

Solid State Broadband High Power Amplifier

2226
900 - 1600 MHz / 2000 Watts

The 2226 is suitable for 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 drawers are constructed in 5RU and 3RU including the forced air-cooling with optional enclosure.

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 class AB design
- Suitable for CW, AM, FM, Pulse and some linear applications (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 | 900 | | 1600 | MHz |
| Power Output CW | P _{OUT} | 2000 | | | Watt |
| Power Output @ 1dB Gain Compression ^(Note 2) | P _{1dB} | 1500 | | | Watt |
| Power Gain @ 1dB Gain Compression | G _{1dB} | | 63 | | dB |
| Input Power for Rated P _{OUT} – MGC Mode | P _{IN} | | -10 | -3 | dBm |
| Input Power Range, Mode ALC | P _{IN} | -3.0 | | +3.0 | dBm |
| Small Signal Gain (MGC)/Leveled ALC – Flatness | ΔG | | | ±1.5 / ±0.5 | dB |
| Gain Adjustment Range | FGA | 15 | 20 | | dB |
| Input Return Loss | S ₁₁ | | | -10 | dB |
| Noise Figure @ maximum gain | NF | | 20 | 25 | dB |
| Third Order Intermodulation Distortion 2-Tone @ 57dBm/Tone, 1MHz Spacing | IM3 | | -25 | | dBc |
| Harmonics @ P _{OUT} = 2000W | 2 ND | | | -14 | dBc |
| | 3 RD | | | -15 | dBc |
| Spurious Signals | Spur | | | -70 | dBc |
| Operating Voltage – (3-phase, line-to-line) ^(Note 3) | V _{AC} | 180 | 208 | 260 | Volt |
| Power Consumption @ 2000W CW | P _D | | | 6,000 | VA |
| Efficiency @ rated output | Eff | 33 | | | % |

Notes:
 1. CW measurement performed in MGC Mode (Manual Gain Control)
 2. P_{1dB} measurement is performed with AM 80% depth of modulation at 1kHz modulation signal
 3. AC Voltage input is factory configurable for 208V 3-phase or 220V single phase and an optional 400 hertz cycle.

MECHANICAL SPECIFICATIONS

| Parameter | Value | Unit |
|---|---|----------|
| Dimensions W x H x D (excludes handles, connectors and brackets) | 17.5 x 14.0 x 22 (3RU + 5RU) | Inch |
| Weight | 230 | Pound |
| RF Connectors Input/Output | Input: Type-N, Female Output: Type-1-5/8 EIA | - |
| RF Sample Ports | SMA-female, Forward and Reverse | FWD/REV |
| Blanking Input | Type-BNC, Female | BLANKING |
| Cooling | Built-in forced air cooling system (airflow, front to rear) | - |

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ENVIRONMENTAL CHARACTERISTICS (Qualification Data available for review):

| Parameter | Symbol | Min | Typ | Max | Unit |
|--|------------------|-----|-----|-----|------|
| Operating Ambient Temperature | T _A | -10 | | +40 | °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 40°C | Min |
| Default Data Recovery | Factory Default Calibration Recovery | |

COMMUNICATION INTERFACES:

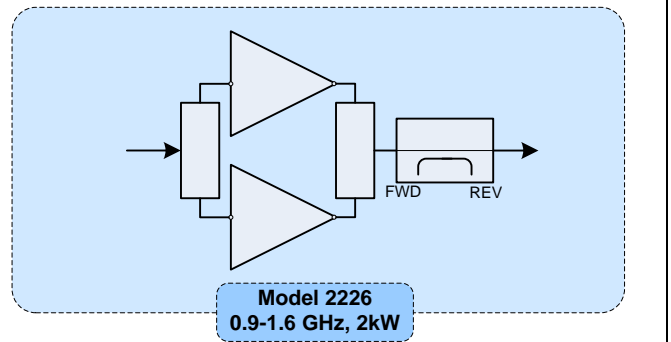
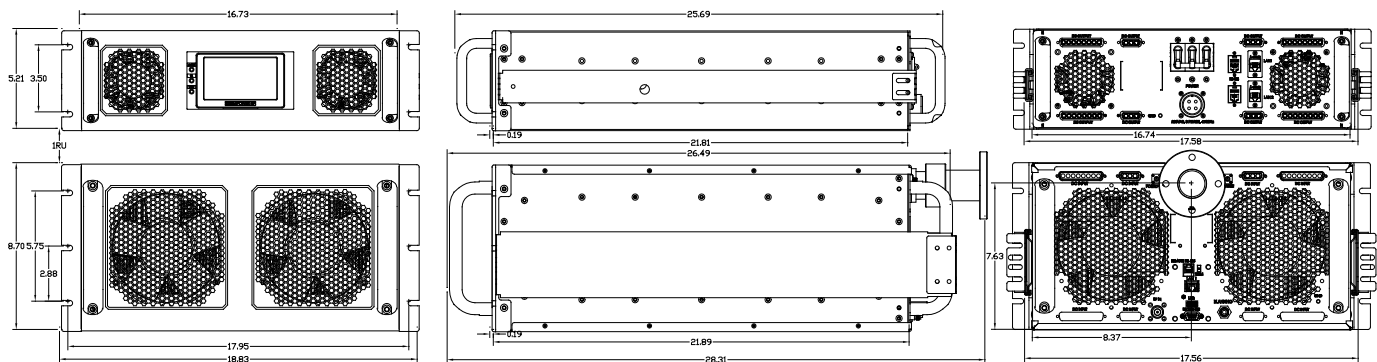
| Function | Utility | Connector |
|------------------------------------|---|------------------------|
| Ethernet | Network management of device / web interface | RJ45 |
| USB | Mass storage / Expansion Bus | USB 1.x/2.0 compatible |
| RS-232 Standard, RS-422 (optional) | Serial management of device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

Available Options

| |
|--|
| 2226-xxx |
| -002 208 VAC, 3-phase-Delta, 47-63 Hz, Rear RF Connectors |
| -00X TBD |
| -00X TBD |
| -00X TBD |
| Contact us for other available options; sales@empowerrf.com |

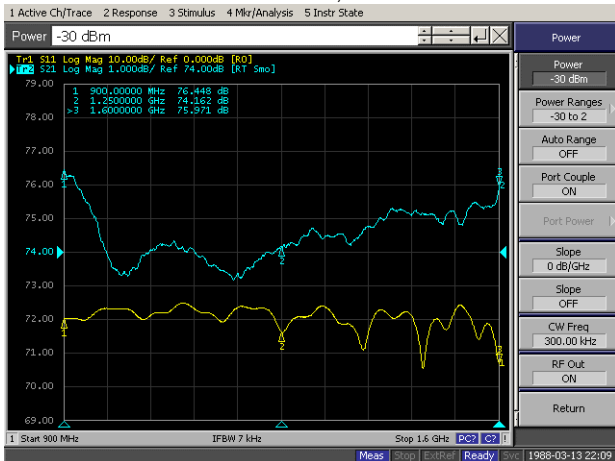
Standard Feature:

- LCD Control, Ethernet & Serial Comm.
- Sample Port: SMA-F [Forward & Reverse]
- Blanking/Gating Port: BNC-F
- Rack Slides, Handles and Rackmount Bracket

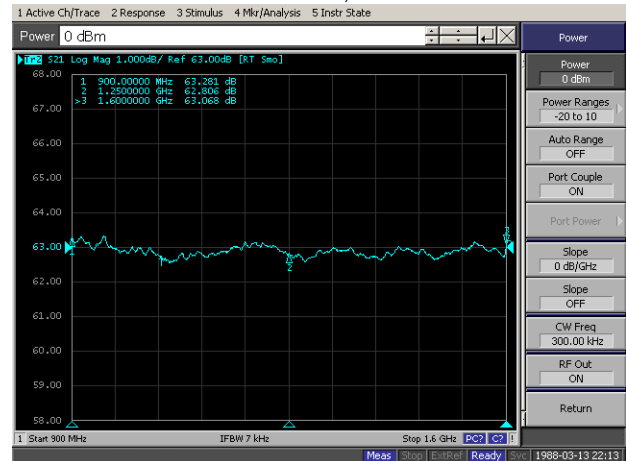
NOTIONAL BLOCK DIAGRAM

SYSTEM OUTLINE


TYPICAL PERFORMANCE
Plot 1 – Small Signal Gain

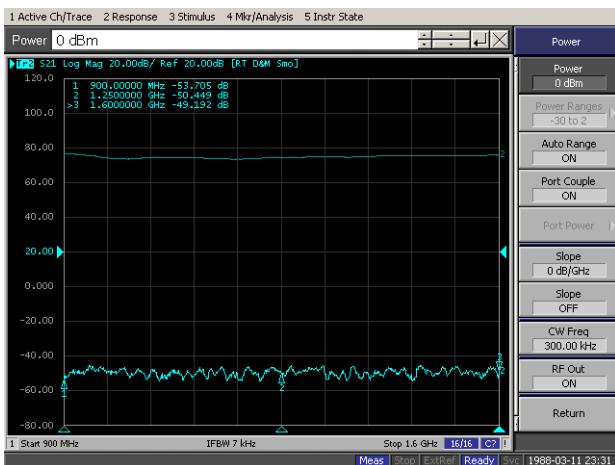
Top Curve: Small Signal Gain @ $P_{IN} = -30\text{dBm}$
 Reference: 71dB, 1dB/div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/div.


Plot 2 – Output Power Flatness @ ALC Mode

Top Curve: Output Power @ 2000W, $P_{IN} = 0\text{dBm}$
 Reference: 60dBm, 1dB/div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/div.


Plot 3 – Gain @ Shutdown

Top Curve: Small Signal Gain @ $P_{IN} = -30\text{dBm}$
 Bottom Curve: Gain @ STANDBY MODE
 Reference: 20dB, 20dB/div.


Plot 4 – Power Gain Adjustment Range @ $P_{IN} = -30\text{dBm}$

Top Curve: Maximum Gain
 Bottom Curve: Minimum Gain
 Reference: 60dB, 10dB/div.

