EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

1112 - BBM1C3KCK | 1 – 520 MHz / 15 Watts

The BBM1C3KCK (SKU 1112) is suitable for broadband high power linear applications. This amplifier utilizes Silicon push-pull MOSFET 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 linear design
- Instantaneous ultra broadband
- Small and lightweight
- Suitable for CW, AM, and FM (for other modulation types contact 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	1		520	MHz
Power Output CW	P_{SAT}	13	20		Watt
Power Output @ 1 dB Gain Compression Point	P_{1dB}	10	12		Watt
Power Gain @ 1 dB Gain Compression Point	G_{1dB}	42			dB
Input Power for Rated Output	P_{IN}		0		dBm
Small Signal Gain Flatness	ΔG		±1.0	±1.5	dB
Gain Adjustment Range (VGC: 0 – 5 V_{DC})	VVA	25			dB
Input Return Loss	S_{11}			-10	dB
Noise Figure	NF		7	10	dB
2-Tones Third Order Intercept Point Pout = 27 dBm/Tone, Δ = 100 KHz	IP3		+49		dBm
Harmonics @ 1 dB Gain Compression Point	H		-25		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V_{DC}	26	28	30	Volt
Supply Current @ nominal P_{OUT}	I_{DD}		2.0	3.0	Amp

MECHANICAL SPECIFICATIONS

Parameter	Value	Units	Limits
Dimensions (excluding heatsink)	4.0 x 2.5 x 1.1	Inch	Max
Weight without HS / with HS	1.0 / 2.5	lb.	Max
RF Connectors In/Out	SMA female		
DC Connectors	Dsub, 9 Pins, Male		
Cooling	External Heatsink		

ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	Tc	0		+50	°C
Storage Temperature	Tstg	-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		

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PROTECTIONS

Input Overdrive	P_{OD}	+10 dBm	Max
Load VSWR	Ψ	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	Nom
Thermal Overload	T_{OD}	85°C shutdown	Max

INTERFACE CONNECTOR, D-Sub, 9-Pin

Pin #	Description	Specifications
1	N/C	Reserved
2	N/C	Reserved
3	Temperature Sense	Analog voltage relative to Module's Temperature @ 10 mV/°C
4	VVA	Continuous Analog 0-5 V_{DC} levels Maximum Gain: 0 V_{DC} Minimum Gain: 5 V_{DC}
5	Shutdown	Amplifier Enable: TTL "Low" or Open Amplifier Disable: TTL "High"
6	VDD	+28 ±2 V_{DC}
7	VDD	+28 ±2 V_{DC}
8	GND	Ground
9	GND	Ground

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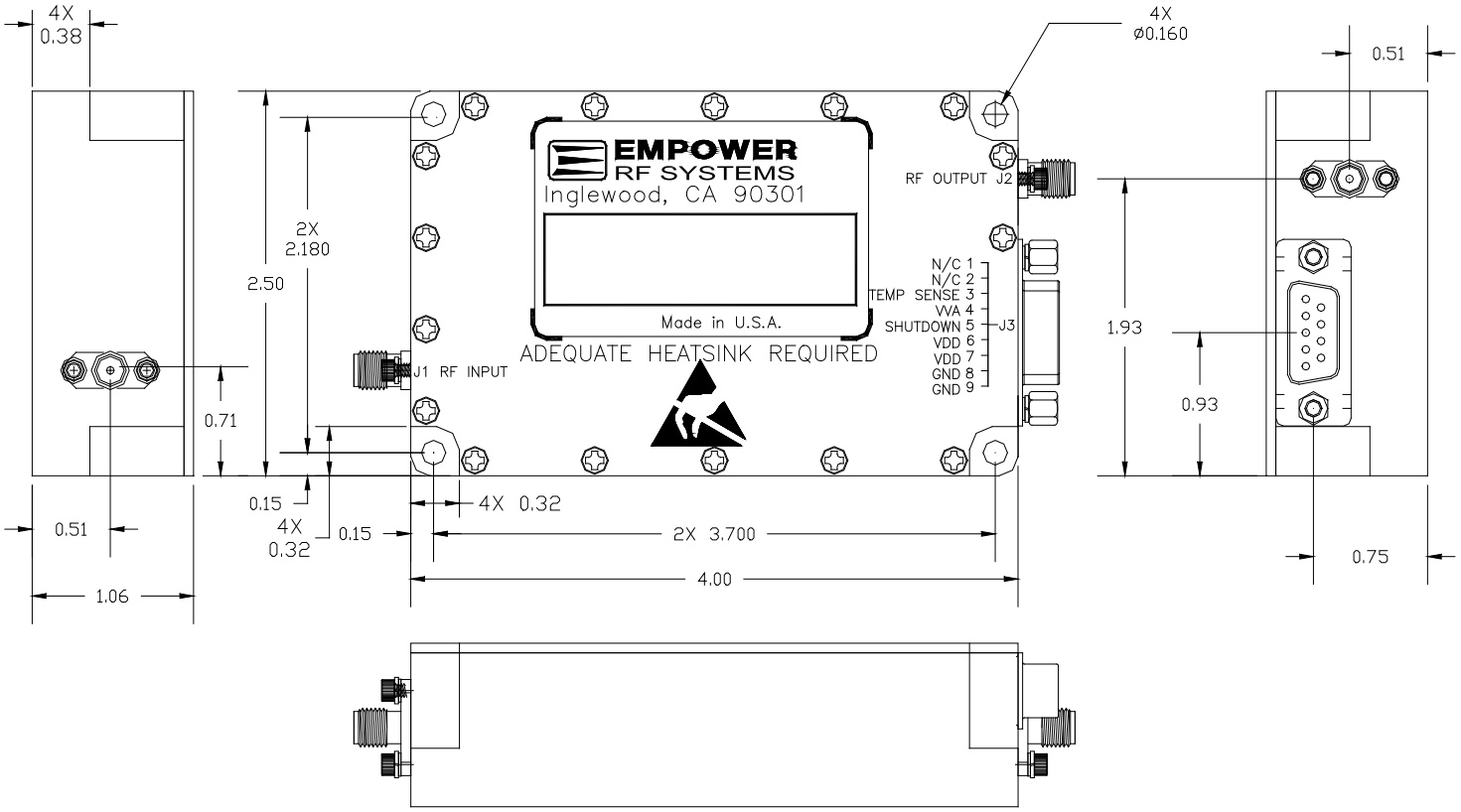
OUTLINE DRAWING



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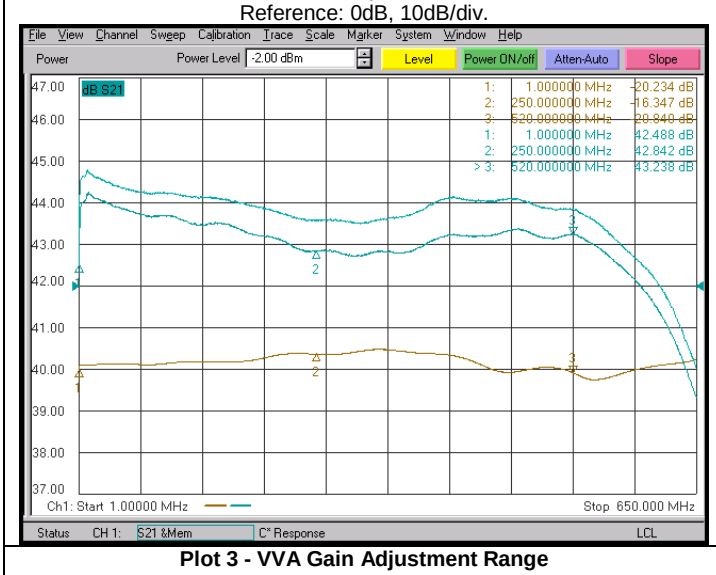
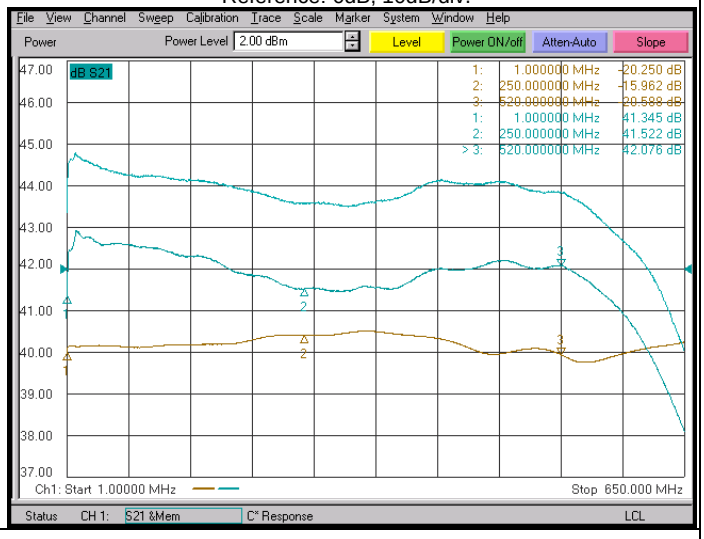
TYPICAL PERFORMANCE PLOTS

Plots 1 - Small Signal and P_{1dB} Gain
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -2.0dBm
Reference: 42dB, 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
Middle Curve: P_{SAT} @ P_{IN} = +2.0dBm
Reference: 42dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plot 3 - VVA Gain Adjustment Range
Top Curve: Max. Gain @ VVA = 0.0V, P_{IN} = -20dBm
Middle Curve: Min. Gain @ VVA = 5.0V
Reference: 22dB, 10dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.