MITSUBISHI ELECTRIC

PRELIMINARY

< High-power GaN HEMT (small signal gain stage) >

MGF0846G

L to C BAND / 40W
non - matched

DESCRIPTION

The MGF0846G, GaN HEMT with an N-channel schottky gate, is designed for MMDS/UMTS/WiMAX applications.

FEATURES

- High voltage operation
  VDS=47V
- High output power
  Po=46.5dBm(TYP.) @f=2.6GHz,P3dB
- High efficiency
  ηd=60%(TYP.) @f=2.6GHz,P3dB
- Designed for use in Class AB linear amplifiers

APPLICATION

- MMDS/UMTS/WiMAX

QUALITY

- GG

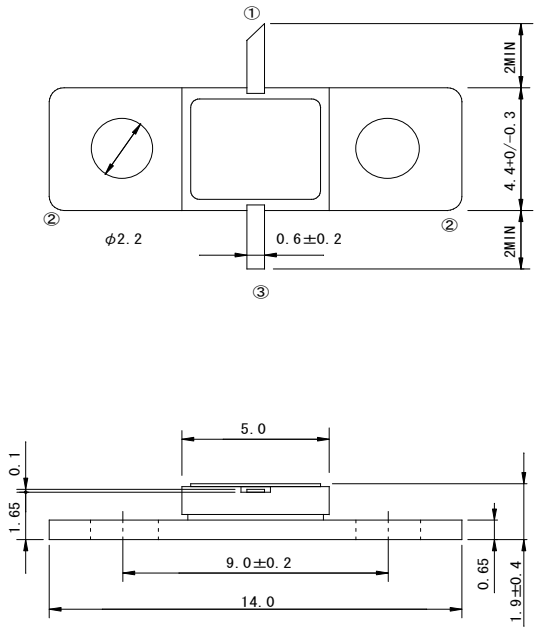
Packaging

- 4 inch Tray (25 pcs)

RECOMMENDED BIAS CONDITIONS

- Vds=47V
- Ids=340mA
- Rg=30Ω

OUTLINE DRAWING Unit : millimeters



GF-7

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

Absolute maximum ratings (Ta=25°C)

Symbol	Parameter	Ratings	Unit
VDS	Drain to Source Voltage	120	V
VGS	Gate to source voltage	-10	V
IGR	Reverse gate current	-6	mA
IGF	Forward gate current	120	mA
PT*1	Total power dissipation	64	W
Tch	Cannel temperature	230	°C
Tstg	Storage temperature	-65 to +175	°C

*1:Tc=25°C

Electrical characteristics (Ta=25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
VGS(off)	Gate to source cut-off voltage	VDS=47V,ID=12mA	-1	-	-5	V
P3dB	3dB gain compression power	VDS=47V,ID(RF off)=340mA	45.5	46.5	-	dBm
P1dB	1dB gain compression power	f=2.6GHz	-	45.5	-	dBm
ηd *2	Drain efficiency	*2 : @P3dB	-	60	-	%
GLP *3	Linear power gain	*3 : Pin=20dBm	12	13	-	dB
Rth(ch-c) *4	Thermal resistance	ΔVf method	-	2.5	3.2	°C/W

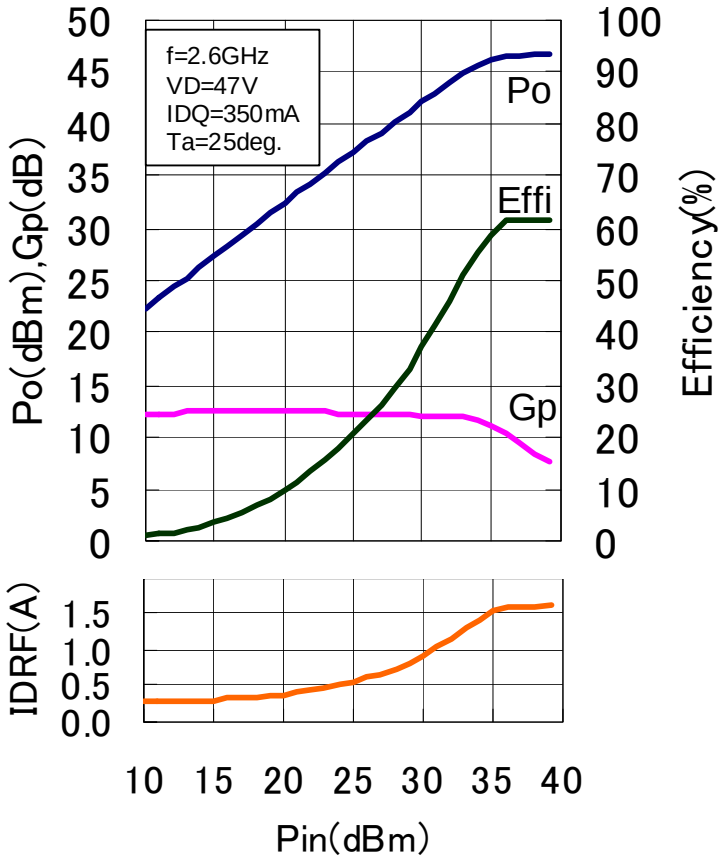
*4 :Channel-case
Specification are subject to change without notice.

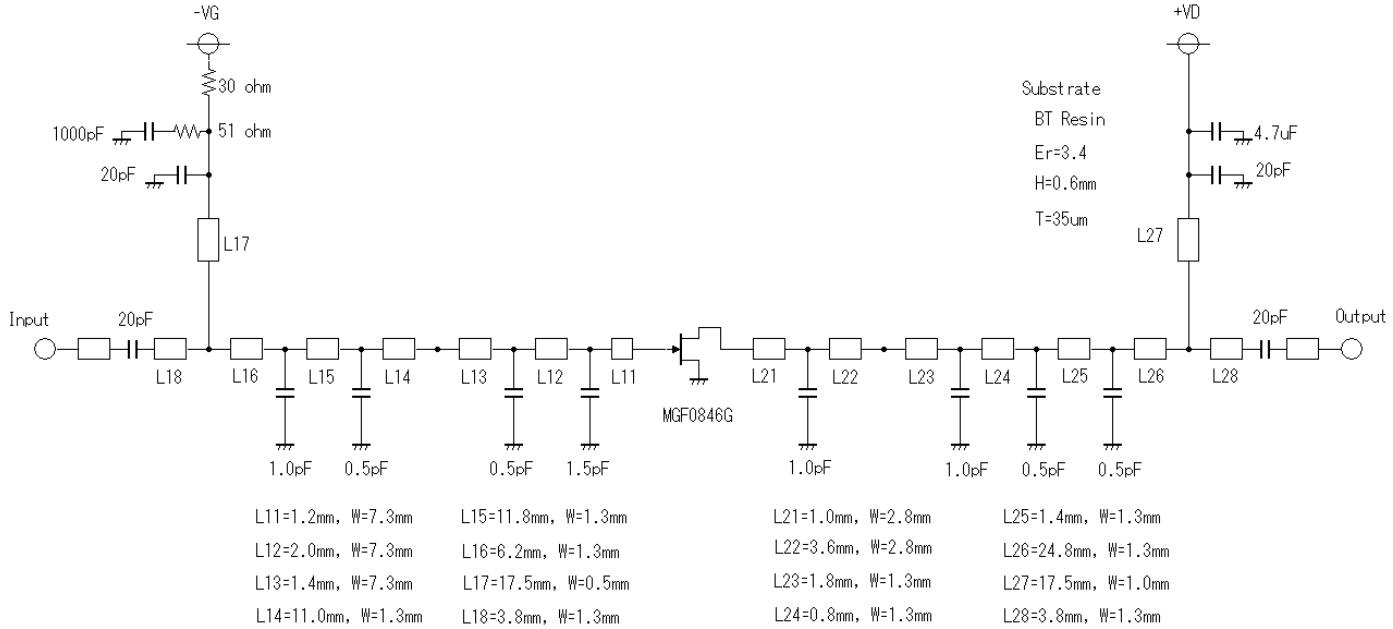
Note

DC aging is recommended to perform before operating in order to stabilize a characteristics of GaN-HEMT. (Ta≧80°C)

- Bias conditions Vds=47V , Ids=340mA
- Time 10hrs

MGF0846G Example of Circuit Schematic and Charactreistics : f = 2.6 GHz





MGF0846G S-parameters(Ta=25deg.C , VDS=47(V),IDS=350(mA))

f (GHz)	S Parameters(Typ.)							
	S11		S21		S12		S22	
	Magn.	Angle(deg.)	Magn.	Angle(deg.)	Magn.	Angle(deg.)	Magn.	Angle(deg.)
0.6	0.966	-173.6	5.549	85.5	0.029	30.5	0.660	-173.7
1.0	0.910	-176.4	3.379	74.4	0.028	3.6	0.643	-179.5
1.4	0.893	176.6	2.433	66.6	0.027	9.1	0.632	178.5
1.8	0.903	174.0	1.992	59.5	0.029	6.7	0.632	178.4
2.2	0.897	168.3	1.675	52.0	0.033	-1.2	0.648	175.2
2.6	0.909	163.9	1.402	42.0	0.026	4.1	0.664	173.0
3.0	0.875	157.0	1.293	34.7	0.031	-1.7	0.628	168.0
3.4	0.905	151.1	1.206	25.6	0.034	11.6	0.635	162.8
3.8	0.894	144.3	1.051	15.3	0.048	1.3	0.644	158.0
4.2	0.907	140.7	0.945	7.4	0.036	-19.0	0.666	152.3
4.6	0.911	136.7	0.853	1.2	0.038	-22.2	0.682	147.7
5.0	0.908	134.5	0.793	-4.8	0.035	-5.2	0.702	144.5
5.4	0.901	130.9	0.728	-10.9	0.039	-3.8	0.715	142.1
5.8	0.894	126.8	0.695	-18.1	0.041	-9.1	0.740	139.3
6.2	0.891	119.4	0.658	-25.5	0.046	-12.4	0.742	137.2
6.6	0.887	110.9	0.630	-33.8	0.049	-14.7	0.751	133.2
7.0	0.894	99.5	0.600	-43.6	0.049	-22.0	0.735	127.9
7.4	0.899	91.5	0.570	-51.5	0.056	-25.4	0.731	120.9
7.8	0.902	83.8	0.530	-60.5	0.052	-32.9	0.733	113.1
8.2	0.906	78.8	0.500	-68.5	0.058	-36.3	0.756	103.9

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.