

# MRS-15-H series

15W Constant Voltage Enclosed Switching Power Supply



## ■ Features:

- Universal AC input / Full range: 85~305VAC / 100~430VDC
- Low no-load power consumption < 0.5W
- Protections: Over current / Short circuit / Over Voltage
- LED indicator for power on
- Wide range of operating temperature range: -30°C to +70°C
- Design to meet EN61558 standard (OVP cat III)
- Operating altitude up to 5000m



## MODEL NUMBERING

| MRS                                                                 | - | 15                 | - | X                    | -    | U                                 | - | Y                         |
|---------------------------------------------------------------------|---|--------------------|---|----------------------|------|-----------------------------------|---|---------------------------|
| SERIES                                                              |   | RATED OUTPUT POWER |   | RATED OUTPUT VOLTAGE |      | INPUT VOLTAGE RANGE               |   | OPTIONS                   |
| ENCLOSED TYPE SWITCHING<br>POWER SUPPLY, CONSTANT<br>VOLTAGE DESIGN |   | 15 means 15W       |   | X = 03               | 3.3V | H means 85~300VAC<br>/ 100~430VDC |   | Y = C                     |
|                                                                     |   |                    |   | X = 05               | 5V   |                                   |   |                           |
|                                                                     |   |                    |   | X = 12               | 12V  |                                   |   |                           |
|                                                                     |   |                    |   | X = 15               | 15V  |                                   |   | Y = Q                     |
|                                                                     |   |                    |   | X = 24               | 24V  |                                   |   |                           |
|                                                                     |   |                    |   | X = 48               | 48V  |                                   |   |                           |
|                                                                     |   |                    |   |                      |      |                                   |   | Terminal block with cover |
|                                                                     |   |                    |   |                      |      |                                   |   | Conformal coating         |

## ELECTRICAL SPECIFICATION

| MODEL                                  | MRS-15-03-H                                           | MRS-15-05-H         | MRS-15-12-H          | MRS-15-15-H          | MRS-15-24-H          | MRS-15-48-H          |
|----------------------------------------|-------------------------------------------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| OUTPUT                                 |                                                       |                     |                      |                      |                      |                      |
| <i>RATED VOLTAGE</i>                   | 3.3V                                                  | 5V                  | 12V                  | 15V                  | 24V                  | 48V                  |
| <i>ADJUSTABLE VOLTAGE RANGE (MIN.)</i> | 2.85V ÷ 3.6V                                          | 4.5V ÷ 5.5V         | 10.8V ÷ 13.2V        | 13.5V ÷ 18V          | 21.6V ÷ 28.8V        | 42V ÷ 54V            |
| <i>RATED CURRENT</i>                   | 3A                                                    | 3A                  | 1.3A                 | 1.0A                 | 0.625A               | 0.32A                |
| <i>RATED POWER</i>                     | 9.9W                                                  | 15W                 | 15.6W                | 15W                  | 15W                  | 15.36W               |
| <i>LINE REGULATION</i>                 | ± 1.0%                                                | ± 1.0%              | ± 0.5%               | ± 0.5%               | ± 0.5%               | ± 0.5%               |
| <i>LOAD REGULATION</i>                 | ± 1.0%                                                | ± 1.0%              | ± 0.5%               | ± 0.5%               | ± 0.5%               | ± 0.5%               |
| <i>RIPPLE &amp; NOISE (MAX.) [2]</i>   | 80mV <sub>p-p</sub>                                   | 80mV <sub>p-p</sub> | 120mV <sub>p-p</sub> | 120mV <sub>p-p</sub> | 150mV <sub>p-p</sub> | 150mV <sub>p-p</sub> |
| <i>HOLD UP TIME (TYP.)</i>             | 48ms / 230VAC at full load; 7ms / 115VAC at full load |                     |                      |                      |                      |                      |
|                                        |                                                       |                     |                      |                      |                      |                      |
| INPUT                                  |                                                       |                     |                      |                      |                      |                      |
| <i>VOLTAGE RANGE</i>                   | 85 ÷ 305VAC; 100 ÷ 430VDC                             |                     |                      |                      |                      |                      |
| <i>FREQUENCY RANGE</i>                 | 47 ÷ 63Hz                                             |                     |                      |                      |                      |                      |
| <i>EFFICIENCY (TYP.)</i>               | 73%                                                   | 78%                 | 82%                  | 82%                  | 83%                  | 83%                  |
| <i>AC CURRENT (TYP.)</i>               | 0.25A / 230VAC; 0.35A / 115VAC                        |                     |                      |                      |                      |                      |
| <i>INRUSH CURRENT (TYP.)</i>           | 50A / 230VAC; 30A / 115VAC                            |                     |                      |                      |                      |                      |
| <i>LEAKAGE CURRENT (MAX.)</i>          | 0.5mA / 277VAC                                        |                     |                      |                      |                      |                      |

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## PROTECTIONS

|                      |                                                      |           |           |           |           |         |
|----------------------|------------------------------------------------------|-----------|-----------|-----------|-----------|---------|
| <b>OVER CURRENT</b>  | Range: 110% ÷ 200% rated current                     |           |           |           |           |         |
|                      | Type: hiccup mode, auto-recovery                     |           |           |           |           |         |
| <b>SHORT CIRCUIT</b> | Type: hiccup mode, auto-recovery, recovery time < 5s |           |           |           |           |         |
| <b>OVER VOLTAGE</b>  | ≤ 6.75VDC                                            | ≤ 6.75VDC | ≤ 16.2VDC | ≤ 21.8VDC | ≤ 33.6VDC | ≤ 60VDC |
|                      | Type: hiccup mode or clamp                           |           |           |           |           |         |

## WORKING ENVIRONMENT

|                                         |                                                    |       |
|-----------------------------------------|----------------------------------------------------|-------|
| <b>WORKING TEMPERATURE</b>              | -30°C ÷ 70°C (Refer to Temperature Derating Curve) |       |
| <b>WORKING HUMIDITY</b>                 | 20 ÷ 90% RH non-condensing                         |       |
| <b>STORAGE TEMPERATURE AND HUMIDITY</b> | -40°C ÷ 85°C, 10 ÷ 95% RH non-condensing           |       |
| <b>TEMPERATURE COEFFICIENT</b>          | ± 0.03% / °C                                       |       |
| <b>OPERATION ALTITUDE (MAX.)</b>        | [5]                                                | 5000m |

## SAFETY AND EMC REGULATIONS

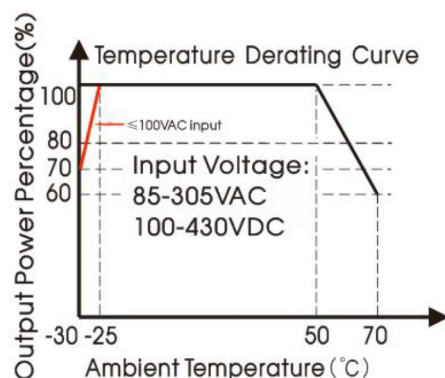
|                             |                                                                                |
|-----------------------------|--------------------------------------------------------------------------------|
| <b>SAFETY STANDARDS</b>     | Compliance to EN62368-1                                                        |
| <b>WITHSTAND VOLTAGE</b>    | IN/OUT: 4000VAC (< 10mA); IN/GND: 2000VAC (< 10mA) ; OUT/GND: 1250VAC (< 10mA) |
| <b>ISOLATION RESISTANCE</b> | IN/OUT, IN/GND, OUT/GND: 100MΩ/500VDC                                          |
| <b>EMC EMISSION</b>         | Compliance to EN55032                                                          |
| <b>EMC IMMUNITY</b>         | Compliance to EN55035; EN61000-4-2, -3, -4, -5, -6, -11                        |
| <b>HARMONIC CURRENT</b>     | Compliance to EN61000-3-3, EN61000-3-2                                         |

## OTHERS

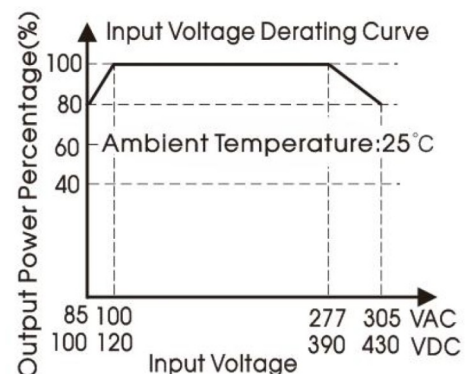
|                                     |                                                  |
|-------------------------------------|--------------------------------------------------|
| <b>MTBF (MIN.)</b>                  | 700 000h / 25°C per MIL-HDBK-217F                |
| <b>DIMENSIONS AND CASE MATERIAL</b> | 65 x 55 x 25mm (L x W x H); Metal (AL5052, SGCC) |
| <b>NET WEIGHT</b>                   | 0.09kg                                           |

1. All parameters NOT specially mentioned are measured at 230VAC input, rated load, 25°C of ambient temperatur and humidity <75% RH.
2. Ripple & noise is measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1μF i 47μF parallel capacitor.
3. 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.
4. Case needs to be connected to the earth (⊕) of the system when the terminal equipment in operating.
5. The room temperature derating of 3.5°C / 1000m is needed for operating altitude greater than 2000m.
6. Power supply is considered as component not indented to apply by end-user. Power supply meets safety and EMC standards however the final equipment with power supply must be re-quality to comply with EMC Directives.

### DERATING CURVE



### STATIC CHARACTERISTIC

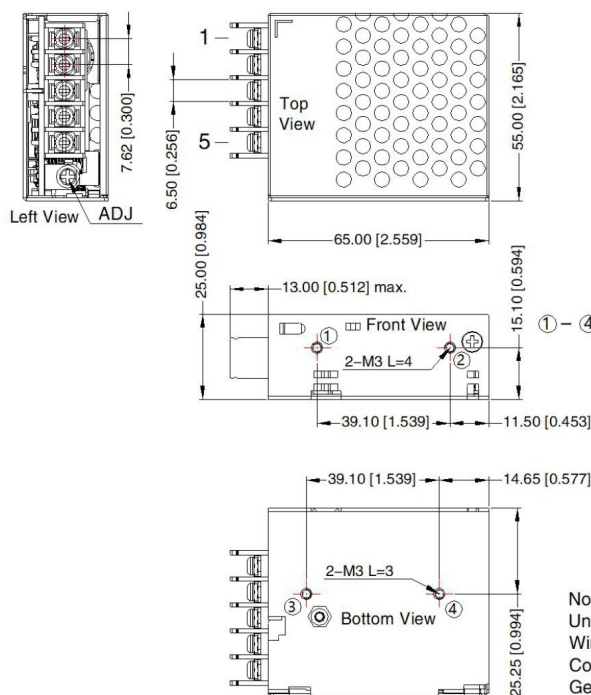


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## MECHANICAL SPECIFICATION of MRS-15-H and MRS-15-H-Q



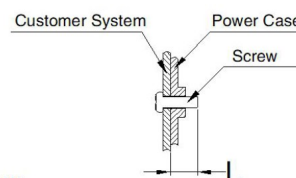
THIRD ANGLE PROJECTION

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

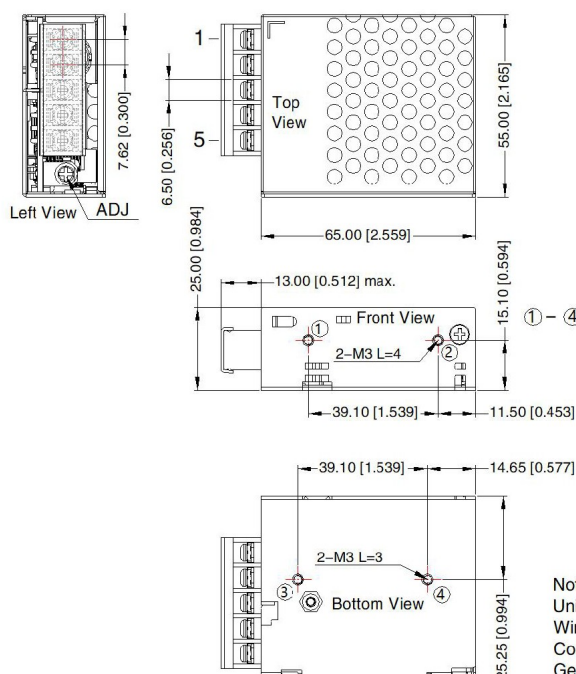
① - ④ any position must be connected to the earth (⊕)

| Position | Screw Spec. | L(max) | Torque(max) |
|----------|-------------|--------|-------------|
| ① - ②    | M3          | 4mm    | 0.4N·m      |
| ③ - ④    | M3          | 3mm    | 0.4N·m      |

Note:  
Unit: mm[inch]  
Wire range: 22-14AWG  
Connector tightening torque: M3, 0.4N·m  
General tolerances:  $\pm 1.00 [\pm 0.039]$



## MECHANICAL SPECIFICATION of MRS-15-H-C



THIRD ANGLE PROJECTION

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

① - ④ any position must be connected to the earth (⊕)

| Position | Screw Spec. | L(max) | Torque(max) |
|----------|-------------|--------|-------------|
| ① - ②    | M3          | 4mm    | 0.4N·m      |
| ③ - ④    | M3          | 3mm    | 0.4N·m      |

Note:  
Unit: mm[inch]  
Wire range: 22-14AWG  
Connector tightening torque: M3, 0.4N·m  
General tolerances:  $\pm 1.00 [\pm 0.039]$

