



Solid-State Pulsed Power Amplifier, 2700–3100 MHz, 1000 W

PSB1000-V2

POAM's PSB1000-V2 is a rugged, standalone Pulse 1000W S-band GaN RF power amplifier designed for radar and field-deployed transmitter applications. Operating from 2700 to 3100 MHz, the PSB1000-V2 delivers up to 60 dB of gain with approximately 50% efficiency under rated operating conditions. The amplifier is powered from a single 48 VDC supply and is based on gallium-nitride-on-silicon-carbide (GaN-on-SiC) technology to support wide instantaneous bandwidth, and high-power density.

The PSB1000-V2 is engineered as a compact, lightweight unit with an integrated thermal management structure to support reliable high-power operation. It is built to military-grade standards and housed in a weatherproof enclosure rated to IP67 for demanding outdoor and mobile environments. Both RF input and output ports are fully matched to 50 Ω, enabling straightforward system integration.



Features

- High Power S-Band Pulsed GaN Power Amplifier
- Small Signal Gain 60dB Typical
- Saturation Output Power 1000 W Typical
- Supply Voltage +48VDC
- IP67 Protection
- 50 Ohm Matched Input/Output
- Compact and rugged design 368x190x140 mm (14.5x7.5x5.5 inch)
- low weight 8 kg (17.5 lbs.)

Typical Applications

- Radar
- Wireless Infrastructure
- Military and Aerospace
- Test Instrumentation
- TR Modules
- TWTA Replacement

ELECTRICAL SPECIFICATIONS

(TEST CONDITION: TA=+25°C, DUTY CYCLE=10%, PULSE= 100US, UNLESS OTHERWISE STATED)

| PARAMETER | | VALUE | UNIT |
|--------------------------------|---------------|-------------------|---|
| Operating Frequency | | 2700 to 3100 | MHz |
| Saturation Output Power-Pulsed | | 1000 (Typical) | W |
| Input Power (Pulsed) | | 0 (min), +6 (max) | dBm |
| Power Gain | | 60 | dB |
| Gain Flatness | | +/- 1 | dB |
| Duty Cycle | | 5 (Max 10) | % |
| Pulse Width | | 100 (Max) | us |
| Spurious | | 70 (min) | dBc |
| Rise/Fall Time [PW=100 us] | | 100/100 | ns |
| Input/Output VSWR | | 1.5:1 | |
| Input Impedance | | 50 | Ω (coaxial option) |
| Power Supply | Voltage | 48 | VDC |
| | Current (AVG) | 6 (Typical) | A (for Duty Cycle=10% and PW=100us) |
| MTBF | | 200,000 | Hours (25°C, Ground fixed, duty cycle 10%; per MIL-HDBK-217F) |



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MECHANICAL AND ENVIRONMENTAL SPECIFICATION

| PARAMETER | VALUE | NOTE |
|--------------------------|---|--|
| Operational Temperature | -30°C to +75°C | |
| Storage Temperature | -40°C to +85°C | |
| Dimension | 368x190x140 mm (14.5x7.5x5.5 inch) | |
| Weight | 7 kg (17.5 lbs.) | |
| RF Connectors | N-Type female (Input/Output) | Also Available with SMA input and waveguide output |
| DC and M&C Connectors | Military Round connectors D38999 Series by AMPHENOL | Mating connectors will be provided |
| Environmental Protection | IP67 | |
| Cooling method | Finless Heatsink | |
| Colour | Anodized Olive Green | Other colours also available |

TEST STANDARDS

| | PARAMETER | VALUE | NOTE - TEST STANDARD |
|------------|--------------------------|--|--|
| Vibration | Random Vibration | 5Hz to 8Hz @ 6mm, 8Hz to 500Hz @ 15m/s ² , 2 hours in each direction of 3 axes | MIL-STD-202G BS EN 60068-2-6 2008: |
| | Vibration Shock | Half Sine, 400m/s ² , 11ms. 3 shocks in each direction of 3 axes | BS EN 60068-2-27: 2009: SHOCK |
| | Bump Test | Half Sine, 250m/s ² , 6ms, 4000 bumps in each direction of 3 axes | BS EN 60068-2-27: 2009: |
| Thermal | Ambient Temperature Test | 14 days | BS EN 60068 |
| | Damp Heat Test | +40°C 93%RH, 16-hour dwell. | BS EN 60068-2-78: |
| | Temperature Shock | +55°C to -30°C, 3-hour dwells, 10 second transfer, 2 cycles. | BS EN 60068-2-14: 2023: |
| | Low Temperature Test | -30°C for 16 hours - Operational -40°C for 16 hours - Storage | BS EN 60068-2-1: 2007: |
| | High Temperature Test | +60°C for 16 hours - Operational +80°C for 16 hours - Storage | BS EN 60068-2-2: 2007: |
| | Humidity Cycling Test | 3-hour ramp +20°C 95%RH to +30°C 95%RH 12-hour dwell +30°C 95%RH 3-hour ramp +30°C 95%RH to +20°C 95%RH 6-hour dwell +20°C 95%RH 24-hour cycle, 14 cycles Functional test performed during the first 2 hours of the +35°C dwell on the 7th and 14th cycles. | BS EN 60068-2-30: 2005: |
| Drop | Drop Test | Drop height 250mm onto 6 faces. Steel plate backed with concrete | BS EN 60068-2-31: 2008: |
| | Topple Test | Drop onto wood, 1 drop from each bottom edge, opposite edge lifted to either 45° or 100mm, then allowed to drop back onto bottom face | BS EN 60068-2-31: 2008: |
| Protection | Ingress Protection, IP6X | Dust tight (with internal pressure reduction) | BS EN 60529:1992+A2:2013 |
| | Driving Rain | 200 l/m ² /h for 1 hour | DEF STAN 00-035, PART 3, ISSUE 4, TEST CL 27 |
| | Environmental Protection | | MIL-STD-108E |



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| | | | |
|-----------------|----------|--|------------------------|
| Altitude | Altitude | 30,000 ft, 30 kPa, 16 hours | MIL-STD-810 method 500 |
| Safety | EMC/EMI | CE102, CS101, CS114, CS115, CS116, CS118, RE102, RS103 | MIL-STD-461G |

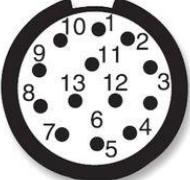
RF CONNECTOR (J1 & J2)

| PIN | DESCRIPTION | NOTE |
|----------------|----------------------|--|
| J1 - RF Input | N-Type Female – 50 Ω | Please advise if SMA coaxial interface is required |
| J2 - RF output | N-Type Female – 50 Ω | Please advise if Waveguide interface is required |

M&C CONNECTOR PIN DESCRIPTION (J4-M&C)

[D38999/20WB35SN AMPHENOL CIRCULAR MIL SPEC CONNECTOR]

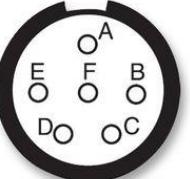
| PIN | DESCRIPTION | NOTE |
|---------|------------------------------------|------|
| 1 | Health and Temperature monitoring | |
| 2 | | |
| 3 | Disable/ Enable Amplifier (on/off) | |
| 4 | | |
| 5 | Ground | |
| 6 | Ground | |
| 7 to 13 | NC | |



DC CONNECTORS PIN DESCRIPTION (J3-POWER)

[D38999/20WB98PN AMPHENOL CIRCULAR MIL SPEC CONNECTOR]

| PIN | DESCRIPTION | NOTE |
|-----|-------------|------|
| A | + 48 VDC | |
| B | + 48 VDC | |
| C | + 48 VDC | |
| D | GND | |
| E | GND | |
| F | GND | |



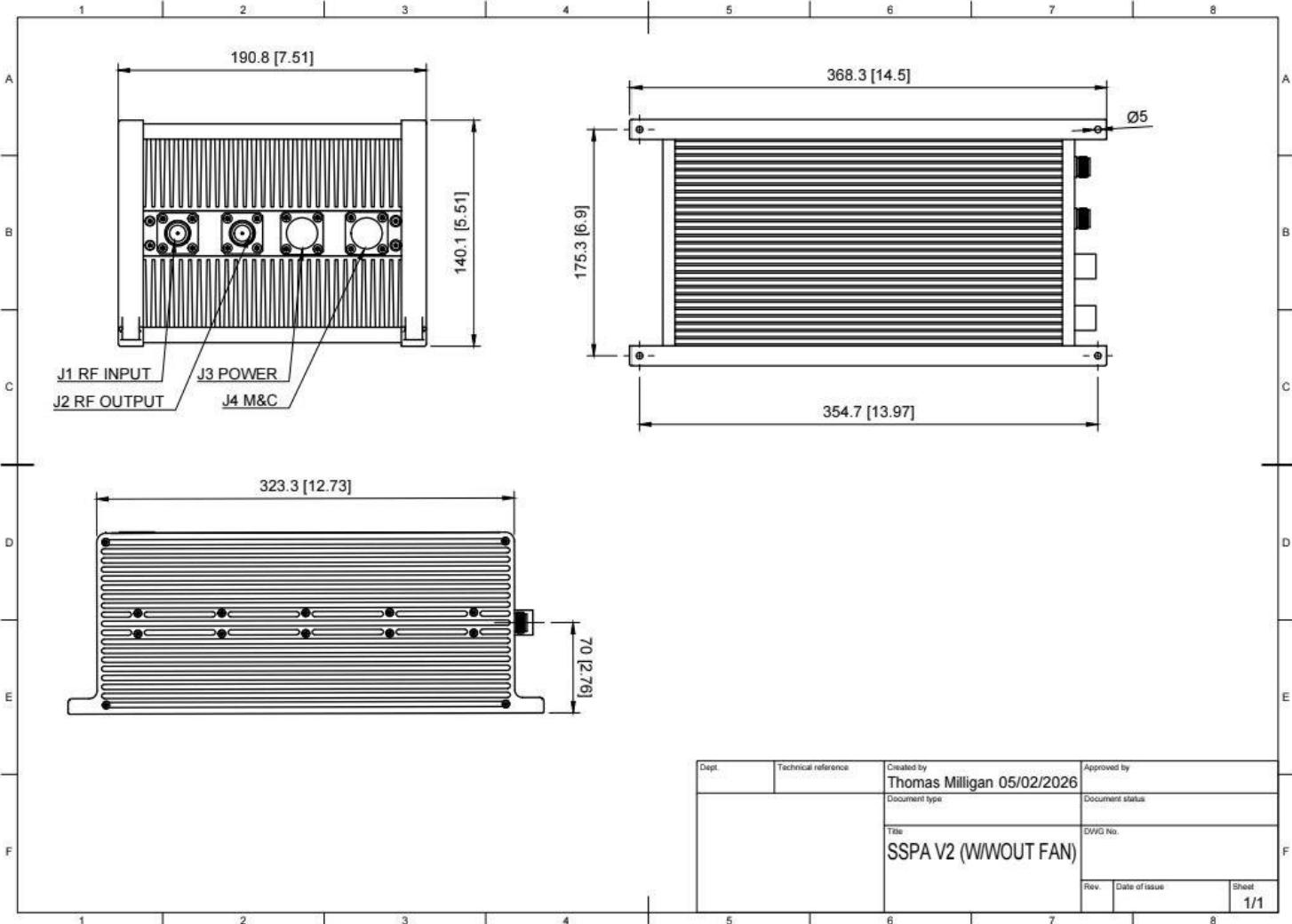


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OUTLINE DRAWING:

Note: Unit mm [Inches]





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Handling Precautions



Caution! ESD-Sensitive Device

RF VOLTAGE HAZARD: Contact with RF fields at the output connector can cause burns or electric shock. High levels of RF/Microwave energy may be present when the unit is operating.

HIGH DC CURRENT HAZARD: High levels of DC current are present when the unit is operating.

Each amplifier is shipped in a rigid protective carrying case designed to prevent mechanical damage during handling and transport.



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