



Key features

- Universal input: 85-264 VAC, 50/60 Hz
- Low ripple and noise
- Over load protection ,short circuit protection
- High efficiency, high density, fine quality and low price
- Industrial design
- Lower power, RoSH , no-load loss <0.5W
- 100% test and work
- 3 Years product warranty

SP20 series--a super small size modular AC/DC power supply offered by Zhongyiguang. This series of power supply is global, ac/dc input voltage range, low power consumption, high efficiency, high reliability, safety isolation, etc. Safe and reliable products, surge resistance is superior, the EMC and safety specifications meet the IEC/EN61000-4, CISPR22 / EN55022, UL60950 and EN60950 standards.

Electrical specifications

Model	Input voltage	Output Power(W)	Output voltage(V)	Output current(A)	Ripple(mv)	Efficiency (%)
SP20-S03	85 ~ 264VAC (70 ~ 370VDC)	13.2	3.3	4	50	73
SP20-S05		20	5	4	50	75
SP20-S12		20	12	1.66	50	79
SP20-S15		20	15	1.33	50	80
SP20-S24		20	24	0.83	50	85

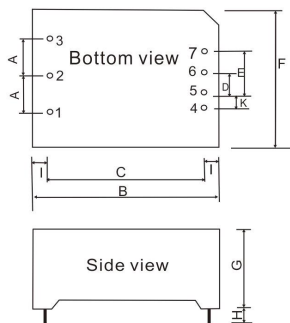
General features

Output	Output voltage accuracy	±2.0%
	Source effect	±1.0%
	Load effect	±1.0%
	Starting time (TYP)	20ms/230VAC;50ms/115VAC at full load
	Output hold time(TYP)	40ms/230VAC;15ms/115VAC at full load
Input	Input voltage range	85 ~ 264VAC (70 ~ 370VDC)
	Input frequency range	47 ~ 440Hz
	Input current(TYP)	480mA / 115VAC; 270m A / 230VAC
	Inrush current (TYP)	Cold Boot20 A / 115 VAC 40 A / 230 VAC
	Recommended values for External Fuses	T2A / 250Vac (disconnected slowly)
	Leakage current (TYP)	< 1mA at 230VAC/50Hz
Protection	Short circuit protection: automatic recovery after troubleshooting; Over-current protection, 110%--150% load, automatic recovery after troubleshooting.	
Work environment	Operating Temperature	-40 ~ +70 °C (≥40°C, According to 0.3W/°C derating)
	Humidity	85% .RH max
	Storage Temperature	-40 ~ +85, 10 ~ 95% RH
	Temperature coefficient	0.03%/ (0~ 50°C)



	Vibration coefficient	10~500Hz,2G10min./1cycle, 60min.each along X,Y,Z axes
Safety and EMC (Note:3)	Safety Standard	UL1012,EN60950,UL60950
	I/O-Isolation voltage	I/P-O/P:3.0KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC
	Isolation resistance	I/P-O/P,I/P-FG,O/P-FG:> 100M Ohms/500VDC @ 25°C 70% RH
	EMI / RFI conducted	EN55011, EN55022 (CISPR22)
	ESD	IEC/EN 61000-4-2 level 4 8kV/15kV (Note: See the application circuit for details)
	RF	IEC/EN 61000-4-3 (Note: See the application circuit for details)
	EFT	IEC/EN 61000-4-4 level 4 4kV (Note: See the application circuit for details)
	SURGE	IEC/EN 61000-4-5 level 4 2kV
Others	MTBF	200K hrs min. MIL-HDBK-217F @ 25°C
	Dimension	70*48*23.5mm (L*W*H)
	Weight	120g/piece, 14.3kg/box
	Packing	112piece
	The size of the packing box	360*300*250mm
Notes	1. Unless otherwise indicated of the above data,Our products are tested in the condition of TA=25o°C, humidity <75%, 230Vac nominal voltage input and rated load output.	
	2. Ripple & noise are measured at 20MHz of bandwidth by using a 300mm twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.	
	3. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.	

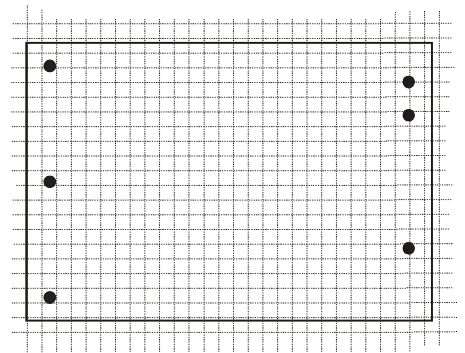
Dimension



Shell size	Pin	Pin function
A 20.0	1	FG
B 70.0	2	AC(N)
C 62.0	3	AC(L)
D 11.5		
E 23.0	4	No pin
F 48.0	5	-Vo
G 23.5	6	No pin
I ≥ 4.0	7	+Vo
K 5.75		

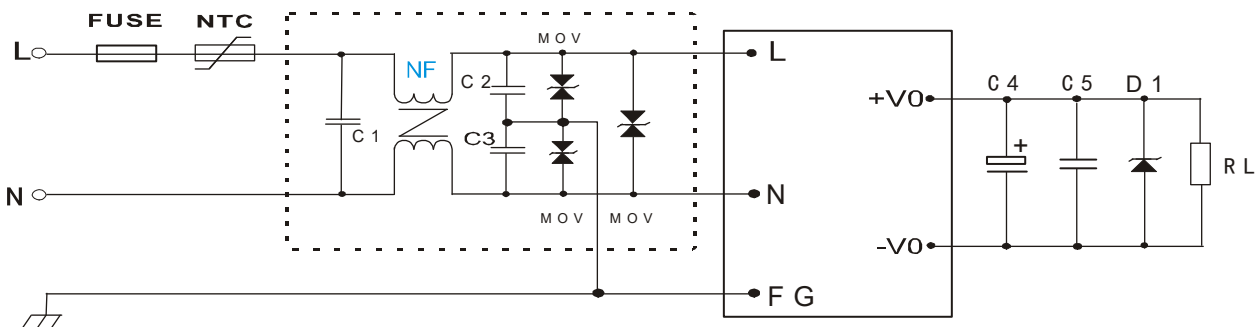
Remark: unit of measurement: mm
 Size of terminal section: 1.00mm
 Terminal to larence: ± 0.1mm
 Leng of the terminal: ≥ 4.00mm
 No to larence: ± 0.5mm
 Module weight: 120g(typical value)

PCB LAYOUT



Note: each cell in the graph is 2.54mm (100mil)

Typical application diagram





Remarks:

1. The output filter capacitor C4 is electrolytic capacitor, recommend using of high frequency and low resistance of electrolytic capacitors, the capacity and the current flowing-through need refer to the technical specifications provided by the manufacturer. Capacitance voltage derating is greater than 80%. C5 is use to remove high frequency noise. TVS D1 is used for protecting flow-up circuit (when module be abnormal) and recommended to use.
2. EMC filter used in the dashed box is to meet the higher requirements, if it is used in general applications, it can be omitted.
3. In order to meet customer demand, our company makes the circuit in the dashed box into products, and named: FA01 FA02 and can be used with switching power supply. Refer to technical manual to get more information. If you need technical support, please contact with our engineer.

Typical values for external circuit components

Component Model	FUSE	NTC	NF	MOV	C1	C2, C3	C4	C5	D1
SP20-S05	T2A/250 V	Model: 10D-9 is recommended for NTC	NF is common mode inductor, L=3	Model: 14D471K is recommended for MOV	Model: 104K/275 V Safety capacitor X is recommended for C1	Model: 102K/400 V Safety capacitor is recommended for C2, C3	470uF/16V	104K/50V (Ceramic capacitors)	P6KE6.8A
SP20-S12			-10mH, I=0.2 A-0.5A.				120uF/16V		P6KE16A
SP20-S15			NF is common mode inductor, L=3				120uF/25V		P6KE20A
SP20-S24			-10mH, I=0.3 A-0.6A.				100uF/35V		P6KE33A
		470uF/16V	P6KE16A						
						120uF/16V		P6KE16A	



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