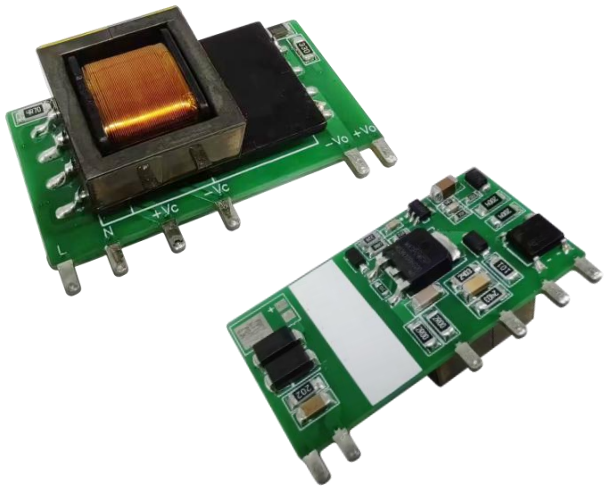
Typical Features

- Wide Input Range: 85–528 VAC / 100–745 VDC
- No-Load Power: ≤0.3W (230VAC)
- Efficiency: 83% (typical)
- Operating Temperature: -40°C to +85°C
- Switching Frequency: 50 kHz
- Protection types: Short-circuit, overcurrent protection
- Isolation Voltage: 4300 VAC
- Designed in accordance with IEC62368, UL62368, and EN62368 standards.
- Ultra-compact bare board, industrial-grade design
- Through-hole mounting on PCB



Application Fields

FG10-G5SXX series is a high-efficiency, compact, open-frame switching power supply designed by AIPU. This series features an ultra-wide input voltage range (AC/DC dual-use), low ripple, low temperature rise, low power consumption, and high safety isolation. Designed in accordance with IEC62368, UL62368, and EN62368 standards, it is widely used in industrial, office, power, and civil applications. For operation in harsh electromagnetic environments, please refer to our recommended application circuits.

Selection Guide

Certifications	Model	Input Voltage Range		Output Specifications			Max Capacitive Load @230VAC	Ripple & Noise @20MHz (Max)	Eff. @ Nom. Input, Full Load (Typ.)
		Nominal Value (VAC)	Range Value (VAC)	Power P (W)	Voltage Vo (VDC)	Current Io (mA)	μF	mVp-p	%
-	FG10-G5S03	230	85-528	6.6	3.3	2000	1500	180	70
	FG10-G5S05			10	5	2000	1500		77
	FG10-G5S09				9	1100	1000		80
	FG10-G5S12				12	830	680		82
	FG10-G5S15				15	670	470		82
	FG10-G5S24				24	420	330		83

Note 1: Typical output efficiency is measured after 30 minutes of operation at full load (burn-in).

Note 2: The tolerance for typical full-load efficiency (%, Typ.) is ±2%. Efficiency is calculated as total output power divided by the module's input power.

Note 3: Due to space constraints, this is only a partial product list. For models not listed, please contact our sales department.

Input Specifications

Test Item	Test Conditions	Mini	Typ.	Max	Unit
Input Voltage Range	AC Input	85	230	528	VAC
	DC Input	100	-	745	VDC
Certified Input Voltage Range	AC Input	100	-	480	VAC
Input Frequency Range	-	47	50	63	Hz
Input Current	115 VAC	-	-	0.30	A
	230 VAC	-	-	0.15	
	380 VAC	-	-	0.10	
Inrush Current	115 VAC	-	15	20	A
	230 VAC	-	30	40	
	380 VAC	-	50	60	
No-load Power Consumption	230 VAC	-	-	0.3	W
	380 VAC	-	-	0.5	
Leakage Current	480 VAC/50 Hz	0.5 mA RMA Max			
Recommended Fuse Rating	-	2A, Slow-Blow (Required)			
Hot Plug	-	N/A			
Remote Control (CNT)	-	N/A			

Output Specifications

Test Item		Test Conditions		Mini	Typ.	Max	Unit
Output Voltage Accuracy		Full Input Voltage Range, 10–100% load (Stable operation achievable at 0%–10% load)	3.3V	-	±6.0	±7.0	%
		Full Input Voltage Range, 10–100% load (Stable operation achievable at 0%–10% load)	5V/9V/12V/15V/24V	-	±5.0	±6.0	%
Line Regulation		Nominal load	3.3V	-	±2.0	±4.0	%
		Nominal Load	5V/9V/12V/15V/24V	-	±1.5	±3.0	%
Load regulation		10%–100% of Nominal Input Voltage load	Vo	-	±3.0	±4.0	%
Ripple & Noise		5%–100% load, 20 MHz bandwidth	Vo	-	-	180	mVp-p
		Note 1: Ripple & Noise measured by parallel cable method; see "Test Instructions" for details.					
Dynamic Response	Overshoot	25%–50%–25%		-5.0	-	+5.0	%
	Recovery time	50%–75%–50%		-	-	+5.0	ms
Minimum load		Single-channel output		10	-	-	%
Temperature Coefficient		-		-	±0.03	-	%/°C

Start-up delay time	Input 115 VAC (full load)	-	-	2000	ms
	Input 230 VAC (full load)	-	-	800	
	Input 380 VAC (full load)	-	-	700	
Power-off hold time	Input 115 VAC (full load)	5	8	-	mS
	Input: 230 VAC (full load)	30	35	-	
	Input 380 VAC (full load)	70	80	-	
Output Startup Overshoot	Full Input Voltage Range	≤10			%Vo
Short-circuit Protection(SCP)		Continuous, Self-recovery			Isolated
Output Over-current Protection (OCP)	Input 230 VAC	110%–200%			Isolated

General Specifications

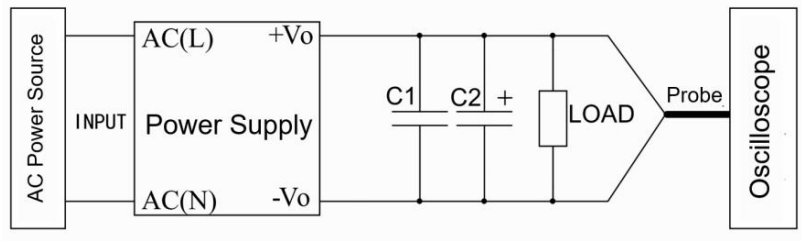
Test Item	Test Conditions		Mini	Typ.	Max	Unit
Switching Frequency	-		-	50	-	kHz
Operating Temperature	Refer to the Temperature Derating Curve		-40	-	+85	°C
Storage temperature	-		-40	-	+105	°C
Soldering temperature	Wave soldering		260±4°C, duration 5–10 s			
	Manual soldering		360±8°C, duration 4–7 s			
Relative Humidity	-		10	-	95	%RH
Isolation Voltage	I/P-O/P,Test 1min, leakage current <5mA		4300	-	-	VAC
MTBF	MIL-HDBK-217F at 25°C		500	-	-	K hours
Vibration	-		10–55 Hz, 10G, 30 min, along X, Y, Z			
Safety Standards	-		Complies with IEC/UL 62368-1, IEC/EN62477-1、EN61010-1			
Safety Rating	-		CLASS II			
Weight/Dimensions	Package Type	Weight (Typ)	Dimensions L x W x H			
	-	10g	38.0X23.0X15.0mm		1.496X0.906X0.591inch	

EMC Specifications

Component		Sub-item	Technical Standard	Performance Criteria
EMC	EMI	CE	CISPR 32/EN 55032	CLASS A (Recommended circuit shown in Figures 2 and 4) CLASS B (see Figure 3 for recommended circuit)
		RE	CISPR 32/EN 55032	CLASS A (Recommended circuits shown in Figures 2 and 4) CLASS B (See Figure 3 for recommended circuit)
	EMS	Electrostatic Discharge (ESD)	IEC/EN 61000-4-2	Contact ±6 kV / Air ±8 kV Performance Criteria B
		Radiated Immunity	IEC/EN 61000-4-3	10 V/m Performance Criteria A
		Burst Immunity (EFT)	IEC/EN 61000-4-4	±4 kV perf. Criteria B
		Surge Immunity	IEC/EN 61000-4-4	Line-to-line ±2 kV (see Figures 2 and 3 for recommended circuit)
				Line-to-line ±2 kV / Line-to-ground ±4 kV (See Figure 4 for recommended circuit)
				Line-to-line ±4 kV (See Figure 5 for recommended circuit)
		CS	IEC/EN 61000-4-5	10 V rms, Performance Criteria A

Ripple & Noise Test Instruction (Parallel Cable Method, 20 MHz Bandwidth)

Test Method:



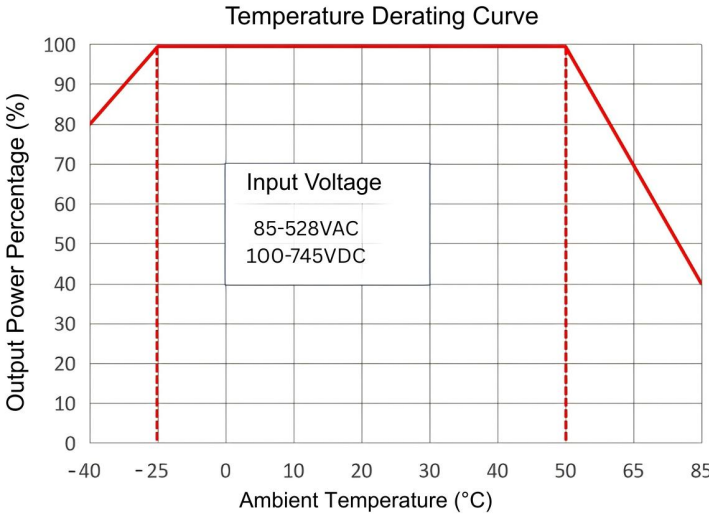
1. Test Setup

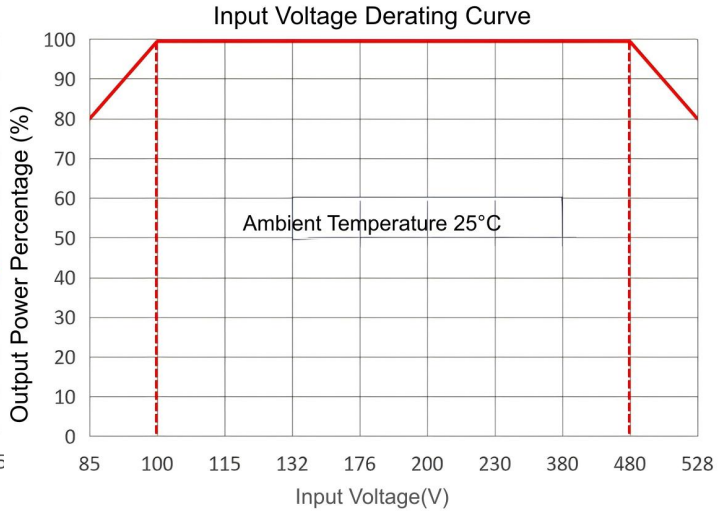
Measurements are conducted using the parallel cable method with oscilloscope bandwidths set to 20MHz and 100MHz. The oscilloscope probe must have its cap and ground lead removed to minimize interference. Additionally, a 0.1μF ceramic capacitor and a 10μF high-frequency low-ESR electrolytic capacitor are connected in parallel across the probe tip. The oscilloscope should be set to Sample mode.

2. Test Configuration

Connect the input terminals to the power source and the output terminals to an electronic load via a test fixture. Ripple and noise must be sampled directly at the output ports using dedicated sensing leads. Power cables should be insulated wires with a gauge (diameter) appropriate for the output current.

Product Characteristic Curves



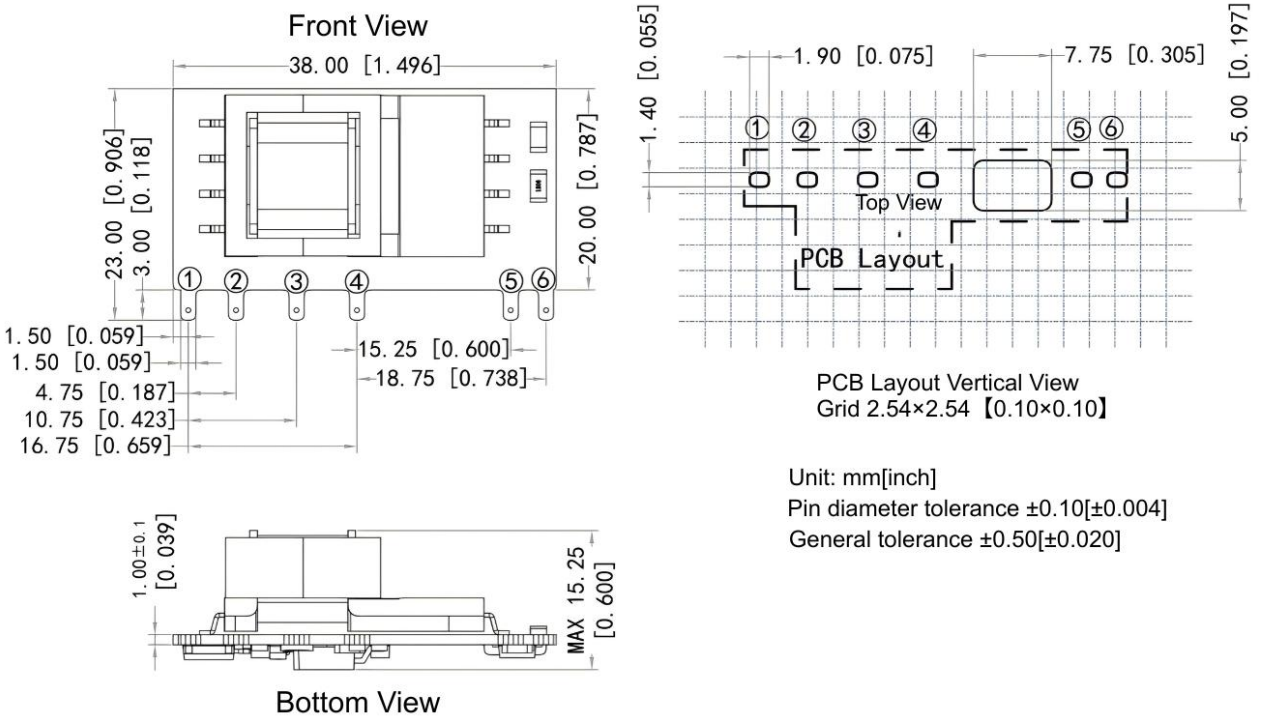


Note 1: Note 1: For input voltages of 85-100VAC or 480-528VAC, the output must be derated according to the Input Voltage Derating Curve.

Note 2: This product is designed for natural convection cooling. Please contact our technical team for applications in enclosed environments

Mechanical Dimensions

Third Angle Protection



Unit: mm[inch]
Pin diameter tolerance ±0.10[±0.004]
General tolerance ±0.50[±0.020]

Pin Definitions

Pin Description	1	2	3	4	5	6
Function	AC(L)	AC (N)	+V(CAP)	-V(CAP)	-Vo	+Vo
	AC Line	AC Neutral	External Capacitor (+)	External Capacitor (-)	Negative Output	Positive Output

Typical Application & Recommended EMC Circuit

1. Typical Application Circuit

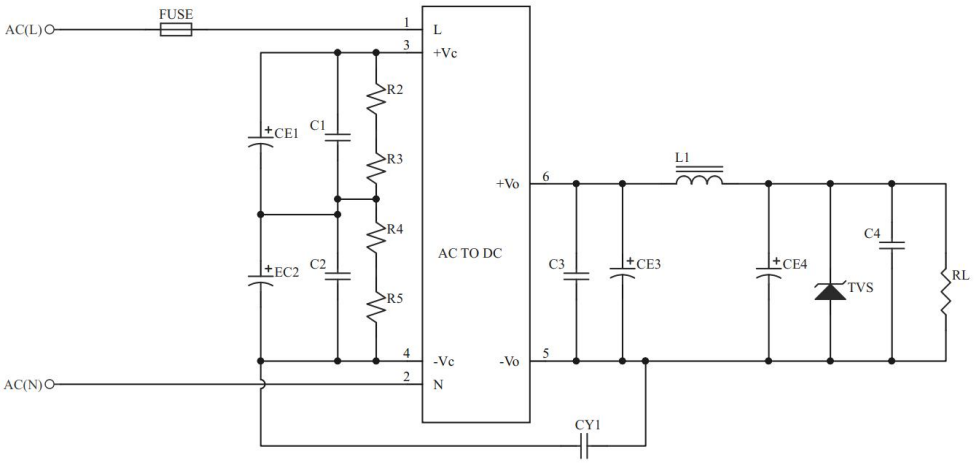


Figure 1

Model	CE1, CE2 (*)	R2, R3, R4, R5 (*)	CE3 (*) Solid Cap. Required	L1 (*)	CE4 (Electrolytic capacitor must be connected)	C1, C2	C3, C4	TVS
FG05-G5S03	47μF/400V	1MΩ /1206	1500μF/6.3V	2.2 μH/5 A	680μF/25V	0.1μF/630V	0.1μF/50 V	SMBJ7.0A
FG05-G5S05			820μF/16V		330 μF/25 V			
FG05-G5S09			470μF/16V		1000μF/16V			SMBJ12A
FG05-G5S12					330μF/16V			SMBJ20A
FG05-G5S15			470μF/25V		100μF/35V			
FG05-G5S24			470μF/35V					SMBJ30A

Recommended specifications:

1. * Mandatory component / connection
2. FUSE refers to a fuse; the recommended rating is 2A/600Vac, slow-blow (required);
3. CE1 and CE2 are electrolytic capacitors; we recommend using a series with high ripple current and low ESR, 47μF/400V (required);
4. R2, R3, R4, and R5 are voltage-balancing resistors, 1MΩ/1206 (required);
5. CY1 is a Y-capacitor, 1nF/400V (required).

2. Recommended EMC Circuit: Basic Application Environment

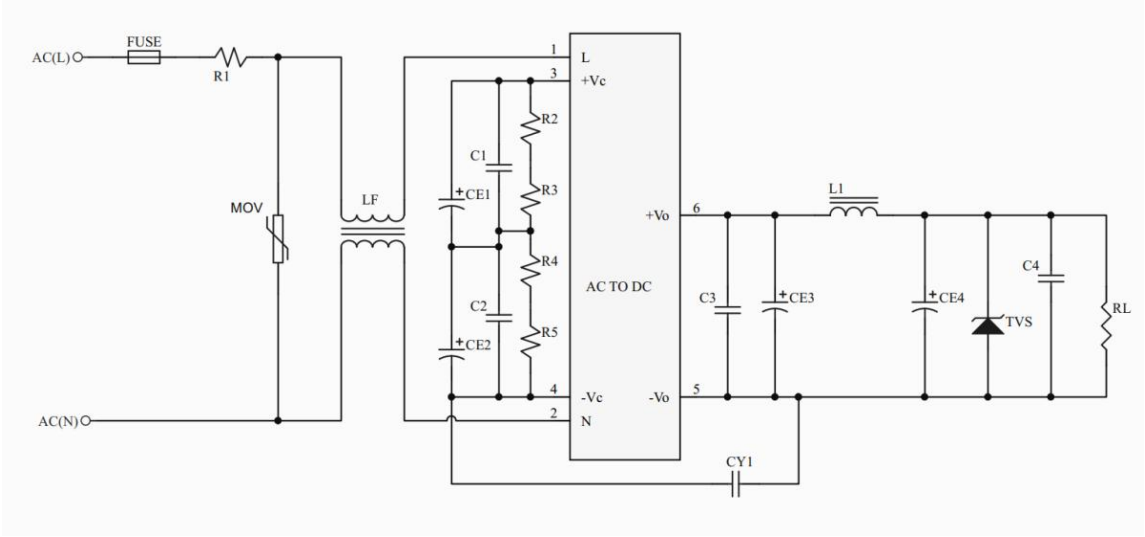


Figure 2

Recommended Parameters:

1. FUSE is a fuse; recommended rating is 2A/600Vac, slow-blow (required);
2. MOV is a varistor, 14D911K (required);
3. R1 is a wire-wound resistor, 6.8Ω/3W (required);
4. CY1 is a Y-capacitor, 1nF/400VAC (required);
5. LF is a Common Mode Choke, 35 mH/0.5 A (required);

Note: Recommended values for other components should be determined based on the specific application, referring to Typical Application Circuits.

3. EMC Recommended Circuit: Indoor Industrial Environment

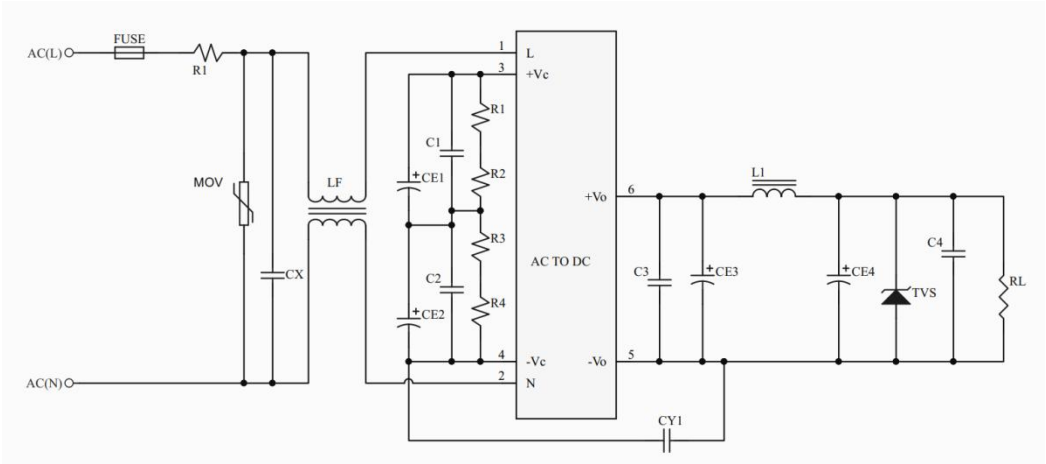


Figure 3

Recommended Parameters:

1. FUSE refers to a fuse; the recommended specification is 2A/600Vac, slow-blow (mandatory);
2. MOV is a varistor, 14D911K (required);
3. R1 is a wire-wound resistor, 6.8Ω/3W (required);
4. CY1 is a Y-capacitor, 1nF/400VAC (required);
5. CX1 is an X-capacitor, 0.22μF/530VAC (required);
6. LF is a Common Mode Choke, 30 mH/0.5 A (required);

Note: For recommended values of other components, refer to Typical Application Circuits based on actual usage.

4. Recommended EMC Circuit: Severe Lightning Surge Environment

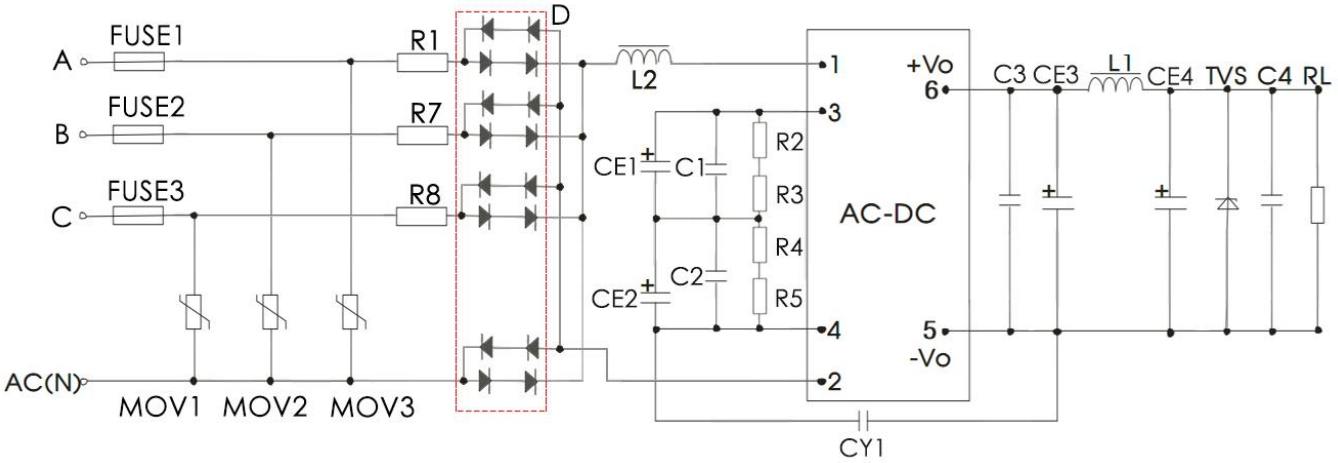


Figure 4.1: Recommended External Circuit for 4KV Differential Mode Surge (Full-wave Rectification)

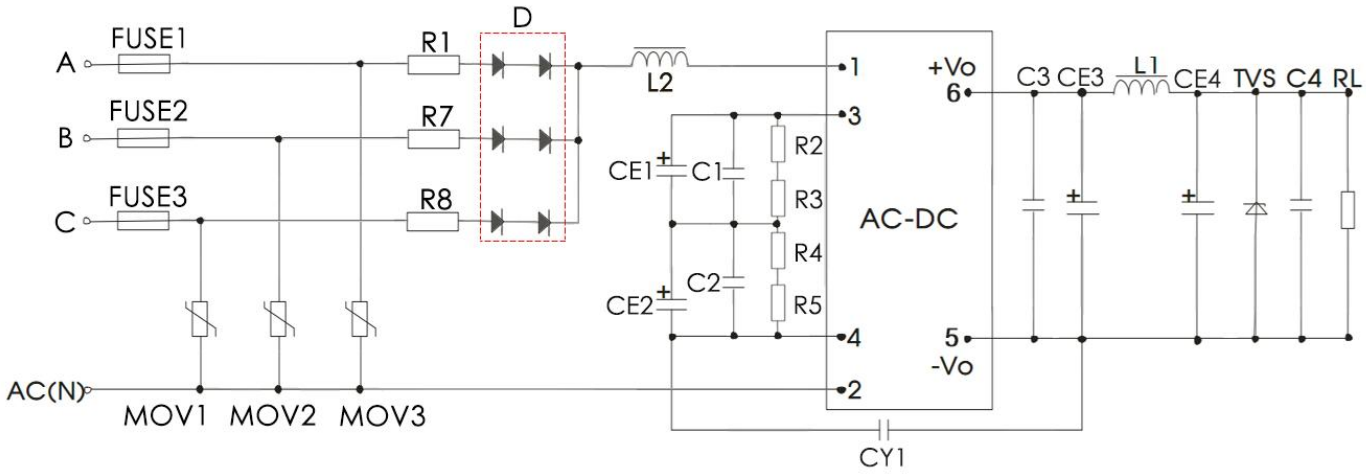


Figure 4.2: Recommended External Circuit for 4KV Differential Mode Surge (Half-wave Rectification)

Recommended Parameters

Component Part Number	Recommended Value
MOV1, MOV2, MOV3	14D911K
R1, R7, R8 (wire-wound resistors, required)	12Ω/5W
L2	2.2 mH / Max: 4.81Ω / Min: 0.31 A
D	2A/1000V
FUSE1, FUSE2, FUSE3 (Required)	6.3A/600V, slow-blow
Note: R1, R7, and R8 must be through-hole wire-wound resistors. Do not use SMD or carbon film resistors.	

5. Recommended EMC Circuit: Outdoor Industrial Environment

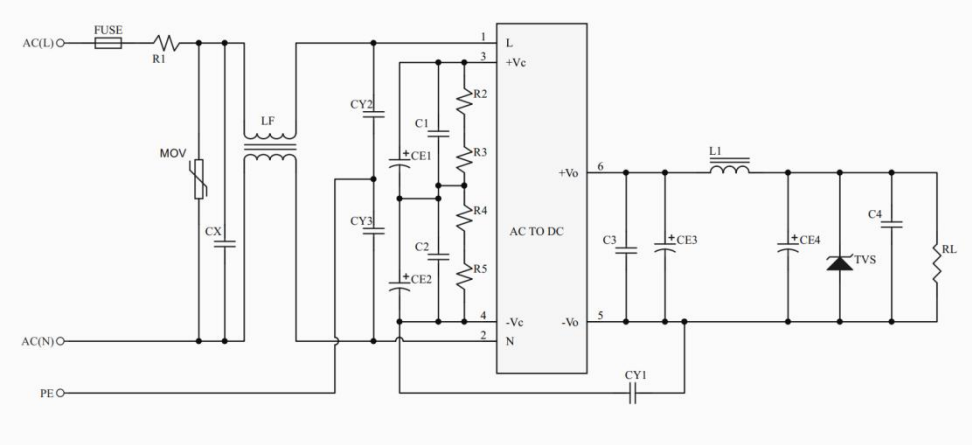


Figure 5

Recommended Parameters:

1. FUSE is a fuse; the recommended specification is 2A/600Vac, slow-blow (mandatory);
2. MOV is a varistor, 14D911K (required);
3. R1 is a wire-wound resistor, 6.8Ω/3W (required);
4. CY1, CY2, and CY3 are Y-capacitors, 1nF/400VAC (required);
5. CX1 is an X-capacitor, 0.22μF/530VAC (required);
6. LF is a Common Mode Choke, 30 mH/0.5 A (required);
7. L2 is a drum core inductor, 900 μH/0.5 A (required);

Note: For recommended values of other components, refer to Typical Application Circuits based on the actual application.

Note:

1.The product must be operated within the specified parameters; otherwise, permanent damage may occur.

2.If the product operates below the minimum load requirement, we cannot guarantee that all performance specifications in this manual will be met.

3.If the product operates beyond its specified load range, we cannot guarantee that all performance specifications in this manual will be met.

4.Unless otherwise specified, all specifications are measured at Ta = 25° C, humidity < 75%, nominal input voltage, and rated output load (resistive load).

5.All testing methods for the specifications listed above are based on our corporate standards.

6.The specifications listed above apply to the standard models in this manual. Specifications for non-standard or customized models may vary. For specific details, please contact our technical support team.

7.Aipupower can offer customized power solutions to meet specific requirements.

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