

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 $\leq 0.2W$
- Transfer efficiency 82% (typ.)
- Switching frequency: 65kHz
- Protections: Short circuit, over current
- Isolation voltage: 3600VAC
- Meets IEC62368/UL62368/EN62368 test standard
- Ultra-small package for bare board, industrial design
- PCB mounting

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 $\leq 0.2W$ 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.



Common specifications

Short circuit protection	Full input voltage range - Continuous, self-recovery Hiccup
Over current protection	Input 220VAC - $\geq 120\%$ 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 ($\pm 4^\circ\text{C}$), time 5-10S Manual soldering 360°C ($\pm 8^\circ\text{C}$), time 4-7S
Relative humidity	10-90% RH
Hot plug	Unavailable
Remote control terminal	Unavailable
Safety standard	EN60950, IEC60950, UL62368
Vibration	10-55Hz, 10G, 30Min, along X, Y, Z
Safety standard	CLASS II
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			0.20 0.10	A
Surge current	115VAC 220VAC			10 20	A
Leakage current	0.25mA TYP/230VAC/50Hz				
Recommended external Input fuse	1A-3A/250VAC slow fusing				

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	± 4.0	%
Line regulation	Nominal load - Vo1		± 0.5	± 1.0	%
Load regulation	Nominal input voltage, 20%-100% load - Vo1		± 1.0	± 3.0	%
No load consumption	Input 115VAC Input 220VAC			0.1	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		$\leq 10\%V_o$		%
Temperature drift			$\pm 0.03\%$		%/°C

Isolation specifications

Item	Operating Conditions	Min	Typ	Max	Units
Isolation voltage	Input-Output, Test 1min, leakage current $\leq 5\text{mA}$	3600			VAC
Insulation resistance	Input-Output@ DC500V	100			MΩ

- The product should be used within the specification range, or it will cause permanent damage to it;
- The input terminal should connect to fuse;
- If the product is worked under the minimum requested load, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
- 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;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a = 25^\circ\text{C}$, humidity <75% with nominal input voltage and rated output load (pure resistance load);
- All index testing methods in this datasheet are based on our company's corporate standards;
- 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;
- We can provide product customization service,
- 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	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 1)
EMC	EMS	CS	IEC/EN61000-4-6	3Vr.m.s	Perf.Criteria B (See Recommended Circuit on photo 1)
EMC	EMS	ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV	Perf.Criteria B
EMC	EMS	Surge	IEC/EN61000-4-5	±1KV	Perf.Criteria B
EMC	EMS	EFT	IEC/EN61000-4-4	±2KV	Perf.Criteria B
EMC	EMS	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%~70%	Perf.Criteria B

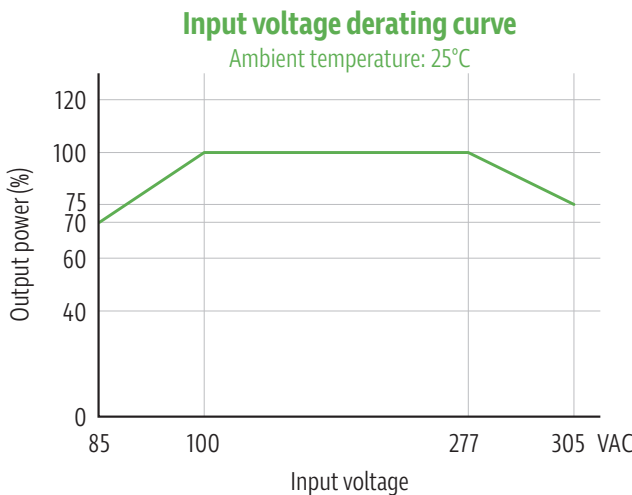
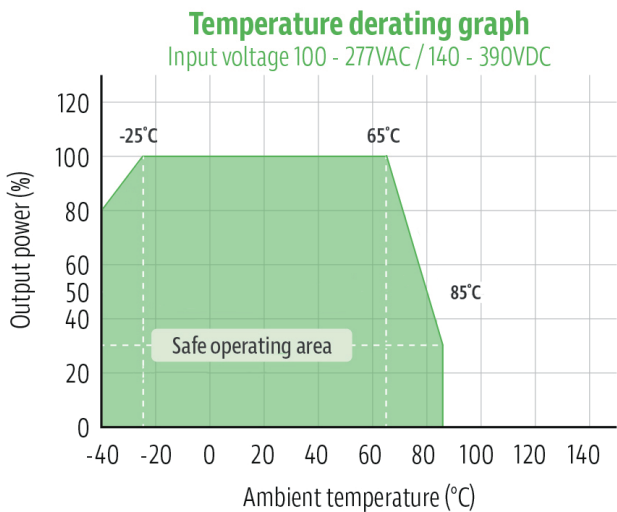
Product Selection Guide

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	10ACFE1W_03S3.6	6.6	3.3	2000	5000	100	75
UL	10ACFE1W_05S3.6	10	5	2000	5000	100	80
UL	10ACFE1W_12S3.6	10	12	833	3000	120	81
UL	10ACFE1W_15S3.6	10	15	667	3000	120	81
UL	10ACFE1W_24S3.6	10	24	416	2000	150	82

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. Ripple & noise is tested by twisted pair method, details please refer to ripple & noise test at back.

Product characteristic curve



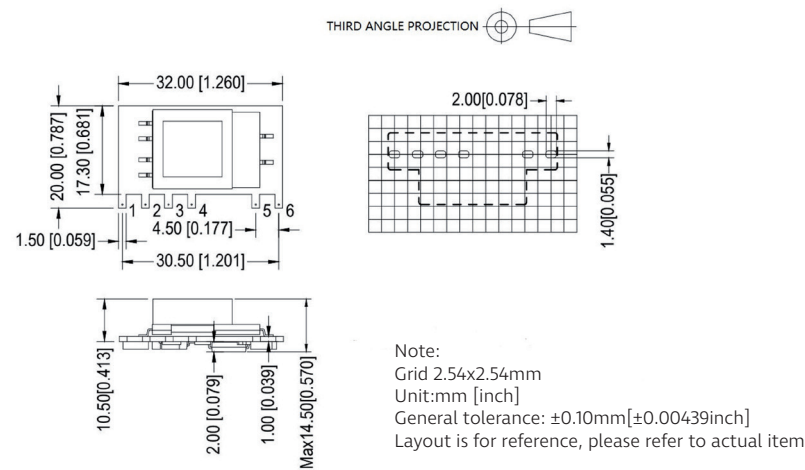
Note

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

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Dimensions and recommended layout



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

Typical Application Circuit

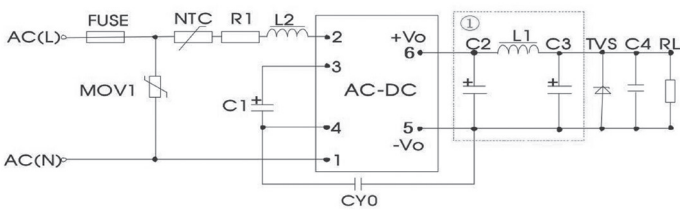
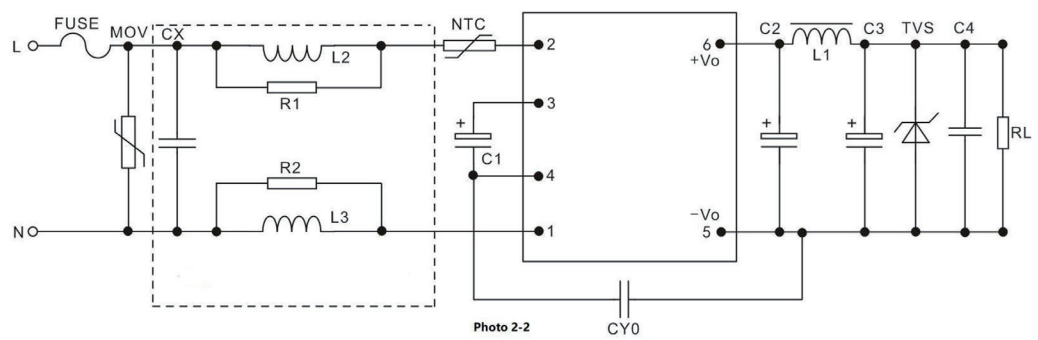
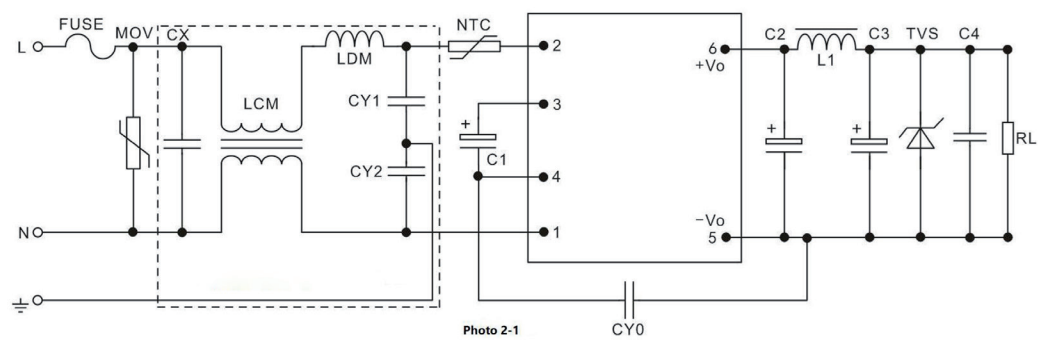


Photo 1
Note : 1 as Pi filter circuit

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	NTC	CY0	FUSE (Necessary)	TVS Tube
10ACFE1W_03S3.6	22uF/450V	220uF/10V	2.0uH	220uF/10V	0.1uF/50V	4.7mH	5D-9	104M/400V	3.15A/250V	SMBJ7.0A
10ACFE1W_05S3.6	22uF/450V	220uF/10V	2.0uH	220uF/10V	0.1uF/50V	4.7mH	5D-9	104M/400V	3.15A/250V	SMBJ7.0A
10ACFE1W_12S3.6	22uF/450V	220uF/16V	2.0uH	220uF/16V	0.1uF/50V	4.7mH	5D-9	104M/400V	3.15A/250V	SMBJ20A
10ACFE1W_15S3.6	22uF/450V	220uF/16V	2.0uH	100uF/16V	0.1uF/50V	4.7mH	5D-9	104M/400V	3.15A/250V	SMBJ20A
10ACFE1W_24S3.6	22uF/450V	100uF/35V	2.0uH	47uF/35V	0.1uF/50V	4.7mH	5D-9	104M/400V	3.15A/250V	SMBJ30A

Note:
1) C1: AC input, C1 is input filter electrolytic capacitor (necessary), recommended value is 10uF/450V; DC input, C1 is big filter capacitor in the EMC filter (necessary), recommended value is 10uF/450V;
2) R1 is limited resistor, recommended value is 12Ω, 5W;
3) MOV1 is piezoresistor, recommended model is 10D561K;

EMC recommended circuit (used under high EMC requirement)



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		