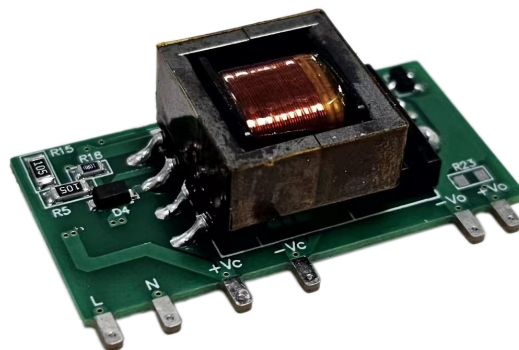


Typical Features	
◆	Wide range input: 176-528VAC/248-745VDC
◆	No load power consumption ≤ 0.3W
◆	Transfer efficiency (typ. 82%)
◆	Switching Frequency: 65KHz
◆	Protections: Short Circuit, over current
◆	Isolation Voltage 3600Vac
◆	Meet IEC62368/UL62368/EN62368 test standards
◆	Ultra-small volume bare board, industrial grade design
◆	PCB mounting



Application Field

FA15-380SXXG9N4 Series----- a compact size, high efficient, power converter offered by Aipu. It features universal input voltage, DC and AC dual-use, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, safer isolation, and good EMC performance. EMC and safety specifications meet the international EN55032, IEC/EN61000 standards. It widely used in power, industrial, instrument and smart home applications. For harsh EMC environment, the application circuit in the datasheet is strongly recommended.

Typical Product List

Certificate	Model	Output Specification			Max. Capacitive Load @220Vac	Ripple & Noise 20MHz (TYP.)	Efficiency@ Full Load, 220Vac (TYP.)
		Power	Voltage 1	Current 1			
		(W)	Vo1(V)	Io1(m A)			
/	FA15-380S05G9N4	15	5	3000	4000	120	81
	FA15-380S12G9N4	15	12	120	2000	120	82
	FA15-380S15G9N4	15	15	1000	2000	120	83
	FA15-380S24G9N4	15	24	625	800	150	84

Note 1: Due to space limitations, above is only a part of our product list, please contact our sales team for more items.
 Note 2: The typical output efficiency is based on that product is full loaded and burned-in after half an hour.
 Note 3: "*" is model under developing.
 Note 4: The fluctuation range of full load efficiency(% ,TYP) is ±2%, full load output efficiency= total output power/module's input power.
 Note 5: The test method of ripple and noise adopts the twisted pair test method. The specific test method and collocation can be seen in the following (Ripple & Noise test instructions)

Input Specification

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	AC Input	176	220	528	VAC
	DC Input	248	310	745	VDC
Input Frequency Range	-	47	50	63	Hz
Input Current	115VAC	/	/	0.25	A
	220VAC	/	/	0.20	

Surge Current	115VAC	/	/	10	
	220VAC	/	/	20	
Leakage Current	-	0.25mA TYP/230VAC/50Hz			
External fuse recommended value	-	2A/500VAC slow-fusing			
Hot plug	-	Unavailable			
Remote control terminal	-	No remote control terminal			

Output Specification

Item		Operating Condition		Min.	Typ.	Max.	Unit
Voltage Accuracy		Full input voltage range Any load	Vo	-	±2.0	±3.0	%
Line Regulation		Nominal Load	Vo	-	-	±0.5	%
Load Regulation		Nominal input voltage 20%~100% load	Vo	-	-	±1.0	%
No load power consumption		Input 176VAC		-	-	0.25	W
		Input 220VAC		-	-		
Minimum load		Single Output		0	-	-	%
Turn-on Delay Time		Nominal input voltage (full load)		-	1000	-	mS
Power-off Holding Time		Input 176VAC (full load)			50		mS
		Input 220VAC (full load)		--	80	-	
Dynamic response	Overshoot amplitude	25%~50%~25% 50%~75%~50%		-5.0	--	+5.0	%
	Recovery time			-	5.0	--	mS
Output Overshooting		Full input voltage range		≤10%Vo			%
Short Circuit Protection				Capable of long-term short circuit and self recovery			Hiccup
Drift Coefficient		-		-	±0.03%	-	%/°C
Over Current Protection		Input 220VAC		≥110% Io, Self-recovery			Hiccup

General Specifications

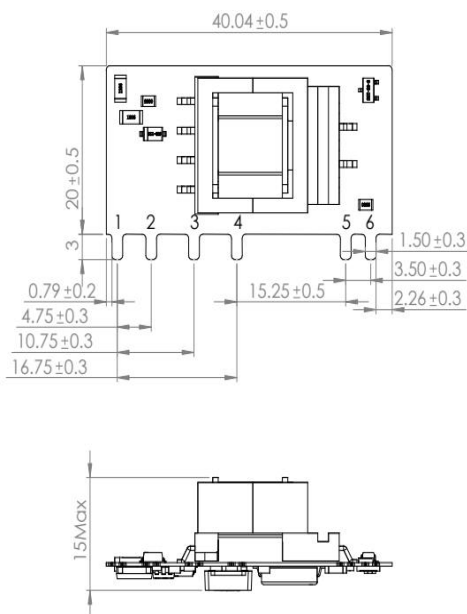
Item		Operating Condition		Min.	Typ.	Max.	Unit
Switching Frequency		-		-	65	-	KHz
Operating Temperature		-		-40	-	+85	°C
Storage Temperature		-		-40	-	+105	
Soldering Temperature		Wave-soldering		260±4°C, timing 5-10S			
		Manual-soldering		360±8°C, timing 4-7S			
Relative Humidity		-		10	-	90	%RH
Isolation Voltage	Input-Output	Test 1min, leakage current≤5mA		3600	-	-	VAC
Insulation Resistance	Input-Output	@DC500V		100	-	-	MΩ

Safety Standard	-	EN62368、IEC62368
Vibration	-	10-55Hz,10G,30Min,alongX,Y,Z
Safety Class	-	CLASS II
MTBF	-	MIL-HDBK-217F@25℃ > 300,000H

EMC Characteristics

Total Item		Sub Item	Test Standard	Class
EMC	EMI	CE	CISPR22/EN55032	CLASS B (Recommended Circuit 2)
		RE	CISPR22/EN55032	CLASS B (Recommended Circuit 2)
	EMS	Radiation immunity	IEC/EN61000-4-3	10V/m Perf.Criteria A (Recommended Circuit 1)
		Conducted disturbance immunity	IEC/EN61000-4-6	10Vr.m.s Perf.Criteria A (Recommended Circuit 1)
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	±2KV Perf.Criteria B (Recommended Circuit 2)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B ±4KV Perf.Criteria B (Recommended Circuit 2)
		Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%~70% Perf.Criteria B

Packing Dimension



Note:
 Unite:mm
 Unmarked tolerance:±1.0
 The layout of the appliance is for reference only, and the specific object shall prevail

Packing Code	L x W x H	
-	40.04 x 20.0 x 15.0 mm	1.576 × 0.787 × 0.591 inch

Pin Definition

Pin-out	1	2	3	4	5	7	8
Single(S)	AC(L)	AC(N)	+Vc	-Vc	-Vo	+Vo	AC(L)

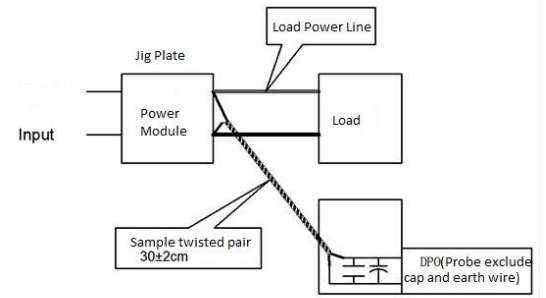
Note: If the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

Ripple& Noise Test: (Twisted Pair Method 20MHZ bandwidth)

Test Method:

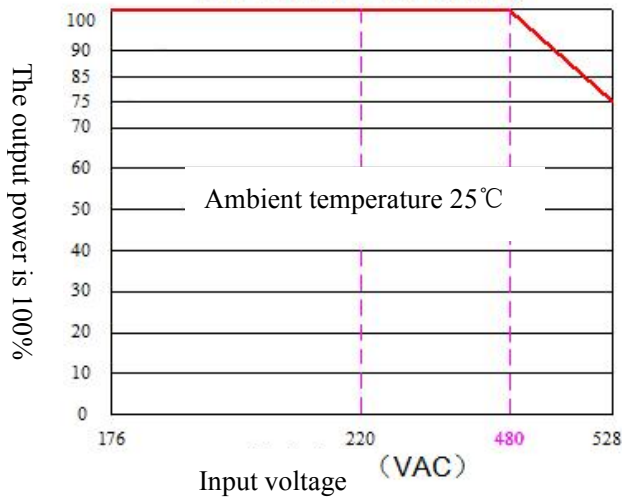
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

(2) Input terminal connect to power supply, output terminal connect to electronic load through jig plate, Use 30cm±2 cm sampling line, Power line selected from corresponding diameter wire with insulation according to the flow of output current.

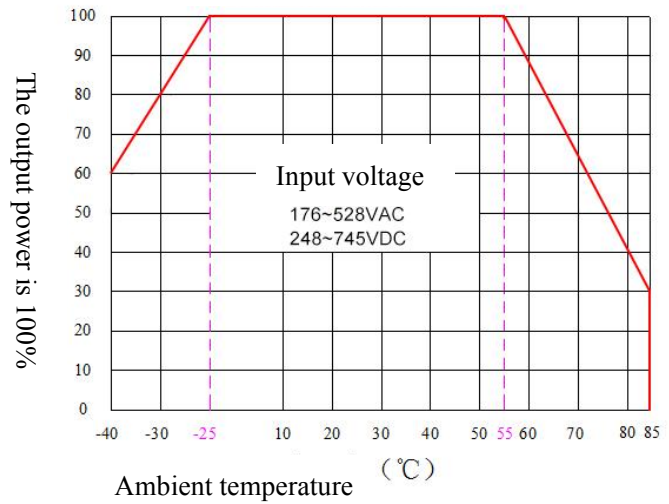


Product Characteristic Curve

Input voltage derating curve



Input voltage derating curve

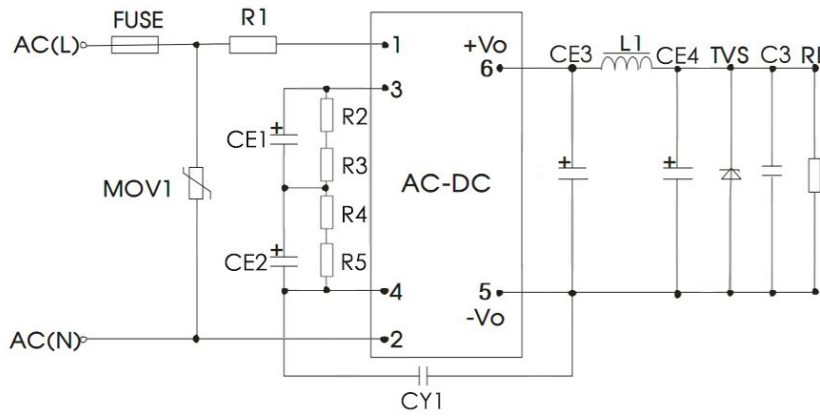


Note

- 1: Input Voltage should be derated base on Input Voltage Derating Curve when it is 480~528VAC/678~745VAC.
- 2: Our product is suitable to use under natural air cooling environment, if use it under closed condition, please contact with us.

Typical EMC Circuit and Recommended Specification

1. Typical EMC circuit



Recommended Circuit 1

Model number	CE1,CE2(Must access)	CE3 Solid-state capacitance(Must access)	L1 (Must access)	CE4 (Must access)	FUSE (Must access)	MOV1	R2,R3,R4,R5 Patch resistance(Must access)	CY1	C3	TVS
FA15-380S05G9N4	47uF/400V	1000uF/16V	2.0uH/6.5A	330uF/16V	2A/ 500V	14D911K	1206/1M	1nF/ 400V	0.1uF/50V	SMBJ7.0A
FA15-380S12G9N4		470uF/16V		330uF/16V						SMBJ20A
FA15-380S15G9N4		475uF/25v		100uF/35V						SMBJ20A
FA15-380S24G9N4		470uF/35V		100uF/35V						SMBJ30A

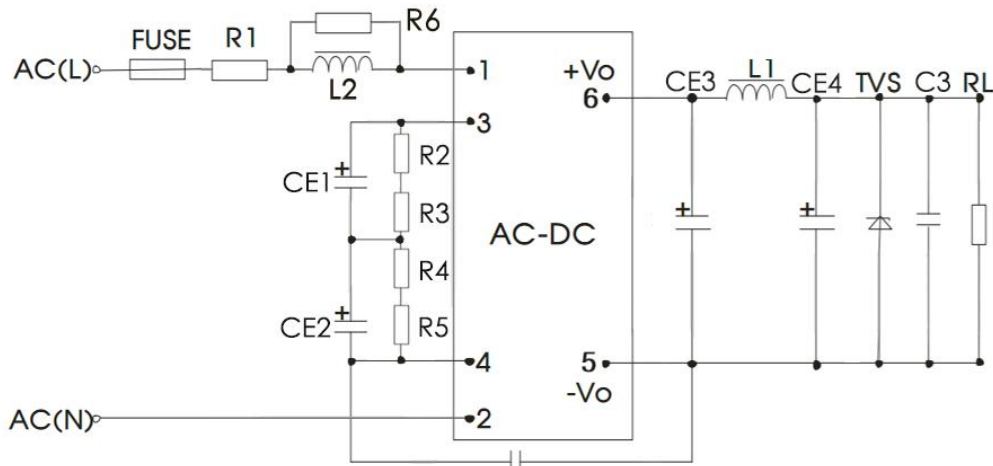
Note :

- 1.CE1,CE2: For AC input, CE1,CE2 are input filter electrolytic capacitors (must be external); For DC input, CE1 and CE2 are large filtering capacitors in EMC filters (they must be externally connected). You are advised to use electrolytic capacitors with ripple current > 200mA@100KHz and ESR≤100Ω at low temperatures
- 2.R2,R3,R4,R5 are the equalizing resistors of the electrolytic capacitor CE1 and CE2 (must be externally connected).
3. R1 is a winding resistor. The recommended type is 3W/6.8ΩC1, C2 choose high frequency low impedance electrolytic capacitor, the capacitance lower than capacitive load, withstand voltage value is above 1.5 times more than output voltage;

2. EMC solution and recommend circuit

1) basic application

Application environment	Ambient temperature range	EMS class	EMI class
Basic application	-40℃-85℃	3 级	CLASS A



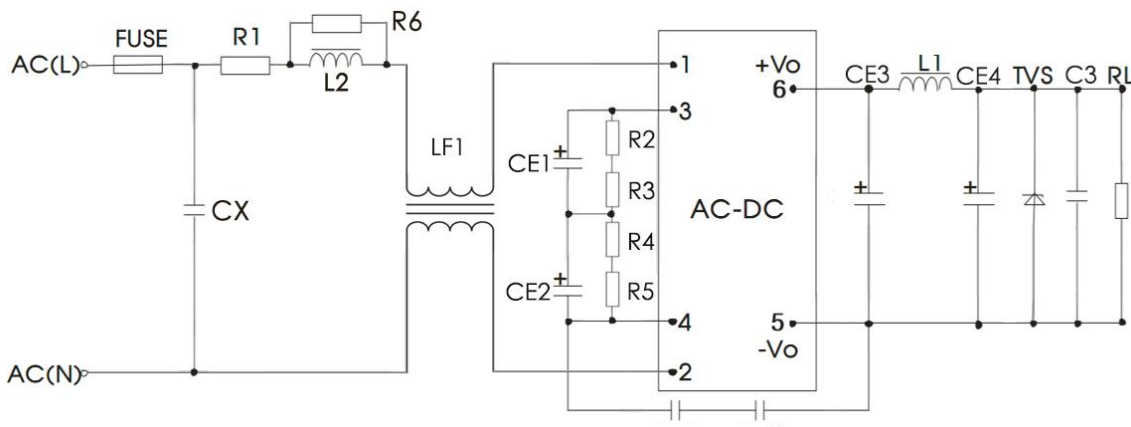
Circuit 2-1

Recommended parameter:

Element bit number	Recommended value
R1(Winding resistance, must be connected)	6.8Ω/3W
R6(patch resistance)	1206/4.7K
L2	2.2mH/Max:4.81Ω/Min:0.31A
FUSE (must asses)	2A/500V, Slow fusing
Note: R1 is the input plug-in resistor, this resistor needs to be wound resistance, do not choose patch resistor or carbon film resistor	

2) Recommended circuit for common system in indoor ordinary environment

Application environment	Ambient temperature range	EMS Class	EMI class
Indoor common	-25℃-55℃	3 Class	CLASS B



Circuit 2-2

Recommend parameter:

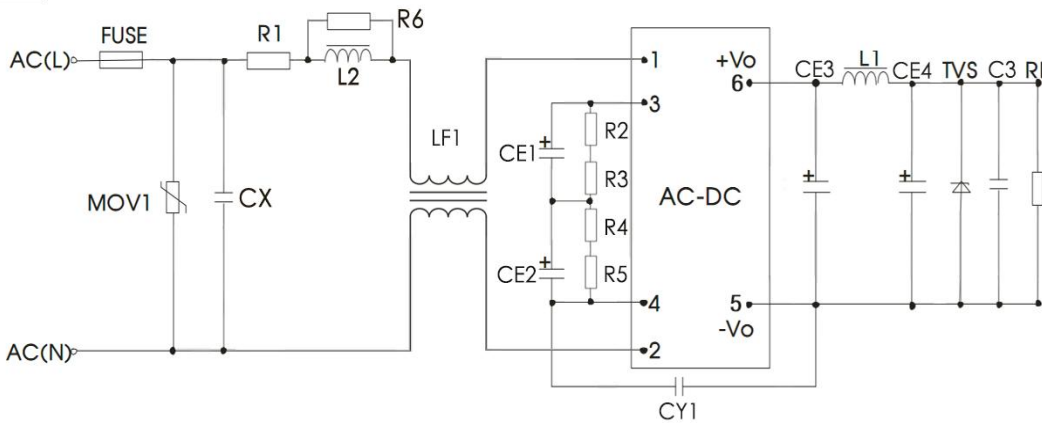
Element bit number	Recommended value
R1(Winding resistance, must be connected)	6.8Ω/3W
R6(patch resistance)	1206/4.7K
L2	2.2mH/Max:4.81Ω/Min:0.31A
LF1	10mH/1A
CX	0.1uF/480VAC
FUSE (must asses)	2A/500V, Slow fusing

Note:

- In the appliance application environment, the two Y capacitors on the original sub-side should be connected externally at the same time (CY1,CY2, specification value is 2.2nF/400VAC), which can meet the 60335 certification;
- According to the certification requirements, the X capacitor needs to be connected in parallel with the bleed resistor. The recommended value is less than 3.8MΩ.
- R1 is the input plug-in resistor, which needs to be wound resistance, do not choose patch resistor or carbon film resistor

3) Recommended circuit for general system in indoor industrial environment

Application environment	Ambient temperature range	EMS Class	EMI class
Indoor common	-25℃-50℃	4 Class	CLASS B



Circuit 2-3

Recommend parameter:

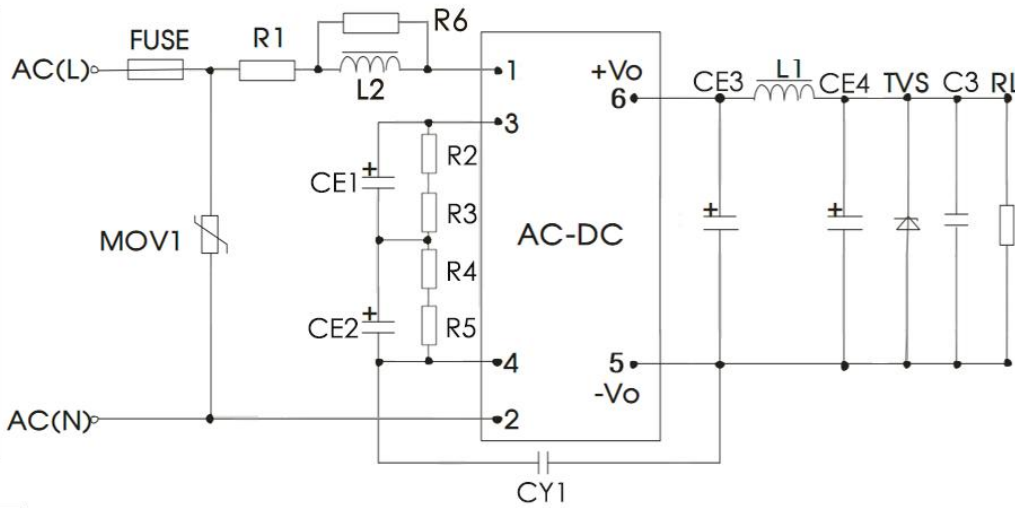
Element bit number	Recommended value
MOV1	14D911K
R1 (Winding resistance, must be connected)	6.8Ω/3W
R6 (patch resistance)	1206/4.7K
L2	2.2mH/Max:4.81Ω/Min:0.31A
LF1	10mH/1A
CX	0.1uF/480VAC
FUSE (must asses)	2A/500V, Slow fusing

Note:

1. According to the certification requirements, the X capacitor must be connected in parallel with the drain resistor. The recommended value is less than 3.8MΩ.
- 2.R1 is the input plug-in resistor, which needs to be wound resistance, do not choose patch resistor or carbon film resistor

4)Recommended circuit for general system in outdoor ordinary environment

Application environment	Ambient temperature range	EMS Class	EMI class
Outdoor ordinary environment	-40℃-85℃	4 Class	CLASS A



Recommend parameter:

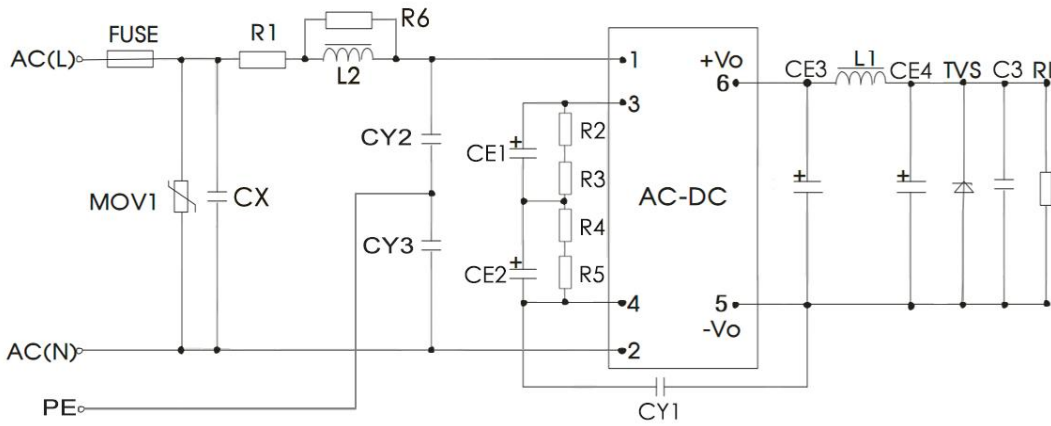
Element bit number	Recommended value
MOV1	14D911K
R1(Winding resistance, must be <math>R1 < 3.8M\Omega</math>)	6.8Ω/3W
R6(patch resistance)	1206/4.7K
L2	2.2mH/Max:4.81Ω/Min:0.31A
FUSE (must asses)	2A/500V, Slow fusing

Note:

R1 is the input plug-in resistor, which needs to be wound resistance, do not choose patch resistor or carbon film resistor

5) Recommended circuit for general system in outdoor industrial environment

Application environment	Ambient temperature range	EMS Class	EMI class
Outdoor industrial environment	-40°C-85°C	4 Class	CLASS A



Circuit 2-4

Recommend parameter:

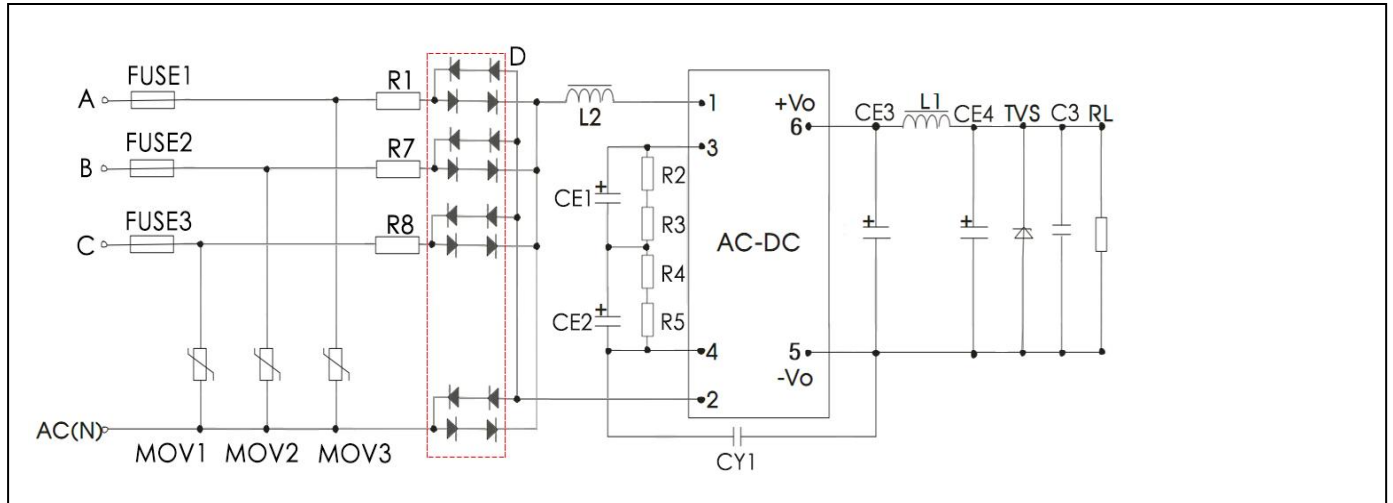
Element bit number	Recommended value
MOV1	14D911K
R1 (Winding resistance, must be connected)	6.8Ω/3W
R6 (patch resistance)	1206/4.7K
L2	2.2mH/Max:4.81Ω/Min:0.31A
LF1	1nF/400VAC
CX	0.1uF/480VAC
FUSE (must asses)	2A/500V, Slow fusing

Note:

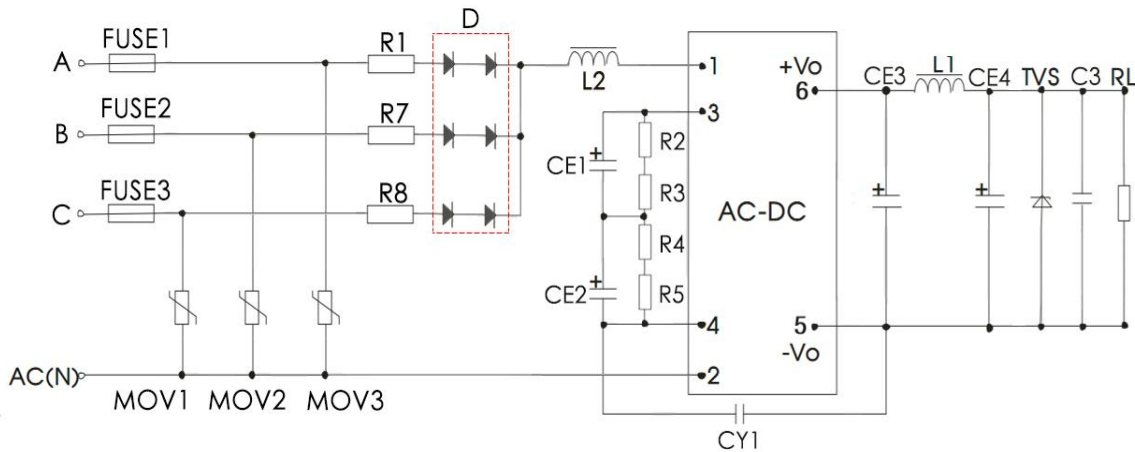
1. According to the certification requirements, the X capacitor must be connected in parallel with the drain resistor. The recommended value is less than 3.8MΩ.
2. R1 is the input plug-in resistor, which needs to be wound resistance, do not choose patch resistor or carbon film resistor

6) Recommended circuit for general system in strong lightning surge environment

Application environment	Ambient temperature range	EMS Class	EMI class
strong lightning surge environment	-40°C-85°C	4 Class	CLASS A



Circuit 3-1:4 KV differential mode surge high requirements Recommended peripheral circuit diagram - full wave rectification



Circuit 3-2:4KV differential mode surge high requirements Recommended peripheral circuit diagram - half wave rectification

Recommend parameter:

Element bit number	Recommended value
FUSE1,FUSE2,FUSE3 (must asses)	6.3A/500V, slow fusing
MOV1,MOV2,MOV3	14D911K
R1,R7,R8 (Winding resistance, must be connected))	12Ω/5W
D	2A/1000V
L2	2.2mH/Max:4.81Ω/Min:0.31A
Note: R1,R7,R8 are input plug-in resistors. This resistor should be wound type resistor, do not choose patch resistor or carbon film resistor	

Note :

- 1.The product should be used under the specification range, otherwise it will cause permanent damage to it.
- 2.Product's input terminal should connect to fuse;
- 3.If the product is not worked under the load range(below the minimum load or beyond the load range), we cannot ensure that the performance of product is in accordance with all the indexes in this manual;
- 4.Unless otherwise specified, data in this datasheet are tested under conditions of **Ta=25℃**, **humidity<75%** when inputting nominal voltage and outputting rated load(pure resistance load);
- 5.All index testing methods in this datasheet are based on our Company's corporate standards
- 6.The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, please directly contact our technician for specific information;
- 7.We can provide customized product service;
- 8.The product specification may be changed at any time without prior notice.

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