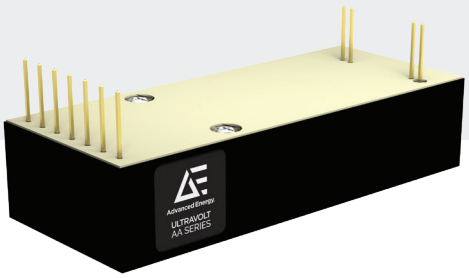
ULTRAVOLT AA SERIES

HIGH VOLTAGE BIASING SUPPLIES



The UltraVolt® AA series consists of high voltage, miniature PCB-mount, 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

- 22% smaller than standard A series
- Eight models from 0 to 62 V through 0 to 6 kV
- 4, 20, or 30 W of output power
- Maximum Iout capability down to 0 V
- Wide input voltage range
- Indefinite output short circuit protection
- Output current and voltage monitors
- Fixed-frequency, low-stored-energy design
- UL/cUL recognized component; CE mark (LVD and RoHS)

TYPICAL APPLICATIONS

- Bias supplies
- Detectors
- Piezos
- Amplifiers
- Photomultiplier tubes (PMT)

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ELECTRICAL SPECIFICATIONS

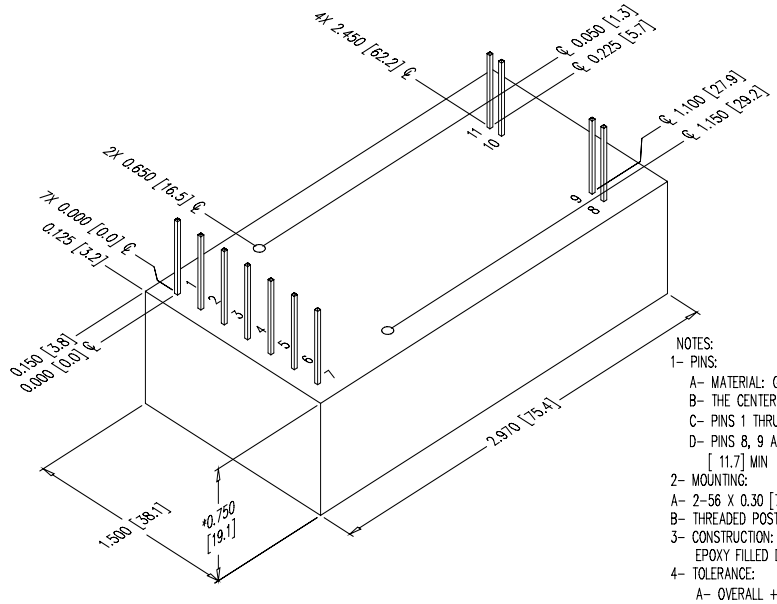
Parameter	Conditions	Models												Units
Input		**12 V**						**24 V**						
Voltage Range	Full Power	+11 to 16						+23 to 30						VDC
Voltage Range	Derated Power Range	+9 to 32						+9 to 32						VDC
Current	Standby/Disable	< 30						< 30						mA
Current	No Load, Max Eout	< 100 (4 W)						150 (20 and 30 W)						mA
Current	Max Load, Max Eout	< 450 (4 W)						< 1000 (20 W) < 1500 (30 W)						mA
AC Ripple Current	Nominal Input, Full Load	< 80						< 80						mA pk to pk
Output		**1/16AA**			**1/8AA**			**1/4AA**			**1/2AA**			
Voltage Range	Nominal Input	0 to 62			0 to 125			0 to 250			0 to 500			VDC
Nominal Input Voltage/Model		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 Scale Factor	Full Load	42.67	969.7	960	11.64	237	258	3.27	70.48	72.7	0.79	17.78	17.65	mA/V
Voltage Monitor Scaling		10:1 ±2% into 10 MΩ												-
Ripple	Full Load, Max Eout	0.03	0.06	0.15	0.03	0.038	0.038	0.023	0.04	0.05	0.01	0.01	0.011	%V pk to pk
Line Regulation	Nom. Input, Max Eout, Full Power	< 0.01%												VDC
Static Load Regulation	No Load to Full Load, Max Eout	< 0.01%												VDC
Stability	30 Min Warmup, Per 8 h, Per Day	< 0.01%/< 0.02%												VDC

ELECTRICAL SPECIFICATIONS (CONTINUED)

Parameter	Conditions	Models												Units
Output		1AA			2AA			4AA			6AA			
Voltage Range	Nominal Input	0 to 1000			0 to 2000			0 to 4000			0 to 6000			VDC
Nominal Input Voltage/Model		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 Scale Factor	Full Load	0.37	4.60	4.62	0.192	1.52	1.52	0.090	0.752	0.76	0.066	0.490	0.50	mA/V
Voltage Monitor Scaling		100:1 ±2% into 10 MΩ												-
Ripple	Full Load, Max Eout	0.026	0.048	0.073	0.01	0.011	0.046	0.042	0.050	0.070	0.035	0.024	0.046	%V pk to pk
Line Regulation	Nom. Input, Max Eout, Full Power	< 0.01%												VDC
Static Load Regulation	No Load to Full Load, Max Eout	< 0.01%												VDC
Stability	30 Min Warmup, Per 8 h, Per Day	< 0.01%/< 0.02%												VDC
Programming and Controls		**All Types**												
Input Impedance	Nominal Input	+output models 1.1 MΩ to ground, - output models 1.1 MΩ to +5 vRef.												MΩ
Adjust Resistance	Typical Potentiometer Values	10 to 100 K (potentiometer across vRef. and signal ground, 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 and 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

Environmental		All Types	
Operating	Full Load, Max Eout, Case Temperature	-40 to +65	°C
Coefficient	Over the Specified Temperature	±50 (±25 optional)	PPM/°C
Thermal Shock	Mil-Std 810, Method 503-4, Proc. II	-40 to +65	°C
Storage	Non-Operating, Case Temperature	-55 to +105	°C
Humidity	All Conditions, Standard Package	0 to 95%, non-condensing	-
Altitude	Standard Package, All Conditions	Sea level through vacuum	-
Shock	Mil-Std-810, Method 516.5, Proc. IV	20	Gs
Vibration	Mil-Std-810, Method 514.5, Fig.514.5C-3	10	Gs

MECHANICAL SPECIFICATIONS



NOTES:
1– PINS:
A– MATERIAL: GOLD PLATED 0.025 [0.64] SQ.
B– THE CENTER OF THE PINS AND MOUNTING HOLES ARE LOCATED FROM THE CENTER OF PIN 1
C– PINS 1 THRU 7 SPACING 0.200 [5.08] ON CENTER, HEIGHT FROM COVER 0.470 [11.7] MIN.
D– PINS 8, 9 AND 10, 11 SPACING 0.100 [2.54] ON CENTER, HEIGHT FROM COVER .0.470 [11.7] MIN
2– MOUNTING:
A– 2–56 X 0.30 [7.62] DP UNC–2B THD 2 PLACES.
B– THREADED POST MAY NOT BE FLUSH TO COVER.
3– CONSTRUCTION:
EPOXY FILLED DAP BOX CERTIFIED TO ASTM–D–5948
4– TOLERANCE:
A– OVERALL +/–0.050 [1.27]
B– PIN TO PIN +/–0.015 [0.38]
C– MOUNTING HOLE LOCATION +/– 0.025 [0.64]
*5– 20 & 30 WATT VERSIONS ARE AN ADDITIONAL 0.062 [1.57] IN HEIGHT.
*6– –M EQUIPPED UNITS ARE AN ADDITIONAL 0.030 [0.76] IN HEIGHT.

Unit: in [mm]

Volumes and Weights		
	cm³	in³
Volume	54.8	3.34
	g	oz
Weight	114	4.0

Tolerance	
Overall	±1.27 mm (0.050")
Pin to Pin	±0.38 mm (0.015")
Mounting Hole Location	±0.64 mm (0.025")

Construction	
Case	RTV silicone-filled DAP box certified to ASTM-D-5948

20 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 all dimensions.

Contact AE for drawings of models equipped with -E or -H options.

INTERFACE

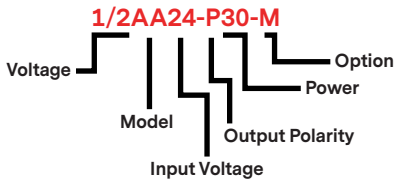
Connections	
Pin	**Function**
1	Input-Power Ground Return
2	Positive Power Input
3	Iout Monitor
4	Enable/Disable
5	Signal Ground Return
6	Remote Adjust Input
7	+5 VDC Reference Output
8	HV Ground Return
9	Eout Monitor
10 and 11	HV Output

All grounds joined internally. Power-supply mounting points isolated from internal grounds by > 100 kΩ, 0.01 uF/50 V (max) on all models except -M (20 W and above), -M-E, and -M-H configurations, which are 0 Ω.

ORDERING INFORMATION

Options		
Type	0 to 62 VDC Output	1/16AA
	0 to 125 VDC Output	1/8AA
	0 to 250 VDC Output	1/4AA
	0 to 500 VDC Output	1/2AA
	0 to 1000 VDC Output	1AA
	0 to 2000 VDC Output	2AA
	0 to 4000 VDC Output	4AA
	0 to 6000 VDC Output	6AA
Input	12 VDC Nominal	12
	24 VDC Nominal	24
Polarity	Positive Output	-P
	Negative Output	-N
Power	W Output (12 V Only)	4
	W Output (24 V Only)	20
	W Output (24 V Only)	30
Case	Plastic Case: - Diallyl Phthalate	(Standard)
	"Eared" Chassis Mounting Plate	-E
Heat Sink	0.500" High (Sized to Fit Case)	-H
Shield	Six-sided Mu-Metal Shield	-M
Temperature Coefficient	25 PPM Temperature Coefficient	-25 PPM
Enhanced Interface	5 V Control and Monitors	-I5
	10 V Control and Monitors (24 Vin Only)	-I10

For more information on the enhanced interface options, download the I5/I10 option datasheet.



Popular accessories ordered with this product include CONN-KIT and BR-18 mounting bracket kit.

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.

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