

## Solid State Broadband High Power Amplifier

**2213**
**2900 – 3500 MHz / 8000 Watts Pulsed**

This SKU 2213 is comprised of multi-drawer integrated subsystems to produce a minimum output of 8kW peak pulsed power. The amplifier subsystem features multiple 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. Each drawer is constructed within single drawer including the integral forced air-cooling fans. The system comes standard to operate from 180-260VAC single phase or a three phase AC sources.

The amplifier system includes a built-in control and monitoring system, with protection functions which preserve maximum output capability and reliability. 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 multilevel security. The control system core supports hardware encryption, 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.

We are delivering more than just RF power, the next generation family of systems provide dynamic adjustments linked to the processing power and digital controls, which focus on maximizing system availability time as well as power output under ALL conditions.

Empower RF's ISO9001:2008 Quality Assurance Program assures consistent performance and the highest reliability.

- Solid-state class AB design
- Suitable for instantaneous pulse operation over the operating band.
- Compact Modular design and scalable architecture
- 50 ohm input/output impedance
- Built-in Control, Monitoring and Protection functions
- High reliability and ruggedness

Preliminary

### ELECTRICAL SPECIFICATIONS over temperature conditions (0 to +50°C)

Parameter	Symbol	Min	Typical	Max	Unit
Operating Frequency	BW	2900		3500	MHz
Power Output – Peak Pulse	P <sub>SAT_PK</sub>	8000			Watt
Pulse Width @ Duty Cycle 12%	P <sub>WIDTH</sub>	2		500	µSec
Duty Cycle		0.5		12	%
Pulse Repetition Rate Frequency	PRF	1		25	kHz
Power Gain @ Rated Peak P <sub>OUT</sub>	G <sub>PK</sub>	70			dB
Power Droop @ 500µSec Pulse Width	P <sub>DROOP</sub>		1.0	TBD	dB
Modulated Pulse Rise/Fall Time (10% to 90%)	T <sub>R</sub> / T <sub>F</sub>		70/70	TBD	nSec
Input Power for rated output power	P <sub>IN</sub>	-4	0	+2	dBm
Power Gain Flatness @ Pulsed P <sub>SAT</sub>	ΔG <sub>P</sub>			±1	dB
Input Return Loss	S <sub>11</sub>			-10	dB
NPO – Noise Power Output	Enabled			-10	dBm/MHz
	Disabled			-106	
Harmonics @ P <sub>OUT_PULSE</sub> = 8kW <sub>PK</sub>	2 <sup>nd</sup>		-20		dBc
	3 <sup>rd</sup>		-12		
Spurious Signals	Spur			-60	dBc
Operating Voltage @ 3-phase (Line-to-Line)	V <sub>AC</sub>	180	208	260	Volt
Operating Voltage @ 1-phase		180	220	260	
Power Consumption @ P <sub>OUT</sub> = 8kW <sub>PK</sub>	P <sub>D</sub>			4500	VA

### MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Overall Dimension W x H x D (excludes brackets, handles and connectors)	17.5 x 22.75 x 22	Inch
Total Weight	TBD	Pound
RF Connectors Input/Output	Input: N-Type Female / Output: WR-284	
RF Samples	SMA Female	
Blanking input	BNC Female	
Cooling	Built-in forced-air system	

# Solid State Broadband High Power Amplifier

**2213**
**2900 – 3500 MHz / 8000 Watts Pulsed**
**ENVIRONMENTAL CHARACTERISTICS:**

Parameter	Symbol	Min	Typ	Max	Unit
Operating Ambient Temperature <i>NOTES 1&amp;2</i>	T <sub>C</sub>	-10		+50	°C
Non-operating Temperature	T <sub>STG</sub>	-35		+75	°C
Relative humidity (non-condensing)	RH			95	%
Altitude (MIL-STD-810F)	ALT			10,000	Feet
Shock / Vibration (MIL-STD-810F, Shock Method 516.5, Vibration Method 514.5)	SH / VI				

*Notes: 1. Graceful degradation above +50°C 2. Call factory for extended operating temperature range.*
**PROTECTIONS**

Parameter	Specification	Unit
Input Overdrive	+10 dBm, Automatic Recovery	Max
Electronic Load VSWR Protection	3:1 @ all load phase & amplitude continuous, fold back to safe operation up to ∞:1 VSWR, Automatic Recovery	-
Thermal – Graceful Degradation	Ambient 75°C, Automatic Recovery	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 pin**

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: TTL “High” (Logic 1) = fault
4	N/C	No Connection
5	Shutdown	Amplifier Enable: TTL “High” (Logic 1) or Open Amplifier Disable: TTL “Low” (Logic 0)
6	AuxPS (TP)	+44 V <sub>DC</sub> ±4.0V (resettable 0.5amp fuse)
7	VDD (TP)	+44 V <sub>DC</sub> ±4.0V (resettable 0.5amp fuse)
8	GND	Ground
9&10	Open drain control	Site management utility (reserved)
12&13	Digital I/O (configurable)	Site management utility (reserved)
14	GND	Ground

**Available Options**

<b>2213-XXX</b>
<b>-001</b> 180-260 VAC, 3-phase-Delta, 47-63 Hz, Rear RF Connectors
<b>-002</b> TBD
<b>-003</b> TBD
<b>-004</b> TBD
Contact us for other available options; <a href="mailto:sales@empowerrf.com">sales@empowerrf.com</a>
<b>Standard Feature:</b>
-LCD Control, Ethernet & Serial Comm
-Sample Port: SMA-F [Forward & Reverse]
-Blanking/Gating Port: BNC-F
-Rack Slides, Handles and Rackmount Brackets

**NOTIONAL BLOCK DIAGRAM**
