

Solid State Broadband High Power Amplifier

2198
20 - 6000 MHz 100/100/40 Watts

The 2198 is a tri-band amplifier housed in a single chassis and is suitable for high bandwidth, high power CW, modulated, and pulse applications. This amplifier utilizes both High power LDMOS and 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 with a 3RU drawer, including the forced air-cooling. Available operating voltage configurations are single phase 100-240 VAC, up to 400Hz and 28 VDC. The amplifier comes standard with user selectable modes; Automatic Gain Control (AGC), Automatic Level Control (ALC) and Manual Gain Control (MGC).



SKU#: 2198-001

Each band overlaps and selection of the band is easy via the front panel touch screen or with a PC connected to the Ethernet port as a peer connection or networked. The amplifier includes a built in control and monitoring system, with remote management and diagnostics 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 Class AB 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 120V_{AC}, @ 25°C, 50 Ω System

| Parameter | Symbol | Min | Typ | Max | Unit |
|---|-----------------------|------------|-----|-------------|------|
| Operating Frequency | Band 1 | 20 | | 1000 | MHz |
| | Band 2 | 1000 | | 3000 | |
| | Band 3 | 2000 | | 6000 | |
| Power Output CW ^(Note 1) | P _{SAT} | 100/100/40 | | | Watt |
| Power Gain | G _P | 49/49/48 | | | dB |
| Input Power for Rated P _{SAT} | P _{IN} | | 0 | | dBm |
| Input Power Range | P _{IN-RANGE} | -5.0 | | +3.0 | dBm |
| Small Signal Gain Flatness / Leveled ALC | ΔG | | | ±3.5 / ±1.5 | dB |
| Gain Adjustment Range | VVA | 20 | | | dB |
| Input Return Loss | S ₁₁ | | | -10 | dB |
| Noise Figure @ maximum gain | NF | | | 15 | dB |
| Third Order Intermodulation Distortion 2-Tone @ 44/44/40dBm per tone, 1MHz Spacing | IM3 | | -25 | | dBc |
| Harmonics @ Rated P _{OUT} | 2 ND | | -20 | -10 | dBc |
| | 3 RD | | -20 | -10 | |
| Spurious Signals | Spur | | | -60 | dBc |
| Operating Voltage (1-phase) | V _{AC} | 100 | 120 | 240 | Volt |
| Power Consumption @ Rated P _{OUT} | P _D | | | 700 | Watt |
| Band Switching Time | T _{SW} | | | 60 | mSec |

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

MECHANICAL SPECIFICATIONS

| Parameter | Value | Unit |
|----------------------------|------------------------------------|-------|
| Dimensions W x H x D | RF Drawer: 19.0 x 5.25 x 23.7 | Inch |
| Weight | 50 | 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

| Parameter | Symbol | Min | Typ | Max | Unit |
|--|------------------|-----|-----|-----|------|
| Operating Ambient Temperature | T _A | -10 | | +50 | °C |
| Non-operating Temperature | T _{STG} | -40 | | +85 | °C |
| Relative Humidity (non-condensing) | RH | | | 95 | % |
| Shock / Vibration - MIL-STD-810F 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 50°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) Or RS-422 (optional) | Serial management of device / local operator access | D-Sub 9-position Male |

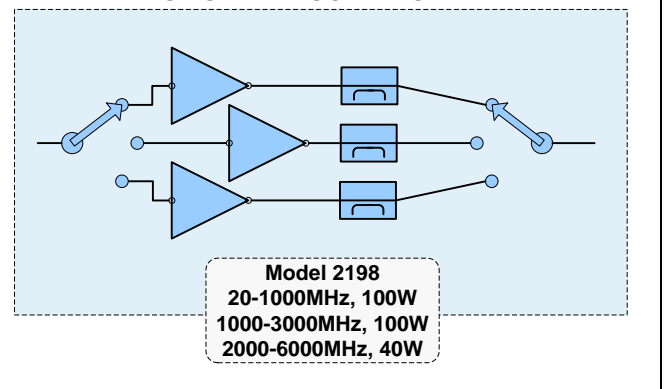
SYSTEM I/O INTERFACE – 14-Position

| Pin # | Description | Specification |
|-------|---------------------------------|---|
| 1 | FWD Test Point | Forward detected power (analog voltage: 0-5 Volt) |
| 2 | REV Test Point | Reverse detected power (analog voltage: 0-5 Volt) |
| 3 | Summary Fault | Summary Fault: Active TTL Logic Low ($\leq 0.7V$) (Internally Pulled-High) |
| 4 | VVA Control (optional) | VVA control/monitor: Analog Voltage Range 0-5V |
| 5 | Shutdown | Amplifier Disable: TTL Logic Low ($\leq 0.7V$) (Internally Pulled-High) |
| 6 | Aux P/S Test Point | +12.0V _{DC} $\pm 2.0V$ (resettable 0.5amp fuse) |
| 7 | Main P/S Test Point | +44.0V _{DC} $\pm 4.8V$ (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

| |
|--|
| 2198-xxx |
| -001 100-240VAC, 1-phase, 47-63 Hz, Rear Connectors |
| -002 TBD |
| -003 TBD |
| -004 TBD |
| Contact us for other available options; sales@empowerrf.com |
| Standard Feature: |
| -LCD Control, Ethernet & Serial Comm |
| -Main RF Connectors: Input & Output [Type-N, F] |
| -Sample Port: SMA-F [Forward & Reverse] |
| -Blanking/Gating Port: BNC-F |
| -Rack Slides, Handles and Rackmount Brackets |

NOTIONAL BLOCK DIAGRAM



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OUTLINE DRAWING

