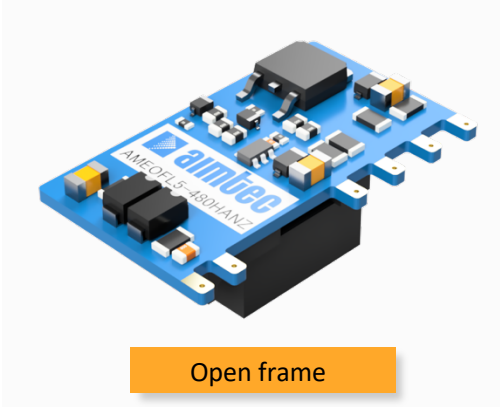




## AMEOFL5-480HANZ



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.

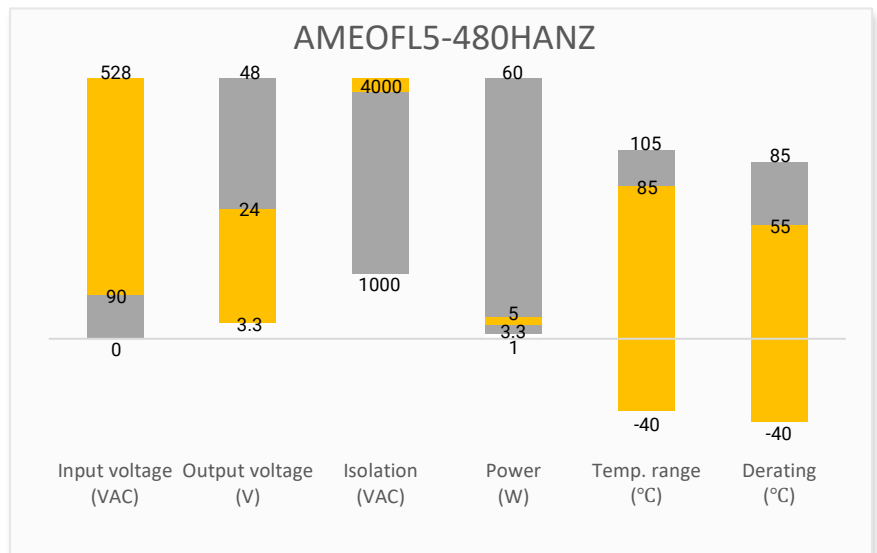
All models are particularly suitable for industrial control, electric power, instrumentation and smart factory applications.

## Features

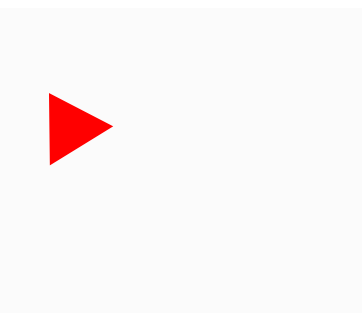


- Universal Input: 90 - 528VAC/100 - 745VDC
- Operating Temp: -40 °C to +85 °C
- High isolation voltage: 4000VAC
- Low ripple & noise, 180mV(p-p), max.
- Output short circuit, over-current
- Open frame package

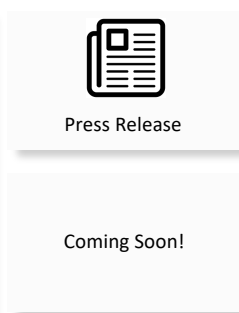
## Summary



## Training



Product Training Video  
(click to open)



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 ( $\mu$ F)	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	$\pm 3$	$\pm 6$	%
	Others	$\pm 2.5$	$\pm 5$	%
Line regulation	Full load	$\pm 1.5$		%
Load regulation	10% - 100% load	$\pm 3$		%
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

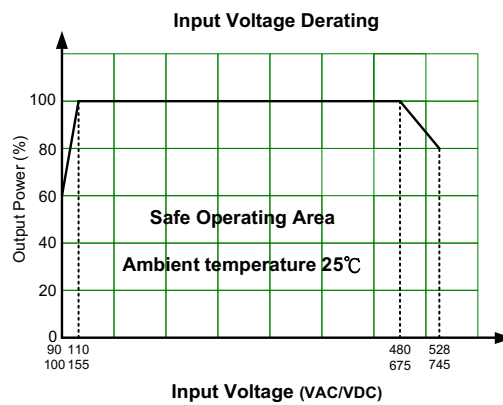
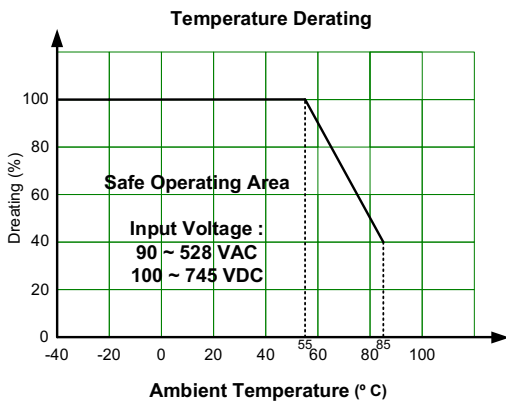
### Isolation Specifications

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

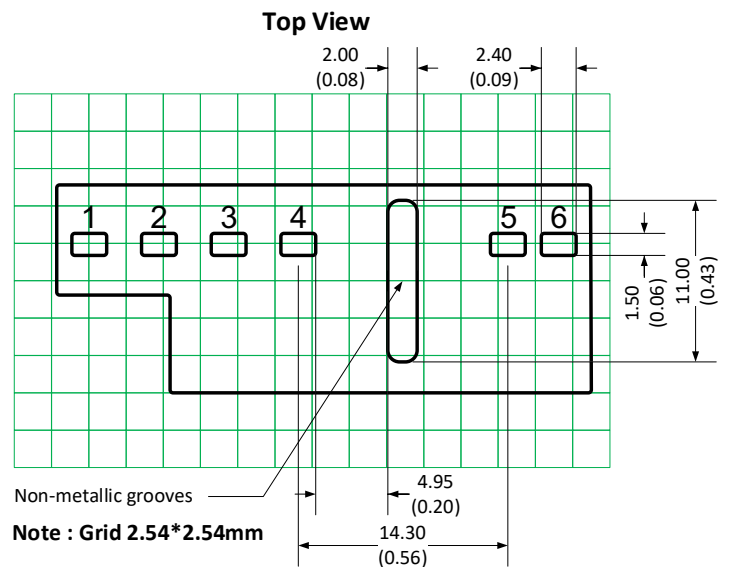
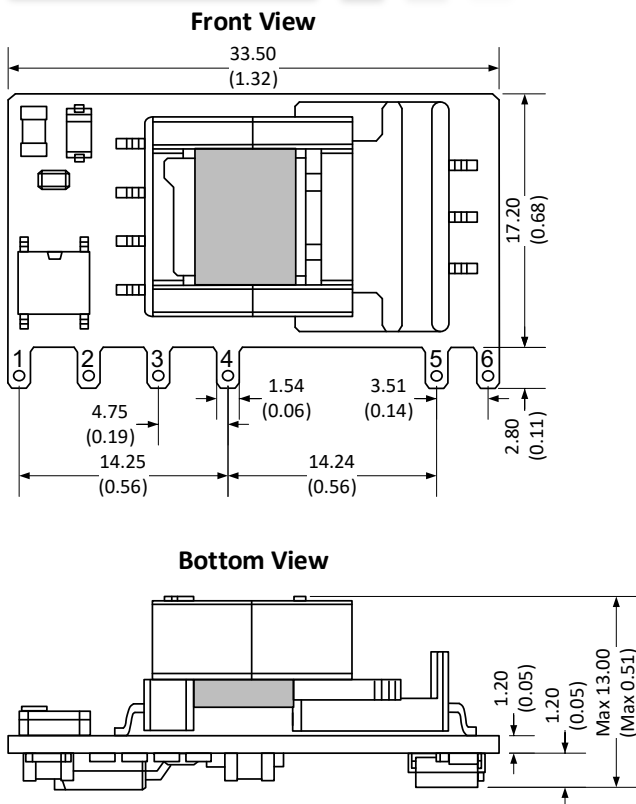
General Specifications				
Parameters	Conditions	Typical	Maximum	Units
Safety class	Class II			
Over current protection	Auto recovery	≥ 120		% of Iout
Short circuit protection	Hiccup, Continuous, Auto recovery			
Power consumption	230VAC		0.3	W
	380VAC		0.5	W
Power derating	+55 °C to +85 °C	2.0		% / °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) 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) 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) IEC/EN 61000-4-5 L-L ±2KV, Criteria B (With EMS Class IV recommended circuit) IEC/EN 61000-4-5 L-L ±2KV, L-G ±4V, Criteria B (With outdoor industrial environment recommended circuit) 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

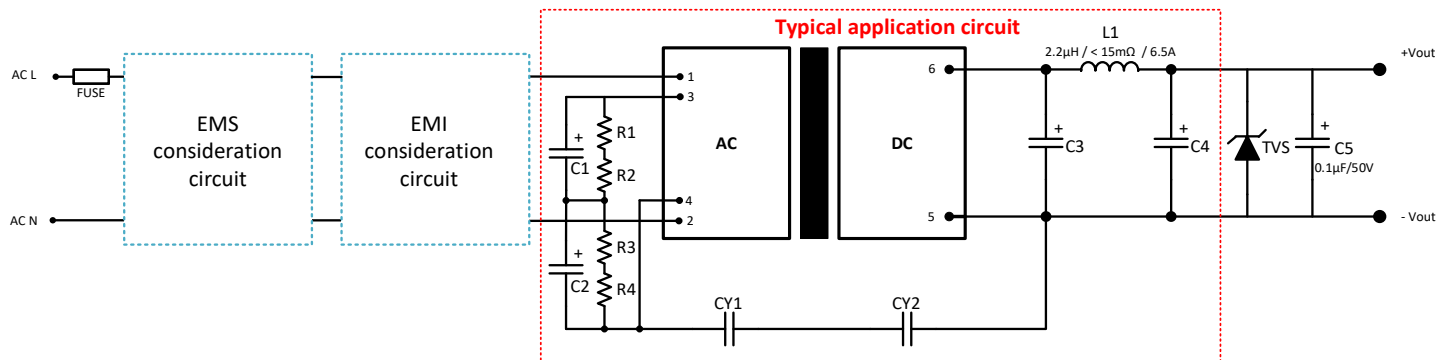


**Note:**  
Unit: mm [inch]  
General tolerances:  $\pm 1.00$  [ $\pm 0.04$ ]  
The layout of the device is for reference only,  
Please refer to the actual product.

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

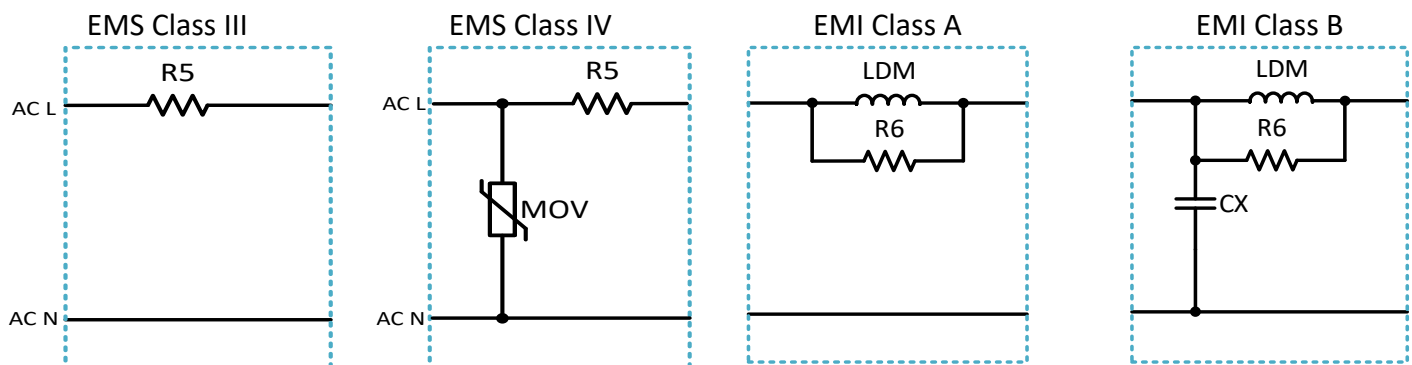
## Recommended EMC external circuit



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

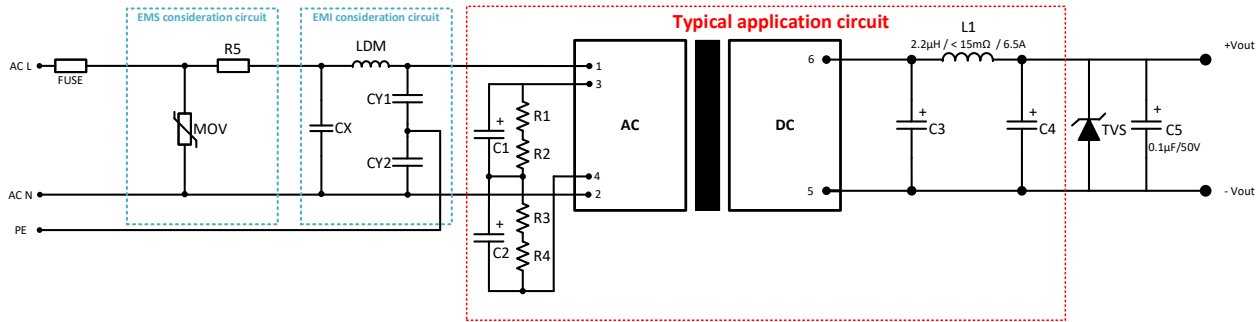
### EMI & EMS Recommended Circuit



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 (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

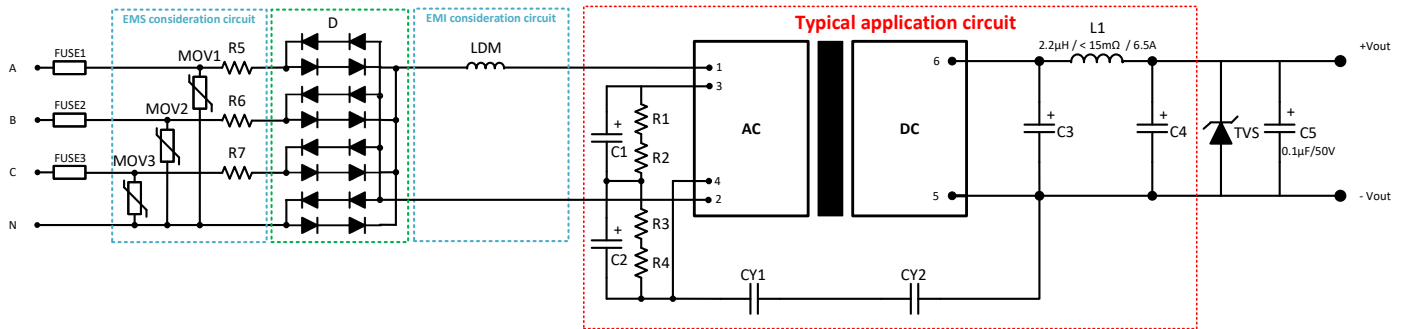


Application environmental	Ambient temperature range	EMS CLASS	EMI CLASS
Outdoor industrial environment	-40 °C ~ +85 °C	CLASS IV	CLASS A

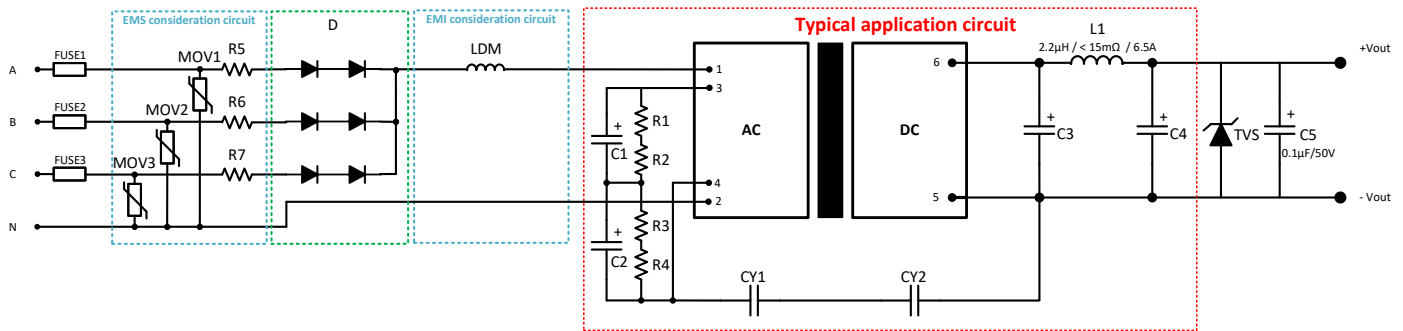
Component	EMS		EMI
	Class IV		CLASS A
FUSE	2A/500V slow blow		-
MOV	S14K550		-
R5(Wire-wound resistor)	12Ω/3W		-
CX	-		0.1μF/480VAC
CY1, CY2	-		1nF/400VAC
LDM	5V output	-	1.2mH / < 2.5Ω / > 0.2A
	9V output	-	2.2mH / < 15Ω / > 0.2A
	3.3V / 12V / 15V / 24V output	-	4.7mH / < 15Ω / > 0.2A

## 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	<b>3.15A/500V slow blow</b>	
MOV1 / MOV2 / MOV3	<b>S14K550</b>	-
R5 / R6 / R7(Wire-wound resistor)	<b>12Ω/5W</b>	-
D		<b>2A/1000V</b>
LDM	5V output	<b>1.2mH / &lt; 2.5Ω / &gt; 0.2A</b>
	9V output	<b>2.2mH / &lt; 15Ω / &gt; 0.2A</b>
	3.3V / 12V / 15V / 24V output	<b>4.7mH / &lt; 15Ω / &gt; 0.2A</b>

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