EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

1131 - BBM5K8CGM

2500 – 6000 MHz / 35 Watts

The BBM5K8CGM (SKU 1131) is suitable for broadband mobile Jamming and band specific high power linear applications in the P/L/S frequency bands. This compact module utilizes high power advanced GaN devices that provide excellent power density, high efficiency, wide dynamic range and low distortions. 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
- Built-in control, monitoring and protection circuits
- Suitable for CW, AM and FM (for other modulation types, consult factory).
- 50 ohm input/output impedance
- High reliability and ruggedness

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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	2500		6000	MHz
Power Output CW	P_{SAT}	35	40		Watt
Output Power @ 1 dB Gain Compression Point	P_{1dB}		10		Watt
Small Signal Gain	G_{1dB}	46	48		dB
Input Power for Rated Pout	P_{IN}		0		dBm
Gain Flatness @ Rated Pout	ΔG		±1.0	±2.0	dB
Gain Adjustment Range	VVA	25			dB
Input Return Loss	S11			-10	dB
Noise Figure @ max gain	NF			10	dB
Third Order Intercept Point 2-Tones @ 39.5 dBm/Tone, Δ = 100 kHz	IP3		+50		dBm
Harmonics @ rated P1 dB Gain Compression Point	2^{nd} / 3^{rd}		-25 / -40		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V_{DC}	27	28	29	Volt
Current Consumption @ 35 W	I_{DD}		7.5	10	Amp
Quiescent Current	I_{DQ}		4.0	6.0	Amp
Switching Speed (10% to 90%)	T_{ON} / T_{OFF}			5.0	µs

MECHANICAL SPECIFICATIONS

Parameter	Value	Units	Limits
Dimensions	6.9 x 3.6 x 1.1	Inch	Max
Weight	2.0	lb.	Max
RF Connectors Input/Output	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	-20		+70	°C
Storage Temperature	Tstg	-40		+85	°C
Relative humidity (non-condensing)	RH			95	%
Altitude (MIL-STD-810F Method 500.4)	ALT			30,000	Feet
Shock & Vibration (MIL-STD-810F Method 516.5)	SH / VI		Airborne		

316 W. Florence Ave.
Inglewood, CA 90301

Ph. 1 (310) 412-8100
Fax. 1 (310) 412-9232

www.EmpowerRF.com

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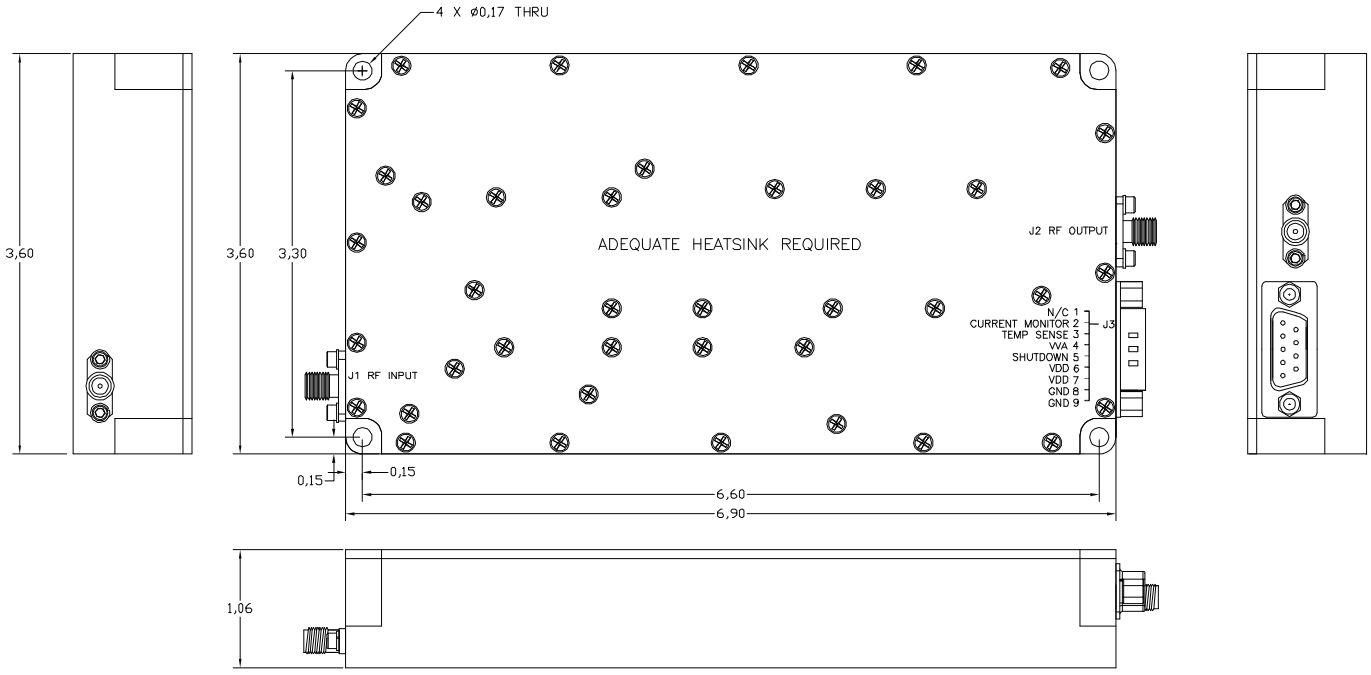
PROTECTIONS

Input Overdrive	+10 dBm	Max
Load VSWR @ rated Pout	∞ @ 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 Monitor	Analog voltage relative to Module's Temperature @ 10 mV/°C
4	VVA	Controlled via Analog 0~5 VDC 0Vdc = Minimum Attenuation 5Vdc = Maximum Attenuation
5	Shutdown	Amplifier Enable: TTL "Low" (Logic 0) or Open Amplifier Disable: TTL "High" (Logic 1)
6	VDD	+28 VDC ± 1 VDC
7	VDD	+28 VDC ± 1 VDC
8	GND	Ground
9	GND	Ground

OUTLINE DRAWING



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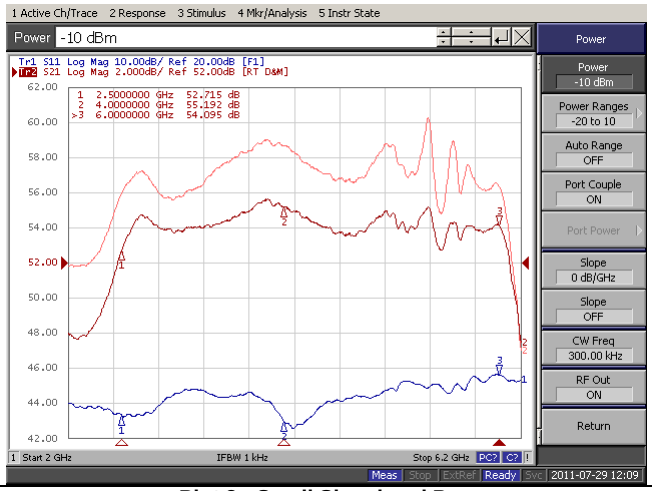
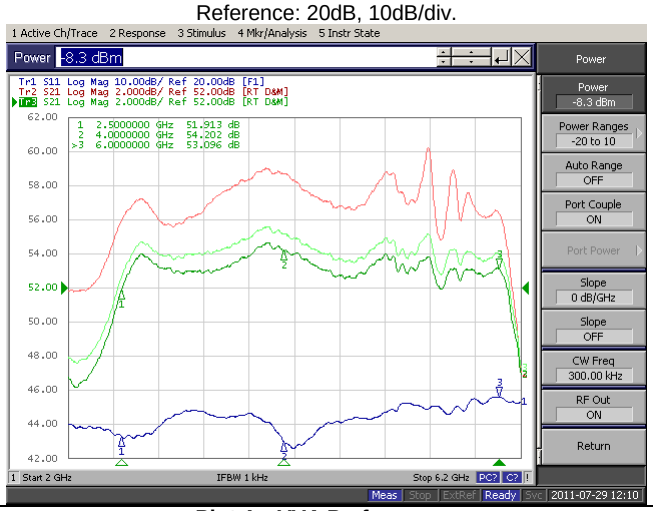
TYPICAL PERFORMANCE PLOTS

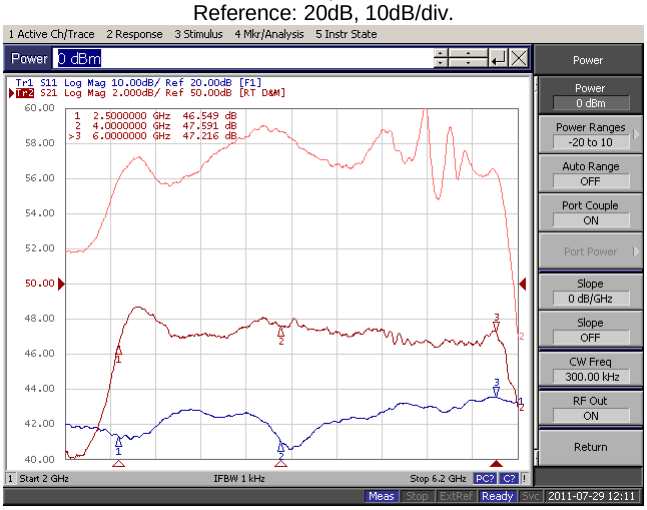
Plots 1 - Small Signals
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Small Signal Gain @ P_{IN} = -10dBm
Reference: 52dB, 2dB/div.
Bottom Curve: Input Return Loss
Reference: 20dB, 10dB/div.



Plot 2 - Small Signal and P_{1dB} Gain
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
2nd Curve: Power Gain(Ref Pin=-20dBm) @ P_{IN} = -10.0dBm
3rd Curve: Power Gain(Ref Pin=-10dBm) @ P_{1dB}, P_{IN} = -8.3dBm
Reference: 52dB, 2dB/div.
Bottom Curve: Input Return Loss
Reference: 20dB, 10dB/div.



Plot 3 - Small Signal and P_{SAT}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: P_{SAT} @ P_{IN} = -0.0dBm **(Note 2)**
Reference: 52dB, 2dB/div.
Bottom Curve: Input Return Loss
Reference: 20dB, 10dB/div.



Plot 4 – VVA Performance