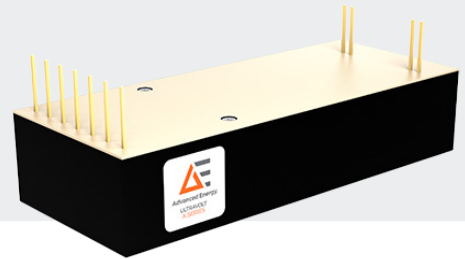


# ULTRAVOLT A SERIES

## HIGH VOLTAGE BIASING SUPPLY



The A Series consists of miniature, PCB-mount, high voltage, regulated DC-DC converters. Designed and built utilizing state-of-the-art power-conversion topology, these units feature surface-mount technology and encapsulation techniques that provide high reliability and performance.

### PRODUCT HIGHLIGHTS

- Eight models from 0 to 62 V through 0 to 6 kV
- 4, 20, or 30 W of output power
- Maximum load capability down to 0 V
- Wide input voltage range
- Available with Ripple Stripper® filter (-F option)
- Indefinite output short-circuit protection
- Output current monitor
- Fixed-frequency, low-stored-energy design
- UL/cUL recognized component; CE Mark (LVD and RoHS)

### TYPICAL APPLICATIONS

- Bias supplies
- Electrostatic detectors
- Mass spectrometers
- Photomultiplier tubes (PMTs)

### AT A GLANCE

#### Output Voltage

Up to 6 kV DC

#### Output Power

4, 20, 30 W

#### Type

Single Output

#### Ripple

To 10 ppm

#### Control

Analog

#### Temperature Coefficient

25 ppm/°C

# ULTRAVOLT A SERIES

## ELECTRICAL SPECIFICATIONS

Parameter	Conditions	Models												Units
<b>Input</b>		<b>12 V</b>						<b>24 V</b>						
Voltage Range	Full Power	+11 to 16						+23 to 30						VDC
Voltage Range	Derated Power Range	+9 to 32						+9 to 32						VDC
Current	Standby / Disable	< 30						< 30						mA
Current	No Load, Max Eout	< 100						< 90						mA
Current	Max Load, Max Eout	~ 400						~ 1350						mA
AC Ripple Current	Nominal Input, Full Load	< 80						< 80						mA p-p
<b>Output</b>		<b>1/16A</b>			<b>1/8A</b>			<b>1/4A</b>			<b>1/2A</b>			
Voltage Range	Nominal Input	0 to 62			0 to 125			0 to 250			0 to 500			VDC
High Voltage Output Accuracy		±2			±2			±2			±2			%Vout
Nominal Input Voltage		12	24	24	12	24	24	12	24	24	12	24	24	VDC
Power	Nominal Input, Max Eout	4	20	30	4	20	30	4	20	30	4	20	30	W
Current	Iout Entire Output Voltage Range	64	320	480	32	160	240	16	80	120	8	40	60	mA
Current Monitor Scaling	Full Load	0.985	3.90	7.40	438.4	1860.5	2891.5	213.3	1000	1481.5	438.4	1860.5	2891.5	mA/V
Voltage Monitor Scaling	With -Y5 option	10:1 ±2% into 10 MΩ						10:1 ±2% into 10 MΩ						-
Ripple	Full Load, Max Eout	0.02	0.03	0.05	0.013	0.015	0.016	0.01	0.04	0.048	0.001	0.02	0.017	%V p-p
Ripple with -F-M Option*	Full Load, Max Eout, 300 pF Bypass Cap	0.002	0.004	0.006	0.0048	0.0056	0.006	0.0052	0.0028	0.005	0.001	0.0138	0.0016	%V p-p
Dynamic Load Regulation	½ to Full Load, Max Eout per 0.1 mA	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12	< 0.12	< 0.20	< 0.20	< 0.20	< 0.50	< 0.50	< 0.50	V pk
Line Regulation	Nom. Input, Max Eout, Full Power	< 0.01 %						< 0.01 %						VDC
Static Load Regulation	No Load to Full Load, Max Eout	< 0.01%						< 0.01%						VDC
Stability	30 Min. warmup, per 8 hr/ Per Day	< 0.01%/< 0.02%						< 0.01%/< 0.02%						VDC

ELECTRICAL SPECIFICATIONS (CONTINUED)

Parameter	Conditions	Models												Units
Output		1A			2A			4A			6A			
Voltage Range	Nominal Input	0 to 1000			0 to 2000			0 to 4000			0 to 6000			VDC
High Voltage Output Accuracy		±2			±2			±2			±2			%Vout
Nominal Input Voltage		12	24	24	12	24	24	12	24	24	12	24	24	VDC
Power	Nominal Input, Max Eout	4	20	30	4	20	30	4	20	30	4	20	30	W
Current	Iout Entire Output Voltage Range	4	20	30	2	10	15	1	5	7.5	0.67	3.3	5	mA
Current Monitor Scaling	Full Load	55.56	243.9	400	31.75	129.9	211.3	16.4	66.7	85.2	12.9	48.5	56.8	mA/V
Voltage Monitor Scaling	With -Y5 option	100:1 ±2% into 10 MΩ						100:1 ±2% into 10 MΩ						-
Ripple	Full Load, Max Eout	0.038	0.071	0.15	0.01	0.05	0.065	0.019	0.057	0.022	0.018	0.073	0.112	%V p-p
Ripple with -F-M Option*	Full Load, Max Eout, 300 pF Bypass Cap	0.001	0.008	0.002	0.007	0.0038	0.004	0.004	0.0088	0.0026	0.003	0.0012	0.004	%V p-p
Dynamic Load Regulation	½ to Full Load, Max Eout per 0.1 mA	< 1.0	< 1.0	< 1.0	< 2.0	< 2.0	< 2.0	< 4.0	< 4.0	< 4.0	< 6.0	< 6.0	< 6.0	V pk
Line Regulation	Nom. Input, Max Eout, Full Power	< 0.01 %						< 0.01 %						VDC
Static Load Regulation	No Load to Full Load, Max Eout	< 0.01%						< 0.01%						VDC
Stability	30 Min. warmup, per 8 hr/ Per Day	< 0.01%/< 0.02%						< 0.01%/< 0.02%						VDC
Programming & Controls		All Types												
Input Impedance	Nominal Input	+ output models 1.1 MΩ to GND, - output models 1.1 MΩ to +5 Vref												MΩ
Adjust Resistance	Typical Potentiometer Values	10 to 100 K (Pot. across Vref. and signal GND, wiper to adjust)												Ω
Adjust Logic	0 to +5 for +Out, +5 to 0 for - Out	+4.64 VDC for +output or +0.36 for -output = nominal Eout												-
Output Voltage & Impedance	T=+25°C	+ 5.00 VDC ± 2%, Zout = 464 Ω ± 1%												-
Enable/Disable		0 to +0.5 disable, +2.4 to 32 enable (default = enable)												VDC

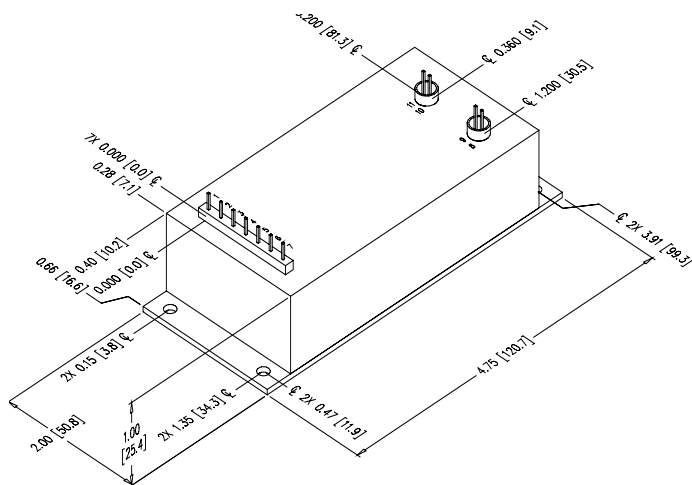
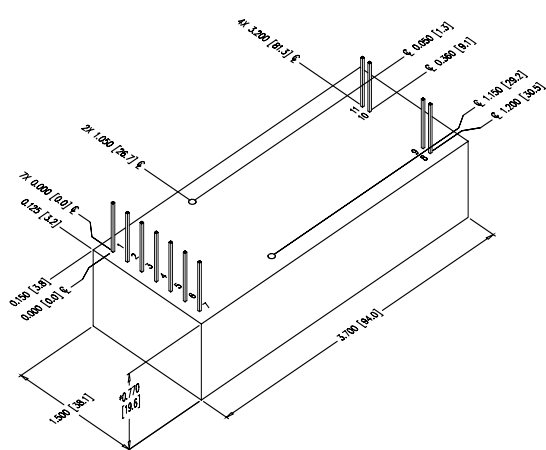
## ULTRAVOLT A SERIES

\* For additional information on the reduced ripple option, see -F Option datasheet.

### ELECTRICAL SPECIFICATIONS (CONTINUED)

Environmental		Standard	-25PPM Option	
Operating	Full Load, Max Eout, Case Temp.	-40 to +65	+10 to +45	°C
Coefficient	Over the Specified Temperature	±50	+25	PPM/°C
Thermal Shock	Mil-Std 810, Method 503-4, Proc. II	-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 vacuum (Vacuum may require -P2 option. Contact factory for details.)		-
Shock	Mil-Std-810, Method 516.5, Proc. IV	20 (standard), 40 (-C option)		Gs
Vibration	Mil-Std-810, Method 514.5, Fig.14.5C-3	10 (standard), 20 (-C option)		Gs

MECHANICAL SPECIFICATIONS FOR STANDARD MODEL



	Volumes and Weights		w/-C Option	
	cm <sup>3</sup>	in <sup>3</sup>	cm <sup>3</sup>	in <sup>3</sup>
Volume	70.5	4.30	131.1	8.00
Weight	g	oz	g	oz
	142	5.0	284	10.0

Construction	
Case	Epoxy-filled DAP box certified to ASTM-D-5948 with -C Option: Aluminum Alloy 5052-H32, Finish: MIL-A-8625 Type II (Anodizing)

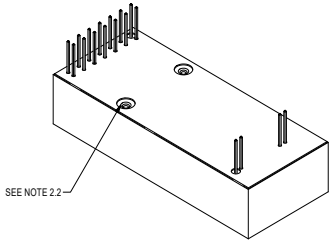
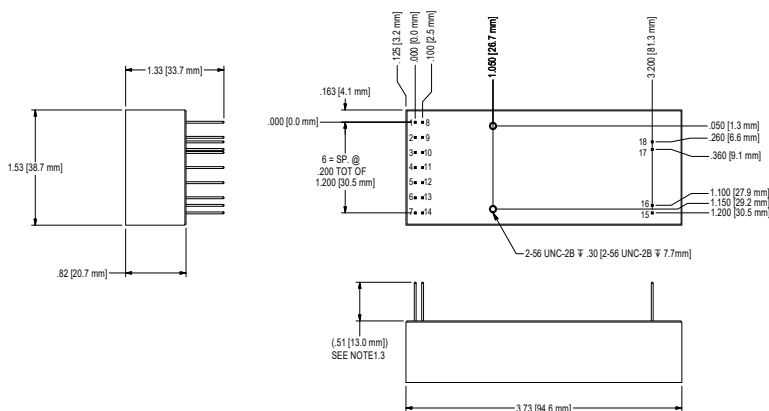
20 W and 30 W versions are an additional 1.57 mm (0.062") in height.  
 -M equipped units are an additional 0.76 mm (0.030") for each dimension.  
 Contact AE for drawings of models equipped with -E or -H options.

Pin Assignment for Standard Model	
Pin	Function
1	Input Power Ground Return
2	Positive Power Input
3	Iout Monitor
4	Enable/Disable
5	Signal Ground Return
6	Remote Adjust Input
7	+5 VDC Reference Output
8	HV Ground Return
9	HV Ground Return or Eout Monitor (-Y5)
10 & 11	HV Output

All grounds joined internally. Power-supply mounting points isolated from internal grounds by > 100 kΩ, 0.01 μF/50 V (Max) on all models except -M (20 W and above), -M-E, -M-C, and -M-H configurations which are 0 Ω. Popular accessories ordered with this product include CONN-KIT and BR-1 mounting bracket kit.

# ULTRAVOLT A SERIES

## MECHANICAL SPECIFICATIONS FOR -I5/I10 MODEL



- NOTES:  
 1- PINS:  
 1.1- MATERIAL: GOLD PLATED 0.025 [0.64mm] SQUARE.  
 1.2- THE CENTER OF THE PINS AND MOUNTING HOLES ARE LOCATED FROM THE CENTER OF PIN 1.  
 1.3- PINS 1 THRU 7 AND 8 THRU 14 SPACING 0.200 [5.08mm] ON CENTER, HEIGHT FROM COVER 0.47 [11.9mm] MIN.  
 1.4- PINS 15,16,17 & 18 SPACING 0.100 [2.54mm] ON CENTER, HEIGHT FROM COVER 0.47 [11.9mm] MIN.  
 2- MOUNTING:  
 2.1- #2-56 X 0.30 [7.62mm] DP UNC-2B THD 2 PLACES.  
 2.2- THREADS MAY NOT BE FLUSH TO COVER.  
 3- CONSTRUCTION:  
 ENCAPSULANT FILLED DAP BOX CERTIFIED TO ASTM-D-5948.  
 4- TOLERANCE:  
 4.1- OVERALL +/-0.050 [1.27mm].  
 4.2- PIN TO PIN +/-0.015 [0.38mm].  
 4.3- MOUNTING HOLE LOCATION +/- 0.025 [0.64mm].  
 \*5- 20 & 30 WATT VERSIONS ARE AN ADDITIONAL 0.062 [1.57mm] IN HEIGHT.

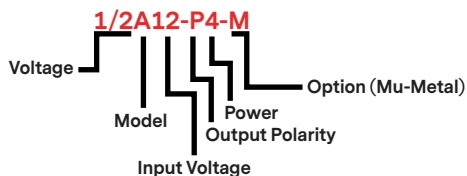
### Pin Assignment for -I5/I10 Model

Pin	Function
1 & 8	Input Power Ground Return
2 & 9	Positive Power Input
3	Iout Monitor
4	Enable/Disable
5	Signal Ground Return
6	Voltage Programming
7	Reference Output
10	No Connection
11	Current Mode Indicator
12	Voltage Mode Indicator
13	Current Programming
14	Vout Monitor
15 & 16	HV Ground Return
17 & 18	HV Output

**ORDERING INFORMATION**

Type	0 to 62 VDC Output	1/16A
	0 to 125 VDC Output	1/8A
	0 to 250 VDC Output	1/4A
	0 to 500 VDC Output	1/2A
	0 to 1000 VDC Output	1A
	0 to 2000 VDC Output	2A
	0 to 4000 VDC Output	4A
	0 to 6000 VDC Output	6A
Input	12 VDC Nominal	12
	24 VDC Nominal	24
Polarity	Positive Output	-P
	Negative Output	-N
Power	Watts Output (12 V Only)	4
	Watts Output (24 V Only)	20
	Watts Output (24 V Only)	30
Case	Plastic Case - Diallyl Phthalate	(Standard)
	'Eared' Chassis Mounting Plate	-E
	RF-Tight Aluminum Case	-C
Heat Sink	0.400" High (Sized to Fit Case)	-H
Ripple Stripper®	Integral Output Filter*	-F
Shield	Six-Sided Mu-Metal Shield	-M
Voltage Monitor	Optional Eout Monitor	-Y5
lout Monitor Boost	Boosted lout Monitor Signal Level	-Y10
Temp. Coefficient	25 PPM Temperature Coefficient	-25PPM
Enhanced Interface	5 V Control and Monitors	-I5
	10 V Control and Monitors (24 Vin only)	-I10
Option	Flying Lead for HV Output	-W
	Shielded Flying Lead for HV Output	-WS

\* For additional information on the reduced ripple option, see -F Option datasheet.





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## ABOUT ADVANCED ENERGY

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