

KGF1156

Small-Signal Amplifier for UHF-Band and PCS Frequencies

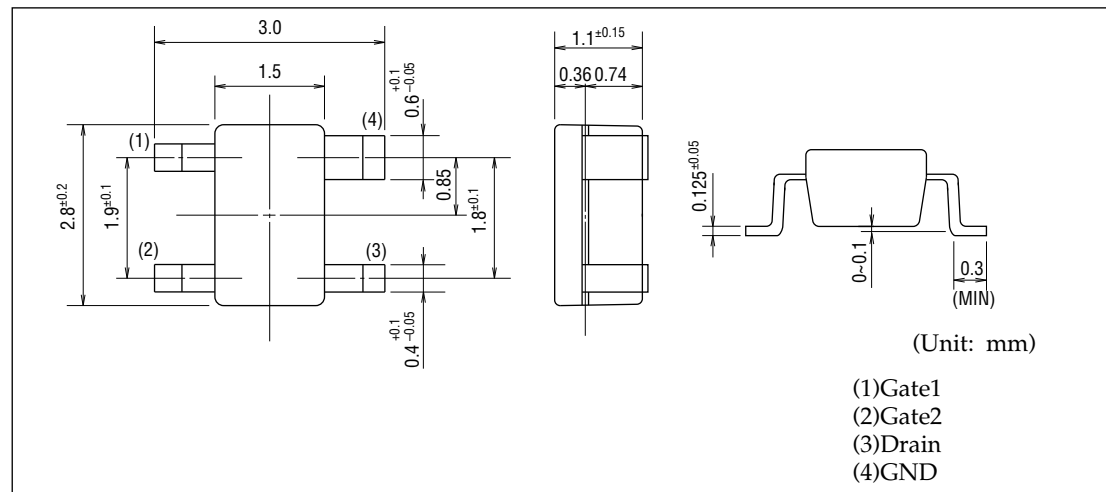
GENERAL DESCRIPTION

The KGF1156 is a small-signal UHF-band amplifier that features high output power, high gain, low noise, and low current dissipation. The KGF1156 specifications are guaranteed by the fixed matching circuit of 5 V and 850 MHz, although external impedance matching circuits are required. Because of the dual gate configuration, high output, high gain, low noise, and low operating current, the KGF1156 is ideal as a receiver mixer for personal handy phones.

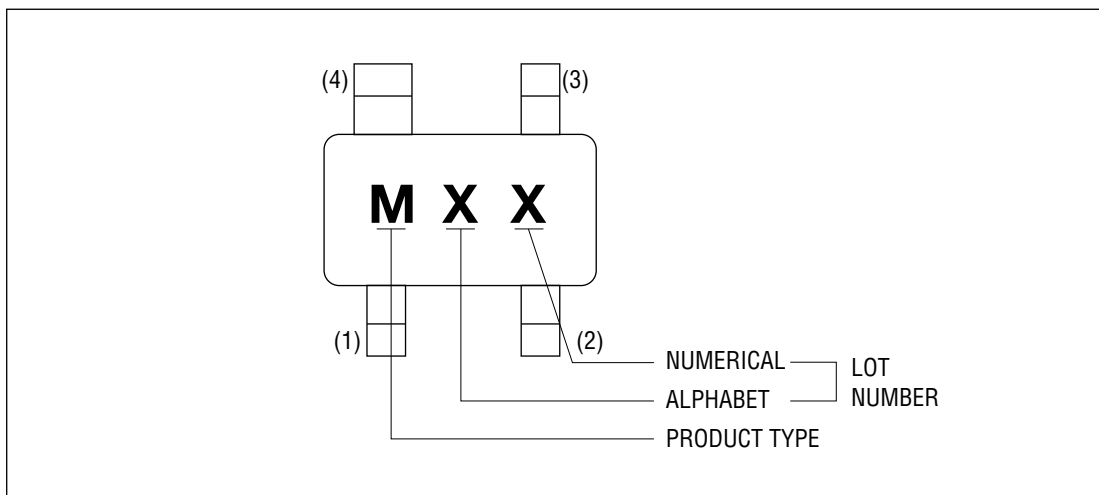
FEATURES

- High output power: 6 dBm (min)
- High linear gain: 15 dB (min)
- Low current: 6 mA (max)
- Low noise: 3 dB (max)
- Self-bias circuit configuration with built-in source capacitor
- Surface-mount 4-pin SOP plastic package

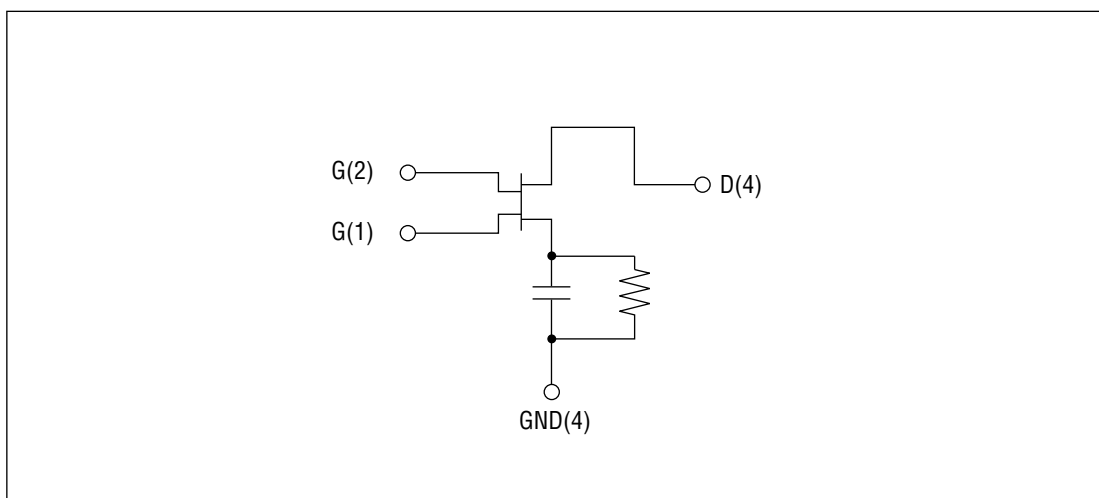
PACKAGE OUTLINE



MARKING



CIRCUIT



ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Condition	Unit	Min.	Max.
Drain-source voltage	V_{DS}	$T_a = 25^{\circ}\text{C}$	V	—	7.0
Gate-source voltage	V_{GS}	$T_a = 25^{\circ}\text{C}$	V	-3.0	0.4
Drain current	I_{DS}	$T_a = 25^{\circ}\text{C}$	mA	—	60
Total power dissipation	P_{tot}	$T_a = 25^{\circ}\text{C}$	mW	—	200
Channel temperature	T_{ch}	—	$^{\circ}\text{C}$	—	150
Storage temperature	T_{stg}	—	$^{\circ}\text{C}$	-45	125

ELECTRICAL CHARACTERISTICS

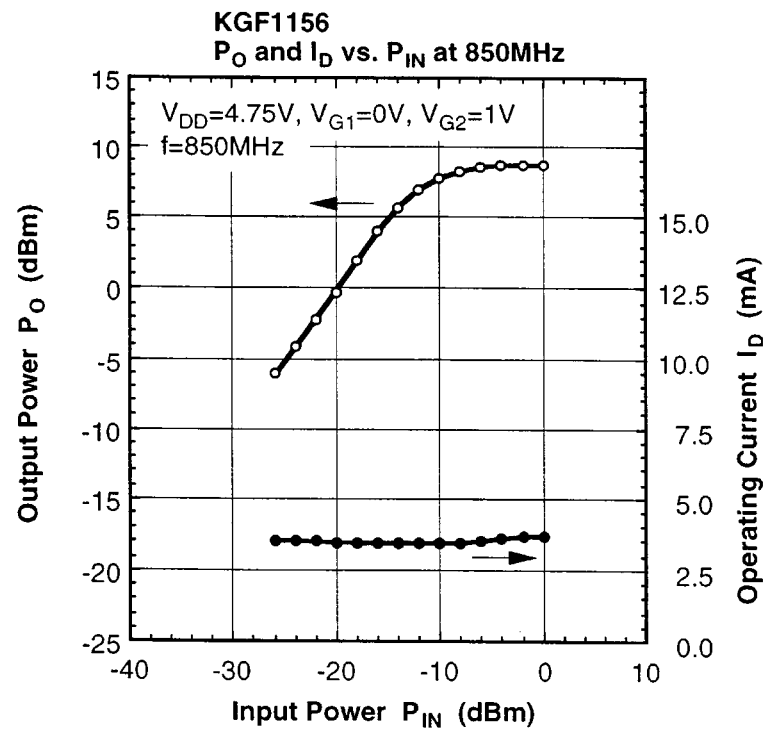
(Ta = 25°C)

Item	Symbol	Condition	Unit	Min.	Typ.	Max.
Gate-source leakage current	I_{GSS}	$V_{GS(1,2)} = -3\text{ V}$	μA	—	—	12
Gate-drain leakage current	I_{GDO}	$V_{GD(1,2)} = -8\text{ V}$	μA	—	—	60
Drain-source leakage current	$I_{DS(off)}$	$V_{DS} = 3\text{ V}, V_{GS(1,2)} = -2.5\text{ V}$	μA	—	—	120
Operating current	I_D	(*1), $P_{IN} = -20\text{ dBm}$	mA	—	—	6.0
Gate-source cut-off voltage	$V_{GS(off)}$	$V_{DS} = 3\text{ V}, I_{DS} = 120\text{ }\mu\text{A}$	V	-2.0	—	-1.0
Noise figure	F	(*1)	dB	—	—	3.0
Linear gain	G_{LIN}	(*1), $P_{IN} = -20\text{ dBm}$	dB	15.0	—	—
Output power	P_O	(*2), $P_{IN} = -3\text{ dBm}$	dBm	6.0	—	—

*1 Self-bias condition: $V_{DD} = 5.0\text{ V} \pm 0.25\text{ V}$, $V_{G1} = 0\text{ V}$, $V_{G2} = 1.0\text{ V}$, $f = 850\text{ MHz}$

*2 Self-bias condition: $V_{DD} = 5.0\text{ V} \pm 0.25\text{ V}$, $V_{G1} = 0\text{ V}$, $V_{G2} = 1.5\text{ V}$, $f = 850\text{ MHz}$

RF CHARACTERISTICS

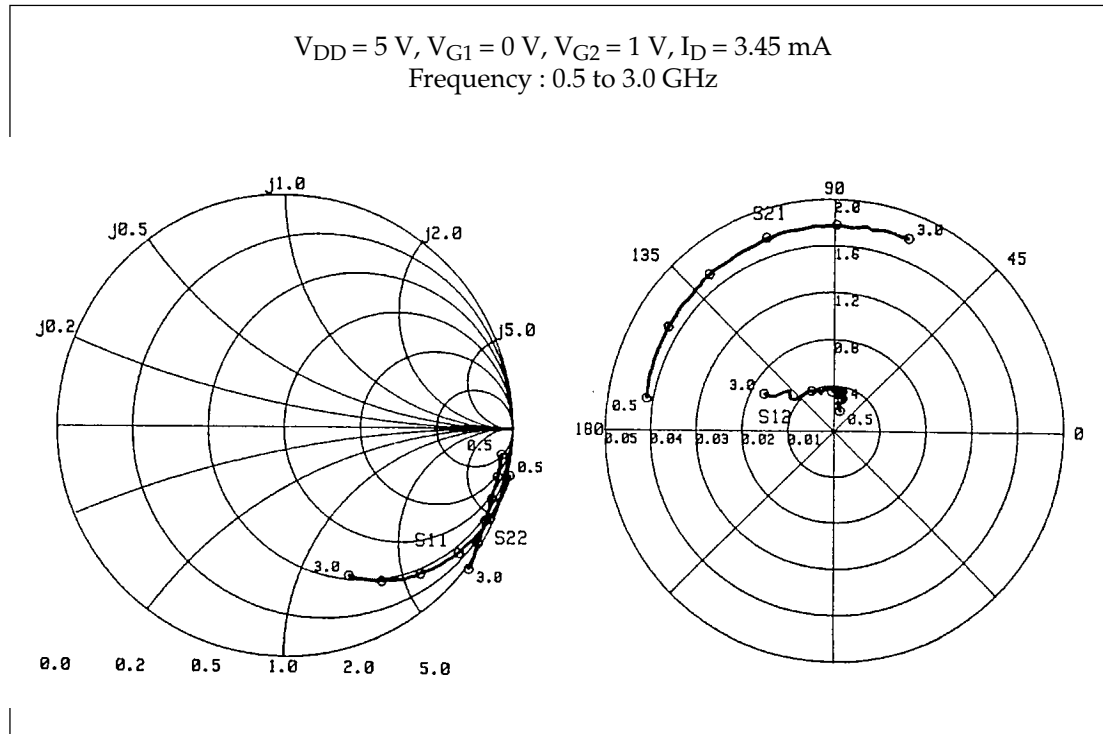


Typical S-Parameters

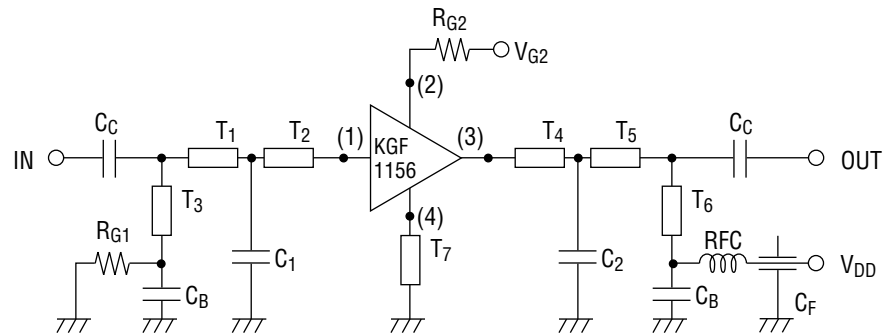
 $V_{DD} = 5\text{ V}$, $V_{G1} = 0\text{ V}$, $V_{G2} = 1\text{ V}$, $I_D = 3.45\text{ mA}$

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	1.006	-11.82	1.659	170.20	0.005	74.34	0.957	-6.73
600.0	1.004	-14.16	1.671	165.31	0.005	75.15	0.956	-7.78
700.0	0.999	-16.46	1.674	160.78	0.006	77.69	0.956	-8.94
800.0	0.993	-18.92	1.684	156.27	0.006	84.33	0.957	-10.16
900.0	0.987	-21.33	1.689	152.35	0.006	75.44	0.955	-11.57
1000.0	0.983	-23.66	1.699	148.07	0.007	76.22	0.957	-12.62
1100.0	0.975	-26.09	1.697	143.94	0.008	77.78	0.957	-13.86
1200.0	0.965	-28.46	1.709	140.23	0.009	76.68	0.957	-15.10
1300.0	0.958	-30.78	1.700	136.62	0.009	73.17	0.957	-16.31
1400.0	0.945	-33.11	1.712	132.59	0.009	79.47	0.956	-17.36
1500.0	0.938	-35.49	1.729	128.78	0.009	78.44	0.958	-18.58
1600.0	0.926	-37.80	1.731	125.12	0.008	82.11	0.960	-19.78
1700.0	0.913	-40.00	1.730	121.32	0.009	79.45	0.963	-20.80
1800.0	0.900	-42.39	1.741	117.25	0.009	84.64	0.964	-22.32
1900.0	0.887	-44.60	1.743	113.22	0.010	87.69	0.965	-23.43
2000.0	0.871	-46.76	1.763	109.51	0.009	92.88	0.966	-24.46
2100.0	0.861	-48.98	1.769	105.94	0.009	93.67	0.969	-25.91
2200.0	0.847	-51.17	1.767	101.30	0.009	98.33	0.975	-26.73
2300.0	0.830	-53.28	1.771	97.56	0.009	110.97	0.977	-28.12
2400.0	0.812	-55.29	1.768	93.63	0.010	110.61	0.984	-29.21
2500.0	0.795	-57.37	1.777	89.55	0.010	118.86	0.982	-30.65
2600.0	0.776	-59.34	1.762	85.37	0.010	125.43	0.993	-31.97
2700.0	0.759	-61.20	1.789	81.01	0.011	141.77	0.994	-33.04
2800.0	0.741	-63.08	1.777	77.33	0.013	137.75	1.004	-34.61
2900.0	0.728	-64.59	1.783	72.83	0.015	149.96	1.010	-35.82
3000.0	0.709	-66.24	1.785	68.76	0.017	151.86	1.012	-37.15

Typical S-Parameters



Test Circuit and Bias Configuration for KGF1156 at 850 MHz



T_1 : $Z_0 = 110 \Omega$, $E = 25 \text{ deg}$

T_2 : $Z_0 = 110 \Omega$, $E = 27 \text{ deg}$

T_3 : $Z_0 = 65 \Omega$, $E = 16 \text{ deg}$

T_7 : $Z_0 = 110 \Omega$, $E = 6 \text{ deg}$

$C_1 = 0.10 \text{ pF}$, $C_2 = 1.05 \text{ pF}$

$C_{C(DC \text{ Block})} = 1000 \text{ pF}$, $C_{B(By-pass)} = 1000 \text{ pF}$, $C_{F(Feed Through)} = 1000 \text{ pF}$

$R_{FC} = 200 \text{ nH}$, $R_{G1} = 1000 \Omega$, $R_{G2} = 750 \Omega$

T_4 : $Z_0 = 110 \Omega$, $E = 7 \text{ deg}$

T_5 : $Z_0 = 110 \Omega$, $E = 35 \text{ deg}$

T_6 : $Z_0 = 65 \Omega$, $E = 16 \text{ deg}$