

OKI electronic components

KGF1323

Power FET(Plastic Package Type)

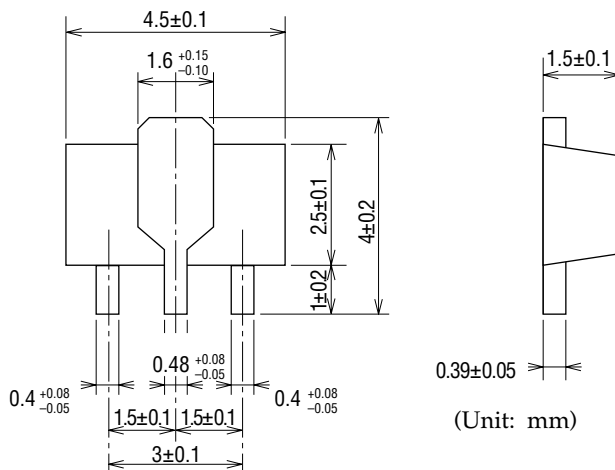
GENERAL DESCRIPTION

The KGF1323, housed in a SOT-89 type plastic-mold package, is a discrete UHF-band power FET that features high efficiency and high output power. The KGF1323 specifications are guaranteed to a fixed matching circuit for 5.8 V and 850 MHz; external impedance-matching circuits are also required. Because of its high efficiency, high output power (more than 33 dBm), and plastic package, the KGF1323 is ideal as a transmitter-final-stage amplifier for personal handy phones, such as TDMA-type cellular phones.

FEATURES

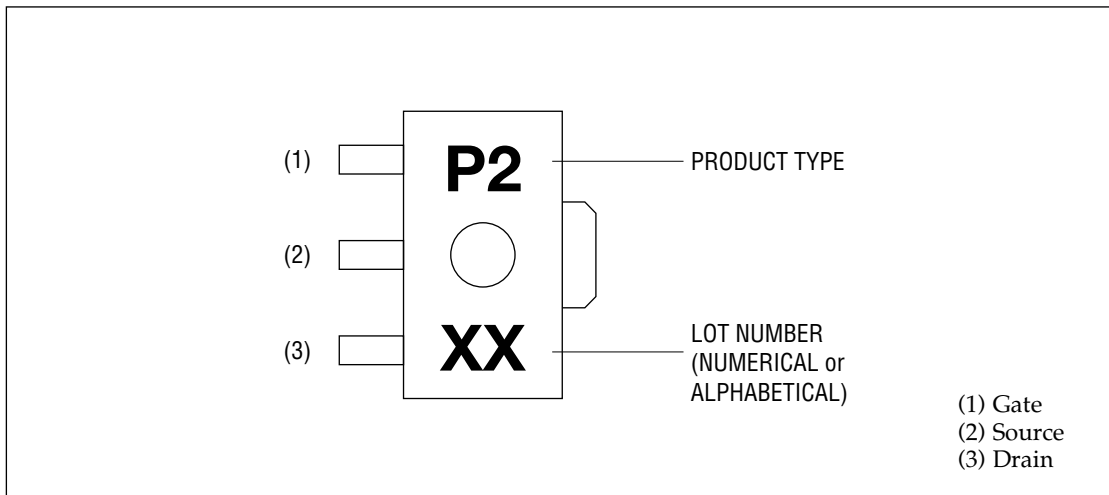
- High output power: 33 dBm (min.)
- High efficiency: 70% (typ.)
- Low thermal resistance: 23°C/W (typ.)
- Package: 3PMMP (SOT-89 type)

PACKAGE DIMENSIONS

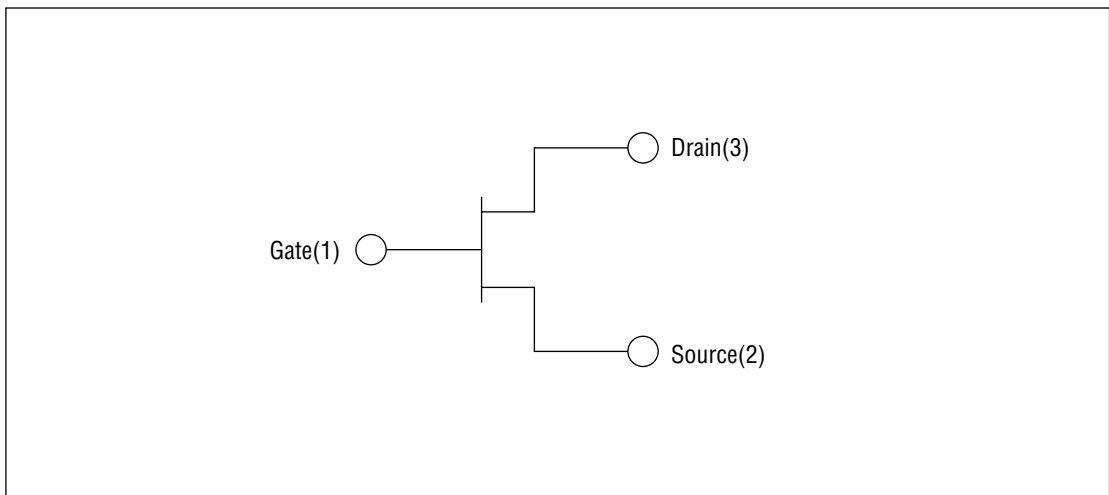


Package material	Epoxy resin
Lead frame material	Cu
Pin treatment	Solder plating
Solder plate thickness	5 μ m or more

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	-6.0	0.4
Drain current	I_{DS}	$T_a = 25^\circ\text{C}$	A	—	3.0
Total power dissipation	P_{tot}	$T_a = T_c = 25^\circ\text{C}$	W	—	5
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}	$V_{GS} = -6\text{ V}$	μA	—	—	100
Gate-drain leakage current	I_{GDO}	$V_{GD} = -16\text{ V}$	μA	—	—	500
Drain-source leakage current	$I_{DS(off)}$	$V_{DS} = 10\text{ V}, V_{GS} = -6\text{ V}$	μA	—	—	1500
Drain current	I_{DSS}	$V_{DS} = 1.5\text{ V}, V_{GS} = 0\text{ V}$	A	2.0	—	—
Gate-source cut-off voltage	$V_{GS(off)}$	$V_{DS} = 3\text{ V}, I_{DS} = 4.8\text{ mA}$	V	-3.8	—	-2.8
Output power	P_O	(*1), $P_{IN} = 22\text{ dBm}$	dBm	33.0	33.5	—
Drain efficiency	η_D	(*1), $P_{IN} = 22\text{ dBm}$	%	60	70	—
Linear gain	G_{LIN}	(*1), $P_{IN} = 0\text{ dBm}$	dB	—	15.0	—
Thermal resistance	R_{th}	Channel to case	$^\circ\text{C}/\text{W}$	—	14	—

*1 Condition: $f = 850\text{ MHz}$, $V_{DS} = 5.8\text{ V}$, $I_{DSQ} = 240\text{ mA}$

RF CHARACTERISTICS

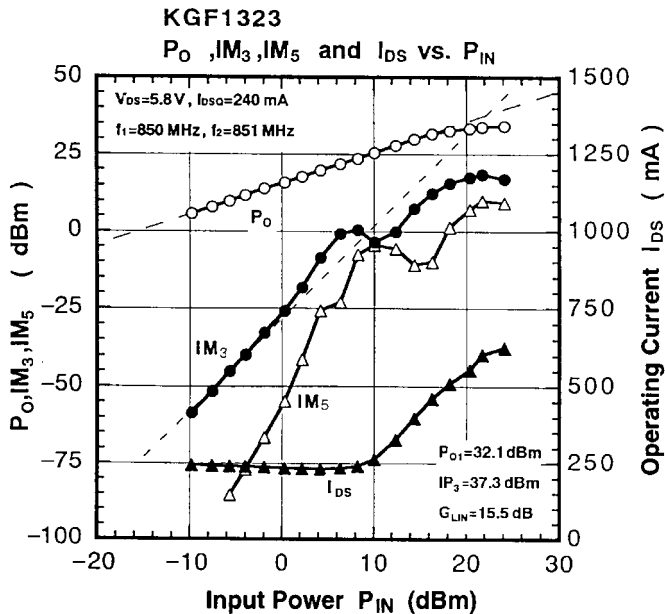
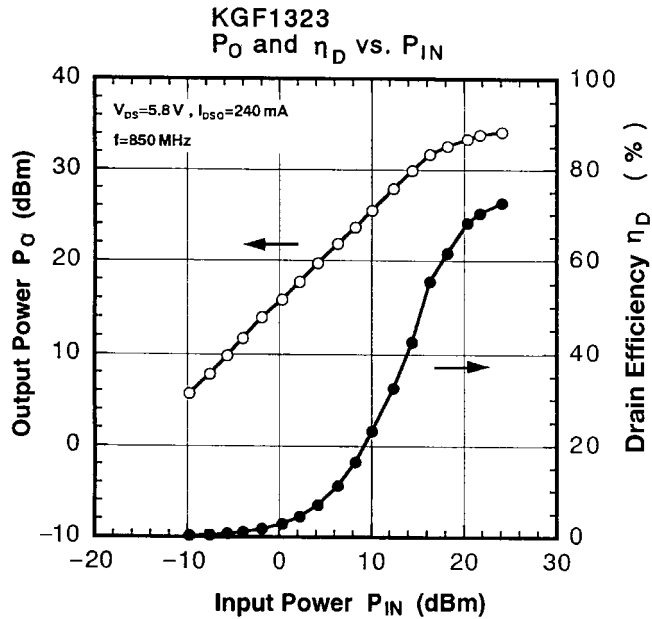
Matching conditions

Gamma S (Source impedance) : $4.79 + j9.80 (\Omega)$

Gamma L (Load impedance) : $10.74 - j2.12 (\Omega)$

Bias conditions

$V_{DS}=5.8V$, $I_{DSQ}=240mA$, $f=850MHz$

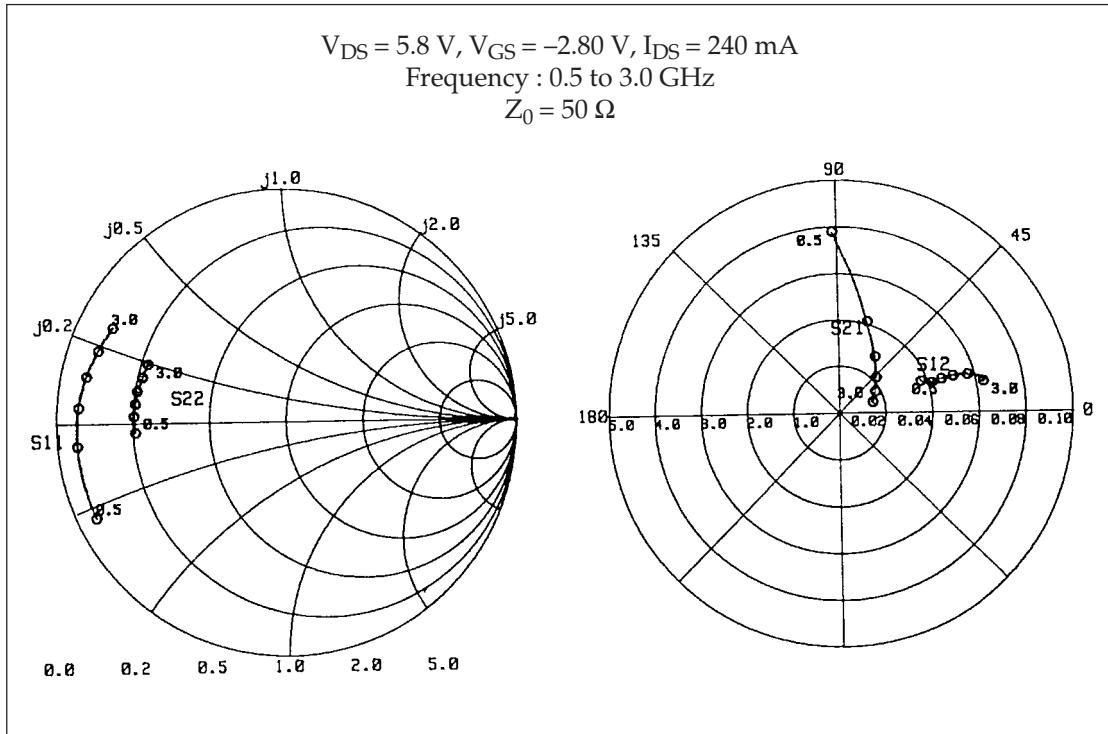


Typical S Parameters

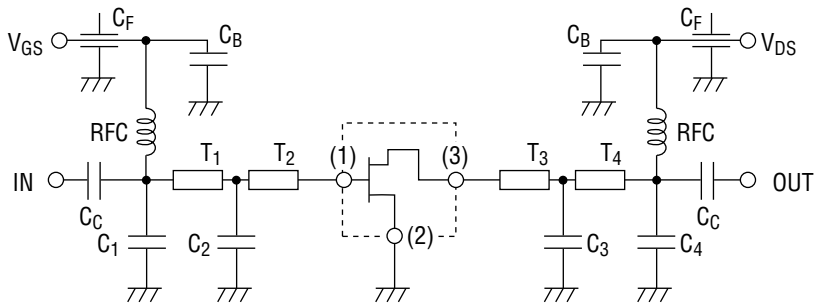
 $V_{DS} = 5.8 \text{ V}$, $V_{GS} = -2.80 \text{ V}$, $I_{DS} = 240 \text{ mA}$

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	0.921	-154.27	3.891	91.63	0.037	20.87	0.655	-176.53
600.0	0.921	-160.15	3.291	87.28	0.038	19.65	0.657	-178.18
700.0	0.920	-164.62	2.854	82.96	0.039	18.86	0.659	-179.48
800.0	0.917	-168.17	2.519	79.31	0.040	18.39	0.661	179.28
900.0	0.917	-171.22	2.250	76.01	0.040	18.30	0.660	178.41
1000.0	0.914	-173.90	2.041	72.42	0.041	17.74	0.661	177.38
1100.0	0.913	-176.22	1.871	69.42	0.042	17.99	0.660	176.61
1200.0	0.911	-178.42	1.721	66.28	0.043	17.72	0.660	175.52
1300.0	0.909	179.67	1.599	63.39	0.044	18.08	0.660	174.76
1400.0	0.907	177.63	1.491	60.39	0.045	17.76	0.661	173.75
1500.0	0.903	175.71	1.404	57.29	0.046	17.98	0.658	172.81
1600.0	0.901	173.93	1.324	54.72	0.047	17.75	0.660	171.94
1700.0	0.899	172.15	1.248	51.47	0.048	17.57	0.654	170.90
1800.0	0.893	170.52	1.188	48.90	0.048	17.85	0.660	170.04
1900.0	0.892	169.01	1.127	45.99	0.050	17.23	0.653	169.08
2000.0	0.888	167.01	1.077	43.37	0.051	17.60	0.658	168.02
2100.0	0.885	165.66	1.027	40.36	0.052	17.24	0.651	167.14
2200.0	0.881	163.90	0.983	37.89	0.053	16.83	0.655	165.92
2300.0	0.875	162.38	0.944	35.01	0.055	16.62	0.650	164.99
2400.0	0.873	160.75	0.906	32.96	0.055	16.02	0.652	163.98
2500.0	0.869	159.09	0.876	29.90	0.057	16.20	0.649	162.58
2600.0	0.866	157.56	0.844	27.58	0.058	15.62	0.649	161.68
2700.0	0.863	155.95	0.816	24.58	0.060	14.77	0.649	160.24
2800.0	0.856	154.35	0.789	22.20	0.061	14.20	0.646	159.52
2900.0	0.854	152.84	0.756	19.48	0.063	12.48	0.649	158.10
3000.0	0.852	151.31	0.736	17.09	0.063	11.90	0.646	157.17

Typical S Parameters



Test Circuit and Bias Configuration for KGF1323 at 850 MHz



$f = 850 \text{ MHz}$

$T_1: Z_0 = 50 \Omega, E = 28.5 \text{ deg}$

$T_3: Z_0 = 50 \Omega, E = 15.0 \text{ deg}$

$T_2: Z_0 = 50 \Omega, E = 16.5 \text{ deg}$

$T_4: Z_0 = 50 \Omega, E = 30.0 \text{ deg}$

$C_1 = 2.0 \text{ pF}, C_2 = 10.0 \text{ pF}, C_3 = 5.0 \text{ pF}, C_4 = 1.0 \text{ pF}$

$C_C = 1000 \text{ pF}, C_F = 1000 \text{ pF}, C_B = 1000 \text{ pF}, \text{RFC} = 200 \text{ nH}$