

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 in³ 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 with an optional 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 | ΔG | | ± 3 | | dB | Pin = -30 dBm |
| Power Gain Flatness | | | ± 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 | μS | 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 | ψ | No damage at all phase angles |

NuPower™ 12B01A-D30 Power Amplifier

Specifications (cont.)

Mechanical Specifications

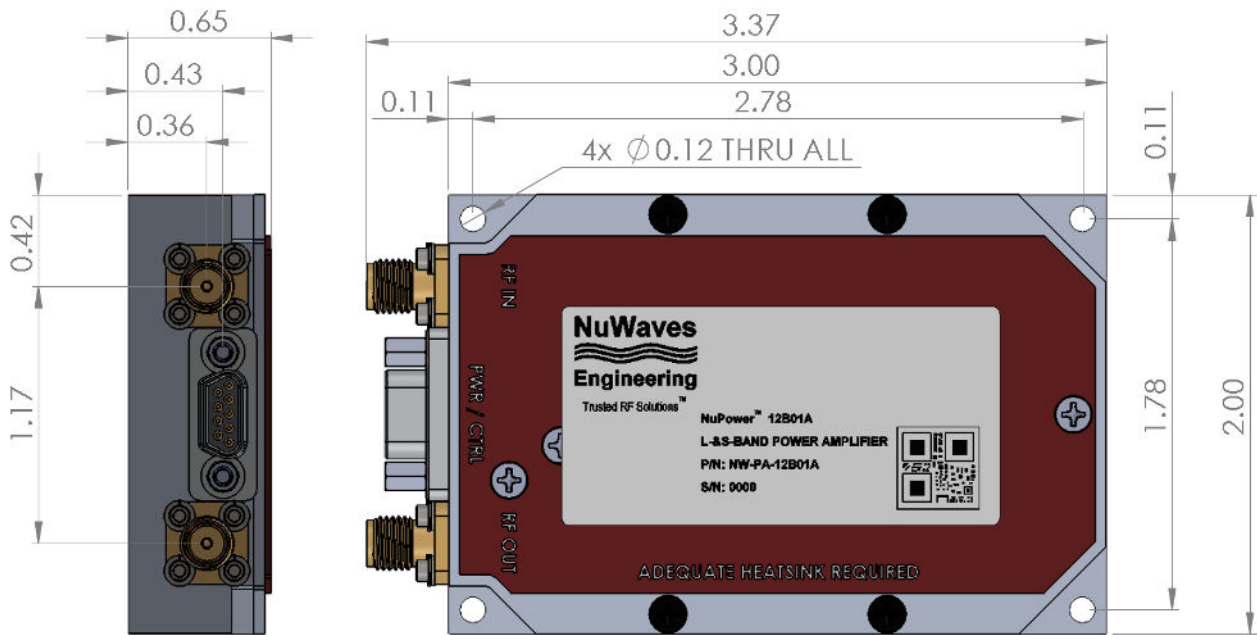
| Parameter | Value | Unit | Limits |
|-----------------------------|----------------------------|------|--------|
| Dimensions | 3.0 x 2.0 x 0.65 | in | Max |
| Weight | 3 | oz | Max |
| RF Connectors, Input/Output | SMA Female | | |
| Interface Connector | Micro-D, 9-pin Socket | | |
| Cooling | Adequate Heatsink Required | | |

Environmental Specifications

| Parameter | Symbol | Min | Typ | Max | Unit |
|---|-----------|-----|-----|--------|------|
| Operating Temperature (ambient) | T_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) | | | | | |

NuPower™ 12B01A-D30 Power Amplifier

Mechanical Outline



Accessory Part Numbers - Sold Separately

| Part Number | Description |
|----------------------------|---|
| NW-FL-05LPLE-2500-SFSF-M01 | Harmonic Filter Module |
| NW-PA-ACC-CB09MA | Standard Interface Cable Assembly - Flying Leads |
| NW-PA-ACC-CT09MA | Upgraded Interface Cable Assembly - Banana Plug Termination |
| 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 | O | 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>

Contact NuWaves



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