

# Coaxial Frequency Mixer

Level 7 (LO Power +7 dBm) 0.04 to 400 MHz

## Maximum Ratings

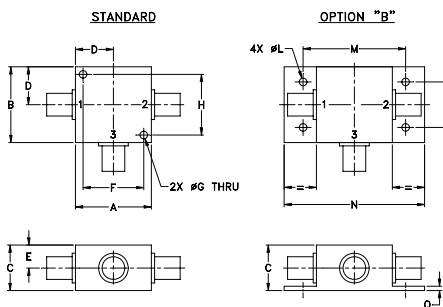
|                       |                |
|-----------------------|----------------|
| Operating Temperature | -55°C to 100°C |
| Storage Temperature   | -55°C to 100°C |
| RF Power              | 50mW           |
| IF Current            | 40mA           |

Permanent damage may occur if any of these limits are exceeded.

## Coaxial Connections

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

## Outline Drawing



## Outline Dimensions (inch/mm)

|       |       |       |       |       |       |      |       |
|-------|-------|-------|-------|-------|-------|------|-------|
| 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  |

## Features

- low conversion loss, 4.78 dB typ.
- high L-R isolation, 50 dB typ, L-I, 45 dB typ.
- rugged shielded case

## Applications

- VHF
- FM radio
- defense & federal communications
- instrumentation



Generic photo used for illustration purposes only

CASE STYLE: K18

|                      |          |
|----------------------|----------|
| Connectors           | Model    |
| BNC                  | ZFM-3+   |
| SMA                  | ZFM-3-S+ |
| BRACKET (OPTION "B") |          |

## +RoHS Compliant

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

## Electrical Specifications

| FREQUENCY (MHz) |        | CONVERSION LOSS (dB) |          |       |      | LO-RF ISOLATION (dB) |      |      |      |      |      | LO-IF ISOLATION (dB) |      |      |      |      |      |
|-----------------|--------|----------------------|----------|-------|------|----------------------|------|------|------|------|------|----------------------|------|------|------|------|------|
| LO/RF           | IF     | Mid-Band             |          | Total |      | L                    |      | M    |      | U    |      | L                    |      | M    |      | U    |      |
| $f_L$ - $f_U$   |        | $\bar{X}$            | $\sigma$ | Max.  | Max. | Typ.                 | Min. | Typ. | Min. | Typ. | Min. | Typ.                 | Min. | Typ. | Min. | Typ. | Min. |
| 0.04-400        | DC-400 | 4.78                 | 0.03     | 7.0   | 8.0  | 60                   | 50   | 50   | 35   | 35   | 25   | 55                   | 40   | 45   | 30   | 35   | 25   |

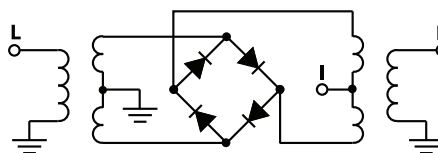
1 dB COMP: +1 dBm typ.

L = low range [ $f_L$  to  $10 f_L$ ] M = mid range [ $10 f_L$  to  $f_U/2$ ] U = upper range [ $f_U/2$  to  $f_U$ ]  
m = mid band [ $2 f_L$  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          |
| 0.04            | 30.04  | 6.15                 | >67.00             | >67.00             | 1.24              | 2.69              |
| 0.05            | 30.05  | 5.52                 | >67.00             | >67.00             | 1.25              | 2.55              |
| 0.07            | 30.07  | 5.12                 | >67.00             | >67.00             | 1.25              | 2.67              |
| 0.10            | 30.10  | 4.92                 | >67.00             | >67.00             | 1.24              | 2.63              |
| 0.50            | 30.50  | 4.77                 | >67.00             | >67.00             | 1.23              | 2.55              |
| 1.00            | 31.00  | 4.76                 | >67.00             | 63.53              | 1.23              | 2.45              |
| 5.00            | 35.00  | 4.75                 | >67.00             | 60.91              | 1.21              | 2.48              |
| 10.00           | 40.00  | 4.75                 | >67.00             | 60.97              | 1.21              | 2.42              |
| 20.00           | 50.00  | 4.74                 | >67.00             | 58.52              | 1.19              | 2.42              |
| 60.87           | 90.87  | 4.73                 | 50.40              | 49.37              | 1.18              | 2.36              |
| 100.00          | 70.00  | 4.63                 | 44.80              | 44.05              | 1.16              | 2.38              |
| 162.61          | 132.61 | 4.79                 | 39.22              | 39.87              | 1.15              | 2.46              |
| 200.00          | 170.00 | 4.95                 | 37.18              | 37.86              | 1.13              | 2.40              |
| 230.44          | 200.44 | 4.89                 | 35.78              | 37.67              | 1.13              | 2.42              |
| 281.31          | 251.31 | 5.05                 | 33.68              | 35.71              | 1.13              | 2.41              |
| 315.23          | 285.23 | 5.25                 | 34.22              | 33.98              | 1.14              | 2.56              |
| 349.14          | 319.14 | 5.32                 | 35.64              | 34.07              | 1.14              | 2.63              |
| 366.10          | 336.10 | 5.37                 | 35.56              | 34.58              | 1.14              | 2.68              |
| 383.05          | 353.05 | 5.44                 | 35.25              | 34.26              | 1.15              | 2.69              |
| 400.00          | 370.00 | 5.56                 | 34.72              | 32.46              | 1.15              | 2.76              |

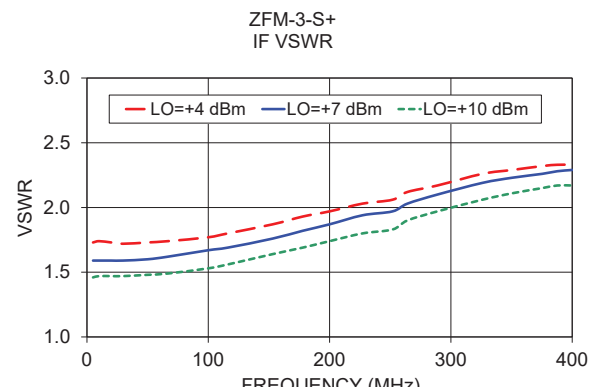
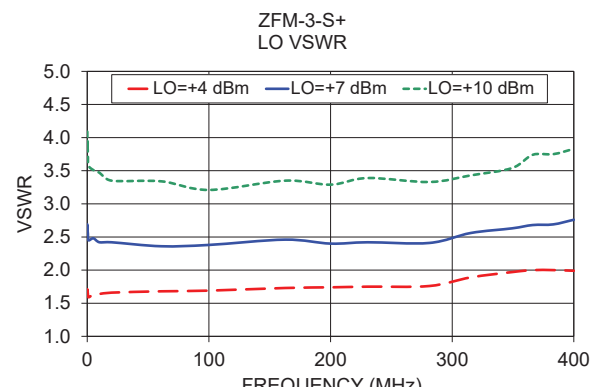
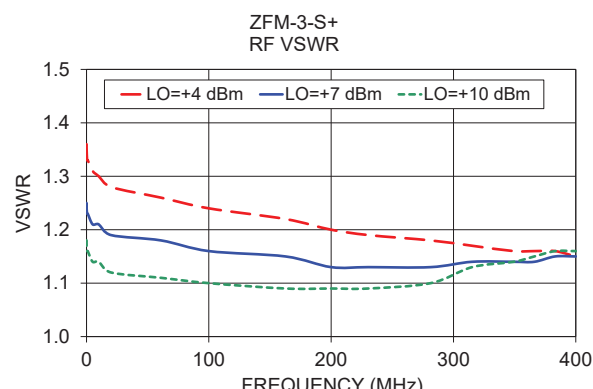
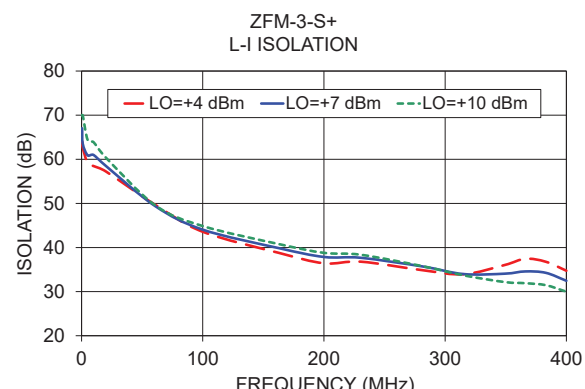
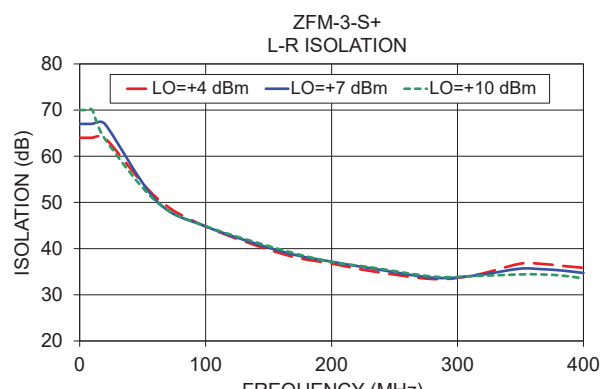
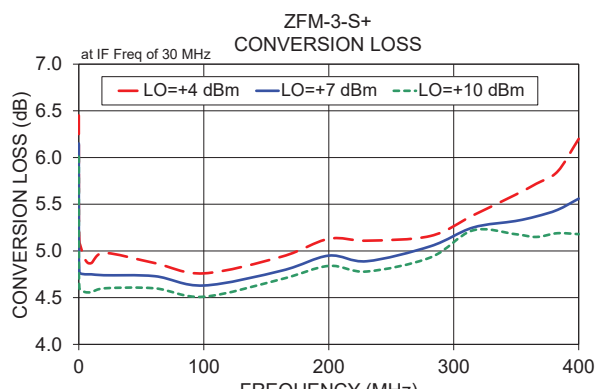
## Electrical Schematic



## Notes

- A. 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.  
B. 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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# Frequency Mixer

# ZFM-3+

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>IF FIXED<br>@IF(OUT)=30MHz<br>(dB) |      |      | RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       | RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF IN=+1dBm<br>(dB) |      |      |
|---------------------|-------------|-------------------------------------------------------|------|------|---------------------|-------------|--------------------|-------|-------|---------------------|-------------|-------------------------------------|------|------|
|                     |             | @LO (dBm)                                             |      |      |                     |             | @LO (dBm)          |       |       |                     |             | @LO (dBm)                           |      |      |
|                     |             |                                                       |      |      |                     |             |                    |       |       |                     |             |                                     |      |      |
| +4                  | +7          | +10                                                   | +4   | +7   | +10                 | +4          | +7                 | +10   | +4    | +7                  | +10         |                                     |      |      |
| 0.04                | 30.04       | 6.45                                                  | 6.15 | 6.01 | 10.1                | 40.1        | 18.34              | 18.12 | 19.29 | 10.1                | 40.1        | 1.41                                | 1.12 | 0.86 |
| 0.05                | 30.05       | 5.82                                                  | 5.52 | 5.36 | 26.5                | 56.5        | 15.46              | 16.47 | 17.00 | 26.5                | 56.5        | 1.37                                | 1.07 | 0.83 |
| 0.07                | 30.07       | 5.44                                                  | 5.12 | 4.99 | 42.9                | 72.9        | 15.83              | 16.32 | 18.84 | 42.9                | 72.9        | 1.42                                | 1.09 | 0.85 |
| 0.1                 | 30.1        | 5.30                                                  | 4.92 | 4.76 | 59.3                | 89.3        | 14.90              | 17.08 | 26.69 | 59.3                | 89.3        | 1.37                                | 1.06 | 0.81 |
| 0.5                 | 30.5        | 5.10                                                  | 4.77 | 4.60 | 75.7                | 105.7       | 15.53              | 20.21 | 21.09 | 75.7                | 105.7       | 1.29                                | 1.00 | 0.76 |
| 1.0                 | 31.0        | 5.07                                                  | 4.76 | 4.59 | 92.2                | 122.2       | 15.69              | 21.92 | 19.52 | 92.2                | 122.2       | 1.29                                | 0.97 | 0.75 |
| 5.0                 | 35.0        | 4.91                                                  | 4.75 | 4.56 | 108.6               | 138.6       | 17.27              | 19.72 | 15.31 | 108.6               | 138.6       | 1.32                                | 1.03 | 0.81 |
| 10.0                | 40.0        | 4.87                                                  | 4.75 | 4.56 | 125.0               | 155.0       | 15.96              | 19.66 | 15.62 | 125.0               | 155.0       | 1.25                                | 0.96 | 0.75 |
| 26.5                | 56.5        | 4.95                                                  | 4.75 | 4.64 | 141.4               | 171.4       | 16.57              | 18.74 | 15.23 | 141.4               | 171.4       | 1.19                                | 0.88 | 0.68 |
| 59.3                | 89.3        | 4.90                                                  | 4.72 | 4.61 | 157.8               | 187.8       | 14.48              | 13.78 | 14.60 | 157.8               | 187.8       | 1.16                                | 0.89 | 0.67 |
| 75.7                | 105.7       | 4.89                                                  | 4.71 | 4.61 | 174.2               | 204.2       | 10.86              | 9.57  | 9.61  | 174.2               | 204.2       | 1.13                                | 0.86 | 0.68 |
| 92.2                | 122.2       | 4.93                                                  | 4.76 | 4.66 | 190.6               | 220.6       | 13.18              | 11.49 | 11.69 | 190.6               | 220.6       | 1.12                                | 0.85 | 0.67 |
| 108.6               | 138.6       | 4.96                                                  | 4.78 | 4.68 | 207.0               | 237.0       | 21.67              | 16.79 | 15.17 | 207.0               | 237.0       | 1.12                                | 0.87 | 0.67 |
| 125.0               | 155.0       | 4.98                                                  | 4.82 | 4.72 | 223.4               | 253.4       | 18.96              | 26.39 | 21.19 | 223.4               | 253.4       | 1.06                                | 0.85 | 0.65 |
| 157.8               | 187.8       | 5.02                                                  | 4.86 | 4.77 | 239.8               | 269.8       | 12.73              | 11.76 | 13.59 | 239.8               | 269.8       | 1.07                                | 0.85 | 0.67 |
| 174.2               | 204.2       | 5.01                                                  | 4.85 | 4.77 | 256.3               | 286.3       | 10.71              | 10.03 | 9.84  | 256.3               | 286.3       | 1.17                                | 0.91 | 0.71 |
| 190.6               | 220.6       | 5.09                                                  | 4.92 | 4.82 | 272.7               | 302.7       | 10.27              | 9.73  | 9.89  | 272.7               | 302.7       | 1.29                                | 0.99 | 0.78 |
| 207.0               | 237.0       | 5.21                                                  | 4.99 | 4.85 | 289.1               | 319.1       | 9.58               | 8.94  | 9.57  | 289.1               | 319.1       | 1.46                                | 1.10 | 0.83 |
| 239.8               | 269.8       | 5.37                                                  | 5.19 | 5.03 | 305.5               | 335.5       | 9.68               | 9.46  | 11.23 | 305.5               | 335.5       | 1.62                                | 1.16 | 0.85 |
| 256.3               | 286.3       | 5.36                                                  | 5.21 | 5.10 | 321.9               | 351.9       | 9.85               | 10.88 | 13.21 | 321.9               | 351.9       | 1.74                                | 1.19 | 0.87 |
| 272.7               | 302.7       | 5.36                                                  | 5.22 | 5.14 | 338.3               | 368.3       | 9.46               | 12.39 | 14.57 | 338.3               | 368.3       | 1.90                                | 1.28 | 0.94 |
| 289.1               | 319.1       | 5.42                                                  | 5.27 | 5.21 | 354.7               | 384.7       | 7.04               | 11.87 | 16.12 | 354.7               | 384.7       | 2.04                                | 1.45 | 1.07 |
| 305.5               | 335.5       | 5.51                                                  | 5.34 | 5.26 | 371.1               | 401.1       | 3.90               | 9.26  | 14.09 | 371.1               | 401.1       | 2.11                                | 1.65 | 1.23 |
| 338.3               | 368.3       | 5.72                                                  | 5.50 | 5.41 | 387.5               | 417.5       | 1.59               | 4.94  | 9.88  | 387.5               | 417.5       | 2.18                                | 1.80 | 1.42 |
| 354.7               | 384.7       | 5.90                                                  | 5.60 | 5.44 | 403.9               | 433.9       | 0.63               | 2.54  | 6.03  | 403.9               | 433.9       | 2.18                                | 1.82 | 1.55 |
| 371.1               | 401.1       | 6.15                                                  | 5.74 | 5.47 | 420.4               | 450.4       | 0.62               | 1.91  | 4.57  | 420.4               | 450.4       | 2.04                                | 1.75 | 1.55 |
| 387.5               | 417.5       | 6.37                                                  | 5.97 | 5.58 | 436.8               | 466.8       | 0.90               | 1.96  | 4.13  | 436.8               | 466.8       | 1.97                                | 1.73 | 1.54 |
| 403.9               | 433.9       | 6.60                                                  | 6.23 | 5.76 | 453.2               | 483.2       | 1.51               | 2.36  | 4.19  | 453.2               | 483.2       | 1.80                                | 1.58 | 1.41 |
| 436.8               | 466.8       | 6.96                                                  | 6.54 | 6.09 | 469.6               | 499.6       | 3.21               | 3.85  | 5.69  | 469.6               | 499.6       | 1.56                                | 1.36 | 1.18 |
| 453.2               | 483.2       | 7.22                                                  | 6.80 | 6.38 | 486.0               | 516.0       | 4.63               | 5.15  | 7.03  | 486.0               | 516.0       | 1.50                                | 1.29 | 1.06 |
| 469.6               | 499.6       | 7.55                                                  | 7.13 | 6.75 | 502.4               | 532.4       | 6.23               | 6.75  | 9.10  | 502.4               | 532.4       | 1.52                                | 1.29 | 1.02 |
| 486.0               | 516.0       | 7.70                                                  | 7.28 | 6.97 | 518.8               | 548.8       | 8.20               | 9.20  | 13.44 | 518.8               | 548.8       | 1.49                                | 1.19 | 0.93 |
| 502.4               | 532.4       | 7.82                                                  | 7.39 | 7.11 | 535.2               | 565.2       | 8.50               | 10.98 | 24.22 | 535.2               | 565.2       | 1.53                                | 1.19 | 1.00 |
| 535.2               | 565.2       | 7.89                                                  | 7.55 | 7.27 | 551.6               | 581.6       | 8.72               | 11.06 | 13.65 | 551.6               | 581.6       | 1.50                                | 1.15 | 1.01 |
| 551.6               | 581.6       | 8.05                                                  | 7.74 | 7.43 | 568.0               | 598.0       | 8.40               | 10.17 | 12.17 | 568.0               | 598.0       | 1.45                                | 1.08 | 0.91 |
| 568.0               | 598.0       | 8.22                                                  | 7.98 | 7.75 | 584.5               | 614.5       | 7.91               | 9.30  | 11.52 | 584.5               | 614.5       | 1.46                                | 1.10 | 0.88 |
| 584.5               | 614.5       | 8.39                                                  | 8.15 | 8.00 | 600.9               | 630.9       | 7.55               | 9.15  | 11.65 | 600.9               | 630.9       | 1.45                                | 1.05 | 0.80 |
| 600.9               | 630.9       | 8.67                                                  | 8.47 | 8.39 | 617.3               | 647.3       | 7.68               | 9.57  | 12.27 | 617.3               | 647.3       | 1.34                                | 0.93 | 0.68 |
| 633.7               | 663.7       | 9.39                                                  | 9.26 | 9.30 | 633.7               | 663.7       | 8.04               | 10.37 | 12.57 | 633.7               | 663.7       | 1.25                                | 0.87 | 0.67 |
| 650.1               | 680.1       | 9.84                                                  | 9.74 | 9.79 | 650.1               | 680.1       | 8.83               | 11.29 | 12.78 | 650.1               | 680.1       | 1.15                                | 0.81 | 0.67 |

REV. X2

ZFM-3+

100818

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IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED • RoHS compliant

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# Frequency Mixer

# ZFM-3+

## Typical Performance Data

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=200.1MHz<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)=400.1MHz<br>(dB) |
|----------------------|-------------|-----------------------------------------------------------------|----------------------|-------------|----------------------------------------------------------------|----------------------|-------------|-----------------------------------------------------------------|
|                      |             | @LO (dBm)                                                       |                      |             | @LO (dBm)                                                      |                      |             | @LO (dBm)                                                       |
|                      |             | +7                                                              |                      |             | +7                                                             |                      |             | +7                                                              |
| 190.0                | 10.1        | 5.22                                                            | 10.0                 | 20.1        | 4.68                                                           | 390.0                | 10.1        | 6.77                                                            |
| 185.4                | 14.7        | 5.19                                                            | 19.7                 | 29.8        | 4.72                                                           | 380.3                | 19.8        | 6.67                                                            |
| 180.8                | 19.3        | 5.17                                                            | 29.5                 | 39.6        | 4.74                                                           | 370.5                | 29.6        | 6.60                                                            |
| 176.2                | 23.9        | 5.14                                                            | 39.2                 | 49.3        | 4.73                                                           | 360.8                | 39.3        | 6.52                                                            |
| 171.5                | 28.6        | 5.12                                                            | 49.0                 | 59.1        | 4.76                                                           | 351.0                | 49.1        | 6.46                                                            |
| 166.9                | 33.2        | 5.09                                                            | 58.7                 | 68.8        | 4.79                                                           | 341.3                | 58.8        | 6.41                                                            |
| 162.3                | 37.8        | 5.07                                                            | 68.5                 | 78.6        | 4.80                                                           | 331.5                | 68.6        | 6.36                                                            |
| 157.7                | 42.4        | 5.05                                                            | 78.2                 | 88.3        | 4.81                                                           | 321.8                | 78.3        | 6.33                                                            |
| 153.1                | 47.0        | 5.02                                                            | 87.9                 | 98.0        | 4.84                                                           | 312.1                | 88.0        | 6.34                                                            |
| 148.5                | 51.6        | 5.00                                                            | 97.7                 | 107.8       | 4.87                                                           | 302.3                | 97.8        | 6.36                                                            |
| 143.8                | 56.3        | 4.99                                                            | 107.4                | 117.5       | 4.91                                                           | 292.6                | 107.5       | 6.34                                                            |
| 139.2                | 60.9        | 4.99                                                            | 117.2                | 127.3       | 4.93                                                           | 282.8                | 117.3       | 6.31                                                            |
| 134.6                | 65.5        | 4.98                                                            | 126.9                | 137.0       | 4.92                                                           | 273.1                | 127.0       | 6.30                                                            |
| 130.0                | 70.1        | 4.97                                                            | 136.7                | 146.8       | 4.96                                                           | 263.3                | 136.8       | 6.28                                                            |
| 125.4                | 74.7        | 4.96                                                            | 146.4                | 156.5       | 5.00                                                           | 253.6                | 146.5       | 6.25                                                            |
| 120.8                | 79.3        | 4.96                                                            | 156.2                | 166.3       | 5.01                                                           | 243.8                | 156.3       | 6.25                                                            |
| 116.2                | 83.9        | 4.96                                                            | 165.9                | 176.0       | 5.00                                                           | 234.1                | 166.0       | 6.26                                                            |
| 111.5                | 88.6        | 4.95                                                            | 175.6                | 185.7       | 5.03                                                           | 224.4                | 175.7       | 6.26                                                            |
| 106.9                | 93.2        | 4.95                                                            | 185.4                | 195.5       | 5.07                                                           | 214.6                | 185.5       | 6.28                                                            |
| 102.3                | 97.8        | 4.94                                                            | 195.1                | 205.2       | 5.06                                                           | 204.9                | 195.2       | 6.28                                                            |
| 97.7                 | 102.4       | 4.94                                                            | 204.9                | 215.0       | 5.06                                                           | 195.1                | 205.0       | 6.33                                                            |
| 93.1                 | 107.0       | 4.94                                                            | 214.6                | 224.7       | 5.06                                                           | 185.4                | 214.7       | 6.34                                                            |
| 88.5                 | 111.6       | 4.93                                                            | 224.4                | 234.5       | 5.07                                                           | 175.6                | 224.5       | 6.31                                                            |
| 83.8                 | 116.3       | 4.93                                                            | 234.1                | 244.2       | 5.14                                                           | 165.9                | 234.2       | 6.28                                                            |
| 79.2                 | 120.9       | 4.94                                                            | 243.8                | 253.9       | 5.24                                                           | 156.2                | 243.9       | 6.23                                                            |
| 74.6                 | 125.5       | 4.94                                                            | 253.6                | 263.7       | 5.35                                                           | 146.4                | 253.7       | 6.17                                                            |
| 70.0                 | 130.1       | 4.96                                                            | 263.3                | 273.4       | 5.46                                                           | 136.7                | 263.4       | 6.11                                                            |
| 65.4                 | 134.7       | 4.95                                                            | 273.1                | 283.2       | 5.52                                                           | 126.9                | 273.2       | 6.08                                                            |
| 60.8                 | 139.3       | 4.94                                                            | 282.8                | 292.9       | 5.50                                                           | 117.2                | 282.9       | 6.05                                                            |
| 56.2                 | 143.9       | 4.94                                                            | 292.6                | 302.7       | 5.50                                                           | 107.4                | 292.7       | 6.07                                                            |
| 51.5                 | 148.6       | 4.92                                                            | 302.3                | 312.4       | 5.47                                                           | 97.7                 | 302.4       | 6.05                                                            |
| 46.9                 | 153.2       | 4.92                                                            | 312.1                | 322.2       | 5.37                                                           | 87.9                 | 312.2       | 6.01                                                            |
| 42.3                 | 157.8       | 4.91                                                            | 321.8                | 331.9       | 5.34                                                           | 78.2                 | 321.9       | 5.96                                                            |
| 37.7                 | 162.4       | 4.90                                                            | 331.5                | 341.6       | 5.29                                                           | 68.5                 | 331.6       | 5.90                                                            |
| 33.1                 | 167.0       | 4.90                                                            | 341.3                | 351.4       | 5.26                                                           | 58.7                 | 341.4       | 5.83                                                            |
| 28.5                 | 171.6       | 4.88                                                            | 351.0                | 361.1       | 5.27                                                           | 49.0                 | 351.1       | 5.75                                                            |
| 23.8                 | 176.3       | 4.88                                                            | 360.8                | 370.9       | 5.27                                                           | 39.2                 | 360.9       | 5.70                                                            |
| 19.2                 | 180.9       | 4.88                                                            | 370.5                | 380.6       | 5.28                                                           | 29.5                 | 370.6       | 5.69                                                            |
| 14.6                 | 185.5       | 4.89                                                            | 380.3                | 390.4       | 5.30                                                           | 19.7                 | 380.4       | 5.71                                                            |
| 10.0                 | 190.1       | 4.89                                                            | 390.0                | 400.1       | 5.33                                                           | 10.0                 | 390.1       | 5.74                                                            |

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## 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   |
| 0.04        | 64.00                   | 67.00 | 70.00 | 64.00                   | 67.00 | 70.00 |
| 0.05        | 64.00                   | 67.00 | 70.00 | 64.00                   | 67.00 | 70.00 |
| 0.07        | 64.00                   | 67.00 | 70.00 | 64.00                   | 67.00 | 70.00 |
| 0.1         | 64.00                   | 67.00 | 70.00 | 64.00                   | 67.00 | 70.00 |
| 0.5         | 64.00                   | 67.00 | 70.00 | 64.00                   | 67.00 | 70.00 |
| 1.0         | 64.00                   | 67.00 | 70.00 | 62.64                   | 63.53 | 70.00 |
| 5.0         | 64.00                   | 67.00 | 70.00 | 59.16                   | 60.91 | 64.41 |
| 10.0        | 64.00                   | 67.00 | 70.00 | 58.46                   | 60.97 | 63.86 |
| 26.5        | 63.64                   | 63.74 | 64.07 | 68.51                   | 67.00 | 63.99 |
| 59.3        | 56.40                   | 57.07 | 57.61 | 59.54                   | 58.60 | 57.92 |
| 75.7        | 54.38                   | 55.00 | 55.47 | 56.44                   | 56.36 | 55.91 |
| 92.2        | 52.53                   | 53.30 | 53.92 | 54.83                   | 55.18 | 54.58 |
| 108.6       | 51.42                   | 52.05 | 52.43 | 53.51                   | 53.60 | 52.81 |
| 125.0       | 49.40                   | 50.12 | 50.74 | 52.77                   | 53.18 | 52.24 |
| 157.8       | 49.08                   | 49.80 | 50.11 | 50.76                   | 49.69 | 48.46 |
| 174.2       | 47.15                   | 48.30 | 48.92 | 53.73                   | 50.60 | 47.63 |
| 190.6       | 44.41                   | 45.24 | 46.10 | 53.19                   | 52.00 | 48.69 |
| 207.0       | 43.23                   | 43.82 | 44.60 | 52.99                   | 49.95 | 47.58 |
| 239.8       | 44.72                   | 44.69 | 44.95 | 44.98                   | 43.33 | 42.13 |
| 256.3       | 46.05                   | 45.83 | 45.40 | 41.80                   | 40.57 | 39.69 |
| 272.7       | 47.71                   | 47.16 | 46.28 | 40.85                   | 39.28 | 38.38 |
| 289.1       | 47.80                   | 47.00 | 46.10 | 39.90                   | 38.12 | 37.25 |
| 305.5       | 47.46                   | 46.56 | 45.14 | 41.22                   | 37.98 | 36.35 |
| 338.3       | 42.22                   | 42.40 | 41.90 | 44.60                   | 36.27 | 32.98 |
| 354.7       | 40.09                   | 40.42 | 40.36 | 43.95                   | 35.36 | 32.12 |
| 371.1       | 38.65                   | 39.37 | 39.91 | 42.50                   | 35.06 | 31.48 |
| 387.5       | 37.78                   | 38.46 | 39.13 | 39.02                   | 33.74 | 30.49 |
| 403.9       | 37.12                   | 37.45 | 37.86 | 37.78                   | 33.32 | 29.88 |
| 436.8       | 37.33                   | 37.91 | 38.27 | 34.50                   | 32.98 | 29.63 |
| 453.2       | 37.59                   | 38.29 | 38.74 | 32.59                   | 31.50 | 29.11 |
| 469.6       | 37.67                   | 38.56 | 39.14 | 31.17                   | 30.32 | 28.26 |
| 486.0       | 37.37                   | 37.94 | 38.03 | 29.85                   | 29.15 | 27.16 |
| 502.4       | 36.40                   | 36.96 | 36.68 | 28.92                   | 28.54 | 26.31 |
| 535.2       | 35.20                   | 35.15 | 33.64 | 26.51                   | 25.98 | 23.22 |
| 551.6       | 34.46                   | 33.90 | 31.90 | 25.22                   | 24.26 | 21.47 |
| 568.0       | 33.13                   | 32.03 | 29.87 | 24.06                   | 22.70 | 19.99 |
| 584.5       | 31.32                   | 29.94 | 27.94 | 22.91                   | 21.36 | 18.92 |
| 600.9       | 29.98                   | 28.61 | 26.77 | 21.70                   | 20.24 | 18.10 |
| 633.7       | 26.75                   | 25.67 | 24.23 | 19.21                   | 18.24 | 16.61 |
| 650.1       | 25.12                   | 24.22 | 22.91 | 17.99                   | 17.19 | 15.72 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +4                      | +7    | +10   |
| 10.1                | 40.1        | 38.99                   | 37.34 | 36.05 |
| 26.5                | 56.5        | 32.65                   | 32.27 | 31.88 |
| 42.9                | 72.9        | 29.18                   | 29.08 | 29.02 |
| 59.3                | 89.3        | 26.91                   | 26.99 | 26.92 |
| 75.7                | 105.7       | 25.62                   | 25.69 | 25.71 |
| 92.2                | 122.2       | 24.42                   | 24.73 | 24.91 |
| 108.6               | 138.6       | 23.61                   | 23.78 | 23.94 |
| 125.0               | 155.0       | 23.72                   | 23.91 | 24.00 |
| 141.4               | 171.4       | 23.61                   | 24.14 | 24.42 |
| 157.8               | 187.8       | 23.25                   | 24.08 | 24.81 |
| 174.2               | 204.2       | 23.05                   | 23.69 | 24.29 |
| 190.6               | 220.6       | 23.19                   | 23.62 | 24.05 |
| 207.0               | 237.0       | 23.97                   | 24.32 | 24.74 |
| 223.4               | 253.4       | 25.47                   | 25.88 | 26.25 |
| 239.8               | 269.8       | 26.73                   | 27.52 | 28.43 |
| 256.3               | 286.3       | 25.99                   | 26.76 | 27.68 |
| 272.7               | 302.7       | 23.49                   | 24.02 | 24.51 |
| 289.1               | 319.1       | 20.80                   | 21.11 | 21.40 |
| 305.5               | 335.5       | 19.00                   | 19.18 | 19.25 |
| 321.9               | 351.9       | 17.53                   | 17.59 | 17.61 |
| 338.3               | 368.3       | 16.54                   | 16.48 | 16.47 |
| 354.7               | 384.7       | 15.82                   | 15.76 | 15.78 |
| 371.1               | 401.1       | 15.40                   | 15.28 | 15.33 |
| 387.5               | 417.5       | 15.02                   | 14.91 | 14.98 |
| 403.9               | 433.9       | 14.87                   | 14.73 | 14.80 |
| 420.4               | 450.4       | 14.83                   | 14.75 | 14.76 |
| 436.8               | 466.8       | 14.68                   | 14.60 | 14.67 |
| 453.2               | 483.2       | 14.55                   | 14.45 | 14.48 |
| 469.6               | 499.6       | 14.28                   | 14.16 | 14.21 |
| 486.0               | 516.0       | 13.70                   | 13.60 | 13.71 |
| 502.4               | 532.4       | 13.15                   | 13.12 | 13.21 |
| 518.8               | 548.8       | 12.51                   | 12.54 | 12.63 |
| 535.2               | 565.2       | 12.03                   | 12.05 | 12.02 |
| 551.6               | 581.6       | 11.51                   | 11.47 | 11.36 |
| 568.0               | 598.0       | 10.92                   | 10.80 | 10.63 |
| 584.5               | 614.5       | 10.41                   | 10.27 | 10.03 |
| 600.9               | 630.9       | 9.83                    | 9.63  | 9.32  |
| 617.3               | 647.3       | 9.14                    | 8.88  | 8.53  |
| 633.7               | 663.7       | 8.45                    | 8.16  | 7.82  |
| 650.1               | 680.1       | 7.79                    | 7.47  | 7.19  |

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## 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=400.1MHz<br>(:1) |      |      |
|---------------------|-------------|-----------------|------|------|-------------|-----------------|------|------|----------------------|---------------------------------|------|------|
|                     |             | @LO (dBm)       |      |      |             | @LO (dBm)       |      |      |                      | @LO (dBm)                       |      |      |
|                     |             | +4              | +7   | +10  |             | +4              | +7   | +10  |                      | +4                              | +7   | +10  |
| 5.0                 | 35.0        | 1.36            | 1.24 | 1.18 | 5.0         | 1.71            | 2.69 | 4.09 | 5.0                  | 1.73                            | 1.59 | 1.46 |
| 10.0                | 40.0        | 1.36            | 1.25 | 1.18 | 10.0        | 1.64            | 2.55 | 3.82 | 10.0                 | 1.74                            | 1.59 | 1.47 |
| 26.5                | 56.5        | 1.36            | 1.25 | 1.17 | 26.5        | 1.66            | 2.44 | 3.42 | 20.0                 | 2.01                            | 1.60 | 1.39 |
| 42.9                | 72.9        | 1.33            | 1.22 | 1.15 | 42.9        | 1.62            | 2.34 | 3.25 | 30.0                 | 2.02                            | 1.61 | 1.40 |
| 59.3                | 89.3        | 1.32            | 1.21 | 1.14 | 59.3        | 1.60            | 2.30 | 3.18 | 40.0                 | 2.02                            | 1.61 | 1.41 |
| 75.7                | 105.7       | 1.27            | 1.17 | 1.11 | 75.7        | 1.62            | 2.34 | 3.24 | 50.0                 | 2.03                            | 1.63 | 1.43 |
| 92.2                | 122.2       | 1.25            | 1.15 | 1.09 | 92.2        | 1.67            | 2.43 | 3.36 | 60.0                 | 2.04                            | 1.64 | 1.45 |
| 108.6               | 138.6       | 1.24            | 1.15 | 1.09 | 108.6       | 1.68            | 2.43 | 3.35 | 70.0                 | 2.05                            | 1.66 | 1.47 |
| 125.0               | 155.0       | 1.22            | 1.13 | 1.08 | 125.0       | 1.66            | 2.36 | 3.22 | 80.0                 | 2.06                            | 1.67 | 1.48 |
| 141.4               | 171.4       | 1.18            | 1.09 | 1.05 | 141.4       | 1.63            | 2.30 | 3.12 | 90.0                 | 2.06                            | 1.68 | 1.50 |
| 157.8               | 187.8       | 1.17            | 1.07 | 1.04 | 157.8       | 1.65            | 2.32 | 3.14 | 100.0                | 2.07                            | 1.70 | 1.52 |
| 174.2               | 204.2       | 1.14            | 1.06 | 1.03 | 174.2       | 1.69            | 2.39 | 3.24 | 110.0                | 2.09                            | 1.73 | 1.55 |
| 190.6               | 220.6       | 1.11            | 1.04 | 1.02 | 190.6       | 1.74            | 2.46 | 3.34 | 120.0                | 2.11                            | 1.75 | 1.57 |
| 207.0               | 237.0       | 1.10            | 1.04 | 1.07 | 207.0       | 1.74            | 2.44 | 3.29 | 130.0                | 2.10                            | 1.76 | 1.59 |
| 223.4               | 253.4       | 1.10            | 1.06 | 1.12 | 223.4       | 1.74            | 2.38 | 3.18 | 140.0                | 2.11                            | 1.77 | 1.61 |
| 239.8               | 269.8       | 1.06            | 1.07 | 1.13 | 239.8       | 1.74            | 2.36 | 3.14 | 150.0                | 2.11                            | 1.79 | 1.64 |
| 256.3               | 286.3       | 1.05            | 1.10 | 1.16 | 256.3       | 1.77            | 2.43 | 3.23 | 160.0                | 2.13                            | 1.80 | 1.66 |
| 272.7               | 302.7       | 1.09            | 1.17 | 1.23 | 272.7       | 1.83            | 2.52 | 3.37 | 170.0                | 2.14                            | 1.82 | 1.68 |
| 289.1               | 319.1       | 1.14            | 1.23 | 1.30 | 289.1       | 1.87            | 2.57 | 3.43 | 180.0                | 2.14                            | 1.84 | 1.70 |
| 305.5               | 335.5       | 1.16            | 1.26 | 1.33 | 305.5       | 1.88            | 2.54 | 3.36 | 190.0                | 2.15                            | 1.86 | 1.73 |
| 321.9               | 351.9       | 1.17            | 1.26 | 1.32 | 321.9       | 1.87            | 2.48 | 3.26 | 200.0                | 2.17                            | 1.88 | 1.75 |
| 338.3               | 368.3       | 1.15            | 1.24 | 1.29 | 338.3       | 1.89            | 2.48 | 3.24 | 210.0                | 2.17                            | 1.89 | 1.77 |
| 354.7               | 384.7       | 1.09            | 1.18 | 1.23 | 354.7       | 1.96            | 2.55 | 3.33 | 220.0                | 2.16                            | 1.89 | 1.78 |
| 371.1               | 401.1       | 1.01            | 1.10 | 1.16 | 371.1       | 2.06            | 2.67 | 3.46 | 230.0                | 2.15                            | 1.90 | 1.79 |
| 387.5               | 417.5       | 1.06            | 1.03 | 1.11 | 387.5       | 2.15            | 2.79 | 3.58 | 240.0                | 2.15                            | 1.90 | 1.81 |
| 403.9               | 433.9       | 1.15            | 1.08 | 1.08 | 403.9       | 2.18            | 2.84 | 3.61 | 250.0                | 2.16                            | 1.92 | 1.82 |
| 420.4               | 450.4       | 1.26            | 1.20 | 1.16 | 420.4       | 2.15            | 2.82 | 3.59 | 260.0                | 2.18                            | 1.93 | 1.83 |
| 436.8               | 466.8       | 1.34            | 1.28 | 1.24 | 436.8       | 2.14            | 2.81 | 3.59 | 270.0                | 2.18                            | 1.94 | 1.85 |
| 453.2               | 483.2       | 1.46            | 1.40 | 1.36 | 453.2       | 2.17            | 2.86 | 3.67 | 280.0                | 2.19                            | 1.96 | 1.87 |
| 469.6               | 499.6       | 1.64            | 1.58 | 1.55 | 469.6       | 2.22            | 2.95 | 3.79 | 290.0                | 2.18                            | 1.96 | 1.88 |
| 486.0               | 516.0       | 1.74            | 1.70 | 1.69 | 486.0       | 2.27            | 3.00 | 3.85 | 300.0                | 2.17                            | 1.95 | 1.88 |
| 502.4               | 532.4       | 1.88            | 1.86 | 1.85 | 502.4       | 2.27            | 2.97 | 3.79 | 310.0                | 2.15                            | 1.94 | 1.86 |
| 518.8               | 548.8       | 2.03            | 2.02 | 2.03 | 518.8       | 2.25            | 2.91 | 3.70 | 320.0                | 2.12                            | 1.92 | 1.85 |
| 535.2               | 565.2       | 2.13            | 2.13 | 2.13 | 535.2       | 2.25            | 2.90 | 3.67 | 330.0                | 2.11                            | 1.91 | 1.84 |
| 551.6               | 581.6       | 2.28            | 2.29 | 2.26 | 551.6       | 2.28            | 2.92 | 3.68 | 340.0                | 2.11                            | 1.90 | 1.84 |
| 568.0               | 598.0       | 2.43            | 2.42 | 2.39 | 568.0       | 2.32            | 2.96 | 3.71 | 350.0                | 2.11                            | 1.90 | 1.84 |
| 584.5               | 614.5       | 2.53            | 2.52 | 2.48 | 584.5       | 2.34            | 2.97 | 3.72 | 360.0                | 2.11                            | 1.90 | 1.84 |
| 600.9               | 630.9       | 2.65            | 2.61 | 2.58 | 600.9       | 2.35            | 2.95 | 3.67 | 370.0                | 2.11                            | 1.90 | 1.84 |
| 617.3               | 647.3       | 2.72            | 2.68 | 2.65 | 617.3       | 2.36            | 2.93 | 3.63 | 380.0                | 2.10                            | 1.90 | 1.84 |
| 633.7               | 663.7       | 2.76            | 2.71 | 2.68 | 633.7       | 2.39            | 2.94 | 3.62 | 390.0                | 2.09                            | 1.89 | 1.83 |
| 650.1               | 680.1       | 2.80            | 2.73 | 2.69 | 650.1       | 2.46            | 2.99 | 3.65 | 400.0                | 2.26                            | 2.09 | 2.06 |

## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 20  | 30  | 13  | 34  | 17  | 36  | 27  | 38  | 38  | 44  |
| 1  | -      | 19     | +0  | 25  | 11  | 39  | 23  | 43  | 39  | 40  | 37  | 42  |
| 2  | >100   | 59     | 55  | 56  | 56  | 58  | 49  | 61  | 54  | 77  | 62  | 79  |
| 3  | >100   | 68     | 64  | 66  | 68  | 71  | 66  | 69  | 73  | 72  | 65  | 69  |
| 4  | >100   | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| 5  | >100   | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| 6  | >100   | >81    | >81 | >81 | >81 | >81 | 78  | >81 | >81 | >81 | >81 | >81 |
| 7  | >100   | >81    | >81 | >81 | >81 | >81 | >81 | 66  | >81 | >81 | >81 | >81 |
| 8  | >100   | >81    | >81 | >81 | >81 | >81 | >81 | >81 | 61  | >81 | >81 | >81 |
| 9  | >100   | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | 51  | >81 | >81 |
| 10 | >100   | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | 79  | >81 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 200.1 MHz; -14.00 dBm.  
LO IN: 230.01 MHz; +7.00 dBm  
IF OUT: 29.91 MHz; -19.03 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 29  | 39  | 24  | 52  | 28  | 50  | 39  | 52  | 52  | 58  |
| 1  | -      | 20     | +0  | 26  | 12  | 36  | 24  | 50  | 38  | 48  | 46  | 50  |
| 2  | 97     | 55     | 51  | 53  | 51  | 54  | 46  | 56  | 50  | 70  | 55  | 62  |
| 3  | >100   | 52     | 39  | 45  | 41  | 45  | 37  | 54  | 49  | 54  | 54  | 51  |
| 4  | >100   | 67     | 68  | 65  | 64  | 64  | 65  | 64  | 56  | 72  | 65  | 80  |
| 5  | >100   | 71     | 60  | 67  | 55  | 74  | 52  | 84  | 53  | 63  | 63  | 67  |
| 6  | >100   | 89     | 82  | 82  | 81  | 81  | 75  | 80  | 78  | 79  | 78  | 85  |
| 7  | >100   | >91    | 89  | 84  | 82  | 76  | 70  | 74  | 65  | 72  | 62  | 89  |
| 8  | >100   | >91    | >91 | >91 | >91 | 87  | >91 | >91 | 75  | 87  | 87  | 91  |
| 9  | >100   | >91    | 89  | 89  | 88  | >91 | 78  | 86  | 82  | 67  | 83  | 87  |
| 10 | >100   | >91    | >91 | >91 | >91 | >91 | >91 | >91 | >91 | >91 | >91 | >91 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 200.1 MHz; -4.00 dBm.  
LO IN: 230.01 MHz; +7.00 dBm  
IF OUT: 29.91 MHz; -9.07 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.

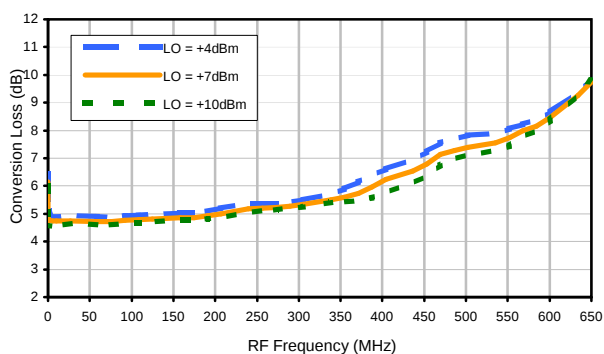
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# Frequency Mixer

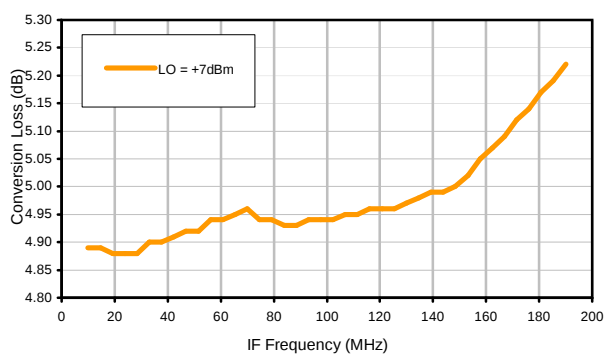
ZFM-3+

## Typical Performance Curves

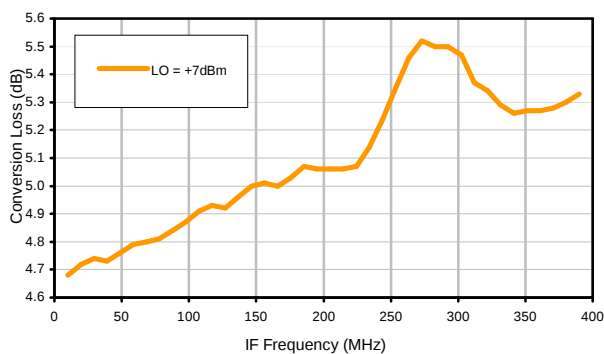
Conversion Loss @ IF=30MHz



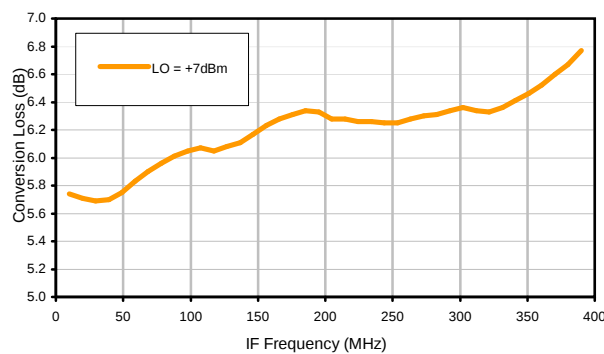
Conversion Loss vs. IF @ RF=200.1MHz



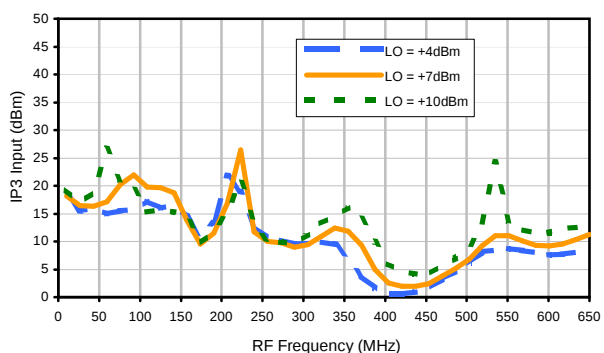
Conversion Loss vs. IF @ RF=10.1MHz



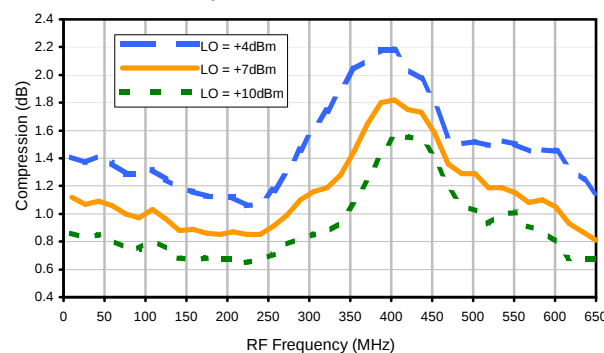
Conversion Loss vs. IF @ RF=400.1MHz



IP3 Input



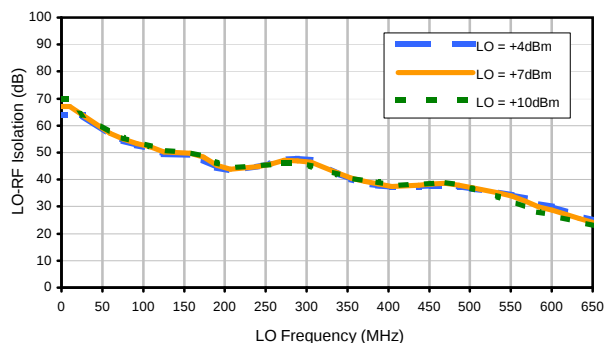
Compression @ RF IN=+1dBm



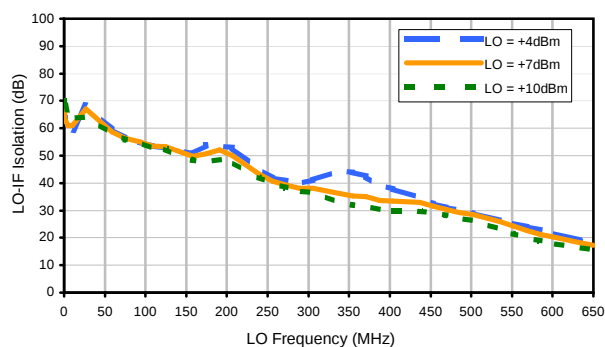
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## Typical Performance Curves

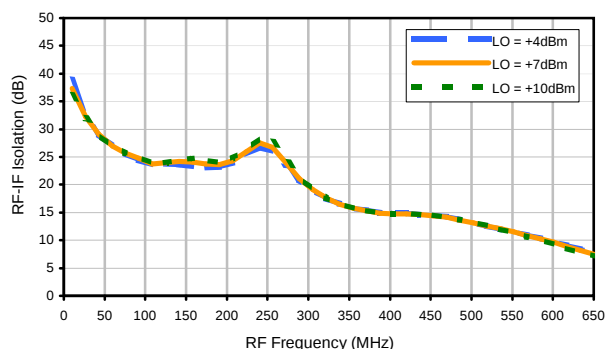
LO-RF Isolation



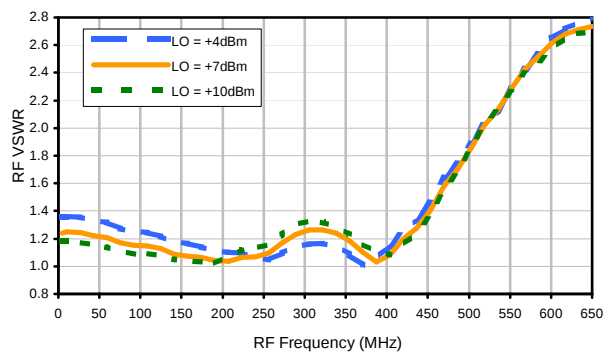
LO-IF Isolation



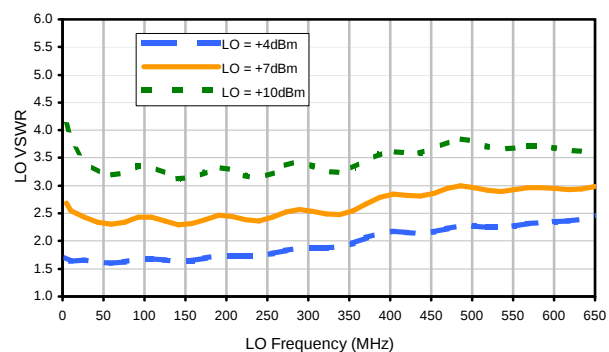
RF-IF Isolation



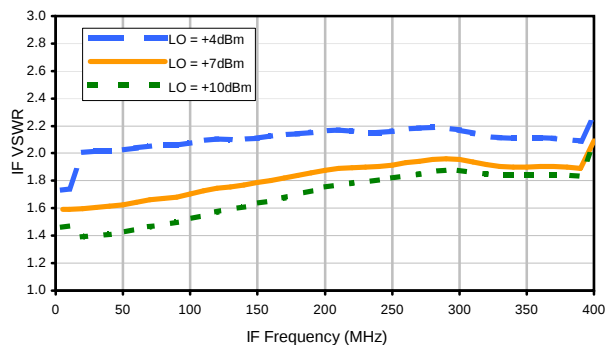
RF VSWR



LO VSWR



IF VSWR



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## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 20  | 30  | 13  | 34  | 17  | 36  | 27  | 38  | 38  | 44  |
| 1  | -      | 19     | +0  | 25  | 11  | 39  | 23  | 43  | 39  | 40  | 37  | 42  |
| 2  | >100   | 59     | 55  | 56  | 56  | 58  | 49  | 61  | 54  | 77  | 62  | 79  |
| 3  | >100   | 68     | 64  | 66  | 68  | 71  | 66  | 69  | 73  | 72  | 65  | 69  |
| 4  | >100   | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| 5  | >100   | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
| 6  | >100   | >81    | >81 | >81 | >81 | >81 | 78  | >81 | >81 | >81 | >81 | >81 |
| 7  | >100   | >81    | >81 | >81 | >81 | >81 | >81 | 66  | >81 | >81 | >81 | >81 |
| 8  | >100   | >81    | >81 | >81 | >81 | >81 | >81 | >81 | 61  | >81 | >81 | >81 |
| 9  | >100   | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | 51  | >81 | >81 |
| 10 | >100   | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | 79  | >81 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 200.1 MHz; -14.00 dBm.  
LO IN: 230.01 MHz; +7.00 dBm  
IF OUT: 29.91 MHz; -19.03 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 29  | 39  | 24  | 52  | 28  | 50  | 39  | 52  | 52  | 58  |
| 1  | -      | 20     | +0  | 26  | 12  | 36  | 24  | 50  | 38  | 48  | 46  | 50  |
| 2  | 97     | 55     | 51  | 53  | 51  | 54  | 46  | 56  | 50  | 70  | 55  | 62  |
| 3  | >100   | 52     | 39  | 45  | 41  | 45  | 37  | 54  | 49  | 54  | 54  | 51  |
| 4  | >100   | 67     | 68  | 65  | 64  | 64  | 65  | 64  | 56  | 72  | 65  | 80  |
| 5  | >100   | 71     | 60  | 67  | 55  | 74  | 52  | 84  | 53  | 63  | 63  | 67  |
| 6  | >100   | 89     | 82  | 82  | 81  | 81  | 75  | 80  | 78  | 79  | 78  | 85  |
| 7  | >100   | >91    | 89  | 84  | 82  | 76  | 70  | 74  | 65  | 72  | 62  | 89  |
| 8  | >100   | >91    | >91 | >91 | >91 | 87  | >91 | >91 | 75  | 87  | 87  | 91  |
| 9  | >100   | >91    | 89  | 89  | 88  | >91 | 78  | 86  | 82  | 67  | 83  | 87  |
| 10 | >100   | >91    | >91 | >91 | >91 | >91 | >91 | >91 | >91 | >91 | >91 | >91 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

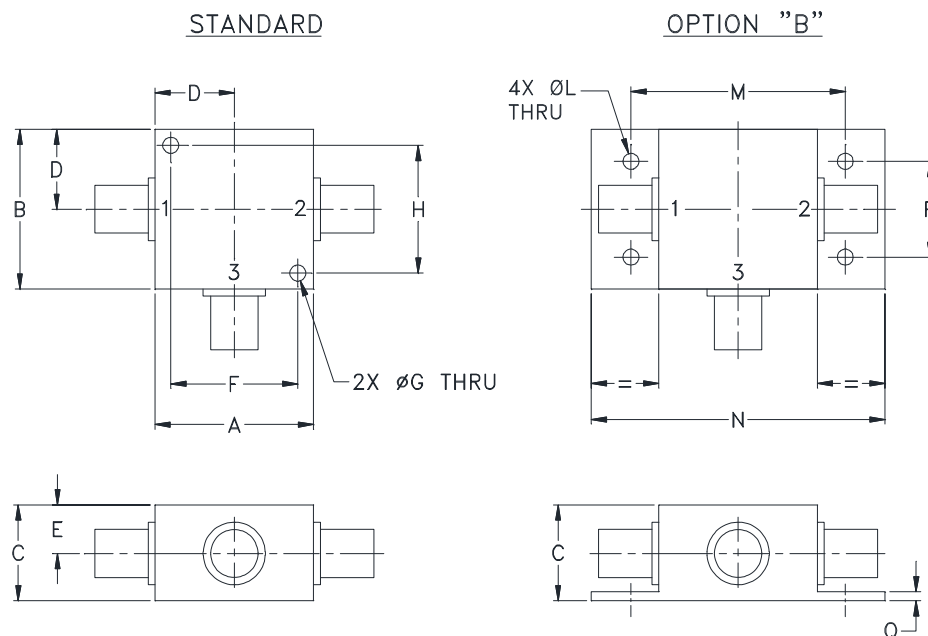
Test conditions: RF IN: 200.1 MHz; -4.00 dBm.  
LO IN: 230.01 MHz; +7.00 dBm  
IF OUT: 29.91 MHz; -9.07 dBm

- 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.

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### 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 |