

Solid State Broadband High Power Amplifier

2076-BBS4A5AMP
1000 – 2000 MHz / 150 Watts

The BBS4A5AMP (SKU (2076) is suitable full octave L-Band broadband high power linear applications. The system utilizes GaAsFET high power RF devices that provide high gain, wide dynamic range, and excellent 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.



Shown with Option Package 10

- Solid-state linear design
- Instantaneous octave bandwidth
- Standard front panel manual gain adjust
- 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, 50 Ω system

Characteristics	Rating	Min	Typ	Max	Units
Frequency Response	BW	1000		2000	MHz
Output Power CW	P _{SAT}	150			Watt
Output Power @ 1dB Gain Compression	P _{1dB}	120			Watt
Power Gain @ 1dB Gain Compression	G _{1dB}	52			dB
Input Power for Rated P _{OUT}	P _{IN}		0		dBm
Small Signal Gain Flatness	ΔG			±1.5	dB
Gain Adjustment Range	FGA	25			dB
Input Return Loss	S ₁₁			-10	dB
Noise Figure @ maximum gain	NF		7	10	dB
Third Order Intercept Point 2-Tone @ 41dBm/Tone, 100kHz Spacing	IP3	+58	+60		dBm
Harmonics @ P _{OUT} = 120W	H			-20	dBc
Spurious Signals	Spur		-70	-60	dBc
Supply Voltage (single phase)	V _{AC}	100		240	Volt
Power Consumption @ 150W CW	P _D		900	1200	Watt

MECHANICAL SPECIFICATIONS

Parameter	Value	Units
Dimensions W x H x D	19 x 5.25 x 22	Inch
Weight	47	lb.
RF Connectors Input / Output	Type-N, Female	
Cooling	Built-in forced air cooling system	

ENVIRONMENTAL SPECIFICATIONS (Design to Meet*)

Parameter	Symbol	Min	Typ	Max	Unit
Operating 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)	VI / SH		Airborne		

LIMITS

Input RF drive level without damage	+10dBm	Max
Load VSWR @ P _{OUT} = 120W CW	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	-
Thermal Overload	85°C shutdown	Max

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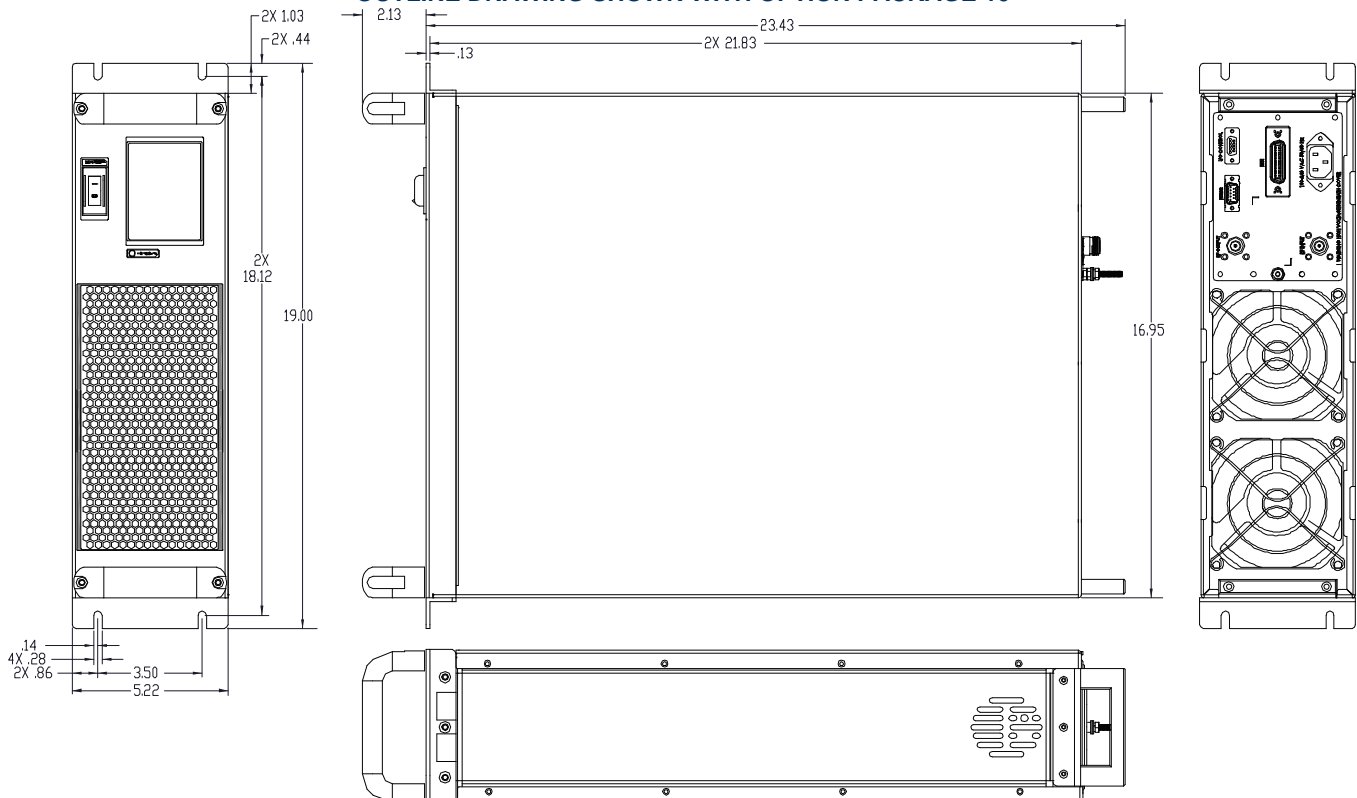
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AVAILABLE OPTIONS (Refer to www.empowerrf.com for complete systems options table)

Option	Number	Description	Price
FGA	061	Front panel manual gain adjustment 10 turns	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 Halt Duplex RS232 or RS422 remote interface. Note: Output Power is lowered by 0.5 - 0.75dB 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 CONTROL 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	Output +5.0V _{DC} ±0.2V	√	√
4	VVA Test Point	VVA Gain Control +5.6V _{DC} ±0.2V	√	
5	EXT Shutdown	Amplifier Disable: TTL Logic High (5V) (Internally Pulled-Low)	√	√
6	12V Test Point	Output +12.0V _{DC} ± 0.5V	√	√
7	P/S Test Point	Power Supply Output voltage 12.0 -15.0V _{DC}	√	√
8	GND	Ground	√	√
9	GND	Ground	√	√

OUTLINE DRAWING SHOWN WITH OPTION PACKAGE 10


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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} = -4.5dBm
 Reference: 55dB, 1dB/div
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/div



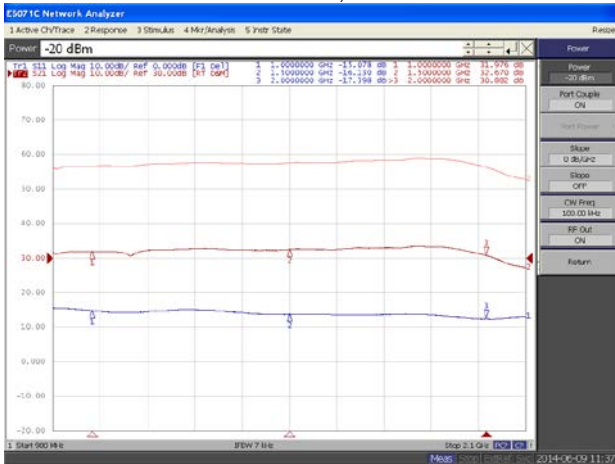
Plot 2 – Small Signal Gain and P_{SAT}

Top Curve: Small Signal Gain @ P_{IN} = -20dBm
 Middle Curve: Power Gain @ P_{SAT}, P_{IN} = -3.0dBm
 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 @ 80W & 16W

Top Curve: ALC @ 80W, P_{IN} = 0dBm
 Bottom Curve: ALC @ 16W, P_{IN} = 0dBm
 Reference: 46dB, 1dB/div.
 Middle Curve: Input Return Loss
 Reference: 0dB, 10dB/div

