General Specification PSM204-120(DC)

Revision Control			Eng	Check	Safety	APP
LTR	Number	Description	Date	Date	Date	Date
A	1	Check and Issue	10/18/05 TT	10/18/05 PH	10/18/05 RF	10/18/05 RF
	2	Update pin 13 description and OVP conditions	11/10/05 TT	11/10/05 PH	11/10/05 RF	11/10/05 RF
	3	Wire color on output harness (pin 5), changed to red	11/11/05 TT	11/11/05 PH	11/11/05 RF	11/11/05 RF
	4	Change section 3.1 to Detail fan cfm of system.	12/12/05 TT	12/12/05 PH	12/12/05 RF	12/12/05 RF
	5	Change section 3.1 to Detail fan cfm of system.	12/15/05 TT	12/15/05 PH	12/15/05 RF	12/15/05 RF
	6	Add Glue drawing to Appendix	06/14/06 TT	06/14/06 PH	06/14/06 RF	06/14/06 RF

Eng Date	Check Date	Safety Date	App Date
TT 06/14/06	PH 06/14/06	RF 06/14/06	RF 06/14/06

PHIHONG TECHNOLOGY CO., LTD.
SWITCHING POWER SUPPLY
SPECIFICATION

MODEL: PSM204-120(DC)
DWG NO: PES11913

1. DC Input Specification:

1.1 DC input voltage rating: -48VDC with reverse voltage protection.
Reverse voltage protection will not cause damage to the PSU.

1.2 DC input voltage range: -40.5VDC to -72VDC
The unit shall be fully operational over a supply voltage range of -40.5VDC to -72 VDC. Unit shall not be damaged by supply voltages in the range of 0 VDC to -75VDC.

Note: The input Voltage must exceed the Under Voltage Recovery threshold of -43.5V before turning on. Once operational, the input voltage can be reduced to -40.5V before the UVLO operates.

1.3 DC input current: 7ADC (-40.5VDC) max, AT MAX LOAD
6ADC (-48VDC) max, AT MAX LOAD
5ADC (-57.5VDC) max, AT MAX LOAD

1.4 DC input frequency: N/A

1.5 MAX. Inrush current: 288A (As per ETSI EN 300 132-2 V2.1.2 (2003-09))

1.6 DC Input fuse value: 10A (time delayed, high breaking)
Fuse must be placed in the -48VDC line.

1.7 Efficiency: >= 75 % efficient at max load

1.8 Start-up time: 2 Seconds
(1) Start-up time will be less than two seconds at full load and full system capacitance, 500uf.
(2) Start-up time is measured as the delay between input voltage being applied and when the output arrives within 10% of its operating value.
(3) Start-up time is measured using an input voltage of -48 VDC.

1.9 Power factor correction: N/A.

1.10 Leakage current: N/A.

2. DC Output:

2.1 Output Voltage: +12 VDC

2.2 Initial Accuracy: +/- 1%

Note: Initial accuracy is how well the supply can be set to its nominal value during the manufacturing process. This setting should be made with a load current of 14.0A on the output and with input -48VDC.

2.3 Min. load current: 1.0 A

2.4 Max load current: 17 A (there is no peak requirement that exceeds the max. value)

2.4.1 Thermal drift will be less than 1mv/ °C with output current @ 17A

2.5 Line regulation: +/- 1 %

2.5.1 Line regulation shall be valid for all voltages from -40.5VDC to -72VDC.

2.6 Load regulation: +/-5 %

2.7 Noise and Ripple: 200mV, peak to peak

Note: The output is decoupled with 500uf bulk electrolytic and 0.1uF ceramic capacitor. Measurement is made with a high impedance probe connected across the decoupling capacitance and 20MHZ bandwidth.

3. Overall performance:

3.1 Total output power: 204W max., with a minimum of 36CFM per fan airflow in the system.

3.2 Hold up time: >1ms at full load and -48VDC.

(1) Hold-up time is measured from when the input is shut off to the drop of the 12V output below 10.8V with full load and with no external output capacitance.

4. Features:

4.1 Short circuit protection: No fire hazard, shock hazard, or damage to the power supply.

Note: The power supply must continue to function when the short circuit is removed.

The power supply must not be damaged by a short circuit applied to the output, it includes starting the power supply up into a short circuit or shorting the output after the supply is operational.

The Power supply shall have a constant current (straight line) current limit characteristic.

4.2 Over voltage protection: 13.2V Maximum with full system capacitance, 500uf under full load conditions.

4.3 A Power good signal is required with an open collector output capable of sinking 5mA

Note: (1) The high voltage will be determined by the customers system.

(2) The maximum low voltage is 0.5V.

(3) The power good signal must go low within 2.5 seconds of the application of power to the system.

(4) The power good signal must have less than 1nF of capacitance on it.

4.4 No load operation: The power supply shall be able to turn on and off under no load condition. The on and off waveform shall be monotonic, but will not be held to over/ undershoot parameters and not violate the max. conditions in this spec.

4.5 UVLO - Under Voltage Lockout

The PSU will turn off if the input voltage shall drop below -37.5 thru -39.5 for greater than 100ms. When the input voltage returns to -43.5 +/-0.5VDC the PSU will restart.

Note: The input Voltage must exceed the Under Voltage Recovery threshold of -43.5V before turning on. Once operational, the input voltage can be reduced to -40.5V before the UVLO operates.

4.6 PSU Shutdown signal:

A high on this input pin will cause the PSU to latch off and remain off until input power is recycled.

5. Overshoot & undershoot: 10 %

5.1 Overshoot / Undershoot on turn on or restart must be met under all loading conditions, with 500uf on the 12V. Overshoot/Undershoot must settle to final value within one second of application of power.

6. DC Output Dynamic Response:

	Minimum	Maximum	Transient Voltage
Case 1	0A	2 A	+/- 10%
Case 2	2 A	17 A	+/- 10%

Note: The dynamic response of the power supply will be measured including the 500uf bulk electrolytic decoupling.

6.1 Current transients have an edge rate of 1A/us. They are generated by an electronic load.

6.2 The power supply output shall not oscillate when these transient are applied.

6.3 Settling time to 1% of final value is 5ms.

7.0 Current Sharing

Oring diodes are in the PSU. At 100% load, sharing will be with 10% of each other. At 50% loading sharing will be with be within 15% of each other. A single wire connection between PSU's between CS pins is required.

Calculation is as follows: (Iout1 (higher) /Iout2 (lower)-1)*100

8. Environmental Specification

8.1 Operating temperatures

8.1.1 The operating temperature of the power supply will be between 0°C and 50°C for up to 204W output. Above 50°C the power rating will derate linearly till a maximum of 120W at 65°C.

8.1.2 A minimum airflow of 36 CFM fan will be available to the supply from the input to output.

8.1.3 The power supply is not required to have an over temperature shutdown circuit.

8.1.4 Nominal ambient temperature for the power supply (internal to the system) will be 50°C.

8.1.5 External system nominal ambient temperature will be 40°C at 204W, 55°C at 120W.

8.1.6 Thermal stabilization for the power supply will be 1 hour or less.

8.1.7 Storage temperature of the supply will be -40°C to +85°C.

8.1.8 The operating relative humidity of the supply will be 10% to 90%.

8.1.9 The storage relative humidity of the supply will be 10% to 95% .

8.1.10 The supply will operate at altitudes from sea level up to 3 km (10,000feet),maximum.

8.1.11The supply can be stored at altitudes up to 12.2km (40,000feet), maximum.

8.1.12 Altitude operating temperature derating coefficient will be 1.8°C/km elevation.

9. Shock and Vibration

9.1 The PSU when mounted in the system needs to comply for the following system level tests as per GR63. Phihong will help support the customer in passing these tests.

Section 4.1 Temperature, Humidity & Altitude

Section 4.2 Fire Resistance

Section 4.4.3 Office Vibration

Section 4.4.4 Transport Vibration

10 Agency Approvals

10.1 EMI:

10.1.1 Conduction: FCC Part 15, subpart J, Class A.
EN55022 (CISPR22), Class A
GR1089 July 2005 Class A

10.1.2 Radiation: Support system in passing FCC/CISPR22 Class A for overall system EMI rating.

10.2 Immunity

10.2.1 Line Transient

<REQ. 1.2-80 >
<SUMMARY: Over and under-voltage transients>
The DC/DC converter(s) of each service group of the NE shall sustain no damage in the presence of over-voltage and under-voltage transients with the following characteristics:

Transient	Duration	Rise Time/Fall Time
200 Volts	5 micro-second	
100 Volts	10 microsecond.	
75 Volts	10 milli-second.	10 volts per milli-second. (Rise) 10 volts per milli-second. (Fall)
0.0 Volts	5 milli-second.	50 volts per milli-second. (Fall) 12.5 volts per milli-second. (Rise)

The service group shall continue operation during and after the transient described above without interruption of service or functionality.

10.3 Dielectric Withstand (HIPOT) Test

10.3.1 Input to earth ground - 2200VDC for 1 minute, less than 10mA leakage current

10.4 Safety Standards and Approvals

10.4.1 UL60950 + CB report

10.4.2 CSA22.2 No. 950, Level 3 - C-UL is acceptable in place of CSA

10.4.3 TUV EN 60950-1

10.4.4 CE mark (LVD)

10.4.5 Pollution degree 2, material group IIIb, 75V creepage required and 1.3mm gap required.

10.5 Reliability

10.6 MTBF: >100K hrs per MIL-HDBK-217F at max. load and -48VDC, 25℃ ambient temperature.

11. Mechanical

11.1 Dimensions: 7.0 inch (197.8mm) L, 4.0 inch (101.6mm) W, 1.334 inch (33.88mm) H
See appendix for more details

11.2 DC CONNECTOR: (1) Molex 09-75-2054 or equivalent
Pinout (from left to right, looking at the connector from the plug in side) 0V- pin 1, Earth Ground - pin 3, -48V - pin 5

11.3 DC Harness:

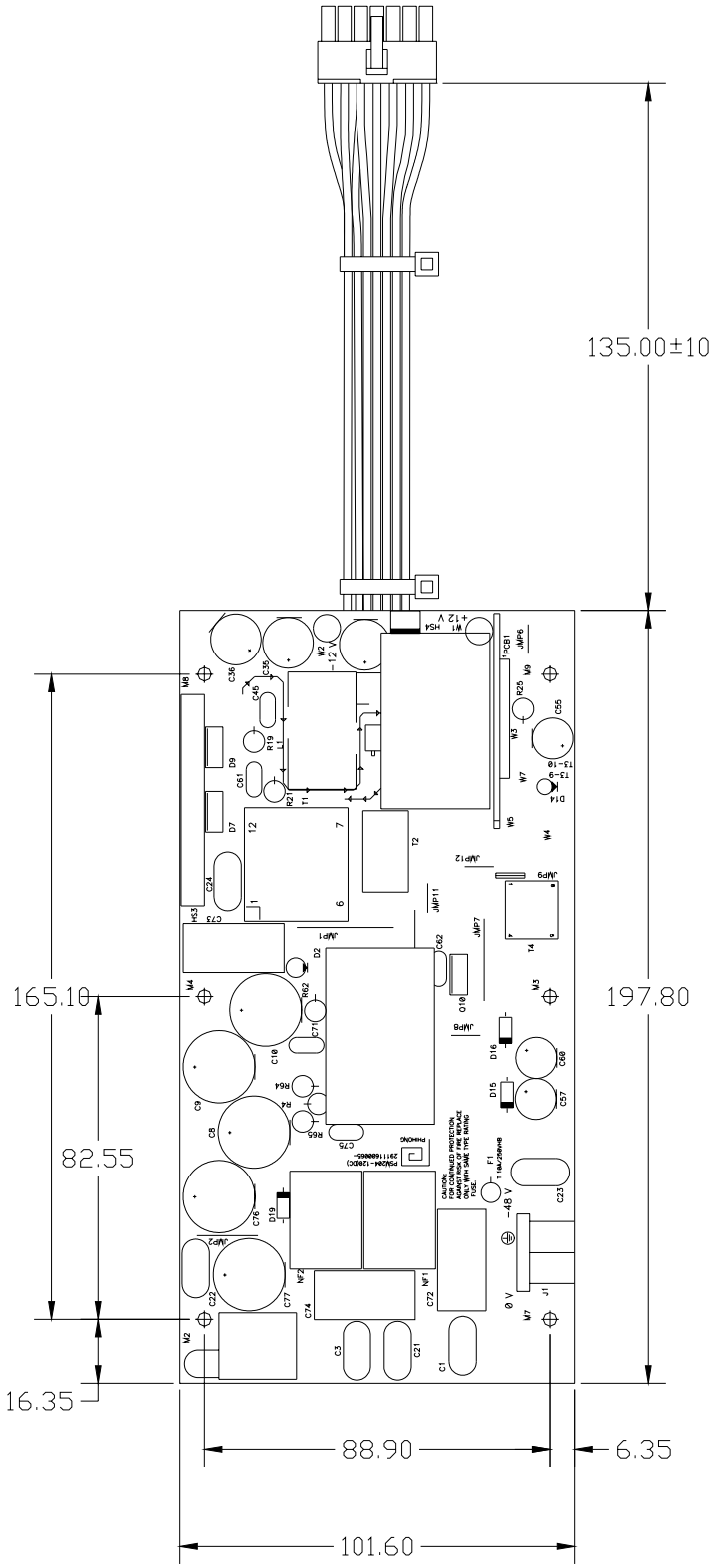
11.3.1 The following pinout will be used on the DC harness:

PIN NUMBER	Designation	Color / wire gauge
1	+12V	WHITE / AWG 18
2	+12V	WHITE / AWG 18
3	GND	BLACK / AWG 18
4	GND	BLACK / AWG 18
5	Current Share	RED / AWG 18
6	Pwr_good	ORANGE / AWG 18
7	DC PSU- grounded	BROWN / AWG 18

	through 100 ohm SMT 0.25w resistor	
8	+12V	WHITE / AWG 18
9	+12V	WHITE / AWG 18
10	GND	BLACK / AWG 18
11	GND	BLACK / AWG 18
12	PSU Shutdown	GREY / AWG 18
13	Optional PSU fan sense	BLUE / AWG 18
14	Reserved	

11.3.2 The dc output connector will be Molex 39-01-2145 or equivalent.

Appendix



Glue Drawing