

# Frequency Mixer

## TUF-2HSM+

Level 17 (LO Power +17 dBm) 50 to 1000 MHz



CASE STYLE: NNN150  
PRICE: \$14.20 ea. QTY (10)

### 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, 6.20 dB typ.
- excellent L-R isolation, 47 dB typ.; L-I, 44 dB typ.
- good IP3, 21 dBm typ.
- rugged welded construction

### Applications

- VHF/UHF
- cellular
- ISM/GSM

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

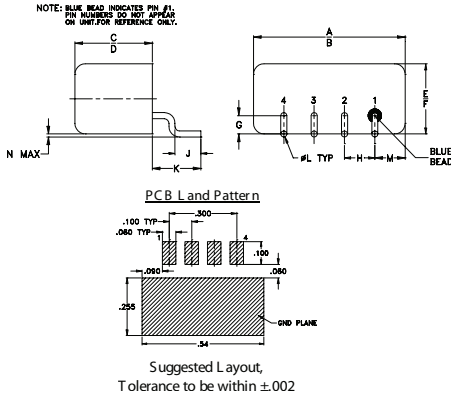
### Electrical Specifications

FREQUENCY (MHz)	CONVERSION LOSS (dB)	LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)						IP3 @ CENTER BAND (dBm)				
		Mid-Band		Total Range		L	M	U	L	M	U							
LO/RF $f_L-f_U$	IF $\bar{X}$ $\sigma$ Max.	m	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.				
50-1000	DC-1000	6.20	0.22	7.5	9.0	58	40	47	30	42	25	58	35	44	25	28	18	21

1 dB COMP: +14 dBm typ.

L = 50-100 MHz M = 100-500 MHz U = upper range [ $f_U/2$  to  $f_L$ ]  
m = mid band [ $2f_L$  to  $f_U/2$ ]

### Outline Drawing



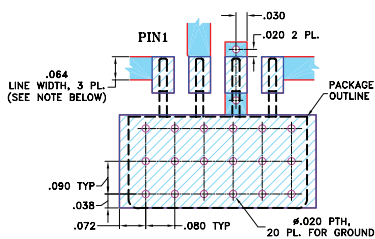
### Outline Dimensions (inch/mm)

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)

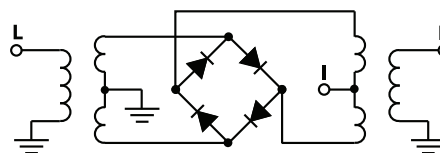


- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.  
■ DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)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

### Typical Performance Data

Frequency (MHz)	Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
5.00	35.00	5.75	73.03	1.24	1.51
35.15	65.15	5.75	53.95	1.10	1.53
65.30	95.30	5.78	47.75	1.10	1.52
125.61	95.61	5.83	45.94	1.09	1.44
185.91	155.91	5.88	41.73	1.09	1.43
216.06	186.06	5.87	40.07	1.10	1.39
276.37	246.37	5.70	37.49	1.11	1.38
336.67	306.67	5.62	35.70	1.11	1.40
396.98	366.98	5.78	35.50	1.12	1.37
457.28	427.28	6.15	33.92	1.13	1.36
517.58	487.58	5.88	34.70	1.15	1.37
547.74	517.74	5.91	35.38	1.15	1.39
608.04	578.04	6.36	34.75	1.16	1.38
668.34	638.34	6.50	34.53	1.17	1.38
728.65	698.65	6.30	33.69	1.20	1.36
788.95	758.95	6.43	32.39	1.22	1.45
849.26	819.26	7.56	32.23	1.26	1.49
909.56	879.56	8.59	32.46	1.34	1.52
969.86	939.86	8.55	32.66	1.46	1.54
1000.00	970.00	8.57	32.20	1.62	1.53

### Electrical Schematic



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](http://minicircuits.com)

IF/RF MICROWAVE COMPONENTS

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