



25ACB1EW_4 series

25W - AC-DC converter

AC-DC Converter

25 Watt

- ⊕ Wide input voltage range: 85-305VAC/120-430VDC
- ⊕ No load power usage up to $\leq 0.5W$
- ⊕ Transfer efficiency: 86% (typ.)
- ⊕ Switching frequency: 65kHz
- ⊕ Protections: short-circuit, over-current
- ⊕ Isolation voltage: 3800VAC
- ⊕ Meets IEC62368/UL62368/EN62368 test standard
- ⊕ 6 Side shielding plastic case, meet flammability UL94 V-0
- ⊕ PCB Mounting, chassis mounting, DIN rail mounting available



Introducing our latest 25ACB1EW_4 series, designed to meet the most demanding applications with unparalleled efficiency and reliability. This state-of-the-art device features a wide input voltage range of 85-305VAC or 120-430VDC, making it versatile for various power environments. With a no-load power usage up to $\leq 0.5W$ and a typical transfer efficiency of 86%, it ensures minimal energy wastage and optimal performance. Operating at a switching frequency of 65kHz, our power supply is equipped with robust protection mechanisms, including short-circuit and over-current protections, ensuring safe and reliable operation. The isolation voltage of 3800VAC provides an extra layer of safety and durability.

Common specifications	
Short circuit protection	Full input voltage range - Continuous, Self-recovery - Hiccup
Over current protection	Single - Input 230VAC - $\geq 130\%$ Io, Self-recovery - Hiccup Dual - Input 220VAC - $\geq 120\%$ Io, Self-recovery - Hiccup
Switching frequency	65 kHz (typ.)
Operating temperature	-40°C - +75°C (with derating)
Storage temperature	-40°C - +85°C
Soldering temperature	Wave soldering 260°C ($\pm 4^\circ\text{C}$), time 5-10s Manual soldering 360°C ($\pm 8^\circ\text{C}$), time 4-7s
Relative humidity	10-90% RH
Hot plug	Unavailable
Remote control terminal	Unavailable
Safety standard	Single - EN62368, IEC62368 Dual - EN60950, IEC60950
Vibration	10-55Hz, 10G, 30Min, along X, Y, Z
Safety class	CLASS II
MTBF (MIL-HDBK-217F@25°C)	>300,000 Hours
Case material	UL94 V-0
Packing Dimension	70.0 x 48.0 x 23.5 mm
Product Weight	128g (typ.)
Cooling Method	Natural air cooling

Input specifications					
Item	Operating condition	Min	Typ	Max	Units
Input voltage range	Single - AC input	85	220	305	VAC
	Single - DC input	120	310	430	VDC
	Dual - AC Input	85	220	265	VAC
	Dual - DC Input	120	310	380	VDC
Input frequency range		47	50	63	Hz
Input current	Single - 100VAC			0.55	A
	Single - 220VAC			0.30	
	Dual - 115VAC			0.5	
	Dual - 220VAC			0.30	
Surge current	Single - 115VAC			15	A
	Single - 220VAC			25	
	Dual - 115VAC			10	
	Dual - 220VAC			20	
No load power consumption	Input 115VAC/230VAC (Single) Input 115VAC/230VAC (Dual)		0.10	0.45 0.5	W
External fuse	Single - 3.15A/250VAC slow-fusing / Dual - Unavailable				
Input terminal capacitor EC1	47uF/450V (Single output)				
Leakage Current	0.5mA typ. /230VAC/50Hz				

Output specifications					
Item	Operating condition	Min	Typ	Max	Units
Voltage accuracy	Full input voltage range, any load		± 1.0	± 3.0	%
Line Regulation	Nominal Load (single) (Vo1 and Vo2 - dual)			± 1.0 ± 1.0	%
Load regulation	Nominal input voltage 20%~100% load			± 1.0	%
Minimum load	Single Output (Single)	5			%
	Single Output (Dual)	0			
Turn-on delay time (Full load)	Input 115VAC/220VAC		800		mS
	Input Normal voltage (dual)		500		mS
Power-off holding time	Single - Input 115VAC (full load)		20		mS
	Single - Input 220VAC (full load)		20		
	Dual - Input 115VAC (full load)		30		
	Dual - Input 220VAC (full load)		50		
Dynamic response	Single Overshoot range 25%-50%-25% Recovery time 50%-75%-50%	-5.0 (min) - +5.0 = (max.)			% mS
	Dual Overshoot range 25%-50%-25% Recovery time 50%-75%-50%	Overshoot range (%): $\leq \pm 5.0$ Recovery time(mS): ≤ 5.0			
Output overshoot	Full input voltage range		$\leq 10\%V_o$		%
Drift coefficient			± 0.03		%/°C

Isolation specifications					
Item	Operating Conditions	Min	Typ	Max	Units
Isolation voltage	Input-Output Test 1min, leakage current $\leq 5\text{mA}$				VAC
	Single	3800			
	Dual	4000			
Insulation Resistance	Input-Output@DC500V	100			MΩ

Example:

25ACB1EW_12D4

25 = 25Watt; AC = AC-DC; B1 = Series; E = Cost effective; W = Wide input; 12 = 12Vout; D = Dual output; 4 = 4 kVAC isolation

- The product should be used under the specification range, otherwise it will cause permanent damage to it.
- Product's input terminal should connect to fuse;
- If the product operated below the minimum load request, we cannot ensure that the performance of product is in accordance with all the indexes in this manual;
- If the product worked beyond the load range, we cannot ensure that the performance of product is in accordance with all the indexes in this manual;
- Unless otherwise specified, data in this datasheet are tested under conditions of $T_a = 25^\circ\text{C}$, humidity < 75% when inputting nominal voltage and outputting rated load
- All index testing methods in this datasheet are based on our Company's corporate standards.
- The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, please directly contact our technician for specific information.

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EMC specifications					
EMC	EMI	CE	CISPR22/EN55032	CLASS B (see recommended circuit Photo 1)	
EMC	EMI	RE	CISPR22/EN55032	CLASS B (see recommended circuit Photo 1)	
EMC	EMS	RS	IEC/EN61000-4-3	10V/m	Perf.Criteria A
EMC	EMS	CS	IEC/EN61000-4-6	3Vr.m.s	Perf.Criteria A
EMC	EMS	ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV	Perf.Criteria B
EMC	EMS	Surge (Single)	IEC/EN61000-4-5	Line to line ±2KV Line to line ±4KV	Perf.Criteria B Perf.Criteria B (see recommended circuit Photo 2,3)
EMC	EMS	Surge (Dual)	IEC/EN61000-4-5	±1KV	Perf.Criteria B
EMC	EMS	EFT	IEC/EN61000-4-4	±2KV ±4KV	Perf.Criteria B Perf.Criteria B (see recommended circuit Photo 2,3)
EMC	EMS	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%~70%	Perf.Criteria B

Product Selection Guide

Approval	Model	Output Power (W)	Output Voltage Vo(V)	Output Current Io(mA)	Max. Capacitive Load (uF)	Ripple & Noise 20MHz (Max) mVp-p	Efficiency Full Load, 220VAC Typ. (%)
	25ACB1EW_05S4	21	5.0	4200	3000	100	78
	25ACB1EW_09S4	25	9.0	2780	3000	100	85
	25ACB1EW_12S4	25	12	2083	2000	120	85
	25ACB1EW_15S4	25	15	1667	2000	120	85
	25ACB1EW_18S4	25	18	1389	2000	120	85
	25ACB1EW_24S4	25	24	1042	700	150	85
	25ACB1EW_28S4	25	28	893	500	150	86
	25ACB1EW_48S4	25	48	520	400	150	86

Approval	Model	Output Power (W)	Output Voltage Vo(V)	Output Current Io(mA)	Max. Capacitive Load (uF)	Ripple & Noise 20MHz (Max) mVp-p	Efficiency Full Load, 220VAC Typ. (%)
	25ACB1EW_12D4	25	±12	1041	1000/1000	100/100	82
	25ACB1EW_15D4	25	±15	833	820/820	100/100	83

Note:

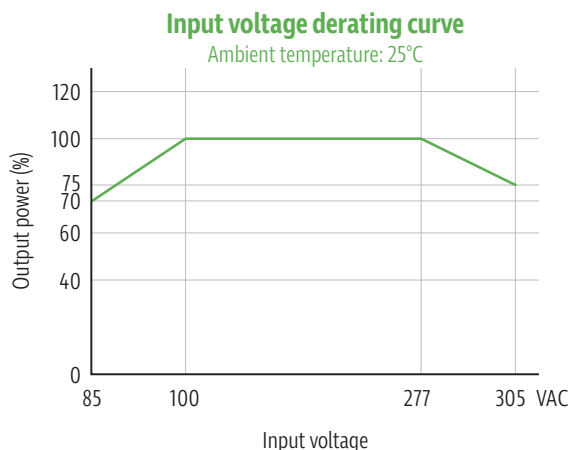
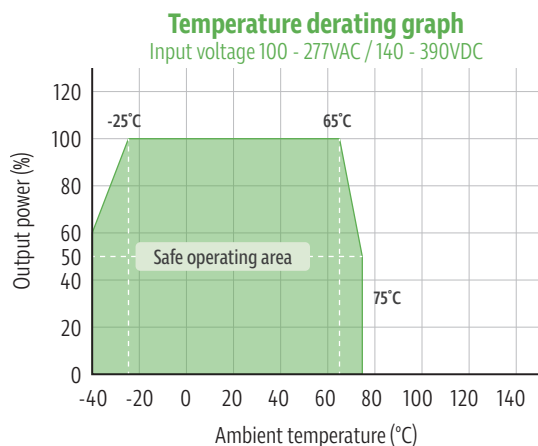
- 1: Please use suffix /CM for chassis mount; please use suffix /DR for DIN rail mounting; rail width 35mm (Example: 25ACB1EW_48S4/CM/DR)
- 2: The typical output efficiency is based on that product is full loaded and burned-in after half an hour.
- 3: The fluctuation range of full load efficiency (% typ) is ±2%, full load output efficiency = total output power/module's input power.
- 4: Ripple and noise is tested by Twisted pair method, please check details from "ripple & noise test" at back of datasheet.

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Product characteristic curve

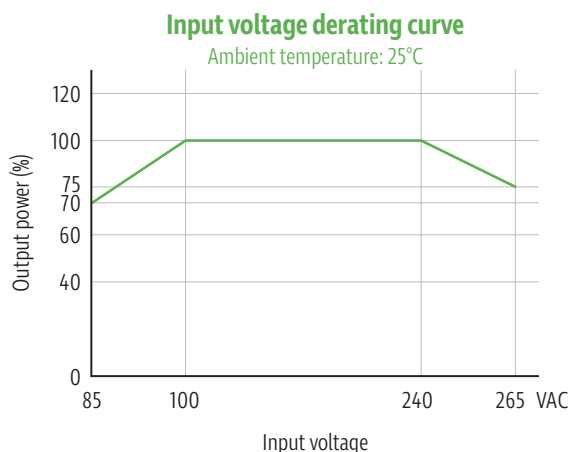
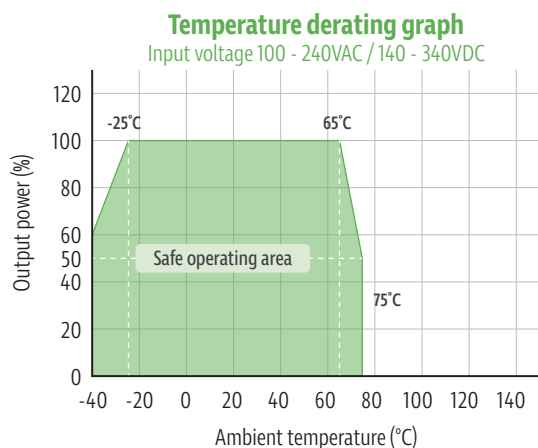
Single output



Note

1. Input Voltage should be derated base on Input Voltage Derating Curve when it is 85~100VAC/277~305VAC/120~140VDC/ 390~430VDC.
2. Our product is suitable to use under natural air cooling environment, if use it under closed condition, please contact with us.

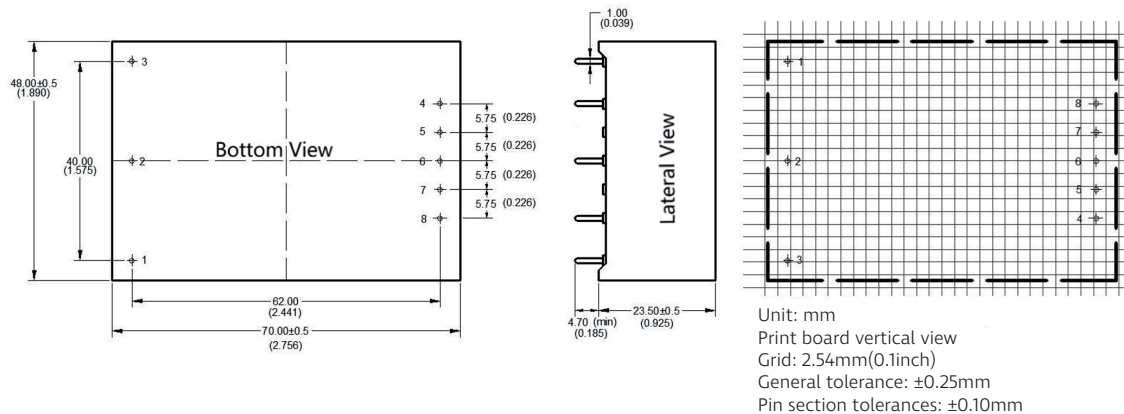
Dual output



Note

1. Input Voltage should be derated base on Input Voltage Derating Curve when it is 85~100VAC/240~265VAC/120~140VDC/ 340~380VDC
2. Our product is suitable to use under natural air cooling environment, if use it under closed condition, please contact with us.

Standard packing dimensions (Single output)

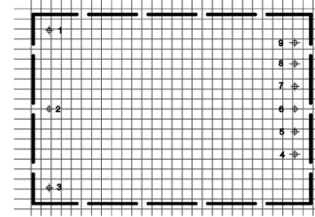
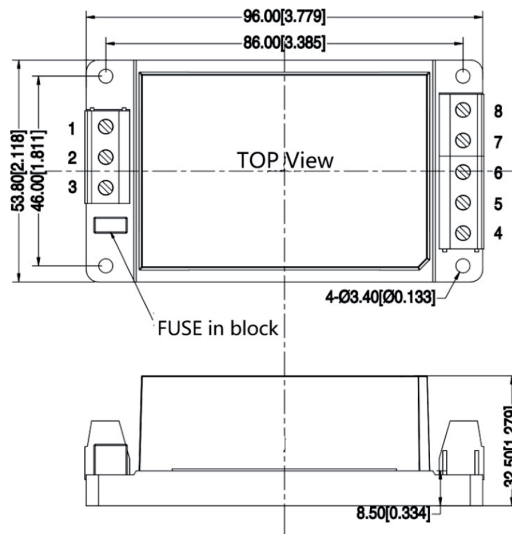


Pin-out	1	2	3	4	5	6	7	8	9
Single (S)	FG	AC(N)	AC(L)	+Vo	NP	NP	NP	-Vo	NP

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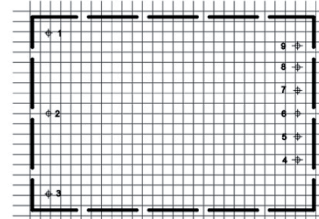
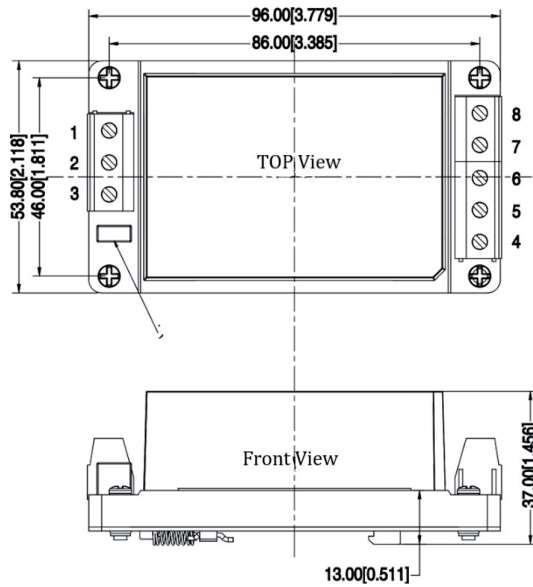
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Chassis mounting packing dimensions



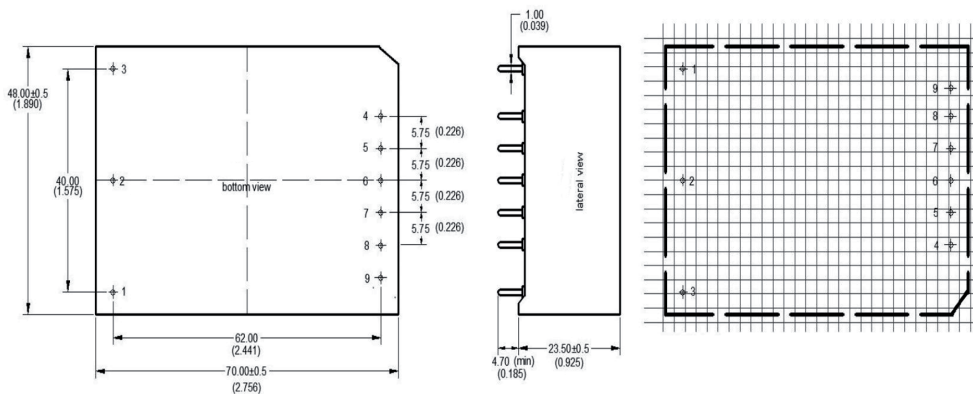
Unit: mm
 Print board vertical view
 Grid: 2.54mm(0.1inch)
 General tolerance: $\pm 0.5\text{mm}$
 Pin section tolerances: $\pm 0.10\text{mm}$

DIN rail mounting dimensions



Unit: mm
 Print board vertical view
 Grid: 2.54mm(0.1inch)
 General tolerance: $\pm 0.5\text{mm}$
 Pin section tolerances: $\pm 0.10\text{mm}$

Standard packing dimensions (Dual output)



Unit: mm
 Print board vertical view
 Grid: 2.54mm(0.1inch)
 General tolerance: $\pm 0.25\text{mm}$
 Pin section tolerances: $\pm 0.10\text{mm}$

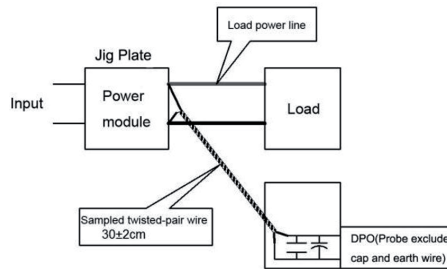
Pin-out	1	2	3	4	6	8
Single(D)	FG	AC (N)	AC (L)	+V1	COM	-V2
Function	Non-functioning feet	Neutral input	Firewire input	Output positive	Output common	Output negative

Note: If the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

Ripple & noise test: (twisted pair method 20MHz bandwidth)

Test Method:

1. 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.
2. Input terminal connect to power supply, output terminal connect to electronic load through jig plate, Use 30cm ±2 cm sampling line. Power line selected from corresponding diameter wire with insulation according to the flow of output current.



Typical application circuit

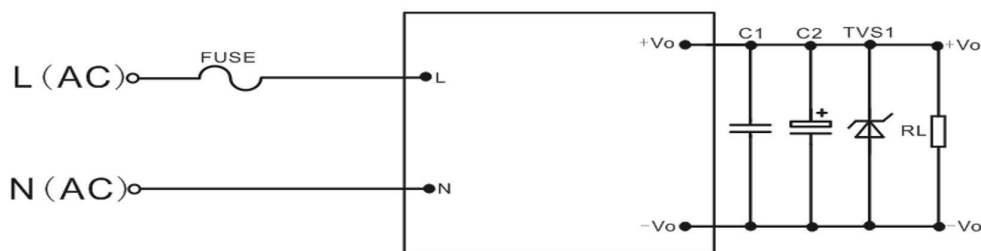


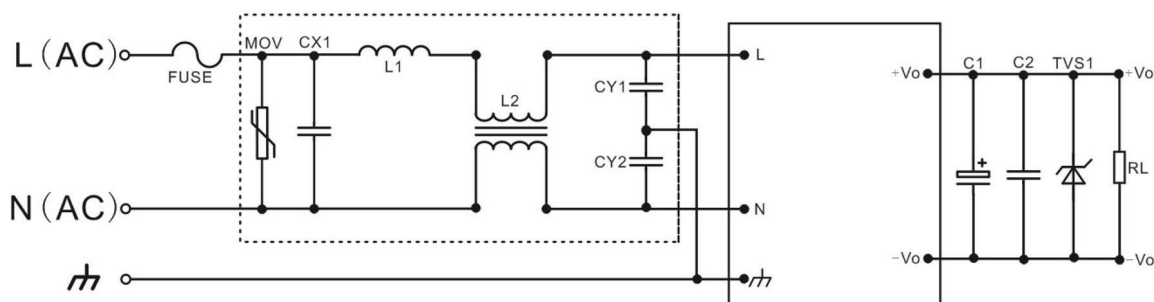
Photo 1: Typical Application Circuit

Model	C2 (uF)	TVS1
25ACB1EW_05S4	680	SMBJ9A
25ACB1EW_09S4	330	SMBJ12A
25ACB1EW_12S4	330	SMBJ15A
25ACB1EW_15S4	330	SMBJ20A
25ACB1EW_18S4	330	SMBJ30A
25ACB1EW_24S4	220	SMBJ30A
25ACB1EW_28S4	220	SMBJ30A
25ACB1EW_48S4	100	SMBJ58A

Note:

Output filter capacitor C2 is electrolytic capacitor, recommend to use high frequency low resistance ones, capacitance and current please refer to the technical specification from each supplier. Capacitor C2 withstand voltage derating is at least 80%. C1 is ceramic capacitor, to filter high frequency noise, recommend 0.1uF/50V/1206. TVS1 tube is a recommend component to protect post-circuit if converter fails. Recommend to connect external FUSE, model:3.15A/250V slow-fusing.

ECM recommended circuit (Single output)

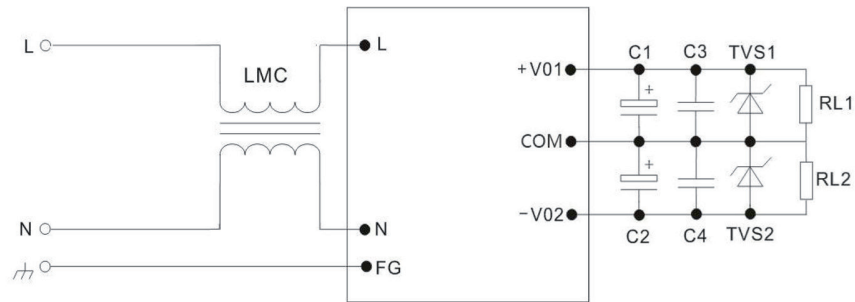


Model	Name	Recommended Value
FUSE	FUSE	3.15A/250VAC, slow fusing, necessary
MOV	Voltage Dependent Resistor	14D561K
CX1	X Capacitor	0.22uF/275VAC
L1	Differential mode inductor	2.0uH/2.5A I inductor
L2	Common mode inductor	Green ring 15mH/2.5A T12X7X6mm
CY1	Y Capacitor	102M-400VAC
CY2	Y Capacitor	102M-400VAC

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ECM recommended circuit (Dual output)



Note:

- 1). LMC is common-mode inductor, recommended to use above 25mH;
- 2) C1, C2 choose high frequency low impedance electrolytic capacitors, the capacitance value less than capacitive load. Withstand voltage is 1.5 times more than output voltage;
- 3) C3, C4 choose ceramic chip capacitor, withstand voltage is 1.5 times more than output voltage;
- 4) TVS1, TVS2 is TVS Tube, 5V output recommend: SMBJ7.0A, 9V output recommend: SMBJ12.0A, 12V output recommend: SMBJ20A, 15V output recommend: SMBJ20.0A, 24V output recommend: SMBJ30.0A, 48V output recommend: SMBJ64A.