

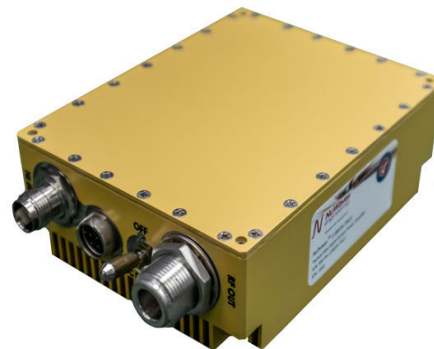
# NuWaves

## RF Solutions

### NuPower™ 11B02A-TAC2 Mini Multi-Octave Power Amplifier w/ Integrated Heatsink

10 Watt CW  
200 MHz - 2600 MHz

P/N: NW-PA-11B02A-TAC2



**The NuWaves NuPower™ 11B02A-TAC2 is a fully integrated, miniature solid state power amplifier that provides ultra-wideband operation across multiple octaves from high VHF through S-band frequencies, and typically 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-TAC2's 20 - 60% power efficiency and small form factor make it ideal for size, weight, and power-constrained (SWaP) broadband RF telemetry and tactical communication systems.

The NuPower 11B02A-TAC2's rugged IP67-rated chassis with integrated heat sink allows the system integrator or operator to easily incorporate the unit into a platform operating in harsh environments with limited space, such as a tactical vehicle or manpack.

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

#### Features

- 10 Watts RF Output Power (typ)
- 200 MHz to 2.6 GHz
- Integrated Heatsink
- IP67 Rated
- Locking DC Power Switch
- External Temp Fault & RF Enable Leads
- High-Efficiency GaN Technology
- Over-Voltage Protection
- Reverse-Voltage Protection

#### Benefits

- Dust / Water Resistant
- High-Reliability
- Extended Range
- Improved Link Margin
- Unique connectors to prevent improper installation in the field
- Lessened load on DC power budget due to high efficiency operation
- Consumes less volume on space-constrained platforms

#### Applications

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

# NuPower™ 11B02A-TAC2 Power Amplifier

## Specifications

### Absolute Maximums

Parameter	Rating	Unit
Max Device Voltage	32	V
Max Device Current	2.0	A
Max RF Input Power, $Z_L = 50 \Omega$ , CW	10	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, $Z_S=Z_L=50 \Omega$ , CW, 0 dBm Input Power (unless otherwise stated)

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Operating Frequency	BW	200		2600	MHz	
RF Output Power	$P_{SAT}$	7	10*		W	
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	$\Delta G$		$\pm 4$		dB	Pin = -30 dBm
Power Gain Flatness			$\pm 4$		dB	
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	
Operating Current	$I_{DD}$		1.3		A	
Module Efficiency			33		%	
Switching Speed	$TX_{ON/OFF}$			30	$\mu S$	10% to 90%
Third Order Order Intercept Point (Two tone test at 1 MHz spacing, $P_{out} = 20$ dBm / tone)	OIP3		42		dBm	200 MHz
			44			1400 MHz
			41			2600 MHz
Harmonics	2nd		-10		dBc	
	3rd		-15			
Output Mismatch (No Damage)				10:1	$\Psi$	No damage at all phase angles

\* The NuPower 11B02A-TAC2 typically provides 10 watts *minimum* RF output power across 200 MHz to 2.6 GHz with an input drive level of +3 dBm.

# NuPower™ 11B02A-TAC2 Power Amplifier

## Specifications (cont.)

### Mechanical Specifications

Parameter	Value	Unit	Limits
Dimensions	4.50 x 3.50 x 1.50	in	Max
Weight	20	oz	Max
RF Connectors, Input/Output	TNC Female / N Female		
Interface Connector	Bayonet, 4-pin Socket		
DC Power Control	Toggle Switch, Locking		
Cooling	Integrated Heatsink		

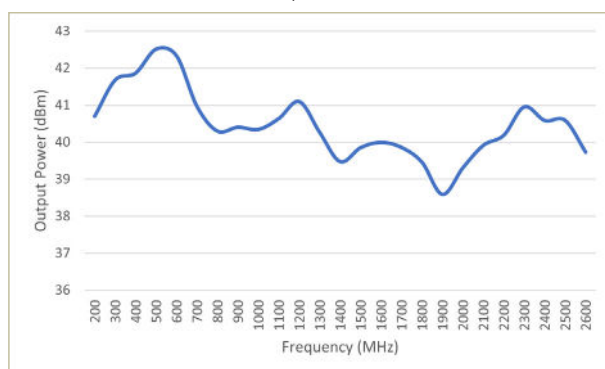
### Environmental Specifications

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)					
Environmental Rating	IP67 (dust and water protection)				

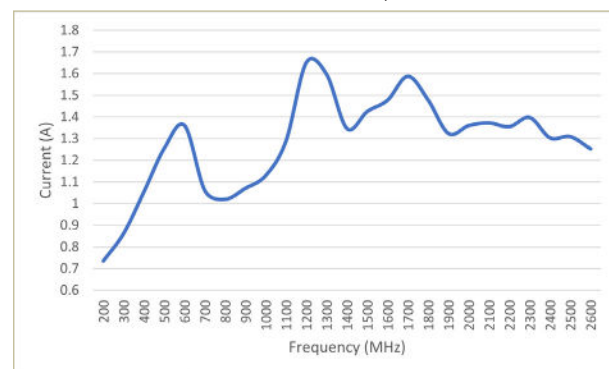
## Performance Plots

Test Conditions: +28 VDC, +25 °C,  $Z_S=Z_L=50 \Omega$ , CW, 0 dBm Input Power (unless otherwise stated)

RF Output Power



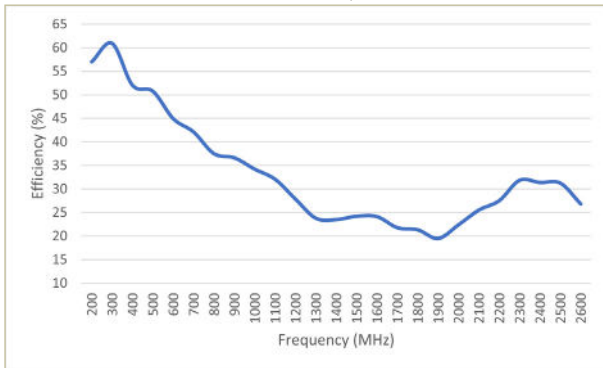
Current Consumption



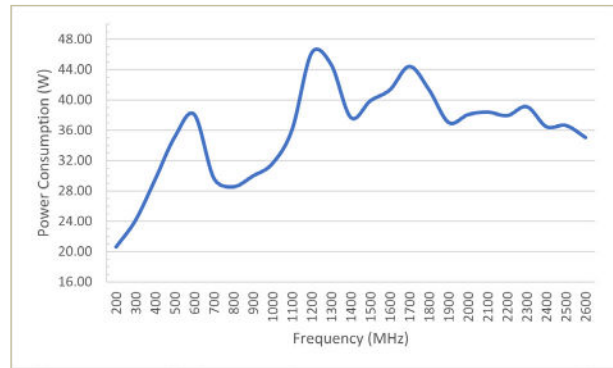
# NuPower™ 11B02A-TAC2 Power Amplifier

## Performance Plots (cont.)

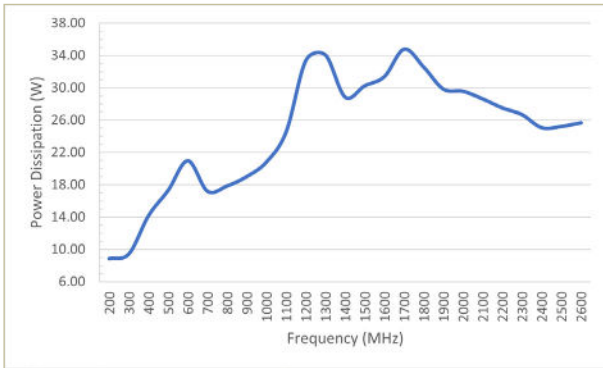
Efficiency



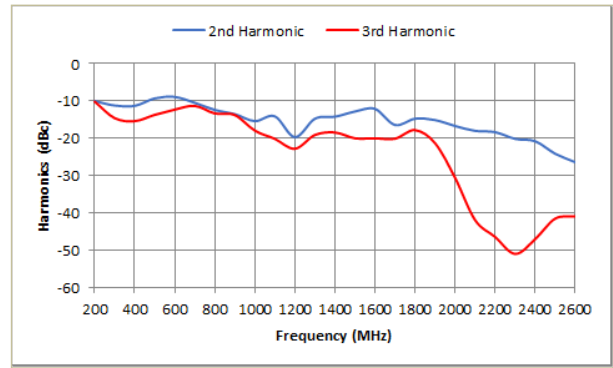
Power Consumption



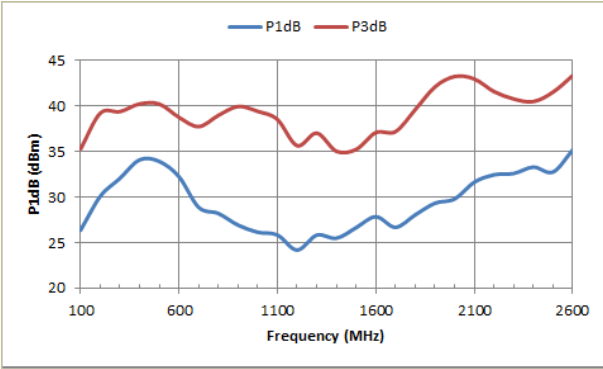
Power Dissipation



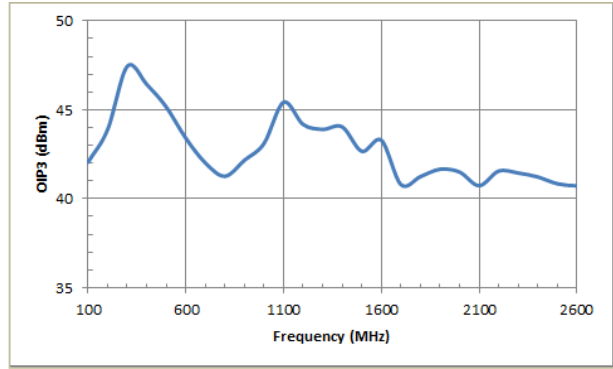
Harmonics (@ Psat)



P1dB & P3dB

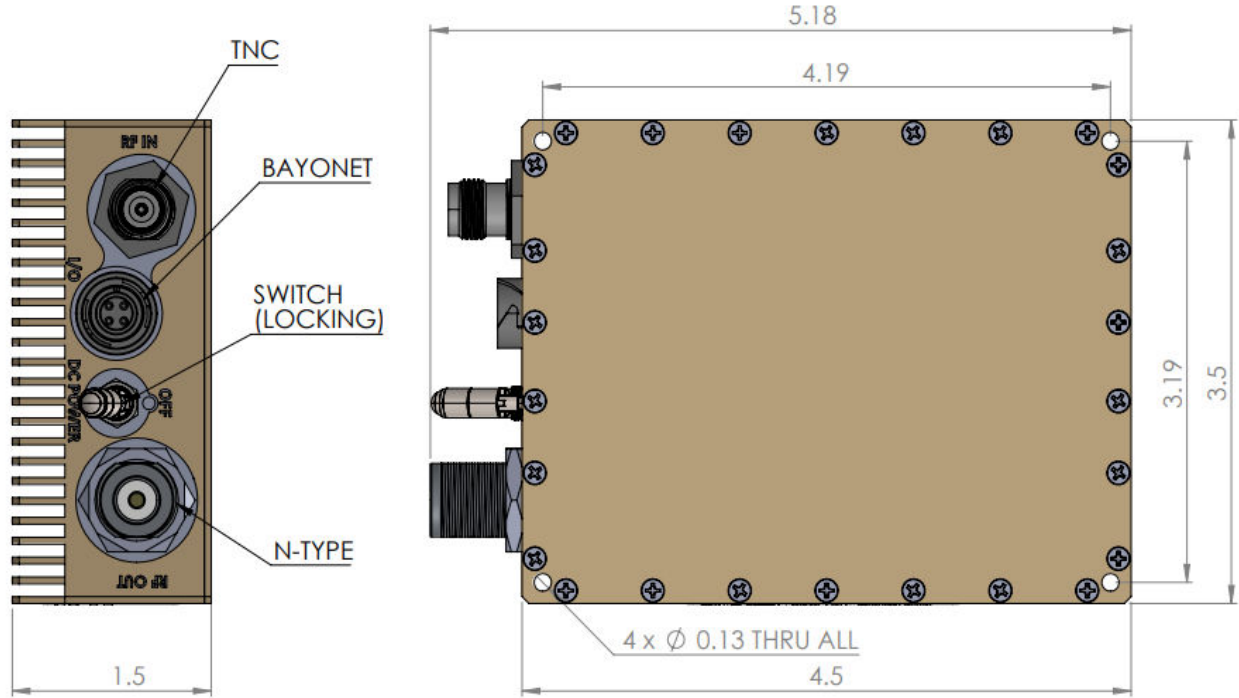


OIP3



# NuPower™ 11B02A-TAC2 Power Amplifier

## Mechanical Outline



## Accessory Part Numbers - Sold Separately

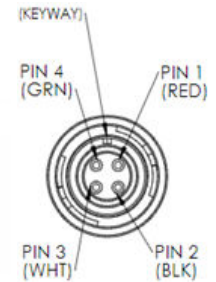
Part Number	Description
NW-FL-05LPLE-2500-SFSF-M01	Harmonic Filter Module
PA-CBL-06-F	Standard Interface Cable Assembly - Flying Leads
PA-CBL-06-B	Upgraded Interface Cable Assembly - Banana Plug Termination

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>

## Pinout

Function	I/O	Pin	Logic Voltage
DC Power (+11 to +32 VDC)	I	1	-
Ground	I	2	-
Temp Flag	O	3	High (no fault): 5 VDC Low (temp fault): 0 VDC
RF Enable	I	4	5V Logic (CMOS) High (standby): 3.5 - 5.5 VDC* Low (bias enable): -0.5 - 1.5 VDC

\*RF Enable is internally pulled high and does not require applying voltage to this line for any purpose



## Contact NuWaves



NuWaves RF Solutions  
 132 Edison Drive  
 Middletown, OH 45044

[www.nuwaves.com](http://www.nuwaves.com)  
[sales@nuwaves.com](mailto:sales@nuwaves.com)  
 513.360.0800

