

Solid State Broadband High Power Amplifier

2011 - BBS3K4ANP

500 – 1000 MHz / 200 Watts

The BBS3K4ANP (SKU 2011) is suitable for broadband and band specific high power linear applications. This amplifier utilizes advanced push-pull MOSFET and LDMOS 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 broadband
- Small form factor and lightweight
- Suitable for CW, AM, and FM (Consult factory for other modulation types)
- 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		1000	MHz
Power Output CW	P _{SAT}	200			Watt
Output Power @ 1dB Gain Compression	P _{1dB}	150			Watt
Power Gain @ 1dB Gain Compression	G _{1dB}	52			dB
Input Power for Rated P _{SAT}	P _{IN}		0		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	NF		15	20	dB
Third Order Intercept Point 2-Tone @ 43dBm/Tone, 100kHz Spacing	IP3		+61		dBm
Harmonics @ P _{OUT} = 150W	H		-20		dBc
Spurious Signals	Spur		-70	-60	dBc
Operating Voltage (single phase)	V _{AC}	100		240	Volt
AC Power Consumption	P _D			1000	Watts

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*	VI/SH		Airborne		
MIL-STD-810F - Method 514.5/516.5 – Proc I					

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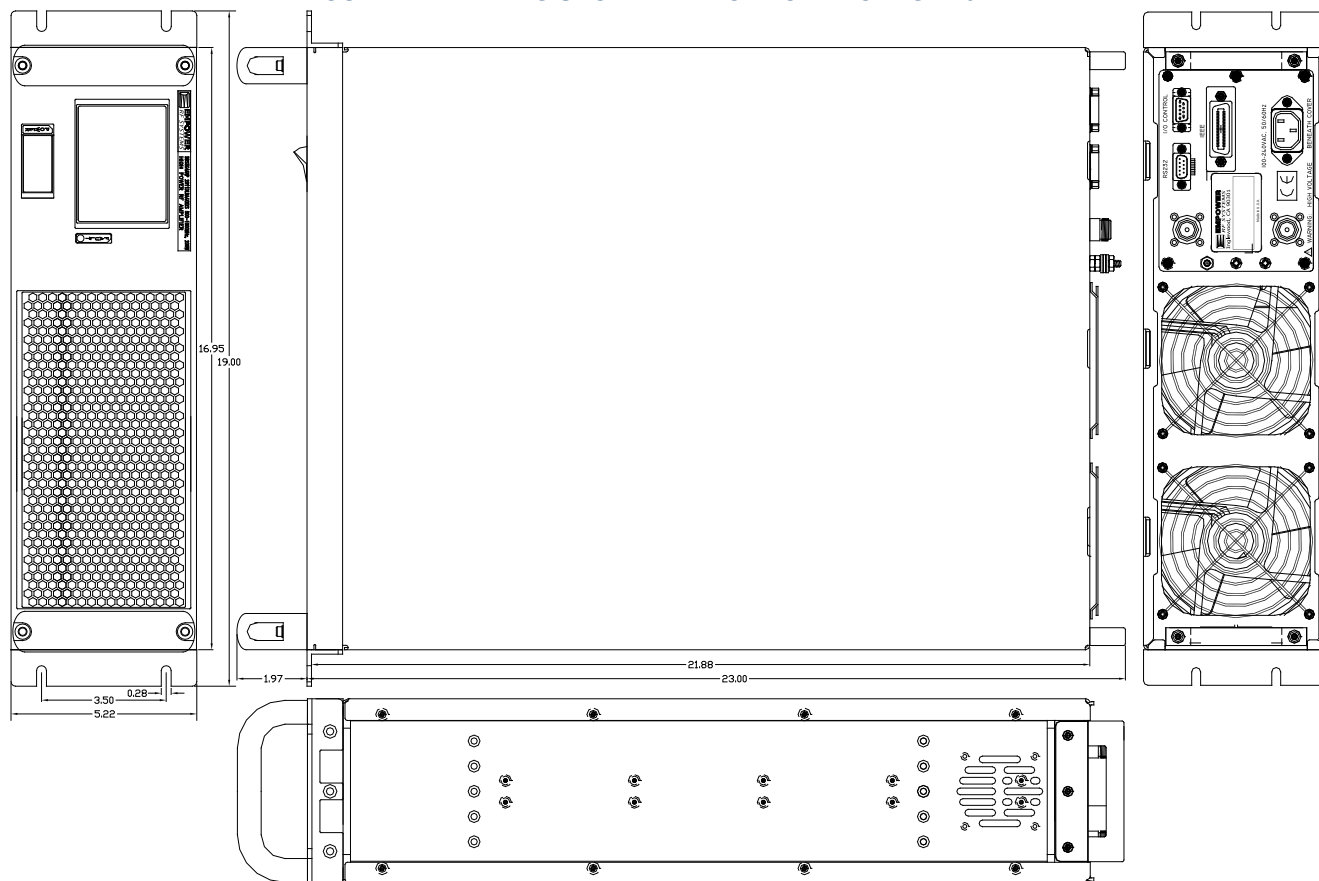
Limits

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

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 +26.0-30V _{DC}	√	√
8	GND	Ground	√	√
9	GND	Ground	√	√

OUTLINE DRAWING SHOWN WITH OPTION PACKAGE 10



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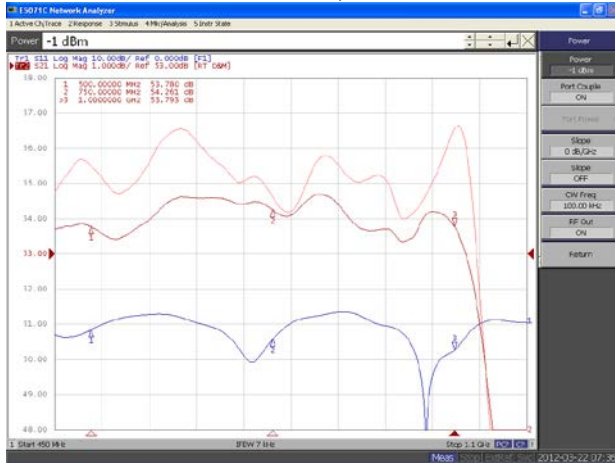
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TYPICAL PERFORMANCE PLOTS

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

Top Curve: Small Signal Gain @ $P_{IN} = -20dBm$
 Middle Curve: Power Gain @ P_{1dB} , $P_{IN} = -1.0dBm$
 Reference: 53dB, 1dB/div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/div.



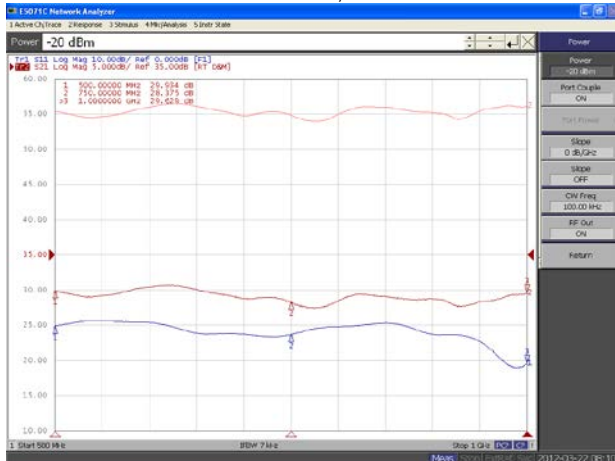
Plot 2 – Small Signal Gain and P_{SAT}

Top Curve: Small Signal Gain @ $P_{IN} = -20dBm$
 Middle Curve: P_{SAT} @ $P_{IN} = 1.0dBm$
 Reference: 53dB, 1dB/div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/div.



Plot 3 – Gain Adjustment Range

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



Plot 4 – ALC Flatness

Top Curve: ALC @ 100W, $P_{IN} = 0dBm$
 Bottom Curve: ALC @ 20W, $P_{IN} = 0dBm$
 Reference: 47dB, 1dB/Div.
 Middle Curve: Input Return Loss
 Reference: 0dB, 10dB/Div.

