

5AC1D_3.6 series

5W - AC-DC converter



AC-DC Converter

5 Watt

- Wide input voltage range 85-265VAC/120-380VDC
- Transfer efficiency (typ. 84%)
- Switching frequency: 50-60KHz
- Protections: over current, short circuit, over voltage, under voltage, over temperature, self-furbish
- Input and output highly isolated 3600VAC
- PCB mounting
- Plastic case, UL94 V-0 conform
- Meets IEC62368/UL62368/EN62368 test standard

Introducing our cutting-edge 5AC1D_3.6 series engineered for robust performance and uncompromised safety: With an extensive input voltage range spanning 85-265VAC/120-380VDC, this power module ensures adaptability across diverse operational settings. Boasting a remarkable transfer efficiency of 84%, it optimizes energy usage for enhanced performance. Safety is paramount, and this module is fortified with comprehensive protections against over current, short circuit, over voltage, under voltage, over temperature, and self-furbish scenarios. With input and output highly isolated at 3750VAC, it ensures unparalleled safety in operation. It meets rigorous industry standards including IEC62368/UL62368/EN62368, ensuring compliance and reliability in every aspect.



Common specifications

Short circuit protection	Self-recovery - Output Switch-off - Hiccup
Over load protection	Input 85~265VAC - $\geq 120\%$ Po - Hiccup
Switching frequency	50 KHz (min.) 55 KHz (typ.) 60 KHz (max.)
Operating temperature	-25°C - +75°C (Free air convection)
Storage temperature	-40°C - +105°C
Relative humidity	10~90% RH
Remote control terminal	Not available
Safety standard	EN55032, EN61000, UL62368
Vibration	10-55HZ, 10G, 30Min, along X,Y,Z
Class of case material	UL94 V-0
MTBF (MIL-HDBK-217F@25°C)	2 x 10 ⁵ Hours

Input specifications

Item	Operating condition	Min	Typ	Max	Units
Input voltage range	AC input	85	220	265	VAC
	DC input	120	310	380	VDC
Input frequency range		47	50	63	Hz
Input current	115VAC~47Hz 230VAC~50Hz		149 73.0	230 100	mA
Input Inrush Current	110VAC~47Hz 230VAC~50Hz			10 20	
Recommended external Input fuse	2A~250Vac slow fusing, block form				

Example:

5AC1D_05S3.6

5 = 5Watt; AC = AC-DC; 1D = Din Rail; 05 = 5Vout;

S = Single output; 3.6 = 3.6kVAC isolation

Output specifications

Item	Operating condition	Min	Typ	Max	Units
Voltage accuracy	Any Load, full voltage range Vo1			± 3.0	%
Linear regulation	Nominal Load, full voltage range - Vo1			± 1.0	%
Load regulation	20% ~ 100% nominal load Vo1			± 1.5	%
Ripple & noise*	Vo $\leq 5.0V$, $\leq 80mVp-p$ Other $\leq 120mVp-p$				
Turn-on delay time	Nominal input voltage		800		mS
Output power-off holding time	Nominal input voltage		30		mS
Temperature drift coefficient				± 0.03	%/°C

Note: *Ripple & Noise tested under twisted-pair method (See Ripple& Noise Test in the back)

Isolation specifications

Item	Operating Conditions	Min	Typ	Max	Units
Isolation voltage	Input to Output 3600VAC $\leq 3.0mA/1min$;				
Insulation resistance	Input and Output $\geq 100M\Omega$ (test voltage as DC500V)				

- The product should be used under the specification range, otherwise it will cause permanent damage to it.
- Product's input terminal should connect to fuse;
- 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;
- Unless otherwise specified, data in this datasheet should be tested under conditions of Ta = 25°C, humidity <75% when inputting nominal voltage and outputting rated 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, and please directly contact our technician for specific information;
- We can provide customized product service;
- The product specification may be changed at any time without prior notice.

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EMC specifications				
EMC	EMI	CE	CISPR22/EN55032/EN55024	CLASS B (See Photo 1 for recommended circuit)
EMC	EMI	RE	CISPR22/EN55032/EN55024	CLASS B (See Photo 1 for recommended circuit)
EMC	EMS	RS	IEC/EN61000-4-3 10V/m	Perf.Criteria B (See Photo 1 for recommended circuit)
EMC	EMS	CS	IEC/EN61000-4-6 3Vr.m.s	Perf.Criteria B(See Photo 1 for recommended circuit)
EMC	EMS	ESD	IEC/EN61000-4-2 Contact ±4KV	Air ±8KV (See Photo 1 for recommended circuit)
EMC	EMS	Surge	IEC/EN61000-4-5 ±1KV	Perf.Criteria B(See Photo 1 for recommended circuit)
EMC	EMS	EFT	IEC/EN61000-4-4 ±2KV	Perf.Criteria B(See Photo 1 for recommended circuit)
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 (Max)	Efficiency@ Full Load, Nominal Input Voltage Typ. (%)
	5AC1D_03S3.6	85V-265VAC / 120-380VDC	3.3	1818	2000	80	71
	5AC1D_05S3.6	85V-265VAC / 120-380VDC	5.0	1200	1500	80	75
	5AC1D_09S3.6	85V-265VAC / 120-380VDC	9.0	667	1000	120	78
	5AC1D_12S3.6	85V-265VAC / 120-380VDC	12.0	500	680	120	80
	5AC1D_15S3.6	85V-265VAC / 120-380VDC	15.0	400	470	120	82
	5AC1D_16S3.6	85V-265VAC / 120-380VDC	16.5	360	470	120	82
	5AC1D_24S3.6	85V-265VAC / 120-380VDC	24.0	250	300	120	84

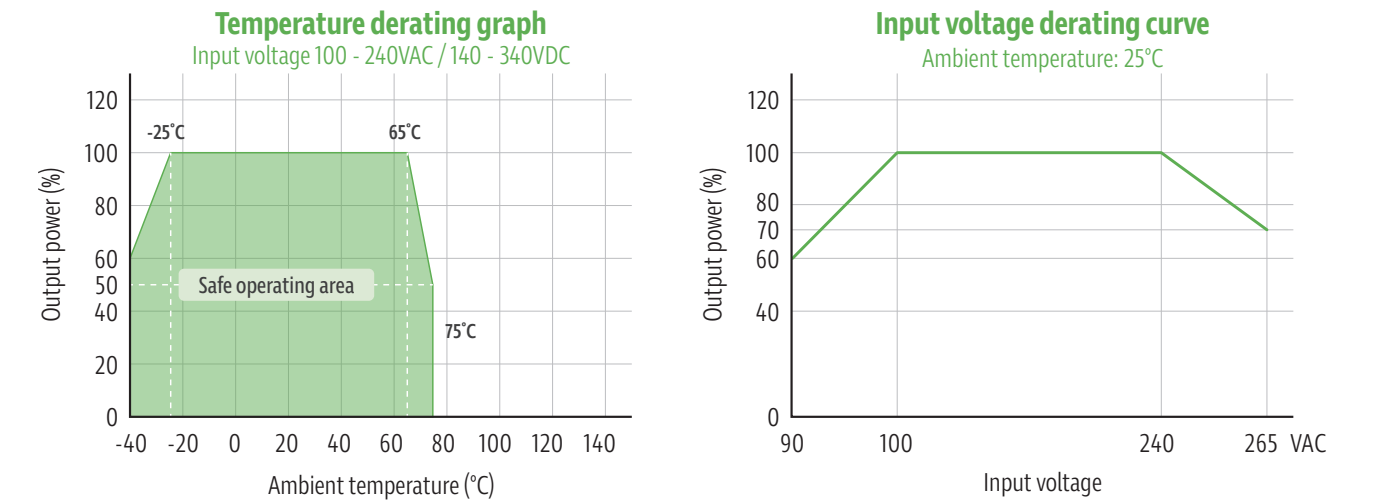
Note:

1: The typical value of output efficiency is based on full load and burn-in after half an hour.

2: The fluctuation range of full load efficiency at table(%TYP) is ±2%, full load efficiency = total output power/module's input power.

3: Ripple & noise is tested by twisted pair method, for details please see (ripple & noise test) at back.

Product characteristic curve

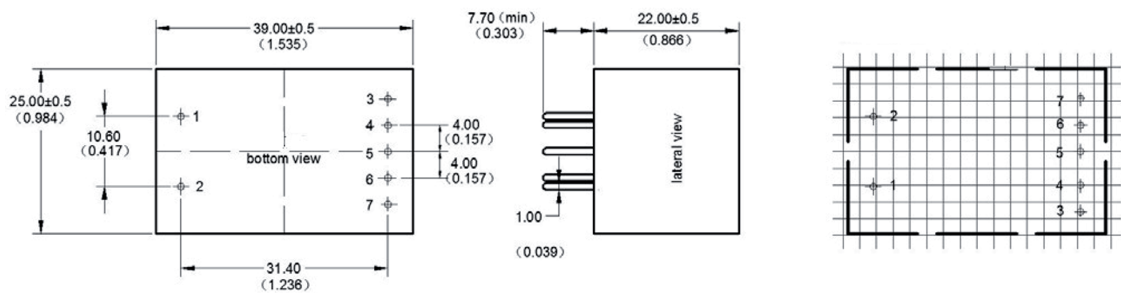


Note

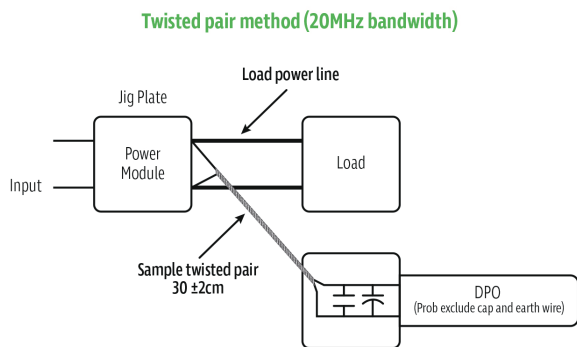
1: Input voltage should be derated based on input voltage derating curve when it is 85~100VAC/240~265VAC/120~140VDC/ 340~380VDC.

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



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 (\pm 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

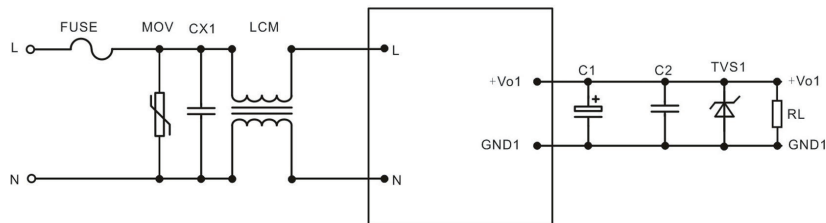


Photo 1

- Note:
1. FUSE, suggest 2A~250VAC slow fusing, block form;
 2. MOV is voltage dependent resistor, suggest model 14D561K;
 3. CX1 is X capacitor, suggest model 0.1uF/275Vac;
 4. LCM is common mode inductor, suggest value 30mH;
 5. C1 choose high frequency low impedance electrolytic capacitor, the capacitance value less than capacitive load. Withstand voltage is 1.5 times more than output voltage;
 6. C2 choose 0.1uF ceramic chip capacitor, withstand voltage is 1.5 times more than output voltage;
 7. TVS1 is TVS tube; 5V output suggest to use: SMBJ7.0A, 9V output suggest to use: SMBJ12.0A, 12V output suggest to use: SMBJ20A, 15V output suggest to use: SMBJ20.0A, 24V output suggest to use: SMBJ30.0A, 48V output suggest to use: SMBJ64A.