EMPOWER
RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

2032 - BBS3Q6AEL

800 – 3000 MHz / 25 Watts

The BBS3Q6AEL (2032) is suitable for ultra broadband high power linear applications. This amplifier utilizes high power GaAsFET devices that provide wide frequency response and dynamic range, high gain, low distortions, and excellent 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#: 2032CLRAAXXXX

- Solid-state class A linear design
- Instantaneous ultra broadband
- Small 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 @ $120V_{AC}$, 25°C, 50 Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	800		3000	MHz
Output Power CW	P_{SAT}	25	30		Watt
Output Power @ 1dB Gain Compression	P_{1dB}	20	25		Watt
Power Gain @ 1dB Gain Compression	G_{1dB}	44			dB
Input Power for Rated P_{SAT}	P_{IN}		0	3	dBm
Small Signal Gain Flatness	ΔG			±1.5	dB
Gain Adjustment Range	FGA	20	25		dB
Input Return Loss	S_{11}			-10	dB
Noise Figure @ max Gain	NF			10	dB
Third Order Intercept Point 2-Tone @ 34dbm/Tone, 100kHz Spacing	IP3		+53		dBm
Harmonics @ P_{OUT} = 20W	H		-30	-20	dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (1-phase)	V_{AC}	100		240	Volt
Power Consumption @ P_{OUT} = 25W	P_D		200	250	Watt

MECHANICAL SPECIFICATIONS

Parameter	Value	Unit
Dimensions	19 x 3.5 x 18	Inch
Weight	30	Pound
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	-10		+55	°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		

LIMITS

Input RF drive level without damage	+6 dBm	Max
Load VSWR @ P_{OUT} = 20W	∞ @ 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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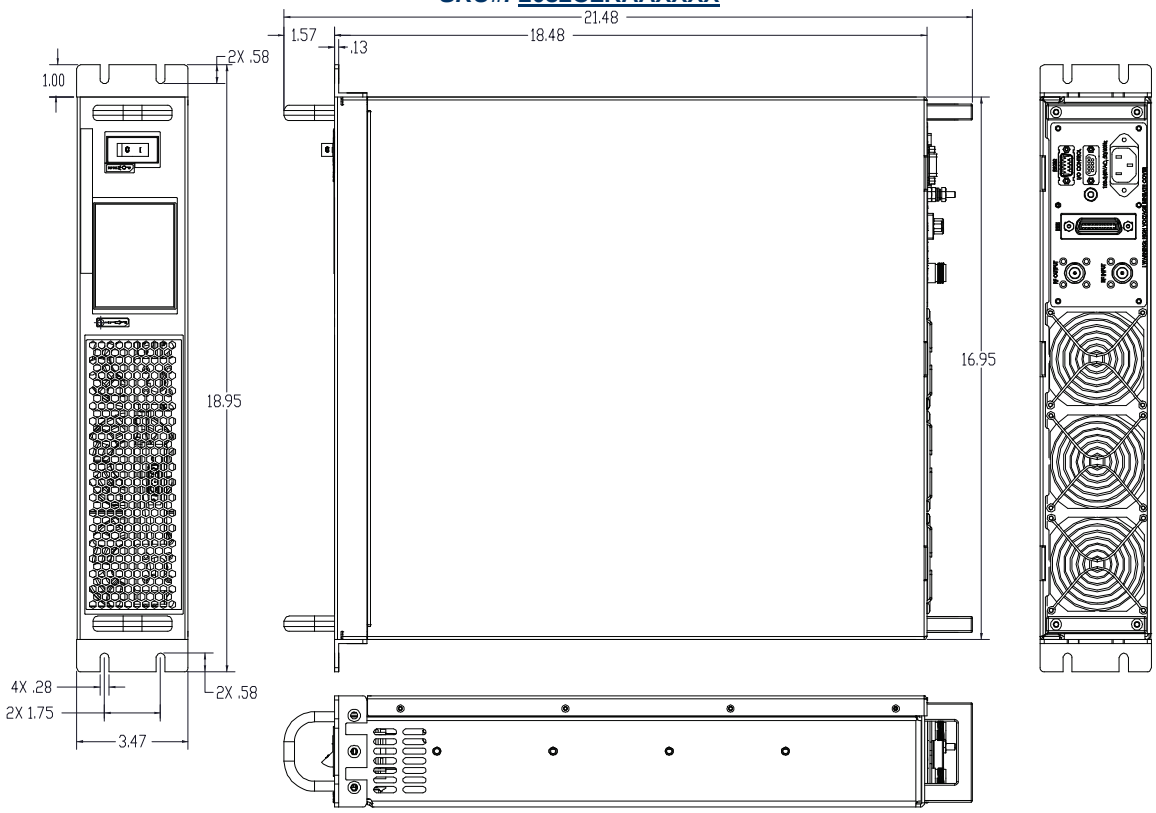
AVAILABLE OPTIONS

SKU Number	Description	LCD Touchscreen
2032CLRAAXLXX	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. ***Note:*** ***(Output power is lowered by 0.5-0.75dB with this option)***
2032CFFAAXXXX	FGA (Front Gain Adjust) Front RF Connectors, 100-240VAC, 50/60Hz	
2032CFRAAXXXX	FGA (Front Gain Adjust) Rear 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 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	Test point: +5.0V_{DC} ±0.2V	√	√
4	VVA Test Point	Test point: +5.6V_{DC} ±0.2V	√	
5	EXT Shutdown	Amplifier Disable: TTL Logic High (5V) (*Internally Pulled-Low*)	√	√
6	12V Test Point	Test point: +12.0V_{DC} ±0.5V	√	√
7	P/S Test Point	Test point: +12.0-15.0V_{DC}	√	√
8&9	GND	Ground	√	√

SYSTEM OUTLINE SHOWN
SKU#: 2032CLRAAXXXX



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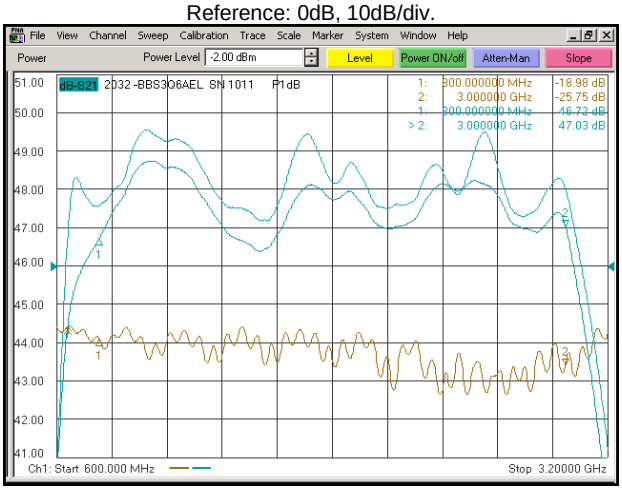
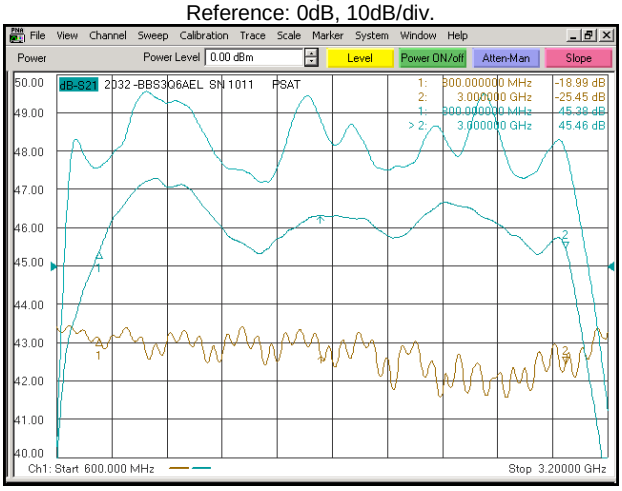
PERFORMANCE PLOTS

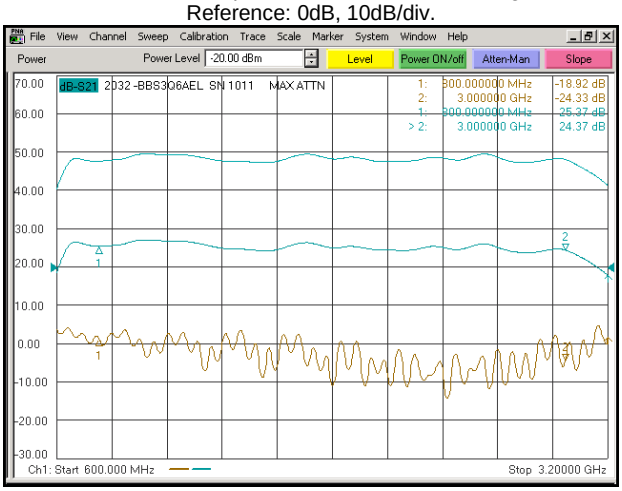
Plot 1 – Small Signal Gain and P_{1dB}
Top Curve: Small Signal Gain @ P_{IN} = -15dBm
Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -2.2dBm
Reference: 46dB, 1dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.



Plot 2 – Small Signal Gain and P_{SAT}
Top Curve: Small Signal Gain @ P_{IN} = -15dBm
Middle Curve: Power Gain @ P_{SAT}, P_{IN} = -0.2dBm
Reference: 45dB, 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
Reference: 20dB, 10dB/div.
Bottom Curve: Input Return Loss @ minimum gain
Reference: 0dB, 10dB/div.



Plot 4 – ALC Flatness @ 20W & 4W
Top Curve: ALC @ 20W, P_{IN} = 0dBm
Middle Curve: ALC @ 4W, P_{IN} = 0dBm
Reference: 37dB, 2dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.