30ACB1W_4 series

30W - AC-DC converter

AC-DC Converter 30 Watt

- Wide input voltage range: 176-528VAC/248-745VDC
- No-load power consumption ≤0.5W
- Transfer efficiency 82%
- Switching frequency: 65kHz
- Output short circuit, over current, over voltage protection
- Isolation voltage: 4000VAC
- Meets IEC62368/UL62368/EN62368 test standards
- Conform to CE, RoHS
- Plastic case, meets flammability UL94 V-0
- PCB mounting, chassis mounting, DIN-rail mounting options

Introducing our advanced 30ACB1W_4 series designed to meet the highest standards of performance and reliability. With a wide input voltage range of 176-528VAC and 248-745VDC, this power supply ensures robust operation across various applications. It features minimal no-load power consumption of ≤0.5W, enhancing energy efficiency, and boasts an impressive transfer efficiency of 82%, optimizing power usage. Operating at a switching frequency of 65KHz, it delivers stable performance. Safety and durability are guaranteed with comprehensive protection mechanisms against output short circuits, over-current, and over-voltage, complemented by a high isolation voltage of 4000VAC for superior electrical isolation. Our power supply conforms to the stringent IEC62368, UL62368, and EN62368 test standards and meets CE and RoHS certifications for quality and environmental compliance.

SHORT CIRCUIT PROTECTED

100% RoHS compliant

c UL us
UL62368 - E347551
Pending

Common specifications

Short circuit protection	Full input voltage range - Continuous, Self-recovery Hiccup
Over current protection	Input 230VAC - ≥120% Io, Self-recovery - Hiccup
Over voltage protection	5VDC Output ≤7.5 VDC 12VDC Output ≤20 VDC 15VDC Output ≤20 VDC 24VDC Output ≤30 VDC
Switching frequency	65 KHz (typ.)
Operating temperature	-40°C - +85°C Derating based on Temperature Derating Curve, see "Product Characteristic Curve" at back.
Storage temperature	-40°C - +85°C
Soldering temperature	Wave soldering 260±4°C, time 5-10S Manual soldering 360±8°C, time 4-7S
Relative humidity	10~90% RH
Hot plug	Unavailable
Remote control terminal	Unavailable
Safety standard	IEC62368/EN62368/UL62368
Vibration	10-55Hz, 10G, 30Min, along X, Y ,Z
Safety class	CLASS I
MTBF (MIL-HDBK-217F@25°C)	>300,000 Hours
Case material	UL94 V-0

Input specifications

Item	Operating condition	Min	Typ	Max	Units
Input voltage range	AC input DC input	176 248	230 325	528 745	VAC VDC
Input frequency range		47	50	63	Hz
Input current	176VAC 230VAC			0.40 0.32	A
Surge current	176VAC 230VAC			35 60	A
No load power consumption	Input 176VAC Input 230VAC			0.5	W
External fuse	2.0-3.15A/500VAC slow-fusing, necessary				
Leakage current	230VAC/50Hz - 0.5mA RMS TYP				

Example:
30ACB1W_05S4
30 = 30Watt; AC = AC-DC; B1 = Series; W = Wide input;
05 = 5Vout; S = Single output; 4 = 4 kVAC isolation

Output specifications

Item	Operating condition	Min	Typ	Max	Units
Voltage accuracy	Full input voltage range, Any load		±2.0	±3.0	%
Line Regulation	Nominal Load			±0.5	%
Load regulation	Nominal input voltage 20%~100% load			±1.0	%
No load power consumption	Input 115VAC Input 220VAC			≤0.5	W
Minimum load	Single Output	0			%
Turn-on delay time	Input 230VAC Input 400VAC		2000		mS
Power-off holding time	Input 230VAC Input 400VAC		35 100		mS
Dynamic response	Overshoot range 25%~50%~25% Recovery time 50%~75%~50%	Overshoot range(%):≤±10.0 Recovery time(mS):≤5.0			
Output overshoot	Full input voltage range		≤10%Vo		%
Drift coefficient		-	±0.02%	-	%/°C

Note 1: Ripple& noise is tested by twisted pair method. Details please refer to the following section (Ripple & Noise Test).

Isolation specifications

Item	Operating Conditions	Min	Typ	Max	Units
Isolation voltage	I/P-O/P test 1min, leakage current ≤5mA I/P-O/P @DC500V	4000 100			VAC MΩ

1. The product should be used under the specification range, otherwise it will cause permanent damage to it.
2. Product's input terminal should connect to fuse;
3. If the product is not worked under the load range (below the minimum load or beyond the load range), we cannot ensure that the performance of product is in accordance with all the indexes in this manual;
4. Unless otherwise specified, data in this datasheet are tested under conditions of Ta = 25°C, humidity <75% when inputting nominal voltage and outputting rated load (pure resistance load);
5. All index testing methods in this datasheet are based on our company's corporate standards
6. The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, please directly contact our technician for specific information;
7. We can provide customized product service;
8. The product specification may be changed at any time without prior notice.

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EMC specifications					
EMC	EMI	CE	CISPR22/EN55032	CLASS B	
EMC	EMI	RE	CISPR22/EN55032	CLASS B	
EMC	EMS	RS	IEC/EN61000-4-3	10V/m	Perf.Criteria A
EMC	EMS	CS	IEC/EN61000-4-6	3Vr.m.s	Perf.Criteria A
EMC	EMS	ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV	Perf.Criteria B
EMC	EMS	Surge	IEC/EN61000-4-5	Line to line ±2KV Line to line ±4KV	Perf.Criteria B Perf.Criteria B (see recommended circuit Photo 2,3)
EMC	EMS	EFT	IEC/EN61000-4-4	±2KV ±4KV	Perf.Criteria B Perf.Criteria B (see recommended circuit Photo 2,3)
EMC	EMS	Voltage dip, short interruption and voltage variation	IEC/EN61000-4-11	0%~70%	Perf.Criteria B

Product Selection Guide

Approval	Model	Output Power (W)	Output Voltage (V)	Output Current (mA)	Max. Capacitive Load (uF)	Ripple & Noise 20MHz (Max) mVp-p	Efficiency Full Load, 230VAC Typ. (%)
	30ACB1W_05S4	30	5	6000	7000	100	78
	30ACB1W_12S4	30	12	2500	5000	120	82
	30ACB1W_15S4	30	15	2000	2000	120	82
	30ACB1W_24S4	30	24	1250	1000	150	83

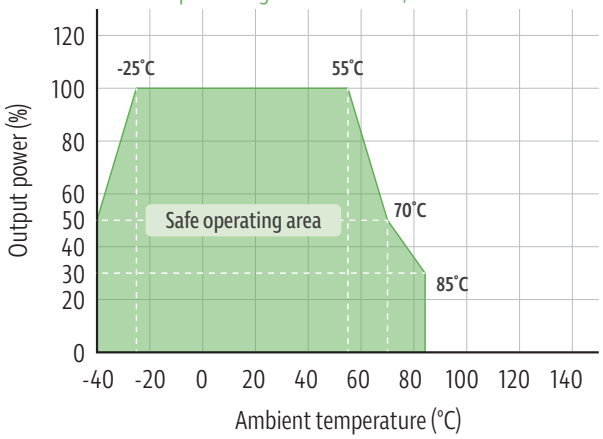
Note:

1. Please use suffix /CM for chassis mounting, suffix /DR for Din-rail mounting, rail width 35mm (30ACB1W_24S4/CM/DR)
2. The typical output efficiency is based on that product is full loaded and burned-in after half an hour.
3. Fluctuation range of full load efficiency (%,typ) is ±2%, full load output efficiency= total output power/module's input power.

Product characteristic curve

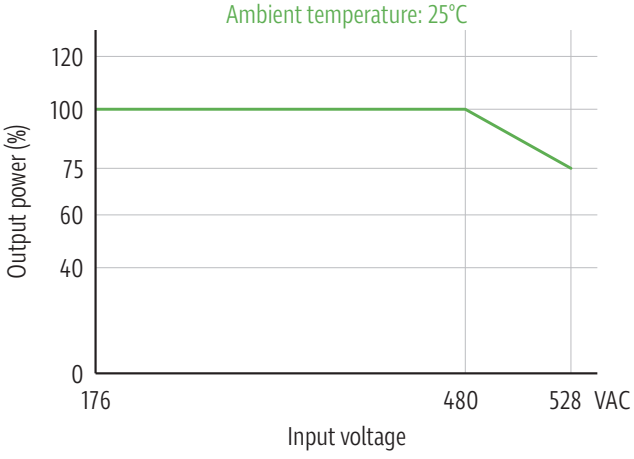
Temperature derating graph

Input voltage 176 - 480VAC / 248 - 678VDC



Input voltage derating curve

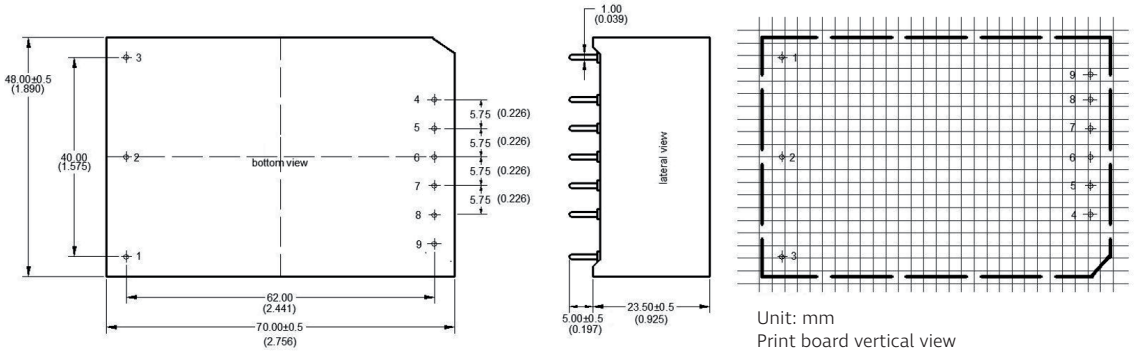
Ambient temperature: 25°C



Note

1. Input Voltage should be derated base on Input Voltage Derating Curve when it is 480~528VAC/675~745VDC.
2. Our product is suitable to use under natural air cooling environment, if use it under closed condition, please contact with us.

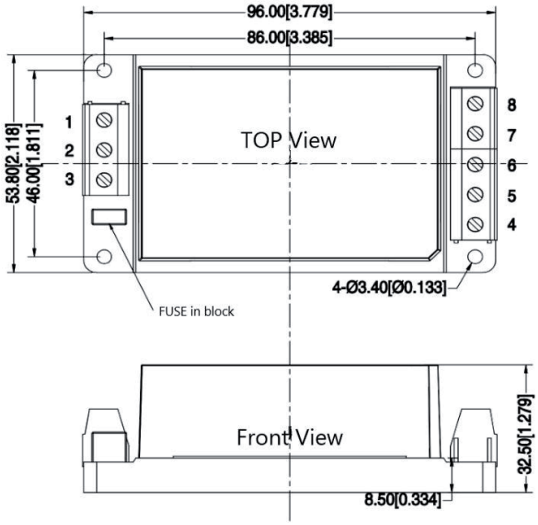
Standard packing dimensions



Unit: mm
Print board vertical view
Grid: 2.54mm(0.1inch)
General tolerance: ±0.25mm
Pin section tolerances: ±0.10mm

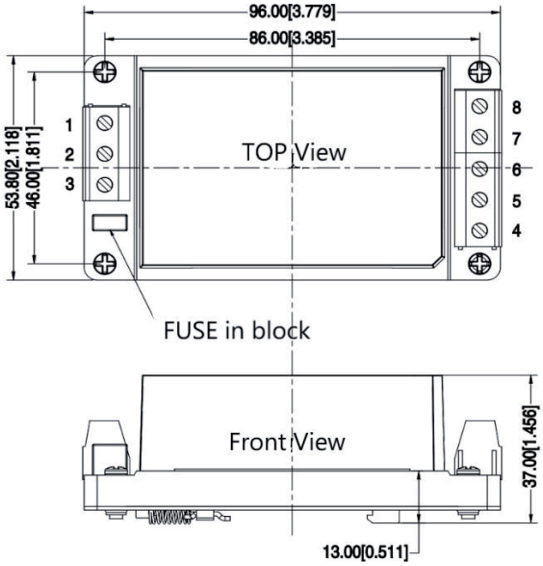
Pin-out	1	2	3	4	5	6	7	8
Standard	FG	AC (N)	AC (L)	+Vo	NP	NP	NP	-Vo
Chassis mount	FG	AC (N)	AC (L)	+Vo	NC	NC	NC	-Vo
DIN rail mount	FG	AC (N)	AC (L)	+Vo	NC	NC	NC	-Vo

Chassis mounting packing dimensions



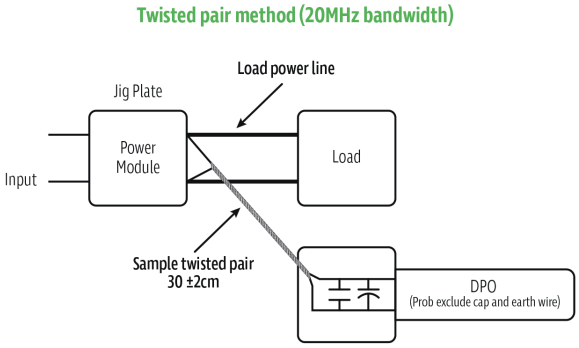
Unit: mm
Print board vertical view
Grid: 2.54mm(0.1inch)
General tolerance: ±0.5mm
Pin section tolerances: ±0.10mm

DIN rail mounting packing dimensions



Unit: mm
Print board vertical view
Grid: 2.54mm(0.1inch)
General tolerance: ±0.5mm
Pin section tolerances: ±0.10mm

Ripple & noise test: (twisted pair method 20MHz bandwidth)



Test Method:

1. Connect the twisted pair, set the oscilloscope bandwidth to 20MHz, use a 100M bandwidth probe, and terminate with a 0.1uF polypropylene capacitor and a 10uF high-frequency low-resistance electrolytic capacitor in parallel. Configure the oscilloscope to sample mode.

2. Connect the input terminal to the power supply and the output terminal to the electronic load using a jig plate. Use a 30cm (±2 cm) sampling line, and select the power line from appropriately insulated wires of the corresponding diameter according to the output current flow.

Typical application circuit

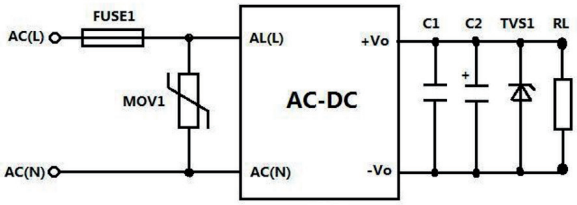


Photo 1

EMC solution recommended circuit

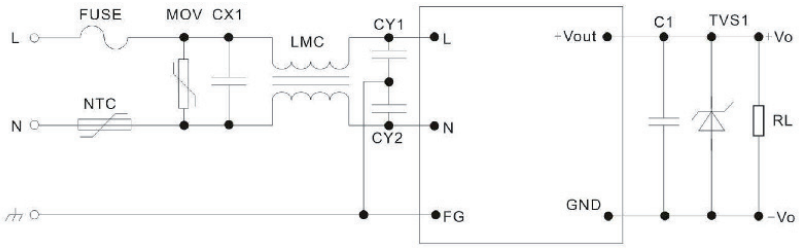


Photo 2

Model	FUSE1	MOV1	C1	C2	TVS1
30ACB1W_05S4	2.5A/500VAC, slowing fusing, necessary	14D911K	1uF/50V	330uF/10V	SMBJ7.0A
30ACB1W_12S4	2.5A/500VAC, slowing fusing, necessary	14D911K	1uF/50V	220uF/16V	SMBJ20A
30ACB1W_15S4	2.5A/500VAC, slowing fusing, necessary	14D911K	1uF/50V	220uF/25V	SMBJ30A
30ACB1W_24S4	2.5A/500VAC, slowing fusing, necessary	14D911K	1uF/50V	220uF/35V	SMBJ30A

Note:

1. CX1 is X capacitor, the recommended model is 0.22uF/275VAC;
2. LMC is a common mode inductor, and the recommended inductance is 25mH;
3. The output filter capacitor C2 is an electrolytic capacitor. It is recommended to use a high-frequency, low-resistance electrolytic capacitor. Please refer to the technical specifications provided by each manufacturer for the capacity and flowing current. The withstand voltage of the C2 capacitor should be derated to at least 80%. C1 is a ceramic capacitor to remove high-frequency noise;
4. The TVS1 tube protects the downstream circuit when the module is abnormal and is recommended to be used.

Recommended circuit for general system in strong lightning surge environment

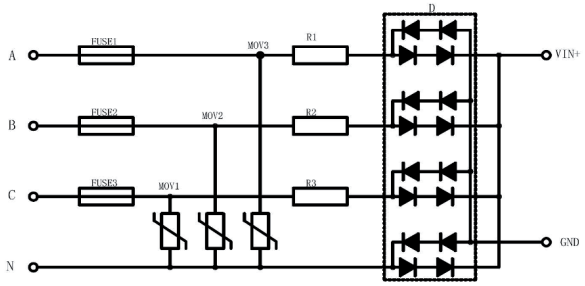


Photo 3: Recommended peripheral circuits for high requirements of 4KV differential mode surge - full wave rectification

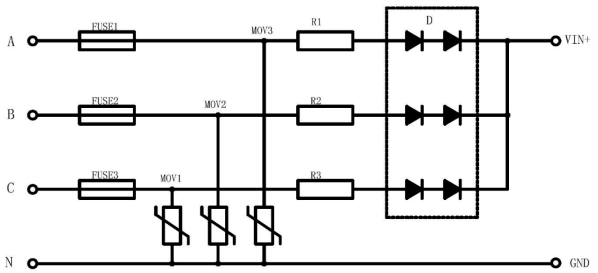


Photo 4: Recommended peripheral circuits for high 4kV differential mode surge requirements - half-wave rectification

Recommended parameter values for application circuits with higher EMC requirements	
Components	Recommended Value
MOV1, MOV2, MOV3	20D911K
D	2A/1000V
R1,R2,R3	10Ω/5W
FUSE1, FUSE2, FUSE3	2.5A/500VAC,slowing fusing, necessary