

# Solid State Broadband High Power Amplifier

**1121 – BBM3C3QHM**
**100 – 800 MHz / 50 Watts**

The BBM3C3QHM (SKU 1121) is suitable for multi-octave broadband high power VHF and UHF linear 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.



- Solid-state Class AB linear design
- Extremely wide instantaneous bandwidth
- Small form factor and lightweight
- Built-in control, monitoring and protection circuits
- Suitable for CW, AM, and FM (for other modulation types, consult factory)
- 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	100		800	MHz
Power Output (CW) at 85 °C base plate temp.	P <sub>SAT</sub>	50		70	Watt
Output Power @ 1 dB Gain Compression Point	P <sub>1dB</sub>		25		Watt
Small Signal Gain	G <sub>SS</sub>			52	dB
Small Signal Gain Flatness	ΔG <sub>SS</sub>			±2	dB
Input Power for Rated P <sub>OUT</sub>	P <sub>IN</sub>		0	4	dBm
Gain Flatness @ Rated P <sub>OUT</sub>	ΔG			±1.5	dB
Input Return Loss	S <sub>11</sub>			-10	dB
Noise Figure	NF			10	dB
Third Order Intercept Point 2-Tones @ 30 dBm/Tone, Δ = 1 MHz	IP3	+54			dBm
Harmonics @ rated 1 dB Gain Compression Point	H		-20		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V <sub>DC</sub>	27.4	28	28.6	Volt
Current Consumption @ Rated P <sub>OUT</sub>	I <sub>DD</sub>			5.1	Amp
Current Consumption @ Shutdown	P <sub>DQ</sub>			350	mA
Switching Time, 1KHz TTL, P <sub>IN</sub> = 0dBm	T <sub>ON/OFF</sub>		1	15	μs

## MECHANICAL SPECIFICATIONS

Parameter	Value	Units	Limits
Dimensions (excluding heatsink)	6.4.x 3.4 x 1.1	Inch	Max
Weight	1.0	lb.	Max
RF Connectors Input/Output	SMA female/SMA female		
DC/Control Connectors	Dsub, 9 Pins, Male		
Cooling	External Heatsink		

## ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T <sub>c</sub>	-40		+85	°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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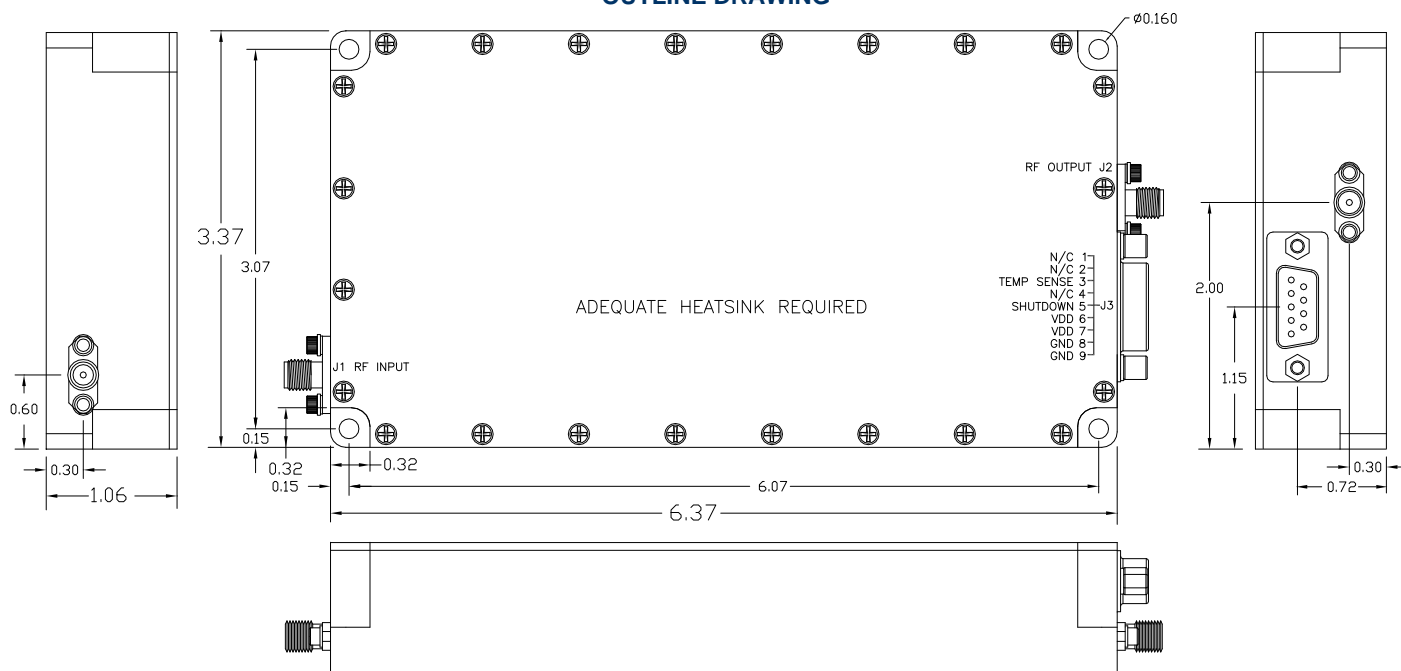
## PROTECTIONS

Input Overdrive	$P_{OD}$	+15 dBm	Max
Load VSWR	$\Psi$	$\infty$ @ All load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	
Thermal Overload	$T_{OD}$	Graceful degradation over 85 °C	

## INTERFACE CONNECTOR, 9-Pin DSUB

Pin #	Description	Specifications
1	N/C	Reserved
2	N/C	Reserved
3	Temperature Sense	Analog voltage relative to module's temperature @ 10 mV/°C
4	N/C	Reserved for VVA (Option 61)
5	Shutdown	Amplifier Enable: TTL "Low" or Open Amplifier Disable: TTL "High"
6	VDD	+28 ±0.6 V <sub>DC</sub>
7	VDD	+28 ±0.6 V <sub>DC</sub>
8	GND	Ground
9	GND	Ground

## OUTLINE DRAWING



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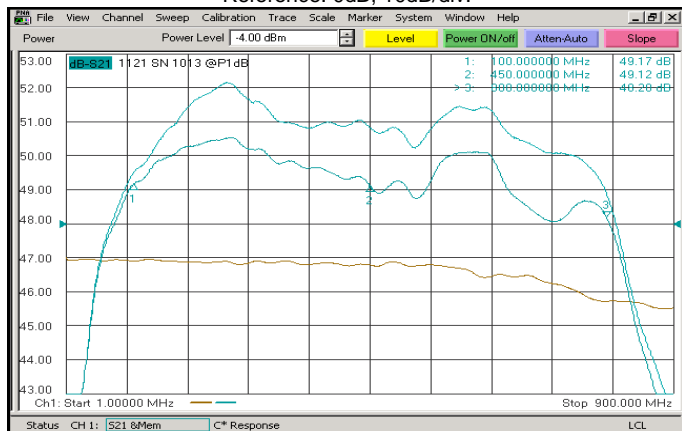
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## TYPICAL PERFORMANCE PLOTS

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

Top Curve: Small Signal Gain @  $P_{IN} = -20dBm$   
 Middle Curve: Power Gain @  $P_{1dB}$ ,  $P_{IN} = -4.0dBm$   
 Reference: 48dB, 1dB/div.  
 Bottom Curve: Input Return Loss  
 Reference: 0dB, 10dB/div.



### Plot 2 - Small Signal and $P_{SAT}$

Top Curve: Small Signal Gain @  $P_{IN} = -20dBm$   
 Bottom Curve:  $P_{SAT}$  @  $P_{IN} = +1.5dBm$   
 Reference: 48dB, 1dB/div.  
 Middle Curve: Input Return Loss  
 Reference: 0dB, 10dB/div.

