

# Surface Mount High Reliability Mixer

## TUF-R1SM+

### Level 7 (LO Power +7 dBm) 5 to 600 MHz



CASE STYLE: NNN150  
PRICE: \$7.90 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	50mW
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

- hermetically sealed ceramic quad
- low conversion loss, 5.9 dB typ.
- excellent isolation L-R, 50 dB typ; L-I, 48 dB typ.
- rugged welded construction
- shielded metal case

#### Applications

- VHF/UHF
- FM radio
- defense & federal communications

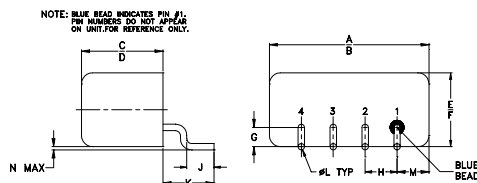
#### Electrical Specifications

FREQUENCY (MHz)	CONVERSION LOSS (dB)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)			IP3 at center band (dBm)						
		L	M	U	L	M	U							
5-600	DC-600	60	45	50	32	42	26	60	43	48	34	40	25	16

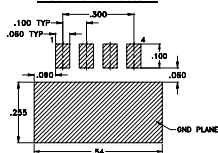
1 dB COMP.: +1 dBm typ.

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



#### PCB Land Pattern

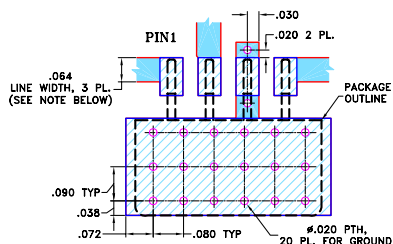


Suggested Layout,  
Tolerance to be within ±.002

#### 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)

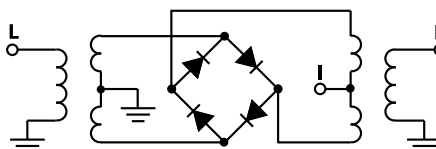


- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
  - 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)
4.00	34.00	6.06	66.56	1.36	2.64
6.00	36.00	5.95	66.02	1.25	2.58
10.00	40.00	5.89	65.37	1.17	2.70
32.00	62.00	5.92	61.99	1.11	2.65
40.50	70.50	5.94	61.46	1.11	2.72
49.00	79.00	5.93	60.24	1.11	2.56
66.00	96.00	5.94	58.07	1.11	2.47
74.50	104.50	5.95	58.24	1.11	2.64
83.00	113.00	5.95	57.74	1.11	2.65
91.50	121.50	5.95	57.54	1.11	2.59
100.00	130.00	5.95	56.70	1.11	2.68
160.00	190.00	5.95	53.29	1.13	2.61
220.00	250.00	5.96	51.73	1.15	2.79
250.00	280.00	5.95	50.55	1.15	2.55
310.00	340.00	5.96	49.80	1.17	2.74
340.00	370.00	5.93	49.37	1.20	2.48
400.00	430.00	5.97	46.91	1.18	2.76
442.50	472.50	5.99	46.17	1.20	2.74
527.50	557.50	6.08	46.85	1.27	2.74
600.00	630.00	6.25	45.82	1.29	2.47

#### 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](http://minicircuits.com)

IF/RF MICROWAVE COMPONENTS

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-Circuits' applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet 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](http://www.minicircuits.com/MCLStore/terms.jsp).

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