

MITSUBISHI SEMICONDUCTOR (GaAs FET)
MGF0910A

L, S BAND POWER GaAs FET

DESCRIPTION

The MGF0910A, 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}=38dBm(TYP) @2.3GHz
- High power gain
GLP=11dB(TYP) @2.3GHz
- High power added efficiency
add=45%(TYP) @2.3GHz, P_{1dB}
- Hermetically sealed metal-ceramic package with ceramic lid

APPLICATION

UHF band power amplifiers

QUALITY GRADE

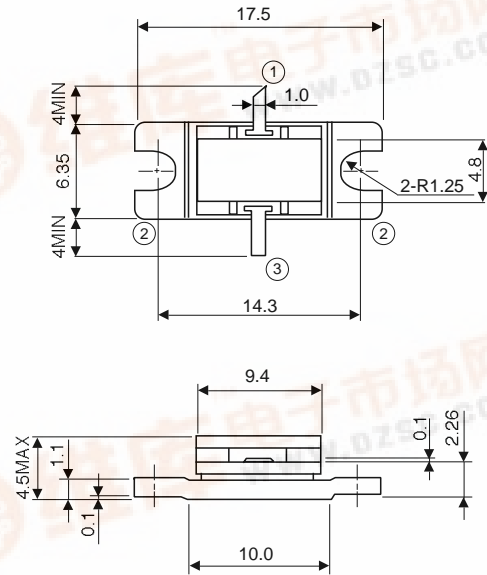
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RECOMMENDED BIAS CONDITIONS

- V_{DS}=10V
- I_D=1.3A
- R_g=100
- Refer to Bias Procedure

OUTLINE DRAWING

Unit: millimeters



GF-21

- ① GATE
- ② SOURCE (FLANGE)
- ③ DRAIN

ABSOLUTE MAXIMUM RATINGS (T_a=25°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	5	A
I _{GR}	Reverse gate current	15	mA
I _{GF}	Forward gate current	31.5	mA
P _T	Total power dissipation *1	27.3	W
T _{ch}	Channel temperature	175	°C
T _{stg}	Storage temperature	-65 to +175	°C

*1: T_C=25°C

ELECTRICAL CHARACTERISTICS (T_a=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I _{DSS}	Saturated drain current	V _{DS} =3V, V _{GS} =0V	-	-	5.0	A
gm	Transconductance	V _{DS} =3V, I _D =1.3A	-	1.5	-	S
V _{GS(off)}	Gate to source cut-off voltage	V _{DS} =3V, I _D =10mA	-2	-	-5	V
P _{1dB}	Output power at 1dB gain compression	V _{DS} =10V, I _D =1.3A, f=2.3GHz	37	38	-	dBm
GLP	Linear power gain *2		10	11	-	dB
add	Power added efficiency at P _{1dB}		-	45	-	%
R _{th(j-c)}	Thermal resistance *1	V _I method	-	-	5.5	°C/W

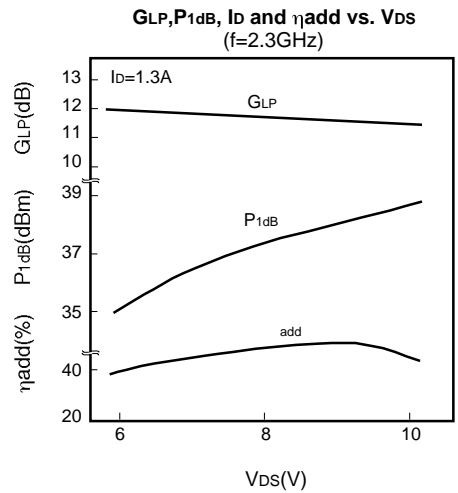
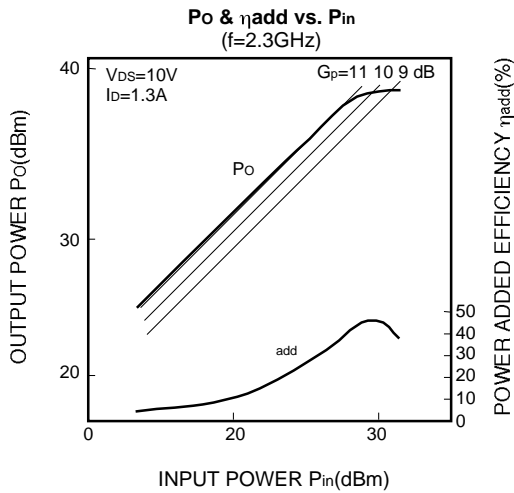
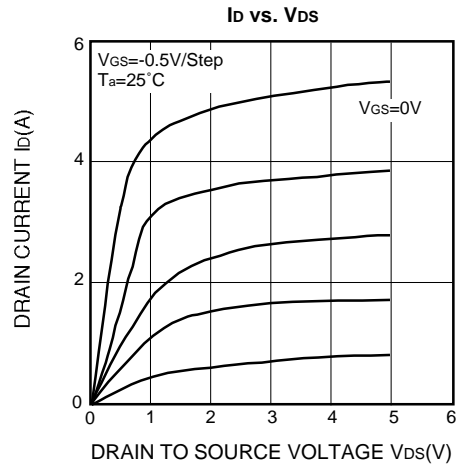
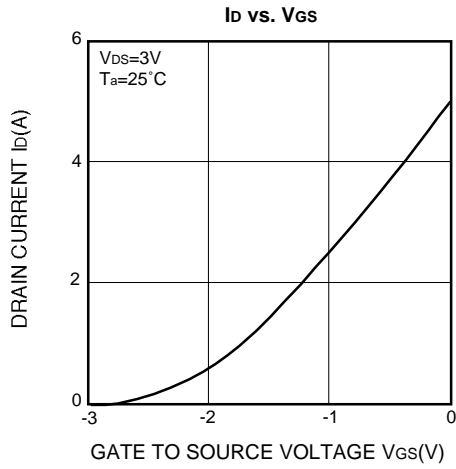
*1: Channel to case *2: Pin=22dBm



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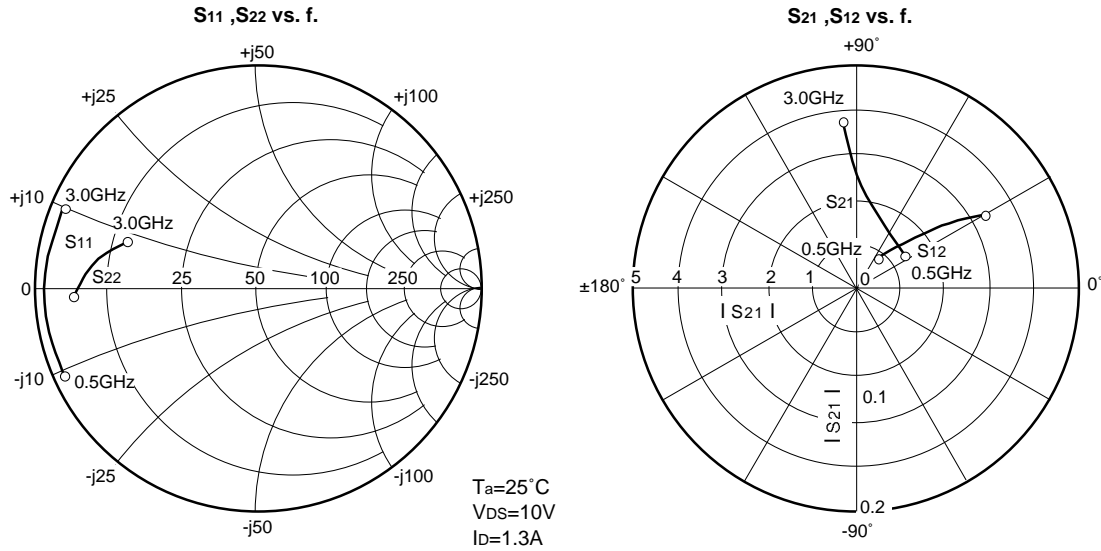
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TYPICAL CHARACTERISTICS



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S PARAMETERS (T_a=25°C, V_{ds}=10V, I_d=1.3A)

Freq. (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MSG/MAG (dB)
	Magn.	Angle(deg.)	Magn.	Angle(deg.)	Magn.	Angle(deg.)	Magn.	Angle(deg.)		
0.50	0.962	-155.5	3.762	97.8	0.0080	50.0	0.869	-177.6	0.752	25.0
0.60	0.961	-159.7	3.339	93.6	0.0090	49.9	0.869	-179.6	0.795	24.8
0.70	0.960	-163.4	2.768	90.8	0.0110	48.5	0.867	178.5	0.835	24.7
0.80	0.959	-166.8	2.460	87.5	0.0130	47.5	0.865	178.2	0.842	23.5
0.90	0.958	-168.4	2.219	87.1	0.0140	46.5	0.860	177.6	0.883	23.0
1.00	0.957	-171.3	2.021	84.1	0.0149	46.0	0.854	176.8	0.902	23.1
1.10	0.956	-173.8	1.830	82.2	0.0156	45.6	0.845	175.6	0.943	22.4
1.20	0.955	-175.4	1.691	80.2	0.0172	44.6	0.840	176.6	1.025	21.5
1.30	0.954	-176.8	1.590	78.0	0.0182	44.0	0.832	176.1	1.055	20.0
1.40	0.952	-178.7	1.500	75.7	0.0189	43.5	0.825	175.7	1.085	19.0
1.50	0.950	-179.7	1.425	73.7	0.0192	42.3	0.818	175.3	1.125	18.5
1.60	0.948	178.4	1.352	71.6	0.0195	40.9	0.805	175.1	1.175	17.8
1.70	0.946	177.2	1.330	69.9	0.0219	40.3	0.795	174.7	1.195	17.0
1.80	0.944	176.0	1.255	67.7	0.0224	39.0	0.782	174.0	1.212	16.9
1.90	0.941	174.7	1.201	66.2	0.0225	38.5	0.773	173.4	1.256	16.0
2.00	0.938	174.3	1.040	65.3	0.0235	38.0	0.757	174.4	1.285	15.4
2.10	0.934	173.3	0.993	63.3	0.0239	37.2	0.750	174.2	1.295	14.8
2.20	0.930	172.3	0.977	61.7	0.0249	36.5	0.740	173.4	1.305	14.5
2.30	0.926	171.2	0.949	59.1	0.0258	35.8	0.725	172.7	1.355	14.2
2.40	0.922	169.9	0.921	57.0	0.0265	35.3	0.708	172.2	1.395	13.8
2.50	0.918	169.0	0.909	55.4	0.0275	34.6	0.687	171.6	1.415	13.5
2.60	0.913	167.6	0.900	54.3	0.0280	33.6	0.672	170.3	1.435	12.8
2.70	0.907	166.1	0.876	52.2	0.0286	32.5	0.662	168.9	1.454	12.3
2.80	0.902	164.6	0.873	49.9	0.0296	31.2	0.642	167.7	1.475	11.9
2.90	0.895	163.3	0.843	48.4	0.0310	30.2	0.629	166.9	1.495	10.8
3.00	0.885	162.0	0.832	45.5	0.0320	29.1	0.610	159.4	1.525	10.5