

## Triple-Balanced Mixer

Rev. V3

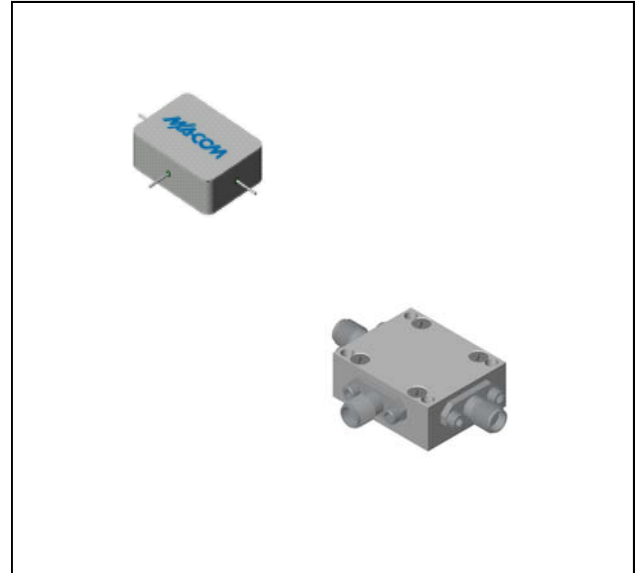
### Features

- LO 2 TO 24 GHz
- RF 2 TO 24 GHz
- IF 1 TO 15 GHz
- LO DRIVE: +10 dBm (NOMINAL)
- HIGH COMPRESSION POINT

### Description

The M51 is a triple balanced mixer, designed for use in military, commercial and test equipment applications. The design utilizes Schottky ring quad diodes and broadband soft dielectric baluns to attain excellent performance. The use of high temperature solder and welded assembly processes used internally makes it ideal for use in manual, semi-automated assembly. Environmental screening available to MIL-STD-883, MIL-STD-202 or MIL-DTL-28837, consult factory.

### Product Image



### Ordering Information

| Part Number | Package           |
|-------------|-------------------|
| M51         | Minpac            |
| M51C        | SMA Connectorized |

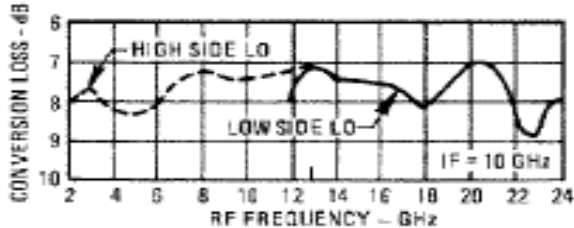
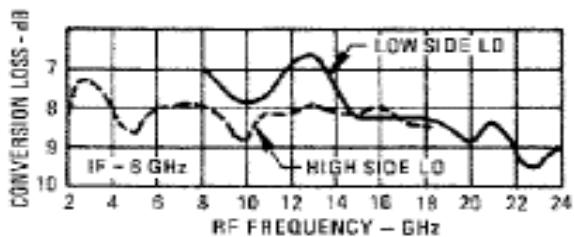
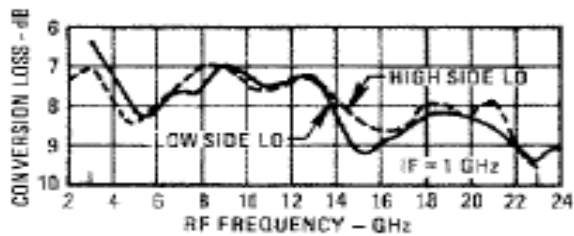
### Electrical Specifications: $Z_0 = 50\Omega$ $L_o = +10$ dBm (Downconverter application only)

| Parameter                                          | Test Conditions                                                                                                                                                                                   | Units          | Typical    | Guaranteed |                 |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------|------------|-----------------|
|                                                    |                                                                                                                                                                                                   |                |            | +25°C      | -54° to +85°C * |
| SSB Conversion Loss (max) & SSB Noise Figure (max) | fR = 2.5 to 18 GHz, fL = 2 to 18 GHz, fI = 2 to 10 GHz<br>fR = 2 to 18 GHz, fL = 2 to 24 GHz, fI = 1 to 12 GHz<br>fR = 2 to 24 GHz, fL = 2 to 24 GHz, fI = 1 to 12 GHz<br>fI = 1 - 15 GHz fL < fR | dB<br>dB<br>dB | 7.5        | 9.5        | 10.0            |
|                                                    |                                                                                                                                                                                                   |                | 8.0        | 10.5       | 11.0            |
|                                                    |                                                                                                                                                                                                   |                | 9.0        | 11.5       | 12.0            |
| Isolation, L to R (min)                            | fL = 2 to 3 GHz<br>fL = 3 to 24 GHz                                                                                                                                                               | dB<br>dB       | 20         | 15         | 13              |
|                                                    |                                                                                                                                                                                                   |                | 30         | 20         | 18              |
| Isolation, L to I (min)                            | fL = 2 to 7 GHz<br>fL = 7 to 24 GHz                                                                                                                                                               | dB<br>dB       | 30         | 20         | 18              |
|                                                    |                                                                                                                                                                                                   |                | 22         | 15         | 13              |
| 1 dB Conversion Comp.                              | fL @ +10 dBm                                                                                                                                                                                      | dBm            | +5         |            |                 |
| Input IP3                                          | fR1 = 5 GHz @ -6 dBm, fR2 = 5.01 GHz @ -6 dBm,<br>fL = 8 GHz @ 10 dBm<br>fR1 = 16 GHz @ -6 dBm, fR2 = 16.01 GHz @ -6 dBm,<br>fL = 18 GHz @ 10 dBm                                                 | dBm<br>dBm     | +15<br>+15 |            |                 |

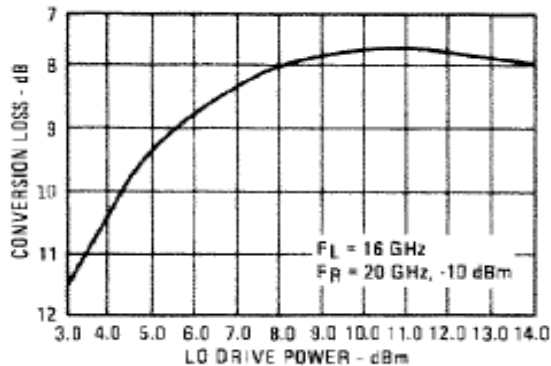
\* The M51C specification limits apply at 0°C to +50°C.

### Typical Performance Curves

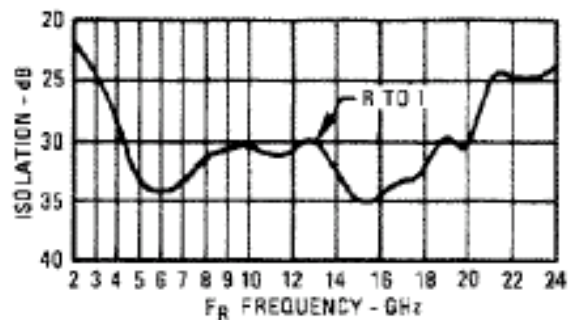
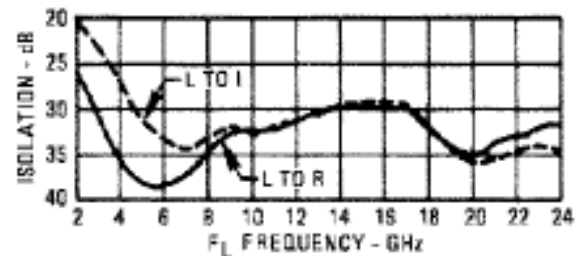
**Conversion Loss vs. Frequency**  
LO @ +10 dBm



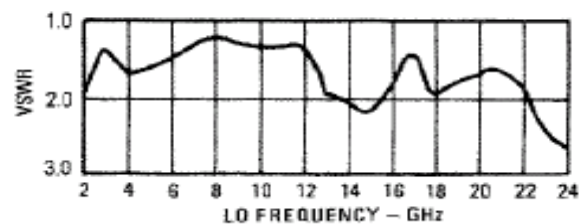
**Drive Level**



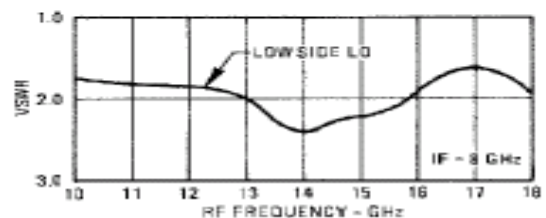
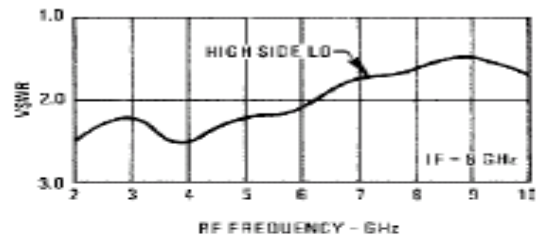
**Isolation vs. Frequency**



**L-Port VSWR**



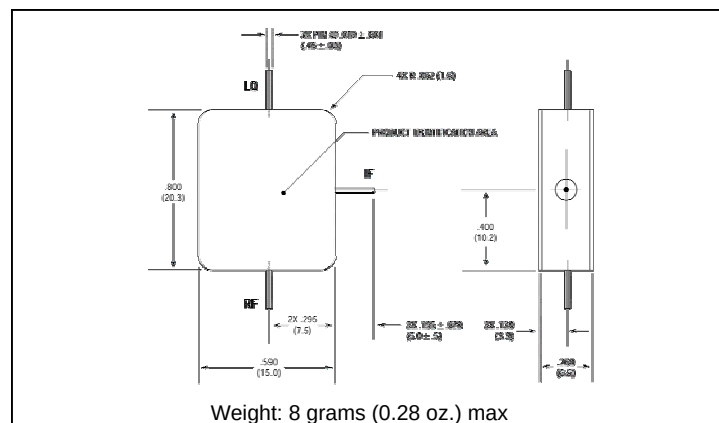
**R-Port VSWR**



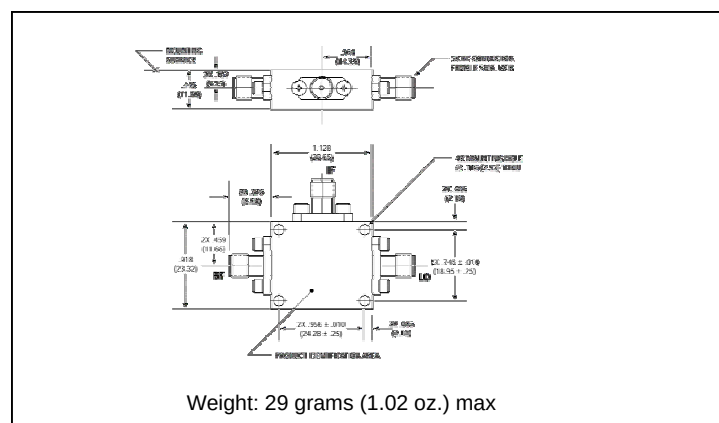
### Absolute Maximum Ratings

| Parameter             | Absolute Maximum                            |
|-----------------------|---------------------------------------------|
| Operating Temperature | -54°C to +100°C                             |
| Storage Temperature   | -65°C to +100°C                             |
| Peak Input Power      | +26 dBm max @ +25°C<br>+22 dBm max @ +100°C |
| Peak Input Current    | mA DC                                       |

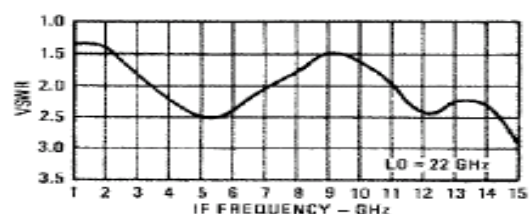
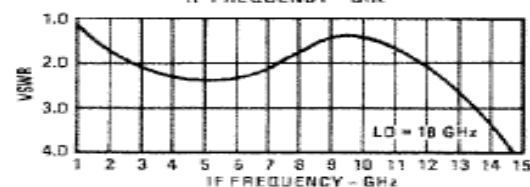
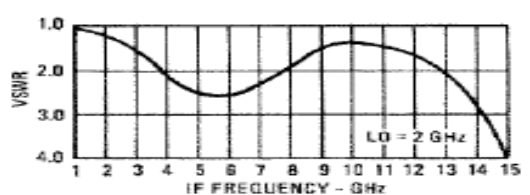
### Outline Drawing: Minpac \*



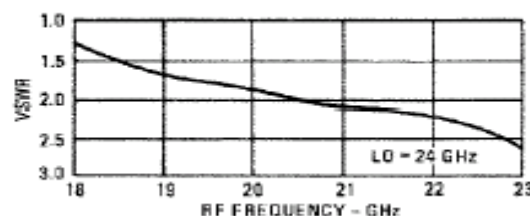
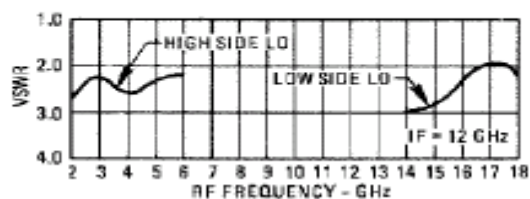
### Outline Drawing: SMA Connectorized \*



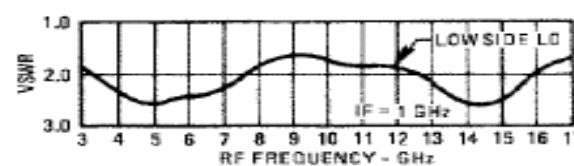
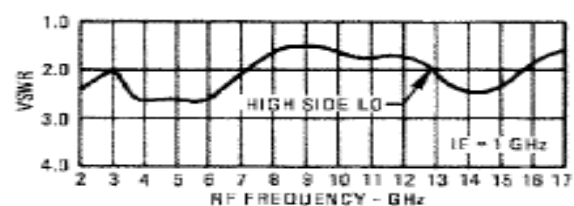
I-Port VSWR



R-Port VSWR



R-Port VSWR LO @ +10 dBm



\* Dimensions are inches (millimeters)  $\pm 0.015$  (0.38) unless otherwise specified.