

## KGF1183

Medium-Power Amplifier for UHF-Band and PCS Frequencies

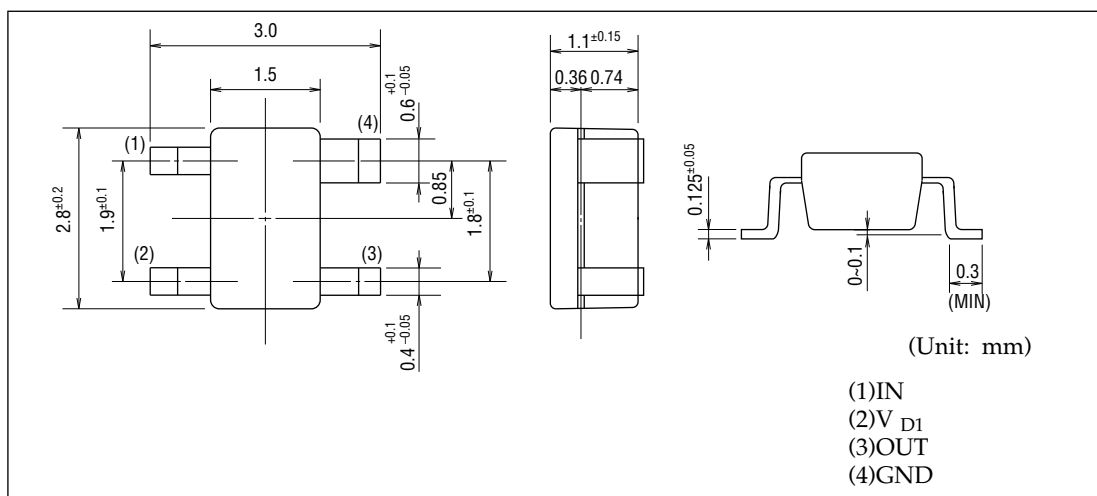
### GENERAL DESCRIPTION

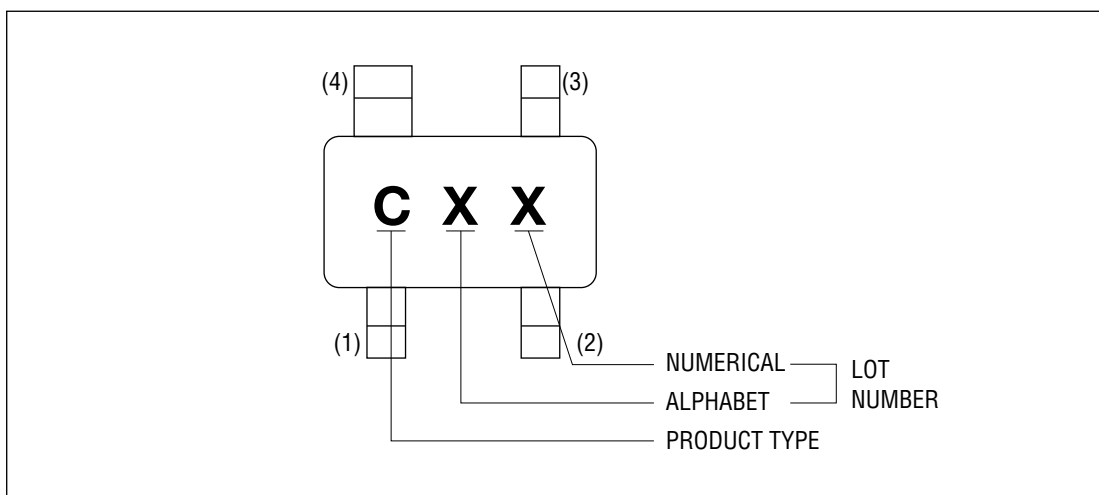
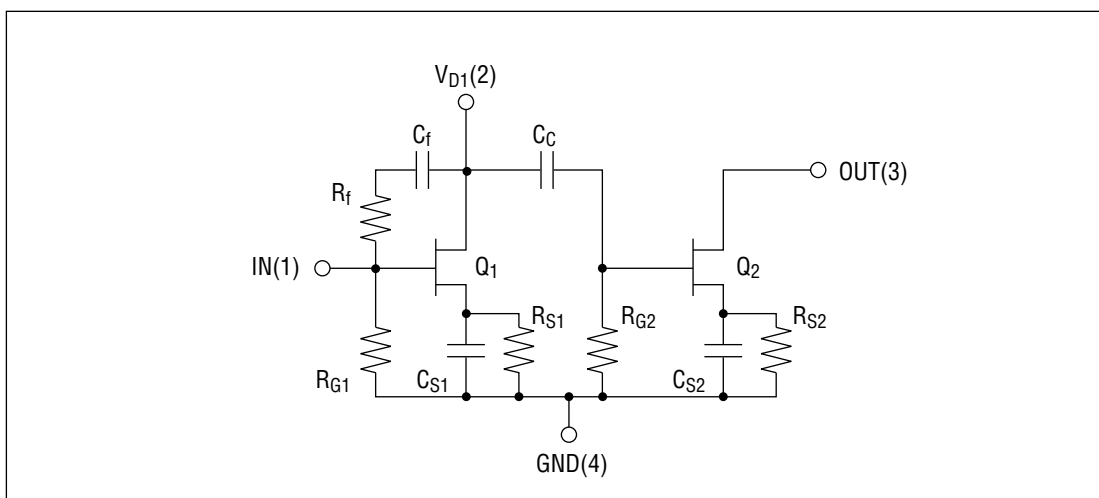
The KGF1183 is a two-stage medium-power UHF-band amplifier that features high gain and high output power. The internally matched  $50\ \Omega$  input eliminates external impedance matching circuits for the input, but it requires a simple matching circuit for the output. All specifications for this device are guaranteed at 5 V and 850 MHz. Because of the high gain and high output power, the KGF1183 is ideal as an intermediate transmitter-stage amplifier for personal handy phones.

### FEATURES

- Internally matched  $50\ \Omega$  input
- High linear gain: 20 dB (min)
- High output power: 17 dBm (min)
- Low current: 80 mA (max)
- Self-bias circuit configuration with built-in source capacitor
- Surface-mount 4-pin SOP plastic package

### PACKAGE OUTLINE



**MARKING****CIRCUIT**

**ABSOLUTE MAXIMUM RATINGS**

| Item                    | Symbol    | Condition                  | Unit               | Min. | Max. |
|-------------------------|-----------|----------------------------|--------------------|------|------|
| Supply voltage          | $V_{DD}$  | $T_a = 25^{\circ}\text{C}$ | V                  | —    | 10   |
| Input power             | $P_{IN}$  | $T_a = 25^{\circ}\text{C}$ | dBm                | —    | 6    |
| Total power dissipation | $P_{tot}$ | $T_a = 25^{\circ}\text{C}$ | mW                 | —    | 300  |
| Channel temperature     | $T_{ch}$  | —                          | $^{\circ}\text{C}$ | —    | 150  |
| Storage temperature     | $T_{stg}$ | —                          | $^{\circ}\text{C}$ | -45  | 125  |

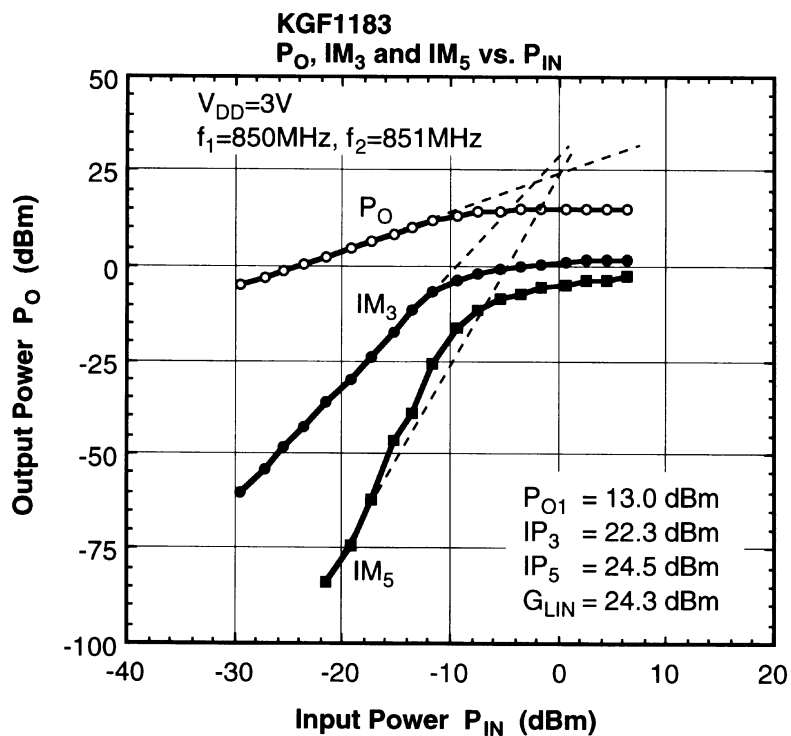
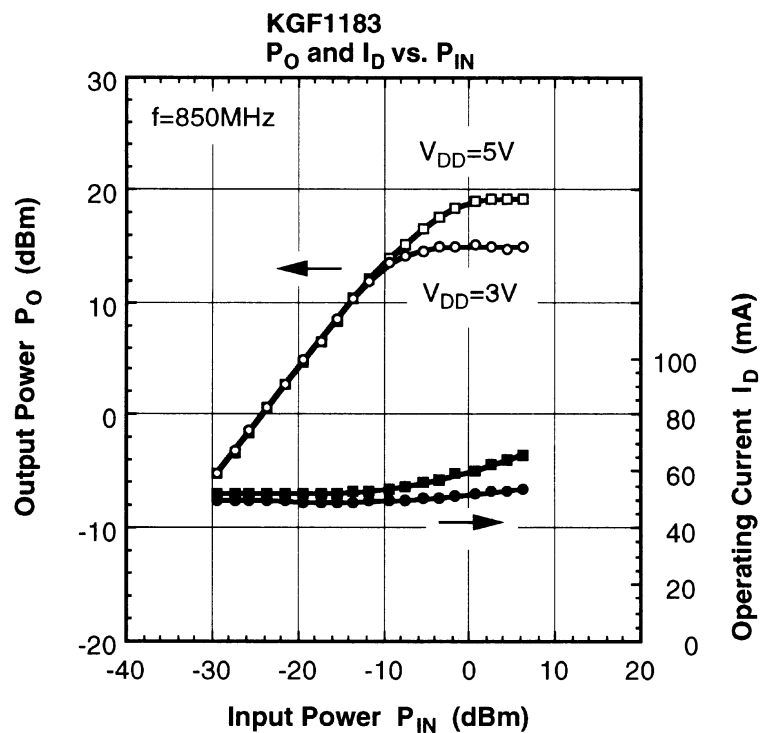
**ELECTRICAL CHARACTERISTICS**

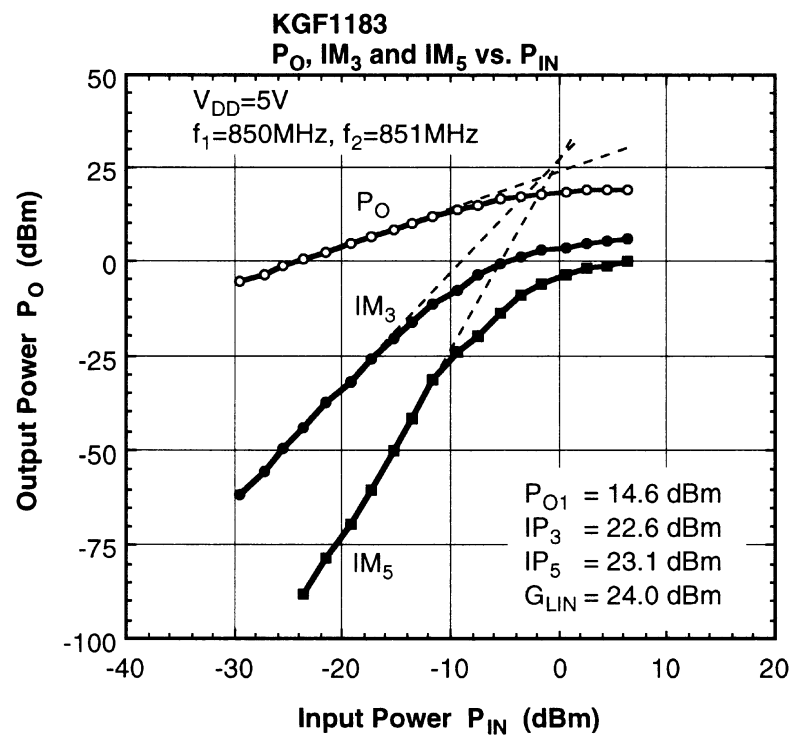
(Ta = 25°C)

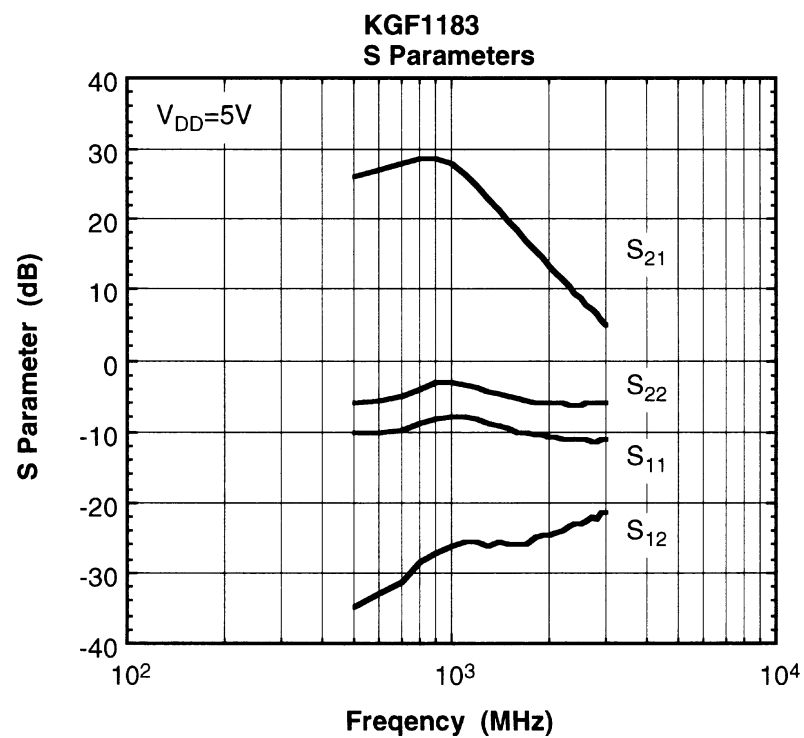
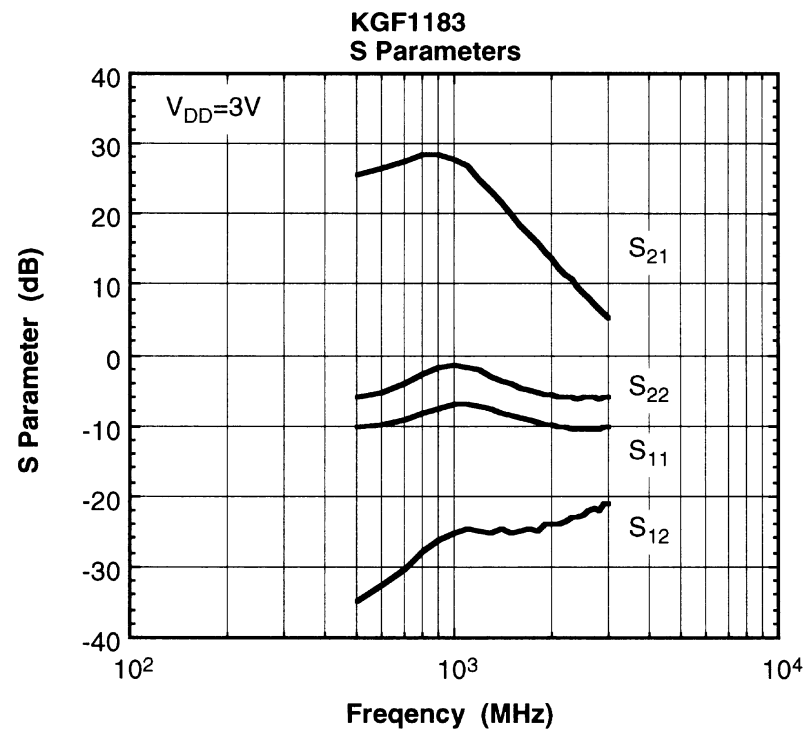
| Item              | Symbol    | Condition                        | Unit | Min. | Typ. | Max. |
|-------------------|-----------|----------------------------------|------|------|------|------|
| Operating current | $I_D$     | (*1), $P_{IN} = 0 \text{ dBm}$   | mA   | —    | 60.0 | 80.0 |
| Output power      | $P_{O1}$  | (*1), $P_{IN} = 0 \text{ dBm}$   | dBm  | 17.0 | —    | —    |
| Linear gain       | $G_{LIN}$ | (*1), $P_{IN} = -20 \text{ dBm}$ | dB   | 20.0 | —    | —    |
| Input return loss | $R_{LIN}$ | (*1), $P_{IN} = -20 \text{ dBm}$ | dB   | —    | -9.0 | —    |

\*1 Self-bias condition:  $V_{DD} = 5.4 \text{ V}$ ,  $V_G = 0 \text{ V}$ ,  $f = 850 \text{ MHz}$

## RF CHARACTERISTICS





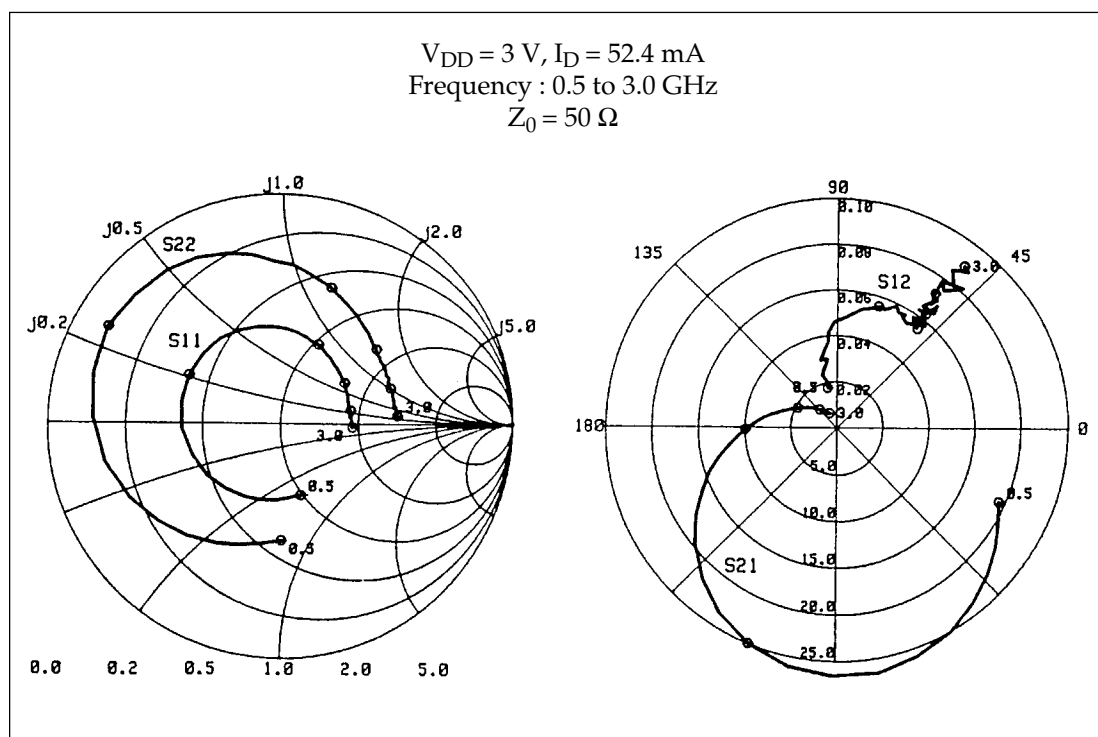


## Typical S-Parameters

 $V_{DD} = 3\text{ V}$ ,  $I_D = 52.4\text{ mA}$ 

| Freq(MHz) | MAG(S <sub>11</sub> ) | ANG(S <sub>11</sub> ) | MAG(S <sub>21</sub> ) | ANG(S <sub>21</sub> ) | MAG(S <sub>12</sub> ) | ANG(S <sub>12</sub> ) | MAG(S <sub>22</sub> ) | ANG(S <sub>22</sub> ) |
|-----------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 500.0     | 0.314                 | -73.77                | 19.224                | -23.89                | 0.018                 | 103.91                | 0.497                 | -89.19                |
| 600.0     | 0.322                 | -92.04                | 21.483                | -36.47                | 0.024                 | 106.42                | 0.543                 | -108.09               |
| 700.0     | 0.343                 | -115.90               | 23.875                | -51.66                | 0.030                 | 104.25                | 0.621                 | -129.90               |
| 800.0     | 0.383                 | -145.41               | 25.956                | -70.01                | 0.041                 | 95.92                 | 0.718                 | -154.16               |
| 900.0     | 0.423                 | -177.00               | 26.532                | -90.60                | 0.049                 | 84.93                 | 0.807                 | 178.21                |
| 1000.0    | 0.444                 | 151.92                | 24.912                | -112.53               | 0.056                 | 71.59                 | 0.853                 | 150.71                |
| 1100.0    | 0.452                 | 125.48                | 21.642                | -132.14               | 0.059                 | 64.47                 | 0.830                 | 126.58                |
| 1200.0    | 0.434                 | 103.93                | 17.830                | -148.33               | 0.057                 | 59.02                 | 0.779                 | 108.00                |
| 1300.0    | 0.412                 | 87.26                 | 14.595                | -160.93               | 0.054                 | 56.85                 | 0.706                 | 92.39                 |
| 1400.0    | 0.391                 | 74.96                 | 11.968                | -170.50               | 0.058                 | 55.96                 | 0.665                 | 80.35                 |
| 1500.0    | 0.378                 | 65.04                 | 9.960                 | -179.14               | 0.055                 | 51.34                 | 0.628                 | 70.27                 |
| 1600.0    | 0.358                 | 57.02                 | 8.476                 | 173.73                | 0.056                 | 53.89                 | 0.591                 | 61.79                 |
| 1700.0    | 0.345                 | 49.79                 | 7.233                 | 167.79                | 0.060                 | 50.50                 | 0.570                 | 55.15                 |
| 1800.0    | 0.337                 | 43.08                 | 6.197                 | 162.18                | 0.058                 | 51.85                 | 0.548                 | 49.04                 |
| 1900.0    | 0.329                 | 37.48                 | 5.454                 | 157.26                | 0.063                 | 53.39                 | 0.533                 | 43.45                 |
| 2000.0    | 0.326                 | 32.68                 | 4.790                 | 152.77                | 0.063                 | 52.40                 | 0.523                 | 38.36                 |
| 2100.0    | 0.316                 | 26.61                 | 4.228                 | 148.19                | 0.065                 | 49.90                 | 0.513                 | 33.82                 |
| 2200.0    | 0.314                 | 23.59                 | 3.782                 | 143.78                | 0.065                 | 52.61                 | 0.511                 | 29.48                 |
| 2300.0    | 0.306                 | 18.36                 | 3.391                 | 139.98                | 0.071                 | 52.15                 | 0.500                 | 24.80                 |
| 2400.0    | 0.304                 | 14.95                 | 3.073                 | 136.45                | 0.071                 | 53.77                 | 0.495                 | 21.41                 |
| 2500.0    | 0.306                 | 10.96                 | 2.777                 | 133.45                | 0.072                 | 54.15                 | 0.497                 | 18.15                 |
| 2600.0    | 0.306                 | 8.19                  | 2.543                 | 129.56                | 0.079                 | 54.77                 | 0.499                 | 14.71                 |
| 2700.0    | 0.299                 | 5.88                  | 2.337                 | 126.43                | 0.082                 | 47.98                 | 0.498                 | 11.73                 |
| 2800.0    | 0.305                 | 2.32                  | 2.153                 | 123.33                | 0.080                 | 51.00                 | 0.494                 | 8.88                  |
| 2900.0    | 0.306                 | -0.50                 | 1.969                 | 120.37                | 0.089                 | 49.99                 | 0.502                 | 5.90                  |
| 3000.0    | 0.309                 | -2.42                 | 1.826                 | 117.03                | 0.090                 | 52.10                 | 0.503                 | 4.23                  |

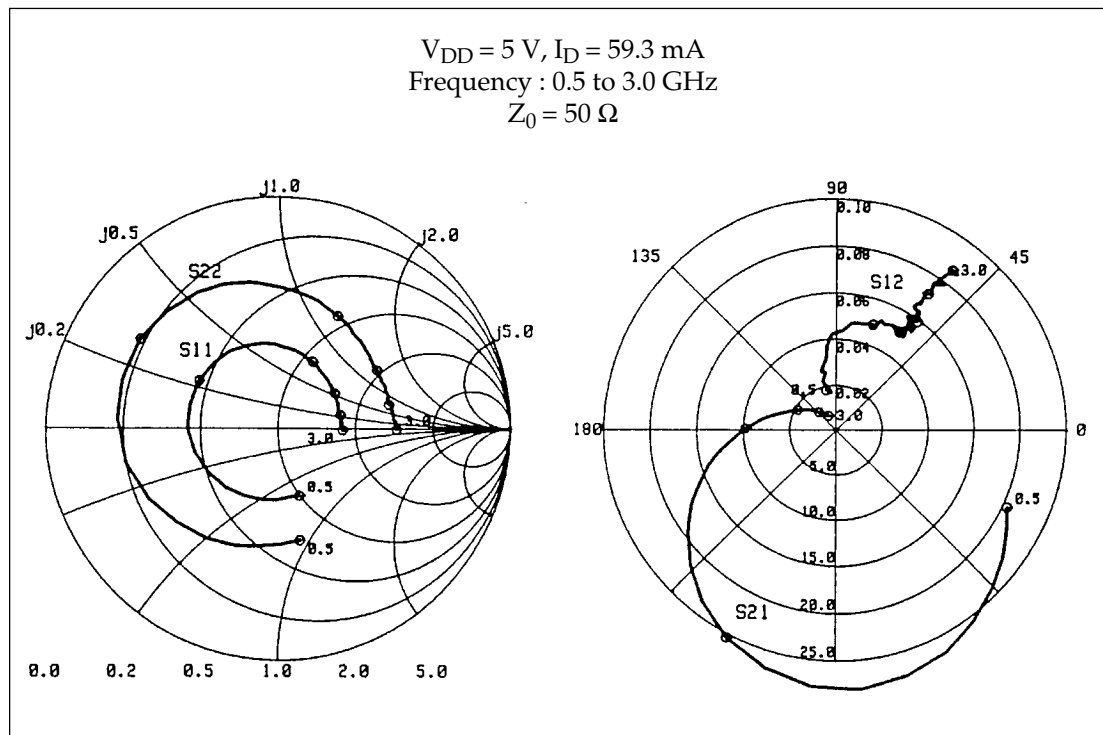
## Typical S-Parameters



**Typical S-Parameters** $V_{DD} = 5\text{ V}$ ,  $I_D = 59.3\text{ mA}$ 

| Freq(MHz) | MAG(S <sub>11</sub> ) | ANG(S <sub>11</sub> ) | MAG(S <sub>21</sub> ) | ANG(S <sub>21</sub> ) | MAG(S <sub>12</sub> ) | ANG(S <sub>12</sub> ) | MAG(S <sub>22</sub> ) | ANG(S <sub>22</sub> ) |
|-----------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 500.0     | 0.311                 | -72.62                | 20.449                | -24.73                | 0.018                 | 103.61                | 0.502                 | -78.78                |
| 600.0     | 0.316                 | -91.07                | 22.960                | -37.93                | 0.022                 | 105.35                | 0.524                 | -98.88                |
| 700.0     | 0.329                 | -115.93               | 25.588                | -54.09                | 0.027                 | 104.30                | 0.573                 | -122.75               |
| 800.0     | 0.357                 | -146.89               | 27.665                | -73.68                | 0.037                 | 96.33                 | 0.635                 | -150.85               |
| 900.0     | 0.388                 | 179.78                | 27.761                | -95.44                | 0.044                 | 86.08                 | 0.691                 | 176.66                |
| 1000.0    | 0.400                 | 147.73                | 25.369                | -117.65               | 0.049                 | 70.92                 | 0.711                 | 146.53                |
| 1100.0    | 0.400                 | 120.80                | 21.527                | -136.72               | 0.052                 | 67.86                 | 0.689                 | 120.34                |
| 1200.0    | 0.382                 | 100.26                | 17.527                | -152.22               | 0.052                 | 61.66                 | 0.652                 | 100.99                |
| 1300.0    | 0.358                 | 85.18                 | 14.264                | -163.95               | 0.050                 | 56.88                 | 0.606                 | 84.56                 |
| 1400.0    | 0.344                 | 72.14                 | 11.683                | -173.03               | 0.052                 | 61.57                 | 0.582                 | 72.49                 |
| 1500.0    | 0.331                 | 62.96                 | 9.725                 | 178.84                | 0.051                 | 57.39                 | 0.554                 | 62.52                 |
| 1600.0    | 0.316                 | 55.47                 | 8.284                 | 171.93                | 0.051                 | 58.63                 | 0.537                 | 54.24                 |
| 1700.0    | 0.308                 | 48.64                 | 7.102                 | 166.11                | 0.050                 | 54.46                 | 0.523                 | 47.76                 |
| 1800.0    | 0.301                 | 42.07                 | 6.073                 | 160.60                | 0.056                 | 52.69                 | 0.513                 | 41.90                 |
| 1900.0    | 0.296                 | 37.46                 | 5.356                 | 155.85                | 0.059                 | 58.46                 | 0.503                 | 36.50                 |
| 2000.0    | 0.291                 | 32.35                 | 4.699                 | 151.14                | 0.059                 | 53.42                 | 0.500                 | 31.17                 |
| 2100.0    | 0.286                 | 27.68                 | 4.159                 | 147.16                | 0.061                 | 55.83                 | 0.499                 | 26.72                 |
| 2200.0    | 0.283                 | 22.88                 | 3.720                 | 142.47                | 0.063                 | 57.68                 | 0.500                 | 22.85                 |
| 2300.0    | 0.276                 | 18.39                 | 3.346                 | 138.93                | 0.068                 | 56.74                 | 0.493                 | 19.15                 |
| 2400.0    | 0.276                 | 15.62                 | 3.023                 | 135.93                | 0.072                 | 57.15                 | 0.493                 | 16.08                 |
| 2500.0    | 0.277                 | 12.64                 | 2.729                 | 132.24                | 0.072                 | 56.20                 | 0.491                 | 12.60                 |
| 2600.0    | 0.278                 | 9.04                  | 2.511                 | 128.36                | 0.075                 | 53.27                 | 0.500                 | 9.73                  |
| 2700.0    | 0.272                 | 6.80                  | 2.312                 | 125.53                | 0.080                 | 53.50                 | 0.504                 | 6.98                  |
| 2800.0    | 0.274                 | 3.45                  | 2.110                 | 122.37                | 0.077                 | 56.57                 | 0.499                 | 4.55                  |
| 2900.0    | 0.283                 | 0.55                  | 1.925                 | 119.21                | 0.086                 | 52.11                 | 0.507                 | 1.76                  |
| 3000.0    | 0.281                 | -1.23                 | 1.799                 | 115.84                | 0.086                 | 53.99                 | 0.512                 | -0.19                 |

## Typical S-Parameters



## Test Circuit and Bias Configuration for KGF1183

