

## Frequency Mixer

## SYM-EDR5092/2

Level 17 (LO Power +17 dBm)

### Important Note

This model has been designed, built and tested in our engineering department. Performance data represents model capability. At present it is a non-catalog model. On request, we can supply a final specification sheet, part number and price/delivery information.



Please click "Back", and then click "Contact Us" for Applications support.

**CASE STYLE : TTT167**

| ELECTRICAL SPECIFICATIONS 50Ω @ +25°C |                                        |      |      |      |       |
|---------------------------------------|----------------------------------------|------|------|------|-------|
| Parameter                             |                                        | Min. | Typ. | Max. | Units |
| Frequency                             | LO (f <sub>L</sub> to f <sub>U</sub> ) | 1550 |      | 1785 | MHz   |
|                                       | RF (f <sub>L</sub> to f <sub>U</sub> ) | 1550 |      | 1785 | MHz   |
|                                       | IF                                     | 160  |      | 180  | MHz   |
| Conversion Loss                       |                                        |      | 8.5  |      | dB    |
| LO-RF Isolation                       |                                        | 22   | 30   |      | dB    |
| LO-IF Isolation                       |                                        | 25   | 33   |      | dB    |

| MAXIMUM RATINGS       |                |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |

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

# Frequency Mixer

SYM-EDR5092/2

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>IF FIXED<br>@IF(OUT)=30MHz<br>(dB) |       |      |
|---------------------|-------------|-------------------------------------------------------|-------|------|
|                     |             | @LO (dBm)                                             |       |      |
|                     |             | +14                                                   | +17   | +20  |
| 10.1                | 40.1        | 5.93                                                  | 5.59  | 5.40 |
| 90.4                | 120.4       | 6.23                                                  | 5.75  | 5.51 |
| 170.6               | 200.6       | 6.36                                                  | 5.87  | 5.62 |
| 250.9               | 280.9       | 6.46                                                  | 6.00  | 5.70 |
| 331.1               | 361.1       | 6.63                                                  | 6.06  | 5.73 |
| 411.4               | 441.4       | 6.78                                                  | 6.15  | 5.76 |
| 491.6               | 521.6       | 7.06                                                  | 6.27  | 5.82 |
| 571.9               | 601.9       | 7.17                                                  | 6.28  | 5.86 |
| 652.1               | 682.1       | 7.09                                                  | 6.28  | 5.91 |
| 732.4               | 762.4       | 7.21                                                  | 6.43  | 6.06 |
| 812.6               | 842.6       | 7.18                                                  | 6.48  | 6.15 |
| 892.9               | 922.9       | 7.02                                                  | 6.45  | 6.20 |
| 973.1               | 1003.1      | 6.94                                                  | 6.41  | 6.19 |
| 1053.4              | 1083.4      | 6.94                                                  | 6.41  | 6.18 |
| 1133.6              | 1163.6      | 6.94                                                  | 6.40  | 6.17 |
| 1213.9              | 1243.9      | 7.08                                                  | 6.42  | 6.18 |
| 1294.1              | 1324.1      | 7.12                                                  | 6.43  | 6.17 |
| 1374.4              | 1404.4      | 7.10                                                  | 6.44  | 6.17 |
| 1454.6              | 1484.6      | 7.20                                                  | 6.47  | 6.20 |
| 1534.9              | 1564.9      | 7.24                                                  | 6.44  | 6.19 |
| 1615.1              | 1645.1      | 7.39                                                  | 6.53  | 6.27 |
| 1695.4              | 1725.4      | 7.62                                                  | 6.64  | 6.35 |
| 1775.6              | 1805.6      | 7.92                                                  | 6.84  | 6.51 |
| 1855.9              | 1885.9      | 8.32                                                  | 7.16  | 6.76 |
| 1936.1              | 1966.1      | 8.69                                                  | 7.48  | 7.02 |
| 2016.4              | 2046.4      | 9.10                                                  | 7.78  | 7.24 |
| 2096.6              | 2126.6      | 9.61                                                  | 8.14  | 7.48 |
| 2176.9              | 2206.9      | 9.99                                                  | 8.40  | 7.61 |
| 2257.1              | 2287.1      | 10.19                                                 | 8.54  | 7.77 |
| 2337.4              | 2367.4      | 9.98                                                  | 8.48  | 7.81 |
| 2417.6              | 2447.6      | 9.72                                                  | 8.29  | 7.71 |
| 2497.9              | 2527.9      | 9.49                                                  | 8.16  | 7.61 |
| 2578.2              | 2608.2      | 9.31                                                  | 8.08  | 7.61 |
| 2658.4              | 2688.4      | 9.26                                                  | 8.06  | 7.62 |
| 2738.7              | 2768.7      | 9.17                                                  | 8.15  | 7.71 |
| 2839.0              | 2869.0      | 9.25                                                  | 8.30  | 7.88 |
| 2919.2              | 2949.2      | 9.45                                                  | 8.55  | 8.13 |
| 3019.5              | 3049.5      | 9.81                                                  | 8.95  | 8.51 |
| 3099.8              | 3129.8      | 10.23                                                 | 9.38  | 8.93 |
| 3200.1              | 3230.1      | 10.93                                                 | 10.03 | 9.53 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       |
|---------------------|-------------|--------------------|-------|-------|
|                     |             | @LO (dBm)          |       |       |
|                     |             | +14                | +17   | +20   |
| 10.1                | 40.1        | 25.93              | 27.85 | 26.56 |
| 90.4                | 120.4       | 21.98              | 22.62 | 22.21 |
| 170.6               | 200.6       | 20.19              | 22.10 | 26.25 |
| 250.9               | 280.9       | 21.63              | 24.44 | 28.97 |
| 331.1               | 361.1       | 21.63              | 26.11 | 30.51 |
| 411.4               | 441.4       | 22.17              | 24.69 | 27.41 |
| 491.6               | 521.6       | 20.66              | 26.81 | 27.64 |
| 571.9               | 601.9       | 21.02              | 25.36 | 32.67 |
| 652.1               | 682.1       | 19.04              | 23.85 | 32.81 |
| 732.4               | 762.4       | 25.76              | 28.08 | 34.15 |
| 812.6               | 842.6       | 25.08              | 33.80 | 39.43 |
| 892.9               | 922.9       | 27.84              | 39.28 | 31.32 |
| 973.1               | 1003.1      | 30.88              | 30.76 | 34.68 |
| 1053.4              | 1083.4      | 25.02              | 30.52 | 30.03 |
| 1133.6              | 1163.6      | 22.35              | 27.56 | 30.16 |
| 1213.9              | 1243.9      | 26.64              | 27.41 | 29.88 |
| 1294.1              | 1324.1      | 24.98              | 28.92 | 27.47 |
| 1374.4              | 1404.4      | 23.31              | 26.29 | 31.16 |
| 1454.6              | 1484.6      | 23.69              | 30.99 | 31.84 |
| 1534.9              | 1564.9      | 23.23              | 28.57 | 31.03 |
| 1615.1              | 1645.1      | 22.17              | 29.49 | 33.95 |
| 1695.4              | 1725.4      | 20.52              | 30.76 | 33.27 |
| 1775.6              | 1805.6      | 19.63              | 24.97 | 32.42 |
| 1855.9              | 1885.9      | 19.74              | 23.47 | 29.41 |
| 1936.1              | 1966.1      | 19.86              | 23.91 | 28.26 |
| 2016.4              | 2046.4      | 19.38              | 24.49 | 32.94 |
| 2096.6              | 2126.6      | 19.25              | 24.74 | 35.74 |
| 2176.9              | 2206.9      | 19.74              | 25.41 | 30.69 |
| 2257.1              | 2287.1      | 20.01              | 26.92 | 27.82 |
| 2337.4              | 2367.4      | 20.55              | 26.31 | 25.61 |
| 2417.6              | 2447.6      | 21.13              | 24.94 | 24.27 |
| 2497.9              | 2527.9      | 21.84              | 24.11 | 23.75 |
| 2578.2              | 2608.2      | 22.14              | 23.59 | 22.88 |
| 2658.4              | 2688.4      | 23.60              | 23.27 | 22.48 |
| 2738.7              | 2768.7      | 23.49              | 23.78 | 23.71 |
| 2839.0              | 2869.0      | 22.72              | 24.83 | 24.47 |
| 2919.2              | 2949.2      | 21.95              | 26.43 | 24.15 |
| 3019.5              | 3049.5      | 22.59              | 25.16 | 24.99 |
| 3099.8              | 3129.8      | 23.82              | 24.70 | 25.28 |
| 3200.1              | 3230.1      | 23.88              | 24.87 | 26.04 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF IN=+10dBm<br>(dB) |       |       |
|---------------------|-------------|--------------------------------------|-------|-------|
|                     |             | @LO (dBm)                            |       |       |
|                     |             | +14                                  | +17   | +20   |
| 10.1                | 40.1        | 0.07                                 | 0.02  | 0.01  |
| 90.4                | 120.4       | -0.06                                | -0.04 | -0.01 |
| 170.6               | 200.6       | -0.06                                | -0.04 | -0.04 |
| 250.9               | 280.9       | -0.05                                | -0.06 | -0.03 |
| 331.1               | 361.1       | -0.12                                | -0.09 | -0.03 |
| 411.4               | 441.4       | -0.17                                | -0.08 | -0.01 |
| 491.6               | 521.6       | -0.27                                | -0.08 | -0.01 |
| 571.9               | 601.9       | -0.24                                | -0.03 | 0.00  |
| 652.1               | 682.1       | -0.10                                | 0.02  | 0.02  |
| 732.4               | 762.4       | -0.09                                | 0.00  | 0.02  |
| 812.6               | 842.6       | -0.03                                | 0.01  | 0.01  |
| 892.9               | 922.9       | 0.11                                 | 0.02  | 0.01  |
| 973.1               | 1003.1      | 0.15                                 | 0.03  | 0.02  |
| 1053.4              | 1083.4      | 0.12                                 | 0.04  | 0.03  |
| 1133.6              | 1163.6      | 0.10                                 | 0.06  | 0.04  |
| 1213.9              | 1243.9      | 0.10                                 | 0.06  | 0.04  |
| 1294.1              | 1324.1      | 0.15                                 | 0.06  | 0.04  |
| 1374.4              | 1404.4      | 0.17                                 | 0.07  | 0.05  |
| 1454.6              | 1484.6      | 0.18                                 | 0.07  | 0.04  |
| 1534.9              | 1564.9      | 0.24                                 | 0.09  | 0.05  |
| 1615.1              | 1645.1      | 0.26                                 | 0.09  | 0.04  |
| 1695.4              | 1725.4      | 0.26                                 | 0.10  | 0.04  |
| 1775.6              | 1805.6      | 0.17                                 | 0.10  | 0.05  |
| 1855.9              | 1885.9      | 0.10                                 | 0.08  | 0.06  |
| 1936.1              | 1966.1      | 0.01                                 | 0.06  | 0.05  |
| 2016.4              | 2046.4      | -0.10                                | 0.04  | 0.03  |
| 2096.6              | 2126.6      | -0.22                                | 0.00  | 0.02  |
| 2176.9              | 2206.9      | -0.36                                | -0.07 | 0.01  |
| 2257.1              | 2287.1      | -0.45                                | -0.09 | 0.00  |
| 2337.4              | 2367.4      | -0.43                                | -0.08 | -0.02 |
| 2417.6              | 2447.6      | -0.37                                | -0.04 | 0.01  |
| 2497.9              | 2527.9      | -0.27                                | 0.01  | 0.04  |
| 2578.2              | 2608.2      | -0.20                                | 0.05  | 0.08  |
| 2658.4              | 2688.4      | -0.11                                | 0.09  | 0.10  |
| 2738.7              | 2768.7      | -0.05                                | 0.08  | 0.10  |
| 2839.0              | 2869.0      | 0.07                                 | 0.11  | 0.12  |
| 2919.2              | 2949.2      | 0.08                                 | 0.10  | 0.11  |
| 3019.5              | 3049.5      | 0.12                                 | 0.12  | 0.11  |
| 3099.8              | 3129.8      | 0.13                                 | 0.11  | 0.10  |
| 3200.1              | 3230.1      | 0.17                                 | 0.12  | 0.09  |

REV. X2

SYM-EDR5092/2

100920

Page 1 of 5



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

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



# Frequency Mixer

SYM-EDR5092/2

## Typical Performance Data

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=1250.1MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=10.1MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=2500.1MHz<br>(dB) |
|----------------------|-------------|------------------------------------------------------------------|----------------------|-------------|----------------------------------------------------------------|----------------------|-------------|------------------------------------------------------------------|
|                      |             | @LO (dBm)                                                        |                      |             | @LO (dBm)                                                      |                      |             | @LO (dBm)                                                        |
|                      |             | +17                                                              |                      |             | +17                                                            |                      |             | +17                                                              |
| 1230.0               | 20.1        | 7.55                                                             | 10.0                 | 20.1        | 5.54                                                           | 1500.0               | 1000.1      | 7.80                                                             |
| 1190.0               | 60.1        | 7.60                                                             | 50.8                 | 60.9        | 5.62                                                           | 1459.2               | 1040.9      | 7.83                                                             |
| 1150.0               | 100.1       | 7.54                                                             | 91.6                 | 101.7       | 5.61                                                           | 1418.4               | 1081.7      | 7.86                                                             |
| 1110.0               | 140.1       | 7.53                                                             | 132.5                | 142.6       | 5.53                                                           | 1377.5               | 1122.6      | 7.94                                                             |
| 1070.0               | 180.1       | 7.55                                                             | 173.3                | 183.4       | 5.65                                                           | 1336.7               | 1163.4      | 7.98                                                             |
| 1030.0               | 220.1       | 7.51                                                             | 214.1                | 224.2       | 5.53                                                           | 1295.9               | 1204.2      | 7.99                                                             |
| 990.0                | 260.1       | 7.53                                                             | 254.9                | 265.0       | 5.58                                                           | 1255.1               | 1245.0      | 8.01                                                             |
| 970.0                | 280.1       | 7.52                                                             | 295.8                | 305.9       | 5.59                                                           | 1214.2               | 1285.9      | 8.03                                                             |
| 930.0                | 320.1       | 7.44                                                             | 336.6                | 346.7       | 5.52                                                           | 1173.4               | 1326.7      | 8.06                                                             |
| 910.0                | 340.1       | 7.50                                                             | 377.4                | 387.5       | 5.58                                                           | 1132.6               | 1367.5      | 8.09                                                             |
| 870.0                | 380.1       | 7.38                                                             | 418.2                | 428.3       | 5.53                                                           | 1091.8               | 1408.3      | 8.15                                                             |
| 850.0                | 400.1       | 7.43                                                             | 459.0                | 469.1       | 5.55                                                           | 1051.0               | 1449.1      | 8.19                                                             |
| 810.0                | 440.1       | 7.32                                                             | 499.9                | 510.0       | 5.58                                                           | 1010.1               | 1490.0      | 8.26                                                             |
| 790.0                | 460.1       | 7.33                                                             | 540.7                | 550.8       | 5.59                                                           | 969.3                | 1530.8      | 8.33                                                             |
| 750.0                | 500.1       | 7.18                                                             | 581.5                | 591.6       | 5.58                                                           | 928.5                | 1571.6      | 8.41                                                             |
| 730.0                | 520.1       | 7.21                                                             | 622.3                | 632.4       | 5.62                                                           | 887.7                | 1612.4      | 8.47                                                             |
| 690.0                | 560.1       | 7.15                                                             | 663.2                | 673.3       | 5.70                                                           | 846.8                | 1653.3      | 8.46                                                             |
| 670.0                | 580.1       | 7.16                                                             | 704.0                | 714.1       | 5.72                                                           | 806.0                | 1694.1      | 8.45                                                             |
| 630.0                | 620.1       | 7.10                                                             | 744.8                | 754.9       | 5.77                                                           | 765.2                | 1734.9      | 8.48                                                             |
| 610.0                | 640.1       | 7.11                                                             | 785.6                | 795.7       | 5.84                                                           | 724.4                | 1775.7      | 8.46                                                             |
| 570.0                | 680.1       | 7.04                                                             | 826.4                | 836.5       | 5.85                                                           | 683.6                | 1816.5      | 8.56                                                             |
| 550.0                | 700.1       | 7.00                                                             | 867.3                | 877.4       | 5.88                                                           | 642.7                | 1857.4      | 8.56                                                             |
| 510.0                | 740.1       | 6.96                                                             | 908.1                | 918.2       | 5.90                                                           | 601.9                | 1898.2      | 8.58                                                             |
| 490.0                | 760.1       | 6.90                                                             | 948.9                | 959.0       | 5.97                                                           | 561.1                | 1939.0      | 8.56                                                             |
| 450.0                | 800.1       | 6.83                                                             | 989.7                | 999.8       | 6.01                                                           | 520.3                | 1979.8      | 8.52                                                             |
| 430.0                | 820.1       | 6.81                                                             | 1030.5               | 1040.6      | 6.01                                                           | 479.5                | 2020.6      | 8.49                                                             |
| 390.0                | 860.1       | 6.76                                                             | 1071.4               | 1081.5      | 6.07                                                           | 438.6                | 2061.5      | 8.46                                                             |
| 370.0                | 880.1       | 6.69                                                             | 1112.2               | 1122.3      | 6.08                                                           | 397.8                | 2102.3      | 8.42                                                             |
| 330.0                | 920.1       | 6.71                                                             | 1153.0               | 1163.1      | 6.10                                                           | 357.0                | 2143.1      | 8.32                                                             |
| 310.0                | 940.1       | 6.66                                                             | 1193.8               | 1203.9      | 6.13                                                           | 316.2                | 2183.9      | 8.30                                                             |
| 270.0                | 980.1       | 6.65                                                             | 1234.7               | 1244.8      | 6.15                                                           | 275.3                | 2224.8      | 8.25                                                             |
| 250.0                | 1000.1      | 6.64                                                             | 1255.1               | 1265.2      | 6.15                                                           | 254.9                | 2245.2      | 8.26                                                             |
| 210.0                | 1040.1      | 6.60                                                             | 1295.9               | 1306.0      | 6.20                                                           | 214.1                | 2286.0      | 8.23                                                             |
| 190.0                | 1060.1      | 6.59                                                             | 1316.3               | 1326.4      | 6.21                                                           | 193.7                | 2306.4      | 8.22                                                             |
| 150.0                | 1100.1      | 6.55                                                             | 1357.1               | 1367.2      | 6.27                                                           | 152.9                | 2347.2      | 8.18                                                             |
| 130.0                | 1120.1      | 6.50                                                             | 1377.5               | 1387.6      | 6.31                                                           | 132.5                | 2367.6      | 8.13                                                             |
| 90.0                 | 1160.1      | 6.49                                                             | 1418.4               | 1428.5      | 6.41                                                           | 91.6                 | 2408.5      | 8.11                                                             |
| 70.0                 | 1180.1      | 6.43                                                             | 1438.8               | 1448.9      | 6.46                                                           | 71.2                 | 2428.9      | 8.13                                                             |
| 30.0                 | 1220.1      | 6.45                                                             | 1479.6               | 1489.7      | 6.57                                                           | 30.4                 | 2469.7      | 8.16                                                             |
| 10.0                 | 1240.1      | 6.47                                                             | 1500.0               | 1510.1      | 6.63                                                           | 10.0                 | 2490.1      | 8.12                                                             |

REV. X2

SYM-EDR5092/2

100920

Page 2 of 5



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

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



# Frequency Mixer

SYM-EDR5092/2

## Typical Performance Data

| LO<br>(MHz) | LO-RF ISOLATION<br>(dB) |       |       | LO-IF ISOLATION<br>(dB) |       |       |
|-------------|-------------------------|-------|-------|-------------------------|-------|-------|
|             | @LO (dBm)               |       |       | @LO (dBm)               |       |       |
|             | +14                     | +17   | +20   | +14                     | +17   | +20   |
| 10.1        | 38.07                   | 40.80 | 43.57 | 43.11                   | 46.26 | 49.05 |
| 90.4        | 38.00                   | 40.42 | 42.38 | 42.75                   | 46.00 | 48.58 |
| 170.6       | 38.08                   | 39.38 | 39.65 | 43.50                   | 46.63 | 47.31 |
| 250.9       | 37.83                   | 37.70 | 37.41 | 44.40                   | 46.58 | 46.60 |
| 331.1       | 37.49                   | 36.44 | 35.97 | 45.88                   | 46.93 | 45.59 |
| 411.4       | 37.02                   | 35.61 | 34.99 | 47.74                   | 46.98 | 44.94 |
| 491.6       | 36.47                   | 35.06 | 34.40 | 48.98                   | 46.20 | 43.89 |
| 571.9       | 36.08                   | 34.83 | 34.02 | 48.71                   | 45.85 | 43.03 |
| 652.1       | 35.60                   | 34.19 | 33.70 | 49.55                   | 45.64 | 43.40 |
| 732.4       | 34.69                   | 34.02 | 33.60 | 49.34                   | 44.86 | 42.47 |
| 812.6       | 34.47                   | 34.26 | 33.75 | 47.50                   | 44.16 | 41.83 |
| 892.9       | 34.13                   | 33.94 | 33.68 | 48.50                   | 44.53 | 41.81 |
| 973.1       | 33.49                   | 33.45 | 33.37 | 50.17                   | 46.82 | 43.11 |
| 1053.4      | 33.23                   | 33.32 | 33.47 | 52.86                   | 50.95 | 45.19 |
| 1133.6      | 32.60                   | 33.43 | 33.91 | 52.48                   | 56.41 | 47.00 |
| 1213.9      | 31.82                   | 33.04 | 33.75 | 51.06                   | 61.81 | 48.57 |
| 1294.1      | 31.37                   | 32.74 | 33.49 | 52.90                   | 64.96 | 50.39 |
| 1374.4      | 31.20                   | 32.69 | 33.40 | 54.17                   | 60.81 | 50.97 |
| 1454.6      | 31.06                   | 32.90 | 33.40 | 50.89                   | 56.08 | 52.05 |
| 1534.9      | 31.09                   | 32.83 | 33.56 | 48.03                   | 52.41 | 52.22 |
| 1615.1      | 31.20                   | 32.78 | 33.38 | 46.20                   | 49.12 | 49.70 |
| 1695.4      | 31.51                   | 32.85 | 33.47 | 44.58                   | 46.30 | 47.04 |
| 1775.6      | 31.85                   | 32.84 | 33.72 | 43.88                   | 45.54 | 46.27 |
| 1855.9      | 32.00                   | 32.97 | 33.64 | 43.21                   | 44.94 | 45.29 |
| 1936.1      | 32.21                   | 33.37 | 34.21 | 42.23                   | 43.72 | 43.56 |
| 2016.4      | 32.37                   | 33.52 | 34.52 | 41.34                   | 42.56 | 41.88 |
| 2096.6      | 32.61                   | 33.72 | 34.73 | 40.60                   | 41.35 | 40.17 |
| 2176.9      | 32.89                   | 33.87 | 34.95 | 39.85                   | 40.06 | 38.76 |
| 2257.1      | 33.28                   | 33.96 | 34.87 | 39.44                   | 39.48 | 37.64 |
| 2337.4      | 33.51                   | 33.81 | 34.57 | 39.04                   | 38.99 | 37.06 |
| 2417.6      | 33.79                   | 33.52 | 33.93 | 38.65                   | 38.29 | 36.45 |
| 2497.9      | 33.68                   | 33.44 | 33.54 | 38.34                   | 37.57 | 35.95 |
| 2578.2      | 33.33                   | 32.51 | 32.36 | 38.21                   | 37.52 | 35.46 |
| 2658.4      | 33.06                   | 31.91 | 31.37 | 37.52                   | 37.05 | 35.13 |
| 2738.7      | 32.79                   | 31.75 | 31.37 | 36.63                   | 36.36 | 35.00 |
| 2839.0      | 31.77                   | 30.66 | 30.54 | 35.88                   | 35.03 | 34.81 |
| 2919.2      | 31.00                   | 30.00 | 29.84 | 35.22                   | 34.08 | 33.93 |
| 3019.5      | 29.75                   | 29.05 | 28.76 | 34.36                   | 33.38 | 32.70 |
| 3099.8      | 28.92                   | 28.28 | 27.83 | 33.61                   | 32.92 | 32.01 |
| 3200.1      | 28.43                   | 27.62 | 27.03 | 32.84                   | 32.40 | 31.93 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +14                     | +17   | +20   |
| 10.1                | 40.1        | 34.78                   | 36.59 | 36.98 |
| 90.4                | 120.4       | 35.77                   | 36.90 | 38.00 |
| 170.6               | 200.6       | 36.97                   | 38.39 | 38.81 |
| 250.9               | 280.9       | 38.56                   | 39.72 | 40.07 |
| 331.1               | 361.1       | 40.80                   | 41.26 | 41.70 |
| 411.4               | 441.4       | 42.56                   | 42.87 | 43.85 |
| 491.6               | 521.6       | 43.88                   | 43.23 | 44.02 |
| 571.9               | 601.9       | 45.32                   | 46.29 | 48.10 |
| 652.1               | 682.1       | 46.83                   | 47.74 | 49.57 |
| 732.4               | 762.4       | 45.99                   | 48.67 | 47.80 |
| 812.6               | 842.6       | 47.58                   | 49.30 | 46.24 |
| 892.9               | 922.9       | 51.40                   | 47.04 | 44.14 |
| 973.1               | 1003.1      | 54.08                   | 47.56 | 43.98 |
| 1053.4              | 1083.4      | 57.26                   | 50.28 | 44.38 |
| 1133.6              | 1163.6      | 48.59                   | 50.71 | 45.36 |
| 1213.9              | 1243.9      | 43.92                   | 50.68 | 47.35 |
| 1294.1              | 1324.1      | 41.61                   | 47.34 | 47.42 |
| 1374.4              | 1404.4      | 39.89                   | 45.02 | 47.51 |
| 1454.6              | 1484.6      | 38.71                   | 42.68 | 46.43 |
| 1534.9              | 1564.9      | 38.36                   | 40.85 | 43.91 |
| 1615.1              | 1645.1      | 38.17                   | 40.52 | 42.14 |
| 1695.4              | 1725.4      | 38.22                   | 39.60 | 41.28 |
| 1775.6              | 1805.6      | 38.09                   | 39.27 | 40.44 |
| 1855.9              | 1885.9      | 38.14                   | 38.38 | 39.53 |
| 1936.1              | 1966.1      | 38.69                   | 38.03 | 38.96 |
| 2016.4              | 2046.4      | 39.55                   | 38.77 | 39.44 |
| 2096.6              | 2126.6      | 41.35                   | 39.37 | 39.83 |
| 2176.9              | 2206.9      | 43.51                   | 41.81 | 40.83 |
| 2257.1              | 2287.1      | 45.13                   | 43.69 | 43.31 |
| 2337.4              | 2367.4      | 45.58                   | 44.51 | 43.71 |
| 2417.6              | 2447.6      | 45.13                   | 45.17 | 44.47 |
| 2497.9              | 2527.9      | 44.46                   | 44.62 | 44.78 |
| 2578.2              | 2608.2      | 42.96                   | 44.39 | 45.62 |
| 2658.4              | 2688.4      | 41.56                   | 42.09 | 43.04 |
| 2738.7              | 2768.7      | 39.97                   | 40.74 | 41.00 |
| 2839.0              | 2869.0      | 38.32                   | 39.44 | 39.94 |
| 2919.2              | 2949.2      | 37.03                   | 37.78 | 38.60 |
| 3019.5              | 3049.5      | 36.14                   | 36.43 | 37.18 |
| 3099.8              | 3129.8      | 35.64                   | 35.87 | 36.66 |
| 3200.1              | 3230.1      | 34.83                   | 35.11 | 35.54 |

REV. X2

SYM-EDR5092/2

100920

Page 3 of 5



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

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



# Frequency Mixer

SYM-EDR5092/2

## 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=2500.1001MHz<br>(:1) |      |  |  |
|---------------------|-------------|-----------------|------|------|-------------|-----------------|------|------|--------|----------------------|-------------------------------------|------|--|--|
|                     |             | @LO (dBm)       |      |      |             | @LO (dBm)       |      |      |        |                      | @LO (dBm)                           |      |  |  |
|                     |             | +14             | +17  | +20  |             | +14             | +17  | +20  | +14    |                      | +17                                 | +20  |  |  |
| 10.1                | 40.1        | 1.34            | 1.18 | 1.09 | 10.1        | 1.02            | 1.57 | 2.29 | 10.0   | 2.05                 | 1.47                                | 1.29 |  |  |
| 90.4                | 120.4       | 1.42            | 1.24 | 1.13 | 90.4        | 1.06            | 1.56 | 2.28 | 49.7   | 1.82                 | 1.34                                | 1.15 |  |  |
| 170.6               | 200.6       | 1.46            | 1.29 | 1.20 | 170.6       | 1.07            | 1.57 | 2.29 | 89.5   | 1.83                 | 1.34                                | 1.14 |  |  |
| 250.9               | 280.9       | 1.54            | 1.39 | 1.29 | 250.9       | 1.09            | 1.58 | 2.31 | 129.2  | 1.86                 | 1.36                                | 1.17 |  |  |
| 331.1               | 361.1       | 1.65            | 1.49 | 1.39 | 331.1       | 1.17            | 1.57 | 2.28 | 168.9  | 1.81                 | 1.33                                | 1.15 |  |  |
| 411.4               | 441.4       | 1.80            | 1.62 | 1.51 | 411.4       | 1.21            | 1.54 | 2.20 | 208.7  | 1.86                 | 1.37                                | 1.19 |  |  |
| 491.6               | 521.6       | 2.01            | 1.79 | 1.66 | 491.6       | 1.23            | 1.51 | 2.13 | 248.4  | 1.84                 | 1.38                                | 1.20 |  |  |
| 571.9               | 601.9       | 2.17            | 1.93 | 1.77 | 571.9       | 1.23            | 1.46 | 2.06 | 288.1  | 1.86                 | 1.38                                | 1.20 |  |  |
| 652.1               | 682.1       | 2.28            | 2.02 | 1.87 | 652.1       | 1.26            | 1.44 | 2.01 | 327.9  | 1.86                 | 1.39                                | 1.21 |  |  |
| 732.4               | 762.4       | 2.43            | 2.18 | 2.04 | 732.4       | 1.27            | 1.42 | 1.97 | 367.6  | 1.82                 | 1.36                                | 1.18 |  |  |
| 812.6               | 842.6       | 2.49            | 2.25 | 2.09 | 812.6       | 1.30            | 1.37 | 1.90 | 407.3  | 1.82                 | 1.36                                | 1.19 |  |  |
| 892.9               | 922.9       | 2.48            | 2.25 | 2.13 | 892.9       | 1.37            | 1.35 | 1.85 | 447.1  | 1.79                 | 1.34                                | 1.17 |  |  |
| 973.1               | 1003.1      | 2.48            | 2.25 | 2.14 | 973.1       | 1.42            | 1.33 | 1.80 | 486.8  | 1.76                 | 1.31                                | 1.14 |  |  |
| 1053.4              | 1083.4      | 2.47            | 2.24 | 2.13 | 1053.4      | 1.47            | 1.33 | 1.76 | 526.5  | 1.76                 | 1.30                                | 1.13 |  |  |
| 1133.6              | 1163.6      | 2.44            | 2.22 | 2.13 | 1133.6      | 1.49            | 1.31 | 1.72 | 566.3  | 1.67                 | 1.25                                | 1.09 |  |  |
| 1213.9              | 1243.9      | 2.40            | 2.18 | 2.08 | 1213.9      | 1.51            | 1.32 | 1.68 | 606.0  | 1.66                 | 1.23                                | 1.05 |  |  |
| 1294.1              | 1324.1      | 2.31            | 2.10 | 1.98 | 1294.1      | 1.51            | 1.31 | 1.64 | 645.7  | 1.63                 | 1.21                                | 1.05 |  |  |
| 1374.4              | 1404.4      | 2.21            | 2.03 | 1.90 | 1374.4      | 1.51            | 1.31 | 1.62 | 685.5  | 1.57                 | 1.15                                | 1.03 |  |  |
| 1454.6              | 1484.6      | 2.10            | 1.93 | 1.80 | 1454.6      | 1.51            | 1.28 | 1.60 | 725.2  | 1.55                 | 1.14                                | 1.03 |  |  |
| 1534.9              | 1564.9      | 2.00            | 1.83 | 1.70 | 1534.9      | 1.52            | 1.26 | 1.58 | 764.9  | 1.51                 | 1.11                                | 1.06 |  |  |
| 1615.1              | 1645.1      | 1.95            | 1.75 | 1.63 | 1615.1      | 1.52            | 1.24 | 1.55 | 804.7  | 1.47                 | 1.09                                | 1.09 |  |  |
| 1695.4              | 1725.4      | 1.95            | 1.70 | 1.58 | 1695.4      | 1.53            | 1.24 | 1.53 | 844.4  | 1.47                 | 1.10                                | 1.09 |  |  |
| 1775.6              | 1805.6      | 2.00            | 1.74 | 1.62 | 1775.6      | 1.53            | 1.25 | 1.52 | 884.1  | 1.44                 | 1.09                                | 1.12 |  |  |
| 1855.9              | 1885.9      | 2.06            | 1.82 | 1.71 | 1855.9      | 1.52            | 1.25 | 1.52 | 923.9  | 1.43                 | 1.11                                | 1.15 |  |  |
| 1936.1              | 1966.1      | 2.13            | 1.90 | 1.80 | 1936.1      | 1.53            | 1.25 | 1.52 | 963.6  | 1.44                 | 1.14                                | 1.18 |  |  |
| 2016.4              | 2046.4      | 2.19            | 1.97 | 1.86 | 2016.4      | 1.53            | 1.25 | 1.52 | 1003.3 | 1.42                 | 1.17                                | 1.21 |  |  |
| 2096.6              | 2126.6      | 2.24            | 2.00 | 1.89 | 2096.6      | 1.52            | 1.26 | 1.50 | 1043.1 | 1.45                 | 1.23                                | 1.27 |  |  |
| 2176.9              | 2206.9      | 2.19            | 1.96 | 1.83 | 2176.9      | 1.50            | 1.26 | 1.47 | 1082.8 | 1.48                 | 1.25                                | 1.28 |  |  |
| 2257.1              | 2287.1      | 2.10            | 1.87 | 1.74 | 2257.1      | 1.48            | 1.26 | 1.46 | 1122.5 | 1.45                 | 1.28                                | 1.33 |  |  |
| 2337.4              | 2367.4      | 1.96            | 1.75 | 1.62 | 2337.4      | 1.48            | 1.26 | 1.44 | 1162.3 | 1.53                 | 1.36                                | 1.40 |  |  |
| 2417.6              | 2447.6      | 1.80            | 1.59 | 1.47 | 2417.6      | 1.48            | 1.27 | 1.43 | 1202.0 | 1.52                 | 1.36                                | 1.39 |  |  |
| 2497.9              | 2527.9      | 1.66            | 1.45 | 1.34 | 2497.9      | 1.49            | 1.26 | 1.40 | 1241.7 | 1.58                 | 1.46                                | 1.51 |  |  |
| 2578.2              | 2608.2      | 1.54            | 1.33 | 1.21 | 2578.2      | 1.47            | 1.26 | 1.37 | 1281.5 | 1.64                 | 1.49                                | 1.50 |  |  |
| 2658.4              | 2688.4      | 1.42            | 1.24 | 1.12 | 2658.4      | 1.45            | 1.25 | 1.35 | 1321.2 | 1.60                 | 1.48                                | 1.52 |  |  |
| 2738.7              | 2768.7      | 1.35            | 1.21 | 1.13 | 2738.7      | 1.42            | 1.24 | 1.34 | 1360.9 | 1.71                 | 1.60                                | 1.63 |  |  |
| 2839.0              | 2869.0      | 1.32            | 1.25 | 1.23 | 2839.0      | 1.40            | 1.21 | 1.31 | 1380.8 | 1.72                 | 1.60                                | 1.62 |  |  |
| 2919.2              | 2949.2      | 1.35            | 1.32 | 1.32 | 2919.2      | 1.38            | 1.19 | 1.29 | 1420.5 | 1.70                 | 1.60                                | 1.62 |  |  |
| 3019.5              | 3049.5      | 1.41            | 1.40 | 1.42 | 3019.5      | 1.37            | 1.18 | 1.25 | 1440.4 | 1.74                 | 1.66                                | 1.70 |  |  |
| 3099.8              | 3129.8      | 1.46            | 1.47 | 1.50 | 3099.8      | 1.35            | 1.17 | 1.23 | 1480.1 | 1.84                 | 1.73                                | 1.74 |  |  |
| 3200.1              | 3230.1      | 1.50            | 1.52 | 1.56 | 3200.1      | 1.33            | 1.17 | 1.21 | 1500.0 | 1.84                 | 1.71                                | 1.72 |  |  |

REV. X2

SYM-EDR5092/2

100920

Page 4 of 5



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

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 33  | 25  | 30  | 38  | 38  | 38  | 30  | 53  | 41  | 39  |
| 1  | -      | 45     | +0  | 45  | 16  | 43  | 26  | 51  | 40  | 47  | 59  | 41  |
| 2  | 93     | 59     | 57  | 66  | 57  | 57  | 56  | 65  | 63  | 70  | 60  | 70  |
| 3  | >100   | 82     | 63  | 80  | 66  | 83  | 66  | 77  | 68  | 88  | 68  | 76  |
| 4  | >100   | >93    | 89  | >93 | >93 | >93 | >93 | 85  | 87  | >93 | 91  | >93 |
| 5  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | 89  | >93 | 91  | >93 |
| 6  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | 92  | >93 | >93 | >93 | >93 |
| 7  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 8  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 9  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 10 | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions:

RF IN: 1250.1 MHz; -1.00 dBm.  
LO IN: 1280.01 MHz; +17.00 dBm  
IF OUT: 29.91 MHz; -7.49 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |      |      |      |      |      |      |     |    |    |    |
|----|--------|--------|------|------|------|------|------|------|-----|----|----|----|
| 0  | -      | -      | 37   | 34   | 43   | 45   | 54   | 56   | 48  | 78 | 63 | 66 |
| 1  | -      | 46     | +0   | 44   | 16   | 45   | 28   | 53   | 44  | 54 | 68 | 54 |
| 2  | 75     | 50     | 47   | 53   | 47   | 53   | 49   | 59   | 58  | 60 | 54 | 68 |
| 3  | >100   | 66     | 41   | 60   | 48   | 60   | 60   | 58   | 56  | 70 | 63 | 60 |
| 4  | >100   | 70     | 68   | 67   | 80   | 70   | 75   | 65   | 62  | 73 | 68 | 88 |
| 5  | >100   | 79     | 77   | 76   | 67   | 91   | 67   | 74   | 65  | 74 | 70 | 80 |
| 6  | >100   | 93     | 96   | 85   | 83   | 80   | 91   | 75   | 81  | 74 | 72 | 84 |
| 7  | >100   | >103   | 98   | 101  | 83   | 96   | 75   | 87   | 72  | 81 | 72 | 87 |
| 8  | >100   | >103   | 98   | 94   | >103 | 91   | 88   | 88   | 87  | 86 | 84 | 83 |
| 9  | >100   | >103   | >103 | >103 | >103 | >103 | 94   | 99   | 86  | 95 | 84 | 93 |
| 10 | >100   | >103   | >103 | >103 | >103 | >103 | >103 | >103 | 101 | 98 | 95 | 97 |
|    | RF CAL | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7   | 8  | 9  | 10 |

### LO HARMONICS ORDER

Test conditions:

RF IN: 1250.1 MHz; 9.00 dBm.  
LO IN: 1280.01 MHz; +17.00 dBm  
IF OUT: 29.91 MHz; 2.53 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.

REV. X2

SYM-EDR5092/2

100920

Page 5 of 5



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

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

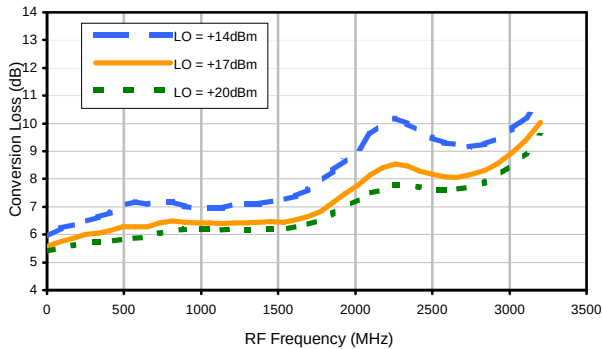


The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see

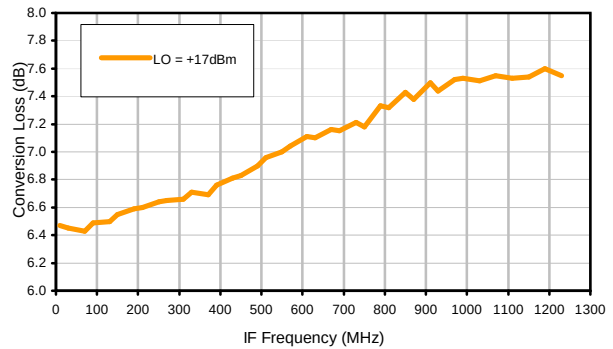


## Typical Performance Curves

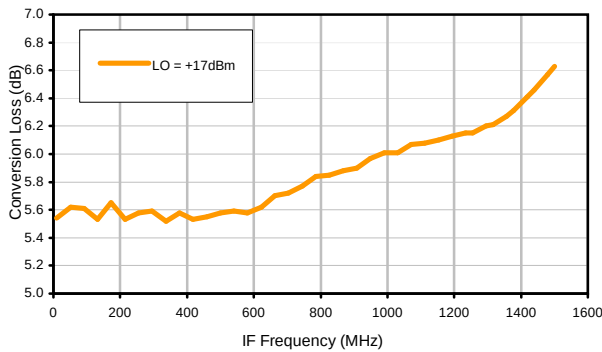
Conversion Loss @ IF=30MHz



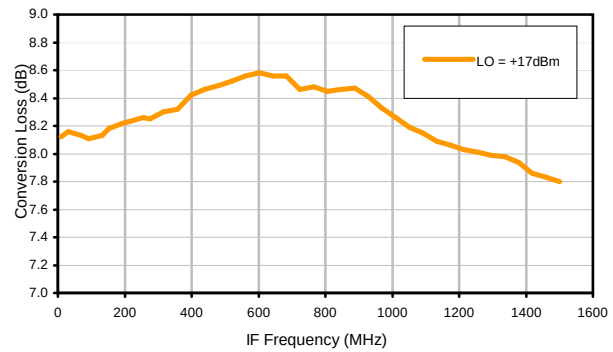
Conversion Loss vs. IF @ RF=1250.1MHz



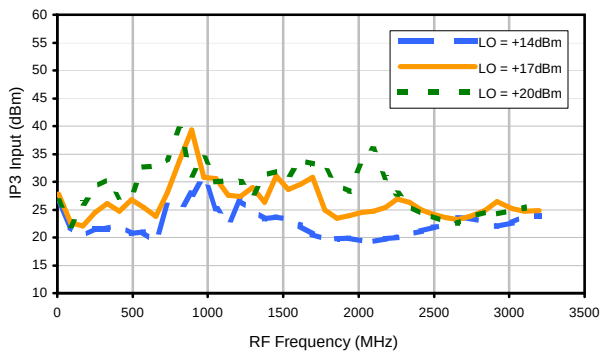
Conversion Loss vs. IF @ RF=10.1MHz



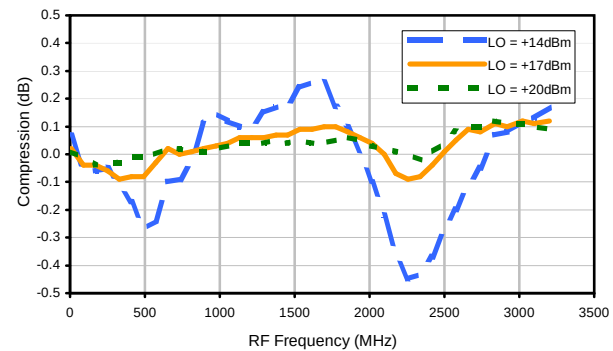
Conversion Loss vs. IF @ RF=2500.1MHz



IP3 Input



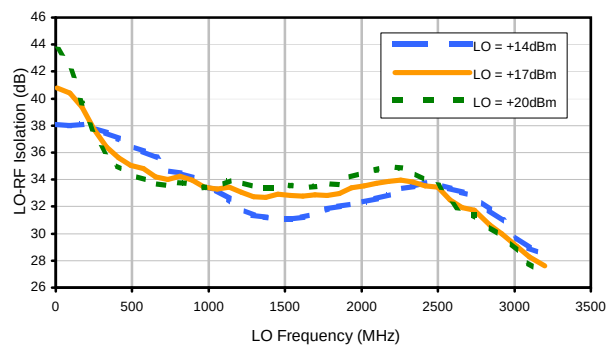
Compression @ RF IN=+10dBm



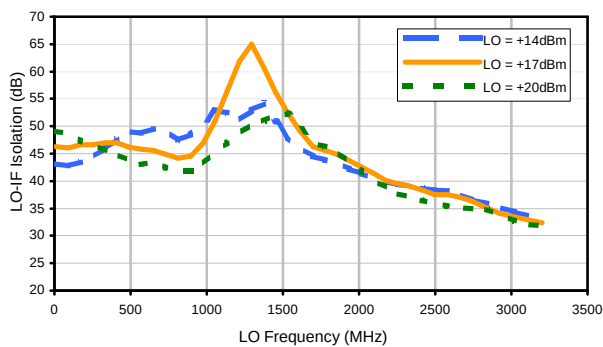


## Typical Performance Curves

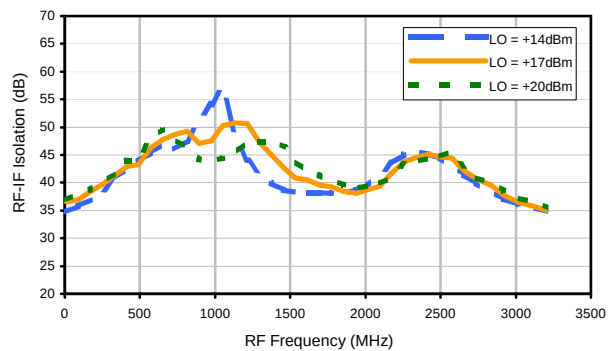
LO-RF Isolation



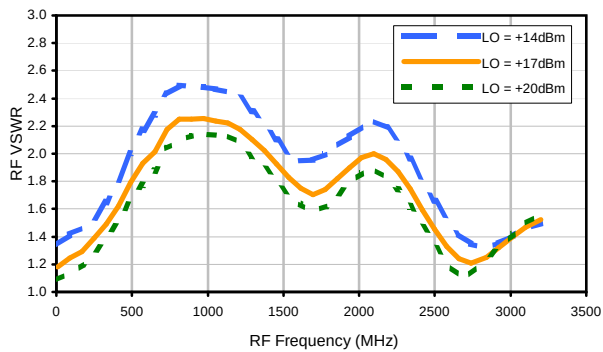
LO-IF Isolation



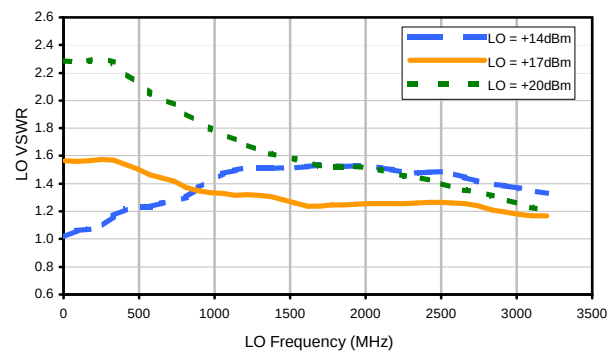
RF-IF Isolation



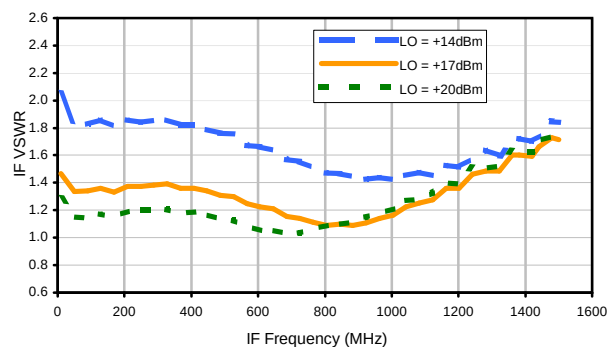
RF VSWR



LO VSWR



IF VSWR



REV. X2

SYM-EDR5092/2

100920

Page 2 of 3



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

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see





## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 33  | 25  | 30  | 38  | 38  | 38  | 30  | 53  | 41  | 39  |
| 1  | -      | 45     | +0  | 45  | 16  | 43  | 26  | 51  | 40  | 47  | 59  | 41  |
| 2  | 93     | 59     | 57  | 66  | 57  | 57  | 56  | 65  | 63  | 70  | 60  | 70  |
| 3  | >100   | 82     | 63  | 80  | 66  | 83  | 66  | 77  | 68  | 88  | 68  | 76  |
| 4  | >100   | >93    | 89  | >93 | >93 | >93 | >93 | 85  | 87  | >93 | 91  | >93 |
| 5  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | 89  | >93 | 91  | >93 |
| 6  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | 92  | >93 | >93 | >93 | >93 |
| 7  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 8  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 9  | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 10 | >100   | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 1250.1 MHz; -1.00 dBm.  
LO IN: 1280.01 MHz; +17.00 dBm  
IF OUT: 29.91 MHz; -7.49 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |      |      |      |      |      |      |     |    |    |    |
|----|--------|--------|------|------|------|------|------|------|-----|----|----|----|
| 0  | -      | -      | 37   | 34   | 43   | 45   | 54   | 56   | 48  | 78 | 63 | 66 |
| 1  | -      | 46     | +0   | 44   | 16   | 45   | 28   | 53   | 44  | 54 | 68 | 54 |
| 2  | 75     | 50     | 47   | 53   | 47   | 53   | 49   | 59   | 58  | 60 | 54 | 68 |
| 3  | >100   | 66     | 41   | 60   | 48   | 60   | 60   | 58   | 56  | 70 | 63 | 60 |
| 4  | >100   | 70     | 68   | 67   | 80   | 70   | 75   | 65   | 62  | 73 | 68 | 88 |
| 5  | >100   | 79     | 77   | 76   | 67   | 91   | 67   | 74   | 65  | 74 | 70 | 80 |
| 6  | >100   | 93     | 96   | 85   | 83   | 80   | 91   | 75   | 81  | 74 | 72 | 84 |
| 7  | >100   | >103   | 98   | 101  | 83   | 96   | 75   | 87   | 72  | 81 | 72 | 87 |
| 8  | >100   | >103   | 98   | 94   | >103 | 91   | 88   | 88   | 87  | 86 | 84 | 83 |
| 9  | >100   | >103   | >103 | >103 | >103 | >103 | 94   | 99   | 86  | 95 | 84 | 93 |
| 10 | >100   | >103   | >103 | >103 | >103 | >103 | >103 | >103 | 101 | 98 | 95 | 97 |
|    | RF CAL | 0      | 1    | 2    | 3    | 4    | 5    | 6    | 7   | 8  | 9  | 10 |

### LO HARMONICS ORDER

Test conditions: RF IN: 1250.1 MHz; 9.00 dBm.  
LO IN: 1280.01 MHz; +17.00 dBm  
IF OUT: 29.91 MHz; 2.53 dBm

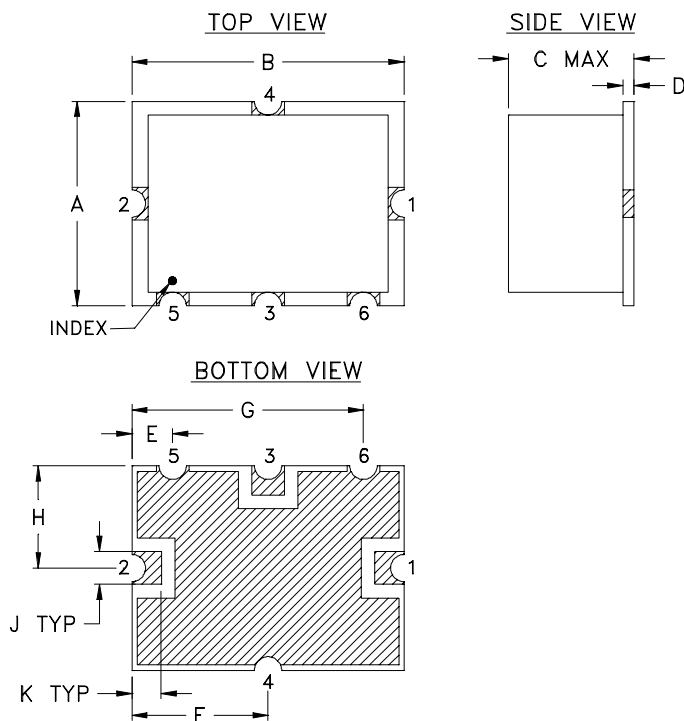
- Notes: 1. All Harmonics are in (dBc) relative to IF OUTPUT.  
2. + entry denotes harmonics are in (dBc) above IF OUTPUT.  
3. RF Cal represent the Harmonics level of the RF input signal to the mixer.

REV. X2  
SYM-EDR5092/2  
100920  
Page 3 of 3

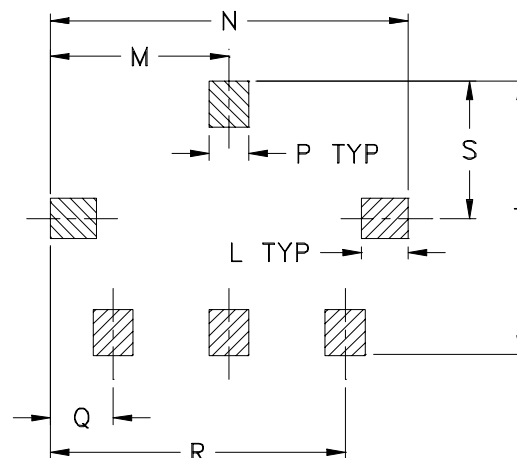


## Outline Dimensions

TTT166  
TTT167



## PCB Land Pattern



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

| CASE # | A             | B              | C             | D              | E              | F              | G               | H              | J              | K              | L              | M              | N               |
|--------|---------------|----------------|---------------|----------------|----------------|----------------|-----------------|----------------|----------------|----------------|----------------|----------------|-----------------|
| TTT166 | .38<br>(9.65) | .50<br>(12.70) | .15<br>(3.81) | .020<br>(0.51) | .075<br>(1.91) | .250<br>(6.35) | .425<br>(10.80) | .187<br>(4.75) | .050<br>(1.27) | .050<br>(1.27) | .070<br>(1.78) | .270<br>(6.86) | .540<br>(13.72) |
| TTT167 |               |                | .23<br>(5.84) |                |                |                |                 |                |                |                |                |                |                 |

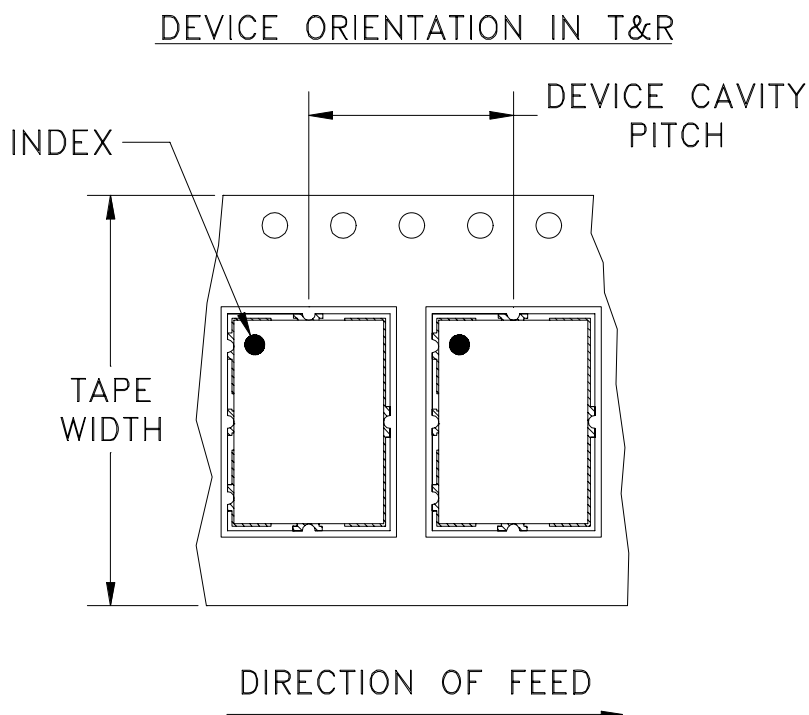
| CASE # | P              | Q              | R               | S              | T               | WT. GRAM |
|--------|----------------|----------------|-----------------|----------------|-----------------|----------|
| TTT166 | .060<br>(1.52) | .095<br>(2.41) | .445<br>(11.30) | .208<br>(5.28) | .415<br>(10.54) | .8       |
| TTT167 |                |                |                 |                |                 | .8       |

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

### Note:

- Case material: Plastic.
- Base material: Printed wiring laminate.
- Termination finish:
  - For RoHS Case Styles: 3-5  $\mu$  inch (.08-.13 microns) Gold over 120-240  $\mu$  inch (3.05-6.10 microns) Nickel plate. All models, (+) suffix.
  - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

# Tape & Reel Packaging TR-F12



| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel                    |     |
|----------------|-------------------------|-------------------|-------------------------------------|-----|
| 24             | 12                      | 7                 | Small quantity standards (see note) | 10  |
|                |                         |                   |                                     | 20  |
|                |                         |                   |                                     | 50  |
|                |                         |                   |                                     | 100 |
|                |                         |                   |                                     | 200 |
|                |                         | 13                | Standard                            | 500 |

Note: Please Consult individual model data sheet to determine device per reel availability.

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)



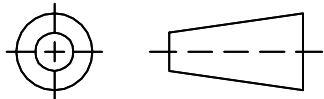
INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified

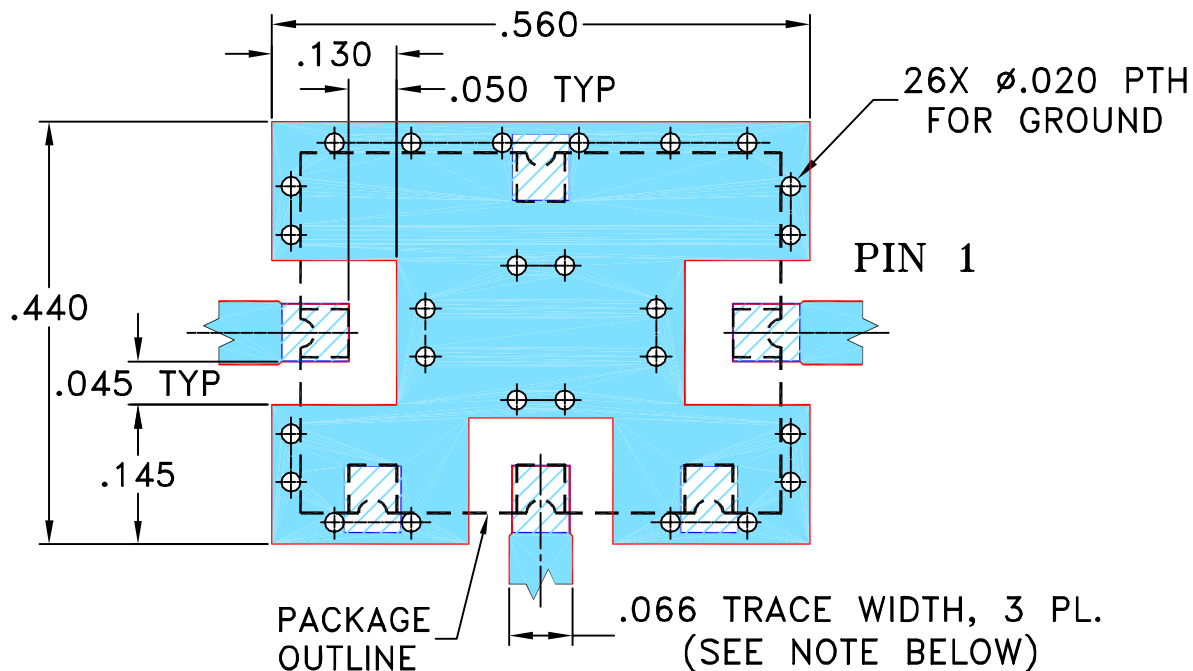
## THIRD ANGLE PROJECTION



## REVISIONS

| REV | ECN No. | DESCRIPTION                 | DATE     | DR  | AUTH |
|-----|---------|-----------------------------|----------|-----|------|
| A   | M86762  | ADDED CONNECTIONS "lp & lq" | 05/23/03 | MMG | WL   |
| B   | M94598  | ADDED CONNECTION "hk"       | 10/08/04 | MMG | HY   |
| C   | M102713 | UPDATED NOTES & DESCRIPTION | 01/14/06 | GF  | IL   |
| D   | M132989 | UPDATED NOTE 2              | 08/24/11 | GF  | DJ   |

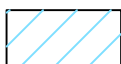
**SUGGESTED MOUNTING CONFIGURATION FOR  
TTT166/167 CASE STYLE, "hk"/"lp"/"lq"  
"x"/"ck"/"ec" PIN CONNECTIONS**

**NOTE:**

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. THE USE OF SOLDER MASK OVER THE GROUND AREA UNDER THE UNIT AS SHOWN IS RECOMMENDED TO PREVENT POTENTIAL SHORTING. IF USER CHOOSES TO EXPOSE METAL UNDER THE ENTIRE UNIT GROUND PAD FOR IMPROVED GROUNDING, IT IS RECOMMENDED A SOLDER MASK DAM BE APPLIED AROUND EACH GROUND PAD TO ENSURE FILLET AND CONNECTION AT GROUND PADS.
3. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER), SEE NOTE 2.



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

GF

03/18/03

CHECKED

IL

04/15/03

APPROVED

DJ

04/15/03

**Mini-Circuits®**13 Neptune Avenue  
Brooklyn NY 11235

PL, hk/lp/lq/x/ck/ec, TTT166/167,  
SYM/HJK/SYAS/SYPD, TB-12

SIZE  
ACODE IDENT  
15542DRAWING NO:  
98-PL-079REV:  
D

FILE: 98PL079

SCALE: 5:1

SHEET: 1 OF 1

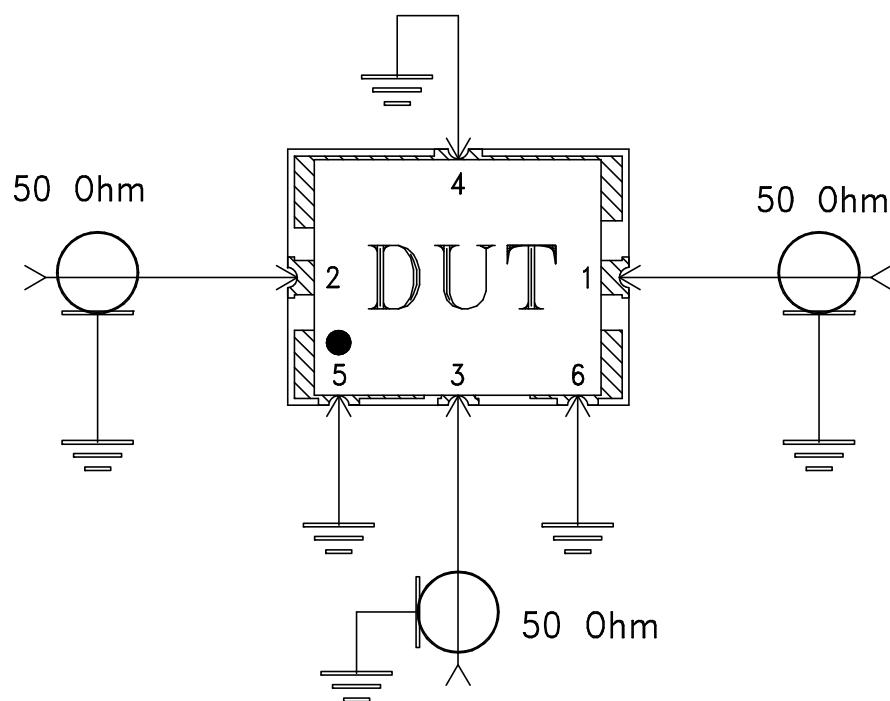
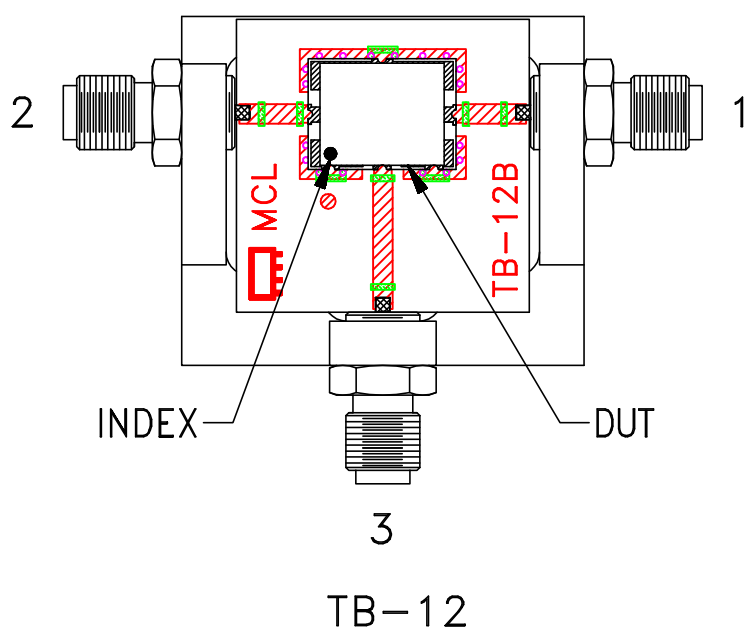
Mini-Circuits®

THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VEEDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE, MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.

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

# Evaluation Board and Circuit

For Pin Connections Refer to Data Sheet of the DUT



Schematic Diagram

## Notes:

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

 **Mini-Circuits®**



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                                                                              |