

< Power GaAs HEMT >

MGF4851A

Leadless ceramic package

DESCRIPTION

The MGF4851A power InGaAs HEMT (High Electron Mobility Transistor) is designed for use in S to K band amplifiers.

The lead-less ceramic package assures minimum parasitic losses.

FEATURES

High gain and High P1dB

Glp=11dB , P1dB=14.5dBm (Typ.) @ f=12GHz

APPLICATION

S to K band low noise amplifiers

QUALITY GRADE

GG

RECOMMENDED BIAS CONDITIONS

VDS=2.5V , ID=25mA

ORDERING INFORMATION

Tape & reel 3,000pcs/reel

RoHS COMPLIANT

MGF4851A is a RoHS compliant product. RoHS compliance is indicated by the letter "G" after the Lot Marking.

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Symbol	Parameter	Ratings	Unit
VGDO	Gate to drain voltage	-5	V
VGSO	Gate to source voltage	-5	V
ID	Drain current	IDSS	mA
PT	Total power dissipation	100	mW
Tch	Channel temperature	125	°C
Tstg	Storage temperature	-65 to +125	°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			MIN.	TYP.	MAX	
V(BR)GDO	Gate to drain breakdown voltage	IG=-10μA	-3	--	--	V
IDSS	Saturated drain current	VGS=0V, VDS=2.5V	30	60	120	mA
VGS(off)	Gate to source cut-off voltage	VDS=2.5V, ID=500μA	-0.1	-0.8	-2.0	V
P1dB	Output Power at 1dB gain Compression	VDS=2.5V, ID=25mA f=12GHz	12	14.5	--	dBm
Glp	Linear Power Gain	VDS=2.5V, ID=25mA f=12GHz, Pin=-5dBm	9	11	--	dB

Note: P1dB and Glp are tested with sampling inspection.

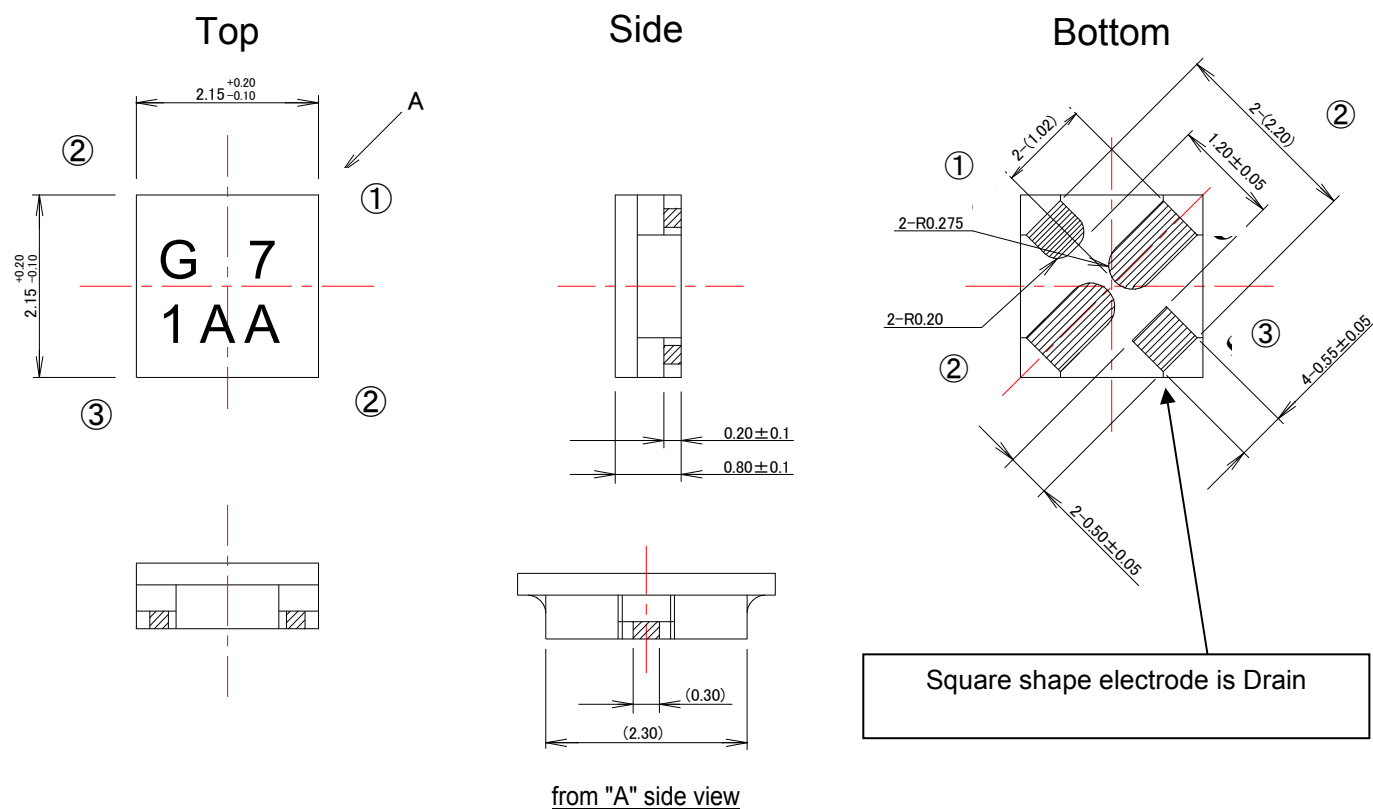
Outline Drawing

Fig. 1

MITSUBISHI Proprietary

Not to be reproduced or disclosed without permission by Mitsubishi Electric

Fig.1

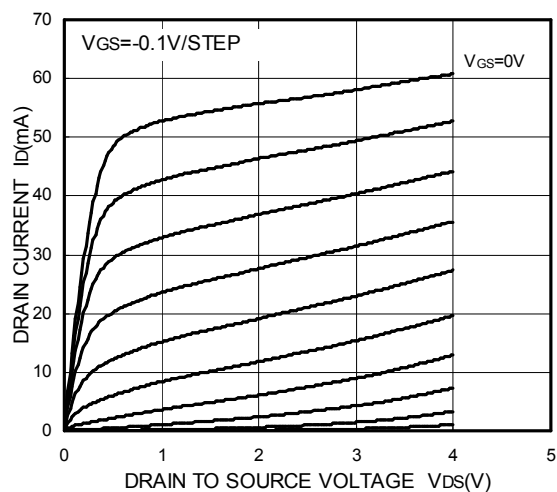


Unit: mm

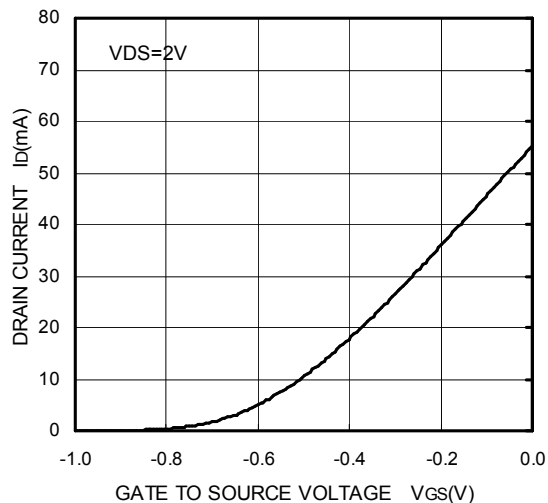
- ① Gate
- ② Source
- ③ Drain

TYPICAL CHARACTERISTICS (Ta=25°C)

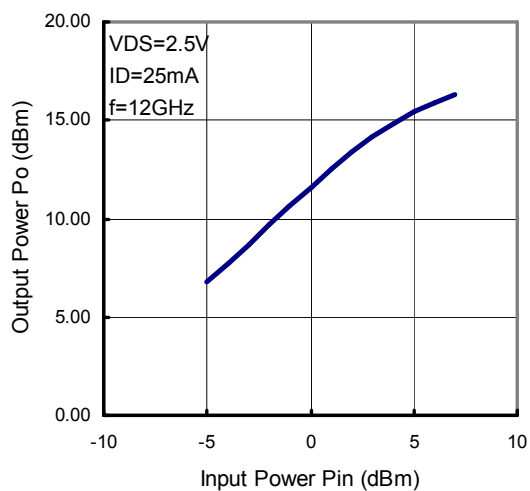
ID vs. VDS



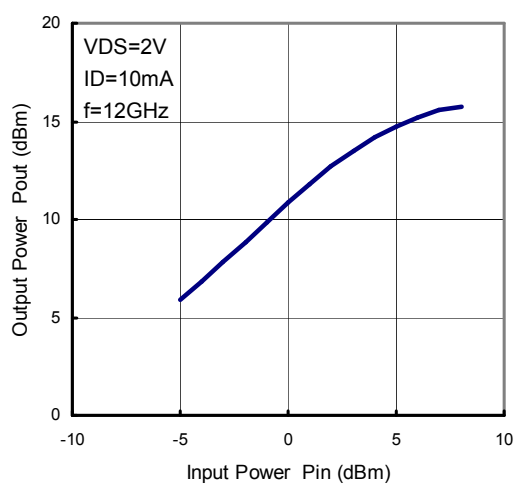
ID vs. VGS



Po vs. Pin

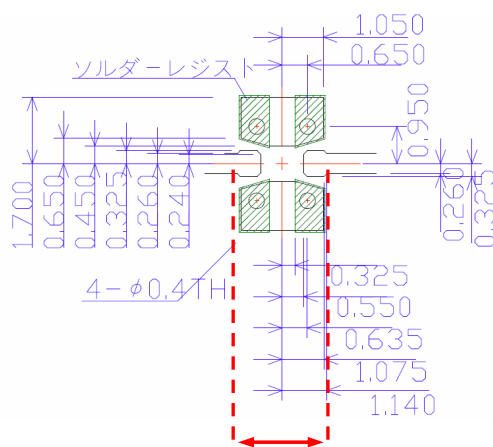


Po vs. Pin



(VDS=2.5V, ID=25mA, Ta=room temperature)

Freq. (GHz)	S11		S21		S12		S22	
	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
1	0.988	-17.6	5.833	163.3	0.014	76.8	0.550	-14.2
2	0.969	-34.6	5.713	147.5	0.028	64.2	0.543	-28.1
3	0.942	-51.1	5.536	132.3	0.040	52.7	0.534	-41.2
4	0.908	-67.4	5.339	117.4	0.052	40.8	0.519	-53.9
5	0.874	-82.6	5.125	103.4	0.061	30.1	0.508	-65.4
6	0.841	-97.4	4.942	89.7	0.070	19.8	0.494	-76.3
7	0.806	-111.9	4.769	76.2	0.078	9.8	0.478	-86.7
8	0.766	-126.6	4.603	62.7	0.086	-0.2	0.455	-97.5
9	0.714	-140.8	4.408	50.2	0.091	-12.4	0.415	-107.0
10	0.670	-154.5	4.277	37.8	0.093	-22.2	0.384	-115.3
11	0.638	-169.3	4.211	25.3	0.096	-31.4	0.351	-124.1
12	0.608	174.5	4.176	12.4	0.099	-40.7	0.318	-132.9
13	0.581	157.3	4.131	-0.9	0.102	-49.9	0.274	-143.7
14	0.569	137.4	4.114	-15.3	0.106	-61.5	0.226	-153.8
15	0.565	115.0	4.038	-30.5	0.103	-71.2	0.184	-165.4
16	0.566	91.9	3.890	-45.6	0.106	-79.8	0.130	177.0
17	0.592	69.4	3.763	-60.3	0.109	-91.6	0.085	130.2
18	0.624	48.6	3.608	-76.1	0.108	-103.7	0.075	59.9
19	0.680	28.2	3.372	-92.2	0.107	-116.0	0.132	18.2
20	0.739	7.7	3.099	-107.8	0.100	-129.0	0.188	-4.6
21	0.771	-9.2	2.815	-122.3	0.093	-138.2	0.251	-20.0
22	0.818	-23.0	2.576	-136.1	0.093	-149.6	0.314	-32.0
23	0.863	-38.7	2.313	-151.8	0.087	-160.1	0.394	-44.3
24	0.877	-51.5	2.018	-165.3	0.077	-173.8	0.447	-56.9
25	0.893	-63.1	1.799	-177.3	0.069	176.9	0.499	-66.2
26	0.908	-73.2	1.625	171.0	0.068	171.0	0.530	-73.6



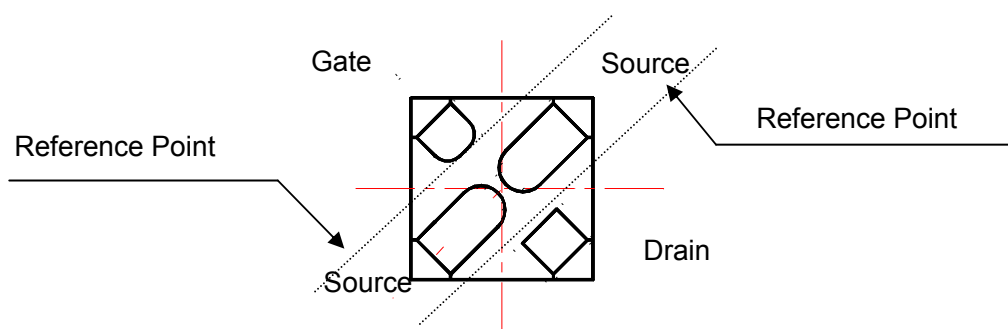
Recommended foot pattern; RO4350B/ROGERS($\epsilon_r=3.48$, $t=0.254\text{mm}$)

We are ready to provide nonlinear model for ADS and MWO users. If you are interested, please contact our sales offices.

S PARAMETERS

(Conditions : VDS=2.5V, ID=25mA, Ta=25deg.C)

f (GHz)	S11		S21		S12		S22	
	Magn.	Angle	Magn.	Angle	Magn.	Angle	Magn.	Angle
1	0.986	-16.1	6.558	165.2	0.015	79.0	0.539	-13.6
2	0.959	-35.1	6.385	148.7	0.028	65.3	0.531	-30.0
3	0.933	-47.6	6.118	136.8	0.040	56.6	0.525	-38.9
4	0.898	-64.4	5.865	123.4	0.050	46.8	0.502	-49.8
5	0.867	-76.5	5.505	112.8	0.058	38.6	0.498	-58.1
6	0.840	-86.5	5.187	103.8	0.064	32.3	0.492	-63.8
7	0.813	-96.0	4.891	94.8	0.069	26.7	0.487	-67.9
8	0.792	-106.6	4.710	83.6	0.073	18.8	0.487	-74.3
9	0.766	-114.9	4.538	74.9	0.077	14.2	0.486	-77.8
10	0.744	-123.4	4.500	66.5	0.083	10.6	0.483	-81.1
11	0.709	-133.5	4.514	57.5	0.092	3.1	0.468	-86.3
12	0.658	-146.0	4.549	47.0	0.099	-4.6	0.437	-91.4
13	0.607	-160.7	4.589	36.3	0.106	-12.3	0.392	-97.5
14	0.561	-176.4	4.607	20.9	0.113	-25.3	0.324	-109.3
15	0.523	-151.0	4.547	7.2	0.116	-36.3	0.241	-118.6
16	0.542	123.0	4.470	-6.8	0.120	-48.5	0.140	-131.0
17	0.598	95.1	4.267	-21.7	0.119	-59.8	0.030	-165.6
18	0.679	70.3	3.880	-37.6	0.113	-71.3	0.097	43.6
19	0.760	51.1	3.447	-51.9	0.105	-83.2	0.214	30.0
20	0.827	35.4	3.005	-65.2	0.094	-94.0	0.323	19.9
21	0.890	21.0	2.560	-80.4	0.084	-106.2	0.407	8.0
22	0.921	10.8	2.187	-90.3	0.074	-111.9	0.481	2.4
23	0.932	2.6	1.879	-100.1	0.064	-117.3	0.570	-2.3
24	0.933	-3.9	1.555	-108.1	0.056	-124.3	0.625	-6.3
25	0.947	-9.0	1.330	-114.7	0.049	-127.9	0.681	-7.6
26	0.947	-14.4	1.146	-121.8	0.042	-128.9	0.730	-8.8



Note:

We are ready to provide nonlinear model for ADS and MWO users. If you are interested, please contact our sales offices.

Keep safety first in your circuit designs!

- Mitsubishi Electric Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of non-flammable material or (iii) prevention against any malfunction or mishap.

Notes regarding these materials

- These materials are intended as a reference to assist our customers in the selection of the Mitsubishi semiconductor product best suited to the customer's application; they do not convey any license under any intellectual property rights, or any other rights, belonging to Mitsubishi Electric Corporation or a third party.
- Mitsubishi Electric Corporation assumes no responsibility for any damage, or infringement of any third-party's rights, originating in the use of any product data, diagrams, charts, programs, algorithms, or circuit application examples contained in these materials.
- All information contained in these materials, including product data, diagrams, charts, programs and algorithms represents information on products at the time of publication of these materials, and are subject to change by Mitsubishi Electric Corporation without notice due to product improvements or other reasons. It is therefore recommended that customers contact Mitsubishi Electric Corporation or an authorized Mitsubishi Semiconductor product distributor for the latest product information before purchasing a product listed herein.
The information described here may contain technical inaccuracies or typographical errors.
Mitsubishi Electric Corporation assumes no responsibility for any damage, liability, or other loss rising from these inaccuracies or errors.
Please also pay attention to information published by Mitsubishi Electric Corporation by various means, including the Mitsubishi Semiconductor home page (<http://www.mitsubishielectric.com/>).
- When using any or all of the information contained in these materials, including product data, diagrams, charts, programs, and algorithms, please be sure to evaluate all information as a total system before making a final decision on the applicability of the information and products. Mitsubishi Electric Corporation assumes no responsibility for any damage, liability or other loss resulting from the information contained herein.
- Mitsubishi Electric Corporation semiconductors are not designed or manufactured for use in a device or system that is used under circumstances in which human life is potentially at stake. Please contact Mitsubishi Electric Corporation or an authorized Mitsubishi Semiconductor product distributor when considering the use of a product contained herein for any specific purposes, such as apparatus or systems for transportation, vehicular, medical, aerospace, nuclear, or undersea repeater use.
- The prior written approval of Mitsubishi Electric Corporation is necessary to reprint or reproduce in whole or in part these materials.
- If these products or technologies are subject to the Japanese export control restrictions, they must be exported under a license from the Japanese government and cannot be imported into a country other than the approved destination.
Any diversion or re-export contrary to the export control laws and regulations of Japan and/or the country of destination is prohibited.
- Please contact Mitsubishi Electric Corporation or an authorized Mitsubishi Semiconductor product distributor for further details on these materials or the products contained therein.