

XT3911



GaAs MMIC Driver Amplifier

24 GHz~40GHz

Rev 1.3

Features

- Frequency : 24GHz~40GHz
- Gain: 11dB
- Output P₁dB: 15dBm
- Supply Voltage: +4~+6V
- Balanced Amplifier
- Die Size: 1.67mm×1.22mm×0.1mm

Typical Applications

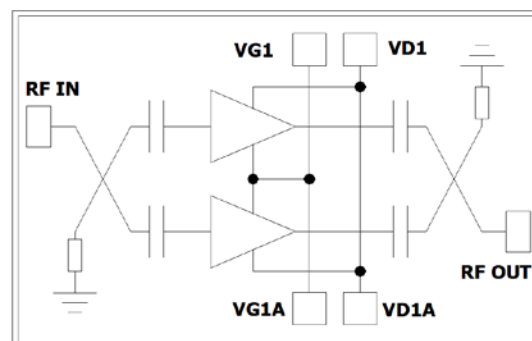
- Point-to-Point Radios
- SATCOM
- Military and Space
- Test and Measurement
- LO Driver

General Description

The XT3911 is a wideband GaAs MMIC driver amplifier which operates between 24GHz~40GHz. The amplifier has moderate gain and output P₁dB making it an ideal linear gain block or driver for microwave radios.

The XT3911 offers full passivation for increased reliability and moisture protection.

Functional Diagram



Electrical Performance ($T_A=25^{\circ}\text{C}$, $V_D=+4\text{V}$, $I_D=60\text{mA}$, $Z_0=50\Omega$)

Parameter	Min.	Typ.	Max.	Units
Frequency Range	24~40			GHz
Gain	8	11	—	dB
Gain Flatness	—	± 1.5	—	dB
Reverse Isolation	—	-35	—	dB
Input/Output Return Loss	—	-15	—	dB
Noise Figure	—	5	—	dB
Output Power for 1 dB Compression (OP ₁ dB)	—	15	—	dBm
Drain Voltage(V_D)	3.8	4	6	V
Supply Current(I_D)	—	60	110	mA
Typical Supply Current(I_D) vs. V_D	4V	-	60	85
	5V	-	80	100
	6V	-	80	100

Absolute Maximum Ratings

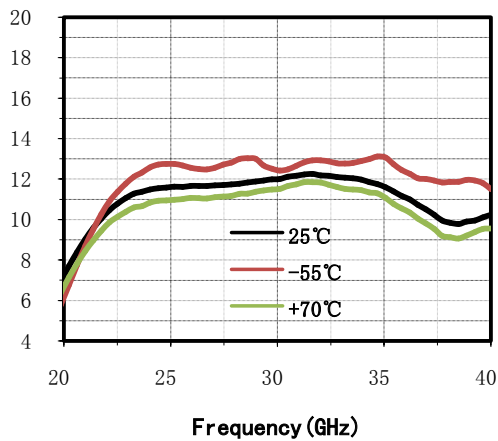
Maximum Input Power	+12dBm	Operating Temperature	-55°C~+85°C
Junction Temperature	+150°C	Storage Temperature	-65°C~+150°C
Maximum V_D	+6.5V	Maximum V_G	-1.2V

Typical Performance Curve

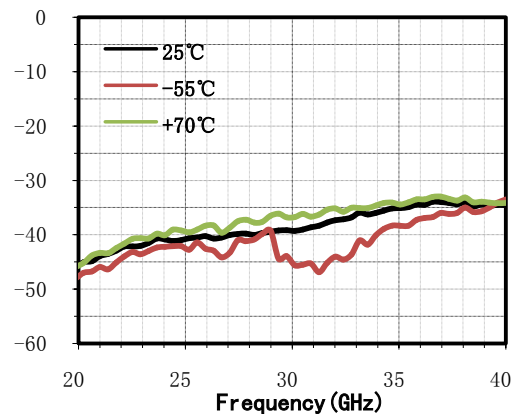
Data Based on the On-Wafer RF Probe Test Results

*Bias Conditions: $V_D = 4V$, $I_D = 60mA$

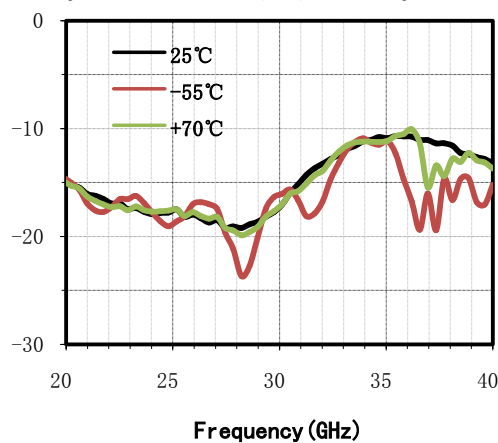
Small Signal Gain(dB) vs.Temperature



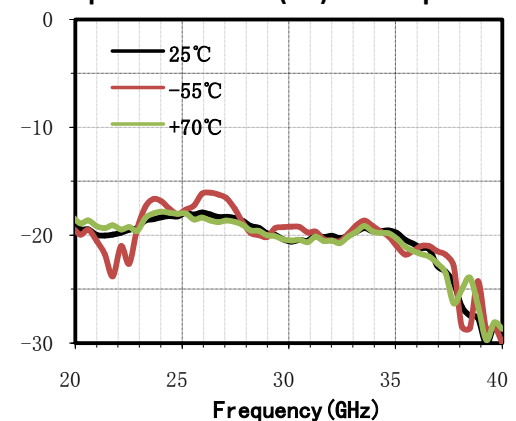
Reverse Isolation (dB)vs.Temperature



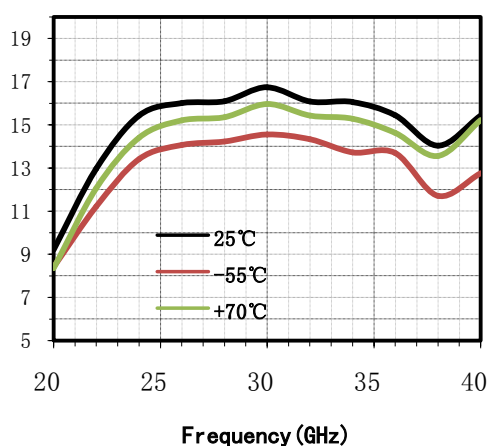
Input Return Loss(dB) vs.Temperature



Output Return Loss(dB) vs.Temperature

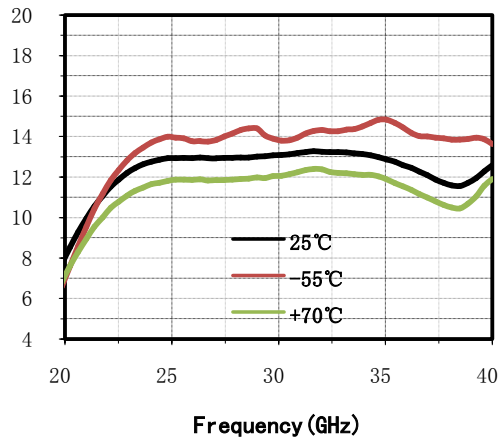


OP₁dB(dBm) vs.Temperature

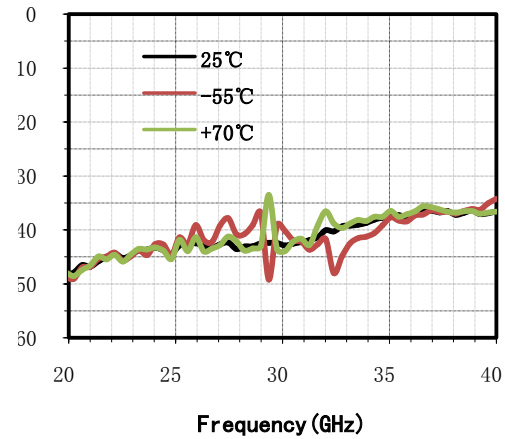


*Bias Conditions: $V_D = 5V$, $I_D = 100mA$

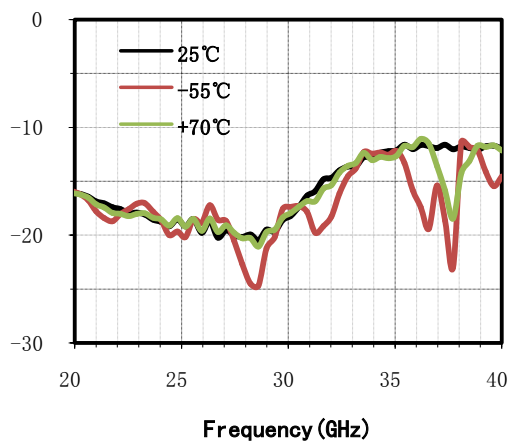
Small Signal Gain(dB) vs.Temperature



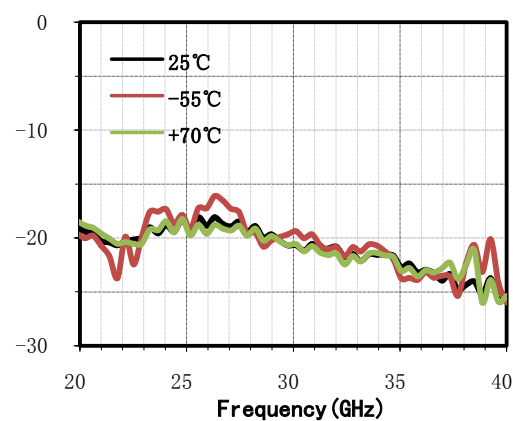
Reverse Isolation (dB) vs.Temperature



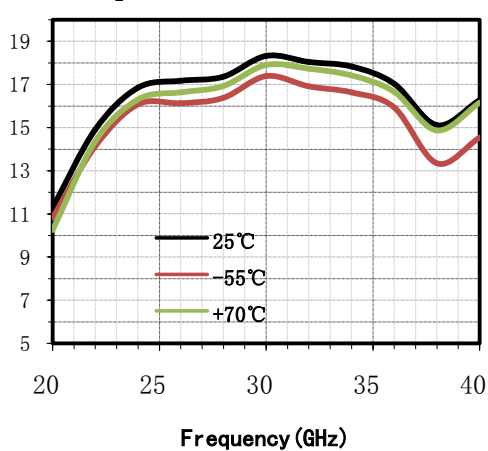
Input Return Loss(dB) vs.Temperature



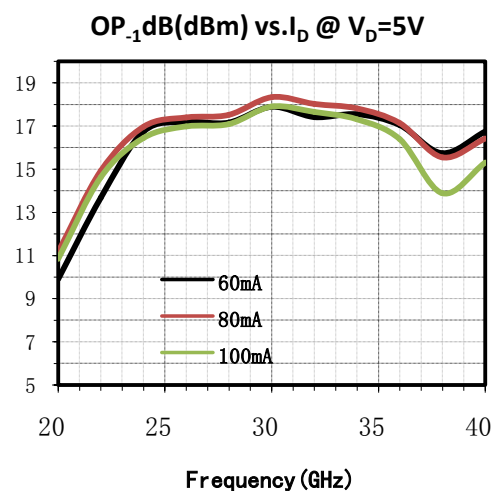
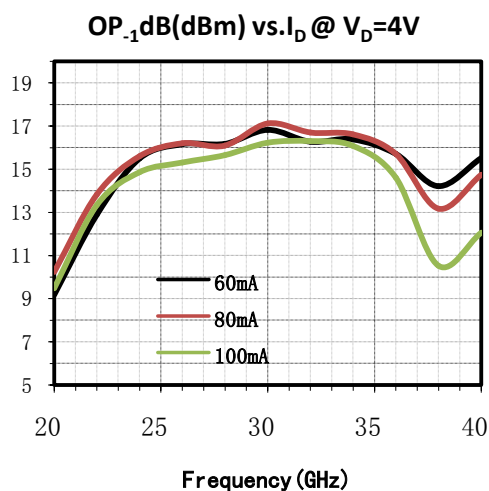
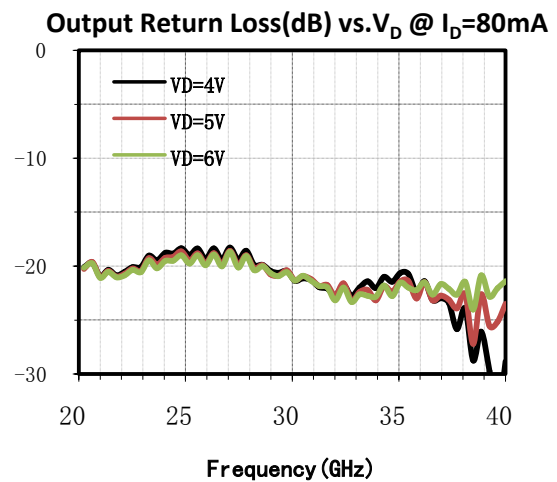
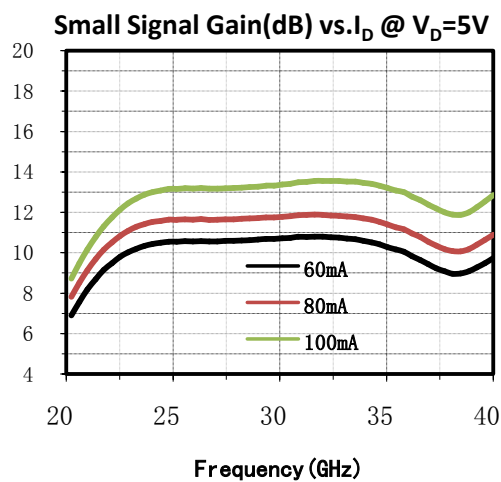
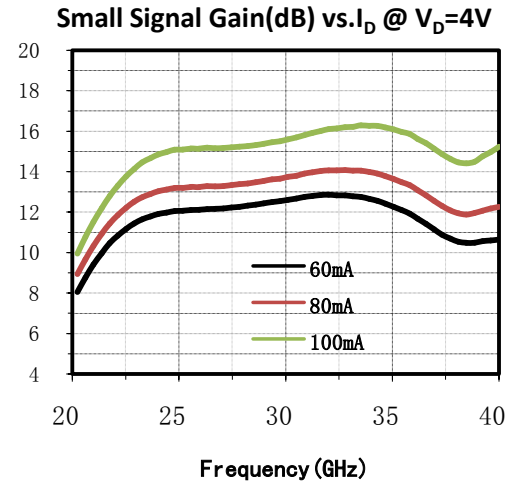
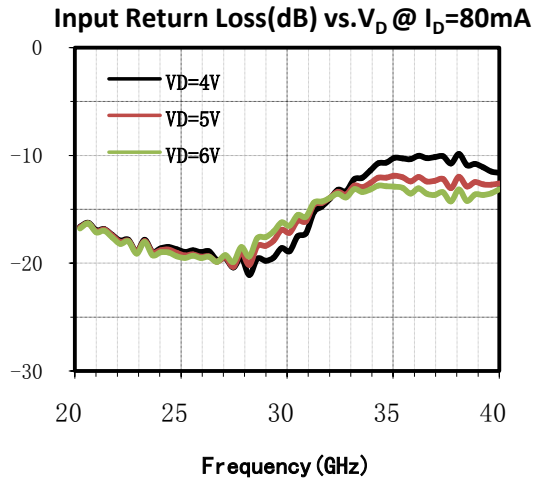
Output Return Loss(dB) vs.Temperature



OP₁dB(dBm) vs.Temperature



*Bias Conditions: $V_D = 4 \sim 6V$, $I_D = 60 \sim 100mA$ $T_A = 25^\circ C$

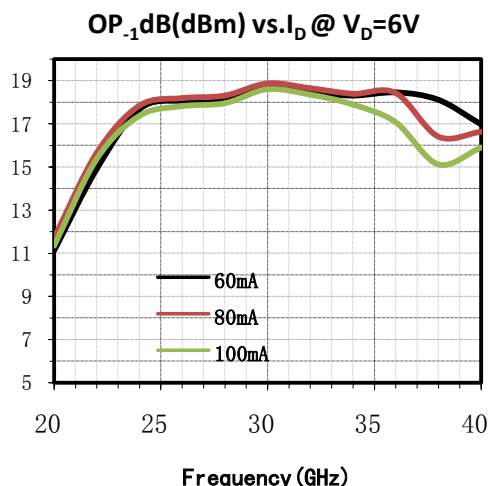


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Components List

Reference Des.	Value	Part Number	Manuf.	Size
C1~C4	2.2uF	0603YD225KAT2A	AVX	0603
C5~C8	300pF	-	ANY	SLC

Attention:

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

Notes

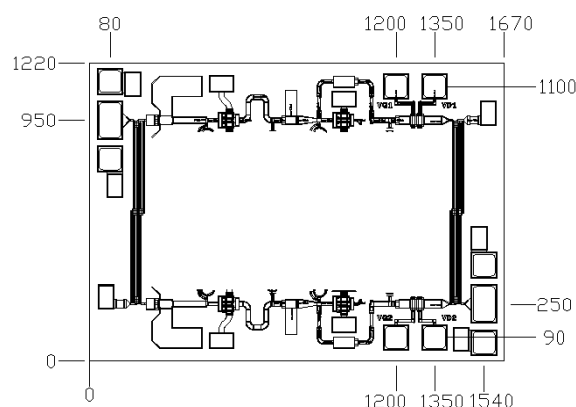
- The XT3911 is biased with a positive drain supply and negative gate supply. when the drain voltage is set to 4 V. The recommended gate voltage is set to -0.5~-0.7 V.
- RF connections should be made as short as possible to reduce the inductive effect of the bond wire. Use of a 0.8 mil thermosonic wedge bonding is highly recommended as the loop height will be minimized. The RF input and output require a double bond wire as shown.
- The backside of the XT3911 is RF ground. Die attach should be accomplished with electrically and thermally conductive epoxy only.
- Bypass caps C1~C4 should be placed no farther than 1.5mm from the amplifier.
- Bond pads VG and VD exist on the upper and lower sides of the MMIC for assembly convenience. For best performance the unused pad should be attached to a 300pF cap to ground.

Die Outline

(all dimensions in um)

RF Bonding pad size:100x150um

VG/VD bonding pas size :100x100um



Assembly Diagram

