

Revision

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| A2 | 4 | 1.0 | Feb-25-2005 | Update |
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| | 8 | 8.4 | | Update |
| A3 | 4 | 1.0 | Mar-10-2005 | Update about discription for module power supply |

MODEL NO. DM1W4-6D50P

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1.0 Scope

This specification defines the performance characteristics of a grounded, 500 watts, 6 output level power supply. This specification also defines world wide safety requirements and manufactures process test requirements.

DM1W4-6D50F power system is a 3+1 Redundant power system consisting of four. DM1W-6500F power modules and one DM1W4-6D50F power system frame.

2.0 Input requirements

2.1 Voltage

Range -36~-72 VDC

Nomal -48VDC

2.3 Steady-state current

15 amp at -48VDC

2.2 Inrush current

30 amps @48VDC (at 25 degrees ambient cold start)

3.0 Output requirements

3.1 OUTPUT CHARACTERISTICS :

| OUTPUT VOLTAGE | OUTPUT CURRENT | | REGULATION |
|----------------|----------------|-------|------------|
| | MIN. | MAX. | LOAD |
| +5V | 6A | 75A | ±5% |
| -5V | 0.2A | 1.2A | +5/-10% |
| +12V | 6A | 90A | ±6% |
| -12V | 0.2A | 1.2A | +5/-10% |
| +3.3V | 3.5A | 67.5A | ±5% |
| +5VSB | 0.4A | 3.5A | +5/-6% |

REMARK: 1. POWER MODULE TOTAL CURRENT OF +5V AND +3.3V NOT EXCEED 40A
 2. POWER MODULE TOTAL OUTPUT POWER NOT EXCEED 500W

When doing the cross regulation test (one output channel at high load and the other output channels at low load), it is requested to set the higher output channel at 80% max. of its spec., and the lower output channels at 20% max. of theirs

3.2 Regulation

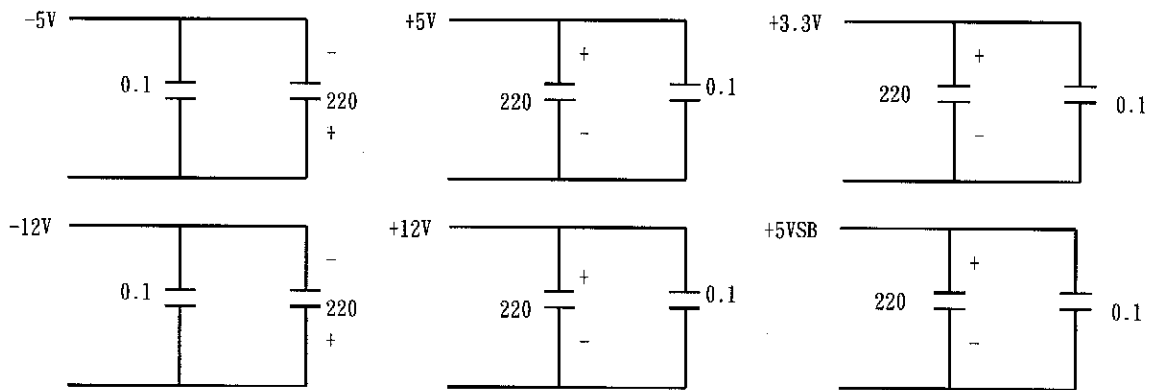
| Output DC voltage | Line regulation |
|-------------------|-----------------|
| +5V | ±50mV |
| -5V | ±50mV |
| +12V | ±50mV |
| -12V | ±50mV |
| +3.3V | ±50mV |
| +5Vsb | ±50mV |

3.3 Ripple and noise

3.3.1 Specification

| | |
|-------|-------------|
| +5V | 70mV (P-P) |
| +12V | 120mV (P-P) |
| -5V | 120mV (P-P) |
| -12V | 120mV (P-P) |
| +3.3V | 70mV (P-P) |
| +5Vsb | 70mV (P-P) |

3.3.2 Ripple voltage test circuit



0.1uF is ceramic the other is tantalum.

3.4 Overshoot

Any overshoot at turn on or turn off shall be less 15% of the nominal voltage value, all output shall be within the regulation limit of section 3.2 before issuing the power good signal of section 6.0.

3.5 Efficiency

Power supply efficiency typical 71% at -48V, full load.

3.6 Remote on/off control

The power supply DC outputs (with the exception of +5Vsb) shall be enabled with an active-low, TTL-compatible signal ("ps-on")

When ps-on is pulled to TTL low, the DC outputs are to be enabled.

When ps-on is pulled to TTL high or open circuited, the DC outputs are to be disabled.

The DC output enable circuit shall be SELV compliant.

4.0 Protection

4.1 Input (primary)

The input power line must have an over power protection device in accordance with safety requirement of section 8.0

4.2 Output (secondary)

4.2.1 Over power protection

The power supply shall provide over power protection on the power supply latches all DC output into a shutdown state. Over power of this type shall cause no damage to power supply, after over load is removed and a power on/off cycle is initiated, the power supply will restart.

Trip point total power min. 110%, max. 160%(one unit power supply)

4.2.2 Over voltage protection

If an over voltage fault occurs (internal of the power supply), the power supply will latch all DC output into a shutdown state.

+5V : 5.7V ~ 6.5V

+3.3V : 3.9V ~ 4.7V

+12V : 13.3V ~ 14.3V

4.2.3 Over current protection

The power supply shall latch off if the +5v, +12v & +3.3v output currents are over it's limitation. The limited current is over 110~180% for each output current at each power module. The power module will back to normal condition after over current removed and a power on/off cycle is initiated the power module will restart.

4.2.4 Short circuit

A short circuit placed on +5V, +3.3V, +12V output to DC return shall cause no damage and power supply latch. -5V, -12V short circuit to DC return shall cause no damage.

5.0 Power supply sequencing

5.1 Power on (see fig.1)

5.2 Hold up time

When power shutdown DC output 5V must be maintain 1.6msec in regulation limit at normal input voltage.

5.3 Power off sequence (see fig. 1)

6.0 Signal requirements

6.1 Power good signal (see fig. 1)

The power supply shall provide a "power good" signal to reset system logic, indicate proper operation of the power supply, and give advance warning of impending loss of regulation at turn off. This signal shall be a TTL compatible up level (2.4V to 5.25V) when +5V output voltage are present and above the minimum UV sense levels specified in paragraph 6.2, or a down level (0.0V to 0.8V) when any output is below its minimum UV sense level.

At power on, the power good signal shall have a turn on delay of at least 100ms but not greater than 500ms after the output voltages have reached their respective minimum sense levels.

6.2 Under voltage (UV) sense levels

| Output | Minimum sense voltage |
|--------|-----------------------|
| +5V | +4.50V |
| +3.3V | +2.50V |

7.0 Environment

7.1 Temperature

| | |
|---|------------------------------------|
| Operating temperature | 0 to 40 degrees centigrade |
| Storage temperature | -20 to 80 degrees centigrade |
| Safety regulation temperature | Applied at room temperature (25°C) |
| Operating temperature from 0°C should start from DC 48V | |

7.2 Humidity

| | |
|------------------------|------------|
| Operating humidity | 20% to 80% |
| Non-operating humidity | 10% to 90% |

7.3 Insulation resistance

| | |
|----------------------|----------------------------|
| Primary to secondary | : 20 meg. ohm min. 500 VDC |
| Primary to Frame Gnd | : 20 meg. ohm min. 500 VDC |

7.4 Dielectric withstanding voltage

| | |
|------------------------|-------------------|
| For approval purpose : | |
| Primary to secondary | :1.5KVAC for 1sec |
| Primary to FG | :1.5KVAC for 1sec |

8.0 Safety

8.1 Underwriters laboratory (UL) recognition.

The power supply designed to meet UL 60950.

8.2 Canadian standards association (CUL) approval

The power supply designed to meet CSA 1402C & CSA 950.

8.3 TUV approval

The power supply shall be designed to meet TUV EN-60950.

9.0 Reliability

9.1 Burn in

All products shipped to customer must be burn in. The burn in shall be performed at high line voltage.

10.0 Mechanical requirements

10.1 Physical dimension : 426 mm * 42 mm * 340 mm

11.0 Warning method

11.1 Audio alarm (buzzer sound, resetable).

11.2 Power defective signal delivery (TTL, low active).

12.0 Hot Swap Requirements

The power supply shall be hot swappable, all DC outputs remain within the limit per specified in section 3.1 during inserting or extracting a power unit from an operating system. Hot swap must be conducted at sub-system in operating under any static or dynamic conditions, but not exceeding the maximum inrush current per specified in section 2.4, details per following:

12.1 DC power is connecting to each module separately, and is disconnected from power unit before extracting from the subsystem in either standby mode or powered on mode, modules shall be inserted before connecting DC power source.

12.2 For power modules with Input docking at the same time as DC.

Extraction: Input and Output power are disconnected simultaneously in either standby mode or powered on mode when module is extracted from cage. No any damage or arcing to Input or Output contacts shall be occurred. Insertion: Input or Output power are connected simultaneously in either standby mode or powered on mode when modules are inserted into cage. No any damage or arcing to both Input or Output contacts shall be allowed.

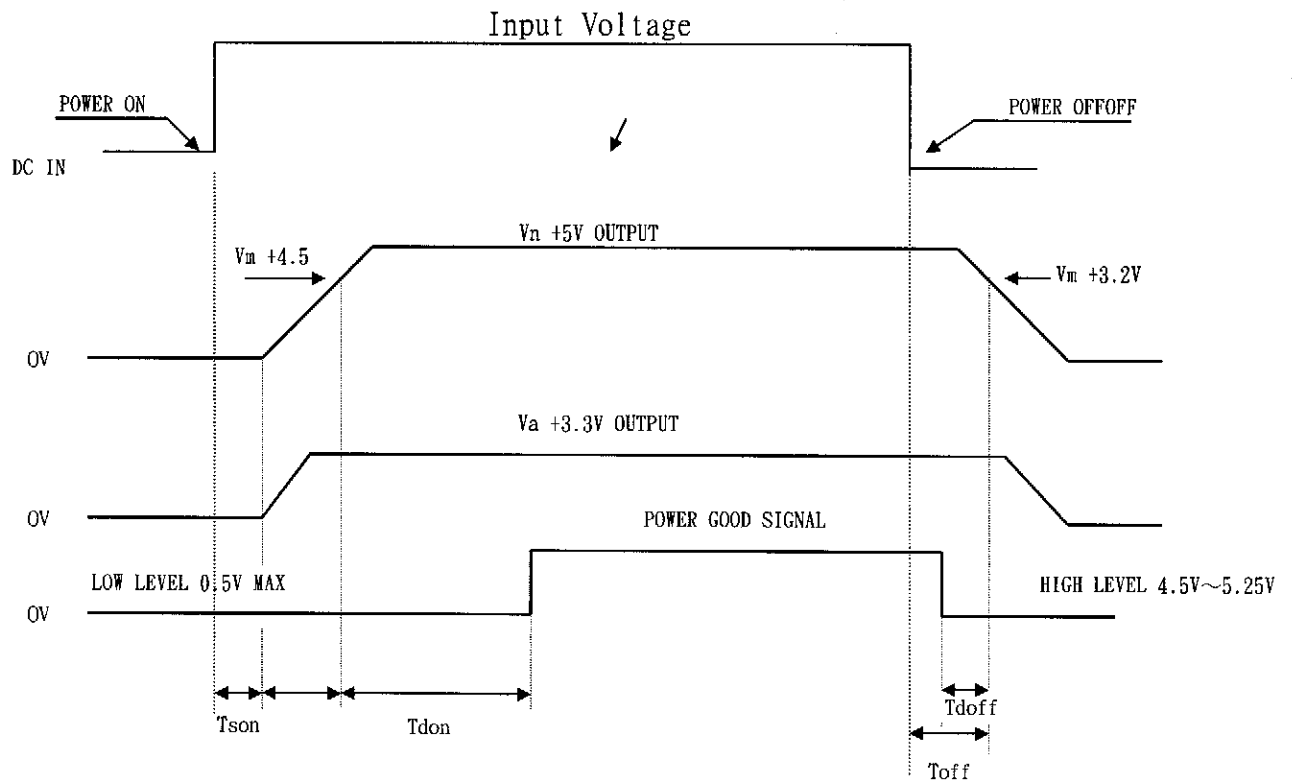
Many to the above are possible, power supplies shall be compatible with different variations depending upon the sub-system constructions. In general, a power supply in failure (off by internal latch or external control) may be replaced by a good one, however hot swap needs to sort with operational as well as failed power supply. The newly inserted unit may be turned on by inserting it into system.

13.0 Current Sharing

Power modules provides individual channel current sense signals on +5V, +3.3V and +12V respectively.

13.1 These signals shall be connected together in module in case of a H+1 Redundant configuration.

13.2 These signal can be connected together or not in case of 1+1 Redundant configuration.



- V_n Nominal voltages +5V
- V_m Minimum voltages +4.5V
- V_a Nominal voltages +3.3V
- V_b +2.0V max
- T_{son} Switch on time (500 ms. max.)
- T_{rs} +5V rise time (100ms. max.)
- T_{don} Delay turn-on (100ms. < T_{don} < 500ms.)
- T_{doff} Delay turn-off (1 ms. min.) (While use remote ON/OFF)
- T_{off} Hold up time (1.6ms. min.) (While V_{in} is -48VDC)

《Figure 1》

15.0 Derating characteristics

Output Power Derating Characteristics

+5V output current and ambient temp curves (Power module)

