EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

2198 | **20 - 6000 MHz 100/100/40 Watts**

The 2198 is a tri-band amplifier housed in a single 3U chassis and is suitable for high bandwidth, high power CW, modulated, and pulse applications. This amplifier utilizes both LDMOS and 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 with a 3RU drawer, including the forced air-cooling. Available operating voltage configurations are single phase 100-240 VAC, up to 400Hz and 28 VDC. The amplifier comes standard with user selectable Automatic Gain Control (AGC), Automatic Level Control (ALC), and Manual Gain Control (MGC).

SKU#: 2198-001

Each band overlaps and selection of the band is easy via the front panel touch screen or with a PC connected to the Ethernet port as a peer connection or LAN. The amplifier includes a built in control and monitoring system, with remote management and diagnostics 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.

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

- Solid-state Class AB 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 120V_{AC}, @ 25ºC, 50 Ω System

Parameter		Symbol	Min	Typ	Max	Unit
Operating Frequency	Band 1	BW	20		1000	MHz
	Band 2		1000		3000	
	Band 3		2000		6000	
Power Output CW *(Note 1)*		P_{SAT}	100/100/40			Watt
Power Output @ 1dB Gain Compression *(Note 2)*		P_{1dB}	80/80/30			Watt
Power Gain @ 1dB Gain Compression		G_{1dB}	49/49/45			dB
Input Power for Rated P_{SAT}		P_{IN}		0		dBm
Input Power Range		P_{IN}	-503U.0		+3.0	dBm
Small Signal Gain Flatness / Leveled ALC		ΔG			±3.5 / ±1.5	dB
Gain Adjustment Range		VVA	20			dB
Input Return Loss		S_{11}			-10	dB
Noise Figure @ maximum gain		NF			15	dB
Third Order Intermodulation Distortion 2-Tone @ 44dBm/Tone, 1MHz Spacing (Band 1&2) 2-Tone @ 43dBm/Tone, 1MHz Spacing (Band 3)		IM3		-25		dBc
Harmonics @ Rated P_{OUT}		2^{ND}		-20	-10	dBc
		3^{RD}		-20	-10	
Spurious Signals		Spur			-60	dBc
Operating Voltage (1-phase)		V_{AC}	100	120	240	Volt
Power Consumption @ Rated P_{OUT}		P_D			600	Watt
Band Switching Time		T_{SW}			30	mSec

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

2 .P1dB measurements performed with 80% AM modulation.

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MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions W x H x D	RF Drawer: 17.5 x 5.25 x 22	Inch
Weight	TBD	Pound
RF Connectors Input/Output	Type-N, Female	
RF Sample	Type-SMA, Female	
Blanking Input	Type-BNC, Female	
Cooling	Built-in forced-air cooling system	

ENVIRONMENTAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit
Operating Ambient Temperature	T_A	-10		+50	°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 50ºC	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) Or RS-422 (optional)	Serial management of device / local operator access	D-Sub 9-position Male

SYSTEM I/O INTERFACE – 14-Position

Pin #	Description	Specification
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***)	VVA control/monitor: Analog Voltage Range 0-5V
5	Shutdown	Amplifier Disable: TTL Logic Low (≤0.7V) (*Internally Pulled-High*)
6	Aux P/S Test Point	+12.0V_{DC} ±2.0V (resettable 0.5amp fuse)
7	Main P/S Test Point	+44.0V_{DC} ±4.8V (resettable 0.5amp fuse)
8	GND	Ground
9-11	Open drain control	Site management utility (reserved)
12&13	Digital I/O (configurable)	Site management utility (reserved)
14	GND	Ground

AVAILABLE OPTIONS

2198-xxx
-001 100-240VAC, 1-phase, 47-63 Hz, Rear Connectors
-002 TBD
-003 TBD
-004 TBD
Contact us for other available options; sales@empowerrf.com
Standard Feature: *-LCD Control, Ethernet & Serial Comm* *-Main RF Connectors: **Input & Output** [Type-N, F]*

NOTIONAL BLOCK DIAGRAM

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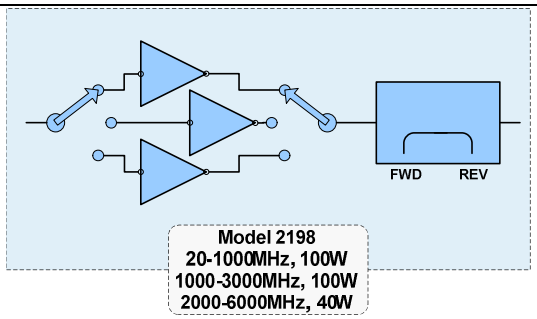
-Sample Port: SMA-F [Forward & Reverse]
-Blanking/Gating Port: BNC-F
-Rack Slides, Handles and Rackmount Bracket



OUTLINE DRAWING