EMPOWER RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

1057 - BBM1C3CKO

1 – 100 MHz / 100 Watts

The BBM1C3CKO (SKU 1057) is suitable for high power RF & VHF broadband or band specific linear applications. This amplifier utilizes 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 design
- Instantaneous ultra broadband
- Small and lightweight
- Suitable for CW, AM, and FM (Consult factory for other modulation types)
- 50 ohm input/output impedance
- High reliability and ruggedness
- Built-in Control and Monitoring functions

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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	1		100	MHz
Output Power CW	P_{SAT}	100			Watt
Output Power @ P_{1dB} Gain Compression	P_{1dB}	60			Watt
Power Gain @ P_{1dB}	G_{1dB}	50			dB
Input Power for Rated P_{SAT}	P_{IN}		0	3	dBm
Small Signal Gain Flatness	ΔG		±1.0	±1.5	dB
Gain Adjustment Range	VVA		25		dB
Input Return Loss	S_{11}			-10	dB
Noise Figure @ Max. Gain	NF		7	15	dB
Third Order Intercept Point 2-Tone @ 40dBm/Tone, 100kHz Spacing	IP3		+57		dBm
Harmonics @ P_{OUT} = 60W	H		-20		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V_{DD}	24	28	32	Volt
Current Consumption @ P_{OUT} = 100 W	I_{DD}			14	Amp

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions	6.6 x 5.8 x 1.0	Inch
Weight	2.0	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	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 1	VI/SH		Airborne		

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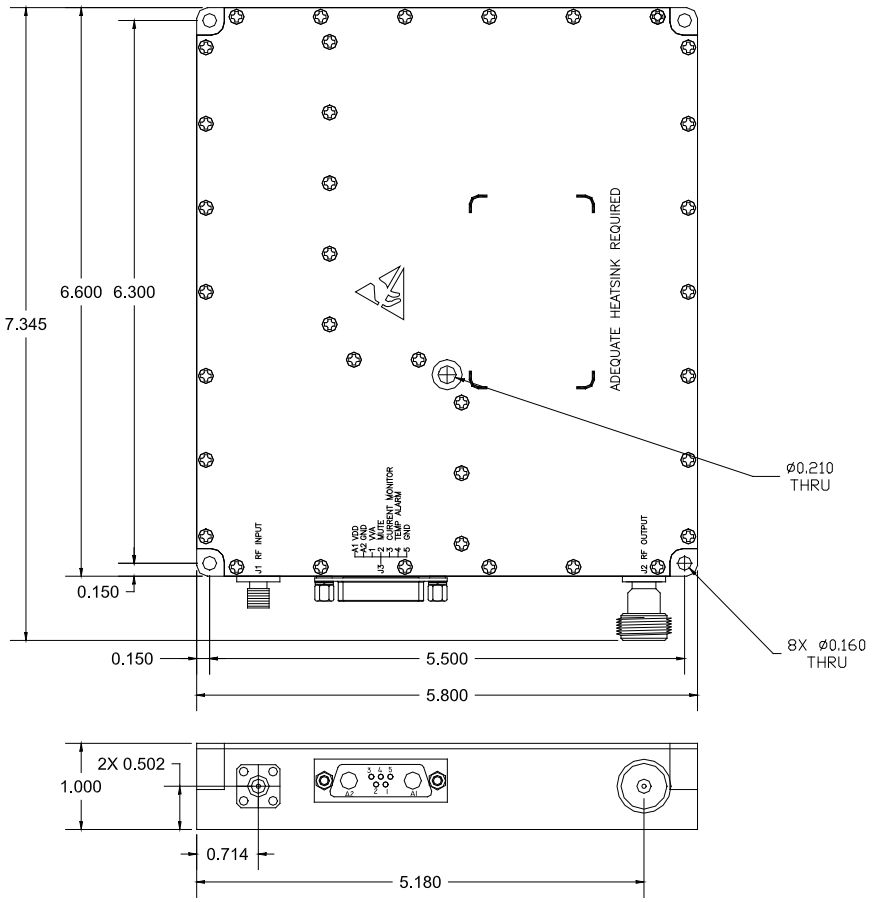
LIMITS

Input RF drive level without damage	+10 dBm	Max
Load VSWR @ P_{OUT} = 60W	∞ @ all 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	+24.0-32.0V_{DC}
A2	GND	Ground
1	VVA	Control voltage range 0-5V_{DC} Max Gain = 5.0$V_{DC,}$ Min Gain = 0V_{DC}
2	Mute	Amplifier Disable: TTL Logic Low (*Internally Pulled-high*)
3	Current Monitor	Analog voltage relative to I_{DD} @ 25mV/100mA
4	Temp Alarm	Temperature Fault: TTL Logic Low
5	GND	Ground

OUTLINE DRAWING



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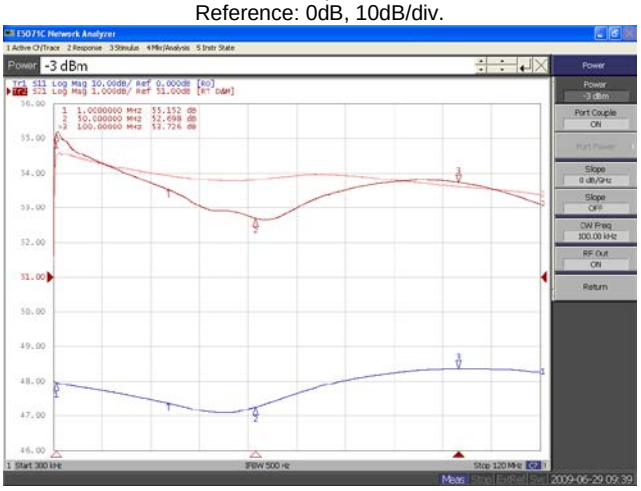
TYPICAL PERFORMANCE PLOTS

Plot 1 – Small Signal Gain and P_{1dB}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -3.0dBm
Reference: 51dB, 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} = -1dBm
Reference: 51dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.

Plot 3 – Gain Adjustment Range
Top Curve: Max. Gain @ VVA_{CTRL} = 5.0V, P_{IN} = -20dBm
Bottom Curve: Min. Gain @ VVA_{CTRL} = 0V, P_{IN} = -20dBm
Reference: 30dB, 10dB/div.
Middle Curve: Input Return Loss @ Minimum Gain
Reference: 0dB, 10dB/div.