

ACS10W-xxV Series



FEATURES

- Input voltage range: 85~305VAC (100~430VDC)
- Working temperature range: -40°C to +85°C
- Complete protection functions
- Isolation 4000VAC
- SIP ultra-small size, high power density, flexible application
- Industrial grade product technical design
- Output short circuit, overcurrent, input undervoltage protection

DESCRIPTION

The ACS10W-xxV series is an efficient modular power supply for miniaturized bare boards, with advantages such as dual use of AC and DC, wide input voltage range, high reliability, low power consumption, and safe isolation. Widely applicable to industrial control, power instruments, smart homes, and other occasions that require strict volume requirements and low EMC requirements. If it is necessary to apply in harsh electromagnetic compatibility environments, EMC peripheral circuits must be added.

MODEL NUMBERING

ACS10W-xxV

Series Name

Output Power

Output Voltage

SELECTION GUIDE

Product Model	Rated Power (W)	Output Voltage (VDC)	Output Current (mA)	Efficiency (230VAC, %/Typ.)	Maximum capacitive load (uF)
ACS10W-03V	6.6	3.3	2000	74	15000
ACS10W-05V	10	5	2000	78	12000
ACS10W-09V	10	9	1100	79	6000
ACS10W-12V	10	12	840	83	2000
ACS10W-15V	10	15	670	83	1500
ACS10W-24V	10	24	420	84	470

INPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage	AC Input	85	--	305	VAC
	DC Input	100	--	430	VDC
Input Voltage Frequency	AC Input	47	--	63	Hz
Input Current	115VAC	--	--	0.30	A
	230VAC	--	--	0.30	A
Input Fuse		1A, recommended slow-blow			

Remarks: This product does not support hot plug

OUTPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy	10% -100% load	--	--	±5	%
Line Regulation Rate	Rated load	--	±1.5	±2.5	%
Load Regulation Rate	10% to 100% load	--	--	±3	%
Minimum Load		10	--	--	%
Stand By Power	230VAC input	--	0.10	0.25	W
Ripple & Noise	20MHz bandwidth (peak to peak)	--	80	100	mV
Temperature Drift Coefficient		--	±0.15	--	%/°C
Hold Time	20MHz bandwidth (peak to peak)	--	8	--	ms
	20MHz bandwidth (peak to peak)	--	40	--	ms
Over Current Protection		110	--	--	%Io
Short Circuit Protection		Continuous, Self-Recovery			

GENERAL CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation voltage	Input-output, test time 1 minute, leakage current less than 5mA	4000	--	--	VAC
Insulation resistance	Input-output, insulated voltage 500VDC	100	--	--	MΩ
Power Derating	+55°C - +85°C	1.67	--	--	%°C
	85VAC - 100VAC	1.72	--	--	%°C
Working temperature		-40	--	+85	°C
Storage Temperature		-55	--	+105	°C
Soldering Profile	Wave-soldering	260 ± 5°C; time : 5 - 10s			
	Manual-welding	360 ± 8°C; time : 3 - 5s			
Soldering Profile		IEC/EN60335-1, IEC/EN61558-1			
Safety Class		CLASS II			
MTBF	MIL-HDBK-217F@25°C	>1000Kh			

PHYSICAL CHARACTERISTICS

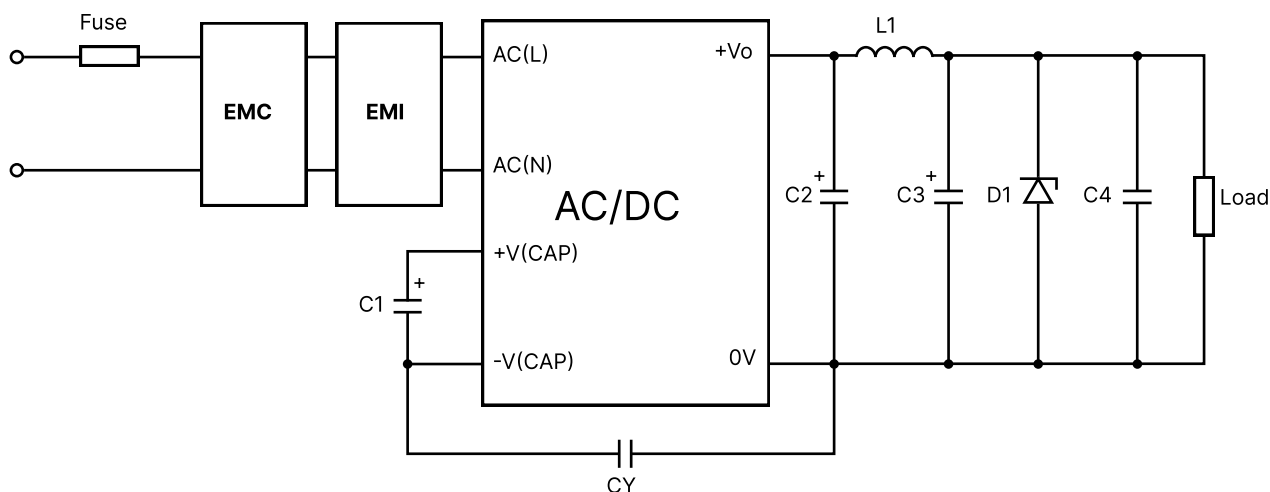
Parameter	Contents
Overall dimensions	32.00 × 17.20 × 15.38mm
Weight	10.2g (Typ.)
Cooling mode	Natural air cooling

EMC CHARACTERISTICS

Parameter		Category	Content
EMI	CE	CISPR32/EN55032	CLASS A (application circuit 1,4)
		CISPR32/EN55032	CLASS B (application circuit 2,3)
	RE	CISPR32/EN55032	CLASS A (application circuit 1,4)
		CISPR32/EN55032	CLASS B (application circuit 2,3)

Parameter	Category	Content		
EMS	RS	IEC/EN61000-4-3	10V/m	Perf. Criteria A
	EFT	IEC/EN61000-4-4	±2KV (application circuit 1,2)	Perf. Criteria B
		IEC/EN61000-4-4	±4KV (application circuit 3,4)	Perf. Criteria B
	Surge immunity	IEC/EN61000-4-5	line to line ±1KV (application circuit 1,2)	Perf. Criteria B
		IEC/EN61000-4-5	line to line ±2KV (application circuit 3,4)	Perf. Criteria B
	CS	IEC/EN61000-4-6	10Vr.m.s	Perf. Criteria A
	ESD	IEC/EN61000-4-2	Contact ±6KV	Perf. Criteria B

CIRCUIT DESIGN AND APPLICATION



Product Model	C1 (required)	C2 (required)	C3 (required)	C4	L1 (required)	CY (required)	D1
ACS10W-03V & ACS10W-05V	22uF/450V	820uF/16V	150uF/ 25V	0.1uF/50V	2.2uH 6.5A 15mΩ MAX	1nF/400VAC	D1 is a TVS transistor that can protect the downstream circuit in case of module abnormalities. It is recommended to choose a model that is 1.2 times the output voltage
ACS10W-09V & ACS10W-12V		470uF/25V					
ACS10W-15V & ACS10W-24V		470uF/35V	100uF/ 35V		3.3uH 5A 25mΩ MAX		

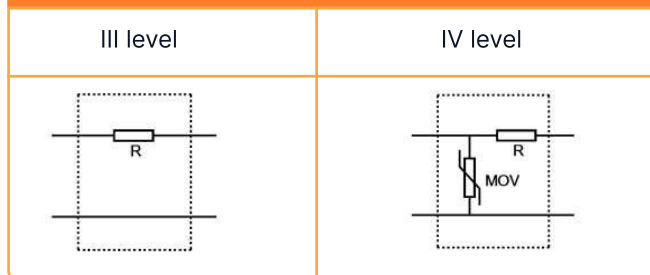
Note:

1. FUSE, EMC protection, and EMI protection are selected based on actual application needs;
2. C1 is a filtering electrolytic capacitor, which is a required component. It is recommended to use ripple current > 400mA@100KHz Electrolytic capacitors.
3. C2, C4, and L1 form a Pi type filtering circuit, and it is recommended to use high-frequency low resistance electrolytic capacitors or solid-state capacitors.
4. When selecting L1, ripple requirements can be considered, while paying attention to current and internal resistance values.

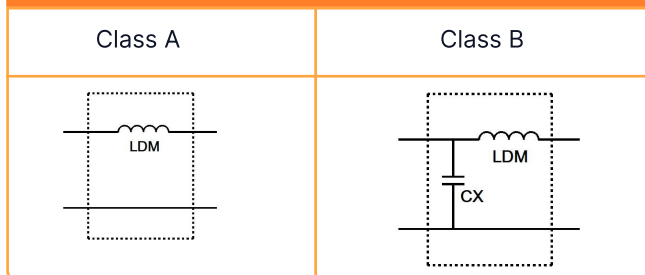
Environmental Application - EMC Solution Selection Table

Recommended circuit	Application environment	Application industry	Input Voltage	Ambient Temperature	EMI	EMS
1	Basic applications	--	85-305VAC	-40°C - +85°C	Class A	III level
2	Indoor civil	Intelligent household electrical appliance		-25°C - +55°C	Class B	III level
	Indoor ordinary	Intelligent building		-25°C - +55°C	Class B	III level
3	Outdoor industry	Manufacturing workshop		-25°C - +55°C	Class B	IV level
4	Outdoor ordinary	ITS/Charging point/ Communication/Security and protection		-40°C - +85°C	Class A	IV level

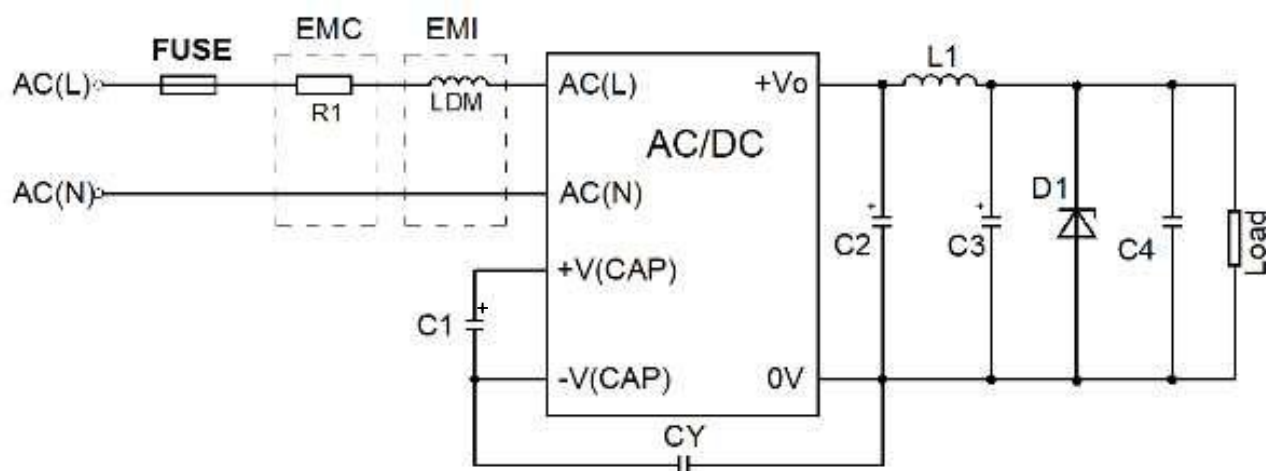
EMS protection circuit design reference



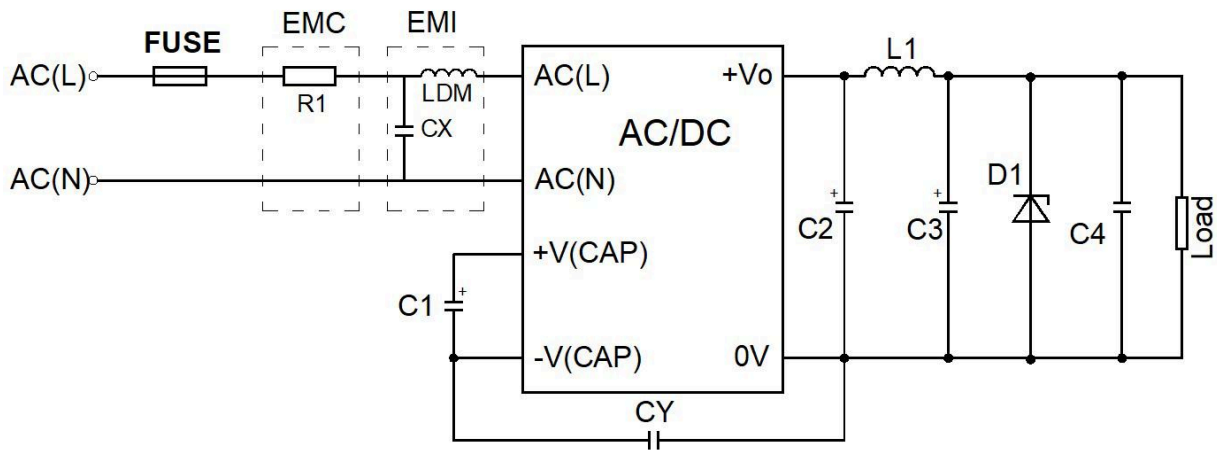
EMI protection circuit design reference



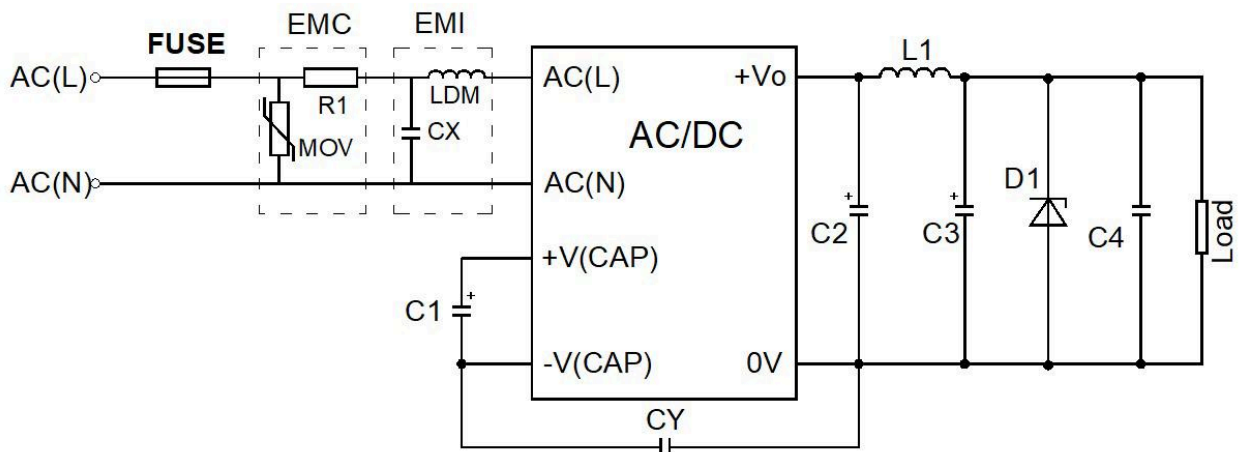
Recommended Circuit 1



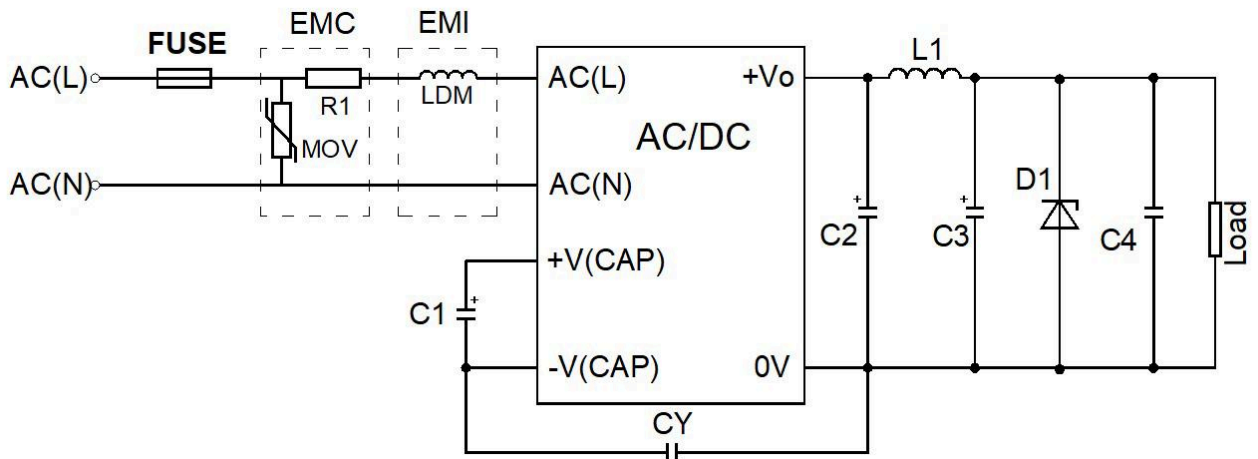
Recommended Circuit 2



Recommended Circuit 3



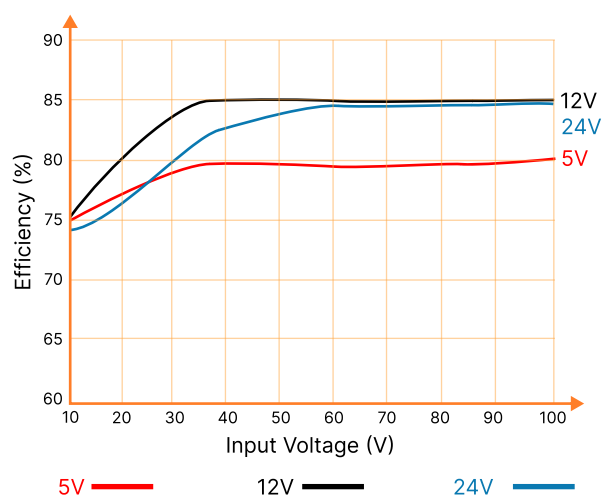
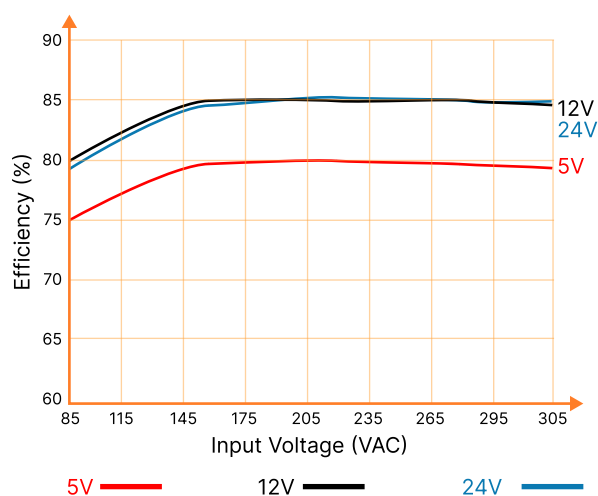
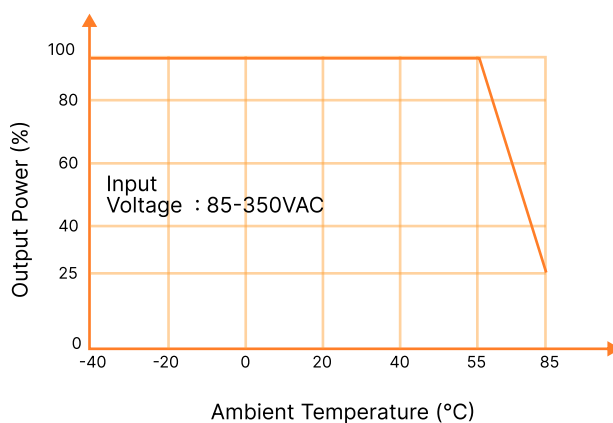
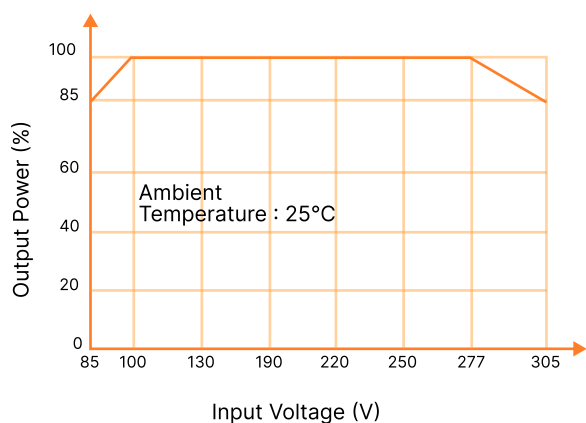
Recommended Circuit 4



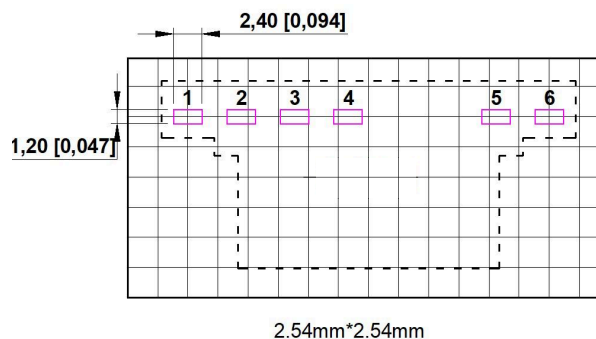
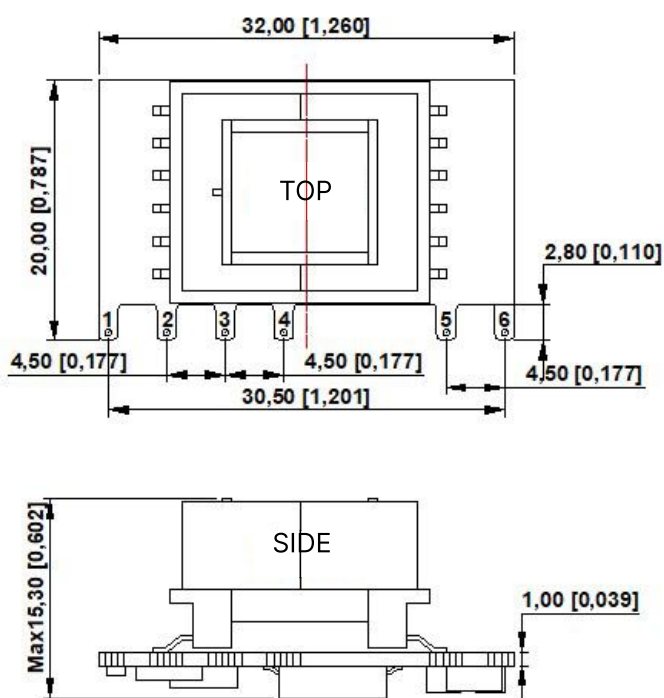
EMC Recommended Circuit Device Selection Reference Table

Components	Recommended Circuit 1 & Recommended Circuit 2	Recommended Circuit 3 & Recommended Circuit 4
Fuse (required)	1A/300V, Slow melting	2A/300V, Slow melting
R1 (Wire-wound resistor, required)	6.8Ω/3W	
MOV	14D561	
LDM	2.2mH/Max: 4Ω/Min:0.24A	
CX	0.1uF/310VAC	

PRODUCT CHARACTERISTIC CURVE



OVERALL DIMENSIONS AND PIN FUNCTIONS



Pin	Function
1	AC(L)
2	AC(N)
3	+V(cap)
4	-V(cap)
5	-Vo
6	+Vo

NOTE

1. The input voltage cannot exceed the specified range value, otherwise permanent and irreparable damage may be caused;
2. Unless otherwise specified, the parameters in this datasheet were measured at 25°C, humidity 40%~75%, input nominal voltage and output pure resistance mode under full load;
3. All index test methods are based on our company's enterprise standards.