

Solid State Broadband High Power Amplifier

2034 - BBS2E3KPQ

20 – 500 MHz / 300 Watts

The BBS2E3KPQ (2034) is suitable for VHF & UHF ultra broadband high power applications. This amplifier utilizes MOSFET and LDMOS push-pull 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.



SKU#: 2034DLRAAXXX

- Solid-state class AB design
- Instantaneous ultra broadband
- Small form factor and lightweight
- Built-in control, monitoring and protection circuits
- 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

Characteristics	Rating	Min	Typ	Max	Units
Frequency Response	BW	20		500	MHz
Output Power CW	P _{SAT}	300			Watt
Output Power @ 1dB Gain Compression	P _{1dB}	200			Watt
Power Gain @ 1dB Gain Compression	G _{1dB}	54			dB
Input Power for Rated P _{SAT}	P _{IN}		0	3	dBm
Small Signal Gain Flatness	ΔG		±1.5	±2.0	dB
Gain Adjustment Range	FGA	25	30		dB
Input Return Loss	S ₁₁			-10	dB
Noise Figure @ maximum gain	NF			10	dB
Harmonics @ P _{OUT} = 200W	H		-20		dBc
Third Order Intercept Point	IP3		+63		dBm
2-Tone @ 47dBm/Tone, 100kHz Spacing					
Spurious Signals	Spur		-70	-60	dBc
Supply Voltage (1-phase)	V _{AC}	100		240	Volt
Power Consumption @ 300W CW	P _D		1200	1400	Watt

MECHANICAL SPECIFICATIONS

Parameter	Value	Units
Dimensions	19 x 5.25 x 22	Inch
Weight	55	lb.
RF Connectors Input/Output	Type-N, Female	
Cooling	Built-in internal forced air cooling system	

ENVIRONMENTAL SPECIFICATIONS (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		

Solid State Broadband High Power Amplifier

2034 - BBS2E3KPQ

20 – 500 MHz / 300 Watts

LIMITS

Input RF drive level without damage	+6 dBm	Max
Load VSWR @ P _{OUT} = 120W	∞ @ all load phase & amplitude for duration of 1 minute 3:1 @ all load phase & amplitude continuous	-
Thermal Overload	85°C shutdown	Max

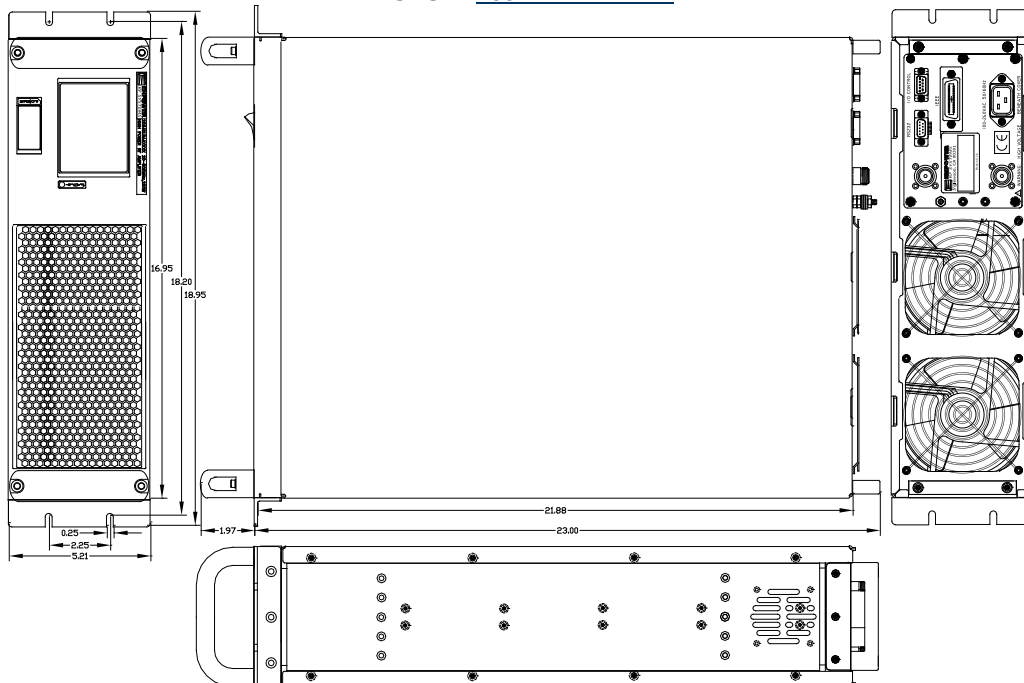
AVAILABLE OPTIONS

SKU #	Description	LCD Touchscreen
2034DLRAAXXX	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.
2034DFRAAXXX	FGA (Front Gain Adjust) Rear RF Connectors, 100-240VAC, 50/60Hz	
Optional	Rack Slides (Call for price)	

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	+5.0V _{DC} ±0.2V	√	√
4	VVA Test Point	+5.6V _{DC} ±0.2V	√	
5	EXT Shutdown	Amplifier Disable: TTL Logic High (5V) (Internally Pulled-Low)	√	√
6	12V Test Point	+12.0V _{DC} ± 0.5V		√
7	P/S Test Point	+26.0-30.0V _{DC}	√	√
8&9	GND	Ground	√	√

OUTLINE DRAWING SHOWN SKU #: 2034DLRAAXXX



Solid State Broadband High Power Amplifier

2034 - BBS2E3KPQ

20 – 500 MHz / 300 Watts

PERFORMANCE PLOTS

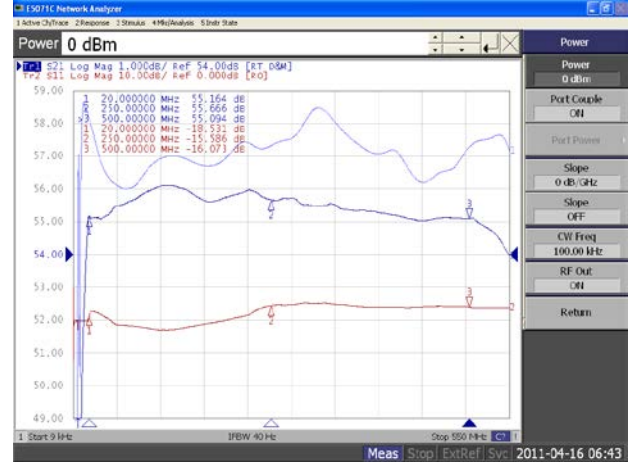
Plot 1 – Small Signal Gain and P_{1dB}

Top Curve: Small Signal Gain @ P_{IN} = -20dBm
 Middle Curve: Power Gain @ P_{1dB}, P_{IN} = -2.0dBm
 Reference: 54dB, 1dB/div.
 Bottom Curve: Input Return Loss
 Reference: 0dB, 10dB/div.



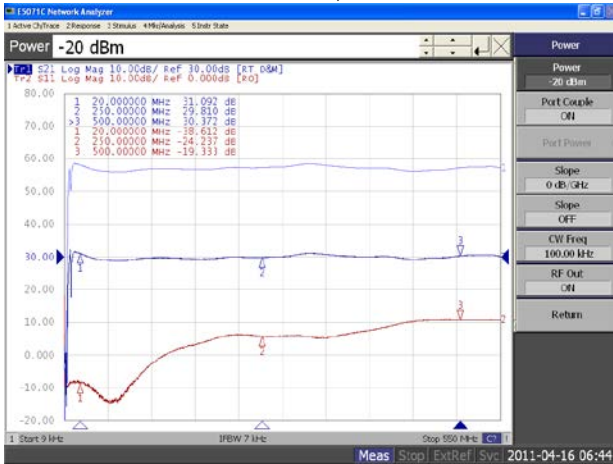
Plot 2 – Small Signal Gain and P_{SAT}

Top Curve: Small Signal Gain @ P_{IN} = -20dBm
 Middle Curve: Power Gain @ P_{SAT}, P_{IN} = 0.0dBm
 Reference: 54dB, 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 Response

Top Curve: ALC @ 52dBm, P_{IN} = 0dBm
 Bottom Curve: ALC @ 45dBm, P_{IN} = 0dBm
 Reference: 49dB, 1dB/div.
 Middle Curve: Input Return Loss
 Reference: 0dB, 10dB/div.

