ULTRAVOLT AEQ SERIES

ULTRA-MINIATURE HIGH VOLTAGE POWER CONVERTERS-02

The UltraVolt© AEQ series of ultra-miniature UL approved isolated single or dual output DC to DC converters supply up to 600 VDC at 0.5 or 1.25 Watts of output power from an input voltage of +5 or +12 VDC. The small size of the units and ease of control make the AEQ series optimal for hand-held devices, portable equipment, and other small high-voltage projects.

PRODUCT HIGHLIGHTS

- Ultra-miniature size (0.5" cube)
- Adjustable 0 to ±300 VDC (dual polarity units with CT), 0 to 600 VDC (floating/reversible units)
- +5 or +12 VDC input
- Output fully adjustable over 0 VDC to maximum rating
- ±1500 VDC @ 0.5 W, ±1750 VDC @ 1.25 W input to output isolation
- Output short-circuit protection
- 0.5 or 1.25 W maximum output power
- Low ripple

  (<1% peak to peak @ 0.5 W, <2% peak to peak @ extended models)
- Temperature coefficient of 500ppm/°C
- Ease of installation with PCB mount
- Reliable modular design, > 3,000,000 hours MTBF per Bellcore TR332
- UL/cUL recognized, CE mark (LVD and RoHS), EN-62368

TYPICAL APPLICATIONS

- Mass spectrometry
- Gas chromatography
- Spectrometers
- PZT drivers
- Flat-panel displays
- Fiber-optic telecom detectors
- Particle physics detectors
- Laser range finder detectors
- Silicon (SiD) detectors
- Ionization chamber detectors
- Avalanche photo diodes (APD)
- Photo multiplier tubes (PMT)
- Photodiodes (PD)
- Multi-pixel photon counters (MPPC)
- Channel electron multipliers
- Silicon photomultipliers (SiPM)
- Microchannel plates (MCP)
- Biasing supplies

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ELECTRICAL SPECIFICATIONS

Parameters	Specifications	
Input Voltage	+5 VDC (±1% recommended)	+12 VDC (±1% recommended)
Input Current Disabled	<3 mA	<10 mA
Input Current at No Load	<150 mA (Module in safe operating region)	
Input Current at Full Load	<250 mA (0.5 W models, normal operating conditions), <450 mA (1.25 W models, normal operating conditions)	
HV Output Range (Vout)	0 to 600 VDC	
HV Turn On	0.08 to 0.55 VDC (Control Pin)	
Output Power	0 to 0.5 W, 0 to 1.25 W (Extended models)	
Polarity	Fixed positive or negative	
HV Setting	Via external source 0 to 5 VDC (±1% recommended)	
Max Output Current (Iout)	See Model Table	
Load Voltage Regulation	30%	
Output Voltage Ripple	≤1% peak to peak (0.5 W models), ≤2% peak to peak (1.25 W models)	
Output Voltage Tolerance	10% (At maximum Vout, full load)	
Temperature Coefficient	200 PPM/°C @ 25°C, 500 PPM/°C when swept from -25 to 70°C, -30 to 70°C (Extended models)	
Regulation	Unregulated, output is proportional to Vcontrol pin	
Short Circuit Protection	2 minutes max (see note 5)	
Mean Time Between Failure	>3 Mhrs (Per Bellcore TR332)	

Note 1 - All specifications are after a 30-minute warm-up at full load at 25°C unless otherwise noted.
Note 2 - Maximum output load is available at the maximum rated output voltage, the load derates linearly as control pin voltage is decreased.
Note 3 - The AEQ output voltage is load dependent, under light load conditions it may be necessary to adjust the control pin, so the maximum rated output voltage is not exceeded.
Note 4 - Good thermal management techniques must be used to maintain the maximum case temperature when operating the AEQ at maximum load.
Note 5 - For further information please see AEQ Application Note: https://www.advancedenergy.com/globalassets/non-resource-library-assets/en-hv-aeq-app-note.pdf

ENVIRONMENTAL SPECIFICATIONS

Parameters	Specifications
Operation Case Temperature	-30 to +70 °C, case temperature
Storage Temperature	-55 to +105 °C
Humidity	5 to 95%, non-condensing
Cooling	Conduction/Convection (Case temperature must be maintained within specified limits)
Operating Altitude	≤2000 meters

GENERAL SPECIFICATIONS

Parameters	Specifications
Input to Output Isolation	±1500 VDC, ±1750 VDC (Extended models) , input pins to output pins
Construction	Solid vacuum encapsulation
RoHS	RoHS 2 and 3 Directive (2011/65/EU)
IP Protection class	IPX0 (Solid vacuum encapsulation with gold plated pins)
Weight	4.0±0.5 g
Warranty	1 year

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REGULATORY

Regulatory	
Certifications	UL/cUL recognized, IEC/EN 62368-1 CE Mark, LVD 2014/35/EU and RoHS 2011/65/EC, amended by (EU) 2015/863

MODEL TABLE

Item#	Model Number	Description	Input	Output	Output Power (W)
1	AEQ5-100FL0.5	Floating / Reversible	5.0 V (<250 mA)	100 V (5.00 mA)	0.5
2	AEQ5-200FL0.5	Floating / Reversible	5.0 V (<250 mA)	200 V (2.5 mA)	0.5
3	AEQ5-300FL0.5	Floating / Reversible	5.0 V (<250 mA)	300 V (1.67 mA)	0.5
4	AEQ5-400FL0.5	Floating / Reversible	5.0 V (<250 mA)	400 V (1.25 mA)	0.5
5	AEQ5-500FL0.5	Floating / Reversible	5.0 V (<250 mA)	500 V (1.00 mA)	0.5
6	AEQ5-600FL0.5	Floating / Reversible	5.0 V (<250 mA)	600 V (0.833 mA)	0.5
7	AEQ5-50BP0.5	Dual polarity with CT	5.0 V (<250 mA)	±50 V (5.00 mA)	0.5
8	AEQ5-100BP0.5	Dual polarity with CT	5.0 V (<250 mA)	±100 V (2.5 mA)	0.5
9	AEQ5-150BP0.5	Dual polarity with CT	5.0 V (<250 mA)	±150 V (1.67 mA)	0.5
10	AEQ5-200BP0.5	Dual polarity with CT	5.0 V (<250 mA)	±200 V (1.25 mA)	0.5
11	AEQ5-250BP0.5	Dual polarity with CT	5.0 V (<250 mA)	±250 V (1.00 mA)	0.5
12	AEQ5-300BP0.5	Dual polarity with CT	5.0 V (<250 mA)	±300 V (0.833 mA)	0.5

Extended Model Table

Item#	Model Number	Description	Input	Output	Output Power (W)
1	AEQ5-100FL1.25	Floating / Reversible	5.0 V (<450 mA)	100 V (12.50 mA)	1.25
2	AEQ5-200FL1.25	Floating / Reversible	5.0 V (<450 mA)	200 V (6.25 mA)	1.25
3	AEQ5-300FL1.25	Floating / Reversible	5.0 V (<450 mA)	300 V (4.16 mA)	1.25
4	AEQ5-400FL1.25	Floating / Reversible	5.0 V (<450 mA)	400 V (3.12 mA)	1.25
5	AEQ5-500FL1.25	Floating / Reversible	5.0 V (<450 mA)	500 V (2.50 mA)	1.25
6	AEQ5-600FL1.25	Floating / Reversible	5.0 V (<450 mA)	600 V (2.08 mA)	1.25
7	AEQ5-50BP1.25	Dual polarity with CT	5.0 V (<450 mA)	±50 V (12.25 mA)	1.25
8	AEQ5-100BP1.25	Dual polarity with CT	5.0 V (<450 mA)	±100 V (6.25 mA)	1.25
9	AEQ5-150BP1.25	Dual polarity with CT	5.0 V (<450 mA)	±150 V (4.16 mA)	1.25
10	AEQ5-200BP1.25	Dual polarity with CT	5.0 V (<450 mA)	±200 V (3.12 mA)	1.25
11	AEQ5-250BP1.25	Dual polarity with CT	5.0 V (<450 mA)	±250 V (2.50 mA)	1.25
12	AEQ5-300BP1.25	Dual polarity with CT	5.0 V (<450 mA)	±300 V (2.08 mA)	1.25

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MODEL TABLE

Extended Model Table

Item#	Model Number	Description	Input	Output	Output Power (W)
1	AEQ12-100FL0.5	Floating / Reversible	12.0 V (<250 mA)	100 V (5.00 mA)	0.5
2	AEQ12-200FL0.5	Floating / Reversible	12.0 V (<250 mA)	200 V (2.5 mA)	0.5
3	AEQ12-300FL0.5	Floating / Reversible	12.0 V (<250 mA)	300 V (1.67 mA)	0.5
4	AEQ12-400FL0.5	Floating / Reversible	12.0 V (<250 mA)	400 V (1.25 mA)	0.5
5	AEQ12-500FL0.5	Floating / Reversible	12.0 V (<250 mA)	500 V (1.00 mA)	0.5
6	AEQ12-600FL0.5	Floating / Reversible	12.0 V (<250 mA)	600 V (0.833 mA)	0.5
7	AEQ12-50BP0.5	Dual polarity with CT	12.0 V (<250 mA)	±50 V (5.00 mA)	0.5
8	AEQ12-100BP0.5	Dual polarity with CT	12.0 V (<250 mA)	±100 V (2.5 mA)	0.5
9	AEQ12-150BP0.5	Dual polarity with CT	12.0 V (<250 mA)	±150 V (1.67 mA)	0.5
10	AEQ12-200BP0.5	Dual polarity with CT	12.0 V (<250 mA)	±200 V (1.25 mA)	0.5
11	AEQ12-250BP0.5	Dual polarity with CT	12.0 V (<250 mA)	±250 V (1.00 mA)	0.5
12	AEQ12-300BP0.5	Dual polarity with CT	12.0 V (<250 mA)	±300 V (0.833 mA)	0.5

Extended Model Table

Item#	Model Number	Description	Input	Output	Output Power (W)
1	AEQ12-100FL1.25	Floating / Reversible	12.0 V (<450 mA)	100 V (12.50 mA)	1.25
2	AEQ12-200FL1.25	Floating / Reversible	12.0 V (<450 mA)	200 V (6.25 mA)	1.25
3	AEQ12-300FL1.25	Floating / Reversible	12.0 V (<450 mA)	300 V (4.16 mA)	1.25
4	AEQ12-400FL1.25	Floating / Reversible	12.0 V (<450 mA)	400 V (3.12 mA)	1.25
5	AEQ12-500FL1.25	Floating / Reversible	12.0 V (<450 mA)	500 V (2.50 mA)	1.25
6	AEQ12-600FL1.25	Floating / Reversible	12.0 V (<450 mA)	600 V (2.08 mA)	1.25
7	AEQ12-50BP1.25	Dual polarity with CT	12.0 V (<450 mA)	±50 V (12.25 mA)	1.25
8	AEQ12-100BP1.25	Dual polarity with CT	12.0 V (<450 mA)	±100 V (6.25 mA)	1.25
9	AEQ12-150BP1.25	Dual polarity with CT	12.0 V (<450 mA)	±150 V (4.16 mA)	1.25
10	AEQ12-200BP1.25	Dual polarity with CT	12.0 V (<450 mA)	±200 V (3.12 mA)	1.25
11	AEQ12-250BP1.25	Dual polarity with CT	12.0 V (<450 mA)	±250 V (2.50 mA)	1.25
12	AEQ12-300BP1.25	Dual polarity with CT	12.0 V (<450 mA)	±300 V (2.08 mA)	1.25

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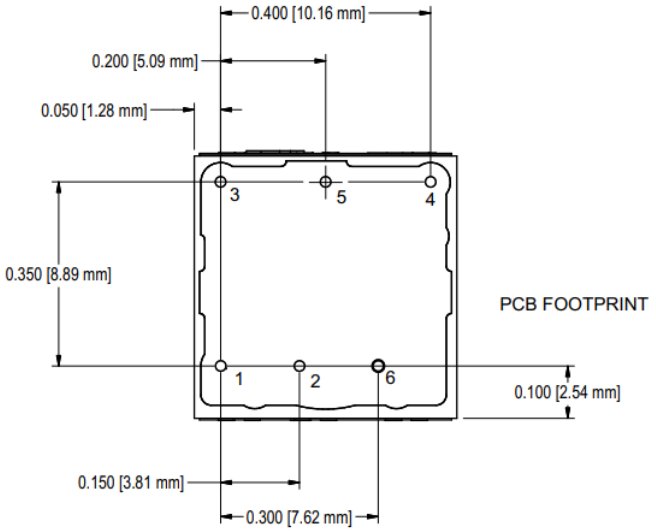
MECHANICAL SPECIFICATIONS

PIN ASSIGNMENT	
PIN 1	Input (-)
PIN 2	Input (+)
PIN 3	Output (+)
PIN 4	Output (-)
PIN 5	Center Tap
PIN 6	Control Pin



RECOMMENDED HOLES AND PAD SIZE

HOLES Ø.043 (1.09mm) PAD Ø.063 (1.65mm)

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ABOUT ADVANCED ENERGY

Since 1981, Advanced Energy (AE) 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 | TRUST

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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