

Surface Mount High Reliability Mixer

TUF-R5SM+

Level 7 (LO Power +7 dBm) 20 to 1500 MHz



CASE STYLE: NNN150
PRICE: \$13.10 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, 6.5 dB typ.
- high isolation L-R, 48 dB typ.
- wideband, 20 to 1500 MHz
- rugged welded construction
- shielded metal case

Applications

- satellite distribution
- cellular
- ISM/GSM

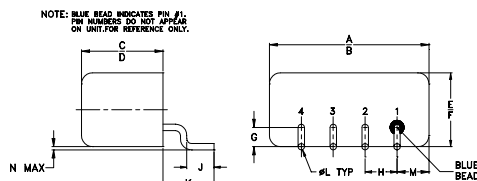
Electrical Specifications

FREQUENCY (MHz)	CONVERSION LOSS (dB)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)			IP3 at center band (dBm)										
		L	M	U	L	M	U											
20-1500	DC-1200	6.5	0.05	9.0	9.0	55	42	48	35	43	32	40	25	30	18	23	10	12

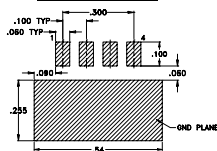
1 dB COMP.: +1 dBm typ.

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

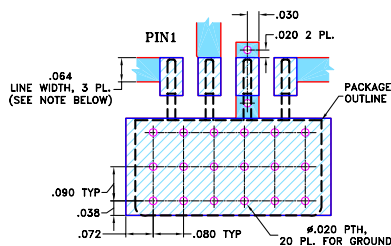


Suggested Layout,
Tolerance to be within ±.002

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)

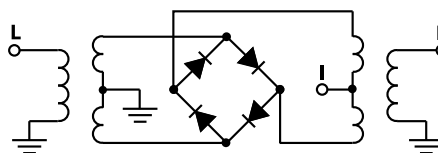


- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
 - 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)
10.10	40.10	5.87	61.00	1.82	2.58
50.10	80.10	5.81	57.81	1.13	2.32
110.10	140.10	5.59	53.70	1.04	2.44
150.10	180.10	5.68	51.95	1.07	2.31
210.10	240.10	5.68	50.41	1.13	2.39
250.10	280.10	5.74	49.16	1.17	2.31
310.10	340.10	5.78	48.33	1.24	2.37
350.10	380.10	5.82	47.76	1.29	2.34
450.10	480.10	5.97	46.00	1.45	2.36
510.10	540.10	6.12	45.60	1.58	2.39
610.10	640.10	6.25	44.37	1.83	2.41
710.10	740.10	6.53	43.52	2.16	2.45
810.10	840.10	6.82	43.21	2.57	2.50
910.10	940.10	7.15	42.23	2.93	2.53
1010.10	1040.10	6.99	41.42	3.06	2.61
1110.10	1140.10	7.06	41.53	3.14	2.71
1210.10	1240.10	7.04	42.18	3.06	2.79
1310.10	1340.10	6.98	43.21	2.92	2.86
1410.10	1440.10	6.98	44.92	2.78	2.93
1510.10	1540.10	6.94	45.94	2.61	2.98

Electrical Schematic



Mini-Circuits®
ISO 9001 ISO 14001 AS 9100 CERTIFIED

For detailed performance specs & shopping online see web site

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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.

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