



3ACEW_4 series

3Watt - AC-DC converter

AC-DC Converter

3 Watt

- ⊕ Ultra-wide 85-305VAC and 100-430VDC input voltage range
- ⊕ 1x1 inch compact size
- ⊕ Operating ambient temperature range: -40°C to +85°C
- ⊕ Up to 79% efficiency
- ⊕ No-load power consumption 0.1W
- ⊕ 5000m altitude application
- ⊕ Plastic case meets UL94V-0 flammability
- ⊕ EMI performance meets CISPR32/EN55032 CLASS B, EN55014

3ACEW_4 series AC-DC converter is one of GAPTEC's compact size power converters. It features ultra-wide AC input and at the same time accepts DC input voltage, low power consumption, high efficiency, high reliability, reinforced isolation. It offers good EMC performance compliant to IEC/EN61000-4 and CISPR32/EN55032 and meets UL/EN/IEC62368, EN60335, EN61558 standards. The converters are widely used in industrial, power, home appliances, instrumentation, communication and civil applications. For extremely harsh EMC environment.



UL-62368-1 (E347551)

Common specifications	
Short circuit protection:	Hiccup, continuous, self-recovery
Cooling:	Free air convection
Operation temperature range:	-40°C to +85°C
Storage temperature range:	-40°C to +105°C
Storage humidity range:	< 95%
Power derating:	+70°C to +85°C: 3.3V 1.67%/°C MIN +70°C to +85°C: Others 1.33%/VAC MIN 277VAC - 305VAC: 1.33%/VAC MIN
Altitude	5000m
Safety standard:	IEC/EN/UL62368, IEC/EN60335, IEC/EN61558
Safety-regulated certification:	IEC/EN/UL62368/EN60335/EN61558
Safety class:	Class II
Hot plug:	Unavailable
Case material:	Black plastic, flame-retardant and heat-resistant (UL94V-0)
Dimension	26.40x14.73x11.00mm
MTBF (MIL-HDBK-217F@25°C):	> 2799,000 h
Designed Life	230VAC: Ta: 25°C 100% load >150x10 ³ h 230VAC: Ta: 70°C 100% load >27x10 ³ h

Output specifications					
Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy*	3.3V output others		±3 ±2		%
Line regulation	Full load		±0.5		%
Load regulation	10% - 100% load		±1		%
Temperature drift	100% full load		±0.15		%/°C
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)		50	100	mV
Stand-by Power Consumption	230VAC		0.1		W
Temperature Coefficient			±0.02		
Over-current Protection	≥200%Io, self-recovery				
Over-voltage Protection	3.3/5VDC output 9VDC output 12VDC output 15VDC output 24VDC output			≤7.5VDC ≤15VDC ≤16VDC ≤20VDC ≤30VDC	
Min. load		0			%
Hold-up Time	115VAC input 230VAC input		5 50		ms

Note: *The "Tip and barrel method" is used for ripple and noise test, output parallel 10uF electrolytic capacitor and 1uF ceramic capacitor, please refer to AC-DC Converter Application Notes for specific information.

Example:
3ACEW_03S4
5 = 3Watt; AC = AC-DC; E = case style; W = wide input
03 = 3.3Vout; S = single output; 3 = 3 kVAC isolation

Note:

1. 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;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta = 25°C, humidity <75% with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on our company corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

Input specifications					
Item	Test condition	Min	Typ	Max	Units
Input voltage range	• AC Input • DC Input	85 100		305 430	VAC VDC
Input frequency		47		63	Hz
Input current	• 115VAC • 230VAC			0.08 0.06	A A
Inrush current	• 115VAC • 230VAC		15 25		A A
Leakage Current	277VAC/50Hz		0.25mA RMS Max.		
Recommended External Input Fuse	1A, slow-blow, required (The actual use needs to be selected according to the application environment)				

Isolation specifications					
Item	Test condition	Min	Typ	Max	Units
Isolation (Input-Output)	Electric Strength Test for 1min, leakage current <5mA	4000			VAC

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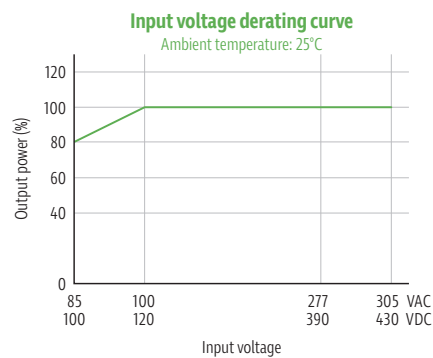
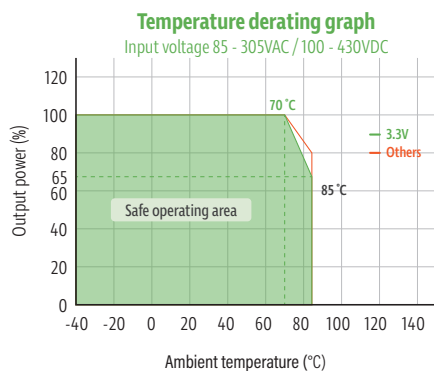
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Approval	Model	Power [W]	Output [Vo]	Output [Io]	Efficiency [%, typ]	Capacitive load [μ F, max]
UL	3ACEW_03S4	3.3	3.3V	900mA	71	4000
UL	3ACEW_05S4	3.3	5V	600mA	75	3000
UL	3ACEW_09S4	3.3	9V	333mA	77	1200
UL	3ACEW_12S4	3.3	12V	250mA	77	1200
UL	3ACEW_15S4	3.3	15V	200mA	78	680
UL	3ACEW_24S4	3.3	24V	125mA	78	220

Note: * Use suffix "/CM" for chassis and suffix "/DR" for DIN-Rail mounting.

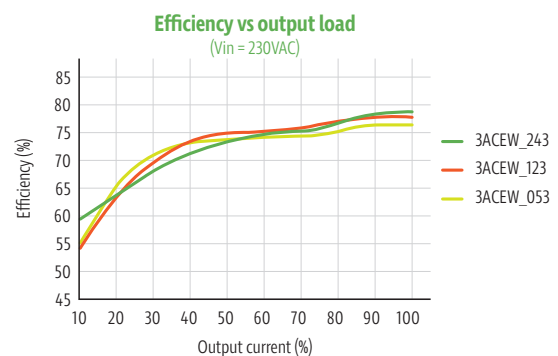
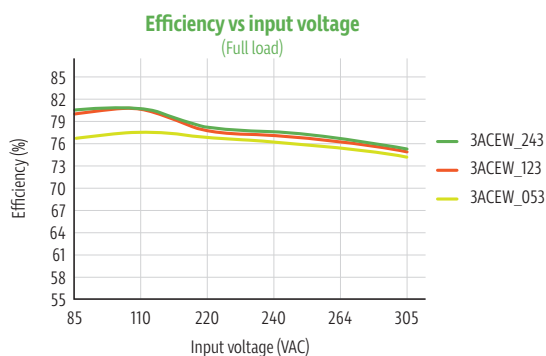
EMC specifications			
Emissions	CE	CISPR32/EN55032 CLASS B EN55014-1	
Emissions	RE	CISPR32/EN55032 CLASS B EN55014-1	
Immunity	ESD	IEC/EN 61000-4-2 EN55014-2	Contact ± 6 KV/Air ± 8 KV perf. Criteria B perf. Criteria B
Immunity	RS	IEC/EN 61000-4-3 EN55014-2	10V/m perf. Criteria A perf. Criteria B
Immunity	EFT	IEC/EN61000-4-4 ± 2 KV (See Fig.1 for typical application circuit) IEC/EN61000-4-4 ± 4 KV (See Fig.2 for recommended circuit) EN55014-2 perf. Criteria B perf. Criteria B	
Immunity	Surge	IEC/EN61000-4-5 line to line ± 1 KV (See Fig.1 for typical application circuit) IEC/EN61000-4-5 line to line ± 2 KV (See Fig.2 for recommended circuit) EN55014-2 perf. Criteria B perf. Criteria B perf. Criteria B	
Immunity	CS	IEC/EN 61000-4-6 EN55014-2	10 Vr.m.s perf. Criteria A perf. Criteria A
Immunity	Voltage dip, short interruption and voltage variation	IEC/EN 61000-4-11 EN55014-2	0%-70% perf. Criteria B perf. Criteria B

Product Characteristic Curve



- ① With an AC input between 85-100V/ a DC input between 100-120VDC, the output power must be derated as per temperature derating curves;
- ② This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.

Efficiency



Typical application circuit

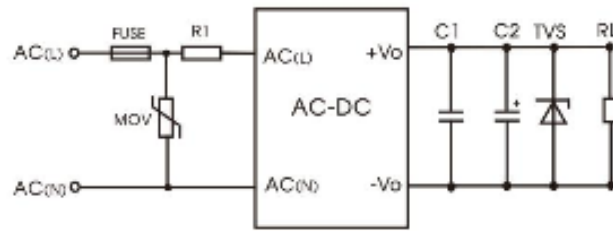


Fig.1: Typical circuit diagram

Model	C1(μF)	C2(μF)	FUSE	R1	TVS	MOV
3ACEW_034	1	150	1A/300V, slow-blow, required	12Ω/3W	SMBJ7.0A	S10K350
3ACEW_054		150			SMBJ7.0A	
3ACEW_094		120			SMBJ12A	
3ACEW_124		120			SMBJ20A	
3ACEW_154		120			SMBJ20A	
3ACEW_244		68			SMBJ30A	

Output Filter Components:

We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2 (refer to manufacture's datasheet). Choose a Capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C1 is a ceramic capacitor used for filtering high-frequency noise and TVS is a recommended suppressor diode to protect the application in case of a converter failure.

EMC recommended circuit

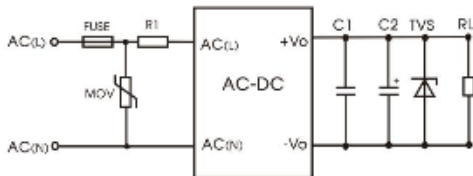
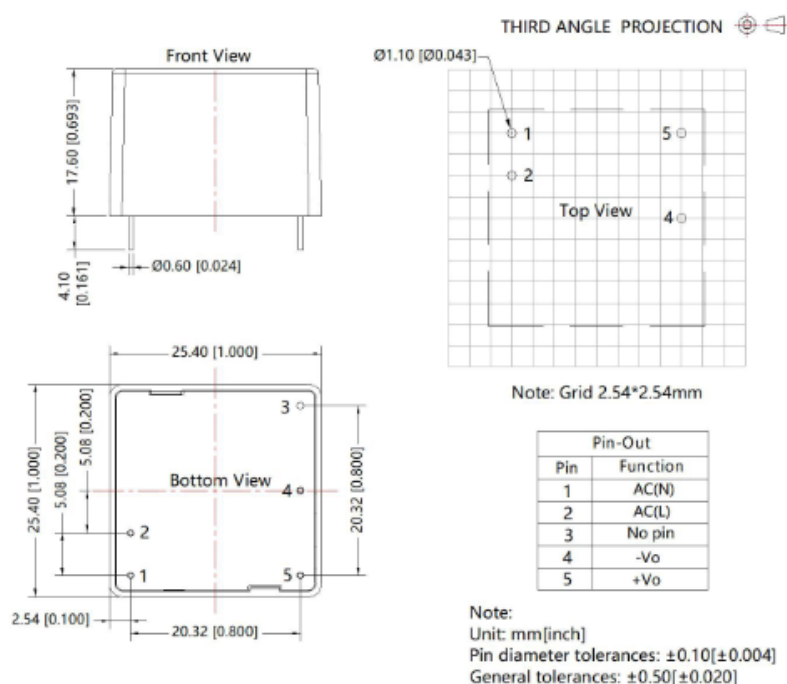


Fig 2: EMC application circuit with higher requirements

Component	Recommended value
MOV	S14K350
R1	33Ω/3W
FUSE	2A/300V, slow-blow, required

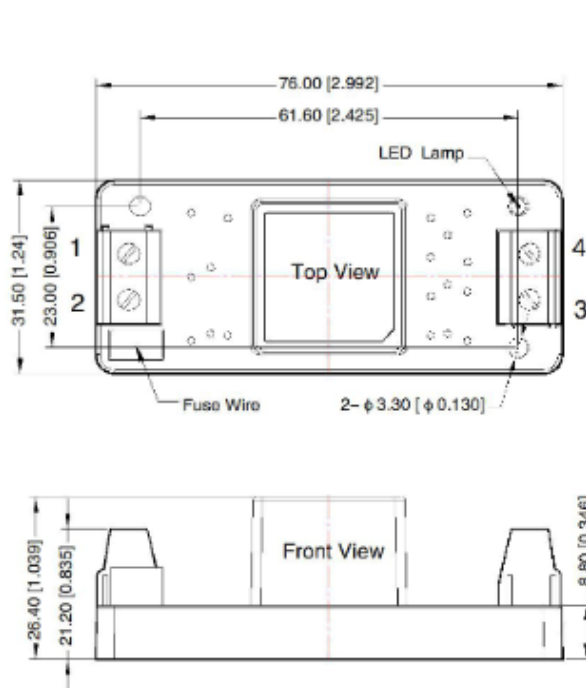
Dimensions and Recommended Layout



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Chassis mounting

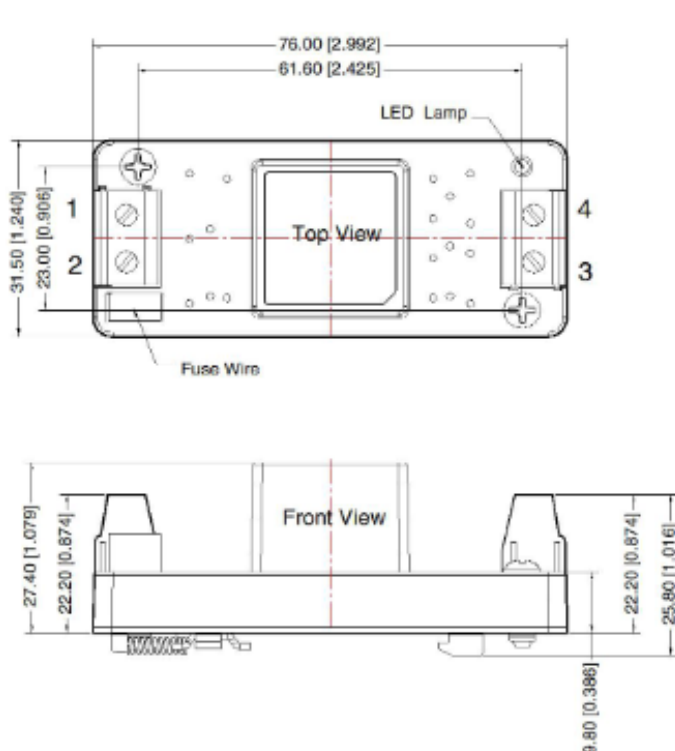


THIRD ANGLE PROJECTION

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

Note:
 Unit: mm[inch]
 Wire range: 24-12 AWG
 Tightening torque: Max 0.4 N·m
 General tolerances: $\pm 1.00 [\pm 0.039]$

DIN rail mounting



THIRD ANGLE PROJECTION

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

Note:
 Unit: mm[inch]
 Wire range: 24-12 AWG
 Tightening torque: Max 0.4 N·m
 Mounting rail: TS35, rail needs to connect safety ground
 General tolerances: $\pm 1.00 [\pm 0.039]$