

# Frequency Mixer

## TUF-1SM+

Level 7 (LO Power +7 dBm) 2 to 600 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

- low conversion loss, 5.85 dB typ.
- excellent L-R isolation, 42 dB typ.; L-I, 47 dB typ.
- rugged welded construction

### Applications

- VHF/UHF
- FM radio
- defense & federal communications

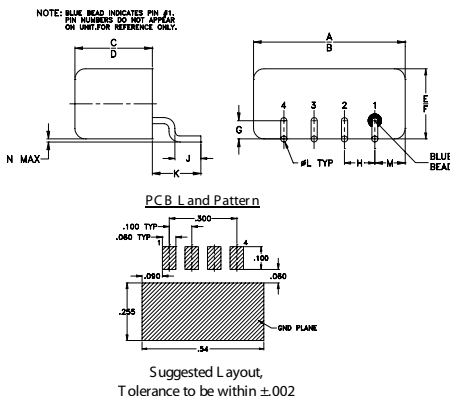
### Electrical Specifications

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)			IP3 @ CENTER BAND (dBm)						
LO/RF	IF	Mid-Band		Total	L	M	U	L	M	U								
$f_L$ - $f_U$	$\bar{X}$	$\sigma$	Max.	Range Max.														
2-600	DC-600	5.85	0.04	7.0	8.0	60	50	42	30	37	25	60	45	47	30	36	22	16

1 dB COMP: +1 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  $f_U/2$ ]

### Outline Drawing



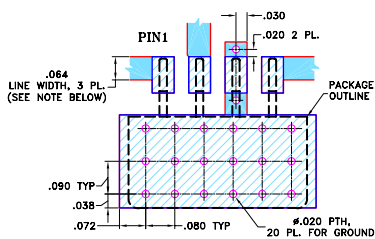
### Outline Dimensions (inch/mm)

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

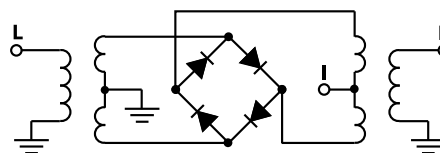
#### Notes

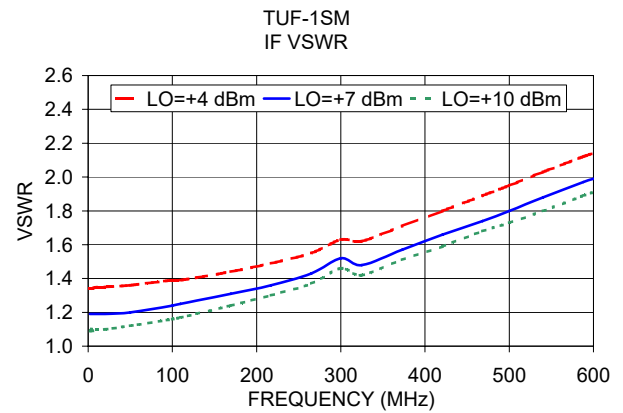
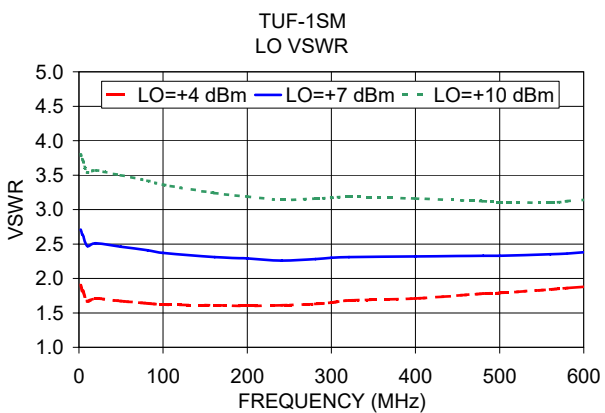
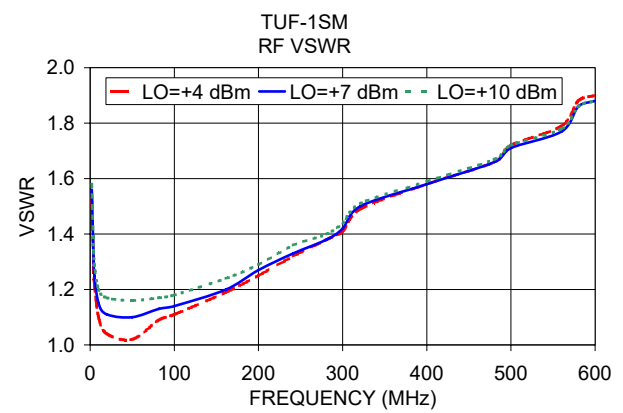
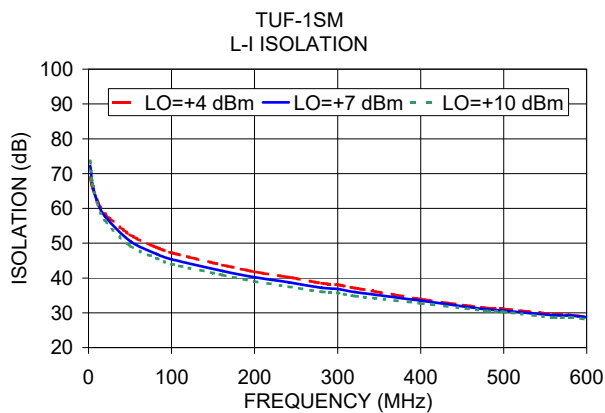
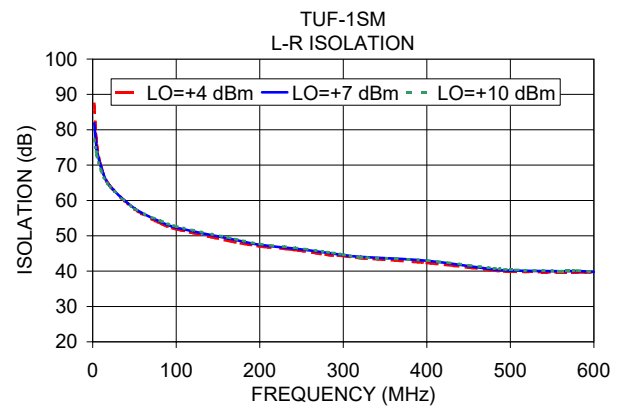
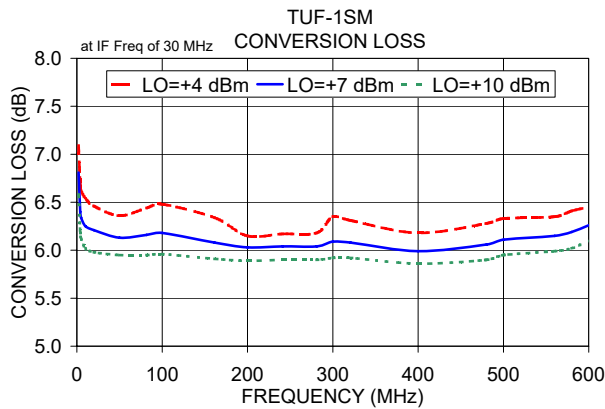
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### Typical Performance Data

Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
RF	LO	LO +7dBm	LO +7dBm	LO +7dBm	LO +7dBm	LO +7dBm
2.00	32.00	6.81	81.85	72.15	1.56	2.71
4.00	34.00	6.40	76.35	68.25	1.31	2.64
5.00	35.00	6.34	74.35	66.65	1.25	2.62
10.00	40.00	6.25	69.58	62.18	1.15	2.47
20.00	50.00	6.21	64.25	57.65	1.11	2.51
50.00	80.00	6.13	57.73	50.60	1.10	2.46
81.73	51.73	6.16	53.89	46.89	1.13	2.41
100.00	70.00	6.18	52.31	45.35	1.14	2.37
161.47	131.47	6.08	49.28	42.03	1.20	2.31
200.00	170.00	6.03	47.46	40.24	1.27	2.29
241.20	211.20	6.04	46.41	38.76	1.33	2.26
281.07	251.07	6.04	45.16	37.18	1.38	2.28
300.00	270.00	6.09	44.55	36.84	1.42	2.30
320.93	290.93	6.08	44.04	35.94	1.50	2.31
400.00	370.67	5.99	42.93	33.45	1.58	2.32
480.40	450.40	6.06	40.46	30.91	1.66	2.33
500.00	470.00	6.11	40.16	30.63	1.71	2.33
560.13	530.13	6.15	39.99	29.30	1.77	2.35
580.07	550.07	6.19	40.02	29.24	1.86	2.36
600.00	570.00	6.26	39.76	28.69	1.88	2.38

### Electrical Schematic





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