EMPOWER RF SYSTEMS, INC.

Solid State Broadband High Power Amplifier

2020 - BBS5A7AKO | 2000 – 4000 MHz / 100 Watts

The BBS5A7AKO (SKU 2020) is suitable for S band 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.

Shown with Option Package 16

- Solid-state linear design
- Instantaneous 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
- Built in control, monitoring & protection circuits
- High reliability and ruggedness

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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	2000		4000	MHz
Output Power CW full range	P_{SAT}	100			Watt
Output Power @ 1dB Gain Compression	P_{1dB}	80			Watt
Power Gain @ 1dB Gain Compression	G_{1dB}	50			dB
Input Power for Rated P_{SAT}	P_{IN}		0		dBm
Small Signal Gain Flatness	ΔG			±2.0	dB
Input Return Loss	S_{11}			-10	dB
Third Order Intercept Point 2-Tone @ 40dBm/Tone, 100kHz Spacing	IP3		+60		dBm
Noise Figure	NF			10	dB
Harmonics @ Rated P_{1dB} = 80W	H			-20	dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage	V_{AC}	100		240	Volt
AC Power Consumption	P_D			1250	Watt

MECHANICAL SPECIFICATIONS

Parameter	Value	Units	Limits
Dimensions	19 x 8.75 x 22	Inch	Max
Weight	80	lb.	Max
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 Temperature	T_C	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		

PROTECTIONS

Input Overdrive	+10 dBm	Max
Load VSWR @ Rated P_{1dB} = 80W	∞ @ 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

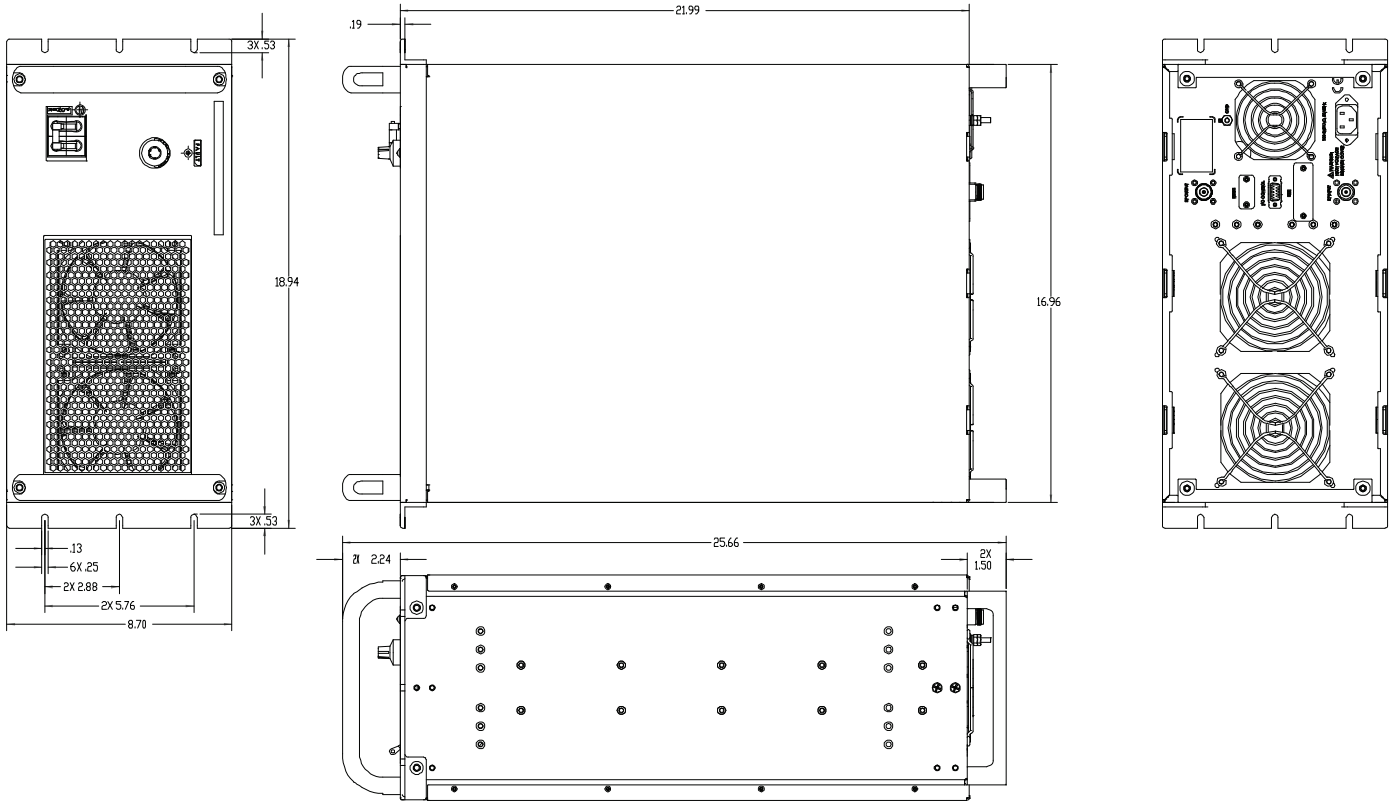
Option	Number	Description	Price
FGA	**061**	Front panel manual gain adjustment 10 turns	Standard
LCD	**062**	Touch screen Color Digital Display, including Fwd/Rev Power indication (dB or Watt scale), Gain Adjustment, ALC Fast/Slow, On/Off, Standby mode, Fault indication, Rear panel HPIB/GPIB IEEE-488.2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

Available Options Packages: 15, 16, 17, 18

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

Pin #	Description	Specifications	Options FGA	Options 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	Output +5.0V_{DC} ±0.2V	√	√
4	VVA Test Point	VVA Gain Control +5.6V_{DC} ±0.2V	√	
5	EXT Shutdown	Amplifier Disable: TTL Logic High (5V) (*Internally Pulled-Low*)	√	√
6	12V Test Point	Output +12.0V_{DC} ± 0.5V	√	√
7	P/S Test Point	Power Supply Output voltage +13.0V_{DC}, -1.0/+2.0V	√	√
8	GND	Ground	√	√
9	GND	Ground	√	√

SYSTEM OUTLINE SHOWN WITH OPTION PACKAGE 16



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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} = -2.0dBm
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} = 0dBm **(Note**
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: VVA @ Minimum Gain
Reference: 20dB, 10dB/div.
Bottom Curve: Input Return Loss
Reference: 0dB, 10dB/div.