

Frequency Mixer

TUF-3MHSM+

Level 13 (LO Power +13 dBm) 0.15 to 400 MHz



CASE STYLE: NNN150
PRICE: \$12.45 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	200mW
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, 5.0 dB typ.
- good IP3, 18 dBm typ.
- excellent L-R isolation, 46 dB typ.; L-I, 42 dB typ.
- rugged welded construction

Applications

- HF/VHF
- defense & federal communications

Electrical Specifications

FREQUENCY (MHz)	CONVERSION LOSS (dB)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)			IP3 @ CENTER BAND (dBm)						
		L	M	U	L	M	U							
0.15-400	DC-400	60	50	46	30	35	25	60	40	42	25	35	20	18

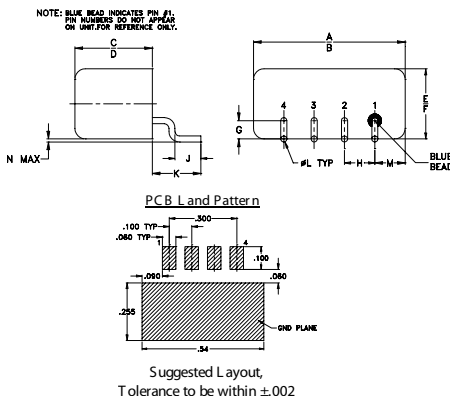
1 dB COMP: +9 dBm typ.

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)		VSWR RF Port (:1)		Frequency (MHz)	Isolation L-R (dB)		Isolation L-I (dB)		VSWR LO Port (:1)	
	RF	LO	LO +13dBm	LO +13dBm		LO	LO +13dBm	LO +13dBm	LO +13dBm	LO	LO +13dBm
0.15	30.15	5.48	1.53		10.50	59.22	67.83	1.72			
0.20	30.20	5.31	1.45		14.50	57.31	65.51	1.71			
0.30	30.30	5.27	1.39		18.50	55.80	63.82	1.71			
0.40	30.40	5.21	1.37		22.50	54.49	62.93	1.69			
0.50	30.50	5.16	1.36		26.50	53.38	61.95	1.70			
1.00	31.00	5.09	1.35		30.50	52.42	61.07	1.69			
5.00	35.00	4.99	1.34		31.00	52.30	61.12	1.68			
10.00	40.00	4.96	1.34		35.10	51.52	60.51	1.68			
20.00	50.00	4.88	1.33		40.10	50.70	60.05	1.68			
50.10	80.10	4.93	1.32		50.10	49.38	59.05	1.68			
75.10	105.10	4.98	1.30		55.10	48.79	58.41	1.68			
100.10	130.10	4.99	1.27		105.10	44.38	48.52	1.69			
150.10	180.10	5.05	1.21		130.10	42.61	44.85	1.71			
200.10	230.10	5.17	1.13		180.10	40.40	39.44	1.75			
250.10	280.10	5.36	1.06		205.10	38.48	37.29	1.80			
300.10	330.10	5.43	1.10		255.10	37.59	35.97	1.86			
325.10	355.10	5.57	1.14		305.10	37.44	32.99	1.94			
350.10	380.10	5.68	1.12		330.10	36.46	31.87	1.97			
375.10	405.10	6.04	1.09		380.10	35.06	30.61	2.12			
400.10	430.10	6.39	1.18		405.10	35.05	29.79	2.17			

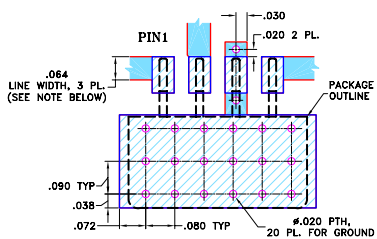
Outline Drawing



Outline Dimensions (inch/mm)

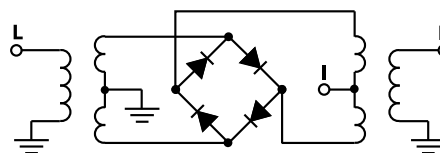
A	B	C	D	E	F	G	H	J	K	L	M	N	wt
.50	.48	.255	.240	.23	.21	.06	.100	.09	.16	.020	.09	.005	grams
12.70	12.19	6.48	6.10	5.84	5.33	1.52	2.54	2.29	4.06	0.51	2.29	0.13	1.9

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



For detailed performance specs & shopping online see web site

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