

SPECIFICATION

產品規格書

產品名稱 / Model Name : R2A-500D1V2

版本 / Revision : 1.1

產品描述 / Description : 500W+500W Redundant Power Supply.

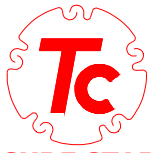
修改紀錄 / Revision History

| 版本 Rev. | 日期 Date | 版本描述 Revision Description | 修改者 Modify By | 客戶認可 Cust. Approval | 認可日期 App. Date |
|------------|-----------------|---|------------------|------------------------|-------------------|
| 1.0 | AUG.08 2011 | 背板 DC-DC 線路調整 Modified the circuit for DC-DC backplane | Kevin Chen | | AUG.10, 2011 |
| 1.1 | Jan. 09 2012 | Modified the 6.3 value. | Jacky Jan | | Jan. 09, 2012 |
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| 提交 / Prepared BY | 檢查 / Checked BY | 批准 / Approved BY |
| | KEVIN | JACKY |

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1. 概述 General Description

This specification describes the performance characteristics of a 500 watts hot swappable, 1+1 power system with +3.3V,+5V,+12V, -12V main DC outputs, and 5V standby outputs. The system is configured to hold two identical 500W power supply modules, **SURE STAR** Model R2A-500D1V2.

2. 輸入規格 Input Characteristics

2.1. 交流輸入電壓和頻率範圍 AC Input voltage and frequency

| 最小值 Minimum | 正常值 Nominal | 最大值 Maximum | 單位 Unit |
|----------------|----------------|----------------|------------|
| 90 | 100~240 | 264 | 伏特 VAC |
| 47 | 50~60 | 63 | 赫茲 Hz |

2.2. 輸入電流與浪湧電流 Input current and inrush current

| 交流輸入電壓 AC Input Voltage | 最大輸入電流 MAX. Input Current per power supply module | 浪湧電流 Inrush Current per power supply module |
|----------------------------|---|---|
| 115Vac | 10A | 25A |
| 230Vac | 5A | 50A |

2.3. 功率因數 Power Factor

| 90Vac | 115Vac | 230Vac | 264Vac |
|-------|--------|--------|--------|
| >0.99 | >0.98 | >0.95 | >0.92 |

3. 效率 Power Efficiency

在滿載狀態，115 伏特 60 赫茲輸入下，電源效率為 80%(Min)。

The Minimum efficiency of the power supply is 80% at full load and 115Vac/60HZ input.

4. 輸出規格 Output Characteristics

4.1. 輸出電壓電流調整率 Output Voltage & Current Regulation

| 輸出電壓 Output Voltage | 最小電流 Min. Current | 額定電流 Rated current | 調整率 REGULATION |
|------------------------|----------------------|-----------------------|-------------------|
| +3.3V | 1A | 25A | ±5% |
| +5V | 1A | 25A | ±5% |
| +12V | 1A | 40A | ±5% |
| -12V | 0A | 1A | ±5% |
| +5VSB | 0.5A | 3.5A | ±5% |

Note: 5V 和 3.3V 相加總不可超過 170 瓦.

The combined total power from 5V & 3.3V shall not exceed 170W.

4.2. 輸出紋波和噪音 DC Output Ripple & Noise

| Output Voltage | Ripple & Noise (Max.) |
|----------------|-----------------------|
| +3.3V | 60mVp-p |
| +5V | 60mVp-p |
| +12V | 120mVp-p |
| -12V | 120mVp-p |
| +5VSB | 50mVp-p |

Note:

- 紋波和噪音頻寬設置在 20 兆赫茲。
Ripple & Noise bandwidth is set to 20MHz。
- 輸出端並聯一個 0.1 uF 陶瓷電容和一個 10 uF 電解電容，測試紋波和噪音。
Use a 0.1uF ceramic capacitor in parallel with a 10uF electrolytic capacitor at output connector terminals for ripple & noise measurements。

4.3. 輸出保持時間 Hold Up Time

| Output Voltage | 115VAC Input | 230VAC Input |
|----------------|--------------|--------------|
| +3.3V | > 16ms | > 16ms |
| +5V | > 16ms | > 16ms |
| +12V | > 16ms | > 16ms |
| -12V | > 16ms | > 16ms |
| +5VSB | > 16ms | > 16ms |

Note: 所有輸出在滿載狀態 All of dc output at full load.。

4.4. 上升時間 Rise Time

| Output Voltage | 115/230Vac Input & Full Load |
|----------------|------------------------------|
| +3.3V | 20ms (max.) |
| +5V | 20ms (max.) |
| +12V | 20ms (max.) |
| -12V | 20ms (max.) |
| +5VSB | 20ms (max.) |

Note: 上升時間為輸出電壓從10%上升至90%的時間。

The rise time measured is when the output voltages rise from 10% to 90% of specified output voltage V_{out} observed on the channel waveform.

4.5. 動態響應時間 Dynamic load response time

The following shall apply to the 3.3 V, 5 V, and 12 V outputs:

Output voltage for each output shall recover to within 5 % of its steady state level in less than 1 ms under the following conditions:

| AC Input Voltage: 90VAC ~ 264VAC | | | |
|---|-------------------------|----------------|-----------------|
| Repetition rate of 100Hz with 50 % duty cycle | | | |
| Output | Step Load Size | Load Slew Rate | Capacitive Load |
| +3.3V | 30% to 100% to 30% load | 0.5 A/u sec | 6000uF |
| +5V | 30% to 100% to 30% load | 0.5 A/u sec | 6000uF |
| +12V | 60% to 100% to 60% load | 1 A/u sec | 6000uf |
| +5SB | 0% to 100% to 0% load | 0.5 A/u sec | 350uF |

4.6. 遠端開關控制 Remote on/off control

The main outputs of this power supply (3.3V, 5V, 12V, -12V) shall be energized when input signal *PSON is active. *PSON is an active low TTL compatible signal referenced to the +5V standby common. This input signal shall be an open collector signal capable of sinking a minimum of 1.6mA. When *PSON becomes inactive, the main outputs shall be disabled.

| | PSU on | PSU off |
|-------------|----------------|-------------|
| PSON Signal | LOW (0.8V max) | HI (2V max) |

5. 電源良好信號 Power good signal

The system shall have an active high TTL compatible signal capable of sinking 1mA and sourcing 100uA. The signal shall become active within 100 to 500 ms from the instant +5V output reaches a steady state level within the specified regulation limits. It shall become inactive at least 1 ms before +5V drops to below the lower regulation limit.

| | |
|-------------------------------------|---------------|
| Power good @ 115/230VAC , Full Load | 200ms ~ 500ms |
| Power Fail @ 115/230VAC , Full Load | 1ms (Min.) |

6. 保護 Protection

6.1. 過壓保護 Over voltage protection

| Output | Min | Max | Comments |
|--------|-------|-------|--------------|
| +3.3V | 3.75V | 4.3V | PSU shutdown |
| +5V | 5.7V | 6.9V | PSU shutdown |
| +12V | 13V | 14.3V | PSU shutdown |

Note：應該在最大交流輸入電壓230伏和輕載、空載下測試。

The power supply shall be test at max AC voltage (230Vac) and min load or no load.

6.2. 低壓保護 Under-voltage protection

| Output | Min | Max | Comments |
|--------|------|------|--------------|
| +3.3V | 2.0V | 2.4V | PSU shutdown |
| +5V | 3.3V | 3.7V | PSU shutdown |
| +12V | 8.5V | 9.5V | PSU shutdown |

Note：應該在最大交流輸入電壓230伏和輕載、空載下測試。

The power supply shall be test at max AC voltage (230Vac) and min load or no load.

6.3. 過流保護 Over current protection

| Output | Over Current(Type) | Over Current(Max.) | Comments |
|--------|--------------------|--------------------|--------------|
| +3.3V | $\geq 27.5A$ | 37.5A | PSU shutdown |
| +5V | $\geq 27.5A$ | 37.5A | PSU shutdown |
| +12V | $\geq 44A$ | 60A | PSU shutdown |

Note：過流保護測試是在其他額定負載時測試。

The over current protection should be tested at other load rating.

6.4. 短路保護 Short circuit protection

| Output | Comments |
|--------|--------------|
| +3.3V | PSU shutdown |
| +5V | PSU shutdown |
| +12V | PSU shutdown |

Note：短路保護測試是在其他額定負載時測試。

The Short circuit protection should be tested at other load rating.

6.5. 過熱保護 Thermal Protection

當外殼溫度超過86°C（±5°C），電源將進入過熱保護狀態。當溫度恢復正常，而且電源重新啓動之後，可以恢復操作。

The power supply shall go into thermal protection as the case temperature exceeds 86°C（±5°C）limit. The output shall recover only when the temperature becomes normal and AC power is turned on again.

7. 電源信號狀態 Power System Signal status

7.1. 蜂鳴器狀態 Buzzer status

| Power Supply Condition | Buzzer status |
|-----------------------------------|---------------|
| No AC power to all PSU | OFF |
| AC present/Only Standby Output On | OFF |
| Power supply DC outputs ON and OK | OFF |
| Power supply failure | Beeping |

7.2. 燈號指示 LED indicators

| Power Supply Condition | Power system status | | Per Power Module status |
|-----------------------------------|---------------------|----------|-------------------------|
| | RED | GREEN | ORANGE |
| No AC power to all PSU | OFF | OFF | OFF |
| AC present/Only Standby Output On | ON | OFF | OFF |
| Power supply DC outputs ON and OK | OFF | ON | ON |
| Power supply failure | OFF | Blinking | OFF |

7.3. TTL 信號 TTL signal

| POWER SUPPLY CONDITION | OUTPUT CONDITION | |
|---------------------------|------------------|-------|
| | Min. | Max. |
| NORMAL(POWER SUPPLY ON) | 3V | 5.25V |
| FAILURE(POWER SUPPLY OFF) | 0V | 1V |

8. 負載均流 Load sharing

| 輸出電壓 Output Voltage | 負載電流 Load Current | 負載均流電壓 Load Share Voltage |
|------------------------|----------------------|------------------------------|
| +12V | 1A | +0.48V ~ +0.52V |
| +5V | 1A | +0.33V ~ +0.37V |
| +3.3V | 1A | +0.33V ~ +0.37V |

9. 絕緣性能 Isolation

9.1. 絕緣電阻 Insulation Resistance

| | |
|-----------------|--|
| Input To Output | 500Vdc , 50M ohms Min.(at room Temperature) |
| Input To FG | 500Vdc , 50M ohms Min.(at room Temperature) |
| Output To FG | Non Insulation |

9.2. 耐壓絕緣 Dielectric Withstand Voltage

| | |
|-----------------|-------------------------------|
| Input To Output | 1834Vac (30 mA) for 1 Minute. |
| Input To FG | 1834Vac (30 mA) for 1 Minute. |
| Output To FG | Non Insulation |

9.3. 漏電電流 Leakage current

在120-264 伏特/50-60 赫茲情況下，最大漏電流為3.5mA。
3.5mA max. at 120~264Vac/50~60HZ.

10. 安全要求 Safety Requirements

- IEC 60950-1
- TUV EN 60950-1
- UL or cUL
- BSMI
- CCC

11. 電磁相容 EMC

電源電磁干擾滿足以下標準

The power supply shall comply with the following criterion:

1) Conduction Emission: (傳導干擾度)

A.EN55022:2006/A1:2007 CLASS A; EN55024:1998/A1:2001/A2:20003.

B.CISPR PUB.22 and FCC PART 15 SUBPART B CLASS A.

2) Radiated Emission : (輻射干擾度)

A.EN55022:2006/A1:2007 CLASS A; EN55024:1998/A1:2001/A2:20003.

B.CISPR PUB.22 and FCC PART 15 SUBPART B CLASS A.

12. 環境條件 Environmental

12.1. Temperature

Operating : 0°C to +40°C

Non Operating: -20°C to +70°C

12.2. Humidity

Operating : 5% to 95%, non-condensing

Non Operating: 20% to 90%,non-condensing

12.3. Altitude

Operating: sea level to 7,000 feet

Non-operating: sea level to 40,000 feet

12.4. 振動耐受 Vibration

10-55Hz, 19.6m/s²(2G), 3minutes period, 60minutes each along X, Y and Z axis.

12.5. 衝擊耐受 Shock

49m/s²(5G), 11ms, once each X, Y and Z axis.

12.6. 冷卻方式 Cooling Method

BY BALL BEARING DC FAN.

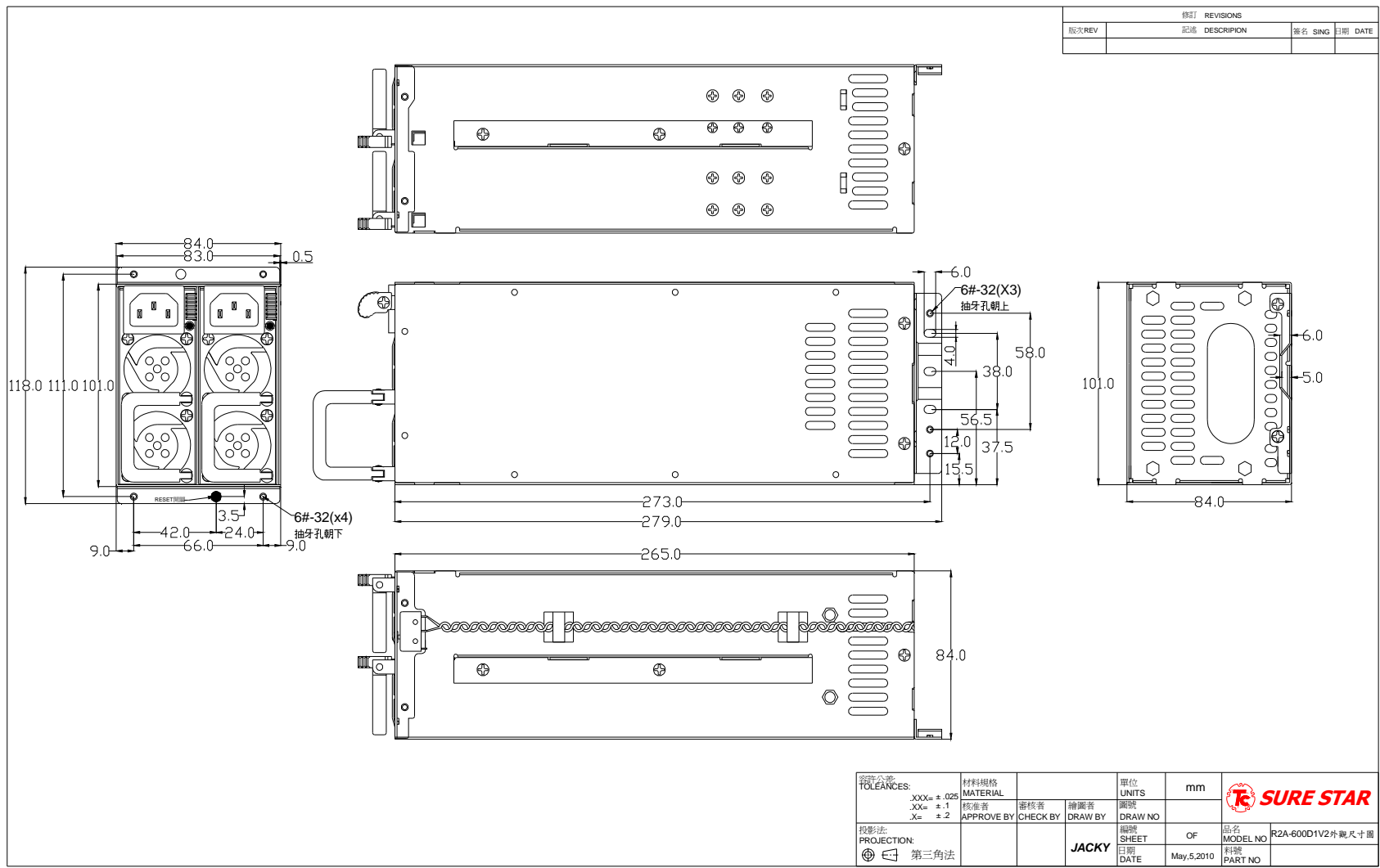
13. 可靠性 Reliability

13.1 平均故障失效時間 MTBF Qualification

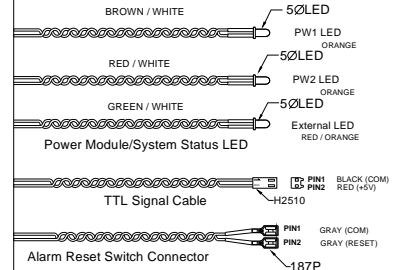
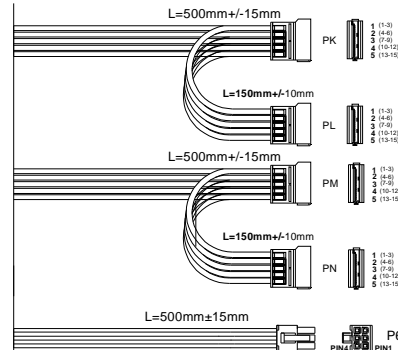
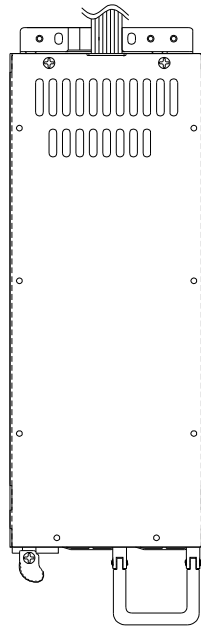
Using MIL - HDBK -217F the calculated MTBF > 100,000 hours at 25°C

14. 機械尺寸和電源連接器 Mechanical 2D Drawing and Power Connector

14.1. Outside Dimension: 265(D)x101(W)x84(H)mm



14.2. DC Output cables



6Pins Connector HOUSING: MOLEX 39-01-0280 or equivalent
TERMINAL: MOLEX 39-00-0060 or equivalent

| Housing | Pin No. | WIRE COLOR | SIGNAL | WIRE TYPE | LENGTH |
|---------|---------|------------|--------|-----------|-------------|
| P6 | 1 | YELLOW | +12V | 18AWG | 500mm ±15mm |
| | 2 | YELLOW | +12V | 18AWG | |
| | 3 | YELLOW | +12V | 18AWG | |
| | 4 | BLACK | COM | 18AWG | |
| | 5 | BLACK | COM | 18AWG | |
| | 6 | BLACK | COM | 18AWG | |

POWER Module/System Status LED

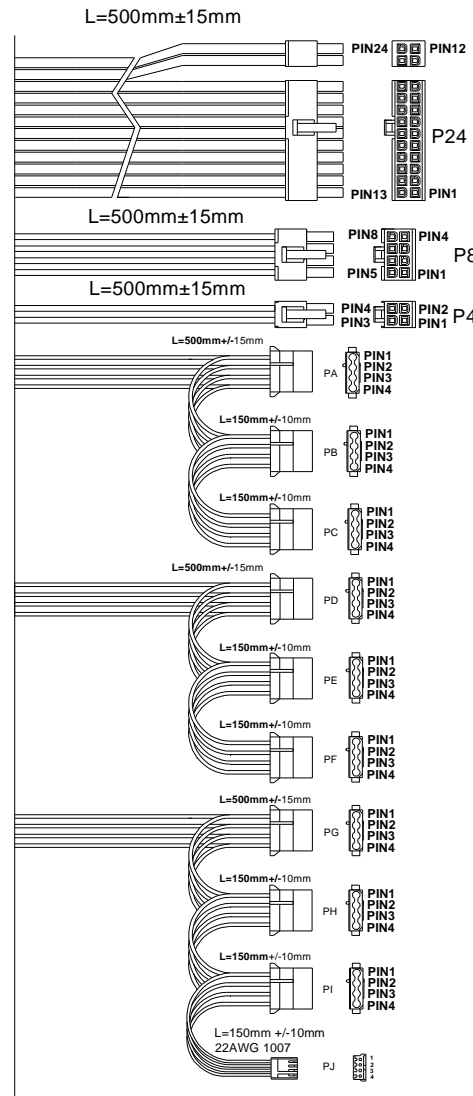
| Name | WIRE COLOR | LED COLOR | WIRE TYPE | LENGTH |
|--------------|---------------|------------|-----------|-------------|
| PW1LED | BROWN / WHITE | ORANGE | 22AWG | 900mm ±20mm |
| PW2LED | RED / WHITE | ORANGE | 22AWG | |
| External LED | GREEN / WHITE | RED/ORANGE | 22AWG | |

TTL Signal
 Connector HOUSING: Molex 22-01-3027 or equivalent

| Pin No. | WIRE COLOR | SIGNAL | WIRE TYPE | LENGTH |
|---------|------------|--------|-----------|-------------|
| 1 | BLACK | COM | 22AWG | 900mm ±20mm |
| 2 | RED | +5V | 22AWG | |

ALARM Reset Switch Connector

| Pin No. | WIRE COLOR | SIGNAL | WIRE TYPE | LENGTH |
|---------|------------|--------|-----------|-------------|
| 1 | GRAY | COM | 22AWG | 900mm ±20mm |
| 2 | GRAY | REST | 22AWG | |



REVISIONS

| REV | DESCRIPTION | SIGN | DATE |
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24Pins(EPS12V)
 Connector HOUSING: MOLEX 39-01-2240 or equivalent
 TERMINAL: MOLEX 39-00-0039 or equivalent

| Housing | Pin No. | WIRE COLOR | LENGTH | Pin No. | WIRE COLOR | LENGTH |
|---------|---------|---------------|-------------|---------|---------------|-------------|
| P24 | 1 | ORANGE(+3.3V) | 500mm±18AWG | 13 | ORANGE(+3.3V) | 500mm±18AWG |
| | 2 | ORANGE(+3.3V) | 500mm±18AWG | 14 | BLUE(+5V) | 500mm±18AWG |
| | 3 | BLACK(GND) | 500mm±18AWG | 15 | BLACK(GND) | 500mm±18AWG |
| | 4 | RED(+5V) | 500mm±18AWG | 16 | GREEN(P5-ON) | 500mm±18AWG |
| | 5 | BLACK(GND) | 500mm±18AWG | 17 | BLACK(GND) | 500mm±18AWG |
| | 6 | RED(+5V) | 500mm±18AWG | 18 | BLACK(GND) | 500mm±18AWG |
| | 7 | BLACK(GND) | 500mm±18AWG | 19 | BLACK(GND) | 500mm±18AWG |
| | 8 | GRAY(PG) | 500mm±20AWG | 20 | NC | |
| | 9 | PURPLE(+5VSB) | 500mm±18AWG | 21 | RED(+5V) | 500mm±18AWG |
| | 10 | YELLOW(+12V) | 500mm±18AWG | 22 | RED(+5V) | 500mm±18AWG |
| | 11 | YELLOW(+12V) | 500mm±18AWG | 23 | RED(+5V) | 500mm±18AWG |
| | 12 | ORANGE(+3.3V) | 500mm±18AWG | 24 | BLACK(GND) | 500mm±18AWG |

8Pins(EPS12V)
 Connector HOUSING: MOLEX 39-01-0280 or equivalent
 TERMINAL: MOLEX 39-00-0060 or equivalent

| Housing | Pin No. | WIRE COLOR | SIGNAL | WIRE TYPE | LENGTH |
|---------|---------|------------|--------|-----------|-------------|
| P8 | 1 | BLACK | COM | 18AWG | 500mm ±15mm |
| | 2 | BLACK | COM | 18AWG | |
| | 3 | BLACK | COM | 18AWG | |
| | 4 | BLACK | COM | 18AWG | |
| | 5 | YELLOW | +12V | 18AWG | |
| | 6 | YELLOW | +12V | 18AWG | |
| | 7 | YELLOW | +12V | 18AWG | |
| | 8 | YELLOW | +12V | 18AWG | |

4Pins(ATX12V FOR P4)
 Connector HOUSING: MOLEX 39-01-0280 or equivalent
 TERMINAL: MOLEX 39-00-0060 or equivalent

| Housing | Pin No. | WIRE COLOR | SIGNAL | WIRE TYPE | LENGTH |
|---------|---------|------------|--------|-----------|-------------|
| P4 | 1 | BLACK | COM | 18AWG | 500mm ±15mm |
| | 2 | BLACK | COM | 18AWG | |
| | 3 | YELLOW | +12V | 18AWG | |
| | 4 | YELLOW | +12V | 18AWG | |

4Pins(HDCD-ROM/RW),P4H1-P4H4
 Connector HOUSING: AMP 68424-4 or equivalent
 TERMINAL:AMP 68419-4 or equivalent
4Pins(FLOPPY DISK) P4F
 Connector HOUSING: AMP 171822-4 or equivalent
 TERMINAL: AMP 170262-2 or equivalent

| Housing | Pin No. | WIRE COLOR | SIGNAL | WIRE TYPE | LENGTH |
|---------|---------|------------|--------|-----------|-------------|
| PA | 1 | YELLOW | +12V | 18AWG | 500mm ±15mm |
| | 2 | BLACK | COM | 18AWG | |
| | 3 | BLACK | COM | 18AWG | |
| | 4 | RED | +5V | 18AWG | |
| PB | 1 | YELLOW | +12V | 18AWG | 150mm ±15mm |
| | 2 | BLACK | COM | 18AWG | |
| PC | 1 | YELLOW | +12V | 18AWG | 150mm ±15mm |
| | 2 | BLACK | COM | 18AWG | |
| PD | 1 | YELLOW | +12V | 18AWG | 150mm ±15mm |
| | 2 | BLACK | COM | 18AWG | |
| PE | 1 | YELLOW | +12V | 18AWG | 150mm ±15mm |
| | 2 | BLACK | COM | 18AWG | |
| PF | 1 | YELLOW | +12V | 18AWG | 150mm ±15mm |
| | 2 | BLACK | COM | 18AWG | |
| PG | 1 | YELLOW | +12V | 22AWG | 150mm ±15mm |
| | 2 | BLACK | COM | 22AWG | |
| PH | 1 | YELLOW | +12V | 22AWG | 150mm ±15mm |
| | 2 | BLACK | COM | 22AWG | |
| PI | 1 | YELLOW | +12V | 22AWG | 150mm ±15mm |
| | 2 | BLACK | COM | 22AWG | |
| PJ | 1 | YELLOW | +12V | 22AWG | 150mm ±15mm |
| | 2 | BLACK | COM | 22AWG | |

SATA HDD
 HOUSING: MOLEX 675820000 or equivalent
 TERMINAL: MOLEX 675810000 or equivalent

| Housing | Pin No. | WIRE COLOR | SIGNAL | WIRE TYPE | LENGTH |
|---------|---------|------------|--------|-----------|-------------|
| PK | 1 | ORANGE | +3V3 | 18AWG | 500mm ±15mm |
| | 2 | BLACK | COM | 18AWG | |
| | 3 | RED | +5V | 18AWG | |
| | 4 | BLACK | COM | 18AWG | |
| | 5 | YELLOW | +12V | 18AWG | |
| PL | 1 | ORANGE | +3V3 | 18AWG | 150mm ±15mm |
| | 2 | BLACK | COM | 18AWG | |
| | 3 | RED | +5V | 18AWG | |
| | 4 | BLACK | COM | 18AWG | |
| | 5 | YELLOW | +12V | 18AWG | |

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| DESIGNER | APPROVE | DATE | REV | MM | |
| DATE | DATE | DATE | DATE | DATE | |
| PRODUCTION | DATE | DATE | DATE | DATE | SS-R2A(09) |