EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

2108-BBS2E4ANP

20 – 1000 MHz / 200 Watts

The BBS2E4ANP (2108) is a broadband high power amplifier suitable for applications, laboratory, and RFI/EMC susceptibility testing. This amplifier utilizes MOSFET and LDMOS power devices combination that provide high gain, wide dynamic range, low distortions and good linearity. Exceptional performance, long term reliability and high efficiency are achieved by employing advanced broadband RF matching networks and combining techniques, built in high quality power supply, EMI/RFI filters, machined housings and all qualified components. Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.

SKU#: 2108DERBAXLXX

- Solid-state class AB design
- Instantaneous ultra-broadband
- Small form factor and light weight
- Low spurious and Harmonics content
- Built in control, monitoring and protection circuits
- Suitable for CW, AM and FM (Consult factory for other modulation types)
- 50 ohm input/output impedance
- High reliability and ruggedness

ELECTRICAL SPECIFICATIONS @ $120V_{AC}$, 25°C, 50 Ω system

Characteristics	Rating	Min	Typ	Max	Units
Frequency Response	BW	20		1000	MHz
Output Power CW	P_{SAT}	200	250		Watt
Output Power @ 1dB Gain Compression	P_{1dB}	150	200		Watt
Power Gain @ 1dB Gain Compression	G_{1dB}	52			dB
Input Power for Rated P_{SAT}	P_{IN}		0	3	dBm
Small Signal Gain Flatness, P_{IN} = -20dBm	ΔG			±2.0	dB
Gain Adjustment Range	FGA	20	25		dB
Input Return Loss	S_{11}			-10	dB
Noise Figure	NF			10	dB
Third Order Intercept Point 2-Tone @ 40dBm/Tone, 100kHz Spacing	IP3	+52	+55		dBm
Harmonics @ P_{OUT} = 150W	H		-20		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (1-phase)	V_{AC}	100		240	Volt
Power Consumption @ P_{OUT} = 200W CW	P_D		900	1500	Watt
Switching Time, 100Hz TTL, P_{IN} = 0dBm	T_{ON} /T_{OFF}			50/20	µsec

MECHANICAL SPECIFICATIONS

Parameter	V alue	Unit
Dimensions W x H x D	19 x 5.25 x 22	Inch
Weight	40	lb.
RF Connectors Input/Output	Type-N, Female	
Cooling	Built-in internal forced-air cooling system	

ENVIRONMENTAL SPECIFICATIONS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Ambient Temperature	T_A	0		50	°C
Non-operating Temperature	T_{STG}	-40		+85	°C
Relative Humidity (non-condensing)	RH			95	%
Altitude (MIL-STD-810F Method 500.4)	ALT			30,000	Feet
Vibration/Shock MIL-STD-810F - Method 514.5/516.4 – Proc I	VI/SH		Airborne		

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LIMITS

Input RF drive level without damage	+10 dBm	Max
Load VSWR @ P_{OUT} = 150W	5:1 @ any phase angle & magnitude	-
Thermal Overload	85°C shutdown	Max

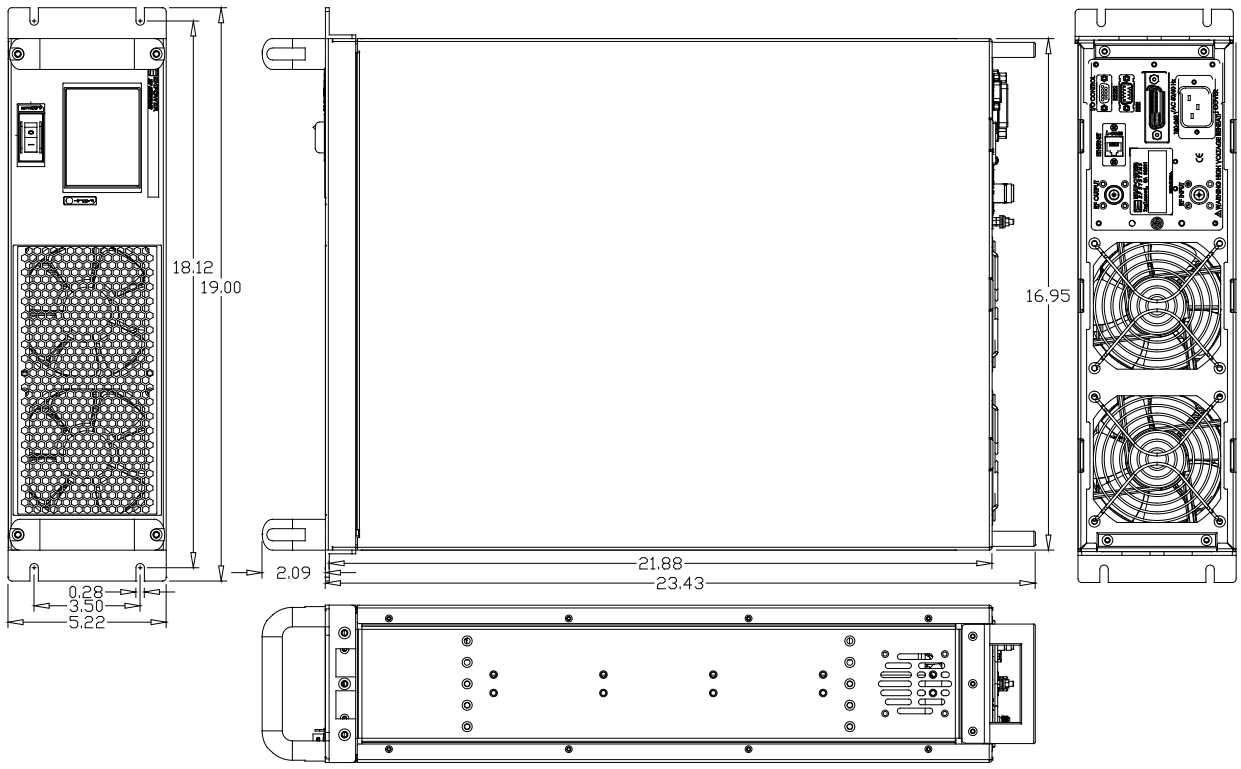
AVAILABLE OPTIONS

SKU #	Description	LCD Touchscreen
2108DLRBAXXXX	LCD controller, Front RF connectors 100-240VAC, 50/60Hz.	Touchscreen Digital Display, including FWD/REV Power indication (dBm or Watt scale), Gain Adjustment, ALC Fast/Slow, On/Off, Standby mode, Fault indication, Rear panel GPIB/HPIB IEEE-488.2 and Half Duplex RS232.
2108DERBAXLXX	LCD controller, Ethernet, Rear RF connectors 100-240VAC, 50/60Hz.	
Optional	Rack Slides (Call for price)	

I/O INTERFACE CONNECTOR – D-Sub 9-Pin, Female

Pin #	Description	Specifications	Options	
			FGA	LCD
1	Forward Test Point	Analog Voltage 0-5V_{DC} relative to Forward Power Level		√
2	Reverse Test Point	Analog Voltage 0-5V_{DC} relative to Reverse Power Level		√
3	5V Test Point	+5.0V_{DC} ±0.2V	√	√
4	VVA Test Point	+5.6V_{DC} ±0.2V	√	
5	EXT Shutdown	Amplifier Disable: TTL Logic High (5V) (*Internally Pulled-Low*)	√	√
6	12V Test Point	+12.0V_{DC} ±0.5V	√	√
7	P/S Test Point	+26.0-30.0V_{DC}	√	√
8, 9	GND	Ground	√	√

OUTLINE DRAWING SHOWN
SKU #: 2108DERBAXXXX



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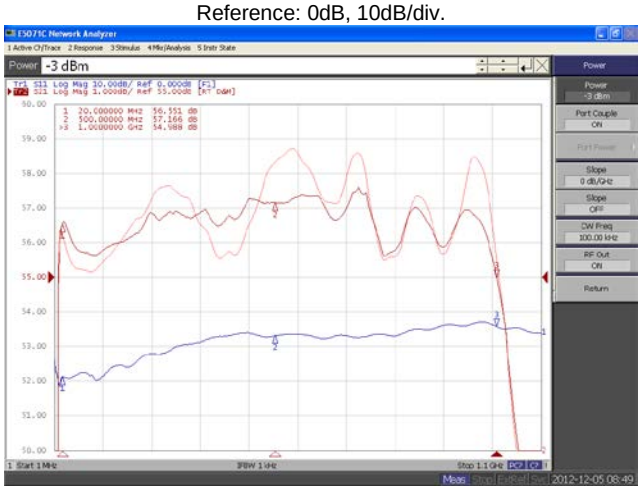
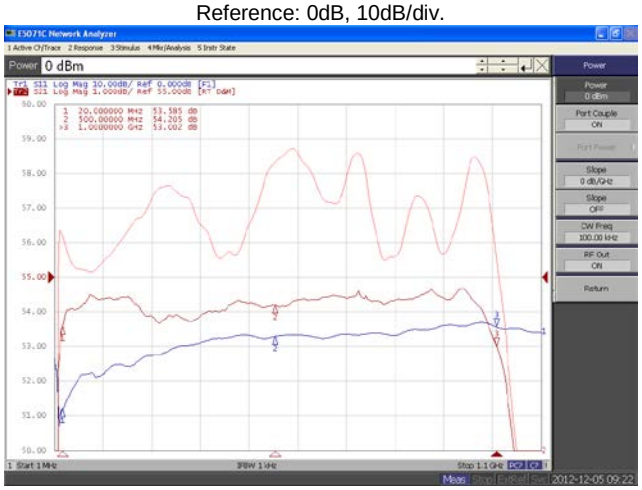
TYPICAL PERFORMANCE PLOTS

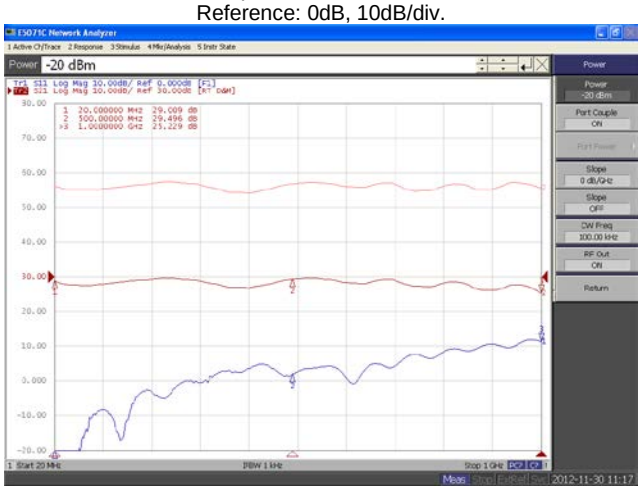
Plot 1 – Small Signal Gain and P_{1dB}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -3.0dBm
Reference: 55dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plot 2 – Small Signal Gain and P_{SAT}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{SAT}, P_{IN} = 0dBm
Reference: 55dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plot 3 – Gain Adjustment Range
Top Curve: Maximum Gain @ P_{IN} = -20dBm
Middle Curve: Minimum Gain @ P_{IN} = -20dBm
Reference: 30dB, 10dB/div.
Bottom Curve: Input Return Loss @ Minimum Gain
Reference: 0dB, 10dB/div.



Plot 4 – ALC Flatness @ 100W & 20W
Top Curve: ALC @ 100W, P_{IN} = 0dBm
Bottom Curve: ALC @ 20W, P_{IN} = 0dBm
Reference: 47dB, 1dB/div.
Middle Curve: Input Return Loss
Reference: 0dB, 10dB/div.