EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

2153 – BBS3O6QNQ

700 – 3800 MHz / 200 Watts

The BBS3O6QNQ (2153) is a broadband high power amplifier suitable for ultra broadband high power linear applications, laboratory, and RFI/EMC susceptibility testing. This amplifier utilizes GaN devices that provide high gain wide dynamic range and good linearity. Employing advanced broadband RF matching networks and combining techniques, EMI/RFI filters, and all qualified components achieve exceptional performance, and high efficiency. 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#: 2153DEFAAXLXX

- 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 @ $220V_{AC}$, 25°C, 50Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	700		3800	MHz
Output Power CW	P_{SAT}	200			Watt
Power Gain @ Rated P_{SAT}	G_{SAT}	52	54		dB
Input Power for Rated P_{SAT}	P_{IN}		0	3	dBm
Gain Flatness	ΔG			±2.0	dB
Gain Adjustment Range	VVA	18			dB
Input Return loss	S_{11}			-10	dB
Noise Figure	NF			15	dB
Third Order Intercept Point 2-Tone @ 46dBm/Tone, 100kHz Spacing	IP3		+56		dBm
Harmonics @ P_{OUT} = 200W	2^{ND}		-20	-12	dBc
	3^{RD}		-20		
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (1-phase)	V_{AC}	180		260	Volt
Power Consumption @ P_{OUT} = 200W CW	P_D			1800	Watt

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions (W x H x L)	19 x 5.25 x 22	Inch
Weight	50	Pound
RF Connectors Input/Output	Type-N, Female	
I/O Interface Connector	D-sub 9-pin, 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		+45	°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	+6 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 shutdown	Max

AVAILABLE OPTION

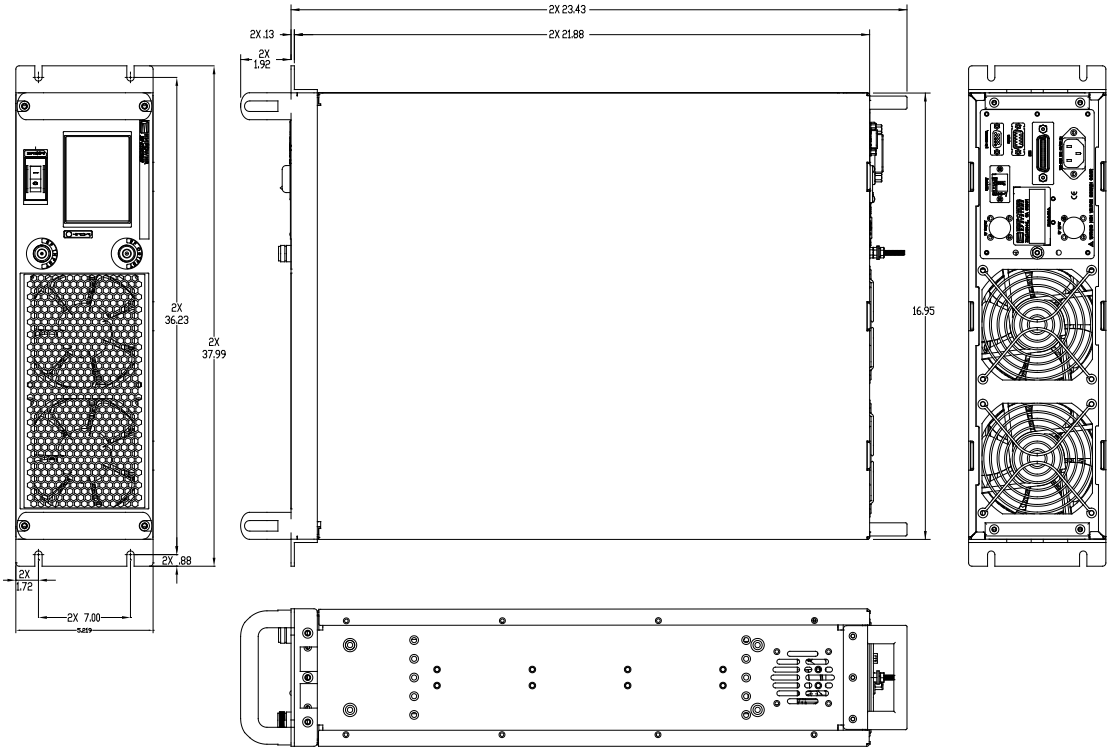
SKU #	Description	LCD Touchscreen
2153DEFAAXLXX	LCD controller, Ethernet, Front RF connectors 180-260VAC, 50/60Hz.	Touchscreen Digital Display, including FWD/REV Power indication (dBm or Watt scale), Gain Adjustment, ALC Fast/Slow, On/Off, Standby mode, Fault indication, Rear panel GPIB/HPIB IEEE-488.2 and Half Duplex RS232.
Optional	Rack Slides (Call for price)	

I/O INTERFACEC 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 (5.0V) (*Internally Pulled-Low*)
6	12V Test Point	+12.0V_{DC} ±0.5V
7	N/C	No Connection
8	P/S Test Point	+26.0-30.0V_{DC}
9	GND	Ground

SYSTEM OUTLINE

SKU #: 2153DEFAAXLXX



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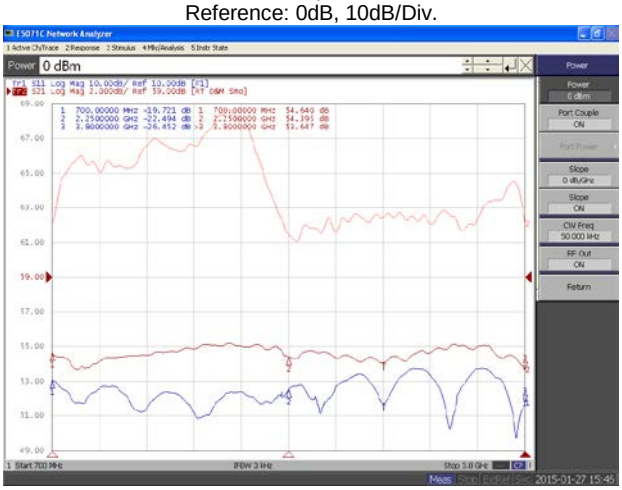
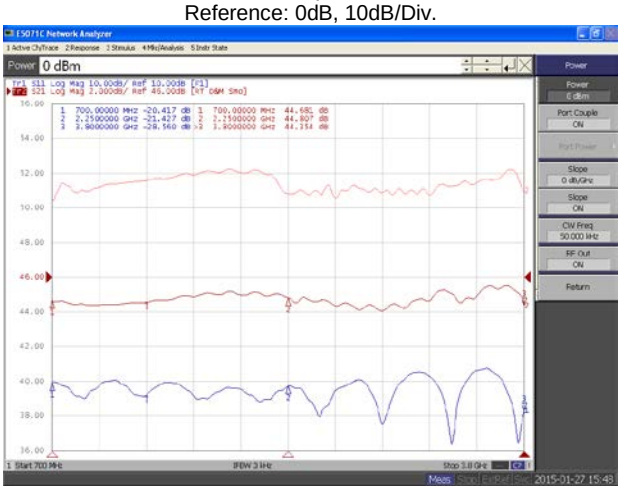
TYPICAL PERFORMANCE PLOTS

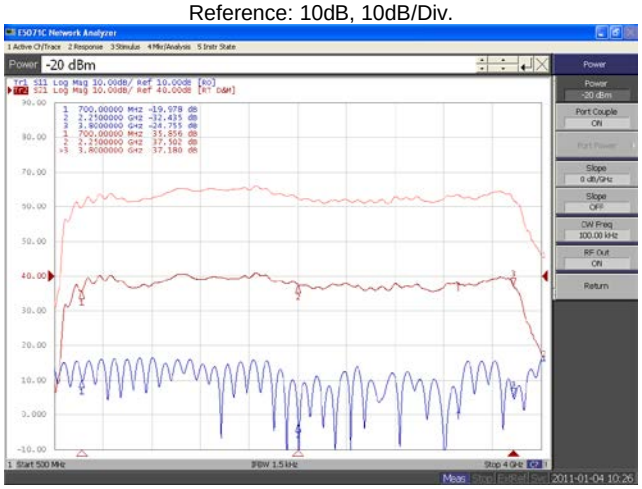
Plot 1 – Small Signal Gain and P_{SAT}
Top Curve: Small Signal Gain @ P_{IN} = -20dBm
Middle Curve: Power Gain @ P_{SAT}, P_{IN} = 0dBm **(Note 2, 3)**
Reference: 59dB, 2dB/Div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/Div.



Plot 2 – ALC Flatness
Top Curve: ALC @ 100W, P_{IN} = 0dBm
Middle Curve: ALC @ 20W, P_{IN} = 0dBm
Reference: 46dB, 2dB/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: 40dB, 10dB/Div.
Bottom Curve: Input Return Loss @ Minimum Gain
Reference: 10dB, 10dB/Div.



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