

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

MGF0843G

L to C BAND / 20W

non - matched

DESCRIPTION

The MGF0843G, 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=43.5dBm(TYP.) @f=2.6GHz,P3dB
- High efficiency
 $\eta_d=60\%$ (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=170mA
- Rg=60 Ω

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	-3	mA
IGF	Forward gate current	60	mA
PT*1	Total power dissipation	39	W
Tch	Channel 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=6mA	-1	-	-5	V
P3dB	3dB gain compression power	VDS=47V, ID(RF off)=170mA	42.5	43.5	-	dBm
P1dB	1dB gain compression power	f=2.6GHz	-	42.5	-	dBm
η_d *2	Drain efficiency	*2 : @P3dB	-	60	-	%
GLP *3	Linear power gain	*3 : Pin=20dBm	13	14	-	dB
Rth(ch-c) *4	Thermal resistance	ΔV_f method	-	3.9	5.3	°C/W

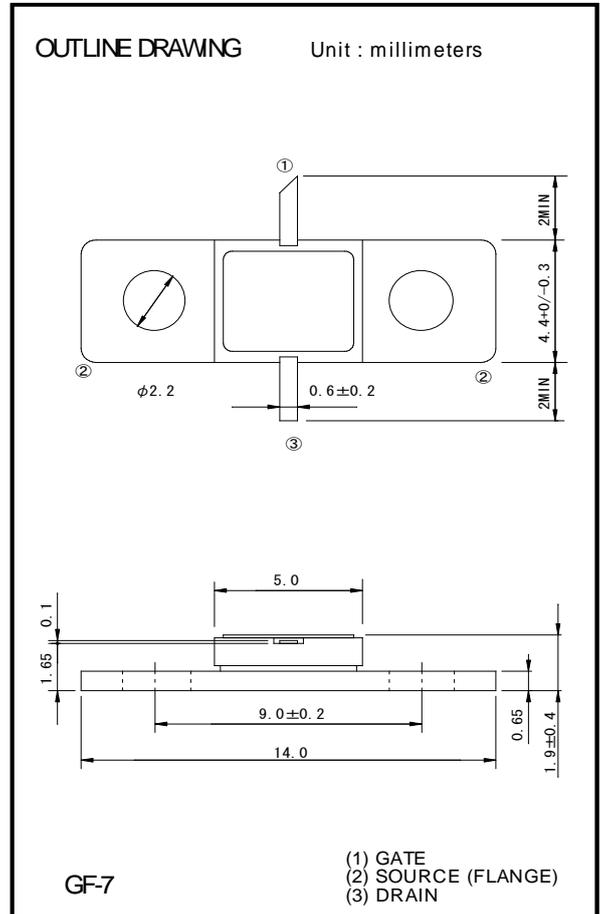
*4 :Channel-case

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 \geq 80°C)

- Bias conditions Vds=47V , Ids=170mA
- Time 10hrs

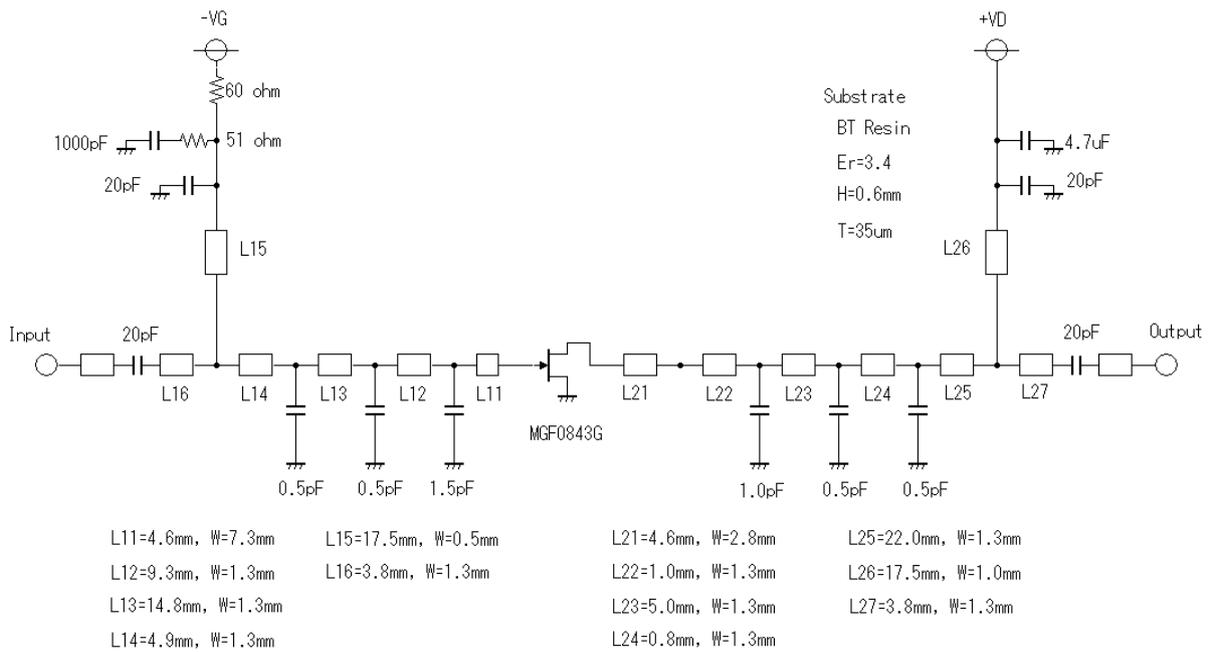
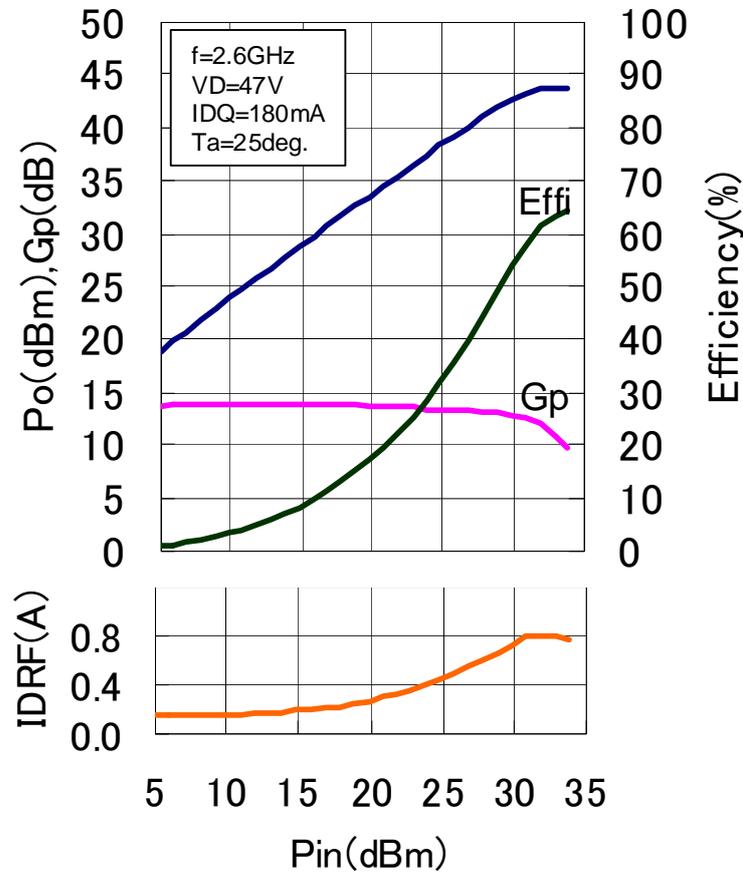


MGF0843G

L to C BAND / 20W

non - matched

MGF0843G Example of Circuit Schematic and Charactreistics : f = 2.6 GHz



MGF0843G

L to C BAND / 20W

non - matched

MGF0843G S-parameters(Ta=25deg.C , VDS=47(V),IDS=180(mA))

f (GHz)	S Parameters(Typ.)							
	S11		S21		S12		S22	
	Magn.	Angle(deg.)	Magn.	Angle(deg.)	Magn.	Angle(deg.)	Magn.	Angle(deg.)
0.6	0.941	-155.7	8.876	92.2	0.038	7.8	0.488	-154.4
1.0	0.841	-166.9	5.442	79.2	0.038	5.3	0.470	-163.8
1.4	0.839	-176.4	3.987	69.6	0.053	14.8	0.458	-168.9
1.8	0.854	176.0	3.255	61.3	0.042	-3.4	0.458	-169.0
2.2	0.835	170.9	2.744	52.5	0.048	-6.4	0.472	-172.5
2.6	0.850	164.3	2.305	42.4	0.043	-10.0	0.492	-175.9
3.0	0.819	155.7	2.115	34.6	0.037	-9.3	0.462	-177.8
3.4	0.850	149.3	1.966	25.1	0.048	-7.7	0.462	176.4
3.8	0.833	141.1	1.743	14.3	0.054	-10.0	0.488	170.6
4.2	0.856	136.0	1.590	6.6	0.049	-26.0	0.510	164.0
4.6	0.856	130.1	1.459	-0.8	0.044	-22.8	0.525	159.2
5.0	0.848	127.4	1.373	-7.5	0.045	-22.7	0.548	154.9
5.4	0.837	121.5	1.287	-15.2	0.048	-19.1	0.574	152.0
5.8	0.823	115.3	1.237	-23.7	0.051	-21.8	0.603	148.9
6.2	0.818	105.7	1.180	-32.3	0.057	-27.6	0.620	147.2
6.6	0.813	95.0	1.138	-41.6	0.057	-27.3	0.621	143.1
7.0	0.828	81.9	1.085	-52.3	0.061	-32.2	0.610	137.5
7.4	0.839	72.5	1.030	-61.1	0.064	-32.6	0.597	130.3
7.8	0.845	64.2	0.979	-70.2	0.062	-38.2	0.596	122.1
8.2	0.855	58.3	0.941	-78.3	0.071	-41.7	0.601	112.4

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.