

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 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 class AB design
- Instantaneous ultra broadband
- Small form factor and lightweight
- Suitable for CW, AM, and FM (for other modulation types contact factory)
- 50 ohm input/output impedance
- High reliability and ruggedness
- Built-in control, monitoring and protection circuits

ELECTRICAL SPECIFICATIONS @ +28V_{DC}, 25°C, 50 Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	1000		2500	MHz
Power Output CW	P _{SAT}	100	125		Watt
Output Power @ 1dB Gain Compression	P _{1dB}	60	80		Watt
Small Signal Gain	G _{SS}	10	12	15	dB
Input Power for Rated P _{SAT}	P _{IN}		+38		dBm
Gain Flatness @ Rated P _{SAT}	ΔG _P			±1.0	dB
Input Return Loss	S ₁₁			-10	dB
Third Order Intercept Point 2-Tone @ 37dBm/Tone, 100kHz Spacing	IP3		+56		dBm
Harmonics @ P _{OUT} = 100W	H		-20		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V _{DC}	26	28	30	Volt
Current Consumption @ P _{OUT} = 100W	I _{DD}		8	10	Amp
Quiescent Current	I _{DQ}		0.7	2.0	Amp
Standby Current Consumption @ Shutdown	I _{SD}			400	mA
Switching Time, 1kHz TTL, P _{OUT} = 100W	T _{ON} /T _{OFF}		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	Unit
Dimensions L x W x H	7.9 X 5.0 x 1.0	Inch
Weight	2.0	Pound
RF Connectors Input / Output	Type-SMA, Female	
DC Interface Connector	Hybrid, D-sub 7-pin, Male	
Cooling	External Heatsink (not supplied)	

ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T _C	-20		+80	°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 – Proc I	VI / SH		Airborne		

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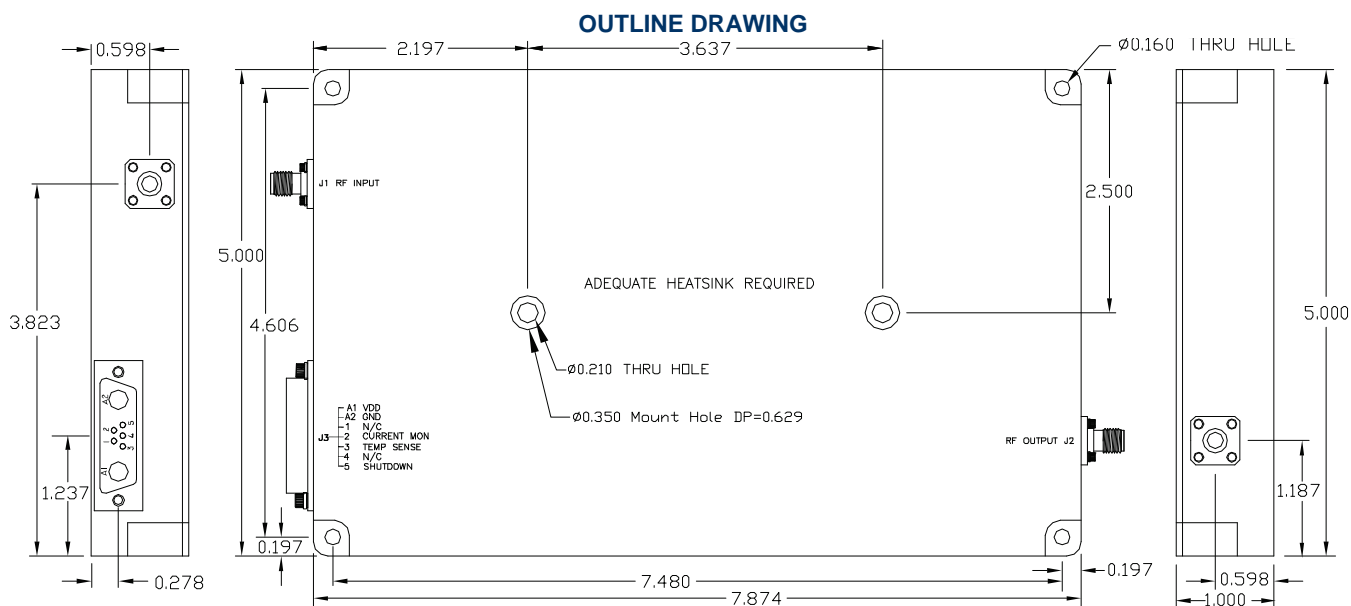
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LIMITS

Input RF drive level without damage	+41 dBm	Max
Load VSWR @ P _{OUT} = 100W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	-
Thermal Overload	85°C	Min

DC INTERFACE CONNECTOR – Hybrid, D-sub 7-pin, Male

Pin #	Description	Specification
1	N/C	No Connection
2	Current Monitor	Analog voltage relative to I _{DD} @ 25mV/100mA
3	Temperature Sense	Analog voltage relative to Module's Temperature @ 10mV/°C (500mV _{OFFSET})
4	N/C	No Connection
5	Shutdown	Amplifier Disable: TTL Logic High (5V) (Internally Pulled-low)
A1	VDD	26-30.0V _{DC}
A2	GND	Ground



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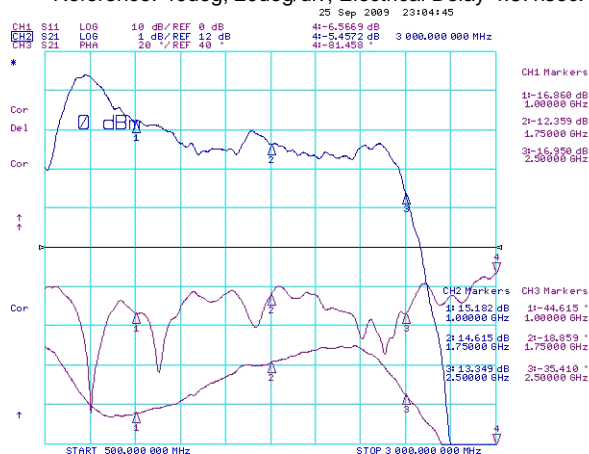
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TYPICAL PERFORMANCE PLOTS

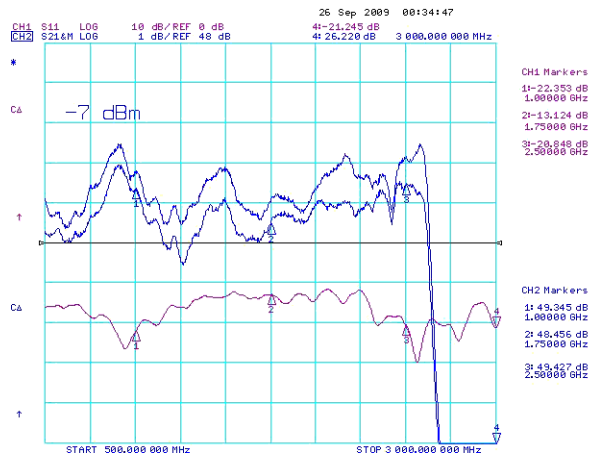
Plot 1 – Small Signal Gain

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.



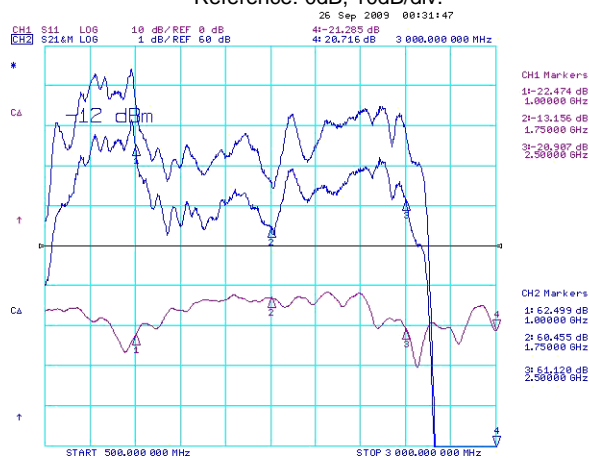
Plot 2 – Small Signal Gain & P_{1dB} of Driver (1117)

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



Plot 3 – Small Signal Gain & P_{1dB} with Driver

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



Plot 4 – Small Signal Gain & P_{SAT} with Driver

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

