

# High Reliability Mixer

## TUF-R3MHSM+

Level 13 (LO Power +13 dBm) 0.3 to 400 MHz



### Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power	50mW
IF Current	40mA

### Pin Connections

LO	4
RF	1
IF	2
GROUND	3
CASE GROUND	3

### Features

- hermetically sealed ceramic quad
- low conversion loss, 5.0 dB typ.
- good IP3, 18 dBm typ.
- excellent isolation L-R, 50 dB typ; L-I, 50 dB typ.
- rugged welded construction
- shielded metal case

### Applications

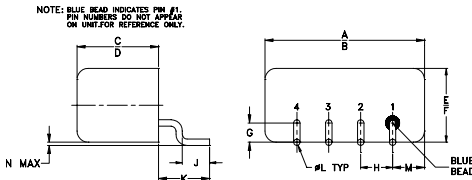
- HF/VHF
- defense & federal communications

CASE STYLE: NNN150  
PRICE: \$12.85 ea. QTY. (1-9)

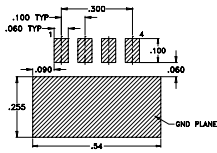
**+ RoHS compliant in accordance with EU Directive (2002/95/EC)**

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

### Outline Drawing



#### PCB Land Pattern

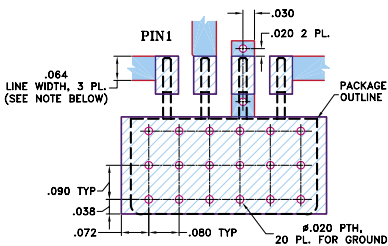


Suggested Layout,  
Tolerance to be within ±.002

### 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 R04350B 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

### Electrical Specifications

FREQUENCY (MHz)	CONVERSION LOSS (dB)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)			IP3 at center band (dBm)										
		L	M	U	L	M	U											
0.3-400	DC-400	5.0	0.03	7.0	8.0	65	50	50	33	43	28	62	48	50	33	38	25	18

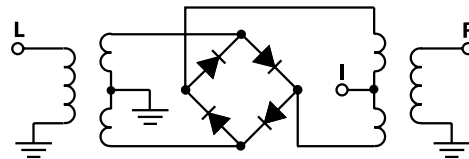
1 dB COMP.: +8 dBm typ.

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 [ $2 f_L$  to  $f_U/2$ ]

### Typical Performance Data

Frequency (MHz)	Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)	
						LO +13dBm
0.21	30.21	5.35	56.50	61.40	1.55	2.24
0.71	30.71	4.77	56.40	61.20	1.57	2.23
1.21	31.21	4.65	56.33	61.29	1.56	2.23
2.71	32.71	4.55	56.11	61.08	1.22	2.22
5.00	35.00	4.51	56.06	60.98	1.22	2.25
10.50	40.50	4.52	55.65	60.48	1.23	2.23
29.50	59.50	4.56	55.50	60.07	1.23	2.26
48.50	78.50	4.74	55.38	59.90	1.23	2.26
67.50	97.50	4.75	52.78	55.86	1.22	2.30
86.50	116.50	4.78	50.01	53.42	1.20	2.16
105.50	135.50	4.81	48.81	53.58	1.20	2.16
143.50	173.50	4.95	46.16	52.77	1.17	2.30
162.50	192.50	4.97	45.47	49.30	1.15	2.24
181.50	211.50	5.00	45.02	48.00	1.13	2.15
200.50	230.50	4.99	42.12	55.32	1.09	2.27
250.00	280.00	5.20	40.22	42.52	1.07	2.18
270.00	300.00	5.25	41.95	39.12	1.03	2.29
310.00	340.00	5.21	44.82	40.01	1.06	2.46
350.00	380.00	5.32	41.50	36.70	1.06	2.46
400.00	430.00	6.00	38.04	30.75	1.20	2.77

### Electrical Schematic



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