

## Solid State Broadband High Power Amplifier

**1113 – BBM4A5KHM**
**1000 – 2500 MHz, 50 Watts**

The BBM4A5KHM (SKU 1113) is suitable for broadband mobile jamming and band specific high power linear applications in the P/L/S frequency bands. 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
- Compact and lightweight
- Built-in control, monitoring and protection circuits
- Suitable for CW, AM, and FM (for other modulation types contact factory)
- 50 ohm input/output impedance
- Highly rugged and reliable

### ELECTRICAL SPECIFICATIONS @ +28 or +24 VDC, 25 °C, 50 Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	1000		2500	MHz
Power Output (CW) @ 28 V <sub>DC</sub>	P <sub>SAT</sub>	50			Watt
Power Output CW @ 24 V <sub>DC</sub> (OPT042)	P <sub>SAT</sub>		40		Watt
Output Power @ 1 dB Gain Compression Point	P <sub>1dB</sub>	30			Watt
Small Signal Gain	G <sub>1dB</sub>	46	48		dB
Input Power for Rated Pout	P <sub>IN</sub>		0		dBm
Small Signal Gain Flatness	ΔG			±1.5	dB
Input Return Loss	S <sub>11</sub>			-10	dB
Noise Figure @ Max Gain	NF			10	dB
Third Order Intercept Point 2-Tones @ 33 dBm/Tone, Δ = 100 kHz	IP3		+50		dBm
Harmonics @ P <sub>1dB</sub> Gain Compression Point	2 <sup>nd</sup> / 3 <sup>rd</sup>		-20		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (28 V <sub>DC</sub> )	V <sub>DC</sub>	26	28	30	Volt
Operating Voltage (24 V <sub>DC</sub> OPT042)	V <sub>DC</sub>	22	24	26	Volt
Current Consumption @ Nominal Output Power	I <sub>DD</sub>			6.5	Amp
Quiescent Current	I <sub>DQ</sub>		2.0		Amp
Switching Speed (10% to 90%)	T <sub>sw</sub>		2	5	uSec

### MECHANICAL SPECIFICATIONS

Parameter	Value	Units	Limits
Dimensions	6.4 x 2.68 x 1.0	Inch	Max
Weight	1.0	lb.	Max
RF Connectors Input/Output	SMA female		
DC 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		40,000	Feet
Shock / Vibration (MIL-STD-810F Method 516.5)	SH / VI		Airborne		

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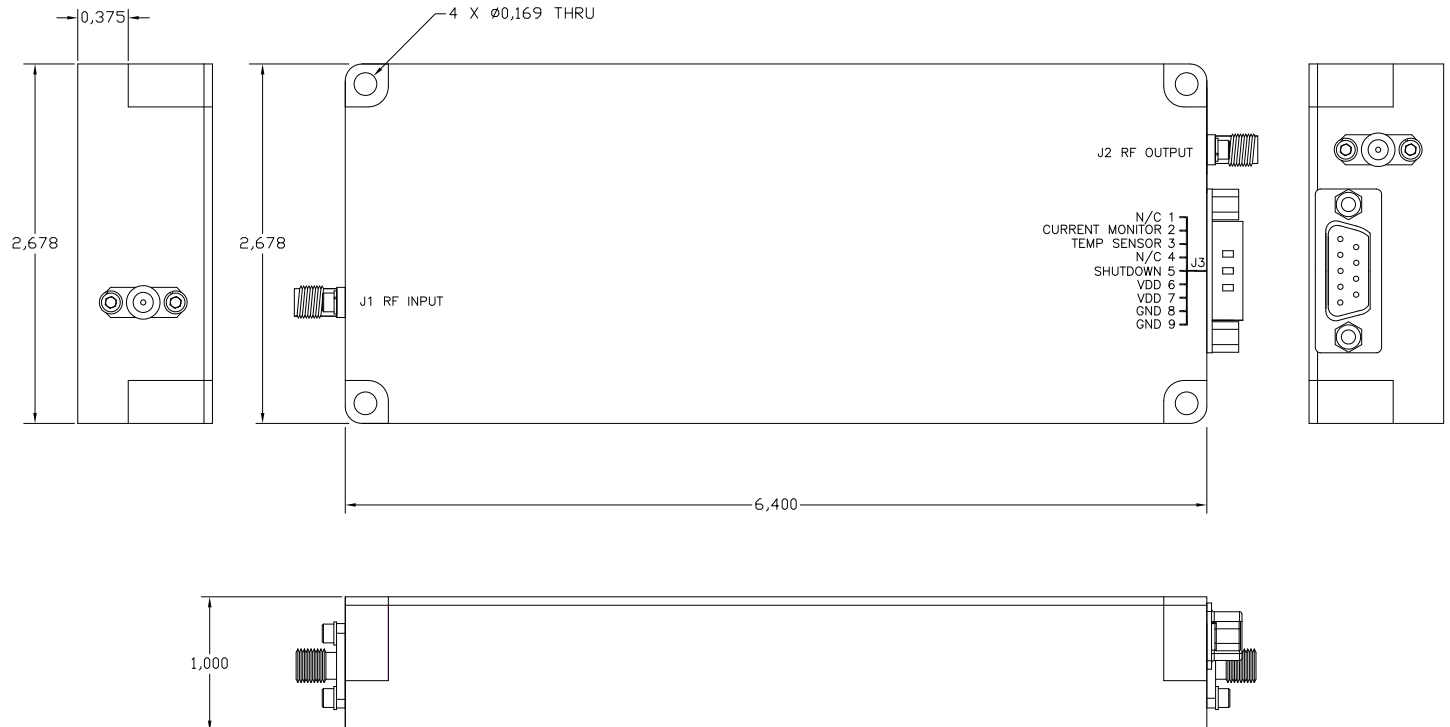
## PROTECTIONS

Input Overdrive	+10 dBm	Max
Load VSWR @ Rated P <sub>out</sub>	∞:1 @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	Nom
Thermal Overload	Graceful degradation	Max

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

Pin #	Description	Specifications
1	N/C	Reserved
2	Current Consumption Monitor	Analog voltage relative to I <sub>D</sub> @ 50 mV/100 mA
3	Temperature Monitor	Analog voltage relative to Module's Temperature @ 10 mV/°C
4	N/C	Reserved
5	Shutdown	Amplifier Enable: TTL "Low" (Logic 0) or Open Amplifier Disable: TTL "High" (Logic 1)
6	VDD	+28 ± 2 V <sub>DC</sub>
7	VDD	+28 ± 2 V <sub>DC</sub>
8	GND	Ground
9	GND	Ground

## OUTLINE DRAWING (Standard)



# Solid State Broadband High Power Amplifier

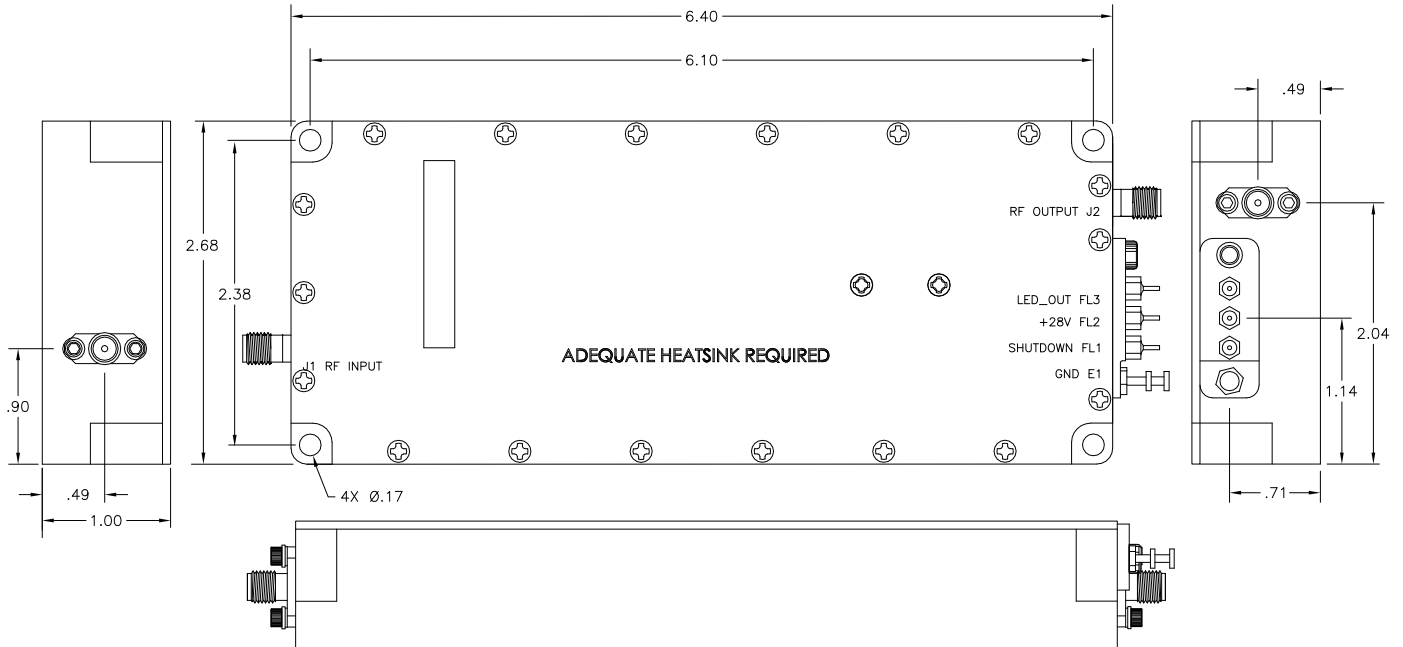
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## INTERFACE CONNECTION - Feed Thru (OPT077 + OPT081 + OPT082 Version)

Pin #	Description	Specifications
FL1	Shutdown	Amplifier Enable: TTL "Low" or Open Amplifier Disable: TTL "High"
FL2	+VDD	+24 ±2 V <sub>DC</sub>
FL3	LED OUT	
E1	GND	Ground

## OUTLINE DRAWING (OPT077 + OPT081 + OPT082 Version)



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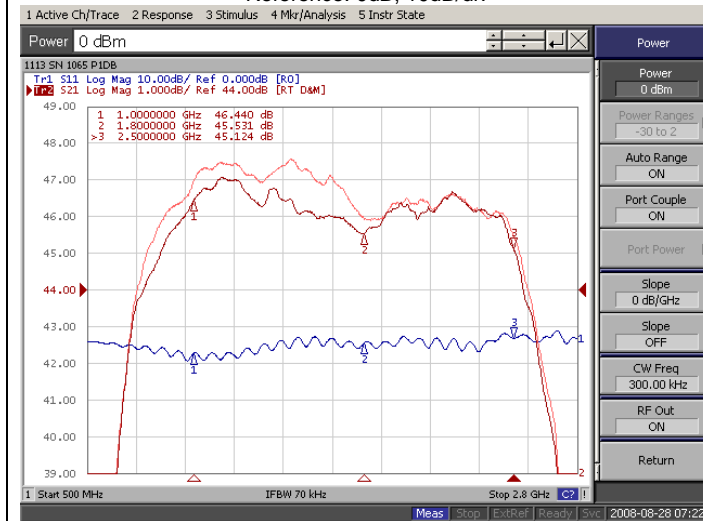
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## TYPICAL PERFORMANCE PLOTS (28 V<sub>DC</sub> Version)

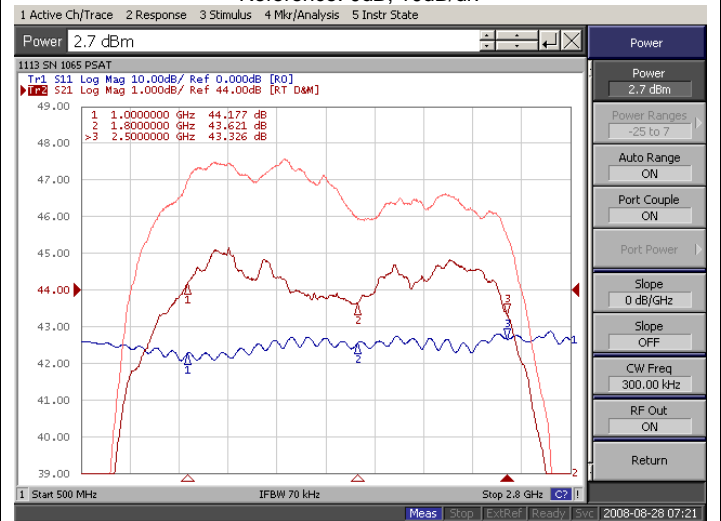
### Plot 1 - Small signal & P<sub>1dB</sub>

Top Curve: Small Signal Gain @ P<sub>in</sub> = -20dBm  
 Middle Curve: P<sub>1dB</sub> Gain @ P<sub>in</sub> = 0dBm  
 Reference: 44dB, 1dB/div  
 Bottom Curve: Input VSWR  
 Reference: 0dB, 10dB/div



### Plot 2 - Small signal & P<sub>sat</sub>

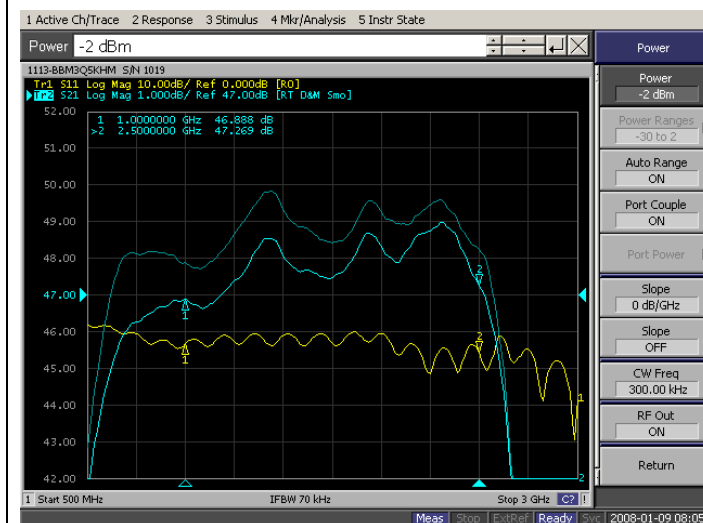
Top Curve: Small Signal Gain @ P<sub>in</sub> = -20dBm  
 Middle Curve: P<sub>sat</sub> @ P<sub>in</sub> = 2.7dBm  
 Reference: 44dB, 1dB/div  
 Bottom Curve: Input VSWR  
 Reference: 0dB, 10dB/div



## TYPICAL PERFORMANCE PLOTS (24 V<sub>DC</sub> OPT042 Version)

### Plots 1 - Small Signal and P<sub>1dB</sub> Gain

Top Curve: Small Signal Gain @ P<sub>in</sub> = -20dBm  
 Middle Curve: Power Gain @ P<sub>1dB</sub>, P<sub>in</sub> = -2.2dBm  
 Reference: 47dB, 1dB/div.  
 Bottom Curve: Input VSWR  
 Reference: 0dB, 10dB/div.



### Plot 2 - Small Signal and P<sub>SAT</sub>

Top Curve: Small Signal Gain @ P<sub>in</sub> = -20dBm  
 Middle Curve: P<sub>SAT</sub> @ P<sub>in</sub> = +1.8dBm  
 Reference: 45dB, 1dB/div.  
 Bottom Curve: Input VSWR  
 Reference: 0dB, 10dB/div.

