

# NuWaves

## RF Solutions

### NuPower™ 12B01A-D30 L- & S-Band Solid State Power Amplifier w/ 1 Watt Input Drive Level

20 Watts (CW) typ  
1.0 - 2.5 GHz

P/N: NW-PA-12B01A-D30

(Replaces P/N: NW-SSPA-10W-1.0-2.5-D30)



**The NuPower™ 12B01A-D30 is a small, highly efficient solid state power amplifier that provides 20 watts (typ) of RF power to boost performance of data links and transmitters.**

Based on the latest gallium nitride (GaN) technology, NuPower's 30% - 50% power efficiency and 3.9 in<sup>3</sup> form factor make it ideal for size, weight, and power-constrained broadband RF telemetry and tactical communication systems.

The NuPower 12B01A-D30 power amplifier accepts a nominal 1 watt RF input and provides 10 dB of gain from 1000 MHz to 2500 MHz. The NuPower 12B01A-D30 module comes standard with a NW-PA-ACC-CB09MA interface cable, for ease of integration. This model is also available with the standard 0 dBm input drive level (P/N: NW-PA-12B01A), making it making it perfect for use with typical communications systems.

NuPower PAs feature over-voltage and reverse-voltage protection and can operate over a wide temperature range of -30 °C to +60 °C.

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

#### Features

- 20 Watts RF Output Power
- 1.0 GHz to 2.5 GHz
- Miniature Package (3.00" x 2.00" x 0.65")
- High-Efficiency GaN Technology
- +30 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 & 3
- Unmanned Ground Vehicles (UGV)
- Broadband RF Telemetry
- RF Communication Systems
- Software Defined Radios

# NuPower™ 12B01A-D30 Power Amplifier

## Specifications

### Absolute Maximums

Parameter	Rating	Unit
Max Device Voltage	32	V
Max Device Current	2.7	A
Max RF Input Power, $Z_L = 50 \Omega$	33	dBm
Max Operating Temperature (ambient)	60	°C
Max Operating Temperature (baseplate)	85	°C
Max Storage Temperature	85	°C

Export Classification
EAR99

### Electrical Specifications @ 28VDC, 25 °C, $Z_S=Z_L=50 \Omega$

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Operating Frequency	BW	1000		2500	MHz	
RF Output Power	$P_{SAT}$	12	20		W	Pin = +30 dBm
Small Signal Gain	G		12.5		dB	1000 MHz, @ -30 dBm input
			13.2			1500 MHz, @ -30 dBm input
			13.4			2000 MHz, @ -30 dBm input
			13.6			2500 MHz, @ -30 dBm input
Small Signal Gain Flatness	$\Delta G$		$\pm 3$		dB	Pin = -30 dBm
Power Gain Flatness			$\pm 4$		dB	Pin = +30 dBm
Input VSWR	VSWR		1.8			
Nominal Input Drive Level	$P_{IN}$		30		dBm	
Operating Voltage	VDC	11	28	32	V	
Quiescent Current	$I_{DQ}$		0.35		A	
Operating Current	$I_{DD}$		2.2	2.8	A	Pin = +30 dBm
Module Efficiency			30		%	
Switching Speed	$TX_{ON/OFF}$			2	$\mu S$	10% to 90%
Third Order Order Intercept Point (Two tone test at 1 MHz spacing, $P_{out} = 20 \text{ dBm} / \text{tone}$ )	OIP3		42		dBm	1000 MHz
			41			1500 MHz
			38			2000 MHz
			41			2500 MHz
Harmonics	2nd		-21		dBc	
	3rd		-24			
Output Mismatch (No Damage)				10:1	$\psi$	No damage at all phase angles

# NuPower™ 12B01A-D30 Power Amplifier

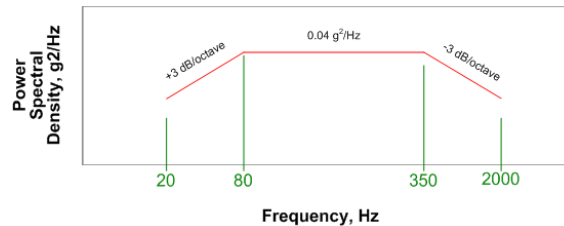
## Specifications (cont.)

### 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		

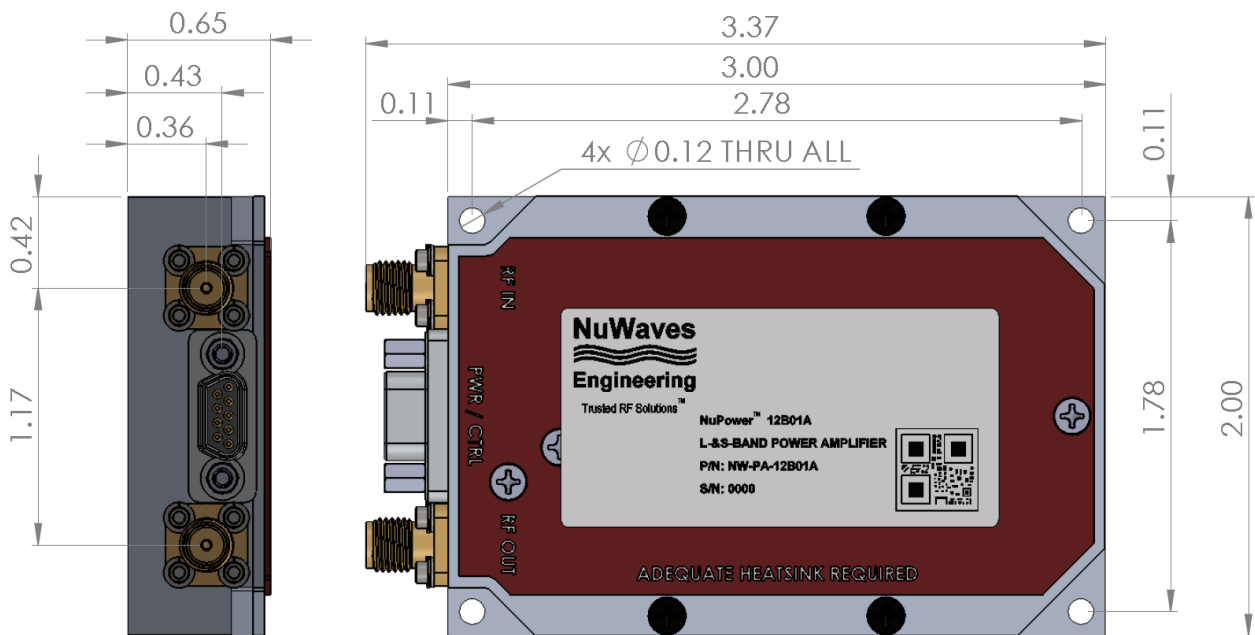
### Environmental Specifications

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature (ambient)	T <sub>A</sub>	-40		+60	°C
Operating Temperature (baseplate)	T <sub>C</sub>	-40		+85	°C
Storage Temperature	T <sub>STG</sub>	-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-D30 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 (included with module)
NW-PA-ACC-CT09MA	Upgraded Interface Cable Assembly - Banana Plug Termination
NW-PA-ACC-KT01	Accessory Kit, which includes Fan-Cooled Heatsink and Upgraded Interface Cable
HTSK-01	Heatsink with Integrated Fan

## Pinout

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

\* Optional inverted RF Enable logic (Active High) is also available, in the NW-PA-12B01A-D30AH module.

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>

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