DESCRIPTIONS

90W，AC-DC Converter







RoHS

c UL us CE Report UK CA Report

UL62368-1 EN62368-1 BS EN62368-1

FEATURES

- Wide input voltage range: 80 - 305VAC/110 - 430VDC
- Operating ambient temperature range: -40℃ to +85℃
- High I/O isolation test voltage up to 4200VAC
- Up to 93% efficiency
- No-load power consumption < 0.21W
- Compact size, high power density
- Output short circuit, over-current, over-voltage protection
- 4000m altitude application
- Plastic case meets UL94V-0 flammability
- OVC III (meet EN62368-1, EN61558-1, 2000m altitude)

APPLICATIONS

- Industrial
- Electric power
- Home appliances
- Instrumentation
- Communication
- Civil applications

Selection Guide

Certification	Part No.*	Output Power (W)	nominal Output Voltage and Current(vo/Io)	Efficiency at 230VAC (%) Typ.	Capacitive Load (uF) Max.
UL/EN/BS EN	APD90-12	80.4W	12V/6700mA	92	6800
EN/BS EN	APD90-15	85.05W	15V/5670mA	92.5	4500
EN/BS EN	APD90-24	90W	24V/3750mA	93	3000
EN/BS EN	APD90-48		48V/1875mA	93	470

Note:1.*APD90-12E2S，APD90-15E2S，APD90-24E2S use suffix “E2S” for chassis mounting and APD90-24D4S 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		80	--	305	VAC
			DC input		110	--	430	VDC
	Input Frequency				47	--	63	Hz
	Input Current		115VAC		--	--	2	A
			230VAC		--	--	1.1	
	Inrush Current		115VAC		--	35	--	
			230VAC		--	65	--	
	Leakage Current		277VAC/50Hz		0.25mA RMS Max.			
	Built In Fuse				3.15A/300V, slow-blow			
	Hot Plug				Unavailable			
Output Specifications	Output Voltage Accuracy				--	±2	--	%
	Line Regulation		Full load		--	±0.5	--	
	Load Regulation		0% - 100% load		--	±1	--	
	Ripple & Noise*		20MHz bandwidth (peak-to-peak value)	12V/15V	--	--	120	mV
				24V	--	--	200	
				48V	--	--	240	
	Temperature Coefficient				--	±0.02	--	%/℃
	Stand-by Power Consumption				--	--	0.21	W
	Short Circuit Protection				Hiccup, continuous, self-recover			
	Over-current Protection				≥110%Io, self-recover			
	Over-voltage protection		12VDC output		≤16VDC (Hiccup or clamp)			
			15VDC output		≤25VDC (Hiccup or clamp)			
			24VDC output		≤35VDC (Hiccup or clamp)			
			48VDC output		≤60VDC (Hiccup or clamp)			
	Minimum Load				0	--	--	%
	Hold-up Time		115VAC input		--	10	--	ms
			230VAC input		--	30	--	
General Specifications	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	℃
	Storage Temperature				-40	--	+85	
	Storage Humidity				--	--	95	%RH
	Soldering Temperature		Wave-soldering		260 ± 5℃; time: 5 - 10s			
			Manual-welding		360 ± 10℃; time: 3 - 5s			
	Switching Frequency				--	75	--	KHz

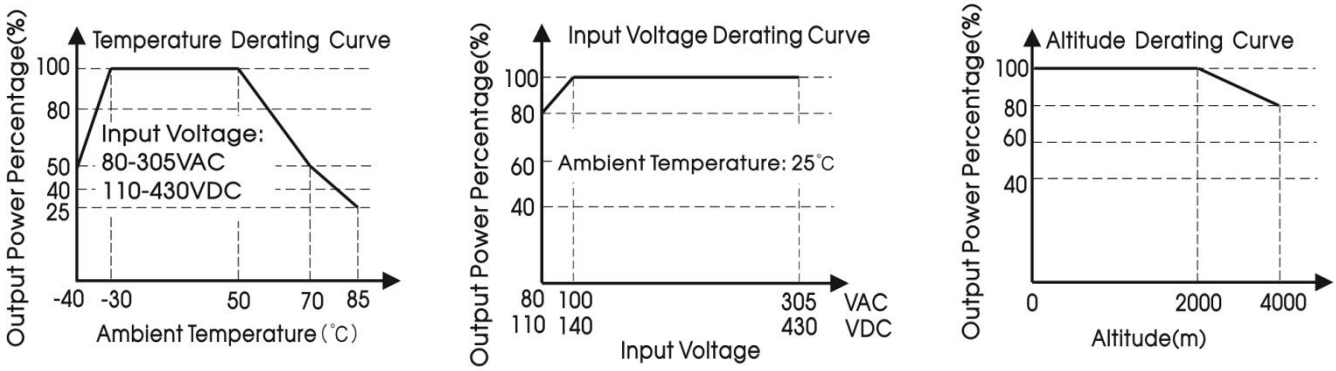
General Specifications	Power Derating	-40℃ to -30℃	5.0	--	--	%/℃
		+50℃ to +70℃	2.50	--	--	
		+70℃ to +85℃	1.66	--	--	
		80VAC - 100VAC	1.0	--	--	%/VAC
		2000m - 4000m	10.0	--	--	%/Km
	Safety Class		CLASS II			
	Vibration		10 - 500Hz, 2G 10min./1cycle, period for 60min. Each along X, Y, Z axes			
	MTBF	MIL-HDBK-217F@25℃	≥500,000 h			
Mechanical Specifications	Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)				
	Dimension	Horizontal package	87.00 x 52.00 x 29.50 mm			
		E2S chassis mounting	135.00 x 70.00 x 37.90 mm			
		D4S Din-Rail mounting	137.00 x 70.00 x 42.40 mm			
	Weight	Horizontal package	200g (Typ.)			
		E2S chassis mounting	280g (Typ.)			
		D4S Din-Rail mounting	350g (Typ.)			
	Cooling Method	Free air convection				

Note: *The "parallel cable" method is used for ripple and noise test, output parallel 10uF electrolytic capacitor and 1uF ceramic capacitor.

Electromagnetic Compatibility (EMC)

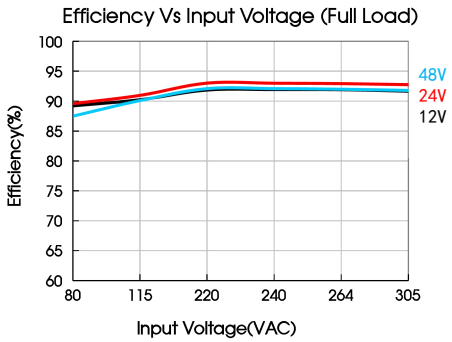
Electromagnetic Compatibility (EMC)	Emissions (EMI)	CE	CISPR32/EN55032 CLASS B	
		RE	CISPR32/EN55032 CLASS B	
		Harmonic current	IEC/EN61000-3-2 CLASS A	
	Immunity (EMS)	ESD	IEC/EN61000-4-2 Contact ±6KV/Air ±8KV	perf. Criteria A
		RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
		EFT	IEC/EN61000-4-4 ±2KV	perf. 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 for recommended circuit)	perf. Criteria B
		CS	IEC/EN61000-4-6 10Vr.m.s	perf. Criteria A
		PFM	IEC/EN61000-4-8 30A/m	perf. Criteria A
		Voltage dip, short interruption and voltage variation	IEC/EN61000-4-11 0%, 70%	perf. Criteria B

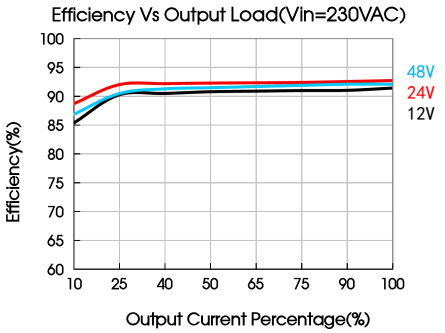
Characteristic Curve



Note: ① With an AC input between 80-100VAC and a DC input between 110-140DC, 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

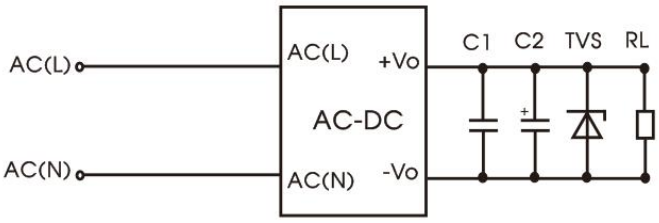


Fig. 1: Typical circuit diagram

Part No.	C1	C2	TVS
APD90-12	1uF/100V	330uF/35V	SMBJ20A
APD90-15		330uF/35V	SMBJ20A
APD90-24		200uF/35V	SMBJ30A
APD90-48		100/63V	SMBJ60A

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.

2. EMC compliance recommended circuit

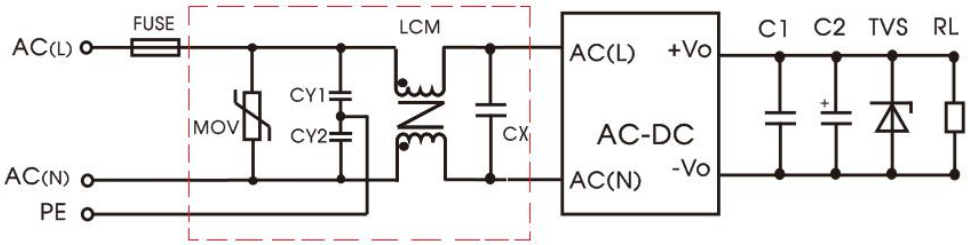
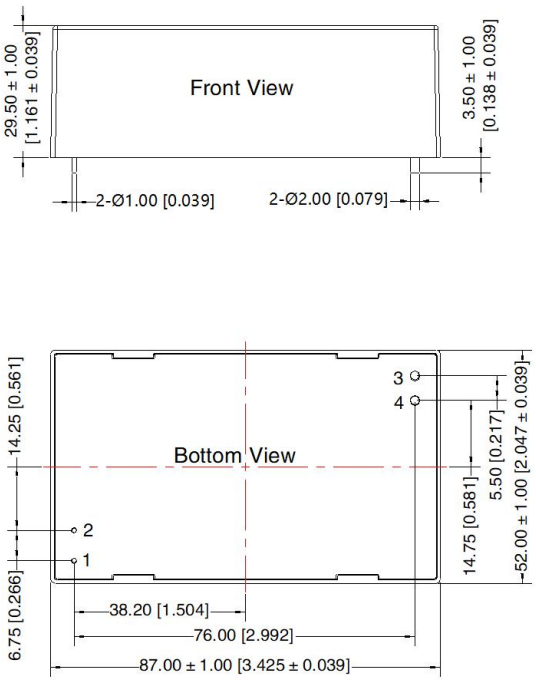


Fig. 2: EMC application circuit with higher requirements

Component	Recommended value
FUSE	6.3A/300V, slow-blow, required
MOV	S14K350
CY1/CY2	1nF/400VAC
CX	684K/310V
LCM	10mH

Dimensions and Recommended



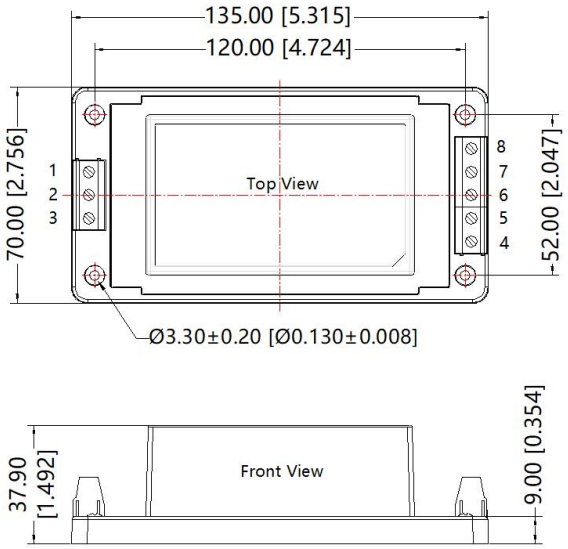
Note：Grid 2.54*2.54mm

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

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

E2S Dimension

THIRD ANGLE PROJECTION

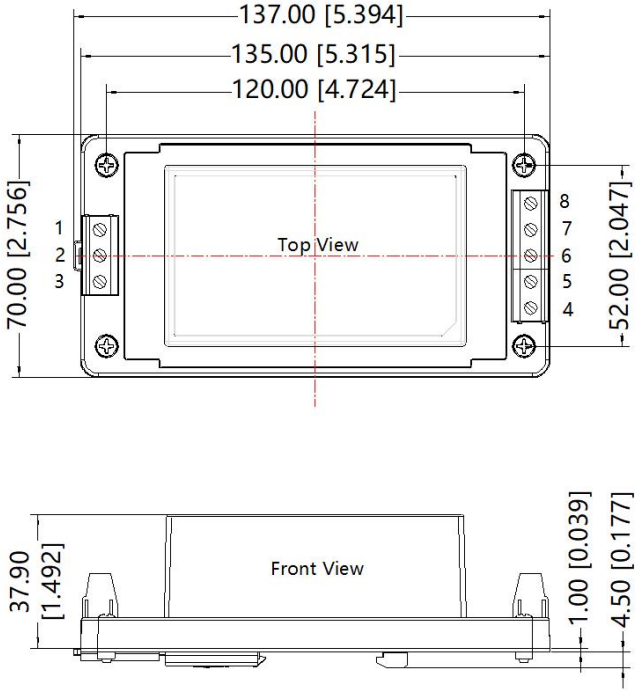


Pin-Out	
Pin	Mark
1	AC(L)
2	NC
3	AC(N)
4	+Vo
5	-Vo
6	NC
7	NC
8	NC

Note:
Unit: mm[inch]
Wire range: 24~12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ±1.00[±0.040]

D4S Dimension

THIRD ANGLE PROJECTION



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

Note:
Unit: mm[inch]
Wire range: 24~12 AWG
Tightening torque: Max 0.4 N·m
Installed on DIN RAIL TS35
General tolerances: ±1.00[±0.040]

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. 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.
7. 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.