

Solid State Broadband High Power Amplifier

2148 - BBS3K5KKO

500 – 2500 MHz / 100 Watts

The BBS3K5KKO (SKU 2148) is suitable for broadband mobile Jamming and band specific high power linear applications in the P/L/S frequency bands. This amplifier utilizes advanced high power GaN devices that provide excellent power density, high efficiency, wide dynamic range and low distortions. Exceptional performance, long term reliability and high efficiency are achieved by employing advanced broadband RF matching networks and combining techniques, EMI/RFI filters, machined housings and qualified components. 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 10

- Solid-state Class AB linear design
- Instantaneous ultra broadband
- Suitable for CW, AM and FM (Consult factory for other modulation types)
- Small form factor and lightweight
- 50 ohm input/output impedance
- High reliability and ruggedness
- Built-in control, monitoring and protection circuits

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

Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	BW	500		2500	MHz
Output Power CW	P _{SAT}	100	125		Watt
Output Power @ 1dB Gain Compression	P _{1dB}	60	80		Watt
Power Gain @ 1dB Gain Compression	G _p	50			dB
Input Power for Rated P _{SAT}	P _{IN}		0		dBm
Gain Flatness @ Rated P _{SAT}	ΔG _p			±1.0	dB
Input Return Loss	S ₁₁			-12	dB
Noise Figure	NF			10	dB
Third Order Intercept Point 2-Tone @ 43dBm/Tone, 100kHz Spacing	IP3		+55		dBm
Harmonics @ Rated P _{1dB} = 60W	H		-20		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (single phase)	V _{AC}	100		240	Volt
AC Power Consumption	P _D			800	Watts
Switching Time, 1kHz TTL, P _{IN} = 0 dBm	T _{ON} /T _{OFF}		2	5	uSec

MECHANICAL SPECIFICATIONS

Parameter	Value	Units	Limits
Dimensions	19 x 5.25 x 22	Inch	Max
Weight	47	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 Ambient Temperature	T _C	0		+50	°C
Storage 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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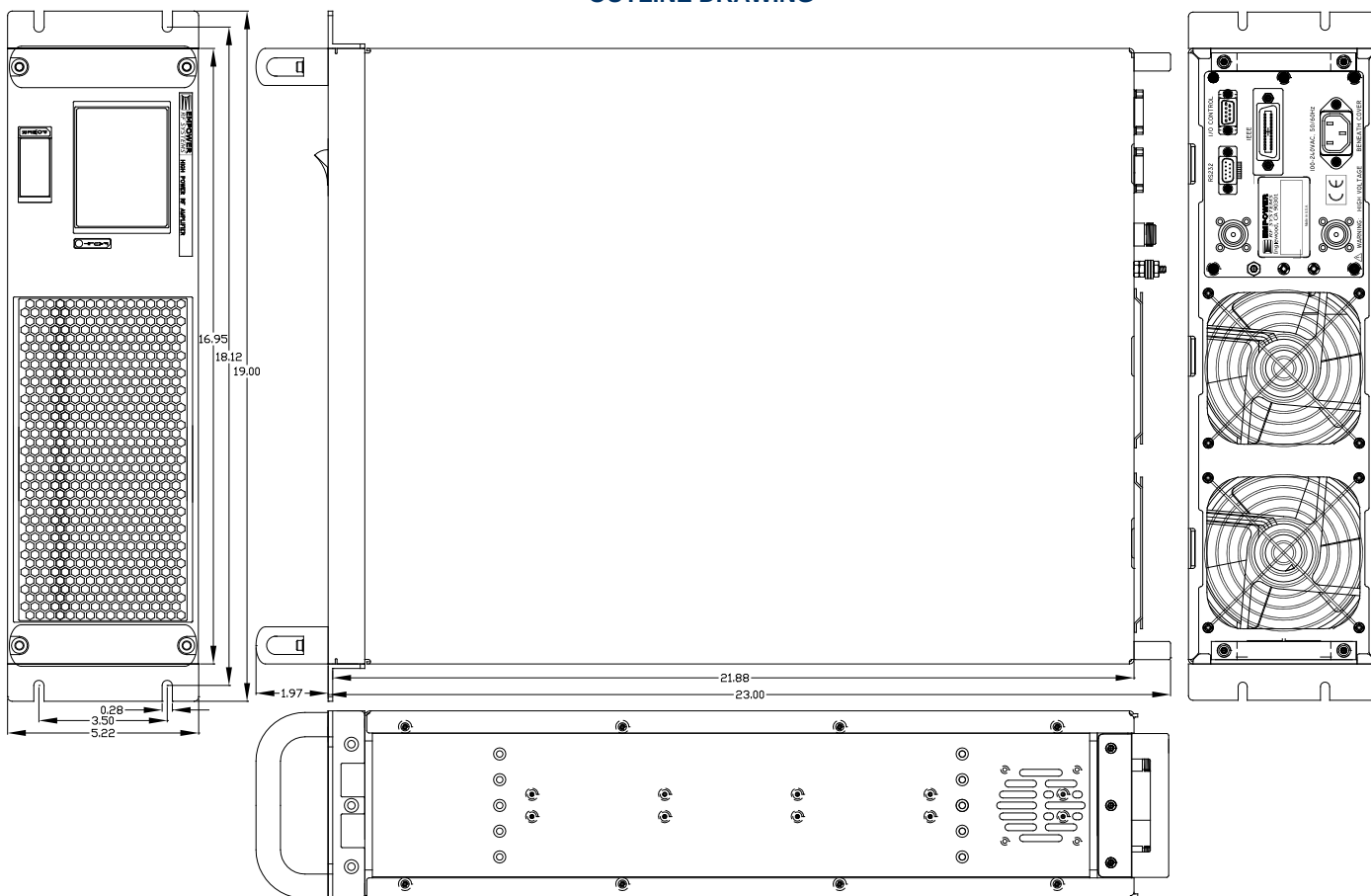
LIMITS

Input RF drive level without damage	+10 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	Max

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 +28.0V _{DC} ±2.0V	√	√
8	GND	Ground	√	√
9	GND	Ground	√	√

OUTLINE DRAWING



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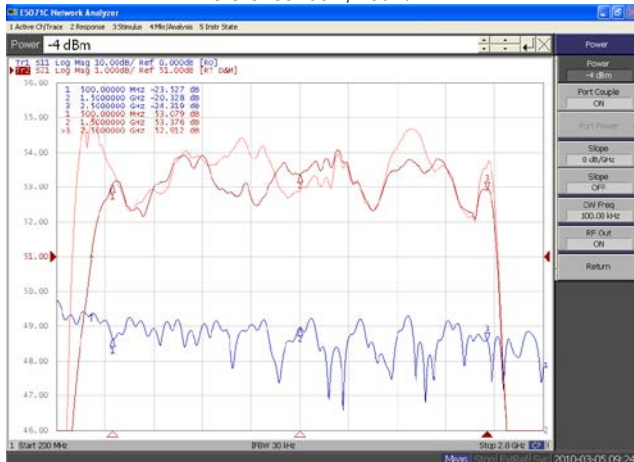
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TYPICAL PERFORMANCE PLOTS

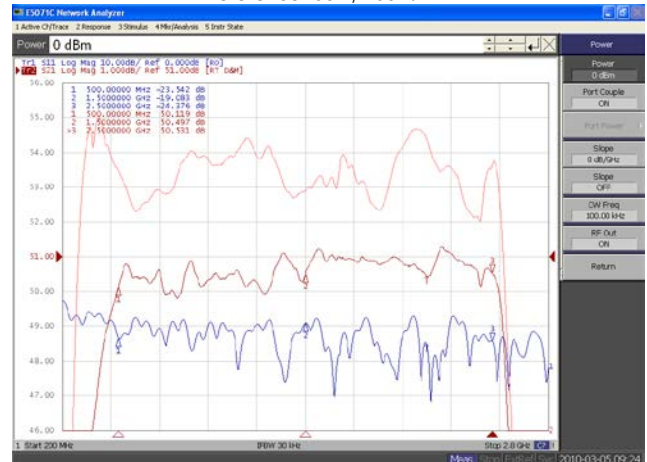
Plot 1 – Small Signal Gain and P_{1dB}

Top Curve: Small Signal Gain @ $P_{IN} = -20\text{dBm}$
 Middle Curve: Power Gain @ P_{1dB} , $P_{IN} = -4.0\text{dBm}$
 Reference: 51dB, 1dB/Div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/Div.



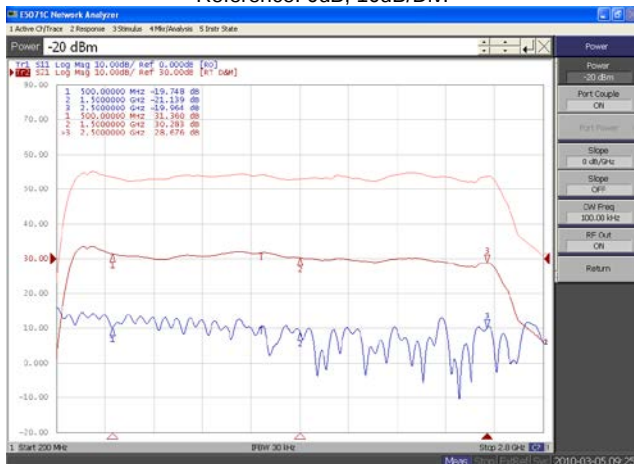
Plot 2 – Small Signal Gain and P_{SAT}

Top Curve: Small Signal Gain @ $P_{IN} = -20\text{dBm}$
 Middle Curve: Power Gain @ P_{SAT} , $P_{IN} = 0.0\text{dBm}$
 Reference: 51dB, 1dB/Div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/Div.



Plot 3 – Gain Adjustment Range

Top Curve: Maximum Gain @ $P_{IN} = -20\text{dBm}$
 Middle Curve: VVA @ Minimum Gain
 Reference: 30dB, 10dB/Div.
 Bottom Curve: Input Return Loss @ Minimum Gain
 Reference: 0dB, 10dB/Div.



Plot 4 – ALC Flatness

Top Curve: ALC @ 50W, $P_{IN} = 0\text{dBm}$
 Bottom Curve: ALC @ 10W, $P_{IN} = 0\text{dBm}$
 Reference: 44dB, 1dB/Div.
 Middle Curve: Input Return Loss
 Reference: 0dB, 10dB/Div.

