NuPhotonics

Part Number: A001T67
Product State: Alpha Build

Rev. 0.4 – Nov. 2023

100 KHz – 67 GHz Amplifier

Description

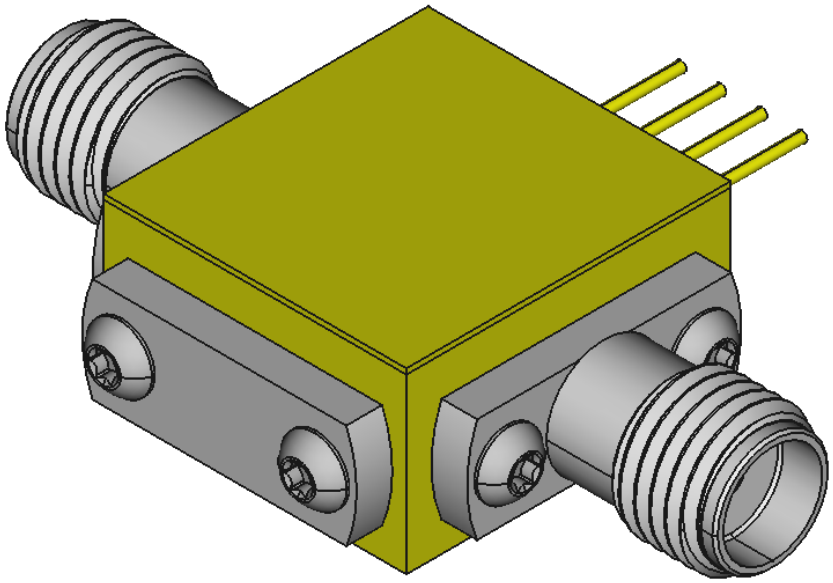
A001T67 is an ultrawide band amplifier that operates from 100 KHz to 67 GHz. The amplifier is packaged in a hermetic package with easy to use 1.85 mm coaxial connectors. The device features good RF matching across the entire operating band for both input and output. This device only requires positive bias voltage.

Features

- Coaxial package
- 14 dB Gain
- 4.6 dB Noise Figure
- 12 dB return loss
- 20 dBm P3dB
- Positive bias voltage
- 20 dB Reverse isolation
- 1.85 mm connectors

Applications

- Communication systems
- Datacenters
- Test and Measurement



Rendered production device

Electrical Specifications (T_{op} 23 ± 3°c, unless otherwise specified)

Parameter	Min.	Typ.	Max.	Unit	Test Conditions
Gain		16 15 14 10		dB	100 KHz – 10 GHz 10 – 50 GHz 50 – 60 GHz 60 – 67 GHz
Noise Figure		6 4.3 4.7		dB	1 - 10 GHz 10 – 20 GHz 20 – 27 GHz
Inputout Return loss	10 10 10	17 16.2 14.8		dB	100 KHz -20 GHz 20 – 40 GHz 40 – 67 GHz
Output Return loss	10 10 10	15 13 11.7		dB	100 KHz -20 GHz 20 – 40 GHz 40 – 67 GHz
P1dB		17.5 17 17.5		dBm	100 KHz – 10 GHz 10 – 20 GHz 20 – 27 GHz
P3dB		21 21 19		dBm	100 KHz – 10 GHz 10 – 20 GHz 20 – 27 GHz
OIP3		25 25 25.5		dBm	100 KHz – 10 GHz 10 – 20 GHz 20 – 27 GHz

Absolute Maximum Ratings

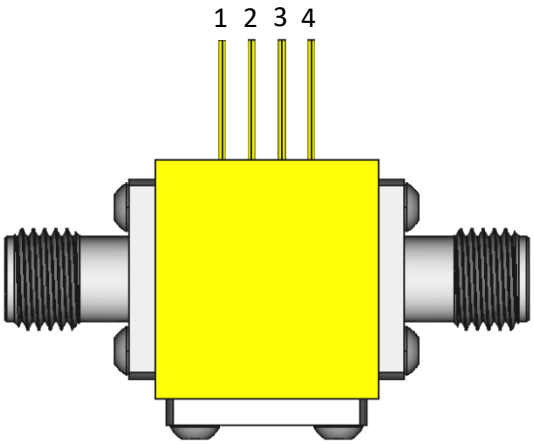
Parameter	Symbol	Condition	Min.	Max.	Unit
Drain Voltage	V			8	V
Drain Current[1]	I_d			150	mA
Storage Temperature	T_{stg}		-65	120	°C
Storage Humidity	H_{stg}			85	% r.H.
Operating Temperature	T_{op}		-40	85	°C
ESD Susceptibility[2]		HBM		1000	V
Input Power	P_{in}	CW		25	dBm

Operating at maximum ratings for a prolonged period will cause damage to the device.

[1] Drain current is limited by the junction temperature.

[2] ESD sensitive device, proper ESD protection procedures must be followed.

Pin Configuration



Pin Number	Function
1	Gate Voltage 1 (V_{G1})
2	Gate Voltage 2 (V_{G2})
3	Detector Voltage (V_{DET})
4	Drain Voltage (V_{DD})

Power On Procedure

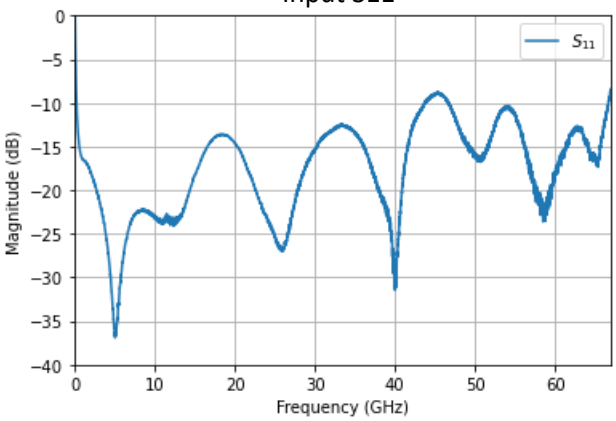
1) Set V_{G1} to 0v
2) Set V_{DD} to 6v
3) Adjust V_{G1} more positive until desired drain current is achieved (Typically 0.65V for Id = 135 mA)
4) Apply RF input signal

Power OFF Procedure

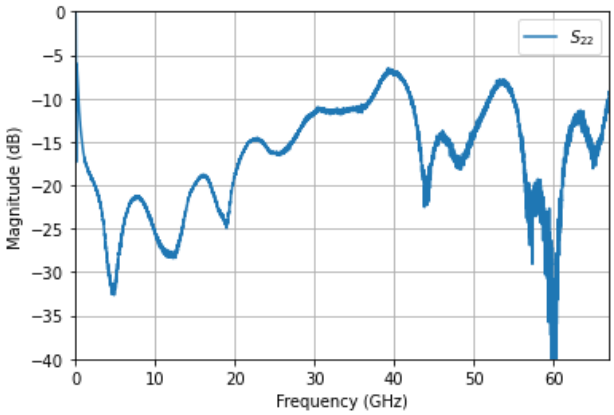
1) Remove RF input signal
2) Set V_{G1} to 0V
3) Slowly decrease V_{DD} to 0V

Typical performnace curves (T_{op} 23 ± 3°c, Id = 125 mA)

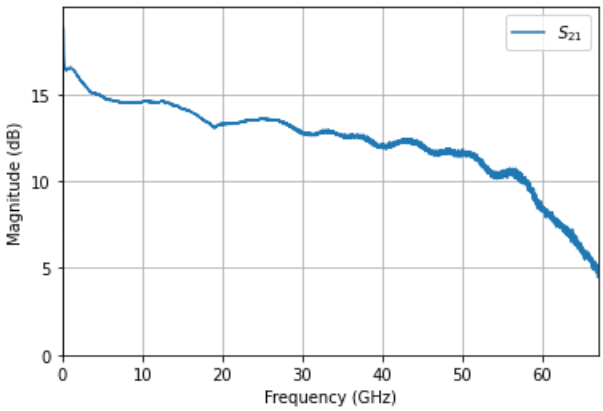
Input S11



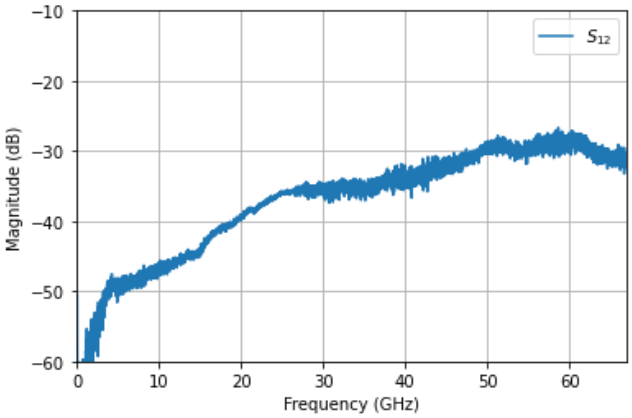
Output S22



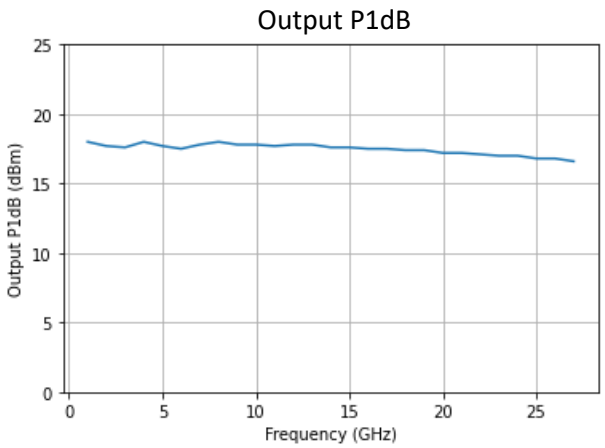
Gain

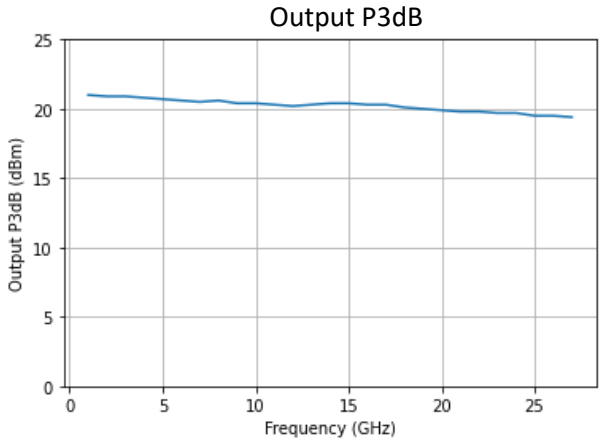


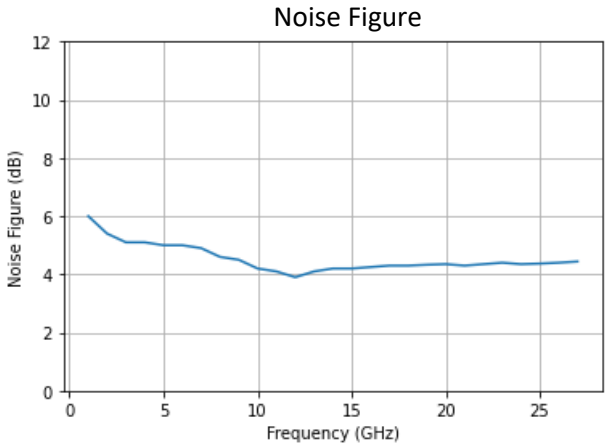
Reverse Isolation

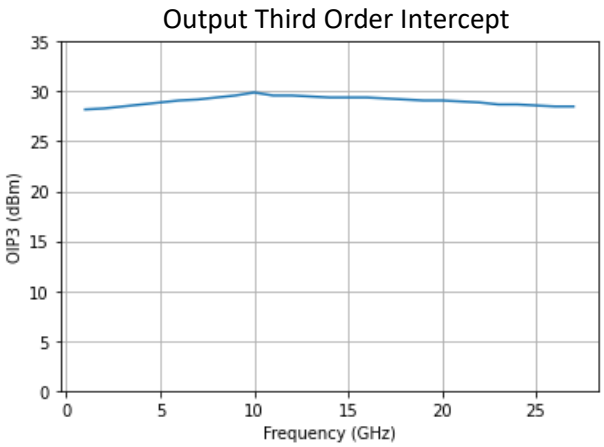


Typical performnace curves (T_{op} 23 ± 3°c, Id = 125 mA)



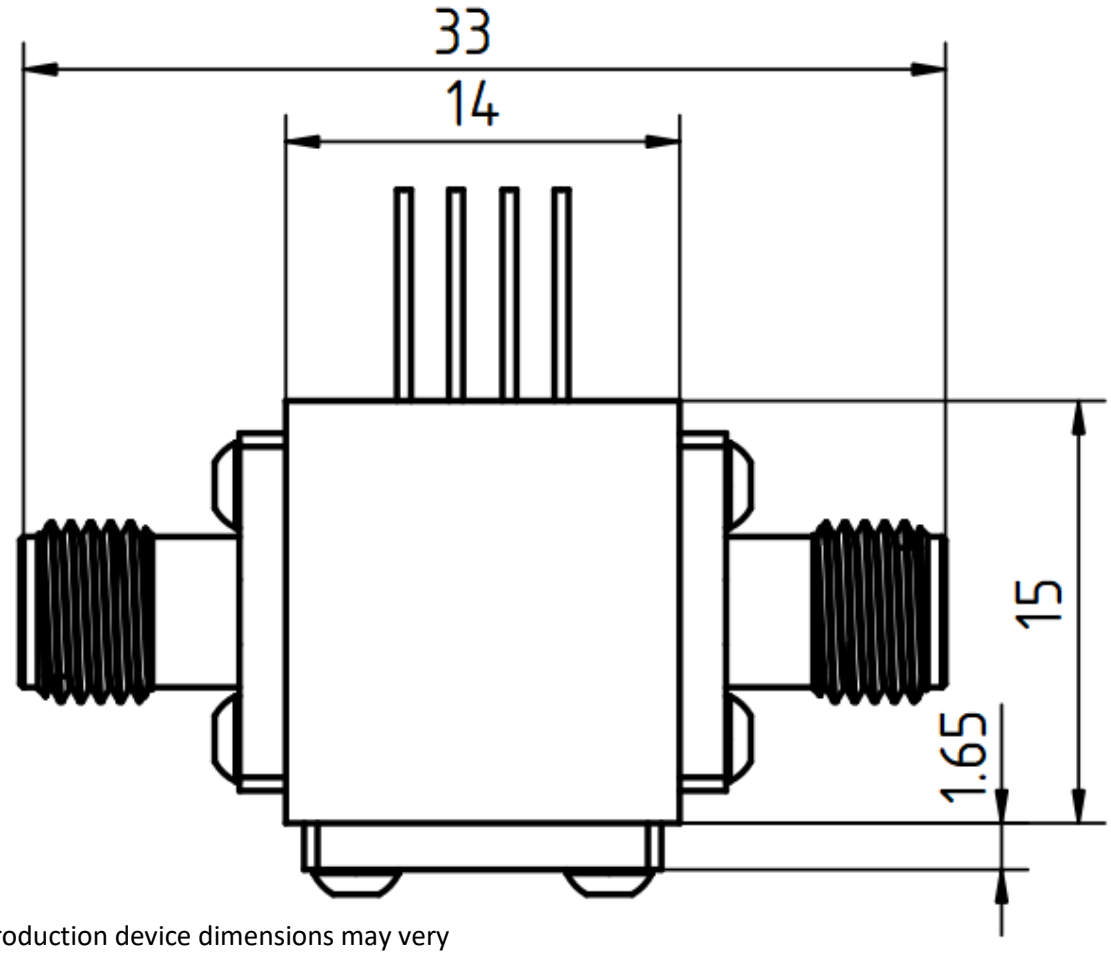






Data taken 1 – 27 GHz at 1 GHz steps. Data was interpolated to fill in data points.

Device Dimensions (all units in mm)



Production device dimensions may very

IMPORTANT NOTICES AND DISCLAIMERS

Warranty: NUPHOTONICS PROVIDES ALL OF THE INFORMATION ON TECHNICAL AND RELIABILITY DATA. THIS INCLUDES INFORMATION PRESENTED IN DATA SHEETS, DESIGN FILES, APPLICATIONS, AND OTHER RESOURCES “AS IS” AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD-PARTY INTELLECTUAL PROPERTY RIGHTS.

The information and resources are presented and intended for developers that are skilled and adequately qualified to work with this technology. You, the customer, are solely responsible for and accept full responsibility for selecting the appropriate NuPhotonics devices for your application. You accept the sole responsibility of designing, validating, and testing your application. You bear all responsibility for your application meeting standards, safety, security, and other regulatory requirements.

NuPhotonics retains the right to change these resources without notice. All rights are reserved for NuPhotonics. NuPhotonics grants you permission to use the information in these resources to design with NuPhotonics devices. Reproduction and display of these resources is prohibited. No Third-party licenses are offered. You will fully indemnify NuPhotonics against any claims, damages, costs, losses, and liabilities that arise from you using these resources.

NuPhotonics does not accept and objects to any terms you have proposed.

For terms and conditions for all NuPhotonics products please refer to www.nuphotonics.com Legal section.

Definitions: Product State

Alpha Build: Devices in Alpha build are in internal engineering build and testing stages. Major changes may happen for production build.

Beta Build: Devices in Beta build are for external customer and engineering sample testing stages. Minor changes may happen for production build.

Production Build: Customer ready devices. Small appearance changes may occur between devices.

Obsolete: Currently not supported.