



### FEATURES:

- Wide 2:1 Input Range
- Adjustable Single Output Voltage
- Undervoltage lockout
- High Power Density
- Efficiency up to 92%
- Remote On/Off Function
- Soft start

### Models Single output



| Model        | Input Voltage (V) | Output Voltage (V) | Output Current max (A) | Maximum Capacitive load (μF) | Efficiency (%) |
|--------------|-------------------|--------------------|------------------------|------------------------------|----------------|
| AM40E-1203SZ | 9-18              | 3.3                | 8                      | 21800                        | 90             |
| AM40E-1205SZ | 9-18              | 5                  | 8                      | 13600                        | 91             |
| AM40E-1212SZ | 9-18              | 12                 | 3.33                   | 2300                         | 91             |
| AM40E-1215SZ | 9-18              | 15                 | 2.67                   | 1500                         | 91             |
| AM40E-2403SZ | 18-36             | 3.3                | 8                      | 21800                        | 91             |
| AM40E-2405SZ | 18-36             | 5                  | 8                      | 13600                        | 92             |
| AM40E-2412SZ | 18-36             | 12                 | 3.33                   | 2300                         | 91             |
| AM40E-2415SZ | 18-36             | 15                 | 2.67                   | 1500                         | 92             |
| AM40E-4803SZ | 36-75             | 3.3                | 8                      | 21800                        | 91             |
| AM40E-4805SZ | 36-75             | 5                  | 8                      | 13600                        | 92             |
| AM40E-4812SZ | 36-75             | 12                 | 3.33                   | 2300                         | 91             |
| AM40E-4815SZ | 36-75             | 15                 | 2.67                   | 1500                         | 92             |

Add suffix "-K" for optional heat sink

### Models Dual output

| Model        | Input Voltage (V) | Output Voltage (V) | Output Current max (A) | Maximum Capacitive load (μF) | Efficiency (%) |
|--------------|-------------------|--------------------|------------------------|------------------------------|----------------|
| AM40E-1212DZ | 9-18              | ±12                | ±1.67                  | ±1200                        | 91             |
| AM40E-1215DZ | 9-18              | ±15                | ±1.33                  | ±750                         | 92             |
| AM40E-2412DZ | 18-36             | ±12                | ±1.67                  | ±1200                        | 91             |
| AM40E-2415DZ | 18-36             | ±15                | ±1.33                  | ±750                         | 92             |
| AM40E-4812DZ | 36-75             | ±12                | ±1.67                  | ±1200                        | 92             |
| AM40E-4815DZ | 36-75             | ±15                | ±1.33                  | ±750                         | 92             |

Add suffix "-K" for optional heat sink

NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

### Input Specifications

| Parameters                     | Nominal                                                                                                                  | Typical     | Maximum | Units  |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------|-------------|---------|--------|
| Voltage range                  | 12                                                                                                                       | 9-18        |         | VDC    |
|                                | 24                                                                                                                       | 18-36       |         |        |
|                                | 48                                                                                                                       | 36-75       |         |        |
| Filter                         | π (Pi) Network                                                                                                           |             |         |        |
| Start up time                  |                                                                                                                          | 30          |         | ms     |
| Absolute Maximum Rating        | 12                                                                                                                       |             | 25      | VDC    |
|                                | 24                                                                                                                       |             | 50      |        |
|                                | 48                                                                                                                       |             | 100     |        |
| Peak Input Voltage time        |                                                                                                                          |             | 1       | s      |
| On/Off control                 | ON: 3 ~12VDC or open circuit ; OFF – 0 ~ 1.2VDC or Short circuit between pin 2 and pin 3 (OFF idle current: 5mA Typical) |             |         |        |
| Under voltage lockout          | 12V ON/OFF                                                                                                               | 8.6 / 7.9   |         | VDC    |
|                                | 24V ON/OFF                                                                                                               | 17.8 / 16   |         |        |
|                                | 48V ON/OFF                                                                                                               | 33.5 / 30.5 |         |        |
| Input Reflected Ripple Current |                                                                                                                          | 20          |         | mA p-p |

## Isolation Specifications

| Parameters            | Conditions | Typical | Rated | Units |
|-----------------------|------------|---------|-------|-------|
| Tested I/O voltage    | 3 sec      |         | 1600  | VDC   |
| Case/Input and Output | 3 sec      | 1600    |       | VDC   |
| Resistance            |            | <1000   |       | MOhm  |
| Capacitance           |            | 1000    |       | pF    |

## Output Specifications

| Parameters                            | Conditions                                         | Typical    | Maximum | Units     |
|---------------------------------------|----------------------------------------------------|------------|---------|-----------|
| Voltage accuracy                      |                                                    | ±1         |         | %         |
| Cross Regulation (Dual Output Models) | 25% load on one output<br>100% load on second load | ±5         |         | %         |
| Over voltage protection               | Zener diode clamp                                  |            |         |           |
| Over load protection                  |                                                    | 130        |         | % of Iout |
| Short Circuit protection              | Continuous                                         |            |         |           |
| Short circuit restart                 | Auto-Recovery                                      |            |         |           |
| Line voltage regulation               | HL-LL                                              | ±0.5       |         | %         |
| Load voltage regulation (Single)      | 0% to 100% load                                    | ±0.5       |         | %         |
| Load voltage regulation (Dual)        | 0% to 100% load                                    | ±1         |         | %         |
| Temperature coefficient               |                                                    | ±0.02      |         | %/°C      |
| Ripple & Noise (20MHz Bandwidth)      | 3.3Vout/5Vout<br>other models                      | 100<br>150 |         | mV p-p    |
| Voltage adjustment range (single)     |                                                    |            | ±10     | %         |
| Minimum Load Current                  |                                                    | 0          |         | % of Max  |

## General Specifications

| Parameters                    | Conditions                                                 | Typical                  | Maximum | Units |
|-------------------------------|------------------------------------------------------------|--------------------------|---------|-------|
| Switching frequency           | 100% load                                                  | 270                      |         | KHz   |
| Operating temperature         | See derating chart                                         | -40 to +71               |         | °C    |
| Storage temperature           | -40 to +125                                                |                          |         | °C    |
| Maximum case temperature      |                                                            |                          | 105     | °C    |
| Derating                      |                                                            | 2.5                      |         | %/°C  |
| Cooling                       | Free Air Convection                                        |                          |         |       |
| Humidity                      |                                                            |                          | 95      | % RH  |
| Case material                 | Nickel coated Copper                                       |                          |         |       |
| Weight                        | 32                                                         |                          |         | g     |
| Dimensions (L x W x H)        | 2.00 x 1.00 x 0.40 inches                                  | 50.80 x 25.40 x 10.16 mm |         |       |
| MTBF                          | >328,000 hrs (MIL-HDBK -217F, Ground Benign, t=+25°C)hours |                          |         |       |
| Maximum soldering temperature | 1.5mm from case for 10 sec                                 |                          | 260     | °C    |
| Transient recovery time       |                                                            | 250                      |         | µS    |
| Transient recovery deviation  |                                                            | ±3                       |         | %     |

## Safety Specifications

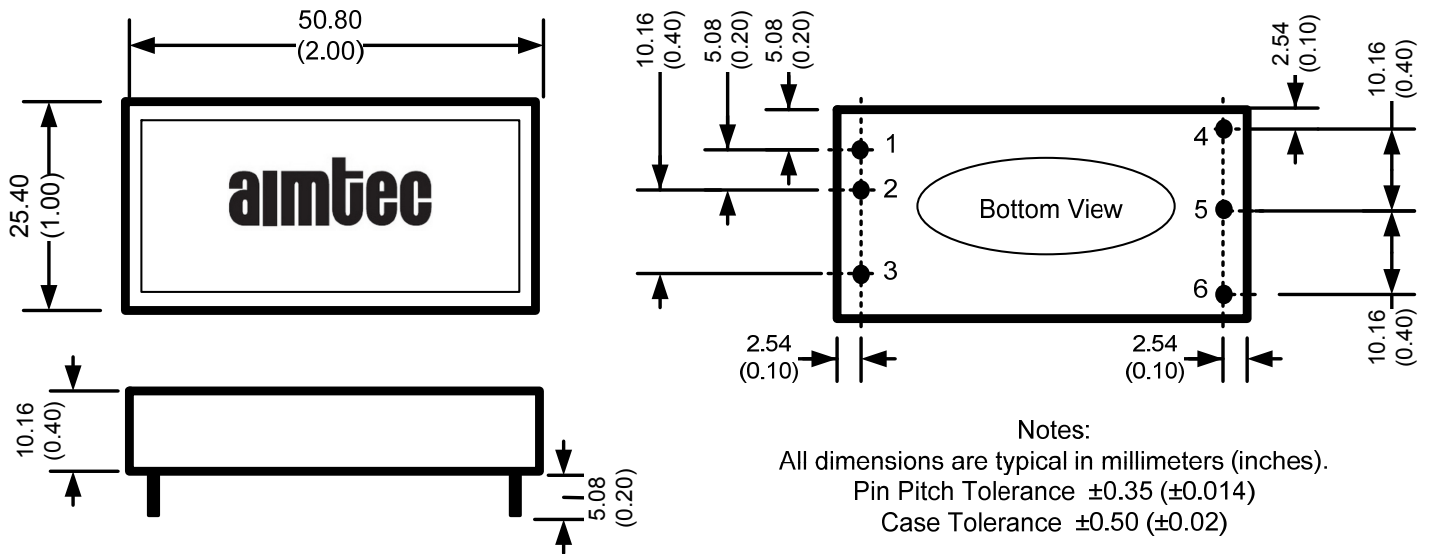
| Parameters      |                                              |
|-----------------|----------------------------------------------|
| Agency Approval | CE                                           |
| Safety          | EN55022: 2006 + A1:2007, Class B             |
|                 | IEC61000-3-2:2006+A2:2009                    |
|                 | IEC61000-3-3:2008                            |
|                 | EN55024:1998 + A1:2001 + A2:2003             |
|                 | IEC61000-4-2: 2008                           |
|                 | IEC61000-4-3:2006+A1: 2007                   |
|                 | IEC61000-4-4:2004                            |
|                 | IEC61000-4-5:2005                            |
|                 | IEC61000-4-6:2008                            |
|                 | IEC61000-4-8:2009                            |
|                 | NOTE: also designed to meet IEC 60950-1:2001 |

## Pin Out Specifications

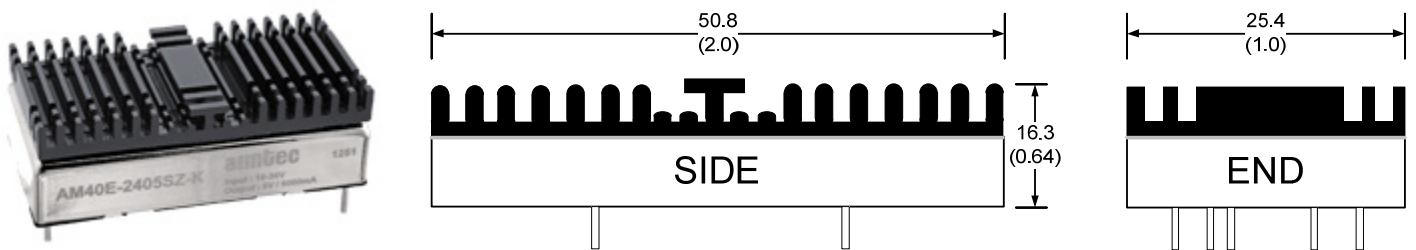
| Pin | Single         | Dual           |
|-----|----------------|----------------|
| 1   | + V Input      | + V Input      |
| 2   | - V Input      | - V Input      |
| 3   | On/Off Control | On/Off Control |
| 4   | + V Output     | + V Output     |
| 5   | -V Output      | Common         |
| 6   | Trim           | - V Output     |

## Dimensions

Single and Dual Output Models

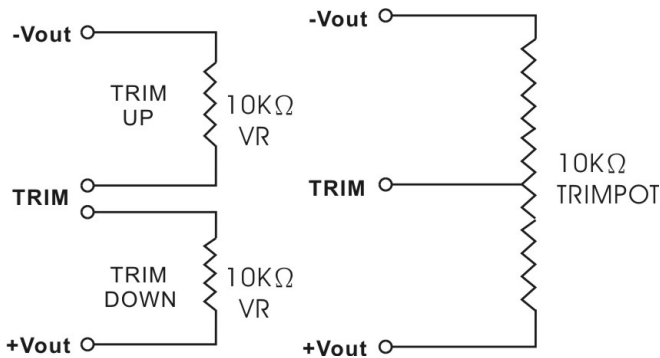


## Dimensions with Optional Heatsink

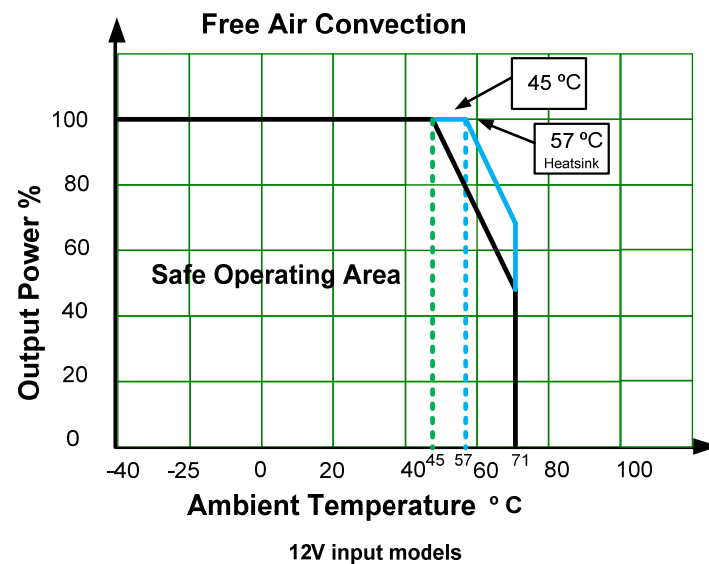
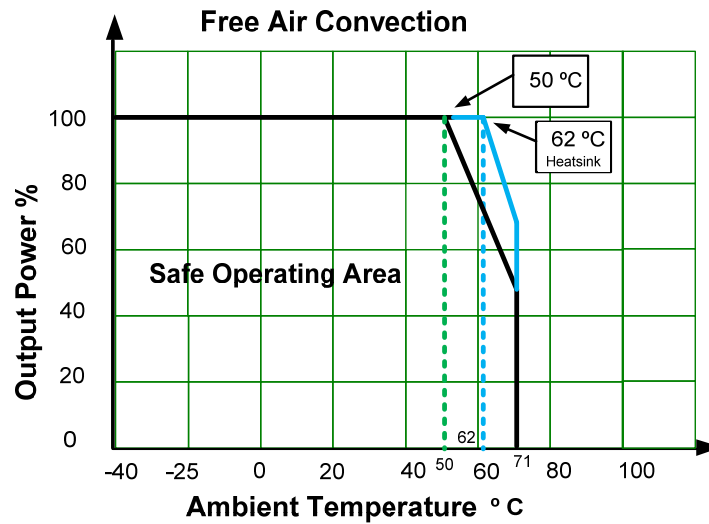


Notes: Add "-K" suffix for ordering, heat sink is affixed with thermally dissipative adhesive tape.  
See derating graph for temperature performance. Heat sink material is anodized (black) aluminum, adds weight 11.2g to total mass (42.2g). Thermal impedance of converter is: with heat sink 10°C/W and 12°C/W without heat sink.

## Trimming

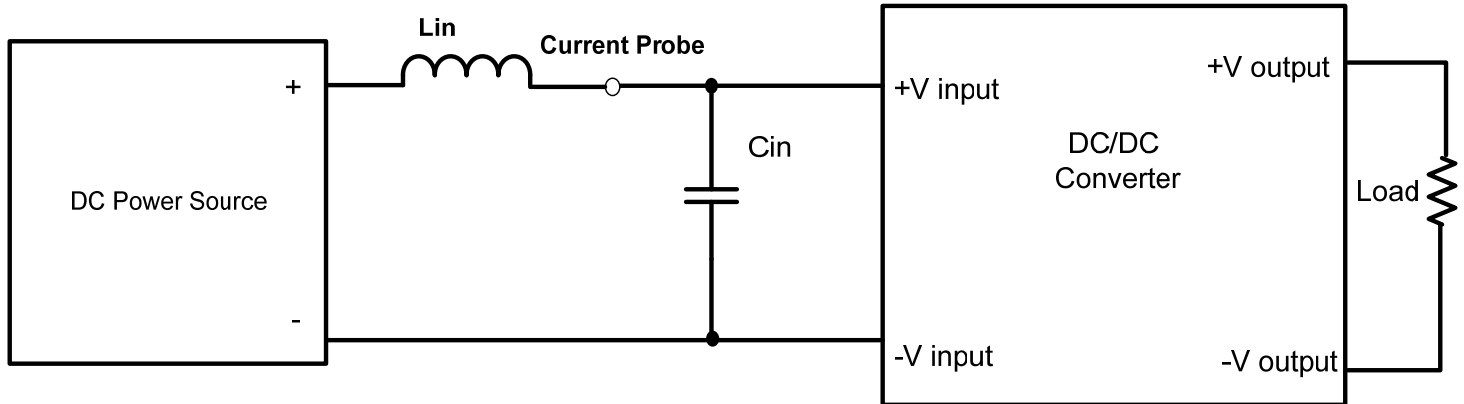


## Derating



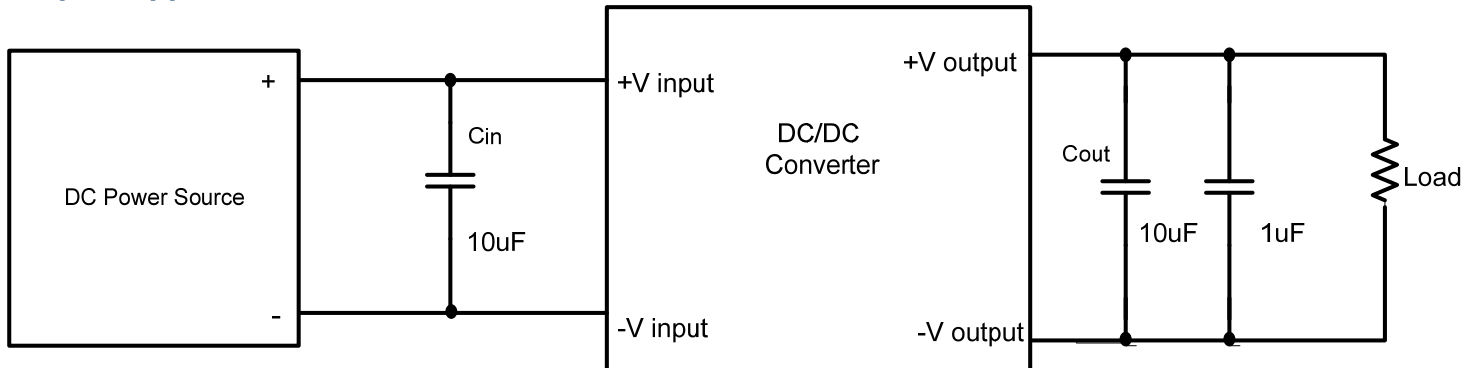
Extended temperature performance can be achieved with optional heat sink. (add suffix “-K” to part number)

### Input Reflected Ripple Current Test Step



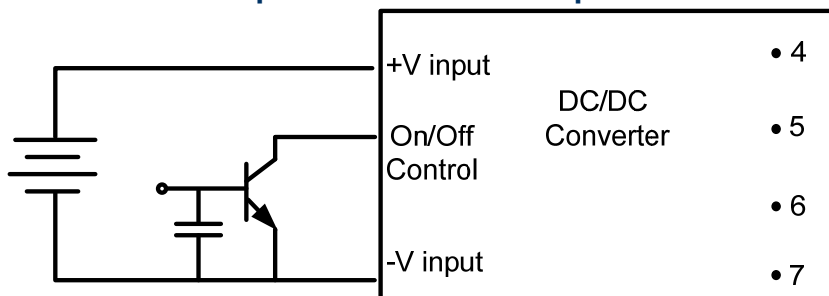
Input reflected ripple current is measured through a source inductor  $L_{in}$  (4.7 $\mu$ H) and a source capacitor  $C_{in}$  (47 $\mu$ F, ESR<1.0 $\Omega$  at 100KHz) at a nominal input and full load

### Output Ripple and noise reduction

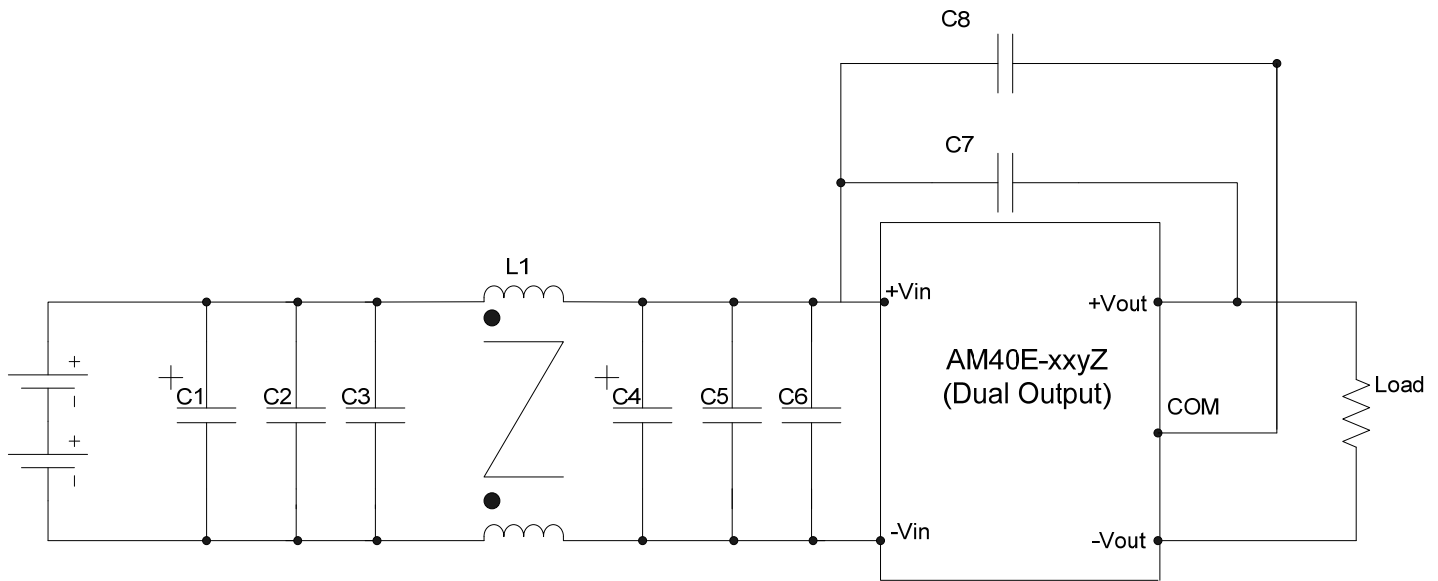
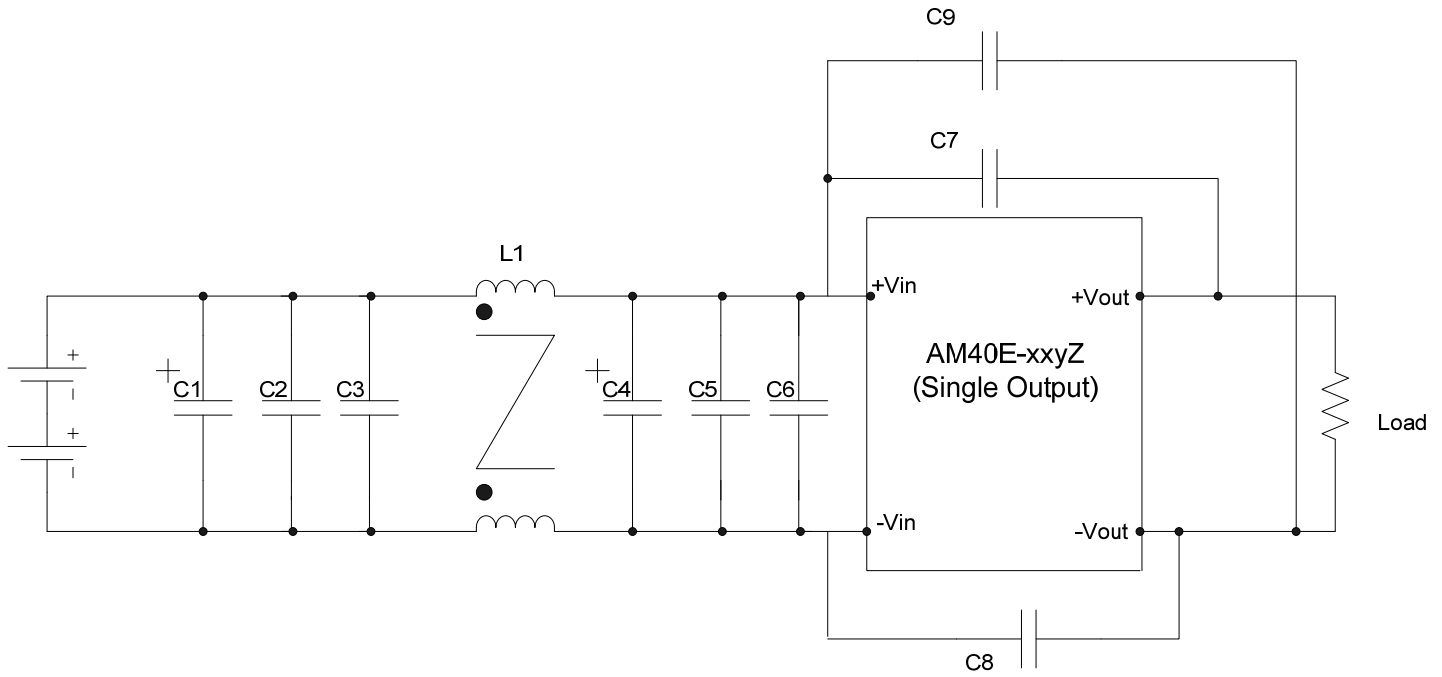


To reduce ripple and noise, it is recommended to use a 1 $\mu$ F ceramic disk capacitor and a 10 $\mu$ F electrolytic

### Control ON/OFF pin connection example

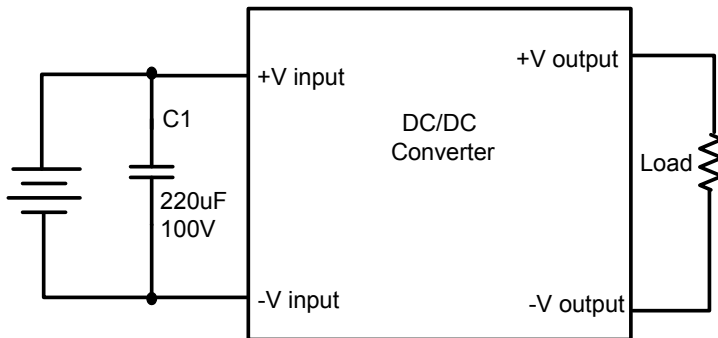


## EMI Filter



| Model                 | C1                | L1                      | C2/C3/C5/C6            | C4                | C7                | C8                | C9                |
|-----------------------|-------------------|-------------------------|------------------------|-------------------|-------------------|-------------------|-------------------|
| AM40E-12xxSZ (single) | 220 $\mu$ F, 100V | Common Choke 68 $\mu$ H | 1812, 6.8 $\mu$ F, 50V | 330 $\mu$ F, 100V |                   |                   | 1206, 1000pF, 2KV |
| AM40E-24xxSZ (single) | 220 $\mu$ F, 100V | Common Choke 68 $\mu$ H | 1812, 4.7 $\mu$ F, 50V | 220 $\mu$ F, 100V | 1206, 1000pF, 2KV | 1206, 1000pF, 2KV |                   |
| AM40E-48xxSZ (single) | 220 $\mu$ F, 100V | Common Choke 68 $\mu$ H | 1812, 1.5 $\mu$ F, 50V | 220 $\mu$ F, 100V | 1206, 1000pF, 2KV | 1206, 1000pF, 2KV |                   |
| AM40E-12xxDZ (dual)   | 220 $\mu$ F, 100V | Common Choke 68 $\mu$ H | 1812, 6.8 $\mu$ F, 50V | 330 $\mu$ F, 100V | 1206, 1000pF, 2KV | 1206, 1000pF, 2KV |                   |
| AM40E-24xxDZ (dual)   | 220 $\mu$ F, 100V | Common Choke 68 $\mu$ H | 1812, 4.7 $\mu$ F, 50V | 220 $\mu$ F, 100V | 1206, 1000pF, 2KV | 1206, 1000pF, 2KV |                   |
| AM40E-48xxDZ (dual)   | 220 $\mu$ F, 100V | Common Choke 68 $\mu$ H | 1812, 1.5 $\mu$ F, 50V | 220 $\mu$ F, 100V | 1206, 1000pF, 2KV | 1206, 1000pF, 2KV |                   |

## EFT/Surge



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