EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

1166 – BBM2E4ANC

20 – 1000 MHz / 200 Watts

The BBM2E4ANC (SKU 1166) is suitable for broadband HF, VHF & UHF high power applications. This amplifier module utilizes push-pull DMOS and 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 design
- Instantaneous multi-Octave broadband
- Small form factor and lightweight
- Suitable for CW, AM, and FM (Consult factory for other modulation types)
- 50 ohm input/output impedance
- Built-in control, monitoring & protection circuits
- High reliability and ruggedness

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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	20		1000	MHz
Output Power CW	P_{SAT}	200			Watt
Output Power @ 1dB Gain Compression	P_{1dB}	150			Watt
Small Signal Gain	G_{ss}	26			dB
Input Power @ Rated P_{SAT}	P_{IN}		25		dBm
Small Signal Gain Flatness	ΔG			±2.0	dB
Input Return Loss	S_{11}			-10	dB
Third Order Intercept Point 2-Tone @ 44dBm/Tone, 100kHz Spacing	IP3		+59		dBm
Harmonics @ P_{OUT} = 150W	$2^{nd}/3^{rd}$		-30/-15		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V_{DD}	26	28	30	Volt
Current Consumption @ P_{OUT} = 200W	I_{DD}			40	Amp

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions	7.2 x 7.6 x 1.2	Inch
Weight	4.0	Pound
RF Connectors Input/Output	Input: Type-SMA, Female Output: Type-N, 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	-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 1	VI/SH		Airborne		

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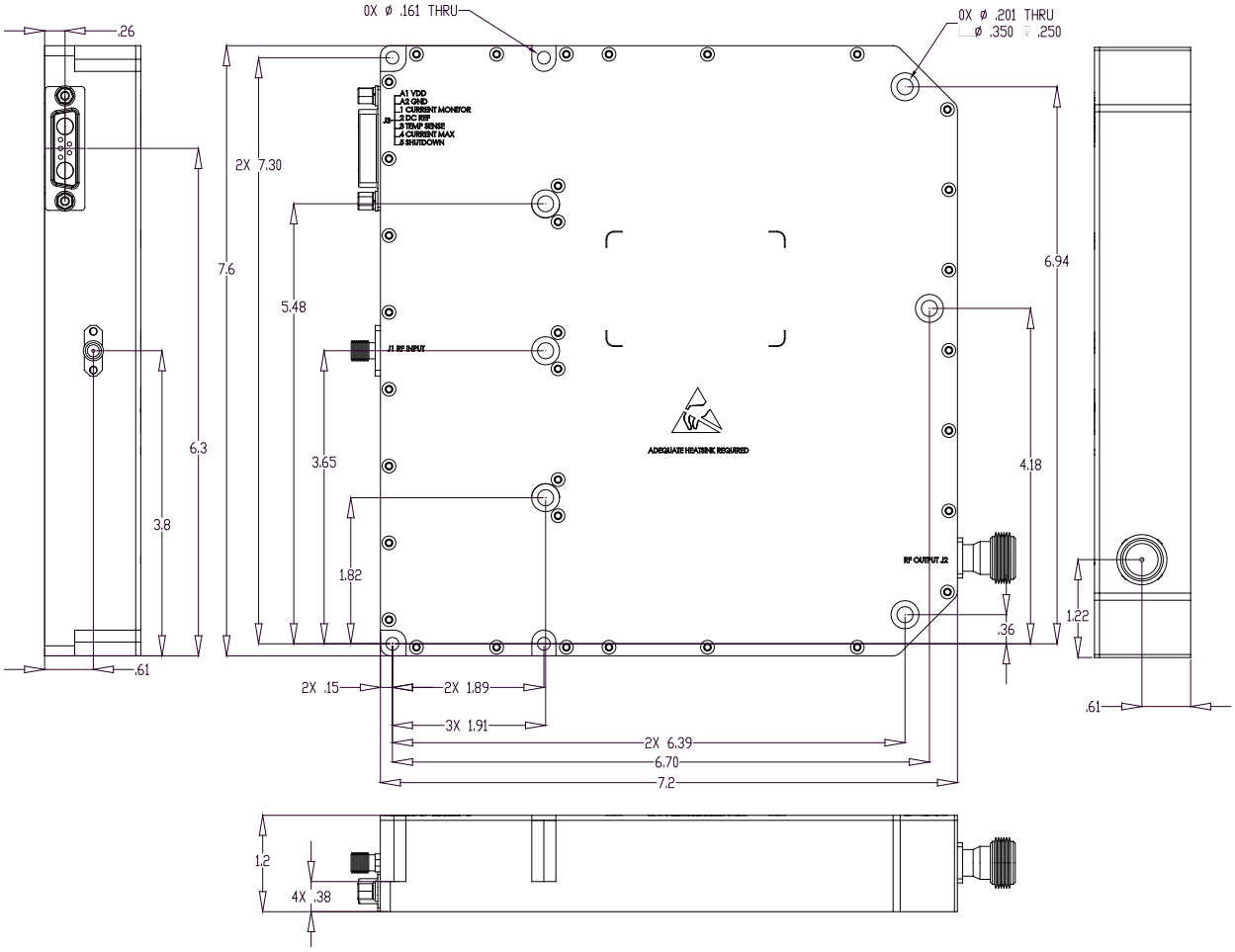
LIMITS

Input RF drive level without damage	30	dBm
Load VSWR @ P_{OUT} = 150W	5:1 @ all load phase & amplitude	-
Thermal Overload	85°C Graceful Degradation	Max

DC INTERFACE CONNECTOR – Hybrid D-Sub 7-Pin, Male

Pin #	Description	Specifications
A1	VDD	+26.0-30.0V_{DC}
A2	GND	Ground
1	Current Monitor	Continuous Analog 0-5 V_{DC} levels
2	DC Ref	+7.5V_{DC} ±0.5V (factory use
3	Temp Sense	Analog voltage relative to Module's Temperature @ 10mV/°C
4	Current Max	+2.0V_{DC} ±0.3V (factory use)
5	Shutdown	Amplifier Disable: TTL Logic High (5V) (*Internally Pulled-Low*)

OUTLINE DRAWING



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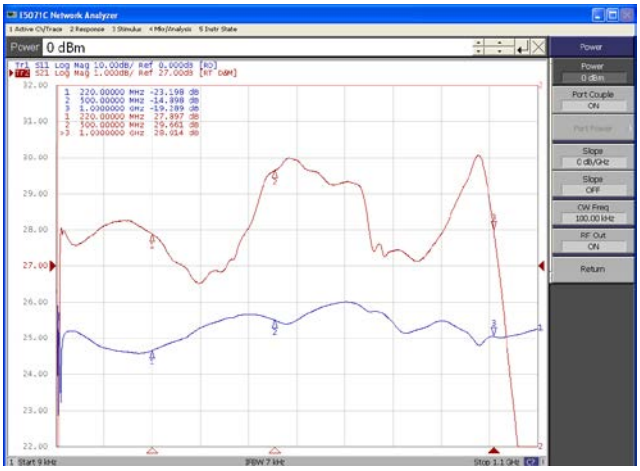
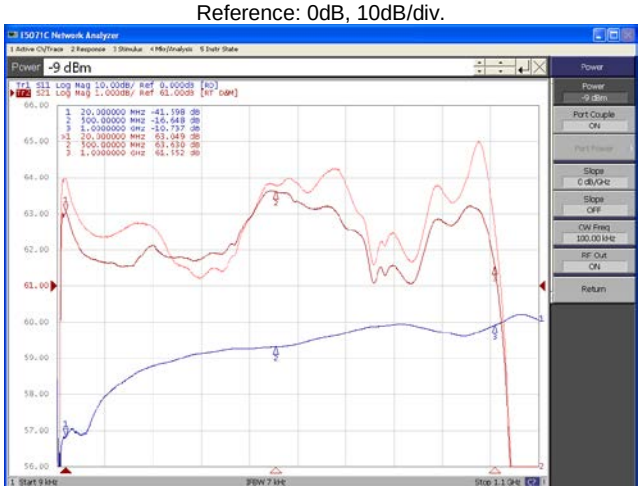
TYPICAL PERFORMANCE PLOTS

Plot 1 – Small Signal Gain
Top Curve: Small Signal Gain @ P_{IN} = 0dBm
Reference: 27dB, 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} = -9.0dBm
Reference: 61dB, 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} = -8dBm
Reference: 61dB, 1dB/div.
Bottom Curve: Input Return Loss of Driver
Reference: 0dB, 10dB/div.