

Preliminary

Mitsubishi Semiconductors < GaN HEMT >

MGF0840G

10 W GaN HEMT [non-matched]

DESCRIPTION

The MGF0840G, 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 : $P_o = 40.0\text{ dBm (typ.) @ P3dB}$
- High efficiency : $\eta_d = 60\% \text{ (typ.) @ P3dB}$
- Designed for use in Class AB linear amplifiers

APPLICATIONS

- MMDS/UMTS/WiMAX

QUALITY

- GG

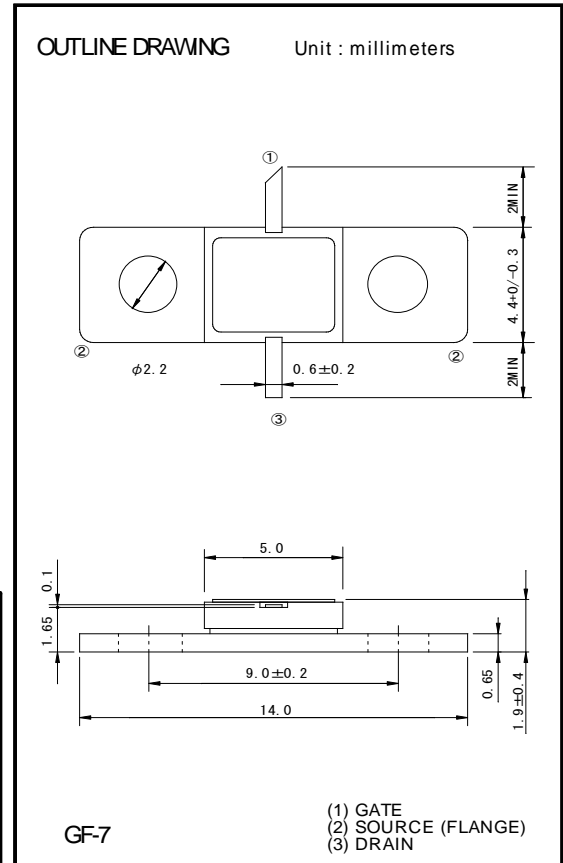
RECOMMENDED BIAS CONDITIONS

- $V_{ds} = 47\text{ V}$ • $I_{ds} = 90\text{ mA}$ • $R_g = 120\ \Omega$

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	21	W
IGR	Reverse gate current	- 1.5	mA
IGF	Forward gate current	+ 30	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	$V_{DS} = 47\text{ V}, I_{DS} = 3\text{ mA}$	-1.0	-	-5.0	V
P3dB	3dB gain compression power	$V_{DS} = 47\text{ V}, I_{DQ} = 90\text{ mA},$ $f = 2.6\text{ GHz}$	39.0	40.0	-	dBm
η_d	Drain efficiency		-	60	-	%
GLP *1	Linear power gain		*1 : $P_{in} = 20\text{ dBm}$	13.0	14.0	-
Rth(ch-c)	Thermal resistance *2	ΔV_f Method	-	6.8	9.7	°C/W

*2 : Channel to case

Specifications are subject to change without notice.

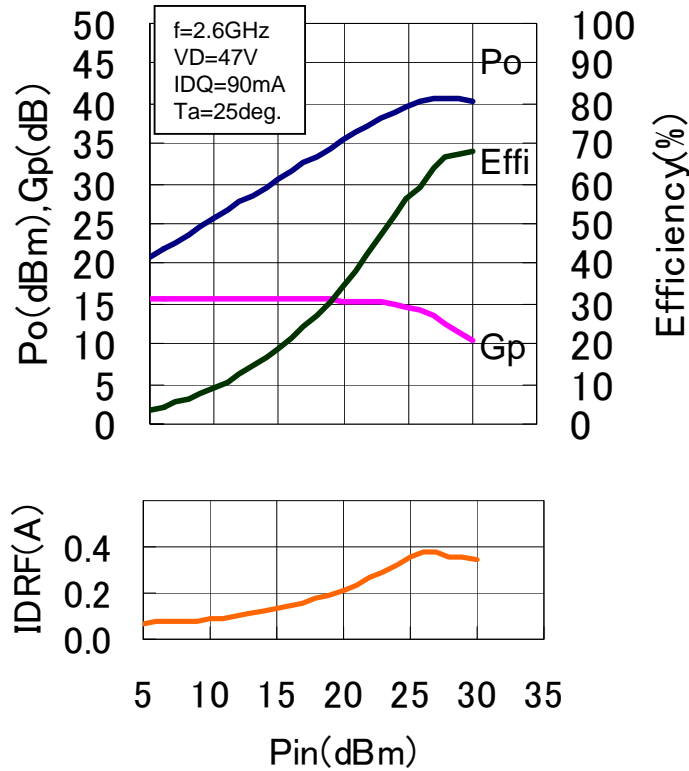
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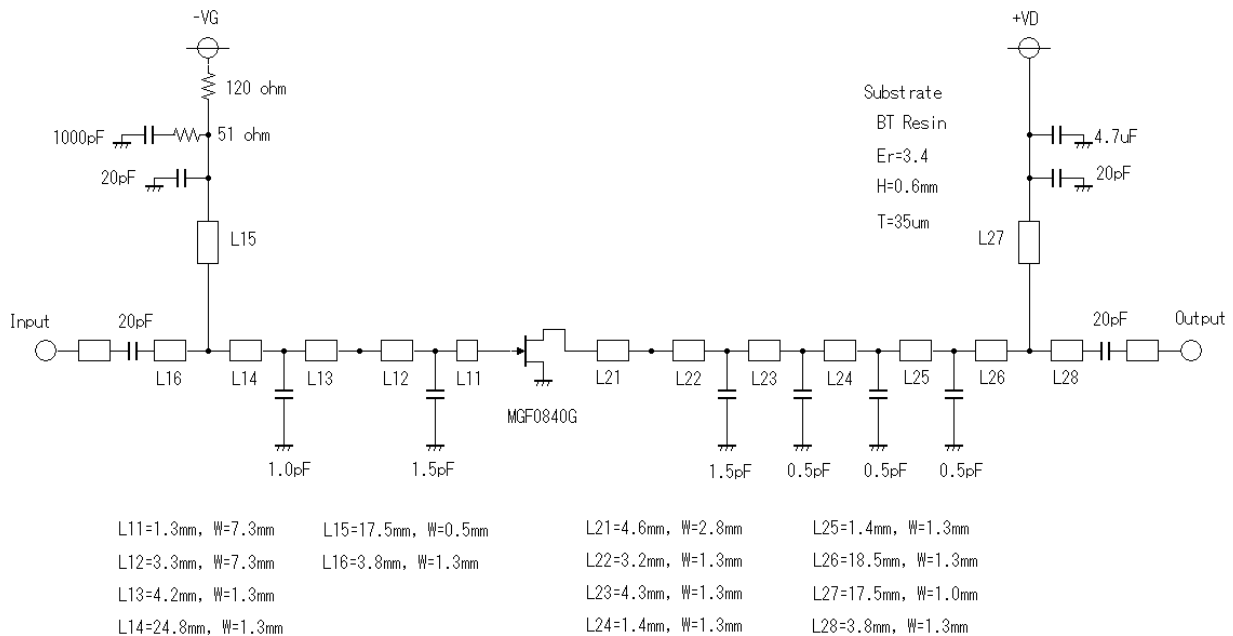
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Example of Circuit Schematic and Characteristics : $f = 2.6 \text{ GHz}$



Example of circuit



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S-parameters:

Condition: VD = 47 V, ID = 90 mA, Ta = 25 deg. C

Freq. (GHz)	S11		S21		S12		S22	
	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)	(mag)	(ang)
0.6	0.884	-114.8	11.163	107.9	0.068	-6.7	0.446	-102.7
1.0	0.803	-144.0	7.081	88.7	0.058	0.3	0.389	-120.9
1.4	0.808	-158.2	5.344	76.2	0.056	4.0	0.356	-129.0
1.8	0.792	-169.5	4.327	66.7	0.065	-1.3	0.379	-130.1
2.2	0.773	-178.2	3.730	56.7	0.059	-10.8	0.389	-137.9
2.6	0.777	172.1	3.184	45.1	0.062	-18.1	0.407	-143.8
3.0	0.730	162.4	2.945	36.9	0.057	-22.6	0.379	-144.0
3.4	0.761	153.0	2.767	26.9	0.064	-22.3	0.374	-148.9
3.8	0.753	141.7	2.505	15.1	0.067	-26.5	0.394	-156.2
4.2	0.777	133.4	2.335	5.9	0.063	-39.3	0.400	-165.8
4.6	0.781	123.8	2.191	-3.2	0.063	-42.4	0.402	-172.7
5.0	0.760	116.5	2.107	-11.7	0.060	-40.3	0.418	-178.9
5.4	0.745	105.0	2.040	-22.2	0.058	-41.0	0.444	175.9
5.8	0.723	93.4	1.985	-33.3	0.060	-41.7	0.476	170.6
6.2	0.719	77.3	1.906	-44.6	0.059	-50.0	0.495	165.8
6.6	0.733	61.2	1.819	-56.3	0.060	-49.6	0.495	161.0
7.0	0.772	44.8	1.713	-68.7	0.056	-53.2	0.478	154.9
7.4	0.801	32.9	1.613	-79.1	0.058	-52.6	0.450	147.0
7.8	0.826	23.4	1.546	-89.0	0.057	-52.6	0.430	137.0
8.2	0.853	13.9	1.513	-99.1	0.061	-48.6	0.420	125.8

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