# SERIES: AE15C-UW | DESCRIPTION: DC-DC CONVERTER

## FEATURES

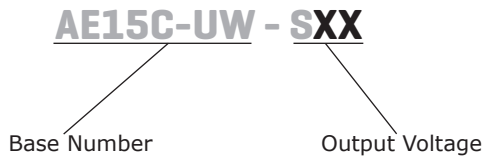
- up to 15 W isolated output
- ultra-wide 10:1 input voltage range, 150~1,500 Vdc
- 4,000 Vac / 5,600 Vdc isolation
- over current, short circuit, over-voltage and input reverse polarity protection
- certified to EN 62109
- certified to UL 1714, CSA C22.2 No. 107.1


## MODEL

| MODEL | input voltage range (Vdc) | output voltage (Vdc) | output current min (A) | output current max (A) | output power max (W) | ripple & noise[1] max (mVp-p) | efficiency[2] typ (%) |
|---|---|---|---|---|---|---|---|
| AE15C-UW-S5 | 150~1500 | 5 | 0 | 2.0 | 10 | 100 | 73.5 |
| AE15C-UW-S12 | 150~1500 | 12 | 0 | 1.25 | 15 | 120 | 81.5 |
| AE15C-UW-S15 | 150~1500 | 15 | 0 | 1.0 | 15 | 150 | 83.0 |
| AE15C-UW-S24 | 150~1500 | 24 | 0 | 0.625 | 15 | 150 | 86.0 |

Notes:
1. Measured at nominal input, 5 Hz to 20 MHz bandwidth oscilloscope, with 10 µF electrolytic and 0.1 µF ceramic capacitors on the output.
2. Measured at 800 Vdc input voltage.
3. All specifications are measured at Ta=25°C, humidity < 75%, nominal input voltage, and rated output load unless otherwise specified.

## PART NUMBER KEY



## INPUT

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| operating input voltage | continuous | 150 | 800 | 1500 | Vdc |
| under voltage lockout | turn-on threshold, full load | 125 | 140 | 147 | Vdc |
| | turn-off threshold, full load | 112 | 130 | 137 | Vdc |
| | lockout hysteresis voltage, full load | | 10 | | Vdc |
| current | at 150 Vdc, full load | | | | |
| | 5 Vdc output model | | 88 | | mA |
| | all other output models | | 120 | | mA |
| | 800 Vdc, 5 Vdc output model, full load | | 17 | | mA |
| | 800 Vdc, 12 Vdc output model, full load | | 23 | | mA |
| | 800 Vdc, 15 Vdc output model, full load | | 23 | | mA |
| | 800 Vdc, 24 Vdc output model, full load | | 22 | | mA |
| no load current | at 800 Vdc, 0 A | | 0.5 | | mA |
| inrush current | at 800 Vdc, cold start at 25°C | | 65 | 150 | A |
| input filter | capacitive | | | | |

## OUTPUT

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| maximum capacitive load | 5 Vdc output model | | | 2,000 | µF |
| | 12 Vdc output model | | | 1,250 | µF |
| | 15 Vdc output model | | | 1,000 | µF |
| | 24 Vdc output model | | | 625 | µF |
| voltage accuracy | at 800 Vdc, full load at 25°C | | ±2 | | % |
| line regulation | from high line to low line, full load | | | ±1 | % |
| load regulation | from 0% to full load | | | ±1 | % |
| switching frequency | PWM mode | 25 | | 75.6 | kHz |
| temperature coefficient | at -40°C ~ 80°C | | | ±0.15 | %/°C |
| start-up time | at minimum Vin to 10% Vout_set, Power up | | 200 | | ms |
| rise time | 10% ~ 90% of output voltage | | 8 | | ms |
| transient response | 75%-100% step load change | | | | |
| | error band | | | ±5 | % |
| | recovery time | | | 250 | µs |

## PROTECTIONS

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| over voltage protection | IC component to clamp, auto recovery | | | | |
| | 5 Vdc output model | | | 8 | Vdc |
| | 12 Vdc output model | | | 16 | Vdc |
| | 15 Vdc output model | | | 19 | Vdc |
| | 24 Vdc output model | | | 30 | Vdc |
| over current protection | auto recovery, hiccup | 110 | | 300 | % |
| short circuit protection | continuous, auto recovery | | | | |

## SAFETY AND COMPLIANCE

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| isolation voltage | input to output for 1 minute | | | 4,000 | Vac |
| | | | | 5,600 | Vdc |
| isolation capacitance | | | 1,100 | | pF |
| safety approvals | certified to 62109-1: EN | | | | |
| | certified to 1741: UL; CSA-C22.2 No.107.1 | | | | |
| EMI/EMC | EN 55032 Compliant (with external filter) Class A | | | | |
| ESD | EN61000-4-2 Level 3: Air ±8 kV, Contact ±4 kV, perf. Criteria A | | | | |

## SAFETY AND COMPLIANCE (CONTINUED)

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| radiated immunity | EN61000-4-3 Level 3: 80~1000 MHz, 10 V/m, perf. Criteria A | | | | |
| EFT/burst | EN61000-4-4 Level 3: On power input port, ±2 kV, external input capacitor required, perf. Criteria A | | | | |
| surge | EN61000-4-5 Level 4: line to line, ±2 kV (with external components), perf. Criteria A | | | | |
| conducted immunity | EN61000-4-6 Level 3: 0.15~80 MHz, 10 V, perf. Criteria A | | | | |
| PFMF | EN61000-4-8 50/60 Hz, 3 A/m (r.m.s.), perf. Criteria A | | | | |
| MTBF | as per MIL-HDBK-217F, Notice 1, GB at 25°C | 300,000 | | | hours |
| shock and vibration | MIL-STD-810F | | | | |
| RoHS | yes | | | | |

## ENVIRONMENTAL

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| operating temperature | see derating curves | -40 | | 80 | °C |
| storage temperature | | -40 | | 85 | °C |
| storage humidity | non-condensing | - | | 95 | % |
| operating altitude | see derating curves | | | 2,000 | m |

## MECHANICAL

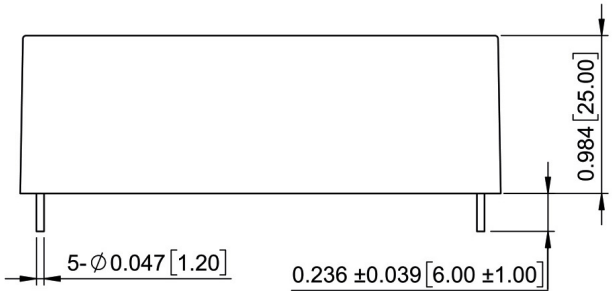
| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| dimensions | 3.00 x 2.00 x 0.984 [76.2 x 50.8 x 25.00 mm] | | | | inch |
| case material | plastic, PBT, UL 94V-0 | | | | |
| potting material | UL 94V-0 | | | | |
| pin material | base: copper<br>plating: nickel with matte tin | | | | |
| weight | | | 170 | | g |

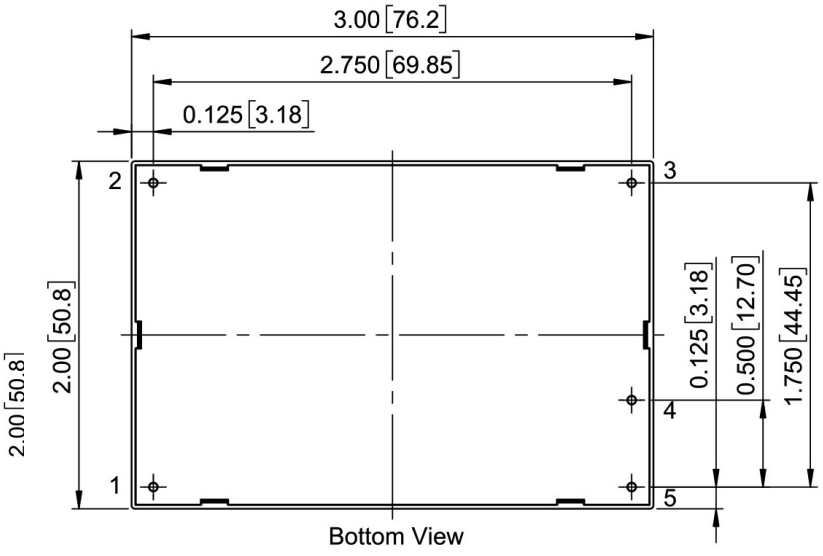
## MECHANICAL DRAWING

units: inch [mm]
tolerance: inches: x.xx=±0.03, x.xxx=±0.020
mm: x.x=±0.7, x.xx=±0.50
pin diameter tolerance: 0.047±0.004 inch [1.20±0.1 mm]

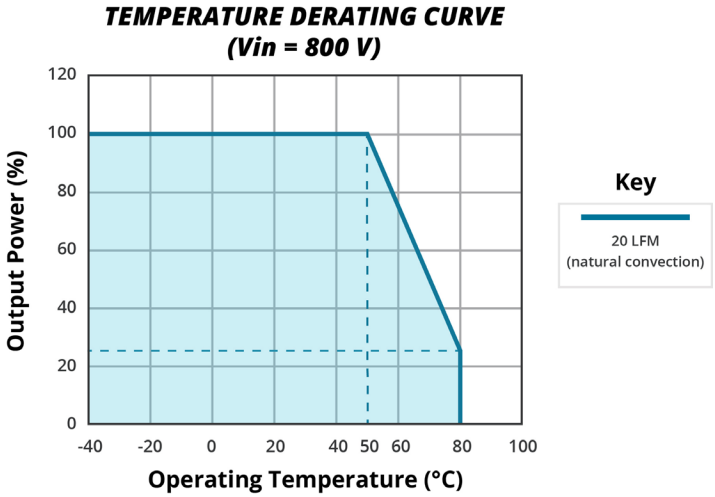
| PIN CONNECTIONS | |
|---|---|
| PIN | Function |
| 1 | -Vin |
| 2 | +Vin |
| 3 | NC |
| 4 | -Vout |
| 5 | +Vout |

NC=no connection

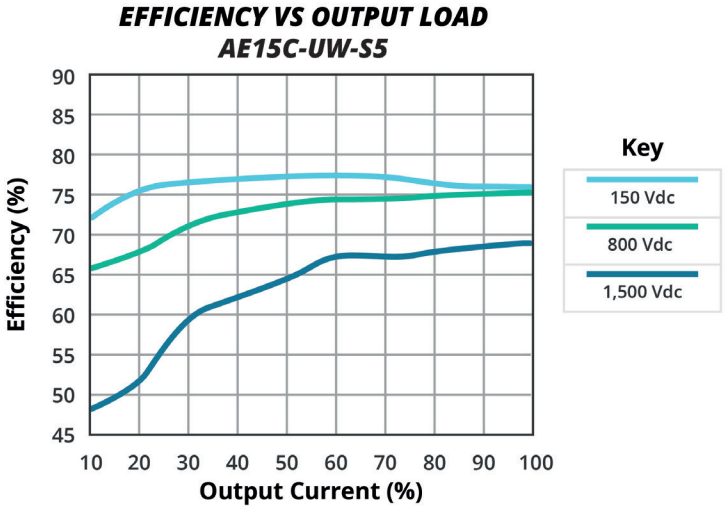


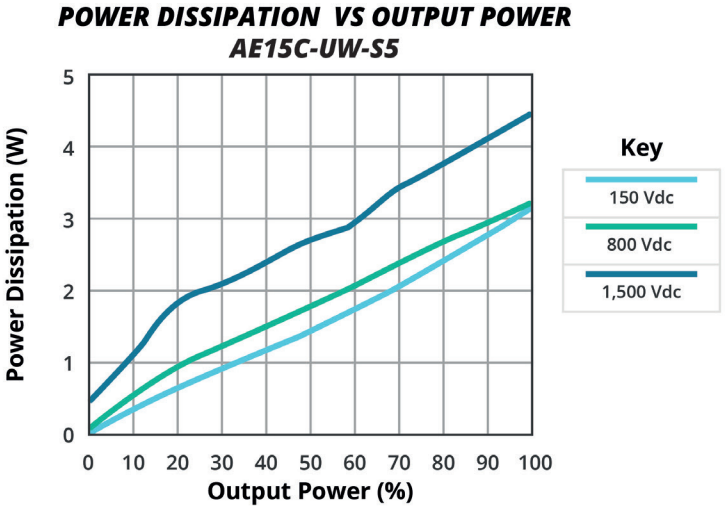



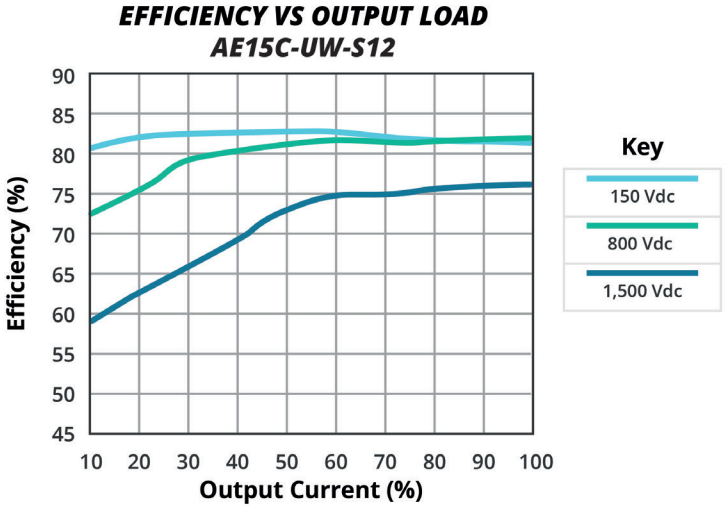
## DERATING CURVE

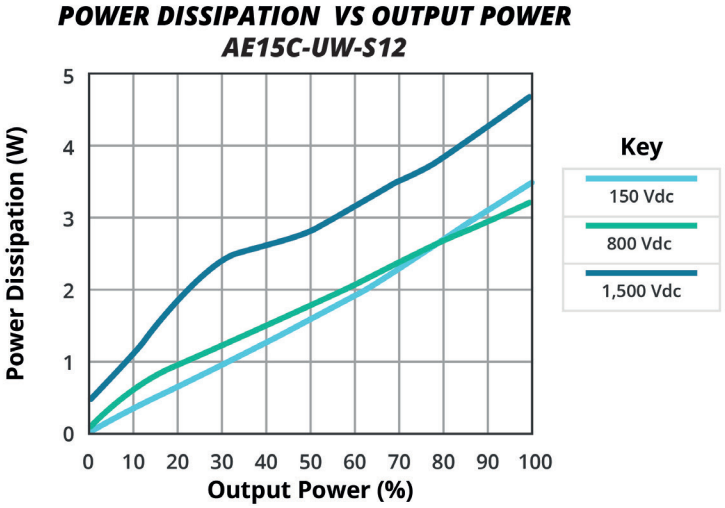



## EFFICIENCY CURVES



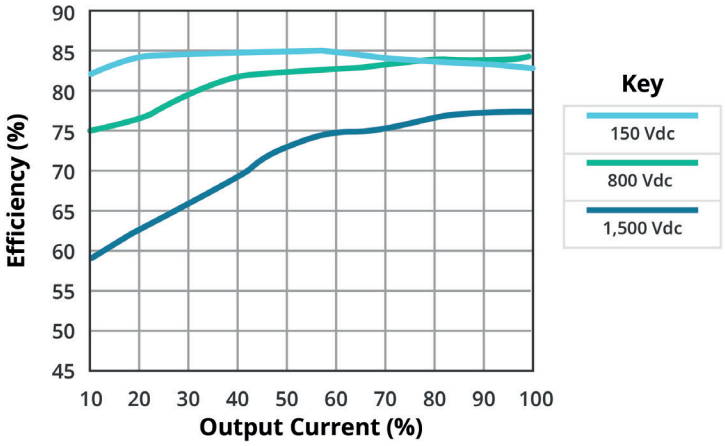



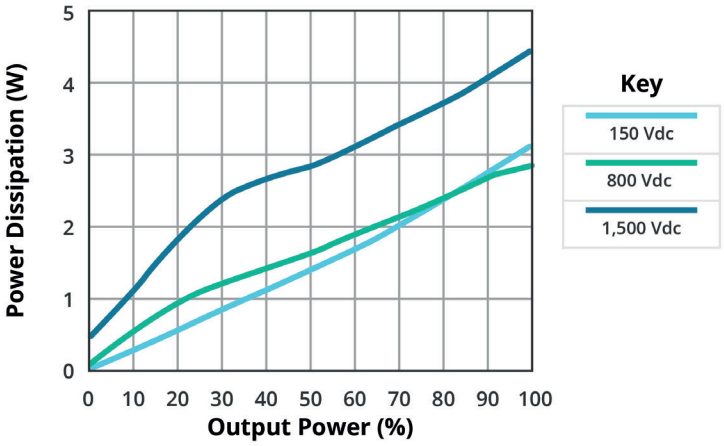



## EFFICIENCY CURVES (CONTINUED)

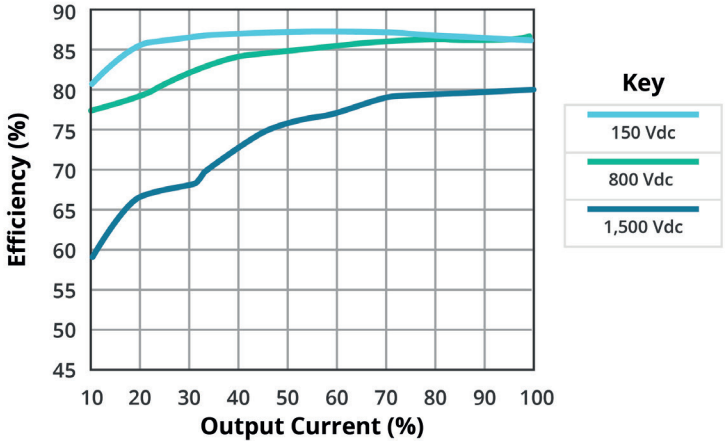
***EFFICIENCY VS OUTPUT LOAD***
***AE15C-UW-S15***



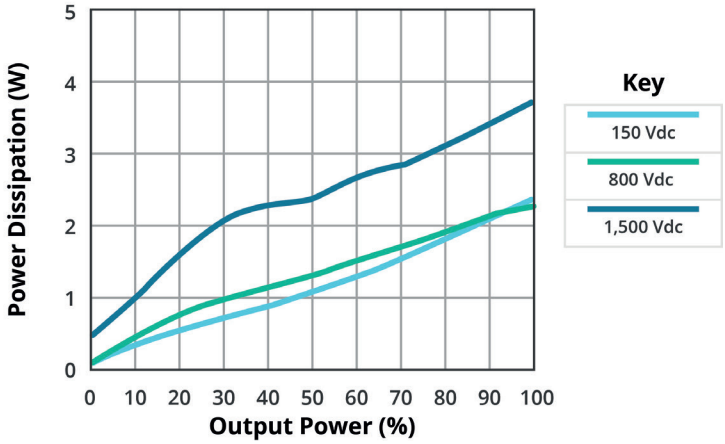

***POWER DISSIPATION VS OUTPUT POWER***
***AE15C-UW-S15***




***EFFICIENCY VS OUTPUT LOAD***
***AE15C-UW-S24***



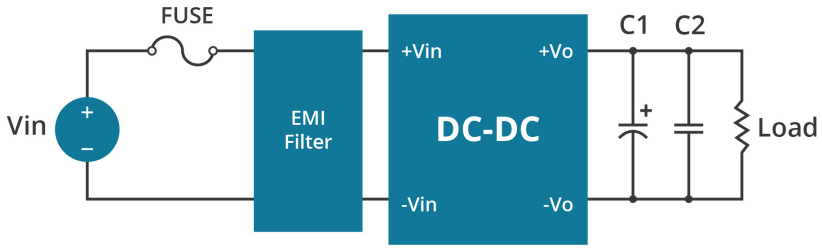

***POWER DISSIPATION VS OUTPUT POWER***
***AE15C-UW-S24***



## APPLICATION NOTES

The AE15C-UW series converters lack an internal fuse. To ensure maximum safety and system protection, always use an input line fuse. We recommend a 4A/1500Vdc fuse for all modules, as shown below.

**Figure 1**




## EMC RECOMMENDED CIRCUIT

EMI Test standard: EN 55032 Conducted & Radiated Emission
To use AE15C-UW series, connection shown below and external components are required to meet EN 55032 Class A.

**Figure 2**

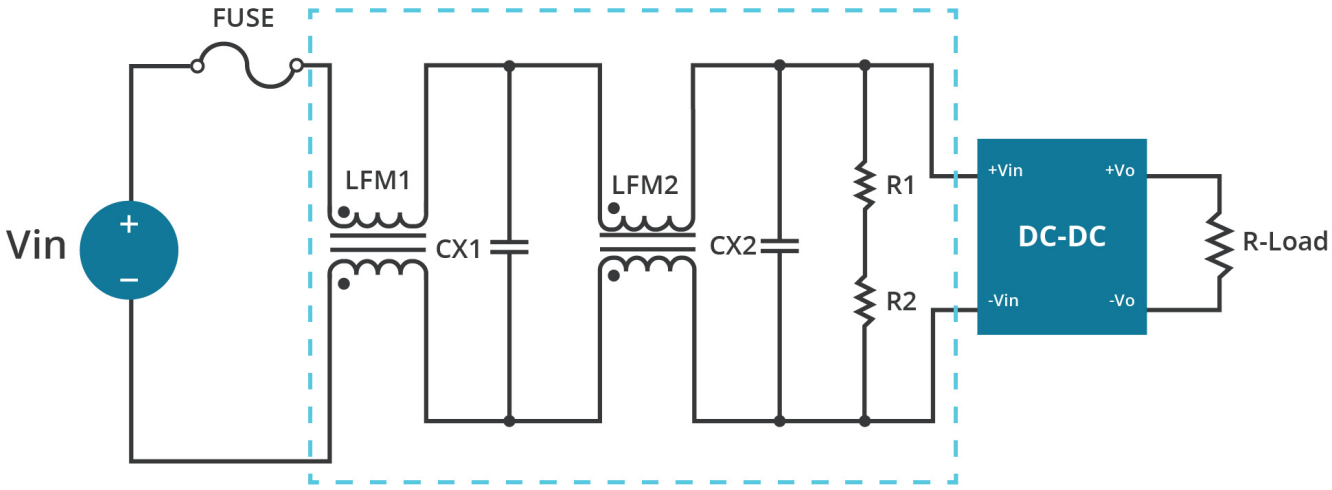



**Table 1**

| Recommended External Circuit Components | |
|---|---|
| FUSE | 4 A/1500 Vdc |
| LFM1, LFM2 | 25 mH SQ 1212 |
| Cx1, Cx2 | 0.33 μF/1,500 Vdc |
| R1, R2 | 1/2W 3M/≥800V |

## REVISION HISTORY

| rev. | description | date |
|---|---|---|
| 1.0 | initial release | 03/31/2025 |

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

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