DC/DC Parallel Redundancy Module

LIHR40-20-H

MORNSUN®

RoHS

FEATURES

- Input voltage range: 22 - 60VDC
- Operating ambient temperature range: -40℃ to +85℃
- High efficiency up to 98%
- Transient peak current function: 6 times rated current for 15ms
- Up to 150% (PN) dynamic power for 5s
- Continuous static power margin of up to 125% (PN)
- 1000VAC insulation voltage
- Double-sided conformal coating, salt-spray proof
- The DC OK function is displayed, relay contact signal output
- Redundant OK indicator function
- Current Sharing OK indicator function
- Operating altitude up to 5000m
- Support output 100VDC voltage backdown
- Support input over-voltage, under-voltage protection
- OVC III (design refer to EN62477, 2000m)
- Supporting for N+1 parallel redundancy
- Safety according to ATEX, IECEx increased safety type explosion-proof certification
- Meets ANSI/ISA 71.04-2013 G3
- Safety according to IEC/UL62368, EN61558, EN60335
- 5 years warranty

LIHR40-20-H is one of Mornsun Din-rail parallel redundancy module. It is used with our high-end Din-rail series 240/480/960 and other series, it features wide input voltage range, wide operating temperature, cost-effective, high efficiency and high reliability. It offers excellent EMC performance and meet UL61010, IEC/EN/UL62368, GB4943 standards and it is widely used in areas of industrial, electricity, security, telecommunications etc.

Selection Guide

Certification	Part No.	Voltage Drop Vin-Vo (V/Typ.)	Nominal Output Current (A) Max.	Efficiency (24/48VDC, %/Typ.)
--	LIHR40-20-H	0.2	40	98

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	DC input	22	24/48	60	VDC
Input Current Range	The sum of 2*20A&1*40A input currents is not greater than 40A (increase power)	--	--	40	A
	The sum of 1*20A input currents is not greater than 20A (Redundant)	--	--	20	
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	200	--	mV
DC OK Function	When the two input voltages are normal and the voltage difference does not exceed the over-voltage or under-voltage alarm, the DC OK function is normal (the relay on), the two input LED indicators light on	--	--	--	--

Output Power	24V/20A (increase power)	--	480	--	W
	48V/20A (Redundant)	--	960	--	
Anti-backflow Voltage	Full load range, back-flow voltage slope≤1V/ms	--	--	100	VDC
Static power	1. The sum of 2*20A&1*40A input currents is not greater than 40A (increase power) 2. The sum of 1*20A input currents is not greater than 20A (Redundant)	125%Io (typ.), work for a long time at room temperature			
Dynamic power		150% Io working 5s (min.), the off time adapts with different load conditions, long-term protection, self-recover			
Transient Peak Current Function		600% Io working 15ms 3 times (typ.), long-term short-circuit protection, self-recover			
LED1 (DC_OK)	ON	Output DC_OK			
LED2 (PCS OK)	ON	Both input current share are OK			
LED3 (Redundant OK)	ON	Both input redundancy OK			

Note: *The "Tip and barrel method" is used for ripple and noise test, output parallel 47uF electrolytic capacitor and 0.1uF ceramic capacitor, please refer to AC-DC Converter Application Notes for specific information.

General Specifications

Item		Operating Conditions		Min.	Typ.	Max.	Unit
Isolation Test	Input output - ⏚	Electric strength test for 1min., leakage current < 5mA		1000	--	--	VAC
Insulation Resistance	Input output - ⏚	At 500VDC		50	--	--	MΩ
Operating Temperature				-40	--	+85	℃
Storage Temperature				-40	--	+85	
Storage Humidity		Non-condensing		--	--	90	%RH
Power Derating		Operating temperature derating	+60℃ to +85℃	3.2	--	--	%/℃
Safety Standard				Design refer to IEC/EN/UL62368-1, EN61558-1, EN60335-1			
Safety Class				CLASS I			
MTBF		MIL-HDBK-217F@25℃		＞1000,000 h			

Environmental Characteristics

Item	Operating Conditions	Standard
High and Low Temperature Working	+85℃, -40℃	GB2423.1, IEC60068-2-1
Sinusoidal Vibration	10 - 500Hz, 2g, three directions of X, Y, Z axis	GB2423.10, IEC60068-2-6
Salt Mist	+35℃, 5%NACL, 48h	GB2423.17, IEC60068-2-11
Alternating Hot and Humid	+25℃, 95%RH - +60℃, 95%RH	GB2423.4, IEC60068-2-30
Low Temperature Storage	-40℃	GB2423.1, IEC60068-2-1
High Temperature Storage	+85℃	GB2423.2, IEC60068-2-2
High Temperature Aging	+60℃	GB2423.2, IEC60068-2-2
Normal Temperature Aging	+25℃	GB2423.1, IEC60068-2-1
Temperature Shock	-40℃ to +85℃	GB2423.22, IEC60068-2-14
Temperature Cycle	-25℃ to +60℃	GB2423.22, IEC60068-2-14
Hot and Humid	+85℃, 85%RH	GB2423.50, IEC60068-2-67
High Temperature Elevation	+60℃, 54KPa	GB2423.26, IEC60068-2-41
Low Temperature Elevation	-25℃, 54KPa	GB2423.25, IEC60068-2-40
Constant Humid and Hot	+40℃, 95%RH	GB2423.3, IEC60068-2-78
Random Vibration	5 - 10Hz, ASD 0.3 - 10g²/Hz, three directions of X, Y, Z axis	GB/T 4798.2-2008, IEC60721-3-2
Sinusoidal Vibration Response	10 - 150Hz, 1g, three directions of X, Y, Z axis	GB/T 11287-2000, IEC60255-21-1
Sinusoidal Vibration Endurance Test		
Sinusoidal Impulse Response	15g, pulse duration 11ms, three times in each direction of X, Y, Z axis	GB/T 114537-1993, IEC60255-21-2
Sinusoidal Impact Endurance Test		
Packaging Drop	1m, one corner, three edges and six sides	GB2423.8, IEC68-2-32

Mechanical Specifications

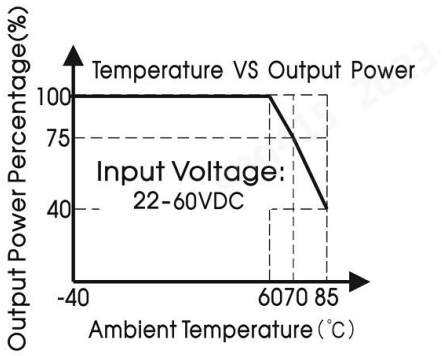
Case Material	Metal (AL5052, SUS304)
Dimensions	121.00mm x 34.00mm x 124.00mm
Weight	485g (Typ.)
Cooling Method	Natural air cooling

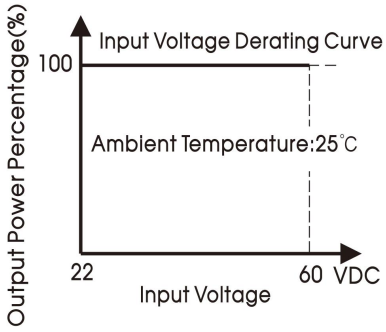
Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B	
	RE	CISPR32/EN55032 CLASS B	
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 ±2KV	perf. Criteria A
	Surge	IEC/EN 61000-4-5 line to line ±1KV/line to ground ±2KV	perf. Criteria A
	CS	IEC/EN61000-4-6 10 Vr.m.s	perf. Criteria A

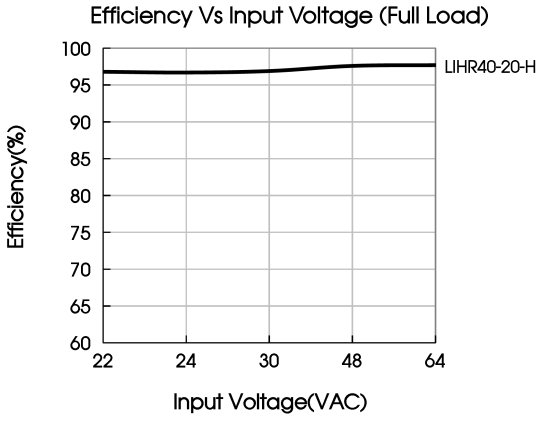
Note: *For immunity test, please add AC-DC module at front of LIR-20 (Mornsun LI, LIF, LIMF, LIHF120/240/480 series products are recommended).

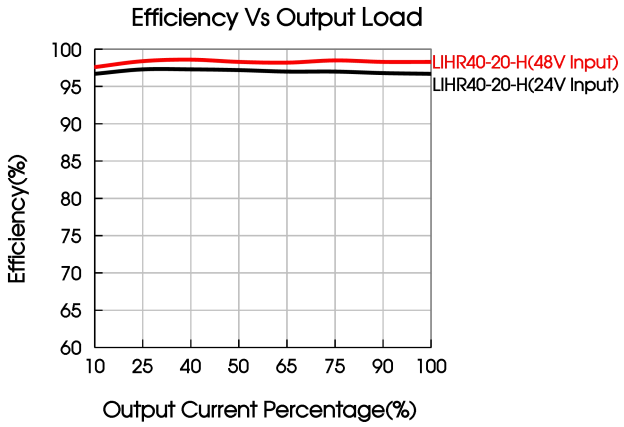
Product Characteristic Curve





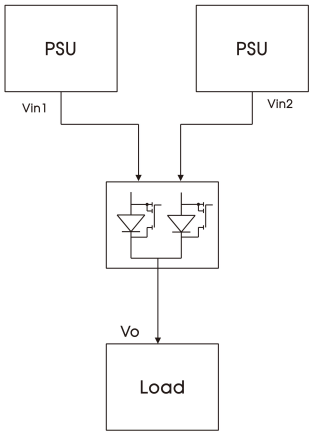
Note: This product is suitable for applications using natural air cooling, for applications in closed environment please consult Mornsun FAE.



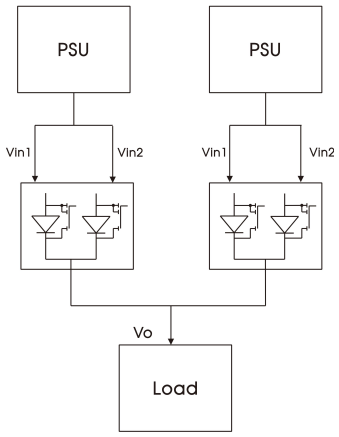


Typical Application

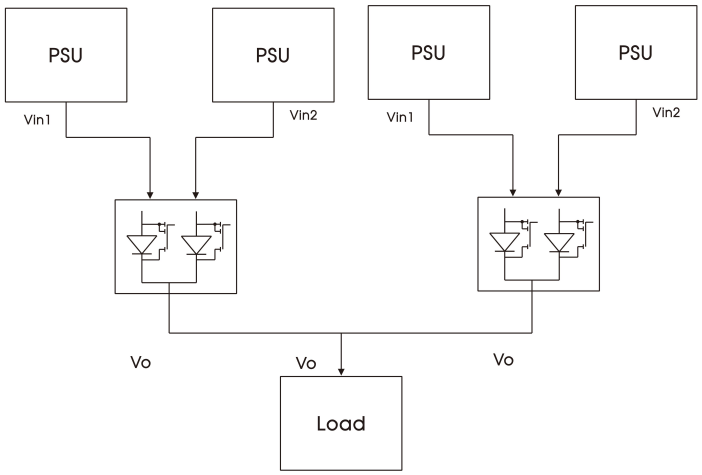
1. 1+1 Redundancy: Using 1 more PSU as the redundant unit.



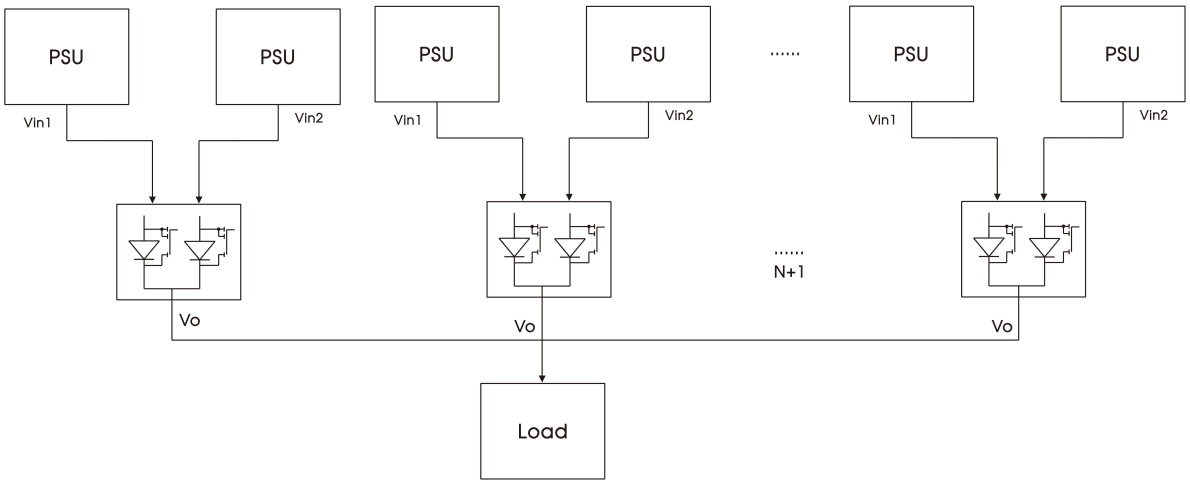
2. Single Use: Connecting only one PSU to one LIR40-40 module to reduce the stress of the MOS and hence increase the reliability.



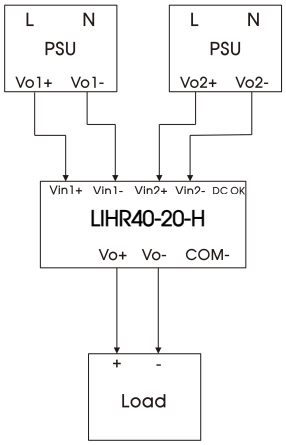
3. 2+2 Redundancy: Using 2 more PSU as the redundant unit.



4. N+1Redundancy: Using more PSUs as the redundant units to increase the reliability.

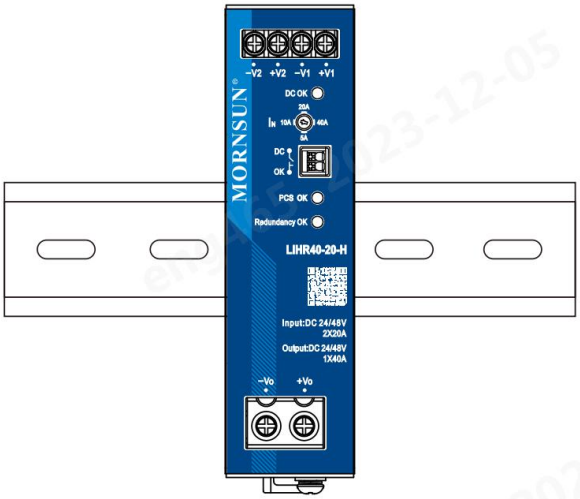


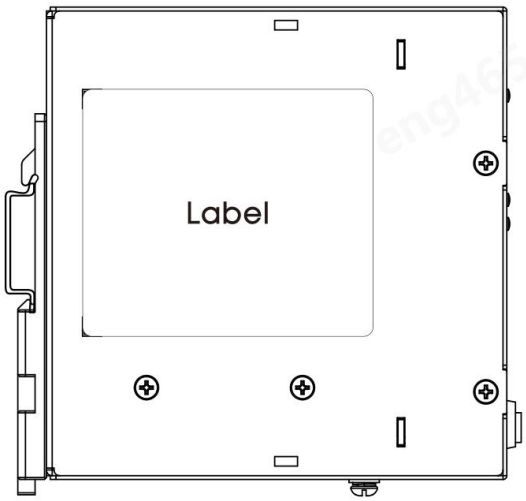
5. Cable connection reference



Note: 1. Please add AC-DC module at front of LIHR40-20-H (Mornsun LI, LIF, LIMF, LIHF120/240/480/960 series products are recommended);
2. When the output is short circuited, the pre-stage AC-DC module short circuit protection will be triggered;

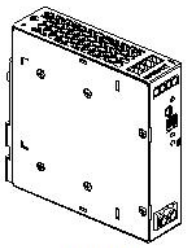
Installation Diagram



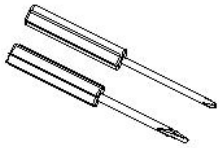


File name	LIHR40–20–H Installation Instruction	Version number	V0	Page 1 of 1

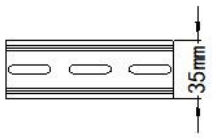
Materials required in the installation		
1	Product	1 PCS
2	Phillips screwdriver Slotted screwdriver	1 PCS
3	TS35/7.5 or TS35/15	1 PCS
4	14–6AWG wire	/ PCS
	The content is for reference only. Regarding the actual wire diameter and tightening torque, refer to the dimensional drawing.	



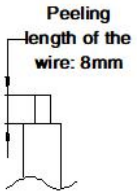
Product



Phillips screwdriver
Slotted screwdriver
Diameter of the cutting
Diameter: 3mm

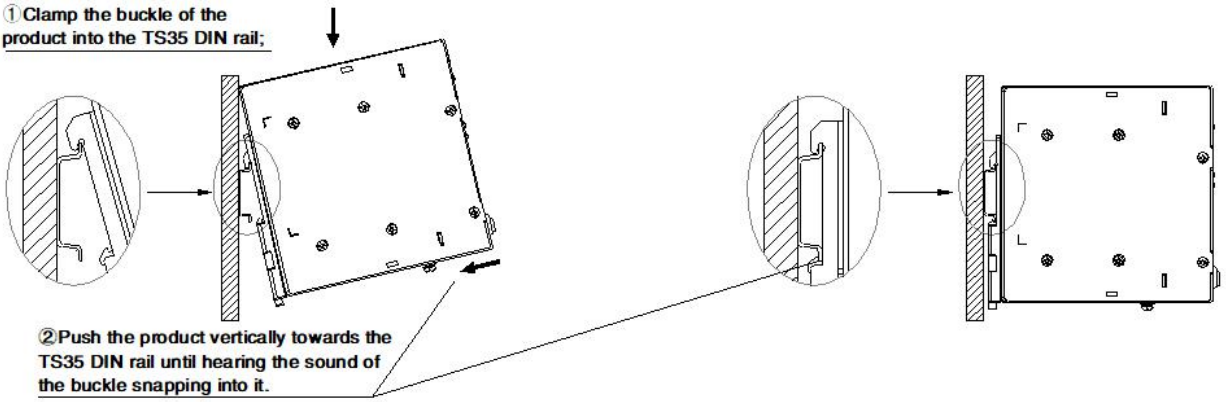


TS35/7.5 or TS35/15

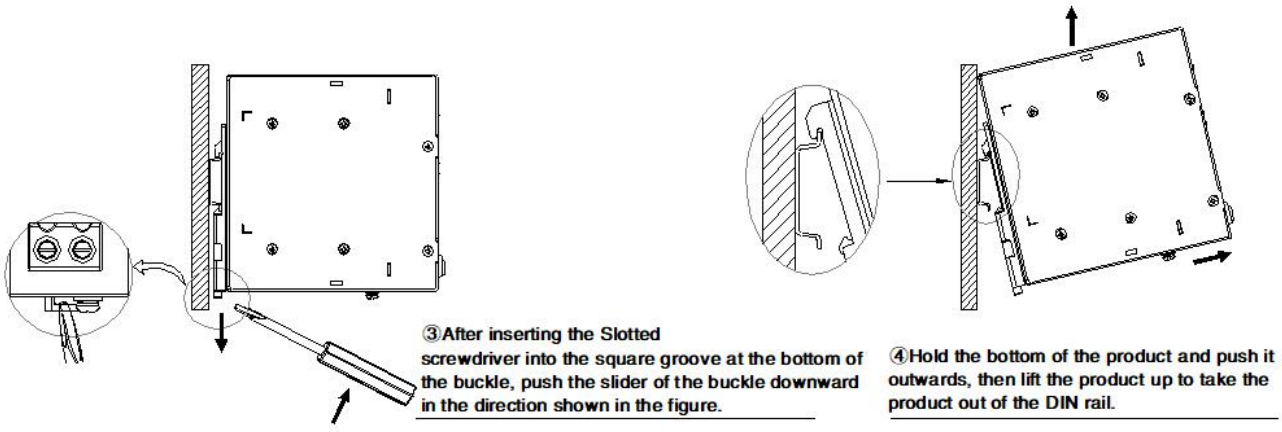


14–6AWG wires

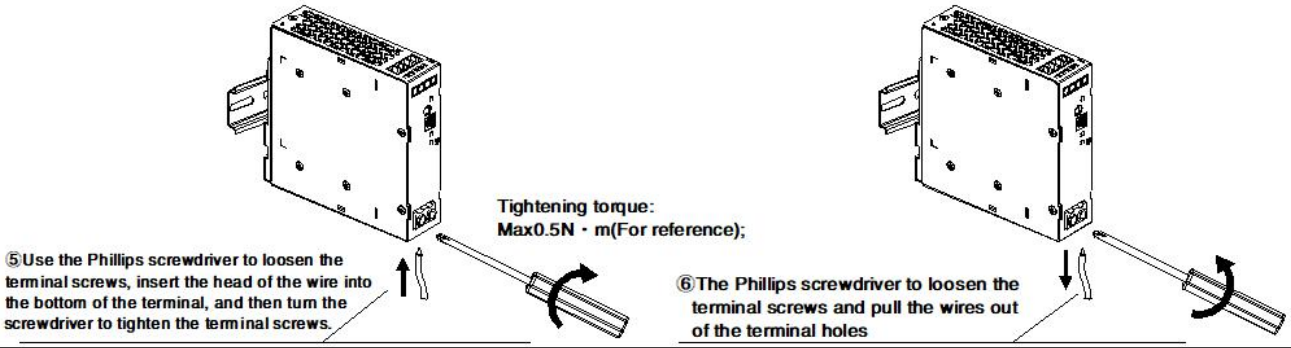
Installation Steps ①–②



Disassembly steps ③–④

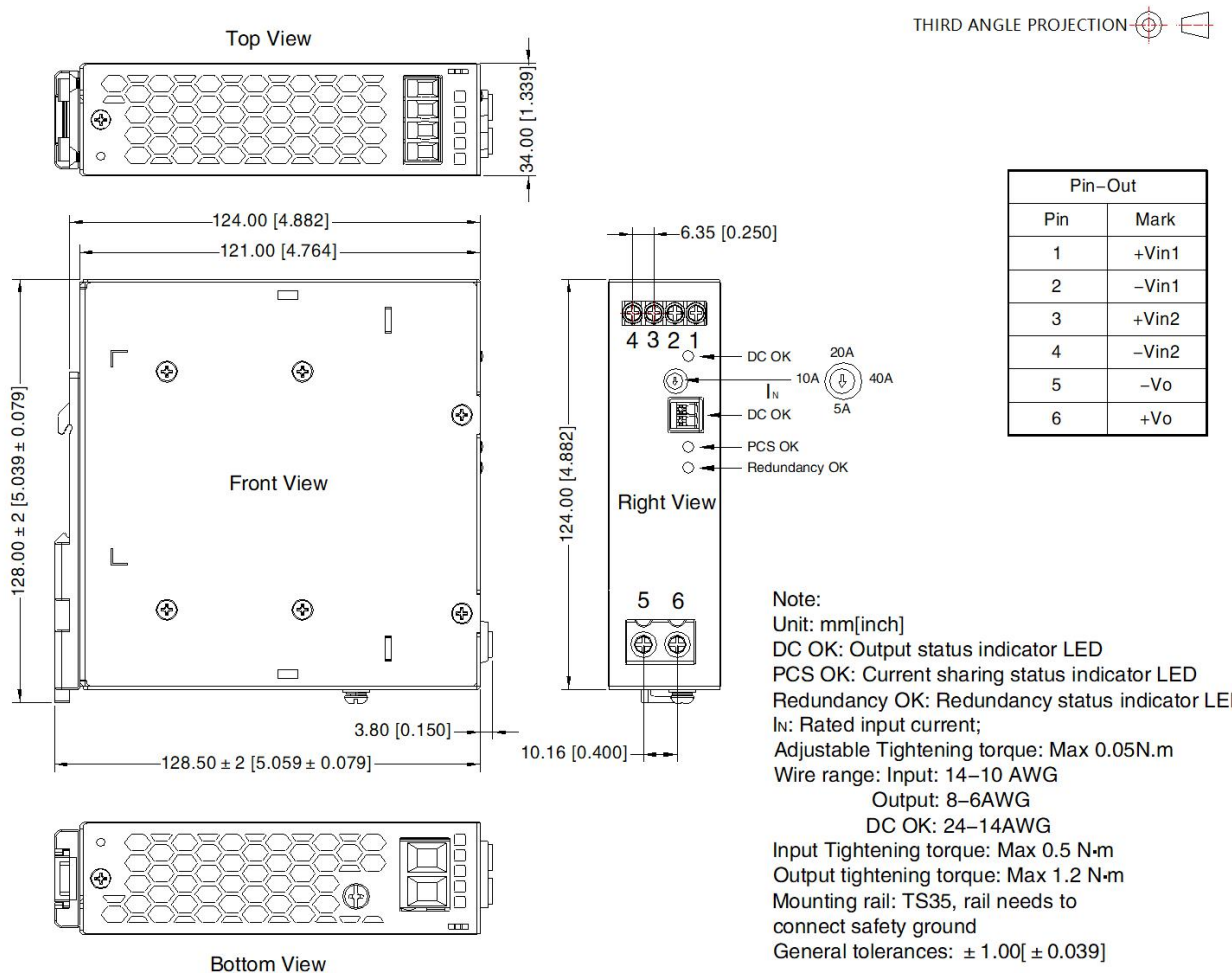


Wiring / Unwiring Steps ⑤–⑥



Note: Keep the following installation clearances: 20mm on top, 20mm on the bottom, 5mm on the left and right sides are recommended when the device is loaded permanently with more than 50% of the rated power. Increase this clearance to 15mm in case the adjacent device is a heat source (e.g. another power supply).

Dimensions and Recommended Layout



Pin-Out	
Pin	Mark
1	+Vin1
2	-Vin1
3	+Vin2
4	-Vin2
5	-Vo
6	+Vo

Note:
Unit: mm[inch]
DC OK: Output status indicator LED
PCS OK: Current sharing status indicator LED
Redundancy OK: Redundancy status indicator LED
IN: Rated input current;
Adjustable Tightening torque: Max 0.05N.m
Wire range: Input: 14-10 AWG
Output: 8-6AWG
DC OK: 24-14AWG
Input Tightening torque: Max 0.5 N•m
Output tightening torque: Max 1.2 N•m
Mounting rail: TS35, rail needs to connect safety ground
General tolerances: ± 1.00[± 0.039]

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220671;
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 ambient temperature derating of 5℃/1000m 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. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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