

# Frequency Mixer

# SYM-25DMHW

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>IF FIXED<br>@IF(OUT)=30MHz<br>(dB) |       |      |
|---------------------|-------------|-------------------------------------------------------|-------|------|
|                     |             | @LO (dBm)                                             |       |      |
|                     |             | +10                                                   | +13   | +16  |
| 10.1                | 40.1        | 6.50                                                  | 5.97  | 5.74 |
| 90.3                | 120.3       | 6.82                                                  | 6.27  | 5.95 |
| 170.6               | 200.6       | 6.81                                                  | 6.32  | 6.00 |
| 250.8               | 280.8       | 6.87                                                  | 6.36  | 6.02 |
| 331.0               | 361.0       | 6.90                                                  | 6.31  | 6.00 |
| 411.3               | 441.3       | 6.96                                                  | 6.33  | 6.00 |
| 491.5               | 521.5       | 6.95                                                  | 6.32  | 6.00 |
| 571.8               | 601.8       | 6.93                                                  | 6.30  | 6.03 |
| 652.0               | 682.0       | 6.92                                                  | 6.33  | 6.06 |
| 732.2               | 762.2       | 6.91                                                  | 6.37  | 6.10 |
| 812.5               | 842.5       | 6.91                                                  | 6.38  | 6.11 |
| 892.7               | 922.7       | 6.95                                                  | 6.43  | 6.16 |
| 972.9               | 1002.9      | 7.02                                                  | 6.45  | 6.17 |
| 1053.2              | 1083.2      | 7.12                                                  | 6.51  | 6.23 |
| 1133.4              | 1163.4      | 7.21                                                  | 6.59  | 6.26 |
| 1233.7              | 1263.7      | 7.32                                                  | 6.64  | 6.32 |
| 1313.9              | 1343.9      | 7.39                                                  | 6.70  | 6.37 |
| 1414.2              | 1444.2      | 7.53                                                  | 6.82  | 6.46 |
| 1494.5              | 1524.5      | 7.67                                                  | 6.96  | 6.58 |
| 1594.8              | 1624.8      | 7.89                                                  | 7.18  | 6.79 |
| 1675.0              | 1705.0      | 8.10                                                  | 7.37  | 6.97 |
| 1775.3              | 1805.3      | 8.41                                                  | 7.60  | 7.14 |
| 1855.5              | 1885.5      | 8.68                                                  | 7.82  | 7.28 |
| 1955.8              | 1985.8      | 8.95                                                  | 8.02  | 7.38 |
| 2036.1              | 2066.1      | 9.08                                                  | 8.10  | 7.43 |
| 2136.4              | 2166.4      | 9.08                                                  | 8.10  | 7.45 |
| 2216.6              | 2246.6      | 9.11                                                  | 8.13  | 7.48 |
| 2316.9              | 2346.9      | 8.97                                                  | 8.13  | 7.51 |
| 2397.1              | 2427.1      | 8.83                                                  | 8.02  | 7.47 |
| 2497.4              | 2527.4      | 8.77                                                  | 7.95  | 7.43 |
| 2577.7              | 2607.7      | 8.77                                                  | 7.97  | 7.46 |
| 2678.0              | 2708.0      | 8.80                                                  | 8.06  | 7.57 |
| 2758.2              | 2788.2      | 8.87                                                  | 8.18  | 7.68 |
| 2858.5              | 2888.5      | 9.09                                                  | 8.35  | 7.85 |
| 2938.7              | 2968.7      | 9.34                                                  | 8.57  | 8.05 |
| 3039.0              | 3069.0      | 9.74                                                  | 8.87  | 8.29 |
| 3119.3              | 3149.3      | 10.07                                                 | 9.14  | 8.52 |
| 3219.6              | 3249.6      | 10.69                                                 | 9.56  | 8.85 |
| 3299.8              | 3329.8      | 11.21                                                 | 9.89  | 9.12 |
| 3400.1              | 3430.1      | 12.00                                                 | 10.41 | 9.54 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       |
|---------------------|-------------|--------------------|-------|-------|
|                     |             | @LO (dBm)          |       |       |
|                     |             | +10                | +13   | +16   |
| 10.1                | 40.1        | 31.69              | 34.12 | 29.65 |
| 90.3                | 120.3       | 24.21              | 25.72 | 26.04 |
| 170.6               | 200.6       | 22.96              | 25.04 | 26.75 |
| 250.8               | 280.8       | 22.60              | 24.37 | 23.37 |
| 331.0               | 361.0       | 22.87              | 23.33 | 21.60 |
| 411.3               | 441.3       | 22.25              | 21.58 | 21.56 |
| 491.5               | 521.5       | 22.14              | 20.55 | 22.47 |
| 571.8               | 601.8       | 19.75              | 20.58 | 24.02 |
| 652.0               | 682.0       | 19.41              | 21.26 | 26.15 |
| 732.2               | 762.2       | 19.21              | 21.47 | 27.49 |
| 812.5               | 842.5       | 19.22              | 21.95 | 27.68 |
| 892.7               | 922.7       | 19.00              | 22.75 | 27.59 |
| 972.9               | 1002.9      | 18.89              | 23.56 | 32.34 |
| 1053.2              | 1083.2      | 20.19              | 26.99 | 27.47 |
| 1133.4              | 1163.4      | 20.40              | 27.08 | 26.68 |
| 1233.7              | 1263.7      | 21.29              | 29.57 | 28.16 |
| 1313.9              | 1343.9      | 20.27              | 28.97 | 27.78 |
| 1414.2              | 1444.2      | 20.04              | 27.18 | 29.38 |
| 1494.5              | 1524.5      | 19.41              | 23.55 | 30.66 |
| 1594.8              | 1624.8      | 19.09              | 23.71 | 29.44 |
| 1675.0              | 1705.0      | 17.76              | 22.05 | 28.03 |
| 1775.3              | 1805.3      | 16.81              | 21.99 | 28.82 |
| 1855.5              | 1885.5      | 15.96              | 19.93 | 27.94 |
| 1955.8              | 1985.8      | 15.87              | 20.11 | 25.50 |
| 2036.1              | 2066.1      | 16.15              | 21.16 | 23.53 |
| 2136.4              | 2166.4      | 17.40              | 20.87 | 20.36 |
| 2216.6              | 2246.6      | 17.79              | 20.32 | 19.71 |
| 2316.9              | 2346.9      | 17.84              | 18.68 | 18.43 |
| 2397.1              | 2427.1      | 17.61              | 17.65 | 17.77 |
| 2497.4              | 2527.4      | 17.03              | 17.31 | 17.70 |
| 2577.7              | 2607.7      | 16.88              | 17.07 | 17.51 |
| 2678.0              | 2708.0      | 16.28              | 16.70 | 17.15 |
| 2758.2              | 2788.2      | 16.23              | 16.64 | 17.18 |
| 2858.5              | 2888.5      | 16.10              | 16.61 | 17.49 |
| 2938.7              | 2968.7      | 16.02              | 16.56 | 17.56 |
| 3039.0              | 3069.0      | 15.97              | 16.48 | 17.59 |
| 3119.3              | 3149.3      | 16.23              | 16.67 | 17.46 |
| 3219.6              | 3249.6      | 16.56              | 16.97 | 17.81 |
| 3299.8              | 3329.8      | 17.07              | 17.60 | 18.32 |
| 3400.1              | 3430.1      | 17.53              | 18.02 | 18.52 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF IN=+9dBm<br>(dB) |      |      |
|---------------------|-------------|-------------------------------------|------|------|
|                     |             | @LO (dBm)                           |      |      |
|                     |             | +10                                 | +13  | +16  |
| 10.1                | 40.1        | 0.60                                | 0.27 | 0.12 |
| 90.3                | 120.3       | 0.57                                | 0.26 | 0.12 |
| 170.6               | 200.6       | 0.55                                | 0.23 | 0.12 |
| 250.8               | 280.8       | 0.58                                | 0.25 | 0.13 |
| 331.0               | 361.0       | 0.58                                | 0.26 | 0.13 |
| 411.3               | 441.3       | 0.54                                | 0.26 | 0.14 |
| 491.5               | 521.5       | 0.53                                | 0.27 | 0.13 |
| 571.8               | 601.8       | 0.58                                | 0.25 | 0.11 |
| 652.0               | 682.0       | 0.60                                | 0.24 | 0.10 |
| 732.2               | 762.2       | 0.58                                | 0.22 | 0.11 |
| 812.5               | 842.5       | 0.58                                | 0.20 | 0.11 |
| 892.7               | 922.7       | 0.57                                | 0.22 | 0.11 |
| 972.9               | 1002.9      | 0.57                                | 0.20 | 0.13 |
| 1053.2              | 1083.2      | 0.49                                | 0.16 | 0.10 |
| 1133.4              | 1163.4      | 0.46                                | 0.17 | 0.11 |
| 1233.7              | 1263.7      | 0.47                                | 0.19 | 0.12 |
| 1313.9              | 1343.9      | 0.50                                | 0.20 | 0.12 |
| 1414.2              | 1444.2      | 0.51                                | 0.21 | 0.12 |
| 1494.5              | 1524.5      | 0.60                                | 0.22 | 0.13 |
| 1594.8              | 1624.8      | 0.64                                | 0.26 | 0.14 |
| 1675.0              | 1705.0      | 0.64                                | 0.31 | 0.16 |
| 1775.3              | 1805.3      | 0.57                                | 0.32 | 0.21 |
| 1855.5              | 1885.5      | 0.52                                | 0.29 | 0.21 |
| 1955.8              | 1985.8      | 0.44                                | 0.29 | 0.21 |
| 2036.1              | 2066.1      | 0.46                                | 0.30 | 0.26 |
| 2136.4              | 2166.4      | 0.45                                | 0.35 | 0.32 |
| 2216.6              | 2246.6      | 0.48                                | 0.37 | 0.33 |
| 2316.9              | 2346.9      | 0.56                                | 0.40 | 0.36 |
| 2397.1              | 2427.1      | 0.66                                | 0.46 | 0.39 |
| 2497.4              | 2527.4      | 0.81                                | 0.58 | 0.48 |
| 2577.7              | 2607.7      | 0.83                                | 0.58 | 0.49 |
| 2678.0              | 2708.0      | 0.87                                | 0.59 | 0.47 |
| 2758.2              | 2788.2      | 0.96                                | 0.58 | 0.43 |
| 2858.5              | 2888.5      | 1.00                                | 0.60 | 0.43 |
| 2938.7              | 2968.7      | 1.05                                | 0.55 | 0.41 |
| 3039.0              | 3069.0      | 1.14                                | 0.57 | 0.39 |
| 3119.3              | 3149.3      | 1.19                                | 0.57 | 0.38 |
| 3219.6              | 3249.6      | 1.20                                | 0.59 | 0.36 |
| 3299.8              | 3329.8      | 1.17                                | 0.60 | 0.33 |
| 3400.1              | 3430.1      | 1.03                                | 0.62 | 0.34 |

# Frequency Mixer

# SYM-25DMHW

## 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)=40.1MHz<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)                                                        |
|                      |             | +13                                                              |                      |             | +13                                                            |                      |             | +13                                                              |
| 1000.0               | 250.1       | 6.90                                                             | 10.0                 | 50.1        | 6.09                                                           | 1000.0               | 1500.1      | 8.30                                                             |
| 979.8                | 270.3       | 6.96                                                             | 30.2                 | 70.3        | 6.18                                                           | 979.8                | 1520.3      | 8.26                                                             |
| 959.6                | 290.5       | 7.00                                                             | 50.4                 | 90.5        | 6.23                                                           | 959.6                | 1540.5      | 8.25                                                             |
| 939.4                | 310.7       | 7.02                                                             | 70.6                 | 110.7       | 6.20                                                           | 939.4                | 1560.7      | 8.23                                                             |
| 919.2                | 330.9       | 6.96                                                             | 90.8                 | 130.9       | 6.15                                                           | 919.2                | 1580.9      | 8.23                                                             |
| 899.0                | 351.1       | 6.95                                                             | 111.0                | 151.1       | 6.20                                                           | 899.0                | 1601.1      | 8.18                                                             |
| 878.8                | 371.3       | 6.97                                                             | 131.2                | 171.3       | 6.22                                                           | 878.8                | 1621.3      | 8.15                                                             |
| 858.6                | 391.5       | 6.93                                                             | 151.4                | 191.5       | 6.20                                                           | 858.6                | 1641.5      | 8.15                                                             |
| 838.4                | 411.7       | 6.97                                                             | 171.6                | 211.7       | 6.22                                                           | 838.4                | 1661.7      | 8.08                                                             |
| 818.2                | 431.9       | 6.92                                                             | 191.8                | 231.9       | 6.17                                                           | 818.2                | 1681.9      | 8.07                                                             |
| 798.0                | 452.1       | 6.88                                                             | 212.0                | 252.1       | 6.16                                                           | 798.0                | 1702.1      | 8.04                                                             |
| 777.8                | 472.3       | 6.95                                                             | 232.2                | 272.3       | 6.22                                                           | 777.8                | 1722.3      | 8.01                                                             |
| 757.6                | 492.5       | 6.89                                                             | 252.4                | 292.5       | 6.19                                                           | 757.6                | 1742.5      | 8.02                                                             |
| 737.3                | 512.8       | 6.86                                                             | 272.7                | 312.8       | 6.18                                                           | 737.3                | 1762.8      | 7.98                                                             |
| 717.1                | 533.0       | 6.86                                                             | 292.9                | 333.0       | 6.12                                                           | 717.1                | 1783.0      | 7.96                                                             |
| 696.9                | 553.2       | 6.82                                                             | 313.1                | 353.2       | 6.14                                                           | 696.9                | 1803.2      | 7.92                                                             |
| 676.7                | 573.4       | 6.83                                                             | 333.3                | 373.4       | 6.15                                                           | 676.7                | 1823.4      | 7.94                                                             |
| 656.5                | 593.6       | 6.83                                                             | 353.5                | 393.6       | 6.10                                                           | 656.5                | 1843.6      | 7.94                                                             |
| 636.3                | 613.8       | 6.82                                                             | 373.7                | 413.8       | 6.11                                                           | 636.3                | 1863.8      | 7.92                                                             |
| 616.1                | 634.0       | 6.81                                                             | 393.9                | 434.0       | 6.03                                                           | 616.1                | 1884.0      | 7.94                                                             |
| 575.7                | 674.4       | 6.81                                                             | 434.3                | 474.4       | 6.07                                                           | 575.7                | 1924.4      | 7.93                                                             |
| 555.5                | 694.6       | 6.79                                                             | 454.5                | 494.6       | 6.02                                                           | 555.5                | 1944.6      | 7.92                                                             |
| 515.1                | 735.0       | 6.78                                                             | 494.9                | 535.0       | 5.98                                                           | 515.1                | 1985.0      | 7.90                                                             |
| 494.9                | 755.2       | 6.77                                                             | 515.1                | 555.2       | 5.99                                                           | 494.9                | 2005.2      | 7.83                                                             |
| 454.5                | 795.6       | 6.78                                                             | 555.5                | 595.6       | 5.98                                                           | 454.5                | 2045.6      | 7.87                                                             |
| 434.3                | 815.8       | 6.78                                                             | 575.7                | 615.8       | 5.95                                                           | 434.3                | 2065.8      | 7.86                                                             |
| 393.9                | 856.2       | 6.78                                                             | 616.1                | 656.2       | 5.96                                                           | 393.9                | 2106.2      | 7.78                                                             |
| 373.7                | 876.4       | 6.79                                                             | 636.3                | 676.4       | 5.94                                                           | 373.7                | 2126.4      | 7.79                                                             |
| 333.3                | 916.8       | 6.75                                                             | 676.7                | 716.8       | 5.93                                                           | 333.3                | 2166.8      | 7.80                                                             |
| 313.1                | 937.0       | 6.76                                                             | 696.9                | 737.0       | 5.92                                                           | 313.1                | 2187.0      | 7.81                                                             |
| 272.7                | 977.4       | 6.74                                                             | 737.3                | 777.4       | 5.97                                                           | 272.7                | 2227.4      | 7.84                                                             |
| 252.4                | 997.7       | 6.71                                                             | 757.6                | 797.7       | 5.97                                                           | 252.4                | 2247.7      | 7.87                                                             |
| 212.0                | 1038.1      | 6.66                                                             | 798.0                | 838.1       | 5.97                                                           | 212.0                | 2288.1      | 7.88                                                             |
| 191.8                | 1058.3      | 6.69                                                             | 818.2                | 858.3       | 5.98                                                           | 191.8                | 2308.3      | 7.85                                                             |
| 151.4                | 1098.7      | 6.65                                                             | 858.6                | 898.7       | 5.98                                                           | 151.4                | 2348.7      | 7.92                                                             |
| 131.2                | 1118.9      | 6.67                                                             | 878.8                | 918.9       | 5.99                                                           | 131.2                | 2368.9      | 7.90                                                             |
| 90.8                 | 1159.3      | 6.68                                                             | 919.2                | 959.3       | 6.02                                                           | 90.8                 | 2409.3      | 7.87                                                             |
| 70.6                 | 1179.5      | 6.65                                                             | 939.4                | 979.5       | 6.01                                                           | 70.6                 | 2429.5      | 7.92                                                             |
| 30.2                 | 1219.9      | 6.61                                                             | 979.8                | 1019.9      | 6.02                                                           | 30.2                 | 2469.9      | 7.91                                                             |
| 10.0                 | 1240.1      | 6.57                                                             | 1000.0               | 1040.1      | 6.03                                                           | 10.0                 | 2490.1      | 7.83                                                             |

# Frequency Mixer

# SYM-25DMHW

## Typical Performance Data

| LO<br>(MHz) | LO-RF ISOLATION<br>(dB) |       |       | LO-IF ISOLATION<br>(dB) |       |       |
|-------------|-------------------------|-------|-------|-------------------------|-------|-------|
|             | @LO (dBm)               |       |       | @LO (dBm)               |       |       |
|             | +10                     | +13   | +16   | +10                     | +13   | +16   |
| 10.1        | 44.95                   | 48.93 | 52.71 | 34.91                   | 38.58 | 42.39 |
| 90.3        | 50.87                   | 57.71 | 62.14 | 33.75                   | 37.60 | 41.44 |
| 170.6       | 51.69                   | 60.75 | 57.09 | 34.15                   | 38.15 | 41.68 |
| 250.8       | 52.87                   | 59.68 | 52.69 | 34.64                   | 38.64 | 41.77 |
| 331.0       | 52.90                   | 57.86 | 50.79 | 35.24                   | 39.27 | 41.61 |
| 411.3       | 54.25                   | 56.21 | 49.75 | 36.24                   | 40.04 | 41.63 |
| 491.5       | 55.95                   | 55.59 | 49.06 | 37.45                   | 40.61 | 41.22 |
| 571.8       | 54.11                   | 58.73 | 49.62 | 38.74                   | 40.84 | 40.69 |
| 652.0       | 52.34                   | 60.08 | 48.93 | 40.07                   | 40.75 | 40.02 |
| 732.2       | 50.75                   | 56.66 | 47.73 | 40.38                   | 39.68 | 38.74 |
| 812.5       | 47.63                   | 53.48 | 46.99 | 40.19                   | 38.93 | 38.38 |
| 892.7       | 46.28                   | 52.41 | 46.71 | 39.90                   | 38.60 | 38.13 |
| 972.9       | 44.77                   | 51.76 | 46.88 | 39.10                   | 37.87 | 37.48 |
| 1053.2      | 42.95                   | 49.74 | 46.89 | 38.89                   | 37.44 | 37.15 |
| 1133.4      | 41.80                   | 47.73 | 45.79 | 38.50                   | 36.98 | 36.90 |
| 1233.7      | 40.86                   | 46.06 | 44.15 | 38.59                   | 37.47 | 37.41 |
| 1313.9      | 40.70                   | 45.51 | 43.55 | 39.25                   | 38.68 | 38.91 |
| 1414.2      | 41.48                   | 46.64 | 42.48 | 40.19                   | 40.20 | 40.98 |
| 1494.5      | 42.25                   | 48.45 | 42.34 | 40.81                   | 41.61 | 43.41 |
| 1594.8      | 44.21                   | 53.10 | 42.31 | 40.17                   | 41.42 | 44.70 |
| 1675.0      | 45.39                   | 54.56 | 42.47 | 38.91                   | 40.09 | 43.21 |
| 1775.3      | 45.60                   | 51.27 | 43.33 | 36.95                   | 37.47 | 39.51 |
| 1855.5      | 44.64                   | 48.98 | 44.31 | 35.25                   | 35.33 | 36.49 |
| 1955.8      | 43.40                   | 48.12 | 46.71 | 33.18                   | 32.92 | 33.47 |
| 2036.1      | 42.73                   | 48.43 | 49.71 | 31.86                   | 31.48 | 31.75 |
| 2136.4      | 42.52                   | 51.51 | 54.26 | 30.09                   | 29.57 | 29.72 |
| 2216.6      | 42.54                   | 53.56 | 51.45 | 29.06                   | 28.54 | 28.52 |
| 2316.9      | 42.12                   | 50.51 | 48.42 | 27.70                   | 27.19 | 27.09 |
| 2397.1      | 41.67                   | 47.37 | 45.48 | 26.57                   | 26.06 | 26.11 |
| 2497.4      | 40.46                   | 43.36 | 42.38 | 25.56                   | 25.14 | 25.11 |
| 2577.7      | 39.00                   | 40.47 | 39.29 | 24.70                   | 24.20 | 23.84 |
| 2678.0      | 37.10                   | 38.15 | 36.99 | 23.93                   | 23.66 | 23.22 |
| 2758.2      | 35.75                   | 36.64 | 35.78 | 23.40                   | 23.17 | 22.70 |
| 2858.5      | 34.10                   | 34.84 | 34.45 | 22.68                   | 22.62 | 22.23 |
| 2938.7      | 33.03                   | 33.66 | 33.41 | 22.20                   | 22.19 | 21.72 |
| 3039.0      | 31.95                   | 32.44 | 32.17 | 21.97                   | 22.00 | 21.57 |
| 3119.3      | 31.04                   | 31.66 | 31.46 | 21.70                   | 21.93 | 21.59 |
| 3219.6      | 29.72                   | 30.83 | 31.03 | 21.53                   | 22.09 | 21.84 |
| 3299.8      | 28.88                   | 30.06 | 30.51 | 21.51                   | 22.07 | 21.87 |
| 3400.1      | 28.15                   | 29.38 | 30.18 | 21.63                   | 22.32 | 22.18 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +10                     | +13   | +16   |
| 10.1                | 40.1        | 26.18                   | 25.55 | 25.48 |
| 90.3                | 120.3       | 25.73                   | 25.51 | 25.42 |
| 170.6               | 200.6       | 25.96                   | 25.90 | 25.90 |
| 250.8               | 280.8       | 26.50                   | 26.47 | 26.50 |
| 331.0               | 361.0       | 27.09                   | 27.23 | 27.16 |
| 411.3               | 441.3       | 28.02                   | 28.16 | 27.89 |
| 491.5               | 521.5       | 28.98                   | 28.96 | 28.85 |
| 571.8               | 601.8       | 30.00                   | 29.68 | 29.51 |
| 652.0               | 682.0       | 31.30                   | 30.70 | 30.42 |
| 732.2               | 762.2       | 32.76                   | 32.11 | 31.48 |
| 812.5               | 842.5       | 34.10                   | 33.70 | 32.99 |
| 892.7               | 922.7       | 35.69                   | 35.34 | 34.70 |
| 972.9               | 1002.9      | 36.76                   | 36.31 | 35.71 |
| 1053.2              | 1083.2      | 37.82                   | 37.41 | 36.82 |
| 1133.4              | 1163.4      | 38.62                   | 37.85 | 37.40 |
| 1233.7              | 1263.7      | 40.18                   | 39.10 | 38.53 |
| 1313.9              | 1343.9      | 41.62                   | 39.81 | 38.77 |
| 1414.2              | 1444.2      | 42.23                   | 39.60 | 38.47 |
| 1494.5              | 1524.5      | 41.83                   | 39.01 | 37.91 |
| 1594.8              | 1624.8      | 42.12                   | 38.72 | 37.64 |
| 1675.0              | 1705.0      | 44.83                   | 40.85 | 38.89 |
| 1775.3              | 1805.3      | 49.37                   | 43.83 | 41.12 |
| 1855.5              | 1885.5      | 51.90                   | 45.18 | 42.18 |
| 1955.8              | 1985.8      | 46.45                   | 44.16 | 41.98 |
| 2036.1              | 2066.1      | 42.99                   | 42.86 | 40.89 |
| 2136.4              | 2166.4      | 40.58                   | 41.91 | 40.93 |
| 2216.6              | 2246.6      | 39.42                   | 40.67 | 40.44 |
| 2316.9              | 2346.9      | 38.69                   | 39.13 | 39.23 |
| 2397.1              | 2427.1      | 38.13                   | 38.18 | 38.44 |
| 2497.4              | 2527.4      | 36.27                   | 36.21 | 36.31 |
| 2577.7              | 2607.7      | 34.62                   | 34.44 | 34.91 |
| 2678.0              | 2708.0      | 32.63                   | 32.43 | 32.91 |
| 2758.2              | 2788.2      | 31.03                   | 30.85 | 31.25 |
| 2858.5              | 2888.5      | 29.72                   | 29.71 | 29.91 |
| 2938.7              | 2968.7      | 28.68                   | 28.95 | 29.21 |
| 3039.0              | 3069.0      | 26.80                   | 27.49 | 27.70 |
| 3119.3              | 3149.3      | 25.36                   | 26.08 | 26.46 |
| 3219.6              | 3249.6      | 23.95                   | 24.51 | 25.02 |
| 3299.8              | 3329.8      | 23.16                   | 23.67 | 24.23 |
| 3400.1              | 3430.1      | 22.48                   | 22.91 | 23.50 |

# Frequency Mixer

# SYM-25DMHW

## 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=2500.1MHz<br>(:1) |      |      |
|---------------------|-------------|-----------------|------|------|-------------|-----------------|------|------|----------------------|----------------------------------|------|------|
|                     |             | @LO (dBm)       |      |      |             | @LO (dBm)       |      |      |                      | @LO (dBm)                        |      |      |
|                     |             | +10             | +13  | +16  |             | +10             | +13  | +16  |                      | +10                              | +13  | +16  |
| 10.1                | 40.1        | 1.26            | 1.10 | 1.03 | 10.1        | 1.05            | 1.49 | 2.20 | 10.0                 | 1.48                             | 1.25 | 1.08 |
| 90.3                | 120.3       | 1.32            | 1.15 | 1.07 | 90.3        | 1.07            | 1.48 | 2.12 | 30.2                 | 1.38                             | 1.17 | 1.03 |
| 170.6               | 200.6       | 1.35            | 1.21 | 1.13 | 170.6       | 1.12            | 1.48 | 2.12 | 50.4                 | 1.43                             | 1.20 | 1.08 |
| 250.8               | 280.8       | 1.41            | 1.26 | 1.19 | 250.8       | 1.17            | 1.47 | 2.12 | 70.6                 | 1.43                             | 1.22 | 1.09 |
| 331.0               | 361.0       | 1.47            | 1.31 | 1.25 | 331.0       | 1.24            | 1.46 | 2.08 | 90.8                 | 1.43                             | 1.21 | 1.07 |
| 411.3               | 441.3       | 1.57            | 1.40 | 1.32 | 411.3       | 1.28            | 1.40 | 1.99 | 111.0                | 1.45                             | 1.22 | 1.08 |
| 491.5               | 521.5       | 1.66            | 1.48 | 1.40 | 491.5       | 1.33            | 1.35 | 1.89 | 131.2                | 1.43                             | 1.21 | 1.07 |
| 571.8               | 601.8       | 1.71            | 1.53 | 1.45 | 571.8       | 1.40            | 1.32 | 1.82 | 151.4                | 1.41                             | 1.20 | 1.07 |
| 652.0               | 682.0       | 1.80            | 1.61 | 1.52 | 652.0       | 1.47            | 1.30 | 1.75 | 171.6                | 1.40                             | 1.19 | 1.06 |
| 732.2               | 762.2       | 1.88            | 1.68 | 1.58 | 732.2       | 1.56            | 1.27 | 1.67 | 191.8                | 1.39                             | 1.18 | 1.06 |
| 812.5               | 842.5       | 1.95            | 1.73 | 1.64 | 812.5       | 1.66            | 1.25 | 1.60 | 212.0                | 1.42                             | 1.20 | 1.06 |
| 892.7               | 922.7       | 2.04            | 1.81 | 1.70 | 892.7       | 1.73            | 1.24 | 1.52 | 232.2                | 1.43                             | 1.21 | 1.08 |
| 972.9               | 1002.9      | 2.11            | 1.86 | 1.74 | 972.9       | 1.78            | 1.21 | 1.45 | 252.4                | 1.45                             | 1.23 | 1.09 |
| 1053.2              | 1083.2      | 2.19            | 1.92 | 1.79 | 1053.2      | 1.82            | 1.19 | 1.38 | 272.7                | 1.44                             | 1.23 | 1.10 |
| 1133.4              | 1163.4      | 2.27            | 1.99 | 1.83 | 1133.4      | 1.83            | 1.16 | 1.32 | 292.9                | 1.43                             | 1.22 | 1.09 |
| 1233.7              | 1263.7      | 2.31            | 2.01 | 1.84 | 1233.7      | 1.83            | 1.13 | 1.29 | 313.1                | 1.43                             | 1.21 | 1.07 |
| 1313.9              | 1343.9      | 2.31            | 2.00 | 1.83 | 1313.9      | 1.81            | 1.13 | 1.29 | 333.3                | 1.44                             | 1.21 | 1.08 |
| 1414.2              | 1444.2      | 2.30            | 1.99 | 1.82 | 1414.2      | 1.76            | 1.15 | 1.35 | 353.5                | 1.44                             | 1.22 | 1.08 |
| 1494.5              | 1524.5      | 2.31            | 2.03 | 1.87 | 1494.5      | 1.70            | 1.19 | 1.41 | 373.7                | 1.44                             | 1.23 | 1.09 |
| 1594.8              | 1624.8      | 2.34            | 2.08 | 1.95 | 1594.8      | 1.63            | 1.24 | 1.53 | 393.9                | 1.44                             | 1.23 | 1.09 |
| 1675.0              | 1705.0      | 2.32            | 2.11 | 2.00 | 1675.0      | 1.56            | 1.29 | 1.62 | 434.3                | 1.44                             | 1.22 | 1.08 |
| 1775.3              | 1805.3      | 2.30            | 2.14 | 2.04 | 1775.3      | 1.46            | 1.36 | 1.74 | 454.5                | 1.43                             | 1.21 | 1.08 |
| 1855.5              | 1885.5      | 2.30            | 2.15 | 2.06 | 1855.5      | 1.40            | 1.41 | 1.84 | 494.9                | 1.46                             | 1.24 | 1.10 |
| 1955.8              | 1985.8      | 2.29            | 2.15 | 2.05 | 1955.8      | 1.33            | 1.48 | 1.94 | 515.1                | 1.46                             | 1.24 | 1.10 |
| 2036.1              | 2066.1      | 2.20            | 2.06 | 1.96 | 2036.1      | 1.30            | 1.55 | 2.04 | 555.5                | 1.43                             | 1.22 | 1.09 |
| 2136.4              | 2166.4      | 2.03            | 1.88 | 1.78 | 2136.4      | 1.27            | 1.62 | 2.14 | 575.7                | 1.44                             | 1.23 | 1.10 |
| 2216.6              | 2246.6      | 1.93            | 1.78 | 1.67 | 2216.6      | 1.27            | 1.69 | 2.23 | 616.1                | 1.48                             | 1.27 | 1.14 |
| 2316.9              | 2346.9      | 1.79            | 1.66 | 1.57 | 2316.9      | 1.29            | 1.76 | 2.30 | 636.3                | 1.47                             | 1.26 | 1.13 |
| 2397.1              | 2427.1      | 1.66            | 1.54 | 1.45 | 2397.1      | 1.33            | 1.81 | 2.34 | 676.7                | 1.46                             | 1.25 | 1.13 |
| 2497.4              | 2527.4      | 1.53            | 1.41 | 1.32 | 2497.4      | 1.40            | 1.87 | 2.38 | 696.9                | 1.48                             | 1.27 | 1.16 |
| 2577.7              | 2607.7      | 1.48            | 1.37 | 1.29 | 2577.7      | 1.45            | 1.89 | 2.39 | 737.3                | 1.53                             | 1.32 | 1.19 |
| 2678.0              | 2708.0      | 1.45            | 1.37 | 1.31 | 2678.0      | 1.54            | 1.96 | 2.42 | 757.6                | 1.52                             | 1.31 | 1.18 |
| 2758.2              | 2788.2      | 1.43            | 1.36 | 1.31 | 2758.2      | 1.62            | 2.00 | 2.43 | 798.0                | 1.51                             | 1.31 | 1.20 |
| 2858.5              | 2888.5      | 1.43            | 1.38 | 1.36 | 2858.5      | 1.74            | 2.08 | 2.47 | 818.2                | 1.53                             | 1.34 | 1.23 |
| 2938.7              | 2968.7      | 1.47            | 1.44 | 1.43 | 2938.7      | 1.84            | 2.14 | 2.50 | 858.6                | 1.57                             | 1.37 | 1.25 |
| 3039.0              | 3069.0      | 1.51            | 1.48 | 1.49 | 3039.0      | 1.97            | 2.22 | 2.53 | 878.8                | 1.57                             | 1.37 | 1.25 |
| 3119.3              | 3149.3      | 1.51            | 1.49 | 1.50 | 3119.3      | 2.08            | 2.30 | 2.58 | 919.2                | 1.58                             | 1.39 | 1.28 |
| 3219.6              | 3249.6      | 1.56            | 1.55 | 1.58 | 3219.6      | 2.20            | 2.37 | 2.62 | 939.4                | 1.60                             | 1.41 | 1.31 |
| 3299.8              | 3329.8      | 1.64            | 1.64 | 1.68 | 3299.8      | 2.29            | 2.44 | 2.67 | 979.8                | 1.64                             | 1.44 | 1.33 |
| 3400.1              | 3430.1      | 1.72            | 1.73 | 1.77 | 3400.1      | 2.40            | 2.52 | 2.71 | 1000.0               | 1.64                             | 1.45 | 1.34 |

## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 24  | 20  | 29  | 30  | 34  | 44  | 45  | 54  | 59  | 62  |
| 1  | -      | 32     | +0  | 32  | 15  | 50  | 28  | 52  | 50  | 47  | 45  | 58  |
| 2  | 77     | 49     | 38  | 56  | 45  | 49  | 52  | 59  | 56  | 62  | 59  | 62  |
| 3  | >100   | 65     | 55  | 55  | 55  | 58  | 50  | 71  | 56  | 63  | 56  | 60  |
| 4  | >100   | 79     | 69  | 62  | 66  | 61  | 67  | 62  | 69  | 65  | 71  | 72  |
| 5  | >100   | 81     | 75  | 73  | 63  | 72  | 62  | 73  | 63  | 90  | 67  | 85  |
| 6  | >100   | 86     | 93  | 85  | 88  | 81  | 82  | 78  | 80  | 81  | 90  | 90  |
| 7  | >100   | 89     | 93  | 93  | 92  | 88  | 93  | 86  | 96  | 88  | 87  | 91  |
| 8  | >100   | >97    | >97 | >97 | >97 | >97 | 96  | >97 | >97 | >97 | 89  | 92  |
| 9  | >100   | >97    | >97 | >97 | >97 | >97 | >97 | >97 | >97 | 96  | >97 | >97 |
| 10 | >100   | >97    | >97 | >97 | >97 | >97 | >97 | >97 | >97 | >97 | >97 | >97 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions:

RF IN: 1270.1 MHz; 4.00 dBm.  
LO IN: 1300.01 MHz; +13.00 dBm  
IF OUT: 29.91 MHz; -3.02 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 12  | 11  | 18  | 19  | 22  | 32  | 31  | 41  | 37  | 46  |
| 1  | -      | 33     | +0  | 34  | 15  | 44  | 27  | 47  | 51  | 42  | 42  | 53  |
| 2  | 89     | 57     | 48  | 59  | 53  | 55  | 62  | 62  | 61  | 66  | 63  | 66  |
| 3  | >100   | 77     | 75  | 77  | 68  | 75  | 65  | 85  | 69  | >87 | 70  | 86  |
| 4  | >100   | >87    | >87 | >87 | >87 | 81  | >87 | >87 | >87 | >87 | >87 | >87 |
| 5  | >100   | >87    | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 |
| 6  | >100   | >87    | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 |
| 7  | >100   | >87    | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 |
| 8  | >100   | >87    | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 |
| 9  | >100   | >87    | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 |
| 10 | >100   | >87    | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 | >87 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions:

RF IN: 1270.1 MHz; -6.00 dBm.  
LO IN: 1300.01 MHz; +13.00 dBm  
IF OUT: 29.91 MHz; -13.06 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-25DMHW  
100818  
Page 5 of 5



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