10AC1AW_3.1 series

10W - AC-DC converter

AC-DC Converter 10 Watt

- Wide input voltage range 90-310VAC/127-438VDC
- Transfer efficiency 83% (typ.)
- Switching frequency: 65kHz (typ.)
- Over current, short circuit protection
- Isolation: 3100VAC
- PCB mounting
- Plastic case shielded, meets flammability UL94 V-0
- Meets IEC62368/UL62368/ EN62368 test standards
- RoHS certificate

Introducing our advanced 10AC1AW_3.1 series with a wide input voltage range of 90-310VAC/127-438VDC, designed to deliver optimal performance with a typical transfer efficiency of 83%. Operating at a switching frequency of 65kHz, this converter includes essential protections such as over-current and short circuit protection. It features robust isolation of 3100VAC and is designed for convenient PCB mounting. The converter is encased in a plastic shielded case that meets the stringent flammability standards of UL94 V-0. Additionally, it complies with IEC62368/UL62368/ EN62368 test standards and holds a RoHS certificate, ensuring both safety and environmental responsibility.

SHORT CIRCUIT PROTECTED

100% RoHS compliant

c UL us
UL62368 - E347551
Pending

Common specifications

Short circuit protection	Continuous, Self-recovery; Output Switched off Hiccup
Over load/current protection	≥110%Po/Io - Output Switched off (Hiccup)
Switching frequency	jitter 65 kHz (typ.)
Operating temperature	-25°C - +65°C For the operating temperature range please refer to the temperature derating curve
Storage temperature	-40°C - +105°C
Max Case Temperature	+95°C
Relative humidity	10~90% RH
MTBF (@25°C)	>300,000 Hours

Input specifications

Item	Operating condition	Min	Typ	Max	Units
Input voltage range		90 127	220	310 438	VAC VDC
Input frequency range		47	50	63	Hz
Input current	100VAC 220VAC			0.18 0.12	A
Surge current	100VAC 220VAC			10 20	A
Standby power consumption				0.2	W
Input Capacitor CE1, CE2	10uF/450V				

Isolation specifications

Item	Operating Conditions	Min	Typ	Max	Units
Isolation voltage	Input to Output ≤ 5.0mA/1min;			3100	VAC

Example:
10AC1AW_05S3.1
10 = 10Watt; AC = AC-DC; 1A = Series; W = Wide input (2:1);
05 = 5Vout; S = Single output; 3.1 = 3.1 kVAC isolation

Output specifications

Item	Operating condition	Min	Typ	Max	Units
Voltage accuracy	Vo1			±2.0	%
Line Regulation	Nominal load, full input voltage range - Vo1			±0.5	%
Load regulation	20% ~ 100% Nominal load, Vo1			±1.0	%
Minimum load	Single Output			10%	Load
Ripple & Noise 20MHz BM (full load)	Vo ≤5.0V, Vo ≥48V Other			≤100 ≤180 ≤150	mVp-p mVp-p mVp-p
Turn-on delay time	Nominal input voltage, full load			≤1000	mS
Power-off holding time	Nominal input voltage, full load			80	mS
Output dynamic characteristics	25% ~ 50% ~ 25% 50% ~ 75% ~ 50%	Overshoot range Recovery time		≤± 5 ≤5.0	% mS
Temperature drift			±0.03%		%/°C

1. The product should be used within the specification range, or it will cause permanent damage to it;
2. The input terminal should connect to fuse;
3. 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;
4. If the product worked beyond the load range, we cannot ensure that the performance of product is in accordance with all the indexes in this manual;
5. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta = 25°C, humidity <75% with nominal input voltage and rated output load (pure resistance load);
6. All index testing methods in this datasheet are based on our company's corporate standards;
7. 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.
8. The datasheet is subject to change without prior notice.

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EMC specifications					
EMC	EMI	CE	CISPR22/EN55032	CLASS B (see recommended circuit)	
EMC	EMI	RE	CISPR22/EN55032	CLASS B (see recommended circuit)	
EMC	EMS	ESD	IEC/EN61000-4-2	±6KV/8KV(bare board)	Perf.Criteria B
EMC	EMS	RS	IEC/EN61000-4-3	10V/m	Perf.Criteria B
EMC	EMS	EFT	IEC/EN61000-4-4 IEC/EN61000-4-4	±2KV (recommended circuit) ±2KV (recommended circuit Photo 1)	Perf.Criteria B Perf.Criteria B
EMC	EMS	Surge	IEC/EN61000-4-5 IEC/EN61000-4-5	±1KV(recommended circuit) ±2KV(recommended circuit Photo 1)	Perf.Criteria B Perf.Criteria B
EMC	EMS	CS	IEC/EN61000-4-6	3Vr.m.s	Perf.Criteria B
EMC	EMS	PFMF	IEC/EN61000-4-8	10A/m	Perf.Criteria A
EMC	EMS	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%-70%	Perf.Criteria B

Product Selection Guide

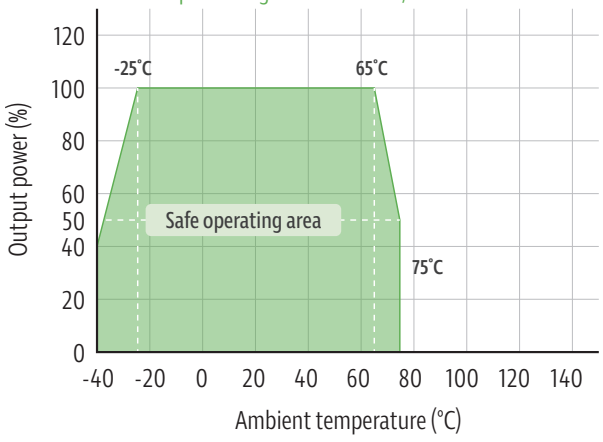
Approval	Model	Input voltage range	Output Voltage Vo1 (V)	Output Current Io1 (mA)	Max. Capacitive Load (uF)	Ripple & Noise 20MHz mVp-p	Efficiency Full Load, Nominal Input Voltage Typ. (%)
	10AC1AW_05S3.1	90-310VAC/127-438VDC	5	1500	6000	100	74
	10AC1AW_09S3.1	90-310VAC/127-438VDC	9	1111	5000	150	81
	10AC1AW_12S3.1	90-310VAC/127-438VDC	12	833	5000	150	82
	10AC1AW_15S3.1	90-310VAC/127-438VDC	15	667	4000	150	82
	10AC1AW_24S3.1	90-310VAC/127-438VDC	24	417	500	150	83

Note:

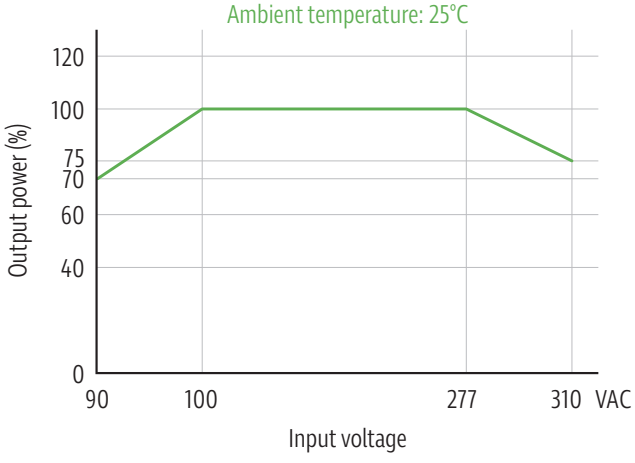
1. The lowest efficiency is -2% of typical value due to instrument tolerance of test equipment.
2. Output Efficiency (typ.) is based on that product is full loaded and burned-in after half an hour.

Product characteristic curve

Temperature derating graph
Input voltage 100 - 277VAC / 140 - 390VDC



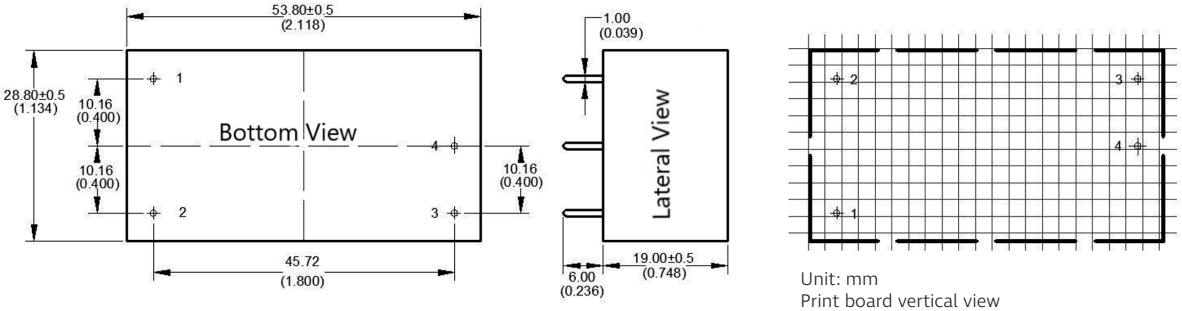
Input voltage derating curve
Ambient temperature: 25°C



Note

1. Input voltage should be derated based on input voltage derating curve when it is 90~100VAC/277~310VAC/127~140VDC/ 390~438VDC;
2. This product is suitable to use in natural air cooling environments, if in a closed environment, please contact with us.

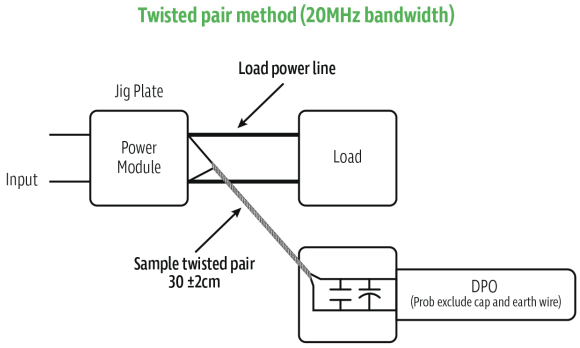
Standard packing dimensions



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
Single (S)	AC (N)	AC (L)	+Vo	-Vo

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.

EMC solution recommended circuit

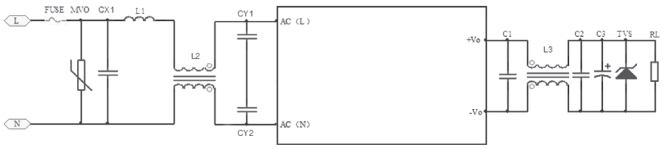


Photo 1

Model	C3(uF)	TVS
10AC1AW_05S3.1	220	SMBJ7A
10AC1AW_12S3.1	220	SMBJ20A
10AC1AW_24S3.1	47	SMBJ30A

Note:
Output filter capacitor C3 is electrolytic capacitor, recommended to use high frequency low resistance one, capacitance and output current please refer to the technical specifications provided by the manufacturers; withstand capacitor C3 voltage derating be 80% or above; capacitor C1,C2 are ceramic capacitors, to remove the high frequency noise, recommend 0.1uF/50V/1206; TVS is a recommended component to protect post-circuits (if converter fails);

Component	Name	Component Recommended Value
FUSE	Fuse	3.15A/250VAC, slow fusing, necessary
MOV	Voltage dependent resistor	14D471K
CX1	X Capacitor	0.22uF/275VAC
L1	Differential mode inductor	2.5uH/2.5A I inductor
L2	Common mode inductor	Green Ring 15mH/2.5A T12X7X6mm
CY1	Y capacitor	102M-400VAC
CY2	Y capacitor	102M-400VAC
L3	Common mode inductor	Green Ring, T13X8,145uH
RL	Customer terminal load (end product)	Customer terminal load (end product)