

# Frequency Mixer

# HJK-272MH+

## Typical Performance Data

| RF (IN) (MHz) | LO (MHz) | CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) |       |       | RF (IN) (MHz) | LO (MHz) | IP-3 INPUT (dBm) |       |       | RF (IN) (MHz) | LO (MHz) | COMPRESSION @RF IN=+16dBm (dB) |      |      |
|---------------|----------|--|-------|-------|---------------|----------|------------------|-------|-------|---------------|----------|--------------------------------|------|------|
|               |          | @LO (dBm)                                    |       |       |               |          | @LO (dBm)        |       |       |               |          | @LO (dBm)                      |      |      |
|               |          | +10  | +13   | +16   |               |          | +10              | +13   | +16   |               |          | +10                            | +13  | +16  |
| 460.5         | 490.5    | 10.13  | 9.66  | 9.22  | 460.5         | 490.5    | 15.39            | 17.74 | 19.73 | 460.5         | 490.5    | 2.05                           | 1.80 | 1.43 |
| 506.0         | 536.0    | 8.61   | 8.25  | 8.00  | 506.0         | 536.0    | 17.10            | 19.55 | 22.71 | 506.0         | 536.0    | 2.37                           | 1.79 | 1.16 |
| 551.5         | 581.5    | 8.03   | 7.72  | 7.51  | 551.5         | 581.5    | 17.92            | 20.93 | 23.71 | 551.5         | 581.5    | 2.60                           | 1.85 | 1.12 |
| 597.0         | 627.0    | 7.71   | 7.44  | 7.25  | 597.0         | 627.0    | 19.24            | 22.05 | 24.27 | 597.0         | 627.0    | 2.20                           | 1.39 | 0.77 |
| 642.5         | 672.5    | 7.53   | 7.28  | 7.10  | 642.5         | 672.5    | 19.63            | 22.41 | 24.70 | 642.5         | 672.5    | 2.36                           | 1.39 | 0.73 |
| 688.0         | 718.0    | 7.37   | 7.14  | 6.98  | 688.0         | 718.0    | 20.18            | 22.81 | 25.11 | 688.0         | 718.0    | 2.41                           | 1.32 | 0.63 |
| 733.5         | 763.5    | 7.22   | 7.00  | 6.85  | 733.5         | 763.5    | 20.02            | 22.40 | 24.72 | 733.5         | 763.5    | 2.19                           | 1.12 | 0.49 |
| 779.0         | 809.0    | 7.14   | 6.94  | 6.81  | 779.0         | 809.0    | 19.82            | 22.09 | 24.42 | 779.0         | 809.0    | 2.21                           | 1.08 | 0.45 |
| 824.5         | 854.5    | 7.06   | 6.88  | 6.75  | 824.5         | 854.5    | 19.99            | 22.23 | 24.67 | 824.5         | 854.5    | 2.33                           | 1.08 | 0.42 |
| 900.0         | 930.0    | 7.00   | 6.83  | 6.71  | 900.0         | 930.0    | 20.25            | 22.48 | 25.07 | 900.0         | 930.0    | 1.87                           | 0.84 | 0.34 |
| 973.5         | 1003.5   | 6.94   | 6.76  | 6.65  | 973.5         | 1003.5   | 20.05            | 22.41 | 25.10 | 973.5         | 1003.5   | 2.01                           | 0.90 | 0.39 |
| 1047.0        | 1077.0   | 6.86   | 6.68  | 6.56  | 1047.0        | 1077.0   | 19.21            | 21.32 | 23.87 | 1047.0        | 1077.0   | 1.78                           | 0.83 | 0.36 |
| 1120.5        | 1150.5   | 6.81   | 6.64  | 6.54  | 1120.5        | 1150.5   | 19.50            | 21.62 | 24.42 | 1120.5        | 1150.5   | 1.87                           | 0.83 | 0.38 |
| 1194.0        | 1224.0   | 6.82   | 6.67  | 6.57  | 1194.0        | 1224.0   | 19.74            | 21.83 | 24.66 | 1194.0        | 1224.0   | 1.87                           | 0.89 | 0.41 |
| 1267.5        | 1297.5   | 6.85   | 6.68  | 6.57  | 1267.5        | 1297.5   | 19.80            | 21.89 | 24.71 | 1267.5        | 1297.5   | 1.99                           | 0.93 | 0.43 |
| 1341.0        | 1371.0   | 6.88   | 6.70  | 6.59  | 1341.0        | 1371.0   | 19.70            | 21.69 | 24.34 | 1341.0        | 1371.0   | 2.25                           | 1.14 | 0.54 |
| 1414.5        | 1444.5   | 6.98   | 6.80  | 6.70  | 1414.5        | 1444.5   | 20.07            | 22.16 | 24.85 | 1414.5        | 1444.5   | 2.38                           | 1.20 | 0.57 |
| 1488.0        | 1518.0   | 7.08   | 6.89  | 6.76  | 1488.0        | 1518.0   | 20.64            | 23.14 | 26.12 | 1488.0        | 1518.0   | 2.56                           | 1.34 | 0.64 |
| 1561.5        | 1591.5   | 7.28   | 7.09  | 6.96  | 1561.5        | 1591.5   | 20.86            | 23.68 | 26.72 | 1561.5        | 1591.5   | 2.77                           | 1.43 | 0.67 |
| 1671.8        | 1701.8   | 7.42   | 7.26  | 7.18  | 1671.8        | 1701.8   | 20.01            | 23.34 | 26.73 | 1671.8        | 1701.8   | 2.88                           | 1.50 | 0.66 |
| 1745.3        | 1775.3   | 7.21   | 7.04  | 6.98  | 1745.3        | 1775.3   | 18.83            | 21.95 | 25.25 | 1745.3        | 1775.3   | 3.08                           | 1.65 | 0.75 |
| 1818.8        | 1848.8   | 7.11   | 6.94  | 6.88  | 1818.8        | 1848.8   | 18.25            | 21.24 | 24.37 | 1818.8        | 1848.8   | 3.48                           | 1.92 | 0.87 |
| 1892.3        | 1922.3   | 7.00   | 6.82  | 6.75  | 1892.3        | 1922.3   | 18.17            | 21.03 | 24.01 | 1892.3        | 1922.3   | 3.69                           | 2.08 | 0.97 |
| 1965.8        | 1995.8   | 6.93   | 6.75  | 6.69  | 1965.8        | 1995.8   | 18.40            | 21.22 | 24.12 | 1965.8        | 1995.8   | 3.66                           | 2.05 | 0.96 |
| 2039.3        | 2069.3   | 6.92   | 6.73  | 6.65  | 2039.3        | 2069.3   | 18.16            | 21.08 | 24.01 | 2039.3        | 2069.3   | 3.98                           | 2.31 | 1.11 |
| 2112.8        | 2142.8   | 6.94   | 6.71  | 6.61  | 2112.8        | 2142.8   | 17.61            | 20.68 | 24.20 | 2112.8        | 2142.8   | 4.10                           | 2.45 | 1.21 |
| 2186.3        | 2216.3   | 6.94   | 6.73  | 6.65  | 2186.3        | 2216.3   | 17.65            | 20.61 | 23.79 | 2186.3        | 2216.3   | 4.18                           | 2.52 | 1.28 |
| 2259.8        | 2289.8   | 7.02   | 6.84  | 6.79  | 2259.8        | 2289.8   | 18.07            | 21.01 | 24.22 | 2259.8        | 2289.8   | 3.59                           | 2.04 | 1.01 |
| 2333.3        | 2363.3   | 7.09   | 6.92  | 6.88  | 2333.3        | 2363.3   | 18.12            | 21.17 | 24.34 | 2333.3        | 2363.3   | 3.81                           | 2.17 | 1.04 |
| 2480.0        | 2510.0   | 7.25   | 7.11  | 7.10  | 2480.0        | 2510.0   | 18.14            | 21.50 | 24.29 | 2480.0        | 2510.0   | 3.78                           | 2.10 | 0.96 |
| 2640.0        | 2670.0   | 7.49   | 7.38  | 7.37  | 2640.0        | 2670.0   | 18.42            | 21.94 | 25.04 | 2640.0        | 2670.0   | 3.50                           | 1.86 | 0.84 |
| 2800.0        | 2830.0   | 7.94   | 7.83  | 7.83  | 2800.0        | 2830.0   | 18.05            | 21.76 | 25.29 | 2800.0        | 2830.0   | 3.53                           | 1.86 | 0.82 |
| 2960.0        | 2990.0   | 8.32   | 8.21  | 8.21  | 2960.0        | 2990.0   | 17.78            | 21.58 | 25.66 | 2960.0        | 2990.0   | 3.48                           | 1.82 | 0.78 |
| 3120.0        | 3150.0   | 8.87   | 8.75  | 8.76  | 3120.0        | 3150.0   | 17.03            | 20.53 | 25.02 | 3120.0        | 3150.0   | 3.72                           | 2.02 | 0.89 |
| 3280.0        | 3310.0   | 9.25   | 9.05  | 9.03  | 3280.0        | 3310.0   | 15.76            | 19.25 | 23.04 | 3280.0        | 3310.0   | 4.18                           | 2.49 | 1.18 |
| 3440.0        | 3470.0   | 9.64   | 9.36  | 9.30  | 3440.0        | 3470.0   | 15.24            | 18.60 | 22.50 | 3440.0        | 3470.0   | 4.24                           | 2.60 | 1.28 |
| 3600.0        | 3630.0   | 10.02  | 9.65  | 9.54  | 3600.0        | 3630.0   | 14.61            | 17.79 | 21.52 | 3600.0        | 3630.0   | 4.49                           | 2.88 | 1.48 |
| 3760.0        | 3790.0   | 10.71  | 10.18 | 9.94  | 3760.0        | 3790.0   | 13.84            | 16.84 | 20.26 | 3760.0        | 3790.0   | 4.59                           | 3.11 | 1.71 |
| 4000.0        | 4030.0   | 11.50  | 10.83 | 10.47 | 4000.0        | 4030.0   | 13.59            | 16.32 | 19.42 | 4000.0        | 4030.0   | 4.56                           | 3.21 | 1.87 |

# Frequency Mixer

# HJK-272MH+

## Typical Performance Data

| IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=1650MHz (dB) |
|----------------|----------|---|
|                |          | @LO (dBm)   |
|                |          | +13   |
| 1196.0         | 454.0    | 13.77   |
| 1180.8         | 469.2    | 11.16   |
| 1165.6         | 484.4    | 9.75  |
| 1150.4         | 499.6    | 9.12  |
| 1135.2         | 514.8    | 8.60  |
| 1000.0         | 650.0    | 7.87  |
| 970.0          | 680.0    | 7.86  |
| 940.0          | 710.0    | 7.81  |
| 910.0          | 740.0    | 7.87  |
| 880.0          | 770.0    | 7.89  |
| 842.5          | 807.5    | 7.99  |
| 812.5          | 837.5    | 8.11  |
| 782.5          | 867.5    | 8.09  |
| 752.5          | 897.5    | 8.00  |
| 722.5          | 927.5    | 7.96  |
| 656.0          | 994.0    | 7.63  |
| 520.0          | 1130.0   | 7.38  |
| 384.0          | 1266.0   | 7.24  |
| 248.0          | 1402.0   | 7.43  |
| 112.0          | 1538.0   | 7.44  |
| 10.0           | 1660.0   | 7.19  |
| 80.0           | 1730.0   | 7.39  |
| 150.0          | 1800.0   | 7.51  |
| 220.0          | 1870.0   | 7.41  |
| 290.0          | 1940.0   | 7.29  |
| 377.5          | 2027.5   | 7.29  |
| 447.5          | 2097.5   | 7.42  |
| 517.5          | 2167.5   | 7.41  |
| 587.5          | 2237.5   | 7.53  |
| 657.5          | 2307.5   | 7.73  |
| 734.0          | 2384.0   | 7.96  |
| 790.0          | 2440.0   | 7.97  |
| 846.0          | 2496.0   | 8.13  |
| 902.0          | 2552.0   | 8.25  |
| 958.0          | 2608.0   | 8.33  |
| 1034.5         | 2684.5   | 8.49  |
| 1132.5         | 2782.5   | 8.74  |
| 1230.5         | 2880.5   | 9.09  |
| 1328.5         | 2978.5   | 9.49  |
| 1426.5         | 3076.5   | 9.92  |

| IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=900MHz (dB) |
|----------------|----------|--|
|                |          | @LO (dBm)  |
|                |          | +13  |
| 10.0           | 910.0    | 6.67   |
| 44.5           | 944.5    | 6.76   |
| 79.0           | 979.0    | 6.68   |
| 113.5          | 1013.5   | 6.67   |
| 148.0          | 1048.0   | 6.78   |
| 182.5          | 1082.5   | 6.63   |
| 217.0          | 1117.0   | 6.73   |
| 251.5          | 1151.5   | 6.74   |
| 286.0          | 1186.0   | 6.61   |
| 320.5          | 1220.5   | 6.71   |
| 372.3          | 1272.3   | 6.56   |
| 406.8          | 1306.8   | 6.58   |
| 441.3          | 1341.3   | 6.67   |
| 475.8          | 1375.8   | 6.61   |
| 510.3          | 1410.3   | 6.65   |
| 544.8          | 1444.8   | 6.65   |
| 579.3          | 1479.3   | 6.50   |
| 613.8          | 1513.8   | 6.53   |
| 648.3          | 1548.3   | 6.53   |
| 682.8          | 1582.8   | 6.46   |
| 752.5          | 1652.5   | 6.58   |
| 777.5          | 1677.5   | 6.56   |
| 802.5          | 1702.5   | 6.60   |
| 827.5          | 1727.5   | 6.70   |
| 852.5          | 1752.5   | 6.69   |
| 877.5          | 1777.5   | 6.68   |
| 902.5          | 1802.5   | 6.88   |
| 927.5          | 1827.5   | 6.98   |
| 952.5          | 1852.5   | 7.03   |
| 977.5          | 1877.5   | 7.02   |
| 1025.0         | 1925.0   | 7.24   |
| 1075.0         | 1975.0   | 7.40   |
| 1125.0         | 2025.0   | 7.61   |
| 1175.0         | 2075.0   | 7.81   |
| 1225.0         | 2125.0   | 7.97   |
| 1275.0         | 2175.0   | 8.15   |
| 1325.0         | 2225.0   | 8.27   |
| 1375.0         | 2275.0   | 8.55   |
| 1425.0         | 2325.0   | 8.68   |
| 1500.0         | 2400.0   | 8.94   |

| IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=2400MHz (dB) |
|----------------|----------|---|
|                |          | @LO (dBm)   |
|                |          | +13   |
| 1500.0         | 900.0    | 8.63  |
| 1452.0         | 948.0    | 8.60  |
| 1404.0         | 996.0    | 8.42  |
| 1356.0         | 1044.0   | 8.56  |
| 1308.0         | 1092.0   | 8.58  |
| 1260.0         | 1140.0   | 8.83  |
| 1212.0         | 1188.0   | 8.80  |
| 1164.0         | 1236.0   | 8.74  |
| 1116.0         | 1284.0   | 8.50  |
| 1068.0         | 1332.0   | 8.35  |
| 1000.0         | 1400.0   | 8.23  |
| 985.0          | 1415.0   | 8.15  |
| 970.0          | 1430.0   | 8.12  |
| 955.0          | 1445.0   | 8.06  |
| 940.0          | 1460.0   | 8.07  |
| 925.0          | 1475.0   | 8.02  |
| 910.0          | 1490.0   | 8.03  |
| 895.0          | 1505.0   | 7.95  |
| 880.0          | 1520.0   | 7.91  |
| 865.0          | 1535.0   | 7.85  |
| 842.5          | 1557.5   | 7.85  |
| 827.5          | 1572.5   | 7.88  |
| 812.5          | 1587.5   | 7.84  |
| 797.5          | 1602.5   | 7.78  |
| 782.5          | 1617.5   | 7.69  |
| 767.5          | 1632.5   | 7.76  |
| 752.5          | 1647.5   | 7.77  |
| 737.5          | 1662.5   | 7.82  |
| 722.5          | 1677.5   | 7.78  |
| 707.5          | 1692.5   | 7.73  |
| 618.0          | 1782.0   | 7.66  |
| 554.0          | 1846.0   | 7.50  |
| 490.0          | 1910.0   | 7.35  |
| 426.0          | 1974.0   | 7.39  |
| 362.0          | 2038.0   | 7.18  |
| 298.0          | 2102.0   | 7.09  |
| 234.0          | 2166.0   | 7.21  |
| 170.0          | 2230.0   | 7.13  |
| 106.0          | 2294.0   | 7.01  |
| 10.0           | 2390.0   | 6.86  |

# Frequency Mixer

# HJK-272MH+

## 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   |
| 490.5       | 32.34                   | 32.96 | 33.57 | 36.28                   | 37.43 | 38.60 |
| 536.0       | 34.22                   | 34.68 | 35.32 | 36.93                   | 37.85 | 38.94 |
| 581.5       | 35.93                   | 36.33 | 36.88 | 36.78                   | 37.47 | 38.26 |
| 627.0       | 36.69                   | 37.11 | 37.65 | 36.18                   | 36.89 | 37.64 |
| 672.5       | 37.81                   | 38.22 | 38.71 | 35.56                   | 36.20 | 36.86 |
| 718.0       | 38.28                   | 38.66 | 39.03 | 35.17                   | 35.84 | 36.53 |
| 763.5       | 39.05                   | 39.37 | 39.66 | 36.22                   | 37.18 | 38.19 |
| 809.0       | 47.93                   | 49.81 | 51.32 | 40.49                   | 42.42 | 44.12 |
| 854.5       | 57.50                   | 53.10 | 50.10 | 35.05                   | 35.57 | 36.06 |
| 930.0       | 52.58                   | 55.81 | 57.09 | 31.55                   | 31.90 | 32.27 |
| 1003.5      | 50.20                   | 53.37 | 57.01 | 30.23                   | 30.51 | 30.80 |
| 1077.0      | 47.82                   | 50.14 | 52.44 | 29.41                   | 29.64 | 29.89 |
| 1150.5      | 44.66                   | 45.95 | 46.86 | 28.65                   | 28.86 | 29.09 |
| 1224.0      | 42.95                   | 43.69 | 44.16 | 28.36                   | 28.53 | 28.72 |
| 1297.5      | 43.40                   | 43.96 | 44.37 | 28.41                   | 28.54 | 28.70 |
| 1371.0      | 44.38                   | 44.91 | 45.27 | 28.95                   | 29.03 | 29.14 |
| 1444.5      | 46.19                   | 47.05 | 47.87 | 29.45                   | 29.45 | 29.49 |
| 1518.0      | 46.95                   | 47.69 | 48.39 | 29.98                   | 29.90 | 29.84 |
| 1591.5      | 45.95                   | 45.49 | 45.25 | 30.93                   | 30.79 | 30.67 |
| 1701.8      | 51.91                   | 48.74 | 47.02 | 32.63                   | 32.45 | 32.28 |
| 1775.3      | 52.05                   | 50.07 | 48.67 | 34.74                   | 34.48 | 34.23 |
| 1848.8      | 49.56                   | 48.54 | 47.68 | 37.33                   | 36.93 | 36.56 |
| 1922.3      | 47.17                   | 46.27 | 45.54 | 39.52                   | 38.89 | 38.32 |
| 1995.8      | 44.66                   | 43.78 | 43.05 | 41.34                   | 40.52 | 39.74 |
| 2069.3      | 43.34                   | 42.71 | 42.17 | 41.46                   | 40.82 | 40.17 |
| 2142.8      | 42.41                   | 41.93 | 41.56 | 39.66                   | 39.38 | 39.04 |
| 2216.3      | 42.76                   | 42.66 | 42.65 | 37.11                   | 37.01 | 36.83 |
| 2289.8      | 46.32                   | 47.01 | 47.94 | 35.05                   | 35.06 | 34.97 |
| 2400.0      | 54.94                   | 57.54 | 60.63 | 33.11                   | 33.28 | 33.36 |
| 2510.0      | 54.37                   | 54.43 | 53.60 | 31.11                   | 31.32 | 31.49 |
| 2670.0      | 45.30                   | 44.82 | 44.41 | 28.57                   | 28.76 | 29.01 |
| 2830.0      | 42.20                   | 41.68 | 41.27 | 28.56                   | 28.65 | 28.78 |
| 2990.0      | 40.37                   | 39.75 | 39.28 | 29.21                   | 29.27 | 29.35 |
| 3150.0      | 40.80                   | 39.92 | 39.24 | 29.62                   | 29.68 | 29.74 |
| 3310.0      | 44.23                   | 43.11 | 42.16 | 30.15                   | 30.16 | 30.19 |
| 3470.0      | 47.34                   | 47.17 | 46.72 | 29.95                   | 29.91 | 29.89 |
| 3630.0      | 43.51                   | 43.72 | 43.84 | 30.32                   | 30.25 | 30.20 |
| 3790.0      | 39.85                   | 39.94 | 40.02 | 31.30                   | 31.22 | 31.16 |
| 4030.0      | 34.67                   | 34.56 | 34.45 | 30.35                   | 30.34 | 30.32 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +10                     | +13   | +16   |
| 460.5               | 490.5       | 21.03                   | 21.06 | 21.62 |
| 506.0               | 536.0       | 25.09                   | 25.75 | 26.27 |
| 551.5               | 581.5       | 27.38                   | 27.93 | 28.40 |
| 597.0               | 627.0       | 29.27                   | 29.89 | 30.26 |
| 642.5               | 672.5       | 30.51                   | 30.90 | 31.17 |
| 688.0               | 718.0       | 32.48                   | 32.67 | 32.76 |
| 733.5               | 763.5       | 34.16                   | 34.34 | 34.64 |
| 779.0               | 809.0       | 35.38                   | 35.43 | 35.53 |
| 824.5               | 854.5       | 32.70                   | 32.56 | 32.68 |
| 900.0               | 930.0       | 34.13                   | 33.96 | 34.14 |
| 973.5               | 1003.5      | 34.57                   | 34.59 | 34.94 |
| 1047.0              | 1077.0      | 34.20                   | 34.15 | 34.43 |
| 1120.5              | 1150.5      | 34.15                   | 34.15 | 34.62 |
| 1194.0              | 1224.0      | 33.78                   | 33.79 | 33.94 |
| 1267.5              | 1297.5      | 33.83                   | 33.98 | 34.51 |
| 1341.0              | 1371.0      | 32.99                   | 33.09 | 33.35 |
| 1414.5              | 1444.5      | 32.28                   | 32.47 | 32.87 |
| 1488.0              | 1518.0      | 31.44                   | 31.64 | 32.02 |
| 1561.5              | 1591.5      | 30.66                   | 30.95 | 31.37 |
| 1671.8              | 1701.8      | 33.08                   | 33.00 | 32.99 |
| 1745.3              | 1775.3      | 34.28                   | 33.46 | 32.83 |
| 1818.8              | 1848.8      | 34.15                   | 33.19 | 32.43 |
| 1892.3              | 1922.3      | 33.62                   | 32.73 | 31.96 |
| 1965.8              | 1995.8      | 33.10                   | 32.46 | 31.80 |
| 2039.3              | 2069.3      | 33.22                   | 32.78 | 32.29 |
| 2112.8              | 2142.8      | 32.89                   | 32.62 | 32.30 |
| 2186.3              | 2216.3      | 32.63                   | 32.41 | 32.19 |
| 2259.8              | 2289.8      | 32.74                   | 32.56 | 32.36 |
| 2333.3              | 2363.3      | 33.49                   | 33.44 | 33.34 |
| 2480.0              | 2510.0      | 35.15                   | 35.58 | 35.78 |
| 2640.0              | 2670.0      | 34.51                   | 34.96 | 35.29 |
| 2800.0              | 2830.0      | 36.31                   | 36.72 | 36.93 |
| 2960.0              | 2990.0      | 37.76                   | 38.27 | 38.58 |
| 3120.0              | 3150.0      | 40.04                   | 40.46 | 40.67 |
| 3280.0              | 3310.0      | 41.24                   | 41.35 | 41.23 |
| 3440.0              | 3470.0      | 39.69                   | 39.27 | 38.82 |
| 3600.0              | 3630.0      | 36.64                   | 36.18 | 35.74 |
| 3760.0              | 3790.0      | 33.74                   | 33.35 | 32.97 |
| 4000.0              | 4030.0      | 29.97                   | 29.80 | 29.60 |

# Frequency Mixer

# HJK-272MH+

## Typical Performance Data

| RF (IN) (MHz) | LO (MHz) | RF VSWR (:1) |      |      | LO (MHz) | LO VSWR (:1) |      |      | IF (OUT) (MHz) | IF VSWR @LO=2400MHz (:1) |      |      |
|---------------|----------|--------------|------|------|----------|--------------|------|------|----------------|--------------------------|------|------|
|               |          | @LO (dBm)    |      |      |          | @LO (dBm)    |      |      |                | @LO (dBm)                |      |      |
|               |          | +10          | +13  | +16  |          | +10          | +13  | +16  |                | +10                      | +13  | +16  |
| 460.5         | 490.5    | 3.48         | 3.31 | 3.16 | 490.5    | 4.25         | 4.25 | 4.24 | 10.0           | 1.48                     | 1.61 | 1.76 |
| 506.0         | 536.0    | 3.18         | 3.01 | 2.84 | 536.0    | 4.35         | 4.36 | 4.35 | 19.0           | 1.47                     | 1.59 | 1.74 |
| 551.5         | 581.5    | 2.97         | 2.80 | 2.64 | 581.5    | 4.38         | 4.39 | 4.40 | 28.0           | 1.47                     | 1.60 | 1.74 |
| 597.0         | 627.0    | 2.75         | 2.58 | 2.43 | 627.0    | 4.38         | 4.40 | 4.43 | 37.0           | 1.48                     | 1.60 | 1.75 |
| 642.5         | 672.5    | 2.59         | 2.43 | 2.28 | 672.5    | 4.35         | 4.39 | 4.44 | 46.0           | 1.47                     | 1.60 | 1.74 |
| 688.0         | 718.0    | 2.47         | 2.32 | 2.18 | 718.0    | 4.29         | 4.33 | 4.38 | 55.0           | 1.47                     | 1.59 | 1.73 |
| 733.5         | 763.5    | 2.33         | 2.19 | 2.06 | 763.5    | 4.20         | 4.23 | 4.27 | 64.0           | 1.47                     | 1.59 | 1.73 |
| 779.0         | 809.0    | 2.21         | 2.07 | 1.95 | 809.0    | 4.12         | 4.15 | 4.19 | 73.0           | 1.47                     | 1.59 | 1.73 |
| 824.5         | 854.5    | 2.19         | 2.04 | 1.92 | 854.5    | 4.05         | 4.08 | 4.12 | 82.0           | 1.47                     | 1.59 | 1.73 |
| 900.0         | 930.0    | 2.10         | 1.96 | 1.83 | 930.0    | 3.92         | 3.94 | 3.96 | 91.0           | 1.46                     | 1.58 | 1.72 |
| 973.5         | 1003.5   | 2.05         | 1.91 | 1.80 | 1003.5   | 3.76         | 3.77 | 3.77 | 120.0          | 1.49                     | 1.61 | 1.74 |
| 1047.0        | 1077.0   | 2.00         | 1.88 | 1.78 | 1077.0   | 3.57         | 3.57 | 3.57 | 164.0          | 1.52                     | 1.63 | 1.77 |
| 1120.5        | 1150.5   | 1.91         | 1.78 | 1.68 | 1150.5   | 3.38         | 3.38 | 3.38 | 208.0          | 1.55                     | 1.66 | 1.78 |
| 1194.0        | 1224.0   | 1.87         | 1.74 | 1.64 | 1224.0   | 3.21         | 3.21 | 3.21 | 252.0          | 1.60                     | 1.70 | 1.82 |
| 1267.5        | 1297.5   | 1.83         | 1.70 | 1.60 | 1297.5   | 3.08         | 3.09 | 3.09 | 296.0          | 1.64                     | 1.74 | 1.84 |
| 1341.0        | 1371.0   | 1.80         | 1.67 | 1.56 | 1371.0   | 2.99         | 3.00 | 3.00 | 340.0          | 1.71                     | 1.79 | 1.90 |
| 1414.5        | 1444.5   | 1.76         | 1.62 | 1.51 | 1444.5   | 2.97         | 2.97 | 2.98 | 384.0          | 1.73                     | 1.81 | 1.90 |
| 1488.0        | 1518.0   | 1.73         | 1.60 | 1.49 | 1518.0   | 3.00         | 3.01 | 3.02 | 428.0          | 1.76                     | 1.84 | 1.93 |
| 1561.5        | 1591.5   | 1.74         | 1.62 | 1.52 | 1591.5   | 3.06         | 3.07 | 3.07 | 472.0          | 1.74                     | 1.80 | 1.88 |
| 1671.8        | 1701.8   | 1.57         | 1.49 | 1.44 | 1701.8   | 3.19         | 3.20 | 3.21 | 516.0          | 1.77                     | 1.82 | 1.90 |
| 1745.3        | 1775.3   | 1.41         | 1.34 | 1.30 | 1775.3   | 3.30         | 3.31 | 3.32 | 582.0          | 1.71                     | 1.76 | 1.81 |
| 1818.8        | 1848.8   | 1.31         | 1.23 | 1.19 | 1848.8   | 3.38         | 3.40 | 3.41 | 626.0          | 1.71                     | 1.75 | 1.81 |
| 1892.3        | 1922.3   | 1.23         | 1.14 | 1.12 | 1922.3   | 3.43         | 3.45 | 3.46 | 670.0          | 1.65                     | 1.68 | 1.72 |
| 1965.8        | 1995.8   | 1.16         | 1.08 | 1.11 | 1995.8   | 3.50         | 3.51 | 3.53 | 714.0          | 1.63                     | 1.65 | 1.69 |
| 2039.3        | 2069.3   | 1.11         | 1.06 | 1.13 | 2069.3   | 3.50         | 3.51 | 3.52 | 758.0          | 1.58                     | 1.60 | 1.63 |
| 2112.8        | 2142.8   | 1.07         | 1.08 | 1.18 | 2142.8   | 3.46         | 3.47 | 3.48 | 802.0          | 1.57                     | 1.59 | 1.63 |
| 2186.3        | 2216.3   | 1.05         | 1.14 | 1.26 | 2216.3   | 3.40         | 3.40 | 3.41 | 846.0          | 1.50                     | 1.54 | 1.58 |
| 2259.8        | 2289.8   | 1.13         | 1.24 | 1.36 | 2289.8   | 3.30         | 3.30 | 3.31 | 890.0          | 1.43                     | 1.46 | 1.51 |
| 2333.3        | 2363.3   | 1.20         | 1.31 | 1.44 | 2400.0   | 3.13         | 3.14 | 3.15 | 934.0          | 1.38                     | 1.42 | 1.48 |
| 2480.0        | 2510.0   | 1.36         | 1.48 | 1.61 | 2510.0   | 2.93         | 2.94 | 2.95 | 1000.0         | 1.30                     | 1.36 | 1.43 |
| 2640.0        | 2670.0   | 1.59         | 1.72 | 1.86 | 2670.0   | 2.70         | 2.71 | 2.72 | 1082.0         | 1.29                     | 1.38 | 1.47 |
| 2800.0        | 2830.0   | 1.80         | 1.94 | 2.09 | 2830.0   | 2.58         | 2.58 | 2.59 | 1126.0         | 1.33                     | 1.43 | 1.52 |
| 2960.0        | 2990.0   | 2.07         | 2.22 | 2.38 | 2990.0   | 2.61         | 2.62 | 2.63 | 1170.0         | 1.38                     | 1.48 | 1.59 |
| 3120.0        | 3150.0   | 2.30         | 2.46 | 2.63 | 3150.0   | 2.72         | 2.72 | 2.73 | 1214.0         | 1.45                     | 1.56 | 1.67 |
| 3280.0        | 3310.0   | 2.52         | 2.66 | 2.82 | 3310.0   | 2.79         | 2.79 | 2.79 | 1258.0         | 1.58                     | 1.70 | 1.82 |
| 3440.0        | 3470.0   | 2.80         | 2.91 | 3.05 | 3470.0   | 2.88         | 2.88 | 2.89 | 1302.0         | 1.67                     | 1.79 | 1.92 |
| 3600.0        | 3630.0   | 3.12         | 3.17 | 3.26 | 3630.0   | 2.93         | 2.93 | 2.93 | 1346.0         | 1.81                     | 1.94 | 2.09 |
| 3760.0        | 3790.0   | 3.41         | 3.39 | 3.40 | 3790.0   | 2.99         | 2.99 | 2.99 | 1390.0         | 1.92                     | 2.07 | 2.22 |
| 4000.0        | 4030.0   | 3.76         | 3.64 | 3.53 | 4030.0   | 3.08         | 3.09 | 3.09 | 1500.0         | 2.29                     | 2.46 | 2.63 |

## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |        |        |        |        |        |        |        |        |        |        |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0  | ---    | ---    | 11.27  | 30.84  | 29.87  | 39.16  | 30.70  | 44.66  | 31.34  | 55.71  | 59.09  | 63.26  |
| 1  | ---    | 25.48  | ---    | 28.32  | 25.18  | 32.22  | 49.11  | 45.71  | 48.86  | 51.05  | 50.55  | 71.62  |
| 2  | 91.96  | 63.94  | 47.48  | 46.84  | 50.11  | 63.56  | 60.30  | 61.66  | 57.81  | 64.97  | 55.65  | 67.81  |
| 3  | 111.81 | 70.83  | 63.70  | 77.46  | 54.09  | 65.35  | 68.12  | 69.53  | 79.05  | 71.57  | 81.88  | 78.02  |
| 4  | 111.46 | 90.25  | 95.22  | 102.93 | 79.02  | 85.04  | 80.04  | 96.34  | 90.27  | 91.72  | 87.72  | 84.13  |
| 5  | 113.76 | 102.10 | 93.85  | 102.19 | 87.08  | 85.94  | 75.10  | 87.26  | 87.24  | 93.69  | 101.06 | 99.21  |
| 6  | 110.13 | 101.80 | 100.81 | 102.41 | 94.80  | 100.29 | 87.93  | 88.77  | 92.12  | 98.58  | 103.46 | 100.20 |
| 7  | 110.24 | 101.52 | 102.33 | 100.59 | 102.05 | 102.93 | 103.51 | 98.93  | 93.70  | 99.45  | 103.03 | 102.08 |
| 8  | 111.86 | 100.69 | 101.33 | 102.49 | 102.52 | 102.26 | 102.08 | 102.18 | 101.39 | 102.82 | 101.97 | 102.92 |
| 9  | 110.51 | 98.14  | 101.43 | 102.07 | 102.19 | 100.55 | 101.99 | 102.46 | 102.78 | 101.93 | 101.13 | 102.78 |
| 10 | 106.87 | 99.64  | 99.41  | 100.94 | 102.91 | 103.06 | 103.50 | 102.88 | 102.62 | 102.36 | 87.36  | 101.80 |
|    | RF CAL | 0      | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     |

### LO HARMONICS ORDER

Test conditions: RF IN: 1650 MHz; 0.00 dBm.  
 LO IN: 1680 MHz; +13.00 dBm  
 IF OUT: 30 MHz; -7.41 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |        |       |       |        |       |        |       |        |       |       |
|----|--------|--------|--------|-------|-------|--------|-------|--------|-------|--------|-------|-------|
| 0  | ---    | ---    | 17.98  | 39.12 | 37.75 | 47.29  | 39.94 | 74.08  | 45.80 | 52.83  | 66.72 | 72.46 |
| 1  | ---    | 25.07  | ---    | 29.83 | 26.93 | 36.28  | 49.32 | 48.45  | 50.66 | 60.49  | 50.24 | 86.29 |
| 2  | 89.04  | 58.04  | 36.07  | 36.82 | 39.54 | 52.42  | 49.40 | 54.60  | 51.56 | 67.76  | 58.70 | 65.73 |
| 3  | 98.12  | 51.48  | 44.79  | 55.32 | 33.78 | 50.70  | 47.27 | 57.45  | 67.84 | 63.82  | 69.01 | 67.13 |
| 4  | 98.65  | 71.16  | 61.15  | 67.77 | 52.79 | 56.36  | 56.39 | 65.54  | 64.48 | 68.02  | 64.43 | 73.19 |
| 5  | 100.24 | 73.88  | 72.76  | 71.91 | 68.83 | 75.83  | 58.74 | 66.31  | 69.63 | 70.91  | 81.14 | 69.81 |
| 6  | 101.05 | 82.42  | 79.10  | 82.09 | 74.57 | 80.56  | 63.61 | 71.61  | 60.76 | 77.34  | 72.92 | 88.74 |
| 7  | 99.94  | 88.28  | 85.38  | 83.98 | 81.07 | 84.63  | 75.99 | 76.93  | 67.14 | 84.27  | 80.31 | 82.16 |
| 8  | 99.65  | 94.23  | 101.27 | 90.81 | 94.02 | 92.31  | 84.66 | 101.34 | 72.80 | 90.32  | 69.81 | 91.24 |
| 9  | 98.09  | 104.02 | 96.29  | 93.79 | 90.47 | 101.22 | 88.46 | 104.85 | 80.85 | 83.85  | 71.76 | 82.75 |
| 10 | 99.00  | 112.11 | 108.91 | 98.01 | 97.33 | 99.62  | 99.67 | 106.76 | 90.98 | 101.68 | 80.87 | 92.77 |
|    | RF CAL | 0      | 1      | 2     | 3     | 4      | 5     | 6      | 7     | 8      | 9     | 10    |

### LO HARMONICS ORDER

Test conditions: RF IN: 1650 MHz; 10.00 dBm.  
 LO IN: 1680 MHz; +13.00 dBm  
 IF OUT: 30 MHz; 2.40 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 represents the Harmonics level of the RF Input Signal to the mixer