DESCRIPTIONS

60W，AC-DC Converter



RoHS

Report Report CB

UL62368-1 EN62368-1 BS EN62368-1 IEC61558-1

EN60335-1

EN61558-1

FEATURES

- Universal 85-305VAC or 100-430VDC input voltage
- Operating ambient temperature range: -40℃ to +85℃
- High I/O isolation test voltage up to 4200VAC
- Up to 91% efficiency
- Compact size, high power density
- Output short circuit, over-current, over-voltage protection
- 5000m altitude application
- OVC III (meet EN62477, 5000m altitude)
- Meets Emissions CLASS B and surge ±2KV without additional circuits

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.
EN/BS EN/IEC	APD60-05	50	5V/10A	89	20000
	APD60-12	60	12V/5A	91	5000
UL/EN/ BS EN/IEC	APD60-15		15V/4A	90	3000
	APD60-24		24V/2.5A	90	1800
EN/BS EN/IEC	APD60-48		48V/1.25A	91	470
EN/IEC	APD60-55	60.5	55.5V/1.09A	91	470

Note: 1.Use suffix " E2S" for chassis and suffix " D4S" for DIN-Rail mounting;

2.APD60-55 of product does not involve expansion package;

3.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	100	--	430	VDC
	Input Frequency			47	--	63	Hz
	Input Current		115VAC	--	--	1.8	A
			230VAC	--	--	1.0	
	Inrush Current		115VAC	--	30	--	
			230VAC	--	60	--	
	Leakage Current		277VAC/50Hz	0.25mA RMS Max.			
	Fuse			3.15A/300V, slow-blow, required			
	Hot Plug			Unavailable			
Output Specifications	Output Voltage Accuracy			--	±2	--	%
	Line Regulation		Full load	--	±1	--	
	Load Regulation		0%-100% load	--	±1.5	--	
	Ripple & Noise*		20MHz bandwidth (peak-to-peak value)	--	80	150	mV
	Stand-by Power Consumption		230VAC	--	0.3	0.45	W
	Temperature Coefficient			--	±0.02	--	%/℃
	Short Circuit Protection			Hiccup, continuous, self-recover			
	Over-current Protection			≥140% Io, self-recover			
	Over-voltage Protection		5VDC output	≤9VDC (Hiccup or clamp)			
			12VDC output	≤16VDC (Hiccup or clamp)			
			15VDC output	≤25VDC (Hiccup or clamp)			
			24VDC output	≤35VDC (Hiccup or clamp)			
			48VDC output	≤60VDC (Hiccup or clamp)			
			55.5VDC output	≤70VDC (Hiccup or clamp)			
	Minimum Load			0	--	--	%
	Hold-up Time		115VAC input	--	8	--	ms
			230VAC input	--	65	--	
General Specifications	Isolation	Input-output	Electric Strength Test for 1min., leakage current <5mA	4200	--	--	VAC
	Insulation Resistance	Input - output	Test voltage 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			

General Specifications	Power Derating	-40℃ to -25℃ (85-200VAC input)	3.33	--	--	%/℃
		-40℃ to -25℃ (200-305VAC input)	1.33	--	--	
		+40℃ to +70℃ (5VDC output)	1.5	--	--	
		+45℃ to +70℃ (85-165VAC input, 12/15/24/48/55.5VDC output)	1.8	--	--	
		+50℃ to +70℃ (≥165VAC input, 12/15/24/48/55.5VDC output)	2.25	--	--	
		+70℃ to +85℃	2	--	--	
		85VAC - 100VAC	1.33	--	--	%/VAC
		277VAC - 305VAC	0.72	--	--	
	Operating Altitude Derating	2000m - 5000m	6.67	--	--	%/Km
	Safety Class		CLASS II			
	MTBF	MIL-HDBK-217F@25℃	≥500,000 h			
Mechanical Specifications	Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)				
	Dimension	Horizontal package	70.00 x 48.00 x 27.00 mm			
		E2S chassis mounting	96.10 x 54.00 x 35.50 mm			
		D4S Din-Rail mounting	96.10 x 54.00 x 40.10 mm			
	Weight	Horizontal package	130g (Typ.)			
		E2S chassis mounting	177g (Typ.)			
		D4S Din-Rail mounting	220g (Typ.)			
	Cooling Method	Free air convection				

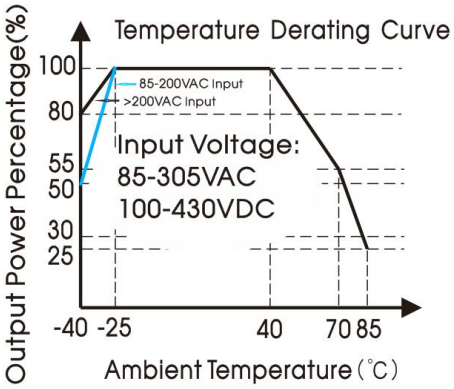
Note: *The "parallel cable" method is used for ripple and noise test, output parallel 47uF electrolytic capacitor and 1uF ceramic capacitor.

Electromagnetic Compatibility (EMC)

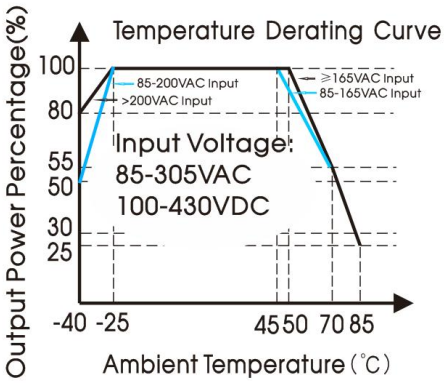
Electromagnetic Compatibility (EMC)	Emissions (EMI)	CE	CISPR32/EN55032 CLASS B	
		RE	CISPR32/EN55032 CLASS B	
	Immunity (EMS)	ESD	IEC/EN61000-4-2 Contact ±6KV/Air ±8KV	perf. Criteria A
		RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
		EFT	IEC/EN61000-4-4 ±2KV	perf. Criteria A
			IEC/EN61000-4-4 ± 4KV (See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

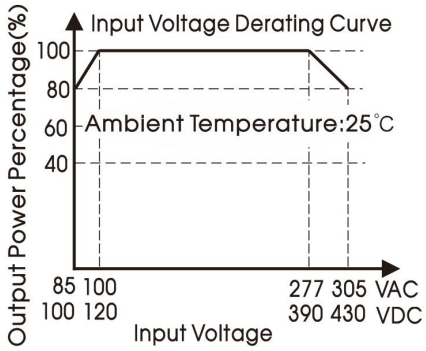
Characteristic Curve

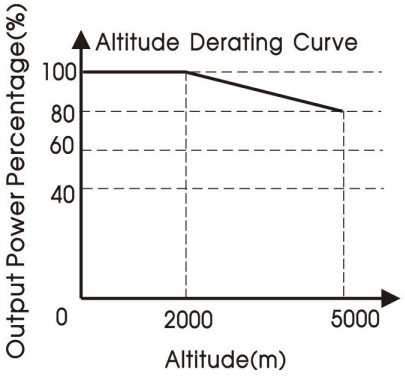
(5VDC output)



(12/15/24/48/55.5VDC output)

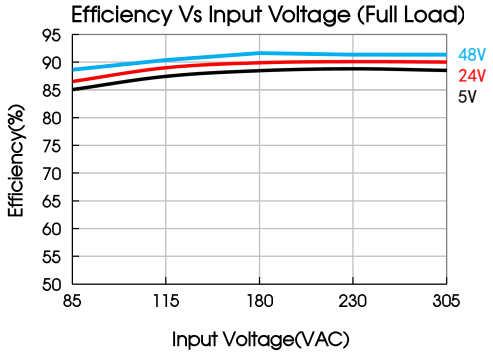


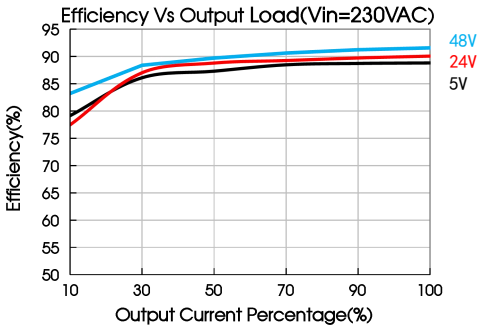




Note: ① With an AC input between 85-100VAC/277-305VAC and a DC input between 100-120VDC/390-430VDC, the output power must be derated as per temperature derating curves;

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





Design Reference

1. Typical application

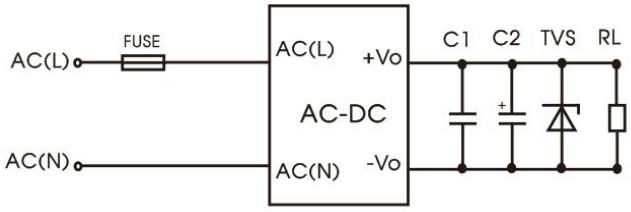


Fig. 1: Typical circuit diagram

Part No.	C1	C2	FUSE	TVS
APD60-05	1uF/50V	470uF/16V	3.15A/300V slow-blow, required	SMBJ10A
APD60-12		330uF/25V		SMBJ20A
APD60-15		330uF/25V		SMBJ30A
APD60-24		220uF/35V		SMBJ40A
APD60-48	1uF/100V	100uF/63V		SMBJ60A
APD60-55		100uF/100V		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

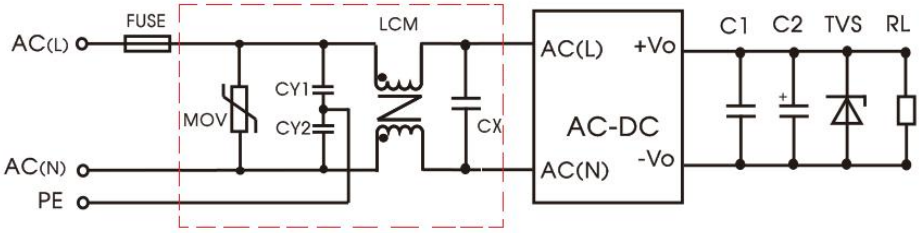
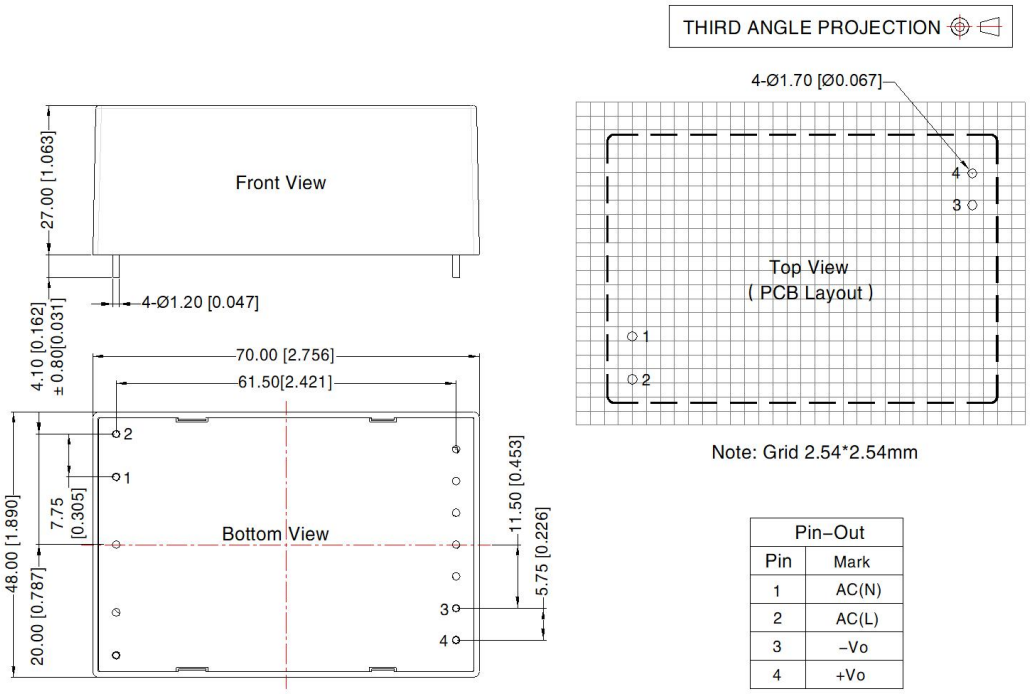


Fig. 2: EMC application circuit with higher requirements

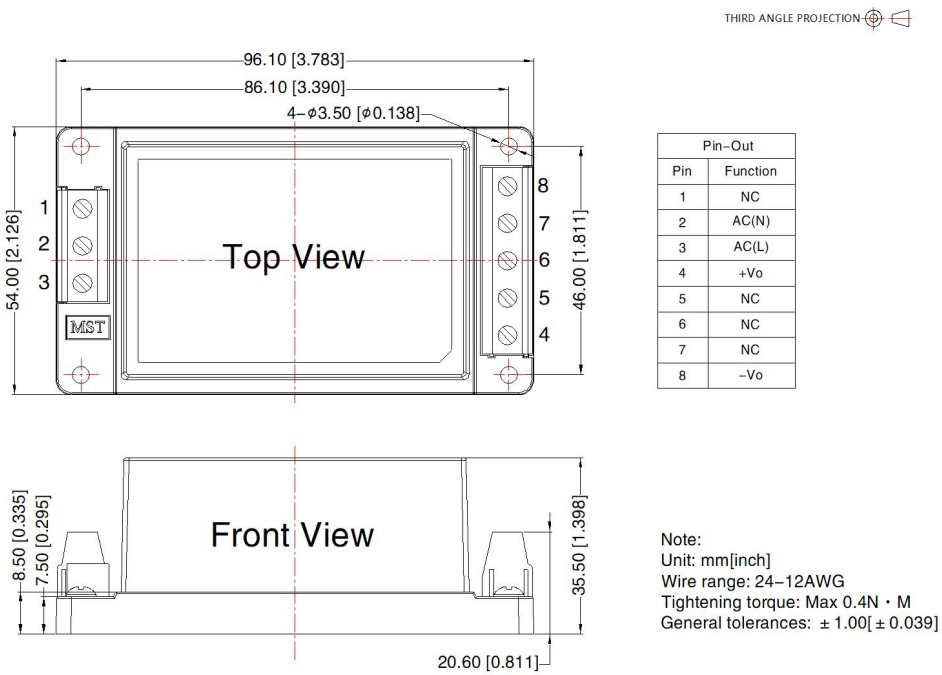
Component	Recommended value
FUSE	3.15A/300V, slow-blow, required
MOV	S14K350
CY1/CY2	1nF/400VAC
CX	684K/310V
LCM	20mH

Dimensions and Recommended



Pin-Out	
Pin	Mark
1	AC(N)
2	AC(L)
3	-Vo
4	+Vo

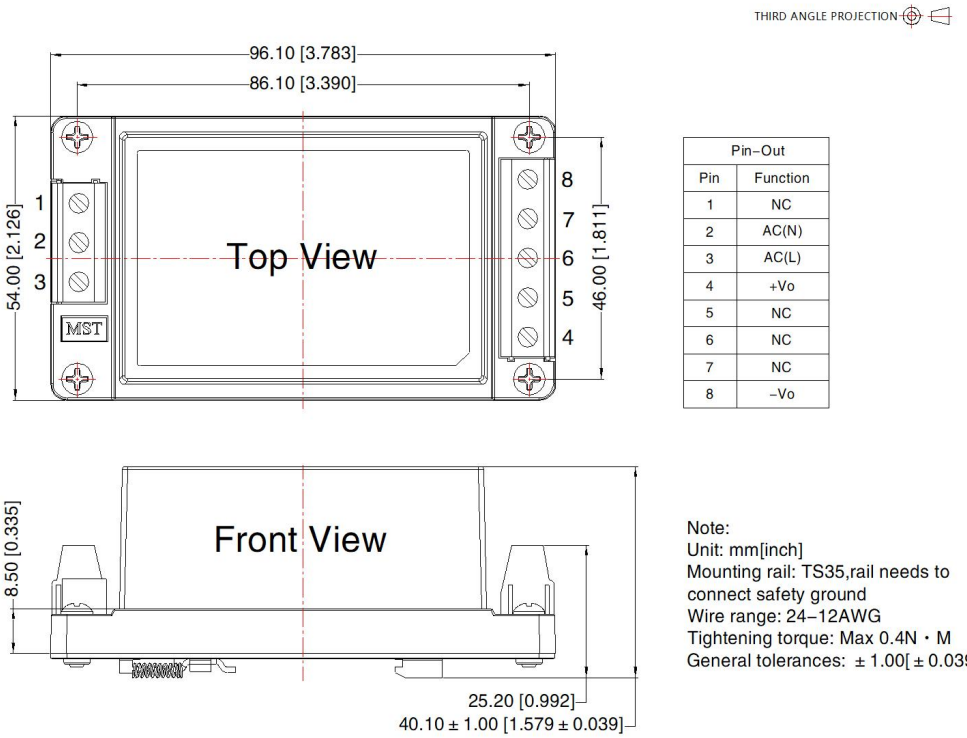
E2S Dimension



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

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

D4S Dimension



Pin-Out	
Pin	Function
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: 24-12AWG
Tightening torque: Max 0.4N・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. 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.