

# Frequency Mixer

HJK-ED9495/2

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>IF FIXED<br>@IF(OUT)=30MHz<br>(dB) |       |       | RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       | RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF IN=+15dBm<br>(dB) |      |      |
|---------------------|-------------|-------------------------------------------------------|-------|-------|---------------------|-------------|--------------------|-------|-------|---------------------|-------------|--------------------------------------|------|------|
|                     |             | @LO (dBm)                                             |       |       |                     |             | @LO (dBm)          |       |       |                     |             | @LO (dBm)                            |      |      |
|                     |             | +14                                                   | +17   | +20   |                     |             | +14                | +17   | +20   |                     |             | +14                                  | +17  | +20  |
| 300.0               | 330.0       | 13.96                                                 | 12.83 | 12.31 | 300.0               | 330.0       | 15.95              | 17.48 | 18.93 | 300.1               | 330.1       | 0.15                                 | 0.43 | 0.44 |
| 380.5               | 410.5       | 12.51                                                 | 11.27 | 10.67 | 380.5               | 410.5       | 14.10              | 16.10 | 17.78 | 380.6               | 410.6       | 1.40                                 | 1.00 | 0.62 |
| 461.0               | 491.0       | 11.00                                                 | 9.94  | 9.28  | 461.0               | 491.0       | 10.35              | 12.01 | 13.50 | 461.1               | 491.1       | 3.72                                 | 2.72 | 1.62 |
| 541.5               | 571.5       | 11.56                                                 | 9.61  | 8.49  | 541.5               | 571.5       | 11.02              | 12.19 | 14.91 | 541.6               | 571.6       | 5.40                                 | 5.02 | 4.05 |
| 622.0               | 652.0       | 9.70                                                  | 8.10  | 7.32  | 622.0               | 652.0       | 15.55              | 14.84 | 16.52 | 622.1               | 652.1       | 3.04                                 | 3.07 | 2.60 |
| 702.5               | 732.5       | 8.54                                                  | 7.32  | 6.76  | 702.5               | 732.5       | 17.76              | 16.65 | 18.24 | 702.6               | 732.6       | 3.76                                 | 3.25 | 2.50 |
| 783.0               | 813.0       | 7.81                                                  | 6.89  | 6.47  | 783.0               | 813.0       | 20.00              | 17.90 | 18.98 | 783.1               | 813.1       | 4.46                                 | 3.58 | 2.64 |
| 863.5               | 893.5       | 7.53                                                  | 6.77  | 6.44  | 863.5               | 893.5       | 22.07              | 19.04 | 19.63 | 863.6               | 893.6       | 4.51                                 | 3.59 | 2.70 |
| 944.0               | 974.0       | 7.64                                                  | 6.73  | 6.40  | 944.0               | 974.0       | 18.67              | 17.77 | 19.04 | 944.1               | 974.1       | 4.83                                 | 3.88 | 3.36 |
| 1024.5              | 1054.5      | 7.95                                                  | 7.03  | 6.71  | 1024.5              | 1054.5      | 16.04              | 16.26 | 18.47 | 1024.6              | 1054.6      | 5.32                                 | 4.23 | 3.43 |
| 1105.0              | 1135.0      | 7.82                                                  | 6.94  | 6.59  | 1105.0              | 1135.0      | 17.40              | 17.40 | 19.39 | 1105.1              | 1135.1      | 3.91                                 | 3.10 | 2.56 |
| 1185.5              | 1215.5      | 7.80                                                  | 6.99  | 6.68  | 1185.5              | 1215.5      | 18.71              | 19.06 | 21.11 | 1185.6              | 1215.6      | 3.22                                 | 2.42 | 1.76 |
| 1266.0              | 1296.0      | 7.69                                                  | 7.03  | 6.79  | 1266.0              | 1296.0      | 19.09              | 20.20 | 22.36 | 1266.1              | 1296.1      | 2.71                                 | 1.98 | 2.40 |
| 1346.5              | 1376.5      | 7.85                                                  | 7.37  | 7.31  | 1346.5              | 1376.5      | 19.89              | 20.68 | 22.46 | 1346.6              | 1376.6      | 1.92                                 | 1.32 | 1.14 |
| 1427.0              | 1457.0      | 7.74                                                  | 7.48  | 7.56  | 1427.0              | 1457.0      | 19.53              | 21.93 | 24.65 | 1427.1              | 1457.1      | 1.66                                 | 1.01 | 0.94 |
| 1507.5              | 1537.5      | 7.49                                                  | 7.40  | 7.58  | 1507.5              | 1537.5      | 18.95              | 21.73 | 24.74 | 1507.6              | 1537.6      | 1.39                                 | 0.94 | 0.75 |
| 1588.1              | 1618.1      | 7.00                                                  | 7.04  | 7.28  | 1588.1              | 1618.1      | 20.15              | 22.71 | 25.15 | 1588.2              | 1618.2      | 1.34                                 | 0.89 | 1.48 |
| 1668.6              | 1698.6      | 6.62                                                  | 6.69  | 6.90  | 1668.6              | 1698.6      | 22.51              | 24.72 | 26.53 | 1668.7              | 1698.7      | 1.10                                 | 0.70 | 1.95 |
| 1749.1              | 1779.1      | 6.57                                                  | 6.65  | 6.86  | 1749.1              | 1779.1      | 24.59              | 26.90 | 28.32 | 1749.2              | 1779.2      | 0.88                                 | 0.57 | 2.57 |
| 1829.6              | 1859.6      | 6.70                                                  | 6.76  | 6.95  | 1829.6              | 1859.6      | 24.23              | 26.86 | 28.25 | 1829.7              | 1859.7      | 0.93                                 | 0.60 | 2.64 |
| 1910.1              | 1940.1      | 6.87                                                  | 6.89  | 7.08  | 1910.1              | 1940.1      | 23.26              | 25.78 | 28.04 | 1910.2              | 1940.2      | 1.11                                 | 0.73 | 3.68 |
| 1990.6              | 2020.6      | 6.86                                                  | 6.82  | 6.96  | 1990.6              | 2020.6      | 21.05              | 24.16 | 26.77 | 1990.7              | 2020.7      | 1.49                                 | 0.94 | 3.15 |
| 2071.1              | 2101.1      | 6.87                                                  | 6.78  | 6.93  | 2071.1              | 2101.1      | 19.92              | 22.54 | 26.17 | 2071.2              | 2101.2      | 1.85                                 | 1.19 | 5.22 |
| 2151.6              | 2181.6      | 6.88                                                  | 6.76  | 6.91  | 2151.6              | 2181.6      | 19.06              | 21.28 | 24.61 | 2151.7              | 2181.7      | 2.29                                 | 1.52 | 3.30 |
| 2232.1              | 2262.1      | 7.03                                                  | 6.79  | 6.89  | 2232.1              | 2262.1      | 18.70              | 20.53 | 23.48 | 2232.2              | 2262.2      | 2.68                                 | 1.84 | 4.35 |
| 2312.6              | 2342.6      | 7.36                                                  | 6.97  | 7.00  | 2312.6              | 2342.6      | 18.87              | 20.09 | 22.77 | 2312.7              | 2342.7      | 2.95                                 | 2.05 | 5.96 |
| 2393.1              | 2423.1      | 7.68                                                  | 7.12  | 7.04  | 2393.1              | 2423.1      | 19.35              | 19.70 | 22.41 | 2393.2              | 2423.2      | 2.89                                 | 2.12 | 6.31 |
| 2473.6              | 2503.6      | 7.83                                                  | 7.21  | 7.03  | 2473.6              | 2503.6      | 19.70              | 19.61 | 22.20 | 2473.7              | 2503.7      | 2.89                                 | 2.22 | 6.60 |
| 2554.1              | 2584.1      | 7.95                                                  | 7.27  | 7.01  | 2554.1              | 2584.1      | 20.09              | 19.87 | 22.09 | 2554.2              | 2584.2      | 3.07                                 | 2.37 | 6.85 |
| 2634.6              | 2664.6      | 8.08                                                  | 7.37  | 7.10  | 2634.6              | 2664.6      | 20.63              | 19.63 | 21.73 | 2634.7              | 2664.7      | 3.26                                 | 2.57 | 7.62 |
| 2715.1              | 2745.1      | 8.26                                                  | 7.44  | 7.19  | 2715.1              | 2745.1      | 20.15              | 19.09 | 21.29 | 2715.2              | 2745.2      | 3.53                                 | 2.66 | 7.79 |
| 2795.6              | 2825.6      | 8.39                                                  | 7.54  | 7.31  | 2795.6              | 2825.6      | 20.19              | 18.77 | 20.77 | 2795.7              | 2825.7      | 3.65                                 | 2.76 | 8.19 |
| 2876.1              | 2906.1      | 8.60                                                  | 7.69  | 7.43  | 2876.1              | 2906.1      | 19.48              | 18.60 | 20.57 | 2876.2              | 2906.2      | 3.57                                 | 2.75 | 7.55 |
| 2956.6              | 2986.6      | 8.84                                                  | 7.90  | 7.57  | 2956.6              | 2986.6      | 18.91              | 18.64 | 20.80 | 2956.7              | 2986.7      | 3.15                                 | 2.54 | 7.59 |
| 3037.1              | 3067.1      | 9.29                                                  | 8.28  | 7.85  | 3037.1              | 3067.1      | 17.37              | 18.05 | 20.69 | 3037.2              | 3067.2      | 2.64                                 | 2.28 | 7.75 |
| 3137.7              | 3167.7      | 9.94                                                  | 8.82  | 8.29  | 3137.7              | 3167.7      | 15.83              | 17.00 | 19.76 | 3137.8              | 3167.8      | 2.22                                 | 2.02 | 8.34 |
| 3218.2              | 3248.2      | 10.68                                                 | 9.48  | 8.85  | 3218.2              | 3248.2      | 14.99              | 16.65 | 19.58 | 3218.3              | 3248.3      | 1.91                                 | 1.83 | 8.65 |
| 3318.9              | 3348.9      | 11.65                                                 | 10.23 | 9.55  | 3318.9              | 3348.9      | 14.10              | 16.35 | 19.26 | 3319.0              | 3349.0      | 1.49                                 | 1.49 | 8.95 |
| 3399.4              | 3429.4      | 12.54                                                 | 11.05 | 10.24 | 3399.4              | 3429.4      | 13.70              | 16.42 | 19.48 | 3399.5              | 3429.5      | 1.09                                 | 1.24 | 9.15 |
| 3500.0              | 3530.0      | 13.87                                                 | 12.21 | 11.23 | 3500.0              | 3530.0      | 13.20              | 16.25 | 19.20 | 3500.1              | 3530.1      | 0.55                                 | 0.77 | 9.25 |

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# Frequency Mixer

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## Typical Performance Data

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=1650.1MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=790.1MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=2510.1MHz<br>(dB) |
|----------------------|-------------|------------------------------------------------------------------|----------------------|-------------|-----------------------------------------------------------------|----------------------|-------------|------------------------------------------------------------------|
|                      |             | @LO (dBm)                                                        |                      |             | @LO (dBm)                                                       |                      |             | @LO (dBm)                                                        |
|                      |             | +17                                                              |                      |             | +17                                                             |                      |             | +17                                                              |
| 1100.0               | 550.1       | 10.78                                                            | 10.0                 | 800.1       | 7.08                                                            | 1630.0               | 880.1       | 10.89                                                            |
| 1047.3               | 602.8       | 10.45                                                            | 70.0                 | 860.1       | 6.93                                                            | 1590.0               | 920.1       | 10.74                                                            |
| 994.5                | 655.6       | 10.24                                                            | 130.0                | 920.1       | 6.94                                                            | 1550.0               | 960.1       | 10.53                                                            |
| 941.8                | 708.3       | 9.94                                                             | 190.0                | 980.1       | 7.10                                                            | 1510.0               | 1000.1      | 10.39                                                            |
| 889.0                | 761.1       | 9.75                                                             | 250.0                | 1040.1      | 7.23                                                            | 1470.0               | 1040.1      | 10.02                                                            |
| 836.3                | 813.8       | 9.50                                                             | 310.0                | 1100.1      | 7.22                                                            | 1430.0               | 1080.1      | 9.65                                                             |
| 783.5                | 866.6       | 9.51                                                             | 370.0                | 1160.1      | 7.27                                                            | 1390.0               | 1120.1      | 9.25                                                             |
| 730.8                | 919.3       | 9.43                                                             | 430.0                | 1220.1      | 7.41                                                            | 1350.0               | 1160.1      | 8.78                                                             |
| 678.1                | 972.0       | 9.51                                                             | 490.0                | 1280.1      | 7.55                                                            | 1310.0               | 1200.1      | 8.58                                                             |
| 625.3                | 1024.8      | 9.64                                                             | 550.0                | 1340.1      | 7.79                                                            | 1270.0               | 1240.1      | 8.23                                                             |
| 572.6                | 1077.5      | 9.82                                                             | 610.0                | 1400.1      | 7.92                                                            | 1230.0               | 1280.1      | 8.16                                                             |
| 519.8                | 1130.3      | 9.44                                                             | 670.0                | 1460.1      | 7.91                                                            | 1190.0               | 1320.1      | 8.53                                                             |
| 467.1                | 1183.0      | 8.94                                                             | 730.0                | 1520.1      | 7.99                                                            | 1150.0               | 1360.1      | 9.11                                                             |
| 414.4                | 1235.7      | 8.42                                                             | 790.0                | 1580.1      | 8.02                                                            | 1110.0               | 1400.1      | 9.17                                                             |
| 361.6                | 1288.5      | 8.01                                                             | 850.0                | 1640.1      | 7.93                                                            | 1070.0               | 1440.1      | 8.98                                                             |
| 308.9                | 1341.2      | 7.73                                                             | 910.0                | 1700.1      | 8.10                                                            | 1030.0               | 1480.1      | 8.89                                                             |
| 256.1                | 1394.0      | 7.57                                                             | 970.0                | 1760.1      | 8.24                                                            | 990.0                | 1520.1      | 8.89                                                             |
| 203.4                | 1446.7      | 7.36                                                             | 1030.0               | 1820.1      | 8.48                                                            | 950.0                | 1560.1      | 8.76                                                             |
| 150.6                | 1499.5      | 7.16                                                             | 1090.0               | 1880.1      | 8.80                                                            | 910.0                | 1600.1      | 8.74                                                             |
| 97.9                 | 1552.2      | 6.90                                                             | 1150.0               | 1940.1      | 9.12                                                            | 870.0                | 1640.1      | 8.47                                                             |
| 45.2                 | 1604.9      | 6.74                                                             | 1230.0               | 2020.1      | 9.16                                                            | 830.0                | 1680.1      | 8.21                                                             |
| 10.0                 | 1660.1      | 6.69                                                             | 1290.0               | 2080.1      | 9.08                                                            | 790.0                | 1720.1      | 7.89                                                             |
| 77.3                 | 1727.4      | 6.78                                                             | 1370.0               | 2160.1      | 8.79                                                            | 750.0                | 1760.1      | 7.78                                                             |
| 144.5                | 1794.6      | 6.58                                                             | 1430.0               | 2220.1      | 8.83                                                            | 710.0                | 1800.1      | 7.80                                                             |
| 234.2                | 1884.3      | 6.59                                                             | 1510.0               | 2300.1      | 8.87                                                            | 670.0                | 1840.1      | 7.76                                                             |
| 301.5                | 1951.6      | 6.69                                                             | 1570.0               | 2360.1      | 8.87                                                            | 630.0                | 1880.1      | 7.66                                                             |
| 391.1                | 2041.2      | 6.95                                                             | 1650.0               | 2440.1      | 8.97                                                            | 590.0                | 1920.1      | 7.65                                                             |
| 458.4                | 2108.5      | 7.39                                                             | 1710.0               | 2500.1      | 9.01                                                            | 550.0                | 1960.1      | 7.55                                                             |
| 548.1                | 2198.2      | 7.86                                                             | 1790.0               | 2580.1      | 8.82                                                            | 510.0                | 2000.1      | 7.54                                                             |
| 615.3                | 2265.4      | 8.26                                                             | 1850.0               | 2640.1      | 8.81                                                            | 470.0                | 2040.1      | 7.53                                                             |
| 705.0                | 2355.1      | 8.67                                                             | 1930.0               | 2720.1      | 9.01                                                            | 430.0                | 2080.1      | 7.58                                                             |
| 772.3                | 2422.4      | 9.09                                                             | 1990.0               | 2780.1      | 9.22                                                            | 390.0                | 2120.1      | 7.51                                                             |
| 861.9                | 2512.0      | 9.43                                                             | 2070.0               | 2860.1      | 9.94                                                            | 350.0                | 2160.1      | 7.46                                                             |
| 929.2                | 2579.3      | 9.62                                                             | 2130.0               | 2920.1      | 10.28                                                           | 310.0                | 2200.1      | 7.28                                                             |
| 1018.9               | 2669.0      | 9.73                                                             | 2210.0               | 3000.1      | 10.32                                                           | 270.0                | 2240.1      | 7.23                                                             |
| 1086.1               | 2736.2      | 9.84                                                             | 2270.0               | 3060.1      | 10.15                                                           | 210.0                | 2300.1      | 7.09                                                             |
| 1175.8               | 2825.9      | 9.82                                                             | 2350.0               | 3140.1      | 10.32                                                           | 170.0                | 2340.1      | 7.10                                                             |
| 1243.1               | 2893.2      | 9.81                                                             | 2410.0               | 3200.1      | 10.57                                                           | 110.0                | 2400.1      | 6.94                                                             |
| 1332.7               | 2982.8      | 9.99                                                             | 2490.0               | 3280.1      | 10.82                                                           | 70.0                 | 2440.1      | 7.09                                                             |
| 1400.0               | 3050.1      | 10.32                                                            | 2550.0               | 3340.1      | 11.25                                                           | 10.0                 | 2500.1      | 7.17                                                             |

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## 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   |
| 300.1       | 60.51                   | 60.16 | 59.70 | 51.41                   | 52.74 | 65.48 |
| 380.6       | 55.61                   | 55.60 | 55.50 | 47.62                   | 48.80 | 59.70 |
| 461.1       | 53.97                   | 53.62 | 54.07 | 44.68                   | 45.72 | 55.59 |
| 541.6       | 48.60                   | 48.01 | 49.94 | 41.37                   | 41.73 | 49.76 |
| 622.1       | 47.99                   | 48.26 | 48.86 | 39.08                   | 39.62 | 46.49 |
| 702.6       | 47.02                   | 47.72 | 46.91 | 37.21                   | 38.00 | 43.75 |
| 783.1       | 45.88                   | 46.69 | 45.33 | 35.80                   | 36.63 | 41.12 |
| 863.6       | 45.50                   | 46.25 | 45.08 | 34.47                   | 35.38 | 38.94 |
| 944.1       | 45.38                   | 45.93 | 45.61 | 33.18                   | 34.05 | 36.77 |
| 1024.6      | 47.08                   | 46.93 | 47.11 | 32.26                   | 33.03 | 34.85 |
| 1105.1      | 50.29                   | 49.51 | 48.36 | 31.93                   | 32.71 | 34.00 |
| 1185.6      | 49.53                   | 48.10 | 44.98 | 31.28                   | 31.98 | 32.53 |
| 1266.1      | 49.50                   | 47.85 | 44.40 | 30.41                   | 31.09 | 31.04 |
| 1346.6      | 48.47                   | 46.40 | 42.71 | 29.64                   | 30.28 | 29.95 |
| 1427.1      | 62.66                   | 59.01 | 52.28 | 29.54                   | 30.16 | 29.85 |
| 1507.6      | 60.90                   | 58.64 | 56.94 | 29.28                   | 29.83 | 29.59 |
| 1588.2      | 60.04                   | 55.08 | 54.51 | 29.32                   | 29.95 | 30.02 |
| 1668.7      | 56.35                   | 53.62 | 50.15 | 30.79                   | 31.63 | 32.15 |
| 1749.2      | 45.03                   | 42.80 | 40.93 | 35.00                   | 36.40 | 37.50 |
| 1829.7      | 37.55                   | 36.64 | 35.63 | 40.57                   | 40.76 | 40.78 |
| 1910.2      | 35.87                   | 35.58 | 35.15 | 47.67                   | 43.46 | 41.01 |
| 1990.7      | 35.74                   | 35.88 | 35.77 | 41.43                   | 39.15 | 37.23 |
| 2071.2      | 35.48                   | 35.72 | 36.01 | 37.66                   | 36.19 | 34.77 |
| 2151.7      | 34.89                   | 35.28 | 35.46 | 35.12                   | 34.51 | 32.87 |
| 2232.2      | 34.54                   | 34.98 | 35.19 | 33.54                   | 33.42 | 31.87 |
| 2312.7      | 34.03                   | 34.41 | 34.59 | 32.04                   | 32.38 | 31.15 |
| 2393.2      | 34.03                   | 34.21 | 34.47 | 30.27                   | 30.65 | 30.26 |
| 2473.7      | 33.99                   | 34.17 | 34.31 | 28.45                   | 28.78 | 28.80 |
| 2554.2      | 34.10                   | 34.47 | 34.27 | 27.24                   | 27.80 | 27.35 |
| 2634.7      | 34.05                   | 34.33 | 33.82 | 26.89                   | 27.46 | 26.54 |
| 2715.2      | 34.84                   | 34.66 | 33.79 | 26.93                   | 27.46 | 26.39 |
| 2795.7      | 35.16                   | 34.12 | 32.96 | 27.01                   | 27.53 | 26.46 |
| 2876.2      | 35.56                   | 34.07 | 32.66 | 27.45                   | 28.06 | 26.99 |
| 2956.7      | 35.51                   | 33.77 | 31.86 | 27.73                   | 28.27 | 27.15 |
| 3037.2      | 36.33                   | 34.72 | 32.99 | 27.97                   | 28.60 | 27.15 |
| 3137.8      | 37.27                   | 35.76 | 34.38 | 28.33                   | 28.94 | 27.68 |
| 3218.3      | 37.12                   | 36.18 | 35.04 | 28.42                   | 28.92 | 27.58 |
| 3319.0      | 35.41                   | 35.30 | 34.80 | 28.14                   | 28.61 | 27.33 |
| 3399.5      | 34.24                   | 34.34 | 34.16 | 27.56                   | 28.07 | 26.87 |
| 3500.1      | 33.44                   | 33.28 | 32.98 | 27.10                   | 27.48 | 26.57 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +14                     | +17   | +20   |
| 300.1               | 330.1       | 46.32                   | 48.72 | 64.92 |
| 380.6               | 410.6       | 43.05                   | 43.12 | 44.12 |
| 461.1               | 491.1       | 41.19                   | 40.06 | 38.88 |
| 541.6               | 571.6       | 40.38                   | 39.56 | 41.31 |
| 622.1               | 652.1       | 37.09                   | 36.99 | 37.56 |
| 702.6               | 732.6       | 36.14                   | 35.81 | 36.20 |
| 783.1               | 813.1       | 36.22                   | 35.54 | 33.86 |
| 863.6               | 893.6       | 38.65                   | 35.44 | 32.88 |
| 944.1               | 974.1       | 36.38                   | 32.16 | 29.86 |
| 1024.6              | 1054.6      | 28.71                   | 29.64 | 28.18 |
| 1105.1              | 1135.1      | 25.39                   | 27.73 | 31.28 |
| 1185.6              | 1215.6      | 27.20                   | 30.22 | 33.63 |
| 1266.1              | 1296.1      | 29.81                   | 32.77 | 34.68 |
| 1346.6              | 1376.6      | 30.84                   | 33.09 | 34.43 |
| 1427.1              | 1457.1      | 31.96                   | 33.44 | 34.52 |
| 1507.6              | 1537.6      | 32.01                   | 33.22 | 34.41 |
| 1588.2              | 1618.2      | 31.75                   | 32.67 | 33.59 |
| 1668.7              | 1698.7      | 32.73                   | 33.20 | 33.85 |
| 1749.2              | 1779.2      | 34.39                   | 34.24 | 34.69 |
| 1829.7              | 1859.7      | 38.70                   | 38.91 | 39.75 |
| 1910.2              | 1940.2      | 43.49                   | 43.69 | 46.15 |
| 1990.7              | 2020.7      | 40.58                   | 40.57 | 40.50 |
| 2071.2              | 2101.2      | 36.05                   | 36.01 | 36.06 |
| 2151.7              | 2181.7      | 33.51                   | 33.55 | 34.08 |
| 2232.2              | 2262.2      | 32.48                   | 32.61 | 33.28 |
| 2312.7              | 2342.7      | 32.36                   | 32.70 | 33.54 |
| 2393.2              | 2423.2      | 33.37                   | 33.94 | 34.69 |
| 2473.7              | 2503.7      | 36.64                   | 37.14 | 36.70 |
| 2554.2              | 2584.2      | 39.82                   | 40.97 | 39.79 |
| 2634.7              | 2664.7      | 38.66                   | 38.92 | 37.76 |
| 2715.2              | 2745.2      | 34.37                   | 34.48 | 34.24 |
| 2795.7              | 2825.7      | 33.62                   | 34.07 | 34.31 |
| 2876.2              | 2906.2      | 34.68                   | 34.61 | 34.18 |
| 2956.7              | 2986.7      | 38.08                   | 36.76 | 35.59 |
| 3037.2              | 3067.2      | 40.04                   | 36.92 | 34.81 |
| 3137.8              | 3167.8      | 42.08                   | 37.85 | 34.99 |
| 3218.3              | 3248.3      | 43.51                   | 39.03 | 35.59 |
| 3319.0              | 3349.0      | 43.29                   | 40.94 | 37.49 |
| 3399.5              | 3429.5      | 38.76                   | 40.52 | 37.90 |
| 3500.1              | 3530.1      | 34.08                   | 36.54 | 40.02 |

# Frequency Mixer

HJK-ED9495/2

## 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=2500MHz<br>(:1) |      |       |
|---------------------|-------------|-----------------|-------|-------|-------------|-----------------|-------|-------|----------------------|--------------------------------|------|-------|
|                     |             | @LO (dBm)       |       |       |             | @LO (dBm)       |       |       |                      | @LO (dBm)                      |      |       |
|                     |             | +14             | +17   | +20   |             | +14             | +17   | +20   |                      | +14                            | +17  | +20   |
| 300.1               | 330.1       | 22.29           | 17.93 | 15.39 | 300.1       | 51.10           | 51.10 | 49.64 | 10.0                 | 1.48                           | 1.30 | 36.97 |
| 380.6               | 410.6       | 12.18           | 9.85  | 8.60  | 380.6       | 69.49           | 66.82 | 64.35 | 30.2                 | 1.39                           | 1.20 | 45.72 |
| 461.1               | 491.1       | 7.02            | 5.99  | 5.33  | 461.1       | 64.35           | 59.91 | 57.91 | 50.4                 | 1.44                           | 1.24 | 40.41 |
| 541.6               | 571.6       | 4.92            | 3.67  | 3.09  | 541.6       | 54.29           | 51.10 | 48.26 | 70.6                 | 1.42                           | 1.23 | 41.37 |
| 622.1               | 652.1       | 3.14            | 2.46  | 2.25  | 622.1       | 49.64           | 46.96 | 44.55 | 90.8                 | 1.47                           | 1.27 | 41.37 |
| 702.6               | 732.6       | 2.04            | 1.73  | 1.68  | 702.6       | 44.55           | 42.38 | 39.49 | 111.0                | 1.50                           | 1.30 | 37.77 |
| 783.1               | 813.1       | 1.50            | 1.29  | 1.31  | 783.1       | 42.38           | 40.41 | 37.77 | 131.2                | 1.55                           | 1.35 | 35.46 |
| 863.6               | 893.6       | 1.38            | 1.12  | 1.09  | 863.6       | 37.77           | 36.20 | 34.75 | 151.4                | 1.56                           | 1.36 | 33.42 |
| 944.1               | 974.1       | 1.56            | 1.30  | 1.20  | 944.1       | 34.75           | 32.79 | 31.60 | 171.6                | 1.63                           | 1.43 | 31.60 |
| 1024.6              | 1054.6      | 1.90            | 1.62  | 1.48  | 1024.6      | 31.60           | 29.96 | 28.49 | 191.8                | 1.63                           | 1.42 | 29.46 |
| 1105.1              | 1135.1      | 2.32            | 1.99  | 1.83  | 1105.1      | 28.03           | 26.33 | 24.83 | 212.0                | 1.74                           | 1.52 | 28.49 |
| 1185.6              | 1215.6      | 2.64            | 2.30  | 2.13  | 1185.6      | 24.14           | 22.29 | 20.45 | 232.2                | 1.77                           | 1.54 | 27.16 |
| 1266.1              | 1296.1      | 2.84            | 2.50  | 2.33  | 1266.1      | 20.45           | 18.90 | 17.39 | 252.4                | 1.79                           | 1.56 | 25.56 |
| 1346.6              | 1376.6      | 2.71            | 2.35  | 2.17  | 1346.6      | 17.39           | 16.26 | 15.26 | 272.7                | 1.88                           | 1.62 | 24.48 |
| 1427.1              | 1457.1      | 2.57            | 2.29  | 2.17  | 1427.1      | 14.62           | 13.81 | 13.19 | 292.9                | 1.90                           | 1.64 | 23.18 |
| 1507.6              | 1537.6      | 2.30            | 2.07  | 1.98  | 1507.6      | 10.62           | 10.07 | 9.63  | 313.1                | 2.03                           | 1.74 | 22.29 |
| 1588.2              | 1618.2      | 2.04            | 1.82  | 1.73  | 1588.2      | 6.91            | 6.53  | 6.26  | 333.3                | 2.02                           | 1.74 | 21.73 |
| 1668.7              | 1698.7      | 1.93            | 1.71  | 1.62  | 1668.7      | 3.83            | 3.61  | 3.45  | 353.5                | 2.09                           | 1.76 | 20.70 |
| 1749.2              | 1779.2      | 1.83            | 1.64  | 1.56  | 1749.2      | 1.85            | 1.74  | 1.66  | 373.7                | 2.12                           | 1.80 | 19.76 |
| 1829.7              | 1859.7      | 1.73            | 1.56  | 1.47  | 1829.7      | 1.23            | 1.29  | 1.35  | 393.9                | 2.22                           | 1.88 | 19.32 |
| 1910.2              | 1940.2      | 1.63            | 1.44  | 1.42  | 1910.2      | 2.34            | 2.45  | 2.55  | 434.3                | 2.30                           | 1.94 | 18.30 |
| 1990.7              | 2020.7      | 1.68            | 1.43  | 1.32  | 1990.7      | 3.80            | 3.93  | 4.04  | 454.5                | 2.28                           | 1.89 | 17.22 |
| 2071.2              | 2101.2      | 1.70            | 1.43  | 1.30  | 2071.2      | 5.20            | 5.28  | 5.31  | 494.9                | 2.46                           | 2.03 | 16.26 |
| 2151.7              | 2181.7      | 1.76            | 1.47  | 1.75  | 2151.7      | 6.21            | 6.21  | 6.11  | 515.1                | 2.45                           | 2.02 | 15.39 |
| 2232.2              | 2262.2      | 1.81            | 1.50  | 1.78  | 2232.2      | 6.81            | 6.76  | 6.66  | 555.5                | 2.43                           | 2.01 | 13.92 |
| 2312.7              | 2342.7      | 1.85            | 1.50  | 1.79  | 2312.7      | 7.17            | 7.11  | 7.02  | 575.7                | 2.56                           | 2.12 | 14.03 |
| 2393.2              | 2423.2      | 1.83            | 1.49  | 1.78  | 2393.2      | 7.28            | 7.17  | 7.11  | 616.1                | 2.56                           | 2.13 | 12.71 |
| 2473.7              | 2503.7      | 1.77            | 1.46  | 1.77  | 2473.7      | 7.00            | 6.86  | 6.73  | 636.3                | 2.53                           | 2.10 | 11.85 |
| 2554.2              | 2584.2      | 1.73            | 1.43  | 1.76  | 2554.2      | 6.44            | 6.28  | 6.07  | 676.7                | 2.63                           | 2.16 | 11.17 |
| 2634.7              | 2664.7      | 1.70            | 1.42  | 1.74  | 2634.7      | 5.89            | 5.70  | 5.46  | 696.9                | 2.65                           | 2.20 | 10.69 |
| 2715.2              | 2745.2      | 1.70            | 1.44  | 1.74  | 2715.2      | 5.36            | 5.22  | 5.09  | 737.3                | 2.62                           | 2.17 | 9.53  |
| 2795.7              | 2825.7      | 1.75            | 1.53  | 1.77  | 2795.7      | 4.68            | 4.56  | 4.47  | 757.6                | 2.69                           | 2.21 | 9.38  |
| 2876.2              | 2906.2      | 1.86            | 1.66  | 1.82  | 2876.2      | 3.95            | 3.86  | 3.79  | 798.0                | 2.73                           | 2.26 | 8.60  |
| 2956.7              | 2986.7      | 2.03            | 1.83  | 1.95  | 2956.7      | 3.31            | 3.25  | 3.20  | 818.2                | 2.62                           | 2.17 | 7.83  |
| 3037.2              | 3067.2      | 2.32            | 2.09  | 2.19  | 3037.2      | 2.82            | 2.77  | 2.71  | 858.6                | 2.67                           | 2.20 | 7.22  |
| 3137.8              | 3167.8      | 2.82            | 2.51  | 2.60  | 3137.8      | 2.32            | 2.27  | 2.23  | 878.8                | 2.72                           | 2.26 | 7.00  |
| 3218.3              | 3248.3      | 3.33            | 2.94  | 3.11  | 3218.3      | 2.02            | 1.98  | 1.93  | 919.2                | 2.67                           | 2.22 | 6.13  |
| 3319.0              | 3349.0      | 4.11            | 3.60  | 3.89  | 3319.0      | 1.79            | 1.75  | 1.73  | 939.4                | 2.68                           | 2.21 | 5.97  |
| 3399.5              | 3429.5      | 4.87            | 4.31  | 4.72  | 3399.5      | 1.75            | 1.72  | 1.70  | 979.8                | 2.70                           | 2.24 | 5.39  |
| 3500.1              | 3530.1      | 6.05            | 5.39  | 6.01  | 3500.1      | 1.97            | 1.96  | 1.94  | 1000.0               | 2.65                           | 2.21 | 4.89  |

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## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | +18 | +3  | +6  | +6  | 10  | +0  | 6   | 18  | 19  | 21  |
| 1  | -      | +1     | +0  | 4   | +13 | 18  | 3   | 19  | 10  | 16  | 12  | 25  |
| 2  | 54     | 26     | 28  | 49  | 21  | 39  | 20  | 21  | 33  | 22  | 32  | 20  |
| 3  | >90    | 48     | 23  | 31  | 37  | 28  | 24  | 30  | 24  | 42  | 36  | 45  |
| 4  | >90    | 53     | 46  | 55  | 51  | >56 | 48  | 55  | 41  | 48  | 50  | 45  |
| 5  | >90    | >56    | 48  | >56 | 55  | 54  | >56 | 45  | 49  | 47  | 48  | >56 |
| 6  | >90    | >56    | >56 | >56 | >56 | >56 | >56 | >56 | >56 | >56 | >56 | >56 |
| 7  | >90    | >56    | >56 | >56 | >56 | >56 | >56 | >56 | >56 | >56 | >56 | >56 |
| 8  | >90    | >56    | >56 | >56 | >56 | >56 | >56 | >56 | >56 | >56 | >56 | >56 |
| 9  | >90    | >56    | >56 | >56 | >56 | >56 | >56 | >56 | >56 | >56 | >56 | >56 |
| 10 | >90    | >56    | >56 | >56 | >56 | >56 | >56 | >56 | >56 | >56 | >56 | >56 |
|    | 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; +17.00 dBm  
IF OUT: 30 MHz; -34.07 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |    |    |    |    |    |    |    |    |    |    |
|----|--------|--------|----|----|----|----|----|----|----|----|----|----|
| 0  | -      | -      | 20 | 34 | 34 | 31 | 49 | 36 | 48 | 42 | 57 | 50 |
| 1  | -      | 26     | +0 | 32 | 17 | 54 | 29 | 48 | 43 | 43 | 53 | 54 |
| 2  | 34     | 49     | 51 | 54 | 47 | 62 | 50 | 52 | 64 | 52 | 71 | 50 |
| 3  | 65     | 56     | 32 | 43 | 49 | 42 | 38 | 49 | 37 | 76 | 53 | 54 |
| 4  | 82     | 56     | 54 | 60 | 59 | 75 | 56 | 63 | 52 | 56 | 81 | 58 |
| 5  | >90    | 70     | 45 | 58 | 49 | 51 | 58 | 50 | 49 | 56 | 48 | 70 |
| 6  | >90    | 70     | 75 | 65 | 62 | 68 | 68 | 77 | 64 | 72 | 59 | 61 |
| 7  | >90    | 67     | 78 | 75 | 57 | 63 | 61 | 60 | 66 | 59 | 60 | 66 |
| 8  | >90    | 77     | 80 | 85 | 77 | 70 | 74 | 76 | 76 | 81 | 70 | 73 |
| 9  | >90    | 83     | 86 | 71 | 81 | 79 | 67 | 67 | 71 | 65 | 73 | 63 |
| 10 | >90    | 87     | 91 | 86 | 77 | 83 | 83 | 76 | 78 | 84 | 84 | 86 |
|    | 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; +17.00 dBm  
IF OUT: 30 MHz; 2.85 dBm

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

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