1. GENERAL DESCRIPTION AND SCOPE

This specification is for Model# ATEC-600EPS8, AC-line powered switching power supply. It features Active PFC (Power Factor Correction) circuits with Full Range Input features, and meets EN61000-3-2.
The specification contained is intended to describe in detail the functions and performance of this product. Any comment or additional requirements to this specification from our customers will be highly appreciated and treated as new target for us to approach.

2. REFERENCE DOCUMENTS

The subject power supply meets the EMI requirements and obtain main safety approvals as following:

2.1 EMI REGULATORY

- FCC Part 15 Subpart J, Class 'B' 115 Vac operation.
- CISPR 22 Class 'B' 230 Vac operation.

3. PHYSICAL REQUIREMENTS

3.1 MECHANICAL SPECIFICATIONS

The mechanical drawing of the subject power supply, which indicates the form factor, location of the mounting holes, location, the length of the connectors, and other physical specifications of the subject power supply. (Please refer to the attachment drawing).

3.2 CONNECTOR SPECIFICATIONS

The power supply connectors are:

The power supplyt connetors are:
Ac Inlet : Standard inlet socket 10A/250V, UL/CSA/VDE approved.
P1 : The equivalent of Molex 39-01-2200, 24 Pin Connector
P2 : The equivalent of 4+4Pin Connector
P3 & P4 : The equivalent of Molex SD-67582-001, 5 Pin Connector
P5 : The equivalent of Molex 39-01-2040, 4 Pin Connector
P6 : The equivalent of Molex 39-01-2060, 6 Pin Connector
P7 : The equivalent of 6+2 Pin Connector

3.3 CONNECTOR PIN DESIGNATIONS

The pin designations and color codes are defined as follows:

REF ID	PIN ON	WIRE COLOR	SIGNAL	CABLE LENGTH
P1	24	BLK	GND	500±20mm
	23	RED	+5V	
	22	RED	+5V	
	21	RED	+5V	
	20	WHITE	-5V	
	19	BLK	GND	
	18	BLK	GND	
	17	BLK	GND	
	16	GREEN	PS-ON	
	15	BLK	GND	
	14	BLUE	-12V	
	13	BROWN	+3.3VS	
		ORANGE	+3.3V	
	12	ORANGE	+3.3V	
	11	YEL	+12V1	
	10	YEL	+12V1	
	9	PURPLE	+5VSB	
	8	GRAY	P.G	
	7	BLK	GND	
	6	RED	+5V	
	5	BLK	GND	
	4	RED	+5V	
	3	BLK	GND	
	2	ORANGE	+3.3V	
	1	ORANGE	+3.3V	
P2	8	YEL	+12V1	
	7	YEL	+12V1	
	6	YEL	+12V1	
	5	YEL	+12V1	
	4	BLK	GND	
	3	BLK	GND	
	2	BLK	GND	
	1	BLK	GND	
P3	5	YEL	+12V1	
	4	BLK	GND	
	3	RED	+5V	
P4	2	BLK	GND	
	1	ORANGE	+3.3V	
P5	4	RED	+5V	
	3	BLK	GND	
	2	BLK	GND	
	1	YEL	+12V1	
P6	6	BLK	GND	
	5	BLK	GND	
	4	BLK	GND	
	3	YEL	+12V2	
	2	YEL	+12V2	
	1	YEL	+12V2	
P7	8	BLK	GND	
	7	BLK	GND	
	6	BLK	GND	
	5	BLK	GND	
	4	BLK	GND	
	3	YEL	+12V2	
	2	YEL	+12V2	
	1	YEL	+12V2	

4. ELECTRICAL REQUIREMENTS

4.1 OUTPUT ELECTRICAL REQUIREMENTS

The subject power supply will meet all electrical specifications below, over the full operation temperature range and dynamic load regulation.

4.1.1. OUTPUT RATING

Output	Nominal	Regulation	Ripple/Noise	Min	Max
1	+3.3V	±5%	50mV	0.3A	18.0A
2	+5V	±5%	50mV	0.5A	20.0A
3	+12V1	±5%	120mV	0.3A	24.0A
4	+12V2	±5%	120mV	0.3A	24.0A
5	-12V	±10%	120mV	0A	1.0A
6	+5VSB	±5%	50mV	0A	3.5A

(1) The +3.3V and +5V total output shall not exceed 130 watts.+12V1 and +12V2 Max total 43A.
(2) Total output for this subject power supply is 600 watts.
(3) Ripple and noise measurements shall be made under all specified load conditions through a single pole low pass filter with 20MHz cutoff frequency. Outputs shall by passed at the connector with a 0.1uF ceramic disk capacitor and a 47uF electrolytic capacitor to simulate system loading.

4.1.2. LOAD CAPACITY SPECIFICATIONS

The cross regulation defined as follows, the voltage regulation limits DC include DC Output ripple & noise.

LOAD	+3.3V	+5V	+12V1	+12V2	-12V	+5VSB
ALL MAX	13.0A	13.5A	19.3A	19.3A	1.0A	3.0A
+5V MAX other MIN	0.5A	20.0A	0.5A	0.5A	0.1A	1.0A
+3.3V MAX other MIN	18.0A	0.5A	1.0A	1.0A	0.1A	1.0A
+12V1 MAX other MIN	0.5A	1.0A	24.0A	1.0A	0.1A	0.5A
+12V2 MAX other MIN	0.5A	1.0A	1.0A	24.0A	0.1A	0.5A
ALL MIN	0.3A	0.5A	0.3A	0.3A	0A	0A

4.1.3. HOLD-UP TIME (@FULL LOAD)

115V / 60Hz : 16.5 Sec. Minimum.
230V / 50Hz: 17 mSec. Minimum

4.1.4.OUTPUT RISE TIME

(10% TO 90% OF FINAL OUTPUT VALUE, @FULL LOAD)

115V rms or 230V rms + 5Vdc : 20ms Maximum

4.1.5.OVER VOLTAGE PROTECTION

Voltage Source	Protection Point
+3.3 V dc	3.5 V - 4.8 V
+5 V dc	5.5 V - 6.82 V
+12 V1 dc +12 V2 dc	13.4 V - 15.6 V

4.1.6.SHORT CIRCUIT PROTECTION

Output short circuit is defined to be a short circuit load of less than 0.1 ohm.

In the event of an output short circuit condition on +3.3V, +5V or +12V output, the power supply will shutdown and latch off without damage to the power supply. The power supply shall return to normal operation after the short circuit has been removed and the power switch has been turned off for no more than 2 seconds.

In the event of an output short circuit condition on -12V output, the power supply will not be damaged. The power supply shall return to normal operation as soon as the short circuit has been removed, and the power switch has been turned off for no more than 2 seconds.

4.1.7.OVERLOAD PROTECTION

Overload currents defined as a 16 amp/sec fault current ramp starting from fall load, applied to the +3.3V, +5V output, shall not cause that output to exceed 16 amps before the output voltage drops below 0.5 volts and is latched off. The +12V1,+12V2 output shall not exceed 58 amps under the same ramp conditions starting at full load before it is latched off.

The overload protection must be such that the power supply is protected from damage by entering a shutdown condition.

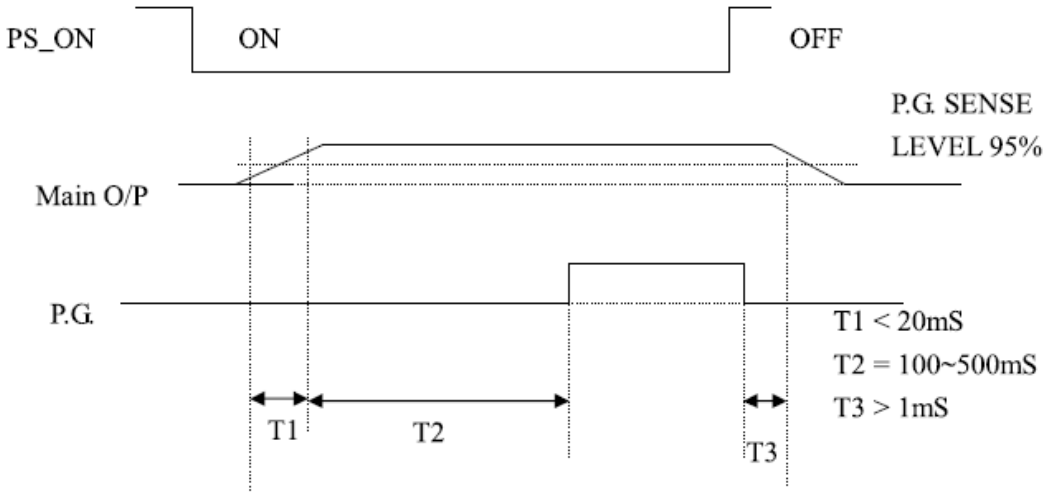
4.1.8.POWER GOOD SIGNAL

The power good signal is a TTL compatible signal for the purpose of initiating an orderly star-up procedure under normal input operating conditions. This signal is asserted (low) until. +5Vdc has reached 4.75 volts during power up. Characteristics:

TTL signal asserted (low state) : less than 0.5V while sinking 10mA.
TTL signal asserted (high state): greater than 4.75V while sourcing 500uA.
High state output impedance: less or equal to 1Kohm from output to common.

POWER GOOD @ 115/230V, FULL LOAD	100 - 500 mSec.

POWER FALL @ 115/230V, FULL LOAD	1 mSec. minimum



4.2. OUTPUT TRANSIENT LOAD RESPONSE

+5V and +12V must be within specification for a step change in current as specified below. The outputs will be tested one section at a time with all other sections at maximum load. The test transition will be from IA to IB and IB to IA. The step current will have a nominal transition time of 0.5 amp per microsecond for +5V and 0.1 amp per microsecond for +12V.

+5Vdc:

IA: 15.0 amps
IB: 9.0 amps
Volts variation: 400 mV max (p-p)
Setting time: 10 ms max

+12V1dc:

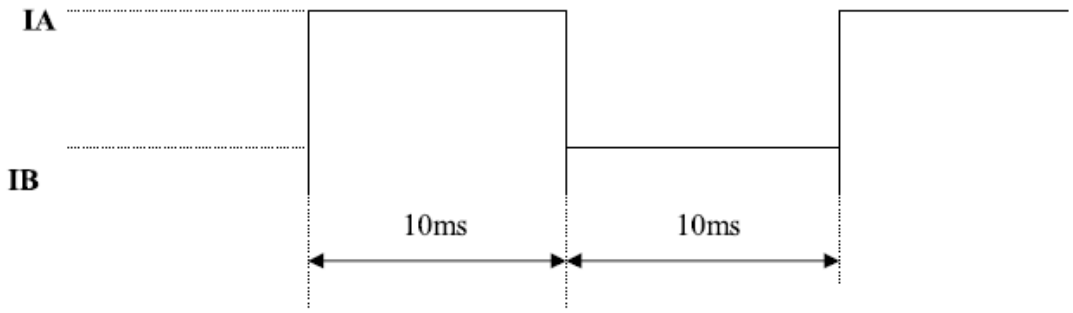
IA: 24.0 amps
IB: 9.0 amps
Volts variation: 450 mV max (p-p)
Setting time: 10 ms max

+12V2dc:

IA: 2.0 amps
IB: 9.0 amps
Volts variation: 450 mV max (p-p)
Setting time: 10 ms max

+3.3Vdc:

IA: 15.0 amps
IB: 9.0 amps
Volts variation: 400 mV max (p-p)
Setting time: 10 ms max



4.3. INPUT ELECTRICAL SPECIFICATIONS

4.3.1. VOLTAGE RANGE

PARAMETER		UNITS
V-in Range	90 - 264	V-rms

4.3.2. INPUT FREQUENCY

INPUT FREQUENCY	47-63Hz

4.3.3. INRUSH CURRENT

(Cold start -25 deg. C)

115V	No damage
230V	No damage

(No damage)

4.3.4. INPUT LINE CURRENT

115V	9.0 Amps -rms maximum
230V	4.5 Amps —rms maximum

4.4. EFFICIENCY

	Full load (100%)	Typical load (50%)	Light load 20%
115VAC	82%	85%	80%
230VAC	82%	85%	80%

(loading shown in Amps)

Loading	+12V1	+12V2	+5V	+3.3V	-12V	+5VSB
Full(100%)	19.3	19.3	13.5	13	1.0	3
Typical(50%)	9.65	9.65	6.75	6.5	0.5	1.5
Light(20%)	3.86	3.86	2.7	2.6	0.2	0.6

4.5. PS_ ON#

PS_ON# is an active-low, TTL-compatible signal that allows a motherboard to remotely control the power supply in conjunction with features such as soft on/off, Wake on LAN+, or wake-on-modem. When PS_ON# is pulled to TTL low, the power supply should turn on the five main DC output rails: +12VDC, +5VDC, +3.3VDC, -5VDC, and -12VDC. When PS_ON# is pulled to TTL high or open-circuited, the DC output rails should not deliver current and should be held at zero potential with respect to ground. PS_ON# has no effect on the +5VSB output, which is always enabled whenever the AC power is present. Table 15 lists PS_ON# signal characteristics.

The power supply shall provide an internal pull-up to TTL high. The power supply shall also provide debounce circuitry on PS_ON# to prevent it from oscillating on/off at startup when activated by a mechanical switch. The DC output enable circuitry must be SELV-compliant.

Table 15. PS_ON# Signal Characteristics

	Min.	Max.
ViL, Input Low Voltage	0.0V	0.8V
IiL, Input Low Current (Vin = 0.4V)		-1.6mA
Vih, Input High Voltage(lin = -200 , μA)	2.0V	
ViH OPEN circuit, lin =0		5.25V

5. ENVIRONMENTAL REQUIREMENTS

The power supply will be compliant with each item in this specification for the following Environmental conditions.

5.1. TEMPERATURE RANGE

Operating	600W	0 to +50 deg. C
Storage		-20 to +80 deg. C

5.2. HUMIDITY

Operating	5-90% RH, Non-condensing
Storage	5-95% RH, Non-condensing

5.3. VIBRATION

The subject power supply will withstand the following imposed conditions without

experiencing non-recoverable failure or deviation from specified output characteristics.

Vibration Operating – Sine wave excited, 0.25 G maximum acceleration, 10-250 Hz swept at one octave / min. Fifteen minute dwell at all resonant points, where resonance is defined as those exciting frequencies at which the device under test experiences excursions two times large than non-resonant excursions.

Plane of vibration to be along three mutually perpendicular axes.

5.4. SHOCK

The subject power supply will withstand the following imposed conditions without experiencing non-recoverable failure or deviation from specified output characteristics.

Storage 40G, 11 mSec. half-sine wave pulse in both directions on three mutually perpendicular axes.

Operating 10G, 11 mSec. half-sine wave pulse in both directions on three mutually Perpendicular axes.

6. SAFETY

6.1. LEAKAGE CURRENT

The leakage current from AC to safety ground will not exceed 3.5 mA rms at 264Vac, 50 Hz.

6.2. Certification:

7. LABELLING

Label marking will be permanent, legible and complied with all agency requirements.

7.1. MODEL NUMBER LABEL

Labels will be affixed to the sides of the power supply showing the following:

- Manufacturer's name and logo.
- Model no., serial no., revision level, location of manufacturer. - The total power output and the maximum load for each output. - AC input rating.

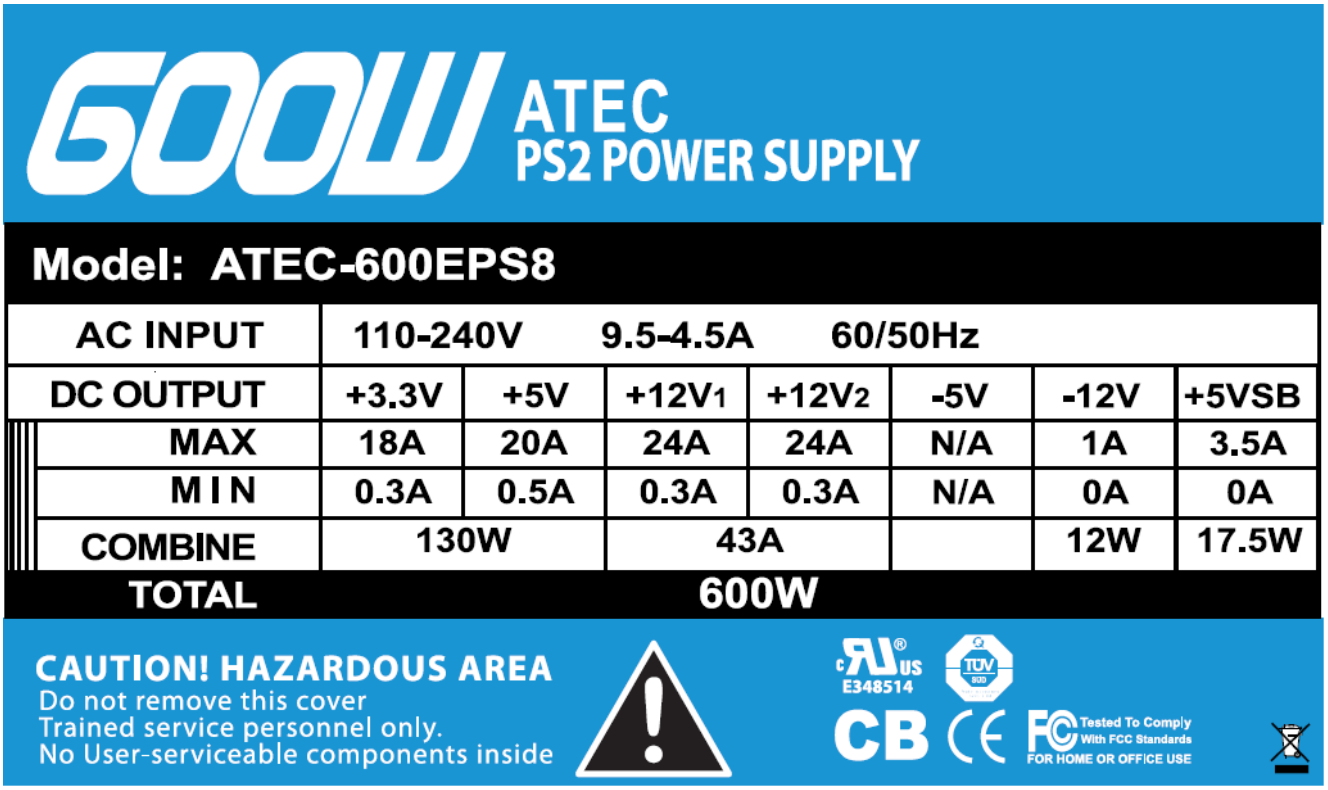
7.2 DC OUTPUT IDENTIFICATION

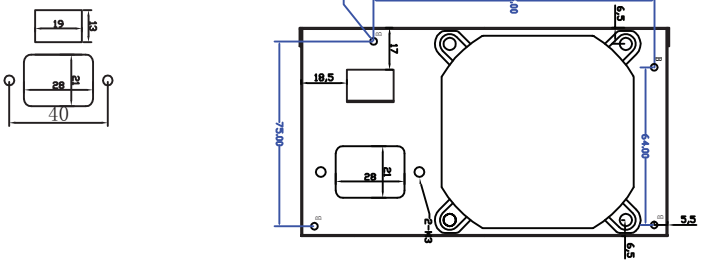
Each output connector will be labeled.

8. RELIABILITY

8.1. MTBF

The power supply have a minimum predicted MTBF(MIL-HDBK-217) of 100,000 hours of continuous operation at 25° C, maximum-output load, and nominal AC input voltage.




19
13
28
21
40
6-Φ3.2(4x2)
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6.5
17
18.5
75.00
64.00
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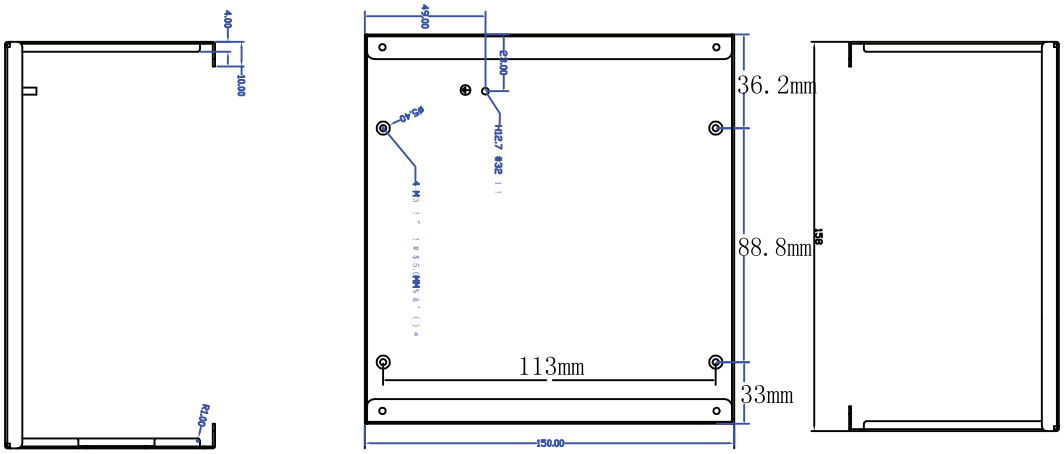
5.5
6.5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10.00
R4.00
45.00
21.00
Φ3.40
Φ2.7 4.32
4-M3
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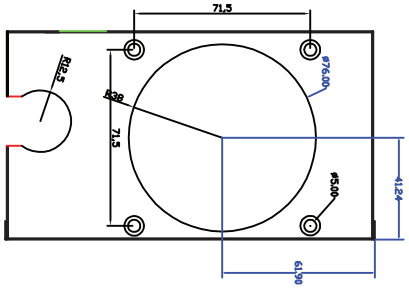
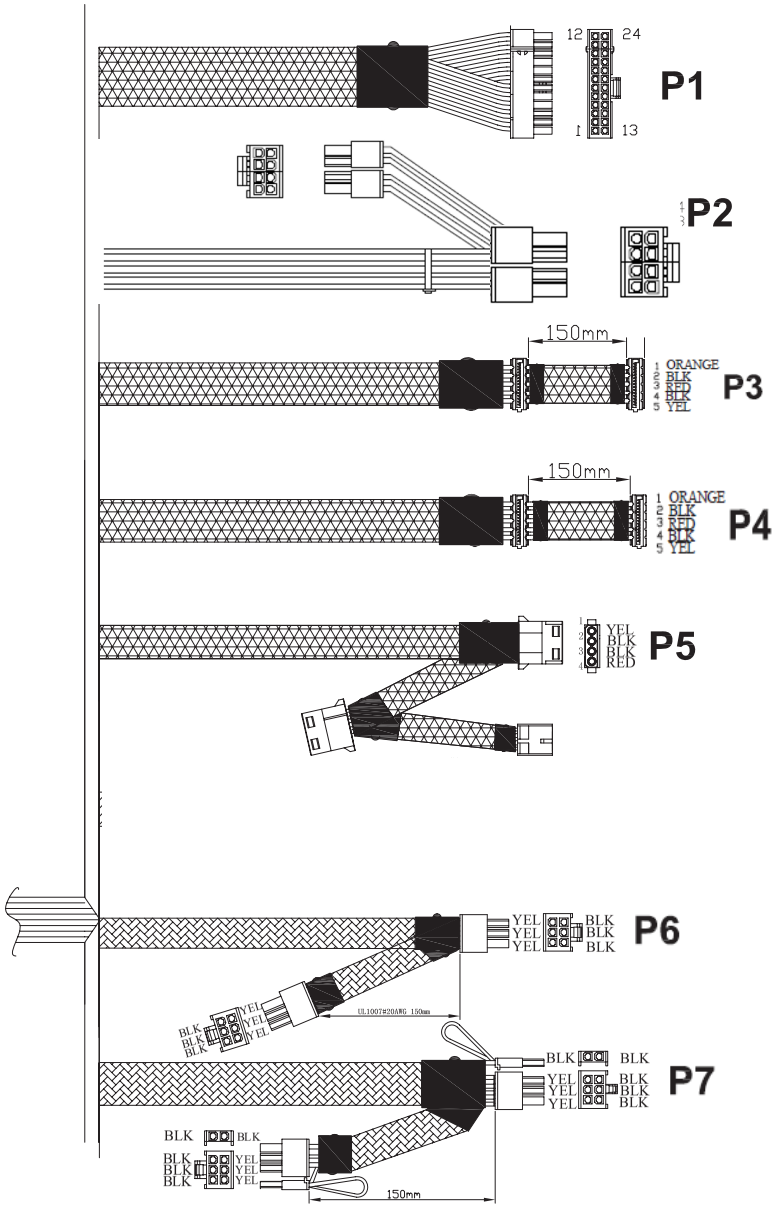
33mm
150.00
150.0


71.5
R12.5
Φ76.00
Φ38
71.5
Φ5.00
41.24
63.50



REF ID	PIN ON	WIRE COLOR	SIGNAL	CABLE LENGTH
P1	24	BLK	GND	500±20mm
	23	RED	+5V	
	22	RED	+5V	
	21	RED	+5V	
	20	WHITE	-5V	
	19	BLK	GND	
	18	BLK	GND	
	17	BLK	GND	
	16	GREEN	PS-ON	
	15	BLK	GND	
	14	BLUE	-12V	
	13	BROWN	+3.3VS	
		ORANGE	+3.3V	
	12	ORANGE	+3.3V	
	11	YEL	+12V1	
	10	YEL	+12V1	
	9	PURPLE	+5VSB	
	8	GRAY	P.G	
	7	BLK	GND	
	6	RED	+5V	
	5	BLK	GND	
	4	RED	+5V	
	3	BLK	GND	
	2	ORANGE	+3.3V	
	1	ORANGE	+3.3V	
P2	8	YEL	+12V1	
	7	YEL	+12V1	
	6	YEL	+12V1	
	5	YEL	+12V1	
	4	BLK	GND	
	3	BLK	GND	
	2	BLK	GND	
	1	BLK	GND	
P3	5	YEL	+12V1	
	4	BLK	GND	
	3	RED	+5V	
P4	2	BLK	GND	
	1	ORANGE	+3.3V	
P5	4	RED	+5V	
	3	BLK	GND	
	2	BLK	GND	
	1	YEL	+12V1	
P6	6	BLK	GND	
	5	BLK	GND	
	4	BLK	GND	
	3	YEL	+12V2	
	2	YEL	+12V2	
	1	YEL	+12V2	
P7	8	BLK	GND	
	7	BLK	GND	
	6	BLK	GND	
	5	BLK	GND	
	4	BLK	GND	
	3	YEL	+12V2	
	2	YEL	+12V2	
	1	YEL	+12V2	

600W
ATEC
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