

## PC Power Specifications

Model: HK1K0-52PP

Consumer:

File No.: 试产

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Issue date:2018-05-07

Change List

Item	Spec. REV	Revise date	Revise description	Reason
1	01	2018/03/20	First	
2	02	2018/05/07	Second	
3				
4				
5				
6				
7				

## HK1K0-52PP Specification

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## 1.0 Input Characteristics:

### 1.1 Input Voltage Range:

108Vac to 264Vac, single phase.

**Table1. Input Voltage Range**

RANGE	MINIMUM	NORMAL	MAXIMUM	UNITS
High Range	108	120~240	264	Vrms

### 1.2 Input Frequency Range:

Frequency Range: 47~63Hz

### 1.3 Input current

Maximum steady state input current shall be less than 14A RMS

### 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:

	115V/60HZ	230V/50HZ
20% Loading (EFF)	>87%	>90%
50% Loading (EFF)	>90%	>92%
100% Loading (EFF)	>87%	>89%

For 产线不热机测试, 所有 eff spec 放宽 2%

#### Efficiency test loading:

LOAD	+12V	+5V	+3.3V	-12V	+5VSB
100% load	71A	15A	15A	0.3A	2A

### 1.6 Power factor:

The power supply must use active PFC,  $PF \geq 0.90$  @ 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 A 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	0.5A	30A		+/- 5%	50mV
+3.3V	0.5A	30A		+/- 5%	50mV
+12V	1A	83.3A		+/- 5%	120mV
+5VSB	0A	4A		+/- 5%	50mV
-12V	0A	0.6A		+/- 10%	200mV

At 25°C & 35°C

(1) The total combined +3.3V & +5V power shall not exceed 170W.

(2) The continuous output power shall not exceed 1000W.

80% each output max load and 80% of output power @ Operate in 45°C

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

**Table 3. Cross Regulation**

Range	+5V	+3.3V	+12V	-12V	+5VSB
1	1	1	1	0	1
2	15	20	71	0.3	1
3	15	20	70	0.3	2.5
4	Stand-by	Stand-by	Stand-by	Stand-by	0
5	Stand-by	Stand-by	Stand-by	Stand-by	2.5
Peak load (Note)	15	20	80	0.3	3

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.

Note B: the output voltage range will be +/-10%, and PSU shall not shut down when peak load test.

Notes C: Power supply can work with Peak load and there is no more electric test for Peak load.

Notes D: CPK of 3.3V cross-load regulation Calculation range will be +/-6%

## 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 10 KHz 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

**Table 4. Dynamic Load Step Sizes**

OUTPUT	STEP LOAD	+12V	+5V	+3.3V	-12V	+5VSB	TRANSIENT TOLERANCE(%)
+12V	50~80A	*	1	1	0.2	1	+/-5
+5V	5~15A	44	*	20	0.2	3	+/-5

+3.3V	5~20A	70	15	*	0.2	3	+/-5
All	*	1~10	0.5~5	0.5~15	0~0.3	0~2.5	+/-5

- 1>Adding external capacitor: 5V/10000uF, 12V/10000uF, 3.3V/10000uF, -12V/350uF, 5Vaux/350uF
- 2>If Item <All> can't be tested at product line ,it can be check at DQA lab when EVT&DVT stage
- 3>Dynamic test item CPK Calculation rang will be +/-10%;

## 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

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

## 3.0 Protection

**3.1 Over Voltage Protection:** use VR parallel to TL431 A, R

+5V: 7V max; +3.3V: 4.7V max;+12V 16V 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.

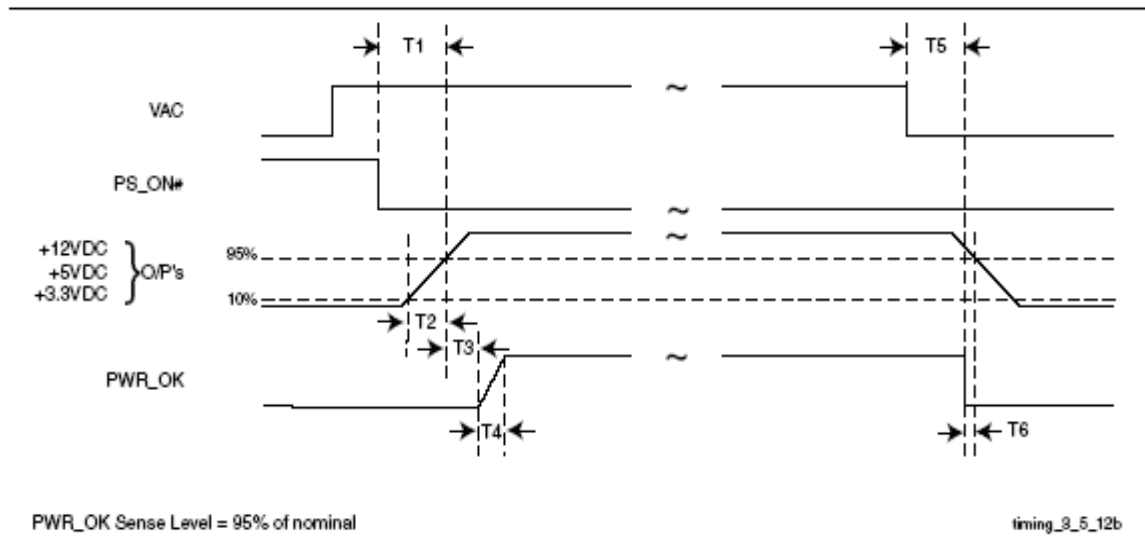
**3.3 Over Power Protection:**

NA , peak load test can cover it.

### 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 60S after the fault has been removed and the ON/Off signal has switched state. Also, the latch shall reset within 60S 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  $\leq 10\%$  of nominal to within the regulation ranges specified in Section 2.1 within 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 8msec after AC power is removed and the test condition: 220V/50HZ, 60% 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: 220V/50HZ, 60% of full load.

#### 4.7 5V and 3.3V tracking

For reference @Rise up and drop down

## 4.8 glitches

For reference @Rise up and drop down

## 4.9 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 5.5V output while sourcing 200µA
High-State Output Impedance	1kΩ from output to common

## 4.10 PS-ON Signal

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	-	5.5V

## 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
	80% each output max load and 80% of output power @Operate in 45°C
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

Fan to switch off at less than 25~40% rated power.

## 7.0 Safety and EMC

### 7.1 SAFETY REQUIREMENTS AND Certify

The power supply has been certified by CCC &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. have 3db margin @ 230Vac/50HZ

### 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:

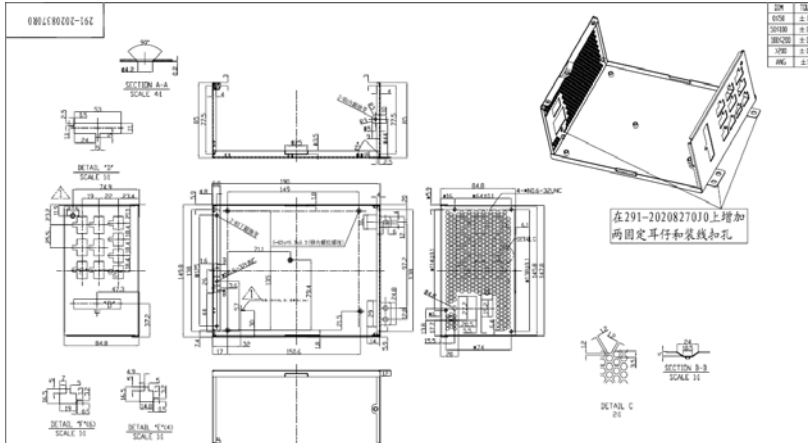
100mΩ MAX at 25.0A .

### 7.8 Ground Leakage Current:

3.5mA MAX. at 264V 50Hz

## 8.0 Mechanical:

### 8.1 Mechanical outline:



### 8.2 DC wire drawing

### 8.3 Label drawing

125.0 ± 0.5

R=3mm

80.0 ± 0.5

**Huntkey**

**MVP** Full Modular

Model/型号: HK1K0-52PP  
**MVP K1000**  
Switching power supply / 开关电源

AC INPUT 交流输入	120-240VAC, 50-60Hz, 10A				
DC OUTPUT 直流输出	+12V	+5V	+3.3V	-12V	+5VSB
	83.3A	30A	30A	0.6A	4.0A
	999.6W	170W	7.2W	20W	1000W

警告：非专业维修人员请勿自行开启此盖！

80 PLUS GOLD

RoHS

10

CCC

CONT. OK

HPOT

ATE

深圳市航嘉驰源电气股份有限公司      www.huntkey.com.cn      MADE IN CHINA (中国制造)

技术要求:

- 1、材质: 75#网格底哑白PET, 表面过耐擦拭PET亚膜, 耐高温80度。
- 2、四色印刷: ■ C: 0 M: 20 Y: 60 K: 20 ■ C: 99 M: 99 Y: 99 K: 100 其他颜色参考图例
- 3、印刷表面干净, 平整, 要求无色点, 划痕等外观缺陷, 表面覆膜要求无翘起, 气泡等现象。
- 4、单面背胶, 粘性好. 无 凝结或缺胶, 粘贴后表面平整, 无翘起或经过高温老化后无翘起现象。
- 5、印刷字体或图案边沿无明显起牙或漏底现象, 字体和图案无明显偏移, 错位现象。
- 6、印刷颜色和图例或签样要求无明显差别, 且清晰可辨, 可参照具体色卡对照。
- 7、尺寸规格如图纸, 公差为+/-0.5mm, 要求切边挺直, 无毛刺。
- 8、具体参考签样。

Huntkey Hong Kong Development Co. Ltd.		File No.:
		Version: <b>01</b>
Prepare by	Check by	Approved by
<b>Cui Ren</b>	<b>HM Dong</b>	<b>XY Yan</b>
Date: 2018-05-07		