

OKI electronic components

KGF1145

Small-Signal Amplifier

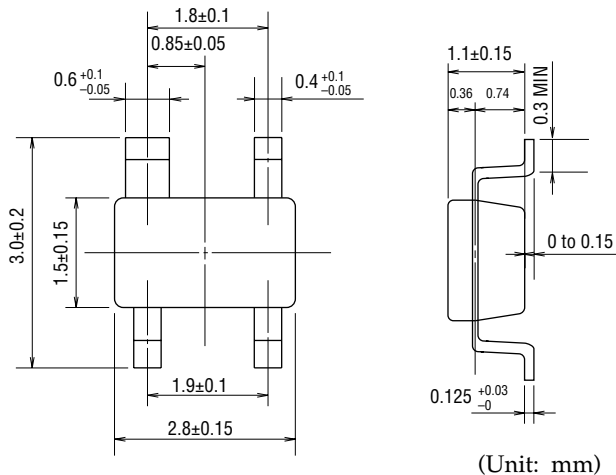
GENERAL DESCRIPTION

The KGF1145 is a two-stage small-signal UHF-band amplifier that features low current operation, high output power, and high isolation. The KGF1145 specifications are guaranteed to a fixed matching circuit for 5 V and 850 MHz; external impedance-matching circuits are also required. Because of the high isolation, the KGF1145 is an ideal part for VCO-buffer amplifiers and intermediate stage amplifiers for portable handy phones, such as cellular phones.

FEATURES

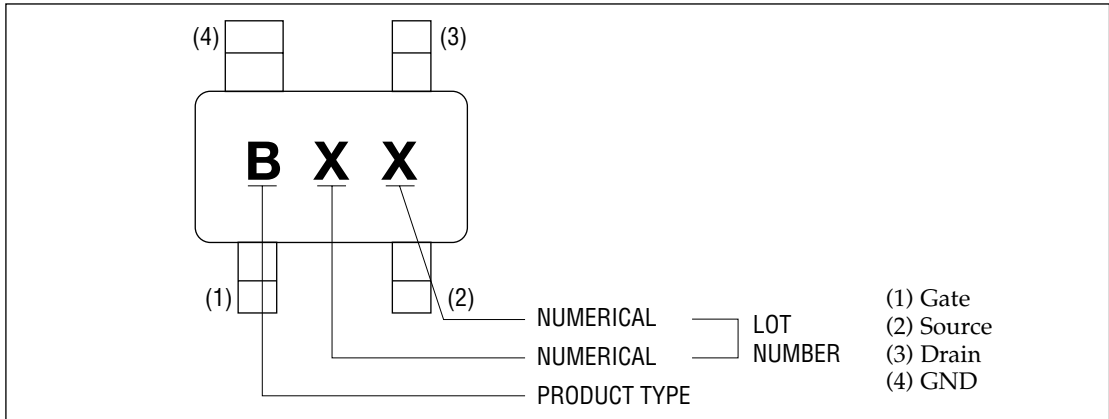
- Low current operation: 4 mA (max.)
- High output power: 2 dBm (min.)
- High isolation: -40 dB
- Self-bias circuit configuration with built-in source capacitor
- Package: 4PSOP

PACKAGE DIMENSIONS

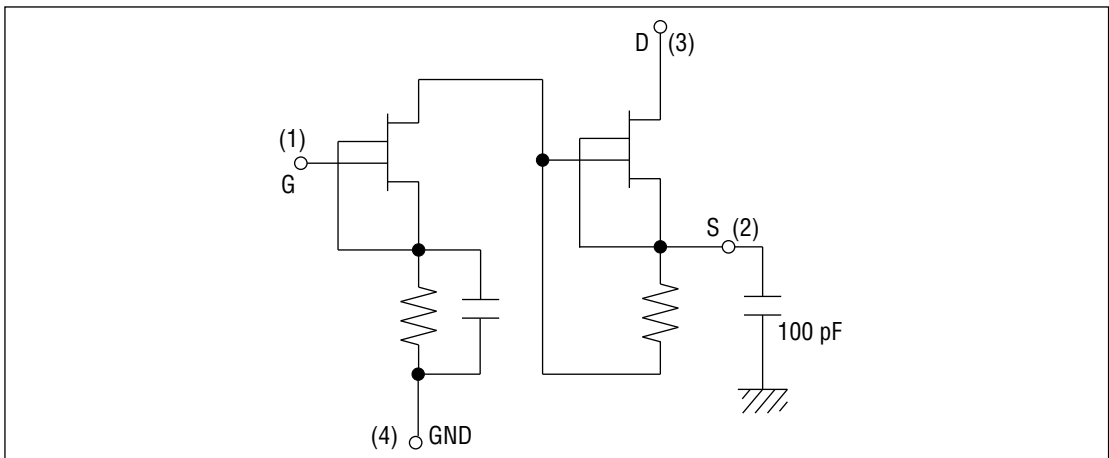


| | |
|------------------------|----------------|
| Package material | Epoxy resin |
| Lead frame material | 42 alloy |
| Pin treatment | Solder plating |
| Solder plate thickness | 5 μm or more |

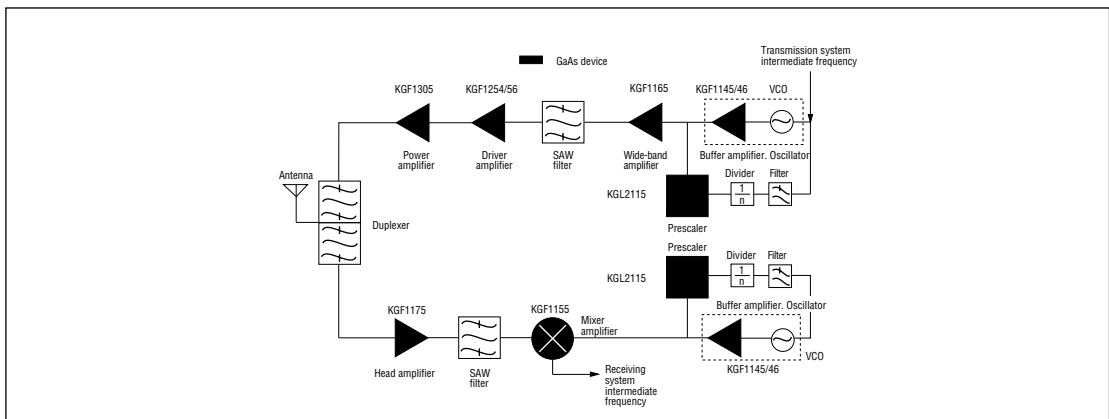
MARKING



CIRCUIT



APPLICATION EXAMPLE FOR PORTABLE PHONES



ABSOLUTE MAXIMUM RATINGS

(Ta = 25°C)

| Item | Symbol | Unit | Min. | Max. |
|-------------------------|------------------|------|------|------|
| Drain-source voltage | V _{DS} | V | — | 6 |
| Gate-source voltage | V _{GS} | V | -3 | 0.4 |
| Drain current | I _{DS} | mA | — | 60 |
| Total power dissipation | P _{tot} | mW | — | 200 |
| Channel temperature | T _{ch} | °C | — | 150 |
| Storage temperature | T _{stg} | °C | -45 | 125 |

ELECTRICAL CHARACTERISTICS

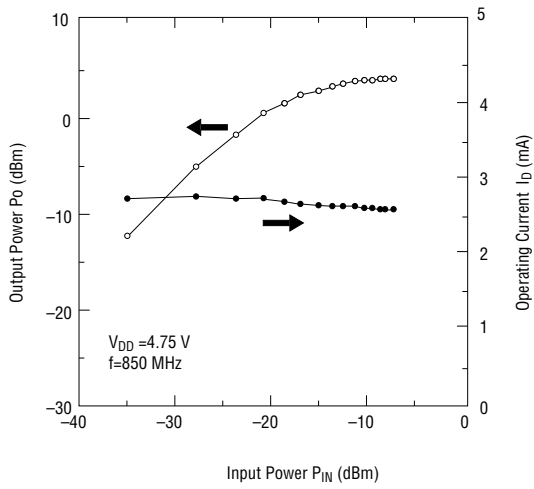
(Ta = 25°C)

| Item | Symbol | Condition | Unit | Min. | Max. |
|------------------------------|----------------------|---|------|------|------|
| Gate-source leakage current | I _{GSS} | V _{GS} = -3 V | μA | — | 12 |
| Gate-drain leakage current | I _{GDO} | V _{GDO} = -6 V | μA | — | 60 |
| Drain-source leakage current | I _{DS(off)} | V _{DS} = 3 V, V _{GS} = -2.5 V | μA | — | 120 |
| Drain current | I _{DSS} | V _{DS} = 3 V, V _{GS} = 0 V | mA | 15 | — |
| Operating current | I _D | (*1), P _{IN} = -10 dBm | mA | — | 4 |
| Gate-source cut-off voltage | V _{GS(off)} | V _{DS} = 3 V, I _{DS} = 120 μA | V | -2.0 | -1.0 |
| Transconductance | g _m | V _{DS} = 3 V, I _{DS} = 2.5 mA | mS | 8 | — |
| Output power | P _O | (*1), P _{IN} = -10 dBm | dBm | 2 | — |
| Isolation | ISO | (*1), P _{IN} = -10 dBm | dB | 40 | — |

*1 Self-bias condition: V_{DD} = 5.0 ± 0.25 V, V_G = 0 V, f = 850 MHz

CHARACTERISTICS

P_o vs. P_{IN}

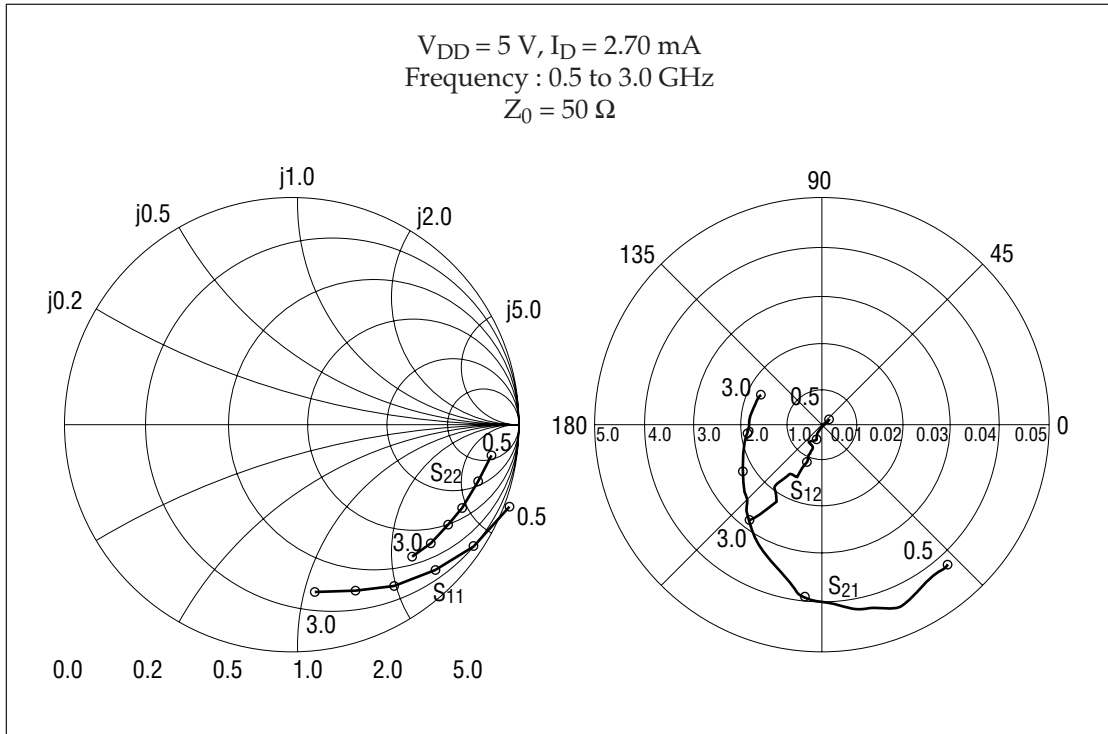


Typical S Parameters

 $V_{DD} = 5\text{ V}$, $I_D = 2.70\text{ mA}$

| 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 | 1.019 | -13.30 | 4.379 | -47.41 | 0.002 | 68.37 | 0.922 | -7.57 |
| 600.0 | 1.014 | -15.83 | 4.408 | -59.30 | 0.001 | 68.30 | 0.921 | -8.97 |
| 700.0 | 1.004 | -18.55 | 4.273 | -70.90 | 0.002 | 76.00 | 0.920 | -10.50 |
| 800.0 | 0.997 | -21.19 | 4.200 | -79.69 | 0.001 | 103.87 | 0.918 | -11.77 |
| 900.0 | 0.989 | -23.73 | 4.021 | -88.70 | 0.002 | 70.31 | 0.918 | -13.39 |
| 1000.0 | 0.979 | -26.33 | 3.914 | -96.04 | 0.001 | 41.49 | 0.912 | -14.69 |
| 1100.0 | 0.970 | -28.86 | 3.594 | -103.81 | 0.002 | 39.66 | 0.913 | -16.08 |
| 1200.0 | 0.958 | -31.41 | 3.432 | -109.87 | 0.002 | 69.82 | 0.910 | -17.60 |
| 1300.0 | 0.949 | -33.99 | 3.195 | -115.80 | 0.003 | 40.98 | 0.909 | -18.98 |
| 1400.0 | 0.936 | -36.74 | 3.019 | -120.72 | 0.001 | 91.26 | 0.901 | -20.60 |
| 1500.0 | 0.926 | -39.31 | 2.806 | -126.82 | 0.001 | 106.35 | 0.901 | -21.77 |
| 1600.0 | 0.914 | -42.03 | 2.627 | -131.34 | 0.001 | 87.82 | 0.898 | -23.04 |
| 1700.0 | 0.903 | -44.77 | 2.427 | -135.76 | 0.000 | 36.68 | 0.895 | -24.52 |
| 1800.0 | 0.889 | -47.30 | 2.318 | -141.70 | 0.001 | -107.00 | 0.889 | -25.91 |
| 1900.0 | 0.882 | -49.93 | 2.232 | -146.80 | 0.003 | -120.41 | 0.888 | -26.97 |
| 2000.0 | 0.867 | -52.61 | 2.170 | -151.72 | 0.003 | -119.09 | 0.881 | -28.24 |
| 2100.0 | 0.856 | -55.68 | 2.118 | -156.73 | 0.004 | -120.95 | 0.878 | -29.59 |
| 2200.0 | 0.849 | -58.49 | 2.017 | -162.05 | 0.006 | -127.04 | 0.875 | -30.86 |
| 2300.0 | 0.840 | -61.23 | 1.954 | -167.23 | 0.006 | -118.02 | 0.870 | -32.08 |
| 2400.0 | 0.829 | -64.11 | 1.903 | -172.08 | 0.010 | -117.98 | 0.867 | -33.30 |
| 2500.0 | 0.820 | -66.28 | 1.846 | -176.86 | 0.011 | -118.51 | 0.864 | -34.57 |
| 2600.0 | 0.807 | -69.20 | 1.781 | 178.08 | 0.012 | -121.43 | 0.863 | -35.57 |
| 2700.0 | 0.798 | -72.04 | 1.748 | 172.95 | 0.015 | -125.86 | 0.856 | -36.57 |
| 2800.0 | 0.783 | -75.15 | 1.705 | 168.29 | 0.019 | -127.35 | 0.857 | -37.71 |
| 2900.0 | 0.779 | -78.39 | 1.670 | 163.69 | 0.024 | -123.08 | 0.850 | -38.64 |
| 3000.0 | 0.765 | -81.35 | 1.609 | 158.74 | 0.029 | -127.91 | 0.852 | -39.54 |

Typical S Parameters



Test Circuit for KGF1145

