



5ACDE1W_4 series

5W - AC-DC converter

AC-DC Converter

5 Watt

- ⊕ Wide input voltage range: 85-305VAC/120-430VDC
- ⊕ No load power consumption $\leq 0.2W$
- ⊕ Transfer efficiency: 82% (typ.)
- ⊕ Switching frequency: 65kHz
- ⊕ Protections: short-circuit, over-current, over-temperature
- ⊕ Isolation voltage: 4000VAC
- ⊕ Meet CISPR32/EN55032 CLASS B test standard
- ⊕ RoHS compliant
- ⊕ Enclosed plastic case, meets UL94 V-0
- ⊕ PCB Mounting

Introducing our state-of-the-art power supply 5ACDE1W_4 series, meticulously designed to provide exceptional performance and reliability across various applications. With an impressive wide input voltage range of 85-305VAC/120-430VDC, this power supply ensures robust and adaptable operation. Engineered for efficiency, it features a typical transfer efficiency of 82%, minimizing energy waste and maximizing output. The unit operates at a switching frequency of 65kHz, delivering smooth and consistent performance. Stand-by power consumption is remarkably low at $\leq 0.2W$, promoting energy savings and cost efficiency. The series includes comprehensive protections such as short-circuit, over-current, and over-temperature safeguards. The isolation voltage of 4000VAC enhances safety by providing robust isolation. Our power supply meets the stringent CISPR32/EN55032 CLASS B test standard.



Common specifications

Short circuit protection	Full input voltage range - Continuous, self-recovery hiccup
Over current protection	Input 220VAC - $\geq 150\%$ Io self-recovery - hiccup
Over Voltage Protection	Output 5VDC ≤ 7.5 VDC Output 12VDC ≤ 18 VDC Output 15VDC ≤ 20 VDC Output 24VDC ≤ 30 VDC
Switching frequency	61 kHz (min.) 65 kHz (typ.) 73 kHz (max.)
Operating temperature	-40°C - +75°C (with derating)
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
Vibration	10-55Hz, 10G, 30Min, along X, Y, Z
MTBF (MIL-HDBK-217F@25°C)	>300,000 Hours

Input specifications

Item	Operating condition	Min	Typ	Max	Units
Input voltage range	AC input	85	220	305	VAC
	DC input	120	310	430	VDC
Input frequency range		47	50	63	Hz
Input current	115VAC			0.2	A
	230VAC			0.1	A
Surge current	115VAC			16	A
	220VAC			30	A
No-load power consumption	115VAC 230VAC			0.2	W
Leakage current	0.5mA typ./230VAC/50Hz				

Example:

5ACDE1W_05S4

5 = 5Watt; AC = AC-DC; D = Din Rail; E1 = Series; W = Wide input (2:1); 05 = 5Vout; S = Single output; 4 = 4 kVAC isolation

Output specifications

Item	Operating condition	Min	Typ	Max	Units
Voltage accuracy	Full input voltage range, any load		± 2.0	± 4.0	%
	• 3.3V • Other		± 2.0	± 3.0	%
Linear regulation	Nominal Load - Vo			± 0.5	%
Load regulation	Nominal input voltage, 20%~100% load - Vo			± 5.0	%
Minimum Load	Single Output	0			%
Turn-on Delay Time	Input 220VAC (full load)		1000		mS
Power-off holding time	Input 220VAC (full load)		100		mS
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

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			MΩ

- 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 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;
- We can provide customized product service;
- The product specification may be changed at any time without prior notice.

5ACDE1W_4 series

5W - AC-DC converter

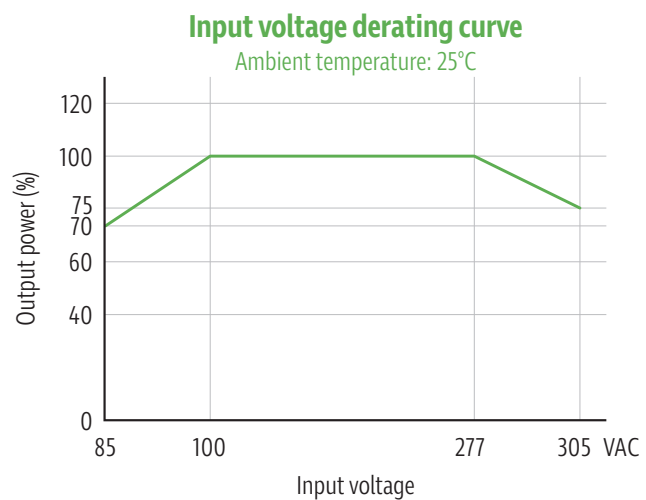
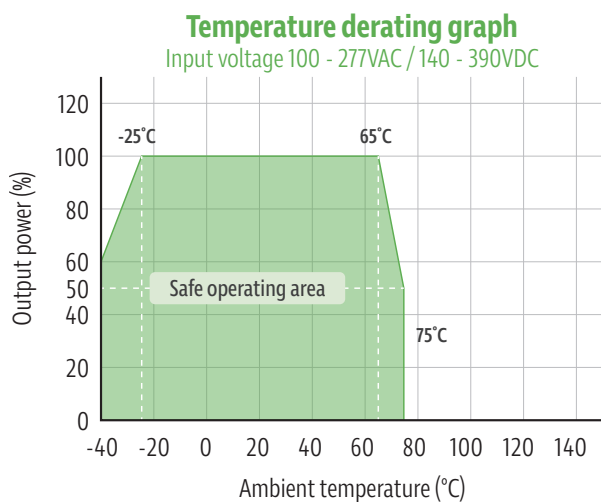
EMC specifications						
EMC	EMI	CE	CISPR22/EN55022	CLASS B (see recommended circuit 1)		
EMC	EMI	RE	CISPR22/EN55022	CLASS B (see recommended circuit 1)		
EMC	EMS	ESD	IEC/EN61000-4-2	±8KV/15KV	Perf.Criteria B	
EMC	EMS	RS	IEC/EN61000-4-3	10V/m	Perf.Criteria A	
EMC	EMS	EFT	IEC/EN61000-4-4 IEC/EN61000-4-4	±1KV IEC/EN61000-4-4 ±2KV (see recommended circuit 1)	Perf.Criteria B Perf.Criteria B	
EMC	EMS	Surge	IEC/EN61000-4-5 IEC/EN61000-4-5	±1KV ±2KV (see recommended circuit 1)	Perf.Criteria B Perf.Criteria B	
EMC	EMS	SC	IEC/EN61000-4-6	10Vr.m.s	Perf.Criteria A	
		PMF	IEC/EN61000-4-8	10A/m	Perf.Criteria A	
EMC	EMS	Voltage sags, dips and short interruptions 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)	Efficiency@ Full Load, 220VAC Typ. (%)
	5ACDE1W_03S4	4.1	3.3	1250	5000	100 (Need peripheral)	73
	5ACDE1W_05S4	5	5	1000	5000	100 (Need peripheral)	76
	5ACDE1W_12S4	5	12	416	4000	150	82
	5ACDE1W_15S4	5	15	333	3000	150	83
	5ACDE1W_24S4	5	24	208	100	200	84

- Note:
1. Due to the instrument error of the test equipment, the minimum efficiency is defined as -2% of the typical value;
 2. The typical value of output efficiency is based on the product after half an hour of full load aging;
 3. The test method for ripple and noise adopts the twisted pair test method. The specific test method and matching can be seen later (Ripple & Noise Test Instructions);
 6. 5ACDE1W_03S4, 5ACDE1W_05S4 need to use peripheral circuits to reduce ripple. The specific peripheral parameters are shown in Figure 2.

Product characteristic curve

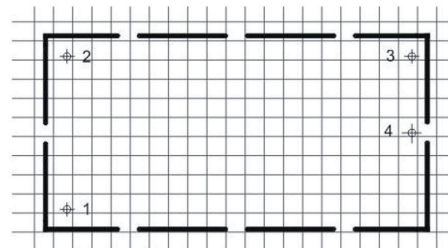
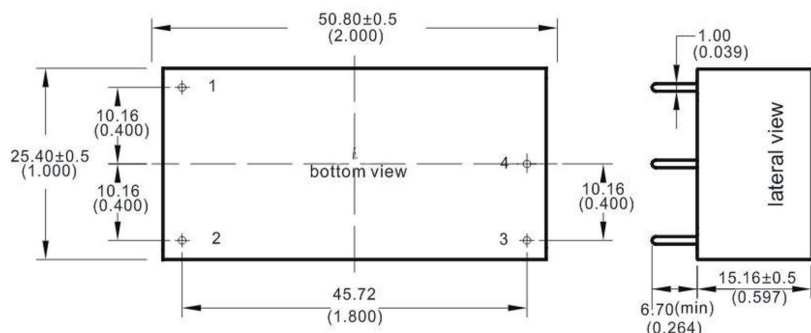


- Note
1. The input voltage is 85~100VAC/277~305VAC/120~140VDC/390~430VDC. The voltage must be derated based on the input voltage derating curve.
 2. Our product is suitable to use under natural air cooling environment, if use it under closed condition, please contact with us.

5ACDE1W_4 series

5W - AC-DC converter

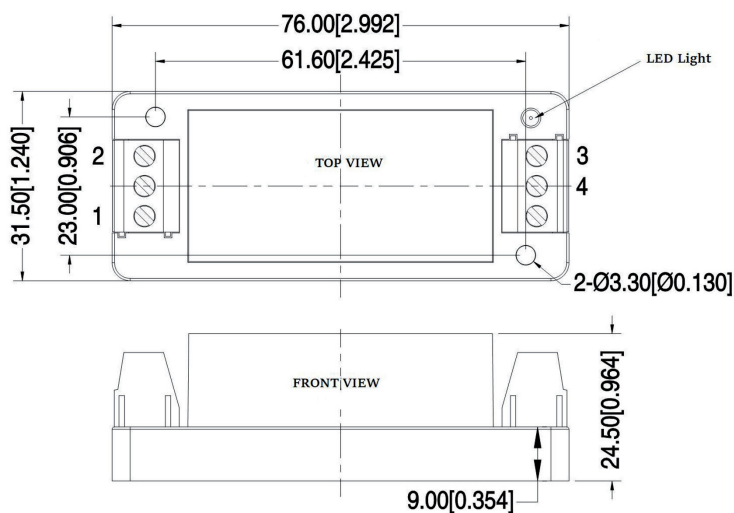
Standard packing dimensions



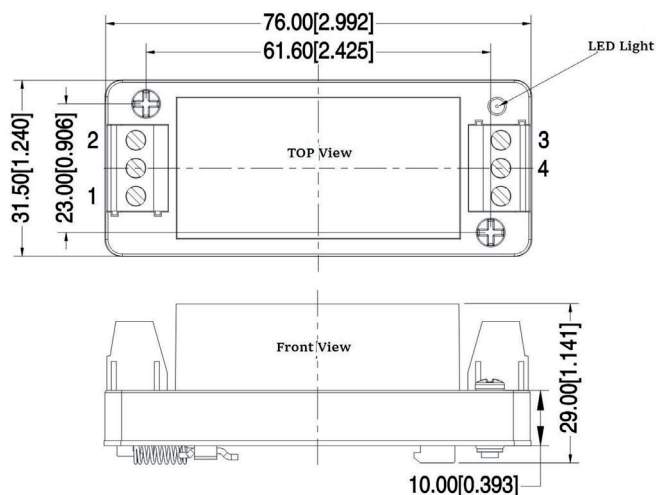
Unit: mm
 Print board vertical view
 Grid: 2.54mm(0.1inch)
 General tolerance: ±0.25mm
 Pin section tolerances: ±0.10mm

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

Chassis mounting packing dimensions

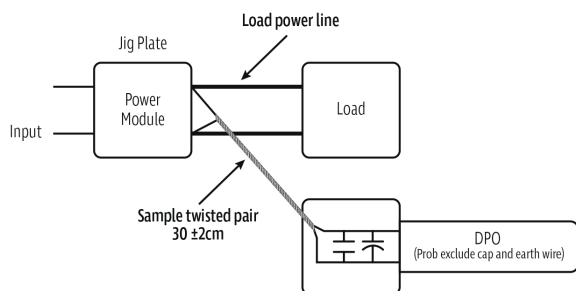


DIN rail mounting packing dimensions



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

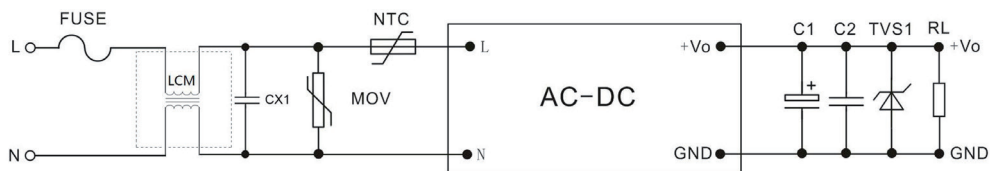
Twisted pair method (20MHz bandwidth)



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 (± 2 cm) sampling line, and select the power line from appropriately insulated wires of the corresponding diameter according to the output current flow.

EMC recommended circuit:



Note:

1. FUSE is a fuse, and it is recommended to use 2A~300VAC slow-break, square type;
2. MOV is a varistor, and the recommended model is 14D561K;
3. NTC is a thermistor, and the recommended model is 10D-11, which is used to protect the module from damage during lightning surges;
4. LMC is a common mode inductor, and the recommended inductance is 40mH; (UU9.8/UU10.5 does not consider conduction and radiation, which can be unnecessary);
5. CX1 is an X capacitor, and the recommended model is 0.1uF/310VAC; (conduction and radiation are not considered, which can be unnecessary);
6. C1 selects a high-frequency low-impedance electrolytic capacitor with a capacitance value less than the capacitive load, and the withstand voltage value is more than 1.5 times the output voltage;
7. C2 selects a 0.1uF ceramic chip capacitor, and the withstand voltage value is more than 1.5 times the output voltage;
8. TVS1 is a TVS tube; 5V output recommended: SMBJ7.0A, 9V output recommended: SMBJ12.0A, 12V output recommended: SMBJ20A, 15V output recommended: SMBJ20.0A, 24V output recommended: SMBJ30.0A, 48V output recommended: SMBJ64A.

Peripheral circuit for reducing ripple

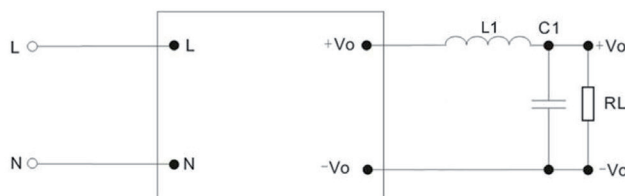


Figure 2

Note:

1. C1 is a solid capacitor, model 220uF/10V;
2. L1 is a rod-type inductor, inductance is 2.2uH, wire diameter is more than 0.4mm.