2ACE1W_3 series

2W - AC-DC converter

AC-DC Converter 2 Watt

- **Wide input voltage range: 85-305VAC/120-430VDC**
- **No load power consumption: ≤0.3W (typ.)**
- **Transfer efficiency (typical 75%)**
- **Switching frequency: 65kHz**
- **Protections: short circuit, over current and over temperature**
- **Isolation voltage: 3000VAC**
- **Meets IEC62368/UL62368/ EN62368 test standard**
- **Pass UL, FCC, CE, RoHS certificate**
- **Plastic case, meet UL94 V-0 class**
- **PCB mounting**

Introducing our latest 2ACE1W_3 series engineered for versatility and reliability: Unlocking a wide input voltage range of 85-305VAC/120-430VDC, this power module adapts effortlessly to diverse operational environments. Its remarkable efficiency is underscored by a minimal no-load power consumption of ≤0.3W (typ.), ensuring optimal energy utilization.

With a transfer efficiency peaking at 75% in typical conditions, this module delivers consistent performance, while its 65KHz switching frequency guarantees smooth operation.

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 220VAC - ≥120% Io self-recovery; Hiccup
Switching frequency	65 kHz (typ.)
Operating temperature	-40°C - +75°C (with derating)
Storage temperature	-40°C - +85°C
Soldering temperature	Wave soldering 260°C (±4°C), time 5-10s Manual soldering 360°C (±8°C), time 4-7s
Relative humidity	10~90% RH
Hot plug	Unavailable
Remote control terminal	Unavailable
Safety standard	EN62368, IEC62368, UL62368
Vibration	10-55Hz, 10G, 30Min, along X, Y, Z
Safety standard	CLASS II
Class of case material	UL94 V-0
MTBF (MIL-HDBK-217F@25°C)	>300,000 Hours

Input specifications

Item	Operating condition	Min	Typ	Max	Units
Input voltage range	AC input DC input	85 120	220 310	305 430	VAC VDC
Input frequency range		47	50	63	Hz
Input current	115VAC 220VAC			0.06 0.04	A
Surge current	115VAC 220VAC			10 20	A
No-load power consumption	Input 230VAC Output 480VAC			0.2 0.5	W
Leakage current	0.5mA typ./230VAC/50Hz				
Recommended external Input fuse	1A-2A/250VAC slow fusing				

Example:
2ACE1W_05S3
2 = 2Watt; AC = AC-DC; E1 = Series; W = Wide input (2:1);
05 = 5Vout; S = Single output; 3 = 3 kVAC isolation

Output specifications

Item	Operating condition	Min	Typ	Max	Units
Voltage accuracy	Input voltage 220V, any load - Vo			±5.0	%
Linear regulation	Nominal load - Vo			±1.0	%
Load regulation	Nominal input voltage, 20%~100% load - Vo			±5.0	%
No load consumption	Input 115VAC Input 220VAC		0.1	0.3	W
Minimum load	Single Output	10			%
Start up delay time	Nominal input voltage (full load)		200		mS
Power-off holding time	Input 115VAC (full load) Input 220VAC (full load)		50 80		mS
Power down hold time	Input 220VAC (full load)		70		mS
Dynamic response	Overshoot range 25% ~ 50% ~ 25% Recovery time 50% ~ 75% ~ 50%	-5.0 -5.0		+5.0 +5.0	% mS
Output overshoot	Input full voltage range		≤10%Vo		%
Temperature drift		-	±0.03%	-	%/°C
Ripple noise*	Input 220VAC (full load)	50	80	120	mV

Note: *Ripple & noise is tested by twisted pair method, details please refer to

Isolation specifications

Item	Operating Conditions	Min	Typ	Max	Units
Isolation voltage	Input-output test 1min, leakage current ≤5mA	3000			VAC
Insulation resistance	Input-Output @ DC500V	100			MΩ

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 worked under the minimum requested load, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
4. 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;
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. We can provide product customization service.

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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 B
EMC	EMS	CS	IEC/EN61000-4-6	3Vr.m.s	Perf.Criteria B
EMC	EMS	ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV	Perf.Criteria B (see recommended circuit photo 2)
EMC	EMS	Surge	IEC/EN61000-4-5	±1KV	Perf.Criteria B (see recommended circuit photo 2)
EMC	EMS	EFT	IEC/EN61000-4-4	±2KV	Perf.Criteria B (see recommended circuit photo 2)
EMC	EMS	Voltage dips and interruptions	IEC/EN61000-4-11	0%~70%	Perf.Criteria B

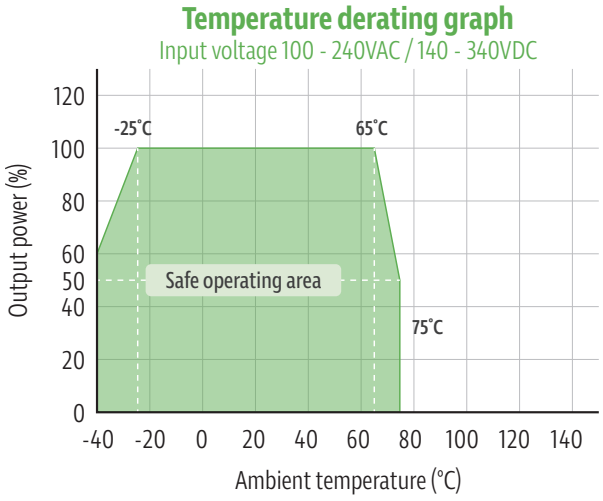
Product Selection Guide

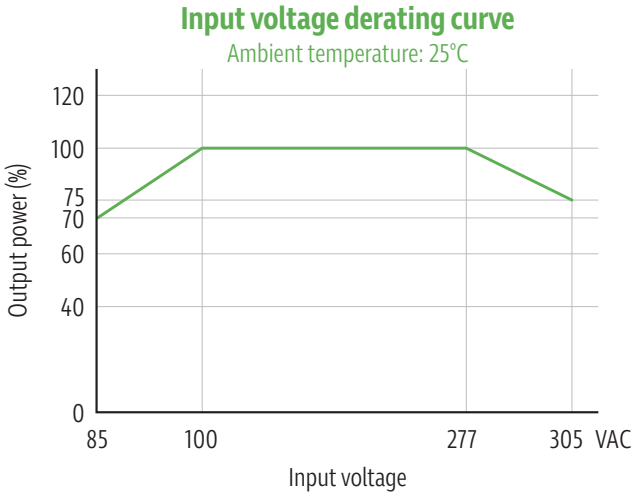
Approval	Model	Output Power (W)	Output Voltage Vo(V)	Output Current Io(mA)	Max. Capacitive Load (uF)	Ripple & Noise 20MHz (Max)	Efficiency Full Load, 220VAC Typ. (%)
UL	2ACE1W_03S3	2	3.3	600	700	120	68
UL	2ACE1W_05S3	2	5	400	900	120	70
UL	2ACE1W_12S3	2	12	167	100	150	75
UL	2ACE1W_24S3	2	24	83	47	150	78

Note:

1: The typical value of output efficiency is based on module is full loaded and burned-in after half an hour.
2: The fluctuation range of full load efficiency(%,TYP) in table is ±2%, full load efficiency = output power/module's input power.

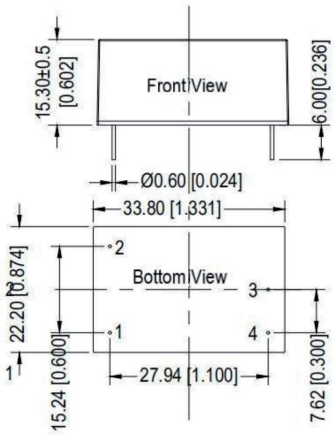
Product characteristic curve

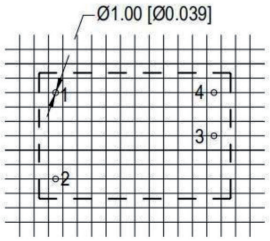




Note
1: Input Voltage should be derated based on Input voltage derating curve when it is 85~100VAC/120~140VDC and 277~305VAC/390~430VDC.
2: Our product is suitable to use under natural air cooling environment, if use it under closed condition, please contact with us.

Dimensions and recommended layout

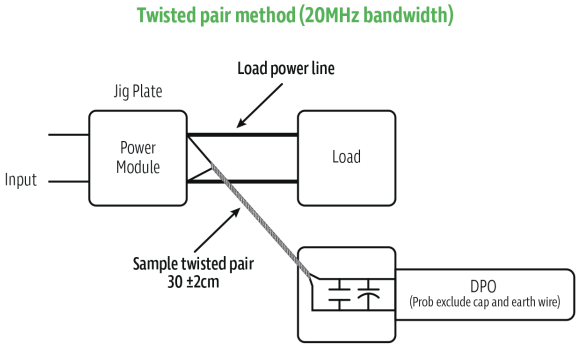




Note:
Grid 2.54x2.54mm
Unit:mm [inch]
Pin tolerance: ±0.10mm[±0.004inch]
General tolerance: ±0.50mm[±0.019inch]

Pin	1	2	3	4
Single	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.

Typical application circuit

Photo 1

Note:

1. The output filter capacitor C1 is an electrolytic capacitor, recommended to use high-frequency, low-resistance ones. For capacity and flowing current, please refer to the technical specifications provided by each manufacturer.
2. C2 is a ceramic capacitor to remove high-frequency noise.
3. The TVS tube protects the downstream circuit when the module is abnormal and is recommended to be used. It is recommended to connect an external FUS, model: 1A/250V slow blow.
4. It is recommended to connect an external RS1 wire-wound resistor, model: 2W, 20Ω.
5. It is recommended to connect an external MOV varistor, model: 10D561K.

Output Voltage	3V3 5V	9V	12V 13V	15V	24V	48V
TVS recommend value	SMBJ7.0A	SMBJ12A	SMBJ20A	SMBJ20A	SMBJ30A	SMBJ64A
C1 recommend value	330uF/10V	220uF/16V	220uF/16V	100uF/25V	47uF/35V	22uF/63V

ECM Recommended Circuit

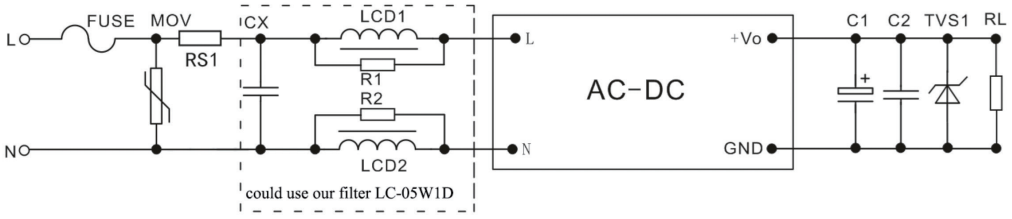


Photo 2

Components	Recommended Value	Components	Recommended Value
MOV	10D561K	RS1	2W,20Ω
CX	0.1UF/275VAC	LMD	1mH/1W color ring inductor
FUSE	1A/250V,slow fusing, necessary		
R1, R2	2KΩ, 5%, 1/8W		