

NuWaves

RF Solutions

NuPower™ 12B01A-02 L-Band Solid State Power Amplifier

26 Watt CW
1.0 GHz - 2.0 GHz

P/N: NW-PA-12B01A-02



Contact sales@nuwaves.com for custom options

The NuPower™ 12B01A-02 is a small, highly efficient solid state power amplifier that provides typically 26 Watts of RF power to boost performance of data links and transmitters.

Based on the latest gallium nitride (GaN) technology, the NuPower 12B01A-02's 42% typical power efficiency and 3.9 in³ form factor make it ideal for size, weight, and power-constrained broadband RF telemetry and tactical communication systems.

The NuPower 12B01A-02 power amplifier accepts a nominal 0 dBm RF input and provides 44 dB of gain from 1.0 GHz to 2.0 GHz. The NuPower 12B01A-02 module pairs with an optional interface cable, for ease of integration. This model is also available with a 1 watt input drive level (P/N: NW-PA-12B01A-D30), making it ideal for use with L-3Harris' Bandit miniature L-band transceiver.

NuPower PAs feature over-voltage and reverse-voltage protection and can operate over a wide temperature range of -40 °C to +60 °C.

Extend your operational communication range with NuPower™ amplifiers from NuWaves RF Solutions.

Features

- 26 Watts RF Output Power
- 1.0 GHz to 2.0 GHz
- Miniature Package (3.00" x 2.00" x 0.65")
- High-Efficiency GaN Technology
- 0 dBm Nominal RF Input
- Reverse-Voltage Protection
- Logic On/Off Control

Benefits

- Extended Range
- Improved Link Margin
- Reduced load on DC power budget due to high efficiency operation
- Requires less volume on space-constrained platforms

Applications

- Unmanned Aircraft Systems (UAS), Group 2 through Group 5
- Air Launch Effect (ALE)
- Common Launch Tube (CLT)
- Counter UAS Detection & Mitigation
- MIMO/MANET Radio Range Extension
- SISO Radio Range Extension

NuPower™ 12B01A-02 Power Amplifier

Specifications

Absolute Maximums

Parameter	Rating	Unit
Max Device Voltage	32	V
Max Device Current	3.0	A
Max RF Input Power, $Z_L = 50 \Omega$	12	dBm
Max Operating Temperature (ambient)	60	°C
Max Operating Temperature (baseplate)	85	°C
Max Storage Temperature	85	°C

Export Classification
EAR99

Electrical Specifications @ 28 VDC, 25 °C, $Z_S = Z_L = 50 \Omega$, 0 dBm input power, CW, unless otherwise stated

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Operating Frequency	BW	1.0		2.0	GHz	
RF Output Power	P_{SAT}	16	26		W	
Output Power @ 1dB Compression	P_{1dB}		30		dBm	
Small Signal Gain	G		54		dB	1000 MHz, $P_{in} = -30$ dBm
			49			1500 MHz, $P_{in} = -30$ dBm
			49			2000 MHz, $P_{in} = -30$ dBm
Small Signal Gain Flatness	ΔG		± 3		dB	$P_{in} = -30$ dBm
Power Gain Flatness	ΔG		± 0.9		dB	
Input VSWR	VSWR		1.8:1			
Nominal Input Drive Level	P_{IN}		0		dBm	
Operating Voltage	VDC	11	28	32	V	
Quiescent Current	I_{DQ}		0.35		A	
Operating Current	I_{DO}		2.25	3	A	
Module Efficiency			42		%	
Switching Speed	$TX_{ON/OFF}$		2		μS	10% to 90%
Third Order Intercept Point (Two tone test at 1 MHz spacing, $P_{out} = 20$ dBm / tone)	OIP3		42		dBm	
Harmonics @ P_{sat}	2nd		-16		dBc	
	3rd		-24			
Output Mismatch (No Damage)				10:1	Ψ	No damage at all phase angles

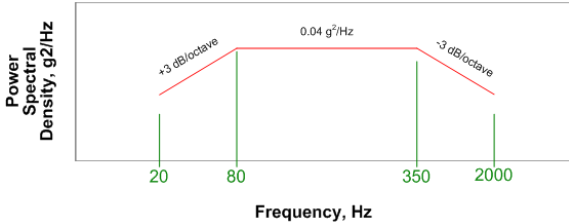
NuPower™ 12B01A-02 Power Amplifier

Specifications (cont.)

Mechanical Specifications

Parameter	Value	Unit	Limits
Dimensions	3.0 x 2.0 x 0.65	in	Max
Weight	3	oz	Max
RF Connectors, Input/Output	SMA Female		
Interface Connector	Micro-D, 9-pin Socket		
Cooling	Adequate Heatsink Required		

Environmental Specifications

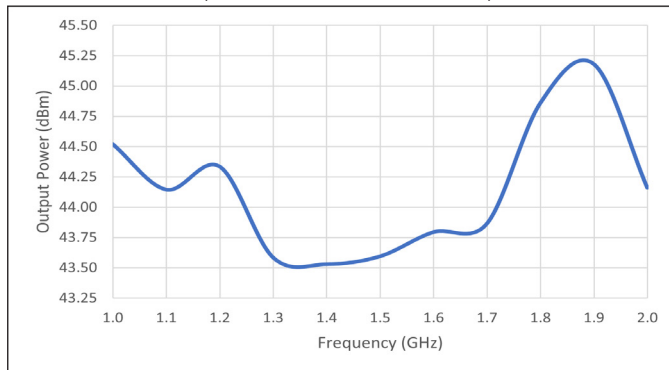
Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature (ambient)	T _A	-40		+60	°C
Operating Temperature (baseplate)	T _C	-40		+85	°C
Storage Temperature	T _{STG}	-55		+85	°C
Relative Humidity (non-condensing)	RH			95	%
Altitude MIL-STD-810F - Method 500.4	ALT			30,000	ft
Vibration / Shock Profile (Random profile in x,y, z axis, as per Figure for 15 minute duration in each axis)					

NuPower™ 12B01A-02 Power Amplifier

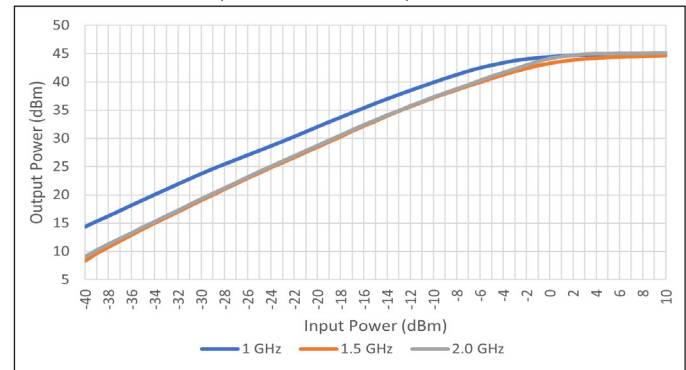
Performance Plots

Test Conditions: @ 28 VDC, 25 °C, $Z_s=Z_L=50\ \Omega$, 0 dBm input power, CW, unless otherwise stated

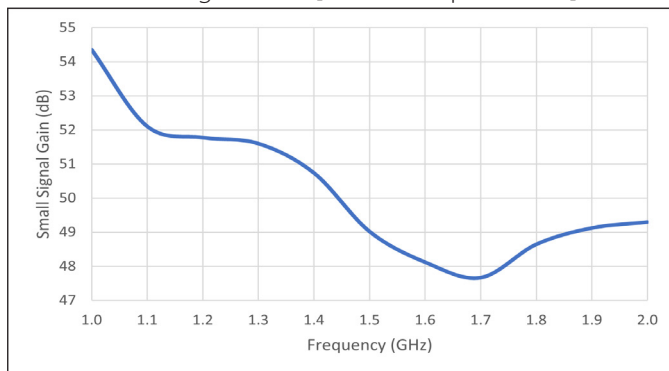
Output Power @ Nominal Input



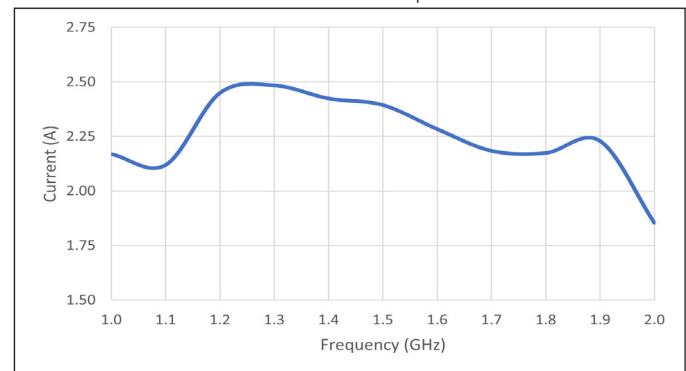
Output Power vs. Input Power



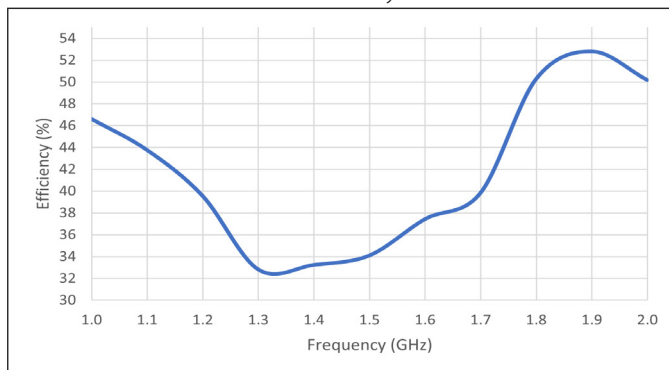
Small Signal Gain [-30 dBm Input Power]



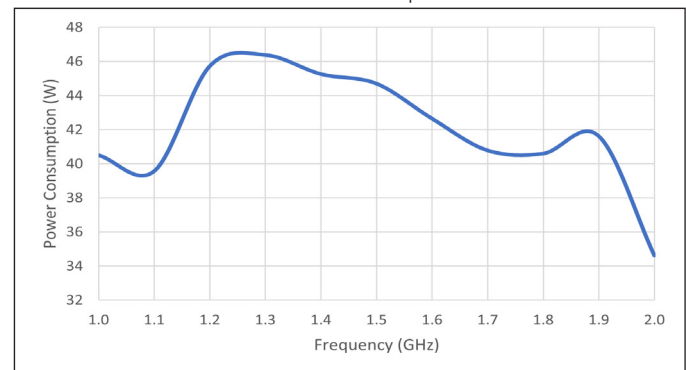
Current Consumption



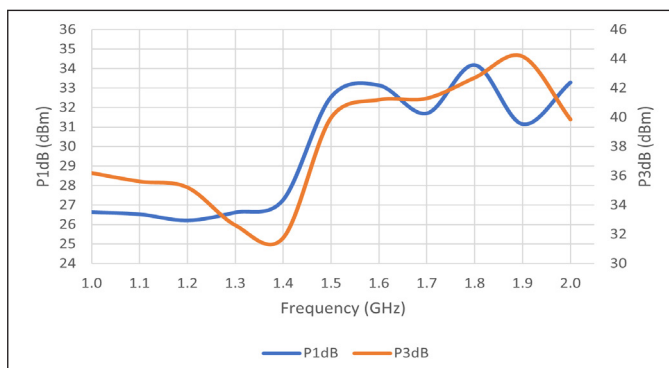
Efficiency



Power Consumption



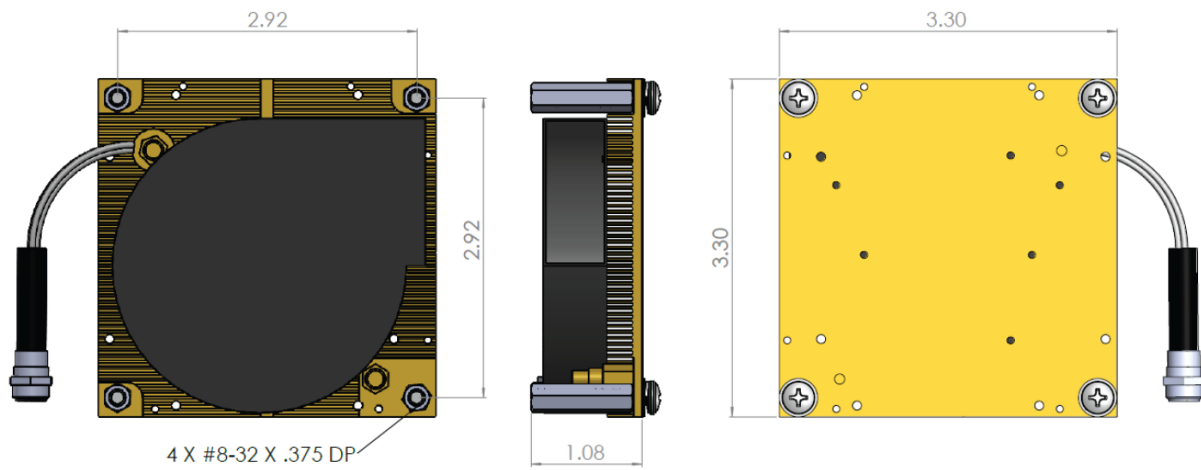
P1dB & P3dB



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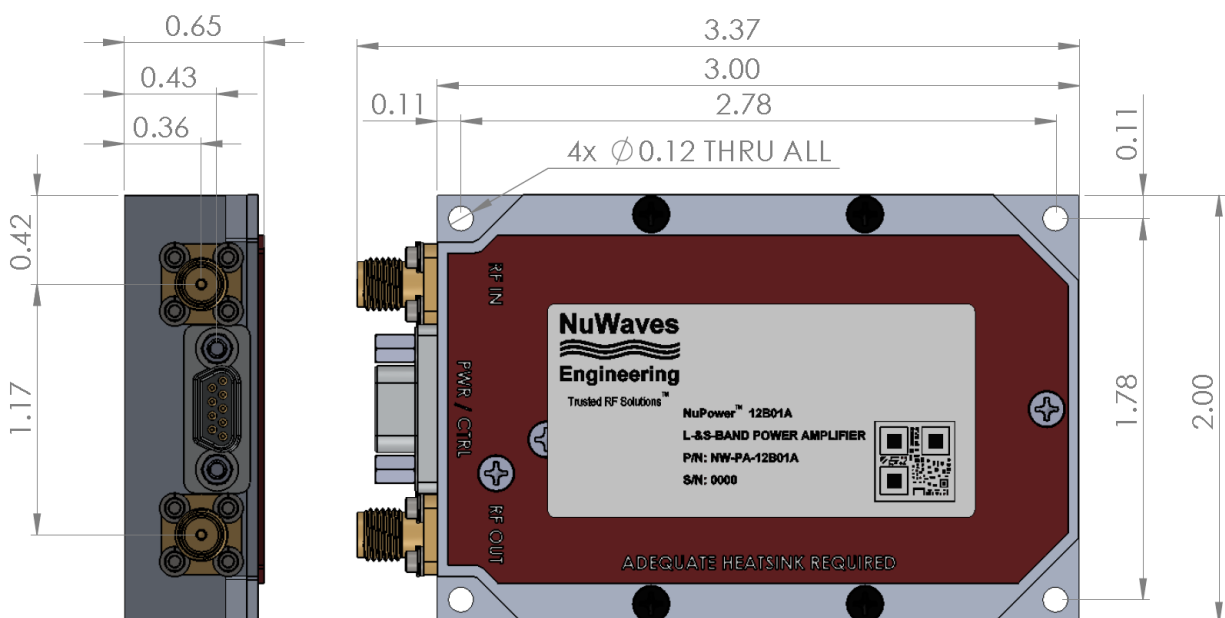
Optional Heatsink

P/N: HTSK-01A



NuPower™ 12B01A-02 Power Amplifier

Mechanical Outline



Accessory Part Numbers

Part Number	Description
NW-FL-05LPLE-2500-SFSF-M01	Harmonic Filter Module
NW-PA-ACC-CB09MA	Standard Interface Cable Assembly - Flying Leads (Sold Separately)
NW-PA-ACC-CT09MA	Upgraded Interface Cable Assembly - Banana Plug Termination (Sold Separately)
HTSK-01A	Heatsink with Integrated Fan (Sold Separately)

Pinout

Function	I/O	Pin
DC Power (+11 to +32 VDC)	I	1, 2
Ground	I	3, 4
RF Enable 0V or GND = RF ON +5V or NC = RF OFF	I	5
No Connect	-	6, 7, 9
Over Temperature Flag 0V = temperature fault +5V = no fault	0	8

For information on product disposal (end-of-life), please refer to this document:
<https://nuwaves.com/wp-content/uploads/Product-Disposal-End-of-Life.pdf>

Contact NuWaves



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