

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 kV DC or peak AC | |
| Output Current Range | 0 to ± 40 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 than 10 kHz (1% Distortion) | |
| Small Signal Bandwidth | DC to greater than 40 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 two ranges (specify when ordering): 90 to 127 VAC or 180 to 250 VAC, either @ 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) |



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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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