E series

XP Power

3W Convection cooled

DC-HVDC converter

The E Series is a broad line of small, component level high voltage converters in a PCB mount package that provides up 3 Watts continuous output power for models up to 7kV (2 Watts for models >7kV). These DC-HVDC converters feature low ripple and noise, and low EMI/ RFI by utilizing a quasi-sinewave oscillator, excellent filtering techniques and a fully enclosed pot-core transformer. The output voltage is directly proportional to the input voltage and is linear from approximately 0.7 volts to maximum input

The galvanically isolated output allows for user selectable output polarity. Dual output models with a center-tap pin provide both positive and negative outputs from one module. Some models are provided with an external aluminum box for increased EMI/RFI shielding and rugged mounting. Proven design techniques, classic topology and custom encapsulation formula come together to provide engineers with a clean, reliable, low cost, and easy to integrate high voltage solution.



Features

- Output voltages 100VDC to 7kVDC (3W), & 8kVDC to 12kVDC (2W)
- Isolated output voltage proportional to input voltage
- General purpose, cost effective
- Low turn on voltage: <0.7VDC
- Positive or negative, reversible polarity
- Input voltage 0 to 12VDC, or 0 to 15VDC
- Very low I/O leakage current
- Low noise, quasi-sinewave resonant oscillator
- MTBF>2Mhrs
- 3 year warranty

Applications

- Mass spectrometry
- Electrostatic chucks
- Electrophoresis
- Capacitor charging
- Particle counter
- Ignition/Spark
- Sustaining ion pumps

Dimensions

63.5 x 38.1 x 21.6 mm (2.50" x 1.50" x 0.85")

Documentation

For further information click the link or scan the code

→ xppower.com

Models & ratings

Model number	Output voltage[6]	Output current[5]	Input voltage	Ripple[7]
E01	0 to 100VDC	30mA	0 to 12VDC	<0.2%
E02	0 to 200VDC	15mA	0 to 12VDC	<0.25%
E03	0 to 300VDC	10mA	0 to 12VDC	<1%

Continued on page 2

Notes:

1. All orderable part numbers are listed above.
2. CT indicates dual output, center tap. Negative side will be ~10% larger than positive side w.r.t. the center tap pin.
3. AB suffix indicates external shield, see Mechanicals.
4. R suffix is used as a RoHS indicator for legacy models.
5. Maximum rated output current is available at maximum rated output voltage and derates linearly as input voltage is decreased.
6. Output voltage is load dependent. Under light or no-load conditions, reduce the input voltage so maximum rated output voltage is not exceeded.
7. Specifications after 30 minute warm-up, full load, at +25°C unless otherwise indicated.
8. Ripple specification for center-tapped units applies to the voltage between the positive and negative output terminals.

Models & ratings

Model number	Output voltage[6]	Output current[5]	Input voltage	Ripple[7]
E03CTR[2,4,8]	0 to ±150VDC	10mA	0 to 12VDC	<1%
E05	0 to 500VDC	6mA	0 to 12VDC	<0.1%
E06	0 to 600VDC	5mA	0 to 12VDC	<0.1%
E06CT[2,8]	0 to ±300VDC	5mA	0 to 12VDC	<0.1%
E06CTAB[2,3,8]	0 to ±300VDC	5mA	0 to 12VDC	<0.1%
E08	0 to 800VDC	3.7mA	0 to 12VDC	<0.1%
E10	0 to 1kVDC	3mA	0 to 12VDC	<0.05%
E10CT[2,8]	0 to ±500VDC	3mA	0 to 12VDC	<0.05%
E12R[4]	0 to 1.2kVDC	2.5mA	0 to 12VDC	<0.05%
E15	0 to 1.5kVDC	2mA	0 to 12VDC	<0.05%
E20	0 to 2kVDC	1.5mA	0 to 12VDC	<0.25%
E30	0 to 3kVDC	1mA	0 to 15VDC	<0.25%
E40	0 to 4kVDC	0.75mA	0 to 15VDC	<0.5%
E50	0 to 5kVDC	0.6mA	0 to 15VDC	<0.5%
E60	0 to 6kVDC	0.5mA	0 to 15VDC	<0.5%
E60RAB[3,4]	0 to 6kVDC	0.5mA	0 to 15VDC	<0.5%
E60CT[2,8]	0 to ±3kVDC	0.5mA	0 to 15VDC	<0.5%
E70	0 to 7kVDC	0.43mA	0 to 15VDC	<1%
E80	0 to 8kVDC	0.25mA	0 to 15VDC	<1.25%
E80CT[2,8]	0 to ±4kVDC	0.25mA	0 to 15VDC	<1.25%
E121	0 to 12kVDC	0.16mA	0 to 15VDC	<1.5%
E121RAB[3,4]	0 to 12kVDC	0.16mA	0 to 15VDC	<1.5%

Notes:

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4. R suffix is used as a RoHS indicator for legacy models.
5. Maximum rated output current is available at maximum rated output voltage and derates linearly as input voltage is decreased.
6. Output voltage is load dependent. Under light or no-load conditions, reduce the input voltage so maximum rated output voltage is not exceeded.
7. Specifications after 30 minute warm-up, full load, at +25°C unless otherwise indicated.
8. Ripple specification for center-tapped units applies to the voltage between the positive and negative output terminals.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage range	0.7		12, 15	VDC	See Models & Ratings table
Input current - full load			400	mA	
Input current - no load			175	mA	

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage[2]			12	kVDC	See Models & Ratings table
Output current[1]			30	mA	See Models & Ratings table
Output voltage tolerance		±5		%	At max Vout, full load
Minimum load	No minimum load required				
Regulation	Unregulated, Output is proportional to Input. See Application Notes				
Ripple & noise[3,5]	0.05		1.5	%	See Models & Ratings table
Response time		10		msec	0 to max Vout, full load

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Isolation: input to output			3500	VDC	<±3500 Bias for Models E01 to E60
Isolation: input to output			500	VDC	<±500 Bias for Models E70 to E121
Switching frequency	30		100	kHz	Stable frequency over entire output voltage range
Construction	Case material is Diallyl Phthalate (DAP). UL 94 V-0 rated solid vacuum encapsulation.				
Mean time between failure	810			khrs	Per Bellcore TR 332

Environmental

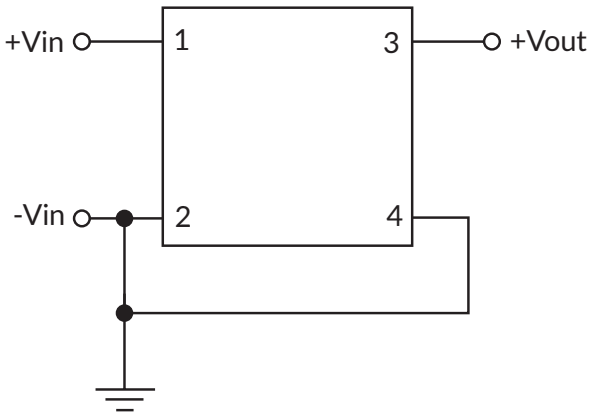
Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature (case)	-10		+60	°C	Models E01 to E60
Operating temperature (case)	-10		+50	°C	Models E70 to E121
Storage temperature	-25		+90	°C	
Cooling	Natural convection				
Humidity			95	%RH	Non-condensing

Notes:

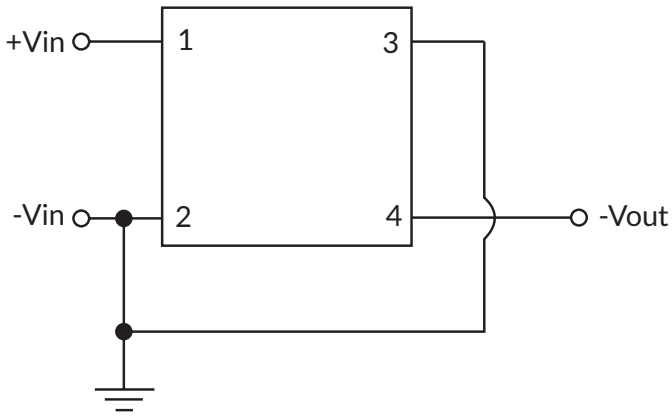
1. Maximum rated output current is available at maximum rated output voltage and derates linearly as input voltage is decreased.
2. Output voltage is load dependent. Under light or no-load conditions, reduce the input voltage so maximum rated output voltage is not exceeded.
3. Specifications after 30 minute warm-up, full load, at 25°C unless otherwise indicated.
4. Proper thermal management techniques are required to maintain safe case temperature at maximum power output.
5. Ripple specification for center-tapped units applies to the voltage between the positive and negative output terminals.

Application Notes

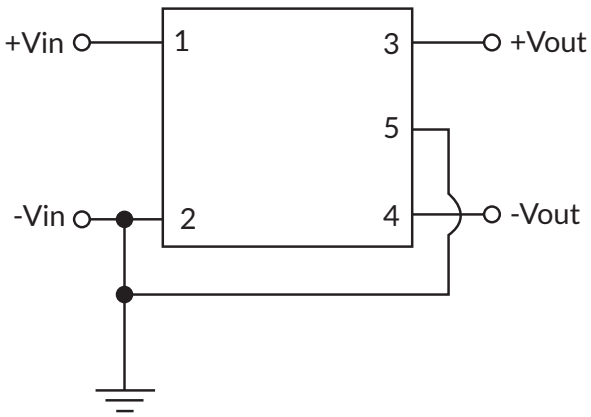
Positive output



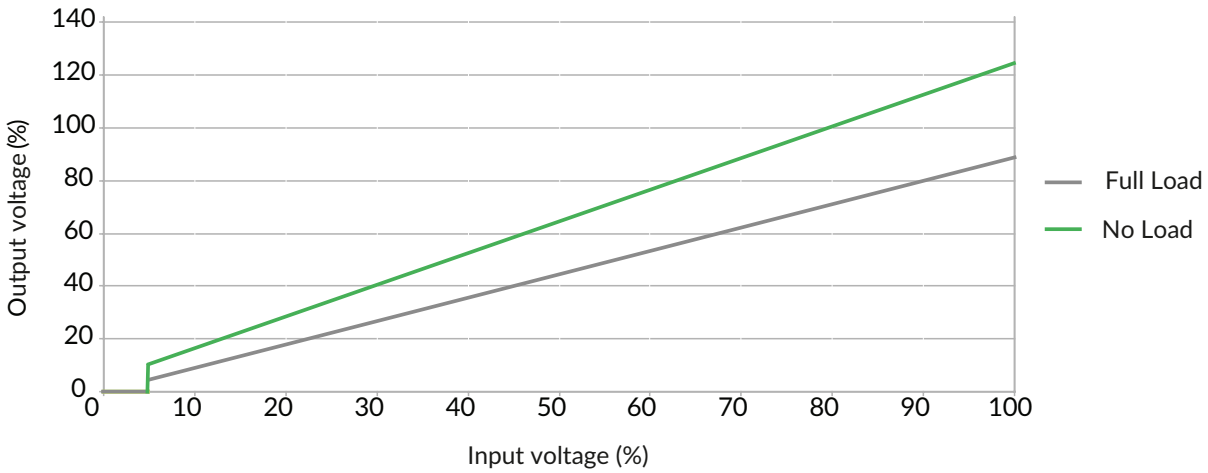
Negative output



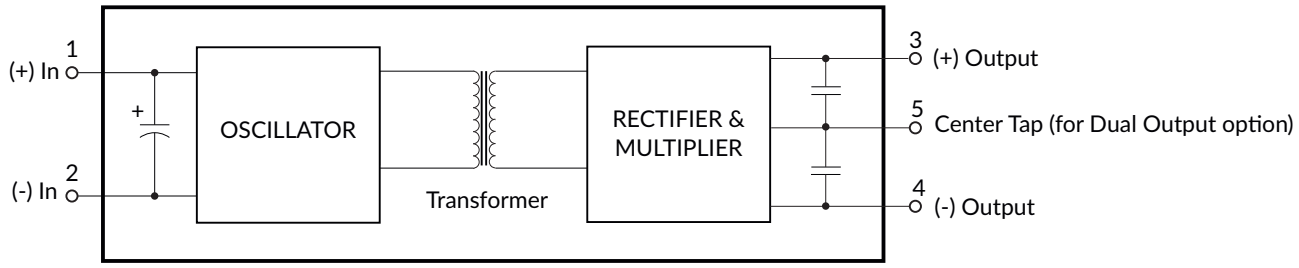
Dual output



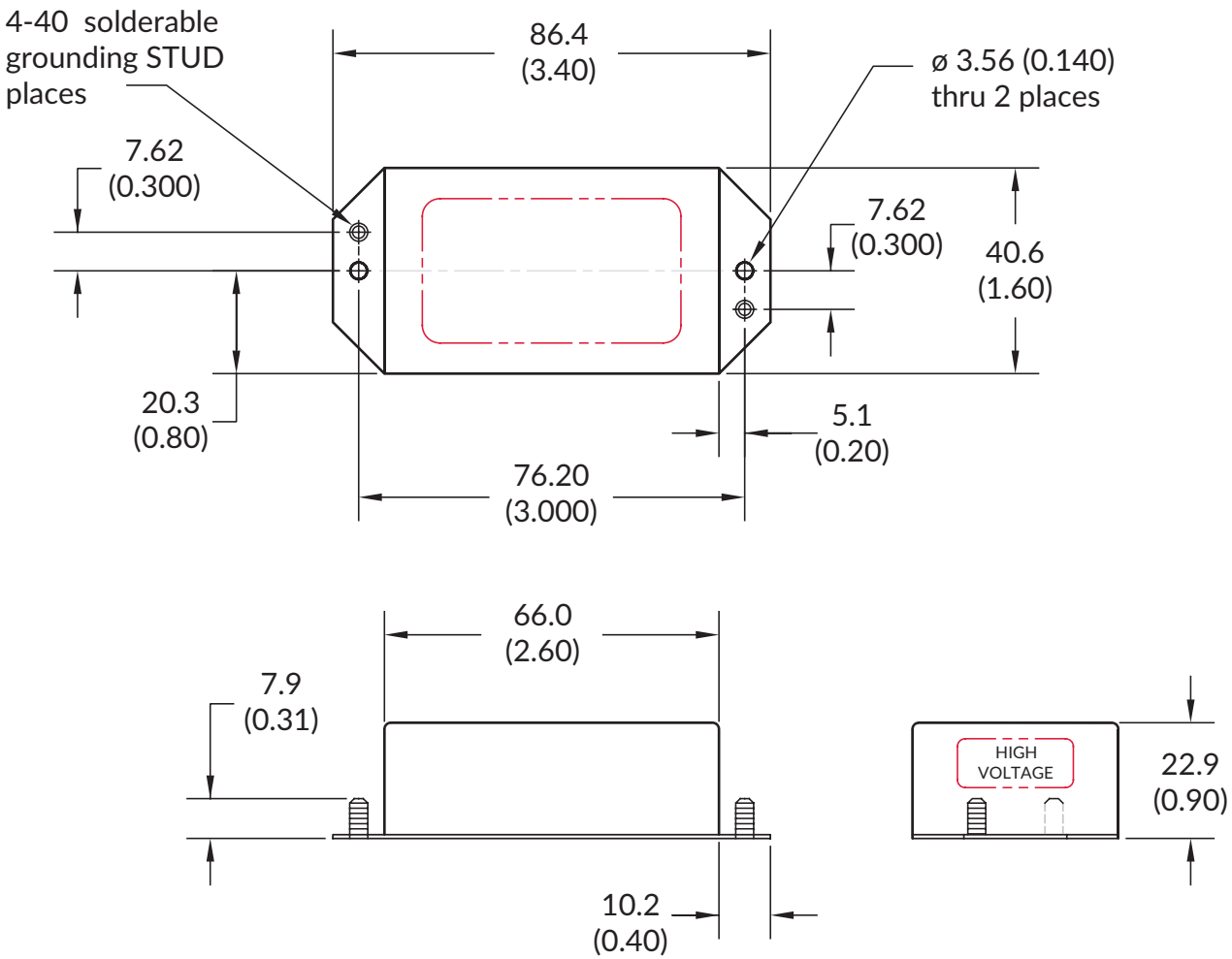
Typical output vs. input voltage



Block diagram



External EMI/RFI shield

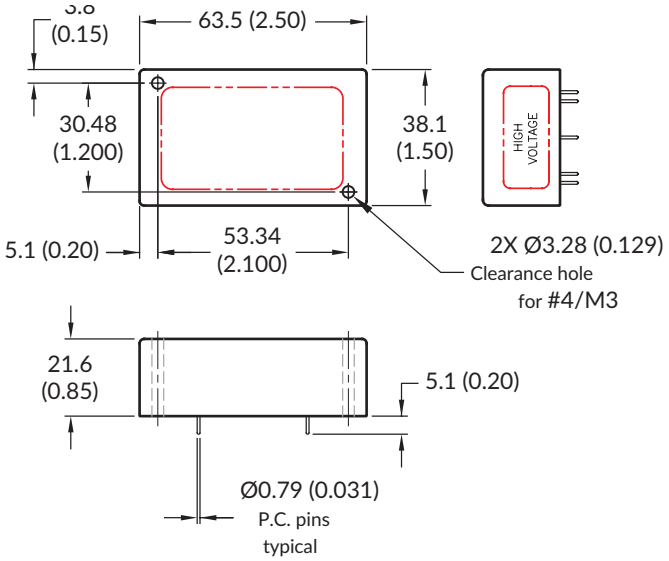


An AB suffix is used to indicate an added external EMI/RFI Shield as shown above. These five-sided aluminum enclosures feature a durable, non-conductive black anodized finish. On models with outputs of 3kV or higher, special care must be taken to ensure adequate spacing and insulation between the metal can and the high voltage output. Single sided layout, encapsulation, or conformal coating may be required. Case grounding studs must be connected to ground. Case ground is not connected to (-) Input.

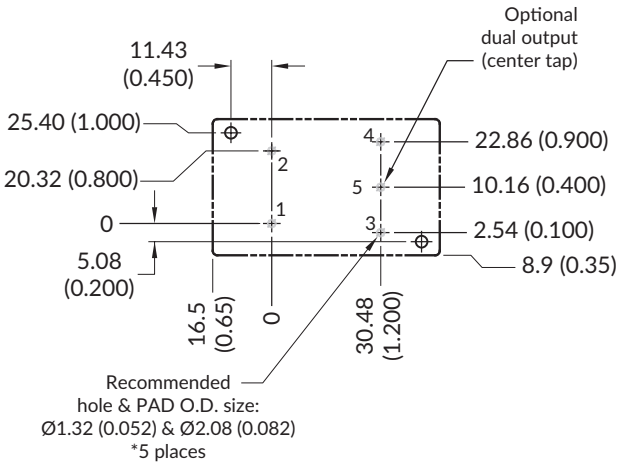
Mechanical details

E01 to E60

Top view



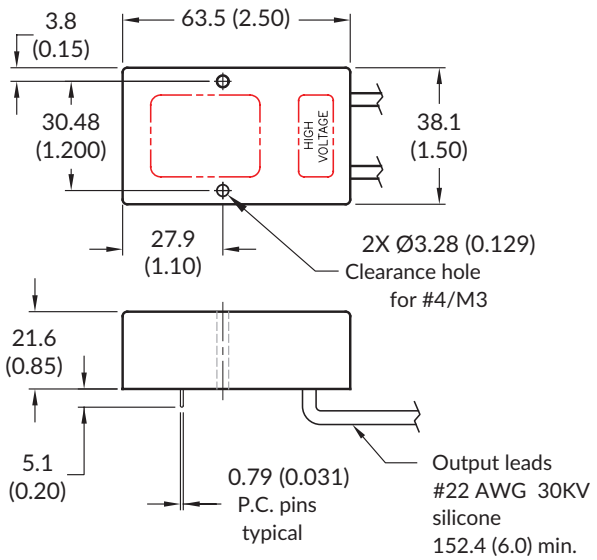
PCB layout



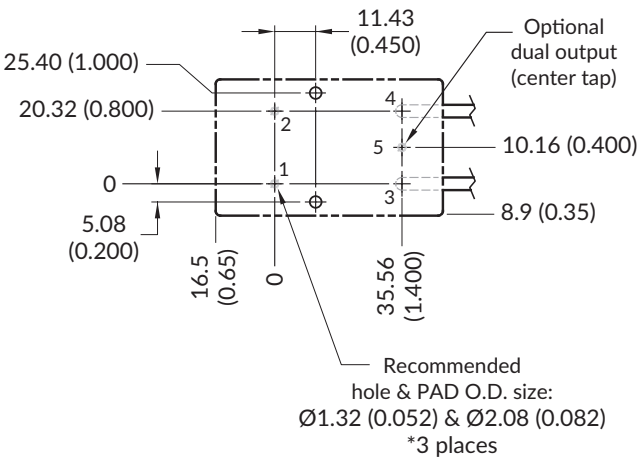
Pin	Function
1	(+) Input
2	(-) Input
3	(+) Output
4	(-) Output
5	Dual output/Center tap (optional)

E70 to E121

Top view



PCB layout



Notes:

1. All dimensions shown in mm (inches).
2. Weight: 85g (3oz)
3. Tolerance: x.x (x.xx) = ±0.51 (±0.02)
4. Pin Tolerance: x.xx (x.xxx) = ±0.127 (±0.005)