

OKI electronic components

KGF1165

Medium-Power Amplifier

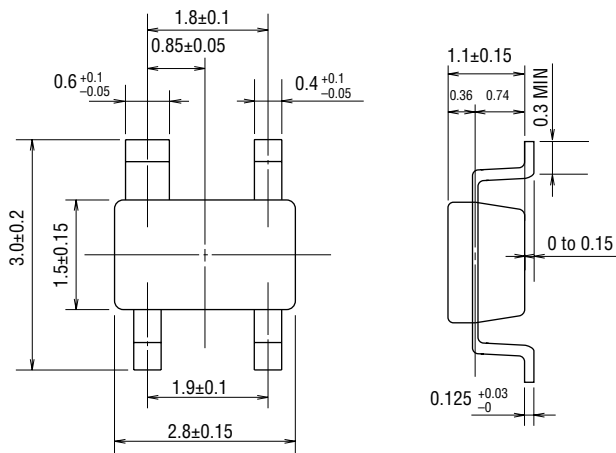
GENERAL DESCRIPTION

The KGF1165 is a one-stage resistive feedback type medium-power amplifier for the UHF-band that features high output power and low current operation. The internally matched 50 Ω input and output eliminate external impedance-matching circuits. All specifications for this device are guaranteed at 5 V and 800 to 1000 MHz. Because there is no need for external impedance-matching circuits, the KGF1165 is best suited to transmitter-intermediate-stage amplifiers for personal handy phones.

FEATURES

- Input and output 50 Ω matched
- High output power: 7 dBm (min.)
- Low current operation: 25 mA (max.)
- Self-bias circuit configuration with built-in source capacitor
- Package: 4PSOP

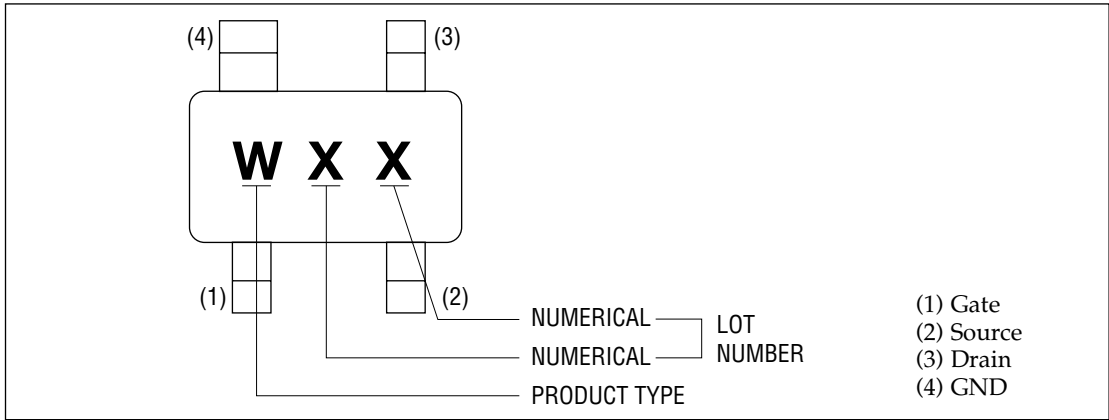
PACKAGE DIMENSIONS



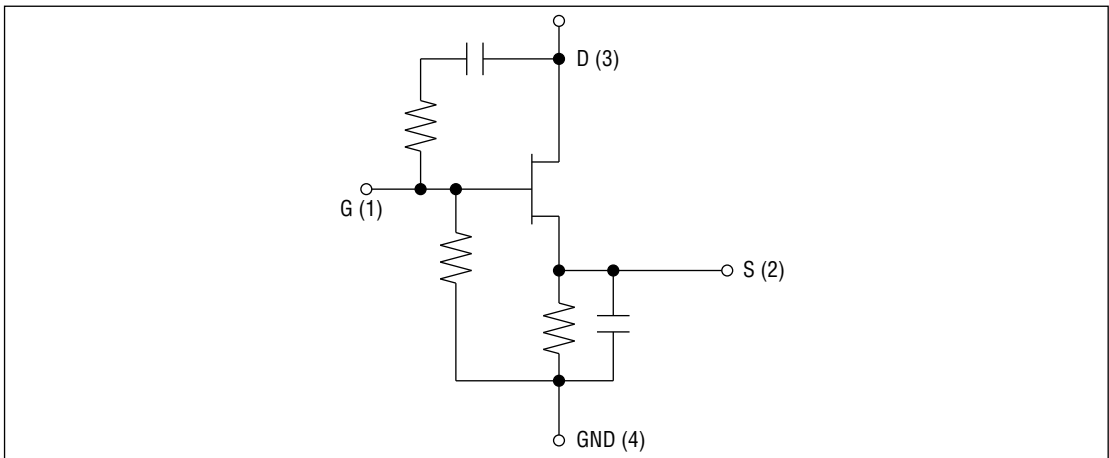
(Unit: mm)

| | |
|------------------------|-------------------------|
| Package material | Epoxy resin |
| Lead frame material | 42 alloy |
| Pin treatment | Solder plating |
| Solder plate thickness | 5 μm or more |

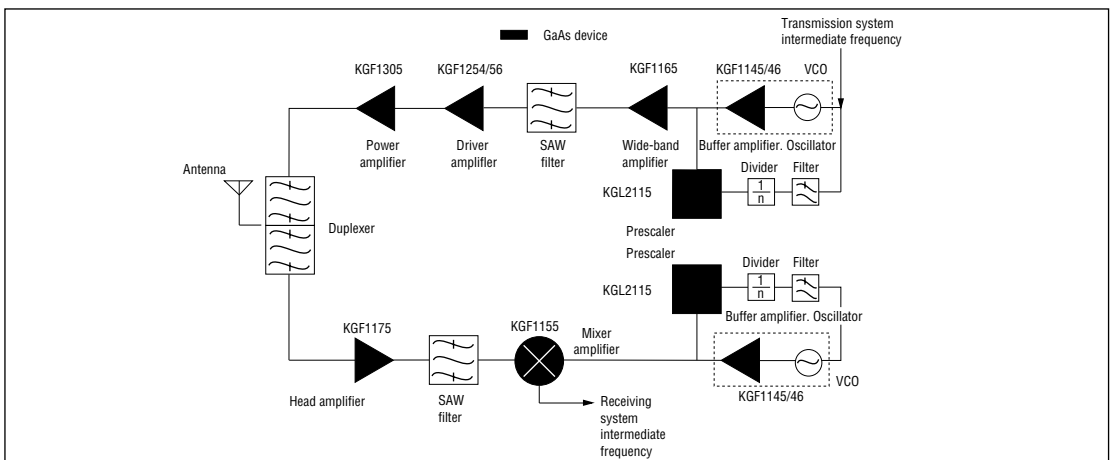
MARKING



CIRCUIT



APPLICATION EXAMPLE FOR PORTABLE PHONES



ABSOLUTE MAXIMUM RATINGS

(Ta = 25°C)

| Item | Symbol | Unit | Min. | Max. |
|-------------------------|------------------|------|------|------|
| Drain-source voltage | V _{DS} | V | — | 7 |
| Gate-source voltage | V _{GS} | V | -3 | 0.4 |
| Drain current | I _{DS} | mA | — | 180 |
| Total power dissipation | P _{tot} | mW | — | 200 |
| Channel temperature | T _{ch} | °C | — | 150 |
| Storage temperature | T _{stg} | °C | -45 | 125 |

ELECTRICAL CHARACTERISTICS

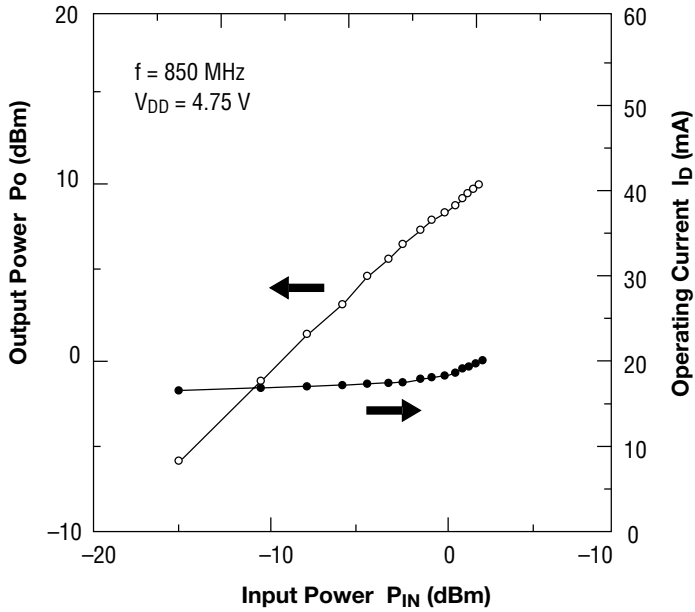
(Ta = 25°C)

| Item | Symbol | Condition | Unit | Min. | Max. |
|------------------------------|----------------------|---|------|------|------|
| Gate-source leakage current | I _{GSS} | V _{GS} = -3 V | μA | — | 40 |
| Gate-drain leakage current | I _{GDO} | V _{GDO} = -7 V | μA | — | 200 |
| Drain-source leakage current | I _{DS(off)} | V _{DS} = 3 V, V _{GS} = -2 V | μA | — | 400 |
| Drain current | I _{DSS} | V _{DS} = 3 V, V _{GS} = 0 V | mA | 40 | — |
| Operating current | I _D | (*1), P _{IN} = 3 dBm | mA | — | 25 |
| Gate-source cut-off voltage | V _{GS(off)} | V _{DS} = 3 V, I _{DS} = 400 μA | V | -1.5 | -0.5 |
| Transconductance | g _m | V _{DS} = 3 V, I _{DS} = 15 mA | mS | 55 | — |
| Noise figure | F | (*1) | dB | — | 4 |
| Linear gain | G _{LIN} | (*1), P _{IN} = -10 dBm | dB | 7 | — |
| Output power | P _O | (*1), P _{IN} = 3 dBm | dBm | 7 | — |
| Input return loss | R _{LIN} | (*1), P _{IN} = -20 dBm | dB | — | -8 |

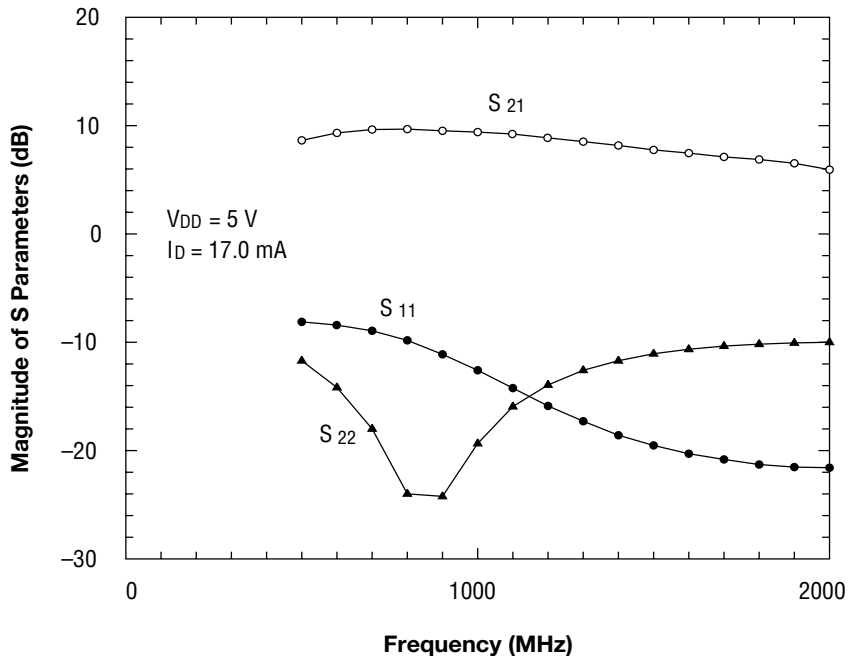
*1 Self-bias condition: V_{DD} = 5.0 ± 0.25 V, V_G = 0 V, f = 800 to 1000 MHz

RF CHARACTERISTICS

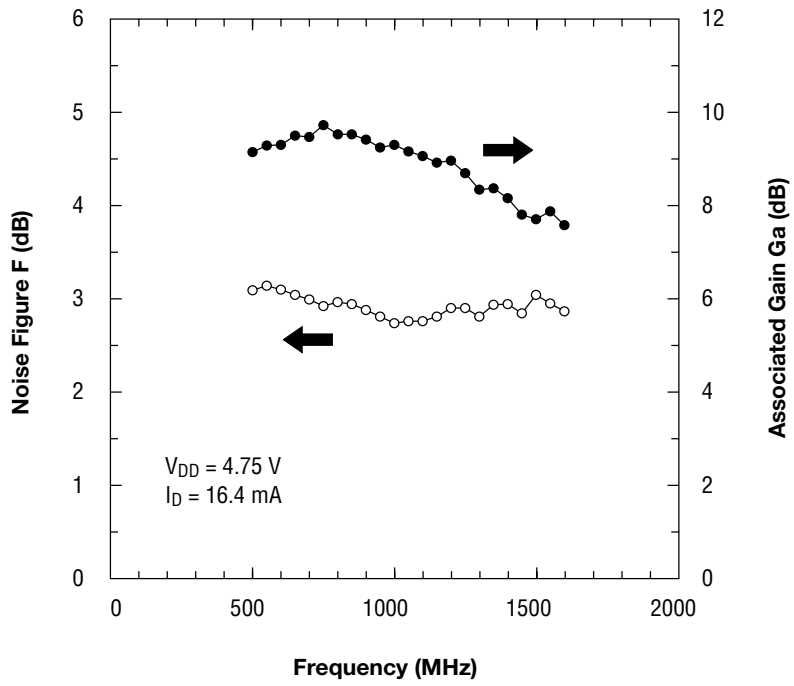
Po vs Pin



Gain and Return Loss



Noise Properties



Typical S Parameters

 $V_{DD} = 5\text{ V}$, $I_D = 16.5\text{ mA}$

| Freq(MHz) | MAG(S ₁₁) | ANG(S ₁₁) | MAG(S ₂₁) | ANG(S ₂₁) | MAG(S ₁₂) | ANG(S ₁₂) | MAG(S ₂₂) | ANG(S ₂₂) |
|-----------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 500.0 | 0.464 | -49.68 | 2.769 | 177.71 | 0.171 | -10.68 | 0.300 | -63.30 |
| 600.0 | 0.420 | -55.84 | 2.937 | 168.40 | 0.161 | -12.60 | 0.222 | -69.18 |
| 700.0 | 0.380 | -61.50 | 3.003 | 159.30 | 0.151 | -12.96 | 0.154 | -71.17 |
| 800.0 | 0.342 | -66.46 | 3.030 | 151.09 | 0.143 | -12.89 | 0.095 | -64.41 |
| 900.0 | 0.309 | -70.67 | 3.000 | 143.39 | 0.135 | -11.77 | 0.064 | -35.77 |
| 1000.0 | 0.278 | -74.31 | 2.952 | 136.12 | 0.130 | -11.00 | 0.065 | 1.80 |
| 1100.0 | 0.253 | -77.45 | 2.894 | 129.57 | 0.125 | -9.35 | 0.095 | 19.44 |
| 1200.0 | 0.228 | -80.33 | 2.808 | 123.58 | 0.122 | -7.61 | 0.123 | 26.35 |
| 1300.0 | 0.209 | -83.08 | 2.732 | 117.90 | 0.118 | -6.18 | 0.153 | 26.56 |
| 1400.0 | 0.191 | -85.44 | 2.653 | 112.33 | 0.116 | -3.49 | 0.177 | 24.88 |
| 1500.0 | 0.174 | -87.16 | 2.564 | 107.34 | 0.113 | -1.18 | 0.202 | 23.28 |
| 1600.0 | 0.159 | -89.15 | 2.483 | 102.84 | 0.111 | 1.07 | 0.219 | 20.69 |
| 1700.0 | 0.147 | -91.27 | 2.405 | 98.02 | 0.112 | 3.65 | 0.238 | 17.73 |
| 1800.0 | 0.133 | -92.93 | 2.334 | 93.99 | 0.111 | 5.85 | 0.252 | 15.08 |
| 1900.0 | 0.124 | -94.17 | 2.252 | 89.67 | 0.110 | 7.92 | 0.266 | 12.92 |
| 2000.0 | 0.113 | -95.51 | 2.198 | 85.85 | 0.111 | 11.13 | 0.276 | 9.93 |
| 2100.0 | 0.103 | -97.04 | 2.128 | 82.15 | 0.112 | 12.88 | 0.287 | 6.87 |
| 2200.0 | 0.096 | -99.77 | 2.074 | 78.77 | 0.113 | 15.72 | 0.292 | 4.62 |
| 2300.0 | 0.090 | -100.62 | 2.019 | 75.32 | 0.117 | 18.01 | 0.301 | 2.40 |
| 2400.0 | 0.082 | -102.87 | 1.971 | 72.05 | 0.119 | 20.59 | 0.307 | -0.30 |
| 2500.0 | 0.078 | -102.03 | 1.917 | 68.80 | 0.122 | 22.87 | 0.314 | -2.57 |
| 2600.0 | 0.072 | -104.03 | 1.877 | 65.35 | 0.128 | 25.14 | 0.320 | -5.23 |
| 2700.0 | 0.065 | -104.75 | 1.833 | 62.41 | 0.131 | 28.00 | 0.322 | -6.89 |
| 2800.0 | 0.059 | -108.33 | 1.797 | 59.18 | 0.137 | 29.32 | 0.330 | -9.99 |
| 2900.0 | 0.060 | -108.58 | 1.770 | 56.54 | 0.143 | 30.93 | 0.331 | -12.00 |
| 3000.0 | 0.052 | -111.63 | 1.731 | 53.77 | 0.149 | 32.47 | 0.333 | -14.99 |

Typical S Parameters

