

OKI electronic components

KGF1256B/1256

Medium-Power Amplifier

GENERAL DESCRIPTION

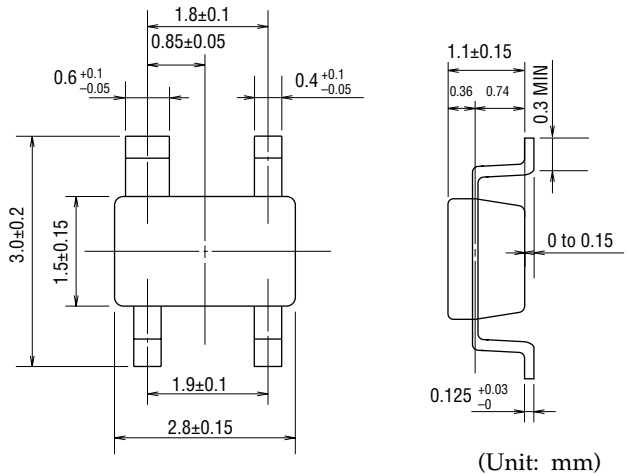
The KGF1256B is a medium-power amplifier, with frequencies ranging from the UHF-band to the L-band, that features high output power, low noise, and low current operation. The KGF1256B specifications are guaranteed to a fixed matching circuit for 5 V and 850 MHz; external impedance-matching circuits are also required. Because of the low noise and high output power at the low operating current, the KGF1256B is ideal as a transmitter-driver amplifier for personal handy phones.

The KGF1256 is similar to the KGF1256B in specifications and typical properties. Although having S Parameters that are slightly different from those of the KGF1256B, the KGF1256 meets the specifications for the KGF1256B, even with the same matching circuits.

FEATURES

- High output power: 15 dBm (min.)
- Low noise: 2.5 dB (max.)
- Low current: 40 mA (max.)
- Self-bias circuit configuration with built-in source capacitor
- Package: 4PSOP

PACKAGE DIMENSIONS

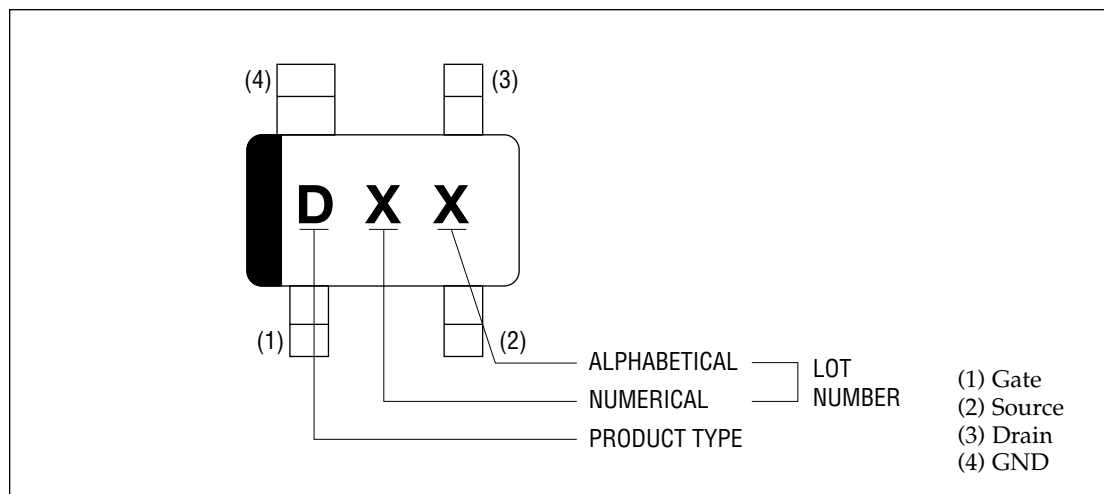


(Unit: mm)

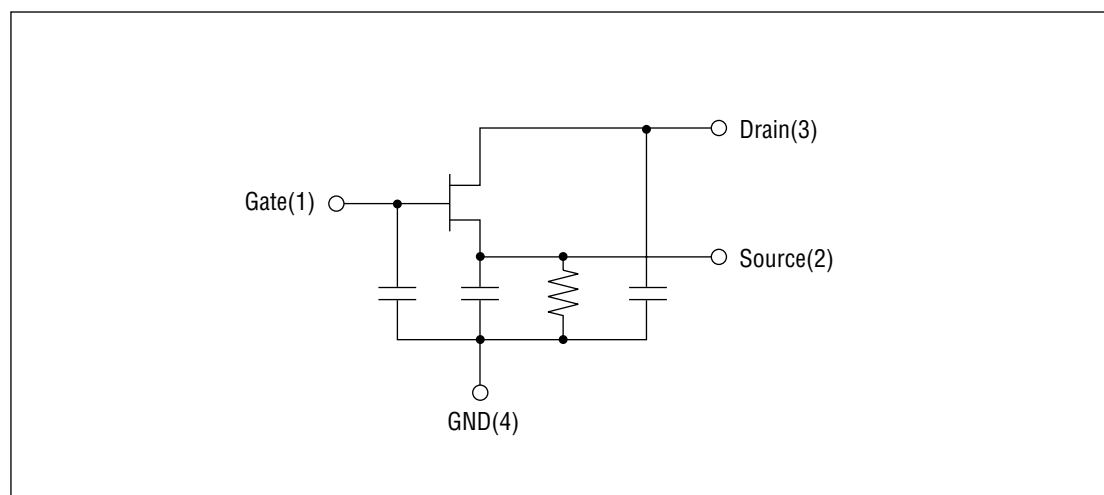
Package material	Epoxy resin
Lead frame material	42 alloy
Pin treatment	Solder plating
Solder plate thickness	5 μ m or more

Note: Ask our sales department for detailed requirements of the KGF1256.

MARKING



CIRCUIT



ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Condition	Unit	Min.	Max.
Drain-source voltage	V_{DS}	$T_a = 25^\circ\text{C}$	V	—	7
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	—	360
Total power dissipation	P_{tot}	$T_a = 25^\circ\text{C}$	mW	—	300
Channel temperature	T_{ch}	—	$^\circ\text{C}$	—	150
Storage temperature	T_{stg}	—	$^\circ\text{C}$	-45	125

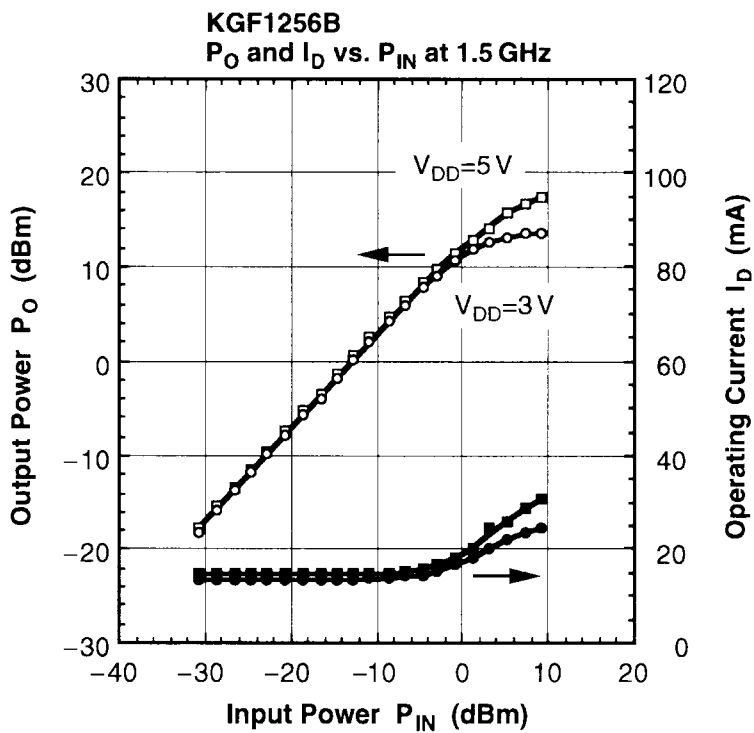
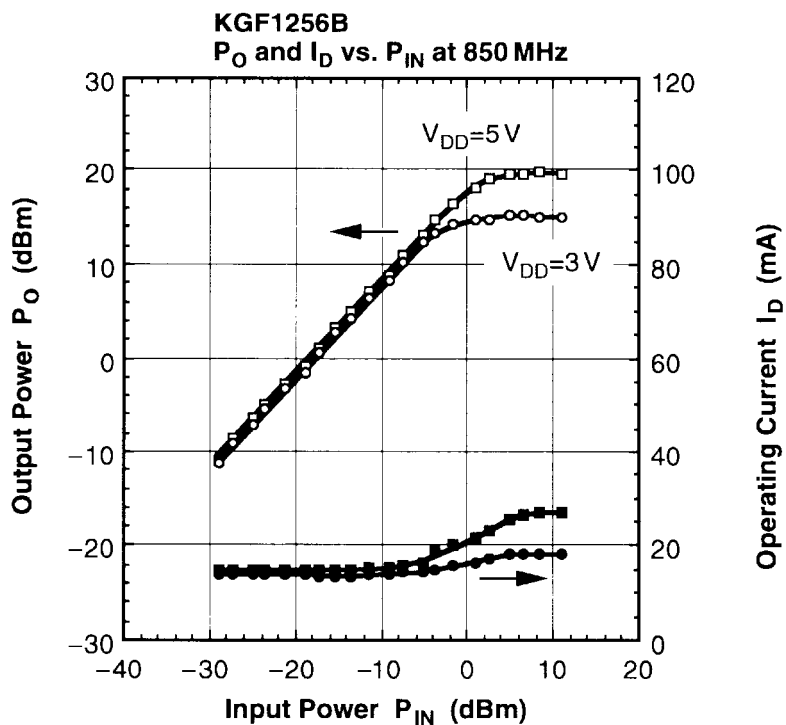
ELECTRICAL CHARACTERISTICS

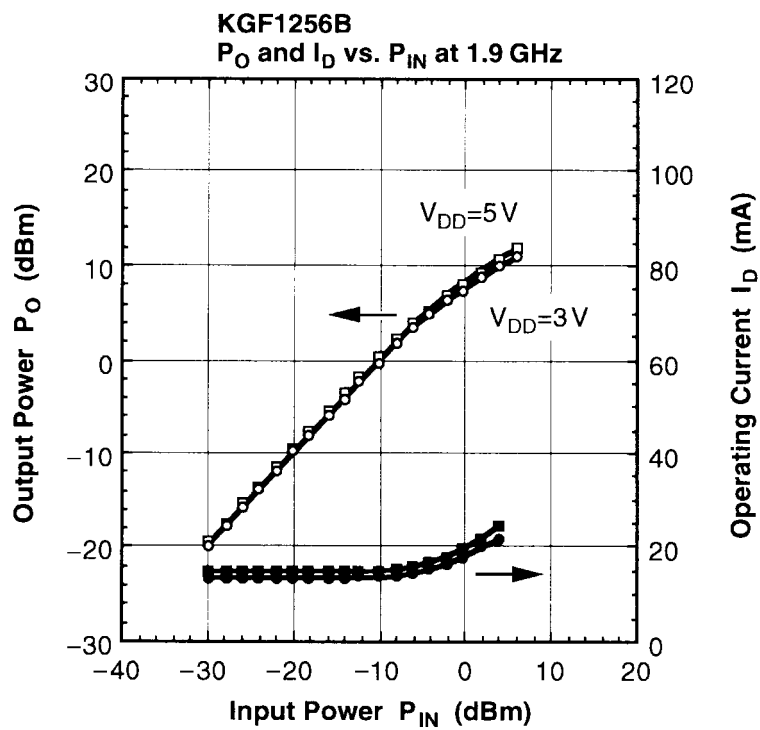
(Ta = 25°C)

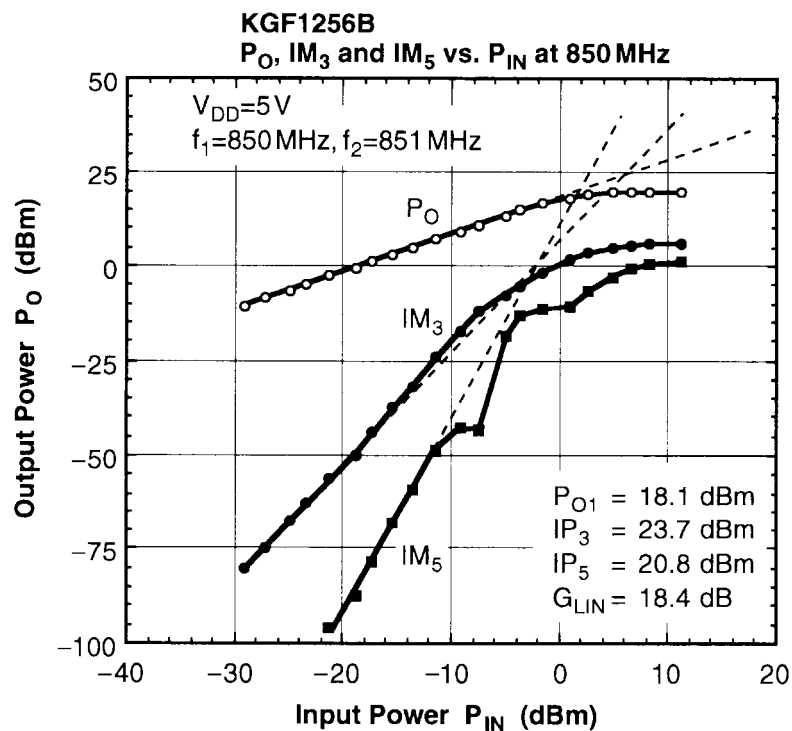
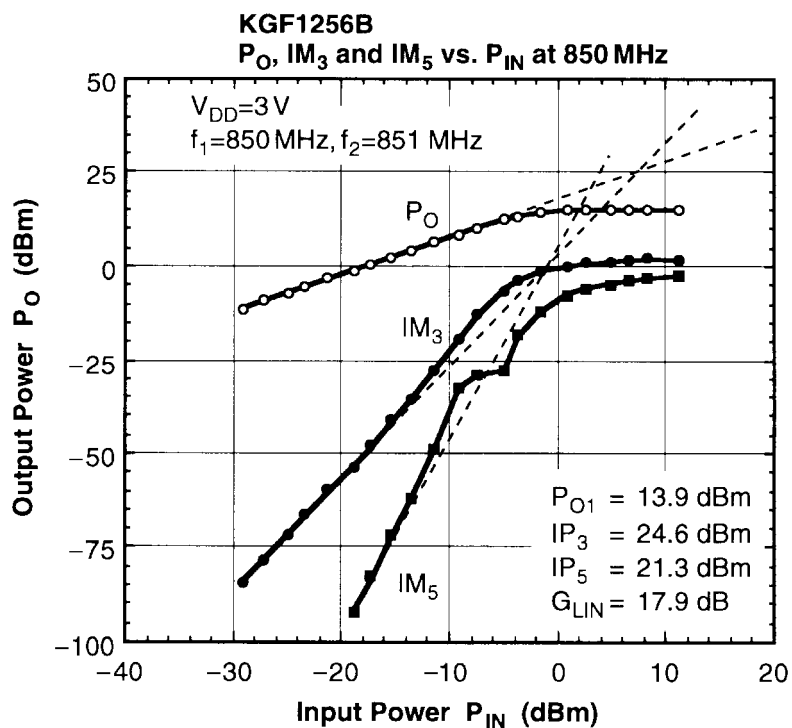
Item	Symbol	Condition		Unit	Min.	Typ.	Max.
Gate-source leakage current	I_{GSS}	$V_{GS} = -3\text{ V}$		μA	—	—	72
Gate-drain leakage current	I_{GDO}	$V_{GD} = -11\text{ V}$		μA	—	—	360
Drain-source leakage current	$I_{DS(off)}$	$V_{DS} = 3\text{ V}, V_{GS} = -2\text{ V}$		μA	—	—	720
Drain current	I_{DSS}	$V_{DS} = 3\text{ V}, V_{GS} = 0\text{ V}$		mA	100	—	—
Operating current	I_D	(*1), $P_{IN} = 5\text{ dBm}$, $f = 850\text{ MHz}$		mA	—	—	40.0
Gate-source cut-off voltage	$V_{GS(off)}$	$V_{DS} = 3\text{ V}, I_{DS} = 720\text{ }\mu\text{A}$		V	-1.5	—	-0.5
Transconductance	g_m	$V_{DS} = 3\text{ V}, I_{DS} = 25\text{ mA}$		mS	100	—	—
Noise figure	F	(*1), $f = 850\text{ MHz}$		dB	—	—	2.5
Linear gain	G_{LIN}	(*1), $P_{IN} = -20\text{ dBm}$	$f = 850\text{ MHz}$	dB	14.0	18.0	—
			$f = 1.5\text{ GHz}$		—	13.0	—
			$f = 1.9\text{ GHz}$		—	10.5	—
		(*2), $P_{IN} = -20\text{ dBm}$	$f = 850\text{ MHz}$		—	18.0	—
			$f = 1.5\text{ GHz}$		—	12.5	—
			$f = 1.9\text{ GHz}$		—	10.0	—
Output power	P_O	(*1), $P_{IN} = 5\text{ dBm}$	$f = 850\text{ MHz}$	dBm	16.0	18.0	—
			$f = 1.5\text{ GHz}$		—	15.5	—
			$f = 1.9\text{ GHz}$		—	11.5	—
		(*2), $P_{IN} = 5\text{ dBm}$	$f = 850\text{ MHz}$		—	15.0	—
			$f = 1.5\text{ GHz}$		—	13.0	—
			$f = 1.9\text{ GHz}$		—	10.5	—

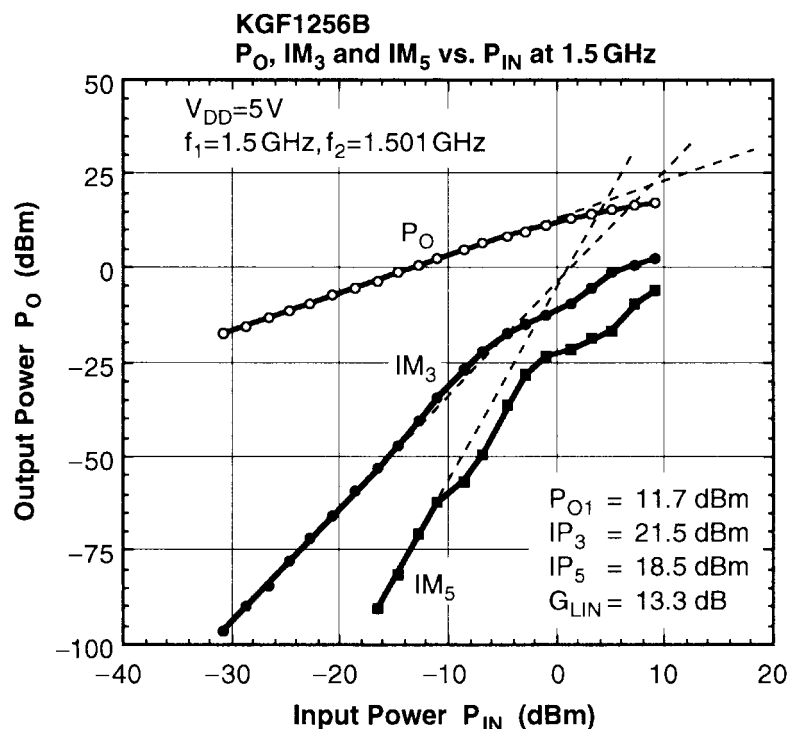
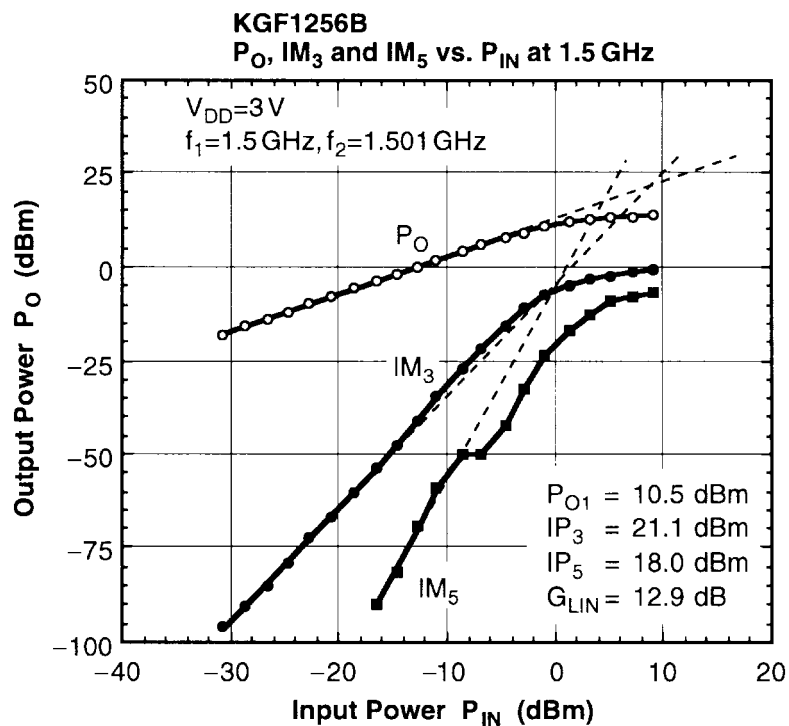
*1 Self-bias condition: $V_{DD} = 5 \pm 0.25\text{ V}$, $V_G = 0\text{ V}$ *2 Self-bias condition: $V_{DD} = 3\text{ V}$, $V_G = 0\text{ V}$

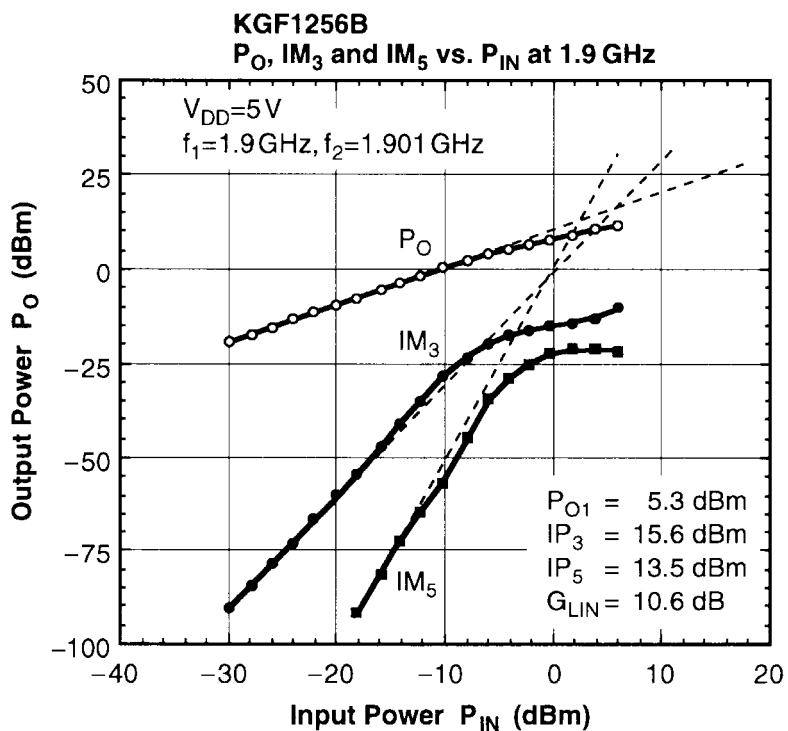
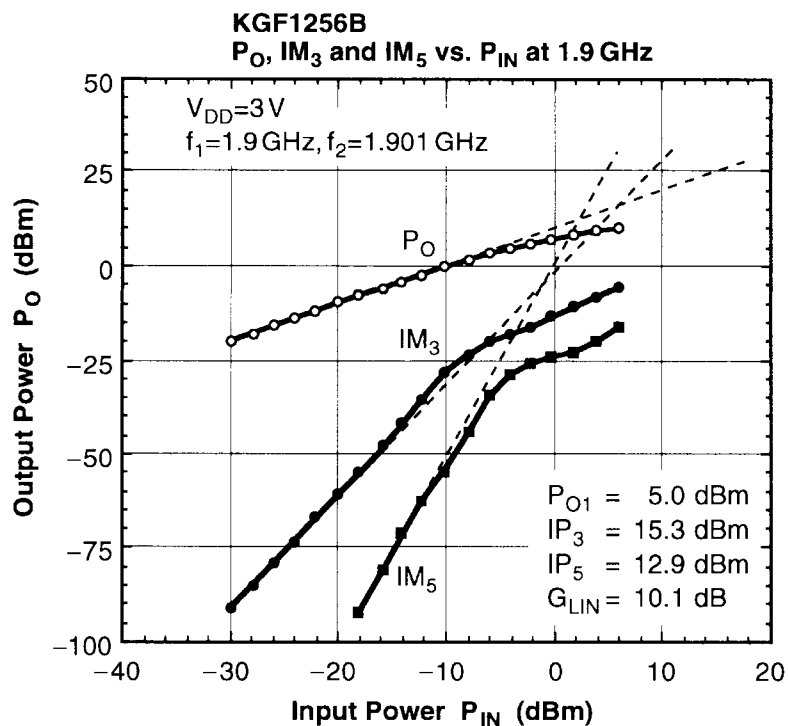
RF CHARACTERISTICS









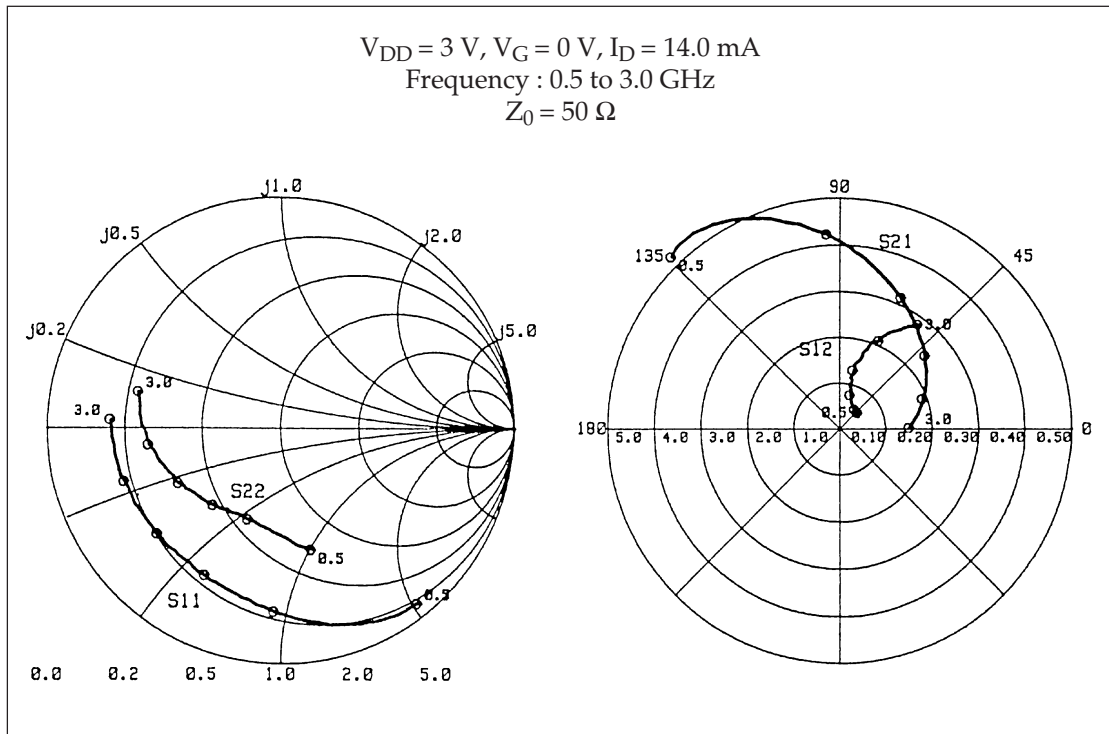


Typical S Parameters of KGF1256B

 $V_{DD} = 3\text{ V}$, $V_G = 0\text{ V}$, $I_D = 14.0\text{ mA}$

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	0.941	-52.03	5.226	134.33	0.051	42.22	0.531	-76.18
600.0	0.917	-62.43	5.315	126.90	0.052	39.67	0.470	-86.88
700.0	0.874	-71.90	5.111	117.12	0.050	38.92	0.443	-94.46
800.0	0.837	-78.93	4.827	108.84	0.048	43.95	0.426	-99.94
900.0	0.806	-86.02	4.537	101.30	0.051	44.67	0.415	-105.46
1000.0	0.777	-92.27	4.238	94.02	0.052	52.24	0.412	-109.85
1100.0	0.755	-98.15	3.966	87.45	0.052	54.10	0.407	-114.89
1200.0	0.737	-102.90	3.730	81.35	0.057	61.31	0.412	-118.94
1300.0	0.720	-108.50	3.496	75.71	0.061	68.35	0.413	-123.38
1400.0	0.710	-113.18	3.307	70.03	0.066	68.45	0.428	-127.26
1500.0	0.703	-117.55	3.145	65.11	0.077	73.21	0.435	-131.30
1600.0	0.700	-122.22	2.968	59.63	0.082	74.54	0.446	-136.06
1700.0	0.693	-126.28	2.830	55.27	0.093	76.69	0.454	-139.61
1800.0	0.691	-131.15	2.672	51.43	0.104	76.81	0.461	-143.33
1900.0	0.696	-135.24	2.559	45.44	0.115	78.98	0.481	-147.66
2000.0	0.693	-139.61	2.432	40.78	0.131	77.39	0.494	-151.56
2100.0	0.693	-144.32	2.310	36.30	0.146	77.41	0.500	-156.02
2200.0	0.695	-147.69	2.205	32.02	0.159	73.86	0.520	-160.73
2300.0	0.704	-152.62	2.092	27.18	0.174	73.40	0.534	-164.01
2400.0	0.702	-156.91	2.006	23.36	0.194	70.69	0.547	-169.05
2500.0	0.707	-161.26	1.898	19.63	0.210	66.14	0.570	-172.95
2600.0	0.716	-165.51	1.816	15.30	0.223	65.02	0.576	-177.32
2700.0	0.719	-170.07	1.732	11.81	0.243	61.54	0.597	178.74
2800.0	0.719	-174.51	1.646	8.05	0.253	58.95	0.607	174.30
2900.0	0.727	-178.84	1.561	4.42	0.269	56.33	0.614	169.67
3000.0	0.731	177.05	1.492	0.51	0.283	53.45	0.630	165.37

Typical S Parameters of KGF1256B

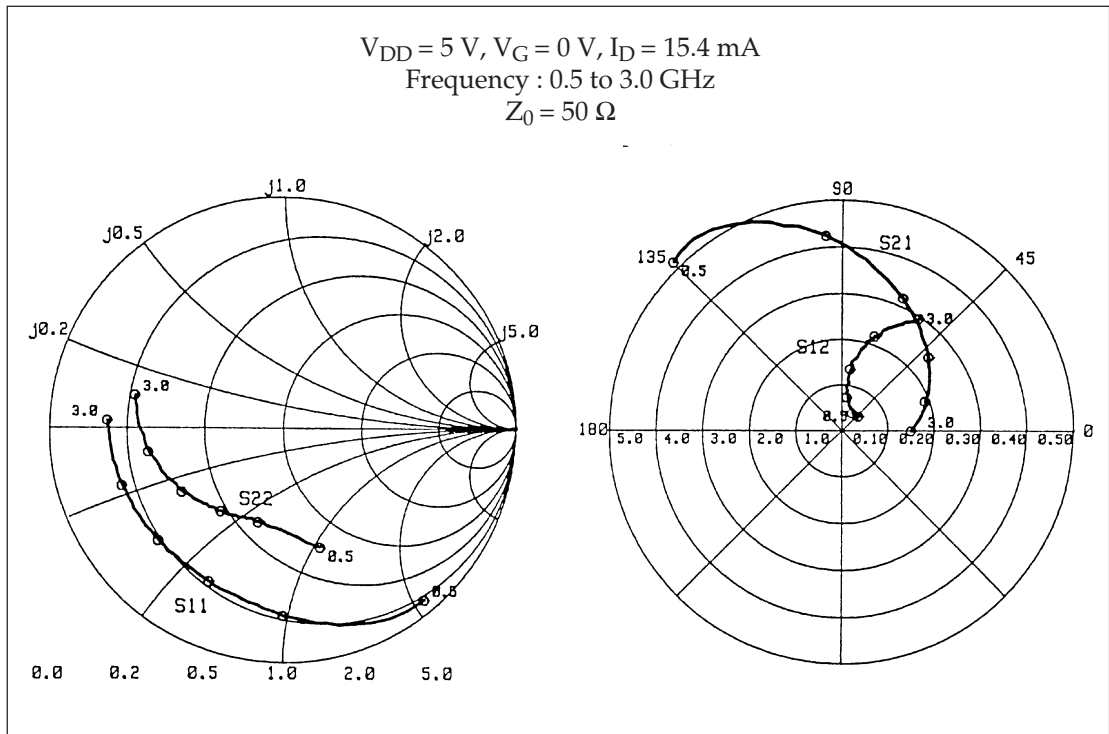


Typical S Parameters of KGF1256B

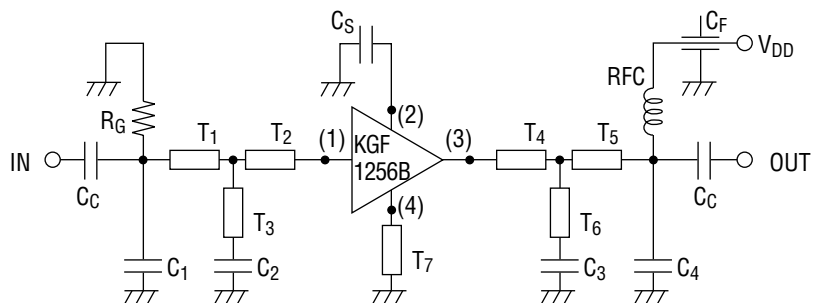
 $V_{DD} = 5\text{ V}$, $V_G = 0\text{ V}$, $I_D = 15.4\text{ mA}$

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	0.946	-50.39	5.163	134.98	0.046	41.95	0.531	-72.83
600.0	0.929	-60.59	5.261	127.92	0.044	42.66	0.469	-82.56
700.0	0.888	-69.71	5.067	118.20	0.043	43.75	0.439	-89.70
800.0	0.849	-77.00	4.808	109.79	0.043	47.27	0.426	-94.94
900.0	0.819	-83.83	4.532	102.16	0.045	46.06	0.420	-99.99
1000.0	0.798	-90.00	4.249	94.87	0.044	60.51	0.414	-104.80
1100.0	0.772	-95.94	3.991	88.30	0.045	62.09	0.407	-109.30
1200.0	0.754	-101.07	3.747	81.91	0.052	68.42	0.414	-113.96
1300.0	0.737	-106.32	3.514	76.24	0.057	76.71	0.424	-118.19
1400.0	0.734	-111.29	3.326	70.45	0.066	76.64	0.437	-122.15
1500.0	0.725	-115.68	3.174	65.44	0.074	81.63	0.442	-126.67
1600.0	0.719	-120.16	2.997	59.74	0.082	84.47	0.451	-131.24
1700.0	0.714	-124.65	2.860	55.18	0.096	85.33	0.460	-134.86
1800.0	0.712	-129.15	2.700	50.32	0.106	81.95	0.475	-138.98
1900.0	0.720	-133.48	2.585	45.17	0.117	83.83	0.490	-143.98
2000.0	0.715	-137.90	2.467	40.55	0.136	82.48	0.509	-147.62
2100.0	0.716	-142.76	2.331	35.99	0.151	83.14	0.517	-152.36
2200.0	0.720	-146.59	2.229	31.65	0.165	78.59	0.539	-156.77
2300.0	0.726	-151.65	2.108	26.60	0.184	76.66	0.551	-160.66
2400.0	0.726	-155.82	2.017	22.47	0.202	75.03	0.563	-165.98
2500.0	0.730	-160.35	1.907	19.12	0.218	71.03	0.583	-169.93
2600.0	0.736	-164.80	1.825	14.31	0.237	67.89	0.595	-174.37
2700.0	0.742	-169.18	1.734	10.62	0.252	64.26	0.611	-179.30
2800.0	0.742	-173.83	1.648	7.08	0.267	60.87	0.623	176.68
2900.0	0.746	-178.20	1.566	3.43	0.285	57.36	0.632	171.64
3000.0	0.753	177.40	1.494	-0.62	0.296	55.75	0.648	167.22

Typical S Parameters of KGF1256B

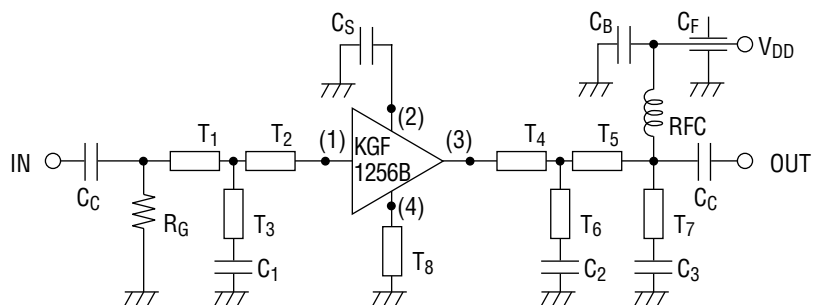


Test Circuit and Bias Configuration for KGF1256B at 850 MHz



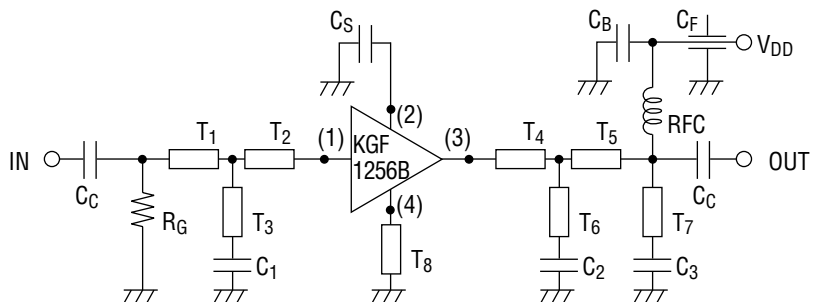
T_1 : $Z_0 = 75 \Omega$, $E = 30 \text{ deg}$ T_4 : $Z_0 = 75 \Omega$, $E = 30 \text{ deg}$
 T_2 : $Z_0 = 75 \Omega$, $E = 28 \text{ deg}$ T_5 : $Z_0 = 75 \Omega$, $E = 30 \text{ deg}$
 $T_3 = T_6$: $Z_0 = 100 \Omega$, $E = 5 \text{ deg}$ T_7 : $Z_0 = 100 \Omega$, $E = 1 \text{ deg}$
 $C_1 = 7.0 \text{ pF}$, $C_2 = 0.8 \text{ pF}$, $C_3 = 5.0 \text{ pF}$, $C_4 = 5.5 \text{ pF}$, $C_S = 100 \text{ pF}$
 $C_{C(\text{DC Block})} = 1000 \text{ pF}$, $C_{F(\text{Feed through})} = 1000 \text{ pF}$
 $RFC = 200 \text{ nH}$, $R_G = 1000 \Omega$

Test Circuit and Bias Configuration for KGF1256B at 1.5 GHz



T_1 : $Z_0 = 75 \Omega$, $E = 65 \text{ deg}$ T_4 : $Z_0 = 75 \Omega$, $E = 50 \text{ deg}$
 T_2 : $Z_0 = 75 \Omega$, $E = 40 \text{ deg}$ T_5 : $Z_0 = 75 \Omega$, $E = 50 \text{ deg}$
 $T_3 = T_6 = T_7$: $Z_0 = 100 \Omega$, $E = 8 \text{ deg}$ T_8 : $Z_0 = 100 \Omega$, $E = 1 \text{ deg}$
 $C_1 = 2.4 \text{ pF}$, $C_2 = 1.2 \text{ pF}$, $C_3 = 0.6 \text{ pF}$, $C_S = 100 \text{ pF}$
 $C_{C(\text{DC Block})} = 1000 \text{ pF}$, $C_{B(\text{By-pass})} = 1000 \text{ pF}$, $C_{F(\text{Feed through})} = 1000 \text{ pF}$
 $RFC = 60 \text{ nH}$, $R_G = 1000 \Omega$

Test Circuit and Bias Configuration for KGF1256B at 1.9 GHz



T_1 : $Z_0 = 75 \, \Omega$, $E = 65 \, \text{deg}$

T_4 : $Z_0 = 75 \, \Omega$, $E = 50 \, \text{deg}$

T_2 : $Z_0 = 75 \, \Omega$, $E = 40 \, \text{deg}$

T_5 : $Z_0 = 75 \, \Omega$, $E = 50 \, \text{deg}$

$T_3 = T_6 = T_7$: $Z_0 = 100 \, \Omega$, $E = 1 \, \text{deg}$ T_8 : $Z_0 = 100 \, \Omega$, $E = 1 \, \text{deg}$

$C_1 = 1.7 \, \text{pF}$, $C_2 = 1.3 \, \text{pF}$, $C_3 = 0.2 \, \text{pF}$, $C_S = 100 \, \text{pF}$

$C_C(\text{DC Block}) = 1000 \, \text{pF}$, $C_B(\text{By-pass}) = 1000 \, \text{pF}$, $C_F(\text{Feed through}) = 1000 \, \text{pF}$

$\text{RFC} = 60 \, \text{nH}$, $R_G = 1000 \, \Omega$