

Solid State Broadband High Power Amplifier

1133 – BBM2E4AEM
20 – 1000 MHz, 25 Watts

The BBM2E4AEM (SKU 1133) is suitable for ultra broadband or band specific high power linear applications. This amplifier utilizes advanced high power GaN 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 linear design
- Instantaneous ultra broadband
- Small and lightweight
- Suitable for CW, AM and FM (for other modulation types, consult factory).
- 50 ohm input/output impedance
- High reliability and ruggedness
- Built-in control, monitoring and protection circuits

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}	25			Watt
Output Power @ 1 dB Gain Compression Point	P _{1dB}		5		Watt
Power Gain @ 1 dB Gain Compression Point	G _{1dB}	44			dB
Input Power for Rated P _{OUT}	P _{IN}		0		dBm
Small Signal Gain Flatness	ΔG		±1.5	±2.0	dB
Gain Adjustment Range	VVA	25	30		dB
Input Return Loss	S ₁₁			-10	dB
Noise Figure @ Minimum Attenuation	NF			10	dB
Third Order Intercept Point 2-Tones @ 2 watts/tone	IP3		+52		dBm
Harmonics @ P _{1dB} Gain Compression Point	H		-20		dBc
Spurious Signals	Spur			-60	dBc
Operating Voltage	VDC	26	28	30	Volt
Supply Current @ Nominal P _{OUT}	I _{DD}			3.5	Amp
Standby Current Consumption	P _{DQ}		100		mA
Switching Time, 1 kHz TTL, P _{IN} = -3 dBm	T _{ON} /T _{OFF}			5	μs

MECHANICAL SPECIFICATIONS

Parameter	Value	Units	Limits
Dimensions	6.0 x 3.0 x 1.1	Inch	Max
Weight	1.0	lb.	Max
RF Connectors Input/Output	SMA female/SMA female		
DC Connectors	Dsub, 9 Pin, Male		
Cooling	External Heatsink		

ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	T _c	-20		+75	°C
Storage Temperature	T _{stg}	-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		

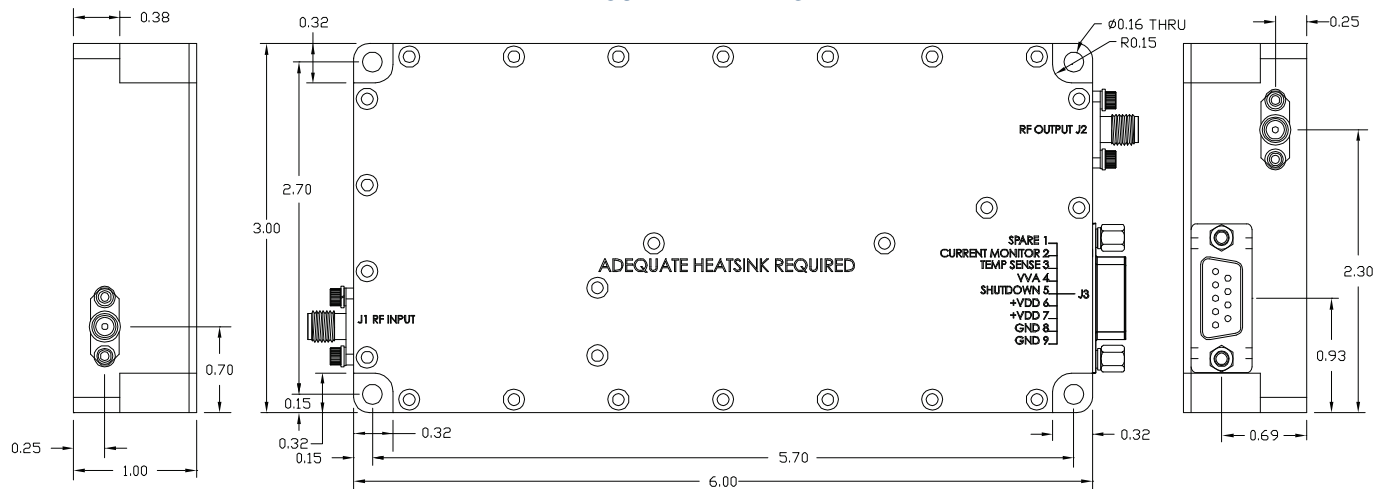
Solid State Broadband High Power Amplifier

1133 – BBM2E4AEM
20 – 1000 MHz, 25 Watts
PROTECTIONS

Input Overdrive	+6 dBm	Max
Load VSWR @ rated P _{1dB}	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	Nom
Thermal Overload	Graceful degradation	Max

INTERFACE CONNECTOR –Dsub, 9 Pin

Pin #	Description	Specifications
1	N/C	Reserved
2	Current Consumption Monitor	Analog voltage relative to I _D @ 50 mV/100 mA
3	Temperature Sense	Analog voltage relative to module temperature @ 10 mV/°C
4	VVA	Max Gain = 0 VDC Min Gain = 5 VDC
5	Shutdown	Amplifier Enable: TTL “Low” or Open Amplifier Disable: TTL “High”
6	VDD	+28 VDC ± 2 VDC
67	VDD	+28 VDC ± 2 VDC
8	GND	Ground
9	GND	Ground

OUTLINE DRAWING

Features:

- Built-in gain adjustment (VVA)
- Fast-switching mute function
- Reverse polarity protection
- Over-temperature protection
- Temperature indication
- Current limit protection
- Current consumption indicator

Solid State Broadband High Power Amplifier

1133 – BBM2E4AEM

20 – 1000 MHz, 25 Watts

TYPICAL PERFORMANCE PLOTS

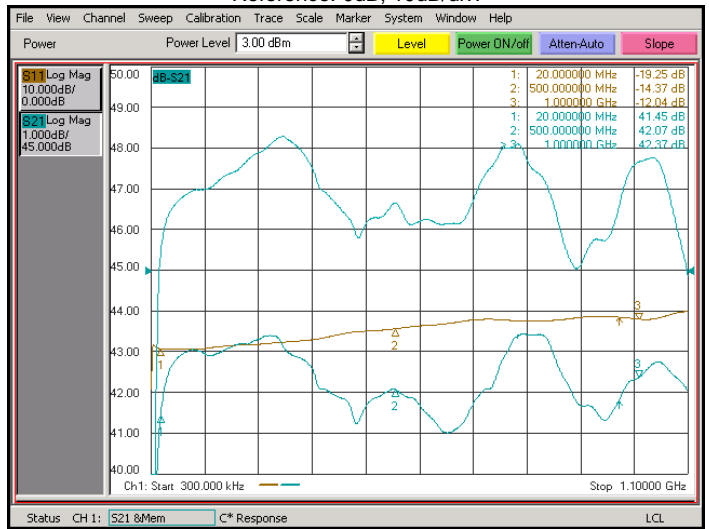
Plot 1

Top Curve Small Signal gain @ $P_{in} = -20\text{dBm}$
 Middle Curve: Power Gain, $P_{in} = -8.0\text{dBm}$ (Note 2)
 Reference: 45dB, 1dB/div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/div.



Plot 2

Top Curve: Small Signal gain @ $P_{in} = -20\text{dBm}$
 Middle Curve: Output Power @ $P_{in} = 3.0\text{dBm}$ (Note 2)
 Reference: 45dB, 1dB/div
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/div.



Plot 3

Top Curve Power Gain @ $P_{in} = -20\text{dBm}$, $VVA=0\text{V}$
 Middle Curve: Power Gain, $P_{in} = -20\text{dBm}$, $VVA=+5\text{V}$
 Reference: 20dB, 10dB/div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/div.

