

## Triple-Balanced Mixer

**MZ5010/MZ5010C**

V3

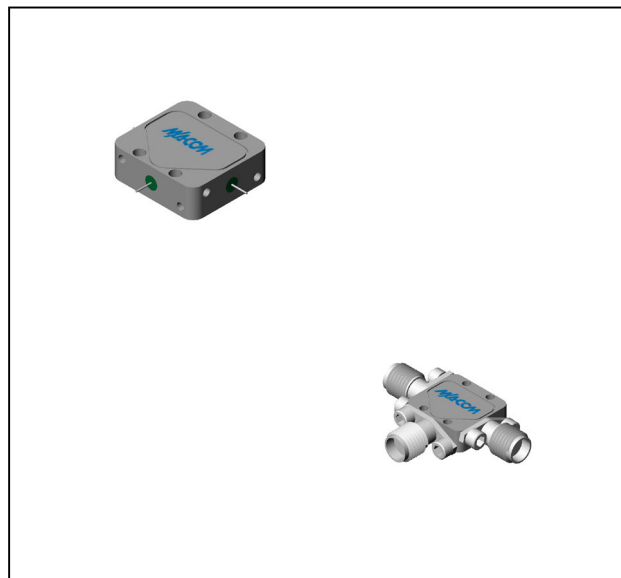
### Features

- LO 2 TO 26 GHz
- RF 2 TO 26 GHz
- IF 1 TO 15 GHz
- LO DRIVE +10 dBm (nominal)
- MINIATURE PACKAGE
- VERY WIDE BANDWIDTH
- AVAILABLE WITH FIELD REPLACEABLE CONNECTORS

### Description

The MZ5010 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           |
|-------------|-------------------|
| MZ5010      | Versapac          |
| MZ5010C     | SMA Connectorized |

### Electrical Specifications: $Z_0 = 50\Omega$ $Lo = +10$ 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 = 3 to 18 GHz, fL = 3.5 to 18 GHz, fI = 4 to 12 GHz<br>fR = 2.5 to 26 GHz, fL = 2.5 to 24 GHz, fI = 4 to 12 GHz<br>fR = 2 to 26 GHz, fL = 2 to 26 GHz, fI = 1 to 15 GHz | dB    | 7.5     | 9.5        | 10.0          |
|                                                    |                                                                                                                                                                            |       | 8.5     | 10.5       | 11.0          |
|                                                    |                                                                                                                                                                            |       | 10.5    | 13.0       | 13.5          |
| Isolation, L to R (min)                            | fL = 2 to 4 GHz<br>fL = 4 to 26 GHz                                                                                                                                        | dB    | 30      | 15         | 13            |
|                                                    |                                                                                                                                                                            |       | 35      | 18         | 16            |
| Isolation, L to I (min)                            | fL = 2 to 4 GHz<br>fL = 4 to 26 GHz                                                                                                                                        | dB    | 20      | 12         | 10            |
|                                                    |                                                                                                                                                                            |       | 35      | 17         | 15            |
| 1 dB Conversion Comp.                              | fL = +10 dBm                                                                                                                                                               | dBm   | +5      |            |               |
| Input IP3                                          | fR1 = 18 GHz at -10 dBm, fR2 = 18.01 GHz at -10 dBm,<br>fL = 14 GHz at +10 dBm<br>fR1 = 5 GHz at -5 dBm, fR2 = 5.01 GHz at -5 dBm,<br>fL = 7 GHz at +10 dBm                | dBm   | +16     |            |               |
|                                                    |                                                                                                                                                                            | dBm   | +16     |            |               |

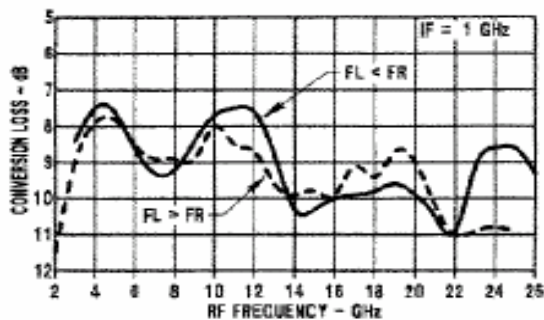
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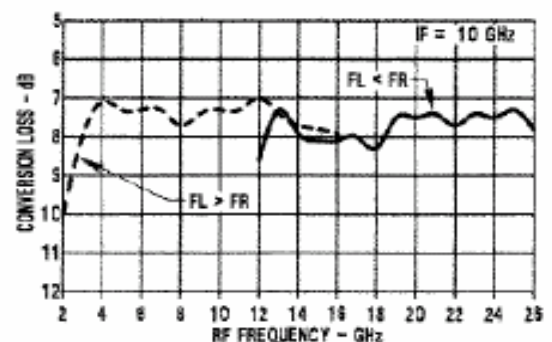
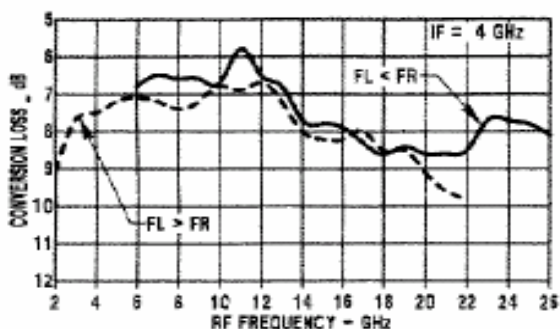
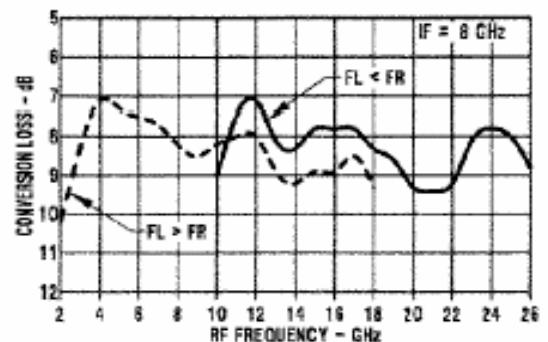
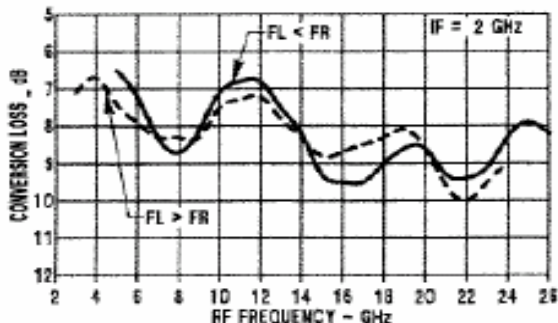
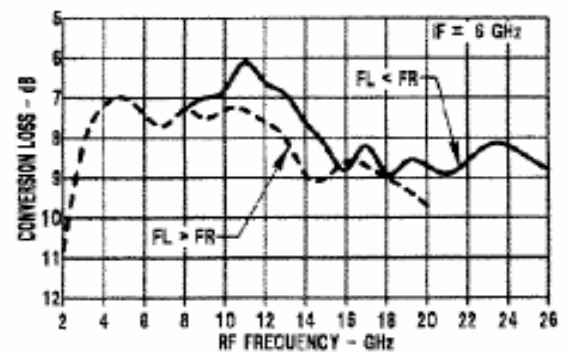
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### Typical Performance Curves

**Conversion Loss vs. Frequency**



**Conversion Loss vs. Frequency**



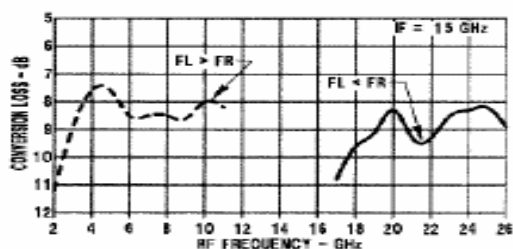
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## Absolute Maximum Ratings

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

Graph showing Conversion Loss (dB) versus RF Frequency (GHz) for a GaAs FET mixer. The dashed line represents the condition  $FL > FR$  and the solid line represents  $FL < FR$ . The IF is 12 GHz.

| RF Frequency (GHz) | Conversion Loss (dB) for $FL > FR$ (dashed) | Conversion Loss (dB) for $FL < FR$ (solid) |
|--------------------|---------------------------------------------|--------------------------------------------|
| 2                  | 9.5                                         | 10.0                                       |
| 4                  | 6.5                                         | 7.5                                        |
| 6                  | 6.8                                         | 7.8                                        |
| 8                  | 7.2                                         | 8.2                                        |
| 10                 | 6.8                                         | 8.5                                        |
| 12                 | 7.5                                         | 9.0                                        |
| 14                 | 8.5                                         | 9.5                                        |
| 16                 | 7.2                                         | 7.2                                        |
| 18                 | 7.5                                         | 7.5                                        |
| 20                 | 8.2                                         | 8.2                                        |
| 22                 | 8.5                                         | 8.5                                        |
| 24                 | 7.8                                         | 7.8                                        |
| 26                 | 7.2                                         | 7.2                                        |



A line graph showing Isolation in dB versus LO Frequency in GHz. The y-axis is labeled 'ISOLATION - dB' and ranges from 15 at the top to 45 at the bottom, with major grid lines every 5 units. The x-axis is labeled 'LO FREQUENCY - GHz' and ranges from 2 to 26, with major grid lines every 2 units. Two curves are plotted: a solid line labeled 'L-R' and a dashed line labeled 'L-I'. Both curves show a series of peaks and valleys. The 'L-R' curve has peaks around 14 GHz and 22 GHz, and valleys around 8 GHz and 18 GHz. The 'L-I' curve follows a similar pattern but with slightly different values, generally showing lower isolation (higher dB value) than the 'L-R' curve in the valley regions.

| LO Frequency (GHz) | L-R Isolation (dB) | L-I Isolation (dB) |
|--------------------|--------------------|--------------------|
| 2                  | 18                 | 18                 |
| 4                  | 25                 | 25                 |
| 6                  | 32                 | 32                 |
| 8                  | 40                 | 42                 |
| 10                 | 32                 | 32                 |
| 12                 | 28                 | 28                 |
| 14                 | 22                 | 22                 |
| 16                 | 35                 | 35                 |
| 18                 | 38                 | 40                 |
| 20                 | 35                 | 35                 |
| 22                 | 28                 | 28                 |
| 24                 | 32                 | 32                 |
| 26                 | 22                 | 22                 |

[illegible]

Weight: 4 grams (0.14 oz.) max

[illegible]

Weight: 13 grams (0.46 oz.) max

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