

Frequency Mixer

SYM-63LH+

Level 10 (LO Power +10 dBm) 1 to 6000 MHz

The Big Deal

- Ultra broadband, 1 to 6000 MHz
- High isolation and good conversion loss across the band
- Low profile compact package



CASE STYLE: TTT166

Product Overview

Model SYM-63LH+ is an ultra broadband double balanced mixer utilizing core and wire transformers and a diode quad in a ring configuration. The transformers are designed to provide ultra wide bandwidth using simulation software together with Mini-Circuits proprietary transformer technology. These mixers provide an IF response from DC to 1000 MHz and are especially useful in wideband system applications such as IED.

Key Features

Feature	Advantages
Low conversion loss, 8dB for wide bandwidth	Low loss enables lower NF front ends thereby improving system sensitivity.
High LO to RF isolation	Less susceptibility to the LO signal interfering with system performance. Reduced levels of unwanted responses especially in a wideband system.
Broadband matching	The IF port VSWR is less than 1.5 to 1 over the specified frequency range. This simplifies the cascading of an amplifier following the mixer.
Compact low profile package 0.38 x 0.50 x 0.15"	Enables high density packaging
Insensitive to LO power level variations	Enable the use of an LO amplifier with reduced specs for gain flatness, consequently improving the potential to lower LO amplifier costs.



ISO 9001 ISO 14001 AS 9100 CERTIFIED

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IF/RF MICROWAVE COMPONENTS

For detailed performance specs
& shopping online see web site

Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet are subject to Mini-Circuits 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-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp.

Surface Mount Frequency Mixer

Level 10 (LO Power +10 dBm) 1 to 6000 MHz

SYM-63LH+



CASE STYLE: TTT166
PRICE: \$12.95 ea. QTY (10-49)

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Maximum Ratings

Operating Temperature	-40°C to 85°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	2
RF	1
IF	3
GROUND	4,5,6

Features

- ultra wide bandwidth, 1-6000 MHz
- IF response to DC

Applications

- test equipment
- cable TV
- cellular
- PCS
- satellite distribution
- ISM/GPS
- WCDMA
- defence communications

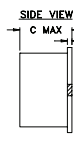
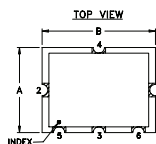
Electrical Specifications @ 25°C

FREQUENCY (MHz)	CONVERSION LOSS* (dB)	LO-RF ISOLATION (dB)			LO-IF ISOLATION (dB)			IP3 at center band (dBm)						
		L	M	U	L	M	U							
1-6000	DC-1000	65	45	35	20	29	20	60	40	25	14	19	12	14

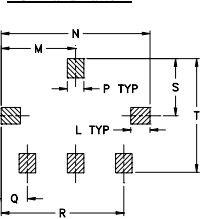
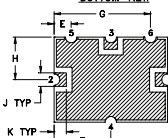
1 dB COMP: +3 dBm typ.
* Conversion Loss at 30 MHz IF.
σ is a measure of repeatability from unit to unit.

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



PCB Land Pattern

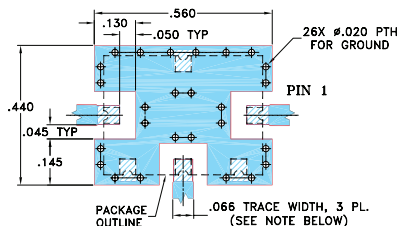


Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	wt.
.38	.50	.15	.020	.075	.250	.425	.187	.050	
9.65	12.70	3.81	0.51	1.91	6.35	10.80	4.75	1.27	
K	L	M	N	P	Q	R	S	T	wt.
.050	.070	.270	.540	.060	.095	.445	.208	.415	grams
1.27	1.78	6.86	13.72	1.52	2.41	11.30	5.28	10.54	0.8

Demo Board MCL P/N: TB-12 Suggested PCB Layout (PL-079)



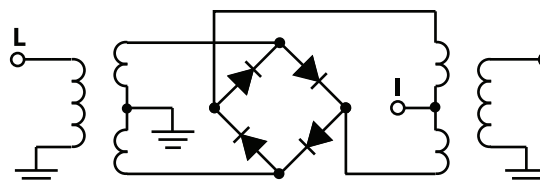
NOTE:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002", COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 2. THE USE OF SOLDER MASK OVER THE GROUND AREA UNDER THE UNIT AS SHOWN IS RECOMMENDED TO PREVENT POTENTIAL SHORTING. IF USER CHOOSES TO EXPOSE METAL UNDER THE ENTIRE UNIT GROUND PAD FOR IMPROVED GROUNDING, IT IS RECOMMENDED A SOLDER MASK DAM BE APPLIED AROUND EACH GROUND PAD TO ENSURE FILLET AND CONNECTION AT GROUND PADS.
 3. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER), SEE NOTE 2.
▨ DENOTES SOLDER LAND PATTERN EDGE OF SOLDER MASK

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	LO +10dBm	LO +10dBm	LO +10dBm
1.00	31.00	5.83	65.41	60.62	1.68	3.60				
10.00	40.00	6.07	63.21	58.28	1.09	3.54				
100.00	130.00	6.21	53.47	46.17	1.04	3.45				
145.00	175.00	6.21	51.34	43.08	1.04	3.46				
505.00	535.00	6.28	42.90	33.70	1.37	2.72				
1000.00	1030.00	6.65	41.76	34.89	2.07	1.72				
1500.00	1530.00	7.31	32.97	23.84	2.07	1.27				
2000.00	2030.00	6.87	30.92	24.37	2.01	1.70				
3000.00	3030.00	8.60	26.67	34.89	2.42	2.64				
4000.00	4030.00	7.94	28.22	18.49	1.76	2.75				
5000.00	5030.00	8.24	36.41	19.92	2.09	2.09				
5100.00	5130.00	8.18	38.17	20.34	2.05	2.18				
5200.00	5230.00	8.20	40.26	20.55	1.86	2.33				
5300.00	5330.00	8.25	42.62	20.82	1.65	2.57				
5400.00	5430.00	8.34	43.72	21.01	1.60	2.77				
5500.00	5530.00	8.43	42.20	21.03	1.76	2.76				
5600.00	5630.00	8.60	39.70	21.01	2.11	2.84				
5700.00	5730.00	8.76	37.69	21.00	2.61	2.88				
5800.00	5830.00	8.85	36.36	20.92	2.89	2.84				
6000.00	6030.00	9.28	34.92	20.45	2.77	2.19				

Electrical Schematic



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