

MGF0907B

L, S BAND POWER GaAs FET

DESCRIPTION

The MGF0907B, GaAs FET with an N-channel schottky gate, is designed for use in UHF band amplifiers.

FEATURES

- Class A operation
- High output power
 $P_{1dB} = 40\text{dBm}$ (TYP) @2.3 GHz
- High power gain
 $G_{LP} = 10\text{ dB}$ (TYP) @2.3GHz
- High power added efficiency
 $\eta_{add} = 37\%$ (TYP) @2.3GHz, P_{1dB}
- Hermetically sealed metal-ceramic package with ceramic lid

APPLICATION

UHF band power amplifiers.

QUALITY GRADE

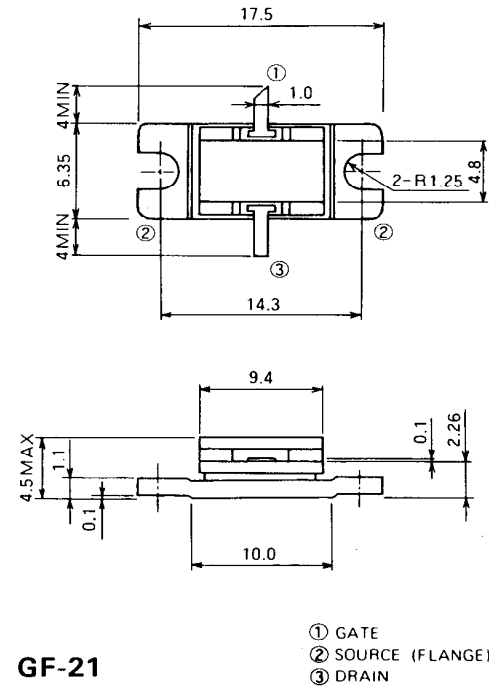
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RECOMMENDED BIAS CONDITIONS

- $V_{DS} = 10\text{V}$
- $I_D = 2.4\text{A}$
- $R_g = 50\Omega$
- 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	6	A
I_{GR}	Reverse-gate current	- 20	mA
I_{GF}	Forward gate current	+ 42	mA
P_T	Total power dissipation *1	37.5	W
T_{ch}	Channel temperature	175	$^\circ\text{C}$
T_{stg}	Storage temperature	- 65 ~ + 175	$^\circ\text{C}$

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

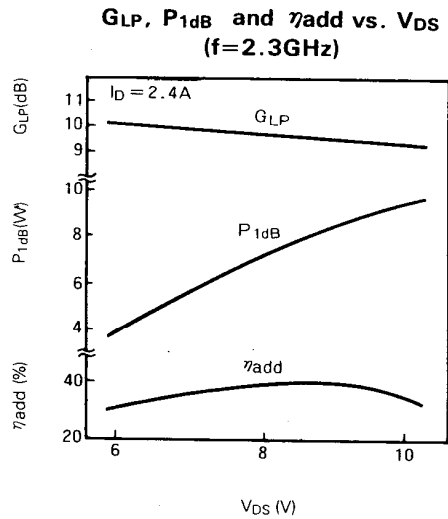
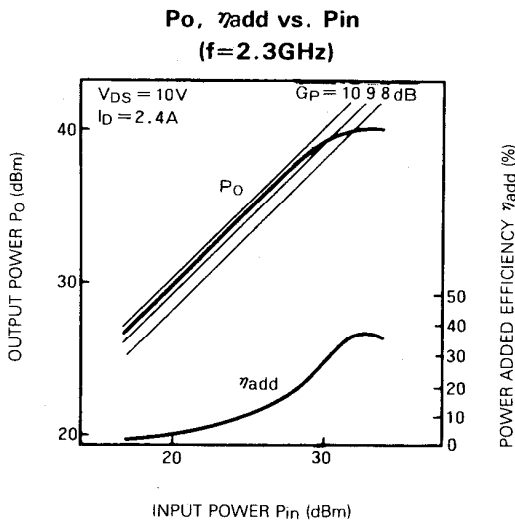
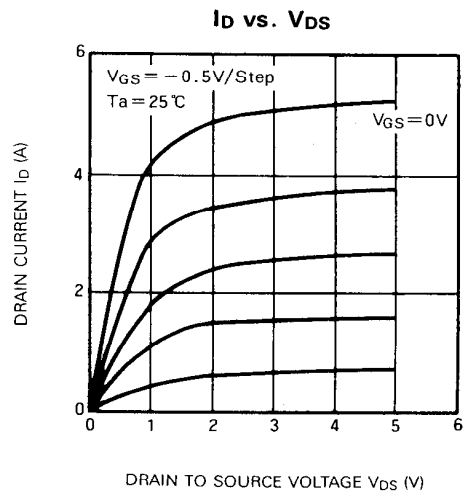
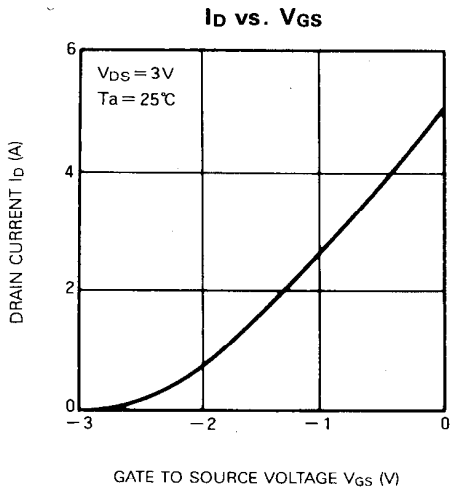
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	$V_{DS} = 3\text{V}, V_{GS} = 0\text{V}$	—	4.0	6.0	A
g_m	Transconductance	$V_{DS} = 3\text{V}, I_D = 2.2\text{A}$	—	2.0	—	S
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS} = 3\text{V}, I_D = 20\text{mA}$	- 1	- 2.5	- 4	V
P_{1dB}	Output power at 1dB gain compression	$V_{DS} = 10\text{V}, I_D = 2.4\text{A}, f = 2.3\text{GHz}$	38.5	40	—	dBm
G_{LP}	Linear power gain		8	10	—	dB
I_D	Drain current		—	2.2	3.0	A
η_{add}	Power added efficiency at P_{1dB}		—	37	—	%
$R_{th(ch-c)}$	Thermal resistance *1	ΔV_f method	—	—	4.0	$^\circ\text{C/W}$

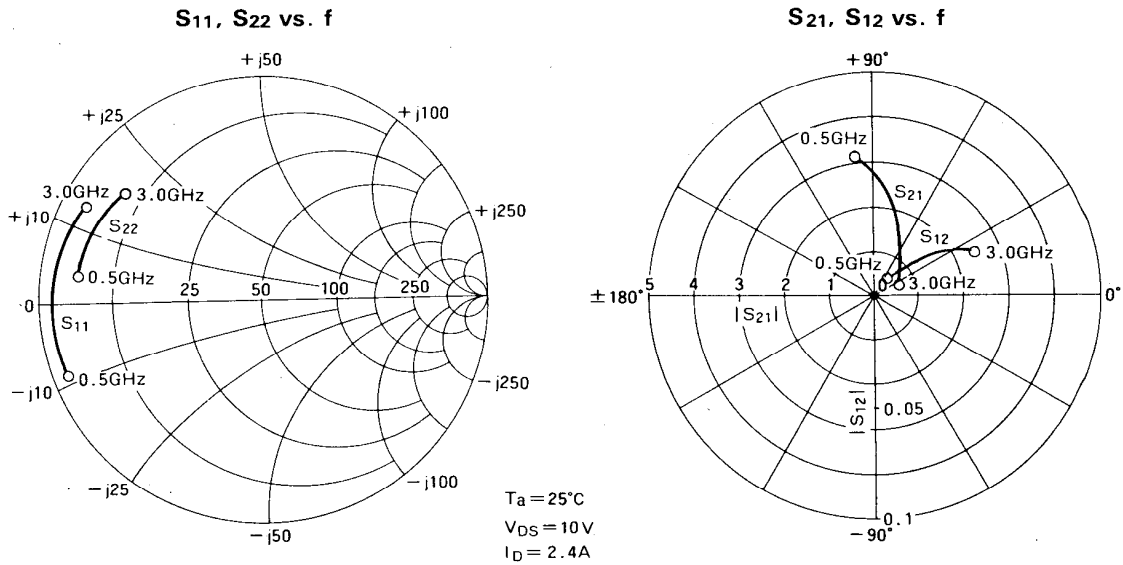
*1. Channel to case

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TYPICAL CHARACTERISTICS



L, S BAND POWER GaAs FET



S PARAMETERS ($T_a=25^\circ\text{C}$, $V_{DS}=10\text{V}$, $I_D=2.4\text{A}$)

f (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG (dB)
	Magn.	Ang. (deg)	Magn.	Ang. (deg)	Magn.	Ang. (deg)	Magn.	Ang. (deg)		
0.5	0.947	-162.1	3.089	96.7	0.010	45.8	0.823	171.6	1.086	23.1
0.6	0.943	-165.6	2.793	90.8	0.012	44.1	0.822	170.1	1.055	22.2
0.7	0.939	-168.7	2.524	85.5	0.014	42.7	0.822	168.7	1.038	21.4
0.8	0.936	-171.4	2.281	80.7	0.014	41.5	0.821	167.5	1.024	20.6
0.9	0.934	-173.8	2.092	76.4	0.017	40.5	0.821	166.4	1.043	19.6
1.0	0.932	-175.9	1.865	72.7	0.018	39.7	0.820	165.5	1.072	18.5
1.1	0.931	-177.7	1.691	69.3	0.019	39.0	0.819	164.7	1.095	17.6
1.2	0.930	-179.3	1.537	66.4	0.020	38.4	0.818	164.0	1.124	16.7
1.3	0.929	-179.3	1.401	63.7	0.021	37.9	0.817	163.3	1.157	15.8
1.4	0.929	-178.1	1.284	61.4	0.021	37.5	0.816	162.7	1.219	15.0
1.5	0.928	-177.0	1.183	59.3	0.022	37.2	0.815	162.1	1.257	14.3
1.6	0.928	-176.0	1.096	57.4	0.022	36.9	0.813	161.5	1.328	13.6
1.7	0.927	-175.1	1.024	55.6	0.023	36.6	0.811	160.8	1.367	12.7
1.8	0.927	-174.2	0.964	54.0	0.023	36.3	0.810	160.2	1.430	12.3
1.9	0.926	-173.3	0.915	52.4	0.024	35.9	0.808	159.4	1.461	11.8
2.0	0.925	-172.3	0.875	50.9	0.025	35.5	0.806	158.6	1.488	11.3
2.1	0.923	-171.2	0.844	49.3	0.026	35.0	0.803	157.7	1.527	10.8
2.2	0.921	-170.0	0.820	47.6	0.027	34.4	0.801	156.7	1.555	10.4
2.3	0.919	-168.6	0.801	45.8	0.028	33.7	0.798	155.5	1.584	10.1
2.4	0.916	-167.1	0.787	43.9	0.030	32.8	0.769	154.1	1.574	9.7
2.5	0.912	-165.3	0.776	41.7	0.032	31.8	0.792	152.6	1.587	9.4
2.6	0.907	-163.3	0.767	39.2	0.035	30.6	0.789	150.9	1.570	9.0
2.7	0.902	-160.9	0.757	36.5	0.037	29.1	0.786	148.9	1.594	8.6
2.8	0.895	-158.3	0.746	33.4	0.040	27.4	0.782	146.6	1.614	8.1
2.9	0.887	-155.2	0.735	29.9	0.044	25.4	0.778	144.1	1.620	7.6
3.0	0.879	-151.7	0.719	26.0	0.048	23.1	0.774	141.4	1.636	7.1

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