



REDUNDANT POWER SUPPLY SPECIFICATION

CP - 46084  
- 3P1

**CLAYPOWER**  
C O M P A N Y

REV.00

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## 1.0 General

This specification describes the physical, functional and electrical Characteristics of a redundancy 300+300+300+300 watts. 6-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.

## 2.0 Input Characteristics

Normal	Minimum	Maximum
-48V DC	-38V DC	-72V DC

### 2.1 Input Voltage: - 38VDC ~ - 72VDC

### 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 current 11.0A/Max (One Power Supply)

### 2.4 In-Rush Current

CONDITION

No damage shall occur

LIMITS

### 2.5 Line Regulation

CONDITION

Full Load At – 48V

LIMITS

1%

### 2.6 Dielectric Withstand Voltage

Primary to Secondary : 1800V ac / 50Hz for 1 Minute.

Primary to Safety Ground: 1800V ac / 50Hz for 1 Minute.

## 2.7 Insulation Resistance

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

## 3.0 Output Characteristics

### 3.1 DC Output Characteristics

To be met under all combinations of loading.

Output voltage	V1 +5V	V2 +3.3V	V3 +12V	V4 -5V	V5 -12V	Vsb +5V
Max Load	86A	58A	30A	2A	2A	3A
Min Load	2A	0.3A	0.5A	0A	0A	0A
Load Reg. %	+/-5%	+/-5%	+/-5%	+/-10%	+/-10%	+/-5%
Cross Reg. 60%	+/-5%	+/-5%	+/-5%	+/-10%	+/-10%	+/-5%
Line Reg. %	+/-1%	+/-1%	+/-1%	+/-1%	+/-1%	+/-1%
Ripple Reg. mV	50mV	50 mV	120 mV	100 mV	200 mV	100 mV
Noise Reg. mV	100mV	70mV	150mV	200mV	200mV	100mV

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 86A.

Note4: The Total Output Power Shall Not exceeds 840W.

### 3.2 Overshoot

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

10% (-5V/-12V output) of nominal voltage value.

### 3.3 Efficiency

58% min. at full load test.

## 4.0 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 full load after a loss of DC input voltage which shall be represented by a short circuit at the DC input. See Figure 2.

### 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. See Figure 2.

#### 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

$I_{OH} = -140\mu A$  Min.

$I_{OL} = 2.8mA$  Min.

#### LIMITS

$V_{OH} = 2.7V$  Min.

$V_{OL} = 0.4V$  Min.

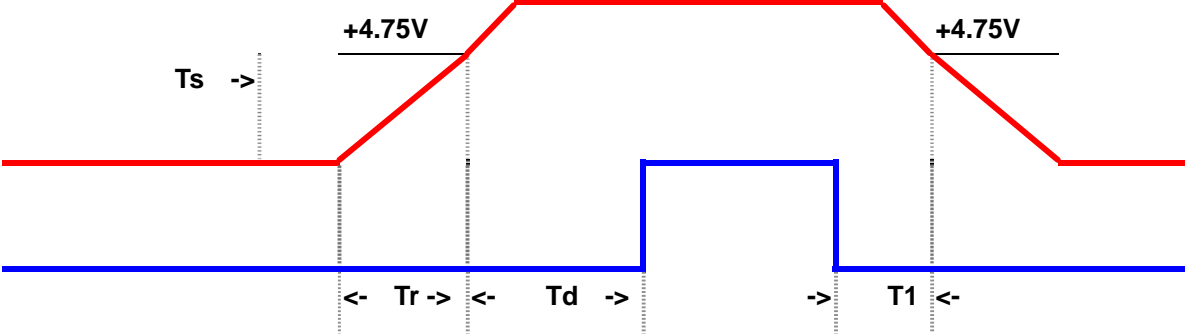
## 4.3 +5V Volt and Power Good Output Rise Time

### 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:  $T_r \leq 100 \text{ ms}$ ,  $T_1 \geq 1 \text{ ms}$ ,  $T_d = 100 - 500 \text{ ms}$ .

**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 See Figure 2.

**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. See Figure3.

**5.0 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 110% ~ 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.

<b>5.2.1</b>	<b>+ 5VDC</b>	
	<u>CONDITION</u>	<u>LIMITS</u>
	All operating	Max.6.8Vdc
<b>5.2.2</b>	<b>+3.3VDC</b>	
	<u>CONDITION</u>	<u>LIMITS</u>
	All operating	Max.4.50Vdc
<b>5.2.3</b>	<b>+12VDC</b>	
	<u>CONDITION</u>	<u>LIMITS</u>
	All operating	Max.15Vdc

### **5.3 Short Circuit Protection**

A short circuit placed on any output shall cause no damage to this unit.  
The power supply shall be shut down.

### **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.

### **6.0 System Interface Signal**

### **7.0 Regulatory Agency Certification**

#### **7.1 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 A computing device.
- (2) CISPR22 (EN55022) Class A.

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.

## **7.2 Safety Standard**

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

(1) UL 1950 (Information Processing / Business equipment).

(2) cUL

(3) TUV Certification to IEC950 1 edition with Amendment#1, #2, and EN60950

(4) CE Certificate & Test Report.

## **8.0 Reliability**

### **8.1 Mean Time Between Failure(MTBF)**

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



