E–SERIES COMPONENTS

RF Signal Processing Devices

M/A-COM's Expertise spans the spectrum... dc through millimeter wave

At M/A-COM, core technologies include material fabrication and processing, circuit design and high volume production.

Materials expertise includes silicon and gallium arsenide. Circuit design capability encompasses passive transmission line circuits through complex integrated circuits in monolithics and hybrid technologies. The latest high volume production techniques are applied to wafers, chips and integrated circuits. This combined with our extensive packaging experience in ceramics and plastics, provides dramatic cost efficiencies.

You'll find our products in commercial applications like cellular telephones, wireless LANs, advanced automotive electronics, and satellite and navigation systems. You'll find us in defense applications too, like radars, missile systems, EW and surveillance. You'll find M/A-COM wherever RF, microwave or millimeter wave expertise and quality manufacturing is critical.

Semiconductors
- Diodes
- Silicon and GaAs Wafers
- Transistors
- MMIC

Control Components
- PIN Diode/GaAsFET
  - Switches
  - Attenuators
  - Phase Shifters
  - Limiters
- E/M Switches
- Receiver Protectors

Sources
- VCO
- Gunn
- Transceivers
- Transistor
- Synthesizers
- YIG Tuned

Amplifiers
- Low Noise
- Small Signal
- Linearized/Power
- Gain Blocks

Receiver Components
- Mixers
- LNAs
- Discriminators
- Detectors
- DLVAs

Antennas
- Horns
- Slot
- GPS
- CNI
- Feeds
- Spirals
- ECM
- Wireless

Passive Components
- Isolators
- Circulators
- Filter Assemblies
- Waveguide Ferrite
- Couplers
- Dividers
- Transformers
- Attenuators
- Terminations
- Rotary Joint

Integrated Assemblies
- RF, Microwave and Millimeter Wave

Cable Assemblies
- High Performance
- CNI
- EW
- Delay Lines
- Test/Instrument
- Fiber Optic

Connectors
- Standard
- Miniature
- Microminiature
- Blind Mate
- Surface Mount
- Millimeter Wave
- Fiber Optic

GaAs Materials
- Substrates
- Wafers
- Bulk

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How to Order
Please specify the M/A-COM model number. If special features are required please describe them completely. When ordering parts on Tape and Reel add 'TR' after part number.

Your local M/A-COM Sales Office or nearest representative is your contact for Sales and Service assistance for the products listed in this catalog.

In addition, many of these products are available directly from stocking distributors. For the name of your locally authorised stocking distributor, call your local M/A-COM Sales Office, representative or contact the Microelectronics Division directly. A listing of M/A-COM sales offices, representatives and distributors is located at the back of this catalog.

Terms:
F.O.B. Origin, Net 30 days if credit has been extended; otherwise shipments will be made on a prepaid or C.O.D. basis at M/A-COM's discretion. Prices are subject to change without notice.

Specifications:
Specifications may change or products may be discontinued at M/A-COM's discretion without prior notice.

Warranty:
M/A-COM warrants the products listed in this publication to be free from defects in materials and workmanship under conditions of normal use. If within 5 years after delivery to the original owner and after prepaid return by the original owner any M/A-COM product listed in the publication is found to be defective, then M/A-COM shall, at its option, repair or replace said defective product. This warranty does not apply to products which have been disassembled, modified, or subjected to conditions exceeding the applicable specifications or ratings.

M/A-COM reserves the right to make design changes without notice on any of its products without any obligations to make same or similar changes to products previously purchased. In no event does M/A-COM assume liability for installation labour or for consequential damages. This warranty is the extent of the obligation or liability assumed by M/A-COM with respect to its products, and no other warranty or guarantee is either expressed or implied.

Notice:
The information in this catalog has been carefully reviewed; no responsibility, however, is assumed for any inaccuracies or errors. This information does not convey to the purchaser or user of any product listed in this catalog any license under any patent, copyright, mask work, trade secret, or other intellectual property. M/A-COM, Inc., and its affiliates reserve the right to change any specification, designs, models and other information contained herein without notice.

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A principal factor in the performance of an organisation is the quality of its products or services. There is a world-wide trend towards more stringent customer expectations with regard to quality. This has led to the development of quality system standards and guidelines that complement relevant product or service requirements given in the technical specifications. The series of International Standards (ISO 9000 to ISO9004 inclusive) embodies a rationalisation of the many and various national approaches in this sphere.

The quality system of an organisation is influenced by the objectives of the organisation. Our objectives are laid out in the Quality Policy below.

Quality Policy

M/A-COM Eurotec Operations is committed to providing products and services which consistently meet or exceed the expectations of our customers. We are looking towards the goal of becoming a "World Class Manufacturer" and be the very best in our area of operation.

Each and every individual at Eurotec has the responsibility of continuously improving quality on a daily basis. We are striving to identify and eliminate error and waste in all products and processes.

M/A-COM Eurotec Operations will ensure continuous improvement in our quality by using the latest philosophies and techniques such as Statistical Process Control (SPC), Work Cells, World Class Manufacturing and the Implementation of ISO-9001.

NSAI

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Performance

All E-Series products are designed, developed and manufactured to meet or exceed published specifications over the operating temperature of -54°C to +100°C after being subjected to any or all of the following physical or environmental tests which are applicable.

Temperature Cycling	-65°C to +125°C
Low Air Pressure	656,000 feet) 9.4 x 10^{-8} in. Mercury
Humidity	93% RH, 40°C, 4-56 days
Thermal Shock	-65°C to +125°C
Seal	less than 10^{-5} Atm cc/s
Free Fall Drop	random 45 min.
Vibration	2 to 2000cps, 20g, 12hrs.
Solder Heat	260°C, 10s
Solderability	95% coverage
Terminal Tensile Strength	2kg, 10s
Terminal Fatigue	1kg, 3 cycles
Mechanical Shock	100g, 6ms
Solvent Resistance	alchohol, trichlorethane, freon

These products are manufactured in a facility that is ISO 9001 qualified.

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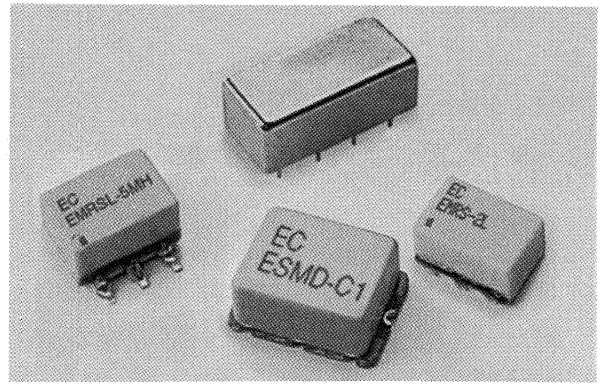
Mixers



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Mixer Selection Guide

LEVEL 1 (+1 dBm LO, up to -3 dBm RF)

Model No.	Frequency MHz		Conversion Loss dB		LO - RF Isolation dB			LO - IF Isolation dB			Case Style	Price $ Qty. (1-9)	Page No.
	LO/RF fL - fu	IF	Mid Typ.	Total Typ.	L Typ.	M Typ.	U Typ.	L Typ.	M Typ.	U Typ.			
ESMD-C1X8	800-1000	DC-200	7	7	30	30	30	25	25	25	SM-32	8.50	1-17

LEVEL 3 (+3 dBm LO, up to -1 dBm RF)

Model No.	Frequency MHz		Conversion Loss dB		LO - RF Isolation dB			LO - IF Isolation dB			Case Style	Price $ Qty. (1-9)	Page No.
	LO/RF fL - fu	IF	Mid Typ.	Total Typ.	L Typ.	M Typ.	U Typ.	L Typ.	M Typ.	U Typ.			
EMA-1L	0.5-500	DC-500	5.5	6.5	50	45	35	45	40	30	R-1	12.11	1-144
EMS-1XL	10-1000	5-500	6	7	50	40	30	50	40	35	R-1	5.81	1-145
EMA-2000L	100-2000	DC-600	6	7	37	37	37	30	30	30	R-1	26.96	1-146
EMT-2L	1-1000	DC-1000	6	7	50	40	30	45	35	25	R-3	6.71	1-147
EMRS-1L	0.5-500	DC-500	7	7.5	55	33	27	55	30	24	SM-1	5.63	1-148
EMRS-2L	5-1000	DC-1000	6.5	7.5	60	40	25	55	30	20	SM-1	6.26	1-149
EMRS-5L	5-1500	DC-1000	6.5	7.5	60	40	30	55	30	15	SM-1	12.56	1-150
EMRS-11L	5-2000	10-600	8.5	9.5	50	35	30	45	30	25	SM-1	17.96	1-151
EMRS-95L	935-960	45	6	6	25	25	25	18	18	18	SM-1	10.30	1-154
EMRS-5LX	935-960	80	7.5	7.5	25	25	25	30	30	30	SM-1	12.56	1-152
ESMD-C3L	20-2500	20-600	8	9	45	30	30	40	25	25	SM-2	10.30	1-156
EMRSL-1L	0.5-500	DC-500	5.5	6.2	55	33	27	55	30	24	SM-24	5.63	1-157
EMRSL-2L	5-1000	DC-1000	6.5	7.5	60	40	25	55	30	20	SM-24	6.26	1-158
EMRSL-5L	5-1500	DC-1000	6.5	7.5	60	40	30	55	30	15	SM-24	12.56	1-159

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Mixer Selection Guide

LEVEL 7 (+7 dBm LO, up to +1 dBm RF)

Model No.	Frequency MHz		Conversion Loss dB		LO - RF Isolation dB			LO - IF Isolation dB			Case Style	Price $ Qty. (1-9)	Page No.
	LO/RF fL - fu	IF	Mid Typ.	Total Typ.	L Typ.	M Typ.	U Typ.	L Typ.	M Typ.	U Typ.			
EMAZ-1	0.5-500	DC-500	5.5	6.5	50	45	35	45	40	30	C-9	39.56	1-160
EMAZ-2	1-1000	0.5-500	5.5	6.5	45	35	30	45	35	30	C-9	39.56	1-161
EMD-113	5-1000	DC-1000	5.8	6	50	40	35	50	40	30	FP-2	15.26	1-162
EMD-156	600-3000	DC-1000	See	Datasheet	See	Data	Sheet	See	Data	Sheet	FP-2	40.46	1-163
EMA-6	0.003-100	DC-100	5.5	6.5	60	45	35	60	40	30	R-1	22.46	1-165
EMS-3	0.025-200	DC-200	5.5	6	55	45	35	45	40	30	R-1	6.71	1-166
EMS-1-1	0.1-400	DC-400	5.5	6	50	45	35	45	40	30	R-1	6.71	1-167
EMA-1-1	0.1-500	DC-500	5.5	6.5	50	45	35	45	40	30	R-1	13.46	1-168
EMA-1	0.5-500	DC-500	5.5	6.5	50	45	35	45	40	30	R-1	12.10	1-169
EMA-1S	0.5-500	DC-500	6	6.5	45	40	30	40	35	30	R-1	12.10	1-170
EMA-2	1-1000	0.5-500	5.5	6.5	45	35	30	45	30	30	R-1	14.36	1-171
EMS-1	1-500	DC-500	5.5	6.5	60	45	40	45	40	30	R-1	4.28	1-175
EMS-1N	1-500	DC-500	5.5	6.5	60	45	40	45	40	30	R-1	4.28	1-174
EMS-1S	1-500	DC-500	5.5	6.5	60	45	40	45	40	30	R-1	4.28	1-172
EMS-505	1-500	DC-500	5.5	6.5	60	45	40	45	40	30	R-1	4.28	1-173
EMA-1W	1-750	DC-750	5.5	7.5	50	45	35	45	40	30	R-1	14.36	1-176
EMS-1X7	10-1000	5-500	7.5	7.5	40	30	20	45	35	25	R-1	5.81	1-179
EMS-1X	10-1000	5-500	6	7	50	40	30	50	40	35	R-1	5.81	1-178
EMS-1Z	10-1000	10-1000	6.5	7	50	35	25	40	25	19	R-1	6.71	1-180
EMS-505X	10-1000	5-500	6	7	50	40	30	50	40	35	R-1	5.81	1-177
EMS-800F	10-800	DC-800	6.5	7	50	40	35	45	35	27	R-1	8.95	1-181
EMA-2000	100-2000	DC-600	6	7	37	37	37	30	30	30	R-1	19.76	1-182
EMA-C3	20-2500	20-600	-	7.5	35	35	35	30	30	30	R-1	20.66	1-183
EMA-2CM	5-1000	DC-1000	6	6.5	60	35	30	50	30	25	R-1	13.46	1-184
EMA-4	5-1250	0.5-500	5.5	6.5	50	40	30	50	40	30	R-1	16.16	1-185
EMA-5	5-1500	10-600	7	7.5	50	35	30	45	30	25	R-1	22.46	1-186
EMS-11	5-2000	10-600	7	7.5	50	35	30	45	30	25	R-1	17.96	1-187
EMA-11	5-2000	10-600	7	7.5	50	35	30	45	30	20	R-1	18.86	1-188
EML-1	5-500	DC-500	5.5	6.5	50	45	35	45	40	30	R-1	5.81	1-192
EMD-108	5-500	DC-500	See	Datasheet	See	Data	Sheet	See	Data	Sheet	R-1	5.81	1-190
EMS-500	5-500	DC-500	6	7	50	45	35	45	40	30	R-1	8.96	1-189
EMA-3500	500-3500	DC-1000	7.5	7.5	30	30	30	20	20	20	R-1	26.06	1-193
EMA-2400	750-2400	DC-400	6.7	6.7	30	30	30	30	30	30	R-1	20.66	1-194
EMA-12	800-1250	50-90	6	6	35	35	35	30	30	30	R-1	26.96	1-195
ETUF-3SM	0.15-400	DC-400	4.7	5.5	60	46	35	60	47	35	R-15	5.49	1-196
ETUF-11ASM	1400-1900	40-500	6.8	7	33	33	33	29	29	29	R-15	15.26	1-197
ETUF-1SM	2-600	DC-600	5.8	6.2	60	42	37	60	47	36	R-15	3.83	1-198
ETUF-5SM	20-1500	DC-1000	6.5	7	55	35	35	40	25	22	R-15	8.51	1-199
ETUF-2SM	50-1000	DC-1000	5.8	6.5	55	37	33	50	40	35	R-15	3.83	1-200
ETUF-860SM	800-1050	DC-250	6.6	6.6	30	30	30	28	28	28	R-15	8.51	1-201

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Mixer Selection Guide

LEVEL 7 (+7 dBm LO, up to +1 dBm RF)

Model No.	Frequency MHz		Conversion Loss dB		LO - RF Isolation dB			LO - IF Isolation dB			Case Style	Price $	Page No.
	LO/RF fL - fu	IF	Mid Typ.	Total Typ.	L Typ.	M Typ.	U Typ.	L Typ.	M Typ.	U Typ.		Qty. (1-9)	
EMA-8	0.0005-10	DC-10	5.5	6.5	60	50	45	60	50	45	R-2	26.96	1-202
EMA-3	0.025-200	DC-200	5.5	6.5	60	45	35	45	40	30	R-2	14.36	1-203
EMT-3	0.04-400	DC-400	5.3	6	60	50	35	55	45	35	R-3	19.31	1-204
ETUF-3	0.15-400	DC-400	4.7	5.5	60	46	35	60	47	35	R-3	5.49	1-205
EMT-2	1-1000	DC-1000	6	7	50	40	30	45	35	25	R-3	12.56	1-206
ETUF-11A	1400-1900	40-500	6.8	7	33	33	33	29	29	29	R-3	15.26	1-207
ETUF-1	2-600	DC-600	5.8	6.2	60	42	37	60	47	36	R-3	3.83	1-208
ETUF-5	20-1500	DC-1000	6.5	7	55	35	35	40	25	22	R-3	8.51	1-209
EMT-4	5-1250	DC-1250	6	7.5	50	40	30	45	35	25	R-3	21.11	1-210
EMT-5	5-1500	DC-1000	6.5	8	60	35	30	60	35	25	R-3	21.11	1-211
ETUF-2	50-1000	DC-1000	5.8	6.5	55	37	33	50	40	35	R-3	3.83	1-212
ETUF-860	800-1050	DC-250	6.6	6.6	30	30	30	28	28	28	R-3	8.51	1-213
EMT-12	800-1250	50-90	-	6	35	35	35	30	30	30	R-3	41.71	1-214
EMT-27X	800-2700	DC-400	-	8	30	30	30	25	25	25	R-3	26.06	1-216
EMT-27	800-2700	DC-400	-	8	30	30	30	25	25	25	R-3	26.06	1-215
EMT-11	1-2000	5-600	7	7.5	50	35	25	45	27	25	R-4	41.71	1-217
EMT-2400	750-2400	DC-400	6.5	6.5	30	30	30	30	30	30	R-4	26.06	1-218
EMK-5	0.01-250	DC-250	5.5	6.5	60	50	40	55	45	35	R-5	18.86	1-219
EMK-6	0.5-600	DC-600	5.5	6.5	60	50	40	55	45	30	R-5	18.86	1-220
EMK-7	2-1000	5-500	5.5	6.5	45	35	30	45	35	30	R-5	18.86	1-221
EMM-3	0.1-500	DC-500	5.5	6.5	60	50	35	50	45	30	R-6	17.96	1-222
EMM-2	1-1000	DC-1000	6	7	55	40	35	50	40	30	R-6	18.41	1-223
EMM-1	1-600	DC-600	5.5	6.5	55	45	35	50	40	30	R-6	15.26	1-224
EMM-4	5-1250	0.5-1000	6.5	6.5	55	35	30	50	35	30	R-6	21.56	1-225
EMM-5	5-1500	0.5-1000	6.5	6.5	55	35	30	50	35	30	R-6	26.96	1-226
EMTS-3	0.1-500	DC-500	5.3	6.5	60	50	35	55	45	35	R-7	19.76	1-227
EMTS-2	1-1000	DC-1000	6	7	55	40	35	50	40	25	R-7	18.86	1-228
EMTS-1	1-600	DC-600	6	6.5	60	45	35	55	40	35	R-7	17.96	1-229
EMTS-5	5-1500	DC-1000	6.5	8	60	35	30	60	35	25	R-7	25.16	1-230
EMRS-6X5	925-960	880-915	-	7	35	35	35	30	30	30	SM-1	12.56	1-231
EMRS-1	0.5-500	DC-500	5.5	6.2	55	33	27	55	30	24	SM-1	5.53	1-232
EMRS-2D	10-1000	DC-1000	6.8	7.5	59	40	33	55	40	30	SM-1	6.53	1-233
EMRS-2U	10-1000	10-750	6.5	7.5	55	40	30	55	35	30	SM-1	10.30	1-234
EMRS-11A	1500-1900	40-400	7	7	25	25	25	23	23	23	SM-1	15.26	1-235
EMRS-6X6	1805-1880	1710-1785	-	9.5	35	35	35	30	30	30	SM-1	14.36	1-236
EMRS-1W	2-750	DC-750	6.5	6.5	65	35	32	50	40	30	SM-1	6.08	1-237
EMRS-11F	350-2000	DC-400	See	Datasheet	See	Data	Sheet	See	Data	Sheet	SM-1	4.91	1-238

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LEVEL 7 (+7 dBm LO, up to +1 dBm RF)

Model No.	Frequency MHz LO/RF fL - fu	IF	Conversion Loss dB Mid Typ.	Total Typ.	LO - RF Isolation dB L Typ.	M Typ.	U Typ.	LO - IF Isolation dB L Typ.	M Typ.	U Typ.	Case Style	Price $ Qty. (1-9)	Page No.
EMRS-2	5-1000	DC-1000	6.5	7	60	40	25	55	30	20	SM-1	6.26	1-240
EMRS-5	5-1500	DC-1000	6.5	7.5	60	40	30	55	30	15	SM-1	12.56	1-241
EMRS-11X	5-1900	5-1000	7.2	7.4	50	35	27	56	37	27	SM-1	3.92	1-242
EMRS-11	5-2000	10-600	7	7.5	50	35	30	45	30	25	SM-1	17.96	1-243
EMRS-860	800-1050	DC-250	5.5	5.5	36	36	36	24	24	24	SM-1	10.30	1-244
EMRS-95	900-1100	40-400	5.5	5.5	25	25	25	18	18	18	SM-1	10.30	1-245
ESMD-C1	1-1000	DC-1000	6.5	7.5	60	45	40	60	35	30	SM-2	7.16	1-246
ESMD-C4	15-2000	DC-1500	7	8	50	30	20	50	20	20	SM-2	8.96	1-247
ESMD-C2	20-1500	DC-1500	7	8.5	50	35	20	40	25	15	SM-2	8.06	1-248
ESMD-C3	20-2500	20-600	8	9	45	30	30	40	25	25	SM-2	8.96	1-249
ESMD-27	800-2700	DC-400	8	8	30	30	30	25	25	25	SM-2	8.96	1-250
EMRS-1A	0.5-500	DC-500	5.5	6.2	55	33	27	55	30	24	SM-23	5.63	1-251
EMRSL-1	0.5-500	DC-500	5.5	6.2	55	33	27	55	30	24	SM-24	5.85	1-252
EMRSL-2D	10-1000	DC-1000	6.8	7.5	59	40	33	55	40	30	SM-24	6.53	1-253
EMRSL-2U	10-1000	10-750	6.5	7.5	55	40	30	55	35	30	SM-24	10.30	1-254
EMRSL-11A	1500-1900	40-400	9	9	25	25	25	23	23	23	SM-24	15.26	1-255
EMRSL-1W	2-750	DC-750	6.5	6.5	65	35	32	50	40	30	SM-24	6.08	1-256
EMRSL-2	5-1000	DC-1000	6.5	7	60	40	25	55	30	20	SM-24	6.08	1-257
EMRSL-5	5-1500	DC-1000	6.5	7.5	60	40	30	55	30	15	SM-24	12.56	1-258
EMRSL-11	5-2000	10-600	7	7.5	50	35	30	45	30	25	SM-24	17.96	1-259
EMRSL-860	800-1050	DC-250	5.5	5.5	36	36	36	24	24	24	SM-24	10.30	1-260
ESCM-1	1-500	DC-500	6	6.5	60	45	40	55	45	40	SM-3	3.83	1-261
ESCM-2	5-1000	DC-500	6	7	50	40	35	55	40	30	SM-3	4.91	1-262
ESCM-2500	500-2500	DC-500	6.9	10	35	35	35	18	18	18	SM-3	10.30	1-263
ESMD-C2A	20-1500	DC-1500	7	8.5	50	35	20	40	25	15	SM-32	23.36	1-264
EMRS-30	200-3000	DC-1000	7.5	7.5	24	24	24	20	20	20	SM-41	6.65	1-265
EMRS-1C	00.5-500	DC-500	-	6.9	20	20	20	20	20	20	SM-44	5.63	1-266
EASK-2	1-1000	DC-1000	7	7.5	60	35	26	50	25	15	SM-5	7.43	1-268
EASK-1	1-600	DC-600	5.5	6	50	35	30	45	30	25	SM-5	6.26	1-269

Distributor stock item.

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Mixer Selection Guide

LEVEL 10 (+10 dBm LO, up to +5 dBm RF)

Model No.	Frequency MHz		Conversion Loss dB		LO - RF Isolation dB			LO - IF Isolation dB			Case Style	Price $	Page No.
	LO/RF fL - fu	IF	Mid Typ.	Total Typ.	L Typ.	M Typ.	U Typ.	L Typ.	M Typ.	U Typ.		Qty. (1-9)	
EMA-220	0.05-2000	0.05-2000	6	7	25	40	30	25	40	25	R-1	28.76	1-18
EMS-1XLH	10-1000	5-500	6	6.5	50	40	30	70	55	45	R-1	6.71	1-19
EMA-15	10-2500	10-1000	7	7.5	55	45	35	35	30	27	R-1	26.96	1-20
EMS-2LH	5-1000	DC-1000	6	7	67	61	57	68	54	43	R-1	7.16	1-21
ETUF-2LHSM	50-1000	DC-1000	5.7	6.5	55	44	38	60	50	34	R-15	6.48	1-22
EMA-2CR	10-1000	5-500	5.5	7	50	40	30	40	30	25	R-2	16.16	1-23
EMT-2LH	2-1000	DC-1000	5.7	6.5	62	44	37	58	45	31	R-3	15.26	1-24
ETUF-2LH	50-1000	DC-1000	5.7	6.5	55	44	38	60	50	34	R-3	6.48	1-25
EMT-150	10-2000	DC-1000	6	6.5	32	35	35	33	30	30	R-4	40.91	1-26
EMT-16	10-2500	10-1000	7	7.5	55	45	35	35	30	27	R-4	23.36	1-27
EMT-15	10-3000	10-800	6.3	6.5	35	35	35	30	30	30	R-4	44.96	1-28
EMRS-1LH	0.5-500	DC-500	5.7	6	58	44	30	55	40	28	SM-1	7.16	1-29
EMRS-2LH	5-1000	DC-1000	6.5	7	60	40	25	55	30	20	SM-1	8.06	1-30
EMRS-5LH	5-1500	DC-1000	6.5	7.5	60	40	30	55	30	15	SM-1	13.46	1-31
ESMD-C1LH	1-1000	DC-1000	-	6.5	60	45	40	60	35	30	SM-2	8.06	1-32
ESMD-169	1-3500	5-1500	See	Datasheet	See	Data	Sheet	See	Data	Sheet	SM-2	23.36	1-33
ESMD-C15	10-2000	10-800	6.5	6.5	35	35	35	30	30	30	SM-2	13.61	1-35
ESMD-C21	1710-1880	150-225	6.5	6.5	25	25	25	30	30	30	SM-2	14.36	1-36
ESMD-C3LH	20-2500	20-600	8	9	45	30	30	40	25	25	SM-2	15.26	1-38
EMRSL-5LH	10-1500	DC-900	8	9.8	58	38	25	56	38	17	SM-24	13.46	1-39
EMRSL-1LH	2-500	DC-500	5.7	6	58	44	30	55	40	28	SM-24	7.16	1-40
EMRSL-2LH	5-1000	DC-1000	6.5	7.5	58	39	22	52	30	18	SM-24	12.56	1-41

LEVEL 12 (+12 dBm LO, up to +9 dBm RF)

Model No.	Frequency MHz		Conversion Loss dB		LO - RF Isolation dB			LO - IF Isolation dB			Case Style	Price $	Page No.
	LO/RF fL - fu	IF	Mid Typ.	Total Typ.	L Typ.	M Typ.	U Typ.	L Typ.	M Typ.	U Typ.		Qty. (1-9)	
EMT-2X8	1-1000	DC-1000	6	7	50	40	30	45	35	25	R-3	22.46	1-42

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Mixer Selection Guide

LEVEL 13 (+13 dBm LO, up to +9 dBm RF)

Model No.	Frequency MHz LO/RF fL - fu	IF	Conversion Loss dB Mid Typ.	Total Typ.	LO - RF Isolation dB L Typ.	M Typ.	U Typ.	LO - IF Isolation dB L Typ.	M Typ.	U Typ.	Case Style	Price $ Qty. (1-9)	Page No.
EMA-3MH	0.025-200	DC-200	4.8	5.5	74	45	38	67	45	36	R-1	15.26	1-44
EMA-1MH	0.5-500	DC-500	5	6.7	79	50	40	63	50	37	R-1	13.46	1-45
EMS-1MH	1-500	DC-500	5.5	6.5	50	45	35	45	40	30	R-1	9.41	1-46
EMA-11MH	10-2000	DC-600	7	7.5	40	38	32	35	30	30	R-1	35.06	1-47
EMS-1ZMH	2-1100	DC-500	6.5	7	50	40	30	40	25	25	R-1	11.21	1-48
ETUF-1MHSM	2-600	DC-600	5.5	6.5	68	50	43	65	48	37	R-15	6.53	1-49
ETUF-2MHSM	50-1000	DC-1000	5.5	7	58	47	37	55	47	32	R-15	7.38	1-50
ETUF-860MHSM	800-1050	DC-250	6.8	7	24	24	24	22	22	22	R-15	11.21	1-51
ETUF-3MH	0.15-400	DC-400	5	5.5	60	46	35	60	42	35	R-3	8.96	1-52
EMT-3MH	1-250	DC-250	5	6	50	40	28	45	35	26	R-3	22.46	1-53
EMT-1MH	2-500	DC-500	6	7	50	40	30	45	35	25	R-3	22.46	1-54
ETUF-1MH	2-600	DC-600	5.5	6.5	68	50	43	65	48	37	R-3	7.25	1-55
ETUF-2MH	50-1000	DC-1000	5.5	7	58	47	37	55	47	32	R-3	6.53	1-56
ETUF-860MH	800-1050	DC-250	6.8	7	24	24	24	22	22	22	R-3	11.21	1-57
EMT-12MH	0.5-2000	0.2-600	5.8	7.2	60	30	30	55	30	25	R-4	44.06	1-58
EMT-42MH	10-4200	10-1000	7.3	7.5	35	40	35	35	35	27	R-4	62.96	1-59
EMRS-1MH	2-500	DC-500	5.7	6	58	44	30	55	36	28	SM-1	8.06	1-60
EMRS-2MH	5-1000	DC-1000	6.5	7	60	40	25	55	30	20	SM-1	8.95	1-61
EMRS-5MH	5-1500	DC-1000	6.5	7.5	60	40	30	55	30	15	SM-1	14.36	1-62
EMRS-25MH	5-2500	5-1500	6.3	7.3	45	35	30	40	30	25	SM-1	7.61	1-63
ESMD-C1MH	1-1000	DC-1000	-	6.5	45	45	45	30	30	30	SM-2	8.96	1-64
ESMD-C3MH	20-2500	20-600	8	9	45	30	30	40	25	25	SM-2	16.61	1-65
ESMD-C2HX2-4	380-500	71	7.5	7.5	25	25	25	15	15	15	SM-2	17.96	1-66
ESMD-11MH	50-2000	50-1000	6.6	7.5	55	44	30	40	36	29	SM-2	14.36	1-68
ESMD-C29	880-915	113-116	-	6	33	33	33	35	35	35	SM-2	17.96	1-69
EMRSL-1MH	2-500	DC-500	5.7	6	58	44	30	55	36	28	SM-24	8.06	1-71
EMRSL-2MH	5-1000	DC-1000	6.5	7	60	40	25	55	30	20	SM-24	8.96	1-72
EMRSL-5MH	5-1500	DC-900	6.5	7.5	55	30	25	55	30	15	SM-24	14.36	1-73
EMRS-1MHC	2-500	DC-500	-	8	20	20	20	17	17	17	SM-44	8.06	1-74

LEVEL 15 (+15 dBm LO, up to +14 dBm RF)

Model No.	Frequency MHz LO/RF fL - fu	IF	Conversion Loss dB Mid Typ.	Total Typ.	LO - RF Isolation dB L Typ.	M Typ.	U Typ.	LO - IF Isolation dB L Typ.	M Typ.	U Typ.	Case Style	Price $ Qty. (1-9)	Page No.
ESMD-C2HX2-1	819-915	71	7.5	7.5	25	25	25	15	15	15	SM-2	16.16	1-76

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LEVEL 17 (+17 dBm LO, up to +14 dBm RF)

Model No.	Frequency MHz LO/RF fL - fu	IF	Conversion Loss dB Mid Typ.	Total Typ.	LO - RF Isolation dB L Typ.	M Typ.	U Typ.	LO - IF Isolation dB L Typ.	M Typ.	U Typ.	Case Style	Price $ Qty. (1-9)	Page No.
EMAZ-1H	0.5-500	DC-500	5.5	6.5	50	45	35	45	40	30	C-9	44.06	1-78
EMAZ-2H	2-1000	DC-1000	6	8.5	50	35	35	45	30	25	C-9	53.96	1-79
EMA-1H	0.5-500	DC-500	5.5	6.5	55	45	35	45	40	30	R-1	18.86	1-80
EMA-1HN	0.5-500	DC-500	5.5	6.5	55	45	35	45	40	30	R-1	18.86	1-81
EMS-1H	0.5-500	DC-500	5.5	6.5	55	45	35	45	40	30	R-1	4.91	1-82
EMA-1WH	1-750	DC-750	5.5	6.5	50	45	35	45	40	30	R-1	22.46	1-83
EMA-11H	10-3000	10-1000	8	10	27	25	23	27	25	23	R-1	43.16	1-84
EMA-2H	2-1000	DC-1000	6	8.5	50	35	35	45	30	25	R-1	35.06	1-85
EMS-173H	5-1000	1-1000	6.0	7.0	50	45	40	40	35	35	R-1	18.86	1-86
EMA-173H	5-1200	DC-1200	6	7	40	35	35	40	35	30	R-1	28.76	1-87
EMA-173HXX	750-960	40-80	-	7	25	25	25	20	20	20	R-1	26.96	1-88
EMA-220X	950-1120	130-150	-	8	-	-	30	-	-	30	R-1	28.76	1-90
ETUF-11AHSM	1400-1900	40-500	6.5	6.5	30	30	30	30	30	30	R-15	20.66	1-91
ETUF-1HSM	2-600	DC-600	5.9	6.5	68	50	43	62	48	33	R-15	8.96	1-92
ETUF-5HSM	20-1500	DC-1000	7	8	60	35	30	40	25	20	R-15	13.01	1-93
ETUF-2HSM	50-1000	DC-1000	6.2	8.0	58	47	42	52	44	28	R-15	9.99	1-94
EMA-3H	0.05-200	DC-200	5.5	5.5	50	40	35	45	40	30	R-2	20.66	1-95
EMT-3H	0.1-250	DC-250	5	6	50	40	28	45	35	26	R-3	23.36	1-96
ETUF-3H	0.15-400	DC-400	5	7	66	50	40	53	45	35	R-3	9.99	1-97
ETUF-11AH	1400-1900	40-500	6.5	6.5	30	30	30	30	30	30	R-3	19.76	1-98
EMT-1H	2-500	DC-500	6	7	50	40	30	45	35	25	R-3	23.36	1-99
ETUF-1H	2-600	DC-600	5.9	6.5	68	50	43	62	48	33	R-3	8.96	1-100
ETUF-5H	20-1500	DC-1000	7	8	60	35	30	40	25	20	R-3	13.01	1-101
EMT-2H	5-1000	DC-1000	6.2	7	50	40	30	45	35	25	R-3	33.26	1-102
EMT-4H	5-1200	DC-1200	6.5	7	50	35	30	50	35	30	R-3	35.51	1-103
ETUF-2H	50-1000	DC-1000	6.2	8.0	58	47	42	52	44	28	R-3	9.99	1-104
EMT-15H	800-2000	70-211	6.5	6.5	35	35	35	32	32	32	R-4	33.26	1-105
EMT-16H	890-915	70	7	7	35	35	35	30	30	30	R-4	26.06	1-106
EMK-3H	0.05-300	DC-300	5	6	55	40	30	50	35	25	R-5	21.11	1-108
EMK-1H	2-500	DC-500	6	7	50	40	30	45	35	25	R-5	19.76	1-109
EMK-1WH	5-750	DC-750	6.2	7	50	40	30	45	35	30	R-5	23.36	1-110
EMM-3H	0.1-500	DC-500	7	8	45	25	20	40	20	15	R-6	21.11	1-111
EMRS-1H	0.5-500	DC-500	5.5	6.2	55	33	27	55	30	24	SM-1	9.86	1-112
EMRS-9H	1886-1926	250	9.5	9.5	25	25	25	25	25	25	SM-1	12.56	1-113
EMRS-2H	5-1000	DC-1000	6.5	7	60	40	25	55	30	20	SM-1	10.30	1-115

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Mixer Selection Guide

LEVEL 17 (+17 dBm LO, up to +14 dBm RF)

Model No.	Frequency MHz		Conversion Loss dB		LO - RF Isolation dB			LO - IF Isolation dB			Case Style	Price $ Qty. (1-9)	Page No.
	LO/RF fL - fu	IF	Mid Typ.	Total Typ.	L Typ.	M Typ.	U Typ.	L Typ.	M Typ.	U Typ.			
EMRS-5H	5-1500	DC-1000	6.5	7.5	60	40	30	55	30	15	SM-1	16.16	1-116
EMRS-11H	5-2000	10-600	7	7.5	50	35	30	45	30	25	SM-1	17.96	1-117
EMRS-1HC	5-500	DC-500	-	8.5	25	25	25	25	25	25	SM-1	9.86	1-118
ESMD-C1H	1-1000	DC-1000	6.5	7.5	60	45	40	60	35	30	SM-2	23.36	1-120
ESMD-C2H	20-1500	DC-1500	7	8.5	50	40	20	40	30	15	SM-2	15.26	1-121
ESMD-C3H	20-2500	20-600	8	9	45	30	30	40	25	25	SM-2	17.96	1-122
ESMD-C2HX2-16	20-2900	20-600	6.5	7.5	45	35	25	35	22	17	SM-2	17.96	1-123
ESMD-11H	2000-2700	750	-	9	20	20	20	18	18	18	SM-2	16.16	1-124
ESMD-C2HX2-12	50-2000	50-1950	6	6.5	45	35	32	40	35	26	SM-2	17.96	1-125
ESMD-173HXX	750-960	40-80	7	7	25	25	25	20	20	20	SM-2	17.96	1-126
ESMD-C2HX2	890-915	71	7.5	7.5	25	25	25	15	15	15	SM-2	17.96	1-128
EMRSL-1H	0.5-500	DC-500	5.5	6.2	55	33	27	55	30	24	SM-24	9.86	1-130
EMRS-1800	1600-2300	10-200	-	8.5	28	28	28	24	24	24	SM-24	14.36	1-131
EMRSL-5H	5-1500	DC-1000	6.5	7.5	60	40	30	55	30	15	SM-24	16.16	1-133
EMRSL-1WH	5-750	DC-750	7	7.8	55	43	28	52	38	29	SM-24	10.30	1-134

LEVEL 23 (+23 dBm LO, up to +20 dBm RF)

Model No.	Frequency MHz		Conversion Loss dB		LO - RF Isolation dB			LO - IF Isolation dB			Case Style	Price $ Qty. (1-9)	Page No.
	LO/RF fL - fu	IF	Mid Typ.	Total Typ.	L Typ.	M Typ.	U Typ.	L Typ.	M Typ.	U Typ.			
EMR-3	0.07-200	DC-200	6	6.5	55	40	30	55	40	30	R-1	36.86	1-135
EMR-1	5-500	DC-500	6	7.5	55	40	30	55	40	30	R-1	36.86	1-136
EMR-6	0.03-50	DC-50	5.5	6.5	60	45	35	60	40	30	R-2	47.21	1-137
EBY-2	0.1-1000	0.01-500	5.3	7.5	40	40	30	37	40	25	R-2	61.16	1-138
EBY-1	0.1-500	0.01-500	5.3	5.3	40	46	40	37	46	40	R-2	56.66	1-139
EMR-2	10-1000	DC-1000	8.5	10	50	40	35	50	35	25	R-2	58.01	1-140
ESMD-C2Y	10-2400	5-1000	7.5	8	28	26	25	28	26	25	SM-2	56.66	1-141

Distributor stock item.

Mixer Selection Guide

LEVEL 27 (+27 dBm LO, up to +24 dBm RF)

Model No.	Frequency MHz		Conversion Loss dB		LO - RF Isolation dB			LO - IF Isolation dB			Case Style	Price $	Page No.
	LO/RF fL - fu	IF	Mid Typ.	Total Typ.	L Typ.	M Typ.	U Typ.	L Typ.	M Typ.	U Typ.		Qty. (1-9)	
EVAY-2	10-2500	10-1000	6.5	7	40	30	30	35	30	30	R-1	76.46	1-142
EVAY-1	0.5-500	0.02-500	6	7.5	47	46	35	47	46	35	R-2	76.46	1-143

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Mixer Specifications Checklist

If your particular requirements are not met with a M/A-COM catalog item, please complete the checklist below and mail, phone, or fax it to M/A-COM Eurotec, Sales and Marketing or your local Sales Office.

Application:

Industrial ..... Commercial ..... Other .....
Description: .....
.....
Parameters important for application: .....
.....

Electrical:

Frequency Range
LO from.....to.....MHz RF(I/P or O/P) from.....to.....MHz IF(I/P or O/P) from.....to.....MHz
RF Input Level Max. ..... dBm
RF Input at 1dB compression level ..... dBm
Isolation Min.
LO - RF ..... dB over .....MHz
LO - IF ..... dB over .....MHz
RF - IF ..... dB over .....MHz
3rd Order Intercept Point..... dBm
LO Power available ..... dBm
VSWR or Return Loss
Impedance .....Ω
LO port ..... RF port .....
IF port .....
Conversion Loss Max. .....dB over .....MHz
Two-tone, 3rd Order IM .....dB at .....dBm, RF input each tone.
Harmonic Intermodulation Requirements:
..... x LO by .....x RF by ..... dB below IF.
(State specific single RF and LO frequencies of interest.)

Mechanical:

Standard Case Style: ..... (for outline drawings see Table of Contents)

PC Board Mounting

☐ Plug-in ☐ Surface-Mount

Coaxial Connector

☐ BNC ☐ TNC ☐ Other
☐ SMA ☐ N

Replacement For Existing Model - Manufacturer..... Model.....

Name: ..... Title: .....

Company: ..... Dept: .....

Company Address: .....

Phone: ..... Fax: .....

Mixer Terminology

INTRODUCTION: A mixer converts radio-frequency energy at one frequency to a second frequency. While the most common use for mixers is in the front end of radio receivers (See Figure 1.), where they convert input signals frequencies to a lower "intermediate frequency", mixers are also used in up-converters, modulators, phase detectors, frequency synthesisers, etc.

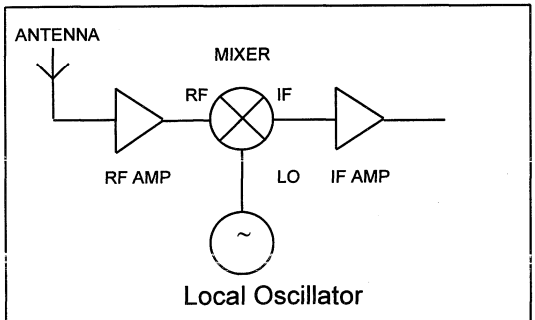


Figure 1: Standard Superheterodyne Radio Receiver Front End

Mixing Action

The mixing action of a mixer arises from two distinct processes acting in tandem. The input signal (designated "RF") is multiplied with a locally generated signal (the local oscillator, "LO"), thus generating two output signals at the sum and difference frequencies. The difference frequency is referred to as the intermediate frequency (IF) frequency.

In a receiver, the sum frequency is normally rejected by a low pass IF filter leaving only the difference. Multiplication, however, is effected using non-linear elements (diodes) and these non-linearities are responsible for the generation of many additional frequencies other than the pure sum and difference frequencies.

Spurious Products

While we would wish all input signal power to be converted without loss to the IF frequency, mathematics tells us that the generation of both sum and difference frequencies is inevitable. Thus, even with an ideal mixer we will necessarily lose half the input signal power (or 3dB) in the mixing process.

Other undesired or spurious products generated as result of diode non-linearities will further increase the amount of signal power lost. In designing M/A-COM mixers, every effort is made to ensure that the generation of such spurious products is kept at a minimum.

Sum and Image Frequencies

We have seen above that an input RF signal and a local oscillator LO signal are multiplied to generate sum and difference IF frequencies. If another input frequency is found that, when mixed with the local oscillator, the correct IF frequency will be generated, then signal or noise power at this frequency will be passed to the mixer IF terminals.

A frequency of 2 x LO - RF is such an input frequency. This particular frequency is called the image frequency (See Figure 2.).

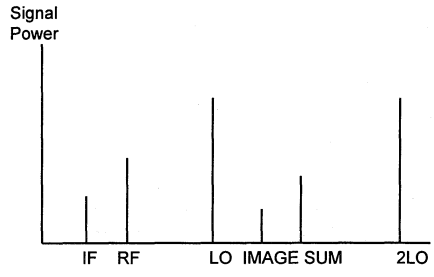


Figure 2: Mixer Frequency Spectrum

Conversion Loss

We have seen above that half the converted power is inevitably lost in the mixing process. Hence this loss (the Single Sideband Conversion Loss) between RF input power and IF output power will have a minimum value of 3 dB. In practice, extra losses due to the generation of spurious products, resistive losses in the diodes, mismatches at the mixer ports, etc., will combine to increase this figure. Careful selection of local oscillator power to bias the diodes at their optimum operating points will minimise mixer conversion loss. All mixers have been designed with optimum diode / LO drive power combinations. Accordingly, our devices always should be operated with the LO drive power specified in this catalog.

Two-Tone Third Order Intercept

The generation of spurious output frequencies in a mixer is the result if using non-linear switching elements. Even for the single input frequency the number of such products that is generated as discernible power levels is quite large. The situation is further exacerbated when the input signal contains multitone components. A figure of merit indicative of the ability of a mixer to suppress such intermodulation products is the "two-tone third order intercept point" (usually measured in dBm). (See Figure 3.)

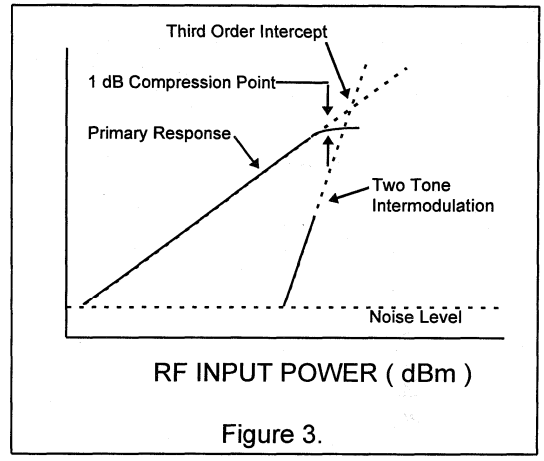


Figure 3.

The hypothetical intercept point is arrived at by extrapolating measured data to suggest an input RF power level at which IF power and intermodulation products would be equal. Mixers with high intercept points generate low intermodulation distortion products.

1 dB Compression Point

The dynamic range of a mixer is the range of input RF power levels (in dBm) for which the mixer produces useful IF output power. Dynamic range is limited at the low end by the noise performance of the mixer devices. When the input power is such as to produce a discernible IF output signal a constant power ratio (equal to the conversion loss) established between input RF power and output IF power.

As input power is increased, a point is reached where this constant power ratio is no longer maintained and conversion loss

begins to increase. When conversion loss has increased by 1dB, the upper limit of the mixers dynamic range is deemed to have been reached and this "1 dB Compression Point" generally delineates the upper level of input power for which the mixer should be used. This catalog contains mixers with 1dB compression points as high as +24dBm.

The 1 dB compression point is tied in closely with the third order intercept point; as a rule of thumb, two-tone third order intercept point is 10 - 15 dB above the 1dB compression point.

Voltage Standing Wave Ratio (VSWR)
Efficient operation of a mixer requires that a maximum signal power transfer be effected at each of the three ports. The degree to which this ideal is met is indicated by the voltage standing wave ratio (VSWR) which quantifies the amount of mismatch at each port. A perfect match of a 50Ω system implies a VSWR of 1:1 while a port with a VSWR of 2:1 means that approximately ten percent of the incident power would be reflected from that port. The importance of minimising mixer VSWR to ensure efficient driving of the diodes and power transfer of RF / IF energies is, therefore, apparent.

Intercept Isolation
All references to the mixer so far have assumed that RF / LO / IF signal powers are present at their respective ports and at no other. In practice, a small portion of the power applied to any port will leak through to the other two ports. This is particularly undesirable in the case of the relatively high level LO signal. The degree to which the LO power is masked from the other two ports is specified by the L - R and L - I isolations (in dB). These are in insertion losses between the respective ports.

Double Balanced Mixers
It is evident from the foregoing that when designing a mixer our goals will be to minimise conversion loss, noise figure, VSWR and the generation of spurious products while maintaining interport isolation, 1 dB compression point and the third order intercept point.

Unfortunately, no single mixer type exists which will simultaneously satisfy all these requirements. The simplest mixer configuration, the "single-ended" mixer, uses a single diode as the switching element. Due to performance, single-ended mixers at frequencies in the RF and low microwave region are unsuitable for general use.

Improved performance is obtained from a "single-balanced" configuration where two diodes are used in a balanced arrangement. However, further significant improvements in intermodulation suppression and dynamic range, as well as low VSWR, conversion loss and noise figure are possible with a "double-balanced" mixer configuration.

This is the optimum configuration for most applications and so is the configuration used in all M/A-COM mixers. Figure 4 shows a typical M/A-COM implementation of a double-balanced mixer configuration. Optimum mixer operation requires the four diodes to have identical characteristics. This requirement is most closely met by a ring quad which contains the four Schottky-barrier ring diodes in a single package. Baluns at mixer ports are carefully designed to match the mixer over the broadest possible frequency ranges.

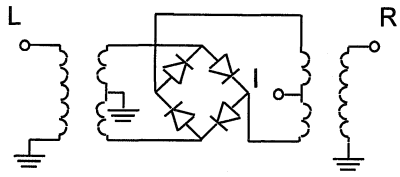


Figure 4: Schematic

Pulse Modulators

The principle of the current controlled attenuator outlined above can be extended to develop a pulse modulator. If the control current is pulsed, the unmodulated input carrier at the LO port will appear at the output RF port as a pulse modulated carrier. Because the switching elements of the mixer are Schottky diodes, very high switching speeds of about 1 nanosecond are possible. Figure 5 shows the functional schematic of a pulse modulator.

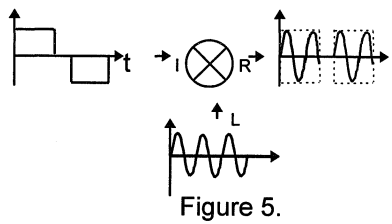


Figure 5.

Phase Detectors

If the signals applied to the RF and LO ports of a mixer have the same frequency, then it can be shown that the resultant IF voltage will be DC and will vary as the cosine of the phase difference between the input signals. Accordingly, a double balanced mixer may be used as a phase detector. Figure 6 shows the fundamental schematic of the phase detector and a plot of the DC output voltage vs. phase difference.

Theoretically, when $\Delta\phi$ is equal to $\pi/2$ the DC voltage at the IF port should be zero. In practice diode imbalance and transformer asymmetry may cause a DC offset. This offset can be counteracted by applying a DC bias to the IF port.

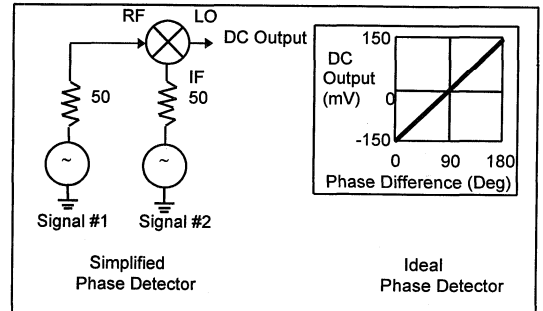


Figure 6: Phase Detector

Quadraphase-Shift-Keying (QPSK) Modulator

A QPSK modulator modulates the phase of a carrier with discrete 0°, 90°, 180° or 270° phase shifts. A functional schematic of such a modulator is shown in Figure 7. The input carrier is passed through a 90° hybrid which provides quadrature signals to double balanced mixers. Control signals to each mixer switch the transmission paths through the diodes causing a 0° or 180° relative phase shift. The mixer outputs are then combined yielding the required four equal amplitude phase states. An output amplifier restores the carrier signal to its original level. (See technical information on I/Q modulators.)

Current Controlled Variable Attenuators
In normal operation, the LO and RF isolation is required to be a maximum. However, in some cases this isolation can be lessened by feeding the IF port with a negative bias current.

In this way a low level variable attenuator with a typical control range of about 50dB can be constructed. With signal input at the LO port and output at the RF port, attenuation is maximum (and equal to LO - RF isolation) at zero bias current. Typically attenuation's as low as 3 dB are attainable with maximum bias current.

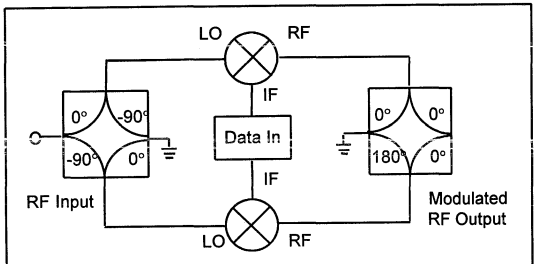


Figure 7 : QPSK Modulator

Glossary of Terms

Conversion Loss (SSB) The ratio of RF input power to the IF output power of one sideband. (Either $F_{LO} - F_{RF}$ or $F_{LO} + F_{RF}$.)

Noise Figure (SSB) The ratio of the signal-to-noise ratio at the mixer input divided by the signal-to-noise ratio of one mixer sideband.

Isolation The amount an input signal is attenuated when measured at another mixer port.

1 dB Compression Point The RF input power that causes a 1dB increase above a mixer's small signal conversion loss.

1 dB Desensitisation Level The RF input level of an interfering signal that causes a mixer's small signal conversion loss to increase by 1 dB.

Harmonic Intermodulation Products
Mixer output signals other than the desired $F_{LO} \pm F_{RF}$ which are harmonically related to either or both of the input signals. (Also termed $N_{LO} \pm M_{RF}$, N x M or "Spurs".)

Two-tone Intermodulation Products
Undesired mixer output products caused by the simultaneous presence of two RF input signals (3rd Order IM consists of [$(2F_{RF1} \pm F_{RF2}) \pm (F_{LO})$] and [$(F_{RF1} \pm 2F_{RF2}) \pm (F_{LO})$].)

DC Polarity The mixer IF voltage polarity, either positive or negative when in phase LO and RF signals are applied.

DC Offset The IF output voltage measured with only the LO operating and the RF terminated in 50 ohms.

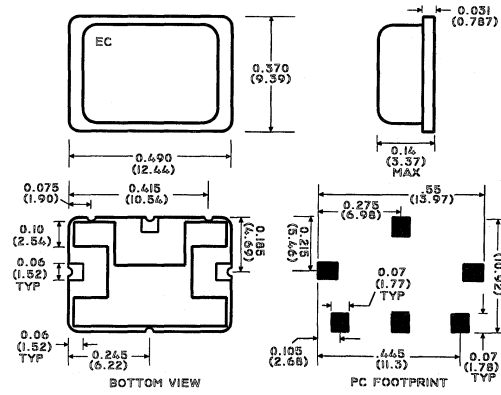
ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
800 - 1000 MHz ESMD-C1X8

Features

* LO Power +1 dBm
* Up to +0 dBm RF
* Surface Mount

SM-32



Specifications @ 25°C

Frequency Range	
RF	800 - 1000 MHz
LO	800 - 1000 MHz
IF	DC - 200 MHz

Conversion Loss (dB)	Typical	Maximum
800 - 1000 MHz	7	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
800 - 1000 MHz	30	25
LO to IF		
800 - 1000 MHz	25	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 0 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	3
IF	1
Ground	4,5
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.05 - 2000 MHz

EMA-220

Features

* LO Power +10 dBm
* Up to +5 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.05 - 2000 MHz
LO	0.05 - 2000 MHz
IF	0.05 - 2000 MHz

Conversion Loss (dB)	Typical	Maximum
0.1 - 1000 MHz	6	8
.05 - 2000 MHz	7	9

Isolation (dB)	Typical	Minimum
LO to RF		
0.05 - 0.5 MHz	25	20
0.5 - 1000 MHz	40	30
1000 - 2000 MHz	30	20
LO to IF		
0.05 - 0.5 MHz	25	20
0.5 - 1000 MHz	40	30
1000 - 2000 MHz	25	15

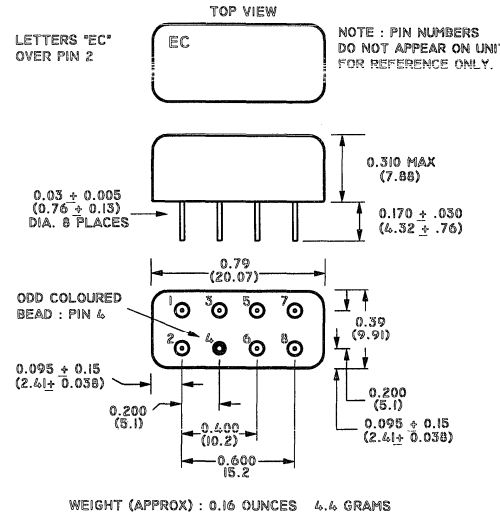
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	4

Specifications Subject to Change Without Notice S 0026 B

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ISO 9001
CERTIFIED

E-Series Plug-In Mixer
10 - 1000 MHz

EMS-1XLH

Features

* LO Power +10 dBm
* Up to +5 dBm RF

Specifications @ 25°C

Frequency Range	
RF	10 - 1000 MHz
LO	10 - 1000 MHz
IF	5 - 500 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 500 MHz	6	7.5
10 - 1000 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 100 MHz	50	40
100 - 500 MHz	40	25
500 - 1000 MHz	30	20
LO to IF		
10 - 100 MHz	70	45
100 - 500 MHz	55	40
500 - 1000 MHz	45	30

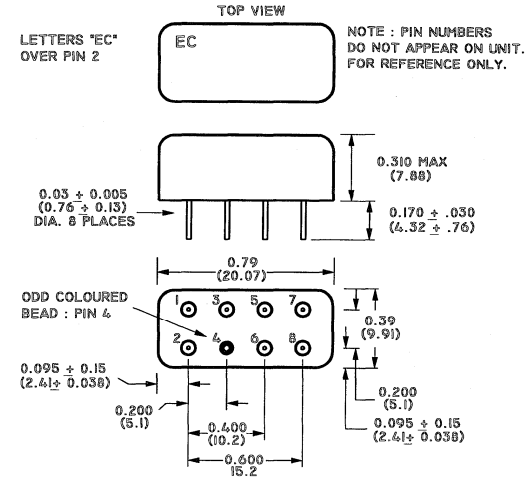
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	3,4
IF	1
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'RF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
10 - 2500 MHz

EMA-15

Features

* LO Power +10 dBm
* Up to +5 dBm RF

Specifications @ 25°C

Frequency Range		
RF		10 - 2500 MHz
LO		10 - 2500 MHz
IF		10 - 1000 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
20 - 1250 MHz	7	8
10 - 2500 MHz	7.5	8.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
10 - 100 MHz	55	35
100 - 1250 MHz	45	30
1250 - 2500 MHz	35	25
LO to IF		
10 - 100 MHz	35	20
100 - 1250 MHz	30	20
1250 - 2500 MHz	27	20

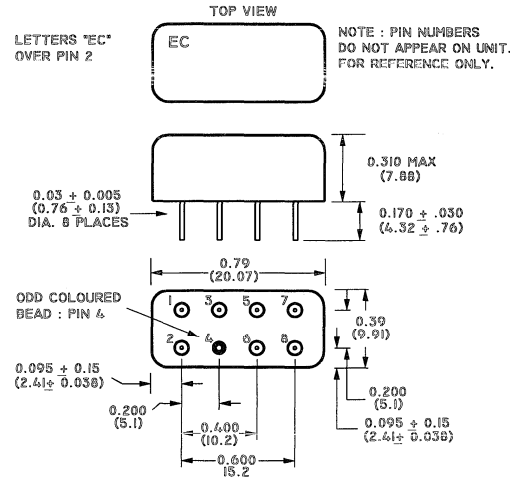
Operating Characteristics

Impedance	**50 Ohms Nominal**
RF input for 1dB Compression	**+ 5 dBm**

Absolute Maximum Ratings

Parameter	**Absolute Maximum**
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	4

ISO 9001
CERTIFIED

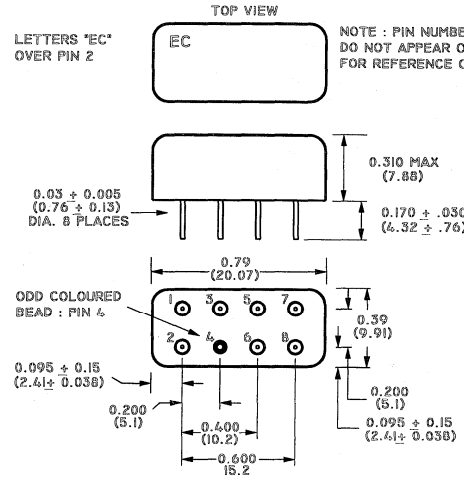
E-Series Plug-In Mixer
5 - 1000 MHz

EMS-2LH

Features

* LO Power +10 dBm
* Up to +5 dBm RF

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Specifications @ 25°C

Frequency Range	
RF	5 - 1000 MHz
LO	5 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 500 MHz	6	7.5
5 - 1000 MHz	7	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	67	45
50 - 500 MHz	61	30
500 - 1000 MHz	57	30
LO to IF		
5 - 50 MHz	68	40
50 - 500 MHz	54	30
500 - 1000 MHz	43	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	7
Case Ground	2,5,6
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

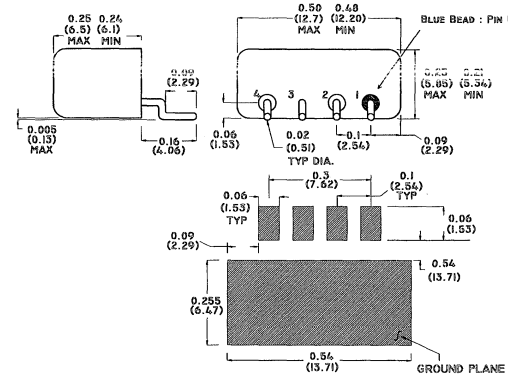
E-Series Plug-In Mixer
50 - 1000 MHz

ETUF-2LHSM

Features

* LO Power +10 dBm
* Up to +5 dBm RF

R-15



Specifications @ 25°C

Frequency Range	
RF	50 - 1000 MHz
LO	50 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
100 - 500 MHz	5.7	7
50 - 1000 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
50 - 500 MHz	55	40
50 - 1000 MHz	44	30
500 - 1000 MHz	38	25
LO to IF		
50 - 500 MHz	60	35
50 - 1000 MHz	50	25
500 - 1000 MHz	34	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
10 - 1000 MHz

EMA-2CR

Features

* LO Power +10 dBm
* Up to +5 dBm RF

Specifications @ 25°C

Frequency Range	
RF	10 - 1000 MHz
LO	10 - 1000 MHz
IF	5 - 500 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 500 MHz	5.5	7.5
10 - 1000 MHz	7	8

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 100 MHz	50	40
100 - 500 MHz	40	30
500 - 1000 MHz	30	20
LO to IF		
10 - 100 MHz	40	25
100 - 500 MHz	30	18
500 - 1000 MHz	25	15

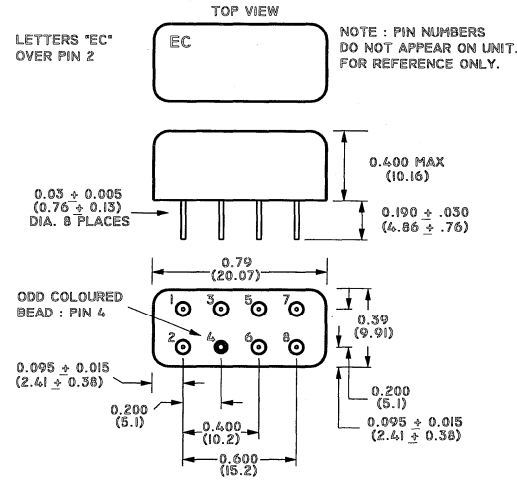
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
LO	1
RF	8
IF	3
Ground	2,5,6,7
Case Ground	2,2,6,7
Unconnected	4

Specifications Subject to Change Without Notice S 0564 B

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ISO 9001
CERTIFIED

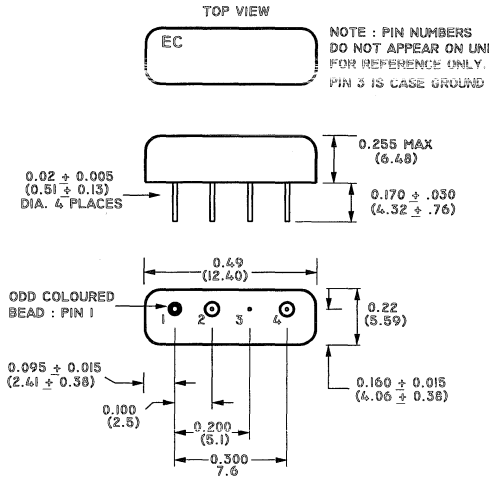
E-Series Plug-In Mixer
2 - 1000 MHz

EMT-2LH

Features

* LO Power +10 dBm
* Up to +5 dBm RF

R-3



WEIGHT (APPROX) : 0.05 OUNCES 1.5 GRAMS

Specifications @ 25°C

Frequency Range		
RF		2 - 1000 MHz
LO		2 - 1000 MHz
IF		DC - 1000 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
4 - 500 MHz	5.7	7.5
2 - 1000 MHz	6.5	9.2
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
2 - 20 MHz	62	45
20 - 500 MHz	44	25
500 - 1000 MHz	37	25
LO to IF		
2 - 20 MHz	58	40
20 - 500 MHz	45	25
500 - 1000 MHz	31	18

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

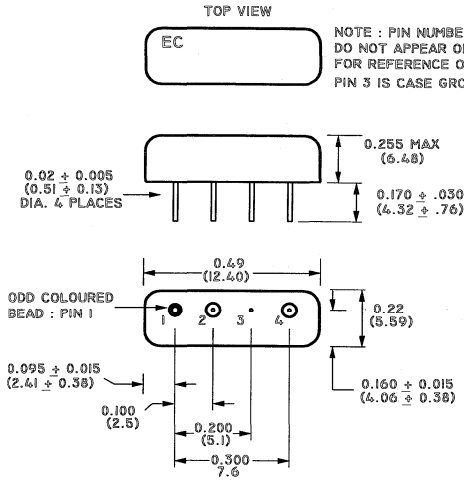
E-Series Plug-In Mixer
50 - 1000 MHz

ETUF-2LH

Features

* LO Power +10 dBm
* Up to +5 dBm RF

R-3



Specifications @ 25°C

Frequency Range	
RF	50 - 1000 MHz
LO	50 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
100 - 500 MHz	5.7	7
50 - 1000 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
50 - 500 MHz	55	40
50 - 1000 MHz	44	30
500 - 1000 MHz	38	25
LO to IF		
50 - 500 MHz	60	35
50 - 1000 MHz	50	25
500 - 1000 MHz	34	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
10 - 2000 MHz

EMT-150

Features

* LO Power +10 dBm
* Up to +5 dBm RF

Specifications @ 25°C

Frequency Range	
RF	10 - 2000 MHz
LO	10 - 2000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 1000 MHz	6	8
10 - 2000 MHz	6.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 100 MHz	32	25
100 - 1000 MHz	35	25
1000 - 2000 MHz	35	25
LO to IF		
10 - 100 MHz	33	20
100 - 1000 MHz	30	20
1000 - 2000 MHz	30	20

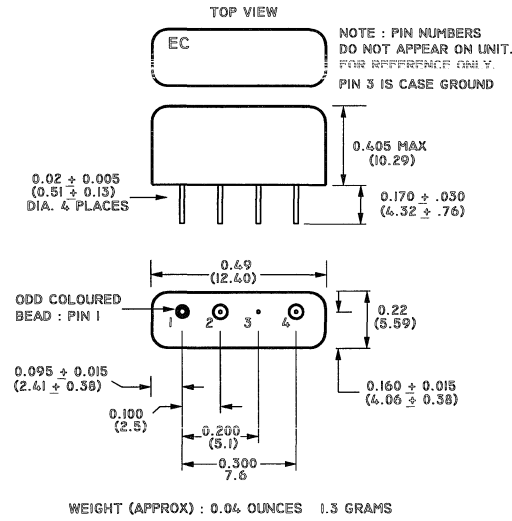
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-4



Function	Pin No.
LO	1
RF	4
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
10 - 2500 MHz

EMT-16

Features

* LO Power +10 dBm
* Up to +5 dBm RF

Specifications @ 25°C

Frequency Range		
RF		10 - 2500 MHz
LO		10 - 2500 MHz
IF		10 - 1000 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
20 - 1250 MHz	7	8
10 - 2500 MHz	7.5	8.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
10 - 100 MHz	55	35
100 - 1250 MHz	45	30
1250 - 2500 MHz	35	25
LO to IF		
10 - 100 MHz	35	20
100 - 1250 MHz	30	20
1250 - 2500 MHz	27	20

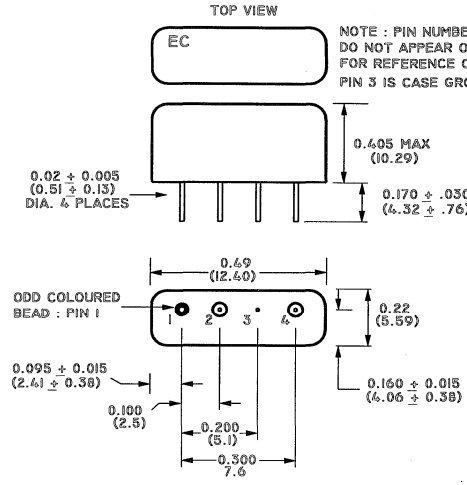
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-4



Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
10 - 3000 MHz

EMT-15

Features

* LO Power + 10 dBm
* Up to + 5 dBm RF

Specifications @ 25°C

Frequency Range	
RF	10 - 3000 MHz
LO	10 - 3000 MHz
IF	10 - 800 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 1500 MHz	6.3	8
10 - 3000 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 3000 MHz	35	25
LO to IF		
10 - 3000 MHz	30	20

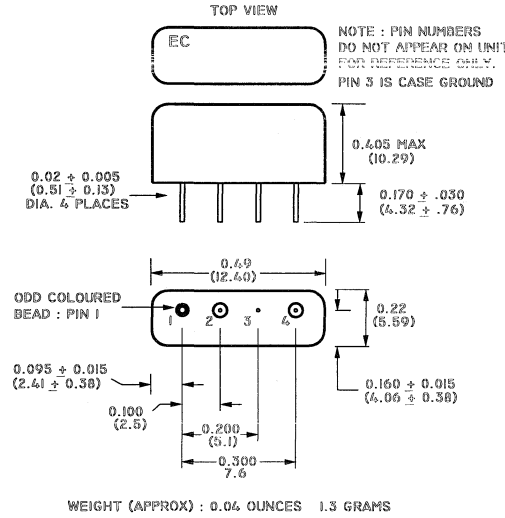
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-4



Function	Pin No.
LO	1
RF	4
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

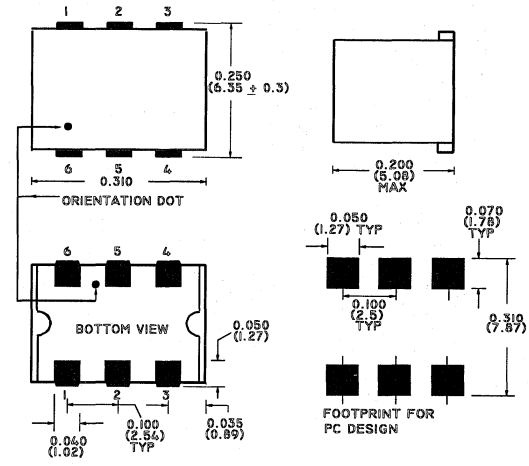
E-Series Surface Mount Mixer
0.5 - 500 MHz

EMRS-1LH

Features

* LO Power +10 dBm
* Up to +5 dBm RF
* Surface Mount

SM-1



Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	5.7	7
.5 - 500 MHz	6	8

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	58	45
5 - 250 MHz	44	25
250 - 500 MHz	30	20
LO to IF		
0.5 - 5 MHz	55	40
5 - 250 MHz	40	25
250 - 500 MHz	28	17

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

The EMRS-1LH is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-1LH

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
5 - 1000 MHz

EMRS-2LH

Features

* LO Power +10 dBm
* Up to +5 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	5 - 1000 MHz
LO	5 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 500 MHz	6.5	8
5 - 1000 MHz	7	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	60	40
50 - 500 MHz	40	20
500 - 1000 MHz	25	18
LO to IF		
5 - 50 MHz	55	30
50 - 500 MHz	30	20
500 - 1000 MHz	20	12

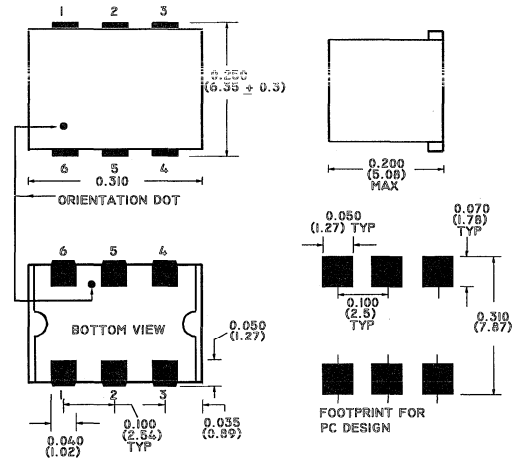
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-2LH is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-2LH

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
5 - 1500 MHz EMRS-5LH

Features

* LO Power + 10 dBm
* Up to + 5 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	5 - 1500 MHz
LO	5 - 1500 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 750 MHz	6.5	7.5
5 - 1500 MHz	7.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	60	40
50 - 750 MHz	40	20
750 - 1500 MHz	30	18
LO to IF		
5 - 50 MHz	55	30
50 - 750 MHz	30	18
750 - 1500 MHz	15	8

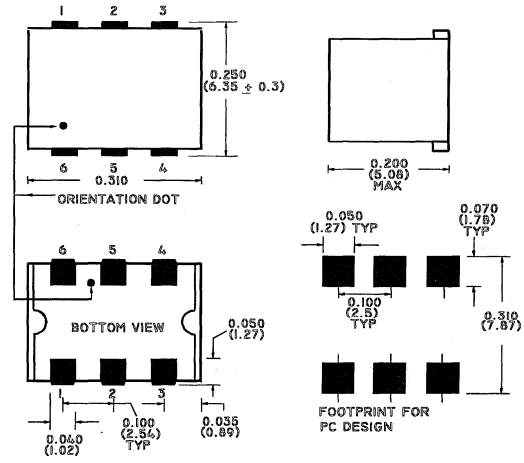
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-5LH is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-5LH

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0077 C

M/A-COM Inc. Cork, Ireland Tel: 353-21-311 266 Fax: 353-21-311 890 See Page 7-26 For Local Office Details
North America Tel: 1-800-366-266 * Europe Tel: +44 (1344) 869 595 * Asia / Pacific Tel: +81 (03) 3226-1671

ISO 9001
CERTIFIED

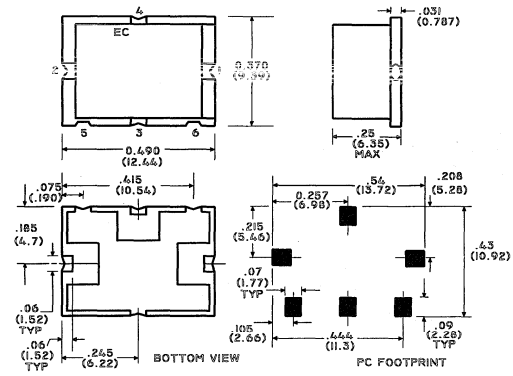
E-Series Surface Mount Mixer
1 - 1000 MHz

ESMD-C1LH

Features

* LO Power +10 dBm
* Up to +10 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	1 - 1000 MHz
LO	1 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 1000 MHz	6.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	60	45
10 - 500 MHz	45	30
500 - 1000 MHz	40	25
LO to IF		
1 - 10 MHz	60	40
10 - 500 MHz	35	23
500 - 1000 MHz	30	15

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 10 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

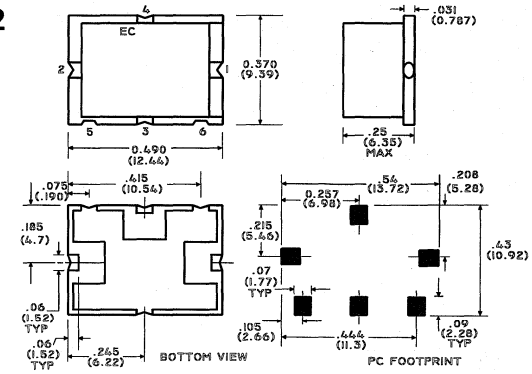
ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
1 - 3500 MHz ESMD-169

Features

* LO Power +10 dBm
* Up to +5 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	1 - 3500 MHz
LO	1 - 3500 MHz
IF	5 - 1500 MHz
Conversion Loss (dB)	
See Additional Specs.	
Isolation (dB)	
See Additional Specs for Details	

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

(Continued to Next Page)

Two Tone Third Order Input Intercept :

Two Tone Intermodulation Ratio
(-10 dBm i/P, each tone & 60 MHz IF)

55 dBc @ 10 MHz
55 dBc @ 500 MHz
56 dBc @ 3000 MHz

Additional Specifications :

Conversion Loss :	Typical	Maximum
5 - 1000 MHz	5.9	7.0
5 - 3000 MHz	7.1	10.0
1 - 3500 MHz	7.5	12.5

LO to RF Isolation :	Typical	Minimum
5 - 1000 MHz	38	30
1 - 3500 MHz	32	15

LO to IF Isolation :	Typical	Minimum
5 - 1000 MHz	38	30
1 - 3500 MHz	34	18

RF to IF Isolation :	Typical	Minimum
10 - 500 MHz	30	20
1 - 3000 MHz	25	15
1 - 3500 MHz	22	15

Typical Midband V.S.W.R. < 2.0 : 1

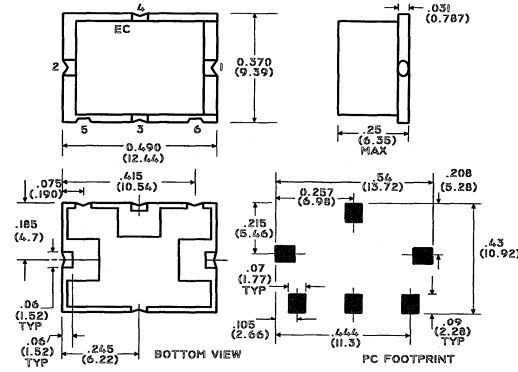
ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
10 - 2000 MHz ESMD-C15

Features

* LO Power +10 dBm
* Up to +5 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	10 - 2000 MHz
LO	10 - 2000 MHz
IF	10 - 800 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 1000 MHz	6.5	8
10 - 2000 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 2000 MHz	35	25
LO to IF		
10 - 2000 MHz	30	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

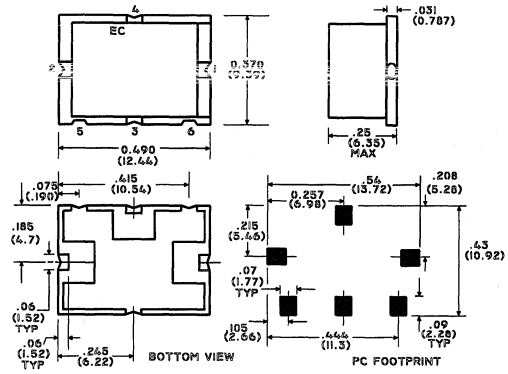
E-Series Surface Mount Mixer
1710 - 1880 MHz

ESMD-C21

Features

* LO Power +10 dBm
* Up to +9 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	1710 - 1880 MHz
LO	1560 - 1655 MHz
IF	150 - 225 MHz

Conversion Loss (dB)	Typical	Maximum
1710 - 1880 MHz	6.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
1560 - 1655 MHz	25	18
LO to IF		
1560 - 1655 MHz	30	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	3
IF	1
Ground	4,5
Case Ground	-
Unconnected	-

Two Tone Third Order Input Intercept :

IIP3 : +17 dBm Typl, +15 dBm Min

Voltage Standing Wave Ratio's :

LO VSWR :	**(Typ)**	**2.8 : 1**
	(Max)	**3.0 : 1**
RF VSWR :	**(Typ)**	**1.8 : 1**
	(Max)	**2.0 : 1**
IF VSWR :	**(Typ)**	**1.5 : 1**
	(Max)	**1.8 : 1**

ISO 9001
CERTIFIED

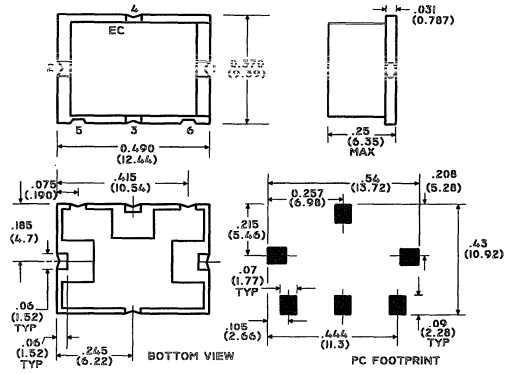
E-Series Surface Mount Mixer
20 - 2500 MHz

ESMD-C3LH

Features

* LO Power +10 dBm
* Up to +5 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	20 - 2500 MHz
LO	20 - 2500 MHz
IF	20 - 600 MHz

Conversion Loss (dB)	Typical	Maximum
40 - 1250 MHz	8	9
20 - 2500 MHz	9	10.5

Isolation (dB)	Typical	Minimum
LO to RF		
20 - 200 MHz	45	30
200 - 1250 MHz	30	23
1250 - 2500 MHz	30	15
LO to IF		
20 - 200 MHz	40	20
200 - 1250 MHz	25	15
1250 - 2500 MHz	25	12

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

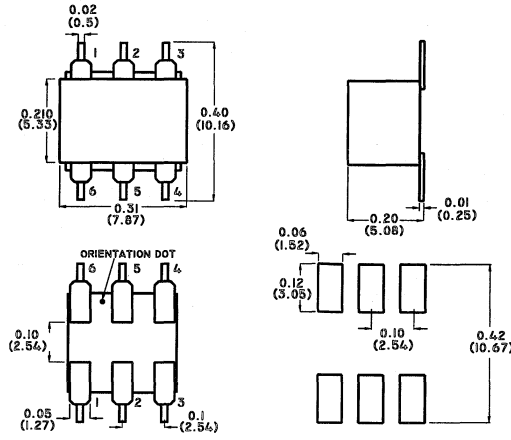
ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
10 - 1500 MHz EMRSL-5LH

Features

* LO Power +10 dBm
* Up to +5 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range	
RF	10 - 1500 MHz
LO	10 - 1500 MHz
IF	DC - 900 MHz

Conversion Loss (dB)	Maximum
20 - 750 MHz	8
10 - 1500 MHz	9.8

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 100 MHz	58	35
100 - 750 MHz	38	20
750 - 1500 MHz	25	18
LO to IF		
10 - 100 MHz	56	30
100 - 750 MHz	38	14
750 - 1500 MHz	17	6

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

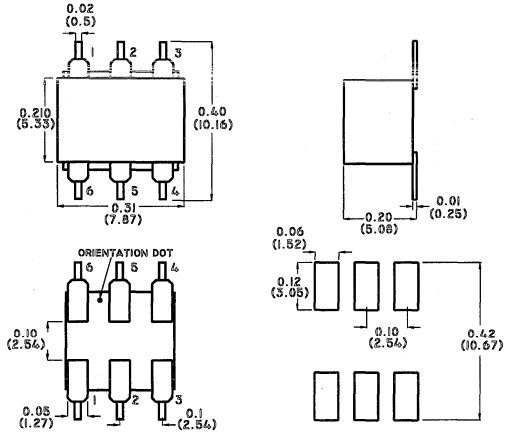
E-Series Surface Mount Mixer
2 - 500 MHz

EMRSL-1LH

Features

* LO Power +10 dBm
* Up to +5 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range		
RF		2 - 500 MHz
LO		2 - 500 MHz
IF		DC - 500 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
4 - 250 MHz	5.7	7
2 - 500 MHz	6	8
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
2 - 20 MHz	58	45
20 - 250 MHz	44	25
250 - 500 MHz	30	20
LO to IF		
2 - 20 MHz	55	40
20 - 250 MHz	40	25
250 - 500 MHz	28	17

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

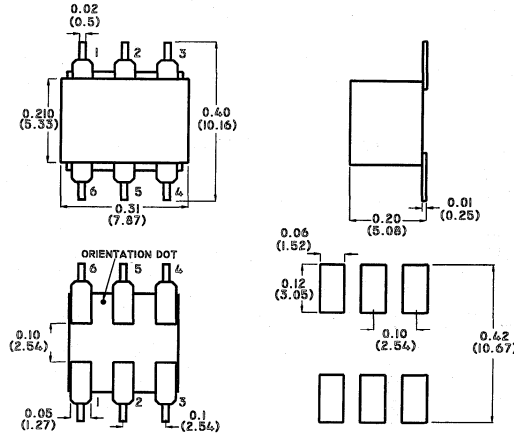
E-Series Surface Mount Mixer
5 - 1000 MHz

EMRSL-2LH

Features

* LO Power +10 dBm
* Up to +5 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range	
RF	5 - 1000 MHz
LO	5 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 500 MHz	6.5	8
5 - 1000 MHz	7.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	58	40
50 - 500 MHz	39	20
500 - 1000 MHz	22	16
LO to IF		
5 - 50 MHz	52	30
50 - 500 MHz	30	17
500 - 1000 MHz	18	11

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 5 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0558 B

ISO 9001
CERTIFIED

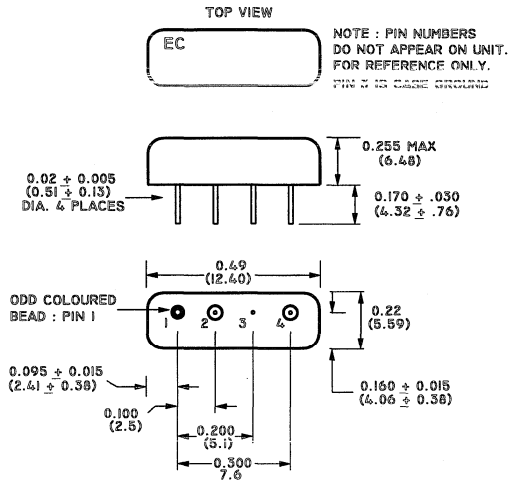
E-Series Plug-In Mixer
1 - 1000 MHz

EMT-2X8

Features

* LO Power +12 dBm
* Up to +9 dBm RF

R-3



Specifications @ 25°C

Frequency Range	
RF	1 - 1000 MHz
LO	1 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 500 MHz	6	7.5
1 - 1000 MHz	7	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	50	45
10 - 500 MHz	40	25
500 - 1000 MHz	30	25
LO to IF		
1 - 10 MHz	45	40
10 - 500 MHz	35	25
500 - 1000 MHz	25	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

Two Tone Third Order Input Intercept :

Test Conditions :

RF1 : 870 MHz @ -10 dBm
RF2 : 871 MHz @ -10 dBm
LO : 810 MHz @ +12 dBm

IIP3 Spec @ 870 MHz
: +19 dBm Typ, +17 dBm Min

Additional Specifications :

Special Conversion Loss Specification :

870 MHz	**:**	**7.0 dB Typical**	**7.5 dB Maximum**

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.025 - 200 MHz

EMA-3MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.025 - 200 MHz
LO	0.025 - 200 MHz
IF	DC - 200 MHz

Conversion Loss (dB)	Typical	Maximum
0.05 - 100 MHz	4.8	7
.025 - 200 MHz	5.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.025 - 0.25 MHz	74	50
0.25 - 100 MHz	45	35
100 - 200 MHz	38	25
LO to IF		
0.025 - 0.25 MHz	67	35
0.25 - 100 MHz	45	30
100 - 200 MHz	36	20

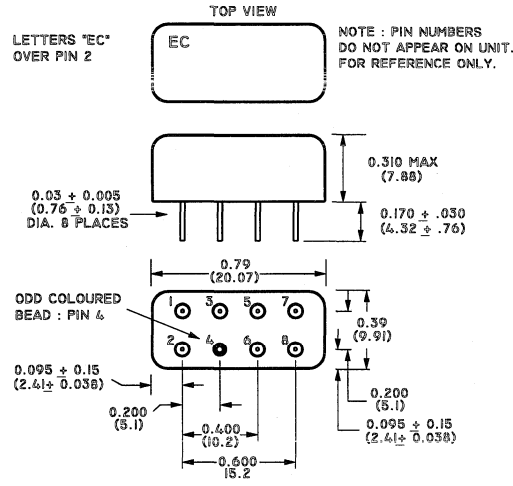
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.5 - 500 MHz

EMA-1MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	5	7
.5 - 500 MHz	6.7	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	79	45
5 - 250 MHz	50	30
250 - 500 MHz	40	25
LO to IF		
0.5 - 5 MHz	63	35
5 - 250 MHz	50	25
250 - 500 MHz	37	30

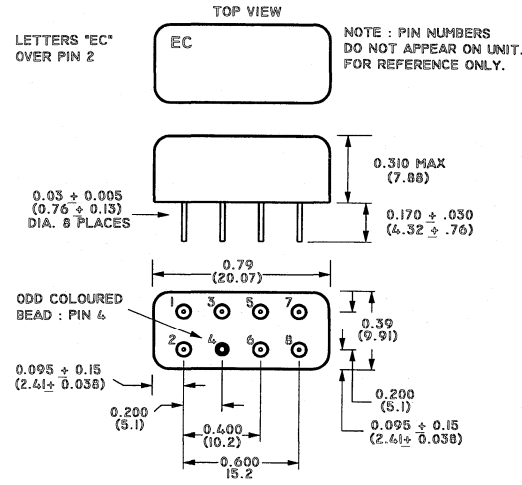
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
1 - 500 MHz

EMS-1MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF

Specifications @ 25°C

Frequency Range	
RF	1 - 500 MHz
LO	1 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 250 MHz	5.5	7.5
1 - 500 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	50	35
10 - 250 MHz	45	30
250 - 500 MHz	35	25
LO to IF		
1 - 10 MHz	45	30
10 - 250 MHz	40	25
250 - 500 MHz	30	20

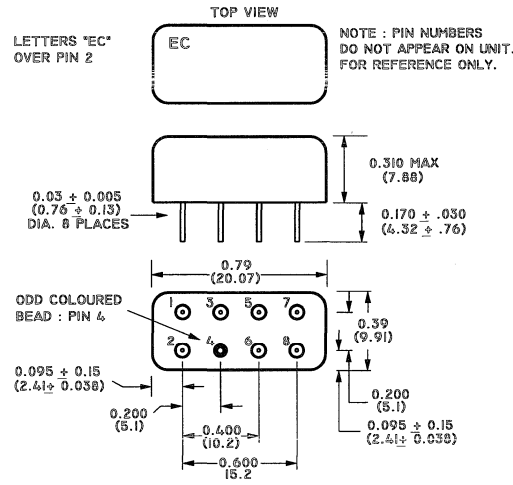
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	-
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
10 - 2000 MHz EMA-11MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF

Specifications @ 25°C

Frequency Range	
RF	10 - 2000 MHz
LO	10 - 2000 MHz
IF	DC - 600 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 1000 MHz	7	8
10 - 2000 MHz	7.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 100 MHz	40	30
100 - 1000 MHz	38	30
1000 - 2000 MHz	32	25
LO to IF		
10 - 100 MHz	35	30
100 - 1000 MHz	30	25
1000 - 2000 MHz	30	20

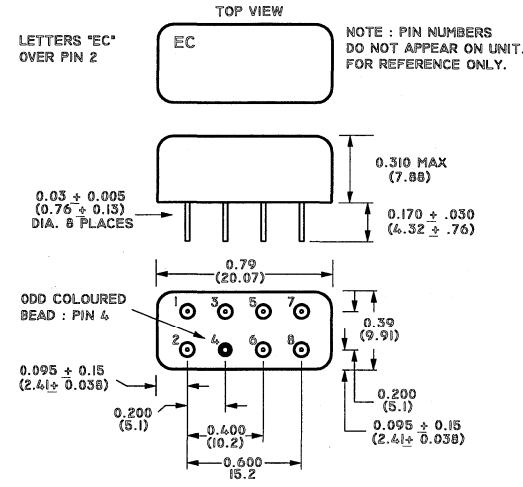
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	4

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
2 - 1100 MHz

EMS-1ZMH

Features

* LO Power +13 dBm
* Up to +9 dBm RF

Specifications @ 25°C

Frequency Range	
RF	2 - 1100 MHz
LO	2 - 1100 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
4 - 550 MHz	6.5	8
2 - 1100 MHz	7	9

Isolation (dB)	Typical	Minimum
LO to RF		
2 - 20 MHz	50	40
20 - 550 MHz	40	30
550 - 1100 MHz	30	20
LO to IF		
2 - 20 MHz	40	30
20 - 550 MHz	25	20
550 - 1100 MHz	25	15

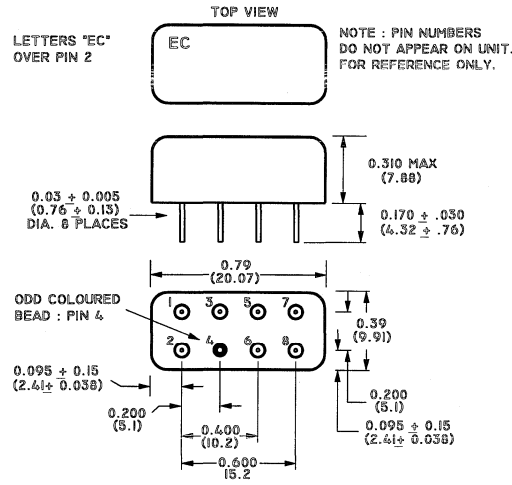
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	1
RF	8
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

ISO 9001
CERTIFIED

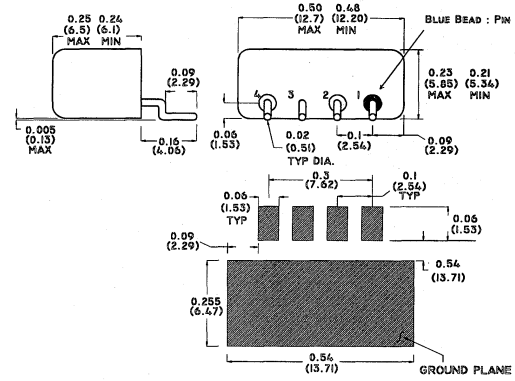
E-Series Plug-In Mixer
2 - 600 MHz

ETUF-1MHSM

Features

* LO Power +13 dBm
* Up to +9 dBm RF

R-15



Specifications @ 25°C

Frequency Range	
RF	2 - 600 MHz
LO	2 - 600 MHz
IF	DC - 600 MHz

Conversion Loss (dB)	Typical	Maximum
4 - 300 MHz	5.5	7
2 - 600 MHz	6.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
2 - 20 MHz	68	50
20 - 300 MHz	50	30
300 - 600 MHz	43	25
LO to IF		
2 - 20 MHz	65	45
20 - 300 MHz	48	30
300 - 600 MHz	37	22

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

Specifications Subject to Change Without Notice S 0570 A

ISO 9001
CERTIFIED

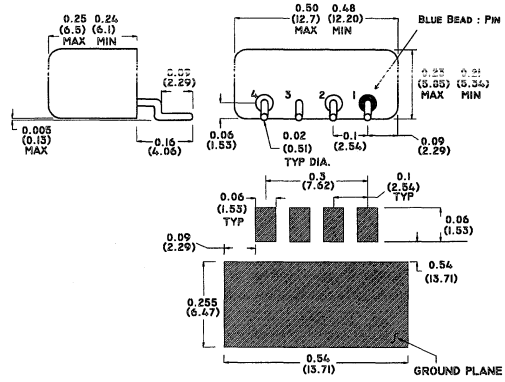
E-Series Plug-In Mixer
50 - 1000 MHz

ETUF-2MHSM

Features

* LO Power +13 dBm
* Up to +9 dBm RF

R-15



Specifications @ 25°C

Frequency Range	
RF	50 - 1000 MHz
LO	50 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
100 - 500 MHz	5.5	7.5
50 - 1000 MHz	7	9

Isolation (dB)	Typical	Minimum
LO to RF		
50 - 500 MHz	58	40
50 - 1000 MHz	47	30
500 - 1000 MHz	37	25
LO to IF		
50 - 500 MHz	55	35
50 - 1000 MHz	47	20
500 - 1000 MHz	32	18

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

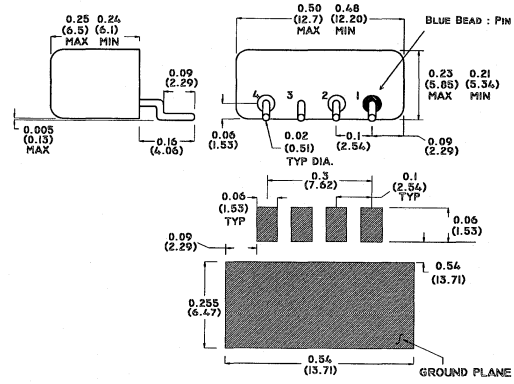
ISO 9001
CERTIFIED

E-Series Plug-In Mixer
800 - 1050 MHz ETUF-860MHSM

Features

* LO Power +13 dBm
* Up to +9 dBm RF

R-15



Specifications @ 25°C

Frequency Range	
RF	800 - 1050 MHz
LO	800 - 1050 MHz
IF	DC - 250 MHz

Conversion Loss (dB)	Typical	Maximum
800 - 1050 MHz	7	8.3

Isolation (dB)	Typical	Minimum
LO to RF		
800 - 1050 MHz	24	20
LO to IF		
800 - 1050 MHz	22	18

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

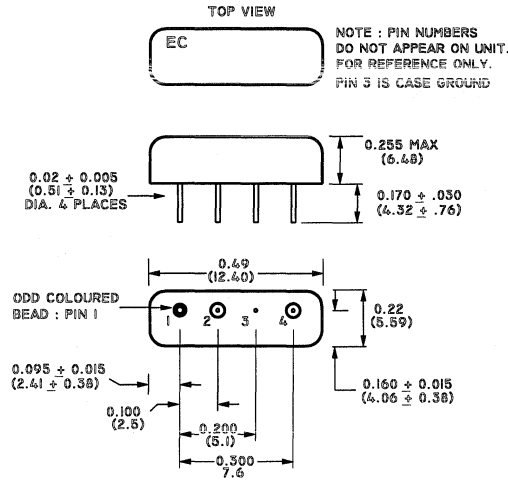
E-Series Plug-In Mixer
0.15 - 400 MHz

ETUF-3MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF

R-3



WEIGHT (APPROX) : 0.05 OUNCES 1.5 GRAMS

Specifications @ 25°C

Frequency Range	
RF	0.15 - 400 MHz
LO	0.15 - 400 MHz
IF	DC - 400 MHz

Conversion Loss (dB)	Typical	Maximum
0.3 - 200 MHz	5	7
.15 - 400 MHz	5.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
0.15 - 1.5 MHz	60	50
1.5 - 200 MHz	46	30
200 - 400 MHz	35	25
LO to IF		
0.15 - 1.5 MHz	60	40
1.5 - 200 MHz	42	25
200 - 400 MHz	35	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
1 - 250 MHz

EMT-3MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF

Specifications @ 25°C

Frequency Range	
RF	1 - 250 MHz
LO	1 - 250 MHz
IF	DC - 250 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 125 MHz	5	7
1 - 250 MHz	6	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	50	45
10 - 125 MHz	40	30
125 - 250 MHz	28	23
LO to IF		
1 - 10 MHz	45	40
10 - 125 MHz	35	25
125 - 250 MHz	26	20

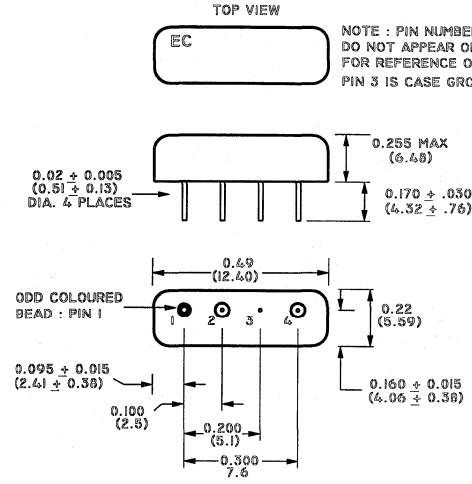
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-3



Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

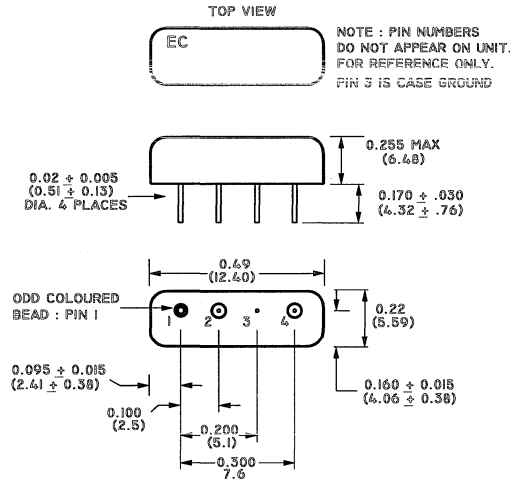
E-Series Plug-In Mixer
2 - 500 MHz

EMT-1MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF

R-3



WEIGHT (APPROX) : 0.05 OUNCES 1.5 GRAMS

Specifications @ 25°C

Frequency Range		
RF		2 - 500 MHz
LO		2 - 500 MHz
IF		DC - 500 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
4 - 250 MHz	6	7.5
2 - 500 MHz	7	8.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
2 - 20 MHz	50	45
20 - 250 MHz	40	30
250 - 500 MHz	30	20
LO to IF		
2 - 20 MHz	45	40
20 - 250 MHz	35	25
250 - 500 MHz	25	20

Operating Characteristics

Impedance	**50 Ohms Nominal**
RF input for 1dB Compression	**+ 9 dBm**

Absolute Maximum Ratings

Parameter	**Absolute Maximum**
RF Power	**200 mW**
Peak IF Current	**40 mA**
Storage Temperature	**-55°C to 100°C**
Operating Temperature	**-55°C to 100°C**
Pin Temperature (10 Seconds)	**260°C**

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

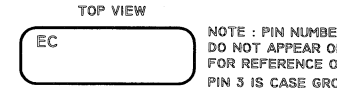
E-Series Plug-In Mixer
2 - 600 MHz

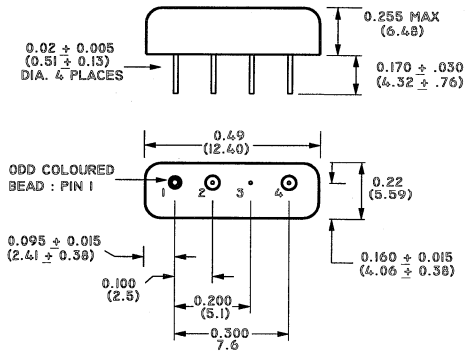
ETUF-1MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF

R-3





WEIGHT (APPROX) : 0.05 OUNCES 1.5 GRAMS

Specifications @ 25°C

Frequency Range	
RF	2 - 600 MHz
LO	2 - 600 MHz
IF	DC - 600 MHz

Conversion Loss (dB)	Typical	Maximum
4 - 300 MHz	5.5	7
2 - 600 MHz	6.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
2 - 20 MHz	68	50
20 - 300 MHz	50	30
300 - 600 MHz	43	25
LO to IF		
2 - 20 MHz	65	45
20 - 300 MHz	48	30
300 - 600 MHz	37	22

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

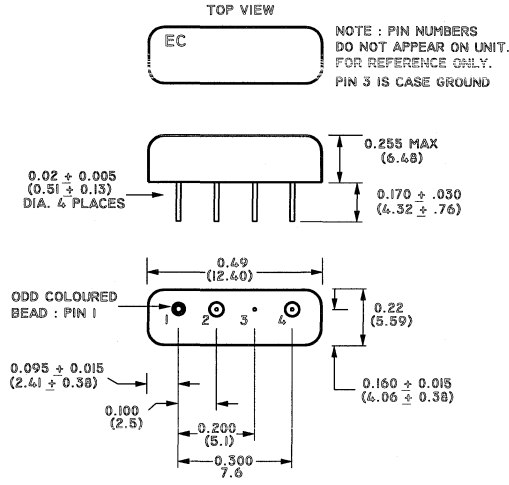
E-Series Plug-In Mixer
50 - 1000 MHz

ETUF-2MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF

R-3



WEIGHT (APPROX) : 0.05 OUNCES 1.5 GRAMS

Specifications @ 25°C

Frequency Range		
RF		50 - 1000 MHz
LO		50 - 1000 MHz
IF		DC - 1000 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
100 - 500 MHz	5.5	7.5
50 - 1000 MHz	7	9
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
50 - 500 MHz	58	40
50 - 1000 MHz	47	30
500 - 1000 MHz	37	25
LO to IF		
50 - 500 MHz	55	35
50 - 1000 MHz	47	20
500 - 1000 MHz	32	18

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series Plug-In Mixer
800 - 1050 MHz

ETUF-860MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF

Specifications @ 25°C

Frequency Range		
RF		800 - 1050 MHz
LO		800 - 1050 MHz
IF		DC - 250 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
800 - 1050 MHz	7	8.3
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
800 - 1050 MHz	24	20
LO to IF		
800 - 1050 MHz	22	18

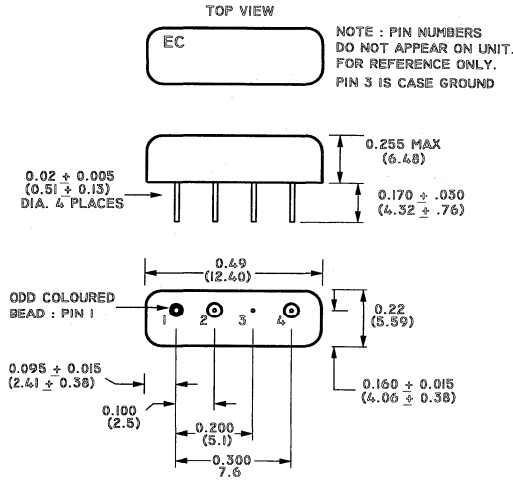
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-3



WEIGHT (APPROX) : 0.05 OUNCES 1.5 GRAMS

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.5 - 2000 MHz

EMT-12MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.5 - 2000 MHz
LO	0.5 - 2000 MHz
IF	0.2 - 600 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 1000 MHz	5.8	8
.5 - 2000 MHz	7.2	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	60	45
5 - 1000 MHz	30	25
1000 - 2000 MHz	30	25
LO to IF		
0.5 - 5 MHz	55	40
5 - 1000 MHz	30	25
1000 - 2000 MHz	25	20

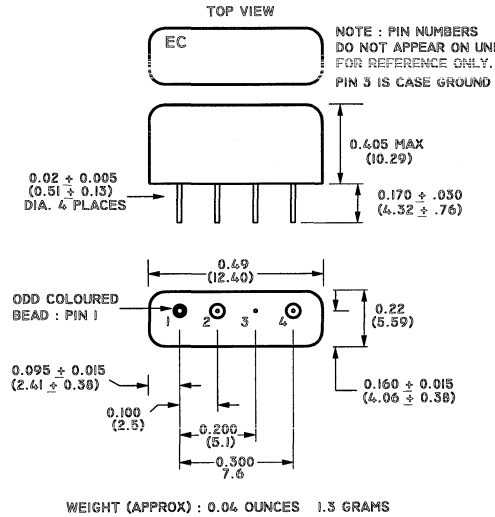
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-4



Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
10 - 4200 MHz

EMT-42MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF

Specifications @ 25°C

Frequency Range	
RF	10 - 4200 MHz
LO	10 - 4200 MHz
IF	10 - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 2100 MHz	7.3	8.5
10 - 4200 MHz	7.5	11

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 100 MHz	35	25
100 - 2100 MHz	40	25
2100 - 4200 MHz	35	25
LO to IF		
10 - 100 MHz	35	20
100 - 2100 MHz	35	25
2100 - 4200 MHz	27	20

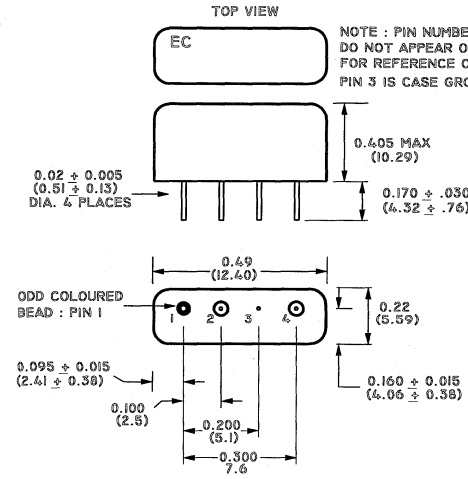
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-4



Function	Pin No.
LO	1
RF	4
IF	2
Ground	3
Case Ground	3
Unconnected	-

E-Series Surface Mount Mixer
2 - 500 MHz EMRS-1MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	2 - 500 MHz
LO	2 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
4 - 250 MHz	5.7	7
2 - 500 MHz	6	8

Isolation (dB)	Typical	Minimum
LO to RF		
2 - 20 MHz	58	45
20 - 250 MHz	44	25
250 - 500 MHz	30	20
LO to IF		
2 - 20 MHz	55	40
20 - 250 MHz	36	25
250 - 500 MHz	28	17

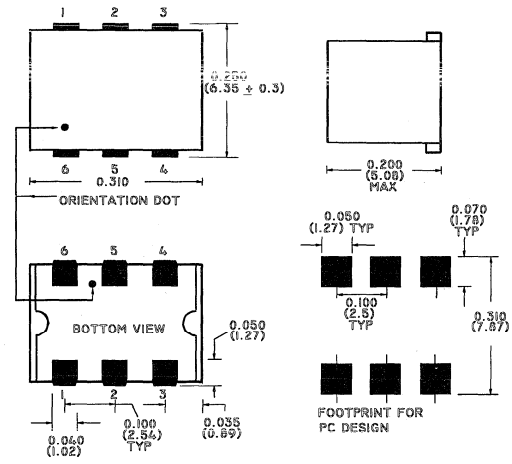
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	150 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-1MH is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-1MH

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series Surface Mount Mixer
5 - 1000 MHz EMRS-2MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	5 - 1000 MHz
LO	5 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 500 MHz	6.5	8
5 - 1000 MHz	7	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	60	40
50 - 500 MHz	40	20
500 - 1000 MHz	25	18
LO to IF		
5 - 50 MHz	55	30
50 - 500 MHz	30	20
500 - 1000 MHz	20	12

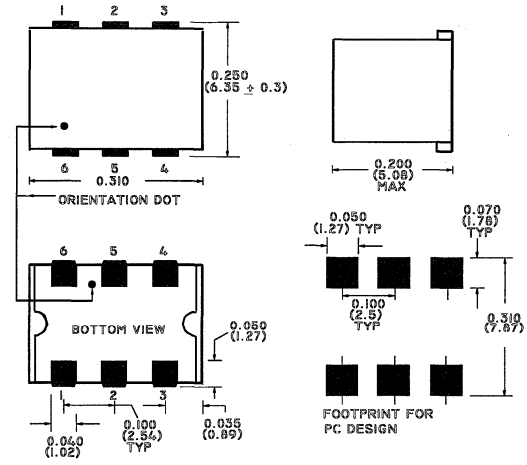
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	150 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-2MH is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-2MH

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series Surface Mount Mixer

5 - 1500 MHz

EMRS-5MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range		
RF		5 - 1500 MHz
LO		5 - 1500 MHz
IF		DC - 1000 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
10 - 750 MHz	6.5	7.5
5 - 1500 MHz	7.5	9.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
5 - 50 MHz	60	40
50 - 750 MHz	40	20
750 - 1500 MHz	30	18
LO to IF		
5 - 50 MHz	55	30
50 - 750 MHz	30	18
750 - 1500 MHz	15	8

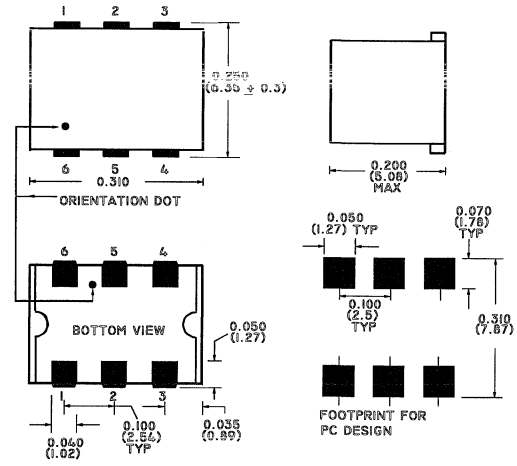
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	150 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-5MH is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-5MH

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
5 - 2500 MHz EMRS-25MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	5 - 2500 MHz
LO	5 - 2500 MHz
IF	5 - 1500 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 1250 MHz	6.3	8.5
5 - 2500 MHz	7.3	9.8

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	45	28
50 - 1250 MHz	35	23
1250 - 2500 MHz	30	20
LO to IF		
5 - 50 MHz	40	23
50 - 1250 MHz	30	20
1250 - 2500 MHz	25	17

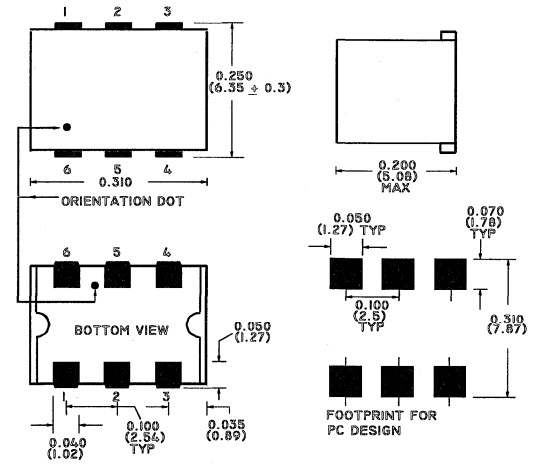
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm
DC Polarity	Positive

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	150 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-25MH is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-25MH

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
1 - 1000 MHz ESMD-C1MH

Features

* LO Power +13 dBm
* Up to +13 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	1 - 1000 MHz
LO	1 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 1000 MHz	6.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 1000 MHz	45	25
LO to IF		
1 - 1000 MHz	30	15

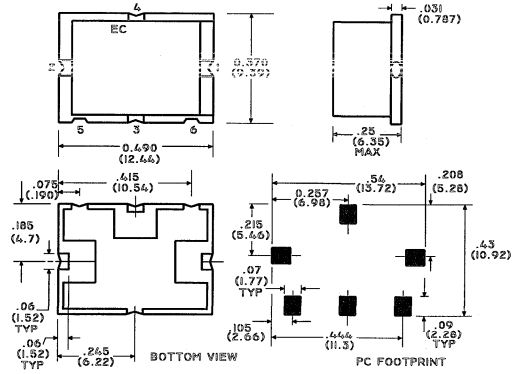
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 13 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-2



Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0152 B

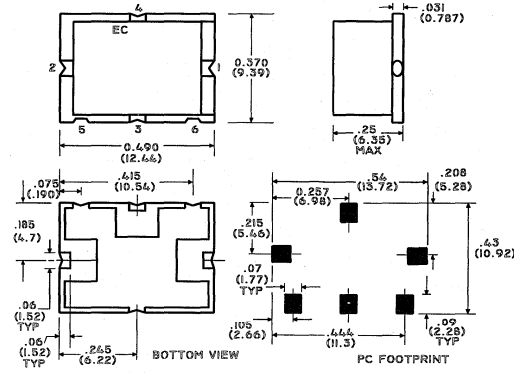
ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
20 - 2500 MHz ESMD-C3MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	20 - 2500 MHz
LO	20 - 2500 MHz
IF	20 - 600 MHz

Conversion Loss (dB)	Typical	Maximum
40 - 1250 MHz	8	9
20 - 2500 MHz	9	10.5

Isolation (dB)	Typical	Minimum
LO to RF		
20 - 200 MHz	45	30
200 - 1250 MHz	30	23
1250 - 2500 MHz	30	15
LO to IF		
20 - 200 MHz	40	20
200 - 1250 MHz	25	15
1250 - 2500 MHz	25	12

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

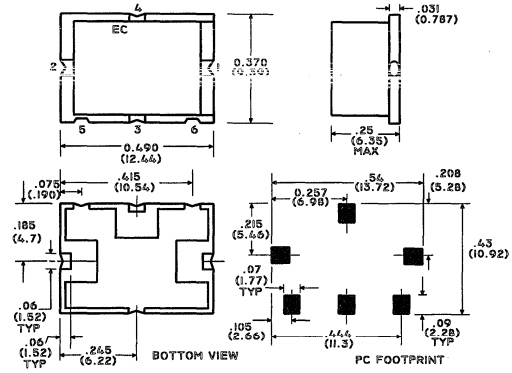
E-Series Surface Mount Mixer

380 - 500 MHz ESMD-C2HX2-4

Features

* LO Power +13 dBm
* Up to +14 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	380 - 500 MHz
LO	379 - 540 MHz
IF	71 MHz
Conversion Loss (dB)	**Maximum**
380 - 500 MHz	7.5
Isolation (dB)	**Minimum**
LO to RF	
379 - 540 MHz	25
LO to IF	
379 - 540 MHz	15

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

Two Tone Third Order Input Intercept :

Test Conditions:

RF1 : 490 MHz @ 0 dBm
RF2 : 491 MHz @ 0 dBm
LO : 420 MHz @ +15 dBm

IIP3 Spec:+23 dBm Typ, +21 dBm Min

Voltage Standing Wave Ratio's :

LO VSWR :	**(Max)**	**2.0 : 1**
RF VSWR :	**(Max)**	**1.7 : 1**
IF VSWR :	**(Max)**	**2.0 : 1**

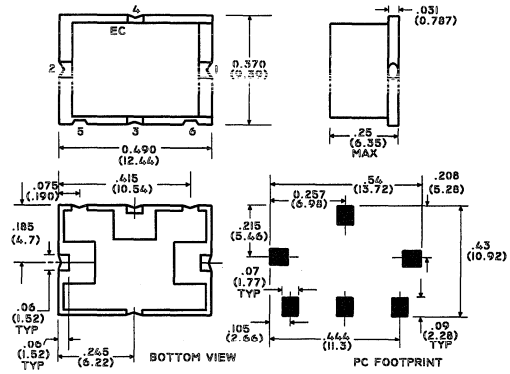
ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
50 - 2000 MHz ESMD-11MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	50 - 2000 MHz
LO	50 - 2000 MHz
IF	50 - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
100 - 1000 MHz	6.6	8
50 - 2000 MHz	7.5	9.9

Isolation (dB)	Typical	Minimum
LO to RF		
50 - 500 MHz	55	35
500 - 1000 MHz	44	25
1000 - 2000 MHz	30	20
LO to IF		
50 - 500 MHz	40	25
500 - 1000 MHz	36	20
1000 - 2000 MHz	29	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0566 B

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
880 - 915 MHz ESMD-C29

Features

* LO Power +13 dBm
* Up to +11 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	880 - 915 MHz
LO	765 - 801 MHz
IF	113 - 116 MHz

Conversion Loss (dB)	Typical	Maximum
880 - 915 MHz	6	7.5

Isolation (dB)	Typical	Minimum
LO to RF		
765 - 801 MHz	33	25
LO to IF		
765 - 801 MHz	35	20

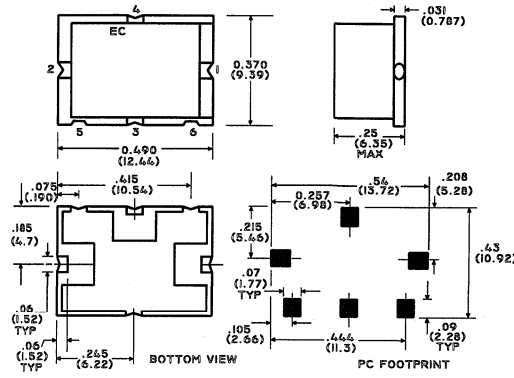
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 11 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-2



Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

(Continued to Next Page)

Two Tone Third Order Input Intercept :

Test Conditions :

RF1 : 900 MHz @ 0 dBm
RF2 : 901 MHz @ 0 dBm
LO : 785 MHz @ +13 dBm

IIP3 Spec: +20.5 dBm Typ :
+19 dBm Min

Voltage Standing Wave Ratio's :

LO VSWR :	**(Typ)**	**1.2 : 1**
	(Max)	**2.0 : 1**
RF VSWR :	**(Typ)**	**1.3 : 1**
	(Max)	**1.7 : 1**
IF VSWR :	**(Typ)**	**1.1 : 1**
	(Max)	**2.0 : 1**

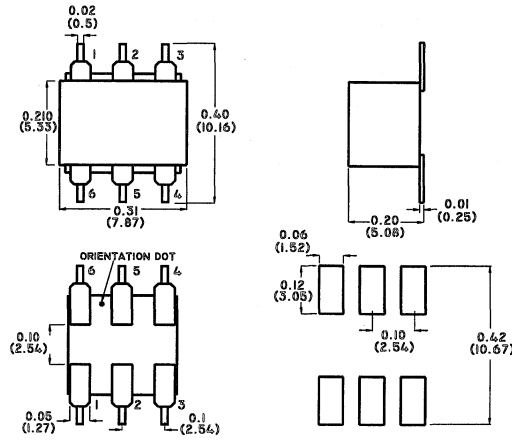
ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
2 - 500 MHz EMRSL-1MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range	
RF	2 - 500 MHz
LO	2 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
4 - 250 MHz	5.7	7
2 - 500 MHz	6	8

Isolation (dB)	Typical	Minimum
LO to RF		
2 - 20 MHz	58	45
20 - 250 MHz	44	25
250 - 500 MHz	30	20
LO to IF		
2 - 20 MHz	55	40
20 - 250 MHz	36	25
250 - 500 MHz	28	17

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	150 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

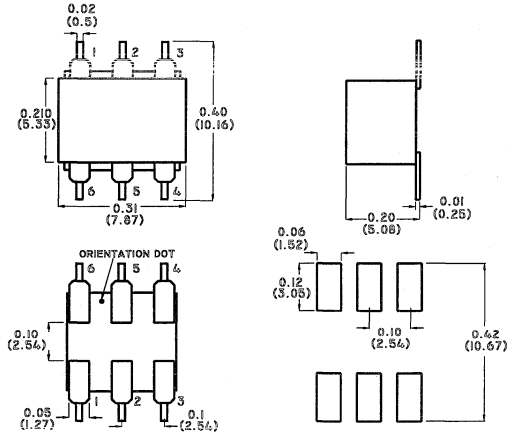
E-Series Surface Mount Mixer
5 - 1000 MHz

EMRSL-2MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range		
RF		5 - 1000 MHz
LO		5 - 1000 MHz
IF		DC - 1000 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
10 - 500 MHz	6.5	8
5 - 1000 MHz	7	9.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
5 - 50 MHz	60	40
50 - 500 MHz	40	20
500 - 1000 MHz	25	18
LO to IF		
5 - 50 MHz	55	30
50 - 500 MHz	30	20
500 - 1000 MHz	20	12

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	150 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0523 B

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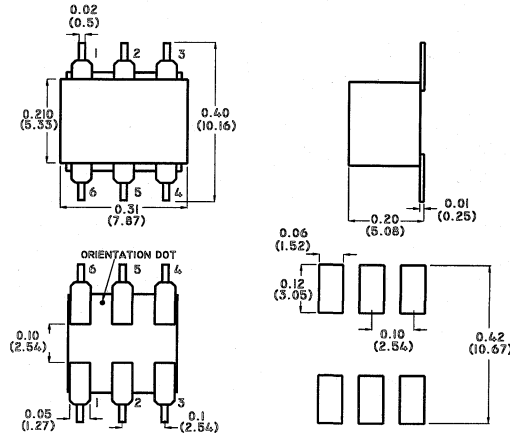
ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
5 - 1500 MHz EMRSL-5MH

Features

* LO Power +13 dBm
* Up to +9 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range	
RF	5 - 1500 MHz
LO	5 - 1500 MHz
IF	DC - 900 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 750 MHz	6.5	7.5
5 - 1500 MHz	7.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	55	30
50 - 750 MHz	30	18
750 - 1500 MHz	25	15
LO to IF		
5 - 50 MHz	55	30
50 - 750 MHz	30	18
750 - 1500 MHz	15	8

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm
DC Polarity	Positive

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	150 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer

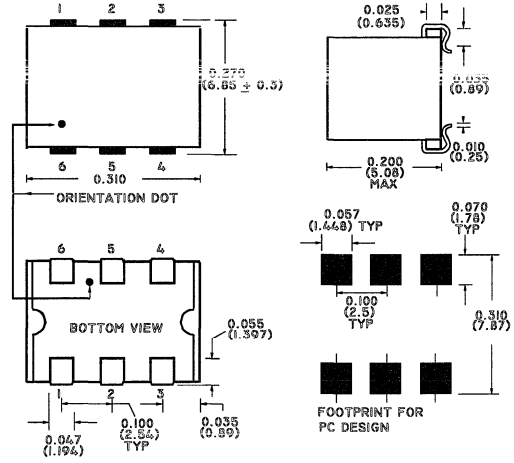
2 - 500 MHz

EMRS-1MHC

Features

* LO Power +13 dBm
* Up to +9 dBm RF
* Surface Mount

SM-44



Specifications @ 25°C

Frequency Range	
RF	2 - 500 MHz
LO	2 - 500 MHz
IF	DC - 500 MHz
Conversion Loss (dB)	**Maximum**
2 - 500 MHz	8
Isolation (dB)	**Minimum**
LO to RF	
2 - 500 MHz	20
LO to IF	
2 - 500 MHz	17

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 9 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	150 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Voltage Standing Wave Ratio's :

LO VSWR :	(Typ)	3.3 : 1
	(Max)	3.5 : 1
RF VSWR :	(Typ)	2.4 : 1
	(Max)	3.3 : 1
IF VSWR :	(Typ)	1.2 : 1
	(Max)	3 : 1

ISO 9001
CERTIFIED

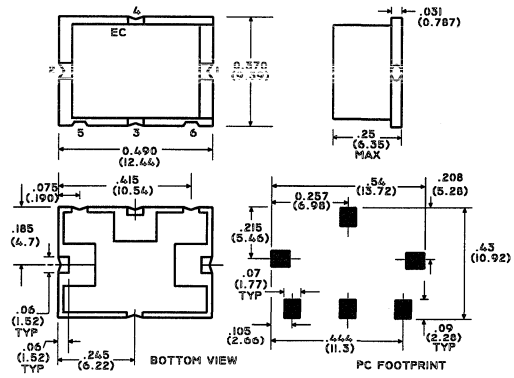
E-Series Surface Mount Mixer

819 - 915 MHz ESMD-C2HX2-1

Features

* LO Power +15 dBm
* Up to +14 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	819 - 915 MHz
LO	819 - 915 MHz
IF	71 MHz

Conversion Loss (dB)	Maximum
819 - 915 MHz	7.5

Isolation (dB)	Minimum
LO to RF	
819 - 915 MHz	25
LO to IF	
819 - 915 MHz	15

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0883 B

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See Page 7-26 For Local Office Details

Voltage Standing Wave Ratio's :

LO VSWR :	**(Max)**	**2.0 : 1**
RF VSWR :	**(Max)**	**1.7 : 1**
IF VSWR :	**(Max)**	**2.0 : 1**

ISO 9001
CERTIFIED

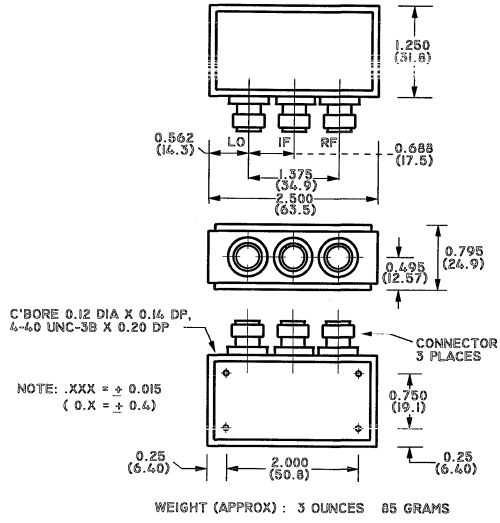
E-Series Standard Mixer
0.5 - 500 MHz

EMAZ-1H

Features

* LO Power +17 dBm
* Up to +10 dBm RF

C-9



Specifications @ 25°C

Frequency Range		
RF	0.5 - 500 MHz	
LO	0.5 - 500 MHz	
IF	DC - 500 MHz	
Conversion Loss (dB)	**Typical**	**Maximum**
1 - 250 MHz	5.5	7.5
.5 - 500 MHz	6.5	8.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
0.5 - 5 MHz	50	45
5 - 250 MHz	45	30
250 - 500 MHz	35	25
LO to IF		
0.5 - 5 MHz	45	35
5 - 250 MHz	40	30
250 - 500 MHz	30	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 10 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	3
IF	2
Ground	
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

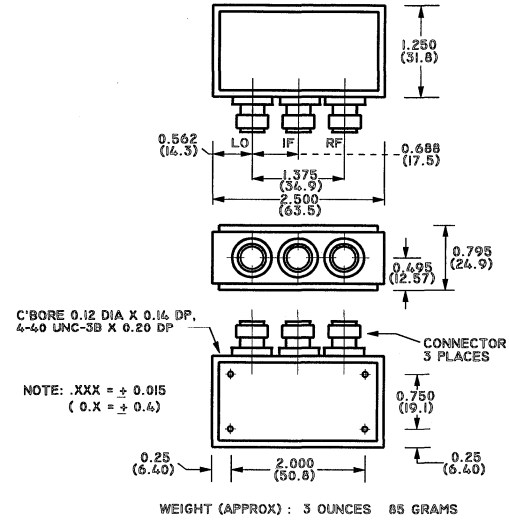
E-Series Standard Mixer
2 - 1000 MHz

EMAZ-2H

Features

C-9

* LO Power +17 dBm
* Up to +10 dBm RF



Specifications @ 25°C

Frequency Range	
RF	2 - 1000 MHz
LO	2 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
4 - 500 MHz	6	7.5
2 - 1000 MHz	8.5	10

Isolation (dB)	Typical	Minimum
LO to RF		
2 - 20 MHz	50	40
20 - 500 MHz	35	25
500 - 1000 MHz	35	25
LO to IF		
2 - 20 MHz	45	35
20 - 500 MHz	30	20
500 - 1000 MHz	25	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 10 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	3
IF	2
Ground	
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0299 A

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.5 - 500 MHz

EMA-1H

Features

* LO Power +17 dBm
* Up to +10 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	5.5	7.5
.5 - 500 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	55	45
5 - 250 MHz	45	30
250 - 500 MHz	35	25
LO to IF		
0.5 - 5 MHz	45	35
5 - 250 MHz	40	30
250 - 500 MHz	30	20

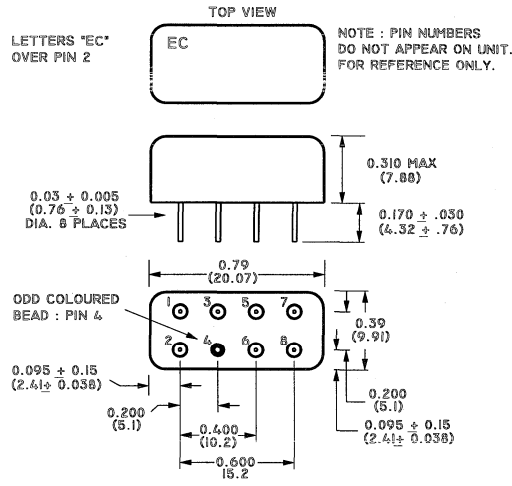
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 10 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.5 - 500 MHz

EMA-1HN

Features

* LO Power +17 dBm
* Up to +10 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	5.5	7.5
.5 - 500 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	55	45
5 - 250 MHz	45	30
250 - 500 MHz	35	25
LO to IF		
0.5 - 5 MHz	45	35
5 - 250 MHz	40	30
250 - 500 MHz	30	20

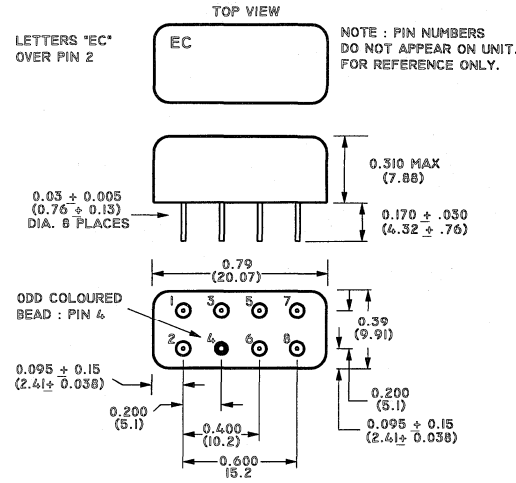
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 10 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.5 - 500 MHz

EMS-1H

Features

* LO Power +17 dBm
* Up to +10 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	5.5	7.5
.5 - 500 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	55	45
5 - 250 MHz	45	30
250 - 500 MHz	35	25
LO to IF		
0.5 - 5 MHz	45	35
5 - 250 MHz	40	30
250 - 500 MHz	30	20

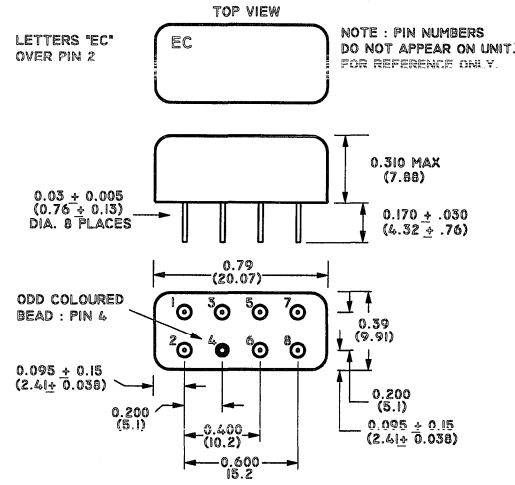
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 10 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
1 - 750 MHz

EMA-1WH

Features

* LO Power +17 dBm
* Up to +10 dBm RF

Specifications @ 25°C

Frequency Range	
RF	1 - 750 MHz
LO	1 - 750 MHz
IF	DC - 750 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 375 MHz	5.5	7.5
1 - 750 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	50	40
10 - 375 MHz	45	25
375 - 750 MHz	35	25
LO to IF		
1 - 10 MHz	45	35
10 - 375 MHz	40	30
375 - 750 MHz	30	20

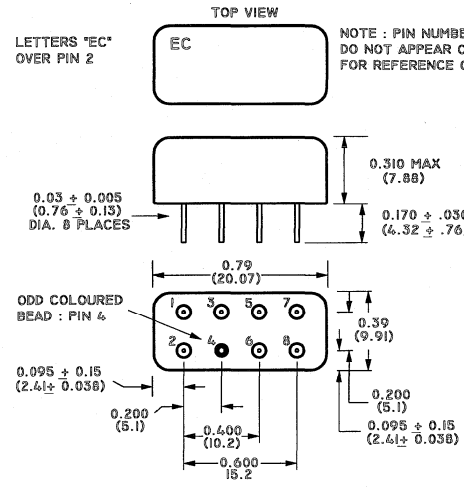
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 10 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'IF' pins must be connected together externally.

Specifications Subject to Change Without Notice S 0038 B

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See Page 7-26 For Local Office Details

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series Plug-In Mixer
10 - 3000 MHz

EMA-11H

Features

* LO Power +17 dBm
* Up to +10 dBm RF

Specifications @ 25°C

Frequency Range	
RF	10 - 3000 MHz
LO	10 - 3000 MHz
IF	10 - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 1500 MHz	8	10
10 - 3000 MHz	10	12

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 100 MHz	27	20
100 - 1500 MHz	25	18
1500 - 3000 MHz	23	16
LO to IF		
10 - 100 MHz	27	20
100 - 1500 MHz	25	18
1500 - 3000 MHz	23	16

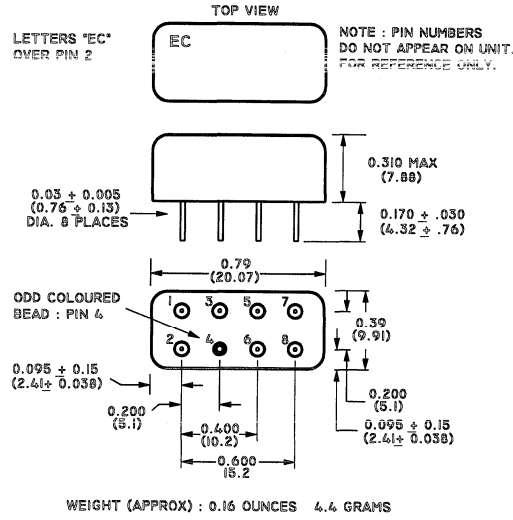
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 10 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	4

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
2 - 1000 MHz

EMA-2H

Features

* LO Power +17 dBm
* Up to +10 dBm RF

Specifications @ 25°C

Frequency Range	
RF	2 - 1000 MHz
LO	2 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
4 - 500 MHz	6	7.5
2 - 1000 MHz	8.5	10

Isolation (dB)	Typical	Minimum
LO to RF		
2 - 20 MHz	50	40
20 - 500 MHz	35	25
500 - 1000 MHz	35	25
LO to IF		
2 - 20 MHz	45	30
20 - 500 MHz	30	20
500 - 1000 MHz	25	20

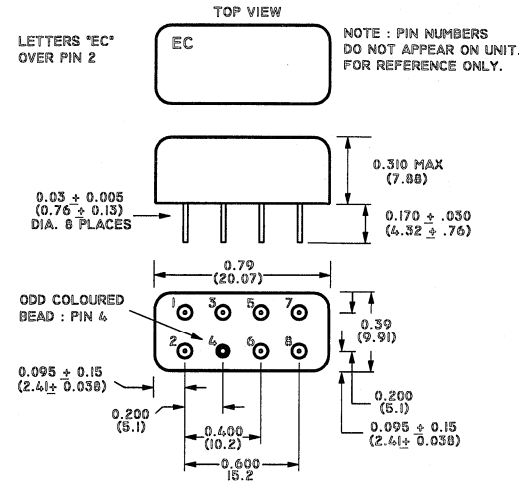
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 10 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	3,4
IF	1
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'RF' pins must be connected together externally.

Specifications Subject to Change Without Notice S 0290 B

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
5 - 1000 MHz

EMS-173H

Features

* LO Power + 17 dBm
* Up to + 14 dBm RF

Specifications @ 25°C

Frequency Range	
RF	5 - 1000 MHz
LO	5 - 1000 MHz
IF	1 - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 500 MHz	6.0	7.0
5 - 1000 MHz	7.0	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	50	35
50 - 500 MHz	45	30
500 - 1000 MHz	40	25
LO to IF		
5 - 50 MHz	40	30
50 - 500 MHz	35	25
500 - 1000 MHz	35	20

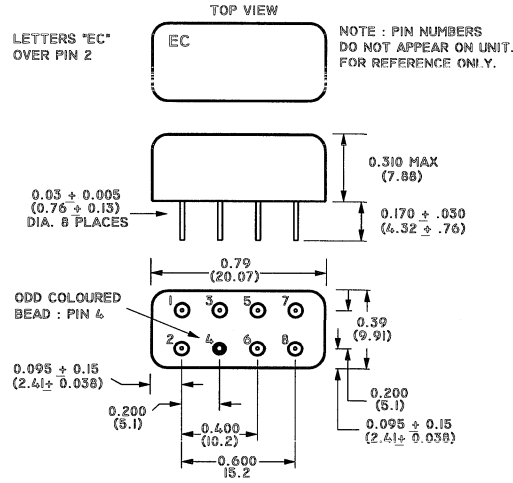
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	3,4
RF	1
IF	8
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

Specifications Subject to Change Without Notice S 0088 B

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
5 - 1200 MHz

EMA-173H

Features

* LO Power +17 dBm
* Up to +10 dBm RF

Specifications @ 25°C

Frequency Range	
RF	5 - 1200 MHz
LO	5 - 1200 MHz
IF	DC - 1200 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 600 MHz	6	7
5 - 1200 MHz	7	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	40	35
50 - 600 MHz	35	25
600 - 1200 MHz	35	20
LO to IF		
5 - 50 MHz	40	35
50 - 600 MHz	35	20
600 - 1200 MHz	30	20

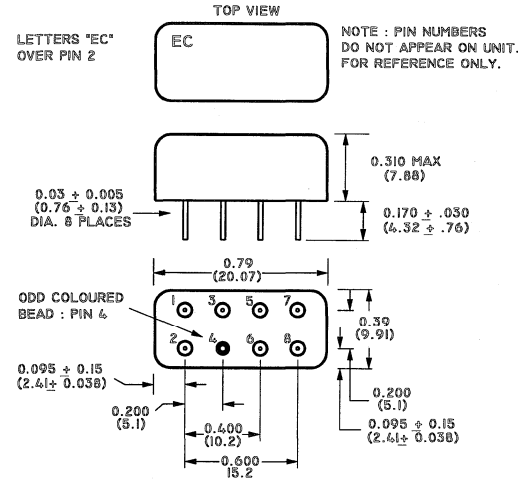
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 10 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
750 - 960 MHz

EMA-173HXX

Features

* LO Power +17 dBm
* Up to +14 dBm RF

Specifications @ 25°C

Frequency Range	
RF	750 - 960 MHz
LO	750 - 960 MHz
IF	40 - 80 MHz

Conversion Loss (dB)	Maximum
750 - 960 MHz	7

Isolation (dB)	Minimum
LO to RF	
750 - 960 MHz	25
LO to IF	
750 - 960 MHz	20
RF to IF	
750 - 960 MHz	20

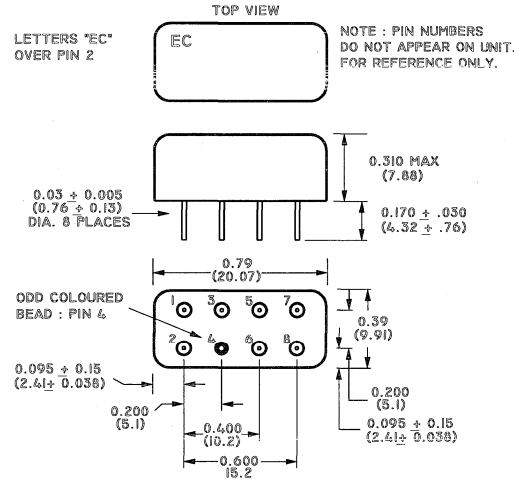
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	1
RF	8
IF	3,4
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'IF' pins must be connected together externally.

Two Tone Third Order Input Intercept :

Intercept Point: +25 dBm Minimum

Test Conditions :

RF1 : 890 MHz @ 0 dBm
RF2 : 891 MHz @ 0 dBm
LO : 820 MHz @ +17 dBm

Voltage Standing Wave Ratio's :

LO VSWR :	**(Max)**	**2.32 : 1**
RF VSWR :	**(Max)**	**2.32 : 1**
IF VSWR :	**(Max)**	**2.61 : 1**

ISO 9001
CERTIFIED

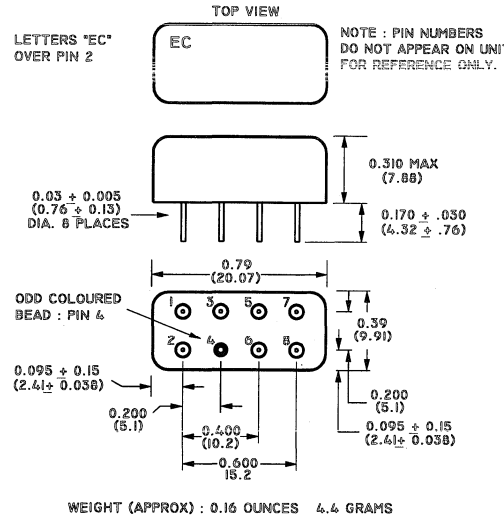
E-Series Plug-In Mixer
950 - 1120 MHz

EMA-220X

Features

* LO Power +17 dBm

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Specifications @ 25°C

Frequency Range	
RF	950 - 1120 MHz
LO	950 - 1120 MHz
IF	130 - 150 MHz
Conversion Loss (dB)	**Maximum**
950 - 1120 MHz	8
Isolation (dB)	**Minimum**
LO to RF	30
LO to IF	30

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	

Absolute Maximum Ratings

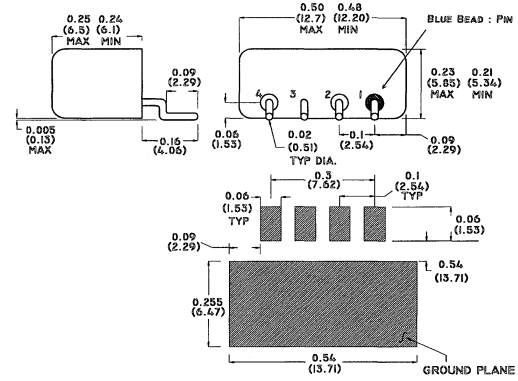
Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	8
RF	1
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	4

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
1400 - 1900 MHz ETUF-11AHSM

R-15



Features

* LO Power + 17 dBm
* Up to + 14 dBm RF

Specifications @ 25°C

Frequency Range		
RF		1400 - 1900 MHz
LO		1400 - 1900 MHz
IF		40 - 500 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
1400 - 1900 MHz	6.5	9
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
1400 - 1900 MHz	30	25
LO to IF		
1400 - 1900 MHz	30	15

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

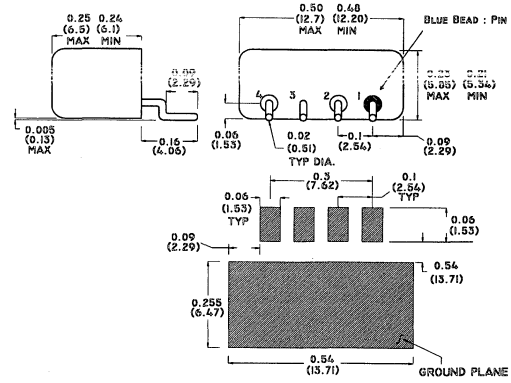
E-Series Plug-In Mixer
2 - 600 MHz

ETUF-1HSM

Features

* LO Power +17 dBm
* Up to +14 dBm RF

R-15



Specifications @ 25°C

Frequency Range	
RF	2 - 600 MHz
LO	2 - 600 MHz
IF	DC - 600 MHz

Conversion Loss (dB)	Typical	Maximum
4 - 300 MHz	5.9	7
2 - 600 MHz	6.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
2 - 20 MHz	68	50
20 - 300 MHz	50	30
300 - 600 MHz	43	25
LO to IF		
2 - 20 MHz	62	45
20 - 300 MHz	48	30
300 - 600 MHz	33	22

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

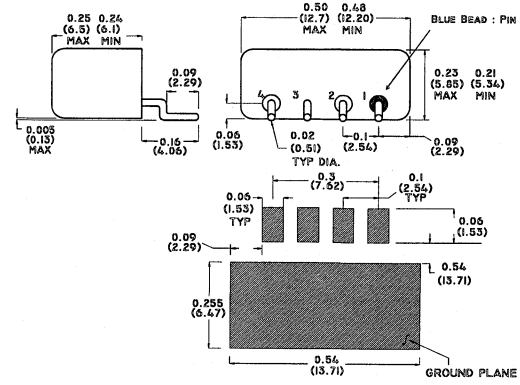
E-Series Plug-In Mixer
20 - 1500 MHz

ETUF-5HSM

Features

* LO Power +17 dBm
* Up to +14 dBm RF

R-15



Specifications @ 25°C

Frequency Range	
RF	20 - 1500 MHz
LO	20 - 1500 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
40 - 750 MHz	7	8.5
20 - 1500 MHz	8	9

Isolation (dB)	Typical	Minimum
LO to RF		
20 - 200 MHz	60	55
200 - 750 MHz	35	30
750 - 1500 MHz	30	25
LO to IF		
20 - 200 MHz	40	25
200 - 750 MHz	25	18
750 - 1500 MHz	20	8

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

Specifications Subject to Change Without Notice S 0692 A

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

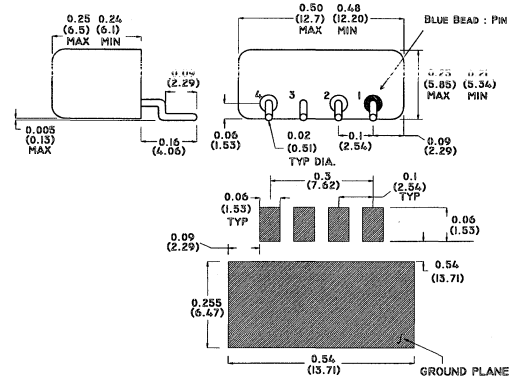
E-Series Plug-In Mixer
50 - 1000 MHz

ETUF-2HSM

Features

* LO Power +17 dBm
* Up to +14 dBm RF

R-15



Specifications @ 25°C

Frequency Range	
RF	50 - 1000 MHz
LO	50 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
100 - 500 MHz	6.2	7.5
50 - 1000 MHz	8.0	9.0

Isolation (dB)	Typical	Minimum
LO to RF		
50 - 500 MHz	58	40
50 - 1000 MHz	47	30
500 - 1000 MHz	42	25
LO to IF		
50 - 500 MHz	52	35
50 - 1000 MHz	44	25
500 - 1000 MHz	28	18

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.05 - 200 MHz

EMA-3H

Features

* LO Power +17 dBm
* Up to +10 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.05 - 200 MHz
LO	0.05 - 200 MHz
IF	DC - 200 MHz

Conversion Loss (dB)	Typical	Maximum
0.1 - 100 MHz	5.5	7
.05 - 200 MHz	5.5	7.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.05 - 0.5 MHz	50	45
0.5 - 100 MHz	40	30
100 - 200 MHz	35	25
LO to IF		
0.05 - 0.5 MHz	45	35
0.5 - 100 MHz	40	30
100 - 200 MHz	30	20

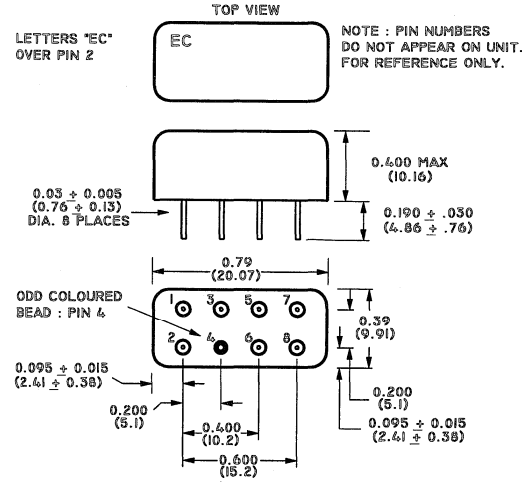
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 10 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

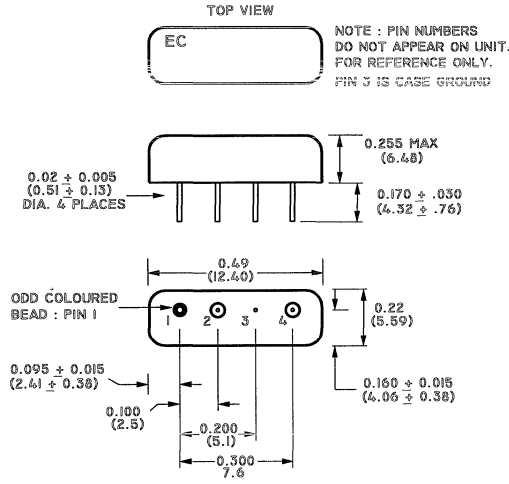
E-Series Plug-In Mixer
0.1 - 250 MHz

EMT-3H

Features

* LO Power +17 dBm
* Up to +14 dBm RF

R-3



Specifications @ 25°C

Frequency Range		
RF	0.1 - 250 MHz	
LO	0.1 - 250 MHz	
IF	DC - 250 MHz	
Conversion Loss (dB)	**Typical**	**Maximum**
0.2 - 125 MHz	5	7
.1 - 250 MHz	6	8.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
0.1 - 1 MHz	50	45
1 - 125 MHz	40	30
125 - 250 MHz	28	23
LO to IF		
0.1 - 1 MHz	45	40
1 - 125 MHz	35	25
125 - 250 MHz	26	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

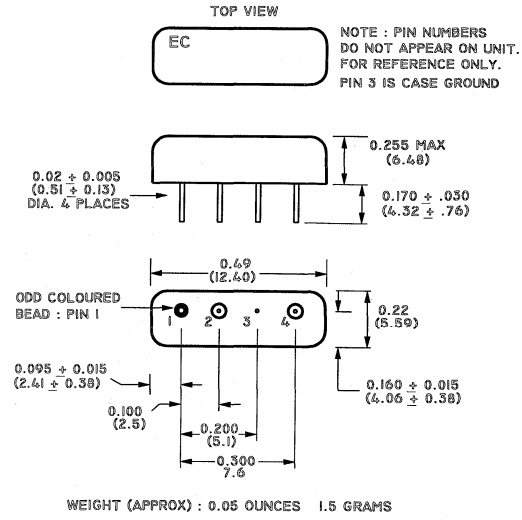
E-Series Plug-In Mixer
0.15 - 400 MHz

ETUF-3H

Features

* LO Power +17 dBm
* Up to +14 dBm RF

R-3



WEIGHT (APPROX) : 0.05 OUNCES 1.5 GRAMS

Specifications @ 25°C

Frequency Range	
RF	0.15 - 400 MHz
LO	0.15 - 400 MHz
IF	DC - 400 MHz

Conversion Loss (dB)	Typical	Maximum
0.3 - 200 MHz	5	7
.15 - 400 MHz	7	8

Isolation (dB)	Typical	Minimum
LO to RF		
0.15 - 1.5 MHz	66	50
1.5 - 200 MHz	50	35
200 - 400 MHz	40	30
LO to IF		
0.15 - 1.5 MHz	53	40
1.5 - 200 MHz	45	25
200 - 400 MHz	35	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

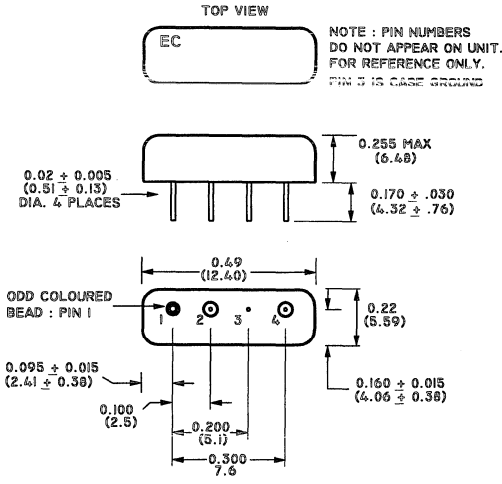
E-Series Plug-In Mixer
1400 - 1900 MHz

ETUF-11AH

Features

* LO Power +17 dBm
* Up to +14 dBm RF

R-3



WEIGHT (APPROX) : 0.05 OUNCES 1.5 GRAMS

Specifications @ 25°C

Frequency Range	
RF	1400 - 1900 MHz
LO	1400 - 1900 MHz
IF	40 - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1400 - 1900 MHz	6.5	9

Isolation (dB)	Typical	Minimum
LO to RF		
1400 - 1900 MHz	30	25
LO to IF		
1400 - 1900 MHz	30	15

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

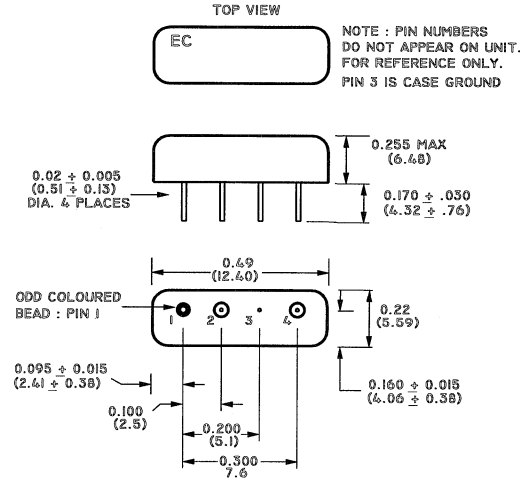
E-Series Plug-In Mixer
2 - 500 MHz

EMT-1H

Features

* LO Power +17 dBm
* Up to +14 dBm RF

R-3



Specifications @ 25°C

Frequency Range	
RF	2 - 500 MHz
LO	2 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
4 - 250 MHz	6	7.5
2 - 500 MHz	7	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
2 - 20 MHz	50	45
20 - 250 MHz	40	30
250 - 500 MHz	30	20
LO to IF		
2 - 20 MHz	45	40
20 - 250 MHz	35	25
250 - 500 MHz	25	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

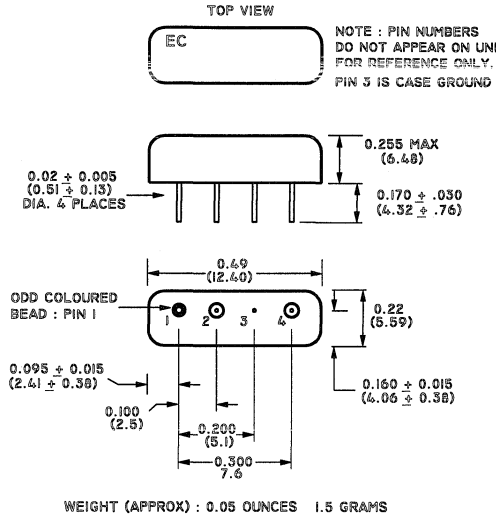
E-Series Plug-In Mixer
2 - 600 MHz

ETUF-1H

Features

* LO Power +17 dBm
* Up to +14 dBm RF

R-3



WEIGHT (APPROX) : 0.05 OUNCES 1.5 GRAMS

Specifications @ 25°C

Frequency Range	
RF	2 - 600 MHz
LO	2 - 600 MHz
IF	DC - 600 MHz

Conversion Loss (dB)	Typical	Maximum
4 - 300 MHz	5.9	7
2 - 600 MHz	6.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
2 - 20 MHz	68	50
20 - 300 MHz	50	30
300 - 600 MHz	43	25
LO to IF		
2 - 20 MHz	62	45
20 - 300 MHz	48	30
300 - 600 MHz	33	22

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

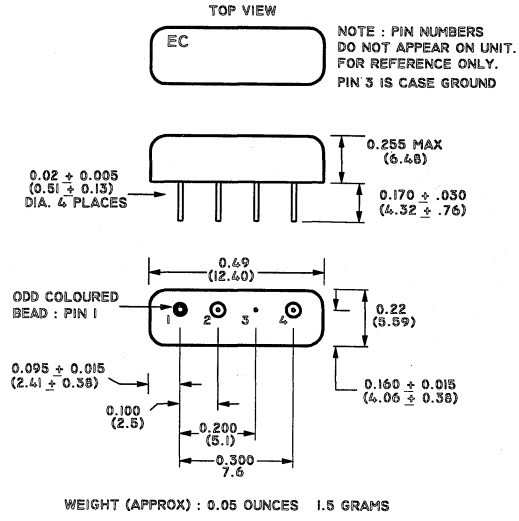
E-Series Plug-In Mixer
20 - 1500 MHz

ETUF-5H

Features

* LO Power +17 dBm
* Up to +14 dBm RF

R-3



Specifications @ 25°C

Frequency Range	
RF	20 - 1500 MHz
LO	20 - 1500 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
40 - 750 MHz	7	8.5
20 - 1500 MHz	8	9

Isolation (dB)	Typical	Minimum
LO to RF		
20 - 200 MHz	60	55
200 - 750 MHz	35	30
750 - 1500 MHz	30	25
LO to IF		
20 - 200 MHz	40	25
200 - 750 MHz	25	18
750 - 1500 MHz	20	8

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

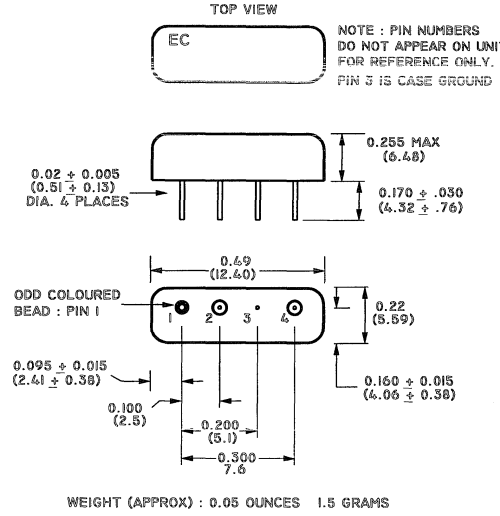
E-Series Plug-In Mixer
5 - 1000 MHz

EMT-2H

Features

* LO Power +17 dBm
* Up to +14 dBm RF

R-3



WEIGHT (APPROX) : 0.05 OUNCES 1.5 GRAMS

Specifications @ 25°C

Frequency Range	
RF	5 - 1000 MHz
LO	5 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 500 MHz	6.2	7
5 - 1000 MHz	7	10

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	50	45
50 - 500 MHz	40	30
500 - 1000 MHz	30	20
LO to IF		
5 - 50 MHz	45	40
50 - 500 MHz	35	25
500 - 1000 MHz	25	17

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
5 - 1200 MHz

EMT-4H

R-3

Features

* LO Power +17 dBm
* Up to +14 dBm RF

Specifications @ 25°C

Frequency Range	
RF	5 - 1200 MHz
LO	5 - 1200 MHz
IF	DC - 1200 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 600 MHz	6.5	8
5 - 1200 MHz	7	9

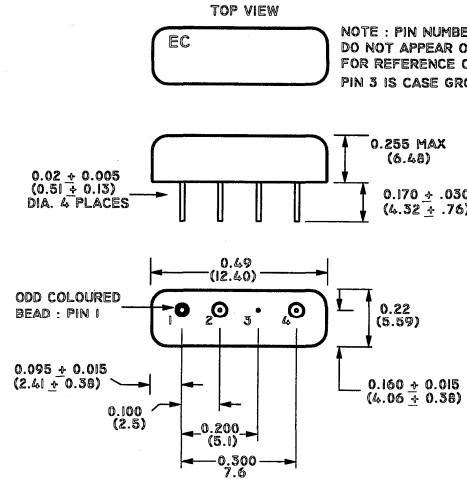
Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	50	40
50 - 600 MHz	35	25
600 - 1200 MHz	30	20
LO to IF		
5 - 50 MHz	50	40
50 - 600 MHz	35	20
600 - 1200 MHz	30	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C



Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

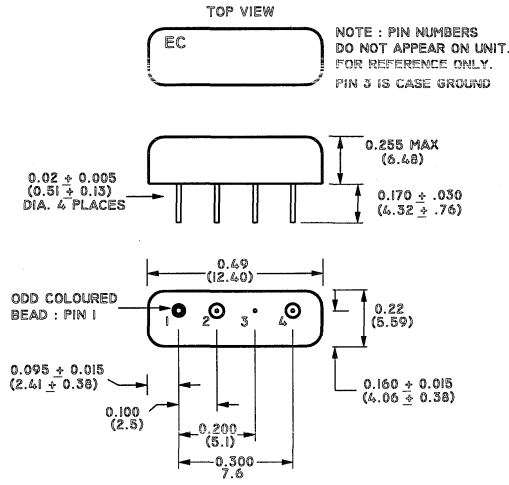
E-Series Plug-In Mixer
50 - 1000 MHz

ETUF-2H

Features

* LO Power +17 dBm
* Up to +14 dBm RF

R-3



WEIGHT (APPROX) : 0.05 OUNCES 1.5 GRAMS

Specifications @ 25°C

Frequency Range	
RF	50 - 1000 MHz
LO	50 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
100 - 500 MHz	6.2	7.5
50 - 1000 MHz	8.0	9.0

Isolation (dB)	Typical	Minimum
LO to RF		
50 - 500 MHz	58	40
50 - 1000 MHz	47	30
500 - 1000 MHz	42	25
LO to IF		
50 - 500 MHz	52	35
50 - 1000 MHz	44	25
500 - 1000 MHz	28	18

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
800 - 2000 MHz

EMT-15H

Features

* LO Power +17 dBm
* Up to +14 dBm RF

Specifications @ 25°C

Frequency Range	
RF	800 - 2000 MHz
LO	800 - 2000 MHz
IF	70 - 211 MHz

Conversion Loss (dB)	Typical	Maximum
800 - 2000 MHz	6.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
800 - 2000 MHz	35	25
LO to IF		
800 - 2000 MHz	32	25
RF to IF		
800 - 2000 MHz	25	20

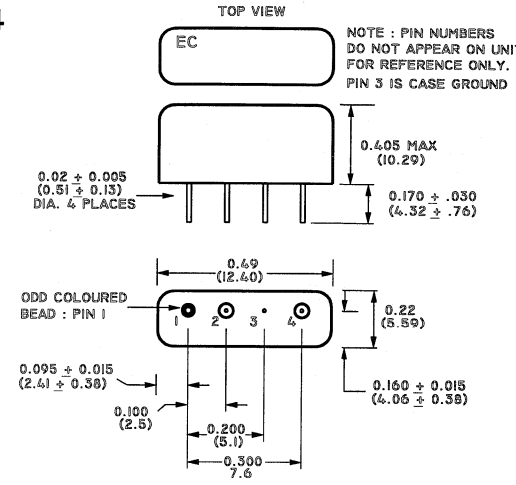
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-4



Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

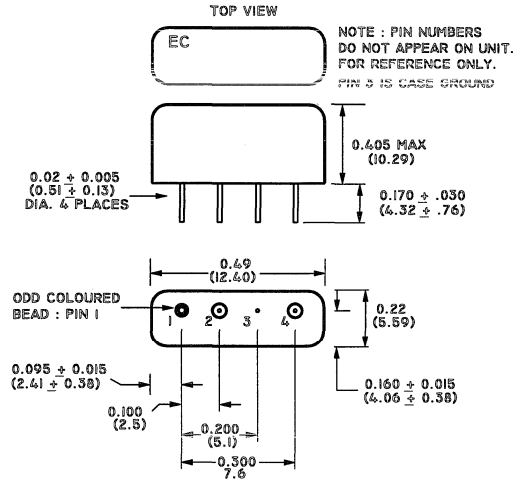
E-Series Plug-In Mixer
890 - 915 MHz

EMT-16H

Features

* LO Power +17 dBm
* Up to +13 dBm RF

R-4



Specifications @ 25°C

Frequency Range	
RF	890 - 915 MHz
LO	820 - 845 MHz
IF	70 MHz

Conversion Loss (dB)	Typical	Maximum
890 - 915 MHz	7	8

Isolation (dB)	Typical	Minimum
LO to RF		
820 - 845 MHz	35	25
LO to IF		
820 - 845 MHz	30	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 13 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

Two Tone Third Order Input Intercept :

Test Conditions :

RF1 : 890 MHz @ 0 dBm
RF2 : 892 MHz @ 0 dBm
LO : 820 MHz @ +17 dBm

Specification : +28 dBm Typical

ISO 9001
CERTIFIED

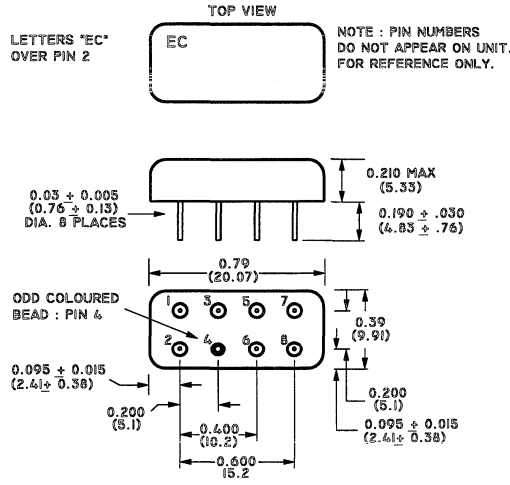
E-Series Plug-In Mixer
0.05 - 300 MHz

EMK-3H

Features

* LO Power +17 dBm
* Up to +14 dBm RF

R-5



WEIGHT (APPROX) : 0.13 OUNCES 3.5 GRAMS

Specifications @ 25°C

Frequency Range	
RF	0.05 - 300 MHz
LO	0.05 - 300 MHz
IF	DC - 300 MHz

Conversion Loss (dB)	Typical	Maximum
0.1 - 150 MHz	5	7
.05 - 300 MHz	6	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.05 - 0.5 MHz	55	45
0.5 - 150 MHz	40	30
150 - 300 MHz	30	25
LO to IF		
0.05 - 0.5 MHz	50	40
0.5 - 150 MHz	35	25
150 - 300 MHz	25	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
2 - 500 MHz

EMK-1H

Features

* LO Power +17 dBm
* Up to +14 dBm RF

Specifications @ 25°C

Frequency Range	
RF	2 - 500 MHz
LO	2 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
4 - 250 MHz	6	7.5
2 - 500 MHz	7	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
2 - 20 MHz	50	40
20 - 250 MHz	40	30
250 - 500 MHz	30	25
LO to IF		
2 - 20 MHz	45	35
20 - 250 MHz	35	25
250 - 500 MHz	25	20

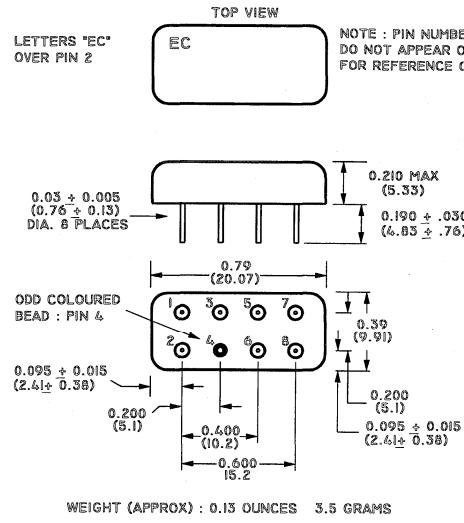
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-5



WEIGHT (APPROX) : 0.13 OUNCES 3.5 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

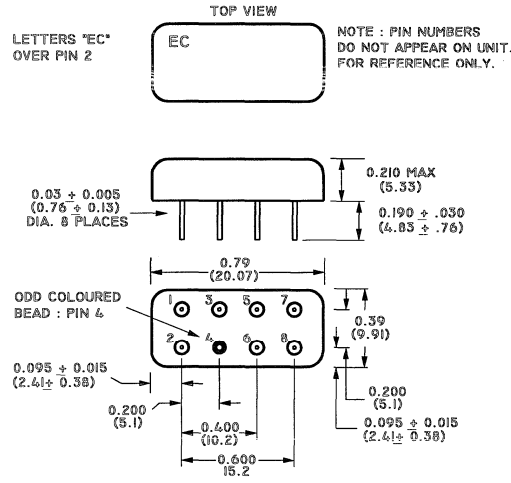
E-Series Plug-In Mixer
5 - 750 MHz

EMK-1WH

Features

* LO Power +17 dBm
* Up to +14 dBm RF

R-5



WEIGHT (APPROX) : 0.13 OUNCES 3.5 GRAMS

Specifications @ 25°C

Frequency Range	
RF	5 - 750 MHz
LO	5 - 750 MHz
IF	DC - 750 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 375 MHz	6.2	7.5
5 - 750 MHz	7	9

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	50	40
50 - 375 MHz	40	30
375 - 750 MHz	30	25
LO to IF		
5 - 50 MHz	45	35
50 - 375 MHz	35	25
375 - 750 MHz	30	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.1 - 500 MHz

EMM-3H

Features

* LO Power +17 dBm
* Up to +10 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.1 - 500 MHz
LO	0.1 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Maximum
0.2 - 250 MHz	7
.1 - 500 MHz	8

Isolation (dB)	Minimum
LO to RF	
0.1 - 1 MHz	45
1 - 250 MHz	25
250 - 500 MHz	20
LO to IF	
0.1 - 1 MHz	40
1 - 250 MHz	20
250 - 500 MHz	15

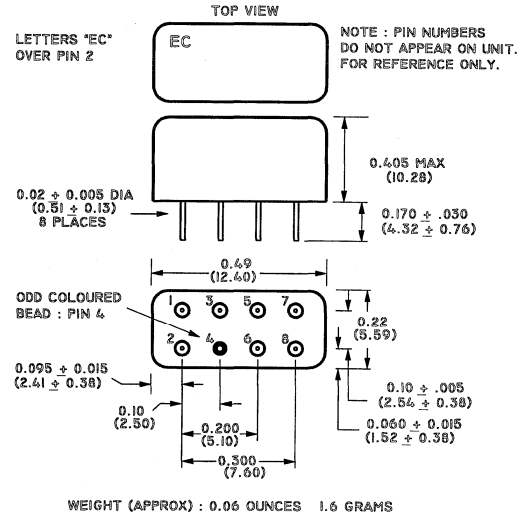
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 10 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-6



Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
0.5 - 500 MHz

EMRS-1H

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	5.5	7
.5 - 500 MHz	6.2	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	55	50
5 - 250 MHz	33	25
250 - 500 MHz	27	20
LO to IF		
0.5 - 5 MHz	55	45
5 - 250 MHz	30	23
250 - 500 MHz	24	19

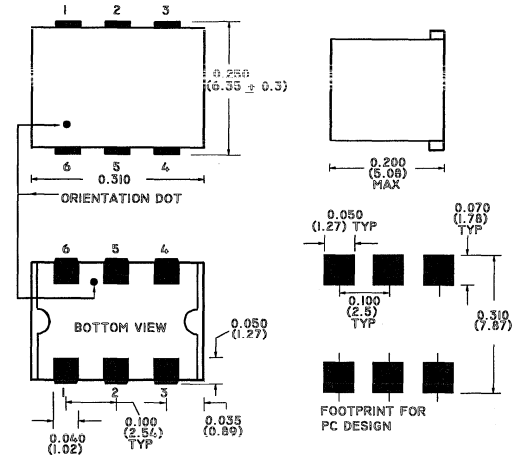
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-1H is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-1H

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
1886 - 1926 MHz

EMRS-9H

Features

* LO Power +17 dBm
* Up to +13 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	1886 - 1926 MHz
LO	1636 - 1676 MHz
IF	250 MHz

Conversion Loss (dB)	Typical	Maximum
1886 - 1926 MHz	9.5	10.5

Isolation (dB)	Typical	Minimum
LO to RF		
1636 - 1676 MHz	25	20
LO to IF		
1636 - 1676 MHz	25	18

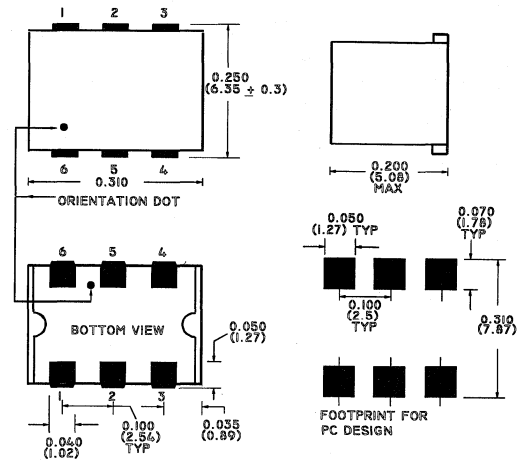
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 13 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-9H is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-9H

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

(Continued to Next Page)

Two Tone Third Order Input Intercept :

RF1 : 1906 MHz @ 0 dBm
RF2 : 1907 MHz @ 0 dBm
L.O. : 1656 MHz @ +17 dBm
I.F.1 : 250 MHz
I.F.2 : 251 MHz
IIP3 Spec. : +21dBm

ISO 9001
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E-Series Surface Mount Mixer
5 - 1000 MHz EMRS-2H

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	5 - 1000 MHz
LO	5 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 500 MHz	6.5	8
5 - 1000 MHz	7	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	60	40
50 - 500 MHz	40	20
500 - 1000 MHz	25	18
LO to IF		
5 - 50 MHz	55	30
50 - 500 MHz	30	20
500 - 1000 MHz	20	12

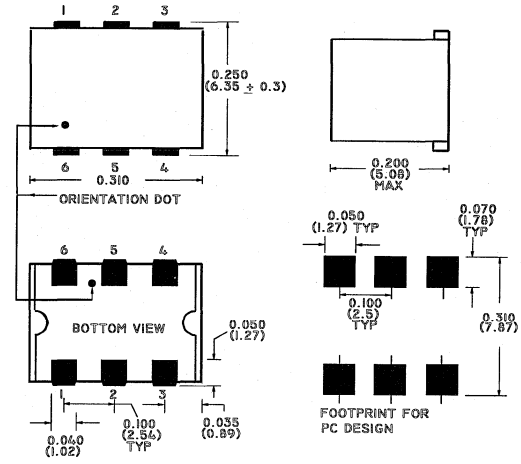
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-2H is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-2H

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
5 - 1500 MHz

EMRS-5H

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	5 - 1500 MHz
LO	5 - 1500 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 750 MHz	6.5	7.5
5 - 1500 MHz	7.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	60	40
50 - 750 MHz	40	20
750 - 1500 MHz	30	18
LO to IF		
5 - 50 MHz	55	30
50 - 750 MHz	30	18
750 - 1500 MHz	15	8

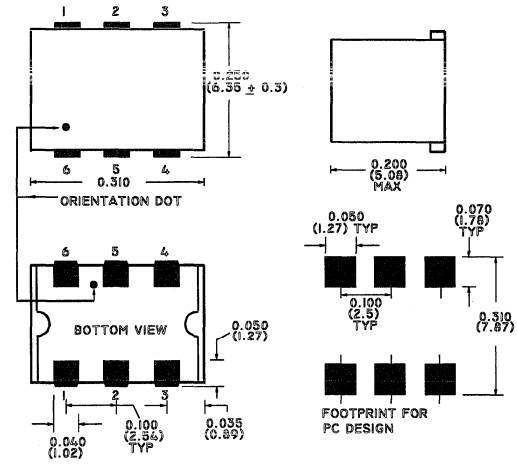
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-5H is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-5H

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
5 - 2000 MHz EMRS-11H

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	5 - 2000 MHz
LO	5 - 2000 MHz
IF	10 - 600 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 1000 MHz	7	8.5
5 - 2000 MHz	7.5	9

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	50	45
50 - 1000 MHz	35	25
1000 - 2000 MHz	30	20
LO to IF		
5 - 50 MHz	45	40
50 - 1000 MHz	30	20
1000 - 2000 MHz	25	15

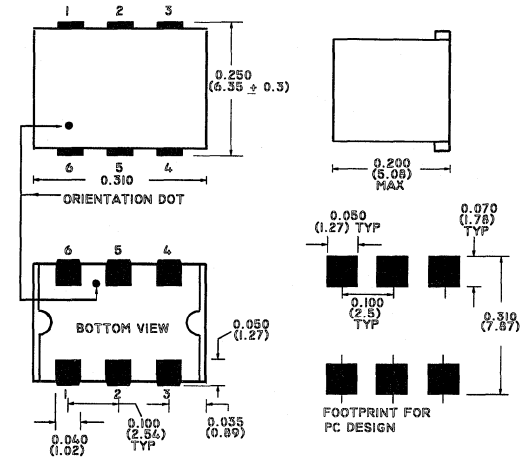
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-11H is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-11H

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0060 B

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ISO 9001
CERTIFIED

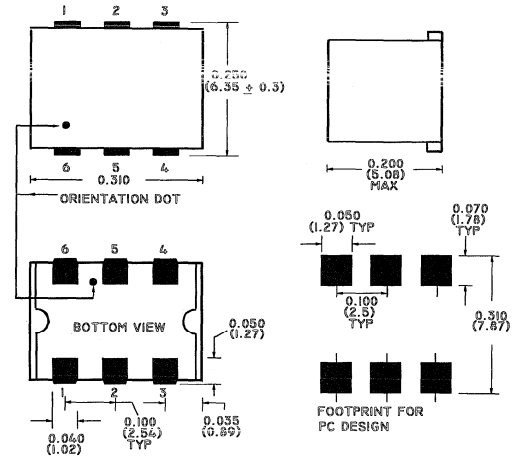
E-Series Surface Mount Mixer
5 - 500 MHz

EMRS-1HC

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

SM-1



Specifications @ 25°C

Frequency Range	
RF	5 - 500 MHz
LO	5 - 500 MHz
IF	DC - 500 MHz
Conversion Loss (dB)	**Maximum**
5 - 500 MHz	8.5
Isolation (dB)	**Minimum**
LO to RF	
5 - 500 MHz	25
LO to IF	
5 - 500 MHz	25

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

The EMRS-1HC is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-1HC

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Two Tone Third Order Input Intercept :

IIP3: 107.7 MHz & 107.9 MHz
@ -10 dBm 21dBm Typical

ISO 9001
CERTIFIED

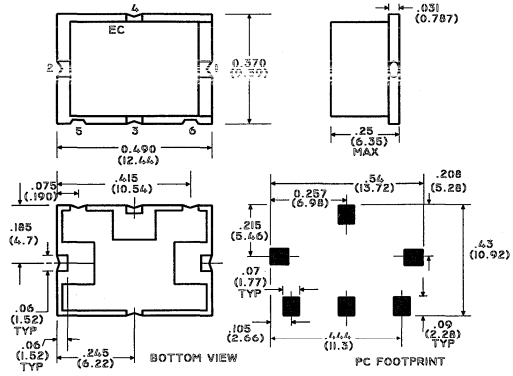
E-Series Surface Mount Mixer
1 - 1000 MHz

ESMD-C1H

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	1 - 1000 MHz
LO	1 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 500 MHz	6.5	7.5
1 - 1000 MHz	7.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	60	45
10 - 500 MHz	45	30
500 - 1000 MHz	40	25
LO to IF		
1 - 10 MHz	60	40
10 - 500 MHz	35	23
500 - 1000 MHz	30	15

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
20 - 1500 MHz ESMD-C2H

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	20 - 1500 MHz
LO	20 - 1500 MHz
IF	DC - 1500 MHz

Conversion Loss (dB)	Typical	Maximum
40 - 750 MHz	7	8.5
20 - 1500 MHz	8.5	9

Isolation (dB)	Typical	Minimum
LO to RF		
20 - 200 MHz	50	35
200 - 750 MHz	40	25
750 - 1500 MHz	20	10
LO to IF		
20 - 200 MHz	40	25
200 - 750 MHz	30	18
750 - 1500 MHz	15	8

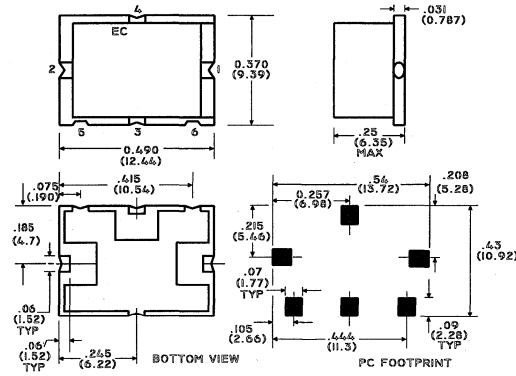
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-2



Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0154 B

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ISO 9001
CERTIFIED

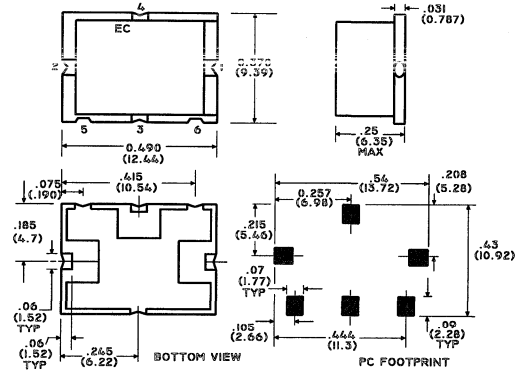
E-Series Surface Mount Mixer
20 - 2500 MHz

ESMD-C3H

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	20 - 2500 MHz
LO	20 - 2500 MHz
IF	20 - 600 MHz

Conversion Loss (dB)	Typical	Maximum
40 - 1250 MHz	8	9
20 - 2500 MHz	9	10.5

Isolation (dB)	Typical	Minimum
LO to RF		
20 - 200 MHz	45	30
200 - 1250 MHz	30	23
1250 - 2500 MHz	30	15
LO to IF		
20 - 200 MHz	40	20
200 - 1250 MHz	25	15
1250 - 2500 MHz	25	12

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

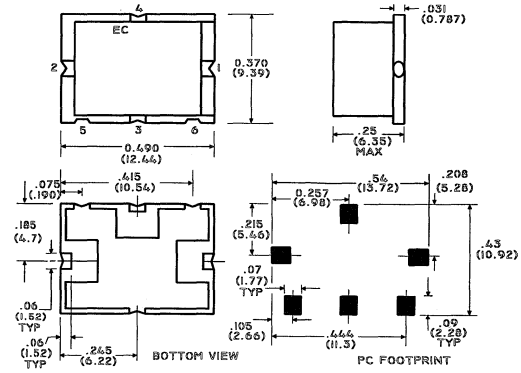
ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
20 - 2900 MHz ESMD-C2HX2-16

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	20 - 2900 MHz
LO	20 - 2900 MHz
IF	20 - 600 MHz

Conversion Loss (dB)	Typical	Maximum
40 - 1450 MHz	6.5	9
20 - 2900 MHz	7.5	10.5

Isolation (dB)	Typical	Minimum
LO to RF		
20 - 200 MHz	45	30
200 - 1450 MHz	35	23
1450 - 2900 MHz	25	15
LO to IF		
20 - 200 MHz	35	20
200 - 1450 MHz	22	15
1450 - 2900 MHz	17	12

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0785 B

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See Page 7-26 For Local Office Details

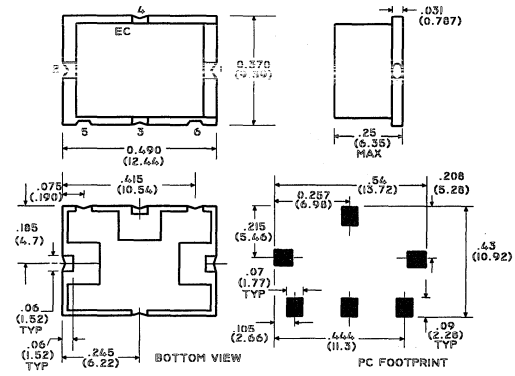
ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
2000 - 2700 MHz ESMD-11H

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	2000 - 2700 MHz
LO	2750 - 3450 MHz
IF	750 MHz

Conversion Loss (dB)	Typical	Maximum
2000 - 2700 MHz	9	12

Isolation (dB)	Typical	Minimum
LO to RF		
2750 - 3450 MHz	20	16
LO to IF		
2750 - 3450 MHz	18	16

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

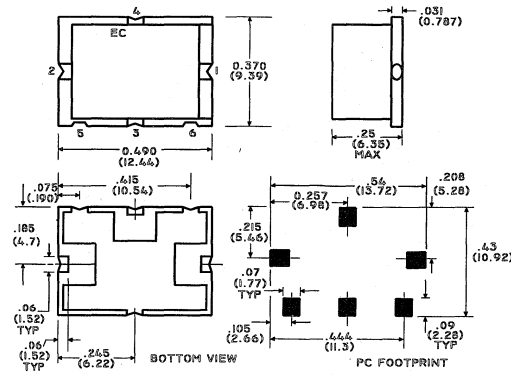
ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
50 - 2000 MHz ESMD-C2HX2-12

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	50 - 2000 MHz
LO	50 - 2000 MHz
IF	50 - 1950 MHz

Conversion Loss (dB)	Typical	Maximum
100 - 1000 MHz	6	7.5
50 - 2000 MHz	6.5	9

Isolation (dB)	Typical	Minimum
LO to RF		
50 - 500 MHz	45	35
500 - 1000 MHz	35	25
1000 - 2000 MHz	32	25
LO to IF		
50 - 500 MHz	40	25
500 - 1000 MHz	35	20
1000 - 2000 MHz	26	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

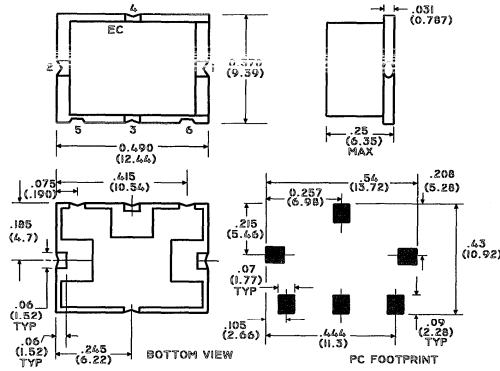
E-Series Surface Mount Mixer

750 - 960 MHz ESMD-173HXX

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	750 - 960 MHz
LO	750 - 960 MHz
IF	40 - 80 MHz

Conversion Loss (dB)	Maximum
750 - 960 MHz	7

Isolation (dB)	Minimum
LO to RF	
750 - 960 MHz	25
LO to IF	
750 - 960 MHz	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

Two Tone Third Order Input Intercept :

Test Conditions :

RF1 : 890 MHz @ 0 dBm
RF2 : 891 MHz @ 0 dBm
LO : 820 MHz @ +17 dBm

IIP3 Spec : +25 dBm Typical

Voltage Standing Wave Ratio's :

LO VSWR :	**(Max)**	**2.3 : 1**
RF VSWR :	**(Max)**	**2.3 : 1**
IF VSWR :	**(Max)**	**2.6 : 1**

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series Surface Mount Mixer

890 - 915 MHz ESMD-C2HX2

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	890 - 915 MHz
LO	819 - 844 MHz
IF	71 MHz

Conversion Loss (dB)	Maximum
890 - 915 MHz	7.5

Isolation (dB)	Minimum
LO to RF	
819 - 844 MHz	25
LO to IF	
819 - 844 MHz	15

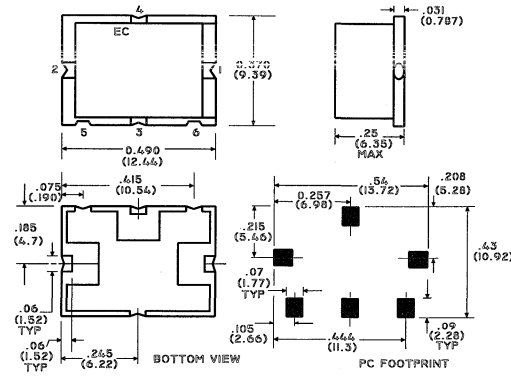
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-2



Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

Two Tone Third Order Input Intercept :

Test Conditions :

RF1 : 890 MHz @ 0 dBm
RF2 : 891 MHz @ 0 dBm
LO : 820 MHz @ +17 dBm

IIP3 Spec:+29 dBm Typ, +27 dBm Min

Voltage Standing Wave Ratio's :

LO VSWR :	**(Max)**	**2.0 : 1**
RF VSWR :	**(Max)**	**1.7 : 1**
IF VSWR :	**(Max)**	**2.0 : 1**

ISO 9001
CERTIFIED

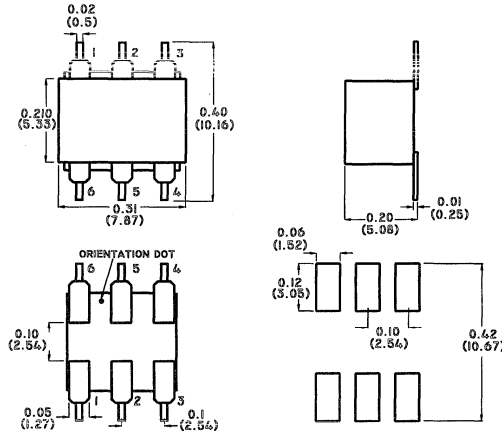
E-Series Surface Mount Mixer
0.5 - 500 MHz

EMRSL-1H

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	5.5	7
.5 - 500 MHz	6.2	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	55	50
5 - 250 MHz	33	25
250 - 500 MHz	27	20
LO to IF		
0.5 - 5 MHz	55	45
5 - 250 MHz	30	23
250 - 500 MHz	24	19

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0360 C

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See Page 7-26 For Local Office Details

ISO 9001
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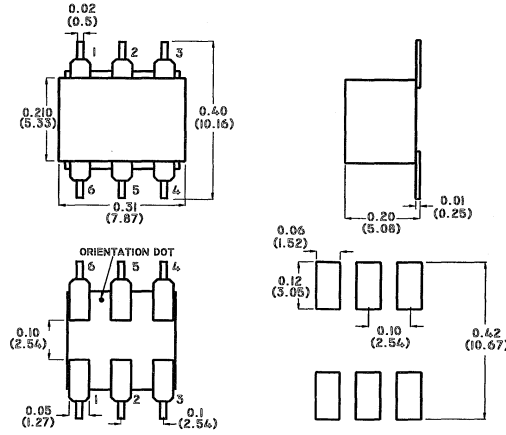
E-Series Surface Mount Mixer
1600 - 2300 MHz EMRS-1800

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range	
RF	1600 - 2300 MHz
LO	1600 - 2300 MHz
IF	10 - 200 MHz

Conversion Loss (dB)	Typical	Maximum
1600 - 2300 MHz	8.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
1600 - 2300 MHz	28	25
LO to IF		
1600 - 2300 MHz	24	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

The EMRS-1800 is also available
in the new J Leaded SM-44 case style
Order As Follows: EMRSJ-1800

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

(Continued to Next Page)

Two Tone Third Order Input Intercept :

Test Conditions:

RF1 : 2100 MHz @ 0dBm
RF2 : 2101 MHz @ 0dBm
LO : 2055 MHz @ +17dBm

IIP3 Spec: +23dBm Typ, +20dBm Min.

ISO 9001
CERTIFIED

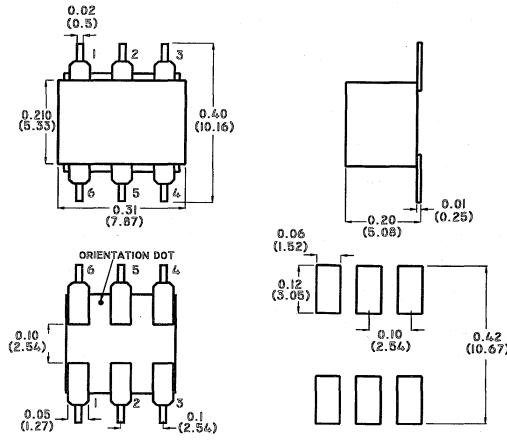
E-Series Surface Mount Mixer
5 - 1500 MHz

EMRSL-5H

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range		
RF	5 - 1500 MHz	
LO	5 - 1500 MHz	
IF	DC - 1000 MHz	
Conversion Loss (dB)	**Typical**	**Maximum**
10 - 750 MHz	6.5	7.5
5 - 1500 MHz	7.5	9.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
5 - 50 MHz	60	40
50 - 750 MHz	40	20
750 - 1500 MHz	30	18
LO to IF		
5 - 50 MHz	55	30
50 - 750 MHz	30	18
750 - 1500 MHz	15	8

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer

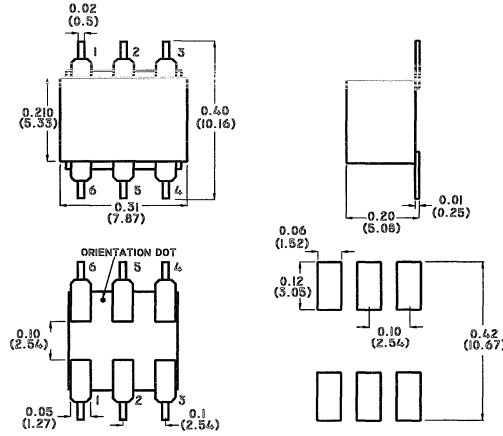
5 - 750 MHz

EMRSL-1WH

Features

* LO Power +17 dBm
* Up to +14 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range		
RF		5 - 750 MHz
LO		5 - 750 MHz
IF		DC - 750 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
10 - 375 MHz	7	8.5
5 - 750 MHz	7.8	8.8
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
5 - 50 MHz	55	40
50 - 375 MHz	43	22
375 - 750 MHz	28	20
LO to IF		
5 - 50 MHz	52	30
50 - 375 MHz	38	22
375 - 750 MHz	29	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 14 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0548 B

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.07 - 200 MHz

EMR-3

Features

* LO Power +23 dBm
* Up to +15 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.07 - 200 MHz
LO	0.07 - 200 MHz
IF	DC - 200 MHz

Conversion Loss (dB)	Typical	Maximum
0.14 - 100 MHz	6	7.5
.07 - 200 MHz	6.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
0.07 - 0.7 MHz	55	45
0.7 - 100 MHz	40	30
100 - 200 MHz	30	25
LO to IF		
0.07 - 0.7 MHz	55	45
0.7 - 100 MHz	40	30
100 - 200 MHz	30	20

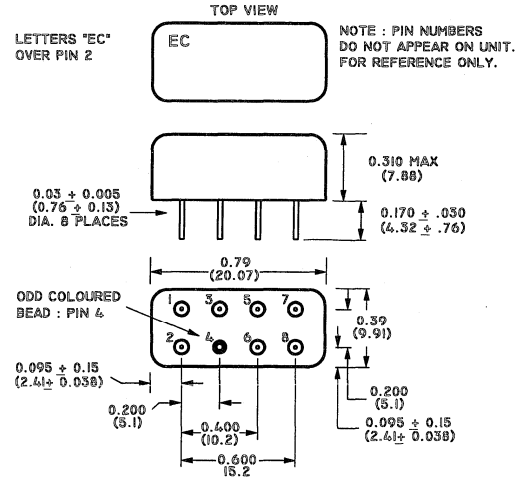
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 15 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	350 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
5 - 500 MHz

EMR-1

Features

* LO Power +23 dBm
* Up to +15 dBm RF

Specifications @ 25°C

Frequency Range	
RF	5 - 500 MHz
LO	5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 250 MHz	6	7.5
5 - 500 MHz	7.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	55	45
50 - 250 MHz	40	30
250 - 500 MHz	30	25
LO to IF		
5 - 50 MHz	55	45
50 - 250 MHz	40	30
250 - 500 MHz	30	20

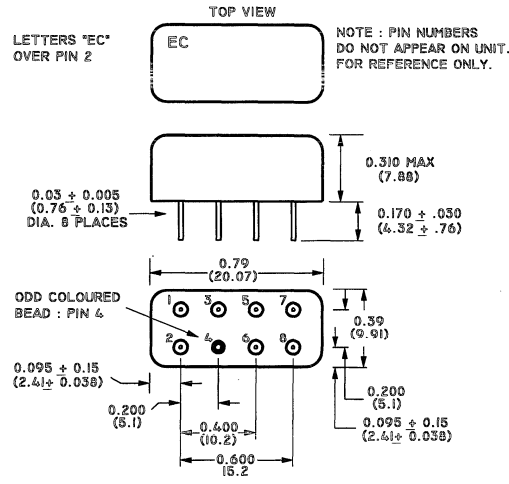
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 15 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	350 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.03 - 50 MHz

EMR-6

Features

* LO Power +23 dBm
* Up to +15 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.03 - 50 MHz
LO	0.03 - 50 MHz
IF	DC - 50 MHz

Conversion Loss (dB)	Typical	Maximum
0.06 - 25 MHz	5.5	7.5
.03 - 50 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.03 - 0.3 MHz	60	50
0.3 - 25 MHz	45	30
25 - 50 MHz	35	25
LO to IF		
0.03 - 0.3 MHz	60	45
0.3 - 25 MHz	40	25
25 - 50 MHz	30	20

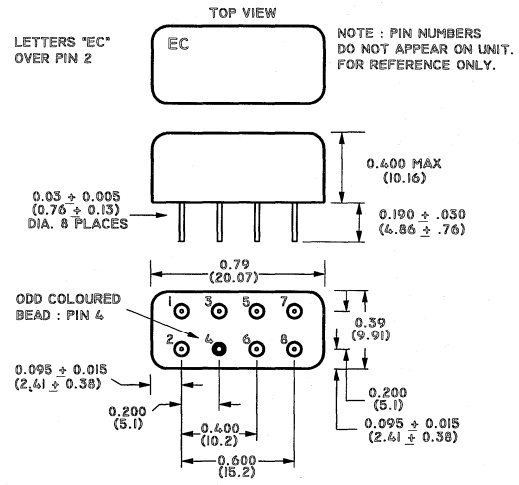
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 15 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	350 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	-
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.1 - 1000 MHz

EBY-2

Features

* LO Power +23 dBm
* Up to +20 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.1 - 1000 MHz
LO	0.1 - 1000 MHz
IF	0.01 - 500 MHz

Conversion Loss (dB)	Typical	Maximum
0.2 - 500 MHz	5.3	7.5
.1 - 1000 MHz	7.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.1 - 1 MHz	40	20
1 - 500 MHz	40	30
500 - 1000 MHz	30	25
LO to IF		
0.1 - 1 MHz	37	23
1 - 500 MHz	40	25
500 - 1000 MHz	25	20

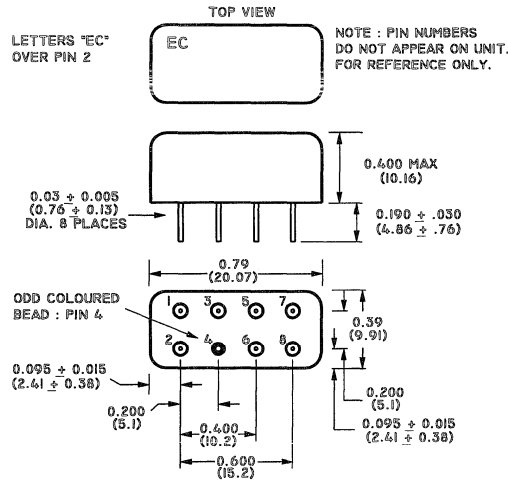
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 20 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	350 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	4

Specifications Subject to Change Without Notice S 0004 B

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.1 - 500 MHz

EBY-1

Features

* LO Power +23 dBm
* Up to +20 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.1 - 500 MHz
LO	0.1 - 500 MHz
IF	0.01 - 500 MHz

Conversion Loss (dB)	Typical	Maximum
0.2 - 250 MHz	5.3	6
.1 - 500 MHz	5.3	7.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.1 - 1 MHz	40	20
1 - 250 MHz	46	35
250 - 500 MHz	40	30
LO to IF		
0.1 - 1 MHz	37	23
1 - 250 MHz	46	35
250 - 500 MHz	40	30

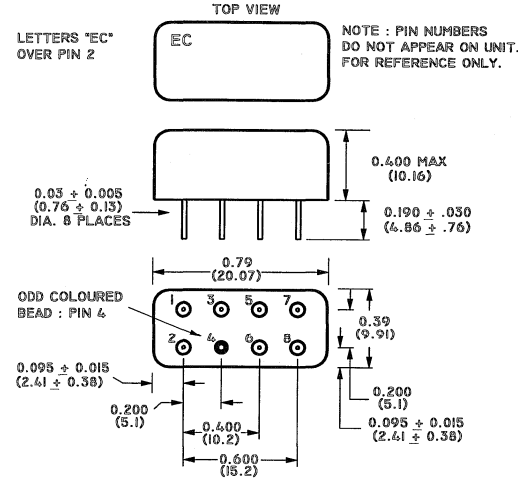
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 20 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	500 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	4

ISO 9001
CERTIFIED

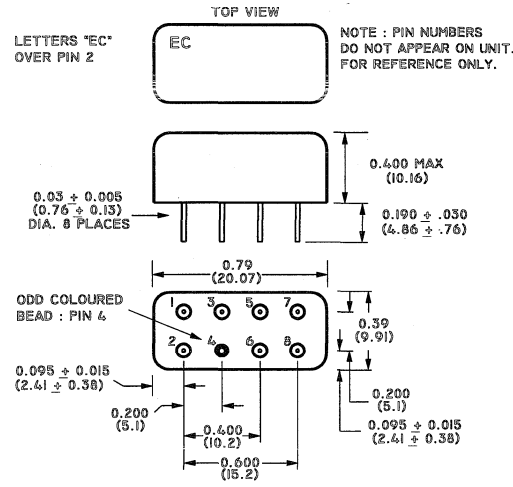
E-Series Plug-In Mixer
10 - 1000 MHz

EMR-2

Features

* LO Power +23 dBm
* Up to +15 dBm RF

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Specifications @ 25°C

Frequency Range	
RF	10 - 1000 MHz
LO	10 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Maximum
20 - 500 MHz	8.5
10 - 1000 MHz	10

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 100 MHz	50	35
100 - 500 MHz	40	30
500 - 1000 MHz	35	25
LO to IF		
10 - 100 MHz	50	35
100 - 500 MHz	35	25
500 - 1000 MHz	25	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 15 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	350 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	-
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

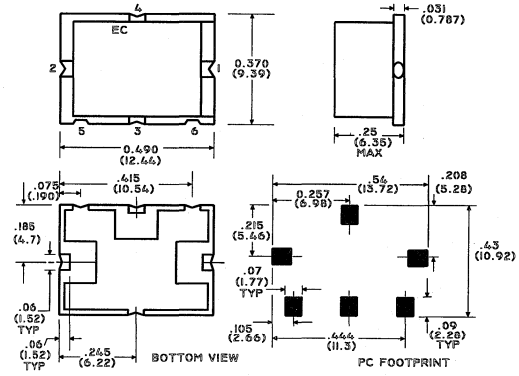
E-Series Surface Mount Mixer
10 - 2400 MHz

ESMD-C2Y

Features

* LO Power +23 dBm
* Up to +20 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	10 - 2400 MHz
LO	10 - 2400 MHz
IF	5 - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 1200 MHz	7.5	8.5
10 - 2400 MHz	8	10

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 100 MHz	28	20
100 - 1200 MHz	26	20
1200 - 2400 MHz	25	20
LO to IF		
10 - 100 MHz	28	20
100 - 1200 MHz	26	20
1200 - 2400 MHz	25	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 20 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	200 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0396 B

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
10 - 2500 MHz

EVAY-2

Features

* LO Power +27 dBm
* Up to +24 dBm RF

Specifications @ 25°C

Frequency Range	
RF	10 - 2500 MHz
LO	10 - 2500 MHz
IF	10 - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 1250 MHz	6.5	7
10 - 2500 MHz	7	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 100 MHz	40	35
100 - 1250 MHz	30	25
1250 - 2500 MHz	30	25
LO to IF		
10 - 100 MHz	35	25
100 - 1250 MHz	30	20
1250 - 2500 MHz	30	20

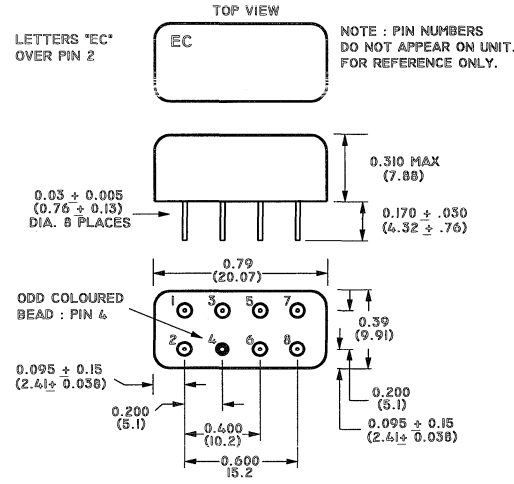
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 24 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	500 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.5 - 500 MHz

EVAY-1

Features

* LO Power +27 dBm
* Up to +24 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	0.02 - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	6	7.5
.5 - 500 MHz	7.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	47	40
5 - 250 MHz	46	35
250 - 500 MHz	35	25
LO to IF		
0.5 - 5 MHz	47	40
5 - 250 MHz	46	35
250 - 500 MHz	35	25

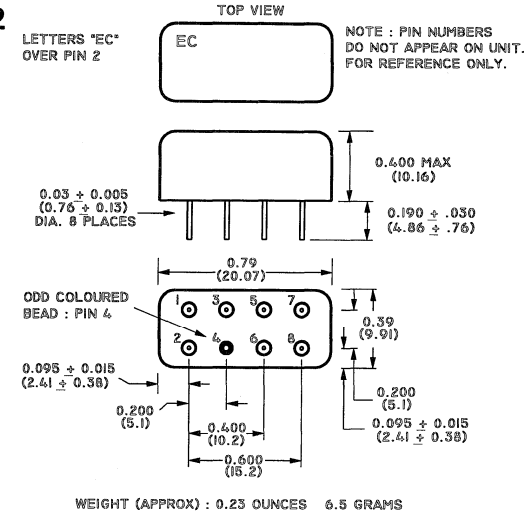
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 24 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	500 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

Specifications Subject to Change Without Notice S 0173 B

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ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.5 - 500 MHz

EMA-1L

Features

* LO Power +3 dBm
* Up to -1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	5.5	7
.5 - 500 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	50	45
5 - 250 MHz	45	30
250 - 500 MHz	35	25
LO to IF		
0.5 - 5 MHz	45	35
5 - 250 MHz	40	25
250 - 500 MHz	30	20

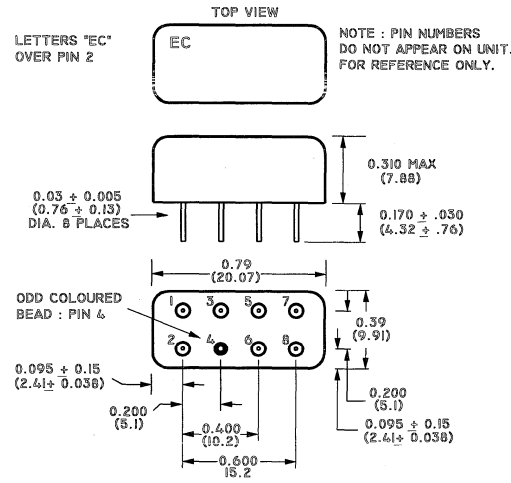
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	-1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
10 - 1000 MHz

EMS-1XL

Features

* LO Power +3 dBm
* Up to -1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	10 - 1000 MHz
LO	10 - 1000 MHz
IF	5 - 500 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 500 MHz	6	7.5
10 - 1000 MHz	7	8

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 100 MHz	50	40
100 - 500 MHz	40	30
500 - 1000 MHz	30	20
LO to IF		
10 - 100 MHz	50	45
100 - 500 MHz	40	35
500 - 1000 MHz	35	25

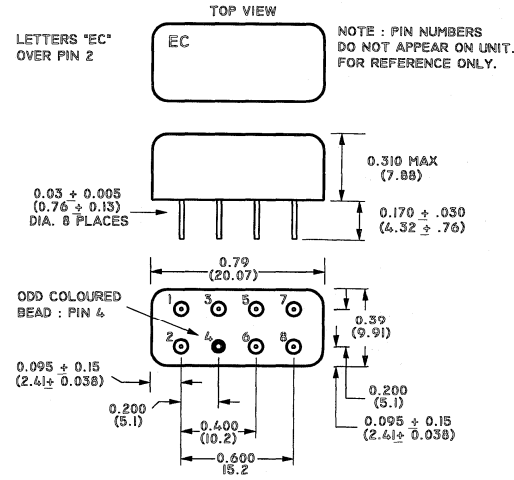
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	-1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	3,4
IF	1
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'RF' pins must be connected together externally.

ISO 9001
CERTIFIED

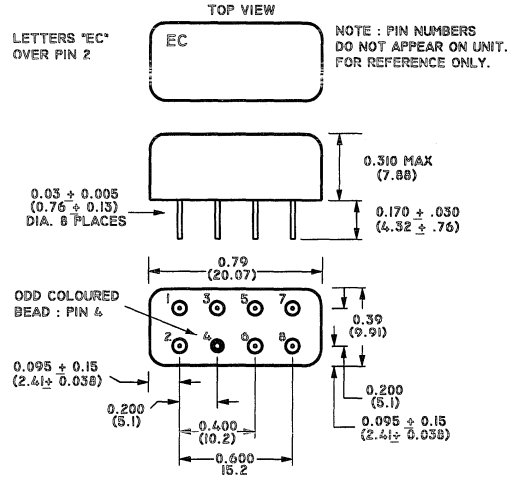
E-Series Plug-In Mixer
100 - 2000 MHz

EMA-2000L

Features

* LO Power +3 dBm
* Up to -1 dBm RF

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Specifications @ 25°C

Frequency Range	
RF	100 - 2000 MHz
LO	100 - 2000 MHz
IF	DC - 600 MHz

Conversion Loss (dB)	Typical	Maximum
200 - 1000 MHz	6	9.5
100 - 2000 MHz	7	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
100 - 2000 MHz	37	20
LO to IF		
100 - 2000 MHz	30	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	-1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	8
RF	1
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	4

ISO 9001
CERTIFIED

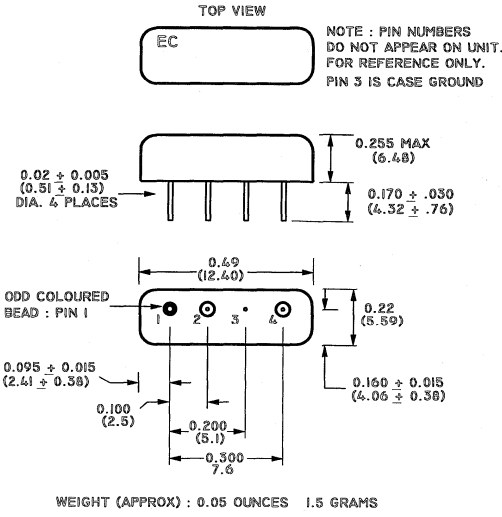
E-Series Plug-In Mixer
1 - 1000 MHz

EMT-2L

Features

* LO Power +3 dBm
* Up to -1 dBm RF

R-3



Specifications @ 25°C

Frequency Range		
RF		1 - 1000 MHz
LO		1 - 1000 MHz
IF		DC - 1000 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
2 - 500 MHz	6	7.5
1 - 1000 MHz	7	8.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
1 - 10 MHz	50	45
10 - 500 MHz	40	25
500 - 1000 MHz	30	25
LO to IF		
1 - 10 MHz	45	40
10 - 500 MHz	35	25
500 - 1000 MHz	25	20

Operating Characteristics

Impedance	**50 Ohms Nominal**
RF input for 1dB Compression	**-1 dBm**

Absolute Maximum Ratings

Parameter	**Absolute Maximum**
RF Power	**50 mW**
Peak IF Current	**40 mA**
Storage Temperature	**-55°C to 100°C**
Operating Temperature	**-55°C to 100°C**
Pin Temperature (10 Seconds)	**260°C**

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
0.5 - 500 MHz

EMRS-1L

Features

* LO Power +3 dBm
* Up to -1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	7	7.5
.5 - 500 MHz	7.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	55	50
5 - 250 MHz	33	25
250 - 500 MHz	27	20
LO to IF		
0.5 - 5 MHz	55	45
5 - 250 MHz	30	23
250 - 500 MHz	24	19

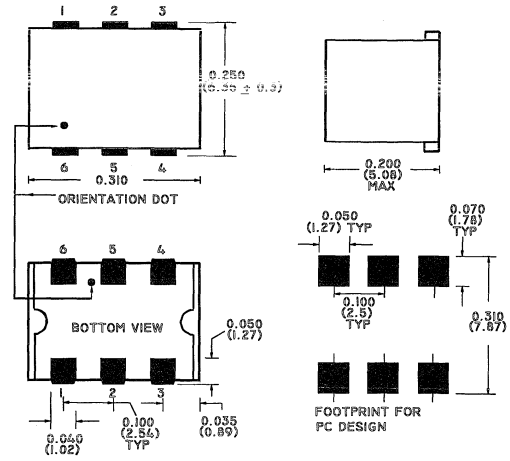
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	-1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-1L is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-1L

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
5 - 1000 MHz

EMRS-2L

Features

* LO Power +3 dBm
* Up to -1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	5 - 1000 MHz
LO	5 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 500 MHz	6.5	8
5 - 1000 MHz	7.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	60	40
50 - 500 MHz	40	20
500 - 1000 MHz	25	18
LO to IF		
5 - 50 MHz	55	30
50 - 500 MHz	30	20
500 - 1000 MHz	20	12

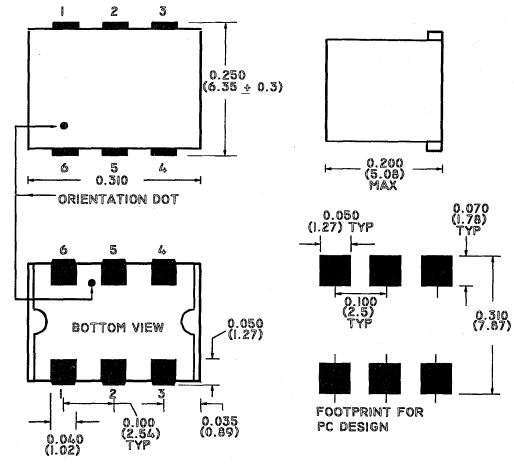
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	-1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-2L is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-2L

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer

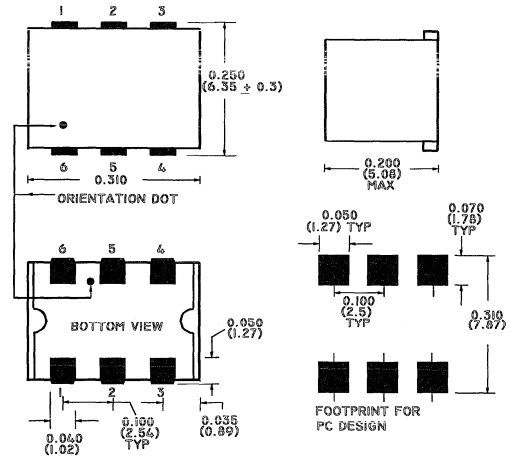
5 - 1500 MHz

EMRS-5L

Features

* LO Power +3 dBm
* Up to -1 dBm RF
* Surface Mount

SM-1



Specifications @ 25°C

Frequency Range	
RF	5 - 1500 MHz
LO	5 - 1500 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 750 MHz	6.5	7.5
5 - 1500 MHz	7.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	60	40
50 - 750 MHz	40	20
750 - 1500 MHz	30	16
LO to IF		
5 - 50 MHz	55	30
50 - 750 MHz	30	18
750 - 1500 MHz	15	8

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	-1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

The EMRS-5L is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-5L

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
5 - 2000 MHz EMRS-11L

Features

* LO Power +3 dBm
* Up to -1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range		
RF		5 - 2000 MHz
LO		5 - 2000 MHz
IF		10 - 600 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
10 - 1000 MHz	8.5	9
5 - 2000 MHz	9.5	10
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
5 - 50 MHz	50	45
50 - 1000 MHz	35	25
1000 - 2000 MHz	30	20
LO to IF		
5 - 50 MHz	45	40
50 - 1000 MHz	30	20
1000 - 2000 MHz	25	15

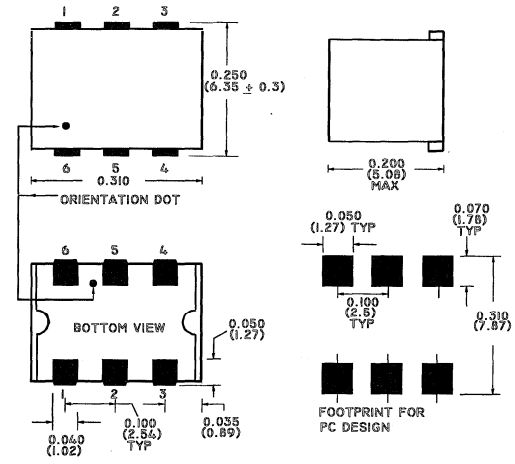
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	-1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-11L is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-11L

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
935 - 960 MHz EMRS-5LX

Features

* LO Power +3 dBm
* Up to -1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range		
RF		935 - 960 MHz
LO		857 - 882 MHz
IF		80 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
935 - 960 MHz	7.5	8.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
857 - 882 MHz	25	20
LO to IF		
857 - 882 MHz	30	22

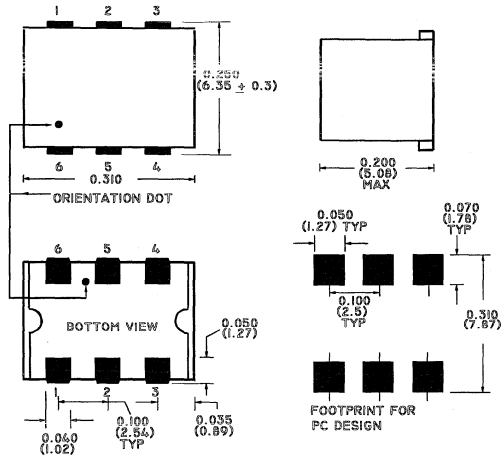
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	-1 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-5LX is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-5LX

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0619 C

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North America Tel: 1-800-366-266 * Europe Tel: +44 (1344) 869 595 * Asia / Pacific Tel: +81 (03) 3226-1671

Two Tone Third Order Input Intercept :

Test Conditions :

1. RF1 : 935 MHz @ -10 dBm
RF2 : 936 MHz @ -10 dBm
LO : 855 MHz @ +3 dBm

2. RF1 : 950 MHz @ -10 dBm
RF2 : 951 MHz @ -10 dBm
LO : 870 MHz @ +3 dBm

3. RF1 : 960 MHz @ -10 dBm
RF2 : 961 MHz @ -10 dBm
LO : 880 MHz @ +3 dBm

IP3 Spec = +10 dBm Typ, 8 dBm Min

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer

935 - 960 MHz EMRS-95L

Features

* LO Power +3 dBm
* Up to -2 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	935 - 960 MHz
LO	890 - 915 MHz
IF	45 MHz

Conversion Loss (dB)	Typical	Maximum
935 - 960 MHz	6	7.5

Isolation (dB)	Typical	Minimum
LO to RF		
890 - 915 MHz	25	20
LO to IF		
890 - 915 MHz	18	15

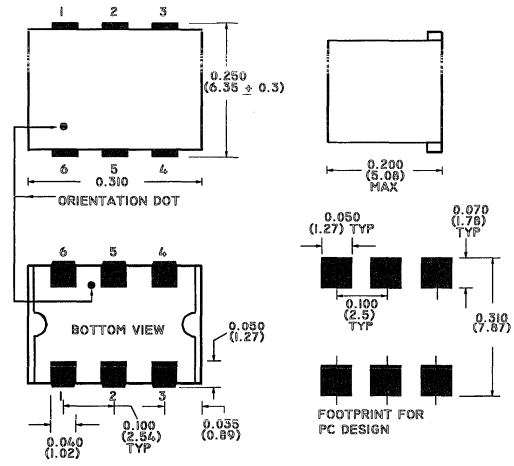
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	-2 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-95L is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-95L

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Two Tone Third Order Input Intercept :

Test Conditions :

RF1 : 945 MHz @ -20 dBm
RF2 : 945 +/- 0.1MHz @ -20 dBm
LO : 900 MHz @ +3 dBm

IIP3 Spec = +6 dBm (-52 dBc) Min

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
20 - 2500 MHz ESMD-C3L

Features

* LO Power +3 dBm
* Up to -2 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	20 - 2500 MHz
LO	20 - 2500 MHz
IF	20 - 600 MHz

Conversion Loss (dB)	Typical	Maximum
40 - 1250 MHz	8	9
20 - 2500 MHz	9	10.5

Isolation (dB)	Typical	Minimum
LO to RF		
20 - 200 MHz	45	30
200 - 1250 MHz	30	20
1250 - 2500 MHz	30	15
LO to IF		
20 - 200 MHz	40	20
200 - 1250 MHz	25	15
1250 - 2500 MHz	25	12

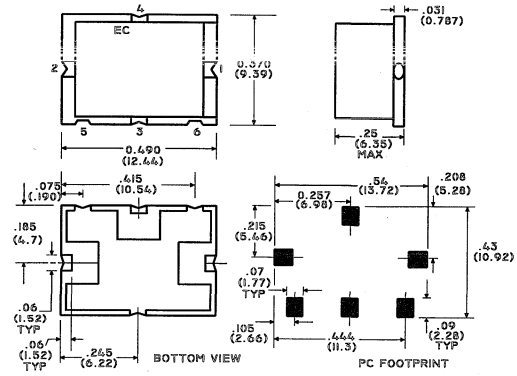
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	-2 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-2



Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
0.5 - 500 MHz

EMRSL-1L

Features

* LO Power +3 dBm
* Up to -1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	5.5	7
.5 - 500 MHz	6.2	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	55	50
5 - 250 MHz	33	25
250 - 500 MHz	27	20
LO to IF		
0.5 - 5 MHz	55	45
5 - 250 MHz	30	23
250 - 500 MHz	24	19

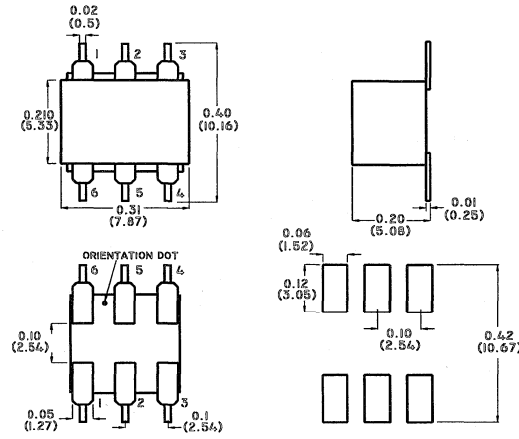
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	-1 dBm
DC Polarity	Positive

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-24



Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0858 B

ISO 9001
CERTIFIED

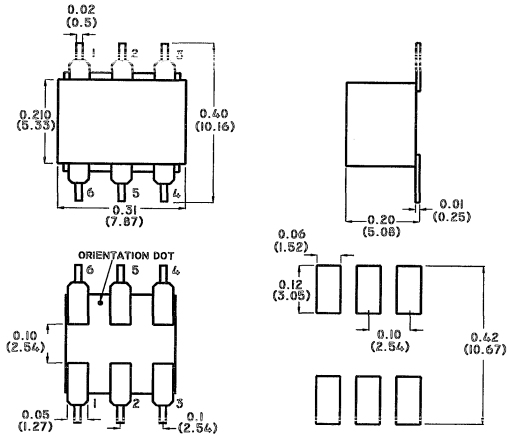
E-Series Surface Mount Mixer
5 - 1000 MHz

EMRSL-2L

Features

* LO Power +3 dBm
* Up to -1 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range	
RF	5 - 1000 MHz
LO	5 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 500 MHz	6.5	8
5 - 1000 MHz	7.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	60	40
50 - 500 MHz	40	20
500 - 1000 MHz	25	18
LO to IF		
5 - 50 MHz	55	30
50 - 500 MHz	30	20
500 - 1000 MHz	20	12

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	-1 dBm
DC Polarity	Positive

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

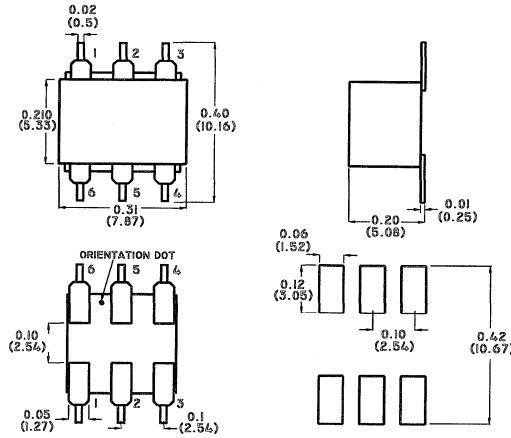
ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
5 - 1500 MHz EMRSL-5L

Features

* LO Power +3 dBm
* Up to -1 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range	
RF	5 - 1500 MHz
LO	5 - 1500 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 750 MHz	6.5	7.5
5 - 1500 MHz	7.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	60	40
50 - 750 MHz	40	20
750 - 1500 MHz	30	18
LO to IF		
5 - 50 MHz	55	30
50 - 750 MHz	30	18
750 - 1500 MHz	15	8

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	-1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Standard Mixer
0.5 - 500 MHz

EMAZ-1

C-9

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	5.5	7
.5 - 500 MHz	6.5	8.5

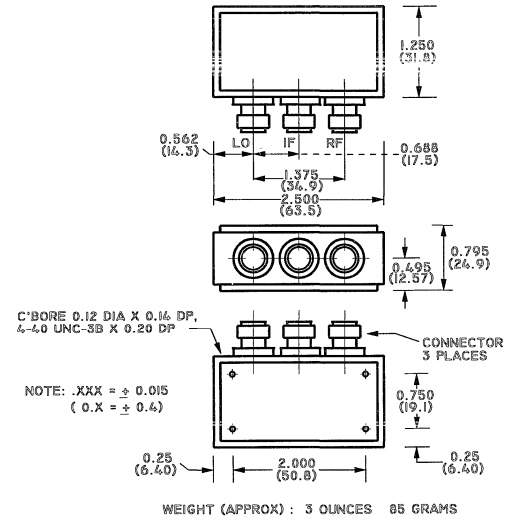
Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	50	45
5 - 250 MHz	45	30
250 - 500 MHz	35	25
LO to IF		
0.5 - 5 MHz	45	35
5 - 250 MHz	40	25
250 - 500 MHz	30	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C



Function	Pin No.
LO	1
RF	3
IF	2
Ground	
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0296 B

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

E-Series Standard Mixer
1 - 1000 MHz EMAZ-2

C-9

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	1 - 1000 MHz
LO	1 - 1000 MHz
IF	0.5 - 500 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 500 MHz	5.5	7.5
1 - 1000 MHz	6.5	8.5

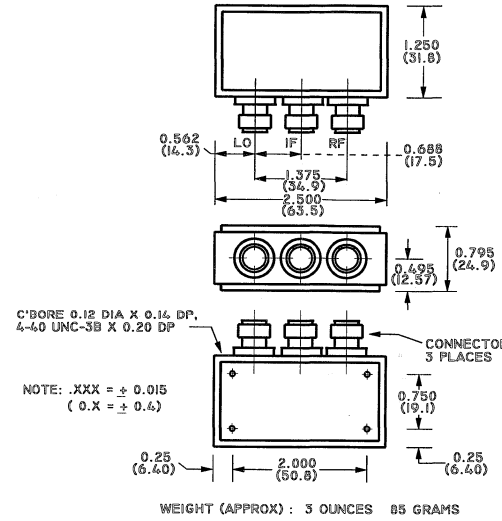
Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	45	30
10 - 500 MHz	35	20
500 - 1000 MHz	30	20
LO to IF		
1 - 10 MHz	45	30
10 - 500 MHz	35	20
500 - 1000 MHz	30	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C



Function	Pin No.
LO	1
RF	3
IF	2
Ground	
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

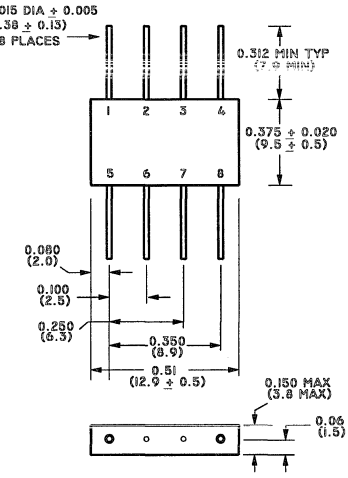
E-Series Standard Mixer
5 - 1000 MHz

EMD-113

Features

* LO Power +7 dBm
* Up to +1 dBm RF

FP-2



WEIGHT (APPROX) : 0.09 OUNCES 2.5 GRAMS

Specifications @ 25°C

Frequency Range		
RF		5 - 1000 MHz
LO		5 - 1000 MHz
IF		DC - 1000 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
10 - 500 MHz	5.8	7
5 - 1000 MHz	6	8
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
5 - 50 MHz	50	40
50 - 500 MHz	40	25
500 - 1000 MHz	35	25
LO to IF		
5 - 50 MHz	50	35
50 - 500 MHz	40	30
500 - 1000 MHz	30	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	8
RF	5
IF	4
Ground	2,3,6,7
Case Ground	-
Unconnected	1

ISO 9001
CERTIFIED

E-Series Standard Mixer
600 - 3000 MHz EMD-156

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	600 - 3000 MHz
LO	600 - 3000 MHz
IF	DC - 1000 MHz

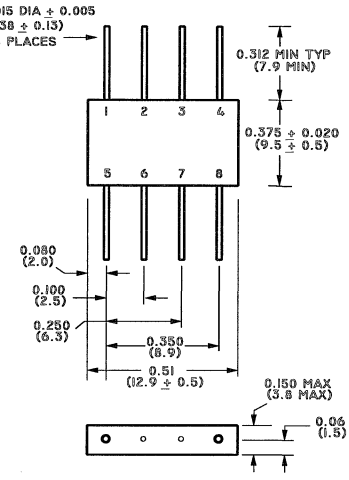
Conversion Loss (dB)

See Additional Specs.

Isolation (dB)

See Additional Specs for Details

FP-2



WEIGHT (APPROX) : 0.09 OUNCES 2.5 GRAMS

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	5
Ground	
Case Ground	2,3,6,7
Unconnected	8

(Continued to Next Page)

Additional Specifications :

Conversion Loss :	Maximum
800 - 2000 MHz	8.0
600 - 3000 MHz	9.0

LO to RF Isolation :	Minimum
600 - 2000 MHz	25
2000 - 3000 MHz	20

LO to IF Isolation :	Minimum
600 - 2000 MHz	20
2000 - 3000 MHz	17

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.003 - 100 MHz

EMA-6

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.003 - 100 MHz
LO	0.003 - 100 MHz
IF	DC - 100 MHz

Conversion Loss (dB)	Typical	Maximum
0.006 - 50 MHz	5.5	7.5
.003 - 100 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.003 - 0.03 MHz	60	50
0.03 - 50 MHz	45	30
50 - 100 MHz	35	25
LO to IF		
0.003 - 0.03 MHz	60	45
0.03 - 50 MHz	40	25
50 - 100 MHz	30	20

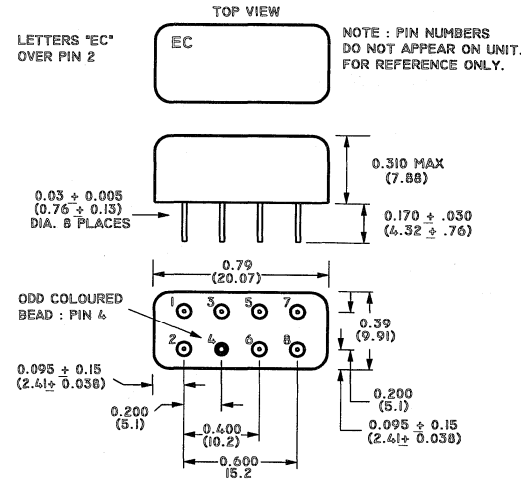
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	-
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.025 - 200 MHz

EMS-3

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.025 - 200 MHz
LO	0.025 - 200 MHz
IF	DC - 200 MHz

Conversion Loss (dB)	Typical	Maximum
0.05 - 100 MHz	5.5	7.5
.025 - 200 MHz	6	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.025 - 0.25 MHz	55	50
0.25 - 100 MHz	45	30
100 - 200 MHz	35	25
LO to IF		
0.025 - 0.25 MHz	45	35
0.25 - 100 MHz	40	30
100 - 200 MHz	30	20

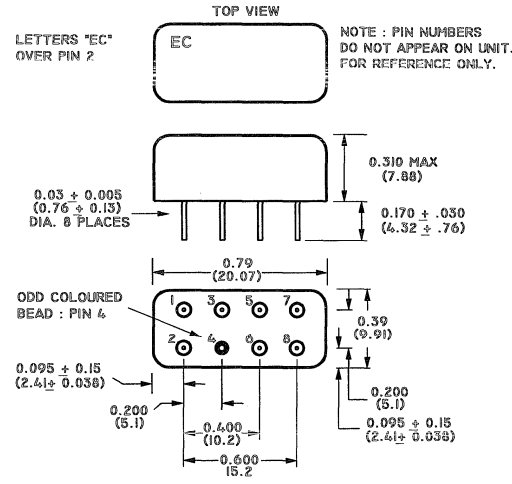
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	-
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.1 - 400 MHz EMS-1-1

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.1 - 400 MHz
LO	0.1 - 400 MHz
IF	DC - 400 MHz

Conversion Loss (dB)	Typical	Maximum
0.2 - 200 MHz	5.5	7
.1 - 400 MHz	6	8

Isolation (dB)	Typical	Minimum
LO to RF		
0.1 - 1 MHz	50	45
1 - 200 MHz	45	30
200 - 400 MHz	35	25
LO to IF		
0.1 - 1 MHz	45	30
1 - 200 MHz	40	25
200 - 400 MHz	30	20

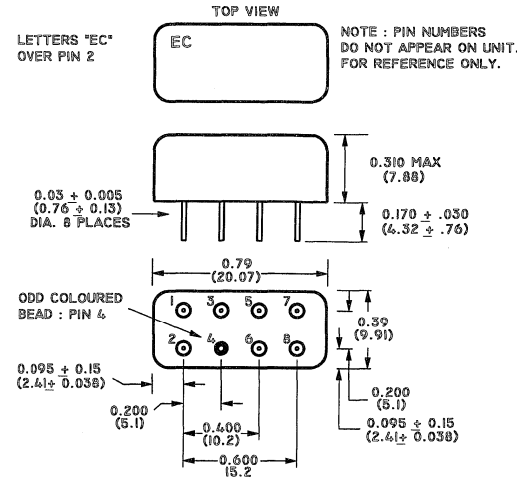
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	-
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

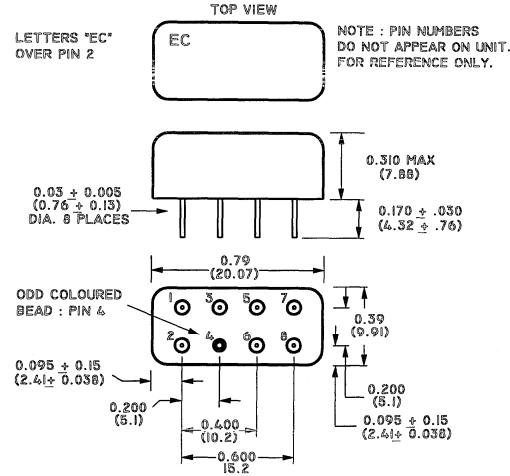
E-Series Plug-In Mixer
0.1 - 500 MHz

EMA-1-1

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Specifications @ 25°C

Frequency Range	
RF	0.1 - 500 MHz
LO	0.1 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
0.2 - 250 MHz	5.5	7.5
.1 - 500 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.1 - 1 MHz	50	45
1 - 250 MHz	45	30
250 - 500 MHz	35	25
LO to IF		
0.1 - 1 MHz	45	30
1 - 250 MHz	40	25
250 - 500 MHz	30	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.5 - 500 MHz

EMA-1

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	5.5	7
.5 - 500 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	50	45
5 - 250 MHz	45	30
250 - 500 MHz	35	25
LO to IF		
0.5 - 5 MHz	45	35
5 - 250 MHz	40	25
250 - 500 MHz	30	20

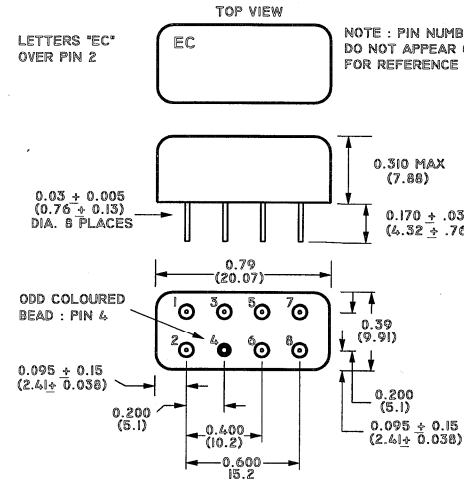
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.5 - 500 MHz

EMA-1S

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	6	7.5
.5 - 500 MHz	6.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	45	35
5 - 250 MHz	40	30
250 - 500 MHz	30	20
LO to IF		
0.5 - 5 MHz	40	30
5 - 250 MHz	35	25
250 - 500 MHz	30	20

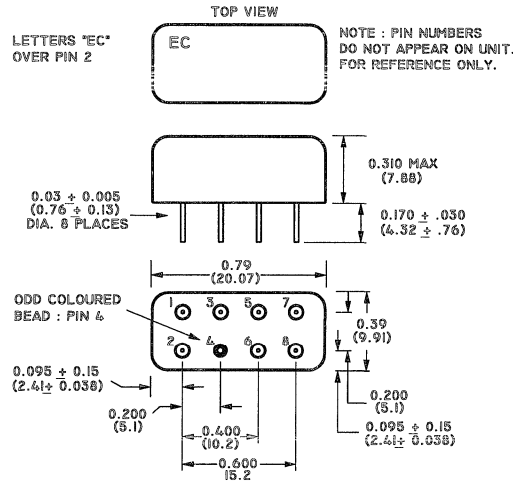
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
1 - 1000 MHz

EMA-2

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	1 - 1000 MHz
LO	1 - 1000 MHz
IF	0.5 - 500 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 500 MHz	5.5	7.5
1 - 1000 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	45	30
10 - 500 MHz	35	20
500 - 1000 MHz	30	20
LO to IF		
1 - 10 MHz	45	30
10 - 500 MHz	30	20
500 - 1000 MHz	30	20

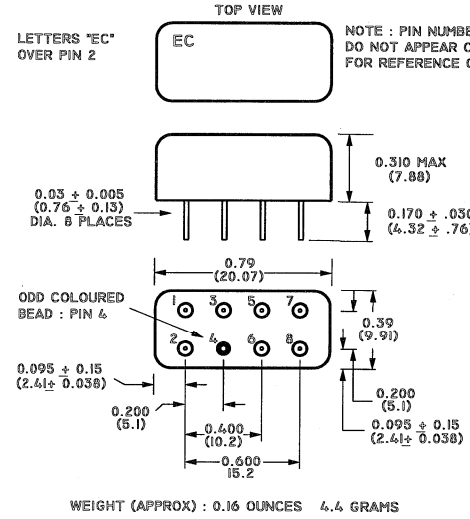
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	3,4
IF	1
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'RF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
1 - 500 MHz

EMS-1S

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	1 - 500 MHz
LO	1 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 250 MHz	5.5	7
1 - 500 MHz	6.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	60	45
10 - 250 MHz	45	35
250 - 500 MHz	40	25
LO to IF		
1 - 10 MHz	45	35
10 - 250 MHz	40	25
250 - 500 MHz	30	20

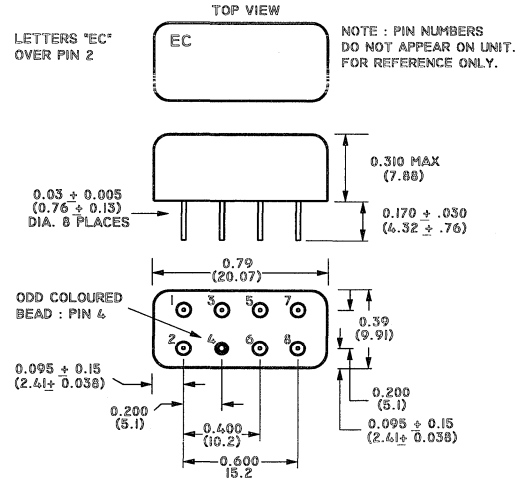
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	-
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
1 - 500 MHz

EMS-505

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	1 - 500 MHz
LO	1 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 250 MHz	5.5	7
1 - 500 MHz	6.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	60	45
10 - 250 MHz	45	35
250 - 500 MHz	40	25
LO to IF		
1 - 10 MHz	45	35
10 - 250 MHz	40	25
250 - 500 MHz	30	20

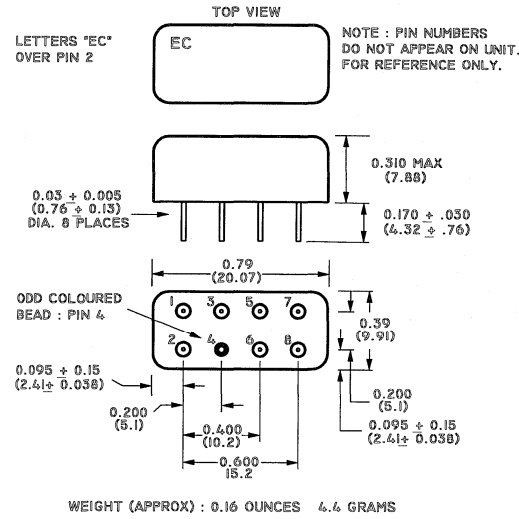
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	-
Unconnected	-

'IF' pins must be connected together externally.

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series Plug-In Mixer
1 - 500 MHz

EMS-1N

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	1 - 500 MHz
LO	1 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 250 MHz	5.5	7
1 - 500 MHz	6.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	60	45
10 - 250 MHz	45	35
250 - 500 MHz	40	25
LO to IF		
1 - 10 MHz	45	35
10 - 250 MHz	40	25
250 - 500 MHz	30	20

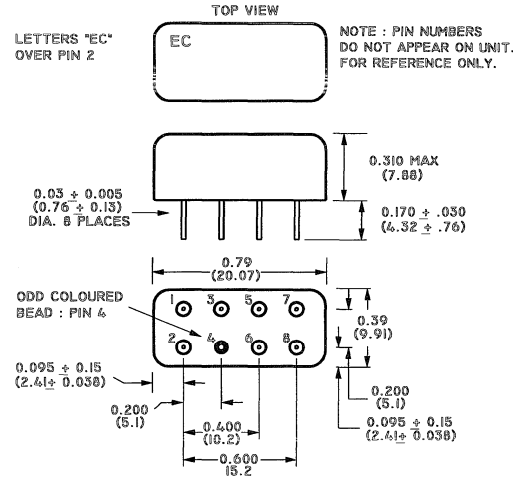
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	-
Unconnected	-

'IF' pins must be connected together externally.

E-Series Plug-In Mixer
1 - 500 MHz

EMS-1

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	1 - 500 MHz
LO	1 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 250 MHz	5.5	7
1 - 500 MHz	6.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	60	45
10 - 250 MHz	45	35
250 - 500 MHz	40	25
LO to IF		
1 - 10 MHz	45	35
10 - 250 MHz	40	25
250 - 500 MHz	30	20

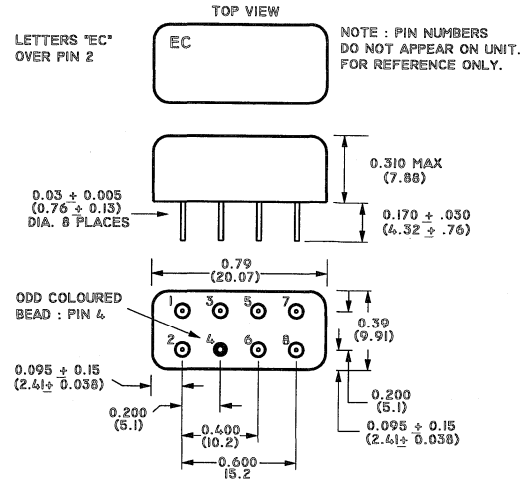
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	-
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

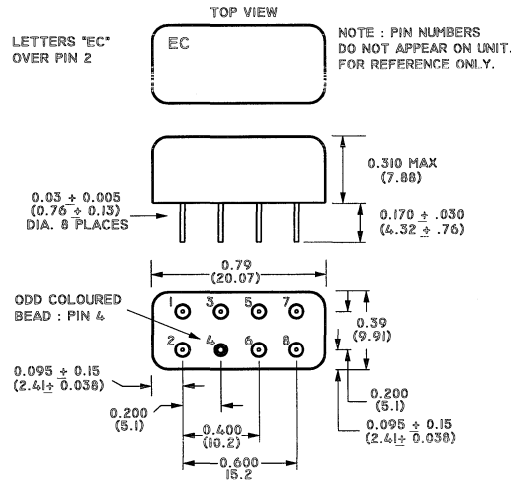
E-Series Plug-In Mixer
1 - 750 MHz

EMA-1W

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Specifications @ 25°C

Frequency Range		
RF		1 - 750 MHz
LO		1 - 750 MHz
IF		DC - 750 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
2 - 375 MHz	5.5	7.5
1 - 750 MHz	7.5	8.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
1 - 10 MHz	50	45
10 - 375 MHz	45	30
375 - 750 MHz	35	25
LO to IF		
1 - 10 MHz	45	30
10 - 375 MHz	40	25
375 - 750 MHz	30	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
10 - 1000 MHz

EMS-505X

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	10 - 1000 MHz
LO	10 - 1000 MHz
IF	5 - 500 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 500 MHz	6	7.5
10 - 1000 MHz	7	8

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 100 MHz	50	40
100 - 500 MHz	40	30
500 - 1000 MHz	30	20
LO to IF		
10 - 100 MHz	50	45
100 - 500 MHz	40	35
500 - 1000 MHz	35	25

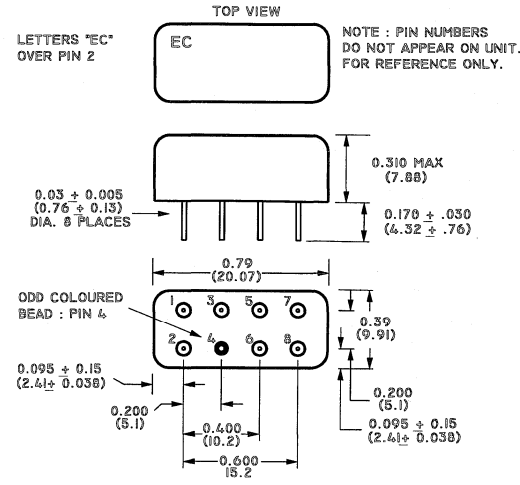
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	3,4
IF	1
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'RF' pins must be connected together externally.

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series Plug-In Mixer
10 - 1000 MHz

EMS-1X

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	10 - 1000 MHz
LO	10 - 1000 MHz
IF	5 - 500 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 500 MHz	6	7.5
10 - 1000 MHz	7	8

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 100 MHz	50	40
100 - 500 MHz	40	28
500 - 1000 MHz	30	20
LO to IF		
10 - 100 MHz	50	45
100 - 500 MHz	40	35
500 - 1000 MHz	35	25

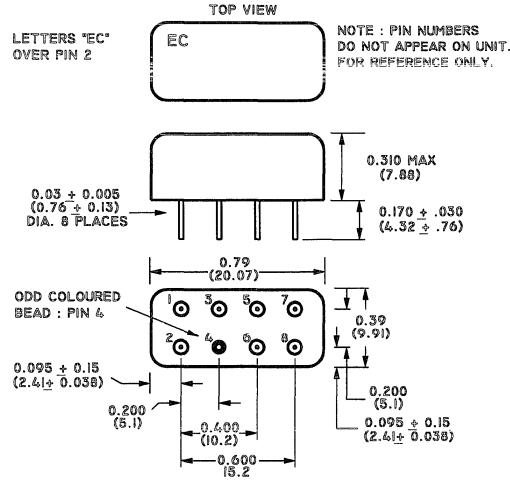
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	3,4
IF	1
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'RF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
10 - 1000 MHz EMS-1X7

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	10 - 1000 MHz
LO	10 - 1000 MHz
IF	5 - 500 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 500 MHz	7.5	8
10 - 1000 MHz	7.5	8

Isolation (dB)	Minimum
LO to RF	
10 - 100 MHz	40
100 - 500 MHz	30
500 - 1000 MHz	20
LO to IF	
10 - 100 MHz	45
100 - 500 MHz	35
500 - 1000 MHz	25

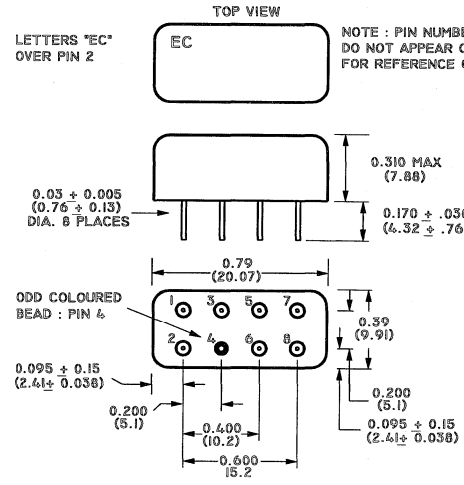
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	2,6
IF	1
Ground	3,4,5,7
Case Ground	3,4,5,7
Unconnected	-

'RF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
10 - 1000 MHz

EMS-1Z

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	10 - 1000 MHz
LO	10 - 1000 MHz
IF	10 - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 500 MHz	6.5	7.5
10 - 1000 MHz	7	9

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 100 MHz	50	40
100 - 500 MHz	35	25
500 - 1000 MHz	25	20
LO to IF		
10 - 100 MHz	40	25
100 - 500 MHz	25	18
500 - 1000 MHz	19	15

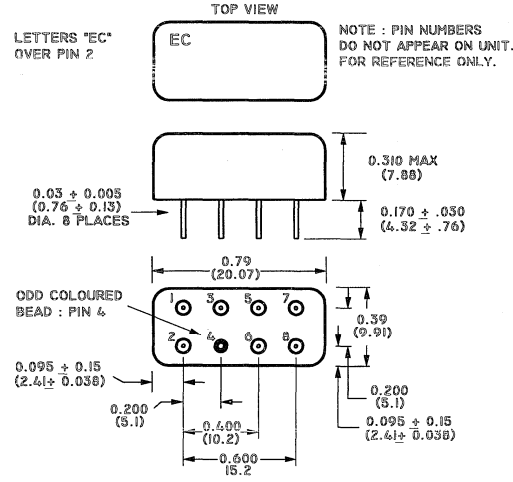
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	1
RF	8
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

Specifications Subject to Change Without Notice S 0096 B

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
10 - 800 MHz

EMS-800F

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range		
RF		10 - 800 MHz
LO		10 - 800 MHz
IF		DC - 800 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
20 - 400 MHz	6.5	7.5
10 - 800 MHz	7	8.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
10 - 100 MHz	50	40
100 - 400 MHz	40	30
400 - 800 MHz	35	27
LO to IF		
10 - 100 MHz	45	40
100 - 400 MHz	35	30
400 - 800 MHz	27	24

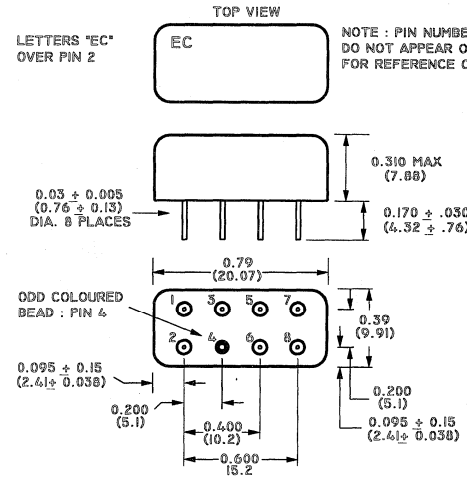
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
100 - 2000 MHz

EMA-2000

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range		
RF		100 - 2000 MHz
LO		100 - 2000 MHz
IF		DC - 600 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
200 - 1000 MHz	6	9.5
100 - 2000 MHz	7	9.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
100 - 2000 MHz	37	20
LO to IF		
100 - 2000 MHz	30	20

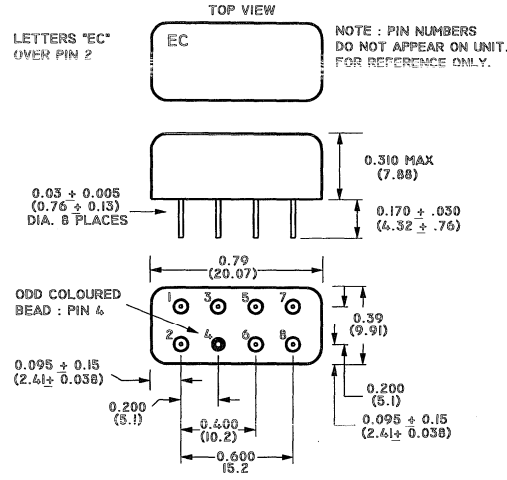
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	4

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
20 - 2500 MHz

EMA-C3

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	20 - 2500 MHz
LO	20 - 2500 MHz
IF	20 - 600 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 2500 MHz	7.5	10.5

Isolation (dB)	Typical	Minimum
LO to RF		
20 - 2500 MHz	35	15
LO to IF		
20 - 2500 MHz	30	12

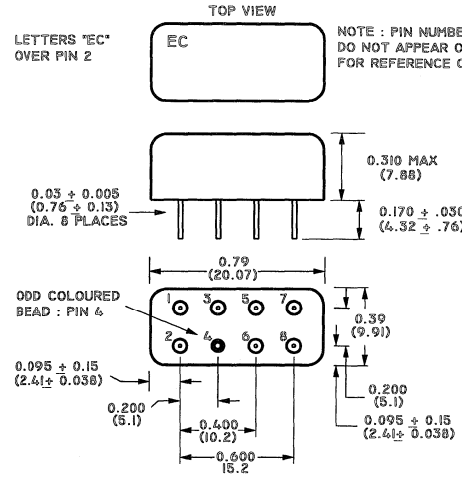
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	4

Specifications Subject to Change Without Notice S 0037 B

M/A-COM Inc. Cork, Ireland Tel: 353-21-311 266 Fax: 353-21-311 890 See Page 7-26 For Local Office Details
North America Tel: 1-800-366-266 * Europe Tel: +44 (1344) 869 595 * Asia / Pacific Tel: +81 (03) 3226-1671

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
5 - 1000 MHz

EMA-2CM

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range		
RF		5 - 1000 MHz
LO		5 - 1000 MHz
IF		DC - 1000 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
10 - 500 MHz	6	7
5 - 1000 MHz	6.5	8.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
5 - 50 MHz	60	50
50 - 500 MHz	35	30
500 - 1000 MHz	30	25
LO to IF		
5 - 50 MHz	50	45
50 - 500 MHz	30	25
500 - 1000 MHz	25	20

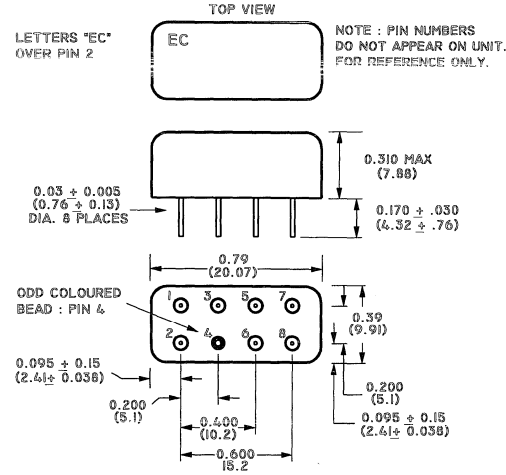
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
5 - 1250 MHz

EMA-4

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	5 - 1250 MHz
LO	5 - 1250 MHz
IF	0.5 - 500 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 625 MHz	5.5	7.5
5 - 1250 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	50	40
50 - 625 MHz	40	20
625 - 1250 MHz	30	20
LO to IF		
5 - 50 MHz	50	40
50 - 625 MHz	40	20
625 - 1250 MHz	30	20

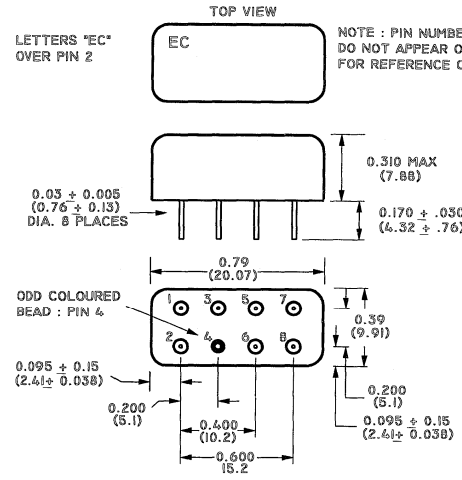
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	3,4
IF	1
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'RF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
5 - 1500 MHz

EMA-5

Features

* LO Power + 7 dBm
* Up to + 1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	5 - 1500 MHz
LO	5 - 1500 MHz
IF	10 - 600 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 750 MHz	7	8
5 - 1500 MHz	7.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	50	45
50 - 750 MHz	35	30
750 - 1500 MHz	30	20
LO to IF		
5 - 50 MHz	45	40
50 - 750 MHz	30	25
750 - 1500 MHz	25	15

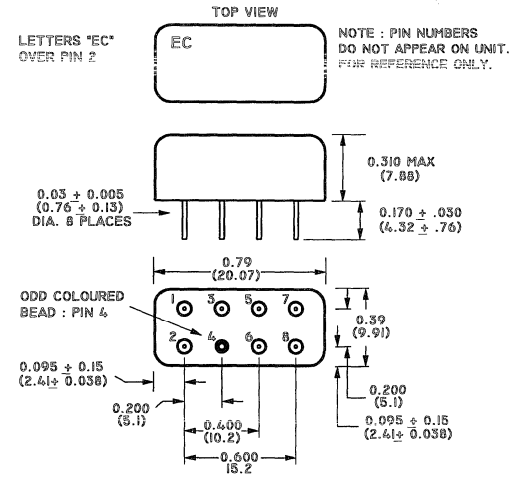
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	4

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
5 - 2000 MHz

EMS-11

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	5 - 2000 MHz
LO	5 - 2000 MHz
IF	10 - 600 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 1000 MHz	7	8.5
5 - 2000 MHz	7.5	9

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	50	45
50 - 1000 MHz	35	25
1000 - 2000 MHz	30	20
LO to IF		
5 - 50 MHz	45	40
50 - 1000 MHz	30	20
1000 - 2000 MHz	25	15

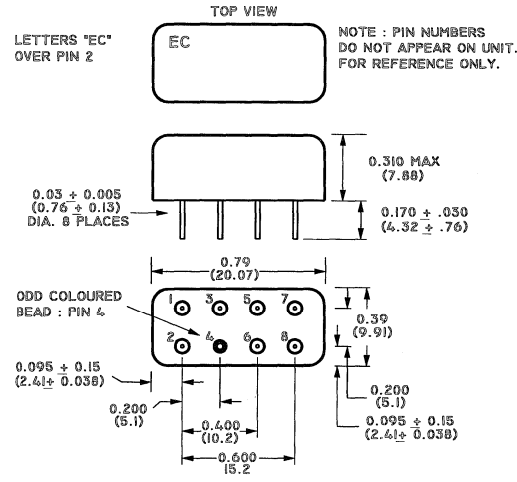
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



Function	Pin No.
LO	8
RF	1
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	4

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
5 - 2000 MHz

EMA-11

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	5 - 2000 MHz
LO	5 - 2000 MHz
IF	10 - 600 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 1000 MHz	7	8.5
5 - 2000 MHz	7.5	9

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	50	45
50 - 1000 MHz	35	25
1000 - 2000 MHz	30	20
LO to IF		
5 - 50 MHz	45	40
50 - 1000 MHz	30	20
1000 - 2000 MHz	20	15

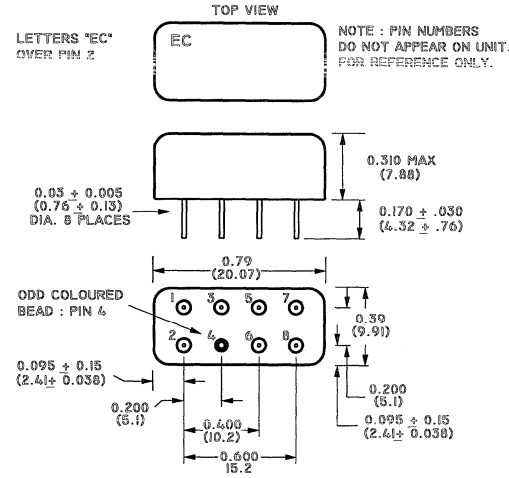
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	4

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
5 - 500 MHz

EMS-500

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	5 - 500 MHz
LO	5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 250 MHz	6	7
5 - 500 MHz	7	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	50	40
50 - 250 MHz	45	30
250 - 500 MHz	35	25
LO to IF		
5 - 50 MHz	45	35
50 - 250 MHz	40	25
250 - 500 MHz	30	20

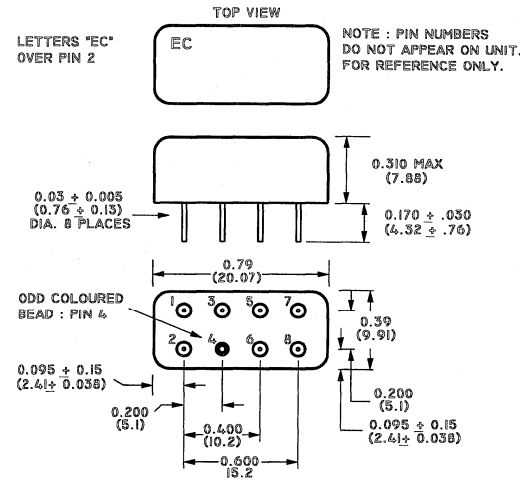
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

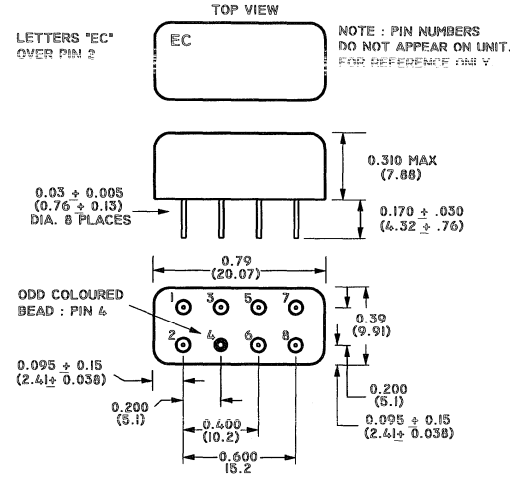
E-Series Plug-In Mixer
5 - 500 MHz

EMD-108

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Specifications @ 25°C

Frequency Range	
RF	5 - 500 MHz
LO	5 - 500 MHz
IF	DC - 500 MHz
Conversion Loss (dB)	
See Additional Specs.	
Isolation (dB)	
See Additional Specs for Details	

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	8
IF	3,7
Ground	2,4,5,6
Case Ground	2,4,6
Unconnected	-

'IF' pins must be connected together externally.

Additional Specifications :

Conversion Loss :	**Maximum**
10 - 150 MHz	7.0
5 - 500 MHz	9.0
LO to RF Isolation :	**Minimum**
10 - 150 MHz	40
5 - 500 MHz	35
LO to IF Isolation :	**Minimum**
5 - 150 MHz	35
150 - 500 MHz	25
RF to IF Isolation :	**Minimum**
5 - 150 MHz	25
150 - 500 MHz	20

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
5 - 500 MHz

EML-1

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	5 - 500 MHz
LO	5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 250 MHz	5.5	7.5
5 - 500 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	50	45
50 - 250 MHz	45	40
250 - 500 MHz	35	25
LO to IF		
5 - 50 MHz	45	30
50 - 250 MHz	40	25
250 - 500 MHz	30	20

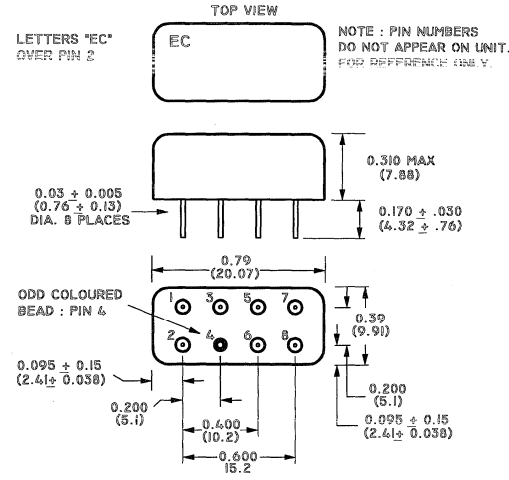
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
500 - 3500 MHz

EMA-3500

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	500 - 3500 MHz
LO	500 - 3500 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
500 - 3500 MHz	7.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
500 - 3500 MHz	30	17
LO to IF		
500 - 3500 MHz	20	8

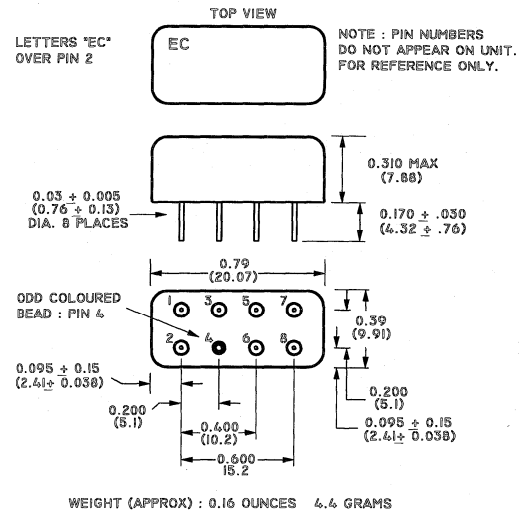
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	1
RF	8
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	4

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
750 - 2400 MHz

EMA-2400

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	750 - 2400 MHz
LO	750 - 2400 MHz
IF	DC - 400 MHz

Conversion Loss (dB)	Typical	Maximum
750 - 2400 MHz	6.7	9

Isolation (dB)	Typical	Minimum
LO to RF		
750 - 2400 MHz	30	20
LO to IF		
750 - 2400 MHz	30	8

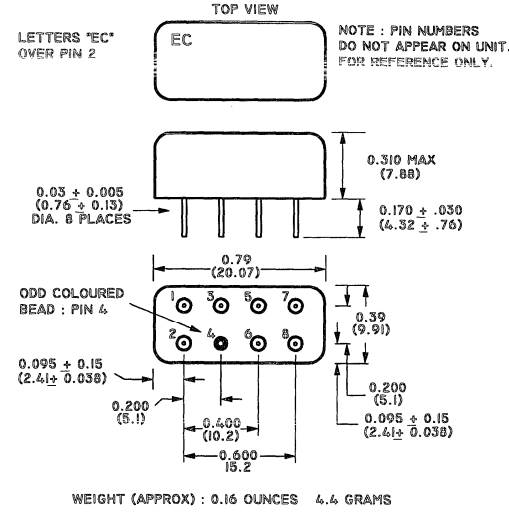
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	1
RF	8
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	4

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
800 - 1250 MHz

EMA-12

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	800 - 1250 MHz
LO	800 - 1250 MHz
IF	50 - 90 MHz

Conversion Loss (dB)	Typical	Maximum
800 - 1250 MHz	6	7.5

Isolation (dB)	Typical	Minimum
LO to RF		
800 - 1250 MHz	35	25
LO to IF		
800 - 1250 MHz	30	20

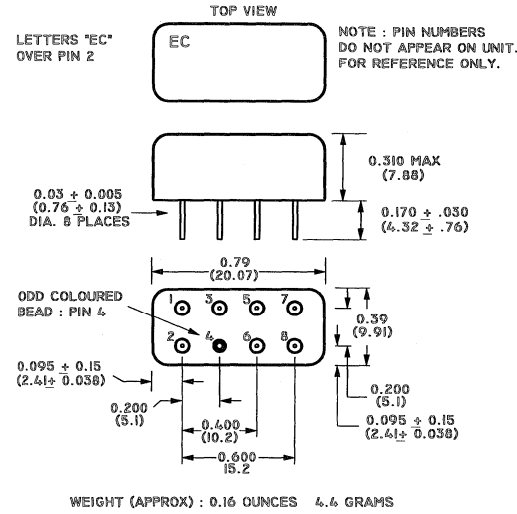
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	4

ISO 9001
CERTIFIED

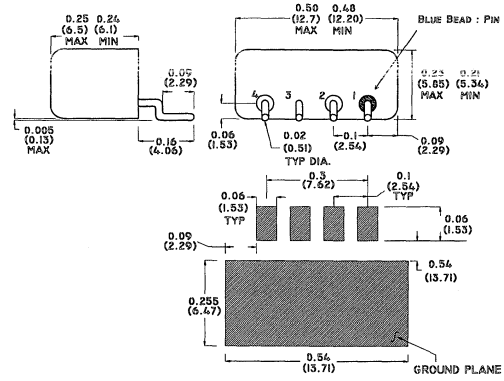
E-Series Plug-In Mixer
0.15 - 400 MHz

ETUF-3SM

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-15



Specifications @ 25°C

Frequency Range	
RF	0.15 - 400 MHz
LO	0.15 - 400 MHz
IF	DC - 400 MHz

Conversion Loss (dB)	Typical	Maximum
0.3 - 200 MHz	4.7	7
.15 - 400 MHz	5.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
0.15 - 1.5 MHz	60	50
1.5 - 200 MHz	46	30
200 - 400 MHz	35	25
LO to IF		
0.15 - 1.5 MHz	60	40
1.5 - 200 MHz	47	25
200 - 400 MHz	35	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Positive

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

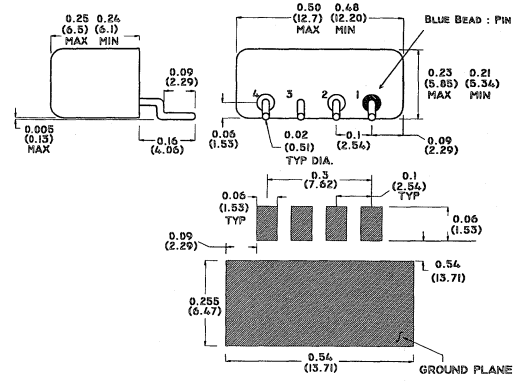
ISO 9001
CERTIFIED

E-Series Plug-In Mixer
1400 - 1900 MHz ETUF-11ASM

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-15



Specifications @ 25°C

Frequency Range	
RF	1400 - 1900 MHz
LO	1400 - 1900 MHz
IF	40 - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1400 - 1900 MHz	7	8.6

Isolation (dB)	Typical	Minimum
LO to RF		
1400 - 1900 MHz	33	20
LO to IF		
1400 - 1900 MHz	29	15

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

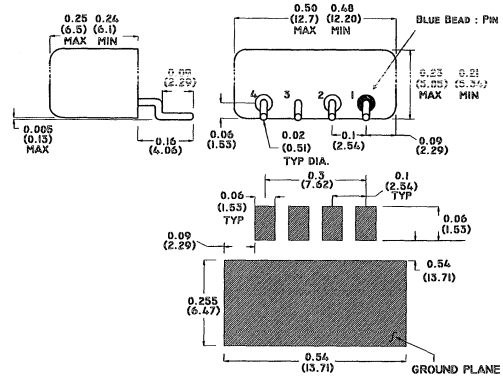
E-Series Plug-In Mixer
2 - 600 MHz

ETUF-1SM

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-15



Specifications @ 25°C

Frequency Range	
RF	2 - 600 MHz
LO	2 - 600 MHz
IF	DC - 600 MHz

Conversion Loss (dB)	Typical	Maximum
4 - 300 MHz	5.8	7
2 - 600 MHz	6.2	8

Isolation (dB)	Typical	Minimum
LO to RF		
2 - 20 MHz	60	50
20 - 300 MHz	42	30
300 - 600 MHz	37	25
LO to IF		
2 - 20 MHz	60	45
20 - 300 MHz	47	30
300 - 600 MHz	36	22

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

Specifications Subject to Change Without Notice S 0614 A

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

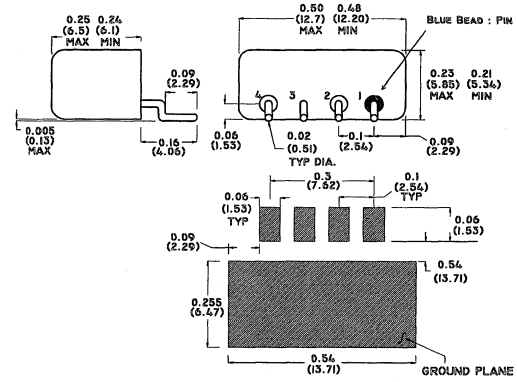
E-Series Plug-In Mixer
20 - 1500 MHz

ETUF-5SM

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-15



Specifications @ 25°C

Frequency Range	
RF	20 - 1500 MHz
LO	20 - 1500 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
40 - 750 MHz	6.5	7.5
20 - 1500 MHz	7	9

Isolation (dB)	Typical	Minimum
LO to RF		
20 - 200 MHz	55	40
200 - 750 MHz	35	25
750 - 1500 MHz	35	25
LO to IF		
20 - 200 MHz	40	25
200 - 750 MHz	25	18
750 - 1500 MHz	22	8

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

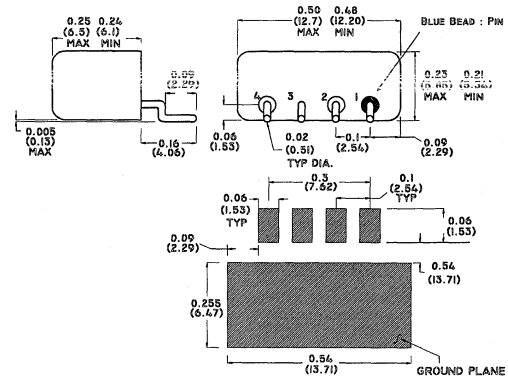
E-Series Plug-In Mixer
50 - 1000 MHz

ETUF-2SM

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-15



Specifications @ 25°C

Frequency Range	
RF	50 - 1000 MHz
LO	50 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
100 - 500 MHz	5.8	7
50 - 1000 MHz	6.5	9

Isolation (dB)	Typical	Minimum
LO to RF		
50 - 500 MHz	55	40
50 - 1000 MHz	37	30
500 - 1000 MHz	33	25
LO to IF		
50 - 500 MHz	50	35
50 - 1000 MHz	40	20
500 - 1000 MHz	35	18

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

Specifications Subject to Change Without Notice S 0615 A

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

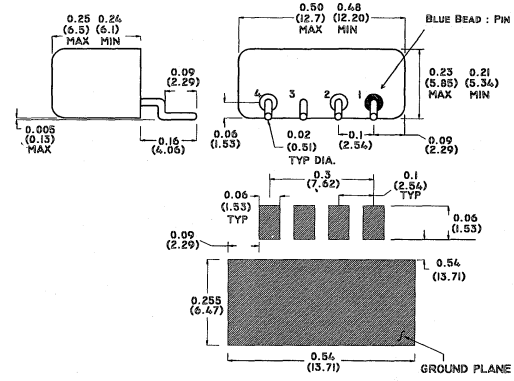
E-Series Plug-In Mixer
800 - 1050 MHz

ETUF-860SM

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-15



Specifications @ 25°C

Frequency Range		
RF	800 - 1050 MHz	
LO	800 - 1050 MHz	
IF	DC - 250 MHz	
Conversion Loss (dB)	**Typical**	**Maximum**
800 - 1050 MHz	6.6	7.75
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
800 - 1050 MHz	30	25
LO to IF		
800 - 1050 MHz	28	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

Specifications Subject to Change Without Notice S 0749 A

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

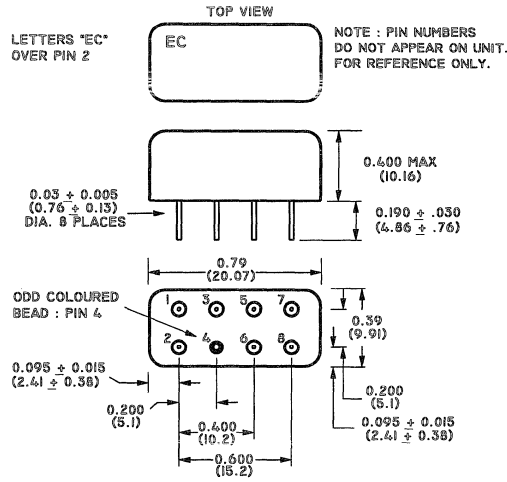
E-Series Plug-In Mixer
0.0005 - 10 MHz

EMA-8

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Specifications @ 25°C

Frequency Range	
RF	0.0005 - 10 MHz
LO	0.0005 - 10 MHz
IF	DC - 10 MHz

Conversion Loss (dB)	Typical	Maximum
0.001 - 5 MHz	5.5	7.5
.0005 - 10 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.0005 - 0.005 MHz	60	50
0.005 - 5 MHz	50	40
5 - 10 MHz	45	35
LO to IF		
0.0005 - 0.005 MHz	60	50
0.005 - 5 MHz	50	40
5 - 10 MHz	45	35

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	-
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.025 - 200 MHz

EMA-3

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.025 - 200 MHz
LO	0.025 - 200 MHz
IF	DC - 200 MHz

Conversion Loss (dB)	Typical	Maximum
0.05 - 100 MHz	5.5	7.5
.025 - 200 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.025 - 0.25 MHz	60	50
0.25 - 100 MHz	45	35
100 - 200 MHz	35	25
LO to IF		
0.025 - 0.25 MHz	45	35
0.25 - 100 MHz	40	30
100 - 200 MHz	30	20

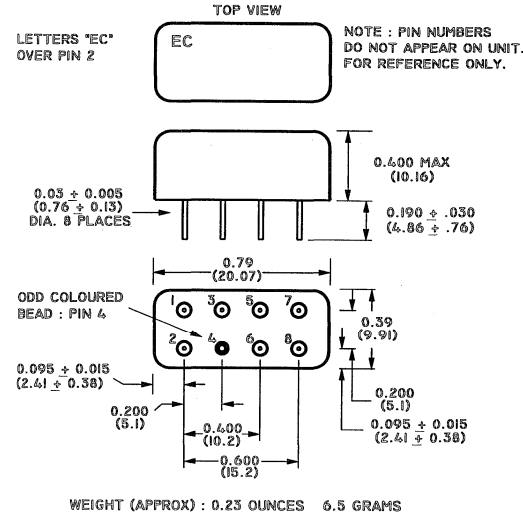
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

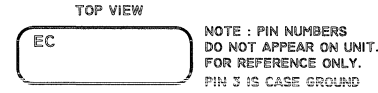
E-Series Plug-In Mixer
0.04 - 400 MHz

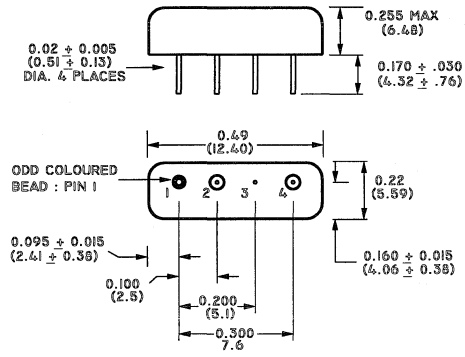
EMT-3

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-3





WEIGHT (APPROX) : 0.05 OUNCES 1.5 GRAMS

Specifications @ 25°C

Frequency Range	
RF	0.04 - 400 MHz
LO	0.04 - 400 MHz
IF	DC - 400 MHz

Conversion Loss (dB)	Typical	Maximum
0.08 - 200 MHz	5.3	7
.04 - 400 MHz	6	8

Isolation (dB)	Typical	Minimum
LO to RF		
0.04 - 0.4 MHz	60	50
0.4 - 200 MHz	50	35
200 - 400 MHz	35	25
LO to IF		
0.04 - 0.4 MHz	55	40
0.4 - 200 MHz	45	30
200 - 400 MHz	35	25

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

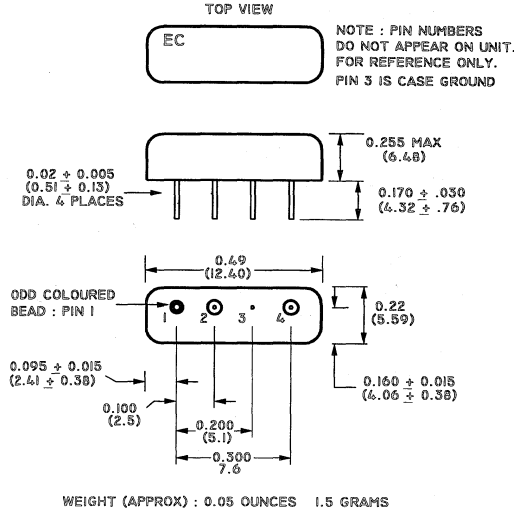
E-Series Plug-In Mixer
0.15 - 400 MHz

ETUF-3

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-3



Specifications @ 25°C

Frequency Range	
RF	0.15 - 400 MHz
LO	0.15 - 400 MHz
IF	DC - 400 MHz

Conversion Loss (dB)	Typical	Maximum
0.3 - 200 MHz	4.7	7
.15 - 400 MHz	5.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
0.15 - 1.5 MHz	60	50
1.5 - 200 MHz	46	30
200 - 400 MHz	35	25
LO to IF		
0.15 - 1.5 MHz	60	40
1.5 - 200 MHz	47	25
200 - 400 MHz	35	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Positive

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001 CERTIFIED

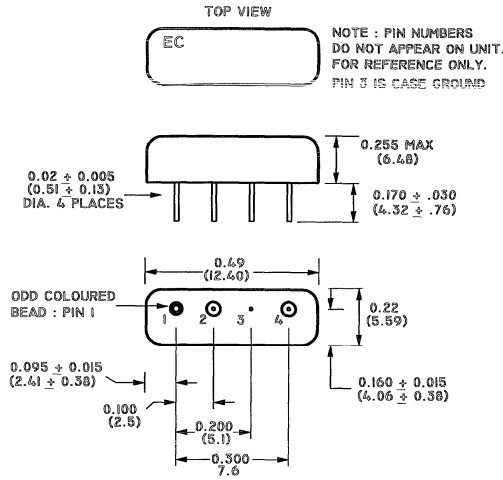
E-Series Plug-In Mixer
1 - 1000 MHz

EMT-2

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-3



Specifications @ 25°C

Frequency Range		
RF		1 - 1000 MHz
LO		1 - 1000 MHz
IF		DC - 1000 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
2 - 500 MHz	6	7.5
1 - 1000 MHz	7	8.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
1 - 10 MHz	50	45
10 - 500 MHz	40	25
500 - 1000 MHz	30	25
LO to IF		
1 - 10 MHz	45	40
10 - 500 MHz	35	25
500 - 1000 MHz	25	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001 CERTIFIED

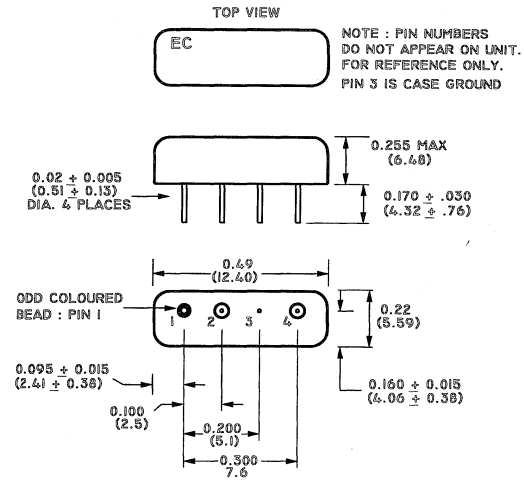
E-Series Plug-In Mixer
1400 - 1900 MHz

ETUF-11A

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-3



Specifications @ 25°C

Frequency Range	
RF	1400 - 1900 MHz
LO	1400 - 1900 MHz
IF	40 - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1400 - 1900 MHz	7	8.6

Isolation (dB)	Typical	Minimum
LO to RF		
1400 - 1900 MHz	33	20
LO to IF		
1400 - 1900 MHz	29	15

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

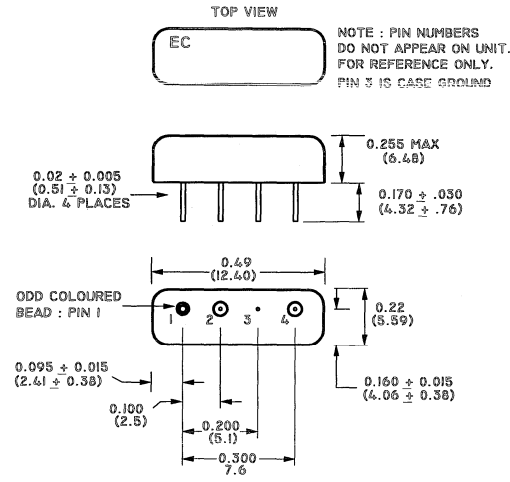
E-Series Plug-In Mixer
2 - 600 MHz

ETUF-1

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-3



Specifications @ 25°C

Frequency Range		
RF		2 - 600 MHz
LO		2 - 600 MHz
IF		DC - 600 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
4 - 300 MHz	5.8	7
2 - 600 MHz	6.2	8
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
2 - 20 MHz	60	50
20 - 300 MHz	42	30
300 - 600 MHz	37	25
LO to IF		
2 - 20 MHz	60	45
20 - 300 MHz	47	30
300 - 600 MHz	36	22

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
20 - 1500 MHz

ETUF-5

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	20 - 1500 MHz
LO	20 - 1500 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
40 - 750 MHz	6.5	7.5
20 - 1500 MHz	7	9

Isolation (dB)	Typical	Minimum
LO to RF		
20 - 200 MHz	55	40
200 - 750 MHz	35	25
750 - 1500 MHz	35	25
LO to IF		
20 - 200 MHz	40	25
200 - 750 MHz	25	18
750 - 1500 MHz	22	8

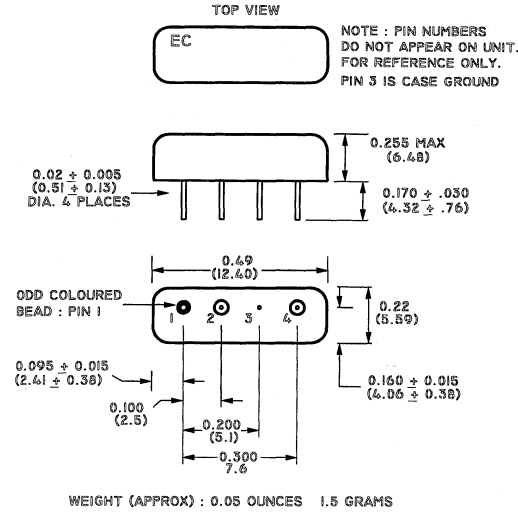
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-3



Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

Specifications Subject to Change Without Notice S 0670 C

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

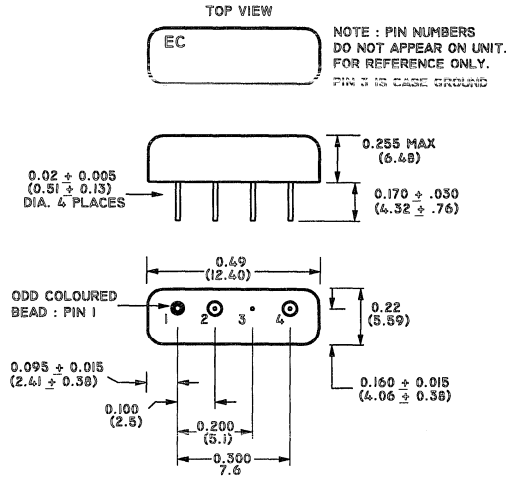
E-Series Plug-In Mixer
5 - 1250 MHz

EMT-4

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-3



WEIGHT (APPROX) : 0.05 OUNCES 1.5 GRAMS

Specifications @ 25°C

Frequency Range	
RF	5 - 1250 MHz
LO	5 - 1250 MHz
IF	DC - 1250 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 625 MHz	6	7.5
5 - 1250 MHz	7.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	50	45
50 - 625 MHz	40	30
625 - 1250 MHz	30	25
LO to IF		
5 - 50 MHz	45	40
50 - 625 MHz	35	30
625 - 1250 MHz	25	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
5 - 1500 MHz EMT-5

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	5 - 1500 MHz
LO	5 - 1500 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 750 MHz	6.5	8.5
5 - 1500 MHz	8	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	60	45
50 - 750 MHz	35	25
750 - 1500 MHz	30	25
LO to IF		
5 - 50 MHz	60	40
50 - 750 MHz	35	15
750 - 1500 MHz	25	14

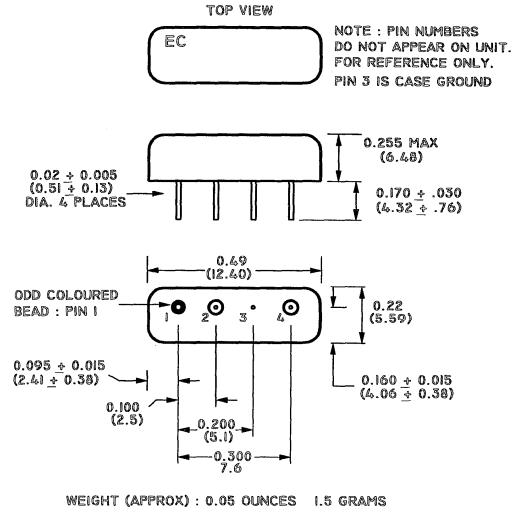
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-3



Function	Pin No.
LO	1
RF	4
IF	2
Ground	3
Case Ground	3
Unconnected	-

Specifications Subject to Change Without Notice S 0139 B

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ISO 9001
CERTIFIED

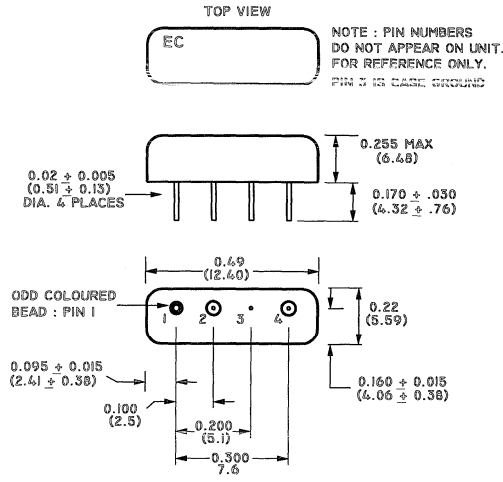
E-Series Plug-In Mixer
50 - 1000 MHz

ETUF-2

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-3



Specifications @ 25°C

Frequency Range		
RF		50 - 1000 MHz
LO		50 - 1000 MHz
IF		DC - 1000 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
100 - 500 MHz	5.8	7
50 - 1000 MHz	6.5	9
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
50 - 500 MHz	55	40
50 - 1000 MHz	37	30
500 - 1000 MHz	33	25
LO to IF		
50 - 500 MHz	50	35
50 - 1000 MHz	40	20
500 - 1000 MHz	35	18

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

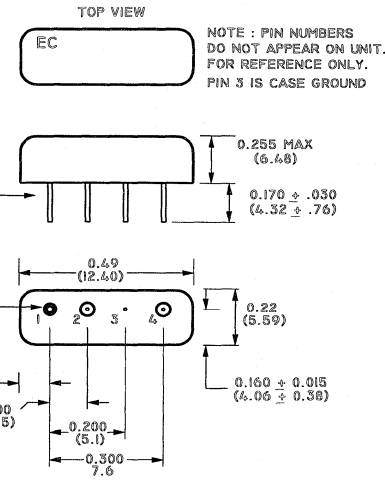
ISO 9001 CERTIFIED

E-Series Plug-In Mixer
800 - 1050 MHz ETUF-860

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-3



Specifications @ 25°C

Frequency Range	
RF	800 - 1050 MHz
LO	800 - 1050 MHz
IF	DC - 250 MHz

Conversion Loss (dB)	Typical	Maximum
800 - 1050 MHz	6.6	7.75

Isolation (dB)	Typical	Minimum
LO to RF		
800 - 1050 MHz	30	25
LO to IF		
800 - 1050 MHz	28	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

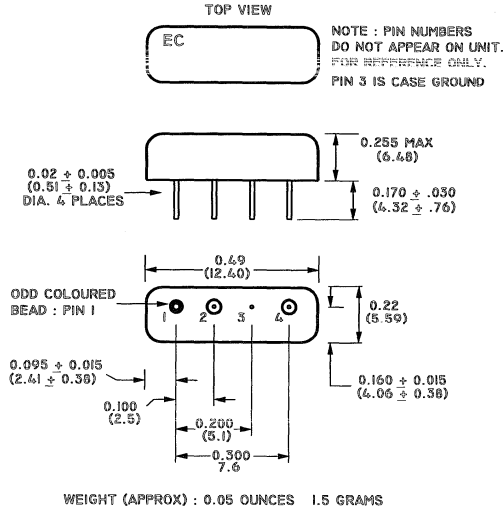
E-Series Plug-In Mixer
800 - 1250 MHz

EMT-12

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-3



WEIGHT (APPROX) : 0.05 OUNCES 1.5 GRAMS

Specifications @ 25°C

Frequency Range	
RF	800 - 1250 MHz
LO	800 - 1250 MHz
IF	50 - 90 MHz

Conversion Loss (dB)	Typical	Maximum
800 - 1250 MHz	6	7.5

Isolation (dB)	Typical	Minimum
LO to RF		
800 - 1250 MHz	35	25
LO to IF		
800 - 1250 MHz	30	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
800 - 2700 MHz

EMT-27

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	800 - 2700 MHz
LO	800 - 2700 MHz
IF	DC - 400 MHz

Conversion Loss (dB)	Typical	Maximum
800 - 2700 MHz	8	10

Isolation (dB)	Typical	Minimum
LO to RF		
800 - 2700 MHz	30	20
LO to IF		
800 - 2700 MHz	25	10

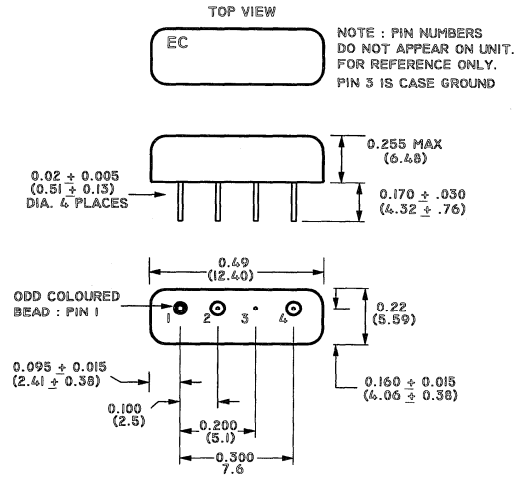
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-3



Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

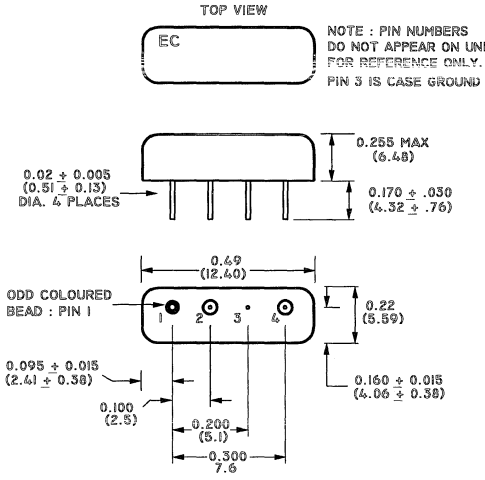
E-Series Plug-In Mixer
800 - 2700 MHz

EMT-27X

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-3



WEIGHT (APPROX) : 0.05 OUNCES 1.5 GRAMS

Specifications @ 25°C

Frequency Range		
RF		800 - 2700 MHz
LO		800 - 2700 MHz
IF		DC - 400 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
800 - 2700 MHz	8	10
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
800 - 2700 MHz	30	20
LO to IF		
800 - 2700 MHz	25	10

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	4
RF	1
IF	2
Ground	3,5,6
Case Ground	3,5,6
Unconnected	-

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
1 - 2000 MHz

EMT-11

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	1 - 2000 MHz
LO	1 - 2000 MHz
IF	5 - 600 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 1000 MHz	7	8.5
1 - 2000 MHz	7.5	9

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	50	45
10 - 1000 MHz	35	25
1000 - 2000 MHz	25	10
LO to IF		
1 - 10 MHz	45	40
10 - 1000 MHz	27	20
1000 - 2000 MHz	25	20

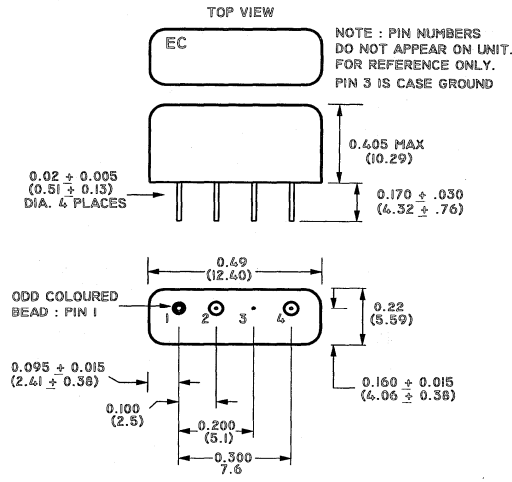
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-4



Function	Pin No.
LO	4
RF	1
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

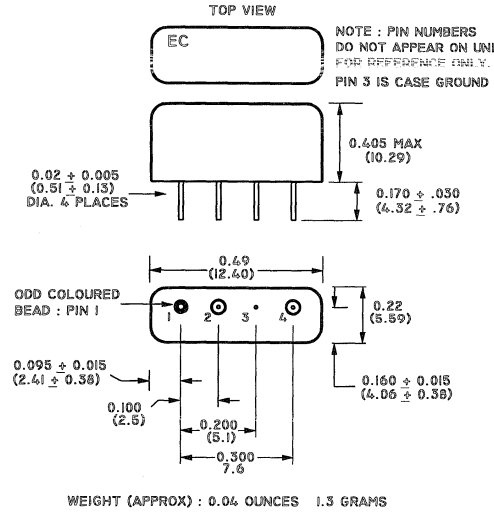
E-Series Plug-In Mixer
750 - 2400 MHz

EMT-2400

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-4



WEIGHT (APPROX) : 0.04 OUNCES 1.3 GRAMS

Specifications @ 25°C

Frequency Range	
RF	750 - 2400 MHz
LO	750 - 2400 MHz
IF	DC - 400 MHz

Conversion Loss (dB)	Typical	Maximum
750 - 2400 MHz	6.5	9

Isolation (dB)	Typical	Minimum
LO to RF		
750 - 2400 MHz	30	20
LO to IF		
750 - 2400 MHz	30	10

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	2
Ground	3
Case Ground	3
Unconnected	-

ISO 9001
CERTIFIED

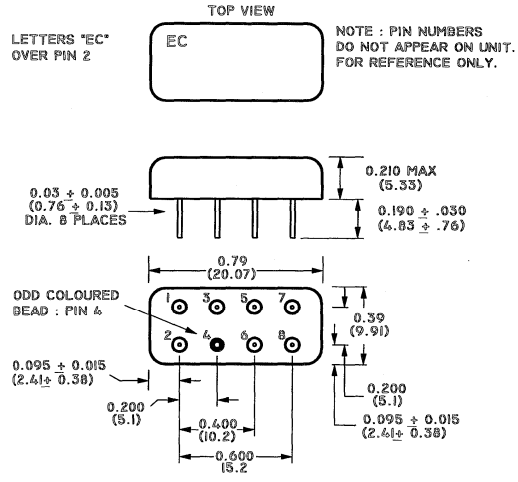
E-Series Plug-In Mixer
0.01 - 250 MHz

EMK-5

Features

* LO Power +7 dBm
* Up to +1 dBm RF

R-5



WEIGHT (APPROX) : 0.13 OUNCES 3.5 GRAMS

Specifications @ 25°C

Frequency Range	
RF	0.01 - 250 MHz
LO	0.01 - 250 MHz
IF	DC - 250 MHz

Conversion Loss (dB)	Typical	Maximum
0.02 - 125 MHz	5.5	7
.01 - 250 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.01 - 0.1 MHz	60	50
0.1 - 125 MHz	50	35
125 - 250 MHz	40	35
LO to IF		
0.01 - 0.1 MHz	55	45
0.1 - 125 MHz	45	30
125 - 250 MHz	35	25

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.5 - 600 MHz

EMK-6

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.5 - 600 MHz
LO	0.5 - 600 MHz
IF	DC - 600 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 300 MHz	5.5	7.5
.5 - 600 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	60	50
5 - 300 MHz	50	30
300 - 600 MHz	40	25
LO to IF		
0.5 - 5 MHz	55	45
5 - 300 MHz	45	30
300 - 600 MHz	30	20

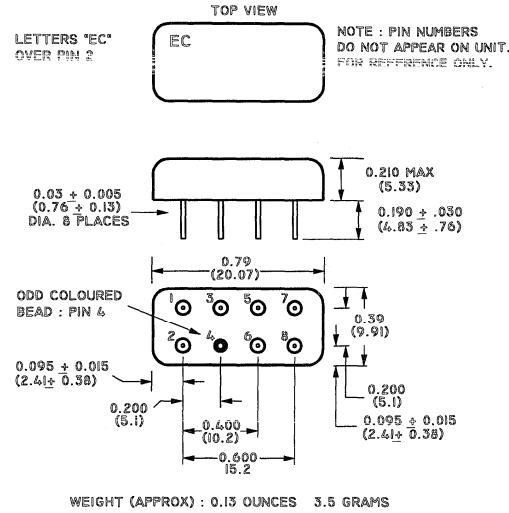
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-5



Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
2 - 1000 MHz

EMK-7

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	2 - 1000 MHz
LO	2 - 1000 MHz
IF	5 - 500 MHz

Conversion Loss (dB)	Typical	Maximum
4 - 500 MHz	5.5	7.5
2 - 1000 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
2 - 20 MHz	45	30
20 - 500 MHz	35	20
500 - 1000 MHz	30	20
LO to IF		
2 - 20 MHz	45	30
20 - 500 MHz	35	20
500 - 1000 MHz	30	20

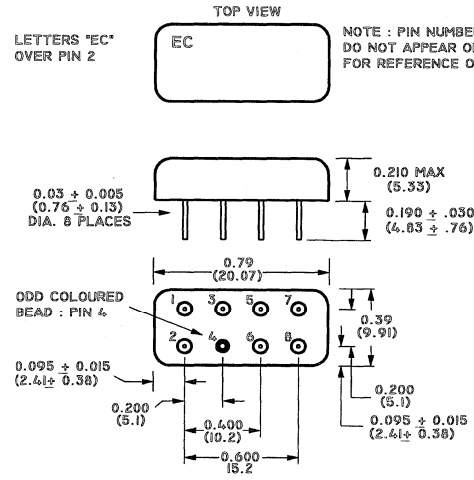
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-5



WEIGHT (APPROX) : 0.13 OUNCES 3.5 GRAMS

Function	Pin No.
LO	8
RF	3,4
IF	1
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'RF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.1 - 500 MHz

EMM-3

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.1 - 500 MHz
LO	0.1 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
0.2 - 250 MHz	5.5	7
.1 - 500 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.1 - 1 MHz	60	50
1 - 250 MHz	50	35
250 - 500 MHz	35	30
LO to IF		
0.1 - 1 MHz	50	40
1 - 250 MHz	45	30
250 - 500 MHz	30	20

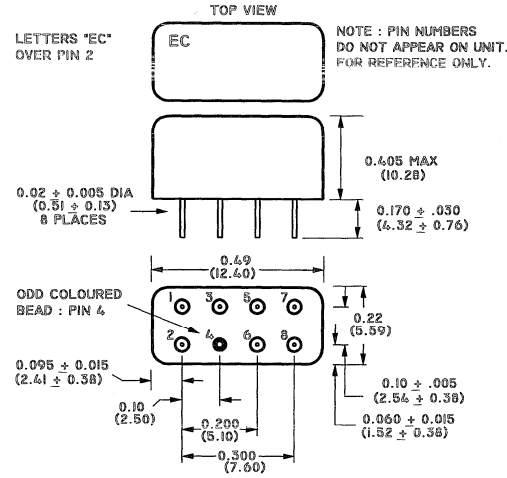
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-6



WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
1 - 1000 MHz

EMM-2

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	1 - 1000 MHz
LO	1 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 500 MHz	6	7.5
1 - 1000 MHz	7	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	55	45
10 - 500 MHz	40	25
500 - 1000 MHz	35	20
LO to IF		
1 - 10 MHz	50	40
10 - 500 MHz	40	25
500 - 1000 MHz	30	25

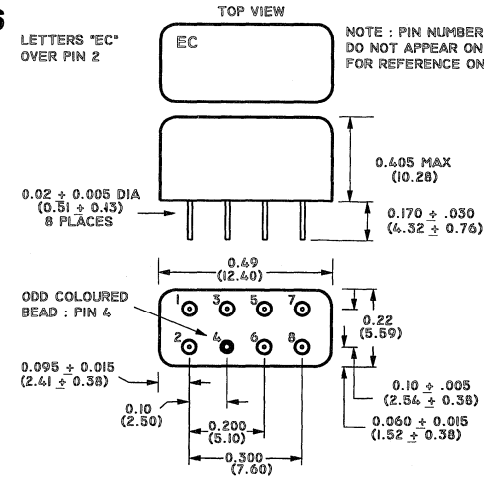
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-6



WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
1 - 600 MHz

EMM-1

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	1 - 600 MHz
LO	1 - 600 MHz
IF	DC - 600 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 300 MHz	5.5	7
1 - 600 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	55	45
10 - 300 MHz	45	30
300 - 600 MHz	35	20
LO to IF		
1 - 10 MHz	50	40
10 - 300 MHz	40	25
300 - 600 MHz	30	20

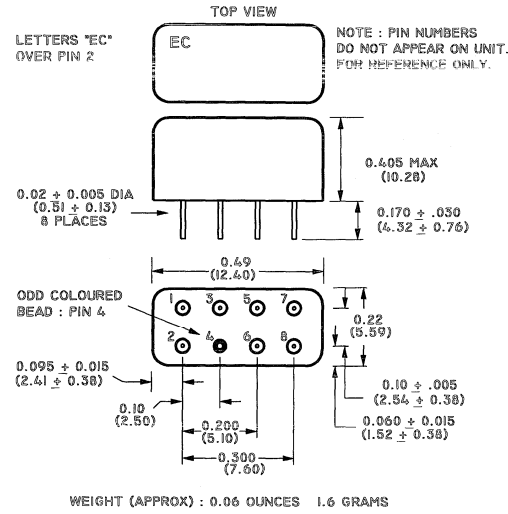
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-6



WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
5 - 1250 MHz

EMM-4

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	5 - 1250 MHz
LO	5 - 1250 MHz
IF	0.5 - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 625 MHz	6.5	8.5
5 - 1250 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	55	40
50 - 625 MHz	35	25
625 - 1250 MHz	30	20
LO to IF		
5 - 50 MHz	50	40
50 - 625 MHz	35	25
625 - 1250 MHz	30	20

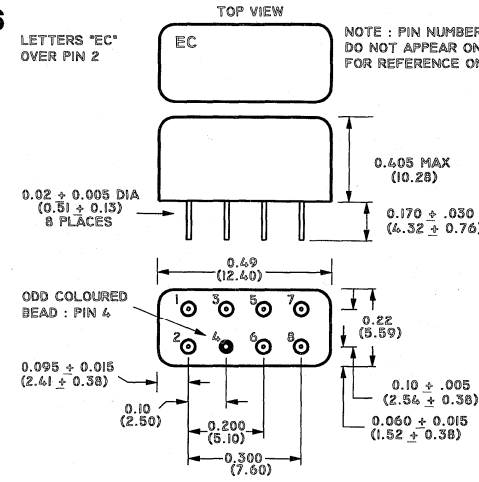
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-6



WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Function	Pin No.
LO	8
RF	3,4
IF	1
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'RF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
5 - 1500 MHz

EMM-5

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	5 - 1500 MHz
LO	5 - 1500 MHz
IF	0.5 - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 750 MHz	6.5	7.5
5 - 1500 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	55	40
50 - 750 MHz	35	25
750 - 1500 MHz	30	20
LO to IF		
5 - 50 MHz	50	40
50 - 750 MHz	35	25
750 - 1500 MHz	30	20

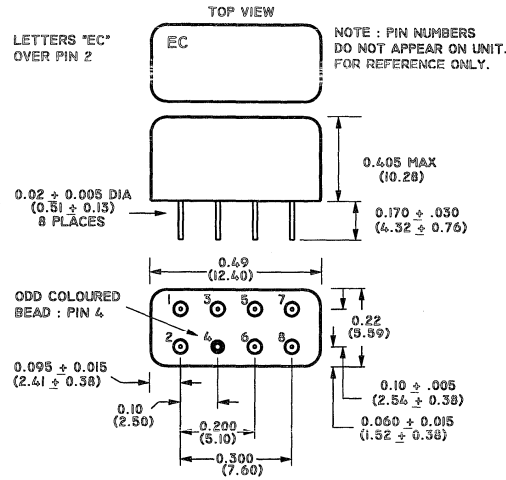
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-6



WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Function	Pin No.
LO	8
RF	3,4
IF	1
Ground	2,5,6,7
Case Ground	2,5,6,7
Unconnected	-

'RF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
0.1 - 500 MHz

EMTS-3

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	0.1 - 500 MHz
LO	0.1 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
0.2 - 250 MHz	5.3	7.5
.1 - 500 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.1 - 1 MHz	60	50
1 - 250 MHz	50	35
250 - 500 MHz	35	25
LO to IF		
0.1 - 1 MHz	55	45
1 - 250 MHz	45	30
250 - 500 MHz	35	25

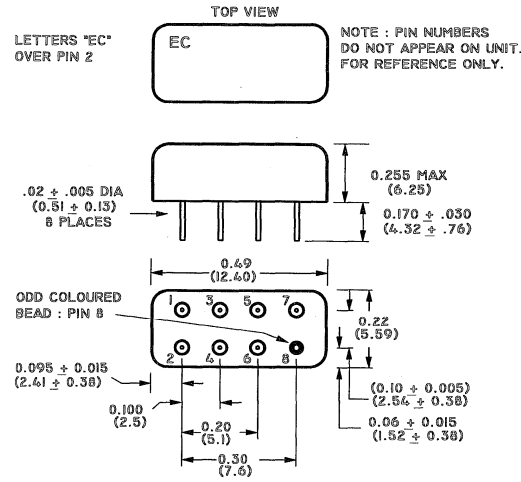
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-7



Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
1 - 1000 MHz

EMTS-2

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	1 - 1000 MHz
LO	1 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 500 MHz	6	7.5
1 - 1000 MHz	7	10

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	55	45
10 - 500 MHz	40	20
500 - 1000 MHz	35	18
LO to IF		
1 - 10 MHz	50	40
10 - 500 MHz	40	20
500 - 1000 MHz	25	18

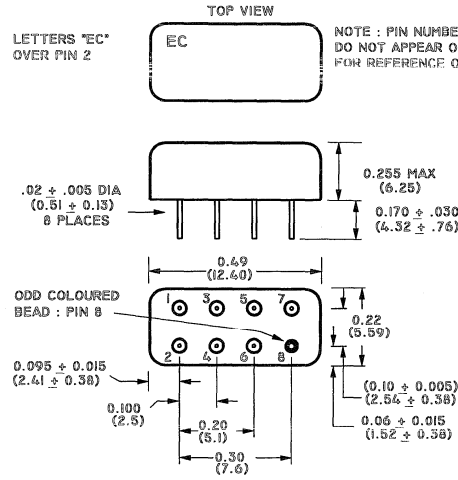
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-7



WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
1 - 600 MHz

EMTS-1

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range		
RF		1 - 600 MHz
LO		1 - 600 MHz
IF		DC - 600 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
2 - 300 MHz	6	7.5
1 - 600 MHz	6.5	8.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
1 - 10 MHz	60	45
10 - 300 MHz	45	35
300 - 600 MHz	35	25
LO to IF		
1 - 10 MHz	55	45
10 - 300 MHz	40	30
300 - 600 MHz	35	25

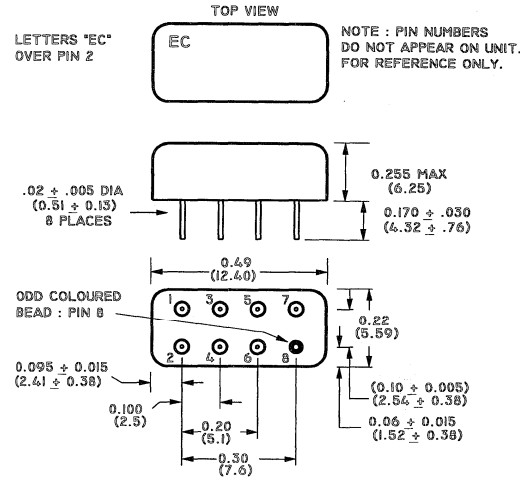
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-7



WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Plug-In Mixer
5 - 1500 MHz

EMTS-5

Features

* LO Power +7 dBm
* Up to +1 dBm RF

Specifications @ 25°C

Frequency Range	
RF	5 - 1500 MHz
LO	5 - 1500 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 750 MHz	6.5	8.5
5 - 1500 MHz	8	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	60	45
50 - 750 MHz	35	25
750 - 1500 MHz	30	25
LO to IF		
5 - 50 MHz	60	45
50 - 750 MHz	35	25
750 - 1500 MHz	25	16

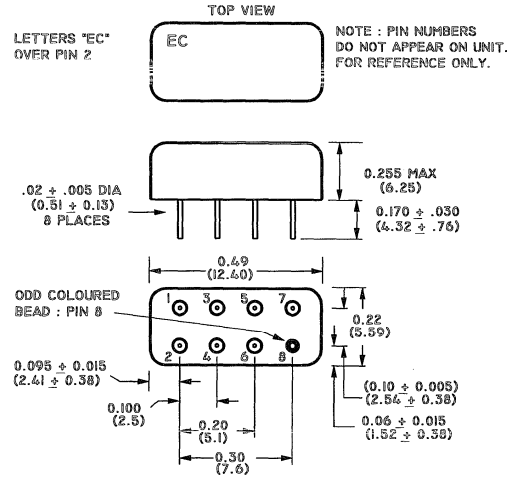
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

R-7



WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	2,7
Unconnected	-

'IF' pins must be connected together externally.

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
925 - 960 MHz EMRS-6X5

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	925 - 960 MHz
LO	45 - 45 MHz
IF	880 - 915 MHz

Conversion Loss (dB)	Typical	Maximum
925 - 960 MHz	7	10

Isolation (dB)	Typical	Minimum
LO to RF		
45 - 45 MHz	35	25
LO to IF		
45 - 45 MHz	30	25

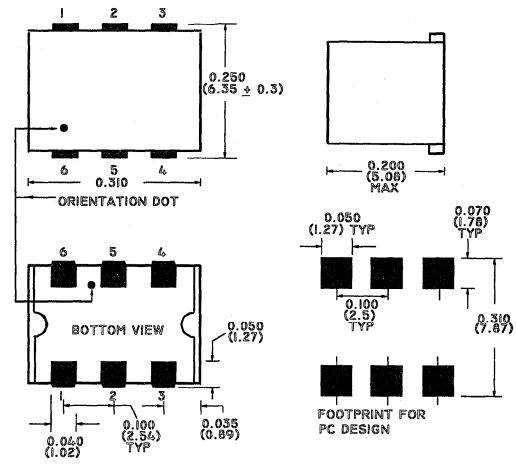
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-6X5 is also available in the new J Leaded SM-44 case style.

Order As Follows: EMRSJ-6X5

Function		Pin No.
LO	I/P	1
RF	O/P	4
IF	I/P	5
Ground		2,3,6
Case Ground		-
Unconnected		-

Specifications Subject to Change Without Notice S 0940 A

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DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series Surface Mount Mixer
0.5 - 500 MHz

EMRS-1

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	5.5	7
.5 - 500 MHz	6.2	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	55	50
5 - 250 MHz	33	25
250 - 500 MHz	27	20
LO to IF		
0.5 - 5 MHz	55	45
5 - 250 MHz	30	23
250 - 500 MHz	24	19

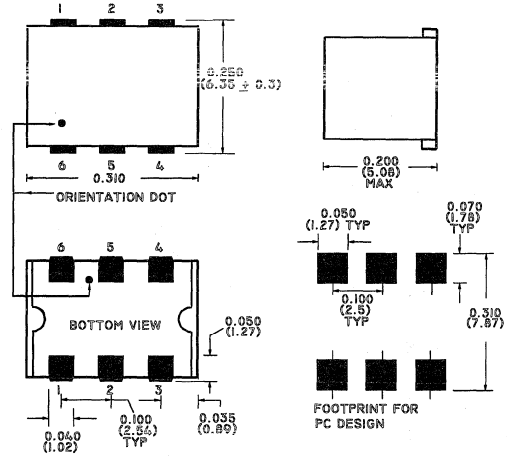
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-1 is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-1

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
10 - 1000 MHz

EMRS-2U

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	10 - 1000 MHz
LO	10 - 1000 MHz
IF	10 - 750 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 500 MHz	6.5	8
10 - 1000 MHz	7.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 100 MHz	55	40
100 - 500 MHz	40	30
500 - 1000 MHz	30	25
LO to IF		
10 - 100 MHz	55	30
100 - 500 MHz	35	25
500 - 1000 MHz	30	22

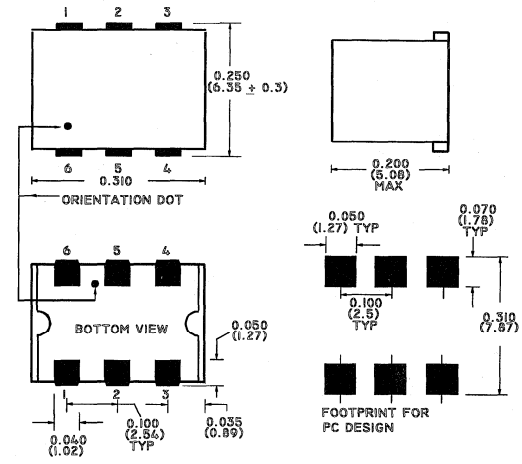
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-2U is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-2U

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
10 - 1000 MHz

EMRS-2D

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	10 - 1000 MHz
LO	10 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
20 - 500 MHz	6.8	8
10 - 1000 MHz	7.5	10

Isolation (dB)	Typical	Minimum
LO to RF		
10 - 100 MHz	59	40
100 - 500 MHz	40	30
500 - 1000 MHz	33	22
LO to IF		
10 - 100 MHz	55	30
100 - 500 MHz	40	22
500 - 1000 MHz	30	20

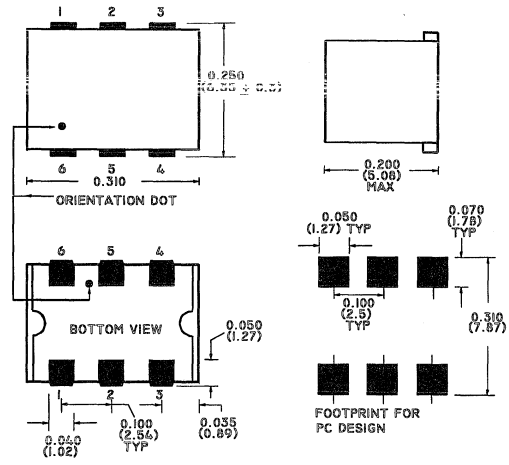
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-2D is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-2D

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
1500 - 1900 MHz EMRS-11A

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	1500 - 1900 MHz
LO	1500 - 1900 MHz
IF	40 - 400 MHz

Conversion Loss (dB)	Typical	Maximum
1500 - 1900 MHz	7	9

Isolation (dB)	Typical	Minimum
LO to RF		
1500 - 1900 MHz	25	17
LO to IF		
1500 - 1900 MHz	23	15

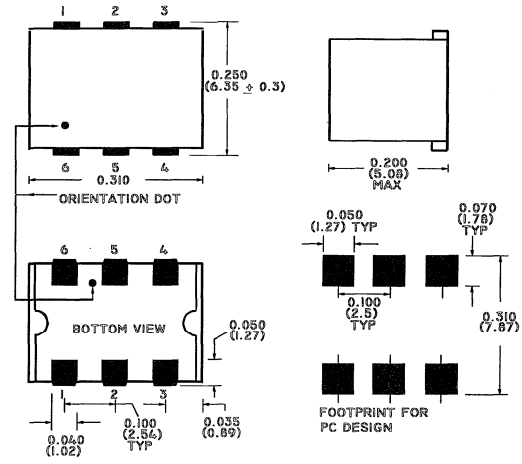
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-11A is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-11A

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
1805 - 1880 MHz

EMRS-6X6

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	1805 - 1880 MHz
LO	95 MHz
IF	1710 - 1785 MHz

Conversion Loss (dB)	Typical	Maximum
1805 - 1880 MHz	9.5	10.5

Isolation (dB)	Typical	Minimum
LO to RF		
95 MHz	35	25
LO to IF		
95 MHz	30	25

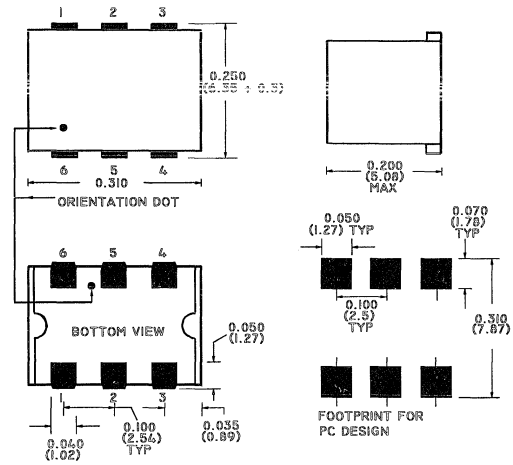
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-6X6 is also available in the new J Leaded SM-44 case style.

Order As Follows: EMRSJ-6X6

Function		Pin No.
LO	I/P	1
RF	O/P	4
IF	I/P	5
Ground		2,3,6
Case Ground		-
Unconnected		-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
2 - 750 MHz

EMRS-1W

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	2 - 750 MHz
LO	2 - 750 MHz
IF	DC - 750 MHz

Conversion Loss (dB)	Typical	Maximum
4 - 375 MHz	6.5	7.5
2 - 750 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
2 - 20 MHz	65	45
20 - 375 MHz	35	28
375 - 750 MHz	32	22
LO to IF		
2 - 20 MHz	50	45
20 - 375 MHz	40	25
375 - 750 MHz	30	20

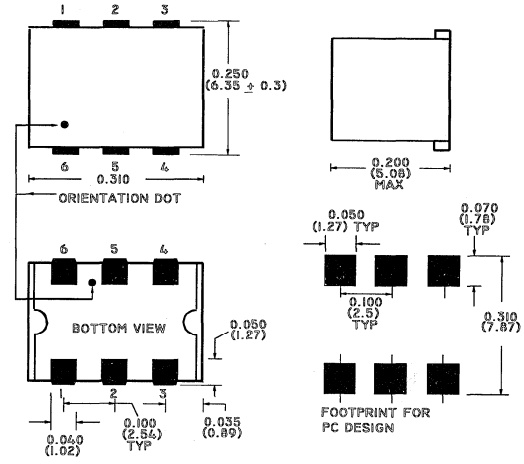
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-1W is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-1W

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series Surface Mount Mixer

350 - 2000 MHz

EMRS-11F

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	350 - 2000 MHz
LO	350 - 2000 MHz
IF	DC - 400 MHz

Conversion Loss (dB)

See Additional Specs.

Isolation (dB)

See Additional Specs for Details

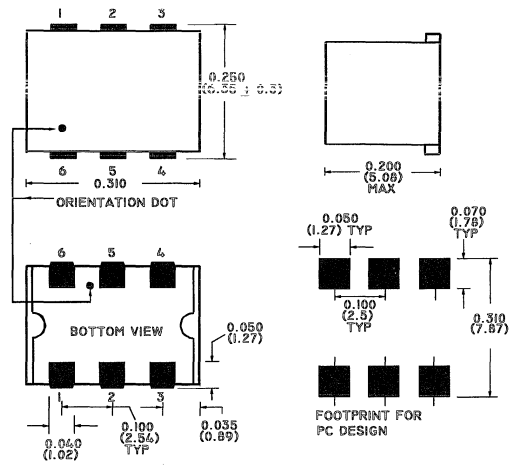
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-11F is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-11F

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Additional Specifications :

Conversion Loss :	Typical	Maximum
350 - 1000 MHz	5.5	7.0
350 - 2000 MHz	6.8	9.2

LO to RF Isolation :	Typical	Minimum
350 - 750 MHz	25	20
750 - 1000 MHz	25	18
1000 - 2000 MHz	30	20

LO to IF Isolation :	Typical	Minimum
350 - 750 MHz	22	14
750 - 1000 MHz	29	22
1000 - 2000 MHz	28	22

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series Surface Mount Mixer
5 - 1000 MHz

EMRS-2

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range		
RF	5 - 1000 MHz	
LO	5 - 1000 MHz	
IF	DC - 1000 MHz	
Conversion Loss (dB)	**Typical**	**Maximum**
10 - 500 MHz	6.5	8
5 - 1000 MHz	7	9.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
5 - 50 MHz	60	40
50 - 500 MHz	40	20
500 - 1000 MHz	25	18
LO to IF		
5 - 50 MHz	55	30
50 - 500 MHz	30	20
500 - 1000 MHz	20	12

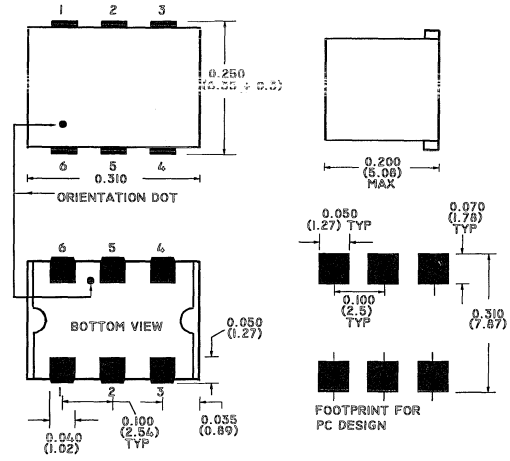
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-2 is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-2

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

E-Series Surface Mount Mixer
5 - 1500 MHz EMRS-5

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	5 - 1500 MHz
LO	5 - 1500 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 750 MHz	6.5	7.5
5 - 1500 MHz	7.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	60	40
50 - 750 MHz	40	20
750 - 1500 MHz	30	18
LO to IF		
5 - 50 MHz	55	30
50 - 750 MHz	30	18
750 - 1500 MHz	15	8

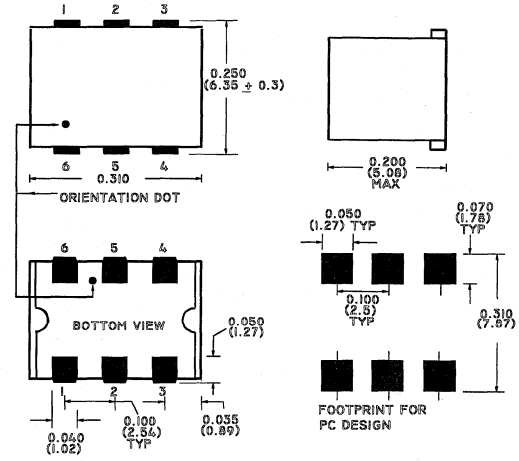
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-5 is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-5

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series Surface Mount Mixer
5 - 1900 MHz

EMRS-11X

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	5 - 1900 MHz
LO	5 - 1900 MHz
IF	5 - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 950 MHz	7.2	8
5 - 1900 MHz	7.4	9.8

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	50	45
50 - 950 MHz	35	20
950 - 1900 MHz	27	18
LO to IF		
5 - 50 MHz	56	45
50 - 950 MHz	37	20
950 - 1900 MHz	27	20

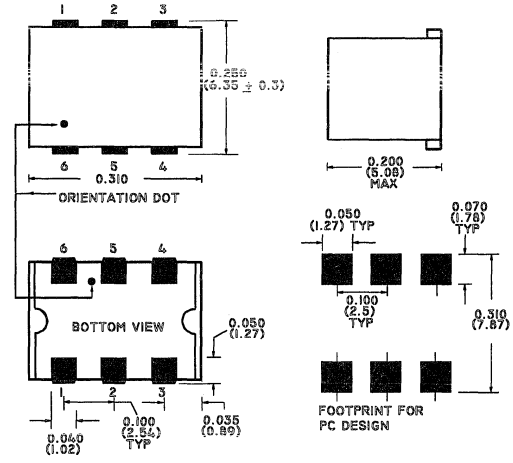
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-11X is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-11X

Function	Pin No.
LO	1
RF	5
IF	4
Ground	2,3,6
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0765 B

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DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series Surface Mount Mixer
5 - 2000 MHz EMRS-11

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	5 - 2000 MHz
LO	5 - 2000 MHz
IF	10 - 600 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 1000 MHz	7	8.5
5 - 2000 MHz	7.5	9

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	50	45
50 - 1000 MHz	35	25
1000 - 2000 MHz	30	20
LO to IF		
5 - 50 MHz	45	40
50 - 1000 MHz	30	20
1000 - 2000 MHz	25	15

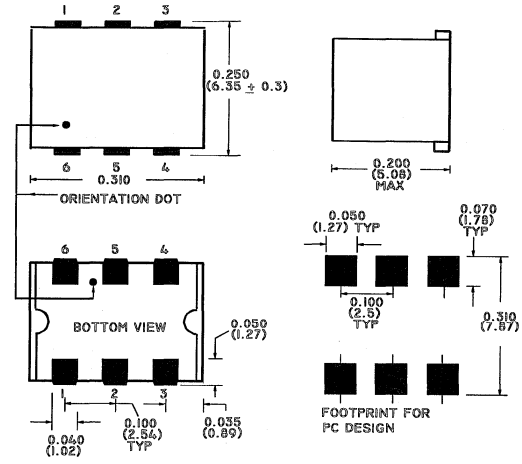
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-11 is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-11

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0055 C

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ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
800 - 1050 MHz EMRS-860

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	800 - 1050 MHz
LO	800 - 1050 MHz
IF	DC - 250 MHz

Conversion Loss (dB)	Typical	Maximum
800 - 1050 MHz	5.5	7.5

Isolation (dB)	Typical	Minimum
LO to RF		
800 - 1050 MHz	36	25
LO to IF		
800 - 1050 MHz	24	18

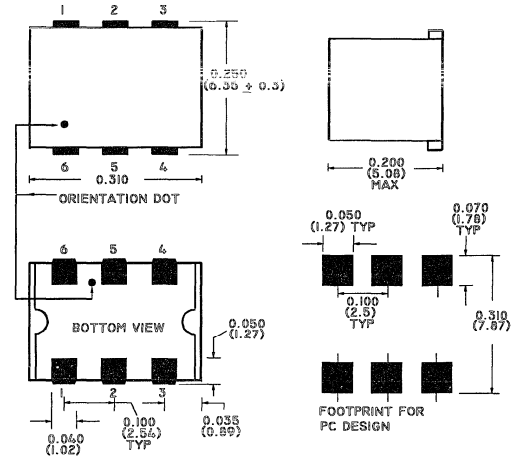
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-860 is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-860

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
900 - 1100 MHz EMRS-95

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range		
RF		900 - 1100 MHz
LO		900 - 1100 MHz
IF		40 - 400 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
900 - 1100 MHz	5.5	7.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
900 - 1100 MHz	25	20
LO to IF		
900 - 1100 MHz	18	15

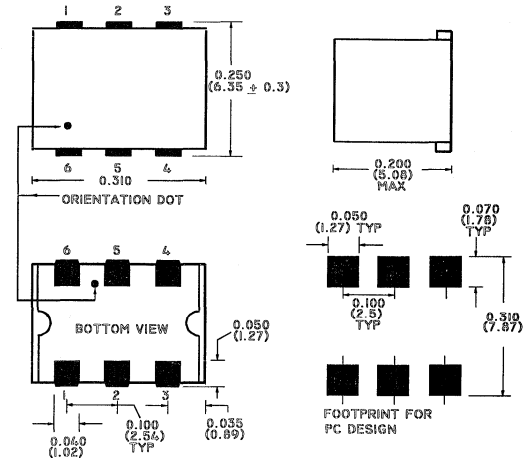
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-1



The EMRS-95 is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-95

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series Surface Mount Mixer

1 - 1000 MHz ESMD-C1

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	1 - 1000 MHz
LO	1 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 500 MHz	6.5	7.5
1 - 1000 MHz	7.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	60	45
10 - 500 MHz	45	30
500 - 1000 MHz	40	25
LO to IF		
1 - 10 MHz	60	40
10 - 500 MHz	35	23
500 - 1000 MHz	30	15

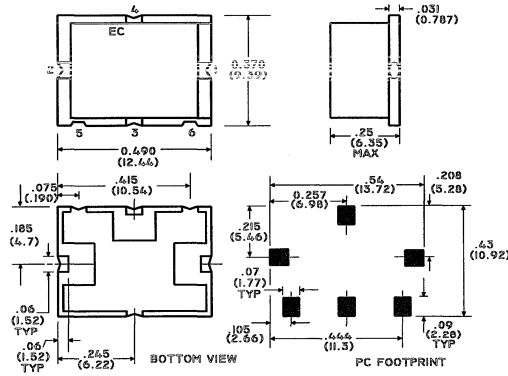
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-2



Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0329 B

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
15 - 2000 MHz ESMD-C4

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	15 - 2000 MHz
LO	15 - 2000 MHz
IF	DC - 1500 MHz

Conversion Loss (dB)	Typical	Maximum
30 - 1000 MHz	7	9
15 - 2000 MHz	8	10.5

Isolation (dB)	Typical	Minimum
LO to RF		
15 - 150 MHz	50	30
150 - 1000 MHz	30	20
1000 - 2000 MHz	20	13
LO to IF		
15 - 150 MHz	50	30
150 - 1000 MHz	20	15
1000 - 2000 MHz	20	10

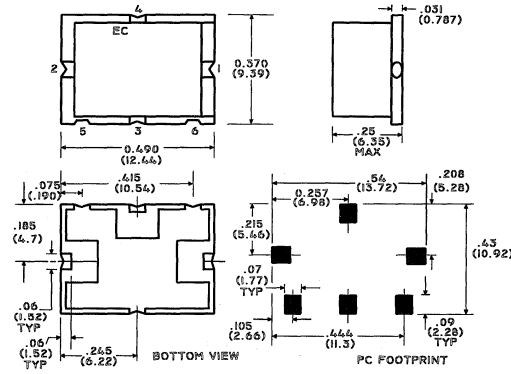
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-2



Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

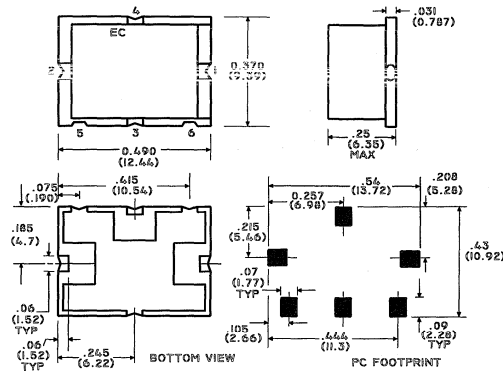
E-Series Surface Mount Mixer
20 - 1500 MHz

ESMD-C2

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	20 - 1500 MHz
LO	20 - 1500 MHz
IF	DC - 1500 MHz

Conversion Loss (dB)	Typical	Maximum
40 - 750 MHz	7	8.5
20 - 1500 MHz	8.5	9

Isolation (dB)	Typical	Minimum
LO to RF		
20 - 200 MHz	50	35
200 - 750 MHz	35	25
750 - 1500 MHz	20	10
LO to IF		
20 - 200 MHz	40	25
200 - 750 MHz	25	18
750 - 1500 MHz	15	8

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

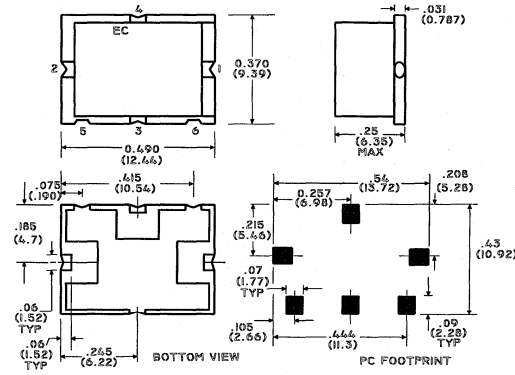
ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
20 - 2500 MHz ESMD-C3

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	20 - 2500 MHz
LO	20 - 2500 MHz
IF	20 - 600 MHz

Conversion Loss (dB)	Typical	Maximum
40 - 1250 MHz	8	9
20 - 2500 MHz	9	10.5

Isolation (dB)	Typical	Minimum
LO to RF		
20 - 200 MHz	45	30
200 - 1250 MHz	30	23
1250 - 2500 MHz	30	15
LO to IF		
20 - 200 MHz	40	20
200 - 1250 MHz	25	15
1250 - 2500 MHz	25	12

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0164 B

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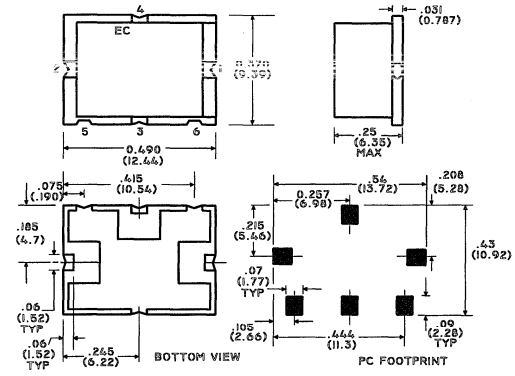
ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
800 - 2700 MHz ESMD-27

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-2



Specifications @ 25°C

Frequency Range	
RF	800 - 2700 MHz
LO	800 - 2700 MHz
IF	DC - 400 MHz

Conversion Loss (dB)	Typical	Maximum
800 - 2700 MHz	8	10

Isolation (dB)	Typical	Minimum
LO to RF		
800 - 2700 MHz	30	20
LO to IF		
800 - 2700 MHz	25	10

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

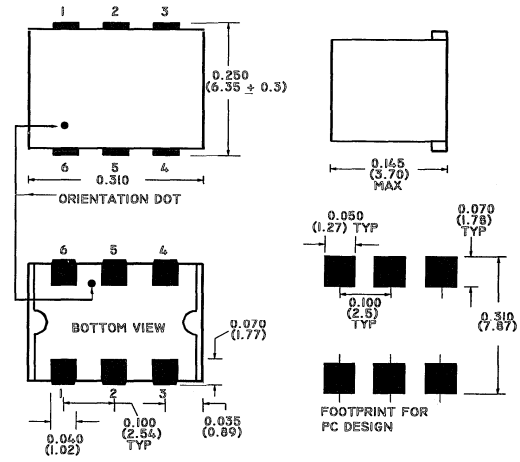
E-Series Surface Mount Mixer
0.5 - 500 MHz

EMRS-1A

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-23



Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	5.5	7
.5 - 500 MHz	6.2	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	55	50
5 - 250 MHz	33	25
250 - 500 MHz	27	20
LO to IF		
0.5 - 5 MHz	55	45
5 - 250 MHz	30	23
250 - 500 MHz	24	19

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

The EMRS-1A is also available in the new J Leaded SM-44 case style

Order As Follows: EMRSJ-1A

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0815 B

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

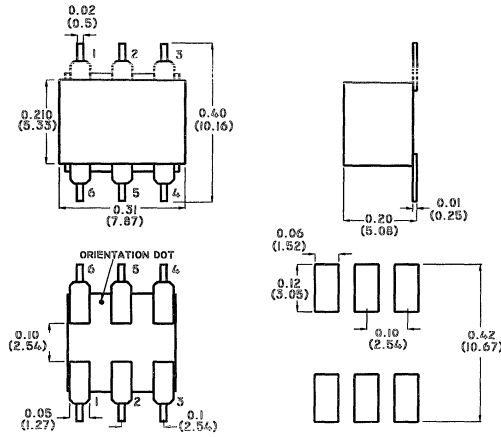
E-Series Surface Mount Mixer
0.5 - 500 MHz

EMRSL-1

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range	
RF	0.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
1 - 250 MHz	5.5	7
.5 - 500 MHz	6.2	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
0.5 - 5 MHz	55	50
5 - 250 MHz	33	25
250 - 500 MHz	27	20
LO to IF		
0.5 - 5 MHz	55	45
5 - 250 MHz	30	23
250 - 500 MHz	24	19

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0176 D

ISO 9001
CERTIFIED

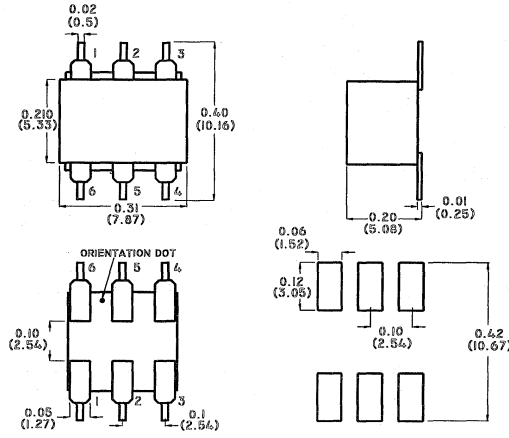
E-Series Surface Mount Mixer
10 - 1000 MHz

EMRSL-2D

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range		
RF		10 - 1000 MHz
LO		10 - 1000 MHz
IF		DC - 1000 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
20 - 500 MHz	6.8	8
10 - 1000 MHz	7.5	10
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
10 - 100 MHz	59	40
100 - 500 MHz	40	30
500 - 1000 MHz	33	22
LO to IF		
10 - 100 MHz	55	30
100 - 500 MHz	40	22
500 - 1000 MHz	30	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Positive

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

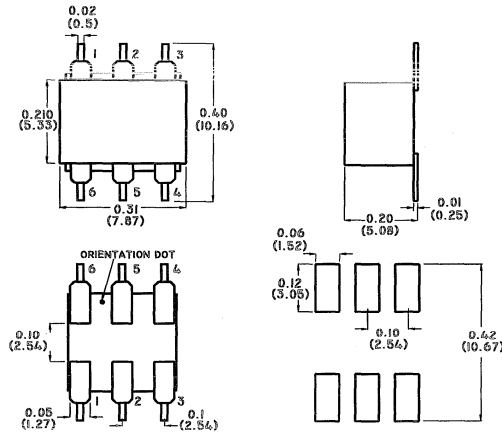
E-Series Surface Mount Mixer
10 - 1000 MHz

EMRSL-2U

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range		
RF		10 - 1000 MHz
LO		10 - 1000 MHz
IF		10 - 750 MHz
Conversion Loss (dB)	**Typical**	**Maximum**
20 - 500 MHz	6.5	8
10 - 1000 MHz	7.5	9.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
10 - 100 MHz	55	40
100 - 500 MHz	40	30
500 - 1000 MHz	30	25
LO to IF		
10 - 100 MHz	55	30
100 - 500 MHz	35	25
500 - 1000 MHz	30	22

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0354 B

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See Page 7-26 For Local Office Details

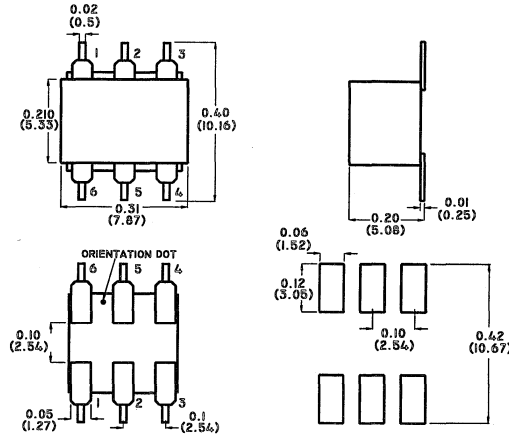
ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
1500 - 1900 MHz EMRSL-11A

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range		
RF		1500 - 1900 MHz
LO		1500 - 1900 MHz
IF		40 - 400 MHz
Conversion Loss (dB)		**Maximum**
1500 - 1900 MHz		9
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
1500 - 1900 MHz	25	17
LO to IF		
1500 - 1900 MHz	23	15

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

E-Series Surface Mount Mixer

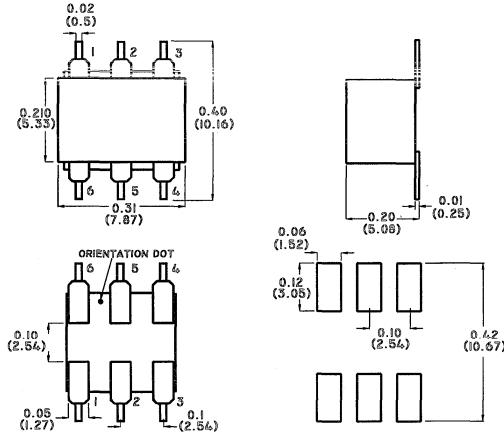
2 - 750 MHz

EMRSL-1W

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range	
RF	2 - 750 MHz
LO	2 - 750 MHz
IF	DC - 750 MHz

Conversion Loss (dB)	Typical	Maximum
4 - 375 MHz	6.5	7.5
2 - 750 MHz	6.5	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
2 - 20 MHz	65	45
20 - 375 MHz	35	28
375 - 750 MHz	32	22
LO to IF		
2 - 20 MHz	50	45
20 - 375 MHz	40	25
375 - 750 MHz	30	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

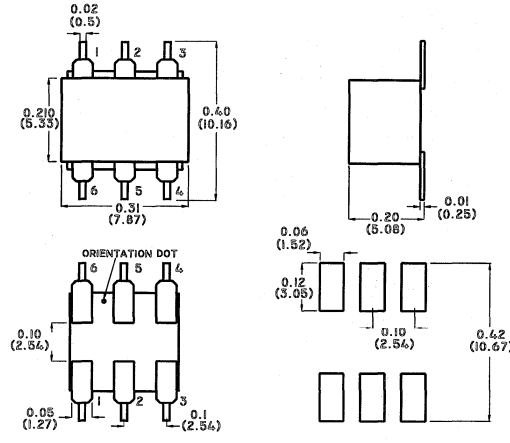
E-Series Surface Mount Mixer
5 - 1000 MHz

EMRSL-2

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range	
RF	5 - 1000 MHz
LO	5 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 500 MHz	6.5	8
5 - 1000 MHz	7	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	60	40
50 - 500 MHz	40	20
500 - 1000 MHz	25	18
LO to IF		
5 - 50 MHz	55	30
50 - 500 MHz	30	20
500 - 1000 MHz	20	12

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Positive

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

ISO 9001
CERTIFIED

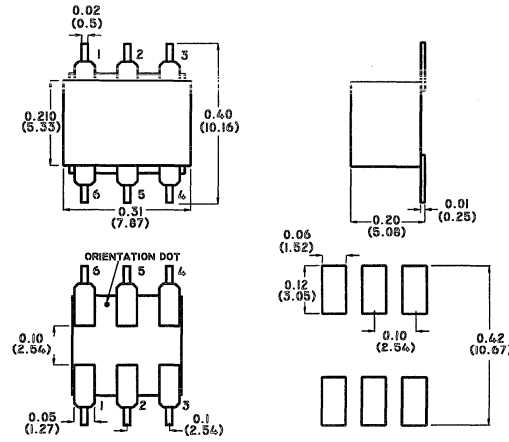
E-Series Surface Mount Mixer
5 - 1500 MHz

EMRSL-5

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range	
RF	5 - 1500 MHz
LO	5 - 1500 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 750 MHz	6.5	7.5
5 - 1500 MHz	7.5	9.5

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	60	40
50 - 750 MHz	40	20
750 - 1500 MHz	30	18
LO to IF		
5 - 50 MHz	55	30
50 - 750 MHz	30	18
750 - 1500 MHz	15	8

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0389 C

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ISO 9001
CERTIFIED

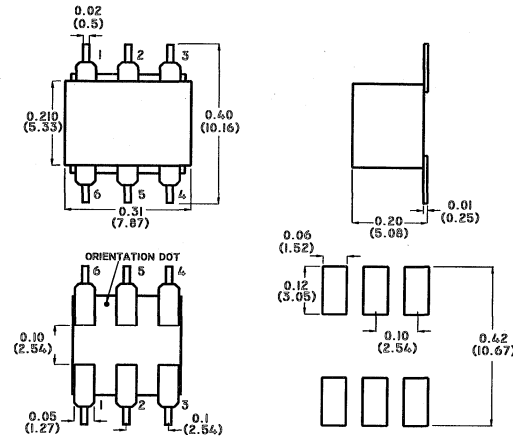
E-Series Surface Mount Mixer
5 - 2000 MHz

EMRSL-11

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range	
RF	5 - 2000 MHz
LO	5 - 2000 MHz
IF	10 - 600 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 1000 MHz	7	8.5
5 - 2000 MHz	7.5	9

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	50	45
50 - 1000 MHz	35	25
1000 - 2000 MHz	30	20
LO to IF		
5 - 50 MHz	45	40
50 - 1000 MHz	30	20
1000 - 2000 MHz	25	15

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0175 C

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See Page 7-26 For Local Office Details

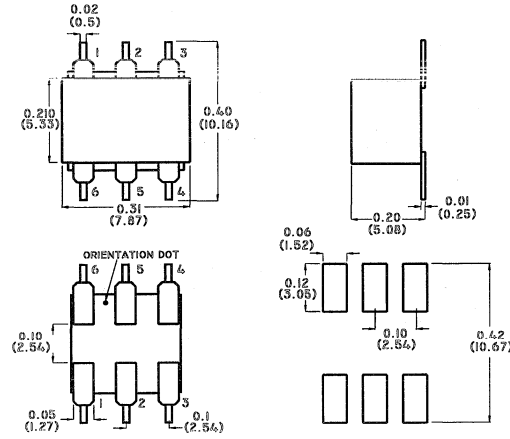
ISO 9001
CERTIFIED

E-Series Surface Mount Mixer
800 - 1050 MHz EMRSL-860

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range		
RF	800 - 1050 MHz	
LO	800 - 1050 MHz	
IF	DC - 250 MHz	
Conversion Loss (dB)	**Typical**	**Maximum**
800 - 1050 MHz	5.5	7.5
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
800 - 1050 MHz	36	25
LO to IF		
800 - 1050 MHz	24	18

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

DISTRIBUTOR Stock ITEM

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E-Series Surface Mount Mixer
1 - 500 MHz

ESCM-1

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	1 - 500 MHz
LO	1 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 250 MHz	6	7
1 - 500 MHz	6.5	8

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	60	40
10 - 250 MHz	45	35
250 - 500 MHz	40	30
LO to IF		
1 - 10 MHz	55	40
10 - 250 MHz	45	35
250 - 500 MHz	40	25

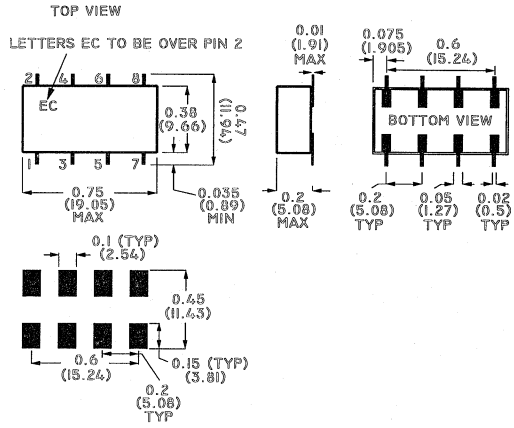
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-26



The ESCM-1 is also available with long leads >0.09 (2.28mm) as case style SM-3

Order As Follows: ESCM-1/SM-3

Function	Pin No.
LO	8
RF	1
IF	3,4
Ground	2,5,6,7
Case Ground	-
Unconnected	-

'IF' pins must be connected together externally.

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E-Series Surface Mount Mixer
5 - 1000 MHz

ESCM-2

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	5 - 1000 MHz
LO	5 - 1000 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
10 - 500 MHz	6	7.5
5 - 1000 MHz	7	9.8

Isolation (dB)	Typical	Minimum
LO to RF		
5 - 50 MHz	50	40
50 - 500 MHz	40	25
500 - 1000 MHz	35	20
LO to IF		
5 - 50 MHz	55	30
50 - 500 MHz	40	25
500 - 1000 MHz	30	18

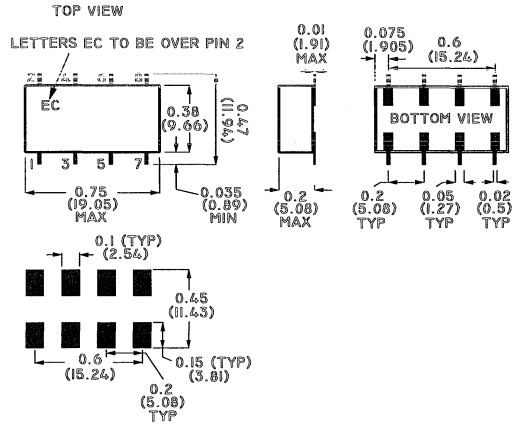
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-26



The ESCM-2 is also available with long leads >0.09 (2.28mm) as case style SM-3

Order As Follows: ESCM-2/SM-3

Function	Pin No.
LO	8
RF	1
IF	3
Ground	2,5,6,7
Case Ground	-
Unconnected	-

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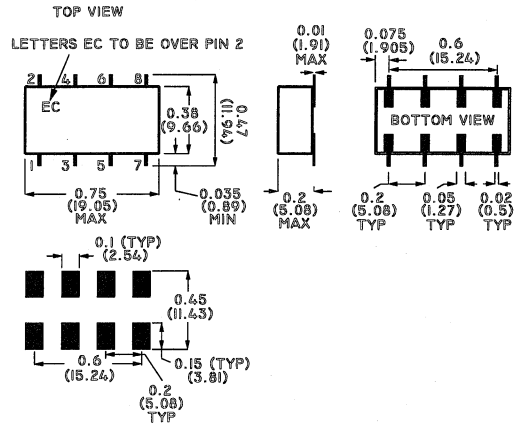
E-Series Surface Mount Mixer
500 - 2500 MHz ESCM-2500

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-26



Specifications @ 25°C

Frequency Range	
RF	500 - 2500 MHz
LO	500 - 2500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Maximum
500 - 2500 MHz	10

Isolation (dB)	Typical	Minimum
LO to RF		
500 - 2500 MHz	35	22
LO to IF		
500 - 2500 MHz	18	12

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

The ESCM-2500 is also available with lon leads >0.09 (2.28mm) as case style SM-3

Order As Follows: ESCM-2500/SM-3

Function	Pin No.
LO	1
RF	8
IF	3
Ground	2,4,5,6,7
Case Ground	-
Unconnected	-

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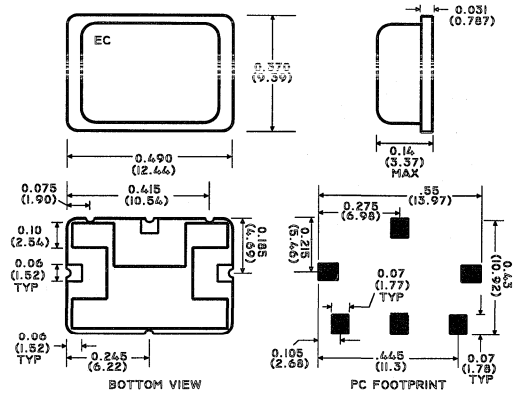
E-Series Surface Mount Mixer
20 - 1500 MHz

ESMD-C2A

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-32



Specifications @ 25°C

Frequency Range	
RF	20 - 1500 MHz
LO	20 - 1500 MHz
IF	DC - 1500 MHz

Conversion Loss (dB)	Typical	Maximum
40 - 750 MHz	7	8.5
20 - 1500 MHz	8.5	9

Isolation (dB)	Typical	Minimum
LO to RF		
20 - 200 MHz	50	35
200 - 750 MHz	35	25
750 - 1500 MHz	20	10
LO to IF		
20 - 200 MHz	40	25
200 - 750 MHz	25	18
750 - 1500 MHz	15	8

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Positive

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	2
RF	1
IF	3
Ground	4,5
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0754 B

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North America Tel: 1-800-366-266 * Europe Tel: +44 (1344) 869 595 * Asia / Pacific Tel: +81 (03) 3226-1671

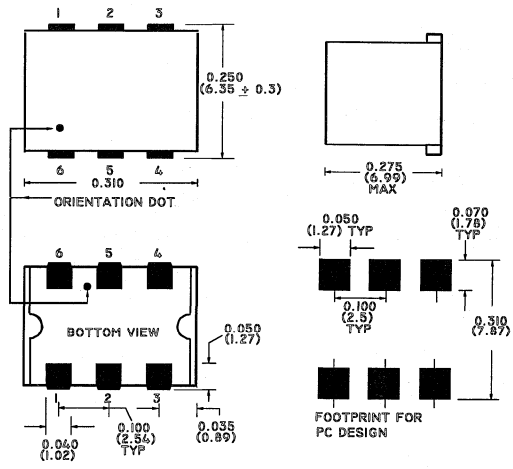
See Page 7-26 For Local Office Details

E-Series Surface Mount Mixer
200 - 3000 MHz EMRS-30

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-41



Specifications @ 25°C

Frequency Range		
RF	200 - 3000 MHz	
LO	200 - 3000 MHz	
IF	DC - 1000 MHz	
Conversion Loss (dB)	**Typical**	**Maximum**
200 - 3000 MHz	7.5	9.8
Isolation (dB)	**Typical**	**Minimum**
LO to RF		
200 - 3000 MHz	24	17
LO to IF		
200 - 3000 MHz	20	7

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Positive

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

The EMRS-30 is also available in the new J Leaded SM-44 case style
Order As Follows: EMRSJ-30

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Specifications Subject to Change Without Notice S 0739 C

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E-Series Surface Mount Mixer

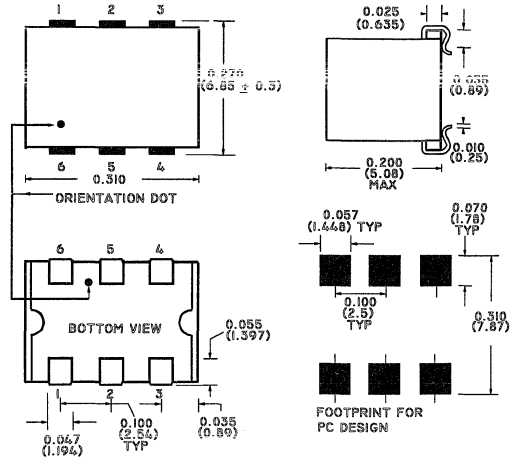
00.5 - 500 MHz

EMRS-1C

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-44



Specifications @ 25°C

Frequency Range	
RF	00.5 - 500 MHz
LO	0.5 - 500 MHz
IF	DC - 500 MHz

Conversion Loss (dB)	Typical	Maximum
0.5 - 500 MHz	6.9	8

Isolation (dB)	Minimum
LO to RF	
0.5 - 500 MHz	20
LO to IF	
0.5 - 500 MHz	20

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

Voltage Standing Wave Ratio's :

LO VSWR : (Max) 3.5 : 1*

RF VSWR : (Max) 3.3 : 1*

IF VSWR : (Max) 3.0 : 1*

Additional Specifications :

Note: * LO & RF VSWR degrades to 6 : 1 between 0.5 MHz and 5 MHz

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E-Series Surface Mount Mixer

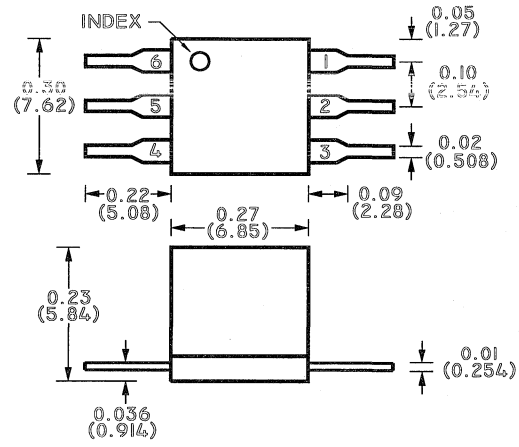
1 - 1000 MHz

EASK-2

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

SM-5



Specifications @ 25°C

Frequency Range	
RF	1 - 1000 MHz
LO	1 - 1000 MHz
IF	DC - 1000 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 500 MHz	7	8
1 - 1000 MHz	7.5	9.8

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	60	40
10 - 500 MHz	35	18
500 - 1000 MHz	26	16
LO to IF		
1 - 10 MHz	50	30
10 - 500 MHz	25	17
500 - 1000 MHz	15	10

Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

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E-Series Surface Mount Mixer
1 - 600 MHz

EASK-1

Features

* LO Power +7 dBm
* Up to +1 dBm RF
* Surface Mount

Specifications @ 25°C

Frequency Range	
RF	1 - 600 MHz
LO	1 - 600 MHz
IF	DC - 600 MHz

Conversion Loss (dB)	Typical	Maximum
2 - 300 MHz	5.5	7
1 - 600 MHz	6	8.5

Isolation (dB)	Typical	Minimum
LO to RF		
1 - 10 MHz	50	30
10 - 300 MHz	35	25
300 - 600 MHz	30	20
LO to IF		
1 - 10 MHz	45	35
10 - 300 MHz	30	20
300 - 600 MHz	25	15

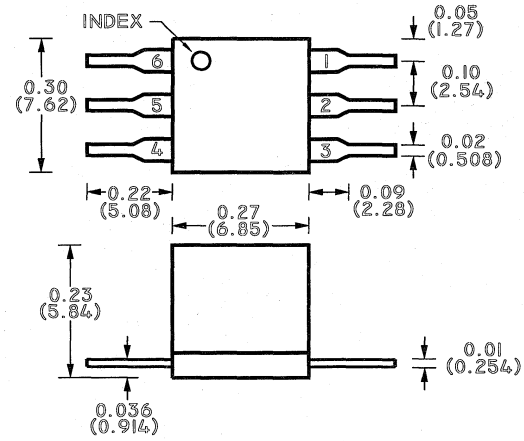
Operating Characteristics

Impedance	50 Ohms Nominal
RF input for 1dB Compression	+ 1 dBm
DC Polarity	Negative

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	50 mW
Peak IF Current	40 mA
Storage Temperature	-55°C to 100°C
Operating Temperature	-55°C to 100°C
Pin Temperature (10 Seconds)	260°C

SM-5



Function	Pin No.
LO	1
RF	4
IF	5
Ground	2,3,6
Case Ground	-
Unconnected	-

(Continued to Next Page)

Spurious Products :

Test Conditions :
LO : 77 - 105 MHz @ + 23 dBm
RF : 75 MHz @ + 7 dBm
IF : 2 - 30 MHz

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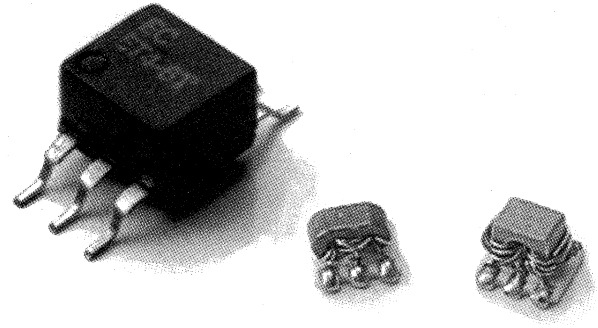
Transformers



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Product Selection Guide 2-2
Specifications Checklist 2-4
Terminology 2-5
Data Pages 2-10
Application Specific Selection Guides 7-16

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Transformer Selection Guide

Model No.	Ω Ratio	Frequency MHz	Insertion Loss			Case Style	Price	Page Number
			3dB MHz	2dB MHz	1dB MHz		Qty. (1-9)	
ET4R-1	4:1	0.001-1500	0.001 - 1500	-	0.001 - 500	R-1	6.26	2-10
ETMO2.5-6T	2.5:1	0.01-100	0.01 - 100	0.02 - 50	0.05 - 20	R-6	7.61	2-11
ETMO4-6	4:1	0.02-200	0.02 - 200	0.05 - 150	0.1 - 100	R-6	7.16	2-12
ETMO1.5-1	1.5:1	1-300	1.0 - 300	0.2 - 150	0.5 - 8	R-7	7.61	2-13
ETMO1-1T	1:1	0.05-200	0.05 - 200	0.08 - 150	0.2 - 80	R-7	7.16	2-14
ETMO1-1	1:1	0.15-400	0.15 - 400	0.35 - 200	2.0 - 50	R-7	5.63	2-15
ETMO2-1T	2:1	0.07-200	0.07 - 200	0.1 - 100	0.5 - 50	R-7	7.61	2-16
ETMO4-1	4:1	0.2-350	0.2 - 350	0.35 - 300	2.0 - 100	R-7	5.63	2-17
ETMO5-1T	5:1	0.3-300	0.3 - 300	0.6 - 200	5.0 - 100	R-7	7.61	2-18
ETMO9-1	9:1	0.15-200	0.15 - 200	0.3 - 150	2 - 40	R-7	7.61	2-19
ET1.5-4	1.5:1	6-1000	-	6-1000	-	SM-1	4.45	2-20
ET1.5-3	1.5:1	10-500	10-500	10-350	10-150	SM-1	4.45	2-21
ET1.5-1	1.5:1	0.1-300	0.1 - 300	0.2 - 150	0.5 - 80	SM-1 *	4.01	2-22
ETT1-6	1:1	0.004-500	0.004 - 500	0.02 - 200	0.1 - 50	SM-1 *	6.26	2-23
ET1-6	1:1	0.01-150	0.01 - 150	0.02 - 100	0.05 - 50	SM-1 *	5.09	2-24
ET1-1T	1:1	0.05-200	0.05 - 200	0.08 - 150	0.2 - 80	SM-1 *	4.01	2-25
~~ET1-1-6-75~~	~~1:1~~	~~0.1-200~~	-	~~0.1 - 200~~	-	~~SM-1 *~~	~~4.45~~	~~2-26~~
ET1-1	1:1	0.15-400	0.15 - 400	0.35 - 200	2 - 50	SM-1 *	2.93	2-27
ET1-1T-2	1:1	0.3-900	0.3 - 900	0.3 - 500	-	SM-1 *	4.45	2-28
ET1-1T-75	1:1	7-235	-	-	7 - 200	SM-1 *	4.45	2-29
ET1-1-9	1:1	9-1200	9 - 1200	12 - 790	20 - 150	SM-1 *	4.45	2-30
ET1-1-2	1:1	40-900	-	-	40 - 900	SM-1 *	4.45	2-31
ET1-1T-4	1:1	810-1900	-	See Datasheet	-	SM-1 *	4.45	2-32
ET2-613-1	1:1:2	0.07-200	0.07 - 200	0.1 - 100	0.5 - 50	SM-1 *	4.45	2-33
ET13-1T	13:1	0.3-120	0.3 - 120	0.7 - 80	5 - 20	SM-1 *	4.45	2-34
ET16-6T	16:1	0.03-75	0.03 - 75	0.06 - 30	0.1 - 20	SM-1 *	4.45	2-35
ET16-1	16:1	0.3-120	0.3 - 120	0.7 - 80	5 - 20	SM-1 *	4.01	2-36
ETT2.5-6	2.5:1	0.01-50	0.01 - 50	0.025 - 25	0.05 - 10	SM-1 *	5.81	2-37
ET2.5-6	2.5:1	0.01-100	0.01-100	0.02-50	0.05-20	SM-1 *	4.01	2-38
ET2.5-6T	2.5:1	0.01-100	0.01-100	0.02-50	0.5-20	SM-1 *	4.01	2-39
ET2-1T	2:1	0.07-200	0.07 - 200	0.1 - 100	0.5 - 50	SM-1 *	5.09	2-40
ET2-1T-1	2:1	900-1000	-	See Datasheet	-	SM-1 *	4.45	2-41
ETC25-1T-1	25:1	78	-	See Datasheet	-	SM-1 *	4.45	2-42
ETT4-1	3:1	0.05-200	0.05 - 200	0.2 - 50	1.0 - 30	SM-1 *	5.36	2-43
ET3-1T	3:1	0.5-250	0.05 - 250	0.1 - 200	0.5 - 70	SM-1 *	4.45	2-44
ET4-6	4:1	0.02-200	0.02 - 200	0.05 - 150	0.1 - 100	SM-1 *	4.01	2-45
ET4-6T	4:1	0.02-250	0.02 - 250	0.05 - 150	0.1 - 100	SM-1 *	4.01	2-46
ETT4-1A	4:1	0.1-300	0.1 - 300	0.2 - 250	0.3 - 180	SM-1 *	6.26	2-47
ET4-1	4:1	0.2-350	0.2 - 350	0.35 - 300	2.0 - 100	SM-1 *	2.93	2-48
ET4-1T-1	4:1	10-900	-	10 - 900	10 - 500	SM-1 *	5.09	2-49
ET4-1T-2	4:1	400-1000	-	400 - 1000	-	SM-1 *	5.09	2-50

*Also available in case styles SM-5, SM-20 and SM-21.

Distributor stock item.

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Transformer Selection Guide

Model No.	Ω Ratio	Frequency MHz	Insertion Loss 3dB MHz	Insertion Loss 2dB MHz	Insertion Loss 1dB MHz	Case Style	Price Qty. (1-9)	Page Number
ET5-1T	5:1	0.03-300	0.03 - 300	0.6 - 200	5 - 100	SM-1 *	4.45	2-51
ET8-1T	8:1	0.03-140	0.03 - 140	0.1 - 90	1.0 - 60	SM-1 *	7.16	2-52
ET9-1	9:1	0.15-200	0.15 - 200	0.3 - 150	2.0 - 40	SM-1 *	3.56	2-53
ETC16-1-2	0.06:1	50	-	-	50	SM-22	4.45	2-54
ETC1-1T-2	1:1	0.05-3	-	0.05 - 3	0.05 - 3	SM-22	4.45	2-55
ETC1-1T	1:1	0.3-200	0.3 - 200	0.3 - 150	0.3 - 50	SM-22	4.45	2-56
ETC1-1-13	1:1	4.5-3000	4.5 - 3000	4.5 - 2000	4.5 - 1000	SM-22	4.45	2-57
ETC1-1-3	1:1	45	-	-	45	SM-22	4.45	2-58
ETC1-1T-4	1:1	52-88	-	-	52 - 88	SM-22	4.45	2-59
ETC1-1T-3	1:1	300-350	-	300 - 350	-	SM-22	4.45	2-60
ETC1-15	1:1	350-1500	-	350-1500	750-1250	SM-22	4.45	2-61
ETC1-1-6	1:1	760-960	-	900	-	SM-22	4.45	2-62
ETC1-1-4	1:1	890-960	-	890 - 960	-	SM-22	4.45	2-63
ETC1-1-2	1:1	1710-1880	-	1710 - 1880	-	SM-22	4.45	2-64
ETC1-1-10	1:1	1710-1910	1710 - 1910	1710 - 1910	-	SM-22	4.45	2-65
ETC16-1TX1	16:1	110.592	-	See Datasheet	-	SM-22	4.45	2-66
ETC2-1-1	2:1	65	-	See Datasheet	-	SM-22	4.45	2-67
ETC3-1T	3:1	0.15-250	0.15 - 0.3	0.3 - 0.5	0.5 - 200	SM-22	4.45	2-68
ETC3-1	3:1	10-750	10-750	10-500	10-100	SM-22	4.45	2-69
ET3-1T-3	3:1	200-400	-	200-400	-	SM-22	4.45	2-70
ETC3-1T-1	3:1	420	-	420	-	SM-22	4.45	2-71
ETC4-1T-3	4:1	0.5-600	0.5 - 600	1.5 - 500	7 - 100	SM-22	4.45	2-72
ETC4-1	4:1	1-350	1.0 - 350	2.0 - 300	5.0 - 100	SM-22	4.45	2-73
ETC4-1-2	4:1	2-800	2.0 - 800	5.0 - 600	10.0 - 100	SM-22	4.45	2-74
ETC4-1T-7	4:1	6-1000	6 - 1000	6 - 600	-	SM-22	4.45	2-75
ETC4-1-3	4:1	40	-	See Datasheet	-	SM-22	4.45	2-76
ETC4-1T-75	4:1	40-1000	40 - 1000	-	-	SM-22	4.45	2-77
ETC4-1-75	4:1	50-750	50 - 750	50 - 400	-	SM-22	4.45	2-78
ETC4-1T-2	4:1	200-700	200 - 700	200 - 500	-	SM-22	4.45	2-79
ETC1.6-4-2-4	4:1	300-2500	1000 - 1300	-	300 - 1000	SM-22	4.45	2-80
ETC1.6-4-2-3	4:1	500-2500	500 - 2500	-	750 - 1200	SM-22	4.45	2-81
ETC4-1T-6	4:1	800-2000	800 - 960	960 - 2000	-	SM-22	4.45	2-82
ETC5-1	5:1	45	-	45	-	SM-22	4.45	2-83
ETC6-1T-1	6:1	110	-	-	110	SM-22	4.45	2-84
ETC64-1T-2	64:1	800-825	-	See Datasheet	-	SM-22	4.45	2-85
ETC7-1T-1	7:1	50-250	-	50 - 250	-	SM-22	4.45	2-86
ETC9-1T-5	9:1	65-75	-	-	65 - 75	SM-22	4.45	2-87
ETC9-1T-1	9:1	200-700	200 - 700	-	-	SM-22	4.45	2-88

*Also available in case styles SM-5, SM-20 and SM-21.

Distributor stock item.

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Transformer Specifications Checklist

If your particular requirements are not met with a M/A-COM catalog item, please complete the checklist below and mail, phone, or fax it to M/A-COM Eurotec, Sales and Marketing or your local Sales Office.

Application:

Industrial ..... Commercial ..... Other .....

Description: .....

.....

Parameters important for application: .....

.....

Electrical:

Frequency Range .....MHz

Schematic ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F

Impedance

Primary .....Ω Secondary .....Ω

VSWR or Return Loss (dB)

Primary ..... Secondary .....

Amplitude Unbalance Max. .....dB

Phase Unbalance Max. .....deg

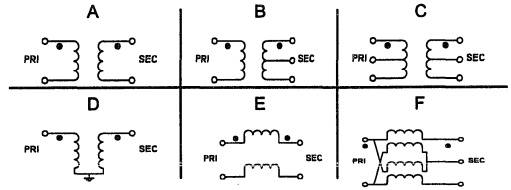
DC Current through windings

Primary .....mA Secondary .....mA

Through Center Tap? (Delete if appropiate)

Primary: YES/NO Secondary: YES/NO

Schematic



Operating Temperature: .....°C

Bandwidth

1 dB .....MHz to .....MHz

2 dB .....MHz to .....MHz

3 dB .....MHz to .....MHz

Mechanical:

Standard Case Style: ..... (for outline drawings see Table of Contents)

PC Board Mounting

☐ Plug-in ☐ Surface-Mount

Coaxial Connector

☐ BNC ☐ TNC

☐ SMA ☐ N ☐ Other

Special Requirements: .....

.....

Name: ..... Title: .....

Company: ..... Dept: .....

Company Address: .....

Phone: ..... Fax: .....

Transformer Terminology

INTRODUCTION: This application note is designed to help the reader understand how balun transformers can be used in todays RF/Microwave communication applications. There is an increasing demand for balun transformers in todays telecommunication market and M/A-COM are leading the field with this device. As many as six of this device can be used around any particular chip as illustrated in figure 4. The balun transformer can be classified into two groups A) The flux coupled balun transformer and B) The transmission line balun transformer.

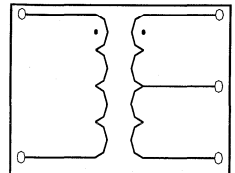


Figure 1 : The flux coupled balun transformer.

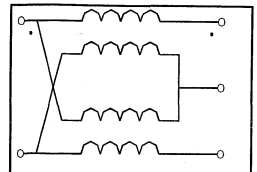


Figure 2 : 4:1 transmission line balun transformer.

DEFINITION OF TERMS:

INSERTION LOSS(dB): Loss due to transmission from primary dot port to secondary dot port and secondary port. Most balun transformers are symmetrical through their central horizontal axis, therefore an input can be applied at the primary dot port or the primary port with differential outputs at the secondary dot and secondary ports.

AMPLITUDE BALANCE(dB): Measure of the difference in amplitude between the two differential outputs.

PHASE BALANCE(degrees): Measure of the difference in phase between the two differential outputs i.e. measured from ± 180°.

RETURN LOSS(dB) : Loss due to reflection at any port.

A) FLUX COUPLED BALUN TRANSFORMERS :

The flux coupled balun transformer can provide a wide range of impedance ratios; 1:1, 4:1, 9:1 and 16:1 are most common. DC isolation from primary coil to secondary coil is also a feature of this device. It has a low loss and good balance over a broad frequency bandwidth. The ETC4-1-2 has an insertion loss of approximately 2.5 dB at 800 MHz and is an example of one of our most popular flux coupled balun transformers.

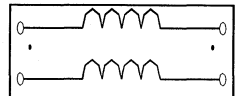


Figure 3 : 1:1 transmission line balun transformer.

B) TRANSMISSION LINE BALUN TRANSFORMERS :

The transmission line balun transformer comes in two impedance ratios as outlined above i.e. 4:1 and 1:1. It operates at higher frequencies and over a greater bandwidth than the flux coupled balun transformer. It cannot provide DC isolation from primary side to secondary side. The ETC1.6-4-2-3 is an example of one of our most popular 4:1 transmission line balun transformers with an optimum performance of 1dB insertion loss at 900 MHz.

APPLICATIONS : The applications of these devices are;

1) Impedance matching.
See figure 5. The inputs to the LO buffer amplifier and the quad diode ring are at 100 W approximately.

2) DC isolation.
See figure 5. At DC there is no magnetic coupling, therefore the LO balun transformer and the RF balun transformer are acting as open circuits at DC.

3) Matching balanced ports to a single ended port.
See figure 6. The inputs to the diode pair are 180° out of phase.

The flux coupled balun transformer can incorporate all of the above, whereas the transmission line balun transformer cannot provide DC isolation. Matching single ended ports to balanced (differential) ports on an integrated circuit is a common application of these devices. Figure 4 shows the first mixer stage and second mixer stage of a receiver chip functional block diagram that is commonly used in digital radio applications.

Here are the differential ports associated with the chip in figure 4;

- Differential outputs from second local oscillator buffer amplifier 1.
  +LOB1
  -LOB1
- Second local oscillator differential inputs.
  +2LOIN
  -2LOIN
- Differential IF inputs.
  +IFIN
  -IFIN
- Differential outputs from first mixer.
  +MXOUT
  - MXOUT

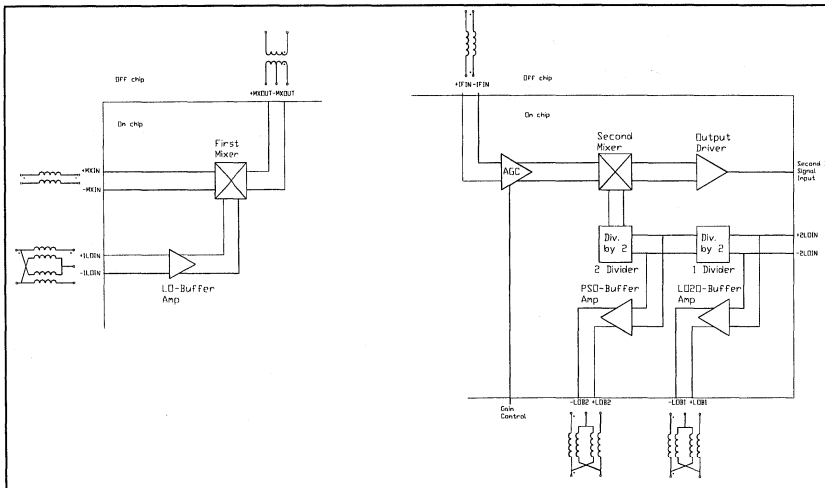


Figure 4 : First mixer stage and second mixer stage of a single-chip double-conversion heterodyne receiver commonly used for digital mobile telephones according to the GSM standard and other digital systems. Shows where six balun transformers can be used.

- Differential inputs to first mixer.
  +MXIN
  -MXIN
- Differential inputs to first local oscillator.
  +1LOIN
  -1LOIN
- Differential outputs from second local oscillator buffer amplifier 2.
  +LOB2
  -LOB2

'Passive matching' refers to the use of a ferrite wound transformer 'off chip' to do this job, while 'active matching' incorporates the transformer (or matching device) on the chip. The advantage of active matching is that there is a cost reduction due to the absence of the ferrite wound transformers but the chip then becomes very specific, also the quality of this matching will not be as good as the matching that a passive transformer would provide. Passive matching allows the design engineer to design a chip that could cover more than one application i.e. his design is more versatile.

Also, matching at IF frequencies for GSM, for DCS, PCS and WLAN for example can be extremely awkward without using low loss, broadband transformers. Examples of the differential ports that would need to be matched to a single ended port are the differential outputs of a diode quad ring, a Gilbert cell or a FET quad. At RF frequencies for GSM, WLAN, DCS and PCS systems, ferrite wound balun transformers are commonly used for matching these differential ports to single ended ports.

As well as matching the balanced ports to the single ended ports, the transformer may also be required to match two different impedances. The impedance of the balanced ports of a quad diode ring is commonly 100 Ω, the impedance of the balanced ports of a Gilbert cell is higher than this. A 4:1 balun transformer operating in a 50 Ω environment will present 100 Ω at both outputs of the device. Eurotec's RF balun transformers are excellent components for fulfilling both of these functions.

Although all of these differential ports do not need to be matched to single ended ports by transformers, (some of these differential ports would be linked to other differential ports in the circuit and others may not be driven as differential ports) there are applications for balun transformers at the IF, LO and RF differential ports on receiver chips such as this one.

In his application, the design engineer may require differential to single ended matching at the inputs to the first mixer i.e. ±MXIN, he may also want to do the same at the input to the first local oscillator i.e. ±1LOIN and at the differential outputs of the second local oscillator buffer amplifiers i.e. ±LOB1 and ±LOB2. The design engineer may also use balun transformers at the IF output of the first mixer and the IF input to the second mixer i.e. ±MXOUT and ±IFIN.

Flux coupled transformers are commonly used for IF applications while transmission line transformers are used for RF and LO applications. However this is a guideline and is not true in all cases.

Some common applications of Eurotec transformers are;

1. Flux coupled balun transformer on miniature ceramic carrier. Impedance matching two balanced outputs from a diode quad ring for a mixer, to a single ended IF output on a down converter chip for digital radio applications. The

input impedance is 50 Ω and the output impedances are 100 Ω. Examples : ETC4-1-2, ETC4-1, ETC4-1T-3.

2. Flux coupled balun transformer on a miniature ceramic carrier. Impedance matching single ended IF input to differential IF ports for digital radio applications. The input impedance is 50 Ω and the output impedances are 75 Ω.
Example : ET3-1T-3.

3. 1:1 transmission line balun transformer on miniature ceramic carrier. Matching two differential RF ports to a single ended RF port for digital radio applications, 800 - 1000MHz. The input impedance is 50Ω and the output impedances are 25 Ω when operating in a 50 Ω environment.
Examples : ETC1-1-13, ETC1-1-6.

4. 1:1 transmission line balun transformer on miniature ceramic carrier. Matching two differential RF ports to a single ended RF port for digital radio applications, 1500 - 2000 MHz. The input impedance is 50 Ω and the output impedances are 25 Ω when operating in a 50 Ω environment.
Examples : ETC1-1-13, ETC1-1-10.

5. 4:1 transmission line balun transformer on miniature ceramic carrier. Impedance matching single ended LO input to differential inputs of a diode pair for a front end single balanced mixer application for digital radio applications. The input impedance is 50 Ω and the output impedances are 100Ω.
Examples: ETC1.6-4-2-3, ETC4-1T-6, ETC1.6-4-2-4, ETC4-1T-7.

6. 1:1 transmission line balun transformer, 0.5 to 700 MHz. Matching differential twisted wire pair to a single ended coaxial cable for a digital distribution board in a telephone exchange, therefore the device operates as an interface between a twisted wire pair and a coaxial cable. The input impedance is 75 Ω and the output impedances are 37.5 Ω when operating in a 75 Ω environment. Example : ETC1-1-75.

7. 4:1 flux coupled unbalanced to unbalanced transformer that provides a 50 Ω to 200 Ω impedance match and DC isolation for a CATV application. 3 dB Bandwidth = 0.2 to 350 MHz.
Example : ET4-1.

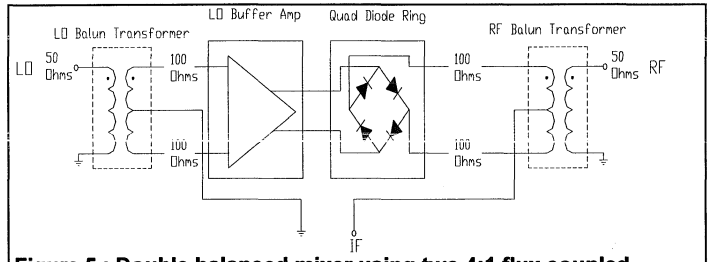


Figure 5 : Double balanced mixer using two 4:1 flux coupled balun transformers.

Figure 5 shows two flux coupled 4:1 balun transformers being used in a double balanced mixer application.

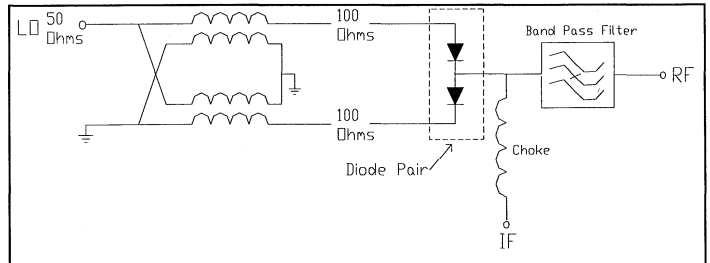


Figure 6 : Single balanced mixer using one 4:1 transmission line balun transformer.

Figure 6 shows one flux coupled 4:1 balun transformer being used in a single balanced mixer application.

CONCLUSION :

M/A-COM has designed to date, a wide range of RF/IF transformers to suit todays most advanced telecommunication applications. The product range comprises of over 100 standard products across a frequency bandwidth of 3 kHz to 3 GHz. The M/A-COM transformer design team will also work closely with system design engineers to meet their specifications.

Since we combine proven technological expertise with innovative high quality and low cost manufacturing capabilities, M/A-COM is the technological partner of choice for the world's most competitive companies.

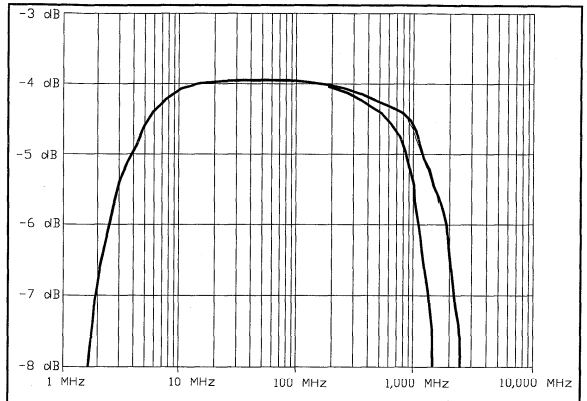


Figure 7 : Insertion loss cure of a 4:1 flux coupled transformer.

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E-Series RF 4:1 Transformer
0.001 - 1500 MHz

ET4R-1

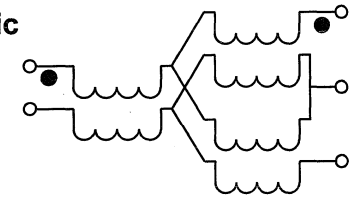
Features

* 4:1 Impedance Ratio

Specifications @ 25°C

Frequency Range	0.001 - 1500 MHz
Insertion Loss	**Maximum**
0.001 - 1500 MHz	3 dB
0.001 - 500 MHz	1 dB
Amplitude Imbalance	**Maximum**
0.001 - 500 MHz	0.3 dB
0.001 - 1500 MHz	0.6 dB
Phase Imbalance	**Maximum**
0.001 - 500 MHz	2°
0.001 - 1500 MHz	6°

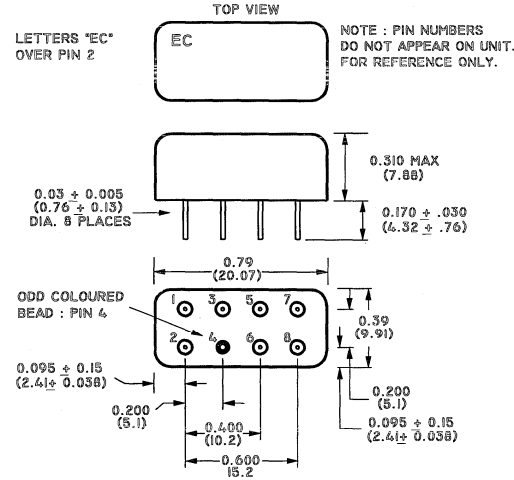
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
Primary dot	2
Primary	-
Primary CT	-
Secondary dot	8
Secondary	7
Secondary CT	-
Case Ground	-
Not Connected	1,3,4,5,6

ISO 9001
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E-Series RF 2.5:1 Transformer
0.01 - 100 MHz ETMO2.5-6T

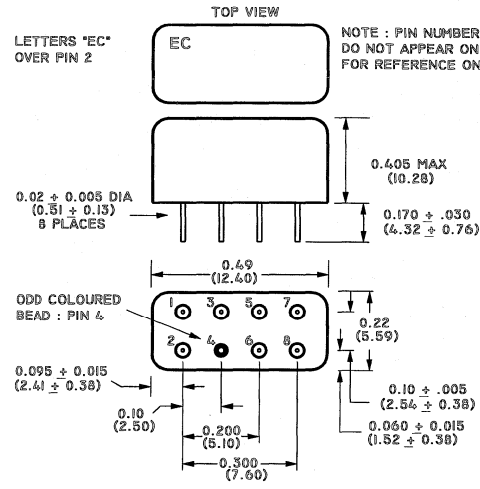
Features

* 2.5:1 Impedance Ratio
* CT on Secondary

Specifications @ 25°C

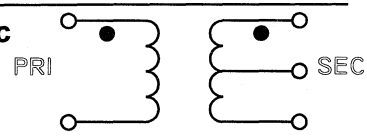
Frequency Range	0.01 - 100 MHz
Insertion Loss	**Maximum**
0.01 - 100 MHz	3 dB
0.02 - 50 MHz	2 dB
0.05 - 20 MHz	1 dB

R-6



WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Schematic



Function	Pin No.
Primary dot	1
Primary	5
Primary CT	-
Secondary dot	2
Secondary	6
Secondary CT	4
Case Ground	7,8
Not Connected	3

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Specifications Subject to Change Without Notice S 0848 B

M/A-COM Inc. Cork, Ireland Tel: 353-21-311 266 Fax: 353-21-311 890
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See Page 7-26 For Local Office Details

ISO 9001
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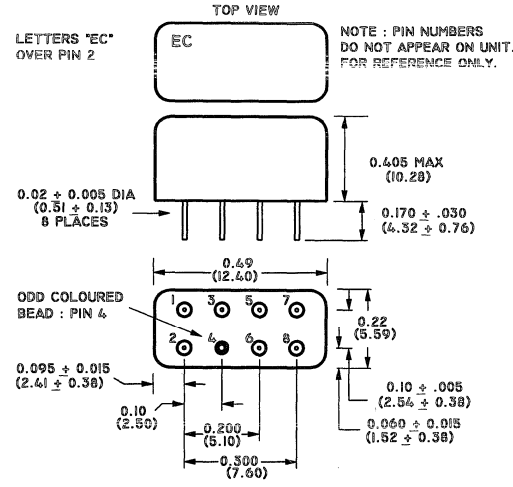
E-Series RF 4:1 Transformer
0.02 - 200 MHz

ETMO4-6

Features

* 4:1 Impedance Ratio

R-6

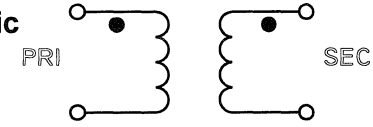


WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Specifications @ 25°C

Frequency Range	**0.02 - 200 MHz**
Insertion Loss	**Maximum**
0.02 - 200 MHz	**3 dB**
0.05 - 150 MHz	**2 dB**
0.1 - 100 MHz	**1 dB**

Schematic



Function	Pin No.
Primary dot	1
Primary	5
Primary CT	-
Secondary dot	2
Secondary	6
Secondary CT	-
Case Ground	7,8
Not Connected	-

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Specifications Subject to Change Without Notice S 0350 B

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ISO 9001
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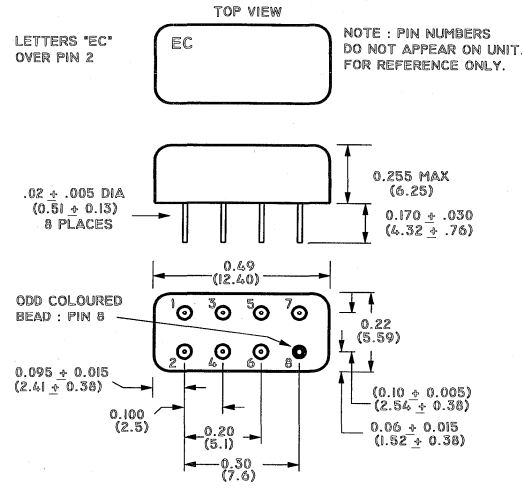
E-Series RF 1.5:1 Transformer
0.1 - 300 MHz

ETMO1.5-1

Features

* 1.5:1 Impedance Ratio

R-7

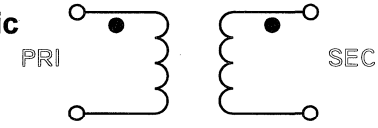


WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Specifications @ 25°C

Frequency Range	0.1 - 300 MHz
Insertion Loss	**Maximum**
0.1 - 300 MHz	3 dB
0.2 - 150 MHz	2 dB
0.5 - 8 MHz	1 dB

Schematic



Function	Pin No.
Primary dot	1
Primary	5
Primary CT	-
Secondary dot	2
Secondary	6
Secondary CT	-
Case Ground	7
Not Connected	3,4,8

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

ISO 9001
CERTIFIED

E-Series RF 1:1 Transformer
0.05 - 200 MHz ETMO1-1T

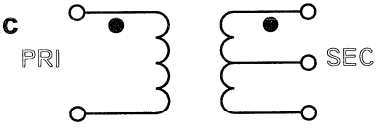
Features

* 1:1 Impedance Ratio
* CT on Secondary

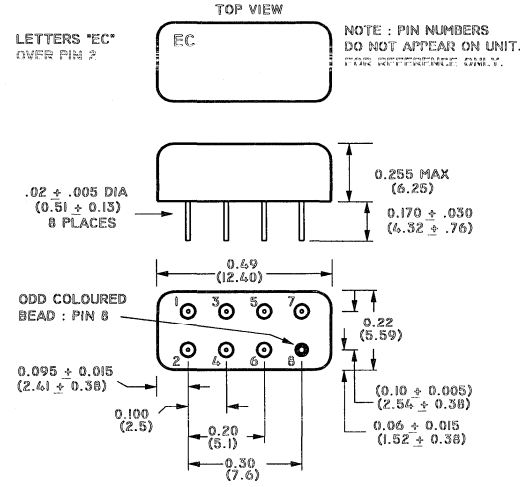
Specifications @ 25°C

Frequency Range	0.05 - 200 MHz
Insertion Loss	**Maximum**
0.05 - 200 MHz	3 dB
0.08 - 150 MHz	2 dB
0.2 - 80 MHz	1 dB
Amplitude Imbalance	**Maximum**
0.2 - 80 MHz	0.1 dB
0.05 - 200 MHz	0.5 dB
Phase Imbalance	**Maximum**
0.2 - 80 MHz	1°
0.05 - 200 MHz	5°

Schematic



R-7



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Function	Pin No.
Primary dot	1
Primary	5
Primary CT	-
Secondary dot	2
Secondary	6
Secondary CT	4
Case Ground	7
Not Connected	3,8

ISO 9001
CERTIFIED

E-Series RF 1:1 Transformer
0.15 - 400 MHz

ETMO1-1

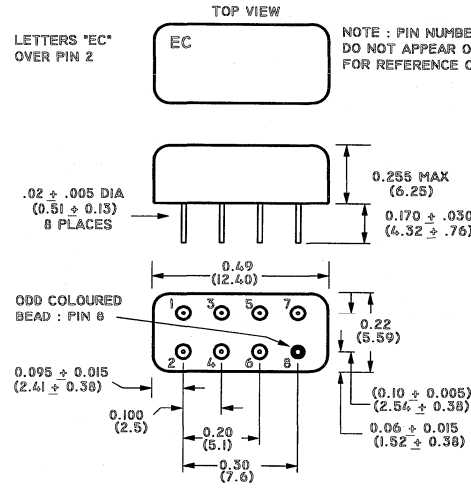
Features

* 1:1 Impedance Ratio

Specifications @ 25°C

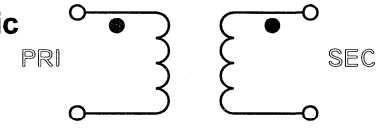
Frequency Range	0.15 - 400 MHz
Insertion Loss	**Maximum**
0.15 - 400 MHz	3 dB
0.35 - 200 MHz	2 dB
2.0 - 50 MHz	1 dB

R-7



WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Function	Pin No.
Primary dot	1
Primary	5
Primary CT	-
Secondary dot	2
Secondary	6
Secondary CT	-
Case Ground	7
Not Connected	3,4,8

ISO 9001
CERTIFIED

E-Series RF 2:1 Transformer
0.07 - 200 MHz

ETMO2-1T

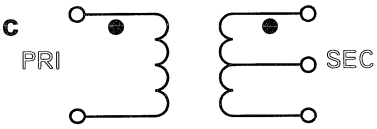
Features

* 2:1 Impedance Ratio
* CT on Secondary

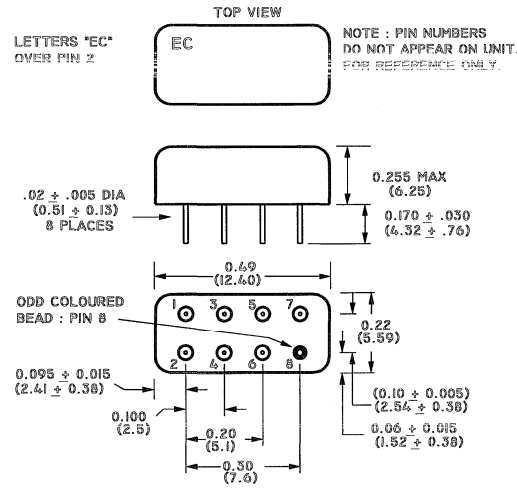
Specifications @ 25°C

Frequency Range	0.07 - 200 MHz
Insertion Loss	**Maximum**
0.07 - 200 MHz	3 dB
0.1 - 100 MHz	2 dB
0.5 - 50 MHz	1 dB
Amplitude Imbalance	**Maximum**
0.5 - 50 MHz	0.1 dB
0.07 - 200 MHz	0.5 dB
Phase Imbalance	**Maximum**
0.5 - 50 MHz	1°
0.07 - 200 MHz	5°

Schematic



R-7



Function	Pin No.
Primary dot	1
Primary	5
Primary CT	-
Secondary dot	2
Secondary	6
Secondary CT	4
Case Ground	7
Not Connected	3,8

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Specifications Subject to Change Without Notice S 0672 B

M/A-COM Inc. Cork, Ireland Tel: 353-21-311 266 Fax: 353-21-311 890
North America Tel: 1-800-366-266 * Europe Tel: +44 (1344) 869 595 * Asia / Pacific Tel: +81 (03) 3226-1671

See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

E-Series RF 4:1 Transformer
0.2 - 350 MHz

ETMO4-1

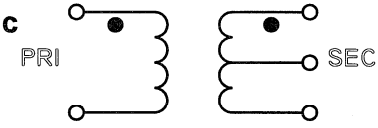
Features

* 4:1 Impedance Ratio
* CT on Secondary

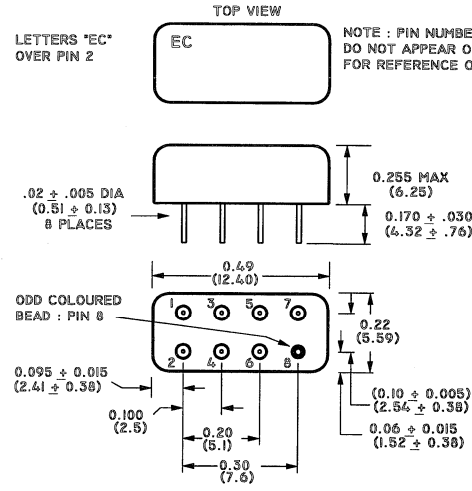
Specifications @ 25°C

Frequency Range	0.2 - 350 MHz
Insertion Loss	**Maximum**
0.2 - 350 MHz	3 dB
0.35 - 300 MHz	2 dB
2.0 - 100 MHz	1 dB
Amplitude Imbalance	**Maximum**
2 - 100 MHz	0.1 dB
0.2 - 350 MHz	0.5 dB
Phase Imbalance	**Maximum**
2 - 100 MHz	1°
0.2 - 350 MHz	5°

Schematic



R-7



WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Function	Pin No.
Primary dot	1
Primary	5
Primary CT	-
Secondary dot	2
Secondary	6
Secondary CT	4
Case Ground	7
Not Connected	3,8

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

ISO 9001
CERTIFIED

E-Series RF 5:1 Transformer
0.3 - 300 MHz ETMO5-1T

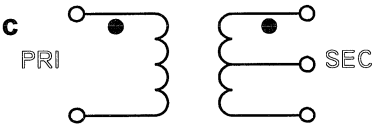
Features

* 5:1 Impedance Ratio
* CT on Secondary

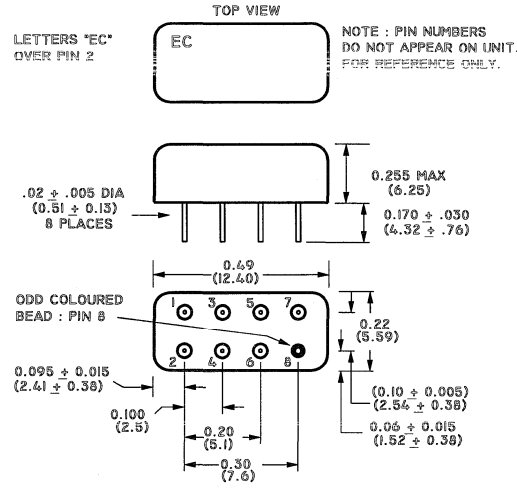
Specifications @ 25°C

Frequency Range	0.3 - 300 MHz
Insertion Loss	**Maximum**
0.3 - 300 MHz	3 dB
0.6 - 200 MHz	2 dB
5.0 - 100 MHz	1 dB
Amplitude Imbalance	**Maximum**
5 - 100 MHz	0.1 dB
0.3 - 300 MHz	0.5 dB
Phase Imbalance	**Maximum**
5 - 100 MHz	1°
0.3 - 300 MHz	5°

Schematic



R-7



WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Function	Pin No.
Primary dot	1
Primary	5
Primary CT	-
Secondary dot	2
Secondary	6
Secondary CT	4
Case Ground	7
Not Connected	3,8

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

ISO 9001
CERTIFIED

E-Series RF 9:1 Transformer
0.15 - 200 MHz ETMO9-1

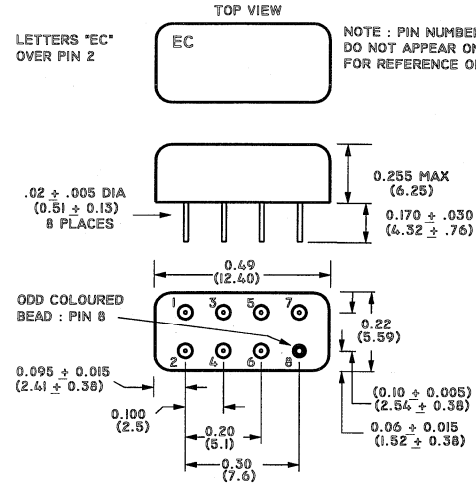
Features

* 9:1 Impedance Ratio

Specifications @ 25°C

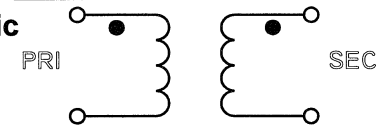
Frequency Range	0.15 - 200 MHz
Insertion Loss	**Maximum**
0.15 - 200 MHz	3 dB
0.3 - 150 MHz	2 dB
2 - 40 MHz	1 dB

R-7



WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Schematic



Function	Pin No.
Primary dot	1
Primary	5
Primary CT	-
Secondary dot	2
Secondary	6
Secondary CT	-
Case Ground	7
Not Connected	3,4,8

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Specifications Subject to Change Without Notice S 0499 B

ISO 9001
CERTIFIED

E-Series RF 1.5:1 Transformer
6 - 1000 MHz

ET1.5-4

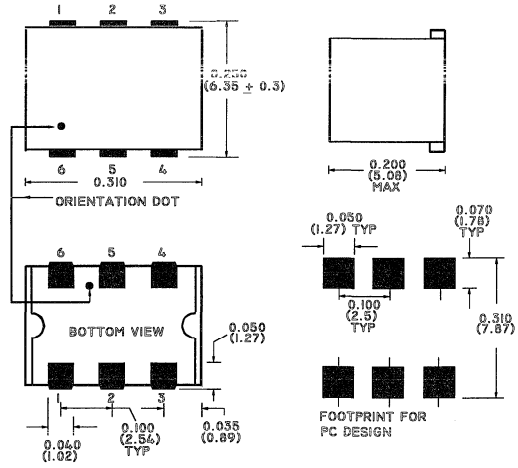
Features

* 1.5:1 Impedance Ratio

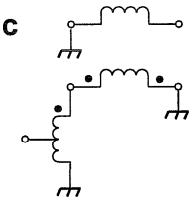
Specifications @ 25°C

Frequency Range	6 - 1000 MHz
Insertion Loss	**Maximum**
6-1000 MHz	2 dB

SM-1



Schematic



Function	Pin No.
Primary dot	1
Primary	6
Primary CT	-
Secondary dot	4
Secondary	3
Secondary CT	-
Case Ground	-
Not Connected	2,6

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Additional Specifications:

I/P Return Loss : >10dB

ISO 9001
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E-Series RF 1.5:1 Transformer
10 - 500 MHz

ET1.5-3

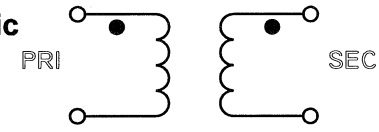
Features

* 1.5:1 Impedance Ratio

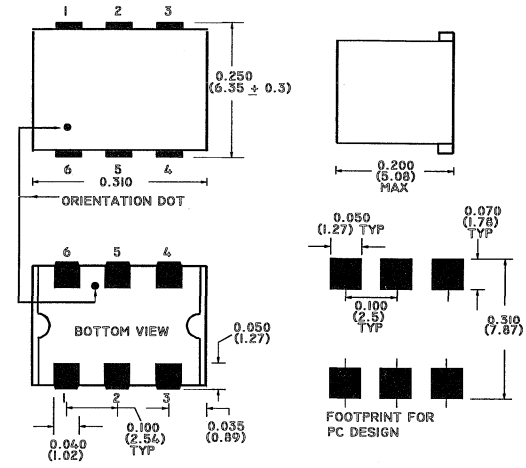
Specifications @ 25°C

Frequency Range	10 - 500 MHz
Insertion Loss	**Maximum**
10-500 MHz	3 dB
10-350 MHz	2 dB
10-150 MHz	1 dB
Amplitude Imbalance	**Maximum**
10-500 MHz	3 dB
Phase Imbalance	**Maximum**
10-500 MHz	20°

Schematic



SM-1



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Function	Pin No.
Primary dot	6
Primary	4
Primary CT	-
Secondary dot	1
Secondary	3
Secondary CT	-
Case Ground	-
Not Connected	2,5

ISO 9001
CERTIFIED

E-Series RF 1.5:1 Transformer
0.1 - 300 MHz

ET1.5-1

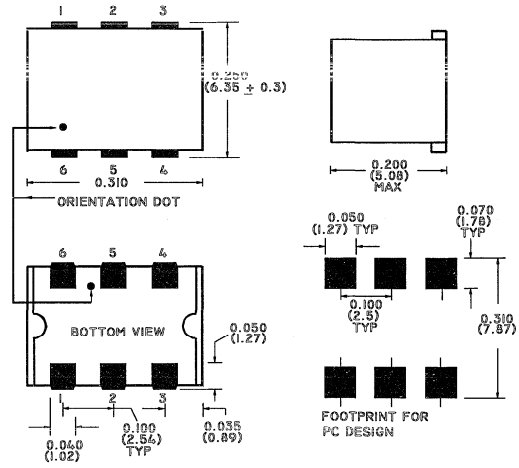
Features

* 1.5:1 Impedance Ratio

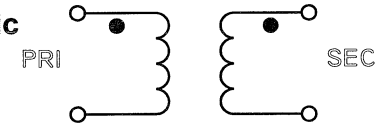
Specifications @ 25°C

Frequency Range	0.1 - 300 MHz
Insertion Loss	**Maximum**
0.1 - 300 MHz	3 dB
0.2 - 150 MHz	2 dB
0.5 - 80 MHz	1 dB

SM-1



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

CASE STYLE OUTLINE

This model is available in four case styles. Order as follows:

ET1.5-1 - SM-1	ET1.5-1 - SM-5
ET1.5-1 - SM-20	ET1.5-1 - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	-
Case Ground	-
Not Connected	2,5

ISO 9001
CERTIFIED

E-Series RF 1:1 Transformer
0.004 - 500 MHz ETT1-6

Features

* 1:1 Impedance Ratio
* CT on Secondary * CT on Primary

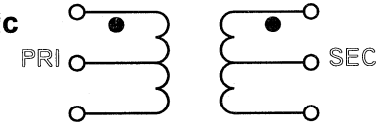
Specifications @ 25°C

Frequency Range	**0.004 - 500 MHz**

Insertion Loss	**Maximum**
0.004 - 500 MHz	3 dB
0.02 - 200 MHz	2 dB
0.1 - 50 MHz	1 dB

Amplitude Imbalance	**Maximum**
0.1 - 50 MHz	0.1 dB
0.004 - 500 MHz	0.5 dB
Phase Imbalance	**Maximum**
0.1 - 50 MHz	1°
0.004 - 50 MHz	5°

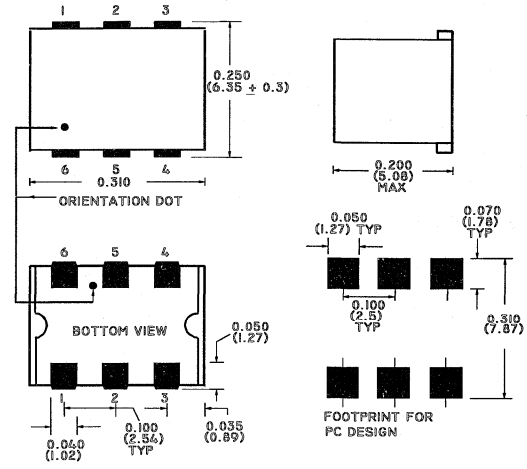
Schematic



Absolute Maximum Ratings

Parameter	**Absolute Maximum**
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-1



CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ETT1-6 - SM-1	**ETT1-6 - SM-5**
ETT1-6 - SM-20	**ETT1-6 - SM-21**

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	5
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

ISO 9001
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E-Series RF 1:1 Transformer
0.01 - 150 MHz

ET1-6

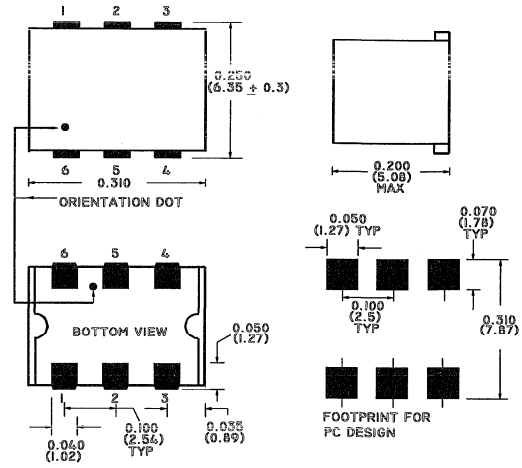
Features

* 1:1 Impedance Ratio

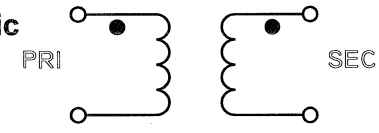
Specifications @ 25°C

Frequency Range	0.01 - 150 MHz
Insertion Loss	**Maximum**
0.01 - 150 MHz	3 dB
0.02 - 100 MHz	2 dB
0.05 - 50 MHz	1 dB

SM-1



Schematic



CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ET1-6 - SM-1	ET1-6 - SM-5
ET1-6 - SM-20	ET1-6 - SM-21

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	-
Case Ground	-
Not Connected	2,5

ISO 9001
CERTIFIED

E-Series RF 1:1 Transformer
0.05 - 200 MHz ET1-1T

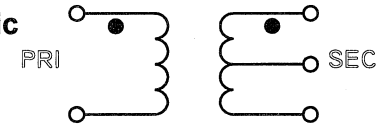
Features

* 1:1 Impedance Ratio
* CT on Secondary

Specifications @ 25°C

Frequency Range	0.05 - 200 MHz
Insertion Loss	**Maximum**
0.05 - 200 MHz	3 dB
0.08 - 150 MHz	2 dB
0.2 - 80 MHz	1 dB
Amplitude Imbalance	**Maximum**
0.2 - 80 MHz	0.1 dB
0.05 - 200 MHz	0.5 dB
Phase Imbalance	**Maximum**
0.2 - 80 MHz	1°
0.05 - 200 MHz	5°

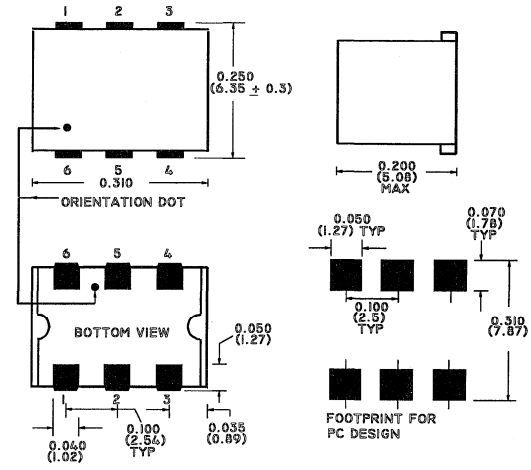
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-1



CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ET1-1T - SM-1	ET1-1T - SM-5
ET1-1T - SM-20	ET1-1T - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	5

ISO 9001
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E-Series RF 1:1 Transformer
0.1 - 200 MHz ET1-1-8-75

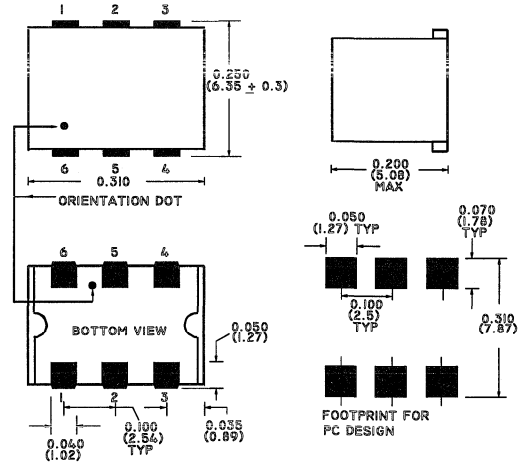
Features

* 1:1 Impedance Ratio

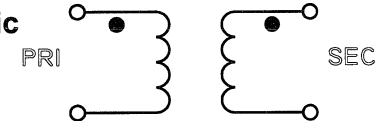
Specifications @ 25°C

Frequency Range	0.1 - 200 MHz
Insertion Loss	**Maximum**
0.1 - 200 MHz	2 dB

SM-1



Schematic



CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ET1-1-8-75 - SM-1	ET1-1-8-75 - SM-5
ET1-1-8-75 - SM-20	ET1-1-8-75 - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	-
Case Ground	-
Not Connected	-

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Additional Specifications:

Designed in 75 ohm enviornment

ISO 9001
CERTIFIED

E-Series RF 1:1 Transformer
0.15 - 400 MHz ET1-1

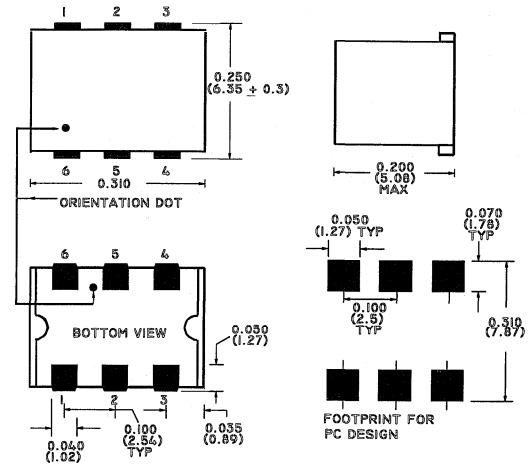
Features

* 1:1 Impedance Ratio

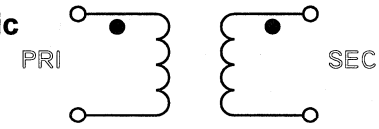
Specifications @ 25°C

Frequency Range	0.15 - 400 MHz
Insertion Loss	**Maximum**
0.15 - 400 MHz	3 dB
0.35 - 200 MHz	2 dB
2 - 50 MHz	1 dB

SM-1



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ET1-1 - SM-1	ET1-1 - SM-5
ET1-1 - SM-20	ET1-1 - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	-
Case Ground	-
Not Connected	2,5

ISO 9001
CERTIFIED

E-Series RF 1:1 Transformer
0.3 - 900 MHz

ET1-1T-2

Features

* 1:1 Impedance Ratio
* CT on Secondary

Specifications @ 25°C

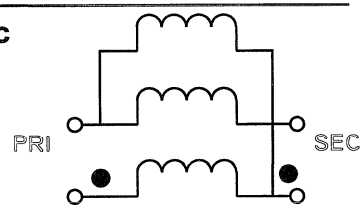
Frequency Range	0.3 - 900 MHz

Insertion Loss	Maximum
0.3 - 900 MHz	3 dB
0.3 - 500 MHz	2 dB

Amplitude Imbalance	Maximum
0.3 - 900 MHz	0.6 dB

Phase Imbalance	Maximum
0.3 - 900 MHz	5°

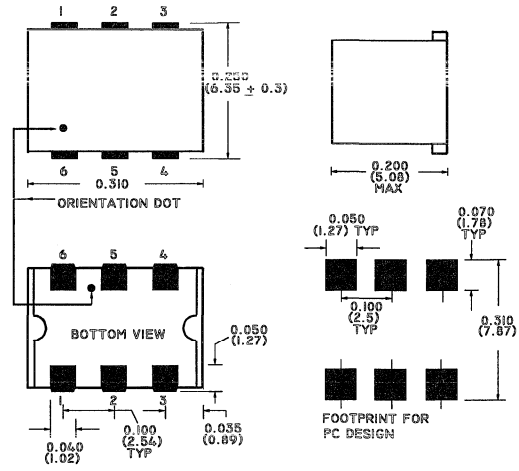
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-1



CASE STYLE OUTLINE

This model is available in four case styles. Order as follows:

ET1-1T-2 - SM-1	ET1-1T-2 - SM-5
ET1-1T-2 - SM-20	ET1-1T-2 - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	6
Case Ground	-
Not Connected	2,5

ISO 9001
CERTIFIED

E-Series RF 1:1 Transformer
7 - 235 MHz ET1-1T-75

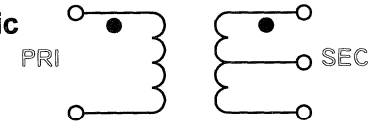
Features

* 1:1 Impedance Ratio
* CT on Secondary

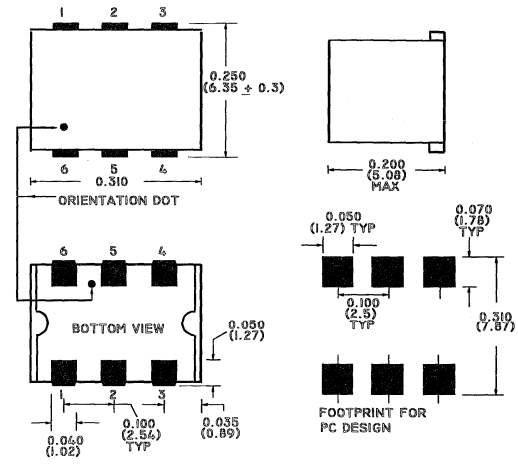
Specifications @ 25°C

Frequency Range	**7 - 235 MHz**
Insertion Loss	**Maximum**
7 - 200 MHz	**1 dB**
Special Insertion Loss	**< 1.5dB: 7 - 235 MHz**
Amplitude Imbalance	**Maximum**
7 - 235 MHz	**2 dB**
Phase Imbalance	**Maximum**
7 - 235 MHz	**1.5°**

Schematic



SM-1



CASE STYLE OUTLINE

This model is available in four case styles. Order as follows:

ET1-1T-75 - SM-1	**ET1-1T-75 - SM-5**
ET1-1T-75 - SM-20	**ET1-1T-75 - SM-21**

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	5

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Additional Specifications:

VSWR : Max = 1.4dB, Typ = 1.35dB, 7 - 235 MHz

Designed in 75 ohm enviornment

ISO 9001
CERTIFIED

E-Series RF 1:1 Transformer
9 - 1200 MHz

ET1-1-9

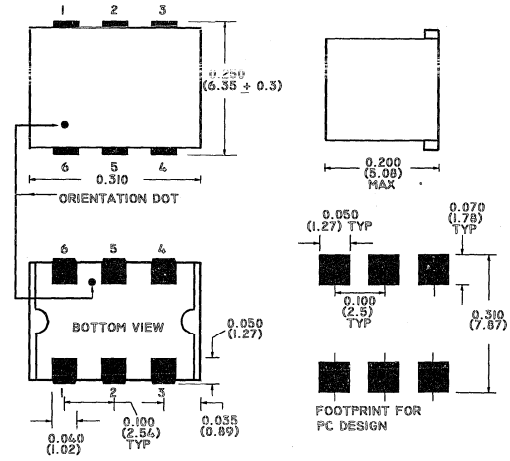
Features

* 1:1 Impedance Ratio

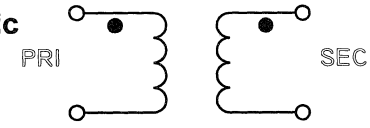
Specifications @ 25°C

Frequency Range	9 - 1200 MHz
Insertion Loss	**Maximum**
9 - 1200 MHz	3 dB
12 - 790 MHz	2 dB
20 - 150 MHz	1 dB

SM-1



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ET1-1-9 - SM-1	ET1-1-9 - SM-5
ET1-1-9 - SM-20	ET1-1-9 - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	-
Case Ground	-
Not Connected	-

ISO 9001
CERTIFIED

E-Series RF 1:1 Transformer
40 - 900 MHz ET1-1-2

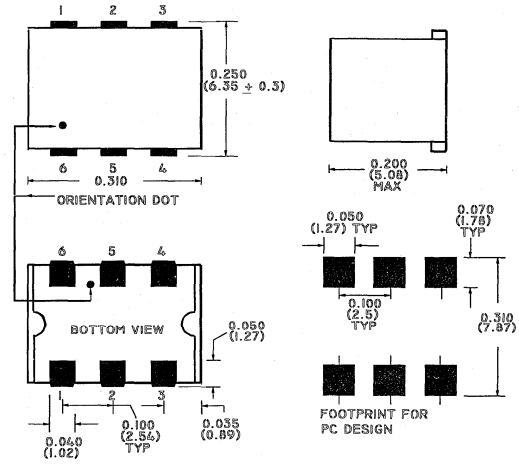
Features

* 1:1 Impedance Ratio

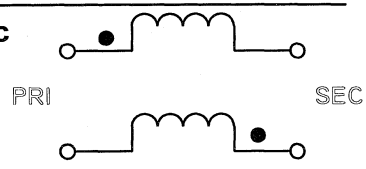
Specifications @ 25°C

Frequency Range	40 - 900 MHz
Insertion Loss	**Maximum**
40 - 900 MHz	1 dB

SM-1



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

CASE STYLE OUTLINE

This model is available in four case styles. Order as follows:

ET1-1-2 - SM-1	ET1-1-2 - SM-5
ET1-1-2 - SM-20	ET1-1-2 - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	1
Secondary	6
Secondary CT	-
Case Ground	-
Not Connected	2,5

ISO 9001
CERTIFIED

E-Series RF 1:1 Transformer
810 - 1900 MHz

ET1-1T-4

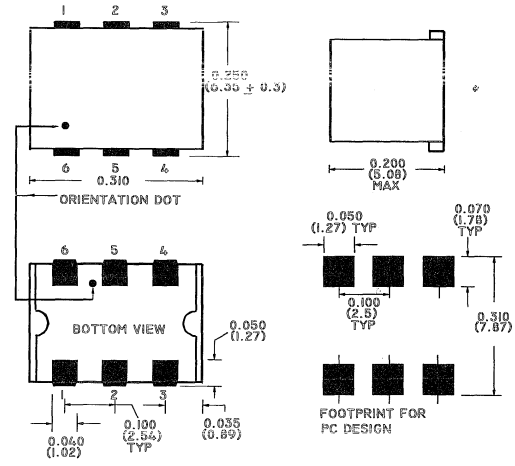
Features

* 1:1 Impedance Ratio
* CT on Secondary

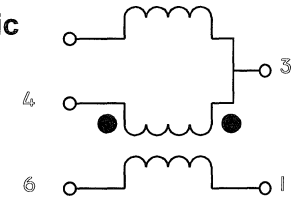
Specifications @ 25°C

Frequency Range	**810 - 1900 MHz**
Insertion Loss	**Maximum**
	2.5 dB
Amplitude Imbalance	**Maximum**
810 - 960 MHz	**0.8 dB**
1.4 - 1900 MHz	**1.5 dB**

SM-1



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	**250 mW**
DC Current	**30 mA**
Operating/Storage Temp.	**-20°C to +85°C**

CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ET1-1T-4- SM-1	**ET1-1T-4- SM-5**
ET1-1T-4- SM-20	**ET1-1T-4- SM-21**

Function	Pin No.
Primary dot	**4**
Primary	**6**
Primary CT	**-**
Secondary dot	**3**
Secondary	**1**
Secondary CT	**6**
Case Ground	**-**
Not Connected	**2,5**

Additional Specifications:

NB. Pin 6 to be grounded

ISO 9001
CERTIFIED

E-Series RF 1:1:2 Transformer
0.07 - 200 MHz ET2-613-1

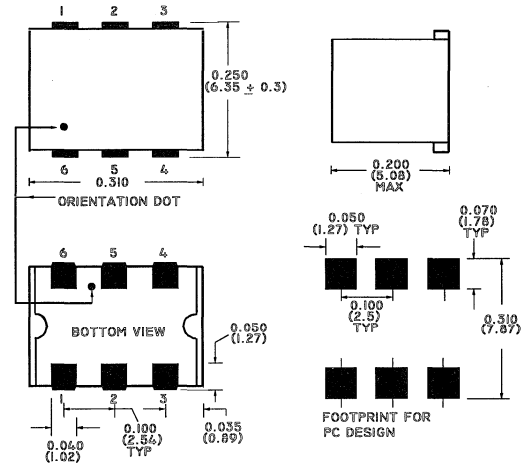
Features

* 1:1:2 Impedance Ratio

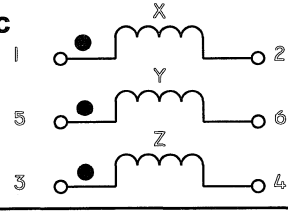
Specifications @ 25°C

Frequency Range	**0.07 - 200 MHz**
Insertion Loss	**Maximum**
0.07 - 200 MHz	3 dB
0.1 - 100 MHz	2 dB
0.5 - 50 MHz	1 dB

SM-1



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

CASE STYLE OUTLINE

This model is available in four case styles. Order as follows:

ET2-613-1 - SM-1	ET2-613-1 - SM-5
ET2-613-1 - SM-20	ET2-613-1 - SM-21

Function	Pin No.
Primary dot	Y : 5
Primary	Y : 6
Primary CT	-
Secondary dot	X:1 ,Z:3
Secondary	X:2 , Z:4
Secondary CT	-
Case Ground	-
Not Connected	-

ISO 9001
CERTIFIED

E-Series RF 13:1 Transformer
0.3 - 120 MHz

ET13-1T

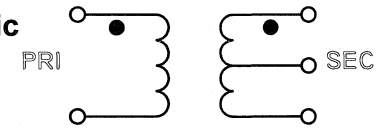
Features

* 13:1 Impedance Ratio
* CT on Secondary

Specifications @ 25°C

Frequency Range	0.3 - 120 MHz
Insertion Loss	**Maximum**
0.3 - 120 MHz	3 dB
0.7 - 80 MHz	2 dB
5 - 20 MHz	1 dB
Amplitude Imbalance	**Maximum**
5 - 20 MHz	0.1 dB
0.3 - 120 MHz	0.5 dB
Phase Imbalance	**Maximum**
5 - 20 MHz	1°
0.3 - 120 MHz	5°

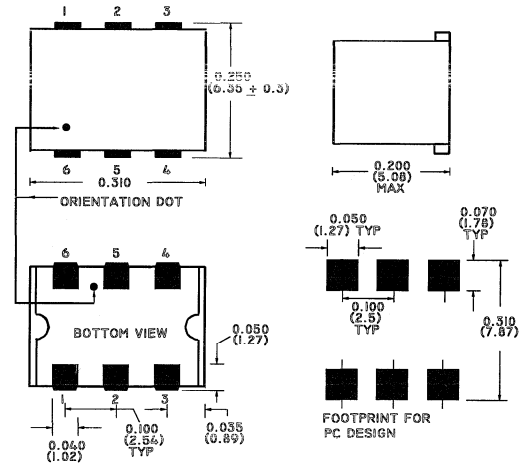
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-1



CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ET13-1T- SM-1	ET13-1T- SM-5
ET13-1T- SM-20	ET13-1T- SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

ISO 9001
CERTIFIED

E-Series RF 16:1 Transformer
0.03 - 75 MHz ET16-6T

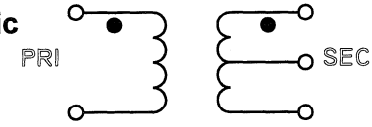
Features

* 16:1 Impedance Ratio
* CT on Secondary

Specifications @ 25°C

Frequency Range	**0.03 - 75 MHz**
Insertion Loss	**Maximum**
0.03 - 75 MHz	3 dB
0.06 - 30 MHz	2 dB
0.1 - 20 MHz	1 dB
Amplitude Imbalance	**Maximum**
0.1 - 20 MHz	0.1 dB
0.03 - 75 MHz	0.5 dB
Phase Imbalance	**Maximum**
0.1 - 20 MHz	1°
0.03 - 75 MHz	1°

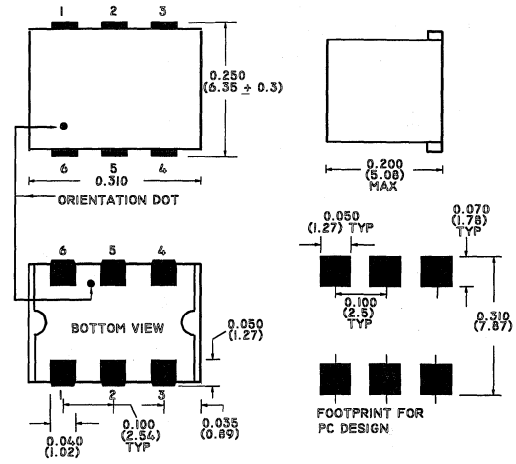
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-1



CASE STYLE OUTLINE

This model is available in four case styles. Order as follows:

ET16-6T - SM-1	**ET16-6T - SM-5**
ET16-6T - SM-20	**ET16-6T - SM-21**

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	5

ISO 9001
CERTIFIED

E-Series RF 16:1 Transformer
0.3 - 120 MHz

ET16-1

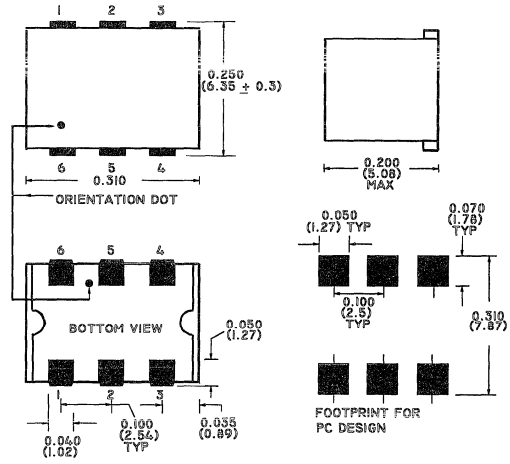
Features

* 16:1 Impedance Ratio

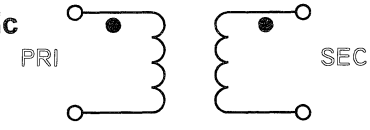
Specifications @ 25°C

Frequency Range	0.3 - 120 MHz
Insertion Loss	**Maximum**
0.3 - 120 MHz	3 dB
0.7 - 80 MHz	2 dB
5 - 20 MHz	1 dB

SM-1



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ET16-1 - SM-1	ET16-1 - SM-5
ET16-1 - SM-20	ET16-1 - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	-
Case Ground	-
Not Connected	2,5

ISO 9001
CERTIFIED

E-Series RF 2.5:1 Transformer
0.01 - 50 MHz ETT2.5-6

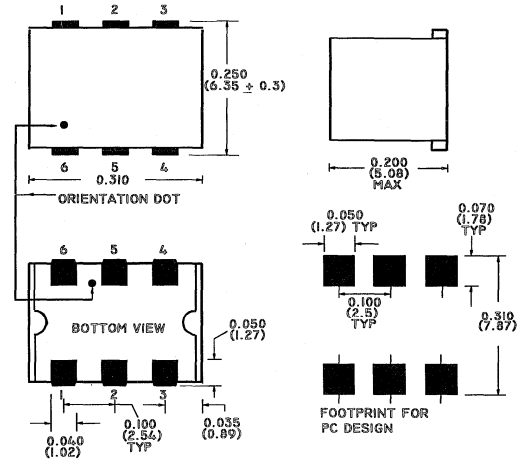
Features

* 2.5:1 Impedance Ratio
* CT on Secondary * CT on Primary

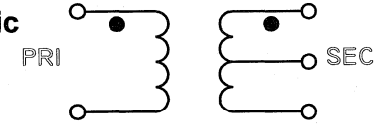
Specifications @ 25°C

Frequency Range	0.01 - 50 MHz
Insertion Loss	**Maximum**
0.01 - 50 MHz	3 dB
0.025 - 25 MHz	2 dB
0.05 - 10 MHz	1 dB

SM-1



Schematic



CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ETT2.5-6 - SM-1	ETT2.5-6 - SM-5
ETT2.5-6 - SM-20	ETT2.5-6 - SM-21

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	5
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

ISO 9001
CERTIFIED

E-Series RF 2.5:1 Transformer
0.01 - 100 MHz

ET2.5-6

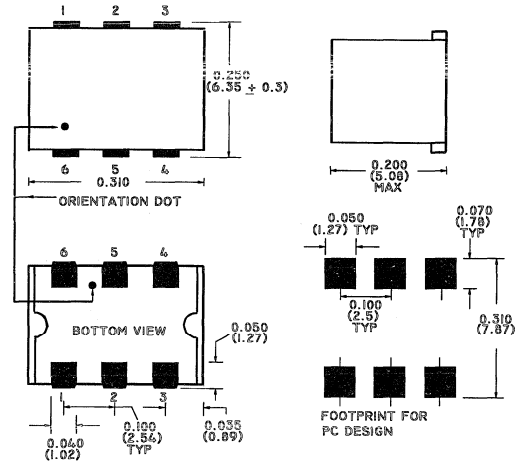
Features

* 2.5:1 Impedance Ratio

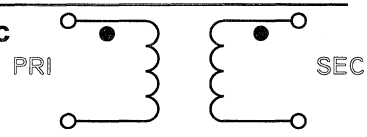
Specifications @ 25°C

Frequency Range	0.01 - 100 MHz
Insertion Loss	**Maximum**
0.01-100 MHz	3 dB
0.02-50 MHz	2 dB
0.05-20 MHz	1 dB

SM-1



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ET2.5-6 - SM-1	ET2.5-6 - SM-5
ET2.5-6 - SM-20	ET2.5-6 - SM-21

Function	Pin No.
Primary dot	6
Primary	4
Primary CT	-
Secondary dot	1
Secondary	3
Secondary CT	-
Case Ground	-
Not Connected	2,5

ISO 9001
CERTIFIED

E-Series RF 2.5:1 Transformer
0.01 - 100 MHz ET2.5-6T

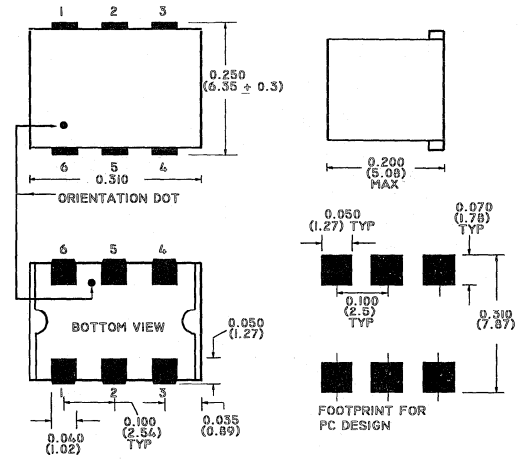
Features

* 2.5:1 Impedance Ratio
* CT on Secondary

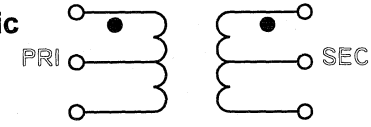
Specifications @ 25°C

Frequency Range	0.01 - 100 MHz
Insertion Loss	**Maximum**
0.01-100 MHz	3 dB
0.02-50 MHz	2 dB
0.5-20 MHz	1 dB

SM-1



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

CASE STYLE OUTLINE

This model is available in four case styles. Order as follows:

ET2.5-6T - SM-1	ET2.5-6T - SM-5
ET2.5-6T - SM-20	ET2.5-6T - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

ISO 9001
CERTIFIED

E-Series RF 2:1 Transformer
0.07 - 200 MHz

ET2-1T

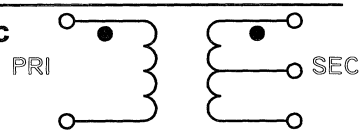
Features

* 2:1 Impedance Ratio
* CT on Secondary

Specifications @ 25°C

Frequency Range	**0.07 - 200 MHz**
Insertion Loss	**Maximum**
0.07 - 200 MHz	3 dB
0.1 - 100 MHz	2 dB
0.5 - 50 MHz	1 dB
Amplitude Imbalance	**Maximum**
0.5 - 50 MHz	0.1 dB
0.07 - 200 MHz	0.5 dB
Phase Imbalance	**Maximum**
0.5 - 50 MHz	1°
0.07 - 200 MHz	5°

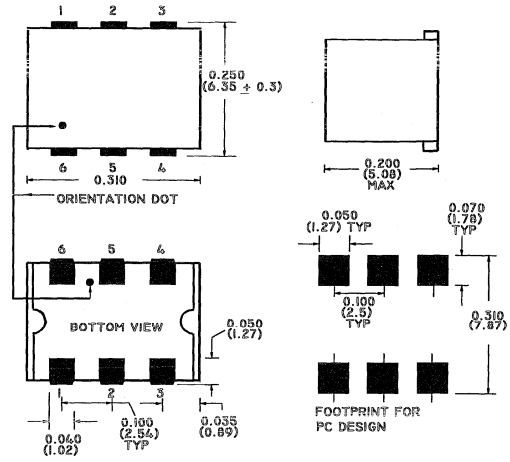
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-1



CASE STYLE OUTLINE

This model is available in four case styles. Order as follows:

ET2-1T - SM-1	**ET2-1T - SM-5**
ET2-1T - SM-20	**ET2-1T - SM-21**

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	5

ISO 9001
CERTIFIED

E-Series RF 2:1 Transformer
900 - 1000 MHz ET2-1T-1

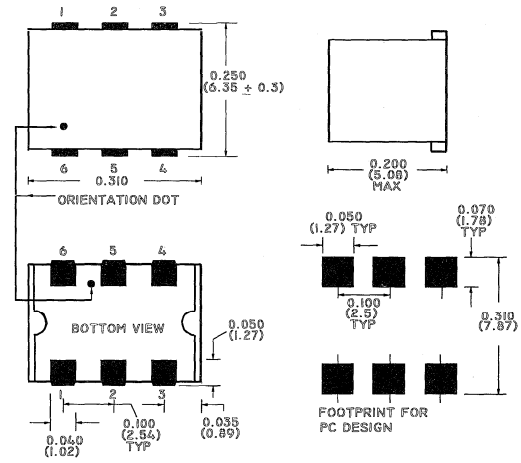
Features

* 2:1 Impedance Ratio

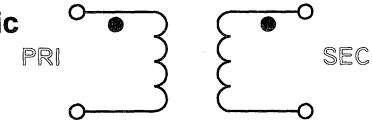
Specifications @ 25°C

Frequency Range	**900 - 1000 MHz**
Insertion Loss	**Maximum**
	4 dB
Amplitude Imbalance	**Maximum**
900 - 1000 MHz	**0.5 dB**

SM-1



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	**250 mW**
DC Current	**30 mA**
Operating/Storage Temp.	**-20°C to +85°C**

CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ET2-1T-1 - SM-1	**ET2-1T-1 - SM-5**
ET2-1T-1 - SM-20	**ET2-1T-1 - SM-21**

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	-
Case Ground	-
Not Connected	-

ISO 9001
CERTIFIED

E-Series RF 25:1 Transformer
78 MHz

ETC25-1T-1

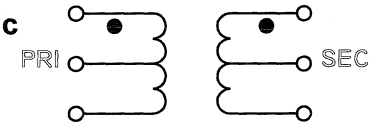
Features

* 25:1 Impedance Ratio
* CT on Primary

Specifications @ 25°C

Frequency Range	**78 MHz**
Insertion Loss	**Maximum**
	2.5 dB
Amplitude Imbalance	**Maximum**
78 MHz	**0.2 dB**
Phase Imbalance	**Maximum**
78 MHz	**2°**

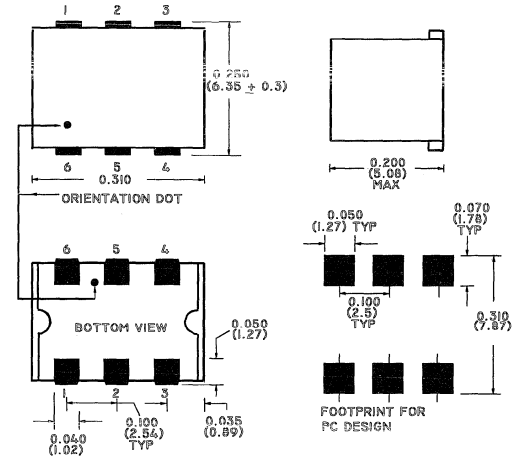
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-1



CASE STYLE OUTLINE

This model is available in four case styles. Order as follows:

ETC25-1T-1 - SM-1 **ETC25-1T-1 - SM-5**
ETC25-1T-1 - SM-20 **ETC25-1T-1 - SM-21**

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	3
Secondary dot	2
Secondary	1
Secondary CT	-
Case Ground	-
Not Connected	5

Additional Specifications:

Sec Inductance: Sec Dot -> Sec CT: 250 mH +/- 150 mH

ISO 9001
CERTIFIED

E-Series RF 3:1 Transformer
0.05 - 200 MHz ETT4-1

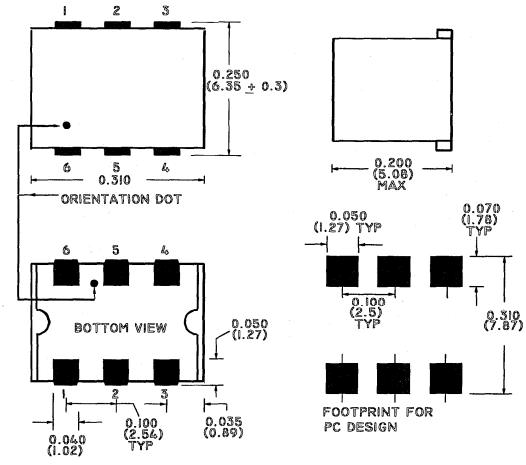
Features

* 3:1 Impedance Ratio
* CT on Secondary * CT on Primary

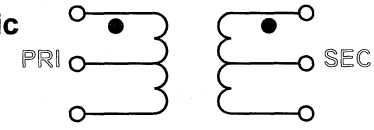
Specifications @ 25°C

Frequency Range	0.05 - 200 MHz
Insertion Loss	**Maximum**
0.05 - 200 MHz	3 dB
0.2 - 50 MHz	2 dB
1.0 - 30 MHz	1 dB

SM-1



Schematic



CASE STYLE OUTLINE

This model is available in four case styles. Order as follows:

ETT4-1 - SM-1	ETT4-1 - SM-5
ETT4-1 - SM-20	ETT4-1 - SM-21

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	5
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

ISO 9001
CERTIFIED

E-Series RF 3:1 Transformer
0.5 - 250 MHz

ET3-1T

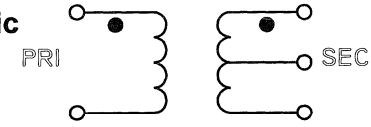
Features

* 3:1 Impedance Ratio
* CT on Secondary

Specifications @ 25°C

Frequency Range	0.5 - 250 MHz
Insertion Loss	**Maximum**
0.05 - 250 MHz	3 dB
0.1 - 200 MHz	2 dB
0.5 - 70 MHz	1 dB
Amplitude Imbalance	**Maximum**
0.5 - 70 MHz	0.1 dB
0.05 - 250 MHz	0.5 dB
Phase Imbalance	**Maximum**
0.5 - 70 MHz	1°
0.05 - 250 MHz	1°

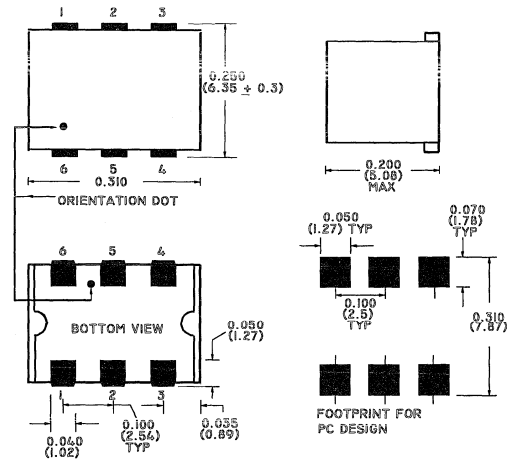
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-1



CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ET3-1T - SM-1	**ET3-1T - SM-5**
ET3-1T - SM-20	**ET3-1T - SM-21**

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	5

ISO 9001
CERTIFIED

E-Series RF 4:1 Transformer
0.02 - 200 MHz

ET4-6

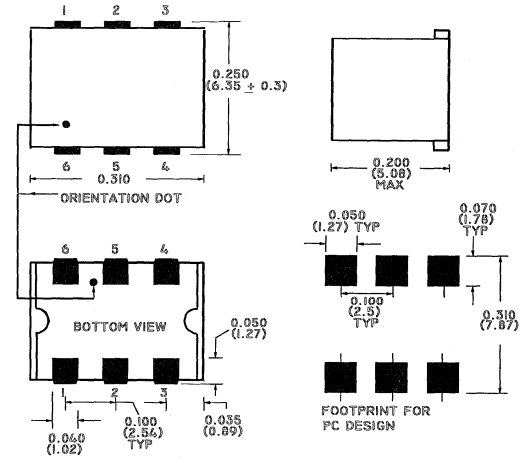
Features

* 4:1 Impedance Ratio

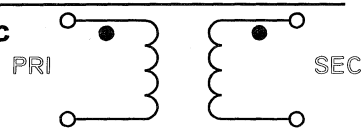
Specifications @ 25°C

Frequency Range	0.02 - 200 MHz
Insertion Loss	**Maximum**
0.02 - 200 MHz	3 dB
0.05 - 150 MHz	2 dB
0.1 - 100 MHz	1 dB

SM-1



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

CASE STYLE OUTLINE

This model is available in four case styles. Order as follows:

ET4-6 - SM-1	ET4-6 - SM-5
ET4-6 - SM-20	ET4-6 - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	-
Case Ground	-
Not Connected	2,5

ISO 9001
CERTIFIED

E-Series RF 4:1 Transformer
0.02 - 250 MHz

ET4-6T

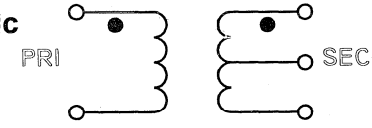
Features

* 4:1 Impedance Ratio
* CT on Secondary

Specifications @ 25°C

Frequency Range	0.02 - 250 MHz
Insertion Loss	**Maximum**
0.02 - 250 MHz	3 dB
0.05 - 150 MHz	2 dB
0.1 - 100 MHz	1 dB
Amplitude Imbalance	**Maximum**
0.1 - 100 MHz	0.1 dB
0.02 - 250 MHz	0.5 dB
Phase Imbalance	**Maximum**
0.1 - 100 MHz	1°
0.02 - 250 MHz	5°

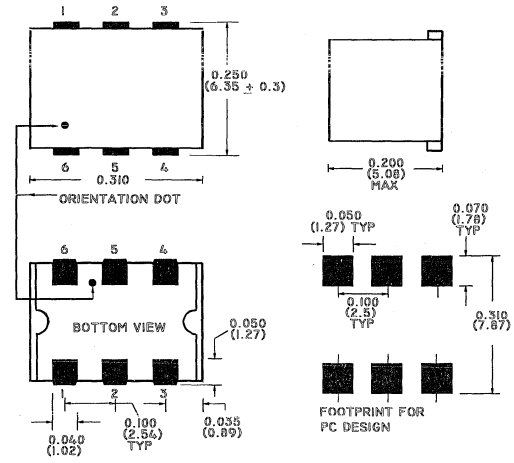
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-1



CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ET4-6T - SM-1	ET4-6T - SM-5
ET4-6T - SM-20	ET4-6T - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

ISO 9001
CERTIFIED

E-Series RF 4:1 Transformer
0.1 - 300 MHz

ETT4-1A

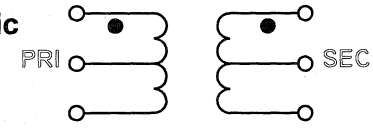
Features

* 4:1 Impedance Ratio
* CT on Secondary
* CT on Primary

Specifications @ 25°C

Frequency Range	0.1 - 300 MHz
Insertion Loss	**Maximum**
0.1 - 300 MHz	3 dB
0.2 - 250 MHz	2 dB
0.3 - 180 MHz	1 dB
Amplitude Imbalance	**Maximum**
0.3 - 180 MHz	0.1 dB
0.1 - 300 MHz	0.5 dB
Phase Imbalance	**Maximum**
0.3 - 180 MHz	1°
0.3 - 180 MHz	5°

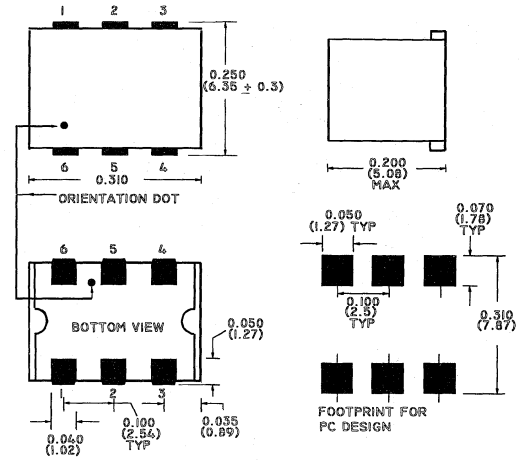
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-1



CASE STYLE OUTLINE

This model is available in four case styles. Order as follows:

ETT4-1A - SM-1	ETT4-1A - SM-5
ETT4-1A - SM-20	ETT4-1A - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	5
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series RF 4:1 Transformer
0.2 - 350 MHz

ET4-1

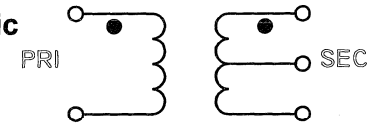
Features

* 4:1 Impedance Ratio
* CT on Secondary

Specifications @ 25°C

Frequency Range	0.2 - 350 MHz
Insertion Loss	**Maximum**
0.2 - 350 MHz	3 dB
0.35 - 300 MHz	2 dB
2.0 - 100 MHz	1 dB
Amplitude Imbalance	**Maximum**
2 - 100 MHz	0.1 dB
0.2 - 350 MHz	1.0 dB
Phase Imbalance	**Maximum**
2-100 MHz	1°
0.2-350 MHz	5°

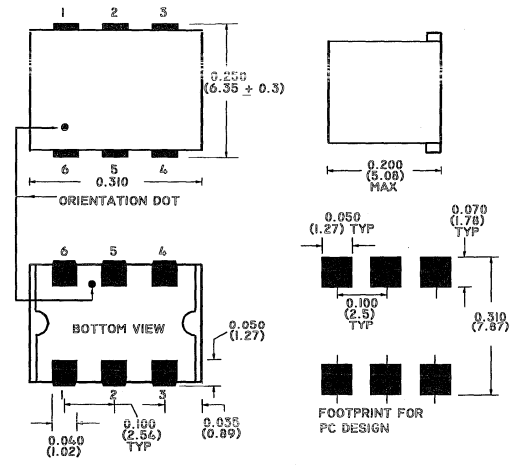
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-40°C to +80°C

SM-1



CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ET4-1 - SM-1	ET4-1 - SM-5
ET4-1 - SM-20	ET4-1 - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	5

ISO 9001
CERTIFIED

E-Series RF 4:1 Transformer
10 - 900 MHz ET4-1T-1

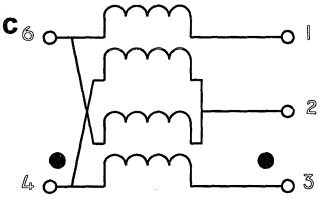
Features

* 4:1 Impedance Ratio
* CT on Secondary

Specifications @ 25°C

Frequency Range	10 - 900 MHz
Insertion Loss	**Maximum**
10 - 900 MHz	2 dB
10 - 500 MHz	1 dB
Amplitude Imbalance	**Maximum**
10 - 500 MHz	0.3 dB
10 - 900 MHz	0.5 dB
Phase Imbalance	**Maximum**
10 - 900 MHz	5°

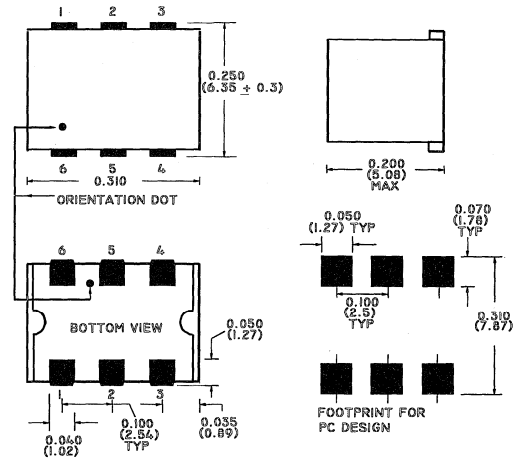
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-1



CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ET4-1T-1 - SM-1	ET4-1T-1 - SM-5
ET4-1T-1 - SM-20	ET4-1T-1 - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	5

ISO 9001
CERTIFIED

E-Series RF 4:1 Transformer
400 - 1000 MHz

ET4-1T-2

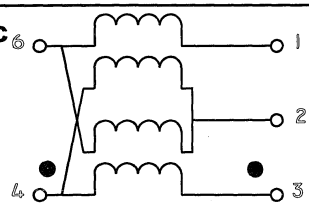
Features

* 4:1 Impedance Ratio
* CT on Secondary

Specifications @ 25°C

Frequency Range	400 - 1000 MHz
Insertion Loss	**Maximum**
400 - 1000 MHz	2 dB
Amplitude Imbalance	**Maximum**
400 - 1000 MHz	0.5 dB
Phase Imbalance	**Maximum**
400 - 1000 MHz	5°

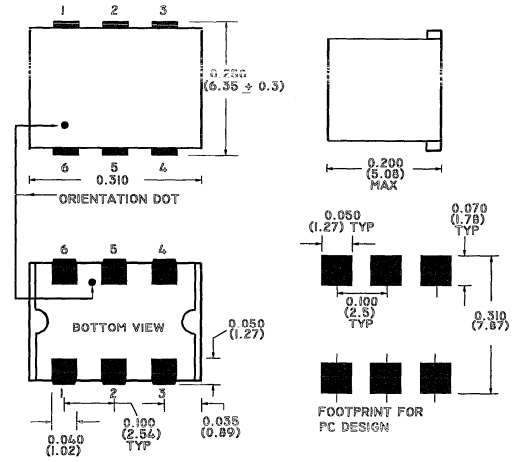
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-1



CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ET4-1T-2 - SM-1	ET4-1T-2 - SM-5
ET4-1T-2 - SM-20	ET4-1T-2 - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	5

ISO 9001
CERTIFIED

E-Series RF 5:1 Transformer
0.03 - 300 MHz ET5-1T

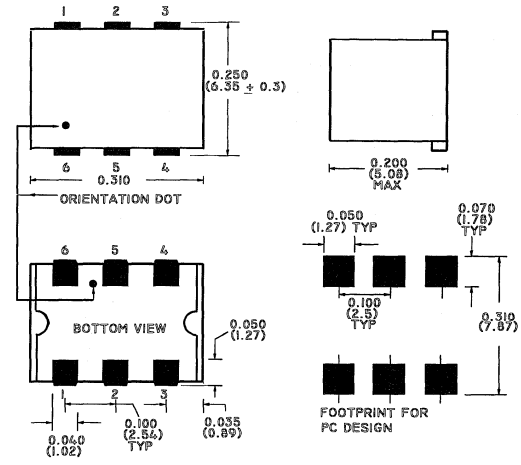
Features

* 5:1 Impedance Ratio
* CT on Secondary

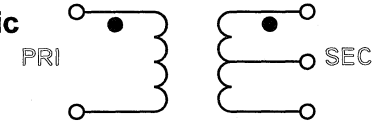
Specifications @ 25°C

Frequency Range	0.03 - 300 MHz
Insertion Loss	**Maximum**
0.03 - 300 MHz	3 dB
0.6 - 200 MHz	2 dB
5 - 100 MHz	1 dB

SM-1



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

CASE STYLE OUTLINE

This model is available in four case styles. Order as follows:

ET5-1T - SM-1	ET5-1T - SM-5
ET5-1T - SM-20	ET5-1T - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	5

ISO 9001
CERTIFIED

E-Series RF 8:1 Transformer
0.03 - 140 MHz

ET8-1T

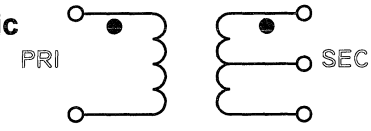
Features

* 8:1 Impedance Ratio
* CT on Secondary

Specifications @ 25°C

Frequency Range	0.03 - 140 MHz
Insertion Loss	**Maximum**
0.03 - 140 MHz	3 dB
0.1 - 90 MHz	2 dB
1.0 - 60 MHz	1 dB
Amplitude Imbalance	**Maximum**
1 - 60 MHz	0.1 dB
0.03 - 140 MHz	0.5 dB
Phase Imbalance	**Maximum**
1 - 60 MHz	1°
0.03 - 140 MHz	1°

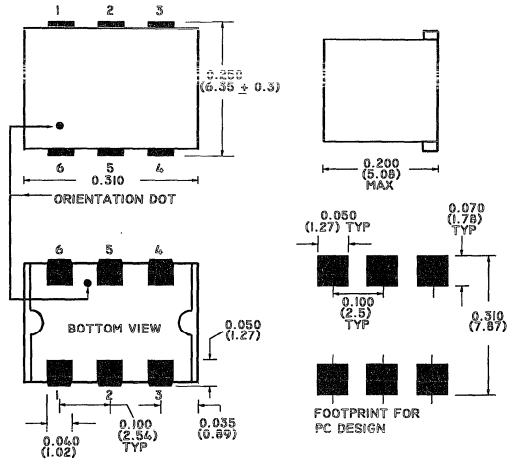
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-1



CASE STYLE OUTLINE

This model is available in four case styles. Order as follows:

ET8-1T - SM-1	ET8-1T - SM-5
ET8-1T - SM-20	ET8-1T - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	5

ISO 9001
CERTIFIED

E-Series RF 9:1 Transformer
0.15 - 200 MHz

ET9-1

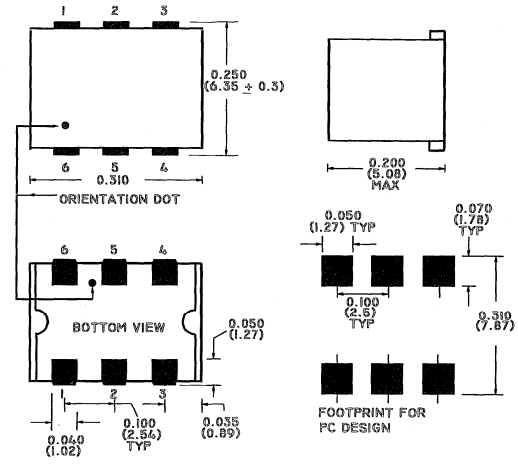
Features

* 9:1 Impedance Ratio

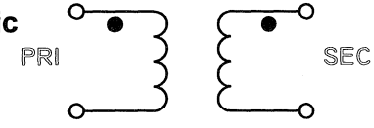
Specifications @ 25°C

Frequency Range	0.15 - 200 MHz
Insertion Loss	**Maximum**
0.15 - 200 MHz	3 dB
0.3 - 150 MHz	2 dB
2.0 - 40 MHz	1 dB

SM-1



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

CASE STYLE OUTLINE

This model is available in four case styles.
Order as follows:

ET9-1 - SM-1	ET9-1 - SM-5
ET9-1 - SM-20	ET9-1 - SM-21

Function	Pin No.
Primary dot	4
Primary	6
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	-
Case Ground	-
Not Connected	-

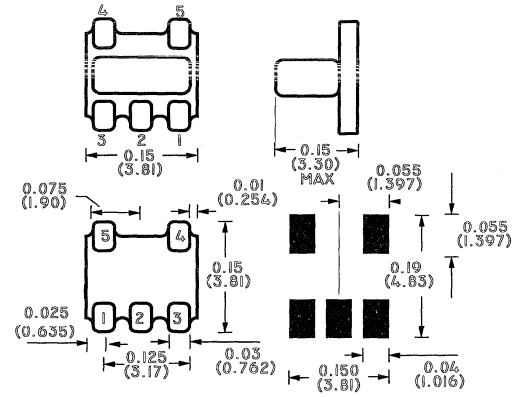
ISO 9001
CERTIFIED

E-Series RF 0.0625:1 Transformer
50 MHz ETC16-1-2

Features

* 0.0625:1 Impedance Ratio

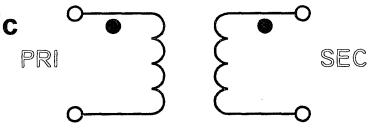
SM-22



Specifications @ 25°C

Frequency Range	50 MHz
Insertion Loss	**Maximum**
50 MHz	1 dB

Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Function	Pin No.
Primary dot	5
Primary	4
Primary CT	-
Secondary dot	1
Secondary	3
Secondary CT	-
Case Ground	-
Not Connected	-

ISO 9001
CERTIFIED

E-Series RF 1:1 Transformer
0.05 - 3 MHz ETC1-1T-2

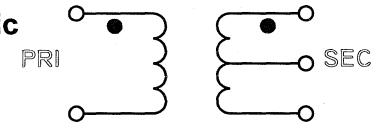
Features

* 1:1 Impedance Ratio
* CT on Secondary

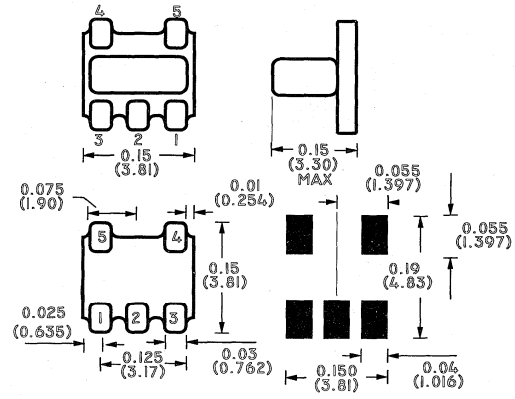
Specifications @ 25°C

Frequency Range	**0.05 - 3 MHz**
Insertion Loss	**Maximum**
0.05 - 3 MHz	2 dB
0.05 - 3 MHz	1 dB
Amplitude Imbalance	**Maximum**
0.2 - 3 MHz	0.1 dB
Phase Imbalance	**Maximum**
0.2 - 3 MHz	1°

Schematic



SM-22



Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series RF 1:1 Transformer

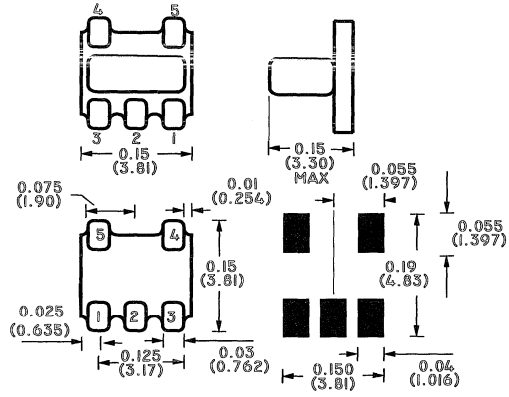
0.3 - 200 MHz

ETC1-1T

Features

* 1:1 Impedance Ratio
* CT on Secondary

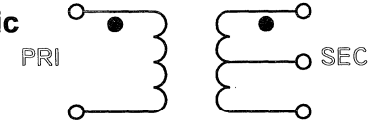
SM-22



Specifications @ 25°C

Frequency Range	0.3 - 200 MHz
Insertion Loss	**Maximum**
0.3 - 200 MHz	3 dB
0.3 - 150 MHz	2 dB
0.3 - 50 MHz	1 dB
Amplitude Imbalance	**Maximum**
0.3 - 50 MHz	0.1 dB
0.3 - 200 MHz	0.5 dB
Phase Imbalance	**Maximum**
0.3 - 50 MHz	1°
0.3 - 200 MHz	5°

Schematic



Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Specifications Subject to Change Without Notice S 0181 C

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series RF 1:1 Transformer
4.5 - 3000 MHz ETC1-1-13

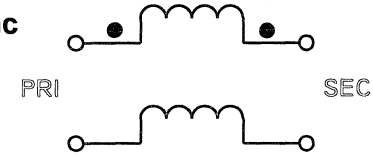
Features

* 1:1 Impedance Ratio

Specifications @ 25°C

Frequency Range	4.5 - 3000 MHz
Insertion Loss	**Maximum**
4.5 - 3000 MHz	3 dB
4.5 - 2000 MHz	2 dB
4.5 - 1000 MHz	1 dB
Amplitude Imbalance	**Maximum**
4.5 - 1000 MHz	1 dB
Phase Imbalance	**Maximum**
4.5 - 1000 MHz	20°

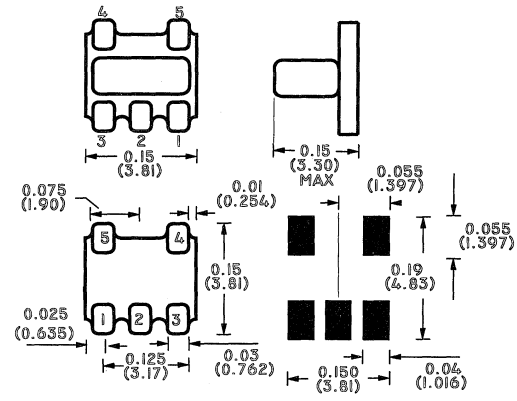
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-22



Function	Pin No.
Primary dot	5
Primary	4
Primary CT	-
Secondary dot	1
Secondary	3
Secondary CT	-
Case Ground	-
Not Connected	2

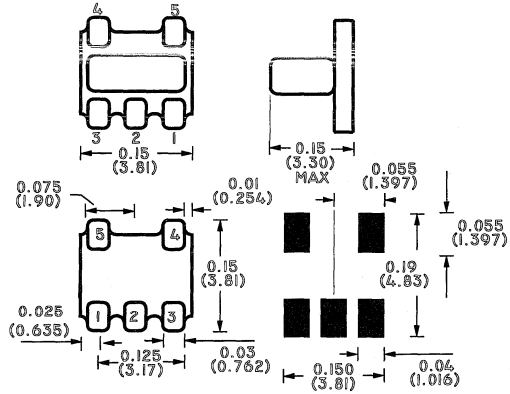
ISO 9001
CERTIFIED

E-Series RF 1:1 Transformer
45 MHz ETC1-1-3

Features

* 1:1 Impedance Ratio

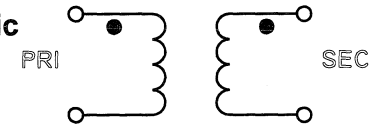
SM-22



Specifications @ 25°C

Frequency Range	45 MHz
Insertion Loss	**Maximum**
45 MHz	1 dB

Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	-
Case Ground	-
Not Connected	2

ISO 9001
CERTIFIED

E-Series RF 1:1 Transformer
52 - 88 MHz ETC1-1T-4

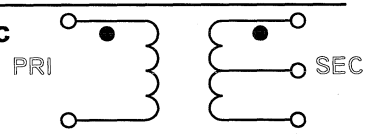
Features

* 1:1 Impedance Ratio
* CT on Secondary

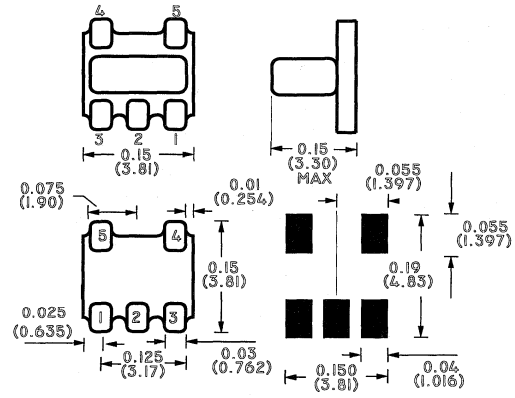
Specifications @ 25°C

Frequency Range	**52 - 88 MHz**
Insertion Loss	**Maximum**
	1.5 dB
Amplitude Imbalance	**Maximum**
52 - 88 MHz	**0.2 dB**
280 MHz	**0.6 dB**
Phase Imbalance	**Maximum**
52 - 88 MHz	**2°**
280 MHz	**8°**

Schematic



SM-22



Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Additional Specifications:

Frequency Range: Also @ 280MHz Insertion Loss: 0.6dB Typ @ 52 - 88MHz, 1.2dB Typ @ 280MHz
Maximum Amplitude ImBalance: 0.1dB Typ over 1dB Freq Range, 0.35dB Typ @ 280MHz
Maximum Phase ImBalance: 1 deg Typ over 1dB Freq Range, 5 deg Typ @ 280MHz

Specifications Subject to Change Without Notice S 0816 B

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DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

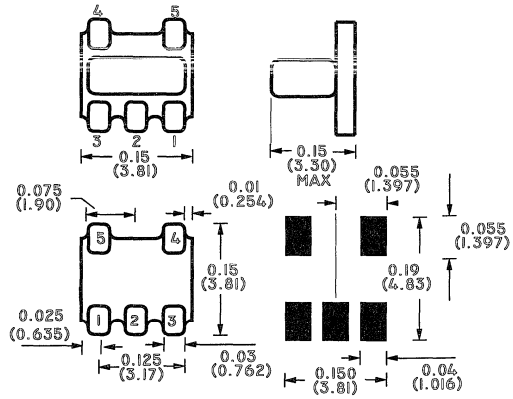
E-Series RF 1:1 Transformer
300 - 350 MHz

ETC1-1T-3

Features

* 1:1 Impedance Ratio
* CT on Secondary

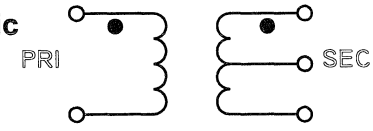
SM-22



Specifications @ 25°C

Frequency Range	300 - 350 MHz
Insertion Loss	**Maximum**
300 - 350 MHz	2 dB
Amplitude Imbalance	**Maximum**
300 - 350 MHz	0.5 dB
Phase Imbalance	**Maximum**
300 - 350 MHz	5°

Schematic



Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Specifications Subject to Change Without Notice S 0793 B

ISO 9001
CERTIFIED

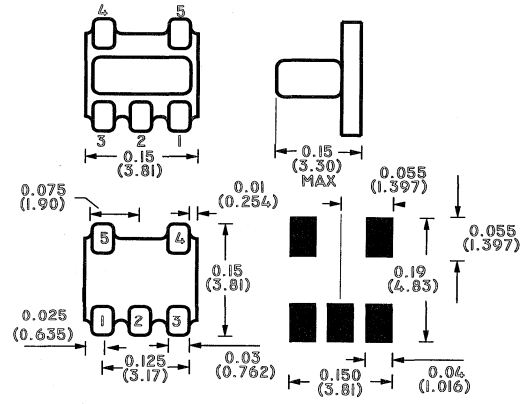
E-Series RF 1:1 Transformer
350 - 1500 MHz

ETC1-15

Features

* 1:1 Impedance Ratio

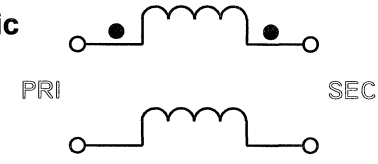
SM-22



Specifications @ 25°C

Frequency Range	**350 - 1500 MHz**
Insertion Loss	**Maximum**
350-1500 MHz	**2 dB**
750-1250 MHz	**1 dB**
Amplitude Imbalance	**Maximum**
750-1250 MHz	**1 dB**
350-1500 MHz	**2 dB**
Phase Imbalance	**Maximum**
350-1500 MHz	**15°**

Schematic



Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	-
Case Ground	-
Not Connected	2

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Specifications Subject to Change Without Notice S0903 A

ISO 9001
CERTIFIED

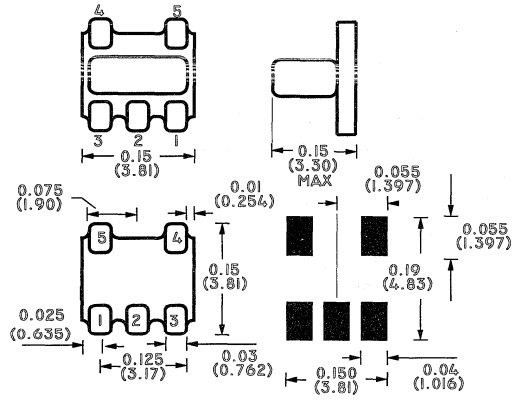
E-Series RF 1:1 Transformer
760 - 960 MHz

ETC1-1-6

Features

* 1:1 Impedance Ratio

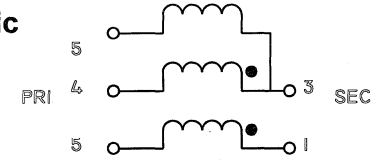
SM-22



Specifications @ 25°C

Frequency Range	**760 - 960 MHz**
Insertion Loss	**Maximum**
900 MHz	**2 dB**
Amplitude Imbalance	**Maximum**
760 - 960 MHz	**1 dB**
Phase Imbalance	**Maximum**
760 - 960 MHz	**20°**

Schematic



Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	-
Case Ground	-
Not Connected	2

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	45 mA
Operating/Storage Temp.	-20°C to +85°C

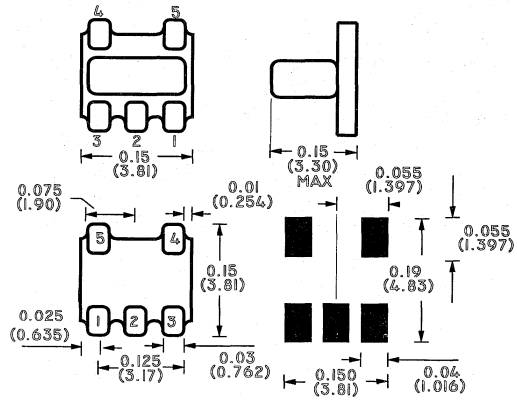
ISO 9001
CERTIFIED

E-Series RF 1:1 Transformer
890 - 960 MHz ETC1-1-4

Features

* 1:1 Impedance Ratio

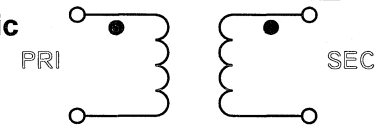
SM-22



Specifications @ 25°C

Frequency Range	890 - 960 MHz
Insertion Loss	**Maximum**
890 - 960 MHz	2 dB
Amplitude Imbalance	**Maximum**
890 - 960 MHz	1 dB
Phase Imbalance	**Maximum**
890 - 960 MHz	10°

Schematic



Function	Pin No.
Primary dot	2
Primary	1
Primary CT	-
Secondary dot	3
Secondary	5
Secondary CT	-
Case Ground	-
Not Connected	4

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Specifications Subject to Change Without Notice S 0729 B

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ISO 9001
CERTIFIED

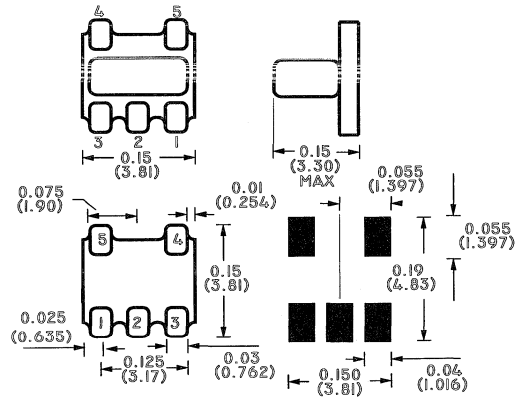
E-Series RF 1:1 Transformer
1710 - 1880 MHz

ETC1-1-2

Features

* 1:1 Impedance Ratio

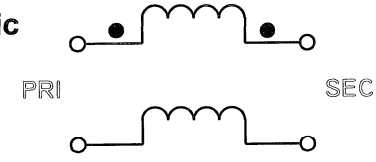
SM-22



Specifications @ 25°C

Frequency Range	**1710 - 1880 MHz**
Insertion Loss	**Maximum**
1710 - 1880 MHz	**2 dB**
Amplitude Imbalance	**Maximum**
1710 - 1880 MHz	**2 dB**
Phase Imbalance	**Maximum**
1710 - 1880 MHz	**5°**

Schematic



Function	Pin No.
Primary dot	5
Primary	3
Primary CT	-
Secondary dot	2
Secondary	1
Secondary CT	-
Case Ground	-
Not Connected	4

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series RF 1:1 Transformer
1710 - 1910 MHz ETC1-1-10

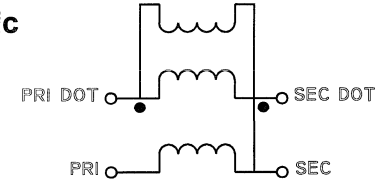
Features

* 1:1 Impedance Ratio
#Name?

Specifications @ 25°C

Frequency Range	1710 - 1910 MHz
Insertion Loss	**Maximum**
1710 - 1910 MHz	3 dB
1710 - 1910 MHz	2 dB
Amplitude Imbalance	**Maximum**
1710 - 1910 MHz	2 dB
Phase Imbalance	**Maximum**
1710 - 1910 MHz	10°

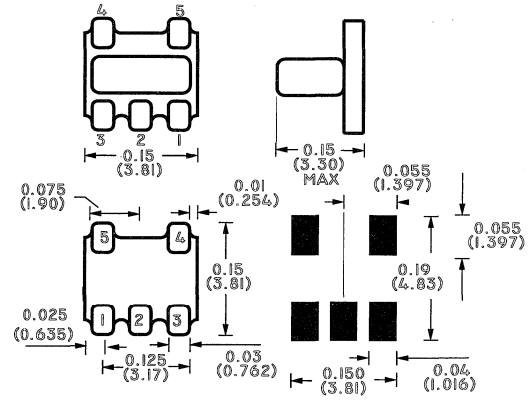
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	0°C to +70°C

SM-22



Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	#Name?
Secondary CT	#Name?
Case Ground	-
Not Connected	2

ISO 9001
CERTIFIED

E-Series RF 16:1 Transformer
110.592 MHz ETC16-1TX1

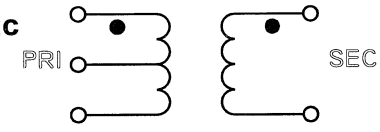
Features

* 16:1 Impedance Ratio
* CT on Primary

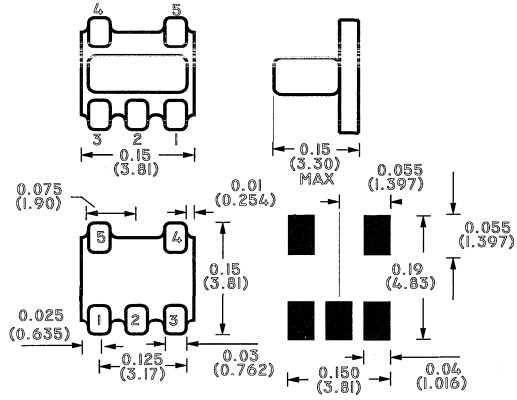
Specifications @ 25°C

Frequency Range	**110.592 MHz**
Insertion Loss	**Maximum**
	2.5 dB
Amplitude Imbalance	**Maximum**
110.592 MHz	**0.1 dB**
Phase Imbalance	**Maximum**
110.592 MHz	**2°**

Schematic



SM-22



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	**250 mW**
DC Current	**30 mA**
Operating/Storage Temp.	**-20°C to +85°C**

Function	Pin No.
Primary dot	**1**
Primary	**3**
Primary CT	**2**
Secondary dot	**5**
Secondary	**4**
Secondary CT	**-**
Case Ground	**-**
Not Connected	**-**

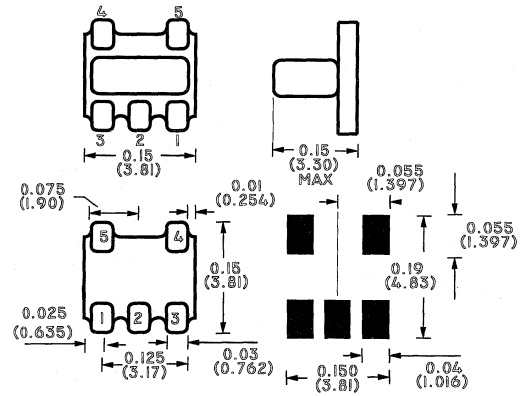
ISO 9001
CERTIFIED

E-Series RF 2:1 Transformer
65 MHz ETC2-1-1

Features

* 2:1 Impedance Ratio

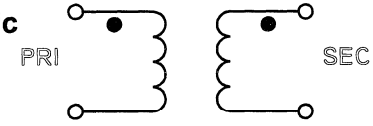
SM-22



Specifications @ 25°C

Frequency Range	**65 MHz**
Insertion Loss	**Maximum**
	0.8 dB

Schematic



Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	-
Case Ground	-
Not Connected	2

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Additional Specifications:

Insertion Loss: Typical 0.5dB @ 65MHz

ISO 9001
CERTIFIED

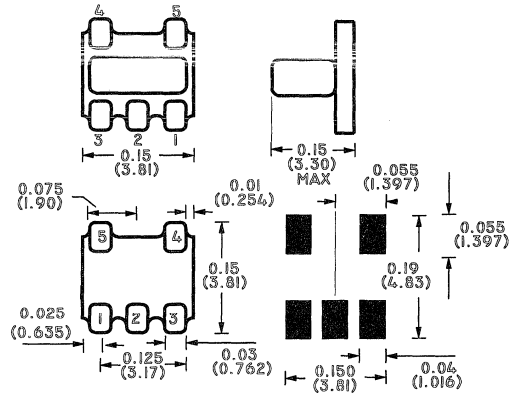
E-Series RF 3:1 Transformer
0.15 - 250 MHz

ETC3-1T

Features

* 3:1 Impedance Ratio
* CT on Secondary

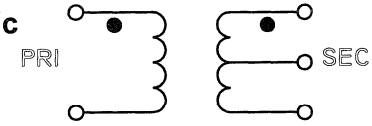
SM-22



Specifications @ 25°C

Frequency Range	0.15 - 250 MHz
Insertion Loss	**Maximum**
0.15 - 0.3 MHz	3 dB
0.3 - 0.5 MHz	2 dB
0.5 - 200 MHz	1 dB
Amplitude Imbalance	**Maximum**
0.5 - 250 MHz	0.1 dB
0.15 - 250 MHz	0.5 dB
Phase Imbalance	**Maximum**
0.5 - 250 MHz	1°
0.15 - 250 MHz	5°

Schematic



Function	Pin No.
Primary dot	5
Primary	4
Primary CT	-
Secondary dot	1
Secondary	3
Secondary CT	2
Case Ground	-
Not Connected	-

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Specifications Subject to Change Without Notice S 0631 C

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ISO 9001
CERTIFIED

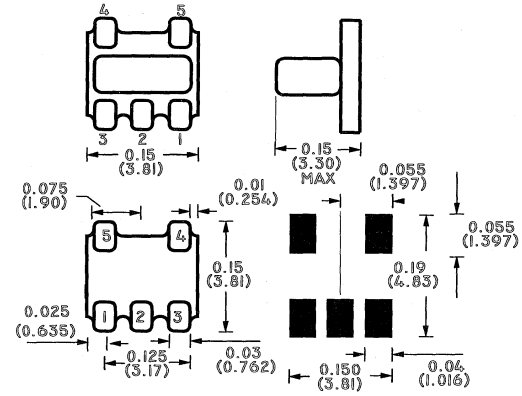
E-Series RF 3:1 Transformer
10 - 750 MHz

ETC3-1

Features

* 3:1 Impedance Ratio

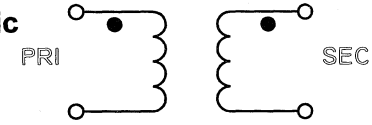
SM-22



Specifications @ 25°C

Frequency Range	10 - 750 MHz
Insertion Loss	**Maximum**
10-750 MHz	3 dB
10-500 MHz	2 dB
10-100 MHz	1 dB

Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	-
Case Ground	-
Not Connected	2

ISO 9001
CERTIFIED

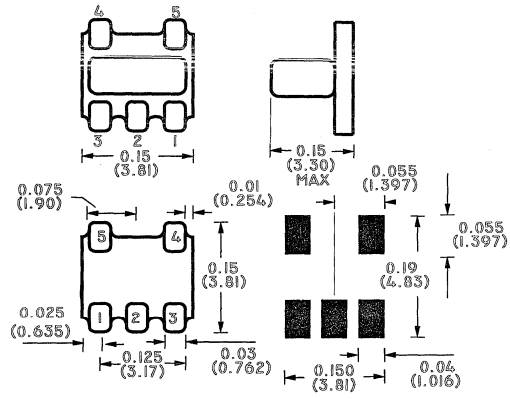
E-Series RF 3:1 Transformer
200 - 400 MHz

ET3-1T-3

Features

* 3:1 Impedance Ratio

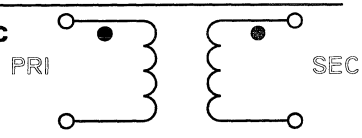
SM-22



Specifications @ 25°C

Frequency Range	200 - 400 MHz
Insertion Loss	**Maximum**
200 - 400 MHz	2 dB

Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Function	Pin No.
Primary dot	1
Primary	3
Primary CT	-
Secondary dot	5
Secondary	4
Secondary CT	-
Case Ground	-
Not Connected	2

ISO 9001
CERTIFIED

E-Series RF 3:1 Transformer
420 MHz ETC3-1T-1

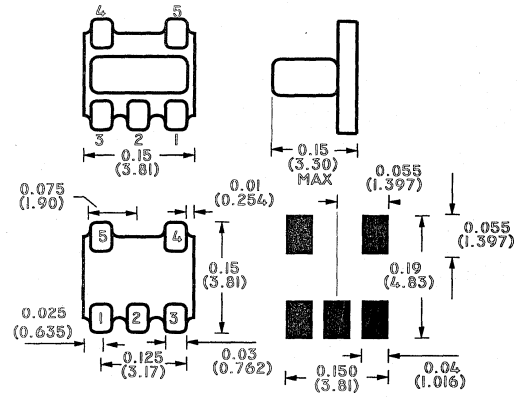
Features

* 3:1 Impedance Ratio
* CT on Primary

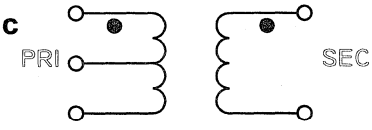
Specifications @ 25°C

Frequency Range	420 MHz
Insertion Loss	**Maximum**
420 MHz	2 dB

SM-22



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Function	Pin No.
Primary dot	3
Primary	1
Primary CT	2
Secondary dot	4
Secondary	5
Secondary CT	-
Case Ground	-
Not Connected	-

Specifications Subject to Change Without Notice S 0658 B

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DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series RF 4:1 Transformer
0.5 - 600 MHz

ETC4-1T-3

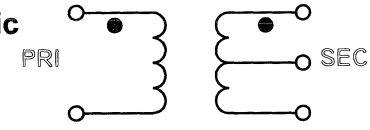
Features

* 4:1 Impedance Ratio
* CT on Secondary

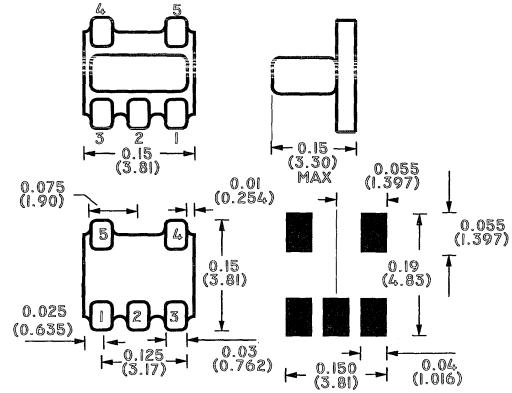
Specifications @ 25°C

Frequency Range	0.5 - 600 MHz
Insertion Loss	**Maximum**
0.5 - 600 MHz	3 dB
1.5 - 500 MHz	2 dB
7 - 100 MHz	1 dB
Amplitude Imbalance	**Maximum**
7 - 100 MHz	0.1 dB
0.5 - 600 MHz	1 dB
Phase Imbalance	**Maximum**
7 - 100 MHz	1°
0.5 - 600 MHz	15°

Schematic



SM-22



Function	Pin No.
Primary dot	5
Primary	4
Primary CT	-
Secondary dot	1
Secondary	3
Secondary CT	2
Case Ground	-
Not Connected	-

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Additional Specifications:

Maximum Phase ImBalance: 5 deg @ 1.5 - 500 MHz

E-Series RF 4:1 Transformer
1 - 350 MHz ETC4-1

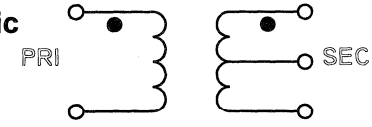
Features

* 4:1 Impedance Ratio
* CT on Secondary

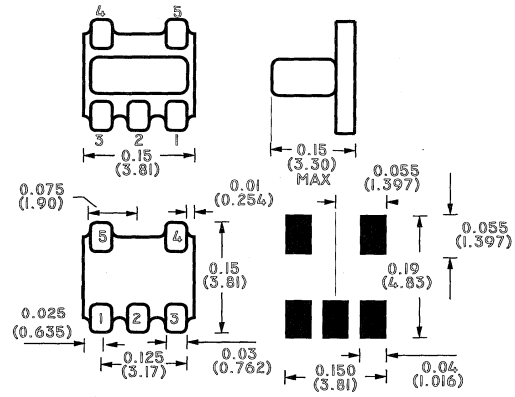
Specifications @ 25°C

Frequency Range	1 - 350 MHz
Insertion Loss	**Maximum**
1.0 - 350 MHz	3 dB
2.0 - 300 MHz	2 dB
5.0 - 100 MHz	1 dB
Amplitude Imbalance	**Maximum**
5 - 100 MHz	0.1 dB
1 - 350 MHz	0.5 dB
Phase Imbalance	**Maximum**
5 - 100 MHz	1°
1 - 350 MHz	5°

Schematic



SM-22



Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series RF 4:1 Transformer
2 - 800 MHz

ETC4-1-2

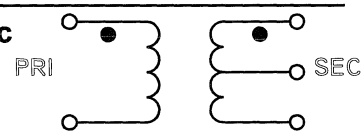
Features

* 4:1 Impedance Ratio
* CT on Secondary

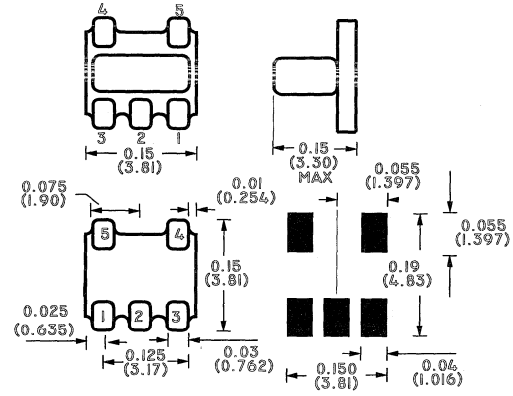
Specifications @ 25°C

Frequency Range	2 - 800 MHz
Insertion Loss	**Maximum**
2.0 - 800 MHz	3 dB
5.0 - 600 MHz	2 dB
10.0 - 100 MHz	1 dB
Amplitude Imbalance	**Maximum**
10 - 100 MHz	0.25 dB
2 - 800 MHz	1 dB
Phase Imbalance	**Maximum**
10 - 100 MHz	2°
2 - 800 MHz	7°

Schematic



SM-22



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

Specifications Subject to Change Without Notice S 0258 H

M/A-COM Inc. Cork, Ireland Tel: 353-21-311 266 Fax: 353-21-311 890
North America Tel: 1-800-366-266 * Europe Tel: +44 (1344) 869 595 * Asia / Pacific Tel: +81 (03) 3226-1671

See Page 7-26 For Local Office Details

DISTRIBUTOR Stock ITEM

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E-Series RF 4:1 Transformer
6 - 1000 MHz

ETC4-1T-7

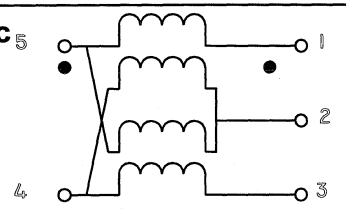
Features

* 4:1 Impedance Ratio
* CT on Secondary

Specifications @ 25°C

Frequency Range	6 - 1000 MHz
Insertion Loss	**Maximum**
6 - 1000 MHz	3 dB
6 - 600 MHz	2 dB
Amplitude Imbalance	**Maximum**
6 - 1000 MHz	1 dB
Phase Imbalance	**Maximum**
6 - 1000 MHz	10°

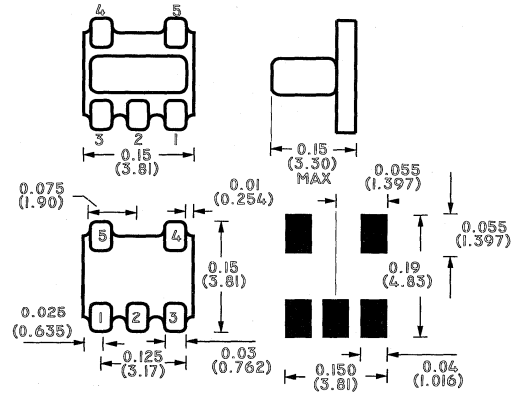
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-22



Function	Pin No.
Primary dot	5
Primary	4
Primary CT	-
Secondary dot	1
Secondary	3
Secondary CT	2
Case Ground	-
Not Connected	-

Specifications Subject to Change Without Notice S 0804 B

ISO 9001
CERTIFIED

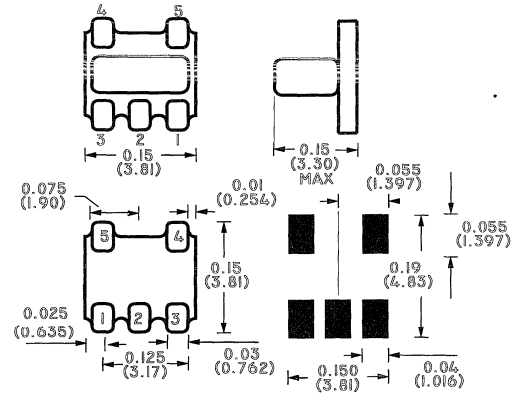
E-Series RF 4:1 Transformer
40 MHz

ETC4-1-3

Features

* 4:1 Impedance Ratio
* CT on Secondary

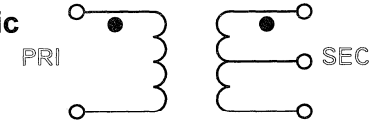
SM-22



Specifications @ 25°C

Frequency Range	**40 MHz**
Insertion Loss	**Maximum**
	0.75 dB
Amplitude Imbalance	**Maximum**
40 MHz	**0.25 dB**
Phase Imbalance	**Maximum**
40 MHz	**1°**

Schematic



Function	Pin No.
Primary dot	5
Primary	4
Primary CT	-
Secondary dot	1
Secondary	3
Secondary CT	2
Case Ground	-
Not Connected	-

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

DISTRIBUTOR Stock ITEM

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E-Series RF 4:1 Transformer
40 - 1000 MHz

ETC4-1T-75

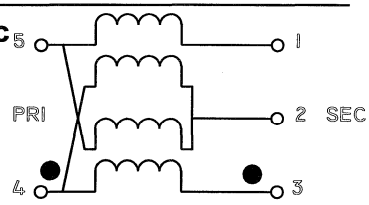
Features

* 4:1 Impedance Ratio
* CT on Secondary

Specifications @ 25°C

Frequency Range	40 - 1000 MHz
Insertion Loss	**Maximum**
40 - 1000 MHz	3 dB
Amplitude Imbalance	**Maximum**
40 - 1000 MHz	1 dB
Phase Imbalance	**Maximum**
40 - 1000 MHz	20°

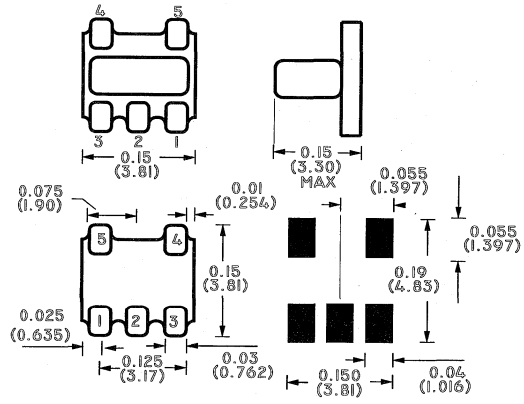
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-22



Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

ISO 9001
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E-Series RF 4:1 Transformer
50 - 750 MHz

ETC4-1-75

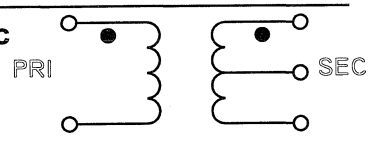
Features

* 4:1 Impedance Ratio
* CT on Secondary

Specifications @ 25°C

Frequency Range	50 - 750 MHz
Insertion Loss	**Maximum**
50 - 750 MHz	3 dB
50 - 400 MHz	2 dB
Amplitude Imbalance	**Maximum**
50 - 750 MHz	1 dB
Phase Imbalance	**Maximum**
50 - 750 MHz	20°

Schematic



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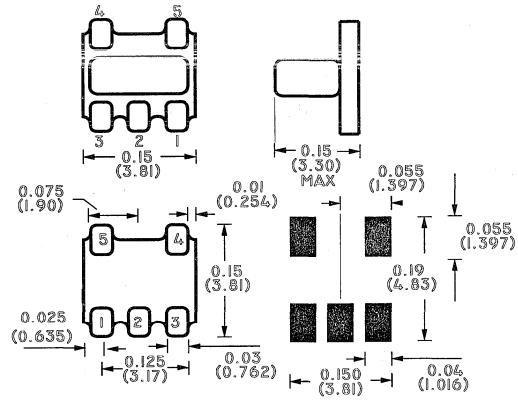

Function	Pin No.
Primary dot	5
Primary	4
Primary CT	-
Secondary dot	1
Secondary	3
Secondary CT	2
Case Ground	-
Not Connected	-

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

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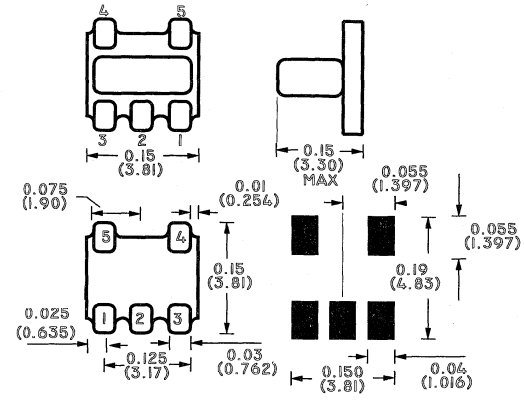
E-Series RF 4:1 Transformer
200 - 700 MHz ETC4-1T-2

Features

* 4:1 Impedance Ratio
* CT on Secondary

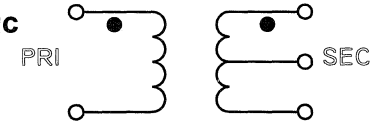
SM-22



Specifications @ 25°C

Frequency Range	200 - 700 MHz
Insertion Loss	**Maximum**
200 - 700 MHz	3 dB
200 - 500 MHz	2 dB
Amplitude Imbalance	**Maximum**
200 - 500 MHz	1.2 dB
200 - 700 MHz	2.2 dB
Phase Imbalance	**Maximum**
200 - 500 MHz	10°
200 - 700 MHz	30°

Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Function	Pin No.
Primary dot	5
Primary	4
Primary CT	-
Secondary dot	1
Secondary	3
Secondary CT	2
Case Ground	-
Not Connected	-

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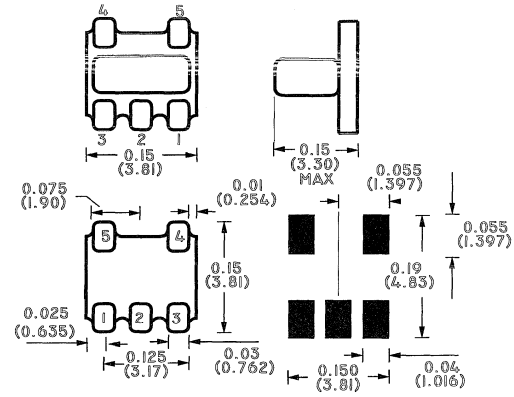
E-Series RF 4:1 Transformer
300 - 2500 MHz

ETC1.6-4-2-4

Features

* 4:1 Impedance Ratio
* CT on Secondary

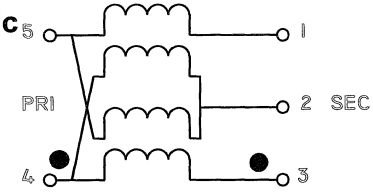
SM-22



Specifications @ 25°C

Frequency Range	**300 - 2500 MHz**
Insertion Loss	**Maximum**
1000 - 1300 MHz	3 dB
300 - 1000 MHz	1 dB

Schematic



Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

E-Series RF 4:1 Transformer
500 - 2500 MHz ETC1.6-4-2-3

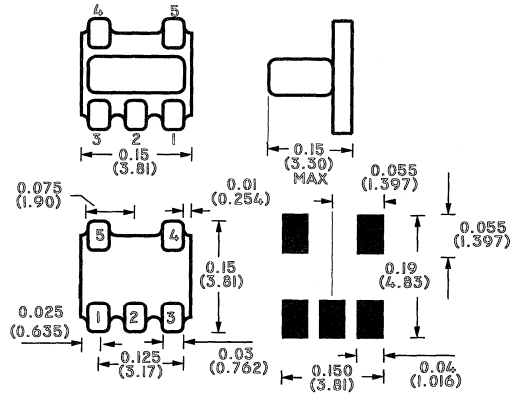
Features

* 4:1 Impedance Ratio
* CT on Secondary

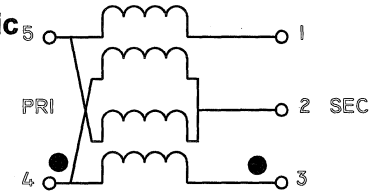
Specifications @ 25°C

Frequency Range	500 - 2500 MHz
Insertion Loss	**Maximum**
500 - 2500 MHz	3 dB
750 - 1200 MHz	1 dB

SM-22



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-30°C to +85°C

Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

DISTRIBUTOR Stock ITEM

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E-Series RF 4:1 Transformer
800 - 2000 MHz

ETC4-1T-6

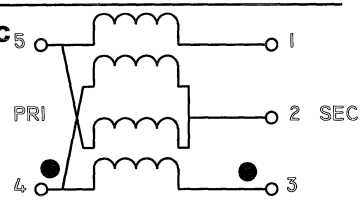
Features

* 4:1 impedance Ratio
* CT on Secondary

Specifications @ 25°C

Frequency Range	800 - 2000 MHz
Insertion Loss	**Maximum**
800 - 960 MHz	3 dB
960 - 2000 MHz	2 dB
Amplitude Imbalance	**Maximum**
800 - 2000 MHz	1.5 dB
Phase Imbalance	**Maximum**
800 - 2000 MHz	5°

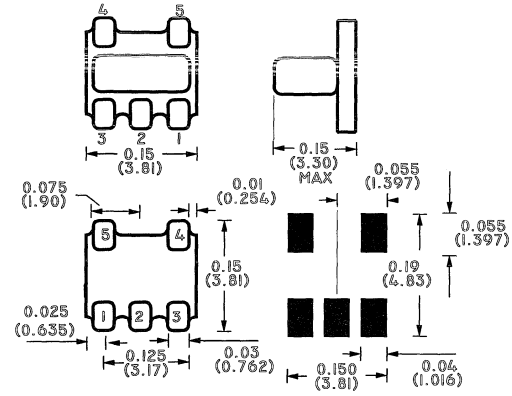
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-22



Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

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E-Series RF 5:1 Transformer
45 MHz ETC5-1

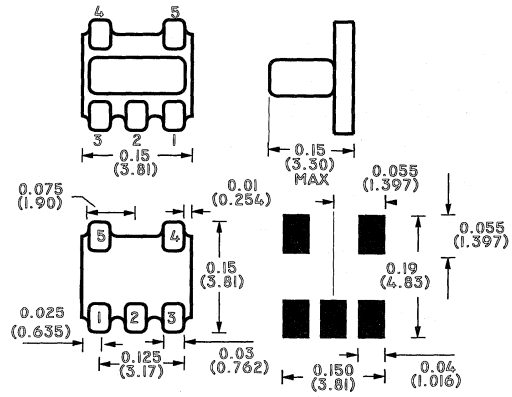
Features

* 5:1 Impedance Ratio
* CT on Secondary

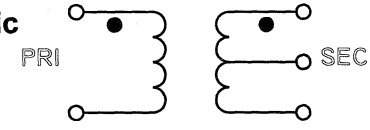
Specifications @ 25°C

Frequency Range	45 MHz
Insertion Loss	**Maximum**
45 MHz	2 dB

SM-22



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Function	Pin No.
Primary dot	4
Primary	5
Primary CT	-
Secondary dot	3
Secondary	1
Secondary CT	2
Case Ground	-
Not Connected	-

DISTRIBUTOR Stock ITEM

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E-Series RF 6:1 Transformer
110 MHz

ETC6-1T-1

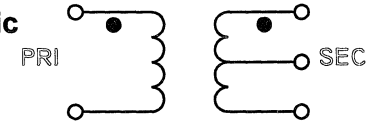
Features

* 6:1 Impedance Ratio
* CT on Secondary

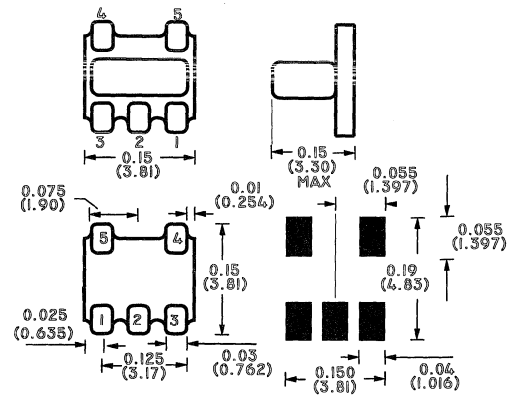
Specifications @ 25°C

Frequency Range	**110 MHz**
Insertion Loss	**Maximum**
110 MHz	**1 dB**
Amplitude Imbalance	**Maximum**
110 MHz	**0.3 dB**
Phase Imbalance	**Maximum**
110 MHz	**2°**

Schematic



SM-22



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	**250 mW**
DC Current	**30 mA**
Operating/Storage Temp.	**-20°C to +85°C**

Function	Pin No.
Primary dot	**5**
Primary	**4**
Primary CT	**-**
Secondary dot	**1**
Secondary	**3**
Secondary CT	**2**
Case Ground	**-**
Not Connected	**-**

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E-Series RF 64:1 Transformer
800 - 825 MHz ETC64-1T-2

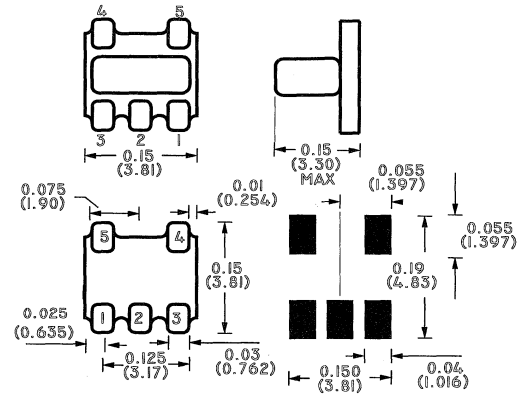
Features

* 64:1 Impedance Ratio
* CT on Secondary

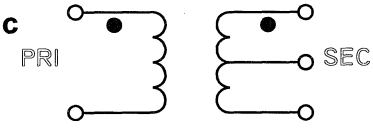
Specifications @ 25°C

Frequency Range	**800 - 825 MHz**
Insertion Loss	**Maximum**
	6 dB

SM-22



Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	**250 mW**
DC Current	**30 mA**
Operating/Storage Temp.	**-20°C to +85°C**

Function	Pin No.
Primary dot	**4**
Primary	**1**
Primary CT	**-**
Secondary dot	**5**
Secondary	**2**
Secondary CT	**3**
Case Ground	**-**
Not Connected	**-**

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E-Series RF 7:1 Transformer
50 - 250 MHz

ETC7-1T-1

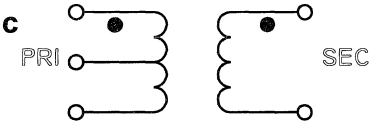
Features

* 7:1 Impedance Ratio
* CT on Primary

Specifications @ 25°C

Frequency Range	50 - 250 MHz
Insertion Loss	**Maximum**
50 - 250 MHz	2 dB
Amplitude Imbalance	**Maximum**
50 - 250 MHz	0.5 dB
Phase Imbalance	**Maximum**
50 - 250 MHz	5°

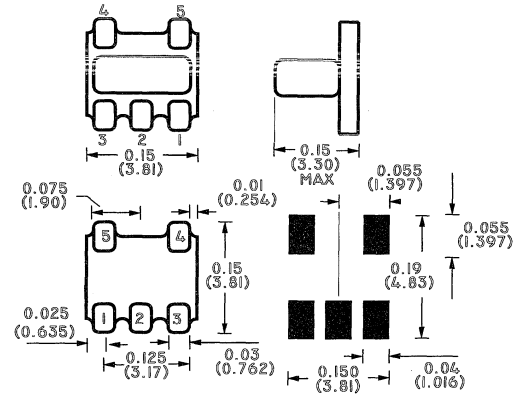
Schematic



Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-22



Function	Pin No.
Primary dot	1
Primary	3
Primary CT	2
Secondary dot	5
Secondary	4
Secondary CT	-
Case Ground	-
Not Connected	-

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E-Series RF 9:1 Transformer
65 - 75 MHz

ETC9-1T-5

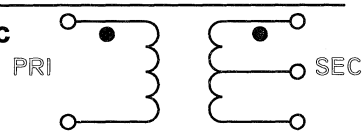
Features

* 9:1 Impedance Ratio
* CT on Secondary

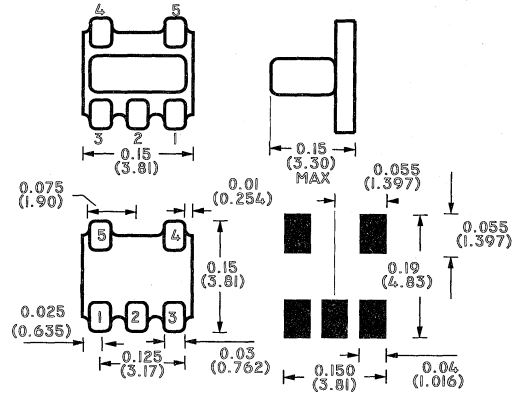
Specifications @ 25°C

Frequency Range	**65 - 75 MHz**
Insertion Loss	**Maximum**
65 - 75 MHz	**1 dB**
Amplitude Imbalance	**Maximum**
65 - 75 MHz	**0.5 dB**
Phase Imbalance	**Maximum**
65 - 75 MHz	**6°**

Schematic



SM-22



Function	Pin No.
Primary dot	5
Primary	4
Primary CT	-
Secondary dot	1
Secondary	3
Secondary CT	2
Case Ground	-
Not Connected	-

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Additional Specifications:

Return Loss: 17 dB Typ, 15 dB Min

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E-Series RF 9:1 Transformer
200 - 700 MHz

ETC9-1T-1

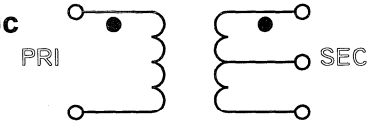
Features

* 9:1 Impedance Ratio
* CT on Secondary

Specifications @ 25°C

Frequency Range	200 - 700 MHz
Insertion Loss	**Maximum**
200 - 700 MHz	3 dB
Amplitude Imbalance	**Maximum**
200 - 700 MHz	1 dB
Phase Imbalance	**Maximum**
200 - 500 MHz	10°
200 - 700 MHz	30°

Schematic



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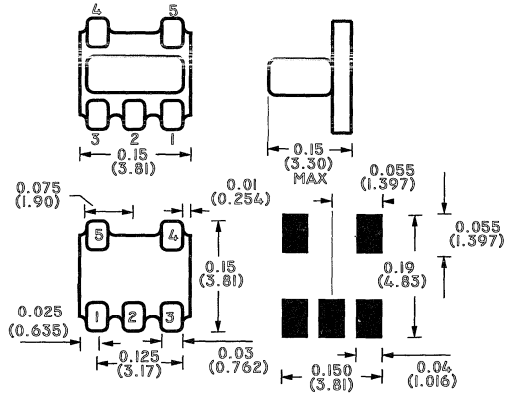

Function	Pin No.
Primary dot	5
Primary	4
Primary CT	-
Secondary dot	1
Secondary	3
Secondary CT	2
Case Ground	-
Not Connected	-

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

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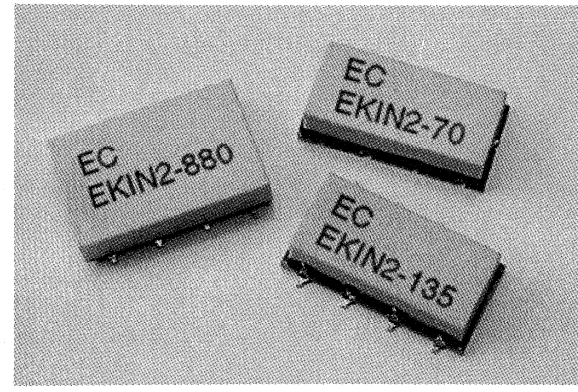
Modulators



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Application Specific Selection Guides 7-16

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Modulator Selection Guide

Model No.	Frequency MHz LO / RF	I / Q	Carrier Suppression dBc Typ.	Carrier Suppression dBc Min.	Single Side-Band Rejection dBc Typ.	Single Side-Band Rejection dBc Min.	Harmonic Suppression dBc 3 x I/Q Typ.	Harmonic Suppression dBc 5 x I/Q Typ.	Case	Price $ Qty. (1-9)	Page Number
EQKR8-10W	9-11	DC-5	37	30	36	30	48	58	R-1	41.58	3-5
EQKR8-40W	30-50	DC-5	35	30	35	30	48	58	R-1	41.58	3-7
EQKR8-70W	50-90	DC-5	35	30	35	30	48	58	R-1	41.58	3-8
EQKR8-90W	60-120	DC-5	35	30	36	30	50	60	R-1	41.58	3-9
EQKR8-91	86-95	DC-5	38	30	38	30	50	60	R-1	41.58	3-10
EQKR8-120W	90-150	DC-5	37	30	36	30	48	58	R-1	41.58	3-4
EQKR8-150W	130-170	DC-1	-	30	-	30	40	55	R-1	41.58	3-6
EKIN2-70	70	DC-0.27	40	30	40	30	50	65	SM-28	20.66	3-15
EKIN2-117	117	DC-0.27	40	30	36	30	52	70	SM-28	20.66	3-12
EKIN2-127.5	118-137	DC-2	38	30	38	30	45	65	SM-28	20.66	3-16
EKIN2-135	135	DC-0.27	40	30	36	30	52	70	SM-28	20.66	3-18
EKIN2-150W	140-160	DC-11	34	30	34	30	42	60	SM-28	20.66	3-14
EKIN2-150H	149.95	0.001-0.6	40	30	40	30	52	62	SM-28	20.66	3-17
EKIN2-240	235-245	DC-0.4	-	30	-	30	40	55	SM-28	20.66	3-19
EKIN2-300	300	DC-0.27	35	30	36	30	55	65	SM-28	20.66	3-11
EKIN2-350	350	DC-13	35	30	35	30	42	62	SM-28	20.66	3-20
EKIN2-960	925-960	DC-0.27	-	30	-	30	40	55	SM-28	20.66	3-21
EKIN2-1082	1074-1090	DC-1	35	30	35	30	55	70	SM-28	20.66	3-13
EKIN2-108	108	DC-0.27	36	30	36	30	48	65	SM-7-1	20.66	3-26
EKIN2-220	215-225	DC-0.27	40	30	38	30	48	65	SM-7-1	20.66	3-23
EKIN2-836	824-849	DC-2	40	30	40	30	45	60	SM-7-1	20.66	3-24
EKIN2-840	830-850	DC-0.27	-	30	-	30	38	55	SM-7-1	20.66	3-25
EKIN2-880	869-894	DC-0.27	-	30	-	30	38	55	SM-7-1	20.66	3-31
EKIN2-881	869-894	DC-2	-	30	-	30	38	55	SM-7-1	20.66	3-29
EKIN2-902	890-915	DC-2	40	30	40	30	45	60	SM-7-1	20.66	3-27
EKIN2-915	902-928	DC-2	35	30	35	30	45	60	SM-7-1	20.66	3-22
EKIN2-947	935-960	DC-2	-	30	-	30	38	55	SM-7-1	20.66	3-30
EKIN2-950	940-960	DC-2	40	30	40	30	45	60	SM-7-1	20.66	3-28

Distributor stock item.

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Modulator Specifications Checklist

If your particular requirements are not met with a M/A-COM catalog item, please complete the checklist below and mail, phone, or fax it to M/A-COM Eurotec, Sales and Marketing or your local Sales Office.

Application:

Industrial ..... Commercial ..... Other .....

Description: .....

.....

Parameters important for application: .....

.....

Electrical:

Frequency Range .....MHz
Conversion / Insertion Loss Max. .....dB
LO Level .....dBm
1 dB Compression at .....dBm
I/Q Level .....dBm
Carrier Rejection Min. .....-dBc
Sideband Rejection Min. .....-dBc
VSWR or Return Loss (dB)

☐ 50 Ohms ☐ 75 Ohms ☐ Other

Input.....Ouput.....

Operating Temperature: .....°C

Enviornmental Requirements:

.....
.....
.....
.....
.....
.....
.....

Harmonic Suppression Min.

LO ± 3 I/Q .....-dBc
LO ± 5 I/Q .....-dBc

Mechanical:

Standard Case Style: ..... (for outline drawings see Table of Contents)

PC Board Mounting

☐ Plug-in ☐ Surface-Mount

Coaxial Connector

☐ BNC ☐ TNC
☐ SMA ☐ N ☐ Other

Special Requirements: .....

.....

Name: ..... Title: .....

Company: ..... Dept: .....

Company Address: .....

Phone: ..... Fax: .....

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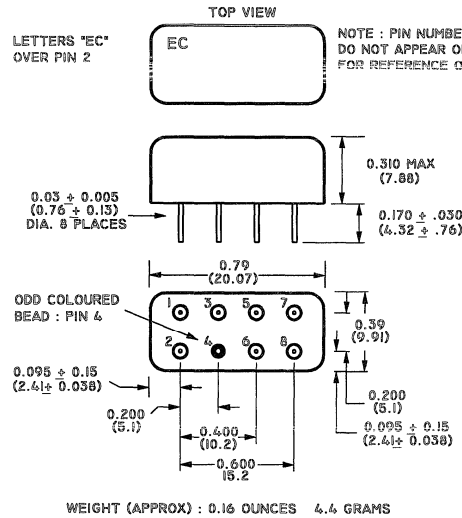
E-Series I/Q Modulator
90 - 150 MHz

EQKR8-120W

Features

R-1

* High carrier suppression
* High 3I and 5I suppression
* Wide band



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Specifications @ 25°C

Frequency Range		
(LO) Carrier		90 - 150 MHz
I/Q		DC - 5 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	37 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	36 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	48 dBc	45 dBc
5 x I/Q	58 dBc	55 dBc
Conversion Loss	**Typical**	**Maximum**
	5 dB	6 dB
(LO) Carrier Power	+10 dBm	
I/Q Drive Level	-7 dBm	

*** Note: When Q = +90 degrees relative to I; Lower sideband is suppressed. Related to wanted sideband power**

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	**Absolute Maximum**
Operating Temp.	**-10°C to +70°C**
Storage Temp.	**-55°C to +100°C**
Pin Temp (10 sec)	**260°C**

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	2
Case Ground	3,4,7
Not Connected	-

ISO 9001
CERTIFIED

E-Series I/Q Modulator
9 - 11 MHz EQKR8-10W

Features

* High carrier suppression
* High 3I and 5I suppression
* Wide band

Specifications @ 25°C

Frequency Range		
(LO) Carrier		9 - 11 MHz
I/Q		DC - 5 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	37 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	36 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	48 dBc	45 dBc
5 x I/Q	58 dBc	55 dBc
Conversion Loss	**Typical**	**Maximum**
	6 dB	7.5 dB
(LO) Carrier Power	+10 dBm	
I/Q Drive Level	-7 dBm	

* Note: When Q = +90 degrees relative to I; Lower sideband is suppressed. Related to wanted sideband power

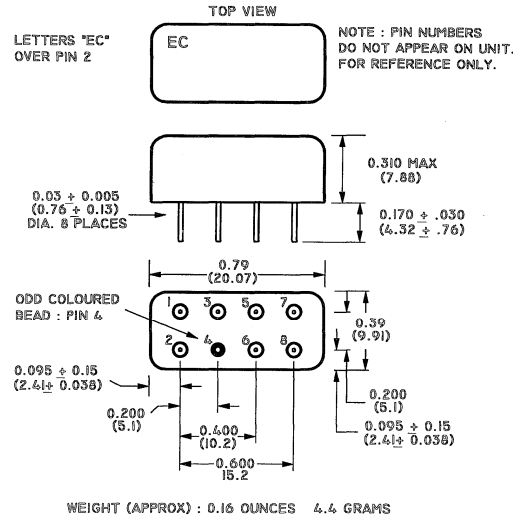
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	2
Case Ground	3,4,7
Not Connected	-

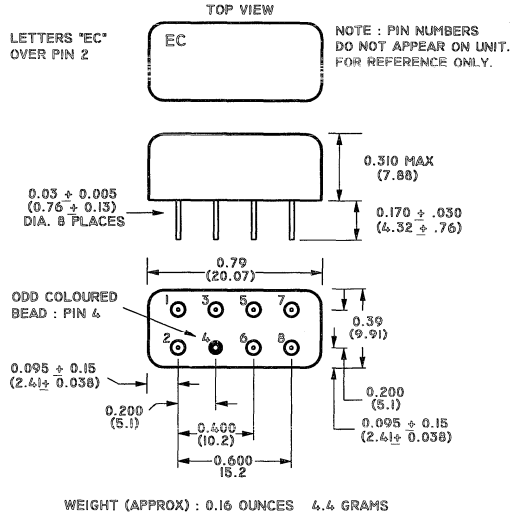
ISO 9001
CERTIFIED

E-Series I/Q Modulator
130 - 170 MHz

EQKR8-150W

Features

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

- * High carrier suppression
- * High 3I and 5I suppression
- * Wide band

Specifications @ 25°C

Frequency Range	
(LO) Carrier	130 - 170 MHz
I/Q	DC - 1 MHz
(LO) Carrier Suppression *	**Minimum**
	30 dBc
SSB Rejection *	**Minimum**
	30 dBc
Harmonic Suppression *	**Minimum**
3 x I/Q	40 dBc
5 x I/Q	55 dBc
Conversion Loss	**Maximum**
	6 dB
(LO) Carrier Power	+10 dBm
I/Q Drive Level	-7 dBm

* Note: When Q = +90 degrees relative to I; Lower sideband is suppressed. Related to wanted sideband power

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	2
Case Ground	3,4,7
Not Connected	-

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

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E-Series I/Q Modulator
30 - 50 MHz

EQKR8-40W

Features

* High carrier suppression
* High 3I and 5I suppression
* Wide band

Specifications @ 25°C

Frequency Range		
(LO) Carrier		30 - 50 MHz
I/Q		DC - 5 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	35 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	35 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	48 dBc	45 dBc
5 x I/Q	58 dBc	55 dBc
Conversion Loss	**Typical**	**Maximum**
	5 dB	6 dB
(LO) Carrier Power	+10 dBm	
I/Q Drive Level	-7 dBm	

* Note: When Q = +90 degrees relative to I; Lower sideband is suppressed. Related to wanted sideband power

Operating Characteristics

Impedance	50 Ohms Nominal

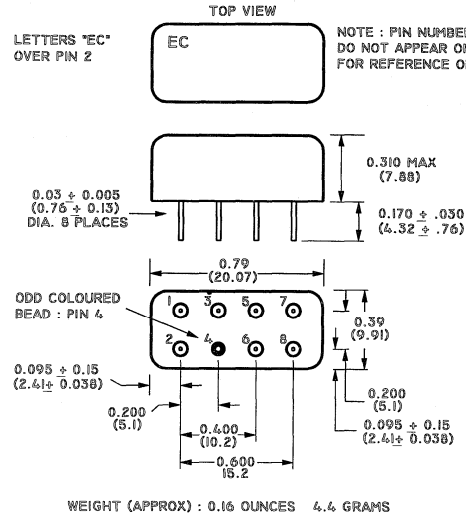
Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Additional Specifications:

Output Power: -12dBm Min

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	2
Case Ground	3,4,7
Not Connected	-

ISO 9001
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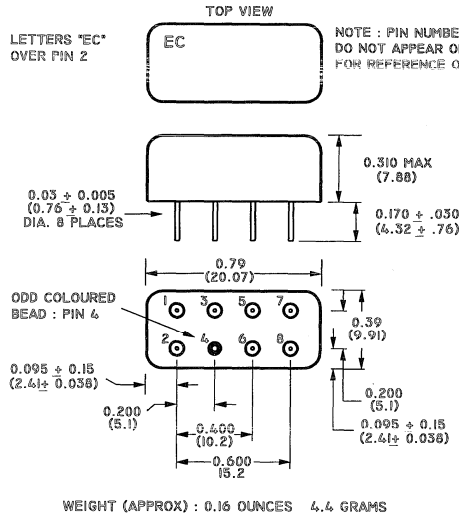
E-Series I/Q Modulator
50 - 90 MHz

EQKR8-70W

Features

R-1

* High carrier suppression
* High 3I and 5I suppression
* Wide band



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Specifications @ 25°C

Frequency Range		
(LO) Carrier		50 - 90 MHz
I/Q		DC - 5 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	35 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	35 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	48 dBc	45 dBc
5 x I/Q	58 dBc	55 dBc
Conversion Loss	**Typical**	**Maximum**
	5 dB	6 dB
(LO) Carrier Power	+10 dBm	
I/Q Drive Level	-7 dBm	

* Note: When Q = +90 degrees relative to I; Lower sideband is suppressed. Related to wanted sideband power

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	2
Case Ground	3,4,7
Not Connected	-

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

ISO 9001
CERTIFIED

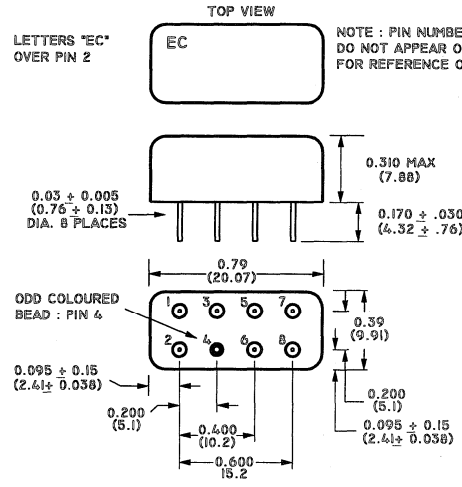
E-Series I/Q Modulator
60 - 120 MHz

EQKR8-90W

Features

R-1

* High carrier suppression
* High 3I and 5I suppression
* Wide band



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Specifications @ 25°C

Frequency Range		
(LO) Carrier		60 - 120 MHz
I/Q		DC - 5 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	35 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	36 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	50 dBc	45 dBc
5 x I/Q	60 dBc	55 dBc
Conversion Loss	**Typical**	**Maximum**
	5 dB	6 dB
(LO) Carrier Power	+10 dBm	

* Note: When Q = +90 degrees relative to I; Lower sideband is suppressed. Related to wanted sideband power

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

ISO 9001
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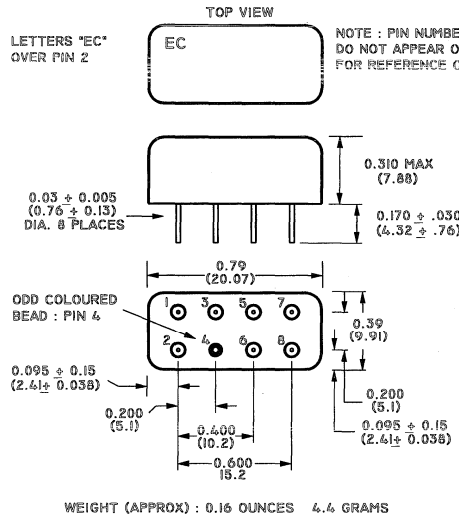
E-Series I/Q Modulator
86 - 95 MHz

EQKR8-91

Features

R-1

* High carrier suppression
* High 3I and 5I suppression



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Specifications @ 25°C

Frequency Range		
(LO) Carrier		86 - 95 MHz
I/Q		DC - 5 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	38 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	38 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	50 dBc	45 dBc
5 x I/Q	60 dBc	55 dBc
Conversion Loss	**Typical**	**Maximum**
	5 dB	6 dB
(LO) Carrier Power	+10 dBm	

* Note: When Q = +90 degrees relative to I; Lower sideband is suppressed. Related to wanted sideband power

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	**Absolute Maximum**
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Function	Pin No.
LO	1
RF	8
I	7
Q	4
External 50 Ohms	-
Case Ground	2,3,5,6
Not Connected	-

ISO 9001
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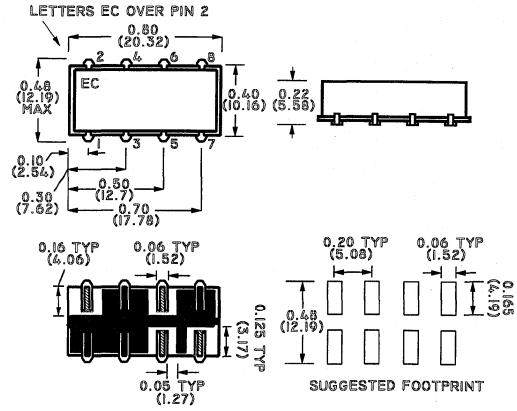
E-Series I/Q Modulator
300 MHz

EKIN2-300

Features

SM-28

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range		
(LO) Carrier		300 MHz
I/Q		DC - 0.27 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	35 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	36 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	55 dBc	40 dBc
5 x I/Q	65 dBc	60 dBc
Conversion Loss	**Typical**	**Maximum**
	5.5 dB	6.5 dB
(LO) Carrier Power	+10 ±2 dBm	
I/Q Drive Level	-10 dBm	

*** Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.**

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Additional Specifications:

LO - RF Isolation: 57 dB Typ, 52 dB Min

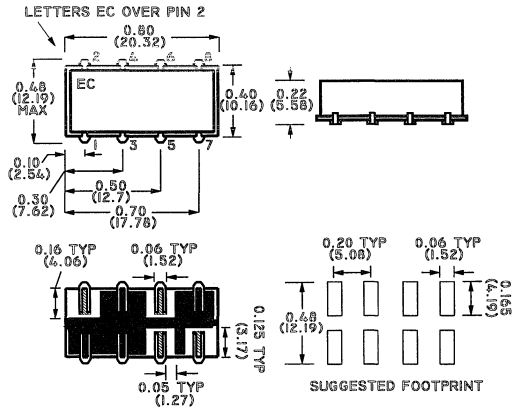
ISO 9001
CERTIFIED

E-Series I/Q Modulator
117 MHz EKIN2-117

Features

SM-28

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range		
(LO) Carrier		117 MHz
I/Q		DC - 0.27 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	40 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	36 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	52 dBc	40 dBc
5 x I/Q	70 dBc	60 dBc
Conversion Loss	**Typical**	**Maximum**
	5.4 dB	6.5 dB
(LO) Carrier Power	+10 ±2 dBm	
I/Q Drive Level	-10 dBm	

*** Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.**

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Additional Specifications:

LO - RF Isolation: 62 dB Typ, 52 dB Min

ISO 9001
CERTIFIED

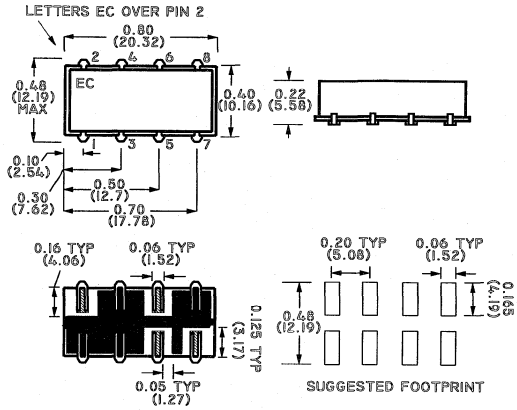
E-Series I/Q Modulator
1074 - 1090 MHz

EKIN2-1082

Features

SM-28

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range		
(LO) Carrier		1074 - 1090 MHz
I/Q		DC - 1 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	35 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	35 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	55 dBc	40 dBc
5 x I/Q	70 dBc	50 dBc
Conversion Loss	**Typical**	**Maximum**
	9.7 dB	11 dB
(LO) Carrier Power	+10 ±1 dBm	
I/Q Drive Level	-10 dBm	

*** Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.**

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	**Absolute Maximum**
Operating Temp.	**-10°C to +70°C**
Storage Temp.	**-55°C to +100°C**
Pin Temp (10 sec)	**260°C**

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

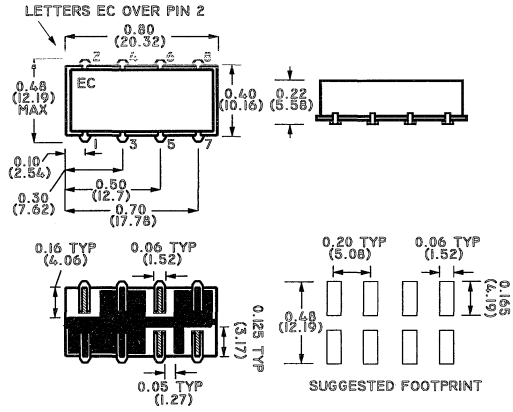
ISO 9001
CERTIFIED

E-Series I/Q Modulator
140 - 160 MHz EKIN2-150W

Features

SM-28

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range		
(LO) Carrier		140 - 160 MHz
I/Q		DC - 11 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	34 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	34 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	42 dBc	40 dBc
5 x I/Q	60 dBc	55 dBc
Conversion Loss	**Typical**	**Maximum**
	7 dB	9 dB
(LO) Carrier Power	+10 ±1 dBm	
I/Q Drive Level	-10 dBm	

*** Note: When Q = -90 degrees relative to I; Lower sideband is suppressed. Related to wanted sideband power.**

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Additional Specifications:

LO - RF Isolation: 50dB Min

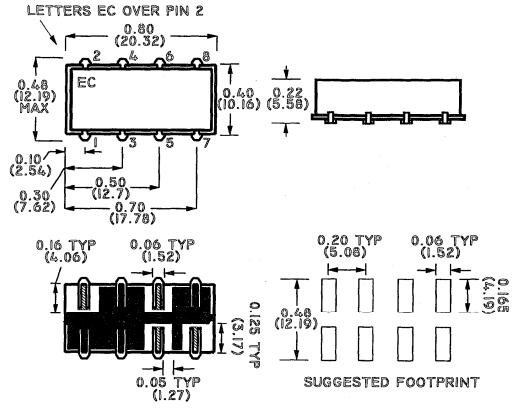
ISO 9001
CERTIFIED

E-Series I/Q Modulator
70 MHz EKIN2-70

Features

SM-28

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range		
(LO) Carrier		70 MHz
I/Q		DC - 0.27 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	40 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	40 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	50 dBc	40 dBc
5 x I/Q	65 dBc	55 dBc
Conversion Loss	**Typical**	**Maximum**
	5.2 dB	6.5 dB
(LO) Carrier Power	+10 ±2 dBm	
I/Q Drive Level	-10 dBm	

*** Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.**

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Additional Specifications:

LO - RF Isolation: 64 dB Typ, 50 dB Min

ISO 9001
CERTIFIED

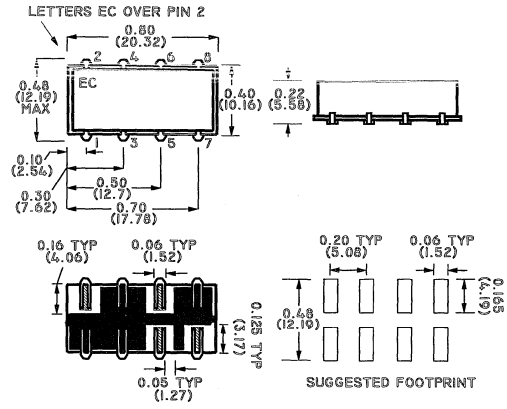
E-Series I/Q Modulator
118 - 137 MHz

EKIN2-127.5

Features

SM-28

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range		
(LO) Carrier		118 - 137 MHz
I/Q		DC - 2 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	38 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	38 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	45 dBc	40 dBc
5 x I/Q	65 dBc	60 dBc
Conversion Loss	**Typical**	**Maximum**
	5.5 dB	7.5 dB
(LO) Carrier Power	+10 ±1 dBm	
I/Q Drive Level	-10 dBm	

*** Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.**

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Additional Specifications:

LO - RF Isolation: 60 dB Typ, 53 dB Min

Specifications Subject to Change Without Notice S 0800 B

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See Page 7-26 For Local Office Details

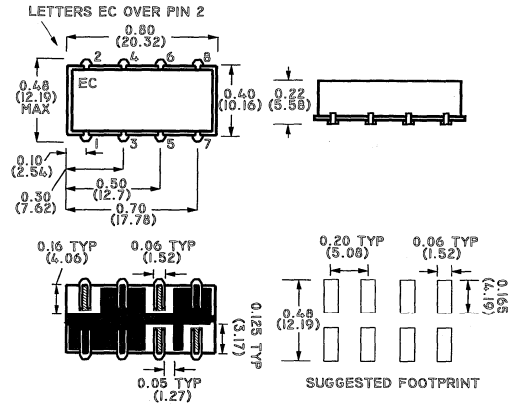
ISO 9001
CERTIFIED

E-Series I/Q Modulator
149.95 MHz EKIN2-150H

Features

SM-28

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range		
(LO) Carrier		149.95 MHz
I/Q		0.001 - 0.630 MHz
(LO) Carrier Suppression *	Typical	Minimum
	40 dBc	30 dBc
SSB Rejection *	Typical	Minimum
	40 dBc	30 dBc
Harmonic Suppression *	Typical	Minimum
3 x I/Q	52 dBc	45 dBc
5 x I/Q	62 dBc	55 dBc
Conversion Loss	Typical	Maximum
	5 dB	6.5 dB
(LO) Carrier Power	+17 ±2 dBm	
I/Q Drive Level	1 dBm	

* Note: When Q = +90 degrees relative to I; Lower sideband is suppressed. Related to wanted sideband power

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Additional Specifications:

Conversion Loss Roll Off Less Than 0.2dB

Specifications Subject to Change Without Notice S0912 A

ISO 9001
CERTIFIED

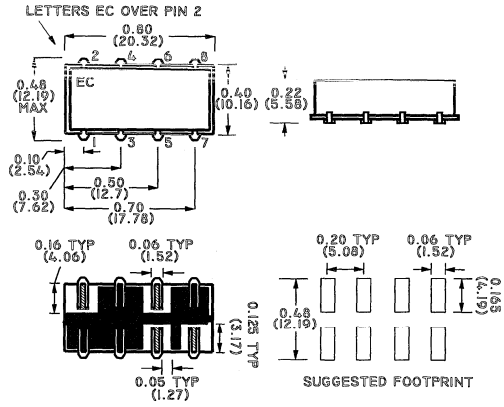
E-Series I/Q Modulator
135 MHz

EKIN2-135

Features

SM-28

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range		
(LO) Carrier		135 MHz
I/Q		DC - 0.27 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	40 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	36 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	52 dBc	40 dBc
5 x I/Q	70 dBc	60 dBc
Conversion Loss	**Typical**	**Maximum**
	5.4 dB	6.5 dB
(LO) Carrier Power	+10 ±2 dBm	
I/Q Drive Level	-10 dBm	

*** Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.**

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Additional Specifications:

LO - RF Isolation: 62 dB Typ, 52 dB Min

ISO 9001
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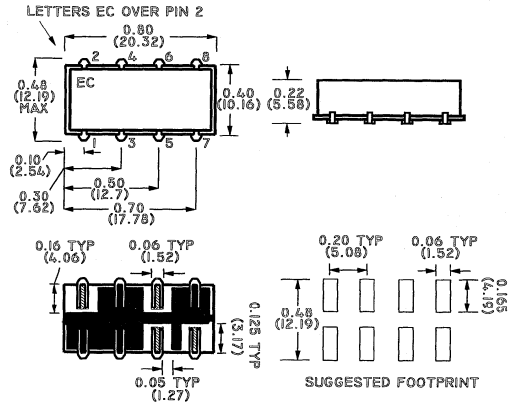
E-Series I/Q Modulator
235 - 245 MHz

EKIN2-240

Features

SM-28

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range	
(LO) Carrier	235 - 245 MHz
I/Q	DC - 0.4 MHz
(LO) Carrier Suppression *	**Minimum**
	30 dBc
SSB Rejection *	**Minimum**
	30 dBc
Harmonic Suppression *	**Minimum**
3 x I/Q	40 dBc
5 x I/Q	55 dBc
Conversion Loss	**Maximum**
	7 dB
(LO) Carrier Power	+10 ±1 dBm
I/Q Drive Level	-10 dBm

*** Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.**

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Additional Specifications:

LO - RF Isolation: 50 dB Min

ISO 9001
CERTIFIED

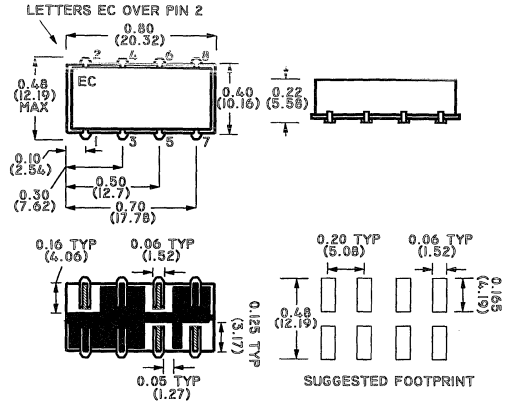
E-Series I/Q Modulator
350 MHz

EKIN2-350

Features

SM-28

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range		
(LO) Carrier		350 MHz
I/Q		DC - 13 MHz
(LO) Carrier Suppression *	Typical	Minimum
	35 dBc	30 dBc
SSB Rejection *	Typical	Minimum
	35 dBc	30 dBc
Harmonic Suppression *	Typical	Minimum
3 x I/Q	42 dBc	38 dBc
5 x I/Q	62 dBc	53 dBc
Conversion Loss	Typical	Maximum
	7 dB	8 dB
(LO) Carrier Power	+10 ±1 dBm	
I/Q Drive Level	-10 dBm	

* Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Additional Specifications:

LO - RF Isolation: 60 dB Typ, 54 dB Min

DISTRIBUTOR Stock ITEM

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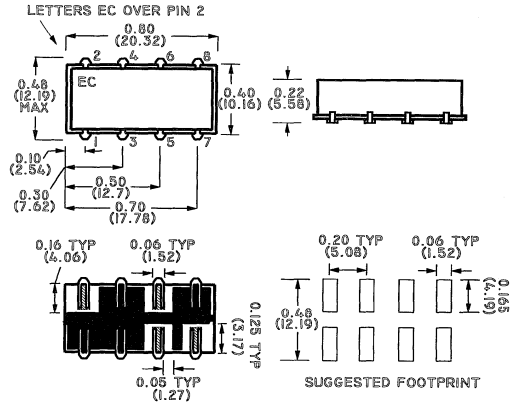
E-Series I/Q Modulator
925 - 960 MHz

EKIN2-960

Features

SM-28

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range	
(LO) Carrier	925 - 960 MHz
I/Q	DC - 0.27 MHz
(LO) Carrier Suppression *	**Minimum 30 dBc**
SSB Rejection *	**Minimum 30 dBc**
Harmonic Suppression *	**Minimum**
3 x I/Q	40 dBc
5 x I/Q	55 dBc
Conversion Loss	**Maximum 10 dB**
(LO) Carrier Power	**+10 ±1 dBm**
I/Q Drive Level	**-10 dBm**

*** Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.**

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Specifications Subject to Change Without Notice S 0657 B

ISO 9001
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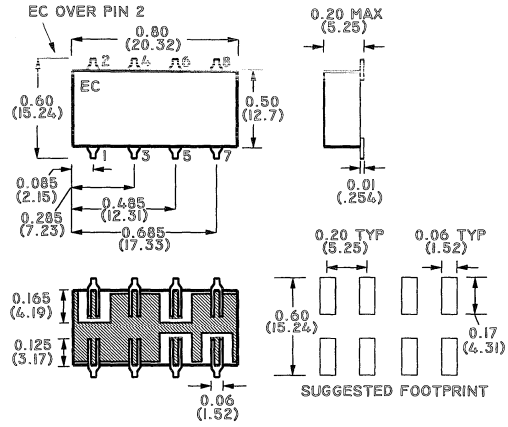
E-Series I/Q Modulator
902 - 928 MHz

EKIN2-915

Features

SM-7-1

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range		
(LO) Carrier		902 - 928 MHz
I/Q		DC - 2 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	35 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	35 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	45 dBc	40 dBc
5 x I/Q	60 dBc	55 dBc
Conversion Loss		**Maximum**
		10 dB
(LO) Carrier Power	+10 ±1 dBm	
I/Q Drive Level	-10 dBm	

* Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Additional Specifications:

LO - IF Isolation: 25 dB Min

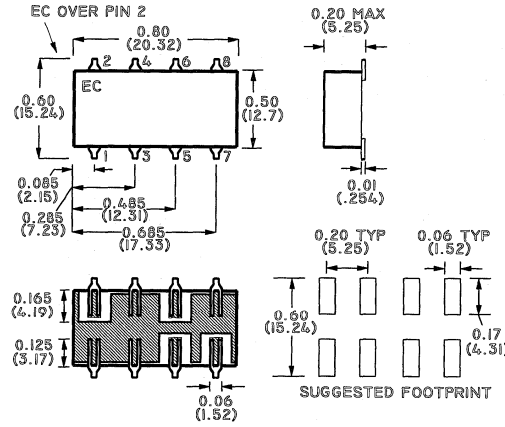
ISO 9001
CERTIFIED

E-Series I/Q Modulator
215 - 225 MHz EKIN2-220

Features

SM-7-1

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range		
(LO) Carrier		215 - 225 MHz
I/Q		DC - 0.27 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	40 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	38 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	48 dBc	40 dBc
5 x I/Q	65 dBc	60 dBc
Conversion Loss	**Typical**	**Maximum**
	6 dB	7 dB
(LO) Carrier Power	+10 ±1 dBm	
I/Q Drive Level	-10 dBm	

* Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Additional Specifications:

LO - RF Isolation: 60 dB Typ, 50 dB Min

ISO 9001
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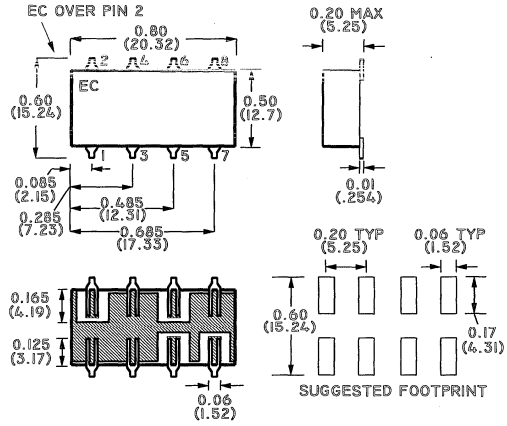
E-Series I/Q Modulator
824 - 849 MHz

EKIN2-836

Features

SM-7-1

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range		
(LO) Carrier		824 - 849 MHz
I/Q		DC - 2 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	40 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	40 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	45 dBc	40 dBc
5 x I/Q	60 dBc	55 dBc
Conversion Loss	**Typical**	**Maximum**
	7.5 dB	8 dB
(LO) Carrier Power	+10 dBm	
I/Q Drive Level	-10 dBm	

*** Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.**

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

ISO 9001
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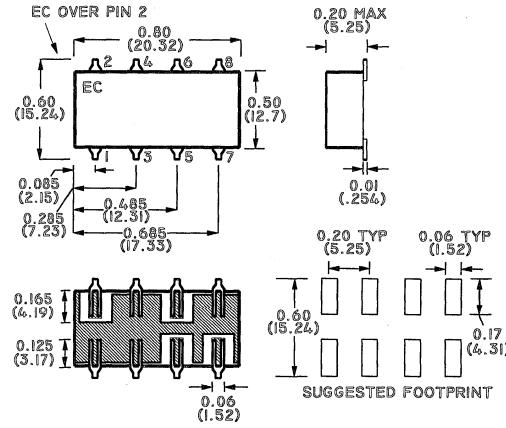
E-Series I/Q Modulator
830 - 850 MHz EKIN2-840

Features

SM-7-1

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range	
(LO) Carrier	830 - 850 MHz
I/Q	DC - 0.27 MHz
(LO) Carrier Suppression *	**Minimum**
	30 dBc
SSB Rejection *	**Minimum**
	30 dBc
Harmonic Suppression *	**Minimum**
3 x I/Q	38 dBc
5 x I/Q	55 dBc
Conversion Loss	**Maximum**
	8 dB
(LO) Carrier Power	+10 ±1 dBm
I/Q Drive Level	-10 dBm

* Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

ISO 9001
CERTIFIED

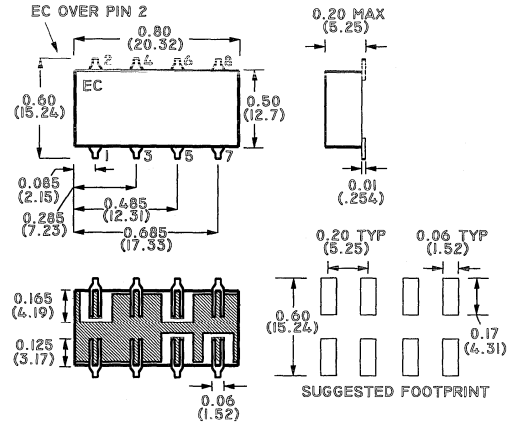
E-Series I/Q Modulator
108 MHz

EKIN2-108

Features

SM-7-1

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range		
(LO) Carrier		108 MHz
I/Q		DC - 0.27 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	36 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	36 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	48 dBc	40 dBc
5 x I/Q	65 dBc	55 dBc
Conversion Loss	**Typical**	**Maximum**
	5.5 dB	6.5 dB
(LO) Carrier Power	+10 ±2 dBm	
I/Q Drive Level	-10 dBm	

*** Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.**

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Additional Specifications:

LO - RF Isolation: 45 dB Min

Specifications Subject to Change Without Notice S 0706 B

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See Page 7-26 For Local Office Details

ISO 9001
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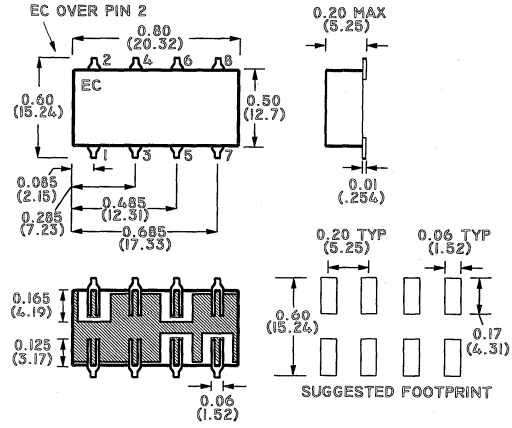
E-Series I/Q Modulator
890 - 915 MHz

EKIN2-902

Features

SM-7-1

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range		
(LO) Carrier		890 - 915 MHz
I/Q		DC - 2 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	40 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	40 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	45 dBc	40 dBc
5 x I/Q	60 dBc	55 dBc
Conversion Loss	**Typical**	**Maximum**
	8.5 dB	9 dB
(LO) Carrier Power	+10 dBm	
I/Q Drive Level	-10 dBm	

*** Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.**

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

ISO 9001
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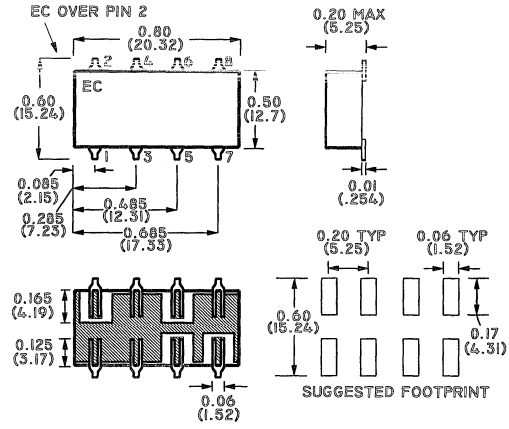
E-Series I/Q Modulator
940 - 960 MHz

EKIN2-950

Features

SM-7-1

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range		
(LO) Carrier		940 - 960 MHz
I/Q		DC - 2 MHz
(LO) Carrier Suppression *	**Typical**	**Minimum**
	40 dBc	30 dBc
SSB Rejection *	**Typical**	**Minimum**
	40 dBc	30 dBc
Harmonic Suppression *	**Typical**	**Minimum**
3 x I/Q	45 dBc	40 dBc
5 x I/Q	60 dBc	55 dBc
Conversion Loss	**Typical**	**Maximum**
	9 dB	10 dB
(LO) Carrier Power	+10 dBm	
I/Q Drive Level	-10 dBm	

* Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Additional Specifications:

LO - RF Isolation: 40 dB Min

ISO 9001
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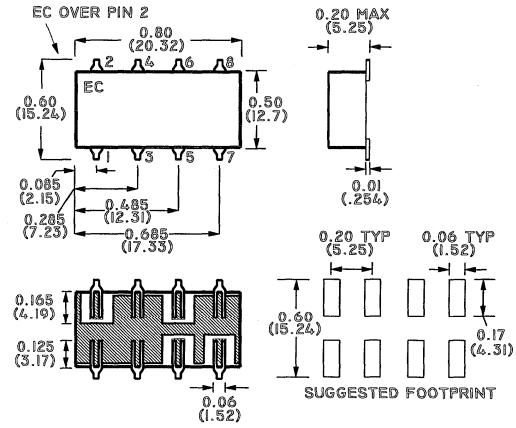
E-Series I/Q Modulator
869 - 894 MHz EKIN2-881

Features

SM-7-1

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range	
(LO) Carrier	869 - 894 MHz
I/Q	DC - 2 MHz
(LO) Carrier Suppression *	**Minimum**
	30 dBc
SSB Rejection *	**Minimum**
	30 dBc
Harmonic Suppression *	**Minimum**
3 x I/Q	38 dBc
5 x I/Q	55 dBc
Conversion Loss	**Maximum**
	9 dB
(LO) Carrier Power	+10 ±1 dBm
I/Q Drive Level	-10 dBm

* Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Specifications Subject to Change Without Notice S 0646 C

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ISO 9001
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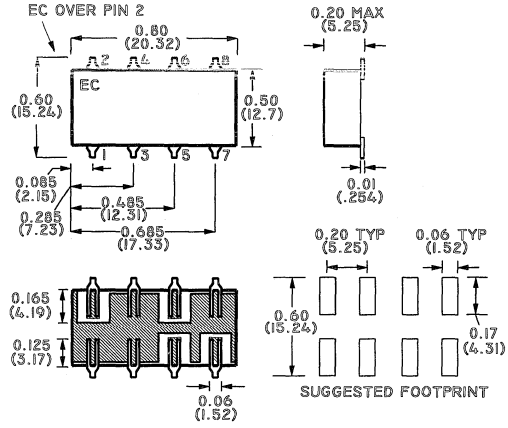
E-Series I/Q Modulator
935 - 960 MHz

EKIN2-947

Features

SM-7-1

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range	
(LO) Carrier	935 - 960 MHz
I/Q	DC - 2 MHz
(LO) Carrier Suppression *	Minimum 30 dBc
SSB Rejection *	Minimum 30 dBc
Harmonic Suppression *	Minimum
3 x I/Q	38 dBc
5 x I/Q	55 dBc
Conversion Loss	Maximum 9 dB
(LO) Carrier Power	+10 ±1 dBm
I/Q Drive Level	-10 dBm

* Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

ISO 9001
CERTIFIED

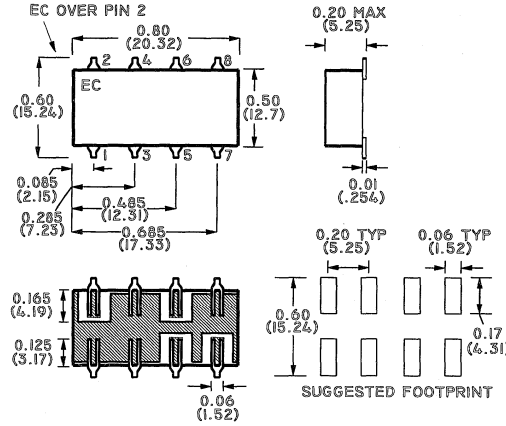
E-Series I/Q Modulator
869 - 894 MHz

EKIN2-880

Features

SM-7-1

* High carrier suppression
* High 3I and 5I suppression



Specifications @ 25°C

Frequency Range	
(LO) Carrier	869 - 894 MHz
I/Q	DC - 0.27 MHz
(LO) Carrier Suppression *	**Minimum**
	30 dBc
SSB Rejection *	**Minimum**
	30 dBc
Harmonic Suppression *	**Minimum**
3 x I/Q	38 dBc
5 x I/Q	55 dBc
Conversion Loss	**Maximum**
	7.5 dB
(LO) Carrier Power	+10 ±1 dBm
I/Q Drive Level	-10 dBm

*** Note: When Q = +90 degrees relative to I; Lower sideband is suppressed.**

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Operating Temp.	-10°C to +70°C
Storage Temp.	-55°C to +100°C
Pin Temp (10 sec)	260°C

Specifications Subject to Change Without Notice S 0643 B

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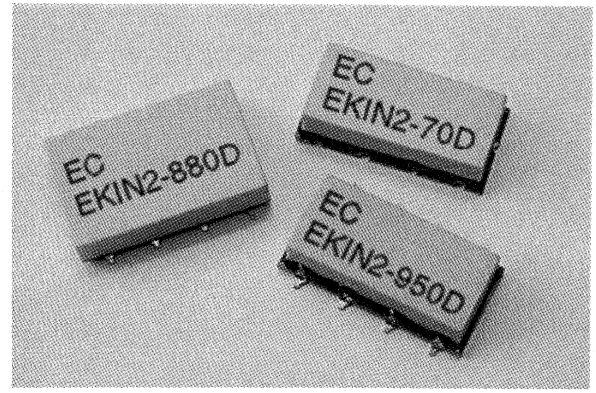
Demodulators



Title **Page**

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Demodulator Selection Guide

Model No.	Frequency MHz		Amplitude Unbalance dB		Phase Unbalance dB		Isolation		Conversion Loss dB	Case Style	Price $ Qty. (1-9)	Page Number
	LO / RF	I / Q	Typ.	Max.	Typ.	Max.	LO-RF Typ.	LO-IQ Typ.	Typ.			
EKIN2-400DX1	390-415	DC-30	0.4	1	2	3	40	25	7.2	SM-27	20.66	4-4
EKIN-10D	10	DC-0.5	-	0.5	-	1	50	-	10	SM-28	20.66	4-5
EKIN2-21.4D	21.4	DC-0.27	-	0.75	-	1.5	55	-	5.5	SM-28	20.66	4-6
EKIN2-70D	70	DC-5	0.2	1	0.5	2	65	-	8	SM-28	20.66	4-7
EKIN-70DL	70.2	DC-1	-	0.5	-	1	40	30	10	SM-28	20.66	4-8
EKIN-82.2D	82.2	DC-0.27	0.3	0.5	0.5	1	40	-	9	SM-28	20.66	4-9
EKIN-86D	86.85	DC-1	-	0.6	-	1.5	40	30	10	SM-28	20.66	4-10
EKIN2-390D	380-400	DC-5	0.3	0.5	1	1.5	55	42	7.8	SM-28	20.66	4-11
EKIN2-915DX1	902-928	DC-10	-	0.75	-	1.5	40	25	9	SM-28	20.66	4-12
EKIN2-108D	108	DC-0.27	0.4	0.5	0.8	1	60	-	5.5	SM-7-1	20.66	4-13
EKIN2-220D	215-255	DC-0.27	0.3	0.5	1	1.5	50	-	6	SM-7-1	20.66	4-14
EKIN2-836D	824-849	DC-20	0.5	1	1.5	3	40	-	8	SM-7-1	20.66	4-15
EKIN2-846D	824-869	DC-45	-	1.5	-	5	40	-	9.5	SM-7-1	20.66	4-16
EKIN2-880D	869-894	DC-2	0.3	0.5	0.6	1	50	-	7.5	SM-7-1	20.66	4-17
EKIN2-902D	890-915	DC-5	-	1	-	3	40	-	7.5	SM-7-1	20.66	4-18
EKIN2-915D	902-928	DC-10	-	0.75	-	1.5	40	25	10	SM-7-1	20.66	4-19
EKIN2-950D	940-960	DC-2	0.3	0.5	0.75	1	60	-	9	SM-7-1	20.66	4-20

Distributor stock item.

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Demodulator Specifications Checklist

If your particular requirements are not met with a M/A-COM catalog item, please complete the checklist below and mail, phone, or fax it to M/A-COM Eurotec, Sales and Marketing or your local Sales Office.

Application:
Industrial ..... Commercial ..... Other .....
Description: .....
.....
Parameters important for application: .....
.....

Electrical:
Frequency Range .....MHz
Conversion / Insertion Loss Max. .....dB
LO Level .....dBm
1 dB Compression at .....dBm
RF Level .....dBm
Amplitude Unbalance Max. .....dB
Phase Unbalance Max. .....deg
VSWR or Return Loss (dB)

☐ 50 Ohms ☐ 75 Ohms ☐ Other
Input.....Ouput.....
Operating Temperature: .....°C

Enviornmental Requirements:
.....
.....
.....
.....
.....
.....
.....

Harmonic Suppression Min.
3 I/Q .....-dBc
5 I/Q .....-dBc

Mechanical:
Standard Case Style: ..... (for outline drawings see Table of Contents)

PC Board Mounting

☐ Plug-in ☐ Surface-Mount

Coaxial Connector

☐ BNC ☐ TNC
☐ SMA ☐ N ☐ Other

Special Requirements: .....
.....

Name: ..... Title: .....

Company: ..... Dept: .....

Company Address: .....

Phone: ..... Fax: .....

Specifications Subject to Change Without Notice

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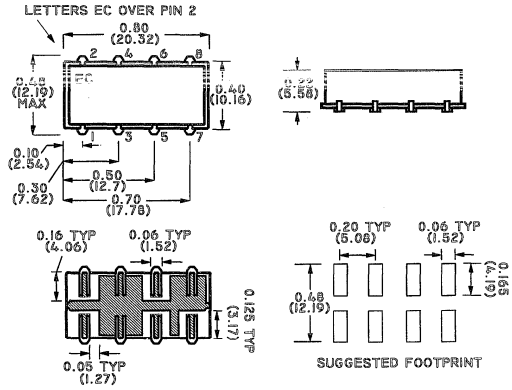
E-Series I/Q Demodulator
390 - 415 MHz EKIN2-400DX1

Features

SM-27



- * Excellent phase and amplitude balance
- * LO Power +10 dBm Typical
- * Surface mount

Specifications @ 25°C

Frequency Range		
LO / RF		390 - 415 MHz
I/Q		DC - 30 MHz
Amplitude Unbalance	**Typical**	**Maximum**
	0.4 dB	1 dB
Phase Unbalance	**Typical**	**Maximum**
	2°	3°
Isolation		**Minimum**
LO to RF		40 dB
LO to I/Q		25 dB
Conversion Loss	**Typical**	**Maximum**
	7.2 dB	9 dB
(LO) Carrier Power	+10 ±1 dBm	

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	4 dBm Max
DC Offset Voltage	1 mV Typ

Additional Specifications:

Q = I - 90 degrees For RF > LO

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	3,4,7
Not Connected	2

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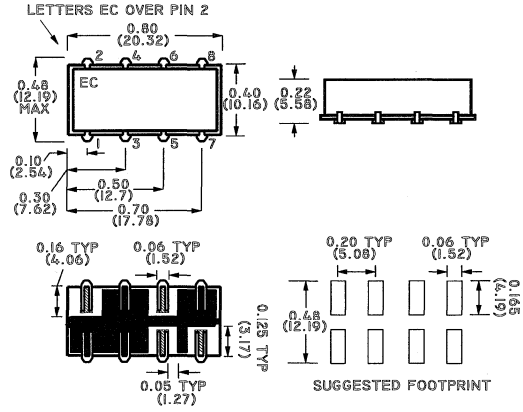
E-Series I/Q Demodulator
10 MHz EKIN-10D

Features

SM-28



- * Excellent phase and amplitude balance
- * LO Power +10 dBm Typical
- * Surface mount

Specifications @ 25°C

Frequency Range	
LO / RF	10 MHz
I/Q	DC - 0.5 MHz
Amplitude Unbalance	Maximum 0.5 dB
Phase Unbalance	Maximum 1°
Isolation	Minimum
LO to RF	50 dB
Conversion Loss	Maximum 10 dB
(LO) Carrier Power	+10 ±2 dBm

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	3 dBm Max
DC Offset Voltage	1 mV Typ

Additional Specifications:

Q = I - 90 degrees For RF > LO

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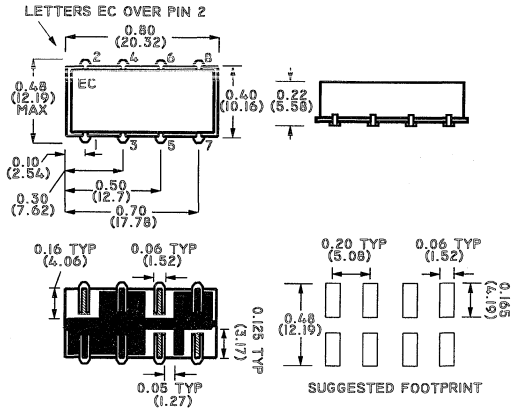
E-Series I/Q Demodulator
21.4 MHz EKIN2-21.4D

Features

SM-28

* Excellent phase and amplitude balance
* LO Power +10 dBm Typical
* Surface mount



Specifications @ 25°C

Frequency Range		
LO / RF		21.4 MHz
I/Q		DC - 0.27 MHz
Amplitude Unbalance		Maximum 0.75 dB
Phase Unbalance		Maximum 1.5°
Isolation		Minimum
LO to RF		55 dB
Conversion Loss	Typical	Maximum
	5.5 dB	6.5 dB
(LO) Carrier Power	+10 ±2 dBm	

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	4 dBm Max
DC Offset Voltage	1 mV Typ

Additional Specifications:

Q = I - 90 degrees For RF > LO

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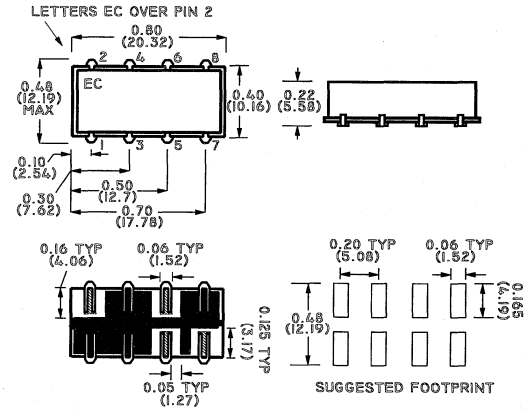
E-Series I/Q Demodulator
70 MHz EKIN2-70D

Features

SM-28



- * Excellent phase and amplitude balance
- * LO Power +10 dBm Typical
- * Surface mount

Specifications @ 25°C

Frequency Range		
LO / RF		70 MHz
I/Q		DC - 5 MHz
Amplitude Unbalance	**Typical**	**Maximum**
	0.2 dB	1 dB
Phase Unbalance	**Typical**	**Maximum**
	0.5°	2°
Isolation	**Typical**	**Minimum**
LO to RF	65 dB	50 dB
Conversion Loss	**Typical**	**Maximum**
	8 dB	9 dB
(LO) Carrier Power	+10 ±2 dBm	

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	4 dBm Max
DC Offset Voltage	1 mV Typ

Additional Specifications:

Q = I - 90 degrees For RF > LO

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,4,3,7
Not Connected	-

Specifications Subject to Change Without Notice S 0783 B

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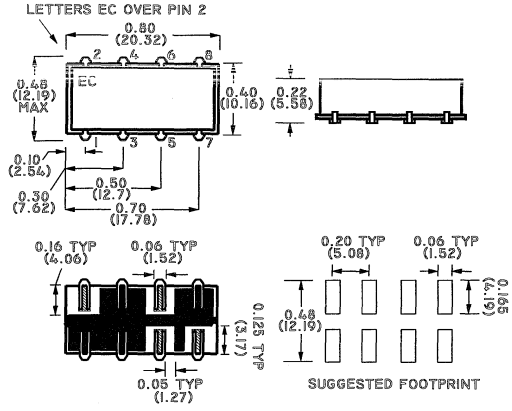
E-Series I/Q Demodulator
70.2 MHz

EKIN-70DL

Features

SM-28

* Excellent phase and amplitude balance
* LO Power +10 dBm Typical
* Surface mount



Specifications @ 25°C

Frequency Range	
LO / RF	70.2 MHz
I/Q	DC - 1 MHz
Amplitude Unbalance	Maximum 0.5 dB
Phase Unbalance	Maximum 1°
Isolation	Minimum
LO to RF	40 dB
LO to I/Q	30 dB
Conversion Loss	Maximum 10 dB
(LO) Carrier Power	+10 ±2 dBm

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	3 dBm Max

Additional Specifications:

VSWR LO/RF: 1.5

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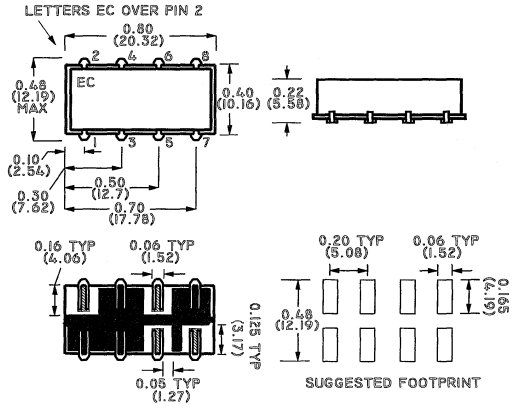
E-Series I/Q Demodulator
82.2 MHz EKIN-82.2D

Features

SM-28



- * Excellent phase and amplitude balance
- * LO Power +10 dBm Typical
- * Surface mount

Specifications @ 25°C

Frequency Range		
LO / RF		82.2 MHz
I/Q		DC - 0.27 MHz
Amplitude Unbalance	Typical	Maximum
	0.3 dB	0.5 dB
Phase Unbalance	Typical	Maximum
	0.5°	1°
Isolation		Minimum
LO to RF		40 dB
Conversion Loss	Typical	Maximum
	9 dB	10 dB
(LO) Carrier Power	+10 ±2 dBm	

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	4 dBm Max
DC Offset Voltage	1 mV Typ

Additional Specifications:

Q = I +90 degrees For RF > LO

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Specifications Subject to Change Without Notice S 0745 C

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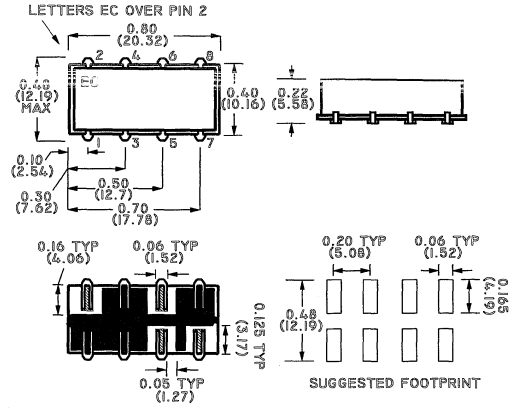
E-Series I/Q Demodulator
86.85 MHz EKIN-86D

Features

SM-28

* Excellent phase and amplitude balance
* LO Power +10 dBm Typical
* Surface mount



Specifications @ 25°C

Frequency Range	
LO / RF	86.85 MHz
I/Q	DC - 1 MHz
Amplitude Unbalance	Maximum 0.6 dB
Phase Unbalance	Maximum 1.5°
Isolation	Minimum
LO to RF	40 dB
LO to I/Q	30 dB
Conversion Loss	Maximum 10 dB
(LO) Carrier Power	+10 ±2 dBm

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	3 dBm Max

Additional Specifications:

Q = I +90 degrees For RF > LO, VSWR LO/RF: 1.5

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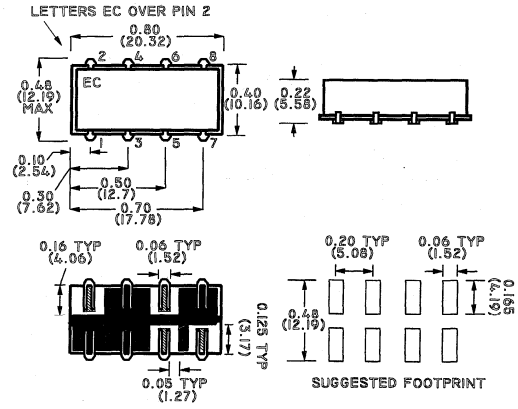
E-Series I/Q Demodulator
380 - 400 MHz EKIN2-390D

Features

SM-28



- * Excellent phase and amplitude balance
- * LO Power +10 dBm Typical
- * Surface mount

Specifications @ 25°C

Frequency Range		
LO / RF		380 - 400 MHz
I/Q		DC - 5 MHz
Amplitude Unbalance	**Typical**	**Maximum**
	0.3 dB	0.5 dB
Phase Unbalance	**Typical**	**Maximum**
	1°	1.5°
Isolation	**Typical**	**Minimum**
LO to RF	55 dB	40 dB
LO to I/Q	42 dB	40 dB
Conversion Loss	**Typical**	**Maximum**
	7.8 dB	9 dB
(LO) Carrier Power	+10 ±1 dBm	

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	3,4,7
Not Connected	2

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	4 dBm Max

Additional Specifications:

With use of recommended Diplex Filters the LO to I/Q isolation becomes 70dB.
DC Offset Voltage 1mV Typical

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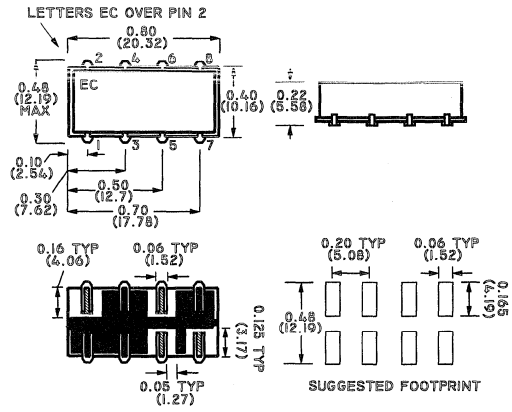
E-Series I/Q Demodulator
902 - 928 MHz EKIN2-915DX1

Features

SM-28



- * Excellent phase and amplitude balance
- * LO Power +10 dBm Typical
- * Surface mount

Specifications @ 25°C

Frequency Range		
LO / RF		902 - 928 MHz
I/Q		DC - 10 MHz
Amplitude Unbalance		Maximum 0.75 dB
Phase Unbalance		Maximum 1.5°
Isolation		Minimum
LO to RF		40 dB
LO to I/Q		25 dB
Conversion Loss	Typical	Maximum
	9 dB	10 dB
(LO) Carrier Power	+10 ±1 dBm	

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	4 dBm Max
DC Offset Voltage	5 mV Typ

Additional Specifications:

Q = I - 90 degrees For RF > LO

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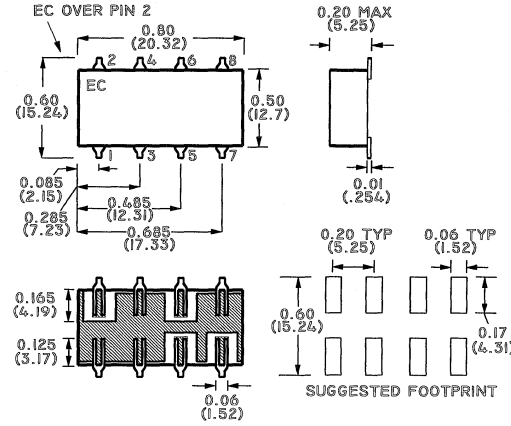
E-Series I/Q Demodulator
108 MHz EKIN2-108D

Features

SM-7-1

* Excellent phase and amplitude balance
* LO Power +10 dBm Typical
* Surface mount



Specifications @ 25°C

Frequency Range		
LO / RF		108 MHz
I/Q		DC - 0.27 MHz
Amplitude Unbalance	Typical	Maximum
	0.4 dB	0.5 dB
Phase Unbalance	Typical	Maximum
	0.8°	1°
Isolation	Typical	Minimum
LO to RF	60 dB	50 dB
Conversion Loss	Typical	Maximum
	5.5 dB	6.5 dB
(LO) Carrier Power	+10 ±2 dBm	

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	4 dBm Max
DC Offset Voltage	1 mV Typ

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Additional Specifications:

Q = I +90 degrees For RF > LO

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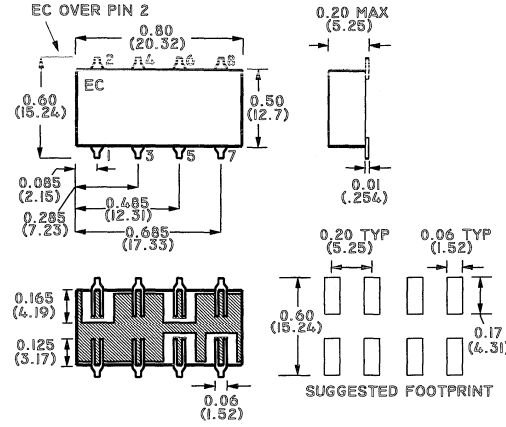
E-Series I/Q Demodulator
215 - 255 MHz EKIN2-220D

Features

SM-7-1



* Excellent phase and amplitude balance
* LO Power +10 dBm Typical
* Surface mount

Specifications @ 25°C

Frequency Range		
LO / RF		215 - 255 MHz
I/Q		DC - 0.27 MHz
Amplitude Unbalance	Typical	Maximum
	0.3 dB	0.5 dB
Phase Unbalance	Typical	Maximum
	1°	1.5°
Isolation		Minimum
LO to RF		50 dB
Conversion Loss	Typical	Maximum
	6 dB	7 dB
(LO) Carrier Power	+10 ±1 dBm	

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	2 dBm Max
DC Offset Voltage	2 mV Typ

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Additional Specifications:

Q = I - 90 degrees For RF > LO

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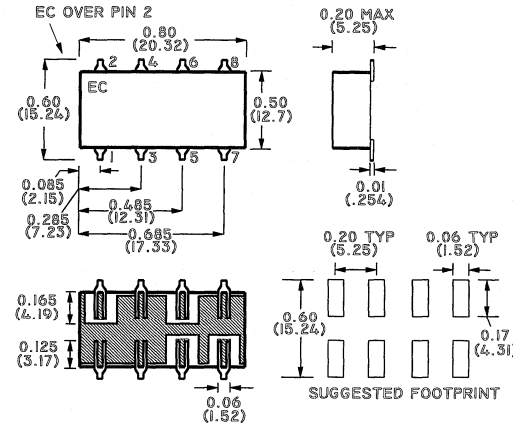
E-Series I/Q Demodulator
824 - 849 MHz EKIN2-836D

Features

SM-7-1

* Excellent phase and amplitude balance
* LO Power +10 dBm Typical
* Surface mount



Specifications @ 25°C

Frequency Range		
LO / RF		824 - 849 MHz
I/Q		DC - 20 MHz
Amplitude Unbalance	Typical	Maximum
	0.5 dB	1 dB
Phase Unbalance	Typical	Maximum
	1.5°	3°
Isolation		Minimum
LO to RF		40 dB
Conversion Loss	Typical	Maximum
	8 dB	8.5 dB
(LO) Carrier Power	+10 ±1 dBm	

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	4 dBm Max
DC Offset Voltage	5 mV Typ

Additional Specifications:

Q = I - 90 degrees For RF > LO

Specifications Subject to Change Without Notice S 0674 C

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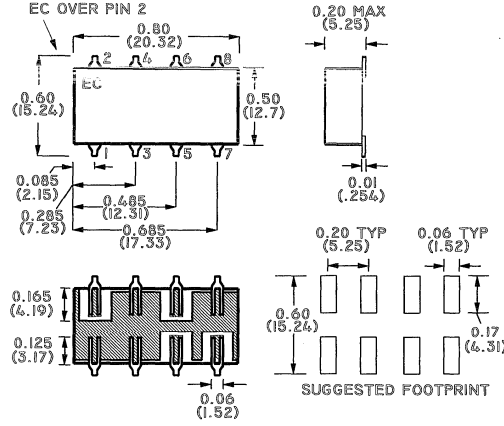
E-Series I/Q Demodulator
824 - 869 MHz

EKIN2-846D

Features

SM-7-1

* Excellent phase and amplitude balance
* LO Power +10 dBm Typical
* Surface mount



Specifications @ 25°C

Frequency Range	
LO / RF	824 - 869 MHz
I/Q	DC - 45 MHz
Amplitude Unbalance	Maximum 1.5 dB
Phase Unbalance	Maximum 5°
Isolation	Minimum
LO to RF	40 dB
Conversion Loss	Maximum 9.5 dB
(LO) Carrier Power	+10 ±1 dBm

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	4 dBm Max
DC Offset Voltage	6 mV Typ

Additional Specifications:

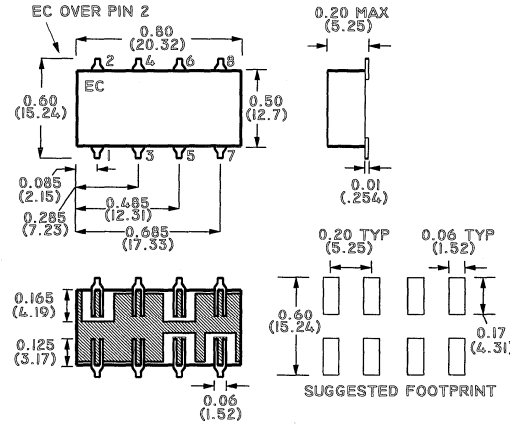
Q = I - 90 degrees For RF > LO

E-Series I/Q Demodulator
869 - 894 MHz EKIN2-880D

Features

SM-7-1

* Excellent phase and amplitude balance
* LO Power +10 dBm Typical
* Surface mount



Specifications @ 25°C

Frequency Range		
LO / RF		869 - 894 MHz
I/Q		DC - 2 MHz
Amplitude Unbalance	Typical	Maximum
	0.3 dB	0.5 dB
Phase Unbalance	Typical	Maximum
	0.6°	1°
Isolation	Typical	Minimum
LO to RF	50 dB	40 dB
Conversion Loss	Typical	Maximum
	7.5 dB	8 dB
(LO) Carrier Power	+10 ±1 dBm	

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	2 dBm Max
DC Offset Voltage	5 mV Typ

Additional Specifications:

Q = I - 90 degrees For RF > LO

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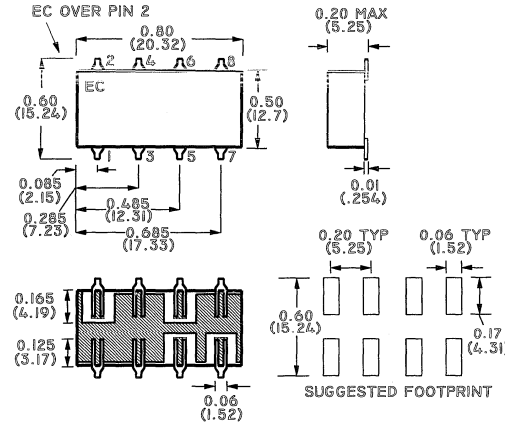
E-Series I/Q Demodulator
890 - 915 MHz

EKIN2-902D

Features

SM-7-1



* Excellent phase and amplitude balance
* LO Power +10 dBm Typical
* Surface mount

Specifications @ 25°C

Frequency Range		
LO / RF		890 - 915 MHz
I/Q		DC - 5 MHz
Amplitude Unbalance		Maximum 1 dB
Phase Unbalance		Maximum 3°
Isolation		Minimum
LO to RF		40 dB
Conversion Loss	Typical	Maximum
	7.5 dB	9 dB
(LO) Carrier Power	+10 ±1 dBm	

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	4 dBm Max
DC Offset Voltage	5 mV Typ

Additional Specifications:

Q = I - 90 degrees For RF > LO

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

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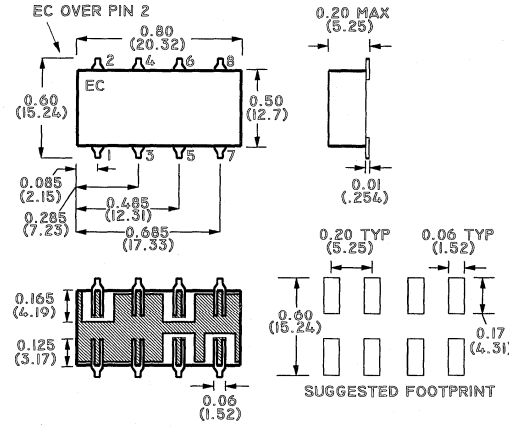
E-Series I/Q Demodulator
902 - 928 MHz EKIN2-915D

Features

SM-7-1

* Excellent phase and amplitude balance
* LO Power +10 dBm Typical
* Surface mount



Specifications @ 25°C

Frequency Range	
LO / RF	902 - 928 MHz
I/Q	DC - 10 MHz
Amplitude Unbalance	Maximum 0.75 dB
Phase Unbalance	Maximum 1.5°
Isolation	Minimum
LO to RF	40 dB
LO to I/Q	25 dB
Conversion Loss	Maximum 10 dB
(LO) Carrier Power	+10 ±1 dBm

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	4 dBm Max
DC Offset Voltage	5 mV Typ

Additional Specifications:

Q = I - 90 degrees For RF > LO

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

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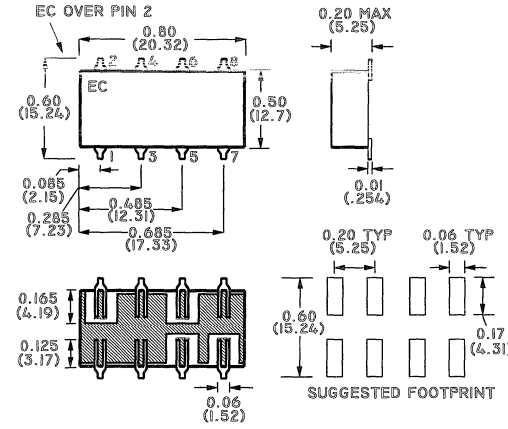
E-Series I/Q Demodulator
940 - 960 MHz EKIN2-950D

Features

SM-7-1



* Excellent phase and amplitude balance
* LO Power +10 dBm Typical
* Surface mount

Specifications @ 25°C

Frequency Range		
LO / RF		940 - 960 MHz
I/Q		DC - 2 MHz
Amplitude Unbalance	**Typical**	**Maximum**
	0.3 dB	0.5 dB
Phase Unbalance	**Typical**	**Maximum**
	0.75°	1°
Isolation	**Typical**	**Minimum**
LO to RF	60 dB	40 dB
Conversion Loss	**Typical**	**Maximum**
	9 dB	10 dB
(LO) Carrier Power	+10 dBm	

Function	Pin No.
LO	1
RF	8
I	5
Q	6
External 50 Ohms	-
Case Ground	2,3,4,7
Not Connected	-

Operating Characteristics

Operating Temp.	-10°C to +70°C
Storage Temp.	-40°C to +85°C
Impedance	50 Ohms Nominal
RF Power (1dB Compression)	4 dBm Max
DC Offset Voltage	5 mV Typ

Additional Specifications:

Q = I - 90 degrees For RF > LO

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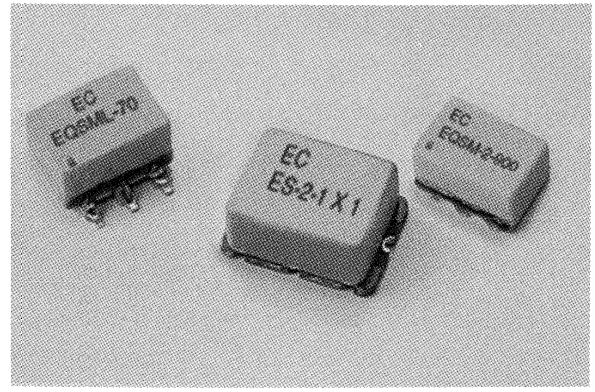
Power Dividers



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Power Dividers Selection Guide

2 Way - 0°

Model No.	Frequency MHz fL - fu	Isolation dB L Typ	M Typ	U Typ	Insertion Loss, dB L Typ	M Typ	U Typ	Phase Unbalance, ° L Max	M Max	U Max	Amplitude Unbalance, dB L Max	M Max	U Max	Case Style	Price $ Qty. (1-9)	Page Number
ESZF-2-4	0.2-1000	20	25	23	0.2	0.5	0.9	2	4	4	0.15	0.15	0.3	C-2	50.36	5-12
ES-2-1	0.1-400	20	25	25	0.2	0.4	0.6	2	3	4	0.15	0.2	0.3	R-1	9.36	5-13
ES-2-1W	1-650	20	20	25	0.3	0.5	0.7	2	3	4	0.15	0.2	0.3	R-1	15.26	5-14
ES-2-10	5-500	30	25	25	0.4	0.4	0.6	2	2	2	0.15	0.2	0.2	R-1	13.46	5-15
ES-2-4	10-1000	30	25	25	0.6	0.6	0.7	2	8	20	0.15	0.2	0.4	R-1	21.56	5-16
ES-2-7	3.8-5.8	23	23	23	0.3	0.3	0.3	2	2	2	0.5	0.5	0.5	R-16	13.46	5-17
ES-2-1-75	0.25-300	20	30	20	0.4	0.4	0.4	2	3	5	0.15	0.2	0.3	R-2	12.11	5-18
ES-2-4-752	10-850	31	32	23	0.3	0.4	0.5	2	5	10	0.1	0.2	0.5	R-2	21.56	5-19
EST-2-1	1-400	30	30	30	0.25	0.4	0.8	2	3	4	0.15	0.2	0.6	R-3	14.36	5-20
ESM-2-1	0.1-450	20	30	30	0.3	0.4	0.6	2	3	4	0.15	0.2	0.3	R-6	9.86	5-21
ESSM-2-6	5-900	25	24	22	0.2	0.4	0.7	2	3	5	0.2	0.3	0.5	SM-1	10.76	5-22
ES-2-1X1	0.1-400	20	25	25	0.2	0.4	0.6	2	3	4	0.15	0.2	0.3	SM-2	9.86	5-23
ES-2-4X1-75	10-1000	25	22	19	0.6	0.6	0.7	2	3	4	0.15	0.2	0.4	SM-2	17.96	5-25
ES-2-4X1	10-1000	25	22	19	0.6	0.6	0.7	2	3	4	0.15	0.2	0.4	SM-2	17.96	5-24
ES-2-5X1	1500-2000	20	20	20	0.8	0.8	0.8	4	4	4	0.5	0.5	0.5	SM-2	17.96	5-26
ESML-2-1	5-500	50	33	30	0.25	0.3	0.5	1	2	3	0.15	0.3	0.6	SM-24	8.06	5-27
ESML-2-7	5-750	27	27	27	0.5	0.5	0.5	3	3	3	1	1	1	SM-24	10.76	5-28
ESML-2-4	10-1000	25	23	19	0.3	0.4	0.8	1	3	5	0.15	0.2	0.4	SM-24	17.96	5-29
ESML-2-800	782-810	29	29	29	0.2	0.2	0.2	5	5	5	0.5	0.5	0.5	SM-24	10.76	5-30
ESC-2-1	0.1-400	25	30	25	0.3	0.2	0.4	2	2	3	0.15	0.2	0.3	SM-3	9.40	5-31
ESCP-2-1A	1-550	25	25	25	0.3	0.3	0.7	2	2	3	0.15	0.2	0.4	SM-3	9.40	5-32
ESSM-2-3-B	870-905	21	21	21	0.22	0.22	0.22	2	2	2	0.1	0.1	0.1	SM-34	21.55	5-33

2 Way - 180°

Model No.	Frequency MHz fL - fu	Isolation dB L Typ	M Typ	U Typ	Insertion Loss, dB L Typ	M Typ	U Typ	Phase Unbalance, ° L Max	M Max	U Max	Amplitude Unbalance, dB L Max	M Max	U Max	Case Style	Price $ Qty. (1-9)	Page Number
ESCJ-2-1	1-200	35	35	30	0.75	0.5	0.75	2	2.5	4	0.15	0.15	0.3	R-2	21.56	5-34
ESCJ-2-1X1	5-200	35	35	35	0.7	0.7	0.7	4	4	8	0.3	0.3	0.3	SM-4	9.86	5-35

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Power Dividers Selection Guide

2 Way - 90°

Model No.	Frequency MHz fL - fu	Isolation dB L Typ	Isolation dB M Typ	Isolation dB U Typ	Insertion Loss, dB L Typ	Insertion Loss, dB M Typ	Insertion Loss, dB U Typ	Phase Unbalance, ° L Max	Phase Unbalance, ° M Max	Phase Unbalance, ° U Max	Amplitude Unbalance, dB L Max	Amplitude Unbalance, dB M Max	Amplitude Unbalance, dB U Max	Case Style	Price $ Qty. (1-9)	Page Number
ESQ-2-900	820-980	20	20	20	0.7	0.7	0.7	4	4	4	1	1	1	R-1	13.46	5-36
ESQ-2-4.0	3.5-4.5	36	36	36	0.4	0.4	0.4	3	3	3	1.5	1.5	1.5	R-2	13.46	5-37
ESQ-2-6.5	5.8-7	30	30	30	0.4	0.4	0.4	3	3	3	1.2	1.2	1.2	R-2	17.96	5-38
ESQ-2-10.5	9-11	25	25	25	0.4	0.4	0.7	3	3	3	1.2	1.2	1.2	R-2	13.46	5-39
ESQ-2-26	14-30	25	25	25	0.4	0.4	0.4	3	3	3	1.5	1.5	1.5	R-2	21.56	5-40
ESQ-2-17.5	16-19	28	28	28	0.6	0.6	0.6	3	3	3	1.6	1.6	1.6	R-2	13.46	5-41
ESQ-2-21.4	20-23	30	30	30	0.4	0.4	0.4	3	3	3	1.2	1.2	1.2	R-2	13.46	5-42
ESQ-2-50	25-50	30	30	30	0.3	0.3	0.3	3	3	3	1.5	1.5	1.5	R-2	21.56	5-43
ESQ-2-88	30-90	23	23	23	0.6	0.6	0.6	3	3	3	1.2	1.2	1.2	R-2	21.56	5-44
ESQ-2-70	40-70	30	30	30	0.3	0.3	0.3	3	3	3	1.5	1.5	1.5	R-2	21.56	5-45
ESQ-2-90	55-90	30	30	30	0.3	0.3	0.3	3	3	3	1.2	1.2	1.2	R-2	21.56	5-46
ESQ-2-120	80-120	25	25	25	0.3	0.3	0.3	3	3	3	1.5	1.5	1.5	R-2	21.56	5-47
ESQ-2-176	104-176	22	22	22	0.4	0.4	0.4	1	1	1	1.2	1.2	1.2	R-2	21.56	5-48
ESQ-2-180	120-180	23	23	23	0.3	0.3	0.3	4	4	4	1.2	1.2	1.2	R-2	21.56	5-49
ESQ-2-175	150-200	30	30	30	0.3	0.3	0.3	3	3	3	1.5	1.5	1.5	R-2	21.56	5-50
ESQ-2-400	250-400	23	23	23	0.5	0.5	0.5	4	4	4	1.5	1.5	1.5	R-2	21.56	5-51
EQSM-2-10.7	10.7	37	37	37	0.1	0.1	0.1	1.5	1.5	1.5	0.2	0.2	0.2	SM-1	12.56	5-52
EQSM-2-21.4	20-23	30	30	30	0.4	0.4	0.4	3	3	3	1.2	1.2	1.2	SM-1	12.56	5-53
EQSM-2-70	65-75	28	28	28	0.5	0.5	0.5	3	3	3	1	1	1	SM-1	12.56	5-54
EQSM-2-130	120-140	25	25	25	0.15	0.15	0.15	3	3	3	0.8	0.8	0.8	SM-1	12.56	5-55
EQSM-2-370	365-375	20	20	20	0.8	0.8	0.8	4	4	4	0.8	0.8	0.8	SM-1	12.56	5-56
EQSM-2-478	463-493	15	15	15	0.2	0.2	0.2	3	3	3	0.6	0.6	0.6	SM-1	12.56	5-57
EQSM-2-600	500-700	19	19	19	0.5	0.5	0.5	5	5	5	1.5	1.5	1.5	SM-1	12.56	5-58
EQSM-820	810-830	16	16	16	0.4	0.4	0.4	3	3	3	0.5	0.5	0.5	SM-1	12.56	5-59
EQSM-980	820-980	22	22	22	0.15	0.15	0.15	5	5	5	1	1	1	SM-1	12.56	5-60
EQSM-2-900	820-980	20	20	20	0.7	0.7	0.7	7	7	7	1	1	1	SM-1	12.56	5-61
EQSM-905	859-905	18.5	18.5	18.5	0.4	0.4	0.4	3	3	3	0.5	0.5	0.5	SM-1	12.56	5-62
EQSML-70	65-75	30	30	30	0.1	0.1	0.1	3	3	3	1.5	1.5	1.5	SM-24	8.96	5-63
EQSML-980	820-980	22	22	22	0.15	0.15	0.15	5	5	5	1	1	1	SM-24	12.56	5-64
EQSML-905	869-895	18.5	18.5	18.5	0.4	0.4	0.4	3	3	3	0.5	0.5	0.5	SM-24	12.56	5-65
ESCQ-2-10.5	9-11	30	30	30	0.4	0.4	0.4	3	3	3	1.2	1.2	1.2	SM-3	13.46	5-66
ESCQ-2-13	10-16	20	20	20	0.8	0.8	0.8	3	3	3	0.9	0.9	0.9	SM-3	13.46	5-67
ESCQ-2-50	25-50	30	30	30	0.5	0.5	0.5	4	4	4	1.5	1.5	1.5	SM-3	13.46	5-68
ESCQ-2-90	55-90	26	26	26	0.2	0.2	0.2	3	3	3	1.2	1.2	1.2	SM-3	12.56	5-69
ESCQ-2-180	120-180	23	23	23	0.3	0.3	0.3	3	3	3	1.2	1.2	1.2	SM-3	21.56	5-70
ESCQ-2-250	150-250	16	16	16	0.7	0.7	0.7	3	3	3	1.2	1.2	1.2	SM-3	21.56	5-71
ESCQ-2-400	250-400	19	19	19	0.5	0.5	0.5	4	4	4	1.2	1.2	1.2	SM-3	13.46	5-72

Note: For **2 Way - 90°** Insertion Loss, Avg. of Coupled Outputs less 3dB.

2 Way-90° continued next page

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Power Dividers Selection Guide

2 Way - 90°

Model No.	Frequency MHz fL - fu	Isolation dB L Typ	M Typ	U Typ	Insertion Loss, dB L Typ	M Typ	U Typ	Phase Unbalance, ° L Max	M Max	U Max	Amplitude Unbalance, dB L Max	M Max	U Max	Case Style	Price $ Qty. (1-9)	Page Number
ESQ-2-10.5X1	10.7-10.7	30	30	30	0.2	0.2	0.2	2	2	2	0.7	0.7	0.7	SM-4	17.96	5-73
ESQ-2-70X1	40-70	30	30	30	0.3	0.3	0.3	3	3	3	1.5	1.5	1.5	SM-4	21.56	5-74
ESQ-2-90X1	55-90	30	30	30	0.3	0.3	0.3	3	3	3	1.2	1.2	1.2	SM-4	21.56	5-75
ESQ-2-120X1	80-120	25	25	25	0.3	0.3	0.3	3	3	3	1.5	1.5	1.5	SM-4	17.96	5-76
ESQ-2-180X1	120-180	23	23	23	0.3	0.3	0.3	4	4	4	1.2	1.2	1.2	SM-4	17.96	5-77
EQSM-340	330-350	21	21	21	0.5	0.5	0.5	5	5	5	1.5	1.5	1.5	SM-4	12.56	5-78
ESQ-2-450X1	350-450	18	18	18	0.6	0.6	0.6	5	5	5	1.5	1.5	1.5	SM-4	21.56	5-79
EQSM-360	355-365	19	19	19	0.4	0.4	0.4	5	5	5	1.5	1.5	1.5	SM-4	12.56	5-80
EQSM-460	450-470	21	21	21	0.4	0.4	0.4	5	5	5	1	1	1	SM-4	12.56	5-81
ESQ-2-900X1	820-980	18	18	18	0.6	0.6	0.6	4	4	4	1.2	1.2	1.2	SM-4	13.46	5-82

Note: For **2 Way - 90°** Insertion Loss, Avg. of Coupled Outputs less 3dB.

3 Way - 0°

Model No.	Frequency MHz fL - fu	Isolation dB L Typ	M Typ	U Typ	Insertion Loss, dB L Typ	M Typ	U Typ	Phase Unbalance, ° L Max	M Max	U Max	Amplitude Unbalance, dB L Max	M Max	U Max	Case Style	Price $ Qty. (1-9)	Page Number
ESZF-3-1	1-500	30	30	25	0.4	0.5	0.8	2	3	4	0.2	0.3	0.4	C-8	46.76	5-83
ES-3-1	1-200	45	40	40	0.6	0.4	0.6	1	2	4	0.15	0.2	0.3	R-1	21.56	5-84
ES-3-1W	5-500	25	31	25	0.4	0.4	0.8	6	14	20	0.1	0.3	0.6	R-1	32.36	5-85
ESCP-3-1	1-300	30	25	20	0.3	0.4	0.7	1	2	4	0.2	0.5	1	SM-26	15.26	5-86
ES-3-1X1	1-200	45	40	40	0.6	0.4	0.6	1	2	4	0.15	0.2	0.3	SM-4	21.56	5-87
ESSM-3-1W	5-500	25	22	18	0.4	0.6	1	2	3	6	0.1	0.3	0.75	SM-4	13.46	5-88

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Power Divider Selection Guide

4-Way - 0°

Model No.	Frequency MHz fL - fu	Isolation dB L Typ	Isolation dB M Typ	Isolation dB U Typ	Insertion Loss, dB L Typ	Insertion Loss, dB M Typ	Insertion Loss, dB U Typ	Phase Unbalance, ° L Max	Phase Unbalance, ° M Max	Phase Unbalance, ° U Max	Amplitude Unbalance, dB L Max	Amplitude Unbalance, dB M Max	Amplitude Unbalance, dB U Max	Case Style	Price $ Qty. (1-9)	Page Number
ES-4-5	5-1000	25	20	20	0.5	1	1.5	1	5	10	0.2	0.7	1	R-1	40.91	5-89
ES-4-1	0.1-200	33	30	27	0.4	0.5	0.7	4	6	8	0.15	0.2	0.25	R-2	32.36	5-90
ES-4-3	0.25-250	33	30	27	0.4	0.5	0.7	4	6	8	0.15	0.2	0.25	R-2	28.76	5-91
ES-4-1W	1-500	29	27	25	0.4	0.5	0.8	1	3	5	0.2	0.3	0.5	R-2	35.06	5-92
ESCP-4-3-2	10-80	30	30	30	0.3	0.3	0.3	6	6	6	0.3	0.3	0.3	SM-26	28.76	5-93
ES-4-6	824-895	22	22	22	1.7	1.7	1.7	5	5	5	0.5	0.5	0.5	SM-42	21.56	5-94

5-Way - 0°

Model No.	Frequency MHz fL - fu	Isolation dB L Typ	Isolation dB M Typ	Isolation dB U Typ	Insertion Loss, dB L Typ	Insertion Loss, dB M Typ	Insertion Loss, dB U Typ	Phase Unbalance, ° L Max	Phase Unbalance, ° M Max	Phase Unbalance, ° U Max	Amplitude Unbalance, dB L Max	Amplitude Unbalance, dB M Max	Amplitude Unbalance, dB U Max	Case Style	Price $ Qty. (1-9)	Page Number
ES-5-1	1-300	25	23	20	0.2	0.6	1.5	2	4	8	0.2	0.3	0.6	R-9	58.00	5-95

6-Way - 0°

Model No.	Frequency MHz fL - fu	Isolation dB L Typ	Isolation dB M Typ	Isolation dB U Typ	Insertion Loss, dB L Typ	Insertion Loss, dB M Typ	Insertion Loss, dB U Typ	Phase Unbalance, ° L Max	Phase Unbalance, ° M Max	Phase Unbalance, ° U Max	Amplitude Unbalance, dB L Max	Amplitude Unbalance, dB M Max	Amplitude Unbalance, dB U Max	Case Style	Price $ Qty. (1-9)	Page Number
ES-6-1	1-175	30	26	26	0.5	0.7	1	4	6	12	0.2	0.4	0.8	R-9	67.46	5-96
ES-6-1X1	10-300	35	30	25	0.4	0.6	0.8	2	4	8	0.2	0.3	0.6	R-9	67.46	5-97

8-Way - 0°

Model No.	Frequency MHz fL - fu	Isolation dB L Typ	Isolation dB M Typ	Isolation dB U Typ	Insertion Loss, dB L Typ	Insertion Loss, dB M Typ	Insertion Loss, dB U Typ	Phase Unbalance, ° L Max	Phase Unbalance, ° M Max	Phase Unbalance, ° U Max	Amplitude Unbalance, dB L Max	Amplitude Unbalance, dB M Max	Amplitude Unbalance, dB U Max	Case Style	Price $ Qty. (1-9)	Page Number
ES-8-1	0.5-175	30	30	25	0.8	0.8	1	1	2.5	5	0.2	0.3	0.5	R-9	67.46	5-98

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Power Divider Specifications Checklist

If your particular requirements are not met with a M/A-COM catalog item, please complete the checklist below and mail, phone, or fax it to M/A-COM Eurotec, Sales and Marketing or your local Sales Office.

Application:
Industrial ..... Commercial ..... Other .....
Description: .....
.....
Parameters important for application: .....
.....

Electrical:
No. of Way ..... ☐ Splitter ☐ Combiner
Phase ☐ 0° ☐ 90° ☐ 180°
Frequency Range .....Mhz
Phase Unbalance Max. .....deg
Amplitue Unbalance Max. .....dB
Isolation between ports Min. .....dB
VSWR or Return Loss (dB)

☐ 50 Ohms ☐ 75 Ohms ☐ Other
Input..... Ouput.....
Insertion Loss Max. .....dB
Operating Temperature: .....°C

Enviornmental Requirements:
.....
.....
.....
.....
.....
.....
.....

Internal load dissipation .....watt
Power rating Max. .....watt

Mechanical:
Standard Case Style: ..... (for outline drawings see Table of Contents)

PC Board Mounting

☐ Plug-in ☐ Surface-Mount

Coaxial Connector

☐ BNC ☐ TNC
☐ SMA ☐ N ☐ Other

Special Requirements: .....
.....

Name: ..... Title: .....

Company: ..... Dept: .....

Company Address: .....

Phone: ..... Fax: .....

Power Divider Terminology

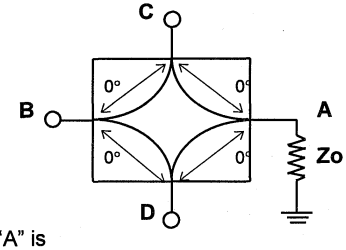
INTRODUCTION: A power divider is ideally a lossless reciprocal device which can also perform vector summation of two or more signals and thus is sometimes called a power combiner or summer. Two forms of power dividers are considered in this discussion; binary and N-way. A binary power divider is composed of one or more terminated 180° hybrids and may have 2,4,8,16,.....,2N outputs. An N-way power divider has an odd number of outputs, generally 3, and utilises a unique patented transformer circuit of frequencies below 1 GHz. Although power dividers could be composed of 90° hybrids, the term normally refers to a device that splits an input signal into two or more in-phase outputs. The purpose of this article is to provide the designer with basic information describing the function of these devices and to define the performance parameters and trade-off critical to specifying a power divider.

FUNCTIONAL DESCRIPTION

Binary Power Dividers: A binary power divider is in fact an internally terminated 180° hybrid. Figure 1 shows the standard diagram for a 180° hybrid with a termination at Port A.

Physically, the 2-way power divider appears to be a three terminal device, since the Zo termination at Port A is normally mounted inside the package. Also, although a conventional 180° hybrid can be used as a power divider, the usual form of 2-way power divider does not have a Zo impedance level at all four ports.

Higher order binary power dividers, such as 4-way and 8-way power dividers, are realised by cascading 2-way power dividers of various configurations. The functional diagram for a 4-way divider is shown in Figure 2 while the 8-way diagram would simply have the "B" port of additional 2-way dividers connected at ports 1, 2, 3 and 4.



Port "A" is internally terminated.

Figure 1. 2-Way, In-Phase (0°) Power Divider/Summer.

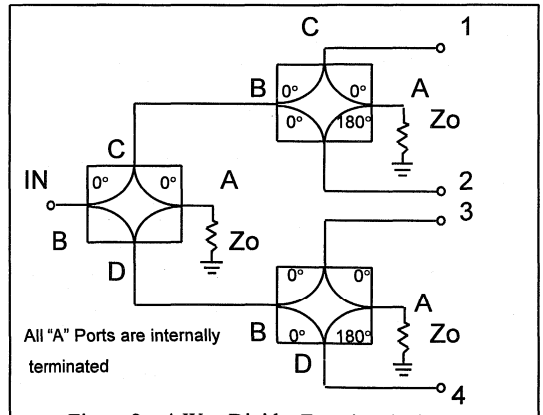
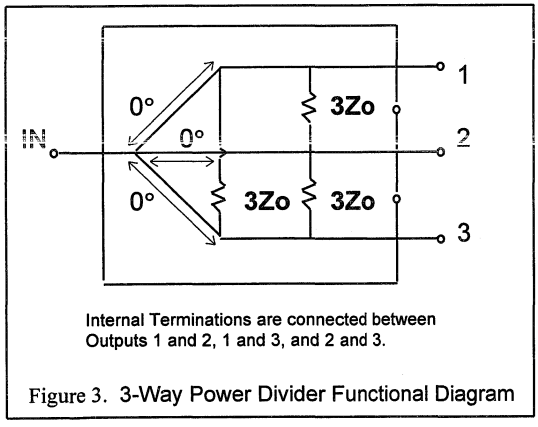


Figure 2. 4-Way Divider Functional Diagram

N-Way Power Dividers: Power dividers having an odd number of outputs (3, 5, 7, etc.) are sometimes classified as N-way power dividers. Because of the complexity of higher order circuits, the 3-way power divider is the only type of this class of divider normally used. The circuit actually used to realise a true 3-way divider, as opposed to a terminated 4-way power divider, is a unique transformer circuit covered by U.S. patent number 3,428,920. It is beyond the scope of this article to review in detail the transformer operation of this circuit, however, Figure 3 shows a functional diagram of a 3-way power divider.



Internal Terminations are connected between Outputs 1 and 2, 1 and 3, and 2 and 3.

Figure 3. 3-Way Power Divider Functional Diagram

The transformer circuit is interconnected in such a manner as to produce three mutually isolated outputs. Three internal terminations of value 3Zo must be connected between ports 1 and 2, 1 and 3, and 2 and 3 in order to maintain port match and port-to-port isolation.

PERFORMANCE PARAMETERS

The critical parameters in selecting a power divider are normally frequency range, insertion loss and VSWR. In addition to these parameters the following two parameters are often specified and are related to the power rating of the internal load resistors.

Matched Power Rating or Input Power
This is the highest power level that can be applied to the input and still maintain other performance limits. It is stated with Zo termination on all outputs to avoid reflected signals from unbalanced loads which may exceed the limit of power dissipation in the internal terminations.

Internal Load Dissipation
This is simply the power rating of any one of the internal terminations. These two parameters are related and the input power rating is normally several times larger than the internal load dissipation. The reason for this is intuitively obvious since most of the input power is delivered to the output loads, not the internal termination.

There are three considerations affecting the amount of input power that a power divider can withstand.

1. Insertion Loss
The first consideration is the total power dissipated in the power divider. Total power dissipation in a power divider under matched conditions can be determined to a reasonable approximation from the insertion loss and the known input power as follows:

Insertion Loss (dB) = 10 log $P_{IN}P_{OUT}$

Therefore:

$$P_{OUT} = \frac{P_{IN}}{10^{(\text{Insertion Loss} / 10)}}$$

$$P_{DISSIPATED} = P_{IN} - P_{OUT}$$

$$P_{DISSIPATED} = P_{IN} - \frac{P_{IN}}{10^{(\text{Insertion Loss} / 10)}}$$

As an example, consider a power divider with the following conditions

Insertion Loss = 0.5 dB

P_{IN} = 2 Watts

$$P_{DISSIPATED} = 2 - \frac{2}{10^{0.5/10}}$$

= 0.218 Watts

Most of this power will be dissipated in the wire and ferrite cores making up the transformer circuits and not in the internal load.

2. Amplitude Balance

In a power divider operating under matched conditions, a second consideration for input power dissipation is the dissipated power in the internal load. If we consider a 2-Way power divider similar to that shown in Figure 1, we observe that ideally no power would be dissipated in the 2 Zo load between Ports C and D, because the voltages at C and D would be equal. In practice, a small differential may occur because of imperfect Amplitude Balance. The approximate dissipation due to this unbalance can shown to be

$$P_{INT\ LOAD} \cong P_{OUT}\,(10^{(\text{Amp Bal} / 20)} - 1)$$

A very small amount of power normally is dissipated due to this effect. Consider the following example:
Let

Amplitude Balance = 0.25 dB

P_{OUT} = 2 Watts

$$P_{INT\ LOAD} \cong 1/2\,(10^{(0.25/20)} - 1)$$

= 0.4 mW

3. When determining input power limits, the third and perhaps most important case to consider is the condition of mismatched loads at the outputs of the power divider. Reflections from these mismatches can cause a considerably larger voltage differential to appear across the internal load. If the VSWR of the two loads is K1 and K2, the limit on the input power P_{IN}, is given in the following:

$$P_{IN} \leq \frac{\text{Internal Load Rating (Watts)}}{\left(\frac{K1 - 1}{K1 + 1}\right)^2 + \left(\frac{K2 - 1}{K2 + 1}\right)^2}$$

As an example, if the internal load rating is 0.5 Watts and the VSWR of K1 and K2 is 2:1 then :

$$P_{IN} \leq \frac{0.5}{\left(\frac{2-1}{2+1}\right)^2 + \left(\frac{2-1}{2+1}\right)^2}$$

$$\leq 2.25 \text{ Watts}$$

This is the worst case formula, which assumes that the two load reflections are out of phase at the output port. If they are identical impedances, P_{IN} may be several times larger without causing damage.

From the preceding discussion of power divider input power ratings, we can draw two conclusions:

1. Under matched loading conditions (Zo terminations at all ports) the input power is limited by heating effects in the ferrite transformers, not by the internal load dissipation. Absolute maximum temperatures for ferrite core transformers are limited by the curie temperature of the ferrite, generally in 130°C to 500°C range, and the temperature rating of the magnet wire which is usually 130°C. It is advisible to stay well below these temperature limits (20°C or more) to avoid performance degradation, particularly increased insertion loss. The actual temperature rise in the ferrite core is dependent on the heat transfer path from the core to the heat sink or surrounding air. This determination involves measuring or calculating the thermal resistance, q, expressed in °C / Watt of this path. Thermal resistance will be highly dependent on the mounting of the power divider as well as its internal construction. For this reason, manufacturers normally provide a very conservative maximum input power rating that applies under absolute worst case conditions with no specific heatsinking of the unit. In many instances power several times higher than this rating can be applied with little, if any, performance degradation.

2. Under conditions where mismatches are present at the power divider output, the internal power dissipation rating may limit the input power that can be applied. A simple worst case calculation can be performed to determine if this is the case using the formula provided.

A final point relative to power ratings that should be considered is the application as a power summer. In this case signals are applied to the ports we have been calling outputs (for example Ports C and D in Figure 1) with the vector sum appearing at the input or S port (Port B in Figure 1). In this case equal signals are normally applied, and little if any power is dissipated in the internal load. A possible condition may occur where one or more of the signal sources fails or is removed. For example, if two equal sources are applied at Ports C and D and the source at D fails, 50% of the power supplied by the source at C will be dissipated in the 2 Zo internal load. Thus the power injected at each port should not exceed twice the rating of the internal load to avoid this condition.

Conclusions

Power dividers are often considered the simplest of the RF devices that may be required in designing a system, and in some respects this is true. Despite the functional simplicity of power dividers and generally rugged and reliable components used in their construction, their specification and

application can still lead to unexpected problems.

In this article we have presented some basic information to give the system designer insight into the internal construction of power dividers and how this influences the operation of the device and its function in the real world of imperfect matches and less than ideal physical installation. On this latter point, the consideration of power dividers was dealt with both analytically and in terms of expected results in the normally mounted configuration. The devices described in this article are generally intended for receive rather than transmit applications and are thus quite conservatively rated for power handling. Care must be taken, however, in using them at higher powers because both internal designs and external mountings provisions are not optimally suited for heat transfer.

Many of the points made and expressions derived for the operation of 180° hybrids can be applied to power dividers, particularly 2-way power dividers, and questions that may arise pertaining to points not covered in this article, such as isolation in the presence of mismatch or other signal flow relationships, can be analyzed by reference to the tables contained in that article.

ISO 9001
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E-Series 2-Way 0° Power Divider
0.2 - 1000 MHz

ESZF-2-4

Features

* 2 Way
* 0 Degree
* Connectorized

Specifications @ 25°C

Frequency Range	0.2 - 1000 MHz
Insertion Loss	**Typical**	**Maximum**
0.2 - 2 MHz	0.2 dB	0.5 dB
2 - 500 MHz	0.5 dB	1 dB
500 - 1000 MHz	0.9 dB	1.2 dB
Isolation	**Typical**	**Minimum**
0.2 - 2 MHz	20 dB	15 dB
2 - 500 MHz	25 dB	20 dB
500 - 1000 MHz	23 dB	18 dB
Amplitude Unbalance		**Maximum**
0.2 - 2 MHz		0.15 dB
2 - 500 MHz		0.15 dB
500 - 1000 MHz		0.3 dB
Phase Unbalance		**Maximum**
0.2 - 2 MHz		2°
2 - 500 MHz		4°
500 - 1000 MHz		4°

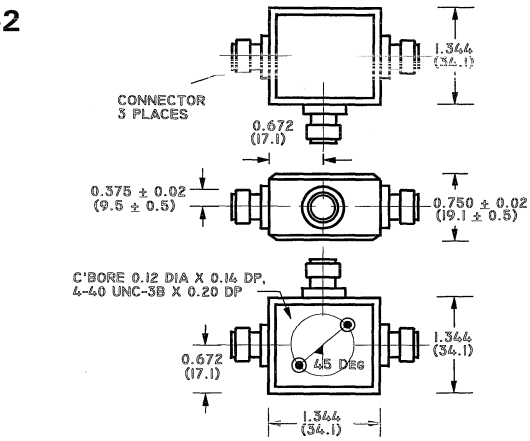
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

C-2



NOTE: .XXX = ± 0.015
(0.X = ± 0.4)

WEIGHT (APPROX) : 2.5 OUNCES 71 GRAMS

Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	-
Case Ground	-
Input	3
Port 1	1
Port 2	2

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series 2-Way 0° Power Divider
0.1 - 400 MHz ES-2-1

Features

* 2 Way
* 0 Degree

Specifications @ 25°C

Frequency Range		0.1 - 400 MHz
Insertion Loss	**Typical**	**Maximum**
0.1 - 1 MHz	0.2 dB	0.6 dB
1 - 200 MHz	0.4 dB	0.75 dB
200 - 400 MHz	0.6 dB	1 dB
Isolation	**Typical**	**Minimum**
0.1 - 1 MHz	20 dB	15 dB
1 - 200 MHz	25 dB	20 dB
200 - 400 MHz	25 dB	20 dB
Amplitude Unbalance		**Maximum**
0.1 - 1 MHz		0.15 dB
1 - 200 MHz		0.2 dB
200 - 400 MHz		0.3 dB
Phase Unbalance		**Maximum**
0.1 - 1 MHz		2°
1 - 200 MHz		3°
200 - 400 MHz		4°

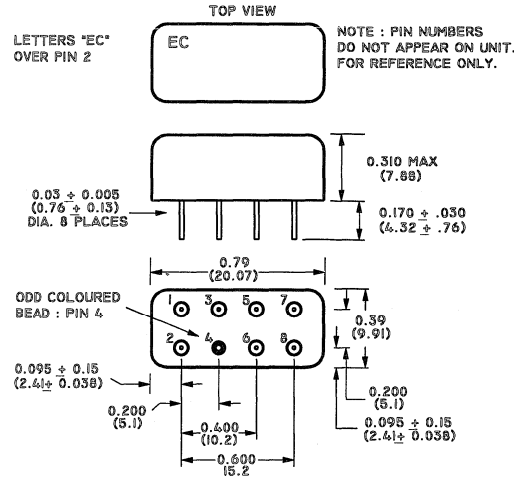
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	2,3,4,7,8
Case Ground	2,3,4,7,8
Input	1
Port 1	5
Port 2	6

ISO 9001
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E-Series 2-Way 0° Power Divider
1 - 650 MHz

ES-2-1W

Features

* 2 Way
* 0 Degree

Specifications @ 25°C

Frequency Range		1 - 650 MHz
Insertion Loss	**Typical**	**Maximum**
1 - 10 MHz	0.3 dB	0.6 dB
10 - 325 MHz	0.5 dB	0.9 dB
325 - 650 MHz	0.7 dB	1 dB
Isolation	**Typical**	**Minimum**
1 - 10 MHz	20 dB	15 dB
10 - 325 MHz	20 dB	15 dB
325 - 650 MHz	25 dB	15 dB
Amplitude Unbalance		**Maximum**
1 - 10 MHz		0.15 dB
10 - 325 MHz		0.2 dB
325 - 650 MHz		0.3 dB
Phase Unbalance		**Maximum**
1 - 10 MHz		2°
10 - 325 MHz		3°
325 - 650 MHz		4°

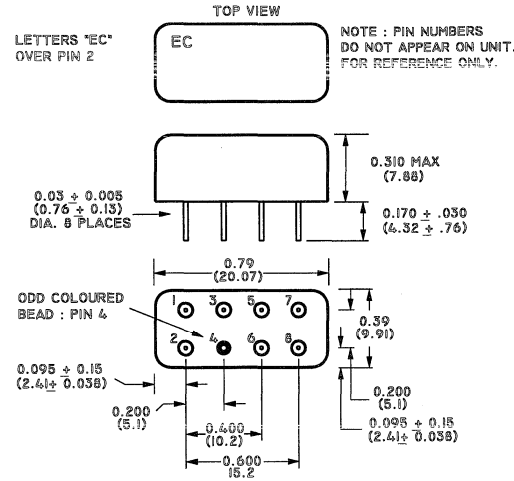
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	2,3,4,7,8
Case Ground	2,3,4,7,8
Input	1
Port 1	5
Port 2	6

ISO 9001
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E-Series 2-Way 0° Power Divider
5 - 500 MHz ES-2-10

Features

* 2 Way
* 0 Degree

Specifications @ 25°C

Frequency Range		5 - 500 MHz
Insertion Loss	**Typical**	**Maximum**
5 - 50 MHz	0.4 dB	0.6 dB
50 - 250 MHz	0.4 dB	0.6 dB
250 - 500 MHz	0.6 dB	1 dB
Isolation	**Typical**	**Minimum**
5 - 50 MHz	30 dB	20 dB
50 - 250 MHz	25 dB	20 dB
250 - 500 MHz	25 dB	18 dB
Amplitude Unbalance		**Maximum**
5 - 50 MHz		0.15 dB
50 - 250 MHz		0.2 dB
250 - 500 MHz		0.2 dB
Phase Unbalance		**Maximum**
5 - 500 MHz		2°

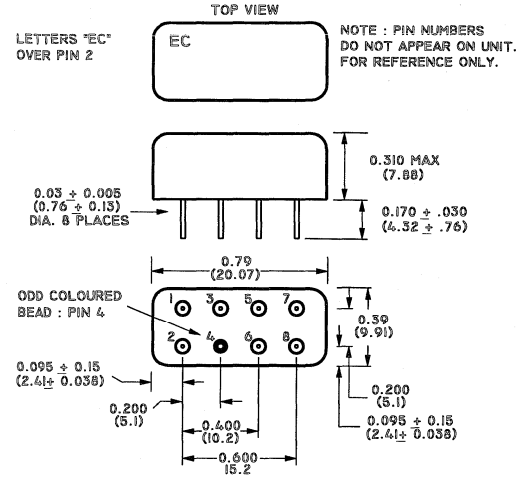
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	2,3,4,7,8
Case Ground	2,3,4,7,8
Input	1
Port 1	5
Port 2	6

ISO 9001
CERTIFIED

E-Series 2-Way 0° Power Divider
10 - 1000 MHz

ES-2-4

Features

* 2 Way
* 0 Degree

Specifications @ 25°C

Frequency Range		10 - 1000 MHz
Insertion Loss	**Typical**	**Maximum**
10 - 100 MHz	0.6 dB	1 dB
100 - 500 MHz	0.6 dB	1 dB
500 - 1000 MHz	0.7 dB	1.2 dB
Isolation	**Typical**	**Minimum**
10 - 100 MHz	30 dB	25 dB
100 - 500 MHz	25 dB	18 dB
500 - 1000 MHz	25 dB	18 dB
Amplitude Unbalance		**Maximum**
10 - 100 MHz		0.15 dB
100 - 500 MHz		0.2 dB
500 - 1000 MHz		0.4 dB
Phase Unbalance		**Maximum**
10 - 100 MHz		2°
100 - 500 MHz		8°
500 - 1000 MHz		20°

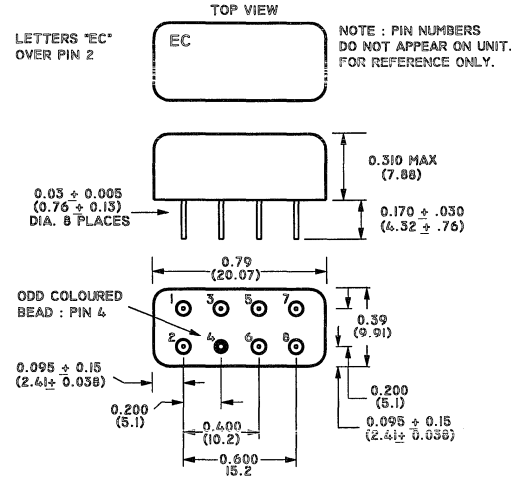
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	2,3,4,7,8
Case Ground	2,3,4,7,8
Input	1
Port 1	5
Port 2	6

ISO 9001
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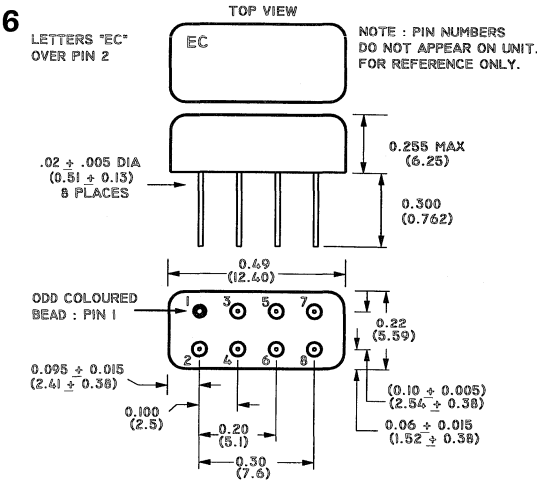
E-Series 2-Way 0° Power Divider
3.8 - 5.8 MHz ES-2-7

Features

* 2 Way
* 0 Degree

R-16



Specifications @ 25°C

Frequency Range	3.8 - 5.8 MHz
Insertion Loss	**Typical**	**Maximum**
3.8 - 5.8 MHz	0.3 dB	0.7 dB
Isolation	**Typical**	**Minimum**
3.8 - 5.8 MHz	23 dB	17 dB
Amplitude Unbalance		**Maximum**
3.8 - 5.8 MHz		0.5 dB
Phase Unbalance		**Maximum**
3.8 - 5.8 MHz		2°

Function	Pin No.
Not Connected	4,7,8
External 50 Ohms	-
Ground	2,3
Case Ground	2
Input	1
Port 1	5
Port 2	6

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Additional Specifications

I/P Return Loss: 30dB Typ 16dB Min O/P Return Loss: 18dB Typ 16dB Min

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E-Series 2-Way 0° Power Divider
0.25 - 300 MHz ES-2-1-75

Features

* 2 Way
* 0 Degree

Specifications @ 25°C

Frequency Range		0.25 - 300 MHz
Insertion Loss	**Typical**	**Maximum**
0.25 - 2.5 MHz	0.4 dB	0.75 dB
2.5 - 150 MHz	0.4 dB	0.75 dB
150 - 300 MHz	0.4 dB	1 dB
Isolation	**Typical**	**Minimum**
0.25 - 2.5 MHz	20 dB	15 dB
2.5 - 150 MHz	30 dB	20 dB
150 - 300 MHz	20 dB	15 dB
Amplitude Unbalance		**Maximum**
0.25 - 2.5 MHz		0.15 dB
2.5 - 150 MHz		0.2 dB
150 - 300 MHz		0.3 dB
Phase Unbalance		**Maximum**
0.25 - 2.5 MHz		2°
2.5 - 150 MHz		3°
150 - 300 MHz		5°

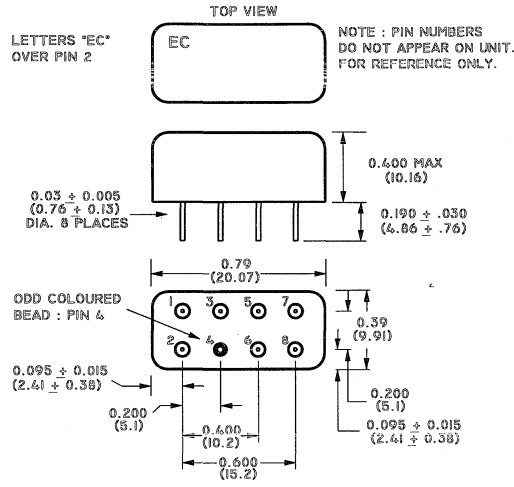
Operating Characteristics

Impedance	75 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	-
External 75 Ohms	-
Ground	2,3,4,7,8
Case Ground	2,3,4,7,8
Input	1
Port 1	5
Port 2	6

ISO 9001
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E-Series 2-Way 0° Power Divider
10 - 850 MHz ES-2-4-752

Features

* 2 Way
* 0 Degree

Specifications @ 25°C

Frequency Range		10 - 850 MHz
Insertion Loss	**Typical**	**Maximum**
10 - 100 MHz	0.3 dB	0.5 dB
100 - 425 MHz	0.4 dB	0.6 dB
425 - 850 MHz	0.5 dB	1 dB
Isolation	**Typical**	**Minimum**
10 - 100 MHz	31 dB	20 dB
100 - 425 MHz	32 dB	23 dB
425 - 850 MHz	23 dB	15 dB
Amplitude Unbalance		**Maximum**
10 - 100 MHz		0.1 dB
100 - 425 MHz		0.2 dB
425 - 850 MHz		0.5 dB
Phase Unbalance		**Maximum**
10 - 100 MHz		2°
100 - 425 MHz		5°
425 - 850 MHz		10°

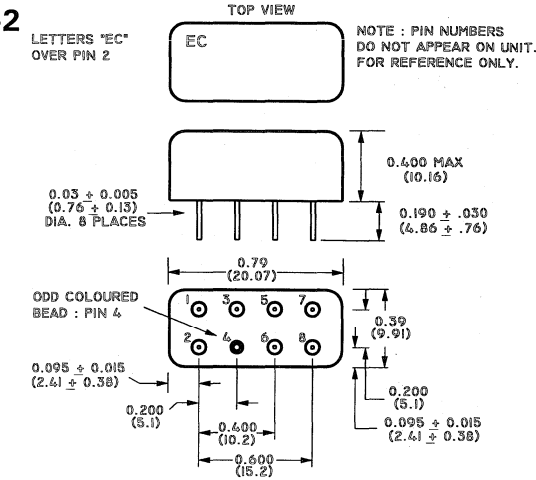
Operating Characteristics

Impedance	75 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	-
External 75 Ohms	-
Ground	2,3,4,7,8
Case Ground	2,3,4,7,8
Input	1
Port 1	5
Port 2	6

Specifications Subject to Change Without Notice S 0474 B

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DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

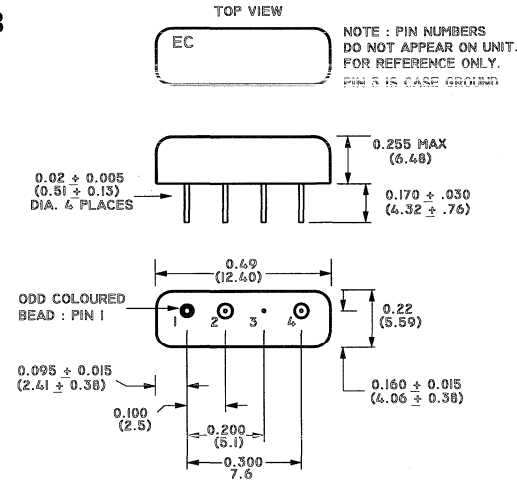
E-Series 2-Way 0° Power Divider
1 - 400 MHz

EST-2-1

Features

* 2 Way
* 0 Degree

R-3



Specifications @ 25°C

Frequency Range	1 - 400 MHz
Insertion Loss	**Typical**	**Maximum**
1 - 10 MHz	0.25 dB	0.5 dB
10 - 200 MHz	0.4 dB	0.75 dB
200 - 400 MHz	0.8 dB	1 dB
Isolation	**Typical**	**Minimum**
1 - 10 MHz	30 dB	25 dB
10 - 200 MHz	30 dB	25 dB
200 - 400 MHz	30 dB	20 dB
Amplitude Unbalance		**Maximum**
1 - 10 MHz		0.15 dB
10 - 200 MHz		0.2 dB
200 - 400 MHz		0.6 dB
Phase Unbalance		**Maximum**
1 - 10 MHz		2°
10 - 200 MHz		3°
200 - 400 MHz		4°

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	3
Case Ground	3
Input	1
Port 1	2
Port 2	4

ISO 9001
CERTIFIED

E-Series 2-Way 0° Power Divider
0.1 - 450 MHz ESM-2-1

Features

* 2 Way
* 0 Degree

Specifications @ 25°C

Frequency Range		0.1 - 450 MHz
Insertion Loss	**Typical**	**Maximum**
0.1 - 1 MHz	0.3 dB	0.5 dB
1 - 225 MHz	0.4 dB	0.75 dB
225 - 450 MHz	0.6 dB	1 dB
Isolation	**Typical**	**Minimum**
0.1 - 1 MHz	20 dB	15 dB
1 - 225 MHz	30 dB	20 dB
225 - 450 MHz	30 dB	20 dB
Amplitude Unbalance		**Maximum**
0.1 - 1 MHz		0.15 dB
1 - 225 MHz		0.2 dB
225 - 450 MHz		0.3 dB
Phase Unbalance		**Maximum**
0.1 - 1 MHz		2°
1 - 225 MHz		3°
225 - 450 MHz		4°

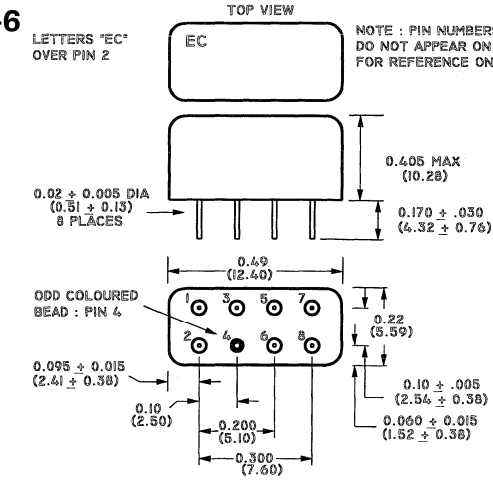
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-6



WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	2,3,4,7,8
Case Ground	2,3,4,7,8
Input	1
Port 1	5
Port 2	6

ISO 9001
CERTIFIED

E-Series 2-Way 0° Power Divider
5 - 900 MHz

ESSM-2-6

Features

* 2 Way
* 0 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		5 - 900 MHz
Insertion Loss	**Typical**	**Maximum**
5 - 50 MHz	0.2 dB	0.4 dB
50 - 450 MHz	0.4 dB	0.6 dB
450 - 900 MHz	0.7 dB	1 dB
Isolation	**Typical**	**Minimum**
5 - 50 MHz	25 dB	20 dB
50 - 450 MHz	24 dB	20 dB
450 - 900 MHz	22 dB	15 dB
Amplitude Unbalance		**Maximum**
5 - 50 MHz		0.2 dB
50 - 450 MHz		0.3 dB
450 - 900 MHz		0.5 dB
Phase Unbalance		**Maximum**
5 - 50 MHz		2°
50 - 450 MHz		3°
450 - 900 MHz		5°

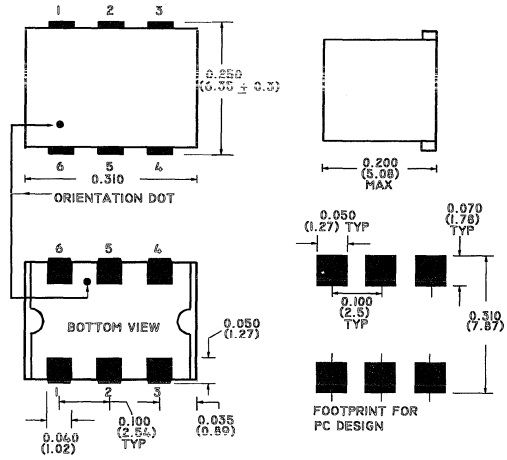
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-1



Function	Pin No.
Not Connected	2,5
External 50 Ohms	-
Ground	1
Case Ground	-
Input	6
Port 1	4
Port 2	3

Additional Specifications

Input & Output Return Loss: 25dB Typ ; 16dB Min over Total Range

ISO 9001
CERTIFIED

E-Series 2-Way 0° Power Divider
0.1 - 400 MHz ES-2-1X1

Features

* 2 Way
* 0 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		0.1 - 400 MHz
Insertion Loss	**Typical**	**Maximum**
0.1 - 1 MHz	0.2 dB	0.6 dB
1 - 200 MHz	0.4 dB	0.75 dB
200 - 400 MHz	0.6 dB	1 dB
Isolation	**Typical**	**Minimum**
0.1 - 1 MHz	20 dB	15 dB
1 - 200 MHz	25 dB	20 dB
200 - 400 MHz	25 dB	20 dB
Amplitude Unbalance		**Maximum**
0.1 - 1 MHz		0.15 dB
1 - 200 MHz		0.2 dB
200 - 400 MHz		0.3 dB
Phase Unbalance		**Maximum**
0.1 - 1 MHz		2°
1 - 200 MHz		3°
200 - 400 MHz		4°

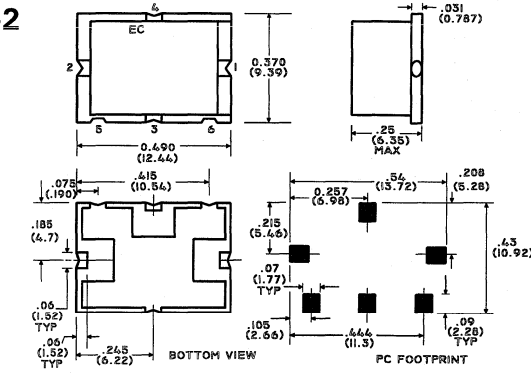
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-2



Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	4,5
Case Ground	-
Input	1
Port 1	3
Port 2	2

ISO 9001
CERTIFIED

E-Series 2-Way 0° Power Divider
10 - 1000 MHz

ES-2-4X1

Features

* 2 Way
* 0 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range	10 - 1000 MHz
Insertion Loss	**Typical**	**Maximum**
10 - 100 MHz	0.6 dB	0.8 dB
100 - 500 MHz	0.6 dB	1 dB
500 - 1000 MHz	0.7 dB	1.2 dB
Isolation	**Typical**	**Minimum**
10 - 100 MHz	25 dB	20 dB
100 - 500 MHz	22 dB	18 dB
500 - 1000 MHz	19 dB	15 dB
Amplitude Unbalance		**Maximum**
10 - 100 MHz		0.15 dB
100 - 500 MHz		0.2 dB
500 - 1000 MHz		0.4 dB
Phase Unbalance		**Maximum**
10 - 100 MHz		2°
100 - 500 MHz		3°
500 - 1000 MHz		4°

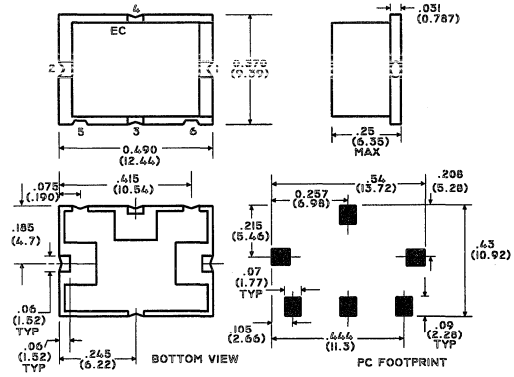
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-2



Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	4,5
Case Ground	-
Input	3
Port 1	2
Port 2	1

ISO 9001
CERTIFIED

E-Series 2-Way 0° Power Divider
10 - 1000 MHz ES-2-4X1-75

Features

* 2 Way
* 0 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		10 - 1000 MHz
Insertion Loss	**Typical**	**Maximum**
10 - 100 MHz	0.6 dB	0.8 dB
100 - 500 MHz	0.6 dB	1 dB
500 - 1000 MHz	0.7 dB	1.2 dB
Isolation	**Typical**	**Minimum**
10 - 100 MHz	25 dB	20 dB
100 - 500 MHz	22 dB	18 dB
500 - 1000 MHz	19 dB	15 dB
Amplitude Unbalance		**Maximum**
10 - 100 MHz		0.15 dB
100 - 500 MHz		0.2 dB
500 - 1000 MHz		0.4 dB
Phase Unbalance		**Maximum**
10 - 100 MHz		2°
100 - 500 MHz		3°
500 - 1000 MHz		4°

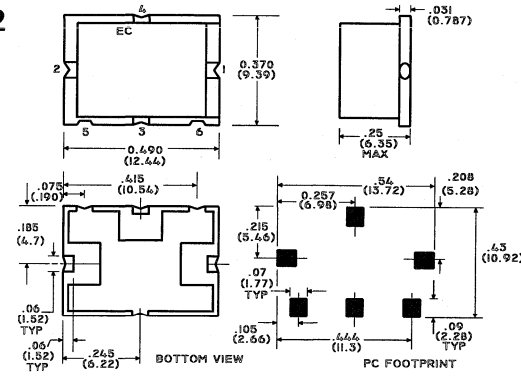
Operating Characteristics

Impedance	**75 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-2



Function	Pin No.
Not Connected	-
External 75 Ohms	-
Ground	4,5
Case Ground	-
Input	3
Port 1	2
Port 2	1

ISO 9001
CERTIFIED

E-Series 2-Way 0° Power Divider
1500 - 2000 MHz ES-2-5X1

Features

* 2 Way
* 0 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range	1500 - 2000 MHz	
Insertion Loss	**Typical**	**Maximum**
1500 - 2000 MHz	0.8 dB	1.5 dB
Isolation	**Typical**	**Minimum**
1500 - 2000 MHz	20 dB	16 dB
Amplitude Unbalance		**Maximum**
1500 - 2000 MHz		0.5 dB
Phase Unbalance		**Maximum**
1500 - 2000 MHz		4°

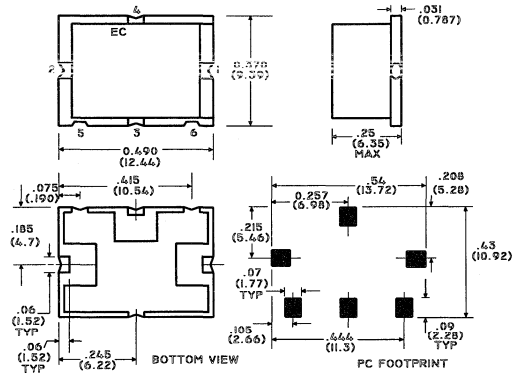
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-2



Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	4,5
Case Ground	-
Input	3
Port 1	1
Port 2	2

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series 2-Way 0° Power Divider
5 - 500 MHz ESML-2-1

Features

* 2 Way
* 0 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		5 - 500 MHz
Insertion Loss	**Typical**	**Maximum**
5 - 50 MHz	0.25 dB	0.5 dB
50 - 250 MHz	0.3 dB	0.6 dB
250 - 500 MHz	0.5 dB	1.2 dB
Isolation	**Typical**	**Minimum**
5 - 50 MHz	50 dB	25 dB
50 - 250 MHz	33 dB	24 dB
250 - 500 MHz	30 dB	23 dB
Amplitude Unbalance		**Maximum**
5 - 50 MHz		0.15 dB
50 - 250 MHz		0.3 dB
250 - 500 MHz		0.6 dB
Phase Unbalance		**Maximum**
5 - 50 MHz		1°
50 - 250 MHz		2°
250 - 500 MHz		3°

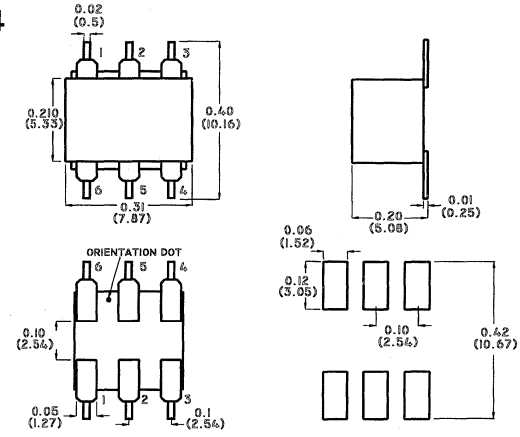
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-24



Function	Pin No.
Not Connected	1
External 50 Ohms	-
Ground	2,5
Case Ground	-
Input	6
Port 1	4
Port 2	3

Specifications Subject to Change Without Notice S 0554 B

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ISO 9001
CERTIFIED

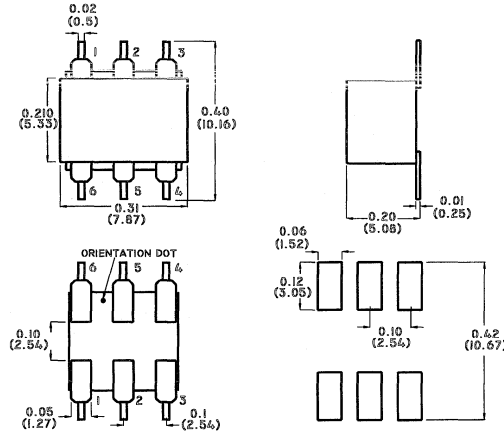
E-Series 2-Way 0° Power Divider
5 - 750 MHz

ESML-2-7

Features

* 2 Way
* 0 Degree
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range		5 - 750 MHz
Insertion Loss	**Typical**	**Maximum**
5 - 750 MHz	0.5 dB	1 dB
Isolation	**Typical**	**Minimum**
5 - 750 MHz	27 dB	17 dB
Amplitude Unbalance		**Maximum**
5 - 750 MHz		1 dB
Phase Unbalance		**Maximum**
5 - 750 MHz		3°

Function	Pin No.
Not Connected	2,5
External 50 Ohms	-
Ground	1
Case Ground	-
Input	6
Port 1	4
Port 2	3

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Additional Specifications

Output Return Loss: 21dB Typ, 18dB Min @ 5-750 MHz

Input Return Loss: 27dB Typ, 17dB Min @ 5-750 MHz

DISTRIBUTOR Stock ITEM

ISO 9001 CERTIFIED

E-Series 2-Way 0° Power Divider
10 - 1000 MHz ESML-2-4

Features

* 2 Way
* 0 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		10 - 1000 MHz
Insertion Loss	**Typical**	**Maximum**
10 - 100 MHz	0.3 dB	0.5 dB
100 - 500 MHz	0.4 dB	0.9 dB
500 - 1000 MHz	0.8 dB	1.5 dB
Isolation	**Typical**	**Minimum**
10 - 100 MHz	25 dB	20 dB
100 - 500 MHz	23 dB	16 dB
500 - 1000 MHz	19 dB	14 dB
Amplitude Unbalance		**Maximum**
10 - 100 MHz		0.15 dB
100 - 500 MHz		0.2 dB
500 - 1000 MHz		0.4 dB
Phase Unbalance		**Maximum**
10 - 100 MHz		1°
100 - 500 MHz		3°
500 - 1000 MHz		5°

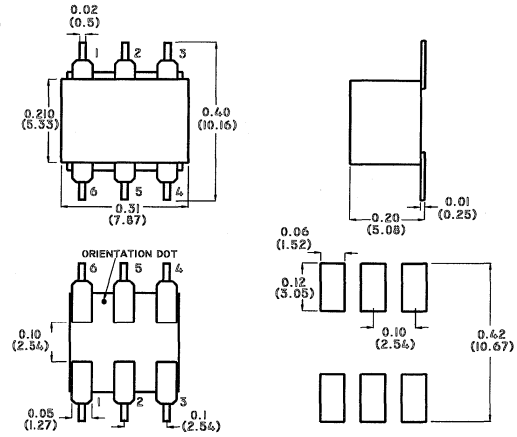
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-24



Function	Pin No.
Not Connected	5
External 50 Ohms	-
Ground	1,2
Case Ground	-
Input	6
Port 1	4
Port 2	3

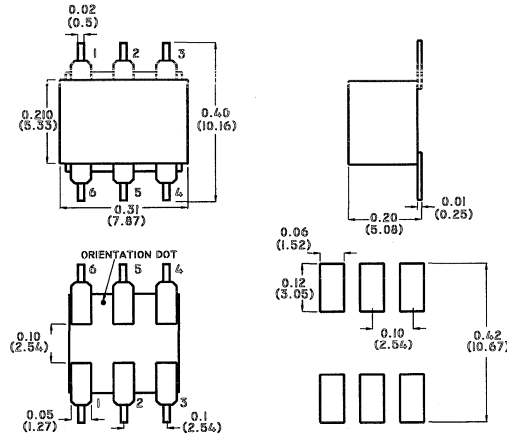
ISO 9001
CERTIFIED

E-Series 2-Way 0° Power Divider
782 - 810 MHz ESML-2-800

Features

* 2 Way
* 0 Degree
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range	782 - 810 MHz	
Insertion Loss	**Typical**	**Maximum**
782 - 810 MHz	0.2 dB	0.7 dB
Isolation	**Typical**	**Minimum**
782 - 810 MHz	29 dB	20 dB
Amplitude Unbalance		**Maximum**
782 - 810 MHz		0.5 dB
Phase Unbalance		**Maximum**
782 - 810 MHz		5°

Function	Pin No.
Not Connected	2,5
External 50 Ohms	-
Ground	1
Case Ground	-
Input	6
Port 1	3
Port 2	4

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

ISO 9001
CERTIFIED

E-Series 2-Way 0° Power Divider
0.1 - 400 MHz

ESC-2-1

Features

* 2 Way
* 0 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		0.1 - 400 MHz
Insertion Loss	**Typical**	**Maximum**
0.1 - 1 MHz	0.3 dB	1.2 dB
1 - 200 MHz	0.2 dB	0.6 dB
200 - 400 MHz	0.4 dB	1.1 dB
Isolation	**Typical**	**Minimum**
0.1 - 1 MHz	25 dB	15 dB
1 - 200 MHz	30 dB	20 dB
200 - 400 MHz	25 dB	20 dB
Amplitude Unbalance		**Maximum**
0.1 - 1 MHz		0.15 dB
1 - 200 MHz		0.2 dB
200 - 400 MHz		0.3 dB
Phase Unbalance		**Maximum**
0.1 - 1 MHz		2°
1 - 200 MHz		2°
200 - 400 MHz		3°

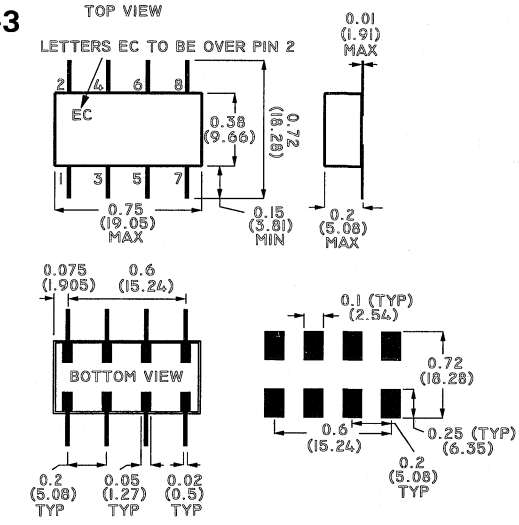
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-3



Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	2,3,4,7,8
Case Ground	-
Input	1
Port 1	5
Port 2	6

ISO 9001
CERTIFIED

E-Series 2-Way 0° Power Divider
1 - 550 MHz ESCP-2-1A

Features

* 2 Way
* 0 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		1 - 550 MHz
Insertion Loss	**Typical**	**Maximum**
1 - 10 MHz	0.3 dB	0.6 dB
10 - 275 MHz	0.3 dB	0.6 dB
275 - 550 MHz	0.7 dB	1.3 dB
Isolation	**Typical**	**Minimum**
1 - 550 MHz	25 dB	20 dB
Amplitude Unbalance		**Maximum**
1 - 10 MHz		0.15 dB
10 - 275 MHz		0.2 dB
275 - 550 MHz		0.4 dB
Phase Unbalance		**Maximum**
1 - 10 MHz		2°
10 - 275 MHz		2°
275 - 550 MHz		3°

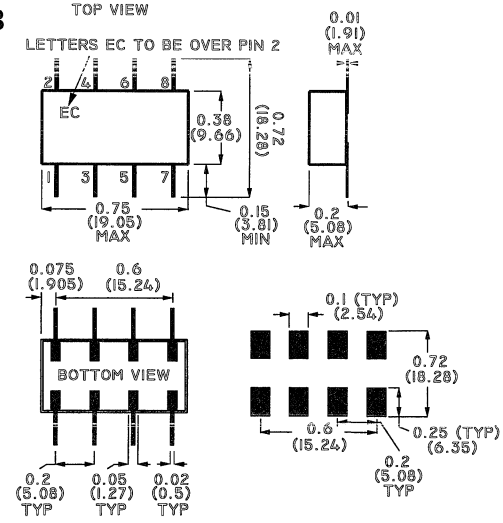
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-3



Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	2,3,4,7,8
Case Ground	-
Input	1
Port 1	5
Port 2	6

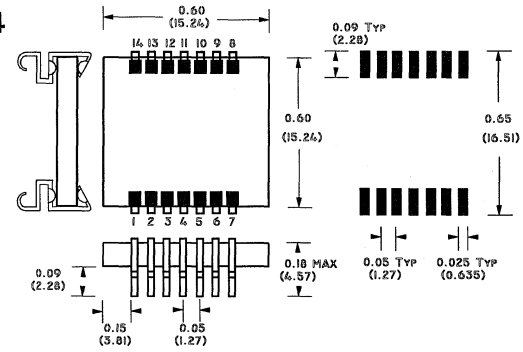
ISO 9001
CERTIFIED

E-Series 2-Way 0° Power Divider
870 - 905 MHz ESSM-2-3-B

Features

* 2 Way
* 0 Degree
* Surface Mount

SM-34



Specifications @ 25°C

Frequency Range	870 - 905 MHz
Insertion Loss	**Typical**	**Maximum**
870 - 905 MHz	0.22 dB	0.3 dB
Isolation	**Typical**	**Minimum**
870 - 905 MHz	21 dB	20 dB
Amplitude Unbalance		**Maximum**
870 - 905 MHz		0.1 dB
Phase Unbalance		**Maximum**
870 - 905 MHz		2°

Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	1,3-10,12-14
Case Ground	1,3-10,12-14
Input	11
Port 1	2
Port 2	6

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Additional Specifications

Return Loss: Input: 16 dB Min, Output: 20 dB Min

ISO 9001
CERTIFIED

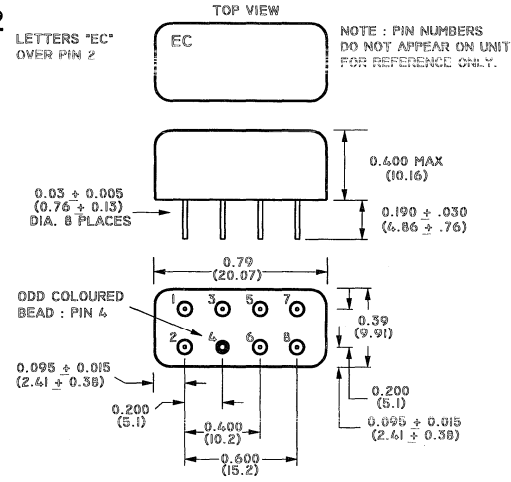
E-Series 2-Way 180° Power Divider
1 - 200 MHz

ESCJ-2-1

Features

* 2 Way
* 180 Degree

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Specifications @ 25°C

Frequency Range		1 - 200 MHz
Insertion Loss	**Typical**	**Maximum**
1 - 10 MHz	0.75 dB	1 dB
10 - 100 MHz	0.5 dB	0.8 dB
100 - 200 MHz	0.75 dB	1.2 dB
Isolation	**Typical**	**Minimum**
1 - 10 MHz	35 dB	30 dB
10 - 100 MHz	35 dB	25 dB
100 - 200 MHz	30 dB	23 dB
Amplitude Unbalance		**Maximum**
1 - 10 MHz		0.15 dB
10 - 100 MHz		0.15 dB
100 - 200 MHz		0.3 dB
Phase Unbalance		**Maximum**
1 - 10 MHz		2°
10 - 100 MHz		2.5°
100 - 200 MHz		4°

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	2,3,4,7,8
Case Ground	2,3,4,7,8
Input	1
Port 1	5
Port 2	6

ISO 9001
CERTIFIED

E-Series 2-Way 180° Power Divider
5 - 200 MHz ESCJ-2-1X1

Features

* 2 Way
* 180 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		5 - 200 MHz
Insertion Loss	**Typical**	**Maximum**
5 - 200 MHz	0.7 dB	1.4 dB
Isolation	**Typical**	**Minimum**
5 - 50 MHz	35 dB	30 dB
50 - 100 MHz	35 dB	30 dB
100 - 200 MHz	35 dB	25 dB
Amplitude Unbalance		**Maximum**
5 - 200 MHz		0.3 dB
Phase Unbalance		**Maximum**
5 - 50 MHz		4°
50 - 100 MHz		4°
100 - 200 MHz		8°

Operating Characteristics

Impedance	**50 Ohms Nominal**

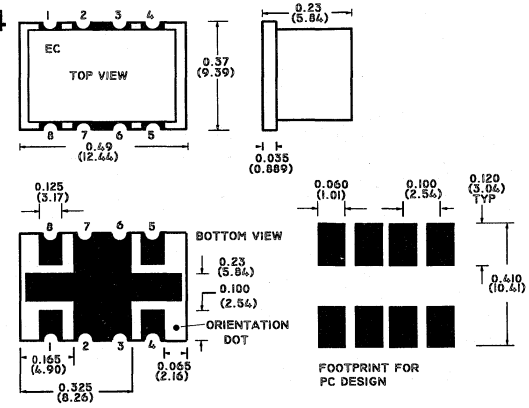
Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Additional Specifications

VSWR: 1.3:1 Typ, 1.5:1 Max @ 5 - 200 MHz

SM-4



Function	Pin No.
Not Connected	1
External 50 Ohms	-
Ground	2,3,6,7
Case Ground	-
Input	8
Port 1	5
Port 2	4

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
820 - 980 MHz ESQ-2-900

Features

* 2 Way
* 90 Degree

Specifications @ 25°C

Frequency Range		820 - 980 MHz
Insertion Loss	**Typical**	**Maximum**
820 - 980 MHz	0.7 dB	1 dB
Isolation	**Typical**	**Minimum**
820 - 980 MHz	20 dB	15 dB
Amplitude Unbalance		**Maximum**
820 - 980 MHz		1 dB
Phase Unbalance		**Maximum**
820 - 980 MHz		4°

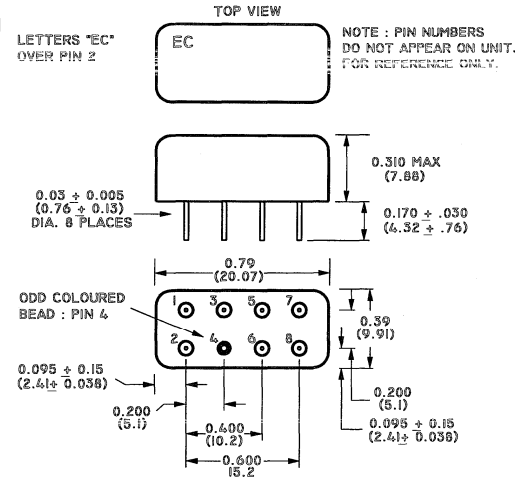
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
Not Connected	-
External 50 Ohms	6
Ground	3,4,7,8
Case Ground	-
Input	2
Port 1	5
Port 2	1

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
3.5 - 4.5 MHz ESQ-2-4.0

Features

* 2 Way
* 90 Degree

Specifications @ 25°C

Frequency Range		3.5 - 4.5 MHz
Insertion Loss	**Typical**	**Maximum**
3.5 - 4.5 MHz	0.4 dB	0.7 dB
Isolation	**Typical**	**Minimum**
3.5 - 4.5 MHz	36 dB	25 dB
Amplitude Unbalance		**Maximum**
3.5 - 4.5 MHz		1.5 dB
Phase Unbalance		**Maximum**
3.5 - 4.5 MHz		3°

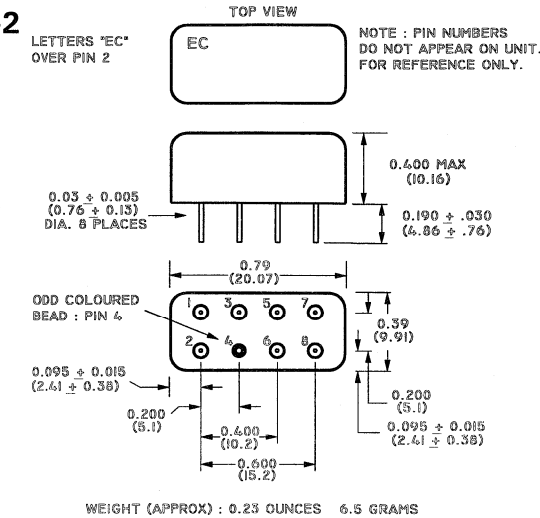
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,4,7,8
External 50 Ohms	6
Ground	-
Case Ground	-
Input	1
Port 1	2
Port 2	5

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
5.8 - 7 MHz ESQ-2-6.5

Features

* 2 Way
* 90 Degree

Specifications @ 25°C

Frequency Range		5.8 - 7 MHz
Insertion Loss	**Typical**	**Maximum**
5.8 - 7 MHz	0.4 dB	0.7 dB
Isolation	**Typical**	**Minimum**
5.8 - 7 MHz	30 dB	25 dB
Amplitude Unbalance		**Maximum**
5.8 - 7 MHz		1.2 dB
Phase Unbalance		**Maximum**
5.8 - 7 MHz		3°

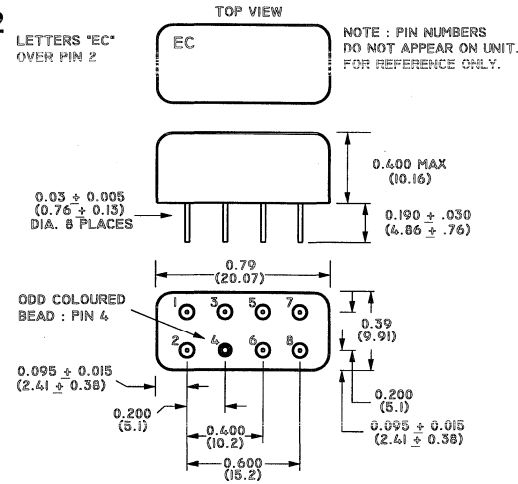
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,4,7,8
External 50 Ohms	6
Ground	-
Case Ground	-
Input	1
Port 1	2
Port 2	5

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
9 - 11 MHz ESQ-2-10.5

Features

* 2 Way
* 90 Degree

Specifications @ 25°C

Frequency Range		9 - 11 MHz
Insertion Loss	**Typical**	**Maximum**
9 - 11 MHz	0.4 dB	0.7 dB
Isolation	**Typical**	**Minimum**
9 - 11 MHz	25 dB	20 dB
Amplitude Unbalance		**Maximum**
9 - 11 MHz		1.2 dB
Phase Unbalance		**Maximum**
9 - 11 MHz		3°

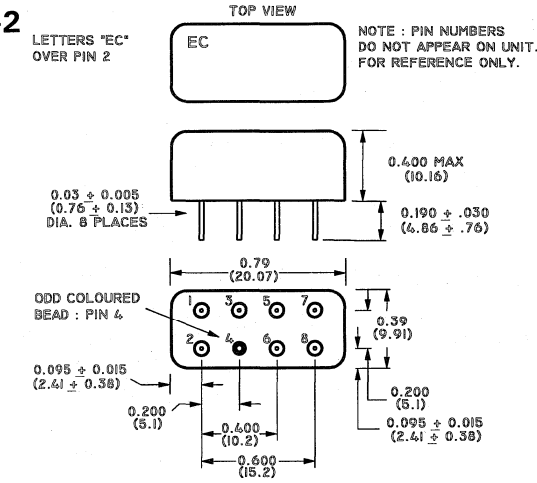
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,4,7,8
External 50 Ohms	6
Ground	-
Case Ground	-
Input	1
Port 1	2
Port 2	5

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
14 - 30 MHz ESQ-2-26

Features

* 2 Way
* 90 Degree

Specifications @ 25°C

Frequency Range		14 - 30 MHz
Insertion Loss	**Typical**	**Maximum**
14 - 30 MHz	0.4 dB	0.7 dB
Isolation	**Typical**	**Minimum**
14 - 30 MHz	25 dB	20 dB
Amplitude Unbalance		**Maximum**
14 - 30 MHz		1.5 dB
Phase Unbalance		**Maximum**
14 - 30 MHz		3°

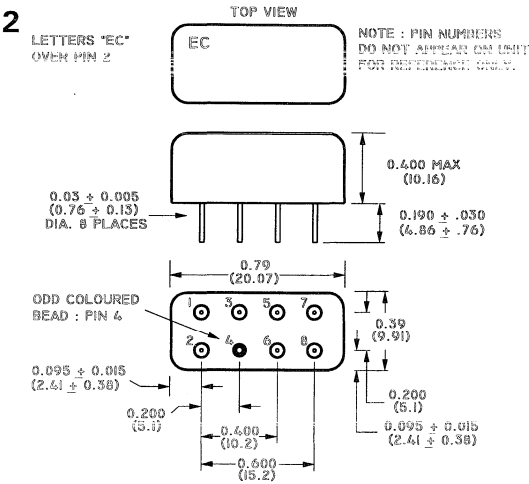
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,4,7,8
External 50 Ohms	6
Ground	-
Case Ground	-
Input	1
Port 1	2
Port 2	5

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
16 - 19 MHz ESQ-2-17.5

Features

* 2 Way
* 90 Degree

Specifications @ 25°C

Frequency Range		16 - 19 MHz
Insertion Loss	**Typical**	**Maximum**
16 - 19 MHz	0.6 dB	0.7 dB
Isolation	**Typical**	**Minimum**
16 - 19 MHz	28 dB	25 dB
Amplitude Unbalance		**Maximum**
16 - 19 MHz		1.6 dB
Phase Unbalance		**Maximum**
16 - 19 MHz		3°

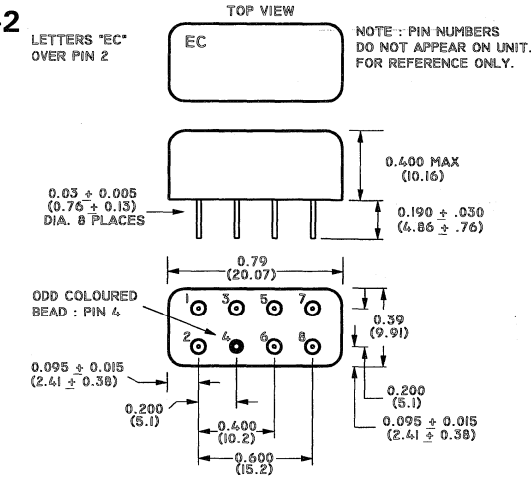
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,4,7,8
External 50 Ohms	6
Ground	-
Case Ground	-
Input	1
Port 1	2
Port 2	5

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
20 - 23 MHz ESQ-2-21.4

Features

* 2 Way
* 90 Degree

Specifications @ 25°C

Frequency Range		20 - 23 MHz
Insertion Loss	**Typical**	**Maximum**
20 - 23 MHz	0.4 dB	0.7 dB
Isolation	**Typical**	**Minimum**
20 - 23 MHz	30 dB	25 dB
Amplitude Unbalance		**Maximum**
20 - 23 MHz		1.2 dB
Phase Unbalance		**Maximum**
20 - 23 MHz		3°

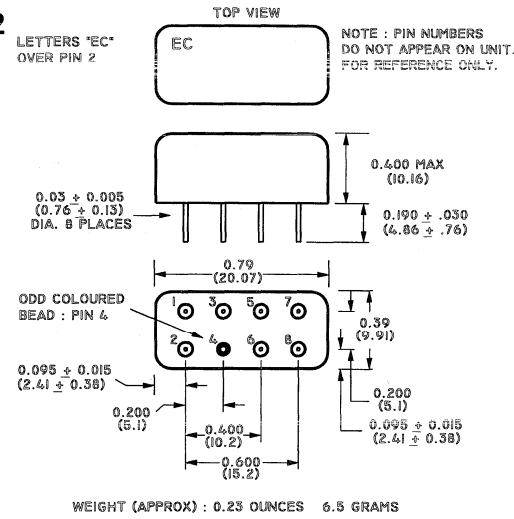
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,4,7,8
External 50 Ohms	6
Ground	-
Case Ground	-
Input	1
Port 1	2
Port 2	5

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
25 - 50 MHz ESQ-2-50

Features

* 2 Way
* 90 Degree

Specifications @ 25°C

Frequency Range		25 - 50 MHz
Insertion Loss	**Typical**	**Maximum**
25 - 50 MHz	0.3 dB	0.7 dB
Isolation	**Typical**	**Minimum**
25 - 50 MHz	30 dB	20 dB
Amplitude Unbalance		**Maximum**
25 - 50 MHz		1.5 dB
Phase Unbalance		**Maximum**
25 - 50 MHz		3°

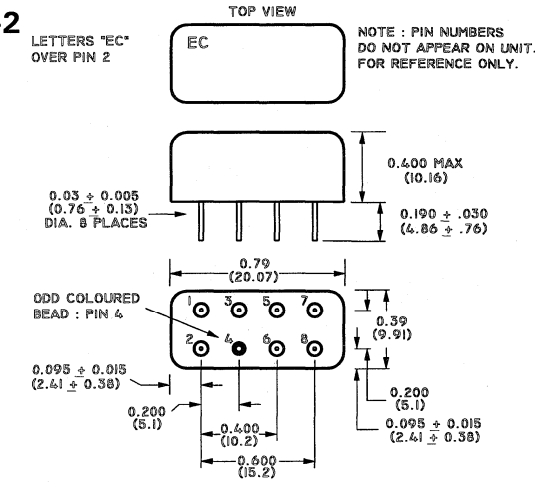
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,4,7,8
External 50 Ohms	6
Ground	-
Case Ground	-
Input	1
Port 1	2
Port 2	5

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
30 - 90 MHz ESQ-2-88

Features

* 2 Way
* 90 Degree

Specifications @ 25°C

Frequency Range		30 - 90 MHz
Insertion Loss	**Typical**	**Maximum**
30 - 90 MHz	0.6 dB	1 dB
Isolation	**Typical**	**Minimum**
30 - 90 MHz	23 dB	20 dB
Amplitude Unbalance		**Maximum**
30 - 90 MHz		1.2 dB
Phase Unbalance		**Maximum**
30 - 90 MHz		3°

Operating Characteristics

Impedance	**50 Ohms Nominal**

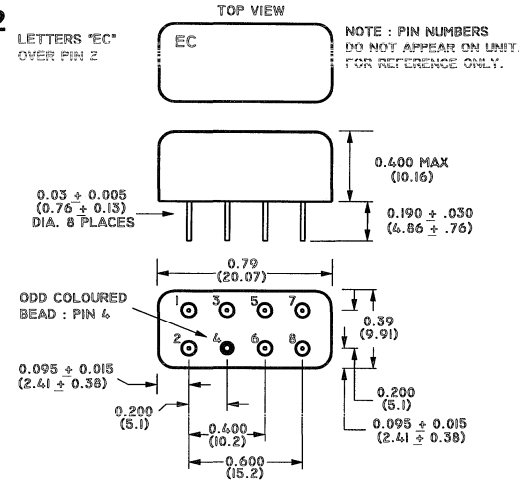
Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Additional Specifications

VSWR: 1.3 : 1 Maximum

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,4,7,8
External 50 Ohms	5
Ground	-
Case Ground	-
Input	1
Port 1	2 (0 Deg)
Port 2	6 (+90 Deg)

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E-Series 2-Way 90° Power Divider
40 - 70 MHz ESQ-2-70

Features

* 2 Way
* 90 Degree

Specifications @ 25°C

Frequency Range		40 - 70 MHz
Insertion Loss	**Typical**	**Maximum**
40 - 70 MHz	0.3 dB	0.7 dB
Isolation	**Typical**	**Minimum**
40 - 70 MHz	30 dB	20 dB
Amplitude Unbalance		**Maximum**
40 - 70 MHz		1.5 dB
Phase Unbalance		**Maximum**
40 - 70 MHz		3°

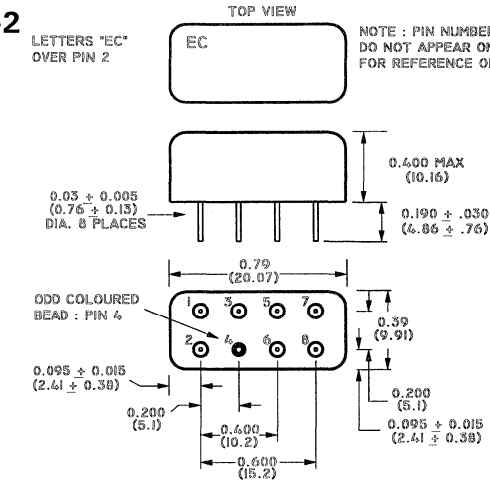
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,4,7,8
External 50 Ohms	6
Ground	-
Case Ground	-
Input	1
Port 1	2
Port 2	5

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
55 - 90 MHz

ESQ-2-90

Features

* 2 Way
* 90 Degree

Specifications @ 25°C

Frequency Range		55 - 90 MHz
Insertion Loss	**Typical**	**Maximum**
55 - 90 MHz	0.3 dB	0.7 dB
Isolation	**Typical**	**Minimum**
55 - 90 MHz	30 dB	20 dB
Amplitude Unbalance		**Maximum**
55 - 90 MHz		1.2 dB
Phase Unbalance		**Maximum**
55 - 90 MHz		3°

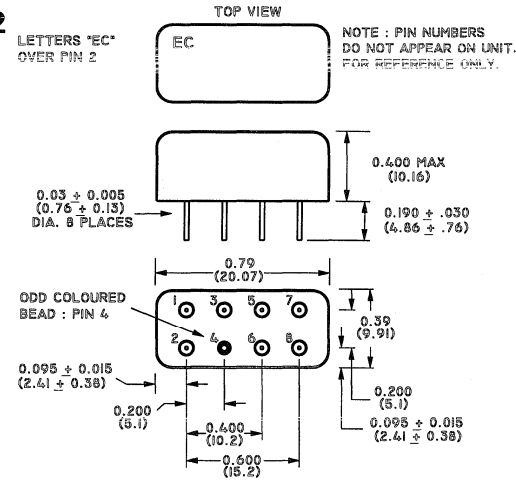
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,4,7,8
External 50 Ohms	6
Ground	-
Case Ground	-
Input	1
Port 1	2
Port 2	5

Specifications Subject to Change Without Notice S 0125 B

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ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
80 - 120 MHz ESQ-2-120

Features

* 2 Way
* 90 Degree

Specifications @ 25°C

Frequency Range		80 - 120 MHz
Insertion Loss	**Typical**	**Maximum**
80 - 120 MHz	0.3 dB	0.7 dB
Isolation	**Typical**	**Minimum**
80 - 120 MHz	25 dB	18 dB
Amplitude Unbalance		**Maximum**
80 - 120 MHz		1.5 dB
Phase Unbalance		**Maximum**
80 - 120 MHz		3°

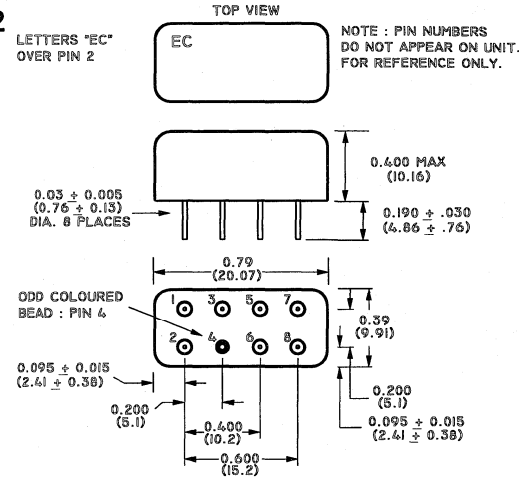
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,4,7,8
External 50 Ohms	6
Ground	-
Case Ground	-
Input	1
Port 1	2
Port 2	5

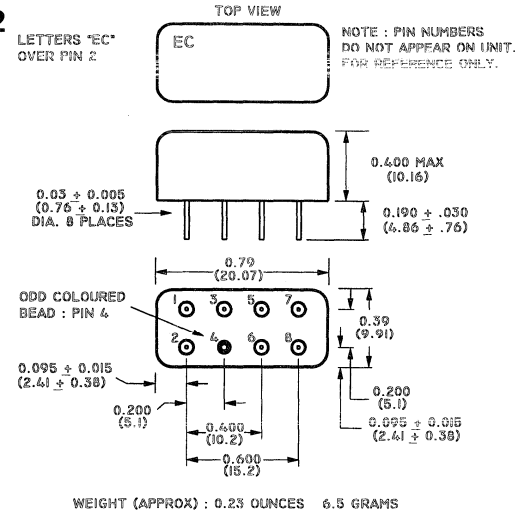
ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
104 - 176 MHz ESQ-2-176

Features

* 2 Way
* 90 Degree

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Specifications @ 25°C

Frequency Range	104 - 176 MHz	
Insertion Loss	**Typical**	**Maximum**
104 - 176 MHz	0.4 dB	0.7 dB
Isolation	**Typical**	**Minimum**
104 - 176 MHz	22 dB	15 dB
Amplitude Unbalance		**Maximum**
104 - 176 MHz		1.2 dB
Phase Unbalance		**Maximum**
104 - 176 MHz		1°

Function	Pin No.
Not Connected	3,4,7,8
External 50 Ohms	6
Ground	-
Case Ground	-
Input	1
Port 1	2
Port 2	5

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Additional Specifications

Phase Flatness: 0.8 Deg Maximum @ 104 - 176 MHz

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
120 - 180 MHz ESQ-2-180

Features

* 2 Way
* 90 Degree

Specifications @ 25°C

Frequency Range		120 - 180 MHz
Insertion Loss	**Typical**	**Maximum**
120 - 180 MHz	0.3 dB	0.7 dB
Isolation	**Typical**	**Minimum**
120 - 180 MHz	23 dB	15 dB
Amplitude Unbalance		**Maximum**
120 - 180 MHz		1.2 dB
Phase Unbalance		**Maximum**
120 - 180 MHz		4°

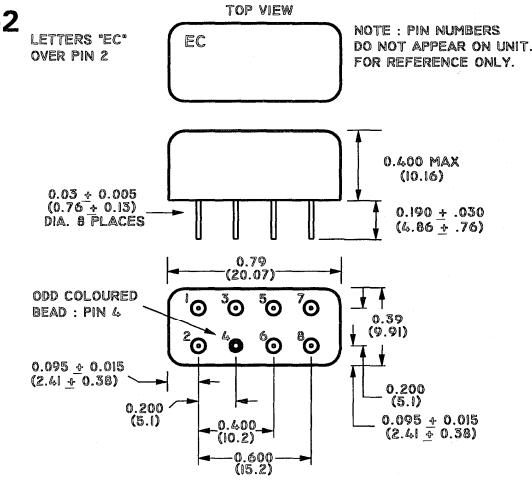
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,4,7,8
External 50 Ohms	6
Ground	-
Case Ground	-
Input	1
Port 1	2
Port 2	5

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
150 - 200 MHz ESQ-2-175

Features

* 2 Way
* 90 Degree

Specifications @ 25°C

Frequency Range		150 - 200 MHz
Insertion Loss	**Typical**	**Maximum**
150 - 200 MHz	0.3 dB	0.7 dB
Isolation	**Typical**	**Minimum**
150 - 200 MHz	30 dB	22 dB
Amplitude Unbalance		**Maximum**
150 - 200 MHz		1.5 dB
Phase Unbalance		**Maximum**
150 - 200 MHz		3°

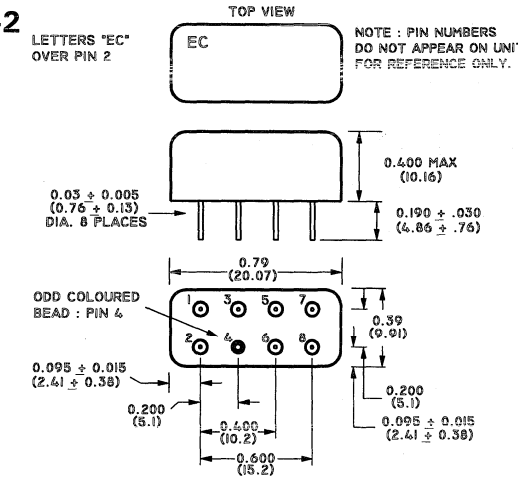
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,4,7,8
External 50 Ohms	6
Ground	-
Case Ground	-
Input	1
Port 1	2
Port 2	5

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
250 - 400 MHz ESQ-2-400

Features

* 2 Way
* 90 Degree

Specifications @ 25°C

Frequency Range		250 - 400 MHz
Insertion Loss	**Typical**	**Maximum**
250 - 400 MHz	0.5 dB	0.9 dB
Isolation	**Typical**	**Minimum**
250 - 400 MHz	23 dB	16 dB
Amplitude Unbalance		**Maximum**
250 - 400 MHz		1.5 dB
Phase Unbalance		**Maximum**
250 - 400 MHz		4°

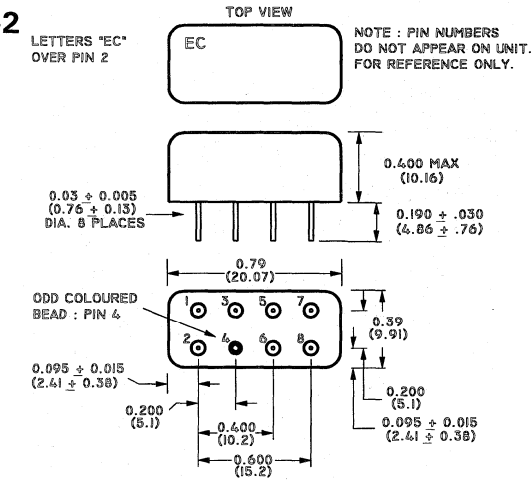
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,4,7,8
External 50 Ohms	6
Ground	-
Case Ground	-
Input	1
Port 1	2
Port 2	5

Specifications Subject to Change Without Notice S 0480 B

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ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
10.7 MHz EQSM-2-10.7

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		10.7 MHz
Insertion Loss	**Typical**	**Maximum**
10.7 MHz	0.1 dB	0.5 dB
Isolation	**Typical**	**Minimum**
10.7 MHz	37 dB	30 dB
Amplitude Unbalance		**Maximum**
10.7 MHz		0.2 dB
Phase Unbalance		**Maximum**
10.7 MHz		1.5°

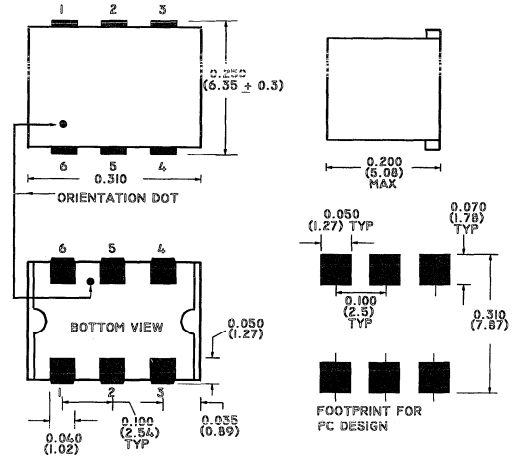
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-1



Function	Pin No.
Not Connected	2,5
External 50 Ohms	3
Ground	-
Case Ground	-
Input	1
Port 1	4
Port 2	6

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
20 - 23 MHz EQSM-2-21.4

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		20 - 23 MHz
Insertion Loss	**Typical**	**Maximum**
20 - 23 MHz	0.4 dB	0.7 dB
Isolation	**Typical**	**Minimum**
20 - 23 MHz	30 dB	25 dB
Amplitude Unbalance		**Maximum**
20 - 23 MHz		1.2 dB
Phase Unbalance		**Maximum**
20 - 23 MHz		3°

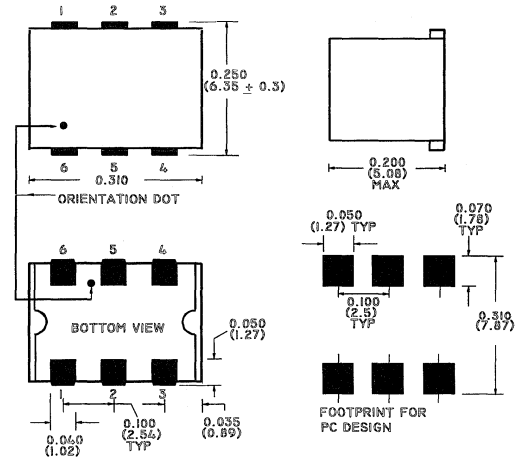
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-1



Function	Pin No.
Not Connected	2,5
External 50 Ohms	3
Ground	-
Case Ground	-
Input	1
Port 1	4
Port 2	6

ISO 9001
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E-Series 2-Way 90° Power Divider
65 - 75 MHz EQSM-2-70

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		65 - 75 MHz
Insertion Loss	**Typical**	**Maximum**
65 - 75 MHz	0.5 dB	0.75 dB
Isolation	**Typical**	**Minimum**
65 - 75 MHz	28 dB	25 dB
Amplitude Unbalance		**Maximum**
65 - 75 MHz		1 dB
Phase Unbalance		**Maximum**
65 - 75 MHz		3°

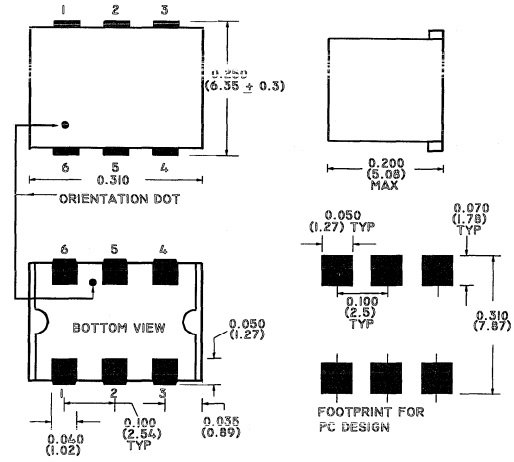
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-1



Function	Pin No.
Not Connected	2,5
External 50 Ohms	3
Ground	-
Case Ground	-
Input	1
Port 1	4
Port 2	6

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
120 - 140 MHz EQSM-2-130

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		120 - 140 MHz
Insertion Loss	**Typical**	**Maximum**
120 - 140 MHz	0.15 dB	0.5 dB
Isolation	**Typical**	**Minimum**
120 - 140 MHz	25 dB	20 dB
Amplitude Unbalance		**Maximum**
120 - 140 MHz		0.8 dB
Phase Unbalance		**Maximum**
120 - 140 MHz		3°

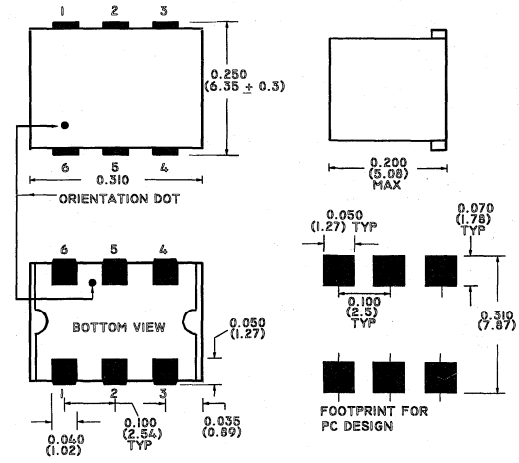
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-1



Function	Pin No.
Not Connected	5
External 50 Ohms	1
Ground	2
Case Ground	-
Input	3
Port 1	4
Port 2	6

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
365 - 375 MHz EQSM-2-370

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range	365 - 375 MHz
Insertion Loss	**Maximum**
365 - 375 MHz	0.8 dB
Isolation	**Minimum**
365 - 375 MHz	20 dB
Amplitude Unbalance	**Maximum**
365 - 375 MHz	0.8 dB
Phase Unbalance	**Maximum**
365 - 375 MHz	4°

Operating Characteristics

Impedance	50 Ohms Nominal

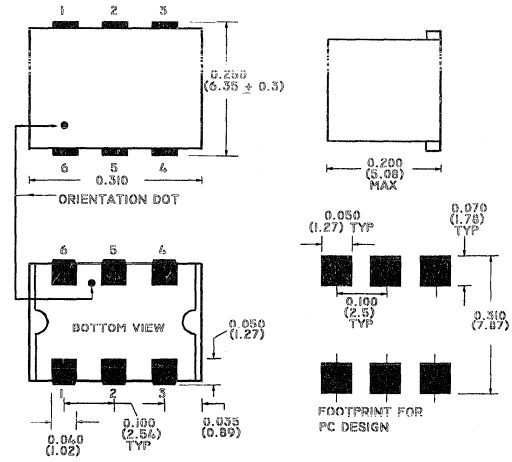
Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Additional Specifications

VSWR: 1.2 : 1 Maximum

SM-1



Function	Pin No.
Not Connected	-
External 50 Ohms	3
Ground	2,5
Case Ground	-
Input	1
Port 1	4
Port 2	6

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
463 - 493 MHz EQSM-2-478

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		463 - 493 MHz
Insertion Loss	**Typical**	**Maximum**
463 - 493 MHz	0.2 dB	0.6 dB
Isolation	**Typical**	**Minimum**
463 - 493 MHz	15 dB	12 dB
Amplitude Unbalance		**Maximum**
463 - 493 MHz		0.6 dB
Phase Unbalance		**Maximum**
463 - 493 MHz		3°

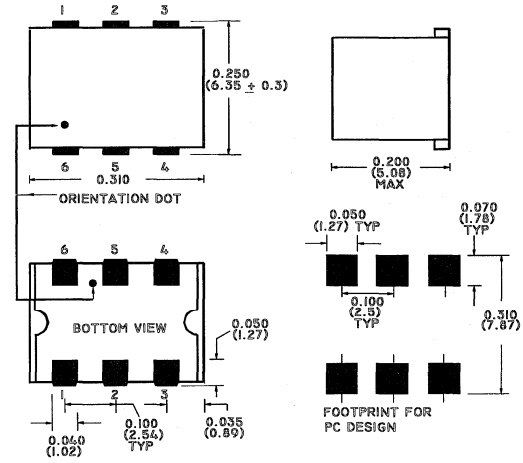
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-1



Function	Pin No.
Not Connected	3
External 50 Ohms	-
Ground	2,5
Case Ground	-
Input	6
Port 1	1
Port 2	4

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E-Series 2-Way 90° Power Divider
500 - 700 MHz EQSM-2-600

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		500 - 700 MHz
Insertion Loss	**Typical**	**Maximum**
500 - 700 MHz	0.5 dB	0.9 dB
Isolation	**Typical**	**Minimum**
500 - 700 MHz	19 dB	15 dB
Amplitude Unbalance		**Maximum**
500 - 700 MHz		1.5 dB
Phase Unbalance		**Maximum**
500 - 700 MHz		5°

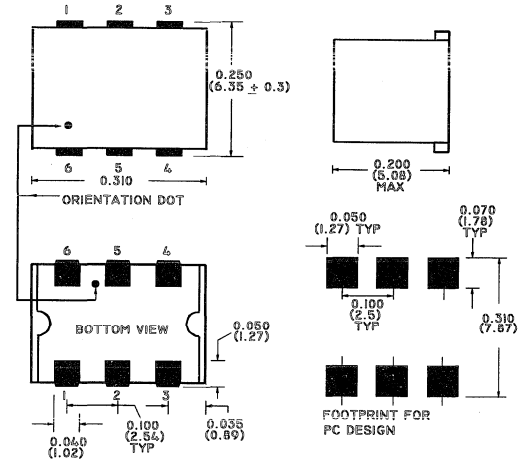
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-1



Function	Pin No.
Not Connected	-
External 50 Ohms	3
Ground	2,5
Case Ground	-
Input	1
Port 1	4
Port 2	6

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E-Series 2-Way 90° Power Divider
810 - 830 MHz EQSM-820

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		810 - 830 MHz
Insertion Loss	**Typical**	**Maximum**
810 - 830 MHz	0.4 dB	0.9 dB
Isolation	**Typical**	**Minimum**
810 - 830 MHz	16 dB	14 dB
Amplitude Unbalance		**Maximum**
810 - 830 MHz		0.5 dB
Phase Unbalance		**Maximum**
810 - 830 MHz		3°

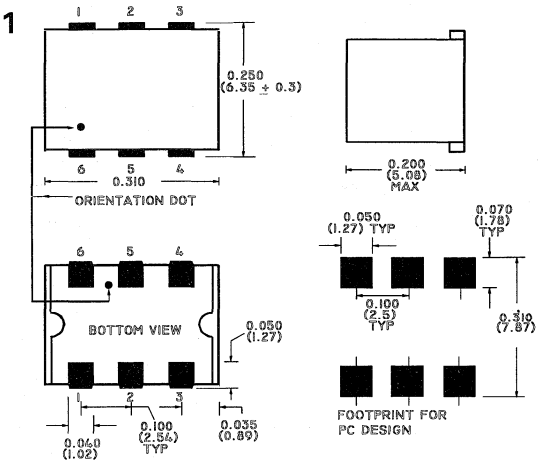
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-1



Function	Pin No.
Not Connected	-
External 50 Ohms	4
Ground	2,5
Case Ground	-
Input	6
Port 1	1
Port 2	3

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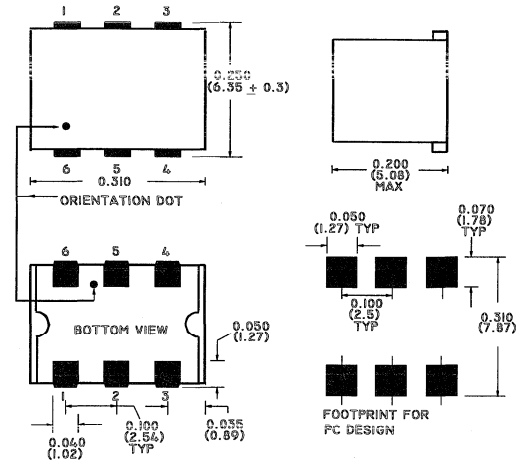
E-Series 2-Way 90° Power Divider
820 - 980 MHz

EQSM-980

Features

* 2 Way
* 90 Degree
* Surface Mount

SM-1



Specifications @ 25°C

Frequency Range	820 - 980 MHz
Insertion Loss	**Typical**	**Maximum**
820 - 980 MHz	0.15 dB	0.8 dB
Isolation	**Typical**	**Minimum**
820 - 980 MHz	22 dB	18 dB
Amplitude Unbalance		**Maximum**
820 - 980 MHz		1 dB
Phase Unbalance		**Maximum**
820 - 980 MHz		5°

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Function	Pin No.
Not Connected	2,5
External 50 Ohms	3
Ground	-
Case Ground	-
Input	6
Port 1	4
Port 2	1

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E-Series 2-Way 90° Power Divider
820 - 980 MHz EQSM-2-900

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		820 - 980 MHz
Insertion Loss	**Typical**	**Maximum**
820 - 980 MHz	0.7 dB	1 dB
Isolation	**Typical**	**Minimum**
820 - 980 MHz	20 dB	12.5 dB
Amplitude Unbalance		**Maximum**
820 - 980 MHz		1 dB
Phase Unbalance		**Maximum**
820 - 980 MHz		7°

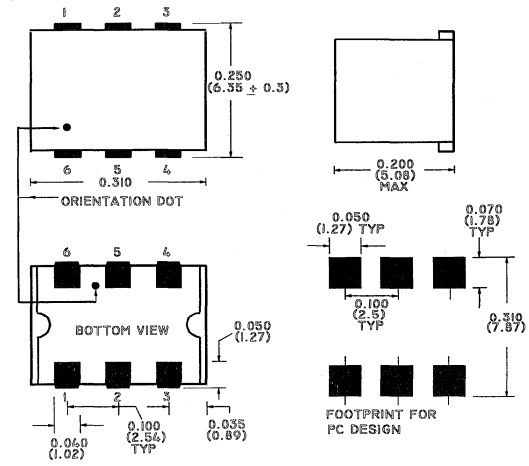
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-1



Function	Pin No.
Not Connected	-
External 50 Ohms	3
Ground	2,5
Case Ground	-
Input	1
Port 1	4
Port 2	6

ISO 9001
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E-Series 2-Way 90° Power Divider
859 - 905 MHz

EQSM-905

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		859 - 905 MHz
Insertion Loss	**Typical**	**Maximum**
859 - 905 MHz	0.4 dB	0.6 dB
Isolation	**Typical**	**Minimum**
859 - 905 MHz	18.5 dB	17 dB
Amplitude Unbalance		**Maximum**
859 - 905 MHz		0.5 dB
Phase Unbalance		**Maximum**
859 - 905 MHz		3°

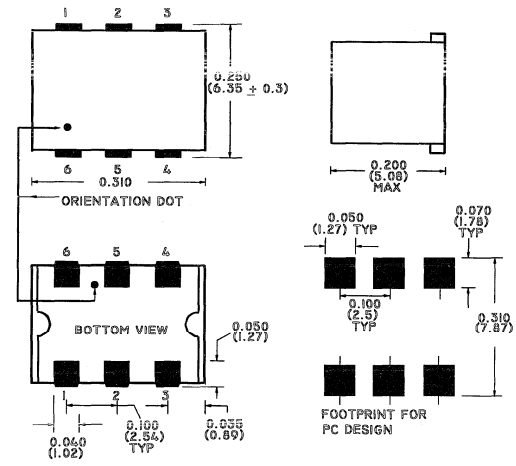
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-1



Function	Pin No.
Not Connected	2,5
External 50 Ohms	4
Ground	-
Case Ground	-
Input	6
Port 1	1
Port 2	3

ISO 9001
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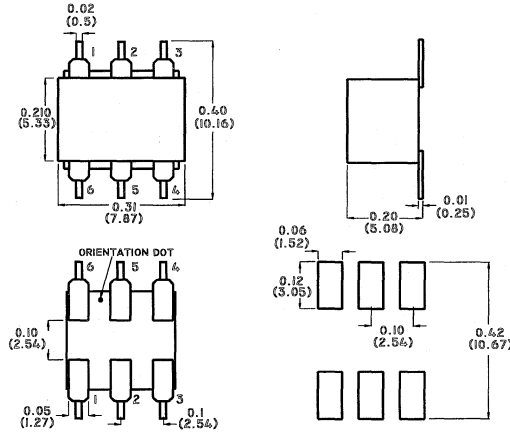
E-Series 2-Way 90° Power Divider
65 - 75 MHz EQSML-70

Features

* 2 Way
* 90 Degree
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range	65 - 75 MHz	
Insertion Loss	**Typical**	**Maximum**
65 - 75 MHz	0.1 dB	0.5 dB
Isolation	**Typical**	**Minimum**
65 - 75 MHz	30 dB	20 dB
Amplitude Unbalance		**Maximum**
65 - 75 MHz		1.5 dB
Phase Unbalance		**Maximum**
65 - 75 MHz		3°

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C
Operating Temperature	-25°C to 70°C

Function	Pin No.
Not Connected	2,5
External 50 Ohms	3
Ground	-
Case Ground	-
Input	6
Port 1	4
Port 2	1

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
820 - 980 MHz EQSML-980

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		820 - 980 MHz
Insertion Loss	**Typical**	**Maximum**
820 - 980 MHz	0.15 dB	0.8 dB
Isolation	**Typical**	**Minimum**
820 - 980 MHz	22 dB	18 dB
Amplitude Unbalance		**Maximum**
820 - 980 MHz		1 dB
Phase Unbalance		**Maximum**
820 - 980 MHz		5°

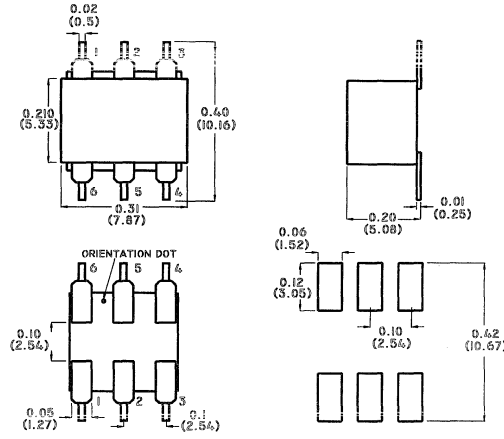
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-24



Function	Pin No.
Not Connected	2,5
External 50 Ohms	3
Ground	-
Case Ground	-
Input	6
Port 1	4
Port 2	1

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E-Series 2-Way 90° Power Divider
869 - 895 MHz EQSML-905

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		869 - 895 MHz
Insertion Loss	**Typical**	**Maximum**
869 - 895 MHz	0.4 dB	0.6 dB
Isolation	**Typical**	**Minimum**
869 - 895 MHz	18.5 dB	17 dB
Amplitude Unbalance		**Maximum**
869 - 895 MHz		0.5 dB
Phase Unbalance		**Maximum**
869 - 895 MHz		3°

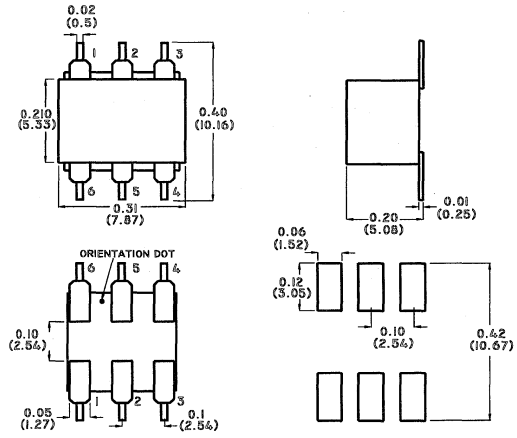
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-24



Function	Pin No.
Not Connected	2,5
External 50 Ohms	4
Ground	-
Case Ground	-
Input	6
Port 1	1
Port 2	3

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E-Series 2-Way 90° Power Divider
9 - 11 MHz ESCQ-2-10.5

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		9 - 11 MHz
Insertion Loss	**Typical**	**Maximum**
9 - 11 MHz	0.4 dB	0.7 dB
Isolation	**Typical**	**Minimum**
9 - 11 MHz	30 dB	20 dB
Amplitude Unbalance		**Maximum**
9 - 11 MHz		1.2 dB
Phase Unbalance		**Maximum**
9 - 11 MHz		3°

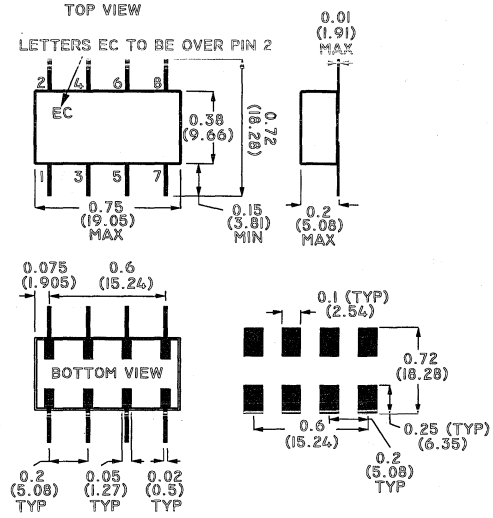
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-3



Function	Pin No.
Not Connected	-
External 50 Ohms	6
Ground	3,4,7,8
Case Ground	-
Input	1
Port 1	2
Port 2	5

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
10 - 16 MHz ESCQ-2-13

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range	10 - 16 MHz
Insertion Loss	**Maximum**
10 - 16 MHz	0.8 dB
Isolation	**Minimum**
10 - 16 MHz	20 dB
Amplitude Unbalance	**Maximum**
10 - 16 MHz	0.9 dB
Phase Unbalance	**Maximum**
10 - 16 MHz	3°

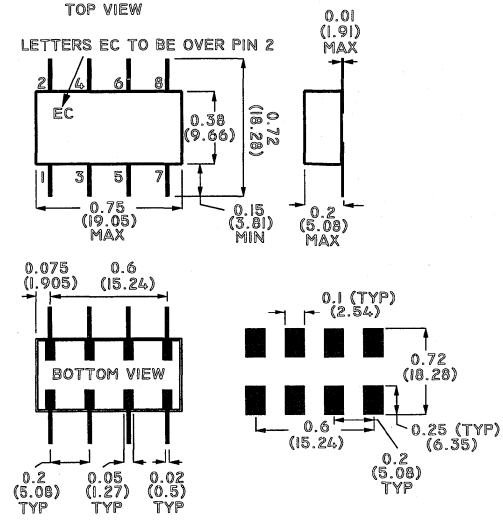
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-3



Function	Pin No.
Not Connected	-
External 50 Ohms	6
Ground	3,4,7,8
Case Ground	-
Input	1
Port 1	2
Port 2	5

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
25 - 50 MHz ESCQ-2-50

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		25 - 50 MHz
Insertion Loss	**Typical**	**Maximum**
25 - 50 MHz	0.5 dB	0.9 dB
Isolation	**Typical**	**Minimum**
25 - 50 MHz	30 dB	20 dB
Amplitude Unbalance		**Maximum**
25 - 50 MHz		1.5 dB
Phase Unbalance		**Maximum**
25 - 50 MHz		4°

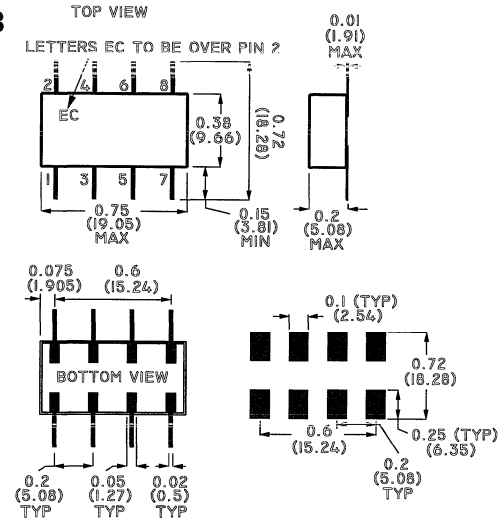
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-3



Function	Pin No.
Not Connected	-
External 50 Ohms	6
Ground	3,4,7,8
Case Ground	-
Input	1
Port 1	2
Port 2	5

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
55 - 90 MHz ESCQ-2-90

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		55 - 90 MHz
Insertion Loss	**Typical**	**Maximum**
55 - 90 MHz	0.2 dB	0.7 dB
Isolation	**Typical**	**Minimum**
55 - 90 MHz	26 dB	20 dB
Amplitude Unbalance		**Maximum**
55 - 90 MHz		1.2 dB
Phase Unbalance		**Maximum**
55 - 90 MHz		3°

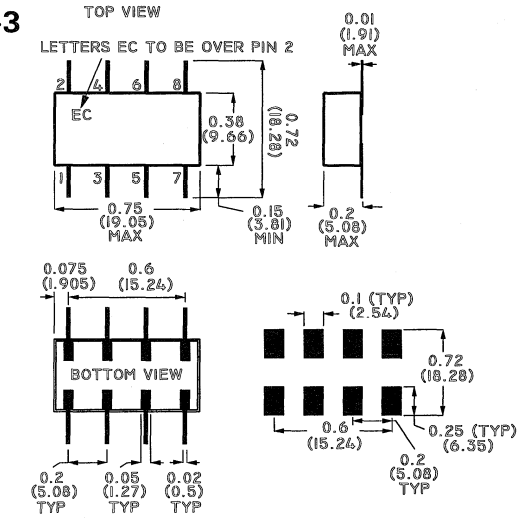
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-3



Function	Pin No.
Not Connected	7,8
External 50 Ohms	6
Ground	3,4
Case Ground	-
Input	1
Port 1	2
Port 2	5

ISO 9001
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E-Series 2-Way 90° Power Divider
120 - 180 MHz ESCQ-2-180

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		120 - 180 MHz
Insertion Loss	**Typical**	**Maximum**
120 - 180 MHz	0.3 dB	0.7 dB
Isolation	**Typical**	**Minimum**
120 - 180 MHz	23 dB	16 dB
Amplitude Unbalance		**Maximum**
120 - 180 MHz		1.2 dB
Phase Unbalance		**Maximum**
120 - 180 MHz		3°

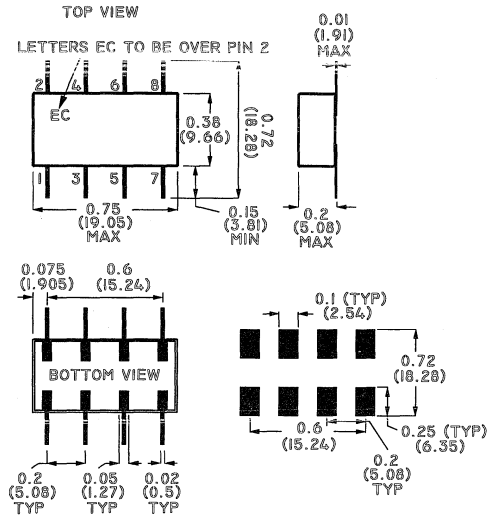
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-3



Function	Pin No.
Not Connected	-
External 50 Ohms	6
Ground	3,4,7,8
Case Ground	-
Input	1
Port 1	2
Port 2	5

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
150 - 250 MHz ESCQ-2-250

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range	150 - 250 MHz
Insertion Loss	**Maximum**
150 - 250 MHz	0.7 dB
Isolation	**Minimum**
150 - 250 MHz	16 dB
Amplitude Unbalance	**Maximum**
150 - 250 MHz	1.2 dB
Phase Unbalance	**Maximum**
150 - 250 MHz	3°

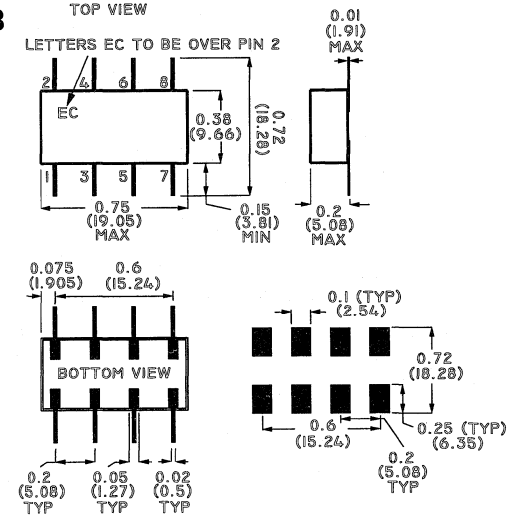
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-3



Function	Pin No.
Not Connected	-
External 50 Ohms	6
Ground	3,4,7,8
Case Ground	-
Input	1
Port 1	2
Port 2	5

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
250 - 400 MHz ESCQ-2-400

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range	250 - 400 MHz	
Insertion Loss	**Typical**	**Maximum**
250 - 400 MHz	0.5 dB	1 dB
Isolation	**Typical**	**Minimum**
250 - 400 MHz	19 dB	15 dB
Amplitude Unbalance		**Maximum**
250 - 400 MHz		1.2 dB
Phase Unbalance		**Maximum**
250 - 400 MHz		4°

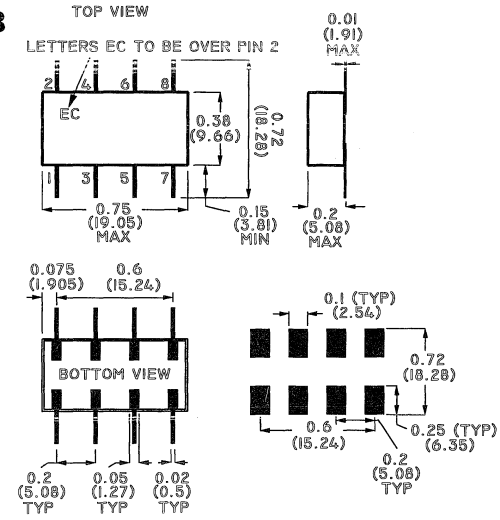
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-3



Function	Pin No.
Not Connected	-
External 50 Ohms	6
Ground	3,4,7,8
Case Ground	-
Input	1
Port 1	2
Port 2	5

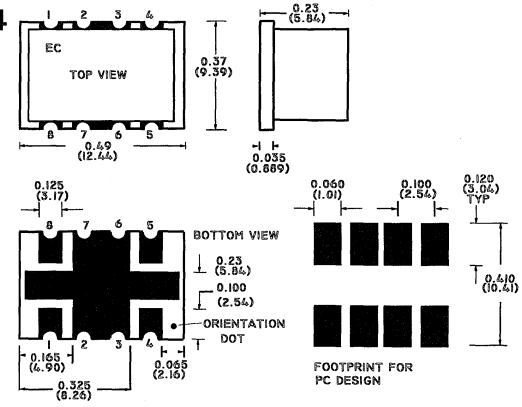
ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
10.7 - 10.7 MHz ESQ-2-10.5X1

Features

* 2 Way
* 90 Degree
* Surface Mount

SM-4



Specifications @ 25°C

Frequency Range	10.7 - 10.7 MHz	
Insertion Loss	**Typical**	**Maximum**
10.7 - 10.7 MHz	0.2 dB	0.3 dB
Isolation	**Typical**	**Minimum**
10.7 - 10.7 MHz	30 dB	25 dB
Amplitude Unbalance		**Maximum**
10.7 - 10.7 MHz		0.7 dB
Phase Unbalance		**Maximum**
10.7 - 10.7 MHz		2°

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Function	Pin No.
Not Connected	-
External 50 Ohms	4
Ground	2,3,6,7
Case Ground	-
Input	1
Port 1	5
Port 2	8

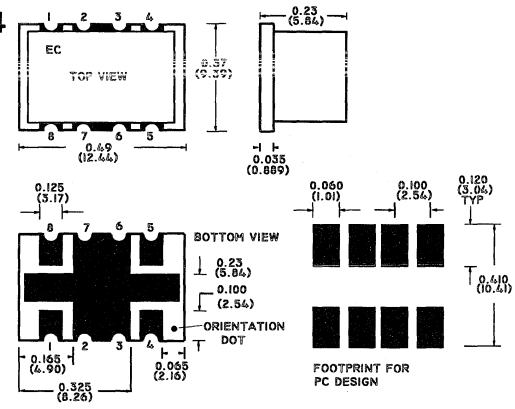
ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
40 - 70 MHz ESQ-2-70X1

Features

* 2 Way
* 90 Degree
* Surface Mount

SM-4



Specifications @ 25°C

Frequency Range		40 - 70 MHz
Insertion Loss	**Typical**	**Maximum**
40 - 70 MHz	0.3 dB	0.7 dB
Isolation	**Typical**	**Minimum**
40 - 70 MHz	30 dB	20 dB
Amplitude Unbalance		**Maximum**
40 - 70 MHz		1.5 dB
Phase Unbalance		**Maximum**
40 - 70 MHz		3°

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Function	Pin No.
Not Connected	-
External 50 Ohms	4
Ground	2,3,6,7
Case Ground	-
Input	1
Port 1	5
Port 2	8

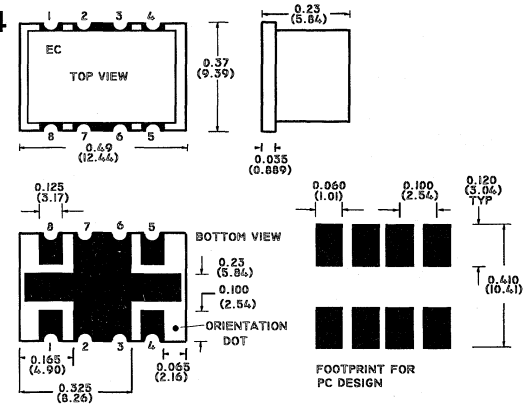
ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
55 - 90 MHz ESQ-2-90X1

Features

* 2 Way
* 90 Degree
* Surface Mount

SM-4



Specifications @ 25°C

Frequency Range		55 - 90 MHz
Insertion Loss	**Typical**	**Maximum**
55 - 90 MHz	0.3 dB	0.7 dB
Isolation	**Typical**	**Minimum**
55 - 90 MHz	30 dB	20 dB
Amplitude Unbalance		**Maximum**
55 - 90 MHz		1.2 dB
Phase Unbalance		**Maximum**
55 - 90 MHz		3°

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Function	Pin No.
Not Connected	2,3,6,7
External 50 Ohms	4
Ground	2,3,6,7
Case Ground	-
Input	1
Port 1	5
Port 2	8

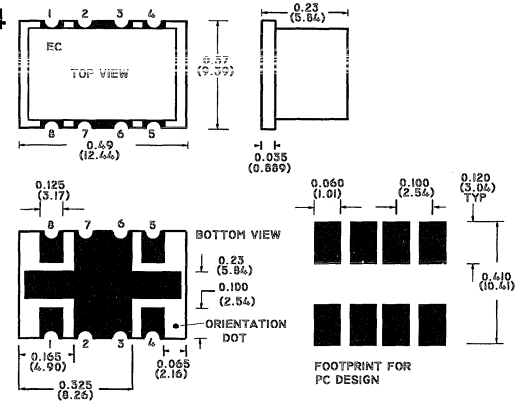
ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
80 - 120 MHz ESQ-2-120X1

Features

* 2 Way
* 90 Degree
* Surface Mount

SM-4



Specifications @ 25°C

Frequency Range		80 - 120 MHz
Insertion Loss	**Typical**	**Maximum**
80 - 120 MHz	0.3 dB	0.7 dB
Isolation	**Typical**	**Minimum**
80 - 120 MHz	25 dB	18 dB
Amplitude Unbalance		**Maximum**
80 - 120 MHz		1.5 dB
Phase Unbalance		**Maximum**
80 - 120 MHz		3°

Function	Pin No.
Not Connected	-
External 50 Ohms	4
Ground	2,3,6,7
Case Ground	-
Input	1
Port 1	5
Port 2	8

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

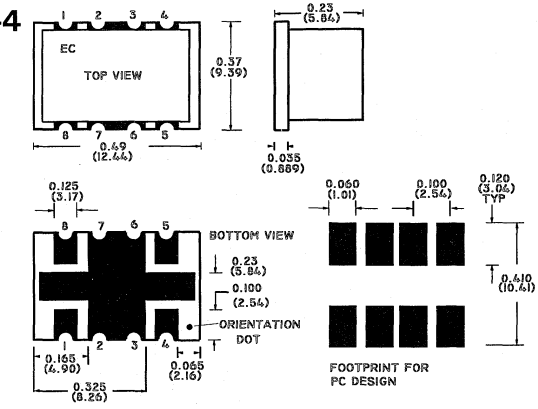
ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
120 - 180 MHz ESQ-2-180X1

Features

* 2 Way
* 90 Degree
* Surface Mount

SM-4



Specifications @ 25°C

Frequency Range		120 - 180 MHz
Insertion Loss	**Typical**	**Maximum**
120 - 180 MHz	0.3 dB	0.7 dB
Isolation	**Typical**	**Minimum**
120 - 180 MHz	23 dB	15 dB
Amplitude Unbalance		**Maximum**
120 - 180 MHz		1.2 dB
Phase Unbalance		**Maximum**
120 - 180 MHz		4°

Function	Pin No.
Not Connected	-
External 50 Ohms	4
Ground	2,3,6,7
Case Ground	-
Input	1
Port 1	5
Port 2	8

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
330 - 350 MHz EQSM-340

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		330 - 350 MHz
Insertion Loss	**Typical**	**Maximum**
330 - 350 MHz	0.5 dB	0.9 dB
Isolation	**Typical**	**Minimum**
330 - 350 MHz	21 dB	16 dB
Amplitude Unbalance		**Maximum**
330 - 350 MHz		1.5 dB
Phase Unbalance		**Maximum**
330 - 350 MHz		5°

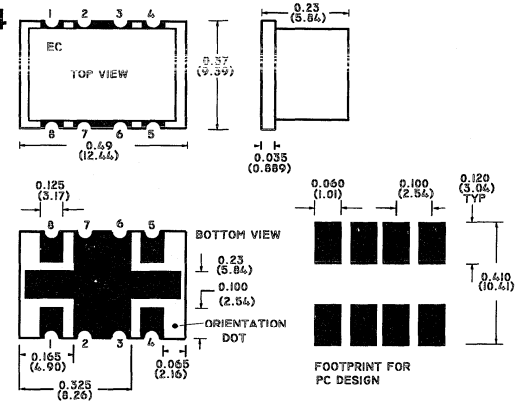
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-4



Function	Pin No.
Not Connected	-
External 50 Ohms	4
Ground	-
Case Ground	-
Input	1
Port 1	8
Port 2	5

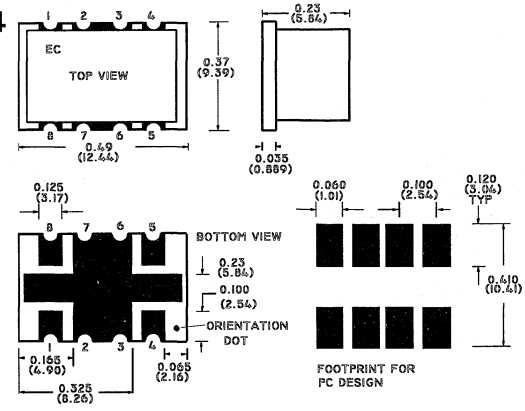
ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
350 - 450 MHz ESQ-2-450X1

Features

* 2 Way
* 90 Degree
* Surface Mount

SM-4



Specifications @ 25°C

Frequency Range	350 - 450 MHz	
Insertion Loss	**Typical**	**Maximum**
350 - 450 MHz	0.6 dB	1.2 dB
Isolation	**Typical**	**Minimum**
350 - 450 MHz	18 dB	14 dB
Amplitude Unbalance		**Maximum**
350 - 450 MHz		1.5 dB
Phase Unbalance		**Maximum**
350 - 450 MHz		5°

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Function	Pin No.
Not Connected	-
External 50 Ohms	5
Ground	2,3,6,7
Case Ground	-
Input	1
Port 1	4
Port 2	8

Specifications Subject to Change Without Notice S 0222 C

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
355 - 365 MHz

EQSM-360

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		355 - 365 MHz
Insertion Loss	**Typical**	**Maximum**
355 - 365 MHz	0.4 dB	0.9 dB
Isolation	**Typical**	**Minimum**
355 - 365 MHz	19 dB	16 dB
Amplitude Unbalance		**Maximum**
355 - 365 MHz		1.5 dB
Phase Unbalance		**Maximum**
355 - 365 MHz		5°

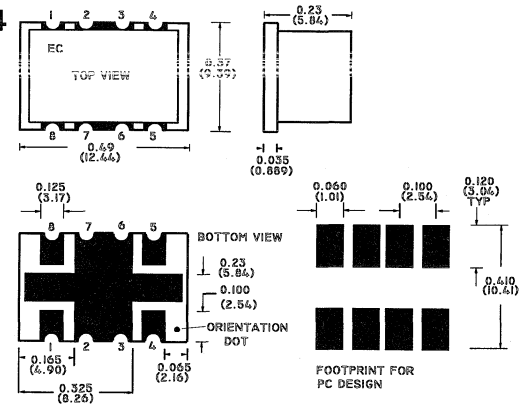
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-4



Function	Pin No.
Not Connected	-
External 50 Ohms	4
Ground	2,3,6,7
Case Ground	2,3,6,7
Input	1
Port 1	8
Port 2	5

ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
450 - 470 MHz EQSM-460

Features

* 2 Way
* 90 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		450 - 470 MHz
Insertion Loss	**Typical**	**Maximum**
450 - 470 MHz	0.4 dB	0.9 dB
Isolation	**Typical**	**Minimum**
450 - 470 MHz	21 dB	16 dB
Amplitude Unbalance		**Maximum**
450 - 470 MHz		1 dB
Phase Unbalance		**Maximum**
450 - 470 MHz		5°

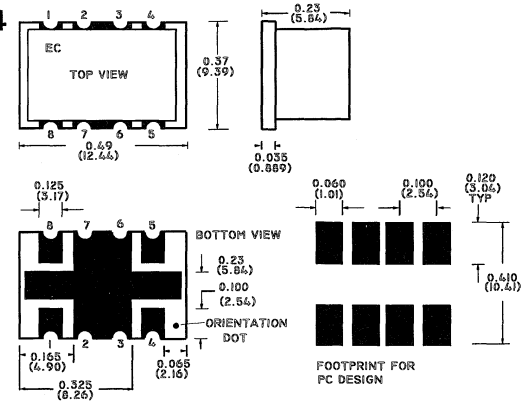
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-4



Function	Pin No.
Not Connected	-
External 50 Ohms	4
Ground	2,3,6,7
Case Ground	2,3,6,7
Input	1
Port 1	8
Port 2	5

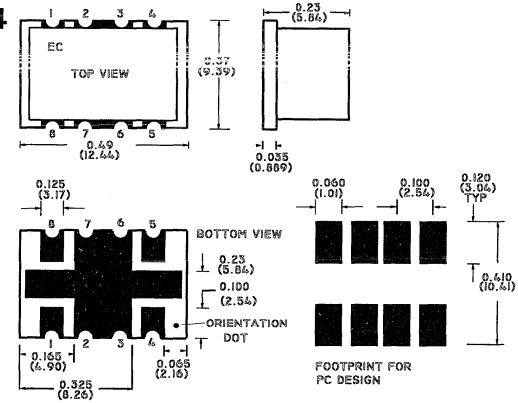
ISO 9001
CERTIFIED

E-Series 2-Way 90° Power Divider
820 - 980 MHz ESQ-2-900X1

Features

* 2 Way
* 90 Degree
* Surface Mount

SM-4



Specifications @ 25°C

Frequency Range	820 - 980 MHz	
Insertion Loss	**Typical**	**Maximum**
820 - 980 MHz	0.6 dB	1 dB
Isolation	**Typical**	**Minimum**
820 - 980 MHz	18 dB	14 dB
Amplitude Unbalance		**Maximum**
820 - 980 MHz		1.2 dB
Phase Unbalance		**Maximum**
820 - 980 MHz		4°

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Function	Pin No.
Not Connected	-
External 50 Ohms	4
Ground	2,3,6,7
Case Ground	-
Input	1
Port 1	5
Port 2	8

ISO 9001
CERTIFIED

E-Series 3-Way 0° Power Divider
1 - 500 MHz ESZF-3-1

Features

* 3 Way
* 0 Degree
* Connectorized

Specifications @ 25°C

Frequency Range		1 - 500 MHz
Insertion Loss	**Typical**	**Maximum**
1 - 10 MHz	0.4 dB	0.75 dB
10 - 250 MHz	0.5 dB	0.9 dB
250 - 500 MHz	0.8 dB	1.2 dB
Isolation	**Typical**	**Minimum**
1 - 10 MHz	30 dB	20 dB
10 - 250 MHz	30 dB	20 dB
250 - 500 MHz	25 dB	18 dB
Amplitude Unbalance		**Maximum**
1 - 10 MHz		0.2 dB
10 - 250 MHz		0.3 dB
250 - 500 MHz		0.4 dB
Phase Unbalance		**Maximum**
1 - 10 MHz		2°
10 - 250 MHz		3°
250 - 500 MHz		4°

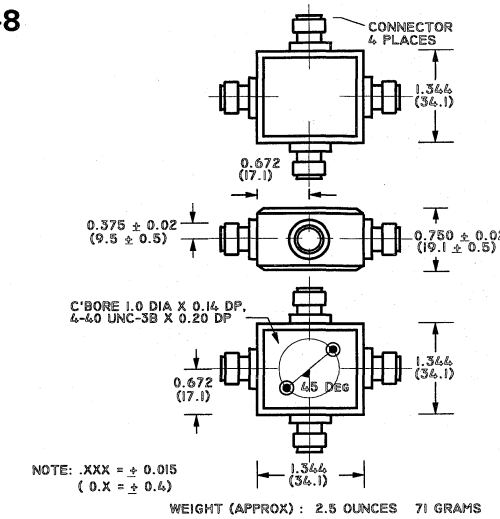
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

C-8



Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	-
Case Ground	-
Input	A
Port 1	B
Port 2	C
Port 3	D

ISO 9001
CERTIFIED

E-Series 3-Way 0° Power Divider
1 - 200 MHz

ES-3-1

Features

* 3 Way
* 0 Degree

Specifications @ 25°C

Frequency Range		1 - 200 MHz
Insertion Loss	**Typical**	**Maximum**
1 - 10 MHz	0.6 dB	1 dB
10 - 100 MHz	0.4 dB	0.7 dB
100 - 200 MHz	0.6 dB	1 dB
Isolation	**Typical**	**Minimum**
1 - 10 MHz	45 dB	30 dB
10 - 100 MHz	40 dB	30 dB
100 - 200 MHz	40 dB	25 dB
Amplitude Unbalance		**Maximum**
1 - 10 MHz		0.15 dB
10 - 100 MHz		0.2 dB
100 - 200 MHz		0.3 dB
Phase Unbalance		**Maximum**
1 - 10 MHz		1°
10 - 100 MHz		2°
100 - 200 MHz		4°

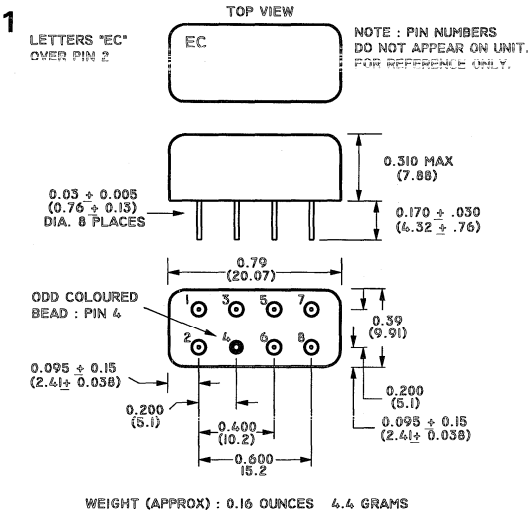
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	3,4,7,8
Case Ground	-
Input	6
Port 1	1
Port 2	2
Port 3	5

ISO 9001
CERTIFIED

E-Series 3-Way 0° Power Divider
5 - 500 MHz ES-3-1W

Features

* 3 Way
* 0 Degree

Specifications @ 25°C

Frequency Range		5 - 500 MHz
Insertion Loss	**Typical**	**Maximum**
5 - 50 MHz	0.4 dB	0.8 dB
50 - 250 MHz	0.4 dB	1.4 dB
250 - 500 MHz	0.8 dB	1.4 dB
Isolation	**Typical**	**Minimum**
5 - 50 MHz	25 dB	20 dB
50 - 250 MHz	31 dB	15 dB
250 - 500 MHz	25 dB	15 dB
Amplitude Unbalance		**Maximum**
5 - 50 MHz		0.1 dB
50 - 250 MHz		0.3 dB
250 - 500 MHz		0.6 dB
Phase Unbalance		**Maximum**
5 - 50 MHz		6°
50 - 250 MHz		14°
250 - 500 MHz		20°

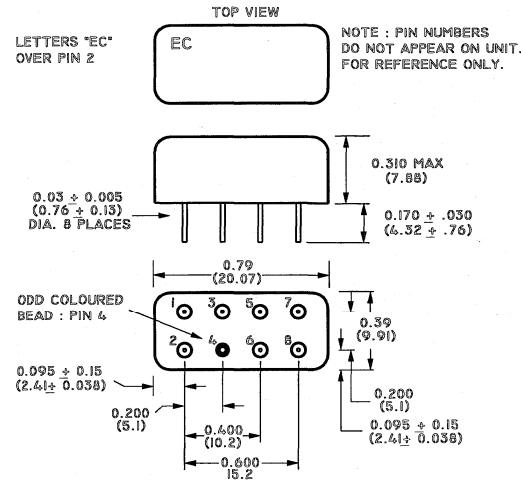
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
Not Connected	2,3,4,6
External 50 Ohms	-
Ground	2,3,4,6
Case Ground	-
Input	1
Port 1	5
Port 2	7
Port 3	8

ISO 9001
CERTIFIED

E-Series 3-Way 0° Power Divider
1 - 300 MHz

ESCP-3-1

Features

* 3 Way
* 0 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		1 - 300 MHz
Insertion Loss	**Typical**	**Maximum**
1 - 10 MHz	0.3 dB	0.6 dB
10 - 150 MHz	0.4 dB	0.8 dB
150 - 300 MHz	0.7 dB	1.5 dB
Isolation	**Typical**	**Minimum**
1 - 10 MHz	30 dB	25 dB
10 - 150 MHz	25 dB	20 dB
150 - 300 MHz	20 dB	15 dB
Amplitude Unbalance		**Maximum**
1 - 10 MHz		0.2 dB
10 - 150 MHz		0.5 dB
150 - 300 MHz		1 dB
Phase Unbalance		**Maximum**
1 - 10 MHz		1°
10 - 150 MHz		2°
150 - 300 MHz		4°

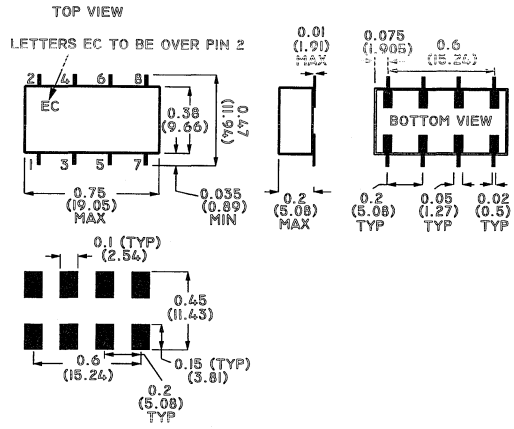
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-26



Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	3,4,7,8
Case Ground	-
Input	6
Port 1	1
Port 2	2
Port 3	5

ISO 9001
CERTIFIED

E-Series 3-Way 0° Power Divider
1 - 200 MHz ES-3-1X1

Features

* 3 Way
* 0 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		1 - 200 MHz
Insertion Loss	**Typical**	**Maximum**
1 - 10 MHz	0.6 dB	1 dB
10 - 100 MHz	0.4 dB	0.7 dB
100 - 200 MHz	0.6 dB	1 dB
Isolation	**Typical**	**Minimum**
1 - 10 MHz	45 dB	30 dB
10 - 100 MHz	40 dB	30 dB
100 - 200 MHz	40 dB	25 dB
Amplitude Unbalance		**Maximum**
1 - 10 MHz		0.15 dB
10 - 100 MHz		0.2 dB
100 - 200 MHz		0.3 dB
Phase Unbalance		**Maximum**
1 - 10 MHz		1°
10 - 100 MHz		2°
100 - 200 MHz		4°

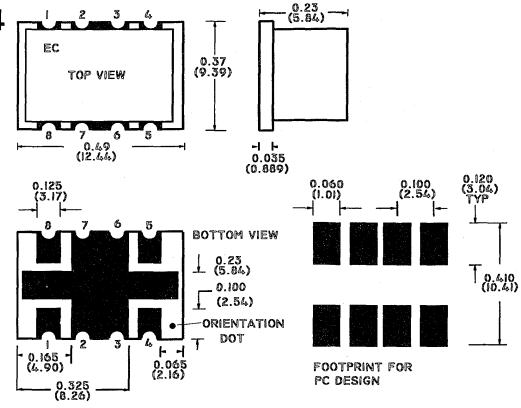
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-4



Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	2,3,6,7
Case Ground	-
Input	1
Port 1	4
Port 2	5
Port 3	8

ISO 9001
CERTIFIED

E-Series 3-Way 0° Power Divider
5 - 500 MHz ESSM-3-1W

Features

* 3 Way
* 0 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		5 - 500 MHz
Insertion Loss	**Typical**	**Maximum**
5 - 50 MHz	0.4 dB	0.8 dB
50 - 250 MHz	0.6 dB	1.4 dB
250 - 500 MHz	1 dB	1.75 dB
Isolation	**Typical**	**Minimum**
5 - 50 MHz	25 dB	20 dB
50 - 250 MHz	22 dB	15 dB
250 - 500 MHz	18 dB	15 dB
Amplitude Unbalance		**Maximum**
5 - 50 MHz		0.1 dB
50 - 250 MHz		0.3 dB
250 - 500 MHz		0.75 dB
Phase Unbalance		**Maximum**
5 - 50 MHz		2°
50 - 250 MHz		3°
250 - 500 MHz		6°

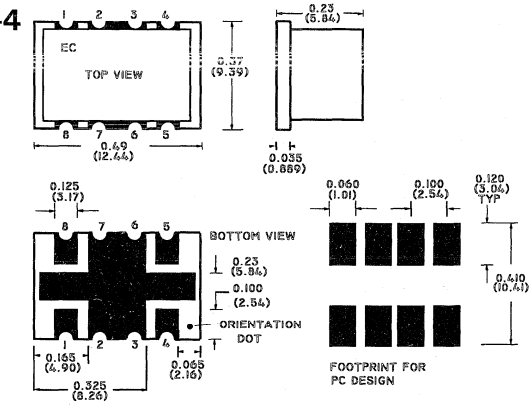
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-4



Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	2,3,6,7
Case Ground	-
Input	8
Port 1	5
Port 2	4
Port 3	1

Specifications Subject to Change Without Notice S 0769 B

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

E-Series 4-Way 0° Power Divider
5 - 1000 MHz

ES-4-5

Features

* 4 Way
* 0 Degree

Specifications @ 25°C

Frequency Range		5 - 1000 MHz
Insertion Loss	**Typical**	**Maximum**
5 - 50 MHz	0.5 dB	0.75 dB
50 - 500 MHz	1 dB	1.8 dB
500 - 1000 MHz	1.5 dB	2.5 dB
Isolation	**Typical**	**Minimum**
5 - 50 MHz	25 dB	20 dB
50 - 500 MHz	20 dB	17 dB
500 - 1000 MHz	20 dB	17 dB
Amplitude Unbalance		**Maximum**
5 - 50 MHz		0.2 dB
50 - 500 MHz		0.7 dB
500 - 1000 MHz		1 dB
Phase Unbalance		**Maximum**
5 - 50 MHz		1°
50 - 500 MHz		5°
500 - 1000 MHz		10°

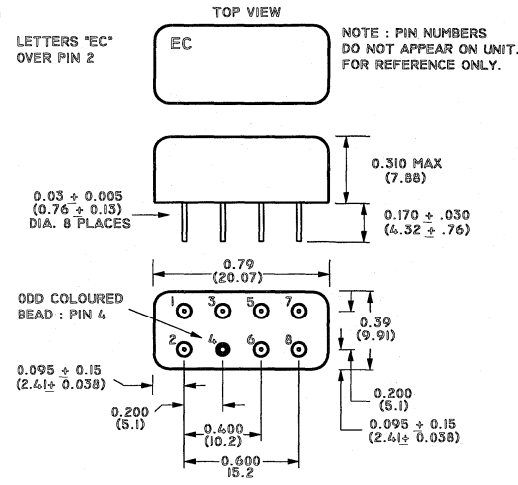
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-1



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

Function	Pin No.
Not Connected	3,5,6
External 50 Ohms	-
Ground	3,5,6
Case Ground	-
Input	4
Port 1	7
Port 2	8
Port 3	1
Port 4	2

ISO 9001
CERTIFIED

E-Series 4-Way 0° Power Divider
0.1 - 200 MHz

ES-4-1

Features

* 4 Way
* 0 Degree

Specifications @ 25°C

Frequency Range	0.1 - 200 MHz
Insertion Loss	**Typical**	**Maximum**
0.1 - 1 MHz	0.4 dB	0.6 dB
1 - 100 MHz	0.5 dB	0.75 dB
100 - 200 MHz	0.7 dB	1 dB
Isolation	**Typical**	**Minimum**
0.1 - 1 MHz	33 dB	20 dB
1 - 100 MHz	30 dB	20 dB
100 - 200 MHz	27 dB	20 dB
Amplitude Unbalance		**Maximum**
0.1 - 1 MHz		0.15 dB
1 - 100 MHz		0.2 dB
100 - 200 MHz		0.25 dB
Phase Unbalance		**Maximum**
0.1 - 1 MHz		4°
1 - 100 MHz		6°
100 - 200 MHz		8°

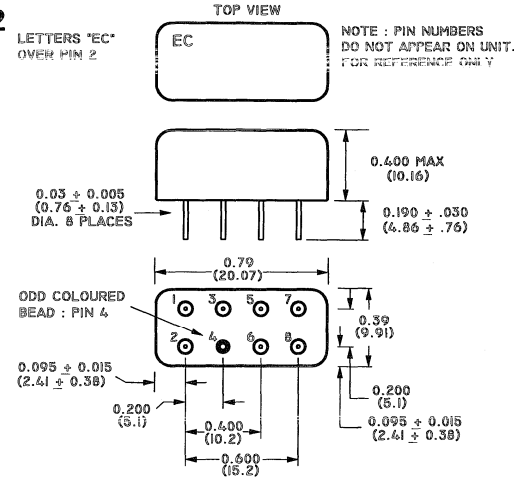
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,56
External 50 Ohms	-
Ground	3,5,6
Case Ground	-
Input	4
Port 1	7
Port 2	8
Port 3	1
Port 4	2

Specifications Subject to Change Without Notice S 0250 B

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

E-Series 4-Way 0° Power Divider
0.25 - 250 MHz ES-4-3

Features

* 4 Way
* 0 Degree

Specifications @ 25°C

Frequency Range		0.25 - 250 MHz
Insertion Loss	**Typical**	**Maximum**
0.25 - 2.5 MHz	0.4 dB	0.7 dB
2.5 - 125 MHz	0.5 dB	0.75 dB
125 - 250 MHz	0.7 dB	1.2 dB
Isolation	**Typical**	**Minimum**
0.25 - 2.5 MHz	33 dB	20 dB
2.5 - 125 MHz	30 dB	20 dB
125 - 250 MHz	27 dB	20 dB
Amplitude Unbalance		**Maximum**
0.25 - 2.5 MHz		0.15 dB
2.5 - 125 MHz		0.2 dB
125 - 250 MHz		0.25 dB
Phase Unbalance		**Maximum**
0.25 - 2.5 MHz		4°
2.5 - 125 MHz		6°
125 - 250 MHz		8°

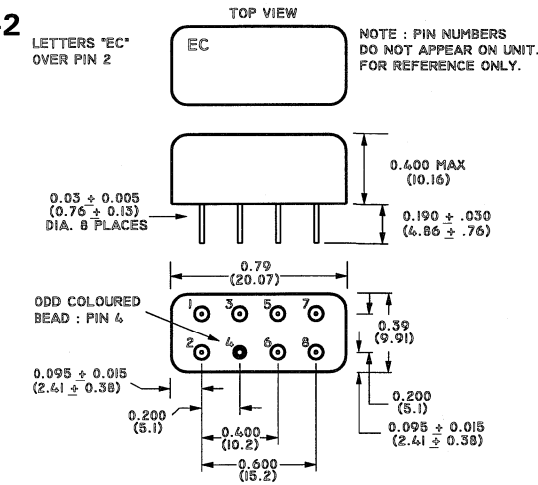
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,5,6
External 50 Ohms	-
Ground	3,5,6
Case Ground	-
Input	4
Port 1	7
Port 2	8
Port 3	1
Port 4	2

ISO 9001
CERTIFIED

E-Series 4-Way 0° Power Divider
1 - 500 MHz

ES-4-1W

Features

* 4 Way
* 0 Degree

Specifications @ 25°C

Frequency Range		1 - 500 MHz
Insertion Loss	**Typical**	**Maximum**
1 - 10 MHz	0.4 dB	0.8 dB
10 - 250 MHz	0.5 dB	1 dB
250 - 500 MHz	0.8 dB	1.5 dB
Isolation	**Typical**	**Minimum**
1 - 10 MHz	29 dB	20 dB
10 - 250 MHz	27 dB	18 dB
250 - 500 MHz	25 dB	18 dB
Amplitude Unbalance		**Maximum**
1 - 10 MHz		0.2 dB
10 - 250 MHz		0.3 dB
250 - 500 MHz		0.5 dB
Phase Unbalance		**Maximum**
1 - 10 MHz		1°
10 - 250 MHz		3°
250 - 500 MHz		5°

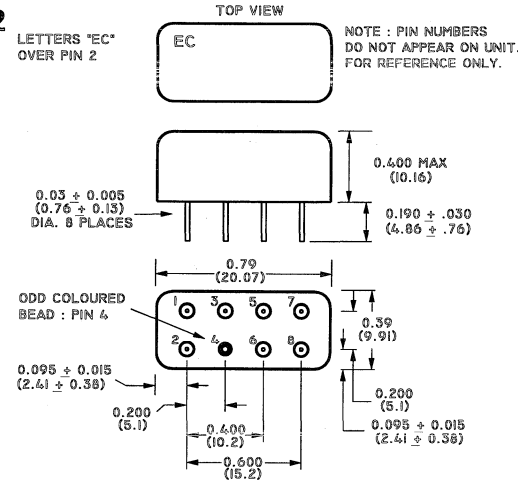
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Not Connected	3,5,6
External 50 Ohms	-
Ground	3,5,6
Case Ground	-
Input	4
Port 1	7
Port 2	8
Port 3	1
Port 4	2

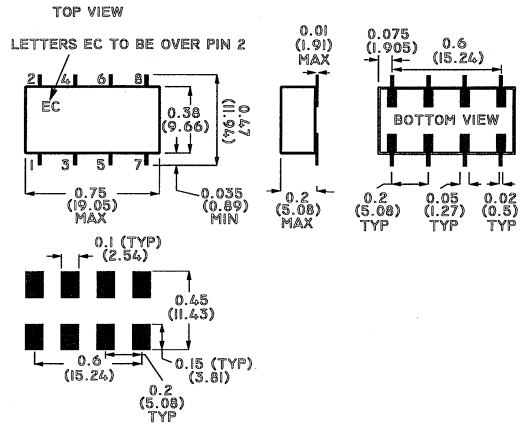
ISO 9001
CERTIFIED

E-Series 4-Way 0° Power Divider
10 - 80 MHz ESCP-4-3-2

Features

* 4 Way
* 0 Degree
* Surface Mount

SM-26



Specifications @ 25°C

Frequency Range		10 - 80 MHz
Insertion Loss	**Typical**	**Maximum**
10 - 80 MHz	0.3 dB	0.8 dB
Isolation	**Typical**	**Minimum**
10 - 80 MHz	30 dB	25 dB
Amplitude Unbalance		**Maximum**
10 - 80 MHz		0.3 dB
Phase Unbalance		**Maximum**
10 - 80 MHz		6°

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	3,5,6
Case Ground	-
Input	4
Port 1	7
Port 2	8
Port 3	1
Port 4	2

ISO 9001
CERTIFIED

E-Series 4-Way 0° Power Divider
824 - 895 MHz ES-4-6

Features

* 4 Way
* 0 Degree
* Surface Mount

Specifications @ 25°C

Frequency Range		824 - 895 MHz
Insertion Loss	**Typical**	**Maximum**
824 - 895 MHz	1.7 dB	2 dB
Isolation	**Typical**	**Minimum**
824 - 895 MHz	22 dB	20 dB
Amplitude Unbalance		**Maximum**
824 - 895 MHz		0.5 dB
Phase Unbalance		**Maximum**
824 - 895 MHz		5°

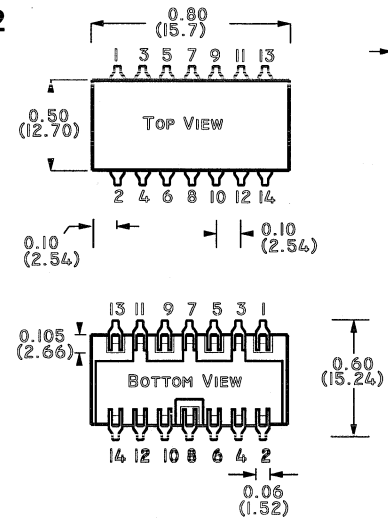
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

SM-42



Function	Pin No.
Not Connected	-
External 50 Ohms	-
Ground	2-4,6,7,10-12,14
Case Ground	-
Input	8
Port 1	13
Port 2	9
Port 3	5
Port 4	1

ISO 9001
CERTIFIED

E-Series 5-Way 0° Power Divider
1 - 300 MHz ES-5-1

Features

* 5 Way
* 0 Degree

Specifications @ 25°C

Frequency Range		1 - 300 MHz
Insertion Loss	**Typical**	**Maximum**
1 - 10 MHz	0.2 dB	0.5 dB
10 - 150 MHz	0.6 dB	1 dB
150 - 300 MHz	1.5 dB	2 dB
Isolation	**Typical**	**Minimum**
1 - 10 MHz	25 dB	20 dB
10 - 150 MHz	23 dB	18 dB
150 - 300 MHz	20 dB	17 dB
Amplitude Unbalance		**Maximum**
1 - 10 MHz		0.2 dB
10 - 150 MHz		0.3 dB
150 - 300 MHz		0.6 dB
Phase Unbalance		**Maximum**
1 - 10 MHz		2°
10 - 150 MHz		4°
150 - 300 MHz		8°

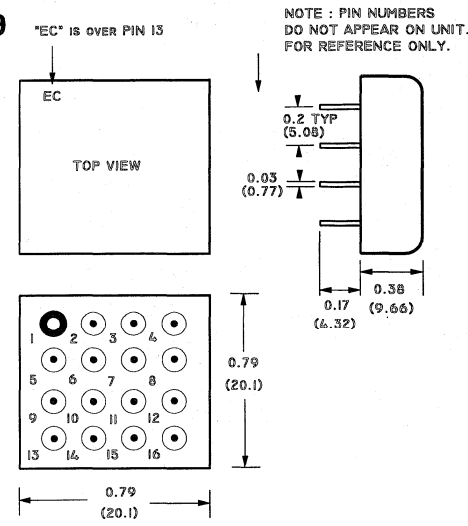
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-9



Function	Pin No.
Not Connected	3,6,9,10
External 50 Ohms	-
Ground	2,5,7,11,13,14
Case Ground	-
Input	1
Port 1	4
Port 2	8
Port 3	12
Port 4	16
Port 5	15

Specifications Subject to Change Without Notice S 0408 B

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See Page 7-26 For Local Office Details

ISO 9001
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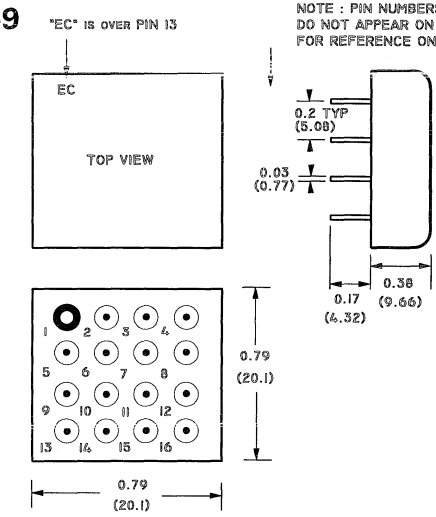
E-Series 6-Way 0° Power Divider
1 - 175 MHz

ES-6-1

Features

* 6 Way
* 0 Degree

R-9



Specifications @ 25°C

Frequency Range		1 - 175 MHz
Insertion Loss	**Typical**	**Maximum**
1 - 10 MHz	0.5 dB	0.8 dB
10 - 87.5 MHz	0.7 dB	1 dB
87.5 - 175 MHz	1 dB	1.5 dB
Isolation	**Typical**	**Minimum**
1 - 10 MHz	30 dB	24 dB
10 - 87.5 MHz	26 dB	18 dB
87.5 - 175 MHz	26 dB	18 dB
Amplitude Unbalance		**Maximum**
1 - 10 MHz		0.2 dB
10 - 87.5 MHz		0.4 dB
87.5 - 175 MHz		0.8 dB
Phase Unbalance		**Maximum**
1 - 10 MHz		4°
10 - 87.5 MHz		6°
87.5 - 175 MHz		12°

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Function	Pin No.
Not Connected	6,9,10
External 50 Ohms	-
Ground	2,5,7,11,13,14
Case Ground	-
Input	1
Port 1	3
Port 2	4
Port 3	8
Port 4	12
Port 5	16
Port 6	15

Specifications Subject to Change Without Notice S 0536 B

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See Page 7-26 For Local Office Details

ISO 9001
CERTIFIED

E-Series 6-Way 0° Power Divider
10 - 300 MHz ES-6-1X1

Features

* 6 Way
* 0 Degree

Specifications @ 25°C

Frequency Range		10 - 300 MHz
Insertion Loss	**Typical**	**Maximum**
10 - 100 MHz	0.4 dB	0.9 dB
100 - 150 MHz	0.6 dB	1.1 dB
150 - 300 MHz	0.8 dB	2 dB
Isolation	**Typical**	**Minimum**
10 - 100 MHz	35 dB	25 dB
100 - 150 MHz	30 dB	23 dB
150 - 300 MHz	25 dB	18 dB
Amplitude Unbalance		**Maximum**
10 - 100 MHz		0.2 dB
100 - 150 MHz		0.3 dB
150 - 300 MHz		0.6 dB
Phase Unbalance		**Maximum**
10 - 100 MHz		2°
100 - 150 MHz		4°
150 - 300 MHz		8°

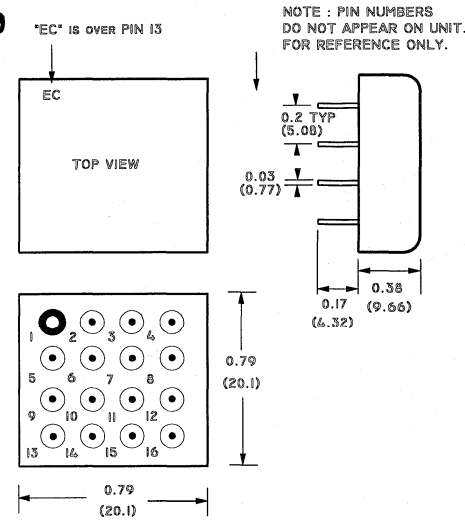
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

R-9



Function	Pin No.
Not Connected	6,9,10
External 50 Ohms	-
Ground	2,5,7,11,13,14
Case Ground	-
Input	1
Port 1	3
Port 2	4
Port 3	8
Port 4	12
Port 5	16
Port 6	15

ISO 9001
CERTIFIED

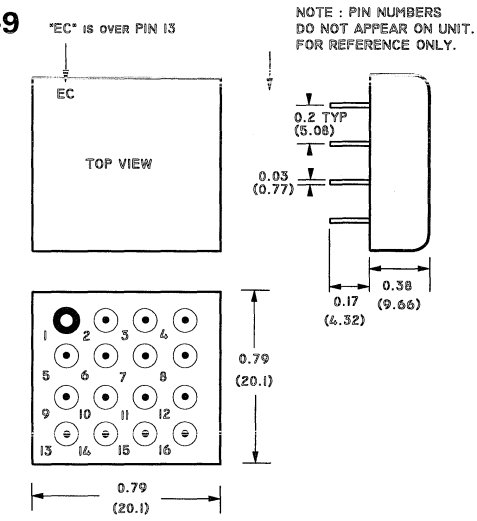
E-Series 8-Way 0° Power Divider
0.5 - 175 MHz

ES-8-1

Features

* 8 Way
* 0 Degree

R-9



Specifications @ 25°C

Frequency Range	0.5 - 175 MHz
Insertion Loss	**Typical**	**Maximum**
0.5 - 5 MHz	0.8 dB	1.2 dB
5 - 87.5 MHz	0.8 dB	1.2 dB
87.5 - 175 MHz	1 dB	1.6 dB
Isolation	**Typical**	**Minimum**
0.5 - 5 MHz	30 dB	25 dB
5 - 87.5 MHz	30 dB	20 dB
87.5 - 175 MHz	25 dB	18 dB
Amplitude Unbalance		**Maximum**
0.5 - 5 MHz		0.2 dB
5 - 87.5 MHz		0.3 dB
87.5 - 175 MHz		0.5 dB
Phase Unbalance		**Maximum**
0.5 - 5 MHz		1°
5 - 87.5 MHz		2.5°
87.5 - 175 MHz		5°

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
Maximum Power Rating	1 Watt
Internal Load Dissipation	0.125 Watt
Pin Temp (10 sec)	260°C
Storage Temperature	-55°C to 100°C

Function	Pin No.
Not Connected	10,11
External 50 Ohms	-
Ground	-
Case Ground	3,6,7,14,15
Input	2
Port 1	1
Port 2	5
Port 3	9
Port 4	13
Port 5	16
Port 6	12
Port 7	8
Port 8	4

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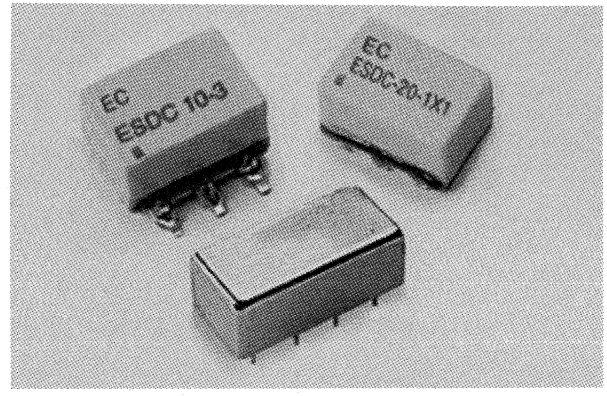
Couplers



Title **Page**

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Specification Checklist 6-3
Data Pages 6-4
Application Specific Selection Guides 7-16

Coupler Selection Guide

Model No.	Frequency MHz fL - fu	Coupling dB Nom.	Coupling dB Flat.	Mainline Loss dB L Typ.	Mainline Loss dB M Typ.	Mainline Loss dB U Typ.	Directivity dB L Typ.	Directivity dB M Typ.	Directivity dB U Typ.	VSWR (:1) Typ.	Input Power, W L Max	Input Power, W MU Max	Case Style	Price $ Qty. (1-9)	Page No.
EPDC-15-1	30-88	14.7	0.2	0.62	0.62	0.62	28	28	28	1.5	1	1	R-2	10.31	6-4
EPDC-10-1BD	1-400	11.5±0.7	0.7	0.6	0.8	0.9	55	35	22	1.2	-	-	R-2	10.31	6-5
EPDC-10-1	0.5-500	11.5±0.5	0.6	0.85	0.65	0.85	32	32	22	1.2	1.5	3	R-2	12.11	6-6
ETDC-10-2	5-1000	11±0.5	0.6	1.4	1.5	1.6	50	25	20	1.5	0.5	0.5	R-3	23.36	6-7
ETDC-10-1	1-400	10±0.5	0.6	1.2	1	1.2	35	30	20	1.5	1	2	R-3	16.16	6-8
ESDC-20-1X3	200-600	20.5	0.8	0.25	0.25	0.25	20	20	20	1.1	-	-	SM-1	14.36	6-9
ESDC-20-1X2	800-900	20±1	-	0.25	0.25	0.25	10	10	10	1.5	-	-	SM-1	14.36	6-10
ESDC-11-1	380-520	11±0.5	0.4	0.9	0.9	0.9	18	18	18	1.3	-	-	SM-1	14.36	6-11
ESDC-10-3	50-400	10	0.4	1	1	1	22.5	22.5	22.5	-	-	-	SM-1	14.36	6-12
ESDC-10-1-75	40-860	9.4	0.5	1.5	1.5	1.5	15	15	15	1.3	-	-	SM-1	14.36	6-13
ESDC-20-1X1	800-900	20±1	-	0.25	0.25	0.25	10	10	10	1.5	-	-	SM-24	14.36	6-14

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Coupler Specifications Checklist

If your particular requirements are not met with a M/A-COM catalog item, please complete the checklist below and mail, phone, or fax it to M/A-COM Eurotec, Sales and Marketing or your local Sales Office.

Application:
Industrial ..... Commercial ..... Other .....
Description: .....
.....
Parameters important for application: .....
.....

Electrical:
Frequency Range .....MHz
Coupling Avg. .....dB, Tol. ± .....dB
Coupling Flatness Max. ± .....dB
Mainline Insertion Loss Max. .....dB
Directivity Min. .....dB
Input Power Max. .....dB
VSWR or Return Loss (dB)

☐ 50 Ohms ☐ 75 Ohms ☐ Other
Input.....Ouput.....Coupled.....
Operating Temperature: .....°C

Enviornmental Requirements:
.....
.....
.....
.....
.....
.....
.....

Mechanical:
Standard Case Style: ..... (for outline drawings see Table of Contents)

PC Board Mounting

☐ Plug-in ☐ Surface-Mount

Coaxial Connector

☐ BNC ☐ TNC
☐ SMA ☐ N ☐ Other

Special Requirements: .....
.....

Name: ..... Title: .....

Company: ..... Dept: .....

Company Address: .....

Phone: ..... Fax: .....

ISO 9001
CERTIFIED

E-Series Coupler
30 - 88 MHz

EPDC-15-1

Features

* Coupling +14.7 dB Typical
* Plug-in

Specifications @ 25°C

Frequency Range		**30 - 88 MHz**
Input Power		**Maximum**
30 - 88 MHz		1 W
Coupling	**Nominal**	**Flatness**
30 - 88 MHz	14.7 dB	±0.2 dB
Main Line Loss	**Typical**	**Maximum**
30 - 88 MHz	0.62 dB	0.7 dB
Directivity	**Typical**	**Minimum**
30 - 88 MHz	28 dB	26 dB
VSWR	**Typical**	
30 - 88 MHz	1.5 : 1	

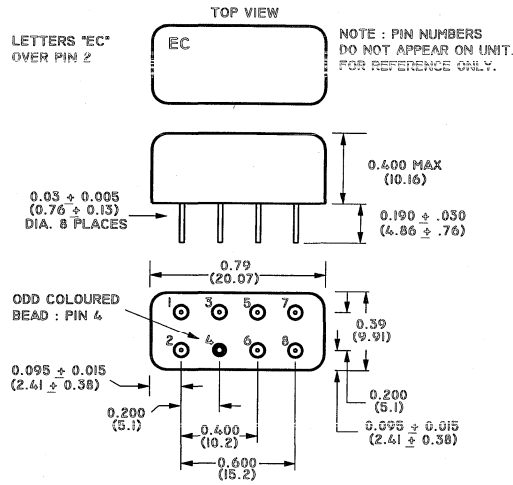
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	**Absolute Maximum**
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Input	1
Output	4
Coupled	3
Ground	2,5,7,8
Case Ground	2,5,7,8
External 50 Ohms	-
Not Connected	6

ISO 9001
CERTIFIED

E-Series Coupler
1 - 400 MHz

EPDC-10-1BD

Features

* Coupling +11.5 dB Typical
* Plug-In
* Bi-Directional

Specifications @ 25°C

Frequency Range	**1 - 400 MHz**

Coupling	Nominal	Flatness
1 - 400 MHz	11.5 ± 0.7 dB	± 0.7 dB

Main Line Loss	Typical	Maximum
1 - 10 MHz	0.6 dB	0.9 dB
10 - 200 MHz	0.8 dB	1.1 dB
200 - 400 MHz	0.9 dB	1.3 dB

Directivity	Typical	Minimum
1 - 10 MHz	55 dB	35 dB
10 - 200 MHz	35 dB	20 dB
200 - 400 MHz	22 dB	15 dB

VSWR	Typical
1 - 400 MHz	1.2 : 1

Operating Characteristics

Impedance	**50 Ohms Nominal**

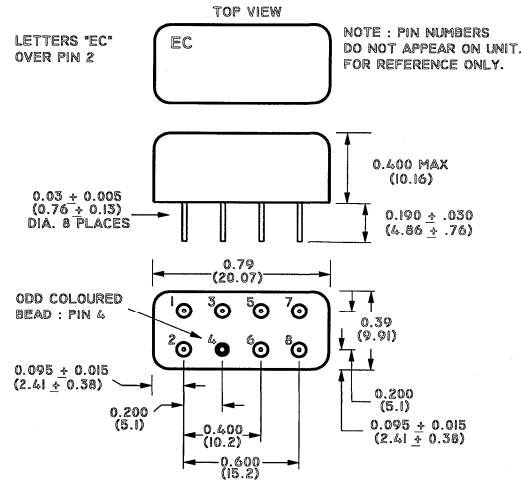
Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Additional Specifications

Pin Out: Coupled Forward = 3, Coupled Reverse = 6

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Input	1
Output	4
Coupled	3,6
Ground	2,5,7,8
Case Ground	2,5,7,8
External 50 Ohms	-
Not Connected	-

ISO 9001
CERTIFIED

E-Series Coupler
0.5 - 500 MHz

EPDC-10-1

Features

* Coupling ± 11.5 dB Typical
* Plug-In

Specifications @ 25°C

Frequency Range		**0.5 - 500 MHz**
Input Power		**Maximum**
0.5 - 5 MHz		1.5 W
5 - 500 MHz		3 W
Coupling	**Nominal**	**Flatness**
0.5 - 500 MHz	11.5 ± 0.5 dB	± 0.6 dB
Main Line Loss	**Typical**	**Maximum**
0.5 - 5 MHz	0.85 dB	1.3 dB
5 - 250 MHz	0.65 dB	1 dB
250 - 500 MHz	0.85 dB	1.3 dB
Directivity	**Typical**	**Minimum**
0.5 - 5 MHz	32 dB	25 dB
5 - 250 MHz	32 dB	25 dB
250 - 500 MHz	22 dB	15 dB
VSWR	**Typical**	
0.5 - 500 MHz	1.2 : 1	

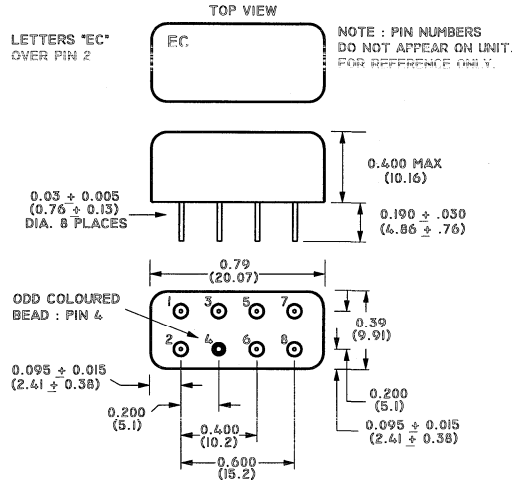
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

Function	Pin No.
Input	1
Output	4
Coupled	3
Ground	2,5,6,7,8
Case Ground	2,5,6,7,8
External 50 Ohms	-
Not Connected	-

ISO 9001
CERTIFIED

E-Series Coupler
5 - 1000 MHz

ETDC-10-2

Features

* Coupling +11 dB Typical
* Plug-In

Specifications @ 25°C

Frequency Range		5 - 1000 MHz
Input Power		Maximum
5 - 50 MHz		0.5 W
50 - 1000 MHz		0.5 W
Coupling	Nominal	Flatness
5 - 1000 MHz	11 ± 0.5 dB	±0.6 dB
Main Line Loss	Typical	Maximum
5 - 50 MHz	1.4 dB	1.8 dB
50 - 500 MHz	1.5 dB	1.8 dB
500 - 1000 MHz	1.6 dB	2 dB
Directivity	Typical	Minimum
5 - 50 MHz	50 dB	35 dB
50 - 500 MHz	25 dB	20 dB
500 - 1000 MHz	20 dB	15 dB
VSWR	Typical	
5 - 1000 MHz	1.5 : 1	

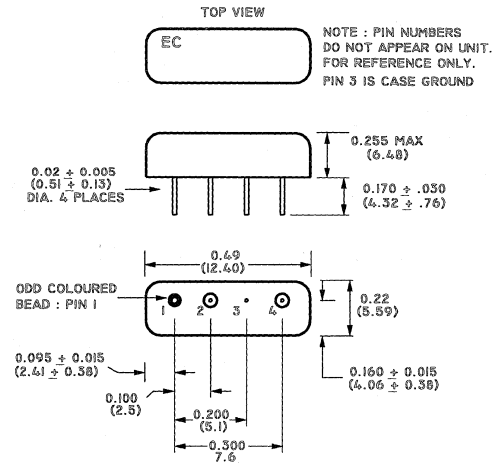
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

R-3



Function	Pin No.
Input	1
Output	2
Coupled	4
Ground	3
Case Ground	3
External 50 Ohms	-
Not Connected	-

ISO 9001
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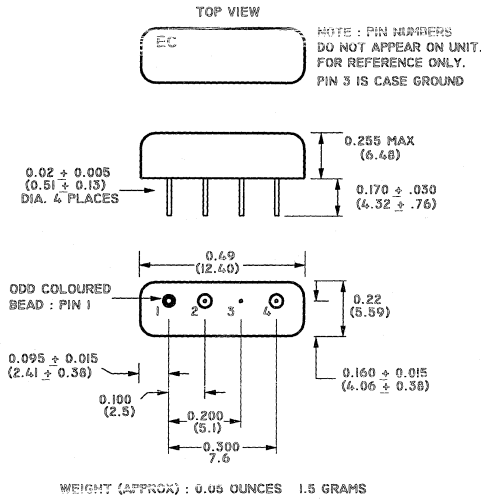
E-Series Coupler
1 - 400 MHz

ETDC-10-1

Features

* Coupling +10 dB Typical
* Plug-in

R-3



Specifications @ 25°C

Frequency Range		1 - 400 MHz
Input Power		**Maximum**
1 - 10 MHz		1 W
10 - 400 MHz		2 W
Coupling	**Nominal**	**Flatness**
1 - 400 MHz	10 ± 0.5 dB	± 0.6 dB
Main Line Loss	**Typical**	**Maximum**
1 - 10 MHz	1.2 dB	1.5 dB
10 - 200 MHz	1 dB	1.3 dB
200 - 400 MHz	1.2 dB	1.5 dB
Directivity	**Typical**	**Minimum**
1 - 10 MHz	35 dB	25 dB
10 - 200 MHz	30 dB	20 dB
200 - 400 MHz	20 dB	15 dB
VSWR	**Typical**	
1 - 400 MHz	1.5 : 1	

Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Function	Pin No.
Input	1
Output	2
Coupled	4
Ground	3
Case Ground	3
External 50 Ohms	-
Not Connected	-

ISO 9001
CERTIFIED

E-Series Coupler
200 - 600 MHz

ESDC-20-1X3

Features

* Coupling +20.5 dB Typical
* Surface Mount

Specifications @ 25°C

Frequency Range	200 - 600 MHz

Coupling	Nominal	Flatness
200 - 600 MHz	20.5 dB	±0.8 dB

Main Line Loss	Typical	Maximum
200 - 600 MHz	0.25 dB	0.6 dB

Directivity	Typical	Minimum
200 - 600 MHz	20 dB	14 dB

VSWR	Typical	Maximum
200 - 600 MHz	1.1 : 1	1.25 : 1

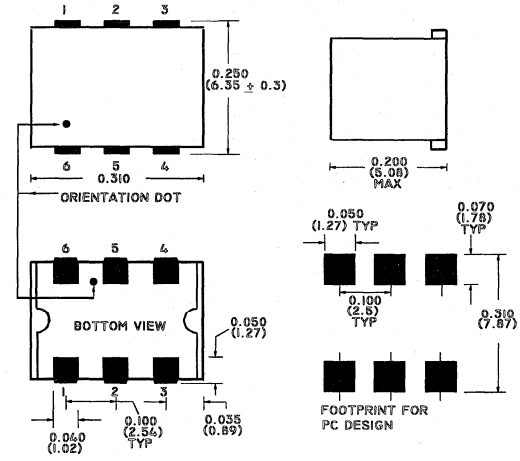
Operating Characteristics

Impedance	50 Ohms Nominal

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-1



Function	Pin No.
Input	6
Output	1
Coupled	4
Ground	2
Case Ground	-
External 50 Ohms	3
Not Connected	5

ISO 9001
CERTIFIED

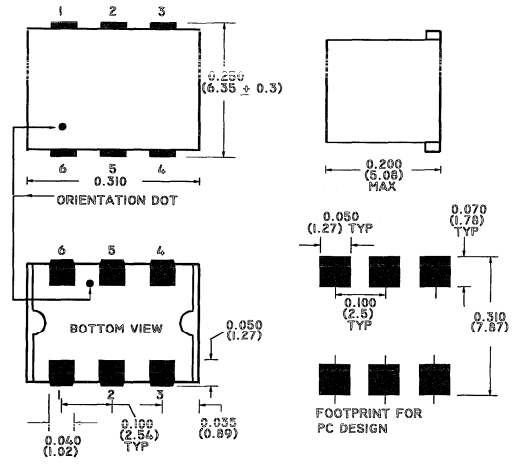
E-Series Coupler
800 - 900 MHz

ESDC-20-1X2

Features

* Coupling +20 dB Typical
* Surface Mount

SM-1



Specifications @ 25°C

Frequency Range	**800 - 900 MHz**

Coupling	**Nominal**
800 - 900 MHz	**20 ± 1 dB**

Main Line Loss	**Typical**	**Maximum**
800 - 900 MHz	**0.25 dB**	**0.5 dB**

Directivity	**Minimum**
800 - 900 MHz	**10 dB**

VSWR	**Typical**
800 - 900 MHz	**1.5 : 1**

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	**Absolute Maximum**
RF Power	**250 mW**
DC Current	**30 mA**
Operating/Storage Temp.	**-20°C to +85°C**

Function	Pin No.
Input	6
Output	1
Coupled	4
Ground	5
Case Ground	-
External 50 Ohms	3
Not Connected	2

Specifications Subject to Change Without Notice S 0803 A

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North America Tel: 1-800-366-266 * Europe Tel: +44 (1344) 869 595 * Asia / Pacific Tel: +81 (03) 3226-1671

See Page 7-26 For Local Office Details

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E-Series Coupler
380 - 520 MHz ESDC-11-1

Features

* Coupling +11 dB Typical
* Surface Mount

Specifications @ 25°C

Frequency Range	**380 - 520 MHz**

Coupling	Nominal	Flatness
380 - 520 MHz	11 ± 0.5 dB	± 0.4 dB

Main Line Loss	Typical	Maximum
380 - 520 MHz	0.9 dB	1.2 dB

Directivity	Typical	Minimum
380 - 520 MHz	18 dB	15 dB

VSWR	Typical
380 - 520 MHz	1.3 : 1

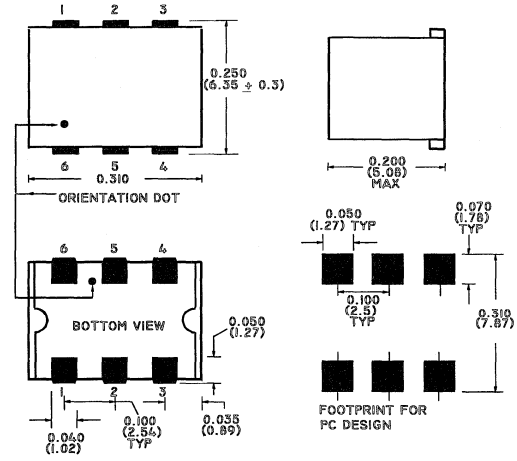
Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

SM-1



Function	Pin No.
Input	6
Output	1
Coupled	4
Ground	5
Case Ground	-
External 50 Ohms	3
Not Connected	2

ISO 9001
CERTIFIED

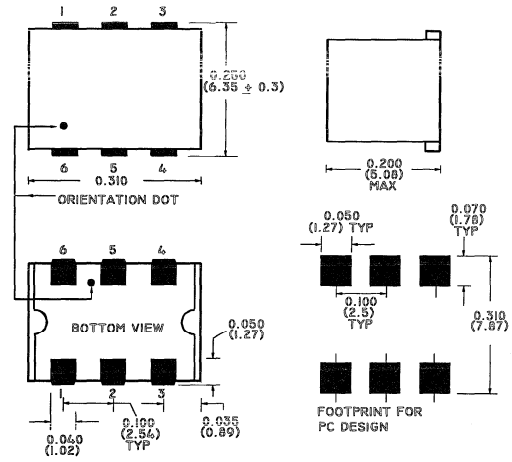
E-Series Coupler
50 - 400 MHz

ESDC-10-3

Features

* Coupling +10 dB Typical
* Surface Mount

SM-1



Specifications @ 25°C

Frequency Range	**50 - 400 MHz**

Coupling	Nominal	Flatness
50 - 400 MHz	10 dB	±0.4 dB

Main Line Loss	Typical	Maximum
50 - 400 MHz	1 dB	1.7 dB

Directivity	Typical	Minimum
50 - 400 MHz	22.5 dB	17 dB

Function	Pin No.
Input	6
Output	1
Coupled	4
Ground	2
Case Ground	-
External 50 Ohms	3
Not Connected	5

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Additional Specifications

Return Loss: 17.5 dB Typ, 12 dB Min

ISO 9001
CERTIFIED

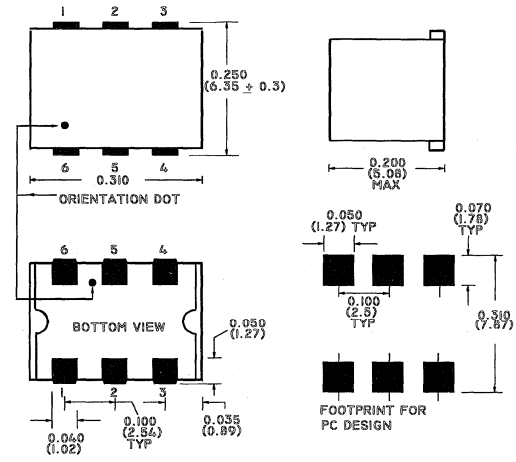
E-Series Coupler
40 - 860 MHz

ESDC-10-1-75

Features

* Coupling +9.4 dB Typical
* Surface Mount

SM-1



Specifications @ 25°C

Frequency Range	**40 - 860 MHz**

Coupling	Nominal	Flatness
40 - 860 MHz	9.4 dB	±0.5 dB

Main Line Loss	Typical	Maximum
40 - 860 MHz	1.5 dB	2.2 dB

Directivity	Typical	Minimum
40 - 860 MHz	15 dB	10 dB

VSWR	Typical	Maximum
40 - 860 MHz	1.3 : 1	1.5 : 1

Operating Characteristics

Impedance	**75 Ohms Nominal**

Absolute Maximum Ratings

Parameter	Absolute Maximum
RF Power	250 mW
DC Current	30 mA
Operating/Storage Temp.	-20°C to +85°C

Function	Pin No.
Input	6
Output	1
Coupled	4
Ground	2
Case Ground	-
External 75 Ohms	3
Not Connected	5

ISO 9001
CERTIFIED

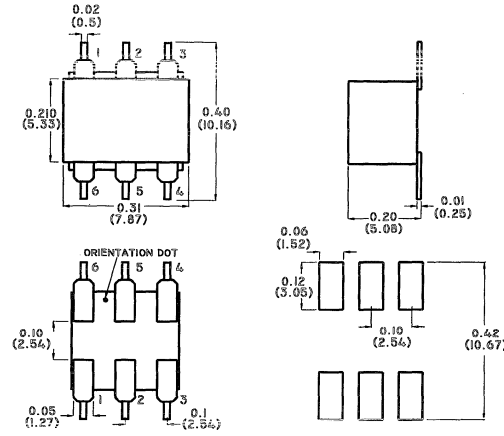
E-Series Coupler
800 - 900 MHz

ESDC-20-1X1

Features

* Coupling +20 dB Typical
* Surface Mount

SM-24



Specifications @ 25°C

Frequency Range	**800 - 900 MHz**

Coupling	**Nominal**
800 - 900 MHz	**20 ± 1 dB**

Main Line Loss	**Typical**	**Maximum**
800 - 900 MHz	**0.25 dB**	**0.5 dB**

Directivity	**Minimum**
800 - 900 MHz	**10 dB**

VSWR	**Typical**
800 - 900 MHz	**1.5 : 1**

Operating Characteristics

Impedance	**50 Ohms Nominal**

Absolute Maximum Ratings

Parameter	**Absolute Maximum**
RF Power	**250 mW**
DC Current	**30 mA**
Operating/Storage Temp.	**-20°C to +85°C**

Function	Pin No.
Input	6
Output	1
Coupled	4
Ground	5
Case Ground	-
External 50 Ohms	3
Not Connected	2

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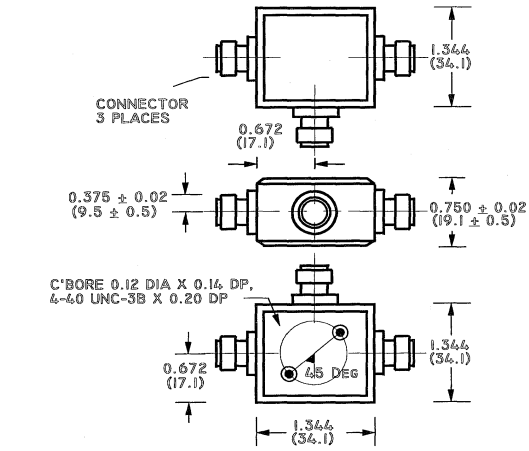
Outline Drawings

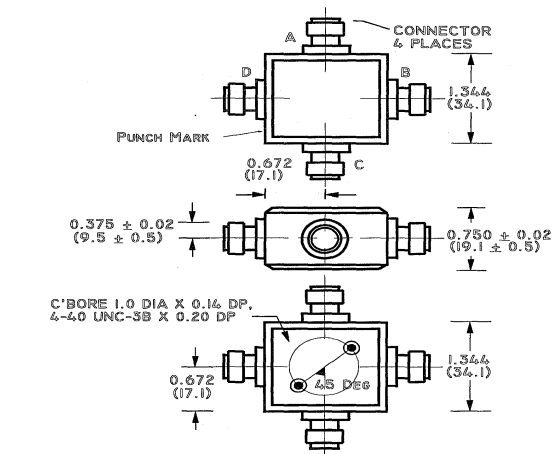
C-2



NOTE: .XXX = ± 0.015
(0.X = ± 0.4)

WEIGHT (APPROX) : 2.5 OUNCES 71 GRAMS

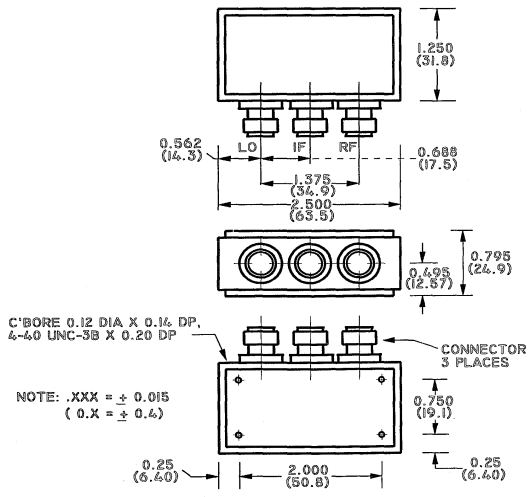
C-8



NOTE: .XXX = ± 0.015
(0.X = ± 0.4)

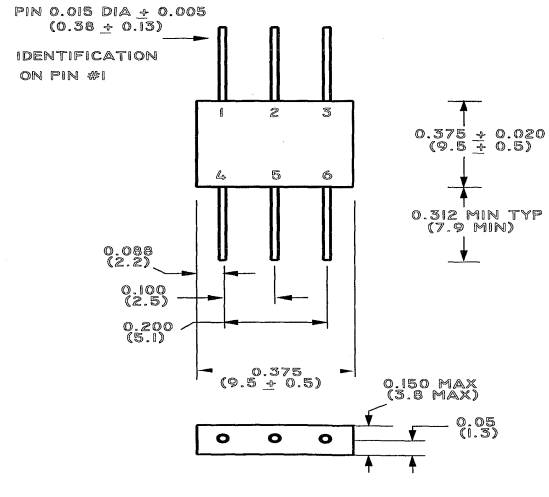
WEIGHT (APPROX) : 2.5 OUNCES 71 GRAMS

C-9



WEIGHT (APPROX) : 3 OUNCES 85 GRAMS

FP-1



WEIGHT (APPROX) : 0.07 OUNCES 2 GRAMS

Specifications Subject to Change Without Notice

ISO 9001
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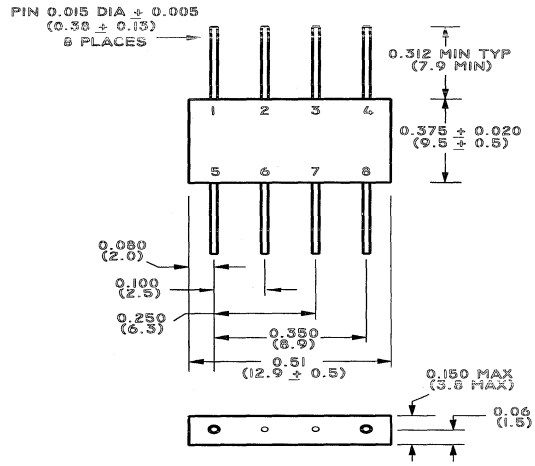
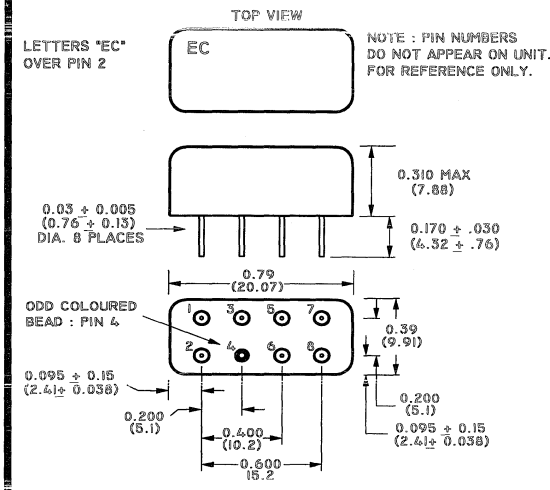
Outline Drawings

FP-2



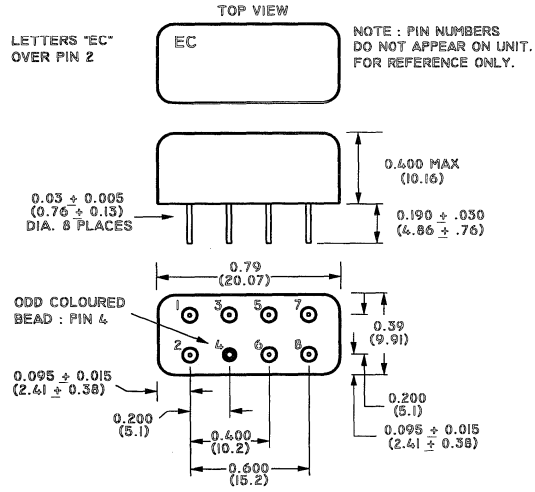
WEIGHT (APPROX) : 0.09 OUNCES 2.5 GRAMS

R-1



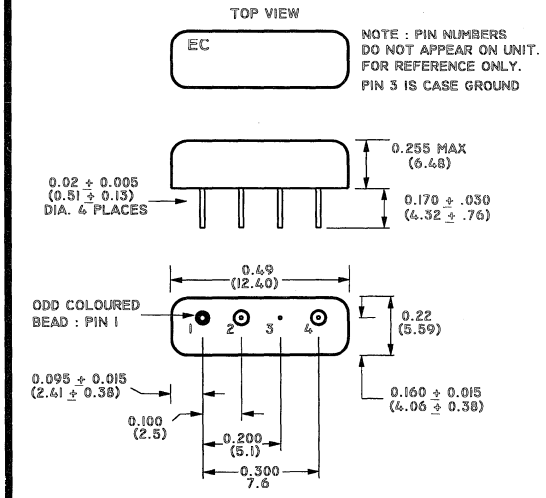
WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

R-2



WEIGHT (APPROX) : 0.23 OUNCES 6.5 GRAMS

R-3



WEIGHT (APPROX) : 0.05 OUNCES 1.5 GRAMS

Specifications Subject to Change Without Notice

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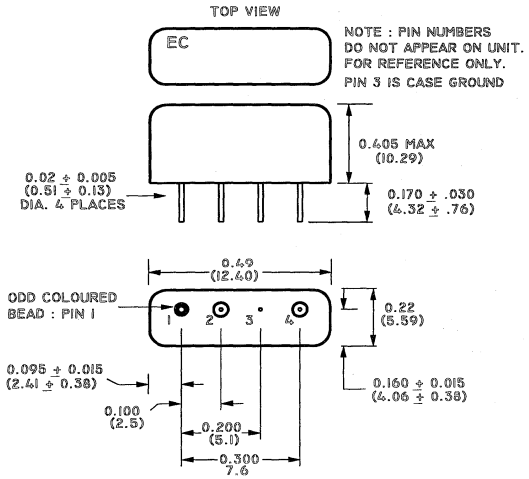
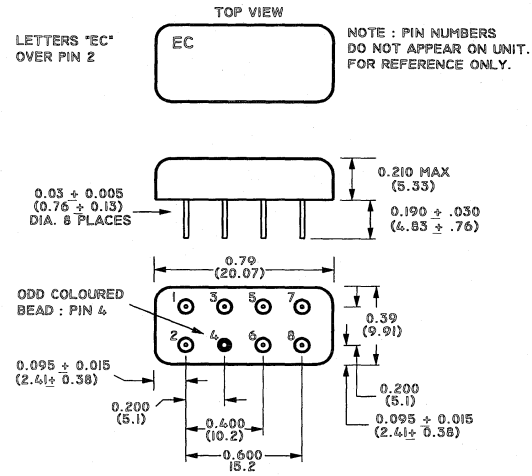
Outline Drawings

R-4



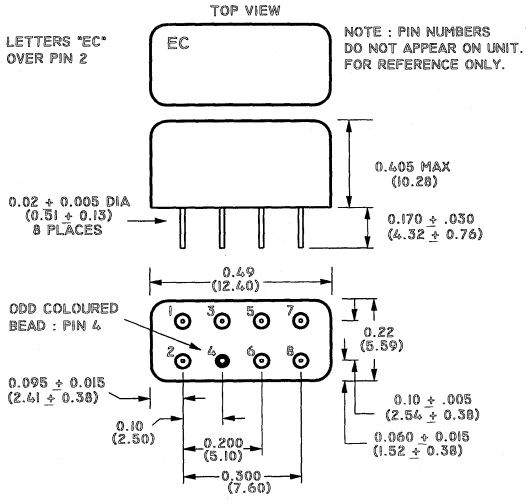
WEIGHT (APPROX) : 0.04 OUNCES 1.3 GRAMS

R-5



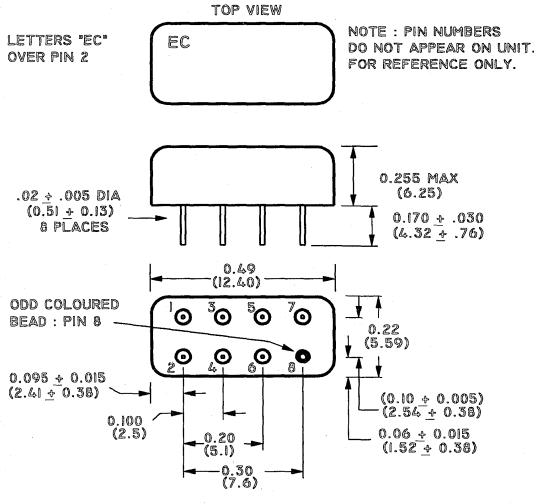
WEIGHT (APPROX) : 0.13 OUNCES 3.5 GRAMS

R-6



WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

R-7



WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

Specifications Subject to Change Without Notice

ISO 9001
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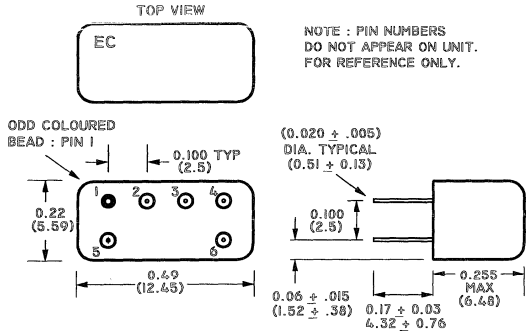
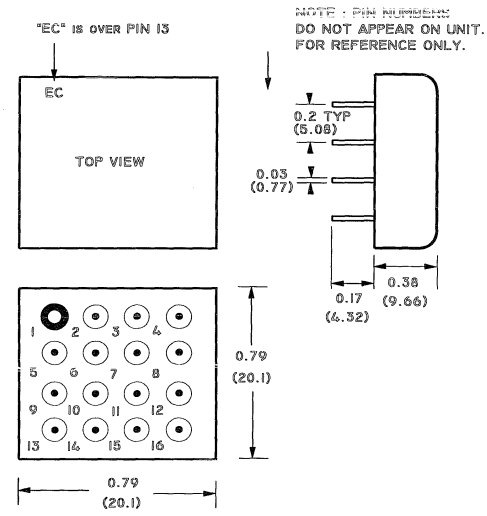
Outline Drawings

R-8

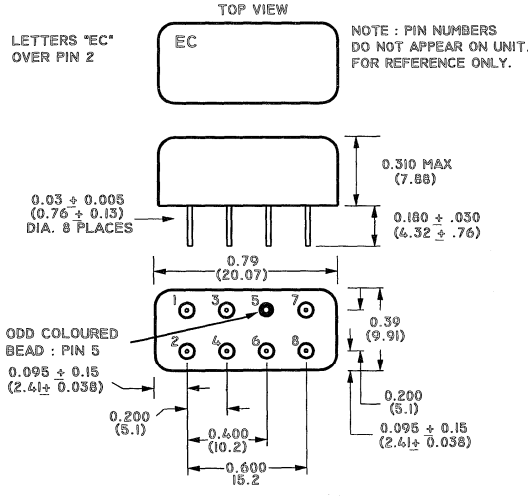


WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

R-9

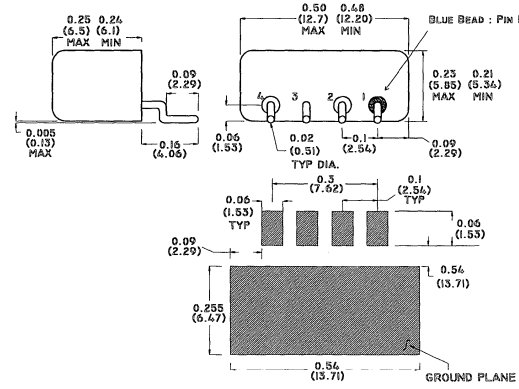


R-14



WEIGHT (APPROX) : 0.16 OUNCES 4.4 GRAMS

R-15



Specifications Subject to Change Without Notice

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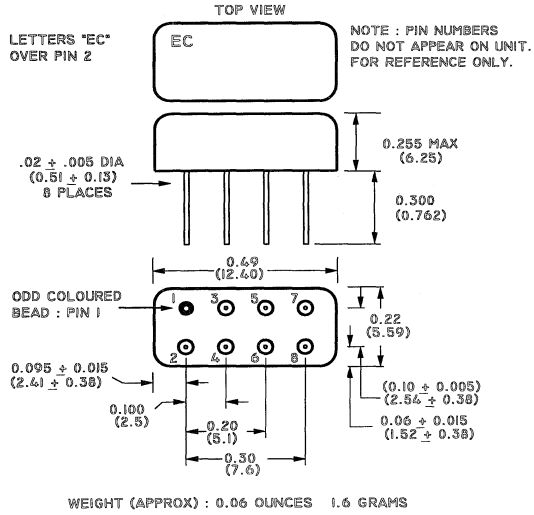
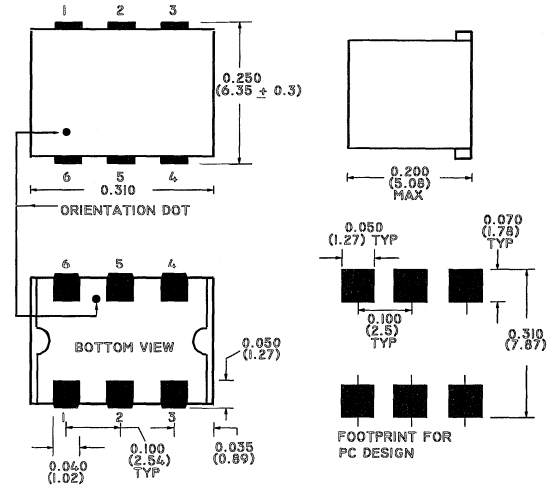
Outline Drawings

R-16

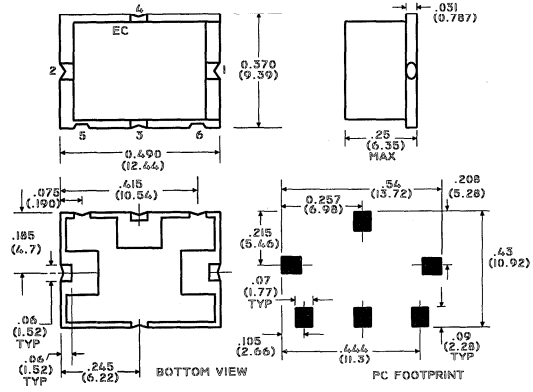


WEIGHT (APPROX) : 0.06 OUNCES 1.6 GRAMS

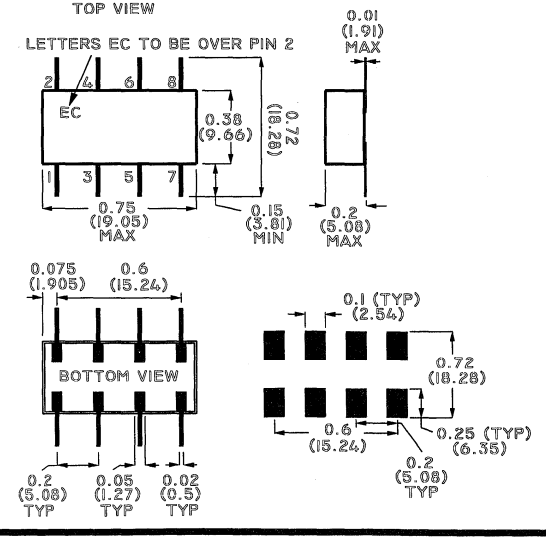
SM-1



SM-2



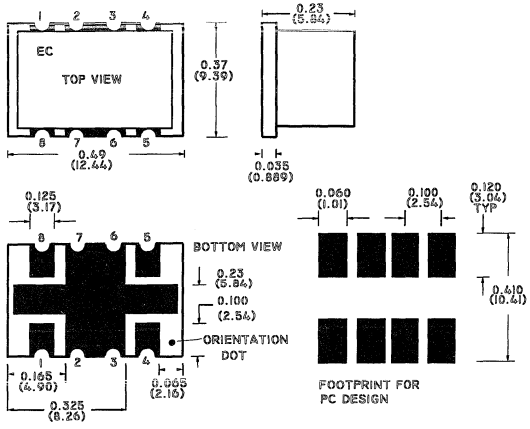
SM-3



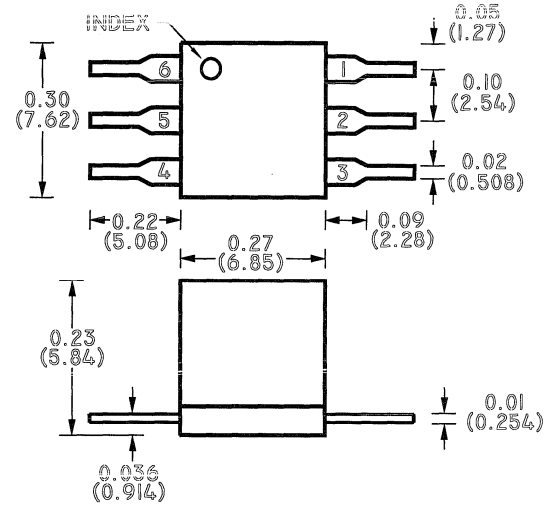
Specifications Subject to Change Without Notice

Outline Drawings

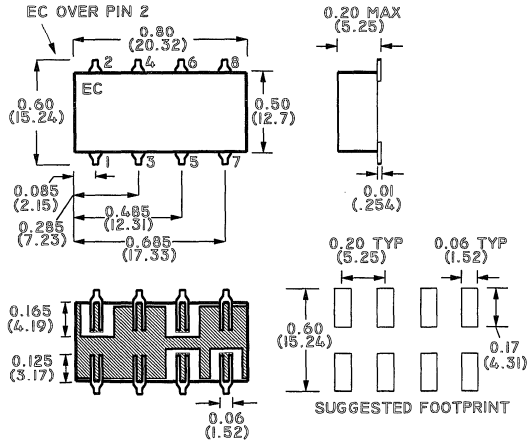
SM-4



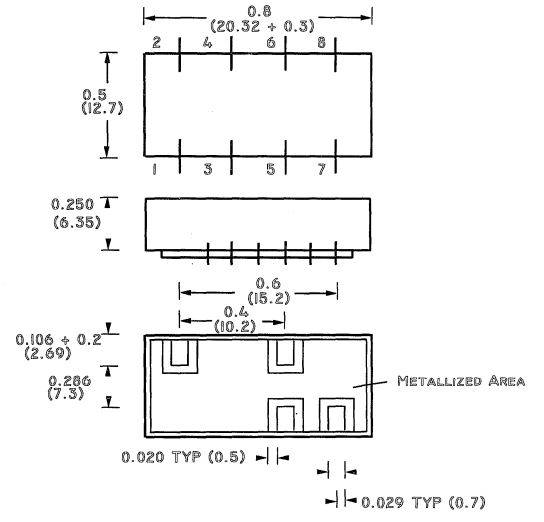
SM-5



SM-7-1



SM-8

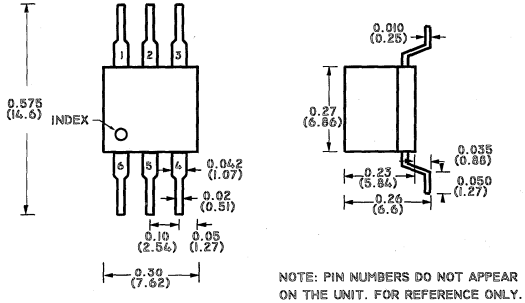


Specifications Subject to Change Without Notice

ISO 9001
CERTIFIED

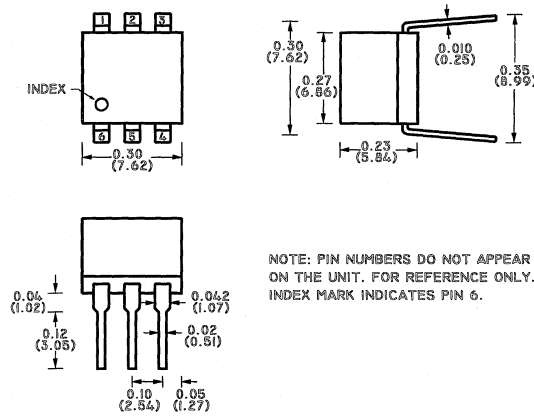
Outline Drawings

SM-20



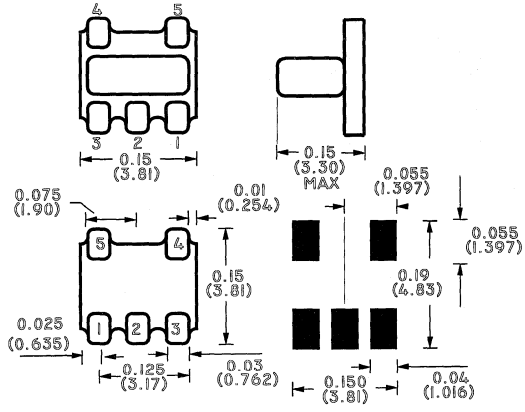
NOTE: PIN NUMBERS DO NOT APPEAR ON THE UNIT. FOR REFERENCE ONLY. INDEX MARK INDICATES PIN 6.

SM-21

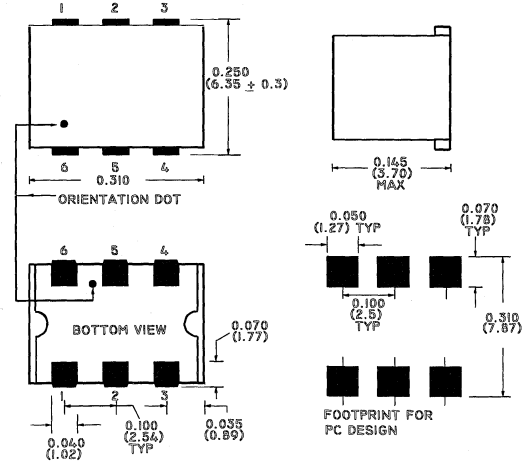


NOTE: PIN NUMBERS DO NOT APPEAR ON THE UNIT. FOR REFERENCE ONLY. INDEX MARK INDICATES PIN 6.

SM-22



SM-23



Specifications Subject to Change Without Notice

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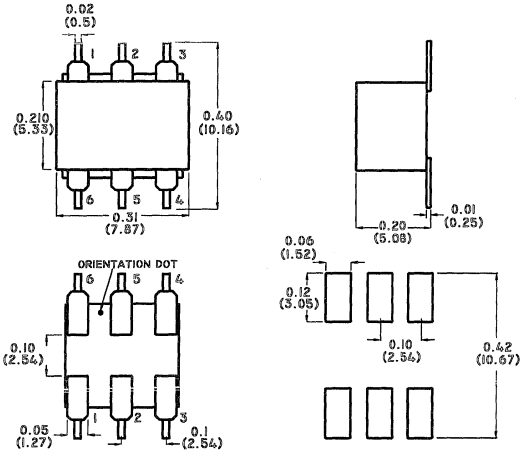
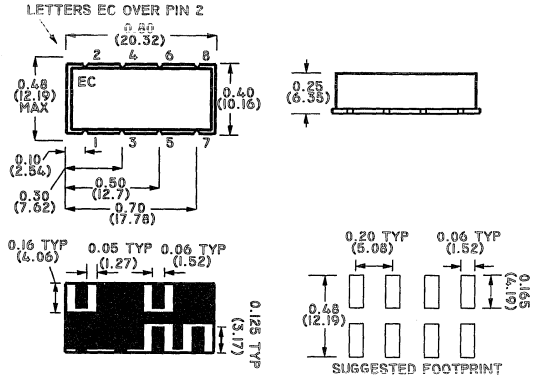
Outline Drawings

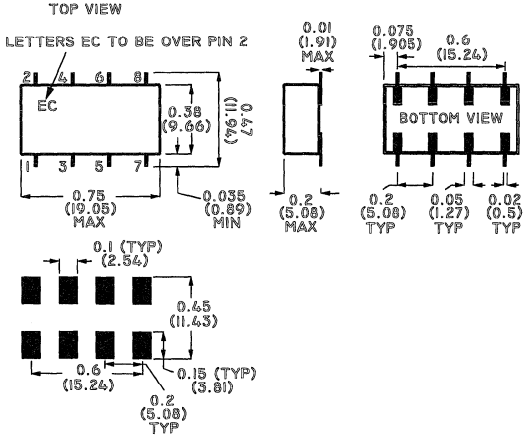
SM-24



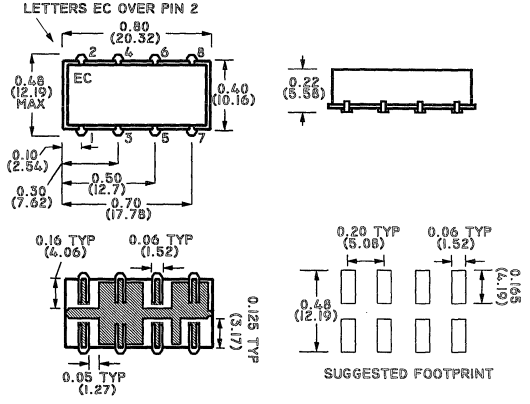
SM-25



SM-26



SM-27



Specifications Subject to Change Without Notice

ISO 9001
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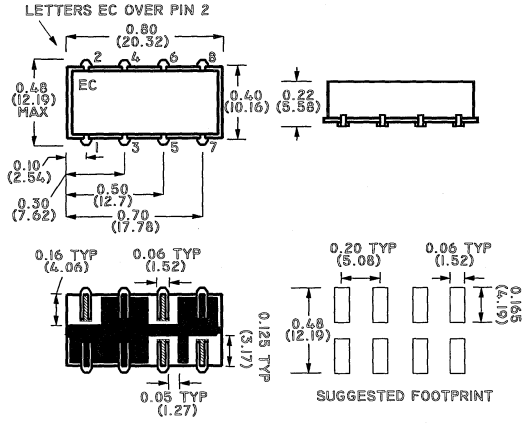
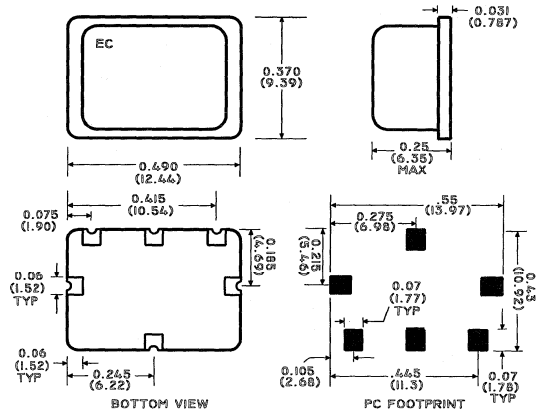
Outline Drawings

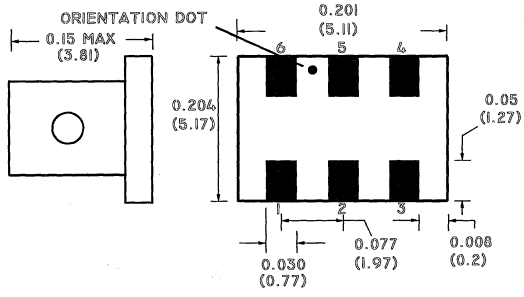
SM-28



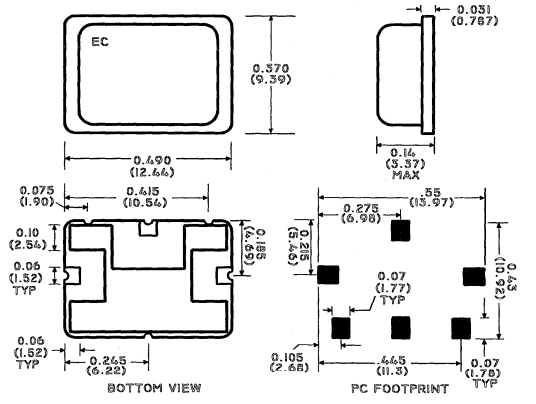
SM-29



SM-31



SM-32



Specifications Subject to Change Without Notice

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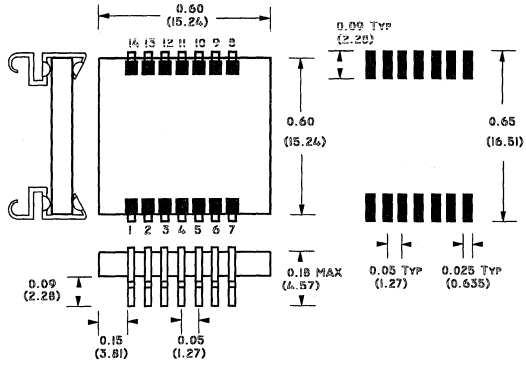
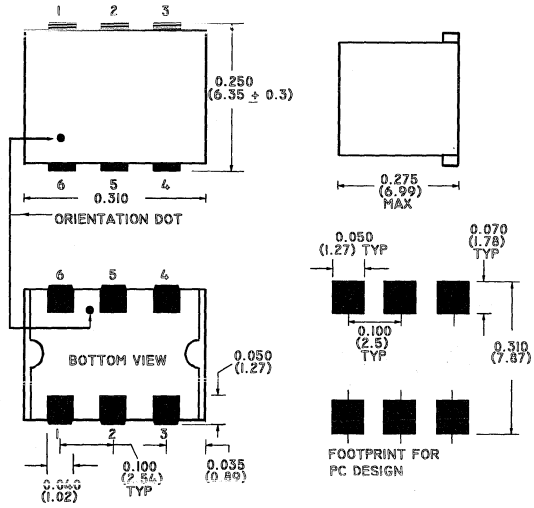
Outline Drawings

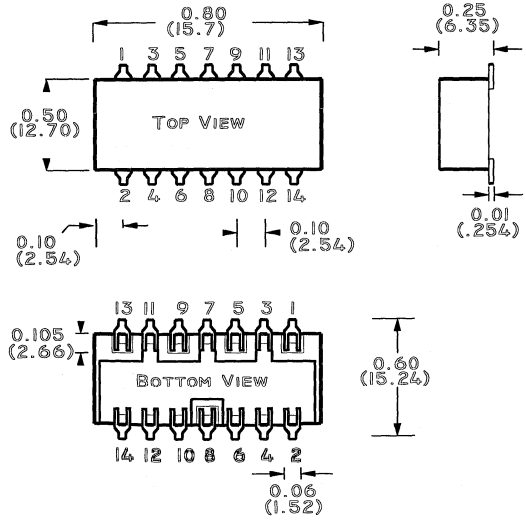
SM-34



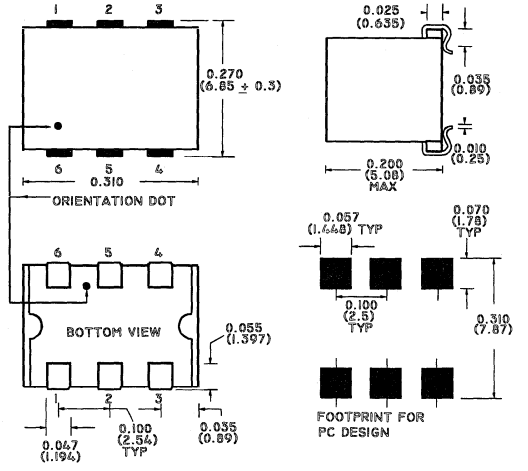
SM-41



SM-42



SM-44



Specifications Subject to Change Without Notice

ISO 9001
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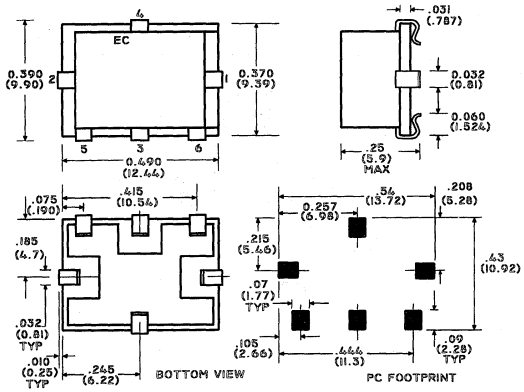
Outline Drawings

SM-45



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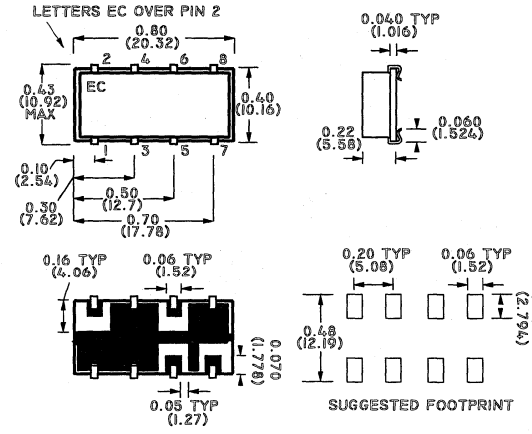
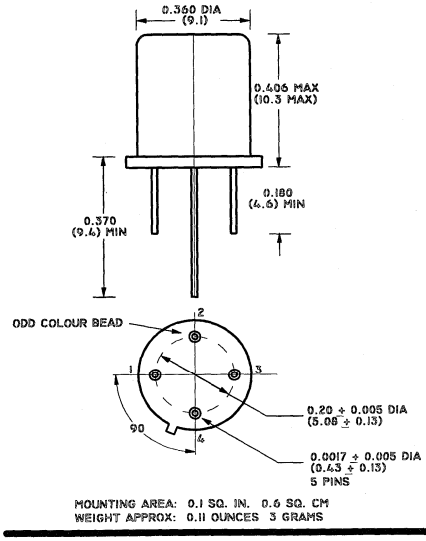
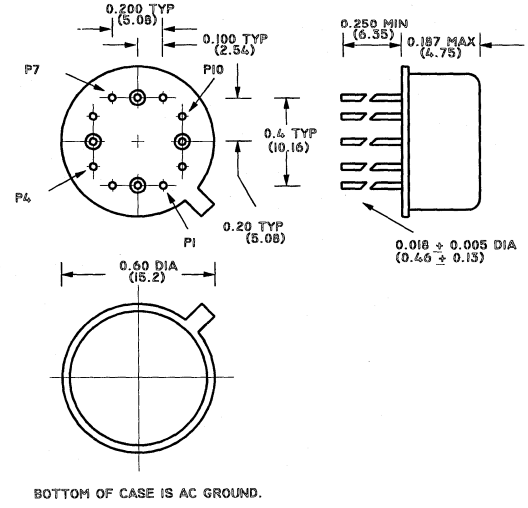


TO-5-2



TO-8-2

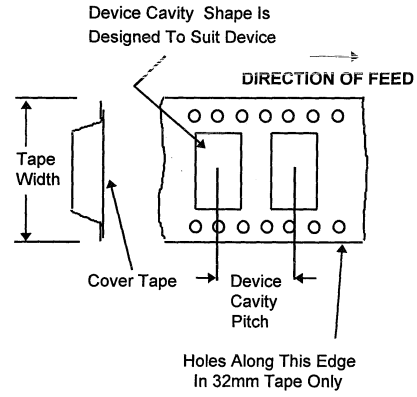


Specifications Subject to Change Without Notice

Tape and Reel Packaging

Packaging Information

Case Style	Tape Width (mm)	Device Cavity Pitch (mm)	Quantity Per Reel	Orientation Figure No.
R-4	24	16	500	F1
R-15	24	16	500	F1
SM-1	16	12	500	F2
SM-2	24	12	500	F3
SM-3	32	24	500	F4
SM-4	24	12	500	F3
SM-22	12	8	2000	F5
SM-23	16	12	500	F6
SM-24	24	16	500	F7
SM-34	24	20	500	F8



Ordering Information:

Normally devices ordered in tubes, devices ordered on tape and reel require a suffix **"TR"**.

For example, to order ESMD-169 on tape and reel, request part number ESMD-169TR.

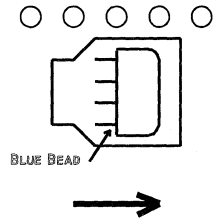
All devices are supplied on a 13-inch reel.

Note: a 500 mm minimum leader and 40 mm minimum trailer is provided on each reel.

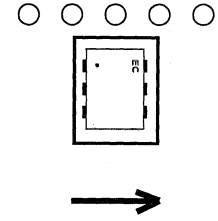
If you require a product on Tape and Reel, which is not listed above then contact M/A-COM Eurotec Operations or your local Sales Office.

Tape and Reel Packaging

F1



F2



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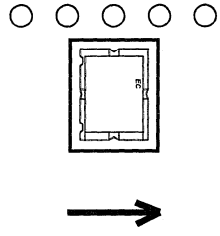

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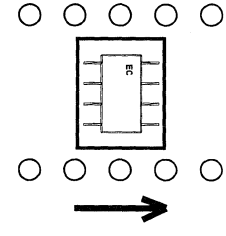

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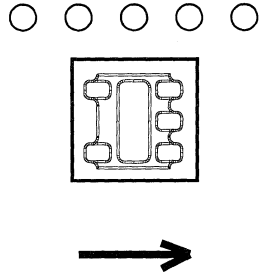

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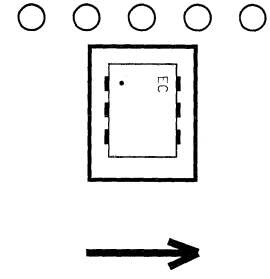

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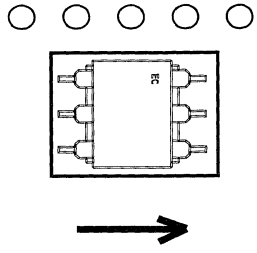
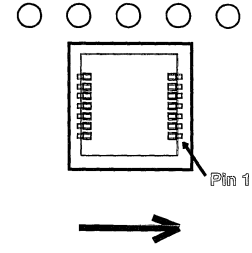


F8



Specifications Subject to Change Without Notice

Power Conversion dBm to Watts

dBm	Milli-watt	dBm	Milli-watt	dBm	Milli-watt	dBm	Milli-watt	dBm	Milli-watt	dBm	Milli-watt	dBm	Watts	dBm	Watts
0.0	1.00	5.0	3.16	10.0	10.0	15.0	31.6	20.0	100	25.0	316	30.1	1.02	35.1	3.24
0.1	1.02	5.1	3.24	10.1	10.2	15.1	32.4	20.1	102	25.1	324	30.2	1.05	35.2	3.31
0.2	1.05	5.2	3.31	10.2	10.5	15.2	33.1	20.2	105	25.2	331	30.3	1.07	35.3	3.39
0.3	1.07	5.3	3.39	10.3	10.7	15.3	33.9	20.3	107	25.3	339	30.4	1.10	35.4	3.47
0.4	1.10	5.4	3.47	10.4	11.0	15.4	34.7	20.4	110	25.4	347	30.5	1.12	35.5	3.55
0.5	1.12	5.5	3.55	10.5	11.2	15.5	35.5	20.5	112	25.5	355	30.6	1.15	35.6	3.63
0.6	1.15	5.6	3.63	10.6	11.5	15.6	36.3	20.6	115	25.6	363	30.7	1.17	35.7	3.72
0.7	1.17	5.7	3.72	10.7	11.7	15.7	37.2	20.7	117	25.7	372	30.8	1.20	35.8	3.80
0.8	1.20	5.8	3.80	10.8	12.0	15.8	38.0	20.8	120	25.8	380	30.9	1.23	35.9	3.89
0.9	1.23	5.9	3.89	10.9	12.3	15.9	38.9	20.9	123	25.9	389	31.0	1.26	36.0	3.98
1.0	1.26	6.0	3.98	11.0	12.6	16.0	39.8	21.0	126	26.0	398	31.1	1.29	36.1	4.07
1.1	1.29	6.1	4.07	11.1	12.9	16.1	40.7	21.1	129	26.1	407	31.2	1.32	36.2	4.17
1.2	1.32	6.2	4.17	11.2	13.2	16.2	41.7	21.2	132	26.2	417	31.3	1.35	36.3	4.27
1.3	1.35	6.3	4.27	11.3	13.5	16.3	42.7	21.3	135	26.3	427	31.4	1.38	36.4	4.37
1.4	1.38	6.4	4.37	11.4	13.8	16.4	43.7	21.4	138	26.4	437	31.5	1.41	36.5	4.47
1.5	1.41	6.5	4.47	11.5	14.1	16.5	44.7	21.5	141	26.5	447	31.6	1.45	36 6	4.57
1.6	1.45	6.6	4.57	11.6	14.5	16.6	45.7	21.6	145	26.6	457	31.7	1.48	36.7	4.68
1.7	1.48	6.7	4.68	11.7	14.8	16.7	46.8	21.7	148	26.7	468	31.8	1.51	36.8	4.79
1.8	1.51	6.8	4.79	11.8	15.1	16.8	47.9	21.8	151	26.8	479	31.9	1.55	36.9	4.90
1.9	1.55	6.9	4.90	11.9	15.5	16.9	49.0	21.9	155	26.9	490	32.0	1.58	37.0	5.01
2.0	1.58	7.0	5.01	12.0	15.8	17.0	50.1	22.0	158	27.0	501	32.1	1.62	37.1	5.13
2.1	1.62	7.1	5.13	12.1	16.2	17.1	51.3	22.1	162	27.1	513	32.2	1.66	37.2	5.25
2.2	1.66	7.2	5.25	12.2	16.6	17.2	52.5	22.2	166	27.2	525	32.3	1.70	37.3	5.37
2.3	1.70	7.3	5.37	12.3	17.0	17.3	53.7	22.3	170	27.3	537	32.4	1.74	37.4	5.50
2.4	1.74	7.4	5.50	12.4	17.4	17.4	55.0	22.4	174	27.4	550	32.5	1.78	37.5	5.62
2.5	1.78	7.5	5.62	12.5	17.8	17.5	56.2	22.5	178	27.5	562	32.6	1.82	37.6	5.75
2.6	1.82	7.6	5.75	12.6	18.2	17.6	57.5	22.6	182	27.6	575	32.7	1.86	37.7	5.89
2.7	1.86	7.7	5.89	12.7	18.6	17.7	58.9	22.7	186	27.7	589	32.8	1.91	37.8	6.03
2.8	1.91	7.8	6.03	12.8	19.1	17.8	60.3	22.8	191	27.8	603	32.9	1.95	37.9	6.17
2.9	1.95	7.9	6.17	12.9	19.5	17.9	61.7	22.9	195	27.9	617	33.0	2.00	38.0	6.31
3.0	2.00	8.0	6.31	13.0	20.0	18.0	63.1	23.0	200	28.0	631	33.1	2.04	38.1	6.46
3.1	2.04	8.1	6.46	13.1	20.4	18.1	64.6	23.1	204	28.1	646	33.2	2.09	38.2	6.61
3.2	2.09	8.2	6.61	13.2	20.9	18.2	66.1	23.2	209	28.2	661	33.3	2.14	38.3	6.76
3.3	2.14	8.3	6.76	13.3	21.4	18.3	67.6	23.3	214	28.3	676	33.4	2.19	38.4	6.92
3.4	2.19	8.4	6.92	13.4	21.9	18.4	69.2	23.4	219	28.4	692	33.5	2.24	38.5	7.08
3.5	2.24	8.5	7.08	13.5	22.4	18.5	70.8	23.5	224	28.5	708	33.6	2.29	38.6	7.24
3.6	2.29	8.6	7.24	13.6	22.9	18.6	72.4	23.6	229	28.6	724	33.7	2.34	38.7	7.41
3.7	2.34	8.7	7.41	13.7	23.4	18.7	74.1	23.7	234	28.7	741	33.8	2.40	38.8	7.59
3.8	2.40	8.8	7.59	13.8	24.0	18.8	75.9	23.8	240	28.8	759	33.9	2.45	38.9	7.76
3.9	2.45	8.9	7.76	13.9	24.5	18.9	77.6	23.9	245	28.9	776	34.0	2.51	39.0	7.94
4.0	2.51	9.0	7.94	14.0	25.1	19.0	79.4	24.0	251	29.0	794	34.1	2.57	39.1	8.13
4.1	2.57	9.1	8.13	14.1	25.7	19.1	81.3	24.1	257	29.1	813	34.2	2.63	39.2	8.32
4.2	2.63	9.2	8.32	14.2	26.3	19.2	83.2	24.2	263	29.2	832	34.3	2.69	39.3	8.51
4.3	2.69	9.3	8.51	14.3	26.9	19.3	85.1	24.3	269	29.3	851	34.4	2.75	39.4	8.71
4.4	2.75	9.4	8.71	14.4	27.5	19.4	87.1	24.4	275	29.4	871	34.5	2.82	39.5	8.91
4.5	2.82	9.5	8.91	14.5	28.2	19.5	89.1	24.5	282	29.5	891	34.6	2.88	39.6	9.12
4.6	2.88	9.6	9.12	14.6	28.8	19.6	91.2	24.6	288	29.6	912	34.7	2.95	39.7	9.33
4.7	2.95	9.7	9.33	14.7	29.5	19.7	93.3	24.7	295	29.7	933	34.8	3.02	39.8	9.55
4.8	3.02	9.8	9.55	14.8	30.2	19.8	95.5	24.8	302	29.8	955	34.9	3.09	39.9	9.77
4.9	3.09	9.9	9.77	14.9	30.9	19.9	97.7	24.9	309	29.9	977	35.0	3.16	40.0	10.00
										30.0	1000				

Specifications Subject to Change Without Notice

VSWR, Return Loss and Transmission Loss vs. Transmitted Power

VSWR	RETURN LOSS (dB)	TRANS LOSS (dB)	VOLT REFL COEFF.	POWER TRANS. (%)	POWER REFL (%)	VSWR	RETURN LOSS (dB)	TRANS LOSS (dB)	VOLT. REFL COEFF.	POWER TRANS. (%)	POWER REFL (%)
1.00	∞	.000	.00	100.0	.0	1.64	12.3	.263	.24	94.1	5.9
1.01	46.1	.000	.00	100.0	.0	1.66	12.1	.276	.25	93.8	6.2
1.02	40.1	.000	.01	100.0	.0	1.68	11.9	.289	.25	93.6	6.4
1.03	36.6	.001	.01	100.0	.0	1.70	11.7	.302	.26	93.3	6.7
1.04	34.2	.002	.02	100.0	.0	1.72	11.5	.315	.26	93.0	7.0
1.05	32.3	.003	.02	99.9	.1	1.74	11.4	.329	.27	92.7	7.3
1.06	30.7	.004	.03	99.9	.1	1.76	11.2	.342	.28	92.4	7.6
1.07	29.4	.005	.03	99.9	.1	1.78	11.0	.356	.28	92.1	7.9
1.08	28.3	.006	.04	99.9	.1	1.80	10.9	.370	.29	91.8	8.2
1.09	27.3	.008	.04	99.8	.2	1.82	10.7	.384	.29	91.5	8.5
1.10	26.4	.010	.05	99.8	.2	1.84	10.6	.398	.30	91.3	8.7
1.11	25.7	.012	.05	99.7	.3	1.86	10.4	.412	.30	91.0	9.0
1.12	24.9	.014	.06	99.7	.3	1.88	10.3	.426	.31	90.7	9.3
1.13	24.3	.016	.06	99.6	.4	1.90	10.2	.440	.31	90.4	9.6
1.14	23.7	.019	.07	99.6	.4	1.92	10.0	.454	.32	90.1	8.9
1.15	23.1	.021	.07	99.5	.5	1.94	9.9	.468	.32	89.8	10.2
1.16	22.6	.024	.07	99.5	.5	1.96	9.8	.483	.32	89.5	10.5
1.17	22.1	.027	.08	99.4	.6	1.98	9.7	.497	.33	89.2	10.8
1.18	21.7	.030	.08	99.3	.7	2.00	9.5	.512	.33	88.9	11.1
1.19	21.2	.033	.09	99.2	.8	2.50	7.4	.881	.43	81.6	18.4
1.20	20.8	.036	.09	99.2	.8	3.00	6.0	1.249	.50	75.0	25.0
1.21	20.4	.039	.10	99.1	.9	3.50	5.1	1.603	.56	69.1	30.9
1.22	20.1	.043	.10	99.0	1.0	4.00	4.4	1.938	.60	64.0	36.0
1.23	19.7	.046	.10	98.9	1.1	4.50	3.9	2.255	.64	59.5	40.5
1.24	19.4	.050	.11	98.9	1.1	5.00	3.5	2.553	.67	55.6	44.4
1.25	19.1	.054	.11	98.8	1.2	5.50	3.2	2.834	.69	52.1	47.9
1.26	18.8	.058	.12	98.7	1.3	6.00	2.9	3.100	.71	49.0	51.0
1.27	18.5	.062	.12	98.6	1.4	6.50	2.7	3.351	.73	46.2	53.8
1.28	18.2	.066	.12	98.5	1.5	7.00	2.5	3.590	.75	43.7	56.2
1.29	17.9	.070	.13	98.4	1.6	7.50	2.3	3.817	.76	41.5	58.5
1.30	17.7	.075	.13	98.3	1.7	8.00	2.2	4.033	.78	39.5	60.5
1.32	17.2	.083	.14	98.1	1.9	8.50	2.1	4.240	.79	37.7	62.3
1.34	16.8	.093	.15	97.9	2.1	9.00	1.9	4.437	.80	36.0	64.0
1.36	16.3	.102	.15	97.7	2.3	9.50	1.8	4.626	.81	34.5	65.5
1.38	15.9	.112	.16	97.5	2.5	10.00	1.7	4.807	.82	33.1	66.9
1.40	15.6	.122	.17	97.2	2.8	11.00	1.6	5.149	.83	30.6	69.4
1.42	15.2	.133	.17	97.0	3.0	12.00	1.5	5.466	.85	28.4	71.6
1.44	14.9	.144	.18	96.7	3.3	13.00	1.3	5.762	.86	26.5	73.5
1.46	14.6	.155	.19	96.5	3.5	14.00	1.2	6.040	.87	24.9	75.1
1.48	14.3	.166	.19	96.3	3.7	15.00	1.2	6.301	.88	23.4	76.6
1.50	14.0	.177	.20	96.0	4.0	16.00	1.1	6.547	.88	22.1	77.9
1.52	13.7	.189	.21	95.7	4.3	17.00	1.0	6.780	.89	21.0	79.0
1.54	13.4	.201	.21	95.5	4.5	18.00	1.0	7.002	.89	19.9	80.1
1.56	13.2	.213	.22	95.2	4.8	19.00	.9	7.212	.90	19.0	81.0
1.58	13.0	.225	.22	94.9	5.1	20.00	.9	7.413	.90	18.1	81.9
1.60	12.7	.238	.23	94.7	5.3	25.00	.7	8.299	.92	14.8	85.2
1.62	12.5	.250	.24	94.4	5.6	30.00	.6	9.035	.94	12.5	87.5

Specifications Subject to Change Without Notice

Specific Application Selection Guide

ADC / AMPS System Selection Guide

Model No.	Frequency MHz fL - fu	Description	Case Style	Price Qty. $ (1-9)	Page Number
EKIN2-836D	824-849	I/Q Demodulator	SM-7-1	20.66	4-15
EKIN2-880D	869-894	I/Q Demodulator	SM-7-1	20.66	4-17
EMA-173HXX	750-960	High Intercept Mixer	R-1	26.96	1-88
EMRS-860	800-1050	Mixer	SM-1	10.30	1-244
EMRSL-860	800-1050	Leaded Mixer	SM-24	10.30	1-260
ESMD-173HXX	750-960	High Intercept / Surface Mount Mixer	SM-2	17.96	1-126
ESMD-C1X8	800-1000	Mixer	SM-32	8.50	1-17
ETUF-860	800-1050	Mixer	R-3	8.50	1-213
ETUF-860-SM	800-1050	Surface Mount Mixer	R-15	8.50	1-201
ETUF-860MH	800-1050	Mixer	R-3	11.21	1-57
ETUF-860MH-SM	800-1050	Surface Mount Mixer	R-15	11.21	1-51
EKIN2-836	824-849	I/Q Modulator	SM-7-1	20.66	3-24
EKIN2-880	869-894	I/Q Modulator	SM-7-1	20.66	3-31
EKIN2-881	869-894	I/Q Modulator	SM-7-1	20.66	3-29
EQSM-905	859-905	2 Way 90° Power Divider	SM-1	12.56	5-62
EQSM-2-900	820-980	2 Way 90° Power Divider	SM-1	12.56	5-61
EQSM-980	820-980	2 Way 90° Power Divider	SM-1	12.56	5-60
EQSML-980	820-980	2 Way 90° Leaded Power Divider	SM-24	12.56	5-64
ESQ-2-900	820-980	2 Way 90° Power Divider	R-1	13.45	5-36
ESQ-2-900X1	820-980	2 Way 90° Power Divider	SM-4	13.45	5-82

DCS1800 System Selection Guide

Model No.	Frequency MHz fL - fu	Description	Case Style	Price Qty. $ (1-9)	Page Number
EMRS-6X1-2	1805-1880	Up Converter Mixer	SM-1	14.36	1-236
EMRS-11A	1500-1900	Mixer	SM-1	15.26	1-235
EMRSL-11A	1500-1900	Leaded Mixer	SM-24	15.26	1-255
ETUF-11A	1400-1900	Mixer	R-3	15.26	1-207
ETUF-11AH	1400-1900	Mixer	R-3	19.76	1-98
ES-2-5X1	1500-2000	2 Way 0° Power Divider	SM-2	17.96	5-26

Prices subject to change without notice

Specifications Subject to Change Without Notice

GSM System Selection Guide

Model No.	Frequency MHz fL - fu	Description	Case Style	Price Qty. $ (1-9)	Page Number
EKIN2-902D	890-915	I/Q Demodulator	SM-7-1	20.66	4-18
EMRS-5LX	935-960	Leaded Mixer	SM-1	12.56	1-152
EMRS-6X1-1	925-960	Up Converter Mixer	SM-1	12.56	1-231
EMRS-95L	935-960	Leaded Mixer	SM-1	10.30	1-154
EMT-16H	890-915	Mixer	R-4	26.05	1-106
ESMD-C29	880-915	Mixer	SM-2	17.96	1-69
ESMD-C2HX2	890-915	Mixer	SM-2	17.96	1-128
EMA-173HXX	750-960	High Intercept Mixer	R-1	26.96	1-88
EMRS-860	800-1050	Mixer	SM-1	10.36	1-244
EMRSL-860	800-1050	Leaded Mixer	SM-24	10.36	1-260
ESMD-173HXX	750-960	High Intercept Mixer	SM-2	17.96	1-126
ESMD-C1X8	800-1000	Mixer	SM-32	8.50	1-17
ETUF-860	800-1050	Mixer	R-3	8.50	1-213
ETUF-860-SM	800-1050	Surface Mount Mixer	R-15	8.50	1-201
ETUF-860MH	800-1050	Mixer	R-3	11.21	1-57
ETUF-860MH-SM	800-1050	Surface Mount Mixer	R-15	11.21	1-51
EKIN2-960	925-960	I/Q Modulator	SM-28	20.66	3-21
EQSM-2-900	820-980	2 Way 90° Power Divider	SM-1	12.56	5-61
EQSM-980	820-980	2 Way 90° Power Divider	SM-1	12.56	5-60
EQSML-980	820-980	2 Way 90° Leaded Power Divider	SM-24	12.56	5-64
ESQ-2-900	820-980	2 Way 90° Power Divider	R-1	13.45	5-36
ESQ-2-900X1	820-980	2 Way 90° Power Divider	SM-4	13.45	5-82

JDC1500 System Selection Guide

Model No.	Frequency MHz fL - fu	Description	Case Style	Price Qty. $ (1-9)	Page Number
ETUF-11A	1400-1900	Mixer	R-3	15.26	1-207
ETUF-11A-SM	1400-1900	Surface Mount Mixer	R-15	15.26	1-197
ETUF-11AH	1400-1900	Mixer	R-3	19.76	1-98
ETUF-11AH-SM	1400-1900	Surface Mount Mixer	R-15	19.76	1-91

Prices subject to change without notice

Specifications Subject to Change Without Notice

JDC800 System Selection Guide

Model No.	Frequency MHz fL - fu	Description	Case Style	Price Qty. $ (1-9)	Page Number
EKIN2-950D	940-960	I/Q Demodulator	SM-7-1	20.66	4-20
EMRS-5LX	935-960	Leaded Mixer	SM-1	12.56	1-152
EMRS-6X1-1	925-960	Up Converter Mixer	SM-1	12.56	1-231
EMRS-95	900-1100	Mixer	SM-1	10.30	1-245
EMRS-95L	935-960	Leaded Mixer	SM-1	10.30	1-154
EMA-173HXX	750-960	High Intercept Mixer	R-1	26.96	1-88
ESMD-173HXX	750-960	High Intercept Mixer	SM-2	17.96	1-126
EMRS-860	800-1050	Mixer	SM-1	10.30	1-244
EMRSL-860	800-1050	Leaded Mixer	SM-24	10.30	1-260
ESMD-C1X8	800-1000	Mixer	SM-32	8.50	1-17
ETUF-860	800-1050	Mixer	R-3	8.50	1-213
ETUF-860-SM	800-1050	Surface Mount Mixer	R-15	8.50	1-201
ETUF-860MH	800-1050	Mixer	R-3	11.21	1-57
ETUF-860MH-SM	800-1050	Surface Mount Mixer	R-15	11.21	1-51
EKIN2-950	940-960	I/Q Modulator	SM-7-1	20.66	3-28
EKIN2-960	925-960	I/Q Modulator	SM-28	20.66	3-21
EQSM-820	810-830	2 Way 90° Power Divider	SM-1	12.56	5-59
EQSM-2-900	820-980	2 Way 90° Power Divider	SM-1	12.56	5-61
EQSM-980	820-980	2 Way 90° Power Divider	SM-1	12.56	5-60
EQSML-980	820-980	2 Way 90° Leaded Power Divider	SM-24	12.56	5-64
ESQ-2-900	820-980	2 Way 90° Power Divider	R-1	13.46	5-36
ESQ-2-900X1	820-980	2 Way 90° Power Divider	SM-4	13.46	5-82
ET2-1T-1	900-1000	2:1 Flux Coupled Transformer	SM-1*	4.45	2-41

Note: * Also available in Case Style SM-5, SM-20 and SM-21.
Prices subject to change without notice

Competitor Cross Reference

Part Number	Competitors Nearest Equaivalent	Page No.
EASK-1	MCL ASK	1-269
EASK-2	MCL ASK-2	1-268
EBY-1	MCL SAY-1	1-139
EBY-2	MCL SAY-2	1-138
EMA-1	MCL SRA-1	1-169
EMA-1H	MCL SRA-1H	1-80
EMA-1HN	MCL SRA-1H	1-81
EMA-1MH	MCL SRA-1MH	1-45
EMA-1W	MCL SRA-1W	1-176
EMA-1WH	MCL SRA-1WH	1-83
EMA-1-1	MCL SRA-1-1	1-168
EMA-2	MCL SRA-2	1-171
EMA-2CM	MCL SRA-2CM	1-184
EMA-2CR	MCL SRA-2CR	1-23
EMA-2H	MCL SRA-2H	1-85
EMA-3	MCL SRA-3	1-203
EMA-3H	MCL SRA-3H	1-95
EMA-3MH	MCL SRA-3MH	1-44
EMA-4	MCL SRA-4	1-185
EMA-5	MCL SRA-5	1-186
EMA-6	MCL SRA-6	1-165
EMA-8	MCL SRA-8	1-202
EMA-11	MCL SRA-11	1-188
EMA-11H	MCL SRA-11H	1-84
EMA-12	MCL SRA-12	1-195
EMA-15	Synergy CLP-205	1-20
EMA-173H	MCL SRA-173H	1-87
EMA-220	MCL SRA-220	1-18
EMA-2000	MCL SRA-2000	1-182
EMA-2400	MCL SRA-2400	1-194
EMA-3500	MCL SRA-3500	1-193
EMAZ-1	MCL ZAD-1	1-160
EMAZ-1H	MCL ZAD-1H	1-78
EMAZ-2	MCL ZAD-2	1-161
EMAZ-2H	MCL ZAD-2H	1-79
EMD-113	MCL LMX-113	1-162
EMK-1H	MCL TAK-1H	1-109
EMK-1WH	MCL TAK-1WH	1-110
EMK-3H	MCL TAK-3H	1-108
EMK-5	MCL TAK-5	1-219
EMK-6	MCL TAK-6	1-220
EMK-7	MCL TAK-7	1-221
EML-1	Varil ML-1	1-192
EMM-1	MCL SAM-1	1-224
EMM-2	MCL SAM-2	1-223
EMM-3	MCL SAM-3	1-222
EMM-4	MCL SAM-4	1-225
EMM-5	MCL SAM-5	1-226
EMR-1	MCL RAY-1	1-136
EMR-2	MCL RAY-2	1-140
EMR-3	MCL RAY-3	1-135
EMR-6	MCL RAY-6	1-137
EMRS-1	MCL RMS-1	1-232
EMRS-1H	MCL RMS-1H	1-112
EMRS-1LH	MCL RMS-1LH	1-29
EMRS-1MH	MCL RMS-1MH	1-60
EMRS-2	MCL RMS-2	1-240
EMRS-2D	MCL RMS-2D	1-233
EMRS-2H	MCL RMS-2H	1-115
EMRS-2L	MCL RMS-2L	1-149
EMRS-2LH	MCL RMS-2LH	1-30
EMRS-2MH	MCL RMS-2MH	1-61
EMRS-2U	MCL RMS-2U	1-234
EMRS-5	MCL RMS-5	1-241
EMRS-5H	MCL RMS-5H	1-116
EMRS-5L	MCL RMS-5L	1-150
EMRS-5LH	MCL RMS-5LH	1-31
EMRS-5MH	MCL RMS-5MH	1-62
EMRS-11	MCL RMS-11	1-243
EMRS-11A	MCL RMS-11A	1-235
EMRS-11F	MCL RMS-11F	1-238
EMRS-11X	MCL RMS-11X	1-242
EMRS-25MH	MCL RMS-25MH	1-63
EMRS-30	MCL RMS-30	1-265
EMRS-860	MCL RMS-860	1-244
EMRSL-1	MCL LRMS-1	1-252
EMRSL-1WH	MCL LRMS-1WH	1-134
EMRSL-2	MCL LRMS-2	1-257
EMRSL-2D	MCL LRMS-2D-11	1-253
EMRSL-2L	MCL LRMS-2L	1-158
EMRSL-2LH	MCL LRMS-5	1-41
EMRSL-5H	MCL LRMS-5H	1-133
EMRSL-5MH	MCL LRMS-5MH	1-73
EMRSL-11A	MCL LRMS-11A	1-255
EMRSL-860	MCL LRMS-860	1-260
EMS-1	MCL SBL-1	1-175
EMS-1-1	MCL SBL-1-1	1-167
EMS-1MH	MCL SBL-1MH	1-46

Part Number	Competitors Nearest Equaivalent	Page No.
EMS-1N	MCL SBL-1	1-174
EMS-1X	MCL SBL-1X	1-178
EMS-1XLH	MCL SBL-1XLH	1-19
EMS-1Z	MCL SBL-1Z	1-180
EMS-1ZMH	MCL SBL-1ZMH	1-48
EMS-3	MCL SBL-3	1-166
EMS-11	MCL SBL-11	1-187
EMS-173H	Synergy CMP 231	1-86
EMS-500	MCL IE-500	1-189
EMS-505	MCL HPF-505	1-173
EMS-800F	MCL IE-800F	1-181
EMT-1H	MCL TFM-1H	1-99
EMT-1MH	MCL TFM-1MH	1-54
EMT-2	MCL TFM-2	1-206
EMT-2H	MCL TFM-2H	1-102
EMT-2LH	MCL TFM-2LH	1-24
EMT-3	MCL TFM-3	1-204
EMT-3MH	MCL TFM-3MH	1-53
EMT-4	MCL TFM-4	1-210
EMT-42MH	MCL TFM-42MH	1-59
EMT-4H	MCL TFM-4H	1-103
EMT-5	MCL TFM-5	1-211
EMT-11	MCL TFM-11	1-217
EMT-12	MCL TFM-12	1-214
EMT-12MH	MCL TFM-12MH	1-58
EMT-15	MCL TFM-15	1-28
EMT-150	MCL TFM-150	1-26
EMT-16	Synergy CLP-305	1-27
EMT-16H	Synergy CMP-A75	1-106
EMT-2400	MCL TFM-2400	1-218
EMTS-1	MCL TSM-1	1-229
EMTS-2	MCL TSM-2	1-228
EMTS-3	MCL TSM-3	1-227
EMTS-5	MCL TSM-5	1-230
EPDC-10-1	MCL PDC-10-1	6-6
EPDC-10-1BD	MCL PDC-10-1BD	6-5
EQSM-905	Murata LDC33	5-62
EQSML-70	MCL LRPQ-70	5-63
EQSML-980	MCL LRPQ-980	5-64
ES-2-1	MCL PSC-2-1	5-13
ES-2-1-75	MCL PSC-2-1-75	5-18
ES-2-1W	MCL PSC-2-1W	5-14
ES-2-4	MCL PSC-2-4	5-16
ES-2-4-752	MCL PSC-2-4-752	5-19
ES-3-1	MCL PSC-3-1	5-84
ES-3-1W	MCL PSC-3-1W	5-85
ES-4-1	MCL PSC-4-1	5-90
ES-4-1W	MCL PSC-4-1W	5-92
ES-4-3	MCL PSC-4-3	5-91
ES-4-5	MCL PSC-4-5	5-89
ES-5-1	MCL PSC-5-1	5-95
ES-6-1	MCL PSC-6-1	5-96
ES-8-1	MCL PSC-8-1	5-98
ESC-2-1	MCL SCP-2-1	5-31
ESCJ-2-1	MCL PSCJ-2-1	5-34
ESCM-2	MCL SCM-2	1-262
ESCM-2500	MCL SCM-2500	1-263
ESCP-3-1	MCL SCP-3-1	5-86
ESCP-4-3-2	MCL SCP-4-3-2	5-93
ESCQ-2-90	MCL SCPQ-2-90	5-69
ESCQ-2-180	MCL SCPQ-180	5-70
ESCQ-2-250	MCL SCPQ-250-1	5-71
ESCQ-2-400	MCL SCPQ-400	5-72
ESDC-20-1X1	MCL LRDC-20-2-1	6-14
ESM-2-1	MCL MSC-2-1	5-21
ESMD-11MH	MCL SYM-11MH	1-68
ESMD-C2A	Synergy SMD-C2M	1-264
ESMD-C2HX2-1	MCL SYM-11H	1-76
ESMD-C2HX2-16	MCL SYMC-C1-1	1-123
ESML-2-1	MCL LRPS-2-1	5-27
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Richardson	Scottsdale	(800) 348-5580

Northern California

Penstock	Sunnyvale	(408) 730-0300
Richardson	San Jose	(800) 348-5580

Southern California

Penstock	Manhattan Beach	(800) 736-7862
Penstock	San Diego	(800) 736-7862
Penstock	Sierre Madre	(800) 736-7862
Richardson	Woodland Hills	(800) 348-5580
Richardson	San Diego	(800) 348-5580

Canada

Penstock	Kanata	(800) 736-7862
Richardson	Mississauga	(800) 348-5580

Colorado

Penstock	Englewood	(800) 736-7862

Florida

Nu Horizons	Altamonte Springs	(407) 831-8008
Nu Horizons	Ft. Lauderdale	(305) 735-2555
Penstock	Winter Park	(800) 736-7862
Penstock	Tampa	(800) 736-7862
Richardson	Altamonte Springs	(800) 348-5580

Georgia

Nu Horizons	Norcross	(404) 416-8666
Penstock	Norcross	(800) 736-7862
Richardson	Alfaretta	(800) 348-5580

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Richardson	LaFox	(800) 348-5580

Kansas

Penstock	Olathe	(800) 736-7862
Richardson	Olathe	(800) 348-5580

Maryland

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Penstock	Columia	(800) 736-7862
Richardson	Towson	(800) 348-5580

Massachusetts

Nu Horizons	Wakefield	(617) 246-4442
Penstock	Burlington	(800) 736-7862
Richardson	North Andover	(800) 348-5580

Metro New York

Nu Horizons	Amityville	(516) 226-6000
Penstock	Plainview	(800) 736-7862
Richardson	Valley Stream	(800) 348-5580

Upstate New York

Nu Horizons	Rochester	(716) 292-0777
Richardson	East Rochester	(800) 348-5580

Northern New Jersey

Nu Horizons	Pine Brook	(201) 882-8300
Penstock	Parsippany	(800) 736-7862
Richardson	Franklin Park	(800) 348-5580

Southern New Jersey

Nu Horizons	Mt. Laurel	(609) 231-0900

Pennsylvania

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Richardson	Montgomery	(800) 348-5580

Ohio

Richardson	Grove City	(800) 348-5580

Oregon

Penstock	Portland	(800) 736-7862

Texas

Penstock	Richardson	(800) 736-7862
Penstock	Austin	(800) 736-7862
Richardson	Arlington	(800) 348-5580

Washington

Penstock	Bellevue	(800) 736-7862

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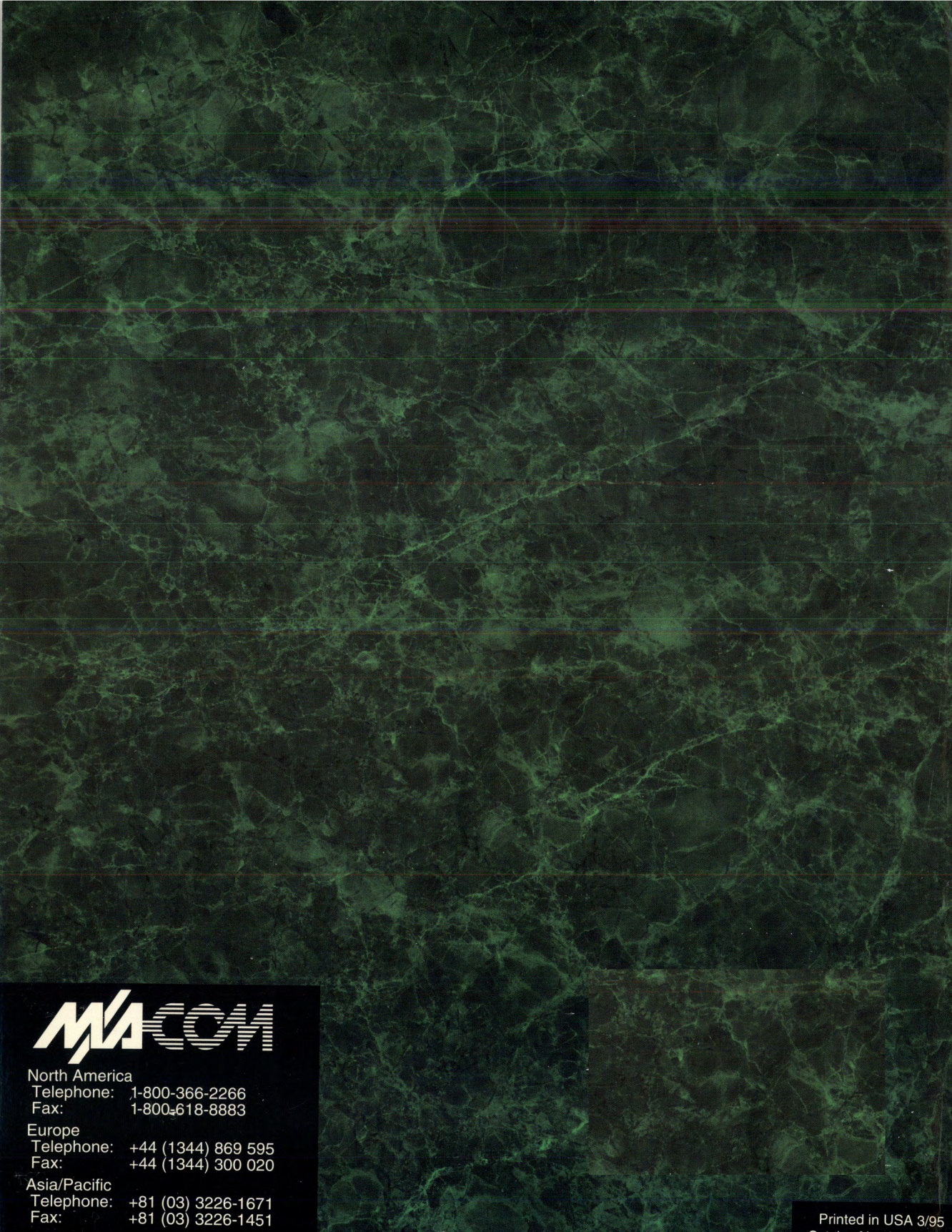

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Printed in USA 3/95