

Specification for approval

Description (产品类型) : Power Module

Customer P/N (客户) : _____

ZETTLER P/N (赛特勒) : APX05S2400WP-100

Revision (版本号) : PD1.0

Drafted (编制) : Honghua Luo

Checked (审核) : Xianzhi Xie

Approved (批准) : Aaron Chen



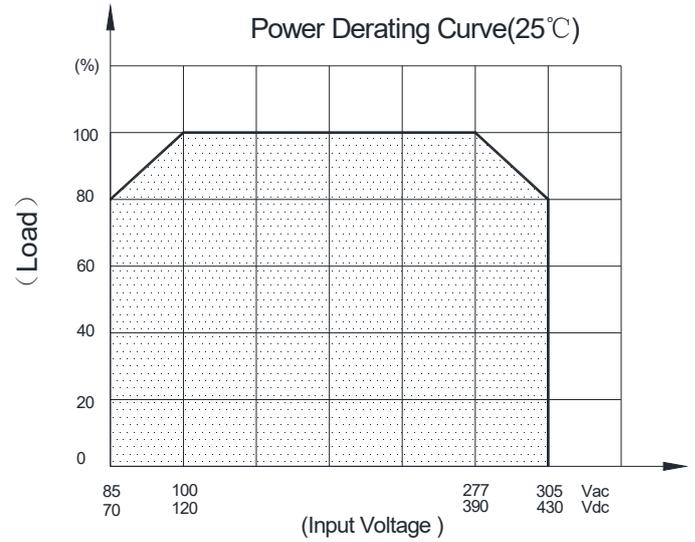
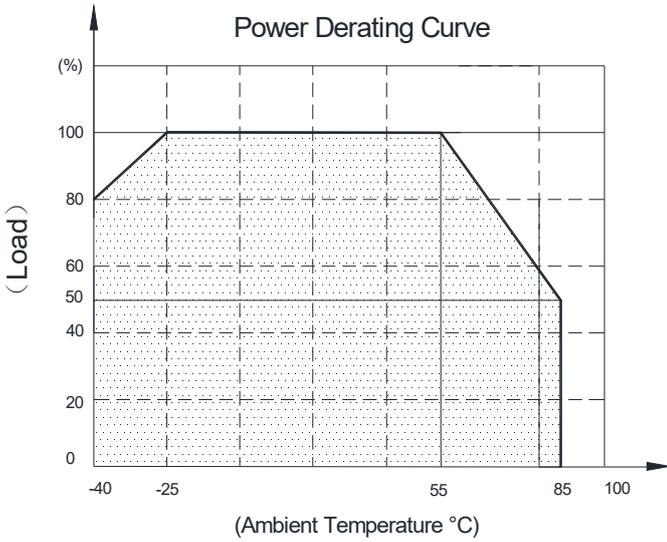
PD1.0	2025/05/22	Initial release	Honghua Luo
Rev.	Date	Description	Approved

Approved by Customer (客户确认) : _____

Friendly Reminder: Please help to sign this Spec when approve , and fax to our company . Or else, we will consider you have accepted it and make future order based on this Spec.

友情提示:请在签字确认后,按封面的传真号码回传给赛特勒磁电有限公司.如无回传,则视为默认,后续的相关订单将以按本承认书的规定为技术要求

1. POWER DERATING (降额功率曲线图)



2. OUTLINE DRAWING (外形图)

Dimensions:
 A: 26.40 [1.039]
 B: 24.00 [0.945]
 C: 16.00 [0.630]
 C1: 4.00 [0.157]
 C2: 1.40 [0.055]
 D: 14.73 [0.58]
 E: 17.60 [0.693]
 F: 6.60 [0.260]
 G: 2.30 [0.091]
 H: 1.00 [0.039]
 H1: 11.0 max. [0.433 max.]

Top view (PCB Layout) Dimensions:
 4.00 [0.157]
 1.4 [0.055]
 2.80 [0.110]
 3.73 [0.147]
 6.80 [0.268]
 3.73 [0.147]
 1.0 [0.039]
 Non-metal hole
 2.00 [0.079]

Outer box label:

ZETTLER
 Switching Power Module
 Model: APX05S2400WP-100
 Input: 100-277Vac 0.2A 50/60Hz
 Output: 24V = 0.21A
 ta=55°C
 YY:year ww:week

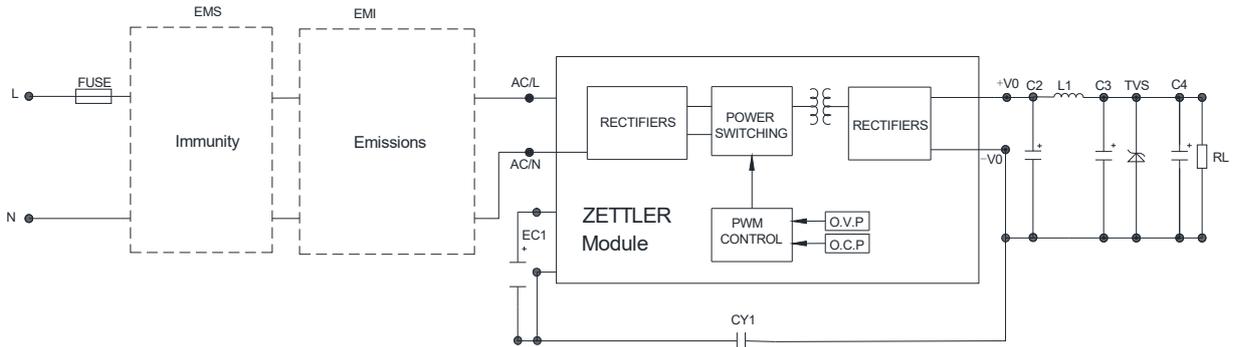
ZETTLER
 名称: 变压器模块
 型号: APX05S2400WP-100
 输入: 100-240Vac 0.2A 50/60Hz
 输出: 24V = 0.21A
 ta=55°C
 YY:year ww:week

PIN	FUNCTION
1	AC(L)
2	AC(N)
3	+V(cap)
4	-V(cap)
5	-Vo
6	+Vo

Label:
 ZETTLER
 APX05S2400WP-100
 YYWW

NOTE:
 1. Unit: mm [inch]
 2. Tolerance: ±1.0mm [±0.039]

3.TYPICAL APPLICATION SCHEMATIC (典型应用电路)



APX05S2400WP-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
APX05S2400WP-100	22μF/450V (-40°C to 85°C with 85-305 Vac input) 10μF/450V (-25°C to 85°C with 85-305 Vac input, or -40°C to 85°C with 165-305 Vac input)	220μF/35V (solid-state capacitor)	4.7μH max 60mΩ/ 2A	47μF/ 35V	104/ 50V (ceramic capacitor)	222/ 400Vac	SMBJ30A

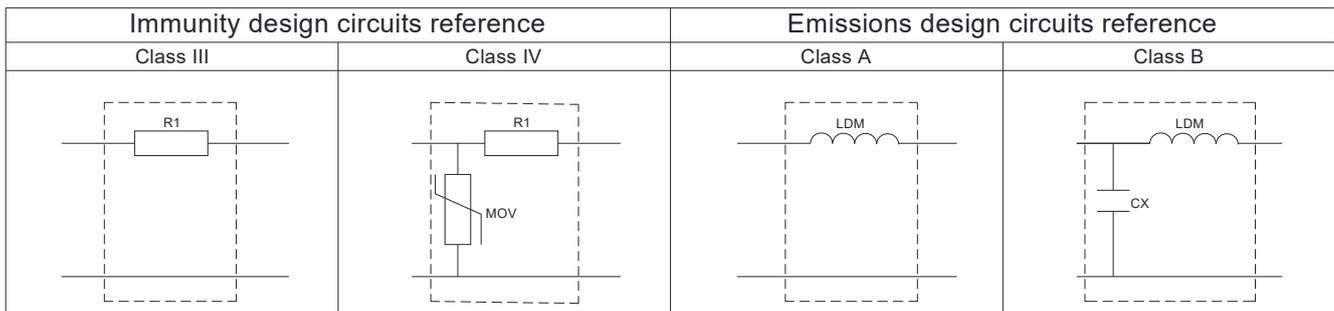
Note: 1.Recommended to use a capacitor with ripple current >200 mA at 100 kHz.

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.

APX05S2400WP-100 Series Environmental 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)				
	Indoor general enviroment	Intelligent building/ Intelligent agriculture		-25°C to 55°C	Class B	Class III
3	Indoor industrial enviroment	Manufacturing workshoop		-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	



Circuit 1

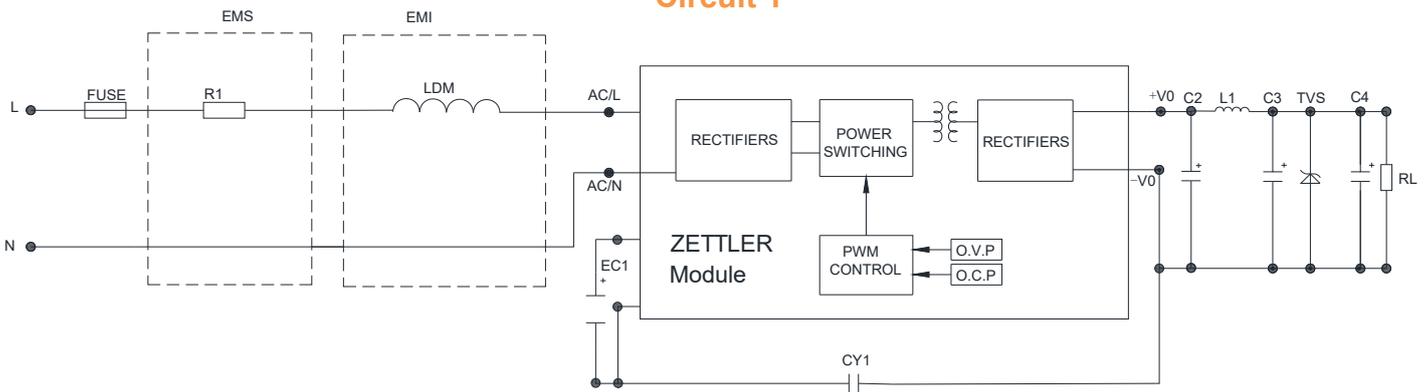


Table 1

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

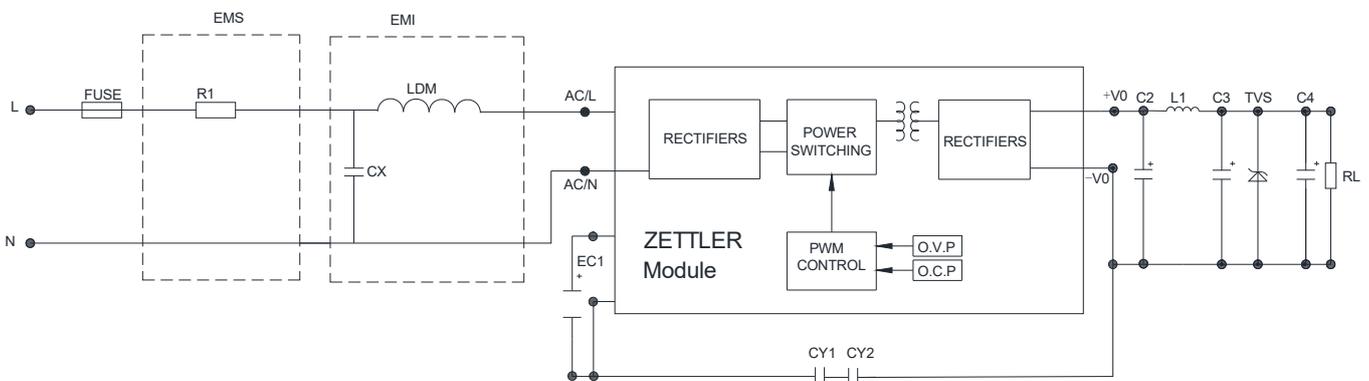


Table 2

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

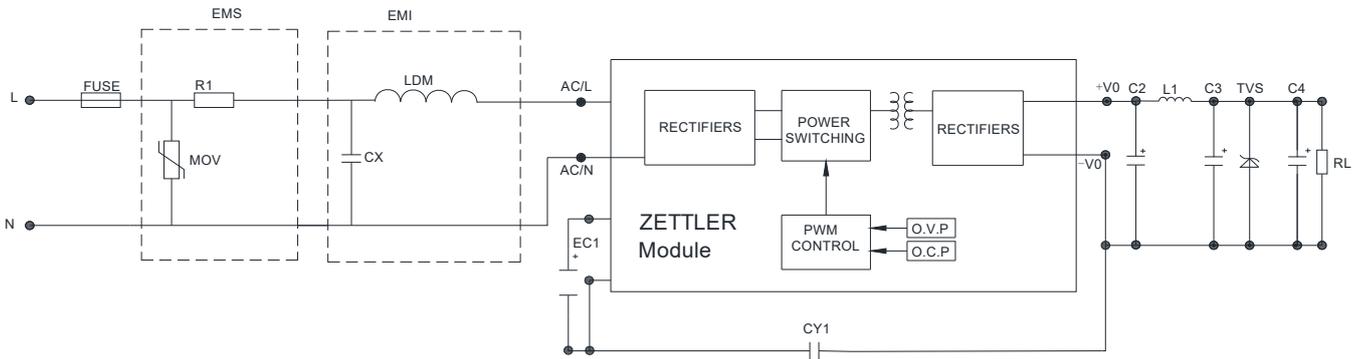


Table 3

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

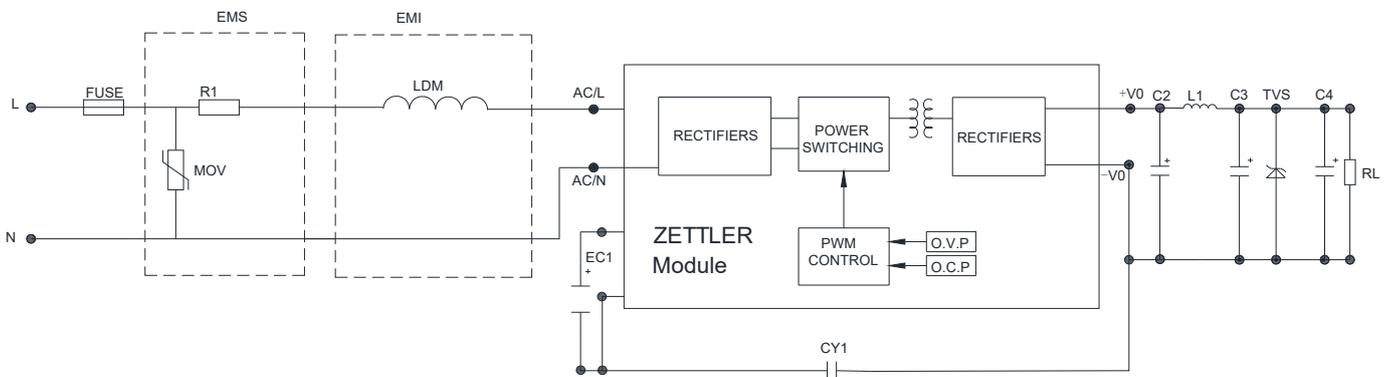


Table 4

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.

4.ELECTRICAL SPECIFICATION (电性能参数)

Model No. / 型号		APX05S2400WP-100		
Input 输入参数	Rated Voltage / 额定电压	100-277VAC (For UL,TUV Certification) ;100-240VAC(For CQC Certification)		
	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	24		
	Current (mA) max. / 输出额定电流	210		
	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	150/20MHz bandwidth (peak-to-peak value)		
	Efficiency (typ.) / 工作效率	81%@230Vac		
	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/EN61558-2-16		
	EMI /EMC	CISPR32/EN55032 CLASS A (Recommended circuit 1, 4) CISPR32/EN55032 CLASS B (Recommended circuit 2, 3)		
	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		