AM1149 – Amplifier

6 to 26.5 GHz Slope Correcting Gain Block

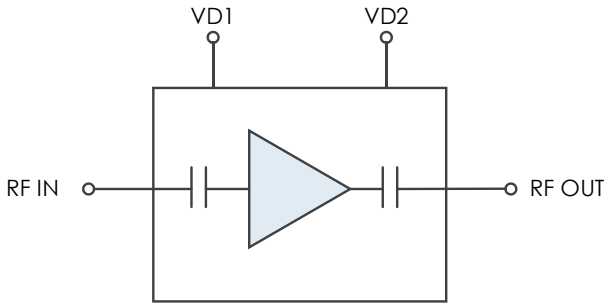
Description

AM1149 is a wideband, cascadable amplifier servicing the 6 to 26.5 GHz frequency range. The device exhibits 2 dB of positive gain slope across the frequency range. The increasing gain across frequency makes the AM1149 an ideal solution to equalize gain/insertion loss across an RF system. Combining both gain and equalization while packaged in a 3mm QFN with internal 50Ω matching, the AM1149 is a small form-factor solution that can enable low SWaP applications.

Features

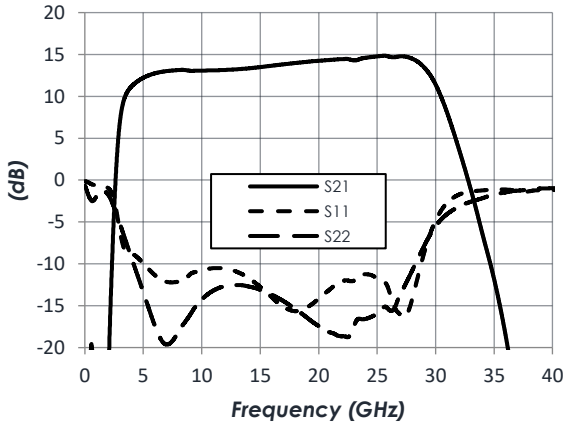
- 2 dB Gain Slope
- 12.5 dB Gain at 6 GHz
- 14.5 dB Gain at 26.5 GHz
- 2.8 dB Noise Figure
- +25 dBm OIP3
- +13 dBm P1dB
- +3.3V Operation
- 3mm QFN
- -40C to +85C Operation

Functional Diagram

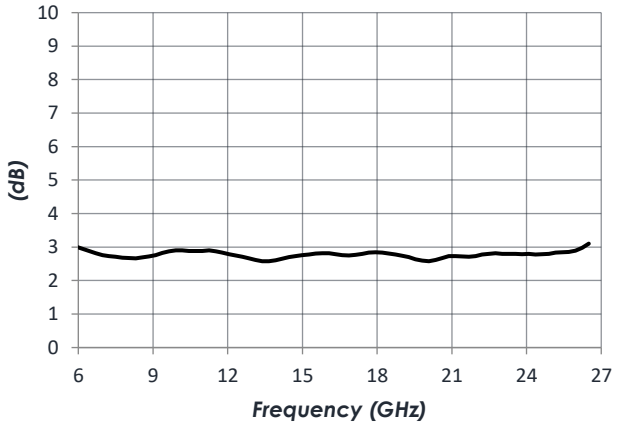


Characteristic Performance

Gain and Return Loss at +25C



Noise Figure



To obtain price, delivery, or to place an order contact sales@atlantamicro.com
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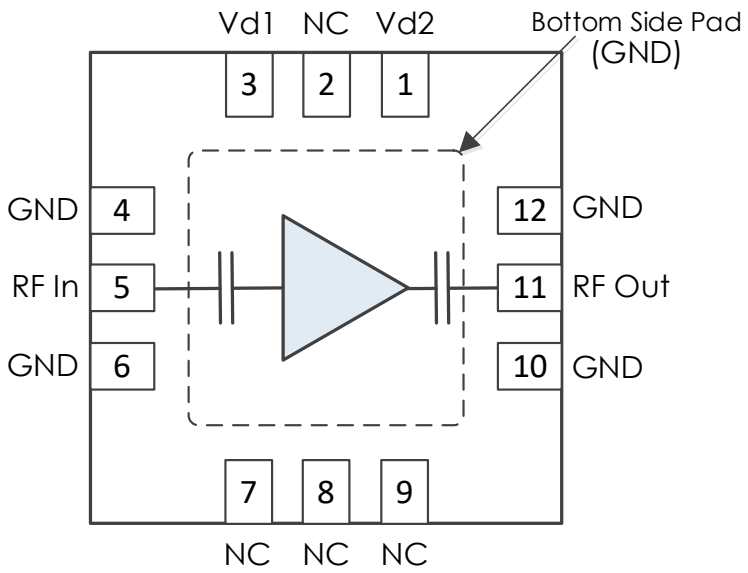
Revision History

Date	Revision Number	Notes
November 15, 2022	1	Initial Release

Pin Layout and Definitions



Pin Number	Pin Name	Pin Function
1	Vd2	DC Power Input
2	NC	No Connect
3	Vd1	DC Power Input
4	GND	Ground – Common
5	RF In	RF Input – 50 Ohms – AC Coupled
6	GND	Ground – Common
7-9	NC	No Connect
10	GND	Ground – Common
11	RF Out	RF Output – 50 Ohms – AC Coupled
12	GND	Ground – Common

Note: NC pins may be grounded or left open

Specifications

Absolute Maximum Ratings

	Minimum	Maximum
Supply Voltage	-0.3 V	+3.6 V
RF Input Power		15 dBm
Storage Temperature Range	-55 C	+150 C

Note: *Any device operation beyond the* Absolute Maximum Ratings *may result in permanent damage to the device. The values listed in this table are extremes and do not imply functional operation of the device at these or any other conditions beyond what is listed under* Recommended Operating Conditions. *Any part subjected to conditions outside of what is recommended for an extended amount of time may suffer from reliability concerns.*

Handling Information

	Minimum	Maximum
Moisture Sensitivity Level	MSL 3	

Atlanta Micro products are electrostatic sensitive.
Follow safe handling practices to avoid damage

Recommended Operating Conditions

	Minimum	Typical	Maximum
Supply Voltage		+3.3 V	
Operating Case Temperature	-40 C		+85 C

Thermal Information

Junction to Case Thermal Resistance (θ_{JC})	210 C/W
Nominal Junction Temperature at +85C Ambient	155 C
Channel Temperature to Maintain 1 Million Hour MTTF	175 C

DC Electrical Characteristics

(T = 25 °C unless otherwise specified)

Parameter	Testing Conditions	Minimum	Typical	Maximum
DC Supply Voltage			+3.3 V	
DC Supply Current	VDD = +3.3 V		91 mA	
Power Dissipated	VDD = +3.3 V		300 mW	

RF Performance

(T = 25 °C unless otherwise specified)

Parameter	Testing Conditions	Minimum	Typical	Maximum
Frequency Range		6 GHz		26.5 GHz
Insertion Loss	f = 6 GHz		12.7 dB	
	f = 16 GHz		13.7 dB	
	f = 26.5 GHz		14.7 dB	
Return Loss	f = 6 GHz		-11 dB	
	f = 16 GHz		-14 dB	
	f = 26.5 GHz		-15 dB	
Output IP3	f = 16 GHz		25.5 dBm	
Output P1dB	f = 16 GHz		13 dBm	
Noise Figure	f = 16 GHz		2.8 dB	

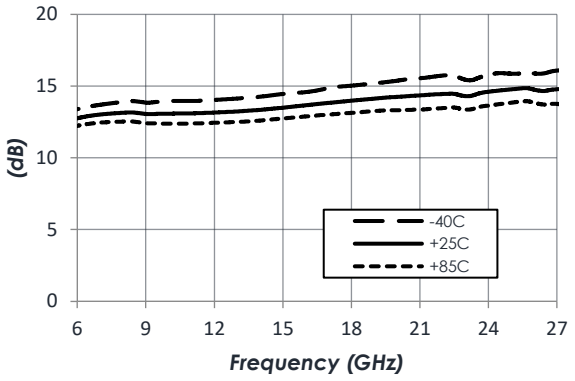
Notes:

1. IP3 measured with 0dBm output power tones at 10MHz spacing

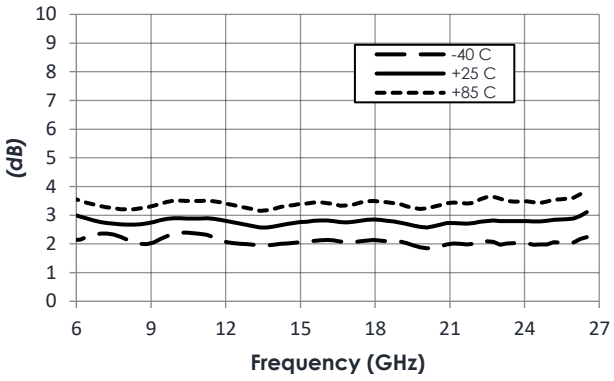
Typical Performance

(VDD = +3.3V, T = 25 °C unless otherwise specified)

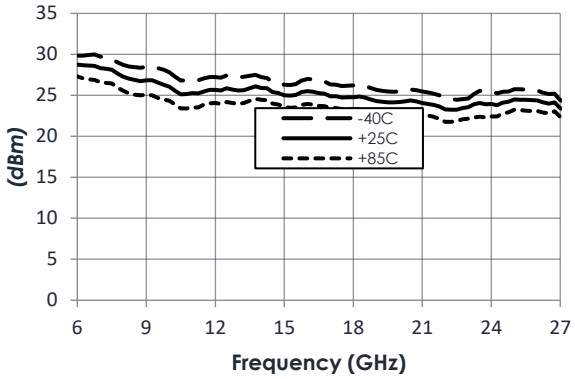
Gain vs Temperature



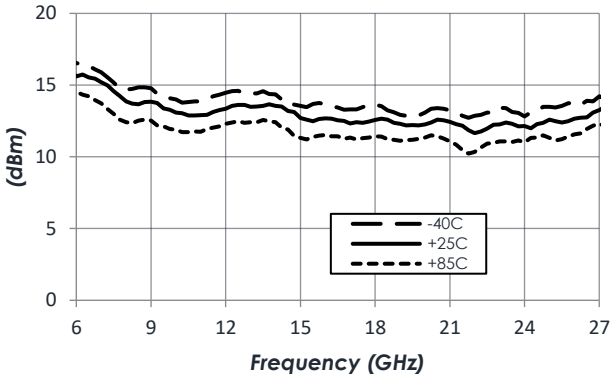
Noise Figure vs Temperature



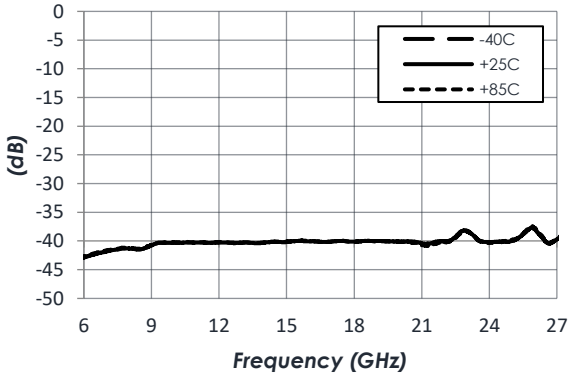
Output IP3 vs Temperature



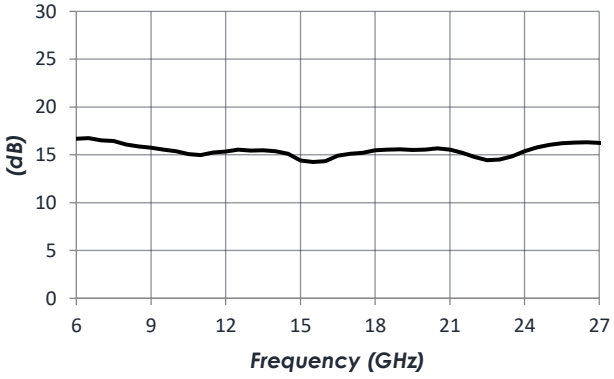
P1dB vs Temperature



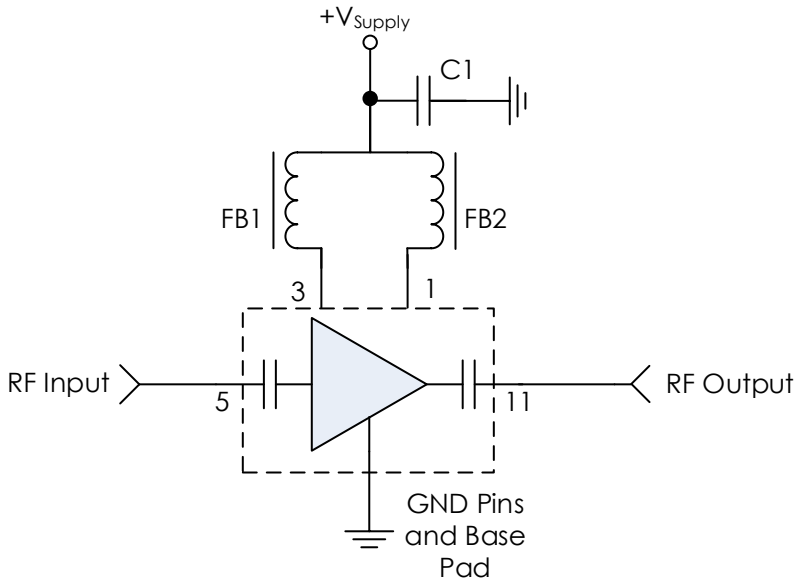
Reverse Isolation vs Temperature



Power Saturation



Typical Application



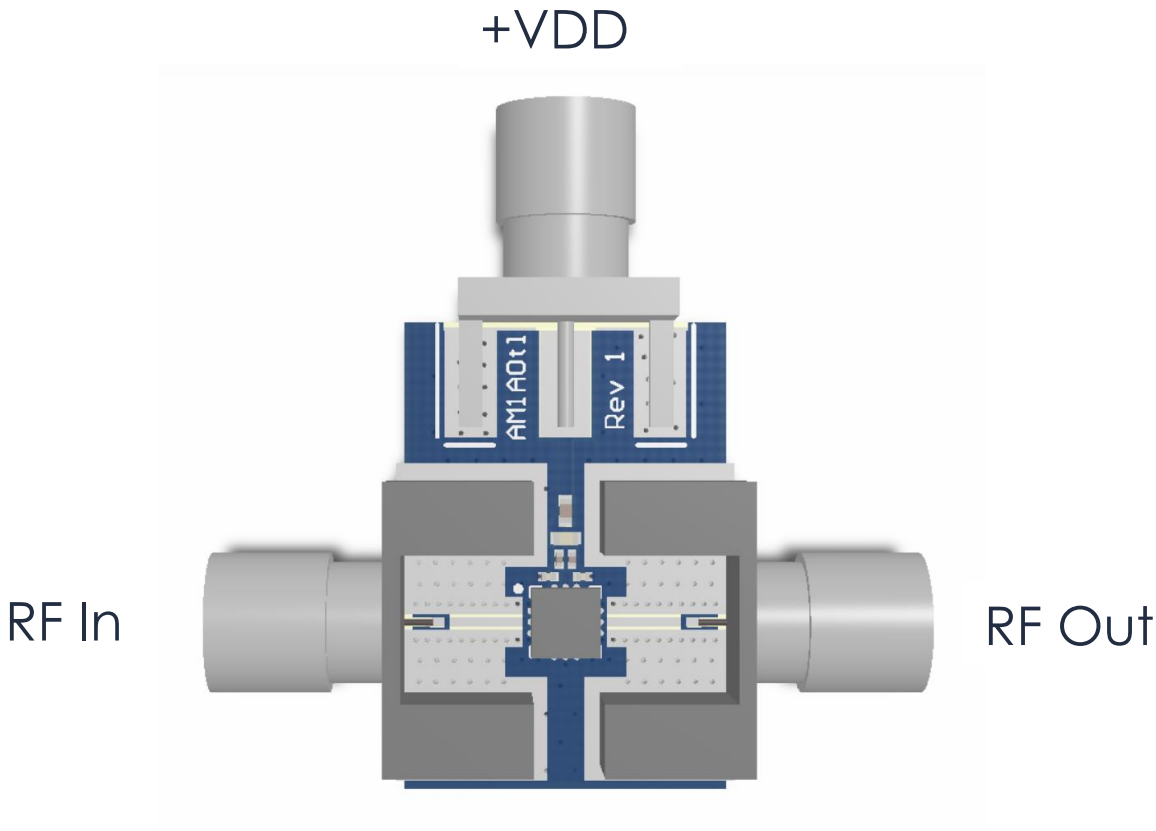
Recommended Component List (or equivalent):

Part	Value	Part Number	Manufacturer
C1	0.1 uF	C1005X7R1H104K05BB	TDK
FB1, FB2	-	MMZ1005A222E	TDK

Notes:

1. AM1149 is AC coupled. No external DC blocking capacitors are required.

Evaluation PC Board



Related Parts

Part Number				Description
AM1101	2 GHz	to	26.5 GHz	Bypassable Amplifier
AM1134	6 GHz	to	26.5 GHz	Low Noise Amplifier
AM1147	6 GHz	to	26.5 GHz	Gain Equalizing Amplifier
AM1148	6 GHz	to	26.5 GHz	Gain Equalizing Amplifier

Component Compliance Information

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Substance List	Allowable Maximum Concentration
Lead (Pb)	<1000 PPM (0.1% by weight)
Mercury (Hg)	<1000 PPM (0.1% by weight)
Cadmium (Cd)	<75 PPM (0.0075% by weight)
Hexavalent Chromium (CrVI)	<1000 PPM (0.1% by weight)
Polybrominated Biphenyls (PBB)	<1000 PPM (0.1% by weight)
Polybrominated Diphenyl ethers (PBDE)	<1000 PPM (0.1% by weight)
Decabromodiphenyl Deca BDE	<1000 PPM (0.1% by weight)
Bis (2-ethylheyl) Phthalate (DEHP)	<1000 PPM (0.1% by weight)
Butyl Benzyl Phthalate (BBP)	<1000 PPM (0.1% by weight)
Dibutyl Phthalate (DBP)	<1000 PPM (0.1% by weight)
Diisobutyl Phthalate (DIBP)	<1000 PPM (0.1% by weight)

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