EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

2132 - BBS3K5KEL

500 – 2500 MHz / 25 Watts

The BBS3K5KEL (2132) 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#: 2132CFFAAXLXX

- Solid-state class AB design
- Instantaneous ultra broadband
- Small form factor 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
Output Power CW	P_{SAT}	25			Watt
Output Power @ 1dB Gain Compression	P_{1dB}		20		Watt
Power Gain @ P_{1dB}	G_{1dB}	44	46		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 @ maximum gain	NF			14	dB
Third Order Intercept Point 2-Tone @ 33dBm/Tone, 100kHz Spacing	IP3		+47		dBm
Harmonics @ P_{OUT} = 20W	H		-20		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (1-phase)	V_{AC}	100		240	Volt
Power Consumption @ P_{OUT} = 25W	P_D		120	165	Watt
Switching Time, 1kHz TTL, P_{IN} = 0 dBm	T_{ON}/T_{OFF}			2.0	uSec

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions	19 x 3.5 x 18.5	Inch
Weight	20	Pound
RF Connectors Input/Output	Type-N, Female	
Cooling	Built-in 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 w/o condensation	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	VI/SH		Airborne		

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LIMITS

Input RF drive level without damage	+10 dBm	Max
Load VSWR @ P_{OUT} = 25W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	-
Thermal Overload	85°C Shutdown	Max

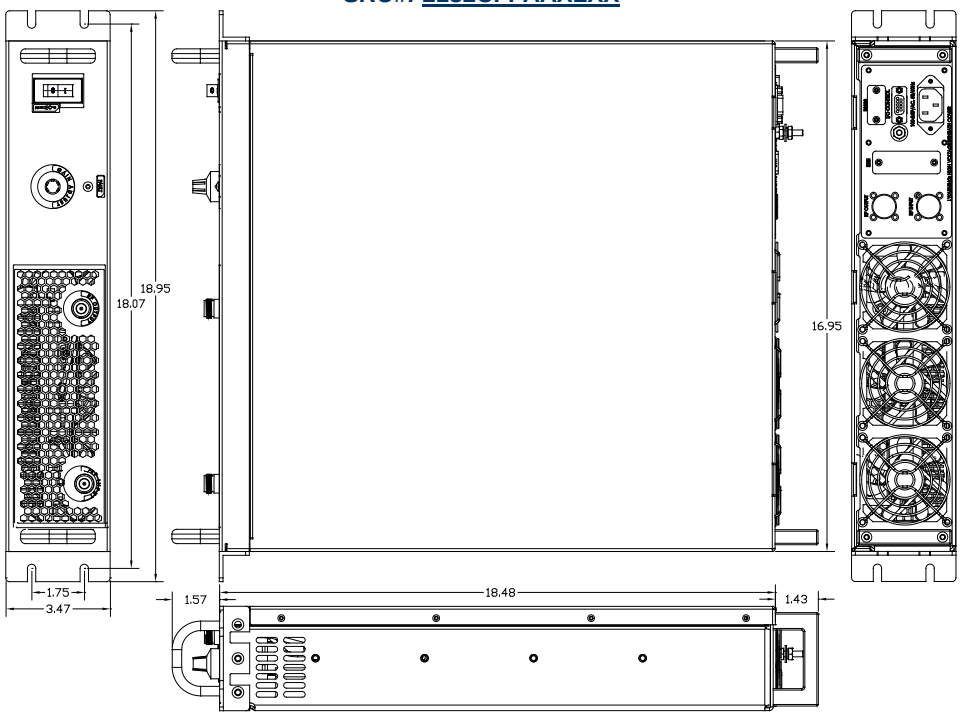
AVAILABLE OPTIONS

SKU #	Description	LCD Touchscreen
2132CLFAAALXX	LCD controller, Front RF connectors and rails 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. ***Note:*** ***(Output power is lowered by 0.5-0.75dB with this option)***
2132CFFAAXLXX	FGA (Front Gain Adjust) Front RF Connectors, 100-240VAC, 50/60Hz	
Optional	Rack Slides (Call for price)	

I/O CONNECTOR – D-Sub 9-Pin, Female

Pin #	Description	Specification	Option	
			FGA	LCD
1	Forward TP	Analog Voltage 0-5V_{DC} relative to Forward Power Level		√
2	Reverse TP	Analog Voltage 0-5V_{DC} relative to Reverse Power Level		√
3	5V TP	Test point: 5.0V_{DC} ±0.2V	√	√
4	VVA TP	Test point: 5.6V_{DC} ±0.2V	√	
5	EXT Shutdown	Disable: TTL Logic High (5V) (*Internally Pulled-Low*)	√	√
6	12V TP	Test point: 12.0V_{DC} ±0.5V	√	√
7	P/S TP	Test point: 26.0-30.0V_{DC}	√	√
8&9	GND	Ground	√	√

SYSTEM OUTLINE SHOWN
SKU#: **2132CFFAAXLXX**



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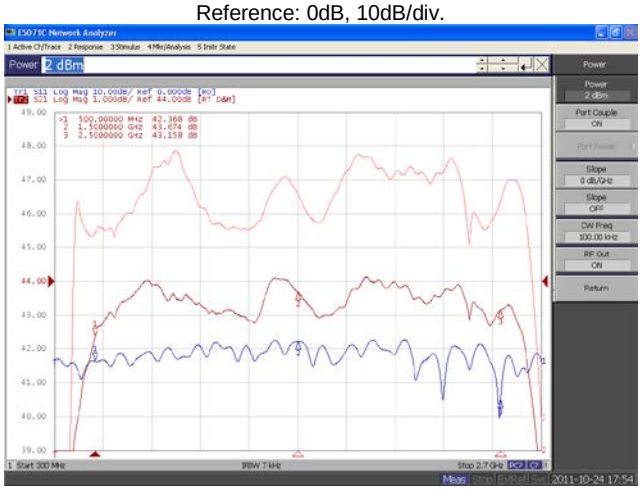
TYPICAL PERFORMANCE PLOTS

Plot 1 – Small Signal Gain and P_{1dB}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -2.0dBm
Reference: 44dB, 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: Power Gain @ P_{SAT}, P_{IN} = 2.0dBm
Reference: 44dB, 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: 31dB, 5dB/div.
Bottom Curve: Input Return Loss @ Minimum Gain
Reference: 0dB, 10dB/div.

Plot 4 – ALC Response
Top Curve: ALC @ 12W, P_{IN} = 0dBm
Bottom Curve: ALC @ 2.5W, P_{IN} = 0dBm
Reference: 38dB, 1dB/div.
Middle Curve: Input Return Loss
Reference: 0dB, 10dB/div