

10W, AC/DC Power Converter

SAP10D

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Introduction

SAP10D series are compact size AC/DC power converters, featuring universal input voltage range, low stand by power consumption, high efficiency. Designed for high reliability industrial applications, these converters are encapsulated to protect from dust and moisture. They meet IEC/EN/UL62368-1, OVC III, EN60335-1, EN61558-1, FCC, UKCA and EMC performance meets CISPR32, EN55032 Class B without support from any external components, ideally suitable for industrial, and critical commercial applications.

Features

- Rated power: 10W Max
- Universal input: 85~305VAC, 47~63Hz
- Regulated single output
- Isolation voltage 4000VAC
- Typical efficiency 74 ... 85%
- Energy saving, standby power only about 0.1W
- Operating temperature range: -40~+85°C
- RoHS compliance
- Compact DIP package
- Over current and short circuit protection
- *Meet IEC/EN/UL62368-1, OVC III, EN60335, EN61558, CISPR32, EN55032 Class B with NO externals
- 3 year warranty

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Part numbers

Model Number	Input Voltage (VAC)	Output Voltage (VDC)	Output Current (mA) Max	Efficiency (%) Typ.	Capacitive Load (uF) Max.
SAP10D033	85~305VAC 100~430VDC	3.3	2600	74	3000
SAP10D050		5	2000	79	3000
SAP10D090		9	1100	81	1000
SAP10D120		12	830	84	820
SAP10D150		15	660	84	680
SAP10D240		24	410	85	220

* Only typical models are listed, other models may be available, upon request.

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Electrical characteristics

Unless otherwise indicated, specifications are measured at TA=25°C, humidity <75%, nominal input voltage and rated output load.

Parameter	Condition	Min.	Type	Max.	Unit	Notes
Input Voltage Range	AC in	85	-	305	VAC	
	DC in	100		430	VDC	
Input Frequency		47	-	63	Hz	
Nominal Input Voltage		100	-	277	VAC	
Input current	115VAC	-	-	0.23	A	
	230VAC			0.15		
Inrush current Cold start	115VAC	-	25	-	A	
	230VAC		40			
Leakage current	230VAC, 50Hz	-	-	0.1	mA RMS	
Output voltage accuracy		-	±2	-	%	
Line regulation	Full load	-	±0.5	-	%	
Load regulation IOUT=0%~100% of IOUT, rated		-	±1.0	-	%	
Ripple and noise 20MHz band- width, peak to peak		-	50	150	mV	
Temperature coefficient		-	±0.02	-	%/°C	
Standby power consumption		-	0.10	-	W	
Hold up time Full load	115VAC	-	10	-	mS	
	230VAC		40			

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Over voltage protection Hiccup or clamping by Zener diode	Automatic recovery	110	-	-	% I _{OUT}	
Over current protection	Automatic recovery	110	-	-	% I _{OUT}	
Short circuit protection		Continuous, hiccup mode, automatic recovery				
Recommended external fuse		2A, 300V slow blow *required*				
Minimum load		No minimum load is required				

* Ripple and noise measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 1uF ceramic capacitor and a 10uF electrolytic capacitor in parallel.

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General Specifications

Parameters	Condition	Min.	Typ.	Max.	Unit
Isolation voltage 1 minute, leakage current 5mA max	I/P to O/P	4000	-	-	VAC
Isolation resistance 500VDC, 25°C, 70%RH	I/P to O/P	100	-	-	M Ohm
Switching frequency		-	65	-	KHz
Operating temperature range	See "Derating Curve"	-40	-	85	°C
Storage temperature		-40	-	85	°C
Storage humidity		10	-	95	%RH
Operating altitude	See "Derating Curve"	-	-	5000	m
Soldering temperature	5 seconds	-	260	-	°C
Case material		Black plastic UL94-V0			
Cooling method		Free air convection			
Class II power		Yes, no FG			
Vibration		10Hz to 55Hz, 10G, 30 minutes along X, Y and Z axis			
MTBF	MIL-HDBK-217F	> 1,000,000 Hours, 25°C			

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Design based on standards		RoHS & REACH directives, IEC/EN/UL 62368-1, OVC III, EN 60335-1, EN 61558-1, UKCA
Safety certifications		IEC/EN62368
EMC	CE	CISPR32, EN55032 Class B
(1) With External Circuit as shown in "Figure 1"	ESD	IEC/EN61000-4-2, Contact $\pm 6\text{kV}$, Air $\pm 8\text{kV}$, Criteria B
	RS	IEC/EN61000-4-3, 10V/m , Criteria A
	EFT	IEC/EN61000-4-4, $\pm 2\text{kV}$, Criteria B
	EFT	IEC/EN61000-4-4, $\pm 4\text{kV}$, Criteria B, (2)
	Surge	IEC/EN61000-4-5, Line to Line $\pm 1\text{kV}$, Criteria B
	Surge	IEC/EN61000-4-5, Line to Line $\pm 2\text{kV}$, Criteria B, (2)
	CS	IEC/EN61000-4-6, 10Vrms , Criteria A
	DIP	IEC/EN61000-4-11, 0%, 70%, Criteria A
Size, and Weight		40x25.4x21mm, 40g

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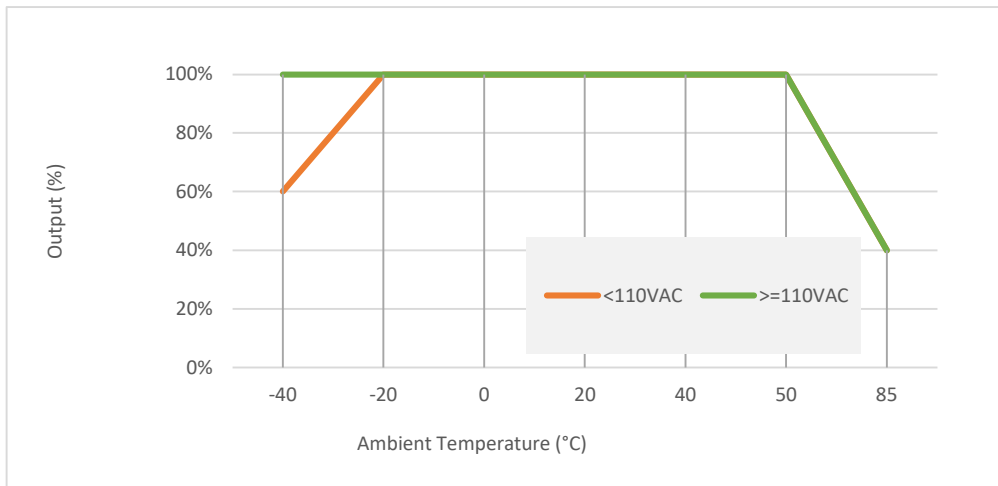
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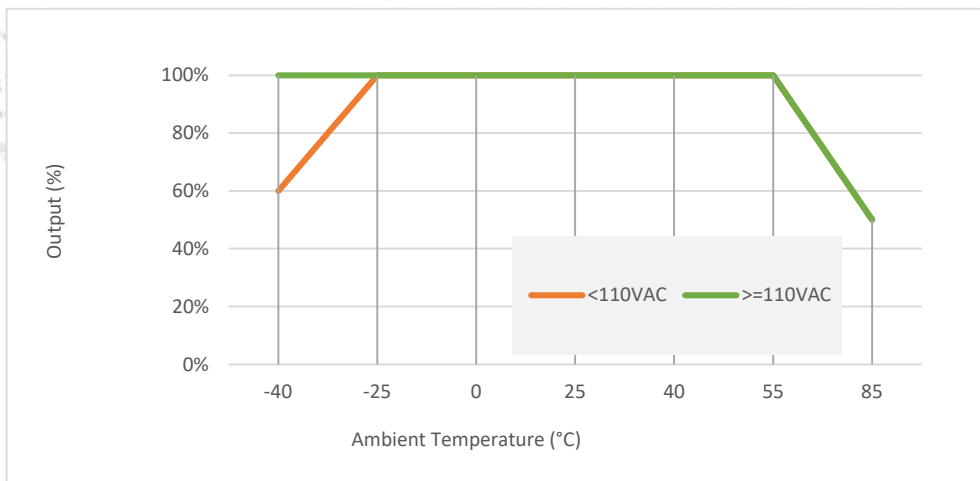
Characteristics Curves

Derating Curve

Output vs Ambient Temperature



V_{OUT}=3.3, 5V



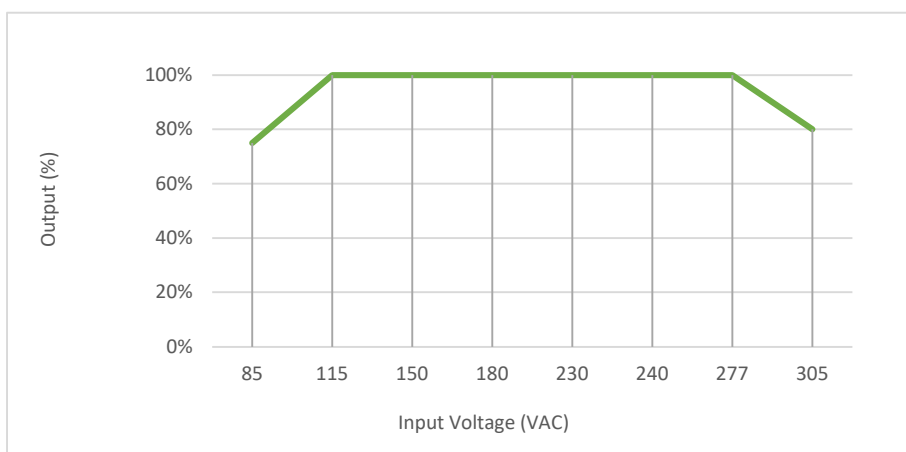
V_{OUT}=9 ... 24V

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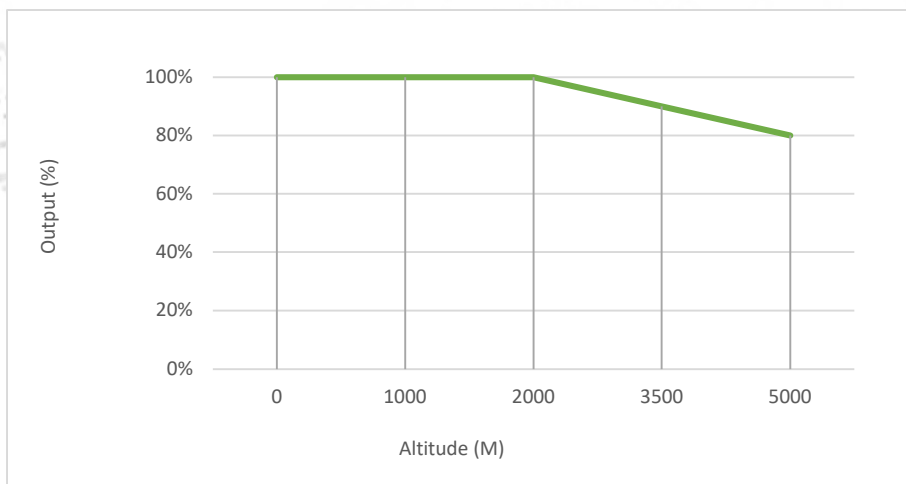
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Output vs Voltage



Output vs Altitude



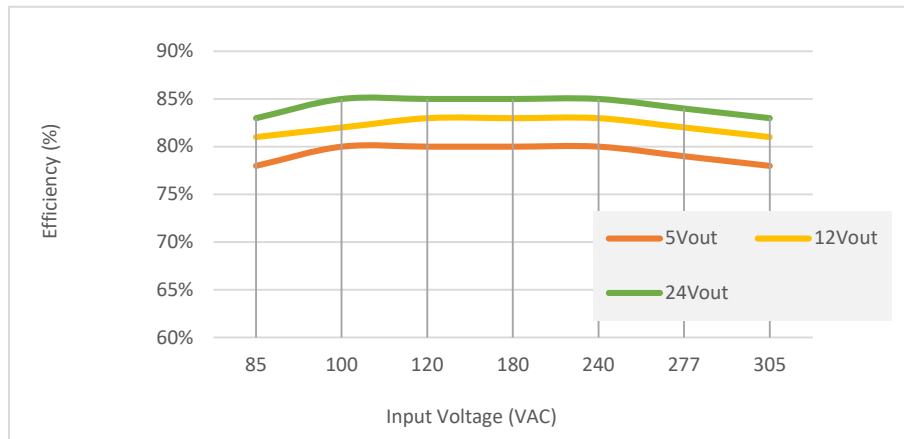
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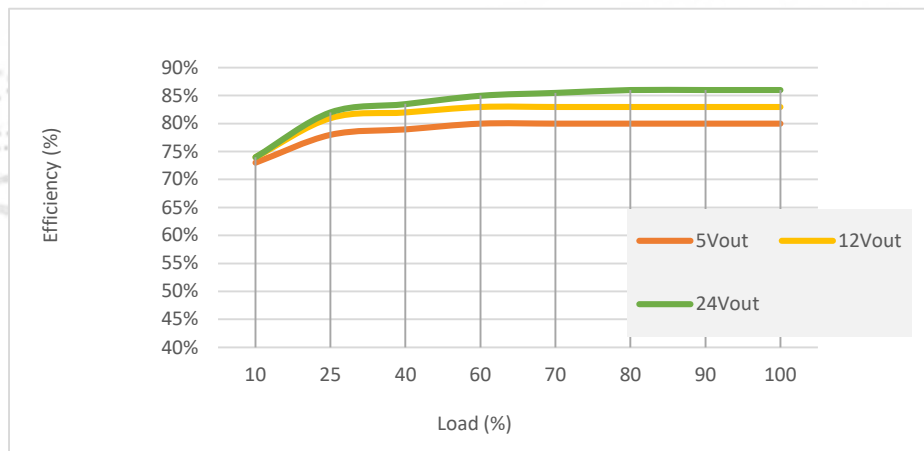
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Efficiency Curves

Efficiency vs Input Voltage



Efficiency vs Load



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Recommended External Circuit

Typical External Circuit

Components with "" are required. The other components are highly recommended.

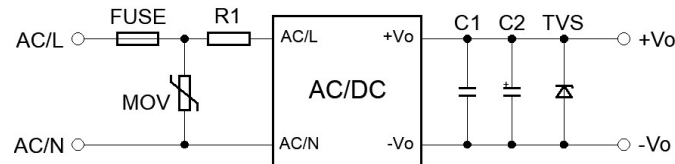


Figure 1: Typical external circuit

Recommended Components

SPEC	FUSE*	MOV	R1*	C1	C2	TVS
$V_{OUT}=3.3, 5V$	2A, 300V	10D561K	12 Ohm, 3W	1uF, 50V	220uF, 35V	SMBJ7.0A
$V_{OUT}=9, 12V$	2A, 300V	10D561K	12 Ohm, 3W	1uF, 50V	150uF, 35V	SMBJ12A
$V_{OUT}=15, 24V$	2A, 300V	10D561K	12 Ohm, 3W	1uF, 50V	100uF, 35V	SMBJ20A

* For further questions contact one of our sales representatives.

EMC Enhancement for EN55032 Class B

*This application circuit is recommended for EMC enhancement. It is not mandatory if this is not critical in the application.

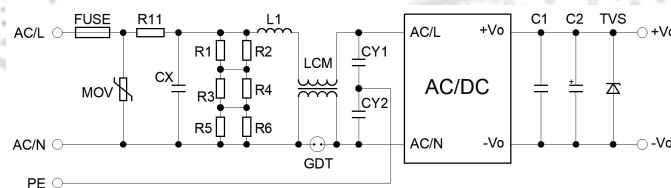


Figure 2. Circuit for EMC Enhancement

Recommended Component Spec

MOV	CX	R11	L1	LCM	GDT	CY1, CY2	
14D561K	0.1uF, 300VAC	12 Ohm, 5W	4.7uH, 2A	2.2mH	300V, 1KA	1nF, 400VAC	

*R1 ... R6 is the bleeder resistance of CX – 1.5Mohm, 150VDC

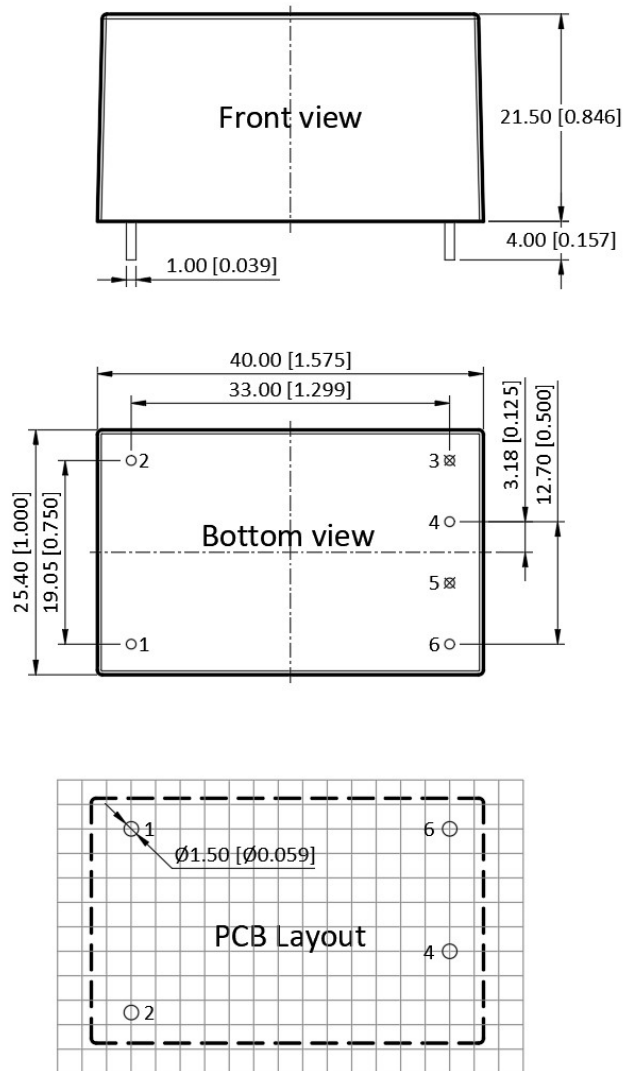
*Other components see the same in Table 1

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Mechanical Specifications



Pin Definition

Pin #	Single Out	
1	AC (L)	
2	AC (N)	
3	No Pin	
4	+V _{OUT}	
5	No Pin	
6	-V _{OUT}	

* Unless otherwise specified unit:
mm [inch]

* General tolerance: ± 1.00 [± 0.040]

* Pin thickness: ± 0.15 [± 0.006]

* Pin distance: ± 0.50 [± 0.020]

* Footprint grid 2.54 x 2.54 mm

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Ordering information

Ordering can be done via www.summit-electronics.com or via info@summit-electronics.com. Please contact us for more information. Customisation of the product is available on request.

Technical support

For all product questions please contact us via info@summit-electronics.com

Document revision

Rev	Date	Changes
2025v0.1	26-08-2025	First issue of document