

OKI electronic components

KGF1607

This version: Jan. 1998
Previous version: Jun. 1996

Power FET (Ceramic Package Type)

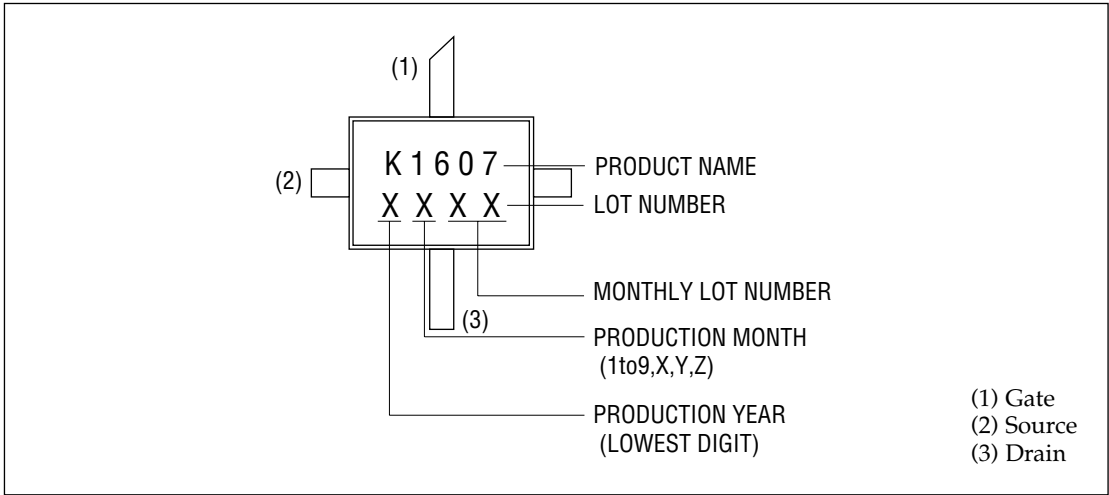
GENERAL DESCRIPTION

The KGF1607, housed in a SMD type ceramic package, is a discrete GaAs power FET that features high efficiency and high output power. The KGF1607 specifications are guaranteed to a fixed matching circuit for 3.4 V and 850 MHz; external impedance-matching circuits are also required. Because of its high efficiency (70% min.), high output power (more than 31.5 dBm), and plastic package, the KGF1607 is ideal as a transmitter-final-stage amplifier for personal handy phones, such as 3-V type analog cellular phones.

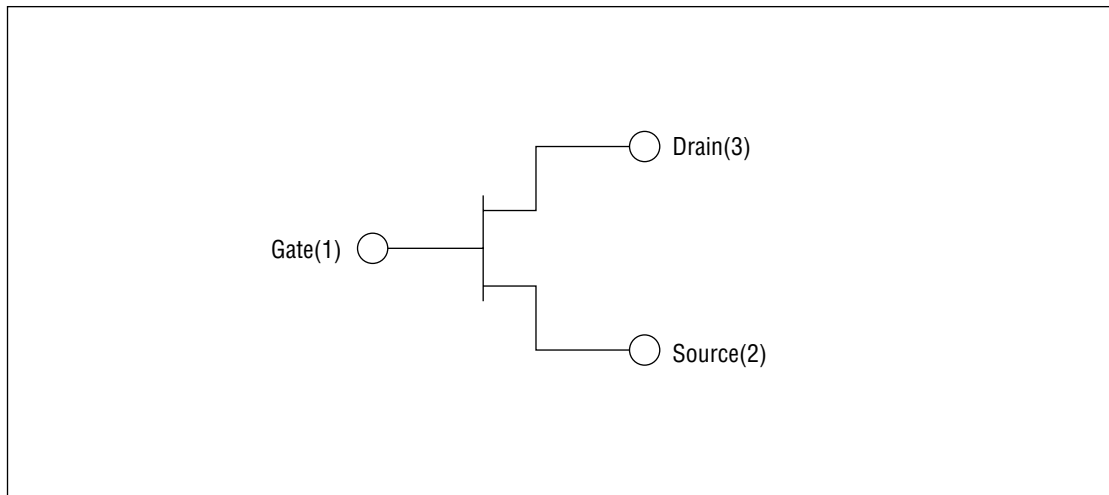
FEATURES

- High output power: 31.5 dBm (min.)
- High efficiency: 70% (min.)
- Specifications guaranteed to a fixed matching circuit for 3.4 V and 850 MHz
- Low thermal resistance: 18°C/W (typ.)
- Package: 3PFP

MARKING



CIRCUIT



ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Condition	Unit	Min.	Max.
Drain-source voltage	V_{DS}	$T_a = 25^\circ\text{C}$	V	—	8
Gate-source voltage	V_{GS}	$T_a = 25^\circ\text{C}$	V	-5	0.4
Drain current	I_{DS}	$T_a = 25^\circ\text{C}$	A	—	4.5
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}	$V_{GS} = -5\text{ V}$	μA	—	—	100
Gate-drain leakage current	I_{GDO}	$V_{GD} = -13\text{ V}$	mA	—	—	3
Drain-source cut-off current	$I_{DS(off)}$	$V_{DS} = 8\text{ V}, V_{GS} = -5\text{ V}$	mA	—	—	3
Drain current	I_{DSS}	$V_{DS} = 1.5\text{ V}, V_{GS} = 0\text{ V}$	A	3.5	—	—
Gate-source cut-off voltage	$V_{GS(off)}$	$V_{DS} = 3\text{ V}, I_{DS} = 8.4\text{ mA}$	V	-3.0	—	-2.0
Output power	P_O	(*1) $P_{IN} = 22\text{ dBm}$	dBm	31.5	—	—
Drain efficiency	η_D	(*1) $P_{IN} = 22\text{ dBm}$	%	70	—	—
Thermal resistance	R_{th}	Channel to case	$^\circ\text{C/W}$	—	18	—

*1 Condition: $f = 850\text{ MHz}$, $V_{DS} = 3.4\text{ V}$, $I_{DSQ} = 300\text{ mA}$,

RF CHARACTERISTICS

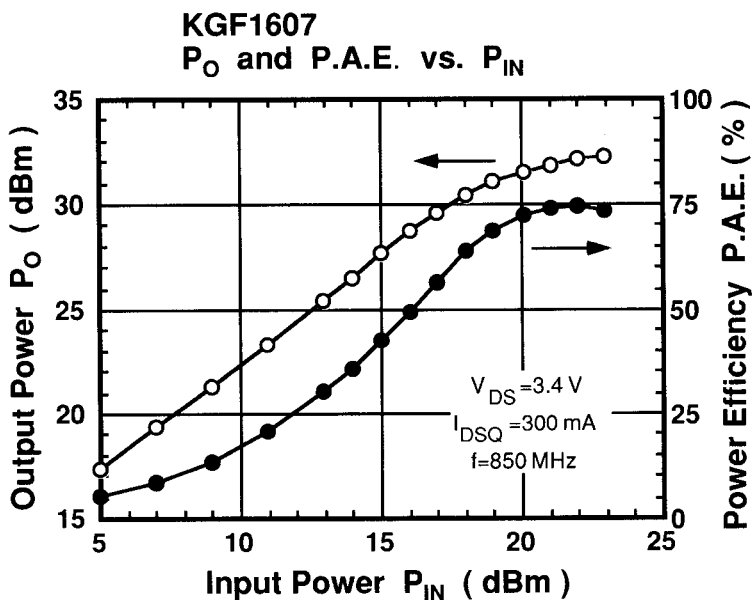
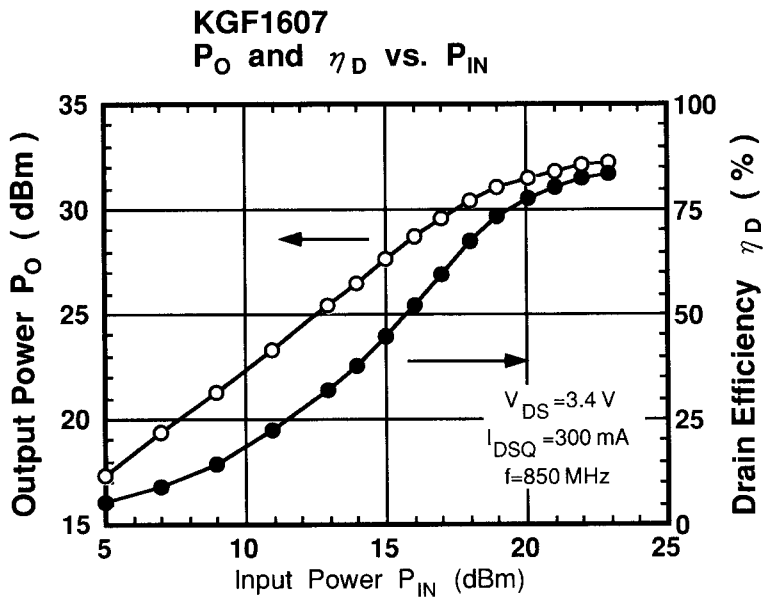
Matching conditions

Gamma S (Source impedance) : $2.03 + j6.71 (\Omega)$

Gamma L (Load impedance) : $4.62 + j1.04 (\Omega)$

Bias conditions

$V_{DS}=3.4\text{ V}$, $I_{DSQ}=300\text{ mA}$, $f=850\text{ MHz}$



Matching conditions

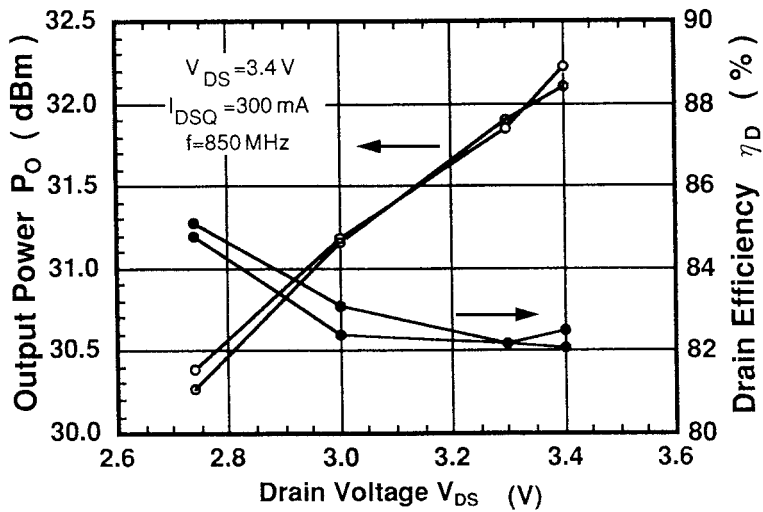
Gamma S (Source impedance) : $2.03 + j6.71 (\Omega)$

Gamma L (Load impedance) : $4.62 + j1.04 (\Omega)$

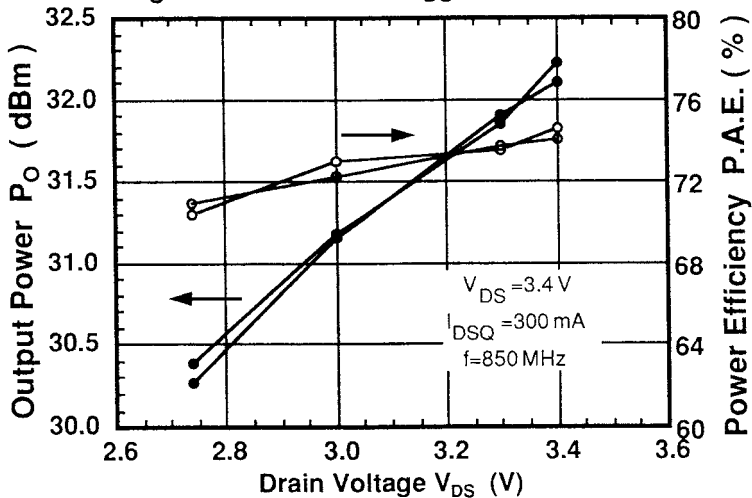
Bias conditions

$V_{DS}=3.4V$, $I_{DSQ}=300mA$, $P_{IN}=22dBm$, $f=850MHz$

KGF1607
 P_O and η_D vs. V_{DS}



KGF1607
 P_O and P.A.E. vs. V_{DS}

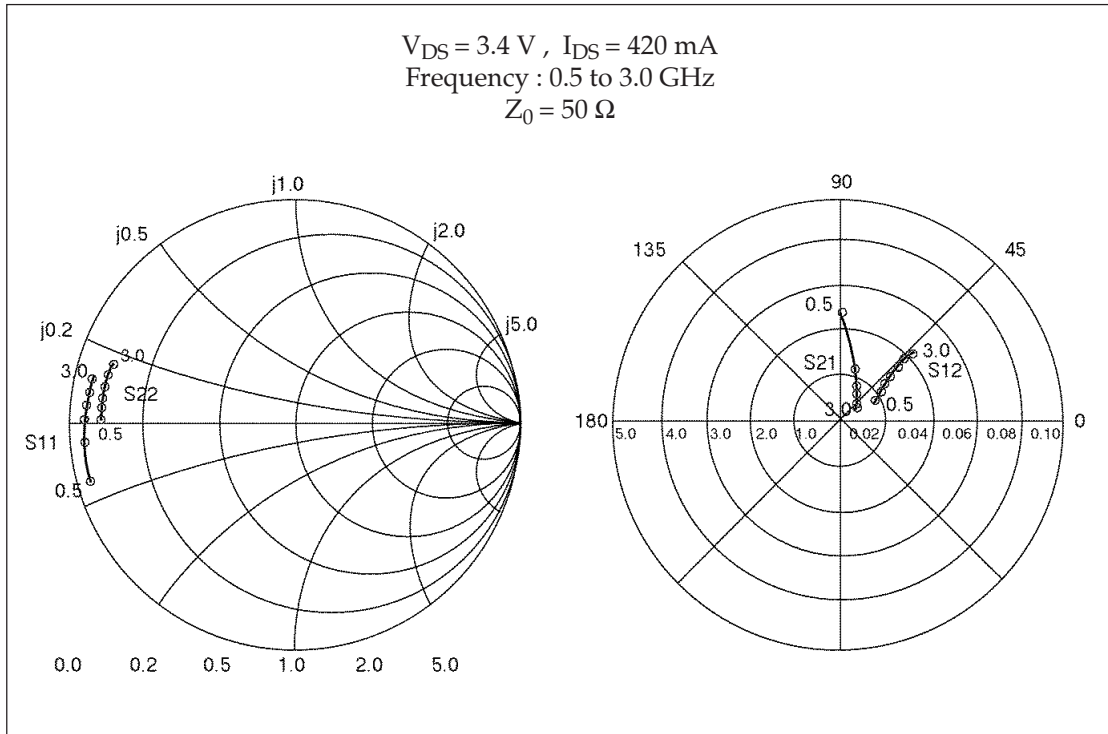


Typical S Parameters

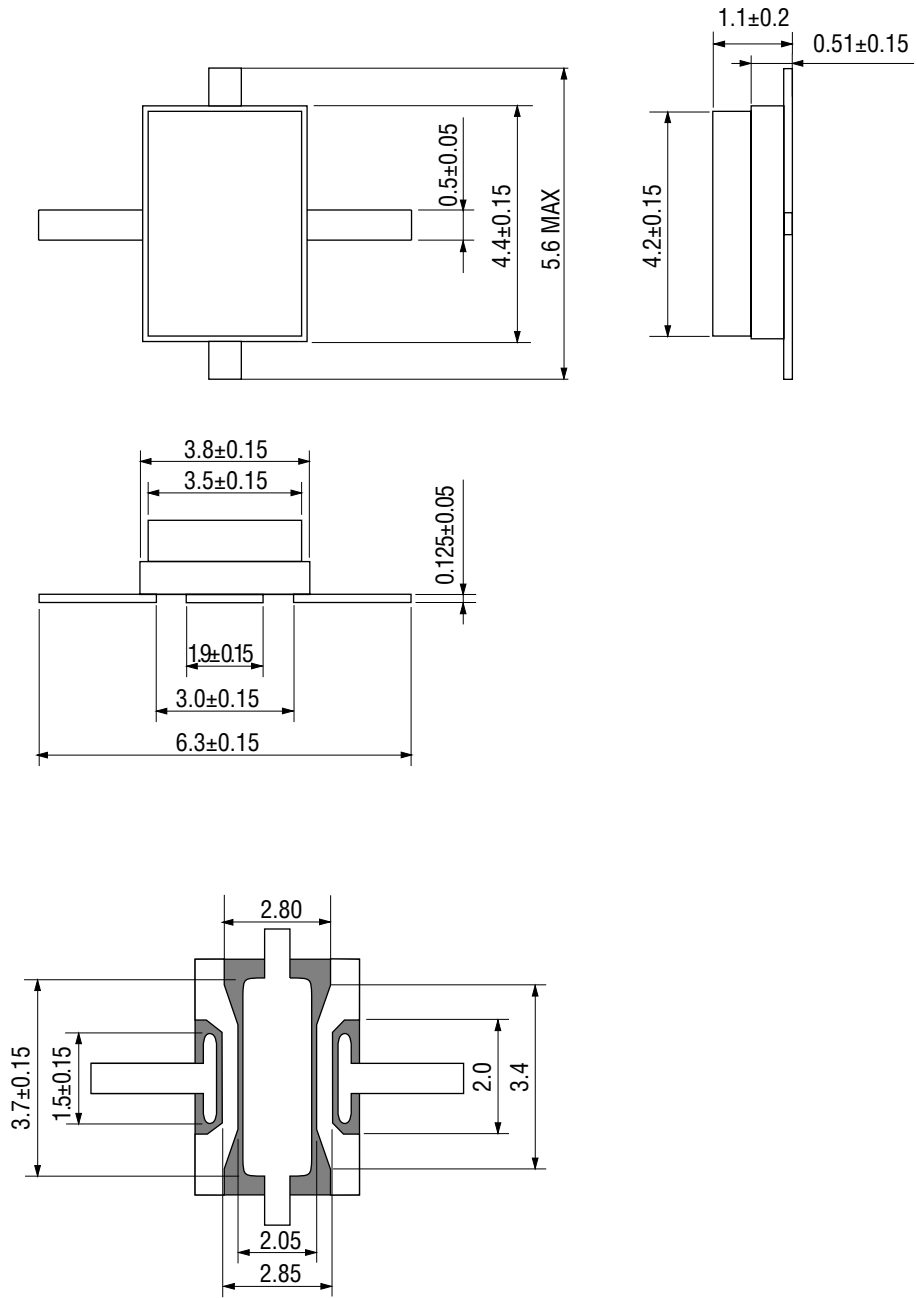
 $V_{DS} = 3.4 \text{ V}$, $I_{DS} = 420 \text{ mA}$

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	0.948	-164.16	2.401	89.58	0.018	28.34	0.862	178.70
600.0	0.949	-167.70	2.004	86.64	0.019	29.90	0.863	177.78
700.0	0.947	-170.31	1.724	83.87	0.019	31.37	0.861	177.41
800.0	0.945	-172.49	1.512	81.08	0.020	32.88	0.868	176.26
900.0	0.945	-174.31	1.344	78.99	0.021	34.56	0.863	175.65
1000.0	0.944	-175.70	1.210	76.50	0.022	35.27	0.865	174.80
1100.0	0.944	-176.99	1.107	74.70	0.023	36.97	0.864	174.53
1200.0	0.943	-178.21	1.013	72.44	0.024	37.73	0.863	173.64
1300.0	0.943	-179.20	0.944	70.68	0.025	39.72	0.862	173.19
1400.0	0.941	179.70	0.871	68.92	0.026	39.48	0.864	172.42
1500.0	0.938	178.76	0.822	66.82	0.027	40.67	0.859	171.75
1600.0	0.940	177.86	0.769	65.23	0.028	41.09	0.866	171.30
1700.0	0.939	177.34	0.729	62.93	0.029	41.66	0.857	170.63
1800.0	0.936	176.11	0.692	62.04	0.030	41.93	0.865	170.07
1900.0	0.935	175.58	0.660	59.93	0.031	42.32	0.856	169.05
2000.0	0.935	174.63	0.629	58.39	0.032	42.64	0.864	168.83
2100.0	0.932	173.95	0.602	56.99	0.033	43.35	0.857	167.69
2200.0	0.933	173.26	0.578	55.14	0.034	42.99	0.862	167.40
2300.0	0.929	172.39	0.555	53.65	0.036	43.23	0.861	166.37
2400.0	0.929	171.83	0.538	52.58	0.036	43.21	0.858	165.60
2500.0	0.929	170.92	0.516	50.22	0.038	43.51	0.856	164.86
2600.0	0.926	170.30	0.504	49.61	0.038	43.16	0.853	164.29
2700.0	0.925	169.54	0.485	47.26	0.040	43.10	0.854	163.33
2800.0	0.924	168.85	0.475	46.57	0.041	43.01	0.852	162.91
2900.0	0.922	168.14	0.458	44.61	0.043	42.65	0.853	161.67
3000.0	0.920	167.38	0.450	43.44	0.043	42.65	0.850	161.18

Typical S Parameters



PACKAGE DIMENSIONS



 METALIZATION

(Unit: mm)

Package material	Al ₂ O ₃
Lead frame material	Fe-Ni-Co alloy
Pin treatment	Ni/Au plating
plate thickness	Au:1.0 μm or more