EMPOWER RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

2129 - BBS3K5KHM | 500 – 2500 MHz / 50 Watts

The BBS3K5KHM (SKU 2129) is suitable for broadband mobile Jamming and band specific high power linear applications in the P/L/S frequency bands. This amplifier 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.

Shown with Option Package 05

- Solid-state Class AB linear 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, monitoring and protection circuits
- Rack Mount and Bench Top models both available with identical electrical specifications.

ELECTRICAL SPECIFICATIONS @ $120V_{AC}$, 25°C, 50 Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	500		2500	MHz
Power Output CW	P_{SAT}	50			Watt
Output Power @ 1dB Gain Compression	P_{1dB}		20		Watt
Small Signal Gain	G_{SS}	46	48		dB
Input Power for Rated P_{SAT}	P_{IN}		0	4	dBm
Gain Flatness @ Rated P_{SAT}	ΔG_P			±1.5	dB
Input Return Loss	S_{11}			-10	dB
Noise Figure	NF			10	dB
Third Order Intercept Point 2-Tone @ 33dBm/Tone, 100kHz Spacing	IP3		+48		dBm
Harmonics @ P_{OUT} = 20W	H		-20		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V_{AC}	100		240	Volt
Power Consumption @ P_{OUT} = 50W CW	P_D		250		Watt
Switching Time @ 1kHz TTL, P_{IN} = 0dBm	T_{ON}/T_{OFF}			2.0	uSec

MECHANICAL SPECIFICATIONS (Rack Mount Unit)

Parameter	Value	Units	Limits
Dimensions	19 x 3.5 x 21.5	Inch	Max
Weight	25	lb.	Max
RF Connectors Input/Output	Type-N, Female		
Cooling	Built-in internal forced air cooling system		

ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Ambient Temperature	T_C	0		+50	°C
Storage 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 I	SH / VI		Airborne		

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LIMITS

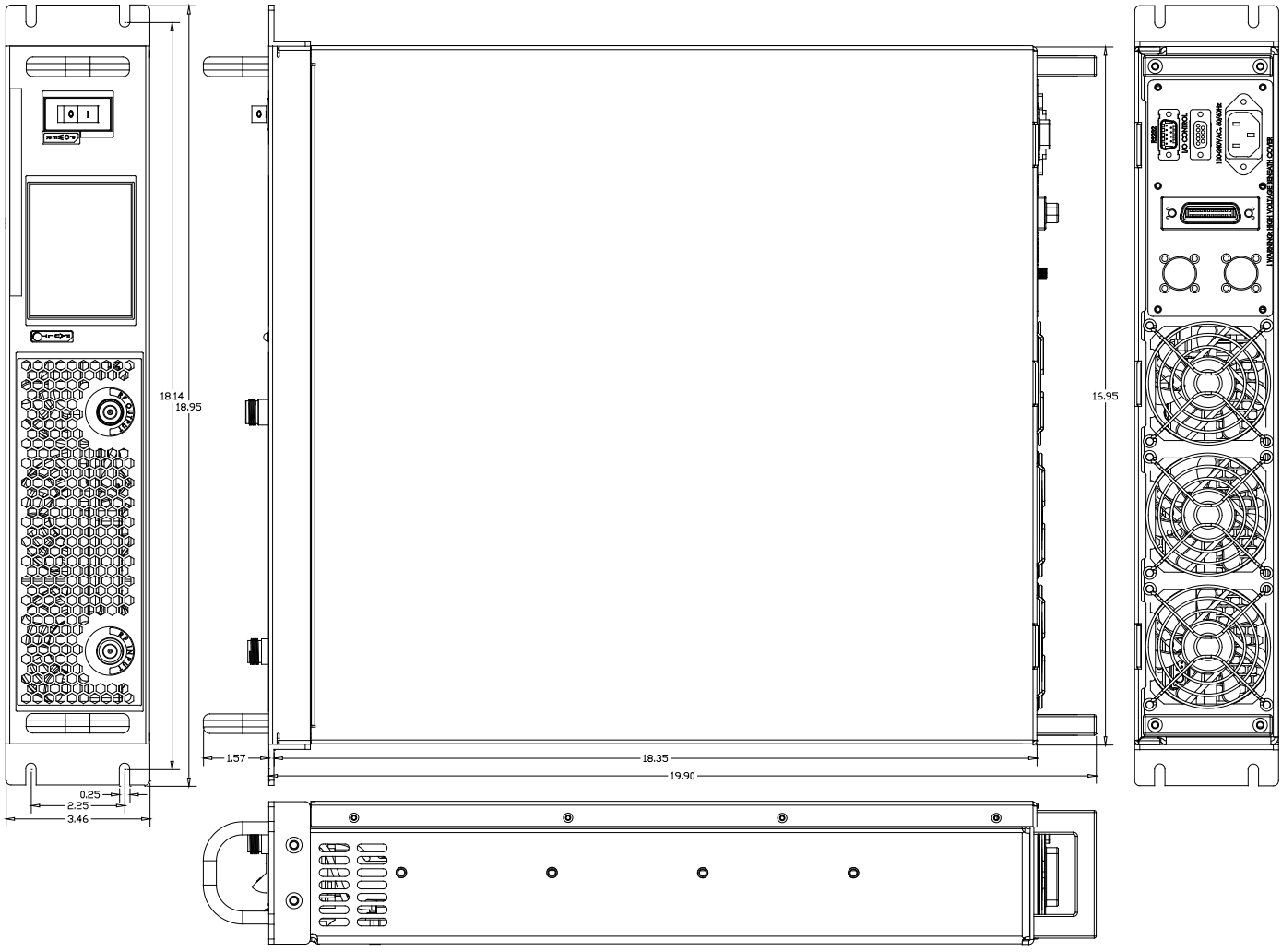
Input RF level without damage	+10 dBm	Max
Load VSWR @ P_{OUT} = 50W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	-
Thermal Overload	85°C Shutdown	Max

AVAILABLE OPTIONS (Refer to www.empowerrfr.com for detailed options list)

Option	Number	Description	Price
FGA	**061**	Front panel manual gain adjustment 10 turns	Standard
LCD	**062**	Touchscreen Digital Display, including Fwd/Rev Power indication (dB or Watt scale), Gain Adjustment, ALC Fast/Slow, On/Off, Standby mode, Fault indication, Rear panel HPIB/GPIB IEEE-488.2 and Half-duplex RS-232 or Full Duplex RS-422 remote interface. ***Note:* Output Power is lowered by 0.5 – 0.75 dB with this option.**	Call
FCN	**051**	Front Panel Type-N, Female	N/C
RCN	**052**	Rear Panel Type-N, Female	N/C

Available Options Packages: 01, 02, 03, 04, 05, 06

RACK MOUNT OUTLINE DRAWING SHOWN WITH OPTION PACKAGE 05



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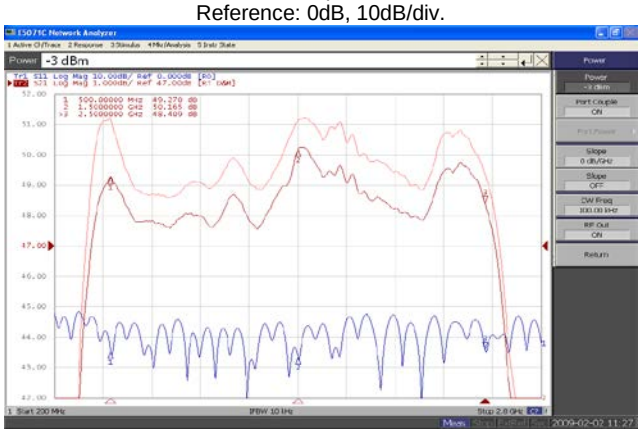
I/O INTERFACE CONNECTOR – D-Sub, 9 Pin, Female

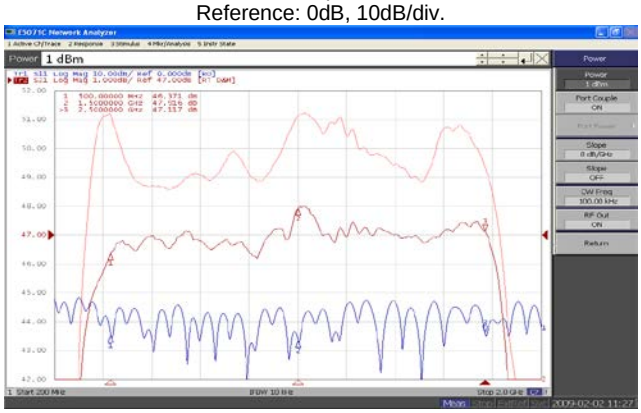
Pin #	Description	Specifications	Options FGA	Options LCD
1	Forward Test Point	Analog Voltage 0-5 V relative to Forward Power Level ***Not Applicable on Opt 01 & 02***		√
2	Reverse Test Point	Analog Voltage 0-5 V relative to Reverse Power Level ***Not Applicable on Opt 01 & 02***		√
3	5V Test Point	+5.0V_{DC} ±0.2V	√	√
4	VVA Test Point	VVA Gain Control: 5.6V_{DC} ±0.2V	√	
5	EXT Shutdown	Amplifier Disable: TTL Logic High (5V) (*Internally Pulled-Low*)	√	√
6	12V Test Point	Output +12.0V_{DC} ±0.5V	√	√
7	P/S Test Point	Power Supply Output Voltage 26.0 – 30.0V_{DC}	√	√
8	GND	Ground	√	√
9	GND	Ground	√	√

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: 47dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plot 2 – Small Signal Gain and P_{SAT}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: P_{SAT} @ P_{IN} = 1.0dBm
Reference: 47dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plot 3 – Gain Adjustment Range
Top Curve: Maximum Gain @ P_{IN} = -20dBm
Middle Curve: VVA @ Minimum Gain
Reference: 20dB, 10dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.