

Solid State Broadband High Power Amplifier

2143-BBS6A8CHM
3000 – 6000 MHz / 50 Watts

The BBS6A8CHM (2143) is suitable for S & C Bands broadband communication, Jamming, laboratory, and RFI/EMC susceptibility testing. This amplifier utilizes high power GaN devices that provide wide frequency response and dynamic range, high gain, high efficiency, 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 housing, and qualified components. Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.



SKU#: 2143DLFAAXLXX

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

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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	3000		6000	MHz
Output Power CW	P _{SAT}	50			Watt
Output Power @ 1dB Gain Compression	P _{1dB}		20		Watt
Power Gain @ 1dB Gain Compression	G _{1dB}	47		53	dB
Input Power for Rated P _{SAT}	P _{IN}		0	3	dBm
Small Signal Gain Flatness	ΔG			±2.0	dB
Gain Adjustment Range	FGA		20		dB
Input Return Loss	S ₁₁			-10	dB
Noise Figure @ max. gain	NF		10		dB
Third Order Intercept Point 2-Tone @ 41dBm/Tone, 100kHz Spacing	IP3		+49		dBm
Harmonics @ P _{OUT} = 20W	H		-30		dBc
Spurious Signals	Spur			-60	dBc
Operating Voltage (1-phase)	V _{AC}	100		240	Volt
Power Consumption, 50W CW	P _D		600	750	Watt

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions	19 x 5.25 x 22	Inch
Weight	40	Pound
RF Connectors Input/Output	Type-N, Female	
Cooling	Built-in internal forced air cooling system	

ENVIRONMENTAL CHARACTERISTICS (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 514.5/516.5 – Proc I	VI/SH		Airborne		

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LIMITS

Input RF drive level without damage	+6 dBm	Max
Load VSWR @ P _{OUT} = 20W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	-
Thermal Overload	85°C shutdown	Max

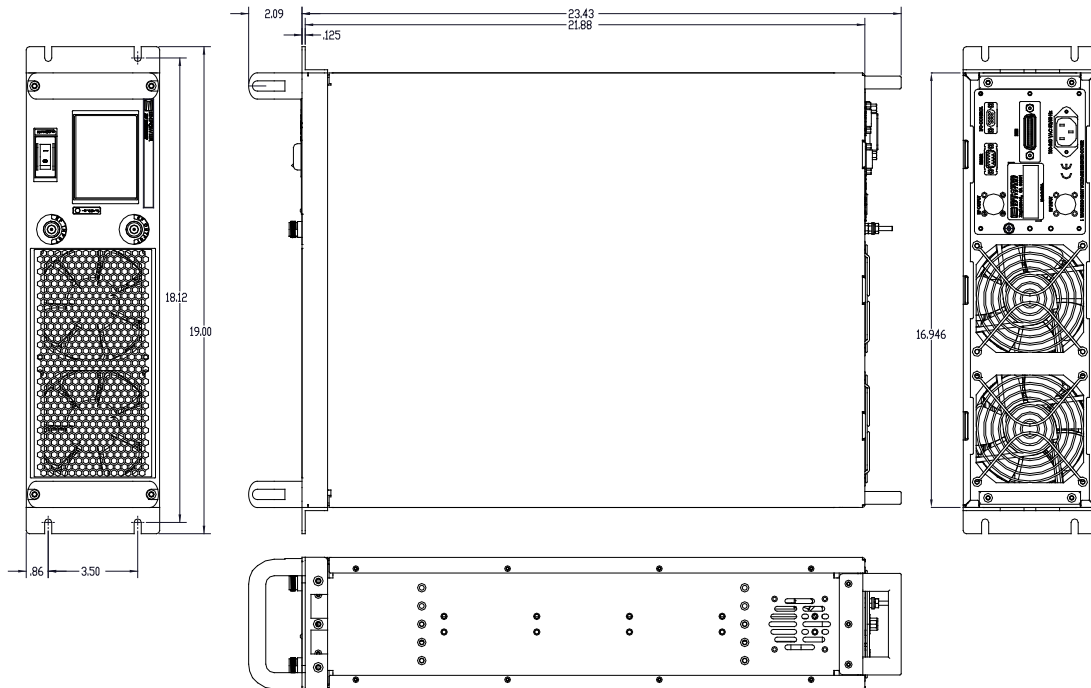
AVAILABLE

SKU #	Description	LCD Touchscreen
2143DLFAAXLXX	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.
Optional	Rack Slides (Call for price)	

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

Pin #	Description	Specification
1	Forward Test Point	Analog Voltage 0-5V Relative to Forward Power Level
2	Reverse Test Point	Analog Voltage 0-5V Relative to Reverse Power Level
3	5V Test Point	+5.0V _{DC} ±0.2V
4	N/C	No Connection
5	Ext. Shutdown	Disable: TTL Logic High (5V) (Internally Pulled-down)
6	12V Test Point	+12.0V _{DC} ±0.5V
7	P/S Test Point	+26.0-30.0V _{DC}
8&9	GND	Ground

SYSTEM OUTLINE SHOWN SKU #: 2143DLFAXLXX



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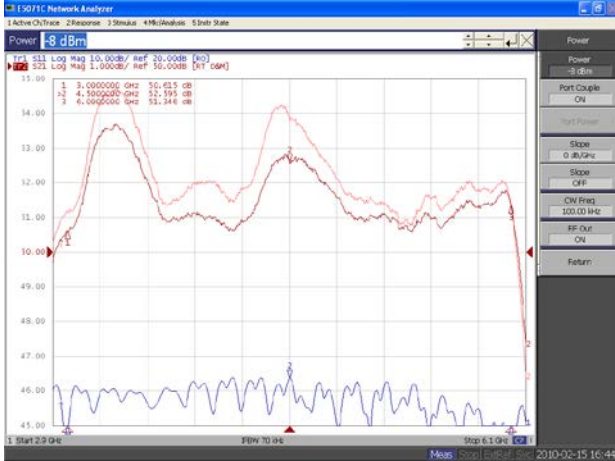
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TYPICAL PERFORMANCE PLOTS

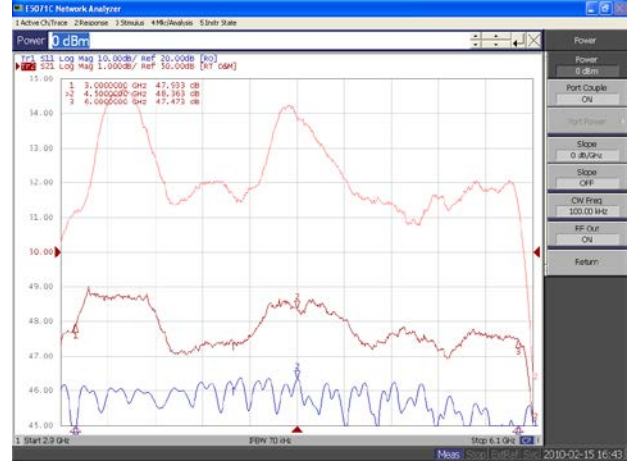
Plot 1 – Small Signal Gain and P_{1dB}

Top Curve: Small Signal Gain @ $P_{IN} = -20dBm$
 Middle Curve: Power Gain @ P_{1dB} , $P_{IN} = -8.0dBm$
 Reference: 50dB, 1dB/div.
 Bottom Curve: Input Return Loss
 Reference: 20dB, 10dB/div.



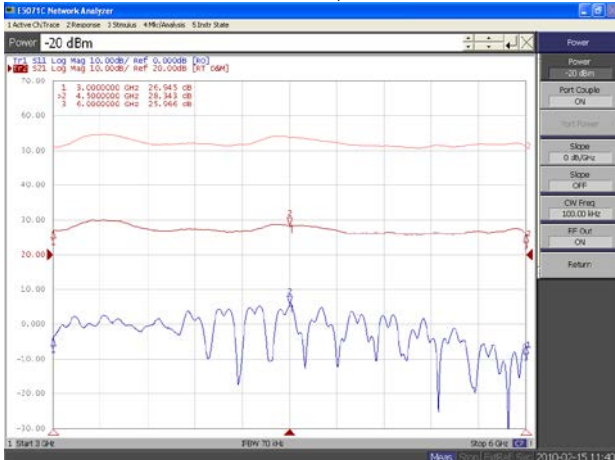
Plot 2 – Small Signal Gain and P_{SAT}

Top Curve: Small Signal Gain @ $P_{IN} = -20dBm$
 Middle Curve: Power Gain @ P_{SAT} , $P_{IN} = 0dBm$
 Reference: 50dB, 1dB/div.
 Bottom Curve: Input Return Loss
 Reference: 20dB, 10dB/div.



Plot 3 – Gain Adjustment Range

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



Plot 4 – ALC Flatness @ 25W & 5W

Top Curve: ALC @ 25W, $P_{IN} = 0dBm$
 Bottom Curve: ALC @ 5W, $P_{IN} = 0dBm$
 Reference: 41dB, 1dB/div.
 Middle Curve: Input Return Loss
 Reference: 0dB, 10dB/div.

