3ACE1W_4R series

3W - Single Output AC-DC Converter



AC-DC Converter 3 Watt

- Input voltage range: 85-305VAC / 100-430VDC
- DIP package type
- Operating temperature range: -40°C to +85°C
- 4000VAC isolation voltage
- Up to 79% efficiency
- OVC III (meets EN61558-1)
- Input undervoltage protection
- Output short circuit (SCP)
- Over current protection
- MTBF: 2,600,000 hours

Introducing our versatile 3ACE1W_4R series with a wide input voltage range of 85-305VAC/100-430VDC, ensuring reliable performance in diverse applications. With an operating temperature range from -40°C to +85°C and transfer efficiency up to 79%, it operates efficiently even under challenging conditions. It provides robust protections against short circuits and overcurrent events. With an isolation voltage of 4000VAC, it meets stringent IEC62368/UL62368/EN62368 test standards and comes with OVC III. Designed for PCB mounting, this ultra-compact module is ideal for industrial-level applications.

SHORT CIRCUIT PROTECTED

100% RoHS compliant

c UL us
UL62368 - E347551
Pending

Common specifications

Short circuit protection	Continuous, self recovery
Over current protection	110 (typ.) %Io
Over temperature protection	Shut down output voltage; recovers automatically after temperature decreases.
Power derating	-40°C - -25°C 3.0 % / °C +50°C - +70°C, 3.3V/5V 2.25 % / °C +55°C - +70°C, other 3.0 % / °C +70°C - +85°C, 3.3V/5V 1.0 % / °C +70°C - +85°C, other 0.33 % / °C 85VAC - 100VAC 1 % / VAC 277VAC - 305VAC 0.535 % / VAC
Working temperature	-40°C - +85°C (with derating)
Storage temperature	-40°C - +105°C
Storage humidity	95%RH (non-condensing)
Soldering profile	Wave-soldering, 260°C (±5°C); time: 5 - 10s Manual-welding, 360°C (±10°C); time: 3 - 5s
Safety standard	IEC/EN/BS EN62368-1, EN61558-1, EN60335-1; UL62368-1
Safety class	CLASS II
MTBF	>2,600,000 h (MIL-HDBK-217F@25°C)
Hot plug	Unavailable
Case material	Black plastic, flame-retardant and heat-resistant (UL94V-0)
Package dimensions	25.40 x 25.40 x 17.60mm
Weight	23g (typ.)
Cooling method	Free air convection

Input specifications I

Item	Operating condition	Min	Typ	Max	Units
Input voltage	AC Input DC Input	85 100		305 430	VAC VDC
Input current	115VAC 230VAC			0.13 0.06	A
Input frequency		47		63	HZ
Fuse	1A, Slow-blow, required				
Leakage current	230VAC/50Hz	0.3mA RMS max.			

Isolation specifications II

Item	Operating conditions	Min	Typ	Max	Units
Isolation voltage	Input-output, test time 1 minute, leakage current less than 5mA	4000			VAC
Isolation resistance	Input-output, isolated voltage 500VDC	100			MΩ

Output specifications

Item	Operating condition	Min	Typ	Max	Units
Output voltage accuracy	5% - 100%, load 3.3V output 5% - 100%, load other		±3 ±2		%
Linear regulation	Nominal load		±0.5		%
Load regulation	5% - 100% load		±1.0		%
Ripple & noise	20MHz bandwidth, 10% - 100% load		60	120	mV
Temperature drift coefficient			±0.02		%/°C
Stand-by power consumption	230VAC		0.10	0.5	W
Min. load		0			%
Over current protection		110			%Io
Hold-up time	230VAC		50		ms

Note: The test method for ripple and noise adopts the proximity test method, with a 10uF electrolytic capacitor and a 1uF ceramic capacitor connected in parallel at the output.

Example:
3ACE1W_05S4R
3 = 3Watt; AC = AC-DC; E1 = Cost effective; W = Wide input; 05 = 5Vout; S = Single output; 4 = 4kVAC isolation; R = Revised version

1. The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
2. It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
3. The maximum capacitive load is tested within the input voltage range and under full load conditions;
4. Unless otherwise specified, all indicators in this manual are measured at Ta = 25°C, humidity <75% RH, nominal input voltage, and output rated load;
5. All indicator testing methods in this datasheet are based on our company's standards;
6. For specific requirements please contact our technical staff directly;
7. Product specifications are subject to change without prior notice.

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Specifications subject to change without notice.

EMC specifications			
EMI	CE	CISPR32/EN55032 CLASS B	
EMI	RE	CISPR32/EN55032 CLASS B	
EMS	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
EMS	EFT	IEC/EN61000-4-4 ±4KV (EMC Solutions - Recommended Circuits Figure 2)	perf. Criteria B
EMS	Surge	IEC/EN61000-4-5 line to line ±1KV IEC/EN61000-4-5 line to line ±2KV (EMC Solutions - Recommended Circuits Figure 2)	perf. Criteria B perf. Criteria B
EMS	CS	IEC/EN61000-4-6 10Vr.m.s	perf. Criteria A
EMS	ESD	IEC/EN61000-4-2 Contact ±6KV/Air ±8KV	perf. Criteria B

Product Selection Guide

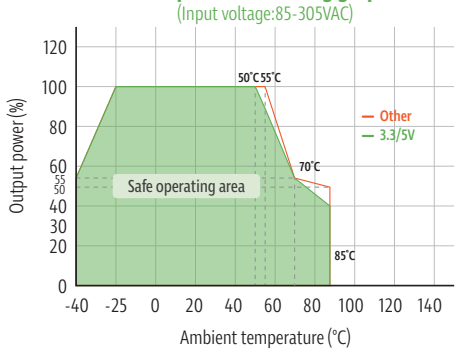
Approval	Part number	Input Voltage (VAC)	Out Power (W)	Out Voltage (VDC)	Out Current (mA) max.	Full Load Efficiency % (typ.)	Capacitive Load (μF) max.
	3ACE1W_03S4R	85-305	3	3.3	900	71	4000
	3ACE1W_05S4R	85-305	3	5	600	75	3000
	3ACE1W_09S4R	85-305	3	9	333	78	1000
	3ACE1W_12S4R	85-305	3	12	250	78	820
	3ACE1W_15S4R	85-305	3	15	200	79	680
	3ACE1W_18S4R	85-305	3	18	167	79	220
	3ACE1W_24S4R	85-305	3	24	125	79	220

Note:

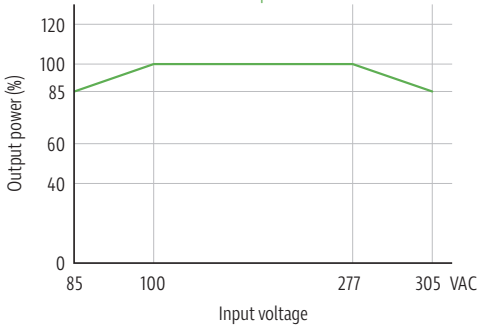
1. All the above data were tested within the parameter range of typical application circuits;
2. Please use suffix /CM for chassis mounting option; please use suffix /DR for DIN rail option (i.e. 3ACE1W_0324S4R/DR).
3. The product images are for reference only. Please refer to the actual product for details.

Typical characteristics

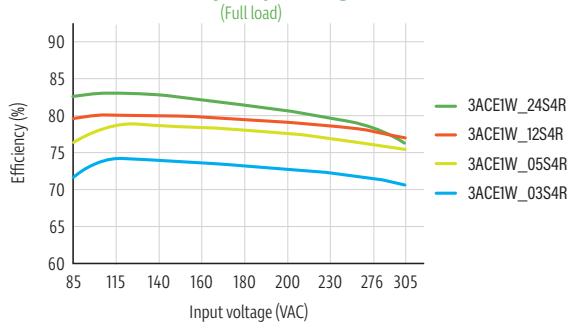
Temperature derating graph
(Input voltage:85-305VAC)



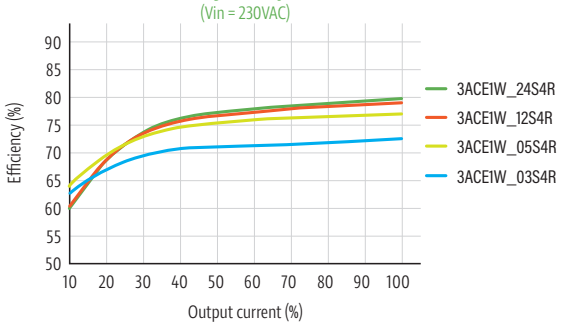
Input voltage derating curve
Ambient temperature: 25°C



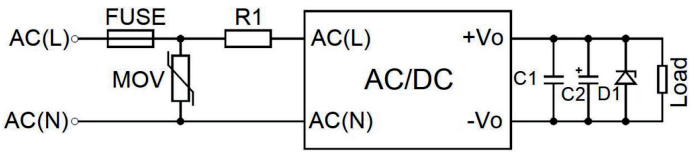
Efficiency vs input voltage
(Full load)



Efficiency vs output load
(Vin = 230VAC)



Application circuit



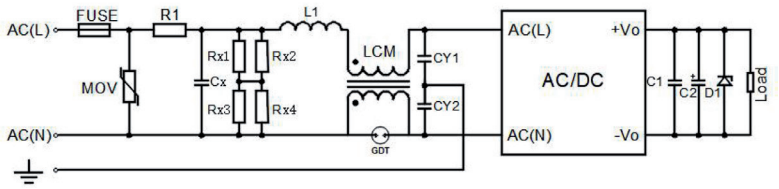
(Figure 1)

Reference Table for Selection of Peripheral Devices

Output voltage	FUSE	MOV	R1	C1	C2	D1
3.3/5VDC	1A/300VAC Slow-blow, Required	10D561K	12Ω/3W (Wire-wound resistor, Required)	1uF/16V	150uF/16V	See Note 2
9/12VDC				1uF/25V	120uF/25V	
15/24VDC				1uF/50V	100uF/35V	

Note:
1. FUSE and Mov Can be selected based on actual needs.
2. D1 is a TVS transistor that can protect the downstream circuit in case of module abnormalities. It is recommended to choose a model that is 1.2 times the output voltage.

EMC Solutions - recommended circuits

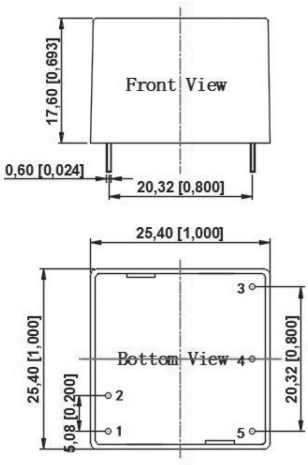


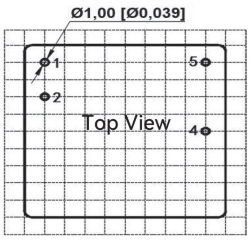
EMC Recommended Circuit (Figure 2)

Recommended parameter values for EMC solution circuits

Model	Recommended value
FUSE	2A/300VAC,Slow-blow, Required
MOV	14D561K
Cx	0.33uF/305VAC
R1	33Ω/5W(Wire-wound resistor, Required)
L1	1.2mH/0.3A
CY1, CY2	1nF/400VAC
LCM	20mH Common mode Choke
Rx1, Rx2, Rx3, Rx4	2MΩ/1206
GDT	300V/1KA

Mechanical dimensions and recommended layout





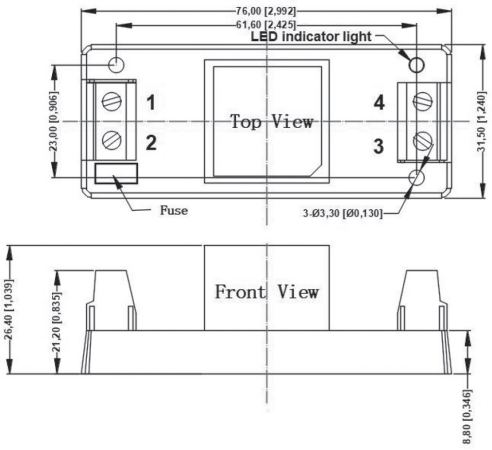
Grid size: 2.54*2.54mm

Pin Function Table

Pin	Function
1	AC (N)
2	AC (L)
3	No Pin
4	-Vo
5	+Vo

Note:
Unit:: mm [inch]
Pin section tolerances: ±0.10 [±0.004]
General tolerances: ±0.50 [±0.020]

Mechanical dimensions and recommended layout - Chassis mounting

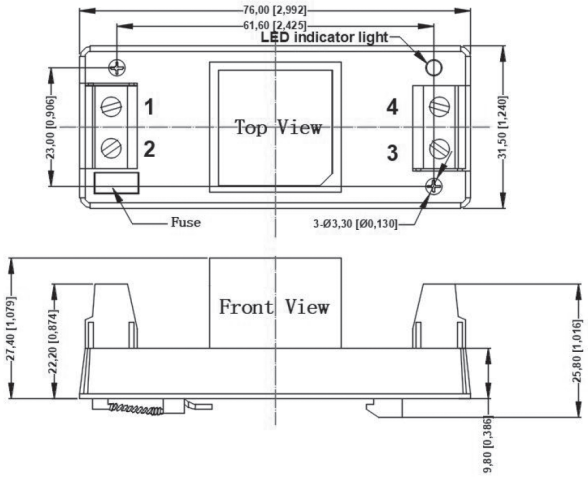


Pin Function Table

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

Note:
Size unit: mm [inch]
Wire diameter: 24-12AWG
Tightening torque: Max 0.4 N ·m
Unmarked tolerance: ±1.00 [±0.039]

Mechanical dimensions and recommended layout - DIN rail



Pin Function Table

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

Note:
Size unit: mm[inch]
Wire diamete r: 24-12AWG
Tightening torque: Max 0.4 N ·m
Mounting rail: TS35, rail needs to connect safety ground
Unmarked tolerance: ±1.00 [±0.039]