

# Surface Mount Frequency Mixer

Level 7 (LO Power +7 dBm) 2800 to 5900 MHz

## MBA-591+ MBA-591



### 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     | 10            |
| RF     | 6             |
| IF     | 1             |
| GROUND | 2,3,4,5,7,8,9 |

### Features

- excellent temperature stability
- excellent performance repeatability
- leads with strain relief
- very low cost
- ultra low height, 0.07"
- aqueous washable
- protected by US Patent 5,534,830

### Applications

- satellite communication
- ISM band
- PCMCIA

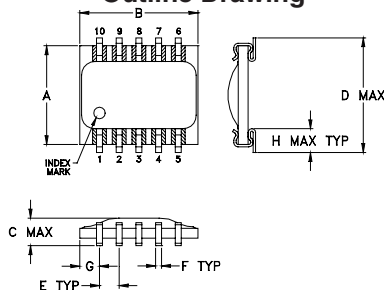
CASE STYLE: SM2

PRICE: \$6.95 ea. QTY (10-49)

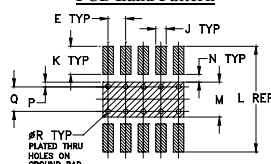
**+ RoHS compliant in accordance  
with EU Directive (2002/95/EC)**

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

### Outline Drawing



### PCB Land Pattern

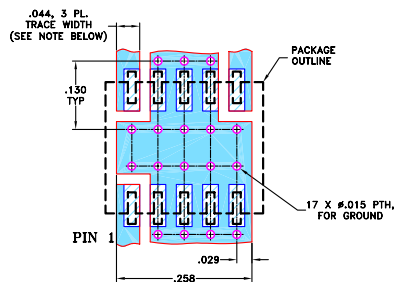


Suggested Layout,  
Tolerance to be within ±.002  
ADJACENT GROUND PINS SHALL BE CONNECTED  
TO EACH OTHER AND TO GROUND PAD

### Outline Dimensions ( inch mm )

| A    | B    | C    | D    | E    | F    | G    | H    |       |
|------|------|------|------|------|------|------|------|-------|
| .250 | .300 | .095 | .290 | .050 | .015 | .050 | .060 |       |
| 6.35 | 7.62 | 2.41 | 7.37 | 1.27 | 0.38 | 1.27 | 1.52 |       |
| J    | K    | L    | M    | N    | P    | Q    | R    | wt    |
| .030 | .080 | .300 | .100 | .020 | .015 | .070 | .014 | grams |
| 0.76 | 2.03 | 7.62 | 2.54 | 0.51 | 0.38 | 1.78 | 0.36 | 0.3   |

**Demo Board MCL P/N: TB-74**  
**Suggested PCB Layout (PL-067)**



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC  
THICKNESS 0.020" ± 0.0015"; 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

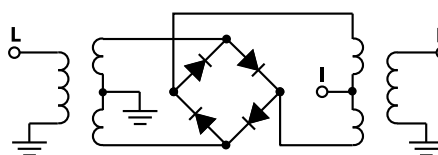
| FREQUENCY<br>(MHz) |         | CONVERSION LOSS<br>(dB) |          |      | LO-RF ISOLATION<br>(dB) |      | LO-IF ISOLATION<br>(dB) |      | IP3<br>at center<br>band<br>(dBm) |
|--------------------|---------|-------------------------|----------|------|-------------------------|------|-------------------------|------|-----------------------------------|
| LO/RF              | IF      | $\bar{X}$               | $\sigma$ | Max. | Typ.                    | Min. | Typ.                    | Min. |                                   |
| 2800-5900          | DC-1000 | 6.5                     | 0.1      | 9.0  | 36                      | 20   | 26                      | 17   | 10                                |

1 dB COMP.: +1 dBm typ.

### Typical Performance Data

| Frequency<br>(MHz) |         | Conversion<br>Loss<br>(dB) | Isolation<br>L-R<br>(dB) | Isolation<br>L-I<br>(dB) | VSWR<br>RF Port<br>(:1) | VSWR<br>LO Port<br>(:1) |
|--------------------|---------|----------------------------|--------------------------|--------------------------|-------------------------|-------------------------|
| RF                 | LO      | LO<br>+7dBm                | LO<br>+7dBm              | LO<br>+7dBm              | LO<br>+7dBm             | LO<br>+7dBm             |
| 2597.00            | 2627.00 | 6.11                       | 33.16                    | 23.57                    | 3.25                    | 7.31                    |
| 2895.00            | 2925.00 | 5.11                       | 31.10                    | 23.98                    | 1.88                    | 5.83                    |
| 3000.00            | 3030.00 | 4.90                       | 31.11                    | 23.73                    | 1.61                    | 5.23                    |
| 3300.00            | 3330.00 | 4.58                       | 31.80                    | 23.98                    | 1.28                    | 4.61                    |
| 3492.50            | 3522.50 | 4.70                       | 33.07                    | 24.97                    | 1.61                    | 4.78                    |
| 3700.00            | 3730.00 | 4.92                       | 33.70                    | 26.25                    | 2.10                    | 4.21                    |
| 3791.00            | 3821.00 | 5.01                       | 34.34                    | 26.80                    | 2.31                    | 3.90                    |
| 4000.00            | 4030.00 | 5.32                       | 36.66                    | 27.71                    | 2.84                    | 2.86                    |
| 4089.50            | 4119.50 | 5.45                       | 37.63                    | 27.98                    | 2.97                    | 2.58                    |
| 4388.00            | 4418.00 | 5.93                       | 38.33                    | 28.33                    | 3.16                    | 1.70                    |
| 4500.00            | 4530.00 | 6.11                       | 39.03                    | 28.13                    | 3.22                    | 1.49                    |
| 4686.50            | 4716.50 | 6.33                       | 39.88                    | 27.54                    | 3.43                    | 1.25                    |
| 4985.00            | 5015.00 | 6.08                       | 40.18                    | 26.99                    | 4.02                    | 1.31                    |
| 5000.00            | 5030.00 | 6.10                       | 40.38                    | 27.03                    | 4.07                    | 1.33                    |
| 5283.50            | 5313.50 | 6.13                       | 39.86                    | 27.04                    | 3.90                    | 1.81                    |
| 5400.00            | 5430.00 | 6.57                       | 38.38                    | 26.96                    | 4.09                    | 2.08                    |
| 5500.00            | 5530.00 | 7.20                       | 38.33                    | 26.75                    | 4.95                    | 2.32                    |
| 5582.00            | 5612.00 | 7.42                       | 38.54                    | 26.53                    | 5.13                    | 2.45                    |
| 5880.50            | 5910.50 | 8.01                       | 38.73                    | 25.90                    | 4.56                    | 2.44                    |
| 6000.00            | 6030.00 | 8.02                       | 38.49                    | 25.53                    | 4.39                    | 2.75                    |

### Electrical Schematic



**Mini-Circuits®**  
ISO 9001 ISO 14001 AS 9100 CERTIFIED  
The Design Engineers Search Engine Provides ACTUAL Data Instantly at [minicircuits.com](http://minicircuits.com)  
IF/RF MICROWAVE COMPONENTS

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

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. C  
M115169  
MBA-591  
EDB990801/1  
090128  
Page 1 of 2

# Performance Charts

## MBA-591+ MBA-591

