

# Surface Mount Frequency Mixer

Level 17 (LO Power +17 dBm) 2 to 500 MHz

JMS-1H+  
JMS-1H



## 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     | 6     |
| RF     | 3     |
| IF     | 2     |
| GROUND | 1,4,5 |

## Features

- low conversion loss, 5.90 dB typ.
- excellent L-R isolation, up to 60 dB typ.
- miniature surface mount
- J-leads for strain relief and excellent solderability

## Applications

- up & down converters for receivers & transmitters
- VHF/UHF

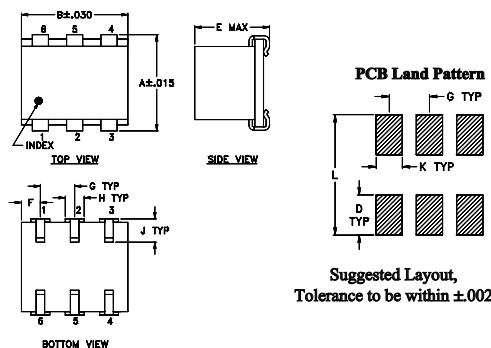
CASE STYLE: BH292

PRICE: \$11.45 ea. QTY (1-9)

**+RoHS Compliant**

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

## Outline Drawing



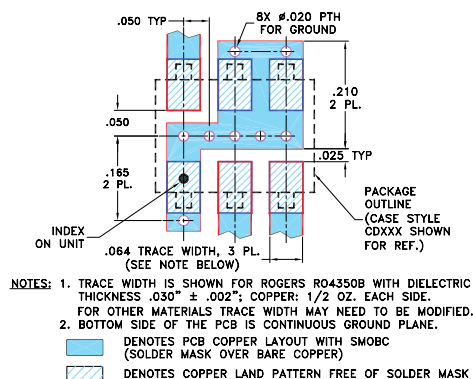
## Outline Dimensions (inch)

| A    | B    | C  | D    | E    | F    | G    |
|------|------|----|------|------|------|------|
| .280 | .310 | -- | .100 | .225 | .055 | .100 |
| 7.11 | 7.87 | -- | 2.54 | 5.72 | 1.40 | 2.54 |

| H    | J    | K    | L    | wt    |
|------|------|------|------|-------|
| .047 | .065 | .065 | .300 | grams |
| 1.19 | 1.65 | 1.65 | 7.62 | 0.45  |

Demo Board MCL P/N: TB-03  
Suggested PCB Layout (PL-052)



NOTES: 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. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.  
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)  
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## Electrical Specifications

| FREQUENCY<br>(MHz) |        | CONVERSION LOSS<br>(dB) |          |      |                        | LO-RF ISOLATION<br>(dB) |      |      |      |      |      | LO-IF ISOLATION<br>(dB) |      |      |      |      |    | IP3<br>at center<br>band<br>(dBm) |
|--------------------|--------|-------------------------|----------|------|------------------------|-------------------------|------|------|------|------|------|-------------------------|------|------|------|------|----|-----------------------------------|
| LO/RF              | IF     | Mid-Band<br>m           |          |      | Total<br>Range<br>Max. | L                       | M    |      | U    |      | L    | M                       |      | U    |      |      |    |                                   |
|                    |        | $\overline{X}$          | $\sigma$ | Max. |                        |                         | Typ. | Min. | Typ. | Min. |      | Typ.                    | Min. | Typ. | Min. |      |    |                                   |
|                    |        |                         |          |      |                        |                         |      |      |      |      |      |                         |      |      |      |      |    |                                   |
| $f_L$ - $f_U$      |        |                         |          |      |                        | Typ.                    | Min. | Typ. | Min. | Typ. | Min. | Typ.                    | Min. | Typ. | Min. | Typ. |    |                                   |
| 2-500              | DC-500 | 5.90                    | .10      | 7.0  | 8.5                    | 60                      | 45   | 50   | 25   | 37   | 22   | 55                      | 45   | 50   | 25   | 37   | 22 | 22                                |

1 dB COMP.: +14 dBm typ.

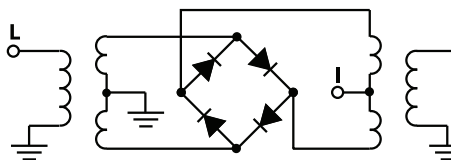
L = low range [ $f_L$  to  $10 f_L$ ]  
m= mid band [ $2 f_L$  to  $f_U/2$ ]

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

## 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         |
| 2.00            | 32.00  | 6.78                 | 79.29              | 69.19              | 1.33              | 1.77              |
| 4.00            | 34.00  | 6.60                 | 72.35              | 63.39              | 1.20              | 1.75              |
| 5.00            | 35.00  | 6.57                 | 71.51              | 62.98              | 1.15              | 1.82              |
| 10.00           | 40.00  | 6.55                 | 65.84              | 61.30              | 1.14              | 1.82              |
| 20.00           | 50.00  | 6.48                 | 59.50              | 58.68              | 1.13              | 1.75              |
| 35.20           | 65.20  | 6.36                 | 51.64              | 53.67              | 1.14              | 1.75              |
| 50.00           | 80.00  | 6.53                 | 51.61              | 53.63              | 1.14              | 1.76              |
| 85.00           | 55.00  | 6.47                 | 45.13              | 48.67              | 1.15              | 1.74              |
| 100.00          | 70.00  | 6.48                 | 44.98              | 48.52              | 1.17              | 1.71              |
| 134.80          | 104.80 | 6.32                 | 41.19              | 46.50              | 1.19              | 1.69              |
| 184.60          | 154.60 | 6.35                 | 38.78              | 44.90              | 1.22              | 1.65              |
| 200.00          | 170.00 | 6.40                 | 38.62              | 44.42              | 1.23              | 1.62              |
| 234.40          | 204.40 | 6.30                 | 36.44              | 41.20              | 1.24              | 1.63              |
| 250.00          | 220.00 | 6.22                 | 36.14              | 41.01              | 1.26              | 1.62              |
| 284.20          | 254.20 | 6.22                 | 35.11              | 38.57              | 1.30              | 1.58              |
| 334.00          | 304.00 | 6.18                 | 33.38              | 37.07              | 1.34              | 1.54              |
| 383.80          | 353.80 | 6.11                 | 32.33              | 33.77              | 1.39              | 1.51              |
| 433.60          | 403.60 | 6.16                 | 32.22              | 31.10              | 1.44              | 1.45              |
| 483.40          | 453.40 | 6.45                 | 31.29              | 29.09              | 1.47              | 1.41              |
| 500.00          | 470.00 | 6.45                 | 30.80              | 28.30              | 1.49              | 1.39              |

## Electrical Schematic



**Mini-Circuits®**  
ISO 9001 ISO 14001 AS 9100 CERTIFIED

For detailed performance specs & shopping online see web site

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 The Design Engineers Search Engine Provides ACTUAL Data Instantly at [minicircuits.com](http://minicircuits.com)

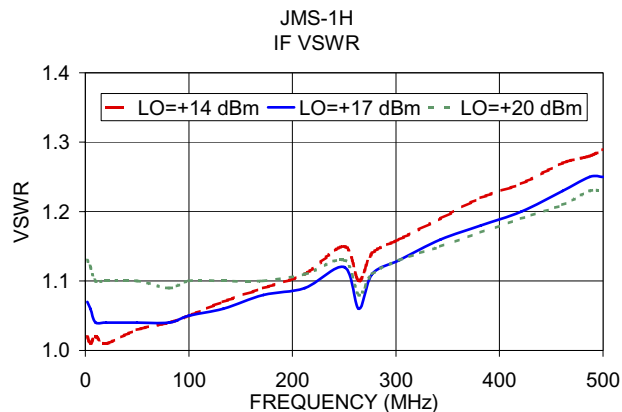
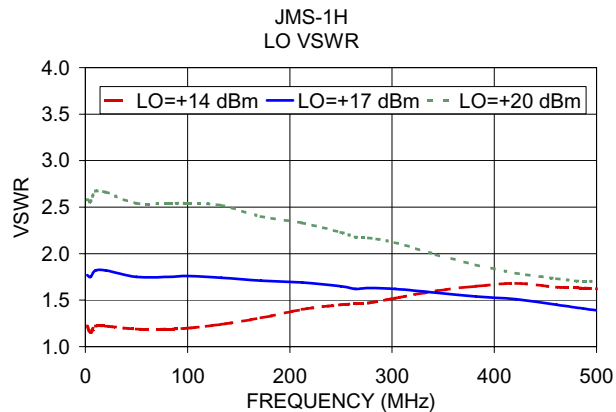
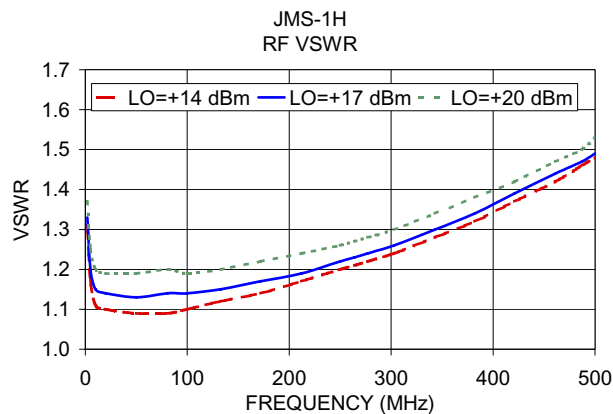
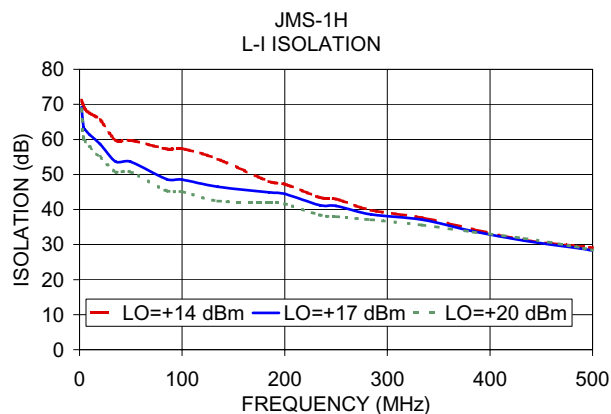
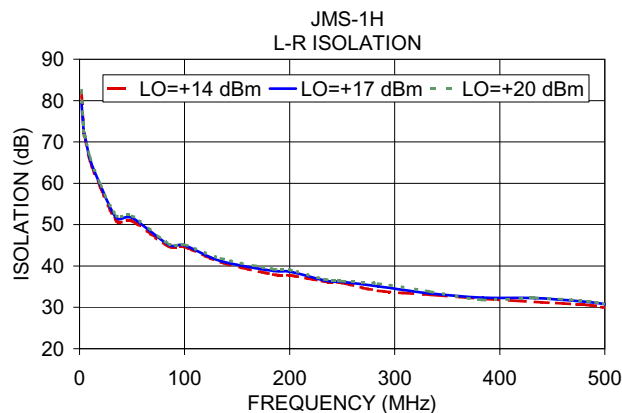
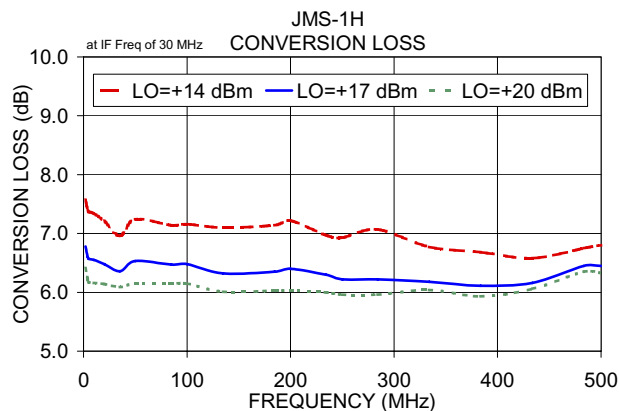
IF/RF MICROWAVE COMPONENTS

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-Circuits' 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](http://www.minicircuits.com/MCLStore/terms.jsp).

REV. B  
M102713  
JMS-1H  
ED-3195/1  
DJ/CP/AM  
130328  
Page 1 of 2

# Performance Charts

**JMS-1H+**  
**JMS-1H**



**Mini-Circuits®**  
ISO 9001 ISO 14001 AS 9100 CERTIFIED

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 The Design Engineers Search Engine [minicircuits.com](http://www.minicircuits.com) Provides ACTUAL Data Instantly at [minicircuits.com](http://minicircuits.com)

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](http://www.minicircuits.com/MCLStore/terms.jsp).