

XT3913



GaAs MMIC Driver Amplifier
8GHz~13GHz

Rev 2.0

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

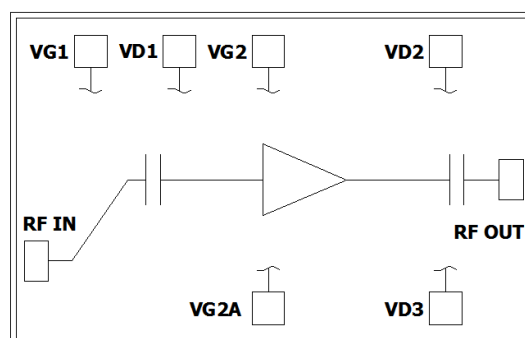
- Point-to-Point Radios
- SATCOM
- Military and Space
- Test and Measurement
- Radar

General Description

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.

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 is 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	—	-15	—	dB
Output Return Loss	—	-15	—	dB
Power-Added Efficiency	—	31	—	%
Output Power for 1 dB Compression (OP _{1dB})	—	32.5	—	dBm
Drain Voltage(V _D)	5	—	6	V
Supply Current(I _D)	—	650	730	mA

Absolute Maximum Ratings

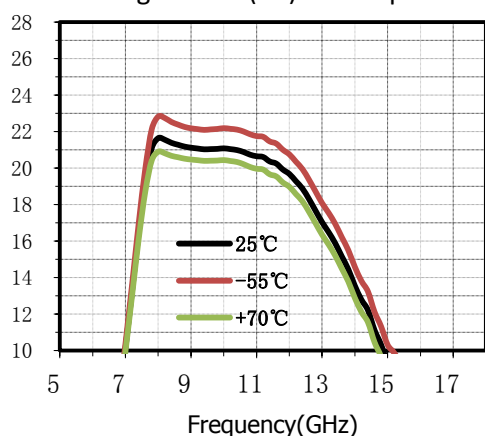
Maximum Input Power	+17dBm	Operating Temperature	-55°C ~ +125°C
Channel Temperature	+150°C	Storage Temperature	-65°C ~ +150°C
Maximum V _D	+6.3V	Maximum V _G	-1.2V

Typical Performance Curve

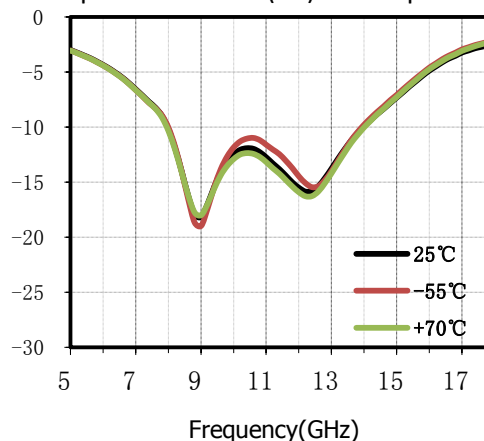
Data is obtained from 3.5-mm connector based test fixture
and this data includes connector loss and board loss.

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

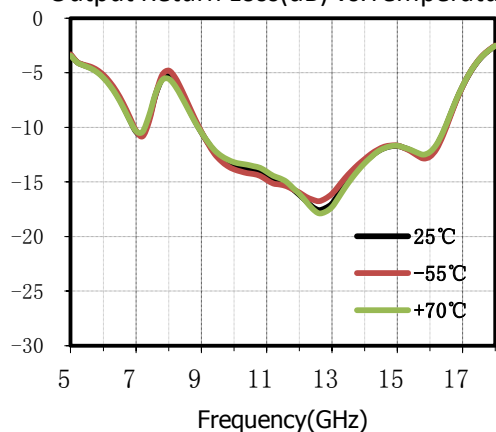
Small Signal Gain(dB) vs. Temperature



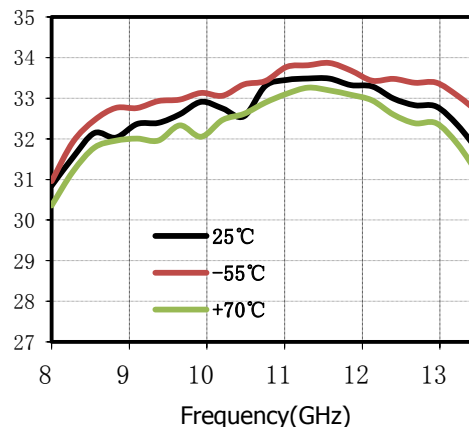
Input Return Loss(dB) vs. Temperature



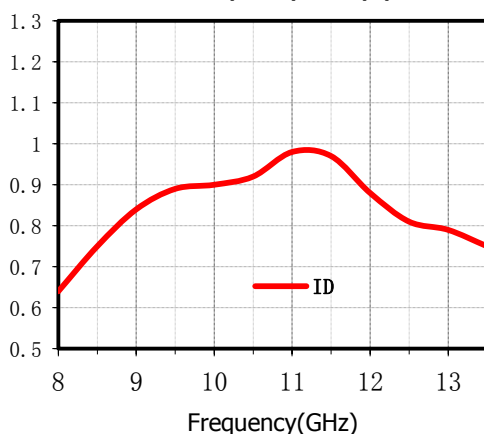
Output Return Loss(dB) vs. Temperature



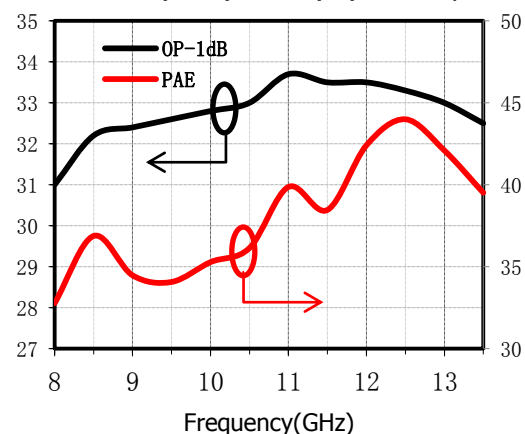
OP₁dB(dBm) vs. Temperature



OP₁dB(dBm) vs. I_D (A)



OP₁dB(dBm), PAE(%) vs. Freq



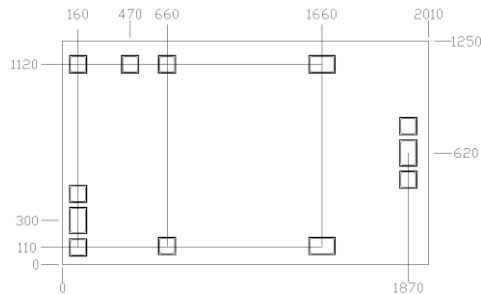
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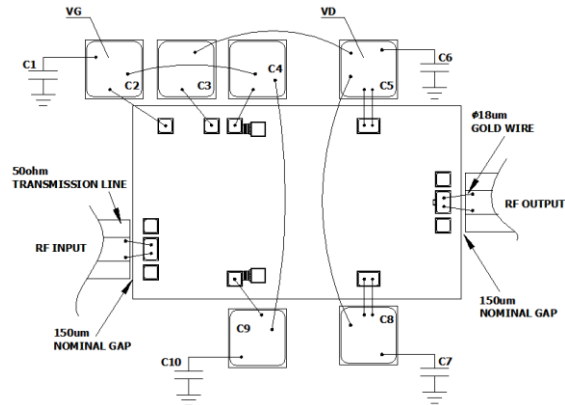
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Die Outline
(all dimensions in um)

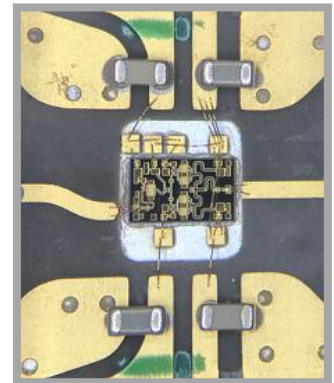


Assembly Diagram



VD2、VD3、RF Bonding pad size:100x150um
VG1、VD1、VG2、VG2A Bonding pad size:100x100um

Chip Test Fixture



Components List

Reference Des.	Value	Part Number	Manuf.	PKG
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 voltage supply and negative gate voltage supply.
When the drain voltage is set to 6V, the recommended gate voltage is -0.5~-0.75V.
2. RF connections should be made as short as possible to reduce the inductive effect of the bond wire.
3. The backside of the XT3913 is RF grounded. Die attach should be accomplished with electrically and thermally conductive epoxy only.
4. Bypass caps C1, C6, C7 and C10 should be placed no more 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.