

FEATURES



- Operating ambient temperature range: -5°C to +50°C
- PMBus / I2C communication function
- Over-current / short-circuit /over-voltage protection, fan-fault protection
- ATX multiplexed output
- Safety according to UL/EN/IEC62368, GB4943
- It can be used with module power supply of ≤ 2000W
- 5 years warranty

LMS2000-12B-2H is a CRPS frame power supply for the server, and supports module power hot swap. Its input module is compatible with CRPS server power supplies, and the output module converts the module output voltage into ATX multi-output. The product is safe and reliable, with excellent EMC performance. Its EMC and safety specifications comply with UL/EN/IEC62368 and GB4943 standards, it is widely applied in the server field.

Selection Guide*

| Part No.* | Rated input voltage | Fan Operation Type | Maximum output power *(W) | Output* | Output current*(A) | | Max. Capacitive Load(μF) |
|----------------|---------------------|--------------------------------|---------------------------|---------|--------------------|------|--------------------------|
| | | | | | Min. | Max. | |
| LMS2000-12B-2H | / | Forward airflow, from DC to AC | 2000 | +12V | 1 | 145 | 25000 |
| | | | | +5V | 0.5 | 25 | 5000 |
| | | | | +3.3V | 0.8 | 25 | 5000 |
| | | | | -12V | 0 | 0.5 | 350 |
| | | | | +5VSB | 0 | 3 | 350 |

Note:1.*This product is a redundant frame power supply, which can be combined with our 185mm CRPS server power supply to form a redundant power supply system (can be used with our LMS1300-P12B, LMS1600-P12B, LMS2000-P12B). The physical picture is for reference only;
 2.*The combined output power of +5V and +3.3V shall not exceed 200W. The output power is determined by the module power supply;
 3.*The main output ports are include +12V,+5V,+3.3V and -12V.The Aux output port is +5VSB;
 4.*Pin16 (green PS-ON signal) of the P1 terminal of the output cable is short-circuited GND, and the main channel can have output, otherwise there is no output;
 5.*The maximum output current of the main +12.2V path is determined by the module power supply, with a rated maximum output current of 145A (when used with the AMS2000 module power supply). When paired with the LMS2000-P12B, LMS1600-P12B, and LMS1300-P12B models: ① The rated currents of the main +12.2V path are 145A, 132A, and 107A respectively; ② The total rated output powers are 2000W, 1600W, and 1300W respectively.

Output Specifications

| Item | Operating Conditions | | | | | | | |
|-----------------------------------|----------------------|--------------------|--------|-----------|-----------|-----------|-------|----------|
| | Output | Output voltage (V) | | | Base load | Step Load | A/us) | Cap (uF) |
| Min. | | Typ. | Max. | Tolerance | | | | |
| Steady State Output Voltage Range | +12V | 11.60 | 12.20 | 12.80 | ±5% | | | |
| | +5V | 4.75 | 5.00 | 5.25 | ±5% | | | |
| | +3.3V | 3.14 | 3.30 | 3.47 | ±5% | | | |
| | -12V | -10.08 | -12.00 | -13.20 | ±10% | | | |
| | +5VSB | 4.75 | 5.00 | 5.25 | ±5% | | | |
| Dynamic | Output | Output voltage (V) | | | Base load | Step Load | A/us) | Cap (uF) |
| | | Min. | Typ. | Max. | | | | |
| | +12V | 11.40 | -- | 12.80 | 2A~40% | 60% Load | 0.5 | 2200 |
| | +5V | 4.75 | -- | 5.25 | 3A~70% | 30% Load | 0.25 | 2200 |
| | +3.3V | 3.14 | -- | 3.47 | 3A~70% | 30% Load | 0.25 | 2200 |
| -12V | -10.08 | -- | -13.20 | 0~0.25A | 0.25A | 0.25 | 100 | |
| +5VSB | 4.75 | -- | 5.25 | 0~2A | 1A | 0.25 | 22 | |
| Ripple & Noise* | Output | Max. | | | | | | |
| | +12V | 120mV | | | | | | |
| | +5V | 60mV | | | | | | |
| | +3.3V | 50mV | | | | | | |

| | | | | | |
|--|--------------|--------------------|------|------|---|
| | -12V | | | | 120mV |
| | +5VSB | | | | 50mV |
| Output current | Output | Output current (A) | | | |
| | | Min. | Typ. | Max. | Remark |
| | +12V | 1 | -- | 145 | The output current is determined by the module power supply provided. +5V and +3.3V combined output power \leq 200W. |
| | +5V | 0.5 | -- | 25 | |
| | +3.3V | 0.8 | -- | 25 | |
| | -12V | 0 | -- | 0.5 | |
| +5VSB | 0 | -- | 3 | | |
| Hold-up Time | Main outputs | | | | \geq 12ms |
| Note: 1.*The "Tip and barrel method" is used for ripple and noise test, +3.3Vand+5Voutputs parallel 100uF electrolytic capacitor, coaxial cable in parallel with 10uF electrolytic capacitor and 0.1uF ceramic capacitor, please refer to Server Power Test Specifications for specific information. | | | | | |

Protective Characteristics

| | | | | | |
|---|--------|-----------------------------|------|---|---|
| Protection *(OVP) | Output | Over Voltage Protection (V) | | | Remark |
| | | Min. | Typ. | Max. | |
| | +12V | -- | -- | -- | It is determined by the power supply of the attached module. Main outputs will shut down and latch off, +5VSB output is normal |
| | +5V | 5.74 | -- | 7 | |
| | +3.3V | 3.76 | -- | 4.7 | |
| | -12V | -13.3 | -- | -16.5 | All outputs will shut down, self-recovery |
| +5VSB | 5.74 | -- | 7 | | |
| Protection *(OCP) | Output | Over Current Protection (A) | | | Remark |
| | | Min. | Typ. | Max. | |
| | +12V | -- | -- | -- | It is determined by the power supply of the attached module.Main outputs will shut down and latch off, +5VSB output is normal |
| | +5V | 33 | -- | 55 | |
| | +3.3V | 33 | -- | 45 | |
| +5VSB | 5.5 | -- | 7.5 | All outputs will shut down, self-recovery | |
| Protection *(SCP) | Output | Short Circuit Protection | | | Remark |
| | | Min. | Typ. | Max. | |
| | +12V | | | | Main outputs will shut down and latch off, +5VSB output is normal |
| | +5V | | | | |
| | +3.3V | | | | |
| | -12V | | | | |
| +5VSB | | | | All outputs will shut down, self-recovery | |
| Note: 1.*The OCP, OVP and SCP of +12V are determined by the OCP, OVP and SCP of the module power supply .For details, refer to the module power supply specification. | | | | | |

Buzzer Alarms*

| Module power supply Status | | Module LED Status* | Buzzer* |
|----------------------------|--|---|---------|
| 1+0 or 0+1 | No AC power | OFF | / |
| | PSU standby state AC present / Only +5VSB on (PSON is high or floating) | Blink Green | / |
| | Power supply failure lead to main output off (PSON is low) | Amber or Blink Green | / |
| | Power output normal | Green | / |
| 1+1 | Dual modules parallel, one module power output normal, another failure (PSON is low) . | Failure module: Amber Normal module: Green | Alarm |
| | Dual modules parallel, Power supply failure lead to main output off (PSON is low) . | Amber or Blink Green | / |
| | Dual modules parallel, turn on AC power of only one module to work (PSON is low) (first power on). | Without AC power: Amber With AC power: Green | Alarm |
| | Both modules power output normal. | Green | / |

Note: 1.*The LED Indicator refers to the module power indicator adapted by our company, for reference.
2.*It is normal for the buzzer to ring briefly when main power on or power off.
3.*When the buzzer alarms, you can press the RESET switch to eliminate the alarm sound.

Data Online Reading and Monitoring*

| Output load* | Main Output Accuracy Range | | |
|-----------------|----------------------------|---------|----------|
| | <10% | 10%-30% | 30%-100% |
| Output Voltage* | ±5% | ±3% | ±3% |
| Output Current* | NA | ±10% | ±5% |

Note: 1.*The +12V accuracy is the accuracy of the module power supply +12V output. For details, see the module power supply specification;
2.*-12V output current accuracy is ±0.15A @ >10% load;
3.*The 100% load is the maximum current of each output, such as the current accuracy of +5V is NA at <10% load (<2.5A), and 10% at 10~30% load (2.5A~7.5A);
4.*Before address shift/After address shift : the upper module (near the nameplate) is 58H/B0h, the lower module is 59H/B2h, and the frame power supply is 60H/C0h.

Timing

| Item | Description | Min. | Max. | Unit |
|----------------|--|------|------|------|
| Tvout_rise | Time for Main output (except -12V) to rise from 0 to within regulation limits | 5 | 70 | ms |
| T-12V_rise | Time for -12V to rise from 0 to within regulation limits | -- | 25 | ms |
| T5VSB_rise | Time for +5VSB to rise from 0 to within regulation limits | -- | 25 | ms |
| Tsb_on_delay | Time from AC power on to +5VSB being within regulation limits | -- | 1500 | ms |
| T ac_on_delay | Time from AC power on to Main output being within regulation limits | -- | 2500 | ms |
| Tvout_holdup* | Time from AC power off to +12V output reaching at 10.8V | 11 | -- | ms |
| Tpwok_holdup | Time from AC power off to PWOK signal decreasing | 10 | -- | ms |
| Tpson_on_delay | Time from high to low of PSON# signal to Main output voltages being within regulation limits. | 5 | 470 | ms |
| T pson_pwok | Time from low to high of PSON# signal to PWOK signal becoming low-level | -- | 65 | ms |
| Tpwok_on | Delay from output voltages within regulation limits to PWOK becoming high-level at turn on | 100 | 500 | ms |
| T pwok_off | Time from PWOK signal becoming low-level to +12V output dropping to 10.8V | 1 | -- | ms |
| Tpwok_low | Time from PWOK signal becoming low-level to when the PWOK signal increases through the PSON switch or AC restart | 100 | -- | ms |
| Tsb_vout | Time from +5VSB being in regulation to Main output being in regulation | 50 | 2000 | ms |

Note: 1.*The Tvout holdup specification is determined by the individual module, and specific conditions should be referred to the module specification document.

General Specifications

| Item | | Operating Conditions | Min. | Typ. | Max. | Unit |
|-----------------------|---|--|--------|--------|--------|------|
| Isolation Test | Input - ⊕ | Electric strength test for 1min., leakage current <5mA | 1500 | -- | -- | VAC |
| | Input - Output* | Electric strength test for 1min., leakage current <10mA | 3000 | -- | -- | |
| Insulation Resistance | Input - ⊕ | Ambient temperature: 25 ± 5°C Relative humidity: < 95%RH, no condensation Test voltage: 500VDC | 50 | -- | -- | M Ω |
| | Input - Output | | | | | |
| Operating Temperature | | | -5 | -- | 50 | °C |
| Storage Temperature | | | -40 | -- | 70 | |
| Operating Humidity | | Non-condensing | 5 | -- | 90 | %RH |
| Storage Humidity | | | 5 | -- | 95 | |
| Operating Altitude | | | -- | -- | 5000 | m |
| Storage Altitude | | | -- | -- | 15200 | |
| Hot swap | 1.0.5m/s<=speed<=1m/s, the backplane voltage cannot exceed the dynamic specification during hot-plug process. 2.Add dynamic cap load of at the output. | +12V | 11.40 | 12.20 | 12.80 | V |
| | | +5V | 4.75 | 5.00 | 5.25 | |
| | | +3.3V | 3.14 | 3.30 | 3.47 | |
| | | -12V | -10.08 | -12.00 | -13.20 | |
| | | +5VSB | 4.75 | 5.00 | 5.25 | |

| | | |
|----------------------|--|-------------|
| MTBF | Rated input, 100% efficiency load @ 25°C Evaluated by Telcordia SR-332 | ≥ 250,000 h |
| Communication Method | PMBus / I2C | |
| Warranty | 5 years | |

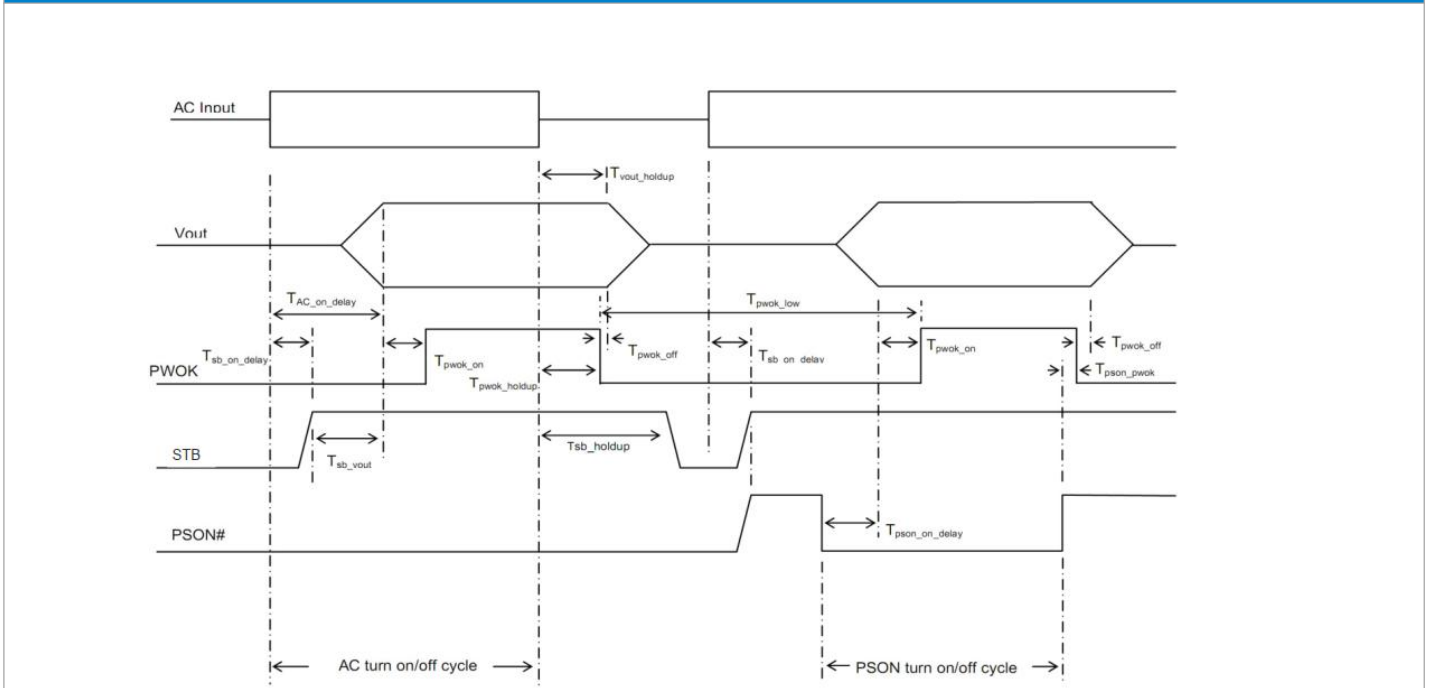
Note: *Input-Output isolation voltage refer to PCBA only.And all the output GND pins of the frame power supply are connected to the metal case.⊕.

Mechanical Specifications*

| | |
|---------------|--|
| Case Material | Metal (SGCC) |
| Dimensions* | 77.00mm x 225.00mm x 84.00mm (W x D x H) |
| Weight* | 1090g(Typ.) |

Note:1.*Product dimensions do not include out wires;
2.*Weight does not include module power supply;
3.*Tips:Module power supply built-in fan, not air.

Timing Diagram



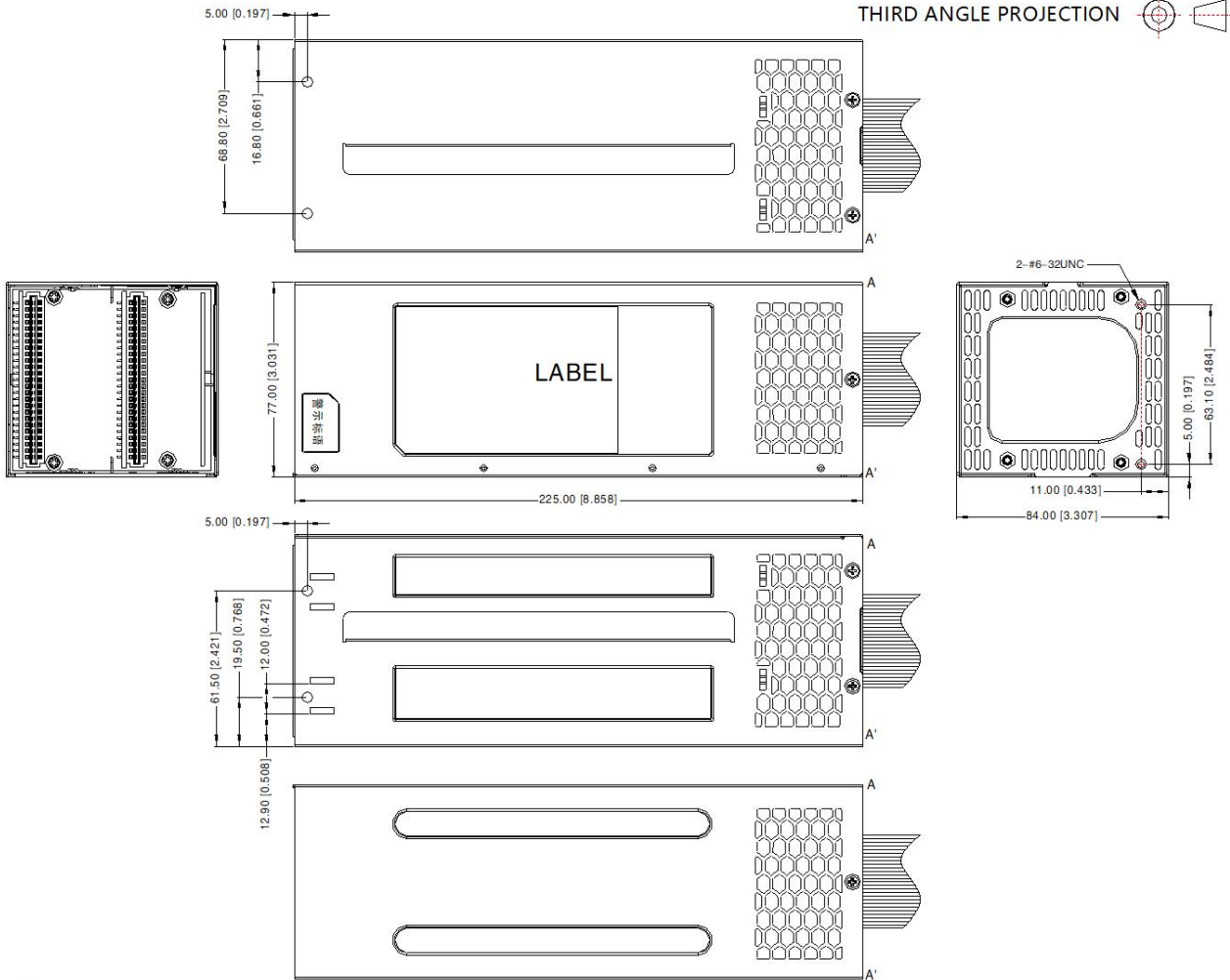
Output Cable Definition

| Cable Terminal | Pin No. | Wire Color | Definition | Cable Terminal | Pin No. | Wire Color | Definition |
|----------------|---------|------------|------------|----------------|---------|------------|------------|
| P1 | 1 | Orange | +3.3V | P1 | 13a&13b | Orange | +3.3V |
| | 2 | Orange | +3.3V | | 14 | Blue | -12V |
| | 3a&3b | Black | GND | | 15 | Black | GND |
| | 4a&4b | Red | +5V | | 16 | Green | PS-ON |
| | 5 | Black | GND | | 17 | Black | GND |
| | 6 | Red | +5V | | 18 | Black | GND |
| | 7 | Black | GND | | 19 | Black | GND |
| | 8 | Gray | PG | | 20 | -- | -- |
| | 9 | Purple | +5VSB | | 21 | Red | +5V |
| | 10a&10b | Yellow | +12V | | 22 | Red | +5V |
| | 11 | Yellow | +12V | | 23 | Red | +5V |
| | 12 | Orange | +3.3V | | 24 | Black | GND |
| P2 | 1 | Black | GND | P3 | 1 | Black | GND |
| | 2 | Black | GND | | 2 | Black | GND |

| | | | | | | | |
|---------|---|--------------|-------|----|----|--------|------|
| | 3 | Black | GND | | 3 | Black | GND |
| | 4 | Black | GND | | 4 | Black | GND |
| | 5 | Yellow/Black | +12V | | 5 | Yellow | +12V |
| | 6 | Yellow/Black | +12V | | 6 | Yellow | +12V |
| | 7 | Yellow/Black | +12V | | 7 | Yellow | +12V |
| | 8 | Yellow/Black | +12V | | 8 | Yellow | +12V |
| P4~P9 | 1 | Orange | +3.3V | -- | -- | -- | -- |
| | 2 | Black | GND | -- | -- | -- | -- |
| | 3 | Red | +5V | -- | -- | -- | -- |
| | 4 | Black | GND | -- | -- | -- | -- |
| | 5 | Yellow | +12V | -- | -- | -- | -- |
| P10~P15 | 1 | Yellow | +12V | -- | -- | -- | -- |
| | 2 | Black | GND | -- | -- | -- | -- |
| | 3 | Black | GND | -- | -- | -- | -- |
| | 4 | Red | +5V | -- | -- | -- | -- |
| P16 | 1 | Green/White | SCL | -- | -- | -- | -- |
| | 2 | Yellow/White | SDA | -- | -- | -- | -- |
| | 3 | Orange/White | Alert | -- | -- | -- | -- |
| | 4 | Black/White | GND | -- | -- | -- | -- |
| | 5 | -- | -- | -- | -- | -- | -- |
| P17 | 1 | Black | GND | -- | -- | -- | -- |
| | 2 | Yellow | Reset | -- | -- | -- | -- |

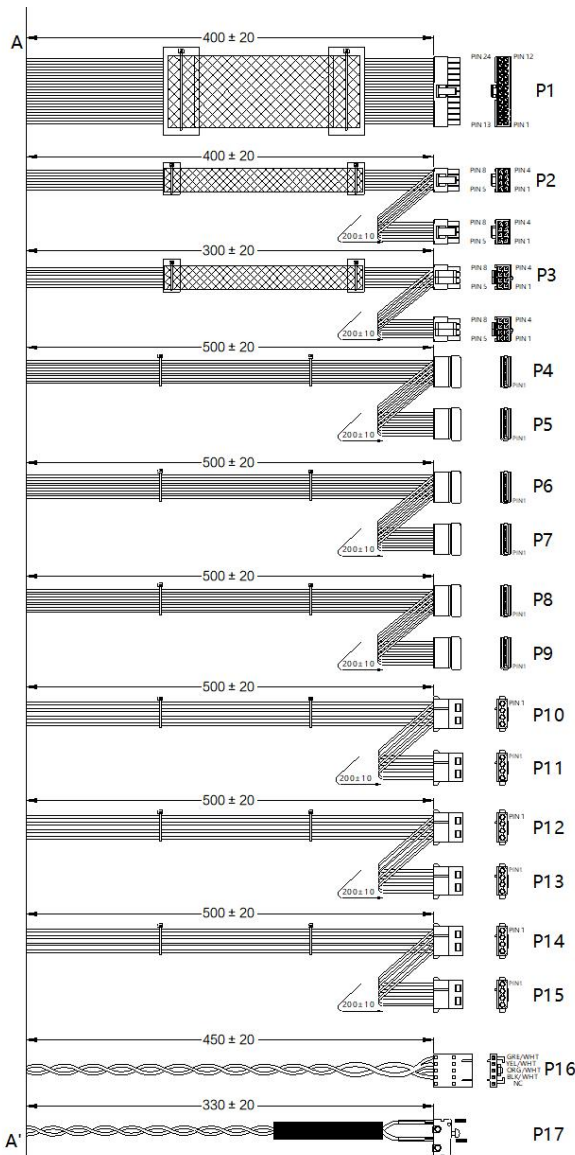
Note: The product is equipped with a built-in cooling fan, Keep the air intake clear of Debris, If the environment cannot meet this requirement, a fanless model is recommended.

Dimensions and Recommended Layout



Note:
Unit: mm[inch]
General tolerances: $\pm 0.50[\pm 0.02]$

Output Cable



Output cable:

| CON | PIN | WIRE COLOR | OUTPUT | WIRE SPECIFICATION | Housing/Terminal |
|-----|-------|------------|--------|-------------------------|--|
| P1 | 1 | ORANGE | +3.3V | UL 1007 18AWG 80°C 300V | Housing: WST P24-142002 Terminal: WST I42002PS-2 OR EQ |
| | 2 | ORANGE | +3.3V | | |
| | 3a | BLACK | GND | | |
| | 3b | BLACK | GND | | |
| | 4a | RED | +5V | | |
| | 4b | RED | +5V | | |
| | 5 | BLACK | GND | | |
| | 6 | RED | +5V | | |
| | 7 | BLACK | GND | | |
| | 8 | GRAY | PG | | |
| | 9 | PURPLE | +5V SB | | |
| | 10a | YELLOW | +12V | | |
| | 10b | YELLOW | +12V | | |
| | 11 | YELLOW | +12V | | |
| | 12 | ORANGE | +3.3V | | |
| | 13a | ORANGE | +3.3V | | |
| | 13b | ORANGE | +3.3V | | |
| | 14 | BLUE | -12V | | |
| | 15 | BLACK | GND | | |
| | 16 | GREEN | PS-ON | | |
| 17 | BLACK | GND | | | |
| 18 | BLACK | GND | | | |
| 19 | BLACK | GND | | | |
| 20 | | | | | |
| P2 | 21 | RED | +5V | UL 1007 18AWG 80°C 300V | Housing: WST P4-142002 Terminal: WST I42002PS-2 OR EQ |
| | 22 | RED | +5V | | |
| | 23 | RED | +5V | | |
| | 24 | BLACK | GND | | |
| | | | | | |
| P3 | 1 | BLACK | GND | UL 1007 18AWG 80°C 300V | Housing: WST P4-142002 K3,K4 Terminal: WST I42002PS-2 OR EQ |
| | 2 | BLACK | GND | | |
| | 3 | BLACK | GND | | |
| | 4 | BLACK | GND | | |
| | 5 | YELLOW | +12V | | |
| P4 | 6 | YELLOW | +12V | UL 1007 18AWG 80°C 300V | Housing: WST P5-112707 Terminal: WST I12707PS-2# WST I12707PS-2#(M) OR EQ |
| | 7 | YELLOW | +12V | | |
| | 8 | YELLOW | +12V | | |
| | 1 | ORANGE | +3.3V | | |
| | 2 | BLACK | GND | | |
| P10 | 3 | RED | +5V | UL 1007 18AWG 80°C 300V | Housing: WST P4-A10202 Terminal: WST I10202PS-2 WST A10202PS-2 OR EQ |
| | 4 | BLACK | GND | | |
| | 5 | YELLOW | +12V | | |
| | 6 | YELLOW | +12V | | |
| P15 | 1 | GRE/WHT | SCL | UL 1007 28AWG 80°C 300V | Housing: WST P5-A125402 Terminal: WST I25402PS-2 OR EQ |
| | 2 | YEL/WHT | SDA | | |
| | 3 | ORG/WHT | Alert | | |
| | 4 | BLK/WHT | GND | | |
| | 5 | NC | NC | | |
| P17 | 1 | BLACK | GND | UL 1007 26AWG 80°C 300V | Button: WST P4-K002 OR EQ |
| | 2 | YELLOW | RESET | | |

Note:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220775;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity <75%RH with nominal input voltage and rated output load;
- The room temperature derating of 1°C/300m is needed for operating altitude greater than 2000m;
- All index testing methods in this datasheet are based on our company corporate standards;
- In order to improve the efficiency at high input voltage, there will be audible noise generated, but it does not affect product performance and reliability;
- Products are related to laws and regulations: see "Features" ;
- The out case needs to be connected to PE (⊕) of system when the terminal equipment in operating;
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
- The power supply is considered a component which will be installed into a terminal equipment. All EMC tests should be confirmed with the final equipment. Please consult our FAE for EMC test operation instructions.

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