

## Double-Balanced Mixer

**M4A/SM4A**

V4

### Features

- LO 10 TO 1500 MHz
- RF 10 TO 1500 MHz
- IF DC TO 1000 MHz
- LO DRIVE: +7 dBm (NOMINAL)
- HIGH ISOLATION: 35 dB (TYP.)

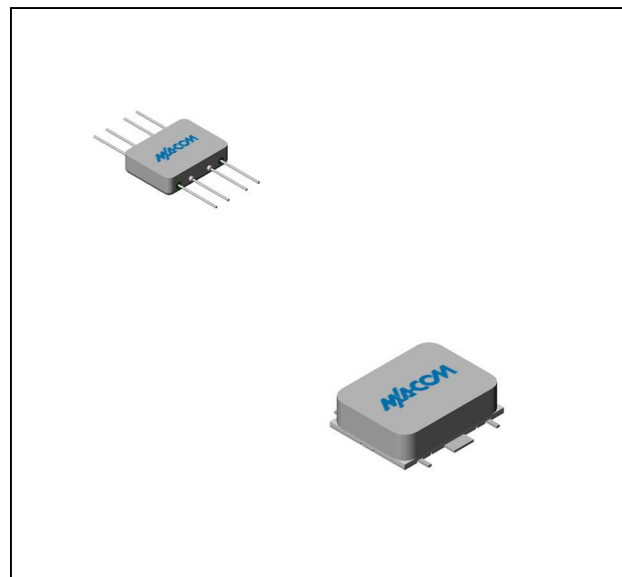
### Description

The M4A is a double balanced mixer, designed for use in military, commercial, and test equipment applications. The design utilizes Schottky ring quad diodes and broadband ferrite baluns to attain excellent performance. This mixer can also be used as a phase detector and/or bi-phase modulator since the IF port is DC coupled to the diodes. Environmental screening is available to MIL-STD-883, MIL-STD-202, or MIL-DTL-28837, consult factory.

### Ordering Information

| Part Number | Package       |
|-------------|---------------|
| M4A         | Flatpack      |
| SM4A        | Surface Mount |

### Product Image



### Electrical Specifications: $Z_0 = 50\Omega$ $L_o = +7$ 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 = 0.02 to 0.6 GHz, fL = 0.01 to 0.8 GHz, fI = 0.001 to 0.2 GHz | dB    | 6.0     | 7.0        | 7.5             |
|                                                    | fR = 0.01 to 1.2 GHz, fL = 0.01 to 1.4 GHz, fI = 0.001 to 0.2 GHz | dB    | 7.0     | 8.0        | 8.5             |
|                                                    | fR = 0.01 to 1.5 GHz, fL = 0.01 to 1.5 GHz, fI = 0.001 to 0.2 GHz | dB    | 7.5     | 8.5        | 9.0             |
|                                                    | fR = 0.01 to 1.5 GHz, fL = 0.01 to 1.5 GHz, fI = 0.001 to 1 GHz   | dB    | 8.5     | 9.5        | 10.0            |
| Isolation, L to R (min)                            | fL = 0.01 to 0.6 GHz                                              | dB    | 40      | 30         | 28              |
|                                                    | fL = 0.6 to 1.2 GHz                                               | dB    | 35      | 25         | 23              |
|                                                    | fL = 1.2 to 1.5 GHz                                               | dB    | 30      | 25         | 23              |
| Isolation, L to I (min)                            | fL = 0.1 to 0.6 GHz                                               | dB    | 40      | 25         | 23              |
|                                                    | fL = 0.6 to 1.2 GHz                                               | dB    | 30      | 20         | 18              |
|                                                    | fL = 1.2 to 1.4 GHz                                               | dB    | 25      | 18         | 16              |
| 1 dB Conversion Comp.                              | fL @ +7 dBm                                                       | dBm   | +0      |            |                 |
| Input IP3                                          |                                                                   |       |         |            |                 |

\* The SM4A specification limits apply at 0°C to +50°C.

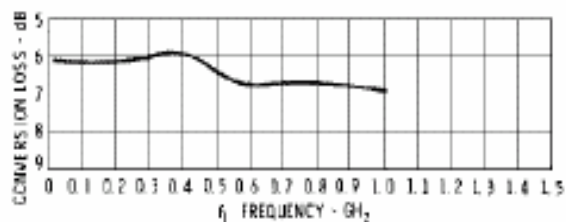
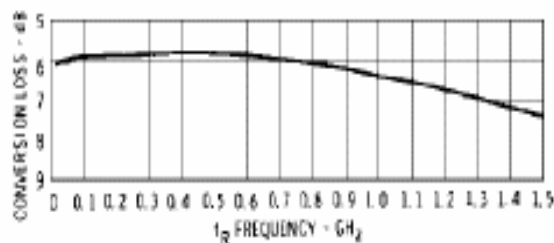
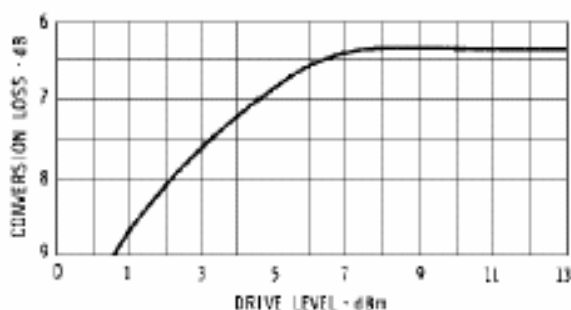
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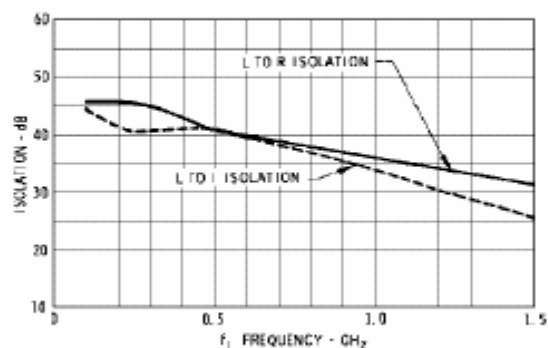
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### Typical Performance Curves

**Conversion Loss**



**Isolation**



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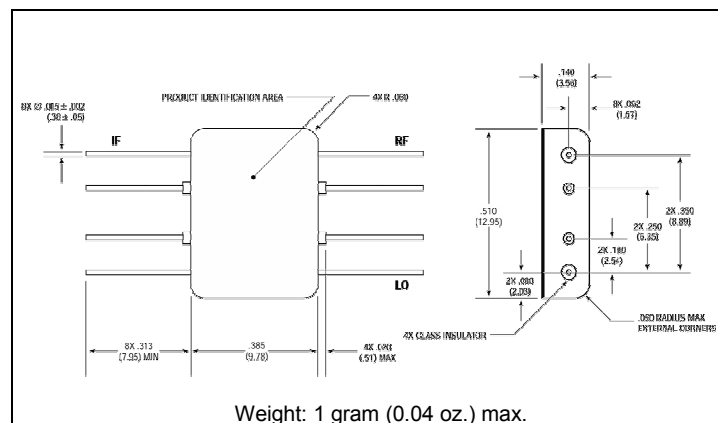
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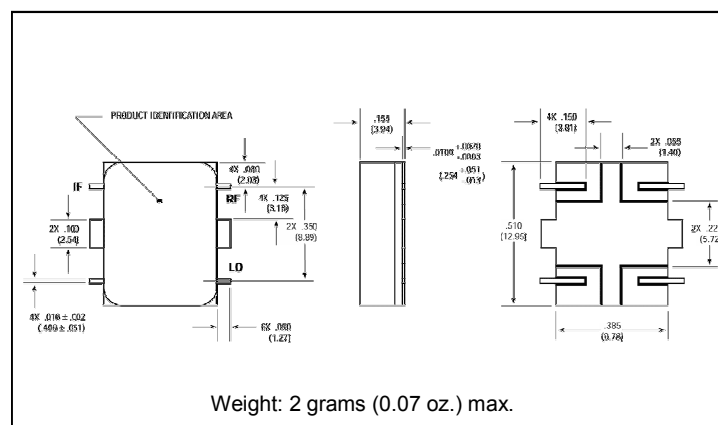
## Absolute Maximum Ratings

| Parameter             | Absolute Maximum                            |
|-----------------------|---------------------------------------------|
| Operating Temperature | -54°C to +100°C                             |
| Storage Temperature   | -65°C to +100°C                             |
| Peak Input Power      | +23 dBm max @ +25°C<br>+17 dBm max @ +100°C |
| Peak Input Current    | 50 mA DC                                    |

## Outline Drawing: Flatpack \*



## Outline Drawing: Surface Mount \*



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