

# Frequency Mixer

# HJK-ED12532A/1

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>IF FIXED<br>@IF(OUT)=110MHz<br>(dB) |       |       |
|---------------------|-------------|--------------------------------------------------------|-------|-------|
|                     |             | @LO (dBm)                                              |       |       |
|                     |             | +14                                                    | +17   | +20   |
| 10.1                | 120.1       | 20.65                                                  | 20.32 | 20.11 |
| 70.1                | 180.1       | 8.49                                                   | 8.34  | 8.24  |
| 130.1               | 240.1       | 6.96                                                   | 6.86  | 6.80  |
| 190.1               | 300.1       | 7.02                                                   | 6.95  | 6.90  |
| 250.1               | 360.1       | 9.55                                                   | 9.85  | 8.80  |
| 310.1               | 420.1       | 7.37                                                   | 7.34  | 7.31  |
| 390.1               | 500.1       | 7.08                                                   | 7.02  | 6.99  |
| 450.1               | 560.1       | 7.01                                                   | 6.94  | 6.91  |
| 530.1               | 640.1       | 6.89                                                   | 6.80  | 6.75  |
| 590.1               | 700.1       | 6.91                                                   | 6.81  | 6.74  |
| 670.1               | 780.1       | 7.18                                                   | 7.04  | 6.94  |
| 730.1               | 840.1       | 7.42                                                   | 7.26  | 7.16  |
| 810.1               | 920.1       | 7.67                                                   | 7.51  | 7.40  |
| 870.1               | 980.1       | 7.82                                                   | 7.65  | 7.53  |
| 950.1               | 1060.1      | 8.09                                                   | 7.91  | 7.79  |
| 1010.1              | 1120.1      | 8.23                                                   | 8.06  | 7.94  |
| 1090.1              | 1200.1      | 8.29                                                   | 8.14  | 8.04  |
| 1150.1              | 1260.1      | 8.16                                                   | 7.98  | 7.87  |
| 1230.1              | 1340.1      | 8.15                                                   | 7.93  | 7.80  |
| 1290.1              | 1400.1      | 8.20                                                   | 7.98  | 7.81  |
| 1370.1              | 1480.1      | 8.30                                                   | 8.09  | 7.95  |
| 1430.1              | 1540.1      | 8.23                                                   | 8.01  | 7.86  |
| 1510.1              | 1620.1      | 8.16                                                   | 7.93  | 7.77  |
| 1570.1              | 1680.1      | 8.10                                                   | 7.85  | 7.68  |
| 1650.1              | 1760.1      | 8.12                                                   | 7.86  | 7.68  |
| 1710.1              | 1820.1      | 8.16                                                   | 7.90  | 7.71  |
| 1790.1              | 1900.1      | 8.22                                                   | 7.92  | 7.70  |
| 1850.1              | 1960.1      | 8.21                                                   | 7.86  | 7.64  |
| 1930.1              | 2040.1      | 8.33                                                   | 7.95  | 7.70  |
| 1990.1              | 2100.1      | 8.55                                                   | 8.17  | 7.93  |
| 2070.1              | 2180.1      | 8.82                                                   | 8.42  | 8.17  |
| 2130.1              | 2240.1      | 8.95                                                   | 8.56  | 8.33  |
| 2210.1              | 2320.1      | 9.20                                                   | 8.79  | 8.53  |
| 2270.1              | 2380.1      | 9.56                                                   | 9.08  | 8.79  |
| 2350.1              | 2460.1      | 9.89                                                   | 9.34  | 9.00  |
| 2410.1              | 2520.1      | 9.93                                                   | 9.35  | 8.95  |
| 2490.1              | 2600.1      | 10.29                                                  | 9.58  | 9.12  |
| 2550.1              | 2660.1      | 10.90                                                  | 10.11 | 9.59  |
| 2630.1              | 2740.1      | 11.66                                                  | 10.74 | 10.25 |
| 2690.1              | 2800.1      | 12.06                                                  | 11.13 | 10.66 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       |
|---------------------|-------------|--------------------|-------|-------|
|                     |             | @LO (dBm)          |       |       |
|                     |             | +14                | +17   | +20   |
| 10.1                | 120.1       | 29.27              | 31.21 | 33.23 |
| 70.1                | 180.1       | 21.47              | 23.82 | 26.38 |
| 130.1               | 240.1       | 28.82              | 32.09 | 34.61 |
| 190.1               | 300.1       | 27.18              | 27.37 | 28.84 |
| 250.1               | 360.1       | 17.76              | 19.19 | 16.35 |
| 310.1               | 420.1       | 27.08              | 29.13 | 30.05 |
| 390.1               | 500.1       | 28.72              | 31.01 | 32.90 |
| 450.1               | 560.1       | 28.45              | 31.23 | 33.26 |
| 530.1               | 640.1       | 27.69              | 30.58 | 33.07 |
| 590.1               | 700.1       | 27.58              | 30.45 | 32.69 |
| 670.1               | 780.1       | 25.43              | 28.29 | 30.90 |
| 730.1               | 840.1       | 23.62              | 26.57 | 29.54 |
| 810.1               | 920.1       | 22.27              | 25.17 | 28.12 |
| 870.1               | 980.1       | 21.70              | 24.51 | 27.54 |
| 950.1               | 1060.1      | 20.73              | 23.34 | 26.35 |
| 1010.1              | 1120.1      | 20.34              | 22.80 | 25.81 |
| 1090.1              | 1200.1      | 20.41              | 22.38 | 25.17 |
| 1150.1              | 1260.1      | 20.80              | 22.38 | 24.58 |
| 1230.1              | 1340.1      | 21.15              | 22.42 | 24.08 |
| 1290.1              | 1400.1      | 21.56              | 22.99 | 24.63 |
| 1370.1              | 1480.1      | 21.94              | 23.95 | 26.21 |
| 1430.1              | 1540.1      | 22.04              | 24.30 | 26.85 |
| 1510.1              | 1620.1      | 21.93              | 24.20 | 26.69 |
| 1570.1              | 1680.1      | 21.94              | 24.34 | 26.71 |
| 1650.1              | 1760.1      | 21.29              | 23.76 | 26.18 |
| 1710.1              | 1820.1      | 20.83              | 23.25 | 25.57 |
| 1790.1              | 1900.1      | 19.93              | 22.35 | 24.52 |
| 1850.1              | 1960.1      | 19.31              | 21.75 | 23.79 |
| 1930.1              | 2040.1      | 18.76              | 21.32 | 23.58 |
| 1990.1              | 2100.1      | 18.26              | 21.01 | 23.54 |
| 2070.1              | 2180.1      | 17.73              | 20.57 | 23.36 |
| 2130.1              | 2240.1      | 17.68              | 20.75 | 23.55 |
| 2210.1              | 2320.1      | 17.13              | 20.15 | 23.24 |
| 2270.1              | 2380.1      | 16.35              | 19.34 | 22.33 |
| 2350.1              | 2460.1      | 15.45              | 18.19 | 21.08 |
| 2410.1              | 2520.1      | 15.11              | 17.61 | 20.37 |
| 2490.1              | 2600.1      | 14.30              | 16.70 | 19.20 |
| 2550.1              | 2660.1      | 13.62              | 15.99 | 18.43 |
| 2630.1              | 2740.1      | 13.38              | 15.96 | 18.39 |
| 2690.1              | 2800.1      | 13.32              | 16.05 | 18.90 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF IN=+15dBm<br>(dB) |       |       |
|---------------------|-------------|--------------------------------------|-------|-------|
|                     |             | @LO (dBm)                            |       |       |
|                     |             | +14                                  | +17   | +20   |
| 10.1                | 120.1       | -0.14                                | -0.05 | -0.05 |
| 70.6                | 180.6       | 0.08                                 | 0.07  | 0.06  |
| 131.0               | 241.0       | 0.21                                 | 0.12  | 0.07  |
| 191.5               | 301.5       | 0.13                                 | 0.07  | 0.03  |
| 251.9               | 361.9       | -0.10                                | 0.10  | -0.45 |
| 312.4               | 422.4       | 0.29                                 | 0.16  | 0.10  |
| 372.8               | 482.8       | 0.29                                 | 0.15  | 0.09  |
| 433.3               | 543.3       | 0.35                                 | 0.17  | 0.09  |
| 513.9               | 623.9       | 0.47                                 | 0.20  | 0.11  |
| 574.3               | 684.3       | 0.56                                 | 0.25  | 0.13  |
| 654.9               | 764.9       | 0.66                                 | 0.26  | 0.12  |
| 715.4               | 825.4       | 0.68                                 | 0.25  | 0.11  |
| 796.0               | 906.0       | 0.65                                 | 0.25  | 0.11  |
| 856.4               | 966.4       | 0.71                                 | 0.32  | 0.15  |
| 937.0               | 1047.0      | 0.67                                 | 0.32  | 0.15  |
| 997.5               | 1107.5      | 0.68                                 | 0.33  | 0.17  |
| 1078.1              | 1188.1      | 0.70                                 | 0.35  | 0.18  |
| 1138.5              | 1248.5      | 0.83                                 | 0.44  | 0.24  |
| 1219.1              | 1329.1      | 0.87                                 | 0.47  | 0.27  |
| 1279.6              | 1389.6      | 0.89                                 | 0.49  | 0.29  |
| 1360.2              | 1470.2      | 0.96                                 | 0.49  | 0.28  |
| 1420.6              | 1530.6      | 1.12                                 | 0.53  | 0.28  |
| 1501.2              | 1611.2      | 1.27                                 | 0.62  | 0.32  |
| 1561.7              | 1671.7      | 1.31                                 | 0.66  | 0.34  |
| 1642.3              | 1752.3      | 1.54                                 | 0.80  | 0.40  |
| 1702.7              | 1812.7      | 1.82                                 | 0.96  | 0.48  |
| 1783.3              | 1893.3      | 2.42                                 | 1.24  | 0.62  |
| 1843.8              | 1953.8      | 2.71                                 | 1.40  | 0.71  |
| 1924.4              | 2034.4      | 3.12                                 | 1.63  | 0.83  |
| 1984.8              | 2094.8      | 3.49                                 | 1.92  | 0.94  |
| 2065.4              | 2175.4      | 3.76                                 | 2.15  | 1.04  |
| 2125.9              | 2235.9      | 3.83                                 | 2.21  | 1.12  |
| 2206.5              | 2316.5      | 4.08                                 | 2.45  | 1.22  |
| 2266.9              | 2376.9      | 4.43                                 | 2.76  | 1.39  |
| 2347.5              | 2457.5      | 4.82                                 | 3.15  | 1.59  |
| 2408.0              | 2518.0      | 5.04                                 | 3.49  | 1.78  |
| 2488.6              | 2598.6      | 5.55                                 | 4.04  | 2.25  |
| 2549.0              | 2659.0      | 5.91                                 | 4.46  | 2.62  |
| 2629.6              | 2739.6      | 6.07                                 | 4.51  | 2.77  |
| 2690.1              | 2800.1      | 6.14                                 | 4.51  | 2.79  |

# Frequency Mixer

HJK-ED12532A/1

## Typical Performance Data

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=560.1MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=39.9MHz<br>(dB) | IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=1120.1MHz<br>(dB) |
|----------------------|-------------|-----------------------------------------------------------------|----------------------|-------------|----------------------------------------------------------------|----------------------|-------------|------------------------------------------------------------------|
|                      |             | @LO (dBm)                                                       |                      |             | @LO (dBm)                                                      |                      |             | @LO (dBm)                                                        |
|                      |             | +17                                                             |                      |             | +17                                                            |                      |             | +17                                                              |
| 550.1                | 10.0        | 12.65                                                           | 10.1                 | 50.0        | 10.02                                                          | 1110.1               | 10.0        | 14.35                                                            |
| 536.3                | 23.8        | 8.43                                                            | 30.5                 | 70.4        | 10.06                                                          | 1090.1               | 30.0        | 9.56                                                             |
| 522.4                | 37.7        | 7.74                                                            | 50.8                 | 90.7        | 9.92                                                           | 1070.1               | 50.0        | 9.04                                                             |
| 508.6                | 51.5        | 7.58                                                            | 71.2                 | 111.1       | 9.81                                                           | 1050.1               | 70.0        | 8.86                                                             |
| 494.7                | 65.4        | 7.47                                                            | 111.9                | 151.8       | 9.71                                                           | 1030.1               | 90.0        | 8.72                                                             |
| 480.9                | 79.2        | 7.43                                                            | 132.2                | 172.1       | 9.72                                                           | 1010.1               | 110.0       | 8.55                                                             |
| 467.0                | 93.1        | 7.33                                                            | 172.9                | 212.8       | 9.32                                                           | 990.1                | 130.0       | 8.39                                                             |
| 453.2                | 106.9       | 7.31                                                            | 193.3                | 233.2       | 9.40                                                           | 970.1                | 150.0       | 8.40                                                             |
| 439.3                | 120.8       | 7.21                                                            | 234.0                | 273.9       | 9.54                                                           | 930.1                | 190.0       | 7.95                                                             |
| 425.5                | 134.6       | 7.04                                                            | 254.3                | 294.2       | 9.73                                                           | 910.1                | 210.0       | 7.84                                                             |
| 411.6                | 148.5       | 7.17                                                            | 295.0                | 334.9       | 10.16                                                          | 870.1                | 250.0       | 8.14                                                             |
| 397.8                | 162.3       | 7.31                                                            | 315.4                | 355.3       | 10.71                                                          | 850.1                | 270.0       | 8.30                                                             |
| 383.9                | 176.2       | 7.33                                                            | 356.1                | 396.0       | 9.45                                                           | 810.1                | 310.0       | 9.01                                                             |
| 370.1                | 190.0       | 6.99                                                            | 376.4                | 416.3       | 9.48                                                           | 790.1                | 330.0       | 9.67                                                             |
| 356.3                | 203.8       | 6.91                                                            | 417.1                | 457.0       | 9.37                                                           | 750.1                | 370.0       | 7.46                                                             |
| 342.4                | 217.7       | 6.95                                                            | 437.5                | 477.4       | 9.31                                                           | 730.1                | 390.0       | 7.03                                                             |
| 328.6                | 231.5       | 6.95                                                            | 478.2                | 518.1       | 9.33                                                           | 690.1                | 430.0       | 6.78                                                             |
| 314.7                | 245.4       | 6.84                                                            | 498.5                | 538.4       | 9.29                                                           | 670.1                | 450.0       | 6.76                                                             |
| 300.9                | 259.2       | 6.58                                                            | 539.2                | 579.1       | 9.30                                                           | 630.1                | 490.0       | 7.09                                                             |
| 287.0                | 273.1       | 6.17                                                            | 559.6                | 599.5       | 9.33                                                           | 610.1                | 510.0       | 7.28                                                             |
| 273.2                | 286.9       | 6.21                                                            | 600.3                | 640.2       | 9.36                                                           | 570.1                | 550.0       | 8.33                                                             |
| 259.3                | 300.8       | 6.74                                                            | 620.6                | 660.5       | 9.43                                                           | 550.1                | 570.0       | 7.61                                                             |
| 245.5                | 314.6       | 7.19                                                            | 661.3                | 701.2       | 9.53                                                           | 510.1                | 610.0       | 7.18                                                             |
| 231.6                | 328.5       | 7.60                                                            | 681.7                | 721.6       | 9.53                                                           | 490.1                | 630.0       | 7.32                                                             |
| 217.8                | 342.3       | 7.89                                                            | 722.4                | 762.3       | 9.72                                                           | 450.1                | 670.0       | 7.50                                                             |
| 203.9                | 356.2       | 9.62                                                            | 742.7                | 782.6       | 9.77                                                           | 430.1                | 690.0       | 7.52                                                             |
| 190.1                | 370.0       | 7.74                                                            | 783.4                | 823.3       | 9.83                                                           | 390.1                | 730.0       | 7.73                                                             |
| 176.3                | 383.8       | 7.34                                                            | 803.8                | 843.7       | 9.97                                                           | 370.1                | 750.0       | 7.75                                                             |
| 162.4                | 397.7       | 7.09                                                            | 844.5                | 884.4       | 10.07                                                          | 330.1                | 790.0       | 7.82                                                             |
| 148.6                | 411.5       | 6.94                                                            | 864.8                | 904.7       | 10.03                                                          | 310.1                | 810.0       | 7.88                                                             |
| 134.7                | 425.4       | 6.82                                                            | 905.5                | 945.4       | 10.21                                                          | 270.1                | 850.0       | 7.87                                                             |
| 120.9                | 439.2       | 6.77                                                            | 925.9                | 965.8       | 10.22                                                          | 250.1                | 870.0       | 7.90                                                             |
| 107.0                | 453.1       | 6.79                                                            | 966.6                | 1006.5      | 10.29                                                          | 210.1                | 910.0       | 7.91                                                             |
| 93.2                 | 466.9       | 6.76                                                            | 986.9                | 1026.8      | 10.43                                                          | 190.1                | 930.0       | 7.95                                                             |
| 79.3                 | 480.8       | 6.80                                                            | 1027.6               | 1067.5      | 10.49                                                          | 150.1                | 970.0       | 7.99                                                             |
| 65.5                 | 494.6       | 6.86                                                            | 1048.0               | 1087.9      | 10.47                                                          | 130.1                | 990.0       | 7.99                                                             |
| 51.6                 | 508.5       | 6.81                                                            | 1088.7               | 1128.6      | 10.63                                                          | 90.1                 | 1030.0      | 8.00                                                             |
| 37.8                 | 522.3       | 6.79                                                            | 1109.0               | 1148.9      | 10.74                                                          | 70.1                 | 1050.0      | 7.98                                                             |
| 23.9                 | 536.2       | 6.80                                                            | 1149.7               | 1189.6      | 10.88                                                          | 30.1                 | 1090.0      | 7.93                                                             |
| 10.1                 | 550.0       | 6.74                                                            | 1170.1               | 1210.0      | 11.00                                                          | 10.1                 | 1110.0      | 7.88                                                             |

REV. X2

HJK-ED12532A/1

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

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# Frequency Mixer

HJK-ED12532A/1

## Typical Performance Data

| LO<br><br>(MHz) | LO-RF ISOLATION<br>(dB) |       |       | LO-IF ISOLATION<br>(dB) |       |       | RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|-----------------|-------------------------|-------|-------|-------------------------|-------|-------|---------------------|-------------|-------------------------|-------|-------|
|                 | @LO (dBm)               |       |       | @LO (dBm)               |       |       |                     |             | @LO (dBm)               |       |       |
|                 | +14                     | +17   | +20   | +14                     | +17   | +20   |                     |             | +14                     | +17   | +20   |
| 120.1           | 57.91                   | 58.09 | 57.92 | 52.38                   | 52.39 | 52.20 | 10.1                | 120.1       | 54.84                   | 52.68 | 49.43 |
| 180.1           | 53.27                   | 53.70 | 53.69 | 45.51                   | 45.42 | 45.35 | 70.1                | 180.1       | 55.89                   | 56.72 | 52.52 |
| 240.1           | 50.59                   | 51.28 | 51.62 | 42.53                   | 42.52 | 42.59 | 130.1               | 240.1       | 43.64                   | 42.46 | 43.19 |
| 300.1           | 43.66                   | 43.77 | 44.43 | 39.14                   | 39.10 | 39.19 | 190.1               | 300.1       | 44.49                   | 43.78 | 47.26 |
| 360.1           | 37.96                   | 40.10 | 38.32 | 35.94                   | 36.77 | 36.25 | 250.1               | 360.1       | 41.83                   | 35.07 | 34.53 |
| 420.1           | 51.99                   | 51.57 | 53.00 | 37.74                   | 37.67 | 37.90 | 310.1               | 420.1       | 45.18                   | 45.70 | 46.49 |
| 500.1           | 55.42                   | 55.01 | 55.24 | 38.82                   | 38.83 | 38.90 | 390.1               | 500.1       | 42.96                   | 43.17 | 43.11 |
| 560.1           | 55.33                   | 55.41 | 55.47 | 39.13                   | 39.12 | 39.16 | 450.1               | 560.1       | 42.24                   | 42.42 | 42.29 |
| 640.1           | 52.47                   | 53.27 | 53.61 | 39.77                   | 39.92 | 39.90 | 530.1               | 640.1       | 43.51                   | 44.13 | 43.96 |
| 700.1           | 49.59                   | 50.13 | 50.43 | 39.60                   | 39.72 | 39.62 | 590.1               | 700.1       | 54.42                   | 55.79 | 57.79 |
| 780.1           | 48.48                   | 49.09 | 49.43 | 40.01                   | 40.17 | 40.26 | 670.1               | 780.1       | 43.14                   | 43.02 | 41.99 |
| 840.1           | 47.37                   | 48.15 | 48.44 | 40.62                   | 40.89 | 41.01 | 730.1               | 840.1       | 41.25                   | 40.97 | 40.19 |
| 920.1           | 48.73                   | 49.86 | 50.39 | 42.79                   | 43.34 | 43.71 | 810.1               | 920.1       | 39.14                   | 38.61 | 38.70 |
| 980.1           | 50.25                   | 52.03 | 53.13 | 42.47                   | 43.03 | 43.39 | 870.1               | 980.1       | 39.80                   | 39.05 | 39.69 |
| 1060.1          | 48.94                   | 50.78 | 51.83 | 41.50                   | 42.10 | 42.40 | 950.1               | 1060.1      | 40.66                   | 39.99 | 41.10 |
| 1120.1          | 48.53                   | 50.35 | 51.33 | 40.02                   | 40.71 | 41.02 | 1010.1              | 1120.1      | 39.96                   | 39.08 | 39.86 |
| 1200.1          | 47.85                   | 49.67 | 50.31 | 38.39                   | 38.99 | 39.24 | 1090.1              | 1200.1      | 40.14                   | 39.37 | 40.51 |
| 1260.1          | 47.70                   | 49.32 | 49.72 | 36.81                   | 37.38 | 37.55 | 1150.1              | 1260.1      | 39.52                   | 39.23 | 40.66 |
| 1340.1          | 49.90                   | 51.75 | 52.33 | 35.55                   | 36.03 | 36.18 | 1230.1              | 1340.1      | 37.91                   | 37.79 | 39.00 |
| 1400.1          | 59.43                   | 59.32 | 59.10 | 34.82                   | 35.35 | 35.45 | 1290.1              | 1400.1      | 36.71                   | 36.53 | 37.52 |
| 1480.1          | 46.33                   | 44.87 | 44.32 | 37.40                   | 38.03 | 38.47 | 1370.1              | 1480.1      | 37.35                   | 37.28 | 38.35 |
| 1540.1          | 46.75                   | 45.38 | 44.63 | 37.73                   | 38.31 | 38.68 | 1430.1              | 1540.1      | 37.57                   | 37.60 | 38.53 |
| 1620.1          | 48.43                   | 46.67 | 45.74 | 37.23                   | 37.54 | 37.69 | 1510.1              | 1620.1      | 37.39                   | 37.46 | 38.12 |
| 1680.1          | 50.52                   | 48.39 | 47.31 | 36.85                   | 37.02 | 37.08 | 1570.1              | 1680.1      | 37.04                   | 37.16 | 37.62 |
| 1760.1          | 51.56                   | 49.33 | 48.42 | 36.80                   | 36.88 | 36.93 | 1650.1              | 1760.1      | 35.62                   | 35.68 | 35.95 |
| 1820.1          | 52.39                   | 50.64 | 49.85 | 37.04                   | 37.28 | 37.33 | 1710.1              | 1820.1      | 34.92                   | 34.89 | 35.10 |
| 1900.1          | 50.69                   | 49.73 | 49.18 | 36.69                   | 36.88 | 36.90 | 1790.1              | 1900.1      | 34.72                   | 34.63 | 34.81 |
| 1960.1          | 47.13                   | 46.26 | 45.96 | 35.82                   | 35.80 | 35.93 | 1850.1              | 1960.1      | 35.63                   | 35.58 | 35.75 |
| 2040.1          | 43.70                   | 43.16 | 42.77 | 34.78                   | 34.72 | 34.75 | 1930.1              | 2040.1      | 36.12                   | 36.02 | 35.86 |
| 2100.1          | 41.96                   | 41.51 | 41.01 | 34.08                   | 34.08 | 33.99 | 1990.1              | 2100.1      | 35.21                   | 35.04 | 34.78 |
| 2180.1          | 40.26                   | 39.95 | 39.59 | 33.37                   | 33.42 | 33.30 | 2070.1              | 2180.1      | 33.54                   | 33.39 | 33.09 |
| 2240.1          | 39.63                   | 39.51 | 39.23 | 32.97                   | 33.06 | 32.99 | 2130.1              | 2240.1      | 32.55                   | 32.43 | 32.13 |
| 2320.1          | 39.06                   | 38.82 | 38.70 | 32.60                   | 32.55 | 32.65 | 2210.1              | 2320.1      | 31.30                   | 31.22 | 30.91 |
| 2380.1          | 38.75                   | 38.61 | 38.44 | 32.51                   | 32.41 | 32.40 | 2270.1              | 2380.1      | 30.66                   | 30.64 | 30.28 |
| 2460.1          | 37.75                   | 37.69 | 37.43 | 32.42                   | 32.32 | 32.20 | 2350.1              | 2460.1      | 29.94                   | 29.98 | 29.67 |
| 2520.1          | 37.18                   | 37.35 | 37.04 | 32.31                   | 32.38 | 32.18 | 2410.1              | 2520.1      | 29.61                   | 29.71 | 29.46 |
| 2600.1          | 36.74                   | 36.95 | 36.74 | 32.44                   | 32.51 | 32.39 | 2490.1              | 2600.1      | 29.18                   | 29.29 | 29.11 |
| 2660.1          | 36.70                   | 36.89 | 36.68 | 32.60                   | 32.64 | 32.53 | 2550.1              | 2660.1      | 28.72                   | 28.81 | 28.64 |
| 2740.1          | 37.05                   | 37.19 | 36.96 | 32.98                   | 32.98 | 32.88 | 2630.1              | 2740.1      | 28.40                   | 28.49 | 28.35 |
| 2800.1          | 38.33                   | 38.17 | 37.92 | 33.36                   | 33.21 | 33.24 | 2690.1              | 2800.1      | 28.26                   | 28.32 | 28.22 |

# Frequency Mixer

# HJK-ED12532A/1

## 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=1220MHz<br>(:1) |      |      |
|---------------------|-------------|-----------------|-------|--------|-------------|-----------------|------|------|----------------------|--------------------------------|------|------|
|                     |             | @LO (dBm)       |       |        |             | @LO (dBm)       |      |      |                      | @LO (dBm)                      |      |      |
|                     |             | +14             | +17   | +20    |             | +14             | +17  | +20  |                      | +14                            | +17  | +20  |
| 10.1                | 120.1       | 46.96           | 82.73 | 115.81 | 120.1       | 5.07            | 5.07 | 5.06 | 10.0                 | 1.58                           | 1.68 | 1.79 |
| 70.1                | 180.1       | 3.42            | 3.40  | 3.38   | 180.1       | 5.06            | 5.06 | 5.04 | 50.7                 | 1.57                           | 1.68 | 1.79 |
| 130.1               | 240.1       | 2.14            | 2.20  | 2.23   | 240.1       | 4.95            | 4.93 | 4.93 | 91.4                 | 1.53                           | 1.64 | 1.75 |
| 190.1               | 300.1       | 1.65            | 1.69  | 1.73   | 300.1       | 4.45            | 4.44 | 4.28 | 111.7                | 1.54                           | 1.65 | 1.77 |
| 250.1               | 360.1       | 1.67            | 2.14  | 1.70   | 360.1       | 3.08            | 3.05 | 2.75 | 152.4                | 1.47                           | 1.57 | 1.68 |
| 310.1               | 420.1       | 2.63            | 2.79  | 2.87   | 420.1       | 3.98            | 3.97 | 3.56 | 172.7                | 1.48                           | 1.59 | 1.70 |
| 390.1               | 500.1       | 2.17            | 2.29  | 2.38   | 500.1       | 4.06            | 4.04 | 4.00 | 213.4                | 1.39                           | 1.49 | 1.59 |
| 450.1               | 560.1       | 2.01            | 2.11  | 2.18   | 560.1       | 4.01            | 4.01 | 3.99 | 233.7                | 1.41                           | 1.51 | 1.61 |
| 530.1               | 640.1       | 1.94            | 2.01  | 2.05   | 640.1       | 3.95            | 3.94 | 3.94 | 274.4                | 1.34                           | 1.43 | 1.53 |
| 590.1               | 700.1       | 2.02            | 2.04  | 2.06   | 700.1       | 3.90            | 3.88 | 3.87 | 294.7                | 1.30                           | 1.39 | 1.48 |
| 670.1               | 780.1       | 2.30            | 2.30  | 2.30   | 780.1       | 3.82            | 3.82 | 3.81 | 335.4                | 1.30                           | 1.39 | 1.48 |
| 730.1               | 840.1       | 2.54            | 2.52  | 2.52   | 840.1       | 3.75            | 3.75 | 3.74 | 355.8                | 1.23                           | 1.32 | 1.40 |
| 810.1               | 920.1       | 2.83            | 2.81  | 2.81   | 920.1       | 3.64            | 3.64 | 3.64 | 396.4                | 1.20                           | 1.29 | 1.37 |
| 870.1               | 980.1       | 3.01            | 2.99  | 2.99   | 980.1       | 3.57            | 3.57 | 3.56 | 416.8                | 1.17                           | 1.25 | 1.33 |
| 950.1               | 1060.1      | 3.09            | 3.06  | 3.07   | 1060.1      | 3.42            | 3.42 | 3.41 | 457.5                | 1.15                           | 1.22 | 1.29 |
| 1010.1              | 1120.1      | 3.00            | 3.00  | 3.00   | 1120.1      | 3.27            | 3.27 | 3.27 | 477.8                | 1.10                           | 1.17 | 1.24 |
| 1090.1              | 1200.1      | 2.84            | 2.82  | 2.83   | 1200.1      | 3.07            | 3.07 | 3.07 | 518.5                | 1.11                           | 1.16 | 1.22 |
| 1150.1              | 1260.1      | 2.73            | 2.69  | 2.69   | 1260.1      | 2.94            | 2.93 | 2.93 | 538.8                | 1.11                           | 1.16 | 1.21 |
| 1230.1              | 1340.1      | 2.63            | 2.58  | 2.57   | 1340.1      | 2.74            | 2.74 | 2.73 | 579.5                | 1.14                           | 1.14 | 1.16 |
| 1290.1              | 1400.1      | 2.47            | 2.43  | 2.43   | 1400.1      | 2.58            | 2.59 | 2.58 | 599.8                | 1.16                           | 1.17 | 1.19 |
| 1370.1              | 1480.1      | 2.14            | 2.10  | 2.10   | 1480.1      | 2.48            | 2.49 | 2.49 | 640.5                | 1.22                           | 1.20 | 1.20 |
| 1430.1              | 1540.1      | 1.96            | 1.92  | 1.92   | 1540.1      | 2.49            | 2.49 | 2.49 | 660.8                | 1.26                           | 1.23 | 1.23 |
| 1510.1              | 1620.1      | 1.72            | 1.70  | 1.70   | 1620.1      | 2.49            | 2.50 | 2.49 | 701.5                | 1.26                           | 1.23 | 1.23 |
| 1570.1              | 1680.1      | 1.54            | 1.52  | 1.53   | 1680.1      | 2.50            | 2.51 | 2.51 | 721.9                | 1.33                           | 1.30 | 1.29 |
| 1650.1              | 1760.1      | 1.35            | 1.33  | 1.35   | 1760.1      | 2.54            | 2.54 | 2.55 | 762.5                | 1.33                           | 1.31 | 1.30 |
| 1710.1              | 1820.1      | 1.27            | 1.25  | 1.26   | 1820.1      | 2.56            | 2.56 | 2.57 | 782.9                | 1.36                           | 1.33 | 1.32 |
| 1790.1              | 1900.1      | 1.20            | 1.19  | 1.21   | 1900.1      | 2.58            | 2.57 | 2.57 | 823.6                | 1.46                           | 1.43 | 1.42 |
| 1850.1              | 1960.1      | 1.16            | 1.19  | 1.23   | 1960.1      | 2.57            | 2.57 | 2.57 | 843.9                | 1.42                           | 1.40 | 1.38 |
| 1930.1              | 2040.1      | 1.18            | 1.26  | 1.32   | 2040.1      | 2.54            | 2.54 | 2.55 | 884.6                | 1.50                           | 1.48 | 1.47 |
| 1990.1              | 2100.1      | 1.24            | 1.34  | 1.41   | 2100.1      | 2.52            | 2.52 | 2.51 | 904.9                | 1.49                           | 1.46 | 1.46 |
| 2070.1              | 2180.1      | 1.32            | 1.44  | 1.53   | 2180.1      | 2.49            | 2.48 | 2.47 | 945.6                | 1.49                           | 1.47 | 1.46 |
| 2130.1              | 2240.1      | 1.38            | 1.51  | 1.61   | 2240.1      | 2.46            | 2.45 | 2.45 | 965.9                | 1.49                           | 1.48 | 1.48 |
| 2210.1              | 2320.1      | 1.43            | 1.57  | 1.66   | 2320.1      | 2.43            | 2.43 | 2.43 | 1006.6               | 1.47                           | 1.46 | 1.46 |
| 2270.1              | 2380.1      | 1.45            | 1.58  | 1.67   | 2380.1      | 2.45            | 2.45 | 2.44 | 1026.9               | 1.48                           | 1.48 | 1.49 |
| 2350.1              | 2460.1      | 1.49            | 1.59  | 1.66   | 2460.1      | 2.48            | 2.48 | 2.46 | 1067.6               | 1.44                           | 1.47 | 1.50 |
| 2410.1              | 2520.1      | 1.53            | 1.59  | 1.64   | 2520.1      | 2.50            | 2.50 | 2.50 | 1088.0               | 1.48                           | 1.51 | 1.54 |
| 2490.1              | 2600.1      | 1.70            | 1.74  | 1.77   | 2600.1      | 2.56            | 2.55 | 2.55 | 1128.6               | 1.58                           | 1.65 | 1.71 |
| 2550.1              | 2660.1      | 1.90            | 1.94  | 1.98   | 2660.1      | 2.61            | 2.60 | 2.58 | 1149.0               | 1.72                           | 1.80 | 1.88 |
| 2630.1              | 2740.1      | 2.16            | 2.22  | 2.28   | 2740.1      | 2.66            | 2.65 | 2.62 | 1189.7               | 2.30                           | 2.45 | 2.59 |
| 2690.1              | 2800.1      | 2.33            | 2.41  | 2.48   | 2800.1      | 2.71            | 2.70 | 2.69 | 1210.0               | 2.75                           | 2.96 | 3.18 |

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## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 16  | 29  | 40  | 43  | 65  | 52  | 50  | 62  | 56  | 51  |
| 1  | -      | 36     | +0  | 46  | 14  | 52  | 40  | 55  | 51  | 54  | 79  | 64  |
| 2  | 63     | 63     | 57  | 60  | 60  | 66  | 72  | 78  | 77  | >83 | >83 | 74  |
| 3  | >90    | >83    | 72  | >83 | 66  | >83 | 70  | >83 | >83 | >83 | >83 | >83 |
| 4  | >90    | >83    | >83 | >83 | >83 | >83 | 83  | >83 | >83 | >83 | >83 | >83 |
| 5  | >90    | >83    | >83 | >83 | >83 | >83 | 80  | >83 | >83 | >83 | >83 | >83 |
| 6  | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 7  | >90    | >83    | >83 | >83 | >83 | >83 | 82  | >83 | 81  | >83 | >83 | >83 |
| 8  | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 9  | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
| 10 | >90    | >83    | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 | >83 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions:

RF IN: 580 MHz; 0.00 dBm.  
LO IN: 690 MHz; +17.00 dBm  
IF OUT: 110 MHz; -6.9 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 27  | 38  | 50  | 52  | 76  | 60  | 60  | 69  | 71  | 64  |
| 1  | -      | 37     | +0  | 45  | 15  | 54  | 43  | 54  | 54  | 54  | 76  | 67  |
| 2  | 43     | 53     | 47  | 52  | 48  | 59  | 60  | 70  | 68  | 83  | 77  | 71  |
| 3  | 67     | 78     | 51  | 71  | 44  | 76  | 48  | 78  | 66  | 78  | 67  | 80  |
| 4  | >90    | 93     | 79  | 76  | 75  | 76  | 76  | 81  | >93 | 93  | 86  | >93 |
| 5  | >90    | >93    | 81  | >93 | 71  | 85  | 72  | 82  | 79  | >93 | >93 | >93 |
| 6  | >90    | >93    | >93 | >93 | 93  | >93 | 85  | 88  | 86  | >93 | >93 | >93 |
| 7  | >90    | >93    | >93 | >93 | >93 | >93 | 86  | >93 | 86  | >93 | >93 | >93 |
| 8  | >90    | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
| 9  | >90    | >93    | >93 | >93 | >93 | >93 | >93 | >93 | 92  | >93 | >93 | >93 |
| 10 | >90    | >93    | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 | >93 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions:

RF IN: 580 MHz; 10.00 dBm.  
LO IN: 690 MHz; +17.00 dBm  
IF OUT: 110 MHz; 3.05 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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