

## HK650-57PP Specification

1.0 Input Characteristics:.....	5
1.1 Input Voltage Range:.....	5
1.2 Input Frequency Range:.....	5
1.3 Input current.....	5
1.4 Inrush current:.....	5
1.5 Power Efficiency:.....	5
1.6 Power factor:.....	5
1.7 Standby Consumption.....	5
1.8 Harmonic Current:.....	5
2.0 Output Characteristics:.....	5
2.1 Static output characteristics:.....	5
2.2 The cross-load regulation in defined in the matrix below (UNIT: A).....	6
2.3 Dynamic Load:.....	6
2.4 Capacitive Load:.....	7
3.0 Protection.....	7
3.1 Over Voltage Protection:.....	7
3.2 Short Circuit Protection:.....	7
3.3 Over Power Protection:.....	7
3.4 Reset after shutdown:.....	7
4.0 Time Sequence.....	8
4.1 Power-on time T1.....	8
4.2 Rise time T2.....	8
4.3 PWR_OK delay T3.....	8
4.4 PWR_OK rise time T4.....	8
4.5 AC loss to PWR_OK hold-up time T5.....	8
4.6. Power Fail Delay Time T6.....	8
4.7 Power OK (POK).....	8
4.8 PS_ON.....	9

---

<b>5.0 Auxiliary 5V Output:</b> .....	<b>9</b>
<b>6.0 Environment:</b> .....	<b>9</b>
<b>6.1 Operating ambient:</b> .....	<b>9</b>
<b>6.2 Shipping and Storage:</b> .....	<b>9</b>
<b>6.3 Altitude:</b> .....	<b>9</b>
<b>6.4 Cooling:</b> .....	<b>9</b>
<b>6.5 Fan speed control:</b> .....	<b>9</b>
<b>7.0 Safety and EMC:</b> .....	<b>9</b>
<b>7.1 SAFETY REQUIREMENTS AND Certify:</b> .....	<b>10</b>
<b>7.2 Conducted and Radiated Emissions:</b> .....	<b>10</b>
<b>7.3 ESD:</b> .....	<b>10</b>
<b>7.4 EFT:</b> .....	<b>10</b>
<b>7.5 Surge Susceptibility:</b> .....	<b>10</b>
<b>7.6 Hi-Pot:</b> .....	<b>10</b>
<b>7.7 Grounding Continuity Test:</b> .....	<b>10</b>
<b>7.8 Ground Leakage Current:</b> .....	<b>10</b>
<b>8.0 Mechanical:</b> .....	<b>11</b>
<b>8.1 Mechanical tline:</b> .....	<b>11</b>
<b>8.2 DC wire drawing:</b> .....	<b>12</b>
<b>8.3 Label drawing:</b> .....	<b>13</b>

**1.0 Input Characteristics:**

**1.1 Input Voltage Range:**

90Vac to 264Vac, single phase.

Table1. Input Voltage Range

RANGE	MINIMUM	NORMAL	MAXIMUM	UNITS
High Range	90	100~240	264	Vrms

**1.2 Input Frequency Range:**

Frequency Range: 50~60Hz

**1.3 Input current**

Maximum steady state input current shall be less than 10A RMS at 115VAC and 5A RMS at 230VAC with maximum load at 25°C.

**1.4 Inrush current:**

Power supply inrush current shall be less than the ratings of its critical components (including bulk rectifiers, fuses, and surge limiting device) under all conditions of line voltage of Section 1.1.

**1.5 Power Efficiency:**

(1)

Min 87% efficiency under 20% full load condition, input Voltage: 115Vac/60Hz or 230Vac/50Hz

Min 90% efficiency under 50% full load condition, input Voltage: 115Vac/60Hz or 230Vac/50Hz

Min 87% efficiency under 100%full load condition, input Voltage: 115Vac/60Hz or 230Vac/50Hz

(2) PF is not less than 0.9 under 100% load with input voltage 100Vac-240Vac , 50Hz/60Hz.

Efficiency test loading

LOAD	+12V	+5V	+3.3V	-12V	+5VSB
100%	37.8A	10A	10A	0.3A	2A

**1.6 Power factor:**

The power supply must use a PFC,PF≥0.90 @100% load at 230Vac/50Hz.

**1.7 Standby Consumption**

AC input power should not exceed 1W under +5VSB /0.05A,at 230Vac/50Hz.

**1.8 Harmonic Current:**

(1) The harmonic of the power line and neutral current shall comply the standard IEC61000-3-2 for class D equipment.

(2) Measurement shall be performed at 75W input power and full output load, Input voltage shall be 230Vac/50Hz, Don't test in process under low range.

**2.0 Output Characteristics:**

**2.1 Static output characteristics:**

Table2. Static output characteristics

Output Voltage	Load			Regulation	Ripple & Noise
	Min	Max	Surge		Max mV P-P
+5V	0.3A	15A		+/- 5%	50mV
+12V	0.5A	42A		+/- 5%	120mV
+5VSB	0A	2.5A		+/- 5%	50mV
+3.3V	0.3A	15A		+/- 5%	50mV
-12V	0A	0.3A		+/- 10%	120mV

At 25°C&35°C

- (1) The total combined 3.3V&5V power shall not exceed 100W.
- (2) The continuous output power shall not exceed 550W.

**2.2 The cross-load regulation in defined in the matrix below (UNIT: A)**

**Table 3. Cross Regulation**

Range	+5V	+3.3V	+12V	-12V	+5VSB
1	0.3	0.3	1	0	0
2	8.6	15.00	37	0.3	2
3	15	5.7	37	0.3	2
4	4	4	42	0.3	2
5	10	10	37.8	0.3	0.05
6	5	5	18.9	0.15	1
7	10	10	37.8	0.3	2

Notes: A 0.1uF ceramic disk capacitor and 10uF tantalum capacitors should be put across output terminals during ripple & noise test. The oscilloscope bandwidth is set at 20 MHz and co-axial probe will be used to measure it.

**2.3 Dynamic Load:**

The following transient loads are to be applied to the output. The waveform shall be a square wave with the slope of the rise and fall at 0.5A/μs(-12V at 0.2A/μs). The square wave shall have a frequency 50Hz to 10KHz with a duty cycle of 10 to 90%.

The output voltages shall not exceed regulation limits as defined in Table 2 under the following condition:

**TRANSIENT VOLTAGE TOLERANCE**

**Table4. Dynamic Load Step Sizes**

OUTPUT	STEP LOAD	+12V	+5V	+3.3V	-12V	+5VSB	TRANSIENT TOLERANCE(%)
+12V	1~9.4A	N/A	0.3	0.3	0	0	+/-5
	33.6~41	N/A	4	4	0.3	2	
+5V	0.3~4.8A	1	N/A	0.3	0	0	+/- 5
	10.5~15A	37	N/A	5.7	0.3	2	
+3.3V	0.3~4.8A	1	0.3	N/A	0	0	+/- 5
	10.5~15A	37	8.6	N/A	0.3	2	
-12V	0~0.15A	1	0.3	0.3	N/A	0	+/- 10

	0.15~0.3A	37	15	5.7	N/A	2	
+5VSB	0~1A	1	0.3	0.3	0	N/A	+/- 5
	1~2.5A	37.8	10	10	0.3	N/A	

(Adding external capacitor: 5V/10000uF, 12V/10000uF, 3.3V/10000uF, -12V/350uF, 5Vaux/350uF)

**2.4 Capacitive Load:**

The power supply should be able to power up and operate with the regulation limits defined in Table 2, with the following capacitances simultaneously present on the DC outputs.

**Table5. Output Capacitive Loads**

Output	Capacitive Load
+12V	10000μF
+5V	10000μF
+3.3V	10000μF
-12V	350μF
+5VSB	350μF

The power supply shall have the output connector and wire harness configurations.

**3.0 Protection**

**3.1 Over Voltage Protection:**

+5V:7V max, +12V: 15.6V max, +3.3V: 4.7V max.

**3.2 Short Circuit Protection:**

The main output shall shut down and latch off for shorting +5V, +12V, -12V or +3.3V rails to DC-return and shorting.

**3.3 Over Power Protection:**

Any output shall not exceed requirement of the table. Otherwise, the unit would shut down.

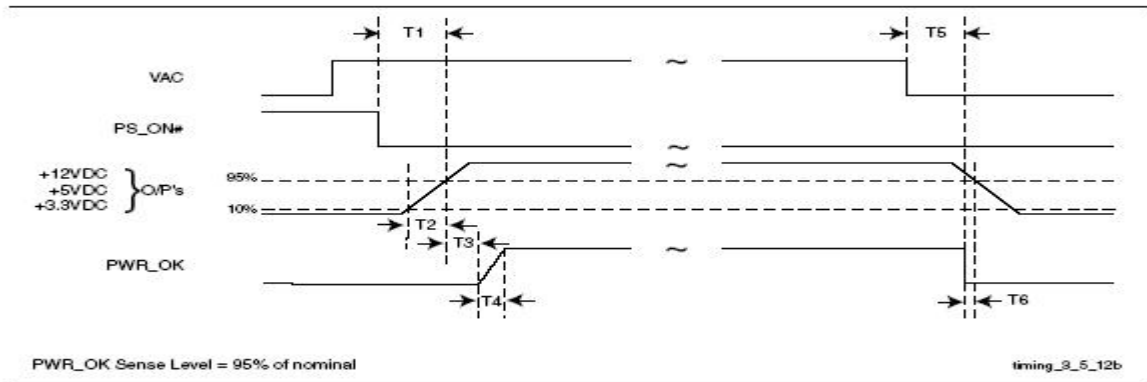
**Table6. Over Power Protection**

Input Voltage	115VAC/60Hz
OPP Range(Output Power)	605W~825W

**3.4 Reset after shutdown:**

When the power supply latches into shutdown condition due to a fault on an output (over current, over voltage or short circuit), the protection latch shall reset within 30S after the fault has been removed and the ON/Off signal has switched state. Also, the latch shall reset within 30S when AC power has been removed.

### 4.0 Time Sequence



Power Supply Timing

#### 4.1 Power-on time T1

The power-on time is defined as the time from when PS\_ON# is pulled low to when the +12 VDC, +5 VDC, and +3.3 VDC outputs are within the regulation ranges specified in Section 2.1. The power-on time shall be less than 500 ms.

#### 4.2 Rise time T2

The output voltages shall rise from ≤10% of nominal to within the regulation ranges specified in Section 2.1 within 0.1 ms to 20 ms.

#### 4.3 PWR\_OK delay T3

The Power Good signal shall have a turn-on delay of at least 100mS but not greater than 500 mS from the time the 3.3V and +5V output has reached their minimum regulation level.

#### 4.4 PWR\_OK rise time T4

The Power Good signal shall have a rise time (measured from the 10% point to the 90% point) of less than 10 ms.

#### 4.5 AC loss to PWR\_OK hold-up time T5

The DC output level for 5V;3.3V and 12V shall remain an up level at least 6msec after AC power is removed and the test condition:115V/60HZ,80% of full load.

#### 4.6. Power Fail Delay Time T6

The Power \_Down warning signal at least 0.5msec shall have a power Good Signal change Low Voltage to the 3.3V or +5V falls below their regulation limit. Test condition:115V/60Hz or 230/50Hz, full load.

#### 4.7 Power OK (POK)

The power supply shall provide a “Power Good” signal to reset system logic, indicate proper operation of the power supply, and give advance warning of impending loss of regulation at turn off.

The electrical characteristics for the Power OK output driver are shown below:

Table7. Power OK Signal Characteristics

Power OK Signal Characteristics	
Signal Type	+5V TTL Compatible

Logic Level Low	<0.4V while sinking 4mA
Logic Level High	Between 2.4V and 5V output while sourcing 200µA
High-State Output Impedance	1kΩ from output to common

**4.8 PS\_ON**

PS\_ON is an active low, +5V tolerant TTL signal that allow the motherboard to remotely control the power supply. An internal pull-up resistor inside the power supply shall provide a TTL high output logic level, once an AC input voltage has been applied to the power supply. The electrical characteristics for the PS\_ON signal are shown below:

**Table8. PS-ON Signal Characteristics**

PS-ON Signal Characteristics		
Signal Description	Min	Max
Input Low Voltage	0.0V	0.8V
Input Low Current (Vin=0.4V)	-	-1.6mA
Input High Voltage (Iin=-200µA)	2.0V	
VIH open circuit	-	5.25V

**5.0 Auxiliary 5V Output:**

The 5V auxiliary output will be active and in regulation whenever an AC input within the specified operating range is applied to the power supply input. The PS\_ON pin of P1 will not affect the 5V auxiliary output.

**6.0 Environment:**

**6.1 Operating ambient:**

**Table9. Operating ambient**

Air Temperature	0 to 35 degrees centigrade
Relative Humidity	5 to 85 percent, non-condensing

**6.2 Shipping and Storage:**

**Table10. Shipping and Storage**

Air Temperature	-40 to 55 degrees centigrade
Relative Humidity	5 to 95 percent, including condensation

**6.3 Altitude:**

Operating to 5000 meters(16,404 ft)  
 Non-operating to 15250 meters (50,000 ft).

**6.4 Cooling:**

The power supply shall provide forced air cooling for the host system.

**6.5 Fan speed control**

The power supply shall contain thermal sensing circuitry capable of varying fan speed.

**7.0 Safety and EMC**

**7.1 SAFETY REQUIREMENTS AND Certify**

The power supply has been certified by CB, CE. The CB, CE Safety mark shall appear on the product.

**7.2 Conducted and Radiated Emissions:**

Conducted and radiated emissions of the power supply shall comply with the requirements of EN55022 Class B.

**7.3 ESD:**

ESD of the power supply shall comply with the requirements of IEC61000-4-2 Level 4.

**7.4 EFT:**

EFT of the power supply shall comply with the requirements of IEC61000-4-4 Level 3.

**7.5 Surge Susceptibility:**

Surge Susceptibility of the power supply shall comply with the requirements of IEC61000-4-5 Level 3.

**7.6 Hi-Pot:**

Input to GND: Voltage 1800VAC Time 3.0S, Cut off current 10mA MAX

**7.7 Grounding Continuity Test:**

100mΩ MAX at 25.0A .

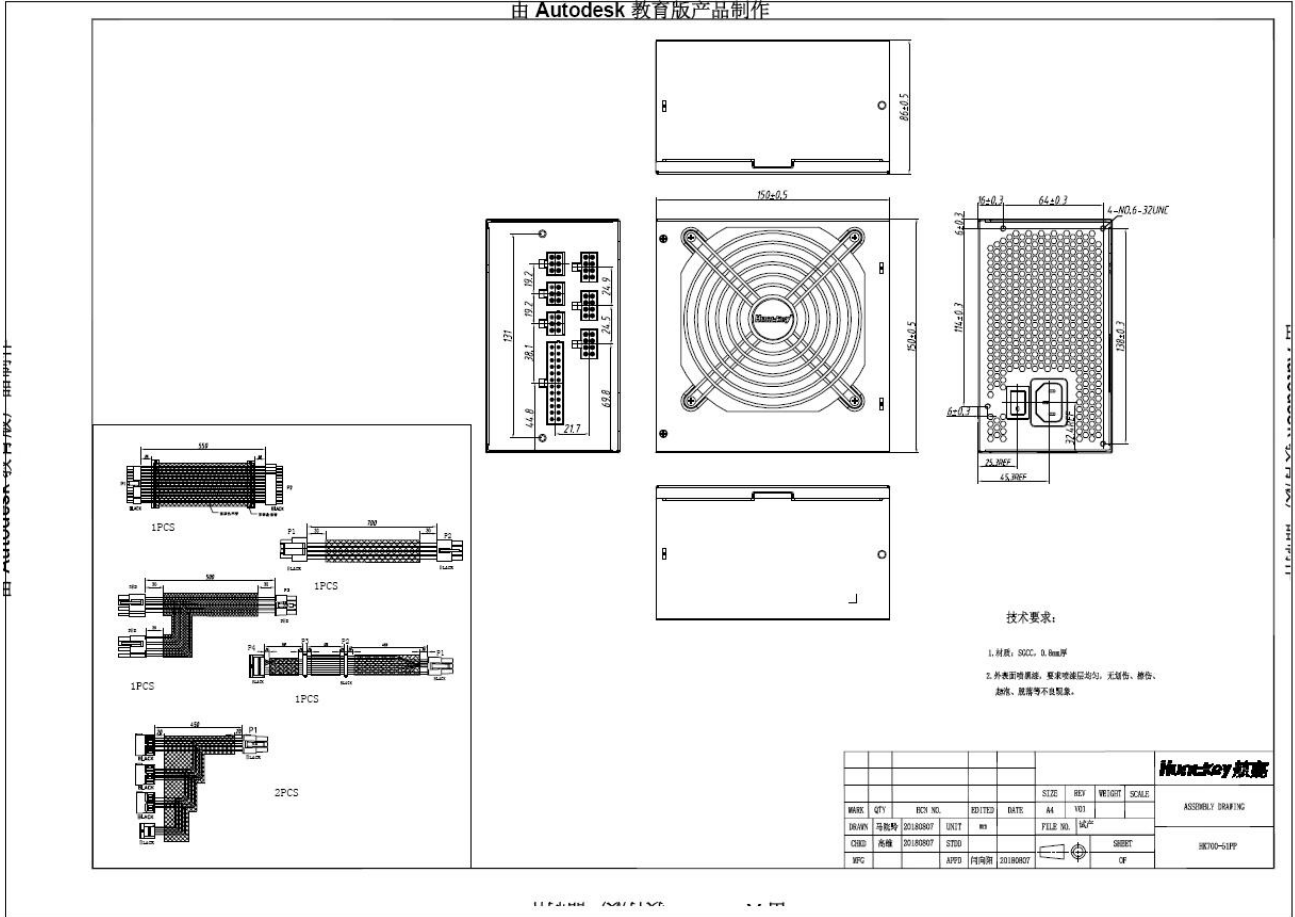
**7.8 Ground Leakage Current:**

3.5mA MAX. at 264V 50Hz

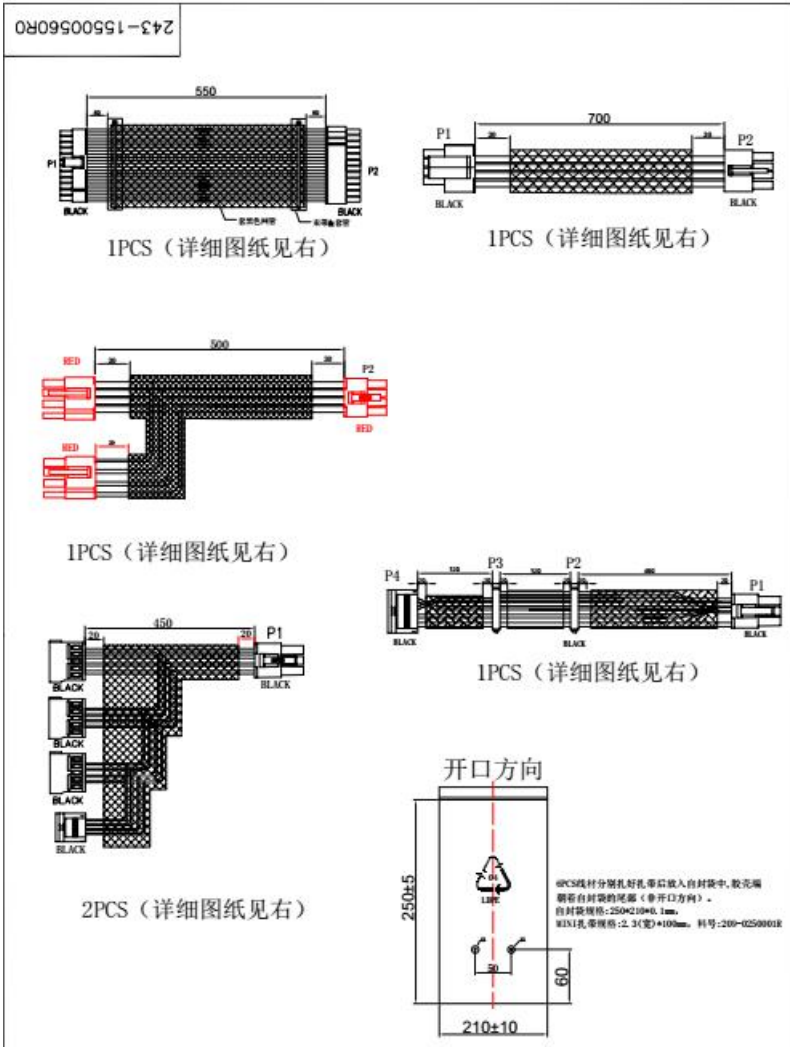


8.0 Mechanical:

8.1 Mechanical tline:



8.2 DC wire drawing



<b>Huntkey 航嘉</b>										
DC CABLE										
△	1	6-2013版自由牌款式变动与修改	马院玲	20181011	SIZE	REV	WEIGHT	SCALE		
MARK	QTY	ECN NO.	EDITED	DATE	A4	T02				
DRAWN	马院玲	20180913	UNIT	mm	FILE NO.	试产				
CHKD	高维	20180913					SHEET		HK650-57PP	
MFG		APPD	闫向阳	20180913			1 OF 6		243-15500560R0	

8.3 Label drawing



Huntkey Hong Kong Development Co. Ltd.		File No. :
		Version : 01
Prepare by	Check by	Approved by
WangBingjie	Cui Jing	Yan xiang yang
Date:2018-11-01		