

Frequency Mixer

TUF-3HSM+

Level 17 (LO Power +17 dBm) 0.15 to 400 MHz



CASE STYLE: NNN150
PRICE: \$14.70 ea. QTY (1-9)

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

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, 5.0 dB typ.
- good IP3, 22 dBm typ.
- excellent L-R isolation, 50 dB typ.; L-I, 45 dB typ.
- rugged welded construction

Applications

- HF/VHF
- defense & federal communications

Electrical Specifications

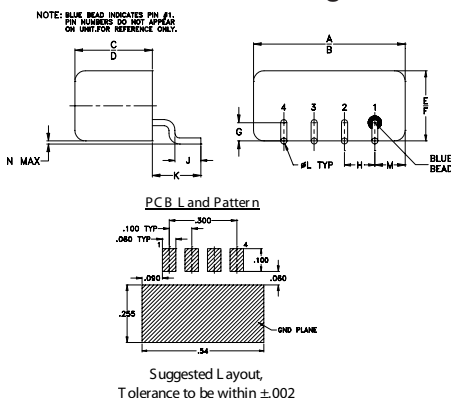
FREQUENCY (MHz)	CONVERSION LOSS (dB)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)			IP3 @ CENTER BAND (dBm)										
		L	M	U	L	M	U											
0.15-400	DC-400	5.00	0.33	7.0	8.0	60	50	50	35	40	30	60	40	45	25	35	20	22

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]
E = [IP3 (dBm)-LO Power (dBm)]/10 m = mid band [$2f_L$ to $f_U/2$]

Typical Performance Data

Frequency (MHz)	Conversion Loss (dB)	VSWR RF Port (:1)	Frequency (MHz)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR LO Port (:1)
RF	LO	LO +17dBm	LO	LO +17dBm	LO +17dBm	LO +17dBm
0.15	30.15	5.73	10.00	82.56	73.10	1.50
0.30	30.30	5.50	20.00	77.94	72.84	1.49
0.50	30.50	5.40	40.00	73.33	71.28	1.46
0.75	30.75	5.32	50.00	71.91	69.09	1.49
1.00	31.00	5.29	68.00	70.74	64.21	1.48
2.80	32.80	5.15	86.00	70.55	58.19	1.45
10.00	40.00	5.07	104.00	68.91	54.46	1.47
20.00	50.00	5.01	122.00	69.27	51.05	1.48
38.00	68.00	4.98	140.00	65.14	48.62	1.50
56.00	86.00	4.96	176.00	69.38	45.57	1.52
110.00	140.00	5.08	212.00	58.50	42.60	1.55
128.00	158.00	5.07	230.00	54.52	41.38	1.56
164.00	194.00	5.10	255.00	55.28	41.47	1.61
200.00	230.00	5.24	280.00	56.41	41.92	1.60
250.00	280.00	5.41	305.00	51.98	40.69	1.64
300.00	330.00	5.43	330.00	48.01	38.86	1.66
325.00	355.00	5.40	355.00	49.07	36.77	1.65
350.00	380.00	5.46	380.00	53.89	34.86	1.74
375.00	405.00	5.63	405.00	51.11	33.11	1.90
400.00	430.00	6.10	430.00	47.28	33.20	1.89

Outline Drawing

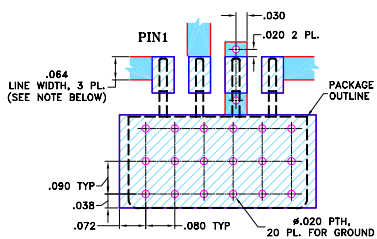


Outline Dimensions (inch/mm)

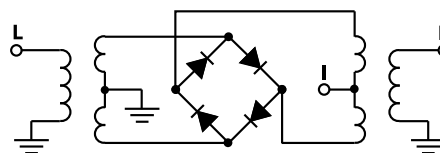
A	B	C	D	E	F	G
.50	.48	.255	.240	.23	.21	.06
12.70	12.19	6.48	6.10	5.84	5.33	1.52

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)



Electrical Schematic



Mini-Circuits
ISO 9001 ISO 14001 AS 9100 CERTIFIED

For detailed performance specs & shopping online see web site

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 The Design Engineers Search Engine Provides ACTUAL Data Instantly at minicircuits.com

Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet 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.

