

# Frequency Mixer

Level 7 (LO Power +7 dBm) 0.05 to 250 MHz

## ADE-6+



Generic photo used for illustration purposes only

CASE STYLE: CD637

**+RoHS Compliant**

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



Available Tape and Reel  
at no extra cost  
Reel Size 13" Devices/Reel 900

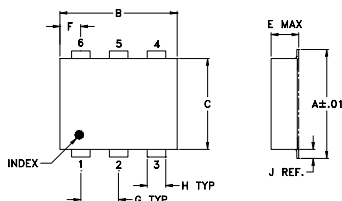
### Maximum Ratings

|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -40°C to 85°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. |                |

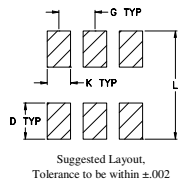
### Pin Connections

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

### Outline Drawing



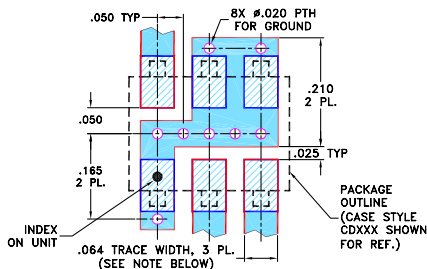
#### PCB Land Pattern



### Outline Dimensions (inch/mm)

| A    | B    | C    | D    | E    | F    | G     |
|------|------|------|------|------|------|-------|
| .272 | .310 | .220 | .100 | .206 | .055 | .100  |
| 6.91 | 7.87 | 5.59 | 2.54 | 5.23 | 1.40 | 2.54  |
| H    | J    | K    | L    |      |      | wt    |
| .030 | .026 | .065 | .300 |      |      | grams |
| 0.76 | 0.66 | 1.65 | 7.62 |      |      | 0.40  |

### Demo Board MCL P/N: TB-03 Suggested PCB Layout (PL-052)



NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE.  
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

### Features

- low conversion loss, 4.6 dB typ.
- excellent L-R isolation, 40 dB typ.
- low profile package
- aqueous washable
- protected by U.S. Patent 6,133,525

### Applications

- cellular

### Electrical Specifications

| FREQUENCY<br>(MHz)     |        | CONVERSION LOSS<br>(dB) |          |                        |      | LO-RF ISOLATION<br>(dB) |    |    |    |    |    | LO-IF ISOLATION<br>(dB) |    |    |      |      |      | IP3<br>at center<br>band<br>(dBm) |
|------------------------|--------|-------------------------|----------|------------------------|------|-------------------------|----|----|----|----|----|-------------------------|----|----|------|------|------|-----------------------------------|
| LO/RF<br>$f_L$ - $f_U$ | IF     | Mid-Band<br>$m$         |          | Total<br>Range<br>Max. |      | L                       | M  | U  | L  | M  | U  | L                       | M  | U  |      |      |      |                                   |
|                        |        | $\overline{X}$          | $\sigma$ | Max.                   | Max. |                         |    |    |    |    |    |                         |    |    |      |      |      |                                   |
|                        |        | Typ.                    | Min.     | Typ.                   | Min. |                         |    |    |    |    |    |                         |    |    | Typ. | Min. | Typ. |                                   |
| 0.05-250               | DC-200 | 4.6                     | 0.05     | 7.0                    | 8.4  | 62                      | 49 | 40 | 30 | 40 | 20 | 58                      | 44 | 45 | 24   | 25   | 15   | 10                                |

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  $f_U$ ]

1 dB COMP.: +1 dBm typ.

L = low range [ $f_L$  to  $10 f_L$ ]

m = mid band [ $2 f_L$  to  $f_U/2$ ]

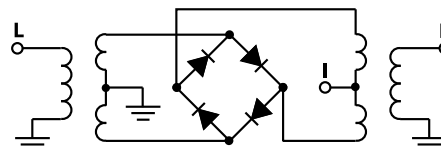
M = mid range [ $10 f_L$  to  $f_U/2$ ]

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          |
| 0.05            | 30.05  | 4.68                 | 59.77              | 56.14              | 1.58              | 2.30              |
| 10.00           | 40.00  | 4.13                 | 66.00              | 52.10              | 1.27              | 2.52              |
| 26.76           | 56.76  | 4.22                 | 68.60              | 49.00              | 1.23              | 2.55              |
| 40.00           | 70.00  | 4.19                 | 66.80              | 46.10              | 1.21              | 2.58              |
| 53.42           | 83.42  | 4.35                 | 57.30              | 45.60              | 1.18              | 2.55              |
| 60.00           | 90.00  | 4.32                 | 54.40              | 44.40              | 1.18              | 2.61              |
| 80.00           | 110.00 | 4.18                 | 56.90              | 41.50              | 1.13              | 2.55              |
| 100.00          | 130.00 | 4.49                 | 48.70              | 40.80              | 1.14              | 2.65              |
| 106.74          | 136.74 | 4.62                 | 43.60              | 42.00              | 1.15              | 2.68              |
| 120.00          | 150.00 | 4.62                 | 40.20              | 40.00              | 1.12              | 2.80              |
| 133.40          | 163.40 | 4.54                 | 38.00              | 37.00              | 1.13              | 2.76              |
| 140.00          | 170.00 | 4.64                 | 37.00              | 35.70              | 1.15              | 2.80              |
| 150.00          | 180.00 | 4.68                 | 36.30              | 34.30              | 1.13              | 2.84              |
| 160.06          | 190.06 | 4.75                 | 53.20              | 32.70              | 1.07              | 2.68              |
| 170.00          | 200.00 | 4.81                 | 54.40              | 32.20              | 1.02              | 2.76              |
| 186.72          | 216.72 | 5.14                 | 54.50              | 31.20              | 1.16              | 2.92              |
| 200.00          | 230.00 | 5.19                 | 53.80              | 31.80              | 1.28              | 2.96              |
| 213.38          | 243.38 | 5.26                 | 61.60              | 31.60              | 1.41              | 2.92              |
| 240.04          | 270.04 | 5.44                 | 42.00              | 26.40              | 1.62              | 2.72              |
| 250.00          | 280.00 | 5.44                 | 39.40              | 24.50              | 1.69              | 2.65              |

### Electrical Schematic



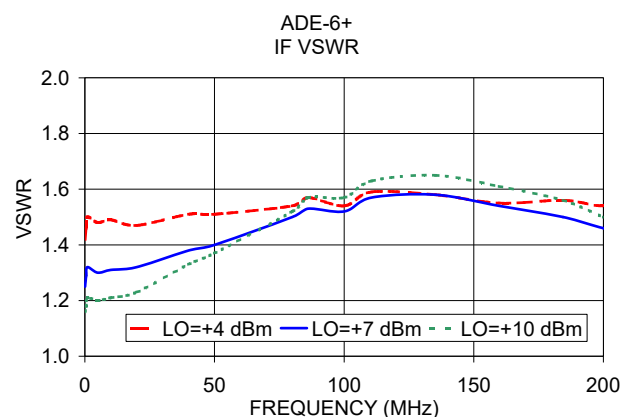
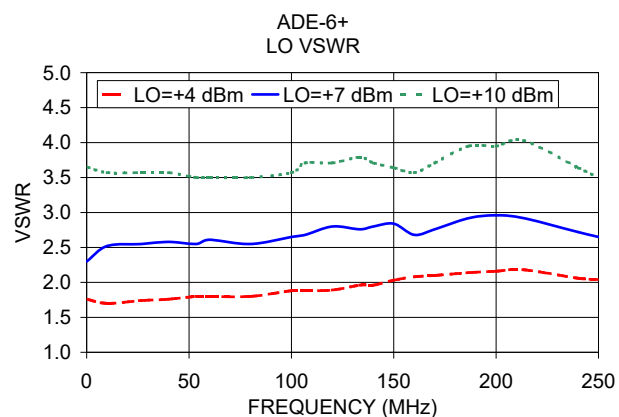
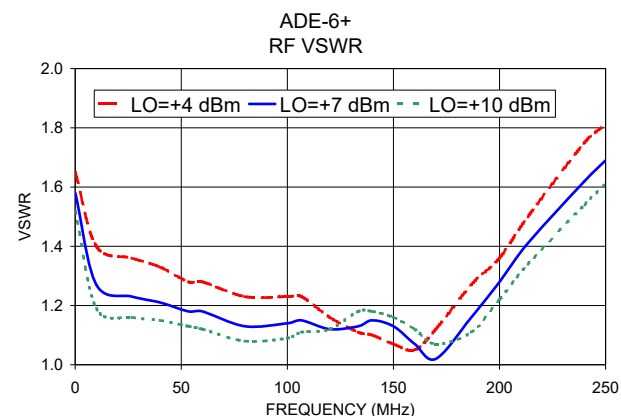
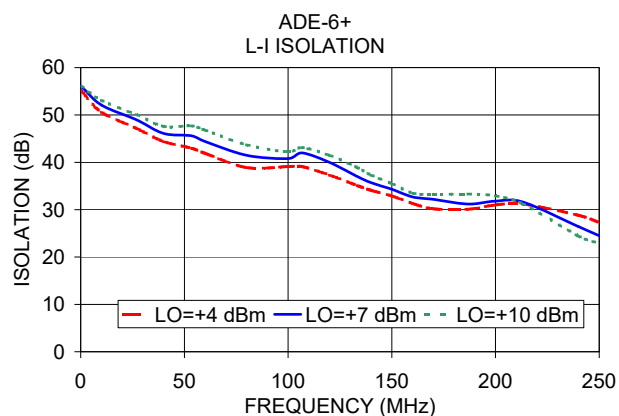
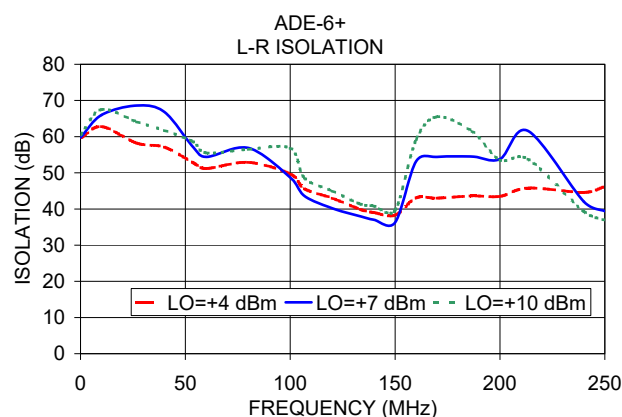
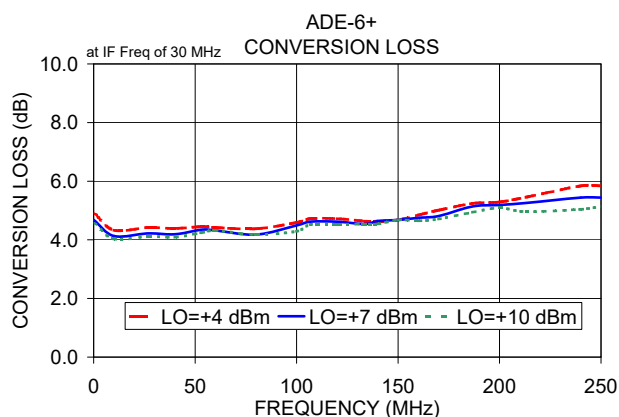
#### Notes

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200423  
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# Frequency Mixer

ADE-6+

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>IF FIXED<br>@IF(OUT)=30MHz<br>(dB) |       |       |
|---------------------|-------------|-------------------------------------------------------|-------|-------|
|                     |             | @LO (dBm)                                             |       |       |
|                     |             | +4                                                    | +7    | +10   |
| 10.1                | 40.1        | 4.67                                                  | 4.48  | 4.59  |
| 20.1                | 50.1        | 4.89                                                  | 4.80  | 4.63  |
| 30.1                | 60.1        | 5.06                                                  | 4.89  | 4.70  |
| 40.1                | 70.1        | 5.08                                                  | 4.86  | 4.74  |
| 50.1                | 80.1        | 5.11                                                  | 4.88  | 4.74  |
| 60.1                | 90.1        | 5.09                                                  | 4.89  | 4.79  |
| 70.1                | 100.1       | 4.96                                                  | 4.85  | 4.75  |
| 80.1                | 110.1       | 4.94                                                  | 4.80  | 4.73  |
| 90.1                | 120.1       | 5.07                                                  | 4.88  | 4.74  |
| 100.1               | 130.1       | 5.29                                                  | 5.01  | 4.83  |
| 110.1               | 140.1       | 5.41                                                  | 5.18  | 4.97  |
| 120.1               | 150.1       | 5.40                                                  | 5.21  | 5.07  |
| 130.1               | 160.1       | 5.42                                                  | 5.25  | 5.12  |
| 140.1               | 170.1       | 5.38                                                  | 5.23  | 5.15  |
| 150.1               | 180.1       | 5.46                                                  | 5.32  | 5.25  |
| 160.1               | 190.1       | 5.49                                                  | 5.36  | 5.30  |
| 170.1               | 200.1       | 5.59                                                  | 5.42  | 5.36  |
| 180.1               | 210.1       | 5.81                                                  | 5.56  | 5.43  |
| 190.1               | 220.1       | 6.03                                                  | 5.69  | 5.48  |
| 200.1               | 230.1       | 6.22                                                  | 5.90  | 5.52  |
| 210.1               | 240.1       | 6.39                                                  | 6.09  | 5.70  |
| 220.1               | 250.1       | 6.50                                                  | 6.20  | 5.88  |
| 230.1               | 260.1       | 6.61                                                  | 6.27  | 5.94  |
| 240.1               | 270.1       | 6.57                                                  | 6.18  | 5.84  |
| 250.1               | 280.1       | 6.76                                                  | 6.30  | 5.91  |
| 260.1               | 290.1       | 6.81                                                  | 6.31  | 5.87  |
| 270.1               | 300.1       | 7.15                                                  | 6.58  | 6.15  |
| 280.1               | 310.1       | 7.06                                                  | 6.58  | 6.25  |
| 290.1               | 320.1       | 7.26                                                  | 6.79  | 6.48  |
| 300.1               | 330.1       | 7.39                                                  | 7.05  | 6.85  |
| 310.1               | 340.1       | 7.50                                                  | 7.19  | 6.98  |
| 320.1               | 350.1       | 7.78                                                  | 7.69  | 7.35  |
| 330.1               | 360.1       | 7.88                                                  | 7.65  | 7.54  |
| 340.1               | 370.1       | 8.55                                                  | 8.36  | 8.31  |
| 350.1               | 380.1       | 8.70                                                  | 8.39  | 8.41  |
| 360.1               | 390.1       | 9.40                                                  | 9.17  | 9.09  |
| 370.1               | 400.1       | 9.50                                                  | 9.27  | 9.20  |
| 380.1               | 410.1       | 10.20                                                 | 9.98  | 9.70  |
| 390.1               | 420.1       | 10.67                                                 | 10.40 | 10.27 |
| 400.1               | 430.1       | 11.39                                                 | 11.07 | 10.89 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       |
|---------------------|-------------|--------------------|-------|-------|
|                     |             | @LO (dBm)          |       |       |
|                     |             | +4                 | +7    | +10   |
| 10.1                | 40.1        | 16.25              | 19.53 | 20.58 |
| 20.1                | 50.1        | 19.39              | 21.60 | 16.69 |
| 30.1                | 60.1        | 19.75              | 18.81 | 15.74 |
| 40.1                | 70.1        | 19.24              | 20.68 | 14.27 |
| 50.1                | 80.1        | 19.41              | 15.59 | 14.16 |
| 60.1                | 90.1        | 19.52              | 15.02 | 13.72 |
| 70.1                | 100.1       | 13.56              | 12.76 | 12.58 |
| 80.1                | 110.1       | 10.69              | 9.65  | 9.65  |
| 90.1                | 120.1       | 12.20              | 10.87 | 11.40 |
| 100.1               | 130.1       | 15.13              | 14.15 | 15.74 |
| 110.1               | 140.1       | 12.91              | 12.66 | 14.50 |
| 120.1               | 150.1       | 11.51              | 10.56 | 10.85 |
| 130.1               | 160.1       | 11.10              | 10.94 | 11.63 |
| 140.1               | 170.1       | 9.68               | 9.77  | 10.73 |
| 150.1               | 180.1       | 8.70               | 9.07  | 10.99 |
| 160.1               | 190.1       | 8.55               | 9.32  | 11.22 |
| 170.1               | 200.1       | 9.09               | 10.21 | 12.04 |
| 180.1               | 210.1       | 7.37               | 10.22 | 12.65 |
| 190.1               | 220.1       | 3.99               | 8.08  | 11.67 |
| 200.1               | 230.1       | 1.83               | 4.49  | 8.56  |
| 210.1               | 240.1       | 1.09               | 2.66  | 5.56  |
| 220.1               | 250.1       | 0.66               | 1.54  | 3.22  |
| 230.1               | 260.1       | 0.87               | 1.52  | 2.44  |
| 240.1               | 270.1       | 1.44               | 2.17  | 3.16  |
| 250.1               | 280.1       | 2.51               | 3.49  | 5.26  |
| 260.1               | 290.1       | 4.04               | 5.50  | 8.10  |
| 270.1               | 300.1       | 5.74               | 7.53  | 10.07 |
| 280.1               | 310.1       | 7.55               | 9.08  | 11.11 |
| 290.1               | 320.1       | 8.60               | 10.12 | 11.75 |
| 300.1               | 330.1       | 9.20               | 10.44 | 11.52 |
| 310.1               | 340.1       | 9.41               | 10.42 | 11.61 |
| 320.1               | 350.1       | 9.33               | 10.26 | 11.67 |
| 330.1               | 360.1       | 8.64               | 9.28  | 10.35 |
| 340.1               | 370.1       | 8.26               | 8.96  | 10.10 |
| 350.1               | 380.1       | 7.80               | 8.44  | 9.47  |
| 360.1               | 390.1       | 7.48               | 8.23  | 9.09  |
| 370.1               | 400.1       | 7.27               | 8.20  | 9.29  |
| 380.1               | 410.1       | 7.46               | 8.50  | 9.87  |
| 390.1               | 420.1       | 8.13               | 9.43  | 11.58 |
| 400.1               | 430.1       | 8.72               | 10.77 | 13.51 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF IN=+1dBm<br>(dB) |      |      |
|---------------------|-------------|-------------------------------------|------|------|
|                     |             | @LO (dBm)                           |      |      |
|                     |             | +4                                  | +7   | +10  |
| 10.1                | 40.1        | 1.98                                | 1.49 | 1.09 |
| 20.1                | 50.1        | 1.62                                | 1.37 | 1.13 |
| 30.1                | 60.1        | 1.68                                | 1.39 | 1.14 |
| 40.1                | 70.1        | 1.61                                | 1.27 | 1.13 |
| 50.1                | 80.1        | 1.52                                | 1.30 | 1.09 |
| 60.1                | 90.1        | 1.59                                | 1.29 | 1.10 |
| 70.1                | 100.1       | 1.59                                | 1.38 | 1.06 |
| 80.1                | 110.1       | 1.61                                | 1.34 | 1.13 |
| 90.1                | 120.1       | 1.44                                | 1.22 | 1.03 |
| 100.1               | 130.1       | 1.28                                | 1.08 | 0.86 |
| 110.1               | 140.1       | 1.24                                | 1.02 | 0.86 |
| 120.1               | 150.1       | 1.32                                | 1.10 | 0.92 |
| 130.1               | 160.1       | 1.41                                | 1.15 | 0.97 |
| 140.1               | 170.1       | 1.58                                | 1.29 | 1.06 |
| 150.1               | 180.1       | 1.78                                | 1.39 | 1.13 |
| 160.1               | 190.1       | 1.97                                | 1.48 | 1.23 |
| 170.1               | 200.1       | 2.09                                | 1.57 | 1.29 |
| 180.1               | 210.1       | 2.28                                | 1.77 | 1.42 |
| 190.1               | 220.1       | 2.46                                | 2.01 | 1.62 |
| 200.1               | 230.1       | 2.61                                | 2.23 | 1.91 |
| 210.1               | 240.1       | 2.64                                | 2.29 | 2.07 |
| 220.1               | 250.1       | 2.69                                | 2.40 | 2.17 |
| 230.1               | 260.1       | 2.64                                | 2.37 | 2.15 |
| 240.1               | 270.1       | 2.69                                | 2.45 | 2.19 |
| 250.1               | 280.1       | 2.51                                | 2.28 | 2.05 |
| 260.1               | 290.1       | 2.44                                | 2.21 | 1.99 |
| 270.1               | 300.1       | 2.18                                | 1.98 | 1.79 |
| 280.1               | 310.1       | 2.15                                | 1.86 | 1.68 |
| 290.1               | 320.1       | 2.11                                | 1.86 | 1.62 |
| 300.1               | 330.1       | 1.95                                | 1.65 | 1.40 |
| 310.1               | 340.1       | 2.03                                | 1.74 | 1.50 |
| 320.1               | 350.1       | 1.90                                | 1.56 | 1.29 |
| 330.1               | 360.1       | 2.01                                | 1.68 | 1.39 |
| 340.1               | 370.1       | 1.73                                | 1.41 | 1.13 |
| 350.1               | 380.1       | 1.80                                | 1.56 | 1.30 |
| 360.1               | 390.1       | 1.45                                | 1.23 | 1.05 |
| 370.1               | 400.1       | 1.45                                | 1.25 | 1.06 |
| 380.1               | 410.1       | 1.29                                | 1.29 | 1.26 |
| 390.1               | 420.1       | 1.18                                | 1.02 | 0.91 |
| 400.1               | 430.1       | 1.09                                | 0.97 | 0.91 |

REV. X2

ADE-6+

101013

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IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant  
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The Design Engineers Search Engine finds the model you need, instantly • For detailed performance specs & shopping online see



# Frequency Mixer

ADE-6+

## Typical Performance Data

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=125.1MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=10MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=250.1MHz<br>(dB) |
|----------------------|-------------|-----------------------------------------------------------------|----------------------|-------------|--------------------------------------------------------------|----------------------|-------------|-----------------------------------------------------------------|
|                      |             | @LO (dBm)                                                       |                      |             | @LO (dBm)                                                    |                      |             | @LO (dBm)                                                       |
|                      |             | +7                                                              |                      |             | +7                                                           |                      |             | +7                                                              |
| 115.1                | 10.0        | 5.28                                                            | 10.1                 | 20.1        | 4.75                                                         | 240.1                | 10.0        | 7.38                                                            |
| 112.6                | 12.5        | 5.24                                                            | 20.1                 | 30.1        | 4.38                                                         | 235.1                | 15.0        | 7.29                                                            |
| 110.1                | 15.0        | 5.18                                                            | 30.1                 | 40.1        | 4.39                                                         | 230.1                | 20.0        | 7.28                                                            |
| 107.6                | 17.5        | 5.14                                                            | 40.1                 | 50.1        | 4.30                                                         | 225.1                | 25.0        | 7.27                                                            |
| 105.1                | 20.0        | 5.09                                                            | 50.1                 | 60.1        | 4.69                                                         | 220.1                | 30.0        | 7.20                                                            |
| 102.6                | 22.5        | 5.11                                                            | 60.1                 | 70.1        | 4.34                                                         | 215.1                | 35.0        | 7.14                                                            |
| 100.1                | 25.0        | 5.09                                                            | 70.1                 | 80.1        | 4.41                                                         | 210.1                | 40.0        | 7.12                                                            |
| 97.6                 | 27.5        | 5.08                                                            | 80.1                 | 90.1        | 4.54                                                         | 205.1                | 45.0        | 7.10                                                            |
| 95.1                 | 30.0        | 5.05                                                            | 90.1                 | 100.1       | 4.64                                                         | 200.1                | 50.0        | 7.00                                                            |
| 92.6                 | 32.5        | 5.03                                                            | 100.1                | 110.1       | 4.70                                                         | 195.1                | 55.0        | 6.92                                                            |
| 90.1                 | 35.0        | 5.01                                                            | 110.1                | 120.1       | 4.67                                                         | 190.1                | 60.0        | 6.91                                                            |
| 87.6                 | 37.5        | 4.97                                                            | 120.1                | 130.1       | 4.82                                                         | 185.1                | 65.0        | 6.96                                                            |
| 85.1                 | 40.0        | 4.95                                                            | 130.1                | 140.1       | 4.93                                                         | 180.1                | 70.0        | 6.99                                                            |
| 82.6                 | 42.5        | 4.98                                                            | 140.1                | 150.1       | 5.12                                                         | 175.1                | 75.0        | 6.97                                                            |
| 80.1                 | 45.0        | 5.03                                                            | 150.1                | 160.1       | 4.90                                                         | 170.1                | 80.0        | 6.96                                                            |
| 77.6                 | 47.5        | 5.07                                                            | 160.1                | 170.1       | 5.01                                                         | 165.1                | 85.0        | 6.97                                                            |
| 75.1                 | 50.0        | 5.08                                                            | 170.1                | 180.1       | 5.12                                                         | 160.1                | 90.0        | 7.01                                                            |
| 72.6                 | 52.5        | 5.03                                                            | 180.1                | 190.1       | 4.54                                                         | 155.1                | 95.0        | 6.91                                                            |
| 70.1                 | 55.0        | 5.06                                                            | 190.1                | 200.1       | 4.70                                                         | 150.1                | 100.0       | 6.81                                                            |
| 67.6                 | 57.5        | 5.02                                                            | 200.1                | 210.1       | 4.75                                                         | 145.1                | 105.0       | 6.80                                                            |
| 65.1                 | 60.0        | 5.01                                                            | 210.1                | 220.1       | 4.88                                                         | 140.1                | 110.0       | 6.83                                                            |
| 62.6                 | 62.5        | 5.10                                                            | 225.1                | 235.1       | 4.84                                                         | 135.1                | 115.0       | 6.77                                                            |
| 60.1                 | 65.0        | 5.03                                                            | 235.1                | 245.1       | 4.87                                                         | 130.1                | 120.0       | 6.70                                                            |
| 57.6                 | 67.5        | 5.06                                                            | 250.1                | 260.1       | 5.04                                                         | 125.1                | 125.0       | 6.80                                                            |
| 55.1                 | 70.0        | 5.07                                                            | 260.1                | 270.1       | 4.81                                                         | 120.1                | 130.0       | 6.63                                                            |
| 52.6                 | 72.5        | 5.08                                                            | 275.1                | 285.1       | 5.10                                                         | 115.1                | 135.0       | 6.62                                                            |
| 50.1                 | 75.0        | 5.06                                                            | 285.1                | 295.1       | 5.06                                                         | 105.1                | 145.0       | 6.38                                                            |
| 47.6                 | 77.5        | 5.04                                                            | 300.1                | 310.1       | 5.46                                                         | 100.1                | 150.0       | 6.41                                                            |
| 45.1                 | 80.0        | 5.01                                                            | 310.1                | 320.1       | 5.49                                                         | 90.1                 | 160.0       | 6.31                                                            |
| 42.6                 | 82.5        | 4.99                                                            | 325.1                | 335.1       | 5.97                                                         | 85.1                 | 165.0       | 6.20                                                            |
| 40.1                 | 85.0        | 4.94                                                            | 335.1                | 345.1       | 5.70                                                         | 75.1                 | 175.0       | 6.08                                                            |
| 37.6                 | 87.5        | 4.99                                                            | 350.1                | 360.1       | 6.19                                                         | 70.1                 | 180.0       | 6.07                                                            |
| 35.1                 | 90.0        | 5.00                                                            | 360.1                | 370.1       | 6.35                                                         | 60.1                 | 190.0       | 5.90                                                            |
| 32.6                 | 92.5        | 5.03                                                            | 375.1                | 385.1       | 6.70                                                         | 55.1                 | 195.0       | 5.87                                                            |
| 27.6                 | 97.5        | 5.01                                                            | 385.1                | 395.1       | 6.97                                                         | 45.1                 | 205.0       | 5.86                                                            |
| 25.1                 | 100.0       | 5.05                                                            | 400.1                | 410.1       | 8.12                                                         | 40.1                 | 210.0       | 5.82                                                            |
| 20.1                 | 105.0       | 5.07                                                            | 410.1                | 420.1       | 8.74                                                         | 30.1                 | 220.0       | 6.00                                                            |
| 17.6                 | 107.5       | 5.06                                                            | 425.1                | 435.1       | 9.42                                                         | 25.1                 | 225.0       | 6.17                                                            |
| 12.6                 | 112.5       | 5.22                                                            | 435.1                | 445.1       | 10.01                                                        | 15.1                 | 235.0       | 6.52                                                            |
| 10.1                 | 115.0       | 5.33                                                            | 450.1                | 460.1       | 11.63                                                        | 10.1                 | 240.0       | 6.77                                                            |

REV. X2

ADE-6+

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IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant  
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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   |
| 40.1        | 57.74                   | 57.75 | 57.94 | 57.96                   | 56.47 | 54.26 |
| 50.4        | 56.55                   | 56.00 | 55.97 | 54.19                   | 54.56 | 53.67 |
| 60.6        | 54.25                   | 54.28 | 54.59 | 50.41                   | 51.33 | 51.91 |
| 70.9        | 54.34                   | 54.43 | 54.73 | 47.30                   | 48.94 | 50.47 |
| 81.1        | 52.21                   | 52.93 | 53.29 | 45.88                   | 47.90 | 49.41 |
| 91.4        | 49.83                   | 49.76 | 50.03 | 43.82                   | 46.55 | 49.38 |
| 101.6       | 50.33                   | 50.18 | 50.20 | 40.93                   | 42.72 | 44.96 |
| 111.9       | 52.14                   | 51.94 | 51.87 | 40.03                   | 41.81 | 43.49 |
| 122.2       | 51.93                   | 52.17 | 51.92 | 39.35                   | 41.39 | 43.52 |
| 132.4       | 49.78                   | 50.81 | 50.93 | 38.78                   | 40.89 | 43.41 |
| 142.7       | 45.28                   | 46.14 | 46.78 | 39.92                   | 42.30 | 44.76 |
| 152.9       | 42.89                   | 43.81 | 44.55 | 38.82                   | 41.77 | 44.44 |
| 163.2       | 41.40                   | 42.38 | 43.11 | 36.11                   | 38.59 | 41.03 |
| 173.4       | 40.66                   | 41.63 | 42.54 | 34.69                   | 36.21 | 37.53 |
| 183.7       | 40.18                   | 41.42 | 42.56 | 33.28                   | 34.11 | 34.96 |
| 193.9       | 40.03                   | 41.30 | 42.27 | 31.85                   | 32.20 | 32.76 |
| 204.2       | 39.88                   | 40.41 | 40.48 | 31.75                   | 32.25 | 32.54 |
| 214.5       | 39.42                   | 39.89 | 39.81 | 31.30                   | 32.18 | 31.85 |
| 224.7       | 39.24                   | 39.91 | 40.16 | 30.47                   | 32.01 | 31.40 |
| 235.0       | 39.14                   | 39.84 | 40.21 | 30.54                   | 31.88 | 32.09 |
| 245.2       | 38.39                   | 38.72 | 38.77 | 30.82                   | 31.80 | 32.38 |
| 255.5       | 37.49                   | 37.51 | 37.24 | 30.88                   | 31.54 | 31.49 |
| 265.7       | 37.21                   | 37.17 | 36.94 | 30.32                   | 30.21 | 29.14 |
| 276.0       | 36.33                   | 35.92 | 35.19 | 29.54                   | 28.42 | 26.56 |
| 286.3       | 35.12                   | 34.06 | 32.89 | 28.63                   | 26.42 | 24.17 |
| 296.5       | 34.17                   | 32.72 | 31.67 | 27.40                   | 24.58 | 22.67 |
| 306.8       | 33.18                   | 31.33 | 30.39 | 25.78                   | 22.97 | 21.53 |
| 317.0       | 31.76                   | 29.68 | 28.69 | 24.33                   | 21.83 | 20.66 |
| 327.3       | 30.38                   | 28.43 | 27.45 | 23.44                   | 21.27 | 20.14 |
| 337.5       | 29.15                   | 27.31 | 26.26 | 22.66                   | 20.66 | 19.48 |
| 347.8       | 28.14                   | 26.12 | 25.01 | 21.98                   | 19.93 | 18.75 |
| 358.0       | 27.11                   | 24.93 | 23.70 | 21.57                   | 19.41 | 18.13 |
| 368.3       | 26.12                   | 23.84 | 22.46 | 20.98                   | 18.82 | 17.44 |
| 378.6       | 25.11                   | 22.74 | 21.37 | 20.37                   | 18.16 | 16.78 |
| 388.8       | 24.38                   | 21.94 | 20.56 | 19.95                   | 17.77 | 16.36 |
| 399.1       | 23.51                   | 21.07 | 19.66 | 19.68                   | 17.58 | 16.19 |
| 409.3       | 22.65                   | 20.32 | 18.84 | 19.44                   | 17.47 | 16.04 |
| 419.6       | 21.81                   | 19.61 | 18.12 | 18.91                   | 17.12 | 15.75 |
| 429.8       | 21.02                   | 18.97 | 17.55 | 18.23                   | 16.62 | 15.32 |
| 440.1       | 20.15                   | 18.24 | 16.85 | 17.71                   | 16.26 | 15.02 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +4                      | +7    | +10   |
| 10.1                | 40.1        | 32.97                   | 31.93 | 31.35 |
| 20.1                | 50.1        | 28.35                   | 28.28 | 28.12 |
| 30.1                | 60.1        | 25.79                   | 25.95 | 26.00 |
| 40.1                | 70.1        | 23.65                   | 23.51 | 23.89 |
| 50.1                | 80.1        | 22.80                   | 22.95 | 22.97 |
| 60.1                | 90.1        | 22.23                   | 22.59 | 22.76 |
| 70.1                | 100.1       | 21.32                   | 21.95 | 22.33 |
| 80.1                | 110.1       | 20.99                   | 21.51 | 21.93 |
| 90.1                | 120.1       | 20.46                   | 20.90 | 21.30 |
| 100.1               | 130.1       | 21.36                   | 21.75 | 22.09 |
| 110.1               | 140.1       | 21.62                   | 21.89 | 22.19 |
| 120.1               | 150.1       | 23.49                   | 24.04 | 24.52 |
| 130.1               | 160.1       | 23.71                   | 24.62 | 25.42 |
| 140.1               | 170.1       | 23.11                   | 24.32 | 25.36 |
| 150.1               | 180.1       | 20.34                   | 20.99 | 21.50 |
| 160.1               | 190.1       | 18.59                   | 19.04 | 19.27 |
| 170.1               | 200.1       | 16.74                   | 17.02 | 17.18 |
| 180.1               | 210.1       | 15.85                   | 16.11 | 16.39 |
| 190.1               | 220.1       | 15.10                   | 15.36 | 15.66 |
| 200.1               | 230.1       | 14.38                   | 14.59 | 15.00 |
| 210.1               | 240.1       | 14.17                   | 14.37 | 14.81 |
| 220.1               | 250.1       | 14.18                   | 14.41 | 14.89 |
| 230.1               | 260.1       | 14.57                   | 14.73 | 15.13 |
| 240.1               | 270.1       | 14.64                   | 14.77 | 15.11 |
| 250.1               | 280.1       | 15.11                   | 15.26 | 15.41 |
| 260.1               | 290.1       | 14.95                   | 14.92 | 14.95 |
| 270.1               | 300.1       | 14.51                   | 14.35 | 14.23 |
| 280.1               | 310.1       | 13.55                   | 13.33 | 13.13 |
| 290.1               | 320.1       | 12.70                   | 12.42 | 12.12 |
| 300.1               | 330.1       | 11.71                   | 11.49 | 11.25 |
| 310.1               | 340.1       | 11.11                   | 10.84 | 10.60 |
| 320.1               | 350.1       | 10.44                   | 10.16 | 9.92  |
| 330.1               | 360.1       | 9.72                    | 9.50  | 9.22  |
| 340.1               | 370.1       | 9.02                    | 8.75  | 8.49  |
| 350.1               | 380.1       | 8.40                    | 8.17  | 7.86  |
| 360.1               | 390.1       | 7.72                    | 7.45  | 7.20  |
| 370.1               | 400.1       | 7.16                    | 6.90  | 6.66  |
| 380.1               | 410.1       | 6.66                    | 6.38  | 6.14  |
| 390.1               | 420.1       | 6.20                    | 5.91  | 5.66  |
| 400.1               | 430.1       | 5.84                    | 5.53  | 5.27  |

## 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=250.1MHz<br>(:1) |      |      |
|---------------------|-------------|-----------------|------|------|-------------|-----------------|------|------|----------------------|---------------------------------|------|------|
|                     |             | @LO (dBm)       |      |      |             | @LO (dBm)       |      |      |                      | @LO (dBm)                       |      |      |
|                     |             | +4              | +7   | +10  |             | +4              | +7   | +10  |                      | +4                              | +7   | +10  |
| 10.1                | 40.1        | 1.54            | 1.32 | 1.36 | 40.1        | 1.75            | 2.52 | 3.52 | 10.0                 | 2.18                            | 1.97 | 1.74 |
| 20.1                | 50.1        | 1.35            | 1.26 | 1.21 | 50.4        | 1.75            | 2.52 | 3.51 | 15.0                 | 2.17                            | 1.96 | 1.73 |
| 30.1                | 60.1        | 1.33            | 1.24 | 1.15 | 60.6        | 1.75            | 2.51 | 3.50 | 20.0                 | 2.15                            | 1.93 | 1.70 |
| 40.1                | 70.1        | 1.32            | 1.21 | 1.14 | 70.9        | 1.76            | 2.49 | 3.47 | 25.0                 | 2.14                            | 1.93 | 1.71 |
| 50.1                | 80.1        | 1.26            | 1.16 | 1.12 | 81.1        | 1.77            | 2.52 | 3.48 | 30.0                 | 2.15                            | 1.95 | 1.72 |
| 60.1                | 90.1        | 1.24            | 1.14 | 1.07 | 91.4        | 1.78            | 2.53 | 3.48 | 35.0                 | 2.18                            | 1.97 | 1.75 |
| 70.1                | 100.1       | 1.21            | 1.11 | 1.05 | 101.6       | 1.81            | 2.56 | 3.50 | 40.0                 | 2.19                            | 1.99 | 1.78 |
| 80.1                | 110.1       | 1.19            | 1.12 | 1.06 | 111.9       | 1.83            | 2.60 | 3.58 | 45.0                 | 2.21                            | 2.02 | 1.80 |
| 90.1                | 120.1       | 1.17            | 1.09 | 1.03 | 122.2       | 1.86            | 2.62 | 3.59 | 50.0                 | 2.21                            | 2.02 | 1.81 |
| 100.1               | 130.1       | 1.15            | 1.06 | 1.03 | 132.4       | 1.86            | 2.60 | 3.50 | 55.0                 | 2.21                            | 2.01 | 1.81 |
| 110.1               | 140.1       | 1.10            | 1.03 | 1.04 | 142.7       | 1.88            | 2.64 | 3.59 | 60.0                 | 2.20                            | 2.00 | 1.80 |
| 120.1               | 150.1       | 1.06            | 1.01 | 1.06 | 152.9       | 1.92            | 2.71 | 3.72 | 65.0                 | 2.20                            | 2.00 | 1.79 |
| 130.1               | 160.1       | 1.03            | 1.06 | 1.11 | 163.2       | 1.95            | 2.72 | 3.73 | 70.0                 | 2.18                            | 1.99 | 1.79 |
| 140.1               | 170.1       | 1.03            | 1.11 | 1.18 | 173.4       | 1.95            | 2.71 | 3.65 | 75.0                 | 2.20                            | 2.01 | 1.81 |
| 150.1               | 180.1       | 1.06            | 1.14 | 1.19 | 183.7       | 1.99            | 2.73 | 3.66 | 80.0                 | 2.22                            | 2.04 | 1.84 |
| 160.1               | 190.1       | 1.09            | 1.15 | 1.20 | 193.9       | 2.06            | 2.81 | 3.79 | 85.0                 | 2.22                            | 2.04 | 1.86 |
| 170.1               | 200.1       | 1.10            | 1.16 | 1.19 | 204.2       | 2.13            | 2.87 | 3.85 | 90.0                 | 2.24                            | 2.06 | 1.89 |
| 180.1               | 210.1       | 1.13            | 1.16 | 1.18 | 214.5       | 2.22            | 2.95 | 3.85 | 95.0                 | 2.25                            | 2.08 | 1.91 |
| 190.1               | 220.1       | 1.17            | 1.14 | 1.14 | 224.7       | 2.28            | 3.07 | 4.02 | 100.0                | 2.23                            | 2.06 | 1.90 |
| 200.1               | 230.1       | 1.21            | 1.16 | 1.12 | 235.0       | 2.30            | 3.13 | 4.14 | 105.0                | 2.21                            | 2.04 | 1.88 |
| 210.1               | 240.1       | 1.26            | 1.20 | 1.13 | 245.2       | 2.29            | 3.10 | 4.06 | 110.0                | 2.19                            | 2.03 | 1.87 |
| 220.1               | 250.1       | 1.34            | 1.27 | 1.20 | 255.5       | 2.28            | 3.10 | 4.06 | 115.0                | 2.15                            | 2.00 | 1.84 |
| 230.1               | 260.1       | 1.44            | 1.36 | 1.28 | 265.7       | 2.29            | 3.12 | 4.12 | 120.0                | 2.13                            | 1.98 | 1.83 |
| 240.1               | 270.1       | 1.51            | 1.41 | 1.33 | 276.0       | 2.33            | 3.15 | 4.19 | 125.0                | 2.12                            | 1.97 | 1.82 |
| 250.1               | 280.1       | 1.64            | 1.54 | 1.46 | 286.3       | 2.30            | 3.08 | 4.07 | 130.0                | 2.13                            | 1.98 | 1.84 |
| 260.1               | 290.1       | 1.67            | 1.57 | 1.50 | 296.5       | 2.25            | 2.96 | 3.84 | 135.0                | 2.15                            | 2.00 | 1.86 |
| 270.1               | 300.1       | 1.82            | 1.72 | 1.66 | 306.8       | 2.26            | 2.99 | 3.90 | 145.0                | 2.17                            | 2.02 | 1.88 |
| 280.1               | 310.1       | 1.79            | 1.71 | 1.67 | 317.0       | 2.30            | 3.06 | 4.05 | 150.0                | 2.16                            | 2.02 | 1.88 |
| 290.1               | 320.1       | 1.98            | 1.90 | 1.86 | 327.3       | 2.27            | 2.99 | 3.88 | 160.0                | 2.11                            | 1.97 | 1.84 |
| 300.1               | 330.1       | 2.06            | 1.99 | 1.95 | 337.5       | 2.27            | 2.95 | 3.81 | 165.0                | 2.09                            | 1.95 | 1.82 |
| 310.1               | 340.1       | 2.17            | 2.10 | 2.05 | 347.8       | 2.32            | 3.00 | 3.88 | 175.0                | 2.08                            | 1.95 | 1.83 |
| 320.1               | 350.1       | 2.22            | 2.17 | 2.13 | 358.0       | 2.35            | 2.98 | 3.77 | 180.0                | 2.08                            | 1.95 | 1.83 |
| 330.1               | 360.1       | 2.25            | 2.18 | 2.12 | 368.3       | 2.39            | 2.99 | 3.78 | 190.0                | 2.10                            | 1.97 | 1.84 |
| 340.1               | 370.1       | 2.32            | 2.24 | 2.18 | 378.6       | 2.51            | 3.12 | 3.92 | 195.0                | 2.09                            | 1.96 | 1.83 |
| 350.1               | 380.1       | 2.27            | 2.18 | 2.12 | 388.8       | 2.58            | 3.11 | 3.82 | 205.0                | 2.02                            | 1.88 | 1.75 |
| 360.1               | 390.1       | 2.33            | 2.24 | 2.17 | 399.1       | 2.57            | 3.01 | 3.66 | 210.0                | 1.98                            | 1.84 | 1.71 |
| 370.1               | 400.1       | 2.29            | 2.20 | 2.13 | 409.3       | 2.68            | 3.08 | 3.70 | 220.0                | 1.98                            | 1.84 | 1.69 |
| 380.1               | 410.1       | 2.38            | 2.27 | 2.20 | 419.6       | 2.87            | 3.26 | 3.90 | 225.0                | 2.01                            | 1.86 | 1.70 |
| 390.1               | 420.1       | 2.38            | 2.28 | 2.20 | 429.8       | 2.94            | 3.26 | 3.83 | 235.0                | 2.08                            | 1.91 | 1.73 |
| 400.1               | 430.1       | 2.42            | 2.30 | 2.22 | 440.1       | 2.92            | 3.16 | 3.59 | 240.0                | 2.09                            | 1.91 | 1.72 |

## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 15  | 19  | 11  | 37  | 17  | 36  | 28  | 51  | 36  | 44  |
| 1  | -      | 20     | +0  | 33  | 12  | 36  | 36  | 60  | 37  | 49  | 31  | 44  |
| 2  | >90    | 52     | 51  | 52  | 54  | 51  | 53  | 62  | 54  | 69  | 67  | >71 |
| 3  | >90    | 65     | 59  | 58  | 61  | 61  | 65  | 70  | 66  | >71 | 60  | >71 |
| 4  | >90    | >71    | >71 | >71 | 66  | >71 | >71 | >71 | >71 | >71 | >71 | >71 |
| 5  | >90    | >71    | >71 | >71 | >71 | >71 | 69  | >71 | >71 | >71 | >71 | >71 |
| 6  | >90    | >71    | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 |
| 7  | >90    | >71    | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 |
| 8  | >90    | >71    | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 |
| 9  | >90    | >71    | >71 | >71 | >71 | >71 | >71 | >71 | 70  | >71 | >71 | >71 |
| 10 | >90    | >71    | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 125.1 MHz; -14.00 dBm.  
LO IN: 155.1 MHz; +7.00 dBm  
IF OUT: 30 MHz; -19.09 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 24  | 31  | 22  | 52  | 28  | 48  | 42  | 67  | 53  | 63  |
| 1  | -      | 20     | +0  | 30  | 12  | 35  | 36  | 51  | 45  | 54  | 39  | 57  |
| 2  | 74     | 48     | 42  | 47  | 42  | 44  | 50  | 54  | 48  | 57  | 69  | 61  |
| 3  | >90    | 50     | 36  | 51  | 40  | 51  | 41  | 53  | 59  | 64  | 49  | 71  |
| 4  | >90    | 68     | 54  | 69  | 60  | 66  | 69  | 60  | 61  | 68  | 70  | 71  |
| 5  | >90    | 71     | 71  | 63  | 53  | 60  | 52  | 55  | 61  | 66  | 68  | 64  |
| 6  | >90    | >81    | >81 | 74  | 68  | 80  | 73  | 70  | 71  | 75  | 76  | 78  |
| 7  | >90    | >81    | >81 | >81 | 72  | 70  | 64  | 67  | 64  | 65  | 75  | 77  |
| 8  | >90    | >81    | >81 | >81 | >81 | >81 | >81 | >81 | 78  | >81 | >81 | >81 |
| 9  | >90    | 79     | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | 76  | >81 |
| 10 | >90    | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 125.1 MHz; -4.00 dBm.  
LO IN: 155.1 MHz; +7.00 dBm  
IF OUT: 30 MHz; -9.21 dBm

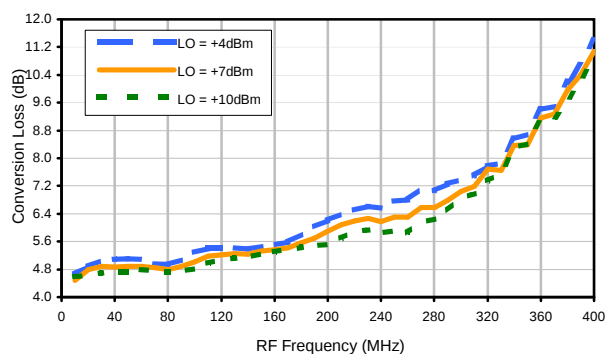
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.  
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.  
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

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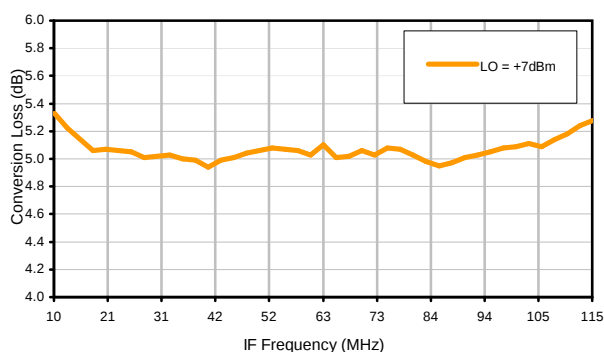


## Typical Performance Curves

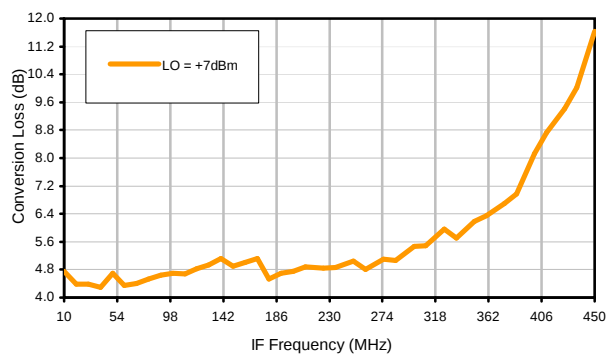
Conversion Loss @ IF=30MHz



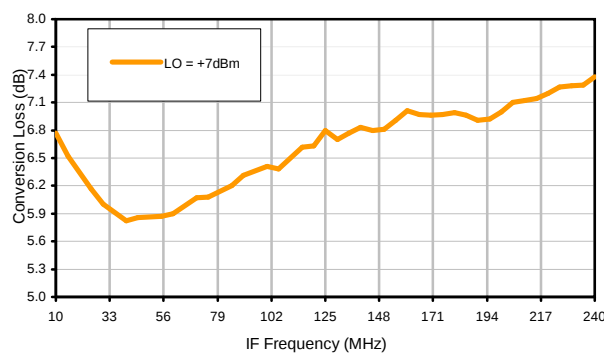
Conversion Loss vs. IF @ RF=125.1MHz



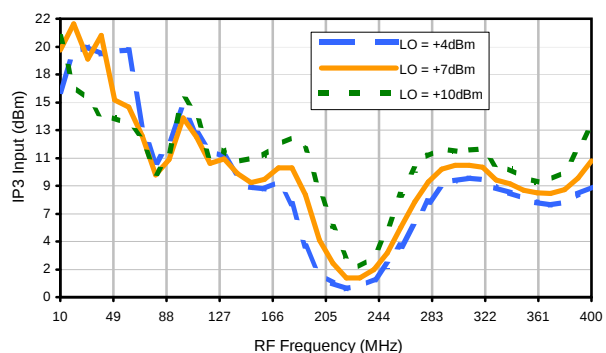
Conversion Loss vs. IF @ RF=10MHz



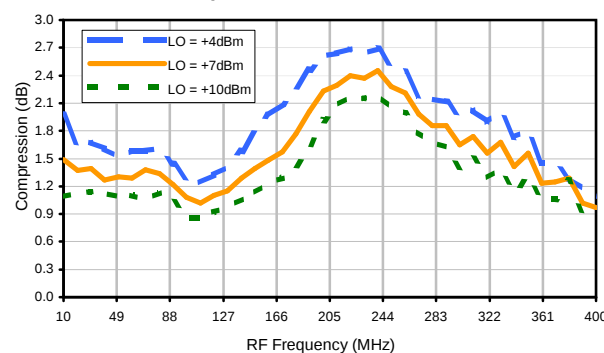
Conversion Loss vs. IF @ RF=250.1MHz



IP3 Input

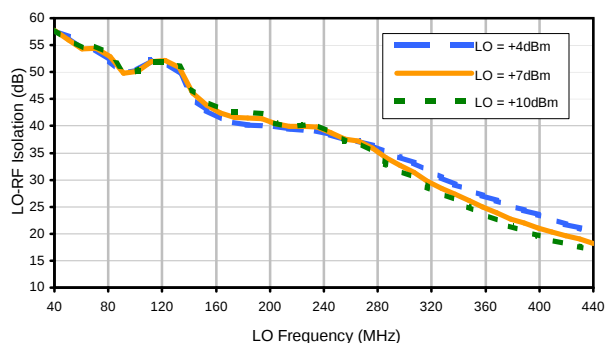


Compression @ RF IN=+1dBm

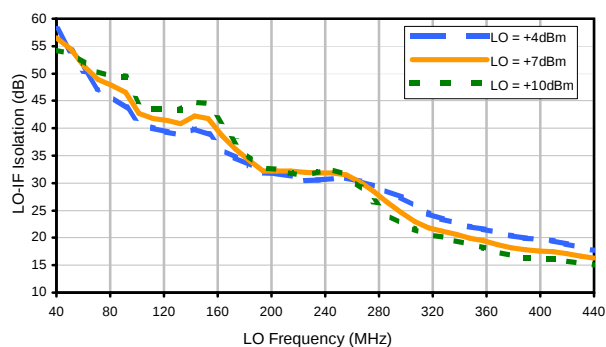


## Typical Performance Curves

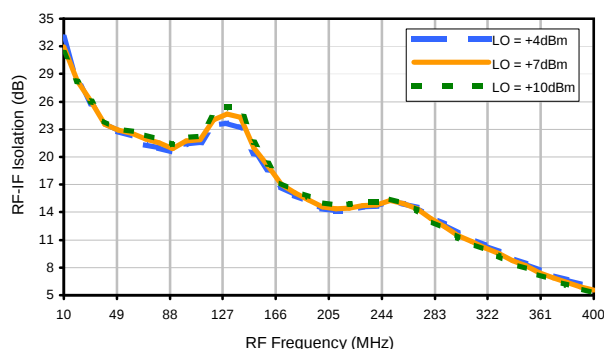
LO-RF Isolation



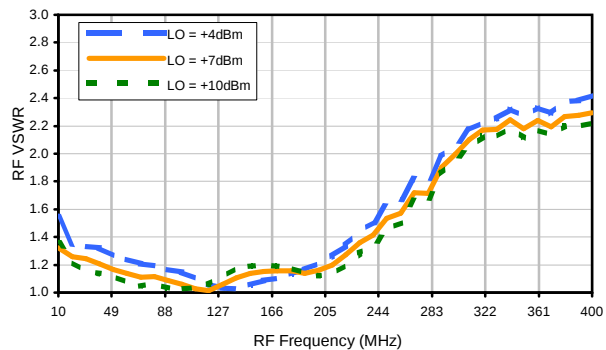
LO-IF Isolation



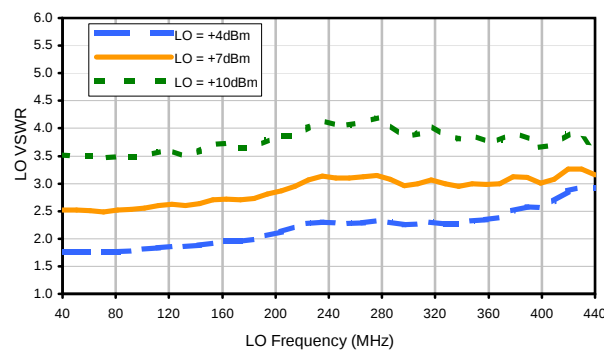
RF-IF Isolation



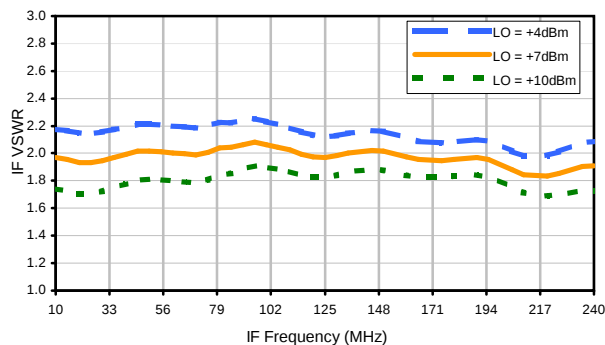
RF VSWR



LO VSWR



IF VSWR



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ADE-6+

101013

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IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant  
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## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 15  | 19  | 11  | 37  | 17  | 36  | 28  | 51  | 36  | 44  |
| 1  | -      | 20     | +0  | 33  | 12  | 36  | 36  | 60  | 37  | 49  | 31  | 44  |
| 2  | >90    | 52     | 51  | 52  | 54  | 51  | 53  | 62  | 54  | 69  | 67  | >71 |
| 3  | >90    | 65     | 59  | 58  | 61  | 61  | 65  | 70  | 66  | >71 | 60  | >71 |
| 4  | >90    | >71    | >71 | >71 | 66  | >71 | >71 | >71 | >71 | >71 | >71 | >71 |
| 5  | >90    | >71    | >71 | >71 | >71 | >71 | 69  | >71 | >71 | >71 | >71 | >71 |
| 6  | >90    | >71    | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 |
| 7  | >90    | >71    | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 |
| 8  | >90    | >71    | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 |
| 9  | >90    | >71    | >71 | >71 | >71 | >71 | >71 | >71 | 70  | >71 | >71 | >71 |
| 10 | >90    | >71    | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 | >71 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 125.1 MHz; -14.00 dBm.  
LO IN: 155.1 MHz; +7.00 dBm  
IF OUT: 30 MHz; -19.09 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 24  | 31  | 22  | 52  | 28  | 48  | 42  | 67  | 53  | 63  |
| 1  | -      | 20     | +0  | 30  | 12  | 35  | 36  | 51  | 45  | 54  | 39  | 57  |
| 2  | 74     | 48     | 42  | 47  | 42  | 44  | 50  | 54  | 48  | 57  | 69  | 61  |
| 3  | >90    | 50     | 36  | 51  | 40  | 51  | 41  | 53  | 59  | 64  | 49  | 71  |
| 4  | >90    | 68     | 54  | 69  | 60  | 66  | 69  | 60  | 61  | 68  | 70  | 71  |
| 5  | >90    | 71     | 71  | 63  | 53  | 60  | 52  | 55  | 61  | 66  | 68  | 64  |
| 6  | >90    | >81    | >81 | 74  | 68  | 80  | 73  | 70  | 71  | 75  | 76  | 78  |
| 7  | >90    | >81    | >81 | >81 | 72  | 70  | 64  | 67  | 64  | 65  | 75  | 77  |
| 8  | >90    | >81    | >81 | >81 | >81 | >81 | >81 | >81 | 78  | >81 | >81 | >81 |
| 9  | >90    | 79     | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | 76  | >81 |
| 10 | >90    | >81    | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 | >81 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 125.1 MHz; -4.00 dBm.  
LO IN: 155.1 MHz; +7.00 dBm  
IF OUT: 30 MHz; -9.21 dBm

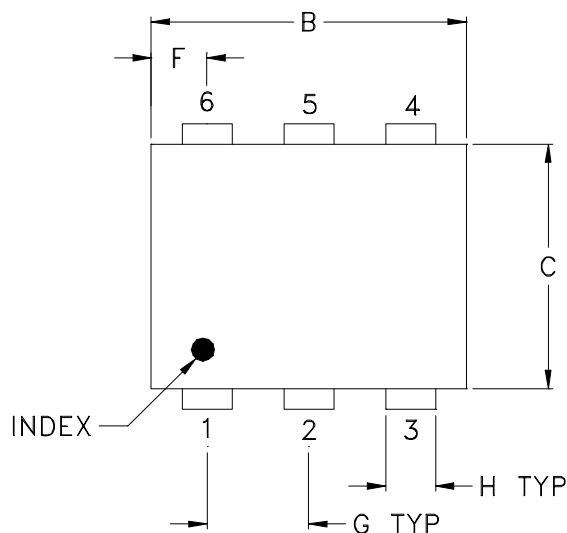
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.  
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.  
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

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CD541  
CD542  
CD636  
CD637

## Outline Dimensions



## PCB Land Pattern



Suggested Layout,  
Tolerance to be within  $\pm.002$

| CASE# | A              | B              | C              | D              | E              | F              | G              | H              | J              | K              | L              | WT,<br>GRAM |
|-------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------------|
| CD541 |                |                |                |                | .082<br>(2.08) |                |                |                |                |                |                | .15         |
| CD542 | .272<br>(6.91) | .310<br>(7.87) | .220<br>(5.58) | .100<br>(2.54) | .112<br>(2.84) | .055<br>(1.40) | .100<br>(2.54) | .030<br>(0.76) | .026<br>(0.66) | .065<br>(1.65) | .300<br>(7.62) | .20         |
| CD636 |                |                |                |                | .162<br>(4.11) |                |                |                |                |                |                | .25         |
| CD637 |                |                |                |                | .206<br>(5.23) |                |                |                |                |                |                | .40         |

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .01$ ; 3 Pl.  $\pm .005$

### Notes:

- Case material: Plastic.
- Termination finish:  
For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.  
For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.



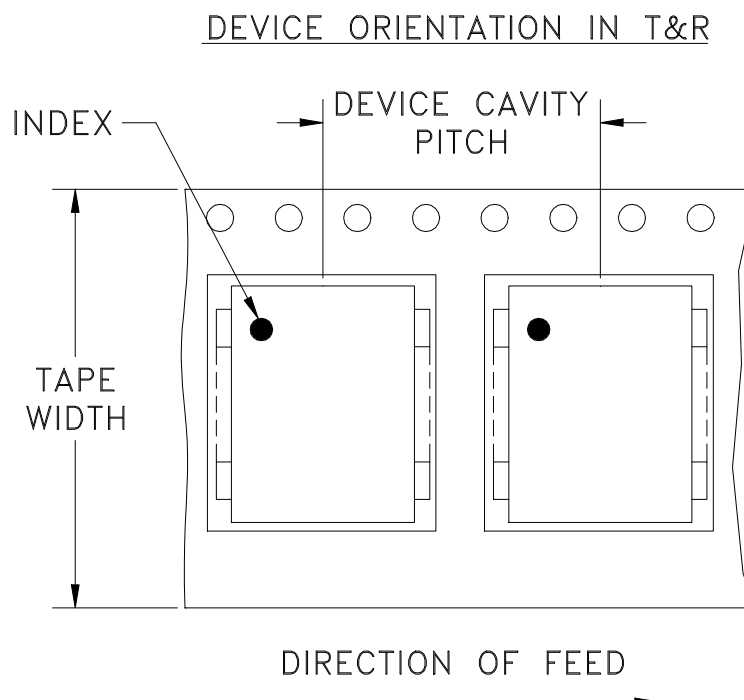
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# Tape & Reel Packaging TR-F46



| Tape Width,<br>mm | Device Cavity<br>Pitch, mm | Reel Size,<br>inches | Devices per Reel |
|-------------------|----------------------------|----------------------|------------------|
| 16                | 12                         | 13                   | 900              |

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: [www.minicircuits.com/pages/pdfs/tape.pdf](http://www.minicircuits.com/pages/pdfs/tape.pdf)



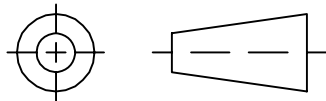
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## THIRD ANGLE PROJECTION



## REVISIONS

| REV | ECN No. | DESCRIPTION                                          | DATE     | DR  | AUTH |
|-----|---------|------------------------------------------------------|----------|-----|------|
| A   | M101143 | ADDED "gk" PIN CONNECTION, TT100 CASE STYLE & NOTE 2 | 10/10/05 | MMG | DJ   |
| B   | M102713 | ADDED "...WITH SMOBC"                                | 01/17/06 | MMG | IL   |
| C   | M108637 | REMOVED "PIN 1", ADDED INDEX ON UNIT                 | 12/01/06 | MYG | FL   |

**SUGGESTED MOUNTING CONFIGURATION**  
**FOR BH292, CD541/542/636/637, TT100/240 CASE**  
**STYLES, "gk", "ht", "hu", "nd", "w" PIN CONNECTIONS**



- NOTES:** 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030"  $\pm$  .002"; COPPER: 1/2 OZ. EACH SIDE.  
 FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
 2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



DENOTES PCB COPPER LAYOUT WITH SMOBC  
 (SOLDER MASK OVER BARE COPPER)



DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED

INITIALS

DATE

DIMENSIONS ARE IN INCHES

TOLERANCES ON:

2 PL DECIMALS  $\pm$ 3 PL DECIMALS  $\pm$  .005ANGLES  $\pm$ FRACTIONS  $\pm$ 

DRAWN

MMG

07/17/02

CHECKED

WL

08/02/02

APPROVED

DJ

08/05/02



**Mini-Circuits®**

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 Brooklyn NY 11235

PL, gk/ht/hu/nd/w, BH292,  
 CD541/542/636/637, TT100/240, TB-03

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-052

REV:

C

FILE:

98PL052

SCALE:

8:1

SHEET:

1 OF 1

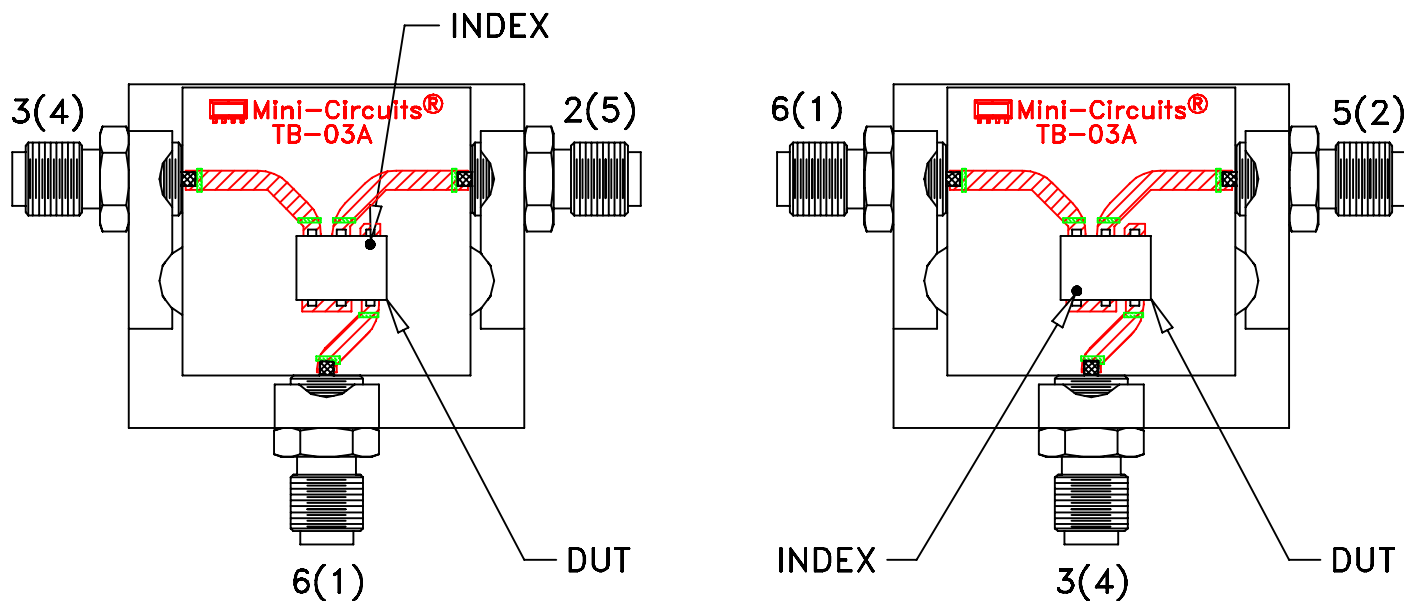
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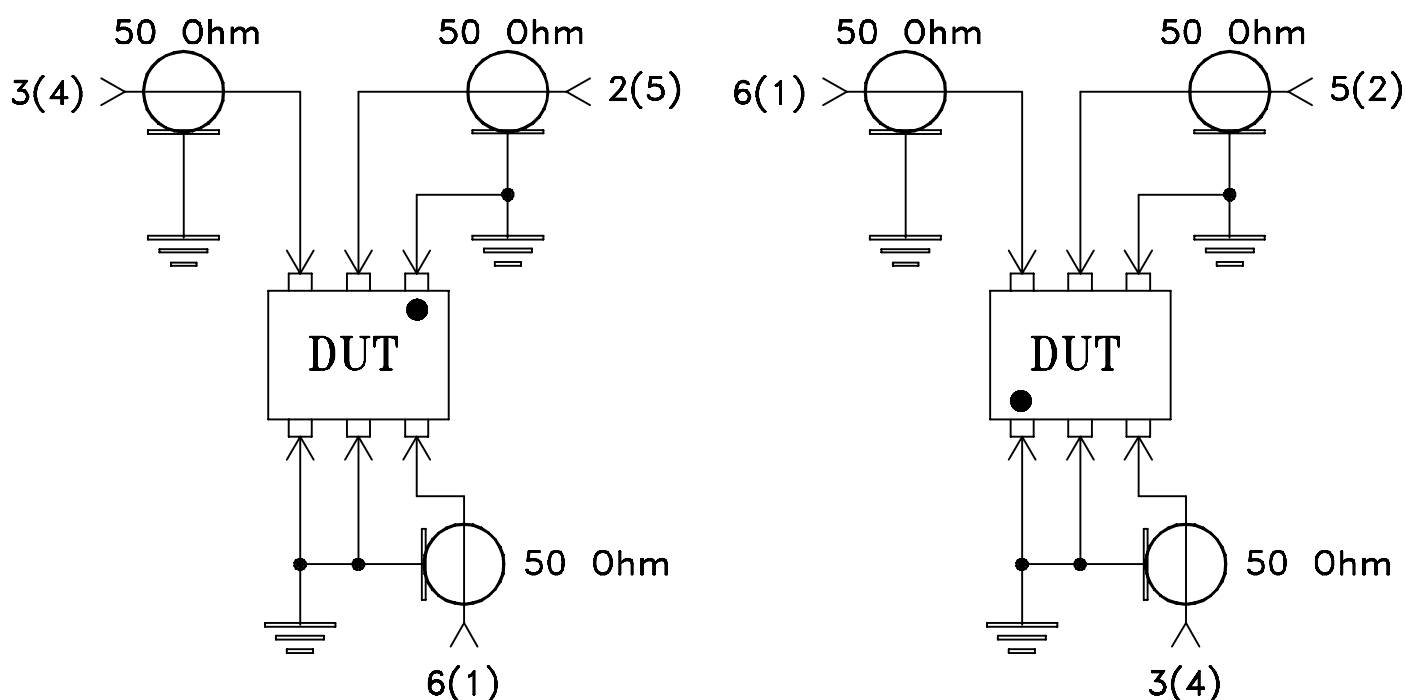
ASHEETA1.DWG REV:A DATE:01/12/95

# Evaluation Board and Circuit

For Pin Connections and DUT Orientation Refer to  
Data Sheet of the DUT



TB-03



Schematic Diagram

## Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.030 inch.

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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          | -40° to 85°C<br>Ambient Environment                                                                                                                             | Individual Model Data Sheet                                                                          |
| Storage Temperature            | -55° to 100° C<br>Ambient Environment                                                                                                                           | Individual Model Data Sheet                                                                          |
| Humidity                       | 90 to 95% RH, 240 hours, 50°C                                                                                                                                   | MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours |
| Thermal Shock                  | -55° to 100°C, 100 cycles                                                                                                                                       | MIL-STD-202, Method 107, Condition A-3, except +100°C                                                |
| Solder Reflow Heat             | Sn-Pb Eutetic Process: 225°C peak<br>Pb-Free Process 245° - 250°C peak                                                                                          | J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1                                                        |
| Solderability                  | 10X Magnification                                                                                                                                               | J-STD-002, 95% Coverage                                                                              |
| 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                                                                 |
| 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                                                                              |