

High Reliability Mixer

TUF-R3LHSM+

Level 10 (LO Power +10 dBm) 0.3 to 400 MHz



Generic photo used for illustration purposes only
CASE STYLE: NNN150

+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, 5.2 dB typ.
- good IP3, 15 dBm typ.
- excellent isolation, 46 dB typ; L-R, L-I
- rugged welded construction
- shielded metal case

Applications

- HF/VHF
- defense & federal communications

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											
LO/RF f_L - f_U	Mid-Band m \bar{X} σ Max. Total Range Max.	Typ. Min.	Typ. Min.	Typ. Min.	Typ. Min.	Typ. Min.	Typ. Min.	Typ.										
0.3-400	DC-400	5.2	0.05	7.0	8.0	62	48	46	30	42	27	62	48	46	30	35	23	15

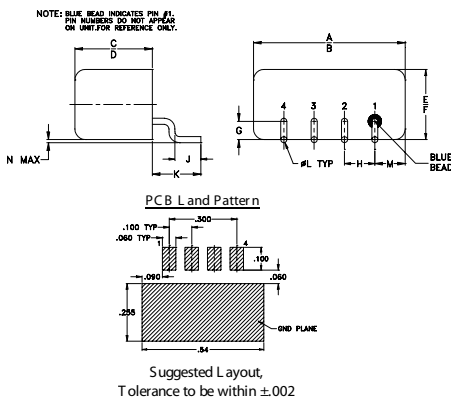
1 dB COMP.: +5 dBm typ.

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
RF	LO	LO +10dBm	LO +10dBm	LO +10dBm	LO +10dBm	
0.21	30.21	5.19	56.65	55.61	1.39	2.17
0.71	30.71	4.83	56.54	55.59	1.45	2.16
1.21	31.21	4.79	56.55	55.57	1.44	2.16
2.71	32.71	4.74	56.07	55.27	1.26	2.17
5.00	35.00	4.73	55.18	55.13	1.26	2.17
10.50	40.50	4.74	54.89	54.46	1.27	2.16
29.50	59.50	4.78	54.74	54.07	1.27	2.17
48.50	78.50	4.81	54.49	53.83	1.27	2.17
67.50	97.50	4.85	52.02	50.57	1.25	2.17
86.50	116.50	4.83	49.80	48.43	1.23	2.12
105.50	135.50	4.90	48.21	47.38	1.22	2.12
143.50	173.50	5.05	45.49	46.13	1.18	2.14
162.50	192.50	5.25	44.62	44.97	1.17	2.11
181.50	211.50	5.30	43.86	44.28	1.14	2.09
200.50	230.50	5.31	42.46	45.88	1.12	2.15
250.00	280.00	5.45	40.90	42.21	1.13	2.14
270.00	300.00	5.57	41.21	38.82	1.12	2.18
310.00	340.00	5.66	42.44	36.51	1.13	2.27
350.00	380.00	5.73	41.37	34.67	1.24	2.27
400.00	430.00	6.20	39.23	30.01	1.18	2.47

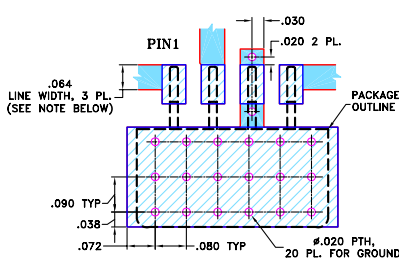
Outline Drawing



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)

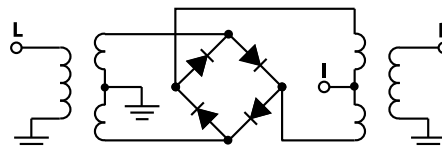


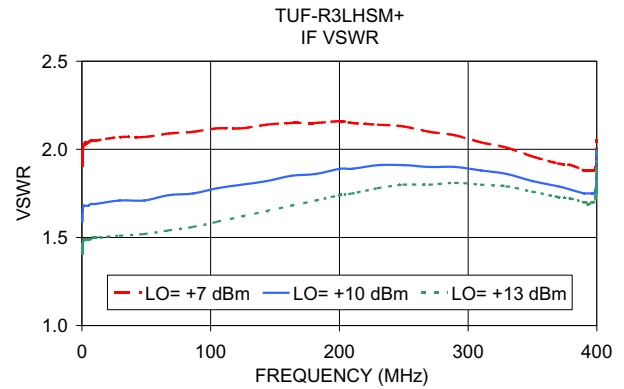
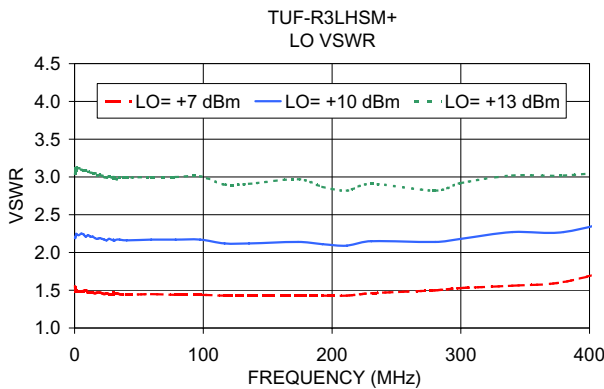
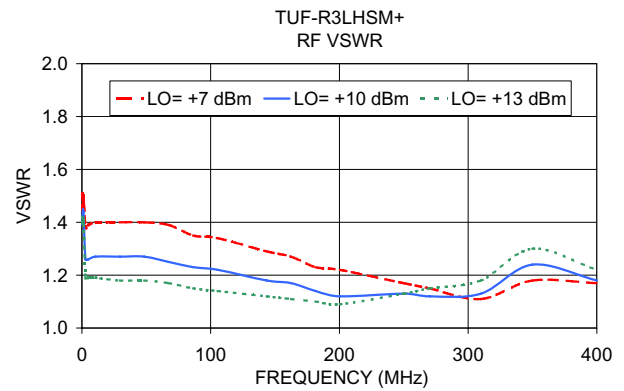
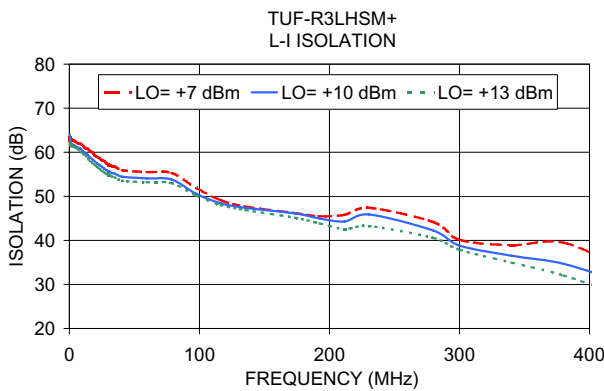
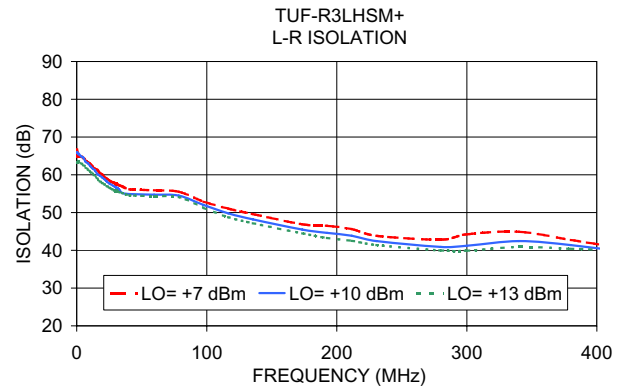
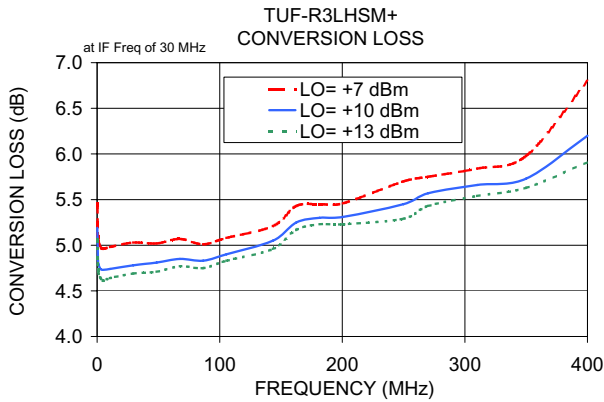
- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
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Electrical Schematic





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