# AC/DC 30W DIN-Rail Power Supply

## LI30-20BxxPR3 Series

MORNSUN®

RoHS

## FEATURES

- Universal 85-264VAC or 120-370VDC input voltage
- Withstand 305VAC surge input for 5s
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range -40℃ to +85℃
- High I/O isolation voltage up to 4000VAC
- OVC III (design refer to EN62477/2000m)
- Low ripple & noise, high efficiency
- Output short circuit, over-current, over-voltage protection
- The output has CV constant current function
- DIN rail TS35X7.5/ TS35X15 mountable
- Meets Class I (peripheralize), Class II (no perimeter required)
- Design refer to UL/EN/BS EN62368, UL508, EN60335, EN61558, EN62477

*LI30-20BxxPR3 is Mornsun's AC-DC series featuring a cost-effective, energy efficient solution for standard DIN-rail mounting. The products offer a high level of stability and immunity to noise, compliant with IEC62368 standards for EMC and safety sepecifitions meet IEC/EN61000-4, CISPR32/EN55032, UL/EN/BS EN62368, UL508, EN60335, EN61558, EN62477. These light weight AC-DC converters also have an extremely compact design for space saving and are ideal for applications such as industrial control equipment machinery and all kinds of applications in a harsh environment. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.*

## Selection Guide

| Certification | Part No.* | Output Power (W) | Nominal Output Voltage and Current (Vo/Io) | Output Voltage Adjustable Range ADJ (V)** | Efficiency at 230VAC (%) Typ. | Capacitive Load (μF) Max. |
|---|---|---|---|---|---|---|
| / | LI30-20B05PR3 | 15 | 5V/3A | 4.5-5.5 | 82 | 12000 |
| | LI30-20B12PR3 | 24 | 12V/2A | 10.8-13.8 | 88 | 6000 |
| | LI30-20B15PR3 | 30 | 15V/2A | 13.5-18.0 | 90 | 5000 |
| | LI30-20B24PR3 | 36 | 24V/1.5A | 21.6-29.0 | 89 | 1400 |
| | LI30-20B48PR3 | 36 | 48V/0.75A | 43.2-55.2 | 90 | 600 |

Note: *Use suffix "Q" for conformal coating;
**The actual adjustment range may extend outside the values stated, care should be exercised to ensure that the output voltage and power levels remain within the published maximum values.

## Input Specifications

| Item | Operating Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Input Voltage Range | AC input | 85 | -- | 264 | VAC |
| | DC input | 120 | -- | 370 | VDC |
| Input Frequency | | 47 | -- | 63 | Hz |
| Input Current | 115VAC | -- | -- | 0.88 | A |
| | 230VAC | -- | -- | 0.48 | |
| Inrush Current | 115VAC | -- | 25 | -- | |
| | 230VAC | -- | 45 | -- | |
| Leakage Current | 264VAC | 0.25mA RMS max. | | | |
| Hot Plug | | Unavailable | | | |

## Output Specifications

| Item | Operating Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Output Voltage Accuracy | 0% - 100% load | 5V | -- | ±2 | -- | % |
| | | 12V/15V/24V/48V | -- | ±1 | -- | |
| Line Regulation | Rated load | | -- | ±0.5 | -- | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Load Regulation | 230VAC | | -- | ±1 | -- | |
| Output Ripple & Noise* | 20MHz bandwidth (peak-to-peak value) | 5V | -- | -- | 80 | mV |
| | | 12V/15V | -- | -- | 120 | |
| | | 24V | -- | -- | 150 | |
| | | 48V | -- | -- | 240 | |
| Temperature Coefficient | | | -- | ±0.02 | -- | %/℃ |
| Stand-by Power Consumption | 230VAC input | 5V/12V/15V/24V | -- | -- | 0.3 | W |
| | | 48V | -- | -- | 0.4 | |
| Short Circuit Protection | | | Hiccup, continuous, self-recovery | | | |
| Over-current Protection | | | ≥115 % Io, self-recovery | | | |
| | | | Belch or constant current mode when output voltage < 50% or constant current mode when output voltage < 50%<br>When the output voltage is 50%-100%, it is in constant current mode, and the load abnormal condition can be automatically restored after removal | | | |
| Over-voltage Protection | 5V | | ≤7.5V | Output voltage hiccup | | |
| | 12V | | ≤16V | | | |
| | 15V | | ≤22.5V | | | |
| | 24V | | ≤36V | | | |
| | 48V | | ≤60V | | | |
| Minimum Load | | | 0 | -- | -- | % |
| Start-up Time | | | -- | -- | 1 | s |
| Hold-up Time | 115VAC | | -- | 12 | -- | ms |
| | 230VAC | | -- | 60 | -- | |

Note: The "Tip and barrel method" is used for ripple and noise test, with a 0.1uf ceramic capacitor & 47uf parallel capacitor, please refer to Enclosed Switching Power Supply Application Notes for specific information.

## General Specifications

| Item | | Operating Conditions | | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|---|
| Isolation | Input - output | Electric Strength Test for 1min., (leakage current<5mA) | | | 4000 | -- | -- | VAC |
| Insulation Resistance | Input - output | Test voltage: 500VDC | | | 100 | -- | -- | MΩ |
| Operating Temperature | | | | | -40 | -- | +85 | ℃ |
| Storage Temperature | | | | | -40 | -- | +85 | |
| Storage Humidity | | | | | -- | -- | 95 | %RH |
| Operating Humidity | | Non-condensing | | | -- | -- | 90 | |
| Altitude | | | | | -- | -- | 5000 | m |
| Output Power Derating | | Operating temperature derating | -40℃ to -30℃ | 5V/48V | 3 | -- | -- | %/℃ |
| | | | | Other output | 5 | -- | -- | |
| | | | +50℃ to +70℃ | | 2.5 | -- | -- | |
| | | | +70℃ to +85℃ | | 2 | -- | -- | |
| | | Input voltage derating | 85VAC - 100VAC | | 1 | -- | -- | %/VAC |
| Safety Standard | | | | | Design refer to UL/EN/BS EN62368-1, UL508, EN60335-1, EN61558-1, EN62477 | | | |
| Safety Class | | | | | Class I (peripheralize), Class II (no perimeter required) | | | |
| MTBF | | MIL-HDBK-217F@25°C | | | > 300,000 h | | | |

## Mechanical Specifications

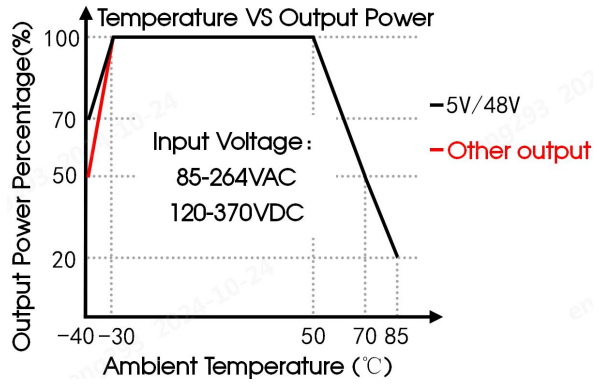
| | |
|---|---|
| Case Material | Plastic, heat-resistant (UL94V-0) |
| Package Dimensions | 92.66 x 35.00 x 58.00mm |
| Weight | 120g (Typ.) |
| Cooling Method | Free air convection |

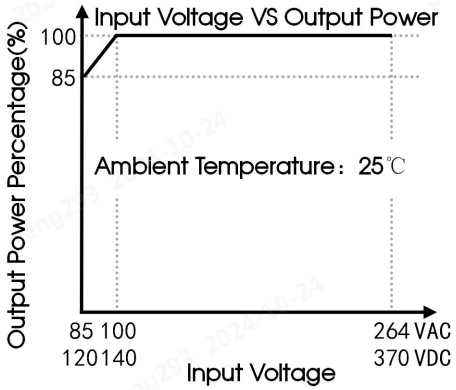
## Electromagnetic Compatibility (EMC)

| | | | | |
|---|---|---|---|---|
| EMI | CE | CISPR32/EN55032 | CLASS B | |
| | RE | CISPR32/EN55032 | CLASS B | |
| | Harmonic current | IEC/EN61000-3-2 | CLASS A | |
| | Voltage flicker | IEC/EN61000-3-3 | | |
| EMS | ESD | IEC/EN61000-4-2 | Contact ±6KV/Air ±8KV | Perf. Criteria A |
| | RS | IEC/EN61000-4-3 | 10V/m | Perf. Criteria A |
| | EFT | IEC/EN61000-4-4 | ±2KV | Perf. Criteria A |
| | | IEC/EN61000-4-4 | ±4KV(See Fig. 1 for typical application circuit) | Perf. Criteria A |
| | Surge | IEC/EN61000-4-5 | Line to line ±2KV | Perf. Criteria A |
| | | | Line to PE ±4KV<br>(See Fig. 1 for typical application circuit) | Perf. Criteria A |
| | CS | IEC/EN61000-4-6 | 10Vr.m.s | Perf. Criteria A |
| | PFMF | IEC/EN61000-4-8 | 30A/m | Perf. Criteria A |
| | Voltage Variations* | IEC61000-6-2/IEC61000-4-11 | 70% $U_n$, 25/30cycle(50/60Hz);<br>40% $U_n$, 10/12cycle(50/60Hz);<br>0% $U_n$, 1cycle | Perf. Criteria B |
| | Short interruptions* | IEC61000-6-2/IEC61000-4-11 | 0% $U_n$, 250/300cycle(50/60Hz) | Perf. Criteria C |

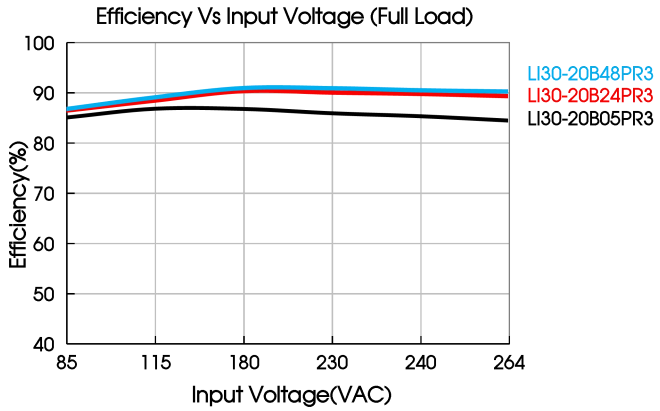
Note: *$U_n$ Maximum input nominal voltage.

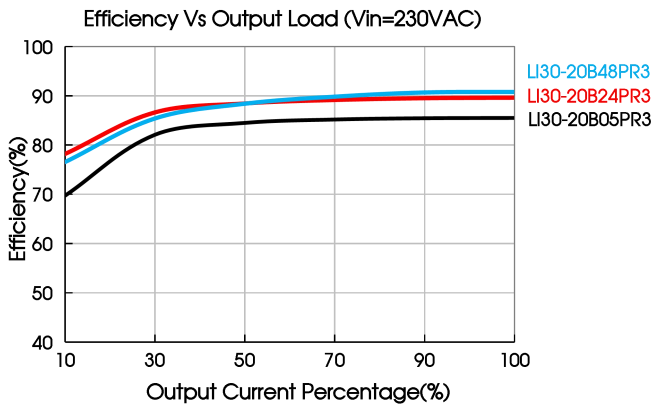
## Product Characteristic Curve




Note: 1.With an AC input between 85-100VAC and a DC input between 120-140VDC, the output power must be derated as per temperature derating curves;
2.This product is suitable for applications using natural free air cooling; for applications in closed environment please consult Mornsun FAE.



## EMC compliance recommended circuit

1. Recommended circuit 1

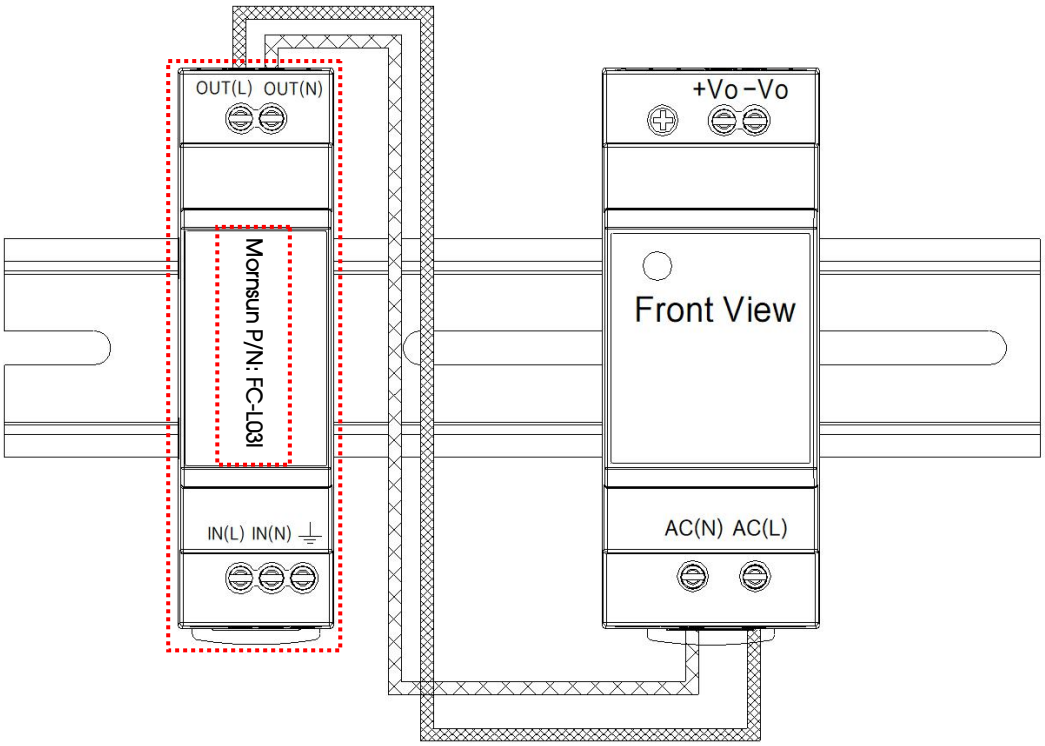
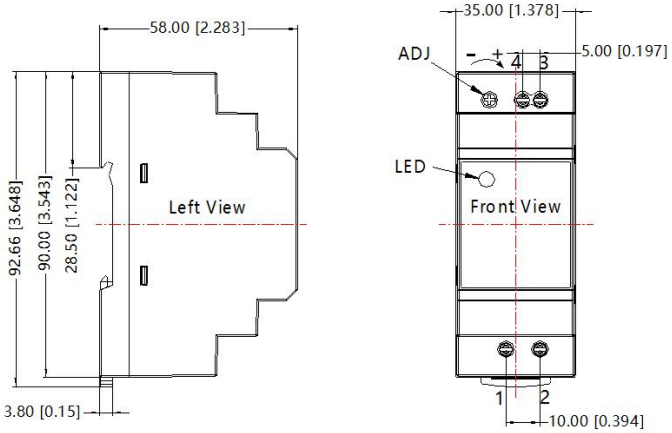



Fig. 1

Note: Applies to Class I (with peripherals), Class II (without peripherals).

## Dimensions and Recommended Layout

THIRD ANGLE PROJECTION




| Pin-Out | |
|---|---|
| Pin | LI30-20B |
| 1 | AC(N) |
| 2 | AC(L) |
| 3 | -Vo |
| 4 | +Vo |

Note:
Unit: mm[inch]
ADJ: adjustable resistance to change output voltage
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
Mounting rail: TS35
General tolerances: ±1.00[±0.039]

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220195;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75% with nominal input voltage and rated output load;
3. The room temperature derating of 3.5℃/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. We can provide product customization service, please contact our technicians directly for specific information;
6. Specifications are subject to change without prior notice.
7. Products are related to laws and regulations: see "Features" and "EMC";
8. The output voltage can be adjusted by the ADJ, clockwise to increase;
9. 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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