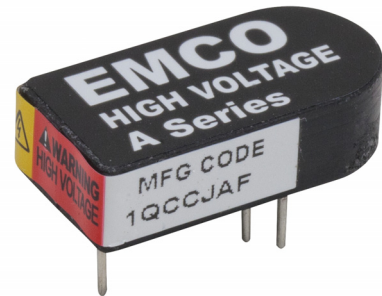


0.1kV - 6kV; 1W, 1.5W ULTRA-MINIATURE, I/O PROPORTIONAL HIGH VOLTAGE POWER SUPPLIES

EMCO HIGH VOLTAGE CORPORATION

- Proportional Input/Output
- Extremely Low Profile and Small Volume
- Low Noise Quasi-sinewave Oscillator
- Control Pin
- Low Leakage Current
- Low Input/Output Capacitance
- Input to Output Galvanic Isolation
- Short Circuit Protection, 1 Minute Minimum
- No Minimum Load Required
- No External Components Required
- Three Standard Input Voltage Ranges
- Designed to meet RoHS and REACH Directives
- MTBF > 1,862,000 hours, per Belcore TR 332



■ APPLICATIONS

- Avalanche Photodiodes
- Capacitor Charging
- Electrophoresis
- Photomultiplier Tubes
- Piezo Devices
- Mass Spectrometry

ISO 9001:2008
CERTIFIED

RoHS
COMPLIANT

IPC
Certified J-STD-001
Application Specialist

The A / AH Series is a new line of ultra-miniature, HV DC/DC converters that set an industry standard in high voltage miniaturization. This unique package occupies less than one tenth of a cubic inch of volume, and features an extremely low profile of only 0.250 inches (6.35mm)! Controllable output voltages range from 100 V to 6000 V. These component-sized converters are ideal for applications requiring minimal size and weight.

Turn-on voltage is very low at less than 0.7 V, allowing for wide output voltage operating range. Use of a resonant, quasi-sinewave oscillator and fully shielded transformer result in clean, reliable high voltage conversion with inherently low ripple, EMI/RFI and input ripple current, making this product ideal for integration into noise sensitive equipment.

A separate high impedance control pin is standard and is designed for external error amplifier and/or DAC control in closed or open loop systems. Or simply connect the control pin to the + input for proportional input to output operation (see schematic and performance charts below).

No external components or minimum load are required. A proprietary encapsulation process and custom 94V0 compliant, high performance formula are used to achieve excellent high voltage and thermal properties.

Isolation is +/- 500 V bias on the output return. Input to output leakage current is very low at less than 100 nA and coupling capacitance is also low at <250 pF.

Output Voltage [VDC]	1 W Models - A Series			1.5 W Models - AH Series		
	Positive Output Model	Negative Output Model	Max. Output Current *1 [mA]	Positive Output Model	Negative Output Model	Max. Output Current *1 [mA]
0 - 100	A01P-*2	A01N-*2	10	AH01P-12 AH01P-24	AH01N-12 AH01N-24	15
0 - 200	A02P-*2	A02N-*2	5	AH02P-*2	AH02N-*2	7.5
0 - 250	A025P-*2	A025N-*2	4	AH025P-*2	AH025N-*2	6
0 - 300	A03P-*2	A03N-*2	3.33	AH03P-*2	AH03N-*2	5
0 - 400	A04P-*2	A04N-*2	2.5	AH04P-*2	AH04N-*2	3.75
0 - 500	A05P-*2	A05N-*2	2	AH05P-*2	AH05N-*2	3
0 - 600	A06P-*2	A06N-*2	1.67	AH06P-*2	AH06N-*2	2.5
0 - 700	A07P-*2	A07N-*2	1.43	AH07P-*2	AH07N-*2	2.15
0 - 800	A08P-*2	A08N-*2	1.25	AH08P-*2	AH08N-*2	1.87
0 - 900	A09P-*2	A09N-*2	1.1	AH09P-*2	AH09N-*2	1.67
0 - 1 000	A10P-*2	A10N-*2	1	AH10P-*2	AH10N-*2	1.5
0 - 1 200	A12P-*2	A12N-*2	0.83	AH12P-*2	AH12N-*2	1.25
0 - 1 500	A15P-*2	A15N-*2	0.67	AH15P-*2	AH15N-*2	1
0 - 2 000	A20P-*2	A20N-*2	0.5	AH20P-*2	AH20N-*2	0.75

Output Voltage [VDC]	1 W Models - A Series			1.5 W Models - AH Series		
	Positive Output Model	Negative Output Model	Max. Output Current *1 [mA]	Positive Output Model	Negative Output Model	Max. Output Current *1 [mA]
0 - 3 000	A30P-*2	A30N-*2	0.33	AH30P-*2	AH30N-*2	0.5
0 - 4 000	A40P-5	A40N-5	0.25			
0 - 5 000	A50P-5	A50N-5	0.2			
0 - 6 000	A60P-5	A60N-5	0.17	AH60P-5	AH60N-5	0.25

*1 At maximum rated output voltage.

*2 Input voltage range designator: "5", "12" or "24" for 0 - 5 V_{DC}, 0 - 12 V_{DC} or 0 - 24 V_{DC} respectively; available for models up to 3kV - eg. A30N-12

SPECIFICATIONS

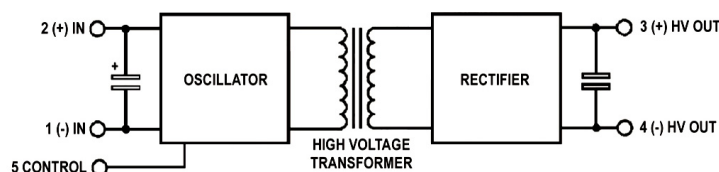
Turn-On Voltage:	< 0.7 V _{DC}
Isolation:	< ±500 V bias on pin 4
Output Voltage Tolerance:	+10%/-10% at full load, max. input voltage
Ripple	- A Series: 1% _{p-p} max (5% for A01) - AH Series: 2% _{p-p} max (3% for AH02)
Input/Output Coupling Capacitance:	< 250 pF typ.
Input/Output Leakage Current:	< 50 nA typ.
Control Pin Voltage:	0 to max. input voltage
Internal Oscillator Frequency:	50 kHz - 350 kHz
Standard Temperature Ranges:	Operating: A/AH01 to A/AH60: -25°C - +75°C (case) Storage: A/AH01 to A/AH60: -55°C - +105°C
Extended Temperature Ranges (Option T):	Operating: A01 to A60: -55°C - +85°C (case) Storage: A01 to A60: -55°C - +105°C
Input Current:	

Input Voltage	A Series		AH Series	
	No-Load	Full-Load	No-Load	Full-Load
5 V _{DC}	< 200 mA	< 470 mA	< 300 mA	< 600 mA
12 V _{DC}	< 100 mA	< 185 mA	< 125 mA	< 250 mA
24 V _{DC}	< 25 mA	< 75 mA	< 40 mA	< 120 mA

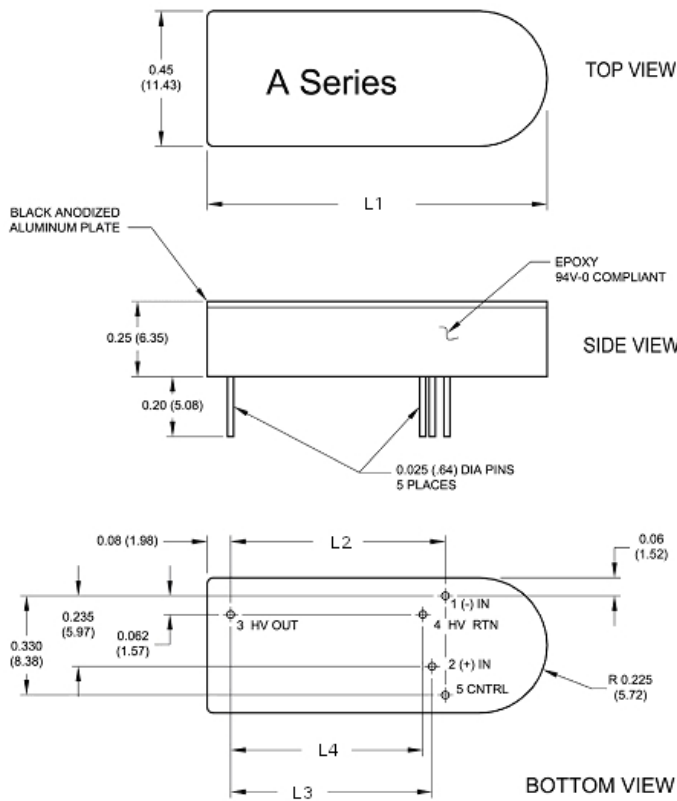
Dimensions (LxWxH)	- A/AH01 to A/AH20:	0.92 (23.4) x 0.45 (11.4) x 0.25 (6.4) inch ³ (mm ³)
	- A/AH30 to A/AH50:	1.13 (28.7) x 0.45 (11.4) x 0.25 (6.4) inch ³ (mm ³)
	- A/AH60:	1.33 (33.8) x 0.45 (11.4) x 0.25 (6.4) inch ³ (mm ³)
Weight	- A/AH01 to A/AH20:	< 0.20 oz (5.7 g)
	- A/AH30 to A/AH50:	< 0.25 oz (7.1 g)
	- A/AH60:	< 0.30 oz (8.5 g)

- Specifications after 30 minutes warm-up, full load, at 25°C unless otherwise indicated.
- Output Voltage is load dependent. Under light or no-load conditions, reduce the Input Voltage so maximum rated Output Voltage is not exceeded.
- Ripple may be reduced substantially by the addition of an external RC filter.

BLOCK DIAGRAM (OUTPUT POSITIVE)



DIMENSIONS

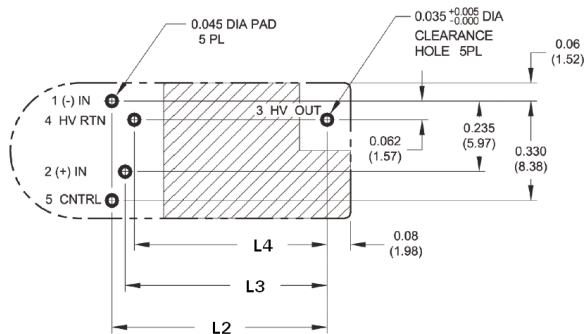


	A01 - A20 AH01 - AH20	A30 - A50 AH30 - AH50	A60 AH60
L1	0.92 (23.37)	1.13 (28.65)	1.33 (33.78)
L2	0.504 (12.8)	0.713 (18.11)	0.918 (23.32)
L3	0.460 (11.68)	0.669 (16.99)	0.874 (22.20)
L4	0.430 (10.92)	0.639 (16.23)	0.844 (21.44)

Dimensions are in inches (metric equivalents in parenthesis)

Dimensional Tolerances: .xx ±.02 (0.51mm)
.xxx ±.005 (0.13mm)

RECOMMENDED LAYOUT



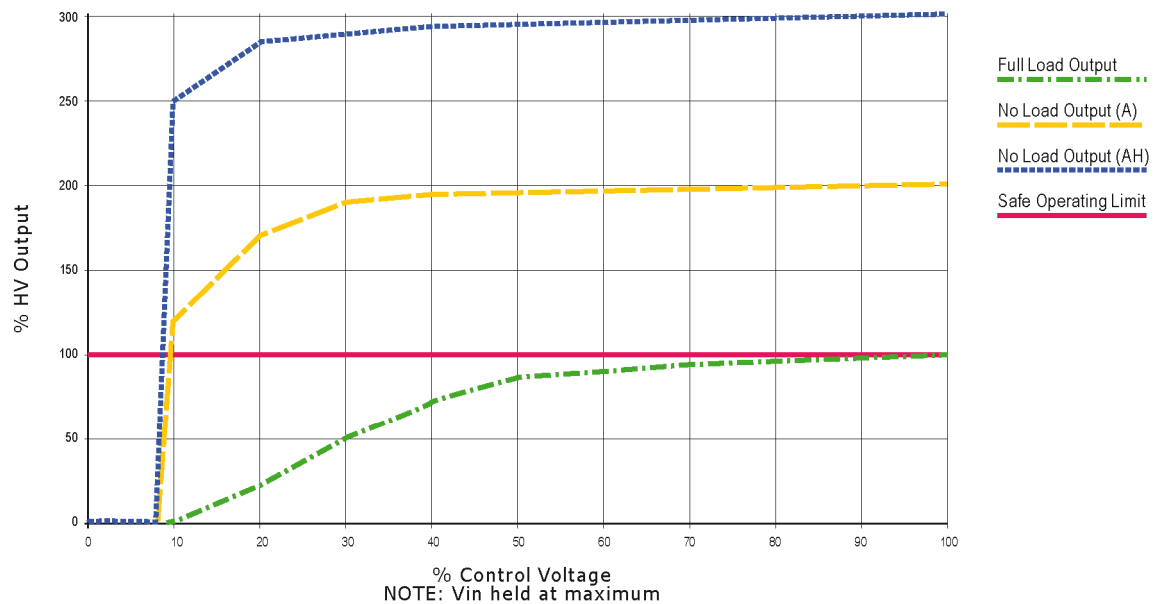
NOTE: No traces to be routed within the shaded area on the component side of the PWB.

PIN FUNCTION DESCRIPTIONS

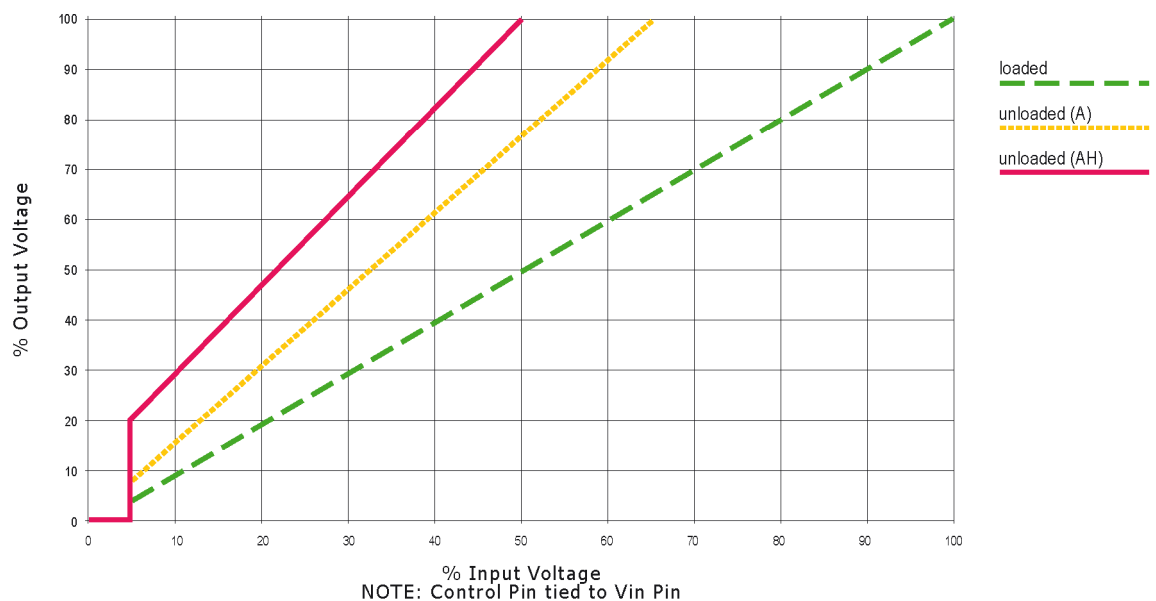
Pin No.	Function
1	(-) Input
2	(+) Input
3	HV Output
4	HV Return
5	Control

CHARACTERISTICS

Typical HV Output vs. Control Voltage



Typical Input vs. Output Voltage



OPTIONS

- T** Extended Operating Temperature - A Series only
(add **T** to model number, e.g. A09N-12T)

Alternate input / output voltages available.