

60W, AC/DC DIN-Rail Power Supply



## FEATURES

- Universal 85-264VAC or 120-370VDC input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -40°C to +70°C
- High I/O isolation test voltage up to 4000VAC
- Industrial product technology design
- Over-voltage class III (Designed to meet EN61558-1 safety standards)
- Low standby power consumption, high efficiency
- Low ripple & noise
- Output short circuit, over-current, over-voltage protection
- Withstand 300VAC surge input for 5s
- DIN rail TS35X7.5/ TS35X15 mountable

LI60-20BxxPR2 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 international IEC62368 standards for EMC and safety specifications meet IEC/EN61000-4, CISPR32, EN55032, UL62368, IEC62368 and EN62368. 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.

## 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. |
|--------------------|---------------|------------------|--|--|-------------------------------|---------------------------|
| UL/EN/IEC/BIS/UKCA | LI60-20B05PR2 | 32.5             | 5V/6.5A                                    | 4.9-5.5                                  | 84                            | 20000                     |
|                    | LI60-20B12PR2 | 54               | 12V/4.5A                                   | 10.8-13.8                                | 88                            | 10000                     |
|                    | LI60-20B15PR2 | 60               | 15V/4.0A                                   | 13.5-18.0                                | 89                            | 8000                      |
|                    | LI60-20B24PR2 | 60               | 24V/2.5A                                   | 21.6-29.0                                | 90                            | 4000                      |
|                    | LI60-20B48PR2 | 60               | 48V/1.25A                                  | 43.2-55.2                                | 91                            | 680                       |

Note: \*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               | --              | --   | 1.2  | A    |
|                     | 230VAC               | --              | --   | 0.8  |      |
| Inrush Current      | 115VAC               | --              | 30   | --   |      |
|                     | 230VAC               | --              | 60   | --   |      |
| 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                       | --         | ±2    | --   | %    |    |
| Line Regulation         | Rated load                           | --         | ±0.5  | --   |      |    |
| Load Regulation         | 230VAC                               | --         | ±1.5  | --   |      |    |
| Output Ripple & Noise*  | 20MHz bandwidth (peak-to-peak value) | 5V output  | --    | --   | 100  | mV |
|                         |                                      | 12V output | --    | --   | 120  |    |
|                         |                                      | 15V output | --    | --   | 120  |    |
|                         |                                      | 24V output | --    | --   | 150  |    |
|                         |                                      | 48V output | --    | --   | 240  |    |
| Temperature Coefficient |                                      | --         | ±0.02 | --   | %/°C |    |

|                            |                                   |                       |                                |    |     |    |
|----------------------------|-----------------------------------|-----------------------|--------------------------------|----|-----|----|
| Stand-by Power Consumption | 230VAC input                      | 5V/12V/15V/24V output | --                             | -- | 0.3 | W  |
|                            |                                   | 48V output            | --                             | -- | 0.4 |    |
| Short Circuit Protection   | Hiccup, continuous, self-recovery |                       |                                |    |     |    |
| Over-current Protection    | ≥ 120%Io, self-recovery           |                       |                                |    |     |    |
| Over-voltage Protection    | 5V output                         | ≤7.5V                 | Output voltage clamp or hiccup |    |     |    |
|                            | 12V output                        | ≤16V                  |                                |    |     |    |
|                            | 15V output                        | ≤20V                  |                                |    |     |    |
|                            | 24V output                        | ≤36V                  |                                |    |     |    |
|                            | 48V output                        | ≤60V                  |                                |    |     |    |
| Minimum Load               |                                   | 0                     | --                             | -- |     | %  |
| Start-up Delay Time        |                                   |                       | --                             | -- | 3   | s  |
| Hold-up Time               | 115VAC                            |                       | --                             | 15 | --  | ms |
|                            | 230VAC                            |                       | --                             | 80 | --  |    |

Note: \*Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.

### General Specifications

| Item                  | Operating Conditions   | Min.  | Typ. | Max. | Unit  |        |
|-----------------------|--|---|------|------|-------|--------|
| Isolation             | Input - output<br>Electric Strength Test for 1min.,<br>(leakage current < 5mA) | 4000  | --   | --   | VAC   |        |
| Operating Temperature |  | -40   | --   | +70  | °C    |        |
| Storage Temperature   |  | -40   | --   | +85  |       |        |
| Storage Humidity      |  | --  | --   | 95   | %RH   |        |
| Operating Altitude    |  | --  | --   | 2000 | m     |        |
| Switching Frequency   |  | --  | 65   | --   | kHz   |        |
| Power Derating        | -40°C to -30°C   | 5V/12V/48V output   | 3.0  | --   | --    | % / °C |
|                       |  | 24V output  | 7.0  | --   | --    |        |
|                       |  | 15V output  | 8.0  | --   | --    |        |
|                       | +45°C to +70°C   |   | 2.0  | --   | --    |        |
|                       | 85VAC - 100VAC   | 1.0   | --   | --   | %/VAC |        |
| Safety Standard       |  | UL/IEC62368-1, IS13252 (Part1) safety approved & EN62368-1, BS EN 62368-1 (Report); Design refer to EN61558-1 |      |      |       |        |
| Safety Class          |  | CLASS II  |      |      |       |        |
| MTBF                  | MIL-HDBK-217F@25°C   | > 300,000 h   |      |      |       |        |

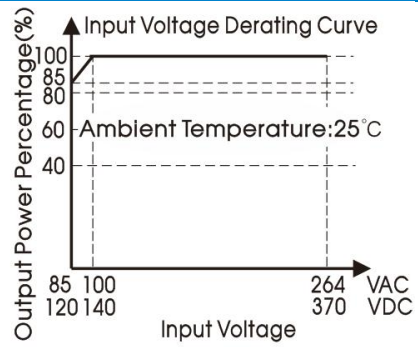
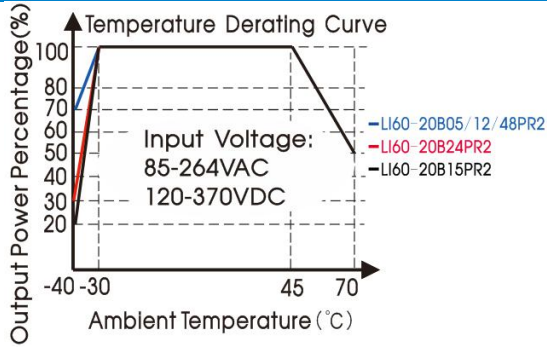
### Mechanical Specifications

|                    |                                   |
|--------------------|-----------------------------------|
| Case Material      | Plastic, heat-resistant (UL94V-0) |
| Package Dimensions | 92.66 x 52.00 x 58.00mm           |
| Weight             | 175g (Typ.)                       |
| Cooling method     | Free air convection               |

### Electromagnetic Compatibility (EMC)

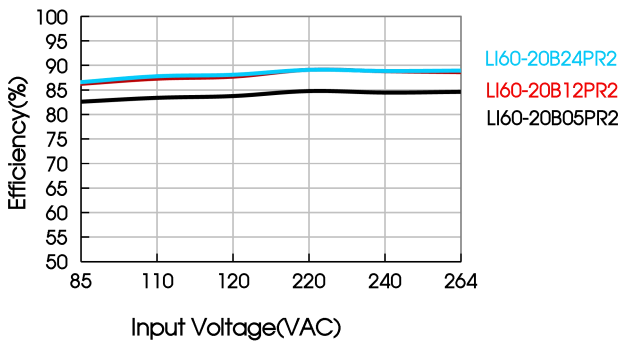
|           |   |                  |  |                  |
|-----------|---|------------------|--|------------------|
| Emissions | CE  | CISPR32/EN55032  | CLASS B  |                  |
|           | RE  | CISPR32/EN55032  | CLASS B  |                  |
| Immunity  | ESD   | IEC/EN61000-4-2  | Contact ±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 |
|           | Surge   | IEC/EN61000-4-5  | line to line ±2KV  | Perf. Criteria A |
|           | CS  | IEC/EN61000-4-6  | 10Vr.m.s   | Perf. Criteria A |
|           | Voltage dips, short interruptions and voltage variations immunity | IEC/EN61000-4-11 | 100% dip 1 periods, 30% dip 25 periods, 100% interruptions 250 periods |                  |

Product Characteristic Curve

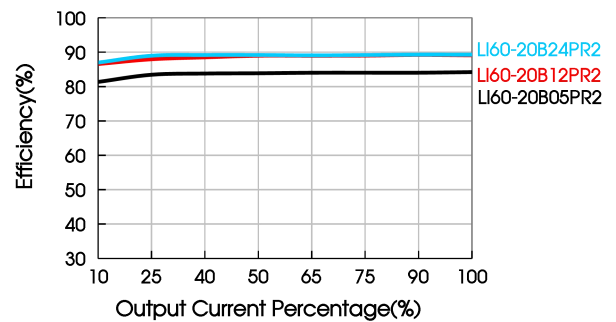


Note: ① With an AC input between 85-100VAC and a DC input between 120-140VDC, the output power must be derated as per temperature derating curves;  
② This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.

Efficiency Vs Input Voltage (Full Load)

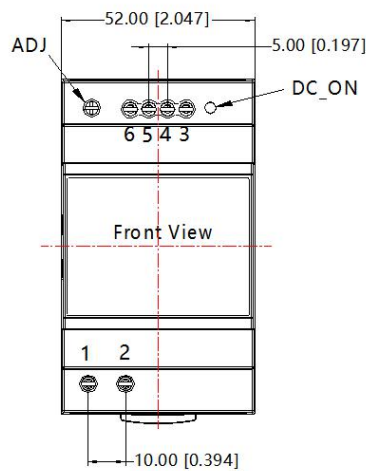
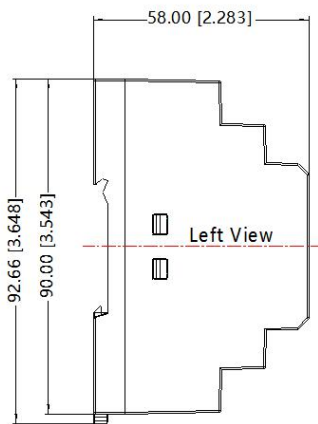


Efficiency Vs Output Load (Vin=230VAC)



Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



| Pin-Out |          |
|---------|----------|
| Pin     | LI60-20B |
| 1       | AC(L)    |
| 2       | AC(N)    |
| 3       | +Vo      |
| 4       | +Vo      |
| 5       | -Vo      |
| 6       | -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](http://www.mornsun-power.com). Packaging bag number: 58220078;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^{\circ}\text{C}$ , humidity<75% with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on our company corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Specifications are subject to change without prior notice.
6. Products are related to laws and regulations: see "Features" and "EMC";
7. 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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