

## Solid State Broadband High Power Amplifier

**2186**
**2000 - 6000 MHz / 150 Watts**

The 2186 is suitable for high bandwidth, 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 amplifier is constructed within a 3RU drawer, including the forced air-cooling. The system comes standard to operate from 180-260VAC single phase.



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 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 over temperature conditions (-10 to +50°C)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	2000		6000	MHz
Power Output CW <sup>(Note 1)</sup>	P <sub>SAT</sub>	150			Watt
Power Output @ 1dB Gain Compression <sup>(Note 2)</sup>	P <sub>1dB</sub>	120			Watt
Power Gain @ 1dB Gain Compression	G <sub>1dB</sub>	55			dB
Input Power for Rated P <sub>SAT</sub>	P <sub>IN</sub>		0		dBm
Input Power Range	P <sub>IN</sub>	-3.0		+3.0	dBm
Gain Flatness / Leveled ALC	ΔG			±3.5/±1.5	dB
Gain Adjustment Range	VVA	20			dB
Input Return Loss	S <sub>11</sub>			-10	dB
Noise Figure @ maximum gain	NF			20	dB
Third Order Intermodulation 2-Tone @ 46dBm/Tone, 1MHz Spacing	IM3		-20		dBc
Harmonics @ P <sub>OUT</sub> = 150W	2 <sup>nd</sup>			-10	dBc
	3 <sup>rd</sup>			-20	
Spurious Signals	Spur			-60	dBc
Operating Voltage – (1-phase)	V <sub>AC</sub>	180	220	260	Volt
Power Consumption @ 150W CW	P <sub>D</sub>			2000	Watt

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

2. P<sub>1dB</sub> measurements performed with AM 80% depth of modulation, 1 kHz modulation signal.

### MECHANICAL SPECIFICATIONS

Parameter	Value	Units
Dimensions W x H x D	17.5 x 5.25 x 22	In.
Weight	70	lb.
RF Connectors Input/Output	Type-N, Female (Optional output – Type-SC, Female)	
RF Sample	Type-SMA, Female	
Blanking Input	Type-BNC, Female	
Cooling	Built-in forced-air cooling system	

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### ENVIRONMENTAL CHARACTERISTICS (Qualification Data available for review):

Parameter	Symbol	Min	Typ	Max	Unit
Operating Ambient Temperature	T <sub>C</sub>	-10		+50	°C
Non-operating Temperature	T <sub>STG</sub>	-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	Specifications	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) 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 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: Active TTL Logic Low ( $\leq 0.7V$ ) (Internally Pulled-High)
4	VVA control ( <i>Optional</i> )	Gain control/Monitor: Analog Voltage Range 0-5V Gain Control: 0V= Max. Attenuator, 5V= Min. Attenuator
5	Shutdown	Amplifier Disable: TTL Logic Low ( $\leq 0.7V$ ) (Internally Pulled-High)
6	Aux P/S TP	+12.0V <sub>DC</sub> $\pm 2V$ (resettable 0.5amp fuse)
7	Main P/S TP	+48.0V <sub>DC</sub> $\pm 4.8V$ (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

### 2186-001, -00X, -00X

-001 180-260, 1-phase, MIL-STD AC Connector, Rear RF Connectors

#### Standard Features:

- LCD Control, Ethernet & Serial Comm
- Type-N Female RF Input & Output
- Rear SMA Sample Ports, Forward & Reverse
- BNC Female Blanking/Gating Port
- Rack Slides, Handles and Rackmount Bracket

### NOTIONAL BLOCK DIAGRAM

