NuWaves engineering

Trusted RF Solutions™

NuPower™ 11B02A

Mini Multi-Octave Power Amplifier

10 Watt CW
200 MHz - 2600 MHz

P/N: NW-PA-11B02A

(includes NW-PA-ACC-CB09ME interface cable)

The NuWaves' NuPower™ 11B02A is a highly efficient, miniature solid state power amplifier that provides ultra-broadband operation across multiple octaves from high VHF through S-band frequencies, and delivers 10 watts of RF power across the frequency range of 200 MHz to 2.6 GHz.

Based on the latest gallium nitride (GaN) technology, the NuPower 11B02A's 20 - 40% power efficiency and 2.84 in^3 form factor make it ideal for size, weight, and power-constrained broadband RF telemetry and tactical communication systems. The NuPower 11B02A's rugged chassis allows the system integrator to easily incorporate the unit into a platform operating in harsh environments with limited space.

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

Features

- 10 Watts RF Output Power
- 200 MHz to 2.6 GHz
- Miniature Package (2.84 in^3)
- High-Efficiency GaN Technology
- Transmit/Standby Mode
- Single Power Supply
- Over-Voltage Protection
- Reverse-Voltage Protection
- Logic On/Off Control

Benefits

- Extended Range
- Improved Link Margin
- Lessened load on DC power budget due to high efficiency operation
- Consumes less volume on space-contstrained platforms

Applications

- Unmanned Aircraft Systems (UAS), Group 2 & 3
- Unmanned Ground Vehicles (UGV)
- Broadband RF Telemetry
- RF Communication Systems
- Software Defined Radios
- Test Labs

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NuPower™ 11B02A Power Amplifier

Specifications

Absolute Maximums

Parameter	Rating	Unit
Max Device Voltage	32	V
Max Device Current	3.0	A
Max RF Input Power, $Z_L = 50\ \Omega$	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	200		2600	MHz	
RF Output Power	P_{SAT}	7	10*		W	Pin = 0 dBm
Output Power @ 1dB Compression	P1dB		26		dBm	200 MHz
			25			1400 MHz
			33			2600 MHz
Small Signal Gain	G		46		dB	200 MHz
			46			1400 MHz
			43			2600 MHz
Small Signal Gain Flatness	ΔG		± 4		dB	Pin = -30 dBm
Power Gain Flatness			± 1.75		dB	Pin = 0 dBm
Input VSWR	VSWR		2.1			
Nominal Input Drive Level	P_{IN}		0		dBm	
Operating Voltage	VDC	11	28	32	V	
Quiescent (no RF) Current	I_{DQ}		0.40		A	@ 28 Volts
Operating Current	I_{DD}		1.4	1.8	A	Pin = 0 dBm
Module Efficiency			33		%	
Switching Speed	$TX_{ON/OFF}$			30	µS	10% to 90%
Third Order Order Intercept Point (Two tone test at 1 MHz spacing, Pout = 20 dBm / tone)	OIP3		42		dBm	200 MHz
			44			1400 MHz
			41			2600 MHz
Harmonics	2nd		-15		dBc	
	3rd		-21			
Output Mismatch (No Damage)				10:1		All phase angles

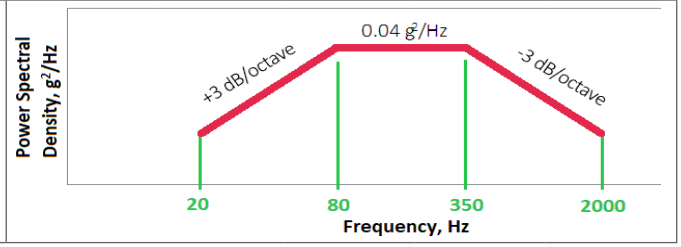
* The NuPower 11B02A will provide 10 watts *minimum* RF output power across 225 MHz to 2.55 GHz with an input drive level of +3 dBm.

Specifications (cont.)

Mechanical Specifications

Parameter	Value	Unit	Limits
Dimensions	2.340 x 1.960 x 0.620	in	Max
Weight	2.0	oz	Max
RF Connectors, Input/Output	SMA Female		
Interface Connector	Micro-D, 9-pin Socket		
Cooling	Adequate Heatsink Required		

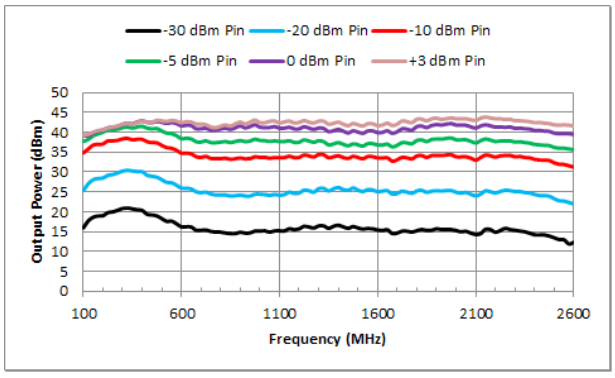
Environmental Specifications

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)					

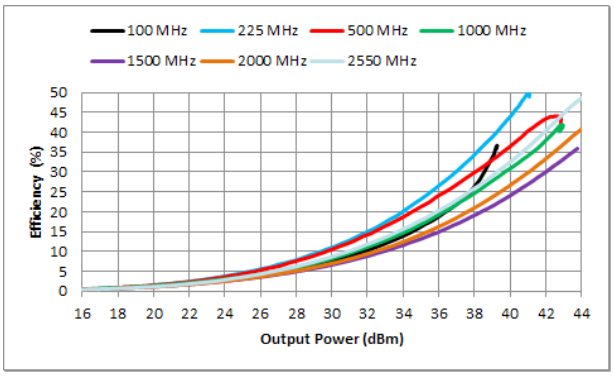
Performance Plots

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

RF Output Power



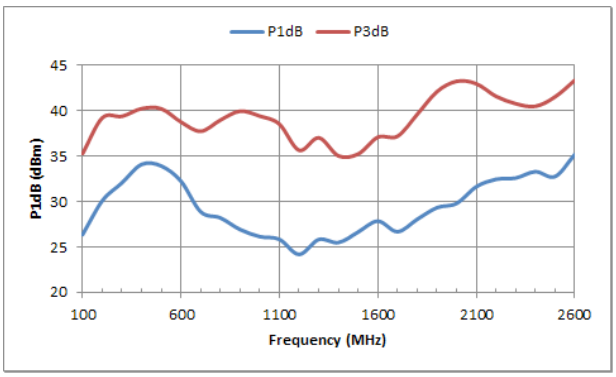
Efficiency vs Power Output



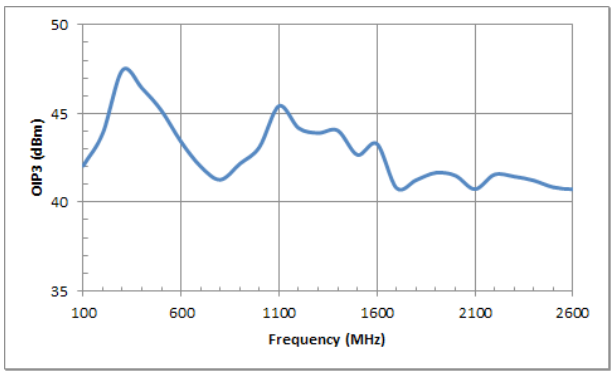
NuPower™ 11B02A Power Amplifier

Performance Plots (cont.)

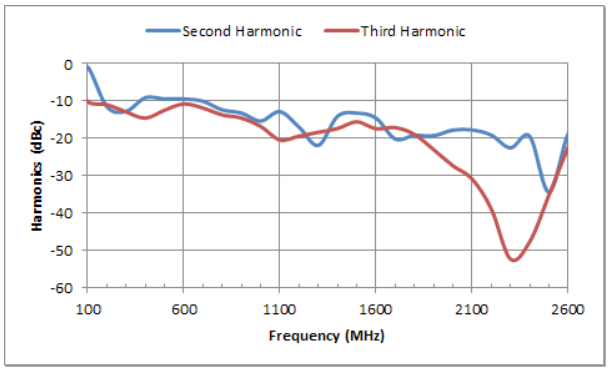
P1dB & P3dB



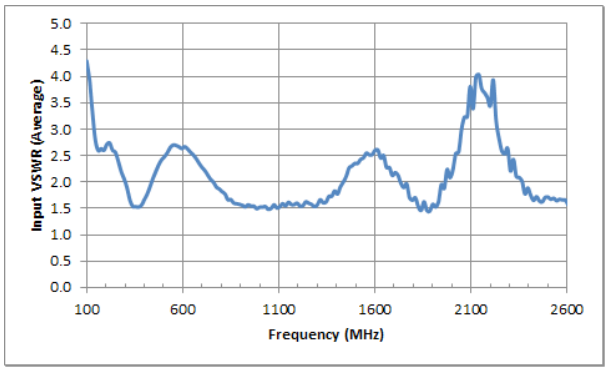
OIP3



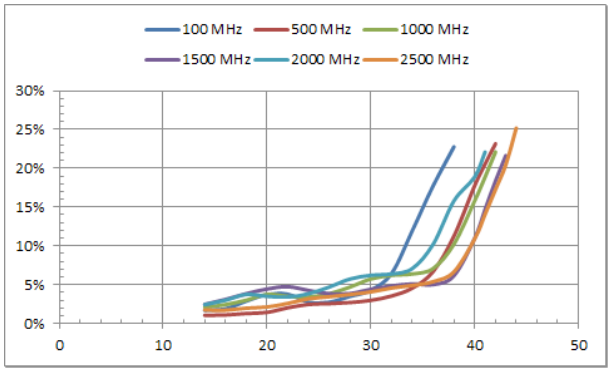
Harmonics (@ Psat)



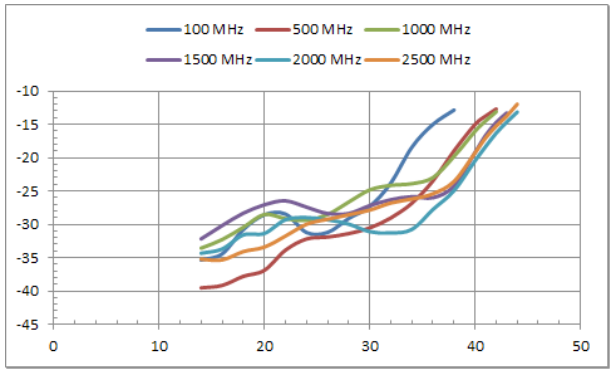
VSWR



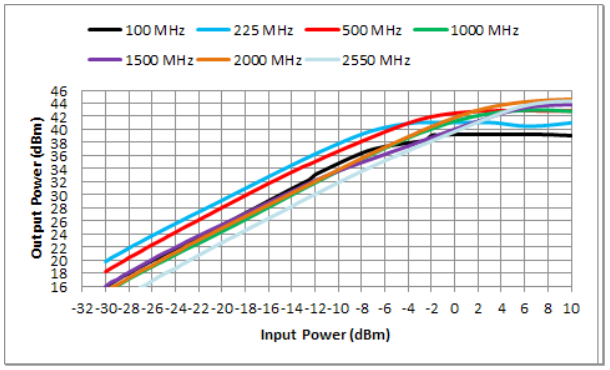
Error Vector Magnitude (%) [w/ OFDM Waveform]



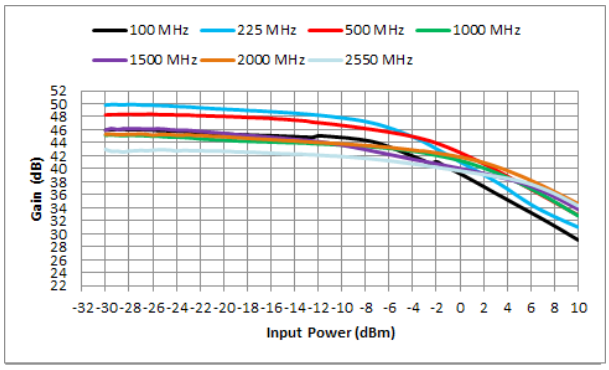
Error Vector Magnitude (dB) [w/ OFDM Waveform]



Output Power vs. Input Power



Gain vs. Input Power



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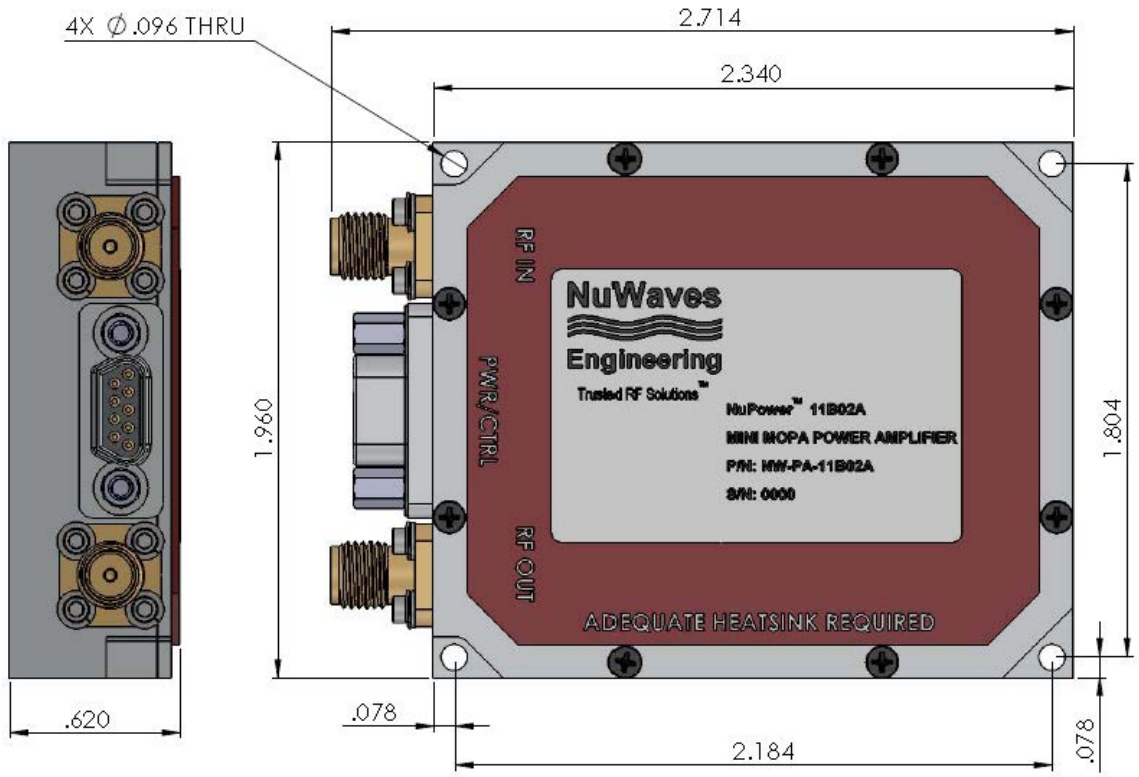
Mechanical Outline



Accessory Part Numbers

Part Number	Description
NW-FL-05LPLE-2500-SFSF-M01	Harmonic Filter Module
NW-PA-ACC-CB09ME	Standard Interface Cable Assembly - Flying Leads (included with module)
NW-PA-ACC-CT09ME	Upgraded Interface Cable Assembly - Banana Plug Termination
NW-PA-ACC-KT02	Accessory Kit, which includes Fan-Cooled Heatsink and Upgraded Interface Cable
NW-PA-ACC-HS01	Heatsink with Integrated Fan

Pinout

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

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