10ACE1W_4 series

10W - AC-DC converter

AC-DC Converter 10 Watt

- **Wide input voltage range: 85-305VAC/120-430VDC**
- **No load power consumption ≤0.2W**
- **Transfer efficiency 84%(typ.)**
- **Switching frequency: 65kHz**
- **Protections: short circuit and over current**
- **Isolation voltage: 4000VAC**
- **Meets IEC62368/UL62368/EN62368 test standards**
- **PCB mounting**

10ACE1W_4 series Introducing our latest 10ACE1W_4 series, designed to meet rigorous industry standards. With a wide input voltage range of 85-305VAC/120-430VDC, this module ensures reliable performance across various applications. It boasts an impressive no-load power consumption of ≤0.2W and a transfer efficiency of 84% (typical).

Operating at a switching frequency of 65KHz, it features robust protections against short circuits and over current. With an isolation voltage of 4000VAC, it meets IEC62368/UL62368/EN62368 test standards and has passed TUV/CE certification. This ultra-reliable module is designed for easy PCB mounting, making it an ideal choice for your industrial designs.

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 - ≥130% Io, self-recovery - Hiccup
Switching frequency	65 KHz
Operating temperature	-40°C - +85°C
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	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			0.25 0.15	A
Surge current	115VAC 220VAC			15 30	A
Leakage current	0.25mA TYP/230VAC/50Hz				
Recommended external Input fuse	2A/300VAC slow fusing				

Example:
10ACE1W_05S4
10 = 10Watt; AC = AC-DC; E1 = Cost effective; 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 - Vo		±2.0	±3.0	%
Line regulation	Nominal load - Vo		±0.5	±1.0	%
Load regulation	Nominal input voltage, 20%~100% load - Vo		±1.0	±2.0	%
No load consumption	Input 115VAC Input 220VAC			0.2	W
Minimum load	Single Output	0			%
Start up delay time	Nominal input voltage (full load)		1000		mS
Power-off holding time	Input 115VAC (full load) Input 220VAC (full load)		50 80		mS
Dynamic response	Overshoot range 25%~50%~25% Recovery time 50%~75%~50%	-5.0 -5.0		+5.0 +5.0	% mS
Output overshoot	Full input voltage range		≤10%Vo		%
Temperature drift		-	±0.03%	-	%/°C
Ripple & noise*	Full input voltage range	-	80	150	mV

Note: *Tested by Twisted Pair method, for details please check at back of datasheet.

Isolation specifications

Item	Operating Conditions	Min	Typ	Max	Units
Isolation voltage	Input-Output/Test 1min, leakage current≤5mA	4000			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,
9. Specifications are subject to change without prior notice, please follow up with our website for newest manual.

GAPTEC-Electronic GmbH & Co. KG
sales@gaptec-electronic.com – www.gaptec-electronic.com

EMC specifications					
EMC	EMI	CE	CISPR22/EN55032	CLASS B (See Recommended Circuit on photo 2)	
EMC	EMI	RE	CISPR22/EN55032	CLASS B (See Recommended Circuit on photo 2)	
EMC	EMS	RS	IEC/EN61000-4-3	10V/m	Perf.Criteria B (See Recommended Circuit on photo 2)
EMC	EMS	CS	IEC/EN61000-4-6	3Vr.m.s	Perf.Criteria B (See Recommended Circuit on photo 2)
EMC	EMS	ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV	Perf.Criteria B
EMC	EMS	Surge	IEC/EN61000-4-5	line to line ±1KV line to line ±2KV / line to ground ±4KV	Perf. Criteria B Perf.Criteria A (See Recommended Circuit on photo 2)
EMC	EMS	EFT	IEC/EN61000-4-4	±2KV ±4KV	Perf.Criteria B Perf.Criteria A (See Recommended Circuit on photo 2)
EMC	EMS	Voltage dips and interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B	

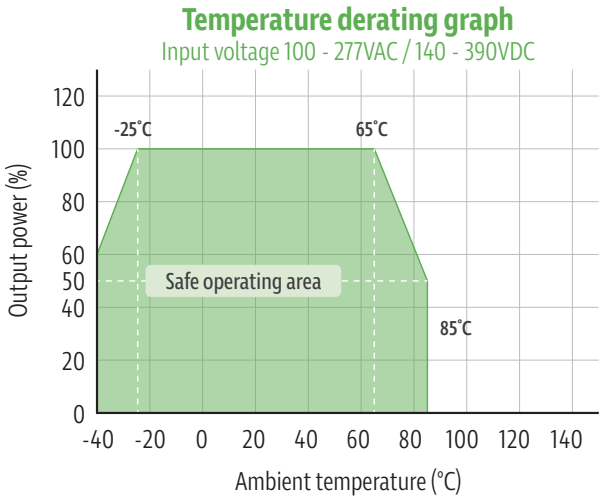
Product Selection Guide

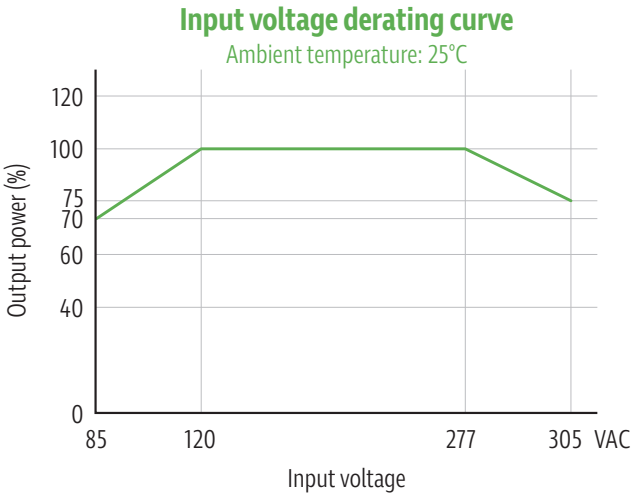
Approval	Model	Output Power (W)	Output Voltage Vo(V)	Output Current Io(mA)	Max. Capacitive Load (uF)	Ripple & Noise 20MHz (Max)	Efficiency Full Load, 220VAC Typ. (%)
Pending	10ACE1W_03S4	8.6	3.3	2600	5000	100	73
UL	10ACE1W_05S4	10	5	2000	5000	100	76
UL	10ACE1W_12S4	10	12	833	3000	120	82
UL	10ACE1W_12.5S4	10	12.5	800	3000	120	82
UL	10ACE1W_15S4	10	15	667	3000	120	83
UL	10ACE1W_24S4	10	24	416	2000	150	85

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.
3: Suffix „/CM" is for chassis mounting (10ACE1W_24S4/CM); Suffix „/DR" is for DIN-rail mounting (10ACE1W_24S4/DR)...

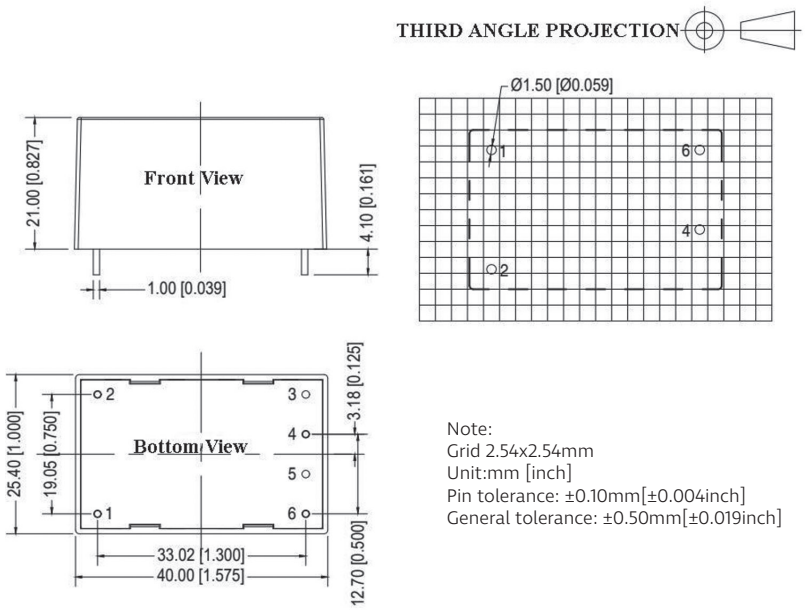
Product characteristic curve





Note:
1: Input Voltage should be derated based on Input voltage derating curve when it is 85~100VAC/277~305VAC/120~140VDC/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

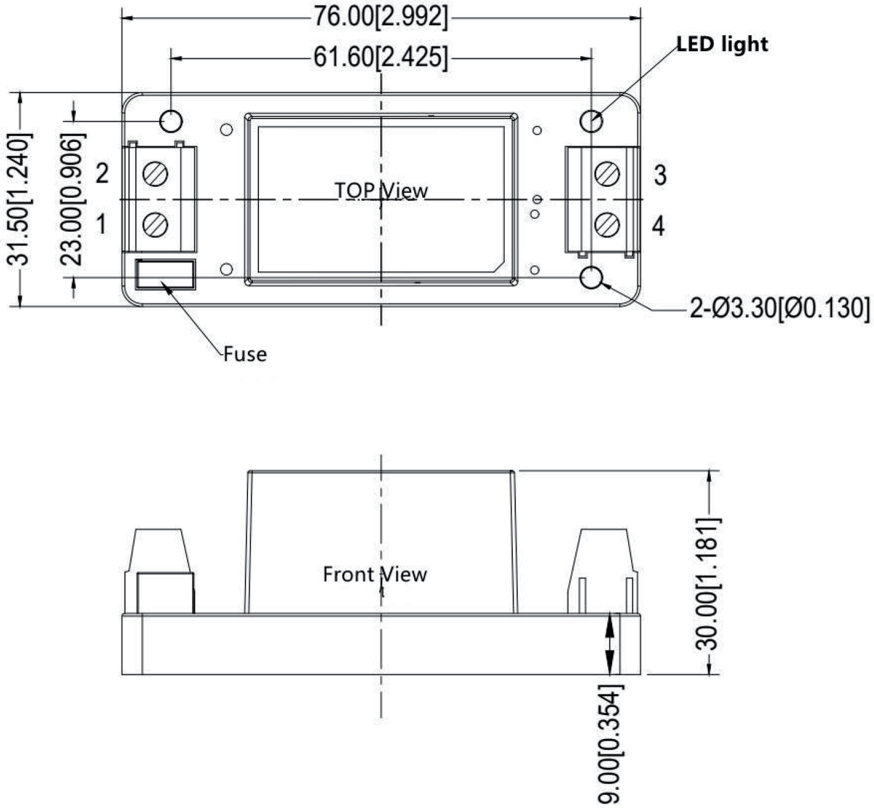


Note:
Grid 2.54x2.54mm
Unit:mm [inch]
Pin tolerance: ±0.10mm[±0.004inch]
General tolerance: ±0.50mm[±0.019inch]

Pin	1	2	3	4	5	6
Single	AC(L)	AC(N)	NP	+Vo	NP	-Vo

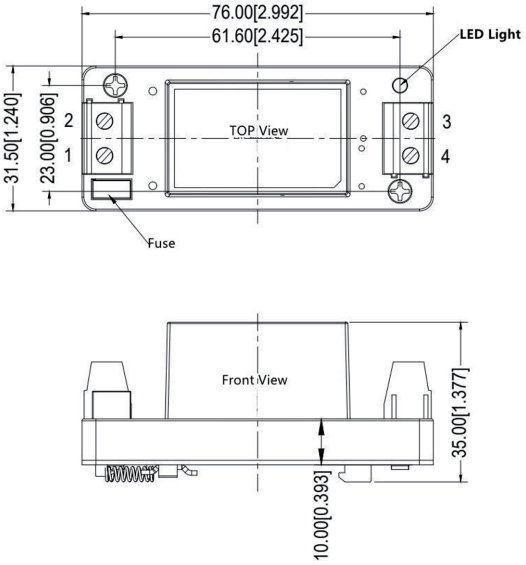
Dimensions and recommended layout

Chassis mounting

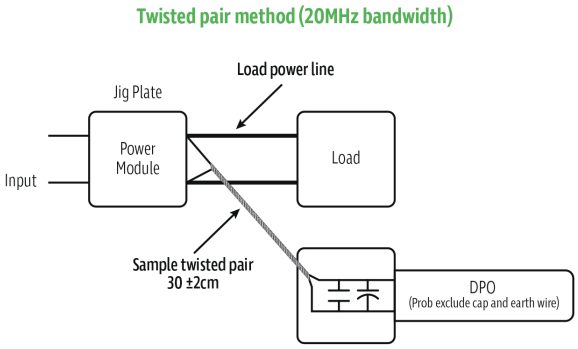


Dimensions and recommended layout

DIN Rail mounting



Ripple & noise test (twisted pair method 20mHZ bandwidth)



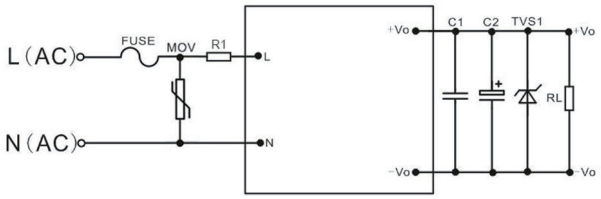
Test Method:

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 EMC Recommended Circuit

Photo 1



Products Number	FUSE (necessary)	MOV	R1	C1	C2	TVS1
10ACE1W_03S4	2.0A/300V	14D561K	6.8 Ω/3W (winding resistor)	1uF/50V	220uF/16V	SMBJ7.0A
10ACE1W_05S4	2.0A/300V	14D561K	6.8 Ω/3W (winding resistor)	1uF/50V	220uF/16V	SMBJ7.0A
10ACE1W_12S4	2.0A/300V	14D561K	6.8 Ω/3W (winding resistor)	1uF/50V	100uF/25V	SMBJ20A
10ACE1W_15S4	2.0A/300V	14D561K	6.8 Ω/3W (winding resistor)	1uF/50V	100uF/25V	SMBJ20A
10ACE1W_24S4	2.0A/300V	14D561K	6.8 Ω/3W (winding resistor)	1uF/50V	100uF/35V	SMBJ30A

Note:
1. 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 current flowing through. Capacitor withstand voltage should be derated to at least 80%.
2. C1 is a ceramic capacitor to remove high frequency noise.
3. TVS tube protects the subsequent circuit when the module is abnormal, it is recommended to use it.

EMC recommended circuit (Used Under high EMC requirement)

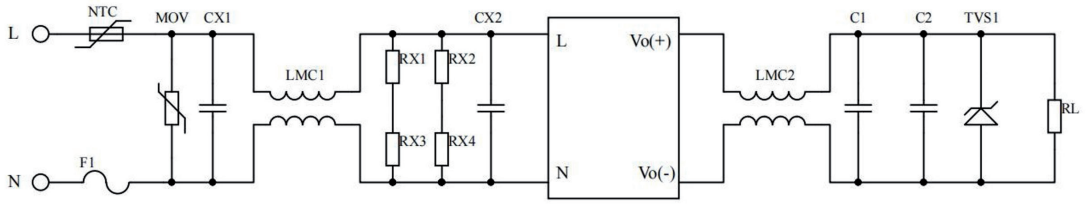


Photo 2

Note:
1) FUSE, recommended type is 2A~250VAC slow-break, square type.
2) MOV is a varistor, the recommended model is 14D561K.
3) NTC is a thermistor, recommended model: 10D-11, to protect the module from damage in the event of a lightning surge.
4) LMC1,LCM2 are common mode inductors, LCM1 recommended inductance 30mH, LCM2 recommended inductance 40uH.
5) CX1 is X-capacitor, the recommended model is 0.22uF/275VAC; CX2 is X-capacitor, the recommended model is 0.1uF/275VAC.
6) RX1, RX2, RX3, RX4 are chip resistors, the recommended model is 1206, 1MΩ.
7) C1 is a high-frequency, low-impedance electrolytic capacitor with a capacitance value less than that of the capacitive load, and the withstand voltage is more than 1.5 times the output voltage.
8) C2 is a 0.1uF ceramic chip capacitor with a withstand voltage of more than 1.5 times the output voltage.
9) TVS1 is TVS tube; 5V output recommended: SMBJ7.0A, 9V output recommended: SMBJ12.0A, 12V output recommended: SMBJ20A, 15V output recommended: SMBJ20A. 24V output recommended: SMBJ30.0A, 48V output recommended: SMBJ64A.