Surface Mount **Frequency Mixer**

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

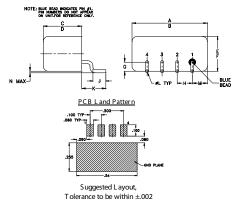
Maximum Ratings

Operating Temperature	-55°C to 100°C					
Storage Temperature	-55°C to 100°C					
RF Power	50mW					
IF Current	40mA					
Permanent damage may occur if any of these limits are exceeded.						

Pin Connections

LO	4
RF	1
IF	2
GROUND	3
CASE GROUND	3

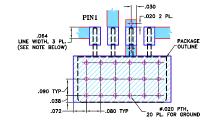
Outline Drawing



Outline Dimensions (inch)

		0 0 1		0.011	• (mm /
А	В	С	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
н	J	к	L	М	Ν	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 02. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED. 2.BOITOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE. DENOTES FOB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

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. B. Electrical specifications and performance data contained in this specification document are based on Nini-Circuit's applicable established test performance criteria and measurement instructions. C. The parts covered by this specification document are subject to Mini-Circuit's standard limited warranty and terms and conditions (collectively, "Standard Terms"), Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuit's website at www.minicircuits.com/WCLStore/terms.jsp

Features

- low conversion loss, 6.9 dB typ.
- high L-R isolation, 42 dB typ.
- rugged welded construction

Applications

- cellular
- satellite distribution • GSM/ISM



TUF-5LHSM+

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

Electrical Specifications

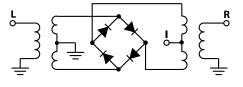
	UENCY Hz)	CO		SION dB)	LOSS	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)						IP3 @ CENTER BAND (dBm)			
LO/RF	IF	N X	/lid-Bai m	nd Max.	Total Range Max.	Typ.	L Min.	N	И Min.	I Tvp.	J Min.	Tm	L Min.	-	И Min.	l Tvp.	J Min.	Turp
12.10			σ	IVIdX.	wax.	тур.	IVIII I.	Тур.	IVIII I.	Typ.	IVIII I.	Тур.	IVIII I.	Тур.	IVIII I.	iyp.	IVIII I.	Тур.
20-1500	DC-1000	6.9	0.27	8.5	9.0	53	40	42	30	38	25	40	25	30	18	22	8	14
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 m = mid band [2f_L to 1/2]							range $[f_{U}/2 \text{ to } f_{U}]$											

m= mid band [2f_L to $f_U/2$]

Typical Performance Data

Typical Performance Data											
Free (I	quency MHz)	Conversion Loss (dB)	lsolation L-R (dB)	lsolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)					
RF	LO	LO +10dBm	LO +10dBm	LO +10dBm	LO +10dBm	LO +10dBm					
20.00 50.00 100.00 158.75 200.00 297.50 436.25 500.00 575.00 713.75	50.00 80.00 70.00 128.75 170.00 267.50 406.25 470.00 545.00 683.75	5.60 5.38 5.25 5.20 5.25 5.37 5.54 5.54 5.74 5.74 5.89 6.61	62.84 57.81 52.60 49.11 47.45 44.43 42.14 41.47 40.90 40.16	53.91 46.30 40.86 38.29 36.98 34.13 31.89 30.68 30.02 28.61	1.43 1.32 1.31 1.34 1.48 1.59 1.91 2.36 2.49 2.97	2.57 2.51 2.50 2.38 2.28 2.36 2.34 2.36 2.36 2.36 2.36 2.36					
750.00 760.00 852.50 991.25 1000.00 1130.00 1222.50 1361.25 1453.75 1500.00	720.00 730.00 822.50 961.25 970.00 1100.00 1192.50 1331.25 1423.75 1470.00	6.80 6.83 7.07 6.99 7.07 7.19 7.02 6.88 6.78 6.78 6.66	39.71 39.62 39.30 38.97 38.98 35.93 38.98 39.21 38.09 37.95	28.48 28.42 28.00 26.26 26.16 24.11 22.14 19.23 16.51 16.08	3.40 3.53 3.80 3.95 3.95 3.91 3.77 3.65 3.54 3.54 3.47	2.46 2.48 2.56 2.67 2.70 2.73 2.73 2.73 2.77 2.78 2.77					

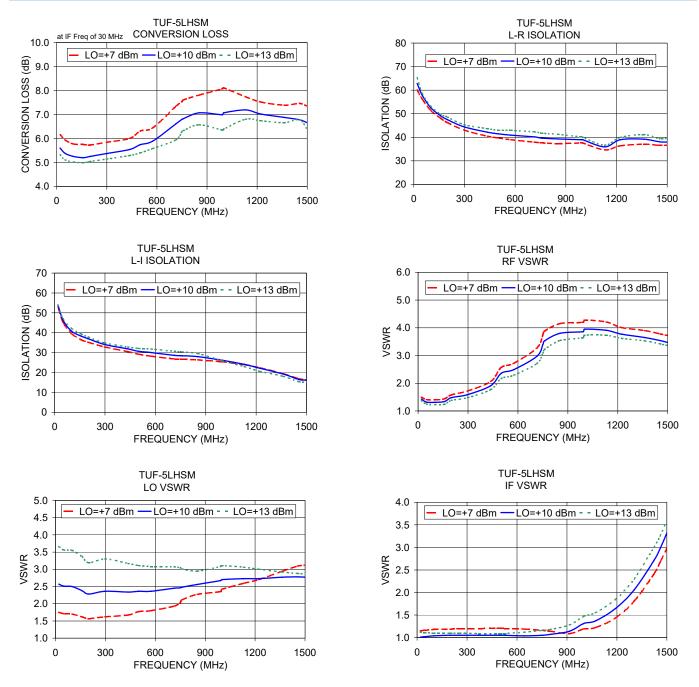
Electrical Schematic



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Performance Charts

TUF-5LHSM+



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