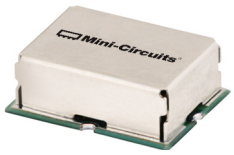
High IP3

Frequency Mixer

HJK-372H+

Level 17 (LO Power +17 dBm) 420 to 3730 MHz



CASE STYLE: TTT1114

The Big Deal

- High IP3, +24 dBm, typ.
- High isolation, 35 dB L-R, 33 dB L-I typ.
- Low conversion loss, 7.5 dB typ.
- Wideband. 420 to 3730 MHz

Product Overview

Mini-Circuits' HJK-372H+ is a surface mount, level 17 FET-based frequency mixer with an RF frequency range from 420 to 3730 MHz, LO frequency range from 610 to 3920 MHz, and IF frequency range from 100 to 600 MHz. Its double-balanced FET configuration achieves an outstanding combination of low conversion loss, low noise figure and high IP3 performance without the need for a DC bias current, ideal for sensitive receiver applications including base stations, PCS, fixed satellite and more. The mixer comes housed in a miniature, shielded 6-lead package (0.38 x 0.50 x 0.15"), saving space in tight PCB layouts.

Feature	Advantages
High IP3, +24 dBm typ.	Minimizes third order intermodulation products and improves dynamic range in demanding environments where multiple carriers may be present.
Low conversion loss, 7.5 dB	Preserves signal integrity from input to output by reducing undesirable signal responses that can degrade system performance and enables lower NF front ends, improving system sensitivity.
Good P1dB compression, +14 dBm at input	Whereas the 1-dB compression point of a diode-based mixer is typically 4 to 6 dB lower than the LO power level, the 1-dB compression point of HJK-372H+ FET-based mixer is +14 dBm higher than the LO signal power. This results in excellent linearity and high dynamic range.
High L-R and L-I isolation, • L-R, 35 dB typ. • L-I, 33 dB typ.	Preserves signal integrity from input to output and reduces undesired signal responses that can interfere with system performance.
Small size (0..38 x 0.50 x 0.15")	Saves PCB real estate and accommodates crowded layouts.

www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

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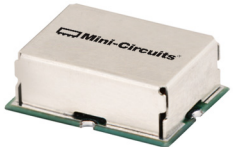


CASE STYLE: TTT1114

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
LO Power	+19 dBm
RF Power	+20 dBm

Permanent damage may occur if any of these limits are exceeded.

Pin Connections

LO	2
RF	1
IF	3
GROUND	4,5,6

Features

- high IP3, 24 dBm typ.
- good L-R isolation, 35 dB typ., L-I isolation, 33dB typ.
- wideband

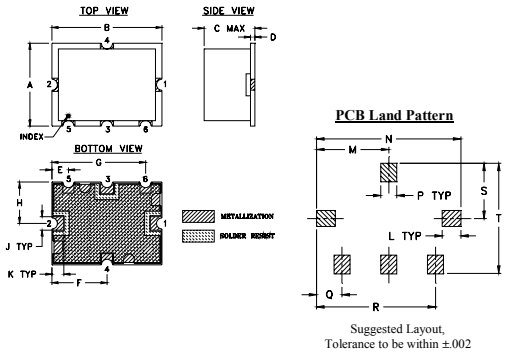
+RoHS Compliant

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

Applications

- radar
- base stations
- cellular
- PCS
- fixed satellite

Outline Drawing



Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	J	K
.38	.50	.15	.020	.075	.250	.425	.187	.050	.050
9.65	12.70	3.81	0.51	1.91	6.35	10.80	4.75	1.27	1.27

L	M	N	P	Q	R	S	T	
.070	.270	.540	.060	.095	.445	.208	.415	wt.
1.78	6.86	13.72	1.52	2.41	11.30	5.28	10.54	grams
								0.8

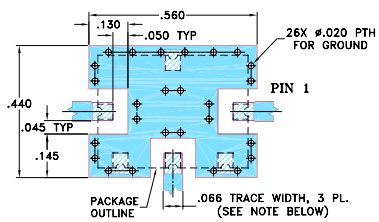
Electrical Specifications at 25°C

Parameter	Min.	Typ.	Max.	Unit
Frequency Range, RF	420		3730	MHz
Frequency Range, LO	610	—	3920	MHz
Frequency Range, IF	100	—	600	MHz
Conversion Loss	—	7.5	9.2	dB
LO to RF Isolation	23	35	—	dB
LO to IF Isolation	24	33	—	dB
IP3	—	24	—	dBm
RF Input Power at 1 dB Compression	—	+14	—	dBm

Typical Performance Data

Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)	IP3 (dBm)
RF	LO	LO +17dBm	LO +17dBm	LO +17dBm	LO +17dBm	LO +17dBm	LO +17dBm
420.10	610.10	7.79	32.76	41.16	1.25	4.41	24.35
540.10	730.10	7.47	34.14	39.01	1.19	4.34	24.80
1060.10	1250.10	7.23	40.41	38.70	1.13	4.06	25.00
1560.10	1750.10	7.00	44.98	36.66	1.28	3.50	24.98
2070.10	2260.10	7.21	44.18	33.39	1.22	3.27	25.14
2450.10	2640.10	7.31	46.25	33.53	1.60	3.42	23.33
2590.10	2780.10	7.63	46.11	34.45	1.65	3.38	23.17
2710.10	2900.10	7.72	47.29	34.46	1.65	3.37	23.43
2850.10	3040.10	7.63	44.56	34.91	1.59	3.28	23.86
2970.10	3160.10	7.67	41.76	35.49	1.54	3.15	24.97
3090.10	3280.10	7.78	42.90	35.69	1.47	2.99	24.61
3230.10	3420.10	7.64	41.77	35.35	1.38	2.81	25.56
3350.10	3540.10	7.61	37.53	35.54	1.37	2.61	25.82
3490.10	3680.10	7.65	33.46	35.49	1.39	2.40	25.68
3610.10	3800.10	7.63	31.69	35.33	1.48	2.20	26.52
3730.10	3920.10	7.79	29.97	35.67	1.53	1.98	26.54

Demo Board MCL P/N: TB-12
Suggested PCB Layout (PL-079)



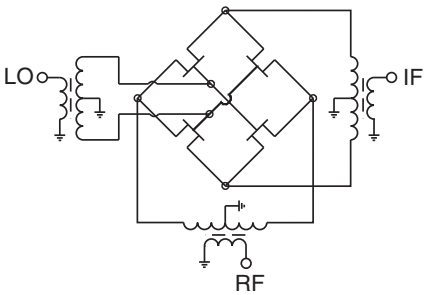
NOTE:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. THE USE OF SOLDER MASK OVER THE GROUND AREA UNDER THE UNIT AS SHOWN IS RECOMMENDED TO PREVENT POTENTIAL SHORTING. IF USER CHOOSES TO EXPOSE METAL UNDER THE ENTIRE UNIT GROUND PAD FOR IMPROVED GROUNDING, IT IS RECOMMENDED A SOLDER MASK DAM BE APPLIED AROUND EACH GROUND PAD TO ENSURE FILLET AND CONNECTION AT GROUND PADS.
3. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER). SEE NOTE 2.

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Electrical Schematic



Notes

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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.
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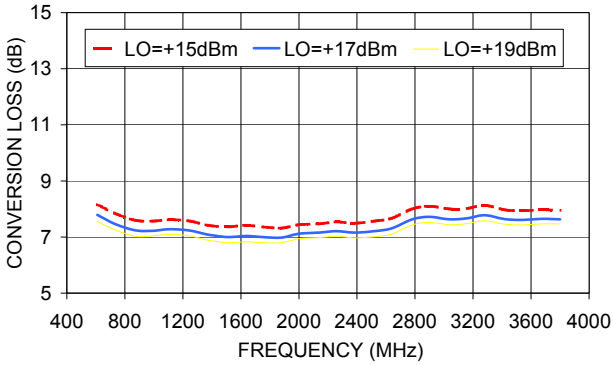
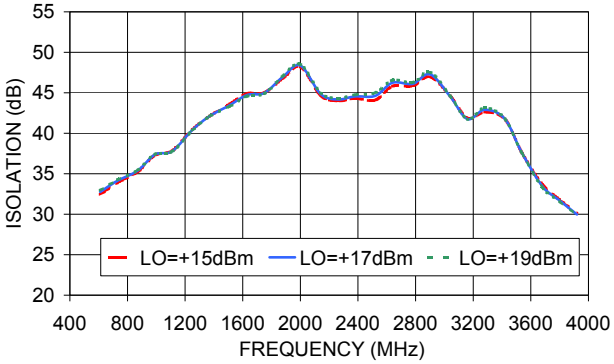
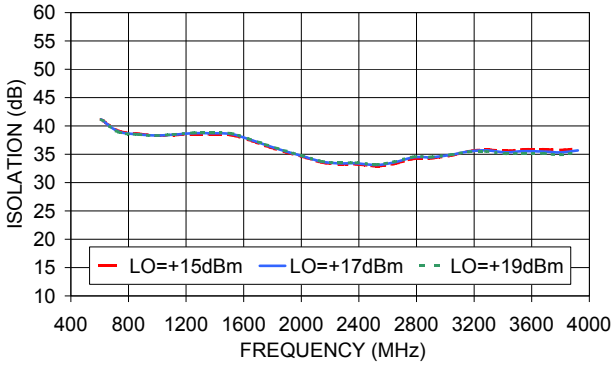
HJK-372H+
CONVERSION LOSS



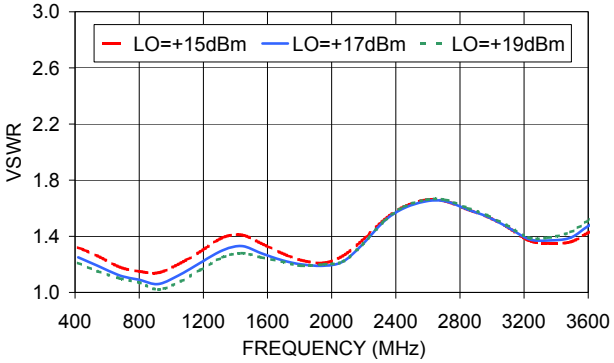
HJK-372H+
L-R ISOLATION



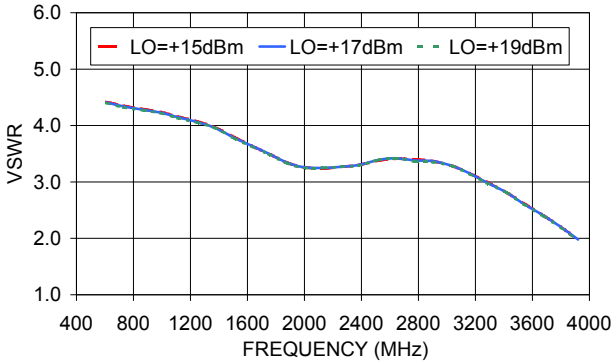
HJK-372H+
L-I ISOLATION



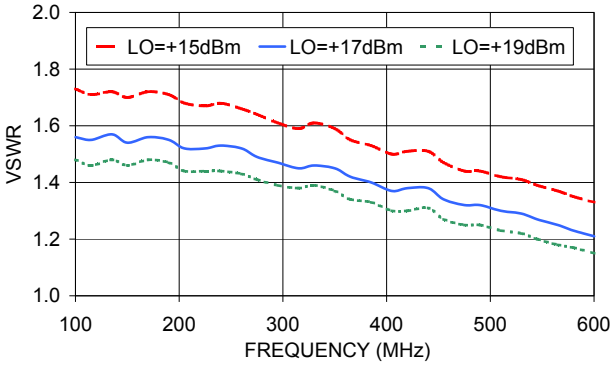
HJK-372H+
RF VSWR



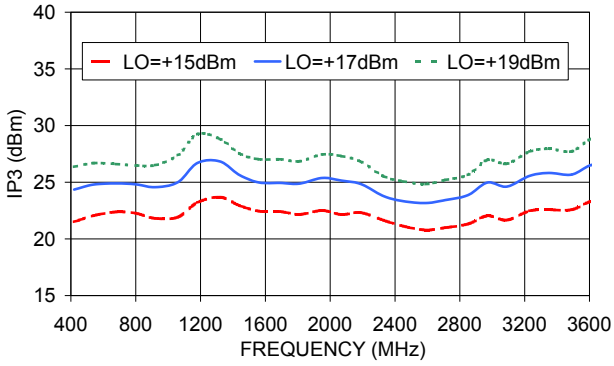
HJK-372H+
LO VSWR



HJK-372H+
IF VSWR



HJK-372H+
IP3



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