

## Solid State Broadband High Power Amplifier

**2187**
**1000 - 3000 MHz / 500 Watts**

The 2187 is suitable for high bandwidth, high power CW, modulated, and pulse applications. This amplifier utilizes high power GaN devices that provide wide frequency response, high gain, high peak power capability, and low distortions. Exceptional performance, long-term reliability and high efficiency are achieved by employing advanced broadband RF matching networks and combining techniques, EMI/RFI filters, and all qualified components. The amplifier is constructed within one single 3RU drawer including the forced air-cooling. Available operating voltage configurations are single-phase 180-260 VAC up to 400 Hz and 28 VDC.


**SKU#: 2187-001**

The amplifier includes a built in control and monitoring system, with protection functions which preserve high availability. Remote management and diagnostics are via an embedded web server allowing network managed site status and control simply by connecting the unit's Ethernet port to a LAN. Using a web browser and the unit's IP address (IPv4) allows ease of access with the benefit of multi-level security. The control system core runs an embedded OS (Linux), has a built-in non-volatile memory for event recording, and factory setup recovery features. The extended memory option allows storage of control parameters and event logs.

Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.

- Solid-state design
- Suitable for CW, AM, FM and pulse (Consult factory for other modulation types)
- Compact Modular design
- 50 ohm input/output impedance
- Built-in Control, Monitoring and Protection functions
- High reliability and ruggedness

### ELECTRICAL SPECIFICATIONS over temperature conditions (-10 to +40°C)

| Parameter                                                        | Symbol           | Min  | Typ | Max       | Unit |
|------------------------------------------------------------------|------------------|------|-----|-----------|------|
| Operating Frequency                                              | BW               | 1000 |     | 3000      | MHz  |
| Power Output CW <sup>(Note 1)</sup>                              | P <sub>SAT</sub> | 500  |     |           | Watt |
| Power Output @ 1dB Gain Compression <sup>(Note 2)</sup>          | P <sub>1dB</sub> | 400  |     |           | Watt |
| Power Gain @ 1dB Gain Compression                                | G <sub>1dB</sub> | 57   |     |           | dB   |
| Input Power for Rated P <sub>SAT</sub>                           | P <sub>IN</sub>  |      | 0   |           | dBm  |
| Input Power Range                                                | P <sub>IN</sub>  | -3.0 |     | +3.0      | dBm  |
| Gain Flatness / Leveled ALC                                      | ΔG               |      |     | ±3.5/±1.5 | dB   |
| Gain Adjustment Range                                            | VVA              | 20   |     |           | dB   |
| Input Return Loss                                                | S <sub>11</sub>  |      |     | -10       | dB   |
| Noise Figure @ maximum gain                                      | NF               |      |     | 20        | dB   |
| Third Order Intermodulation<br>2-Tone @ 51dBm/Tone, 1MHz Spacing | IM3              |      | -20 |           | dBc  |
| Harmonics @ P <sub>OUT</sub> = 500W                              | 2 <sup>ND</sup>  |      |     | -10       | dBc  |
|                                                                  | 3 <sup>RD</sup>  |      |     | -20       |      |
| Spurious Signals                                                 | Spur             |      |     | -60       | dBc  |
| Operating Voltage                                                | V <sub>AC</sub>  | 180  | 220 | 260       | Volt |
|                                                                  | V <sub>DC</sub>  | 24   | 28  | 32        |      |
| Power Consumption @ 500W CW                                      | P <sub>D</sub>   |      |     | 3000      | VA   |

Notes:

1. CW measurement performed in MGC Mode (Manual Gain Control)

2. P<sub>1dB</sub> measurements performed with AM 80% depth of modulation, 1 kHz modulation signal.

### MECHANICAL SPECIFICATIONS

| Parameter                                                           | Value                              | Unit  |
|---------------------------------------------------------------------|------------------------------------|-------|
| Dimensions W x H x D<br>(excludes connectors, handles and brackets) | 17 x 5.25 x 22                     | Inch  |
| Weight                                                              | 80                                 | Pound |
| RF Connectors Input/Output                                          | Type-N, Female                     |       |
| RF Sample                                                           | Type-SMA, Female                   |       |
| Blanking Input                                                      | Type-BNC, Female                   |       |
| Cooling                                                             | Built-in forced-air cooling system |       |

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### ENVIRONMENTAL CHARACTERISTICS (Qualification Data available for review):

| Parameter                                                                      | Symbol           | Min | Typ | Max | Unit |
|--------------------------------------------------------------------------------|------------------|-----|-----|-----|------|
| Operating Ambient Temperature                                                  | T <sub>A</sub>   | -10 |     | +40 | °C   |
| Non-operating Temperature                                                      | T <sub>STG</sub> | -40 |     | +85 | °C   |
| Relative Humidity (non-condensing)                                             | RH               |     |     | 95  | %    |
| Shock / Vibration - MIL-STD-810F<br>Shock Method 516.5, Vibration Method 514.5 | SH / VI          |     |     |     |      |

### PROTECTIONS:

| Parameter                      | Specification                                                                                                 | Unit |
|--------------------------------|---------------------------------------------------------------------------------------------------------------|------|
| Input Overdrive                | +10 dBm                                                                                                       | Max  |
| VSWR protection                | At 3:1 – PA backs-off output power to a safe operating level – no system shutdown, “On Air” time is maximized | -    |
| Thermal – Graceful Degradation | Ambient 40°C                                                                                                  | Min  |
| Default Data Recovery          | Factory Default Calibration Recovery                                                                          |      |

### COMMUNICATION INTERFACES:

| Function                           | Utility                                             | Connector              |
|------------------------------------|-----------------------------------------------------|------------------------|
| Ethernet                           | Network management of device / web interface        | RJ45                   |
| USB                                | Mass storage / Expansion Bus                        | USB 1.x/2.0 compatible |
| RS-232 (default) RS-422 (optional) | Serial management of device / local operator access | D-Sub 9-position Male  |

### SYSTEM I/O CONNECTOR – 14-Position

| Pin # | Description                | Specification                                                                 |
|-------|----------------------------|-------------------------------------------------------------------------------|
| 1     | FWD TP                     | Forward detected power (analog voltage: 0-5 Volt)                             |
| 2     | REV TP                     | Reverse detected power (analog voltage: 0-5 Volt)                             |
| 3     | Summary Fault              | Summary Fault: Active TTL Logic Low ( $\leq 0.7V$ ), (Internally Pulled-High) |
| 4     | N/C                        | No Connection (reserved)                                                      |
| 5     | Shutdown                   | Amplifier Disable: TTL Logic Low ( $\leq 0.7V$ ), (Internally Pulled-High)    |
| 6     | Aux P/S TP                 | +12.0V <sub>DC</sub> $\pm 2V$ (resettable 0.5amp fuse)                        |
| 7     | Main P/S TP                | +48.0V <sub>DC</sub> $\pm 4.8V$ (resettable 0.5amp fuse)                      |
| 8     | GND                        | Ground                                                                        |
| 9-11  | Open drain control         | Site management utility (reserved)                                            |
| 12&13 | Digital I/O (configurable) | Site management utility (reserved)                                            |
| 14    | GND                        | Ground                                                                        |

### AVAILABLE OPTIONS

#### 2187-XXX

**-001** - 180-260VAC, 1-1hase, MIL-STD AC Connector, Rear RF Connectors

**-002** - 28VDC, Rear RF Connectors

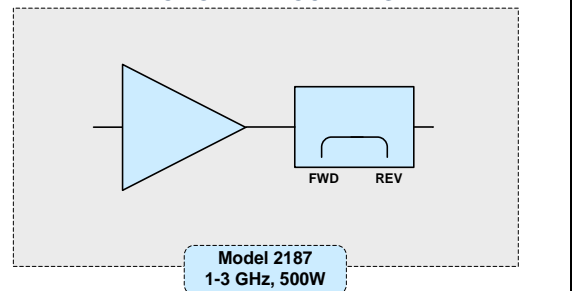
**-003** - 180-260VAC, 1-1hase, MIL-STD AC Connector, Front RF Connectors

**-004** - 28VDC, Front RF Connectors

#### Standard Features:

- LCD Control, Ethernet & Serial Comm
- Type-N Female Input & Output
- Rear SMA Sample Ports, Forward & Reverse
- BNC Female Blanking/Gating Port
- Rack Slides, Handles and Rackmount Bracket

### NOTIONAL BLOCK DIAGRAM

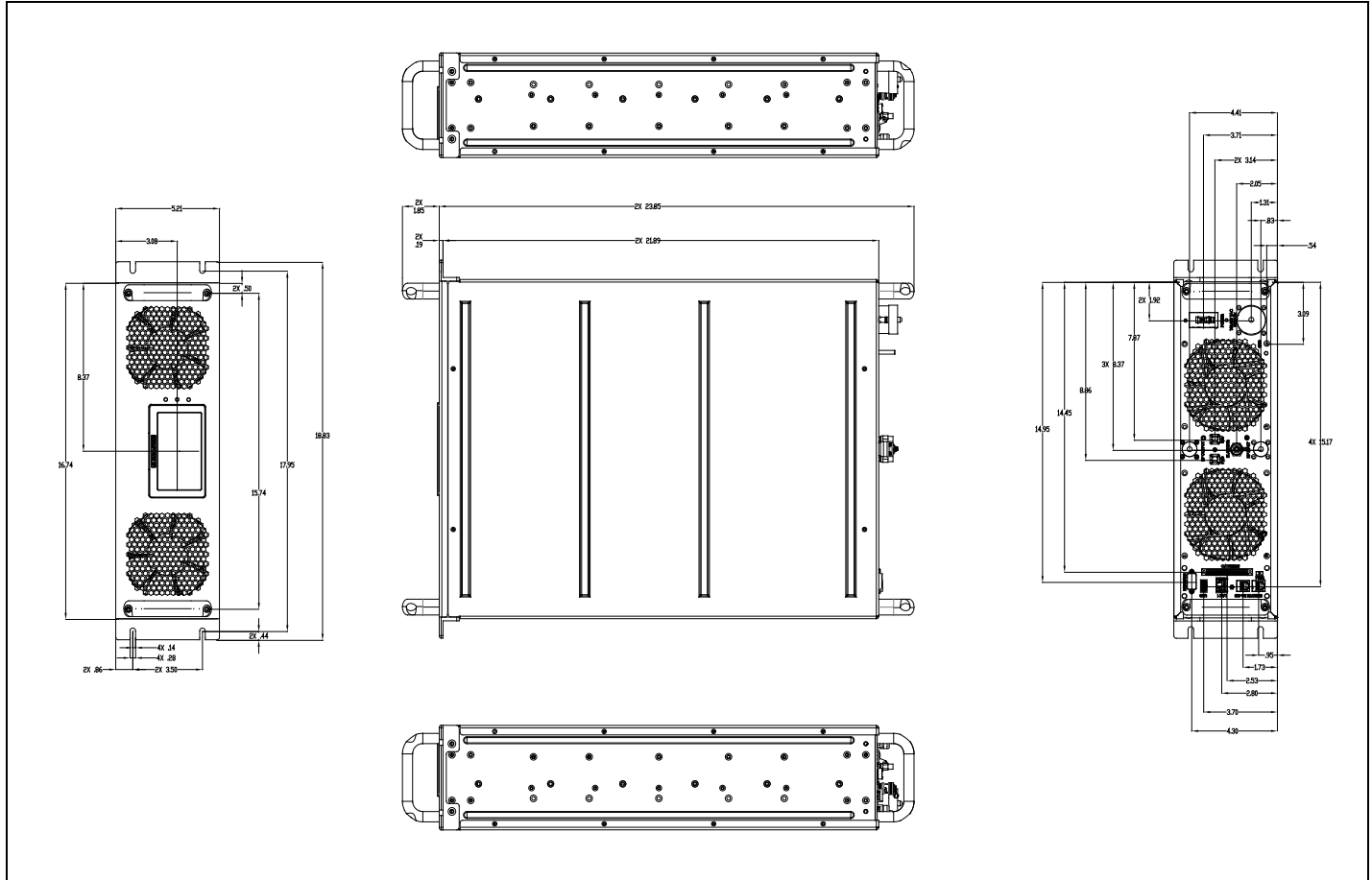


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OUTLINE DRAWING – (shown with Rear RF Connectors)



Front and Rear Views

