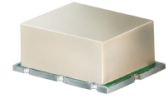


# High IP3 Frequency Mixer

## SYM-24DH+ SYM-24DH

Level 17 (LO Power +17 dBm) 1400 to 2400 MHz



### Maximum Ratings

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

### Pin Connections

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

### Features

- low conversion loss, 7.0 dB typ.
- high IP3, 29 dBm typ.
- good L-R isolation, 32 dB typ.; & L-I isolation, 36 dB typ.

### Applications

- base stations
- cellular
- communications
- DCS
- PCS

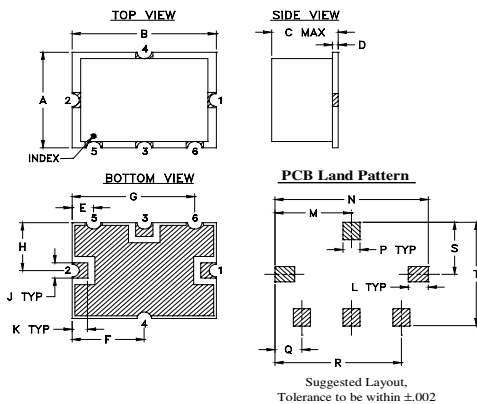
CASE STYLE: TTT167

PRICE: \$9.95 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.

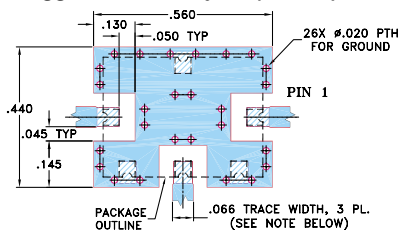
### Outline Drawing



### 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

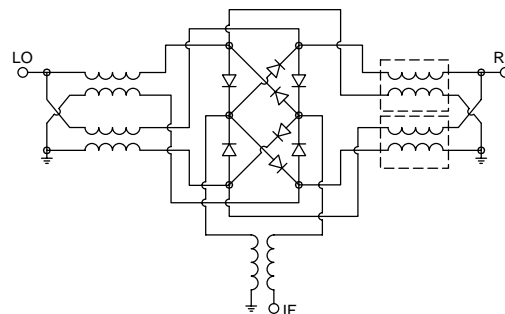
| FREQUENCY (MHz) |           | CONVERSION LOSS (dB) |             | LO-RF ISOLATION (dB) |      | LO-IF ISOLATION (dB) |      | IP3 at center band (dBm) |    |
|-----------------|-----------|----------------------|-------------|----------------------|------|----------------------|------|--------------------------|----|
| LO/RF           | IF        | Mid-Band             | Total Range | Typ.                 | Min. | Typ.                 | Min. | Typ.                     |    |
| $f_L - f_U$     | $\bar{X}$ | $\sigma$             | Max.        |                      |      |                      |      |                          |    |
| 1400-2400       | 10-250    | 7.0                  | .20         | 9.3                  | 32   | 22                   | 36   | 23                       | 29 |

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         |
| 1400.00         | 1430.00 | 6.43                 | 34.31              | 47.72              | 2.53              | 1.09              |
| 1418.18         | 1448.18 | 6.38                 | 34.13              | 48.31              | 2.49              | 1.08              |
| 1436.36         | 1466.36 | 6.52                 | 33.90              | 49.48              | 2.48              | 1.06              |
| 1454.55         | 1484.55 | 6.56                 | 33.73              | 49.50              | 2.46              | 1.04              |
| 1490.91         | 1520.91 | 6.42                 | 33.42              | 50.50              | 2.38              | 1.02              |
| 1527.27         | 1557.27 | 6.39                 | 33.23              | 51.77              | 2.25              | 1.01              |
| 1563.64         | 1593.64 | 6.48                 | 32.99              | 51.26              | 2.17              | 1.03              |
| 1600.00         | 1630.00 | 6.35                 | 32.79              | 50.00              | 2.03              | 1.05              |
| 1671.88         | 1701.88 | 6.49                 | 32.33              | 50.20              | 1.86              | 1.08              |
| 1715.63         | 1745.63 | 6.45                 | 32.12              | 50.44              | 1.81              | 1.09              |
| 1737.50         | 1767.50 | 6.59                 | 32.09              | 49.78              | 1.81              | 1.10              |
| 1759.38         | 1789.38 | 6.70                 | 32.03              | 49.47              | 1.78              | 1.11              |
| 1803.13         | 1833.13 | 6.70                 | 32.25              | 48.37              | 1.81              | 1.13              |
| 1846.88         | 1876.88 | 7.05                 | 32.45              | 48.05              | 1.84              | 1.15              |
| 1890.63         | 1920.63 | 7.16                 | 32.55              | 46.45              | 1.90              | 1.17              |
| 1934.38         | 1964.38 | 7.38                 | 32.81              | 45.93              | 1.94              | 1.20              |
| 1956.25         | 1986.25 | 7.52                 | 32.91              | 45.18              | 1.96              | 1.21              |
| 2000.00         | 2030.00 | 7.53                 | 33.09              | 44.01              | 2.02              | 1.23              |
| 2166.67         | 2196.67 | 8.12                 | 34.12              | 39.40              | 2.04              | 1.28              |
| 2400.00         | 2430.00 | 8.08                 | 33.99              | 37.27              | 2.08              | 1.35              |

### Electrical Schematic



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RF/IF MICROWAVE COMPONENTS

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## Performance Charts

