EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

1100 – BBM2E4AJP

20 – 1000 MHz, 80 Watts

The BBM2E4AJP (SKU 1100) is suitable for ultra broadband or band specific high power linear applications. This amplifier utilizes silicon LDMOS power devices that provide high gain, wide dynamic range, low distortion 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
- Extremely wide instantaneous bandwidth
- Compact and lightweight
- Built-in control, monitoring and protection circuits
- Suitable for all modulation schemes
- 50 ohm input and output impedance
- Highly rugged and reliable

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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	20		1000	MHz
Power Output (CW)	P_{SAT}	80			Watt
Output Power @ 1 dB Gain Compression Point	P_{1dB}	50			Watt
Small Signal Gain	G_{1dB}	49	52	55	dB
Input Power for Rated P_{out}	P_{IN}		0		dBm
Small Signal Gain Flatness	ΔG			±1.5	dB
Gain Adjustment Range	VVA	25	30		dB
Input Return Loss	S11			-10	dB
Noise Figure @ Max Gain	NF			10	dB
Third Order Intercept Point 2-Tones @ 43 dBm/Tone, Δ = 0.1 – 30MHz	IP3		+53		dBm
Harmonics @ rated P_{1dB}	2^{nd} / 3^{rd}		-40 / -20		dBc
Spurious Signals	Spur			-60	dBc
Operating Voltage	VDC	26	28	30	Volt
Supply Current @ 80 Watts RF Output	I_{DD}			9.5	Amp
Quiescent Current	I_{DQ}		6.2		Amp
Switching Speed (10% to 90%)	T_{SW}		2	5	µs

MECHANICAL SPECIFICATIONS

Parameter	Value	Units	Limits
Dimensions	6.4 x 3.4 x 1.1	Inch	Max
Weight	1.0	lb.	Max
RF Connectors, Input/Output	SMA female		
DC Connectors	Dsub, 9-Pins, Male		
Cooling	External Heatsink		

ENVIRONMENTAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	Tc	-40		+85	°C
Storage Temperature	Tstg	-40		+85	°C
Relative humidity (non-condensing)	RH			95	%
Altitude (MIL-STD-810F Method 500.4)	ALT	10,000		40,000	Feet
Shock / Vibration (MIL-STD-810F Method 516.5)	SH / VI		Airborne		

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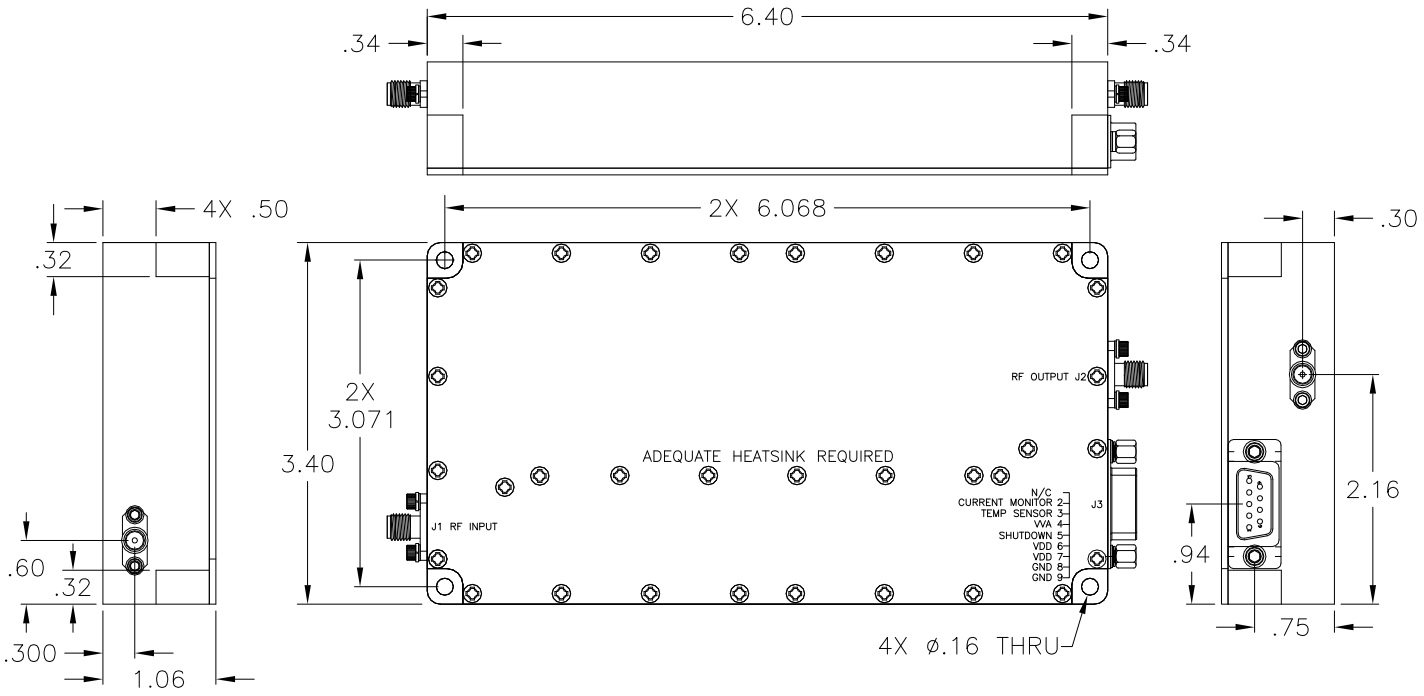
PROTECTIONS

Input Overdrive	+10 dBm	Max
Load VSWR @ P_{out} = 80 W	∞:1 @ all load phase and amplitude	Nom
Thermal Overload	Graceful degradation	Max

INTERFACE CONNECTOR – Dsub, 9-Pin

Pin #	Description	Specifications
1	Reserved	N/C
2	Current Consumption Monitor	Analog voltage relative to I_D @ 50 mV/100 mA
3	Temperature Monitor	Analog voltage relative to module's temperature @ 10 mV/°C
4	VVA	Continuous Analog 0-5 VDC levels Minimum Gain: 5 VDC Maximum Gain: 0 VDC
5	Shutdown	Amplifier Enable: TTL "Low" (Logic 0) or Open Amplifier Disable: TTL "High" (Logic 1)
6, 7	VDD	+28 VDC ± 2 VDC
8, 9	GND	Ground

OUTLINE DRAWING



Features:

a. Fast-switching Shutdown function
b. Reverse polarity protection
c. Over-temperature protection
d. Temperature indication
e. High-temp graceful degradation
f. Current limit protection
g. Current consumption indication

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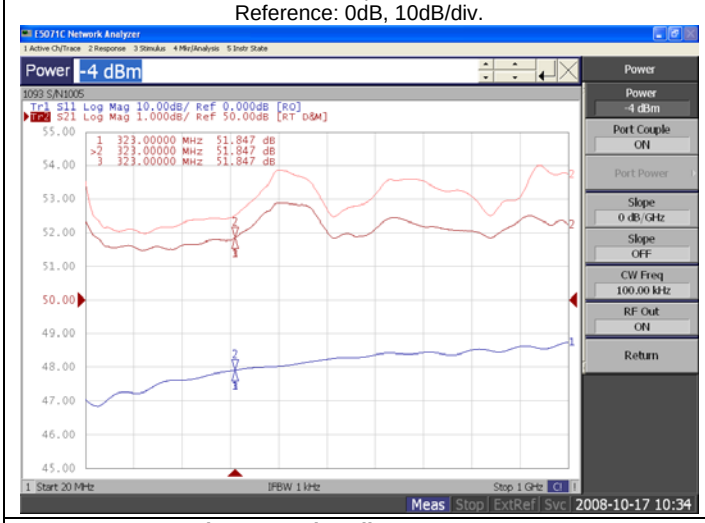
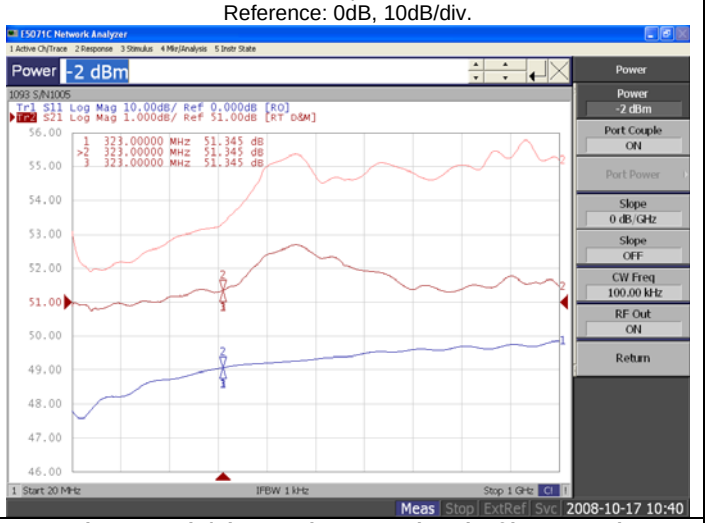
TYPICAL PERFORMANCE PLOTS

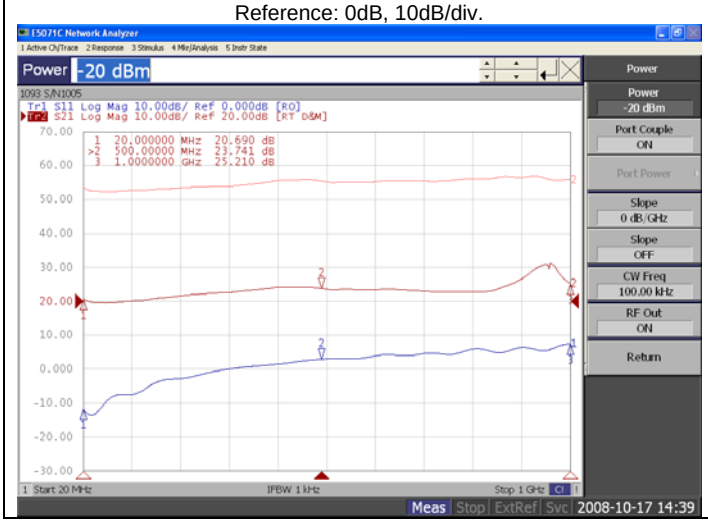
Plots 1 - Small Signal and P_{1dB} Gain
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -4.0dBm
Reference: 50dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plot 2 - Small Signal and P_{SAT}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Bottom Curve: P_{SAT} @ P_{IN} = -2.0dBm
Reference: 51dB, 1dB/div.
Middle Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plots 3 – Gain Adjustment Range
Top Curve: Max Gain @ P_{IN} = -20dBm
Middle Curve: Min Gain @ P_{IN} = -20.0dBm
Reference: 20dB, 10dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plots 4 - Gain/Phase Delta, P_{IN} = 0dBm (Ref in memory)
Top Curves: Power Gain vs. Ref. Unit
Reference: 47dB, 1dB/div.
Bottom Curve: Phase vs. Ref. Unit
Reference: -110deg, 10deg/div.