10ACFE1W_3.6 series

10W - AC-DC converter

AC-DC Converter 10 Watt

- Wide input voltage range: 85-305VAC/120-430VDC
- No load power consumption ≤0.2W
- Up to 82% efficiency
- Switching frequency 65kHz
- Short Circuit Protection (SCP)
- Over Current Protection
- 3600VAC isolation
- Compliant with IEC/EN62368/UL62368
- Ultra-small package for bare board, industrial design
- PCB mounting
- Altitude during operating 5000m Max

10ACFE1W_3.6 series Introducing our latest 10ACFE1W_3.6 series with a wide input voltage range of 85-305VAC/120-430VDC, designed to meet the highest industry standards. With no load power consumption as low as ≤0.2W and a transfer efficiency of 82% (typ.), this unit ensures energy efficiency and reliability. Operating at a switching frequency of 65kHz, it offers robust protections including short circuit and over current safeguards. Featuring an isolation voltage of 3600VAC and compliance with IEC62368/UL62368/EN62368 test standards, this ultra-small package is perfect for industrial applications with PCB mounting.

SHORT CIRCUIT PROTECTED

100% RoHS compliant

c UL us
UL62368 - E347551

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
Operating temperature	-40°C - +85°C (with derating)
Storage temperature	-40°C - +105°C
Soldering temperature	Wave soldering 260 (±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	IEC/EN62368/UL62368
Vibration	10-55Hz, 10G, 30Min, along X, Y, Z
Safety standard	CLASS II
Dimensions	32.0 x 20.0x 14.0 mm
Weight	10g
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			0.30 0.18	A
Surge current	115VAC 220VAC			15 30	A
Leakage current	0.25mA typ./230VAC/50Hz				
Recommended external Input fuse	2A/300VAC Time-delay fuse				

Example:
10ACFE1W_05S3.6
10 = 10Watt; AC = AC-DC; F = Open Frame; E1 = Cost effective;
W = Wide input; 05 = 5Vout; S = Single output; 3.6 = 3.6 kVAC isolation

Output specifications

Item	Operating condition	Min	Typ	Max	Units
Voltage accuracy	Input voltage 220V, any load - Vo1		±2.0	±3.0	%
Line regulation	Rated load		±0.5	±1.0	%
Load regulation	Nominal input voltage, 20% ~ 100% load - Vo1		±1.0	±3.0	%
No load consumption	Input 115VAC Input 220VAC			0.20	W
Minimum load	Single output	10			%
Turn-on Delay Time	Input 115VAC (full load) Input 220VAC (full load)		1000		mS
Power-off holding time	Input 115VAC (full load) Input 220VAC (full load)		50		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

Isolation specifications

Item	Operating Conditions	Min	Typ	Max	Units
Isolation voltage	Input-Output, test 1min, leakage current ≤5mA	3600			VAC
Isolation 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. Specifications are subject to change without prior notice, please follow up with our website for newest manual.

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EMC specifications					
EMC	EMI	CE	CISPR32/EN55032	CLASS B (with the Recommended Circuit 2/1)	
EMC	EMI	RE	CISPR32/EN55032	CLASS B (with the Recommended Circuit 2/1)	
EMC	EMS	RS	IEC/EN61000-4-3	10V/m	Perf. Criteria B (with the Recommended Circuit 2/1)
EMC	EMS	CS	IEC/EN61000-4-6	3Vr.m.s	Perf. Criteria B (with the Recommended Circuit 2/1)
EMC	EMS	ESD	IEC/EN61000-4-2	Contact ±6kV / Air ±8KV	Perf. Criteria B (with the Recommended Circuit 2/1)
EMC	EMS	Surge	IEC/EN61000-4-5	Line to line ±2kV, line to ground ±4KV	Perf. Criteria B (with the Recommended Circuit 2/1)
EMC	EMS	EFT	IEC/EN61000-4-4	±2kV	Perf. Criteria B (with the Recommended Circuit 2/1)
EMC	EMS	Voltage dips & Interruptions	IEC/EN61000-4-11	0%~70%	Perf. Criteria B (with the Recommended Circuit 2/1)

Product Selection Guide

Approval	Model	Input Voltage Nom. (VAC)	Input Voltage Range (VAC)	Output Power (W)	Output Voltage Vo (V)	Output Current Io (mA)	Max. Capacitive Load (uF) @220VAC	Ripple & Noise 20MHz (max)	Efficiency Full Load, 220VAC typ. (%)
UL	10ACFE1W_03S3.6	220	85-305	6.6	3.3	2000	5000	100	73
UL	10ACFE1W_05S3.6	220	85-305	10	5	2000	5000	100	77
UL	10ACFE1W_09S3.6	220	85-305	10	9	1111	4000	100	78
UL	10ACFE1W_12S3.6	220	85-305	10	12	833	1000	120	80
UL	10ACFE1W_15S3.6	220	85-305	10	15	667	1000	120	81
UL	10ACFE1W_24S3.6	220	85-305	10	24	416	300	150	83

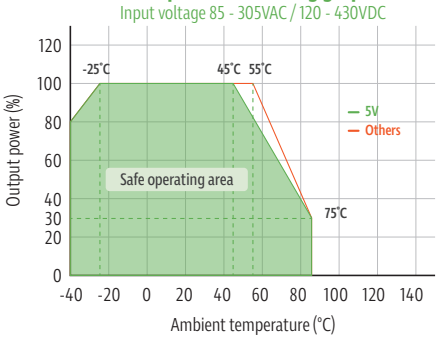
Note:

1: The typical value of efficiency is based on the product tested after half an hour burn-in at full load.
2: The full load efficiency should be in ±2% of the typical value in this table. The efficiency is calculated by the way that the full output power is divided by the input power.
3: The Ripple & noise is tested by the twisted pair method, please refer to the following Ripple & noise test instruction.
4: Please contact Aipu sales for other output voltages requirement in this series but not listed in this table.

Product characteristic curve

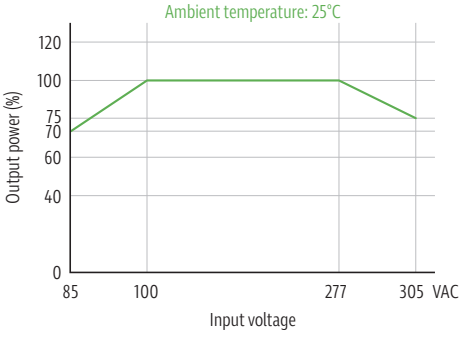
Temperature derating graph

Input voltage 85 - 305VAC / 120 - 430VDC

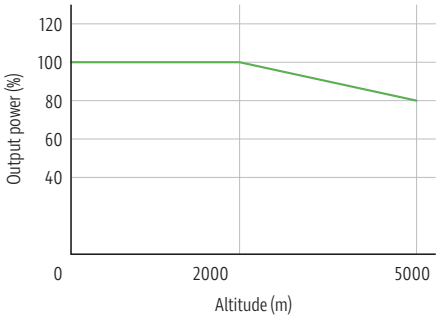


Input voltage derating curve

Ambient temperature: 25°C



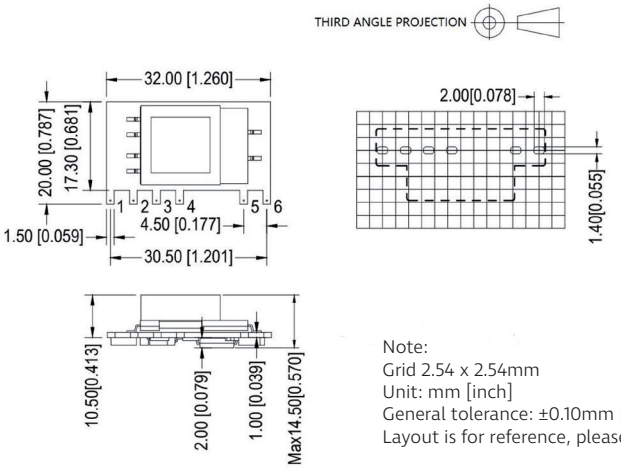
Altitude derating curve



Note

1: The output power should be derated based on the input voltage derating graph at 85~100VAC/277~305VAC/120~140VDC/ 390~430VDC.
2: This product should operate at the natural air condition, please contact us if it could be used at a closed space.

Dimensions and recommended layout



Note:
Grid 2.54 x 2.54mm
Unit: mm [inch]
General tolerance: ±0.10mm [±0.00439inch]
Layout is for reference, please refer to actual item

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

Typical application circuit

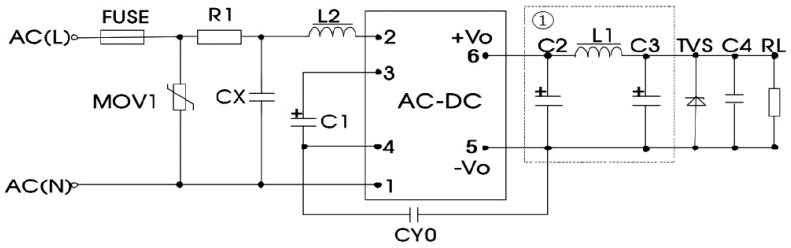


Photo 1
Note : 1 as Pi filter circuit

Products Number	C1 (Necessary)	C2 (Necessary to connect the external solid-state capacitor)	L1 (Necessary)	C3 (Necessary to connect the external solid-state capacitor)	C4	L2	CX	CY0	FUSE (Necessary, time delay fuse)	TVS Tube
10ACFE1W_03S3.6	22uF/450V	820uF/16V	2.0uH/3A	150uF/35V	0.1uF/50V	2.2mH/0.5A	5D-9	Y1/102M/400VAC	2A/300V	SMBJ7.0A
10ACFE1W_05S3.6	22uF/450V	820uF/16V	2.0uH/3A	150uF/35V	0.1uF/50V	2.2mH/0.5A	5D-9	Y1/102M/400VAC	2A/300V	SMBJ7.0A
10ACFE1W_09S3.6	22uF/450V	470uF/16V	2.0uH/3A	220uF/16V	0.1uF/50V	2.2mH/0.5A	5D-9	Y1/102M/400VAC	2A/300V	SMBJ7.0A
10ACFE1W_12S3.6	22uF/450V	220uF/16V	2.0uH/3A	220uF/16V	0.1uF/50V	2.2mH/0.5A	5D-9	Y1/102M/400VAC	2A/300V	SMBJ20A
10ACFE1W_15S3.6	22uF/450V	220uF/16V	2.0uH/3A	220uF/16V	0.1uF/50V	2.2mH/0.5A	5D-9	Y1/102M/400VAC	2A/300V	SMBJ20A
10ACFE1W_24S3.6	22uF/450V	100uF/35V	2.0uH/3A	68uF/35V	0.1uF/50V	2.2mH/0.5A	5D-9	Y1/102M/400VAC	2A/300V	SMBJ30A

Note:
1) 6.8Ω/3W wire-wound resistor is recommended for R1, Carbon film or other resistors are not available.
2) 14D561K/4500A is recommended for MOV1.

EMC recommended circuit (used under high EMC requirement)

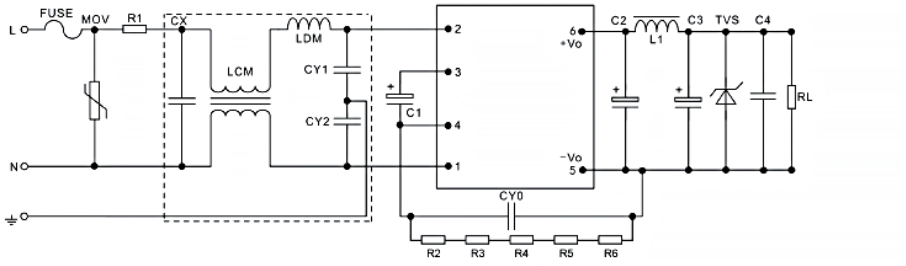


Figure - Circuit 2/1

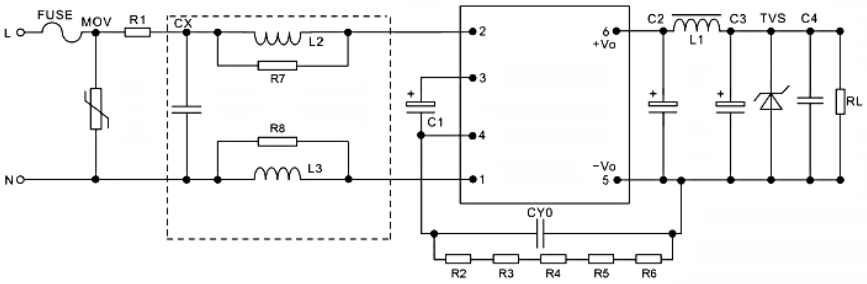


Figure - Circuit 2/2

Component	Recommend 3.15A, 250V (Necessary)	NTC	5D-9	R1, R2	Resistor 2.2K, above 1/8W
MOV	10D561K	CY1, CY2	1nF/400VAC		
CX	Recommended 0.22uF/275VAC	LDM	330uH		
LCM	40mH min	L2, L3	Coloring inductor 1mH, 1W		