



## Solid-State Pulsed/CW Power Amplifier, 18-28 GHz, 150 W

**WB1828G150-V3**

An excellent alternative to traveling wave tube amplifiers, the POAM WB1828G150-V3 is a solid-state pulsed/CW power amplifier operating from 18 to 28 GHz, delivering a saturated output power of 52 dBm (150 W) on CW and Pulsed modes. With high gain, efficiency and RF output power, this SSPA is an ideal building block for millimeter-wave subsystems across a wide range of applications.

The WB1828G150-V3 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 IP66 for demanding outdoor and mobile environments. The RF input port is 2.92mm (F) coaxial and the output port is WR42 waveguide, enabling straightforward system integration.



### Features

- Frequency Range: 18– 28 GHz
- Saturated Power (Pulsed/CW): 52 dBm (150W)
- Solid-state MMIC Reliability
- Over Temperature Protection
- Over Current Protection
- Monitoring and Control via RS422/RS485
- IP66 protection
- Low weight: 10 kg (22lbs.)
- Compact size: 368x190x166 mm (14.5x7.5x6.5 inch)

### Typical Applications

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

### ELECTRICAL SPECIFICATIONS (TA=+25°C)

| PARAMETER                          | VALUE              | UNIT                                                         |
|------------------------------------|--------------------|--------------------------------------------------------------|
| Operating Frequency                | 18 to 28           | GHz                                                          |
| Saturation Output Power-Pulsed/CW  | 150                | W                                                            |
| Input Power (Pulsed & CW)          | -2 (min), +6 (max) | dBm                                                          |
| Small Signal Gain                  | 60                 | dB                                                           |
| Pulsed Width                       | 0.5                | us                                                           |
| Pulsed Period                      | 1                  |                                                              |
| Power-Added Efficiency (CW/Pulsed) | 16                 | %                                                            |
| Rise/Fall Time [PW=500 ns, DC=50%] | 100/100            | ns                                                           |
| Second / Third Harmonics - CW      | -28/-14            | dBc                                                          |
| IMD3                               | -17                | dBc                                                          |
| Input/Output VSWR                  | 1.5:1              |                                                              |
| Input Impedance                    | 50                 | Ω (for coax connector)                                       |
| Operating Voltage                  | 36                 | VDC                                                          |
| Current                            | 20                 | A                                                            |
| MTBF                               | 250,000            | Hours 25°C, Ground fixed, duty cycle 50%; per MIL-HDBK-217F) |



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### MECHANICAL AND ENVIRONMENTAL SPECIFICATION

| PARAMETER                | VALUE                                               | NOTE                               |
|--------------------------|-----------------------------------------------------|------------------------------------|
| Operational Temperature  | -40°C to +75°C                                      |                                    |
| Storage Temperature      | -40°C to +85°C                                      |                                    |
| Dimension                | 368x190x166 mm (14.5x7.5x6.5 inch)                  |                                    |
| Weight                   | 10 kg (22 lbs.)                                     |                                    |
| RF Connectors            | 2.92mm-female (Input)<br>WR-42 Waveguide (Output)   |                                    |
| DC and M&C Connectors    | Military Round connectors D38999 Series by AMPHENOL | Mating connectors will be provided |
| Environmental Protection | IP66                                                |                                    |
| Cooling method           | Heatsink with fans                                  | fans rated IP66                    |
| Colour                   | Anodized Olive Green                                | Other colours also available       |

### TEST STANDARDS

|                   | PARAMETER                | VALUE                                                                                                                                                                                                                                                                      | NOTE - TEST STANDARD                         |
|-------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| <b>Vibration</b>  | Random Vibration         | 5Hz to 8Hz @ 6mm, 8Hz to 500Hz @ 15m/s <sup>2</sup> , 2 hours in each direction of 3 axes                                                                                                                                                                                  | MIL-STD-202G<br>BS EN 60068-2-6 2008:        |
|                   | Vibration Shock          | Half Sine, 400m/s <sup>2</sup> , 11ms. 3 shocks in each direction of 3 axes                                                                                                                                                                                                | BS EN 60068-2-27: 2009:<br>SHOCK             |
|                   | Bump Test                | Half Sine, 250m/s <sup>2</sup> , 6ms, 4000 bumps in each direction of 3 axes                                                                                                                                                                                               | BS EN 60068-2-27: 2009:                      |
| <b>Thermal</b>    | 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<br>-40°C for 16 hours - Storage                                                                                                                                                                                                           | BS EN 60068-2-1: 2007:                       |
|                   | High Temperature Test    | +60°C for 16 hours - Operational<br>+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<br>12-hour dwell +30°C 95%RH<br>3-hour ramp +30°C 95%RH to +20°C 95%RH<br>6-hour dwell +20°C 95%RH<br>24-hour cycle, 14 cycles<br>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:                      |
| <b>Drop</b>       | 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:                      |
| <b>Protection</b> | Ingress Protection, IP6X | Dust tight (with internal pressure reduction)                                                                                                                                                                                                                              | BS EN 60529:1992+A2:2013                     |
|                   | Driving Rain             | 200 l/m <sup>2</sup> /h for 1 hour                                                                                                                                                                                                                                         | DEF STAN 00-035, PART 3, ISSUE 4, TEST CL 27 |
|                   | Environmental Protection | IP66                                                                                                                                                                                                                                                                       | MIL-STD-108E                                 |



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

### RF CONNECTOR (J1 & J2)

| PIN            | DESCRIPTION         | NOTE                                           |
|----------------|---------------------|------------------------------------------------|
| RF Input (J1)  | Coax -2.92mm female | Please advise if other type connector required |
| RF output (J2) | WRD-42 Waveguide    |                                                |

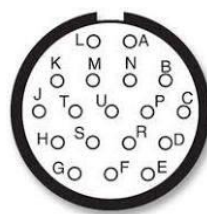
### M&C CONNECTOR PIN DESCRIPTION (J5)

[D38999/20WB35SN AMPHENOL CIRCULAR MIL SPEC CONNECTOR]

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

### DC CONNECTORS PIN DESCRIPTION (J3 & J4)

[D38999/20WD18PN AMPHENOL CIRCULAR MIL SPEC CONNECTOR]

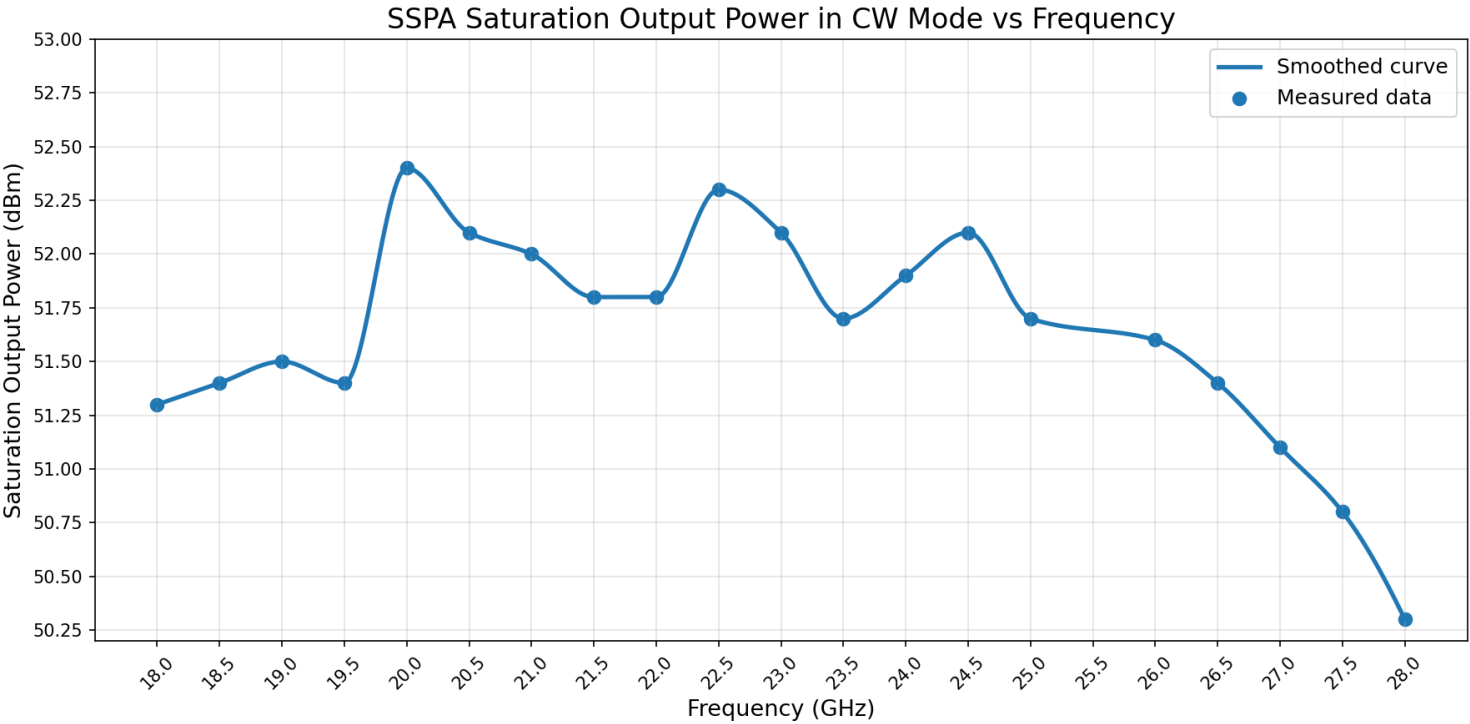
| PIN    | DESCRIPTION | NOTE                                                                                  |
|--------|-------------|---------------------------------------------------------------------------------------|
| A      | + 36 VDC    |  |
| B      | + 36 VDC    |                                                                                       |
| C      | + 36 VDC    |                                                                                       |
| D      | + 36 VDC    |                                                                                       |
| E      | + 36 VDC    |                                                                                       |
| F      | + 36 VDC    |                                                                                       |
| G      | + 36 VDC    |                                                                                       |
| H      | + 36 VDC    |                                                                                       |
| J      | + 36 VDC    |                                                                                       |
| K to U | GND         |                                                                                       |



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**TYPICAL OUTPUT GRAPH:**

Conditions unless otherwise specified: VD = 36V, PIN = 0 dBm, DC = 100%, Tclamp = 25 °C



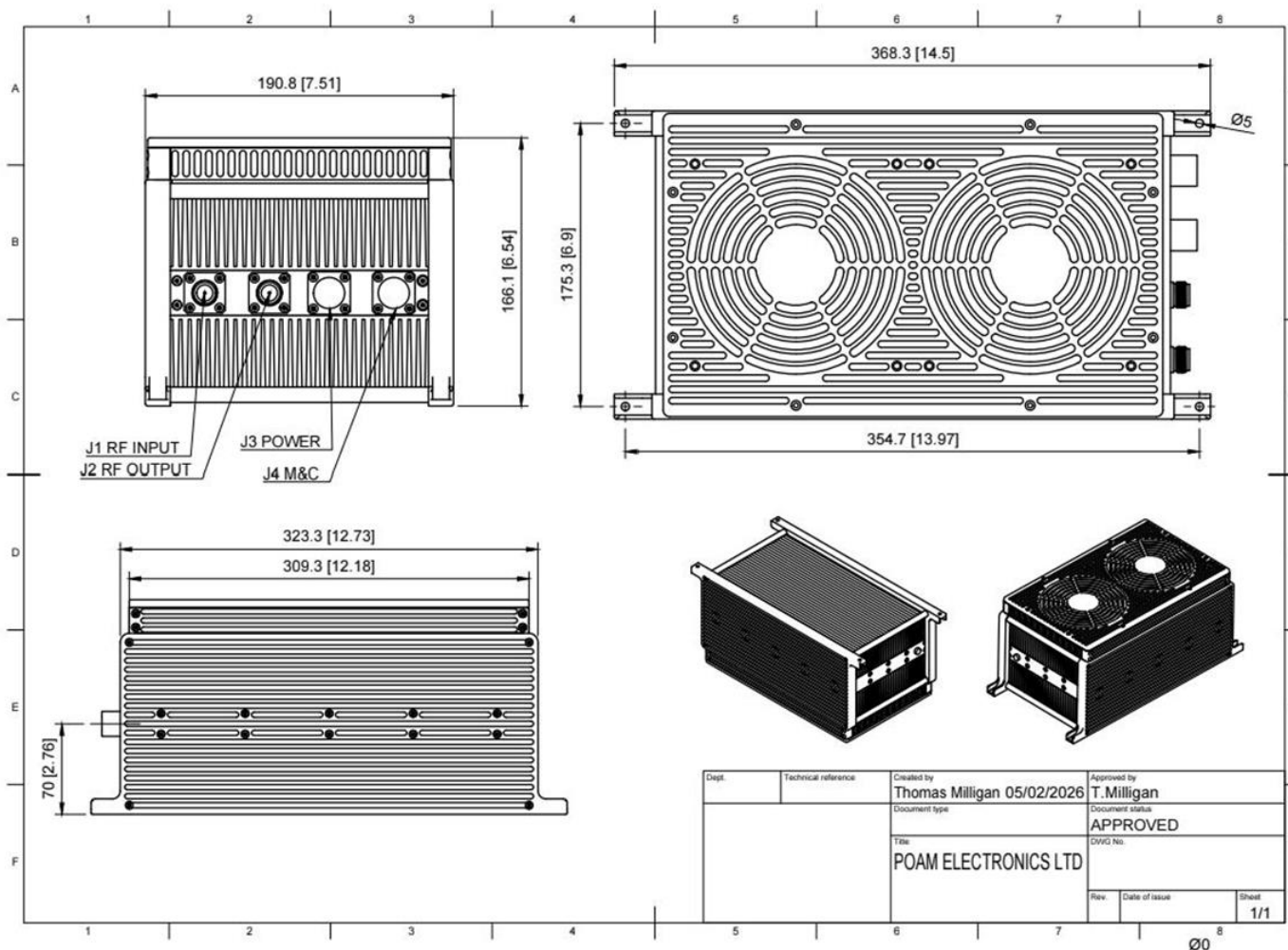


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## OUTLINE DRAWING:

Unit: mm [Inches]

Note: The RF IN/OUT ports for this unit are: 2.92mm-female input and WR-42 output







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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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