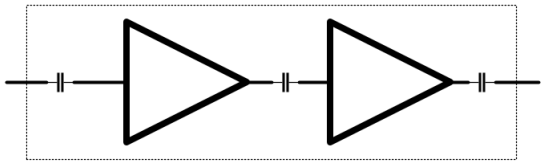
Product Overview

The ASA6011 is a GaN MMIC two-stage power amplifier designed for X-band applications. The amplifier provides 21 dB of power gain, 35 dBm of saturated power and 44.8% PAE from a +28 V supply voltage. All data is measured with the chip in a 50 Ohm test fixture connected via two 0.025 mm (1 mil) diameter bondwires of minimal length 0.51 mm (20 mil).

Key Features

1. Integrated DC blocking at RF input/output
2. Frequency Range: 8.5 GHz to 10 GHz
3. Power Gain: 21 dB
4. PAE: 44.8%
5. Saturated Output Power: +35 dBm
6. 50 Ohm Matched Input/output
7. Die Size: 1.9 x 1.0 x 0.1 mm

Functional Block Diagram



Applications

1. General Communication Applications
2. VSAT
3. LO Driver for Mixers
4. Point to Point Radios

Absolute Maximum Rating

Drain Bias Voltage (VDD)	+40 Vdc
Gate Bias Voltage (VGG)	-8 Vdc
Drain Current (ID)	0.3 A
RF Input Power (Pin),CW,50 Ω,(VDD = +28 V)	28 dBm
Channel Temperature	200 °C
Continuous Pdiss(T = 85 °C)	6.5 W
Storage Temperature	-65 to +150 °C

Typical Supply Current vs. VDD

Parameter	Value/Range
VDD	28 V
ID @ VGG=-3.2V	28 mA
Operating Temperature	-40 to +85 °C

1. Currents are measured at 15 °C.
2. The typical operation of amplifier is for supply voltages VGG =-3.9 V and VDD =+28 V.


ELECTROSTATIC SENSITIVE DEVICE OBSERVE HANDLING PRECAUTIONS

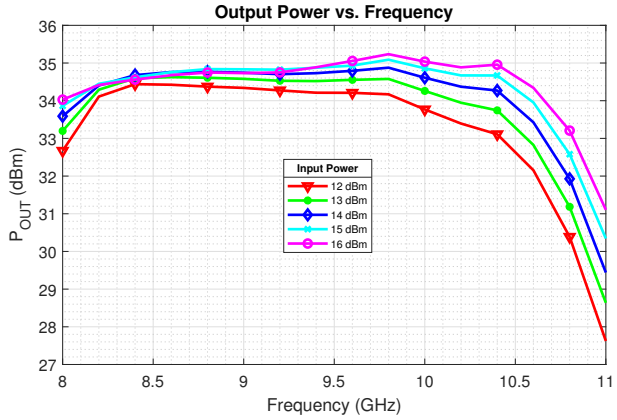
Electrical Specifications

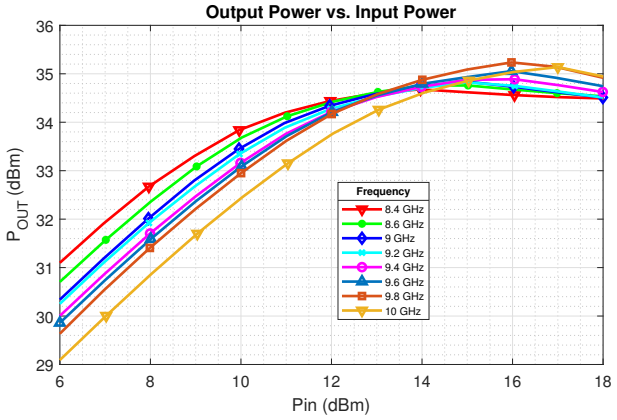
Parameter	Min.	Typ.	Max.	Units
Frequency Range	-	8.5-10	-	GHz
Power Gain	20.8	21	21	dB
Small Signal Gain (IDQ = 50 mA)	23	25	28	dB
Input Return Loss	-	11	-	dB
Power Added Efficiency (PAE)	43	44	44.8	%
Saturated Output Power	34.8	35	35	dBm
Supply Current (with RF)	260	270	-	mA

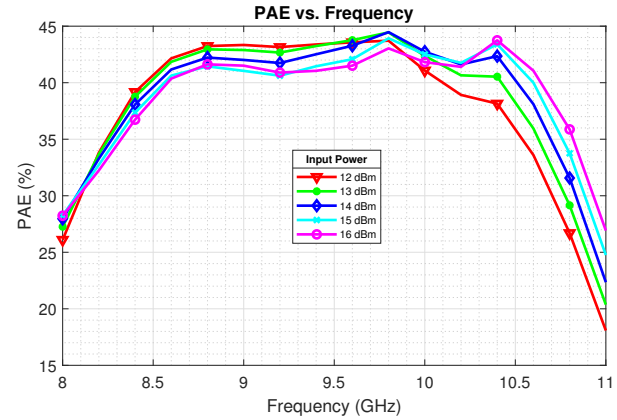
Test conditions unless otherwise noted: Tcase=15°C, VDD=28 V, VGG=-3.2 V, IDQ=28 mA, Z0=50 Ω, Pin=14 dBm
Tcase is Cold Plate temperature, and Base Plate temperature (TBP) is 85°C.

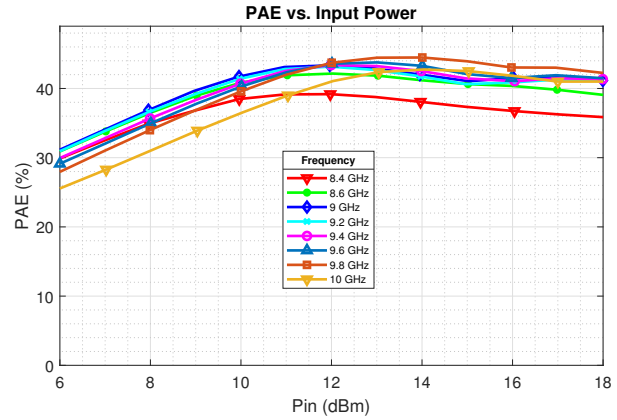
Performance Plots – Large Signal

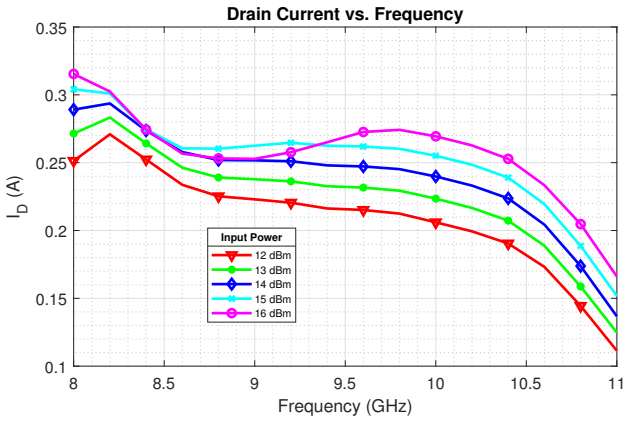
Test conditions unless otherwise noted:VDD=28 V, VGG=-3.2 V, IDQ=28 mA, Pin=14 dBm, Tcase=15 °C, CW

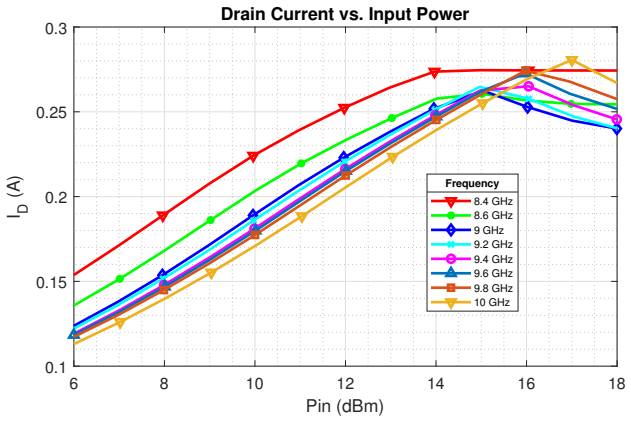






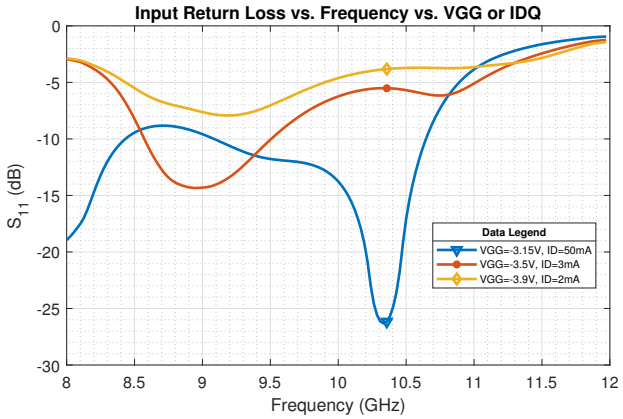


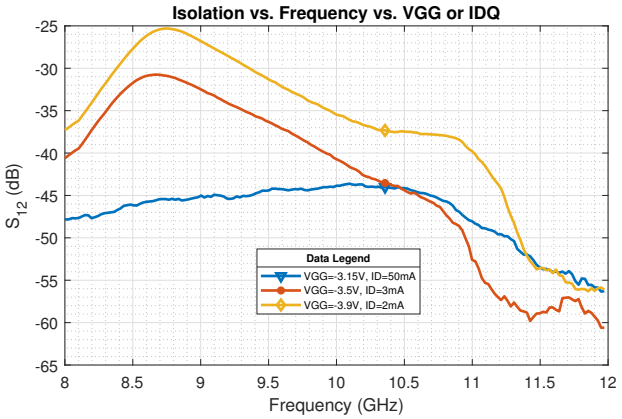


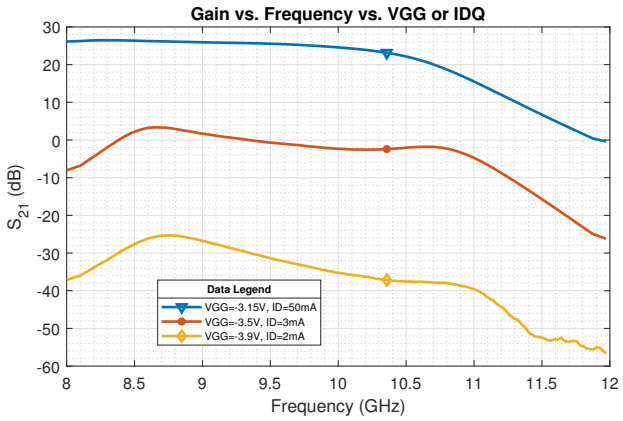


Performance Plots – Small Signal

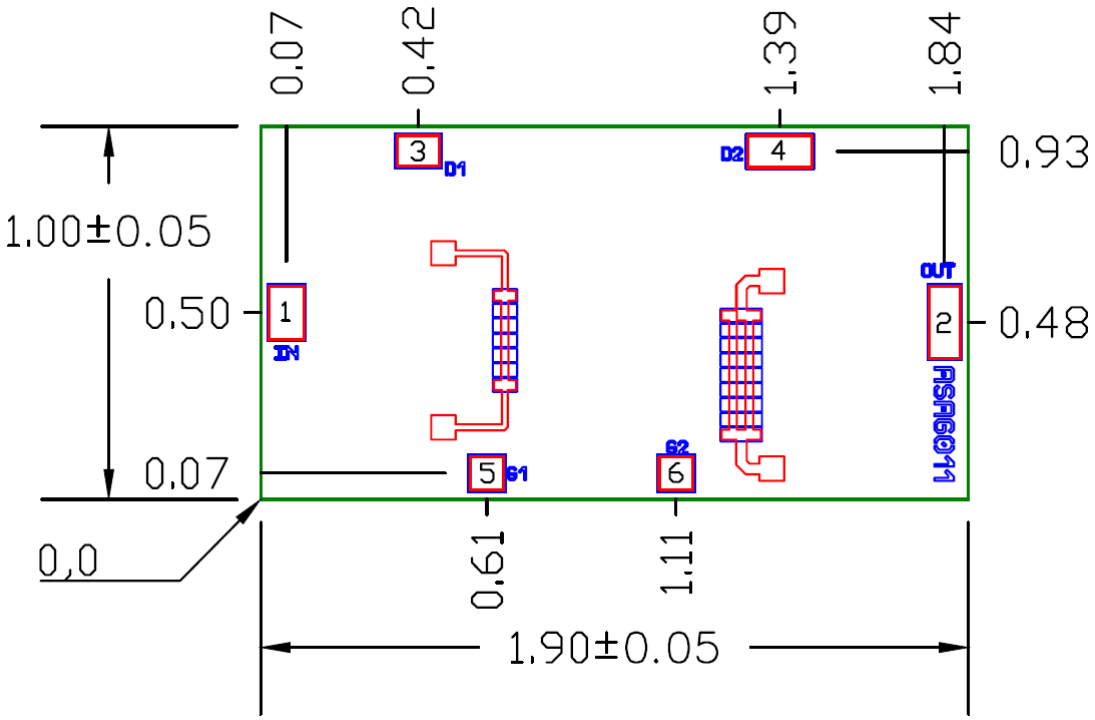
Test conditions unless otherwise noted:VDD=28 V, Tcase=15 °C







Mechanical Information



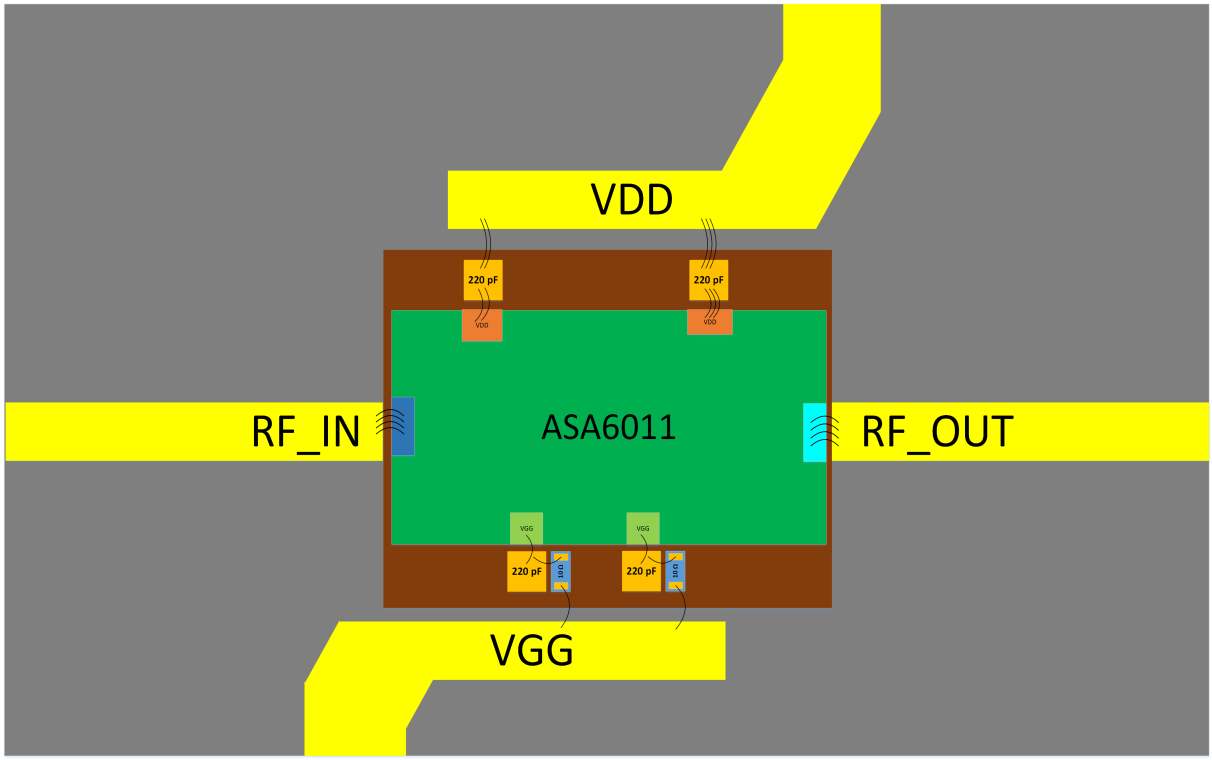
NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS
2. CHIP SIZE = 1.9 mm × 1.0 mm (DICING STREET INCLUDED) ± 0.05 mm
3. RF pads (1) = 0.09 × 0.2 mm
4. RF pads (2) = 0.1 × 0.15 mm
5. DC pads (3) = 0.09 × 0.12 mm
6. DC pads (4) = 0.1 × 0.18 mm
7. DC pads (5,6) = 0.1 × 0.1 mm
8. BACKSIDE METALLIZATION: GOLD
9. BACKSIDE METAL IS GROUND
10. BOND PAD METALIZATION: GOLD
11. NO CONNECTION REQUIRED FOR UNLABELED BOND PADS
12. OVERALL DIE SIZE ±50 µm

Bond Pad Description

1	RF-IN	This pad is AC coupled and matched to 50 Ohms.
2	RF-OUT	This pad is AC coupled and matched to 50 Ohms.
3,4	VDD	Positive Supply Voltage for the amplifier. External bypass capacitors of 220 pF are required.
5,6	VGG	Negative Supply Voltage for the amplifier.

Assembly Diagram



Assembly Notes

Component Placement and Adhesive Attachment Assembly Notes:

1. Use vacuum collet to pick up the die.
2. The force should be controlled during placement and mounting specially no force should be applied to air bridges.

Reflow process assembly notes:

1. Use CMC or MoCu carrier to decrease thermal expansion mechanical stress
2. Use AuSn (80/20) solder and limit exposure to temperatures above 300 °C to 3-4 minutes, maximum.
3. An alloy station or conveyor furnace with reducing atmosphere should be used.
4. Do not use any kind of flux.
5. Devices must be stored in a dry nitrogen atmosphere.
6. Use Au bond wire.

Contact Information

For the latest specifications, additional product information:
Web: `www.abba-semi.com`
Email: info@abba-semi.com