

Solid State Broadband High Power Amplifier

2170 – BBS4A6AUT

1000 - 3000 MHz / 1000 Watts

The BBS4A6AUT (SKU 2170) is suitable for octave bandwidth high power CW, modulated, and pulse applications. This amplifier utilizes 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 within one single 5RU drawer including the forced air-cooling. The system comes standard to operate from 180-260VAC single phase or can be ordered optionally with a three phase AC supply.



The amplifier includes a built in control and monitoring system, with protection functions which preserve high availability. Remote management and diagnostics are 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, IPv6) allows ease of access with the benefit of multi-level security. The control system core supports hardware encryption, runs an embedded OS (Linux), has a built-in non-volatile memory for event recording, and factory setup recovery features. The extended memory option allows storage of control parameters and event logs.

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

- Solid-state linear 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 over temperature conditions (-10 to +40°C)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	1000		3000	MHz
Power Output CW ^(Note 1)	P _{SAT}	1000			Watt
Power Output @ 1dB Gain Compression ^(Note 2)	P _{1dB}	500			Watt
Power Gain @ 1dB Gain Compression	G _{1dB}	63			dB
Input Power for Rated P _{SAT}	P _{IN}		0		dBm
Input Power Range	P _{IN}	-5.0		+5.0	dBm
Gain Flatness / Leveled ALC	ΔG			±3.5/±1.0	dB
Gain Adjustment Range	VVA	20			dB
Input Return Loss	S ₁₁			-10	dB
Noise Figure @ maximum gain	NF			20	dB
3 RD Order Intermodulation 2-Tone @ 54dBm/Tone, 1MHz Spacing	IM3		-20		dBc
Harmonics @ P _{OUT} = 1000W	2 ND			-10	dBc
	3 RD			-15	
Spurious Signals	Spur			-60	dBc
Operating Voltage – (1-phase)	V _{AC}	180	220	260	Volt
Operating Voltage – (3-phase)	V _{AC}		208		Volt
Power Consumption @ 1000W CW	P _D			5000	Watt

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

2. P_{1dB} measurement performed with CCDF Method, IS-95, 1MHz BW.

MECHANICAL SPECIFICATIONS

Parameter	Value	Units
Dimensions W x H x D	17.5 x 8.75 x 22	In.
Weight	95	Lbs.
RF Connectors Input/Output	Input: Type-N, Female Output: Type-7/16-DIN, Female	
RF Sample	Type-SMA, Female	
Blanking Input	Type-BNC, Female	
Cooling	Built-in forced air cooling system	

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ENVIRONMENTAL CHARACTERISTICS (Qualification Data available for review):

Parameter	Symbol	Min	Typ	Max	Unit
Operating Ambient Temperature	T _A	-10		+40	°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	Specifications	Unit
Input Overdrive	+10 dBm	Max
VSWR protection @ P _{OUT} = 1000W	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 40°C	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, RS-422 (optional)	Serial management of device / local operator access	D-Sub 9-position Male

SYSTEM I/O CONNECTOR – 14-Position

Pin #	Description	Specifications
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 ($\leq 0.7V$) (Internally Pulled-High)
4	VVA control (optional)	Gain control/Monitor: Analog Voltage Range 0-5V Gain Control: 0V= Max. Attenuator, 5V= Min. Attenuator
5	Shutdown	Amplifier Disable: TTL Logic Low ($\leq 0.7V$) (Internally Pulled-High)
6	Aux P/S Test Point	+12.0V _{DC} $\pm 2V$ (resettable 0.5amp fuse)
7	PSS Test Point	+44.0V _{DC} $\pm 4.8V$ (resettable 0.5amp fuse)
8	GND	Ground
9	Open drain control	Site management utility (reserved)
10	Open drain control	Site management utility (reserved)
11	Open drain control	Site management utility (reserved)
12	Digital I/O (configurable)	Site management utility (reserved)
13	Digital I/O (configurable)	Site management utility (reserved)
14	GND	Ground

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OUTLINE DRAWING

