

Solid State Broadband High Power Amplifier

2129 - BBS3K5KHM
500 – 2500 MHz / 50 Watts

The BBS3K5KHM (2129) is suitable for broadband mobile Jamming and band specific high power 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.



SKU#: 2129CLFAAXLXX

- 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, monitoring and protection circuits

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

Parameter	Value	Unit
Dimensions (Rack Mount / Bench Top)	19 x 3.5 x 21.5 / 8.5 x 3.5 x 16.0)	Inch
Weight	25/20	Pound
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 _A	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 I	SH / VI		Airborne		

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LIMITS

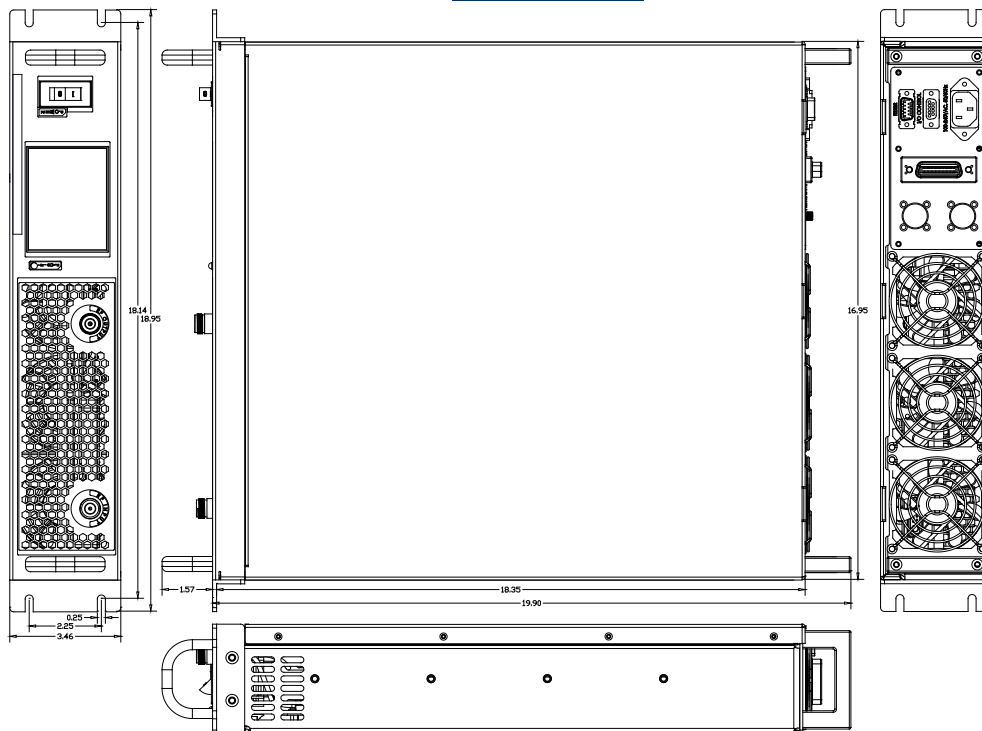
Input RF level without damage	+10 dBm	Max
Load VSWR @ P _{OUT} = 50W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	-
Thermal Overload	85°C Shutdown	Max

AVAILABLE OPTIONS

SKU #	Description	LCD Touchscreen
2129CLFAAXLXX	LCD controller, Front RF connectors 100-240VAC, 50/60Hz.	Touchscreen Digital Display, including FWD/REV Power indication (dBm or Watt scale), Gain Adjustment, ALC Fast/Slow, On/Off, Standby mode, Fault indication, Rear panel GPIB/HPIB IEEE-488.2 and Half Duplex RS232.
2129AFFAAXXXX Optional	Bench Top, FGA (Front Gain Adjust) Front RF Connectors, 100-240VAC, 50/60Hz Rack Slides (Call for price)	

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

Pin #	Description	Specifications	Options	
			FGA	LCD
1	Forward Test Point	Analog Voltage 0-5 V relative to Forward Power Level		√
2	Reverse Test Point	Analog Voltage 0-5 V relative to Reverse Power Level		√
3	5V Test Point	+5.0V _{DC} ±0.2V	√	√
4	VVA Test Point	+5.6V _{DC} ±0.2V	√	
5	EXT Shutdown	Amplifier Disable: TTL Logic High (5V) <i>(Internally Pulled-Low)</i>	√	√
6	12V Test Point	+12.0V _{DC} ±0.5V	√	√
7	P/S Test Point	+26.0-30.0V _{DC}	√	√
8&9	GND	Ground	√	√

OUTLINE DRAWING SHOWN
SKU #: [2129CLFAAXLXX](#)


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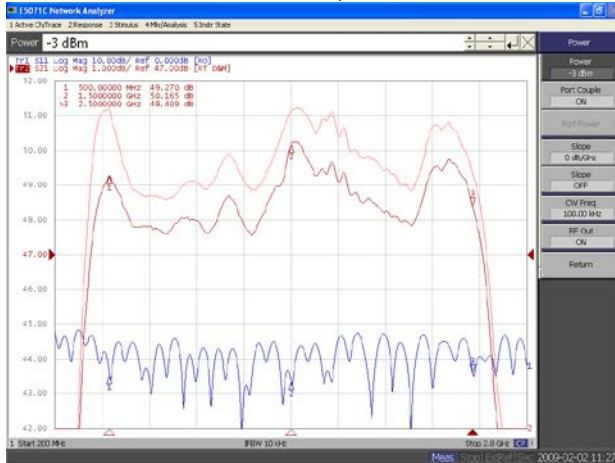
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TYPICAL PERFORMANCE PLOTS

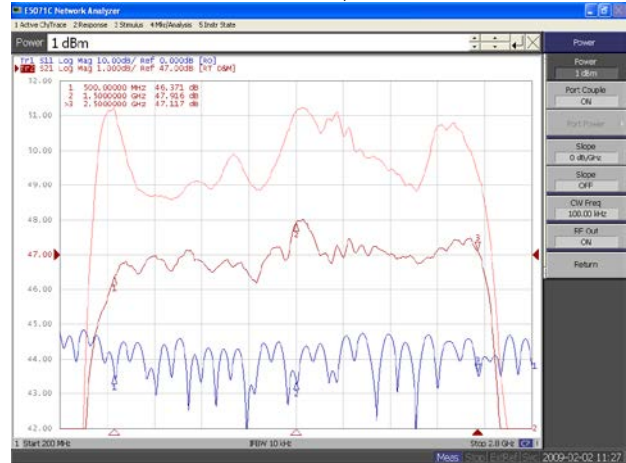
Plot 1 – Small Signal Gain and P_{1dB}

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

