SERIES: AE15B-UW | **DESCRIPTION:** DC-DC CONVERTER

FEATURES

- up to 15 W isolated output
- ultra-wide 7.5:1 input voltage range, 200~1,500 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
- meets UL 1714, CSA C22.2 No. 107.1

RoHS CE UKCA

MODEL

MODEL	input voltage range (Vdc)	output voltage nom (Vdc)	output current max (A)	output power max (W)	ripple & noise[1] max (mVp-p)	efficiency[2] typ (%)
AE15B-UW-S5	200~1500	5	2.0	10	150	64
AE15B-UW-S12	200~1500	12	1.25	15	150	71
AE15B-UW-S15	200~1500	15	1.0	15	150	80
AE15B-UW-S24	200~1500	24	0.625	15	150	83

Notes:
1. Measured at nominal input, 20 MHz bandwidth oscilloscope, with 10 µF electrolytic and 1 µF ceramic capacitors on the output.
2. Measured at 800 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-UW - SXX - XXX

- AE15B-UW: Base Number
- SXX: Output Voltage
- XXX: Mounting Style:
  "blank" = board mount
  T = chassis mount
  DIN = DIN-rail mount

INPUT

parameter	conditions/description	min	typ	max	units
operating input voltage		200	800	1,500	Vdc
	transient (10s)			1,600	Vdc
under voltage shutdown	shut-down range	130		175	Vdc
	turn-on range	155		200	Vdc
current	at 200 Vdc			120	mA
	at 800 Vdc			30	mA
	at 1,500 Vdc			16	mA
inrush current	at 200 Vdc		30		A
	at 1,500 Vdc		90		A
reverse input voltage protection	yes				
input fuse	4 A / 1,500 Vdc (external), required				

OUTPUT

parameter	conditions/description	min	typ	max	units
maximum capacitive load	5 Vdc output model			6,000	µF
	12 Vdc output model			2,000	µF
	15 Vdc output model			1,200	µF
	24 Vdc output model			470	µF
total accuracy			±2		%
line regulation	full load		±1		%
load regulation	from 0% to full load		±1		%
start-up time[4]	200 ~ 1,500 Vdc			2	s
hold-up time	at full load, 25°C, 800 Vdc input		20		ms
switching frequency			65		kHz
temperature coefficient			±0.02	±0.15	%/°C

Note: 4. Tested at full voltage input range, full output load range. (The cooling time between input power-off and power-on again is greater than 15s.)

PROTECTIONS

parameter	conditions/description	min	typ	max	units
over voltage protection	5 Vdc output model			8	Vdc
	12 & 15 Vdc outuput models			20	Vdc
	24 Vdc ouput model			30	Vdc
over current protection	auto recovery	120			%
short circuit protection	continuous, auto recovery				

SAFETY AND COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	input to output for 1 minute, 3 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 (see Fig. 2 for recommended circuit)				
ESD	IEC/EN61000-4-2 Contact +/-6KV/ Air +/-8KV, perf. Criteria B				
radiated immunity	IEC/EN61000-4-3 10V/m, perf. Criteria B				
EFT/burst	IEC/EN61000-4-4 +/- 2KV, +/-4KV (see Fig. 2 for recommended circuit), 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 10Vr.m.s, 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		85	°C
storage humidity	non-condensing			95	%
altitude	see derating curves			5,000	m

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: 89.00 x 63.50 x 25.00 [3.503 x 2.500 x 0.984 inch] chassis mount: 135.00 x 70.00 x 33.50 [5.314 x 2.755 x 1.319 inch] din-rail mount: 135.00 x 70.00 x 39.00 [5.314 x 2.755 x 1.535 inch]				mm mm mm
case material	black flame-retardant heat-resistant plastic (UL94V-0)				
weight	board mount chassis mount din-rail mount		200 280 350		g g g
cooling	natural convection				

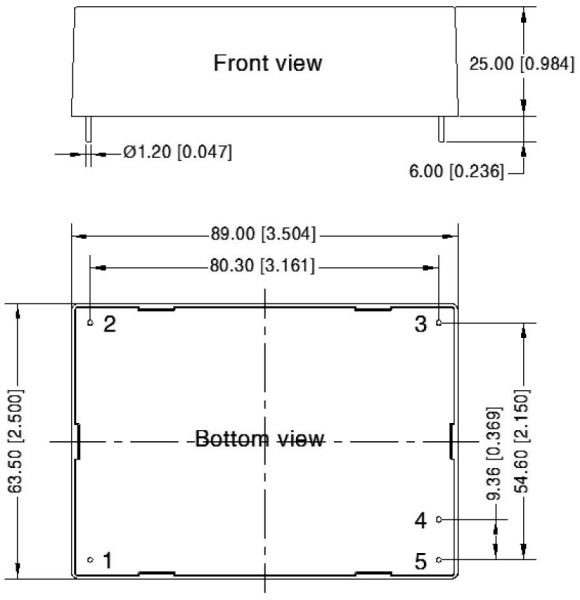
MECHANICAL DRAWING

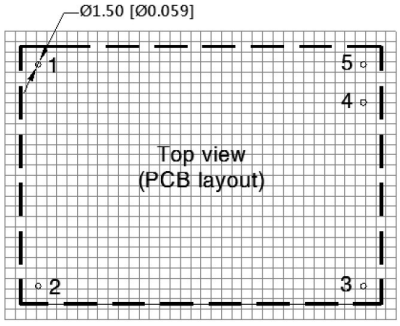
Board mount

units: mm [inch]
tolerance: ±0.50[±0.020]
pin diameter tolerance: ±0.10[±0.004]

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

NC=no connection





Note: Grid 2.54*2.54mm

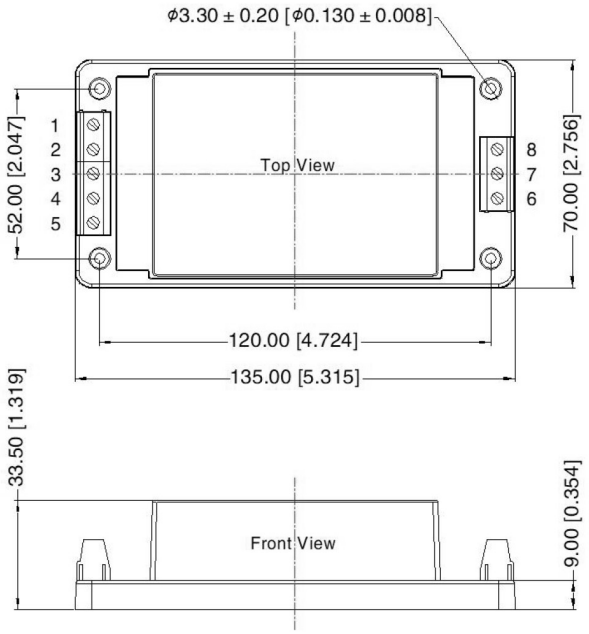
MECHANICAL DRAWING (CONTINUED)

Chassis mount

units: mm [inch]
wire range: 24-12 AWG
general tolerance: ±1.00[±0.040]
tightening torque: Max 0.4 N·m

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

NC=no connection

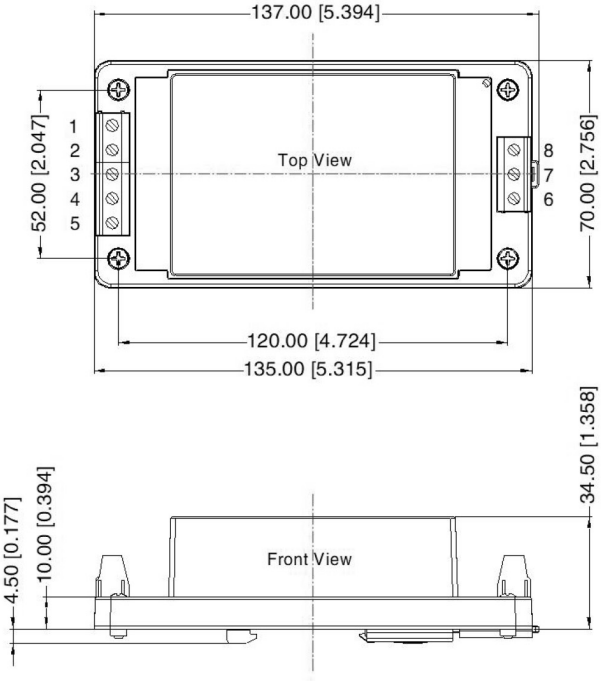


Din-rail mount

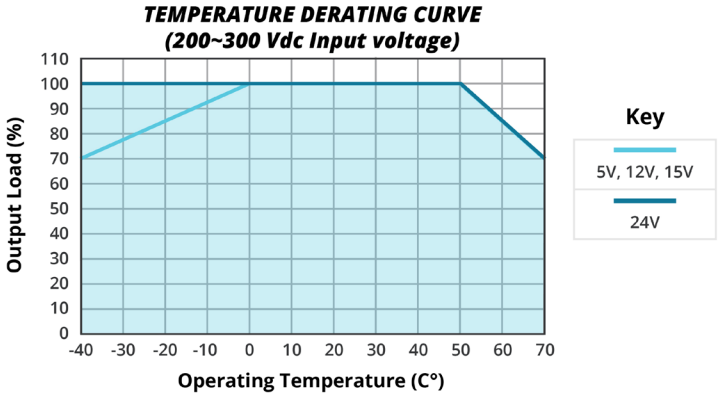
units: mm [inch]
wire range: 24-12 AWG
tightening torque: Max 0.4 N·m
mounting rail: TS35, rail needs to connect safety ground
tolerance: ±1.00[±0.040]

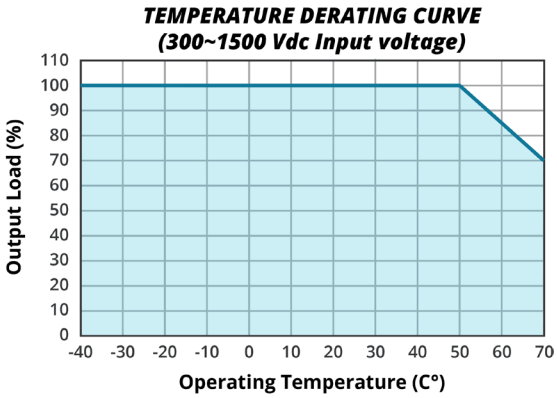
PIN CONNECTIONS	
PIN	Function
1	-Vin
2	NC
3	NC
4	NC
5	+Vin
6	NC
7	-Vout
8	+Vout

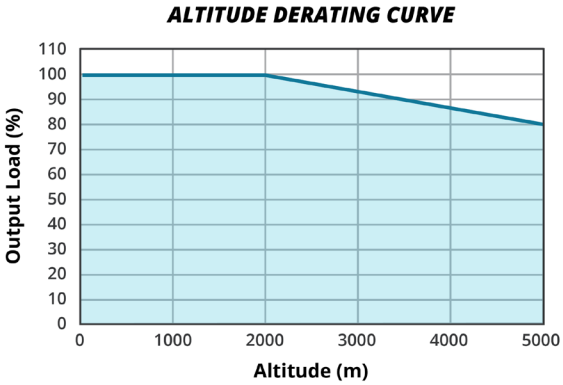
NC=no connection



DERATING CURVES

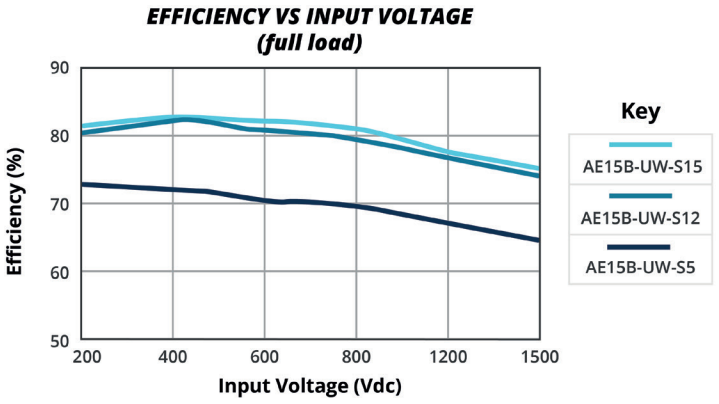


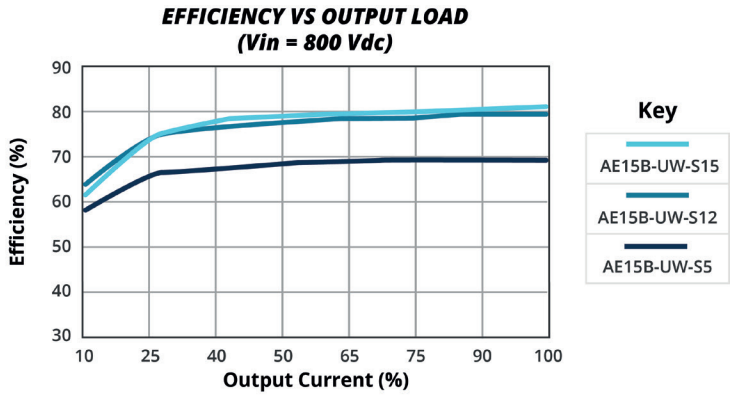




Note: 5. For operation of this converter series in an altitude between 2000 - 5000m above sea level, the output power must be derated as per the altitude derating curve.
6. This product is suitable for applications using natural air cooling; for applications in closed environment please contact CUI.

EFFICIENCY CURVES





APPLICATION CIRCUIT

Figure 1

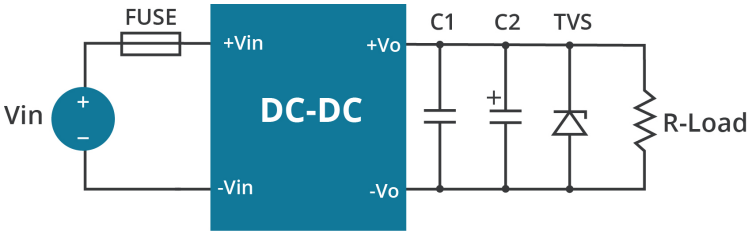


Table 1

Vout (Vdc)	Fuse	C1 (µF/V)	C2 (µF/V)	TVS
5	4 A / 1500 Vdc, required	1 µF/35V	120 µF/35V	SMBJ7.0A
12			120 µF/35V	SMBJ20A
15			120 µF/35V	SMBJ20A
24			68 µF/35V	SMBJ30A

We recommend using an electrolytic capacitor with high frequency and low ESR rating for C2 (refer to manufacture's datasheet). 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

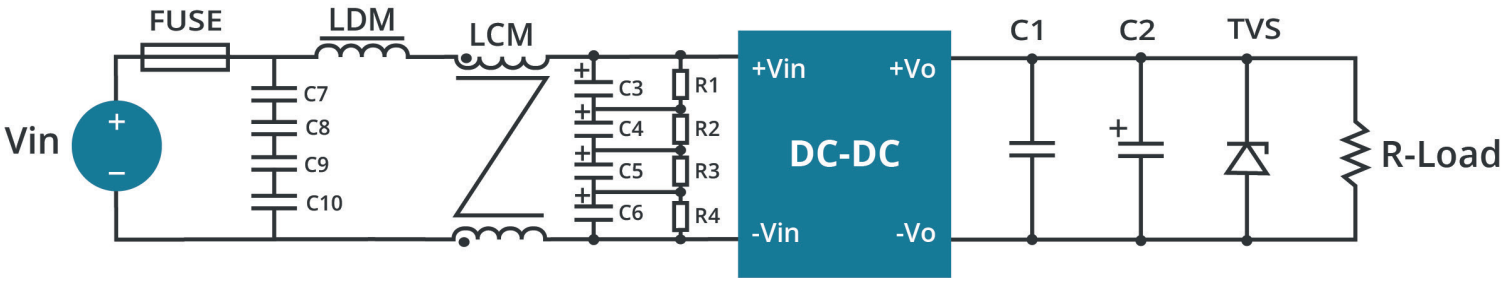


Table 2

Recommended External Circuit Components	
C7, C8, C9, C10	safety capacitor 104K/275 Vac
C3, C4, C5, C6	10 µF/450 Vdc
R1, R2, R3, R4	1 MΩ/2 W
LDM	330 µH/1 A
LCM	7 mH/1 A
FUSE	4 A/1500 Vdc, required

Note: See also Table 1.

REVISION HISTORY

rev.	description	date
1.0	initial release	11/22/2022
1.01	features updated	12/14/2022
1.02	product image updated	02/09/2023

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

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