

# AC/DC 200W Enclosed Switching Power Supply

LMF200-23BxxUH, LMF200-23BxxUH-C, LMF200-23BxxUH-YW

Series

MORNSUN®



CE Report  
EN62368-1



GB4943.1



BS EN 62368-1



www.bqs.gov.in



UL62368-1

RoHS



## FEATURES

- Universal 85 - 305VAC or 120 - 430VDC Input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Semi-potted process, fanless design
- Operating ambient temperature range: -40°C to +70°C
- High efficiency, active PFC
- 150% peak load output for 1 second
- High I/O isolation test voltage up to 4000VAC
- Output short circuit, over-current, over-voltage, over-temperature protection
- Operating altitude up to 5000m
- 3 years warranty

LMF200-23BxxUH series is one of Mornsun's enclosed fanless semi-potted ultra narrow AC-DC switching power supply, it is suitable for industrial and outdoor occasions where the application environment is relatively harsh. It features 305VAC operating conditions, universal AC input and at the same time accepts DC input voltage, cost-effective, high PF value, high efficiency, high reliability, 150% peak load output and operating altitude up to 5000m. These converters offer excellent EMC performance and meet UL/EN/BS EN 62368, EN60335, EN61558, GB4943 standards and they are widely used in areas of industrial, lighting, electricity, security, telecommunications, smart home etc.

## Selection Guide

| Certification | Part No.*      | Output Power (W) | Nominal Output Voltage and Current (Vo/Io) | Output Voltage Adjustable Range (V) | Efficiency at 230VAC (%) Typ. | Max. Capacitive Load (μF) |
|---------------|----------------|------------------|--------------------------------------------|-------------------------------------|-------------------------------|---------------------------|
| CCC/EN/BIS/UL | LMF200-23B05UH | 200              | 5V/40A                                     | 4.5-5.5                             | 91                            | 10000                     |
|               | LMF200-23B12UH | 200.4            | 12V/16.7A                                  | 11.4-12.6                           | 93                            | 8000                      |
|               | LMF200-23B24UH | 201.6            | 24V/8.4A                                   | 22.8-25.2                           | 94                            | 5000                      |
| EN (Pending)  | LMF200-23B28UH | 200.2            | 28V/7.15A                                  | 26.6-29.4                           | 94                            | 4000                      |
| CCC/EN/BIS/UL | LMF200-23B36UH | 201.6            | 36V/5.6A                                   | 34.2-37.8                           | 94                            | 3000                      |
|               | LMF200-23B48UH | 201.6            | 48V/4.2A                                   | 45.6-50.4                           | 94                            | 2000                      |

Note: \*Use suffix "C" for terminal with protective cover and 12V, 24V output product with optional salt-spray proof at terminal: LMF200-23BxxUH-YW.

## Input Specifications

| Item                    | Operating Conditions            |            | Min.        | Typ. | Max. | Unit |
|-------------------------|---------------------------------|------------|-------------|------|------|------|
| Input Voltage Range     | Rated input (Certified voltage) |            | 100         | --   | 277  | VAC  |
|                         | AC input                        |            | 85          | --   | 305  |      |
|                         | DC input                        |            | 120         | --   | 430  | VDC  |
| Input Voltage Frequency |                                 |            | 47          | --   | 63   | Hz   |
| Input Current           | 115VAC                          |            | --          | 2.1  | 2.5  | A    |
|                         | 230VAC                          |            | --          | 1.0  | 1.2  |      |
| Inrush Current          | 115VAC                          | Cold start | --          | 40   | --   |      |
|                         | 230VAC                          |            | --          | 80   | --   |      |
| Power Factor            | 115VAC                          | Full load  | --          | 0.98 | --   | --   |
|                         | 230VAC                          |            | --          | 0.95 | --   |      |
| Leakage Current         | 240VAC                          |            | <0.5mA      |      |      |      |
| Hot Plug                |                                 |            | Unavailable |      |      |      |

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## LMF200-23BxxUH, LMF200-23BxxUH-C, LMF200-23BxxUH-YW Series

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### Output Specifications

| Item                        | Operating Conditions                                  |                                      | Min.                                                                                              | Typ.  | Max. | Unit |
|-----------------------------|-------------------------------------------------------|--------------------------------------|---------------------------------------------------------------------------------------------------|-------|------|------|
| Output Voltage Accuracy     | Full load range                                       | 5V                                   | --                                                                                                | ±2.0  | --   | %    |
|                             |                                                       | 12V/24V/28V/36V/48V                  | --                                                                                                | ±1.0  | --   |      |
| Line Regulation             | Rated load                                            | 5V                                   | --                                                                                                | ±0.5  | --   |      |
|                             |                                                       | 12V/24V/28V/36V/48V                  | --                                                                                                | ±0.3  | --   |      |
| Load Regulation             | 0% - 100% load                                        | 5V                                   | --                                                                                                | ±1.0  | --   |      |
|                             |                                                       | 12V/24V/28V/36V/48V                  | --                                                                                                | ±0.5  | --   |      |
| Ripple & Noise*             | 20MHz bandwidth<br>(peak-to-peak value), 25°C         | 5V                                   | --                                                                                                | --    | 200  | mV   |
|                             |                                                       | 12V/24V/28V/36V                      | --                                                                                                | --    | 240  |      |
|                             |                                                       | 48V                                  | --                                                                                                | --    | 300  |      |
| Temperature Coefficient     |                                                       |                                      | --                                                                                                | ±0.03 | --   | %/°C |
| Minimum Load                |                                                       |                                      | 0                                                                                                 | --    | --   | %    |
| Hold-up Time                | 115VAC/230VAC                                         |                                      | 10                                                                                                | --    | --   | ms   |
| Short Circuit Protection    | Recovery time <10s after the short circuit disappear. | 5V                                   | Hiccup mode, constant current (200%Io-300%Io) works 200ms, turn off 10s, continuous, self-recover |       |      |      |
|                             |                                                       | 12V/24V/36V/48V                      | Hiccup mode, constant current (200%Io-300%Io) works 1s, turn off 10s, continuous, self-recover    |       |      |      |
| Over-current Protection     | 230VAC, rated load                                    | Normal temperature, high temperature | 105% - 200% Io, delay protection, delay time 1s, self-recovery after the abnormality is removed   |       |      |      |
|                             |                                                       | Low temperature                      | ≥ 105%Io, delay protection, delay time 1s, self-recovery after the abnormality is removed         |       |      |      |
| Over-voltage Protection     | 5V                                                    |                                      | < 6.3V (Hiccup, self-recover)                                                                     |       |      |      |
|                             | 12V                                                   |                                      | < 16V (Hiccup, self-recover)                                                                      |       |      |      |
|                             | 24V                                                   |                                      | < 35V (Hiccup, self-recover)                                                                      |       |      |      |
|                             | 28V                                                   |                                      | < 35V (Hiccup, self-recover)                                                                      |       |      |      |
|                             | 36V                                                   |                                      | < 47V (Hiccup, self-recover)                                                                      |       |      |      |
|                             | 48V                                                   |                                      | < 60V (Hiccup, self-recover)                                                                      |       |      |      |
| Over-temperature Protection |                                                       |                                      | Output voltage turn off, self-recover after the temperature drops                                 |       |      |      |

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 Enclosed Switching Power Supply Application Notes for specific information.

### General Specifications

| Item                  |                                                                                              | Operating Conditions                                                                                |                | Min.         | Typ. | Max. | Unit  |
|-----------------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|----------------|--------------|------|------|-------|
| Isolation             | Input -   | Electric strength test for 1min., leakage current <5mA                                              |                | 2000         | --   | --   | VAC   |
|                       | Input - output                                                                               |                                                                                                     |                | 4000         | --   | --   |       |
|                       | Output -  |                                                                                                     |                | 1250         | --   | --   |       |
| Insulation Resistance | Input -   | Ambient temperature: 25 ± 5℃<br>Relative humidity: < 95%RH, no condensation<br>Test voltage: 500VDC |                | 100          | --   | --   | M Ω   |
|                       | Input - output                                                                               |                                                                                                     |                | 100          | --   | --   |       |
|                       | Output -  |                                                                                                     |                | 100          | --   | --   |       |
| Operating Temperature |                                                                                              |                                                                                                     |                | -40          | --   | +70  | ℃     |
| Storage Temperature   |                                                                                              |                                                                                                     |                | -40          | --   | +85  |       |
| Storage Humidity      |                                                                                              | Non-condensing                                                                                      |                | 10           | --   | 95   | %RH   |
| Operating Humidity    |                                                                                              |                                                                                                     |                | 20           | --   | 90   |       |
| Power Derating        | Operating temperature derating                                                               | With aluminum plate*                                                                                |                | -40℃ to -30℃ | 4.0  | --   | % / ℃ |
|                       |                                                                                              |                                                                                                     |                | +50℃ to +70℃ | 2.0  | --   |       |
|                       |                                                                                              | Without aluminum plate                                                                              | 230VAC, others | -40℃ to -30℃ | 4.0  | --   |       |
|                       |                                                                                              |                                                                                                     |                | +50℃ to +70℃ | 3.0  | --   |       |

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|                                                                                                                                                                                                                                                                                                                                              |                        |  |                                    |                   |                                                                                                                                     |     |    |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--|------------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----|----|----|
|                                                                                                                                                                                                                                                                                                                                              |                        |  | 230VAC, 5V & 100VAC, others; 80%Io | -40℃ to -30℃      | 2.0                                                                                                                                 | --  | -- |    |
|                                                                                                                                                                                                                                                                                                                                              |                        |  |                                    | +50℃ to +70℃      | 2.0                                                                                                                                 | --  | -- |    |
|                                                                                                                                                                                                                                                                                                                                              |                        |  |                                    | 100VAC, 5V, 60%Io | +50℃ to +70℃                                                                                                                        | 1.0 | -- |    |
|                                                                                                                                                                                                                                                                                                                                              | Input voltage derating |  | 85VAC -100VAC                      |                   |                                                                                                                                     | 2.0 | -- | -- |
| Safety Standard                                                                                                                                                                                                                                                                                                                              |                        |  |                                    |                   | GB4943.1, UL62368-1, IS13252 (Part1)<br>safety approved & EN62368-1, BS EN62368-1 (Report);<br>Design refer to EN61558-1, EN60335-1 |     |    |    |
| Safety Class                                                                                                                                                                                                                                                                                                                                 |                        |  |                                    |                   | CLASS I                                                                                                                             |     |    |    |
| MTBF                                                                                                                                                                                                                                                                                                                                         | MIL-HDBK-217F@25℃      |  |                                    |                   | ≥ 300,000 h                                                                                                                         |     |    |    |
| Note: *In order to optimize the heat dissipation performance, when the aluminum plate is used for auxiliary heat dissipation, please note: 1. The size of the aluminum plate is 450mm x 450mm x 3mm; 2. The surface of the aluminum plate must be coated with thermal grease; 3. The product must be tightly attached to the aluminum plate. |                        |  |                                    |                   |                                                                                                                                     |     |    |    |

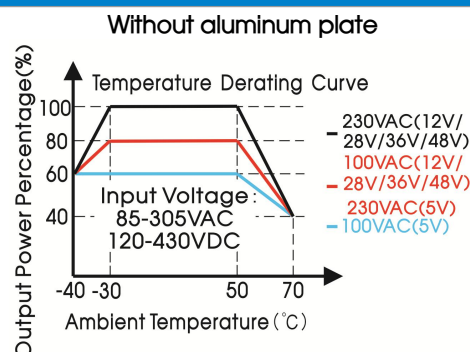
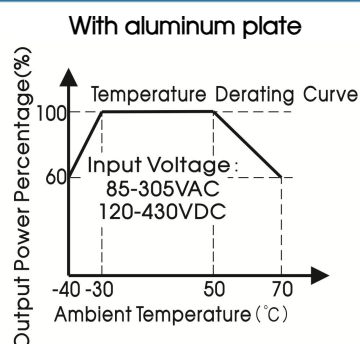
## Mechanical Specifications

|                |                              |
|----------------|------------------------------|
| Case Material  | Metal (AL6063, SGCC)         |
| Dimensions     | 194.00mm x 55.00mm x 26.00mm |
| Weight         | 430g (Typ.)                  |
| Cooling Method | Free air convection          |

## Electromagnetic Compatibility (EMC)

|           |                                                       |                                                    |                              |
|-----------|-------------------------------------------------------|----------------------------------------------------|------------------------------|
| Emissions | CE (Input port)                                       | CISPR32 EN55032 150K - 30MHz                       | CLASS B                      |
|           | RE                                                    | CISPR32 EN55032 30MHz - 2GHz                       | CLASS B                      |
|           | Harmonic current                                      | IEC/EN61000-3-2                                    | CLASS A, CLASS C and CLASS D |
| Immunity  | ESD                                                   | IEC/EN 61000-4-2 Contact ±6KV/Air ±8KV             | perf. Criteria A             |
|           | RS                                                    | IEC/EN 61000-4-3 10V/m                             | perf. Criteria A             |
|           | EFT                                                   | IEC/EN 61000-4-4 ±4KV                              | perf. Criteria A             |
|           | Surge                                                 | IEC/EN 61000-4-5 line to line ±2KV/line to PE ±4KV | perf. Criteria A             |
|           | CS                                                    | IEC/EN61000-4-6 0.15 - 80MHz 10 Vr.m.s             | perf. Criteria A             |
|           | Voltage dip, short interruption and voltage variation | IEC/EN61000-4-11 0%, 70%                           | perf. Criteria B             |
|           | Intercom interference test                            | MS-SOP-DQC-007                                     | perf. Criteria B             |

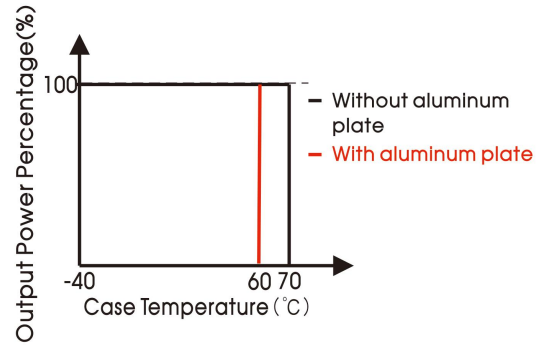
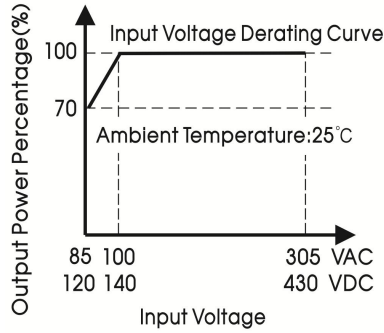
## Product Characteristic Curve



# AC/DC 200W Enclosed Switching Power Supply

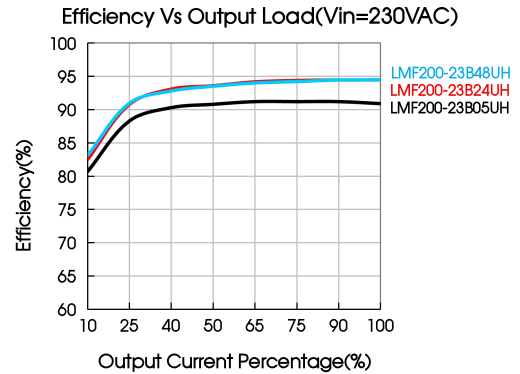
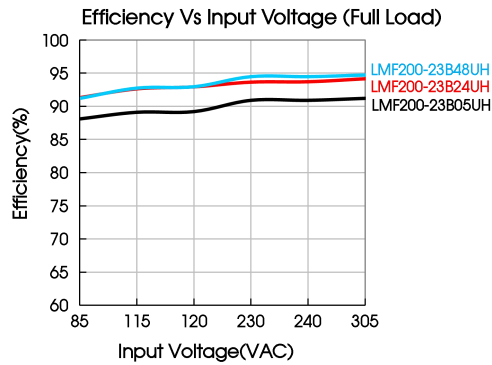
## LMF200-23BxxUH, LMF200-23BxxUH-C, LMF200-23BxxUH-YW Series

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Note: 1. With an AC input voltage between 85 - 100VAC and a DC input between 120 - 140VDC the output power must be derated as per the temperature derating curves;

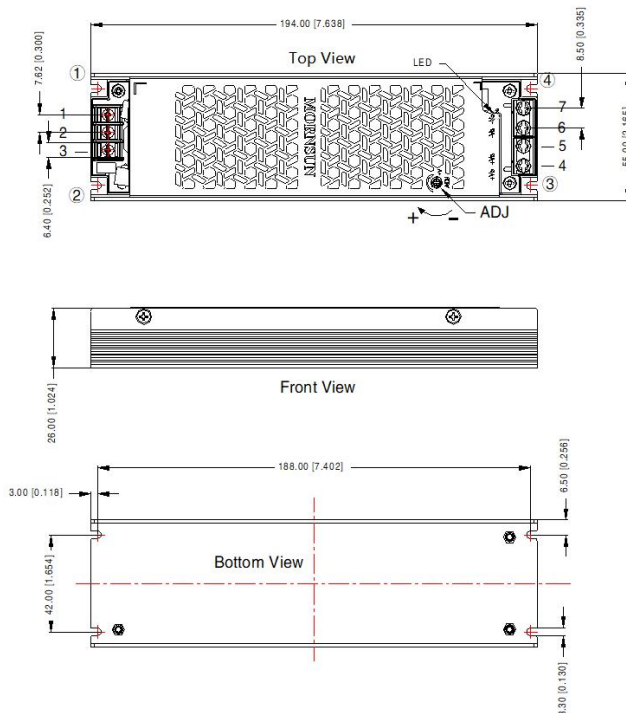
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.



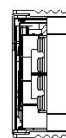
## Dimensions and Recommended Layout

LMF200-23BxxUH, LMF200-23BxxUH-YW Series

第三角投影



右视图



| Pin-Out |          |
|---------|----------|
| Pin     | Function |
| 1       | ⊕        |
| 2       | AC(L)    |
| 3       | AC(N)    |
| 4       | +Vo      |
| 5       | +Vo      |
| 6       | -Vo      |
| 7       | -Vo      |

Connector wires range

| Pro. No      | Input connector     | Output connector (single wire) | Output connector (double wire) | Output connector (double wires) Pic. |
|--------------|---------------------|--------------------------------|--------------------------------|--------------------------------------|
| 5V           |                     | No suggested                   | 14-12AWG                       |                                      |
| 12V          |                     | 14-12AWG                       | 18-12AWG                       |                                      |
| 24/36/48V    |                     | 16-12AWG                       | 20-12AWG                       |                                      |
| Screw/torque | M3.0,<br>Max 0.5N·m | M3.5,<br>Max 0.8N·m            |                                |                                      |

Note:

Unit: mm[inch]

ADJ: Output voltage adjustable resistor

General tolerances:  $\pm 1.00[\pm 0.039]$

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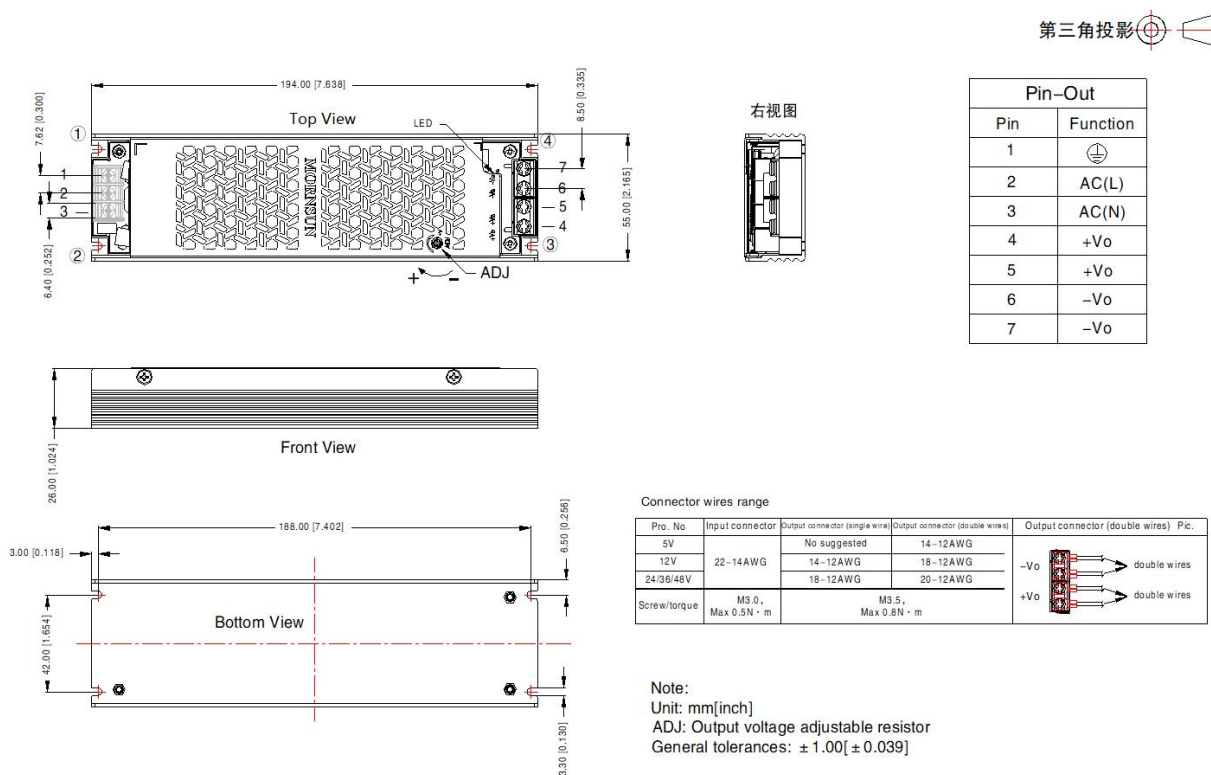
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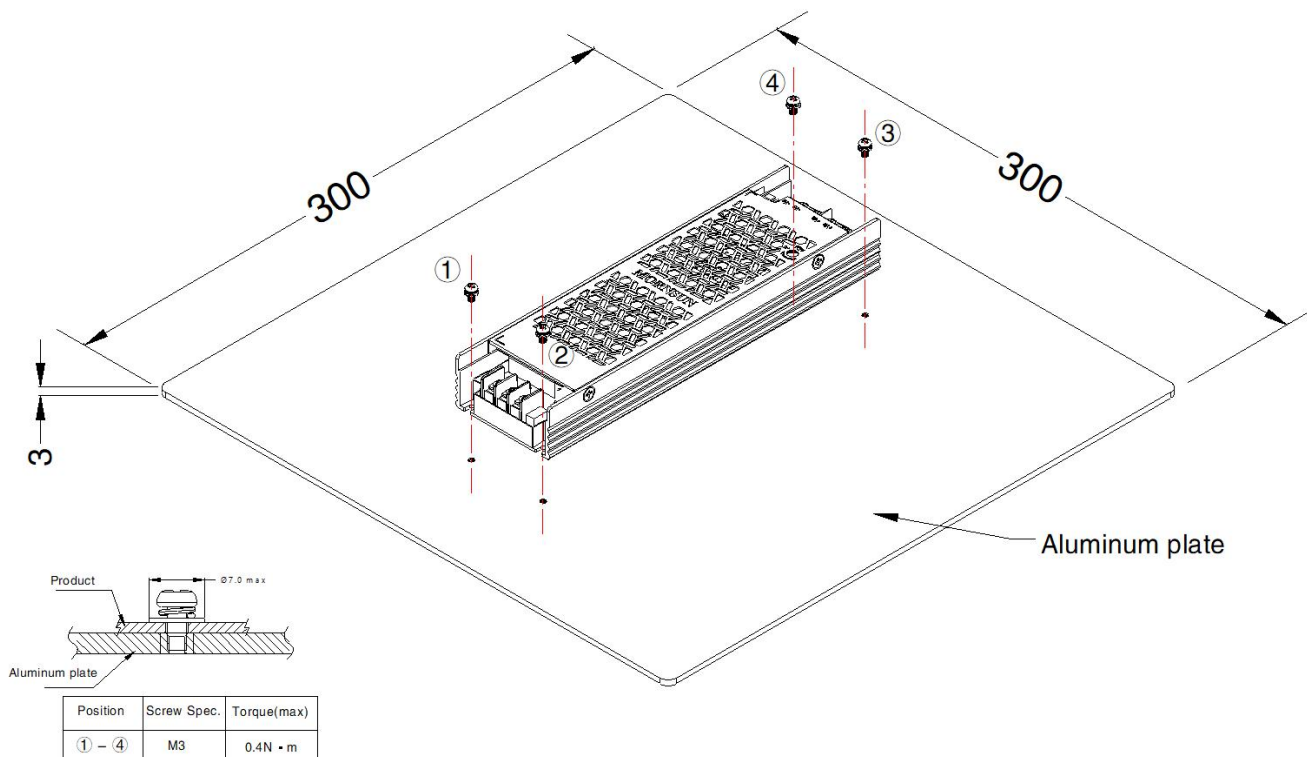
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### LMF200-23BxxUH-C Series



## Installation Diagram

### LMF200-23BxxUH, LMF200-23BxxUH-YW Series



**Note:** 1. In order to meet the "Derating Curve", the product testing must be installed onto an aluminum plate. The size of the suggested aluminum plate is shown as above. And for optimizing thermal performance, it is necessary to apply thermal grease on the bottom of the product.  
2. It is suggested to install the product with M3 combination screws, and the product must be firmly installed at the center of the aluminum plate.

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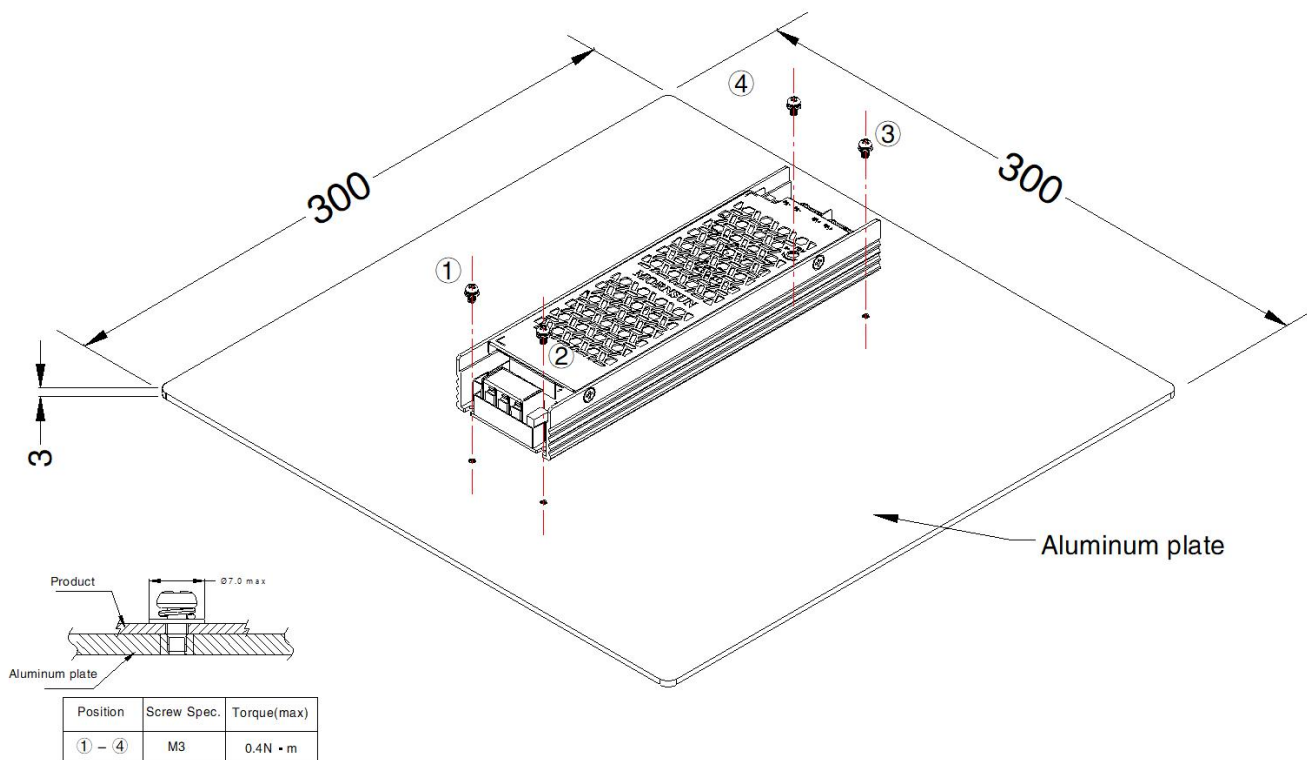
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LMF200-23BxxUH-C Series



**Note:** 1. In order to meet the "Derating Curve", the product testing must be installed onto an aluminum plate. The size of the suggested aluminum plate is shown as above. And for optimizing thermal performance, it is necessary to apply thermal grease on the bottom of the product.  
2. It is suggested to install the product with M3 combination screws, and the product must be firmly installed at the center of the aluminum plate.