

## 10ACBEW\_4 series

10Watt - AC-DC converter

### AC-DC Converter

10 Watt

- ⊕ Universal 85-305VAC or 100-430VDC input voltage
- ⊕ Operating ambient temperature range: -40°C to +85°C
- ⊕ High I/O isolation test voltage up to 4200VAC
- ⊕ Up to 82% efficiency
- ⊕ Output short circuit, over-current, over-voltage protection
- ⊕ 5000m altitude application
- ⊕ Plastic case meets UL94V-0 flammability
- ⊕ Meets Emissions CLASS B and surge  $\pm 2KV/\pm 4KV$  without additional circuits
- ⊕ Over-voltage category OVCIII (meet IEC62477-1) (2000m altitude)

The 10ACBEW\_4 AC-DC converters are highly efficient, environmental-friendly 10W power modules. It features universal 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 IEC/EN/UL62368 standards. The converters are widely used in industrial, power and office applications. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.



#### Common specifications

Item	Operating condition	Min	Typ	Max	Units
Short circuit-protection:		Hiccup, continuous, self-recovery			
Cooling:		Free air convection			
Operating temperature:		-40	85		°C
Storage Temperature		-40	105		°C
Soldering temperature:	Wave-soldering Manual-welding	260 $\pm$ 5°C; time: 5 - 10s 360 $\pm$ 10°C; time: 3 - 5s			
Storage humidity:			95		%RH
Power derating:	-40°C to -25°C	2.67			%/°C
	+55°C to +70°C	2.67			%/°C
	+70°C to +85°C	1.33			%/°C
	85VAC - 100VAC	1.67			%/°VAC
	277VAC-305VAC	0.71			%/°VAC
Safety standard:		IEC62368/EN62368/UL62368			
Safety Certification:		EN62368			
Safety Class:		Class II			
MTBF:		MIL-HDBK-217F@25°C >500,000 h			
Hot plug:		Unavailable			
Case material:		Black flame-retardant and heat-resistant plastic (UL94V-0)			
Designed Life: (230VAC)	Ta: 25°C 100% load	>130x10 <sup>3</sup> h			
	Ta: 55°C 100% load	>20x10 <sup>3</sup> h			
	Ta: 55°C 80% load	>27x10 <sup>3</sup> h			
Dimension	Horizontal package	55.00 x 45.00 x 21.00 mm			
	Chassis mounting	96.10 x 54.00 x 29.50 mm			
	DIN rail mounting	96.10 x 54.00 x 34.10 mm			
Weight: (Horizontal package)		75			g
Weight: (Chassis mounting)		125			g
Weight: (DIN rail mounting)		165			g

#### Isolation specifications

Item	Operating Conditions	Min	Typ	Max	
Isolation (Input-Output)	Electric Strength Test for 1min., leakage current <5mA	4200			VAC

#### Example:

##### 10ACBEW\_03S4

10 = 10Watt; AC = AC-DC; B = Pinning; E = case style ; W = wide input  
03 = 3.3Vout; S = Single output; 4 = 4 kVAC isolation

#### Input specifications

Item	Operating condition	Min	Typ	Max	Units
Input voltage range	• AC Input	85		305	VAC
	• DC Input	100		430	VDC
Input frequency		47		63	Hz
Input current	• 115VAC			0.26	A
	• 230VAC			0.16	A
Inrush current	• 115VAC		13		A
	• 230VAC		23		A
Leakage Current	305VAC/50Hz		0.25mA RMS Max.		
Recommended External Input Fuse	2A/300V, slow-blow, required				

#### Output specifications

Item	Operating condition	Min	Typ	Max	Units
Output voltage accuracy	All load range				
	3.3V Output		$\pm 3$		%
	Others		$\pm 2$		%
Line regulation	Rated load		$\pm 0.5$		%
Load regulation	0% - 100% load		$\pm 1$		%
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)		50	100	mV
Stand-by Power Consumption	24V Output			0.5	W
	Others			0.45	W
Temperature Coefficient			$\pm 0.02$		
Over-current Protection			$\geq 150\%$ Io, self-recovery		
Over-voltage Protection	3.3/5VDC output			7.5	
	9VDC output			15	
	12/15VDC output			20	
	24VDC output			30	
Min. load		0			%
Hold-up Time	115VAC input		8		ms
	230VAC input		65		ms

#### Note:

1. 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;
2. All index testing methods in this datasheet are based on our company corporate standards;
3. We can provide product customization service, please contact our technicians directly for specific information;
4. Products are related to laws and regulations: see "Features" and "EMC";
5. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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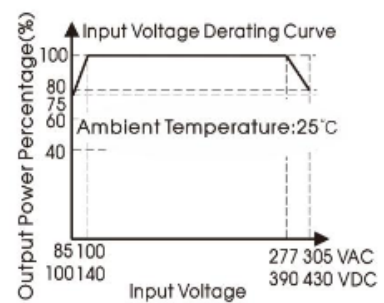
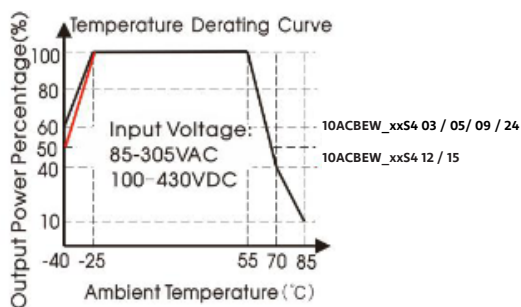
EMC specifications				
Emissions	CE	CISPR32/EN55032 CLASS B		
Emissions	RE	CISPR32/EN55032 CLASS B		
Immunity	ESD	IEC/EN 61000-4-2	Contact ±8KV/Air ±15KV	perf. Criteria B
Immunity	RS	IEC/EN 61000-4-3	10V/m	perf. Criteria A
Immunity	EFT	IEC/EN61000-4-4 ±4KV (See Fig.2 for recommended circuit)		perf. Criteria B
Immunity	Surge	IEC/EN61000-4-5	line to line ±2KV/ line to ground ±2KV	perf. Criteria B
		IEC/EN61000-4-5	line to line±4KV/ line to ground ±4KV (See Fig. 2 for recommended circuit)	perf. Criteria B
Immunity	CS	IEC/EN 61000-4-6	10 Vr.m.s	perf. Criteria A
Immunity	Voltage dips, short interruptions and voltage variations immunity	IEC/EN 61000-4-11	0%-70%	perf. Criteria B

## Product Selection Guide

Approval	Model	Power [W]	Output [Vo]	Output [Io]	Efficiency [%, typ]	Capacitive load [μF, max]
UL	10ACBEW_03S4	6.6	3.3V	2000mA	70	26000
UL	10ACBEW_05S4	10	5V	2000mA	76	9800
UL	10ACBEW_09S4	10	9V	1100mA	78	3600
UL	10ACBEW_12S4	10	12V	900mA	80	2400
UL	10ACBEW_15S4	10	15V	700mA	81	1200
UL	10ACBEW_24S4	10	24V	450mA	82	400

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

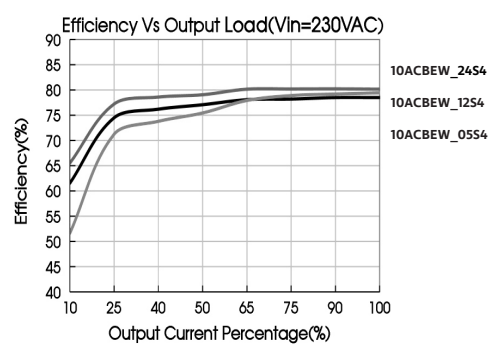
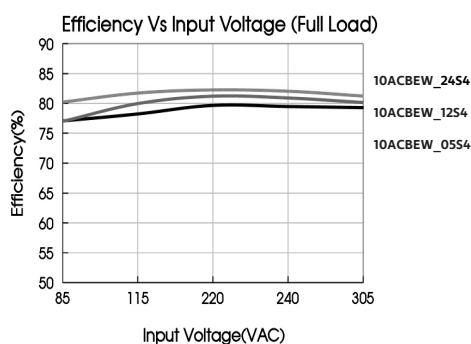
## Product Characteristic Curve



**Note:**

- ① With an AC input between 85 - 100VAC/277 - 305VAC and a DC input between 100 - 140VDC/390 - 430VDC, 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 one of our FAE.

## Efficiency



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## Typical application

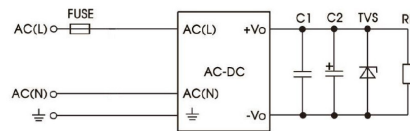


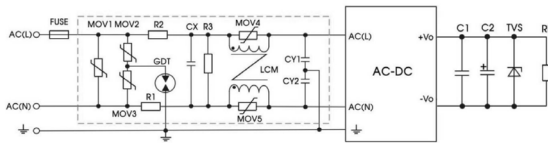
Fig. 1: Typical circuit diagram

Part No.	C1 (μF)	C2 (μF)	FUSE	MOV	TVS
10ACBEW_03S4	1	470	2A/300V, slow-blow, required	S14K350	SMBJ7.0A
10ACBEW_05S4		330			SMBJ7.0A
10ACBEW_09S4		120			SMBJ12A
10ACBEW_12S4		120			SMBJ20A
10ACBEW_15S4		120			SMBJ20A
10ACBEW_24S4		68			SMBJ30A

### Output Filter Components:

We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2 (refer to manufacturer'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.

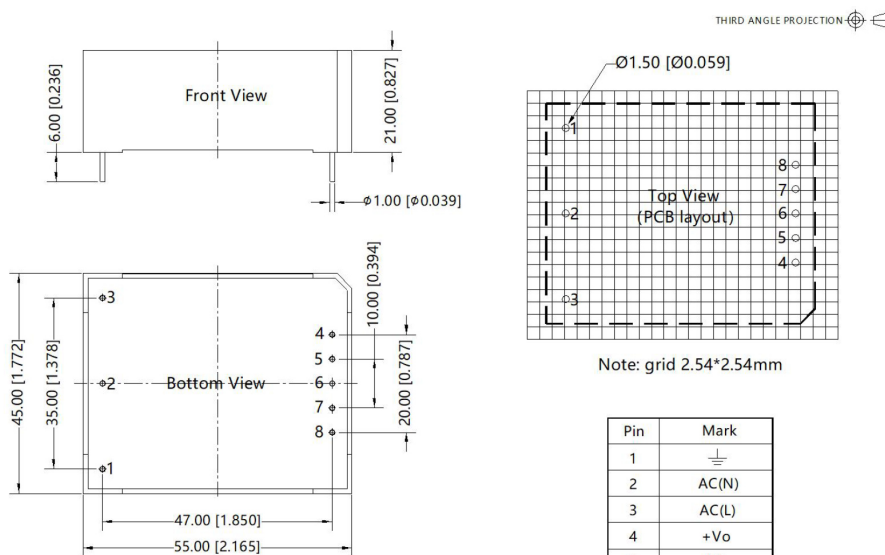
## EMC compliance recommended circuit



Component	Recommended value	Component	Recommended value
MOV1	S20K350	CY1/CY2	2200pF/400VAC
MOV2/MOV3	S14K350	GDT	B 5G3600
MOV4/MOV5	S07K350	R3	1MΩ/2W (wire-wound resistor, required)
CX	0.15μF/310VAC	FUSE	2A/300V, slow-blow, required
R1/R2	2Ω /3W (wire-wound resistor, required)		
LCM	10mH		

Note: R3 (required) can also be replaced by 4 pieces of 1.5MΩ /1206 patch resistors in series and parallel.

## Dimensions and Recommended Layout



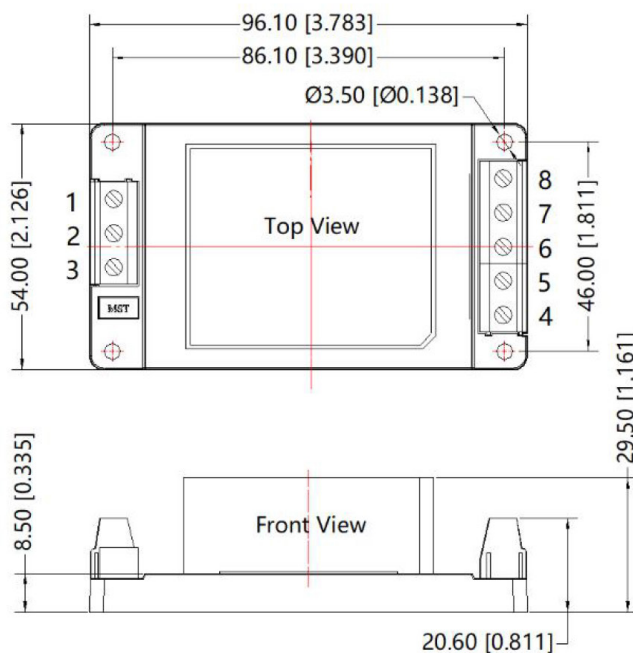
Note:  
Unit: mm[inch]  
Pin diameter tolerances: ±0.10[±0.004]  
General tolerances: ±0.50[±0.020]

Pin	Mark
1	⊥
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	NC
7	NC
8	-Vo

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## Chassis mounting

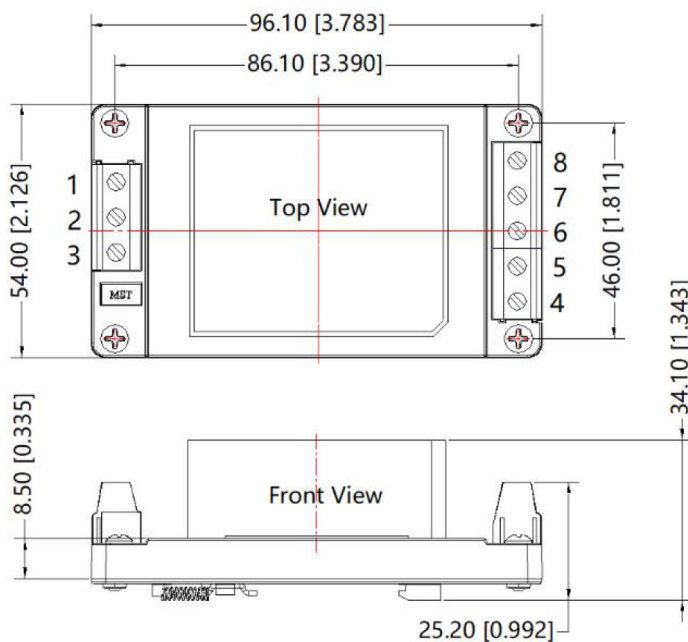


THIRD ANGLE PROJECTION

Pin	Mark
1	
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	NC
7	NC
8	-Vo

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

## DIN rail mounting



THIRD ANGLE PROJECTION

Pin	Mark
1	
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	NC
7	NC
8	-Vo

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