AC/DC Converter
SMCP100 Series

100W, 165~265VAC Input
AC/DC capacitor charging module power supply

FEATURES

- With charging function, the output ultra-capacitor can be charged
- Industrial grade operating temperature: -40℃ to 75℃
- High isolation voltage: 3000VAC
- Output Voltage continuously adjustable
- Chassis mounting
- MTBF>100,000 H

SMCP100 100-W converter offered by SCHMID-M: It features high reliability and high isolation voltage, continuously adjustable output voltage, They are widely used in power permanent-magnet switch controller, Electricity network cabinet and other electrical equipment. They can be used as uninterruptible power supply with ultra capacitor.

Selection Guide

Part No.	Output Power	Nominal Output Voltage and Current		Efficiency(230VAC, %/Typ.)	Max. CapacitiveLoad(uF)
		(Vo1/Io1)	(Voc/Ioc)		Vo1
SMCP100-2A27D27	100W	27V/1.5A	27V/3A	85	3000

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Rang	AC input	165	220	265	VAC
	DC input	200	310	375	VDC
Input frequency		40	50	60	Hz
Input current	230VAC	--	--	1600	mA
Inrush current	230VAC	--	50	--	A
Recommended External Input Fuse		3.15A, slow fusing			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Regulation Range	Vo1	24	27	28	VDC
	Voc	24	27	28	
Line Regulation	Vo1	--	±1	--	%
Load Regulation	Vo1	--	±3	--	
Output Current Accuracy*	Voc	--	±3	--	
Output Ripple & Noise**	Vo1 20MHz bandwidth (peak-peak value)	--	100	--	mV
Charging Capacitor Capacity	Voc	--	--	10	F
Short Circuit Protection		Continuous, self-recovery			
Over-voltage Protection		Feedback clamp limiting			

Note: *When the voltage on Voc is between 0V and the rated output voltage (24~28V adjustable),the Voc works in constant current mode, and it was constant voltage mode after the voltage reaches the rated output voltage;
**Ripple and noise tested with "parallel cable" method, please see *AC-DC Converter Application Notes* for specific operation methods.

General Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output	Test time: 1min	3000	--	--	VAC
Operating Temperature			-40	--	+75	℃
Storage Temperature			-40	--	+105	
Storage Humidity			--	--	95	%RH
Power Derating		+55℃~+75℃	3.25	--	--	%/℃
Hot Plug		Unavailable				
MTBF		MIL-HDBK-217F@25℃ > 100,000 h				

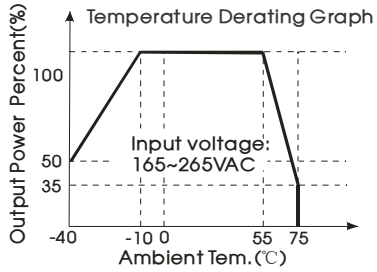
Physical Specifications

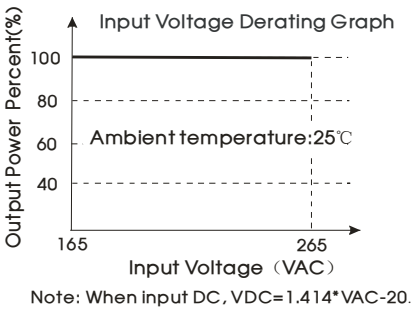
Casing Material	Metal
Package Dimensions	168.0*79.0*28.0 mm
Weight	400g(Typ.)
Cooling method	Free air convection

EMC Specifications

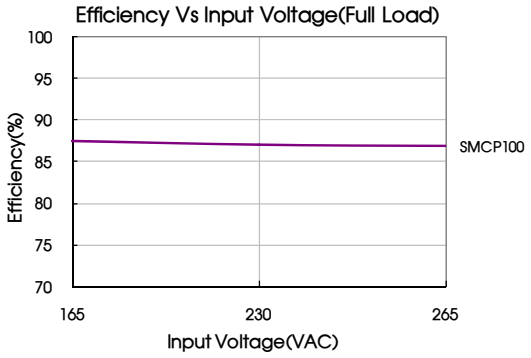
EMI	Conducted Disturbance	CISPR22/EN55022, CLASS A	
	Radiated Emission	CISPR22/EN55022, CLASS A	
EMS	Electrostatic Discharge	IEC/EN61000-4-2 ±4KV	Perf. Criteria B
	Radiation Immunity	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±4KV	perf. Criteria B
EMS	Surge Immunity	IEC/EN61000-4-5 ±2KV/±4KV	perf. Criteria B
		IEC/EN61000-4-5 ±4KV/±6KV(recommended circuit refer to Fig.2)	perf. Criteria B
	Conducted Disturbance immunity	IEC/EN61000-4-6 10 Vr.m.s	perf. Criteria A
	Immunity for Power frequency magnetic field	IEC/EN61000-4-8 10A/m	perf. Criteria A
	Immunities of voltage dip, drop and short interruption	IEC/EN61000-4-11 0%-70%	perf. Criteria B

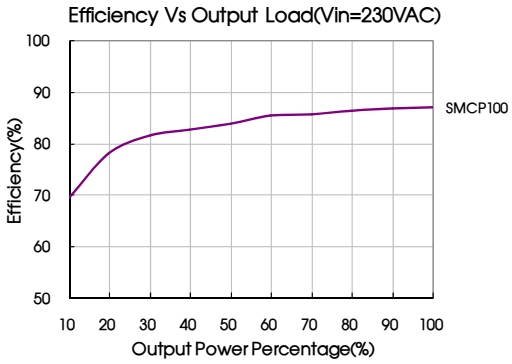
Product Characteristic Curve





Note: When input DC, VDC=1.414*VAC-20.





Design Reference

1. Typical application circuit

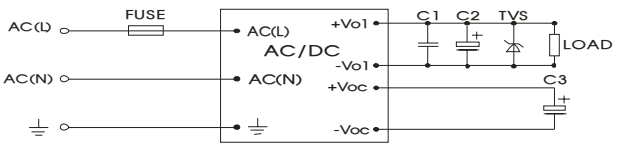


Fig. 1: Typical application circuit

Model	C1(μF)	C2(μF)	TVS tube
SMCP100-2A27D27	1	220	SMBJ30A

Note:
Output filtering capacitor C2 is electrolytic capacitor, it is recommended to apply electrolytic capacitor with high frequency and low resistance. For capacitance and current of capacitor please refer to manufacture's datasheet. Capacitance withstand voltage derating should be 80% or above. C1 is ceramic capacitor, which is used to filter high-frequency noise. TVS is a recommended component to protect post-circuits if converter fails.C3 is super-capacitor for Uninterrupted Power Supply.

2. EMC recommended circuit

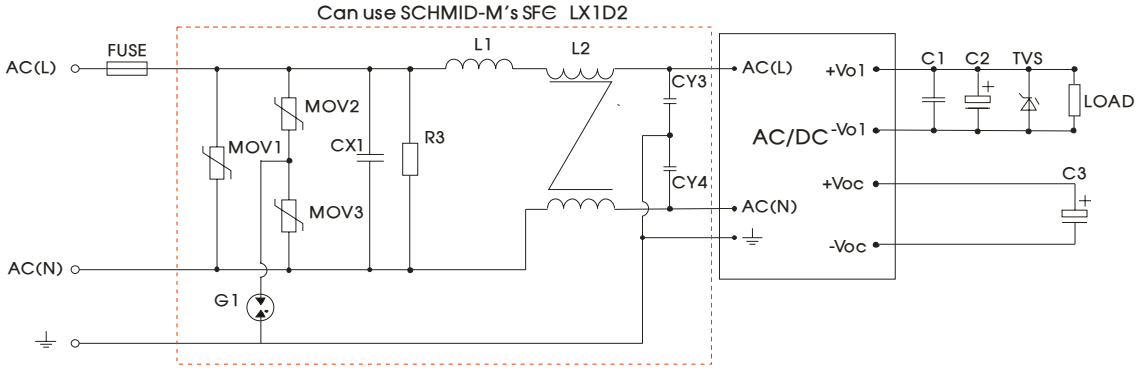


Fig 2: EMC application circuit with higher requirements

Element model	Recommended value	Element model	Recommended value
MOV1	S20K350	L1	4.7uH
MOV2, MOV3	S10K300	G1	B5G3600
CY3, CY4	1000pF/400VAC	R3	1MΩ/2W
CX1	0.22μF/275VAC	FUSE	3.15A/250V, slow fusing
L2	1mH, recommended to use MORNSUN's FL2D-30-102	FC-LX1D2	4KV/6KV EMC Filter

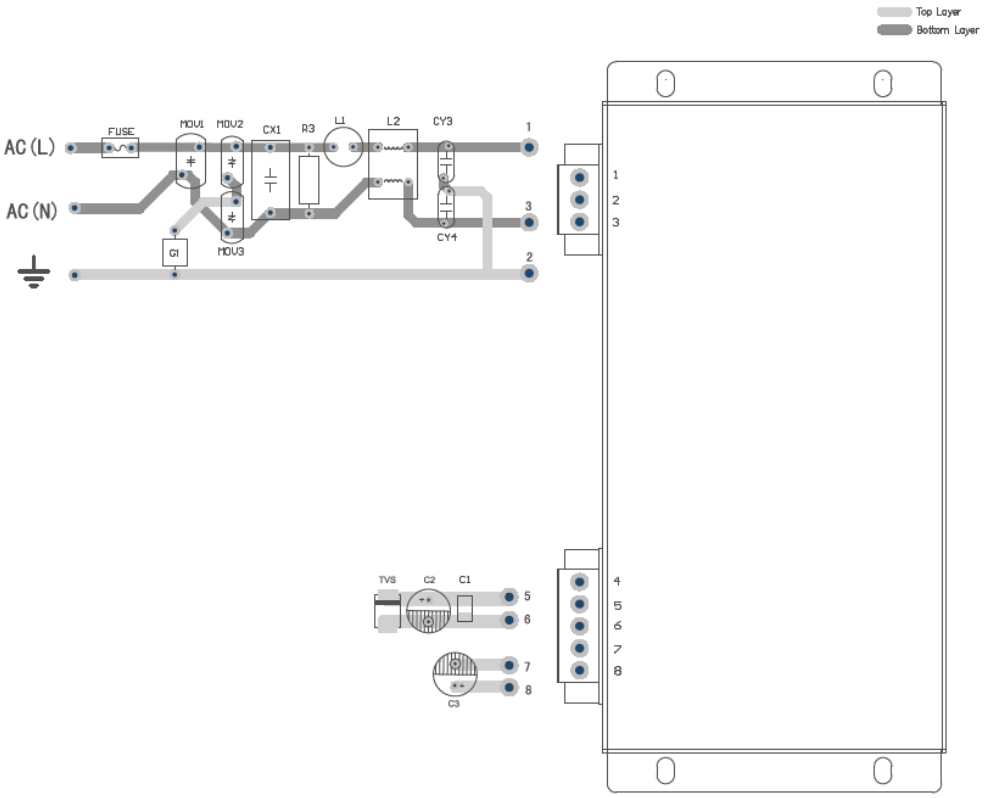


Fig 3: Recommended EMC circuit-PCB layout

Suggestions for safety regulation and wiring width: wire width ⩾3mm, distance between wires ⩾6mm, and distance between wire and ground ⩾6mm

3. Application specification

(1) The K terminal is a warning terminal. When the AC input is normal, The K terminal is a high level to -Vo1, which is greater than 23V. When the AC input fails, The K terminal is a low level to -Vo1, which is less than 5V. The K terminal can not be used as a load output terminal.

(2) To avoid any danger, the output super capacitance can not reverse.

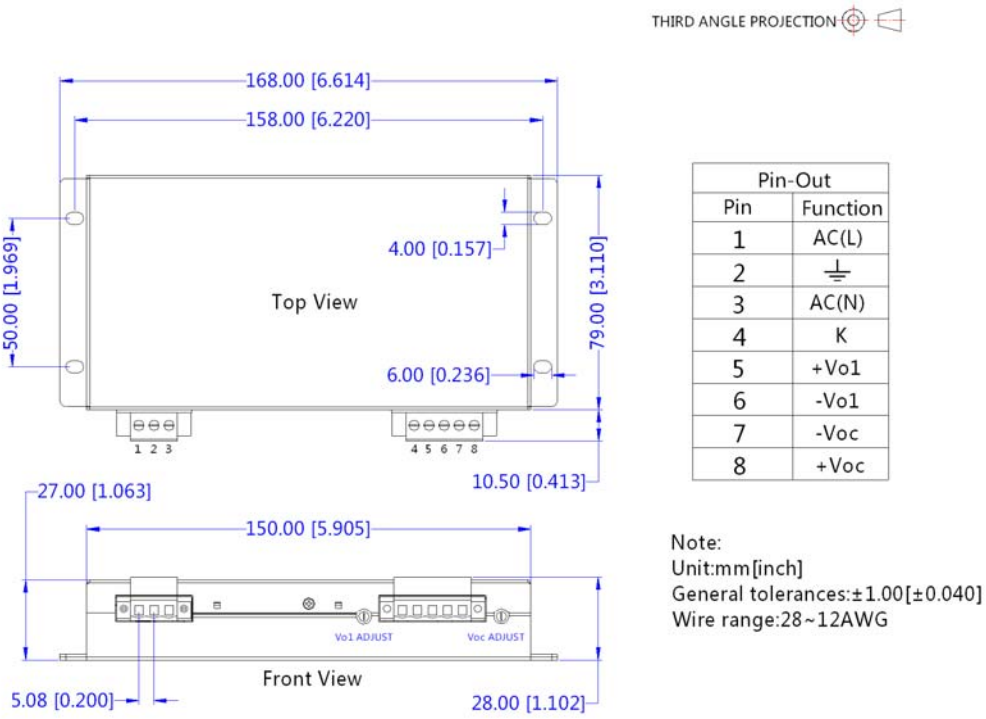
(3) To protect the module, do not connect a charged capacitor to it, until the capacitor is discharged.

(4) The module can only used as a uninterruptible power source, do not use under continuous nor frequent charging-discharging conditions. IF it must work under those conditions, please make sure the interval between two charging operations is not less than 60 seconds. When the operating temperature exceeds +55℃, the power derating must be under consideration.

(5) The output regulation terminal can see the Dimensions and Recommended Layout, counterclockwise regulating output voltage rise; when regulating the output voltage, please limit the voltage to ensure that the output voltage Vo1 is slightly higher than Voc, and it is better to ensure this while Vo1 is under full load condition.

4. For more information please find the application notes on www.schmid-m.com

Dimensions and Recommended Layout



Pin-Out	
Pin	Function
1	AC(L)
2	⏚
3	AC(N)
4	K
5	+Vo1
6	-Vo1
7	-Voc
8	+Voc

Note:
Unit:mm[inch]
General tolerances:±1.00[±0.040]
Wire range:28~12AWG

Note:

1. Packing Information please refer to 'Product Packing Information'. Packing bag number: 58020022;
2. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25° C, humidity<75% when inputting nominal voltage and outputting rated load;
3. All index testing methods in this datasheet are based on our Company's corporate standards;
4. 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;
5. We can provide product customization service;
6. Specifications of this product are subject to changes without prior notice.

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