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1.0 General

This specification describes the physical, functional and electrical Characteristics of a redundancy 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 +24V

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	30A	22A	11A	1A	1A	1.5A
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 160W.

Note4: The Total Output Power Shall Not exceeds 300W.

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.

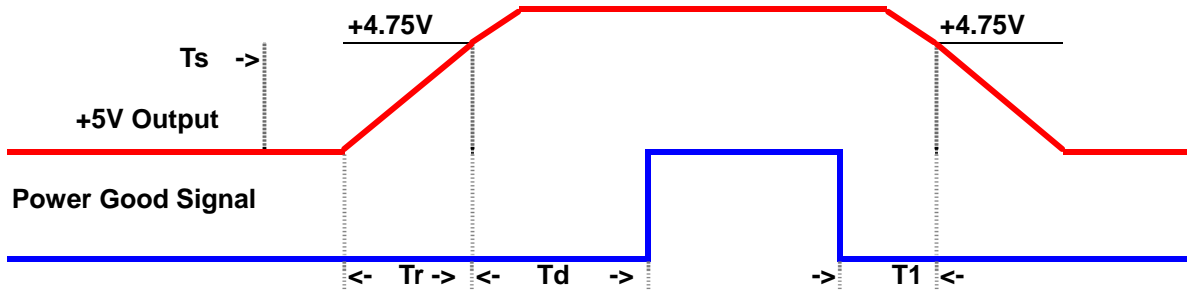
4.3 +5V Volt and Power Good Output Rise Time

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: $T_r \leq 100$ ms, $T_1 \geq 1$ ms, $T_d = 100 - 500$ 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 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 V_r is less than +/-5% of +5V and +12V output, the recovery time T_r 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

Nominal input

LIMITS

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.

5.2.1 + 5VDC

CONDITION

All operating

LIMITS

Max.6.8Vdc

5.2.2 +3.3VDC

CONDITION

All operating

LIMITS

Max.4.50Vdc

5.2.3 +12VDC

CONDITION

All operating

LIMITS

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 & 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.

8.2 Warranty

Two (2) years manufacture's warranty.

