

Solid State Broadband High Power Amplifier

2056 - BBS4A6AKO
1000 – 3000 MHz / 100 Watts

The BBS4A6AKO (SKU 2056) is suitable for L & 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 17

- 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
- High reliability and ruggedness

ELECTRICAL SPECIFICATIONS @ 120V_{AC}, 25°C, 50Ω System

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	1000		3000	MHz
Output Power CW	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
Gain Adjustment Range	FGA	20	25		dB
Input Return Loss	S ₁₁			-10	dB
Noise Figure @ max gain	NF		7	10	dB
Third Order Intercept Point 2-Tone @ 40dbm/Tone, 100kHz Spacing	IP3		+59		dBm
Harmonics @ P _{OUT} = 80W	H		-20		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (single phase)	V _{AC}	100		240	Volt
Power Consumption @ P _{OUT} = 100W CW	P _D			1400	Watt

ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

Parameter	Symbol	Min	Typ	Max	Unit
Operating Ambient Temperature	T _A	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		

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		

LIMITS

Input RF drive level without damage	+6dBm	Max
Load VSWR @ P _{OUT} = 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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SELECTED AVAILABLE OPTIONS (Refer to table for systems options @ www.empowerrf.com)

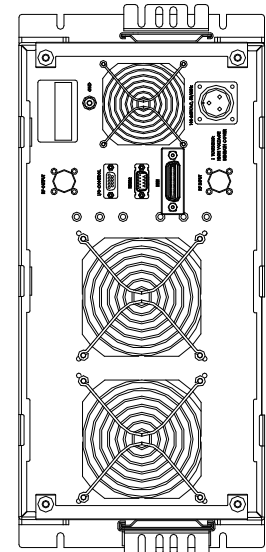
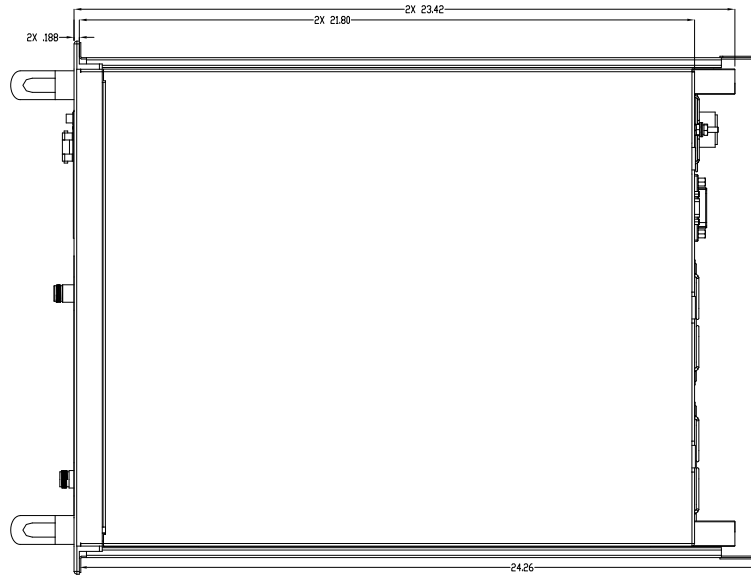
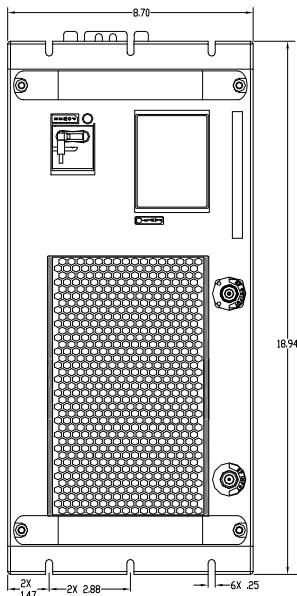
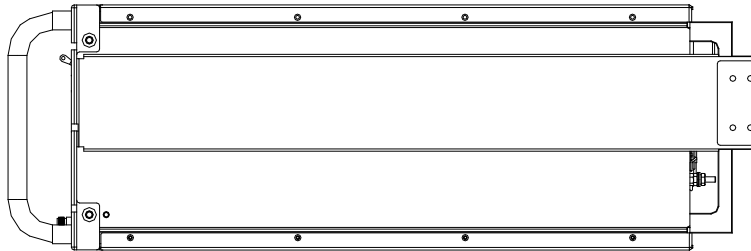
Option	Number	Description	Price
FGA	061	Front panel 10 turns manual gain adjustment.	Standard
LCD	062	Touchscreen Digital Display, including FWD/REV Power indication (dBm or Watt scale), Gain Adjustment, ALC Fast/Slow, On/Off, Standby mode, Fault indication, Rear panel GPIB/HPIB IEEE-488.2 and Half Duplex RS232 or Full Duplex RS422 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 Option Packages: 15, 16, 17, 18

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

Pin #	Description	Specifications	Options	
			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	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: +12.0-15.0V _{DC}	√	√
8&9	GND	Ground	√	√

SYSTEM OUTLINE SHOWN WITH OPTION PACKAGE 17



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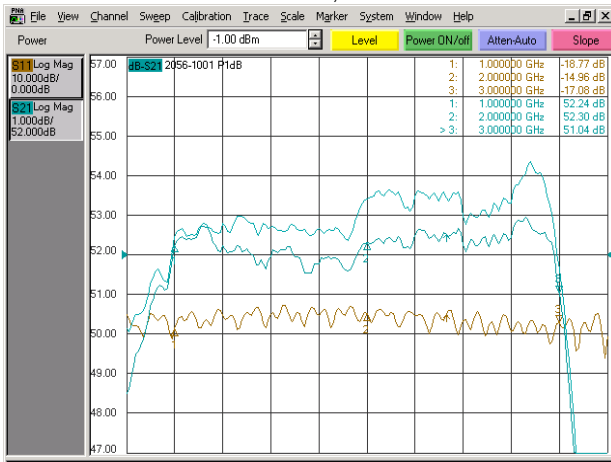
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TYPICAL PERFORMANCE PLOTS

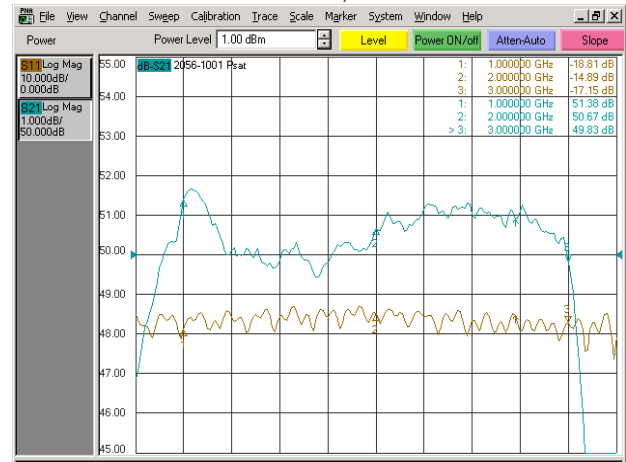
Plot 1 – Small Signal Gain and P_{1dB}

Top Curve: Small Signal Gain @ P_{IN} = -20dBm
 Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -1.5dBm
 Reference: 52dB, 1dB/Div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/Div.



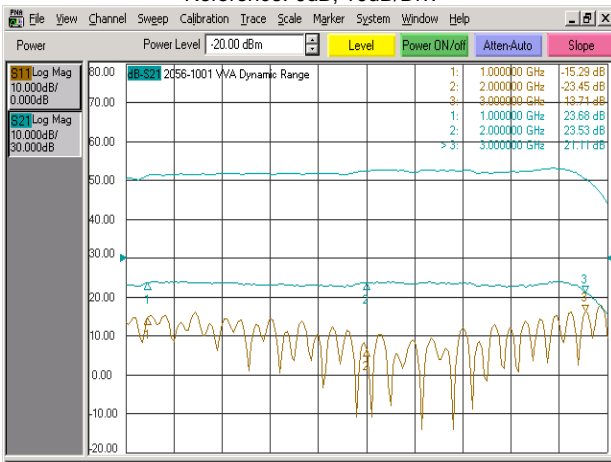
Plot 2 – Small Signal Gain and P_{SAT}

Top Curve: Small Signal Gain @ P_{IN} = -20dBm
 Middle Curve: Power Gain @ P_{SAT}, P_{IN} = 0.5dBm
 Reference: 49dB, 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 @ P_{IN} = -20dBm
 Reference: 30dB, 10dB/Div.
 Bottom curve: Input Return Loss @ Minimum Gain
 Reference: 0dB, 10dB/Div.



Plot 4 – ALC Flatness 47dBm & 40dBm

Top curve: ALC @ 50W, P_{IN} = 0dBm
 Middle Curve: ALC @ 10W, P_{IN} = 0dBm
 Reference: 43dB, 2dB/Div.
 Bottom curve: Input Return Loss
 Reference: 0dB, 10dB/Div.

