

Frequency Mixer

Level 7 (LO Power +7 dBm) 0.15 to 400 MHz

TUF-3SM+



CASE STYLE: NNN150
PRICE: \$10.10 ea. QTY (10)

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

- low conversion loss, 4.7 dB typ.
- excellent L-R isolation, 46 dB typ.; L-I, 47 dB typ.
- rugged welded construction

Applications

- HF/VHF
- defense & federal communication

+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)
LO/RF	IF	Mid-Band		Total Range Max.	L		M		U		L		M		U			
		$\overline{X}$	σ		Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.		
		f_L - f_U																
0.15-400	DC-400	4.7	0.02	7.0	8.0	60	50	46	30	35	25	60	40	47	25	35	20	11

1 dB COMP.: +1 dBm typ.

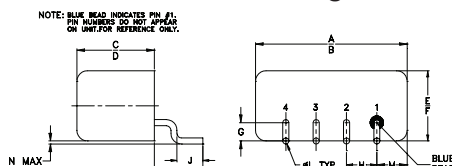
For phase detection, DC positive polarity with in-phase RF & LO.

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

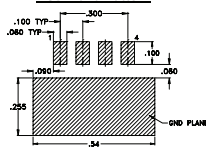
Typical Performance Data

Frequency (MHz)		Conversion Loss (dB)	VSWR RF Port (:1)	Frequency (MHz)		Isolation L-R (dB)	Isolation L-I (dB)	VSWR LO Port (:1)
RF	LO			LO	LO			
		LO +7dBm	LO +7dBm		LO +7dBm			
0.15	30.15	5.37	1.57	10.00	68.68	61.84	2.59	
0.23	30.23	5.27	1.41	20.00	65.36	56.87	2.60	
0.30	30.30	5.21	1.33	30.00	63.22	54.20	2.59	
0.50	30.50	5.16	1.25	40.00	61.75	52.09	2.58	
1.00	31.00	5.08	1.21	76.00	57.56	47.59	2.54	
2.80	32.80	4.91	1.21	94.00	56.48	45.97	2.50	
6.40	36.40	4.91	1.21	112.00	54.90	44.70	2.50	
10.00	40.00	4.73	1.21	149.00	52.63	42.36	2.57	
28.00	58.00	4.71	1.21	168.00	54.13	42.02	2.55	
64.00	94.00	4.75	1.17	206.00	49.62	38.81	2.62	
100.00	130.00	4.83	1.14	225.00	48.10	38.56	2.66	
138.00	168.00	4.85	1.13	244.00	48.03	37.82	2.68	
157.00	187.00	4.88	1.10	282.00	53.65	37.79	2.67	
195.00	225.00	4.92	1.08	301.00	55.10	38.07	2.76	
233.00	263.00	4.97	1.10	320.00	54.03	37.59	2.82	
252.00	282.00	5.10	1.12	340.00	52.86	36.62	2.76	
271.00	301.00	5.17	1.14	360.00	51.53	35.44	2.69	
290.00	320.00	5.15	1.17	390.00	47.44	33.11	2.86	
370.00	340.00	5.38	1.10	410.00	45.39	32.24	3.05	
400.00	370.00	5.41	1.05	430.00	44.42	32.17	3.06	

Outline Drawing



PCB Land Pattern

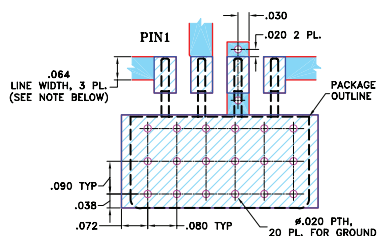


Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch mm)

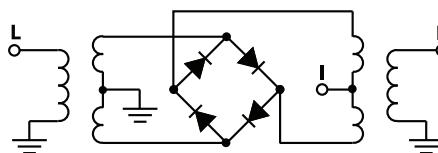
A	B	C	D	E	F	G
.50	.48	.255	.240	.23	.21	.06
12.70	12.19	6.48	6.10	5.84	5.33	1.52
H	J	K	L	M	N	wt
.100	.09	.16	.020	.09	.005	grams
2.54	2.29	4.06	0.51	2.29	0.13	1.9

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.
3. DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
4. DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

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

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