

Features

- Frequency : 20GHz~38GHz
- Gain: 8dB
- Output P₁dB: 18dBm
- Supply Voltage: +5~+6V
- Balanced Amplifier
- Die Size: 1.67mm×1.25mm×0.1mm

Typical Applications

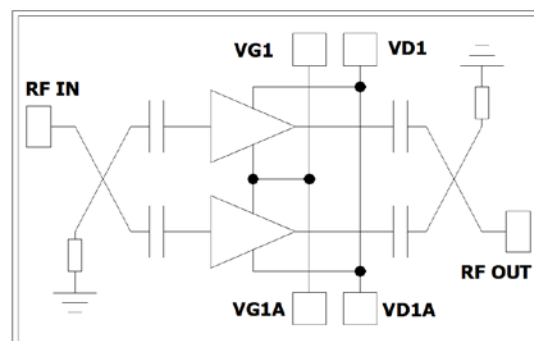
- Point-to-Point Radios
- SATCOM
- Military and Space
- Test and Measurement
- LO Driver

General Description

The XT3912 is a wideband GaAs MMIC driver amplifier which operates between 20GHz~38GHz. The amplifier has moderate gain and output P₁dB making it an ideal linear gain block or driver for microwave radios. The XT3912 is a balanced amplifier that has good input and output return loss when amplifier is turn off or on.

The XT3912 offers full passivation for increased reliability and moisture protection.

Functional Diagram



Electrical Performance (T_A=25°C, V_D=+5V, I_D=100mA, Z₀=50Ω)

Parameter	Min.	Typ.	Max.	Units
Frequency Range	20~38			GHz
Gain	6	8	—	dB
Gain Flatness	—	±1.5	—	dB
Reverse Isolation	—	-32	—	dB
Input/Output Return Loss	—	-13	—	dB
Noise Figure	—	5	—	dB
Output Power for 1 dB Compression (OP ₁ dB)	—	18	—	dBm
Drain Voltage(V _D)	5	—	6	V
Supply Current(I _D)	—	100	150	mA

Absolute Maximum Ratings

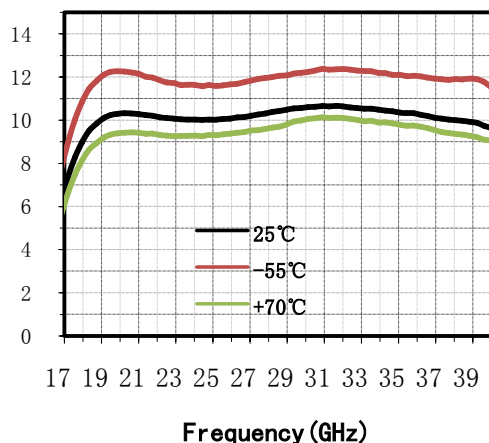
Maximum Input Power	+12dBm	Operating Temperature	-55°C~+85°C
Junction Temperature	+150°C	Storage Temperature	-65°C~+150°C
Maximum V _D	+6.5V	Maximum V _G	-1.2V

Typical Performance Curve

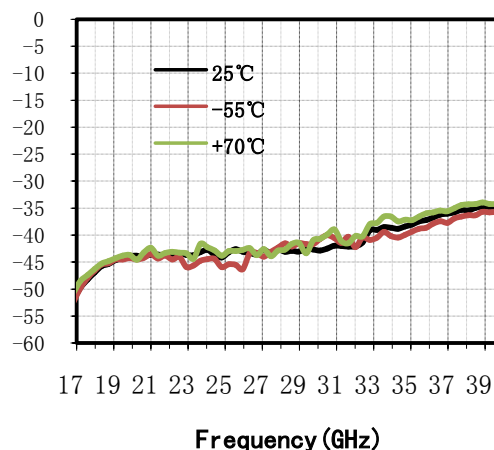
Data Based on the On-Wafer RF Probe Test Results

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

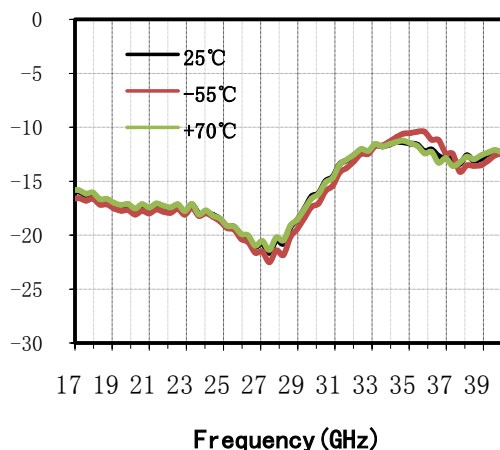
Small Signal Gain(dB) vs.Temperature



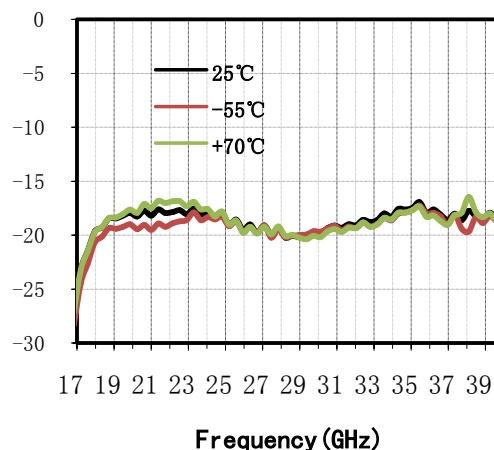
Reverse Isolation(dB) vs.Temperature



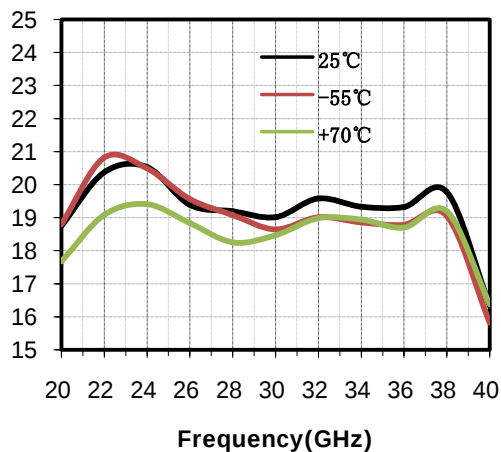
Input Return Loss(dB) vs.Temperature



Output Return Loss(dB) vs.Temperature

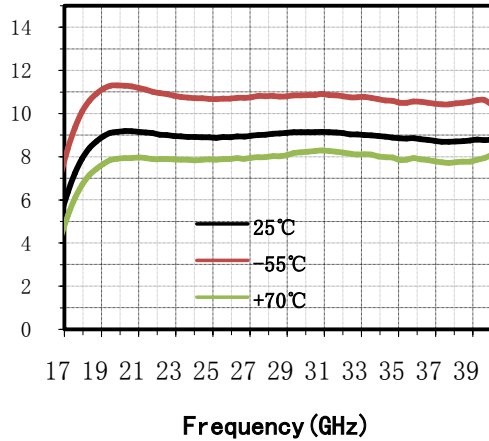


OP₁dB vs.Temperature @ VD=5V

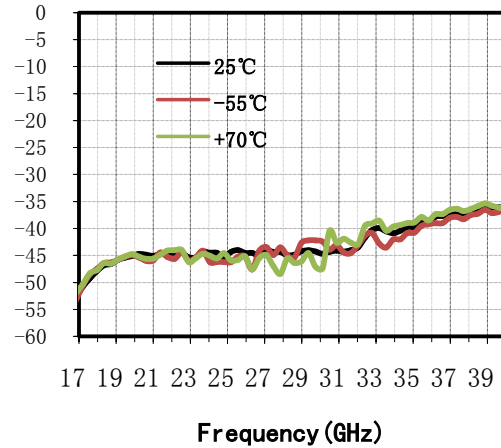


*Bias Conditions: $V_D = 6V$, $I_D = 100mA$

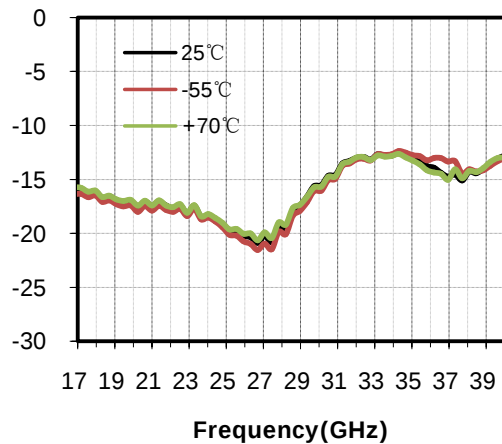
Small Signal Gain(dB) vs.Temperature



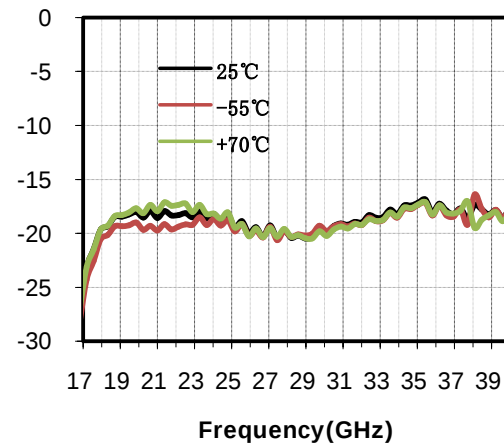
Reverse Isolation(dB) vs.Temperature



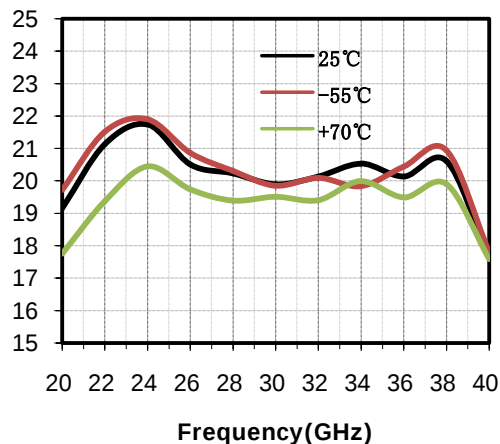
Input Return Loss(dB) vs.Temperature



Output Return Loss(dB) vs.Temperature



OP₁ dB vs.Temperature @ $V_D = 6V$



XT3912



GaAs MMIC Driver Amplifier 20GHz~38GHz

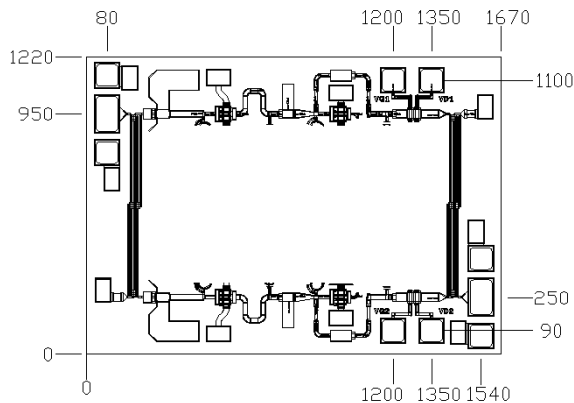
Rev 1.1

Die Outline

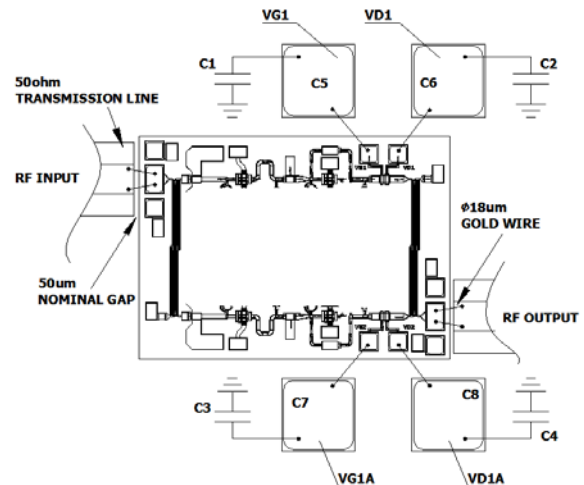
(all dimensions in μm)

RF Bonding pad size:100x150 μm

VG/VD bonding pad size :100x100 μm



Assembly Diagram



Components List

Reference Des.	Value	Part Number	Manuf.	Size
C1~C4	2.2 μF	0603YD225KAT2A	AVX	0603
C5~C8	100pF	-	ANY	SLC

Notes

1. The XT3912 is biased with a positive drain supply and negative gate supply.
when the drain voltage is set to 5 V. The recommended gate voltage is set to -0.5~-0.7 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 XT3912 is RF ground. Die attach should be accomplished with electrically and thermally conductive epoxy only.
4. Bypass caps C1~C4 should be placed no farther than 1.5mm from the amplifier.
5. 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 100pF cap to ground.

Attention:

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