

SPECIFICATION



ESD15025568

HP500S

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SPECIFICATION

HYPER Single Rail Series

HP500S /PPA5005801

**Main Feature:
Meet 2013 ErP
Meet 80Plus on 230Vac-in
Active PFC Circuit
ATX2.3 Version**

MAY 20, 2015

REV : 1.01



MODEL: HP500S

Revision History

<u>Rev</u>	<u>Description</u>	<u>Date</u>	<u>Author</u>
1.00		2014/10/21	
1.01	Change the model name from 9PA500AP01 to PPA5005801	2015/5/20	陳定伶

1. GENERAL DESCRIPTION AND SCOPE

This is the specification of Model HP500S AC-line powered switching power supply with active PFC (Power Factor Correction) circuit, meet EN61000-3-2 features. Also, 5Vsb power is less than $0.5W_{input}$ at power off mode (PS_ON input at high state) which is comply with ErP Lot 6 year 2013 requirement.

The specification below is intended to describe as detailedly as possible the functions and performance of the subject power supply. Any comment or additional requirements to this specification from our customers will be highly appreciated and treated as a new target for us to approach.

2. REFERENCE DOCUMENTS

The subject power supply will meet the EMI requirements and obtain main safety approvals as following:

2.1. EMI REGULATORY

EMC : EMI DIRECTIVE 2004/108/EC(EN55022 / EN55024)

2.2. SAFETY

CB : IEC 60950-1:2005+A1

TUV : EN 60950 – 1 : 2006+A11+A1+A12

CE : EN 50581;2012

UL : UL 60950-1, 2nd Edition,

2011-12-19 Information Technologh Equipment – Safety Part 1 : Genrerall Requirements;

CSA C22.2 No. 60950-1-07, 2nd Edition

2011-12 Information Technologh Equipment – Safety Part 1 : Genrerall Requirements;

3. INPUT ELECTRICAL SPECIFICATIONS

3.1. AC INPUT

Parameter	Min.	Nom.	Max.	Unit
V _{in} (230VAC)	180	230	264	VAC _{rms}
V _{in} Frequency	47	50	53	HZ

◆ Nominal voltages for test purposes are considered to be within $\pm 1.0V$ of nominal.

3.2. INRUSH CURRENT

Maximum inrush current from power-on (with power on at any point on the AC sine) and including, but not limited to, three line cycles, shall be limited to a level below the surge rating of the input line cord, AC switch if present, bridge rectifier, fuse, and EMI filter components. Repetitive ON/OFF cycling of the AC input voltage should not damage the power supply or cause the input fuse to blow.

3.3. INPUT LINE CURRENT & POWER FACTOR (P.F.)

(At Full load)

AC input	Input line current	P.F.@ Full Load	P.F.@ Pin=75W
230V	< 3.0Amps – rms	> 0.9	> 0.65

3.4. EFFICIENCY

3.4.1 General

Under the load conditions defined in Table 1. and Table 2. The loading condition for testing efficiency shown in Table 1 represents a fully loaded system. a ~ 50% (typical) loaded system. and a ~ 20% (light) loaded system.

Table 1. Loading Table for Efficiency Measurements

500W(loading shown in Amps)					
Loading	+12V	+5V	+3.3V	-12V	+5Vsb
FULL	31.96	12.16	12.16	0.25	2.52
TYPICAL	15.98	6.08	6.08	0.13	1.26
LIGHT	6.4	2.43	2.43	0.05	0.5

Table 2. Minimum Efficiency Vs Load

Loading	Voltage	Full	Typical	Light
Required Minimum Efficiency	230V	82%	85%	82%

3.4.2 Standby Power Consumption (+5Vsb):

Input Power < 0.5W @ 5Vsb/45mA & 230Vac input

PS_ON input signal @ High State

4. OUTPUT ELECTRICAL REQUIREMENTS**4.1. OUTPUT VOLTAGE AND CURRENT RATING**

Output	MINIMUM LOAD	NORMAL LOAD	MAXIMUM LOAD	PEAK LOAD	LOAD REG.	LINE REG.	Ripple & Noise
+3.3V	0.2A	10A	20A		±5%	±1%	50mV P-P
+5V	0.2A	10A	20A		±5%	±1%	50mV P-P
+12V	1A	20A	38A		±5%	±1%	120mV P-P
-12V	0A	0.15A	0.3A		±10%	±1%	120mV P-P
+5VSB	0A	1.5A	3A		±5%	±1%	50mV P-P

(1) +3.3V & +5V total output not exceed 120W.

(2) Maximum combined current for the +12V outputs shall be 38A .

Voltages and ripple are measured at the load side of mating connectors with a 0.1 uF monolithic ceramic capacitor paralleled by a 10 uF electrolytic capacitor across the measuring terminals.

4.2. LOAD CAPACITY SPECIFICATIONS

The cross regulation defined as follows, the voltage regulation limits DC include DC Output ripple & noise.

LOAD	+3.3V	+5V	+12V	-12V	+5Vsb
Condition_1	1A	0.2A	2A	0.2A	3A
Condition_2	0.2A	0.2A	1A	0A	0A
Condition_3	1A	1A	1A	0.3A	0.1A
Condition_4	1A	7.8A	38A	0.1A	0.1A
Condition_5	1A	18A	12.6A	0.1A	0.1A
Condition_6	18A	3A	12.6A	0.1A	0.1A
Condition_7	20A	10.8A	30.1A	0.3A	3A
Condition_8	6A	20A	30.2A	0.3A	3A
Condition_9	2.3A	3.6A	38A	0.3A	3A
Condition_10	9.5	9.9A	25.6A	0.2A	2A
Condition_11	0.2A	0.2A	0.8A	0A	0A

4.3. OVER VOLTAGE PROTECTION

Voltage Source	Protection Point
+3.3V	3.76V-5.2V
+5V	5.75V-7.5V
+12V	13.5V-16.5V

4.4. OVER CURRENT PROTECTION

OUTPUT VOLTAGE	Max. over current limit
+3.3V	45A
+5V	45A

OCP test load condition as below :

+3.3V OCP test load at the condition_6

+5V OCP test load at the condition_5

4.5. Dynamic (Condition_11)

4.6. SHORT CIRCUIT PROTECTION

Output short circuit is defined to be a short circuit load of less than 0.1 ohm.

In the event of an output short circuit condition on +3.3V, +5V, +12V or -12V output, the power supply will shutdown and latch off without damage to the power supply. The power supply shall return to normal operation after the short circuit has been removed and the power switch has been turned off for no more than 2 seconds.

4.7. POWER SIGNAL

POWER GOOD @230V, FULL LOAD	100 –500mSec.
POWER FAIL @230V, FULL LOAD	1 mSec. minimum

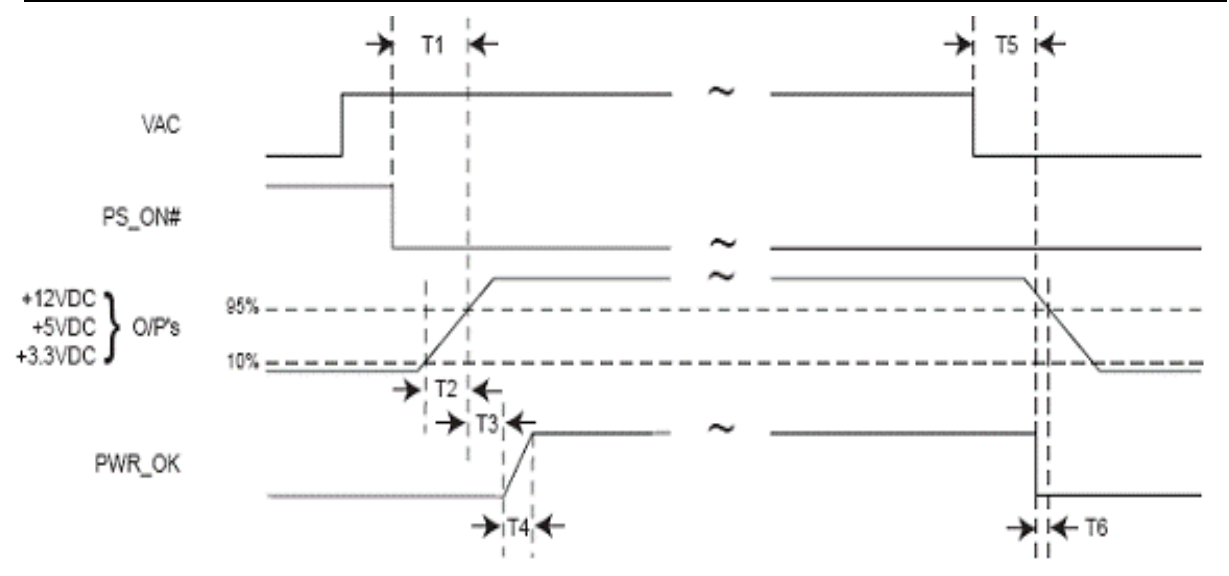


Figure:

T1: Power-on time shall be less than 500 ms ($T1 < 500$ ms).

T2: Rise time : 0.1 ms to 20 ms ($0.1 \text{ ms} \leq T2 \leq 20 \text{ ms}$).

T3: Power-ok delay time: $100 \text{ ms} < T3 < 500 \text{ ms}$

T4: Power-ok rise time: $T4 \leq 1 \text{ ms}$

T5 + T6: AC loss to PWR_OK hold-up time

OUTPUT RISE TIME

(10% TO 90% OF FINAL OUTPUT VALUE, @ FULL LOAD of Table 1.)

230V-rms

- + 3.3Vdc : 20ms Maximum
- + 5Vdc : 20ms Maximum
- + 12Vdc : 20ms Maximum
- + 5Vsb : 20ms Maximum
- 12Vdc : 20ms Maximum

4.8. HOLD-UP TIME (@Condition_10, 80% FULL LOAD)

230V / 50Hz : 17 mSec. Minimum.

The output voltage will remain within specification, in the event that the input power is removed or interrupted, for the duration of one cycle of the input frequency. The interruption may occur at any point in the AC voltage cycle. The power good signal shall remain high during this test.

5. FAN NOISE REQUIREMENTS

5.1. The subject power supply is cooled by a self-contained, 120mm, 12VDC fan.

5.2. FAN NOISE

AC INPUT	Full (Table 1.)	Typical (Table 1.)	Light (Table 1.)
230V	NOISE \leq 38dB	NOISE \leq 30dB	NOISE \leq 28dB

6. ENVIRONMENTAL REQUIREMENTS

The power supply will be compliant with each item in this specification for the following Environmental conditions.

6.1. TEMPERATURE RANGE

Operating	+10 to +40 deg. C
Storage	-20 to +80 deg. C

6.2. HUMIDITY

Operating	5 –95% RH, Non-condensing
Storage	5 –95% RH, Non-condensing

6.3. VIBRATION

Random Vibration

0.01g²/ Hz at 5 Hz, sloping to 0.02g²/ Hz at 20 Hz, and maintaining 0.02g²/ Hz from 20Hz to 500Hz. The area under the PSD curve is 3.13gRMS.

The duration shall be 20 minutes per axis for all three axes on all samples.

6.4. GROUND LEAKAGE CURRENT

The power supply ground leakage current shall be less than 3.5 mA.

6.5. RELIABILITY

The power supply reliability, when calculated by MIL-HDBK-217; latest revision, are exceed 100,000 hours with all output at maximum load and an ambient temperature of 25°C.

6.6. DIELECTRIC STRENGTH

Primary to Frame Ground : 1800 Vac for 1 sec.

Primary to Secondary : 1800Vac for 1 sec

6.7. INSULATION RESISTANCE

Primary to Frame Ground : 20 Meg.ohms Minimum

Primary to Secondary : 20 Meg.ohms Minimum

7. LABELLING

Label marking will be permanent, legible and complied with all agency requirements.

7.1. MODEL NUMBER LABEL

Labels will be affixed to the sides of the power supply showing the following:

- Manufacturer's name and logo.
- Model no., serial no., revision level, location of manufacturer.
- The total power output and the maximum load for each output.
- AC input rating.

8. MECHANICAL SPECIFICATIONS

The mechanical drawing of the subject power supply, which indicate the form factor, location of the mounting holes, location, the length of the connectors, and other physical specifications of the subject power supply. Please refer to the attachment drawing.