

Specification for approval

Description (产品类型) : Power Module

Customer P/N (客户) : _____

ZETTLER P/N (赛特勒) : APX05S2400WP-200

Revision (版本号) : PD1.0

Drafted (编制) : Honghua Luo

Checked (审核) : Xianzhi Xie

Approved (批准) : Aaron Chen



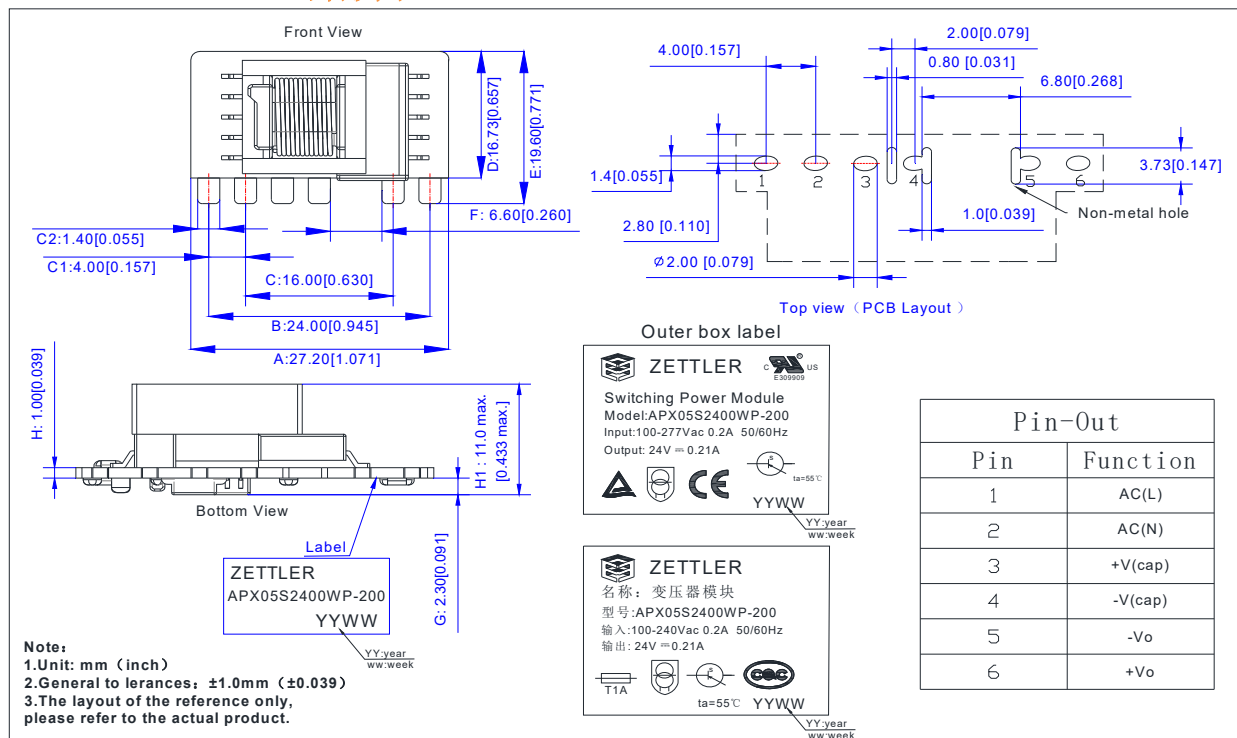
PD1.0	2025/05/23	Initial release	Honghua Luo
Rev.	Date	Description	Approved

Approved by Customer (客户确认) : _____

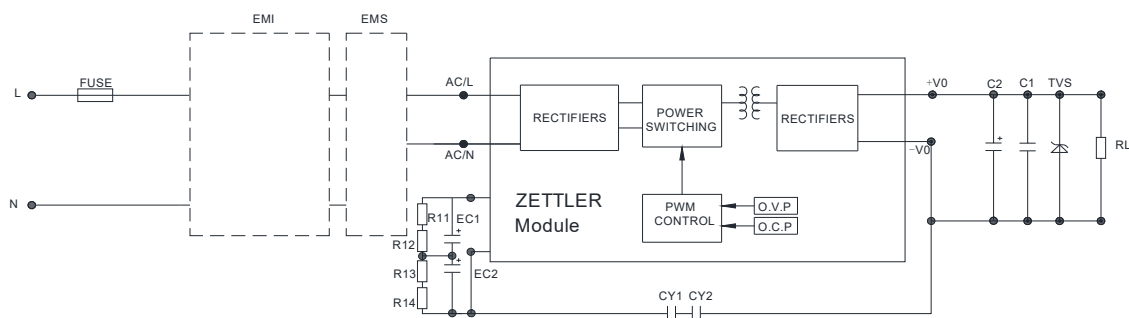
Friendly Reminder: Please help to sign this Spec when approve , and fax to our company . Or else, we will consider you have accepted it and make future order based on this Spec.

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.OUTLINE DRAWING (外形图)



2.SCHEMATIC (原理图)



Component	EC1/EC2	C2	C1	CY1,CY2	TVS	FUSE
Spec.	22UF/400V	220UF/35V	104PF/50V	100~2200pF/400VAC	SMBJ30CA	1A 400V

External recommended components selection guide (No EMC devices)

注:

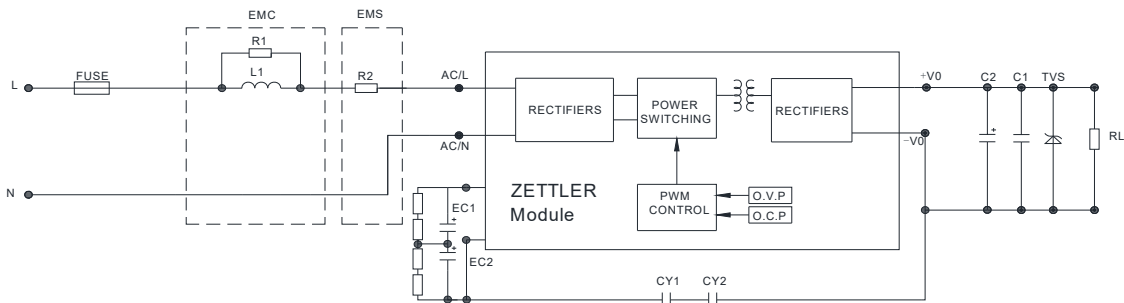
- EC1/EC2 is used as filter capacitor with AC input (must be connected externally) and as EMC filter capacitor with DC input (must be connected), External recommended to use the capacitor with ripple current $>200\text{mA}@100\text{KHz}$.
- R11/R12/R13/R14 used as voltage equalizing resistors for EC1/EC2, which must be externally connected. It is recommended to use surface mount resistors with a resistance greater than $1\text{M}\Omega$ and a specification of 1206 or higher.
- We recommend using an electrolytic capacitor with high frequency and low ESR (ESR of C2 at low temperature of $-40^\circ\text{C}\leq 1.1\Omega$) rating for C2.Choose a capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C1 is a ceramic capacitor, used for filtering high frequency noise.
- A suppressor diode (TVS) is recommended to protect the application in case of converter failure and specification should be 1.2 times of the output voltage.

ZETTLER MAGNETICS

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Electromagnetic Compatibility Solution--Recommended Circuit

1. Application circuit 1——Basic application (Immunity Level 3, Emissions Class A)



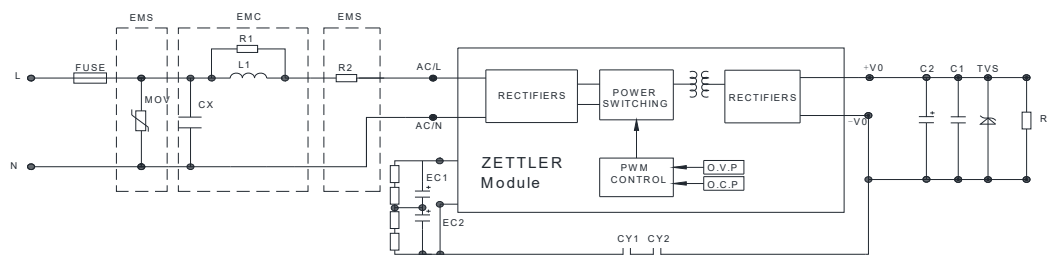
Component	R1	L1	R2	CY1, CY2	FUSE
Spec.	10K/1206	0.5~2mH/0.5A	12Ω/3W	100~2200pF/400VAC	1A/400V

Note:

1. R2 is the input plug-in resistor, this resistor needs to be a wire-wound resistor (required).

2. In the home appliance application environment, the two Y capacitors of the primary and secondary need to be externally connected.

2. Application circuit 2: Universal system recommended circuits for outdoor general environment (Immunity Level 4, Emissions Class B)



Component	MOV	R1	CX	L1	R2	CY1, CY2	FUSE
Spec.	14D751K	10K/1206	0.1UF/480VAC	0.5~2mH/0.5A	12Ω/3W	100~2200pF/400VAC	1A/400V

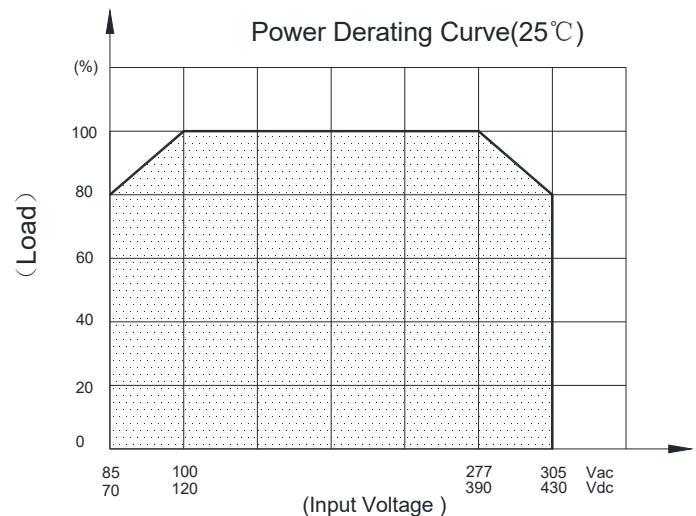
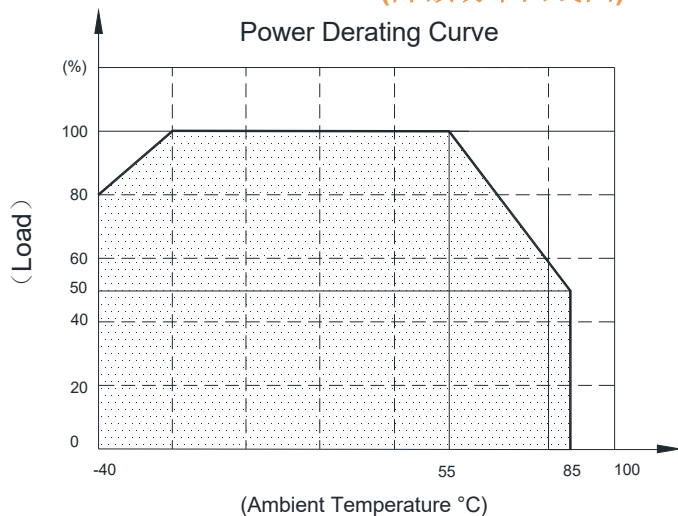
Note:

1. According to the certification requirements, the X capacitor needs to be connected in parallel with the bleeder resistance, the recommended resistance value is less than 3.8MΩ, and the actual need to be selected according to the certification standard.

2. R2 is the input plug-in resistor, this resistor needs to be a wire-wound resistor (required).

3. In the home appliance application environment, the two Y capacitors of the primary and secondary need to be externally connected.

3. POWER DERATING (降额功率曲线图)



NOTE: With an AC input between 85~100VAC and a DC input between 70~120VDC, the output power must be derated as per temperature derating curves.

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4.ELECTRICAL SPECIFICATION (电性能参数)

Model No. / 型号		APX05S2400WP-200	
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 120-430VDC	
	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 max. @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% full load@230VAC	
	Start-up Time / 开机延迟时间	3s	
	Hold up Time / 掉电保持时间(典型值)	8ms/115VAC ,40ms/230VAC	
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...+85°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,3-5Sec	
Physical 外观结构	Case Material / 外壳材质	N/A	
	Weight / 产品净重	4.9g(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 (External components are required)	
	EMI	Compliance with EN55032 CLASS B,EN61000-3-2,EN61000-3-3	Need to add external EMC component (Reference to the Schematic)
	EMS (Noise Immunity)	ESD ±4KV contact; ±8KV Air EN 61000-4-2:2009 Criteria B SURGE ±2.0KV(L-N) EN 61000-4-5 Criteria B EFT ±2KV EN61000-4-4 Criteria B	
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 25°C	