

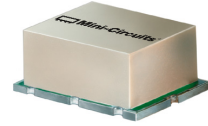
Frequency Mixer

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.

Notes

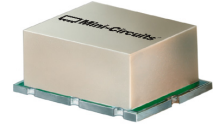
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Surface Mount Frequency Mixer

SYM-63LH+

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



CASE STYLE: TTT166

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

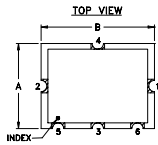
- test equipment
- cable TV
- cellular
- PCS
- satellite distribution
- ISM/GPS
- WCDMA
- defence communications

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

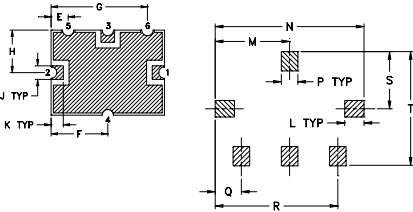
Available Tape and Reel at no extra cost

Reel Size	Devices/Reel
7"	10, 20, 50, 100, 200
13"	500

Outline Drawing



PCB Land Pattern

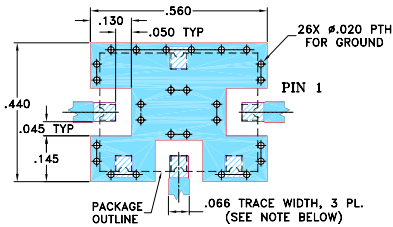


Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J	
.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 R04350B 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 COPPER LAND PATTERN FREE OF SOLDER MASK

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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]

U = upper range [f_U/2 to f_U]

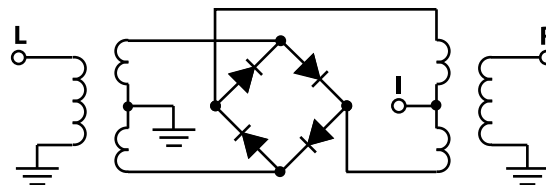
M = mid range [10 f_L to f_U/2]

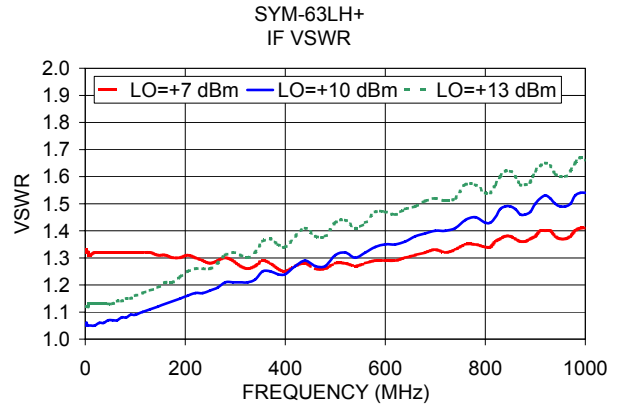
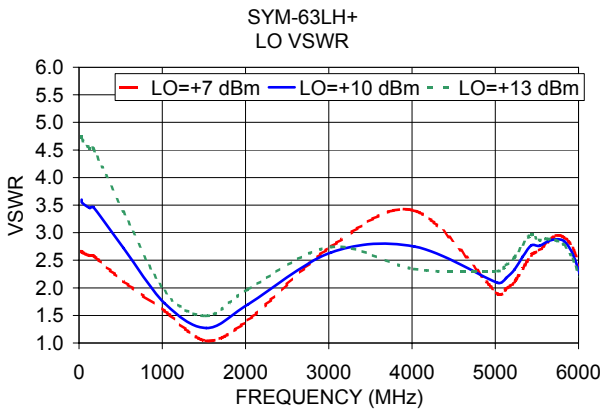
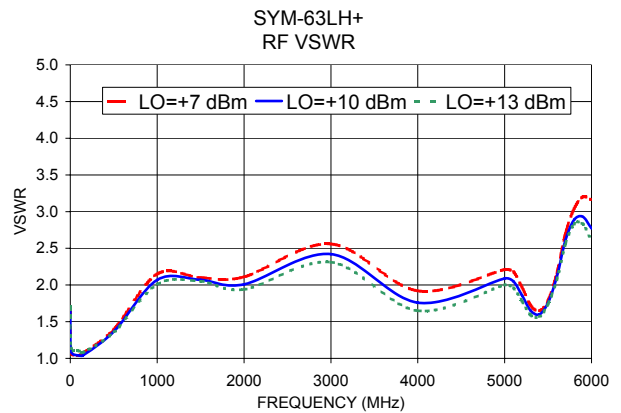
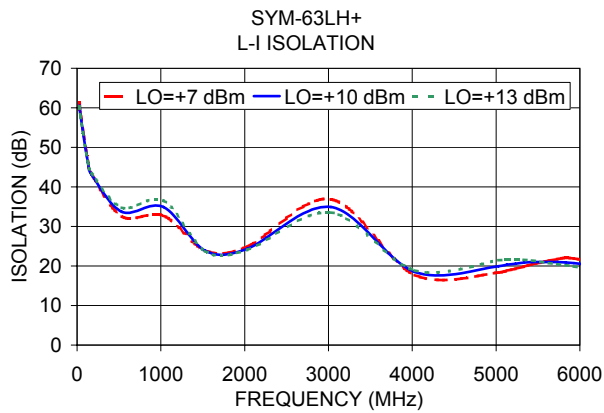
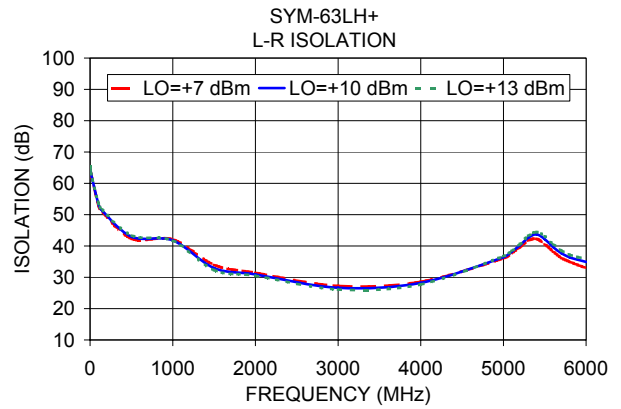
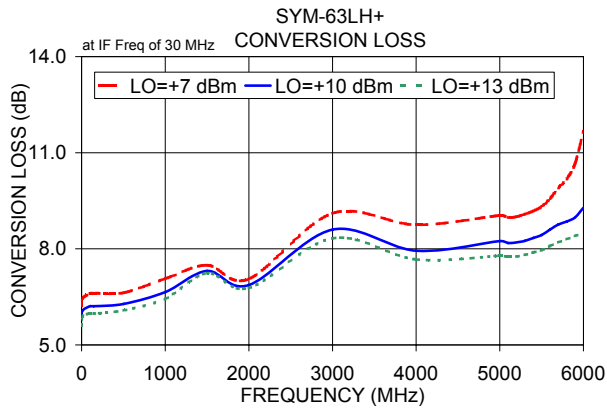
m = mid band [2f_L to f_U/2]

Typical Performance Data

Frequency (MHz)	Conversion Loss (dB)		Isolation L-R (dB)		Isolation L-I (dB)		VSWR RF Port (:1)		VSWR LO Port (:1)	
	LO	RF	LO	RF	LO	RF	LO	RF	LO	RF
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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