

High Reliability Mixer

TUF-R5LHSM+

Level 10 (LO Power +10 dBm) 20 to 1500 MHz



Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power	50mW
IF Current	40mA

Pin Connections

LO	4
RF	1
IF	2
GROUND	3
CASE GROUND	3

Features

- hermetically sealed ceramic quad
- low conversion loss, 6.9 dB typ.
- high L-R isolation, 47 dB typ.
- rugged welded construction
- shielded metal case

Applications

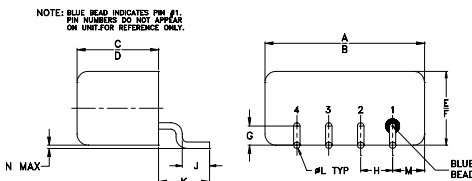
- cellular
- satellite distribution
- GSM/ISM

CASE STYLE: NNN150
PRICE: \$15.10 ea. QTY. (1-9)

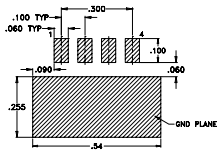
+ RoHS compliant in accordance with EU Directive (2002/95/EC)

The +Suffix has been added in order to identify RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications.

Outline Drawing



PCB Land Pattern

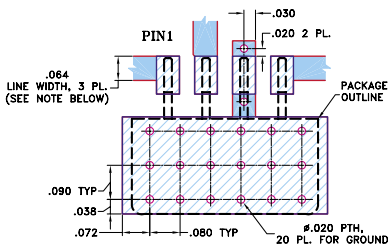


Suggested Layout,
Tolerance to be within ±.002

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 R04350B 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)										
		L	M	U	L	M	U											
20-1500	DC-650	6.9	0.2	8.8	9.3	55	42	47	35	42	30	40	25	28	16	22	9	13

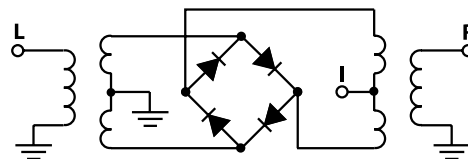
1 dB COMP.: +5 dBm typ.

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 [$2 f_L$ 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)	
						LO +10dBm
10.10	40.10	6.30	66.91	44.49	1.83	2.18
30.10	60.10	6.18	63.66	41.18	1.24	2.07
50.10	80.10	6.24	60.93	38.67	1.15	2.00
150.10	180.10	6.03	54.27	32.75	1.07	1.98
250.10	280.10	6.08	51.21	30.09	1.13	1.99
290.10	320.10	6.05	50.33	29.10	1.15	2.03
350.10	380.10	6.18	49.47	27.91	1.22	2.01
450.10	480.10	6.32	48.02	26.28	1.36	2.04
550.10	580.10	6.43	47.19	24.91	1.55	2.07
650.10	680.10	6.62	46.13	23.92	1.80	2.11
750.10	780.10	6.91	45.11	22.87	2.13	2.16
790.10	820.10	7.14	45.15	22.56	2.30	2.18
850.10	880.10	7.39	45.17	22.10	2.55	2.20
950.10	980.10	7.55	44.36	21.43	2.87	2.22
1050.10	1080.10	7.61	43.37	20.47	3.15	2.31
1150.10	1180.10	7.95	42.59	19.45	3.34	2.39
1250.10	1280.10	7.64	42.32	18.51	3.23	2.43
1350.10	1380.10	7.43	42.21	17.84	3.02	2.47
1450.10	1480.10	7.20	42.60	17.00	2.75	2.50
1510.10	1540.10	7.04	38.13	16.49	2.49	2.53

Electrical Schematic



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