

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 72

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

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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	2500		6000	MHz
Power Output (CW)	P _{SAT}	10	12		Watt
Power Output @ 1 dB Gain Compression Point	P _{1dB}		8		Watt
Power Gain @ 1 dB Gain Compression Point	G _{1dB}	40			dB
Input Power for Rated Output	P _{IN}		0	5	dBm
Small Signal Gain Flatness	ΔG		±1.0	±1.5	dB
Gain Adjustment Range (Optional)	VVA		25		dB
Input Return Loss	S11			-10	dB
Noise Figure	NF			10	dB
Harmonics @ Rated P _{1dB} Gain Compression Point	H		-20	-15	dBc
Spurious Signals	Spur		-70	-60	dBc
Blanking Response Time	T _{ON/OFF}			5	μs
Gain, Amplifier Muted	G _{MUTE}			-30	dB
Operating Voltage	VDC	26	28	30	Volt
Current Consumption @ Rated P _{out} = 10 W	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 In/Out	SMA female/SMA female		
DC/Control Connector	Dsub, 9-Pins, Male		
Cooling	External Heatsink		

ENVIRONMENTAL CHARACTERISTICS

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			40,000	Feet
Shock & Vibration (MIL-STD-810F Method 516.5)	SH / VI		Airborne		

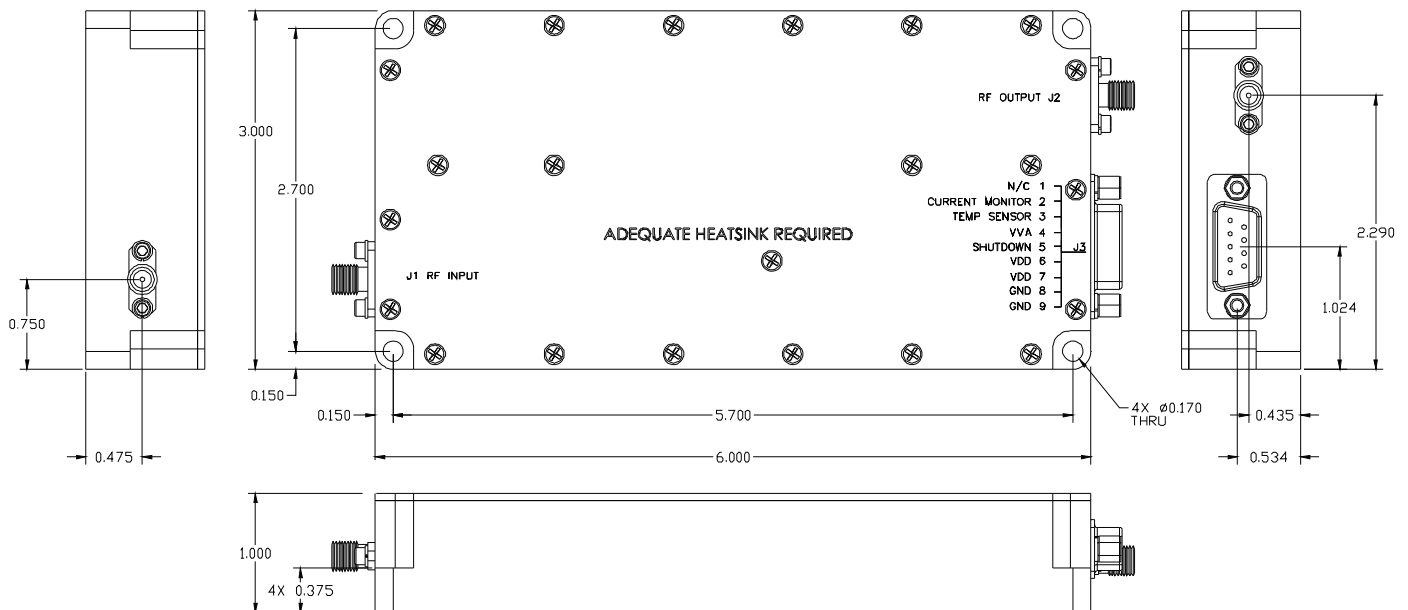
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PROTECTIONS

Input Overdrive	P_{OD}	+10 dBm	Max
Load VSWR @ rated P_{out}	Ψ	∞ @ all load phase & amplitude	Nom
Thermal Overload	T_{OD}	85 °C shutdown	Max

INTERFACE CONNECTOR – 9 Pin DSUB

Pin #	Description	Specifications
1	Not Assigned	Reserved
2	Current Monitor	Analog voltage relative to current consumption @ 100 mV/100 mA
3	Temperature Sense	Analog voltage relative to case temperature @ 10 mV/°C
4	VVA (Optional)	Continuous Analog 0 – 5 VDC levels Maximum Gain: 5 VDC Minimum Gain: 0 VDC
5	Shutdown	Amplifier Enable: TTL “Low” or Open Amplifier Disable: TTL “High” (Default)
6	VDD	+28 V \pm 2.0 VDC
7	VDD	+28 V \pm 2.0 VDC
8	GND	Ground
9	GND	Ground

OUTLINE DRAWING


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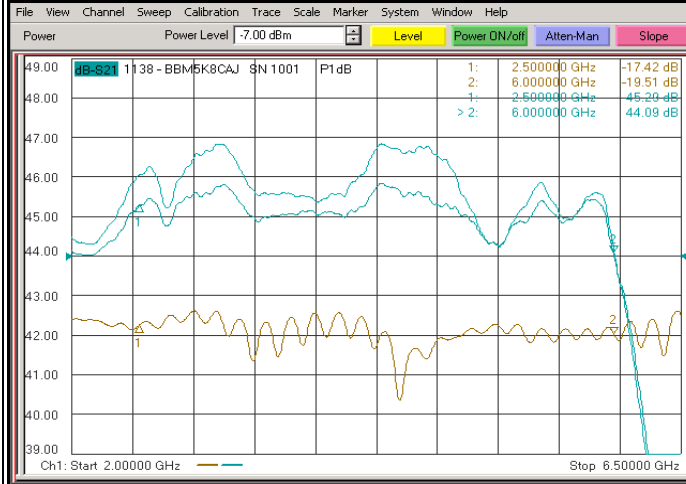
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TYPICAL PERFORMANCE PLOTS

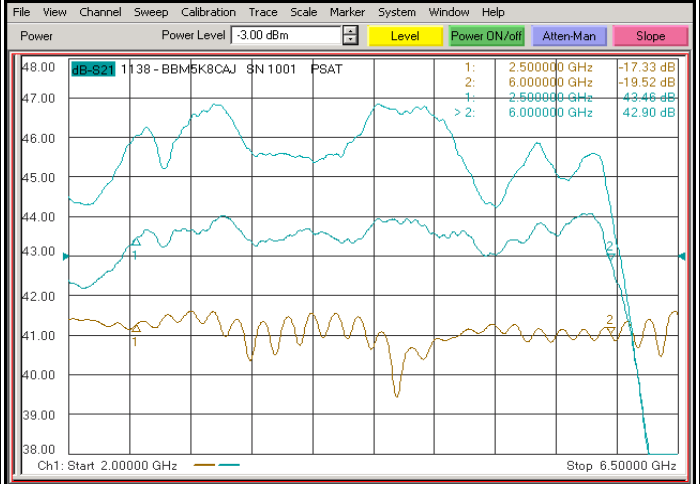
Plots 1 - Small Signal and P_{1dB} Gain

Top Curve: Small Signal Gain @ $P_{IN} = -20dBm$
 Middle Curve: Power Gain @ P_{1dB} , $P_{IN} = -7.2dBm$
 Reference: 44dB, 1dB/div.
 Bottom Curve: Input VSWR
 Reference: 0dB, 10dB/div.



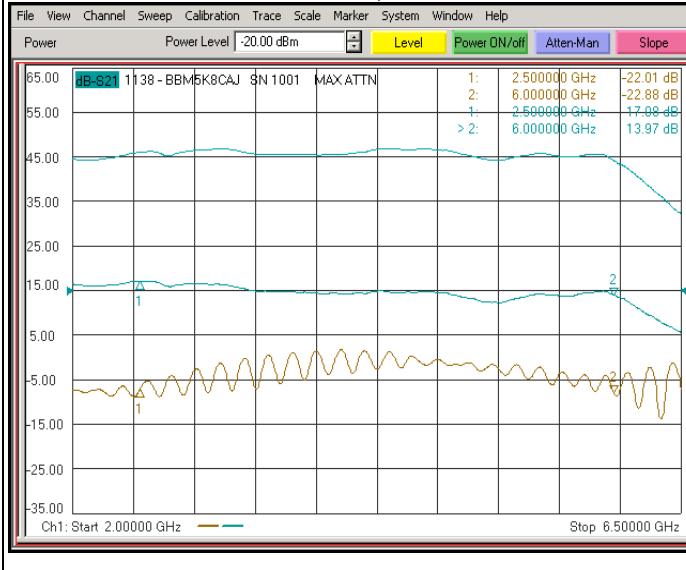
Plot 2 - Small Signal and P_{SAT}

Top Curve: Small Signal Gain @ $P_{IN} = -20dBm$
 Middle Curve: P_{SAT} @ $P_{IN} = -3.2dBm$
 Reference: 43dB, 1dB/div.
 Bottom Curve: Input VSWR
 Reference: 20dB, 10dB/div.



Plot 3 - VVA Adjustment Range

Top Curve: Max. Gain @ VVA = 0.0V, $P_{IN} = -20dBm$
 Middle Curve: Min. Gain @ VVA = 5.0V
 Reference: 15dB, 10dB/div.
 Bottom Curve: Input VSWR
 Reference: 0dB, 10dB/div.



Plot 4 - Small Signal and P_{SAT}

Top Curve: Small Signal Gain @ $P_{IN} = -20dBm$
 Middle Curve: P_{SAT} @ $P_{IN} = -2.2dBm$ (Note 2)
 Reference: 43dB, 1dB/div.
 Bottom Curve: Input VSWR
 Reference: 20dB, 10dB/div.

