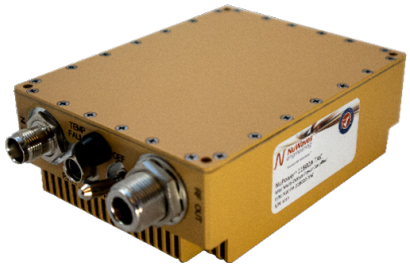
NuWaves
RF Solutions

# NuPower™ 11B02A-TAC

## Mini Multi-Octave Power Amplifier w/ Integrated Heatsink

10 Watt CW
200 MHz - 2600 MHz



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

(includes PA-CBL-05-F interface cable)

**The NuWaves NuPower™ 11B02A-TAC 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-TAC'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-TAC'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 Engineering.**

## Features

- 10 Watts RF Output Power (typ)
- 200 MHz to 2.6 GHz
- Integrated Heatsink
- IP67 Rated
- Locking RF Enable Switch
- LED Temp Fault Indicator
- 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

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# NuPower™ 11B02A-TAC 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 Ω, 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 | ΔG | | ± 4 | | dB | Pin = -30 dBm |
| Power Gain Flatness | | | ± 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 | 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 | | -10 | | dBc | |
| | 3rd | | -15 | | | |
| Output Mismatch (No Damage) | | | | 10:1 | Ψ | No damage at all phase angles |

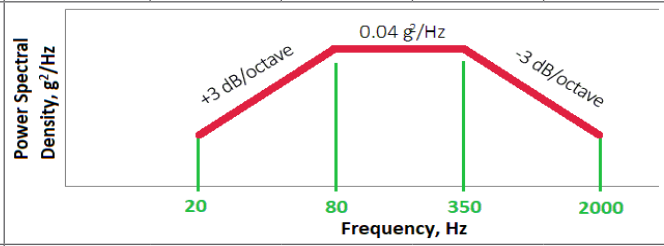
* The NuPower 11B02A-TAC typically provides 10 watts *minimum* RF output power across 200 MHz to 2.6 GHz with an input drive level of +3 dBm.

# 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, 3-pin Socket | | |
| RF Enable Control | Toggle Switch, Locking | | |
| Cooling | Integrated Heatsink | | |

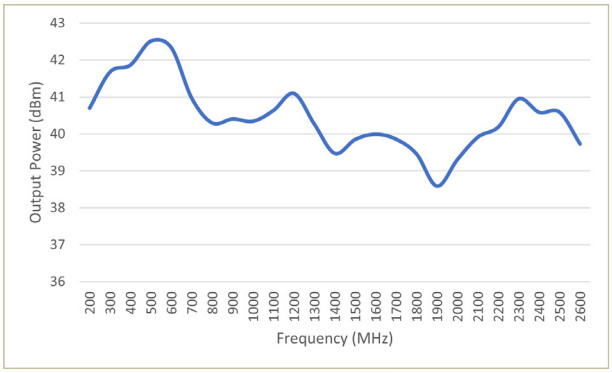
## Environmental Specifications

| Parameter | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Operating Temperature (ambient) | $T_A$ | -40 | | +60 | ℃ |
| Operating Temperature (baseplate) | $T_C$ | -40 | | +85 | ℃ |
| Storage Temperature | $T_{STG}$ | -55 | | +85 | ℃ |
| Relative Humidity (non-condensing) | RH | | | 95 | % |
| Altitude<br>MIL-STD-810F - Method 500.4 | ALT | | | 30,000 | ft |
| Vibration / Shock Profile<br>(Random profile in x,y, z axis, as per Figure for 15 minute duration in each axis) |  | | | | |
| Environmental Rating | IP67 (dust and water protection) | | | | |

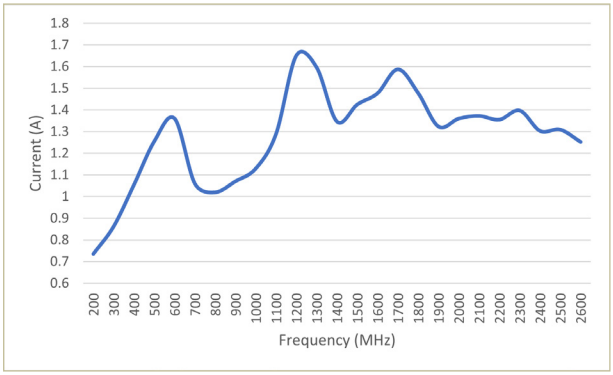
# Performance Plots

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

RF Output Power



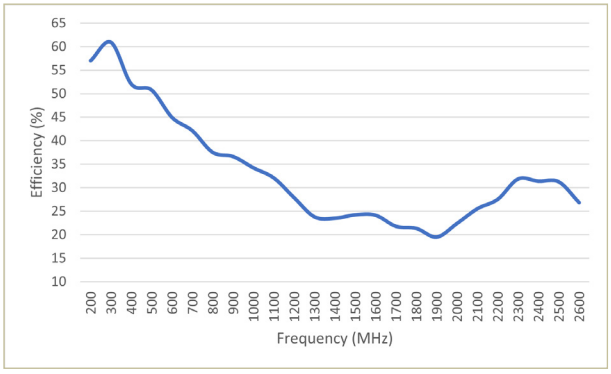

Current Consumption



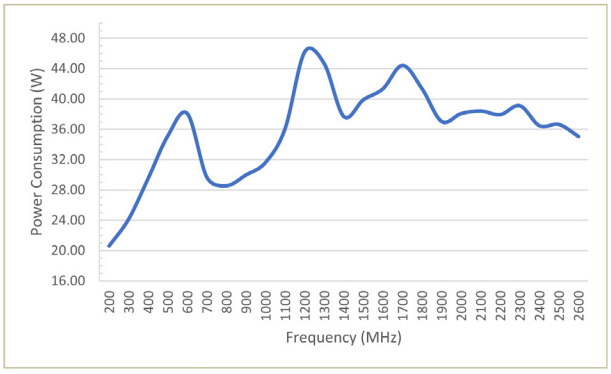
# NuPower™ 11B02A-TAC Power Amplifier

## Performance Plots (cont.)

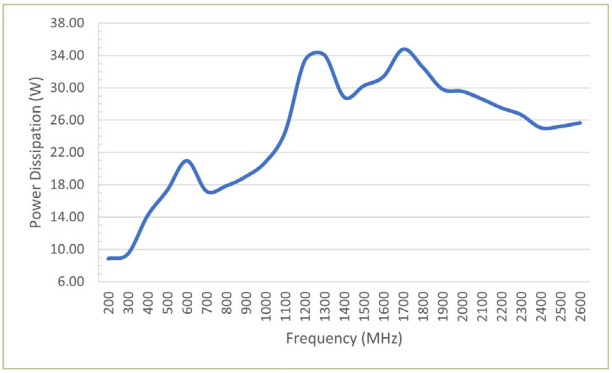
Efficiency



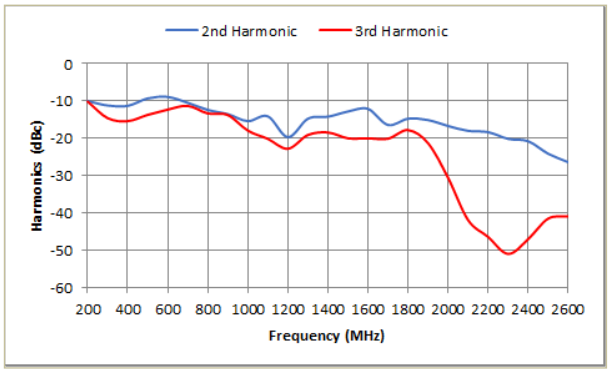

Power Consumption



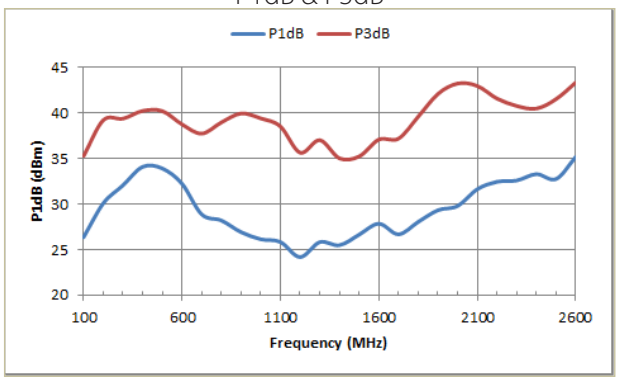

Power Dissipation



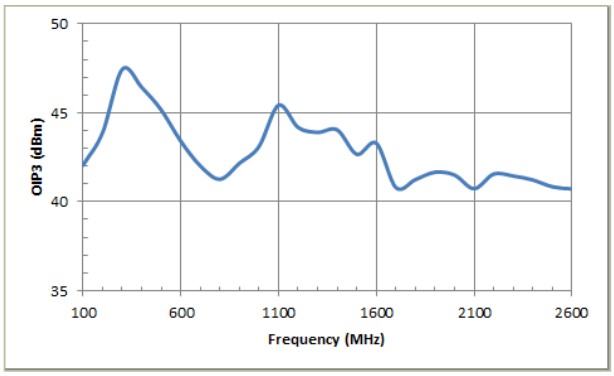

Harmonics (@ Psat)




P1dB & P3dB

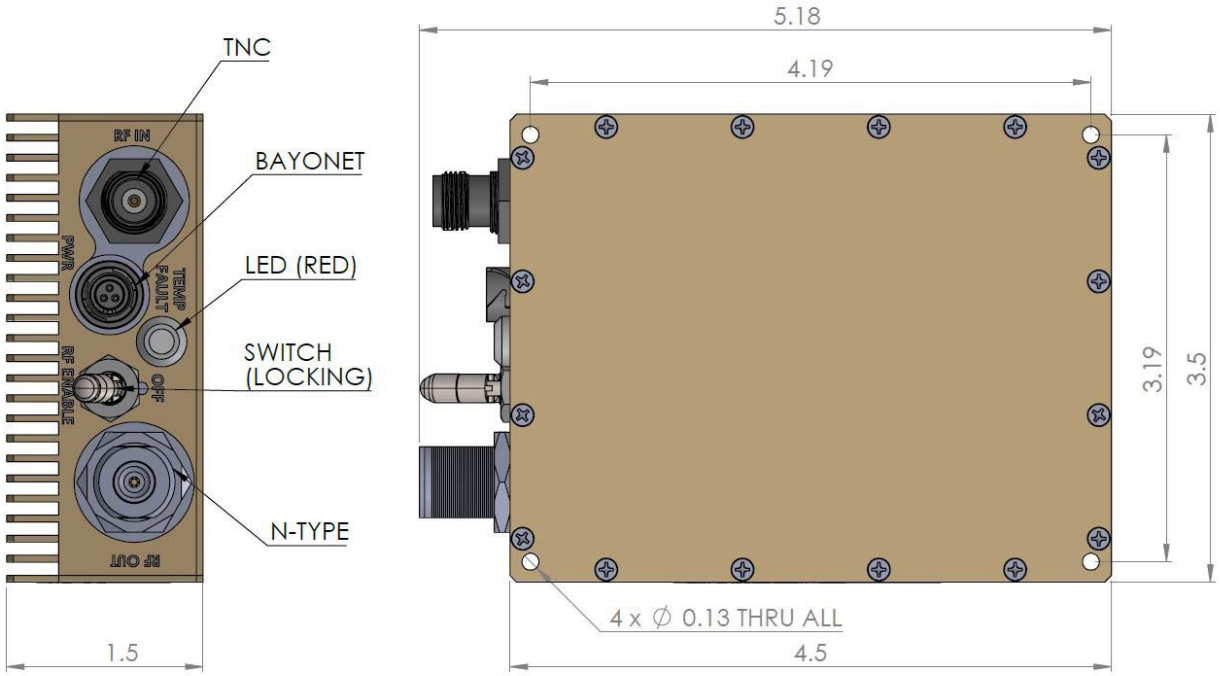



OIP3



# NuPower™ 11B02A-TAC Power Amplifier

## Mechanical Outline

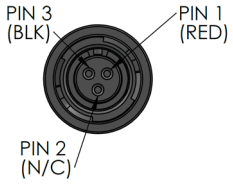



## Accessory Part Numbers

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

## Pinout

| Function | I/O | Pin |
|---|---|---|
| DC Power (+11 to +32 VDC) | I | 1 |
| No Connect | I | 2 |
| Ground | - | 3 |




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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