

# Solid State Broadband High Power Amplifier

**1094 - BBM2E3KKO**
**20 – 520 MHz / 100 Watts**

The BBM2E3KKO (SKU 1094) is suitable for VHF & UHF broadband and band specific high power linear applications. This amplifier utilizes push-pull LDMOS 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 AB linear design
- Instantaneous ultra broadband
- Small and lightweight
- Built in Protection, Control & Monitoring Circuits
- Suitable for most modulation types (contact factory for details)
- 50 ohm input/output impedance
- High reliability, ruggedness, and High Efficiency

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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	20		520	MHz
Power Output CW	P <sub>SAT</sub>	100	120		Watt
Power Output @ 1 dB Gain Compression Point	P <sub>1dB</sub>	60 *			Watt
Power Gain @ 1 dB Gain Compression Point	G <sub>1dB</sub>	50			dB
Input Power for Rated Output	P <sub>IN</sub>		0		dBm
Small Signal Gain Flatness	ΔG		±1.0	±1.5	dB
Gain Adjustment Range (VVA: 0 – 5 VDC)	VVA	25	30		dB
Input Return Loss	S <sub>11</sub>			-10	dB
Noise Figure @ minimum attenuation	NF		7	10	dB
Third Order Intercept Point 2 - Tones, P <sub>OUT</sub> = 37 dBm/Tone, Δ = 100 KHz	IP3		+56		dBm
Harmonics @ 100 W	2 <sup>nd</sup>		-40		dBc
	3 <sup>rd</sup>		-15		
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V <sub>DC</sub>	26	28	30	Volt
Current Consumption @ 100 W	I <sub>DD</sub>			8.5 *	Amp
Turn-On/Off @ 10 KHz TTL, 50% Duty Cycle	T <sub>ON/OFF</sub>		1.0		uSec

\* On Rev A thru Rev H P1dB = 80W & I<sub>DD</sub> = 12.5A; on Rev J and later P1dB = 60W & I<sub>DD</sub> = 8.5A.

## MECHANICAL SPECIFICATIONS

Parameter	Value	Units
Dimensions	6.4 x 3.4 x 1.1	Inch
Weight	1.0	lb.
RF Connectors In/Out	SMA female	
DC & Control Connector	Dsub, 9-Pins, Male	
Cooling	External Heatsink	

## ENVIRONMENTAL CHARACTERISTICS

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		

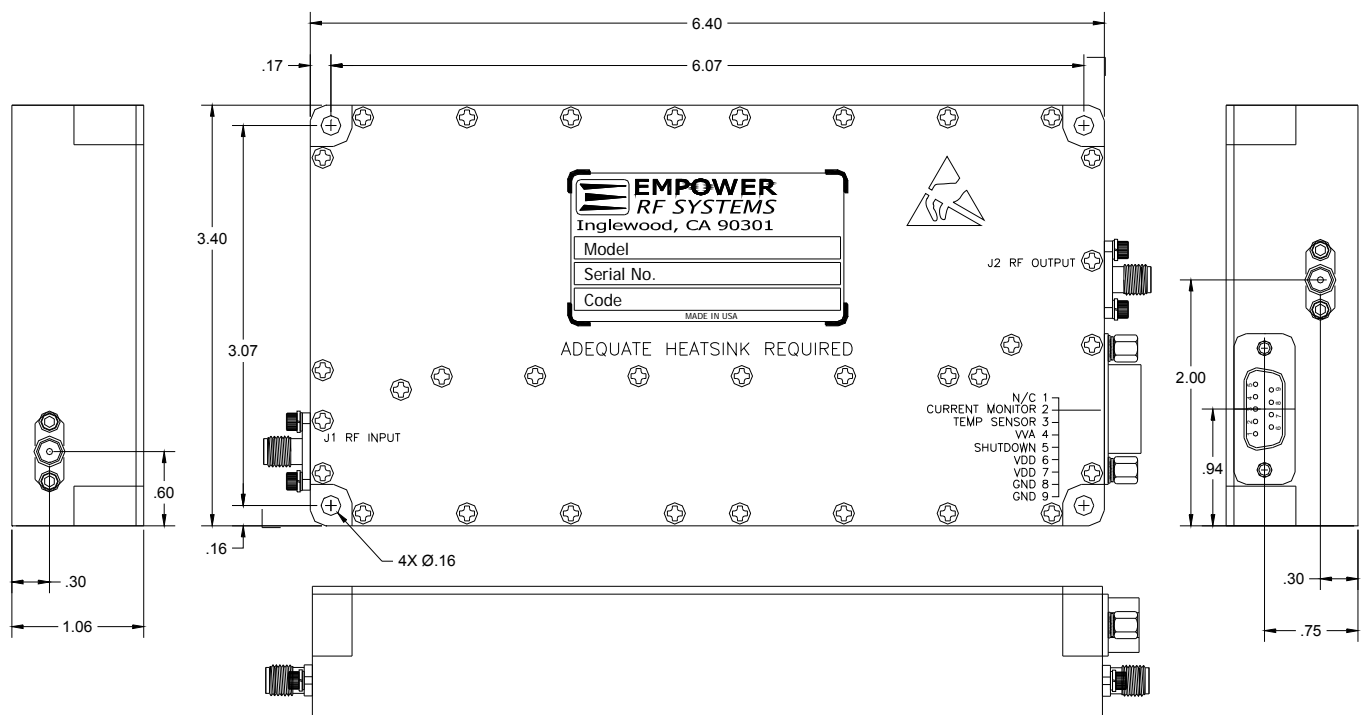
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**PROTECTIONS (Note 1)**

Input Overdrive	$P_{OD}$	+10 dBm	Max
Load VSWR	$\Psi$	$\infty$ @ all load phase & amplitude	Nom
Thermal Overload	$T_{OL}$	104°C shutdown	Max

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

Pin #	Description	Specifications
1	N/C	Spare
2	Current Consumption Monitor	Analog voltage relative to $I_D$ @ 50mV/100 mA
3	Temperature Monitor	Analog voltage relative to Module's Temperature @ 10 mV/°C
4	VVA	Controlled via Analog 0 – 5 V
5	Shutdown	Amplifier Enable: TTL "Low" (Logic 0) or Open Amplifier Disable: TTL "High" (Logic 1)
6, 7	VDD	+28 VDC
8, 9	GND	Ground

**OUTLINE DRAWING**

**Features:**

- Built in gain adjust VVA
- Fast switching - Mute function
- Reverse polarity protection
- Temperature protection
- Temperature indication
- Current limit protection
- Current consumption indicator

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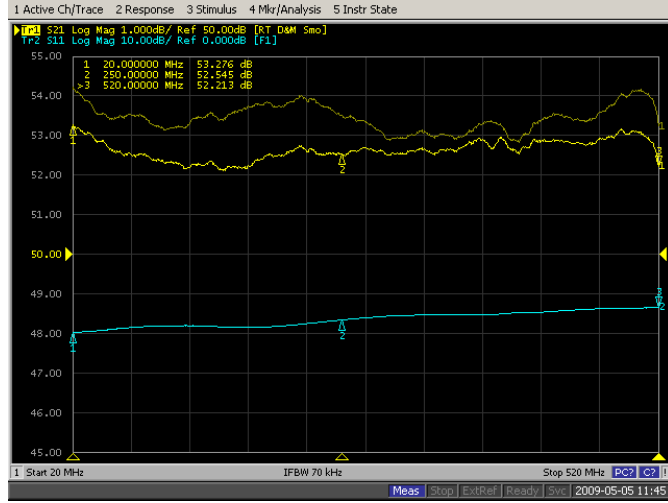
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## TYPICAL PERFORMANCE PLOTS

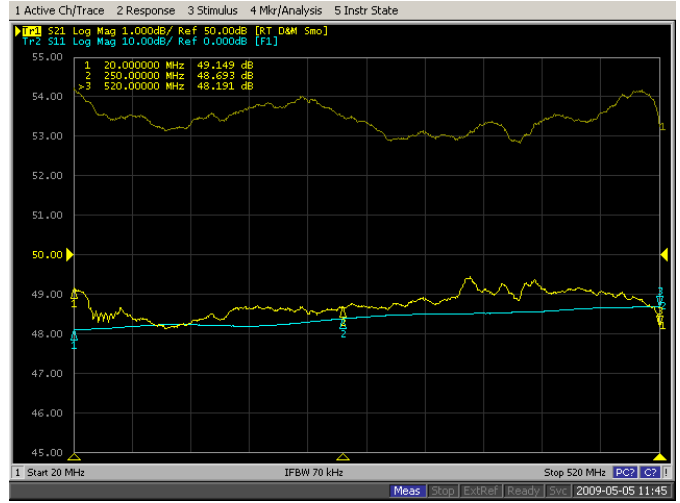
**Plot 1**

Top Curve: Small Signal gain @ Pin = -20dBm  
 Middle Curve: Power Gain, Pin = -3.4dBm  
 Reference: 50dB, 1dB/div.  
 Bottom Curve: Input Return Loss  
 Reference: 0dB, 10dB/div.



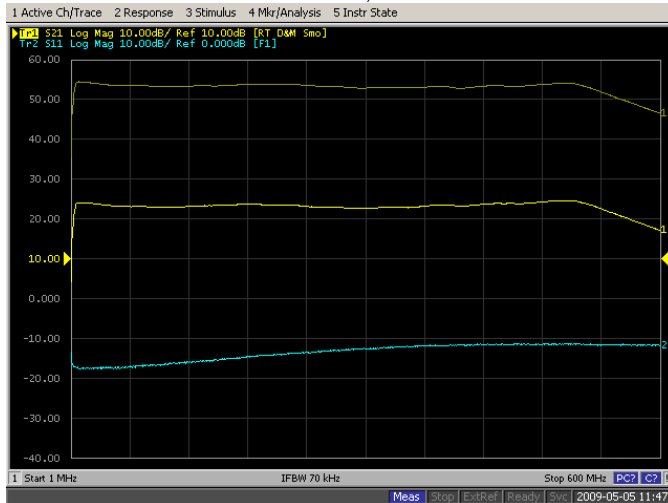
**Plot 2**

Top Curve: Small Signal gain @ Pin = -20dBm  
 Middle Curve: Output Power @ Psat, Pin = 2dBm  
 Reference: 50dB, 1dB/div.  
 Bottom Curve: Input Return Loss  
 Reference: 0dB, 10dB/div.



**Plot 3 - VVA Adjustment Range**

Top curve: Max Gain @ Pin = -20dB  
 Middle curve: Min Gain @ Pin = -20dB  
 Reference: 20dB, 10dB/div.  
 Bottom Curve: Input Return Loss  
 Reference: 0dB, 10dB/div.



**Note(s):**

1. Verify NO change in performance after test.
2. Cable Loss/Source Correction included in Pin and Pout Measurements.