Table of Contents

1. General

1.1 Scope

This specification defines the general design and performance requirements for HPC-340-201 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
115 Vrms	90 - 132 Vrms
230 Vrms	180 - 264 Vrms

* The power supply is designed to operate in two specified voltage range depending upon inside manual input voltage jumper selected.

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
8A	90-132 Vrms
5A	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-340-201 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	3.0A	30.0A	+5% ~ -5%	100 mV	50 mV
2. +12V	1.0A	15.0A	+5% ~ -5%	200 mV	120 mV
3. –12V	0A	1.0 A	+10% ~ -10%	240 mV	200 mV
4. –5V	0A	0.5A	+10% ~ -10%	240 mV	200 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

**** +5V,+3.3V&+12V maximum total output not exceed 315 Watts.***

**** Maximum total peak output power shall not exeeced 340 watts***

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	+5V	+3.3V	+12V	-12V	-5V	+5Vsb
1	25.0A	20.0A	10.5A	1.0A	0.3A	1.5A
2	3.0A	0.3A	1.0A	0A	0A	0A
3	5.0A	25.0A	8.0A	0A	0A	0.1A
4	15.0A	1.5A	5.0A	0.5A	0.25A	1.0A
5	5.0A	20.0A	3.5A	0.8A	0.25A	1.A

3.4 Rise Time

DC output rise time is less than 2~20 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 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.

3.7 3.3V Sense

A default 3.3V sense line should be implemented pin 11 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 DC output are protected against the over voltage condition . Maximum value can't be over 6.5V at 5V terminal,15.6V at 12V and 4.4V at 3.3V.

4.2.2 Short Circuit Protection

Short circuit placed on any DC output will shut down all DC outputs and latch.

5. Start Stability

5.1 No Load Start

When power is applied to HPC-340-201 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 , 90Vac input voltage , at maximum load after 4 hours storage in 5℃ environment.

6. Environments

6.1 Temperature and Humidity

6.1.1 Operating

Temperature 5 to 50 °C

Relative Humidity 20 to 90 %

6.1.2 Storage

Temperature -20 to 60 °C

Relative Humidity 5 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 octave/min

Frequency	Duration	Amplitude
5 – 25.6 Hz	2 minutes	0.38 mm
25.6 - 250 Hz	4 minutes	0.5G

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.

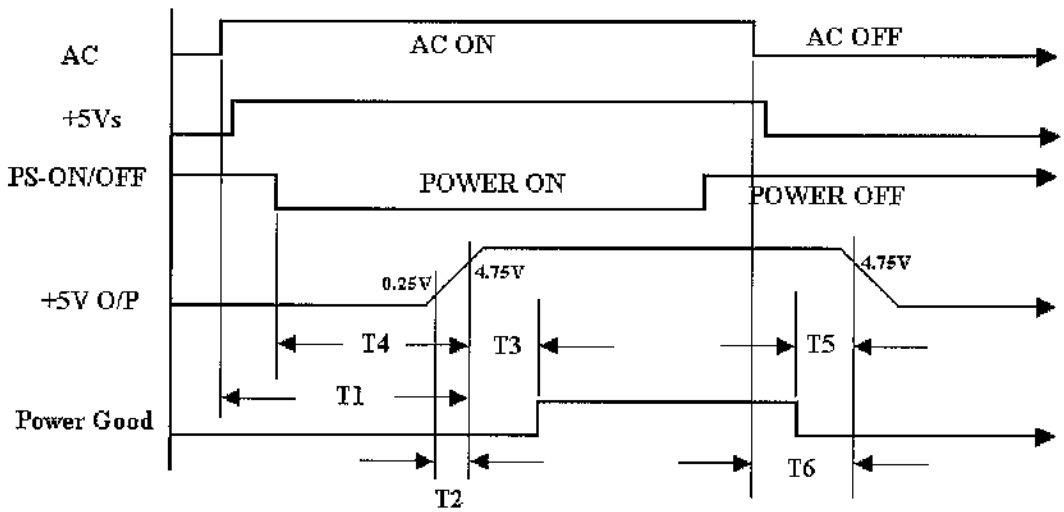
8.4 Dielectric Voltage Withstand

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

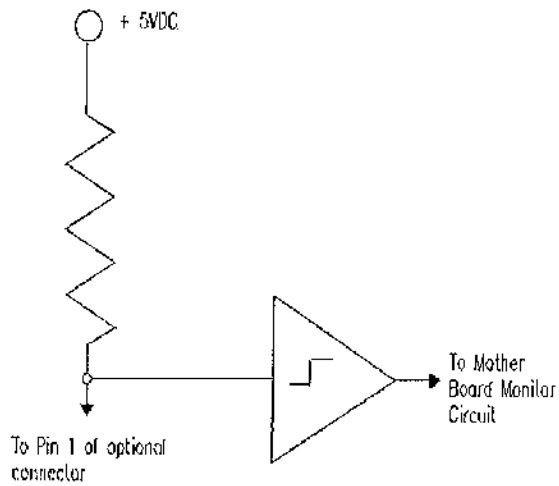


* T1 : Turn on time (2 sec. Max.)
* T2 : Rise time (≦ 20mS Max.)
* T3 : Power good turn on delay time (100 < T3 < 500 mS)
* T4 : Switch on time (1 sec. Max.)
* T5 : Power good turn off delay time (1.0 mS Min.) PS-ON/OFF
* T6 : Power hold-on time (16 mS Min.)

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^{0}C

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.Harmonics

The product shall meet requirement for EN61000-3-2 & EN61000-3-3 :1995 standard of class D, test at 230Vac 50Hz.

14. Mechanical Specification

14.1 Outline Dimension

Please refer the mechanical drawing of HPC-340-201

14.2 Weight

Maximum weight is 2.0 Kgs

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14.3 Pin Designation :

14.3.1 DC CONNECTOR REQUIREMENTS

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

14.3.2BASEBOARD CONNECTOR

PA

CONNECTOR : MOLEX 39-01-2200 OR APPROVED EQUIVALENT

18AWG Wire	Signal	Pin
Orange	+3.3 VDC	11
Blue	-12 VDC	12
Black	COM	13
Green	PS-ON	14
Black	COM	15
Black	COM	16
Black	COM	17
White	-5V	18
Red	+5 VDC	19
Red	+5 VDC	20

Pin	Signal	18 AWG Wire
1	+3.3 VDC	Orange
2	+3.3 VDC	Orange
2	+3.3V Positive remote sense	Orange
3	COM	Black
4	+5 VDC	Red
5	COM	Black
6	+5 VDC	Red
7	COM	Black
7	+3.3V Negative remote sense	Orange
8	POK	Gray
9	+5 Vsb	Purple
10	+12 VDC	Yellow

14.3.3 PERIPHERAL CONNECTORS

PB,PC,PE,PF,PH,PI

Connector : AMP 1-480424-0 or MOLEX 8981-04P or approved equivalent

Contacts : AMP 61314-1 terminals or equiv

Pin	Signal	18 AWG Wire
1	+12 VDC	Yellow
2	COM	Black
3	COM	Black
4	+5 VDC	Red

PD.PG

Connector : AMP 171822-4 or approved equivalent

Pin	signal	20 AWG Wire
1	+5 VDC	Red
2	COM	Black
3	COM	Black
4	+12 VDC	Yellow

14.3.4 Auxiliary power Connector

P6

Connector : Molex 90331-0010 or equivalent

Pin	Signal	18 AWG Wire
1	COM	Black
2	COM	Black
3	COM	Black
4	+3.3 VDC	Orange
5	+3.3 VDC	Orange
6	+5 VDC	Red

14.3.5 +12V Power Connector

P4

Connector : Molex 39-01-2040 or equebalent

Pin	Signal	18 AWG Wire
1	COM	Black
2	COM	Black
3	+12VDC	Yellow
4	+12VDC	Yellow