ATEK584P4

2 to 6 GHz 2.5W Power Amplifier

Product Description

ATEK584P4 is a GaN MMIC 2.5W power amplifier operating from 2 to 6 GHz while providing 25dB of small signal gain.

The ATEK584P4 amplifier delivers 2.5W of output power at 30% PAE across the operating frequency range with an +18dBm RF input power applied.

Amplifier housed in compact 4x4mm SMD package, input and output matched to 50 ohms internally.

Evaluation Board, bare die, custom package, and module options are available upon request.

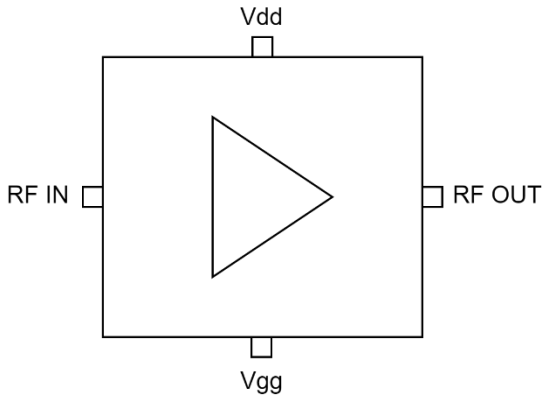
Product Features

- Frequency Range: 2 - 6 GHz
- Gain: 25 dB
- Large Signal Gain: 15 dB
- Output Power: 2.5W
- 30% PAE
- VD= +25V, IDQ=40mA
- 4x4 mm Compact Size

Applications

- S & C-Band Radar
- EW / ECM / C-UAS
- Test & Measurement
- WiFi & ISM
- SDRs

Functional Block Diagram



Electrical Specifications

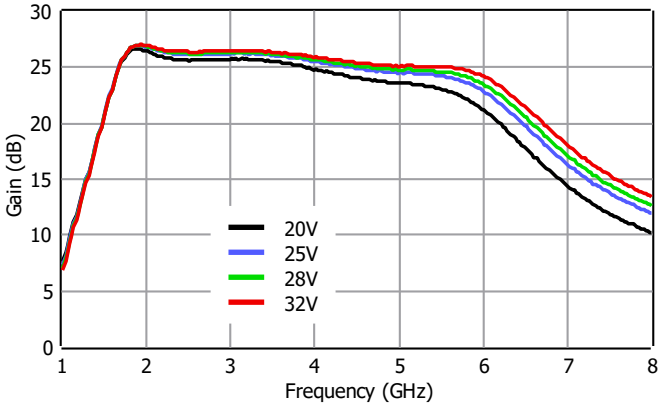
Conditions unless otherwise specified: V_{DD} = 25 V, I_{DQ} = 40 mA, Typical, T = 25 C, CW.

Parameter		Min	Typ	Max	Units
Operational Frequency Range		2		6	GHz
Output Power at 18 dBm Input Power	2 GHz		32.3		dB
	4 GHz		33.9		
	6 GHz		33.7		
Small Signal Gain	2 GHz		26.4		dB
	4 GHz		25.2		
	6 GHz		22.5		
Input Return Loss			-17		dB
Output Return Loss			-12		dB
Noise Figure			TBD		dB
Output IP3			TBD		dBm
Drain Voltage (Vdd)		20	25	32	dBm
Gate Voltage (Vgg) *Adjust the gate voltage between −4V and −1V to achieve an IDQ = 40mA typical*			-2.1		V
Quiescent Current (Idq)			40		mA
PAE			30		%
Operating Temperature		-40		85	°C

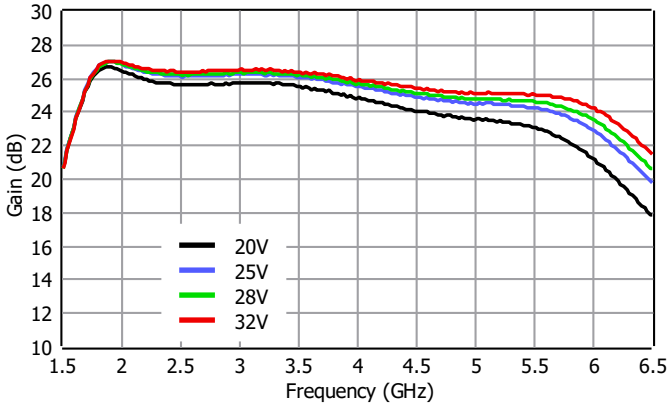
Typical Performance Plots

Conditions unless otherwise specified: V_{DD} = 25 V, I_{DQ} = 40 mA, Typical, T = 25 C, CW.

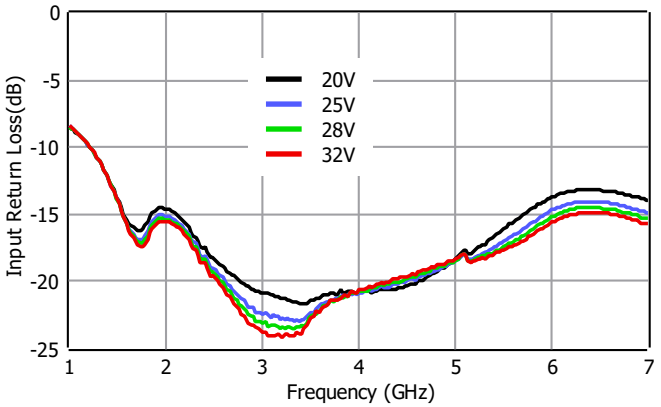
Wideband Gain



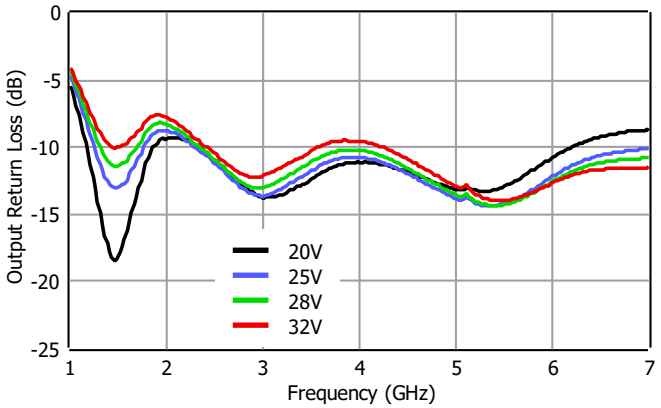
Gain



Input Return Loss



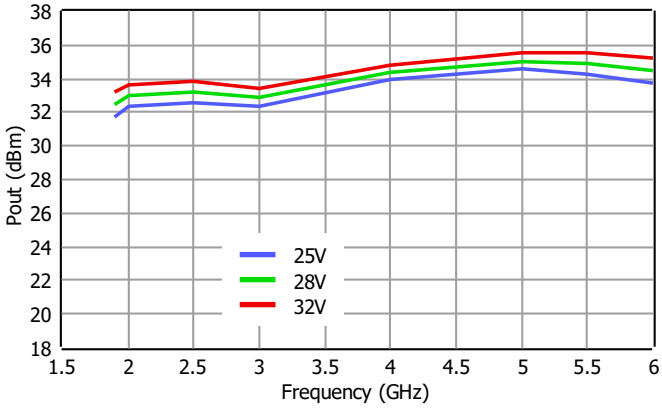
Output Return Loss



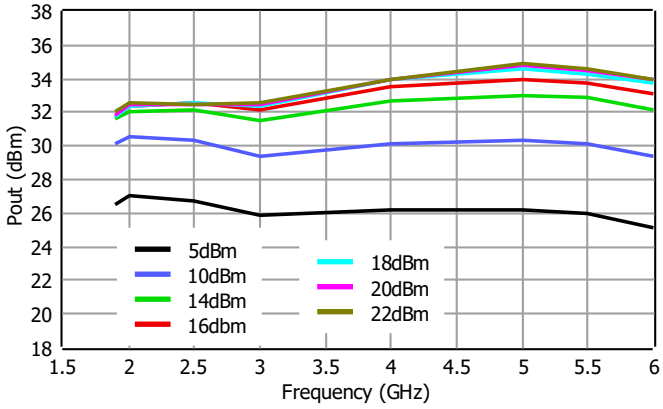
Typical Performance Plots

Conditions unless otherwise specified: V_{DD} = 25 V, I_{DQ} = 40 mA, Typical, T = 25 C, CW.

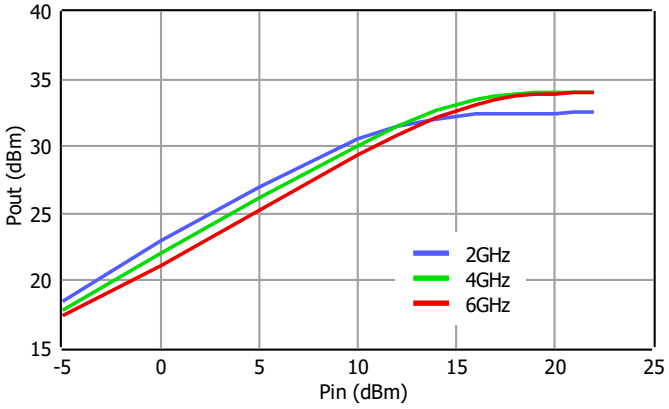
Pout vs Vdd, Pin = +18 dBm



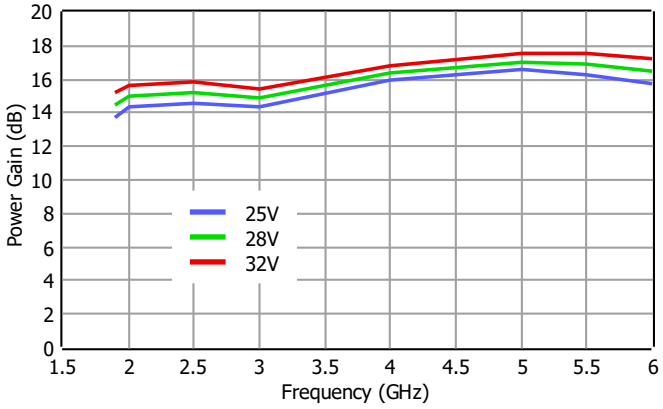
Pout vs Frequency, Pin



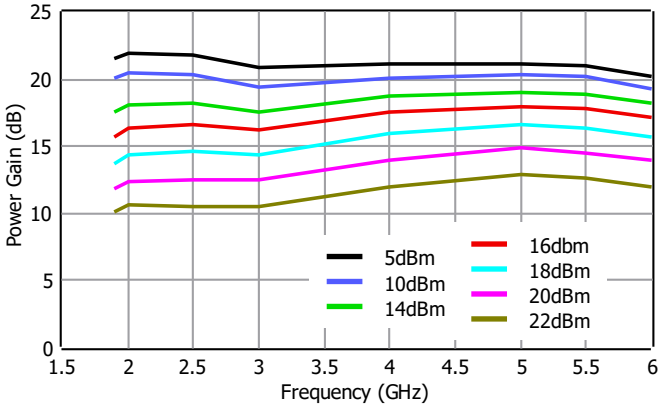
Pout vs Pin, Frequency



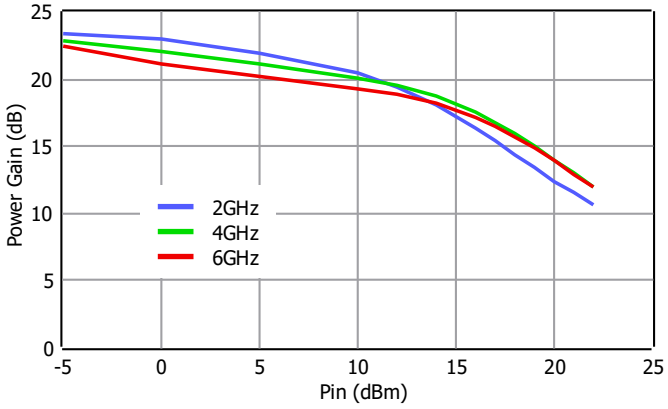
Power Gain vs Vdd, Pin = +18 dBm



Power Gain vs Frequency, Pin



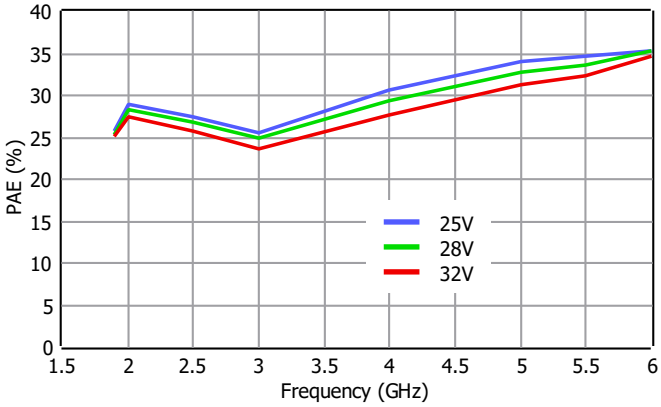
Power Gain vs Pin, Frequency



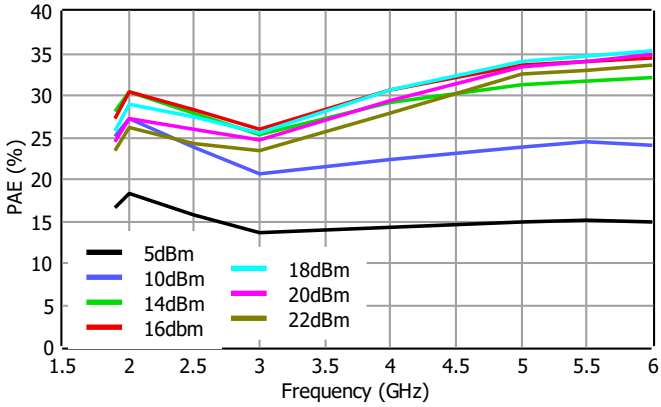
Typical Performance Plots

Conditions unless otherwise specified: V_{DD} = 25 V, I_{DQ} = 40 mA, Typical, T = 25 C, CW.

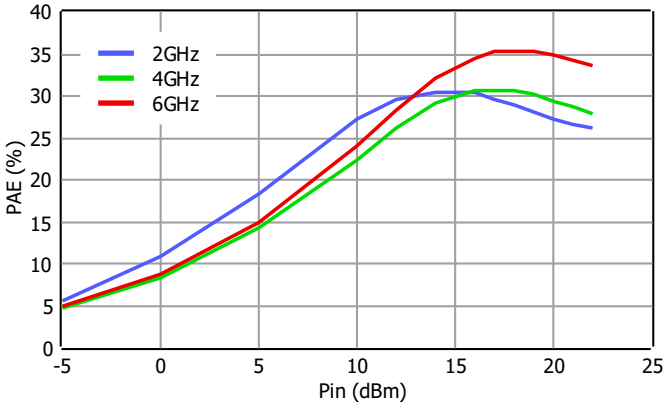
PAE vs Vdd, Pin = +18 dBm



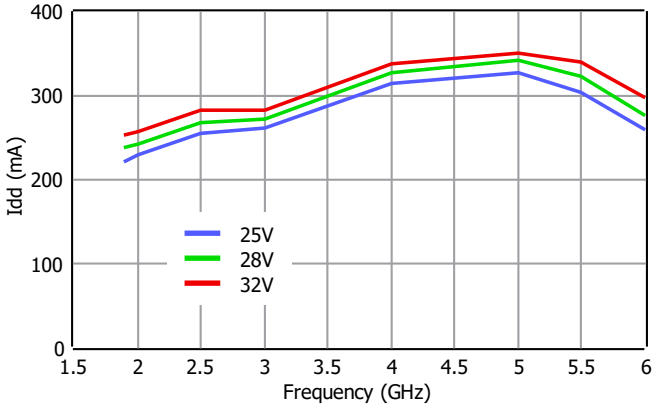
PAE vs Frequency, Pin



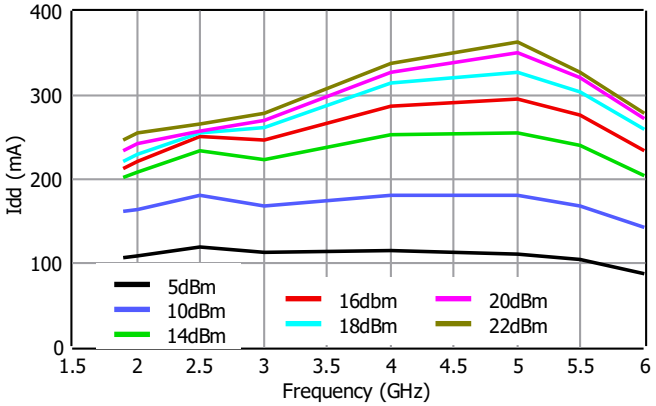
PAE vs Pin, Frequency



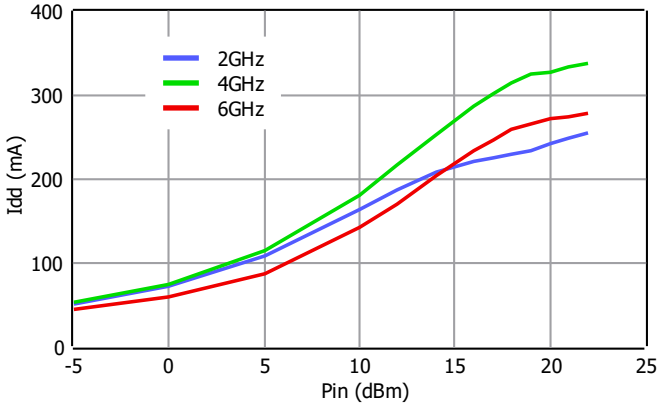
Idd vs Vdd, Pin = +18 dBm



Idd vs Frequency, Pin



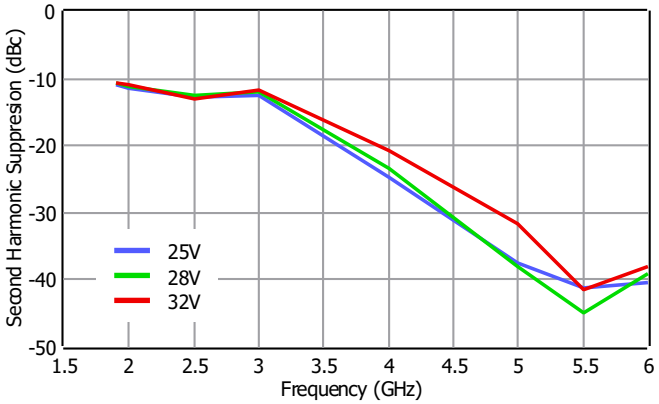
Idd vs. Pin, Frequency



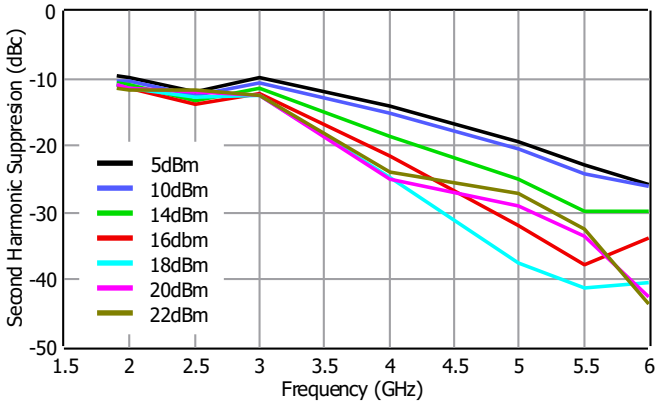
Typical Performance Plots

Conditions unless otherwise specified: V_{DD} = 25 V, I_{DQ} = 40 mA, Typical, T = 25 C, CW.

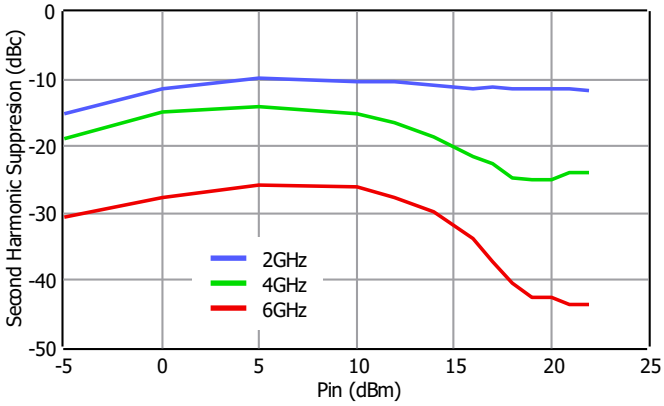
2nd Harmonic vs Vdd, Pin = +18 dBm



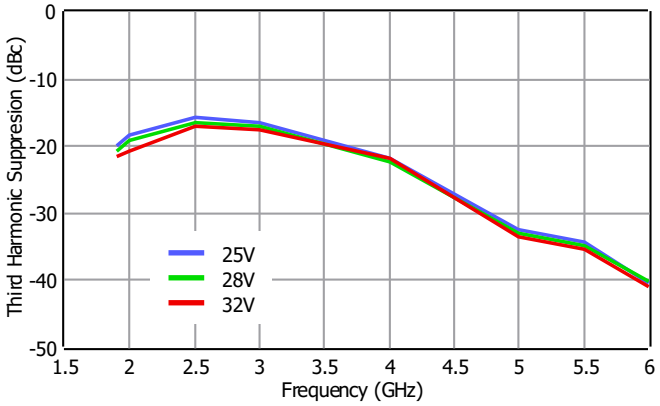
2nd Harmonic vs Frequency, Pin



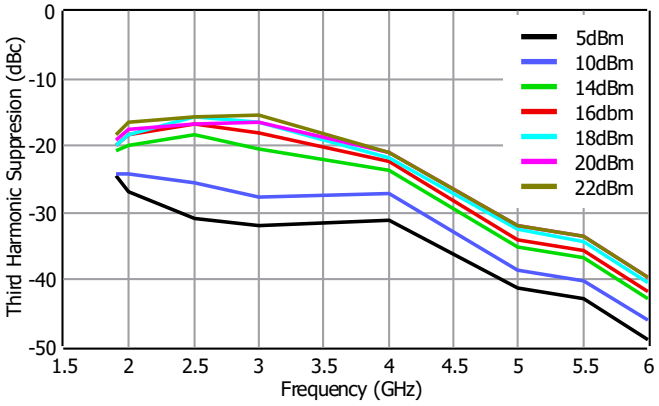
2nd Harmonic vs Pin, Frequency



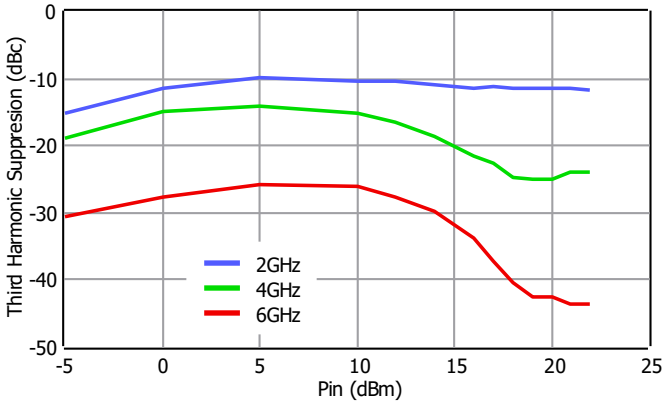
3rd Harmonic vs Vdd, Pin = +18 dBm



3rd Harmonic vs Frequency, Pin



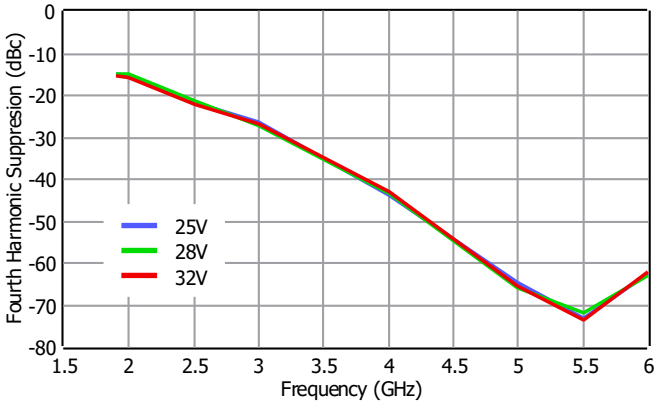
3rd Harmonic vs. Pin, Frequency



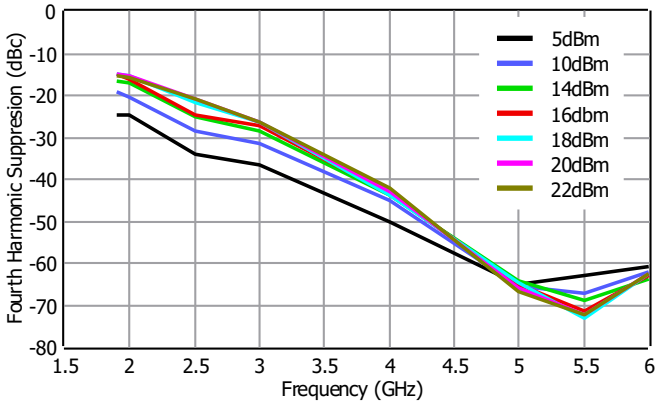
Typical Performance Plots

Conditions unless otherwise specified: V_{DD} = 25 V, I_{DQ} = 40 mA, Typical, T = 25 C, CW.

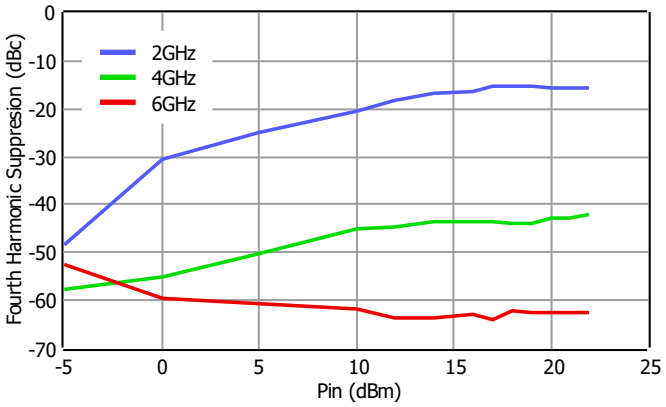
4th Harmonic vs Vdd, Pin = +18 dBm



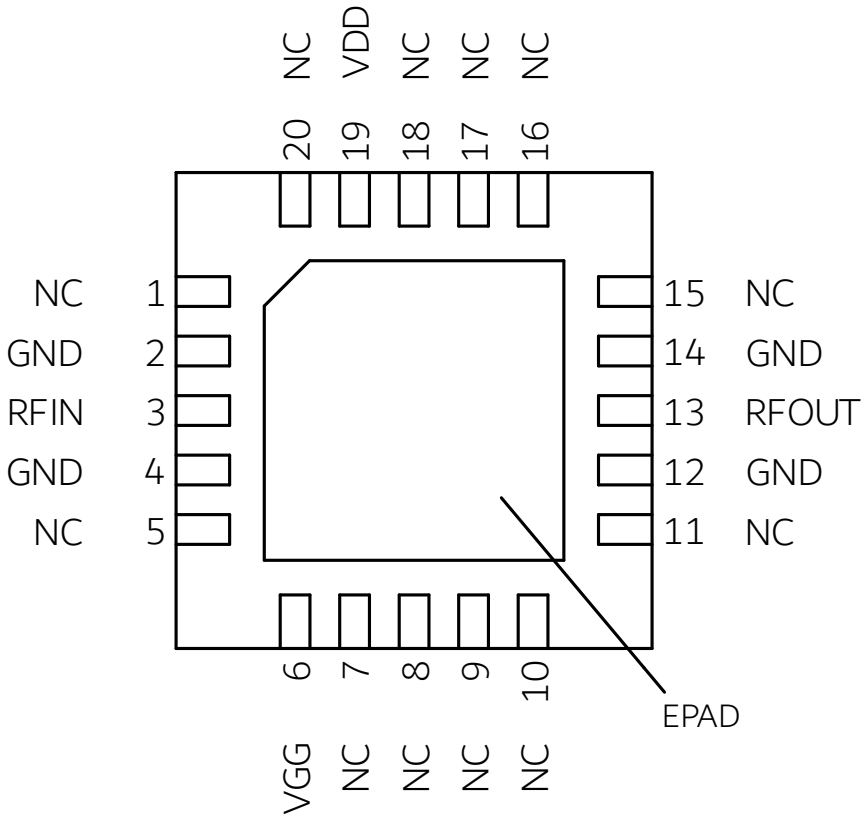
4th Harmonic vs Frequency, Pin



4th Harmonic vs Pin, Frequency



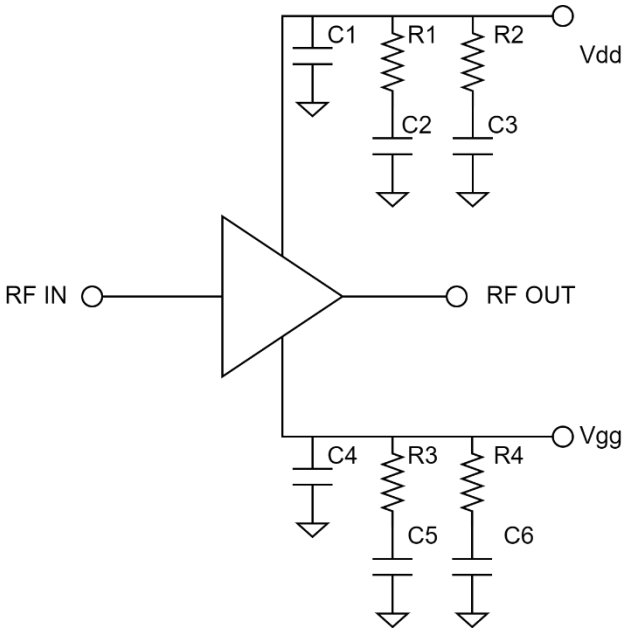
Pin Description



Pin Number	Pin Name	Description
3	RF IN	RF input pin. AC Coupled.
13	RF OUT	RF output pin. AC Coupled.
19	VDD	Vdd supply pin.
6	VGG	Vgg bias pin.
1, 5, 7-11, 15-18, 20	NC	These pins are not internally connected. Can be grounded on the PCB.
2, 4, 12, 14	GND	Ground.
21	EPAD	Exposed Pad on the bottom of the package should be connected to ground with multiple number of vias to reduce the inductance to the GND.

Applications Information

Signal entering from RF IN goes to RF OUT with an amplification.
A typical application schematic to operate the amplifier is given below.



C1 to C6 and R1 to R4 are used to filter out the ripples and unwanted signals coming from the Vdd supply.

All plots are generated with the ATEK581P4 mounted to a connectorized evaluation board. The PCB trace and connector transition losses are de-embedded, to generate plots shown in this document.

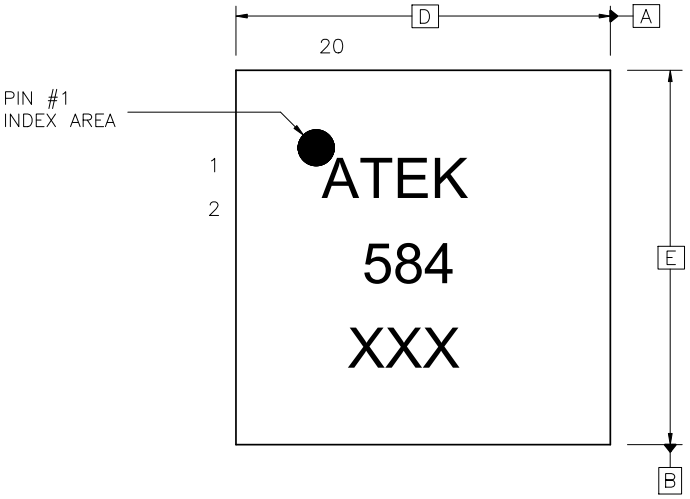
The NC pins of the Amplifier are connected to the GND on the PCBs used to generate the plots shown in this document.

Absolute Maximum Ratings

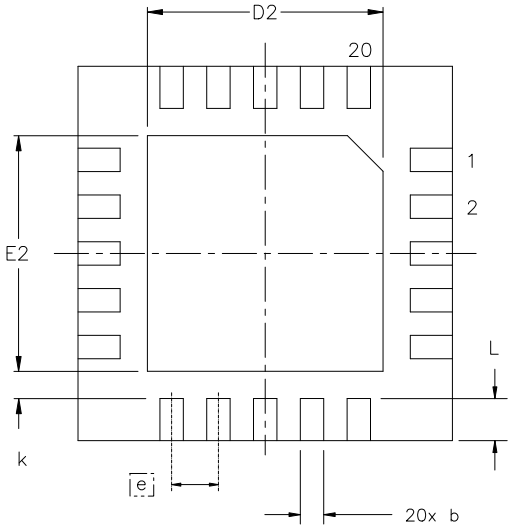
Parameter	Value/Range
Supply Voltage (Vdd)	+32V
RF Input Power (Vdd = +25V)	+24dBm
Channel Temperature	220 °C
Thermal Resistance	20°C/W
Power Dissipation (Ta=85 °C)	6W
Storage Temperature	−55 to +125 °C
Operating Temperature	−40 to +85 °C

Operation of this device outside the parameter ranges given above may cause damage. These conditions should not be applied simultaneously.

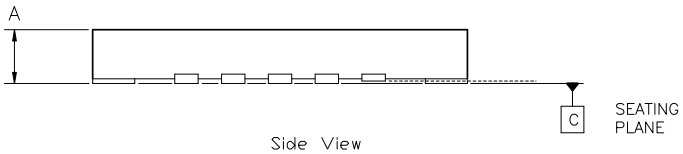
Mechanical and Marking Information



Top View



Bottom View



Side View

NOTES:
1) ALL DIMENSIONS IN MM

△

SYMBOL	MIN	MAX	SYMBOL	MIN	MAX
A, V	0.80	1.00	E2	2.42	2.62
b	0.18	0.30	e	0.50 BSC	
D	4.00 BSC		k	0.20	–
D2	2.42	2.62	L	0.40	0.50
E	4.00 BSC				

Handling Precautions

Caution!
ESD-Sensitive Device
Handle Accordingly

Contact Information

For the latest specifications, additional product information, support, and sales.
Web: www.atekmidas.com
Tel: +90-212-483-71-67
Email: support@atekmidas.com

Notice

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Revisions

Revision No	Revision Date	Revision Reason	Section / Page No
0.1	10.11.2025	Initial Release	
0.2	05.06.2025	Product Release, Format & Content Fixed	