ULTRAVOLT E SERIES

PRECISION HIGH VOLTAGE POWER SUPPLIES



The UltraVolt® E series of precision high voltage power supplies has very low ripple, excellent linearity, and very stable temperature characteristics. Models in this series are offered at two levels of performance; the best delivers 10 ppm characteristics. This series is ideal for applications where system performance is directly linked to high voltage power quality and performance.

PRODUCT HIGHLIGHTS

- Precision output voltage from 0 to 1 kV through 0 to 15 kV
- PPM level ripple, regulation, and stability
- As low as 10 ppm temperature coefficient and reference
- 0 to 4, 15/20, or 30 W of output power
- Maximum Iout capability down to 0 V
- Voltage and current regulation/limit capability
- Precision output voltage and current monitors

TYPICAL APPLICATIONS

- Bias supplies
- Mass spectrometry
- SEM/FIB
- Electron beams
- Ion beams

AT A GLANCE

Output Voltage

To 20 kV
To 20 kV or 25 kV DC

Output Power

To 30 W

Type

Single Output

Ripple

To 100 ppm (2.5 Vpp)

Control

Analog

Temperature Coefficient

25 ppm/°C

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ELECTRICAL SPECIFICATIONS

Parameter	Conditions	Models									Units
Input		**All Types**									
Voltage Range	Full Power	+23 to 30									VDC
Current	Standby/Disable	< 50									mA
Current	No Load, Max Eout	< 325									mA
Current	Full Load, Max Eout	2.5									A
AC Ripple Current	Nominal Input, Full Load	< 10									mA pk to pk
Output		**1E**			**2E**			**4E**			
Voltage Range	Nominal Input	0 to 1000			0 to 2000			0 to 4000			VDC
Nominal Input Voltage/Model		24	24	24	24	24	24	24	24	24	VDC
Power	Nominal Input, Max Eout	4	20	30	4	20	30	4	20	30	Watts
Current	Iout Entire Output Voltage Range	4	20	30	2	10	15	1	5	7.5	mA
Voltage Monitor	Normal Operating Conditions	0 to 10 ±0.5%									VDC
Current Monitor	Normal Operating Conditions	0 to 10 ±0.5%									VDC
Ripple	Full Load, Max Eout	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	ppm
Line Regulation	Nom Input, Max Eout, Full Power	< 25 ppm or < 10 ppm									VDC
Static Load Regulation	No Load to Full Load, Max Eout	< 25 ppm or < 10 ppm									VDC
Stability	30 Min Warmup, Per 8 h, Per Day	< 25 ppm or < 10 ppm									VDC
Output		**6E**			**10E**			**15E**			
Voltage Range	Nominal Input	0 to 6000			0 to 10000			0 to 15000			VDC
Nominal Input Voltage/Model		24	24	24	24	24	24	24	24	24	VDC
Power	Nominal Input, Max Eout	4	20	30	4	15	30	4	15	30	Watts
Current	Iout Entire Output Voltage Range	0.67	3.3	5	0.4	1.5	3	0.26	1	2	mA
Voltage Monitor	Normal Operating Conditions	0 to 10 ±0.5%									VDC
Current Monitor	Normal Operating Conditions	0 to 10 ±0.5%									VDC
Ripple	Full Load, Max Eout	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	≤ 10	ppm
Line Regulation	Nom Input, Max Eout, Full Power	< 25 ppm or < 10 ppm									VDC
Static Load Regulation	No Load to Full Load, Max Eout	< 25 ppm or < 10 ppm									VDC
Stability	30 Min Warmup, Per 8 h, Per Day	< 25 ppm or < 10 ppm									VDC

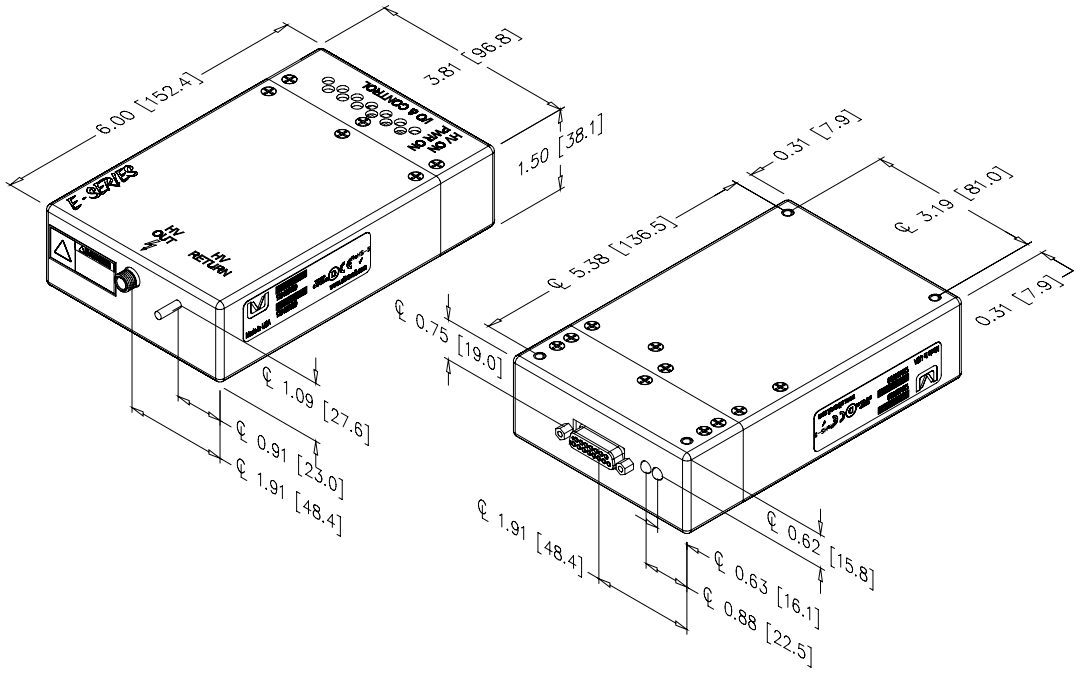
ELECTRICAL SPECIFICATIONS (CONTINUED)

Programming and Controls		All Types	
Input Impedance	Nominal Input	10	MΩ
Adjust Accuracy and Adjust Linearity	10 to 100%	±0.05%	%
Adjust Voltage	Differential	0 to +10	VDC
Output Voltage	T = +25°C, Initial Value	+10.00 ±0.05%	VDC
Max Source Current	T = +25°C	5	mA
Output Impedance	Normal Operating Conditions	Buffered, low impedance, 2 mA max for source/sink current	-
Enable/Disable		0 to +0.8 disable, +2.5 to 10 enable (default = disable)	VDC

Environmental		All Types	
Operating	Full Load, Max Eout, Case Temp.	+10 to +45	°C
Temperature Coefficient	Over the Specified Temperature	±25 or ±10	ppm/°C
Thermal Shock	Mil-Std-810, Method 504, Class 2	-40 to +65	°C
Storage	Non-Operating, Case Temp.	-55 to +105	°C
Humidity	All Conditions, Standard Package	0 to 95%, non-condensing	-
Altitude	Standard Package, All Conditions	Sea level through 10,000	ft
Shock	Mil-Std-810, Method 516, Proc. 4	20	Gs
Vibration	Mil-Std-810, Method 514, Fig. 514-3	10	Gs

MECHANICAL SPECIFICATIONS

Construction	
Material	Aluminum alloy 5052-H32
Finish	Anodize MIL-A-8625E blue
Size	
Volume	561.9 cc (34.29 in³)
Weight	1.1 kg (2.4 lb)
Tolerance	
Overall	±1.27 mm (0.030")
Pin to Pin	±0.38 mm (0.015")
Mounting Hole Location	±0.64 mm (0.025")
Connections	
D-Sub	15-pin, female
HV Connector	LGH1/2L
HV Return	#6-32 x 0.437 long threaded post



INTERFACE

E Series Input Connector Pinout and Function

Pin	Description	Function
1	Reference Voltage	(+)10.00 V precision reference
2	Voltage Programming -	0 to 10 v to program full output voltage Programming input is differential between pins 2 and 3
3	Voltage Programming +	0 to 10 v to program full output voltage Programming input is differential between pins 2 and 3
4	Voltage Monitor	0 to +10 v represents 0 to full output voltage
5	Voltage Mode Indicator	Open drain active low when in voltage control
6	Signal Ground	Reference all control signals here.
7	Input Power	+23 to +30 V
8	Input Power	+23 to +30 V
9	Power Ground	Input Power Return
10	Power Ground	Input Power Return
11	Enable	TTL high to enable, low to disable, default is OFF
12	Current Monitor	0 to +10 v represents 0 to full output current
13	Current Programming	0 to +10 v sets current from 0 to full rated output current
14	Current Mode Indicator	Open drain active low when in current control
15	Signal Ground	Reference all control signals here.

NOTE: Use stud next to high voltage output connector as HV return. A secure ground connection here is critical to safety and proper operation.

ORDERING INFORMATION

Ordering Information		
Type	0 to 1000 VDC Output	1E
	0 to 2000 VDC Output	2E
	0 to 4000 VDC Output	4E
	0 to 6000 VDC Output	6E
	0 to 10,000 VDC Output	10E
	0 to 15,000 VDC Output	15E
Input	24 V Input	24
Polarity	Positive Output	-P
	Negative Output	-N
Power	4 W Output	4
	15 W Output (10 and 15 kV only)	15
	20 W Output (1 to 6 kV only)	20
	30 W Output	30
Performance		
Level	10 ppm Line/Load Regulation, Stability, and Temp. Coefficient	-10 ppm
	25 ppm Line/Load Regulation, Stability, and Temp. Coefficient	-25 ppm
Connectors	LGH	(Standard)
	5 kV, SHV Type	-SHV-5 kV
	10 kV, BNC Type	-BNC-10 kV

ABOUT ADVANCED ENERGY

Since 1981, UltraVolt® — now part of the Advanced Energy (AE) family — has perfected how power performs for its customers. For both end users and OEMs, AE's comprehensive portfolio of standard and custom high voltage components precisely match system specifications to deliver unparalleled energy, quality, and performance. Through close customer collaboration, design expertise, application insight, and world-class support, AE creates successful partnerships and enables customers to push the boundaries of innovation and stay ahead of evolving market needs.

PRECISION | POWER | PERFORMANCE



CAUTION:
High Voltage

Read and understand all documentation before you install, operate, or maintain Advanced Energy high voltage power supplies. Follow all safety instructions and precautions to protect against property damage and serious or possibly fatal bodily injury. Never defeat safety interlocks or grounds.

Advanced Energy

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