MGF0909A

L, S BAND POWER GaAs FET

DESCRIPTION

The MGF0909A, GaAs FET with an N-channel schottky gate, is designed for use in UHF band amplifiers.

FEATURES

- High output power
  P_{1dB}=38dBm(TYP.) @f=2.3GHz
- High power gain
  G_{LP}=11dB(TYP.) @f=2.3GHz,P_{in}=20dBm
- High power added efficiency
  η_{add}=45%(TYP.) @f=2.3GHz,P_{1dB}=20dBm

APPLICATION

For UHF Band power amplifiers

QUALITY GRADE

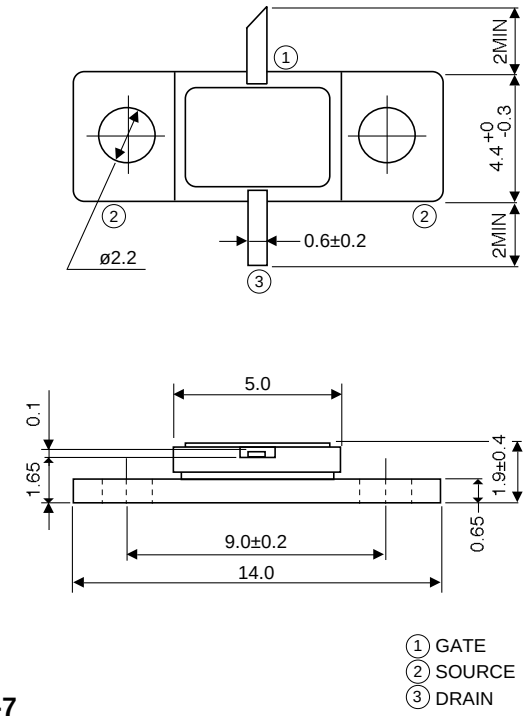
- GG

RECOMMENDED BIAS CONDITIONS

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

OUTLINE DRAWING

Unit:millimeters



GF-7

ABSOLUTE MAXIMUM RATINGS (T_a=25˚C)

Symbol	Parameter	Ratings	Unit
V_{GSO}	Gate to source voltage	-15	V
V_{GDO}	Gate to drain voltage	-15	V
I_D	Drain current	5.0	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:TC=25˚C

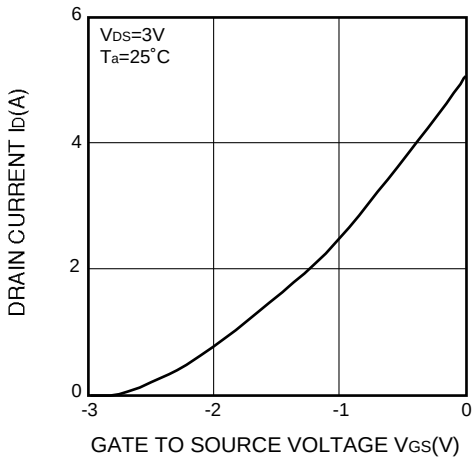
ELECTRICAL CHARACTERISTICS (T_a=25˚C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	V_{DS}=3V,V_{GS}=0V	–	–	5	A
$V_{GS(off)}$	Gate to source cut-off voltage	V_{DS}=3V,I_D=10mA	-2	–	-5	V
gm	Transconductance	V_{DS}=3V,I_D=1.3A	–	1.5	–	S
P_{1dB}	Output power	V_{DS}=10V,I_D=1.3A,f=2.3GHz	37	38	–	dBm
G_{LP}	Linear power gain *2		10	11	–	dB
η_{add}	Power added efficiency at P_{1dB}		–	45	–	%
$R_{th(ch-c)}$	Thermal resistance *1	ΔV_f method	–	–	5.5	˚C/W

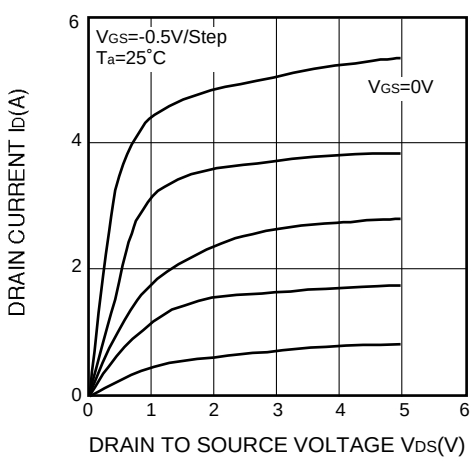
*1:Channel to case *2:Pin=22dBm

TYPICAL CHARACTERISTICS

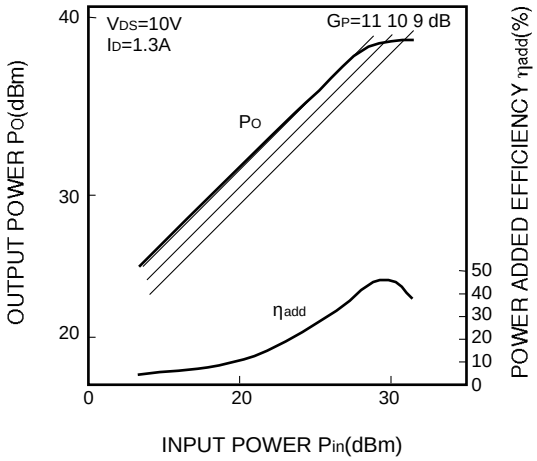
ID vs. VGS



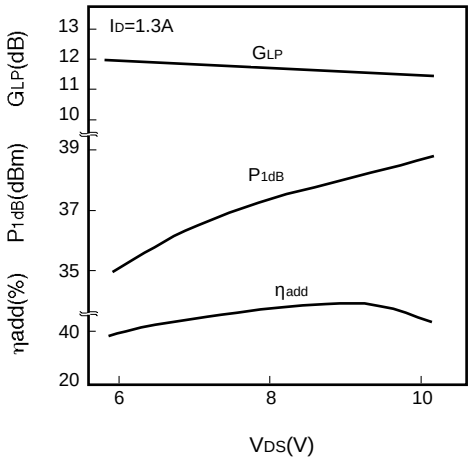
ID vs. VDS



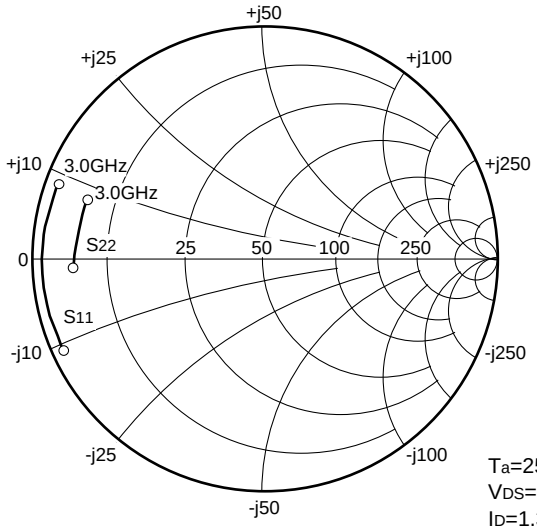
PO & ηadd vs. Pin
(f=2.3GHz)



GLP,P1dB, ID and ηadd vs. VDS
(f=2.3GHz)

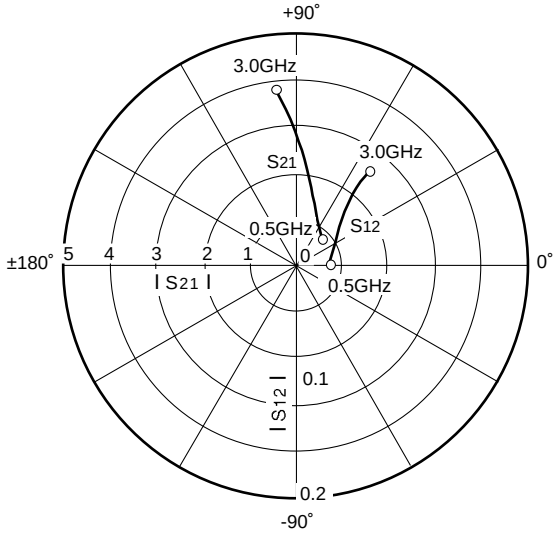


S_{11} ,S_{22} vs. f.



T_a=25˚C
V_{DS}=10V
I_D=1.3A

S_{21} ,S_{12} vs. f.



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	0.968	-155.5	3.763	97.8	0.013	13.2	0.823	-177.6	0.652	25.4
0.60	0.966	-159.7	3.340	93.6	0.013	14.6	0.823	-179.6	0.713	25.2
0.70	0.966	-163.4	2.768	90.8	0.014	16.5	0.822	178.5	0.755	24.7
0.80	0.965	-166.8	2.460	87.5	0.014	18.2	0.822	178.2	0.782	23.4
0.90	0.964	-168.4	2.219	87.1	0.015	20.6	0.820	177.6	0.825	23.1
1.00	0.963	-171.3	2.021	84.1	0.015	22.5	0.819	176.8	0.855	23.0
1.10	0.961	-173.8	1.831	82.2	0.016	24.1	0.818	175.6	0.875	22.4
1.20	0.960	-175.4	1.613	80.2	0.016	25.8	0.814	176.6	0.955	19.0
1.30	0.959	-176.8	1.591	78.0	0.017	27.8	0.804	176.1	0.985	19.2
1.40	0.959	-178.7	1.500	75.7	0.017	29.5	0.807	175.7	0.996	19.0
1.50	0.959	-179.7	1.425	73.7	0.018	31.2	0.805	175.3	1.105	18.9
1.60	0.958	178.4	1.359	71.6	0.018	33.8	0.801	175.1	1.135	18.5
1.70	0.958	177.2	1.301	69.9	0.019	35.4	0.795	174.7	1.145	18.0
1.80	0.957	176.0	1.255	67.7	0.019	37.6	0.789	174.0	1.185	16.9
1.90	0.958	174.7	1.201	66.2	0.020	39.5	0.785	173.4	1.205	16.5
2.00	0.958	174.3	1.040	65.3	0.021	41.5	0.784	174.4	1.194	16.2
2.10	0.957	173.3	0.993	63.3	0.021	43.1	0.783	174.2	1.203	15.5
2.20	0.956	172.3	0.977	61.7	0.022	44.8	0.783	173.4	1.235	14.9
2.30	0.954	171.2	0.949	59.1	0.022	46.5	0.782	172.7	1.295	14.7
2.40	0.954	169.9	0.921	57.0	0.023	48.7	0.780	172.2	1.325	14.5
2.50	0.953	169.0	0.909	55.4	0.023	50.8	0.779	171.6	1.345	13.8
2.60	0.953	167.6	0.901	54.3	0.024	52.6	0.778	170.3	1.362	12.8
2.70	0.953	166.1	0.876	52.2	0.024	54.3	0.778	168.9	1.403	12.3
2.80	0.948	164.6	0.873	49.9	0.025	55.2	0.776	167.7	1.452	11.9
2.90	0.956	163.3	0.843	48.4	0.025	57.3	0.775	166.9	1.523	10.8
3.00	0.944	162.0	0.832	45.5	0.025	58.0	0.773	165.1	1.554	10.5