

# Frequency Mixer

# HJK-ED9680A/1

## Typical Performance Data

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>IF FIXED<br>@IF(OUT)=250MHz<br>(dB) |       |       |
|---------------------|-------------|--------------------------------------------------------|-------|-------|
|                     |             | @LO (dBm)                                              |       |       |
|                     |             | +19                                                    | +21   | +23   |
| 400.1               | 150.1       | 7.16                                                   | 6.84  | 6.65  |
| 480.1               | 230.1       | 6.65                                                   | 6.42  | 6.31  |
| 560.1               | 310.1       | 7.84                                                   | 7.44  | 7.23  |
| 640.1               | 390.1       | 8.06                                                   | 7.64  | 7.38  |
| 720.1               | 470.1       | 9.30                                                   | 9.26  | 9.03  |
| 800.1               | 550.1       | 8.64                                                   | 8.08  | 7.80  |
| 880.1               | 630.1       | 8.79                                                   | 8.18  | 7.85  |
| 960.1               | 710.1       | 8.94                                                   | 8.30  | 7.93  |
| 1040.1              | 790.1       | 8.95                                                   | 8.32  | 7.99  |
| 1120.1              | 870.1       | 9.01                                                   | 8.40  | 8.07  |
| 1200.1              | 950.1       | 9.19                                                   | 8.60  | 8.27  |
| 1280.1              | 1030.1      | 8.73                                                   | 8.17  | 7.87  |
| 1360.1              | 1110.1      | 8.46                                                   | 7.95  | 7.67  |
| 1440.1              | 1190.1      | 8.11                                                   | 7.70  | 7.47  |
| 1520.1              | 1270.1      | 7.75                                                   | 7.40  | 7.21  |
| 1600.1              | 1350.1      | 7.48                                                   | 7.21  | 7.05  |
| 1680.1              | 1430.1      | 7.35                                                   | 7.12  | 6.99  |
| 1760.1              | 1510.1      | 7.40                                                   | 7.23  | 7.12  |
| 1840.1              | 1590.1      | 7.59                                                   | 7.48  | 7.46  |
| 1920.1              | 1670.1      | 7.83                                                   | 7.79  | 7.89  |
| 2000.1              | 1750.1      | 7.95                                                   | 7.92  | 7.99  |
| 2080.1              | 1830.1      | 8.04                                                   | 8.01  | 8.02  |
| 2160.1              | 1910.1      | 8.07                                                   | 7.99  | 7.97  |
| 2240.1              | 1990.1      | 8.22                                                   | 8.08  | 8.05  |
| 2320.1              | 2070.1      | 8.37                                                   | 8.14  | 8.04  |
| 2400.1              | 2150.1      | 8.65                                                   | 8.29  | 8.12  |
| 2480.1              | 2230.1      | 9.05                                                   | 8.55  | 8.30  |
| 2560.1              | 2310.1      | 9.46                                                   | 8.84  | 8.56  |
| 2640.1              | 2390.1      | 9.75                                                   | 9.05  | 8.73  |
| 2720.1              | 2470.1      | 9.91                                                   | 9.20  | 8.84  |
| 2800.1              | 2550.1      | 10.05                                                  | 9.36  | 8.96  |
| 2880.1              | 2630.1      | 10.39                                                  | 9.60  | 9.11  |
| 2960.1              | 2710.1      | 10.74                                                  | 9.88  | 9.32  |
| 3040.1              | 2790.1      | 10.95                                                  | 10.08 | 9.53  |
| 3140.1              | 2890.1      | 11.19                                                  | 10.33 | 9.82  |
| 3220.1              | 2970.1      | 11.31                                                  | 10.52 | 10.09 |
| 3320.1              | 3070.1      | 11.49                                                  | 10.79 | 10.39 |
| 3400.1              | 3150.1      | 11.45                                                  | 10.77 | 10.37 |
| 3500.1              | 3250.1      | 11.70                                                  | 11.00 | 10.52 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | IP3 INPUT<br>(dBm) |       |       |
|---------------------|-------------|--------------------|-------|-------|
|                     |             | @LO (dBm)          |       |       |
|                     |             | +19                | +21   | +23   |
| 400.1               | 150.1       | 26.84              | 27.31 | 26.95 |
| 480.1               | 230.1       | 24.53              | 25.13 | 25.98 |
| 560.1               | 310.1       | 26.05              | 27.11 | 28.14 |
| 640.1               | 390.1       | 27.85              | 27.82 | 27.48 |
| 720.1               | 470.1       | 18.79              | 23.42 | 26.59 |
| 800.1               | 550.1       | 25.55              | 27.22 | 28.46 |
| 880.1               | 630.1       | 26.79              | 28.69 | 30.48 |
| 960.1               | 710.1       | 25.30              | 27.93 | 29.86 |
| 1040.1              | 790.1       | 25.02              | 28.11 | 30.48 |
| 1120.1              | 870.1       | 24.96              | 27.78 | 30.93 |
| 1200.1              | 950.1       | 35.36              | 31.91 | 31.38 |
| 1280.1              | 1030.1      | 30.58              | 32.40 | 37.07 |
| 1360.1              | 1110.1      | 33.08              | 34.81 | 33.99 |
| 1440.1              | 1190.1      | 31.99              | 31.93 | 31.71 |
| 1520.1              | 1270.1      | 31.47              | 31.43 | 31.97 |
| 1600.1              | 1350.1      | 31.72              | 32.07 | 32.85 |
| 1680.1              | 1430.1      | 33.63              | 34.05 | 34.30 |
| 1760.1              | 1510.1      | 34.88              | 34.20 | 33.65 |
| 1840.1              | 1590.1      | 33.93              | 33.63 | 34.49 |
| 1920.1              | 1670.1      | 36.80              | 35.75 | 35.28 |
| 2000.1              | 1750.1      | 38.51              | 37.89 | 37.27 |
| 2080.1              | 1830.1      | 36.76              | 39.62 | 39.33 |
| 2160.1              | 1910.1      | 32.47              | 36.61 | 39.43 |
| 2240.1              | 1990.1      | 29.29              | 32.65 | 37.00 |
| 2320.1              | 2070.1      | 27.44              | 30.10 | 33.66 |
| 2400.1              | 2150.1      | 25.75              | 28.23 | 31.71 |
| 2480.1              | 2230.1      | 24.32              | 26.02 | 28.90 |
| 2560.1              | 2310.1      | 23.77              | 25.51 | 27.79 |
| 2640.1              | 2390.1      | 23.49              | 25.19 | 27.47 |
| 2720.1              | 2470.1      | 23.40              | 25.07 | 27.26 |
| 2800.1              | 2550.1      | 23.39              | 24.81 | 28.43 |
| 2880.1              | 2630.1      | 23.23              | 24.80 | 26.65 |
| 2960.1              | 2710.1      | 22.81              | 24.19 | 29.57 |
| 3040.1              | 2790.1      | 23.08              | 24.19 | 25.83 |
| 3140.1              | 2890.1      | 25.19              | 25.94 | 27.75 |
| 3220.1              | 2970.1      | 27.52              | 27.78 | 30.14 |
| 3320.1              | 3070.1      | 26.07              | 27.54 | 30.58 |
| 3400.1              | 3150.1      | 25.85              | 27.96 | 37.84 |
| 3500.1              | 3250.1      | 25.93              | 30.95 | 37.30 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | COMPRESSION<br>@RF IN=+18dBm<br>(dB) |      |      |
|---------------------|-------------|--------------------------------------|------|------|
|                     |             | @LO (dBm)                            |      |      |
|                     |             | +19                                  | +21  | +23  |
| 400.1               | 150.1       | 0.28                                 | 0.19 | 0.11 |
| 480.1               | 230.1       | 1.04                                 | 0.69 | 0.50 |
| 560.1               | 310.1       | 0.72                                 | 0.55 | 0.35 |
| 640.1               | 390.1       | 0.56                                 | 0.25 | 0.02 |
| 720.1               | 470.1       | 0.63                                 | 0.24 | 0.25 |
| 800.1               | 550.1       | 0.95                                 | 0.96 | 0.70 |
| 880.1               | 630.1       | 0.92                                 | 0.89 | 0.62 |
| 960.1               | 710.1       | 0.81                                 | 0.77 | 0.53 |
| 1040.1              | 790.1       | 0.60                                 | 0.60 | 0.39 |
| 1120.1              | 870.1       | 0.25                                 | 0.26 | 0.11 |
| 1200.1              | 950.1       | 0.30                                 | 0.36 | 0.26 |
| 1280.1              | 1030.1      | 0.76                                 | 0.58 | 0.33 |
| 1360.1              | 1110.1      | 0.75                                 | 0.57 | 0.36 |
| 1440.1              | 1190.1      | 0.79                                 | 0.59 | 0.36 |
| 1520.1              | 1270.1      | 0.74                                 | 0.53 | 0.33 |
| 1600.1              | 1350.1      | 0.59                                 | 0.43 | 0.28 |
| 1680.1              | 1430.1      | 0.42                                 | 0.30 | 0.21 |
| 1760.1              | 1510.1      | 0.31                                 | 0.24 | 0.19 |
| 1840.1              | 1590.1      | 0.22                                 | 0.19 | 0.16 |
| 1920.1              | 1670.1      | 0.15                                 | 0.15 | 0.10 |
| 2000.1              | 1750.1      | 0.12                                 | 0.11 | 0.08 |
| 2080.1              | 1830.1      | 0.15                                 | 0.09 | 0.10 |
| 2160.1              | 1910.1      | 0.26                                 | 0.16 | 0.11 |
| 2240.1              | 1990.1      | 0.41                                 | 0.24 | 0.15 |
| 2320.1              | 2070.1      | 0.53                                 | 0.35 | 0.21 |
| 2400.1              | 2150.1      | 0.71                                 | 0.51 | 0.27 |
| 2480.1              | 2230.1      | 0.86                                 | 0.66 | 0.38 |
| 2560.1              | 2310.1      | 0.89                                 | 0.71 | 0.44 |
| 2640.1              | 2390.1      | 0.82                                 | 0.69 | 0.43 |
| 2720.1              | 2470.1      | 0.78                                 | 0.65 | 0.44 |
| 2800.1              | 2550.1      | 0.71                                 | 0.63 | 0.42 |
| 2880.1              | 2630.1      | 0.65                                 | 0.62 | 0.41 |
| 2960.1              | 2710.1      | 0.63                                 | 0.60 | 0.38 |
| 3040.1              | 2790.1      | 0.49                                 | 0.49 | 0.29 |
| 3140.1              | 2890.1      | 0.43                                 | 0.42 | 0.30 |
| 3220.1              | 2970.1      | 0.54                                 | 0.50 | 0.40 |
| 3320.1              | 3070.1      | 0.53                                 | 0.55 | 0.41 |
| 3400.1              | 3150.1      | 0.49                                 | 0.52 | 0.35 |
| 3500.1              | 3250.1      | 0.45                                 | 0.37 | 0.16 |

REV. X2

HJK-ED9680A/1

101012

Page 1 of 5



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant  
P.O. Box 350186, Brooklyn, New York 11235-0008 (718) 934-4500 Fax (718) 332-4861



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



## Typical Performance Data

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=1950.1MHz<br>(dB) |
|----------------------|-------------|------------------------------------------------------------------|
|                      |             | @LO (dBm)                                                        |
|                      |             | +21                                                              |
| 1490.0               | 460.1       | 11.41                                                            |
| 1407.8               | 542.3       | 10.43                                                            |
| 1325.6               | 624.5       | 10.41                                                            |
| 1243.3               | 706.8       | 10.39                                                            |
| 1161.1               | 789.0       | 10.27                                                            |
| 1078.9               | 871.2       | 10.17                                                            |
| 996.7                | 953.4       | 9.67                                                             |
| 914.4                | 1035.7      | 9.59                                                             |
| 832.2                | 1117.9      | 8.97                                                             |
| 750.0                | 1200.1      | 8.47                                                             |
| 667.8                | 1282.3      | 8.02                                                             |
| 585.6                | 1364.5      | 7.65                                                             |
| 503.3                | 1446.8      | 7.41                                                             |
| 421.1                | 1529.0      | 7.33                                                             |
| 338.9                | 1611.2      | 7.63                                                             |
| 256.7                | 1693.4      | 7.74                                                             |
| 174.4                | 1775.7      | 7.83                                                             |
| 92.2                 | 1857.9      | 7.76                                                             |
| 10.0                 | 1940.1      | 8.59                                                             |
| 49.4                 | 1999.5      | 7.86                                                             |
| 128.3                | 2078.4      | 7.87                                                             |
| 187.5                | 2137.6      | 7.96                                                             |
| 266.4                | 2216.5      | 8.20                                                             |
| 325.6                | 2275.7      | 8.26                                                             |
| 404.4                | 2354.5      | 8.58                                                             |
| 463.6                | 2413.7      | 8.91                                                             |
| 542.5                | 2492.6      | 9.12                                                             |
| 601.7                | 2551.8      | 9.21                                                             |
| 680.6                | 2630.7      | 9.57                                                             |
| 739.7                | 2689.8      | 9.80                                                             |
| 818.6                | 2768.7      | 10.04                                                            |
| 877.8                | 2827.9      | 10.20                                                            |
| 956.7                | 2906.8      | 10.63                                                            |
| 1015.8               | 2965.9      | 10.81                                                            |
| 1094.7               | 3044.8      | 11.01                                                            |
| 1153.9               | 3104.0      | 11.13                                                            |
| 1232.8               | 3182.9      | 11.27                                                            |
| 1291.9               | 3242.0      | 11.28                                                            |
| 1370.8               | 3320.9      | 11.55                                                            |
| 1430.0               | 3380.1      | 11.78                                                            |

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=1920.1MHz<br>(dB) |
|----------------------|-------------|------------------------------------------------------------------|
|                      |             | @LO (dBm)                                                        |
|                      |             | +21                                                              |
| 10.0                 | 1930.1      | 8.68                                                             |
| 50.0                 | 1970.1      | 7.80                                                             |
| 90.0                 | 2010.1      | 7.79                                                             |
| 130.0                | 2050.1      | 7.85                                                             |
| 170.0                | 2090.1      | 7.85                                                             |
| 210.0                | 2130.1      | 7.96                                                             |
| 250.0                | 2170.1      | 7.99                                                             |
| 290.0                | 2210.1      | 8.20                                                             |
| 330.0                | 2250.1      | 8.25                                                             |
| 370.0                | 2290.1      | 8.43                                                             |
| 410.0                | 2330.1      | 8.62                                                             |
| 450.0                | 2370.1      | 8.62                                                             |
| 490.0                | 2410.1      | 8.89                                                             |
| 530.0                | 2450.1      | 8.83                                                             |
| 570.0                | 2490.1      | 9.14                                                             |
| 610.0                | 2530.1      | 9.25                                                             |
| 650.0                | 2570.1      | 9.29                                                             |
| 690.0                | 2610.1      | 9.59                                                             |
| 730.0                | 2650.1      | 9.55                                                             |
| 770.0                | 2690.1      | 9.82                                                             |
| 810.0                | 2730.1      | 9.92                                                             |
| 850.0                | 2770.1      | 9.97                                                             |
| 890.0                | 2810.1      | 10.26                                                            |
| 930.0                | 2850.1      | 10.23                                                            |
| 970.0                | 2890.1      | 10.52                                                            |
| 990.0                | 2910.1      | 10.73                                                            |
| 1030.0               | 2950.1      | 10.63                                                            |
| 1050.0               | 2970.1      | 10.71                                                            |
| 1090.0               | 3010.1      | 11.03                                                            |
| 1110.0               | 3030.1      | 10.99                                                            |
| 1150.0               | 3070.1      | 10.98                                                            |
| 1170.0               | 3090.1      | 11.13                                                            |
| 1210.0               | 3130.1      | 11.14                                                            |
| 1230.0               | 3150.1      | 11.09                                                            |
| 1270.0               | 3190.1      | 11.25                                                            |
| 1290.0               | 3210.1      | 11.30                                                            |
| 1330.0               | 3250.1      | 11.19                                                            |
| 1350.0               | 3270.1      | 11.25                                                            |
| 1390.0               | 3310.1      | 11.52                                                            |
| 1410.0               | 3330.1      | 11.51                                                            |

| IF<br>(OUT)<br>(MHz) | LO<br>(MHz) | CONVERSION LOSS<br>VS. IF FREQUENCY<br>@RF(IN)=1980.1MHz<br>(dB) |
|----------------------|-------------|------------------------------------------------------------------|
|                      |             | @LO (dBm)                                                        |
|                      |             | +21                                                              |
| 1510.0               | 470.1       | 11.99                                                            |
| 1470.0               | 510.1       | 10.64                                                            |
| 1430.0               | 550.1       | 10.18                                                            |
| 1390.0               | 590.1       | 10.28                                                            |
| 1350.0               | 630.1       | 10.20                                                            |
| 1310.0               | 670.1       | 10.22                                                            |
| 1270.0               | 710.1       | 10.23                                                            |
| 1230.0               | 750.1       | 10.16                                                            |
| 1190.0               | 790.1       | 10.30                                                            |
| 1150.0               | 830.1       | 10.06                                                            |
| 1110.0               | 870.1       | 10.10                                                            |
| 1070.0               | 910.1       | 9.93                                                             |
| 1030.0               | 950.1       | 9.74                                                             |
| 990.0                | 990.1       | 8.90                                                             |
| 950.0                | 1030.1      | 9.53                                                             |
| 910.0                | 1070.1      | 9.37                                                             |
| 870.0                | 1110.1      | 8.99                                                             |
| 830.0                | 1150.1      | 8.78                                                             |
| 790.0                | 1190.1      | 8.51                                                             |
| 750.0                | 1230.1      | 8.33                                                             |
| 710.0                | 1270.1      | 8.15                                                             |
| 670.0                | 1310.1      | 8.01                                                             |
| 630.0                | 1350.1      | 7.82                                                             |
| 590.0                | 1390.1      | 7.64                                                             |
| 550.0                | 1430.1      | 7.52                                                             |
| 510.0                | 1470.1      | 7.42                                                             |
| 470.0                | 1510.1      | 7.47                                                             |
| 430.0                | 1550.1      | 7.48                                                             |
| 390.0                | 1590.1      | 7.63                                                             |
| 350.0                | 1630.1      | 7.73                                                             |
| 310.0                | 1670.1      | 7.84                                                             |
| 270.0                | 1710.1      | 7.86                                                             |
| 230.0                | 1750.1      | 7.94                                                             |
| 190.0                | 1790.1      | 7.93                                                             |
| 150.0                | 1830.1      | 7.85                                                             |
| 130.0                | 1850.1      | 7.85                                                             |
| 90.0                 | 1890.1      | 7.73                                                             |
| 70.0                 | 1910.1      | 7.87                                                             |
| 30.0                 | 1950.1      | 7.88                                                             |
| 10.0                 | 1970.1      | 8.55                                                             |

## Typical Performance Data

| LO<br>(MHz) | LO-RF ISOLATION<br>(dB) |       |       | LO-IF ISOLATION<br>(dB) |       |       |
|-------------|-------------------------|-------|-------|-------------------------|-------|-------|
|             | @LO (dBm)               |       |       | @LO (dBm)               |       |       |
|             | +19                     | +21   | +23   | +19                     | +21   | +23   |
| 150.1       | 58.78                   | 59.54 | 59.52 | 51.88                   | 52.47 | 52.69 |
| 230.1       | 55.48                   | 56.33 | 56.26 | 48.67                   | 49.30 | 49.62 |
| 310.1       | 55.29                   | 56.26 | 56.09 | 49.71                   | 50.22 | 50.36 |
| 390.1       | 54.02                   | 55.03 | 55.12 | 50.35                   | 50.61 | 50.52 |
| 470.1       | 49.52                   | 50.22 | 50.22 | 53.86                   | 53.34 | 52.55 |
| 550.1       | 48.50                   | 49.27 | 49.44 | 50.63                   | 49.86 | 49.48 |
| 630.1       | 47.34                   | 48.12 | 48.32 | 49.76                   | 48.89 | 48.45 |
| 710.1       | 46.18                   | 46.89 | 47.21 | 48.96                   | 47.99 | 47.59 |
| 790.1       | 44.97                   | 45.73 | 46.14 | 47.58                   | 46.74 | 46.32 |
| 870.1       | 43.67                   | 44.45 | 44.94 | 45.62                   | 45.13 | 44.94 |
| 950.1       | 43.30                   | 44.14 | 44.59 | 44.01                   | 43.98 | 43.90 |
| 1030.1      | 42.62                   | 42.77 | 42.92 | 48.21                   | 47.71 | 47.29 |
| 1110.1      | 41.06                   | 41.16 | 41.14 | 51.14                   | 50.39 | 50.05 |
| 1190.1      | 40.38                   | 40.79 | 40.95 | 49.90                   | 48.88 | 48.44 |
| 1270.1      | 40.02                   | 40.70 | 41.01 | 48.80                   | 47.89 | 47.54 |
| 1350.1      | 39.83                   | 40.60 | 41.03 | 44.24                   | 43.78 | 43.55 |
| 1430.1      | 38.22                   | 38.73 | 38.96 | 38.16                   | 37.87 | 37.70 |
| 1510.1      | 33.81                   | 33.90 | 33.87 | 33.84                   | 33.62 | 33.45 |
| 1590.1      | 30.64                   | 30.88 | 31.08 | 38.33                   | 37.59 | 37.09 |
| 1670.1      | 31.09                   | 31.63 | 32.10 | 44.71                   | 42.98 | 41.30 |
| 1750.1      | 33.39                   | 34.21 | 34.85 | 35.50                   | 35.42 | 35.16 |
| 1830.1      | 36.06                   | 37.06 | 37.89 | 32.98                   | 33.01 | 32.91 |
| 1910.1      | 38.71                   | 39.88 | 40.82 | 32.05                   | 31.96 | 31.85 |
| 1990.1      | 40.63                   | 41.87 | 42.66 | 31.51                   | 31.30 | 31.09 |
| 2070.1      | 41.62                   | 42.84 | 43.60 | 31.09                   | 30.77 | 30.61 |
| 2150.1      | 41.24                   | 42.09 | 42.56 | 30.91                   | 30.42 | 29.96 |
| 2230.1      | 39.91                   | 40.17 | 40.27 | 30.82                   | 30.20 | 29.70 |
| 2310.1      | 38.08                   | 38.18 | 38.21 | 30.72                   | 30.31 | 29.98 |
| 2390.1      | 36.76                   | 36.85 | 36.92 | 30.41                   | 30.33 | 30.28 |
| 2470.1      | 35.51                   | 35.62 | 35.77 | 30.44                   | 30.44 | 30.54 |
| 2550.1      | 34.27                   | 34.76 | 35.01 | 30.21                   | 30.56 | 30.68 |
| 2630.1      | 33.19                   | 33.70 | 33.90 | 30.24                   | 30.61 | 30.59 |
| 2710.1      | 32.32                   | 32.67 | 33.05 | 30.60                   | 30.83 | 30.88 |
| 2790.1      | 31.58                   | 31.85 | 32.27 | 31.20                   | 31.31 | 31.31 |
| 2890.1      | 31.08                   | 31.24 | 31.89 | 32.36                   | 32.19 | 32.09 |
| 2970.1      | 31.24                   | 31.49 | 32.06 | 33.62                   | 33.30 | 33.16 |
| 3070.1      | 33.39                   | 34.08 | 34.56 | 35.09                   | 34.85 | 34.68 |
| 3150.1      | 36.64                   | 37.79 | 38.10 | 34.58                   | 34.74 | 34.69 |
| 3250.1      | 41.59                   | 41.16 | 39.48 | 33.45                   | 33.93 | 34.10 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +19                     | +21   | +23   |
| 400.1               | 150.1       | 29.99                   | 34.23 | 33.47 |
| 480.1               | 230.1       | 29.60                   | 32.95 | 31.43 |
| 560.1               | 310.1       | 27.99                   | 30.86 | 29.11 |
| 640.1               | 390.1       | 29.02                   | 32.30 | 31.01 |
| 720.1               | 470.1       | 26.16                   | 27.08 | 24.62 |
| 800.1               | 550.1       | 23.98                   | 25.96 | 24.66 |
| 880.1               | 630.1       | 24.04                   | 25.17 | 23.53 |
| 960.1               | 710.1       | 24.44                   | 25.59 | 24.04 |
| 1040.1              | 790.1       | 24.31                   | 25.85 | 25.15 |
| 1120.1              | 870.1       | 22.79                   | 24.02 | 23.21 |
| 1200.1              | 950.1       | 25.80                   | 28.50 | 27.35 |
| 1280.1              | 1030.1      | 42.00                   | 58.80 | 39.44 |
| 1360.1              | 1110.1      | 39.38                   | 44.87 | 35.59 |
| 1440.1              | 1190.1      | 36.34                   | 38.81 | 33.50 |
| 1520.1              | 1270.1      | 35.49                   | 37.89 | 34.65 |
| 1600.1              | 1350.1      | 35.91                   | 38.00 | 36.43 |
| 1680.1              | 1430.1      | 38.00                   | 38.97 | 39.16 |
| 1760.1              | 1510.1      | 42.28                   | 38.11 | 38.05 |
| 1840.1              | 1590.1      | 42.28                   | 35.98 | 34.19 |
| 1920.1              | 1670.1      | 40.17                   | 37.64 | 34.48 |
| 2000.1              | 1750.1      | 37.61                   | 37.36 | 35.57 |
| 2080.1              | 1830.1      | 36.61                   | 36.72 | 36.88 |
| 2160.1              | 1910.1      | 38.51                   | 38.83 | 38.87 |
| 2240.1              | 1990.1      | 40.40                   | 44.31 | 44.21 |
| 2320.1              | 2070.1      | 37.69                   | 42.51 | 40.14 |
| 2400.1              | 2150.1      | 34.26                   | 37.13 | 35.08 |
| 2480.1              | 2230.1      | 32.49                   | 34.30 | 32.30 |
| 2560.1              | 2310.1      | 32.04                   | 33.24 | 31.32 |
| 2640.1              | 2390.1      | 32.61                   | 33.80 | 31.72 |
| 2720.1              | 2470.1      | 33.58                   | 34.99 | 32.64 |
| 2800.1              | 2550.1      | 35.37                   | 37.29 | 34.40 |
| 2880.1              | 2630.1      | 38.31                   | 41.46 | 37.79 |
| 2960.1              | 2710.1      | 38.94                   | 41.02 | 41.33 |
| 3040.1              | 2790.1      | 34.87                   | 34.32 | 35.03 |
| 3140.1              | 2890.1      | 30.98                   | 29.77 | 29.86 |
| 3220.1              | 2970.1      | 29.61                   | 28.45 | 28.52 |
| 3320.1              | 3070.1      | 29.29                   | 28.57 | 28.50 |
| 3400.1              | 3150.1      | 28.90                   | 28.41 | 27.98 |
| 3500.1              | 3250.1      | 28.21                   | 27.69 | 27.08 |

# Frequency Mixer

# HJK-ED9680A/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=1730MHz<br>(:1) |      |      |
|---------------------|-------------|-----------------|------|------|-------------|-----------------|-------|-------|----------------------|--------------------------------|------|------|
|                     |             | @LO (dBm)       |      |      |             | @LO (dBm)       |       |       |                      | @LO (dBm)                      |      |      |
|                     |             | +19             | +21  | +23  |             | +19             | +21   | +23   |                      | +19                            | +21  | +23  |
| 400.1               | 150.1       | 1.82            | 1.82 | 1.82 | 150.1       | 18.70           | 18.50 | 18.30 | 50.0                 | 1.81                           | 1.96 | 2.10 |
| 480.1               | 230.1       | 2.03            | 2.03 | 2.02 | 230.1       | 19.54           | 19.76 | 19.76 | 90.0                 | 1.81                           | 1.97 | 2.10 |
| 560.1               | 310.1       | 2.33            | 2.24 | 2.20 | 310.1       | 36.97           | 36.97 | 36.20 | 130.0                | 1.81                           | 1.97 | 2.10 |
| 640.1               | 390.1       | 2.57            | 2.45 | 2.39 | 390.1       | 43.44           | 42.38 | 42.38 | 170.0                | 1.80                           | 1.95 | 2.07 |
| 720.1               | 470.1       | 2.58            | 2.27 | 2.16 | 470.1       | 39.49           | 38.61 | 37.77 | 210.0                | 1.81                           | 1.95 | 2.07 |
| 800.1               | 550.1       | 2.47            | 2.29 | 2.22 | 550.1       | 41.37           | 40.41 | 37.77 | 250.0                | 1.81                           | 1.94 | 2.05 |
| 880.1               | 630.1       | 2.68            | 2.42 | 2.31 | 630.1       | 40.41           | 39.49 | 36.97 | 290.0                | 1.81                           | 1.93 | 2.03 |
| 960.1               | 710.1       | 2.86            | 2.55 | 2.41 | 710.1       | 39.49           | 37.77 | 35.46 | 330.0                | 1.79                           | 1.90 | 1.99 |
| 1040.1              | 790.1       | 2.95            | 2.63 | 2.48 | 790.1       | 34.75           | 34.07 | 32.18 | 370.0                | 1.86                           | 1.96 | 2.04 |
| 1120.1              | 870.1       | 2.94            | 2.64 | 2.48 | 870.1       | 33.42           | 32.79 | 31.60 | 410.0                | 1.83                           | 1.92 | 1.99 |
| 1200.1              | 950.1       | 2.84            | 2.56 | 2.41 | 950.1       | 30.49           | 29.96 | 28.03 | 450.0                | 1.91                           | 1.99 | 2.05 |
| 1280.1              | 1030.1      | 2.77            | 2.49 | 2.33 | 1030.1      | 25.19           | 23.81 | 22.00 | 490.0                | 1.88                           | 1.94 | 1.99 |
| 1360.1              | 1110.1      | 2.59            | 2.33 | 2.19 | 1110.1      | 21.73           | 20.22 | 17.93 | 530.0                | 1.89                           | 1.94 | 1.98 |
| 1440.1              | 1190.1      | 2.37            | 2.14 | 2.02 | 1190.1      | 20.45           | 19.32 | 17.75 | 570.0                | 1.91                           | 1.95 | 1.98 |
| 1520.1              | 1270.1      | 2.10            | 1.91 | 1.80 | 1270.1      | 17.05           | 16.56 | 15.81 | 610.0                | 1.91                           | 1.92 | 1.94 |
| 1600.1              | 1350.1      | 1.89            | 1.72 | 1.63 | 1350.1      | 12.35           | 12.09 | 11.61 | 650.0                | 1.94                           | 1.94 | 1.95 |
| 1680.1              | 1430.1      | 1.69            | 1.55 | 1.47 | 1430.1      | 7.80            | 7.56  | 7.28  | 690.0                | 1.90                           | 1.88 | 1.87 |
| 1760.1              | 1510.1      | 1.50            | 1.40 | 1.34 | 1510.1      | 4.32            | 4.15  | 3.98  | 730.0                | 1.95                           | 1.91 | 1.90 |
| 1840.1              | 1590.1      | 1.32            | 1.28 | 1.29 | 1590.1      | 2.72            | 2.61  | 2.49  | 770.0                | 1.95                           | 1.90 | 1.88 |
| 1920.1              | 1670.1      | 1.27            | 1.32 | 1.40 | 1670.1      | 1.59            | 1.55  | 1.51  | 810.0                | 2.00                           | 1.93 | 1.90 |
| 2000.1              | 1750.1      | 1.28            | 1.36 | 1.44 | 1750.1      | 2.03            | 2.10  | 2.18  | 850.0                | 1.99                           | 1.92 | 1.88 |
| 2080.1              | 1830.1      | 1.26            | 1.32 | 1.38 | 1830.1      | 3.65            | 3.74  | 3.80  | 890.0                | 2.02                           | 1.93 | 1.88 |
| 2160.1              | 1910.1      | 1.27            | 1.28 | 1.32 | 1910.1      | 5.70            | 5.72  | 5.59  | 930.0                | 2.01                           | 1.91 | 1.86 |
| 2240.1              | 1990.1      | 1.33            | 1.31 | 1.32 | 1990.1      | 8.01            | 7.97  | 7.73  | 970.0                | 2.01                           | 1.90 | 1.84 |
| 2320.1              | 2070.1      | 1.41            | 1.36 | 1.36 | 2070.1      | 10.43           | 10.43 | 10.19 | 1010.0               | 2.00                           | 1.88 | 1.82 |
| 2400.1              | 2150.1      | 1.52            | 1.44 | 1.42 | 2150.1      | 11.77           | 11.53 | 11.03 | 1050.0               | 1.95                           | 1.83 | 1.77 |
| 2480.1              | 2230.1      | 1.63            | 1.53 | 1.49 | 2230.1      | 11.77           | 11.09 | 9.96  | 1110.0               | 1.93                           | 1.81 | 1.74 |
| 2560.1              | 2310.1      | 1.74            | 1.61 | 1.57 | 2310.1      | 11.53           | 10.69 | 9.28  | 1150.0               | 1.91                           | 1.77 | 1.70 |
| 2640.1              | 2390.1      | 1.81            | 1.68 | 1.63 | 2390.1      | 11.77           | 11.17 | 10.07 | 1210.0               | 1.84                           | 1.71 | 1.64 |
| 2720.1              | 2470.1      | 1.88            | 1.75 | 1.70 | 2470.1      | 11.85           | 11.61 | 11.03 | 1250.0               | 1.84                           | 1.71 | 1.64 |
| 2800.1              | 2550.1      | 1.95            | 1.83 | 1.76 | 2550.1      | 10.82           | 10.56 | 10.02 | 1310.0               | 1.78                           | 1.67 | 1.60 |
| 2880.1              | 2630.1      | 2.01            | 1.88 | 1.80 | 2630.1      | 9.18            | 8.81  | 8.27  | 1350.0               | 1.82                           | 1.70 | 1.64 |
| 2960.1              | 2710.1      | 2.02            | 1.88 | 1.80 | 2710.1      | 7.83            | 7.38  | 6.73  | 1410.0               | 1.73                           | 1.63 | 1.57 |
| 3040.1              | 2790.1      | 1.97            | 1.82 | 1.74 | 2790.1      | 6.78            | 6.44  | 5.95  | 1450.0               | 1.76                           | 1.67 | 1.61 |
| 3140.1              | 2890.1      | 1.97            | 1.80 | 1.72 | 2890.1      | 5.56            | 5.28  | 4.93  | 1510.0               | 1.65                           | 1.58 | 1.52 |
| 3220.1              | 2970.1      | 1.95            | 1.78 | 1.69 | 2970.1      | 5.03            | 4.84  | 4.61  | 1550.0               | 1.69                           | 1.63 | 1.57 |
| 3320.1              | 3070.1      | 1.94            | 1.79 | 1.69 | 3070.1      | 4.50            | 4.37  | 4.22  | 1610.0               | 1.64                           | 1.59 | 1.54 |
| 3400.1              | 3150.1      | 1.94            | 1.81 | 1.71 | 3150.1      | 4.27            | 4.21  | 4.14  | 1650.0               | 1.70                           | 1.65 | 1.61 |
| 3500.1              | 3250.1      | 1.95            | 1.84 | 1.76 | 3250.1      | 3.87            | 3.82  | 3.77  | 1710.0               | 1.67                           | 1.68 | 1.69 |

REV. X2

HJK-ED9680A/1

101012

Page 4 of 5



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant  
P.O. Box 350186, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4861



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



## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 15  | 14  | 26  | 20  | 27  | 31  | 37  | 32  | 32  | 44  |
| 1  | -      | 30     | +0  | 37  | 18  | 40  | 32  | 45  | 63  | 50  | 60  | 49  |
| 2  | 58     | 59     | 62  | 64  | 61  | 66  | 64  | 66  | 75  | 68  | 71  | 75  |
| 3  | >90    | >85    | 79  | >85 | 75  | >85 | 83  | 85  | >85 | >85 | >85 | >85 |
| 4  | >90    | >85    | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 |
| 5  | >90    | >85    | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 |
| 6  | >90    | >85    | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 |
| 7  | >90    | >85    | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 |
| 8  | >90    | >85    | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 |
| 9  | >90    | >85    | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 |
| 10 | >90    | >85    | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 | >85 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions:

RF IN: 1950.1 MHz; 3.00 dBm.  
LO IN: 1700.1 MHz; +21.00 dBm  
IF OUT: 250 MHz; -4.91 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 26  | 25  | 36  | 30  | 38  | 40  | 47  | 41  | 44  | 58  |
| 1  | -      | 29     | +0  | 35  | 18  | 39  | 32  | 46  | 63  | 50  | 58  | 50  |
| 2  | 38     | 49     | 54  | 51  | 54  | 55  | 57  | 55  | 66  | 60  | 66  | 70  |
| 3  | 66     | 65     | 53  | 64  | 50  | 64  | 55  | 64  | 61  | 69  | 79  | 67  |
| 4  | >90    | 80     | 74  | 80  | 82  | 73  | 76  | 85  | 82  | 88  | 80  | 84  |
| 5  | >90    | >95    | 85  | 87  | 74  | 93  | 70  | 83  | 73  | 83  | 80  | 84  |
| 6  | >90    | 91     | >95 | 93  | 92  | 87  | 94  | 84  | 93  | 87  | >95 | >95 |
| 7  | >90    | >95    | >95 | >95 | >95 | >95 | 90  | 94  | 88  | 90  | 85  | >95 |
| 8  | >90    | >95    | >95 | >95 | >95 | >95 | >95 | >95 | >95 | >95 | >95 | >95 |
| 9  | >90    | >95    | >95 | >95 | >95 | >95 | >95 | >95 | >95 | >95 | >95 | >95 |
| 10 | >90    | >95    | >95 | >95 | >95 | >95 | >95 | >95 | >95 | >95 | >95 | >95 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions:

RF IN: 1950.1 MHz; 13.00 dBm.  
LO IN: 1700.1 MHz; +21.00 dBm  
IF OUT: 250 MHz; 4.87 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.