EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

2148 - BBS3K5KKO | 500 – 2500 MHz / 100 Watts

The BBS3K5KKO (2148) is suitable for broadband mobile Jamming and band specific high power applications in the P/L/S frequency bands. This amplifier utilizes advanced high power 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. The system includes a universal voltage, single phase, power supply and a built in forced air-cooling system. Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.

SKU#: 2148DERAAXLXX

- Solid-state Class AB design
- Instantaneous ultra broadband
- Suitable for CW, AM and FM (Consult factory for other modulation types)
- Small form factor and lightweight
- 50 ohm input/output impedance
- High reliability and ruggedness
- Built-in control, monitoring and protection circuits

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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	500		2500	MHz
Output Power CW	P_{SAT}	100			Watt
Output Power @ 1dB Gain Compression	P_{1dB}	60	80		Watt
Power Gain @ 1dB Gain Compression	G_p	50			dB
Input Power for Rated P_{SAT}	P_{IN}		0	3	dBm
Gain Flatness @ Rated P_{SAT}	ΔG_P			±1.0	dB
Input Return Loss	S_{11}			-12	dB
Noise Figure	NF			10	dB
Third Order Intercept Point 2-Tone @ 43dBm/Tone, 100kHz Spacing	IP3		+55		dBm
Harmonics @ P_{OUT} = 60W	H		-20		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (1-phase)	V_{AC}	100		240	Volt
Power Consumption	P_D			800	Watts
Switching Time, 1kHz TTL, P_{IN} = 0 dBm	T_{ON}/T_{OFF}		2	5	uSec

MECHANICAL SPECIFICATIONS

Parameter	Value	Units
Dimensions	19 x 5.25 x 22	Inch
Weight	47	lb.
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	VI/SH		Airborne		

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LIMITS

Input RF drive level without damage	+10 dBm	Max
Load VSWR @ P_{OUT} = 100W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	-
Thermal Overload	85°C	Max

AVAILABLE OPTIONS

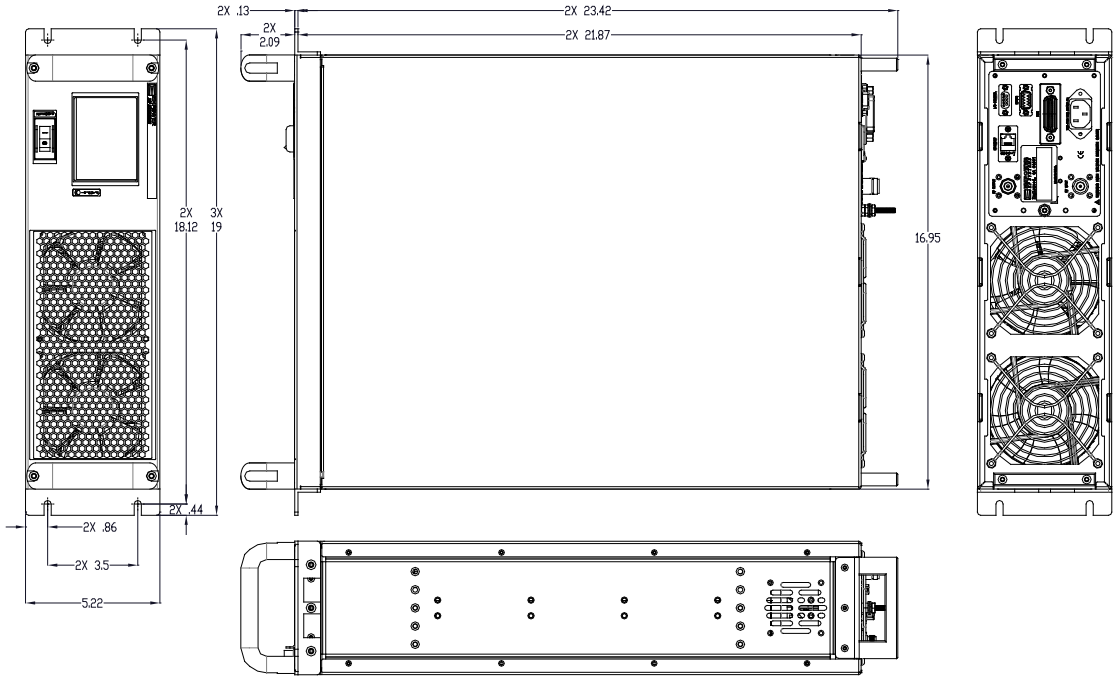
SKU #	Description	LCD Touchscreen
2148DLFAAXMXX	LCD controller, Front RF connectors 100-240VAC, 50/60Hz.	Touchscreen Digital Display, including FWD/REV Power indication (dBm or Watt scale), Gain Adjustment, ALC Fast/Slow, On/Off, Standby mode, Fault indication, Rear panel GPIB/HPIB IEEE-488.2 and Half Duplex RS232.
2148DERAAXLXX	LCD controller, Ethernet, Rear RF connectors 100-240VAC, 50/60Hz.	
Optional	Rack Slides (Call for price)	

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

Pin #	Description	Specifications
1	Forward Test Point	Analog Voltage 0-5V_{DC} relative to Forward Power Level
2	Reverse Test Point	Analog Voltage 0-5V_{DC} relative to Reverse Power Level
3	5V Test Point	+5.0V_{DC} ±0.2V
4	N/C	No Connection
5	EXT Shutdown	Amplifier Disable: TTL Logic High (5V) (*Internally Pulled-Low*)
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 #: 2148DERAAXLXX



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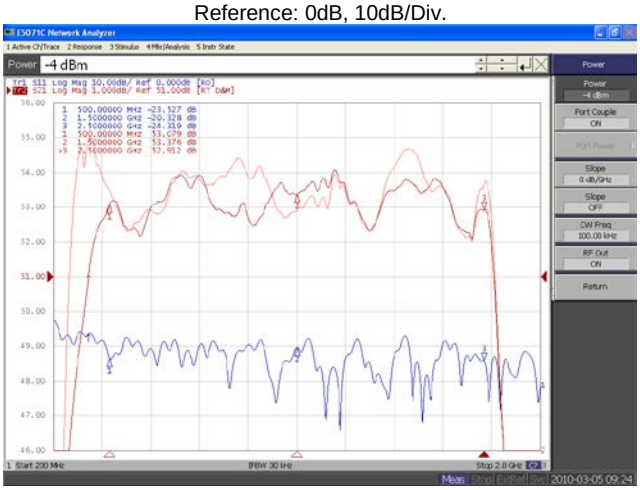
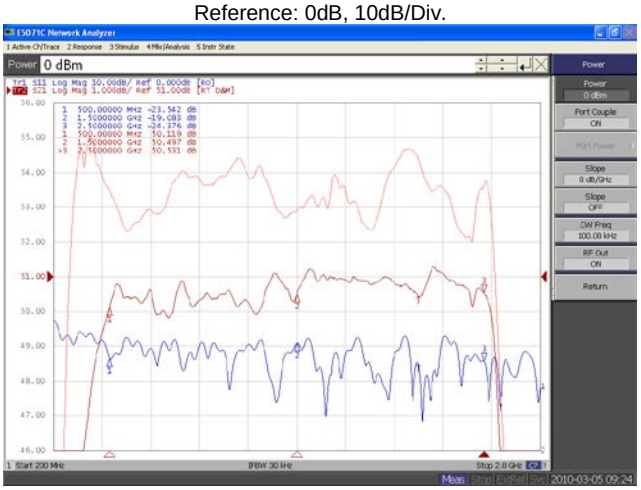
TYPICAL PERFORMANCE PLOTS

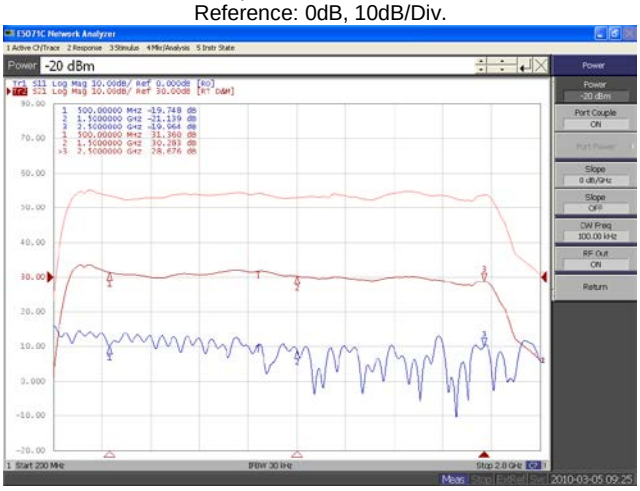
Plot 1 – Small Signal Gain and P_{1dB}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -4.0dBm
Reference: 51dB, 1dB/Div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/Div.



Plot 2 – Small Signal Gain and P_{SAT}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{SAT}, P_{IN} = 0.0dBm
Reference: 51dB, 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: 30dB, 10dB/Div.
Bottom Curve: Input Return Loss @ Minimum Gain
Reference: 0dB, 10dB/Div.



Plot 4 – ALC Flatness
Top Curve: ALC @ 50W, P_{IN} = 0dBm
Bottom Curve: ALC @ 10W, P_{IN} = 0dBm
Reference: 44dB, 1dB/Div.
Middle Curve: Input Return Loss
Reference: 0dB, 10dB/Div.