

# Solid State Broadband High Power Amplifier

**1139 - BBM4A5KK5**
**1000 – 2500 MHz / 100 Watts**

The BBM4A5KK5 (SKU 1139) is suitable for broadband mobile Jamming and band specific high power linear applications in the L and S frequency bands. 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 linear design
- Instantaneous ultra broadband
- Small form factor and lightweight
- Suitable for most modulation standards
- 50 ohm input/output impedance
- High reliability and ruggedness
- Built-in control, monitoring and protection circuits

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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	1000		2500	MHz
Power Output CW	P <sub>SAT</sub>	100	125		Watt
Output Power @ 1dB Gain Compression Point	P <sub>1dB</sub>	60	80		Watt
Small Signal Gain	G <sub>SS</sub>	10	12	15	dB
Input Power for Rated P <sub>OUT</sub>	P <sub>IN</sub>		+38		dBm
Gain Flatness @ rated output power	ΔG <sub>P</sub>			±1.0	dB
Input / Output Return Loss	S <sub>11</sub> / S <sub>22</sub>			-10	dB
Noise Figure	NF			10	dB
Third Order Intercept Point	IP3		+58		dBm
Harmonics @ rated output power	H		-20		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V <sub>DC</sub>	26	28	30	Volt
Current Consumption @ rated P <sub>OUT</sub>	I <sub>DD</sub>		8	10	Amp
Quiescent Current	I <sub>DQ</sub>		0.7	2.0	Amp
Standby Current Consumption @ Shutdown	I <sub>SD</sub>			400	mA
Switching Time, 1KHz TTL, P <sub>OUT</sub> = 100W	T <sub>ON</sub> /T <sub>OFF</sub>		2.0	5.0	uSec
Module to Module Gain Matching	Opt			±0.5	dB
Module to Module Phase Matching	Opt			±10	Deg

## MECHANICAL SPECIFICATIONS

Parameter	Value	Units	Limits
Dimensions L x W x H	7.9 X 5.0 x 1.0	Inch	Max
Weight	2.0	lb.	Max
RF Connectors In / Out	SMA female		
DC / Control Connector	Hybrid Dsub, 7 Pins, Male		
Cooling	External Heatsink		

## ENVIRONMENTAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T <sub>c</sub>	-20		+80	°C
Storage Temperature	T <sub>stg</sub>	-40		+85	°C
Relative humidity (non-condensing)	RH			95	%
Altitude (MIL-STD-810F Method 500.4)	ALT	10,000		30,000	Feet
Shock & Vibration (MIL-STD-810F Method 516.5)	SH / VI		Airborne		

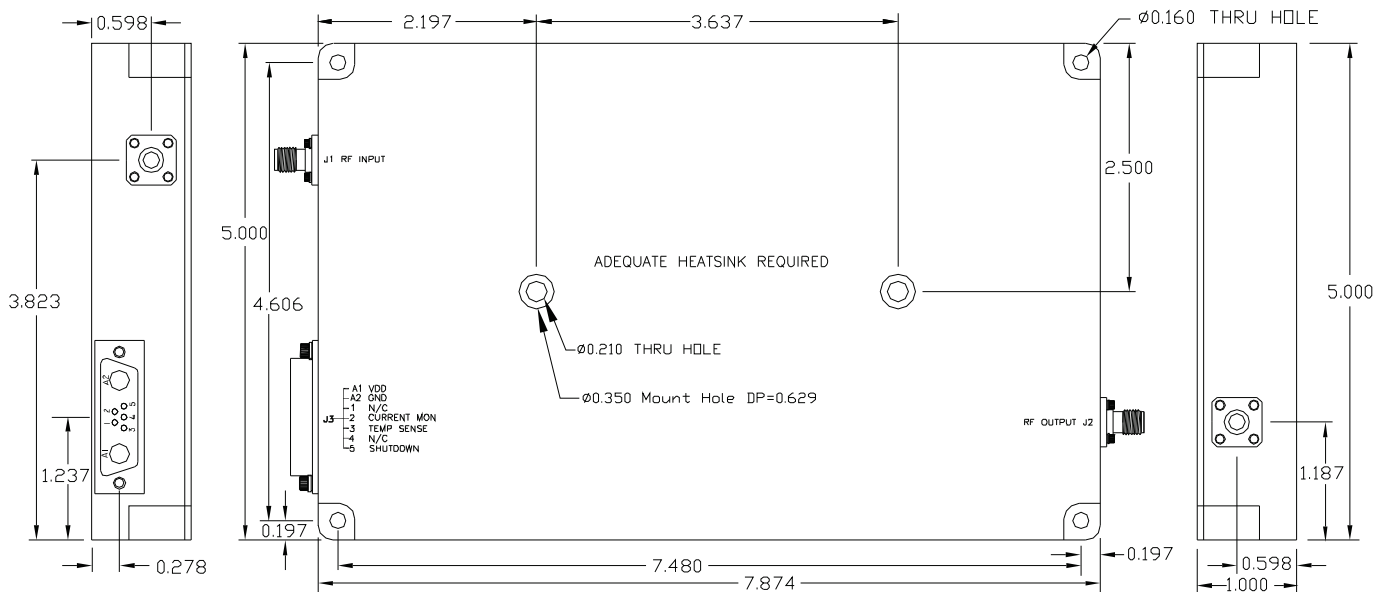
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**PROTECTIONS**

Input Overdrive	+41 dBm	Max
Load VSWR @ rated output power	$\infty$ @ all load phase & amplitude	Nom
Thermal Overload	85°C	Min

**INTERFACE CONNECTOR - D-Sub, 9 Pin**

Pin #	Description	Specifications
1	N/C	Reserved
2	Current Monitor	Analog voltage relative to $I_D$ @ 25 mV/100 mA
3	Temperature Sense	Analog voltage relative to Module's Temperature @ 10 mV/°C + 500 mV
4	N/C	Reserved
5	Shutdown	Amplifier Enable: TTL "Low" (Logic 0) or Open Amplifier Disable: TTL "High" (Logic 1)
A1	VDD	+28 V <sub>DC</sub> to $\pm 2$ V
A2	GND	Ground

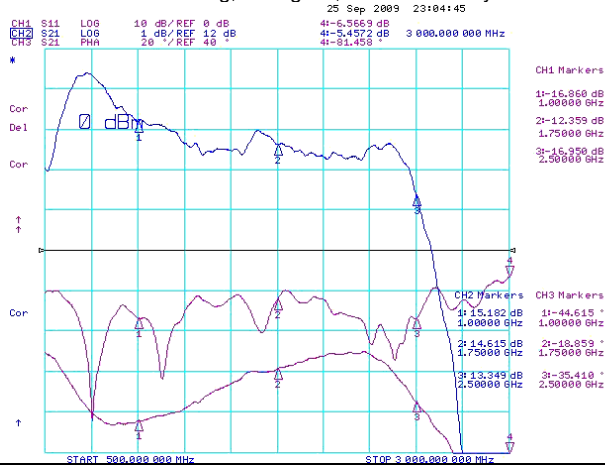
**OUTLINE DRAWING**


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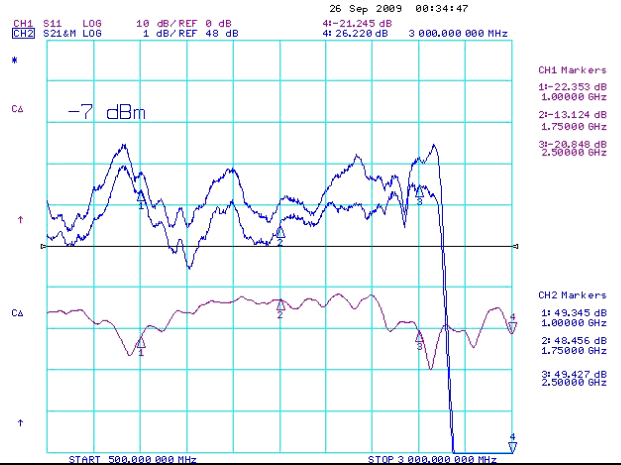
**1139 - BBM4A5KK5**
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**TYPICAL PERFORMANCE PLOTS**
**Plots 1 - Small Signal Gain**

Top Curve: Small Signal Gain @  $P_{IN} = 0\text{dBm}$   
 Reference: 12dB, 1dB/div.  
 Middle Curve: Input Return Loss  
 Reference: 0dB, 10dB/div.

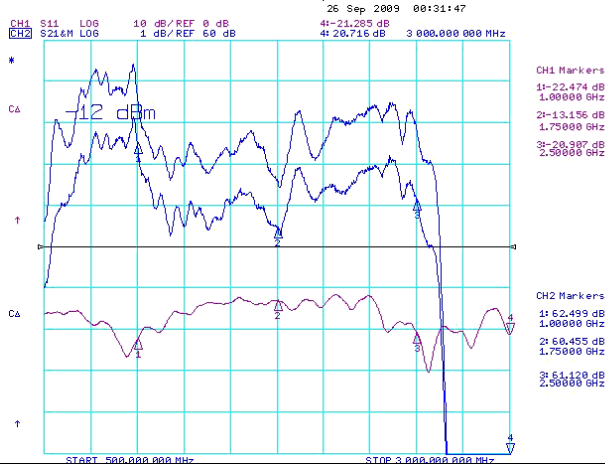
Bottom Curve: Phase  
 Reference: 40deg, 20deg/div, Electrical Delay 4.87nsec.


**Plot 2-Power@ Driver Module 1117**

Top Curve: Small Signal Gain @  $P_{IN} = -20\text{dBm}$   
 Middle Curve: Power Gain @  $P_{1dB}$ ,  $P_{IN} = -7\text{dBm}$   
 Reference = 48dB, Scale = 1dB/div  
 Bottom Curve: Input Return Loss  
 Reference = 0dB, Scale = 10dB/div


**Plot 3-Power@P1dB  
 Use1117 Driver**

Top Curve: Small Signal Gain @  $P_{IN} = -20\text{dBm}$   
 Middle Curve: Power Gain @  $P_{1dB}$ ,  $P_{IN} = -12\text{dBm}$   
 Reference = 60dB, Scale = 1dB/div  
 Bottom Curve: Input Return Loss  
 Reference = 0dB, Scale = 10dB/div


**Plot 4-Power@Psat  
 Use 1117 Driver**

Top Curve: Small Signal Gain @  $P_{IN} = -20\text{dBm}$   
 Middle Curve: Power Gain @  $P_{SAT}$ ,  $P_{IN} = -7\text{dBm}$   
 Reference = 59dB, Scale = 1B/div  
 Bottom Curve: Input Return Loss  
 Reference = 0dB, Scale = 10dB/div

