



## FEATURES:

- Wide 4:1 Input Voltage Range
- High efficiency up to 88%
- 1500 & 2250VDC Isolation
- Over Current Protection
- Design to meet EN50155
- Operating Temperature -40°C to +85°C
- Output Over Voltage protection
- Continuous Short Circuit Protection
- Input Under Voltage Protection

## Models Single output



| Model              | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Isolation (VDC) | Max Capacitive Load (uF) | Efficiency (%) |
|--------------------|-------------------|--------------------|-------------------------|-----------------|--------------------------|----------------|
| AM6CW-2403S-NZ     | 9-36              | 3.3                | 1500                    | 1500            | 1800                     | 79             |
| AM6CW-2405S-NZ     | 9-36              | 5                  | 1200                    | 1500            | 1000                     | 83             |
| AM6CW-2409S-NZ     | 9-36              | 9                  | 667                     | 1500            | 680                      | 85             |
| AM6CW-2412S-NZ     | 9-36              | 12                 | 500                     | 1500            | 470                      | 87             |
| AM6CW-2415S-NZ     | 9-36              | 15                 | 400                     | 1500            | 220                      | 87             |
| AM6CW-2424S-NZ     | 9-36              | 24                 | 250                     | 1500            | 100                      | 88             |
| AM6CW-4803S-NZ     | 18-75             | 3.3                | 1500                    | 1500            | 1800                     | 79             |
| AM6CW-4805S-NZ     | 18-75             | 5                  | 1200                    | 1500            | 1000                     | 83             |
| AM6CW-4812S-NZ     | 18-75             | 12                 | 500                     | 1500            | 470                      | 87             |
| AM6CW-4815S-NZ     | 18-75             | 15                 | 400                     | 1500            | 220                      | 88             |
| AM6CW-4824S-NZ     | 18-75             | 24                 | 250                     | 1500            | 100                      | 88             |
| AM6CW-11005SH22-NZ | 40-160            | 5                  | 1200                    | 2250            | 1000                     | 80             |
| AM6CW-11012SH22-NZ | 40-160            | 12                 | 500                     | 2250            | 470                      | 84             |
| AM6CW-11015SH22-NZ | 40-160            | 15                 | 400                     | 2250            | 220                      | 85             |
| AM6CW-11024SH22-NZ | 40-160            | 24                 | 250                     | 2250            | 100                      | 86             |

## Models Dual output

| Model              | Input Voltage (V) | Output Voltage (V) | Output Current max (mA) | Isolation (VDC) | Max Capacitive Load(uF) | Efficiency (%) |
|--------------------|-------------------|--------------------|-------------------------|-----------------|-------------------------|----------------|
| AM6CW-2405D-NZ     | 9-36              | ±5                 | ±600                    | 1500            | ±470                    | 83             |
| AM6CW-2412D-NZ     | 9-36              | ±12                | ±250                    | 1500            | ±100                    | 87             |
| AM6CW-2415D-NZ     | 9-36              | ±15                | ±200                    | 1500            | ±100                    | 87             |
| AM6CW-2424D-NZ     | 9-36              | ±24                | ±125                    | 1500            | ±100                    | 87             |
| AM6CW-4805D-NZ     | 18-75             | ±5                 | ±600                    | 1500            | ±470                    | 83             |
| AM6CW-4812D-NZ     | 18-75             | ±12                | ±250                    | 1500            | ±100                    | 87             |
| AM6CW-4815D-NZ     | 18-75             | ±15                | ±200                    | 1500            | ±100                    | 88             |
| AM6CW-11005DH22-NZ | 40-160            | ±5                 | ±600                    | 2250            | ±470                    | 80             |
| AM6CW-11012DH22-NZ | 40-160            | ±12                | ±250                    | 2250            | ±100                    | 84             |
| AM6CW-11015DH22-NZ | 40-160            | ±15                | ±200                    | 2250            | ±100                    | 85             |

### Note:

\* Add suffix "-ST" for optional screw terminal bottom plate.

\*\* Add suffix "-STD" for optional DIN Rail screw terminal bottom plate.

\*\*\* For 110V input models, add suffix "-K" for optional heatsink.

\*\*\*\* For 110V input models, add suffix "-K-ST" for optional heat sink with screw terminal bottom plate.

\*\*\*\*\* For 110V input models, add suffix "-K-STD" for optional heat sink with DIN Rail screw terminal bottom plate.

\*\*\*\*\* -ST and -STD bottom plates come with the reverse polarity protection and will reduce the efficiency by 2%.

\*\*\*\*\* For 24V and 48V input models with -ST or -STD option, the input under voltage protection threshold and minimum input voltage will increase by 1V.

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                | 24<br>48<br>110 | 9-36<br>18-75<br>40-160 | 40<br>80<br>170                       | VDC   |
| Filter                       | Pi              |                         |                                       |       |
| Absolute maximum rating (1s) | 24<br>48<br>110 |                         | -0.7 - 50<br>-0.7 - 100<br>-0.7 - 180 | VDC   |
| No load input current        | 24<br>48, 110   |                         | 12<br>8                               | mA    |
| Input reflected current      | 24, 48<br>110   | 20<br>25                |                                       | mA    |
| Input under voltage turn off | 24<br>48<br>110 | 6.5<br>15.5<br>33       |                                       | VDC   |
| Startup time                 | 110             | 10                      |                                       | ms    |

## Isolation Specifications

| Parameters                 | Conditions                  | Typical | Rated       | Units |
|----------------------------|-----------------------------|---------|-------------|-------|
| Tested I/O voltage         | 60 sec, <1mA                |         | 1500 & 2250 | VDC   |
| Tested I, O / Case voltage | 60 sec, <1mA, 110Vin models |         | 1600        | VDC   |
| Resistance                 | 500VDC                      |         | >1000       | MOhm  |
| Capacitance                | I/O, 100KHz/0.1V            | 1000    |             | pF    |

## Output Specifications

| Parameters                   | Conditions                                       | Typical | Maximum | Units     |
|------------------------------|--------------------------------------------------|---------|---------|-----------|
| Voltage accuracy             |                                                  | ±1      | ±3      | %         |
| Over voltage protection      |                                                  | 110-160 |         | % of Vout |
| Over current protection      | 24 & 48Vin models                                | 110-190 |         | % of Iout |
|                              | 110Vin models                                    | 120-210 |         | % of Iout |
| Short Circuit protection     | Continuous                                       |         |         |           |
| Short circuit restart        | Auto-Recovery                                    |         |         |           |
| Line voltage regulation      | Full load, LL to HL, single output               | ±0.2    | ±0.5    | % of Vin  |
|                              | Full load, LL to HL, dual output                 | ±0.5    | ±1      | % of Vin  |
| Load voltage regulation      | 0-100% load, 110Vin single output                | ±0.5    | ±1      | %         |
|                              | 5- 100% load, 24/48Vin single output             | ±0.5    | ±1      | %         |
|                              | 5% to 100% load, dual output                     | ±0.5    | ±1.5    | %         |
| Cross Regulation             | 24/48Vin, output1 50% load, output2 10-100% load |         | ±5      | %         |
|                              | 110Vin, output1 50% load, output2 25-100% load   |         | ±10     | %         |
| Temperature coefficient      | 100% load                                        |         | ±0.03   | %/°C      |
| Ripple & Noise*              | 24/48Vin, 20MHz bandwidth, 5-100% load           | 60      | 85      | mV p-p    |
|                              | 110Vin, 20MHz bandwidth, 5-100% load             | 50      | 100     | mV p-p    |
| Transient recovery time      | 25% load step change                             | 300     | 500     | µS        |
| Transient recovery deviation | 25% load step change                             |         | ±8      | %         |

\* Please refer to the application note for specific detail.

## General Specifications

| Parameters            | Conditions                           | Typical     | Maximum | Units |
|-----------------------|--------------------------------------|-------------|---------|-------|
| Switching frequency*  | 100% load                            | 300         |         | KHz   |
| Operating temperature | See derating graph                   | -40 to +85  |         | °C    |
| Storage temperature   |                                      | -55 to +125 |         | °C    |
| Cooling               | Free air convection                  |             |         |       |
| Humidity              |                                      |             | 95      | % RH  |
| Case material         | Aluminum Alloy                       |             |         |       |
| Weight                | Pin mountable                        | 12.5        |         | g     |
|                       | With optional -ST mounting plate:    | 36          |         |       |
|                       | With optional -STD mounting plate:   | 56          |         |       |
|                       | With optional -K Pin mountable       | 17          |         |       |
|                       | With optional -ST-K mounting plate:  | 40          |         |       |
|                       | With optional -STD-K mounting plate: | 59          |         |       |

|                        |                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions (L x W x H) | Pin mountable<br>With optional -ST mounting plate:<br>With optional -STD mounting plate:<br>With optional -K Pin mountable<br>With optional -ST-K mounting plate:<br>With optional -STD-K mounting plate: | 1 x 1 x 0.46inches, 25.40 x 25.40 x 11.70mm<br>2.99 x 1.24 x 0.84inches, 76.00 x 31.50 x 21.20mm<br>2.99 x 1.24 x 1.02inches, 76.00 x 31.50 x 25.80mm<br>1 x 1 x 0.64inches, 25.40 x 25.40 x 16.20mm<br>2.99 x 1.24 x 0.99inches, 76.00 x 31.50 x 25.20mm<br>2.99 x 1.24 x 1.17inches, 76.00 x 31.50 x 29.80mm |
| MTBF                   | >1,000,000 hours (MIL-HDBK -217F, Ground Benign, $t=+25^{\circ}\text{C}$ )                                                                                                                                |                                                                                                                                                                                                                                                                                                                |
| Soldering temperature  | 1.5mm from case for 10 sec                                                                                                                                                                                | 300 °C                                                                                                                                                                                                                                                                                                         |

## Environmental Specifications

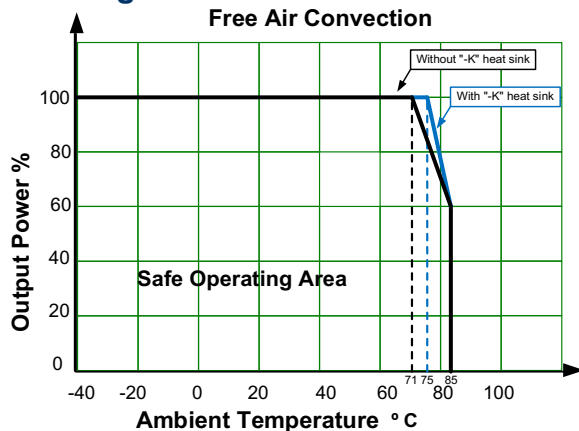
| Parameters |           |                                |
|------------|-----------|--------------------------------|
| Vibration  | Test mode | IEC61373 - Category 1, Grade B |

## Safety Specifications

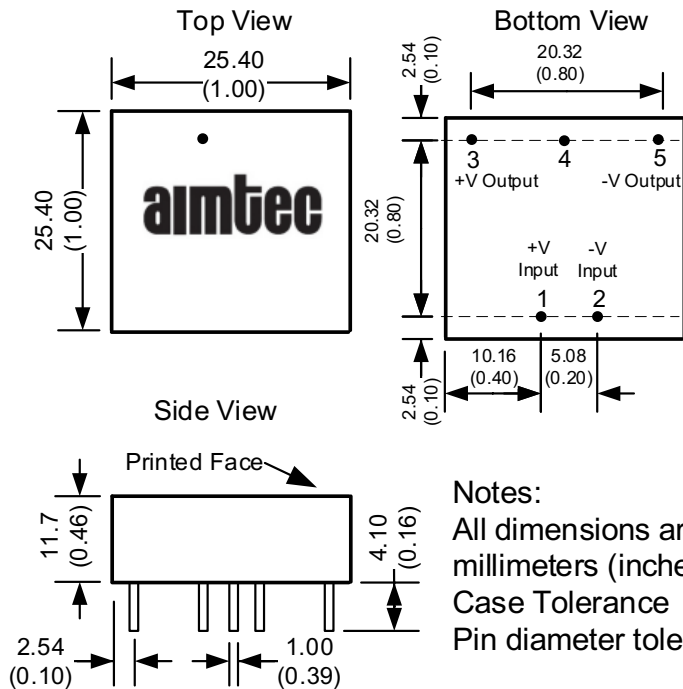
| Parameters |                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Approvals  | CE, UL<br>EN/IEC/UL60950-1<br>Design to meet EN62368 (except 110Vin single output models), EN50155 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Standards  | EMI - Conducted and radiated emission                                                              | EN55032, class A (24 & 48Vin models only, without external components)<br>EN55032, class B (24 & 48Vin models with EMC circuit 3-B) (110Vin models with EMC circuit 1 or 2-B)<br>EN50121-3-2 150kHz-500kHz 99dBuV (24 & 48Vin models with EMC circuit 3-B) *<br>EN55016-2-1 500kHz-30MHz 93dBuV (24 & 48Vin models with EMC circuit 3-B) *<br>EN50121-3-2 30MHz-230MHz 40dBuV/m at 10m (24 & 48Vin models with EMC circuit 3-B) *<br>EN55016-2-1 230MHz-1GHz 47dBuV/m at 10m (24 & 48Vin models with EMC circuit 3-B) * |
|            | Electrostatic Discharge Immunity                                                                   | IEC61000-4-2, Contact $\pm 4\text{KV}$ , Criteria B (24 & 48Vin models only)<br>IEC61000-4-2, Contact $\pm 6\text{KV}$ , Air $\pm 8\text{KV}$ , Criteria B (110Vin models only)<br>EN50121-3-2 Contact $\pm 6\text{KV}$ , Air $\pm 8\text{KV}$ , Criteria A (24 & 48Vin models only)<br>EN50121-3-2 Contact $\pm 6\text{KV}$ , Air $\pm 8\text{KV}$ , Criteria B (110Vin models only) *                                                                                                                                 |
|            | RF, Electromagnetic Field Immunity                                                                 | IEC61000-4-3, 10V/m, Criteria A (24 & 48Vin models only)<br>IEC61000-4-3, 20V/m, Criteria A (110Vin models only)<br>EN50121-3-2 20V/m, Criteria A *                                                                                                                                                                                                                                                                                                                                                                     |
|            | Electrical Fast Transient/Burst Immunity                                                           | IEC61000-4-4, $\pm 2\text{KV}$ , Criteria B (24 & 48Vin models only, with EMC circuit 3-A)<br>IEC61000-4-4, $\pm 4\text{KV}$ , Criteria B (110Vin models only, with EMC circuit 1 or 2-A)<br>EN50121-3-2 $\pm 2\text{kV}$ , 5/50ns, 5KHz, Criteria A (24 & 48Vin models with EMC circuit 3-A) *                                                                                                                                                                                                                         |
|            | Surge Immunity                                                                                     | IEC61000-4-5, L-L $\pm 2\text{KV}$ , Criteria B, (24 & 48Vin models only, with EMC circuit 3-A)<br>IEC61000-4-5, L-L $\pm 2\text{KV}$ , L-G $\pm 4\text{KV}$ , Criteria B (110Vin models only, with EMC circuit 1)<br>EN50121-3-2 L-L $\pm 1\text{KV}$ (42 $\Omega$ 0.5 $\mu\text{F}$ ) (24 & 48Vin models only, with EMC circuit 3-A)<br>EN50121-3-2 L-L $\pm 1\text{KV}$ (42 $\Omega$ 0.5 $\mu\text{F}$ ), L-G $\pm 2\text{KV}$ (42 $\Omega$ 0.5 $\mu\text{F}$ ), Criteria B (110Vin models only) *                   |
|            | RF, Conducted Disturbance Immunity                                                                 | IEC61000-4-6, 3 Vrms, Criteria A (24 & 48Vin models only)<br>IEC61000-4-6, 10 Vrms, Criteria A (110Vin models only)<br>EN50121-3-2 0.15MHz-80MHz 10Vr.m.s, Criteria A *                                                                                                                                                                                                                                                                                                                                                 |
|            | Voltage dips, short interruptions, and voltage variations                                          | IEC61000-4-29, 0-70%, Criteria B (24 & 48Vin models only)                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

\* For 110Vin models, EN50155, EN50121-3-2 and EN55016-2-1 are measured with a 100 $\mu\text{F}$ /200V input capacitor or AMFW72-13NZ.

## Derating



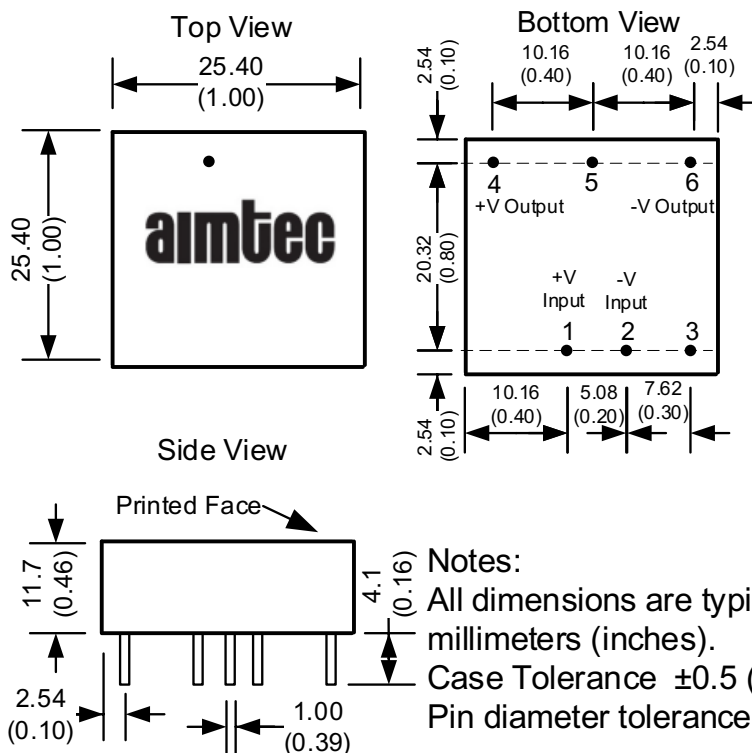
## Dimensions 24, 48Vin models



## Pin Out Specifications

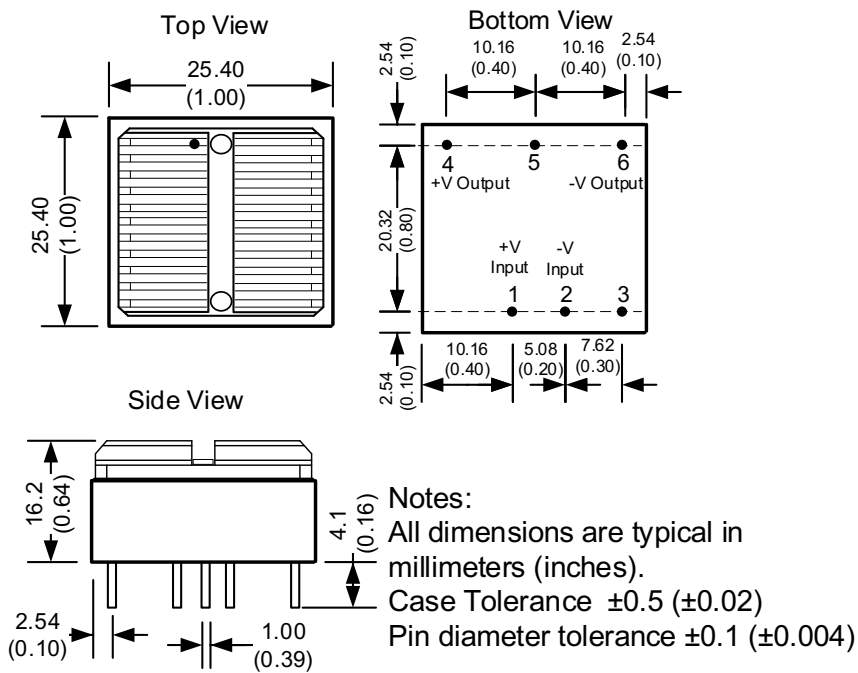
| 24, 48Vin models |           |           |
|------------------|-----------|-----------|
| Pin              | Single    | Dual      |
| 1                | +V Input  | +V Input  |
| 2                | -V Input  | -V Input  |
| 3                | +V Output | +V Output |
| 4                | No pin    | Common    |
| 5                | -V Output | -V Output |

## 110Vin models



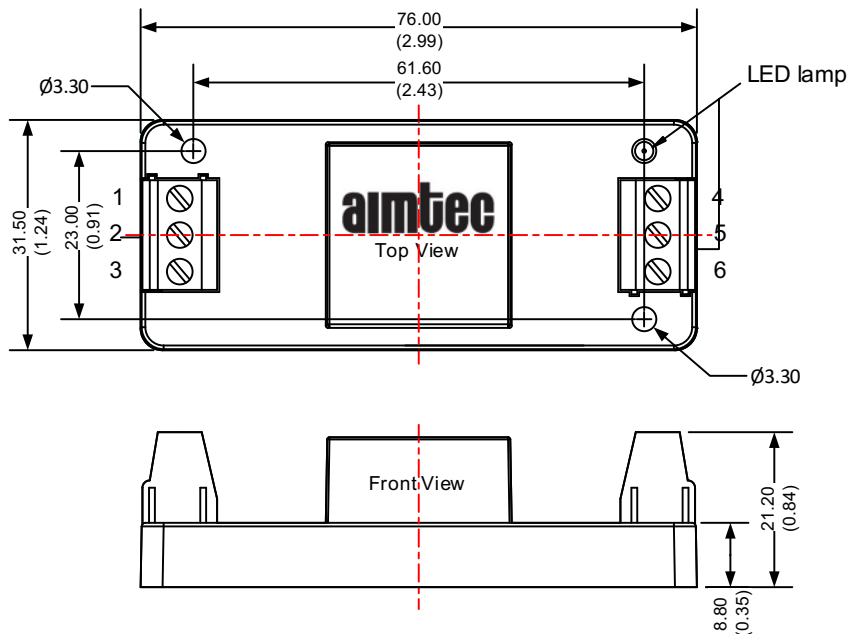
| 110Vin models |            |                |
|---------------|------------|----------------|
| Pin           | Single     | Dual           |
| 1             | + V input  | + V input      |
| 2             | - V input  | - V input      |
| 3             | No pin     | On/Off Control |
| 4             | + V output | + V output     |
| 5             | No pin     | Common         |
| 6             | - V output | - V output     |

**Heatsink Option: AM6CW-NZ-K**  
**110Vin models**



| 110Vin models |            |                |
|---------------|------------|----------------|
| Pin           | Single     | Dual           |
| 1             | + V input  | + V input      |
| 2             | - V input  | - V input      |
| 3             | No pin     | On/Off Control |
| 4             | + V output | + V output     |
| 5             | No pin     | Common         |
| 6             | - V output | - V output     |

**Screw Terminal Option: AM6CW-NZ-ST**

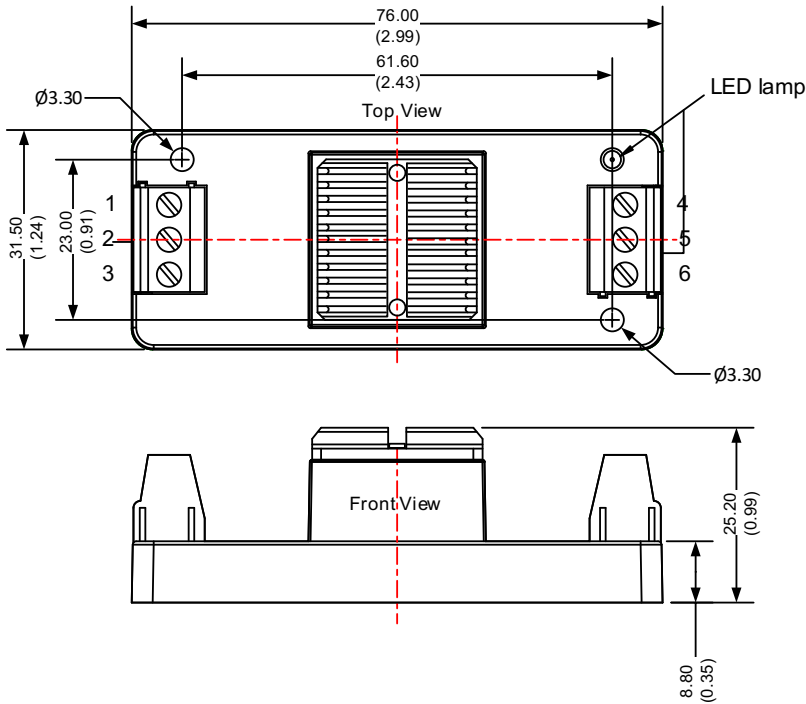


**Note:**  
Unit: mm (inch)  
Wire range: 24-12 AWG  
Tightening torque: Max 0.4 N\*m  
General tolerances:  $\pm 0.50$  ( $\pm 0.02$ )

| 24, 48Vin models |           |           |
|------------------|-----------|-----------|
| Pin              | Single    | Dual      |
| 1                | NC        | NC        |
| 2                | -V Input  | -V Input  |
| 3                | +V Input  | +V Input  |
| 4                | -V Output | -V Output |
| 5                | NC        | Common    |
| 6                | +V Output | +V Output |

| 110Vin models |           |                |
|---------------|-----------|----------------|
| Pin           | Single    | Dual           |
| 1             | NC        | On/Off Control |
| 2             | -V Input  | -V Input       |
| 3             | +V Input  | +V Input       |
| 4             | -V Output | -V Output      |
| 5             | NC        | Common         |
| 6             | +V Output | +V Output      |

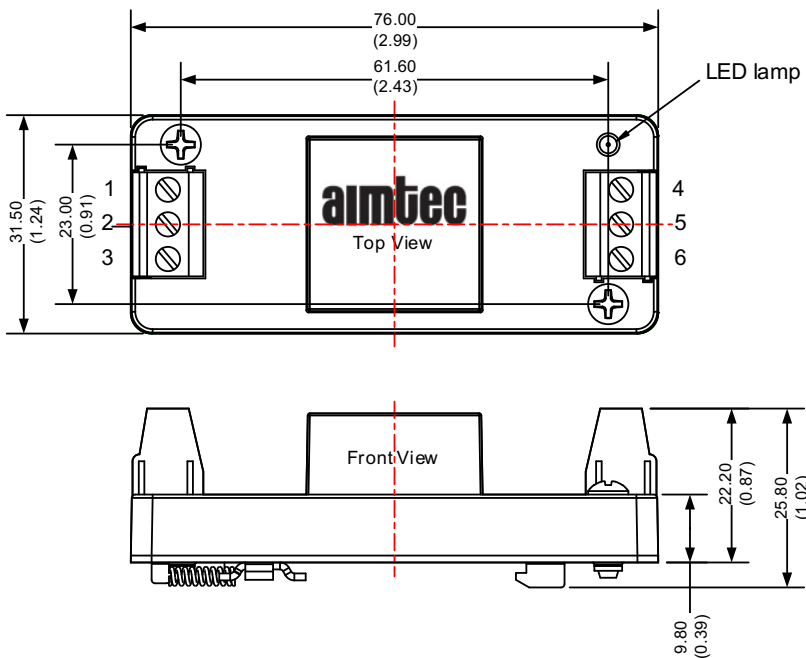
**Screw Terminal with heatsink Option: AM6CW-NZ-K-ST**



| 110Vin models |           |                |
|---------------|-----------|----------------|
| Pin           | Single    | Dual           |
| 1             | NC        | On/Off Control |
| 2             | -V Input  | -V Input       |
| 3             | +V Input  | +V Input       |
| 4             | -V Output | -V Output      |
| 5             | NC        | Common         |
| 6             | +V Output | +V Output      |

Note:  
Unit: mm (inch)  
Wire range: 24-12 AWG  
Tightening torque: Max 0.4 N\*m  
General tolerances:  $\pm 0.50$  ( $\pm 0.02$ )

**DIN-RAIL Option: AM6CW-NZ-STD**

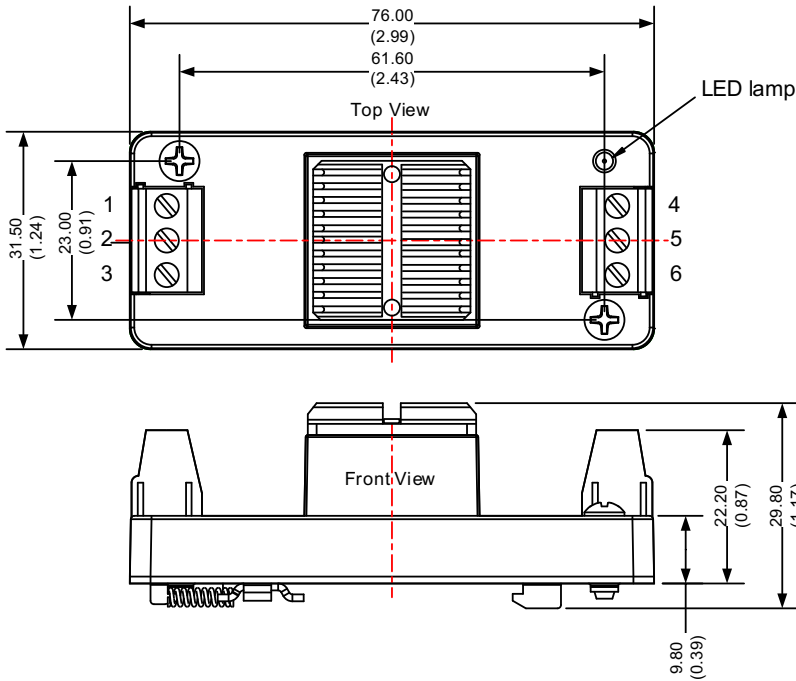


| 24, 48Vin models |           |           |
|------------------|-----------|-----------|
| Pin              | Single    | Dual      |
| 1                | NC        | NC        |
| 2                | -V Input  | -V Input  |
| 3                | +V Input  | +V Input  |
| 4                | -V Output | -V Output |
| 5                | NC        | Common    |
| 6                | +V Output | +V Output |

| 110Vin models |           |                |
|---------------|-----------|----------------|
| Pin           | Single    | Dual           |
| 1             | NC        | On/Off Control |
| 2             | -V Input  | -V Input       |
| 3             | +V Input  | +V Input       |
| 4             | -V Output | -V Output      |
| 5             | NC        | Common         |
| 6             | +V Output | +V Output      |

Note:  
Unit: mm (inch)  
Mounting rail: TS35  
Wire range: 24-12 AWG  
Tightening torque: Max 0.4 N\*m  
General tolerances:  $\pm 0.50$  ( $\pm 0.02$ )

**DIN-RAIL with heatsink Option: AM6CW-NZ-K-STD**

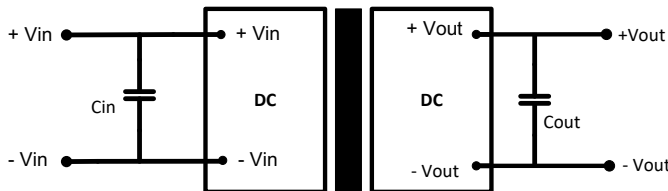


| 110Vin models |           |                |
|---------------|-----------|----------------|
| Pin           | Single    | Dual           |
| 1             | NC        | On/Off Control |
| 2             | -V Input  | -V Input       |
| 3             | +V Input  | +V Input       |
| 4             | -V Output | -V Output      |
| 5             | NC        | Common         |
| 6             | +V Output | +V Output      |

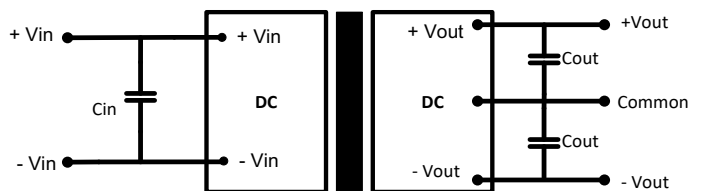
Note:  
Unit: mm (inch)  
Mounting rail: TS35  
Wire range: 24-12 AWG  
Tightening torque: Max 0.4 N\*m  
General tolerances:  $\pm 0.50$  ( $\pm 0.02$ )

**Typical application circuit**

**Single output models**

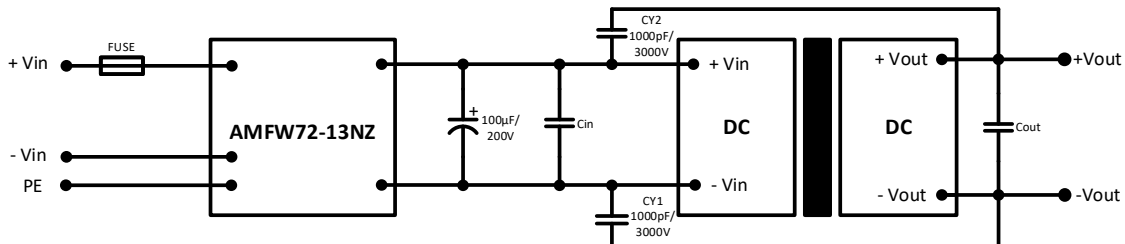


**Dual output models**

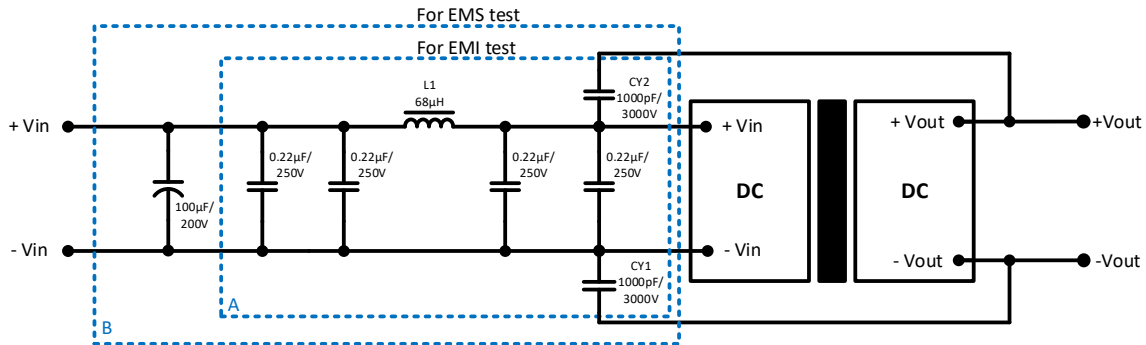


| Vin       | Cin           | Cout       |
|-----------|---------------|------------|
| 24V       | 100 $\mu$ F   | 10 $\mu$ F |
| 48V, 110V | 10-47 $\mu$ F | 10 $\mu$ F |

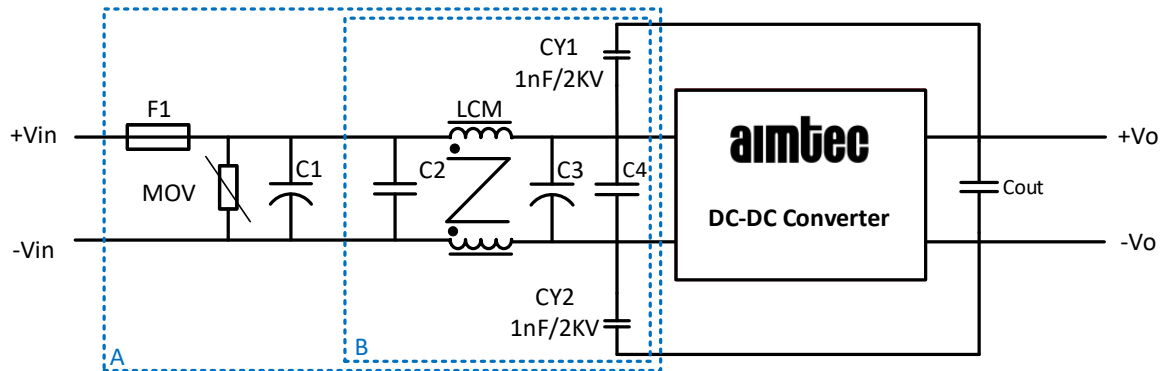
**Recommended EMC circuit 1 (110Vin models)**



### Recommended EMC circuit 2 (110Vin models)



### Recommended EMC circuit 3 (24 & 48 Vin models)



Notes: Part A for EMI filtering and Part B is used for EMS filtering.

| Vin | MOV    | C1            | C2          | C3            | C4            | LCM   |
|-----|--------|---------------|-------------|---------------|---------------|-------|
| 24V | S20K30 | 680 µF / 50V  | 1 µF / 50V  | 330 µF / 50V  | 4.7 µF / 50V  | 4.7mH |
| 48V | S14K60 | 680 µF / 100V | 1 µF / 100V | 330 µF / 100V | 4.7 µF / 100V | 4.7mH |

**NOTE:** 1. Datasheets are updated as needed and as such, specifications are subject to change without notice. Once printed or downloaded, datasheets are no longer controlled by Aimtec; refer to [www.aimtec.com](http://www.aimtec.com) for the most current product specifications. 2. Product labels shown, including safety agency certifications on labels, may vary based on the date manufactured. 3. Mechanical drawings and specifications are for reference only. 4. All specifications are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified. 5. Aimtec may not have conducted destructive testing or chemical analysis on all internal components and chemicals at the time of publishing this document. CAS numbers and other limited information are considered proprietary and may not be available for release. 6. This product is not designed for use in critical life support systems, equipment used in hazardous environments, nuclear control systems or other such applications which necessitate specific safety and regulatory standards other than the ones listed in this datasheet. 7. Warranty is in accordance with Aimtec's standard Terms of Sale available at [www.aimtec.com](http://www.aimtec.com).