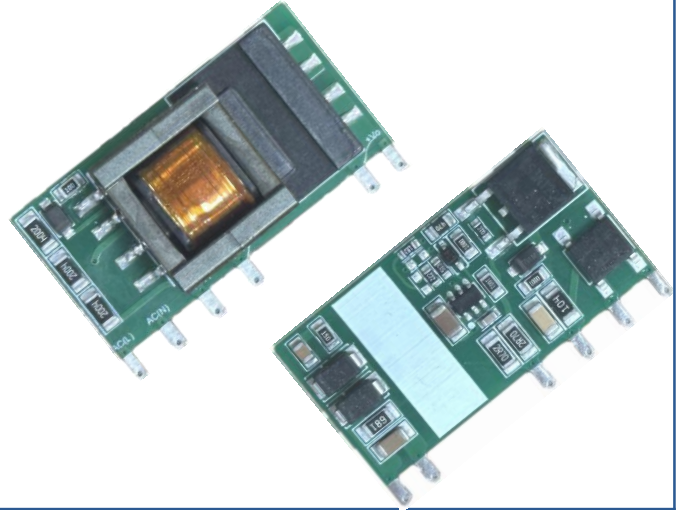


### Typical Features

- ◆ Wide Input Range: 90–528 VAC / 100–745 VDC
- ◆ No-Load Power: ≤0.3W (230VAC)
- ◆ Efficiency: 78% (typical)
- ◆ Operating Temperature: -40°C to +85°C
- ◆ Switching Frequency: 50 kHz
- ◆ Protection types: Short-circuit, overcurrent protection
- ◆ Isolation Voltage: 4300 VAC
- ◆ Complies with IEC/UL 62368-1, IEC/EN 60335-1, IEC/EN 61558-1
- ◆ Ultra-compact bare board, industrial-grade design
- ◆ Through-hole mounting on PCB



### Applications

The **FG05-G5SXX series** consists of high-efficiency, compact open-frame switching power supplies compliant with IEC/UL62368-1, IEC/EN60335-1, and IEC/EN61558-1 safety standards. Featuring ultra-wide AC/DC input, low ripple, low temperature rise, and high isolation, these reliable converters are widely used in industrial, office, power, and civil applications. For environments with harsh electromagnetic compatibility (EMC), please refer to the recommended application circuits provided.

### 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	%
-	FG05-G5S03	230	90-528	3.3	3.3	1000	2000	180	70
	FG05-G5S05				5	1000	1500		72
	FG05-G5S09			9	560	680	72		
	FG05-G5S12			12	420	470	78		
	FG05-G5S15			15	340	330	78		
	FG05-G5S24			24	210	100	78		

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

Note 2: Due to instrument error, the minimum efficiency is defined as -2% of the typical value.

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	90	230	528	VAC
	DC Input	100	-	745	VDC
Input frequency range	-	47	50	63	Hz
Input current	115 VAC	-	-	0.20	A
	230 VAC	-	-	0.10	
	480 VAC	-	-	0.07	
Inrush current	115 VAC	-	10	20	A
	230 VAC	-	17	30	
	480 VAC	-	28	40	
No-load Power Consumption	230 VAC	-	-	0.3	W
	380 VAC	-	-	0.5	
Leakage current	480 VAC/50 Hz	0.6 mA RMS Max			
Recommended Fuse Rating	-	1A, Slow-Blow (Required)			
Hot Plug	-	N/A			
Remote Control (CNT)	-	N/A			

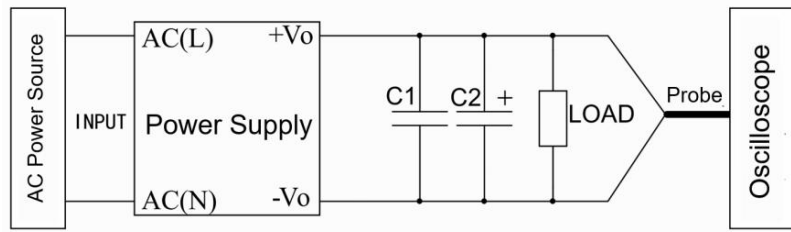
Output Specifications						
Test Item	Test Conditions	Mini	Typ.	Max	Unit	
Output Voltage Accuracy	Full input range, 10%-100% load (functional at 0%-10% load)	3.3V output	-	±3.0	±6.0	%
		Other outputs	-	±2.5	±5.0	%
Line Regulation	Rated load	-	±1.5	±3.0	%	
Load regulation	10%–100% of Nominal Input Voltage load	-	±3.0	±4.0	%	
Ripple & Noise	5%–100% load, 20 MHz bandwidth	-	100	180	mVp-p	
	Note 1: Ripple & Noise measured by parallel cable method; see "Test Instructions" for details.					
Dynamic Response	25%–50%–25%	Overshoot	-5.0	-	+5.0	%
	50%–75%–50%	Recovery time	-	-	25.0	ms
Minimum load	Single Output	10	-	-	%	
Temperature Coefficient	-	-	±0.2	-	%/°C	
Turn-on Delay Time	230VAC Input (Full Load)		-	-	1800	
	380 VAC Input (Full Load)		-	-	1000	
Power-off hold time	115 VAC Input (Full Load)		5	8	-	ms
	230 VAC Input (Full Load)		30	35	-	
	380 VAC Input (Full Load)		90	100	-	
Output Startup Overshoot	Full Input Voltage Range		≤10			%Vo
Short-circuit Protection			Continuous, Self-recovery			Hiccup
Output Over-current Protection(OCP)	Input 230 VAC		120% Io ≤ Io ≤ 200%			Hiccup

General Specifications					
Test Item	Test Conditions	Mini	Typ.	Max	Unit
Switching Frequency	-	-	50	-	KHz
Operating Temperature	Refer to the Temperature Derating Graph	-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/EN 60335-1, IEC/EN 61558-1			
Safety Rating	-	CLASS II			
Weight/Dimensions	Package Type	Weight (Typ)	Dimensions L x W x H		
	FG05-G5SXX	6.5 g	33.5 x 20.0 x 13.0 mm	1.319 x 0.787 x 0.512 in	

EMC Performance					
Component	Sub-item	Technical Standard	Class & Circuit		
EMC	EMI	CE	CISPR 32/EN 55032	CLASS A (See Fig. 2, 4) CLASS B (See Fig. 3)	
		RE	CISPR 32/EN 55032	CLASS A (See Fig. 2, 4) CLASS B (See Fig. 3)	
	EMS	ESD	IEC/EN 61000-4-2	Contact ±6KV Perf. Criteria B	
		Radiated Immunity	IEC/EN 61000-4-3	10 V/m Perf. Criteria A	
		EFT	IEC/EN 61000-4-4	±2KV Perf. Criteria B (See Fig.1)	
				±4KV Perf. Criteria B (See Fig.2,3,4)	
		Surge Immunity	IEC/EN 61000-4-5	Line to Line ±2KV, Perf. Criteria B(Refer to Fig. 2, 3)	
				Line to Line ±2KV, Perf. Criteria B(Refer to Fig. 4)	
				Line to Ground ±4KV, Perf. Criteria B(Refer to Fig. 4)	
		CS	IEC/EN 61000-4-6	10Vr.m.s Perf.Criteria A	
Immunity to Voltage Dips and Interruptions	IEC/EN 61000-4-11			0%~70% Perf.Criteria B	

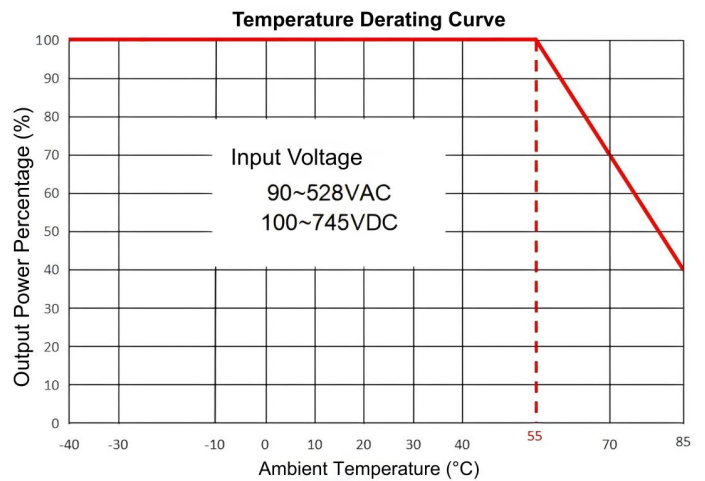
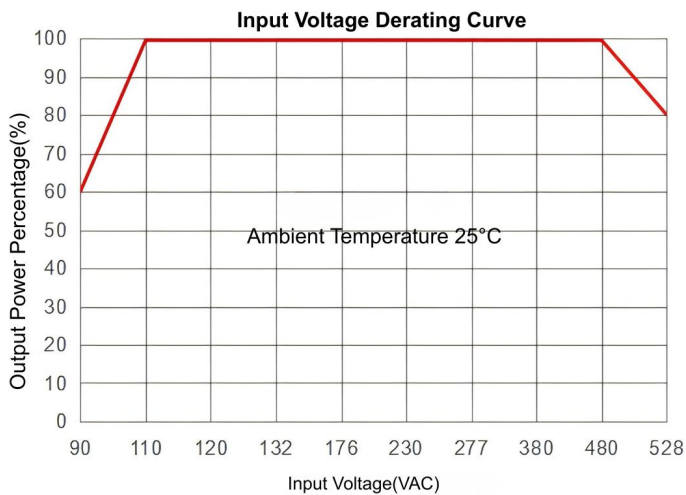
**Ripple & Noise Test Instruction (Parallel Cable Method, 20 MHz Bandwidth)**

Test Method:



1. Test Setup: Use the parallel line connection method. Set oscilloscope bandwidth to 20MHz (100M bandwidth) and sampling to Sample Mode. Remove the probe cap and ground lead. Connect a 0.1μF ceramic capacitor (C1) and a 10μF high-frequency low-ESR electrolytic capacitor (C2) in parallel across the probe terminals.
2. Schematic Description: Connect the power module input to the power source and the output to an electronic load via a test jig. Use a dedicated sampling line to take measurements directly from the output ports. Select insulated power cables with appropriate wire gauge based on the output current.

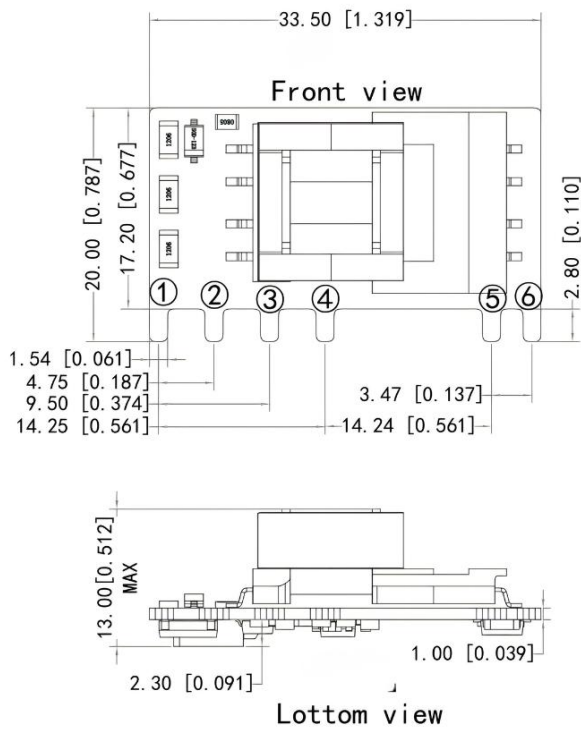
**Product Characteristic Curves**



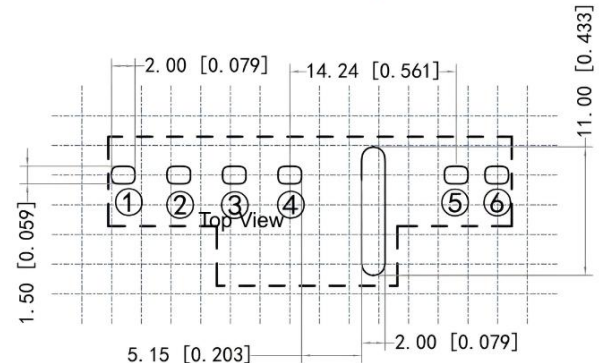
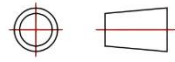
Note 1: When operating at input voltages of 90 - 110VAC / 480 - 528VAC / 100 - 155VDC / 675 - 745VDC, the output must be derated according to the Input Voltage Derating Curve.

Note 2: This product is designed for natural convection cooling. For applications in enclosed environments, please contact our technical support.

**Mechanical Dimensions**



Third Angle Projection



PCB Layout Vertical View  
Grid 2.54×2.54 [0.10×0.10]

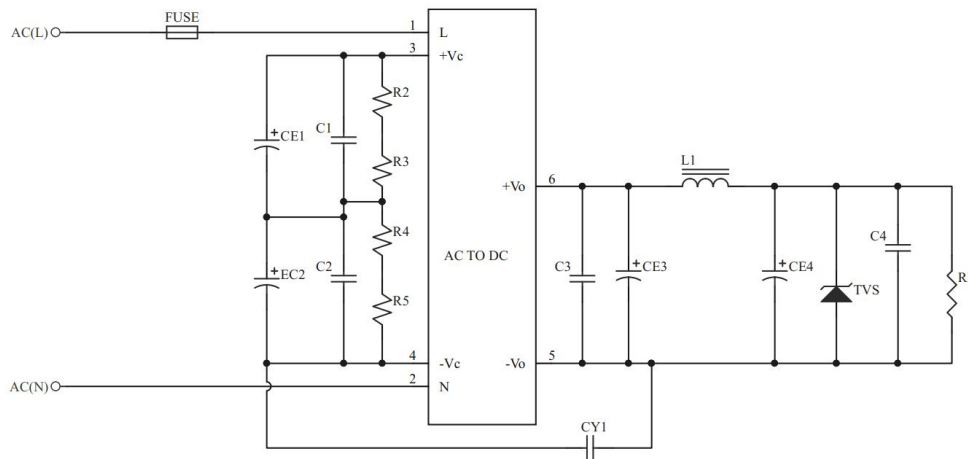
Unit: mm[inch]  
Pin diameter tolerance ±0.10[±0.004]  
General tolerance ±0.50[±0.020]

**Pin Definitions**

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

**Typical Application & Recommended EMC Circuit**

**1. Typical Application Circuit**



**Figure 1**

Model	CE3 (*)	L1 (*)	CE4 (Electrolytic capacitor must be connected)	C1, C2	C3, C4	TVS
FG05-G5S03	470µF/16V (Solid Cap.)	2.2 µH/5 A	220µF/35V	0.1µF/630 V	0.1µF/50V	SMBJ7.0A
FG05-G5S05			100µF/35V			SMBJ12A
FG05-G5S09	330µF/16V (Solid Cap.)		47µF/35V			SMBJ20A
FG05-G5S12						SMBJ30A
FG05-G5S15	220µF/35V (Electrolytic Capacitor)					
FG05-G5S24						

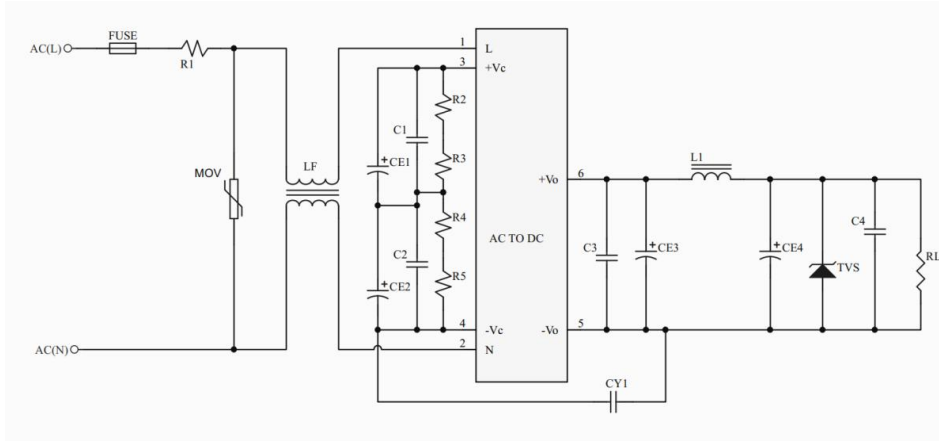
CE1,CE2(*)		R2,R3,R4,R5(*)	
/	-25°C-85°C	-40°C-85°C	1206/1MΩ
90-528VAC	33µF/400V	47µF/400V	
165-528VAC	22µF/400V	33µF/400V	
90-305VAC	CE1: 10µF/450V CE2: Jumper Wire	CE1: 22µF/450V CE2: Jumper Wire	/

Note: (\*) Mandatory components for application circuits.

**Recommended Parameters:**

1. FUSE: 1A/600Vac, slow-blow (Required);
2. CE1, CE2: Electrolytic capacitors, high ripple current and low-ESR series recommended;
3. R2, R3, R4, R5: Voltage-balancing resistors, 1MΩ/1206 (Required);
4. CY1: Y-capacitor, 1nF/400VAC (Required).

**2. Recommended EMC Circuit: Basic Application Environment**



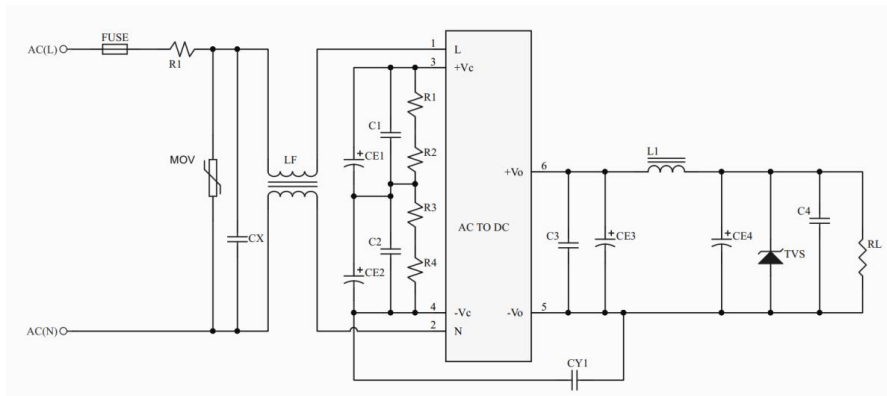
**Figure 2**

Recommended Parameters:

1. FUSE: 1A/600Vac, slow-blow (Required);
2. MOV: Varistor, 14D911K (Required);
3. R1: Wire-wound resistor, 12Ω/3W (Required);
4. CY1: Y-capacitor, 1nF/400VAC (Required);
5. LF: Common mode choke, 30mH/0.5A, EE8.3 (Required);

Note: For other components, please refer to the typical application circuit.

**3. EMC Recommended Circuit: Indoor Industrial Environment**



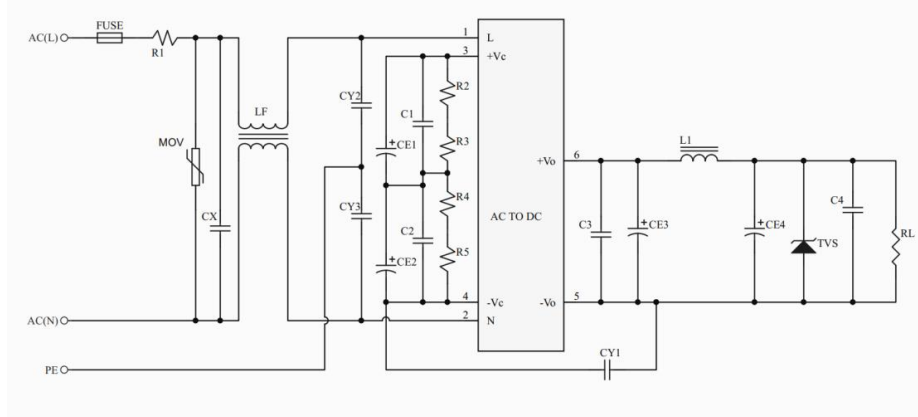
**Figure 3**

Recommended Parameters:

1. FUSE: 1A/600Vac, slow-blow (Required);
2. MOV: Varistor, 14D911K (Required);
3. R1: Wire-wound resistor, 12Ω/3W (Required);
4. CY1: Y-capacitor, 1nF/400VAC (Required);
5. CX1: X-capacitor, 0.22μF/530VAC (Required);
6. LF: Common mode choke, 30mH/0.5A, EE8.3 (Required);

Note: For other components, please refer to the typical application circuit.

**4.Recommended EMC Circuit: Outdoor Industrial Environment**



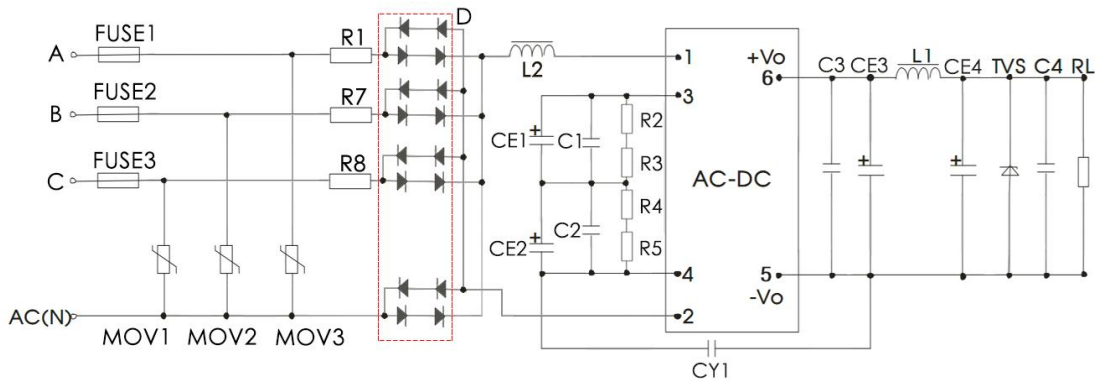
**Figure 4**

Recommended Parameters:

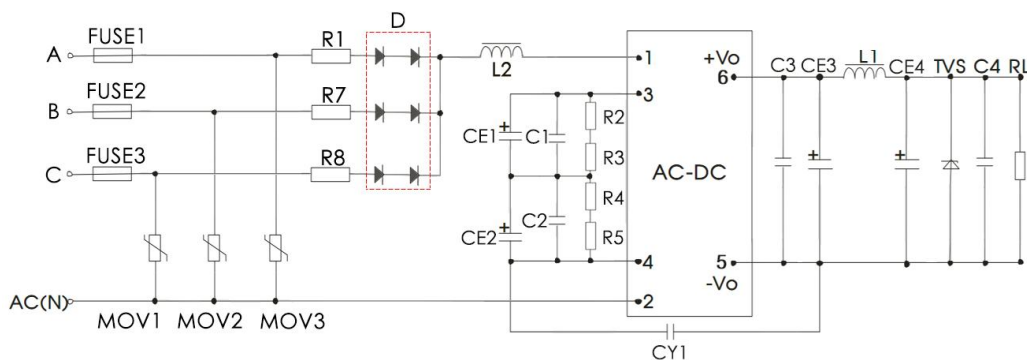
1. FUSE: 1A/600Vac, slow-blow (Required);
2. MOV: Varistor, 14D911K (Required);
3. R1: Wire-wound resistor, 12Ω/3W (Required);
4. CY1, CY2, CY3: Y-capacitors, 1nF/400VAC (Required);
5. CX1: X-capacitor, 0.22uF/530VAC (Required);
6. LF: Common mode choke, 30mH/0.5A, EE8.3 (Required);

Note: For other components, please refer to the typical application circuit.

**5. Recommended EMC Circuit: Severe Lightning Surge Environment**



**Figure 5.1:** Recommended External Circuit for 4KV Differential Mode Surge (Full-wave Rectification)



**Figure 5.2:** Recommended Peripheral Circuit for 4KV Differential Mode Surge (High Requirement) - Half-Wave Rectification

**Recommended Parameters**

Reference Designator	Recommended Value
MOV1,MOV2,MOV3	14D911K
R1,R7,R8(Wire-wound, Required)	12Ω/5W
L2	2.2mH/Max:4.81Ω/Min:0.31A
CX	0.1μF/480VAC
D	2A/1000V
FUSE1,FUSE2,FUSE3(Required)	3.15A/600V,slow-blow
Note: R1, R7, and R8 are input-side through-hole resistors. Wire-wound resistors must be used; do not use SMD or carbon film resistors.	

**Notes:**

- 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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