EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

1015 - BBM2E4AKA

20 – 1000 MHz / 100 Watts

The BBM2E4AKA (SKU 1015) is suitable for ultra broadband high power linear applications. This amplifier utilizes high power MOSFET push-pull 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. The amplifier has a built in control, monitoring and protection functions. Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.

- Solid-state Class A linear design
- Instantaneous ultra broadband
- Small and lightweight
- Built-in control, monitoring & protection circuits
- Suitable for CW, AM, and FM (Consult factory for other modulation type)
- 50 ohm input/output impedance
- High reliability and ruggedness

ELECTRICAL SPECIFICATIONS @ +28V_{DC}, 25°C, 50 Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	20		1000	MHz
Power Output CW	P_{SAT}	100	120		Watt
Power Output @ 1dB Gain Compression	P_{1dB}	60			Watt
Power Gain @ 1dB Gain Compression	G_{1dB}		22		dB
Input Power for Rated P_{SAT}	P_{IN}		30		dBm
Small Signal Gain Flatness	ΔG		±1.5	±2.0	dB
Input Return Loss	S_{11}			-10	dB
Noise Figure	NF			10	dB
Third Order Intercept Point 2-Tone @ 40dBm/Tone, 100kHz Spacing	IP3		+57		dBm
Harmonics @ P_{OUT} = 60W	H		-25		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V_{DD}	26	28	30	Volt
Current consumption @ P_{OUT} = 100W	I_{DD}		20		Amp

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimension	7.6 x 7.2 x 1.2	Inch
Weight	4.0	Pound
RF Connectors Input / Output	Type-SMA, Female	
DC Interface Connector	Hybrid, D-Sub 7-Pin, Male	
Cooling	External Heatsink (not supplied)	

ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T_C	0		+50	°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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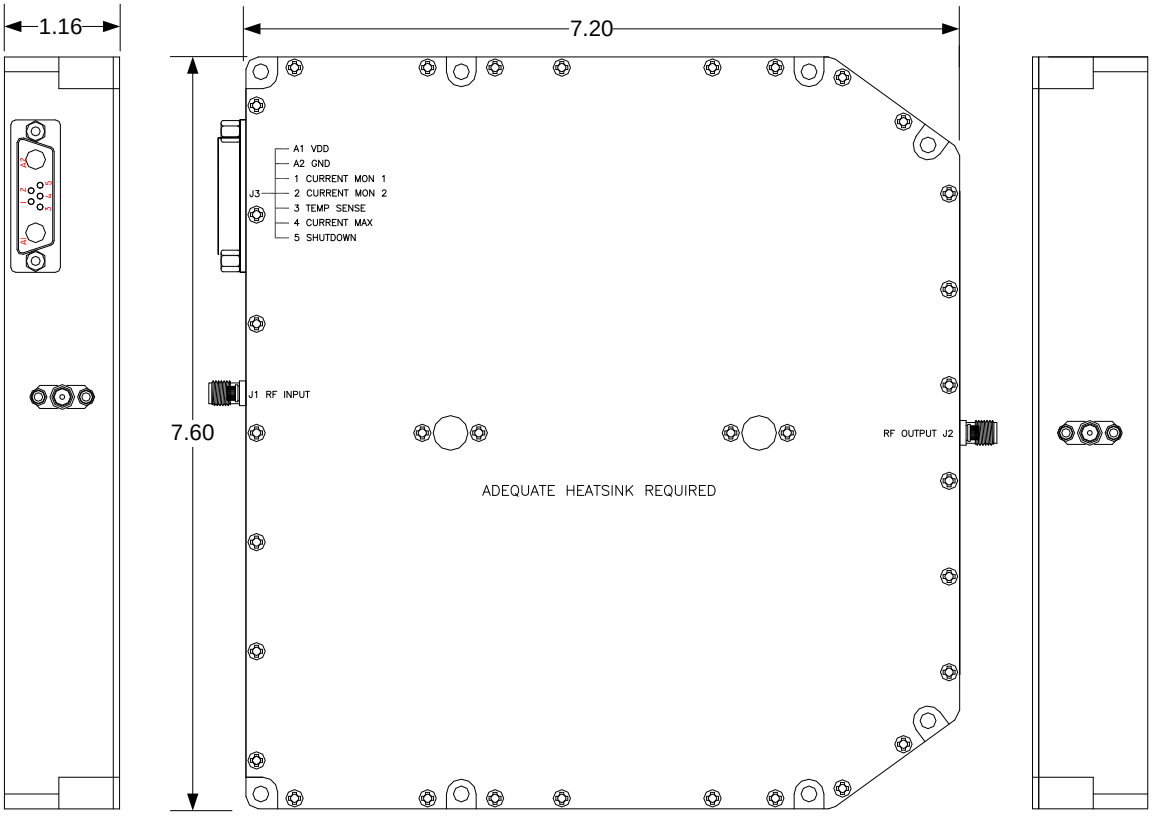
LIMITS

Input RF drive level without damage	+35dBm	Max
Load VSWR @ P_{OUT} = 100W	∞ @ 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 – Hybrid, D-Sub 7-Pin, Male

Pin #	Description	Specification
A1	VDD	26.0-30.0V_{DC}
A2	GND	Ground
1	Current MON (1)	Analog voltage relative to module's 1ST halve of the current @ 25mV/100mA
2	Current MON (2)	Analog voltage relative to module's 2ND halve of the current @ 25mV/100mA
3	Temp Sense	Analog voltage relative to module's temperature @ 10mV/ ºC
4	Current Max	Factory use only
5	Shutdown	Amplifier Disable: TTL Logic High (5V) (*Internally Pulled-low*)

OUTLINE DRAWING



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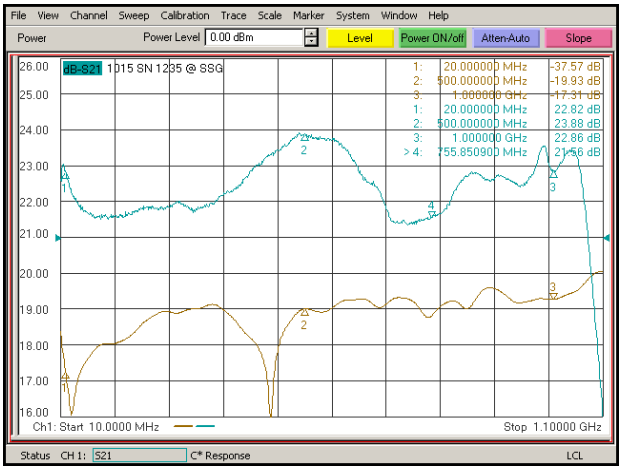
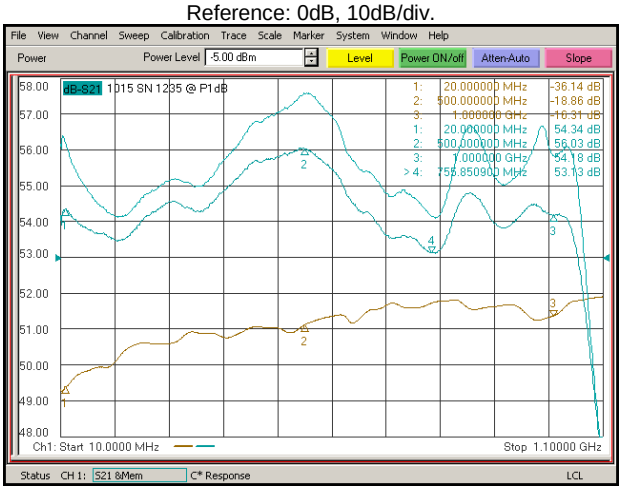
TYPICAL PERFORMANCE PLOTS

Plot 1 – Small Signal Gain
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Reference: 21dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plot 2 – Small Signal Gain and P_{1dB} with Driver
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -5dBm
Reference: 53dB, 1dB/div.
Bottom Curve: Input Return Loss of Driver
Reference: 0dB, 10dB/div.



Plot 3 – Small Signal Gain and P_{SAT} with Driver
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{SAT}, P_{IN} = -1.5dBm
Reference: 53dB, 1dB/div.
Bottom Curve: Input Return Loss of Driver
Reference: 0dB, 10dB/div.