AC/DC 550WCRPS REDUNDANT POWER SUPPLY

LMS550-P12B-2H

MORNSUN®

RoHS

FEATURES

- Input voltage range: 90 - 264VAC and supports AC & HVDC wide voltage range input
- Operating ambient temperature range: -5℃ to +50℃
- 80 PLUS Platinum efficiency
- Module power supply 1+1 redundancy, active current sharing function
- Active current sharing function
- PMBus / I2C communication function
- Over-current / short-circuit /over-voltage protection, fan-fault protection
- 5 years warranty
- Meet UL/EN/IEC62368, GB4943
- ATX multiplexed output

LMS550-P12B-2H is a CRPS redundant framework supply for the server. Tow modules of LMS550-P12B are inserted vertically into the frame backplane. It supports AC & HVDC wide voltage range input, meets the requirments of module power supply 1+1 parallel, and supports module power hot swap. With PMBus / I2C communication function, it can support online monitoring of input / output voltage / current. The power supply is equipped with a fan for heat dissipation,with a suction heat dissipation mode,and the fan adopts an automatic speed regulation design.EMC and safety specifications meet the standards of UL/EN/IEC62368 and GB4943.

Selection Guide

Certification	Part No.	Rated input voltage	Fan Operation Type	Output Power *(W)	Output	Output current*(A)		Max. Capacitive Load (μF)
						Min.	Max.	
--	LMS550-P12B-2H	100-240VAC 240VDC	Forward airflow, from DC to AC	550W	+12V	1	45	25000
					+5V	0.5	25	5000
					+3.3V	0.8	25	5000
					-12V	0	0.5	350
					+5VSB	0	3	350

Note: 1, The combined output power of +5V and +3.3V shall not exceed 200W. The continuous total max output power is 550W;
2, The main output ports are include +12V,+5V,+3.3V and -12V.The Aux output port is +5VSB;
3, This product is a redundant power supply, which already matched with LMS550-P12B module power supply, and the actual picture is for reference only;
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.

Input Specifications

Item	Operating Conditions			Min.	Typ.	Max.	Unit
Input Voltage Range	AC input			90	115/230	264	VAC
	DC input			180	240	320	VDC
Frequency	AC input			47	50/60	63	Hz
Efficiency*	TA=25℃, 1+0	Vin: 230VAC/50Hz	20% load	87	--	--	%
			50% load	90	--	--	
			100% load	87	--	--	
Input Current	V_{in}=100Vac/60Hz	P_{out}=550W		--	--	7	A
	V_{in}=200Vac/50Hz	P_{out}=550W		--	--	3.5	
Inrush Current	V_{in}=264Vac/50Hz	P_{out}=550W	Cold start 1+0	--	30	--	
Leakage Current	Vin=264Vac fin=50Hz			--	--	3.5	mA
Power Factor*	Io=10% Load	230Vac/50Hz, 1+0		0.92	--	--	--
	Io=20% Load			0.98	--	--	
	Io=50% Load			0.99	--	--	
	Io=100% Load			0.99	--	--	

Note：1.*The efficiency and power Factor are tested under 1+0 conditions, and the load needs to be configured according to the 80 PLUS spec.

Output Specifications

	Output	Output voltage（V）			
		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%

	Output	Output voltage（V）			Base load	Step Load	A/us)	Cap (uF)
		Min.	Typ.	Max.				
Dynamic	+12V	11.60	--	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

	Output	Max.
Ripple & Noise*	+12V	120mV
	+5V	60mV
	+3.3V	50mV
	-12V	120mV
	+5VSB	50mV

	Output	Output current（A）			
		Min.	Typ.	Max.	Remark
Output current	+12V	1	--	45	1.+5V and +3.3V combined output power≦ 200W 2.Rated output power ≦ 550W.
	+5V	0.5	--	25	
	+3.3V	0.8	--	25	
	-12V	0	--	0.5	
	+5VSB	0	--	3	
Hold-up Time	Main outputs			≧12ms	

Note：*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

Item	Operating Conditions				Note
Protection *(OVP)	Output	Over Voltage Protection（V）			Remark
		Min.	Typ.	Max.	
	+12V	13.2	--	15	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	
	+5VSB	5.74	--	7	All outputs will shut down, self-recovery

	Output	Over Current Protection（A）			Remark
		Min.	Typ.	Max.	
Protection *(OCP)	+12V	47	--	55	The main outputs shut down and latch off after 20s, +5VSB output is normal
	+12V	55	--	65	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			
	+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：*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	No-alarm
	PSU standby state AC present / Only +5VSBVSB on （PSON is high or floating）	Blink Green	No-alarm
	Power supply failure lead to main output off（PSON is low）	Amber or Blink Green	No-alarm
	Power output normal	Green	No-alarm
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	No-alarm
	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	No-alarm

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 loading	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.The address of the upper module (near the nameplate) is B0h, the lower module is B2h, and the frame power supply is 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	12	--	ms
Tpwok_holdup	Time from AC power off to PWOK signal decreasing	11	--	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

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℃ Relative humidity: < 95%RH, no condensation Test voltage: 500VDC		50	--	--	MΩ
	Input - Output						
Operating Temperature				-5	--	50	℃
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	11.60	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℃ Evaluated by Telcordia SR-332		≧250,000 h			
Communication Method		PMBus / I2C					
Warranty		5 years					

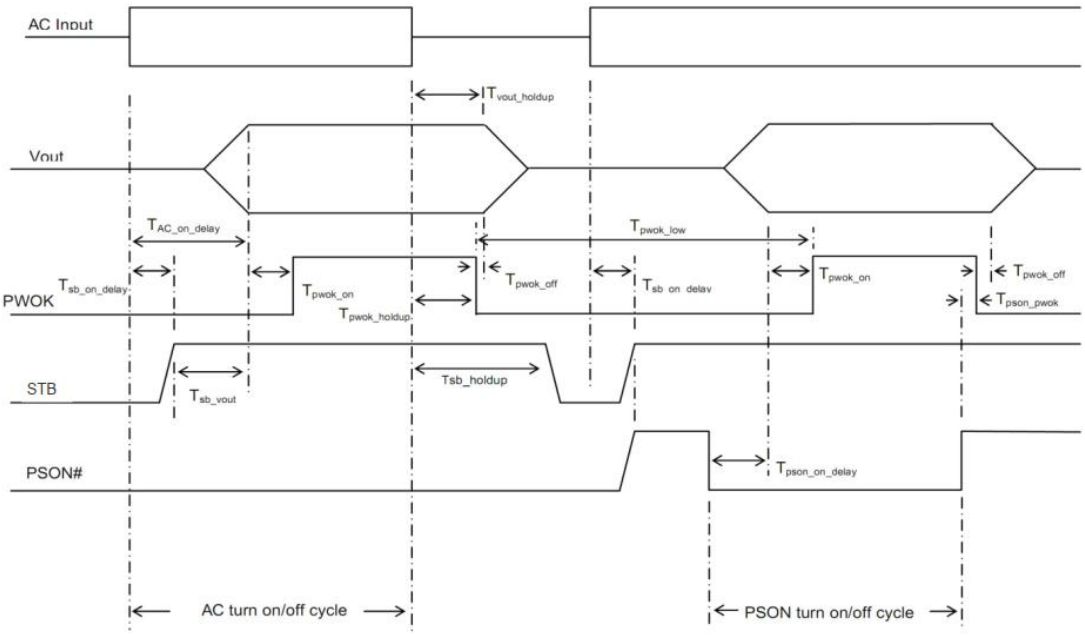
Note：*Input-Output isolation voltage refer to PCBA only.

General Specifications*

Case Material	Metal (SGCC)
Dimensions*	77.00mm x 225.00mm x 84.00mm (W x D x H)
Weight*	1065g (Typ.)
Cooling Method	Forced-air cooling

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



Electromagnetic Compatibility (EMC)

Emissions (EMI)	CE	CISPR32/EN55032 CLASS A	
	RE	CISPR32/EN55032 CLASS A	
	Harmonic current	IEC/EN61000-3-2 CLASS A	
Immunity	ESD	IEC/EN 61000-4-2 Contact ±8KV/Air ±15KV	perf. Criteria A
	RS	IEC/EN 61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN 61000-4-4 Input port: ±2KV	perf. Criteria A
		IEC/EN 61000-4-4 Output port: ±1KV	perf. Criteria A
	Surge	IEC/EN 61000-4-5 line to line ±2KV/line to ground ±4KV	perf. Criteria A
	CS	IEC/EN61000-4-6 3Vrms	perf. Criteria A
	Voltage dips, interruption	IEC/EN61000-4-11 >95% dip 0.5 periods	perf. Criteria A

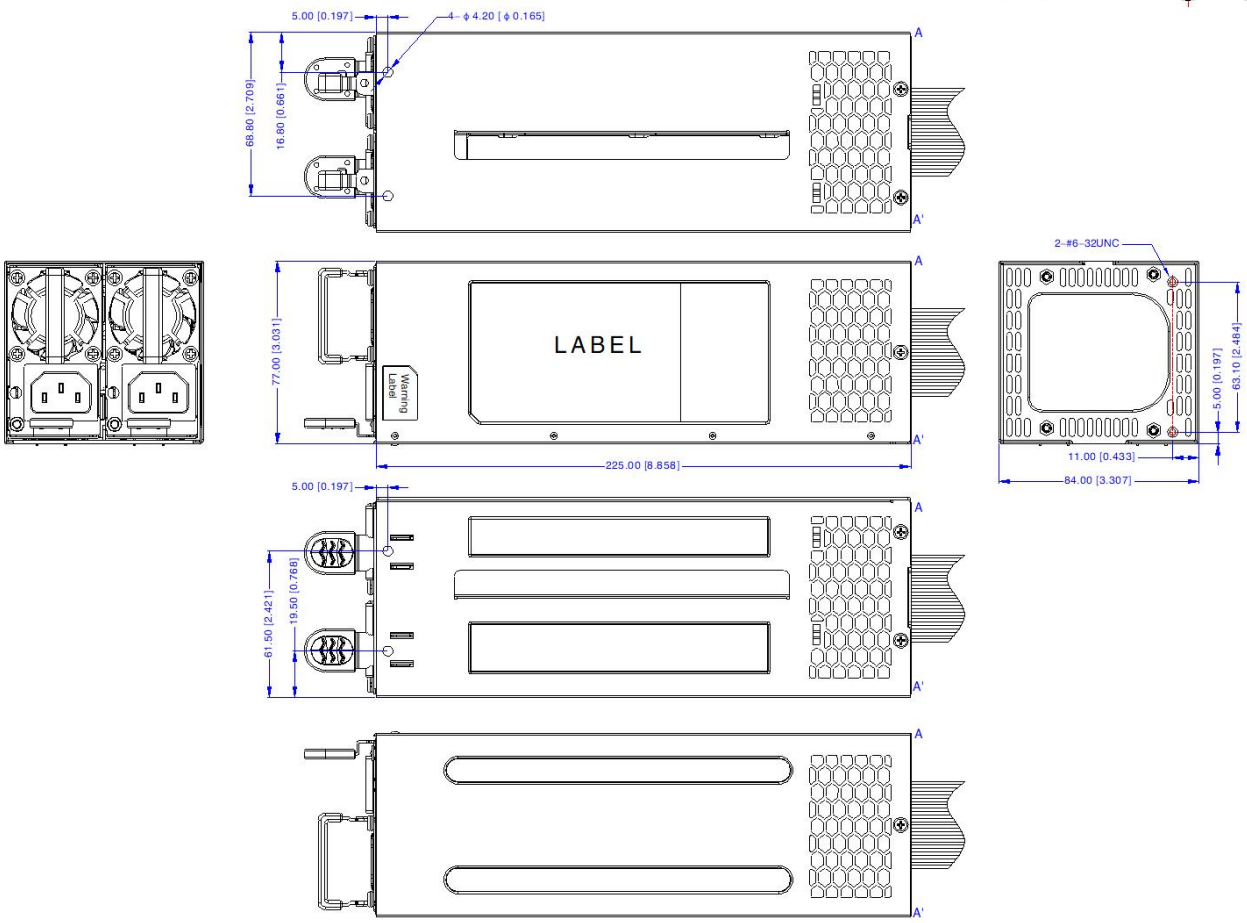
Output Cable Definition

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.

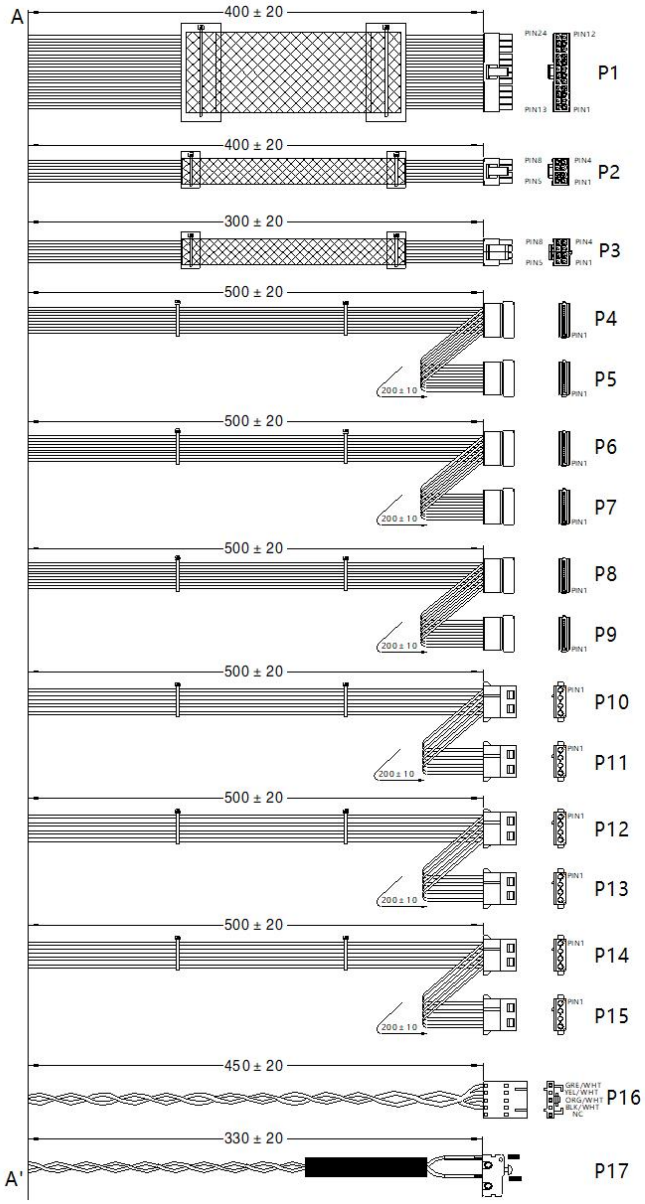
Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Note:
Unit: mm[inch]
General tolerances: ± 0.50[± 0.02]

Output Cable



Output cable:

CON	PIN	WIRE COLOR	OUT PUT	WIRE SPECIFICATION	Housing/Terminal
P1	1	ORANGE	+3.3V	UL 1007 18AWG 80°C 300V	Housing: WST P24-I42002 Terminal: WST I42002PS-2 OR EQ
	2	ORANGE	+3.3V		
	3a	BLACK	GND		
	3b	BLACK	GND	UL 1007 22AWG 80°C 300V	
	4a	RED	+5V	UL 1007 18AWG 80°C 300V	
	4b	RED	+5V	UL 1007 22AWG 80°C 300V	
	5	BLACK	GND	UL 1007 18AWG 80°C 300V	
	6	RED	+5V		
	7	BLACK	GND		
	8	GRAY	PG	UL 1007 22AWG 80°C 300V	
	9	PURPLE	+5V SB	UL 1007 18AWG 80°C 300V	
	10a	YELLOW	+12V		
	10b	YELLOW	+12V	UL 1007 22AWG 80°C 300V	
	11	YELLOW	+12V	UL 1007 18AWG 80°C 300V	
	12	ORANGE	+3.3V		
	13a	ORANGE	+3.3V		
	13b	ORANGE	+3.3V	UL 1007 22AWG 80°C 300V	
	14	BLUE	-12V		
	15	BLACK	GND	UL 1007 18AWG 80°C 300V	
	16	GREEN	PS-ON	UL 1007 22AWG 80°C 300V	
	17	BLACK	GND	UL 1007 18AWG 80°C 300V	
	18	BLACK	GND		
	19	BLACK	GND		
	20				
	21	RED	+5V	UL 1007 18AWG 80°C 300V	
	22	RED	+5V		
	23	RED	+5V		
	24	BLACK	GND		
P2	1	BLACK	GND	UL 1007 18AWG 80°C 300V	Housing: WST P4-I42002 Terminal: WST I42002PS-2 OR EQ
	2	BLACK	GND		
	3	BLACK	GND		
	4	BLACK	GND		
	5	YEL/BLK	+12V		
	6	YEL/BLK	+12V		
	7	YEL/BLK	+12V		
	8	YEL/BLK	+12V		
P3	1	BLACK	GND	UL 1007 18AWG 80°C 300V	Housing: WST P4-I42002 K3,K4 Terminal: WST I42002PS-2 OR EQ
	2	BLACK	GND		
	3	BLACK	GND		
	4	BLACK	GND		
	5	YELLOW	+12V		
	6	YELLOW	+12V		
	7	YELLOW	+12V		
	8	YELLOW	+12V		
P4 | P9	1	ORANGE	+3.3V	UL 1007 18AWG 80°C 300V	Housing: WST P5-I12707 Terminal: WST I12707PS-2# WST I12707PS-2#(M) OR EQ
	2	BLACK	GND		
	3	RED	+5V		
	4	BLACK	GND		
	5	YELLOW	+12V		
P10 | P15	1	YELLOW	+12V	UL 1007 18AWG 80°C 300V	Housing: WST P4-A10202 Terminal: WST A10204PS-2 WST A10209PS-2 OR EQ
	2	BLACK	GND		
	3	BLACK	GND		
	4	RED	+5V		
P16	1	GRE/WHT	SCL	UL 1007 28AWG 80°C 300V	Housing: WST P5-AI25402 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: BEJ KW02 OR EQ
	2	YELLOW	RESET		

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220775;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity <75%RH with nominal input voltage and rated output load;
3. The room temperature derating of 1℃/300m is needed for operating altitude greater than 2000m;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. 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;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. The out case needs to be connected to PE (⏚)of system when the terminal equipment in operating;
8. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
9. 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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