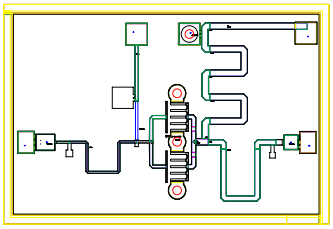
MMA-061827

6 - 18 GHz Power Amplifier MMIC Chip
Preliminary Data Sheet
June 2008

Features:

- **Frequency Range: 6-18 GHz**
- **P1dB: +27 dBm**
- **Gain: 8dB**
- **Best Suited in a balanced configuration**
- **MTTF > 100 years @ 85°C ambient temperature**



Applications:

- **EW**

Description:

The MMA-061827 is a 6-18 GHz GaAs power amplifier MMIC chip. Small signal gain is typically 8.0 dB across band. In a balanced configuration, input and output VSWR are better than 1.5:1 with a typical P1B more than 29 dBm, and a Psat of 30 dBm. The typical performance is shown below. MMA-061827 can be used in broadband EW and defense applications. Hi-rel and space screening are available.

Typical Performance in a balanced configuration:

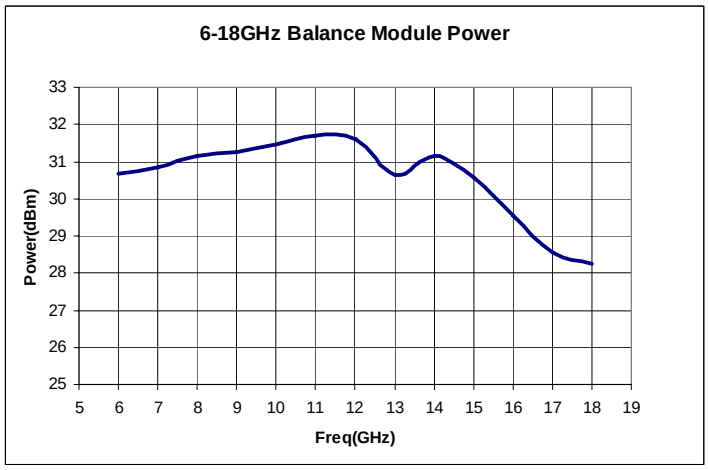
(Vds = 8.0V, Vgs = -0.65V, Ids=380mA, Zo=50 ohm, T_A =25 °C)

Parameter	Units	Min.	Typ.	Max.
Frequency Range (Min/Max)	GHz	6		18
Small Signal Gain	dB	6.0	8.0	
Gain Flatness	+/-dB		1.0	
Input Return Loss	dB		10	
Output Return Loss	dB		10	
Output P1dB	dBm	+27.0	+29.0	
Output Saturation Power	dBm		+30.0	
Noise Figure	dB	5.5	6.5	
Operating Current Range (Min/Max)	mA	300	380	500
Thermal Resistance	°C/W		20	

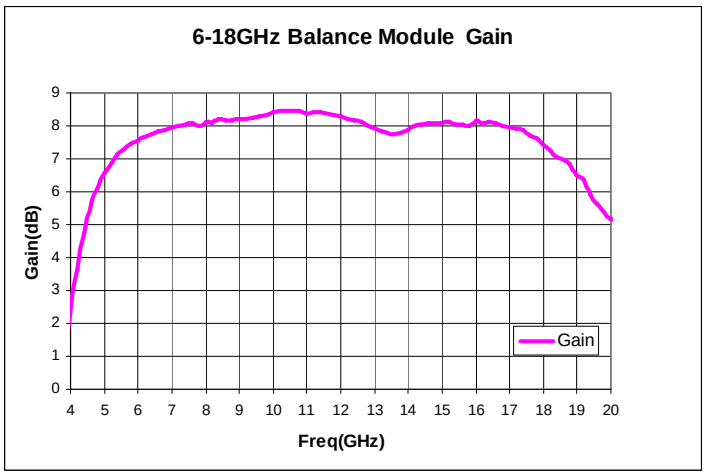
Typical RF Performance in balanced configuration:

(Vds = 8.0V, Ids=380mA, T_A =25 °C, 50 Ohm system unless stated otherwise)

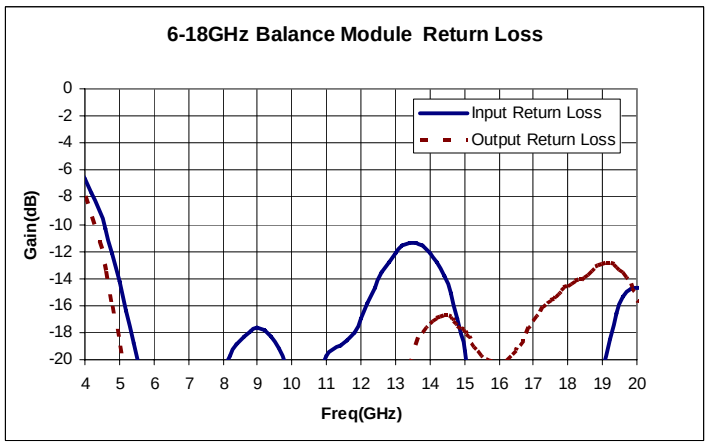
Output Power



Gain



Input and Output Return Loss



S-parameter in balanced configuration: (Vds = 8.0V, Ids=380mA, T_A =25 °C, 50 Ohm system)

Freq(GHz)	magS11	angS11	magS21	angS21	magS12	angS12	magS22	angS22
4	0.47	136.0	1.32	-22.8	0.019	-92.9	0.40	142.0
5	0.20	-14.3	2.14	-144.0	0.030	148.0	0.11	10.5
6	0.05	150.0	2.39	108.0	0.033	43.1	0.02	129.0
7	0.07	-63.2	2.50	7.4	0.036	-55.2	0.09	5.8
8	0.09	123.0	2.54	-88.5	0.040	-151.0	0.07	-84.7
9	0.13	-9.1	2.57	177.0	0.044	118.0	0.05	-106.0
10	0.08	-91.9	2.63	83.7	0.048	26.5	0.06	163.0
11	0.10	-147.0	2.63	-11.1	0.052	-65.2	0.06	60.5
12	0.14	63.7	2.60	-105.0	0.055	-157.0	0.07	-17.9
13	0.25	-74.2	2.48	161.0	0.056	110.0	0.06	-29.2
14	0.25	173.0	2.48	69.0	0.063	18.2	0.14	-85.8
15	0.11	59.1	2.53	-27.4	0.069	-76.4	0.13	-175.0
16	0.05	64.9	2.56	-125.0	0.076	-173.0	0.10	107.0
17	0.05	-54.9	2.49	133.0	0.081	88.6	0.14	22.0
18	0.02	-82.1	2.35	27.7	0.081	-12.0	0.19	-44.0
19	0.09	-42.8	2.11	-78.6	0.076	-118.0	0.22	-116.0
20	0.19	166.0	1.81	169.0	0.071	131.0	0.17	144.0

Absolute Maximum Ratings (*):

SYMBOL	PARAMETER	UNITS	ABSOLUTE MAXIMUM
Vds	Drain-Source Voltage	V	9.0
Vgs	Gate-Source Voltage	V	-2.0 to +0.8
Ids	Drain Current	mA	600
Igs	Gate Current	mA	3.0
Pdiss	DC Power Dissipation	W	5.0
Pin max	RF Input Power	dBm	+25
Tch	Channel Temperature	ºC	150
Tstg	Storage Temperature	ºC	-60 to 150

(*) Operation of this device above any one of these parameters may cause permanent damage.

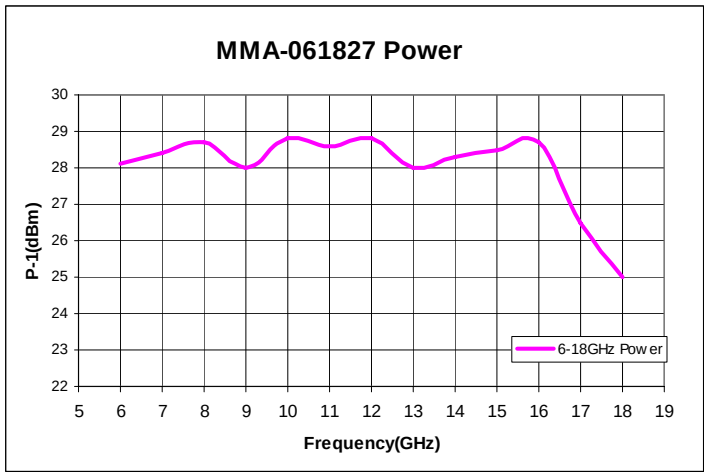
Electrical Specifications: (Vds = 8.0V, Vgs = -0.65V, Ids=180mA, Zo=50 ohm, T_A =25 °C)

Parameter	Units	Min.	Typ.	Max.
Frequency Range (Min/Max)	GHz	6		18
Small Signal Gain	dB	6.0	8.0	
Gain Flatness	+/-dB		1.0	
Output Return Loss	dB		8	
Input Return Loss	dB		2	
Output P1dB	dBm		+27.0	
Output Saturation Power	dBm		+30.0	
Noise Figure	dB		6.5	
Operating Current Range (Min/Max)	mA	150	180	250
Thermal Resistance	°C/W		20	

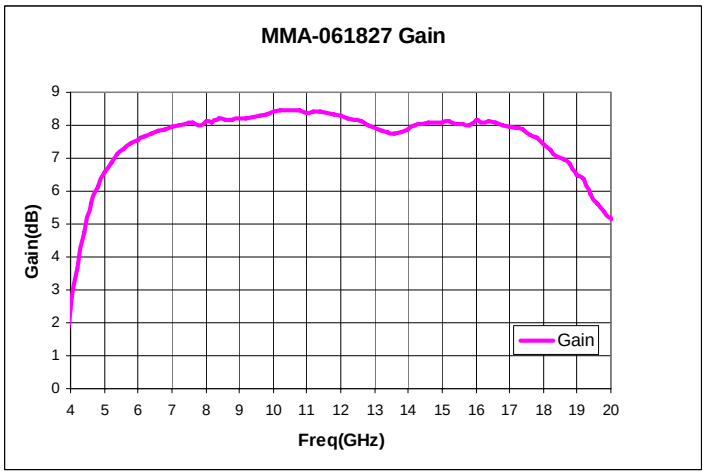
Typical Chip RF Performance:

(Vds = 8.0V, Ids=180mA, T_A =25 °C, 50 Ohm system unless stated otherwise)

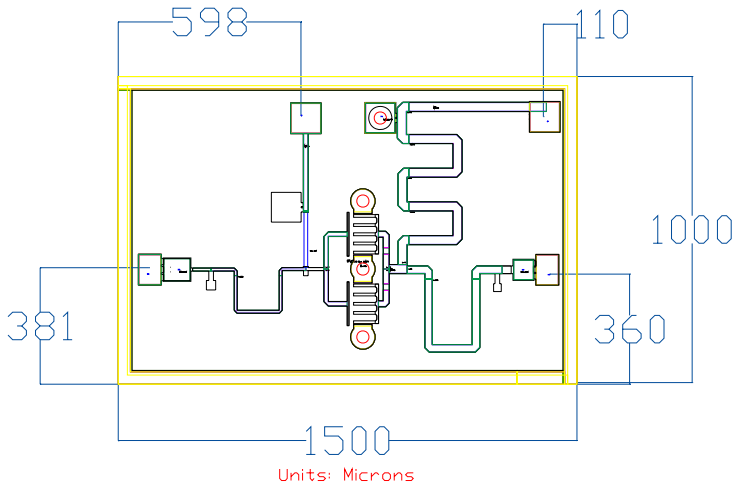
Output Power



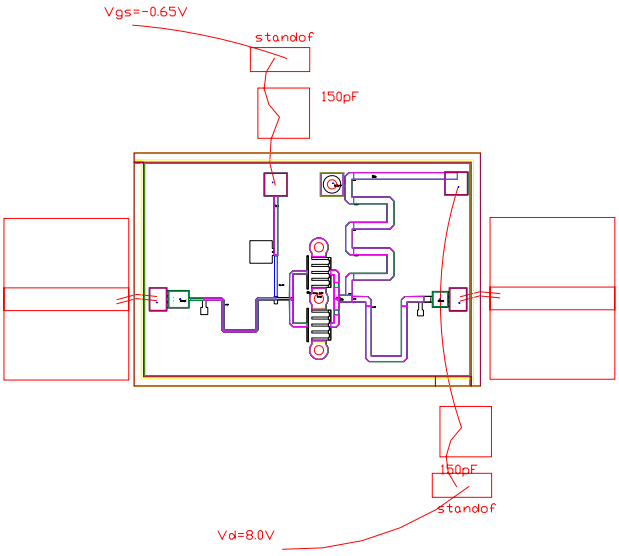
Gain



Mechanical Diagram:



Application Information:



Notes: Put 10 mils ridge underneath the MMIC chip to make MMIC same height with the circuit; make output bond short to improve the performance.