

## Solid State Broadband High Power Amplifier

2015 – BBS0D3FOQ

0.15 – 230 MHz / 250 Watts

The BBS0D3FOQ (SKU 2015) is suitable for immunity testing, laboratory, and ultra broadband high power linear applications, applications. This rack mount amplifier utilizes Push-pull MOSFET power devices that provide high gain, wide dynamic range, low distortions and good linearity. Exceptional performance, long term reliability and high efficiency are achieved by employing advanced broadband RF matching networks and combining techniques, built in high quality power supply, EMI/RFI filters, machined housings and all qualified components. Empower RF's ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.



Shown with Option Package 10

- Solid-state linear design
- Instantaneous ultra broadband
- Small form factor and lightweight
- Standard front panel manual gain adjust
- Suitable for CW, AM, and FM (Consult factory for other modulation types)
- 50 ohm input/output impedance
- High reliability and ruggedness

### ELECTRICAL SPECIFICATIONS @ 220V<sub>AC</sub>, 25°C, 50 Ω System

Characteristics	Rating	Min	Typ	Max	Units
Frequency Response	BW	0.15		230	MHz
Output Power CW	P <sub>SAT</sub>	250	300		Watt
Output Power @ 1dB Gain Compression	P <sub>1dB</sub>	150			Watt
Power Gain @ 1dB Gain Compression	G <sub>1dB</sub>	54			dB
Input Power for Rated P <sub>SAT</sub>	P <sub>IN</sub>		0		dBm
Small Signal Gain Flatness	ΔG			±1.5	dB
Gain Adjustment Range	FGA	25	30		dB
Input Return Loss	S <sub>11</sub>			-10	dB
Noise Figure @ maximum gain	NF		7	10	dB
Harmonics @ P <sub>OUT</sub> = 150W	H		-20		dBc
Third Order Intercept Point 2-Tone @ 44dBm/Tone, 100kHz Spacing	IP3		+61		dBm
Spurious Signals	Spur		-70	-60	dBc
Supply Voltage (single phase)	V <sub>AC</sub>	100		240	Volt
Power Consumption @ P <sub>OUT</sub> = 250W CW	P <sub>D</sub>			1200	Watt

### MECHANICAL SPECIFICATIONS

Parameter	Value	Units	Limits
Dimensions W x H x D	19 x 5.25 x 22	Inch	Typ
Weight	50	lb.	Max
RF Connectors Input/Output	Type-N, Female		
Cooling	Built in forced-air system		

### ENVIRONMENTAL SPECIFICATIONS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature	T <sub>C</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		-

### LIMITS

Input RF level drive without damage	+10 dBm	Max
Load VSWR @ P <sub>OUT</sub> = 150W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	-
Thermal Overload	85°C shutdown	Max

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### AVAILABLE OPTIONS

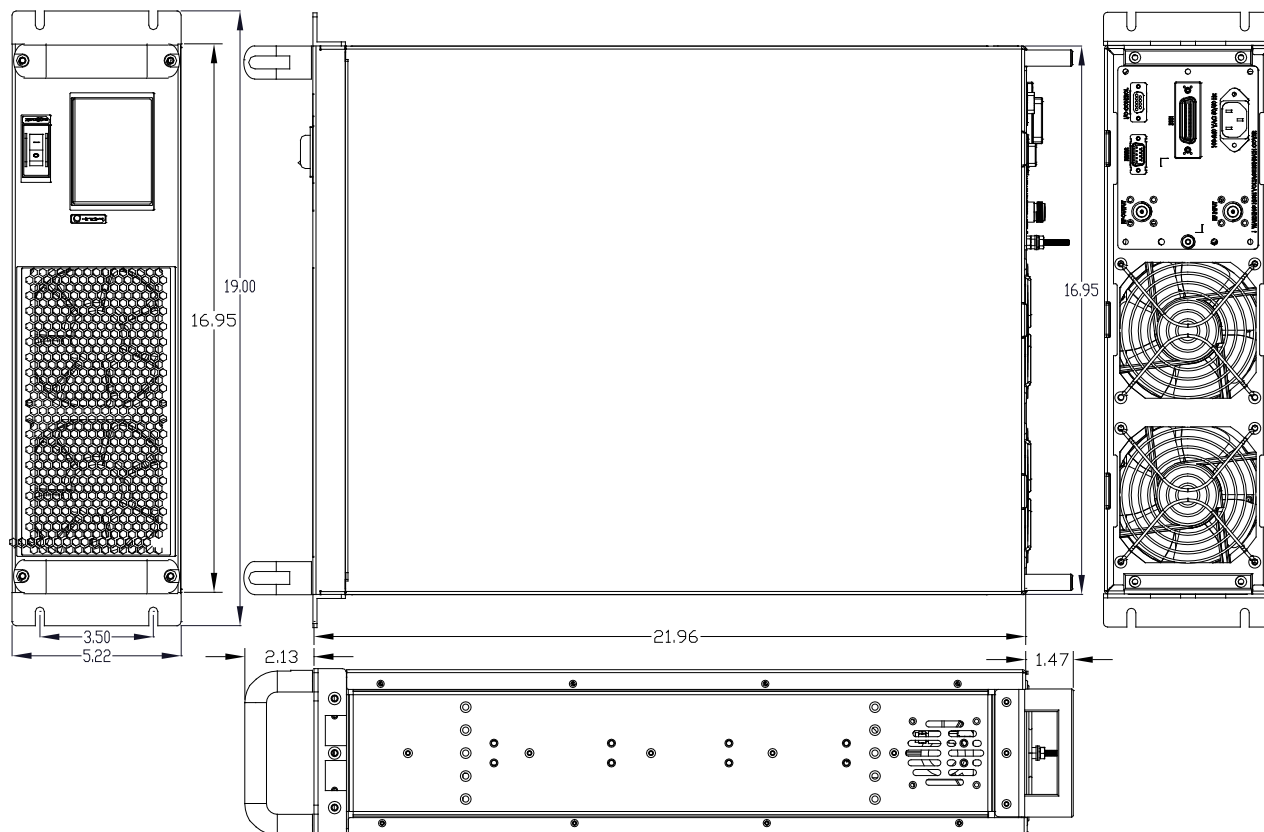
Option	Number	Description	Price
FGA	061	Front panel manual gain adjustment 10 turns	Standard
LCD	062	Touchscreen Digital Display, including Fwd/Rev Power indication (dB or Watt scale), Gain Adjustment, ALC Fast/Slow, On/Off, Standby mode, Fault indication, Rear panel HPIB/GPIB IEEE-488.2 and Half Duplex RS-232 or Full Duplex RS-422 remote interface. <b>Note: Output Power is lowered by 0.5 – 0.75 dB with this option.</b>	Call
FCN	051	Front Panel Type-N, Female	N/C
RCN	052	Rear Panel Type-N, Female	N/C

Available Option Packages: 07, 08, 09, 10

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

Pin #	Description	Specifications	Options	
			FGA	LCD
1	Forward Test Point	Analog Voltage 0-5V <sub>DC</sub> relative to Forward Power Level		√
2	Reverse Test Point	Analog Voltage 0-5V <sub>DC</sub> relative to Reverse Power Level		√
3	5V Test Point	Output +5.0V <sub>DC</sub> ±0.2V	√	√
4	VVA Test Point	VVA Gain Control +5.6V <sub>DC</sub> ±0.2V	√	
5	EXT Shutdown	Amplifier Disable: TTL Logic High (5V) (Internally Pulled-Low)	√	√
6	12V Test Point	Output +12.0V <sub>DC</sub> ± 0.5V	√	√
7	P/S Test Point	Power Supply Output voltage +28.0V <sub>DC</sub> ±2.0V	√	√
8, 9	GND	Ground	√	√

### SYSTEM OUTLINE SHOWN WITH OPTION PACKAGE 10



# Solid State Broadband High Power Amplifier

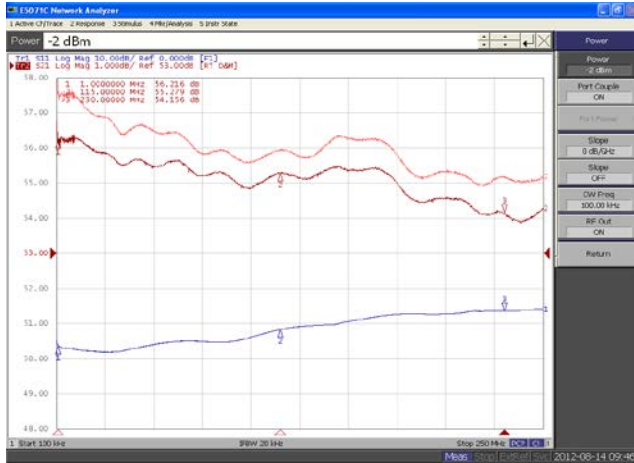
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## TYPICAL PERFORMANCE PLOTS

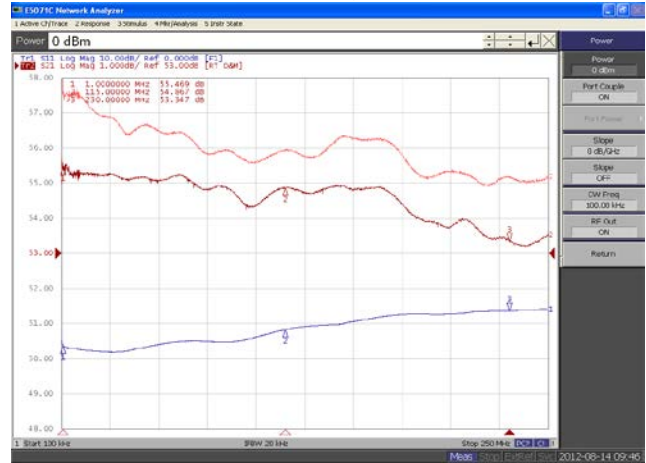
### Plot 1 – Small Signal Gain and $P_{1dB}$

Top Curve: Small Signal Gain @  $P_{IN} = -20\text{dBm}$   
 Middle Curve: Power Gain @  $P_{1dB}$ ,  $P_{IN} = -2.0\text{dBm}$   
 Reference: 53dB, 1dB/div.  
 Bottom Curve: Input Return Loss  
 Reference: 0dB, 10dB/div.



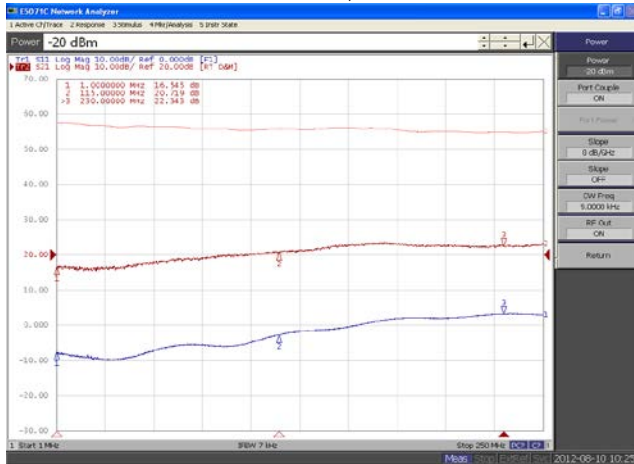
### Plot 2 – Small Signal Gain and $P_{SAT}$

Top Curve: Small Signal Gain @  $P_{IN} = -20\text{dBm}$   
 Middle Curve: Power Gain @  $P_{SAT}$ ,  $P_{IN} = 0.0\text{dBm}$   
 Reference: 53dB, 1dB/div.  
 Bottom Curve: Input Return Loss  
 Reference: 0dB, 10dB/div.



### Plot 3 – Gain Adjustment Range

Top Curve: Maximum Gain @  $P_{IN} = -20\text{dBm}$   
 Bottom Curve: VVA @ Minimum Gain  
 Reference: 20dB, 10dB/div.  
 Middle Curve: Input Return Loss @ Minimum Gain  
 Reference: 0dB, 10dB/div.



### Plot 4 – ALC Flatness @ 50dBm & 42dBm

Top Curve: ALC @ 50dBm,  $P_{IN} = 0\text{dBm}$   
 Middle Curve: ALC @ 42dBm,  $P_{IN} = 0\text{dBm}$   
 Reference: 44dB, 2dB/div.  
 Bottom Curve: Input Return Loss  
 Reference: 0dB, 10dB/div.

