

# Preliminary

#### DESCRIPTION

The MGF0843G, GaN HEMT with an N-channel schottky Gate, is designed for MMDS/UMTS/WiMAX applications.

#### FEATURES

- High voltage operation :  $V_{DS} = 47\text{ V}$
- High output power :  $P_o = 43.0\text{ dBm (typ.) @ P3dB}$
- High efficiency :  $\eta_d = 60\% \text{ (typ.) @ P3dB}$
- Designed for use in Class AB linear amplifiers

#### APPLICATIONS

- MMDS/UMTS/WiMAX

#### QUALITY

- GG

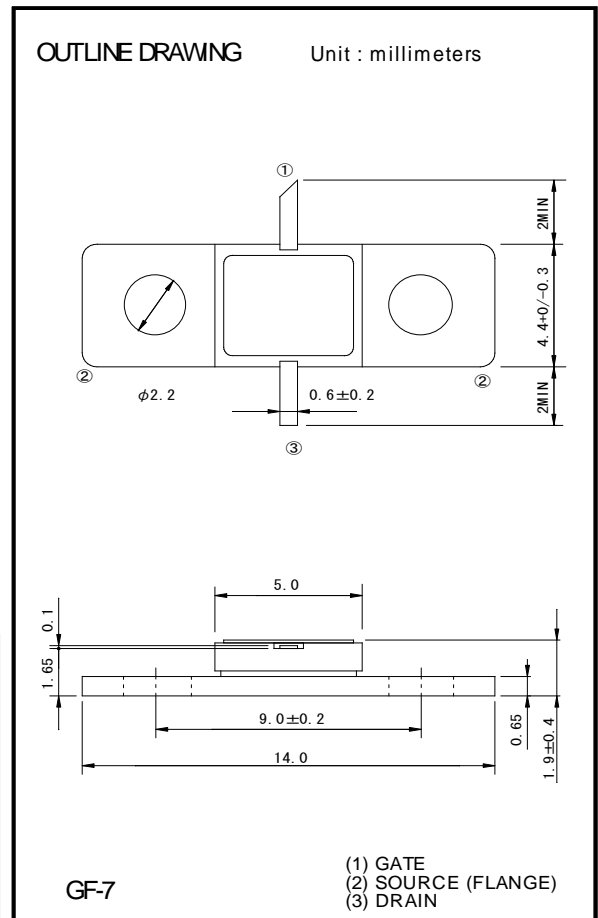
#### RECOMMENDED BIAS CONDITIONS

- $V_{ds} = 47\text{ V}$  •  $I_{ds} = 170\text{ mA}$  •  $R_g = 60\ \Omega$

**Packaging** 4 inch Tray ( 25 pcs)

#### Absolute maximum ratings ( $T_a = 25^\circ\text{ C}$ )

Symbol	Parameter	Ratings	Unit
VDS	Drain to Source Voltage	120	V
VGS	Gate to Source Voltage	- 10	V
PT	Total power dissipation	39	W
IGR	Reverse gate current	-3	mA
IGF	Forward gate current	+ 60	mA
Tch	Channel temperature	230	°C
Tstg	Storage temperature	- 65 to +175	°C



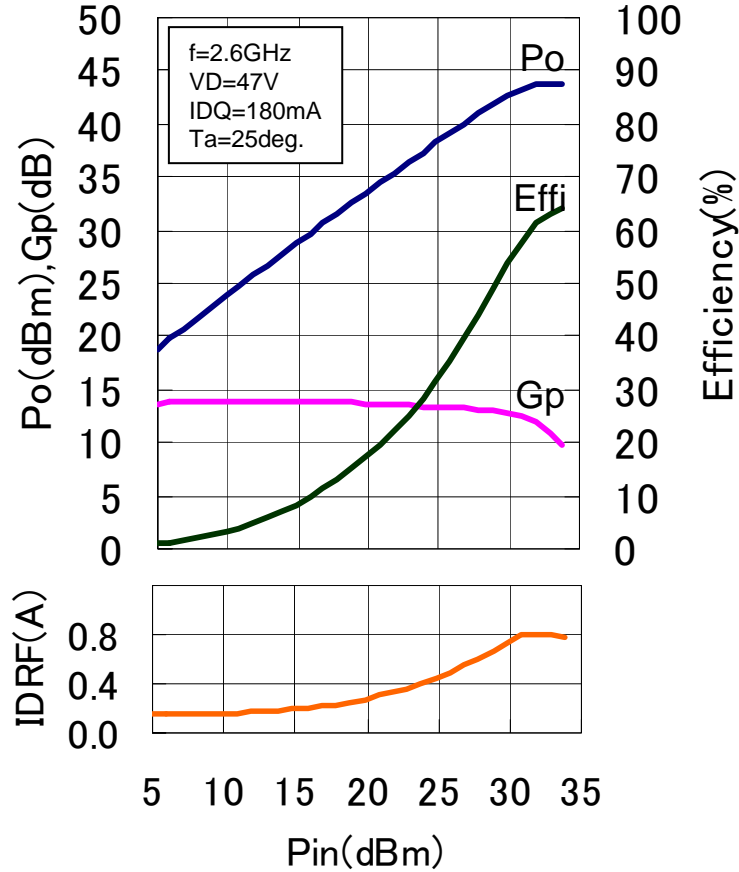
#### Electrical characteristics ( $T_a = 25^\circ\text{ C}$ )

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
VGS(off)	Gate to source cut-off voltage	$V_{DS} = 47\text{ V}, I_{DS} = 6\text{ mA}$	-1.0	-	-5.0	V
P3dB	3dB gain compression power	$V_{DS} = 47\text{ V}, I_{DQ} = 170\text{ mA}, f = 2.6\text{ GHz}$	42.0	43.0	-	dBm
$\eta_d$	Drain efficiency		-	60	-	%
GLP *1	Linear power gain	*1 : $P_{in} = 20\text{ dBm}$	12.0	13.0	-	dB
Rth(ch-c)	Thermal resistance *2	$\Delta V_f$ Method	-	3.9	5.3	°C/W

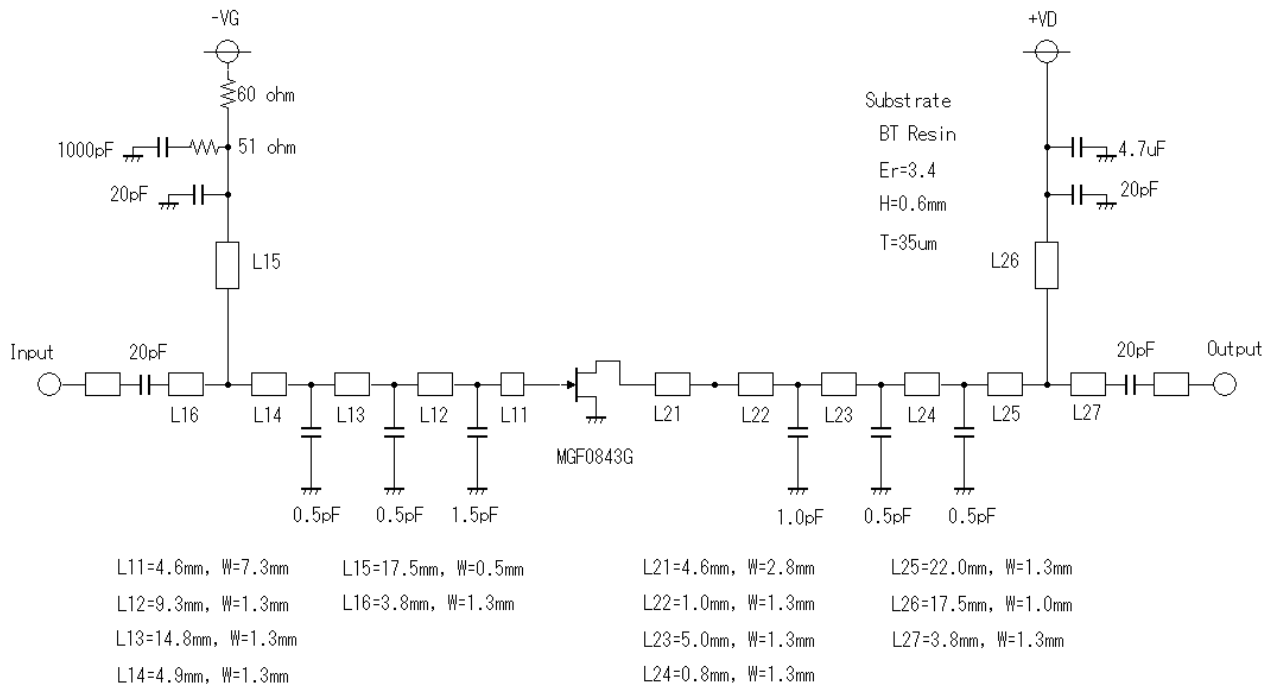
\*2 : Channel to case

Specifications are subject to change without notice.

### Example of Circuit Schematic and Characteristics : f = 2.6 GHz



### Example of circuit



# Preliminary

Mitsubishi Semiconductors &lt; GaN HEMT &gt;

**MGF0843G**

20 W GaN HEMT [ non-matched ]

**S-parameters:**Condition:  $V_D = 47\text{ V}$ ,  $I_D = 180\text{ mA}$ ,  $T_a = 25\text{ deg. C}$ 

Freq. (GHz)	S11		S21		S12		S22	
	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
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



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