

**SERIES:** AE15B-EW | **DESCRIPTION:** DC-DC CONVERTER
**FEATURES**

- 15 W isolated output
- ultra-wide 10:1 input voltage range, 100~1,000 V
- 5,600 Vdc isolation
- input reverse polarity and under voltage protection
- output over voltage, over current, and short circuit protection
- reinforced insulation
- PCB, chassis and DIN-rail mounting styles available
- EN 62109 certified



| MODEL        | input voltage  | output voltage | output current | output power | ripple & noise <sup>1</sup> | efficiency <sup>2</sup> |
|--------------|----------------|----------------|----------------|--------------|-----------------------------|-------------------------|
|              | range<br>(Vdc) | nom<br>(Vdc)   | max<br>(A)     | max<br>(W)   | max<br>(mVp-p)              | typ<br>(%)              |
| AE15B-EW-S12 | 100~1000       | 12             | 1.25           | 15           | 200                         | 81                      |
| AE15B-EW-S15 | 100~1000       | 15             | 1.0            | 15           | 200                         | 81                      |
| AE15B-EW-S24 | 100~1000       | 24             | 0.625          | 15           | 200                         | 83                      |

Notes: 1. Measured at nominal input, 20 MHz bandwidth oscilloscope, with 10  $\mu$ F electrolytic and 1  $\mu$ F ceramic capacitors on the output.  
 2. Measured at 200 Vdc input voltage, full load.  
 3. All specifications are measured at Ta=25°C, humidity < 75%, nominal input voltage, and rated output load unless otherwise specified.

**PART NUMBER KEY**
**AE15B-EW - SXX - XXX**

Base Number

Output Voltage

 Mounting Style:  
 "blank" = board mount  
 T = chassis mount  
 DIN = DIN-rail mount

## INPUT

| parameter               | conditions/description                   | min      | typ           | max             | units          |
|-------------------------|------------------------------------------|----------|---------------|-----------------|----------------|
| operating input voltage | transient (60s)                          | 100      |               | 1,000<br>1,200  | Vdc<br>Vdc     |
| under voltage shutdown  | shut-down range<br>turn-on range         | 60<br>75 |               | 85<br>95        | Vdc<br>Vdc     |
| current                 | at 200 Vdc<br>at 600 Vdc<br>at 1,000 Vdc |          |               | 120<br>40<br>22 | mA<br>mA<br>mA |
| inrush current          | at 200 Vdc<br>at 600 Vdc<br>at 1,000 Vdc |          | 7<br>20<br>30 |                 | A<br>A<br>A    |
| input fuse              | 2 A / 1,000 Vdc (external), required     |          |               |                 |                |

## OUTPUT

| parameter               | conditions/description                                            | min | typ        | max                   | units                         |
|-------------------------|-------------------------------------------------------------------|-----|------------|-----------------------|-------------------------------|
| maximum capacitive load | 12 Vdc output model<br>15 Vdc output model<br>24 Vdc output model |     |            | 2,000<br>1,200<br>470 | $\mu$ F<br>$\mu$ F<br>$\mu$ F |
| voltage accuracy        |                                                                   |     | $\pm 1$    | $\pm 2$               | %                             |
| line regulation         |                                                                   |     | $\pm 0.5$  | $\pm 1$               | %                             |
| load regulation         |                                                                   |     | $\pm 0.5$  | $\pm 1$               | %                             |
| start-up time           | 100 ~ 1,000 Vdc                                                   |     |            | 1                     | s                             |
| hold-up time            | at full load, 25°C<br>600 Vdc input<br>1,000 Vdc input            |     | 10<br>30   |                       | ms<br>ms                      |
| switching frequency     |                                                                   |     | 65         |                       | kHz                           |
| temperature coefficient |                                                                   |     | $\pm 0.02$ | $\pm 0.15$            | %/°C                          |

## PROTECTIONS

| parameter                | conditions/description                                                                 | min | typ | max            | units             |
|--------------------------|----------------------------------------------------------------------------------------|-----|-----|----------------|-------------------|
| over voltage protection  | 12 Vdc output model, clamp<br>15 Vdc output model, clamp<br>24 Vdc output model, clamp |     |     | 15<br>19<br>28 | Vdc<br>Vdc<br>Vdc |
| over current protection  | auto recovery                                                                          | 110 |     |                | %                 |
| short circuit protection | continuous, auto recovery                                                              |     |     |                |                   |

## SAFETY AND COMPLIANCE

| parameter           | conditions/description                                                                                                          | min     | typ | max | units |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------|---------|-----|-----|-------|
| isolation voltage   | input to output for 1 minute, 5 mA max                                                                                          | 5,600   |     |     | Vdc   |
| safety approvals    | certified to 62109-1: EN, BS EN                                                                                                 |         |     |     |       |
| conducted emissions | CISPR32/EN55032 Class A (see Fig. 2 for recommended circuit)                                                                    |         |     |     |       |
| radiated emissions  | CISPR32/EN55032 Class A                                                                                                         |         |     |     |       |
| ESD                 | IEC/EN61000-4-2 Contact +/-6KV/ Air +/-8KV, perf. Criteria B                                                                    |         |     |     |       |
| radiated immunity   | IEC/EN61000-4-3 10V/m, perf. Criteria A                                                                                         |         |     |     |       |
| EFT/burst           | IEC/EN61000-4-4 +/-4KV, perf. Criteria B                                                                                        |         |     |     |       |
| surge               | IEC/EN61000-4-5 line to line +/-1KV, IEC/EN61000-4-5 line to line +/-2KV (see Fig. 2 for recommended circuit), perf. Criteria B |         |     |     |       |
| conducted immunity  | IEC/EN 61000-4-6 10 Vrms, perf. Criteria A                                                                                      |         |     |     |       |
| MTBF                | as per MIL-HDBK-217F, 25°C                                                                                                      | 300,000 |     |     | hours |
| RoHS                | yes                                                                                                                             |         |     |     |       |

## ENVIRONMENTAL

| parameter             | conditions/description | min | typ | max | units |
|-----------------------|------------------------|-----|-----|-----|-------|
| operating temperature | see derating curves    | -40 |     | 70  | °C    |
| storage temperature   |                        | -40 |     | 105 | °C    |
| storage humidity      | non-condensing         |     |     | 95  | %     |

## SOLDERABILITY

| parameter      | conditions/description | min | typ | max | units |
|----------------|------------------------|-----|-----|-----|-------|
| hand soldering | for 3~5 seconds        | 350 | 360 | 370 | °C    |
| wave soldering | for 5~10 seconds       | 255 | 260 | 265 | °C    |

## MECHANICAL

| parameter     | conditions/description                                                                                                                                                                            | min | typ               | max | units          |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------------------|-----|----------------|
| dimensions    | board mount: 70.0 x 48.0 x 23.5 [2.756 x 1.890 x 0.925 inch]<br>chassis mount: 96.1 x 54.0 x 32.0 [3.783 x 2.126 x 1.260 inch]<br>DIN-rail mount: 96.1 x 54.0 x 36.6 [3.783 x 2.126 x 1.441 inch] |     |                   |     | mm<br>mm<br>mm |
| case material | black flame-retardant heat-resistant plastic (UL94V-0)                                                                                                                                            |     |                   |     |                |
| weight        | board mount<br>chassis mount<br>DIN-rail mount                                                                                                                                                    |     | 115<br>170<br>210 |     | g<br>g<br>g    |
| cooling       | natural convection                                                                                                                                                                                |     |                   |     |                |

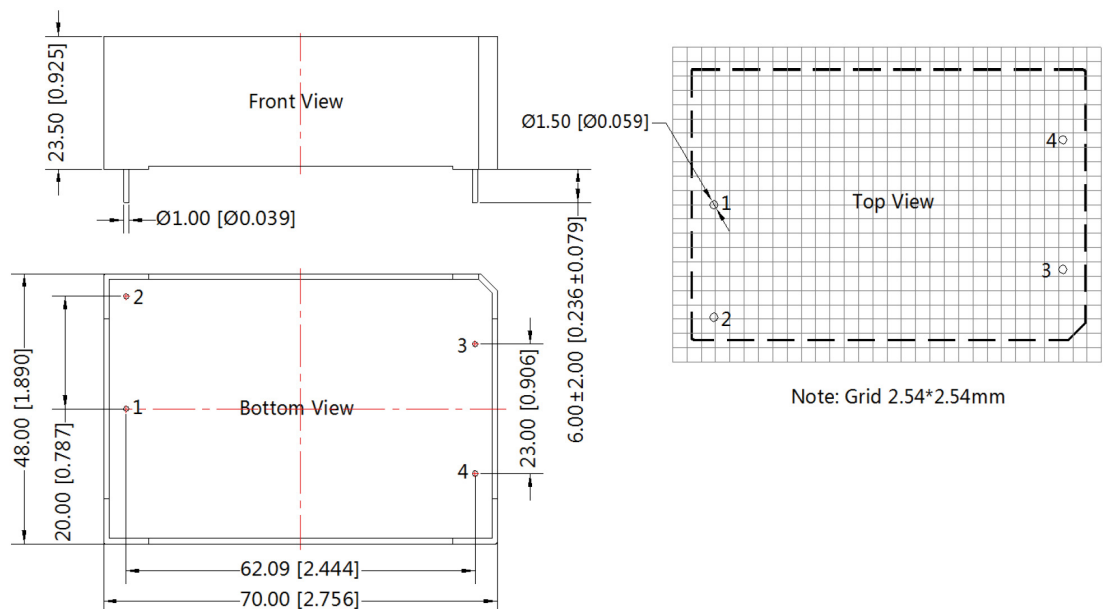
## MECHANICAL DRAWING

### Board mount

units: mm [inch]

tolerance:  $\pm 0.50$  [ $\pm 0.020$ ]pin diameter tolerance:  $\pm 0.10$  [ $\pm 0.004$ ]

| PIN CONNECTIONS |          |
|-----------------|----------|
| PIN             | Function |
| 1               | -Vin     |
| 2               | +Vin     |
| 3               | +Vout    |
| 4               | -Vout    |



## MECHANICAL DRAWING (CONTINUED)

### Chassis mount

units: mm [inch]

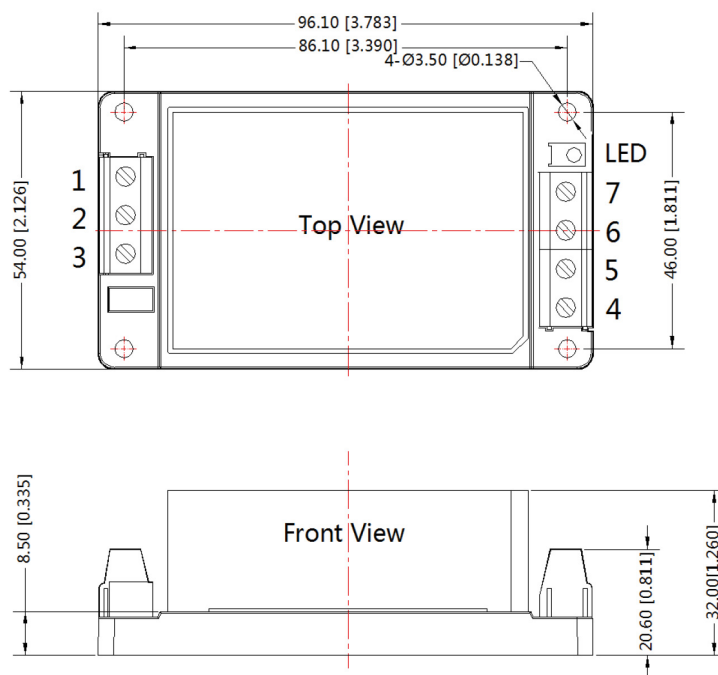
wire range: 24-12 AWG

general tolerance:  $\pm 1.00[\pm 0.039]$ 

tightening torque: Max 0.4 N·m

| PIN CONNECTIONS |          |
|-----------------|----------|
| PIN             | Function |
| 1               | -Vin     |
| 2               | NC       |
| 3               | +Vin     |
| 4               | +Vout    |
| 5               | NC       |
| 6               | NC       |
| 7               | -Vout    |

NC=no connection



### Din-rail mount

units: mm [inch]

wire range: 24-12 AWG

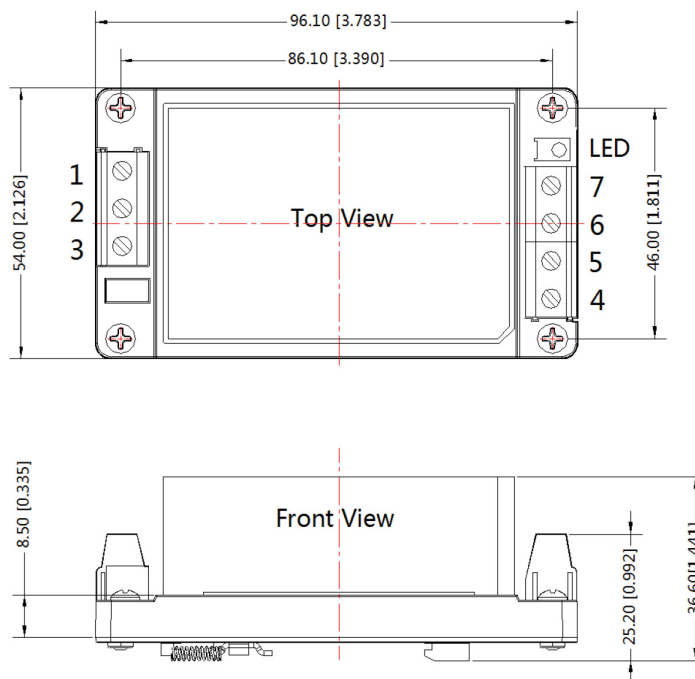
tightening torque: Max 0.4 N·m

mounting rail: TS35, rail needs to connect safety ground

tolerance:  $\pm 1.00[\pm 0.039]$ 

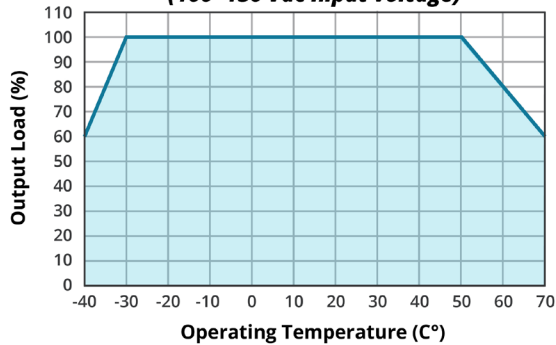
| PIN CONNECTIONS |          |
|-----------------|----------|
| PIN             | Function |
| 1               | -Vin     |
| 2               | NC       |
| 3               | +Vin     |
| 4               | +Vout    |
| 5               | NC       |
| 6               | NC       |
| 7               | -Vout    |

NC=no connection

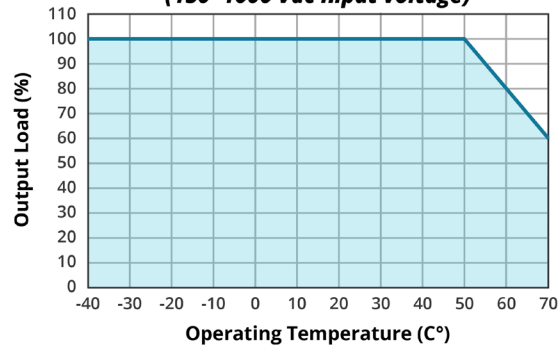


## DERATING CURVES

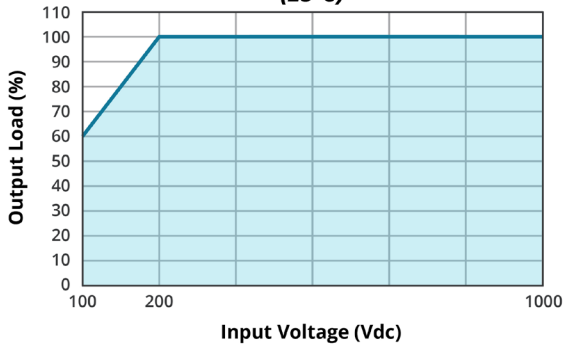
**TEMPERATURE DERATING CURVE  
(100~150 Vdc Input voltage)**



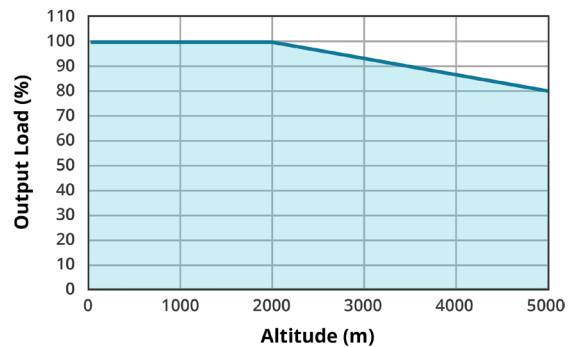
**TEMPERATURE DERATING CURVE  
(150~1000 Vdc Input voltage)**



**INPUT VOLTAGE DERATING CURVE  
(25°C)**



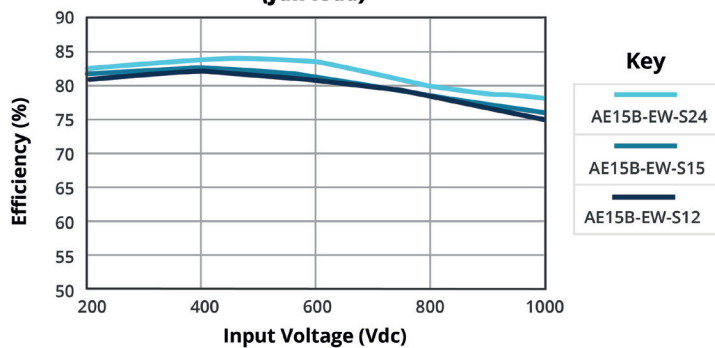
**ALTITUDE DERATING CURVE**



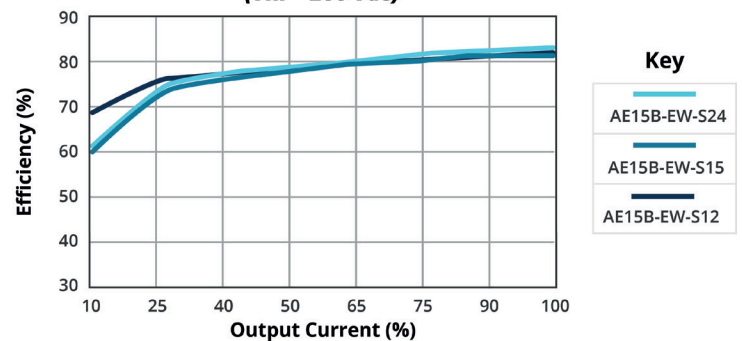
Note: 5. With an input between 100 - 200VDC, the output power must be derated as per temperature derating curves.  
6. This product is suitable for use in natural air cooling environments, if in a closed environment, please contact CUI.

## EFFICIENCY CURVES

**EFFICIENCY VS INPUT VOLTAGE  
(full load)**



**EFFICIENCY VS OUTPUT LOAD  
(Vin = 200 Vdc)**



## APPLICATION CIRCUIT

Figure 1

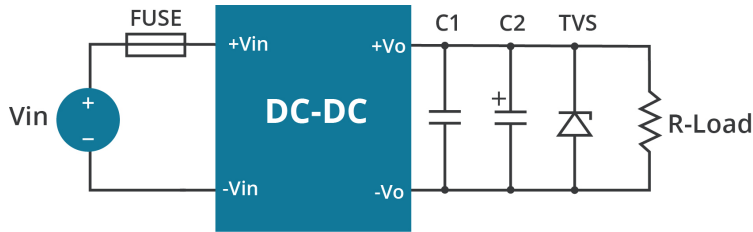


Table 1

| Vout (Vdc) | Fuse                     | C1 (μF) | C2 (μF) | TVS     |
|------------|--------------------------|---------|---------|---------|
| 12         | 2 A / 1000 Vdc, required | 1       | 120     | SMBJ20A |
| 15         |                          |         |         | SMBJ20A |
| 24         |                          |         |         | SMBJ30A |

We recommend using an electrolytic capacitor with high frequency and low ESR rating for C2 (refer to manufacture's data-sheet). Choose a capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C1 is a ceramic capacitor, used to filter high-frequency noise. TVS is a recommended suppressor diode to protect the application in case of a converter failure.

## EMC RECOMMENDED CIRCUIT

Figure 2

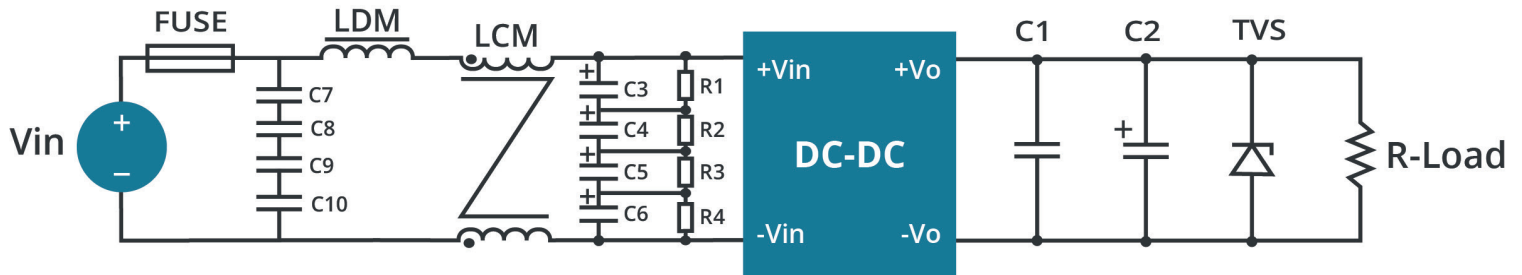


Table 2

| Recommended External Circuit Components |                        |
|-----------------------------------------|------------------------|
| C3, C4, C5, C6                          | 10 μF/400 Vdc          |
| C7, C8, C9, C10                         | 224K/275 Vac           |
| R1, R2, R3, R4                          | 1 MΩ/0.25 W            |
| LDM                                     | 1.2 mH/ 0.38 A         |
| LCM                                     | 10 mH                  |
| FUSE                                    | 2 A/1000 Vdc, required |

Note: See also Table 1.

## REVISION HISTORY

| rev. | description      | date       |
|------|------------------|------------|
| 1.0  | initial release  | 11/23/2022 |
| 1.01 | features updated | 12/14/2022 |

The revision history provided is for informational purposes only and is believed to be accurate.



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