EMPOWER RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

1116 - BBM2E3KAJ	20 – 520 MHz / 10 Watts

The BBM2E3KAJ (SKU 1116) is suitable for multi octave broadband high power RF, VHF & UHF linear applications. This compact module utilizes advanced high power GaN devices that provide excellent power density, high efficiency, wide dynamic range and low distortions. 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 form factor and lightweight
- Suitable for CW, AM, and FM (Consult factory for other modulation types)
- 50 ohm input/output impedance
- High reliability and ruggedness
- Built-in control, monitoring and protection circuits

ELECTRICAL SPECIFICATIONS @ +28.0V_{DC}, 25°C, 50Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	20		520	MHz
Output Power CW	P_{SAT}	10	15		Watt
Output Power @ 1dB Gain Compression	P_{1dB}	8	10		Watt
Power Gain @ 1dB Gain Compression	G_{1dB}	40			dB
Input Power for Rated P_{SAT}	P_{IN}		0		dBm
Small Signal Gain Flatness	ΔG		±1.0	±1.5	dB
Input Return Loss	S_{11}			-10	dB
Noise Figure	NF		7	10	dB
Third Order Intercept Point 2-Tone @ 37dBm/Tone, 100kHz Spacing	IP3		+49		dBm
Harmonics @ P_{OUT} = 8W	H		-25		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V_{DC}	24	28	30	Volt
Current Consumption @ P_{OUT} = 10W	I_{DD}		1.25	1.55	Amp

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions	4.0 x 2.5 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_C	-20		+75	°C
Non-operating Temperature	T_{STG}	-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		

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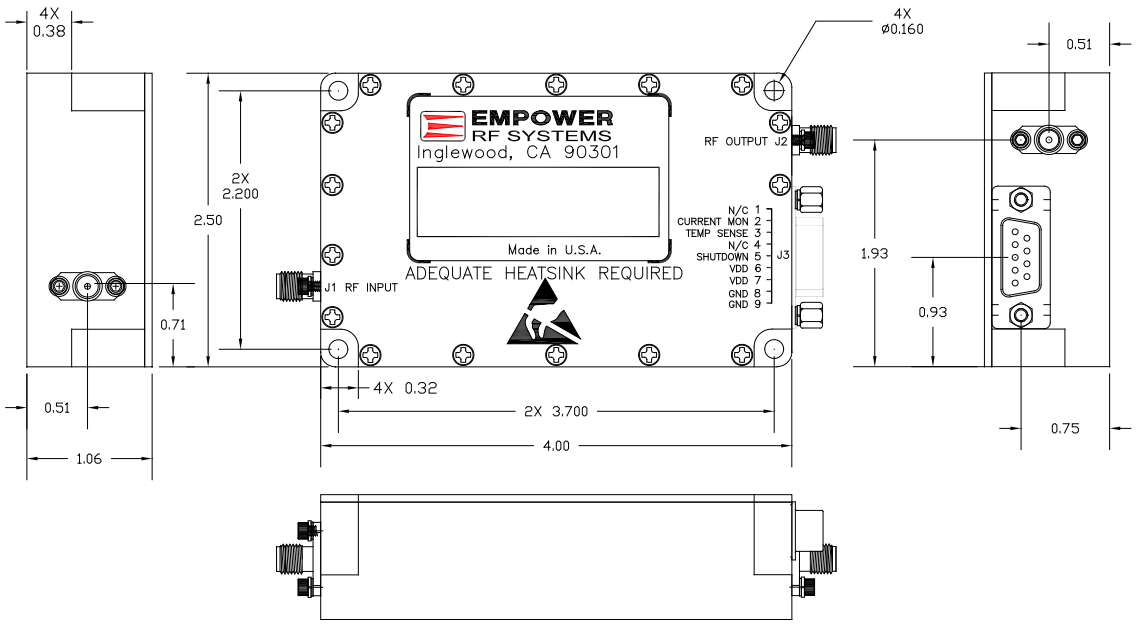
LIMITS

Input RF drive level without damage	+10 dBm	Max
Load VSWR @ P_{OUT} = 8W	∞ @ 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

Pin #	Description	Specifications
1	N/C	No Connection
2	Current Monitor	Analog voltage relative to I_{DD} @ 3V per Ampere
3	Temperature Sense	Analog voltage relative to Module's Temperature @ 10 mV/°C
4	N/C	No Connection
5	Shutdown	Amplifier Disable: TTL Logic High (5V) (*Internally Pulled-Low*)
6&7	VDD	24.0-30.0V_{DC}
8&9	GND	Ground

OUTLINE DRAWING



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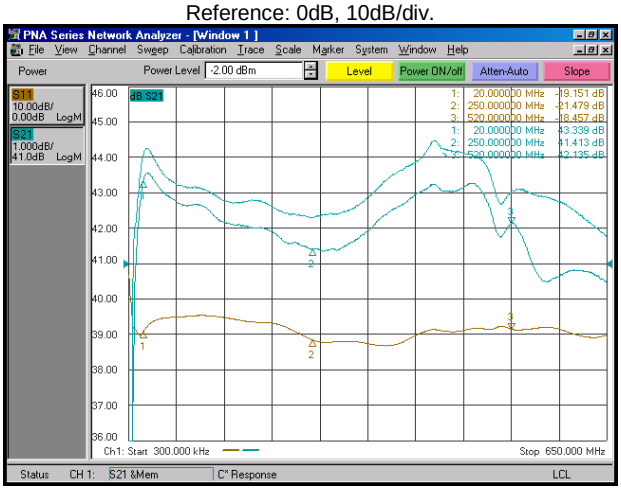
TYPICAL PERFORMANCE PLOTS

Plot 1 – Small Signal Gain and P_{1dB}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -2dBm
Reference: 41dB, 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} = 1.0dBm
Reference: 41dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.