Surface Mount

High Reliability Mixer

TUF-R1LHSM+

Level 10 (LO Power +10 dBm) 5 to 600 MHz

CASE STYLE: NNN150
PRICE: $9.90 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	50mW
IF Current	40mA

Pin Connections

LO	4
RF	1
IF	2
GROUND	3
CASE GROUND	3

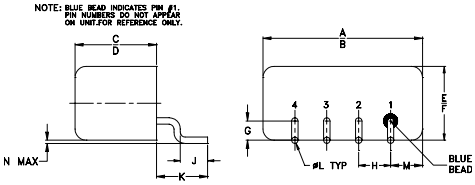
Features

- hermetically sealed ceramic quad
- low conversion loss, 6.2 dB typ.
- high isolation L-R, 48 dB typ; L-I, 45 dB typ.
- rugged welded construction
- shielded metal case

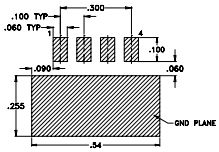
Applications

- VHF/UHF
- defense & federal communications

Outline Drawing



PCB Land Pattern



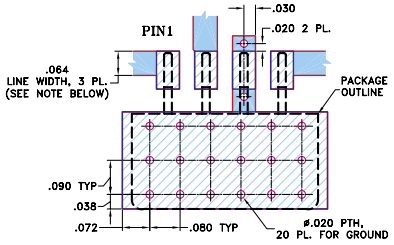
Suggested Layout,
Tolerance to be within ±.002

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.

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)
LO/RF	IF	Mid-Band m			Total Range	L		M		U		L		M		U		
f_L-f_U		$\bar{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.
5-600	DC-600	6.2	0.03	7.2	8.5	53	40	48	30	40	24	50	40	45	30	38	21	18

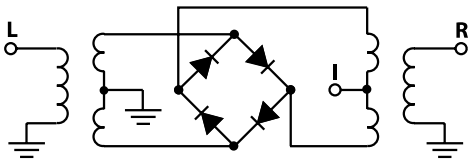
1 dB COMP.: +5 dBm typ.

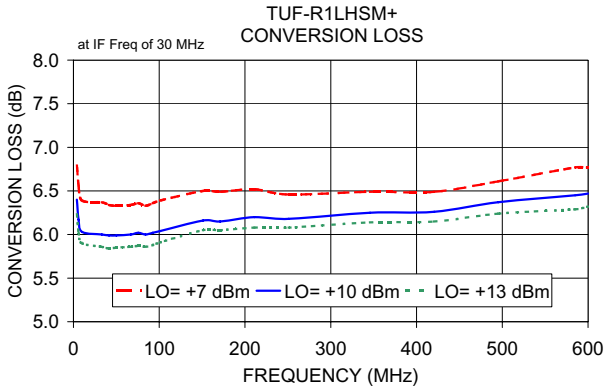
L = low range [f_L to 10 f_L] M = mid range [10 f_L to f_U/2] U = upper range [f_U/2 to f_U]
m= mid band [2f_L to f_U/2]

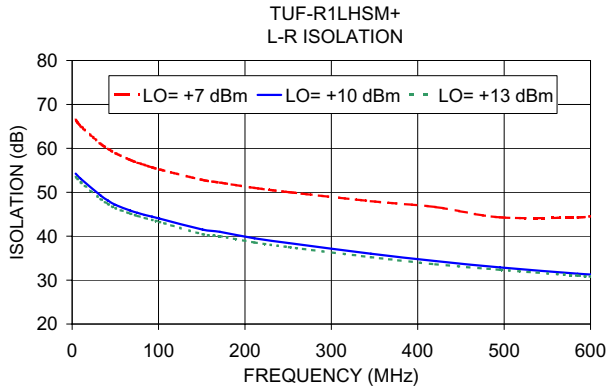
Typical Performance Data

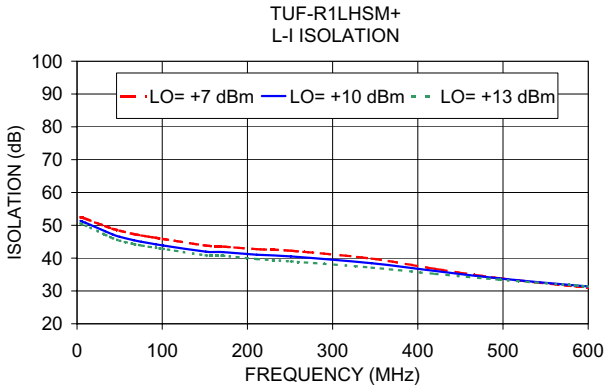
Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
RF	LO	LO +10dBm	LO +10dBm	LO +10dBm	LO +10dBm	LO +10dBm
4.00	34.00	6.40	54.24	51.36	1.43	2.35
6.00	36.00	6.17	53.84	51.17	1.30	2.34
10.00	40.00	6.03	53.07	50.79	1.18	2.33
33.00	63.00	6.00	49.26	48.20	1.06	2.32
41.50	71.50	5.99	48.09	47.25	1.05	2.30
50.00	80.00	5.99	47.13	46.51	1.05	2.27
67.00	97.00	6.00	45.86	45.45	1.05	2.24
75.50	105.50	6.02	45.31	44.99	1.04	2.26
84.00	114.00	6.00	44.84	44.60	1.04	2.25
92.50	122.50	6.02	44.44	44.22	1.04	2.25
101.00	131.00	6.04	44.01	43.85	1.03	2.26
151.00	181.00	6.16	41.50	41.97	1.04	2.20
171.00	201.00	6.15	40.99	41.84	1.04	2.19
211.00	241.00	6.20	39.51	41.02	1.05	2.14
251.00	281.00	6.18	38.42	40.51	1.07	2.17
345.75	375.75	6.25	36.02	38.44	1.09	2.14
420.50	450.50	6.26	34.34	36.08	1.13	2.11
495.25	525.25	6.37	32.88	33.82	1.11	2.09
585.00	615.00	6.45	31.47	31.69	1.18	2.15
600.00	630.00	6.47	31.28	31.39	1.19	2.17

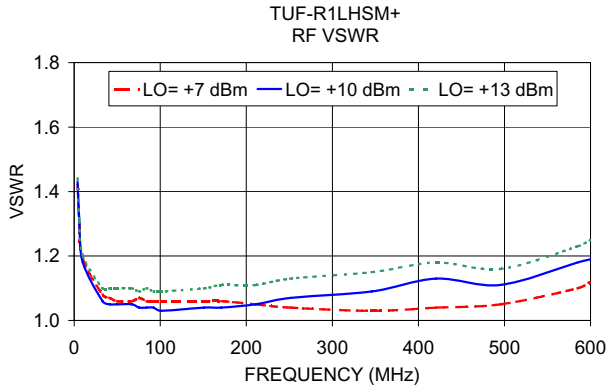
Electrical Schematic

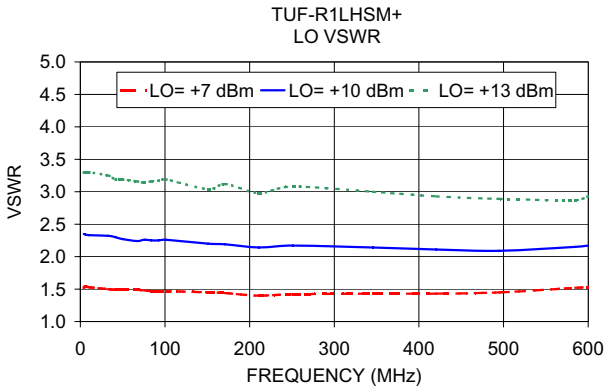


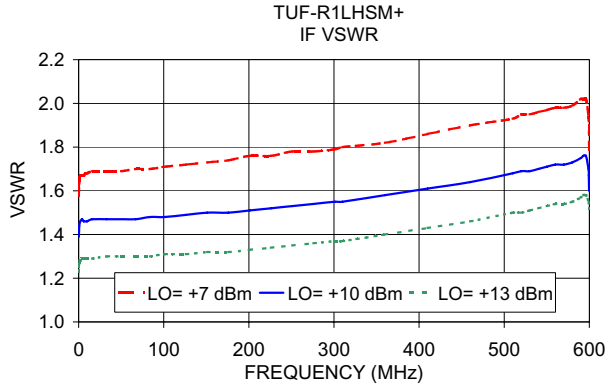

TUF-R1LHSM+
CONVERSION LOSS
at IF Freq of 30 MHz
CONVERSION LOSS (dB)
8.0
7.5
7.0
6.5
6.0
5.5
5.0
0
100
200
300
400
500
600
FREQUENCY (MHz)
LO= +7 dBm
LO= +10 dBm
LO= +13 dBm


TUF-R1LHSM+
L-R ISOLATION
ISOLATION (dB)
80
70
60
50
40
30
20
0
100
200
300
400
500
600
FREQUENCY (MHz)
LO= +7 dBm
LO= +10 dBm
LO= +13 dBm


TUF-R1LHSM+
L-I ISOLATION
ISOLATION (dB)
100
90
80
70
60
50
40
30
20
0
100
200
300
400
500
600
FREQUENCY (MHz)
LO= +7 dBm
LO= +10 dBm
LO= +13 dBm


TUF-R1LHSM+
RF VSWR
VSWR
1.8
1.6
1.4
1.2
1.0
0
100
200
300
400
500
600
FREQUENCY (MHz)
LO= +7 dBm
LO= +10 dBm
LO= +13 dBm


TUF-R1LHSM+
LO VSWR
VSWR
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0
100
200
300
400
500
600
FREQUENCY (MHz)
LO= +7 dBm
LO= +10 dBm
LO= +13 dBm


TUF-R1LHSM+
IF VSWR
VSWR
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0
100
200
300
400
500
600
FREQUENCY (MHz)
LO= +7 dBm
LO= +10 dBm
LO= +13 dBm