

5ACE1W_4 series

5W - AC-DC converter



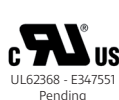
AC-DC Converter

5 Watt

- Wide input voltage range: 85-305VAC/120-430VDC
- No load power consumption $\leq 0.25W$
- Transfer efficiency up to 76% (typ.)
- Switching frequency: 65kHz
- Protections: short circuit and over current
- Isolation voltage: 4000VAC
- Meets IEC62368/UL62368/EN62368 test standard
- Safety class: CLASS II & OVCI
- 4000m altitude application

Introducing our latest 5ACE1W_4 series: featuring a wide input voltage range of 85-305VAC/120-430VDC, this converter is designed for versatility in various applications. With no-load power consumption $\leq 0.25W$ and a typical transfer efficiency of up to 76%, it ensures efficient performance. Operating at a switching frequency of 65KHz, it includes protections against short circuit and over current.

The converter offers robust isolation with a voltage of 4000VAC and meets the IEC62368/UL62368/EN62368 test standards for safety and reliability. Additionally, it is designed for convenient PCB mounting.



Common specifications

Short circuit protection	Full input voltage range - Continuous, self-recovery hiccup
Over current protection	Full input voltage range - $\geq 130\%$ Io self-recovery hiccup
Switching frequency	65 kHz (typ.)
Operating temperature	-40°C - +85°C (with derating)
Storage temperature	-40°C - +105°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	EN62368, IEC62368, UL62368
Vibration	10-55Hz, 10G, 30Min, along X, Y, Z
Safety standard	CLASS II
Class of case material	UL94 V-0
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 220VAC			0.12 0.08	A
Surge current	115VAC 220VAC			15 20	A
Leakage current	0.5mA typ./230VAC/50Hz				
Recommended external Input fuse	2A/250VAC slow fusing				

Example:

5ACE1W_05S4

5 = 5Watt; AC = AC-DC; E1 = Pinning; W = Wide input;
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 - Vo		± 2.0	± 3.0	%
Line regulation	Nominal load - Vo			± 0.5	%
Load regulation	Nominal input voltage, 20%-100% load - Vo			± 1.0	%
No load consumption	Input 115VAC Input 220VAC			0.25	W
Minimum load	Single output	0			%
Start up delay time	Nominal input voltage (full load)		50		mS
Power-off holding time	Input 115VAC (full load) Input 220VAC (full load)		50 100		mS
Dynamic response	Overshoot range 25% ~ 50% ~ 25%	-5.0		+5.0	%
	Recovery time 50% ~ 75% ~ 50%		5.0		mS
Output overshoot	Full input voltage range		$\leq 10\%V_o$		%
Temperature drift			$\pm 0.03\%$		%/°C
Ripple & noise*	Full input voltage range		60	150	mV

Note: *Tested by twisted pair method, please check "Ripple & noise test" at back.

Isolation specifications

Item	Operating Conditions	Min	Typ	Max	Units
Isolation voltage	I/P-O/P - I/P-Case - I/P-FG Test 1min, leakage current $\leq 5\text{mA}$	4000			VAC
Insulation resistance	I/P-O/P @ DC500V	100			MΩ

- The product should be used within the specification range, or it will cause permanent damage to it;
- The input terminal should connect to fuse;
- If the product is worked under the minimum requested load, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
- If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a = 25^\circ\text{C}$, humidity $< 75\%$ with nominal input voltage and rated output 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;
- Specifications are subject to change without prior notice, please follow up with our website for newest manual.

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EMC specifications					
EMC	EMI	CE	CISPR22/EN55032	CLASS B (See Recommended Circuit on photo 1)	
EMC	EMI	RE	CISPR22/EN55032	CLASS B (See Recommended Circuit on photo 1)	
EMC	EMS	RS	IEC/EN61000-4-3	10V/m	Perf.Criteria B (See Recommended Circuit on photo 1)
EMC	EMS	CS	IEC/EN61000-4-6	3Vr.m.s	Perf.Criteria B (See Recommended Circuit on photo 1)
EMC	EMS	ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV	Perf.Criteria B
EMC	EMS	Surge	IEC/EN61000-4-5	line to line ±2KV / line to ground ±4KV	Perf.Criteria B(See Recommend Circuit photo 1)
EMC	EMS	EFT	IEC/EN61000-4-4	±2KV	Perf.Criteria B
EMC	EMS	Voltage dips and variations	IEC/EN61000-4-11	0%~70%	Perf.Criteria B

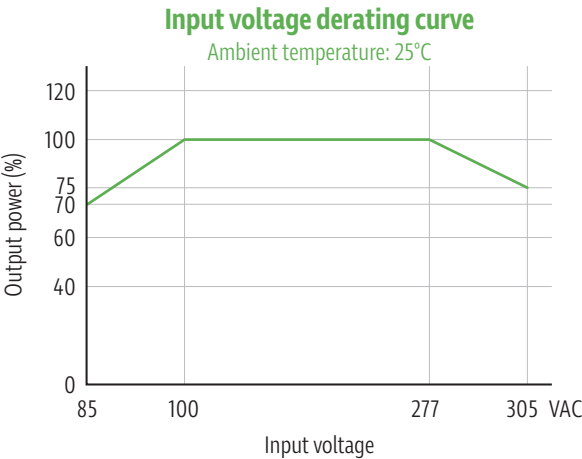
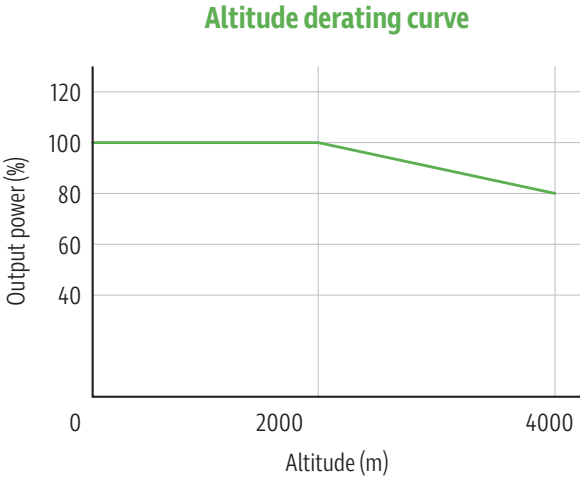
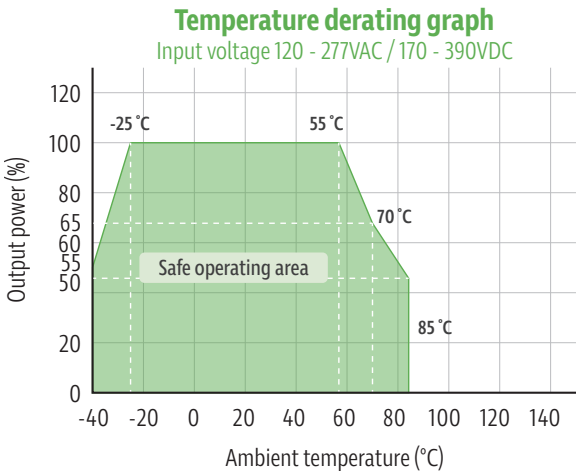
Product Selection Guide

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. (%)
UL	5ACE1W_03S4	3.3	3.3	1000	2000	100	69
UL	5ACE1W_05S4	5	5	1000	2000	100	72
UL	5ACE1W_12S4	5	12	416	800	120	75
UL	5ACE1W_12.5S4	5	12.5	400	800	120	76
UL	5ACE1W_15S4	5	15	333	800	120	76
UL	5ACE1W_24S4	5	24	208	300	150	78

Note:

- 1: The typical value of output efficiency is based on module is full loaded and burned-in after half an hour.
2: The fluctuation range of full load efficiency (%TYP) in table is ±2%, full load efficiency = output power/module's input power.

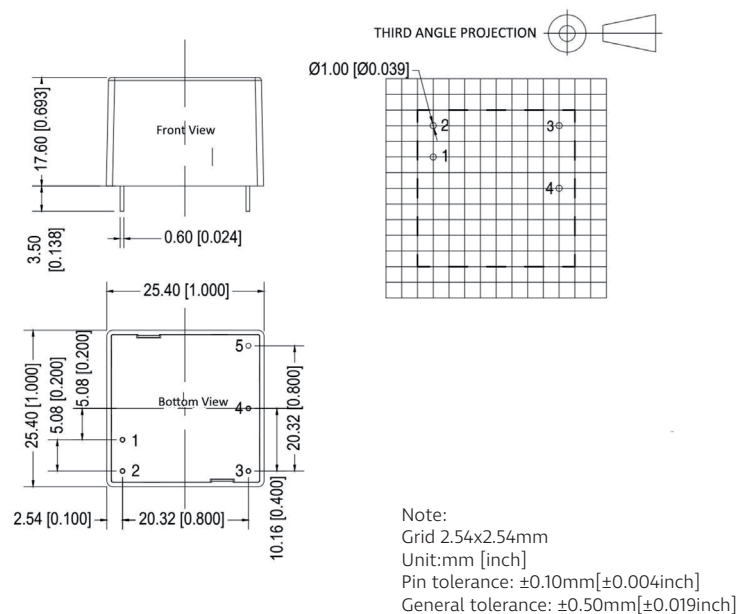
Product characteristic curve



Note:

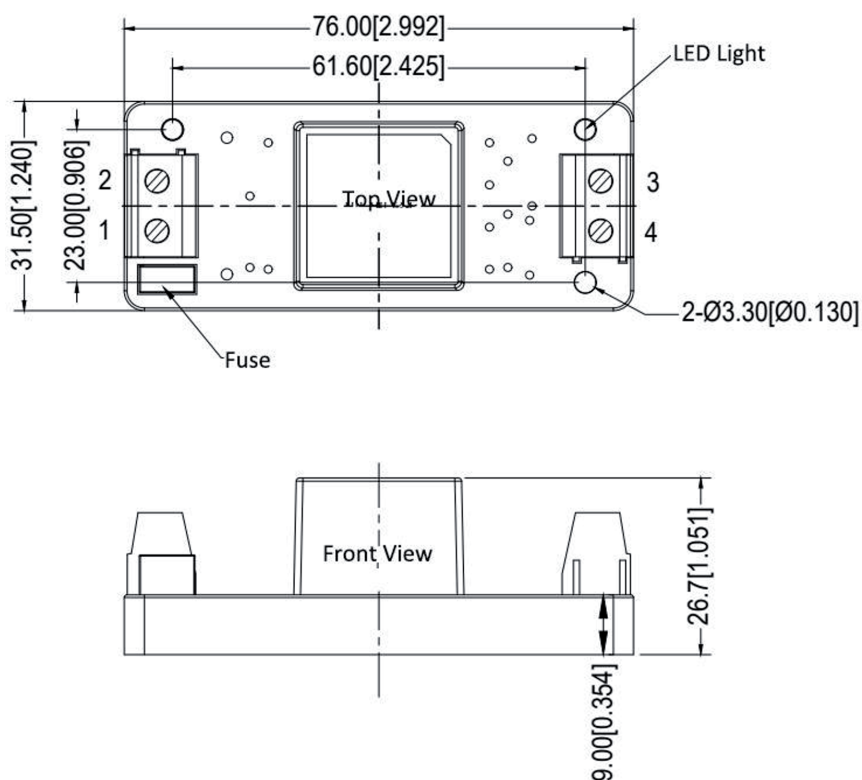
1. Input Voltage should be derated based on Input voltage derating curve when it is 85~120VAC/277~305VAC/120~170VDC/ 390~430VDC.
2. Our product is suitable to use under natural air cooling environment, if use it under closed condition, please contact with us.

Standard package dimensions and recommended layout

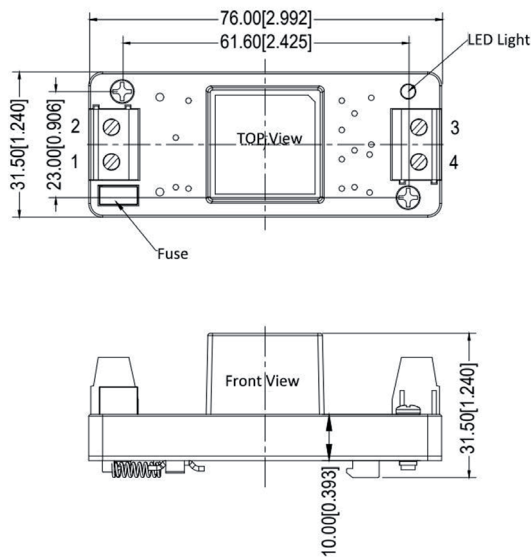


Pin	1	2	3	4	5
Single	AC (L)	AC (N)	+Vo	-Vo	NP

Chassis mounting



DIN rail mounting



EMC solution and recommend circuit

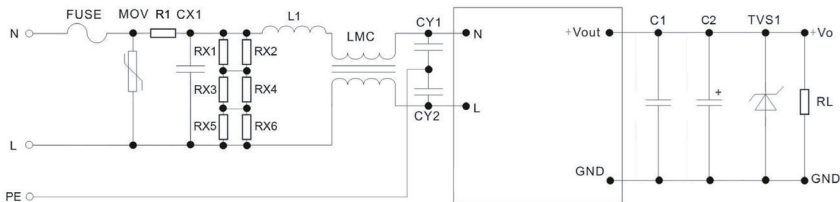


Photo 1

Products Number	FUSE (necessary)	MOV	R1	CX1	RX1, RX2, RX3, RX4, RX5, RX6	L1	LMC	CY1, CY2	C1	C2	TVS1
5ACE1W_03S4	2A/250V (Slowing Fuse)	14D 561K	33Ω/3W (Wire- wound resistor)	334/305VAC	1206,1.5M	1.2mH/0.3A	20mH	1nF/400VAC	1uF/50V	100uF/16V	SMBJ7.0A
5ACE1W_05S4	2A/250V (Slowing Fuse)	14D 561K	33Ω/3W (Wire- wound resistor)	334/305VAC	1206,1.5M	1.2mH/0.3A	20mH	1nF/400VAC	1uF/50V	100uF/16V	SMBJ7.0A
5ACE1W_12S4	2A/250V (Slowing Fuse)	14D 561K	33Ω/3W (Wire- wound resistor)	334/305VAC	1206,1.5M	1.2mH/0.3A	20mH	1nF/400VAC	1uF/50V	68uF/16V	SMBJ20A
5ACE1W_12.5S4	2A/250V (Slowing Fuse)	14D 561K	33Ω/3W (Wire- wound resistor)	334/305VAC	1206,1.5M	1.2mH/0.3A	20mH	1nF/400VAC	1uF/50V	68uF/16V	SMBJ20A
5ACE1W_15S4	2A/250V (Slowing Fuse)	14D 561K	33Ω/3W (Wire- wound resistor)	334/305VAC	1206,1.5M	1.2mH/0.3A	20mH	1nF/400VAC	1uF/50V	68uF/16V	SMBJ20A
5ACE1W_24S4	2A/250V (Slowing Fuse)	14D 561K	33Ω/3W (Wire- wound resistor)	334/305VAC	1206,1.5M	1.2mH/0.3A	20mH	1nF/400VAC	1uF/50V	47uF/35V	SMBJ30A