XT3127Q6

GaAs Power Amplifier
28GHz～31GHz 35.5dBm

Rev1.3

Features

- Frequency: 28GHz～31GHz
- Gain: 23dB
- Output P_{-1}dB: 35.5dBm
- Supply Voltage: +6V
- Power-Added Efficiency: 22%
- Package Size: 6mm×6mm×1.1mm

Typical Applications

- P2P Radio
- Satellite Communication

General Description

The XT3127Q6 is a ka band GaAs power amplifier. The XT3127Q6 provides 23 dB of gain, and 35.5dBm of output power for 1 dB compression and 22% PAE from a +6V supply voltage.

XT3127Q6 is plastic SMT package that eliminates the need for wire bonding, and is compatible with high volume surface mount manufacturing techniques.

Electrical Performance

T_A=25℃, V_D=+6V, I_{DQ}=2.5A^, Z_0=50Ω, CW, Test Fixture

Parameter	Min.	Typ.	Max.	Units
Frequency Range		28～31		GHz
Small Signal Gain	20	23	—	dB
Small Signal Gain Flatness	—	±2	—	dB
Reverse Isolation	—	-50	—	dB
Input Return Loss	—	-5	—	dB
Power-Added Efficiency	—	22	—	%
Output Power for 1 dB Compression (OP_{-1}dB)	35	35.5	—	dBm
OIP_3**	—	40	—	dBm
IM_3**	—	-22	—	dBc
Drain Voltage(V_D)	—	6	6.3	V
Gate Current(I_G)	—	5	22	mA
Supply Current(I_D)	—	3	4	A
Thermal Resistance*	—	4.1	—	℃/W

^VG=-0.75v typ.

*Test condition: The device is soldered on Ro4350b t=0.168mm, with 81 filled metal vias for grounding

** Test condition: Pout / Tone = 29dBm, fc= 30GHz, Δf=1MHz

Chengdu Fairchild Technology Co., Ltd.
Add.: 4F, Block B, No.98 Tiancai road, Hi-Tech(West)Zone, Chengdu.
Cel.: 18381641733 Tel.: +86-28-8792 9948, +86-28-8793 2498 Fax: 028-8793 3348
E-mail: sales@fairchild-tech.com. Web.: www.fairchild-tech.com
WeChat: R18381641733.

Absolute Maximum Ratings

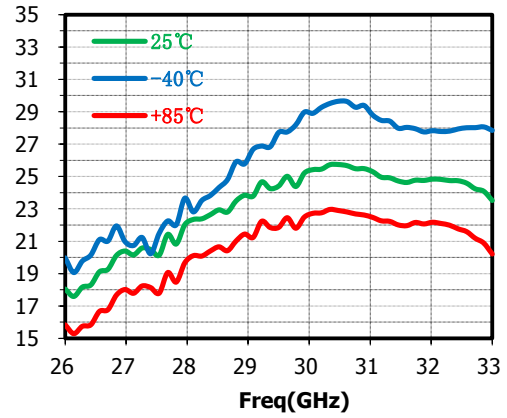
Maximum Input Power	+18dBm	Operating Temperature	-40℃～+85℃
Channel Temperature	+165℃	Storage Temperature	-65℃～+150℃
Maximum V_D	+6.5V	Maximum V_G	-1.2V

Typical Small Signal Performance Curve

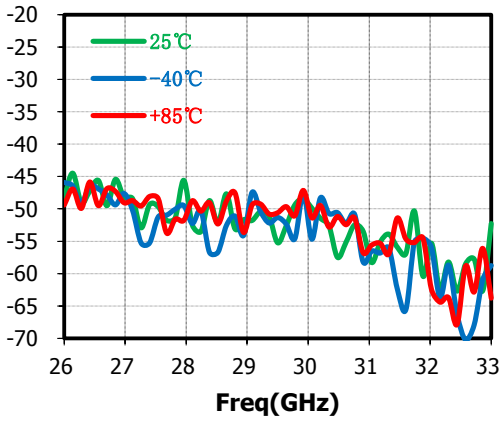
The following data are obtained using the XT3127Q6 fixture test.

V_D=+6V I_D=2.5A CW

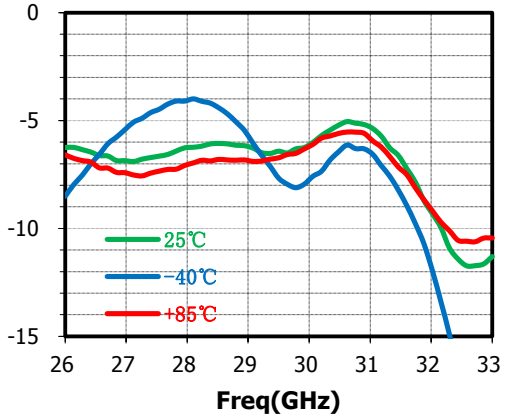
Small Signal Gain(dB) vs. Temperature



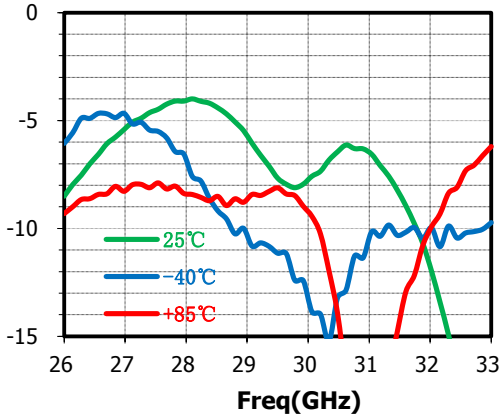
Reverse Isolation(dB) vs. Temperature



Input Return Loss(dB) vs. Temperature



Output Return Loss(dB) vs. Temperature



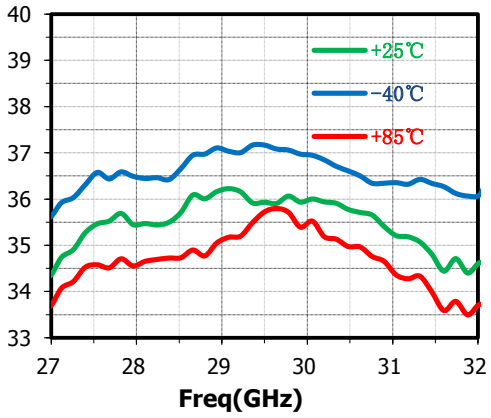
Chengdu Fairchild Technology Co., Ltd.
Add.: 4F, Block B, No.98 Tiancai road, Hi-Tech(West)Zone, Chengdu.
Cel.: 18381641733 Tel.: +86-28-8792 9948, +86-28-8793 2498 Fax: 028-8793 3348
E-mail: sales@fairchild-tech.com. Web.: www.fairchild-tech.com
WeChat: R18381641733.

Power and PAE Performance Curve

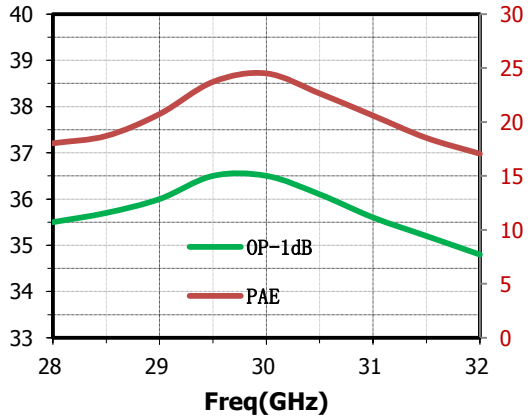
The results captured in the test-jig environment within connector plan, then de-embedded the housing an come back in the die plan.

V_D=+6V I_D=2.5A CW

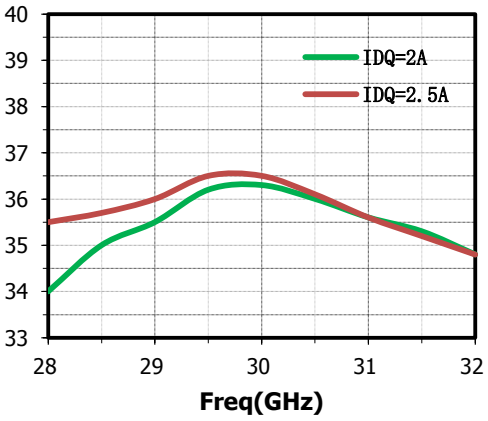
OP$_{-1}$dB(dBm) vs. Temperature



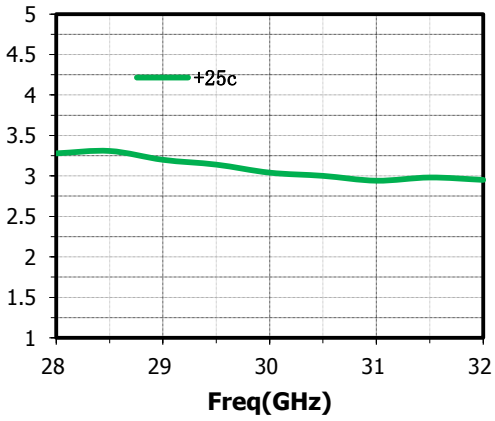
OP$_{-1}$dB(dBm)、PAE@T_A=25℃



OP$_{-1}$dB(dBm)vs.I_{DQ}@T_A=25℃



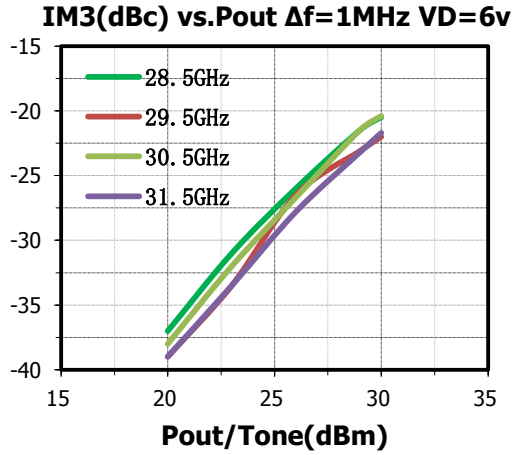
I_D(Amps) @ OP$_{-1}$dB T_A=25℃



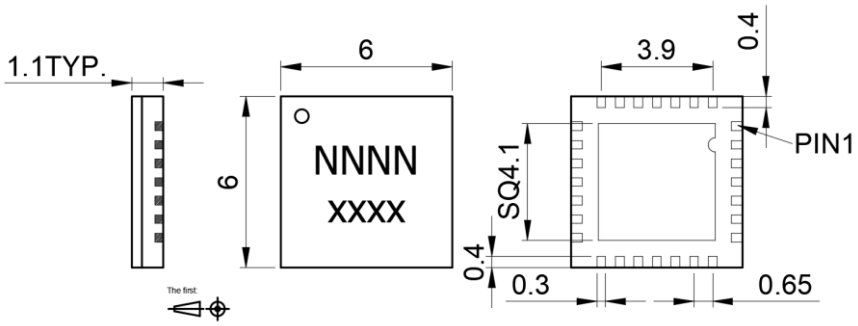
Chengdu Fairchild Technology Co., Ltd.
Add.: 4F, Block B, No.98 Tiancai road, Hi-Tech(West)Zone, Chengdu.
Cel.: 18381641733 Tel.: +86-28-8792 9948, +86-28-8793 2498 Fax: 028-8793 3348
E-mail: sales@fairchild-tech.com. Web.: www.fairchild-tech.com
WeChat: R18381641733.

IM_3 Performance Curve

The results captured in the test-jig environment within connector plan, then de-embedded the housing an come back in the die plan.



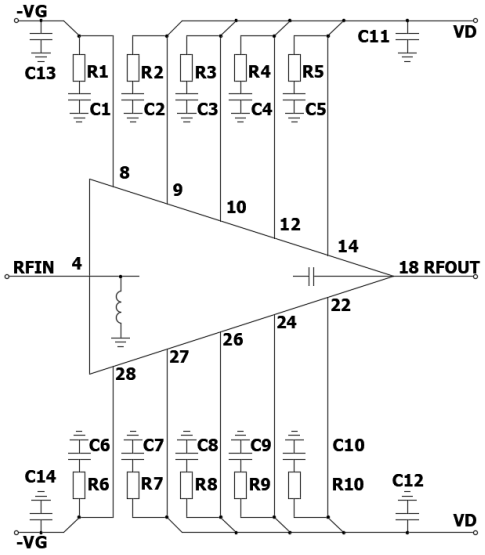
Outline Drawing（mm）



Pin Descriptions

Pin No.	function	Pin No.	function
1	Connect to GND	15	Connect to GND
2	Connect to GND	16	Connect to GND
3	Connect to GND	17	Connect to GND
4	RFIN	18	RFOUT
5	Connect to GND	19	Connect to GND
6	Connect to GND	20	Connect to GND
7	Connect to GND	21	Connect to GND
8	Gate bias 1B	22	Drain bias 4
9	Drain bias 1B	23	Connect to GND
10	Drain bias 2B	24	Drain bias 3
11	Connect to GND	25	Connect to GND
12	Drain bias 3B	26	Drain bias 2
13	Connect to GND	27	Drain bias 1
14	Drain bias 4B	28	Gate bias 1

Assembly Diagram



Attention:

1. The moisture resistant grade of products is 2A, the storage environment ≤30° C/60% RH，The surrounding workshop Life is 4 weeks. 2. After un-packing, It is necessary to bake the parts for 6 hours in 125+/-5 degree environment before soldering.

Biasing:

1. User must apply negative bias to VG before applying positive bias to VD to prevent damage to the amplifier.

Components List

Reference Des.	Value	Part Number	Manuf.	Size
C11～C14	10uF	CC0805KKX5R6BB106	Yageo	0805
C3～C10	0.47uF	CC402KRX5R6BB474	Yageo	0402
R1～R10	5.1Ω	—	ANY	0402

Chengdu Fairchild Technology Co., Ltd.
Add.: 4F, Block B, No.98 Tiancai road, Hi-Tech(West)Zone, Chengdu.
Cel.: 18381641733 Tel.: +86-28-8792 9948, +86-28-8793 2498 Fax: 028-8793 3348
E-mail: sales@fairchild-tech.com. Web.: www.fairchild-tech.com
WeChat: R18381641733.