

- Input voltage range: 85 - 305VAC and 120 - 430VDC (48V output), 85 - 305VAC and 100 - 430VDC (others)
- Operating ambient temperature range: -40°C to +85°C
- Up to 90% efficiency
- No-load power consumption as low as 0.1W
- 5000m altitude application

AST30-2324D



RoHS



3-Year Warranty

Description

AST30-23XXD series features 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 EN62368-1/EN60335-1/EN61558-1 standards. The converters are widely used in industrial, power, home appliances, instrumentation, communication and civil applications. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

Selection Guide

Certification	Part No.	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 230VAC (%) Typ.	Capacitive Load (uF) Max.
/	AST30-2303D	19.8	3.3V/6000mA	85	6600
	AST30-2305D	30	5V/6000mA	86	6600
	AST30-2309D	30.6	9V/3400mA	88	4400
	AST30-2312D	30	12V/2500mA	90	4400
	AST30-2315D	30	15V/2000mA	90	3300
	AST30-2318D	30.06	18V/1670mA	87	2000

Selection Guide

Certification	Part No.	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 230VAC (%) Typ.	Capacitive Load (uF) Max.
/	AST30-2324D	31.2	24V/1300mA	88	1000
	AST30-2348D	30.2	48V/630mA	90	470
Note: 1. *Use suffix "A2S" for chassis and suffix "A4S" for DIN-Rail mounting. 2. The product picture is for reference only. For details, please refer to the actual product.					

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input		85	--	305	VAC
	DC input	3.3V/5V/9V/12V/15V/18V/24V	100	--	430	VDC
		48V	120	--	430	VDC
Input Frequency			47	--	63	Hz
Input Current	115VAC		--	--	0.75	A
	230VAC		--	--	0.5	
Inrush Current	115VAC		--	25	--	
	230VAC		--	50	--	
Leakage Current	277VAC/50Hz		0.1mA RMS Max.			
Built In Fuse			2A/300V, slow-blow			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	3.3V		--	±3	--	%
	5V/9V/12V/15V/18V/24V/48V		--	±2	--	
Line Regulation	Full load		--	±0.5	--	
Load Regulation	0%-100% load	3.3V	--	±2	--	
		5V	--	±1.5	--	
		9V/12V/15V/18V/24V/48V	--	±1	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	3.3V/5V/9V/12V/15V	--	--	100	mV
		18V/24V/48V	--	100	150	
Stand-by Power Consumption	230VAC	3.3V/5V/9V/12V/15V	--	0.1	0.12	W
		18V	--	0.1	0.15	
		24V/48V	--	0.15	0.2	
Temperature Coefficient			--	±0.02	--	%/℃
Short Circuit Protection			Hiccup, continuous, self-recover			
Over-current Protection			≥110%Io, self-recover			
Over-voltage Protection	3.3VDC Output		≤6.3VDC (Output voltage hiccup)			
	5VDC Output		≤16VDC (Output voltage hiccup)			
	9VDC Output		≤16VDC (Output voltage hiccup)			
	12VDC Output		≤16VDC (Output voltage hiccup)			
	15VDC Output		≤25VDC (Output voltage hiccup)			
	18VDC Output		≤25VDC (Output voltage hiccup)			
	24VDC Output		≤35VDC (Output voltage hiccup)			
	48VDC Output		≤60VDC (Output voltage hiccup)			
Minimum Load			0	--	--	%
Hold-up Time	115VAC input		--	10	--	ms
	230VAC input		--	50	--	

General Specifications

Item		Operating Conditions		Min.	Typ.	Max.	Unit
Isolation	Input-output	Electric Strength Test for 1min., leakage current <5mA		4200	--	--	VAC
Insulation Resistance	Input - output	At 500VDC		100	--	--	MΩ
Operating Temperature				-40	--	+85	°C
Storage Temperature				-40	--	+85	
Storage Humidity				--	--	95	%RH
Soldering Temperature		Wave-soldering		260 ± 5°C; time: 5 - 10s			
		Manual-welding		360 ± 10°C; time: 3 - 5s			
Switching Frequency				--	65	--	kHz
Power Derating		-40°C to -25°C (<115VAC)	5V	2.67	--	--	% / °C
			3.3V/9V/12V/15V/18V/24V/48V				
		-40°C to -25°C (<115VAC)	48V	1.33	--	--	
		+50°C to +70°C		2.5	--	--	
		+70°C to +85°C		0.67	--	--	
		85VAC - 100VAC		1.33	--	--	% / VAC
		277VAC - 305VAC		0.72	--	--	
		2000m - 5000m		6.7	--	--	% / Km
Safety Standard		3.3V/5V/9V/12V/15V/24V/48V		EN61558-1, EN60335-1, EN62368-1(Report) safety approval			
		18V		Design refer to EN61558-1, EN60335-1, EN62368-1			
Safety Class				CLASS I I			
Vibration				10 - 500Hz, 5G 10min./1cycle, period for 60min. Each along X, Y, Z axes			
MTBF		MIL-HDBK-217F@25°C		≥500,000 h			

Mechanical Specifications

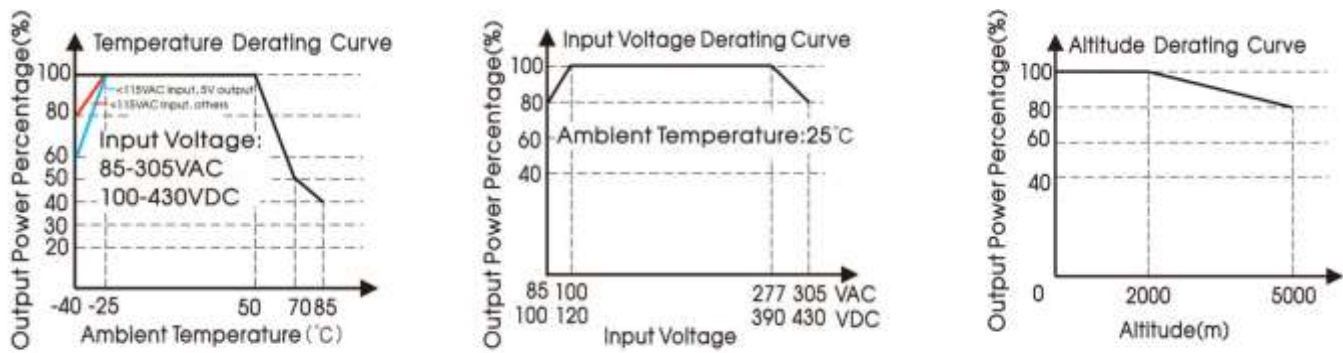
Case Material		Black plastic, flame-retardant and heat-resistant (UL94V-0)/Metal
Dimension	DIP package	69.50 x 39.00 x 24.00 mm
	A2S chassis mounting	96.10 x 54.00 x 32.50 mm
	A4S Din-Rail mounting	96.10 x 54.00 x 37.10 mm
Weight	DIP package	100g (Typ.)
	A2S chassis mounting	147g (Typ.)
	A4S Din-Rail mounting	190g (Typ.)
Cooling method		Free air convection

Electromagnetic Compatibility (EMC)

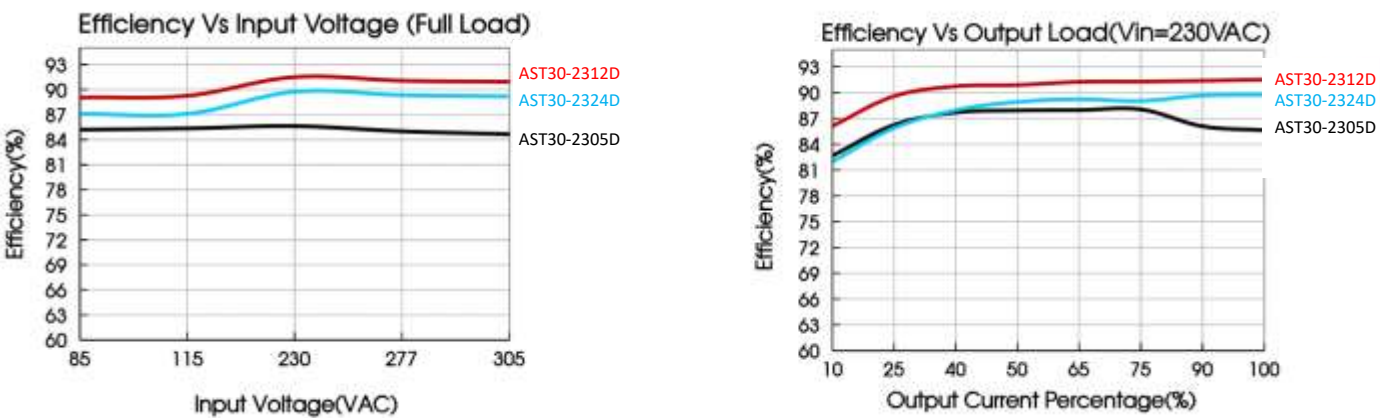
Emissions	CE	CISPR32/EN55032 CLASS B			
		EN55014-1			
	RE	CISPR32/EN55032 CLASS B			
		EN55014-1			
Immunity	ESD	IEC/EN61000-4-2 Contact ±8KV/Air ±15KV		perf. Criteria A	
		IEC/EN55014-2		perf. Criteria A	
	RS	IEC/EN61000-4-3 10V/m		perf. Criteria A	
		IEC/EN55014-2		Perf. Criteria A	
	EFT	IEC/EN61000-4-4 ±2KV		perf. Criteria A	
		IEC/EN61000-4-4 ±4KV (See Fig. 2, Fig. 3 for recommended circuit)		perf. Criteria A	
		IEC/EN55014-2		perf. Criteria A	
	Surge	IEC/EN61000-4-5 line to line ±2KV		perf. Criteria A	
		IEC/EN61000-4-5 line to line ±2KV/line to PE ±4KV (See Fig. 2, Fig. 3 for recommended circuit)		perf. Criteria A	
		IEC/EN55014-2		perf. Criteria A	
	CS	IEC/EN61000-4-6 10Vr.m.s		perf. Criteria A	
		IEC/EN55014-2		Perf. Criteria A	
	Voltage variation*	IEC61000-6-2/IEC61000-4-11	70% Un, 25/30 cycle(50/60Hz) 40% Un, 10/12 cycle(50/60Hz) 0% Un, 1 cycle		perf. Criteria B
		IEC/EN55014-2			perf. Criteria B
	voltage interruption*	IEC61000-6-2/IEC61000-4-11	0% Un, 250/300 cycle(50/60Hz)		perf. Criteria B
		IEC/EN55014-2			perf. Criteria B

Note: 1. When the output terminal of the product needs to be connected to PE through a Y capacitor, or close to the metal frame, please refer to the Fig. 3 for recommended circuit.
2. *Un is the maximum input nominal voltage.

Product Characteristic Curves



Note: ① With an AC input between 85-100V/277-305VAC and a DC input between 100-120V/390-430VDC, the output power must be derated as per temperature derating curves;



Design Reference

1. Typical application

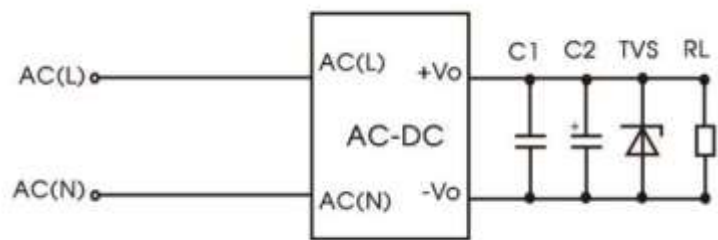


Fig. 1: Typical circuit diagram

Design Reference

Part No.	C1	C2	TVS
AST30-2303D	10uF/100V	10uF/50V	SMBJ7.0A
AST30-2305D		10uF/50V	SMBJ7.0A
AST30-2309D		10uF/50V	SMBJ12A
AST30-2312D		10uF/50V	SMBJ20A
AST30-2315D		10uF/50V	SMBJ20A
AST30-2318D		10uF/50V	SMBJ30A
AST30-2324D		10uF/50V	SMBJ30A
AST30-2348D		10uF/63V	SMBJ64A

Output Filter Components:
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.

2. EMC compliance recommended circuit

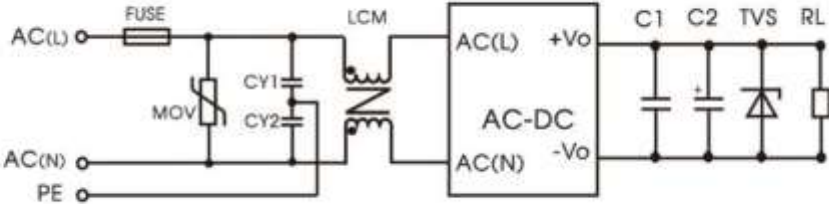


Fig. 2: EMC application circuit with higher requirements

Component	Recommended value
FUSE	3.15A/300V, slow-blow, required
MOV	S14K350
CY1/CY2	1nF/400VAC
LCM	10mH

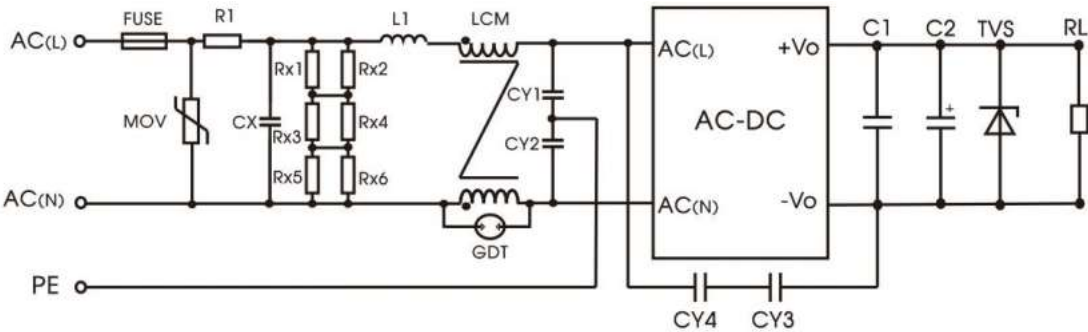


Fig. 3: Recommended circuit for class I equipment

Design Reference

(Recommended when the output terminal of the product needs to be connected to PE or connected to PE through a Y capacitor)

Component	Recommended value
FUSE	3.15A/300V, slow-blow, required
MOV	S14K350
CX	334K/305VAC
R1	6.8Ω/5W (wire-wound resistor)
L1	1.2mH/0.5A
CY1/CY2	2.2nF/400VAC
CY3/CY4	1nF/400VAC
GDT	300V/1KA
LCM	20 mH

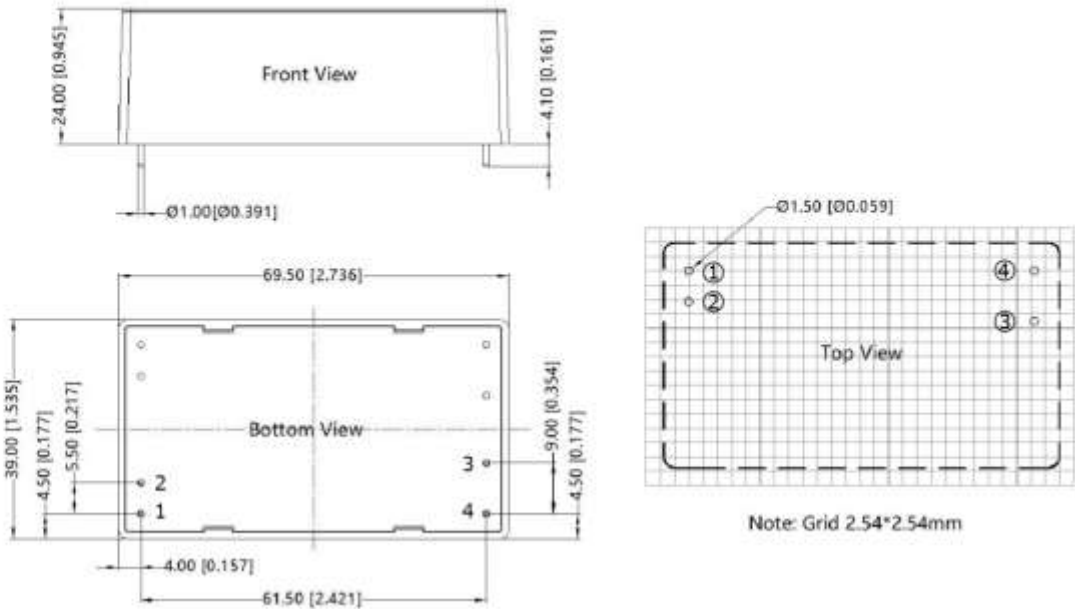
Note: Rx1/Rx2/Rx3/Rx4/Rx5/Rx6 is the bleeder resistance of CX, and the recommended resistance value is 1.5MΩ/150VDC.

Dimensions and Recommended Layout

Board mount

units: mm [inch]
pin diameter tolerance: ±0.10 [±0.004]
tolerance: ±0.50 [±0.020]

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



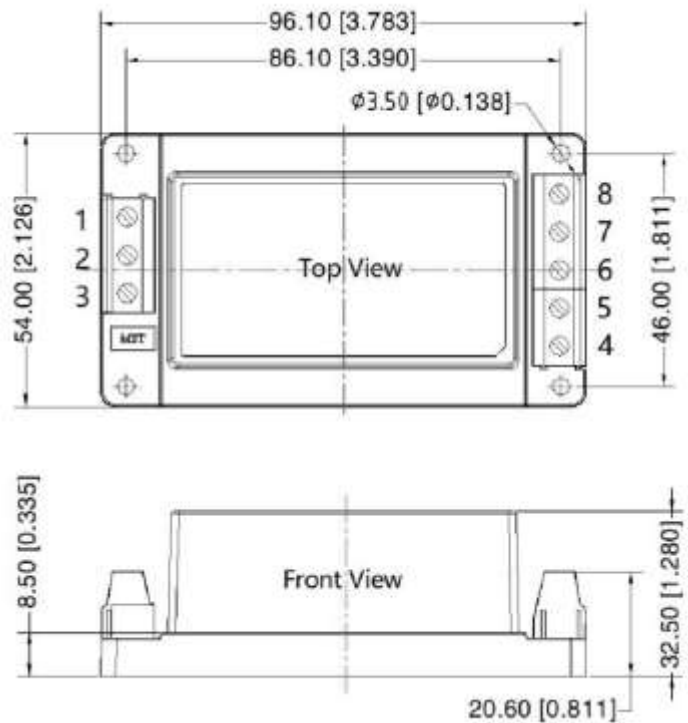
A2S Dimensions

Chassis mount

units: mm [inch]
 wire range: 24~12 AWG
 tightening torque: Max 0.4 N·m
 tolerance: ± 1.0 [± 0.039]

PIN CONNECTIONS	
PIN	Function
1	NC
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	NC
7	NC
8	-Vo

Note: NC = no connection



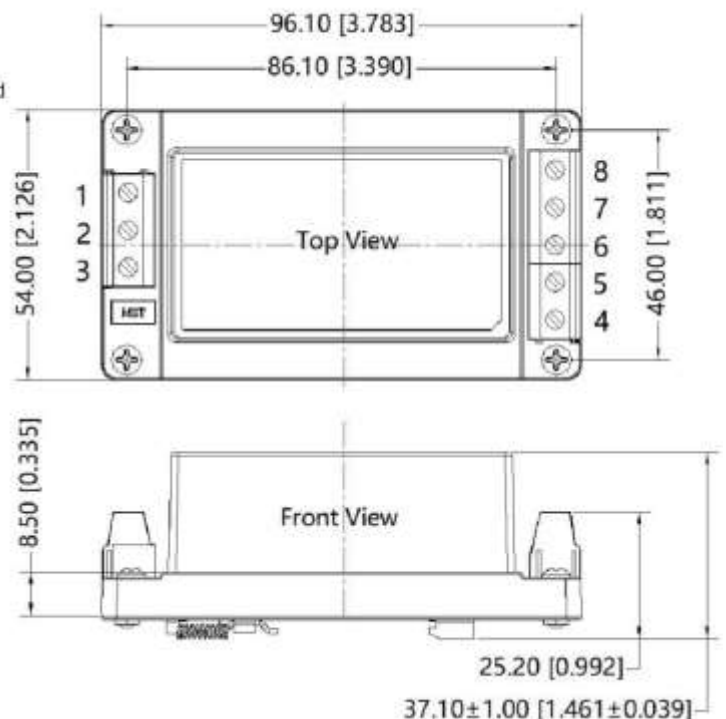
A4S Dimensions

DIN-rail mount

units: mm [inch]
 wire range: 24~12 AWG
 tightening torque: Max 0.4 N·m
 mounting rail: TS35, must be connected to safety ground
 tolerance: ± 1.0 [± 0.039]

PIN CONNECTIONS	
PIN	Function
1	NC
2	AC(N)
3	AC(L)
4	+Vo
5	NC
6	NC
7	NC
8	-Vo

Note: NC = no connection



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 $T_a=25^{\circ}\text{C}$, 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";