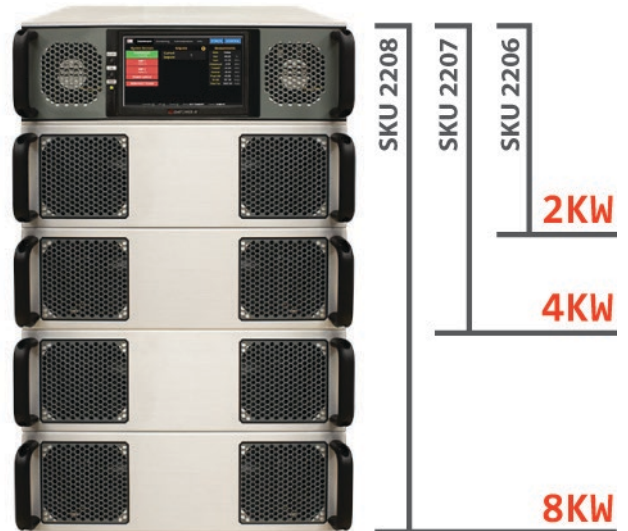


# Solid State Broadband High Power Amplifier

**2208**
**1000 - 2000 MHz / 8000 Watts Peak**

The 2208 is a pulsed L band high-power solid-state power amplifier system suitable for octave bandwidth applications. This amplifier utilizes high power GaN on SiC devices that provide wide frequency response, high gain, high peak power capability, and low distortion. Exceptional performance, long-term reliability and high efficiency are achieved by employing advanced broadband RF matching networks and combining techniques, EMI/RFI filters, fast input and output detectors and built-in DDC with exceptional VSWR protection. The amplifier architecture is based on Empowers proprietary scalable technology and consists of a 3RU controller with power supply and four 3RU RF power blocks and is air-cooled. In addition to scalability, this amplifier is inherently rugged due to a design that virtually eliminates every internal connector found in the typical RF/Microwave system amplifier.

With a proprietary scalable architecture this amplifier can be split into two separate 4KW 2207's with the purchase of only one 3U controller and the optional accessory kit. More commonly you would start with the scalable 2206 or 2207 and add only 3U power blocks and combiner to create a 2208 when your future power requirements increase.



The amplifier comes standard with Manual Gain Control (MGC). The amplifier can be controlled via the LCD touch screen, peer to peer PC connection, or through LAN for remote monitoring, control, and diagnostics. The user GUI is easy to navigate and is accessed simply through your web browser with no software to install. The control system core runs an embedded OS (Linux) and has a built-in non-volatile memory for storing multiple user configurations.

Empower RF's ISO9001:2015 Quality Assurance Program assures consistent performance and the highest reliability.

- Blanking/Gating Input
- Solid-state GaN on SiC compact modular design
- Embedded directional coupler
- High Reliability and Ruggedness
- A Member of our Pulsed Scalable Family - 2206, 2207, 2208 (Contact factory to learn more)

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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency, Instantaneous bandwidth	BW	1000		2000	MHz
Power Output Peak	P <sub>PK</sub>	8000			Watt
Pulse Width @ Duty Cycle 10% Max.	P <sub>WIDTH</sub>	5.0		50	uS
Duty Cycle	DC	0.1		10	%
Pulse Repetition Rate	PRF			25	kHz
Power Droop over 50µS pulse width	P <sub>DROOP</sub>			0.5	dB
Modulated Pulse Rise/Fall Time (10% to 90%)	T <sub>R</sub> /T <sub>F</sub>			70/70	nS
Input Power for Rated P <sub>PK</sub>	P <sub>IN</sub>		0		dBm
Input Power Range	P <sub>IN</sub>	-5.0		+5.0	dBm
Power Gain @ Rated P <sub>PK</sub>	G <sub>P</sub>	69			dB
Gain Adjustment Range	VVA	20			dB
Gain Flatness	ΔG			±2.5 / ±1.0	dB
Gain Stability/24HR	G <sub>STABILITY</sub>			±0.25	dB
Input Return Loss	S <sub>11</sub>			-10	dB
NPO – Noise Power Output	Enabled			-10	dBm/MHz
	Disabled			-110	
Delay	Delay		400		nS
Spurious Signals	Spur			-60	dBc
Operating Voltage – (single-phase, 47-63Hz)	V <sub>AC</sub>	180		260	Volt
Power Consumption @ P <sub>OUT</sub> = 8KW <sub>PK</sub> (10%Duty Cycle)	P <sub>D</sub>			4000	VA

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**MECHANICAL SPECIFICATIONS**

Parameter	Value	Unit
Dimensions W x H x D (Excluding Brackets, Handles and Connectors)	17.5 x 26.25 x 27.0 [5 x 3RU]	Inch
Weight	320	Pound
RF Connectors Input/Output	Input: N-type Female, Output: 7/16-DIN Female	RF INPUT/RF OUTPUT
Blanking Input Connector	BNC, Female	Blanking
Cooling	Built-in, forced air-cooling system – front to rear	Airflow direction

**ENVIRONMENTAL CHARACTERISTICS:**

Parameter	Symbol	Min	Typ	Max	Unit
Operating Ambient Temperature *	T <sub>A</sub>	-10 *		+40	°C
Non-operating Temperature *	T <sub>STG</sub>	-20 *		+85	°C
Relative Humidity (non-condensing)	RH			95	%
Altitude	Operating			10,000	Feet
	Non-operating			40,000	
Shock / Vibration - MIL-STD-810F Shock Method 516.5, Vibration Method 514.5	SH / VI				

**Note:** [ \* ] Consult Empower RF for application conditions below -10°C / -20°C temperatures (Operational / Non-operational).

**PROTECTIONS:**

Parameter	Specification	Unit
Input Overdrive	+10 dBm	Max.
VSWR protection @ P <sub>OUT</sub> = 8000W <sub>PK</sub>	At 3:1 – PA backs-off peak output power to a safe operating level – no system shutdown, “On Air” time is maximized	-
Thermal – Graceful Degradation	Ambient +40°C, Automatic Recovery	Min.
Duty Cycle Limit	12%	Max.
Default Data Recovery	Factory Default Calibration Recovery	

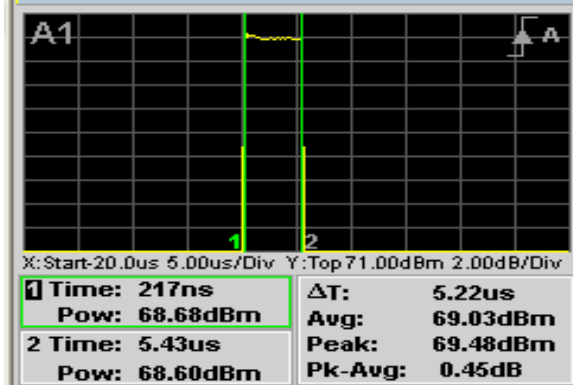
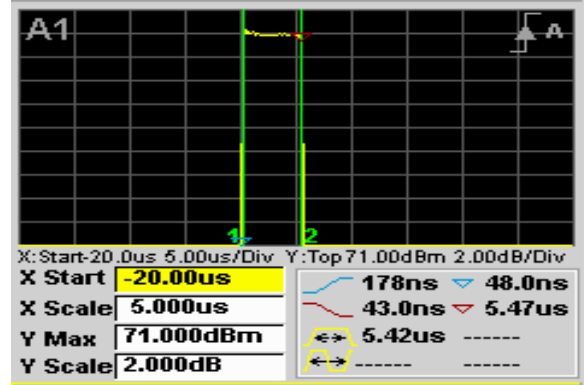
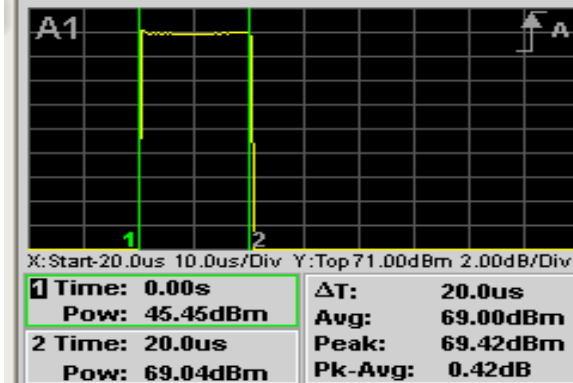
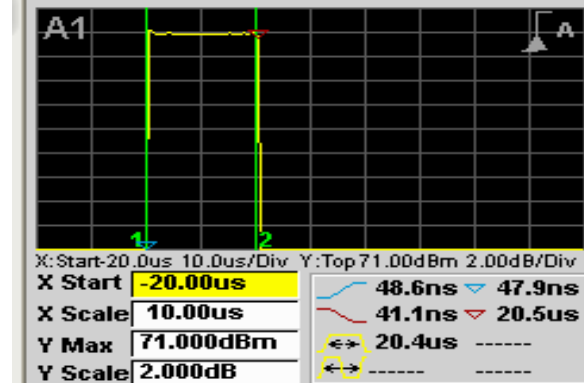
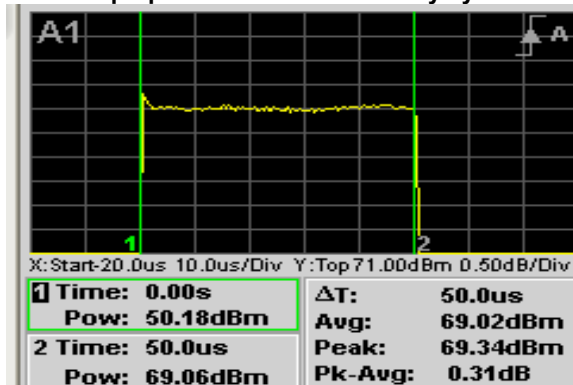
**COMMUNICATION INTERFACES:**

Function	Utility	Connector
Ethernet	Network management of device / web interface	RJ45
USB	Mass storage / Expansion Bus	USB 1.x/2.0 compatible

**Available Options**

2208-001
<b>Available optional accessory kit to scale down output power capability is required for;</b> <ul style="list-style-type: none"> <li>- <b>SKU 2206</b>, 2 kilowatts</li> <li>- <b>SKU 2207</b>, 4 kilowatts</li> </ul> Contact factory for details
<b>Standard Features:</b> <ul style="list-style-type: none"> <li>-180-260 VAC, Single Phase</li> <li>-LCD Control, Ethernet</li> <li>-Main RF Connectors: <b>Input &amp; Output</b> [N-type Female &amp; 7/16-DIN Female]</li> <li>-SMA Female Sample Ports: Forward &amp; Reverse</li> <li>-Blanking/Gating Port: BNC Female</li> </ul>

# Solid State Broadband High Power Amplifier

**2208**
**1000 - 2000 MHz / 8000 Watts Peak**
**TYPICAL PERFORMANCE**
**Plot 1 – Pulse Performance @ 69dBm, Gated Input  
5  $\mu$ S pulse width and 10% duty cycle**

**Plot 2 – Pulse Performance @ 69dBm, Gated Input  
Rise Time/Fall Time: 178ns/43ns**

**Plot 3 – Pulse Performance @ 69dBm, Gated Input  
20  $\mu$ S pulse width and 10% duty cycle**

**Plot 4 – Pulse Performance @ 69dBm, Gated Input  
Rise Time/Fall Time: 48.6ns/41.1ns**

**Plot 5 – Pulse Performance @ 69dBm, Gated Input  
50  $\mu$ S pulse width and 10% duty cycle**

**Plot 6 – Pulse Performance @ 69dBm, Gated Input  
Rise Time/Fall Time: 47.0ns/40.3ns**
