Table of Contents

1. General

1.1 Scope

This specification defines the general design and performance requirements for HPC-360-102 switching power supply .This power supply can meet the Energy Start computer requirement specified by Environment Protection Agency of America. It also supports remote On/Off control function.Standby voltage and 3.3VDC output which will be the major trend for power supply in future.

2. Input Characteristics

2.1 Input Voltage

Nominal Voltage	Voltage Variation Range
115Vrms	90 - 132 Vrms
230 Vrms	180 - 264 Vrms

* The power supply is designed Uto operate in two specified voltage range the depending upon outside manual input voltage switch selected. Unless specified the HPC-360-102 shall be set at 230Vac

2.2 Input Frequency

Nominal Frequency	Frequency Variation Range
50/60 Hz	47 Hz to 63 Hz

* Waveform harmonic distortion will be less than 5%.

* The power supply must operate at above frequency with both 90-132/180-264 Vrms input voltage range.

2.3 Max. Input AC Current

Max. Input Current	Measuring Range
8.0A	90 - 132 Vrms
5.0A	180 - 264 Vrms

2.4 Inrush Current

Less than the ratings of it`s critical components (Including bulk rectifiers.Fuses and surge limiting device).

2.5 Efficiency

HPC-360-102 provides an efficiency of 65 % minimum when measured at full load under 115V/60Hz and 230V/50Hz condition.

3. Output characteristics

3.1

a. Normal Operation Output

Output Voltage	Load Range MIN	MAX	Regulation	Ripple&Noise Peak-to-Peak Max.	Ripple Peak-to-Peak Max.
1. +5V	1.5A	35.0A	+5% ~ -5%	150 mV	50 mV
2. +12V	0.2A	17.0A	+5% ~ -5%	200 mV	120 mV
3. –12V	0A	0.3 A	+10% ~ -10%	250 mV	120 mV
4. –5V	0A	0.8A	+10% ~ -10%	250 mV	100 mV
4. +5Vs	0A	2.0A	+5% ~ -5%	100 mV	50 mV
5. +3.3V	0.3A	28.0A	+5% ~ -5%	100 mV	50 mV

＊. The max load can`t be over 220W when both DC +5V and +3.3V are used.

＊. Maximum total peak output power shall not exeeced 360 watts and also the working time can not exceed 15 sec at normal input voltage.

NOTE:

1. Noise test should be measured with 20 MHz bandwidth frequency oscilloscope. The output terminal shall add a tantalum capacitor of 10uF in parallel with a ceramic capacitor of 0.1uF.

2. Regulation should cover +/-10% dynamic output current changed within the static limit of para 3.1 for any one of combination of levels at frequency less than **1 KHz**

3.2 Remote On/Off Controlled mode

When AC power present, the power supply shall be in save mode operation and +5Vsb shall within its regulation window. When there comes a TTL "L" signal inserted, the power supply shall be on. When TTL signal "H" is inserted the power supply shall be off.

TTL level "H" 3.0V - 5.5V
"L" 0.0V - 0.8V

3.3 Regulation

The cross regulation defined as follows, the output regulation should be within the specified range.

Load	SYM	+5V	+3.3V	+12V	-12V	-5V
ALL Max.	HHHHH	25.5A	28.0A	10.0A	0.8A	0.3A
ALL Min.	LLLLL	1.5A	0.3A	0.2A	0A	0A
+5V Middle others Min.	MLLLL	10.0A	0.3A	1.0A	0.0A	0.0A
+5V Middle others Max.	MHHHH	5.0A	16.0A	10.0A	0.8A	0.3A

3.4 Rise Time

DC output rise time is less than 20 mS at nominal line and full load.

3.5 Hold-up Time

DC +5V output maintains at least 16mS after power off which hold within para 3.1.

3.6 5 VSB

5VSB is required for the implementation of PS-ON described above. 5VSB is a standby voltage that may be used to power circuits that require power input during the powered-down state of all power rails. The 5VSB pin should deliver 5V ±5% at a minimum of 2.0A maximum form this pin. This power may be used to operate circuits such as soft power control.

3.7 PG-OK

PG-OK is a power good signal and should be asserted high by power supply to indicate that the +5 VDC and +3.3 VDC outputs are above the under-voltage thresholds of the power supply. When this signal is asserted high, there should be sufficient mains energy stored by the converter to guarantee continuous power operation within specification. Conversely, when either the +5VDC or the +3.3VDC output voltage falls below the under-voltage threshold, or when mains power has been removed for a time sufficiently long so that power supply operation is no longer guaranteed, PG-OK should be deasserted to a low state. See Figure 1 for a representation of the timing characteristics of the PG-OK,PS-ON, and germane power rail signals.

3.8 3.3V Sense

A default 3.3V sense line should be implemented pin 2 of the connector.

4. Protection

4.1 Input Protection

In primary circuit of the power supply , a protected fuse is inserted. Only internal fault of the power supply will cause the fuse blown. Any overload or short circuit at DC output will not cause fuse brown or fire hazard.

4.2 Output Protection

4.2.1 Over Voltage Protection

The +5V/+12V/+3.3V DC output are protected against the over voltage condition . Maximum value can't be over 6.8V at 5V terminal,15.6V at 12V and 4.5V at 3.3V.

4.2.2 Under Voltage Protection

The +5V/+12V/+3.3V DC output are protected against the under voltage condition . Maximum value should be under 4.3V at 5V terminal,10.1V at 12V and 2.8V at 3.3V.

4.2.3 Over Power Protection

The power supply can be used electronic circuit to limit the output current against exceeding 60% of surge output or protected against excessive power delivery since short circuit of any output or over total power at nominal line.

4.2.4 Short Circuit Protection

Short circuit placed on any DC output will shut down all DC outputs and latch. Standby power will be auto recovery.

4.2.5 Overtemperature Protection

The power supply may include an overtemperature protection sensor, which can trip and shut down the power supply at a preset temperature point. Such an overheated condition is typically the result of internal current overloading or a cooling fan failure. If the protection circuit is nonlatching, then it should have hysteresis built in to avoid intermittent tripping.

5. Start Stability

5.1 No Load Start

When power is applied to HPC-360-102 with no load connected or under minimum load connected, neither damage to power supply nor hazards to users should occur.

5.2 Cold Start

The power supply shall operate properly when first applied after 8 hours storage in 10℃ environment.

6. Environments

6.1 Temperature and Humidity

6.1.1 Operating

Temperature	10 to 50 ^{O}C
Relative Humidity	20 to 90 %

6.1.2 Storage

Temperature -40 to 60 ^{O}C

Relative Humidity 20 to 95 % noncondensing

6.2 Altitude

The power supply can operate normally at any altitude between 0 to 8000 feet.

6.3 Vibration and Shock

Sweep and resonance search for each of X,Y,Z, axis at the sweep rate of Rate of 1/Octave/min

Frequency	Duration	Amplitude
5 – 20 Hz	15 minutes	0.38 mm
20 - 250 Hz	15 minutes	0.25G

7. Conducted EMI

The power supply will comply with FCC DOCKET 20780, Part 15 Class B limit for 115Vac input, FTZ 243 Class B for 230 Vac input and VCCI CLASS 2 requirement.

8. Product Safety

8.1 Safety Requirement

The power supply will be recognized under UL Standard 1950 without D3 deviation, certified with CSA standard C22.2 No.234-M90 safety requirements, and type approval with IEC publication 950 with A2 amendments.

8.2 Leakage Current

The AC leakage current is less than 3.5mA when the power supply connect to 254Vac/50Hz .

8.3 Insulation Resistance

The insulation resistance should be not less than 30M ohm after applying of 500VDC for 1 minute.

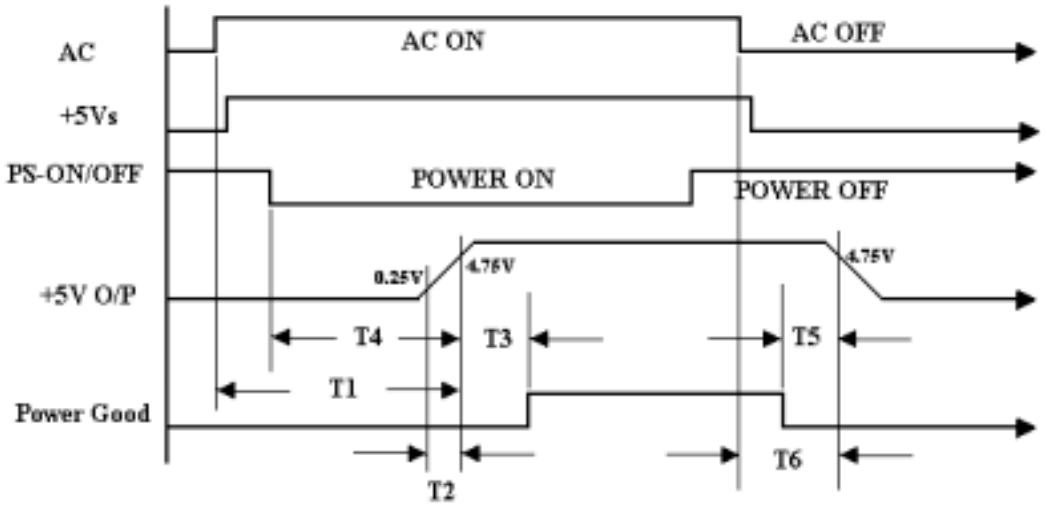
8.4 Dielectric Voltage Withstand

The power supply shall withstand for 1 minute without breakdown by the application of a 60Hz 1500V AC voltage applied between both input line and chassis (20mA DC cut-off current). Main transformer shall similarly withstand 3000Vac applied between both primary and secondary windings for a minimum of one minute.

9. Power Good Signal

A TTL compatible signal for the purpose of initiating an orderly start-up procedure under normal input operating conditions. During power up, this signal is asserted (low) until +5V is under regulation and AC reaches min. line voltage. After all voltage are going appropriate level, the system may have a turn on delay of 100mS, but no greater than 500mS. During power off the signal should go to low level before +5V is out of regulation. The low level is 0 to 0.8V and high level is 4.75 to 5.25V. The " Power Good "signal can drive up to 6 standard TTL loads.

Time Diagram

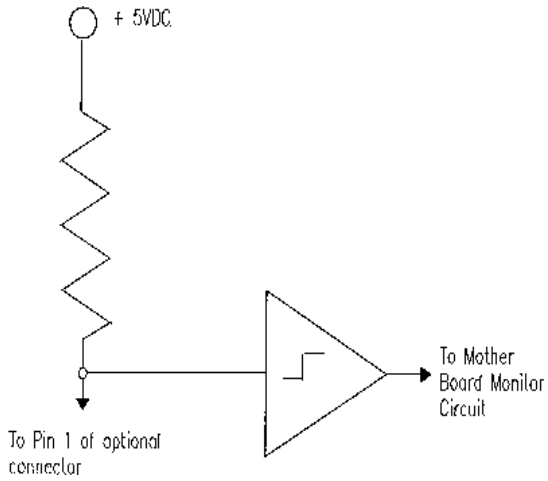


* T1 : Turn on time (2 sec. Max.)
* T2 : Rise time (≦ 20mS Max.)
* T3 : Power good turn on delay time (100 < T3 < 500 mS)
* T4 : Switch on time (0.5 sec. Max.)
* T5 : Power good turn off delay time (1.0 mS Min.) AC OFF
* T6 : Power hold-on time (16 mS Min.)

When the power supply is turned off for a minimum of 1.0 sec. and turn on again, the power good signal will be asserted.

10. FanM signal

The FanM signal is an open collector, 2 pulse per revolution tachometer signal from the power supply fan. The signal stops cycling during a lock rotor state; the level can be either high or low. This signal allows the system to monitor the power supply for fan speed or failures. Implementation of this signal would allow a system designer to gracefully power down the system in the case of a critical fan failure. The monitoring circuit on the motherboard should use a 1k Ohm to 10k Ohm pullup resistor for this signal. The output should be fed into a high impedance gate for the motherboard implementation. Figure 13 shows a simple illustration of the basic circuit requirements. If this signal is not implemented on the motherboard, it should not impact the power supply function.



11. MTBF

The MTBF of the power supply should be 100,000hrs min , under the condition as below :

1. Input Voltage : 110/220VAC±10%
2. Load : 75% of Max. Load
3. Environmental Temperature : 25^0C

12. Burn-In

12.1 Input Voltage

Applying 220Vac for 230V model, and 110Vac for 115V.

12.2 Test Condition

Applying 80% loads for the power supply in 45 (+/-5) ^{o}C chamber for 4 hours.

13. Mechanical Specification

13.1 Outline Dimension

Please refer the mechanical drawing of HPC-360-102

13.2 Weight

Maximum weight is 2.0 Kgs

13.3 Pin Designation :

13.3.1 DC CONNECTOR REQUIREMENTS

List or recognized component appliance wiring material(AVLV2)，CN，rated min 85^{0}C ，300VAC shall be used for all output wiring. .

13.3.2

P3 Housing : WST P/N P3-125004 Terminal : WST P/N 125004PS-2

Pin	Signal	28 AWG Wire
1	GND	Black
2		
3	FAN M Signal	Yellow

13.3.3 BASEBOARD CONNECTOR