REDUNDANT POWER SUPPLY SPECIFICATION

CP-17060

CLAYPOWER COMPANY

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1. General

This specification describes the physical, functional and electrical Characteristics of a redundancy 300+300 watts. 5-output, fan-cooled switching power supplies.

1.1 Parameter Specification

Unless specification otherwise, all parameters must be meet over the limits of temperature, load and input voltage.

2. Input Characteristics

2.1 Input Voltage:

90Vac To 264Vac,With Active Power Factor ,PF=90% Min.

2.2 Input Waveform

The unit is capable of operating with 10% distorted sine wave input. It is measured by a distortion analyzer. Its flat-topping clipped 10% from the peak value of standard sine-wave.

2.3 Input Frequency

47 – 63Hz

2.4 Input current

4A（RMS）FOR 230VAC/8A（RMS）FOR 115VAC

2.5 In-Rush Current

CONDITION	LIMITS
132/264Vac, Full load. Turn off 1 sec; turn on at peak of input voltage cycle. 25℃ Air Ambient cold start.	No damage shall occur or components over stressed, Input Fuse shall not blow.

2.6 Line Regulation

CONDTION	LIMITS
Full Load 90Vac To 264Vac, With Active Power Factor ,PF=90% Min.	1%

2.7 Input Leakage Current

Input leakage current from line to frame ground will be less than 3.5mA rms. for each power module. Condition: 264Vac/60Hz

2.8 Dielectric Withstand Voltage

Primary to Secondary : 1500V ac / 50Hz for 1 Minute.

Primary to Safety Ground: 1500V ac / 50Hz for 1 Minute.

2.9 Insulation Resistance

Primary to Safety Ground : 500Vdc, 50Mohms Minimum.

3. Output Characteristics

3.1 DC Output Characteristics

To be met under all combinations of loading.

Output Voltage	Output Current Min.	Output Current Max.	Output Current Peak	Regulation Load	Regulation Line	Output Ripple & Noise Max.[P-P
+5V	1.0A	50A max		± 5%	± 1%	50mV
+12V	2.0A	40Amax		± 5%	± 1%	120mV
-12V	0.1A	0.5Amax		± 10%	± 1%	120mV
+3.3V	1.0A	36Amax		± 5%	± 1%	50mV
+5VSB	0.1A	3Amax		± 5%	± 1%	50mV

Note1: Noise bandwidth is from DC to 20MHz. Add 0.1uF/10uF Capacitor at output connector terminals for Ripple And Noise measurement.

Note2: Regulation tolerance shall include temperature change, warm up drift and dynamic load.

Note3: Combined Total Power from +3.3V and +5V Rails Shall Not Exceed 65A.

Note4: The Total Output Power Shall Not exceeds 600W.

3.2 Overshoot

Any output overshoots at TURN-ON shall not exceed 10% (+5V/+12V output) and 10% (-12V/ output) of nominal voltage value.

3.3 Efficiency

70% min. at full load test.

4. Time Sequence

4.1 Hold-Up Time

Unit shall continue to supply regulated DC outputs and power good signal for at least 16 Milliseconds at 115/230Vac full load after a loss of AC input voltage which shall be represented by a short circuit at the AC input.

4.2 Power Good Signal

When the power supply is turned off a minimum of 1.0 second and turned on, the power-good signal as described below will be generated.

The power supply shall provide a power-good signal to indicate proper operation of the power supply. This signal shall be a TTL compatible high level for normal operation; low level for fault conditions.

Power-good shall go to low level at least 1 ms before the +5V output voltage falls below the regulation limits described in 3.1 DC output Characteristics.

The operation point used as a reference for measuring the 1ms shall be minimum line voltage and maximum load.

All waveform transitions shall be smooth and monotony, i.e. no oscillations.

The power-good signal shall stay low (during POWER-ON) until all output voltages are delay greater than 100ms but less than 500ms.

4.2.1 Fan out

Power Good output circuit shall consist of an active pull down component and a passive pull up resistor.

Power-Good output voltage to be met under recommended loading conditions.

CONDITION	LIMITS
I_{OH}=-140uA Min.	V_{OH}=2.7V Min.
I_{OL}=2.8mA Min.	V_{OL}=0.4V Min.

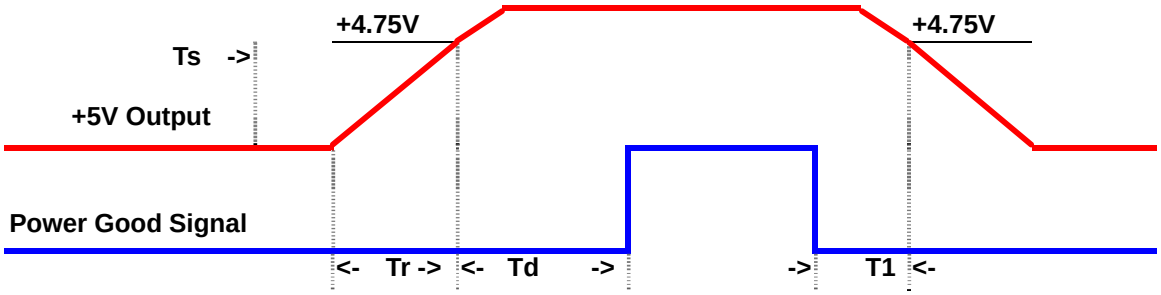
4.3 +5V Volt and Power Good Output Rise Time

4.3.1 + 5 Volt Output Rise Time

The +5V output shall have a turn-on rise time of less than 100ms under all load conditions. Rise time is measured between 0.0 and 4.75V.

The +5V output shall not vary from a smooth curve by more than 0.5V_{p-p} during turn-on and turn-off.

4.3.2. Power Good Output Rise



Note: Tr ≤ 100 ms, T1 ≥ 1 ms, Td = 100 - 500 ms.

4.4 Start-Up timing

All output shall be stable and in regulation in less than 2.0 second under all load and line condition. Start-up time is measured between the AC turn-on and 4.75V on +5V

4.5 Dynamic Load Response Time

Transient response is measured by switching the output load from 80 to 100 to 80 percent of its full value at a frequency of 100Hz and 50% duty cycle, step load change is 0.5A/us, The magnitude Vr is less than +/-5% of +5V and +12V output, the recovery time Tr is less than 1mS.

5. Protection

5.1 Over Power Protection

This power supply shut down all DC output when outputs are overloaded to the limit. The power supply logic shall latch into the off state requiring a power on cycle to be performed by the operator. The power supply will turn-off within 20ms of the occurrence of the overload.

CONDITION	LIMITS
Nominal input	When output power is over to 120% ~ 150%

5.2 Over Voltage Protection

The power supply shall latch off if the +5VDC or +12VDC or +3.3VDC maximum voltage exceeds the limits shown. The AC must be recycled to restart.

5.2.1 + 5VDC

CONDITION	LIMITS
All operating	+5.7V-6.7Vdc

5.2.2 +3.3VDC

CONDITION	LIMITS
All operating	+3.7V-4.7Vdc

5.2.3 +12VDC

CONDITION	LIMITS
All operating	+Max.13.0V-15.0Vdc

5.3 Short Circuit Protection

short circuit placed on +3.3V/+5V/+12V/-12V output shall cause no damage to this unit. The power supply shall be shut down.
AUTO-RECOVERED: 5VSB,

5.4 No Load Operation

When primary power is applied, with no load on any output voltage, no damage or hazardous condition shall occur. In such a case, the power supply shall power up and stabilize.

6. System Interface Signal

6.1 Power System Fault Signal

The Hot-Swap Redundant Power Supply shall give fault signal (an open collector) that will indicate the status of the power supply operation.
If one of the power supply unit shut down, the power fault signal could be generated. This signal shall be high level for normal operation; Low level for fault conditions.

6.2 Alarm Beeping Sound

The alarm system monitors the power supply failure and provides alarm to indicate the status of the power supply. By checking the LED on the power supply, end users will be able to locate the defective power unit. The alarm system will give a beeping sound to indicate the power supply failure until that particular power unit is replaced.

Beeping sound could be suspended before the failure power supply unit replaced.

7. Physical Characteristics

7.1 Size

See Figure1

7.2 Mounting Requirements

See Figure1

7.3 Cooling

BY BALL-BEARING FAN.

8. Connections

8.1 DC Output Wire List

Connector	Output **ATX24P**	Wire Color	Wire Size
P1-1	+3.3V	Orange	18 AWG
P1-1-1	+3.3V Sense	Orange	22 AWG
P1-2	+3.3V	Orange	16 AWG
P1-3	COM	Black	18 AWG
P1-3-1	COM Sense	Black	22 AWG
P1-4	+5V	Red	18 AWG
P1-4-1	+5V Sense	Red	22 AWG
P1-5	COM	Black	16 AWG
P1-6	+5V	Red	16 AWG
P1-7	COM	Black	16 AWG
P1-8	PWR OK	Gray	18 AWG
P1-9	+5VSB	Purple	16 AWG
P1-10	+12V	Yellow	18 AWG
P1-10-1	+12V Sense	Yellow	22 AWG
P1-11	+12V	Yellow	16 AWG
P1-12	+3.3V	Orange	16 AWG

P1-13	+3.3V	Orange	16 AWG
P1-14	-12V	Blue	16 AWG
P1-15	COM	Black	16 AWG
P1-16	PS-ON	Green	16 AWG
P1-17	COM	Black	16 AWG
P1-18	COM	Black	16 AWG
P1-19	COM	Black	16 AWG
P1-20	Reserved(-5V in TAX)	N.C	
P1-21	+5V	Red	16 AWG
P1-22	+5V	Red	18 AWG
P1-23	+5V	Red	16 AWG
P1-24	COM	Black	16 AWG

Connector	Output	**4P peripheral**	Wire Color	Wire Size
1	+12V		Yellow	18 AWG
2	COM		Black	18 AWG
3	COM		Black	18 AWG
4	+5V		Red	18 AWG

Connector	Output	CPU 4p	Wire Color	Wire Size
1	COM		Black	18 AWG
2	COM		Black	18 AWG
3	+12V		Yellow	18 AWG
4	+12V		Yellow	18 AWG

Connector	Output	CPU 8p	Wire Color	Wire Size
1	COM		Black	18 AWG
2	COM		Black	18 AWG
3	COM		Black	18 AWG
4	COM		Black	18 AWG
5	+12V		Yellow	18 AWG
6	+12V		Yellow	18 AWG
7	+12V		Yellow	18 AWG
8	+12V		Yellow	18 AWG

	Connector	Output	SATA	Wire Color	Wire Size
	1	+3.3V		Orange	18 AWG
	2	COM		Black	18 AWG
	3	+5V		Red	18 AWG
	4	GND		Black	18 AWG
	5	+12V		Yellow	18 AWG

PS LED	Connector	Output **GREEN LED**	Wire Color	Wire Size
			GREEN	22 AWG
			BLACK	22 AWG

TTL	Connector	Output	Wire Color	Wire Size
			BLUE	22 AWG
			BLACK	22 AWG

8.2 AC Input

IEC-320 power inlet.

(Optional)

9. Environmental

9.1 Temperature

9.1.1 Operating

50 to 122°F (10 to 40°C). De-rate Linearly to 50% at 70°C

9.1.2 Non-Operating

-4.0 to 140°F (-20 to 60°C)

9.2 Relative Humidity

9.2.1 Operating

20 to 90 % non-condensing at 104°F (40°C).

9.2.2 Non-Operating

10 to 90 % non-condensing at 104°F (40°C)

9.3 Altitude

9.3.1 Operating

Sea level to 10,000feet.

9.3.2 Non-Operating

Sea Level to 40,000 feet.

9.4 Shock

9.4.1 Operating

The power supply shall exhibit no sings of damage or degradation of performances when subjected to a shock of 5g's for 11 ms, with 1 1/2 sine wave for each of the perpendicular axes X,Y and Z.

9.4.2 Non-Operating

The power supply shall exhibit no sings of damage or degradation of performances when subjected to a shock of 30g's for 11 ms, with 1 1/2 sine-wave for each of the perpendicular axes X, Y and Z.

9.5 Vibration

9.5.1 Operating

The power supply shall be subjected to a vibration test consisting of a 10 to 500Hz sweep at a constant acceleration of 0.5g for a duration of one (1) Hour for each of the perpendicular axes X, Y and Z.
The output voltage shall remain within specification.

9.5.2 Non-Operating

The power supply shall be subjected to a vibration test consisting of a 10 to 300Hz sweep at a constant acceleration of 2.0g for a duration of one (1) hour for each of the perpendicular axes X, Y and Z.
The power supply shall not incur physical damage or degradation of any characteristics below the performance specifications.

9.6 Power Line Transient

9.6.1 Drop out

With a full cycle input voltage drop-out at 50 Hz, the power supply shall operating within the prescribed voltages whit a drop-out cycle repetition rate of 500ms.

CONDITIONS	LIMITS
Full load, Nom. AC voltage Input	Meet all requirements

9.6.2 Transient Voltage Spikes

The unit shall meet the following standards, The IEEE Standard 587-1980 for surge withstand capability under categories A and B. The crest value of the first half peak of the injected Ring-wave (0.5/10us) Bi-wave (1.2/50us) will be 3k volts open circuit and 3KA (8us X 20us) short circuit.
IEC 801–2 (ESD) to a level of 8KV contact, and 15K air discharge without causing the device(s) to fail the test.
IEC 801-4 (EFT) on the power lines and all I/O cables to a level of 2.5KV Without causing the Device(s) to fail the test.
IEC 801-5 Surge immunity measurement on the input power source of 2.5KV. All output shall be stable and in regulation.

9.7 Acoustic Noise

10. Regulatory Agency Certification

10.1 RFI/EMI Standards

The power supply, When installed in system, shall comply with the following

Radiated and conducted emissions standards:
(1) FCC part 15, Subpart B, Class B computing device.
(2) CISPR22 (EN55022) Class B.
(3) VCCI Class 2.

These limits shall be met with a margin of at less 6dB at all applicable frequencies. The units shall comply with the above limits when tested under all normal working conditions and with all interface cables connected.

10.2 Safety Standard

The power supply shall be certified with the following safety standards,

(1) UL 60950-1 (Information Processing / Business equipment).

(2) c-UL

(3) TUV Certification to EN60950-1 CB by IEC60950-1

(4) CE Certificate & Test Report.

(5) Harmonic Requirement ---IEC61000-3-2 & IEC61000-3-3 Class " D ".

11. Reliability

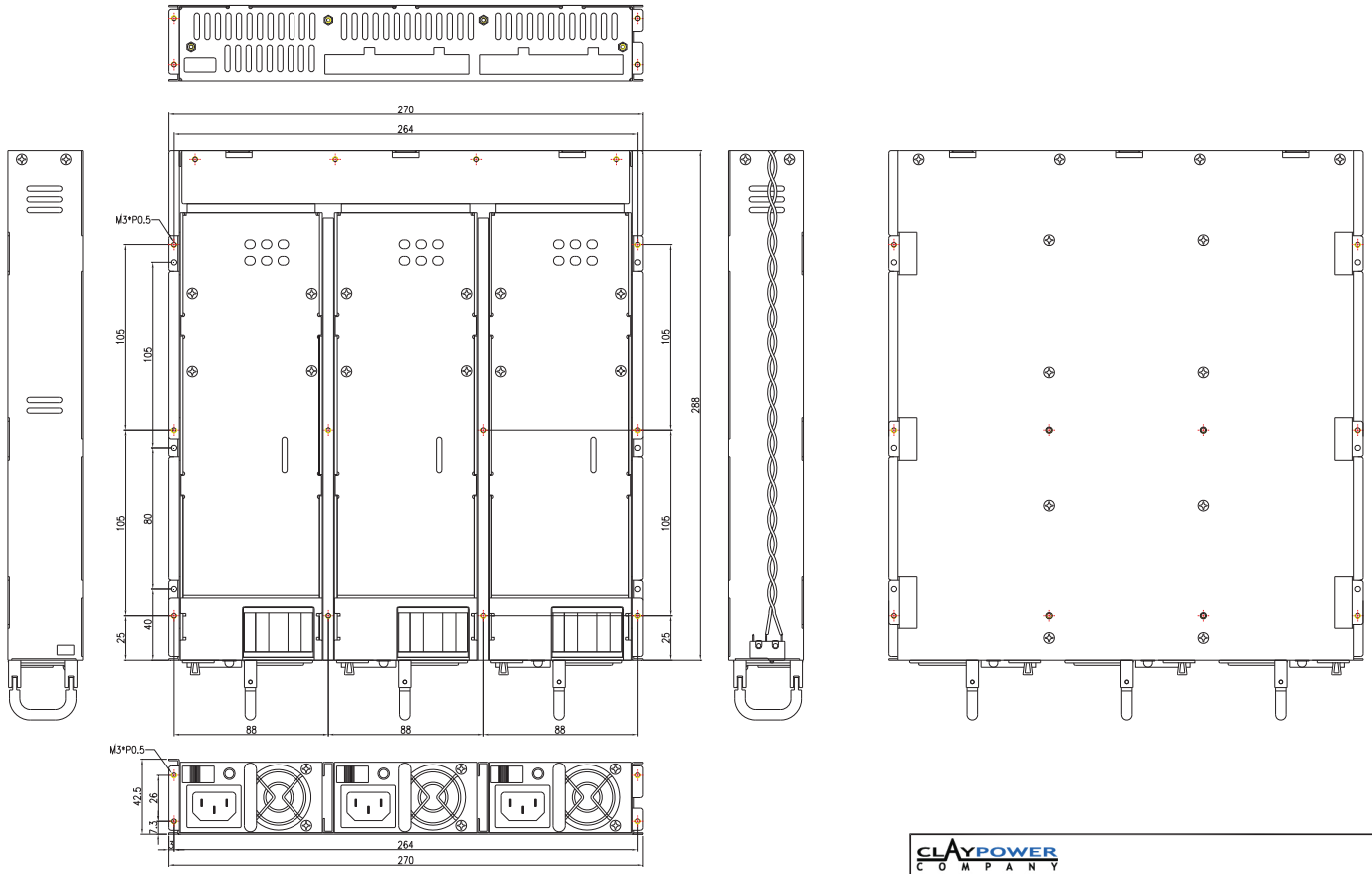
11.1 Mean Time Between Failure(MTBF)

Using MIL 217E the calculated MTBF=100,000 hours at 25℃ 75% loading.

11.2 Warranty

Two (2) years manufacture's warranty.

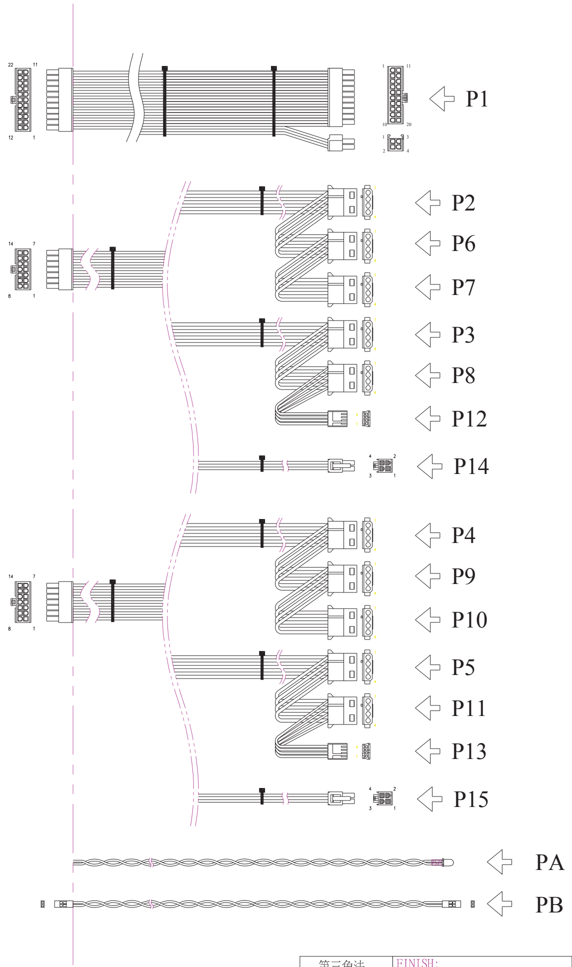
REVISIONS			
NO	DESCRIPTION	DATE	APPROVED



第三角法 (Projection)	FINISH:		MATERIAL:		
	採購		生產		品管

CLAYPOWER COMPANY

APPROVED	DATE	TITLE: CP-17060		PART NO.
CHECKED	DATE	SCALE : MM(INCHES) 1:1	DRAWING NO.	REV. A0
DESIGNED 2038	DATE 08/06'07	TOLERANCES: .XX = ±.10 .XXX = ±.010	MODEL NO. 3U水平	SHEET 1of1



REVISIONS			
NO	DESCRIPTION	DATE	APPROVED

REF.ID	PIN NO.	SIGNAL	WIRE COLOR	GAUGE	CONNECTOR TYPE	LENGTH
P1	1	+3.3V	ORANGE	18	LTT/H756-20S+ LTT/H756-4S	600±20mm
	2	+3.3V	ORANGE	18		
	3	COM	BLACK	20		
		COM Sense	BLACK	22		
	4	+5V	RED	18		
	5	COM	BLACK	20		
	6	+5V	RED	18		
	7	COM	BLACK	20		
	8	PWR OK	GRAY	20		
	9	+5VSB	PURPLE	18		
	10	+12V	YELLOW	18		
		+12V Sense	YELLOW	22		
	11	+12V	YELLOW	18		
	12	+3.3V	ORANGE	18		
	13	+3.3V	ORANGE	18		
		+3.3V Sense	BROWN	22		
	14	-12V	BLUE	20		
	15	COM	BLACK	20		
	16	PS-ON	GREEN	20		
	17	COM	BLACK	20		
	18	COM	BLACK	20		
	19	COM	BLACK	20		
	20	NC				
	21	+5V	RED	18		
	22	+5V	RED	20		
		+5V Sense	RED	22		
	23	+5V	RED	20		
	24	COM	BLACK	20		
P2 – P5	1	+12V	YELLOW	18	WST/P4-A10202 or equivalent	600±20mm
	2	COM	BLACK	18		
	3	COM	BLACK	18		
	4	+5V	RED	18		
P6 – P11	1	+12V	YELLOW	18	WST/P4-A10202 or equivalent	150±5mm
	2	COM	BLACK	18		
	3	COM	BLACK	18		
	4	+5V	RED	18		
P12 / P13	1	+12V	YELLOW	22	YIYI/H6681-004 or equivalent	150±5mm
	2	COM	BLACK	22		
	3	COM	BLACK	22		
	4	+5V	RED	22		
P14 / P15	1	COM	BLACK	18	YIYI/H6657系列 or equivalent	600±20mm
	2	COM	BLACK	18		
	3	+12V	YELLOW	18		
	4	+12V	YELLOW	18		
PA	PS1 LED		GREEN	22	絞線+橙縟雙色LED燈	800±20mm
			BLACK	22		
PB	TTL		BLUE	22	杜邦	800±20mm
			BLACK	22		

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APPROVED	DATE	TITLE CP-17060		PART NO.
CHECKED	DATE	SCALE : MM(INCHES) 1:1	DRAWING NO.	REV. A0
DESIGNED LOIS	DATE 08/18'07	TOLERANCES: .XX = ±.10 .XXX = ±.010	MODEL NO.	SHEET 1of1

Fig.1