XT3118Q6

GaAs MMIC Power Amplifier
27GHz～30GHz　35.5dBm

Rev 2.2

Features

- Frequency：27GHz～30GHz
- Gain：26dB
- Output P_{-1}dB：35.5dBm
- Supply Voltage：+6V
- Power-Added Efficiency：20%
- Package Size：6mm×6mm×1.2mm

Typical Applications

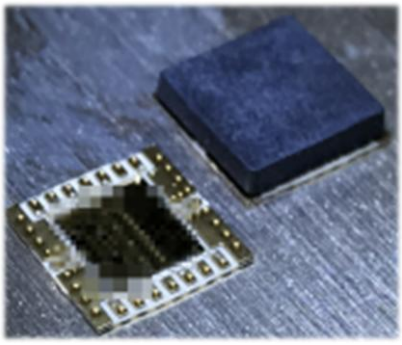
- Microwave radio
- Telecommunication
- Test instrumentation
- SATCOM
- VSAT

General Description

The XT3118Q6 is a KA band GaAs MMIC power amplifier. The XT3118Q6 provides 26dB of gain, and 35.5dBm of output power for 1 dB compression and 20% PAE from a +6V supply.

The XT3118Q6 is a GaAs MMIC power amplifier housed in a 6x6 mm surface mount package. XT3118Q6 is ideal for SATCOM, test equipment applications, Point to Point radio and radar applications.

Image



Electrical Performance

T_A=25℃, V_D=+6V, I_{DQ}=2A, Z_0=50Ω, CW Fixture Test

Parameter	Min.	Typ.	Max.	Units
Frequency Range		27～30		GHz
Small Signal Gain	23	26	—	dB
Small Signal Gain Flatness	—	±2	—	dB
Reverse Isolation	—	-40	—	dB
Input Return Loss	—	-10	—	dB
Power-Added Efficiency	—	20	—	%
Output Power for 1 dB Compression (OP_{-1}dB)	35	35.5	—	dBm
Output Third Order Intercept(OIP_3)*	—	39	—	dBm
IM_3***	—	-24	—	dBc
Drain Voltage(V_D)	—	6	6.3	V
Gate Current(I_G)	—	5	28	mA
Supply Current(I_D)	—	3.5	4.2	A
Thermal Resistance **	—	4.1	—	℃/W

*Pout / Tone = 22dBm, fc= 29GHz, Δf=1MHz

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

*** Pout / Tone = 27dBm, fc= 29GHz, Δf=1MHz

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Absolute Maximum Ratings

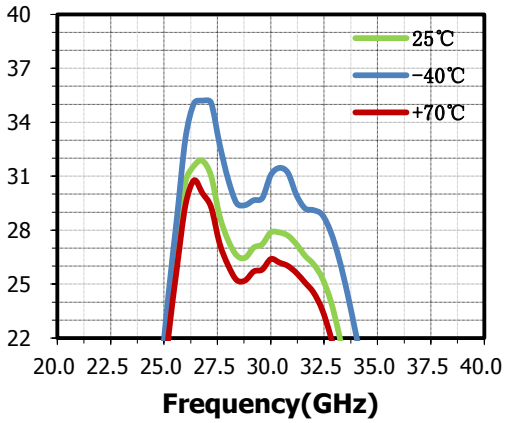
Maximum Input Power	+14dBm	Operating Temperature	-40℃～+70℃
Channel Temperature	165℃	Storage Temperature	-65℃～+150℃
Maximum V_D	+6.5V	Maximum V_G	-1.2V

Typical Performance Curve

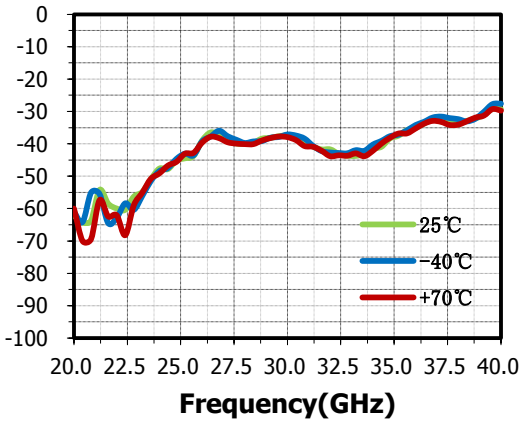
The results captured in the test-jig environment within connector plane

V_D=+6v I_D=2A CW

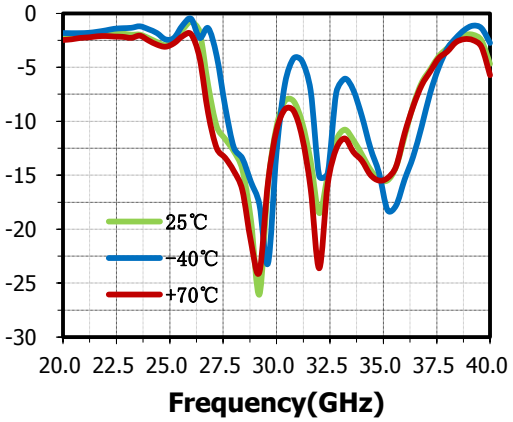
Small Signal Gain(dB) vs.Temperature



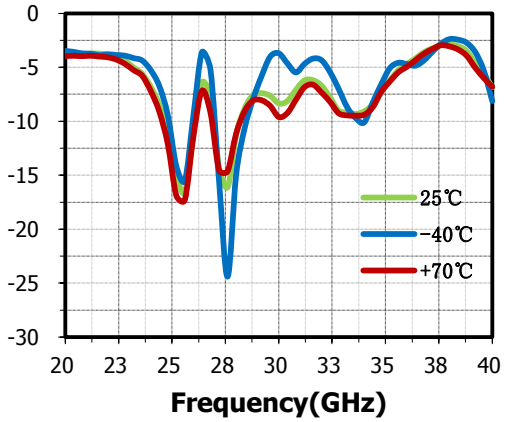
Reverse Isolation(dB) vs.Temperature



Input Return Loss(dB) vs.Temperature



Output Return Loss(dB) vs.Temperature

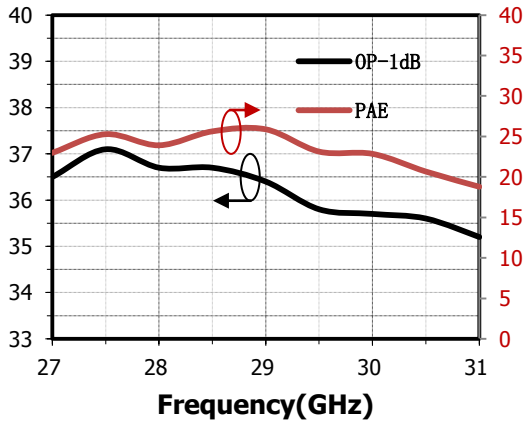


Power and PAE Performance Curve

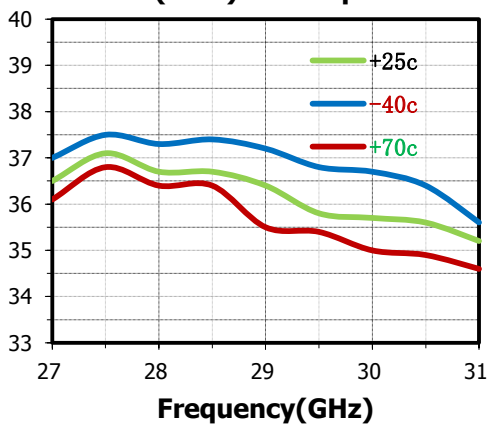
The results captured in the test-jig environment within connector plane, then de-embedded the housing an come back in the die plane

V_D=+6V I_D=2A CW

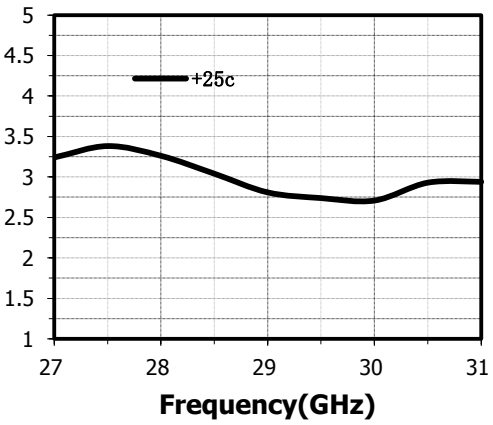
OP_{-1}dB(dBm)、PAE@T_A=25℃



OP-1dB(dBm) vs.Temperature

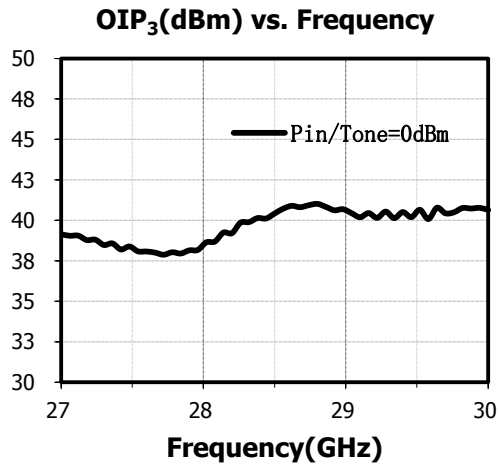


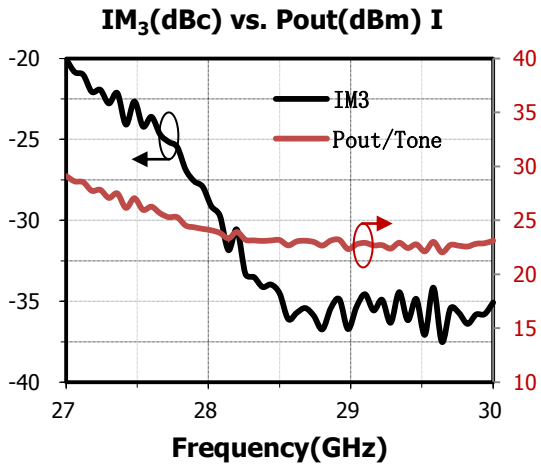
I_D(Amps) @ OP_{-1}dB、T_A=25℃

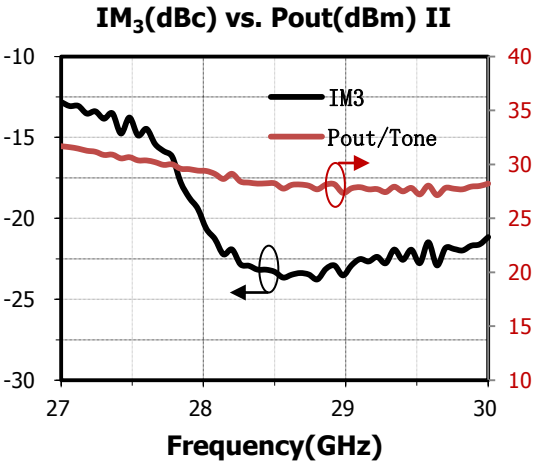


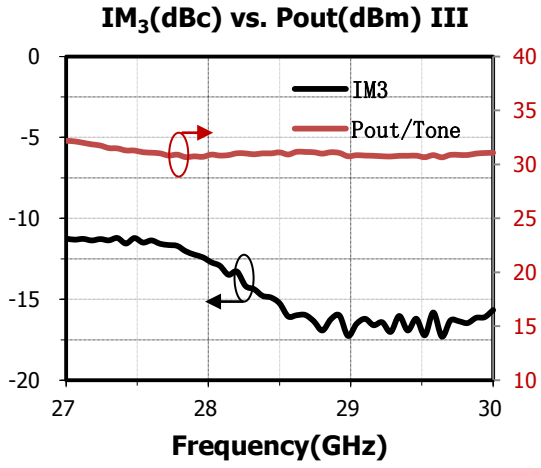
OIP_3 、IM3 Performance Curve

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









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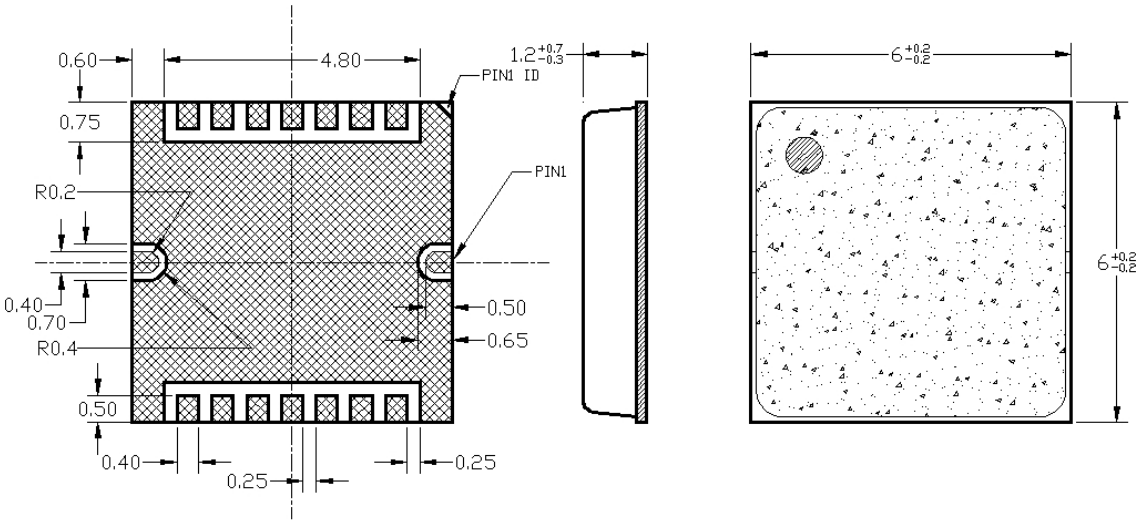
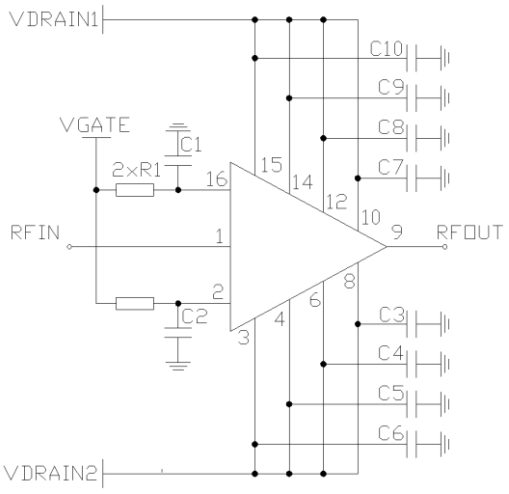
Outline Drawing(mm)



Pin Descriptions

Pin No.	function	Pin No.	function
1	RF Input，Internal grounding	9	RF Output，AC coupled
2	Gate1 A	10	Drain 4B
3	Drain A	11	NC
4	Drain 2 A	12	Drain 3B
5	NC	13	NC
6	Drain 3 A	14	Drain 2B
7	NC	15	Drain 1B
8	Drain 4A	16	Gate 1 B

Application Circuit

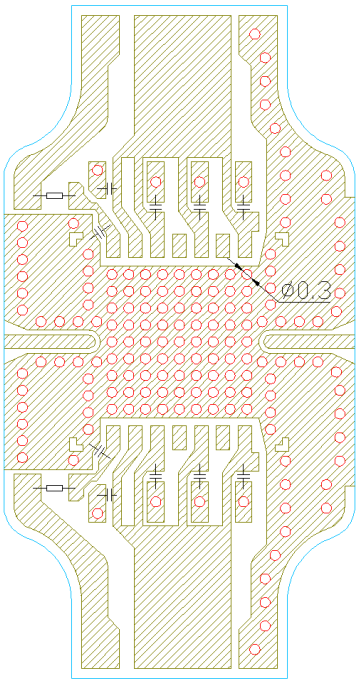


List of Material

Reference Des.	Value	Part Number	Manuf.	Size
C1～C2	2.2uF	GRM033R61A225KE47D	Murata	0201
C3～C10	0.047uF	GRM033R61A473KE47D	Murata	0201
R1*	20Ω	—	ANY	0603

*The value of R1 is related the internal resistance of gate bias circuit, when the internal resistance of the gate bias circuit is less than 2 Ohms, set the R1 to 15--30 Ohms.

XT3118Q6 test fixture layout

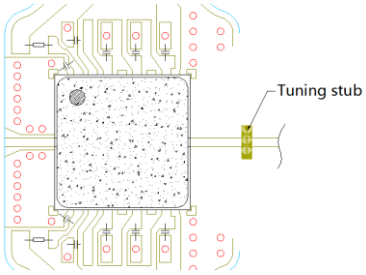


a. PCB substrate: RO4350B, Thickness of substrate: 0.254mm

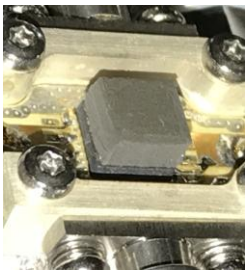
b. Electronic copy of board design documents are available for reference.

Recommended use of this chip with special attention

1.It is highly recommended to reserve a micro-strip line at the output of device, it will be used for fine tune of output power .etc

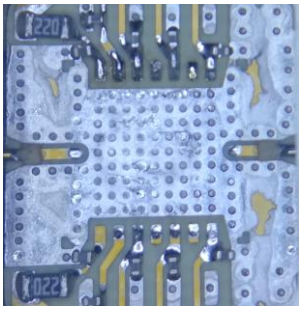


2.If there is resonance, try to put some absorbing material at the top of the device.



3.Put all de-coupling capacitors as closer as possible to the device.

4.In order to prevent the device being destroyed by bad heat dissipation, make sure most of the ground via be filled with solder paste once device soldering work has been done.



5.Use thin PCB board to short the thermal dissipation path.