

## Solid State Broadband High Power Amplifier

**1004 - BBM1C4AEL**
**1 – 1000 MHz / 25 Watt**

The BBM1C4AEL (SKU 1004) is suitable for ultra broadband and band specific high power linear applications. This amplifier utilizes Silicon MOSFET power devices that provide high gain, wide dynamic range, low distortions, and good linearity. 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 A linear design
- Instantaneous ultra broadband
- Small form factor and lightweight
- Suitable for CW, AM, and FM (Consult factory for other modulation types)
- Built-in Voltage Variable Attenuator
- 50 ohm input/output impedance
- High reliability and ruggedness

### ELECTRICAL SPECIFICATIONS @ +28V<sub>DC</sub>, 25°C, 50Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	1		1000	MHz
Output Power CW	P <sub>SAT</sub>	25	30		Watt
Output Power @ 1dB Gain Compression	P <sub>1dB</sub>	12	15		Watt
Power Gain @ 1dB Gain Compression	G <sub>1dB</sub>	44			dB
Input Power for Rated P <sub>SAT</sub>	P <sub>IN</sub>		0	3	dBm
Small Signal Gain Flatness	ΔG		±1.0	±1.5	dB
Gain Adjustment Range	VVA	20	25		dB
Input Return Loss	S <sub>11</sub>			-10	dB
Noise Figure @ max gain	NF		15		dB
Harmonics @ P <sub>OUT</sub> = 12W	H		-25		dBc
Third Order Intercept Point	IP3		+51		dBm
2-Tone @ 30dBm/Tone, 100kHz Spacing	Spur		-70	-60	dBc
Operating Voltage	V <sub>DC</sub>	24	28	32	Volt
Current Consumption @ P <sub>OUT</sub> = 25W	I <sub>DD</sub>			5.5	Amp

### MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions	6.4 x 3.4 x 1.1	Inch
Weight	1.0	Pound
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 <sub>C</sub>	0		+50	°C
Storage Temperature	T <sub>STG</sub>	-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		

## Solid State Broadband High Power Amplifier

**1004 - BBM1C4AEL**
**1 – 1000 MHz / 25 Watt**

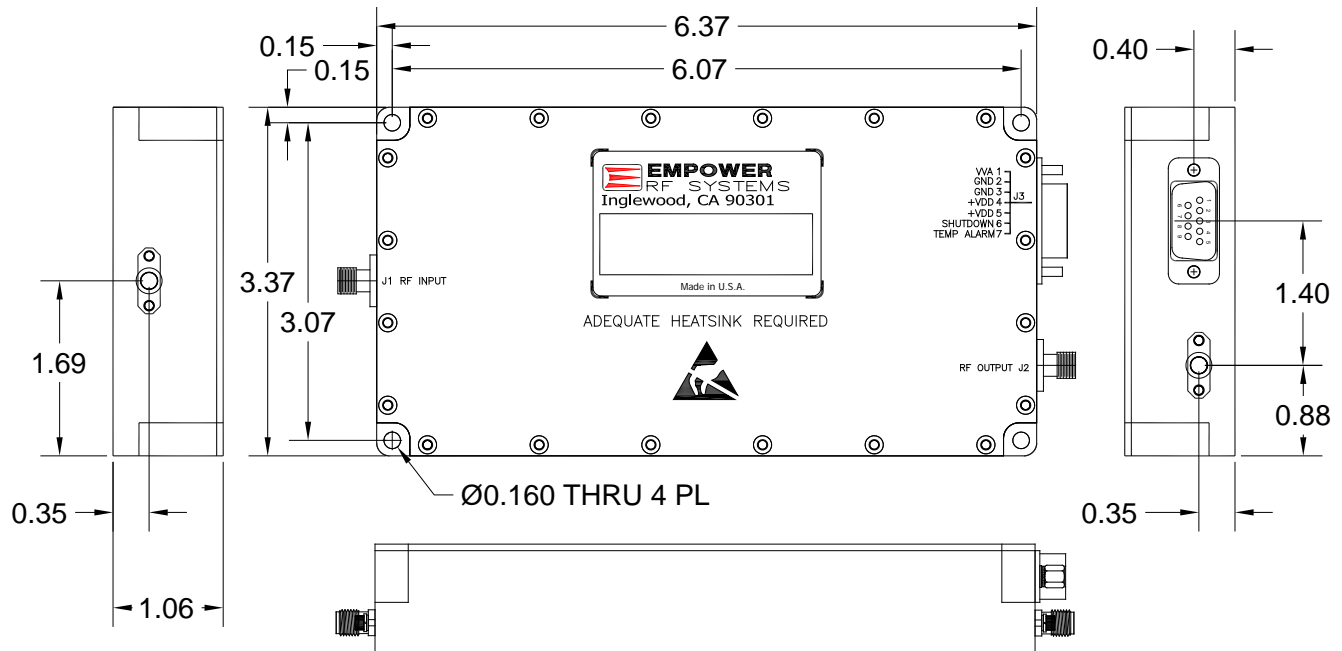
### LIMITS

Input RF drive level without damage	+10 dBm	Max
Load VSWR @ P <sub>OUT</sub> = 12W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	-
Thermal Overload	85°C shutdown	Max

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

Pin #	Description	Specification
1	VVA	Control Voltage, Analog Continuous: Max. Gain = 5V <sub>DC</sub> , Min. Gain = 0V <sub>DC</sub>
2&3	GND	Ground
4&5	VDD	+24.0-32.0V <sub>DC</sub>
6	Shutdown	Amplifier Disable: TTL Logic High (5V) (Internally Pulled-Low)
7	Temp Alarm	TTL logic Low (0V) Thermal Overload (Internally Pulled-High, 5V)
8&9	N/C	No Connection

### OUTLINE DRAWING



# Solid State Broadband High Power Amplifier

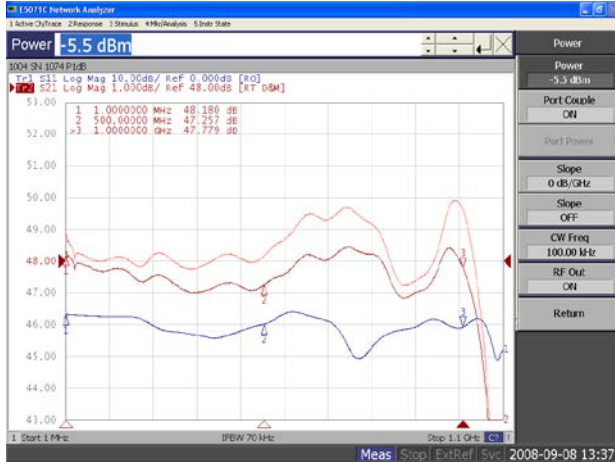
1004 - BBM1C4AEL

1 – 1000 MHz / 25 Watt

## TYPICAL PERFORMANCE PLOTS

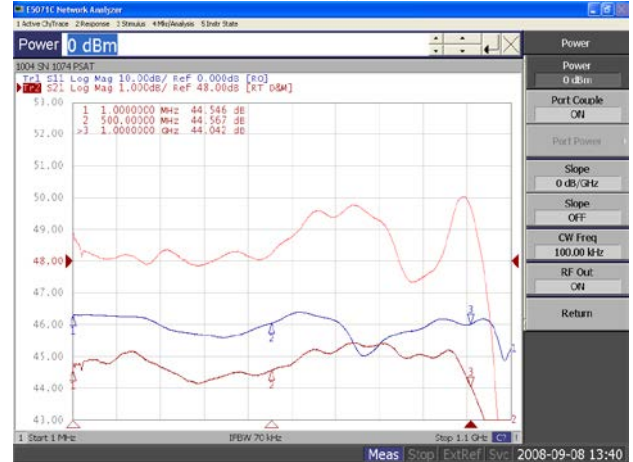
**Plot 1 – Small Signal Gain and  $P_{1dB}$**

Top Curve: Small Signal Gain @  $P_{IN} = -20dBm$   
 Middle Curve: Power Gain @  $P_{1dB}$ ,  $P_{IN} = -5.5dBm$   
 Reference: 48dB, 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 @  $P_{SAT}$ ,  $P_{IN} = 0.0dBm$   
 Reference: 48dB, 1dB/div.  
 Bottom Curve: Input Return Loss  
 Reference: 0dB, 10dB/div.



**Plot 3 – Gain Adjustment Range**

Top Curve: Max. Gain @  $VVA_{CTRL} = 5.0V$ ,  $P_{IN} = -20dBm$   
 Middle Curve: Min. Gain @  $VVA_{CTRL} = 1.9V$ ,  $P_{IN} = -20dBm$   
 Reference: 20dB, 10dB/div.  
 Bottom Curve: Input Return Loss  
 Reference: 0dB, 10dB/div.

