

# Coaxial Frequency Mixer

Level 7 (LO Power +7 dBm) 10 to 750 MHz

ZFM-1W+

## Maximum Ratings

|                       |                |
|-----------------------|----------------|
| Operating Temperature | -55°C to 100°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.

## Coaxial Connections

|    |   |
|----|---|
| LO | 1 |
| RF | 2 |
| IF | 3 |

## Features

- low conversion loss, 5.42 dB typ.
- good L-R isolation, 45 dB typ, L-I, 40 dB typ.
- rugged shielded case

## Applications

- VHF/UHF
- defense & federal communications
- instrumentation



Generic photo used for illustration purposes only

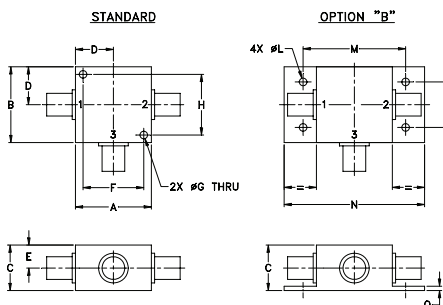
CASE STYLE: K18

| Connectors           | Model     |
|----------------------|-----------|
| BNC                  | ZFM-1W+   |
| SMA                  | ZFM-1W-S+ |
| BRACKET (OPTION "B") |           |

**+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    | H     |
|-------|-------|-------|-------|-------|-------|------|-------|
| 1.25  | 1.25  | .75   | .63   | .38   | 1.00  | .125 | 1.000 |
| 31.75 | 31.75 | 19.05 | 16.00 | 9.65  | 25.40 | 3.18 | 25.40 |
| J     | K     | L     | M     | N     | P     | Q    | wt    |
| --    | --    | .125  | 1.688 | 2.18  | .75   | .07  | grams |
| --    | --    | 3.18  | 42.88 | 55.37 | 19.05 | 1.78 | 70.0  |

## Electrical Specifications

| FREQUENCY (MHz)    |        | CONVERSION LOSS (dB) |          |                        |      | LO-RF ISOLATION (dB) |      |      |      |      |      | LO-IF ISOLATION (dB) |      |      |      |      |      |
|--------------------|--------|----------------------|----------|------------------------|------|----------------------|------|------|------|------|------|----------------------|------|------|------|------|------|
| LO/RF<br>$f_L-f_U$ | IF     | Mid-Band             |          | Total<br>Range<br>Max. | Max. | L                    |      | M    |      | U    |      | L                    |      | M    |      | U    |      |
|                    |        | $\bar{X}$            | $\sigma$ |                        |      | Typ.                 | Min. | Typ. | Min. | Typ. | Min. | Typ.                 | Min. | Typ. | Min. | Typ. | Min. |
| 10-750             | DC-750 | 5.42                 | 0.14     | 7.0                    | 8.0  | 50                   | 45   | 45   | 30   | 35   | 25   | 45                   | 40   | 40   | 25   | 27   | 20   |

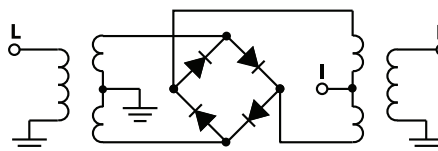
1 dB COMP.: +1 dBm typ.

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

## 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 +7dBm             | LO +7dBm           | LO +7dBm           | LO +7dBm          | LO +7dBm          |
| 1.00            | 31.00  | 6.42                 | >67.00             | >67.00             | 1.20              | 3.31              |
| 2.00            | 32.00  | 5.97                 | >67.00             | >67.00             | 1.12              | 3.09              |
| 5.00            | 35.00  | 5.50                 | >67.00             | >67.00             | 1.10              | 3.15              |
| 10.00           | 40.00  | 5.66                 | >67.00             | >67.00             | 1.12              | 2.99              |
| 20.00           | 50.00  | 5.60                 | >67.00             | >67.00             | 1.14              | 2.99              |
| 50.00           | 80.00  | 5.60                 | >67.00             | 62.28              | 1.16              | 2.84              |
| 100.00          | 70.00  | 5.47                 | >67.00             | 55.09              | 1.20              | 2.88              |
| 130.14          | 100.14 | 5.52                 | 57.96              | 51.55              | 1.23              | 2.75              |
| 200.00          | 170.00 | 5.62                 | 50.48              | 45.84              | 1.30              | 2.74              |
| 285.11          | 255.11 | 5.47                 | 45.61              | 40.64              | 1.35              | 2.74              |
| 362.59          | 332.59 | 5.71                 | 42.62              | 37.34              | 1.40              | 2.78              |
| 414.25          | 384.25 | 5.97                 | 40.09              | 36.21              | 1.45              | 2.78              |
| 500.00          | 470.00 | 6.14                 | 39.49              | 33.17              | 1.48              | 2.80              |
| 543.39          | 513.39 | 6.24                 | 37.59              | 31.35              | 1.50              | 2.82              |
| 595.04          | 565.04 | 6.21                 | 37.44              | 31.39              | 1.49              | 2.85              |
| 646.70          | 616.70 | 6.16                 | 36.31              | 33.58              | 1.51              | 2.93              |
| 672.53          | 642.53 | 6.27                 | 36.63              | 31.60              | 1.58              | 2.94              |
| 698.36          | 668.36 | 6.43                 | 36.64              | 29.86              | 1.64              | 3.03              |
| 724.18          | 694.18 | 6.68                 | 36.68              | 28.78              | 1.72              | 3.01              |
| 750.00          | 720.00 | 6.98                 | 35.77              | 27.45              | 1.83              | 3.01              |

## Electrical Schematic



### Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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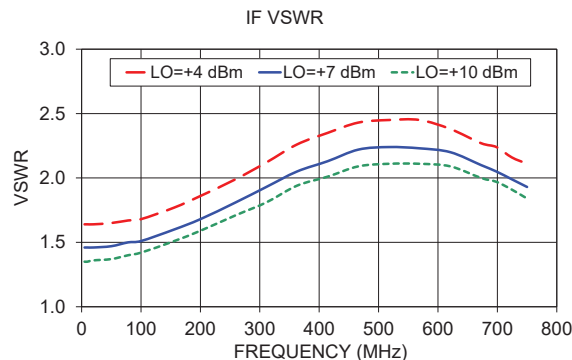
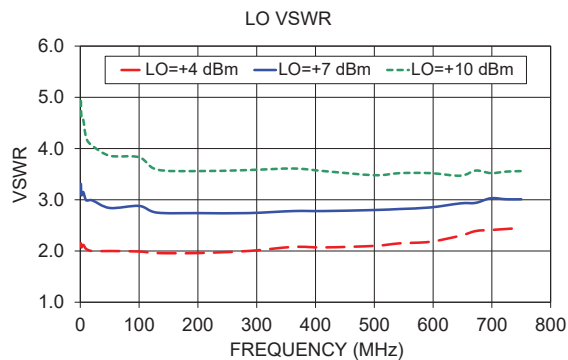
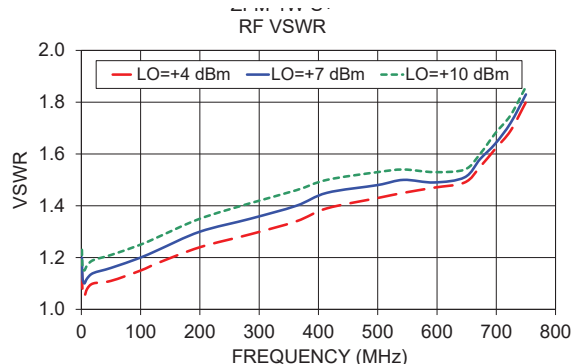
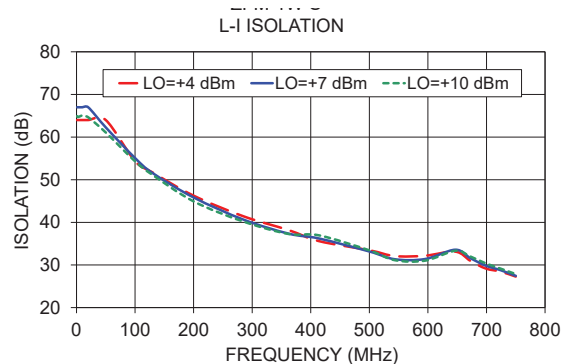
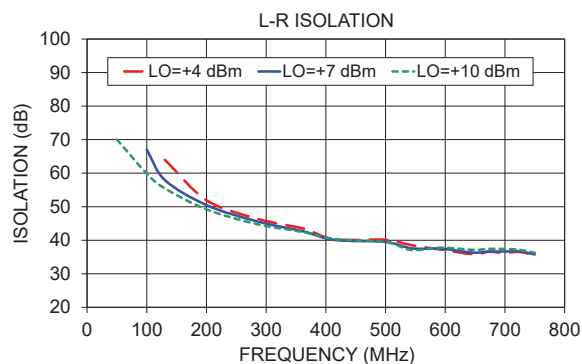
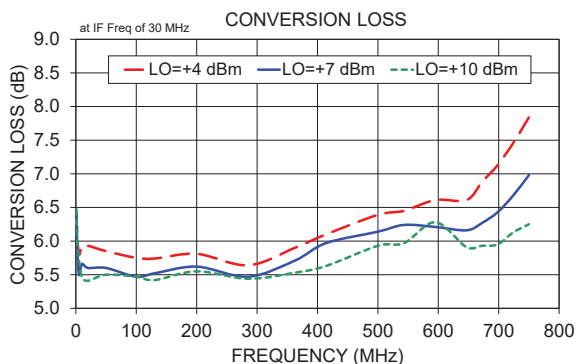


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M151107  
ZFM-1W+  
DJ/TD/CP  
200811  
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# Performance Charts

**ZFM-1W+**  
**ZFM-1W**



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# Frequency Mixer

ZFM-1W+

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>IF FIXED<br>@IF(OUT)=30MHz<br>(dB) |       |      |
|---------------------|-------------|-------------------------------------------------------|-------|------|
|                     |             | @LO (dBm)                                             |       |      |
|                     |             | +4                                                    | +7    | +10  |
| 10.1                | 40.1        | 6.15                                                  | 5.72  | 5.11 |
| 50.1                | 80.1        | 6.44                                                  | 6.04  | 5.84 |
| 90.1                | 120.1       | 6.40                                                  | 6.09  | 5.94 |
| 130.1               | 160.1       | 6.52                                                  | 6.15  | 5.96 |
| 170.1               | 200.1       | 6.47                                                  | 6.17  | 6.03 |
| 210.1               | 240.1       | 6.57                                                  | 6.25  | 6.08 |
| 250.1               | 280.1       | 6.57                                                  | 6.27  | 6.10 |
| 290.1               | 320.1       | 6.65                                                  | 6.35  | 6.16 |
| 330.1               | 360.1       | 6.77                                                  | 6.44  | 6.24 |
| 370.1               | 400.1       | 6.76                                                  | 6.43  | 6.25 |
| 410.1               | 440.1       | 6.97                                                  | 6.60  | 6.38 |
| 450.1               | 480.1       | 6.92                                                  | 6.56  | 6.34 |
| 490.1               | 520.1       | 7.15                                                  | 6.73  | 6.48 |
| 530.1               | 560.1       | 7.28                                                  | 6.87  | 6.60 |
| 570.1               | 600.1       | 7.45                                                  | 6.99  | 6.70 |
| 610.1               | 640.1       | 7.62                                                  | 7.10  | 6.77 |
| 650.1               | 680.1       | 7.60                                                  | 7.04  | 6.69 |
| 690.1               | 720.1       | 7.72                                                  | 7.06  | 6.69 |
| 730.1               | 760.1       | 7.78                                                  | 7.06  | 6.68 |
| 770.1               | 800.1       | 7.91                                                  | 7.16  | 6.72 |
| 810.1               | 840.1       | 8.01                                                  | 7.29  | 6.81 |
| 850.1               | 880.1       | 8.08                                                  | 7.42  | 6.93 |
| 890.1               | 920.1       | 8.13                                                  | 7.51  | 7.04 |
| 930.1               | 960.1       | 8.28                                                  | 7.68  | 7.23 |
| 970.1               | 1000.1      | 8.33                                                  | 7.78  | 7.35 |
| 1010.1              | 1040.1      | 8.46                                                  | 7.95  | 7.53 |
| 1050.1              | 1080.1      | 8.50                                                  | 8.04  | 7.66 |
| 1070.1              | 1100.1      | 8.59                                                  | 8.13  | 7.77 |
| 1110.1              | 1140.1      | 8.60                                                  | 8.19  | 7.88 |
| 1130.1              | 1160.1      | 8.69                                                  | 8.28  | 7.99 |
| 1170.1              | 1200.1      | 8.79                                                  | 8.45  | 8.22 |
| 1190.1              | 1220.1      | 8.86                                                  | 8.53  | 8.31 |
| 1230.1              | 1260.1      | 9.02                                                  | 8.73  | 8.56 |
| 1250.1              | 1280.1      | 9.11                                                  | 8.85  | 8.69 |
| 1290.1              | 1320.1      | 9.29                                                  | 8.98  | 8.82 |
| 1310.1              | 1340.1      | 9.42                                                  | 9.09  | 8.93 |
| 1350.1              | 1380.1      | 9.82                                                  | 9.42  | 9.25 |
| 1370.1              | 1400.1      | 9.96                                                  | 9.50  | 9.32 |
| 1410.1              | 1440.1      | 10.43                                                 | 9.86  | 9.65 |
| 1430.1              | 1460.1      | 10.70                                                 | 10.10 | 9.87 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       |
|---------------------|-------------|--------------------|-------|-------|
|                     |             | @LO (dBm)          |       |       |
|                     |             | +4                 | +7    | +10   |
| 10.1                | 40.1        | 18.30              | 20.01 | 21.45 |
| 50.1                | 80.1        | 20.23              | 20.45 | 18.18 |
| 90.1                | 120.1       | 19.46              | 16.08 | 18.47 |
| 130.1               | 160.1       | 14.10              | 15.31 | 19.06 |
| 170.1               | 200.1       | 13.86              | 16.78 | 20.99 |
| 210.1               | 240.1       | 13.56              | 17.73 | 20.96 |
| 250.1               | 280.1       | 13.44              | 17.69 | 20.95 |
| 290.1               | 320.1       | 13.91              | 18.22 | 20.92 |
| 330.1               | 360.1       | 13.55              | 18.42 | 20.88 |
| 370.1               | 400.1       | 15.37              | 20.78 | 19.75 |
| 410.1               | 440.1       | 15.24              | 19.69 | 19.76 |
| 450.1               | 480.1       | 15.43              | 20.72 | 20.83 |
| 490.1               | 520.1       | 12.73              | 18.05 | 20.76 |
| 530.1               | 560.1       | 11.82              | 14.97 | 20.62 |
| 570.1               | 600.1       | 12.15              | 15.27 | 19.68 |
| 610.1               | 640.1       | 13.46              | 15.72 | 16.28 |
| 650.1               | 680.1       | 14.16              | 14.01 | 14.32 |
| 690.1               | 720.1       | 11.70              | 11.84 | 12.39 |
| 730.1               | 760.1       | 10.63              | 11.27 | 11.86 |
| 770.1               | 800.1       | 9.48               | 10.79 | 11.40 |
| 810.1               | 840.1       | 8.37               | 9.67  | 10.68 |
| 850.1               | 880.1       | 8.30               | 9.52  | 10.63 |
| 890.1               | 920.1       | 7.70               | 8.97  | 9.99  |
| 930.1               | 960.1       | 7.83               | 8.93  | 10.09 |
| 970.1               | 1000.1      | 8.05               | 9.26  | 10.55 |
| 1010.1              | 1040.1      | 7.98               | 9.06  | 10.51 |
| 1050.1              | 1080.1      | 9.05               | 10.16 | 11.50 |
| 1070.1              | 1100.1      | 9.61               | 10.65 | 12.02 |
| 1110.1              | 1140.1      | 10.86              | 11.99 | 13.27 |
| 1130.1              | 1160.1      | 10.95              | 12.27 | 13.64 |
| 1170.1              | 1200.1      | 12.11              | 13.37 | 14.69 |
| 1190.1              | 1220.1      | 12.73              | 14.08 | 15.21 |
| 1230.1              | 1260.1      | 13.09              | 14.76 | 15.56 |
| 1250.1              | 1280.1      | 13.35              | 15.16 | 15.81 |
| 1290.1              | 1320.1      | 13.24              | 15.30 | 16.34 |
| 1310.1              | 1340.1      | 13.35              | 15.90 | 17.01 |
| 1350.1              | 1380.1      | 13.48              | 16.01 | 17.34 |
| 1370.1              | 1400.1      | 13.56              | 16.03 | 17.20 |
| 1410.1              | 1440.1      | 13.51              | 16.24 | 17.74 |
| 1430.1              | 1460.1      | 13.61              | 15.94 | 17.81 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF IN=+1dBm<br>(dB) |      |      |
|---------------------|-------------|-------------------------------------|------|------|
|                     |             | @LO (dBm)                           |      |      |
|                     |             | +4                                  | +7   | +10  |
| 10.1                | 40.1        | 0.63                                | 0.77 | 0.27 |
| 50.1                | 80.1        | 0.71                                | 0.48 | 0.29 |
| 90.1                | 120.1       | 0.70                                | 0.42 | 0.25 |
| 130.1               | 160.1       | 0.60                                | 0.34 | 0.20 |
| 170.1               | 200.1       | 0.68                                | 0.39 | 0.27 |
| 210.1               | 240.1       | 0.53                                | 0.32 | 0.20 |
| 250.1               | 280.1       | 0.58                                | 0.40 | 0.27 |
| 290.1               | 320.1       | 0.54                                | 0.35 | 0.25 |
| 330.1               | 360.1       | 0.54                                | 0.36 | 0.25 |
| 370.1               | 400.1       | 0.61                                | 0.42 | 0.31 |
| 410.1               | 440.1       | 0.59                                | 0.40 | 0.30 |
| 450.1               | 480.1       | 0.75                                | 0.58 | 0.42 |
| 490.1               | 520.1       | 0.76                                | 0.57 | 0.44 |
| 530.1               | 560.1       | 0.87                                | 0.67 | 0.54 |
| 570.1               | 600.1       | 0.92                                | 0.72 | 0.59 |
| 610.1               | 640.1       | 0.95                                | 0.75 | 0.62 |
| 650.1               | 680.1       | 1.07                                | 0.89 | 0.74 |
| 690.1               | 720.1       | 1.12                                | 0.95 | 0.78 |
| 730.1               | 760.1       | 1.09                                | 1.00 | 0.80 |
| 770.1               | 800.1       | 1.03                                | 0.97 | 0.81 |
| 810.1               | 840.1       | 0.97                                | 0.90 | 0.76 |
| 850.1               | 880.1       | 0.92                                | 0.81 | 0.70 |
| 890.1               | 920.1       | 0.95                                | 0.81 | 0.70 |
| 930.1               | 960.1       | 0.86                                | 0.71 | 0.60 |
| 970.1               | 1000.1      | 0.88                                | 0.71 | 0.59 |
| 1010.1              | 1040.1      | 0.85                                | 0.66 | 0.55 |
| 1050.1              | 1080.1      | 0.88                                | 0.66 | 0.54 |
| 1070.1              | 1100.1      | 0.83                                | 0.63 | 0.51 |
| 1110.1              | 1140.1      | 0.88                                | 0.64 | 0.51 |
| 1130.1              | 1160.1      | 0.89                                | 0.62 | 0.49 |
| 1170.1              | 1200.1      | 0.81                                | 0.55 | 0.42 |
| 1190.1              | 1220.1      | 0.77                                | 0.51 | 0.39 |
| 1230.1              | 1260.1      | 0.68                                | 0.43 | 0.33 |
| 1250.1              | 1280.1      | 0.65                                | 0.40 | 0.30 |
| 1290.1              | 1320.1      | 0.64                                | 0.37 | 0.27 |
| 1310.1              | 1340.1      | 0.63                                | 0.34 | 0.25 |
| 1350.1              | 1380.1      | 0.57                                | 0.31 | 0.21 |
| 1370.1              | 1400.1      | 0.58                                | 0.31 | 0.21 |
| 1410.1              | 1440.1      | 0.56                                | 0.31 | 0.20 |
| 1430.1              | 1460.1      | 0.52                                | 0.30 | 0.19 |

REV. X3

ZFM-1W+

101011

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IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant  
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# Frequency Mixer

**ZFM-1W+**

## Typical Performance Data

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=385.1MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=10.1MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=762.1MHz<br>(dB) |
|----------------------|-------------|-----------------------------------------------------------------|----------------------|-------------|----------------------------------------------------------------|----------------------|-------------|-----------------------------------------------------------------|
|                      |             | @LO (dBm)                                                       |                      |             | @LO (dBm)                                                      |                      |             | @LO (dBm)                                                       |
|                      |             | +7                                                              |                      |             | +7                                                             |                      |             | +7                                                              |
| 370.1                | 15.0        | 6.49                                                            | 10.0                 | 20.1        | 5.95                                                           | 752.1                | 10.0        | 7.13                                                            |
| 360.1                | 25.0        | 6.42                                                            | 47.0                 | 57.1        | 5.55                                                           | 732.1                | 30.0        | 7.05                                                            |
| 350.1                | 35.0        | 6.35                                                            | 84.0                 | 94.1        | 5.52                                                           | 712.1                | 50.0        | 7.04                                                            |
| 340.1                | 45.0        | 6.37                                                            | 121.0                | 131.1       | 5.75                                                           | 692.1                | 70.0        | 7.07                                                            |
| 330.1                | 55.0        | 6.40                                                            | 158.0                | 168.1       | 5.75                                                           | 672.1                | 90.0        | 7.14                                                            |
| 320.1                | 65.0        | 6.37                                                            | 195.0                | 205.1       | 5.78                                                           | 652.1                | 110.0       | 7.06                                                            |
| 310.1                | 75.0        | 6.37                                                            | 232.0                | 242.1       | 5.54                                                           | 632.1                | 130.0       | 7.10                                                            |
| 300.1                | 85.0        | 6.39                                                            | 269.0                | 279.1       | 5.83                                                           | 612.1                | 150.0       | 7.08                                                            |
| 290.1                | 95.0        | 6.34                                                            | 306.0                | 316.1       | 5.69                                                           | 592.1                | 170.0       | 7.09                                                            |
| 280.1                | 105.0       | 6.33                                                            | 343.0                | 353.1       | 5.89                                                           | 572.1                | 190.0       | 7.15                                                            |
| 270.1                | 115.0       | 6.33                                                            | 380.0                | 390.1       | 5.69                                                           | 552.1                | 210.0       | 7.07                                                            |
| 260.1                | 125.0       | 6.30                                                            | 417.0                | 427.1       | 5.90                                                           | 532.1                | 230.0       | 7.15                                                            |
| 250.1                | 135.0       | 6.29                                                            | 454.0                | 464.1       | 6.21                                                           | 512.1                | 250.0       | 7.07                                                            |
| 240.1                | 145.0       | 6.34                                                            | 491.0                | 501.1       | 5.87                                                           | 492.1                | 270.0       | 7.13                                                            |
| 230.1                | 155.0       | 6.35                                                            | 528.0                | 538.1       | 5.88                                                           | 472.1                | 290.0       | 7.14                                                            |
| 220.1                | 165.0       | 6.33                                                            | 565.0                | 575.1       | 6.10                                                           | 452.1                | 310.0       | 7.08                                                            |
| 210.1                | 175.0       | 6.34                                                            | 602.0                | 612.1       | 5.93                                                           | 432.1                | 330.0       | 7.13                                                            |
| 200.1                | 185.0       | 6.38                                                            | 639.0                | 649.1       | 6.00                                                           | 412.1                | 350.0       | 7.14                                                            |
| 190.1                | 195.0       | 6.35                                                            | 676.0                | 686.1       | 6.08                                                           | 392.1                | 370.0       | 7.19                                                            |
| 180.1                | 205.0       | 6.33                                                            | 713.0                | 723.1       | 6.04                                                           | 372.1                | 390.0       | 7.23                                                            |
| 170.1                | 215.0       | 6.35                                                            | 750.0                | 760.1       | 6.02                                                           | 352.1                | 410.0       | 7.16                                                            |
| 160.1                | 225.0       | 6.35                                                            | 787.0                | 797.1       | 6.14                                                           | 332.1                | 430.0       | 7.27                                                            |
| 150.1                | 235.0       | 6.37                                                            | 824.0                | 834.1       | 5.82                                                           | 312.1                | 450.0       | 7.19                                                            |
| 140.1                | 245.0       | 6.40                                                            | 861.0                | 871.1       | 6.10                                                           | 292.1                | 470.0       | 7.21                                                            |
| 130.1                | 255.0       | 6.41                                                            | 898.0                | 908.1       | 6.02                                                           | 272.1                | 490.0       | 7.21                                                            |
| 120.1                | 265.0       | 6.37                                                            | 935.0                | 945.1       | 6.12                                                           | 252.1                | 510.0       | 7.16                                                            |
| 110.1                | 275.0       | 6.38                                                            | 972.0                | 982.1       | 6.17                                                           | 232.1                | 530.0       | 7.26                                                            |
| 100.1                | 285.0       | 6.45                                                            | 1009.0               | 1019.1      | 6.09                                                           | 212.1                | 550.0       | 7.18                                                            |
| 90.1                 | 295.0       | 6.42                                                            | 1046.0               | 1056.1      | 6.32                                                           | 192.1                | 570.0       | 7.24                                                            |
| 85.1                 | 300.0       | 6.43                                                            | 1083.0               | 1093.1      | 6.43                                                           | 172.1                | 590.0       | 7.18                                                            |
| 75.1                 | 310.0       | 6.43                                                            | 1120.0               | 1130.1      | 6.74                                                           | 152.1                | 610.0       | 7.16                                                            |
| 70.1                 | 315.0       | 6.44                                                            | 1157.0               | 1167.1      | 7.02                                                           | 132.1                | 630.0       | 7.16                                                            |
| 60.1                 | 325.0       | 6.46                                                            | 1194.0               | 1204.1      | 7.26                                                           | 112.1                | 650.0       | 7.06                                                            |
| 55.1                 | 330.0       | 6.47                                                            | 1231.0               | 1241.1      | 7.39                                                           | 102.1                | 660.0       | 7.08                                                            |
| 45.1                 | 340.0       | 6.46                                                            | 1268.0               | 1278.1      | 7.88                                                           | 82.1                 | 680.0       | 6.93                                                            |
| 40.1                 | 345.0       | 6.45                                                            | 1305.0               | 1315.1      | 8.25                                                           | 72.1                 | 690.0       | 6.99                                                            |
| 30.1                 | 355.0       | 6.47                                                            | 1342.0               | 1352.1      | 8.63                                                           | 52.1                 | 710.0       | 6.95                                                            |
| 25.1                 | 360.0       | 6.45                                                            | 1397.5               | 1407.6      | 9.21                                                           | 42.1                 | 720.0       | 6.97                                                            |
| 15.1                 | 370.0       | 6.56                                                            | 1434.5               | 1444.6      | 9.62                                                           | 22.1                 | 740.0       | 6.98                                                            |
| 10.1                 | 375.0       | 6.83                                                            | 1490.0               | 1500.1      | 10.34                                                          | 12.1                 | 750.0       | 7.23                                                            |

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ZFM-1W+

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# Frequency Mixer

ZFM-1W+

## Typical Performance Data

| LO<br>(MHz) | LO-RF ISOLATION<br>(dB) |       |       | LO-IF ISOLATION<br>(dB) |       |       |
|-------------|-------------------------|-------|-------|-------------------------|-------|-------|
|             | @LO (dBm)               |       |       | @LO (dBm)               |       |       |
|             | +4                      | +7    | +10   | +4                      | +7    | +10   |
| 40.1        | 60.58                   | 60.50 | 61.53 | 58.33                   | 59.99 | 61.49 |
| 80.1        | 56.14                   | 56.03 | 56.26 | 56.48                   | 58.01 | 59.44 |
| 120.1       | 53.57                   | 53.43 | 53.55 | 53.89                   | 55.76 | 58.07 |
| 160.1       | 50.84                   | 51.06 | 51.05 | 51.00                   | 53.21 | 55.47 |
| 200.1       | 49.14                   | 49.18 | 49.16 | 49.16                   | 51.33 | 53.45 |
| 240.1       | 47.87                   | 47.82 | 47.81 | 47.55                   | 49.51 | 51.33 |
| 280.1       | 46.73                   | 46.74 | 46.78 | 46.20                   | 47.89 | 49.34 |
| 320.1       | 45.65                   | 45.74 | 45.70 | 44.58                   | 45.96 | 47.27 |
| 360.1       | 44.78                   | 44.87 | 44.84 | 43.39                   | 44.67 | 45.73 |
| 400.1       | 44.36                   | 44.37 | 44.31 | 42.68                   | 43.72 | 44.59 |
| 440.1       | 44.09                   | 44.05 | 43.92 | 42.07                   | 42.54 | 42.79 |
| 480.1       | 43.25                   | 43.27 | 43.22 | 41.27                   | 41.58 | 41.61 |
| 520.1       | 42.37                   | 42.57 | 42.63 | 39.70                   | 40.02 | 40.17 |
| 560.1       | 41.41                   | 41.66 | 41.77 | 37.97                   | 38.27 | 38.54 |
| 600.1       | 41.07                   | 41.25 | 41.43 | 36.68                   | 36.62 | 36.85 |
| 640.1       | 40.59                   | 40.88 | 41.02 | 35.96                   | 35.60 | 35.33 |
| 680.1       | 40.26                   | 40.58 | 40.76 | 35.32                   | 34.88 | 34.49 |
| 720.1       | 40.21                   | 40.59 | 40.64 | 34.34                   | 33.98 | 33.35 |
| 760.1       | 39.53                   | 40.04 | 40.25 | 33.14                   | 32.83 | 32.20 |
| 800.1       | 38.94                   | 39.51 | 39.87 | 31.93                   | 31.88 | 31.30 |
| 840.1       | 38.10                   | 38.59 | 38.98 | 30.44                   | 30.65 | 30.20 |
| 880.1       | 37.50                   | 37.91 | 38.24 | 28.94                   | 29.30 | 29.21 |
| 920.1       | 36.99                   | 37.26 | 37.53 | 27.24                   | 27.52 | 27.73 |
| 960.1       | 36.23                   | 36.52 | 36.83 | 25.92                   | 25.92 | 26.11 |
| 1000.1      | 35.34                   | 35.62 | 35.81 | 24.92                   | 24.75 | 24.63 |
| 1040.1      | 34.50                   | 34.78 | 34.97 | 24.02                   | 23.75 | 23.44 |
| 1080.1      | 33.82                   | 34.05 | 34.17 | 23.47                   | 23.18 | 22.75 |
| 1100.1      | 33.43                   | 33.55 | 33.59 | 23.19                   | 22.81 | 22.44 |
| 1140.1      | 32.96                   | 33.09 | 33.14 | 22.50                   | 22.19 | 21.78 |
| 1160.1      | 32.84                   | 32.99 | 33.03 | 22.13                   | 21.83 | 21.49 |
| 1200.1      | 32.35                   | 32.50 | 32.49 | 21.47                   | 21.28 | 20.99 |
| 1220.1      | 32.13                   | 32.29 | 32.14 | 21.12                   | 21.01 | 20.66 |
| 1260.1      | 31.74                   | 32.04 | 31.88 | 20.54                   | 20.60 | 20.32 |
| 1280.1      | 31.46                   | 31.83 | 31.71 | 20.26                   | 20.39 | 20.15 |
| 1320.1      | 30.68                   | 31.14 | 31.17 | 19.70                   | 19.95 | 19.76 |
| 1340.1      | 30.33                   | 30.81 | 30.97 | 19.47                   | 19.70 | 19.62 |
| 1380.1      | 29.77                   | 30.33 | 30.59 | 19.13                   | 19.46 | 19.44 |
| 1400.1      | 29.32                   | 29.93 | 30.23 | 18.81                   | 19.18 | 19.22 |
| 1440.1      | 28.63                   | 29.44 | 29.78 | 18.43                   | 18.95 | 18.98 |
| 1460.1      | 28.38                   | 29.27 | 29.56 | 18.27                   | 18.88 | 18.84 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +4                      | +7    | +10   |
| 10.1                | 40.1        | 48.46                   | 48.36 | 48.14 |
| 50.1                | 80.1        | 35.34                   | 37.19 | 37.44 |
| 90.1                | 120.1       | 32.54                   | 32.13 | 32.20 |
| 130.1               | 160.1       | 29.31                   | 29.86 | 29.98 |
| 170.1               | 200.1       | 28.25                   | 28.18 | 28.31 |
| 210.1               | 240.1       | 27.02                   | 27.59 | 27.61 |
| 250.1               | 280.1       | 26.42                   | 26.94 | 26.94 |
| 290.1               | 320.1       | 26.23                   | 26.91 | 27.25 |
| 330.1               | 360.1       | 26.20                   | 26.97 | 27.22 |
| 370.1               | 400.1       | 26.13                   | 26.98 | 27.34 |
| 410.1               | 440.1       | 25.82                   | 26.57 | 27.49 |
| 450.1               | 480.1       | 25.52                   | 26.51 | 27.41 |
| 490.1               | 520.1       | 25.27                   | 26.30 | 27.03 |
| 530.1               | 560.1       | 24.83                   | 25.24 | 25.50 |
| 570.1               | 600.1       | 23.59                   | 23.73 | 23.52 |
| 610.1               | 640.1       | 22.35                   | 22.24 | 22.14 |
| 650.1               | 680.1       | 21.28                   | 21.06 | 20.97 |
| 690.1               | 720.1       | 20.71                   | 20.36 | 20.18 |
| 730.1               | 760.1       | 20.39                   | 20.06 | 19.70 |
| 770.1               | 800.1       | 20.56                   | 20.10 | 19.66 |
| 810.1               | 840.1       | 20.55                   | 20.17 | 19.71 |
| 850.1               | 880.1       | 20.80                   | 20.41 | 19.96 |
| 890.1               | 920.1       | 20.76                   | 20.45 | 20.19 |
| 930.1               | 960.1       | 20.49                   | 20.06 | 19.82 |
| 970.1               | 1000.1      | 19.94                   | 19.53 | 19.07 |
| 1010.1              | 1040.1      | 19.02                   | 18.54 | 18.06 |
| 1050.1              | 1080.1      | 18.06                   | 17.46 | 16.94 |
| 1070.1              | 1100.1      | 17.54                   | 16.89 | 16.34 |
| 1110.1              | 1140.1      | 16.38                   | 15.68 | 15.21 |
| 1130.1              | 1160.1      | 15.85                   | 15.08 | 14.59 |
| 1170.1              | 1200.1      | 14.75                   | 14.05 | 13.59 |
| 1190.1              | 1220.1      | 14.19                   | 13.54 | 13.06 |
| 1230.1              | 1260.1      | 13.28                   | 12.66 | 12.23 |
| 1250.1              | 1280.1      | 12.85                   | 12.21 | 11.84 |
| 1290.1              | 1320.1      | 12.18                   | 11.55 | 11.23 |
| 1310.1              | 1340.1      | 11.85                   | 11.28 | 10.92 |
| 1350.1              | 1380.1      | 11.14                   | 10.62 | 10.30 |
| 1370.1              | 1400.1      | 11.02                   | 10.40 | 10.08 |
| 1410.1              | 1440.1      | 10.49                   | 9.91  | 9.59  |
| 1430.1              | 1460.1      | 10.20                   | 9.71  | 9.42  |

# Frequency Mixer

# ZFM-1W+

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF VSWR<br>(:1) |      |      | LO<br>(MHz) | LO VSWR<br>(:1) |      |      | IF<br>(OUT)<br>(MHz) | IF VSWR<br>@LO=750.1MHz<br>(:1) |      |      |
|---------------------|-------------|-----------------|------|------|-------------|-----------------|------|------|----------------------|---------------------------------|------|------|
|                     |             | @LO (dBm)       |      |      |             | @LO (dBm)       |      |      |                      | @LO (dBm)                       |      |      |
|                     |             | +4              | +7   | +10  |             | +4              | +7   | +10  |                      | +4                              | +7   | +10  |
| 10.1                | 40.1        | 1.10            | 1.15 | 1.11 | 40.1        | 1.62            | 2.42 | 3.44 | 10.1                 | 1.69                            | 1.43 | 1.27 |
| 50.1                | 80.1        | 1.07            | 1.04 | 1.10 | 80.1        | 1.52            | 2.17 | 3.00 | 30.1                 | 1.66                            | 1.40 | 1.25 |
| 90.1                | 120.1       | 1.10            | 1.10 | 1.14 | 120.1       | 1.56            | 2.28 | 3.19 | 50.1                 | 1.66                            | 1.40 | 1.25 |
| 130.1               | 160.1       | 1.07            | 1.08 | 1.12 | 160.1       | 1.54            | 2.21 | 3.05 | 70.1                 | 1.70                            | 1.43 | 1.28 |
| 170.1               | 200.1       | 1.11            | 1.13 | 1.16 | 200.1       | 1.54            | 2.21 | 3.05 | 90.1                 | 1.74                            | 1.46 | 1.31 |
| 210.1               | 240.1       | 1.09            | 1.11 | 1.14 | 240.1       | 1.58            | 2.25 | 3.09 | 110.1                | 1.70                            | 1.44 | 1.28 |
| 250.1               | 280.1       | 1.10            | 1.12 | 1.16 | 280.1       | 1.57            | 2.20 | 2.99 | 130.1                | 1.70                            | 1.44 | 1.28 |
| 290.1               | 320.1       | 1.11            | 1.11 | 1.14 | 320.1       | 1.62            | 2.27 | 3.08 | 150.1                | 1.70                            | 1.43 | 1.28 |
| 330.1               | 360.1       | 1.11            | 1.11 | 1.14 | 360.1       | 1.63            | 2.24 | 2.99 | 170.1                | 1.73                            | 1.46 | 1.31 |
| 370.1               | 400.1       | 1.14            | 1.13 | 1.15 | 400.1       | 1.67            | 2.29 | 3.05 | 190.1                | 1.78                            | 1.51 | 1.35 |
| 410.1               | 440.1       | 1.15            | 1.13 | 1.13 | 440.1       | 1.68            | 2.26 | 2.97 | 210.1                | 1.74                            | 1.47 | 1.32 |
| 450.1               | 480.1       | 1.17            | 1.14 | 1.15 | 480.1       | 1.72            | 2.30 | 3.00 | 230.1                | 1.72                            | 1.45 | 1.30 |
| 490.1               | 520.1       | 1.19            | 1.15 | 1.14 | 520.1       | 1.75            | 2.30 | 2.97 | 250.1                | 1.75                            | 1.49 | 1.34 |
| 530.1               | 560.1       | 1.22            | 1.18 | 1.16 | 560.1       | 1.77            | 2.31 | 2.96 | 270.1                | 1.79                            | 1.52 | 1.37 |
| 570.1               | 600.1       | 1.29            | 1.24 | 1.21 | 600.1       | 1.81            | 2.32 | 2.95 | 290.1                | 1.78                            | 1.52 | 1.37 |
| 610.1               | 640.1       | 1.38            | 1.33 | 1.30 | 640.1       | 1.82            | 2.29 | 2.89 | 310.1                | 1.78                            | 1.52 | 1.37 |
| 650.1               | 680.1       | 1.47            | 1.42 | 1.38 | 680.1       | 1.86            | 2.33 | 2.90 | 330.1                | 1.76                            | 1.50 | 1.36 |
| 690.1               | 720.1       | 1.57            | 1.51 | 1.48 | 720.1       | 1.88            | 2.31 | 2.85 | 350.1                | 1.79                            | 1.53 | 1.38 |
| 730.1               | 760.1       | 1.68            | 1.61 | 1.57 | 760.1       | 1.92            | 2.36 | 2.89 | 370.1                | 1.84                            | 1.58 | 1.43 |
| 770.1               | 800.1       | 1.78            | 1.70 | 1.65 | 800.1       | 1.94            | 2.36 | 2.86 | 390.1                | 1.80                            | 1.55 | 1.41 |
| 810.1               | 840.1       | 1.89            | 1.81 | 1.76 | 840.1       | 1.94            | 2.36 | 2.86 | 410.1                | 1.79                            | 1.54 | 1.40 |
| 850.1               | 880.1       | 1.94            | 1.87 | 1.81 | 880.1       | 1.96            | 2.37 | 2.86 | 430.1                | 1.81                            | 1.56 | 1.41 |
| 890.1               | 920.1       | 2.03            | 1.97 | 1.91 | 920.1       | 1.96            | 2.35 | 2.82 | 450.1                | 1.83                            | 1.58 | 1.44 |
| 930.1               | 960.1       | 2.06            | 2.00 | 1.94 | 960.1       | 1.98            | 2.37 | 2.84 | 470.1                | 1.83                            | 1.58 | 1.45 |
| 970.1               | 1000.1      | 2.09            | 2.04 | 2.00 | 1000.1      | 1.98            | 2.36 | 2.81 | 490.1                | 1.82                            | 1.57 | 1.44 |
| 1010.1              | 1040.1      | 2.12            | 2.08 | 2.04 | 1040.1      | 1.99            | 2.36 | 2.81 | 510.1                | 1.82                            | 1.57 | 1.44 |
| 1050.1              | 1080.1      | 2.09            | 2.07 | 2.03 | 1080.1      | 2.02            | 2.39 | 2.83 | 530.1                | 1.81                            | 1.57 | 1.43 |
| 1070.1              | 1100.1      | 2.12            | 2.10 | 2.07 | 1100.1      | 2.03            | 2.38 | 2.82 | 550.1                | 1.82                            | 1.58 | 1.44 |
| 1110.1              | 1140.1      | 2.11            | 2.10 | 2.08 | 1140.1      | 2.06            | 2.41 | 2.86 | 570.1                | 1.83                            | 1.59 | 1.46 |
| 1130.1              | 1160.1      | 2.08            | 2.08 | 2.07 | 1160.1      | 2.10            | 2.45 | 2.90 | 580.1                | 1.80                            | 1.56 | 1.43 |
| 1170.1              | 1200.1      | 2.13            | 2.14 | 2.14 | 1200.1      | 2.16            | 2.50 | 2.94 | 600.1                | 1.81                            | 1.57 | 1.44 |
| 1190.1              | 1220.1      | 2.13            | 2.14 | 2.15 | 1220.1      | 2.20            | 2.54 | 2.97 | 610.1                | 1.77                            | 1.53 | 1.40 |
| 1230.1              | 1260.1      | 2.10            | 2.12 | 2.13 | 1260.1      | 2.34            | 2.67 | 3.11 | 630.1                | 1.80                            | 1.56 | 1.43 |
| 1250.1              | 1280.1      | 2.13            | 2.16 | 2.18 | 1280.1      | 2.41            | 2.73 | 3.16 | 640.1                | 1.76                            | 1.53 | 1.39 |
| 1290.1              | 1320.1      | 2.17            | 2.20 | 2.22 | 1320.1      | 2.55            | 2.84 | 3.25 | 660.1                | 1.78                            | 1.55 | 1.42 |
| 1310.1              | 1340.1      | 2.16            | 2.18 | 2.20 | 1340.1      | 2.65            | 2.93 | 3.34 | 670.1                | 1.74                            | 1.51 | 1.38 |
| 1350.1              | 1380.1      | 2.25            | 2.27 | 2.29 | 1380.1      | 2.84            | 3.10 | 3.49 | 690.1                | 1.74                            | 1.51 | 1.38 |
| 1370.1              | 1400.1      | 2.29            | 2.31 | 2.33 | 1400.1      | 2.93            | 3.16 | 3.54 | 700.1                | 1.70                            | 1.47 | 1.34 |
| 1410.1              | 1440.1      | 2.33            | 2.34 | 2.36 | 1440.1      | 3.15            | 3.37 | 3.74 | 720.1                | 1.69                            | 1.47 | 1.34 |
| 1430.1              | 1460.1      | 2.39            | 2.39 | 2.41 | 1460.1      | 3.26            | 3.48 | 3.84 | 730.1                | 1.70                            | 1.47 | 1.33 |

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## Harmonics Tables

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0      | -      | -      | 16  | 24  | 21  | 34  | 16  | 53  | 19  | 43  | 40  | 62  |
| 1      | -      | 20     | +0  | 32  | 13  | 33  | 24  | 44  | 42  | 55  | 45  | 56  |
| 2      | >90    | >70    | 66  | 68  | >70 | 68  | 61  | >70 | 57  | >70 | 55  | >70 |
| 3      | >90    | >70    | >70 | >70 | >70 | >70 | 62  | >70 | >70 | >70 | >70 | >70 |
| 4      | >90    | >70    | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 |
| 5      | >90    | >70    | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 |
| 6      | >90    | >70    | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 |
| 7      | >90    | >70    | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 |
| 8      | >90    | >70    | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 |
| 9      | >90    | >70    | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 |
| 10     | >90    | >70    | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 |
| RF CAL | 0      | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |     |

### LO HARMONICS ORDER

Test conditions: RF IN: 380 MHz; -14.00 dBm.  
LO IN: 410 MHz; +7.00 dBm  
IF OUT: 30 MHz; -20.45 dBm

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0      | -      | -      | 25  | 34  | 32  | 46  | 27  | 60  | 32  | 58  | 54  | 78  |
| 1      | -      | 21     | +0  | 31  | 12  | 35  | 25  | 48  | 42  | 59  | 48  | 62  |
| 2      | 72     | 75     | 55  | 64  | 60  | 62  | 52  | 63  | 49  | 64  | 47  | 69  |
| 3      | >90    | 49     | 53  | 53  | 57  | 66  | 47  | 60  | 55  | 64  | 63  | 66  |
| 4      | >90    | >79    | 78  | 79  | >79 | 79  | >79 | 76  | 77  | >79 | 71  | 79  |
| 5      | >90    | 76     | 72  | 70  | 59  | 71  | 57  | 69  | 56  | 68  | 64  | >79 |
| 6      | >90    | >79    | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 |
| 7      | >90    | >79    | >79 | >79 | 77  | >79 | >79 | >79 | >79 | >79 | >79 | >79 |
| 8      | >90    | >79    | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 |
| 9      | >90    | >79    | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 |
| 10     | >90    | >79    | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 |
| RF CAL | 0      | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |     |

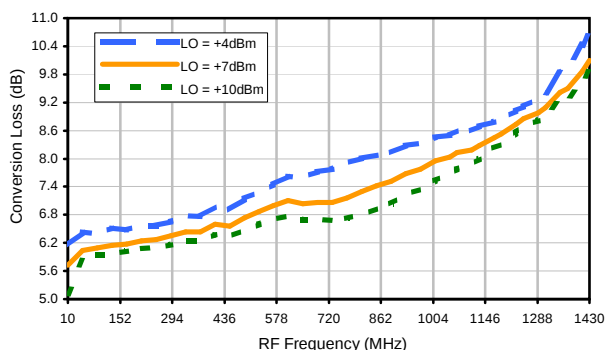
### LO HARMONICS ORDER

Test conditions: RF IN: 380 MHz; -4.00 dBm.  
LO IN: 410 MHz; +7.00 dBm  
IF OUT: 30 MHz; -10.57 dBm

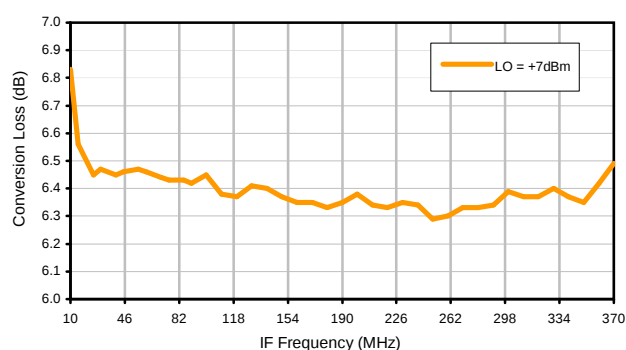
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.  
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.  
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

## Typical Performance Curves

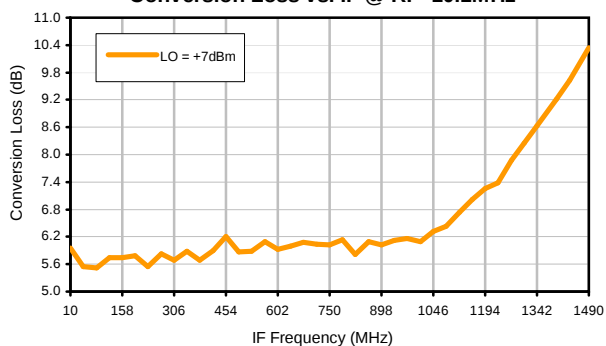
Conversion Loss @ IF=30MHz



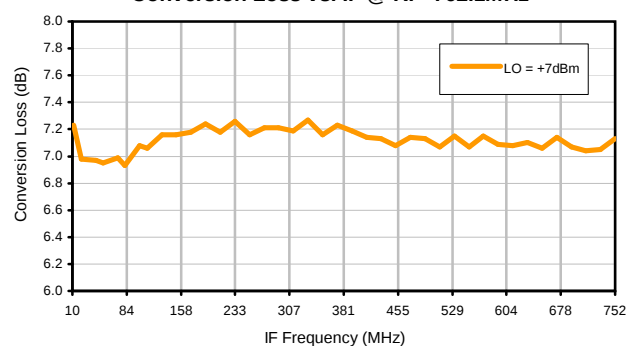
Conversion Loss vs. IF @ RF=385.1MHz



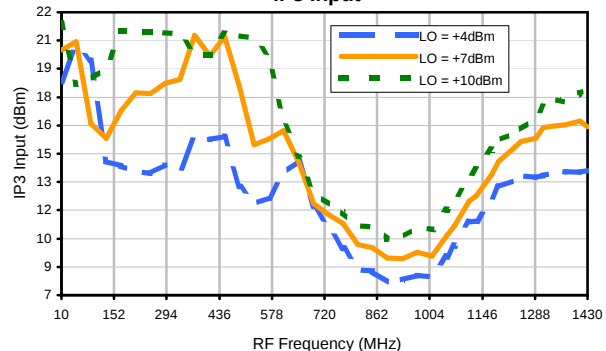
Conversion Loss vs. IF @ RF=10.1MHz



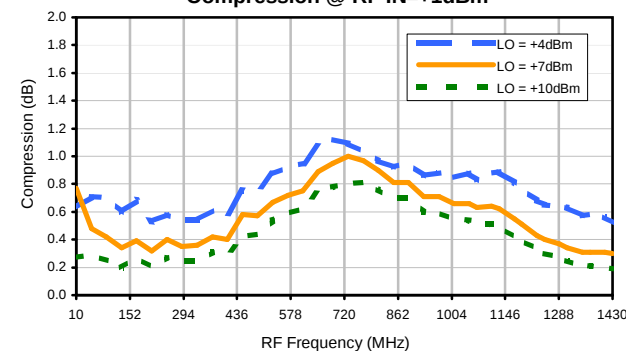
Conversion Loss vs. IF @ RF=762.1MHz



IP3 Input

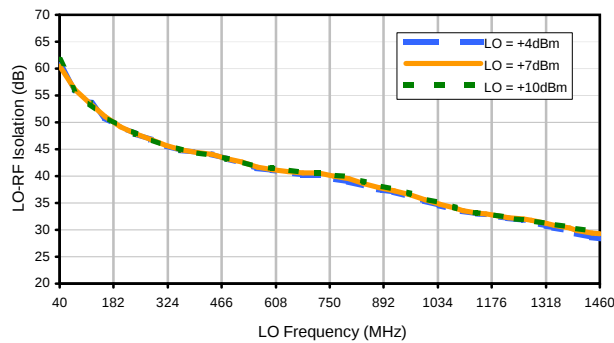


Compression @ RF IN=+1dBm

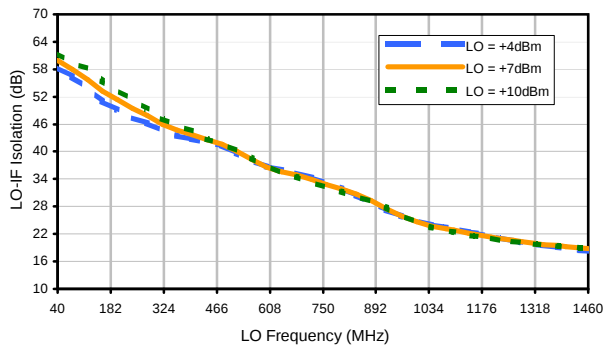


## Typical Performance Curves

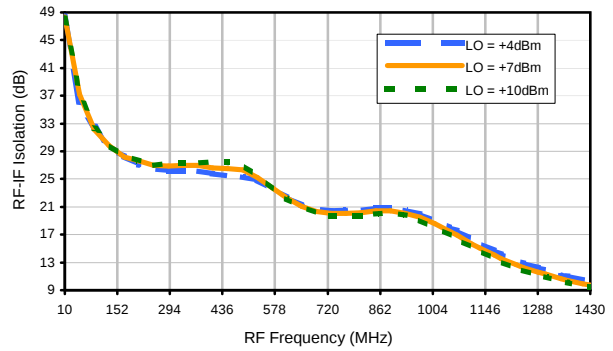
LO-RF Isolation



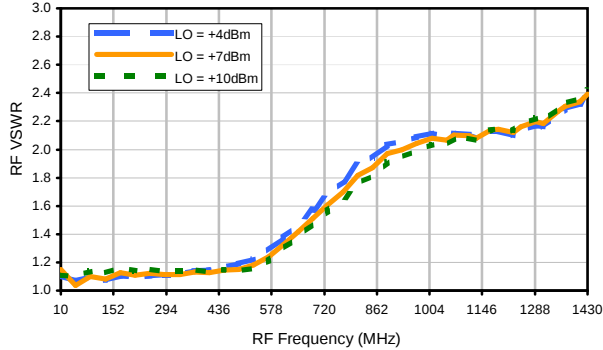
LO-IF Isolation



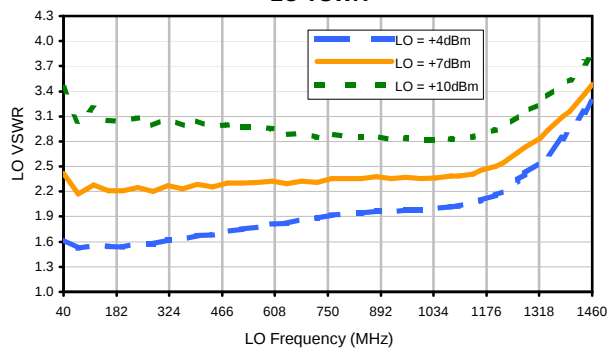
RF-IF Isolation



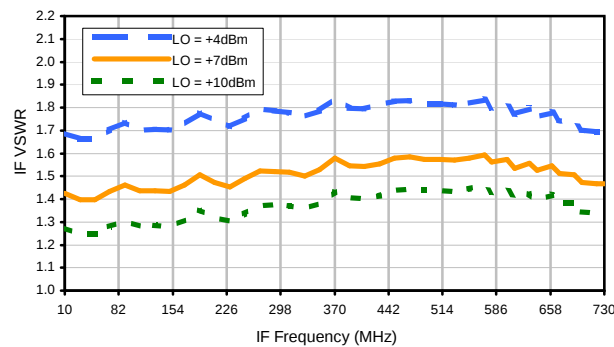
RF VSWR



LO VSWR



IF VSWR



## Harmonics Tables

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0      | -      | -      | 16  | 24  | 21  | 34  | 16  | 53  | 19  | 43  | 40  | 62  |
| 1      | -      | 20     | +0  | 32  | 13  | 33  | 24  | 44  | 42  | 55  | 45  | 56  |
| 2      | >90    | >70    | 66  | 68  | >70 | 68  | 61  | >70 | 57  | >70 | 55  | >70 |
| 3      | >90    | >70    | >70 | >70 | >70 | >70 | 62  | >70 | >70 | >70 | >70 | >70 |
| 4      | >90    | >70    | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 |
| 5      | >90    | >70    | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 |
| 6      | >90    | >70    | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 |
| 7      | >90    | >70    | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 |
| 8      | >90    | >70    | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 |
| 9      | >90    | >70    | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 |
| 10     | >90    | >70    | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 | >70 |
| RF CAL | 0      | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |     |

### LO HARMONICS ORDER

Test conditions: RF IN: 380 MHz; -14.00 dBm.  
LO IN: 410 MHz; +7.00 dBm  
IF OUT: 30 MHz; -20.45 dBm

RF HARMONICS ORDER

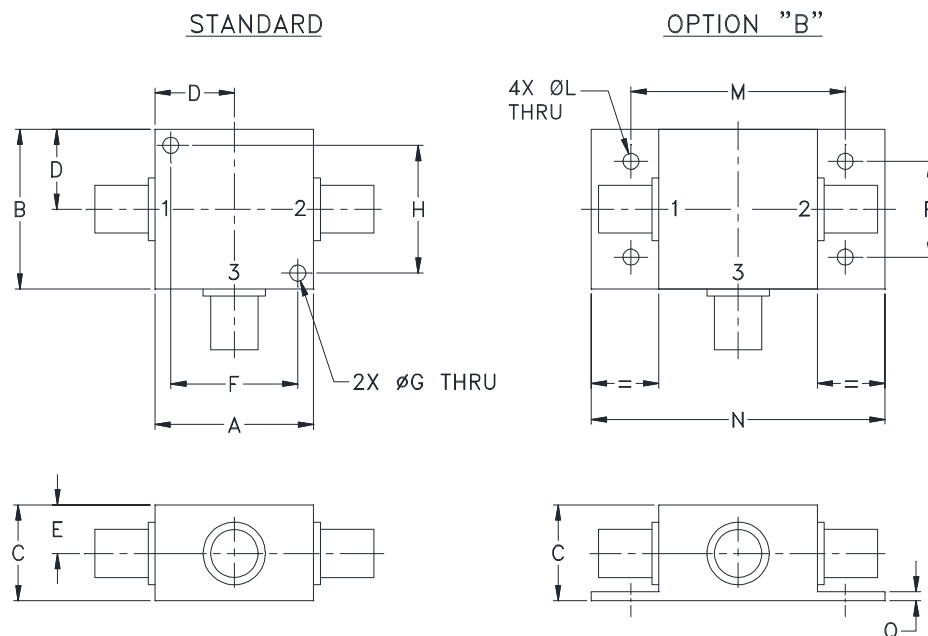
|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0      | -      | -      | 25  | 34  | 32  | 46  | 27  | 60  | 32  | 58  | 54  | 78  |
| 1      | -      | 21     | +0  | 31  | 12  | 35  | 25  | 48  | 42  | 59  | 48  | 62  |
| 2      | 72     | 75     | 55  | 64  | 60  | 62  | 52  | 63  | 49  | 64  | 47  | 69  |
| 3      | >90    | 49     | 53  | 53  | 57  | 66  | 47  | 60  | 55  | 64  | 63  | 66  |
| 4      | >90    | >79    | 78  | 79  | >79 | 79  | >79 | 76  | 77  | >79 | 71  | 79  |
| 5      | >90    | 76     | 72  | 70  | 59  | 71  | 57  | 69  | 56  | 68  | 64  | >79 |
| 6      | >90    | >79    | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 |
| 7      | >90    | >79    | >79 | >79 | 77  | >79 | >79 | >79 | >79 | >79 | >79 | >79 |
| 8      | >90    | >79    | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 |
| 9      | >90    | >79    | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 |
| 10     | >90    | >79    | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 | >79 |
| RF CAL | 0      | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |     |

### LO HARMONICS ORDER

Test conditions: RF IN: 380 MHz; -4.00 dBm.  
LO IN: 410 MHz; +7.00 dBm  
IF OUT: 30 MHz; -10.57 dBm

- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.  
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.  
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

### Outline Dimensions



| CASE# | A               | B               | C              | D              | E             | F                | G              | H                | J  | K  | L              | M                | N               |
|-------|-----------------|-----------------|----------------|----------------|---------------|------------------|----------------|------------------|----|----|----------------|------------------|-----------------|
| K18   | 1.25<br>(31.75) | 1.25<br>(31.75) | .75<br>(19.05) | .63<br>(16.00) | .38<br>(9.65) | 1.000<br>(25.40) | .125<br>(3.18) | 1.000<br>(25.40) | -- | -- | .125<br>(3.18) | 1.688<br>(42.88) | 2.18<br>(55.37) |

| CASE# | P              | Q             | WT. GRAMS |
|-------|----------------|---------------|-----------|
| K18   | .75<br>(19.05) | .07<br>(1.78) | 70.0      |

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .03$ ; 3 Pl.  $\pm .015$

#### Notes:

- Case material: Aluminum alloy.
- Case finish:  
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
- Mounting bracket available on request. Add suffix B to part number.
- For port marking 1, 2, and 3 see specifications data sheet.
- For bracket version, option B, dimension "C" changes from .75 to .94 inches when connectors are type N.
- Refer to the individual model data sheet for the type of connectors available.



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All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification              | Test/Inspection Condition                                                              | Reference/Spec                       |
|----------------------------|----------------------------------------------------------------------------------------|--------------------------------------|
| Operating Temperature      | -55° to 100°C<br>Ambient Environment                                                   | Individual Model Data Sheet          |
| Storage Temperature        | -55° to 100° C<br>Ambient Environment                                                  | Individual Model Data Sheet          |
| Barometric Pressure        | 100,000 Feet                                                                           | MIL-STD-202, Method 105, Condition D |
| Humidity                   | 90% RH, 65°C<br>Units may require bake-out after humidity to restore full performance. | MIL-STD-202, Method 103              |
| Thermal Shock              | -65° to 125°C, 5 cycles                                                                | MIL-STD-202, Method 107, Condition B |
| Vibration (High Frequency) | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)    | MIL-STD-202, Method 204, Condition D |
| Mechanical Shock           | 100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)                          | MIL-STD-202, Method 213, Condition I |