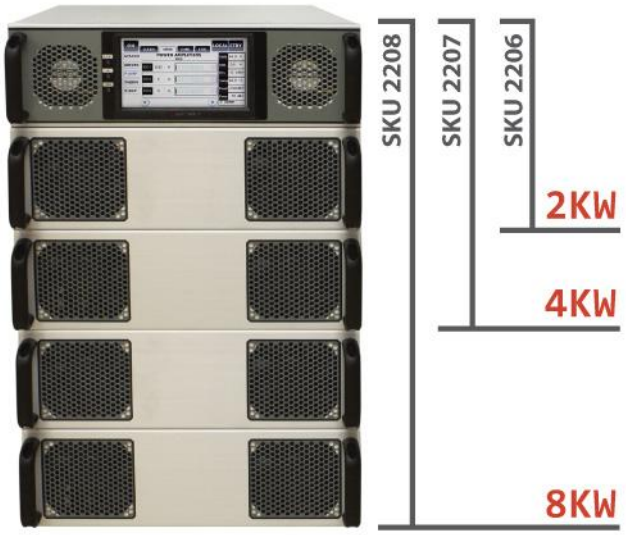
EMPOWER
RF SYSTEMS, INC.

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 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 amplifiers 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. 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 user selectable Automatic Gain Control (AGC), Automatic Level Control (ALC), and 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.

- Blanking Input
- Solid-state GaN design
- Compact Modular design
- High Reliability and Ruggedness
- A Member of our Pulsed Scalable Family - 2206, 2207, 2208 (Call factory to learn more)

ELECTRICAL SPECIFICATIONS over temperature conditions (-10 to +40ºC)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency, Instantaneous bandwidth	BW	1000		2000	MHz
Power Output Peak	P_{PK}	8000			Watt
Pulse Width @ Duty Cycle 10% Max.	P_{WIDTH}	1.0		50	uS
Duty Cycle	DC	0.1		10	%
Power Droop over 50uS pulse Width	P_{DROOP}			0.5	dB
Modulated Pulse Rise/Fall Time (10% to 90%)	T_R/T_F			70/70	nS
Input Power for Rated P_{PK} 8KW	P_{IN}		0		dBm
Input Power Range	P_{IN}	-5.0		+5.0	dBm
Power Gain @ Rated P_{SAT}	G_P	69			dB
Gain Adjustment Range	VVA	20			dB
Gain Flatness / Leveled ALC	ΔG			±2.5 / ±1.0	dB
Gain Stability/24HR	$G_{STABILITY}$			±0.25	dB
Input Return Loss	S_{11}			-10	dB
Output Return Loss	S_{22}			-7.5	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_{AC}	180		260	Volt
Power Consumption @10% , P_{OUT} = 8KW$_{PK}$	P_D			4000	Watts

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MECHANICAL SPECIFICATIONS

Parameter	Value	Units
Dimensions W x H x D (Excluding Brackets, Handles and Connectors)	17.5 x 26.25x 27.0 5x3RU	Inch
Weight	320	lbs
RF Connectors Input/Output (Rear Panel)	Input Type-N Female. Output Type-7/16 Female	-
Blanking Input	Type-BNC, Female	-
Cooling (front to rear)	Built-in, forced air cooling system	-

ENVIRONMENTAL CHARACTERISTICS:

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	%
Altitude	Operating	ALT			10,000	Feet
	Non-operating				40,000	
Shock / Vibration - MIL-STD-810F Shock Method 516.5, Vibration Method 514.5		SH / VI		In Accordance With		

PROTECTIONS:

Parameter	Specifications	Unit
Input Overdrive	+10 dBm	Max.
VSWR protection @ P_{OUT} = 8000W_{PK}	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 +75ºC, Automatic Recovery	Min.
Duty Cycle Limit	10%	Max.
Default Data Recovery	Factory Default Calibration Recovery	

COMMUNICATION INTERFACES:

Function	Utility	Connector
Ethernet	Network management of device / web interface	RJ45
RS-232, RS-422 (optional)	Serial management of device / local operator access	D-Sub 9-position Male

SYSTEM I/O CONNECTOR – 14-Position

Pin #	Description	Specifications
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 (≤0.7V) (*Internally Pulled-High*)
4	VVA control (optional)	Gain control/Monitor: Analog Voltage Range 0-5V Gain Control: 0V= Max. Attenuator, 5V= Min. Attenuator
5	Shutdown	Amplifier Disable: TTL Logic Low (≤0.7V) (*Internally Pulled-High*)
6	Aux P/S Test Point	+12.0V_{DC} ±2V (resettable 0.5amp fuse)
7	PSS Test Point	+44.0V_{DC} ±4.8V (resettable 0.5amp fuse)
8	GND	Ground
9	Open drain control	Site management utility (reserved)
10	Open drain control	Site management utility (reserved)
11	Open drain control	Site management utility (reserved)
12	Digital I/O (configurable)	Site management utility (reserved)
13	Digital I/O (configurable)	Site management utility (reserved)
14	GND	Ground

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Available Options

2208-001

Standard Features:

-180 -260 VAC, Single Phase
-LCD Control, Ethernet & Serial Com
-Type N Female Input & 7/16 (DIN) Female Output
-Rear SMA Sample Ports, Forward & Reverse Power
-BNC Female Blanking/Gating Port