

MODEL NO. ATX0200

This specification describes the requirements of 300W,350W,400W,450W,500W, 550W,600W with active P.F.C Switching Power Supply with an ATX form-factor,+5V standby voltage,fan control,ATX 12V Power supply version 2.3, remote on/off control,dual line input capability and forced air cooling characteristics.

☞ **1.0 Table1. AC INPUT requirements**

The input voltage, current, and frequency requirements for continuous operation are stated below.

(300W)

Parameter	Min	Nom.		Max	Unit
V _{in}	90	100	- 240	264	VACrms
V _{in} Frequency	47	60	50	63	Hz
I _{in}		6	3		A

(350W)

Parameter	Min	Nom.		Max	Unit
V _{in}	90	100	- 240	264	VACrms
V _{in} Frequency	47	60	50	63	Hz
I _{in}		7	4		A

(400W)

Parameter	Min	Nom.		Max	Unit
V _{in}	90	100	- 240	264	VACrms
V _{in} Frequency	47	60	50	63	Hz
I _{in}		8	4		A

(450W)

Parameter	Min	Nom.		Max	Unit
V _{in}	90	100	- 240	264	VACrms
V _{in} Frequency	47	60	50	63	Hz
I _{in}		8	4		A

(500W)

Parameter	Min	Nom.		Max	Unit
V _{in}	90	100	- 240	264	VACrms
V _{in} Frequency	47	60	50	63	Hz
I _{in}		10	5		A

(550W)

Parameter	Min	Nom.		Max	Unit
V _{in}	103	115	240	264	VACrms
V _{in} Frequency	47	60	50	63	Hz
I _{in}		10	5		A

(600W)

Parameter	Min	Nom.		Max	Unit
V _{in}	103	115	240	264	VACrms
V _{in} Frequency	47	60	50	63	Hz
I _{in}		10	5		A

1.1 Inrush current limiting

50 A @ 115Vrms

100 A @ 230Vrms (at 25°C ambient cold start).

2. DC OUTPUT

2.1 Table 1. DC voltage regulation

Parameter	Range	Min	Nom.	Max	Unit
+3.3V	+/-5%	+3.14	+3.3	+3.47	Volts
+5V	+/-5%	+4.75	+5.0	+5.25	Volts
+12V1	+/-5%	+11.40	+12.0	+12.6	Volts
+12V2	+/-5%	+11.40	+12.0	+12.6	Volts
-12V	+/-10%	-10.80	-12.0	-13.2	Volts
+5VSB	+/-5%	+4.75	+5.0	+5.25	Volts

2.2 Load Ranges

2.2.1 Table5 Typical Power Distribution for a 300W ATX12V Configuration

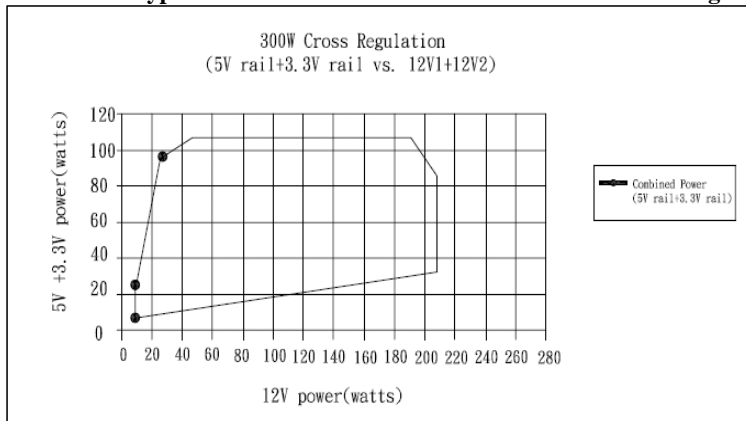


Table5 Typical Power Distribution for a 300W ATX12V Configuration

Parameter	Min	Nom.	Max	Peak	Unit
+12V1DC	0.1	-	8.0	13.0	Amps
+12V2DC	0.5	-	11.0	13.0	Amps
+5VDC	0.2	-	15.0	-	Amps
+3.3VDC	0.1	-	21.0	-	Amps
-12VDC	0.0	-	0.3	-	Amps
+5VSB	0.0	-	2.5	3.5	Amps

Note:

1. Total combined output of 3.3V and 5V is $\leq 103W$
2. Total combined output of +12V1&+12V2 is $\leq 216W$
3. Peak currents may last up to 17 seconds with not more than one occurrence per minute requirements.

2.2.2 Table5 Typical Power Distribution for a 350W ATX12V Configuration

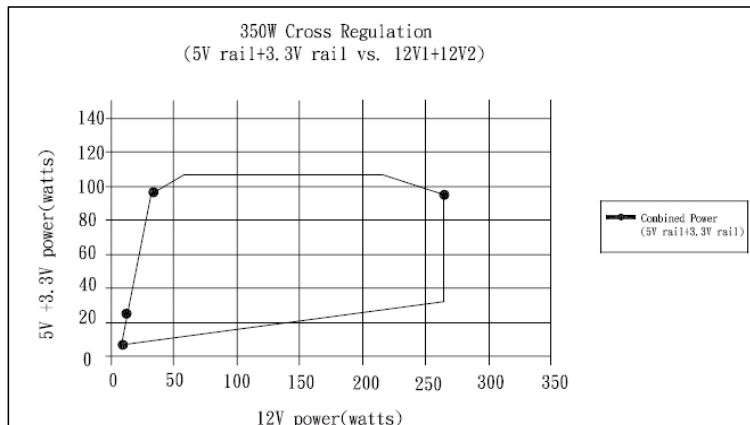


Table5 Typical Power Distribution for a 350W ATX12V Configuration

Parameter	Min	Nom.	Max	Peak	Unit
+12V1DC	0.1	-	11.0	15.0	Amps
+12V2DC	0.5	-	14.0	18.0	Amps
+5VDC	0.2	-	15.0	-	Amps
+3.3VDC	0.1	-	21.0	-	Amps
-12VDC	0.0	-	0.3	-	Amps
+5VSB	0.0	-	2.5	3.5	Amps

Note:

1. Total combined output of 3.3V and 5V is $\leq 103W$
2. Total combined output of +12V1&+12V2 is $\leq 265W$
3. Peak currents may last up to 17 seconds with not more than one occurrence per minute requirements.

2.2.3 Table5 Typical Power Distribution for a 400W ATX12V Configuration

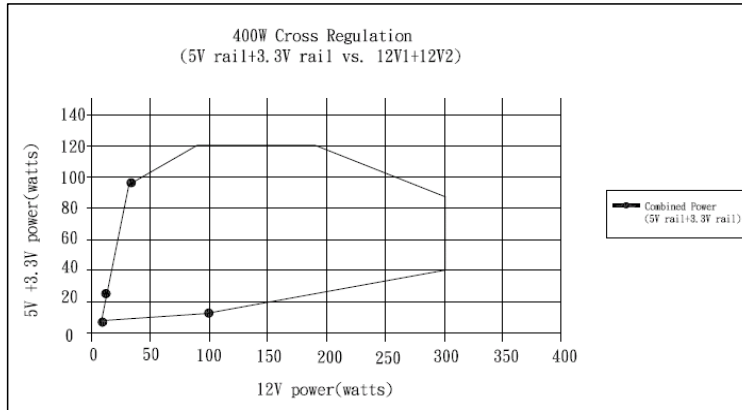


Table5 Typical Power Distribution for a 400W ATX12V Configuration

Parameter	Min	Nom.	Max	Peak	Unit
+12V1DC	0.1	-	18.0	19.0	Amps
+12V2DC	0.5	-	18.0	19.0	Amps
+5VDC	0.2	-	20.0	-	Amps
+3.3VDC	0.1	-	24.0	-	Amps
-12VDC	0.0	-	0.3	-	Amps
+5VSB	0.0	-	2.5	3.5	Amps

Note:

1. Total combined output of 3.3V and 5V is $\leq 120W$
2. Total combined output of +12V1&+12V2 is $\leq 300W$
3. Peak currents may last up to 17 seconds with not more than one occurrence per minute requirements.
4. When +12V1 & +12V2 load is over 20A, +5V min load is 0.5A
5. When +5V load is over 16A, +12V1 & +12V2 min load is 20A.

2.2.4 Table5 Typical Power Distribution for a 450W ATX12V Configuration

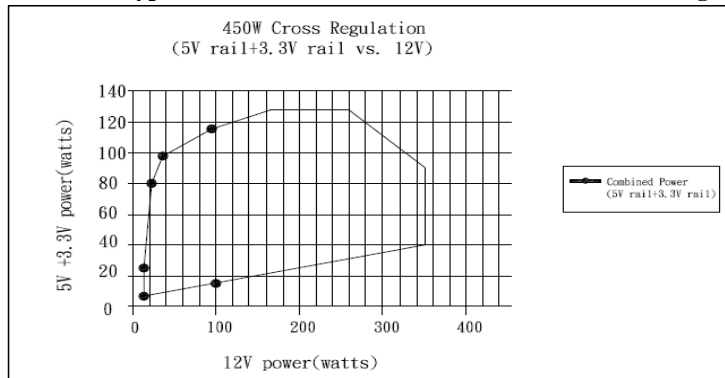


Table5 Typical Power Distribution for a 450W ATX12V Configuration

Parameter	Min	Nom.	Max	Peak	Unit
+12V1DC	0.1	-	18.0	19.0	Amps
+12V2DC	0.5	-	18.0	19.0	Amps
+5VDC	0.2	-	20.0	-	Amps
+3.3VDC	0.1	-	24.0	-	Amps
-12VDC	0.0	-	0.3	-	Amps
+5VSB	0.0	-	2.5	3.5	Amps

Note:

1. Total combined output of 3.3V and 5V is $\leq 130W$
2. Total combined output of +12V1&+12V2 is $\leq 350W$
3. Peak currents may last up to 17 seconds with not more than one occurrence per minute requirements.
4. When +12V1 & +12V2 load is over 20A,+5V min load is 0.5A
5. When +5V load is over 16A,+12V1 & +12V2 min load is 20A.

2.2.5 Table5 Typical Power Distribution for a 500W ATX12V Configuration

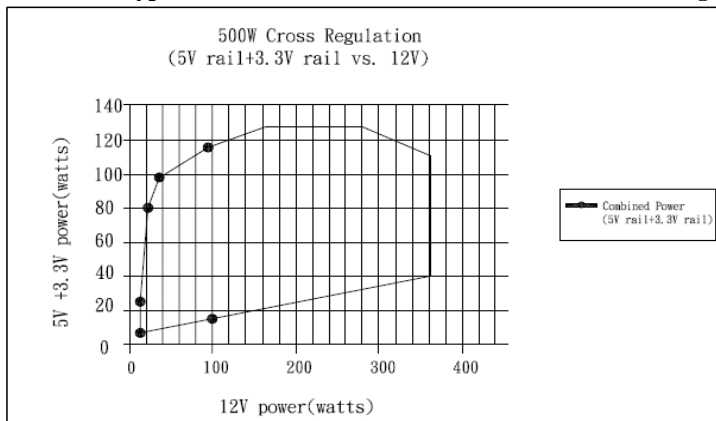


Table5 Typical Power Distribution for a 500W ATX12V Configuration

Parameter	Min	Nom.	Max	Peak	Unit
+12V1DC	0.1	-	20.0	21.0	Amps
+12V2DC	0.5	-	20.0	21.0	Amps
+5VDC	0.2	-	20.0	-	Amps
+3.3VDC	0.1	-	24.0	-	Amps
-12VDC	0.0	-	0.3	-	Amps
+5VSB	0.0	-	2.5	3.5	Amps

Note:

1. Total combined output of 3.3V and 5V is $\leq 130W$
2. Total combined output of +12V1&+12V2 is $\leq 360W$
3. Peak currents may last up to 17 seconds with not more than one occurrence per minute
4. When +12V1 & +12V2 load is over 30A,+5V min load is 2.5A

2.2.6 Table5 Typical Power Distribution for a 550W ATX12V Configuration

550W Cross Regulation(5V rail +3.3V rail vs,12V)

Cross Loading Graph for 550W Configuraton

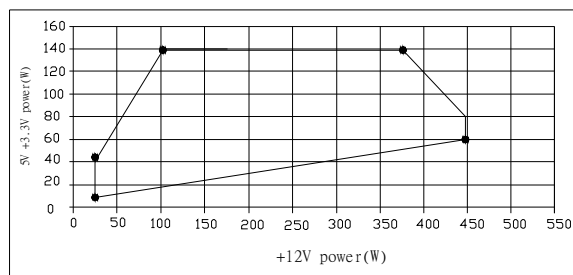


Table5 Typical Power Distribution for a 550W ATX12V Configuration

Parameter	Min	Nom.	Max	Peak	Unit
+12V1DC	0.1	-	25.0	-	Amps
+12V2DC	0.5	-	25.0	-	Amps
+5VDC	0.2	-	24.0	-	Amps
+3.3VDC	0.1	-	24.0	-	Amps
-12VDC	0.0	-	0.3	-	Amps
+5VSB	0.0	-	2.5	3.5	Amps

Note:

1. Total combined output of 3.3V and 5V is $\leq 140W$
2. Total combined output of +12V1&+12V2 is $\leq 420W$
3. Peak currents may last up to 17 seconds with not more than one occurrence per minute
4. When +12V1 & +12V2 load is over 30A,+5V min load is 2.5A

2.2.7 Table5 Typical Power Distribution for a 600W ATX12V Configuration

Cross Loading Graph for 600W Configuraton

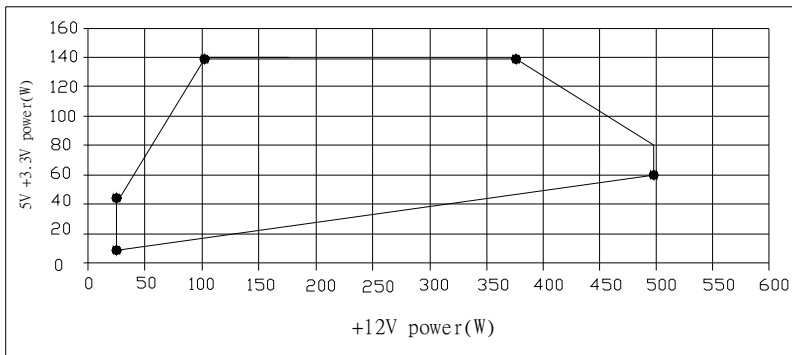


Table5 Typical Power Distribution for a 600W ATX12V Configuration

Parameter	Min	Nom.	Max	Peak	Unit
+12V1DC	0.1	-	30.0	-	Amps
+12V2DC	0.5	-	30.0	-	Amps
+5VDC	0.2	-	24.0	-	Amps
+3.3VDC	0.1	-	24.0	-	Amps
-12VDC	0.0	-	0.3	-	Amps
+5VSB	0.0	-	2.5	3.5	Amps

Note:

1. Total combined output of 3.3V and 5V is $\leq 140W$
2. Total combined output of +12V1&+12V2 is $\leq 500W$
3. Peak currents may last up to 17 seconds with not more than one occurrence per minute requirements.

2.3 DC Output Ripple/Noise.

2.3.1 Talbe6 Ripple regulation

Parameter	Ripple+Noise	Unit
+3.3V	50	mVp-p
+5V	50	mVp-p
+12V1	120	mVp-p
+12V2	120	mVp-p
-12V	120	mVp-p
+5VSB	50	mVp-p

2.3.2 Definition

The ripple voltage of the outputs shall be measured at the pins of the output connector when terminated in the load impedance specified in figure 1. Ripple and noise are measured at the connectors with a 0.1uF ceramic capacitor and a 10uF electrolytic capacitor to simulate system loading. Ripple shall be measured under any condition of line voltage, output load, line frequency, operation temperature.

2.3.3 Figure3. Ripple/Noise voltage test circuit

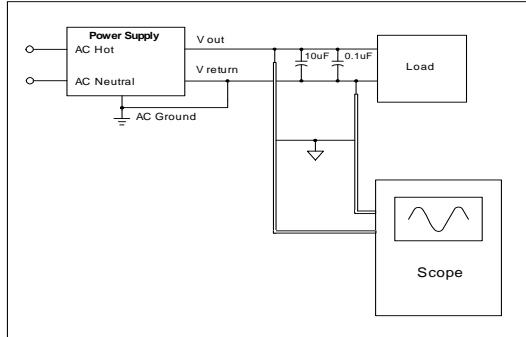


Figure 3. Ripple/Noise voltage test circuit

2.4 Overshoot

Any overshoot at turn on or turn off shall be less 10% of the nominal voltage value, all outputs shall be within the regulation limit of section 2.0 before issuing the power good signal of section 5.0.

2.5 Efficiency

Power supply typical efficiency is 80% under full Load at nominal input voltage of 115VAC or 230VAC.

2.6 Remote on/off control

When the logic level "PS-ON" is low, the DC outputs are to be enabled.

When the logic level is high or open collector, the DC outputs are to be disabled.

3. PROTECTION

3.1 Over-power protection

The power supply will be shutdown and latch off when output power is 110%~160%.

3.2 Over voltage protection

The over voltage sense circuitry and reference shall reside in packages that are separate and distinct from the regulator control circuitry and reference. No single point fault shall be able to cause a sustained over voltage condition on any or all outputs. The supply shall provide latch-mode over voltage protection as defined in Table.

output	Minimum	Nominal	Maximum	Unit
+12 V1DC or +12V2DC	13.4	15.0	17	Volts
+5 VDC	5.74	6.3	7.5	Volts
+3.3 VDC	3.76	4.2	4.8	Volts

3.3 Over Current Protection(300W)

+5VDC' and '+3.3VDC' have separate over current protection circuits to meet 240VA safety requirement.

Parameter	Min.	Max.	Unit
+12V1	14	30	A
+12V2	13	30	A

3.4 Over Current Protection(350W)

+5VDC'and '+3.3VDC' have separate over current protection circuits to meet 240VA safety requirement.

Parameter	Min.	Max.	Unit
+12V1	16	34	A
+12V2	19	34	A

3.5 Over Current Protection(400W)

+5VDC' and '+3.3VDC' have separate over current protection circuits to meet 240VA safety requirement.

Parameter	Min.	Max.	Unit
+12V1	23	36	A
+12V2	23	36	A

3.6 Over Current Protection(450W)

+5VDC',and '+3.3VDC' have separate over current protection circuits to meet 240VA safety requirement.

Parameter	Min.	Max.	Unit
+12V1	23	36	A
+12V2	23	36	A

3.7 Over Current Protection(500W)

+5VDC'and '+3.3VDC' have separate over current protection circuits to meet 240VA safety requirement.

Parameter	Min.	Max.	Unit
+12V1	23	37	A
+12V2	23	37	A

3.8 Over Current Protection(550W)

+5VDC" and '+3.3VDC' have separate over current protection circuits to meet 240VA safety requirement.

Parameter	Min.	Max.	Unit
+12V1	28	45	A
+12V2	28	45	A

3.9 Over Current Protection(600W)

+5VDC' and '+3.3VDC' have separate over current protection circuits to meet 240VA safety requirement.

Parameter	Min.	Max.	Unit
+12V1	31	50	A
+12V2	31	50	A

No damage or hazardous condition should occur with all the DC output connectors disconnected from the load.The power supply may latch into the shutdown state.

3.10 Over temperature protection(OPTIONS)

4. TIMING

4.1 Signal timing drawing

Figure 4 is a reference for signal timing for main power connector signals and rails.

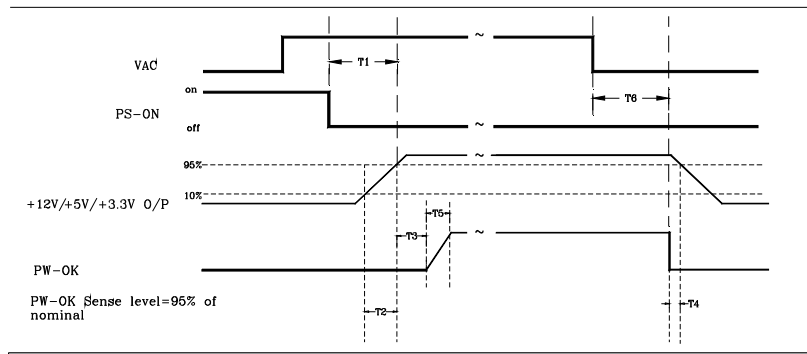


Figure 4. PS-OK Timing Sequence

- (1)T2: Rise time (0.1ms~20ms)
- (2)T3: Power good turn on delay time (100ms~500ms)
- (3)T4: Power good turn off delay time (1ms min)
- (4)T5: Rise time (10ms max)

4.2 .Output Transient Response

Table 13. summarizes the expected output transient step sizes for each output. The transient load slew rate is =1.0A/us.

Table 13. DC Output Transient Step Sizes

Output	Max.step size (% of rated output amps per Sec 3.2.3) ⁽¹⁾	Max.step size (amps)
+12 V1DC	40%	
+12 V2DC	60%	
+5 VDC	30%	
+3.3 VDC	30%	
-12 VDC		0.1A
+5 VSB		0.5A

⁽¹⁾ For example,for a rated +5 VDC output of 18A,the transient step would be 30% x 18A=5.4A

Output voltages should remain within the regulation limits of Section 2.1,and the power supply should stable when subjected to load transients per Table 13. from any steady state load,including any or all of the following conditions:

- * Simultaneous load steps on the +12 VDC,+5 VDC,and +3.3 VDC outputs
(all steps occurring in the same direction)
- * Load-changing repetition rate of 50 Hz to 10 kHz
- * AC input range per Section 1.0
- *+5vsb Loading min 0.1A

4.3 Hold up time (T6 of figure 4.)

300W~500W

When the power loss its input power, The output shall maintain 16ms in regulation ranges at nominal input voltage. (AC:115V/60Hz or 230V/50Hz/90% load)

550W

When the power loss its input power, The output shall maintain 13ms in regulation ranges at nominal input voltage. (AC:115V/60Hz or 230V/50Hz/90% load)

600W

When the power loss its input power, The output shall maintain 10ms in regulation ranges at nominal input voltage. (AC:115V/60Hz or 230V/50Hz/90% load)

4.4 Capacitive Load-REQUIRED

The power supply should be able to power up and operate with the regulation limits defined in Table 15,With the following capacitances simultaneously present on the DC outputs.

Output Capacitive Loads

Output	Capacitive Load(uF)
+12V1DC	10000
+12V2DC	10000
+5VDC	10000
+3.3VDC	10000
+5VSB	6000
-12VDC	330

5. ENVIRONMENT

5.1 Operation

Temperature	0°C to 40°C
Relative Humidity	20 to 85%, non-condensing

5.2 Shipping and Storage

Temperature	-40 TO 70°C
Relative Humidity	5 to 90%, non-condensing

5.3 Altitude

Operating	3,000FT max.
Storage	15,000FT max.

5.4 Operating AC Input Voltage

300W~500W	AC 90 ~ 264V auto ranging
550W&600W	AC 103 ~ 264V auto ranging

6. SAFETY

6.1 Underwriters Laboratory (UL) recognition.

The power supply designed to meet UL 1950.

6.2 The power supply must be certified to EN 60950-1:2006.

6.3 The power supply must bear the German Bauart Mark from TUV.

6.4 Canadian Standards Association(CSA) approval.

The power supply designed to meet CSA C22.2 NO. 950.

6.5 SEMKO,NEMKO,DEMKO,FIMKO certified by any NORDIC .

7.0 ELECTROMAGNETIC COMPATIBILITY (EMC)

7.1 ELECTROSTATIC DISCHARGE (ESD) - EN 61000 – 4 - 2 : 1995

7.2 ELECTRICAL FAST TRANSIENT / BURST (EFT/B) – EN 61000 – 4 - 4 : 1995

7.3 SURGE – EN 61000 – 4 - 5 : 1995

7.4 POWER FREQUENCY MAGNETIC FIELD – EN 61000 – 4 - 8 : 1993

7.5 VOLTAGE DIPS – RN 61000 – 4 - 11 : 1994

7.6 RADIATED SUSCEPTIBILITY – EN 61000 – 4 – 3 : 1996

7.7 CONDUCTED SUSCEPTIBILITY – EN 61000 – 4 - 6 : 1996

7.8 VOLTAGE FLUCTUATION - EN 61000 – 3 – 3 : 1995

7.9 EN61000-3-2 harmonic current emissions.

If applicable to sales in Europe, the power supply shall meet the requirements of EN 61000-3-2 Class D and the Guidelines for the Suppression of Harmonics in Appliances and General Use Equipment Class D for harmonic line current content at full-rated power.

7.10 EN 55022:2006+A1:2007 class B Radio interference.

7.11 FCC part 15 class B 115VAC operation.

8. MTBF

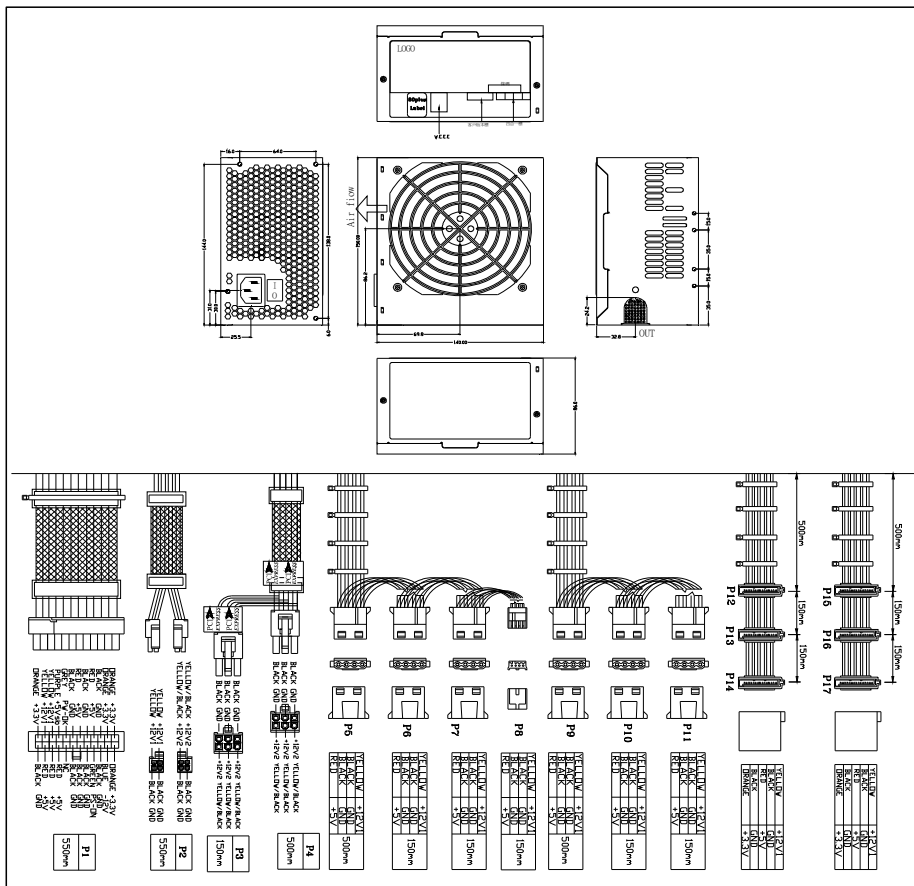
8.1 MTBF (MEAN TIME BETWEEN FAILURES) CALCULATION

The demonstrated MTBF shall be 100,000 hours of continuous operation at 25°C, full load, 80% confidence limit and nominal line. The MTBF of the power supply shall be calculated in accordance with MIL-STD-217D/E. The DC FAN is not included.

9. MECHANICAL REQUIREMENTS

9.1 Physical Dimension

(線材組合 & 外露長度僅供參考，可根據客戶要求更改或新增。)



9.2 Connectors (INTEL approved equivalent)

P1 connector (Molex 39-01-2240 or equivalent)

18AWG wire	Signal	Pin	Pin	Signal	18AWG wire
Orange	+3.3V	11	1	+3.3V	Orange
Orange(22AWG)	3.3 sense	11			
Blue	-12VDC	12	2	+3.3V	Orange
Black	COM	13	3	COM	Black
Green(20AWG)	PS-ON	14	4	+5VDC	Red
Black	COM	15	5	COM	Black
Black	COM	16	6	+5VDC	Red
Black	COM	17	7	COM	Black
White	NC	18	8	POK	Grey(20AWG)
Red	+5VDC	19	9	+5VSB	Purple
Red	+5VDC	20	10	+12V1DC	Yellow
Red	+5VDC	J3	J1	+12V1DC	Yellow
Black	COM	J4	J2	+3.3VDC	Orange

P2 Connector(Molex 39-01-2040 or Equivalent)

18 AWG wire	Signal	Pin	Pin	Signal	18AWG wire
Black	GND	1	3	Yellow/Black Stripe +12V2	
Black	GND	2	4	Yellow/Black Stripe +12V2	

P3,P4,P5,P6,P7,P8,P9(AMP 1-480424-0

P12,P16 (AMP 171822-4 or Equivalent)

or Molex 8981-04P or Equivalent)

18 AWG wire	Signal	Pin	Pin	Signal	20AWG wire
Yellow	+12V1	1	1	+5VDC	Red
Black	COM	2	2	COM	Black
Black	COM	3	3	COM	Black
Red	+5V	4	4	+12V1	Yellow

P10,P11,P12,P13 (optional) SATA Power Connector (Molex* 88751 or equivalent)

18 AWG wire	Signal	Pin
Orange	+3.3V	5
Black	GND	4
Red	+5V	3
Black	GND	2
Yellow	+12V1	1

10. OPTIONS

10.1 FAN SPEED CONTROL

Main fan voltage varies with the ambient temperature or output power.