

## Solid State Broadband High Power Amplifier

**2151 - BBS3K5KNP**
**500 – 2500 MHz / 170 Watts**

The BBS3K5KNP (2151) 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#: 2151DLRAAXMXX

- 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<sub>AC</sub>, 25°C, 50Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	500		2500	MHz
Output Power CW	P <sub>SAT</sub>	170	200		Watt
Output Power @ 1dB Gain Compression	P <sub>1dB</sub>	80	100		Watt
Power Gain @ P <sub>SAT</sub>	G <sub>P</sub>	52			dB
Input Power for Rated P <sub>SAT</sub>	P <sub>IN</sub>		0	3	dBm
Gain Flatness @ Rated P <sub>SAT</sub>	ΔG <sub>P</sub>			±2.0	dB
Input Return Loss	S <sub>11</sub>			-10	dB
Noise Figure	NF		14	18	dB
Third Order Intercept Point 2-Tone @ 47dBm/Tone, 100kHz Spacing	IP3		+55		dBm
Harmonics @ P <sub>OUT</sub> = 170W	2 <sup>ND</sup> / 3 <sup>RD</sup>			-9/-18	dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (1-phase)	V <sub>AC</sub>	100		240	Volt
Power Consumption @ P <sub>OUT</sub> = 170W	P <sub>D</sub>		800	1250	Watts
Switching Time, 1kHz TTL, P <sub>IN</sub> = 0 dBm	T <sub>ON</sub> /T <sub>OFF</sub>		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 <sub>A</sub>	0		+50	°C
Non-operating Temperature	T <sub>STG</sub>	-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 <sub>OUT</sub> = 170W	5:1 @ all load phase & amplitude continuous	-
Thermal Overload	85°C	Max

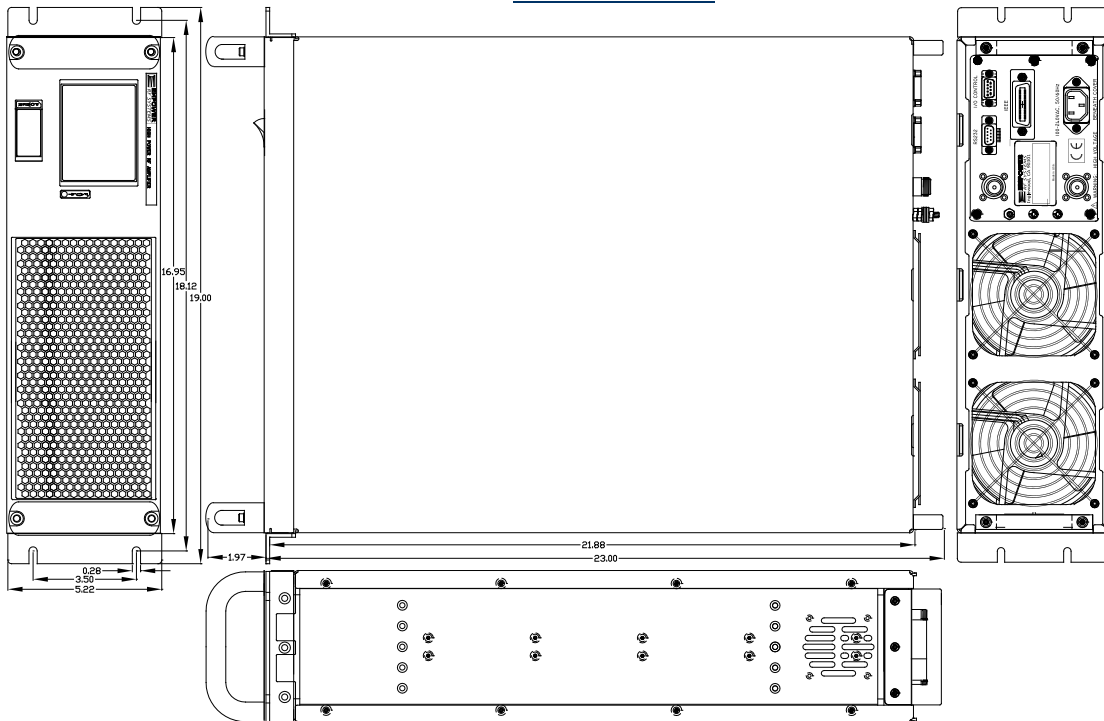
### AVAILABLE OPTION

SKU #	Description	LCD Touchscreen
2151DLRAAXMXX	LCD controller, Rear 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.
Optional	Rack Slides (Call for price)	

### I/O INTERFACE CONNECTOR – D-sub 9-pin, Female

Pin #	Description	Specifications
1	Forward Test Point	Analog Voltage 0-4V <sub>DC</sub> relative to Forward Power Level
2	Reverse Test Point	Analog Voltage 0-4V <sub>DC</sub> relative to Reverse Power Level
3	5V Test Point	+5.0V <sub>DC</sub> ±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 <sub>DC</sub> ±0.5V
7	P/S Test Point	+26.0-30.0V <sub>DC</sub>
8&9	GND	Ground

### OUTLINE DRAWING SKU #: 2151DLRAAXMXX



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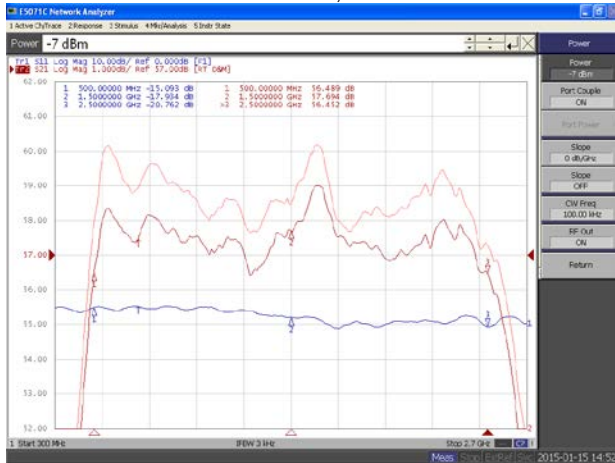
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## TYPICAL PERFORMANCE PLOTS

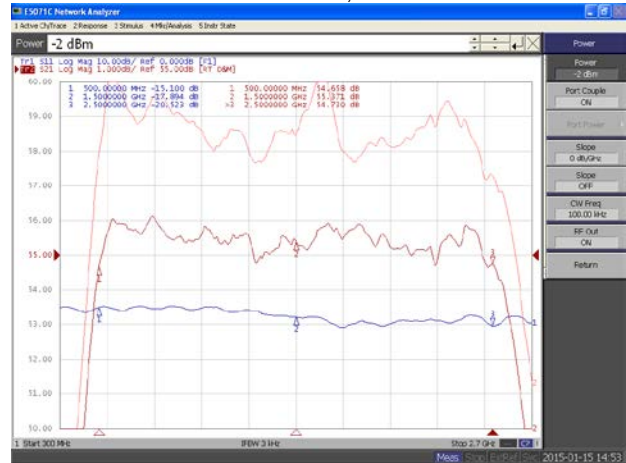
### Plot 1 – Small Signal Gain and $P_{1dB}$

Top Curve: Small Signal Gain,  $P_{IN} = -20dBm$   
 Middle Curve: Power Gain @  $P_{1dB}$  @  $P_{IN} = -7.0dBm$  (Note 2)  
 Reference: 57dB, 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 @  $P_{SAT}$ ,  $P_{IN} = -2.0dBm$  (Note 2)  
 Reference: 55dB, 1dB/Div.  
 Bottom Curve: Input Return Loss  
 Reference: 10dB, 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 – Mode ALC @ 100W and 20W

Top Curve: ALC @ 100W,  $P_{IN} = 0dBm$   
 Bottom Curve: ALC @ 20W,  $P_{IN} = 0dBm$   
 Middle Curve: Input Return Loss  
 Reference: 0dB, 10dB/Div.

