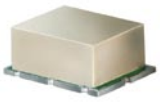
Surface Mount

Frequency Mixer

SYM-11LH+
SYM-11LH

Level 10 (LO Power +10 dBm) 1 to 2000 MHz



CASE STYLE: TTT167
PRICE: $11.95 ea. QTY (1-9)

+ RoHS compliant in accordance with EU Directive (2002/95/EC)

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

Pin Connections

LO	2
RF	1
IF	3
GROUND	4,5,6

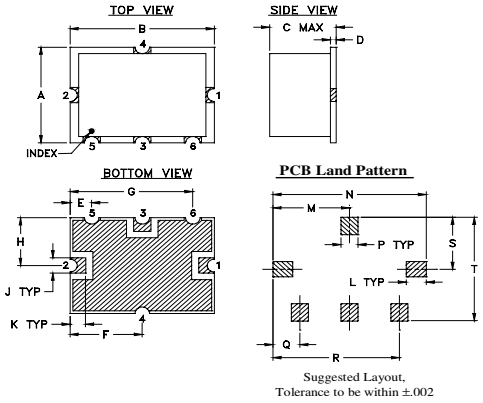
Features

- wideband, 1 to 2000 MHz
- low conversion loss, 7.0 dB typ.
- good isolation, 45 dB typ. L-R, 33 dB typ. L-I

Applications

- cellular
- ISM/GSM
- satellite distribution
- GPS

Outline Drawing

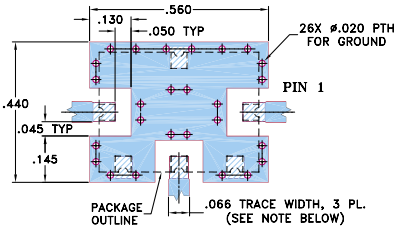


Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	J	K
.38	.50	.23	.020	.075	.250	.425	.187	.050	.050
9.65	12.70	5.84	0.51	1.91	6.35	10.80	4.75	1.27	1.27

L	M	N	P	Q	R	S	T	wt.
.070	.270	.540	.060	.095	.445	.208	.415	grams
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. GROUND PAD SHALL BE FREE OF SOLDER MASK IF REQUIRED FOR SOLDERING.
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

Electrical Specifications

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)						IP3 at center band (dBm)
		Mid-Band m			Total Range	L		M		U		L		M		U		
LO/RF f_L-f_U	IF	$\overline{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.
1-2000	10-600	7.0	.10	8.3	9.85	60	40	45	25	37	25	59	40	33	20	25	20	14

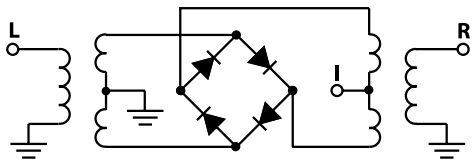
1 dB COMP.: +5 dBm typ.

L=low range(f_L to 10 f_L) M= mid range(10f_L to f_U/2) U=upper range (f_U/2 to f_U)
m= mid band (2fL to fU/2)

Typical Performance Data

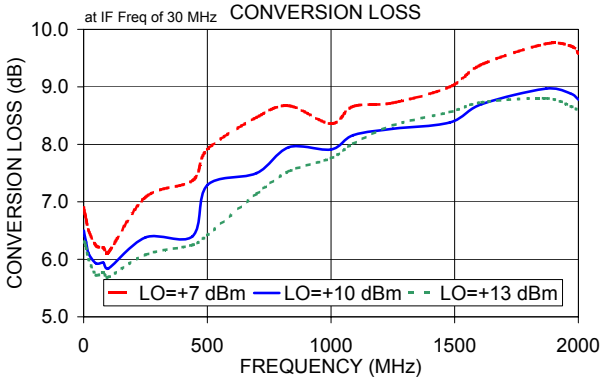
Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
RF	LO	LO +10dBm	LO +10dBm	LO +10dBm	LO +10dBm	LO +10dBm
1.00	31.00	6.50	61.00	60.60	1.69	2.23
5.00	35.00	6.40	60.80	60.00	1.91	2.25
10.00	40.00	6.30	60.77	59.99	1.92	2.23
20.00	50.00	6.10	61.07	59.34	1.91	2.18
50.00	80.00	5.93	60.38	54.58	1.89	2.10
80.00	110.00	5.94	59.60	51.54	1.92	2.14
100.00	130.00	5.84	58.27	48.96	1.94	2.14
250.00	280.00	6.38	48.22	36.40	2.12	2.08
440.00	470.00	6.40	45.06	34.17	2.58	2.10
500.00	530.00	7.29	42.23	31.50	2.65	2.12
700.00	730.00	7.50	38.46	29.07	2.84	2.06
830.00	860.00	7.95	38.08	28.07	3.11	1.92
1000.00	1030.00	7.91	37.94	28.08	3.38	2.08
1090.00	1120.00	8.16	36.12	27.65	3.38	1.92
1250.00	1280.00	8.27	36.11	27.37	3.26	1.97
1480.00	1510.00	8.38	36.02	25.08	3.57	1.97
1610.00	1640.00	8.70	36.26	25.19	3.44	1.94
1870.00	1900.00	8.97	35.66	25.82	3.44	1.89
1970.00	2000.00	8.88	33.51	28.03	3.50	1.85
2000.00	1970.00	8.78	32.77	31.12	3.44	1.84

Electrical Schematic

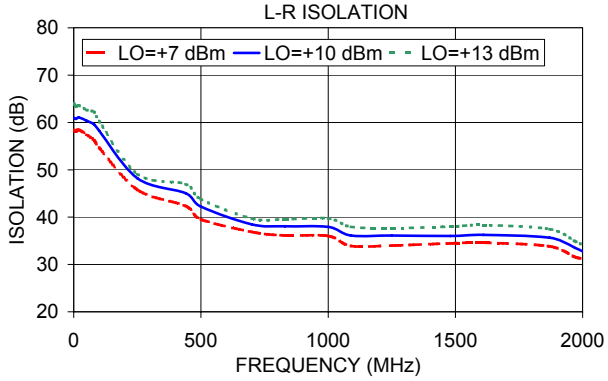


Performance Charts

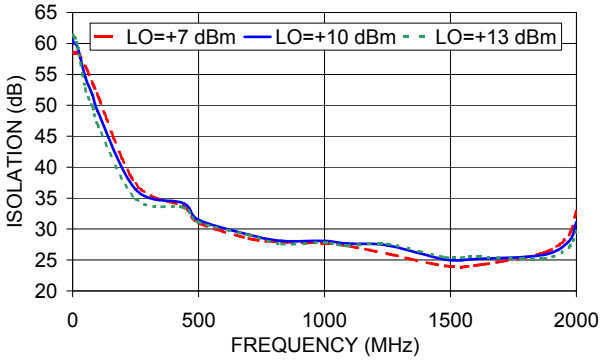
SYM-11LH
at IF Freq of 30 MHz CONVERSION LOSS



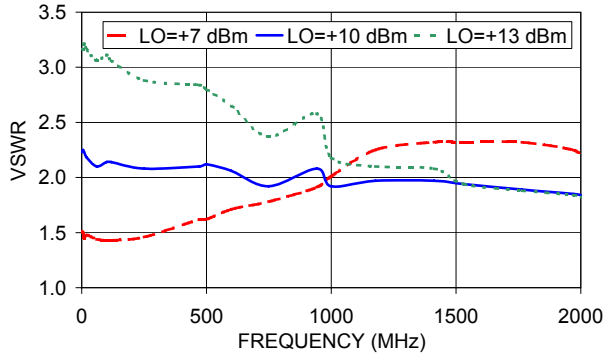
SYM-11LH
L-R ISOLATION



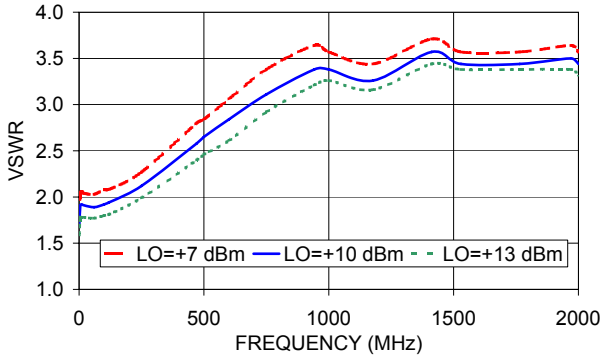
SYM-11LH
L-I ISOLATION



SYM-11LH
LO VSWR



SYM-11LH
RF VSWR



SYM-11LH
IF VSWR