

TREK 623B

High voltage power amplifier provides precise control of bi-polar output voltages using an all solid-state design for a high slew rate, wide bandwidth, and low-noise operation.



The Trek® 623B is a DC-stable, high voltage power amplifier designed to provide precise control of bi-polar output voltages. It features an all-solid-state design for high slew rate, low-noise operation and a wide bandwidth of DC to greater than 10 kHz. The four-quadrant, active output stage sinks or sources current into reactive or resistive loads throughout the output voltage range. This type of output is essential to achieve an accurate output response and high slew rate demanded by a variety of loads such as highly capacitive or reactive loads.

PRODUCT HIGHLIGHTS

- Four-quadrant output for driving capacitive loads
- Closed loop system for high accuracy
- Short-circuit protected for equipment protection
- All solid-state design for maintenance free operation
- DC-stable for programmable supply applications
- Low output noise for ultra-accurate outputs
- NIST-traceable Certificate of Calibration provided with each unit

TYPICAL APPLICATIONS

- Electrostatic beam deflection
- Electrooptic modulation
- Electrophoresis research
- Piezoelectric poling and driving

AT A GLANCE

Output Voltage Range

0 to ± 2 kV DC or peak AC

Output Current Range

0 to ± 40 mA DC or peak AC

Slew Rate

Greater than 300 V/ μ s

Large Signal Bandwidth (1%)

DC to greater than 10 kHz

TREK 623B HIGH VOLTAGE POWER AMPLIFIER

TECHNICAL DATA

Performance Specifications		
Output Voltage Range	0 to ± 2 k VDC or peak AC	
Output Current Range	0 to ± 4 mA DC or peak AC	
Input Voltage Range	0 to ± 2 V DC or peak AC	
Input Impedance	Non-inverting	25 k Ω , nominal
	Inverting	50 k Ω , nominal
	Differential	50 k Ω , nominal
DC Voltage Gain	1000 V/V	
	Non-inverting (V_A) Configuration	1000 V/V
	Inverting (V_A) Configuration	-1000 V/V
	Differential Configuration	Function of the difference between two input signals. Represented by the equation: $V_{OUT} = 1000 (V_A - V_B)$
DC Voltage Gain Accuracy	Better than 0.1% of full scale	
DC Offset Voltage	Less than ± 1 V	
Output Noise	Less than 80 mV rms ¹	
Slew Rate	Greater than 300 V/ μ s (10% to 90%, typical)	
Settling Time	Less than 150 μ s for a 0 to 2 kV step	
Large Signal Bandwidth	DC to greater 10 kHz (1% Distortion)	
	DC to greater 40 kHz (-3 dB)	
Small Signal Bandwidth	DC to greater than 35 kHz (-3dB)	
Stability	Drift with Time	Less than 100 ppm/hr, noncumulative
	Drift with Temp	Less than 200 ppm/ $^{\circ}$ C

Voltage Monitor Specifications	
Ratio	1/1000th of the high voltage output signal
DC Accuracy	Better than 0.1% of full scale
DC Offset Voltage	Less than ± 2.5 mV
Output Noise	Less than 2 mV rms ¹
Output Impedance	0.1 Ω

Current Monitor Specifications	
Ratio	0.25 V/mA
DC Accuracy	Better than 5% of full scale
DC Offset Voltage	Less than ± 5 mV
Output Noise	Less than 10 mV ¹
Small Signal Bandwidth	DC to greater than 10 kHz (-3 dB)
Output Impedance	47 Ω

Mechanical Specifications	
Dimensions (H x W x D)	134 x 432 x 439 mm (5.25 x 17 x 17.25 in)
Weight	13.2 kg (29 lb)
HV Connector	Alden High Voltage Connector
BNC Connectors	Voltage monitor, current monitor, remote HV ON/OFF, out of regulation, fault/trip status
Amplifier Input	3-pin connector may be configured for inverting, noninverting or differential amplification

¹ Measured using the true rms feature of the HP Model 34401A digital multimeter

TECHNICAL DATA

Electrical Specifications	
Line Voltage	Factory set for one of three ranges (specify when ordering): 100 VAC, 115 VAC or 230 VAC at 48 to 63 Hz
Power Consumption	220 VA, maximum

Environmental Specifications	
Temperature	0 to 40°C (32 to 104°F)
Relative Humidity	To 85%, noncondensing
Altitude	To 2000 meters (6561.68 ft.)

REFERENCE NUMBERS

Included Accessories	
PN	Description
23185	Operator's Manual
43406	HV Output Cable
43418	Input Cable Connector Assembly
N5011	Line Cord (90 V to 127 V operation)
Contact factory	Line Cord 230 VAC

Other Accessories	
PN	Description
43406	HV Output Cable
607RA	19 in Rack Mount Kit (with EIA hole spacing)
607RAJ	19 in Rack Mount Kit (with JIS hole spacing)



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ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

PRECISION | POWER | PERFORMANCE

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