

Solid State Broadband High Power Amplifier

1138 – BBM5K8CAJ
2500 – 6000 MHz, 10 Watts

The BBM5K8CAJ (SKU 1138) is suitable for broadband high power L and S band linear and jamming applications. This compact module utilizes high-power advanced GaN devices that provide excellent power density, high efficiency, wide dynamic range and low distortion. 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.



Shown with Option 072

RoHS Compliant available
SKU# 1138-0001

- Solid-state Class AB linear design
- Extremely wide instantaneous bandwidth
- Compact and lightweight
- Built-in control, monitoring and protection circuits
- Suitable for CW, AM and FM (Consult factory for other modulation types)
- 50 ohm input/output impedance
- Highly rugged and reliable

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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	2500		6000	MHz
Output Power CW	P _{SAT}	10	12		Watt
Output Power @ 1dB Gain Compression	P _{1dB}		8		Watt
Power Gain @ P _{1dB}	G _{1dB}	40			dB
Input Power for Rated P _{SAT}	P _{IN}		0	5	dBm
Small Signal Gain Flatness	ΔG _{SS}		±1.0	±2.0	dB
Third Order Intercept Point 2-Tone @ 28dBm/Tone, 100kHz Spacing	IP3		+48		dBm
Gain Adjustment Range	VVA		25		dB
Input Return Loss	S ₁₁			-10	dB
Noise Figure	NF			10	dB
Harmonics @ P _{OUT} = 8W	H		-20	-15	dBc
Spurious Signals	Spur		-70	-60	dBc
Switching Time, 1kHz TTL, P _{IN} = 0dBm	T _{ON/OFF}			5	μs
Operating Voltage	V _{DC}	26	28	30	Volt
Current Consumption @ P _{OUT} = 10W	I _{DD}		2.7		Amp

MECHANICAL SPECIFICATIONS

Parameter	Value	Units	Limits
Dimensions	6.0 X 3.0 X 1.0	Inch	Max
Weight	1.0	lb.	Max
RF Connectors Input/Output	Type-SMA, Female		
DC Interface Connector	D-Sub 9-Pin, Male		
Cooling	External Heatsink (Not Supplied)		

ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T _C	-20		+75	°C
Storage 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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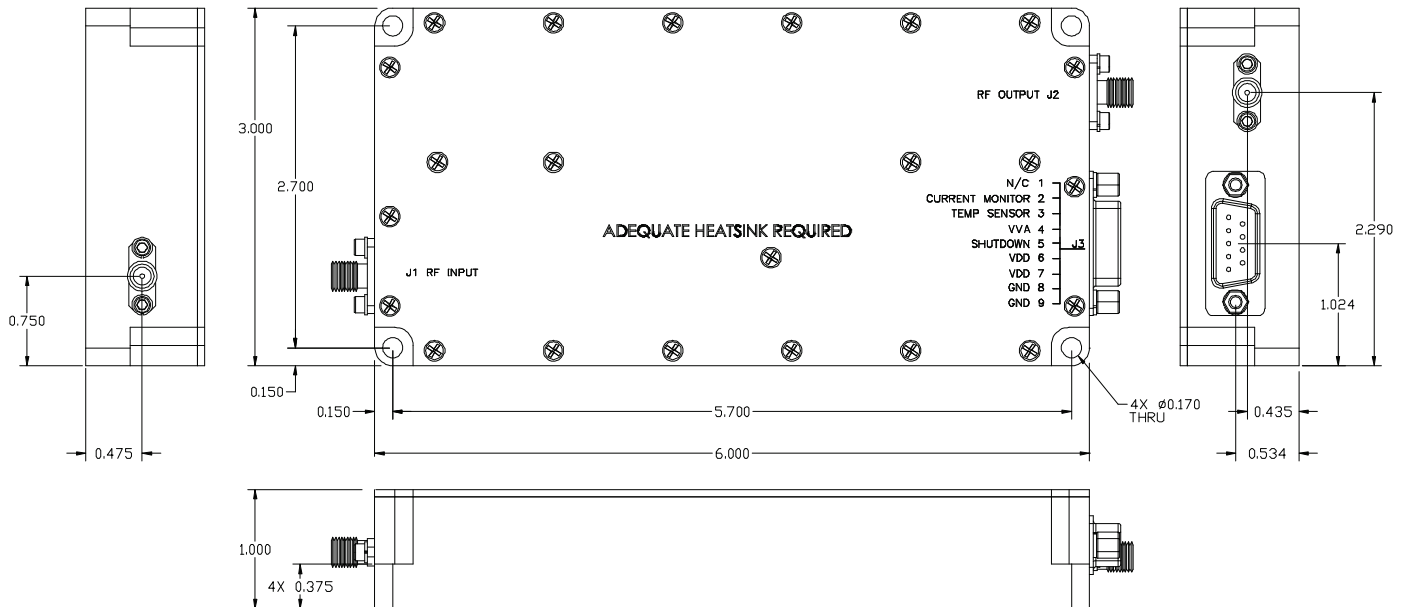
LIMITS

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

DC INTERFACE CONNECTOR – D-Sub 9-Pin, Male

Pin #	Description	Specifications
1	N/C	No Connection
2	Current Monitor	Analog voltage relative to current consumption @ 100mV/100mA
3	Temp Sense	Analog voltage relative to case temperature @ 10mV/°C
4	VVA	Continuous Analog level: 0 - 5 V _{DC} Maximum Gain: 0V _{DC} , Minimum Gain: 5V _{DC}
5	Shutdown	Amplifier Disable: TTL Logic High (5V) (Internally Pulled-Low)
6, 7	VDD	+28.0V _{DC} ±2V
8, 9	GND	Ground

OUTLINE DRAWING



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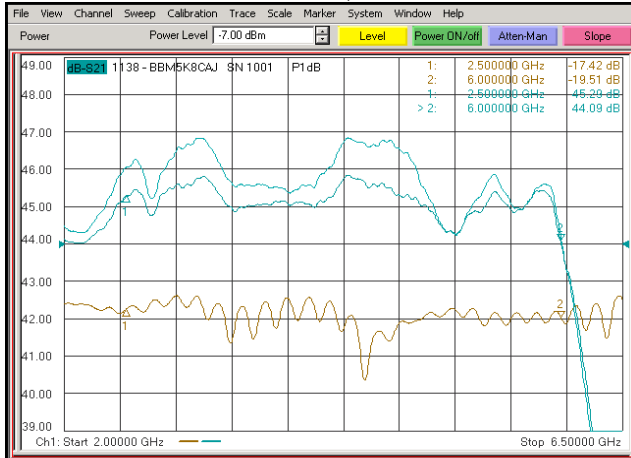
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TYPICAL PERFORMANCE PLOTS

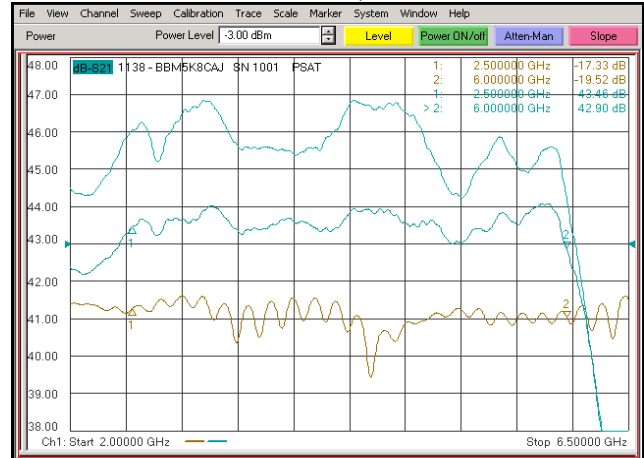
Plot 1 – Small Signal Gain and P_{1dB}

Top Curve: Small Signal Gain @ $P_{IN} = -20dBm$
 Middle Curve: Power Gain @ P_{1dB} , $P_{IN} = -7.0dBm$
 Reference: 44dB, 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: 43dB, 1dB/div.
 Bottom Curve: Input Return Loss
 Reference: 20dB, 10dB/div.



Plot 3 – Gain Adjustment Range

Top Curve: Max. Gain @ $V_{VACtrl} = 0V$, $P_{IN} = -20dBm$
 Middle Curve: Min. Gain @ $V_{VACtrl} = 5.0V$
 Reference: 15dB, 10dB/div.
 Bottom Curve: Input Return Loss @ Minimum Gain
 Reference: 0dB, 10dB/div.

