DESCRIPTIONS

20W, AC/DC Converter

RoHS

3 Years Warranty

CE Report UKCA Report

EN62368-1 BS EN62368-1

FEATURES

- Ultra-wide 85 - 305VAC and 100 - 430VDC input voltage range
- Operating ambient temperature range: -40℃ to +85℃
- High I/O isolation voltage up to 4200VAC
- Output short circuit, over-current, over-voltage protection
- Plastic case meets UL94V-0 flammability
- OVC III (meet EN62477-1)
- EMI performance meets CISPR32/EN55032 CLASS B

APPLICATIONS

- Industrial
- Electric automation
- Home appliances
- EV charging applications

Selection Guide

Certification	Part No.	Output Power	Nominal Output Voltage and Current(Vo/Io)	Efficiency at 230VAC (%) Typ.	Capacitive Load (uF) Max.
EN/BS EN	APD20-03-RC	13.2W	3.3V/4000mA	83	8000
	APD20-05-RC	20W	5V/4000mA	86	8000
	APD20-09-RC		9V/2222mA	86	5400
	APD20-12-RC		12V/1670mA	87	4000
	APD20-15-RC		15V/1333mA	88	3000
	APD20-24-RC		24V/830mA	87	1000
	APD20-48-RC		48V/410mA	89	330

Note: 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		--	--	0.5	A
			230VAC		--	--	0.3	
	Inrush Current		115VAC		--	20	--	
			230VAC		--	40	--	
	Leakage Current		277VAC/50Hz		0.1mA RMS Max.			
	Recommended External Input Fuse				3.15A/300V, slow-blow, required			
	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)	3.3V/5V/9V/12V/15V/24V output	--	100	150	mV
				48V output	--	100	250	
	Stand-by Power Consumption		230VAC	3.3V/5V/9V/12V/15V/ 24V output	--	0.12	--	W
				48V output	--	0.2	--	
	Temperature Coefficient				--	±0.02	--	%/℃
	Short circuit Protection				Hiccup, continuous, self-recover			
	Over-current Protection				≥120% Io, self-recover			
	Over-voltage Protection		3.3V/5V output		≤7.5VDC (Output voltage clamp or hiccup)			
			9V/12V output		≤16VDC (Output voltage clamp or hiccup)			
			15V output		≤20VDC (Output voltage clamp or hiccup)			
			24V output		≤30VDC (Output voltage clamp or hiccup)			
			48V output		≤60VDC (Output voltage clamp or hiccup)			
	Minimum Load				0	--	--	%
	Hold-up Time		115VAC input		--	5	--	ms
			230VAC input		--	40	--	
General Specifications	Isolation	Input-output	Hipot test for 1min., leakage current <5 mA		4200	--	--	VAC
	Insulation Resistance	Input-output	At 500VDC		100	--	--	MΩ
	Operating Temperature				-40	--	+85	℃
	Storage Temperature				-40	--	+85	

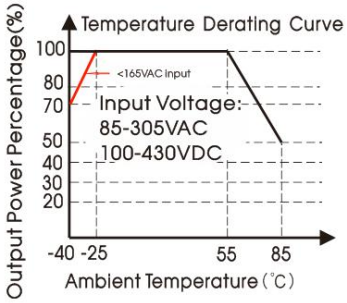
	Storage Humidity			--	--	95	%RH
	Soldering Temperature	Wave-soldering		260 ± 5℃; time: 5 - 10s			
		Manual-welding		360 ± 10℃; time: 3 - 5s			
	Switching Frequency			--	70	--	kHz
	Power Derating	-40℃ to -25℃	85VAC - 165VAC	2	--	--	%/℃
		+55℃ to +85℃		1.67	--	--	
		85VAC - 100VAC		1.333	--	--	%/VAC
		277VAC - 305VAC		0.714	--	--	
	Safety Class			CLASS I I			
	MTBF	MIL-HDBK-217F@25℃		≥1,000,000 h			
Mechanical Specifications	Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)					
	Dimension	52.40 x 27.20 x 24.00 mm					
	Weight	55g (Typ.)					
	Cooling method	Free air convection					

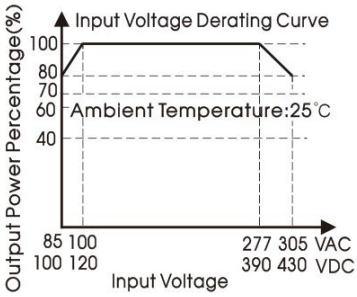
Note: *The "Tip and barrel method" is used for ripple and noise test, output parallel 10uF electrolytic capacitor and 1uF ceramic capacitor,

Electromagnetic Compatibility (EMC)

Electromagnetic Compatibility (EMC)	Emissions (EMI)	CE	CISPR32/EN55032 CLASS B	
		RE	CISPR32/EN55032 CLASS B	
		Flicker	IEC/EN6100-3-3	
	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, Fig. 3 for recommended circuit)	perf. Criteria A
		Surge	IEC/EN61000-4-5 line to line ±1KV	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
		CS	IEC/EN61000-4-6 10Vr.m.s	perf. Criteria A
		MS	IEC/EN6100-4-8 10A/m	perf. Criteria A
		Voltage dip, short interruption and voltage variation	IEC/EN61000-4-11 0%, 70%	perf. Criteria B

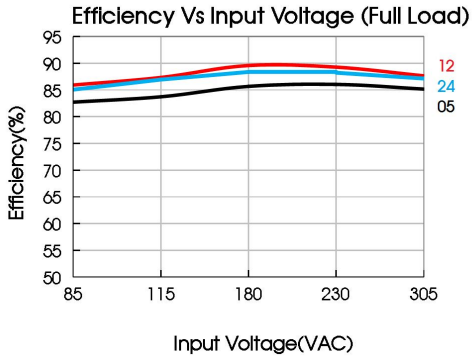
Characteristic Curve

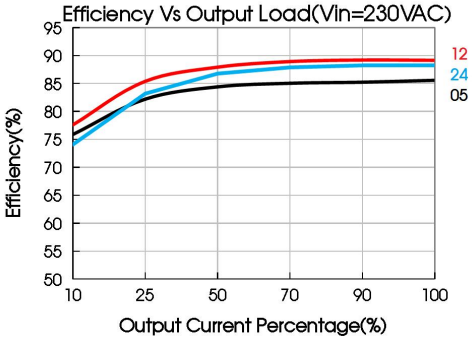




Note: ① With an AC input between 85-100VAC/277-305VAC and a DC input between 100-120VDC/390-430VDC, the output power must be derated as per temperature derating curves;

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





Design Reference

1. Typical application

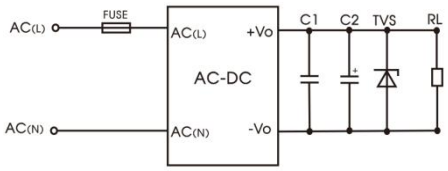


Fig.1: Typical ci-RCuit diagram

Part No.	FUSE	C1	C2	TVS
APD20-03-RC	3.15A/300V, slow-blow, required	1uF/50V	820uF/16V	SMBJ7.0A
APD20-05-RC			820uF/16V	SMBJ7.0A
APD20-09-RC			10uF/25V	SMBJ12A
APD20-12-RC			10uF/25V	SMBJ16A
APD20-15-RC			10uF/25V	SMBJ20A
APD20-24-RC			10uF/35V	SMBJ30A
APD20-48-RC		1uF/100V	10uF/63V	SMBJ60A

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 ci-RCuit

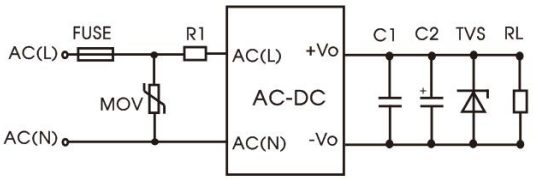


Fig. 2: EMC application ci-RCuit with higher requirements

Component	Recommended value
FUSE	3.15A/300V, slow-blow, required
MOV	S14K350
R1	12Ω/5W(wire-wound resistor, required)

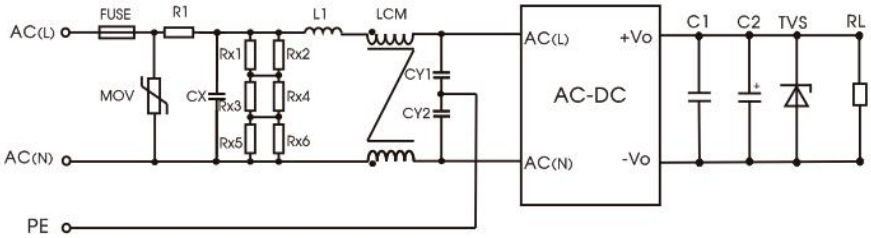
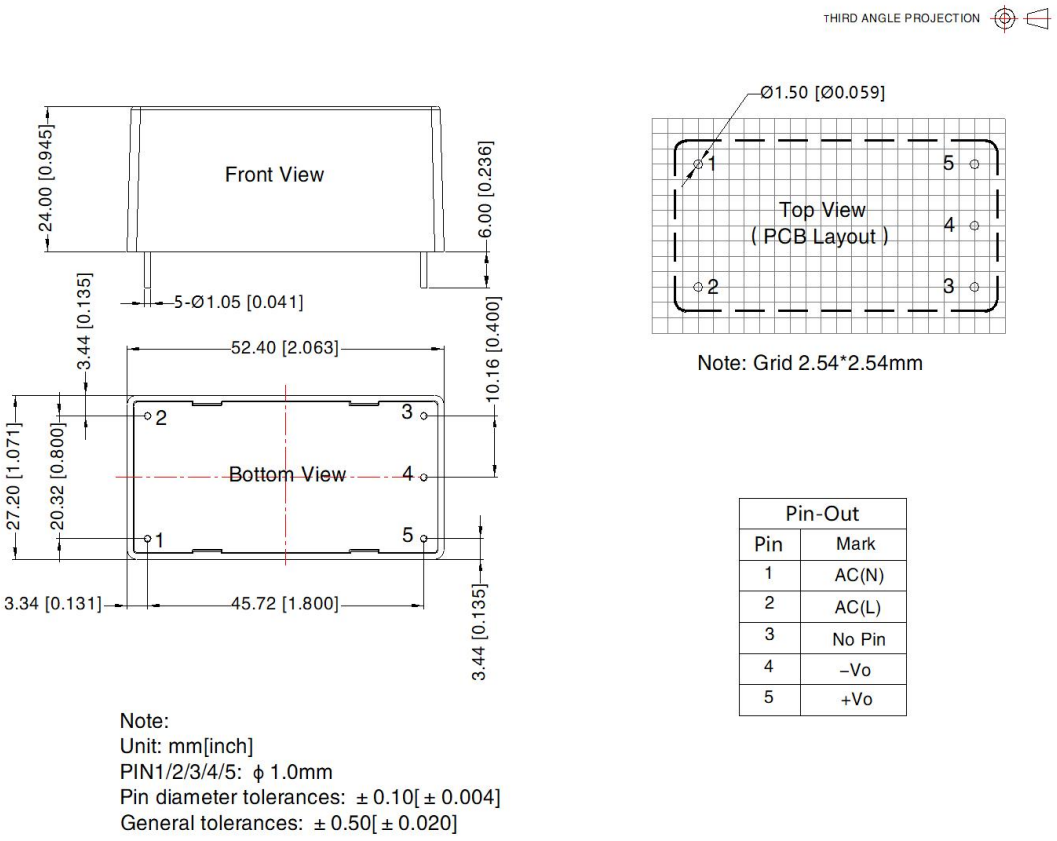


Fig. 3: EMC application ci-RCuit with higher requirements(Class Ⅰ)

Component	Recommended value
FUSE	3.15A/300V, slow-blow, required
MOV	S14K350
R1	12Ω/5W (wire-wound resistor, required)
CX	0.1uF/310VAC
L1	4.7uH/2A
LCM	10mH
CY1, CY2	1000pF/400VAC
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



Pin-Out	
Pin	Mark
1	AC(N)
2	AC(L)
3	No Pin
4	-Vo
5	+Vo

Note:
Unit: mm[inch]
PIN1/2/3/4/5: ϕ 1.0mm
Pin diameter tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.50[± 0.020]

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.