Surface Mount

High Reliability Mixer

TUF-R1MHSM+

Level 13 (LO Power +13 dBm) 5 to 600 MHz

CASE STYLE: NNN150
PRICE: $10.60 ea. QTY (10)

+RoHS Compliant
The +Suffix identifies 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

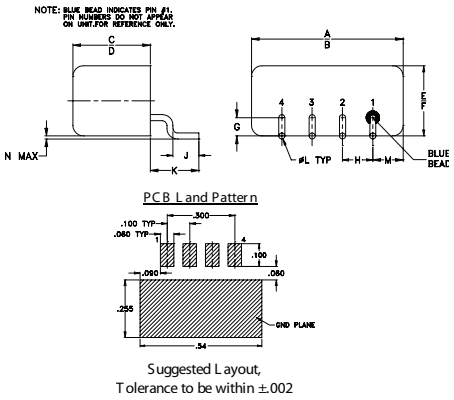
Features

- hermetically sealed ceramic quad
- low conversion loss, 6.0 dB typ.
- high L-R & L-I isolation, 40 dB typ.
- rugged welded construction
- shielded metal case

Applications

- VHF/UHF
- defense & federal communications

Outline Drawing

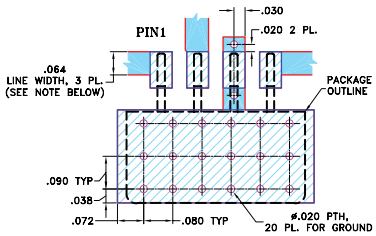


Outline Dimensions (inch / mm)

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

Electrical Specifications

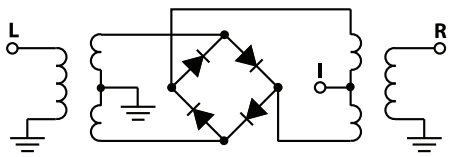
FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)						IP3 at center band (dBm)
		Mid-Band m			Total Range	L		M		U		L		M		U		
LO/RF f_L-f_U	IF	$\overline{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.
5-600	DC-600	6.0	0.07	7.0	8.5	55	43	45	33	37	28	55	42	43	32	34	23	20

1 dB COMP.: +9 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]

Typical Performance Data

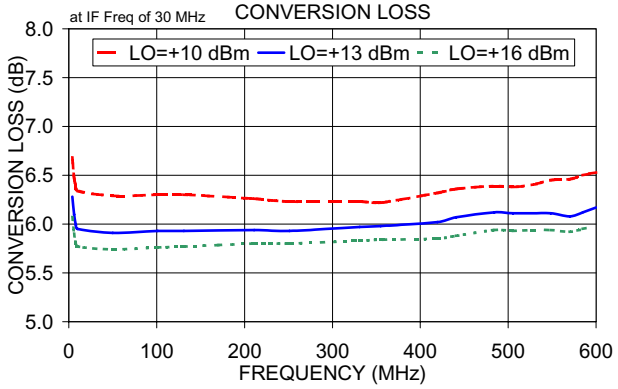
Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
RF	LO	LO +13dBm	LO +13dBm	LO +13dBm	LO +13dBm	LO +13dBm
4.00	34.00	6.28	54.64	53.43	1.40	2.34
6.00	36.00	6.10	54.57	53.25	1.28	2.37
8.00	38.00	5.99	54.47	53.04	1.21	2.36
10.00	40.00	5.95	54.33	52.89	1.16	2.35
50.00	80.00	5.91	49.58	47.41	1.03	2.28
101.00	131.00	5.93	47.52	45.29	1.04	2.33
131.00	161.00	5.93	45.98	43.86	1.05	2.23
211.00	241.00	5.94	43.69	42.58	1.11	2.19
251.00	281.00	5.93	42.16	40.86	1.13	2.30
331.00	361.00	5.97	40.35	38.43	1.16	2.27
355.00	385.00	5.98	40.29	38.20	1.17	2.22
419.50	449.50	6.02	38.24	35.31	1.17	2.21
441.00	471.00	6.07	37.56	34.30	1.17	2.26
484.00	514.00	6.12	36.97	34.19	1.20	2.27
505.50	535.50	6.11	36.70	33.71	1.21	2.23
527.00	557.00	6.11	36.47	33.20	1.22	2.30
548.50	578.50	6.11	36.19	32.30	1.23	2.33
570.00	600.00	6.08	36.00	31.73	1.23	2.23
585.00	615.00	6.12	36.00	31.73	1.23	2.23
600.00	630.00	6.17	35.53	30.83	1.22	2.40

Electrical Schematic

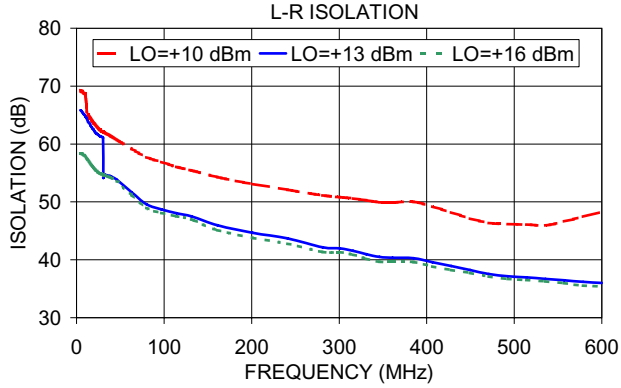


REV. OR
M109914
TUF-R1MHSM+
ED-12914/1
WL/AM
130502

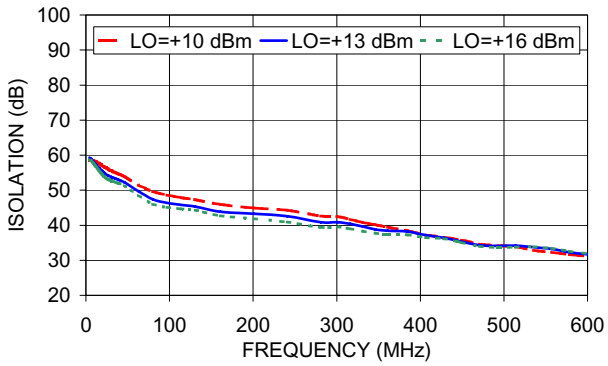
TUF-R1MHSM+
CONVERSION LOSS
at IF Freq of 30 MHz



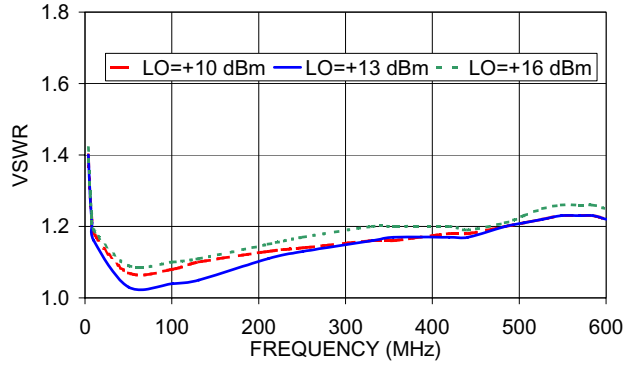
TUF-R1MHSM+
L-R ISOLATION



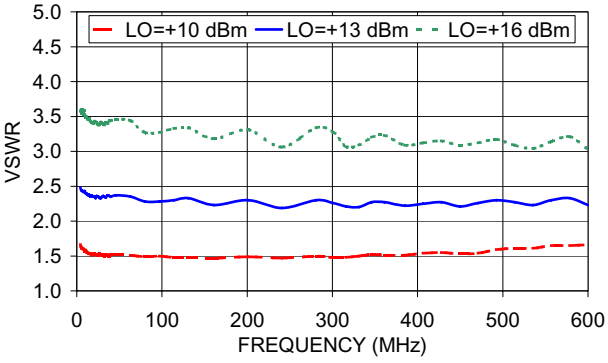
TUF-R1MHSM+
L-I ISOLATION



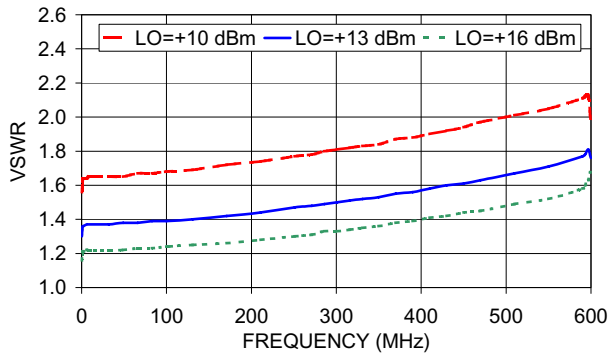
TUF-R1MHSM+
RF VSWR



TUF-R1MHSM+
LO VSWR



TUF-R1MHSM+
IF VSWR



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-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.