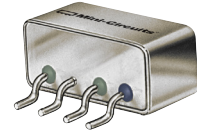


Frequency Mixer

TUF-1HSM+

Level 17 (LO Power +17 dBm) 2 to 600 MHz



CASE STYLE: NNN150

Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power	200mW
IF Current	40mA
Permanent damage may occur if any of these limits are exceeded.	

Pin Connections

LO	4
RF	1
IF	2
GROUND	3
CASE GROUND	3

Features

- low conversion loss, 5.90 dB typ.
- high IP3, 26 dB typ.
- excellent L-R isolation, 50 dB typ.; L-I, 48 dB typ.
- rugged welded construction

Applications

- VHF/UHF
- defense & federal communications

+RoHS Compliant
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

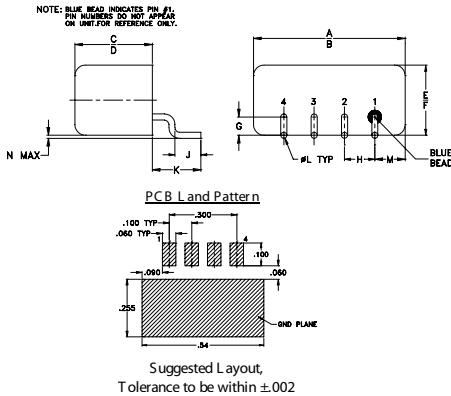
Electrical Specifications

FREQUENCY (MHz)	CONVERSION LOSS (dB)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)			IP3 @ CENTER BAND (dBm)										
		L	M	U	L	M	U											
LO/RF f_L - f_U	Mid-Band m \bar{X} σ Max. Total Range Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.										
2-600	DC-600	5.90	0.18	7.0	8.0	68	50	50	30	43	25	62	45	48	30	33	22	26

1 dB COMP.: +14 dBm typ.

L = low range [f_L to $10 f_L$] M = mid range [$10 f_L$ to $f_U/2$] U = upper range [$f_U/2$ to f_U]
m = mid band [$2f_L$ to $f_U/2$]

Outline Drawing

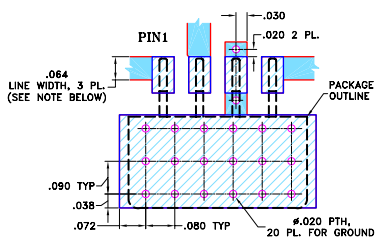


Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.50	.48	.255	.240	.23	.21	.06
12.70	12.19	6.48	6.10	5.84	5.33	1.52

H	J	K	L	M	N	wt
.100	.09	.16	.020	.09	.005	grams
2.54	2.29	4.06	0.51	2.29	0.13	1.9

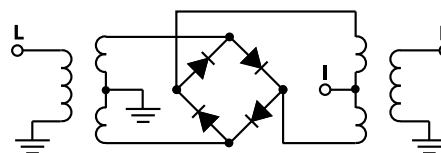
Demo Board MCL PIN: TB-201 Suggested PCB Layout (PL-081)



Typical Performance Data

Frequency (MHz)	Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
2.00	32.00	6.30	62.98	1.22	1.67
5.00	35.00	5.95	62.06	1.10	1.60
10.00	40.00	5.92	60.47	1.03	1.63
20.00	50.00	5.91	57.14	1.02	1.61
34.13	64.13	5.81	53.27	1.04	1.58
50.00	80.00	5.72	50.24	1.06	1.57
66.26	96.26	5.66	48.03	1.07	1.55
82.33	52.33	5.71	46.33	1.08	1.54
100.00	70.00	5.63	44.99	1.09	1.57
130.52	100.52	5.61	43.18	1.10	1.55
162.65	132.65	5.61	41.46	1.10	1.55
200.00	170.00	5.60	40.12	1.08	1.60
259.04	229.04	5.42	38.10	1.07	1.67
307.24	277.24	5.62	37.54	1.06	1.70
355.43	325.43	5.86	37.41	1.05	1.76
387.56	357.56	5.92	36.35	1.04	1.82
435.76	405.76	5.81	35.35	1.05	1.84
483.95	453.95	6.08	36.44	1.08	1.87
500.00	470.00	6.27	36.27	1.09	1.90
600.00	570.00	6.18	36.36	1.09	1.89

Electrical Schematic

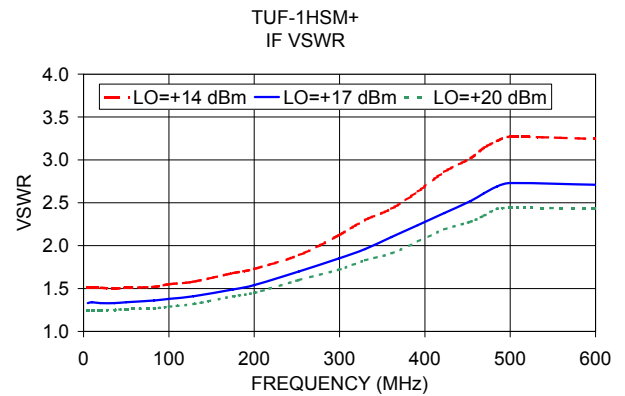
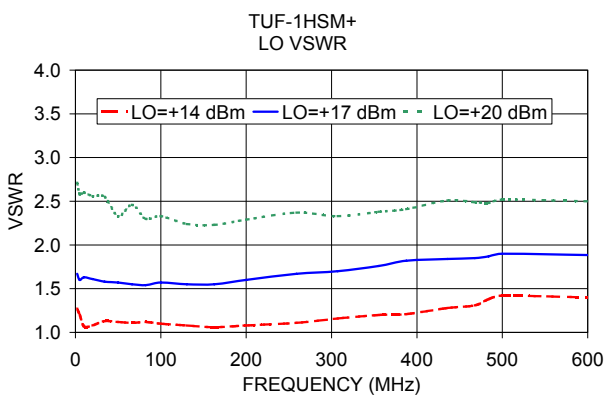
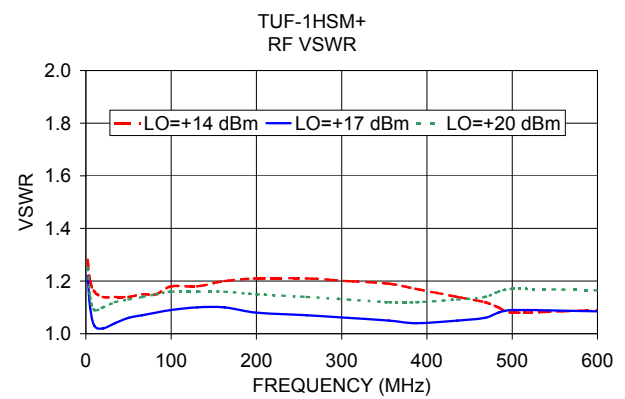
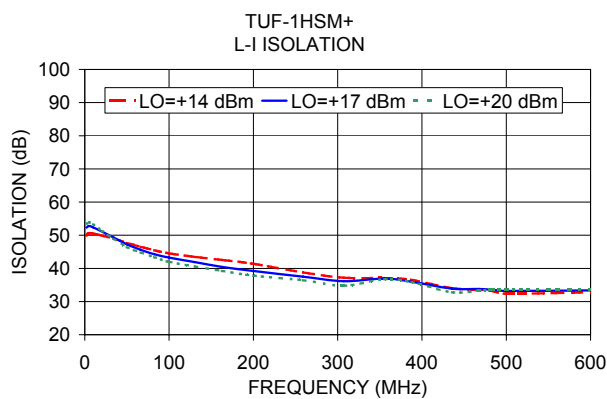
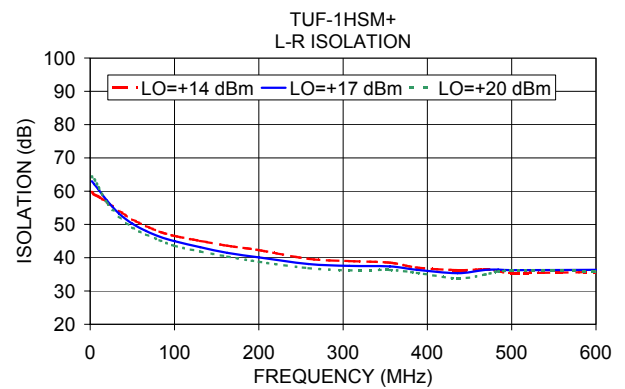
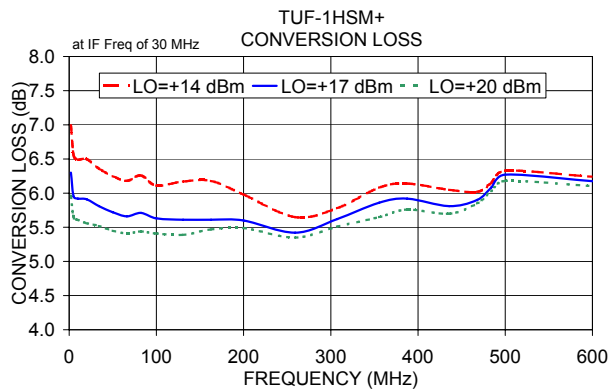


NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuit's standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuit's website at www.minicircuits.com/MCLStore/terms.jsp





Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

