

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 RF/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 (for other modulation types, consult factory).
- 50 ohm input/output impedance
- High reliability and ruggedness
- Built-in control, monitoring and protection circuits

ELECTRICAL SPECIFICATIONS @ 120 VAC, 25°C, 50 Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	3000		6000	MHz
Output Power CW	P _{SAT}	50			Watt
Output Power @ 1 dB Gain Compression Point	P _{1dB}		20		Watt
Power Gain @ 1 dB Gain Compression Point	G _{1dB}	47		53	dB
Input Power for Nominal P _{OUT}	P _{IN}		0		dBm
Small Signal Gain Flatness	ΔG			±2.0	dB
Gain Adjustment Range	VVA		20		dB
Input Return Loss	S ₁₁			-10	dB
Noise Figure	NF		10		dB
Third Order Intercept Point	IP3		+49		dBm
Harmonics @ 1 dB Gain Compression Point	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	VI	MIL-STD-810F Method 514.5 Proc I random sinusoidal Category 4 or 9 or 13			
Shock	SH	MIL-STD-810F Method 516.4 Proc I Operational: Acceleration (A) of 20.0 g ±1.5 g with Duration of 11.0 ms ±1.0 ms shock pulse. Non-Operational: Impact shocks of 25 g ±3.0 g with Duration of 11.0 ms ±1.0 ms shock pulse.			

Solid State Broadband High Power Amplifier

2143-BBS6A8CHM
3000 – 6000 MHz / 50 Watts

PROTECTIONS

Input Overdrive	+6 dBm	Max
Load VSWR @ 20 W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	Nom
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 HPIB IEEE-488.2 or Full Duplex RS232 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 CONNECTOR – D-sub, 9 Pin

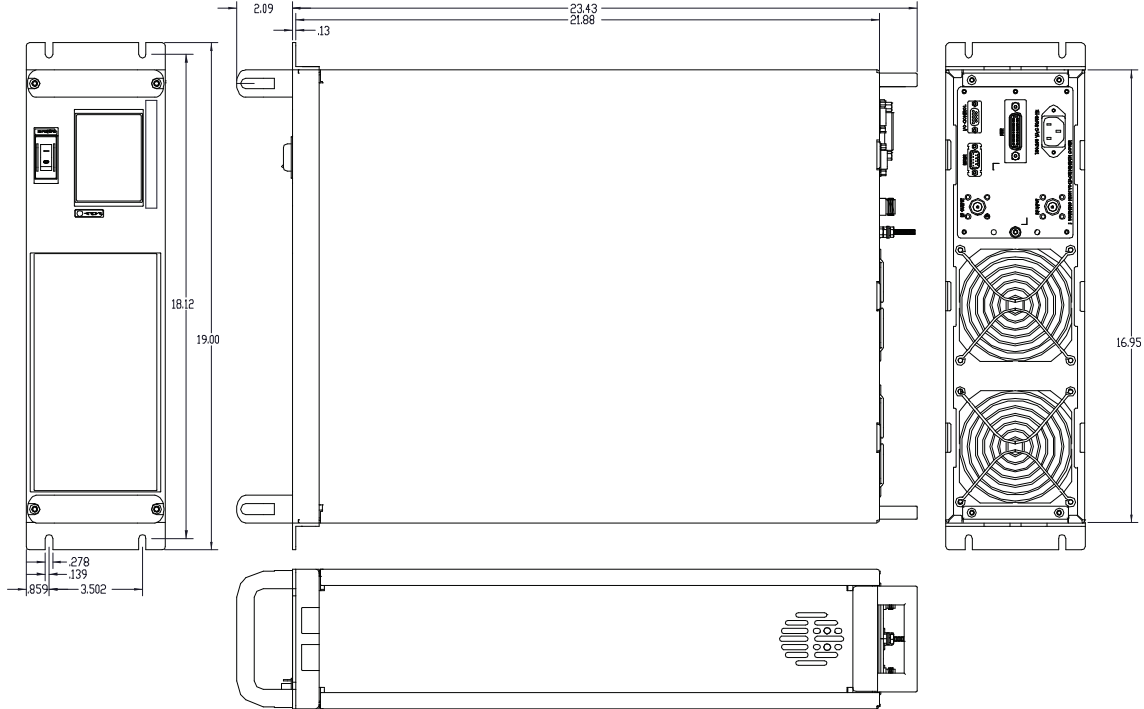
Pin #	Description	Specifications
1	Forward Power Test Point	Analog Voltage 0-5 V Test Point relative to Forward Power Output (with LCD Option 062)
2	Reverse Power Test Point	Analog Voltage 0-5 V Test Point relative to Reverse Power (with LCD Option 062)
3	+5 V Test Point	Measurement Voltage Output 5 V
4	N/C	Reserved (for VVA Option 061)
5	EXT Shutdown	Amplifier Enable: TTL Low (0 V) or Open or Ground Amplifier Disable: TTL High (5 V)
6	+12 V Test Point	Output 12 V Test Point
7	P/S+ Test Point	Unit supply voltage 28 V Test Point
8	GND	Ground
9	GND	Ground

Solid State Broadband High Power Amplifier

2143-BBS6A8CHM

3000 – 6000 MHz / 50 Watts

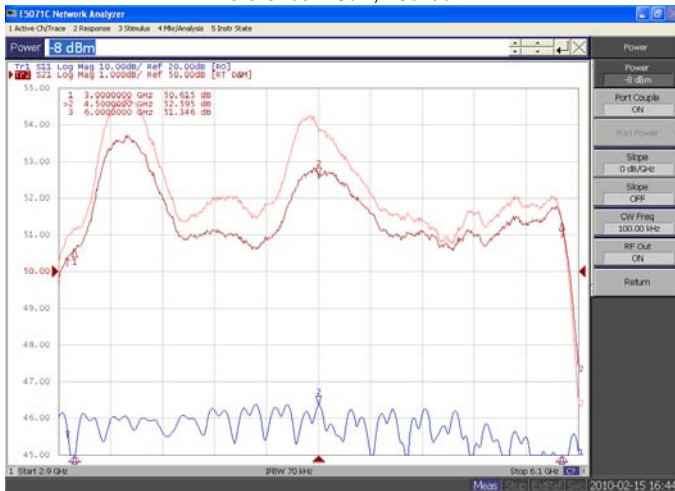
SYSTEM OUTLINE SHOWN WITH OPTION PACKAGE 10



TYPICAL PERFORMANCE PLOTS

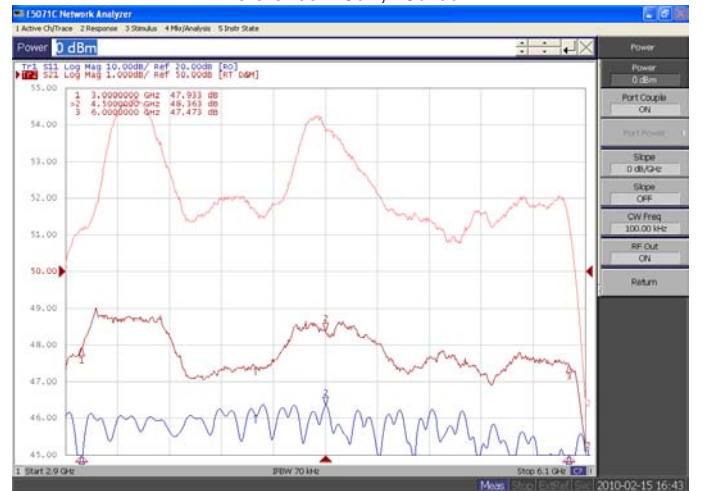
Plots 1 - Small Signal and P_{1dB} Gain

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



Plot 2 - Small Signal and P_{SAT}

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

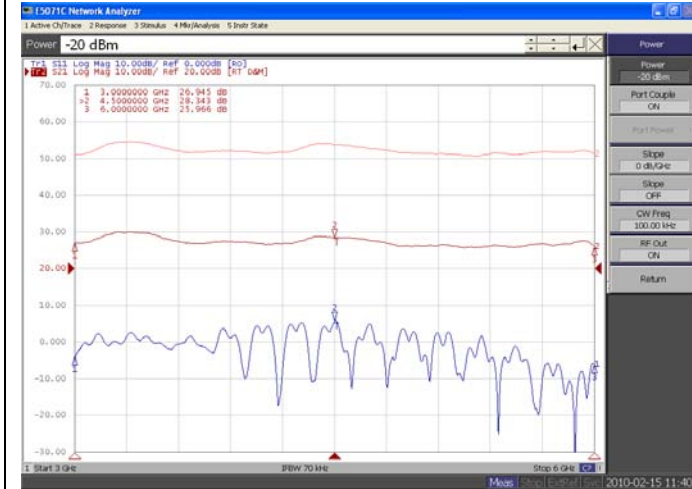


Solid State Broadband High Power Amplifier

2143-BBS6A8CHM

3000 – 6000 MHz / 50 Watts

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



Plot 4 - ALC Flatness @ 5W & 25W
 Top Curve: ALC @ 25W, $P_{IN} = 0\text{dBm}$
 Bottom Curve: ALC @ 5W, $P_{IN} = 0\text{dBm}$
 Reference: 41dB, 1dB/div.
 Middle Curve: Input Return Loss
 Reference: 0dB, 10dB/div.

