EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

2143-BBS6A8CHM

3000 – 6000 MHz / 50 Watts

The BBS6A8CHM (SKU 2143) is suitable for S & C Bands broadband high power 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.

Shown with Option Package 10

- 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		dBm
Small Signal Gain Flatness	ΔG			±2.0	dB
Gain Adjustment Range	FGA		20		dB
Input Return Loss	S_{11}			-10	dB
Noise Figure	NF		10		dB
Third Order Intercept Point 2-Tone @ 41dBm/Tone, 100kHz Spacing	IP3		+49		dBm
Harmonics @ Rated P_{1dB} = 20W	H		-30		dBc
Spurious Signals	Spur			-60	dBc
Operating Voltage (single phase)	V_{AC}	100		240	Volt
AC Power Consumption	P_D		600	750	Watt

MECHANICAL SPECIFICATIONS

Parameter	Value	Units	Limits
Dimensions	19 x 5.75 x 22	Inch	Max
Weight	40	lb.	Max
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_C	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		

EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

2143-BBS6A8CHM	3000 – 6000 MHz / 50 Watts

PROTECTIONS

Input Overdrive	+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

SELECTED AVAILABLE OPTIONS (Refer to web table for additional systems options)

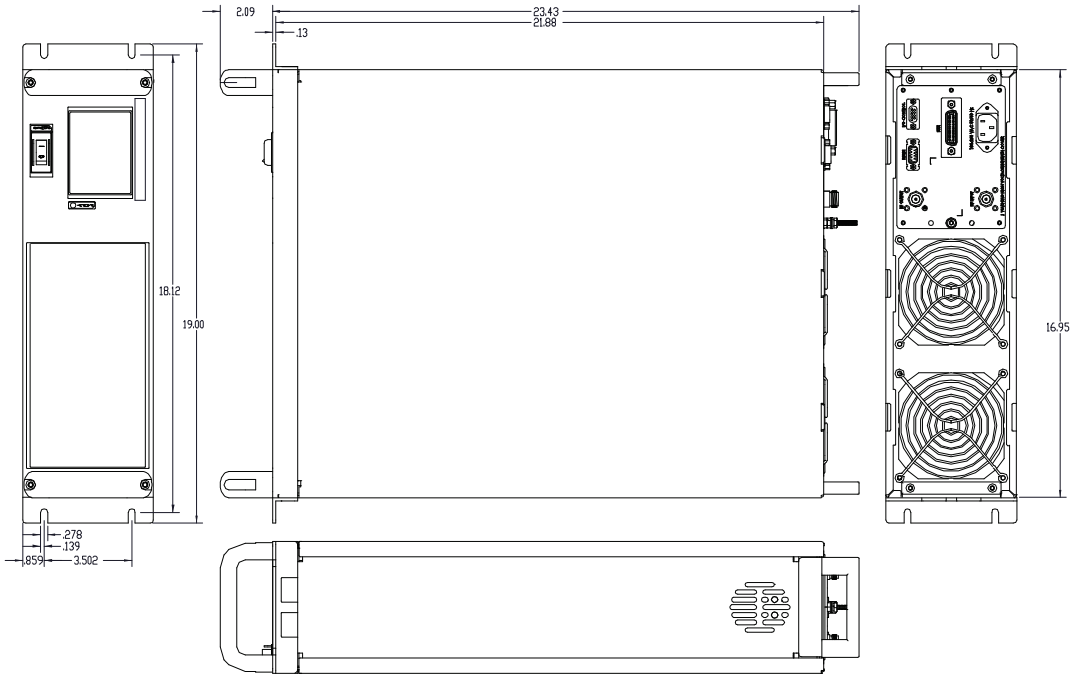
Option	Number	Description	Price
FGA	**061**	Front panel 10 turns manual gain adjustment.	Standard
LCD	**062**	Touchscreen Digital Display, including Fwd/Rev Power indication (dB or Watt scale), Gain Adjustment, ALC Fast/Slow, On/Off, Standby mode, Fault indication, Rear panel GPIB/HPIB IEEE-488.2 and Half Duplex RS-232 or Full Duplex RS-422 Remote Interface. **Note: Output Power is lowered by 0.5 - 0.75 dB with this option.**	Call
FCN	**051**	Front Panel Type-N, Female	N/C
RCN	**052**	Rear Panel Type-N, Female	N/C

Available Option Packages: 07, 08, 09, 10

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

Pin #	Description	Specifications	Options FGA	Options LCD
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	Output +5.0V_{DC} ±0.2V	√	√
4	VVA Test point	VVA Gain Control Voltage +5.6V_{DC} ±0.2V	√	
5	Ext. Shutdown	Disable: TTL Logic High (5V) (*Internally Pulled-down*)	√	√
6	12V Test Point	Output +12.0V_{DC}±0.5V	√	√
7	P/S Test Point	Power Supply Output Voltage +28.0V_{DC} ±2.0V	√	√
8	GND	Ground	√	√
9	GND	Ground	√	√

SYSTEM OUTLINE SHOWN WITH OPTION PACKAGE 10



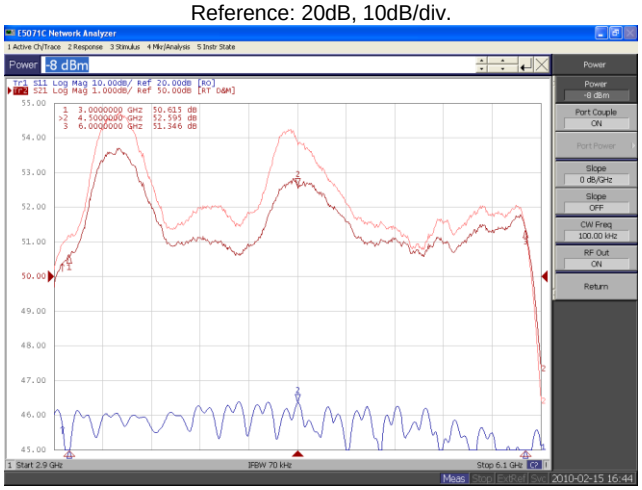
EMPOWER RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

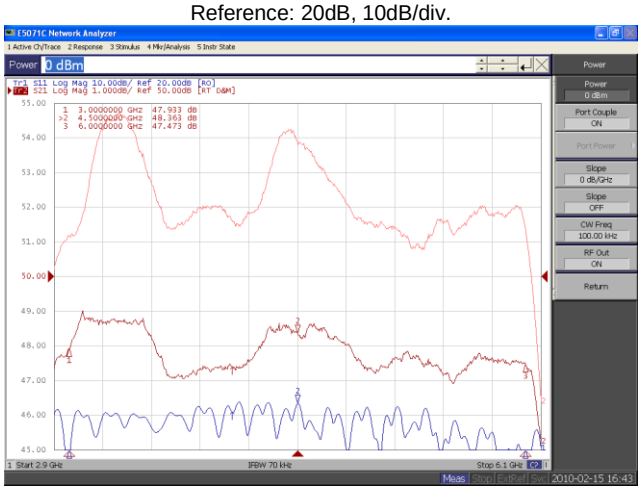
2143-BBS6A8CHM | 3000 – 6000 MHz / 50 Watts

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: VVA @ Minimum Gain
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.