



## 5ACD1E\_4 series

5W - AC-DC converter

### AC-DC Converter

5 Watt

- ⊕ Wide input voltage range: 90-265VAC/127-375VDC
- ⊕ No load power consumption  $\leq 0.3W$
- ⊕ Transfer efficiency: 82% (typ.)
- ⊕ Switching frequency: 65kHz
- ⊕ Protections: short-circuit, over-current, over-temperature
- ⊕ Isolation voltage: 4000VAC Meets IEC62368/UL62368/EN62368 test standard
- ⊕ RoHS conform
- ⊕ Plastic case, meet UL94 V-0
- ⊕ PCB mounting

Introducing our high-performance power supply 5ACD1E\_4 series with a wide input voltage range of 90-265VAC/127-375VDC. It features a low no-load power consumption of  $\leq 0.3W$  and a typical transfer efficiency of 82%. Operating at a switching frequency of 65kHz, it provides robust protection against short-circuit, over-current, and over-temperature conditions. With an isolation voltage of 4000VAC, this unit meets IEC62368/UL62368/EN62368 test standards and conforms to RoHS certifications, ensuring reliable and safe operation.



Common specifications	
Short circuit protection	Full input voltage range - Continuous, Self-recovery Hiccup
Over current protection	Input 220VAC - $\geq 120\%$ Io Self-recovery - Hiccup
Switching frequency	65 kHz (typ.)
Operating temperature	-40°C - +75°C
Storage temperature	-40°C - +85°C
Soldering temperature	Wave soldering 260°C ( $\pm 4^\circ C$ ), time 5-10S Manual soldering 360°C ( $\pm 8^\circ C$ ), time 4-7S
Relative humidity	10~90% RH
Hot plug	Unavailable
Remote control terminal	Unavailable
Safety standard	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

Input specifications					
Item	Operating condition	Min	Typ	Max	Units
Input voltage range	AC input	90	220	265	VAC
	DC input	127	310	375	VDC
Input frequency range		47	50	63	Hz
Input current	115VAC			0.10	A
	220VAC			0.06	
Input inrush current	115VAC			10	A
	220VAC			20	
Leakage current	0.5mA typ/230VAC/50Hz				
Recommended external input fuse	1A-3A/250VAC slow-fusing				

#### Example:

**5ACD1E\_05S4**  
**5 = 5Watt; AC = AC-DC; D1 = Serie; E = Cost effective; 05 = 5Vout;**  
**S = Single output; 4 = 4 kVAC isolation**

#### Output specifications

Item	Operating condition	Min	Typ	Max	Units
Voltage accuracy	Full input voltage range, 10%-100% load		$\pm 2.0$	$\pm 5.0$	%
Linear regulation	Nominal Load		$\pm 1.0$	$\pm 3.0$	%
Load regulation	Nominal input voltage, 20%-100% load		$\pm 1.0$	$\pm 3.0$	%
No Load Power Consumption	Input 115VAC Input 220VAC			0.3	W
Minimum Load	Single Output	10			%
Turn-on Delay Time	Nominal input voltage		600		mS
Power-off holding time	Input 115VAC (full load)		100		mS
	Input 220VAC (full load)		80		
Dynamic response	Overshoot range 25%-50%-25%	-5.0		+5.0	%
	Recovery time 50%-75%-50%	-5.0		+5.0	mS
Output overshoot	Full input voltage range		$\leq 10\%V_o$		%
Drift coefficient		-	$\pm 0.03\%$	-	%/°C
Ripple noise*	Output $V_o \leq 5VDC$		40	80	mV
	Output $V_o > 5VDC$		60	120	

Note: \*Ripple & noise is tested by twisted pair method, details please see ripple & noise test at back.

#### Isolation specifications

Item	Operating Conditions	Min	Typ	Max	Units
Isolation voltage	Input-Output - Test 1min, leakage current $\leq 5mA$	4000			VAC
Insulation resistance	Input-Output @DC500V	100			M $\Omega$

- 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 is not worked under the load range (below the minimum load or 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  $T_a = 25^\circ C$ , humidity  $< 75\%$  when inputting nominal voltage and outputting rated load (pure resistance load);
- All testing methods in this datasheet are based on our 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;
- The product specification may be changed at any time without prior notice.

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EMC specifications					
EMC	EMI	CE	CISPR22/EN55032	CLASS B	
EMC	EMI	RE	CISPR22/EN55032	CLASS B	
EMC	EMS	RS	IEC/EN61000-4-3	10V/m	Perf.Criteria B (see recommended circuit Photo 1)
EMC	EMS	CS	IEC/EN61000-4-6	3Vr.m.s	Perf.Criteria B (see recommended circuit Photo 1)
EMC	EMS	ESD	IEC/EN61000-4-2	Contact $\pm 6KV$ / Air $\pm 8KV$	Perf.Criteria B
EMC	EMS	Surge	IEC/EN61000-4-5	line to line $\pm 2KV$ / line to ground $\pm 4KV$	Perf.Criteria B (see recommend circuit Photo 1)
EMC	EMS	EFT	IEC/EN61000-4-4	$\pm 2KV$	Perf.Criteria B
EMC	EMS	Voltage dips and interruptions	IEC/EN61000-4-11	0%~70%	Perf.Criteria B

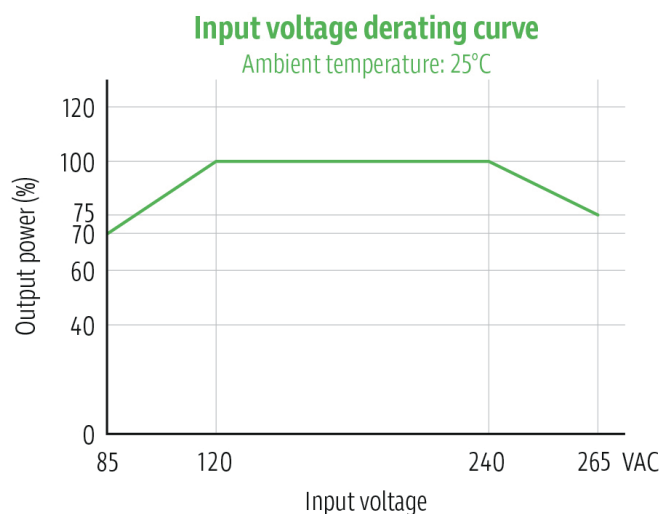
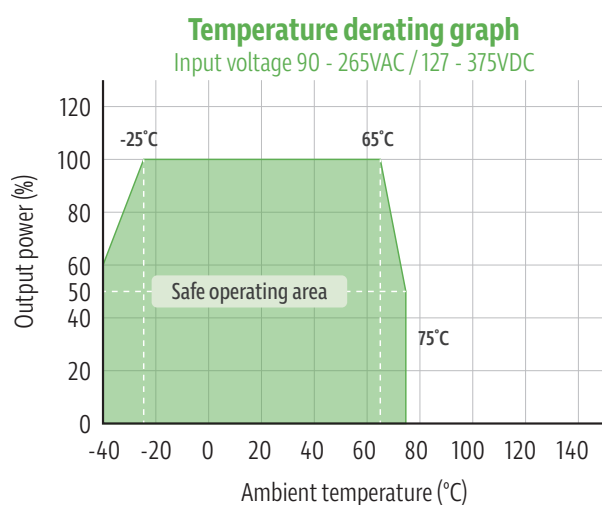
## Product Selection Guide

Approval	Model	Output Power (W)	Output Voltage Vo1(V)	Output Current Io1(mA)	Max. Capacitive Load (uF)	Ripple & Noise 20MHz (Max)	Efficiency@ Full Load, 220VAC Typ. (%)
	5ACD1E_03S4	4.1	3.3	1250	2000	80	69
	5ACD1E_05S4	5	5	1000	1000	80	71
	5ACD1E_09S4	5	9	556	470	120	74
	5ACD1E_12S4	5	12	416	100	120	78
	5ACD1E_15S4	5	15	333	100	120	78
	5ACD1E_24S4	5	24	208	100	120	82

Note:

1. The typical output efficiency is based on that product is full loaded and burned-in after half an hour.
2. The fluctuation range of full load efficiency (%typ) is  $\pm 2\%$ , full load output efficiency = total output power/module's input power.
3. Use suffix /CM for chassis mounting; use suffix /DR for DIN rail mounting, din-rail width 35mm. Example: 5ACD1E\_24S4/CM/DR

## Product characteristic curve



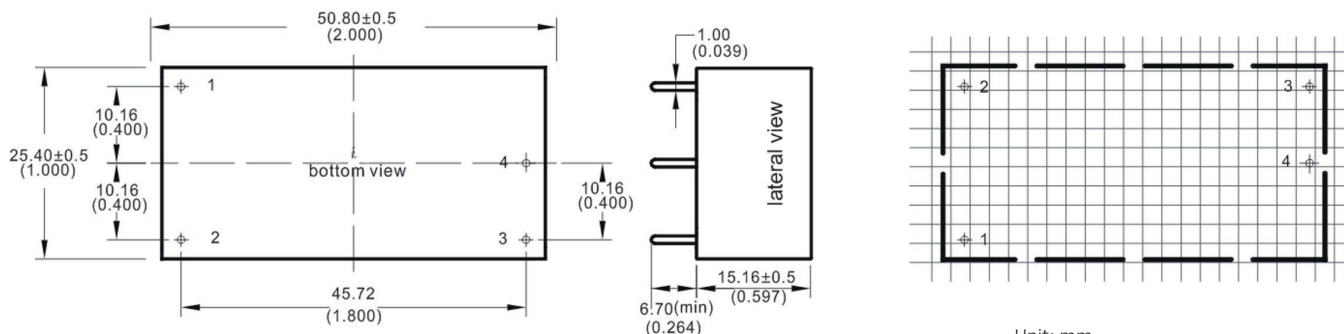
Note

- 1: Input voltage should be derated based 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.

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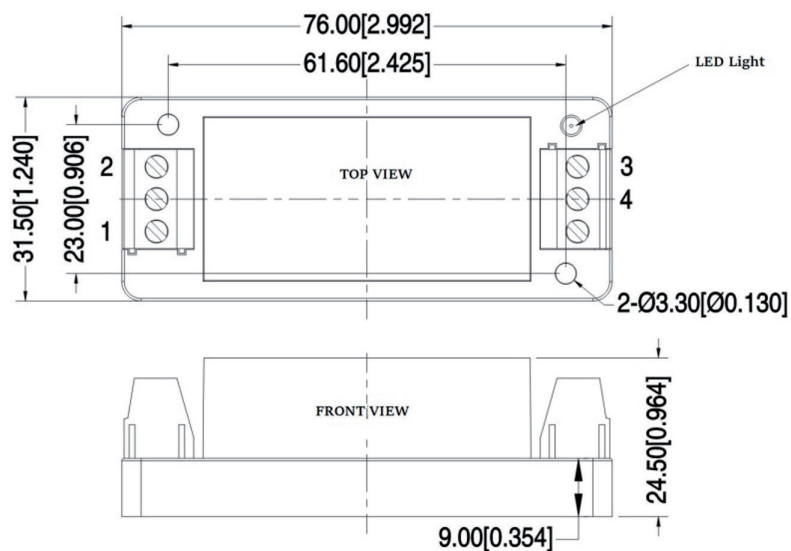
### Standard packing dimensions



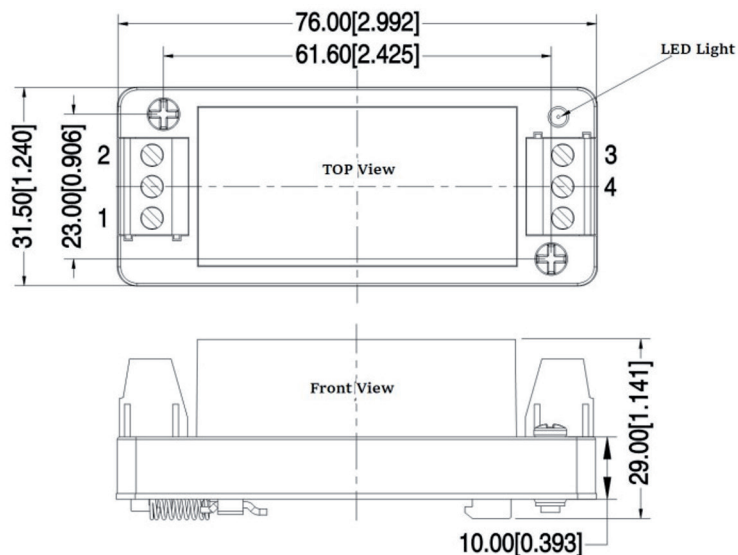
Pin	1	2	3	4
Single	AC (L)	AC (N)	+Vo	-Vo

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

### Chassis mounting packing dimensions

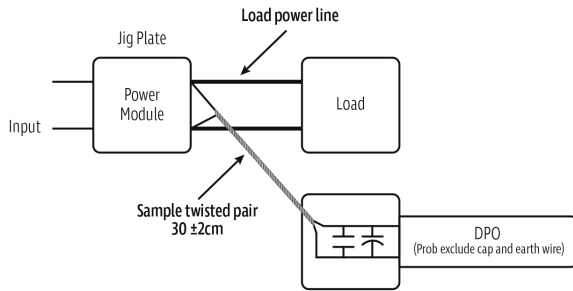


### DIN rail mounting packing dimensions



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

### Twisted pair method (20MHz bandwidth)



#### Test Method:

1. Connect the twisted pair, set the oscilloscope bandwidth to 20MHz, use a 100M bandwidth probe, and terminate with a 0.1uF polypropylene capacitor and a 10uF high-frequency low-resistance electrolytic capacitor in parallel. Configure the oscilloscope to sample mode.

2. Connect the input terminal to the power supply and the output terminal to the electronic load using a jig plate. Use a 30cm ( $\pm 2$  cm) sampling line, and select the power line from appropriately insulated wires of the corresponding diameter according to the output current flow.

## Typical application circuit

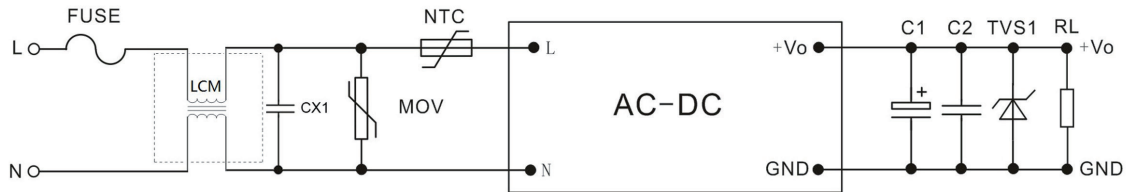


Photo 1

#### Note:

1. FUSE: necessary, suggest 2A~250Vac, slow fusing, block form;
2. MOV is voltage dependent resistor, suggest model: 10D561K;
3. LCM is common mode inductance, recommended value above 30mH; CX1 is X Capacitor, recommended value: 0.22uF/275V;
4. NTC1 is thermistors, suggest model:5D-11, to prevent the module from damage when lightning surge.
5. C1 is high frequency low impedance electrolytic capacitor whose capacitance value less than capacitive load, withstand voltage is above 1.5 times or more of output voltage.
6. C2 is 0.1uF ceramic chip capacitors, withstand voltage is 1.5 times more than output voltage.
7. TVS1 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.