



Jameco SKU Number: 213604

500W Single Output with PFC Function

SP-500 series



■ Features :

- Universal AC input / Full range
- Built-in active PFC function, PF>0.95
- Protections: Short circuit / Overload/ Over voltage / Over temperature
- Forced air cooling by built-in DC fan
- Built-in cooling Fan ON-OFF control
- Built-in remote ON-OFF control
- Built-in remote sense function
- Fixed switching frequency at 110KHz
- 3 years warranty



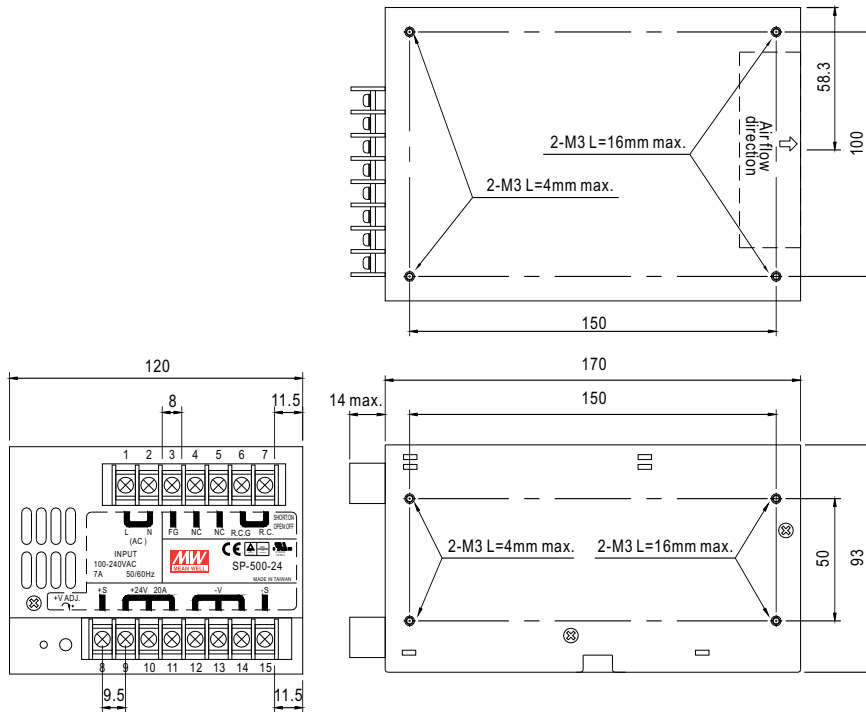
SPECIFICATION

MODEL		SP-500-12	SP-500-13.5	SP-500-15	SP-500-24	SP-500-27	SP-500-48
OUTPUT	DC VOLTAGE	12V	13.5V	15V	24V	27V	48V
	RATED CURRENT	40A	36A	32A	20A	18A	10A
	CURRENT RANGE	0 ~ 40A	0 ~ 36A	0 ~ 32A	0 ~ 20A	0 ~ 18A	0 ~ 10A
	RATED POWER	480W	486W	480W	480W	486W	480W
	RIPPLE & NOISE (max.) Note.2	240mVp-p	240mVp-p	240mVp-p	240mVp-p	200mVp-p	300mVp-p
	VOLTAGE ADJ. RANGE	10 ~ 13.2V	12 ~ 15V	13.5 ~ 18V	20 ~ 26.4V	24 ~ 30V	41 ~ 56V
	VOLTAGE TOLERANCE Note.3	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
	LINE REGULATION	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
	LOAD REGULATION	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
	SETUP, RISE TIME	1500ms, 50ms at full load					
HOLD UP TIME (Typ.)	24ms at full load						
INPUT	VOLTAGE RANGE Note.5	88 ~ 264VAC		124 ~ 370VDC			
	FREQUENCY RANGE	47 ~ 63Hz					
	POWER FACTOR (Typ.)	PF>0.95/230VAC		PF>0.95/115VAC at full load			
	EFFICIENCY(Typ.)	84%	84%	83%	85.5%	86.5%	87%
	AC CURRENT (Typ.)	7A/115VAC	3.5A/230VAC				
	INRUSH CURRENT (Typ.)	18A/115VAC	36A/230VAC				
	LEAKAGE CURRENT	<3.5mA/240VAC					
PROTECTION	OVERLOAD	105 ~ 135% rated output power Protection type : Fold back current limiting, recovers automatically after fault condition is removed					
	OVER VOLTAGE	13.8 ~ 16.2V	15.5 ~ 18.2V	18 ~ 21V	27.6 ~ 32.4V	31 ~ 36.5V	57.6 ~ 67.2V
		Protection type : Hiccup mode, recovers automatically after fault condition is removed					
	FAN CONTROL, O.T.P.	RTH1 or RTH2 ≥50℃ FAN ON, ≤45℃ FAN OFF, ≥70℃ output shutdown					
FUNCTION	REMOTE CONTROL	RC+/RC-: Short = power on ; Open = power off					
ENVIRONMENT	WORKING TEMP.	-10 ~ +50℃ (Refer to output load derating curve)					
	WORKING HUMIDITY	20 ~ 90% RH non-condensing					
	STORAGE TEMP., HUMIDITY	-20 ~ +85℃, 10 ~ 95% RH					
	TEMP. COEFFICIENT	0.03%/℃ (0 ~ 50℃)					
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes					
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UL60950-1, TUV EN60950-1 approved					
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC 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					
	EMI CONDUCTION & RADIATION	Compliance to EN55022 (CISPR22) Class B					
	HARMONIC CURRENT	Compliance to EN61000-3-2,-3					
	EMS IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, light industry level, criteria A					
OTHERS	MTBF	133.4K hrs min. MIL-HDBK-217F (25℃)					
	DIMENSION	170*120*93mm (L*W*H)					
	PACKING	1.9Kg; 8pcs/15.5Kg/1.06CUFT					
NOTE	1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. 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. 5. Derating may be needed under low input voltages. Please check the derating curve for more details.						



Mechanical Specification

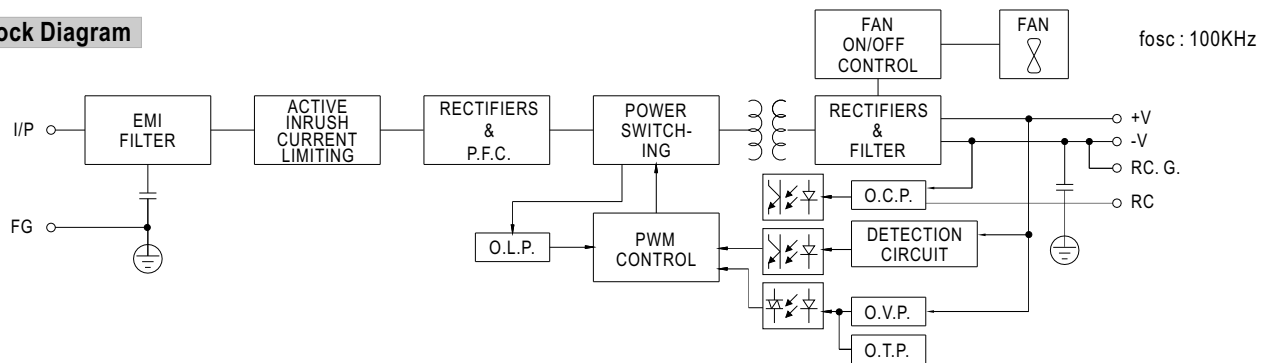
Case No. 910 Unit:mm



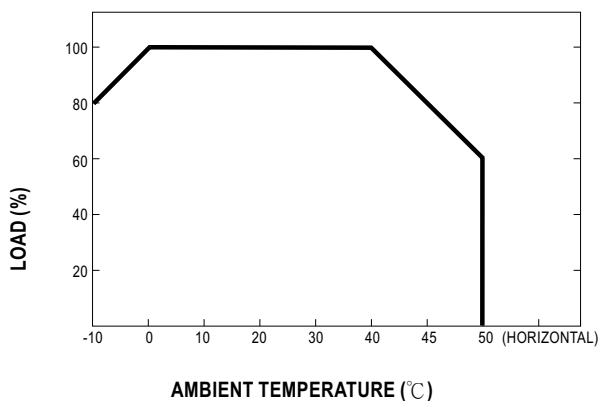
Terminal Pin No. Assignment

Pin No.	Assignment	Pin No.	Assignment
1	AC/L	7	R.C.
2	AC/N	8	+S
3	FG	9~11	DC OUTPUT +V
4,5	NC	12~14	DC OUTPUT -V
6	R.C.G	15	-S

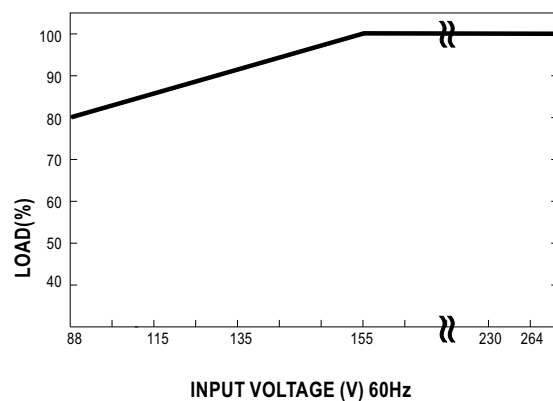
Block Diagram



Derating Curve



Output Derating VS Input Voltage



Quality Engineering Test Report

SERIES: SP-500 500W AC-DC SINGLE OUTPUT SWITCHING POWER SUPPLY

SAMPLE: A.SP-500-12 12V / 40 A D.SP-500-24 24V / 20 A

B.SP-500-13.5 13.5V / 36 A E.SP-500-27 27V / 18 A

C.SP-500-15 15V / 32 A F.SP-500-48 48V / 10 A

NO	TEST ITEM	TEST CONDITION / SPECIFICATION	RESULT	VERDICT
1	AC INPUT VOLTAGE RANGE	I/P:TESTING SPEC:88~264VAC O/P:FULL LOAD	E :60VAC~267VAC	P
2	LINE REGULATION	I/P:88~264VAC SPEC: O/P:FULL LOAD A: $\pm 0.5\%$ B: $\pm 0.5\%$ C: $\pm 0.5\%$ D: $\pm 0.5\%$ E: $\pm 0.5\%$ F: $\pm 0.5\%$ $\pm 0.5\%$	A: 0% ~ +0.05% B: 0% ~ 0% C: 0% ~ 0% D: -0.02% ~ +0.02% E: -0.02% ~ +0% F: -0.01% ~ 0%	P
3	LOAD REGULATION	I/P:230VAC SPEC: O/P:MIN. TO FULL LOAD A: $\pm 0.5\%$ B: $\pm 0.5\%$ C: $\pm 0.5\%$ D: $\pm 0.5\%$ E: $\pm 0.5\%$ F: $\pm 0.5\%$ $\pm 0.5\%$	A: -0.05% ~ +0.05% B: -0.18% ~ +0.13% C: -0.1% ~ +0.08% D: -0.02% ~ +0.07% E: -0.13% ~ +0.06% F: -0.04% ~ +0.04%	P
4	OUTPUT VOLTAGE TOLERANCE	I/P:88~264VAC SPEC: O/P:0% TO FULL LOAD A: $\pm 1\%$ B: $\pm 1\%$ C: $\pm 1\%$ D: $\pm 1\%$ E: $\pm 1\%$ F: $\pm 1\%$ $\pm 1\%$	A: -0.05% ~ +0.1% B: -0.33% ~ +0.04% C: -0.04% ~ 0.2% D: -0.13% ~ +0.05% E: -0.13% ~ +0.21% F: -0.05% ~ +0.03%	P
5	RIPPLE&NOISE	I/P:230VAC SPEC: O/P:FULL LOAD A: 240mV B: 240mV C: 240mV D: 240mV E: 200mV F: 300mV	A: 99mV B: 165mV C: 101mV D: 78mV E: 87mV F: 108mV	P
6	AC INPUT CURRENT	I/P:230VAC SPEC:3.5A O/P:FULL LOAD	E : 2.4A	P
7	MAX. INRUSH CURREN	I/P:230VAC SPEC:36A O/P: FULL LOAD	E : 22A	P
8	O/P VOLTAGE ADJ.RANGE	I/P:230VAC SPEC: A: 10~13.2V O/P:MIN. LOAD B: 12~15V C: 13.5~18V D: 20~26.4V E: 24~30V F: 41~56V	A: 9.20V~13.80V B: 11.62V~16.55V C: 12.46V~19.06V D: 19.0V~27.5V E: 23.461V~32.40V F: 38.61V~58.21V	P
9	SET UP TIME	I/P:230VAC SPEC:1.5S O/P:FULL LOAD	E : 472mS	P
10	HOLD UP TIME	I/P:230VAC SPEC:20mS O/P:FULL LOAD	E : 36.2mS	P
11	EFFICIENCY	I/P:230VAC SPEC: A:84% O/P:FULL LOAD B:84% C:83% D:85.5% E:86.5% F:87%	A:84.4% B:85.73% C:83.91% D:86.7% E:86.9% F:89.27%	P

NO	TEST ITEM	TEST CONDITION / SPECIFICATION	RESULT	VERDICT
12	OVER LOAD PROTECTION	I/P:230VAC SPEC: 105%~135% O/P:TESTING	A:109% B:125.5% C:112.5% D:123% E:109.5% F:117.9%	P
13	OVER VOLTAGE PROTECTION	I/P:230VAC SPEC: A:13.8V~16.2V O/P:TESTING B:15.5V~18.2V C:18V~21V D:27.6V~32.4V E:31V~36.5V F:57.6V~67.2V	A:14.57V B:17.57V C:20.2V D:29.3V E:35.2V F:57.92V	P
14	OVER TEMPERATURE PROTECTION & FAN ON/OFF TEST	I/P:230VAC SPEC: RTH1 or RTH2 O/P:FULL LOAD OTP > = 70°C FAN ON > = 50°C FAN OFF < = 45°C	E: OTP : 72°C FAN ON : 50°C FAN OFF: 47°C	P
15	POWER FACTOR	I/P:230VAC SPEC: 0.95 O/P:FULL LOAD	E: 0.993	P
16	GROUND LEAKAGE CURRENT	I/P:240VAC SPEC: L-FG--<3.5mA N-FG--<3.5mA	E: L-FG:0.90mA N-FG:0.72mA	P
17	INSULATION RESISTANCE	SPEC: I/P-O/P: 500VDC/100M Ohms MIN. I/P-FG: 500VDC/100M Ohms MIN. O/P-FG: 500VDC/100M Ohms MIN.	E: O/P-FG >100M Ohms I/P-O/P >100M Ohms I/P-FG >100M Ohms	P
18	DIELECTRIC / WITHSTAND VOLTAGE	SPEC: I/P- O/P: 3KVAC/ 1 min. (10mA CUT-OFF) I/P - FG: 1.5KVAC/ 1 min. (10mA CUT-OFF) O/P -FG: 0.5KVAC/ 1 min. (10mA CUT-OFF)	E: I/P-O/P :0.002mA I/P-FG :4.2mA O/P-FG :17.7mA	P
19	EMS TEST	EFT TEST: EN50082-1 IEC1000-4-4	F: CRITERIA A OK	P
		SURGE TEST: EN50082-1 IEC1000-4-5	F: CRITERIA A OK	P
20	ESD TEST	ESD TEST: EN50082-2 IEC1400-4-2	F: CRITERIA A OK	P
21	REMOTE SENSE	I/P: 230VAC SPEC:----- O/P:FULL LOAD	D:24V	P
22	BURN-IN TEST	I/P: 230VAC O/P: FULL LOAD TA:24.3°C BURN-IN DURATION : 1 hrs	D:NON BREAK	P

NO	TEST ITEM	TEST CONDITION / SPECIFICATION	RESULT	VERDICT																																												
23	ENVIRONMENT TEST (SAMPLE C:)	1.LOW TEMPERATURE TEST I/P:90 VAC O/P:80% LOAD AMBIENT TEMPERATURE:-10°C	AFTER 3 hrs POWER ON OK	P																																												
		2.HIGH AMBIENT TEMPERATURE FULL LOAD TEST I/P:230VAC O/P:FULL LOAD AMBIENT TEMPERATURE:43°C	AFTER 14 hrs NON BREAK																																													
		3.ACCELERATED LIFE TEST I/P:267VAC O/P:FULL LOAD POWER ON :3 min POWER OFF :5 sec AMBIENT TEMPERATURE:58°C AMBIENT HUMIDITY:95%	AFTER 4 hrs NON BREAK																																													
24	TEMPERATURE RISE TEST T rise OF PARTS	D: I/P :230VAC AFTER 1 hr BURN-IN O/P :FULL LOAD TA:24.3°C <table><tr><th>POSITION</th><th>P/N</th><th>TEMP</th><th>T rise</th></tr><tr><td>BD1</td><td>BRIDGE DIODE</td><td>43.2°C</td><td>18.9°C</td></tr><tr><td>Q52</td><td>MAIN TRANSISTOR</td><td>45.2°C</td><td>20.9°C</td></tr><tr><td>T51</td><td>MAIN TRANSFORMER WIRE</td><td>52°C</td><td>27.7°C</td></tr><tr><td>D61</td><td>O/P DIODE</td><td>49.7°C</td><td>25.4°C</td></tr><tr><td>C24</td><td>O/P FILTER CAPACITOR</td><td>51.5°C</td><td>27.2°C</td></tr><tr><td>L51</td><td>O/P CHOCK</td><td>58°C</td><td>33.7°C</td></tr><tr><td>RT</td><td>THERMISTOR</td><td>50.2°C</td><td>25.9°C</td></tr><tr><td>RTH1</td><td>THERMISTOR</td><td>40.0°C</td><td>15.7°C</td></tr><tr><td>Q2</td><td>TRANSISTOR</td><td>40.5°C</td><td>16.2°C</td></tr><tr><td>D1</td><td>DIODE</td><td>37.5°C</td><td>13.2°C</td></tr></table>		POSITION	P/N	TEMP	T rise	BD1	BRIDGE DIODE	43.2°C	18.9°C	Q52	MAIN TRANSISTOR	45.2°C	20.9°C	T51	MAIN TRANSFORMER WIRE	52°C	27.7°C	D61	O/P DIODE	49.7°C	25.4°C	C24	O/P FILTER CAPACITOR	51.5°C	27.2°C	L51	O/P CHOCK	58°C	33.7°C	RT	THERMISTOR	50.2°C	25.9°C	RTH1	THERMISTOR	40.0°C	15.7°C	Q2	TRANSISTOR	40.5°C	16.2°C	D1	DIODE	37.5°C	13.2°C	P
POSITION	P/N	TEMP	T rise																																													
BD1	BRIDGE DIODE	43.2°C	18.9°C																																													
Q52	MAIN TRANSISTOR	45.2°C	20.9°C																																													
T51	MAIN TRANSFORMER WIRE	52°C	27.7°C																																													
D61	O/P DIODE	49.7°C	25.4°C																																													
C24	O/P FILTER CAPACITOR	51.5°C	27.2°C																																													
L51	O/P CHOCK	58°C	33.7°C																																													
RT	THERMISTOR	50.2°C	25.9°C																																													
RTH1	THERMISTOR	40.0°C	15.7°C																																													
Q2	TRANSISTOR	40.5°C	16.2°C																																													
D1	DIODE	37.5°C	13.2°C																																													
25	LIFE CYCLE	D: SUPPOSE C74 IS THE MOST CRITICAL COMPONENT I/P:230VAC O/P:FULL LOAD Ta:25°C Tc74:52.2°C Life: 93054hrs I/P:230VAC O/P:FULL LOAD Ta:40°C Tc74:57°C Life: 66717hrs		P																																												
26	CRITICAL COMPONENT RECORD (FOR QC INSPECTION REFERENCE ONLY)	F: FUSE :10AL/250V BRIDGE DIODE :D15XB60 LINE FILTER :TF360 ET-28 TRANSFOMER :TF402 ETD-44 POWER SWITCHER :2SK1358 TO-3P OUTPUT DIODE :ESAD9202 TO-3P OUTPUT CAPACITOR :ELNA 1000uF/35V 105°C RJH INPUT CAPACITOR :JAMICON 150uF/400V 85°C LP P.C.B :SP-500-R4 FR-4 2 OZ DS																																														
DATE	SAMPLE	TEST RESULT	TEST	APPROVAL																																												
19980529	SP-500	PASS	H.C.LIOU	Max Lin																																												
19990817	SP-500-48	PASS	H.C.LIOU	Max Lin																																												