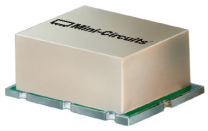
*High IP3*

# Frequency Mixer

## SYM-10DH

Level 17 (LO Power +17 dBm) 800 to 1000 MHz



CASE STYLE: TTT167

### Maximum Ratings

| | |
|---|---|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| RF Power | 200mW |
| 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 |

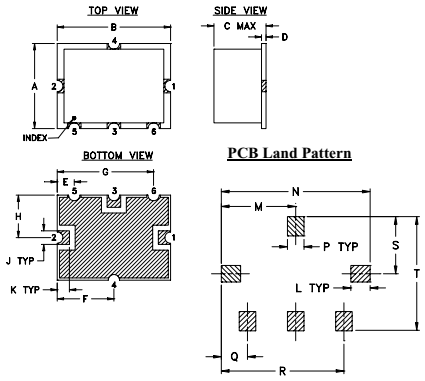
### Features

- low conversion loss, 7.6 dB typ.
- excellent L-R isolation, 45 dB typ. & L-I isolation, 29 dB typ.
- high IP3, 31 dBm typ.
- excellent LO & RF VSWR, 1.32:1 typ. excellent IF VSWR, 1.1:1 typ.

### Applications

- cellular
- ISM/SMR/GSM

### Outline Drawing



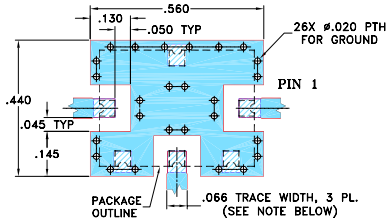

Suggested Layout,
Tolerance to be within ±.002

### 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 | |
|---|---|---|---|---|---|---|---|---|
| .070 | .270 | .540 | .060 | .095 | .445 | .208 | .415 | wt. |
| 1.78 | 6.86 | 13.72 | 1.52 | 2.41 | 11.30 | 5.28 | 10.54 | grams 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 COPPER LAND PATTERN FREE OF SOLDER MASK

### Electrical Specifications

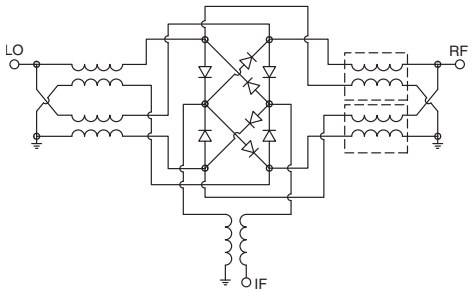
| FREQUENCY (MHz) | | CONVERSION LOSS (dB) | | LO-RF ISOLATION (dB) | | LO-IF ISOLATION (dB) | | IP3 at center band (dBm) |
|---|---|---|---|---|---|---|---|---|
| LO/RF $f_L$-$f_U$ | IF | $\overline{X}$ | Total Range Max. | Typ. | Min. | Typ. | Min. | Typ. |
| 800-1000 | 20-200 | 7.6 | 9.3 | 45 | 34 | 29 | 20 | 31 |

1 dB COMP.: +14 dBm typ.

### 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 +17dBm | LO +17dBm | LO +17dBm | LO +17dBm | LO +17dBm |
| 800.10 | 801.10 | 7.45 | 41.49 | 30.20 | 1.29 | 1.22 |
| 810.63 | 811.63 | 7.48 | 41.53 | 30.14 | 1.29 | 1.21 |
| 821.15 | 822.15 | 7.50 | 41.50 | 30.05 | 1.30 | 1.20 |
| 831.68 | 832.68 | 7.49 | 41.42 | 30.01 | 1.31 | 1.20 |
| 842.21 | 843.21 | 7.48 | 41.37 | 29.94 | 1.32 | 1.20 |
| 852.73 | 853.73 | 7.46 | 41.31 | 29.89 | 1.33 | 1.21 |
| 863.26 | 864.26 | 7.52 | 41.41 | 29.88 | 1.34 | 1.21 |
| 873.78 | 874.78 | 7.59 | 41.44 | 29.78 | 1.35 | 1.21 |
| 884.31 | 885.31 | 7.68 | 41.41 | 29.71 | 1.35 | 1.20 |
| 894.84 | 895.84 | 7.76 | 41.43 | 29.74 | 1.36 | 1.19 |
| 905.36 | 906.36 | 7.82 | 41.42 | 29.74 | 1.36 | 1.18 |
| 915.89 | 916.89 | 7.84 | 41.16 | 29.61 | 1.37 | 1.17 |
| 926.42 | 927.42 | 7.85 | 40.86 | 29.53 | 1.38 | 1.17 |
| 936.94 | 937.94 | 7.86 | 40.49 | 29.43 | 1.40 | 1.17 |
| 947.47 | 948.47 | 7.90 | 40.18 | 29.32 | 1.41 | 1.17 |
| 958.00 | 959.00 | 7.95 | 40.09 | 29.25 | 1.42 | 1.17 |
| 968.52 | 969.52 | 8.04 | 40.04 | 29.19 | 1.43 | 1.17 |
| 979.05 | 980.05 | 8.14 | 40.07 | 29.08 | 1.44 | 1.15 |
| 989.57 | 990.57 | 8.25 | 40.13 | 29.03 | 1.45 | 1.14 |
| 1000.10 | 1001.10 | 8.35 | 40.12 | 29.02 | 1.46 | 1.13 |

### Electrical Schematic




Notes

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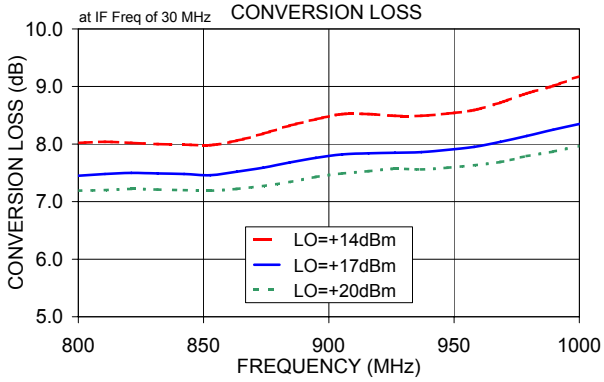
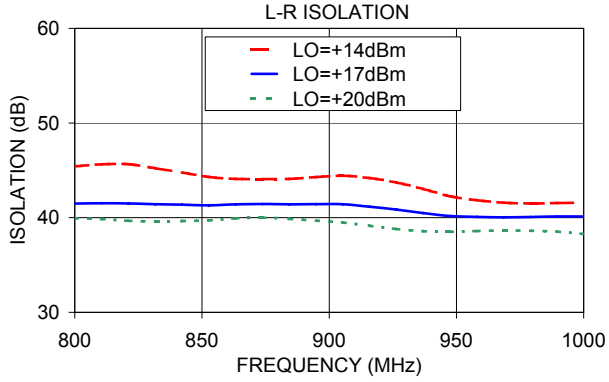
# Performance Charts

# SYM-10DH

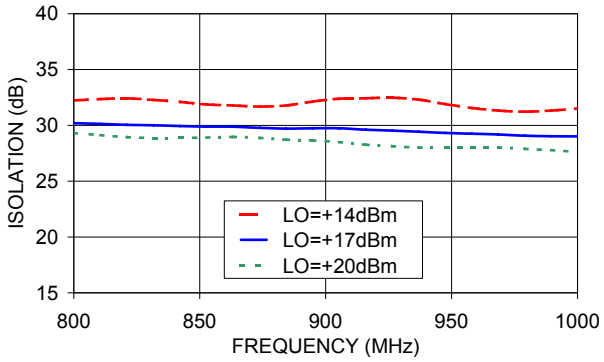
SYM-10DH
at IF Freq of 30 MHz CONVERSION LOSS



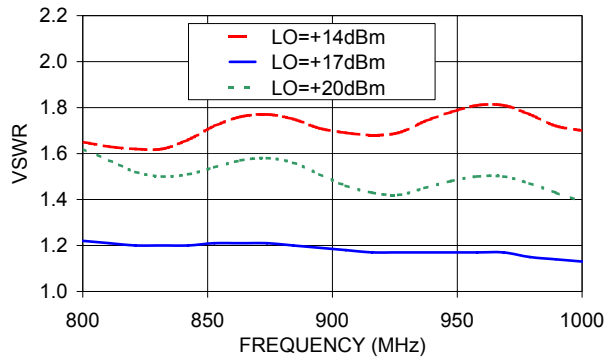

SYM-10DH
L-R ISOLATION



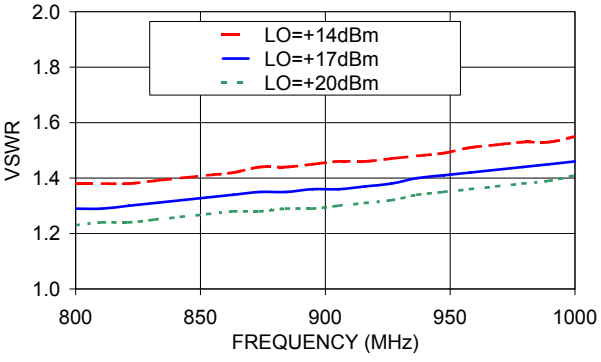

SYM-10DH
L-I ISOLATION



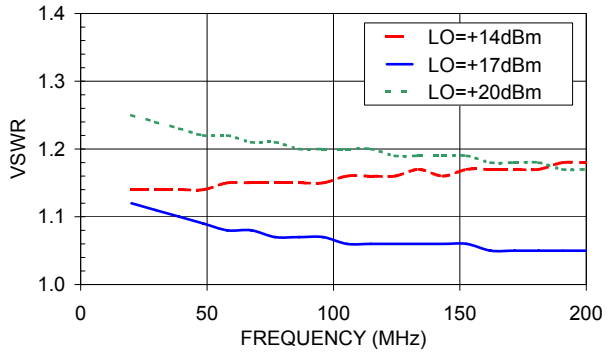

SYM-10DH
LO VSWR




SYM-10DH
RF VSWR




SYM-10DH
IF VSWR

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