

Solid State Broadband High Power Amplifier

1165 – BBM4A5ALO
1000 – 2000 MHz / 120 Watts

The BBM4A5ALO (SKU 1165) is suitable for broadband mobile Jamming, Communication and band specific high power linear applications in the L frequency band. This compact module utilizes high power advanced GaN devices that provide excellent power density, high efficiency, wide dynamic range 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, machined housings and qualified components. Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.



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

ELECTRICAL SPECIFICATIONS @ +28 VDC, 25°C, 50 Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	1000		2000	MHz
Power Output CW @ P _{SAT}	P _{SAT}	120			Watt
Output Power @ 1 dB Gain Compression Point	P _{1dB}		50		Watt
Gain @ P1 dB Gain Compression Point	G _p	50			dB
Input Power for Rated P _{OUT}	P _{IN}		0		dBm
Gain Flatness @ rated P _{OUT}	ΔG			±1.5	dB
Input Return Loss	S ₁₁			-10	dB
Noise Figure	NF			10	dB
Third Order Intercept Point	IP3		+55		dBm
Harmonics @ 100 W, 2 nd / 3 rd @ P _{SAT}	H			-10 / -17	dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V _{DC}	26	28	30	Volt
Current Consumption @ rated P _{OUT}	I _{DD}			14	Amp
Quiescent Current (No RF input)	I _{DQ}			3.0	Amp
Switching Speed (10% to 90%)	T _{SW}		2.0	5.0	uSec

MECHANICAL SPECIFICATIONS

Parameter	Value	Units	Limits
Dimensions	7.4 x 4.1 x 1.1	Inch	Max
Weight	2	lb.	Max
RF Connectors In/Out	J1-input SMA female, J2 - output TNC female Finish Stainless Steel		
DC / Control Connector (Mating Connector)	J3 - Hybrid Dsub, 7 Pin, Male ITT Cannon P/N DAM7W2SA197		
Cooling	External Heatsink		
Sealing and Coating	Sealed Unit with gaskets covers, sealed connectors, and conformal coated boards		
External Coating	AkzoNobel Interpon 700 EM150K 7.5YR6/3 SEMI GLOSS (Powder Application by electrostatic spraying) Base plate for thermal conduction shall be coated with conversion coating acc. to MIL-C-5541 class 3		

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ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T _c	-40		+85	°C
Storage Case Temperature	T _{stg}	-40		+85	°C
Relative humidity (non-condensing)	RH			95	%
Altitude (MIL-STD-810F Method 500.4)	ALT			50,000	Feet
Shock / Vibration (MIL-STD-810F Method 516.5)	SH / VI		Airborne		

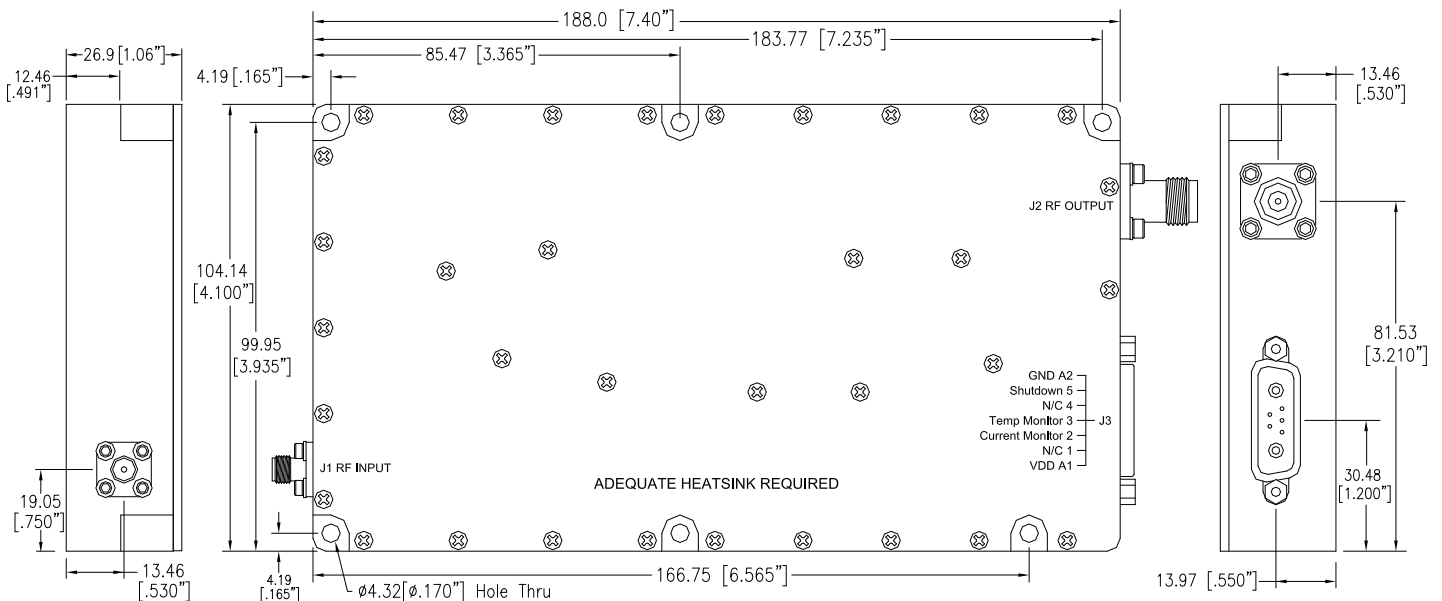
PROTECTIONS

Input Overdrive	+15 dBm	Max
DC Input	Reverse Polarity	
Load VSWR @ 100 W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	Nom
Thermal Overload	Graceful Degradation	Typ

INTERFACE CONNECTOR - Dsub, Hybrid (J3)

Pin #	Description	Specifications
A1	VDD	+28 V _{DC} ±2 V
A2	GND	Ground
1	N/C	Reserved
2	Current Monitor	Analog voltage relative to I _D @ 25 mV/100 mA (4V max)
3	Temp Monitor	Analog voltage relative to module temperature @ 10 mV/°C + 500 mV (4V max)
4	N/C	Reserved
5	Shutdown	Amplifier Enable: TTL "Low" (Logic 0) (10KΩ pull up resistor to 5V) Amplifier Disable: TTL "High" (Logic 1)

OUTLINE DRAWING



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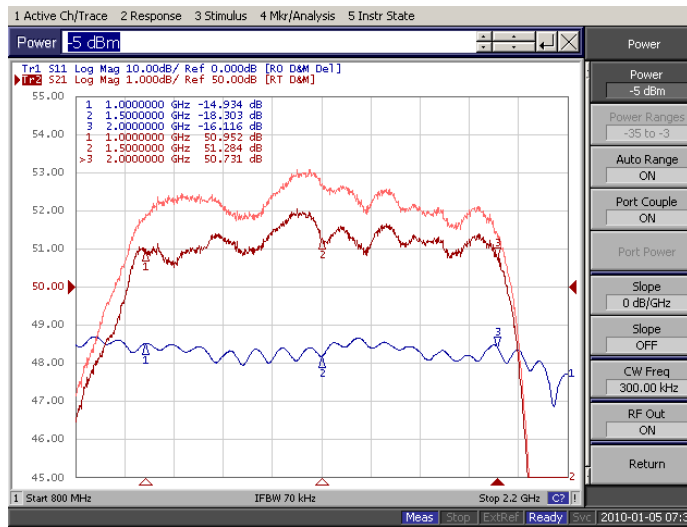
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TYPICAL PERFORMANCE PLOTS

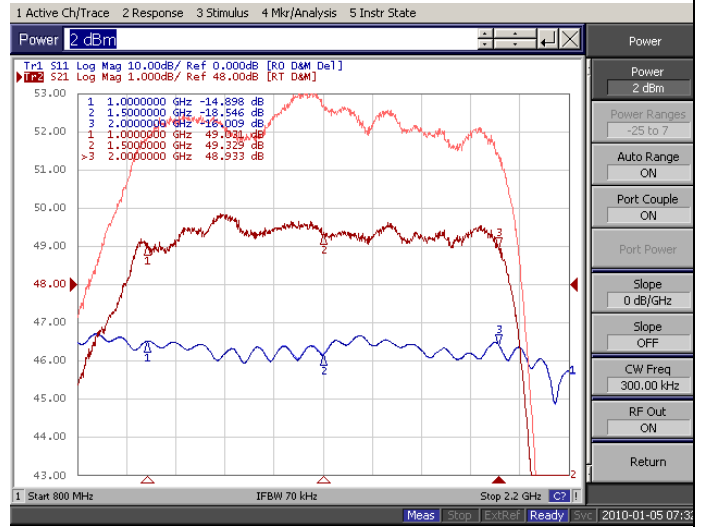
Plots 1 – Small Signal and P_{1dB} Gain

Top Curve: Small Signal Gain @ Pin = -20dBm
 Middle Curve: P_{1dB} @ Pin = -5 dBm
 Reference: 50dB, 1dB/Div
 Bottom Curve: Input Return Loss
 Reference: 10dB, 10dB/Div



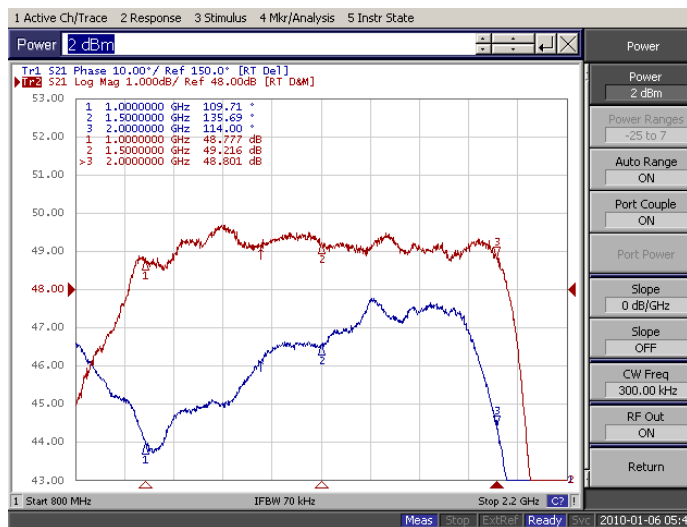
Plot 2 – Small Signal and Psat

Top Curve: Small Signal Gain @ Pin = -20dBm
 Middle Curve: Psat @ Pin = +2 dBm
 Reference: 48dB, 1dB/Div
 Bottom Curve: Input Return Loss
 Reference: 10dB, 10dB/Div



Plots 3 – Psat Gain & Phase Tracking

Top Curve: Psat Gain @ P_{IN} = +2dBm
 Reference: 48dB, 1dB/div.
 Bottom Curve: Phase
 Reference: 150deg, 10deg/div, Electrical Delay 10.9nsec.



Plots 4 – Switching Time, 200kHz TTL, P_{IN} = 0dBm

