

# 1U 12V PC Power Specifications

**Model: HK354-11UEP**

**File NO: EQS-731-5689**

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ECN List

Item	Spec. REV	Revise date	Revise description	Reason
1	01	2019-05-13	Original	
2	02	2019-10-19	修正工作海拔高度	
3	03	2019-12-02	1、-12V Max Load 由 0.5A 改为 0.3A 2、工作温度由 0~40 改为 0~50 3、运输与储存温度由-40~50 改为-40~70	1、上一版错误 2、要求 50°C可以降额 3、满足 70°C运输和储存
4	V01	2020-03-20	File NO: 由试产改为量产	
5	V02	2020-10-12	1、4.5 AC loss to PWR_OK hold-up time T5 下的定义内容 2、4.6. Power Fail Delay Time T6 下的定义内容	上一版定义内容不够清楚，重新编辑定义
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12				
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16				
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18				
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## HK354-11UEP Specification

<b>1.0 Input Characteristics</b> .....	3
1.1 Input Voltage Range	
1.2 Input Frequency Range	
1.3 Input current	
1.4 Inrush current	
1.5 Power Efficiency	
1.6 Standby Consumption	
1.7 Harmonic Current	
<b>2.0 Output specification description</b> .....	3
2.1 Static output characteristics	
2.2 Cross-load regulation	
2.3 Dynamic Load	
2.4 Capacitive Load	
2.5 Output connector	
<b>3.0 Protection</b> .....	6
3.1 Over Voltage Protection	
3.2 Short Circuit Protection	
3.3 Over Power Protection	
3.4 Reset after shutdown:	
<b>4.0 Time Sequence</b> .....	6
4.1 Power-on time	
4.2 Rise Time	
4.3 PWR_OK delay	
4.4 PWR_OK Rise	
4.5 AC loss to PWR_OK hold-up time	
4.6 Power Fail Delay Time	
4.7 Power OK	
4.8 PS_ON	
<b>5.0 Auxiliary Output</b> .....	8
<b>6.0 Environment</b> .....	8
6.1 Operating ambient:	
6.2 Shipping and Storage:	
6.3 Altitude:	
6.4 Cooling	

6.5 Fan speed control

**7.0 Safety and EMC.....9**

7.1 SAFETY REQUIREMENTS AND Certify

7.2 Conducted and Radiated Emissions

7.3 ESD

7.4 EFT

7.5 Surge Susceptibility

7.6 Hi-Pot

7.7 Grounding Continuity Test

7.8 Ground Leakage Current:

**8.0 Mechanical.....10**

8.1 Mechanical outline:

8.2 Label drawing

## 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:

50+/-3Hz and 60+/-3Hz

### 1.3 Input current

Input current is 5A Max.

### 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:

70% min. at full load and normal AC input.

### 1.6 Standby Consumption

AC input power should not exceed 3W under +5VSb /0.1A and normal input voltage.

### 1.7 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 220Vac/50Hz or 230Vac/60Hz, 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		Max mV P-P
+5V	0.3A	12A	+/- 5%	50mV
+12V	1.0A	18A	+/- 5%	120mV
+5VSb	0A	2A	+/- 5%	50mV
+3.3V	0.5A	16A	+/- 5%	50mV
-12V	0A	0.3A	+/- 10%	120mV

At 35°C

- (1) The total combined +3.3V&+12V power shall not exceed 220W
- (2) The total combined 3.3V/5V/+12V power shall not exceed 240W.
- (3)The continuous output power shall not exceed 250W.

At 50°C

- (2) The total combined +3.3V&+12V power shall not exceed 176W
- (2) The total combined 3.3V/5V/+12V power shall not exceed 192W.
- (3)The continuous output power shall not exceed 200W.

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

**Table 3.Cross Regulation**

Range	+5V	+12V	+3.3V	-12V	+5Vsb
1	0.3	1.0	0.5	0	0
2	1	2	1	0.1	0.5
3	5	6.5	4.5	0.15	1
4	4	18	0.3	0.3	2
5	12	13	6	0.3	2
6	5.4	13	16	0.3	2
7	10	13	9	0.3	2

When the output are at +5V/6A,+12V/1A,-12V/0A,+3.3V/0.3A,+5Vsb/0A, the +5V will greater than 4.96V.

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 0.1A/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**

NOM. OUTPUT VOLTAGE (VDC)	CURRENT I <sub>min</sub>	CURRENT I <sub>max</sub>	STEP LOAD CHANGE (%)	TRANSIENT TOLERANCE (%)
+5.0	0.3A	12A	30	±5
+12.0	1.0 A	18A	40	±5
+3.3	0.5 A	16A	30	±5

(Adding external capacitor: 5V/6000uF, 12V/10000uF, 3.3V/6000uF, -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	6000μF
+3.3V	6000μF
-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:**

+5V:7V max, +12V: 15.6V max, +3.3V: 4.5V 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.

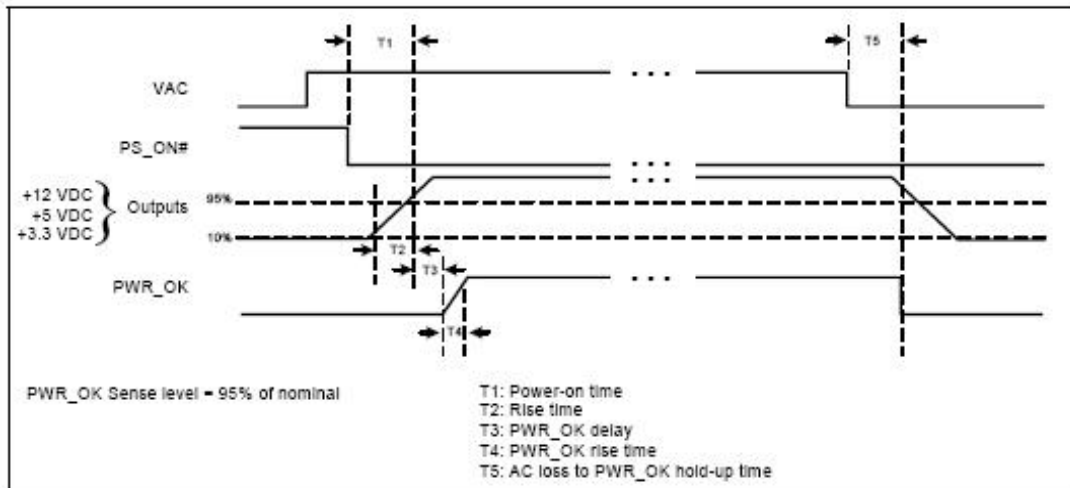
### 3.3 Over Power Protection:

The main output will be shutdown and latch off when output power is at 275W~420W.

### 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. (5Vsb load shall not less than 0.5A)

## 4.0 Time Sequence



### 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 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 milliseconds.

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

T5 is defined by the keep up time which between input voltage drop to 0V and PWR-OK drop to 90% at least 8ms after the test condition:230V/60HZ,80% of full load.

#### **4.6. Power Fail Delay Time T6**

The Power \_Down warning signal at least 1.0msec shall have a power Good Signal change Low Voltage to the 3.3V or +5V falls below their 90% of nominal voltage。 ( 80% 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:

#### **Table6. 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

#### 4.7 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:

**Table7. 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:

Table8. Operating ambient

Air Temperature	0 to 50 degrees centigrade
Relative Humidity	5 to 85 percent, non-condensing

### 6.2 Shipping and Storage:

Table9. Shipping and Storage

Air Temperature	-40 to 70 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 to be certified by CCC,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 EN55032

Class B.

**7.3 ESD:**

ESD of the power supply shall comply with the requirements of IEC61000-4-2 Level 3.

**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

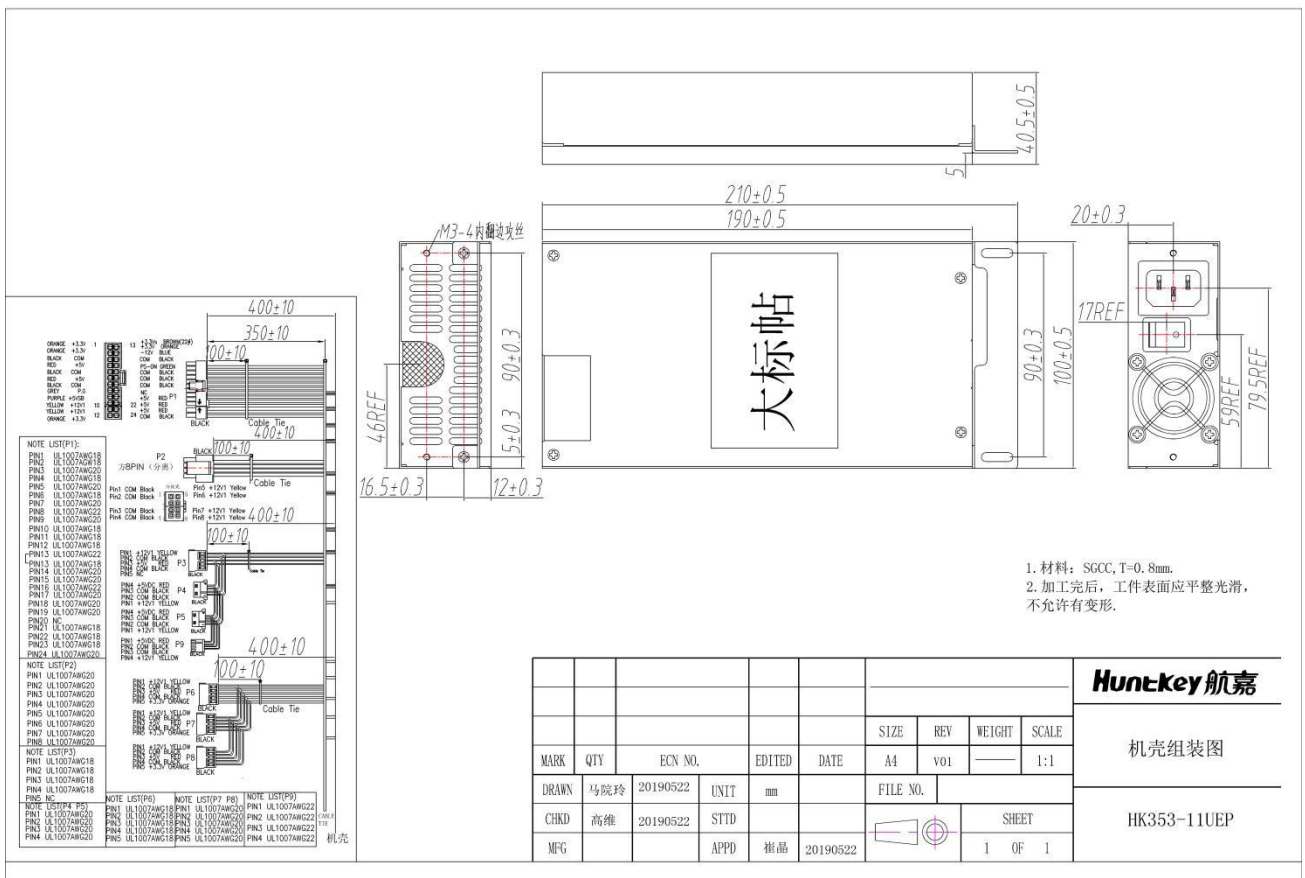
**7.7 Grounding Continuity Test:**

100mΩ MAX at 25.0A .

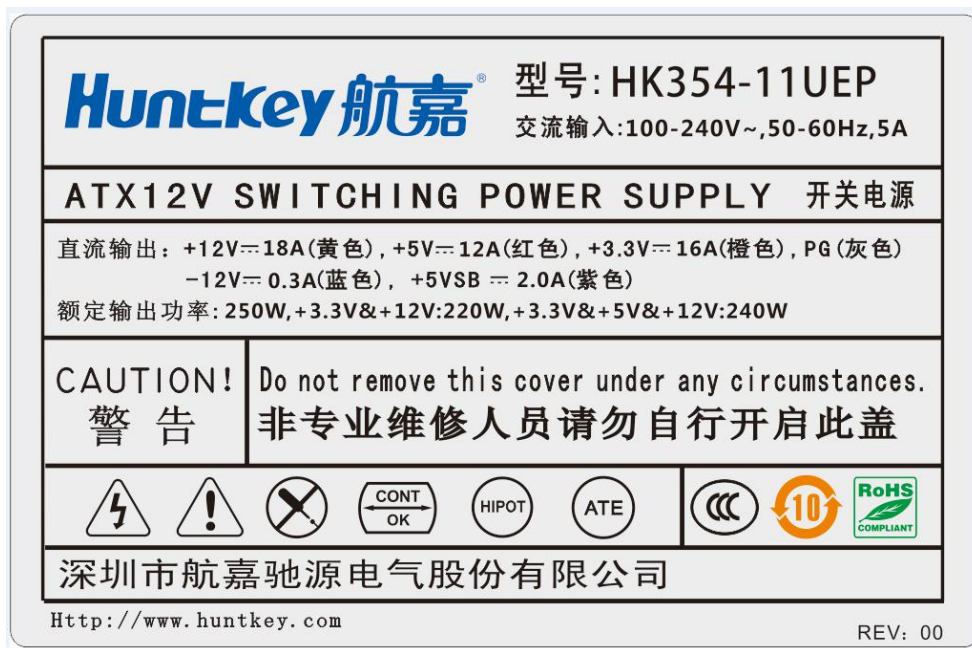
**7.8 Ground Leakage Current:**

3.5mA MAX. at 264V 50Hz

**8.0 Mechanical:****8.1 Mechanical outline**



### 8.2 Label drawing



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