

MGF0906B

L, S BAND POWER GaAs FET

DESCRIPTION

The MGF0906B, GaAs FET with an N-channel schottky gate, is designed for use in UHF band amplifiers.

FEATURES

- Class A operation
- High output power
 $P_{1dB} = 37\text{dBm}$ (TYP) @2.3GHz
- High power gain
 $G_{LP} = 11\text{dB}$ (TYP) @2.3GHz
- High power added efficiency
 $\eta_{add} = 40\%$ (TYP) @2.3GHz, P_{1dB}
- Hermetically sealed metal-ceramic package with ceramic lid

APPLICATION

UHF band power amplifiers

QUALITY GRADE

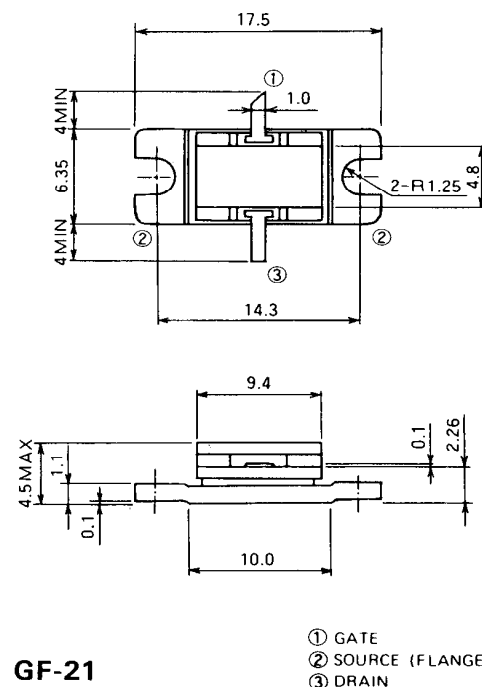
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RECOMMENDED BIAS CONDITIONS

- $V_{DS} = 10\text{V}$
- $I_D = 1.2\text{A}$
- $R_g = 100\Omega$
- Refer to Bias Procedure

OUTLINE DRAWING

Unit: millimeters



ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

Symbol	Parameter	Ratings	Unit
V_{GDO}	Gate to drain voltage	- 15	V
V_{GSO}	Gate to source voltage	- 15	V
I_D	Drain current	3	A
I_{GR}	Reverse gate current	- 10	mA
I_{GF}	Forward gate current	+ 21	mA
P_T	Total power dissipation *1	23	W
T_{ch}	Channel temperature	175	$^\circ\text{C}$
T_{stg}	Storage temperature	- 65 ~ + 175	$^\circ\text{C}$

*1: $T_c = 25^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

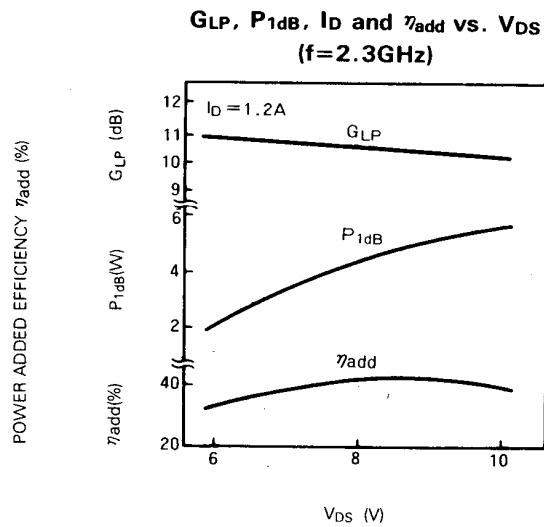
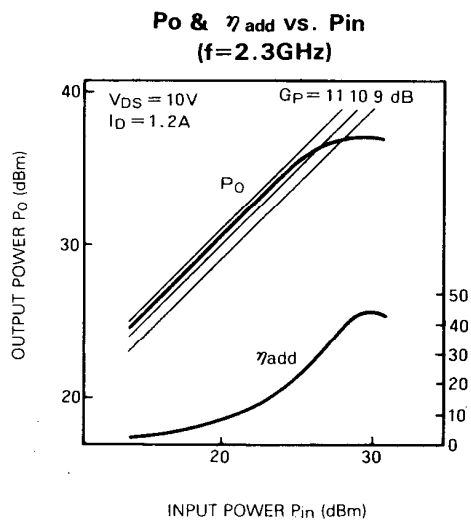
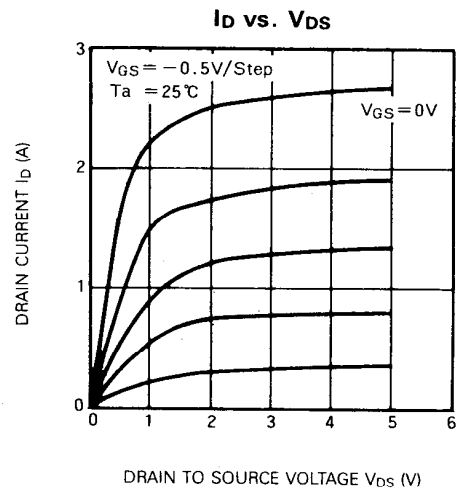
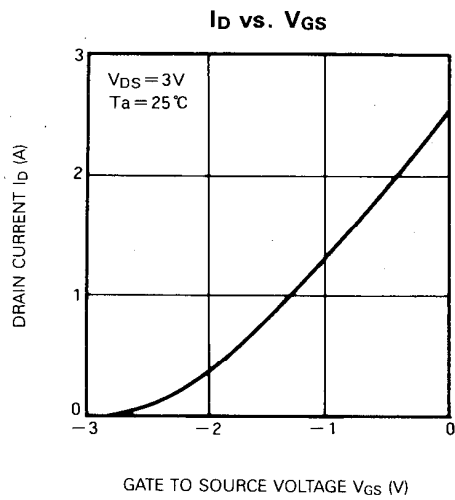
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	$V_{DS} = 3\text{V}$, $V_{GS} = 0\text{V}$	—	2.0	3.0	A
g_m	Transconductance	$V_{DS} = 3\text{V}$, $I_D = 1.1\text{A}$	—	1.0	—	S
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS} = 3\text{V}$, $I_D = 10\text{mA}$	- 1	- 2.5	- 4	V
P_{1dB}	Output power at 1dB gain compression	$V_{DS} = 10\text{V}$, $I_D = 1.2\text{A}$, $f = 2.3\text{GHz}$	35.5	37	—	dBm
G_{LP}	Linear power gain		10	11	—	dB
I_D	Drain current		—	1.1	1.5	A
η_{add}	Power added efficiency at P_{1dB}		—	40	—	%
$R_{th(ch-c)}$	Thermal resistance *1	ΔV_f method	—	—	6.5	$^\circ\text{C/W}$

*1: Channel to case

NOV. '97

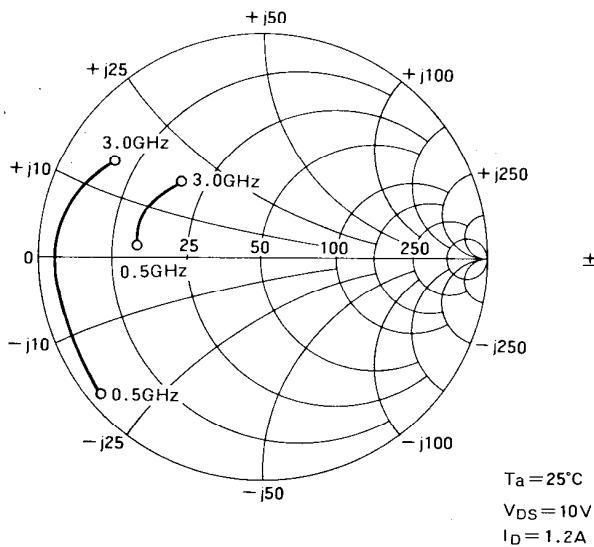
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TYPICAL CHARACTERISTICS

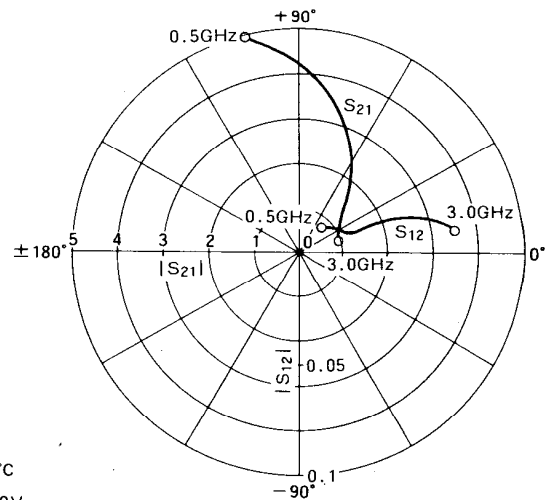


L, S BAND POWER GaAs FET

S₁₁, S₂₂ vs. f



S₂₁, S₁₂ vs. f



S PARAMETERS (Ta=25°C, V_{DS}=10V, I_D=1.2A)

f (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MSG/MAG (dB)
	Magn.	Ang. (deg.)	Magn.	Ang. (deg.)	Magn.	Ang. (deg.)	Magn.	Ang. (deg.)		
0.5	0.922	-139.9	4.997	104.1	0.016	51.5	0.673	174.9	0.869	25.0
0.6	0.913	-146.2	4.570	97.5	0.019	44.9	0.674	172.5	0.837	23.8
0.7	0.906	-151.8	4.176	91.5	0.022	39.3	0.676	170.4	0.807	22.8
0.8	0.900	-156.8	3.815	85.9	0.023	34.6	0.677	168.6	0.826	22.1
0.9	0.896	-161.2	3.484	80.9	0.025	30.7	0.679	167.0	0.819	21.4
1.0	0.894	-165.0	3.182	76.3	0.026	27.7	0.680	165.7	0.834	20.9
1.1	0.892	-168.4	2.909	72.2	0.026	25.2	0.680	164.5	0.883	20.5
1.2	0.891	-171.4	2.662	68.3	0.027	23.4	0.681	163.5	0.906	19.9
1.3	0.891	-174.0	2.440	64.8	0.027	22.1	0.681	162.6	0.959	19.6
1.4	0.891	-176.3	2.242	61.6	0.027	21.3	0.680	161.8	1.024	18.2
1.5	0.892	-178.3	2.067	58.7	0.027	20.9	0.679	161.1	1.086	17.1
1.6	0.892	-179.9	1.913	55.9	0.027	20.7	0.678	160.5	1.160	16.1
1.7	0.892	-178.2	1.779	53.2	0.028	20.8	0.676	159.8	1.202	15.3
1.8	0.892	-176.6	1.664	50.7	0.028	21.0	0.673	159.2	1.285	14.5
1.9	0.891	-175.1	1.565	48.2	0.029	21.3	0.670	158.6	1.334	13.9
2.0	0.890	-173.6	1.482	45.8	0.030	21.6	0.666	157.9	1.384	13.2
2.1	0.887	-172.0	1.414	43.4	0.031	21.9	0.661	157.1	1.455	12.6
2.2	0.883	-170.2	1.359	40.8	0.033	21.9	0.655	156.3	1.487	12.0
2.3	0.877	-168.3	1.315	38.2	0.035	21.8	0.649	155.3	1.538	11.4
2.4	0.870	-166.2	1.282	35.4	0.038	21.3	0.642	154.1	1.553	10.9
2.5	0.861	-163.8	1.258	32.5	0.042	20.5	0.633	152.8	1.554	10.4
2.6	0.850	-161.1	1.241	29.3	0.046	19.2	0.624	151.3	1.569	9.9
2.7	0.837	-157.9	1.231	25.8	0.051	17.4	0.614	149.5	1.569	9.4
2.8	0.821	-154.4	1.226	22.0	0.057	15.0	0.602	147.5	1.566	8.9
2.9	0.803	-150.3	1.224	17.9	0.064	11.9	0.589	145.1	1.566	8.4
3.0	0.781	-145.6	1.224	13.4	0.072	8.0	0.576	142.5	1.549	7.9