

Frequency Mixer

ADE-1MH+

Level 13 (LO Power +13 dBm) 2 to 500 MHz

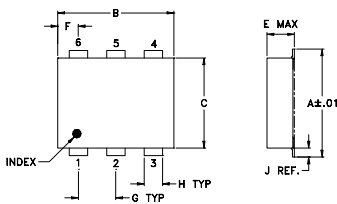
Maximum Ratings

| | |
|---|----------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| RF Power | 200mW |
| IF Current | 40mA |
| Permanent damage may occur if any of these limits are exceeded. | |

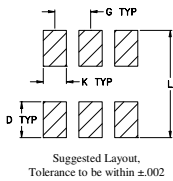
Pin Connections

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

Outline Drawing



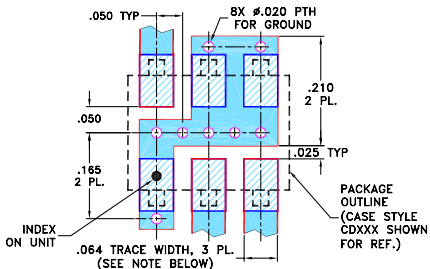
PCB Land Pattern



Outline Dimensions (inch/mm)

| A | B | C | D | E | F | G |
|------|------|------|------|-------|------|------|
| .272 | .310 | .220 | .100 | .112 | .055 | .100 |
| 6.91 | 7.87 | 5.59 | 2.54 | 2.84 | 1.40 | 2.54 |
| H | J | K | L | wt | | |
| .030 | .026 | .065 | .300 | grams | | |
| 0.76 | 0.66 | 1.65 | 7.62 | 0.20 | | |

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



- NOTES:**
- 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.
 - 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

Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
 B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
 C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

Features

- good L-R isolation, 50 dB typ.
L-I isolation, 45 dB typ.
- low profile package
- aqueous washable
- protected by U.S. Patent 6,133,525

Applications

- cellular
- VHF/UHF receivers



Generic photo used for illustration purposes only
 CASE STYLE: CD542

+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 | Devices/Reel |
|-----------|------------------|
| 7" | 20, 50, 100, 200 |
| 13" | 500, 1000 |

Electrical Specifications

| FREQUENCY (MHz) | CONVERSION LOSS (dB) | LO-RF ISOLATION (dB) | | | LO-IF ISOLATION (dB) | | | IP3 at center band (dBm) | | | | | | |
|-----------------|----------------------|----------------------|----|----|----------------------|----|----|--------------------------|----|----|----|----|----|----|
| | | L | M | U | L | M | U | | | | | | | |
| 2-500 | DC-500 | 60 | 45 | 50 | 35 | 48 | 25 | 55 | 40 | 45 | 30 | 40 | 22 | 17 |

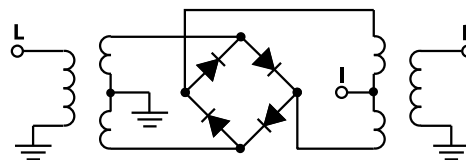
1 dB COMP.: +9 dBm typ.

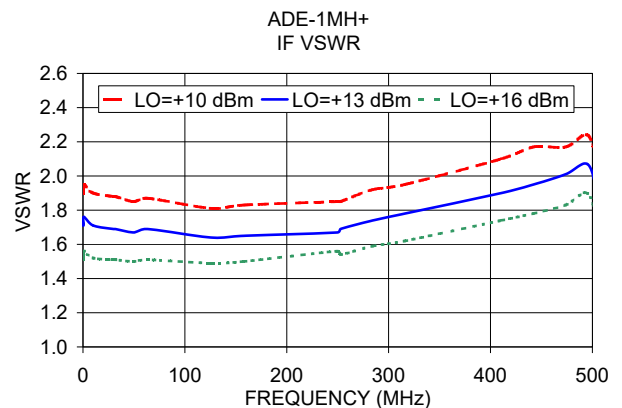
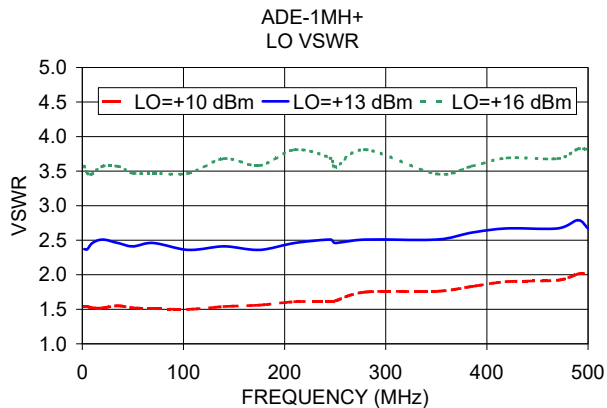
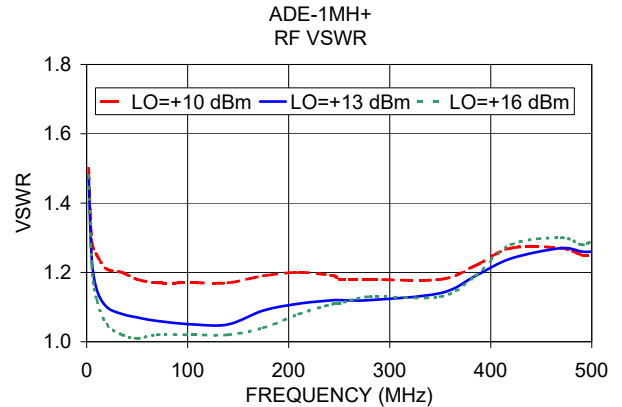
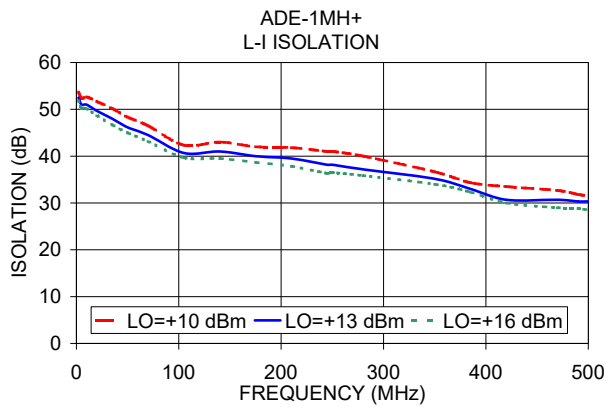
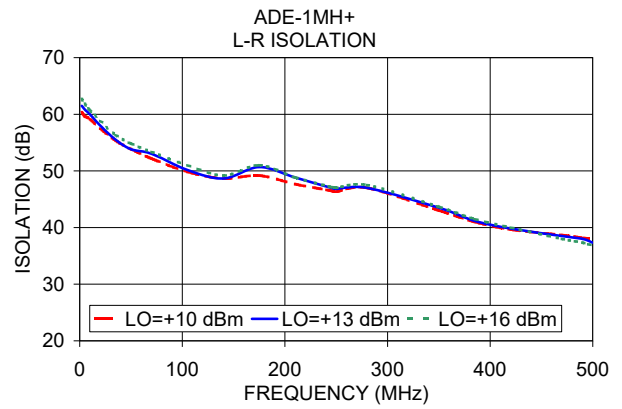
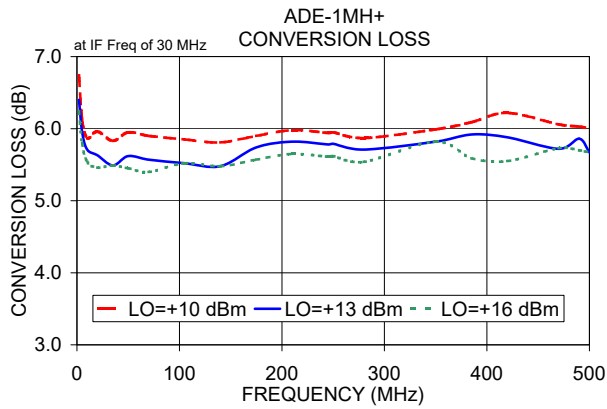
L = low range [f_L to $10 f_L$] M = mid range [$10 f_L$ to $f_U/2$] U = upper range [$f_U/2$ to f_U]
 m = mid band [$2f_L$ to $f_U/2$]

Typical Performance Data

| Frequency (MHz) | | Conversion Loss (dB) | Isolation L-R (dB) | Isolation L-I (dB) | VSWR RF Port (:1) | VSWR LO Port (:1) |
|-----------------|--------|----------------------|--------------------|--------------------|-------------------|-------------------|
| RF | LO | LO +13dBm | LO +13dBm | LO +13dBm | LO +13dBm | LO +13dBm |
| 2.00 | 32.00 | 6.40 | 61.50 | 52.50 | 1.48 | 2.37 |
| 5.00 | 35.00 | 5.96 | 60.83 | 51.00 | 1.24 | 2.37 |
| 10.00 | 40.00 | 5.71 | 60.00 | 51.00 | 1.15 | 2.46 |
| 20.00 | 50.00 | 5.63 | 58.00 | 49.67 | 1.10 | 2.51 |
| 35.10 | 65.10 | 5.49 | 55.50 | 48.00 | 1.08 | 2.46 |
| 50.00 | 80.00 | 5.62 | 53.83 | 46.17 | 1.07 | 2.41 |
| 70.09 | 100.09 | 5.57 | 53.01 | 44.50 | 1.06 | 2.46 |
| 105.09 | 135.09 | 5.52 | 50.16 | 40.67 | 1.05 | 2.36 |
| 140.08 | 170.08 | 5.48 | 48.66 | 41.00 | 1.05 | 2.41 |
| 175.08 | 205.08 | 5.74 | 50.67 | 40.00 | 1.09 | 2.36 |
| 210.07 | 240.07 | 5.82 | 48.84 | 39.50 | 1.11 | 2.46 |
| 245.07 | 275.07 | 5.78 | 47.00 | 38.17 | 1.12 | 2.51 |
| 250.00 | 280.00 | 5.79 | 46.83 | 38.17 | 1.12 | 2.46 |
| 280.06 | 310.06 | 5.71 | 47.00 | 37.17 | 1.12 | 2.51 |
| 350.05 | 380.05 | 5.82 | 43.50 | 35.17 | 1.14 | 2.51 |
| 385.05 | 415.05 | 5.92 | 41.17 | 33.00 | 1.19 | 2.61 |
| 420.04 | 450.04 | 5.88 | 39.83 | 30.67 | 1.24 | 2.67 |
| 470.00 | 500.00 | 5.72 | 38.50 | 30.67 | 1.27 | 2.67 |
| 490.03 | 520.03 | 5.86 | 38.00 | 30.34 | 1.26 | 2.79 |
| 500.00 | 530.00 | 5.67 | 37.33 | 30.33 | 1.26 | 2.67 |

Electrical Schematic





Notes

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Frequency Mixer

ADE-1MH+

Typical Performance Data

| RF (IN) (MHz) | LO (MHz) | CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) | | | RF (IN) (MHz) | LO (MHz) | IP3 INPUT (dBm) | | | RF (IN) (MHz) | LO (MHz) | COMPRESSION @RF IN=+9dBm (dB) | | |
|---------------|----------|--|-------|-------|---------------|----------|-----------------|-------|-------|---------------|----------|-------------------------------|------|------|
| | | @LO (dBm) | | | | | @LO (dBm) | | | | | @LO (dBm) | | |
| | | +10 | +13 | +16 | | | +10 | +13 | +16 | | | +10 | +13 | +16 |
| 2.0 | 32.0 | 6.74 | 6.40 | 6.24 | 10.1 | 40.1 | 24.69 | 29.56 | 29.78 | 10.1 | 40.1 | 1.77 | 1.56 | 1.38 |
| 5.0 | 35.0 | 6.13 | 5.96 | 5.80 | 50.4 | 80.4 | 24.84 | 27.76 | 31.13 | 50.4 | 80.4 | 1.70 | 1.49 | 1.31 |
| 10.0 | 40.0 | 5.87 | 5.71 | 5.54 | 90.7 | 120.7 | 25.46 | 29.26 | 26.25 | 90.7 | 120.7 | 1.70 | 1.51 | 1.32 |
| 50.4 | 80.4 | 5.63 | 5.32 | 5.20 | 131.0 | 161.0 | 25.66 | 25.70 | 23.80 | 131.0 | 161.0 | 1.74 | 1.51 | 1.31 |
| 90.7 | 120.7 | 5.63 | 5.31 | 5.20 | 171.3 | 201.3 | 25.00 | 22.68 | 25.70 | 171.3 | 201.3 | 1.64 | 1.41 | 1.24 |
| 131.0 | 161.0 | 5.57 | 5.33 | 5.23 | 211.5 | 241.5 | 21.01 | 21.79 | 24.71 | 211.5 | 241.5 | 1.67 | 1.45 | 1.28 |
| 171.3 | 201.3 | 5.59 | 5.37 | 5.26 | 251.8 | 281.8 | 24.59 | 25.18 | 25.26 | 251.8 | 281.8 | 1.61 | 1.35 | 1.21 |
| 211.5 | 241.5 | 5.58 | 5.36 | 5.25 | 292.1 | 322.1 | 18.13 | 17.41 | 18.43 | 292.1 | 322.1 | 1.57 | 1.35 | 1.22 |
| 251.8 | 281.8 | 5.62 | 5.42 | 5.32 | 332.4 | 362.4 | 20.46 | 19.33 | 20.46 | 332.4 | 362.4 | 1.56 | 1.33 | 1.19 |
| 292.1 | 322.1 | 5.66 | 5.47 | 5.35 | 372.7 | 402.7 | 18.70 | 25.03 | 31.11 | 372.7 | 402.7 | 1.46 | 1.38 | 1.18 |
| 332.4 | 362.4 | 5.68 | 5.50 | 5.40 | 413.0 | 443.0 | 15.32 | 15.18 | 18.00 | 413.0 | 443.0 | 1.47 | 1.31 | 1.21 |
| 372.7 | 402.7 | 5.89 | 5.51 | 5.33 | 453.3 | 483.3 | 17.44 | 16.85 | 17.09 | 453.3 | 483.3 | 1.57 | 1.35 | 1.22 |
| 453.3 | 483.3 | 5.96 | 5.78 | 5.65 | 493.6 | 523.6 | 22.94 | 24.72 | 23.84 | 493.6 | 523.6 | 1.82 | 1.54 | 1.41 |
| 493.6 | 523.6 | 5.94 | 5.71 | 5.54 | 533.9 | 563.9 | 24.43 | 20.44 | 24.25 | 533.9 | 563.9 | 2.08 | 1.59 | 1.38 |
| 533.9 | 563.9 | 5.86 | 5.59 | 5.48 | 574.2 | 604.2 | 17.79 | 26.76 | 29.76 | 574.2 | 604.2 | 2.36 | 1.86 | 1.60 |
| 574.2 | 604.2 | 6.02 | 5.68 | 5.55 | 614.4 | 644.4 | 10.44 | 19.42 | 29.07 | 614.4 | 644.4 | 2.40 | 2.27 | 1.91 |
| 614.4 | 644.4 | 6.50 | 5.87 | 5.64 | 654.7 | 684.7 | 7.73 | 10.25 | 17.30 | 654.7 | 684.7 | 2.40 | 2.28 | 2.12 |
| 654.7 | 684.7 | 6.94 | 6.42 | 5.85 | 695.0 | 725.0 | 7.70 | 8.08 | 10.47 | 695.0 | 725.0 | 2.38 | 2.25 | 2.20 |
| 695.0 | 725.0 | 7.39 | 6.90 | 6.32 | 735.3 | 765.3 | 8.36 | 8.41 | 9.00 | 735.3 | 765.3 | 2.12 | 2.06 | 2.01 |
| 735.3 | 765.3 | 7.95 | 7.43 | 6.93 | 775.6 | 805.6 | 9.79 | 10.45 | 11.52 | 775.6 | 805.6 | 1.78 | 1.79 | 1.84 |
| 775.6 | 805.6 | 8.44 | 7.90 | 7.36 | 815.9 | 845.9 | 12.18 | 13.74 | 16.47 | 815.9 | 845.9 | 1.70 | 1.78 | 1.89 |
| 815.9 | 845.9 | 8.60 | 7.96 | 7.28 | 856.2 | 886.2 | 13.08 | 17.28 | 19.76 | 856.2 | 886.2 | 1.82 | 1.96 | 1.86 |
| 856.2 | 886.2 | 8.48 | 7.65 | 7.01 | 896.5 | 926.5 | 14.73 | 20.26 | 22.40 | 896.5 | 926.5 | 2.20 | 2.18 | 2.03 |
| 896.5 | 926.5 | 8.03 | 7.11 | 6.53 | 916.6 | 946.6 | 16.93 | 25.15 | 22.71 | 916.6 | 946.6 | 2.34 | 2.21 | 2.01 |
| 956.9 | 986.9 | 7.32 | 6.80 | 6.55 | 956.9 | 986.9 | 20.28 | 20.96 | 22.95 | 956.9 | 986.9 | 2.60 | 2.24 | 1.98 |
| 977.1 | 1007.1 | 7.25 | 6.84 | 6.65 | 977.1 | 1007.1 | 19.62 | 21.19 | 22.63 | 977.1 | 1007.1 | 2.49 | 2.13 | 1.87 |
| 1017.3 | 1047.3 | 7.36 | 7.02 | 6.85 | 1017.3 | 1047.3 | 19.82 | 21.37 | 22.78 | 1017.3 | 1047.3 | 2.22 | 1.91 | 1.71 |
| 1037.5 | 1067.5 | 7.45 | 7.16 | 6.98 | 1037.5 | 1067.5 | 19.53 | 21.13 | 22.48 | 1037.5 | 1067.5 | 2.06 | 1.77 | 1.62 |
| 1077.8 | 1107.8 | 7.73 | 7.42 | 7.25 | 1077.8 | 1107.8 | 18.86 | 20.58 | 21.75 | 1077.8 | 1107.8 | 1.81 | 1.61 | 1.51 |
| 1097.9 | 1127.9 | 7.92 | 7.58 | 7.41 | 1097.9 | 1127.9 | 18.91 | 20.27 | 21.40 | 1097.9 | 1127.9 | 1.80 | 1.63 | 1.54 |
| 1138.2 | 1168.2 | 8.34 | 8.04 | 7.86 | 1138.2 | 1168.2 | 19.28 | 19.59 | 20.79 | 1138.2 | 1168.2 | 1.70 | 1.44 | 1.39 |
| 1158.4 | 1188.4 | 8.55 | 8.28 | 8.14 | 1158.4 | 1188.4 | 18.59 | 18.89 | 19.45 | 1158.4 | 1188.4 | 1.67 | 1.39 | 1.33 |
| 1198.7 | 1228.7 | 8.83 | 8.64 | 8.55 | 1198.7 | 1228.7 | 17.86 | 19.12 | 19.77 | 1198.7 | 1228.7 | 1.67 | 1.25 | 1.16 |
| 1218.8 | 1248.8 | 8.96 | 8.81 | 8.77 | 1218.8 | 1248.8 | 17.92 | 20.14 | 21.10 | 1218.8 | 1248.8 | 1.65 | 1.19 | 1.06 |
| 1259.1 | 1289.1 | 9.24 | 9.09 | 9.08 | 1259.1 | 1289.1 | 17.07 | 20.35 | 21.75 | 1259.1 | 1289.1 | 1.73 | 1.21 | 0.98 |
| 1279.2 | 1309.2 | 9.42 | 9.22 | 9.28 | 1279.2 | 1309.2 | 16.77 | 19.46 | 21.22 | 1279.2 | 1309.2 | 1.76 | 1.17 | 0.90 |
| 1319.5 | 1349.5 | 9.87 | 9.71 | 9.75 | 1319.5 | 1349.5 | 16.07 | 18.52 | 20.72 | 1319.5 | 1349.5 | 1.82 | 1.10 | 0.79 |
| 1339.7 | 1369.7 | 10.13 | 9.92 | 9.98 | 1339.7 | 1369.7 | 16.17 | 19.06 | 21.16 | 1339.7 | 1369.7 | 1.73 | 1.00 | 0.69 |
| 1380.0 | 1410.0 | 10.70 | 10.48 | 10.52 | 1380.0 | 1410.0 | 15.64 | 19.80 | 21.70 | 1380.0 | 1410.0 | 1.84 | 0.97 | 0.67 |
| 1400.1 | 1430.1 | 10.96 | 10.76 | 10.75 | 1400.1 | 1430.1 | 15.90 | 20.62 | 20.51 | 1400.1 | 1430.1 | 1.77 | 0.92 | 0.63 |



Frequency Mixer

ADE-1MH+

Typical Performance Data

| IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=250.1MHz (dB) | IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB) | IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=500.1MHz (dB) |
|----------------|----------|--|----------------|----------|---|----------------|----------|--|
| | | @LO (dBm) | | | @LO (dBm) | | | @LO (dBm) |
| | | +13 | | | +13 | | | +13 |
| 240.0 | 10.1 | 5.46 | 10.0 | 20.1 | 5.19 | 490.0 | 10.1 | 5.68 |
| 234.1 | 16.0 | 5.45 | 22.3 | 32.4 | 5.04 | 477.7 | 22.4 | 5.68 |
| 228.2 | 21.9 | 5.43 | 34.6 | 44.7 | 5.01 | 465.4 | 34.7 | 5.63 |
| 222.3 | 27.8 | 5.43 | 46.9 | 57.0 | 5.01 | 453.1 | 47.0 | 5.61 |
| 216.4 | 33.7 | 5.41 | 59.2 | 69.3 | 4.98 | 440.8 | 59.3 | 5.63 |
| 210.5 | 39.6 | 5.40 | 71.5 | 81.6 | 5.00 | 428.5 | 71.6 | 5.57 |
| 204.6 | 45.5 | 5.39 | 83.8 | 93.9 | 5.01 | 416.2 | 83.9 | 5.52 |
| 198.7 | 51.4 | 5.36 | 96.2 | 106.3 | 5.01 | 403.8 | 96.3 | 5.47 |
| 192.8 | 57.3 | 5.35 | 108.5 | 118.6 | 5.02 | 391.5 | 108.6 | 5.44 |
| 186.9 | 63.2 | 5.32 | 120.8 | 130.9 | 5.01 | 379.2 | 120.9 | 5.45 |
| 181.0 | 69.1 | 5.33 | 133.1 | 143.2 | 5.01 | 366.9 | 133.2 | 5.46 |
| 175.1 | 75.0 | 5.34 | 145.4 | 155.5 | 5.06 | 354.6 | 145.5 | 5.44 |
| 169.2 | 80.9 | 5.31 | 157.7 | 167.8 | 5.06 | 342.3 | 157.8 | 5.45 |
| 163.3 | 86.8 | 5.29 | 170.0 | 180.1 | 5.05 | 330.0 | 170.1 | 5.46 |
| 157.4 | 92.7 | 5.29 | 182.3 | 192.4 | 5.07 | 317.7 | 182.4 | 5.46 |
| 151.5 | 98.6 | 5.27 | 194.6 | 204.7 | 5.08 | 305.4 | 194.7 | 5.49 |
| 145.6 | 104.5 | 5.29 | 206.9 | 217.0 | 5.08 | 293.1 | 207.0 | 5.47 |
| 139.7 | 110.4 | 5.29 | 219.2 | 229.3 | 5.08 | 280.8 | 219.3 | 5.47 |
| 133.8 | 116.3 | 5.27 | 231.5 | 241.6 | 5.09 | 268.5 | 231.6 | 5.49 |
| 127.9 | 122.2 | 5.24 | 243.8 | 253.9 | 5.13 | 256.2 | 243.9 | 5.51 |
| 122.1 | 128.0 | 5.23 | 256.2 | 266.3 | 5.14 | 243.8 | 256.3 | 5.53 |
| 116.2 | 133.9 | 5.26 | 268.5 | 278.6 | 5.12 | 231.5 | 268.6 | 5.52 |
| 110.3 | 139.8 | 5.28 | 280.8 | 290.9 | 5.14 | 219.2 | 280.9 | 5.49 |
| 104.4 | 145.7 | 5.28 | 293.1 | 303.2 | 5.17 | 206.9 | 293.2 | 5.52 |
| 98.5 | 151.6 | 5.28 | 305.4 | 315.5 | 5.20 | 194.6 | 305.5 | 5.54 |
| 92.6 | 157.5 | 5.27 | 317.7 | 327.8 | 5.25 | 182.3 | 317.8 | 5.56 |
| 86.7 | 163.4 | 5.28 | 330.0 | 340.1 | 5.24 | 170.0 | 330.1 | 5.60 |
| 80.8 | 169.3 | 5.29 | 342.3 | 352.4 | 5.20 | 157.7 | 342.4 | 5.62 |
| 74.9 | 175.2 | 5.30 | 354.6 | 364.7 | 5.19 | 145.4 | 354.7 | 5.64 |
| 69.0 | 181.1 | 5.29 | 366.9 | 377.0 | 5.17 | 133.1 | 367.0 | 5.65 |
| 63.1 | 187.0 | 5.28 | 379.2 | 389.3 | 5.14 | 120.8 | 379.3 | 5.60 |
| 57.2 | 192.9 | 5.28 | 391.5 | 401.6 | 5.13 | 108.5 | 391.6 | 5.56 |
| 51.3 | 198.8 | 5.30 | 403.8 | 413.9 | 5.15 | 96.2 | 403.9 | 5.56 |
| 45.4 | 204.7 | 5.33 | 416.2 | 426.3 | 5.28 | 83.8 | 416.3 | 5.58 |
| 39.5 | 210.6 | 5.36 | 428.5 | 438.6 | 5.37 | 71.5 | 428.6 | 5.68 |
| 33.6 | 216.5 | 5.35 | 440.8 | 450.9 | 5.40 | 59.2 | 440.9 | 5.73 |
| 27.7 | 222.4 | 5.36 | 453.1 | 463.2 | 5.42 | 46.9 | 453.2 | 5.72 |
| 21.8 | 228.3 | 5.40 | 465.4 | 475.5 | 5.42 | 34.6 | 465.5 | 5.77 |
| 15.9 | 234.2 | 5.44 | 477.7 | 487.8 | 5.43 | 22.3 | 477.8 | 5.80 |
| 10.0 | 240.1 | 5.56 | 490.0 | 500.1 | 5.46 | 10.0 | 490.1 | 5.95 |



Frequency Mixer

ADE-1MH+

Typical Performance Data

| LO (MHz) | LO-RF ISOLATION (dB) | | | LO-IF ISOLATION (dB) | | | RF (IN) (MHz) | LO (MHz) | RF-IF ISOLATION (dB) | | |
|-------------|-------------------------|-------|-------|-------------------------|-------|-------|---------------------|-------------|-------------------------|-------|-------|
| | @LO (dBm) | | | @LO (dBm) | | | | | @LO (dBm) | | |
| | +10 | +13 | +16 | +10 | +13 | +16 | | | +10 | +13 | +16 |
| 2.0 | 60.3 | 61.5 | 62.7 | 53.7 | 52.5 | 51.8 | 10.1 | 40.1 | 42.25 | 44.24 | 42.96 |
| 5.0 | 59.7 | 60.8 | 61.8 | 52.3 | 51.0 | 50.2 | 50.4 | 80.4 | 31.93 | 31.92 | 31.74 |
| 10.0 | 59.2 | 60.0 | 60.7 | 52.7 | 51.0 | 50.2 | 90.7 | 120.7 | 27.44 | 27.52 | 27.55 |
| 50.4 | 56.23 | 56.29 | 56.32 | 57.82 | 55.74 | 54.39 | 131.0 | 161.0 | 24.82 | 24.97 | 25.05 |
| 90.7 | 51.52 | 51.73 | 51.99 | 52.52 | 50.61 | 49.51 | 171.3 | 201.3 | 23.28 | 23.40 | 23.50 |
| 131.0 | 48.90 | 49.34 | 49.22 | 49.20 | 47.71 | 47.12 | 211.5 | 241.5 | 22.18 | 22.31 | 22.42 |
| 171.3 | 47.48 | 47.71 | 47.43 | 47.06 | 46.24 | 45.51 | 251.8 | 281.8 | 21.81 | 21.95 | 21.98 |
| 211.5 | 46.08 | 45.98 | 45.58 | 46.15 | 45.30 | 44.23 | 292.1 | 322.1 | 21.31 | 21.54 | 21.90 |
| 251.8 | 44.99 | 44.89 | 44.50 | 45.73 | 44.23 | 43.07 | 332.4 | 362.4 | 21.36 | 21.72 | 21.98 |
| 292.1 | 43.62 | 43.11 | 42.72 | 45.84 | 44.15 | 42.55 | 372.7 | 402.7 | 21.84 | 22.15 | 22.47 |
| 332.4 | 42.89 | 42.49 | 41.84 | 44.83 | 42.31 | 40.41 | 413.0 | 443.0 | 22.85 | 23.04 | 23.21 |
| 372.7 | 42.17 | 41.84 | 41.35 | 44.75 | 41.96 | 39.66 | 453.3 | 483.3 | 23.59 | 24.01 | 24.46 |
| 453.3 | 38.12 | 37.82 | 37.45 | 38.78 | 36.67 | 35.45 | 493.6 | 523.6 | 23.52 | 24.03 | 24.68 |
| 493.6 | 36.79 | 36.63 | 36.22 | 38.62 | 35.90 | 34.27 | 533.9 | 563.9 | 22.67 | 23.58 | 24.22 |
| 533.9 | 34.87 | 34.43 | 33.85 | 38.72 | 35.10 | 32.65 | 574.2 | 604.2 | 20.59 | 20.58 | 20.47 |
| 574.2 | 34.63 | 33.92 | 33.21 | 39.44 | 35.16 | 32.22 | 614.4 | 644.4 | 19.02 | 18.42 | 18.06 |
| 614.4 | 34.88 | 33.68 | 32.49 | 36.14 | 33.81 | 31.48 | 654.7 | 684.7 | 17.57 | 17.34 | 16.86 |
| 654.7 | 34.09 | 33.06 | 31.88 | 33.90 | 32.10 | 29.94 | 695.0 | 725.0 | 16.63 | 16.39 | 16.28 |
| 695.0 | 33.37 | 32.37 | 31.16 | 31.24 | 30.44 | 28.83 | 735.3 | 765.3 | 16.40 | 16.08 | 15.89 |
| 735.3 | 32.58 | 31.91 | 30.71 | 29.28 | 28.24 | 27.07 | 775.6 | 805.6 | 16.16 | 15.88 | 15.71 |
| 775.6 | 32.06 | 31.41 | 30.34 | 28.25 | 26.99 | 25.87 | 815.9 | 845.9 | 15.83 | 15.61 | 15.73 |
| 815.9 | 31.73 | 31.15 | 30.21 | 27.43 | 26.16 | 24.95 | 856.2 | 886.2 | 15.51 | 15.36 | 15.21 |
| 856.2 | 31.60 | 31.06 | 30.33 | 27.07 | 25.98 | 24.53 | 896.5 | 926.5 | 15.00 | 14.54 | 14.29 |
| 896.5 | 31.23 | 30.61 | 29.83 | 27.38 | 26.29 | 23.96 | 916.6 | 946.6 | 14.70 | 14.31 | 14.23 |
| 956.9 | 31.00 | 30.09 | 29.57 | 26.43 | 23.93 | 21.87 | 956.9 | 986.9 | 14.39 | 14.30 | 14.31 |
| 977.1 | 30.96 | 30.10 | 29.53 | 25.38 | 23.12 | 21.25 | 977.1 | 1007.1 | 14.37 | 14.30 | 14.28 |
| 1017.3 | 31.42 | 30.58 | 30.12 | 22.63 | 21.13 | 19.68 | 1017.3 | 1047.3 | 14.32 | 14.24 | 14.15 |
| 1037.5 | 31.93 | 31.05 | 30.64 | 21.57 | 20.47 | 19.17 | 1037.5 | 1067.5 | 14.24 | 14.15 | 14.03 |
| 1077.8 | 32.88 | 31.54 | 30.99 | 19.64 | 19.12 | 18.05 | 1077.8 | 1107.8 | 13.95 | 13.83 | 13.62 |
| 1097.9 | 33.10 | 31.28 | 30.48 | 18.72 | 18.40 | 17.39 | 1097.9 | 1127.9 | 13.76 | 13.69 | 13.50 |
| 1138.2 | 33.63 | 30.69 | 29.37 | 17.29 | 17.46 | 16.64 | 1138.2 | 1168.2 | 13.08 | 13.09 | 13.02 |
| 1158.4 | 33.50 | 30.12 | 28.61 | 16.68 | 17.05 | 16.32 | 1158.4 | 1188.4 | 12.61 | 12.59 | 12.52 |
| 1198.7 | 32.63 | 28.49 | 26.54 | 15.46 | 16.19 | 15.71 | 1198.7 | 1228.7 | 11.47 | 11.27 | 11.08 |
| 1218.8 | 32.25 | 27.80 | 25.70 | 14.89 | 15.89 | 15.59 | 1218.8 | 1248.8 | 10.87 | 10.56 | 10.28 |
| 1259.1 | 30.33 | 26.28 | 24.17 | 13.97 | 15.20 | 15.10 | 1259.1 | 1289.1 | 9.74 | 9.32 | 8.93 |
| 1279.2 | 29.23 | 25.38 | 23.27 | 13.63 | 14.99 | 14.95 | 1279.2 | 1309.2 | 9.29 | 8.84 | 8.43 |
| 1319.5 | 27.16 | 24.07 | 22.03 | 12.81 | 14.42 | 14.54 | 1319.5 | 1349.5 | 8.33 | 7.86 | 7.44 |
| 1339.7 | 26.29 | 23.53 | 21.58 | 12.60 | 14.30 | 14.45 | 1339.7 | 1369.7 | 7.88 | 7.40 | 6.98 |
| 1380.0 | 24.26 | 22.40 | 20.60 | 11.94 | 13.86 | 14.25 | 1380.0 | 1410.0 | 7.09 | 6.63 | 6.26 |
| 1400.1 | 23.29 | 21.88 | 20.22 | 11.47 | 13.51 | 14.16 | 1400.1 | 1430.1 | 6.71 | 6.27 | 5.93 |



Frequency Mixer

ADE-1MH+

Typical Performance Data

| RF (IN) (MHz) | LO (MHz) | RF VSWR (:1) | | |
|------------------|-------------|-----------------|------|------|
| | | @LO (dBm) | | |
| | | +10 | +13 | +16 |
| 2.0 | 32.0 | 1.50 | 1.48 | 1.48 |
| 5.0 | 35.0 | 1.29 | 1.24 | 1.22 |
| 10.0 | 40.0 | 1.25 | 1.15 | 1.12 |
| 50.4 | 80.4 | 1.18 | 1.08 | 1.02 |
| 90.7 | 120.7 | 1.18 | 1.08 | 1.03 |
| 131.0 | 161.0 | 1.17 | 1.08 | 1.05 |
| 171.4 | 201.4 | 1.16 | 1.08 | 1.07 |
| 211.7 | 241.7 | 1.16 | 1.09 | 1.09 |
| 252.0 | 282.0 | 1.16 | 1.11 | 1.11 |
| 292.3 | 322.3 | 1.17 | 1.14 | 1.14 |
| 332.6 | 362.6 | 1.16 | 1.14 | 1.14 |
| 372.9 | 402.9 | 1.20 | 1.16 | 1.19 |
| 413.2 | 443.2 | 1.23 | 1.19 | 1.19 |
| 453.5 | 483.5 | 1.24 | 1.22 | 1.22 |
| 493.9 | 523.9 | 1.25 | 1.25 | 1.27 |
| 514.0 | 544.0 | 1.24 | 1.27 | 1.31 |
| 554.3 | 584.3 | 1.24 | 1.29 | 1.32 |
| 574.5 | 604.5 | 1.23 | 1.27 | 1.30 |
| 614.8 | 644.8 | 1.26 | 1.23 | 1.26 |
| 634.9 | 664.9 | 1.31 | 1.23 | 1.24 |
| 675.3 | 705.3 | 1.42 | 1.34 | 1.29 |
| 695.4 | 725.4 | 1.49 | 1.41 | 1.35 |
| 735.7 | 765.7 | 1.71 | 1.62 | 1.56 |
| 755.9 | 785.9 | 1.84 | 1.75 | 1.68 |
| 796.2 | 826.2 | 2.06 | 1.96 | 1.88 |
| 816.4 | 846.4 | 2.17 | 2.07 | 1.97 |
| 856.7 | 886.7 | 2.34 | 2.21 | 2.12 |
| 876.8 | 906.8 | 2.41 | 2.27 | 2.19 |
| 917.1 | 947.1 | 2.51 | 2.38 | 2.33 |
| 937.3 | 967.3 | 2.54 | 2.44 | 2.40 |
| 977.6 | 1007.6 | 2.64 | 2.57 | 2.53 |
| 997.8 | 1027.8 | 2.68 | 2.62 | 2.57 |
| 1038.1 | 1068.1 | 2.82 | 2.75 | 2.69 |
| 1058.2 | 1088.2 | 2.90 | 2.82 | 2.76 |
| 1098.5 | 1128.5 | 3.04 | 2.95 | 2.88 |
| 1118.7 | 1148.7 | 3.12 | 3.02 | 2.95 |
| 1159.0 | 1189.0 | 3.18 | 3.11 | 3.05 |
| 1179.2 | 1209.2 | 3.19 | 3.12 | 3.07 |
| 1219.5 | 1249.5 | 3.19 | 3.11 | 3.07 |
| 1239.6 | 1269.6 | 3.17 | 3.08 | 3.02 |
| 1279.9 | 1309.9 | 3.13 | 3.01 | 2.97 |
| 1300.1 | 1330.1 | 3.06 | 2.95 | 2.91 |

| LO (MHz) | LO VSWR (:1) | | |
|-------------|-----------------|------|------|
| | @LO (dBm) | | |
| | +10 | +13 | +16 |
| 32.0 | 1.54 | 2.37 | 3.57 |
| 35.0 | 1.54 | 2.37 | 3.47 |
| 40.0 | 1.52 | 2.46 | 3.46 |
| 80.4 | 1.49 | 2.32 | 3.40 |
| 120.7 | 1.49 | 2.30 | 3.35 |
| 161.0 | 1.49 | 2.30 | 3.34 |
| 201.4 | 1.50 | 2.30 | 3.31 |
| 241.7 | 1.54 | 2.31 | 3.30 |
| 282.0 | 1.57 | 2.34 | 3.33 |
| 322.3 | 1.62 | 2.37 | 3.31 |
| 362.6 | 1.67 | 2.43 | 3.41 |
| 402.9 | 1.76 | 2.50 | 3.47 |
| 443.2 | 1.80 | 2.55 | 3.50 |
| 483.5 | 1.85 | 2.61 | 3.60 |
| 523.9 | 1.85 | 2.55 | 3.47 |
| 544.0 | 1.87 | 2.52 | 3.41 |
| 584.3 | 1.98 | 2.57 | 3.42 |
| 604.5 | 2.21 | 2.79 | 3.61 |
| 644.8 | 2.31 | 3.00 | 3.79 |
| 664.9 | 2.32 | 3.06 | 3.92 |
| 705.3 | 2.36 | 3.11 | 4.01 |
| 725.4 | 2.33 | 3.03 | 3.90 |
| 765.7 | 2.33 | 3.00 | 3.85 |
| 785.9 | 2.31 | 2.93 | 3.72 |
| 826.2 | 2.25 | 2.83 | 3.58 |
| 846.4 | 2.26 | 2.86 | 3.62 |
| 886.7 | 2.18 | 2.77 | 3.57 |
| 906.8 | 2.17 | 2.77 | 3.57 |
| 947.1 | 2.33 | 2.94 | 3.72 |
| 967.3 | 2.41 | 2.96 | 3.69 |
| 1007.6 | 2.64 | 3.10 | 3.76 |
| 1027.8 | 2.78 | 3.21 | 3.87 |
| 1068.1 | 3.03 | 3.36 | 3.95 |
| 1088.2 | 3.14 | 3.43 | 3.96 |
| 1128.5 | 3.35 | 3.56 | 4.05 |
| 1148.7 | 3.46 | 3.62 | 4.07 |
| 1189.0 | 3.61 | 3.75 | 4.13 |
| 1209.2 | 3.65 | 3.80 | 4.19 |
| 1249.5 | 3.68 | 3.87 | 4.24 |
| 1269.6 | 3.69 | 3.91 | 4.28 |
| 1309.9 | 3.65 | 3.91 | 4.28 |
| 1330.1 | 3.58 | 3.86 | 4.23 |

| IF (OUT) (MHz) | IF VSWR @LO=500.5MHz (:1) | | |
|-------------------|---------------------------------|------|------|
| | @LO (dBm) | | |
| | +10 | +13 | +16 |
| 0.1 | 1.90 | 1.73 | 1.52 |
| 0.3 | 1.90 | 1.71 | 1.51 |
| 0.5 | 1.92 | 1.72 | 1.54 |
| 1.0 | 1.95 | 1.76 | 1.56 |
| 10.0 | 1.90 | 1.71 | 1.52 |
| 22.4 | 1.75 | 1.64 | 1.54 |
| 34.6 | 1.72 | 1.59 | 1.50 |
| 46.9 | 1.75 | 1.62 | 1.51 |
| 59.1 | 1.79 | 1.66 | 1.54 |
| 71.4 | 1.80 | 1.66 | 1.54 |
| 83.6 | 1.80 | 1.66 | 1.55 |
| 95.9 | 1.79 | 1.67 | 1.55 |
| 108.1 | 1.78 | 1.65 | 1.53 |
| 120.4 | 1.80 | 1.66 | 1.55 |
| 132.6 | 1.82 | 1.68 | 1.57 |
| 144.9 | 1.83 | 1.69 | 1.57 |
| 157.1 | 1.83 | 1.69 | 1.57 |
| 169.4 | 1.82 | 1.69 | 1.57 |
| 181.6 | 1.83 | 1.70 | 1.58 |
| 193.9 | 1.87 | 1.74 | 1.61 |
| 218.4 | 1.89 | 1.76 | 1.63 |
| 230.6 | 1.87 | 1.73 | 1.61 |
| 242.9 | 1.87 | 1.73 | 1.61 |
| 255.1 | 1.89 | 1.75 | 1.62 |
| 267.4 | 1.90 | 1.77 | 1.64 |
| 279.6 | 1.92 | 1.78 | 1.66 |
| 291.9 | 1.92 | 1.78 | 1.66 |
| 304.1 | 1.91 | 1.77 | 1.65 |
| 316.4 | 1.91 | 1.77 | 1.65 |
| 328.6 | 1.93 | 1.80 | 1.67 |
| 340.9 | 1.96 | 1.82 | 1.69 |
| 353.1 | 1.96 | 1.83 | 1.70 |
| 365.4 | 1.96 | 1.82 | 1.70 |
| 377.6 | 1.97 | 1.84 | 1.71 |
| 389.9 | 2.00 | 1.86 | 1.73 |
| 402.1 | 2.03 | 1.89 | 1.77 |
| 414.4 | 2.07 | 1.93 | 1.80 |
| 438.9 | 2.04 | 1.90 | 1.78 |
| 451.1 | 2.04 | 1.91 | 1.78 |
| 463.4 | 2.07 | 1.93 | 1.80 |
| 487.9 | 2.12 | 1.99 | 1.87 |
| 500.1 | 2.10 | 1.99 | 1.88 |



Harmonics Tables

RF HARMONICS ORDER

| | (-dBm) | (-dBc) | | | | | | | | | | |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | - | - | 20 | 25 | 21 | 33 | 18 | 37 | 29 | 45 | 30 | 48 |
| 1 | - | 17 | +0 | 26 | 12 | 31 | 17 | 34 | 31 | 41 | 40 | 47 |
| 2 | >100 | 70 | 57 | 66 | 57 | 65 | 54 | 66 | 50 | 62 | 63 | 72 |
| 3 | >100 | 66 | 68 | 73 | 61 | 75 | 55 | 74 | 55 | 70 | 58 | 75 |
| 4 | >100 | 88 | 77 | >89 | 77 | >89 | 78 | 83 | 77 | 87 | 84 | >89 |
| 5 | >100 | 86 | 81 | >89 | 78 | >89 | 80 | >89 | 78 | 87 | 76 | 87 |
| 6 | >100 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 |
| 7 | >100 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 |
| 8 | >100 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 |
| 9 | >100 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | 70 | >89 | >89 |
| 10 | >100 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | 77 | >89 |
| | RF CAL | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -6.00 dBm.
 LO IN: 280.01 MHz; +13.00 dBm
 IF OUT: 29.91 MHz; -11.36 dBm

RF HARMONICS ORDER

| | (-dBm) | (-dBc) | | | | | | | | | | |
|----|--------|--------|----|-----|----|----|----|-----|----|----|----|----|
| 0 | - | - | 29 | 35 | 34 | 46 | 31 | 48 | 43 | 59 | 49 | 65 |
| 1 | - | 17 | +0 | 27 | 12 | 34 | 18 | 34 | 32 | 47 | 46 | 54 |
| 2 | 87 | 71 | 46 | 59 | 47 | 71 | 47 | 61 | 44 | 61 | 57 | 65 |
| 3 | >100 | 41 | 45 | 46 | 46 | 47 | 42 | 45 | 40 | 58 | 51 | 55 |
| 4 | >100 | 67 | 68 | 66 | 68 | 66 | 65 | 63 | 59 | 68 | 56 | 66 |
| 5 | >100 | 75 | 59 | 57 | 51 | 61 | 48 | 57 | 46 | 63 | 47 | 60 |
| 6 | >100 | 82 | 75 | 81 | 75 | 85 | 73 | >99 | 70 | 75 | 68 | 73 |
| 7 | >100 | 76 | 73 | 74 | 72 | 68 | 72 | 65 | 65 | 62 | 59 | 61 |
| 8 | >100 | 91 | 88 | 85 | 84 | 88 | 80 | 83 | 80 | 77 | 76 | 74 |
| 9 | >100 | 89 | 80 | 84 | 72 | 73 | 71 | 69 | 71 | 70 | 70 | 70 |
| 10 | >100 | 98 | 93 | >99 | 92 | 90 | 84 | 88 | 85 | 92 | 79 | 89 |
| | RF CAL | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; 4.00 dBm.
 LO IN: 280.01 MHz; +13.00 dBm
 IF OUT: 29.91 MHz; -1.43 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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 100817
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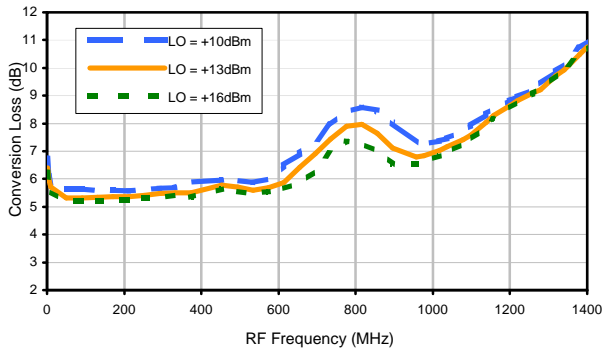
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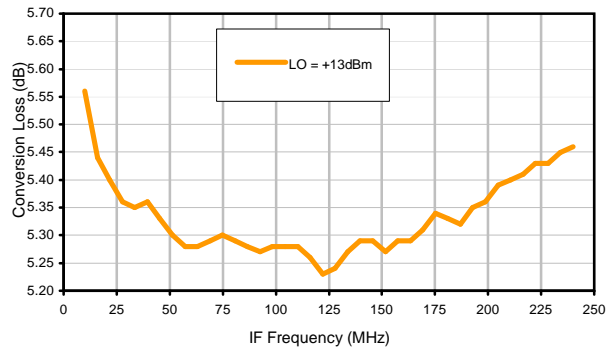
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

Typical Performance Curves

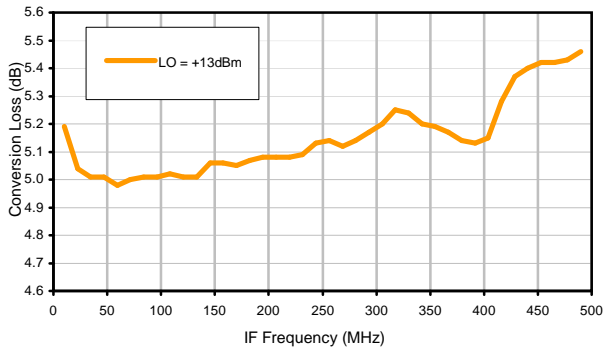
Conversion Loss @ IF=30MHz



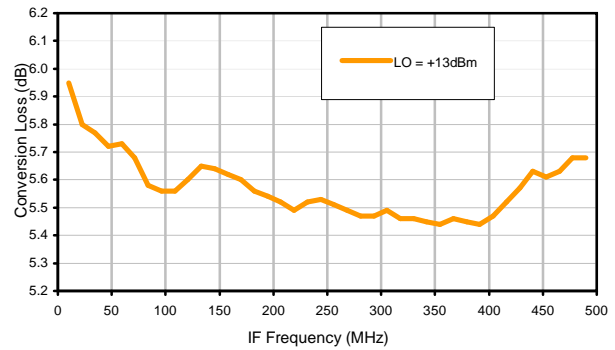
Conversion Loss vs. IF @ RF=250.1MHz



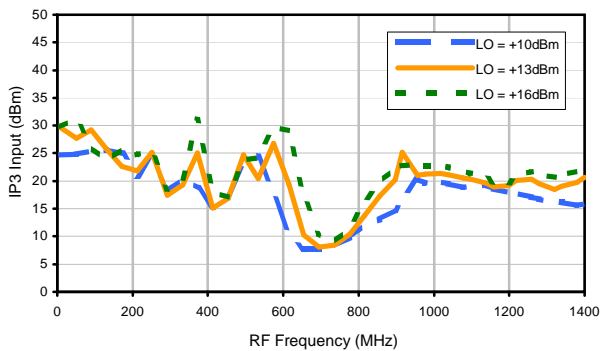
Conversion Loss vs. IF @ RF=10.1MHz



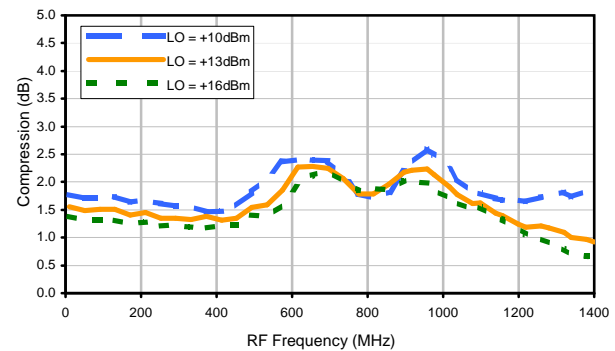
Conversion Loss vs. IF @ RF=500.1MHz



IP3 Input

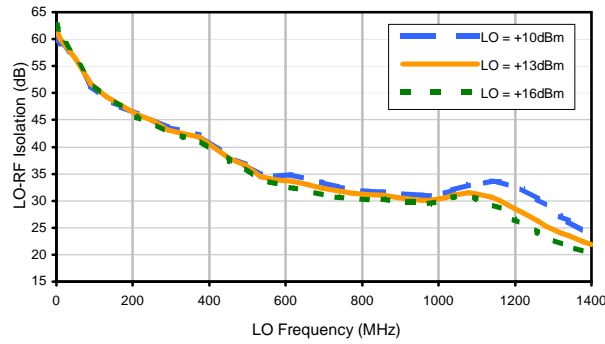


Compression @ RF IN=+9dBm

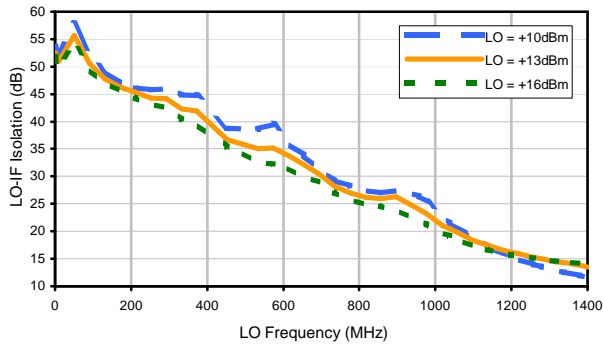


Typical Performance Curves

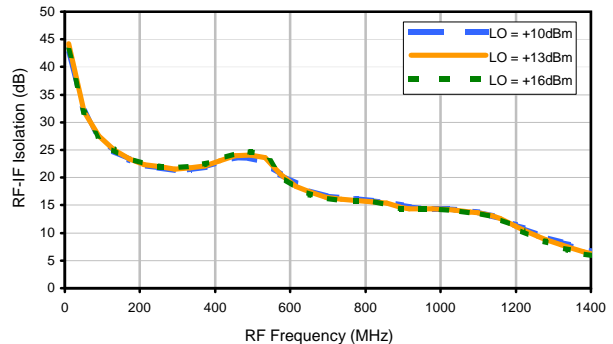
LO-RF Isolation



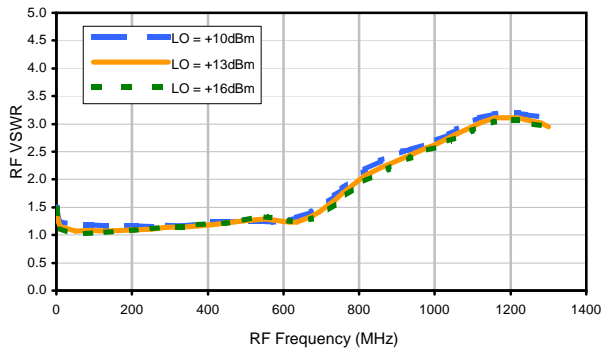
LO-IF Isolation



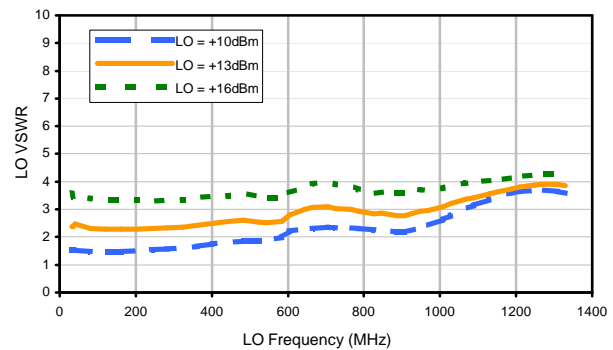
RF-IF Isolation



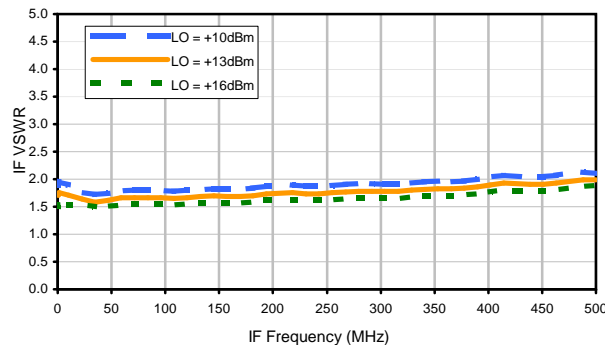
RF VSWR



LO VSWR



IF VSWR



Harmonics Tables

RF HARMONICS ORDER

| | (-dBm) | (-dBc) | | | | | | | | | | |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0 | - | - | 20 | 25 | 21 | 33 | 18 | 37 | 29 | 45 | 30 | 48 |
| 1 | - | 17 | +0 | 26 | 12 | 31 | 17 | 34 | 31 | 41 | 40 | 47 |
| 2 | >100 | 70 | 57 | 66 | 57 | 65 | 54 | 66 | 50 | 62 | 63 | 72 |
| 3 | >100 | 66 | 68 | 73 | 61 | 75 | 55 | 74 | 55 | 70 | 58 | 75 |
| 4 | >100 | 88 | 77 | >89 | 77 | >89 | 78 | 83 | 77 | 87 | 84 | >89 |
| 5 | >100 | 86 | 81 | >89 | 78 | >89 | 80 | >89 | 78 | 87 | 76 | 87 |
| 6 | >100 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 |
| 7 | >100 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 |
| 8 | >100 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 |
| 9 | >100 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | 70 | >89 | >89 |
| 10 | >100 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | >89 | 77 | >89 |
| | RF CAL | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; -6.00 dBm.
 LO IN: 280.01 MHz; +13.00 dBm
 IF OUT: 29.91 MHz; -11.36 dBm

RF HARMONICS ORDER

| | (-dBm) | (-dBc) | | | | | | | | | | |
|----|--------|--------|----|-----|----|----|----|-----|----|----|----|----|
| 0 | - | - | 29 | 35 | 34 | 46 | 31 | 48 | 43 | 59 | 49 | 65 |
| 1 | - | 17 | +0 | 27 | 12 | 34 | 18 | 34 | 32 | 47 | 46 | 54 |
| 2 | 87 | 71 | 46 | 59 | 47 | 71 | 47 | 61 | 44 | 61 | 57 | 65 |
| 3 | >100 | 41 | 45 | 46 | 46 | 47 | 42 | 45 | 40 | 58 | 51 | 55 |
| 4 | >100 | 67 | 68 | 66 | 68 | 66 | 65 | 63 | 59 | 68 | 56 | 66 |
| 5 | >100 | 75 | 59 | 57 | 51 | 61 | 48 | 57 | 46 | 63 | 47 | 60 |
| 6 | >100 | 82 | 75 | 81 | 75 | 85 | 73 | >99 | 70 | 75 | 68 | 73 |
| 7 | >100 | 76 | 73 | 74 | 72 | 68 | 72 | 65 | 65 | 62 | 59 | 61 |
| 8 | >100 | 91 | 88 | 85 | 84 | 88 | 80 | 83 | 80 | 77 | 76 | 74 |
| 9 | >100 | 89 | 80 | 84 | 72 | 73 | 71 | 69 | 71 | 70 | 70 | 70 |
| 10 | >100 | 98 | 93 | >99 | 92 | 90 | 84 | 88 | 85 | 92 | 79 | 89 |
| | RF CAL | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

LO HARMONICS ORDER

Test conditions: RF IN: 250.1 MHz; 4.00 dBm.
 LO IN: 280.01 MHz; +13.00 dBm
 IF OUT: 29.91 MHz; -1.43 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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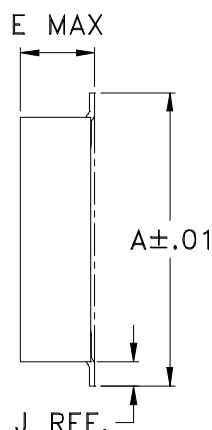
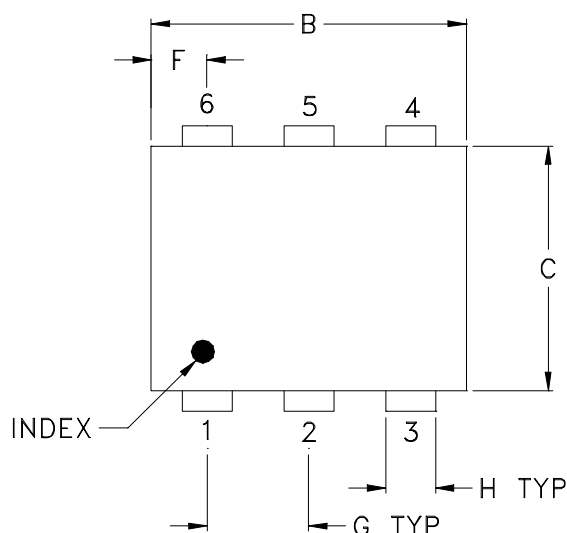
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see minicircuits.com

Case Style

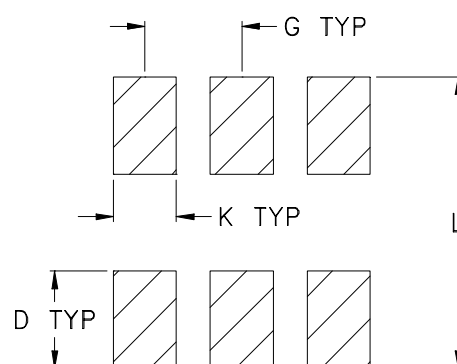
CD

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, GRAM |
|-------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------|
| CD541 | | | | | .082 (2.08) | | | | | | | .15 |
| CD542 | .272 (6.91) | .310 (7.87) | .220 (5.58) | .100 (2.54) | .112 (2.84) | .055 (1.40) | .100 (2.54) | .030 (0.76) | .026 (0.66) | .065 (1.65) | .300 (7.62) | .20 |
| CD636 | | | | | .162 (4.11) | | | | | | | .25 |
| CD637 | | | | | .206 (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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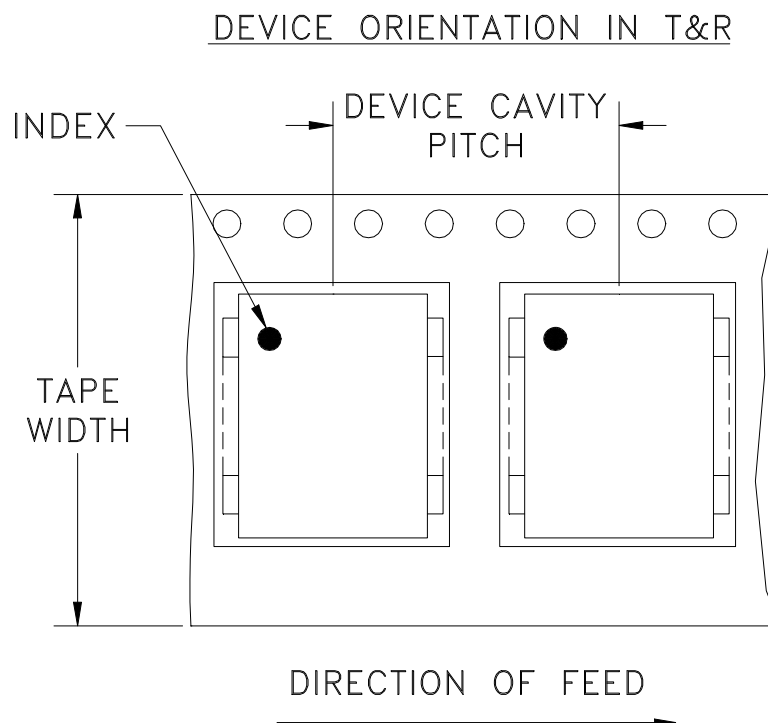
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Tape & Reel Packaging TR-F34



| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel see note | |
|----------------|-------------------------|-------------------|------------------------------------|------|
| 16 | 12 | 7 | Small quantity standard (see note) | 20 |
| | | | | 50 |
| | | | 100 | |
| | | | 200 | |
| | | 13 | Standard | 500 |
| | | | | 1000 |

Note: Availability of small reel quantity varies by model.
Refer to pricing and availability on individual model dashboard.

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



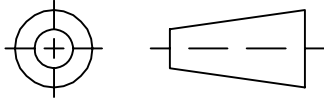
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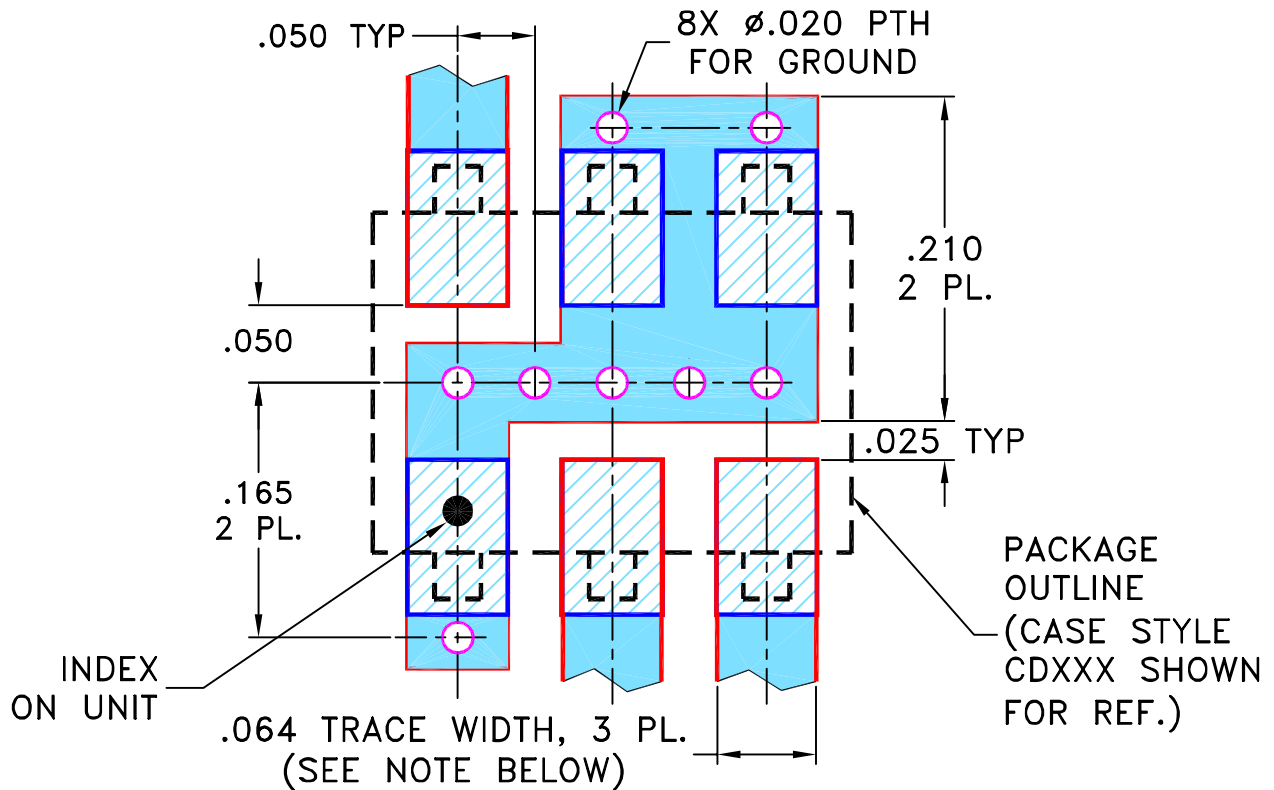
THIRD ANGLE PROJECTION



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" ± .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 | MMG | 07/17/02 |
| TOLERANCES ON: | WL | 08/02/02 |
| 2 PL DECIMALS ± | DJ | 08/05/02 |
| 3 PL DECIMALS ± .005 | | |
| ANGLES ± | | |
| FRACTIONS ± | | |

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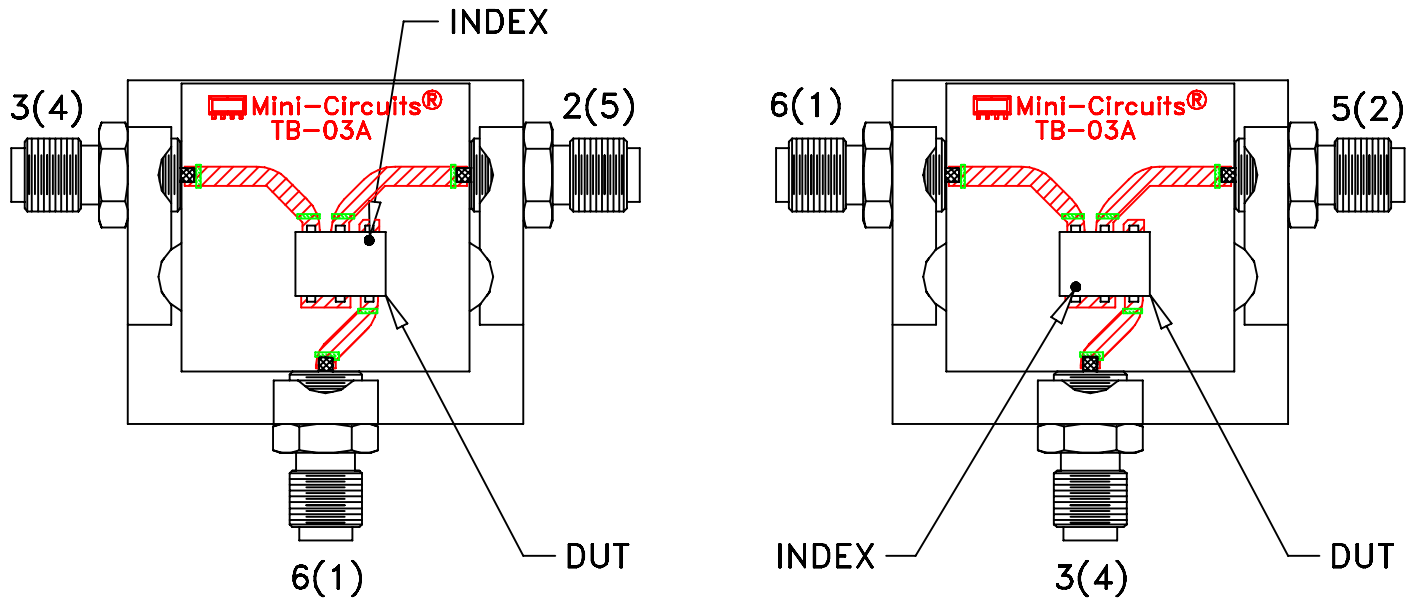
PL, gk/ht/hu/nd/w, BH292,
 CD541/542/636/637, TT100/240, TB-03

| | | | |
|------------------|---------------------|--------------------------|-----------|
| SIZE A | CODE IDENT 15542 | DRAWING NO: 98-PL-052 | REV: C |
| FILE: 98PL052 | SCALE: 8:1 | SHEET: 1 OF 1 | |

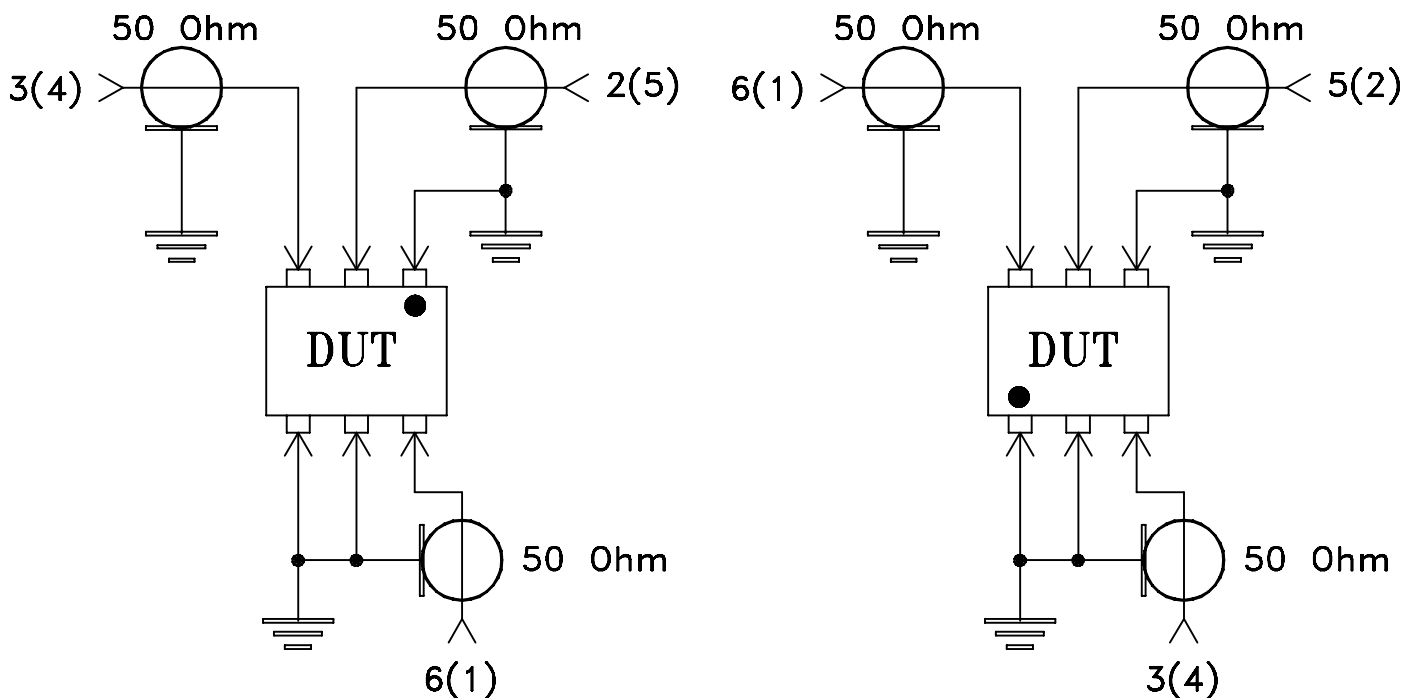
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Evaluation Board and Circuit

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 Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C 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 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; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215 |