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OKI electronic components

KGF1262

Medium-Power Amplifier

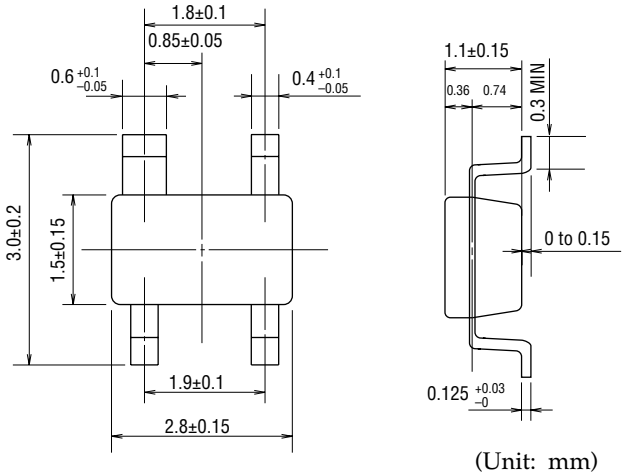
GENERAL DESCRIPTION

The KGF1262 is a medium-power amplifier, with frequencies ranging from the UHF-band to the L-band, that features high gain, high output power, and low current operation. The KGF1262 specifications are guaranteed to a fixed matching circuit for 5.2 V and 1.9 GHz; external impedance-matching circuits are also required. Because of the high gain and high output power at the low operating current, the KGF1262 is ideal as a transmitter-driver amplifier for personal handy phones of more than 1.5 GHz band.

FEATURES

- High linear gain: 15 dB (min.) at 1.9 GHz
- High output power: 18 dBm (min.) at 1.9 GHz
- Low current operation: 70 mA (max.)
- Self-bias circuit configuration with built-in source capacitor
- package: 4PSOP

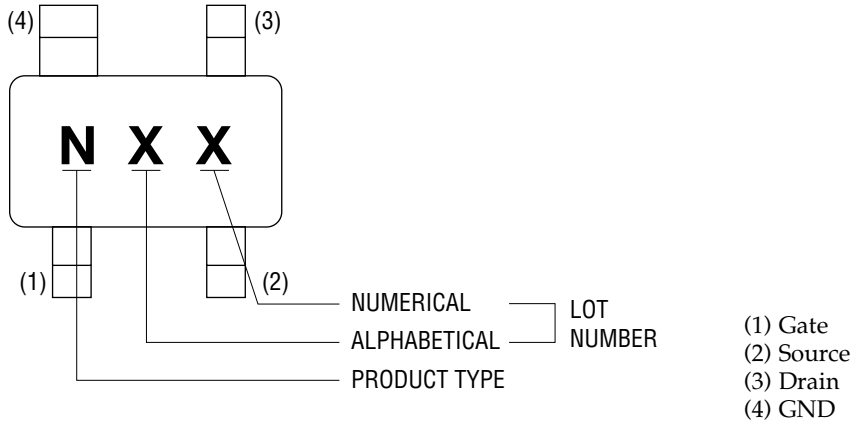
PACKAGE DIMENSIONS



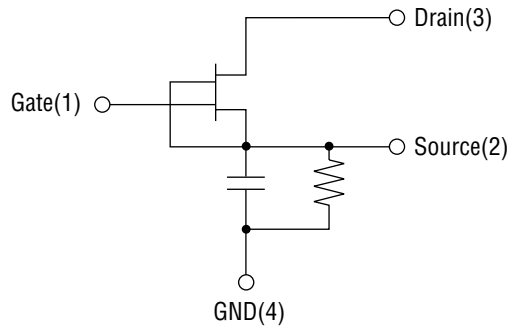
(Unit: mm)

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

MARKING



CIRCUIT



ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Condition	Unit	Min.	Max.
Drain-source voltage	V_{DS}	Ta = 25°C	V	—	10
Gate-source voltage	V_{GS}	Ta = 25°C	V	–5.0	0.4
Drain current	I_{DS}	Ta = 25°C	mA	—	360
Total power dissipation	P_{tot}	Ta = 25°C	mW	—	300
Channel temperature	T_{ch}	—	°C	—	150
Storage temperature	T_{stg}	—	°C	–45	125

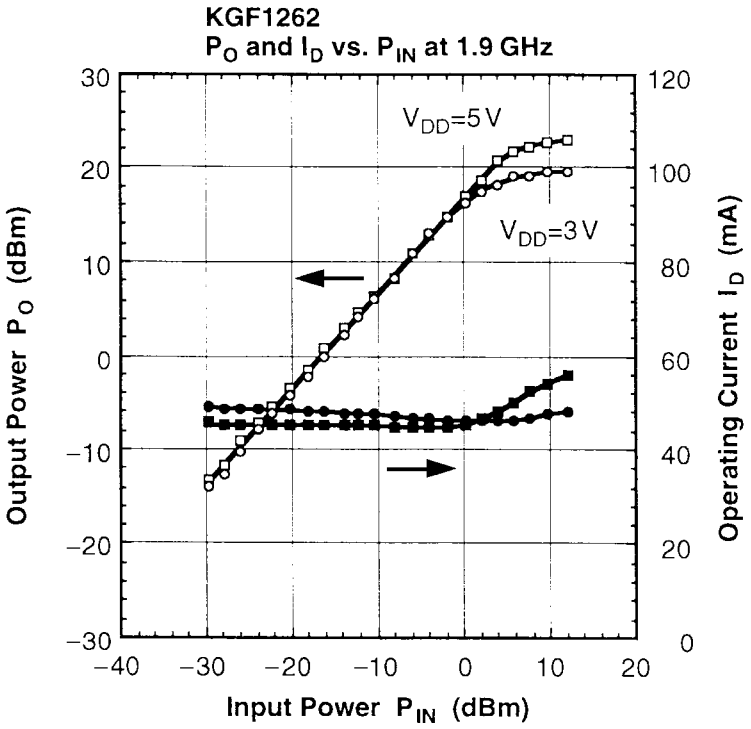
ELECTRICAL CHARACTERISTICS

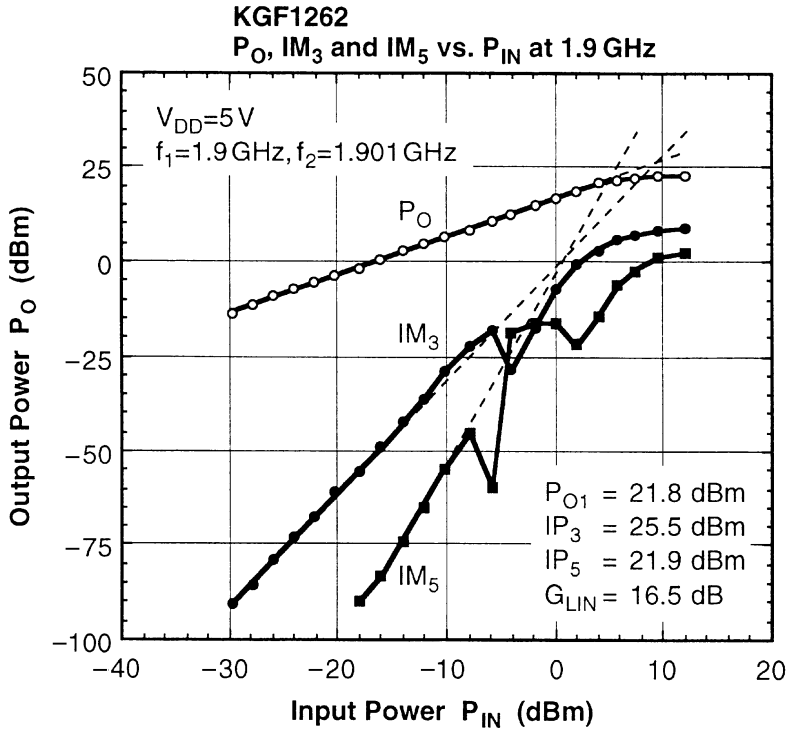
(Ta = 25°C)

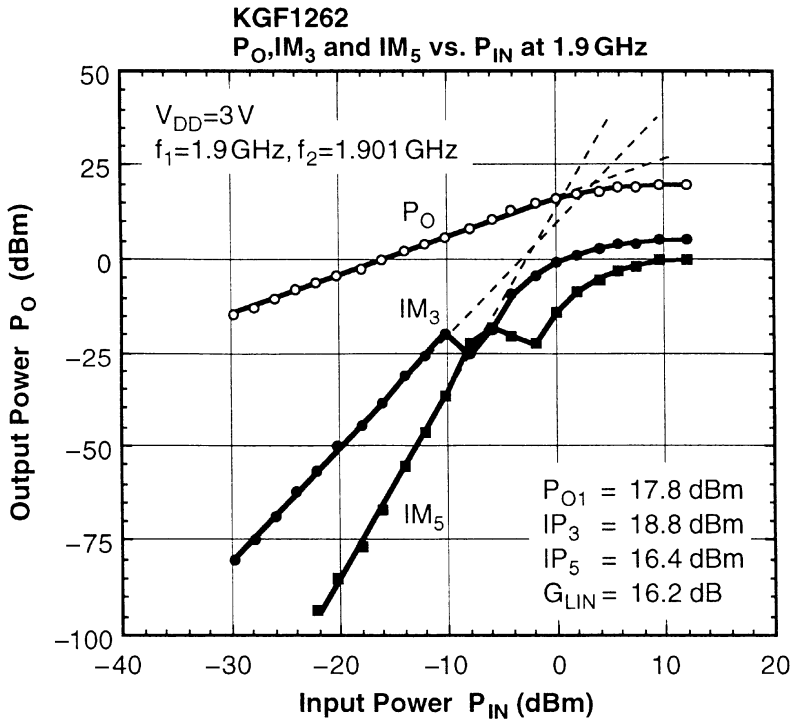
Item	Symbol	Condition	Unit	Min.	Typ.	Max.
Gate-source leakage current	I_{GSS}	V_{GS} = –5 V	mA	—	—	0.1
Gate-drain leakage current	I_{GDO}	V_{GD} = –15 V	mA	—	—	0.5
Drain-source leakage current	$I_{DS(off)}$	V_{DS} = 3 V, V_{GS} = –2.5 V	mA	—	—	1.0
Drain current	I_{DSS}	V_{DS} = 3 V, V_{GS} = 0 V	mA	180	—	—
Operating current	I_D	(*1), P_{IN} = 7 dBm	mA	—	50.0	70.0
Gate-source cut-off voltage	$V_{GS(off)}$	V_{DS} = 3 V, I_{DS} = 720 µA	µA	–2.0	—	–1.0
Transconductance	gm	V_{DS} = 3 V, I_{DS} = 60 mA	mS	100	—	—
Linear gain	G_{LIN}	(*1), P_{IN} = –10 dBm	dB	15.0	16.5	—
Output power	P_O	(*1), P_{IN} = 7 dBm	dBm	18.0	20.0	—

*1 Self-bias condition: V_{DD} = 5 V±0.25 V, V_G = 0 V, f = 1.9 GHz

RF CHARACTERISTICS






KGF1262
P_O,IM_3 and IM_5 vs. P_{IN} at 1.9 GHz
V_{DD}=3 V
f_1=1.9 GHz, f_2=1.901 GHz
P_O
IM_3
IM_5
P_{O1} = 17.8 dBm
IP_3 = 18.8 dBm
IP_5 = 16.4 dBm
G_{LIN} = 16.2 dB
Output Power P_O (dBm)
Input Power P_{IN} (dBm)
50
25
0
−25
−50
−75
−100
−40
−30
−20
−10
0
10
20

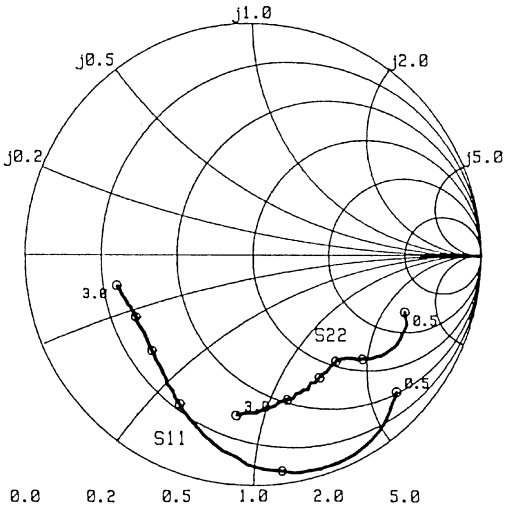
Typical S Parameters

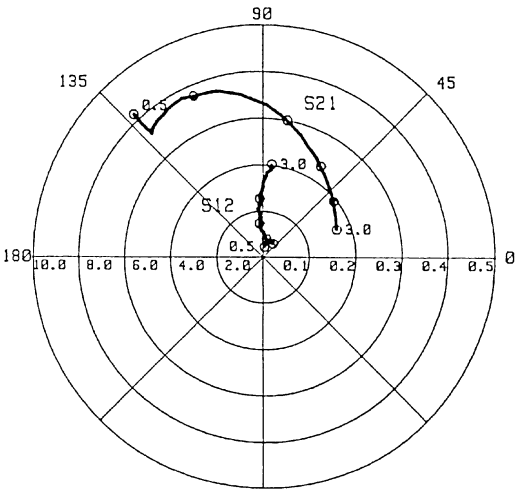
V_{DD} = 5 V, V_G = 0 V, I_D = 45.4 mA

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	0.861	–43.20	8.314	132.26	0.023	81.74	0.708	–20.18
600.0	0.885	–46.52	7.319	131.88	0.032	73.96	0.740	–23.72
700.0	0.938	–53.35	7.176	131.57	0.035	68.04	0.739	–29.36
800.0	0.969	–62.62	7.448	127.57	0.038	58.11	0.724	–34.75
900.0	0.972	–72.43	7.617	121.79	0.041	59.61	0.693	–39.17
1000.0	0.942	–82.27	7.566	113.36	0.037	52.91	0.657	–42.84
1100.0	0.907	–91.58	7.454	105.56	0.038	55.56	0.630	–44.99
1200.0	0.852	–99.25	7.080	97.79	0.037	61.75	0.610	–46.73
1300.0	0.804	–105.78	6.706	91.46	0.038	66.19	0.599	–48.16
1400.0	0.756	–112.04	6.346	85.32	0.038	75.05	0.591	–49.34
1500.0	0.718	–116.78	6.004	79.92	0.040	78.36	0.584	–51.27
1600.0	0.681	–121.54	5.672	74.96	0.046	85.13	0.589	–52.35
1700.0	0.654	–125.66	5.394	70.48	0.052	88.18	0.588	–54.02
1800.0	0.631	–129.73	5.093	65.90	0.057	93.35	0.594	–56.54
1900.0	0.618	–133.88	4.889	61.24	0.064	95.49	0.598	–59.04
2000.0	0.603	–137.40	4.659	57.66	0.074	95.70	0.605	–60.99
2100.0	0.594	–140.49	4.501	53.61	0.083	94.46	0.614	–63.71
2200.0	0.585	–143.89	4.321	50.05	0.095	94.21	0.619	–66.74
2300.0	0.581	–146.80	4.179	46.29	0.107	96.61	0.624	–69.08
2400.0	0.582	–150.18	4.056	42.23	0.117	94.20	0.628	–72.55
2500.0	0.578	–152.79	3.902	38.65	0.128	92.99	0.643	–76.40
2600.0	0.581	–156.41	3.786	35.05	0.143	91.07	0.646	–80.05
2700.0	0.587	–158.85	3.685	31.84	0.156	89.38	0.662	–83.66
2800.0	0.592	–161.90	3.578	27.91	0.171	88.38	0.668	–86.20
2900.0	0.597	–164.17	3.502	25.03	0.185	87.34	0.683	–91.62
3000.0	0.611	–167.83	3.398	20.74	0.202	84.36	0.696	–96.08

Typical S Parameters

V_{DD} = 5 V, V_G = 0 V, I_D = 45.4 mA
Frequency : 0.5 to 3.0 GHz
Z_0 = 50 Ω





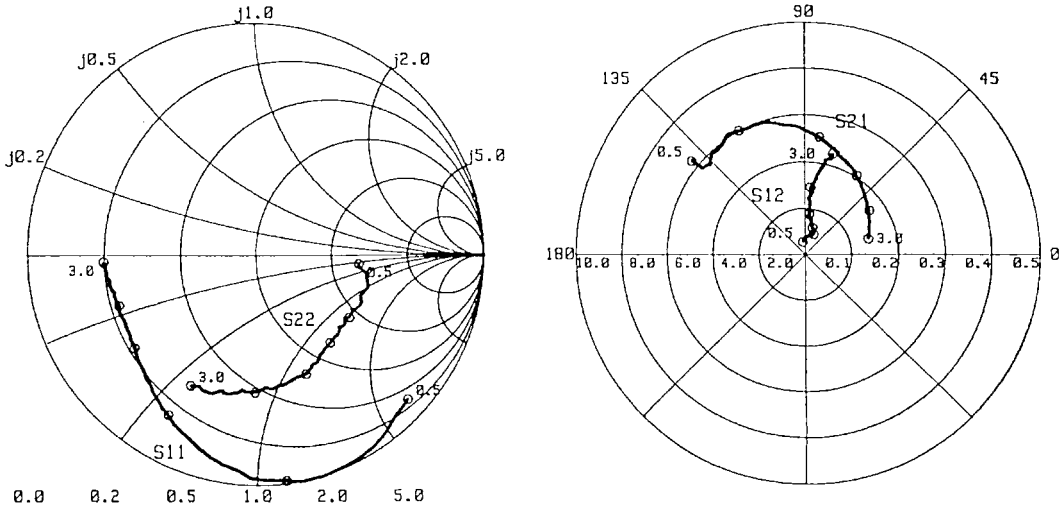
Typical S Parameters

V_{DD} = 3 V, V_G = 0 V, I_D = 48.5 mA

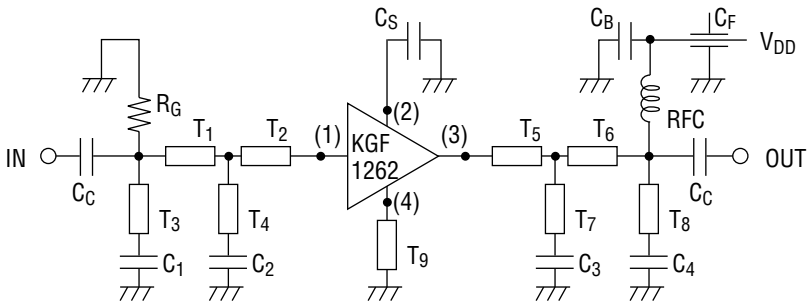
Freq(MHz)	MAG(S_{11})	ANG(S_{11})	MAG(S_{21})	ANG(S_{21})	MAG(S_{12})	ANG(S_{12})	MAG(S_{22})	ANG(S_{22})
500.0	0.916	–43.51	6.335	140.34	0.027	98.55	0.457	–4.57
600.0	0.927	–48.23	5.762	139.83	0.039	83.96	0.498	–8.99
700.0	0.964	–54.71	5.580	136.14	0.042	75.40	0.502	–19.93
800.0	0.993	–63.63	5.892	132.31	0.043	69.15	0.515	–24.18
900.0	1.005	–72.69	5.909	126.70	0.048	69.44	0.483	–28.86
1000.0	0.987	–82.39	6.026	117.94	0.047	65.48	0.493	–33.12
1100.0	0.967	–91.73	5.982	111.07	0.051	67.55	0.477	–34.38
1200.0	0.920	–99.80	5.754	101.93	0.053	67.95	0.490	–39.74
1300.0	0.876	–107.04	5.571	95.56	0.055	70.09	0.495	–41.60
1400.0	0.836	–113.69	5.299	88.68	0.059	72.60	0.498	–45.70
1500.0	0.797	–119.30	5.086	82.78	0.060	73.94	0.501	–49.18
1600.0	0.763	–124.95	4.821	77.21	0.065	76.41	0.507	–52.17
1700.0	0.733	–129.64	4.628	71.96	0.071	78.66	0.514	–55.11
1800.0	0.706	–134.46	4.421	67.14	0.076	80.42	0.524	–58.04
1900.0	0.691	–139.12	4.262	61.28	0.083	84.73	0.540	–62.81
2000.0	0.669	–143.06	4.068	56.47	0.089	83.56	0.562	–66.89
2100.0	0.661	–146.80	3.913	51.74	0.100	83.44	0.562	–71.44
2200.0	0.651	–149.92	3.747	47.17	0.112	83.94	0.576	–76.90
2300.0	0.643	–153.50	3.620	43.20	0.123	86.10	0.578	–79.82
2400.0	0.648	–157.16	3.475	38.19	0.136	84.08	0.579	–85.80
2500.0	0.638	–160.05	3.359	34.18	0.146	84.76	0.598	–90.54
2600.0	0.646	–164.22	3.210	30.03	0.164	81.24	0.591	–96.30
2700.0	0.650	–167.02	3.130	26.08	0.176	80.05	0.618	–101.05
2800.0	0.651	–170.84	3.000	21.96	0.193	78.05	0.607	–104.47
2900.0	0.659	–173.51	2.930	18.10	0.211	76.90	0.634	–112.05
3000.0	0.667	–177.55	2.809	13.75	0.225	74.08	0.638	–117.04

Typical S Parameters

V_{DD} = 3 V, V_G = 0 V, I_D = 48.5 mA
Frequency : 0.5 to 3.0 GHz
Z_0 = 50 Ω



Test Circuit and Bias Configuration for KGF1262 at 1.9 GHz



T_1: Z_0 = 75 Ω, E = 90 deg
T_2: Z_0 = 75 Ω, E = 55 deg
T_3 = T_9: Z_0 = 100 Ω, E = 1 deg
T_5: Z_0 = 75 Ω, E = 70 deg
T_6: Z_0 = 75 Ω, E = 65 deg
T_4 = T_7 = T_8: Z_0 = 100 Ω, E = 5 deg
C_1 = 1.2 pF, C_2 = 1.5 pF, C_3 = 0.6 pF, C_4 = 0.4 pF, C_S = 100 pF
$C_{C(DC\ Block)}$ = 1000 pF, $C_{B(By\text{-}pass)}$ = 1000 pF, $C_{F(Feed\ through)}$ = 1000 pF
RFC = 60 nH, R_G = 1000 Ω