NuWaves engineering

Trusted RF Solutions™

NuPower™ 12B01A-08

L-Band Solid State Power Amplifier

11 Watt CW
2.5 Watts Linear, 5% EVM @ 34 dBm
1755 MHz - 1850 MHz

P/N: NW-PA-12B01A-08

The NuPower™ 12B01A-08 is a small, highly efficient solid state power amplifier that provides over 11 watts 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^3 form factor make it ideal for size, weight, and power-constrained broadband RF telemetry and tactical communication systems.

The NuPower 12B01A-08 power amplifier accepts a nominal 0 dBm RF input and provides 40 dB of gain from 1755 MHz to 1850 MHz. The NuPower 12B01A-08 module comes standard with a NW-PA-ACC-CB09MA interface cable, for ease of integration. This model is also available with a 1 watt input drive level (P/N: NW-PA-12B01A-08-D30), making it ideal for use with L-3 Communications' Bandit miniature L-band transceiver.

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 Engineering.

Features

- 11 Watts RF Output Power
- 1755 MHz to 1850 MHz
- 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 & 3
- Unmanned Ground Vehicles (UGV)
- Broadband RF Telemetry
- RF Communication Systems
- Software Defined Radios

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NuPower™ 12B01A-08 Power Amplifier

Specifications

Absolute Maximums

Parameter	Rating	Unit
Max Device Voltage	32	V
Max Device Current	2.4	A
Max RF Input Power, $Z_L = 50\ \Omega$	10	dBm
Max Operating Temperature (ambient)	60	℃
Max Operating Temperature (baseplate)	85	℃
Max Storage Temperature	85	℃

Export Classification
EAR99

Electrical Specifications @ 28 VDC, 25 ℃, Z_S=Z_L=50 Ω

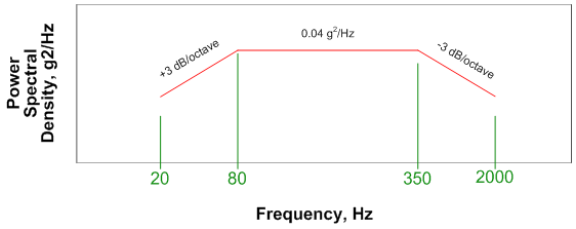
Parameter	Symbol	Min	Typ	Max	Unit	Condition
Operating Frequency	BW	1755		1850	MHz	
RF Output Power	P_{SAT}	11	14		W	Pin = 0 dBm
Output Power @ 1dB Compression	P1dB		34.2		dBm	1700 MHz
			36.5			1800 MHz
			36.0			1900 MHz
Small Signal Gain	G		47.4		dB	1700 MHz, @ -30 dBm input
			47.9			1800 MHz, @ -30 dBm input
			46.6			1900 MHz, @ -30 dBm input
Small Signal Gain Flatness	ΔG		± 1.4		dB	Pin = -30 dBm
Power Gain Flatness			± 0.5		dB	Pin = 0 dBm
Input VSWR	VSWR	2.9:1	3.2:1	3.4:1		
Nominal Input Drive Level	P_{IN}		0		dBm	
Operating Voltage	VDC	11	28	30	V	
Quiescent Current	I_{DQ}		0.35		A	
Operating Current	I_{DD}		1.5	2.4	A	Pin = 0 dBm
Module Efficiency			30		%	
Switching Speed	$TX_{ON/OFF}$			2	µS	10% to 90%
Third Order Order Intercept Point (Two tone test at 1 MHz spacing, Pout = 20 dBm / tone)	OIP3		38.9		dBm	1700 MHz
			38.5			1800 MHz
			37.9			1900 MHz
Harmonics	2nd	-21	-19	-19	dBc	
	3rd	-36	-34	-32		
Output Mismatch (No Damage)				10:1		

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	External Heatsink (Optional)		

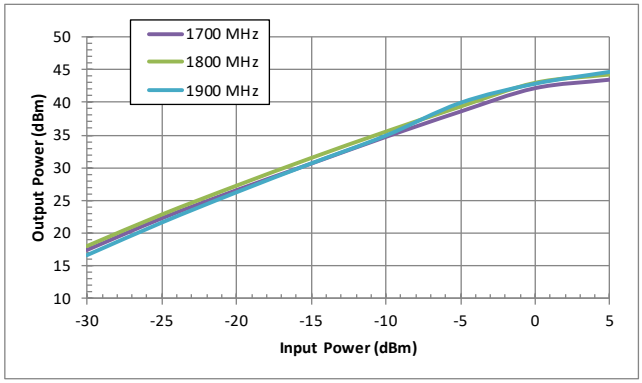
Environmental Specifications

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)					

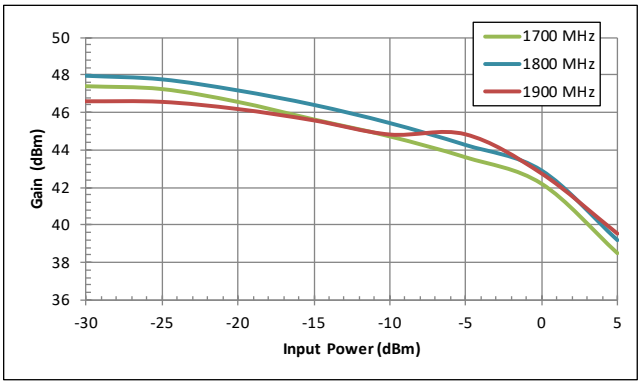
Performance Plots

Test Conditions: +28 VDC, +25 °C, Z_S=Z_L=50 Ω

Output Power vs. Input Power



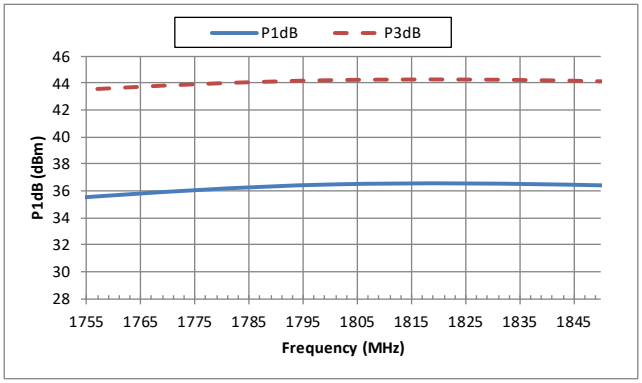
Gain vs. Input Power



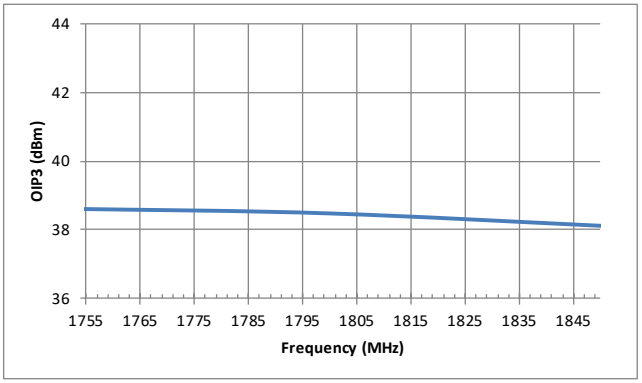
NuPower™ 12B01A-08 Power Amplifier

Performance Plots (cont.)

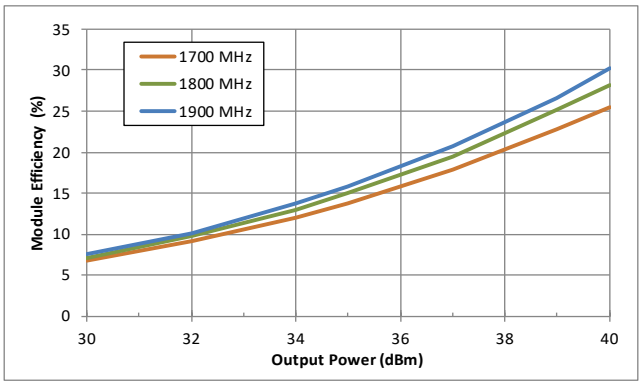
P1dB & P3dB



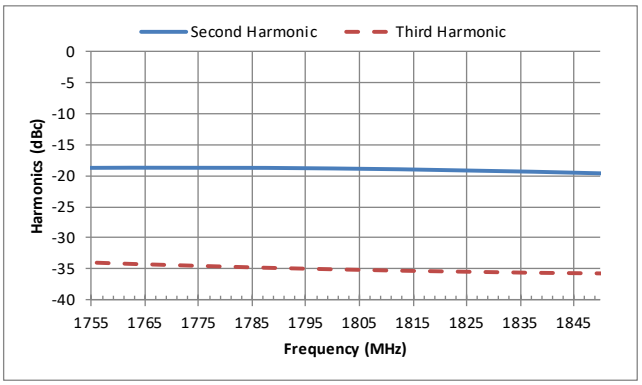
OIP3



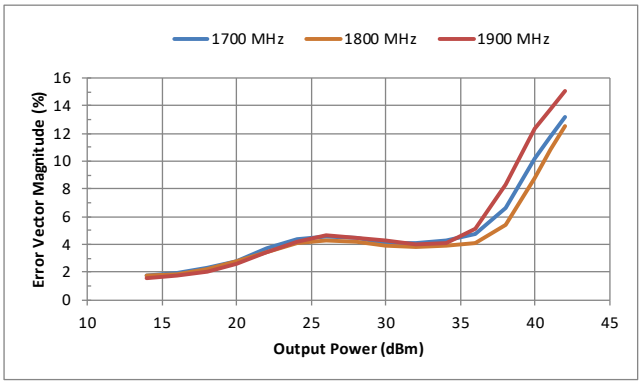
Efficiency



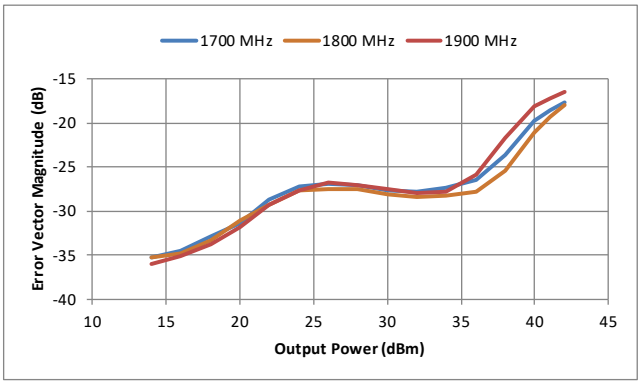
Harmonics (@ Psat)



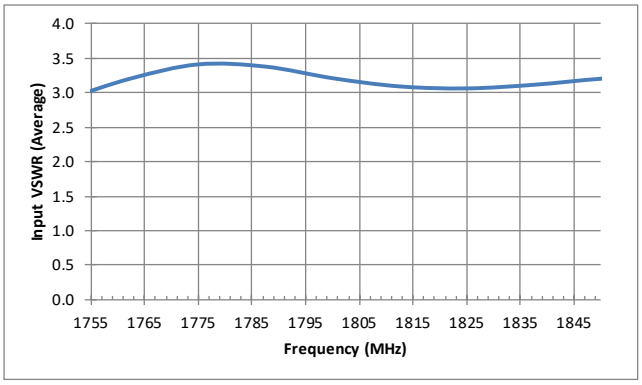
Error Vector Magnitude (%) [w/ OFDM Waveform]



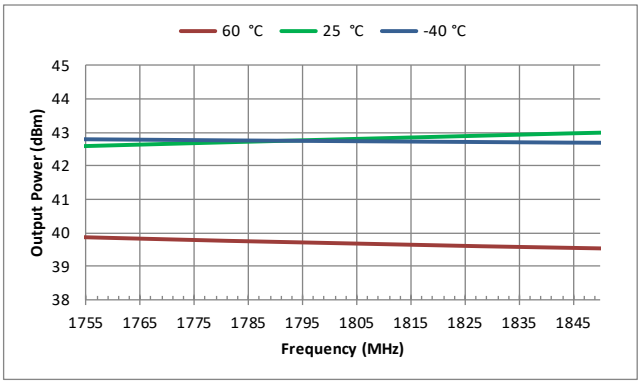
Error Vector Magnitude (dB) [w/ OFDM Waveform]



VSWR



Power Out vs. Temperature (ambient)



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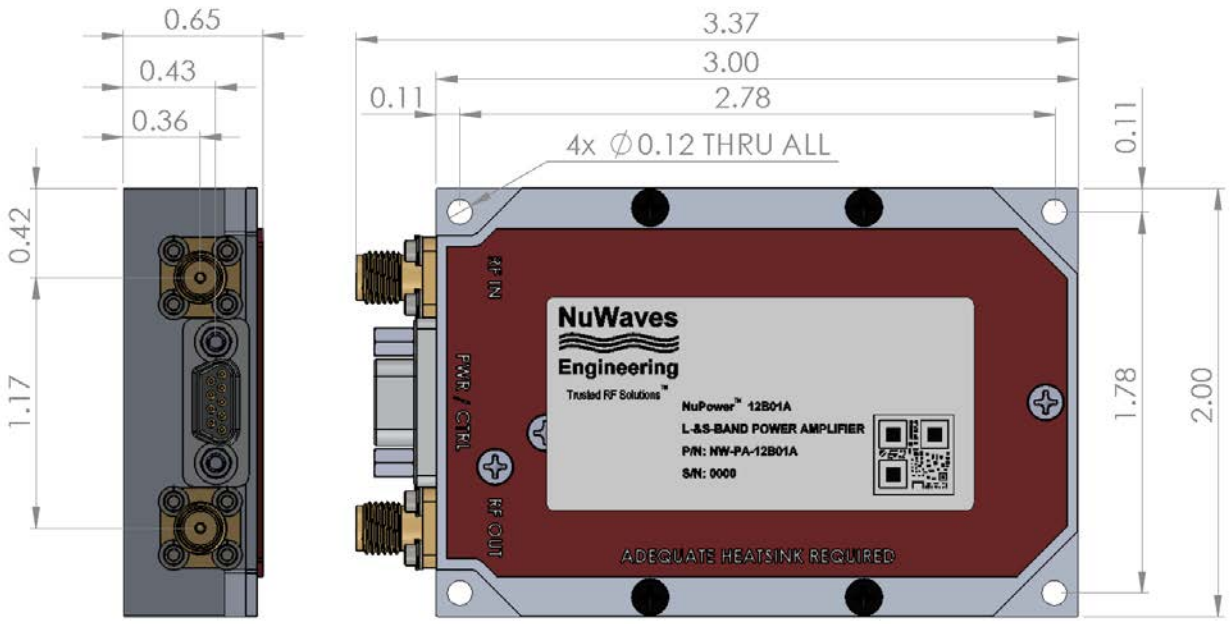
Mechanical Outline



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
NW-PA-ACC-HS02	Heatsink with Integrated Fan

Pinout

Function	I/O	Pin
DC Power (+11 to +32 VDC)	I	1, 2
Ground	I	3, 4
RF Enable 0 V 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	O	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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