

DESCRIPTION

The MGF0911A, GaAs FET with an N-channel schottky gate, is designed for use in UHF band amplifiers.

FEATURES

- Class A operation
- High output power
 $P_{1dB}=41dBm(TYP)$ @2.3GHz
- High power gain
 $GLP=11dB(TYP)$ @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

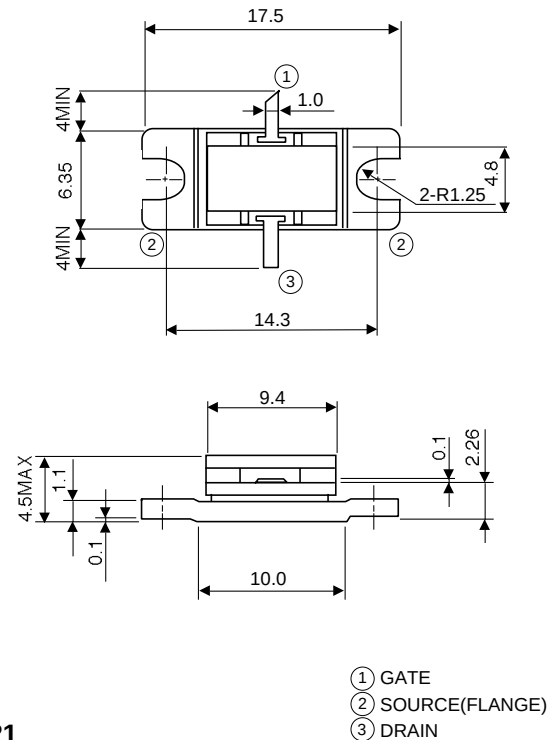
- IG

RECOMMENDED BIAS CONDITIONS

- $V_{DS}=10V$
- $I_D=2.6A$
- $R_g=50W$
- Refer to Bias Procedure

OUTLINE DRAWING

Unit: millimeters

**ABSOLUTE MAXIMUM RATINGS** ($T_a=25^\circ C$)

Symbol	Parameter	Ratings	Unit
V_{GDO}	Gate to drain voltage	-15	V
V_{GSO}	Gate to source voltage	-15	V
I_D	Drain current	10	A
I_{GR}	Reverse gate current	30	mA
I_{GF}	Forward gate current	63	mA
P_T	Total power dissipation *1	37.5	W
T_{ch}	Channel temperature	175	$^\circ C$
T_{stg}	Storage temperature	-65 to +175	$^\circ C$

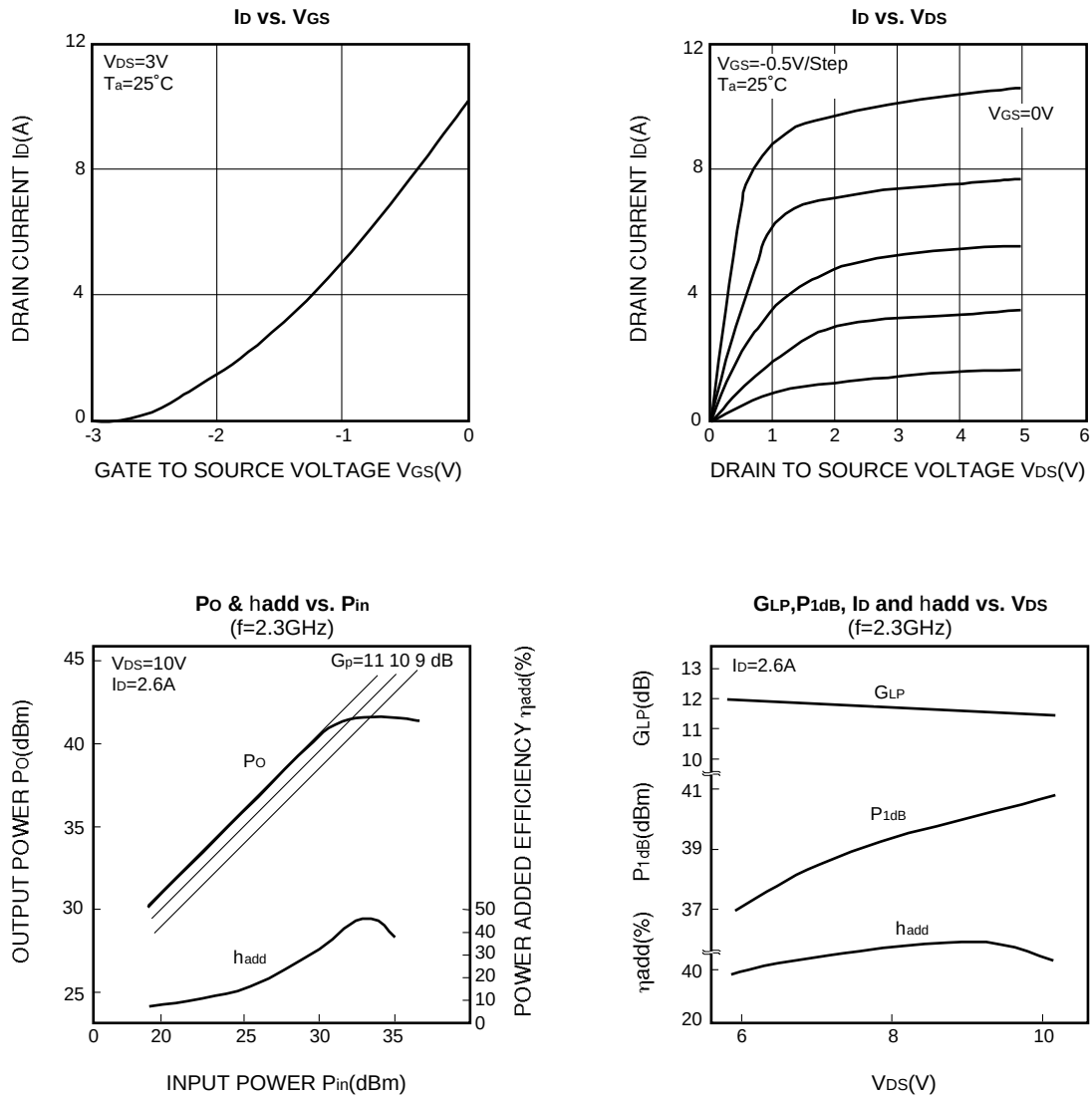
*1: $T_C=25^\circ C$

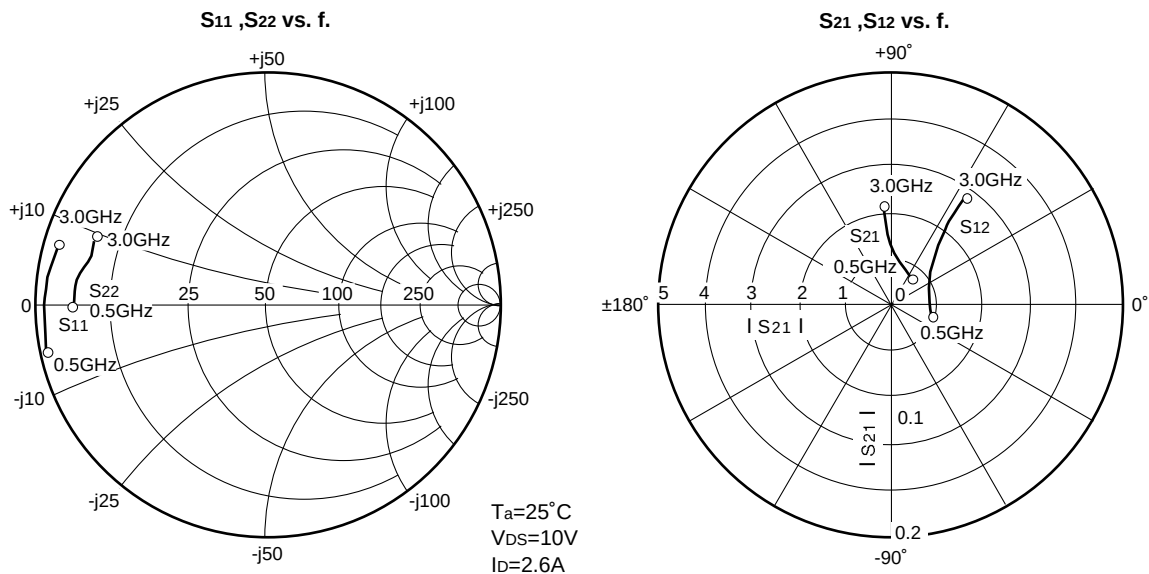
ELECTRICAL CHARACTERISTICS ($T_a=25^\circ C$)

Symbol	Parameter		Limits			Unit
			Min	Typ	Max	
I_{DSS}	Saturated drain current	$V_{DS}=3V, V_{GS}=0V$	—	—	10	A
g_m	Transconductance	$V_{DS}=3V, I_D=2.6A$	—	3.0	—	S
$V_{GS(off)}$	Gate to source cut-off voltage	$V_{DS}=3V, I_D=20mA$ Test conditions	-2	—	-5	V
P_{1dB}	Output power at 1dB gain compression	$V_{DS}=10V, I_D=2.6A, f=2.3GHz$	40	41	—	dBm
GLP	Linear power gain *2		10	11	—	dB
η_{add}	Power added efficiency at P_{1dB}		—	40	—	%
$R_{th(ch-c)}$	Thermal resistance *1	DVf method	—	—	4.0	$^\circ C/W$

*1: Channel to case *2: $P_{in}=25dBm$

TYPICAL CHARACTERISTICS





S PARAMETERS (T_a=25°C, V_{DS}=10V, I_D=2.6A)

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	0.986	-167.3	2.046	91.2	0.008	44.1	0.913	-178.6	0.515	23.1
0.60	0.985	-171.3	1.833	87.9	0.010	44.2	0.911	-179.9	0.567	22.7
0.70	0.984	-174.3	1.515	86.1	0.011	44.6	0.909	178.6	0.583	21.8
0.80	0.983	-175.5	1.356	83.6	0.012	44.9	0.907	178.2	0.675	21.2
0.90	0.982	-172.1	1.233	84.0	0.013	45.3	0.904	177.7	0.683	20.3
1.00	0.981	-173.9	1.128	81.1	0.013	45.8	0.902	176.6	0.713	19.6
1.10	0.980	-175.3	1.033	79.7	0.015	46.4	0.898	175.7	0.736	19.3
1.20	0.979	-176.3	0.970	77.8	0.015	46.8	0.895	176.6	0.785	18.7
1.30	0.978	-176.9	0.919	75.8	0.016	47.0	0.889	176.0	0.815	18.2
1.40	0.976	-177.9	0.878	73.6	0.017	47.3	0.883	175.6	0.835	17.5
1.50	0.975	-178.2	0.845	71.6	0.018	47.6	0.875	175.2	0.900	17.1
1.60	0.974	-179.3	0.811	69.4	0.019	48.0	0.865	175.0	0.951	16.8
1.70	0.973	-179.8	0.788	67.8	0.020	48.4	0.858	174.6	0.989	15.8
1.80	0.972	179.5	0.771	65.8	0.020	48.9	0.850	173.6	1.011	14.7
1.90	0.971	178.6	0.754	64.1	0.022	49.2	0.843	173.4	1.050	14.1
2.00	0.970	176.7	0.653	63.1	0.023	49.6	0.837	172.6	1.149	13.9
2.10	0.969	175.9	0.638	60.9	0.023	49.9	0.833	174.1	1.170	13.7
2.20	0.968	175.1	0.638	59.0	0.023	50.4	0.829	173.6	1.221	12.7
2.30	0.967	174.1	0.635	56.3	0.024	50.7	0.826	172.9	1.242	12.3
2.40	0.966	173.1	0.625	54.2	0.025	51.0	0.823	171.0	1.256	11.9
2.50	0.965	172.3	0.628	52.3	0.025	51.2	0.820	170.3	1.267	11.6
2.60	0.965	171.2	0.634	51.3	0.027	51.6	0.818	168.8	1.292	11.4
2.70	0.964	170.2	0.635	48.9	0.027	51.9	0.816	167.1	1.315	11.0
2.80	0.963	168.7	0.646	46.3	0.028	52.3	0.814	165.7	1.327	10.1
2.90	0.962	167.6	0.642	44.0	0.029	52.5	0.812	164.6	1.366	9.8
3.00	0.961	166.3	0.651	41.0	0.029	52.7	0.811	162.7	1.412	9.4

Requests Regarding Safety Designs

Mitsubishi Electric constantly strives to raise the level of its quality and reliability. Despite these concerted efforts, however, there will be occasions when our semiconductor products suffer breakdowns, malfunctions or other problems. In view of this reality, it is requested that every feasible precaution be taken in the pursuit of redundancy design, malfunction prevention design and other safety-related designs, to prevent breakdowns or malfunctions in our products from resulting in accidents involving people, fires, social losses or other problems, thereby upholding the highest levels of safety in the products when in use by customers.

Matters of Importance when Using these Materials

1. These materials are designed as reference materials to ensure that all customers purchase Mitsubishi Electric semiconductors best suited to their specific use applications. Please be aware, however, that the technical information contained in these materials does not comprise consent for the execution or use of intellectual property rights or other rights owned by Mitsubishi Electric Corporation.
2. Mitsubishi Electric does not assume responsibility for damages resulting from the use of product data, graphs, charts, programs, algorithms or other applied circuit examples described in these materials, or for the infringement of the rights of third-party owners resulting from such use.
3. The data, graphs, charts, programs, algorithms and all other information described in these materials were current at the issue of these materials, with Mitsubishi Electric reserving the right to make any necessary updates or changes in the products or specifications in these materials without prior notice. Before purchasing Mitsubishi Electric semiconductor products, therefore, please obtain the latest available information from Mitsubishi Electric directly or an authorized dealer.
4. Every possible effort has been made to ensure that the information described in these materials is fully accurate. However, Mitsubishi Electric assumes no responsibility for damages resulting from inaccuracies occurring within these materials.
5. When using the product data, technical contents indicated on the graphs, charts, programs or algorithms described in these materials, assessments should not be limited to only the technical contents, programs and algorithm units. Rather, it is requested that ample evaluations be made of each individual system as a whole, with the customer assuming full responsibility for decisions on the propriety of application. Mitsubishi Electric does not accept responsibility for the propriety of application.
6. The products described in these materials, with the exception of special mention concerning use and reliability, have been designed and manufactured with the purpose of use in general electronic machinery. Accordingly these products have not been designed and manufactured with the purpose of application in machinery or systems that will be used under conditions that can affect human life, or in machinery or systems used in social infrastructure that demand a particularly high degree of reliability. When considering the use of the products described in these materials in transportation machinery (automobiles, trains, vessels), for objectives related to medical treatment, aerospace, nuclear power control, submarine repeaters or systems or other specialized applications, please consult with Mitsubishi Electric directly or an authorized dealer.
7. When considering use of products for purposes other than the specific applications described in these materials, please inquire at Mitsubishi Electric or an authorized dealer.
8. The prior consent of Mitsubishi Electric in writing is required for any reprinting or reproduction of these materials.
9. Please direct any inquiries regarding further details of these materials, or any other comments or matters of attention, to Mitsubishi Electric or an authorized dealer.