

XT3913



GaAs MMIC Power Amplifier 8GHz~13GHz 32.5dBm

Rev 1.0

Features

- Frequency : 8GHz~13GHz
- Gain: 19dB
- Output P_{1dB}: 32.5dBm
- Supply Voltage: +5~+6V
- Power-Added Efficiency: 35%
- Die Size: 2.01mm×1.25mm×0.1mm

Typical Applications

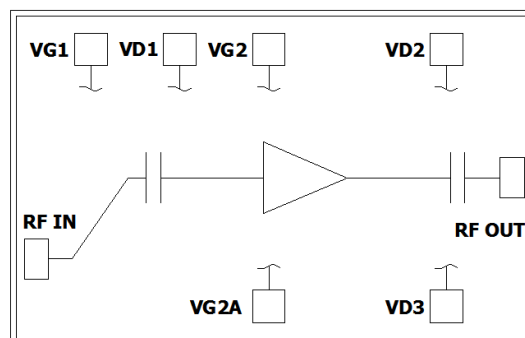
- Point-to-Point Radios
- SATCOM
- Military and Space
- Test and Measurement
- Radar

General Description

The XT3913 is a wideband GaAs MMIC driver amplifier which operates between 8GHz~13GHz. The amplifier has high PAE at output P_{1dB} power making it an ideal driver amplifier for high efficiency applications.

The XT3913 offers full passivation for increased reliability and moisture protection.

Functional Diagram



Electrical Performance (T_A=25°C, V_D=+6V, I_D=650mA, Z₀=50Ω)

Data obtained from 3.5-mm connector based test fixture,
and this data includes connector loss and board loss

Parameter	Min.	Typ.	Max.	Units
Frequency Range	8~13			GHz
Small Signal Gain	-	19	—	dB
Small Signal Gain Flatness	—	±2	—	dB
Reverse Isolation	—	-42	—	dB
Input Return Loss	—	-12	—	dB
Output Return Loss	—	-13	—	dB
Power-Added Efficiency	—	35	—	%
Output Power for 1 dB Compression (OP _{1dB})	—	32.5	—	dBm
Drain Voltage(V _D)	5	-	6	V
Supply Current(I _D)	—	650	1100	mA

Absolute Maximum Ratings

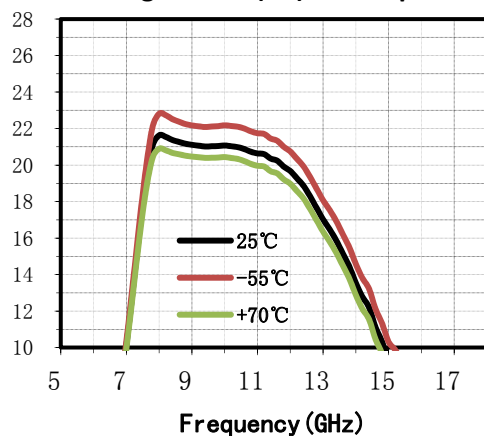
Maximum Input Power	+17dBm	Operating Temperature	-55°C~+85°C
Junction Temperature	+150°C	Storage Temperature	-65°C~+150°C
Maximum V _D	+6.3V	Maximum V _G	-1.2V

Typical Performance Curve

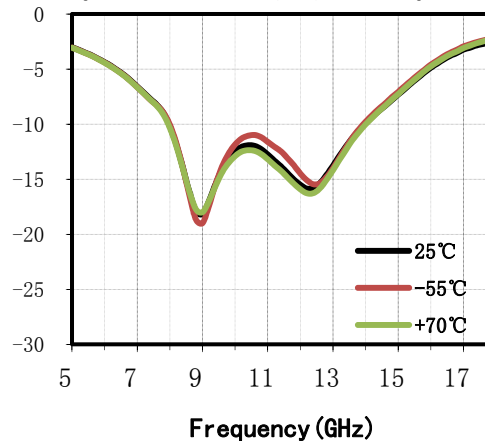
Data obtained from 3.5-mm connector based test fixture,
and this data includes connector loss and board loss

*Bias Conditions: $V_D = 6V$, $I_D = 650mA$

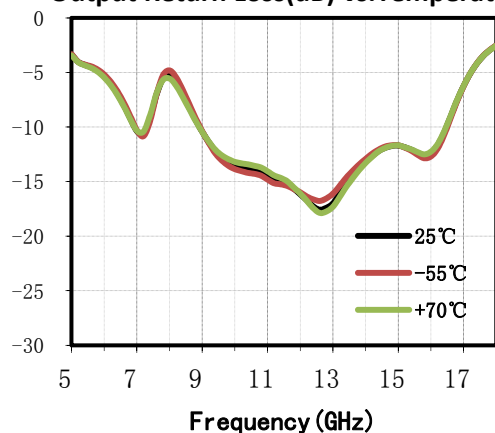
Small Signal Gain(dB) vs.Temperature



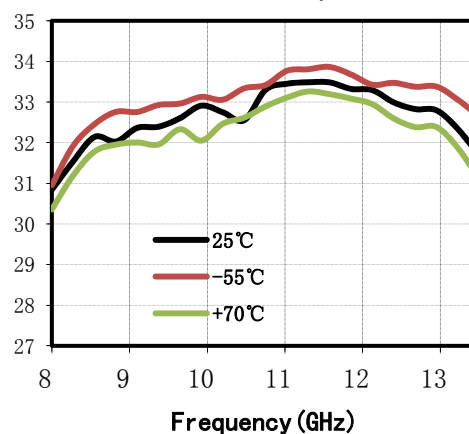
Input Return Loss(dB) vs.Temperature



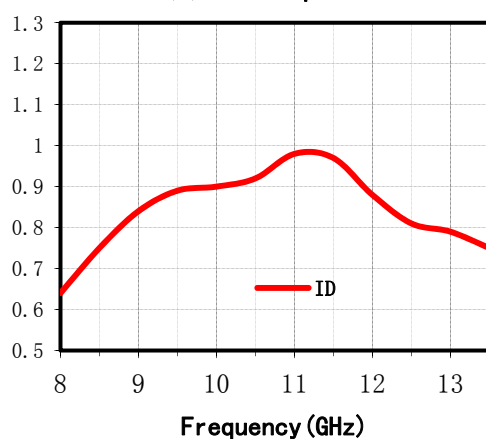
Output Return Loss(dB) vs.Temperature



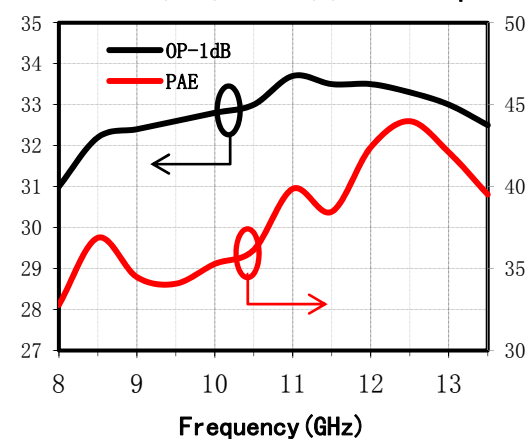
OP-1dB vs. Temperature



I_D (A) vs. Freq@OP-1dB



OP-1dB (dBm) 、 PAE (%) vs. Freq



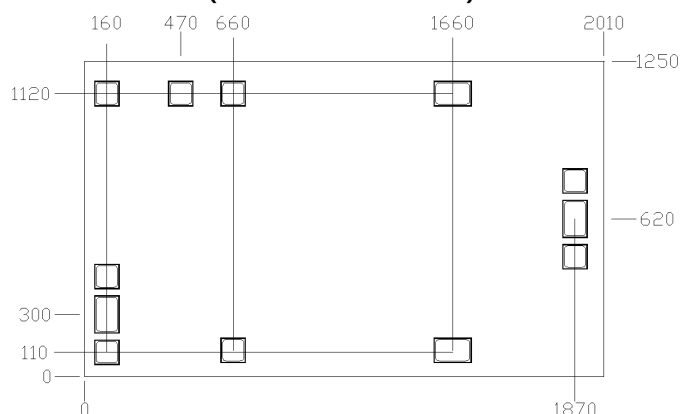
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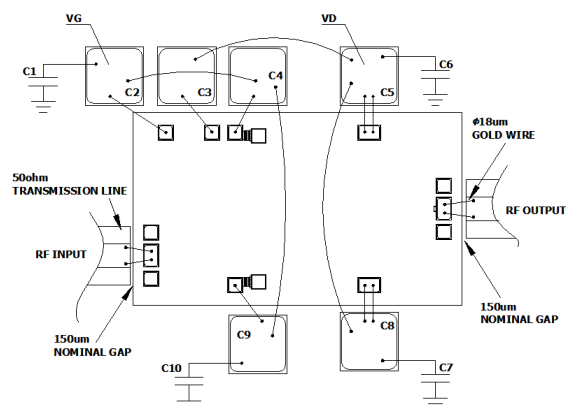
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Die Outline
(all dimensions in um)

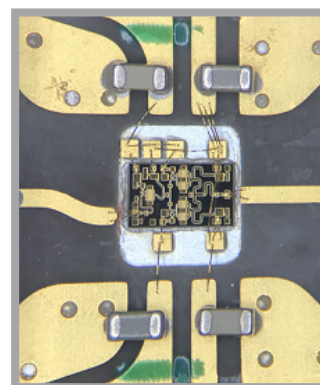


VD2, VD3, RF Bonding Pad Size:100x150um
VG1, VD1, VG2, VG2A Bonding Pad Size:100x100um

Assembly Diagram



Chip Test Fixture



Components List

Reference Des.	Value	Part Number	Manuf.	Size
C1、C6、C7、C10	1uF	GRM155R61A105KE15D	Murata	0402
C2~C5、C8、C9	300pF	-	ANY	SLC

Notes

1. The XT3913 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~-0.75 V.
2. RF connections should be made as short as possible to reduce the inductive effect of the bond wire. Use of a 0.8 mil thermosonic wedge bonding is highly recommended as the loop height will be minimized. The RF input and output require a double bond wire as shown.
3. The backside of the XT3913 is RF ground. Die attach should be accomplished with electrically and thermally conductive epoxy only.
4. Bypass caps C1、C6、C7、C10 should be placed no farther than 1.5mm from the amplifier.

Attention:

GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.



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