DESCRIPTIONS

20W, AC/DC Converter







RoHS

3 Years Warranty

c UL us Report

CE Report

UKCA Report

UL62368-1 EN62368-1 BS EN62368-1

FEATURES

- Ultra-wide 90 - 528VAC and 100 - 745VDC input voltage range
- Regulated output, low output ripple & noise
- Operating ambient temperature range : -40℃ to +70℃
- Output short circuit, over-current, over-voltage protection
- I/O isolation test voltage up to 4000VAC
- EFT /Surge: ±4KV Perf. Criteria B
- ES1 output (EN62368)

APPLICATIONS

- Electrical
- Instrumentation

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	APDW20-03	11.88	3.3V/3600mA	74	10000
UL/EN/ BS EN	APDW20-05	18	5V/3600mA	78	10000
UL/EN/ BS EN	APDW20-09	20	9V/2230mA	79	7000
UL/EN/ BS EN	APDW20-12		12V/1660mA	82	5000
UL/EN/ BS EN	APDW20-15		15V/1330mA	83	3000
UL/EN/ BS EN	APDW20-24		24V/833mA	83	1000

Note: 1. Use suffix " E2" for chassis and suffix " D4" 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	90	--	528	VAC
			DC input	100	--	745	VDC
	Input Frequency			47	--	63	Hz
	Input Current		115VAC	--	--	0.8	A
			230VAC	--	--	0.4	
	Inrush Current		115VAC	--	35	--	
			230VAC	--	60	--	
	Leakage Current		230VAC/50Hz	0.25mA RMS typ.			
	Recommended External Input Fuse			3.15A/500VAC, slow-blow, required			
	Hot Plug			Unavailable			
Output Specifications	Output Voltage Accuracy		3.3V	--	±3	--	%
			Others	--	±2	--	
	Line Regulation		Full load	--	±0.5	--	
	Load Regulation		0% - 100% load	--	±1.0	--	
	Ripple & Noise*		20MHz bandwidth (peak-to-peak value)	--	--	150	mV
	Temperature Coefficient			--	±0.02	--	%/℃
	Minimum Load			0	--	--	%
	Stand-by Power Consumption			--	--	0.75	W
	Hold-up Time		230VAC input	--	35	--	ms
			400VAC input	--	100	--	
	Short Circuit Protection			Hiccup, continuous, self-recovery			
	Over-current Protection			130 - 400%Io, self-recovery			
	Over-voltage Protection		3.3/5V output	≤ 7.5 V (Output voltage clamp)			
			9V output	≤ 15 V (Output voltage clamp)			
			12/15V output	≤ 20 V (Output voltage clamp)			
			24V output	≤ 30 V (Output voltage clamp)			
General Specifications	Isolation	Input-output	Electric Strength Test for 1min., leakage current < 5mA	4000	--	--	VAC
	Operating Temperature		Work in the power drop curve range	-40	--	+70	℃
	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	Switching Frequency			--	65	--	kHz

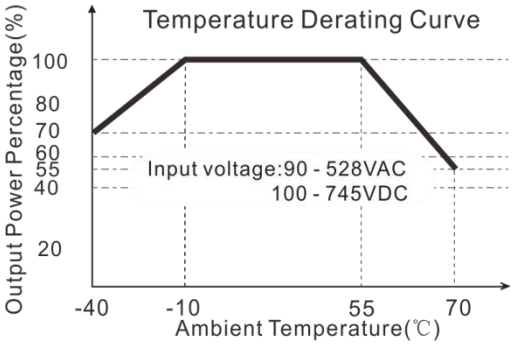
Specifications	Power Derating	+55℃ to +70℃	3.0	--	--	%/℃
		-40℃ to -10℃	1.0	--	--	
		90VAC - 110VAC	2.0	--	--	%/VAC
		480AVC - 528VAC	0.417	--	--	
	Safety Class		CLASS I I			
	MTBF	MIL-HDBK-217F@25℃	≥ 300,000 h			
Mechanical Specifications	Case Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)				
	Dimension	Horizontal package	70.00 x 48.00 x 30.00mm			
		E2 chassis mounting	96.10 x 54.00 x 38.50 mm			
		D4 Din-Rail mounting	96.10 x 54.00 x 43.10 mm			
	Weight	Horizontal package	160g (Typ.)			
		E2 chassis mounting	210g (Typ.)			
		D4 Din-Rail mounting	250g (Typ.)			
	Cooling method	Free air convection				

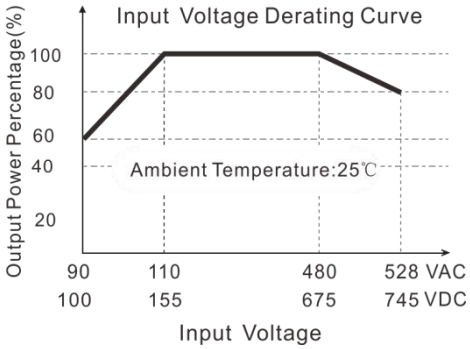
Note: *The "parallel cable" method is used for ripple and noise test.

Electromagnetic Compatibility (EMC)

Electromagnetic Compatibility (EMC)	Emissions (EMI)	CE	CISPR32/EN55032 CLASS B	
		RE	CISPR32/EN55032 CLASS B	
	Immunity (EMS)	ESD	IEC/EN 61000-4-2 Contact ±6KV/Air ±8KV	Perf. Criteria B
		RS	IEC/EN 61000-4-3 10V/m	perf. Criteria A
		EFT	IEC/EN 61000-4-4 ±2KV	perf. Criteria B
			IEC/EN 61000-4-4 ±4KV (See Fig. 2 or Fig. 3 for recommended circuit)	perf. Criteria B
		Surge	IEC/EN 61000-4-5 line to line ±2KV	perf. Criteria B
			IEC/EN 61000-4-5 line to line ±4KV (See Fig. 2 or Fig. 3 for recommended circuit)	perf. Criteria B
		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

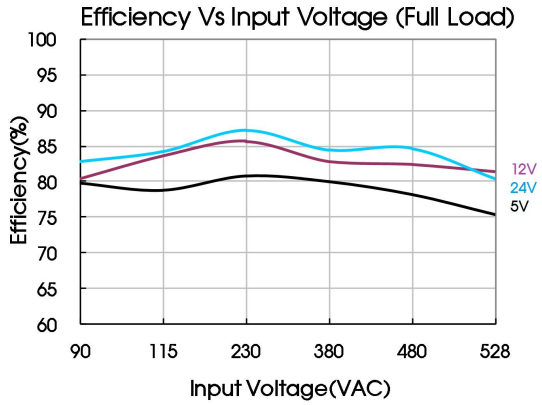
Characteristic Curve

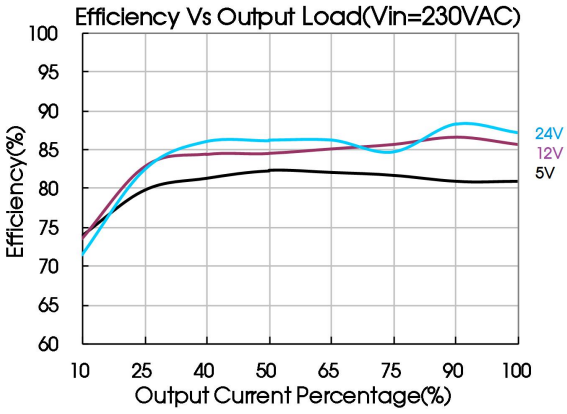




Note: ① With an AC input between 90-110VAC/ 480-528VAC and a DC input between 100-155VDC/675-745VDC, the output power must be derated as per temperature derating curves;

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





Design Reference

1. Typical application

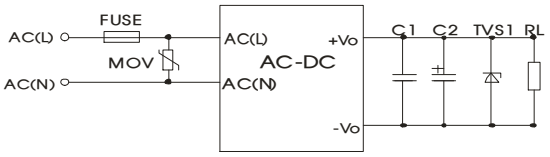


Fig. 1

Part No.	FUSE	MOV	C1 (uF)	C2 (uF)	TVS1
APDW20-03	3.15A/500VAC, slow-blow, required	S20K625	1	330	SMBJ7.0A
APDW20-05				330	SMBJ7.0A
APDW20-09				220	SMBJ12A
APDW20-12				220	SMBJ20A
APDW20-15				220	SMBJ20A
APDW20-24				220	SMBJ30A

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

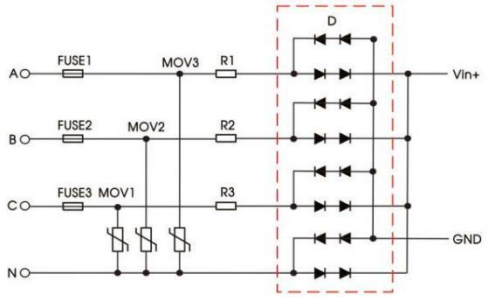


Fig. 2 Recommended circuit for applications which require 4KV differential-mode inrush standard (full-wave rectification)

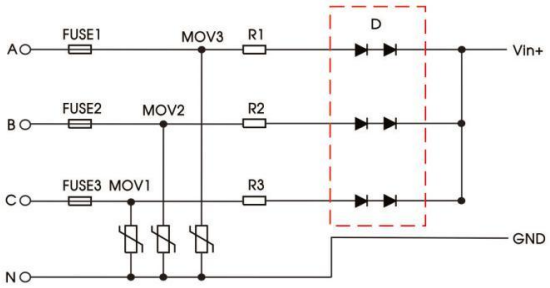
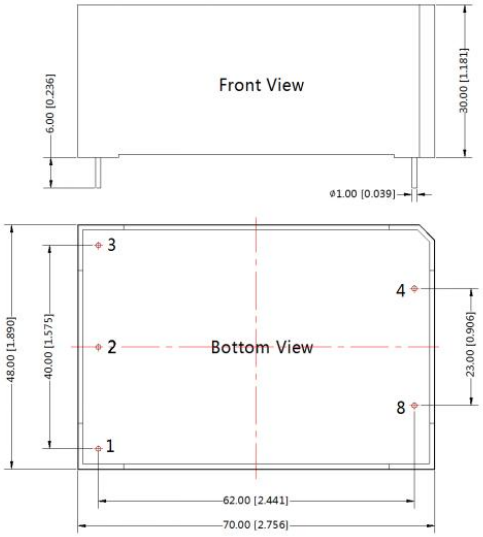
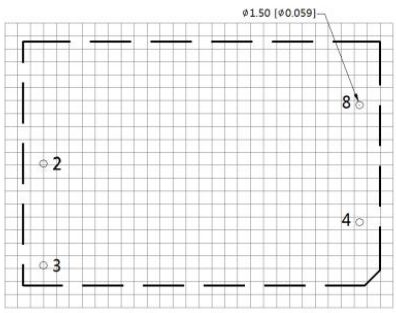


Fig. 3 Recommended circuit for applications which require 4KV differential-mode inrush standard (half-wave rectification)

Recommend Parameter For Higher EMC Standard Circuit	
Component	Recommended value
MOV1, MOV2, MOV3	S20K510
D	2A/1000V
R1, R2, R3	10Ω/5W
FUSE1, FUSE2, FUSE3	3.15A/500VAC, slow-blow, required

Dimensions and Recommended



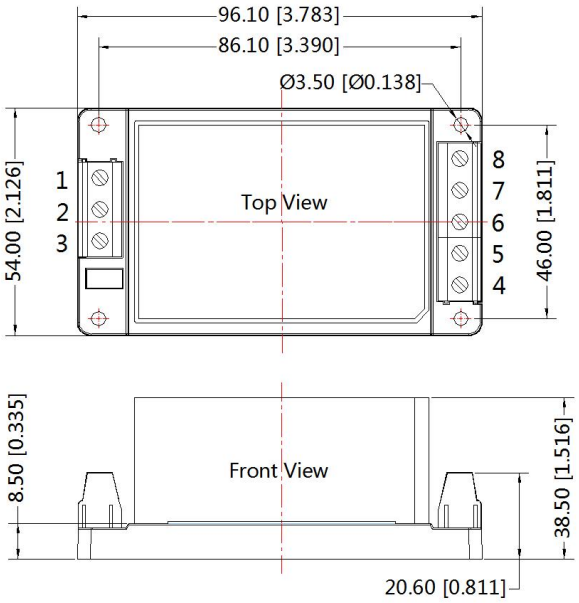


Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	No pin
2	AC(N)
3	AC(L)
4	+Vo
8	-Vo

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

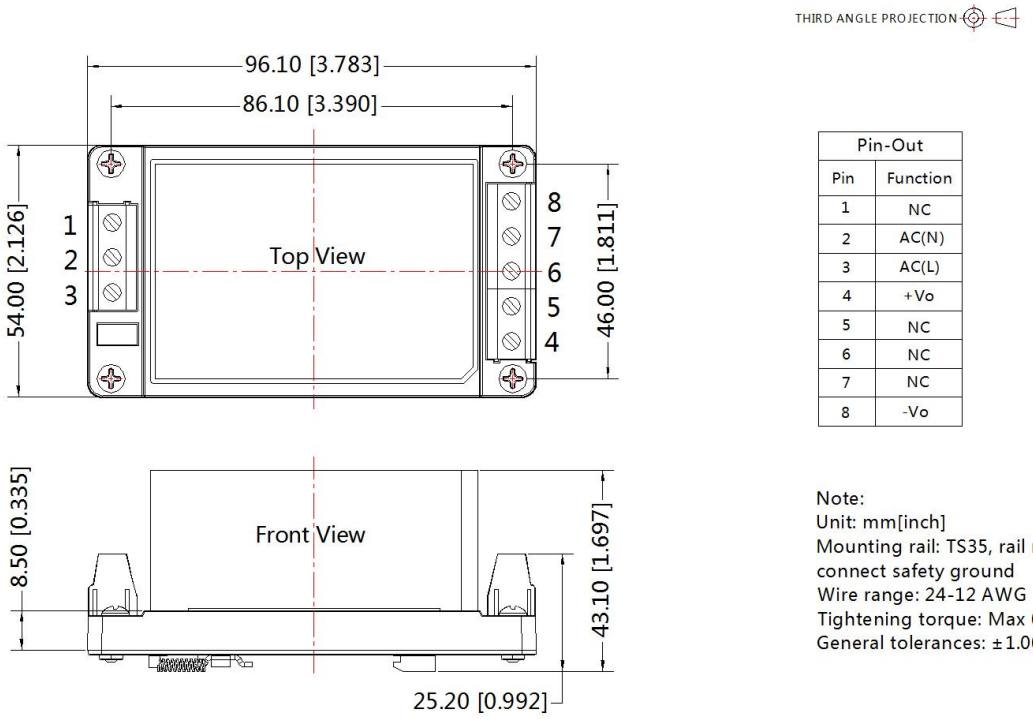
E2 Dimension



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: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ±1.00[±0.039]

D4 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: 24-12 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. 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.