



ORDERING CODE (命名规则)

	APX	05	S	12	00	W	P	-100
Example:								
ZPX=Zettler standard series								
APX=Customized series								
HPX=High Performance series								
DPX=DC-DC								
Output Power (W)								
03=3W								
20=20W								
Output Type								
S=Single Output								
D=Dual Output								
T=Triple Output								
First Output Voltage								
05=5V, 12=12V								
Second Output Voltage								
06=6V, 12=12V								
00= No Second Output								
Input AC Voltage Range								
W=Wide Voltage Input								
H=High Voltage Input ($\geq 165\text{VAC}$)								
L=Low Voltage Input ($< 165\text{VAC}$)								
Case Dimension								
A: A Type case								
B: B Type case...								
P:PCBA(no case)								
Running Number								

FEATURES (产品特点)

- PCB mounted switching Power module
- AC input voltage range: 85VAC~305VAC
- AC input rated voltage: 100VAC~277VAC
- DC input voltage range: 70VDC~430VDC
- Ambient temperature range: -40℃~85℃
- Storage temperature range: -40℃~105℃
- Leakage current (Input :305VAC): <0.20mA
- Isolation voltage: Input –Output ≥3600VAC 60S
- Insulation Resistance: Input –Output 500VDC ≥100M Ohms
- MTBF:1000Khrs Min MIL-HDBK-217F (25℃)
- Compact size, easy installation
- High efficiency low standby power consumption <0.15W, Environment-friendly
- Built-in output over current protection, over-voltage protection, short circuit protection
- Class II Construction

APPLICATIONS (应用)

APX05SXX00WP-100 series is one of the ZETTLER highly efficient green power AC-DC Converter series. They feature wide input range accepting either AC or DC voltage, high reliability, low power consumption and reinforced isolation. All models are particularly suitable for industrial control, electric power, instrumentation and smart home applications which have high requirement for dimension and don't have high requirement on EMC. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

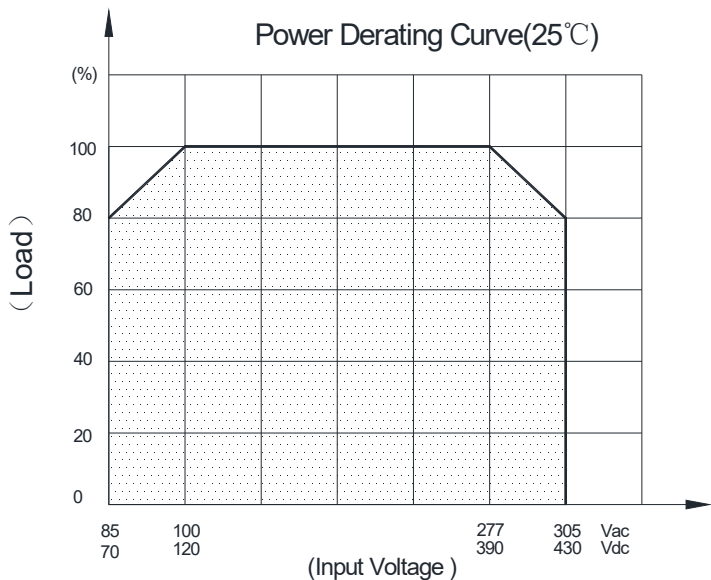
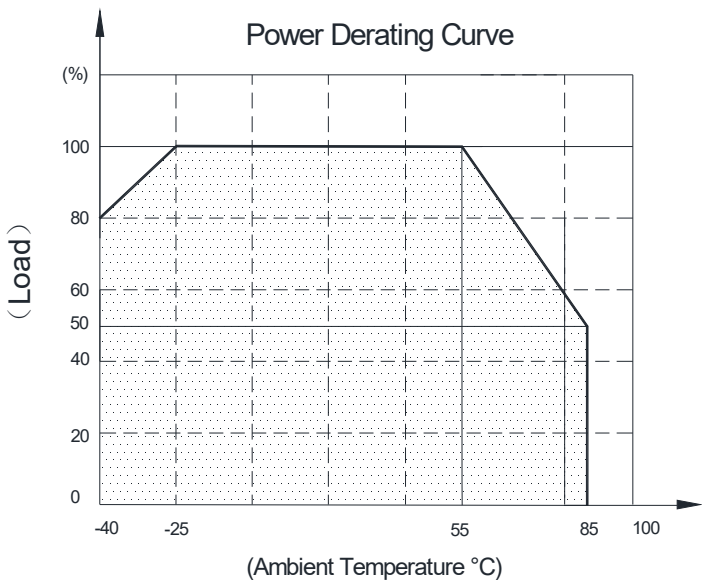
MODEL LIST (型号列表)

Model No.	Output Power	DC Voltage	Rated Current	Efficiency 230VAC, % Typ.	Ripple&Noise (max)	Ambient TEMP(℃)	Weight
APX05S0300WP-100	3.3W	3.3Vdc	1000mA	69%	150mVp-p	85	4.8g
APX05S0500WP-100	5W	5 Vdc	1000mA	76%	150mVp-p	85	4.8g
APX05S0900WP-100	5W	9 Vdc	560mA	77%	150mVp-p	85	4.8g
APX05S1200WP-100	5W	12Vdc	420mA	79%	150mVp-p	85	4.8g
APX05S1500WP-100	5W	15Vdc	340mA	79%	150mVp-p	85	4.8g
APX05S2400WP-100	5W	24Vdc	210mA	81%	150mVp-p	85	4.8g

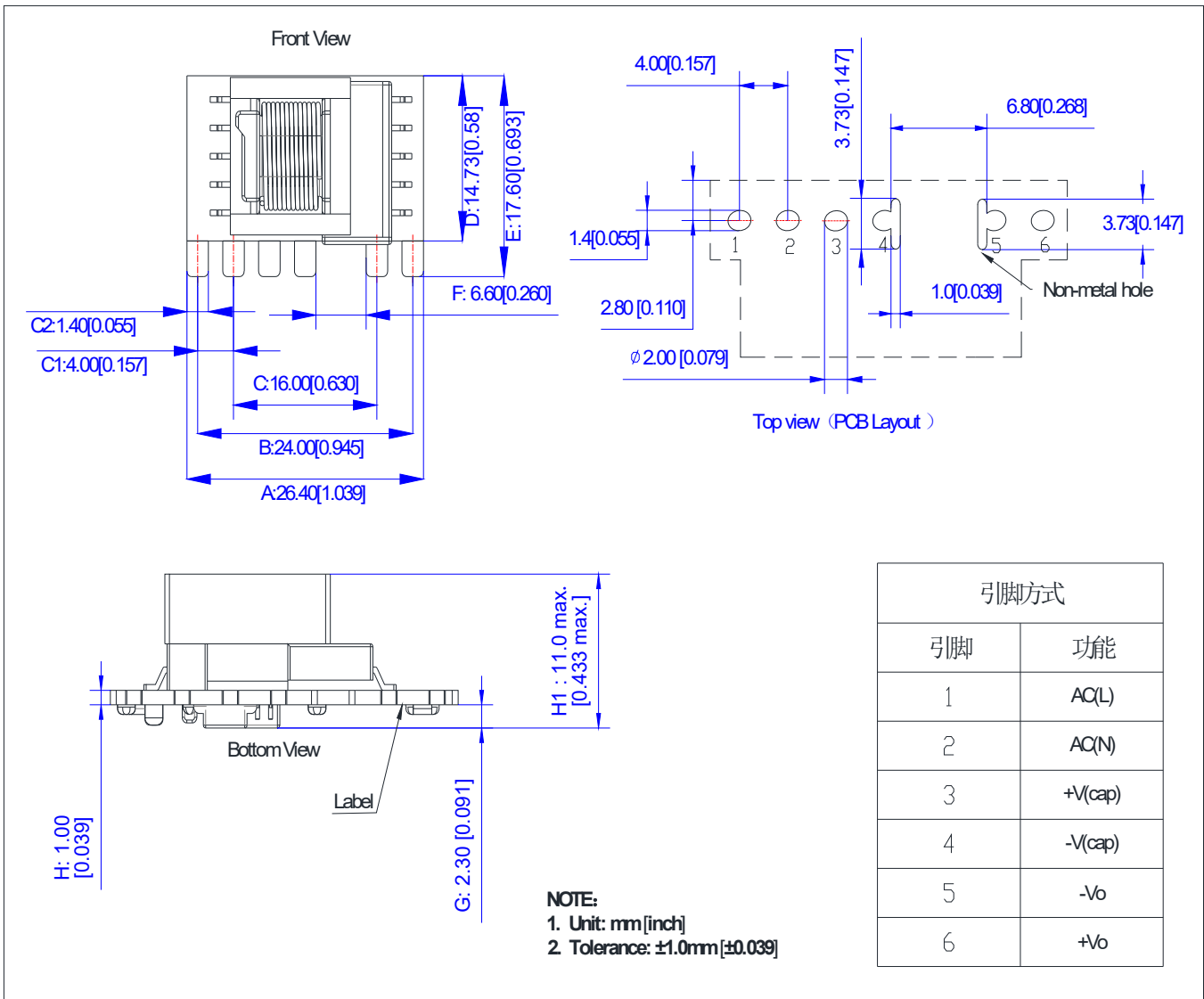
ELECTRICAL SPECIFICATION (电性能参数)

Model No. / 型号		APX05SXX00WP-100	
Input 输入参数	Rated Voltage / 额定电压	100-277VAC	
	Voltage Range / 输入电压范围	85-305VAC or 100-430VDC	
	Frequency (Hz) / 输入频率范围	47-63 Hz	
	Current (Full load) / 输入电流	115VAC	230VAC
		200mA	100mA
	Inrush Current (<500us) / 冲击电流	20A	40A
	No Load Loss / 待机功耗	0.15W@230Vac	
HOT PLUG / 热拔插	Unavailable		
Output 输出参数	Voltage (V) / 输出电压	Refer to “Model List”	
	Current (mA) max. / 输出额定电流	Refer to “Model List”	
	Voltage Accuracy / 输出电压精度	±5%@(10%-100% load)	
	Line Regulation / 线性调节率	±1.5%(at rated load)	
	Load Regulation / 负载调节率	±3%@(10%-100% load)	
	Minimum Load (mA) / 最小负载	10%	
	Ripple & Noise （mV） / 输出纹波	Refer to “Model List”	
	Efficiency（typ.） / 工作效率	Refer to “Model List”	
	Start-up Time / 开机延迟时间	3s	
Protection 保护特性	Over Current Protection / 过流保护	Hiccup mode	
	Short Circuit Protection / 短路保护	Hiccup mode	
Environment 环境	Operating Temperature / 工作温度	-40°C...+ 85°C(Reference to the De-rating Curve) @free air convection	
	Operating Humidity / 工作湿度	10-90% RH	
	Storage Temperature / 存储温度	-40°C...+105°C	
	Storage Humidity / 存储湿度	5-95% RH	
	Temperature Coefficient/温度漂移系数	±0.15%/°C（0~60°C）	
	Resistance to solder heat/焊锡耐热性	260±5°C,5-10Sec	
Physical 外观结构	Case Material / 外壳材质	N/A	
	Weight / 产品净重	4.8g(ref.)	
Safety & EMC 安全认证及 电磁兼容	Dielectric Strength / 绝缘强度	I/P-O/P : 3600VAC	
	Safety Standards / 安全标准	Compliance with EN/IEC/UL62368-1;IEC/EN60335-1;IEC/EN61558-2-16	
	EMI /EMC	CISPR32/EN55032 CLASS A (Recommended circuit 1, 4) CISPR32/EN55032 CLASS B (Recommended circuit 2, 3)	Need to add external EMC component (Reference to the Schematic)
	ESD	IEC/EN 61000-4-2 Contact ±6KV perf. Criteria B	
	radiated immunity	IEC/EN61000-4-3 10V/m perf. Criteria A	
	EFT/burst	IEC/EN61000-4-4 ±2KV (Recommended circuit 1, 2) perf. Criteria B IEC/EN61000-4-4 ±4KV (Recommended circuit 3, 4) perf. Criteria B	
	surge	IEC/EN61000-4-5 line to line ±1KV (Recommended circuit 1, 2) perf. Criteria B IEC/EN61000-4-5 line to line±2KV (Recommended circuit 3, 4) perf. Criteria B	
	conducted immunity	IEC/EN61000-4-6 10Vr.m.s perf. Criteria A	
Reliability Requirement 可靠性要求	MTBF	1000KHrs Min MIL-HDBK-217F（25°C）	
	Burn-In Test	The unit shall be burned in for 2~4 Hours under 277Vac input and with full load at 45°C	

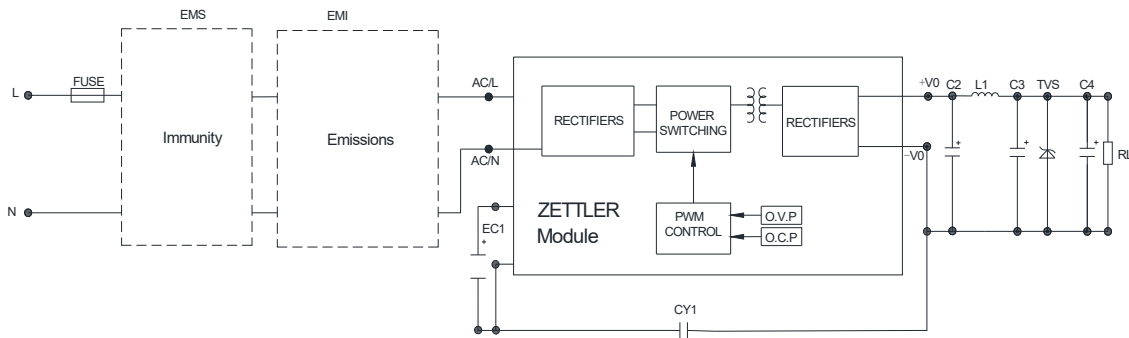
PRODUCT CHARACTERISTIC CURVE (产品特性曲线)



MECHANICAL SPECIFICATION (尺寸图)



TYPICAL APPLICATION SCHEMATIC (典型应用电路)



APX05SXX00WP-100 Series additional component selection guide(no EMC devices)

Part no.	EC1 ¹	C2 (required)	L1 (required)	C3 ² (required)	C4	CY1 (required)	TVS ³
APX05S0300WP-100	22μF/450V (-40°C to 85°C with	820μ/6.3V (solid-state capacitor)	4.7μH max 60mΩ/ 2A	100μF/ 16V	0.1μF/ 50V (ceramic capacitor)	1.0nF/ 400Vac	SMBJ5.0A
APX05S0500WP-100	85-305 Vac input) 10μF/450V	470uF/16V (solid-state capacitor)		47μF/ 35V			SMBJ7.0A
APX05S0900WP-100	(-25°C to 85°C with	270uF/16V (solid-state capacitor)					SMBJ12A
APX05S1200WP-100	85-305 Vac input, or						SMBJ20A
APX05S1500WP-100	-40°C to 85°C with						SMBJ20A
APX05S2400WP-100	165-305 Vac input)	220uF/35V					SMBJ30A

Note:

- 1.Recommended to use a capacitor with ripple current >200 mA at 100 kHz.
- 2.Recommended to use a high frequency, low ESR, electrolytic capacitor (<= 1.1Ω at -40 C) with at least 20% margin on voltage rating.
- 3.A suppressor diode (TVS) is recommended to protect the downstream application in case of converter failure and should be rated for a minimum of 1.2 times the converter's output voltage.
- 4.The FUSE component is required , recommended to use a slow break fuse with 1A/300V SPEC.

APX05SXX00WP-100 Series Enviromental and EMC selection guide

Recommended circuit	Application enviromental	Typical industry	Input voltage range	Environment temperature	Emissions	Immunity
1	Basic application	None	85~305Vac	-40°C to 85°C	Class A	Class III
2	Indoor civil enviroment	Smart home/Home appliances (2 Y-caps)		-25°C to 55°C	Class B	Class III
	Indoor general enviroment	Intelligent building/ Intelligent agriculture		-25°C to 55°C	Class B	Class IV
3	Indoor industrial enviroment	Manufacturing workshope		-25°C to 55°C	Class B	Class IV
4	Outdoor general enviroment	ITS/Video monitoring/ Charging point/ Communication/Security and protection		-40°C to 85°C	Class A	Class IV

Immunity design circuits reference

Class III	Class IV	Class A	Class B

Circuit 1

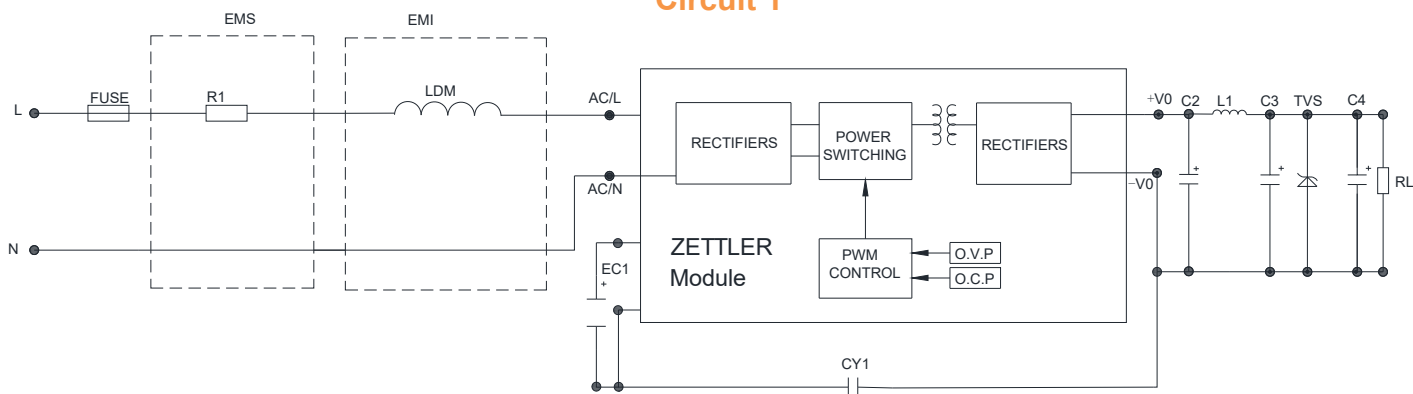


Table 1

Application enviromental	Ambient temperature range	Imunity Class	Emissions Class
Basic application	-40°C ~ 85°C	Class III	Class A

Component	Recommended value
FUSE (required)	1A/300V, slow blow
R1 (wire-wound resistor, required)	12Ω/3W
LDM	4.7mH/15Ω max/0.2A min

Note: R1 must be a wire-wound resistor; do not use a chip or carbon film resistor.

Circuit 2

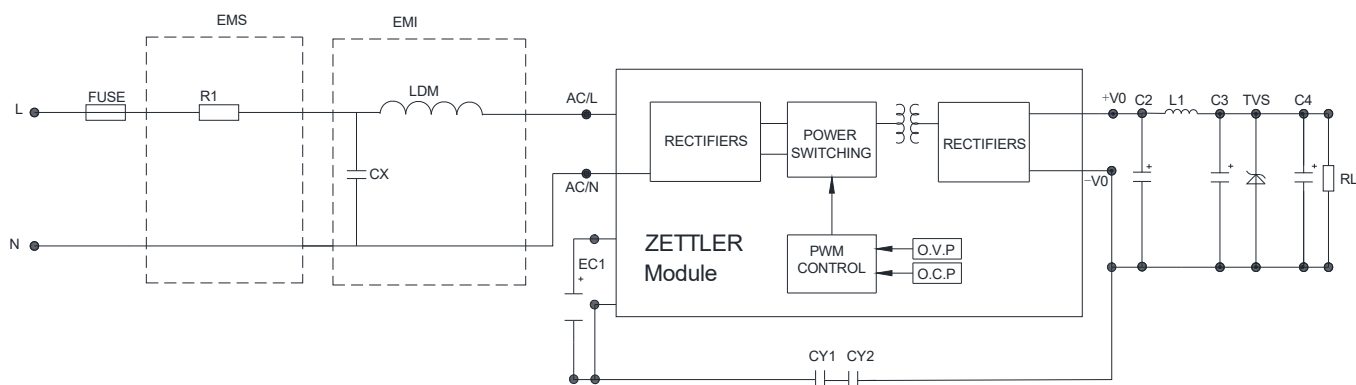


Table 2

Application enviromental	Ambient temperature range	Imunity Class	Emissions Class
Indoor civil / general	-25°C ~ 55°C	Class III	Class B

Component	Recommended value
FUSE (required)	1A/300V, slow blow
R1 (wire-wound resistor, required)	12Ω/3W
LDM	1.2mH/ 4Ω/0.2A
CX	0.1μF/310Vac

Note: R1 must be a wire-wound resistor; do not use a chip or carbon film resistor.

Circuit 3

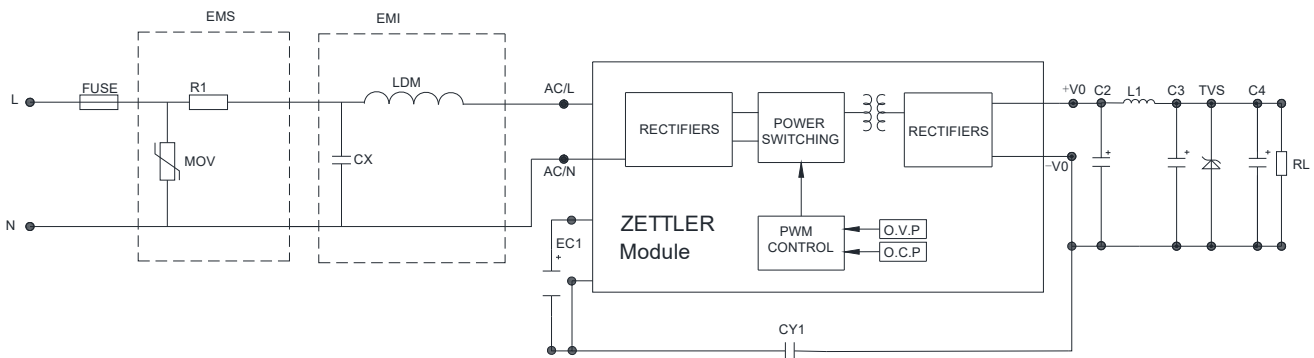


Table 3

Application enviromental	Ambient temperature range	Imunity Class	Emissions Class
Indoor industrial	-25°C ~ 55°C	Class IV	Class B

Component	Recommended value
FUSE (required)	2A/300V, slow-blow
R1 (wire-wound resistor, required)	12Ω/3W
LDM	1.2mH/ 4Ω/0.2A
CX	0.1μF/310Vac
MOV	S14K350

Note: 1. Many safety standards require a bleeder resistor no greater than 3.8MΩ in parallel with the X-capacitor.
2. R1 must be a wire-wound resistor; do not use a chip or carbon film resistor.

Circuit 4

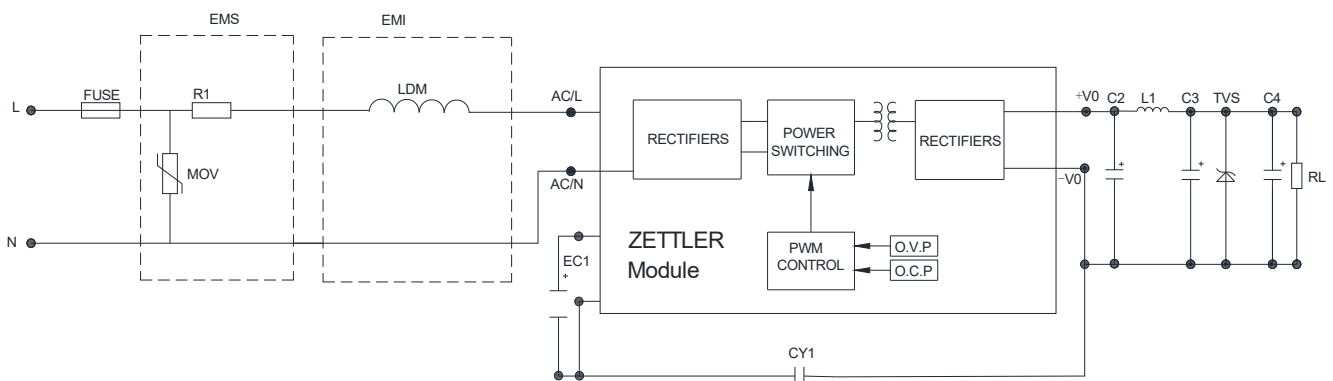


Table 4

Application enviromental	Ambient temperature range	Imunity Class	Emissions Class
Outdoor general enviroment	-40°C ~ 85°C	Class IV	Class A

Component	Recommended value
FUSE (required)	2A/300V, slow-blow
R1 (wire-wound resistor, required)	12Ω/2W
LDM	4.7mH/ 15Ω/0.2A
MOV	S14K350

Note: R1 must be a wire-wound resistor; do not use a chip or carbon film resistor.