

# Plug-In Frequency Mixer

## SBL-1-1+

Level 7 (LO Power +7 dBm) 0.1 to 400 MHz

### Maximum Ratings

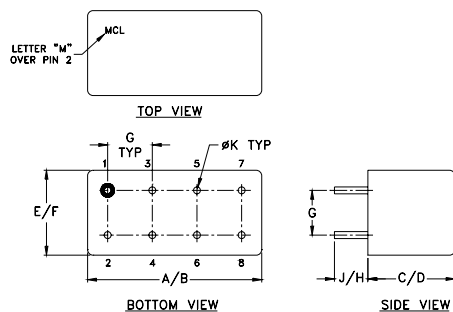
|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -55°C to 100°C |
| Storage Temperature                                             | -55°C to 100°C |
| RF Power                                                        | 50mW           |
| IF Current                                                      | 40mA           |
| Permanent damage may occur if any of these limits are exceeded. |                |

### 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, 4.84 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           | 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. |
| 0.1-400         | DC-400 | 4.84                 | .04      | 7.0   | 8.0  | 50                   | 45   | 45   | 30   | 35   | 25   | 45                   | 30   | 40   | 25   | 30   | 20   |

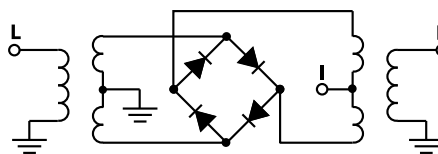
1 dB COMP.: +1 dBm typ.

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  $f_U$ ]

### 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          |
| 0.10            | 30.10  | 5.97                 | >67.00             | >67.00             | 1.27              | 2.30              |
| 0.20            | 30.20  | 5.50                 | >67.00             | >67.00             | 1.27              | 2.24              |
| 0.50            | 30.50  | 5.10                 | >67.00             | >60.77             | 1.27              | 2.26              |
| 1.00            | 31.00  | 5.03                 | >67.00             | 61.39              | 1.25              | 2.20              |
| 2.00            | 32.00  | 4.95                 | >67.00             | 61.65              | 1.23              | 2.16              |
| 5.00            | 35.00  | 4.94                 | >67.00             | 62.29              | 1.18              | 2.11              |
| 10.00           | 40.00  | 4.92                 | >67.00             | 61.63              | 1.15              | 2.08              |
| 20.00           | 50.00  | 5.01                 | >67.00             | 61.41              | 1.12              | 2.09              |
| 50.00           | 80.00  | 4.95                 | 57.89              | 55.93              | 1.09              | 2.12              |
| 69.83           | 99.83  | 4.92                 | 53.82              | 51.57              | 1.10              | 2.18              |
| 100.00          | 70.00  | 4.82                 | 51.38              | 49.30              | 1.11              | 2.22              |
| 121.45          | 91.45  | 4.86                 | 50.92              | 48.83              | 1.15              | 2.23              |
| 155.86          | 125.36 | 4.95                 | 48.48              | 46.32              | 1.19              | 2.35              |
| 200.00          | 170.00 | 5.08                 | 42.54              | 40.81              | 1.22              | 2.38              |
| 224.69          | 194.69 | 5.23                 | 42.61              | 40.35              | 1.27              | 2.43              |
| 241.90          | 211.90 | 5.21                 | 43.39              | 40.85              | 1.31              | 2.44              |
| 293.52          | 263.52 | 5.32                 | 38.74              | 36.85              | 1.34              | 2.56              |
| 327.93          | 297.93 | 5.57                 | 37.88              | 36.40              | 1.35              | 2.65              |
| 379.55          | 349.55 | 5.70                 | 36.54              | 33.55              | 1.36              | 2.75              |
| 413.97          | 383.97 | 5.75                 | 37.59              | 34.68              | 1.35              | 2.83              |

### Electrical Schematic



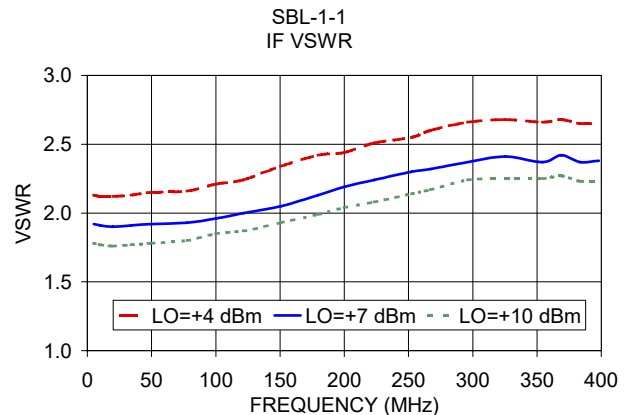
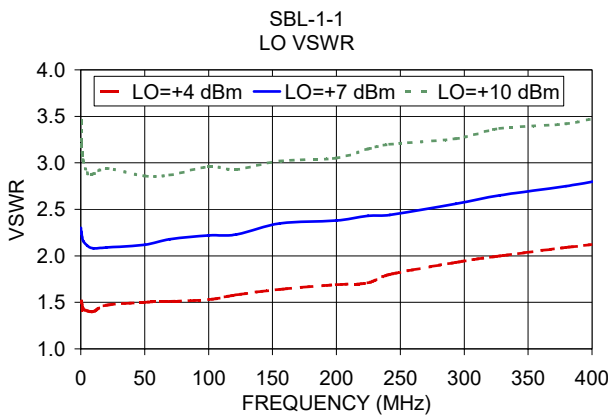
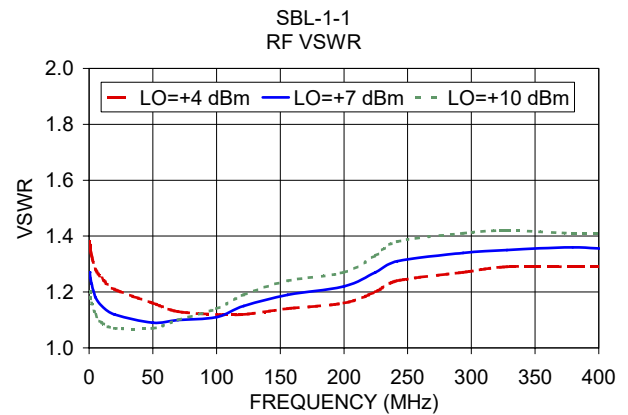
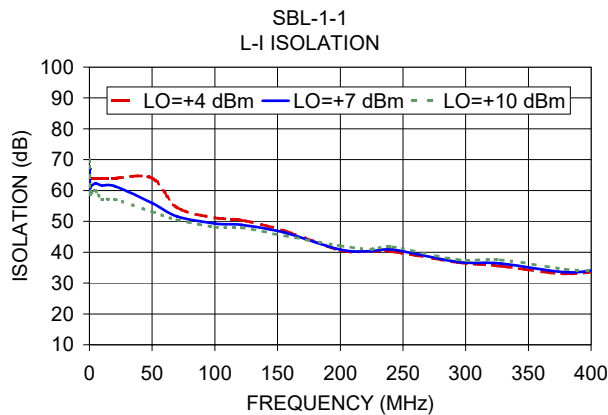
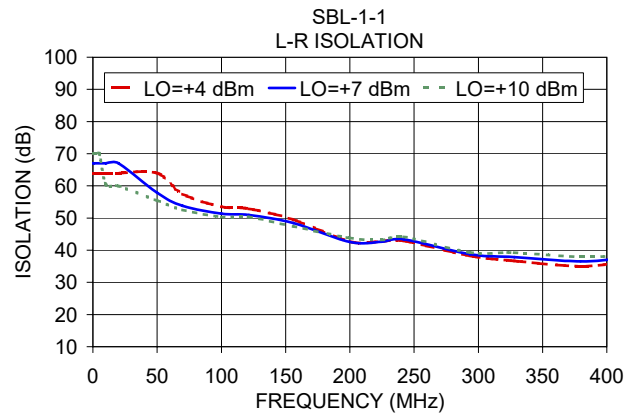
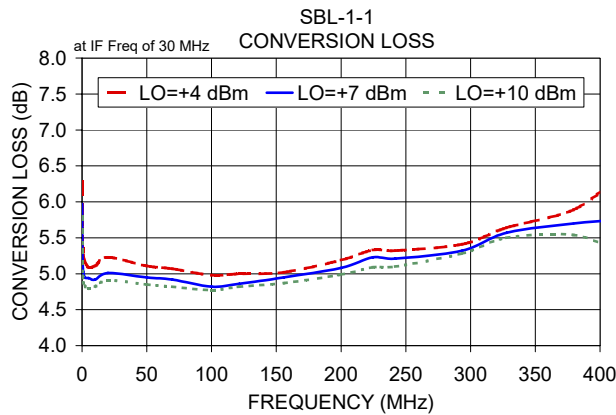
### Notes

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# Frequency Mixer

# SBL-1-1+

## 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         |                                     |      |      |
| 0.1                 | 30.1        | 6.29                                                  | 5.97  | 5.79  | 10.1                | 40.1        | 15.98              | 16.69 | 18.72 | 10.1                | 40.1        | 1.54                                | 1.22 | 0.95 |
| 0.2                 | 30.2        | 5.79                                                  | 5.50  | 5.33  | 30.4                | 60.4        | 15.65              | 16.88 | 19.22 | 30.4                | 60.4        | 1.46                                | 1.20 | 0.91 |
| 0.5                 | 30.5        | 5.39                                                  | 5.10  | 4.97  | 50.6                | 80.6        | 16.34              | 17.23 | 19.78 | 50.6                | 80.6        | 1.43                                | 1.10 | 0.85 |
| 1.0                 | 31.0        | 5.26                                                  | 5.03  | 4.88  | 70.9                | 100.9       | 16.22              | 16.60 | 25.74 | 70.9                | 100.9       | 1.36                                | 1.06 | 0.87 |
| 2.0                 | 32.0        | 5.17                                                  | 4.95  | 4.83  | 91.1                | 121.1       | 15.60              | 17.78 | 20.85 | 91.1                | 121.1       | 1.29                                | 1.00 | 0.79 |
| 5.0                 | 35.0        | 5.09                                                  | 4.94  | 4.79  | 111.4               | 141.4       | 19.77              | 18.46 | 15.81 | 111.4               | 141.4       | 1.24                                | 0.93 | 0.75 |
| 10.0                | 40.0        | 5.11                                                  | 4.92  | 4.82  | 131.6               | 161.6       | 14.85              | 22.74 | 21.28 | 131.6               | 161.6       | 1.21                                | 0.98 | 0.78 |
| 30.4                | 60.4        | 5.30                                                  | 5.07  | 4.94  | 151.9               | 181.9       | 18.00              | 16.72 | 13.28 | 151.9               | 181.9       | 1.25                                | 0.95 | 0.76 |
| 50.6                | 80.6        | 5.28                                                  | 5.11  | 4.99  | 172.2               | 202.2       | 18.33              | 14.66 | 14.87 | 172.2               | 202.2       | 1.14                                | 0.86 | 0.70 |
| 91.1                | 121.1       | 5.28                                                  | 5.13  | 5.00  | 192.4               | 222.4       | 11.40              | 9.90  | 10.00 | 192.4               | 222.4       | 1.08                                | 0.84 | 0.68 |
| 111.4               | 141.4       | 5.27                                                  | 5.14  | 5.02  | 212.7               | 242.7       | 15.97              | 12.92 | 12.36 | 212.7               | 242.7       | 1.06                                | 0.80 | 0.66 |
| 131.6               | 161.6       | 5.34                                                  | 5.18  | 5.06  | 232.9               | 262.9       | 16.54              | 19.02 | 22.24 | 232.9               | 262.9       | 1.16                                | 0.88 | 0.68 |
| 151.9               | 181.9       | 5.37                                                  | 5.20  | 5.08  | 253.2               | 283.2       | 16.80              | 19.06 | 26.35 | 253.2               | 283.2       | 1.16                                | 0.93 | 0.75 |
| 172.2               | 202.2       | 5.38                                                  | 5.21  | 5.08  | 273.4               | 303.4       | 10.84              | 9.95  | 11.14 | 273.4               | 303.4       | 1.34                                | 1.06 | 0.84 |
| 212.7               | 242.7       | 5.54                                                  | 5.37  | 5.21  | 293.7               | 323.7       | 8.84               | 8.15  | 8.68  | 293.7               | 323.7       | 1.47                                | 1.15 | 0.95 |
| 232.9               | 262.9       | 5.61                                                  | 5.39  | 5.21  | 313.9               | 343.9       | 7.32               | 7.33  | 7.92  | 313.9               | 343.9       | 1.62                                | 1.29 | 1.08 |
| 253.2               | 283.2       | 5.70                                                  | 5.48  | 5.30  | 334.2               | 364.2       | 7.29               | 8.48  | 10.12 | 334.2               | 364.2       | 1.84                                | 1.42 | 1.16 |
| 273.4               | 303.4       | 5.73                                                  | 5.60  | 5.47  | 354.5               | 384.5       | 9.58               | 12.33 | 15.29 | 354.5               | 384.5       | 2.02                                | 1.51 | 1.25 |
| 293.7               | 323.7       | 5.80                                                  | 5.68  | 5.59  | 374.7               | 404.7       | 8.78               | 14.76 | 19.83 | 374.7               | 404.7       | 2.20                                | 1.70 | 1.44 |
| 334.2               | 364.2       | 6.03                                                  | 5.86  | 5.74  | 395.0               | 425.0       | 6.71               | 13.21 | 21.90 | 395.0               | 425.0       | 2.26                                | 1.94 | 1.65 |
| 354.5               | 384.5       | 6.17                                                  | 5.96  | 5.84  | 415.2               | 445.2       | 3.99               | 8.35  | 17.03 | 415.2               | 445.2       | 2.46                                | 2.23 | 2.02 |
| 374.7               | 404.7       | 6.39                                                  | 6.06  | 5.87  | 435.5               | 465.5       | 3.29               | 5.93  | 10.39 | 435.5               | 465.5       | 2.33                                | 2.19 | 2.08 |
| 395.0               | 425.0       | 6.66                                                  | 6.18  | 5.88  | 455.7               | 485.7       | 3.18               | 5.15  | 7.83  | 455.7               | 485.7       | 2.35                                | 2.16 | 2.08 |
| 415.2               | 445.2       | 7.03                                                  | 6.39  | 5.86  | 476.0               | 506.0       | 4.00               | 5.92  | 8.91  | 476.0               | 506.0       | 2.24                                | 2.08 | 2.02 |
| 455.7               | 485.7       | 7.48                                                  | 6.89  | 6.28  | 496.3               | 526.3       | 4.15               | 5.79  | 8.85  | 496.3               | 526.3       | 2.12                                | 1.91 | 1.83 |
| 476.0               | 506.0       | 7.56                                                  | 7.00  | 6.45  | 516.5               | 546.5       | 5.09               | 7.03  | 11.54 | 516.5               | 546.5       | 2.03                                | 1.75 | 1.60 |
| 496.3               | 526.3       | 7.80                                                  | 7.34  | 6.82  | 536.8               | 566.8       | 6.28               | 8.80  | 15.13 | 536.8               | 566.8       | 2.01                                | 1.71 | 1.47 |
| 516.5               | 546.5       | 7.87                                                  | 7.51  | 7.13  | 557.0               | 587.0       | 7.42               | 10.24 | 15.60 | 557.0               | 587.0       | 1.96                                | 1.61 | 1.33 |
| 536.8               | 566.8       | 7.81                                                  | 7.47  | 7.19  | 577.3               | 607.3       | 7.47               | 10.89 | 14.67 | 577.3               | 607.3       | 1.95                                | 1.50 | 1.24 |
| 577.3               | 607.3       | 7.76                                                  | 7.50  | 7.32  | 597.5               | 627.5       | 7.35               | 9.86  | 11.87 | 597.5               | 627.5       | 1.95                                | 1.44 | 1.14 |
| 597.5               | 627.5       | 7.76                                                  | 7.54  | 7.39  | 617.8               | 647.8       | 7.31               | 10.04 | 10.84 | 617.8               | 647.8       | 1.86                                | 1.31 | 1.00 |
| 617.8               | 647.8       | 7.84                                                  | 7.65  | 7.54  | 638.0               | 668.0       | 7.82               | 10.22 | 11.02 | 638.0               | 668.0       | 1.79                                | 1.23 | 0.93 |
| 638.0               | 668.0       | 7.91                                                  | 7.75  | 7.66  | 658.3               | 688.3       | 8.03               | 12.18 | 12.28 | 658.3               | 688.3       | 1.68                                | 1.15 | 0.84 |
| 658.3               | 688.3       | 8.07                                                  | 7.94  | 7.91  | 678.6               | 708.6       | 8.59               | 11.59 | 12.80 | 678.6               | 708.6       | 1.67                                | 1.11 | 0.80 |
| 698.8               | 728.8       | 8.65                                                  | 8.52  | 8.51  | 698.8               | 728.8       | 8.96               | 9.74  | 10.37 | 698.8               | 728.8       | 1.69                                | 1.15 | 0.83 |
| 719.1               | 749.1       | 9.03                                                  | 8.92  | 8.88  | 719.1               | 749.1       | 8.41               | 8.25  | 8.65  | 719.1               | 749.1       | 1.68                                | 1.14 | 0.87 |
| 739.3               | 769.3       | 9.41                                                  | 9.29  | 9.24  | 739.3               | 769.3       | 7.97               | 7.36  | 7.98  | 739.3               | 769.3       | 1.73                                | 1.20 | 0.97 |
| 759.6               | 789.6       | 9.86                                                  | 9.70  | 9.61  | 759.6               | 789.6       | 8.05               | 7.86  | 7.55  | 759.6               | 789.6       | 1.74                                | 1.29 | 1.10 |
| 779.8               | 809.8       | 10.37                                                 | 10.14 | 9.99  | 779.8               | 809.8       | 7.95               | 8.10  | 8.30  | 779.8               | 809.8       | 1.81                                | 1.32 | 1.14 |
| 800.1               | 830.1       | 10.98                                                 | 10.72 | 10.54 | 800.1               | 830.1       | 8.24               | 8.58  | 8.69  | 800.1               | 830.1       | 1.80                                | 1.30 | 1.08 |

REV. X2

SBL-1-1+

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# Frequency Mixer

**SBL-1-1+**

## 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        | 5.36                                                            | 10.0                 | 20.1        | 4.88                                                           | 390.0                | 10.1        | 6.49                                                            |
| 185.4                | 14.7        | 5.31                                                            | 19.7                 | 29.8        | 4.94                                                           | 380.3                | 19.8        | 6.42                                                            |
| 180.8                | 19.3        | 5.27                                                            | 29.5                 | 39.6        | 4.87                                                           | 370.5                | 29.6        | 6.34                                                            |
| 176.2                | 23.9        | 5.20                                                            | 39.2                 | 49.3        | 4.89                                                           | 360.8                | 39.3        | 6.29                                                            |
| 171.5                | 28.6        | 5.18                                                            | 49.0                 | 59.1        | 4.90                                                           | 351.0                | 49.1        | 6.24                                                            |
| 166.9                | 33.2        | 5.13                                                            | 58.7                 | 68.8        | 4.89                                                           | 341.3                | 58.8        | 6.19                                                            |
| 162.3                | 37.8        | 5.13                                                            | 68.5                 | 78.6        | 4.96                                                           | 331.5                | 68.6        | 6.17                                                            |
| 157.7                | 42.4        | 5.12                                                            | 78.2                 | 88.3        | 4.97                                                           | 321.8                | 78.3        | 6.17                                                            |
| 153.1                | 47.0        | 5.13                                                            | 87.9                 | 98.0        | 4.99                                                           | 312.1                | 88.0        | 6.13                                                            |
| 148.5                | 51.6        | 5.10                                                            | 97.7                 | 107.8       | 4.95                                                           | 302.3                | 97.8        | 6.10                                                            |
| 143.8                | 56.3        | 5.10                                                            | 107.4                | 117.5       | 4.98                                                           | 292.6                | 107.5       | 6.09                                                            |
| 139.2                | 60.9        | 5.10                                                            | 117.2                | 127.3       | 5.00                                                           | 282.8                | 117.3       | 6.07                                                            |
| 134.6                | 65.5        | 5.09                                                            | 126.9                | 137.0       | 4.99                                                           | 273.1                | 127.0       | 6.07                                                            |
| 130.0                | 70.1        | 5.09                                                            | 136.7                | 146.8       | 5.02                                                           | 263.3                | 136.8       | 6.07                                                            |
| 125.4                | 74.7        | 5.11                                                            | 146.4                | 156.5       | 5.06                                                           | 253.6                | 146.5       | 6.10                                                            |
| 120.8                | 79.3        | 5.11                                                            | 156.2                | 166.3       | 5.12                                                           | 243.8                | 156.3       | 6.09                                                            |
| 116.2                | 83.9        | 5.10                                                            | 165.9                | 176.0       | 5.13                                                           | 234.1                | 166.0       | 6.09                                                            |
| 111.5                | 88.6        | 5.10                                                            | 175.6                | 185.7       | 5.15                                                           | 224.4                | 175.7       | 6.09                                                            |
| 106.9                | 93.2        | 5.10                                                            | 185.4                | 195.5       | 5.15                                                           | 214.6                | 185.5       | 6.10                                                            |
| 102.3                | 97.8        | 5.08                                                            | 195.1                | 205.2       | 5.11                                                           | 204.9                | 195.2       | 6.08                                                            |
| 97.7                 | 102.4       | 5.09                                                            | 204.9                | 215.0       | 5.14                                                           | 195.1                | 205.0       | 6.12                                                            |
| 93.1                 | 107.0       | 5.10                                                            | 214.6                | 224.7       | 5.17                                                           | 185.4                | 214.7       | 6.15                                                            |
| 88.5                 | 111.6       | 5.11                                                            | 224.4                | 234.5       | 5.18                                                           | 175.6                | 224.5       | 6.16                                                            |
| 83.8                 | 116.3       | 5.12                                                            | 234.1                | 244.2       | 5.18                                                           | 165.9                | 234.2       | 6.15                                                            |
| 79.2                 | 120.9       | 5.11                                                            | 243.8                | 253.9       | 5.24                                                           | 156.2                | 243.9       | 6.19                                                            |
| 74.6                 | 125.5       | 5.12                                                            | 253.6                | 263.7       | 5.31                                                           | 146.4                | 253.7       | 6.21                                                            |
| 70.0                 | 130.1       | 5.12                                                            | 263.3                | 273.4       | 5.42                                                           | 136.7                | 263.4       | 6.19                                                            |
| 65.4                 | 134.7       | 5.13                                                            | 273.1                | 283.2       | 5.54                                                           | 126.9                | 273.2       | 6.21                                                            |
| 60.8                 | 139.3       | 5.15                                                            | 282.8                | 292.9       | 5.68                                                           | 117.2                | 282.9       | 6.22                                                            |
| 56.2                 | 143.9       | 5.14                                                            | 292.6                | 302.7       | 5.70                                                           | 107.4                | 292.7       | 6.19                                                            |
| 51.5                 | 148.6       | 5.15                                                            | 302.3                | 312.4       | 5.77                                                           | 97.7                 | 302.4       | 6.22                                                            |
| 46.9                 | 153.2       | 5.17                                                            | 312.1                | 322.2       | 5.78                                                           | 87.9                 | 312.2       | 6.26                                                            |
| 42.3                 | 157.8       | 5.16                                                            | 321.8                | 331.9       | 5.69                                                           | 78.2                 | 321.9       | 6.24                                                            |
| 37.7                 | 162.4       | 5.18                                                            | 331.5                | 341.6       | 5.67                                                           | 68.5                 | 331.6       | 6.22                                                            |
| 33.1                 | 167.0       | 5.19                                                            | 341.3                | 351.4       | 5.56                                                           | 58.7                 | 341.4       | 6.24                                                            |
| 28.5                 | 171.6       | 5.21                                                            | 351.0                | 361.1       | 5.48                                                           | 49.0                 | 351.1       | 6.22                                                            |
| 23.8                 | 176.3       | 5.23                                                            | 360.8                | 370.9       | 5.50                                                           | 39.2                 | 360.9       | 6.16                                                            |
| 19.2                 | 180.9       | 5.20                                                            | 370.5                | 380.6       | 5.39                                                           | 29.5                 | 370.6       | 6.09                                                            |
| 14.6                 | 185.5       | 5.28                                                            | 380.3                | 390.4       | 5.34                                                           | 19.7                 | 380.4       | 6.06                                                            |
| 10.0                 | 190.1       | 5.18                                                            | 390.0                | 400.1       | 5.39                                                           | 10.0                 | 390.1       | 5.95                                                            |

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# Frequency Mixer

**SBL-1-1+**

## 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   |
| 0.1         | 64.00                   | 67.00 | 70.00 | 64.00                   | 67.00 | 70.00 |
| 0.2         | 64.00                   | 67.00 | 70.00 | 64.00                   | 67.00 | 70.00 |
| 0.5         | 64.00                   | 67.00 | 70.00 | 64.00                   | 60.77 | 58.85 |
| 1.0         | 64.00                   | 67.00 | 70.00 | 64.00                   | 61.39 | 59.31 |
| 2.0         | 64.00                   | 67.00 | 70.00 | 64.00                   | 61.65 | 59.31 |
| 5.0         | 64.00                   | 67.00 | 70.00 | 64.00                   | 62.29 | 59.84 |
| 10.0        | 64.00                   | 67.00 | 60.40 | 64.00                   | 61.63 | 57.18 |
| 30.4        | 67.24                   | 68.37 | 69.58 | 55.68                   | 55.94 | 55.89 |
| 50.6        | 63.05                   | 64.91 | 66.87 | 52.51                   | 52.69 | 52.74 |
| 91.1        | 58.68                   | 60.49 | 62.24 | 48.63                   | 48.58 | 49.12 |
| 111.4       | 57.43                   | 59.63 | 61.36 | 48.00                   | 48.00 | 47.69 |
| 131.6       | 56.75                   | 58.34 | 59.81 | 47.04                   | 47.44 | 46.32 |
| 151.9       | 56.14                   | 58.55 | 60.22 | 46.51                   | 46.08 | 45.73 |
| 172.2       | 53.81                   | 55.72 | 57.57 | 46.45                   | 45.53 | 44.93 |
| 212.7       | 56.03                   | 58.99 | 61.12 | 45.56                   | 44.33 | 42.74 |
| 232.9       | 54.54                   | 56.65 | 57.96 | 43.81                   | 42.81 | 41.90 |
| 253.2       | 53.09                   | 55.63 | 57.73 | 41.72                   | 40.48 | 39.42 |
| 273.4       | 50.95                   | 53.69 | 55.70 | 38.90                   | 37.69 | 36.74 |
| 293.7       | 48.76                   | 51.45 | 54.35 | 38.51                   | 37.08 | 35.90 |
| 334.2       | 48.48                   | 51.49 | 53.92 | 37.09                   | 35.31 | 34.47 |
| 354.5       | 51.72                   | 55.40 | 52.42 | 36.84                   | 34.04 | 32.13 |
| 374.7       | 55.35                   | 52.94 | 49.42 | 35.33                   | 32.26 | 30.43 |
| 395.0       | 55.95                   | 49.41 | 46.31 | 33.86                   | 31.24 | 29.72 |
| 415.2       | 54.86                   | 49.76 | 47.32 | 33.01                   | 30.48 | 29.06 |
| 455.7       | 53.30                   | 49.28 | 45.76 | 30.62                   | 28.48 | 26.44 |
| 476.0       | 54.83                   | 48.88 | 44.71 | 29.64                   | 28.19 | 26.04 |
| 496.3       | 51.59                   | 47.78 | 44.07 | 28.19                   | 27.12 | 25.41 |
| 516.5       | 50.72                   | 45.74 | 42.33 | 27.60                   | 26.89 | 25.23 |
| 536.8       | 48.83                   | 43.88 | 40.48 | 26.59                   | 26.30 | 24.84 |
| 577.3       | 46.33                   | 40.68 | 36.64 | 24.33                   | 23.85 | 21.81 |
| 597.5       | 44.58                   | 39.00 | 35.12 | 23.18                   | 22.55 | 20.07 |
| 617.8       | 41.05                   | 36.23 | 32.66 | 21.89                   | 21.03 | 18.68 |
| 638.0       | 39.03                   | 34.64 | 31.52 | 20.58                   | 19.47 | 17.44 |
| 658.3       | 35.73                   | 32.25 | 29.64 | 19.17                   | 18.12 | 16.44 |
| 698.8       | 30.20                   | 28.26 | 26.57 | 16.32                   | 15.62 | 14.46 |
| 719.1       | 28.36                   | 26.72 | 25.39 | 15.12                   | 14.64 | 13.71 |
| 739.3       | 26.88                   | 25.61 | 24.46 | 14.49                   | 14.04 | 13.17 |
| 759.6       | 25.73                   | 24.42 | 23.41 | 14.04                   | 13.49 | 12.60 |
| 779.8       | 25.02                   | 23.71 | 22.70 | 13.71                   | 12.92 | 12.05 |
| 800.1       | 24.36                   | 23.23 | 22.09 | 13.37                   | 12.67 | 11.79 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +4                      | +7    | +10   |
| 10.1                | 40.1        | 41.65                   | 41.80 | 44.05 |
| 30.4                | 60.4        | 37.05                   | 36.46 | 36.37 |
| 50.6                | 80.6        | 32.69                   | 33.29 | 32.82 |
| 70.9                | 100.9       | 30.38                   | 30.49 | 30.59 |
| 91.1                | 121.1       | 28.98                   | 29.22 | 29.53 |
| 111.4               | 141.4       | 27.89                   | 28.09 | 28.48 |
| 131.6               | 161.6       | 27.19                   | 27.53 | 27.60 |
| 151.9               | 181.9       | 27.27                   | 27.74 | 27.89 |
| 172.2               | 202.2       | 26.71                   | 27.61 | 28.35 |
| 192.4               | 222.4       | 26.60                   | 27.21 | 27.79 |
| 212.7               | 242.7       | 26.02                   | 26.46 | 26.81 |
| 232.9               | 262.9       | 26.24                   | 26.71 | 27.23 |
| 253.2               | 283.2       | 26.94                   | 27.77 | 28.49 |
| 273.4               | 303.4       | 26.77                   | 27.62 | 28.24 |
| 293.7               | 323.7       | 26.43                   | 26.99 | 27.64 |
| 313.9               | 343.9       | 24.80                   | 25.36 | 25.72 |
| 334.2               | 364.2       | 23.03                   | 23.25 | 23.36 |
| 354.5               | 384.5       | 21.45                   | 21.43 | 21.29 |
| 374.7               | 404.7       | 20.37                   | 20.19 | 20.06 |
| 395.0               | 425.0       | 19.71                   | 19.60 | 19.57 |
| 415.2               | 445.2       | 19.45                   | 19.54 | 19.65 |
| 435.5               | 465.5       | 19.08                   | 19.33 | 19.57 |
| 455.7               | 485.7       | 18.94                   | 19.12 | 19.28 |
| 476.0               | 506.0       | 19.03                   | 19.04 | 19.00 |
| 496.3               | 526.3       | 18.71                   | 18.61 | 18.38 |
| 516.5               | 546.5       | 18.43                   | 18.26 | 18.09 |
| 536.8               | 566.8       | 17.75                   | 17.35 | 16.90 |
| 557.0               | 587.0       | 17.01                   | 16.60 | 16.34 |
| 577.3               | 607.3       | 16.22                   | 15.85 | 15.51 |
| 597.5               | 627.5       | 15.77                   | 15.42 | 15.00 |
| 617.8               | 647.8       | 15.19                   | 14.72 | 14.05 |
| 638.0               | 668.0       | 14.51                   | 13.95 | 13.18 |
| 658.3               | 688.3       | 13.55                   | 12.94 | 12.18 |
| 678.6               | 708.6       | 12.59                   | 11.91 | 11.26 |
| 698.8               | 728.8       | 11.63                   | 11.00 | 10.46 |
| 719.1               | 749.1       | 10.78                   | 10.20 | 9.69  |
| 739.3               | 769.3       | 10.22                   | 9.64  | 9.13  |
| 759.6               | 789.6       | 9.63                    | 9.11  | 8.69  |
| 779.8               | 809.8       | 9.29                    | 8.87  | 8.48  |
| 800.1               | 830.1       | 8.84                    | 8.43  | 8.12  |

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# Frequency Mixer

**SBL-1-1+**

## 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=400.1MHz<br>(:1) |      |      |
|---------------------|-------------|-----------------|------|------|-------------|-----------------|------|------|----------------------|---------------------------------|------|------|
|                     |             | @LO (dBm)       |      |      |             | @LO (dBm)       |      |      |                      | @LO (dBm)                       |      |      |
|                     |             | +4              | +7   | +10  |             | +4              | +7   | +10  |                      | +4                              | +7   | +10  |
| 5.0                 | 35.0        | 1.38            | 1.27 | 1.20 | 5.0         | 1.50            | 2.30 | 3.45 | 10.0                 | 1.80                            | 1.55 | 1.37 |
| 10.0                | 40.0        | 1.38            | 1.27 | 1.20 | 10.0        | 1.42            | 2.24 | 3.20 | 20.0                 | 1.86                            | 1.56 | 1.41 |
| 30.4                | 60.4        | 1.22            | 1.12 | 1.06 | 30.4        | 1.89            | 2.79 | 3.95 | 30.0                 | 1.97                            | 1.69 | 1.52 |
| 50.6                | 80.6        | 1.21            | 1.11 | 1.05 | 50.6        | 1.80            | 2.61 | 3.67 | 40.0                 | 2.00                            | 1.72 | 1.56 |
| 70.9                | 100.9       | 1.16            | 1.08 | 1.04 | 70.9        | 1.71            | 2.44 | 3.37 | 50.0                 | 2.03                            | 1.76 | 1.60 |
| 91.1                | 121.1       | 1.13            | 1.06 | 1.04 | 91.1        | 1.71            | 2.43 | 3.34 | 60.0                 | 2.01                            | 1.73 | 1.59 |
| 111.4               | 141.4       | 1.10            | 1.06 | 1.07 | 111.4       | 1.78            | 2.56 | 3.54 | 70.0                 | 2.02                            | 1.73 | 1.59 |
| 131.6               | 161.6       | 1.10            | 1.07 | 1.09 | 131.6       | 1.83            | 2.63 | 3.63 | 80.0                 | 1.99                            | 1.71 | 1.59 |
| 151.9               | 181.9       | 1.09            | 1.09 | 1.12 | 151.9       | 1.80            | 2.56 | 3.48 | 90.0                 | 2.08                            | 1.78 | 1.63 |
| 172.2               | 202.2       | 1.11            | 1.15 | 1.20 | 172.2       | 1.79            | 2.51 | 3.40 | 100.0                | 2.11                            | 1.82 | 1.66 |
| 192.4               | 222.4       | 1.12            | 1.15 | 1.18 | 192.4       | 1.84            | 2.57 | 3.48 | 110.0                | 2.12                            | 1.84 | 1.68 |
| 212.7               | 242.7       | 1.14            | 1.18 | 1.22 | 212.7       | 1.93            | 2.71 | 3.67 | 120.0                | 2.11                            | 1.83 | 1.69 |
| 232.9               | 262.9       | 1.16            | 1.25 | 1.32 | 232.9       | 1.97            | 2.75 | 3.71 | 130.0                | 2.12                            | 1.85 | 1.71 |
| 253.2               | 283.2       | 1.21            | 1.30 | 1.40 | 253.2       | 1.96            | 2.70 | 3.60 | 140.0                | 2.13                            | 1.88 | 1.74 |
| 273.4               | 303.4       | 1.27            | 1.36 | 1.43 | 273.4       | 2.00            | 2.73 | 3.63 | 150.0                | 2.19                            | 1.93 | 1.80 |
| 293.7               | 323.7       | 1.34            | 1.42 | 1.49 | 293.7       | 2.09            | 2.87 | 3.81 | 160.0                | 2.26                            | 1.99 | 1.86 |
| 313.9               | 343.9       | 1.40            | 1.49 | 1.56 | 313.9       | 2.18            | 2.99 | 3.96 | 170.0                | 2.29                            | 2.04 | 1.90 |
| 334.2               | 364.2       | 1.43            | 1.53 | 1.59 | 334.2       | 2.21            | 3.00 | 3.95 | 180.0                | 2.29                            | 2.02 | 1.89 |
| 354.5               | 384.5       | 1.45            | 1.52 | 1.57 | 354.5       | 2.21            | 2.96 | 3.88 | 190.0                | 2.24                            | 2.00 | 1.86 |
| 374.7               | 404.7       | 1.36            | 1.42 | 1.46 | 374.7       | 2.27            | 3.01 | 3.94 | 200.0                | 2.23                            | 1.97 | 1.84 |
| 395.0               | 425.0       | 1.25            | 1.31 | 1.34 | 395.0       | 2.40            | 3.16 | 4.11 | 210.0                | 2.24                            | 1.98 | 1.86 |
| 435.5               | 465.5       | 1.06            | 1.07 | 1.14 | 435.5       | 2.59            | 3.37 | 4.28 | 220.0                | 2.29                            | 2.03 | 1.91 |
| 455.7               | 485.7       | 1.08            | 1.04 | 1.10 | 455.7       | 2.64            | 3.43 | 4.34 | 230.0                | 2.33                            | 2.09 | 1.97 |
| 476.0               | 506.0       | 1.21            | 1.19 | 1.21 | 476.0       | 2.73            | 3.56 | 4.50 | 240.0                | 2.38                            | 2.13 | 2.01 |
| 496.3               | 526.3       | 1.34            | 1.33 | 1.36 | 496.3       | 2.84            | 3.69 | 4.66 | 250.0                | 2.39                            | 2.15 | 2.03 |
| 516.5               | 546.5       | 1.50            | 1.53 | 1.57 | 516.5       | 2.90            | 3.75 | 4.72 | 260.0                | 2.37                            | 2.13 | 2.01 |
| 536.8               | 566.8       | 1.66            | 1.71 | 1.77 | 536.8       | 2.92            | 3.75 | 4.69 | 270.0                | 2.32                            | 2.09 | 1.97 |
| 557.0               | 587.0       | 1.86            | 1.93 | 2.01 | 557.0       | 2.96            | 3.78 | 4.70 | 280.0                | 2.32                            | 2.09 | 1.96 |
| 577.3               | 607.3       | 2.07            | 2.17 | 2.25 | 577.3       | 3.04            | 3.85 | 4.77 | 290.0                | 2.36                            | 2.11 | 1.98 |
| 597.5               | 627.5       | 2.27            | 2.37 | 2.45 | 597.5       | 3.10            | 3.89 | 4.75 | 300.0                | 2.40                            | 2.17 | 2.04 |
| 617.8               | 647.8       | 2.49            | 2.58 | 2.65 | 617.8       | 3.10            | 3.84 | 4.66 | 310.0                | 2.42                            | 2.19 | 2.07 |
| 638.0               | 668.0       | 2.65            | 2.72 | 2.79 | 638.0       | 3.09            | 3.77 | 4.55 | 320.0                | 2.42                            | 2.18 | 2.06 |
| 658.3               | 688.3       | 2.81            | 2.87 | 2.93 | 658.3       | 3.11            | 3.76 | 4.52 | 330.0                | 2.39                            | 2.16 | 2.05 |
| 678.6               | 708.6       | 2.95            | 2.99 | 3.05 | 678.6       | 3.19            | 3.82 | 4.56 | 340.0                | 2.39                            | 2.16 | 2.05 |
| 698.8               | 728.8       | 3.08            | 3.11 | 3.16 | 698.8       | 3.27            | 3.88 | 4.59 | 350.0                | 2.40                            | 2.18 | 2.06 |
| 719.1               | 749.1       | 3.20            | 3.22 | 3.25 | 719.1       | 3.37            | 3.93 | 4.59 | 360.0                | 2.44                            | 2.20 | 2.08 |
| 739.3               | 769.3       | 3.29            | 3.28 | 3.29 | 739.3       | 3.48            | 4.00 | 4.61 | 370.0                | 2.46                            | 2.23 | 2.10 |
| 759.6               | 789.6       | 3.35            | 3.30 | 3.30 | 759.6       | 3.57            | 4.07 | 4.63 | 380.0                | 2.48                            | 2.25 | 2.12 |
| 779.8               | 809.8       | 3.42            | 3.37 | 3.35 | 779.8       | 3.62            | 4.10 | 4.64 | 390.0                | 2.45                            | 2.23 | 2.11 |
| 800.1               | 830.1       | 3.54            | 3.50 | 3.47 | 800.1       | 3.62            | 4.10 | 4.62 | 400.0                | 2.47                            | 2.29 | 2.18 |

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## Harmonics Tables

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0      | -      | -      | 16  | 32  | 15  | 36  | 18  | 39  | 25  | 48  | 35  | 55  |
| 1      | -      | 22     | +0  | 30  | 12  | 48  | 21  | 44  | 34  | 52  | 41  | 51  |
| 2      | >100   | 71     | 50  | 69  | 50  | 67  | 48  | 66  | 57  | 72  | 62  | 74  |
| 3      | >100   | 65     | 54  | 65  | 57  | 70  | 53  | 67  | 68  | 73  | 66  | 80  |
| 4      | >100   | >81    | >81 | >81 | >81 | >81 | >81 | >81 | 78  | >81 | >81 | >81 |
| 5      | >100   | >81    | >81 | >81 | >81 | 79  | >81 | >81 | >81 | >81 | >81 | >81 |
| 6      | >100   | >81    | >81 | >81 | >81 | >81 | 76  | >81 | >81 | >81 | >81 | >81 |
| 7      | >100   | >81    | >81 | >81 | >81 | >81 | >81 | 68  | 81  | >81 | >81 | >81 |
| 8      | >100   | >81    | >81 | >81 | >81 | >81 | >81 | >81 | 57  | >81 | >81 | >81 |
| 9      | >100   | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | 71  | >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; -19.3 dBm

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0      | -      | -      | 25  | 44  | 27  | 46  | 29  | 51  | 37  | 57  | 49  | 73  |
| 1      | -      | 23     | +0  | 32  | 12  | 44  | 24  | 52  | 36  | 60  | 46  | 58  |
| 2      | 99     | 61     | 45  | 65  | 47  | 61  | 50  | 66  | 56  | 65  | 56  | 74  |
| 3      | >100   | 48     | 36  | 48  | 40  | 51  | 35  | 58  | 44  | 57  | 51  | 66  |
| 4      | >100   | 76     | 62  | 84  | 60  | 81  | 59  | 74  | 55  | 75  | 71  | 81  |
| 5      | >100   | 85     | 65  | 74  | 52  | 66  | 50  | 65  | 54  | 63  | 83  | 69  |
| 6      | >100   | 88     | 73  | 86  | 72  | 81  | 81  | 83  | 75  | 87  | 68  | 84  |
| 7      | >100   | >91    | 73  | 89  | 66  | 75  | 64  | 78  | 62  | >91 | 60  | 76  |
| 8      | >100   | >91    | >91 | >91 | 90  | >91 | 90  | >91 | 68  | >91 | 88  | >91 |
| 9      | >100   | >91    | 87  | >91 | 85  | 90  | 80  | 89  | 83  | >91 | 82  | >91 |
| 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; -9.42 dBm

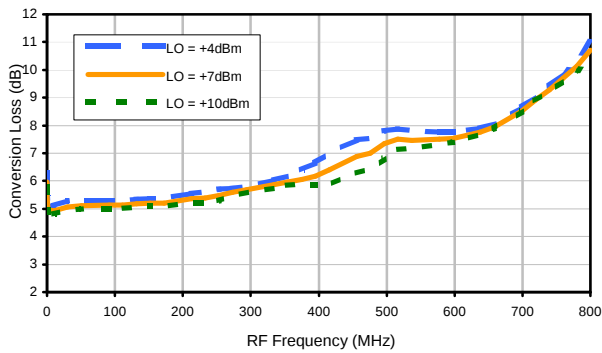
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.  
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.  
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

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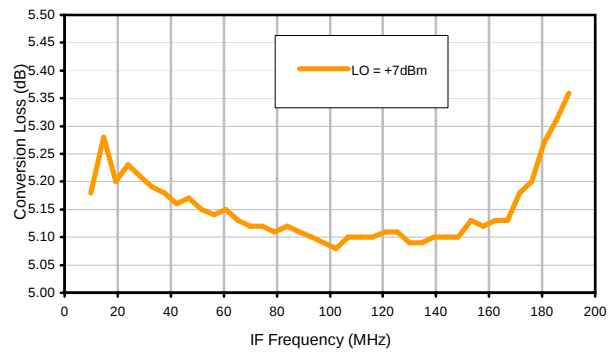


## Typical Performance Curves

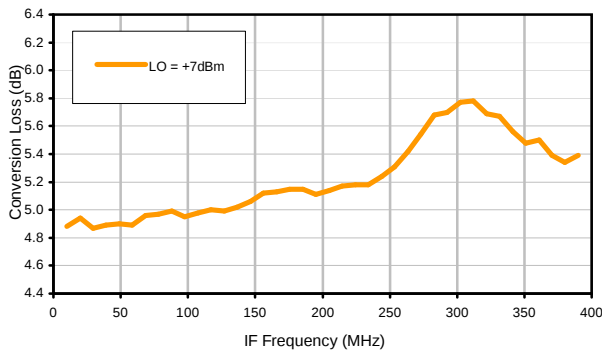
Conversion Loss @ IF=30MHz



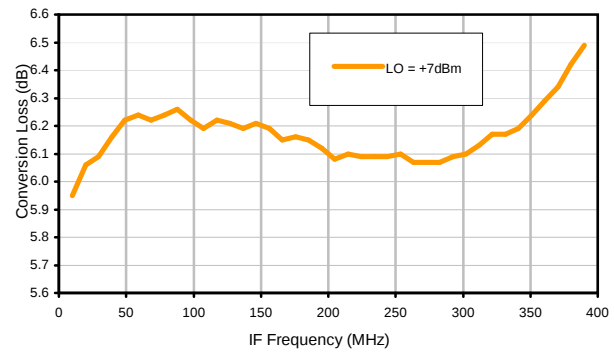
Conversion Loss vs. IF @ RF=200.1MHz



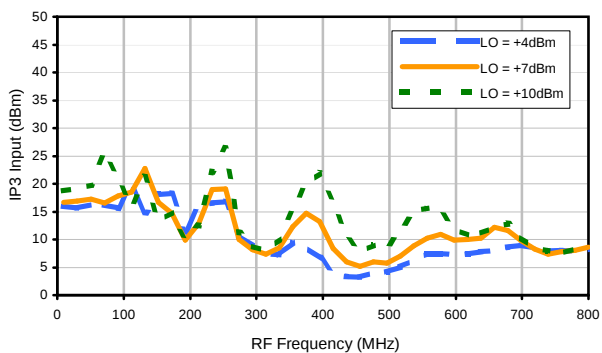
Conversion Loss vs. IF @ RF=10.1MHz



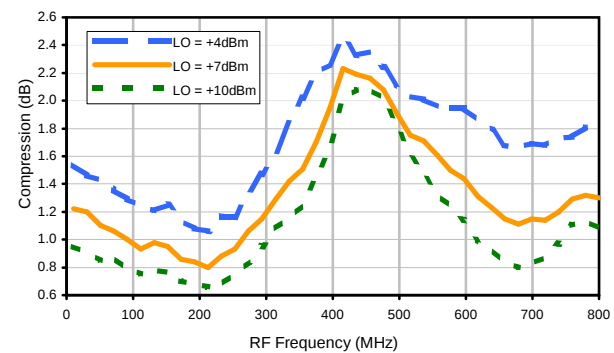
Conversion Loss vs. IF @ RF=400.1MHz



IP3 Input

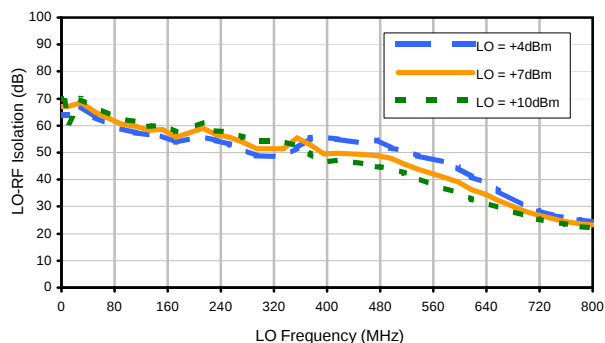


Compression @ RF IN=+1dBm

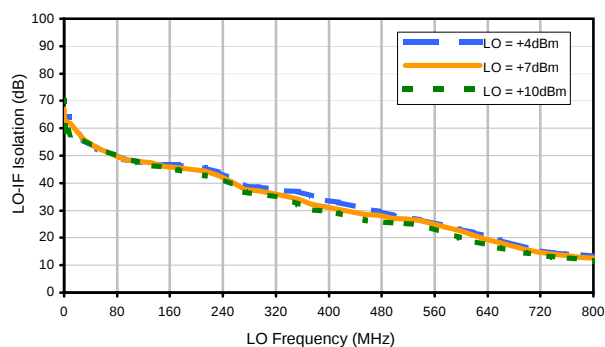


## Typical Performance Curves

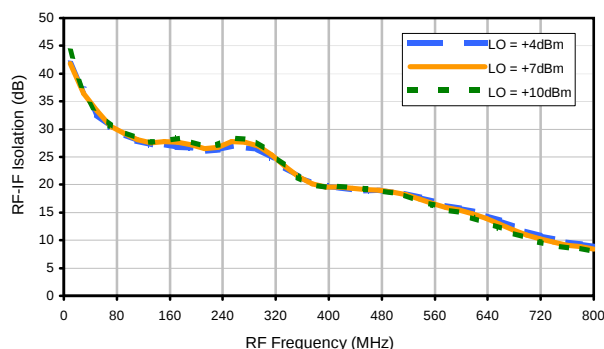
LO-RF Isolation



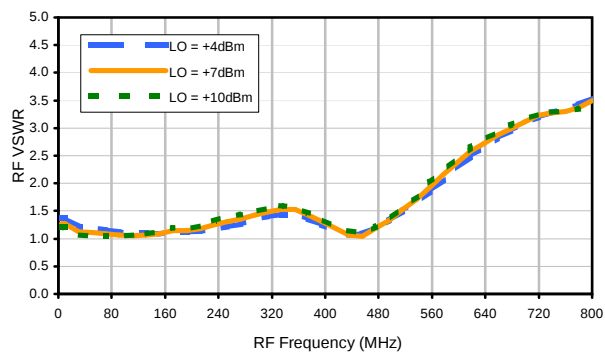
LO-IF Isolation



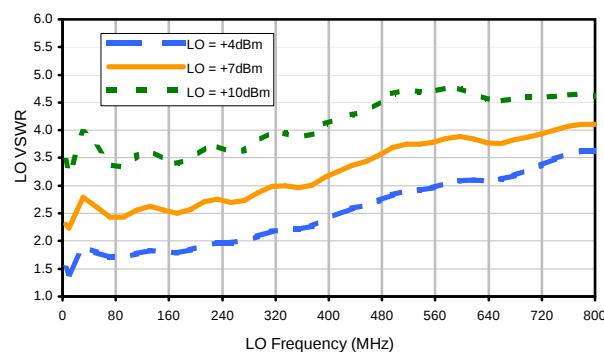
RF-IF Isolation



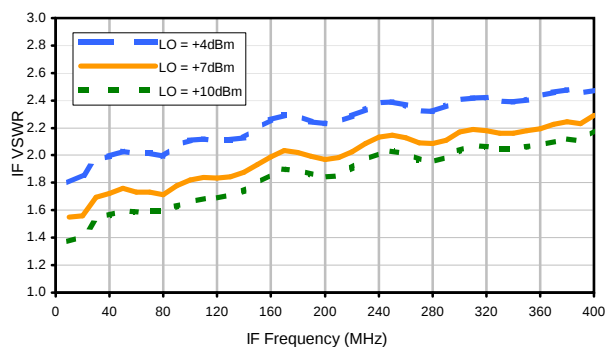
RF VSWR



LO VSWR



IF VSWR



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## Harmonics Tables

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0      | -      | -      | 16  | 32  | 15  | 36  | 18  | 39  | 25  | 48  | 35  | 55  |
| 1      | -      | 22     | +0  | 30  | 12  | 48  | 21  | 44  | 34  | 52  | 41  | 51  |
| 2      | >100   | 71     | 50  | 69  | 50  | 67  | 48  | 66  | 57  | 72  | 62  | 74  |
| 3      | >100   | 65     | 54  | 65  | 57  | 70  | 53  | 67  | 68  | 73  | 66  | 80  |
| 4      | >100   | >81    | >81 | >81 | >81 | >81 | >81 | >81 | 78  | >81 | >81 | >81 |
| 5      | >100   | >81    | >81 | >81 | >81 | 79  | >81 | >81 | >81 | >81 | >81 | >81 |
| 6      | >100   | >81    | >81 | >81 | >81 | >81 | 76  | >81 | >81 | >81 | >81 | >81 |
| 7      | >100   | >81    | >81 | >81 | >81 | >81 | >81 | 68  | 81  | >81 | >81 | >81 |
| 8      | >100   | >81    | >81 | >81 | >81 | >81 | >81 | >81 | 57  | >81 | >81 | >81 |
| 9      | >100   | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | 71  | >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; -19.3 dBm

RF HARMONICS ORDER

|        | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|--------|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0      | -      | -      | 25  | 44  | 27  | 46  | 29  | 51  | 37  | 57  | 49  | 73  |
| 1      | -      | 23     | +0  | 32  | 12  | 44  | 24  | 52  | 36  | 60  | 46  | 58  |
| 2      | 99     | 61     | 45  | 65  | 47  | 61  | 50  | 66  | 56  | 65  | 56  | 74  |
| 3      | >100   | 48     | 36  | 48  | 40  | 51  | 35  | 58  | 44  | 57  | 51  | 66  |
| 4      | >100   | 76     | 62  | 84  | 60  | 81  | 59  | 74  | 55  | 75  | 71  | 81  |
| 5      | >100   | 85     | 65  | 74  | 52  | 66  | 50  | 65  | 54  | 63  | 83  | 69  |
| 6      | >100   | 88     | 73  | 86  | 72  | 81  | 81  | 83  | 75  | 87  | 68  | 84  |
| 7      | >100   | >91    | 73  | 89  | 66  | 75  | 64  | 78  | 62  | >91 | 60  | 76  |
| 8      | >100   | >91    | >91 | >91 | 90  | >91 | 90  | >91 | 68  | >91 | 88  | >91 |
| 9      | >100   | >91    | 87  | >91 | 85  | 90  | 80  | 89  | 83  | >91 | 82  | >91 |
| 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; -9.42 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                                                                 |



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| Specification       | Test/Inspection Condition | Reference/Spec                       |
|---------------------|---------------------------|--------------------------------------|
| Barometric Pressure | 100,000 Feet              | MIL-STD-202, Method 105, Condition D |