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|  | <b>PRODUCT SPECIFICATION</b>                            | File: EA-350ES1-B10 |
|   | Model: SS-350ES Active PFC<br>Full Range Revision: B1.0 | Date: Jul. 10, 2008 |
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## 1. SCOPE

This specification defines electrical performance and characteristic of “**SS-350ES Active PFC**” Full Range Power supplies which comply with Intel ATX12V v2.2 Requirements and 80PLUS specification.

## 2. AC INPUT :

| Limits                             | RANGE <sup>1</sup> .           |         | Unit      |
|------------------------------------|--------------------------------|---------|-----------|
|                                    | Minimum                        | Maximum |           |
| AC Input voltage                   | 90                             | 264     | Vac       |
| AC Input frequency                 | 47                             | 63      | Hz        |
| AC Input Current                   |                                | 6       | Amp(rms)  |
| Inrush current <sup>2</sup> (cold) |                                | 100     | Amp(peak) |
| Inrush current (warm)              | NO COMPONENT OVER STRESSED.    |         |           |
|                                    | NO FUSE BLOW                   |         |           |
|                                    | NO DAMAGE TO THE POWER SUPPLY. |         |           |

NOTE: 1. The AC input is 90~264 Vac full range. No selectable hard switch is  
2. Measured at 25 Deg C Ambient

## 3. DC OUTPUT :

### 3.1 VOLTAGE and CURRENT LOAD RANGES

| DC OUTPUT |         | Tolerance |
|-----------|---------|-----------|
| Group1    | +3.3VDC | +5%/-5%   |
|           | +5VDC   | +5%/-5%   |
|           | +12VDC  | +5%/-5%   |
|           | -12VDC  | +10%/-10% |
| Group2    | +5Vsb   | +5%/-5%   |

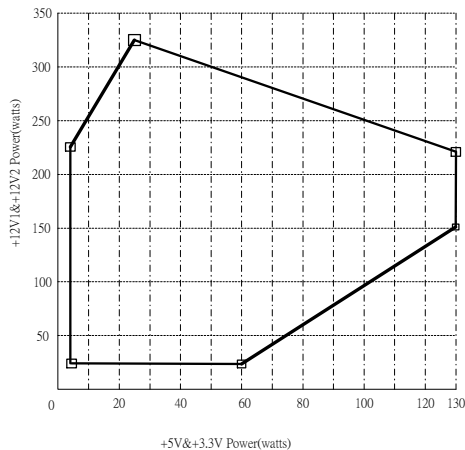
## Load Range

| Output | Minimum Load | Maximum Load | Peak Load |
|--------|--------------|--------------|-----------|
| +12V1  | 1A           | 17A          | 20A       |
| +12V2  | 1A           | 17A          | 20A       |
| +5V    | 0.3A         | 20A          | X         |
| +3.3V  | 0.5A         | 20A          | X         |
| -12V   | 0A           | 0.8A         | X         |
| +5Vsb  | 0A           | 2.5A         | 3.0A      |

- Maximum continuous total DC output power should not exceed 350 W.
- Maximum continuous combined load on +3.3 VDC and +5 VDC outputs should not exceed 130 W.
- Maximum continuous combined load on +12V1DC&+12V2DC outputs should not exceed 27A/324W.
- Maximum peak total DC output power should not exceed 385 W.
- Peak power and current loading should be supported for a minimum of 1 second.

### 3.2 CROSS REGULATION

The +5V & +3.3V combined load and +12VDC load shall remain within the regulation Defined in section 3.1 over cross load combinations shown as following figure:



### 3.3 OUTPUT RIPPLE and NOISE

Measurement is made with an oscilloscope with 20 MHz bandwidth. Output should be bypassed at the connector with a 0.1uF ceramic disk capacitor and a 10uF electrolytic capacitor to simulate system load. The length of ground wire on probe should not longer than 40mm, if a Non - differential type of scope was used.

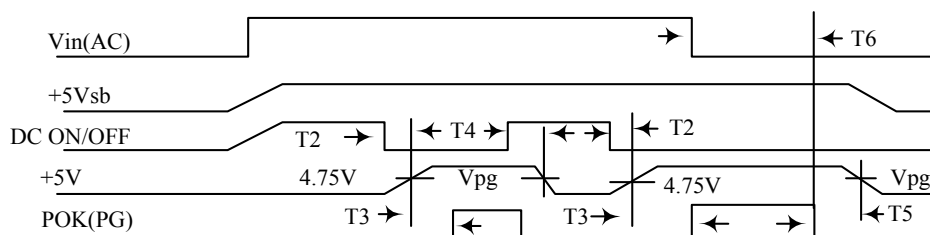
| +3.3V | +5V  | +12V  | -12V  | +5Vsb |
|-------|------|-------|-------|-------|
| 50mV  | 50mV | 120mV | 120mV | 50 mV |

### 3.4 DYNAMIC DC OUTPUT CHARACTERISTICS

+/-10% Max. (tested with capacitors added at output) Excursion for 30% max. load change with return to regulation in 0.5 mS.

### 3.5 DC OUTPUT ON/OFF CONTROL

A low active PS-ON (DC ON/OFF) input signal is equipped, which provide the interface to **ENABLE** or to **DISABLE** the **GROUP1** of DC output. This signal is electrically compatible to interface with **TTL, OPEN COLLECTOR** and the **HARD SWITCH**.



| SIGNAL NAME          | MAXIMUM | MINIMUM |
|----------------------|---------|---------|
| T2 +5V TURN-ON DELAY | 150 mS  |         |
| T3 RESET TIME        | 500 mS  | 100 mS  |

|   |   |  |                                     |
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|    |                                    |            |       |
|----|------------------------------------|------------|-------|
| T4 | DC SAVE TIME                       |            | 1 mS  |
| T5 | SAVE TIME                          | Vpg= 4.75V | 1 mS  |
| T6 | HOLD-ON TIME (AT NOMINAL AC INPUT) |            | 10 mS |

#### 4. OUTPUT PROTECTION

##### 4.1 TOTAL POWER PROTECTION: ( OPP )

Total power 135% max with shut-down and latch off protection.

##### 4.2 OVER VOLTAGE PROTECTION: ( OVP )

| OVER VOLTAGE | ACTIVE RANGE |       | RESULT   |
|--------------|--------------|-------|--|
|              | Min.         | Max.  |  |
| +3.3V        | 3.76V        | 4.3V  | Shut down & Latch OFF<br>The Group 1 DC Output |
| +5V          | 5.74V        | 7.0V  |  |
| +12V         | 13.4V        | 15.6V |  |

##### 4.3 SHORT CIRCUIT PROTECTION: ( SCP )

The short between any output of group 1 will shut down all group1.

The short at group 2 will Shut down both group 1 and group 2.

##### 4.4 RESET AFTER SHUTDOWN

Whenever the power supply latches into shutdown state due to fault condition on its output, The power supply will return to normal operation only after the fault has been removed and the power switch has been cycled off/on with **A MINIMUM OFF TIME OF 20mS.** (PS-ON)

#### 5. POWER GOOD SIGNAL:

Signal Type: open collector +5DC, TTL compatible.

Logic Level: <0.4V while sinking 4 mA.

Logic Level High: between 2.4VDC and +5V output while sourcing 200 uA.

#### 6. EFFICIENCY:

##### 6.1 80PLUS Specification:

Over 80% at normal input voltage(AC 115V 60Hz or AC 230V 50Hz) when 20%,50%,100% loading.

##### 6.2 STANDBY MODE

During measurement of the "STANDBY MODE" condition, the main converter is off (PS\_ON=High). +5Vsb converter is working and standby input power is measured.

|  |         |
|--|---------|
| true RMS input power (standby)<br>+5Vsb/ 0.1A; input voltage: 230VAC 50HZ  | =< 1.2W |
| true RMS input power (standby)<br>+5Vsb/ 0.25A; input voltage: 230VAC 50HZ | =< 2.2W |
| true RMS input power (standby)<br>+5Vsb/ 1.0A; input voltage: 230VAC 50HZ  | =< 7.0W |

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## 7. COOLING OF PSU

A DC FAN was equipped to Cooling The Power Supply and system Load , The FAN will draw in AIR Through The vent Holes in DC Output Cable Side , and Exhaust it in The AC Receptacle Side.

Fan parameters

|               |              |
|---------------|--------------|
| Rated Voltage | 12VDC        |
| Dimension     | 80*80*25(mm) |
| Air flow      | 34 CFM min.  |
| Noise         | <35 db(A)    |

## 8. ACTIVE POWER FACTOR CORRECTION (PFC):

**8.1** Harmonic current meets IEC1000-3-2 / EN61000-3-2 standards.

**8.2** PFC >0.95 at full load.

=0.99 at AC 110v 60Hz(typical)

=0.98 at AC 220v 50Hz(typical)

## 9. ENVIRONMENT

### 9.1 OPERATING

Temperature: 0 to 50 °C. (The rated power will derate from 100% to 80% from 40°C to 50 °C Linearly)

Relative Humidity: 20% to 80%

### 9.2 SHIPPING / STORAGE

Temperature: -40 to 85 Deg C

Relative Humidity: 10% to 95%

## 10. MTBF

Over 100,000 hours at 25 Deg C. excluding the DC Fan.

## 11. EMC

Comply to EN61204-3:2000, & FCC Part 15 & Part 2 (CISPR 22 CLASS B)

GB9254-1998 , GB17625.1-2003 standards,C-TICK

## 12. SAFETY:

Conform to IEC60950-1:2000 , EN60950-1:2001 , UL60950-1 1st , GB4943-2001 standards : TUV,CUL (LEVEL 6),CB

## 13. MECHANICAL DRAWING:

Dimension: W150 x L140 x H86 mm