

XT3106



GaAs MMIC Power Amplifier 27GHz~33GHz 33dBm

Rev 1.2

Features

- Frequency : 27GHz~33GHz
- Gain: 20dB
- Output P₁dB: 33dBm
- Output OIP₃:38dBm
- Supply Voltage:+6V
- Power-Added Efficiency:22%
- Die Size: 3.18 mm×2.46mm×0.1mm

Typical Applications

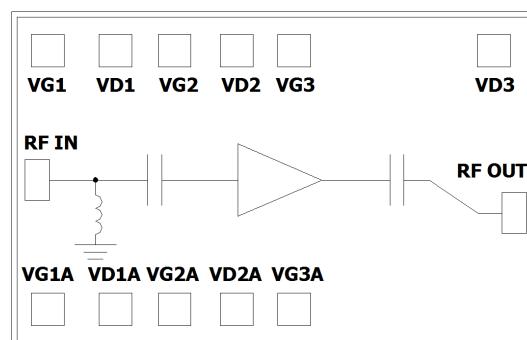
- Point-to-Point Radios
- SATCOM
- Military and Space
- Test and Measurement
- Radar

General Description

The XT3106 is a wideband GaAs MMIC driver amplifier which operates between 27GHz~33GHz. The XT3106 provides 20 dB of gain, and +33 dBm of output power for 1 dB compression and 22% PAE from a +6V supply.

The XT3106 offers full passivation for increased reliability and moisture protection.

Functional Diagram



Electrical Performance (T_A=25°C,V_D=+6V, I_D=1000mA, Z₀=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range	27~33			GHz
Small Signal Gain	15	20	—	dB
Small Signal Gain Flatness	—	± 2.5	—	dB
Reverse Isolation	—	-45	—	dB
Input Return Loss	—	-10	—	dB
Output Return Loss	—	-13	—	dB
Power-Added Efficiency	—	22	—	%
Output Power for 1 dB Compression (OP ₁ dB)	31.5	33	—	dBm
Output Third Order Intercept(OIP ₃)*	—	38	—	dBm
Drain Voltage(V _D)	5	-	6	V
Supply Current(I _D)	—	1000	1600	mA

* Measurement taken at Pout / Tone = +28 dBm

Absolute Maximum Ratings

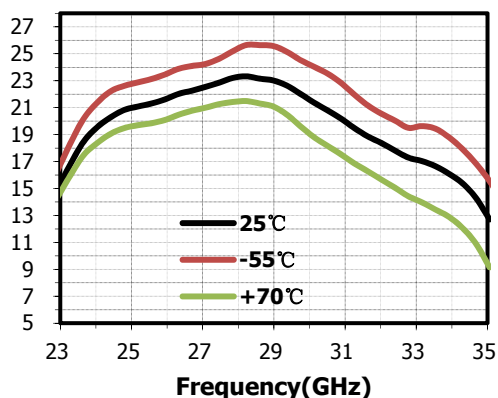
Maximum Input Power	+19dBm	Operating Temperature	-55°C~+85°C
Junction Temperature	+150°C	Storage Temperature	-65°C~+150°C
Maximum V _D	+6.5V	Maximum V _G	-1.2V

Typical Performance Curve

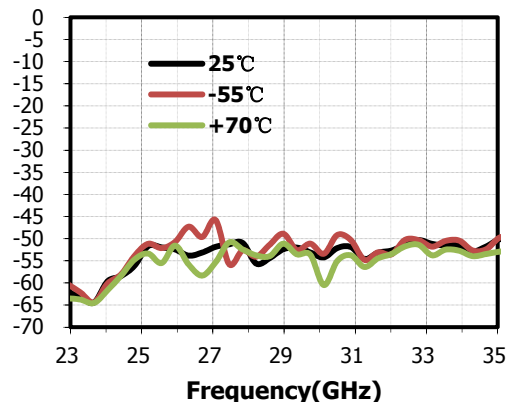
S-parameter Data obtained from On-Wafer RF Probe Test Results
 OP₁dB and PAE Data obtained from K connector based test fixture

*Bias Conditions: $V_D = 6V$, $I_D = 1000mA$

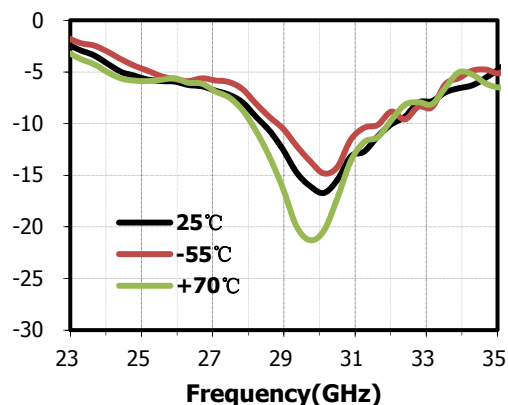
Small Signal Gain(dB) vs.Temperature



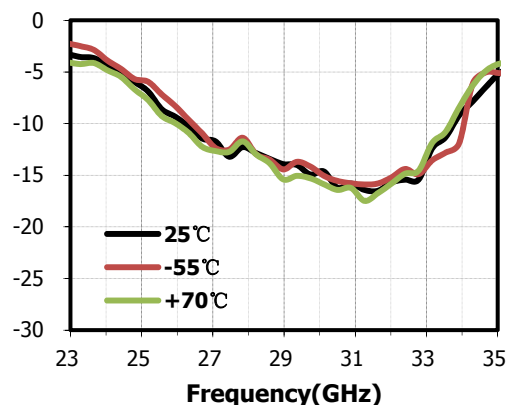
Reverse Isolation(dB) vs.Temperature



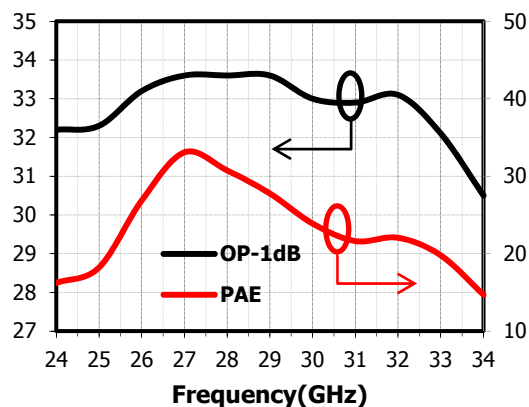
Input Return Loss(dB) vs.Temperature



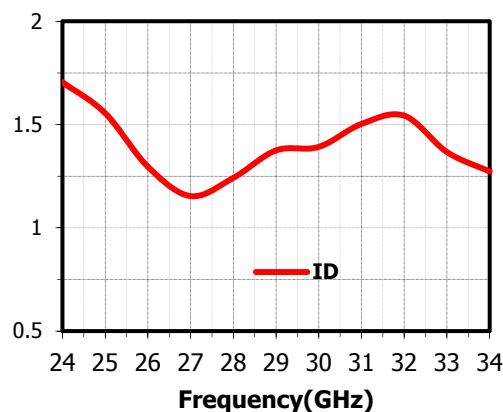
Output Return Loss(dB) vs.Temperature



OP₁dB(dBm)、PAE(%) vs.Freq



ID(A) vs.Freq@OP₁dB



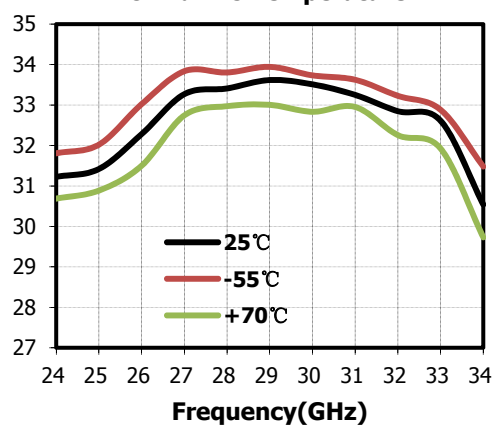
XT3106



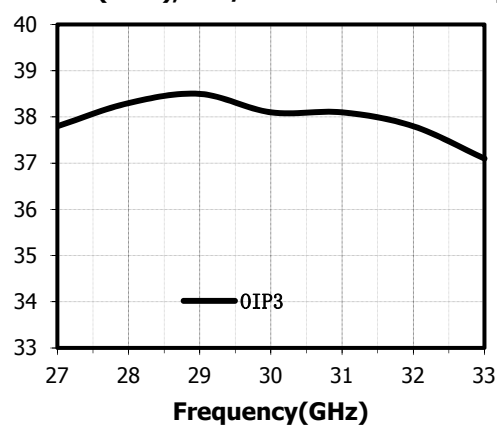
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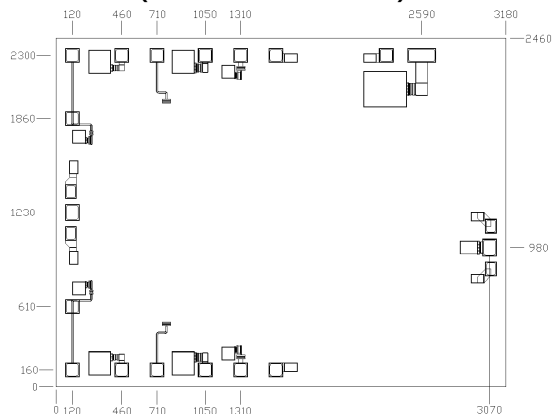
OP-1dB vs. Temperature



OIP₃(dBm), P_{OUT}/Tone=28dBm vs. Freq

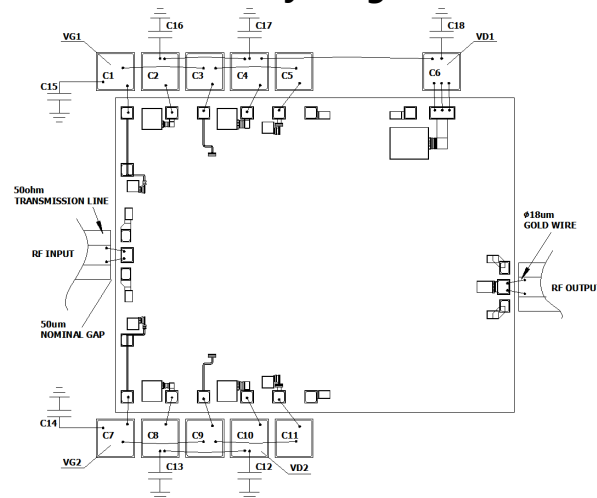


Die Outline
(all dimensions in um)



VG1~VG3, VD1~VD2 Bonding Pad Size:100x100um
VG1A~VG3A, VD1A~VD2A Bonding Pad Size:100x100um
RF IN, RF OUT Bonding Pad Size:100x120um
VD3 Bonding Pad Size:200x100um

Assembly Diagram



Components List

Reference Des.	Value	Part Number	Manuf.	Size
C12~C18	4.7uF	GRM155R61A475KE15D	Murata	0402
C1~C11	100pF	-	ANY	SLC

Notes

1. The XT3106 is biased with a positive drain supply and negative gate supply.
when the drain voltage is set to 6 V. The recommended gate voltage is set to -0.5~-0.8 V.
2. RF connections should be made as short as possible to reduce the inductive effect of the bond wire. Use of a 1 mil thermosonic wedge bonding is highly recommended. The RF input and output require a double bond wire as shown.
3. The backside of the XT3106 is RF ground. Die attach should be accomplished with electrically and thermally conductive epoxy only.
4. Bypass caps C12~C18 should be placed no farther than 1.5mm from the amplifier.