MITSUBISHI
ELECTRONIC DEVICE GROUP

**Die** MGFC1423, MGFC1425

**Package** MGF1323, MGF1423, MGF1425, MGF1923

## DESCRIPTION

The MGF1423/1425 series devices are low noise GaAs FETs wtih N-channel schottky gates. These devices are suitable for a wide range of amplifier and oscillator applications in S to Ku-band. In die form, the devices are popular in broad band balanced amplifiers. In packaged form these devices are also available in low cost commerical versions as MGF1323 (tray packaged) and MGF1923 (tape & reel packaged).

## FEATURES

- High linear power gain
- High output power at 1dB gain compression
- Low noise figure
- High associated gain

## APPLICATION

- S- to Ku-band low noise amplifiers and oscillators.

## ABSOLUTE MAXIMUM RATINGS ($T_a$ = 25°C)

| SYMBOL | PARAMETER | TYPE | RATINGS | UNIT |
|---|---|---|---|---|
| $V_{GDO}$ | Gate to drain voltage | | –6 | V |
| $V_{GSO}$ | Gate to source voltage | | –6 | V |
| $I_D$ | Drain current | MGFC1423 | 80 | mA |
| | | MGF1323/1423/1923 | 70 | |
| | | MGFC1425 | 70 | |
| | | MGF1425 | 60 | |
| $P_T$ | Total power dissipation | MGFC1423 | 500 | mW |
| | | MGF1323/1423/1923 | 240 | |
| | | MGFC1425 | 350 | |
| | | MGF1425 | 200 | |
| $T_{ch}$ | Channel temperature | MGFC1423 | 175 | °C |
| | | MGF1323/1423/1923 | 175 | |
| | | MGFC1425 | 150 | |
| | | MGF1425 | 150 | |
| $T_{stg}$ | Storage temperature | MGFC1423 | –55 ~ +175 | °C |
| | | MGF1323/1423/1923 | –55 ~ +175 | |
| | | MGFC1425 | –55 ~ +150 | |
| | | MGF1425 | –55 ~ +150 | |
| $R_{TH}$ | Thermal resistance | MGFC1423/MGFC1425 | 228 | °C/W |
| | | MGF1323/1423/1425/1923 | 625 | |

Low Noise GaAs FETs

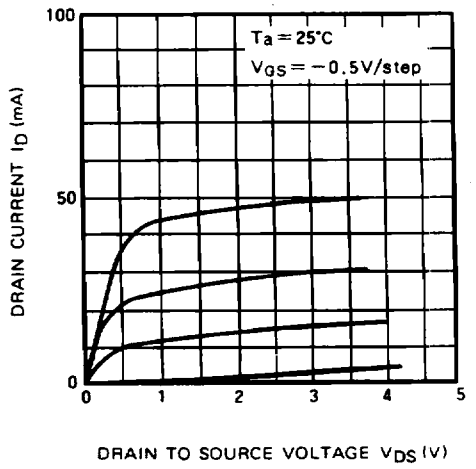
## ELECTRICAL CHARACTERISTICS ($T_a$ = 25°C)

| SYMBOL | PARAMETER | TEST CONDITIONS | TYPE | LIMITS | | | UNIT |
|---|---|---|---|---|---|---|---|
| | | | | MIN | TYP | MAX | |
| $V_{(BR)GDO}$ | Gate to drain breakdown voltage | $I_G$ = –100 µA | | –6 | | | V |
| $V_{(BR)GSO}$ | Gate to source breakdown voltage | $I_G$ = –100 µA | | –6 | | | V |
| $I_{GSS}$ | Gate to source leakage current | $V_{GS}$ = –3V, $V_{DS}$ = 0V | | | | 10 | µA |
| $I_{DSS}$ | Saturated drain current | $V_{GS}$ = 0V, $V_{DS}$ = 3V | MGFC1423 | 40 | 60 | 80 | mA |
| | | | MGF1323/1423/1923 | 40 | 60 | 80 | |
| | | | MGFC1425 | 13 | 35 | 60 | |
| | | | MGF1425 | 13 | 30 | 60 | |
| $V_{GS(off)}$ | Gate to source cut-off voltage | $V_{DS}$ = 3V, $I_D$ = 100 µA | MGFC1423 | –0.5 | | –3.5 | V |
| | | | MGF1323/1423/1923 | –0.5 | | –3.5 | |
| | | | MGFC1425 | –0.3 | | –3.5 | |
| | | | MGF1425 | –0.3 | | –3.5 | |
| $g_m$ | Transconductance | $V_{DS}$ = 3V, $I_D$ = 30 mA | MGFC1423 | 20 | 35 | | mS |
| | | | MGF1323/1423/1923 | 20 | 35 | | |
| | | | MGFC1425 | 15 | 30 | | |
| | | | MGF1425 | 25 | 40 | | |
| $NF_{min}$ | Minimum noise figure | $V_{DS}$ = 3V, $I_D$ = 10 mA, f = 12 GHz | MGFC1423 | | | 2.3 | dB |
| | | | MGF1323/1423/1923 | | | 2.3 | |
| | | | MGFC1425 | | | 1.7 | |
| | | | MGF1425 | | 1.4 | 1.6 | |
| $G_S$ | Associated gain | $V_{DS}$ = 3V, $I_D$ = 10 mA, f = 12 GHz | MGFC1423 | 8 | 10 | | dB |
| | | | MGF1323/1423/1923 | 8 | 10 | | |
| | | | MGFC1425 | 9 | 10.5 | | |
| | | | MGF1425 | 9 | 10.5 | | |
| $P_{1dB}$ | Output power at 1dB gain compression | $V_{DS}$ = 3V, $I_D$ = 30 mA, f = 12 GHz | | +10 | +13 | | dBm |
| $G_{LP}$ | Linear power gain | $V_{DS}$ = 3V, $I_D$ = 30 mA, f = 12 GHz | | 9 | 11 | | dB |

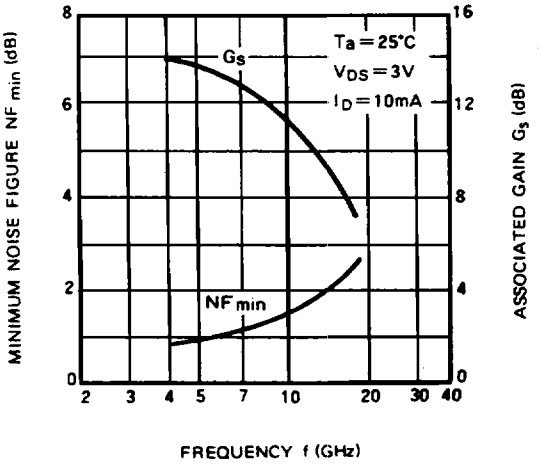
## TYPICAL CHARACTERISTICS

### MGFC1423

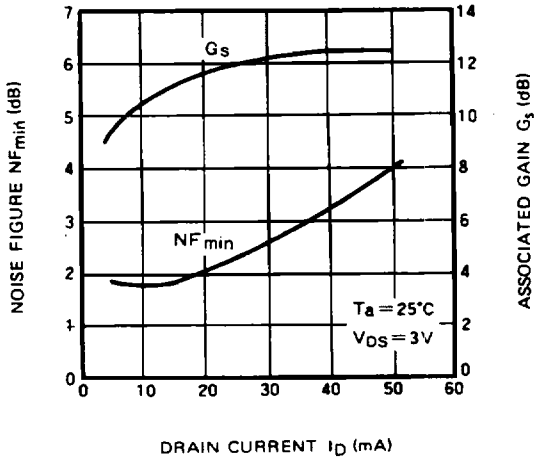
$I_D$ vs. $V_{DS}$



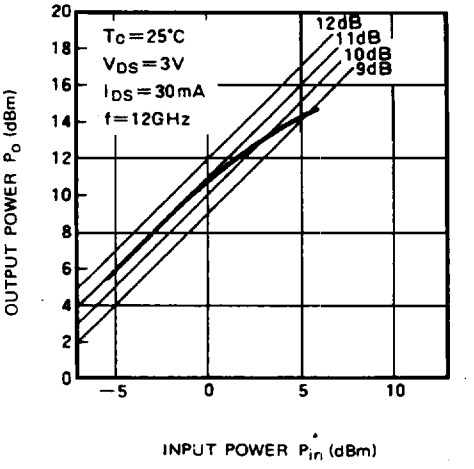

$NF_{min}$ & $G_s$ vs. f




$NF_{min}$ & Gs vs. $I_D$ ( f = 12 GHz)



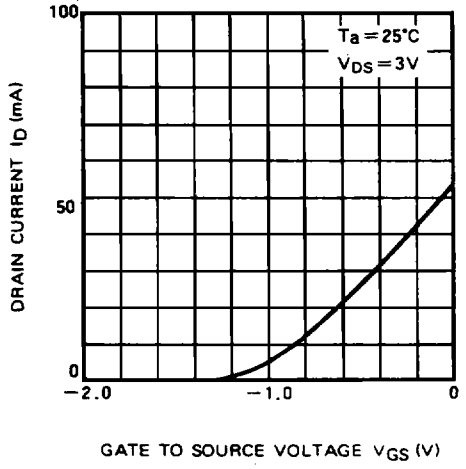

$P_o$ vs. Pin



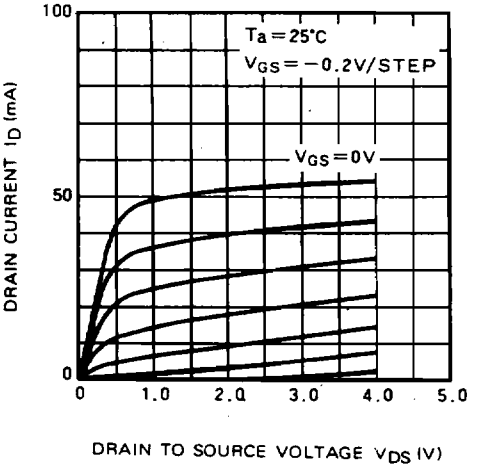
## TYPICAL CHARACTERISTICS

### MGF1423/1323/1923

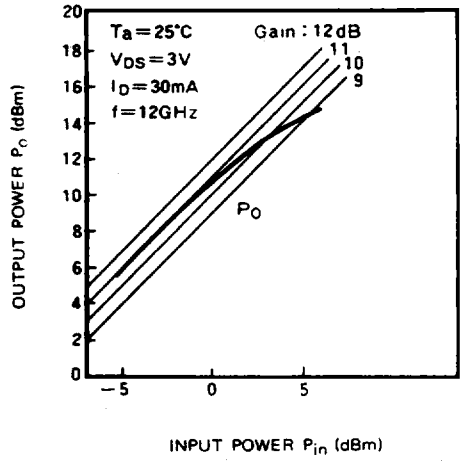
**$I_D$ vs. $V_{GS}$**



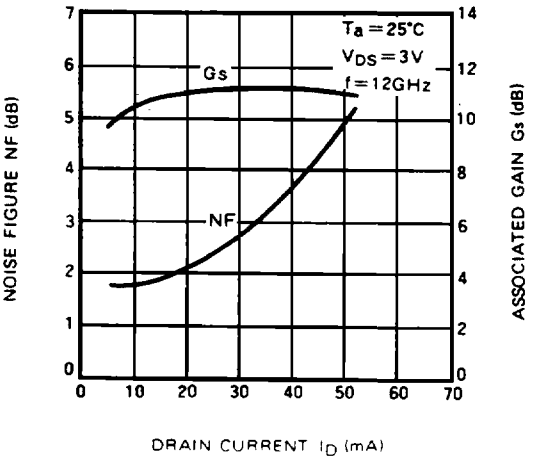

**$I_D$ vs. $V_{DS}$**



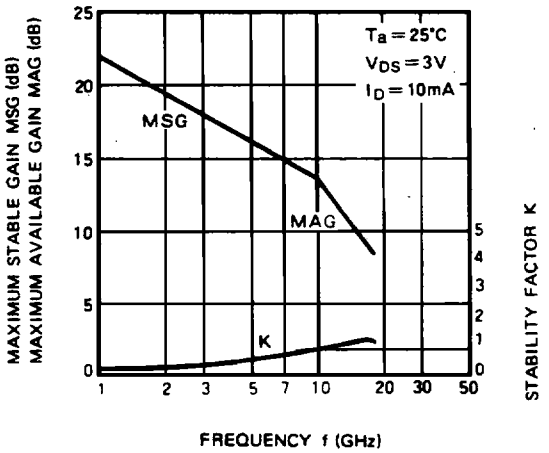

**$P_o$ vs. $P_{in}$**



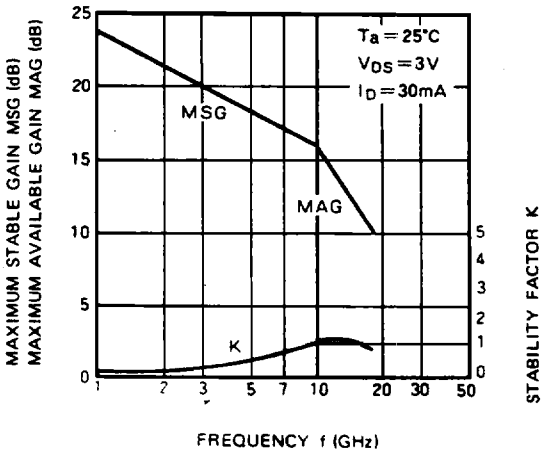

**NF & $G_s$ vs. $I_D$**




**MSG, MAG & K vs. f ($I_D$ = 10 mA)**



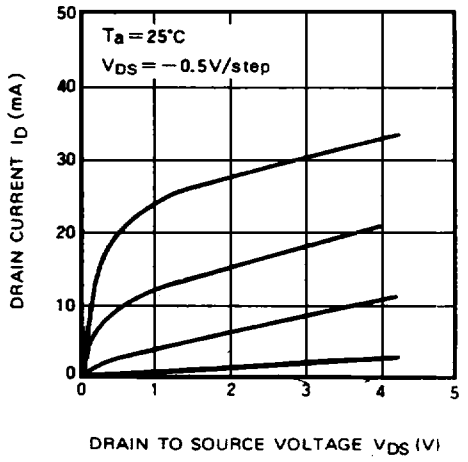

**MSG, MAG & K vs. f ($I_D$ = 30 mA)**



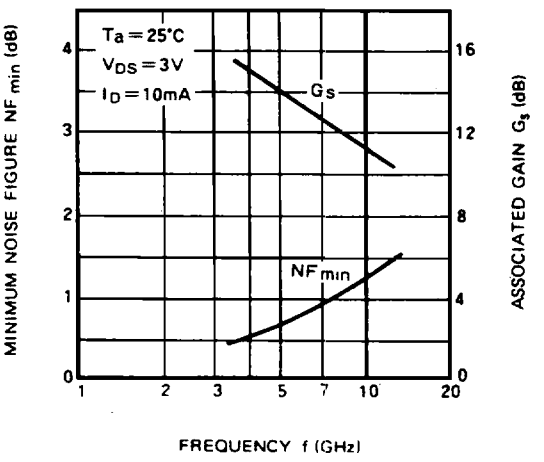
## TYPICAL CHARACTERISTICS

### MGFC1425

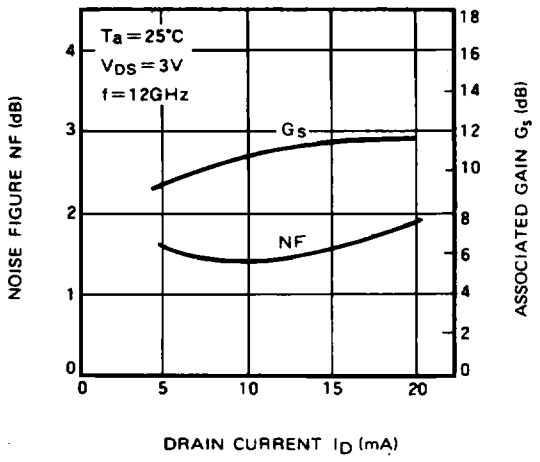
$I_D$ vs. $V_{DS}$




$NF_{min}$ & $G_s$ vs. f



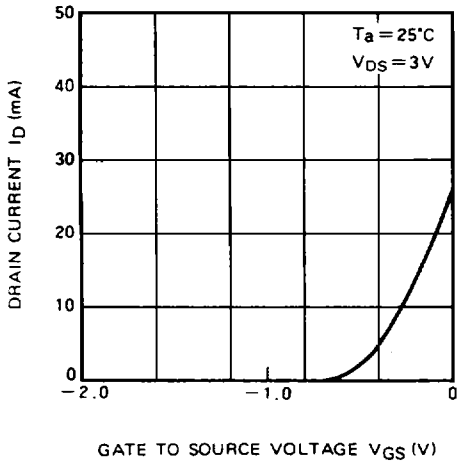

NF & $G_s$ vs. $I_D$



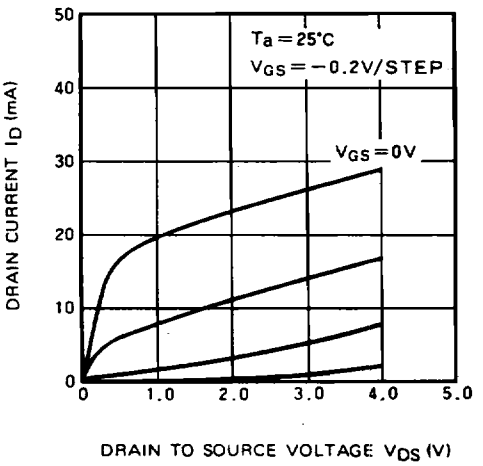
## TYPICAL CHARACTERISTICS

### MGF1425

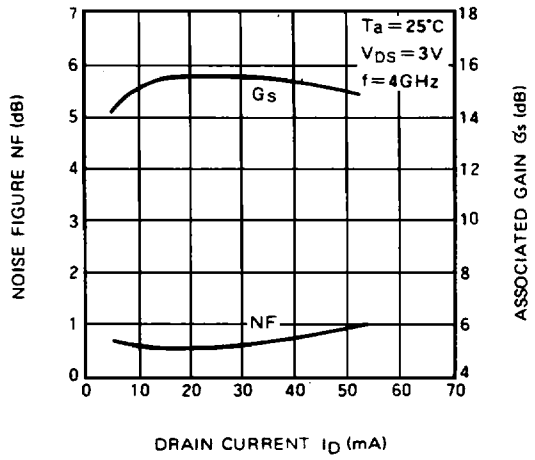
**$I_D$ vs. $V_{GS}$**



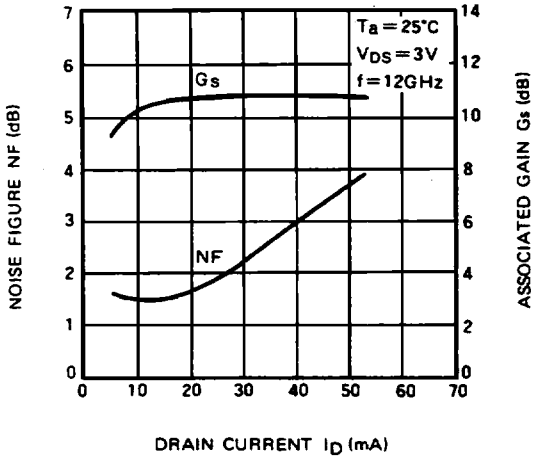

**$I_D$ vs. $V_{DS}$**



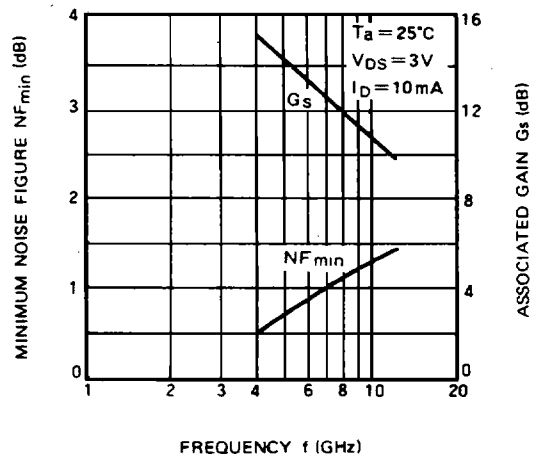

**NF & $G_S$ vs. $I_D$ (f = 4 GHz)**



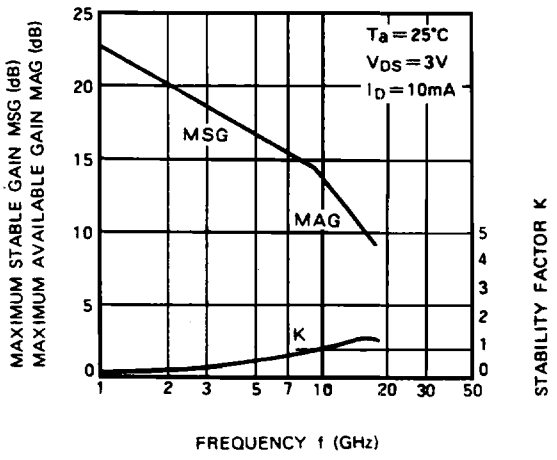

**NF & $G_S$ vs. $I_D$ (f = 12 GHz)**




**$NF_{min}$ & Gs vs. f**




**MSG, MAG & K vs. f**



**MGFC1423 S PARAMETERS** ($T_a$ = 25°C, $V_{DS}$ = 3V, $I_D$ = 10mA)

| f (GHz) | $S_{11}$ | | $S_{12}$ | | $S_{21}$ | | $S_{22}$ | |
|---|---|---|---|---|---|---|---|---|
| | Magn. | Angle(deg.) | Magn. | Angle(deg.) | Magn. | Angle(deg.) | Magn. | Angle(deg.) |
| 1 | 0.973 | − 14.0 | 0.033 | 80.6 | 2.963 | 168.7 | 0.687 | −11.7 |
| 2 | 0.948 | − 27.4 | 0.037 | 69.9 | 2.808 | 154.8 | 0.667 | −16.0 |
| 3 | 0.918 | − 38.1 | 0.039 | 62.7 | 2.705 | 147.1 | 0.650 | −20.3 |
| 4 | 0.885 | − 48.0 | 0.042 | 56.3 | 2.592 | 140.1 | 0.630 | −24.2 |
| 5 | 0.857 | − 58.4 | 0.046 | 49.1 | 2.491 | 132.9 | 0.615 | −28.4 |
| 6 | 0.832 | − 67.8 | 0.049 | 43.1 | 2.400 | 126.6 | 0.601 | −32.4 |
| 7 | 0.807 | − 77.9 | 0.055 | 36.0 | 2.310 | 119.1 | 0.586 | −36.5 |
| 8 | 0.786 | − 87.2 | 0.059 | 30.2 | 2.231 | 112.4 | 0.573 | −40.4 |
| 9 | 0.761 | − 96.9 | 0.065 | 23.4 | 2.153 | 105.6 | 0.560 | −44.6 |
| 10 | 0.738 | −106.0 | 0.070 | 17.7 | 2.085 | 99.3 | 0.549 | −48.8 |
| 11 | 0.718 | −115.6 | 0.075 | 11.1 | 2.022 | 92.0 | 0.537 | −53.2 |
| 12 | 0.700 | −124.2 | 0.080 | 5.6 | 1.956 | 85.1 | 0.527 | −57.4 |
| 13 | 0.675 | −133.7 | 0.088 | − 1.4 | 1.893 | 78.2 | 0.516 | −61.6 |
| 14 | 0.656 | −142.4 | 0.095 | − 7.1 | 1.837 | 71.6 | 0.506 | −65.8 |
| 15 | 0.632 | −152.4 | 0.102 | −14.1 | 1.779 | 64.6 | 0.495 | −70.0 |
| 16 | 0.617 | −161.4 | 0.112 | −19.9 | 1.723 | 58.0 | 0.486 | −74.8 |
| 17 | 0.595 | −170.7 | 0.122 | −26.9 | 1.670 | 51.3 | 0.473 | −78.6 |
| 18 | 0.580 | −179.4 | 0.133 | −32.6 | 1.620 | 44.7 | 0.465 | −82.9 |

**MGF1323/1423/1923 S PARAMETERS** ($T_a$ = 25°C, $V_{DS}$ = 3V, $I_D$ = 10mA)

| f (GHz) | $S_{11}$ | | $S_{12}$ | | $S_{21}$ | | $S_{22}$ | |
|---|---|---|---|---|---|---|---|---|
| | Magn. | Angle(deg.) | Magn. | Angle(deg.) | Magn. | Angle(deg.) | Magn. | Angle(deg.) |
| 0.5 | 0.989 | − 10.0 | 0.009 | 84.0 | 2.704 | 170.0 | 0.692 | − 8.0 |
| 1.0 | 0.986 | − 20.1 | 0.017 | 76.2 | 2.698 | 161.7 | 0.685 | − 14.9 |
| 1.5 | 0.981 | − 28.3 | 0.024 | 69.2 | 2.633 | 151.5 | 0.677 | − 21.6 |
| 2.0 | 0.971 | − 37.9 | 0.033 | 62.5 | 2.559 | 143.0 | 0.672 | − 27.2 |
| 2.5 | 0.955 | − 47.2 | 0.044 | 56.3 | 2.472 | 134.8 | 0.666 | − 34.5 |
| 3.0 | 0.933 | − 56.3 | 0.049 | 50.5 | 2.371 | 127.0 | 0.662 | − 40.6 |
| 3.5 | 0.919 | − 65.0 | 0.053 | 44.4 | 2.283 | 119.3 | 0.661 | − 47.0 |
| 4.0 | 0.902 | − 73.1 | 0.056 | 39.2 | 2.200 | 111.2 | 0.658 | − 53.0 |
| 4.5 | 0.883 | − 80.0 | 0.059 | 34.0 | 2.123 | 104.0 | 0.657 | − 58.2 |
| 5.0 | 0.869 | − 86.8 | 0.061 | 29.3 | 2.054 | 97.0 | 0.658 | − 63.1 |
| 5.5 | 0.853 | − 93.0 | 0.063 | 24.9 | 1.986 | 90.0 | 0.659 | − 67.9 |
| 6.0 | 0.845 | − 99.4 | 0.064 | 20.8 | 1.919 | 83.8 | 0.661 | − 72.3 |
| 6.5 | 0.834 | −102.8 | 0.065 | 17.2 | 1.879 | 77.1 | 0.667 | − 76.6 |
| 7.0 | 0.824 | −111.6 | 0.066 | 13.8 | 1.795 | 71.2 | 0.672 | − 80.8 |
| 7.5 | 0.814 | −117.0 | 0.067 | 10.3 | 1.746 | 65.4 | 0.677 | − 84.9 |
| 8.0 | 0.804 | −122.5 | 0.068 | 7.7 | 1.702 | 59.6 | 0.682 | − 88.9 |
| 8.5 | 0.794 | −128.1 | 0.068 | 5.4 | 1.663 | 53.9 | 0.686 | − 93.0 |
| 9.0 | 0.785 | −133.4 | 0.068 | 3.0 | 1.633 | 47.8 | 0.689 | − 96.0 |
| 9.5 | 0.775 | −138.9 | 0.069 | 1.0 | 1.601 | 41.9 | 0.690 | −100.1 |
| 10.0 | 0.765 | −143.9 | 0.069 | − 0.4 | 1.574 | 35.2 | 0.690 | −103.9 |
| 10.5 | 0.753 | −149.0 | 0.069 | − 2.1 | 1.547 | 28.3 | 0.689 | −107.0 |
| 11.0 | 0.739 | −154.2 | 0.069 | − 3.7 | 1.528 | 22.1 | 0.686 | −110.5 |
| 11.5 | 0.723 | −159.3 | 0.069 | − 4.5 | 1.505 | 16.0 | 0.686 | −113.9 |
| 12.0 | 0.708 | −165.5 | 0.070 | − 6.0 | 1.496 | 10.5 | 0.689 | −116.9 |
| 12.5 | 0.689 | −171.6 | 0.071 | − 7.5 | 1.489 | 4.8 | 0.689 | −120.0 |
| 13.0 | 0.668 | −177.0 | 0.071 | − 8.3 | 1.489 | 0 | 0.689 | −123.3 |
| 13.5 | 0.652 | −183.0 | 0.072 | −10.0 | 1.491 | − 5.2 | 0.686 | −126.3 |
| 14.0 | 0.631 | 171.2 | 0.073 | −11.8 | 1.496 | −10.5 | 0.684 | −129.9 |
| 14.5 | 0.610 | 165.2 | 0.075 | −13.7 | 1.505 | −16.0 | 0.681 | −132.4 |
| 15.0 | 0.585 | 158.3 | 0.076 | −15.8 | 1.515 | −21.7 | 0.676 | −135.0 |
| 15.5 | 0.562 | 150.3 | 0.079 | −18.0 | 1.531 | −27.0 | 0.668 | −137.8 |
| 16.0 | 0.542 | 142.0 | 0.081 | −20.5 | 1.549 | −32.8 | 0.661 | −140.8 |
| 16.5 | 0.519 | 133.7 | 0.084 | −23.1 | 1.567 | −39.4 | 0.653 | −143.9 |
| 17.0 | 0.498 | 124.9 | 0.087 | −26.5 | 1.585 | −45.6 | 0.638 | −146.5 |
| 17.5 | 0.476 | 117.0 | 0.091 | −30.4 | 1.613 | −52.3 | 0.624 | −150.3 |
| 18.0 | 0.452 | 109.1 | 0.097 | −34.5 | 1.633 | −58.6 | 0.606 | −154.8 |

**MGF1323/1423/1923 S PARAMETERS** ($T_a$ = 25°C, $V_{DS}$ = 3V, $I_D$ = 30mA)

| f (GHz) | $S_{11}$ | | $S_{12}$ | | $S_{21}$ | | $S_{22}$ | |
|---|---|---|---|---|---|---|---|---|
| | Magn. | Angle (deg.) | Magn. | Angle (deg.) | Magn. | Angle (deg.) | Magn. | Angle (deg.) |
| 0.5 | 0.992 | − 11.1 | 0.007 | 83.7 | 3.467 | 169.5 | 0.661 | − 7.3 |
| 1.0 | 0.987 | − 21.6 | 0.014 | 76.0 | 3.400 | 161.0 | 0.647 | − 14.9 |
| 1.5 | 0.979 | − 32.8 | 0.020 | 70.1 | 3.334 | 152.5 | 0.638 | − 21.4 |
| 2.0 | 0.962 | − 41.7 | 0.027 | 63.8 | 3.266 | 144.1 | 0.628 | − 28.2 |
| 2.5 | 0.944 | − 50.8 | 0.033 | 56.4 | 3.199 | 136.0 | 0.622 | − 34.6 |
| 3.0 | 0.916 | − 58.3 | 0.038 | 52.0 | 3.065 | 128.1 | 0.617 | − 39.5 |
| 3.5 | 0.889 | − 69.7 | 0.042 | 46.9 | 2.955 | 120.3 | 0.612 | − 46.0 |
| 4.0 | 0.875 | − 80.2 | 0.044 | 42.8 | 2.835 | 112.2 | 0.610 | − 51.1 |
| 4.5 | 0.853 | − 85.4 | 0.046 | 38.8 | 2.716 | 104.7 | 0.610 | − 55.9 |
| 5.0 | 0.840 | − 91.2 | 0.048 | 35.2 | 2.600 | 97.2 | 0.610 | − 60.7 |
| 5.5 | 0.827 | − 96.8 | 0.050 | 32.0 | 2.495 | 89.7 | 0.611 | − 65.8 |
| 6.0 | 0.810 | −103.3 | 0.051 | 29.2 | 2.399 | 82.5 | 0.615 | − 70.0 |
| 6.5 | 0.801 | −109.1 | 0.051 | 26.3 | 2.312 | 75.6 | 0.622 | − 73.8 |
| 7.0 | 0.796 | −114.3 | 0.052 | 24.0 | 2.239 | 68.5 | 0.631 | − 77.9 |
| 7.5 | 0.788 | −120.2 | 0.052 | 22.0 | 2.170 | 61.5 | 0.645 | − 81.7 |
| 8.0 | 0.775 | −125.7 | 0.052 | 20.0 | 2.109 | 54.9 | 0.653 | − 85.6 |
| 8.5 | 0.759 | −130.8 | 0.053 | 18.2 | 2.054 | 47.9 | 0.657 | − 90.0 |
| 9.0 | 0.747 | −135.9 | 0.054 | 16.8 | 2.002 | 40.9 | 0.661 | − 93.1 |
| 9.5 | 0.734 | −140.8 | 0.056 | 15.4 | 1.961 | 35.3 | 0.663 | − 97.3 |
| 10.0 | 0.725 | −146.0 | 0.057 | 14.5 | 1.925 | 29.7 | 0.666 | −101.0 |
| 10.5 | 0.712 | −151.5 | 0.059 | 13.9 | 1.895 | 24.3 | 0.666 | −104.1 |
| 11.0 | 0.691 | −156.8 | 0.061 | 13.0 | 1.873 | 19.0 | 0.668 | −106.8 |
| 11.5 | 0.675 | −162.0 | 0.063 | 12.1 | 1.856 | 13.4 | 0.668 | −110.1 |
| 12.0 | 0.650 | −167.8 | 0.065 | 11.2 | 1.839 | 7.8 | 0.668 | −112.5 |
| 12.5 | 0.628 | −173.9 | 0.067 | 10.8 | 1.824 | 1.6 | 0.671 | −115.3 |
| 13.0 | 0.610 | 179.9 | 0.069 | 9.7 | 1.809 | − 4.0 | 0.674 | −118.0 |
| 13.5 | 0.583 | 174.7 | 0.072 | 8.9 | 1.795 | − 9.0 | 0.675 | −120.1 |
| 14.0 | 0.560 | 167.7 | 0.076 | 7.9 | 1.789 | −13.8 | 0.676 | −122.4 |
| 14.5 | 0.541 | 159.4 | 0.080 | 6.0 | 1.784 | −18.5 | 0.675 | −125.1 |
| 15.0 | 0.521 | 151.4 | 0.085 | 4.0 | 1.784 | −23.0 | 0.676 | −128.0 |
| 15.5 | 0.501 | 145.2 | 0.090 | 0.8 | 1.786 | −28.5 | 0.676 | −130.7 |
| 16.0 | 0.478 | 136.9 | 0.095 | − 2.6 | 1.795 | −34.6 | 0.676 | −133.6 |
| 16.5 | 0.449 | 128.8 | 0.101 | − 7.1 | 1.807 | −40.8 | 0.669 | −136.3 |
| 17.0 | 0.436 | 115.7 | 0.108 | −12.4 | 1.818 | −46.8 | 0.653 | −139.5 |
| 17.5 | 0.414 | 105.0 | 0.117 | −17.7 | 1.830 | −52.0 | 0.645 | −142.6 |
| 18.0 | 0.399 | 96.3 | 0.128 | −22.3 | 1.847 | −57.9 | 0.631 | −146.5 |

## MGFC1425 S PARAMETERS ($T_a$ = 25°C, $V_{DS}$ = 3V, $I_D$ = 10mA)

| f (GHz) | $S_{11}$ | | $S_{12}$ | | $S_{21}$ | | $S_{22}$ | |
|---|---|---|---|---|---|---|---|---|
| | Magn. | Angle(deg.) | Magn. | Angle(deg.) | Magn. | Angle(deg.) | Magn. | Angle(deg.) |
| 1 | 0.974 | − 12.7 | 0.030 | 81.6 | 3.228 | 169.9 | 0.688 | −11.8 |
| 2 | 0.950 | − 24.9 | 0.033 | 71.9 | 3.080 | 157.0 | 0.671 | −16.0 |
| 3 | 0.920 | − 34.9 | 0.036 | 65.2 | 2.995 | 149.7 | 0.655 | −20.2 |
| 4 | 0.887 | − 44.2 | 0.039 | 59.2 | 2.900 | 143.0 | 0.638 | −24.0 |
| 5 | 0.857 | − 54.2 | 0.044 | 52.3 | 2.813 | 136.1 | 0.622 | −28.2 |
| 6 | 0.829 | − 63.4 | 0.047 | 46.4 | 2.731 | 130.0 | 0.607 | −32.0 |
| 7 | 0.800 | − 73.4 | 0.053 | 39.5 | 2.646 | 122.7 | 0.591 | −36.1 |
| 8 | 0.775 | − 82.7 | 0.057 | 33.7 | 2.570 | 116.0 | 0.577 | −40.0 |
| 9 | 0.747 | − 92.7 | 0.064 | 26.7 | 2.491 | 109.2 | 0.562 | −44.0 |
| 10 | 0.724 | −102.0 | 0.068 | 21.0 | 2.420 | 103.0 | 0.549 | −48.0 |
| 11 | 0.698 | −111.9 | 0.075 | 13.8 | 2.346 | 95.7 | 0.535 | −52.1 |
| 12 | 0.677 | −121.0 | 0.081 | 8.2 | 2.280 | 88.9 | 0.522 | −56.1 |
| 13 | 0.651 | −130.9 | 0.089 | 0.7 | 2.211 | 81.8 | 0.508 | −60.0 |
| 14 | 0.633 | −140.0 | 0.097 | − 4.5 | 2.150 | 75.3 | 0.497 | −64.0 |
| 15 | 0.608 | −150.4 | 0.106 | −12.4 | 2.081 | 68.4 | 0.484 | −67.9 |
| 16 | 0.591 | −160.0 | 0.117 | −17.3 | 2.020 | 61.8 | 0.473 | −72.0 |
| 17 | 0.568 | −169.9 | 0.127 | −25.6 | 1.966 | 54.9 | 0.459 | −75.9 |
| 18 | 0.553 | −179.0 | 0.140 | −30.0 | 1.905 | 48.2 | 0.450 | −80.0 |

## MGF1425 S PARAMETERS ($T_a$ = 25°C, $V_{DS}$ = 3V, $I_D$ = 10mA)

| f (GHz) | $S_{11}$ | | $S_{12}$ | | $S_{21}$ | | $S_{22}$ | |
|---|---|---|---|---|---|---|---|---|
| | Magn. | Angle (deg.) | Magn. | Angle (deg.) | Magn. | Angle (deg.) | Magn. | Angle (deg.) |
| 0.5 | 0.992 | − 11.0 | 0.009 | 83.4 | 3.467 | 170.0 | 0.668 | − 7.8 |
| 1.0 | 0.989 | − 22.1 | 0.018 | 74.8 | 3.400 | 160.1 | 0.662 | − 15.5 |
| 1.5 | 0.977 | − 32.1 | 0.026 | 67.3 | 3.311 | 150.0 | 0.655 | − 22.4 |
| 2.0 | 0.954 | − 42.4 | 0.036 | 60.0 | 3.217 | 140.0 | 0.646 | − 30.0 |
| 2.5 | 0.930 | − 53.3 | 0.043 | 53.8 | 3.090 | 131.2 | 0.638 | − 36.6 |
| 3.0 | 0.908 | − 63.7 | 0.049 | 48.1 | 2.968 | 122.5 | 0.631 | − 43.2 |
| 3.5 | 0.885 | − 73.6 | 0.053 | 42.3 | 2.851 | 115.6 | 0.625 | − 49.1 |
| 4.0 | 0.861 | − 83.0 | 0.057 | 37.9 | 2.723 | 108.1 | 0.621 | − 54.5 |
| 4.5 | 0.846 | − 91.3 | 0.059 | 33.7 | 2.615 | 100.8 | 0.618 | − 59.6 |
| 5.0 | 0.829 | − 99.1 | 0.061 | 29.3 | 2.512 | 94.1 | 0.617 | − 64.0 |
| 5.5 | 0.813 | −106.0 | 0.063 | 25.4 | 2.427 | 86.5 | 0.619 | − 68.6 |
| 6.0 | 0.794 | −112.3 | 0.064 | 22.2 | 2.333 | 79.7 | 0.622 | − 72.9 |
| 6.5 | 0.781 | −119.1 | 0.065 | 18.5 | 2.252 | 72.6 | 0.628 | − 77.0 |
| 7.0 | 0.766 | −124.5 | 0.066 | 15.5 | 2.188 | 65.7 | 0.633 | − 81.8 |
| 7.5 | 0.754 | −130.1 | 0.067 | 12.3 | 2.126 | 59.2 | 0.638 | − 85.9 |
| 8.0 | 0.741 | −136.0 | 0.067 | 9.3 | 2.065 | 52.6 | 0.643 | − 90.1 |
| 8.5 | 0.729 | −141.8 | 0.068 | 6.5 | 2.007 | 46.1 | 0.646 | − 94.0 |
| 9.0 | 0.718 | −147.8 | 0.068 | 4.5 | 1.941 | 40.1 | 0.648 | − 97.6 |
| 9.5 | 0.703 | −153.5 | 0.068 | 3.0 | 1.894 | 34.0 | 0.651 | −101.5 |
| 10.0 | 0.686 | −159.0 | 0.069 | 2.0 | 1.851 | 28.3 | 0.652 | −105.4 |
| 10.5 | 0.668 | −164.6 | 0.070 | 1.2 | 1.820 | 23.3 | 0.653 | −108.0 |
| 11.0 | 0.653 | −171.0 | 0.071 | 0.7 | 1.799 | 17.9 | 0.653 | −111.8 |
| 11.5 | 0.634 | −176.9 | 0.072 | 0 | 1.778 | 12.0 | 0.653 | −115.4 |
| 12.0 | 0.617 | 176.5 | 0.073 | − 0.5 | 1.758 | 5.8 | 0.653 | −118.0 |
| 12.5 | 0.598 | 169.9 | 0.075 | − 2.5 | 1.738 | 0 | 0.653 | −121.3 |
| 13.0 | 0.581 | 162.6 | 0.077 | − 3.8 | 1.732 | − 6.0 | 0.652 | −124.5 |
| 13.5 | 0.562 | 154.8 | 0.079 | − 6.0 | 1.718 | −11.8 | 0.650 | −127.2 |
| 14.0 | 0.543 | 147.2 | 0.082 | − 8.3 | 1.708 | −17.6 | 0.649 | −130.2 |
| 14.5 | 0.528 | 139.5 | 0.085 | −11.5 | 1.698 | −23.5 | 0.647 | −133.6 |
| 15.0 | 0.510 | 132.0 | 0.089 | −14.0 | 1.698 | −30.0 | 0.642 | −136.5 |
| 15.5 | 0.495 | 123.7 | 0.093 | −16.5 | 1.698 | −36.1 | 0.640 | −140.0 |
| 16.0 | 0.484 | 114.1 | 0.098 | −19.8 | 1.698 | −42.0 | 0.629 | −143.8 |
| 16.5 | 0.473 | 104.3 | 0.103 | −23.0 | 1.698 | −48.3 | 0.617 | −146.1 |
| 17.0 | 0.465 | 93.0 | 0.111 | −27.5 | 1.698 | −57.1 | 0.599 | −149.0 |
| 17.5 | 0.457 | 80.0 | 0.120 | −32.3 | 1.708 | −71.0 | 0.579 | −152.0 |
| 18.0 | 0.452 | 66.8 | 0.134 | −38.0 | 1.718 | −92.2 | 0.562 | −154.9 |

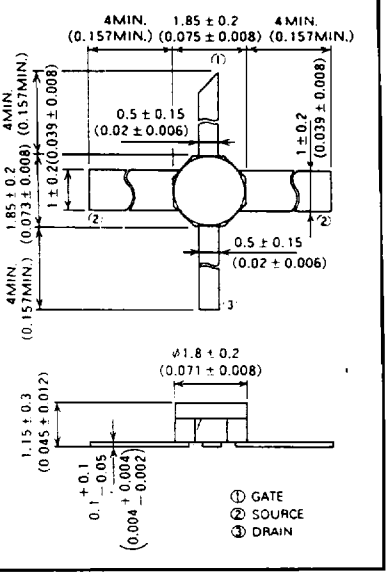
## MGF1423 NOISE PARAMETERS ($V_{DS}$ = 3V, $I_D$ = 10mA)

| Frequency (GHz) | $\Gamma_{OPT}$ MAG | $\Gamma_{OPT}$ ANG | Rn (Ω) | NFmin (dB) |
|---|---|---|---|---|
| 2 | 0.820 | 18.5 | 23.5 | 0.68 |
| 4 | 0.695 | 36.0 | 21 | 0.75 |
| 8 | 0.573 | 81.2 | 19 | 1.30 |
| 12 | 0.489 | 115.8 | 17 | 1.80 |
| 18 | 0.362 | 173.0 | 21 | 2.55 |

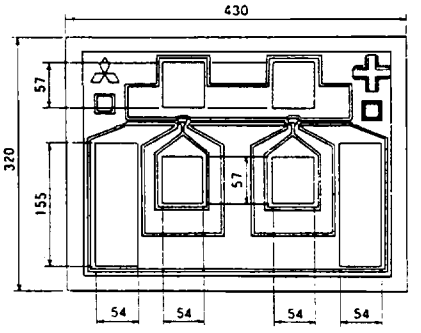
## MGF1425 NOISE PARAMETERS ($V_{DS}$ = 3V, $I_D$ = 10mA)

| Frequency (GHz) | $\Gamma_{OPT}$ MAG | $\Gamma_{OPT}$ ANG | Rn (Ω) | NFmin (dB) |
|---|---|---|---|---|
| 2 | 0.813 | 19.7 | 23.5 | 0.57 |
| 4 | 0.681 | 34.3 | 21 | 0.60 |
| 8 | 0.527 | 79.5 | 19 | 1.20 |
| 12 | 0.462 | 114.4 | 17 | 1.50 |
| 18 | 0.325 | 176.6 | 21 | 2.20 |

## MGF1323 OUTLINE DRAWING
Unit: mm (inches)

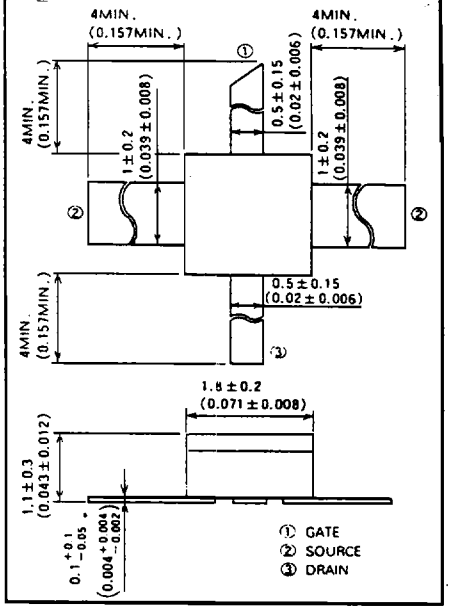



## MGFC1423 OUTLINE DRAWING
MGFC1425 Unit: mm

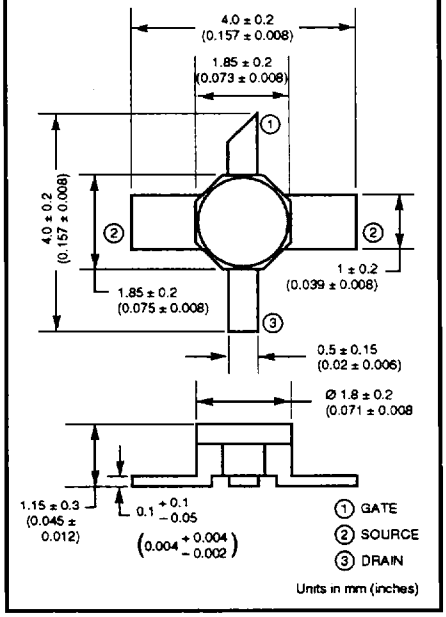



Lg = 0.4 μm
Wgu = Wgt = 249 μm

## MGF1423 OUTLINE DRAWING
MGF1425 Unit: mm (inches)




## MGF1923 OUTLINE DRAWING




## ORDERING INFORMATION

| Part Number | Grade | Test at | Noise Figure | Notes |
|---|---|---|---|---|
| MGFC1423-T01 | A | 12GHz, sample | 2.3 | |
| MGFC1423-T02 | B | 12GHz, sample | 2.3 | |
| MGFC1423-T03 | C | 12GHz, sample | 2.3 | |
| MGFC1425-T01 | A | 12GHz, sample | 1.7 | |
| MGFC1425-T02 | B | 12GHz, sample | 1.7 | |
| MGFC1425-T03 | C | 12GHz, sample | 1.7 | |
| MGF1423-61-23 | Industrial | 12GHz, 100% RF | 2.3 | Ceramic package |
| MGF1425-61-16 | Industrial | 12GHz, 100% RF | 1.6 | Ceramic package |
| MGF1323-01 | General | 12GHz, sample | 2.3 | Ceramic package |
| MGF1923-01 | General | 12GHz, sample | 2.3 | Ceramic tape & reel package |