SPECIFICATION

DC TO DC
REDUNDANT POWER SUPPLY
EDR-2302H
300W+300W 4-OUTPUT

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1.0 General

This specification describes the physical, functional and electrical characteristics of a DC to DC redundancy 300+300 watts, 4-output, fan-cooled switching power supply.

1.1 Parameter Specifications

Unless specified otherwise, all parameters must be met over the limits of Temperature, load and input voltage.

2.0 Input Characteristics

2.1 Input Voltage

Normal	Minimum	Maximum
-48 VDC	-38 VDC	-58 VDC

2.2 Input current

14A max.

2.3 In-Rush Current

25A max. / -58 VDC input

2.4 Line Regulation

-38 VDC to -58 VDC input

3.0 Output Characteristics

3.1 DC Output Characteristics

To be met under all combinations of loading.

Output Voltage	V1 +5	V2 +12V	V3 -5V	V4 -12V
Max. Load	25A	10A	1A	4A
Min. Load	2A	0A	0A	0A
Max. Power	Combined total 250W		5W	48W
Load Reg. %	+/-3%	+/-3%	+/-5%	+/-5%
Line Reg. %	+/-1%	+/-1%	+/-1%	+/-1%
Ripple %	+/-1%	+/-1%	+/-1%	+/-1%
Noise %	+/-1%	+/-1%	+/-2%	+/-2%

Note : 1. Noise bandwidth is from DC to 20 MHz. See figure 2

2. +5V & +12V total output should be not exceeded 250 Watts.

3.2 Overshoot

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

3.3 Efficiency

65% min. at full load test.

4.0 Time Sequence

4.1 Power Good Signal

When the power supply is turned off for 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 a 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 stable within regulation limits. The power-good signal shall have a TURN-ON delay greater than 100 ms but less than 500 ms. See Figure 2.

4.1.1 Fanout

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.

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

4.2 +5 Volt and Power Good Outputs Rise Time

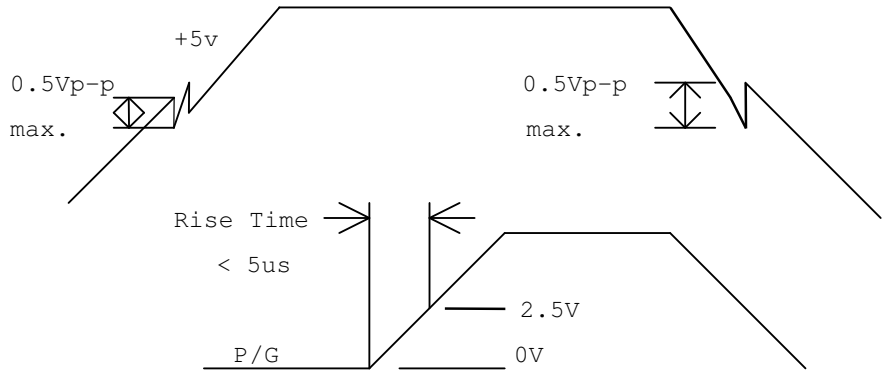
4.2.1 +5 Volt Output Rise Time

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

The +5 Volt output shall not vary from a smooth curve by more than 0.5 VP-P

during turn-on and turn-off.

4.2.2 Power Good Output Rise Time



4.3 Start-up timing

All outputs shall be stable and in regulation in less then 3.0 second under all load and line conditions. Start-up time is measured between the -48V turn-on and 4.75 volts on +5V output. See Figure 2.

4.4 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 100 Hz and 50% duty cycle, step load change is 0.5A/us, The magnitude Vr is less than +/- 5% of +5V and +12V outputs, the recovery time Tr is less than 1ms. See Figure 3.

5.0 Protection

5.1 Over Current Protection

+5 VDC

CONDITIONS	LIMITS
-48 VDC input	35A – 45A of full load

+12 VDC

CONDITIONS	LIMITS
-48 VDC input	15A – 25A of full load

-12 VDC

CONDITIONS	LIMITS
-48 VDC input	6A - 10A of full load

5.1.1 Primary (Input)

Shall have an overcurrent protection device, i.e., fuse protection.

5.1.2 Secondary

This power supply shut down all DC outputs when +5V and +12V outputs are overloaded to the limit. The power supply logic shall latch into the off state requiring a power on cycle. The power supply will turn-off with in 20ms of the occurrence of the overload. The -5V and -12V outputs will be internally current limited.

5.1.3 Overcurrent Protection Per Individual Output

+5 VDC

CONDITIONS	LIMITS
-48 VDC	110% -130% of full load

+12 VDC

CONDITIONS	LIMITS
-48 VDC input	110% - 130% of full load

-12 VDC

CONDITIONS	LIMITS
-48 VDC input	110% - 130% of full load

5.2 Over Voltage Protection

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

5.2.1 +5 VDC

CONDITIONS	LIMITS
All operating	6.25 VDC +/- 0.65 VDC

5.2.2 +12 VDC

CONDITIONS	LIMITS
All operating	13.6 — 15.6 VDC

5.3 Over Temperature Protection

The power supply shall off all outputs if an excess internal temperature condition exists. This shutdown shall not occur within the operating limits of this specification.

The normal power good signal sequence shall be generated. The unit must latch off and require recycling the input AC power to reset or automatically restart. The

power

ON must be recycled to start.

5.4 Short Circuit Protection

A short circuit placed on any output shall cause no damage to this unit.

5.5 No Load Operation

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

6.0 Redundant Operation

6.1 Fault Tolerance (Zero Down Time)

Each output voltage is internally diode isolated so that a failure in one power module will not cause the second to shut down.

6.2 Power System Fault Signal

The Hot-Swap Redundant Power Supply shall give fault signal (an open collector output) 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.

6.3 Alarm Beeping Sound

The alarm system monitors the power supply failure and provides alarm to indicate the status of the power system. 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 by pressing the Alarm Switch.

7.0 Physical Characteristics

7.1 Size

353 (W) x 201 (L) x 104.5 (H)
See Figure 1

7.2 Mounting Requirements

See Figure 1

7.3 Weight

12 pounds

7.4 Cooling

Fans: NIDEC [(D08T-120H) (ME)] equivalent or better.

Air flow from the power supply should be in exhaust direction and shall be rated at 35 cfm minimum.

8.0 Connections

8.1 DC Output Wire List → See Figure 5

Connector	Output	Wire Color	Wire Size	Device
P8-1	PG	Orange	18 AWG	Mother Board
P8-2	+5V	Red	18 AWG	
P8-3	+12V	Yellow	18 AWG	
P8-4	-12V	Blue	18 AWG	
P8-5	COM	Black	18 AWG	
P8-6	COM	Black	18 AWG	
P9-1	COM	Black	18 AWG	Mother Board
P9-2	COM	Black	18 AWG	
P9-3	-5V	White	18 AWG	
P9-4	+5V	Red	18 AWG	
P9-5	+5V	Red	18 AWG	
P9-6	+5V	Red	18 AWG	
P10-1	+5V	Red	18 AWG	Mother Board
P10-2	+5V	Red	18 AWG	
P10-3	+5V	Red	18 AWG	
P10-4	COM	Black	18 AWG	
P10-5	COM	Black	18 AWG	
P10-6	COM	Black	18 AWG	
P11-1	+5V	Red	22 AWG	3.5”
P11-2	COM	Black	22 AWG	Floppy
P11-3	COM	Black	22 AWG	Drive
P11-4	+12V	Yellow	22 AWG	

P13-1	+12V	Yellow	18 AWG	5.25”
P13-2	COM	Black	18 AWG	CD-ROM
P13-3	COM	Black	18 AWG	Drive
P13-4	+5V	Red	18 AWG	

P14、15

Pn-1	+12V	Yellow	18 AWG	Hard Drive
Pn-2	COM	Black	18 AWG	
Pn-3	COM	Black	18 AWG	
Pn-4	+5V	Red	18 AWG	

9.0 Environmental

9.1 Temperature

9.1.1 Operating

50 to 122 °F (0 to 50 °C). Derate 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

5 to 95 % non-condensing at 122°F (50°C).

9.3 Altitude

9.3.1 Operating

Sea level to 10,000 feet.

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 performance when subjected to a shock of 5g`s for 11 ms, with a 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 performance when subjected to a shock of 30g's for 11 ms, with a 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 500 Hz 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 voltages shall remain within specification.

9.5.2 Non-Operating

The power supply shall be subjected to a vibration test consisting of a 10 to 300 Hz 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.

10.0 Reliability

10.1 Life Expectancy

Average life expectancy of 5 years.

10.2 Mean Time Between failures (MTBF)

Using MIL217E the calculated MTBF = 100,000 hours at 25°C

10.3 Warranty

Two (2) years manufacture's warranty

Date code indicating week and year of manufacture.