OKI

Oki, Network Solutions for a Global Society

Electronic Components

ODRKGF1922-05
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KGF1922

Preliminary

RF Driver HEMT

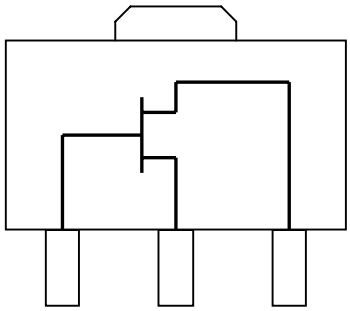
GENERAL DESCRIPTION

The KGF1922, housed in a SOT-89 type plastic-mold package, is a discrete RF power HEMT that features high efficiency, high output power and low current operation. The KGF1922 specifications are guaranteed to a fixed matching circuit for 10V and 1.9GHz; external impedance-matching circuits are also required. Because of its high efficiency, and high output power (more than 30dBm), the KGF1922 is ideal as a transmitter-driver-stage amplifier for base station of various wireless systems, such as cellular phone.

FEATURES

- Operating frequency from 0.05GHz to 3GHz
- High output power > 30dBm
- Package: SOT-89

FUNCTION DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Condition	Min	Max	Unit	Note
Drain - source Voltage	V_{DS}	Ta=25°C	—	16	V	
Gate - source Voltage	V_{GS}	Ta=25°C	- 4	0.7	V	
Drain Current	I_{DS}	Ta=25°C	—	1	A	
Total Power Dissipation	P_{TOT}	Ta=Tc=25°C	—	1.25	W	
Channel Temperature	T_{CH}	—	—	175	°C	
Storage Temperature	T_{STG}	—	-45	125	°C	

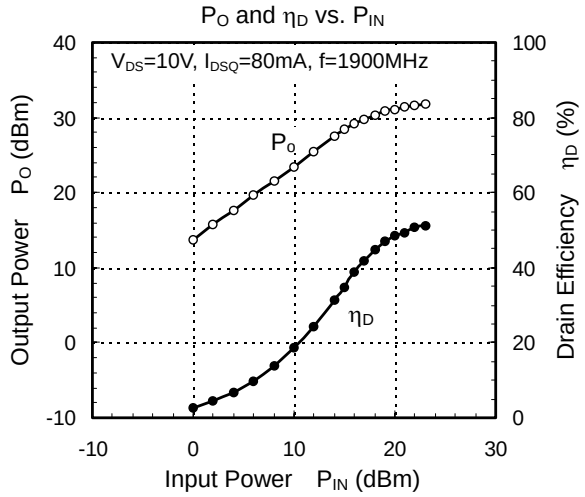
ELECTRICAL CHARACTERISTICS

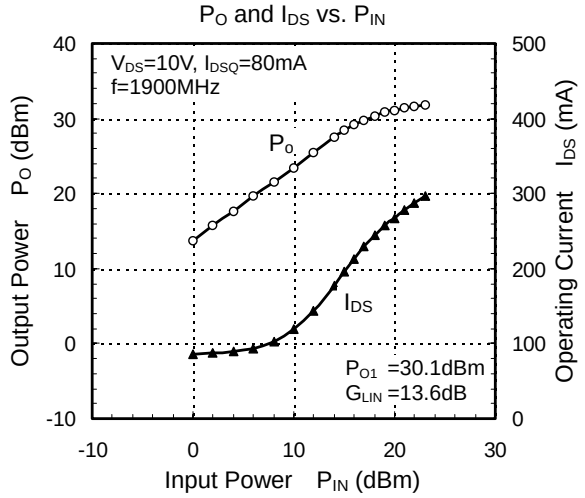
(Ta=25°C)

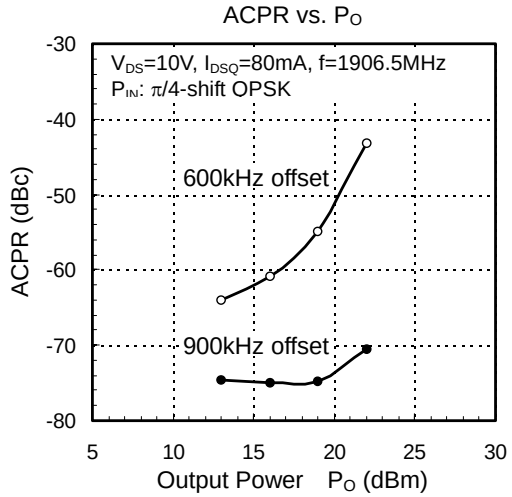
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Gate-source Leakage Current	I_{GSS}	V_{GS}=-4V	—	—	0.15	mA
Gate-drain Leakage Current	I_{GDO}	V_{GD}=-20V	—	—	0.8	mA
Drain-source Leakage Current	$I_{GS(off)}$	V_{DS}=16V, V_{GS}=-4V	—	—	0.8	mA
Drain Current	I_{DSS}	V_{DS}=1.5V, V_{GS}=0.7V	0.5	—	—	A
Gate-source Cut-off Voltage	$V_{GS(off)}$	V_{DS}=3V, I_{DS}=1.14mA	- 0.8	—	- 0.4	V
Output Power	P_O	(*1), P_{IN}=22dBm	30	31.5	—	dBm
Drain Efficiency	η_D	(*1), P_{IN}=22dBm	40	50		%
Linear Gain	G_{LIN}	(*1), P_{IN}=5dBm	—	13	—	dB
Thermal Resistant	R_{TH}	Channel to Case	—	85	—	°C/W

(*1): V_{DS}=10V, I_{DSQ}=80mA, f=1.9GHz

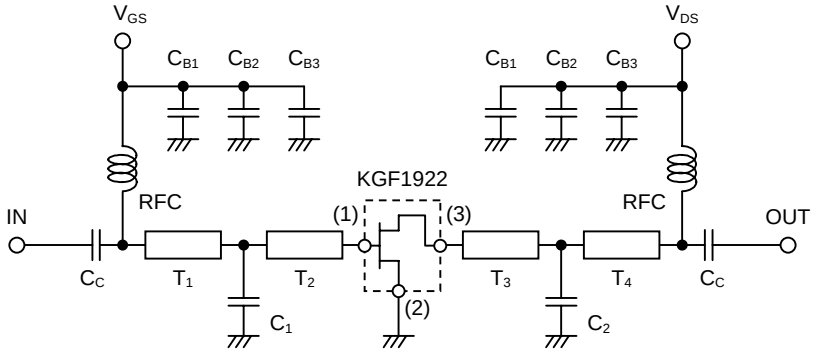
TYPICAL CHARACTERISTICS
f=1900MHz







Test circuit



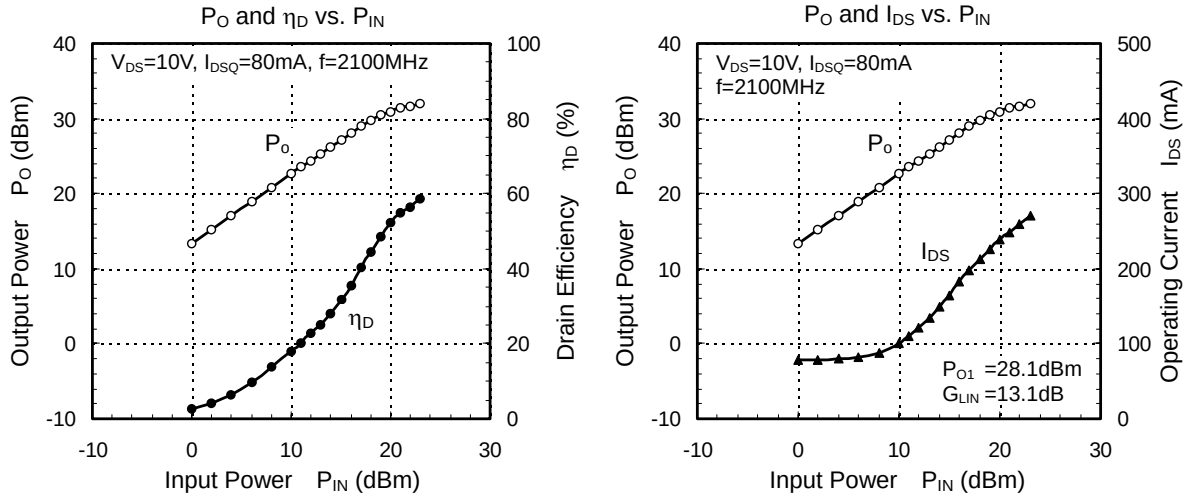
f=1900MHz Board: Glass epoxy (t=0.8mm, ε= 4.3)

T_1: Z_0=50Ω, E=33deg T_2: Z_0=50Ω, E=23deg T_3: Z_0=50Ω, E=23deg T_4: Z_0=50Ω, E=33deg

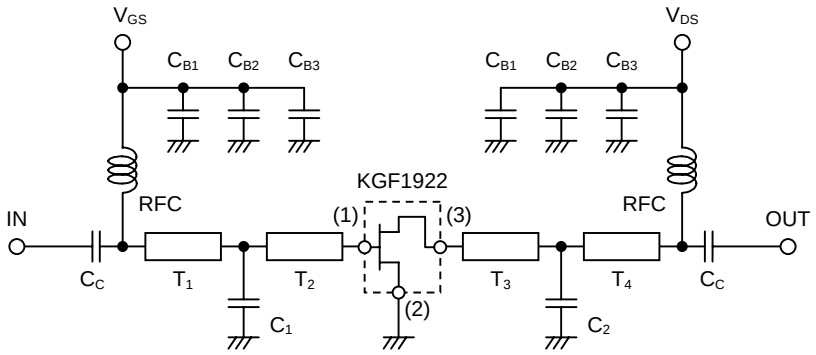
C_1 =1.5pF C_2 =0.5pF

C_C =51pF C_{B1} =51pF C_{B2}=1,000pF C_{B3}=10,000pF RFC =27nH

TYPICAL CHARACTERISTICS
f=2100MHz



Test circuit



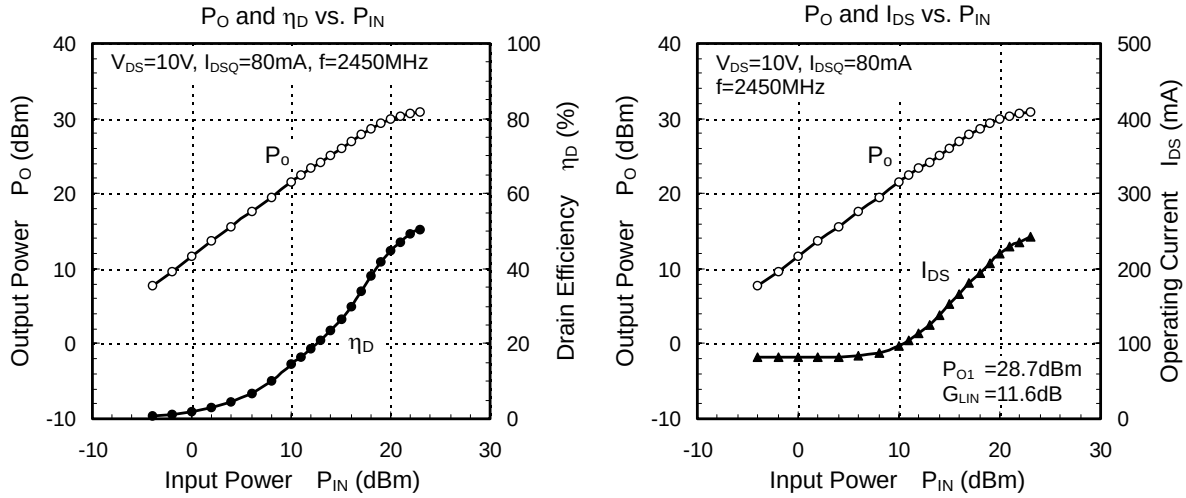
f=2100MHz Board: Glass epoxy (t=0.8mm, ε= 4.3)

T_1: Z_0=50Ω, E=48deg T_2: Z_0=50Ω, E=14deg T_3: Z_0=50Ω, E=32deg T_4: Z_0=50Ω, E=30deg

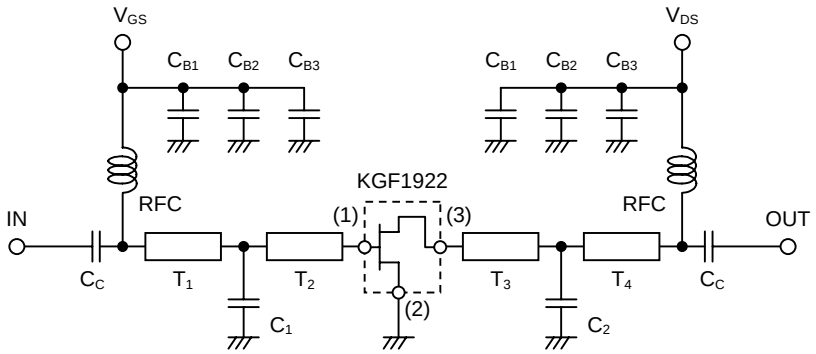
C_1 =1.5pF C_2 =0.5pF

C_C =51pF C_{B1} =51pF C_{B2}=1,000pF C_{B3}=10,000pF RFC =27nH

TYPICAL CHARACTERISTICS
f=2450MHz



Test circuit



f=2450MHz Board: Glass epoxy (t=0.8mm, ε= 4.3)

T_1: Z_0=50Ω, E=65deg T_2: Z_0=50Ω, E=5deg T_3: Z_0=50Ω, E=23deg T_4: Z_0=50Ω, E=27deg

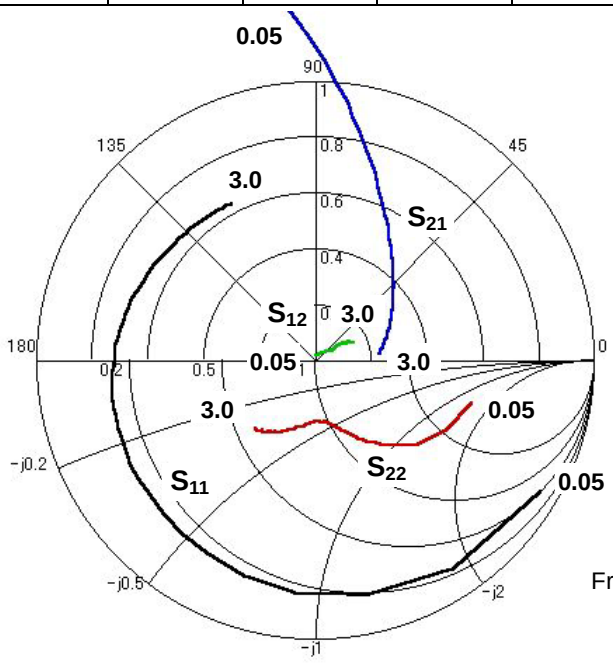
C_1 =1.5pF C_2 =0.5pF

C_C =51pF C_{B1} =51pF C_{B2}=1,000pF C_{B3}=10,000pF RFC =27nH

TYPICAL S PARAMETERS

V_{DS}=10V, I_{DS}=80mA

Freq(MHz)	MAG(S11)	ANG(S11)	MAG(S21)	ANG(S21)	MAG(S12)	ANG(S12)	MAG(S22)	ANG(S22)
50	0.936	-30.204	37.423	161.458	0.008	75.451	0.583	-15.403
100	0.898	-56.385	33.484	146.391	0.014	60.097	0.532	-28.181
200	0.834	-95.004	25.297	124.540	0.021	44.007	0.424	-46.264
300	0.793	-118.932	19.354	111.153	0.027	38.871	0.343	-57.468
400	0.771	-134.686	15.430	101.679	0.029	35.718	0.294	-64.171
500	0.760	-145.938	12.705	94.358	0.029	34.724	0.264	-69.096
600	0.752	-154.496	10.795	88.353	0.030	32.988	0.246	-74.060
700	0.746	-161.457	9.368	82.836	0.032	31.590	0.233	-77.290
800	0.738	-167.001	8.274	78.590	0.034	31.345	0.223	-80.671
900	0.733	-171.803	7.365	74.090	0.035	33.416	0.223	-83.512
1000	0.727	-176.456	6.672	70.170	0.036	29.072	0.221	-85.940
1100	0.719	179.574	6.083	66.228	0.038	31.348	0.220	-89.292
1200	0.717	175.548	5.608	62.633	0.040	34.395	0.222	-92.751
1300	0.709	172.269	5.181	59.128	0.040	31.937	0.226	-94.357
1400	0.702	168.582	4.824	55.660	0.043	32.637	0.233	-96.096
1500	0.699	165.467	4.525	52.158	0.044	34.119	0.235	-99.675
1600	0.692	162.199	4.234	48.732	0.047	31.548	0.245	-102.208
1700	0.687	159.040	3.996	45.502	0.048	33.211	0.248	-103.218
1800	0.678	155.669	3.781	42.293	0.048	33.017	0.254	-106.429
1900	0.674	152.685	3.598	39.123	0.052	29.879	0.264	-107.803
2000	0.671	149.551	3.440	35.854	0.053	32.356	0.268	-111.348
2100	0.663	146.524	3.268	32.601	0.057	31.069	0.276	-111.680
2200	0.660	143.113	3.141	29.389	0.057	30.226	0.282	-114.624
2300	0.655	140.072	2.999	26.414	0.061	30.014	0.288	-116.755
2400	0.653	136.854	2.874	23.287	0.063	30.267	0.295	-119.516
2500	0.649	133.722	2.751	20.140	0.067	29.444	0.301	-120.380
2600	0.645	130.552	2.665	17.393	0.066	28.706	0.305	-122.940
2700	0.642	127.563	2.567	14.490	0.070	28.033	0.316	-124.757
2800	0.642	123.983	2.467	11.608	0.072	25.510	0.318	-126.108
2900	0.639	121.251	2.385	8.572	0.075	24.755	0.325	-129.093
3000	0.636	118.023	2.308	6.139	0.073	26.215	0.324	-131.488

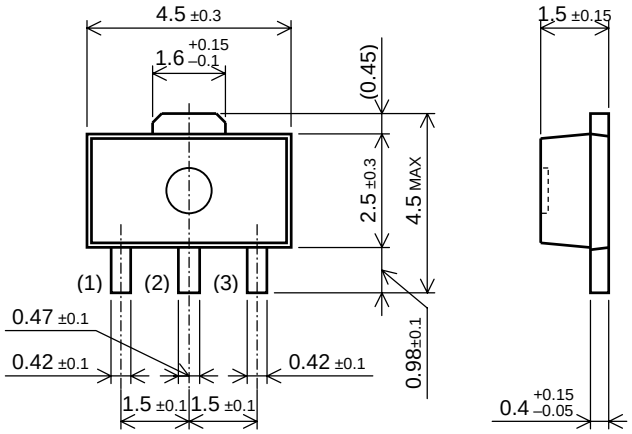


V_{DS}=10V, I_{DS}=80mA
Frequency: 0.05 to 3.0GHz
Z_0=50Ω

PACKAGE

SOT-89 (lead-free terminal plating of Sn-Bi material)

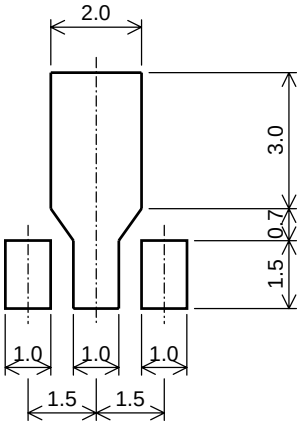
unit: mm



Pin Configuration	
(1)	Gate
(2)	Source
(3)	Drain

Footprint

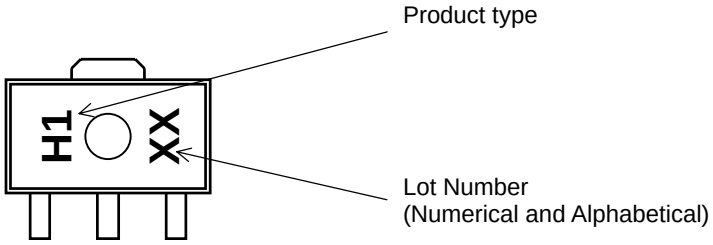
unit: mm



notes:

1) This footprint is an example. The size of footprint depends on accuracy of your mounter.
2) The mounting design should fully be considered in RF grounding and heat dissipation for the better RF performance of the product.
3) Vias are effective in a RF grounding and heat dissipation.

MARKING



SAFETY AND HANDLING INFORMATION ON GAAS DEVICES

Arsenic Compound (GaAs Devices)
The product contains arsenic (As) as a compound.
This material is stable for normal use, however, its dust or vapor may be potentially hazardous to the human body.
Avoid ingestion, fracture, burning or chemical treatment to the product.

- Do not put the product in your mouth.
- Do not burn or destroy the product.
- Do not perform chemical treatment for the product.

Keep laws and ordinances related to the disposal of the products.

NOTICE

1. The information contained herein can change without notice owing to product and/or technical improvements. Before using the product, please make sure that the information being referred to is up-to-date.

2. The outline of action and examples for application circuits described herein have been chosen as an explanation for the standard action and performance of the product. When planning to use the product, please ensure that the external conditions are reflected in the actual circuit, assembly, and program designs.

3. When designing your product, please use our product below the specified maximum ratings and within the specified operating ranges including, but not limited to, operating voltage, power dissipation, and operating temperature.

4. Oki assumes no responsibility or liability whatsoever for any failure or unusual or unexpected operation resulting from misuse, neglect, improper installation, repair, alteration or accident, improper handling, or unusual physical or electrical stress including, but not limited to, exposure to parameters beyond the specified maximum ratings or operation outside the specified operating range.

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