

## KGF1262

Medium-Power Amplifier for UHF-Band and PCS Frequencies

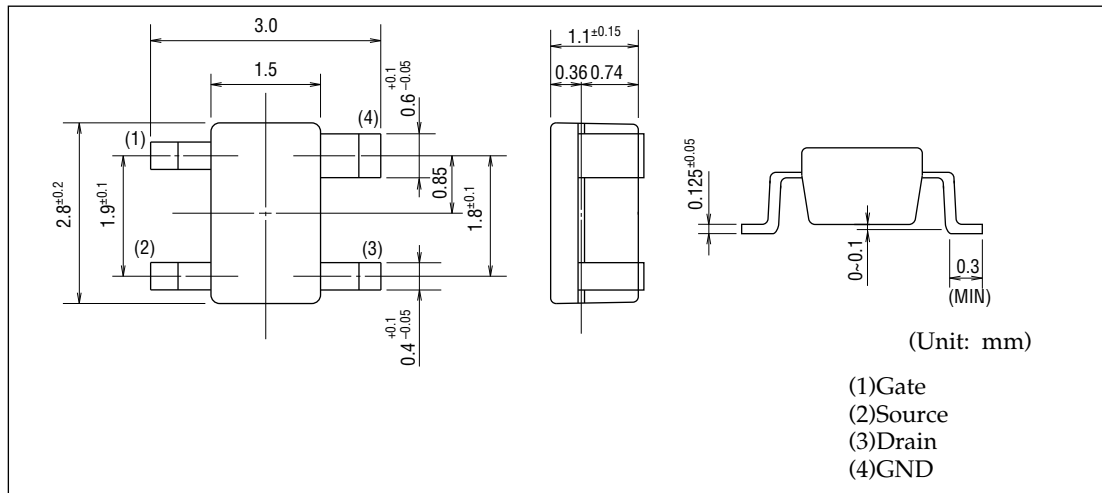
### GENERAL DESCRIPTION

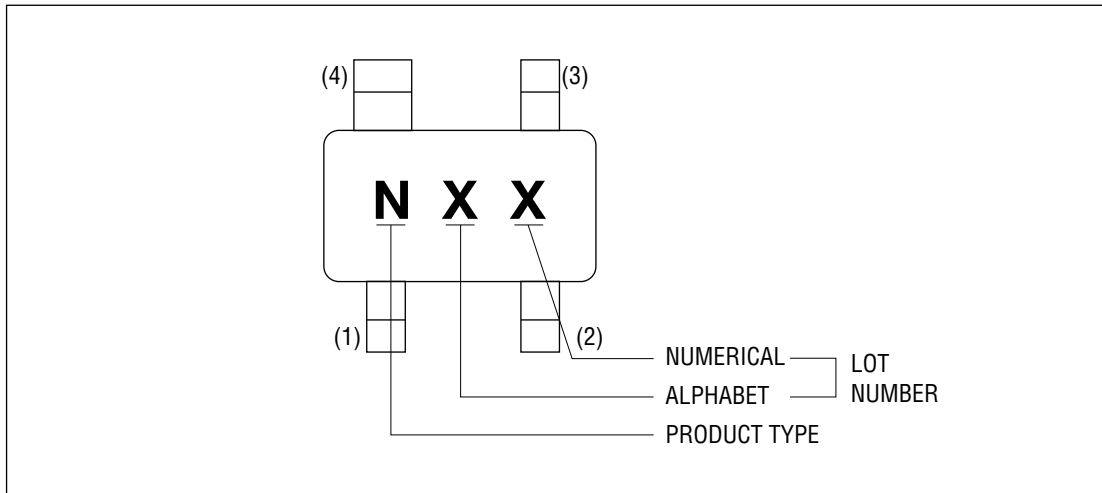
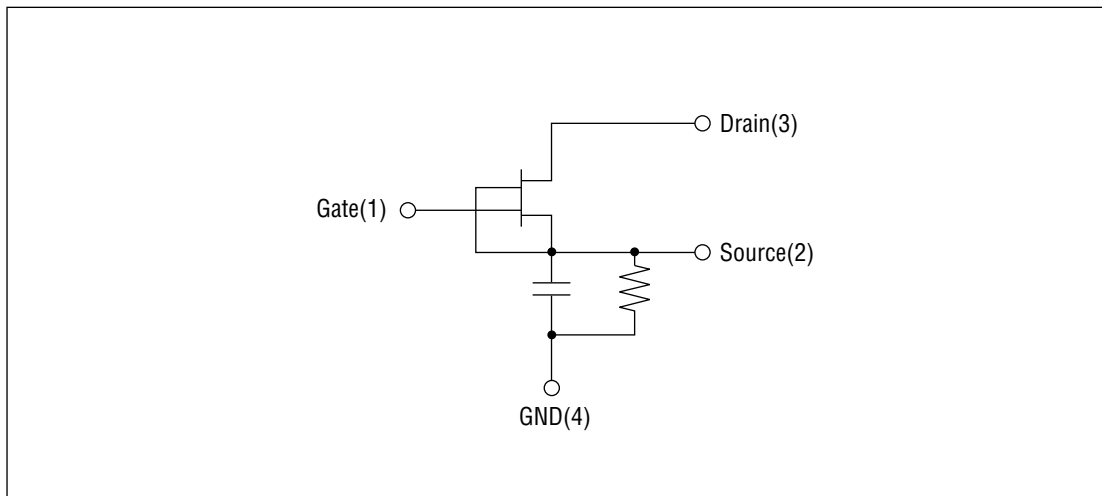
The KGF1262 is a medium-power amplifier, with frequencies ranging from the UHF band to the L band, that features high gain, high output power, and low-current dissipation. The KGF1262 specifications are guaranteed by the fixed matching circuit of 5.2 V and 1.9 GHz, although external impedance matching circuits are required. Because of the high gain and high output power at the low operating current, the KGF1262 is ideal as a transmitter-driver-stage amplifier for personal handy phones of more than 1.5 GHz band.

### FEATURES

- High linear gain: 15 dB (min) at 1.9 GHz
- High output power: 18 dBm (min) at 1.9 GHz
- Low current: 70 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. |
|-------------------------|-----------|----------------------------|--------------------|------|------|
| Drain-source voltage    | $V_{DS}$  | $T_a = 25^{\circ}\text{C}$ | V                  | —    | 10   |
| Gate-source voltage     | $V_{GS}$  | $T_a = 25^{\circ}\text{C}$ | V                  | -5.0 | 0.4  |
| Drain current           | $I_{DS}$  | $T_a = 25^{\circ}\text{C}$ | mA                 | —    | 360  |
| 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  |

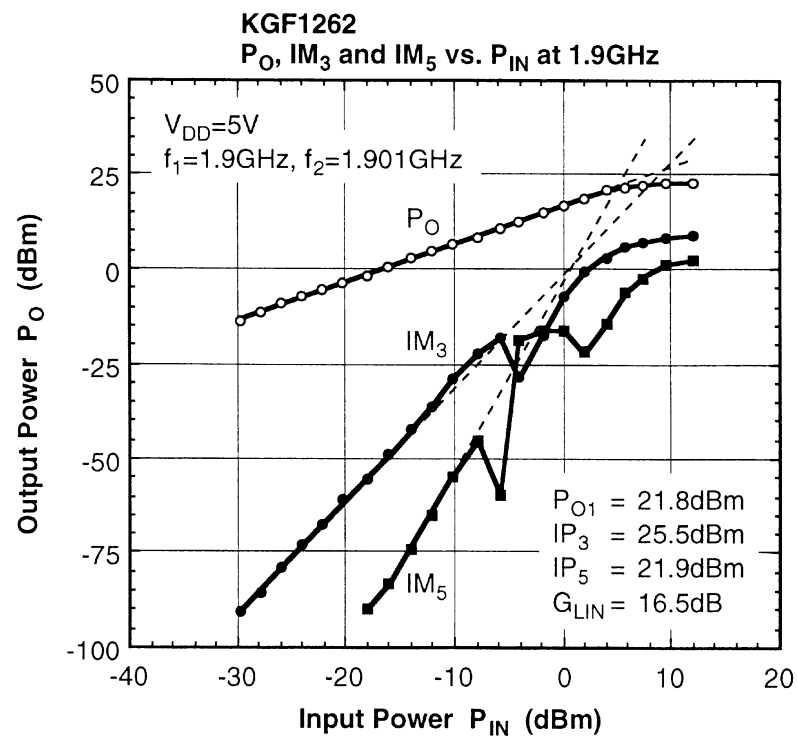
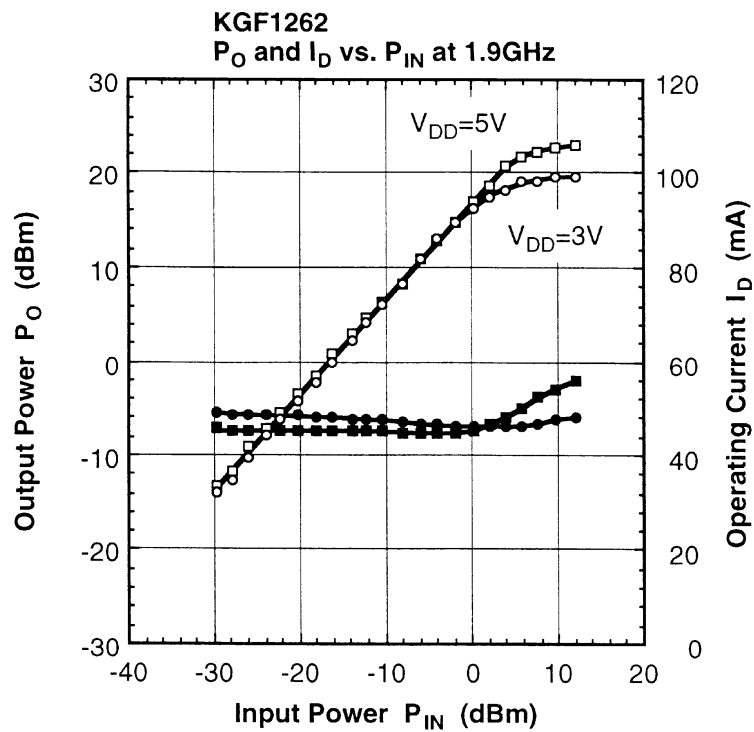
**ELECTRICAL CHARACTERISTICS**

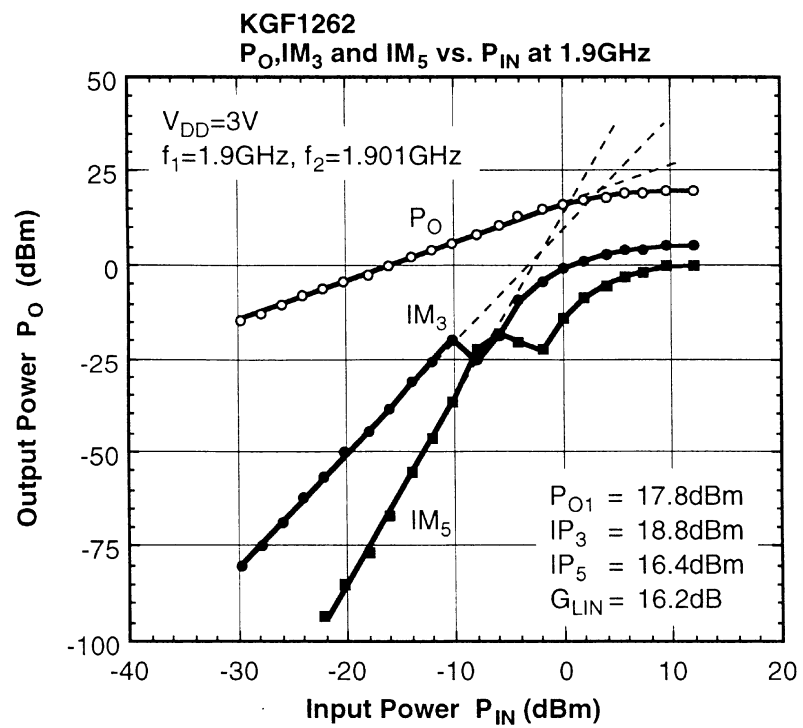
(Ta = 25°C)

| Item                         | Symbol        | Condition                                              | Unit          | Min. | Typ. | Max. |
|------------------------------|---------------|--------------------------------------------------------|---------------|------|------|------|
| Gate-source leakage current  | $I_{GSS}$     | $V_{GS} = -5\text{ V}$                                 | mA            | —    | —    | 0.1  |
| Gate-drain leakage current   | $I_{GDO}$     | $V_{GD} = -15\text{ V}$                                | mA            | —    | —    | 0.5  |
| Drain-source leakage current | $I_{DS(off)}$ | $V_{DS} = 3\text{ V}, V_{GS} = -2.5\text{ V}$          | mA            | —    | —    | 1.0  |
| Drain current                | $I_{DSS}$     | $V_{DS} = 3\text{ V}, V_{GS} = 0\text{ V}$             | mA            | 180  | —    | —    |
| Operating current            | $I_D$         | (*1), $P_{IN} = 7\text{ dBm}$                          | mA            | —    | 50.0 | 70.0 |
| Gate-source cut-off voltage  | $V_{GS(off)}$ | $V_{DS} = 3\text{ V}, I_{DS} = 720\text{ }\mu\text{A}$ | $\mu\text{A}$ | -2.0 | —    | -1.0 |
| Transconductance             | $g_m$         | $V_{DS} = 3\text{ V}, I_{DS} = 60\text{ mA}$           | mS            | 100  | —    | —    |
| Linear gain                  | $G_{LIN}$     | (*1), $P_{IN} = -10\text{ dBm}$                        | dB            | 15.0 | 16.5 | —    |
| Output power                 | $P_O$         | (*1), $P_{IN} = 7\text{ dBm}$                          | dBm           | 18.0 | 20.0 | —    |

\*1 Self-bias condition:  $V_{DD} = 5\text{ V} \pm 0.25\text{ V}$ ,  $V_G = 0\text{ V}$ ,  $f = 1.9\text{ GHz}$

## RF CHARACTERISTICS



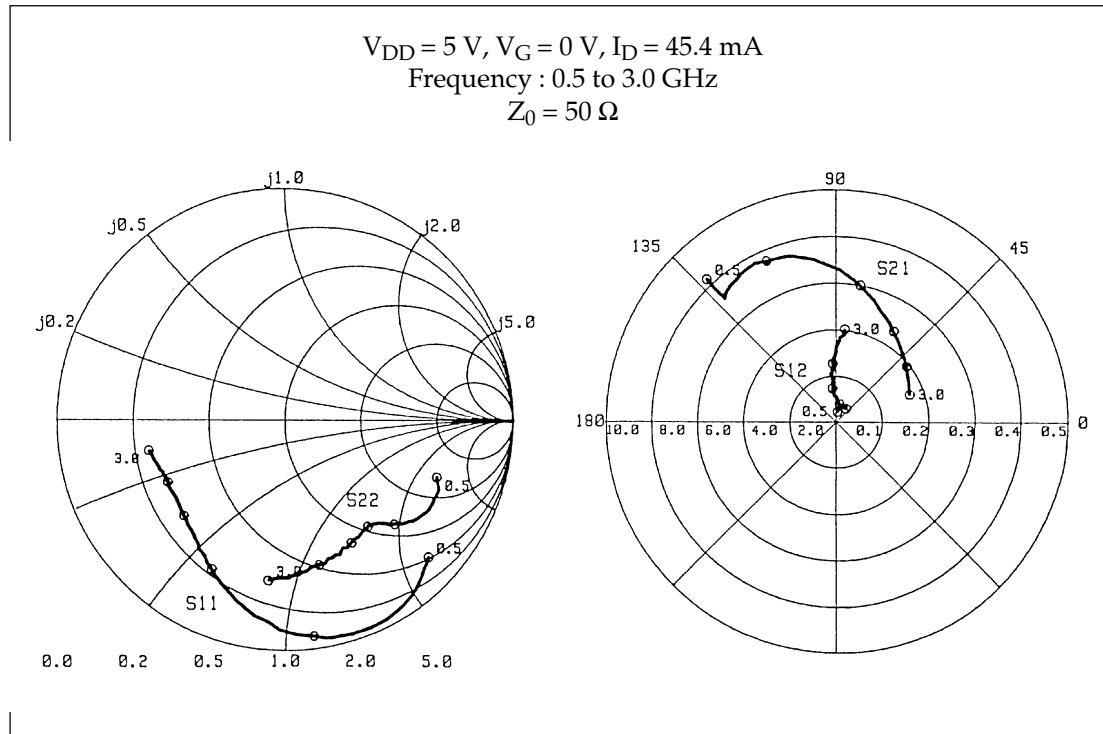


## Typical S-Parameters

 $V_{DD} = 5\text{ V}$ ,  $V_G = 0\text{ V}$ ,  $I_D = 45.4\text{ mA}$ 

| 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     | 0.861                 | -43.20                | 8.314                 | 132.26                | 0.023                 | 81.74                 | 0.708                 | -20.18                |
| 600.0     | 0.885                 | -46.52                | 7.319                 | 131.88                | 0.032                 | 73.96                 | 0.740                 | -23.72                |
| 700.0     | 0.938                 | -53.35                | 7.176                 | 131.57                | 0.035                 | 68.04                 | 0.739                 | -29.36                |
| 800.0     | 0.969                 | -62.62                | 7.448                 | 127.57                | 0.038                 | 58.11                 | 0.724                 | -34.75                |
| 900.0     | 0.972                 | -72.43                | 7.617                 | 121.79                | 0.041                 | 59.61                 | 0.693                 | -39.17                |
| 1000.0    | 0.942                 | -82.27                | 7.566                 | 113.36                | 0.037                 | 52.91                 | 0.657                 | -42.84                |
| 1100.0    | 0.907                 | -91.58                | 7.454                 | 105.56                | 0.038                 | 55.56                 | 0.630                 | -44.99                |
| 1200.0    | 0.852                 | -99.25                | 7.080                 | 97.79                 | 0.037                 | 61.75                 | 0.610                 | -46.73                |
| 1300.0    | 0.804                 | -105.78               | 6.706                 | 91.46                 | 0.038                 | 66.19                 | 0.599                 | -48.16                |
| 1400.0    | 0.756                 | -112.04               | 6.346                 | 85.32                 | 0.038                 | 75.05                 | 0.591                 | -49.34                |
| 1500.0    | 0.718                 | -116.78               | 6.004                 | 79.92                 | 0.040                 | 78.36                 | 0.584                 | -51.27                |
| 1600.0    | 0.681                 | -121.54               | 5.672                 | 74.96                 | 0.046                 | 85.13                 | 0.589                 | -52.35                |
| 1700.0    | 0.654                 | -125.66               | 5.394                 | 70.48                 | 0.052                 | 88.18                 | 0.588                 | -54.02                |
| 1800.0    | 0.631                 | -129.73               | 5.093                 | 65.90                 | 0.057                 | 93.35                 | 0.594                 | -56.54                |
| 1900.0    | 0.618                 | -133.88               | 4.889                 | 61.24                 | 0.064                 | 95.49                 | 0.598                 | -59.04                |
| 2000.0    | 0.603                 | -137.40               | 4.659                 | 57.66                 | 0.074                 | 95.70                 | 0.605                 | -60.99                |
| 2100.0    | 0.594                 | -140.49               | 4.501                 | 53.61                 | 0.083                 | 94.46                 | 0.614                 | -63.71                |
| 2200.0    | 0.585                 | -143.89               | 4.321                 | 50.05                 | 0.095                 | 94.21                 | 0.619                 | -66.74                |
| 2300.0    | 0.581                 | -146.80               | 4.179                 | 46.29                 | 0.107                 | 96.61                 | 0.624                 | -69.08                |
| 2400.0    | 0.582                 | -150.18               | 4.056                 | 42.23                 | 0.117                 | 94.20                 | 0.628                 | -72.55                |
| 2500.0    | 0.578                 | -152.79               | 3.902                 | 38.65                 | 0.128                 | 92.99                 | 0.643                 | -76.40                |
| 2600.0    | 0.581                 | -156.41               | 3.786                 | 35.05                 | 0.143                 | 91.07                 | 0.646                 | -80.05                |
| 2700.0    | 0.587                 | -158.85               | 3.685                 | 31.84                 | 0.156                 | 89.38                 | 0.662                 | -83.66                |
| 2800.0    | 0.592                 | -161.90               | 3.578                 | 27.91                 | 0.171                 | 88.38                 | 0.668                 | -86.20                |
| 2900.0    | 0.597                 | -164.17               | 3.502                 | 25.03                 | 0.185                 | 87.34                 | 0.683                 | -91.62                |
| 3000.0    | 0.611                 | -167.83               | 3.398                 | 20.74                 | 0.202                 | 84.36                 | 0.696                 | -96.08                |

## Typical S-Parameters

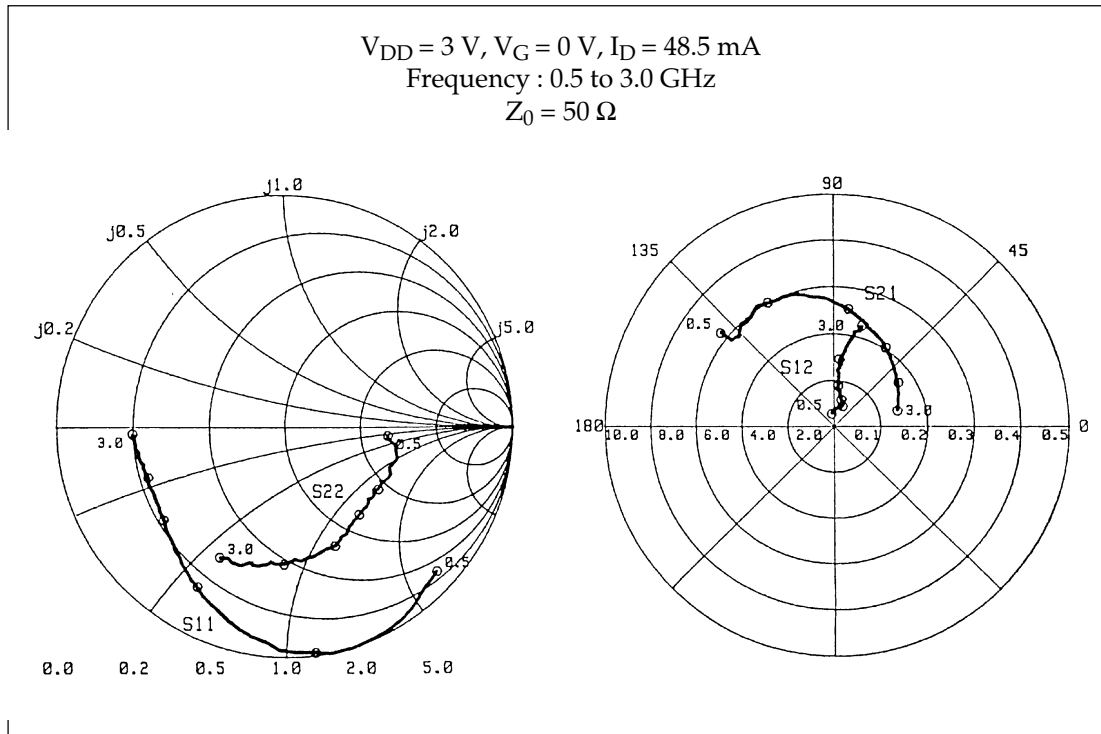


## Typical S-Parameters

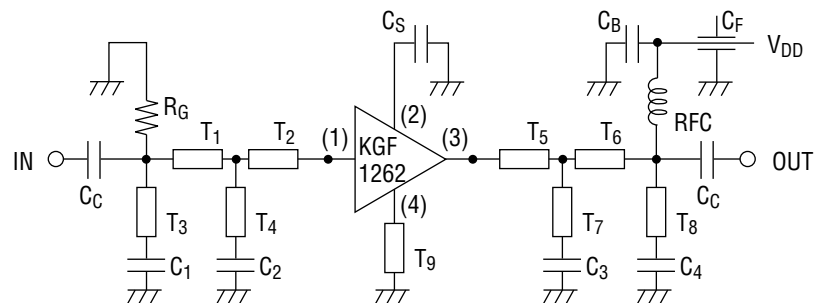
 $V_{DD} = 3\text{ V}$ ,  $V_G = 0\text{ V}$ ,  $I_D = 48.5\text{ mA}$ 

| 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     | 0.916                 | -43.51                | 6.335                 | 140.34                | 0.027                 | 98.55                 | 0.457                 | -4.57                 |
| 600.0     | 0.927                 | -48.23                | 5.762                 | 139.83                | 0.039                 | 83.96                 | 0.498                 | -8.99                 |
| 700.0     | 0.964                 | -54.71                | 5.580                 | 136.14                | 0.042                 | 75.40                 | 0.502                 | -19.93                |
| 800.0     | 0.993                 | -63.63                | 5.892                 | 132.31                | 0.043                 | 69.15                 | 0.515                 | -24.18                |
| 900.0     | 1.005                 | -72.69                | 5.909                 | 126.70                | 0.048                 | 69.44                 | 0.483                 | -28.86                |
| 1000.0    | 0.987                 | -82.39                | 6.026                 | 117.94                | 0.047                 | 65.48                 | 0.493                 | -33.12                |
| 1100.0    | 0.967                 | -91.73                | 5.982                 | 111.07                | 0.051                 | 67.55                 | 0.477                 | -34.38                |
| 1200.0    | 0.920                 | -99.80                | 5.754                 | 101.93                | 0.053                 | 67.95                 | 0.490                 | -39.74                |
| 1300.0    | 0.876                 | -107.04               | 5.571                 | 95.56                 | 0.055                 | 70.09                 | 0.495                 | -41.60                |
| 1400.0    | 0.836                 | -113.69               | 5.299                 | 88.68                 | 0.059                 | 72.60                 | 0.498                 | -45.70                |
| 1500.0    | 0.797                 | -119.30               | 5.086                 | 82.78                 | 0.060                 | 73.94                 | 0.501                 | -49.18                |
| 1600.0    | 0.763                 | -124.95               | 4.821                 | 77.21                 | 0.065                 | 76.41                 | 0.507                 | -52.17                |
| 1700.0    | 0.733                 | -129.64               | 4.628                 | 71.96                 | 0.071                 | 78.66                 | 0.514                 | -55.11                |
| 1800.0    | 0.706                 | -134.46               | 4.421                 | 67.14                 | 0.076                 | 80.42                 | 0.524                 | -58.04                |
| 1900.0    | 0.691                 | -139.12               | 4.262                 | 61.28                 | 0.083                 | 84.73                 | 0.540                 | -62.81                |
| 2000.0    | 0.669                 | -143.06               | 4.068                 | 56.47                 | 0.089                 | 83.56                 | 0.562                 | -66.89                |
| 2100.0    | 0.661                 | -146.80               | 3.913                 | 51.74                 | 0.100                 | 83.44                 | 0.562                 | -71.44                |
| 2200.0    | 0.651                 | -149.92               | 3.747                 | 47.17                 | 0.112                 | 83.94                 | 0.576                 | -76.90                |
| 2300.0    | 0.643                 | -153.50               | 3.620                 | 43.20                 | 0.123                 | 86.10                 | 0.578                 | -79.82                |
| 2400.0    | 0.648                 | -157.16               | 3.475                 | 38.19                 | 0.136                 | 84.08                 | 0.579                 | -85.80                |
| 2500.0    | 0.638                 | -160.05               | 3.359                 | 34.18                 | 0.146                 | 84.76                 | 0.598                 | -90.54                |
| 2600.0    | 0.646                 | -164.22               | 3.210                 | 30.03                 | 0.164                 | 81.24                 | 0.591                 | -96.30                |
| 2700.0    | 0.650                 | -167.02               | 3.130                 | 26.08                 | 0.176                 | 80.05                 | 0.618                 | -101.05               |
| 2800.0    | 0.651                 | -170.84               | 3.000                 | 21.96                 | 0.193                 | 78.05                 | 0.607                 | -104.47               |
| 2900.0    | 0.659                 | -173.51               | 2.930                 | 18.10                 | 0.211                 | 76.90                 | 0.634                 | -112.05               |
| 3000.0    | 0.667                 | -177.55               | 2.809                 | 13.75                 | 0.225                 | 74.08                 | 0.638                 | -117.04               |

## Typical S-Parameters



## Test Circuit and Bias Configuration for KGF1262 at 1.9 GHz



$T_1$ :  $Z_0 = 75 \Omega$ ,  $E = 90 \text{ deg}$        $T_5$ :  $Z_0 = 75 \Omega$ ,  $E = 70 \text{ deg}$   
 $T_2$ :  $Z_0 = 75 \Omega$ ,  $E = 55 \text{ deg}$        $T_6$ :  $Z_0 = 75 \Omega$ ,  $E = 65 \text{ deg}$   
 $T_3 = T_9$ :  $Z_0 = 100 \Omega$ ,  $E = 1 \text{ deg}$        $T_4 = T_7 = T_8$ :  $Z_0 = 100 \Omega$ ,  $E = 5 \text{ deg}$   
 $C_1 = 1.2 \text{ pF}$ ,  $C_2 = 1.5 \text{ pF}$ ,  $C_3 = 0.6 \text{ pF}$ ,  $C_4 = 0.4 \text{ pF}$ ,  $C_S = 100 \text{ pF}$   
 $C_C(\text{DC Block}) = 1000 \text{ pF}$ ,  $C_B(\text{By-pass}) = 1000 \text{ pF}$ ,  $C_F(\text{Feed Through}) = 1000 \text{ pF}$   
 $R_{FC} = 60 \text{ nH}$ ,  $R_G = 1000 \Omega$