

# Frequency Mixer

# TUF-1SM+

## Typical Performance Data

| RF (IN) (MHz) | LO (MHz) | CONVERSION LOSS IF FIXED @IF(OUT)=30MHz (dB) |       |       | RF (IN) (MHz) | LO (MHz) | IP3 INPUT (dBm) |       |       | RF (IN) (MHz) | LO (MHz) | COMPRESSION @RF IN=+1dBm (dB) |      |      |
|---------------|----------|--|-------|-------|---------------|----------|-----------------|-------|-------|---------------|----------|-------------------------------|------|------|
|               |          | @LO (dBm)                                    |       |       |               |          | @LO (dBm)       |       |       |               |          | @LO (dBm)                     |      |      |
|               |          | +4   | +7    | +10   |               |          | +4              | +7    | +10   |               |          | +4                            | +7   | +10  |
| 2.0           | 32.0     | 7.09   | 6.81  | 6.58  | 10.1          | 40.1     | 17.26           | 20.30 | 18.82 | 10.1          | 40.1     | 0.91                          | 0.64 | 0.45 |
| 4.0           | 34.0     | 6.68   | 6.40  | 6.19  | 51.1          | 81.1     | 16.74           | 17.65 | 19.18 | 51.1          | 81.1     | 0.82                          | 0.61 | 0.39 |
| 5.0           | 35.0     | 6.62   | 6.34  | 6.12  | 92.0          | 122.0    | 14.72           | 17.20 | 20.51 | 92.0          | 122.0    | 0.71                          | 0.54 | 0.35 |
| 10.0          | 40.0     | 6.54   | 6.25  | 6.02  | 133.0         | 163.0    | 16.79           | 20.84 | 19.84 | 133.0         | 163.0    | 0.73                          | 0.50 | 0.34 |
| 51.1          | 81.1     | 6.18   | 5.88  | 5.69  | 173.9         | 203.9    | 17.32           | 19.65 | 26.13 | 173.9         | 203.9    | 0.70                          | 0.48 | 0.33 |
| 92.0          | 122.0    | 6.17   | 5.85  | 5.68  | 214.9         | 244.9    | 18.65           | 20.56 | 22.59 | 214.9         | 244.9    | 0.65                          | 0.48 | 0.33 |
| 133.0         | 163.0    | 6.16   | 5.85  | 5.72  | 255.8         | 285.8    | 22.56           | 20.24 | 21.68 | 255.8         | 285.8    | 0.76                          | 0.47 | 0.33 |
| 173.9         | 203.9    | 6.20   | 5.87  | 5.75  | 296.8         | 326.8    | 20.39           | 22.81 | 25.09 | 296.8         | 326.8    | 0.73                          | 0.49 | 0.34 |
| 214.9         | 244.9    | 6.12   | 5.83  | 5.72  | 337.7         | 367.7    | 17.65           | 20.36 | 19.65 | 337.7         | 367.7    | 0.73                          | 0.50 | 0.36 |
| 255.8         | 285.8    | 6.20   | 5.88  | 5.73  | 378.7         | 408.7    | 17.64           | 17.81 | 26.11 | 378.7         | 408.7    | 0.64                          | 0.47 | 0.34 |
| 337.7         | 367.7    | 6.21   | 5.89  | 5.77  | 419.6         | 449.6    | 17.16           | 18.21 | 19.16 | 419.6         | 449.6    | 0.63                          | 0.47 | 0.34 |
| 378.7         | 408.7    | 6.21   | 5.93  | 5.79  | 440.1         | 470.1    | 22.67           | 23.79 | 23.56 | 440.1         | 470.1    | 0.69                          | 0.47 | 0.33 |
| 419.6         | 449.6    | 6.26   | 5.97  | 5.82  | 481.1         | 511.1    | 19.18           | 22.36 | 23.55 | 481.1         | 511.1    | 0.67                          | 0.49 | 0.34 |
| 440.1         | 470.1    | 6.26   | 5.99  | 5.83  | 501.5         | 531.5    | 18.44           | 15.93 | 17.10 | 501.5         | 531.5    | 0.72                          | 0.50 | 0.35 |
| 481.1         | 511.1    | 6.36   | 6.04  | 5.87  | 542.5         | 572.5    | 15.45           | 24.27 | 19.27 | 542.5         | 572.5    | 0.77                          | 0.52 | 0.37 |
| 501.5         | 531.5    | 6.31   | 6.02  | 5.90  | 563.0         | 593.0    | 14.77           | 18.01 | 24.66 | 563.0         | 593.0    | 0.81                          | 0.57 | 0.38 |
| 542.5         | 572.5    | 6.42   | 6.14  | 5.96  | 603.9         | 633.9    | 12.37           | 12.80 | 15.91 | 603.9         | 633.9    | 0.85                          | 0.59 | 0.41 |
| 563.0         | 593.0    | 6.43   | 6.18  | 6.04  | 624.4         | 654.4    | 11.33           | 12.92 | 14.56 | 624.4         | 654.4    | 0.92                          | 0.64 | 0.44 |
| 603.9         | 633.9    | 6.52   | 6.31  | 6.17  | 665.3         | 695.3    | 11.84           | 13.59 | 16.21 | 665.3         | 695.3    | 0.99                          | 0.67 | 0.47 |
| 665.3         | 695.3    | 6.69   | 6.40  | 6.30  | 685.8         | 715.8    | 13.28           | 15.27 | 18.35 | 685.8         | 715.8    | 1.02                          | 0.71 | 0.47 |
| 685.8         | 715.8    | 6.67   | 6.45  | 6.30  | 726.8         | 756.8    | 13.04           | 17.11 | 23.56 | 726.8         | 756.8    | 1.14                          | 0.79 | 0.56 |
| 726.8         | 756.8    | 6.83   | 6.52  | 6.36  | 747.2         | 777.2    | 11.99           | 18.34 | 21.27 | 747.2         | 777.2    | 1.23                          | 0.89 | 0.62 |
| 747.2         | 777.2    | 6.89   | 6.59  | 6.40  | 788.2         | 818.2    | 10.13           | 17.81 | 20.47 | 788.2         | 818.2    | 1.28                          | 0.97 | 0.69 |
| 788.2         | 818.2    | 7.12   | 6.65  | 6.47  | 808.7         | 838.7    | 7.97            | 15.40 | 19.58 | 808.7         | 838.7    | 1.28                          | 0.99 | 0.72 |
| 808.7         | 838.7    | 7.26   | 6.74  | 6.51  | 849.6         | 879.6    | 6.56            | 11.80 | 22.44 | 849.6         | 879.6    | 1.34                          | 1.08 | 0.79 |
| 849.6         | 879.6    | 7.53   | 6.88  | 6.55  | 870.1         | 900.1    | 6.54            | 10.54 | 19.45 | 870.1         | 900.1    | 1.24                          | 1.03 | 0.78 |
| 870.1         | 900.1    | 7.71   | 7.04  | 6.67  | 911.1         | 941.1    | 6.91            | 9.77  | 15.23 | 911.1         | 941.1    | 1.14                          | 1.03 | 0.82 |
| 911.1         | 941.1    | 8.02   | 7.33  | 6.88  | 931.5         | 961.5    | 7.35            | 9.96  | 14.41 | 931.5         | 961.5    | 1.03                          | 0.94 | 0.76 |
| 931.5         | 961.5    | 8.31   | 7.56  | 7.03  | 972.5         | 1002.5   | 7.74            | 10.72 | 15.42 | 972.5         | 1002.5   | 0.83                          | 0.82 | 0.73 |
| 972.5         | 1002.5   | 8.71   | 7.90  | 7.33  | 993.0         | 1023.0   | 8.38            | 11.23 | 14.91 | 993.0         | 1023.0   | 0.69                          | 0.69 | 0.64 |
| 993.0         | 1023.0   | 8.94   | 8.18  | 7.55  | 1033.9        | 1063.9   | 8.04            | 10.04 | 13.11 | 1033.9        | 1063.9   | 0.52                          | 0.54 | 0.51 |
| 1033.9        | 1063.9   | 9.28   | 8.55  | 7.92  | 1054.4        | 1084.4   | 8.37            | 9.94  | 12.54 | 1054.4        | 1084.4   | 0.41                          | 0.46 | 0.44 |
| 1054.4        | 1084.4   | 9.43   | 8.71  | 8.16  | 1095.3        | 1125.3   | 7.82            | 9.00  | 11.09 | 1095.3        | 1125.3   | 0.32                          | 0.34 | 0.35 |
| 1095.3        | 1125.3   | 9.78   | 9.07  | 8.44  | 1115.8        | 1145.8   | 7.89            | 9.41  | 11.02 | 1115.8        | 1145.8   | 0.36                          | 0.33 | 0.30 |
| 1156.8        | 1186.8   | 10.11  | 9.39  | 8.79  | 1156.8        | 1186.8   | 8.26            | 9.06  | 11.35 | 1156.8        | 1186.8   | 0.29                          | 0.27 | 0.26 |
| 1177.2        | 1207.2   | 10.25  | 9.52  | 8.92  | 1177.2        | 1207.2   | 7.79            | 9.59  | 12.03 | 1177.2        | 1207.2   | 0.28                          | 0.28 | 0.28 |
| 1218.2        | 1248.2   | 10.42  | 9.65  | 9.18  | 1218.2        | 1248.2   | 9.12            | 10.83 | 12.77 | 1218.2        | 1248.2   | 0.33                          | 0.29 | 0.27 |
| 1238.7        | 1268.7   | 10.49  | 9.78  | 9.32  | 1238.7        | 1268.7   | 10.17           | 12.12 | 13.16 | 1238.7        | 1268.7   | 0.35                          | 0.30 | 0.27 |
| 1279.6        | 1309.6   | 10.77  | 10.19 | 9.80  | 1279.6        | 1309.6   | 11.03           | 13.04 | 13.51 | 1279.6        | 1309.6   | 0.38                          | 0.32 | 0.26 |
| 1300.1        | 1330.1   | 10.95  | 10.37 | 10.06 | 1300.1        | 1330.1   | 11.44           | 13.10 | 13.71 | 1300.1        | 1330.1   | 0.38                          | 0.33 | 0.24 |



# Frequency Mixer

# TUF-1SM+

## Typical Performance Data

| IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=300.1MHz (dB) | IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=10.1MHz (dB) | IF (OUT) (MHz) | LO (MHz) | CONVERSION LOSS VS. IF FREQUENCY @RF(IN)=600.1MHz (dB) |
|----------------|----------|--|----------------|----------|---|----------------|----------|--|
|                |          | @LO (dBm)  |                |          | @LO (dBm)   |                |          | @LO (dBm)  |
|                |          | +7   |                |          | +7  |                |          | +7   |
| 290.0          | 10.1     | 5.97   | 10.0           | 20.1     | 5.66  | 590.0          | 10.1     | 6.35   |
| 282.8          | 17.3     | 6.00   | 24.9           | 35.0     | 5.56  | 575.1          | 25.0     | 6.28   |
| 275.6          | 24.5     | 5.95   | 39.7           | 49.8     | 5.58  | 560.3          | 39.8     | 6.25   |
| 268.5          | 31.6     | 5.94   | 54.6           | 64.7     | 5.66  | 545.4          | 54.7     | 6.21   |
| 261.3          | 38.8     | 5.88   | 69.5           | 79.6     | 5.64  | 530.5          | 69.6     | 6.23   |
| 254.1          | 46.0     | 5.91   | 84.4           | 94.5     | 5.70  | 515.6          | 84.5     | 6.19   |
| 246.9          | 53.2     | 5.91   | 99.2           | 109.3    | 5.68  | 500.8          | 99.3     | 6.13   |
| 239.7          | 60.4     | 5.92   | 114.1          | 124.2    | 5.69  | 485.9          | 114.2    | 6.12   |
| 232.6          | 67.5     | 5.88   | 129.0          | 139.1    | 5.68  | 471.0          | 129.1    | 6.06   |
| 225.4          | 74.7     | 5.88   | 143.8          | 153.9    | 5.71  | 456.2          | 143.9    | 6.10   |
| 218.2          | 81.9     | 5.85   | 158.7          | 168.8    | 5.75  | 441.3          | 158.8    | 6.10   |
| 211.0          | 89.1     | 5.91   | 173.6          | 183.7    | 5.76  | 426.4          | 173.7    | 6.13   |
| 203.8          | 96.3     | 5.85   | 188.5          | 198.6    | 5.75  | 411.5          | 188.6    | 6.08   |
| 196.7          | 103.4    | 5.86   | 203.3          | 213.4    | 5.73  | 396.7          | 203.4    | 6.06   |
| 189.5          | 110.6    | 5.83   | 218.2          | 228.3    | 5.73  | 381.8          | 218.3    | 6.10   |
| 182.3          | 117.8    | 5.82   | 233.1          | 243.2    | 5.72  | 366.9          | 233.2    | 6.08   |
| 175.1          | 125.0    | 5.82   | 247.9          | 258.0    | 5.77  | 352.1          | 248.0    | 6.11   |
| 167.9          | 132.2    | 5.81   | 262.8          | 272.9    | 5.79  | 337.2          | 262.9    | 6.09   |
| 160.8          | 139.3    | 5.82   | 277.7          | 287.8    | 5.79  | 322.3          | 277.8    | 6.14   |
| 153.6          | 146.5    | 5.77   | 292.6          | 302.7    | 5.79  | 307.4          | 292.7    | 6.12   |
| 146.4          | 153.7    | 5.80   | 307.4          | 317.5    | 5.77  | 292.6          | 307.5    | 6.11   |
| 139.2          | 160.9    | 5.82   | 322.3          | 332.4    | 5.81  | 277.7          | 322.4    | 6.10   |
| 132.1          | 168.0    | 5.84   | 337.2          | 347.3    | 5.79  | 262.8          | 337.3    | 6.10   |
| 124.9          | 175.2    | 5.81   | 352.1          | 362.2    | 5.82  | 247.9          | 352.2    | 6.15   |
| 117.7          | 182.4    | 5.82   | 366.9          | 377.0    | 5.85  | 233.1          | 367.0    | 6.13   |
| 110.5          | 189.6    | 5.82   | 381.8          | 391.9    | 5.84  | 218.2          | 381.9    | 6.18   |
| 103.3          | 196.8    | 5.83   | 396.7          | 406.8    | 5.84  | 203.3          | 396.8    | 6.17   |
| 96.2           | 203.9    | 5.84   | 411.5          | 421.6    | 5.79  | 188.5          | 411.6    | 6.17   |
| 89.0           | 211.1    | 5.81   | 426.4          | 436.5    | 5.86  | 173.6          | 426.5    | 6.18   |
| 81.8           | 218.3    | 5.81   | 441.3          | 451.4    | 5.89  | 158.7          | 441.4    | 6.16   |
| 74.6           | 225.5    | 5.80   | 456.2          | 466.3    | 5.89  | 143.8          | 456.3    | 6.20   |
| 67.4           | 232.7    | 5.82   | 471.0          | 481.1    | 5.88  | 129.0          | 471.1    | 6.17   |
| 60.3           | 239.8    | 5.82   | 485.9          | 496.0    | 5.87  | 114.1          | 486.0    | 6.18   |
| 53.1           | 247.0    | 5.82   | 500.8          | 510.9    | 5.91  | 99.2           | 500.9    | 6.15   |
| 45.9           | 254.2    | 5.82   | 515.6          | 525.7    | 5.90  | 84.4           | 515.7    | 6.16   |
| 38.7           | 261.4    | 5.85   | 530.5          | 540.6    | 5.95  | 69.5           | 530.6    | 6.17   |
| 31.5           | 268.6    | 5.87   | 545.4          | 555.5    | 5.98  | 54.6           | 545.5    | 6.18   |
| 24.4           | 275.7    | 5.90   | 560.3          | 570.4    | 6.02  | 39.7           | 560.4    | 6.22   |
| 17.2           | 282.9    | 5.89   | 575.1          | 585.2    | 6.00  | 24.9           | 575.2    | 6.25   |
| 10.0           | 290.1    | 5.92   | 590.0          | 600.1    | 5.98  | 10.0           | 590.1    | 6.31   |

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# Frequency Mixer

# TUF-1SM+

## Typical Performance Data

| LO<br>(MHz) | LO-RF ISOLATION<br>(dB) |       |       | LO-IF ISOLATION<br>(dB) |       |       |
|-------------|-------------------------|-------|-------|-------------------------|-------|-------|
|             | @LO (dBm)               |       |       | @LO (dBm)               |       |       |
|             | +4                      | +7    | +10   | +4                      | +7    | +10   |
| 2.0         | 87.30                   | 81.85 | 77.21 | 68.80                   | 72.15 | 73.61 |
| 4.0         | 78.00                   | 76.35 | 73.81 | 66.70                   | 68.25 | 68.21 |
| 5.0         | 75.70                   | 74.35 | 72.61 | 65.80                   | 66.65 | 66.71 |
| 10.0        | 69.63                   | 69.58 | 68.44 | 62.53                   | 62.18 | 61.74 |
| 51.1        | 61.70                   | 62.73 | 63.60 | 54.48                   | 55.97 | 55.64 |
| 92.0        | 58.28                   | 58.95 | 59.33 | 52.97                   | 53.83 | 53.67 |
| 133.0       | 55.96                   | 56.59 | 56.74 | 52.76                   | 52.25 | 51.83 |
| 173.9       | 53.82                   | 54.49 | 54.69 | 52.27                   | 51.48 | 50.37 |
| 214.9       | 52.81                   | 52.98 | 52.96 | 52.21                   | 50.43 | 49.21 |
| 255.8       | 51.29                   | 51.70 | 51.73 | 51.55                   | 49.40 | 48.05 |
| 337.7       | 49.52                   | 49.70 | 49.71 | 48.41                   | 46.85 | 45.85 |
| 378.7       | 48.12                   | 48.50 | 48.55 | 46.31                   | 45.39 | 45.01 |
| 419.6       | 46.95                   | 47.01 | 46.97 | 45.17                   | 44.05 | 43.27 |
| 440.1       | 46.46                   | 46.52 | 46.63 | 44.33                   | 43.64 | 42.82 |
| 481.1       | 46.26                   | 46.14 | 46.06 | 44.02                   | 43.84 | 43.52 |
| 501.5       | 46.22                   | 45.94 | 45.84 | 43.08                   | 43.08 | 42.95 |
| 542.5       | 46.63                   | 46.46 | 45.97 | 42.72                   | 42.47 | 42.46 |
| 563.0       | 46.37                   | 46.23 | 45.90 | 41.89                   | 41.48 | 41.21 |
| 603.9       | 45.84                   | 45.54 | 45.15 | 41.44                   | 41.43 | 40.76 |
| 665.3       | 44.09                   | 43.76 | 43.38 | 39.32                   | 40.48 | 40.65 |
| 685.8       | 43.77                   | 43.40 | 43.06 | 38.68                   | 40.13 | 40.78 |
| 726.8       | 42.56                   | 42.45 | 42.24 | 37.08                   | 38.94 | 40.34 |
| 747.2       | 42.14                   | 42.20 | 42.11 | 36.41                   | 38.18 | 39.67 |
| 788.2       | 40.98                   | 41.11 | 41.19 | 35.27                   | 36.61 | 38.12 |
| 808.7       | 40.55                   | 40.59 | 40.47 | 35.31                   | 36.48 | 37.91 |
| 849.6       | 40.22                   | 40.47 | 40.48 | 34.86                   | 35.52 | 36.97 |
| 870.1       | 40.25                   | 40.38 | 40.51 | 35.53                   | 35.71 | 36.99 |
| 911.1       | 40.10                   | 40.26 | 40.31 | 35.70                   | 35.42 | 36.37 |
| 931.5       | 40.15                   | 40.23 | 40.31 | 36.48                   | 35.91 | 36.52 |
| 972.5       | 40.33                   | 40.46 | 40.55 | 37.19                   | 36.45 | 36.57 |
| 993.0       | 39.99                   | 40.03 | 39.86 | 38.07                   | 37.36 | 37.05 |
| 1033.9      | 40.28                   | 40.23 | 40.10 | 38.55                   | 38.63 | 38.03 |
| 1054.4      | 40.19                   | 40.41 | 40.57 | 38.41                   | 39.30 | 39.35 |
| 1095.3      | 39.78                   | 39.88 | 40.04 | 36.63                   | 37.47 | 38.56 |
| 1156.8      | 38.84                   | 38.55 | 38.32 | 33.95                   | 33.05 | 32.62 |
| 1177.2      | 38.52                   | 37.95 | 37.56 | 33.57                   | 32.19 | 31.47 |
| 1218.2      | 37.95                   | 37.15 | 36.71 | 32.69                   | 30.84 | 29.88 |
| 1238.7      | 37.98                   | 37.22 | 36.69 | 32.31                   | 30.37 | 29.27 |
| 1279.6      | 37.55                   | 36.60 | 36.02 | 31.70                   | 29.61 | 28.41 |
| 1300.1      | 37.21                   | 36.24 | 35.52 | 31.41                   | 29.24 | 27.96 |

| RF<br>(IN)<br>(MHz) | LO<br>(MHz) | RF-IF ISOLATION<br>(dB) |       |       |
|---------------------|-------------|-------------------------|-------|-------|
|                     |             | @LO (dBm)               |       |       |
|                     |             | +4                      | +7    | +10   |
| 10.1                | 40.1        | 47.19                   | 49.02 | 51.18 |
| 51.1                | 81.1        | 35.95                   | 35.74 | 35.74 |
| 92.0                | 122.0       | 31.27                   | 31.22 | 31.17 |
| 133.0               | 163.0       | 28.62                   | 28.63 | 28.54 |
| 173.9               | 203.9       | 27.07                   | 27.08 | 27.11 |
| 214.9               | 244.9       | 25.98                   | 26.08 | 26.05 |
| 255.8               | 285.8       | 25.52                   | 25.54 | 25.54 |
| 296.8               | 326.8       | 25.50                   | 25.66 | 25.67 |
| 337.7               | 367.7       | 25.41                   | 25.80 | 25.96 |
| 378.7               | 408.7       | 25.61                   | 25.87 | 26.09 |
| 419.6               | 449.6       | 26.07                   | 26.11 | 26.09 |
| 440.1               | 470.1       | 26.59                   | 26.57 | 26.54 |
| 481.1               | 511.1       | 26.56                   | 26.77 | 26.90 |
| 501.5               | 531.5       | 26.12                   | 26.67 | 27.05 |
| 542.5               | 572.5       | 24.04                   | 24.66 | 25.30 |
| 563.0               | 593.0       | 22.82                   | 23.33 | 23.81 |
| 603.9               | 633.9       | 20.78                   | 21.01 | 21.25 |
| 624.4               | 654.4       | 19.82                   | 19.98 | 20.11 |
| 665.3               | 695.3       | 18.49                   | 18.45 | 18.48 |
| 685.8               | 715.8       | 17.88                   | 17.79 | 17.77 |
| 726.8               | 756.8       | 16.96                   | 16.74 | 16.69 |
| 747.2               | 777.2       | 16.45                   | 16.27 | 16.15 |
| 788.2               | 818.2       | 15.82                   | 15.56 | 15.49 |
| 808.7               | 838.7       | 15.56                   | 15.37 | 15.28 |
| 849.6               | 879.6       | 15.09                   | 14.94 | 14.84 |
| 870.1               | 900.1       | 14.89                   | 14.61 | 14.54 |
| 911.1               | 941.1       | 14.46                   | 14.36 | 14.30 |
| 931.5               | 961.5       | 14.20                   | 14.22 | 14.19 |
| 972.5               | 1002.5      | 14.00                   | 14.08 | 14.10 |
| 993.0               | 1023.0      | 13.91                   | 14.02 | 14.11 |
| 1033.9              | 1063.9      | 13.88                   | 14.00 | 14.13 |
| 1054.4              | 1084.4      | 13.86                   | 13.99 | 14.13 |
| 1095.3              | 1125.3      | 13.60                   | 13.87 | 13.98 |
| 1115.8              | 1145.8      | 13.55                   | 13.84 | 13.98 |
| 1156.8              | 1186.8      | 13.49                   | 13.72 | 13.95 |
| 1177.2              | 1207.2      | 13.38                   | 13.75 | 13.94 |
| 1218.2              | 1248.2      | 13.22                   | 13.56 | 13.71 |
| 1238.7              | 1268.7      | 13.13                   | 13.45 | 13.60 |
| 1279.6              | 1309.6      | 12.89                   | 13.15 | 13.22 |
| 1300.1              | 1330.1      | 12.75                   | 12.95 | 12.98 |

# Frequency Mixer

# TUF-1SM+

## Typical Performance Data

| RF (IN)<br>(MHz) | LO<br>(MHz) | RF VSWR (:1) |      |      |
|------------------|-------------|--------------|------|------|
|                  |             | @LO (dBm)    |      |      |
|                  |             | +4           | +7   | +10  |
| 2.0              | 32.0        | 1.53         | 1.56 | 1.58 |
| 4.0              | 34.0        | 1.28         | 1.31 | 1.34 |
| 5.0              | 35.0        | 1.22         | 1.25 | 1.29 |
| 10.0             | 40.0        | 1.10         | 1.15 | 1.20 |
| 51.1             | 81.1        | 1.09         | 1.04 | 1.09 |
| 92.0             | 122.0       | 1.07         | 1.06 | 1.11 |
| 133.0            | 163.0       | 1.08         | 1.09 | 1.14 |
| 173.9            | 203.9       | 1.09         | 1.10 | 1.15 |
| 214.9            | 244.9       | 1.10         | 1.13 | 1.18 |
| 255.8            | 285.8       | 1.13         | 1.16 | 1.20 |
| 296.8            | 326.8       | 1.16         | 1.19 | 1.23 |
| 337.7            | 367.7       | 1.18         | 1.21 | 1.25 |
| 378.7            | 408.7       | 1.20         | 1.23 | 1.27 |
| 419.6            | 449.6       | 1.22         | 1.25 | 1.28 |
| 440.1            | 470.1       | 1.25         | 1.28 | 1.31 |
| 481.1            | 511.1       | 1.27         | 1.31 | 1.35 |
| 501.5            | 531.5       | 1.30         | 1.34 | 1.38 |
| 542.5            | 572.5       | 1.31         | 1.36 | 1.41 |
| 563.0            | 593.0       | 1.32         | 1.37 | 1.42 |
| 603.9            | 633.9       | 1.33         | 1.38 | 1.42 |
| 624.4            | 654.4       | 1.33         | 1.38 | 1.42 |
| 665.3            | 695.3       | 1.33         | 1.38 | 1.42 |
| 685.8            | 715.8       | 1.34         | 1.38 | 1.42 |
| 726.8            | 756.8       | 1.33         | 1.36 | 1.40 |
| 747.2            | 777.2       | 1.33         | 1.36 | 1.39 |
| 788.2            | 818.2       | 1.36         | 1.37 | 1.39 |
| 808.7            | 838.7       | 1.38         | 1.39 | 1.40 |
| 849.6            | 879.6       | 1.48         | 1.47 | 1.47 |
| 870.1            | 900.1       | 1.55         | 1.52 | 1.52 |
| 911.1            | 941.1       | 1.72         | 1.67 | 1.65 |
| 931.5            | 961.5       | 1.82         | 1.76 | 1.73 |
| 972.5            | 1002.5      | 2.03         | 1.96 | 1.91 |
| 993.0            | 1023.0      | 2.13         | 2.06 | 2.01 |
| 1033.9           | 1063.9      | 2.34         | 2.27 | 2.21 |
| 1054.4           | 1084.4      | 2.42         | 2.35 | 2.30 |
| 1095.3           | 1125.3      | 2.60         | 2.53 | 2.48 |
| 1115.8           | 1145.8      | 2.67         | 2.60 | 2.55 |
| 1156.8           | 1186.8      | 2.78         | 2.72 | 2.67 |
| 1177.2           | 1207.2      | 2.82         | 2.77 | 2.72 |
| 1218.2           | 1248.2      | 2.89         | 2.84 | 2.79 |
| 1238.7           | 1268.7      | 2.92         | 2.88 | 2.83 |
| 1279.6           | 1309.6      | 2.97         | 2.95 | 2.92 |
| 1300.1           | 1330.1      | 3.00         | 2.98 | 2.95 |

| LO<br>(MHz) | LO VSWR (:1) |      |      |
|-------------|--------------|------|------|
|             | @LO (dBm)    |      |      |
|             | +4           | +7   | +10  |
| 2.0         | 1.90         | 2.71 | 3.80 |
| 4.0         | 1.82         | 2.64 | 3.73 |
| 5.0         | 1.81         | 2.62 | 3.70 |
| 10.0        | 1.67         | 2.47 | 3.54 |
| 51.1        | 1.75         | 2.61 | 3.72 |
| 92.0        | 1.65         | 2.38 | 3.30 |
| 133.0       | 1.71         | 2.54 | 3.58 |
| 173.9       | 1.64         | 2.37 | 3.29 |
| 214.9       | 1.69         | 2.44 | 3.42 |
| 255.8       | 1.68         | 2.43 | 3.37 |
| 296.8       | 1.66         | 2.38 | 3.29 |
| 337.7       | 1.72         | 2.47 | 3.41 |
| 378.7       | 1.68         | 2.38 | 3.26 |
| 419.6       | 1.73         | 2.46 | 3.37 |
| 440.1       | 1.74         | 2.46 | 3.35 |
| 481.1       | 1.72         | 2.40 | 3.25 |
| 501.5       | 1.74         | 2.43 | 3.29 |
| 542.5       | 1.78         | 2.46 | 3.31 |
| 563.0       | 1.78         | 2.44 | 3.27 |
| 603.9       | 1.80         | 2.47 | 3.32 |
| 624.4       | 1.83         | 2.49 | 3.34 |
| 665.3       | 1.82         | 2.45 | 3.25 |
| 685.8       | 1.83         | 2.45 | 3.25 |
| 726.8       | 1.87         | 2.48 | 3.27 |
| 747.2       | 1.88         | 2.47 | 3.25 |
| 788.2       | 1.92         | 2.50 | 3.27 |
| 808.7       | 1.96         | 2.55 | 3.31 |
| 849.6       | 1.99         | 2.57 | 3.30 |
| 870.1       | 2.01         | 2.59 | 3.33 |
| 911.1       | 2.05         | 2.64 | 3.38 |
| 931.5       | 2.06         | 2.65 | 3.38 |
| 972.5       | 2.07         | 2.66 | 3.40 |
| 993.0       | 2.08         | 2.68 | 3.42 |
| 1033.9      | 2.08         | 2.66 | 3.39 |
| 1054.4      | 2.08         | 2.66 | 3.38 |
| 1095.3      | 2.09         | 2.65 | 3.37 |
| 1115.8      | 2.08         | 2.63 | 3.34 |
| 1156.8      | 2.07         | 2.60 | 3.30 |
| 1177.2      | 2.07         | 2.60 | 3.30 |
| 1218.2      | 2.06         | 2.57 | 3.25 |
| 1238.7      | 2.06         | 2.57 | 3.25 |
| 1279.6      | 2.09         | 2.60 | 3.29 |
| 1300.1      | 2.11         | 2.60 | 3.28 |

| IF (OUT)<br>(MHz) | IF VSWR @LO=600.1MHz (:1) |      |      |
|-------------------|---------------------------|------|------|
|                   | @LO (dBm)                 |      |      |
|                   | +4                        | +7   | +10  |
| 2.0               | 1.34                      | 1.19 | 1.09 |
| 4.0               | 1.34                      | 1.19 | 1.10 |
| 5.0               | 1.34                      | 1.19 | 1.09 |
| 10.0              | 1.35                      | 1.19 | 1.10 |
| 25.1              | 1.68                      | 1.50 | 1.35 |
| 40.3              | 1.71                      | 1.51 | 1.36 |
| 55.4              | 1.76                      | 1.54 | 1.39 |
| 70.5              | 1.79                      | 1.57 | 1.42 |
| 85.6              | 1.76                      | 1.56 | 1.41 |
| 100.8             | 1.73                      | 1.54 | 1.38 |
| 115.9             | 1.73                      | 1.54 | 1.39 |
| 131.0             | 1.76                      | 1.57 | 1.42 |
| 146.2             | 1.80                      | 1.61 | 1.46 |
| 161.3             | 1.80                      | 1.60 | 1.46 |
| 176.4             | 1.78                      | 1.58 | 1.44 |
| 191.5             | 1.77                      | 1.58 | 1.43 |
| 206.7             | 1.77                      | 1.59 | 1.44 |
| 221.8             | 1.77                      | 1.59 | 1.45 |
| 236.9             | 1.77                      | 1.59 | 1.45 |
| 252.1             | 1.78                      | 1.60 | 1.47 |
| 267.2             | 1.81                      | 1.63 | 1.49 |
| 282.3             | 1.82                      | 1.65 | 1.51 |
| 297.4             | 1.81                      | 1.64 | 1.51 |
| 312.6             | 1.81                      | 1.64 | 1.51 |
| 327.7             | 1.83                      | 1.67 | 1.53 |
| 342.8             | 1.87                      | 1.70 | 1.57 |
| 357.9             | 1.89                      | 1.73 | 1.60 |
| 373.1             | 1.90                      | 1.73 | 1.61 |
| 388.2             | 1.89                      | 1.73 | 1.61 |
| 403.3             | 1.90                      | 1.74 | 1.61 |
| 418.5             | 1.91                      | 1.76 | 1.63 |
| 433.6             | 1.91                      | 1.76 | 1.64 |
| 448.7             | 1.91                      | 1.76 | 1.64 |
| 463.8             | 1.92                      | 1.77 | 1.66 |
| 479.0             | 1.94                      | 1.79 | 1.69 |
| 494.1             | 1.96                      | 1.81 | 1.71 |
| 509.2             | 1.96                      | 1.82 | 1.71 |
| 524.4             | 1.95                      | 1.81 | 1.70 |
| 539.5             | 1.94                      | 1.80 | 1.70 |
| 554.6             | 1.94                      | 1.81 | 1.71 |
| 569.7             | 1.97                      | 1.84 | 1.75 |
| 584.9             | 2.01                      | 1.88 | 1.79 |
| 600.0             | 2.17                      | 2.20 | 2.23 |

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## Harmonics Tables

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 20  | 26  | 27  | 52  | 23  | 39  | 27  | 53  | 28  | 50  |
| 1  | -      | 20     | +0  | 29  | 12  | 32  | 17  | 34  | 31  | 50  | 50  | 49  |
| 2  | >100   | 70     | 61  | 71  | 62  | 70  | 61  | 72  | 67  | 73  | 62  | >80 |
| 3  | >100   | >80    | 73  | >80 | 76  | >80 | 65  | >80 | 70  | >80 | 72  | >80 |
| 4  | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 |
| 5  | >100   | >80    | >80 | >80 | >80 | >80 | 79  | >80 | >80 | >80 | >80 | >80 |
| 6  | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 |
| 7  | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 |
| 8  | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 |
| 9  | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | >80 | 76  | >80 | >80 |
| 10 | >100   | >80    | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 | >80 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 300.1 MHz; -14.00 dBm.  
 LO IN: 330.01 MHz; +7.00 dBm  
 IF OUT: 29.91 MHz; -19.96 dBm

RF HARMONICS ORDER

|    | (-dBm) | (-dBc) |     |     |     |     |     |     |     |     |     |     |
|----|--------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 0  | -      | -      | 29  | 36  | 39  | 57  | 33  | 52  | 40  | 64  | 44  | 71  |
| 1  | -      | 20     | +0  | 29  | 12  | 33  | 18  | 36  | 32  | 56  | 53  | 55  |
| 2  | >100   | 61     | 53  | 66  | 54  | 64  | 55  | 67  | 57  | 66  | 55  | 76  |
| 3  | >100   | 53     | 50  | 58  | 52  | 60  | 46  | 58  | 46  | 60  | 56  | 67  |
| 4  | >100   | 81     | >90 | 78  | 77  | 76  | 77  | 73  | 69  | 78  | 83  | >90 |
| 5  | >100   | 81     | 65  | 65  | 60  | 68  | 58  | 67  | 57  | 77  | 57  | 73  |
| 6  | >100   | >90    | 87  | 90  | 87  | >90 | 87  | >90 | 87  | >90 | 90  | >90 |
| 7  | >100   | >90    | 79  | 84  | 75  | >90 | 80  | 88  | 89  | 85  | 83  | 86  |
| 8  | >100   | >90    | >90 | >90 | >90 | >90 | >90 | >90 | >90 | >90 | >90 | >90 |
| 9  | >100   | >90    | >90 | >90 | 88  | >90 | 88  | >90 | >90 | >90 | >90 | >90 |
| 10 | >100   | >90    | >90 | >90 | >90 | >90 | >90 | >90 | >90 | >90 | >90 | >90 |
|    | RF CAL | 0      | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  |

### LO HARMONICS ORDER

Test conditions: RF IN: 300.1 MHz; -4.00 dBm.  
 LO IN: 330.01 MHz; +7.00 dBm  
 IF OUT: 29.91 MHz; -10.01 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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