

# Plug-In Frequency Mixer

## SBL-1+

Level 7 (LO Power +7 dBm) 1 to 500 MHz

### Maximum Ratings

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

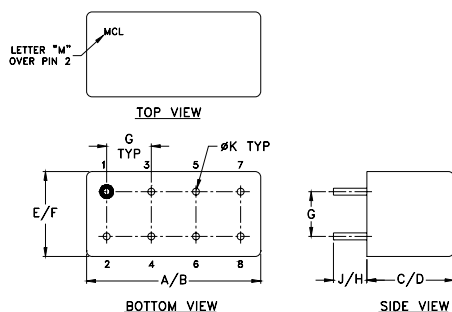
Permanent damage may occur if any of these limits are exceeded.

### Pin Connections

|        |         |
|--------|---------|
| LO     | 8       |
| RF     | 1       |
| IF     | 3,4^    |
| GROUND | 2,5,6,7 |

^ pins must be connected together externally

### Outline Drawing



### Outline Dimensions (inch/mm)

|       |       |      |      |       |       |
|-------|-------|------|------|-------|-------|
| A     | B     | C    | D    | E     | F     |
| .770  | .800  | .285 | .310 | .370  | .400  |
| 19.56 | 20.32 | 7.24 | 7.87 | 9.40  | 10.16 |
| G     | H     | J    | K    | wt    |       |
| .200  | .20   | .14  | .031 | grams |       |
| 5.08  | 5.08  | 3.56 | 0.79 | 5.2   |       |

### Features

- excellent conversion loss, 5.6 dB typ.
- high L-R isolation, 45 dB typ. L-I isolation, 40 dB typ.
- rugged welded construction

### Applications

- VHF
- defense & federal communications



Generic photo used for illustration purposes only

CASE STYLE: A06

+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<br>$f_L$ - $f_U$ | IF     | Mid-Band<br>m        |          | Total<br>Range |      | L                    |      | M    |      | U    |      | L                    |      | M    |      | U    |      |
|                        |        | $\bar{X}$            | $\sigma$ | Max.           | Max. | Typ.                 | Min. | Typ. | Min. | Typ. | Min. | Typ.                 | Min. | Typ. | Min. | Typ. | Min. |
| 1-500                  | DC-500 | 5.60                 | .09      | 7.0            | 8.0  | 60                   | 45   | 45   | 35   | 40   | 25   | 45                   | 35   | 40   | 25   | 30   | 20   |

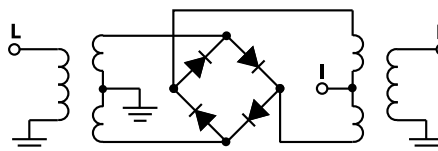
1 dB COMP.: +1 dBm typ.

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

### 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  | 6.67                 | 67.00              | 65.61              | 1.80              | 3.75              |
| 2.00            | 32.00  | 6.24                 | 67.00              | 67.00              | 1.14              | 2.81              |
| 5.00            | 35.00  | 5.74                 | 64.84              | 67.00              | 1.14              | 2.89              |
| 10.00           | 40.00  | 5.58                 | 64.19              | 64.81              | 1.14              | 2.83              |
| 20.00           | 50.00  | 5.67                 | 62.22              | 61.69              | 1.15              | 2.69              |
| 32.19           | 62.19  | 5.60                 | 59.04              | 57.74              | 1.16              | 2.72              |
| 50.00           | 80.00  | 5.60                 | 56.71              | 54.39              | 1.17              | 2.62              |
| 78.97           | 48.97  | 5.56                 | 52.21              | 49.67              | 1.18              | 2.62              |
| 100.00          | 70.00  | 5.52                 | 49.41              | 46.90              | 1.20              | 2.66              |
| 156.94          | 126.94 | 5.53                 | 44.20              | 41.66              | 1.22              | 2.62              |
| 200.00          | 170.00 | 5.68                 | 41.56              | 38.98              | 1.26              | 2.58              |
| 203.72          | 173.72 | 5.67                 | 41.05              | 38.52              | 1.26              | 2.56              |
| 250.50          | 220.50 | 5.63                 | 40.04              | 37.29              | 1.28              | 2.59              |
| 297.29          | 267.29 | 5.61                 | 36.90              | 33.97              | 1.30              | 2.64              |
| 344.07          | 314.07 | 5.81                 | 37.11              | 33.88              | 1.31              | 2.59              |
| 375.26          | 345.26 | 6.13                 | 36.02              | 32.79              | 1.30              | 2.60              |
| 406.44          | 376.44 | 6.15                 | 34.80              | 31.05              | 1.28              | 2.72              |
| 437.63          | 407.63 | 6.08                 | 33.79              | 30.39              | 1.27              | 2.77              |
| 468.82          | 438.82 | 6.00                 | 32.80              | 30.12              | 1.24              | 2.82              |
| 500.00          | 470.00 | 6.31                 | 32.36              | 30.37              | 1.21              | 3.01              |

### Electrical Schematic



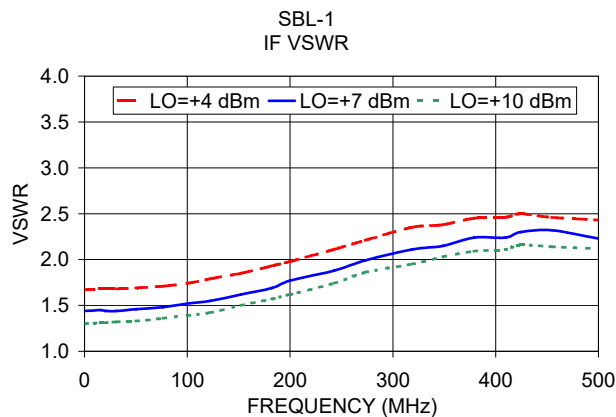
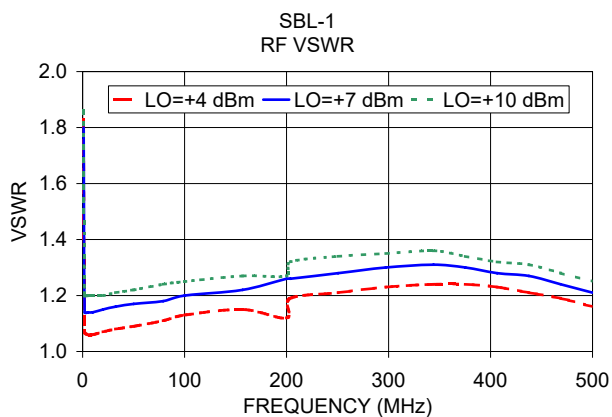
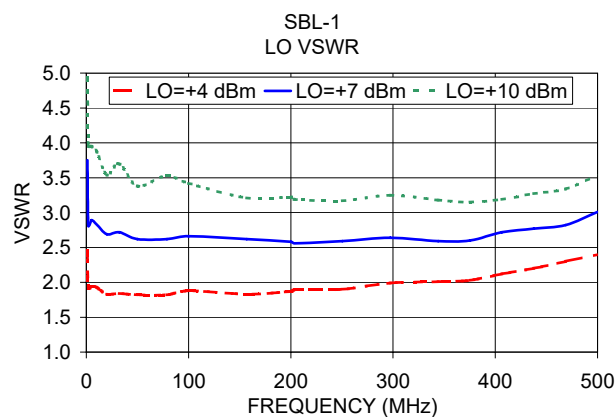
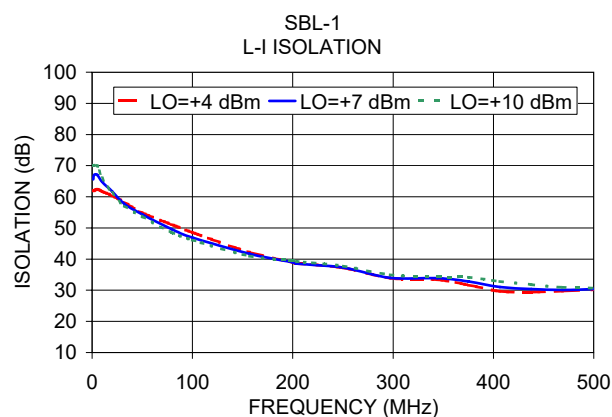
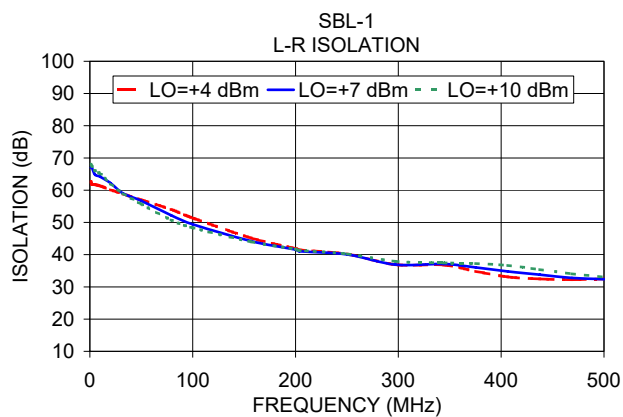
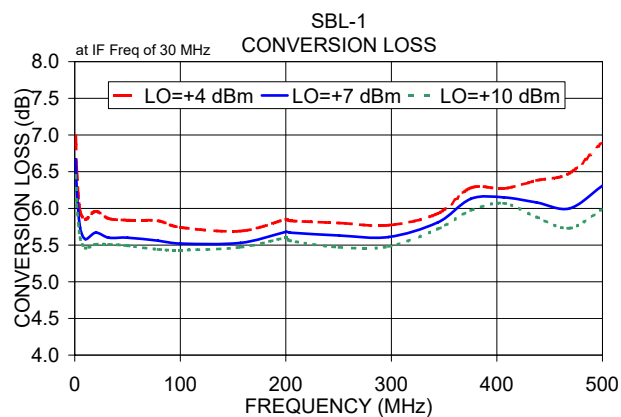
### Notes

- 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.
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# Frequency Mixer

**SBL-1+**

## 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  |
| 1.0                 | 31.0        | 6.99                                                  | 6.67  | 6.45 |
| 2.0                 | 32.0        | 6.50                                                  | 6.24  | 6.05 |
| 5.0                 | 35.0        | 5.96                                                  | 5.74  | 5.60 |
| 10.0                | 40.0        | 5.85                                                  | 5.58  | 5.46 |
| 30.6                | 60.6        | 5.74                                                  | 5.31  | 5.01 |
| 51.1                | 81.1        | 5.95                                                  | 5.39  | 5.11 |
| 71.6                | 101.6       | 5.66                                                  | 5.38  | 5.30 |
| 92.1                | 122.1       | 5.73                                                  | 5.55  | 5.18 |
| 112.5               | 142.5       | 5.64                                                  | 5.24  | 5.24 |
| 133.0               | 163.0       | 5.66                                                  | 5.45  | 5.29 |
| 153.5               | 183.5       | 5.71                                                  | 5.63  | 5.21 |
| 174.0               | 204.0       | 5.70                                                  | 5.43  | 5.31 |
| 194.5               | 224.5       | 5.71                                                  | 5.50  | 5.32 |
| 235.5               | 265.5       | 5.86                                                  | 5.68  | 5.43 |
| 256.0               | 286.0       | 5.94                                                  | 5.59  | 5.41 |
| 276.4               | 306.4       | 5.90                                                  | 5.67  | 5.50 |
| 296.9               | 326.9       | 5.86                                                  | 5.86  | 5.59 |
| 317.4               | 347.4       | 6.07                                                  | 5.89  | 5.74 |
| 337.9               | 367.9       | 6.10                                                  | 5.85  | 5.78 |
| 358.4               | 388.4       | 6.17                                                  | 6.00  | 5.87 |
| 378.9               | 408.9       | 6.33                                                  | 6.11  | 5.99 |
| 399.4               | 429.4       | 6.49                                                  | 6.25  | 6.03 |
| 419.9               | 449.9       | 6.65                                                  | 6.31  | 6.03 |
| 460.8               | 490.8       | 7.31                                                  | 6.63  | 6.12 |
| 481.3               | 511.3       | 7.63                                                  | 6.93  | 6.28 |
| 501.8               | 531.8       | 8.00                                                  | 7.33  | 6.58 |
| 522.3               | 552.3       | 8.26                                                  | 7.66  | 6.80 |
| 542.8               | 572.8       | 8.38                                                  | 7.87  | 7.17 |
| 563.3               | 593.3       | 8.61                                                  | 8.06  | 7.33 |
| 583.8               | 613.8       | 8.64                                                  | 8.17  | 7.63 |
| 604.2               | 634.2       | 8.72                                                  | 8.24  | 7.60 |
| 645.2               | 675.2       | 8.68                                                  | 8.11  | 7.64 |
| 665.7               | 695.7       | 8.63                                                  | 8.09  | 7.67 |
| 686.2               | 716.2       | 8.63                                                  | 8.10  | 7.77 |
| 706.7               | 736.7       | 8.77                                                  | 8.21  | 7.89 |
| 727.2               | 757.2       | 8.81                                                  | 8.30  | 8.06 |
| 768.1               | 798.1       | 9.02                                                  | 8.65  | 8.39 |
| 788.6               | 818.6       | 9.33                                                  | 8.92  | 8.61 |
| 829.6               | 859.6       | 10.04                                                 | 9.65  | 9.37 |
| 850.1               | 880.1       | 10.56                                                 | 10.15 | 9.83 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       |
|---------------------|-------------|--------------------|-------|-------|
|                     |             | @LO (dBm)          |       |       |
|                     |             | +4                 | +7    | +10   |
| 10.1                | 40.1        | 26.04              | 23.13 | 26.42 |
| 30.6                | 60.6        | 26.13              | 26.34 | 21.79 |
| 51.1                | 81.1        | 24.36              | 21.59 | 26.44 |
| 71.6                | 101.6       | 26.17              | 25.61 | 26.35 |
| 92.1                | 122.1       | 24.82              | 23.78 | 26.41 |
| 112.5               | 142.5       | 26.18              | 23.47 | 25.75 |
| 133.0               | 163.0       | 26.17              | 21.44 | 26.35 |
| 153.5               | 183.5       | 20.69              | 20.80 | 26.40 |
| 174.0               | 204.0       | 26.15              | 23.50 | 23.03 |
| 194.5               | 224.5       | 22.38              | 26.25 | 23.33 |
| 215.0               | 245.0       | 22.58              | 25.83 | 21.15 |
| 235.5               | 265.5       | 21.89              | 21.37 | 26.28 |
| 256.0               | 286.0       | 23.03              | 21.11 | 24.98 |
| 276.4               | 306.4       | 20.78              | 26.16 | 26.11 |
| 296.9               | 326.9       | 22.28              | 19.99 | 25.76 |
| 317.4               | 347.4       | 24.53              | 18.53 | 22.16 |
| 337.9               | 367.9       | 22.13              | 22.48 | 24.79 |
| 358.4               | 388.4       | 25.92              | 20.49 | 20.85 |
| 378.9               | 408.9       | 24.70              | 23.08 | 22.36 |
| 399.4               | 429.4       | 22.84              | 18.48 | 24.73 |
| 419.9               | 449.9       | 23.57              | 25.85 | 24.03 |
| 440.3               | 470.3       | 20.39              | 25.11 | 24.75 |
| 460.8               | 490.8       | 20.42              | 21.84 | 23.15 |
| 481.3               | 511.3       | 17.46              | 18.96 | 19.50 |
| 501.8               | 531.8       | 17.40              | 16.40 | 17.60 |
| 522.3               | 552.3       | 16.11              | 17.71 | 16.75 |
| 542.8               | 572.8       | 16.63              | 17.19 | 15.59 |
| 563.3               | 593.3       | 18.57              | 17.06 | 14.91 |
| 583.8               | 613.8       | 16.24              | 20.01 | 16.67 |
| 604.2               | 634.2       | 19.92              | 17.84 | 17.77 |
| 624.7               | 654.7       | 18.98              | 20.71 | 19.01 |
| 645.2               | 675.2       | 20.83              | 24.95 | 19.76 |
| 665.7               | 695.7       | 20.67              | 24.96 | 18.90 |
| 686.2               | 716.2       | 18.31              | 21.15 | 25.12 |
| 706.7               | 736.7       | 21.33              | 24.90 | 23.79 |
| 727.2               | 757.2       | 18.93              | 24.85 | 18.48 |
| 768.1               | 798.1       | 18.53              | 21.47 | 18.90 |
| 788.6               | 818.6       | 15.85              | 19.69 | 16.45 |
| 829.6               | 859.6       | 21.84              | 17.67 | 14.39 |
| 850.1               | 880.1       | 19.42              | 18.60 | 13.96 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF IN=+1dBm<br>(dB) |       |       |
|---------------------|-------------|-------------------------------------|-------|-------|
|                     |             | @LO (dBm)                           |       |       |
|                     |             | +4                                  | +7    | +10   |
| 10.1                | 40.1        | -0.53                               | 0.83  | -0.39 |
| 30.6                | 60.6        | -0.38                               | -0.05 | 0.15  |
| 51.1                | 81.1        | 0.05                                | -0.05 | 0.37  |
| 71.6                | 101.6       | 0.11                                | 0.00  | 0.01  |
| 92.1                | 122.1       | -0.54                               | 0.05  | 0.05  |
| 112.5               | 142.5       | -0.39                               | 0.05  | -0.02 |
| 133.0               | 163.0       | -0.17                               | 0.07  | 0.07  |
| 153.5               | 183.5       | -0.15                               | 0.05  | -0.05 |
| 174.0               | 204.0       | 0.03                                | -0.07 | -0.06 |
| 194.5               | 224.5       | 0.08                                | 0.01  | -0.01 |
| 215.0               | 245.0       | -0.07                               | -0.03 | -0.09 |
| 235.5               | 265.5       | -0.06                               | 0.00  | 0.01  |
| 256.0               | 286.0       | -0.06                               | 0.06  | -0.04 |
| 276.4               | 306.4       | -0.02                               | 0.01  | 0.07  |
| 296.9               | 326.9       | -0.03                               | 0.05  | 0.00  |
| 317.4               | 347.4       | 0.05                                | -0.03 | -0.11 |
| 337.9               | 367.9       | 0.00                                | -0.03 | 0.03  |
| 358.4               | 388.4       | -0.01                               | -0.01 | -0.03 |
| 378.9               | 408.9       | -0.03                               | 0.07  | -0.05 |
| 399.4               | 429.4       | 0.04                                | 0.02  | 0.04  |
| 419.9               | 449.9       | -0.04                               | 0.08  | 0.04  |
| 440.3               | 470.3       | 0.03                                | 0.07  | 0.01  |
| 460.8               | 490.8       | -0.01                               | -0.03 | -0.05 |
| 481.3               | 511.3       | -0.09                               | 0.00  | -0.01 |
| 501.8               | 531.8       | -0.08                               | -0.01 | -0.01 |
| 522.3               | 552.3       | -0.12                               | -0.13 | -0.06 |
| 542.8               | 572.8       | -0.16                               | -0.15 | -0.04 |
| 563.3               | 593.3       | -0.14                               | -0.11 | -0.03 |
| 583.8               | 613.8       | -0.16                               | -0.09 | -0.06 |
| 604.2               | 634.2       | -0.10                               | -0.07 | -0.07 |
| 624.7               | 654.7       | -0.11                               | -0.02 | -0.02 |
| 645.2               | 675.2       | -0.08                               | 0.01  | 0.02  |
| 665.7               | 695.7       | -0.03                               | -0.04 | 0.07  |
| 686.2               | 716.2       | 0.05                                | 0.09  | 0.01  |
| 706.7               | 736.7       | 0.03                                | 0.03  | -0.02 |
| 727.2               | 757.2       | 0.06                                | 0.01  | -0.01 |
| 768.1               | 798.1       | 0.09                                | 0.04  | 0.00  |
| 788.6               | 818.6       | 0.00                                | 0.03  | 0.04  |
| 829.6               | 859.6       | 0.12                                | 0.04  | 0.05  |
| 850.1               | 880.1       | 0.12                                | 0.05  | 0.05  |

REV. X2

SBL-1+

100818

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

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# Frequency Mixer

**SBL-1+**

## Typical Performance Data

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=250.1MHz<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)=500.1MHz<br>(dB) |
|----------------------|-------------|-----------------------------------------------------------------|----------------------|-------------|----------------------------------------------------------------|----------------------|-------------|-----------------------------------------------------------------|
|                      |             | @LO (dBm)                                                       |                      |             | @LO (dBm)                                                      |                      |             | @LO (dBm)                                                       |
|                      |             | +7                                                              |                      |             | +7                                                             |                      |             | +7                                                              |
| 240.0                | 10.1        | 5.87                                                            | 10.0                 | 20.1        | 5.09                                                           | 490.0                | 10.1        | 7.46                                                            |
| 234.1                | 16.0        | 5.82                                                            | 22.3                 | 32.4        | 5.11                                                           | 477.7                | 22.4        | 7.33                                                            |
| 228.2                | 21.9        | 5.70                                                            | 34.6                 | 44.7        | 5.20                                                           | 465.4                | 34.7        | 7.25                                                            |
| 222.3                | 27.8        | 5.67                                                            | 46.9                 | 57.0        | 5.20                                                           | 453.1                | 47.0        | 7.22                                                            |
| 216.4                | 33.7        | 5.63                                                            | 59.2                 | 69.3        | 5.23                                                           | 440.8                | 59.3        | 7.25                                                            |
| 210.5                | 39.6        | 5.61                                                            | 71.5                 | 81.6        | 5.28                                                           | 428.5                | 71.6        | 7.16                                                            |
| 204.6                | 45.5        | 5.57                                                            | 83.8                 | 93.9        | 5.18                                                           | 416.2                | 83.9        | 7.09                                                            |
| 198.7                | 51.4        | 5.53                                                            | 96.2                 | 106.3       | 5.37                                                           | 403.8                | 96.3        | 7.07                                                            |
| 192.8                | 57.3        | 5.52                                                            | 108.5                | 118.6       | 5.45                                                           | 391.5                | 108.6       | 6.99                                                            |
| 186.9                | 63.2        | 5.49                                                            | 120.8                | 130.9       | 5.32                                                           | 379.2                | 120.9       | 7.02                                                            |
| 181.0                | 69.1        | 5.53                                                            | 133.1                | 143.2       | 5.72                                                           | 366.9                | 133.2       | 7.04                                                            |
| 175.1                | 75.0        | 5.50                                                            | 145.4                | 155.5       | 5.64                                                           | 354.6                | 145.5       | 6.97                                                            |
| 169.2                | 80.9        | 5.50                                                            | 157.7                | 167.8       | 5.59                                                           | 342.3                | 157.8       | 7.00                                                            |
| 163.3                | 86.8        | 5.51                                                            | 170.0                | 180.1       | 5.53                                                           | 330.0                | 170.1       | 6.98                                                            |
| 157.4                | 92.7        | 5.49                                                            | 182.3                | 192.4       | 5.57                                                           | 317.7                | 182.4       | 7.00                                                            |
| 151.5                | 98.6        | 5.50                                                            | 194.6                | 204.7       | 5.68                                                           | 305.4                | 194.7       | 7.02                                                            |
| 145.6                | 104.5       | 5.50                                                            | 206.9                | 217.0       | 5.52                                                           | 293.1                | 207.0       | 6.95                                                            |
| 139.7                | 110.4       | 5.50                                                            | 219.2                | 229.3       | 5.62                                                           | 280.8                | 219.3       | 6.94                                                            |
| 133.8                | 116.3       | 5.45                                                            | 231.5                | 241.6       | 5.86                                                           | 268.5                | 231.6       | 6.95                                                            |
| 127.9                | 122.2       | 5.45                                                            | 243.8                | 253.9       | 5.71                                                           | 256.2                | 243.9       | 6.95                                                            |
| 122.1                | 128.0       | 5.48                                                            | 256.2                | 266.3       | 5.77                                                           | 243.8                | 256.3       | 7.06                                                            |
| 116.2                | 133.9       | 5.52                                                            | 268.5                | 278.6       | 5.75                                                           | 231.5                | 268.6       | 7.00                                                            |
| 110.3                | 139.8       | 5.53                                                            | 280.8                | 290.9       | 5.88                                                           | 219.2                | 280.9       | 6.91                                                            |
| 104.4                | 145.7       | 5.52                                                            | 293.1                | 303.2       | 6.09                                                           | 206.9                | 293.2       | 6.90                                                            |
| 98.5                 | 151.6       | 5.47                                                            | 305.4                | 315.5       | 6.09                                                           | 194.6                | 305.5       | 6.84                                                            |
| 92.6                 | 157.5       | 5.49                                                            | 317.7                | 327.8       | 6.39                                                           | 182.3                | 317.8       | 6.84                                                            |
| 86.7                 | 163.4       | 5.49                                                            | 330.0                | 340.1       | 6.45                                                           | 170.0                | 330.1       | 6.88                                                            |
| 80.8                 | 169.3       | 5.50                                                            | 342.3                | 352.4       | 6.20                                                           | 157.7                | 342.4       | 6.91                                                            |
| 74.9                 | 175.2       | 5.50                                                            | 354.6                | 364.7       | 6.22                                                           | 145.4                | 354.7       | 6.95                                                            |
| 69.0                 | 181.1       | 5.48                                                            | 366.9                | 377.0       | 6.22                                                           | 133.1                | 367.0       | 6.94                                                            |
| 63.1                 | 187.0       | 5.50                                                            | 379.2                | 389.3       | 6.09                                                           | 120.8                | 379.3       | 6.85                                                            |
| 57.2                 | 192.9       | 5.49                                                            | 391.5                | 401.6       | 5.94                                                           | 108.5                | 391.6       | 6.82                                                            |
| 51.3                 | 198.8       | 5.55                                                            | 403.8                | 413.9       | 6.11                                                           | 96.2                 | 403.9       | 6.67                                                            |
| 45.4                 | 204.7       | 5.55                                                            | 416.2                | 426.3       | 5.99                                                           | 83.8                 | 416.3       | 6.48                                                            |
| 39.5                 | 210.6       | 5.63                                                            | 428.5                | 438.6       | 5.98                                                           | 71.5                 | 428.6       | 6.36                                                            |
| 33.6                 | 216.5       | 5.55                                                            | 440.8                | 450.9       | 5.95                                                           | 59.2                 | 440.9       | 6.27                                                            |
| 27.7                 | 222.4       | 5.59                                                            | 453.1                | 463.2       | 5.67                                                           | 46.9                 | 453.2       | 6.29                                                            |
| 21.8                 | 228.3       | 5.55                                                            | 465.4                | 475.5       | 6.04                                                           | 34.6                 | 465.5       | 6.42                                                            |
| 15.9                 | 234.2       | 5.74                                                            | 477.7                | 487.8       | 5.96                                                           | 22.3                 | 477.8       | 6.58                                                            |
| 10.0                 | 240.1       | 5.39                                                            | 490.0                | 500.1       | 5.86                                                           | 10.0                 | 490.1       | 6.67                                                            |

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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   |
| 1.0         | 62.73                   | 67.00 | 68.01 | 61.88                   | 65.61 | 70.00 |
| 2.0         | 61.86                   | 67.00 | 67.46 | 61.93                   | 67.00 | 70.00 |
| 5.0         | 61.73                   | 64.84 | 66.12 | 62.43                   | 67.00 | 70.00 |
| 10.0        | 61.35                   | 64.19 | 65.15 | 61.72                   | 64.81 | 66.04 |
| 30.6        | 63.29                   | 64.90 | 66.09 | 58.07                   | 56.85 | 55.84 |
| 51.1        | 59.26                   | 60.58 | 61.78 | 54.56                   | 53.47 | 52.63 |
| 71.6        | 56.16                   | 57.67 | 58.95 | 53.00                   | 51.50 | 50.57 |
| 92.1        | 54.28                   | 55.59 | 56.83 | 50.97                   | 50.27 | 48.66 |
| 112.5       | 52.52                   | 54.29 | 55.26 | 49.14                   | 48.68 | 47.44 |
| 133.0       | 51.12                   | 52.35 | 53.33 | 47.12                   | 46.83 | 45.72 |
| 153.5       | 50.11                   | 51.43 | 52.45 | 46.28                   | 45.82 | 45.16 |
| 174.0       | 48.88                   | 50.14 | 51.16 | 45.09                   | 45.28 | 44.51 |
| 194.5       | 47.54                   | 48.68 | 49.67 | 43.58                   | 44.07 | 43.80 |
| 235.5       | 46.70                   | 47.99 | 49.18 | 41.02                   | 41.48 | 41.68 |
| 256.0       | 46.11                   | 47.26 | 48.38 | 39.94                   | 40.74 | 41.43 |
| 276.4       | 45.11                   | 46.42 | 47.41 | 40.36                   | 41.34 | 42.12 |
| 296.9       | 44.87                   | 46.08 | 47.18 | 39.89                   | 41.02 | 41.72 |
| 317.4       | 44.36                   | 45.82 | 46.99 | 39.77                   | 41.43 | 42.35 |
| 337.9       | 42.79                   | 44.25 | 45.53 | 39.04                   | 40.93 | 42.37 |
| 358.4       | 42.74                   | 44.32 | 45.84 | 37.42                   | 39.19 | 40.70 |
| 378.9       | 42.32                   | 43.90 | 45.39 | 36.56                   | 38.53 | 40.37 |
| 399.4       | 42.38                   | 44.52 | 47.23 | 35.62                   | 37.41 | 39.43 |
| 419.9       | 42.41                   | 44.95 | 47.71 | 34.83                   | 36.27 | 38.03 |
| 460.8       | 41.99                   | 44.40 | 46.97 | 34.41                   | 35.05 | 36.45 |
| 481.3       | 42.13                   | 45.13 | 49.18 | 35.04                   | 35.37 | 36.49 |
| 501.8       | 43.18                   | 46.30 | 49.52 | 35.29                   | 35.86 | 36.61 |
| 522.3       | 43.46                   | 47.39 | 52.77 | 35.59                   | 36.22 | 36.58 |
| 542.8       | 43.43                   | 46.82 | 49.97 | 35.33                   | 35.96 | 36.44 |
| 563.3       | 44.39                   | 48.68 | 52.30 | 35.26                   | 35.55 | 35.51 |
| 583.8       | 43.21                   | 45.17 | 46.03 | 35.49                   | 35.47 | 35.11 |
| 604.2       | 44.06                   | 46.45 | 47.42 | 35.46                   | 34.96 | 34.23 |
| 645.2       | 43.90                   | 44.33 | 43.37 | 34.50                   | 33.04 | 31.39 |
| 665.7       | 43.47                   | 41.83 | 39.48 | 33.12                   | 31.22 | 28.60 |
| 686.2       | 44.30                   | 41.21 | 38.11 | 31.26                   | 28.71 | 25.69 |
| 706.7       | 45.36                   | 38.99 | 35.70 | 29.55                   | 26.45 | 23.81 |
| 727.2       | 44.68                   | 37.44 | 34.55 | 27.76                   | 24.64 | 22.34 |
| 768.1       | 40.31                   | 34.45 | 32.17 | 24.58                   | 22.27 | 20.71 |
| 788.6       | 37.55                   | 33.06 | 30.96 | 23.36                   | 21.42 | 19.96 |
| 829.6       | 33.78                   | 30.97 | 29.08 | 21.38                   | 20.02 | 18.81 |
| 850.1       | 32.11                   | 29.84 | 28.12 | 20.52                   | 19.44 | 18.25 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +4                      | +7    | +10   |
| 10.1                | 40.1        | 13.03                   | 22.48 | 31.18 |
| 30.6                | 60.6        | 12.90                   | 22.13 | 32.34 |
| 51.1                | 81.1        | 27.20                   | 25.12 | 33.34 |
| 71.6                | 101.6       | 31.86                   | 26.65 | 29.55 |
| 92.1                | 122.1       | 32.04                   | 27.65 | 28.66 |
| 112.5               | 142.5       | 30.06                   | 32.34 | 30.42 |
| 133.0               | 163.0       | 28.80                   | 30.60 | 32.10 |
| 153.5               | 183.5       | 27.98                   | 28.81 | 29.84 |
| 174.0               | 204.0       | 27.58                   | 29.49 | 29.69 |
| 194.5               | 224.5       | 28.48                   | 28.43 | 29.86 |
| 215.0               | 245.0       | 27.47                   | 28.31 | 28.67 |
| 235.5               | 265.5       | 27.82                   | 27.85 | 27.20 |
| 256.0               | 286.0       | 27.31                   | 28.26 | 28.84 |
| 276.4               | 306.4       | 27.41                   | 29.06 | 29.96 |
| 296.9               | 326.9       | 26.75                   | 27.86 | 29.18 |
| 317.4               | 347.4       | 25.41                   | 26.16 | 26.26 |
| 337.9               | 367.9       | 23.80                   | 24.12 | 24.62 |
| 358.4               | 388.4       | 22.62                   | 22.74 | 22.84 |
| 378.9               | 408.9       | 21.39                   | 21.75 | 21.38 |
| 399.4               | 429.4       | 20.49                   | 20.32 | 20.27 |
| 419.9               | 449.9       | 20.05                   | 20.02 | 19.97 |
| 440.3               | 470.3       | 19.58                   | 19.57 | 19.67 |
| 460.8               | 490.8       | 19.56                   | 19.59 | 19.72 |
| 481.3               | 511.3       | 19.46                   | 19.70 | 19.89 |
| 501.8               | 531.8       | 19.50                   | 19.50 | 19.64 |
| 522.3               | 552.3       | 20.08                   | 19.98 | 20.20 |
| 542.8               | 572.8       | 20.32                   | 20.16 | 20.19 |
| 563.3               | 593.3       | 20.60                   | 20.42 | 20.18 |
| 583.8               | 613.8       | 20.28                   | 20.08 | 19.84 |
| 604.2               | 634.2       | 19.71                   | 19.45 | 19.23 |
| 624.7               | 654.7       | 19.02                   | 18.72 | 18.35 |
| 645.2               | 675.2       | 18.18                   | 17.77 | 17.35 |
| 665.7               | 695.7       | 17.37                   | 16.80 | 16.21 |
| 686.2               | 716.2       | 16.57                   | 15.94 | 15.37 |
| 706.7               | 736.7       | 15.80                   | 15.03 | 14.48 |
| 727.2               | 757.2       | 14.96                   | 14.22 | 13.70 |
| 768.1               | 798.1       | 13.40                   | 12.69 | 12.17 |
| 788.6               | 818.6       | 12.71                   | 12.07 | 11.53 |
| 829.6               | 859.6       | 11.24                   | 10.67 | 10.11 |
| 850.1               | 880.1       | 10.75                   | 10.12 | 9.53  |

# Frequency Mixer

**SBL-1+**

## 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=500.1MHz<br>(:1) |      |      |
|---------------------|-------------|-----------------|------|------|-------------|-----------------|------|------|----------------------|---------------------------------|------|------|
|                     |             | @LO (dBm)       |      |      |             | @LO (dBm)       |      |      |                      | @LO (dBm)                       |      |      |
|                     |             | +4              | +7   | +10  |             | +4              | +7   | +10  |                      | +4                              | +7   | +10  |
| 1.0                 | 31.0        | 1.83            | 1.80 | 1.86 | 1.0         | 2.45            | 3.75 | 5.47 | 1.0                  | 1.67                            | 1.44 | 1.30 |
| 10.1                | 40.1        | 1.18            | 1.14 | 1.10 | 10.1        | 1.85            | 2.60 | 3.76 | 22.6                 | 2.17                            | 1.84 | 1.61 |
| 30.6                | 60.6        | 1.22            | 1.05 | 1.05 | 30.6        | 1.84            | 2.73 | 3.80 | 35.1                 | 2.22                            | 1.88 | 1.65 |
| 51.1                | 81.1        | 1.15            | 1.06 | 1.07 | 51.1        | 1.76            | 2.56 | 3.56 | 47.7                 | 2.40                            | 2.02 | 1.77 |
| 71.6                | 101.6       | 1.06            | 1.04 | 1.01 | 71.6        | 1.67            | 2.37 | 3.27 | 60.3                 | 2.50                            | 2.11 | 1.85 |
| 92.1                | 122.1       | 1.09            | 1.02 | 1.08 | 92.1        | 1.69            | 2.38 | 3.26 | 72.8                 | 2.49                            | 2.12 | 1.86 |
| 112.5               | 142.5       | 1.06            | 1.07 | 1.12 | 112.5       | 1.74            | 2.51 | 3.45 | 85.4                 | 2.39                            | 2.05 | 1.81 |
| 133.0               | 163.0       | 1.03            | 1.04 | 1.09 | 133.0       | 1.79            | 2.57 | 3.51 | 97.9                 | 2.31                            | 1.97 | 1.76 |
| 153.5               | 183.5       | 1.02            | 1.08 | 1.13 | 153.5       | 1.75            | 2.48 | 3.37 | 110.5                | 2.31                            | 1.99 | 1.78 |
| 174.0               | 204.0       | 1.04            | 1.14 | 1.20 | 174.0       | 1.75            | 2.44 | 3.29 | 123.1                | 2.41                            | 2.07 | 1.87 |
| 194.5               | 224.5       | 1.06            | 1.14 | 1.22 | 194.5       | 1.80            | 2.52 | 3.38 | 135.6                | 2.52                            | 2.18 | 1.96 |
| 215.0               | 245.0       | 1.09            | 1.13 | 1.22 | 215.0       | 1.88            | 2.62 | 3.52 | 148.2                | 2.59                            | 2.24 | 2.02 |
| 235.5               | 265.5       | 1.10            | 1.15 | 1.19 | 235.5       | 1.91            | 2.65 | 3.52 | 160.8                | 2.58                            | 2.22 | 2.01 |
| 256.0               | 286.0       | 1.15            | 1.24 | 1.28 | 256.0       | 1.90            | 2.61 | 3.45 | 173.3                | 2.54                            | 2.19 | 1.98 |
| 276.4               | 306.4       | 1.21            | 1.32 | 1.41 | 276.4       | 1.93            | 2.63 | 3.47 | 185.9                | 2.54                            | 2.20 | 2.00 |
| 296.9               | 326.9       | 1.26            | 1.37 | 1.47 | 296.9       | 2.01            | 2.73 | 3.58 | 198.5                | 2.56                            | 2.23 | 2.04 |
| 317.4               | 347.4       | 1.27            | 1.39 | 1.48 | 317.4       | 2.10            | 2.84 | 3.70 | 211.0                | 2.58                            | 2.25 | 2.08 |
| 337.9               | 367.9       | 1.31            | 1.41 | 1.47 | 337.9       | 2.12            | 2.85 | 3.70 | 223.6                | 2.61                            | 2.27 | 2.10 |
| 358.4               | 388.4       | 1.37            | 1.44 | 1.53 | 358.4       | 2.13            | 2.84 | 3.67 | 236.2                | 2.63                            | 2.29 | 2.11 |
| 378.9               | 408.9       | 1.39            | 1.46 | 1.52 | 378.9       | 2.18            | 2.91 | 3.74 | 248.7                | 2.66                            | 2.33 | 2.14 |
| 399.4               | 429.4       | 1.34            | 1.41 | 1.43 | 399.4       | 2.27            | 2.99 | 3.84 | 261.3                | 2.71                            | 2.36 | 2.17 |
| 419.9               | 449.9       | 1.26            | 1.32 | 1.32 | 419.9       | 2.32            | 3.03 | 3.86 | 273.8                | 2.72                            | 2.38 | 2.19 |
| 440.3               | 470.3       | 1.20            | 1.22 | 1.23 | 440.3       | 2.36            | 3.04 | 3.84 | 286.4                | 2.69                            | 2.36 | 2.19 |
| 460.8               | 490.8       | 1.15            | 1.12 | 1.14 | 460.8       | 2.42            | 3.10 | 3.89 | 299.0                | 2.65                            | 2.33 | 2.17 |
| 481.3               | 511.3       | 1.13            | 1.08 | 1.04 | 481.3       | 2.53            | 3.24 | 4.02 | 311.5                | 2.67                            | 2.34 | 2.17 |
| 501.8               | 531.8       | 1.20            | 1.12 | 1.07 | 501.8       | 2.64            | 3.37 | 4.16 | 324.1                | 2.74                            | 2.40 | 2.23 |
| 542.8               | 572.8       | 1.41            | 1.37 | 1.31 | 542.8       | 2.72            | 3.44 | 4.24 | 336.7                | 2.81                            | 2.47 | 2.29 |
| 563.3               | 593.3       | 1.55            | 1.51 | 1.48 | 563.3       | 2.78            | 3.50 | 4.30 | 349.2                | 2.85                            | 2.49 | 2.29 |
| 583.8               | 613.8       | 1.68            | 1.65 | 1.63 | 583.8       | 2.87            | 3.60 | 4.41 | 361.8                | 2.79                            | 2.45 | 2.25 |
| 604.2               | 634.2       | 1.83            | 1.80 | 1.81 | 604.2       | 2.95            | 3.67 | 4.47 | 374.4                | 2.72                            | 2.39 | 2.20 |
| 624.7               | 654.7       | 1.97            | 1.97 | 2.00 | 624.7       | 2.97            | 3.68 | 4.47 | 386.9                | 2.71                            | 2.37 | 2.18 |
| 645.2               | 675.2       | 2.12            | 2.14 | 2.16 | 645.2       | 3.00            | 3.69 | 4.46 | 399.5                | 2.75                            | 2.40 | 2.20 |
| 665.7               | 695.7       | 2.27            | 2.29 | 2.32 | 665.7       | 3.05            | 3.73 | 4.50 | 412.1                | 2.80                            | 2.44 | 2.24 |
| 686.2               | 716.2       | 2.42            | 2.44 | 2.45 | 686.2       | 3.10            | 3.76 | 4.51 | 424.6                | 2.75                            | 2.40 | 2.21 |
| 706.7               | 736.7       | 2.51            | 2.56 | 2.56 | 706.7       | 3.12            | 3.76 | 4.48 | 437.2                | 2.73                            | 2.35 | 2.15 |
| 727.2               | 757.2       | 2.64            | 2.64 | 2.64 | 727.2       | 3.14            | 3.76 | 4.46 | 449.7                | 2.72                            | 2.36 | 2.13 |
| 768.1               | 798.1       | 2.83            | 2.80 | 2.72 | 768.1       | 3.27            | 3.86 | 4.56 | 462.3                | 2.74                            | 2.36 | 2.15 |
| 788.6               | 818.6       | 2.91            | 2.84 | 2.80 | 788.6       | 3.38            | 3.94 | 4.61 | 474.9                | 2.77                            | 2.37 | 2.14 |
| 829.6               | 859.6       | 3.14            | 3.04 | 3.00 | 829.6       | 3.63            | 4.09 | 4.68 | 487.4                | 2.76                            | 2.37 | 2.13 |
| 850.1               | 880.1       | 3.26            | 3.18 | 3.14 | 850.1       | 3.79            | 4.21 | 4.75 | 500.0                | 2.51                            | 2.36 | 2.35 |

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## Harmonics Tables

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0      | -      | -      | 20  | 37  | 17  | 35  | 25  | 40  | 42  | 44  | 51  | 68  |
| 1      | -      | 25     | +0  | 39  | 11  | 37  | 25  | 45  | 37  | 48  | 41  | 48  |
| 2      | >100   | 72     | 55  | 74  | 57  | 80  | 60  | 80  | 61  | 72  | 74  | 77  |
| 3      | >100   | 71     | 63  | 68  | 65  | 73  | 59  | 73  | >80 | 75  | 70  | 77  |
| 4      | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 |
| 5      | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 |
| 6      | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 |
| 7      | >100   | >80    | >80 | >80 | >80 | >80 | >80 | 79  | >80 | >80 | >80 | >80 |
| 8      | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | 77  | >80 | >80 | >80 |
| 9      | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | >80 | 61  | >80 | >80 |
| 10     | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | 64  | >80 |
| RF CAL | 0      | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |     |

### LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -14.00 dBm.  
LO IN: 280.01 MHz; +7.00 dBm  
IF OUT: 29.91 MHz; -19.54 dBm

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |    |     |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|
| 0      | -      | -      | 30  | 47  | 27  | 46  | 36  | 52  | 55  | 56  | 72 | 74  |
| 1      | -      | 26     | +0  | 36  | 12  | 36  | 27  | 52  | 39  | 58  | 50 | 57  |
| 2      | 97     | 58     | 50  | 63  | 51  | 62  | 59  | 64  | 57  | 66  | 66 | 77  |
| 3      | >100   | 57     | 37  | 51  | 42  | 65  | 36  | 54  | 51  | 59  | 55 | 66  |
| 4      | >100   | 78     | 71  | 75  | 64  | 75  | 64  | 78  | 66  | >90 | 68 | 81  |
| 5      | >100   | 74     | 61  | 68  | 53  | 64  | 53  | 68  | 58  | 64  | 73 | 68  |
| 6      | >100   | >90    | 90  | 86  | 88  | 85  | 87  | >90 | 77  | 84  | 84 | >90 |
| 7      | >100   | >90    | 80  | 83  | 70  | 76  | 64  | 79  | 64  | 83  | 63 | 74  |
| 8      | >100   | >90    | >90 | >90 | >90 | >90 | >90 | >90 | >90 | >90 | 86 | >90 |
| 9      | >100   | 88     | >90 | >90 | >90 | >90 | 81  | >90 | 83  | 72  | 83 | 90  |
| 10     | >100   | >90    | >90 | >90 | >90 | >90 | >90 | >90 | >90 | >90 | 82 | >90 |
| RF CAL | 0      | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10 |     |

### LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -4.00 dBm.  
LO IN: 280.01 MHz; +7.00 dBm  
IF OUT: 29.91 MHz; -9.63 dBm

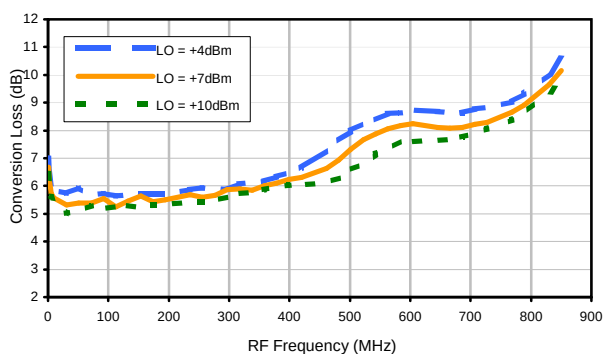
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.  
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.  
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

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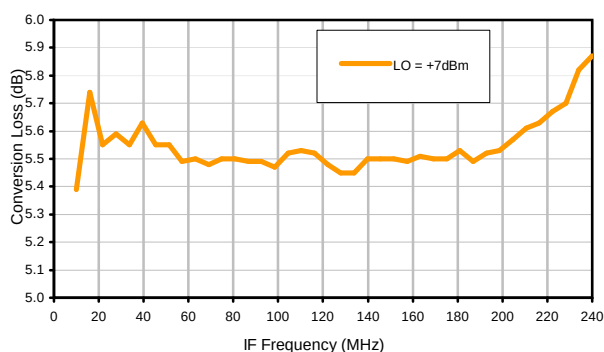


## Typical Performance Curves

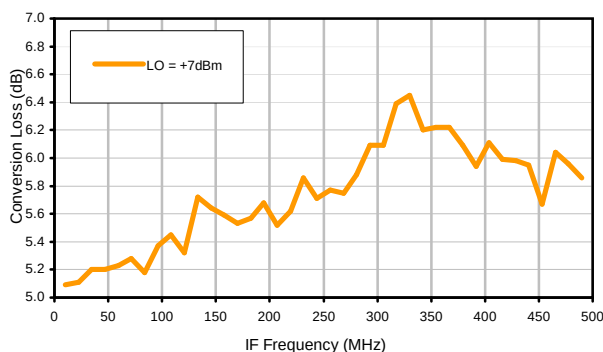
Conversion Loss @ IF=30MHz



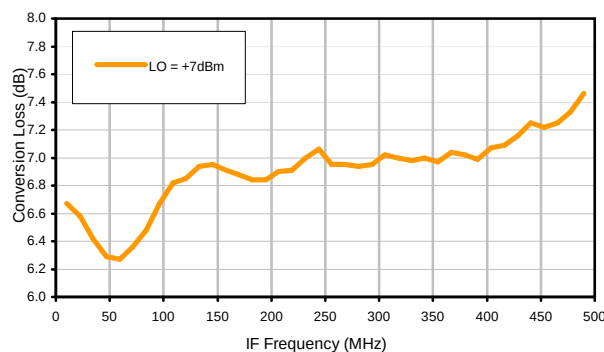
Conversion Loss vs. IF @ RF=250.1MHz



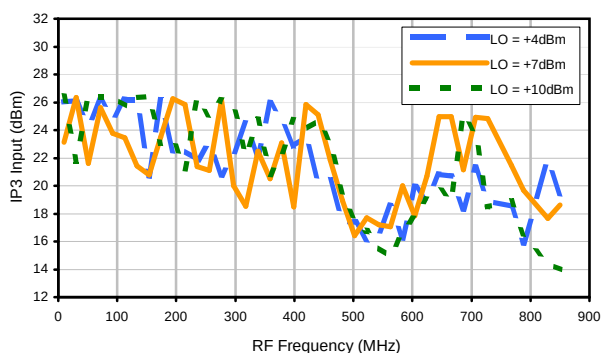
Conversion Loss vs. IF @ RF=10.1MHz



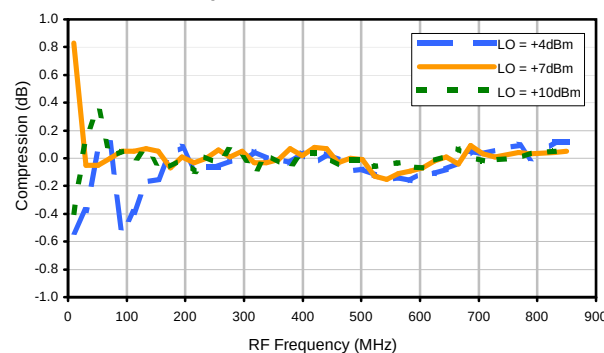
Conversion Loss vs. IF @ RF=500.1MHz



IP3 Input



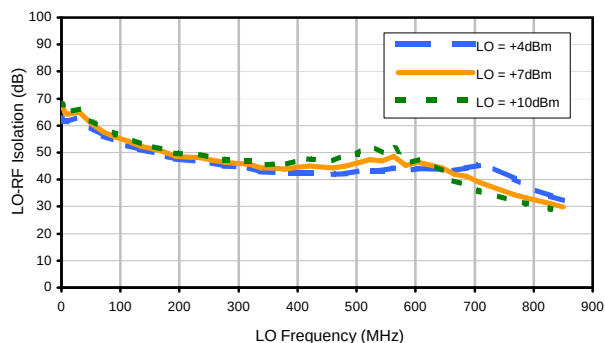
Compression @ RF IN=+1dBm



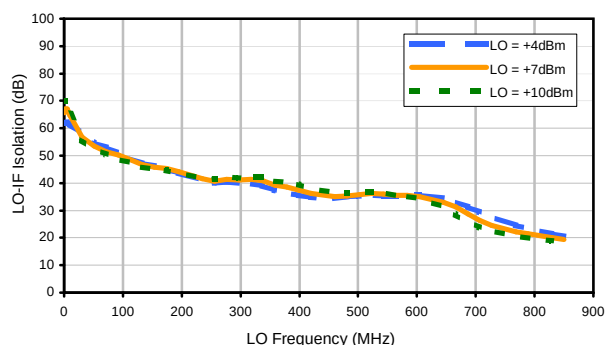


## Typical Performance Curves

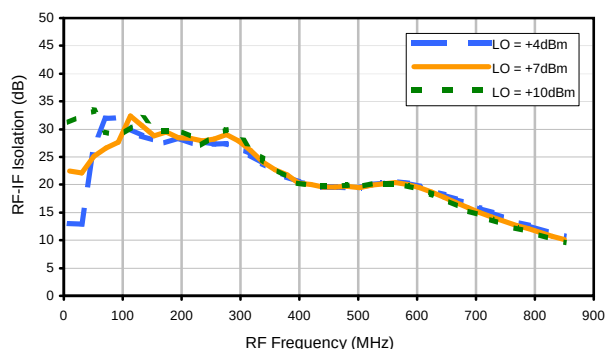
LO-RF Isolation



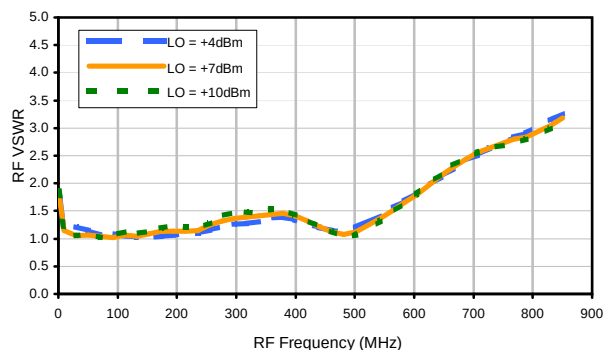
LO-IF Isolation



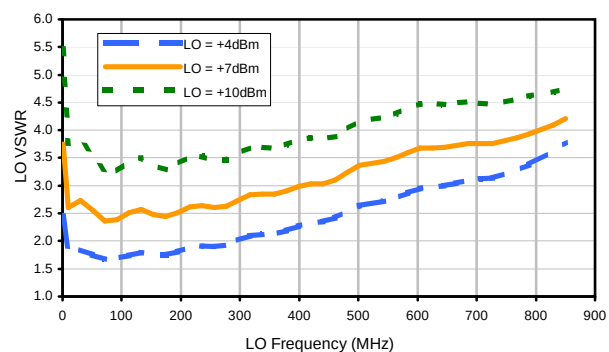
RF-IF Isolation



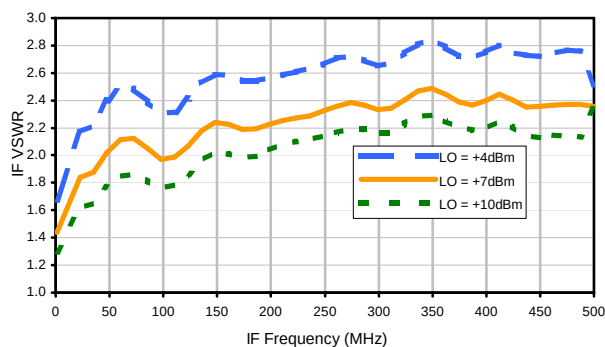
RF VSWR



LO VSWR



IF VSWR



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## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 20  | 37  | 17  | 35  | 25  | 40  | 42  | 44  | 51  | 68  |
| 1  | -      | 25     | +0  | 39  | 11  | 37  | 25  | 45  | 37  | 48  | 41  | 48  |
| 2  | >100   | 72     | 55  | 74  | 57  | 80  | 60  | 80  | 61  | 72  | 74  | 77  |
| 3  | >100   | 71     | 63  | 68  | 65  | 73  | 59  | 73  | >80 | 75  | 70  | 77  |
| 4  | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 |
| 5  | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 |
| 6  | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 |
| 7  | >100   | >80    | >80 | >80 | >80 | >80 | >80 | 79  | >80 | >80 | >80 | >80 |
| 8  | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | 77  | >80 | >80 | >80 |
| 9  | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | >80 | 61  | >80 | >80 |
| 10 | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | 64  | >80 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -14.00 dBm.  
LO IN: 280.01 MHz; +7.00 dBm  
IF OUT: 29.91 MHz; -19.54 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |    |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|
| 0  | -      | -      | 30  | 47  | 27  | 46  | 36  | 52  | 55  | 56  | 72 | 74  |
| 1  | -      | 26     | +0  | 36  | 12  | 36  | 27  | 52  | 39  | 58  | 50 | 57  |
| 2  | 97     | 58     | 50  | 63  | 51  | 62  | 59  | 64  | 57  | 66  | 66 | 77  |
| 3  | >100   | 57     | 37  | 51  | 42  | 65  | 36  | 54  | 51  | 59  | 55 | 66  |
| 4  | >100   | 78     | 71  | 75  | 64  | 75  | 64  | 78  | 66  | >90 | 68 | 81  |
| 5  | >100   | 74     | 61  | 68  | 53  | 64  | 53  | 68  | 58  | 64  | 73 | 68  |
| 6  | >100   | >90    | 90  | 86  | 88  | 85  | 87  | >90 | 77  | 84  | 84 | >90 |
| 7  | >100   | >90    | 80  | 83  | 70  | 76  | 64  | 79  | 64  | 83  | 63 | 74  |
| 8  | >100   | >90    | >90 | >90 | >90 | >90 | >90 | >90 | >90 | >90 | 86 | >90 |
| 9  | >100   | 88     | >90 | >90 | >90 | >90 | 81  | >90 | 83  | 72  | 83 | 90  |
| 10 | >100   | >90    | >90 | >90 | >90 | >90 | >90 | >90 | >90 | >90 | 82 | >90 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9  | 10  |

### LO HARMONICS ORDER

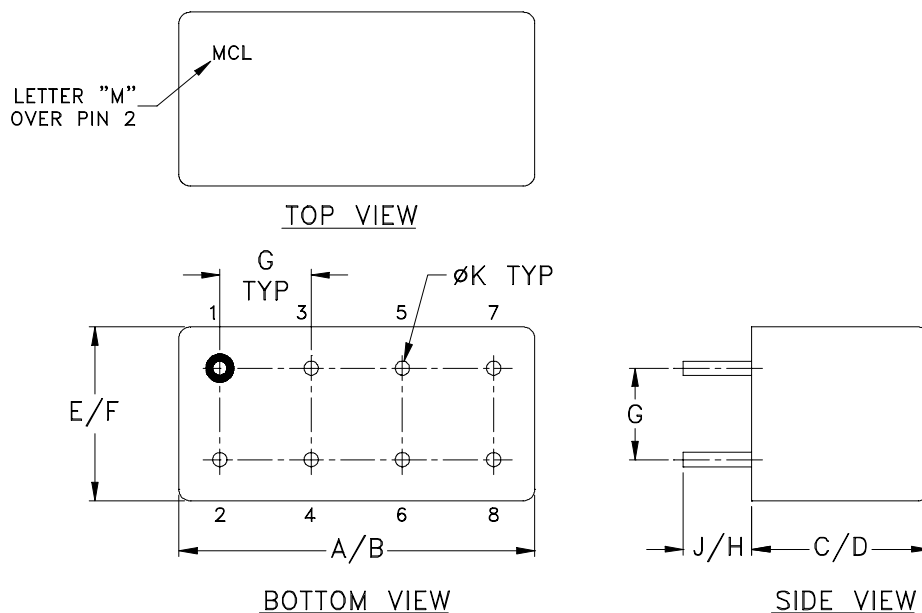
Test conditions: RF IN: 250.1 MHz; -4.00 dBm.  
LO IN: 280.01 MHz; +7.00 dBm  
IF OUT: 29.91 MHz; -9.63 dBm

- 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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A01  
A04  
A05  
A06

## Outline Dimensions



| CASE# | A               | B               | C              | D               | E              | F               | G              | H             | J             | K             | WT,<br>GRAM |
|-------|-----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|---------------|---------------|---------------|-------------|
| A01   | .770<br>(19.56) | .800<br>(20.32) | .385<br>(9.78) | .400<br>(10.16) | .370<br>(9.40) | .400<br>(10.16) | .200<br>(5.08) | .20<br>(5.08) | .14<br>(3.56) | .031<br>(.79) | 5.2         |
| A04   |                 |                 | .200<br>(5.08) | .210<br>(5.33)  |                |                 |                |               |               |               | 3.7         |
| A05   |                 |                 | .240<br>(6.10) | .250<br>(6.35)  |                |                 |                |               |               |               | 3.7         |
| A06   |                 |                 | .285<br>(7.24) | .310<br>(7.87)  |                |                 |                |               |               |               | 5.2         |

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

### Notes:

- Header material: C.R.S.  
Pin material: #52 alloy.  
Cover material: Cupro-Nickel.
- Pin finish: Electro Tin-Silver.
- Insulated spacer available. Request P/N B14-045-01.
- Tolerance on pin diameter  $\pm .005$  inch.
- Glass meniscus 0.015 inch max.
- Blue bead indicates Pin 1. Pin numbers do not appear on unit, for reference only.



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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                                                                          |
| Thermal Shock                  | -55° to 100°C, 100 cycles                                                                                                                                       | MIL-STD-202, Method 107, Condition A-3, except +100°C                                                |
| 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               | 50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes                                                                                               | MIL-STD-202, Method 213, Condition A                                                                 |
| Moisture Resistance            | 10 cycles, 24 hours per cycle                                                                                                                                   | MIL-STD-202, Method 106, Condition A, except 50°C and end point electrical test done within 12 hours |
| Solderability                  | 10X Magnification                                                                                                                                               | J-STD-002, 95% Coverage                                                                              |
| Resistance to Solder Heat      | 260°C for 10 seconds                                                                                                                                            | MIL-STD-202, Method 210, Condition B                                                                 |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C;<br>distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215                                                                              |
| Terminal Strength              | 4 1/2 Pound Pull                                                                                                                                                | MIL-STD-202, Method 211, Condition A                                                                 |



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                       |
|---------------------|---------------------------|--------------------------------------|
| Barometric Pressure | 100,000 Feet              | MIL-STD-202, Method 105, Condition D |