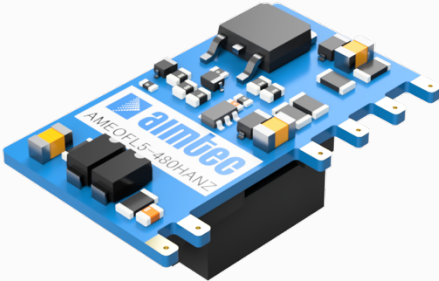


## AMEOFL5-480HANZ

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samples



Open frame

Aimtec's AMEOFL5-480HANZ series is one of Aimtec high efficiency green power 5W AC-DC converter. It features an ultra-wide input range accepting either AC or DC voltage, high efficiency and power density in an open-frame package with low power consumption and CLASS II reinforced insulation. Adding a variety of EMC external circuits allow this product to meet the needs of multiple industries.

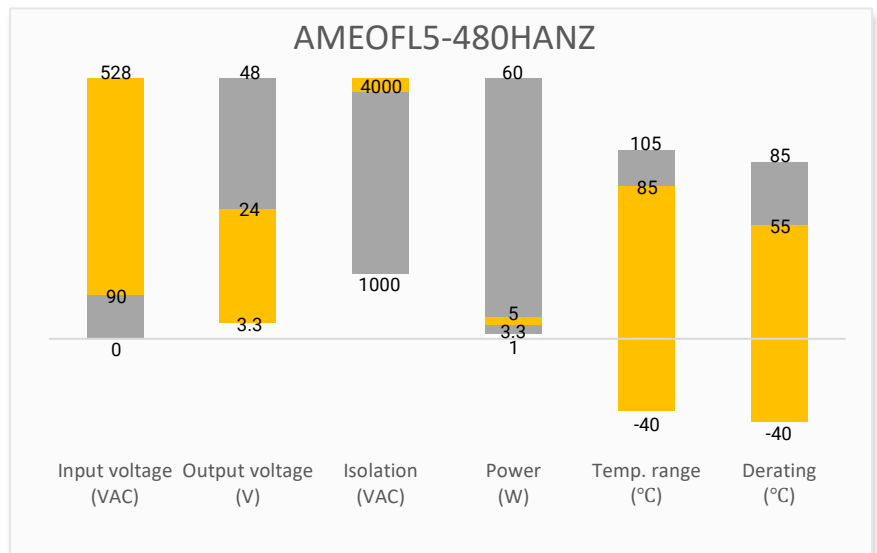
This series offers great operating temperatures, from -40°C to 85°C and features an isolation of 4000VAC for improved reliability and system safety. Furthermore, a high MTBF of 500,000h, output short circuit protection (OSCP) and an output over-current protection (OCP) come standard with the series.

All models are particularly suitable for industrial control, electric power, instrumentation and smart factory applications.

## Features

- Universal Input: 90 - 528VAC/100 - 745VDC
- Operating Temp: -40 °C to +85 °C
- High isolation voltage: 4000VAC
- Low ripple & noise, 180mV(p-p), max.
- Output short circuit, over-current
- Open frame package

## Summary



## Training



Product Training Video  
(click to open)



Press Release

Coming Soon!

Application Notes

## Applications



Power Grid



Industrial



Telecom



Instrumentation

## Models & Specifications

| Single Output      |                        |                     |                        |                    |                        |                              |                         |
|--------------------|------------------------|---------------------|------------------------|--------------------|------------------------|------------------------------|-------------------------|
| Model              | Input Voltage (VAC/Hz) | Input Voltage (VDC) | Max Output wattage (W) | Output Voltage (V) | Output Current max (A) | Maximum capacitive load (μF) | Efficiency @ 230VAC (%) |
| AMEOFL5-3S480HANZ  | 90~528/47~63           | 100~745             | 3.3                    | 3.3                | 1                      | 2200                         | 70                      |
| AMEOFL5-5S480HANZ  | 90~528/47~63           | 100~745             | 5                      | 5                  | 1                      | 1500                         | 72                      |
| AMEOFL5-9S480HANZ  | 90~528/47~63           | 100~745             | 5                      | 9                  | 0.56                   | 680                          | 72                      |
| AMEOFL5-12S480HANZ | 90~528/47~63           | 100~745             | 5                      | 12                 | 0.42                   | 470                          | 78                      |
| AMEOFL5-15S480HANZ | 90~528/47~63           | 100~745             | 5                      | 15                 | 0.34                   | 330                          | 78                      |
| AMEOFL5-24S480HANZ | 90~528/47~63           | 100~745             | 5                      | 24                 | 0.21                   | 100                          | 78                      |

Note: The output voltage is referred to the voltage applied to the load terminal with external circuits added.  
The solid fixing or gluing process is necessary if the product is applied in a severe vibrating environment or application.

| Input Specifications |                           |         |         |                   |
|----------------------|---------------------------|---------|---------|-------------------|
| Parameters           | Conditions                | Typical | Maximum | Units             |
| Input current        | 115VAC                    |         | 200     | mA                |
|                      | 230VAC                    |         | 100     | mA                |
|                      | 480VAC                    |         | 70      | mA                |
| Inrush current       | 115VAC                    | 10      |         | A                 |
|                      | 230VAC                    | 17      |         | A                 |
|                      | 480VAC                    | 28      |         | A                 |
| Leakage current      | 480VAC/50Hz               |         | 0.6     | mA <sub>RMS</sub> |
| External fuse        | Slow blow type(necessary) | 1       |         | A                 |

| Output Specifications |                                  |         |         |                   |
|-----------------------|----------------------------------|---------|---------|-------------------|
| Parameters            | Conditions                       | Typical | Maximum | Units             |
| Voltage accuracy      | 3.3V output                      | ± 3     | ± 6     | %                 |
|                       | Others                           | ± 2.5   | ± 5     | %                 |
| Line regulation       | Full load                        | ± 1.5   |         | %                 |
| Load regulation       | 10% - 100% load                  | ± 3     |         | %                 |
| Ripple & Noise        | 20MHz bandwidth, 10% - 100% load | 100     | 180     | mV <sub>p-p</sub> |
| Minimum load          |                                  | 10      |         | %                 |
| Hold up time          | 115VAC                           | 8       |         | ms                |
|                       | 230VAC                           | 35      |         | ms                |
|                       | 380VAC                           | 100     |         | ms                |

| Isolation Specifications |                 |         |       |       |
|--------------------------|-----------------|---------|-------|-------|
| Parameters               | Conditions      | Typical | Rated | Units |
| Tested I/O voltage       | 60 sec, 5mA max |         | 4000  | VAC   |

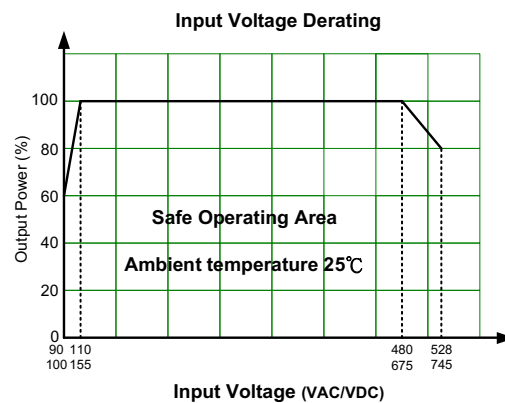
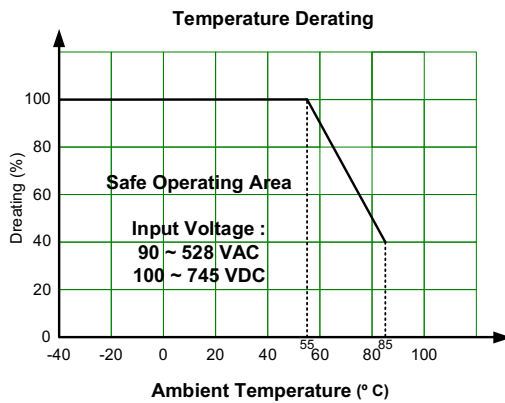
## General Specifications

| Parameters                                                                                                                                                                          | Conditions                                             | Typical | Maximum | Units     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|---------|---------|-----------|
| Safety class                                                                                                                                                                        | Class II                                               |         |         |           |
| Over current protection                                                                                                                                                             | Auto recovery                                          | ≥ 120   |         | % of Iout |
| Short circuit protection                                                                                                                                                            | Hiccup, Continuous, Auto recovery                      |         |         |           |
| Power consumption                                                                                                                                                                   | 230VAC                                                 |         | 0.3     | W         |
|                                                                                                                                                                                     | 380VAC                                                 |         | 0.5     | W         |
| Power derating                                                                                                                                                                      | +55 °C to +85 °C                                       | 2.0     |         | % / °C    |
|                                                                                                                                                                                     | 90VAC ~ 110VAC                                         | 2.0     |         | % /VAC    |
|                                                                                                                                                                                     | 480VAC ~ 528VAC                                        | 0.42    |         | % /VAC    |
| Operating temperature                                                                                                                                                               | -40 to +85                                             |         |         | °C        |
| Storage temperature                                                                                                                                                                 | -40 to +105                                            |         |         | °C        |
| Temperature coefficient                                                                                                                                                             |                                                        | ±0.2    |         | % / °C    |
| Cooling                                                                                                                                                                             | Free air convection                                    |         |         |           |
| Storage Humidity                                                                                                                                                                    |                                                        |         | 95      | % RH      |
| Weight                                                                                                                                                                              |                                                        | 6.2     |         | g         |
| Dimensions (L x W x H)                                                                                                                                                              | 1.32 x 0.68 x 0.51 inches ( 33.50 x 17.20 x 13.00 mm ) |         |         |           |
| MTBF                                                                                                                                                                                | > 500 000 hrs (MIL-HDBK -217F, t=+25°C)/Full Load      |         |         |           |
| 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. |                                                        |         |         |           |

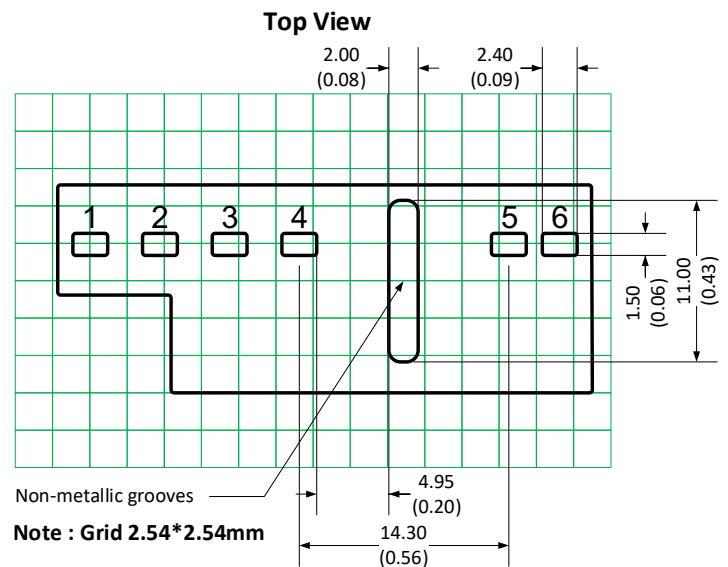
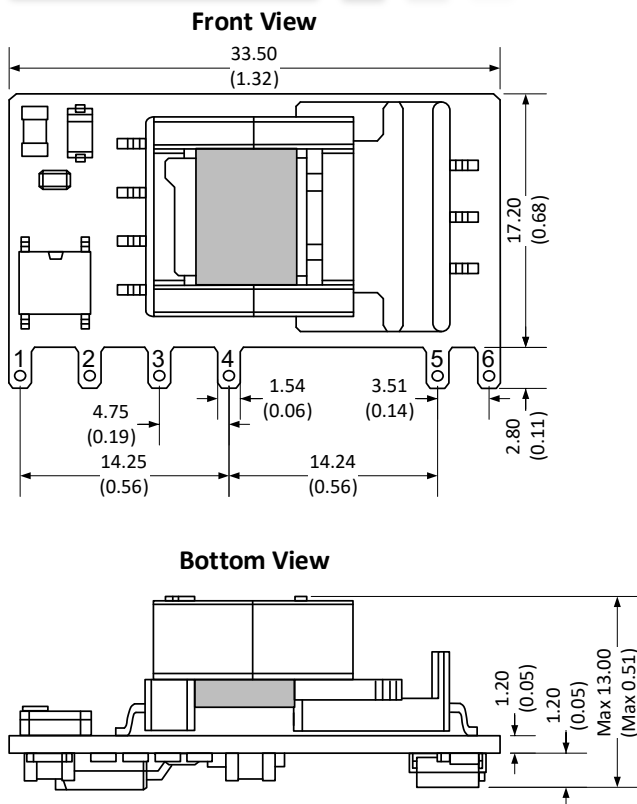
## Safety Specifications

| Parameters |                                                               |                                                                                                                                                                                                                                                                                                                                                                                    |
|------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standards  | Design to meet IEC/EN60335-1, IEC/EN61558-1, IEC/EN/UL62368-1 |                                                                                                                                                                                                                                                                                                                                                                                    |
|            | EMC - Conducted and radiated emission                         | CISPR32 / EN55032, Class A (With EMI class A recommended circuit)<br>CISPR32 / EN55032, Class B (With EMI class B recommended circuit)                                                                                                                                                                                                                                             |
|            | Electrostatic Discharge Immunity                              | IEC/EN 61000-4-2 Contact ±6KV, Criteria B                                                                                                                                                                                                                                                                                                                                          |
|            | RF, Electromagnetic Field Immunity                            | IEC/EN 61000-4-3 10V/m, Criteria A                                                                                                                                                                                                                                                                                                                                                 |
|            | Electrical Fast Transient/Burst Immunity                      | IEC/EN 61000-4-4 ±2KV, Criteria B (With EMS Class III recommended circuit)<br>IEC/EN 61000-4-4 ±4KV, Criteria B (With EMS Class IV recommended circuit)                                                                                                                                                                                                                            |
|            | Surge Immunity                                                | IEC/EN 61000-4-5 L-L ±1KV, Criteria B (With EMS Class III recommended circuit)<br>IEC/EN 61000-4-5 L-L ±2KV, Criteria B (With EMS Class IV recommended circuit)<br>IEC/EN 61000-4-5 L-L ±2KV, L-G ±4V, Criteria B (With outdoor industrial environment recommended circuit)<br>IEC/EN 61000-4-5 L-L ±4KV, Criteria B (With strong lightning surge environment recommended circuit) |
|            | RF, Conducted Disturbance Immunity                            | IEC/EN 61000-4-6 10Vr.m.s, Criteria A                                                                                                                                                                                                                                                                                                                                              |
|            | Voltage dips, Short Interruptions Immunity                    | IEC/EN 61000-4-11 0%, 70%, Criteria B                                                                                                                                                                                                                                                                                                                                              |

## Derating



## Dimensions



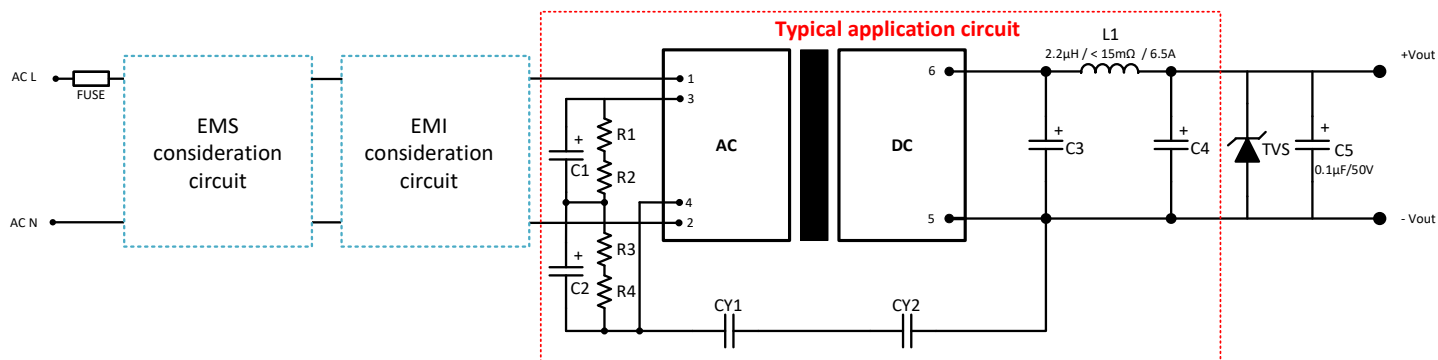
**Note:**  
Unit: mm [inch]  
General tolerances:  $\pm 1.00$  [ $\pm 0.04$ ]  
The layout of the device is for reference only,  
Please refer to the actual product.

### Pin Output Specifications

| Pin | Function     |
|-----|--------------|
| 1   | +V Input (L) |
| 2   | -V Input (N) |
| 3   | +V_Cap       |
| 4   | -V_Cap       |
| 5   | -V Output    |
| 6   | +V Output    |

1. It is necessary to add C1 between pin3 to pin4
2. It is necessary to add circuit to the output as shown in recommended circuit
3. The layout of the device is for reference only, please refer to the actual product

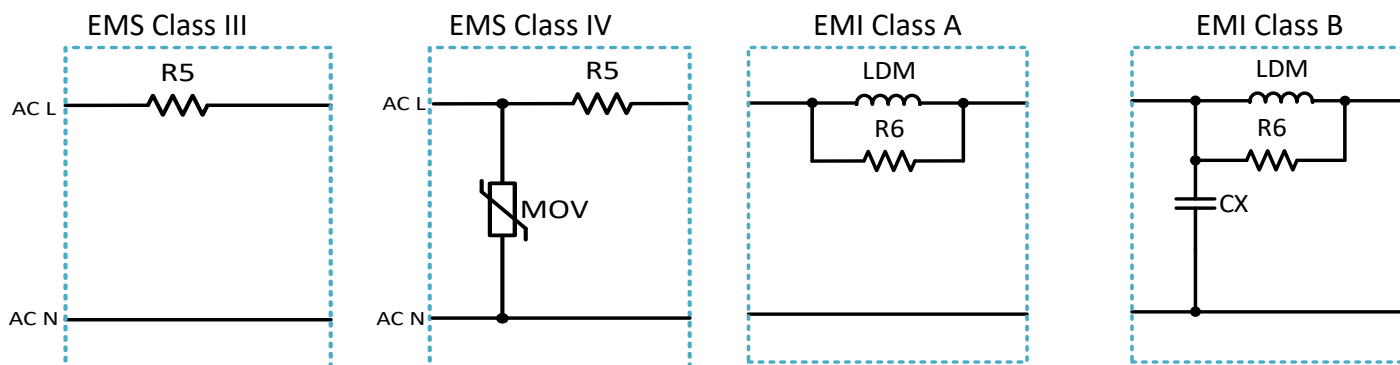
## Recommended EMC external circuit



| Model name         | C1/C2                                                                                            | R1/R2/R3/R4                                                                                                             | C3                                        | C4               | TVS        |
|--------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------|------------|
| AMEOFL5-3S480HANZ  | <b>47μF/400V</b><br>(-40 °C ~ +85 °C, 90 - 528VAC input)                                         | <b>1MΩ/1206/0.25W</b><br>(90 - 528VAC input /<br>165 - 528VAC input)<br><br><b>No connection</b><br>(90 - 305VAC input) | <b>470μF/16V</b><br>solid-state capacitor | <b>150μF/35V</b> | <b>7V</b>  |
| AMEOFL5-5S480HANZ  | <b>33μF/400V</b><br>(-25 °C ~ +85 °C, 90 - 528VAC input;<br>-40 °C ~ +85 °C, 165 - 528VAC input) |                                                                                                                         | <b>470μF/16V</b><br>solid-state capacitor | <b>150μF/35V</b> | <b>7V</b>  |
| AMEOFL5-9S480HANZ  | <b>22μF/400V</b><br>(-25 °C ~ +85 °C, 165 - 528VAC input)                                        |                                                                                                                         | <b>270μF/16V</b><br>solid-state capacitor | <b>100μF/35V</b> | <b>12V</b> |
| AMEOFL5-12S480HANZ | <b>C1: 22μF/450V &amp; C2: Wire</b><br>(-40 °C ~ +85 °C, 90 - 305VAC input)                      |                                                                                                                         | <b>270μF/16V</b><br>solid-state capacitor | <b>47μF/35V</b>  | <b>20V</b> |
| AMEOFL5-15S480HANZ | <b>C1: 10μF/450V &amp; C2: Wire</b><br>(-25 °C ~ +85 °C, 90 - 305VAC input)                      |                                                                                                                         | <b>220μF/35V</b>                          | <b>47μF/35V</b>  | <b>20V</b> |
| AMEOFL5-24S480HANZ |                                                                                                  |                                                                                                                         | <b>150μF/35V</b>                          | <b>47μF/35V</b>  | <b>30V</b> |

- The **FUSE** and the components in red box are basic necessary components for typical application circuit.
- C4 is recommended a high frequency and low ESR (ESR rated at low temperature of  $-40^{\circ}\text{C} \leq 1.1\Omega$ ) electrolytic capacitor.
- With the variable combination of below EMS and EMI circuits which offer the different level of protection.
- A suppressor diode (TVS) is recommended to protect the application in case of a converter failure and specification should be 1.2 times of the output voltage.

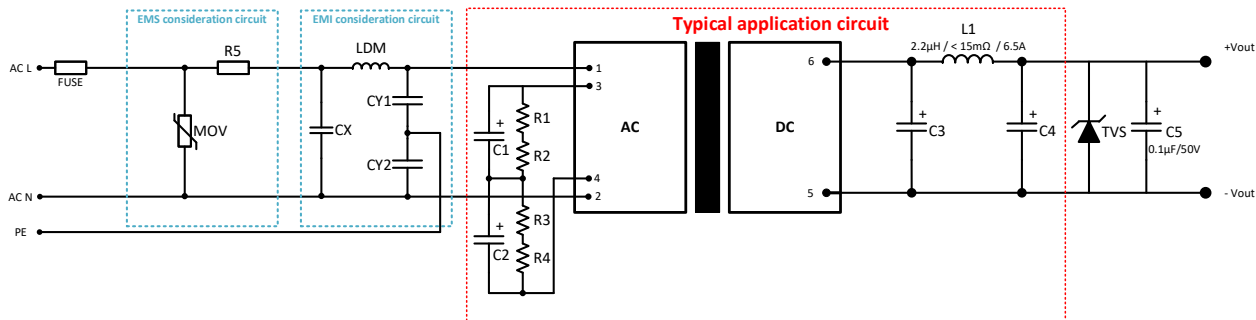
### EMI & EMS Recommended Circuit



| Application environmental | Ambient temperature range | EMS CLASS | EMI CLASS | CY1          | CY2          |
|---------------------------|---------------------------|-----------|-----------|--------------|--------------|
| Basic application         | -40 °C ~ +85 °C           | CLASS III | CLASS A   | 1nF/400VAC   | Wire         |
| Indoor general            | -25 °C ~ +55 °C           | CLASS III | CLASS B   | 2.2nF/250VAC | 2.2nF/250VAC |
| Indoor industrial         | -25 °C ~ +55 °C           | CLASS IV  | CLASS B   | 1nF/400VAC   | Wire         |
| Outdoor general           | -40 °C ~ +85 °C           | CLASS IV  | CLASS A   | 1nF/400VAC   | Wire         |

| Component               |                               | EMS               |                   | EMI                     |              |
|-------------------------|-------------------------------|-------------------|-------------------|-------------------------|--------------|
|                         |                               | Class III         | Class IV          | CLASS A                 | CLASS B      |
| MOV                     |                               | -                 | S14K550           | -                       | -            |
| R5(Wire-wound resistor) |                               | 12Ω/3W            |                   | -                       | -            |
| R6<br>(Chip resistor)   | 5V / 9V output                | -                 | -                 | 20KΩ/1206/0.25W         | -            |
|                         | 3.3V / 12V output             | -                 | -                 | 2KΩ/1206/0.25W          | -            |
|                         | 15V / 24V output              | -                 | -                 | 15KΩ/1206/0.25W         | -            |
| CX                      |                               | -                 | -                 | -                       | 0.1μF/480VAC |
| LDM                     | 5V output                     | -                 | -                 | 1.2mH / < 2.5Ω / > 0.2A | -            |
|                         | 9V output                     | -                 | -                 | 2.2mH / < 15Ω / > 0.2A  | -            |
|                         | 3.3V / 12V / 15V / 24V output | -                 | -                 | 4.7mH / < 15Ω / > 0.2A  | -            |
| FUSE                    |                               | 1A/500V slow blow | 2A/500V slow blow | -                       | -            |

## Outdoor Industrial Environment Recommended Circuit

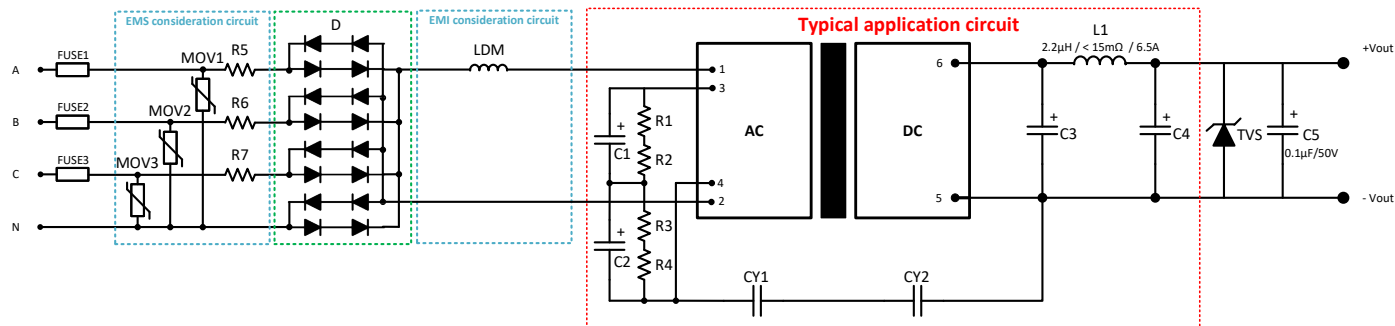


| Application environmental      | Ambient temperature range | EMS CLASS | EMI CLASS |
|--------------------------------|---------------------------|-----------|-----------|
| Outdoor industrial environment | -40 °C ~ +85 °C           | CLASS IV  | CLASS A   |

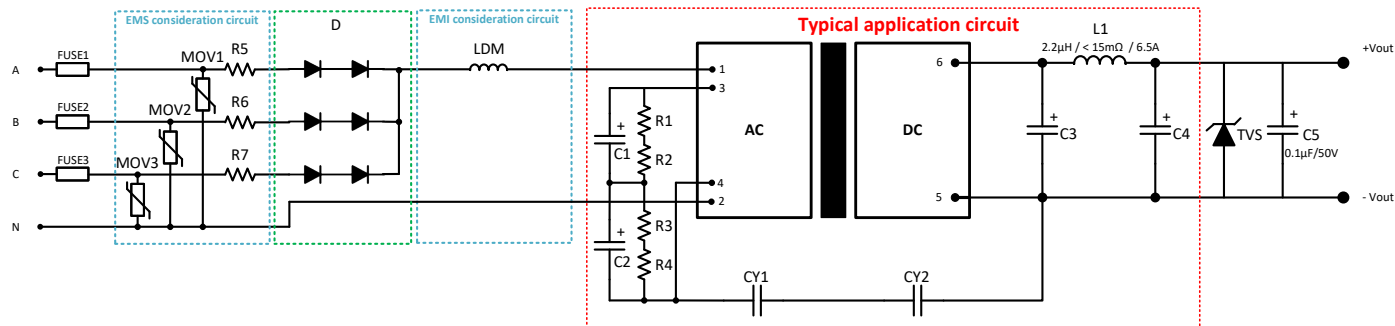
| Component               |                               | EMS               | EMI                     |
|-------------------------|-------------------------------|-------------------|-------------------------|
|                         |                               | Class IV          | CLASS A                 |
| FUSE                    |                               | 2A/500V slow blow | -                       |
| MOV                     |                               | S14K550           | -                       |
| R5(Wire-wound resistor) |                               | 12Ω/3W            | -                       |
| CX                      |                               | -                 | 0.1μF/480VAC            |
| CY1, CY2                |                               | -                 | 1nF/400VAC              |
| LDM                     | 5V output                     | -                 | 1.2mH / < 2.5Ω / > 0.2A |
|                         | 9V output                     | -                 | 2.2mH / < 15Ω / > 0.2A  |
|                         | 3.3V / 12V / 15V / 24V output | -                 | 4.7mH / < 15Ω / > 0.2A  |

## Strong Lightning Surge Environment Recommended Circuit

### Full-wave rectification



### Half-wave rectification



| Application environmental          | Ambient temperature range | EMS CLASS | EMI CLASS | CY1        | CY2  |
|------------------------------------|---------------------------|-----------|-----------|------------|------|
| Strong lightning surge environment | -40 °C ~ +85 °C           | CLASS IV  | CLASS A   | 1nF/400VAC | Wire |

| Component                         |                               | EMS                  | EMI                     |
|-----------------------------------|-------------------------------|----------------------|-------------------------|
|                                   |                               | Class IV             | CLASS A                 |
| FUSE1 / FUSE2 / FUSE3             |                               | 3.15A/500V slow blow |                         |
| MOV1 / MOV2 / MOV3                |                               | S14K550              | -                       |
| R5 / R6 / R7(Wire-wound resistor) |                               | 12Ω/5W               | -                       |
| D                                 |                               | 2A/1000V             |                         |
| LDM                               | 5V output                     | -                    | 1.2mH / < 2.5Ω / > 0.2A |
|                                   | 9V output                     | -                    | 2.2mH / < 15Ω / > 0.2A  |
|                                   | 3.3V / 12V / 15V / 24V output | -                    | 4.7mH / < 15Ω / > 0.2A  |

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