Power Amplifier

PRODUCT DATASHEET RFPA06_EV1

Features:

- RF Frequency: 2-6 GHz
- Small signal gain: 23 dB
- Output P1dB : 25 dBm
- DC drain bias voltage: 5 V
- DC gate bias voltage: - 0.5 V
- DC supply current: 210 mA
- 0.1um GaAs pHEMT Technology
- Die Size : 0.9 mm * 2.6 mm

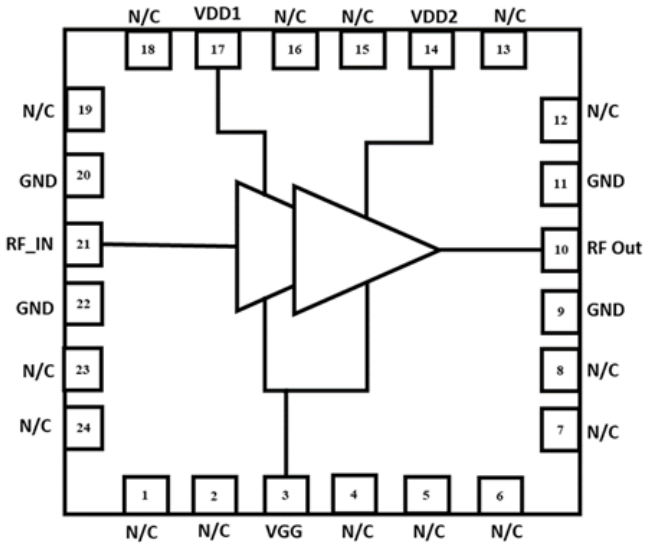
Applications:

- Satellite communication
- Radar systems
- Bluetooth and ISM band applications
- Test and measurement systems

Deliverables:

- Sample Ready Die
- Test Results

Functional Block Diagram



Pin Configuration

Pin No.	Pin Name	Description
1,2,4,5,6,7,8,12,13, 15,16,18,19,23,24	N/C	Not Connected
9,11,20,22	GND	Ground
14	VDD1	Drain Bias Voltage 1
17	VDD2	Drain Bias Voltage 2
3	VGG1	Gate Bias Voltage
10	RF-IN	RF Input
21	RF-OUT	RF Output

Description:

RFPA06 is a two-stage power amplifier operating from 2-6 GHz, designed to deliver output power for RF transmit applications. Based on EVB measurements, the amplifier provides approximately 23 dB of small-signal gain across the operating band.

The input and output are internally matched to 50 ohms and incorporate on-chip DC blocking capacitors, with minimal external components required for optimal performance.

The device is suitable for applications in the 2-6 GHz frequency range, including Bluetooth, Zigbee, WiFi, IoT, and SATCOM systems.

The power amplifier is designed using a 0.1 µm GaAs pHEMT process.

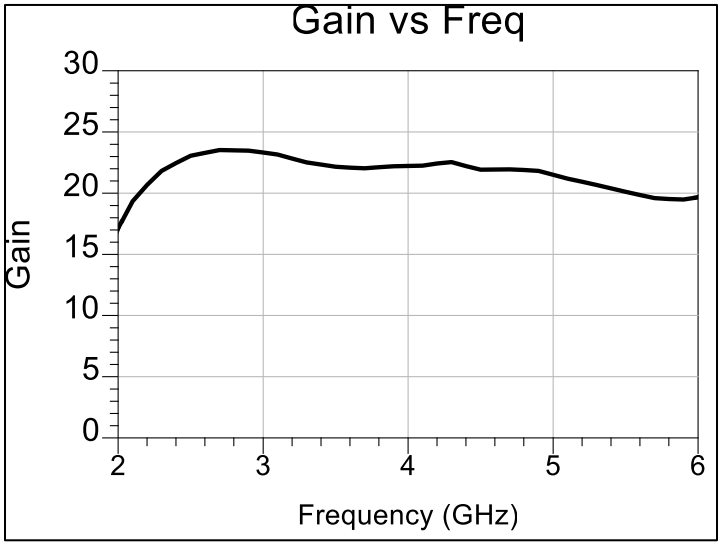
Electrical Specification:

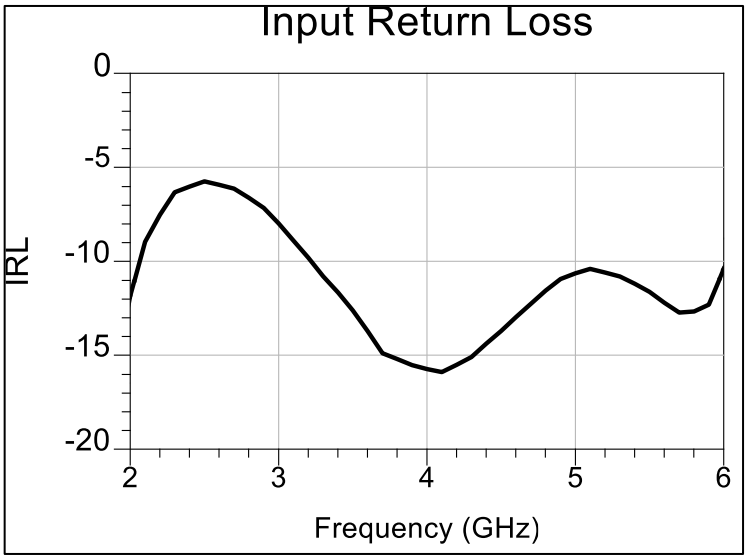
Freq= 2 - 6 GHz, VDD1=VDD2= 5 V, VGG1= - 0.5 V, ID= 210 mA, Zo=50 Ω

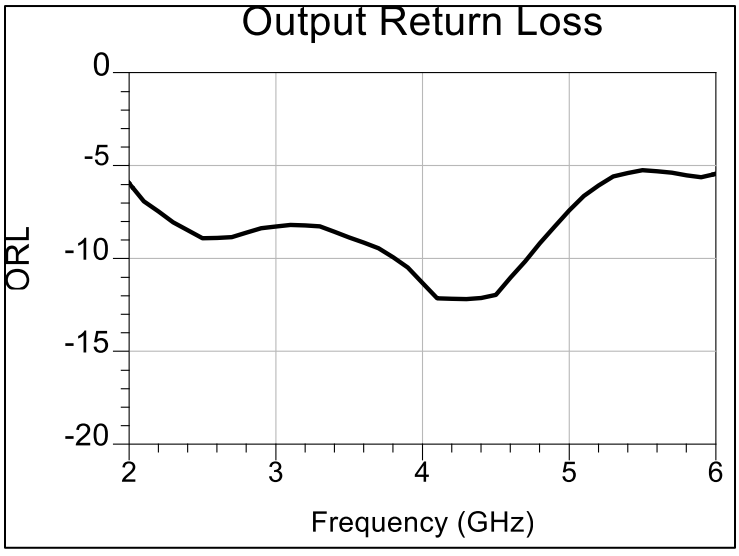
Parameters	Test Condition	Units	Typ
Gain	2 GHz	dB	15.5
	4 GHz		23
	6 GHz		21.9
Output P1 dB	4 GHz	dBm	
	4.5 GHz		25
OIP3 Pin = -11 dBm Δf = 50MHz	2 GHz	dBm	
	4 GHz		38
	6 GHz		
Input Return Loss	2 GHz	dB	12
	4 GHz		16
	6 GHz		11
Output Return Loss	2 GHz	dB	6
	4 GHz		11.5
	6 GHz		6
Operating Bias Conditions			
Drain Current (Id)	-	mA	210
Drain Voltage (VDD)	-	V	5
Gate Voltage (VGG)	-	V	-0.5

EVB Measured Results

Small Signal Analysis:

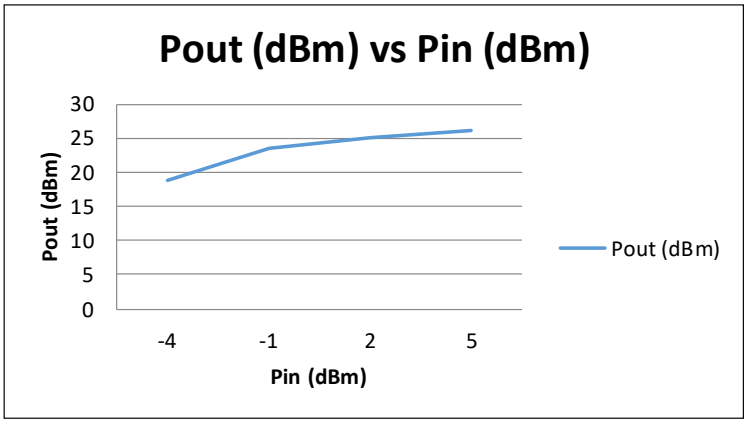


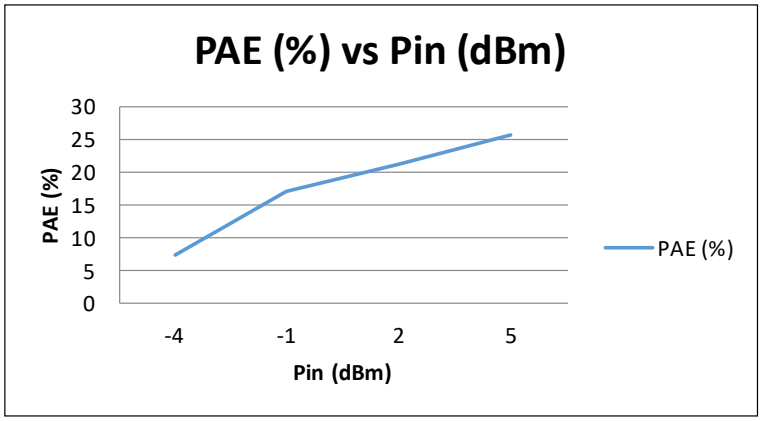




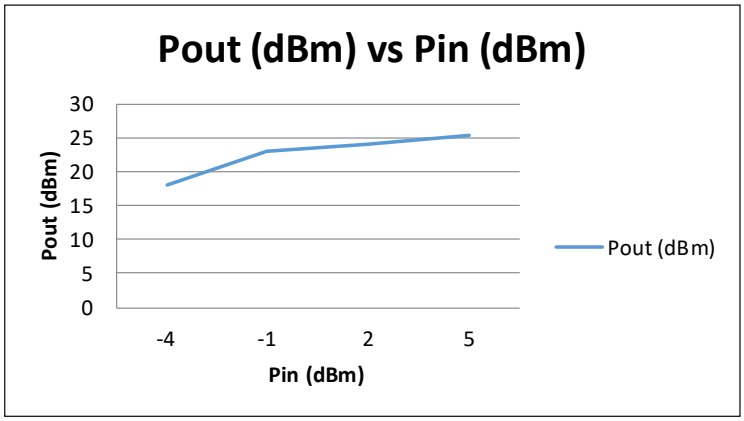
Large Signal Analysis:

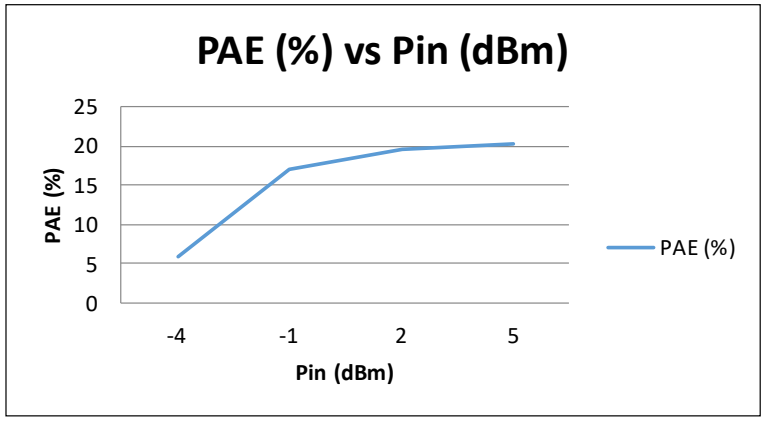
Testing Frequency: 4 GHz



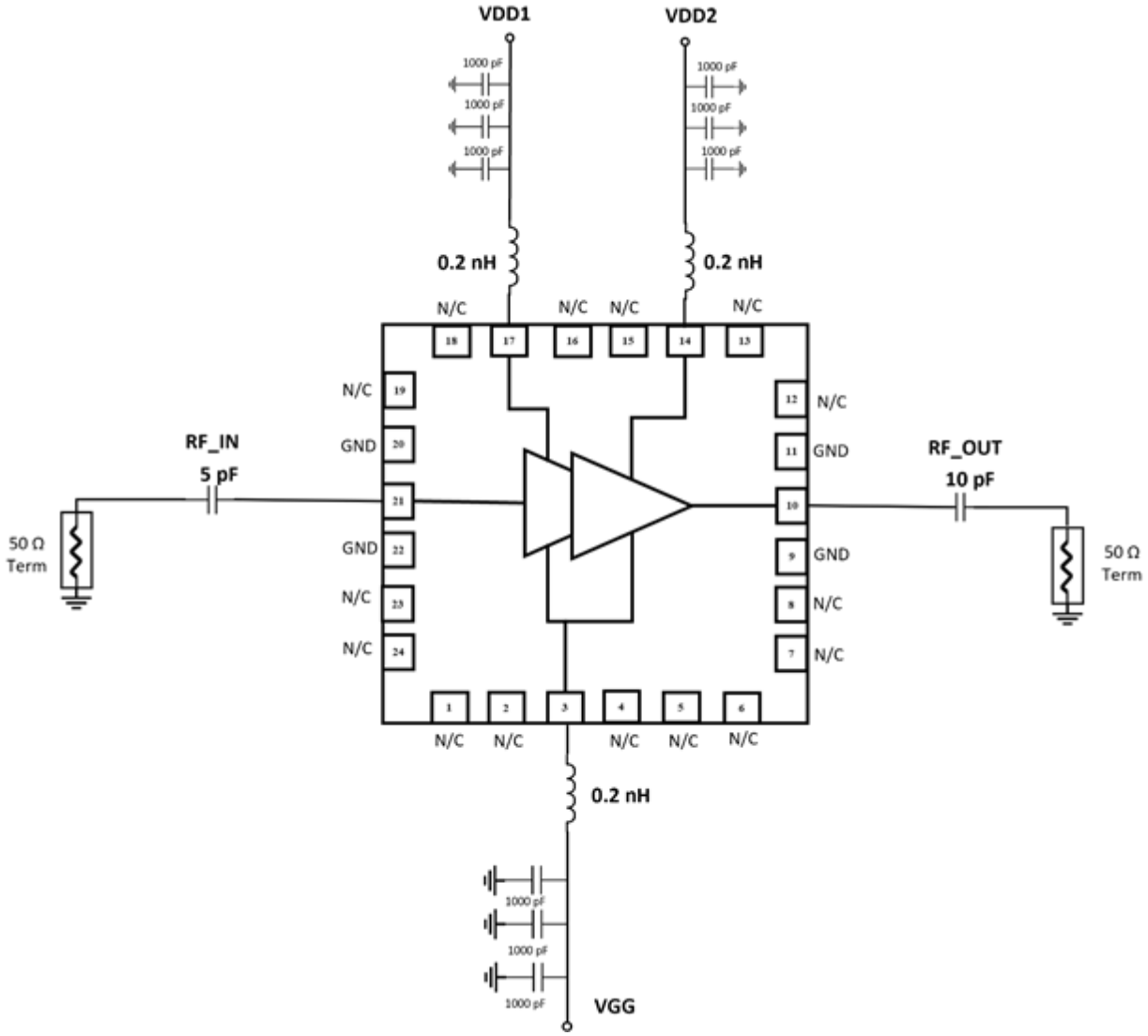


Testing Frequency: 4.5 GHz





Application Diagram:



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Contact information

For the latest specifications, additional product information:

Web: www.signifyrf.com
Email: sales@signifyrf.com
Tel: (+1) 840 356 8957, (+91) 90220 78131, (+91) 84858 41789