APD30-xx Series

DESCRIPTIONS

30W, AC-DC Converter





RoHS

c UL us	CE Report	UKCA Report	CB
UL62368-1	EN62368-1	BS EN62368-1	IEC62368-1
	EN61558-1		IEC61558-1
	EN60335-1		IEC60335-1

FEATURES

- Input voltage range: 85 - 305VAC and 120 - 430VDC (48V output), 85 - 305VAC and 100 - 430VDC (others)
- Operating ambient temperature range: -40℃ to +85℃
- Up to 90% efficiency
- No-load power consumption as low as 0.1W
- 5000m altitude application
- EMI performance meets CISPR32/EN55032 CLASS B, EN55014
- Meets surge ±2KV without additional circuits
- OVC III (meet EN61558-1)

APPLICATIONS

- Industrial control
- Electricity
- Home appliances
- Instrumentation
- Communication
- Civil applications
- AC pile

Selection Guide

Certification	Part No*	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 230VAC (%) Typ.	Capacitive Load (uF) Max.
EN/BS EN/UL/IEC	APD30-03	19.8	3.3V/6000mA	85	6600
	APD30-05	30	5V/6000mA	86	6600
	APD30-09	30.6	9V/3400mA	88	4400
UL/EN/BS EN/IEC	APD30-12	30	12V/2500mA	90	4400
EN/BS EN/UL/IEC	APD30-15	30	15V/2000mA	90	3300
	APD30-24	31.2	24V/1300mA	88	1000
	APD30-48	30.2	48V/630mA	90	470

Note:1.Use suffix " E2S" for chassis and suffix " D4S" for DIN-Rail mounting.
2.The product picture is for reference only.For details, please refer to the actual product.

Specifications

Product Specifications	Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	Input Voltage Range	AC input		85	--	305	VAC
		DC input	3.3V/5V/9V/12V/15V/24V	100	--	430	VDC
			48V	120	--	430	
	Input Voltage Frequency			47	--	63	Hz
	Input Current	115VAC		--	--	0.75	A
		230VAC		--	--	0.5	
	Inrush Current	115VAC	Cold start	--	25	--	
		230VAC		--	50	--	
	Leakage Current	277VAC/50Hz		0.1mA RMS Max.			
	Built In Fuse			2A/300V, slow-blow			
	Hot Plug			Unavailable			
Output Specifications	Output Voltage Accuracy	Full load range	3.3V	--	±3	--	%
			5V/9V/12V/15V/24V/48V	--	±2	--	
	Line Regulation	Full load		--	±0.5	--	
	Load Regulation	0% - 100% load	3.3V	--	±2	--	
			5V	--	±1.5	--	
			9V/12V/15V/24V/48V	--	±1	--	
	Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	3.3V/5V/9V/12V/15V	--	--	100	mV
			24V/48V	--	100	150	
	Temperature Coefficient			--	±0.02	--	%/℃
	Minimum Load			0	--	--	%
	Stand-by Power Consumption	230VAC	3.3V/5V/9V/12V/15V	--	0.1	0.12	W
			24V/48V	--	0.15	0.2	
	Hold-up Time	115VAC		--	10	--	ms
		230VAC		--	50	--	
	Short Circuit Protection			Hiccup, continuous, self-recovery			
	Over-current Protection			≥110%Io, self-recovery			
	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)			
		24VDC Output		≤35VDC (Output voltage hiccup)			
		48VDC Output		≤60VDC (Output voltage hiccup)			
General	Isolation	Input - output	Electric Strength Test for 1min., leakage current <5mA	4200	--	--	VAC
	Insulation	Input -	At 500VDC	100	--	--	MΩ

Specifications	Resistance output					
	Operating Temperature		-40	--	+85	℃
	Storage Temperature		-40	--	+85	
	Storage Humidity	Non-condensing	--	--	95	%RH
	Soldering Temperature	Wave-soldering	260 ± 5℃; time: 5 - 10s			
		Manual-welding	360 ± 10℃; time: 3 - 5s			
	Switching Frequency		--	65	--	KHz
	Power Derating	-40℃ to -25℃ (<115VAC) 5V	2.67	--	--	%/℃
		-40℃ to -25℃ (<115VAC) 3.3V/9V/12V/15V/24V /48V	1.33	--	--	
		+50℃ to +70℃	2.5	--	--	
		+70℃ to +85℃	0.67	--	--	
		85VAC - 100VAC	1.33	--	--	%/VAC
		277VAC - 305VAC	0.72	--	--	
		2000m - 5000m	6.7	--	--	%/KM
	Safety Standard		CLASS II			
	Vibration		10 - 500Hz, 5G 10min./1cycle, period for 60min. Each along X, Y, Z axes			
	MTBF	MIL-HDBK-217F@25℃	≥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				

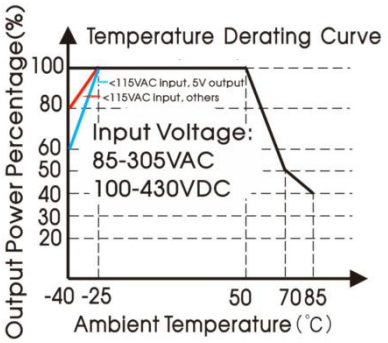
Note: *The "Tip and barrel method" is used for ripple and noise test, output parallel 10uF electrolytic capacitor and 0.1uF ceramic capacitor.

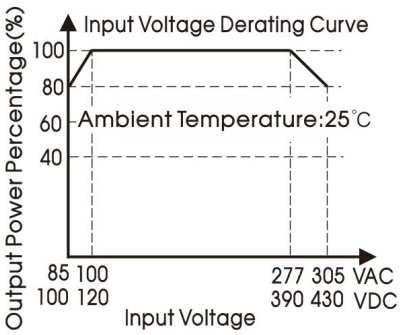
Electromagnetic Compatibility (EMC)

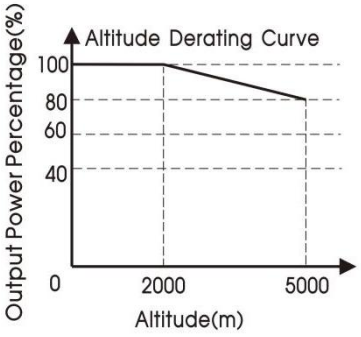
Electromagnetic Compatibility (EMC)	Emissions (EMI)	CE	CISPR32/EN55032 CLASS B	
			EN55014-1	
		RE	CISPR32/EN55032 CLASS B	
			EN55014-1	
	Immunity (EMS)	ESD	IEC/EN61000-4-2 Contact ±8KV/Air ±15KV	perf. Criteria A
			IEC/EN55014-2	perf. Criteria A
		RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
			IEC/EN55014-2	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 dip, short interruption and voltage variation	IEC/EN61000-4-11 0%, 70%	perf. Criteria B
			IEC/EN55014-2	perf. Criteria B

Note: 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.

Characteristic Curve

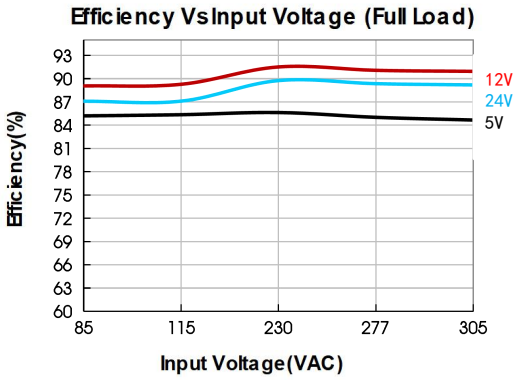


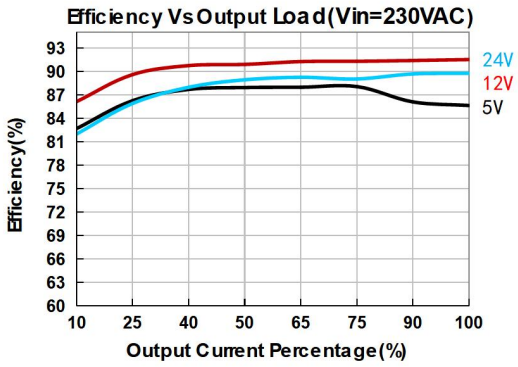




Note: 1. With an AC input between 85-100V/277-305VAC and a DC input between 100-120VDC/390-430VDC, the output power must be derated as per temperature derating curves;

2. This product is suitable for applications using natural air cooling.





Design Reference

1. Typical application

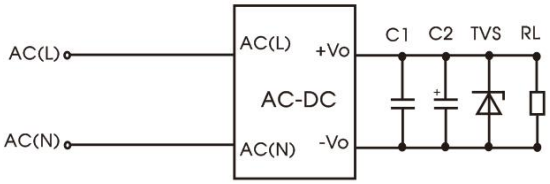


Fig. 1: Typical circuit diagram

Part No.	C1	C2	TVS
APD30-03	1uF/100V	10uF/50V	SMBJ7.0A
APD30-05		10uF/50V	SMBJ7.0A
APD30-09		10uF/50V	SMBJ12A
APD30-12		10uF/50V	SMBJ20A
APD30-15		10uF/50V	SMBJ20A
APD30-24		10uF/50V	SMBJ30A
APD30-48		10uF/63V	SMBJ64A

Output Filter Components:

1.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

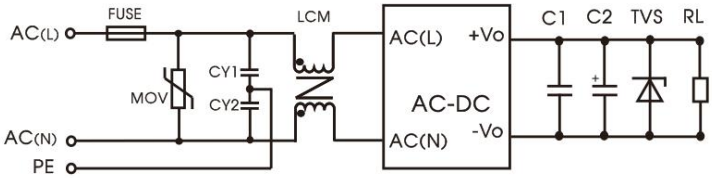


Fig 2: EMC application circuit with higher requirements

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

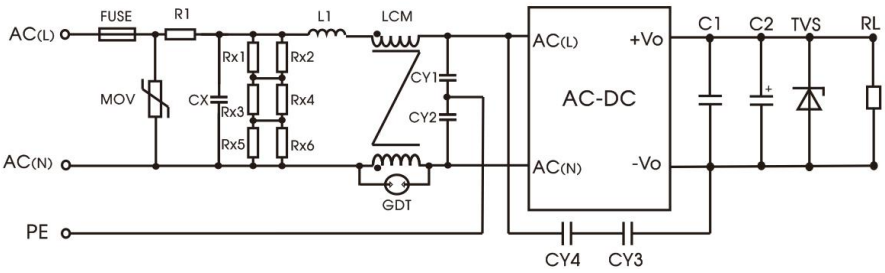


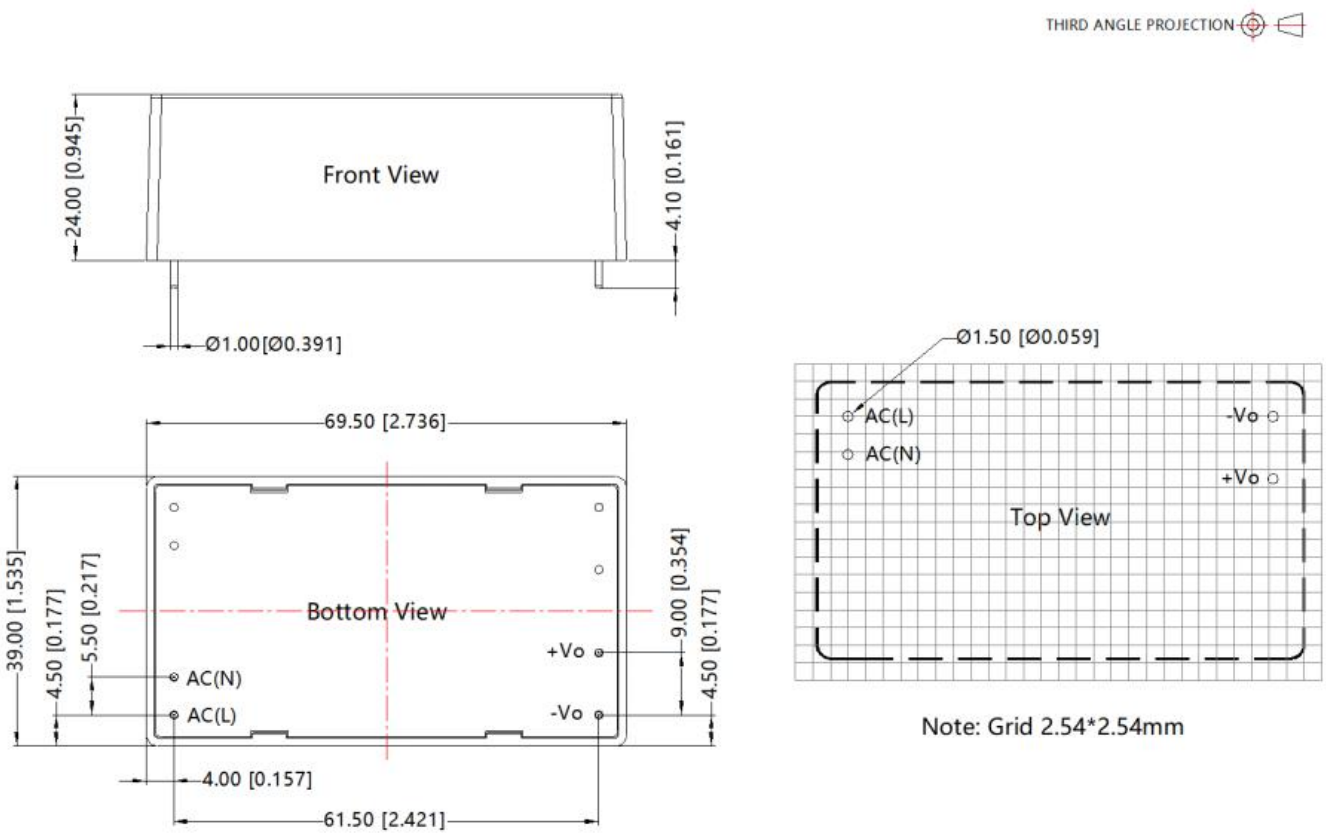
Fig. 3: Recommended circuit for class I equipment

(It is recommended to use the output of the product when it is necessary to connect to PE or to PE through Y capacitors)

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.	

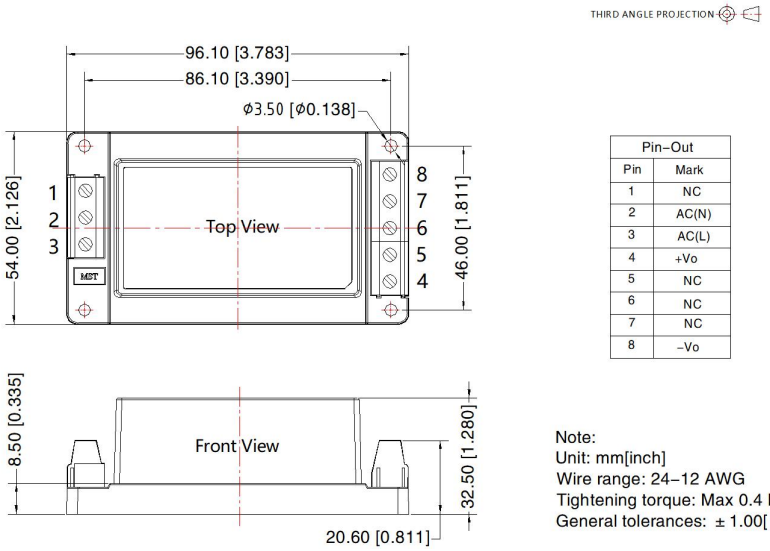
Dimensions and Recommended



Note: Grid 2.54*2.54mm

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

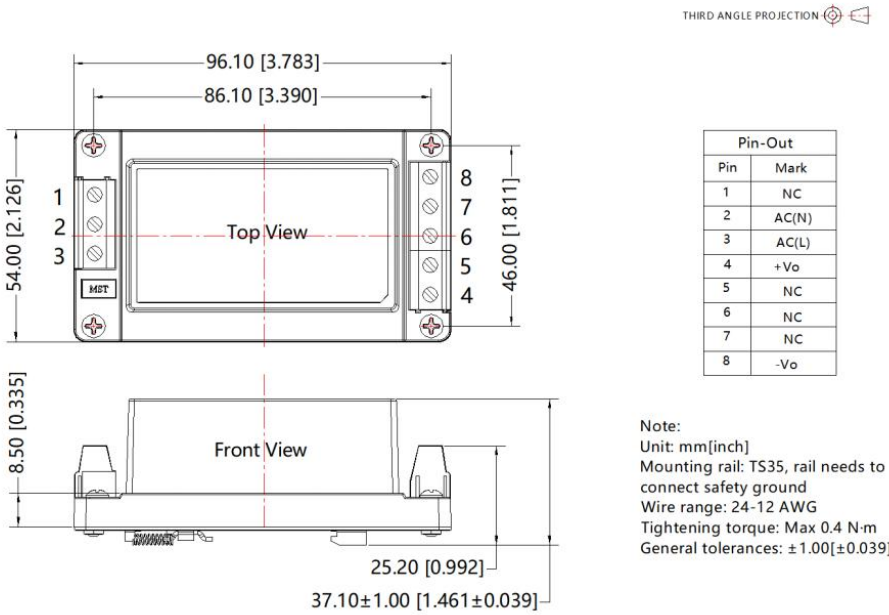
E2S Dimension



Pin-Out	
Pin	Mark
1	NC
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]

D4S Dimension



Pin-Out	
Pin	Mark
1	NC
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]

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℃, 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. 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.
6. The image certification marks are for reference only; please refer to the selection table for actual specifications. Certification is based on the physical mark or packaging label.