



# 500W Enclosed Type Reliable Railway DC-DC Converter **RSD-500** series



## ■ Features

- Compliance to BS EN/EN50155 and BS EN/EN45545-2 railway standard
- 1U low profile 41mm
- 2:1 wide input range
- **Fanless design**, half encapsulated , cooling by free air convection
- -40~+80°C wide operating temperature
- DC output adjustable
- Protections: Short circuit / Overload / Over voltage / Over temperature / Input reverse polarity/ Input under voltage protection
- 4KVdc I/O isolation(Reinforced isolation)
- Operating additude up to 5000 meters(Note.5)
- LED indicator for power on
- 3 years warranty

## ■ Description

RSD-500 series is a 500W enclosed type reliable railway DC-DC converter. This series is compliant with BS EN/EN50155/BS EN/EN45545-2 railway standard, constituting three types of models with 2:1 wide but different input ranges 16.8~33.6V/33.6~67.2V/67.2~154V, suitable for railway and all kinds of transportation systems exploiting the frequently used standard input voltages such as 24V, 36V, 48V, 72V, 96V and 110V. Various output voltages, 12V, 24V and 48V are available for selection.

This series has the capability of working under -40~+80°C, low ripple and noise, supreme EMC characteristics, 4KVdc I/O isolation, low enclosure profile 41mm and an interior with semi-potted silicone. It does not only well fits the in-car systems or the facilities by rails for railway, trams and buses but also can be used in the harsh environment with high vibration, high dust, extremely low or high temperature, etc.

## ■ Model Encoding

**RSD - 500 B - 24**

- Output voltage(12/24/48Vdc)
- Input voltage (B:16.8~33.6Vdc, C:33.6~67.2Vdc, D:67.2~154Vdc)
- Rated wattage
- Series name

## ■ Applications

- Bus, tram, metro or railway system
- Industrial control system
- Semi-conductor fabrication equipment
- Factory automation
- Electro-mechanical
- Wireless network
- Telecom or datacom system
- Highly vibrating, highly dusty, extremely low or high temperature harsh environment

## ■ GTIN CODE

MW Search: <https://www.meanwell.com/serviceGTIN.aspx>

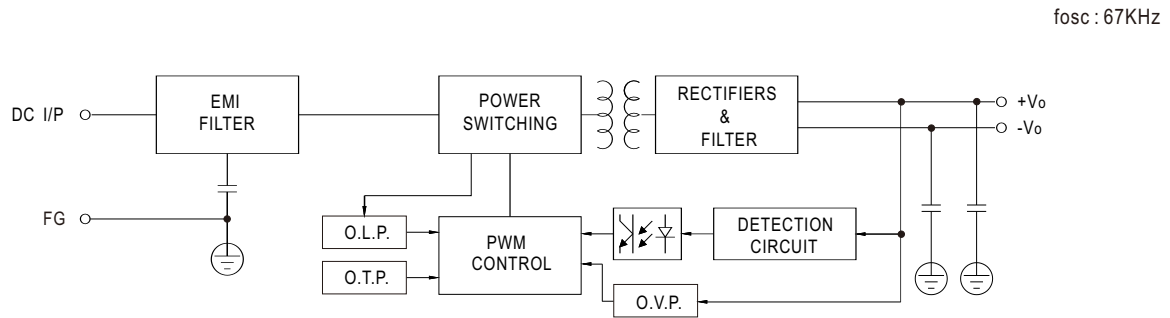


# 500W Enclosed Type Reliable Railway DC-DC Converter **RSD-500** series

## SPECIFICATION

| MODEL                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                  | RSD-500B-12                                                                                                                                                       | RSD-500B-24 | RSD-500B-48                        | RSD-500C-12                 | RSD-500C-24 | RSD-500C-48                                                   | RSD-500D-12    | RSD-500D-24 | RSD-500D-48 |  |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------------------------|-----------------------------|-------------|---------------------------------------------------------------|----------------|-------------|-------------|--|
| OUTPUT                    | DC VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                  | 12V                                                                                                                                                               | 24V         | 48V                                | 12V                         | 24V         | 48V                                                           | 12V            | 24V         | 48V         |  |
|                           | RATED CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                  | 35A                                                                                                                                                               | 17.5A       | 8.8A                               | 35A                         | 19.2A       | 9.6A                                                          | 35A            | 20.8A       | 10.4A       |  |
|                           | CURRENT RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                  | 0 ~ 35A                                                                                                                                                           | 0 ~ 17.5A   | 0 ~ 8.8A                           | 0 ~ 35A                     | 0 ~ 19.2A   | 0 ~ 9.6A                                                      | 0 ~ 35A        | 0 ~ 20.8A   | 0 ~ 10.4A   |  |
|                           | RATED POWER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                  | 420W                                                                                                                                                              | 420W        | 422.4W                             | 420W                        | 460.8W      | 460.8W                                                        | 420W           | 499.2W      | 499.2W      |  |
|                           | RIPPLE & NOISE (max.) <small>Note.2</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                  | 100mVp-p                                                                                                                                                          | 120mVp-p    | 150mVp-p                           | 100mVp-p                    | 120mVp-p    | 150mVp-p                                                      | 100mVp-p       | 120mVp-p    | 150mVp-p    |  |
|                           | VOLTAGE ADJ. RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                  | 12 ~ 14V                                                                                                                                                          | 24 ~ 28V    | 48~ 56V                            | 12 ~ 14V                    | 24 ~ 28V    | 48~ 56V                                                       | 12 ~ 14V       | 24 ~ 28V    | 48~ 56V     |  |
|                           | VOLTAGE TOLERANCE <small>Note.3</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                  | ±1.0%                                                                                                                                                             | ±1.0%       | ±1.0%                              | ±1.0%                       | ±1.0%       | ±1.0%                                                         | ±1.0%          | ±1.0%       | ±1.0%       |  |
|                           | LINE REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                  | ±0.5%                                                                                                                                                             | ±0.5%       | ±0.5%                              | ±0.5%                       | ±0.5%       | ±0.5%                                                         | ±0.5%          | ±0.5%       | ±0.5%       |  |
|                           | LOAD REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                  | ±1.0%                                                                                                                                                             | ±1.0%       | ±1.0%                              | ±1.0%                       | ±1.0%       | ±1.0%                                                         | ±1.0%          | ±1.0%       | ±1.0%       |  |
|                           | SETUP, RISE TIME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                  | 500ms, 60ms                                                                                                                                                       |             |                                    |                             |             |                                                               |                |             |             |  |
| HOLD UP TIME (Typ.)       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Please refer to page 4 hold up time (Load de-rating curve )                                                                                      |                                                                                                                                                                   |             |                                    |                             |             |                                                               |                |             |             |  |
| INPUT                     | VOLTAGE RANGE <small>Note.4</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | CONTINUOUS                                                                                                                                       | 16.8 ~ 33.6Vdc                                                                                                                                                    |             |                                    | 33.6 ~ 67.2Vdc              |             |                                                               | 67.2 ~ 154Vdc  |             |             |  |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1s                                                                                                                                               | 14.4 ~ 16.8Vdc                                                                                                                                                    |             |                                    | 28.8 ~ 33.6Vdc              |             |                                                               | 57.6 ~ 67.2Vdc |             |             |  |
|                           | EFFICIENCY (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                  | 92%                                                                                                                                                               | 92%         | 92%                                | 93%                         | 93%         | 93%                                                           | 93%            | 93%         | 93%         |  |
|                           | DC CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                  | 21.5A @24Vdc                                                                                                                                                      |             |                                    | 11A @48Vdc                  |             |                                                               | 5A @110Vdc     |             |             |  |
|                           | INRUSH CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                  | 30A                                                                                                                                                               |             |                                    |                             |             |                                                               |                |             |             |  |
|                           | INTERRUPTION OF VOLTAGE SUPPLY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                  | EN50155:2021-B/C/D type comply with S1 level (3ms)@ full load;<br>B/C type comply with S2 level (10ms)@ 70% load, D- type comply with S2 level (10ms) @ full load |             |                                    |                             |             |                                                               |                |             |             |  |
| PROTECTION                | OVERLOAD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                  | Constant current limiting 105~135% rated output power with auto-recovery                                                                                          |             |                                    |                             |             |                                                               |                |             |             |  |
|                           | OVER VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                  | 14.4 ~ 17.5V                                                                                                                                                      | 28.8 ~ 35V  | 57.6 ~ 65V                         | 14.4 ~ 17.5V                | 28.8 ~ 35V  | 57.6 ~ 65V                                                    | 14.4 ~ 17.5V   | 28.8 ~ 35V  | 57.6 ~ 65V  |  |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                  | Protection type : Shut down o/p voltage, re-power on to recover                                                                                                   |             |                                    |                             |             |                                                               |                |             |             |  |
|                           | OVER TEMPERATURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                  | Shut down o/p voltage, re-power on to recover                                                                                                                     |             |                                    |                             |             |                                                               |                |             |             |  |
|                           | REVERSE POLARITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                  | By internal, MOSFET, no damage, recovers automatically after fault condition is removed                                                                           |             |                                    |                             |             |                                                               |                |             |             |  |
| UNDER VOLTAGE LOCKOUT     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 24Vin :Power ON≥16.8V ,<br>OFF≤16.5V                                                                                                             |                                                                                                                                                                   |             | 48Vin :Power ON≥33.6V ,<br>OFF≤33V |                             |             | 110Vin :Power ON≥67.2V ,<br>OFF≤65V                           |                |             |             |  |
| ENVIRONMENT               | WORKING TEMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                  | -40 ~ +80℃ (Refer to "Derating Curve")                                                                                                                            |             |                                    |                             |             |                                                               |                |             |             |  |
|                           | WORKING HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                  | 5 ~ 95% RH non-condensing                                                                                                                                         |             |                                    |                             |             |                                                               |                |             |             |  |
|                           | STORAGE TEMP., HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                  | -40 ~ +85, 5 ~ 95% RH non-condensing                                                                                                                              |             |                                    |                             |             |                                                               |                |             |             |  |
|                           | TEMP. COEFFICIENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                  | ±0.03%/℃ (0 ~ 55℃ )                                                                                                                                               |             |                                    |                             |             |                                                               |                |             |             |  |
|                           | VIBRATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                  | Component:10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes; Mounting: Compliance to IEC61373                                                          |             |                                    |                             |             |                                                               |                |             |             |  |
|                           | OPERATING ALTITUDE <small>Note.5</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                  | 5000 meters / OVCII                                                                                                                                               |             |                                    |                             |             |                                                               |                |             |             |  |
| SAFETY & EMC<br>(Note 6 ) | SAFETY STANDARDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                  | UL62368-1, IEC 62368-1, AS/NZS 62368-1, EAC TP TC 004 approved, Design refer to BS EN/EN62368-1                                                                   |             |                                    |                             |             |                                                               |                |             |             |  |
|                           | WITHSTAND VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                  | I/P-O/P:4KVdc I/P-FG:2.5KVdc O/P-FG:2.5KVdc                                                                                                                       |             |                                    |                             |             |                                                               |                |             |             |  |
|                           | ISOLATION RESISTANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                  | I/P-O/P, I/P-FG, O/P-FG:>100M Ohms / 500Vdc / 25℃ / 70% RH                                                                                                        |             |                                    |                             |             |                                                               |                |             |             |  |
|                           | EMC EMISSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                  | Parameter                                                                                                                                                         |             | Standard                           |                             |             | Test Level / Note                                             |                |             |             |  |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                  | Conducted                                                                                                                                                         |             | BS EN/EN55032 (CISRP32)            |                             |             | Class A                                                       |                |             |             |  |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                  | Radiated                                                                                                                                                          |             | BS EN/EN55032 (CISRP32)            |                             |             | Class B                                                       |                |             |             |  |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                  | Voltage Flicker                                                                                                                                                   |             | BS EN/EN61000-3-3                  |                             |             | -----                                                         |                |             |             |  |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                  | Harmonic Current                                                                                                                                                  |             | -----                              |                             |             | -----                                                         |                |             |             |  |
|                           | EMC IMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                  | BS EN/EN55035                                                                                                                                                     |             |                                    |                             |             |                                                               |                |             |             |  |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                  | Parameter                                                                                                                                                         |             | Standard                           |                             |             | Test Level / Note                                             |                |             |             |  |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                  | ESD                                                                                                                                                               |             | BS EN/EN61000-4-2                  |                             |             | Level 3, 8KV air ; Level 3, 6KV contact; criteria A           |                |             |             |  |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                  | Radiated                                                                                                                                                          |             | BS EN/EN61000-4-3                  |                             |             | Level 3, 10V/m ; criteria A                                   |                |             |             |  |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                  | EFT / Burst                                                                                                                                                       |             | BS EN/EN61000-4-4                  |                             |             | Level 3, 2KV ; criteria A                                     |                |             |             |  |
|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                  | Surge                                                                                                                                                             |             | BS EN/EN61000-4-5                  |                             |             | Level 3, 1KV/Line-Line ;Level 3, 2KV/Line-Line-FG ;criteria A |                |             |             |  |
| Conducted                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                  | BS EN/EN61000-4-6                                                                                                                                                 |             |                                    | Level 3, 10V ; criteria A   |             |                                                               |                |             |             |  |
| Magnetic Field            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                  | BS EN/EN61000-4-8                                                                                                                                                 |             |                                    | Level 4, 30A/m ; criteria A |             |                                                               |                |             |             |  |
| RAILWAY STANDARD          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Compliance to BS EN/EN45545-2 for fire protection ; BS EN/EN50155 / IEC60571 including IEC61373 for shock & vibration, BS EN/EN50121-3-2 for EMC |                                                                                                                                                                   |             |                                    |                             |             |                                                               |                |             |             |  |
| OTHERS                    | MTBF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                  | 834.7K hrs min. Telcordia SR-332 (Bellcore) ; 99.1K hrs min. MIL-HDBK-217F (25℃)                                                                                  |             |                                    |                             |             |                                                               |                |             |             |  |
|                           | DIMENSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                  | 237*100*41mm (L*W*H)                                                                                                                                              |             |                                    |                             |             |                                                               |                |             |             |  |
|                           | PACKING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                  | 1.45Kg;10pcs/15.5Kg/0.8CUFT                                                                                                                                       |             |                                    |                             |             |                                                               |                |             |             |  |
| NOTE                      | <div>1. All parameters NOT specially mentioned are measured at normal input (B:24Vdc , C:48Vdc , D:110Vdc ) , rated load and 25℃ of ambient temperature.</div> <div>2. Ripple &amp; noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1μf &amp; 47μf parallel capacitor.</div> <div>3. Tolerance : includes set up tolerance, line regulation and load regulation.</div> <div>4. Derating may be needed under low input voltage. Please check the derating curve for more details.</div> <div>5. The ambient temperature derating of 3.5℃/1000m with fanless models and of 5℃/1000m with fan models for operating altitude higher than2000m(6500ft).</div> <div>6. The power supply is considered as an independent unit, but the final equipment still need to re-confirm that the whole system complies with the EMC directives. For guidance on how to perform these EMC tests, please refer to “EMI testing of component power supplies.”<br/>(as available on <a href="https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf">https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf</a> )</div> <div>※ Product Liability Disclaimer : For detailed information, please refer to <a href="https://www.meanwell.com/serviceDisclaimer.aspx">https://www.meanwell.com/serviceDisclaimer.aspx</a></div> |                                                                                                                                                  |                                                                                                                                                                   |             |                                    |                             |             |                                                               |                |             |             |  |

## Block Diagram



## Input Fuse

There are two or three fuses connected in series to the positive input line, which are used to protect against abnormal surge. Fuse specifications of each model are shown as below.

| Type | Fuse Type | Reference and Rating       |
|------|-----------|----------------------------|
| B    | Time-Lag  | WALTER WN 20, 20A, 500V *2 |
| C    | Time-Lag  | Conquer MST, 10A, 250V *3  |
| D    | Time-Lag  | Conquer MST, 10A, 250V *2  |

## Input Reverse Polarity Protection

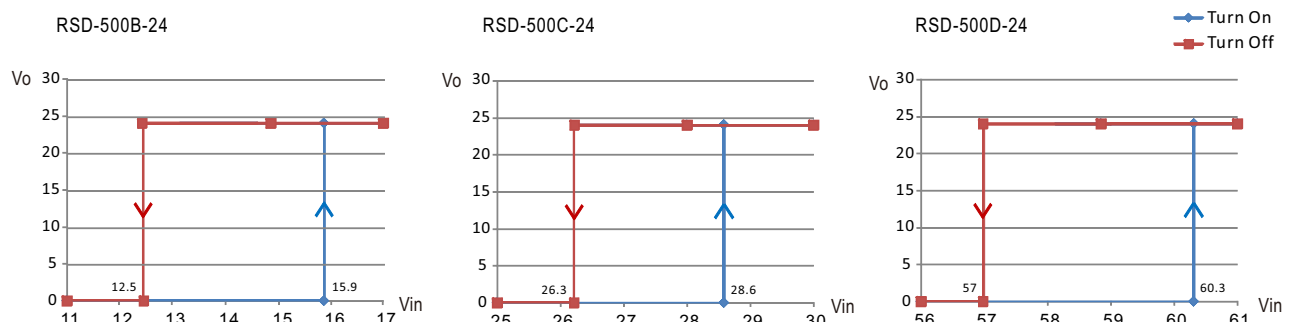
There is a MOSFET connected in series to the negative input line. If the input polarity is connected reversely, the MOSFET opens and there will be no output to protect the unit.

## Input Range and Transient Ability

The series has a wide range input capability. Within  $\pm 30\%$  of rated input voltage, it can be executed at full-load operation and operate properly; with  $\pm 40\%$  of rated input voltage, it can withstand that for 1 second.

## Input Under-Voltage Protection

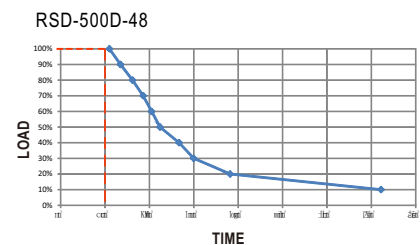
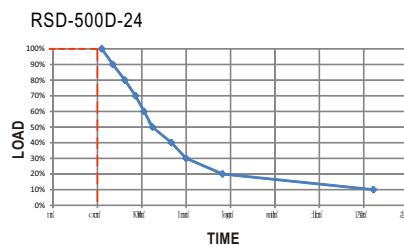
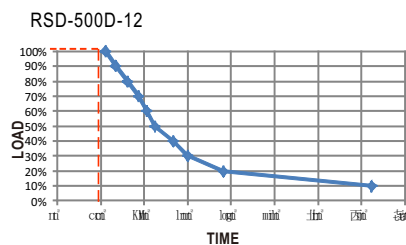
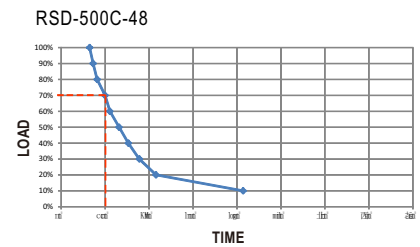
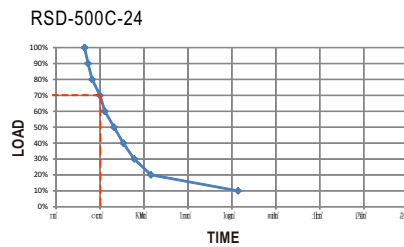
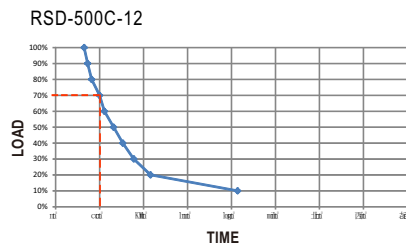
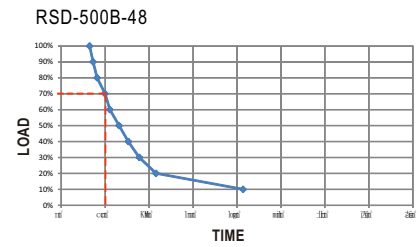
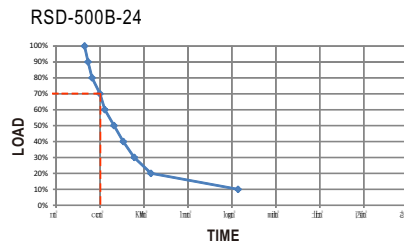
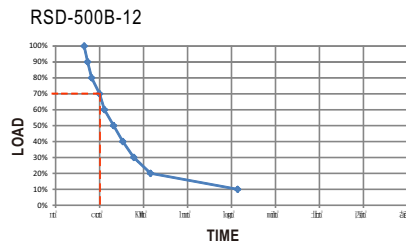
If input voltage drops below  $V_{min}$ , the internal control IC shuts down and there is no output voltage. It recovers automatically when input voltage reaches above  $V_{min}$ , please refer to the curve below.



## Inrush Current

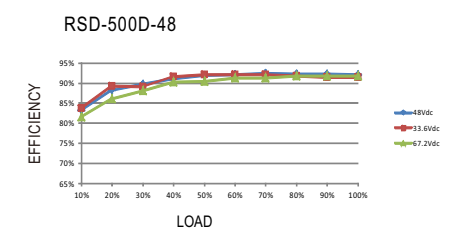
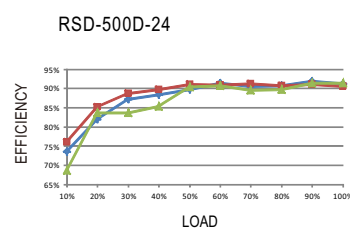
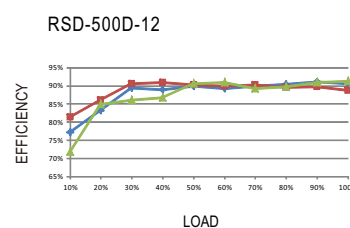
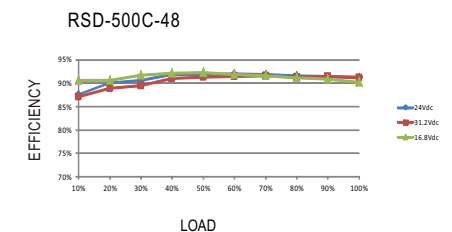
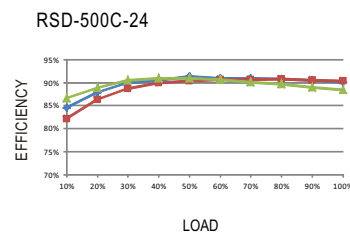
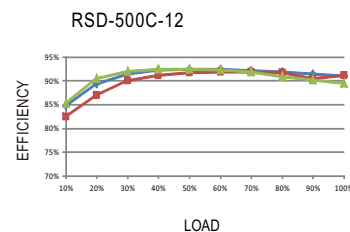
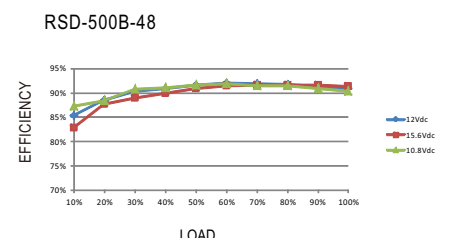
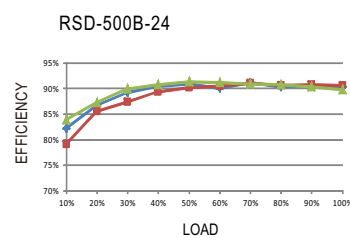
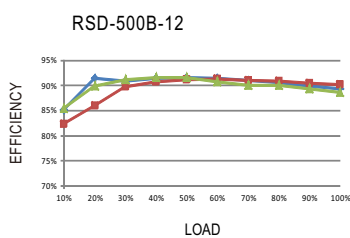
Inrush current is suppressed by a resistor during the initial start-up, and then the resistor is bypassed by a Relay to reduce power consumption after accomplishing the start-up.

## Hold-up Time



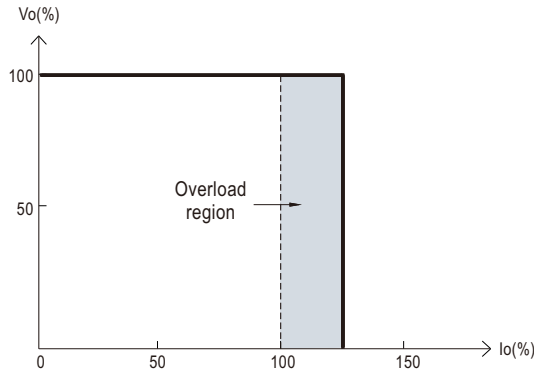
## Efficiency vs Load & Vin Curve

The efficiency vs load & Vin curves of each model are shown as below.



## ■ Overload Protection

If the output draw up to 105~135% of its output power rating, the converter will go into overload protection which is constant current mode. After the faulty condition is removed, it will recover automatically. Please refer to the diagram below for the detail operation characteristic. Please note that it's not suitable to operate within the overload region continuously, or it may cause to over temperature and reduce the life of the power supply unit or even damage it.



## ■ Over Voltage Protection

The converter shuts off to protect itself when the output voltage drawn exceeds 115~140% of its output rating. It must be repowered on to recover.

## ■ Over Temperature Protection

The converter shuts off to protect itself when the built-in temperature sensor mounted on the main power transformer senses a high temperature. It must be repowered on to recover.

## ■ LED Indicator

Equipped with a built-in LED indicator, the converter provides an easy way for users to check its condition through the LED indicator.

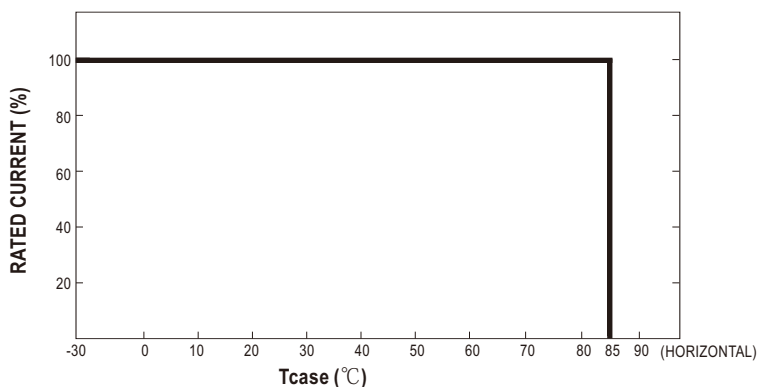
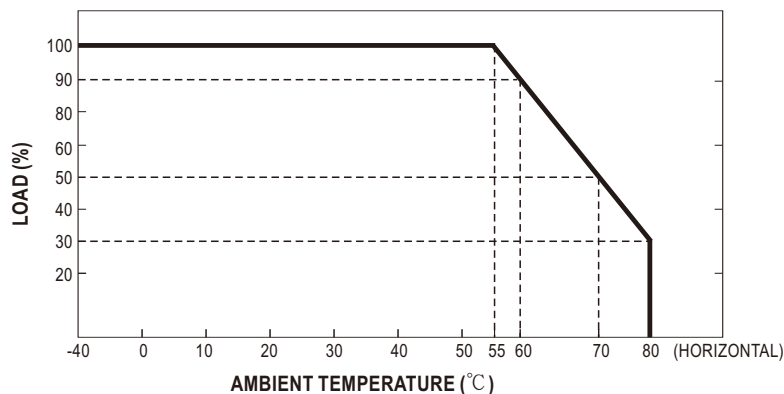
Green : normal operation;

No signal: no power or failure.

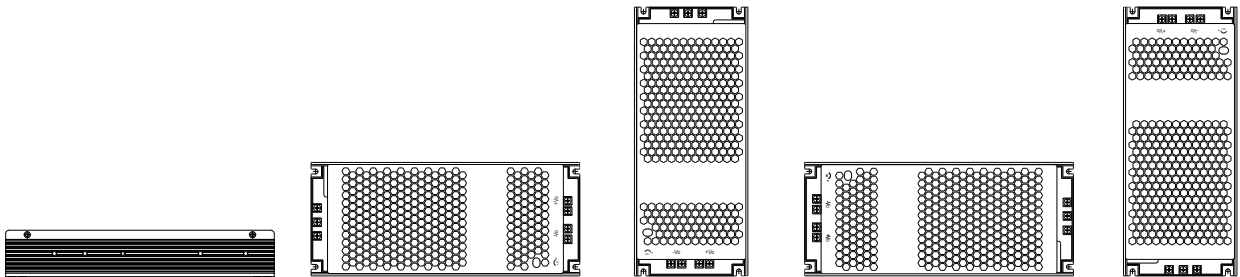
## ■ Derating Curve

### a. Single unit operation

If the unit has no iron plate mounted on its bottom, the maximum ambient temperature for the unit will be 55°C as operating under full load condition. It requires de-rating output current when ambient temperature is between 55 ~ 80°C, please refer to the de-rating curve as below.

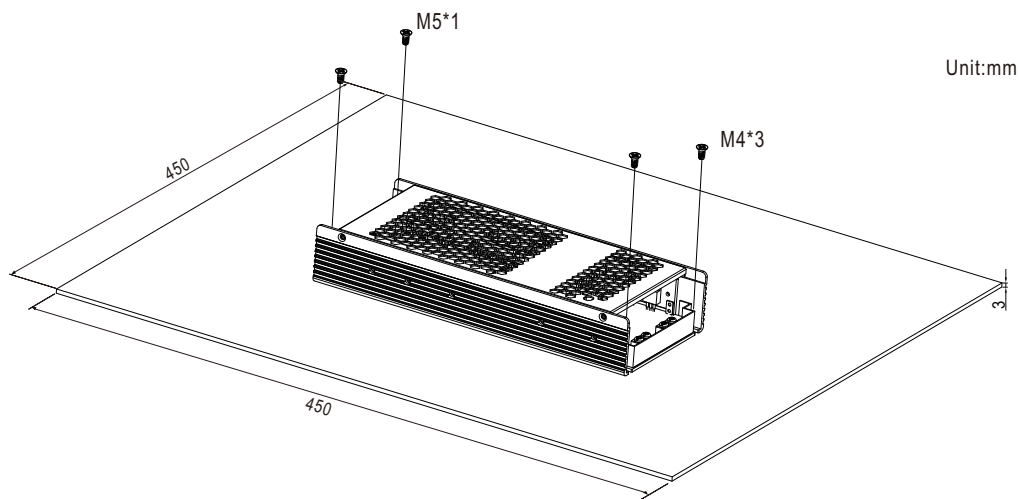


Suitable installation methods are shown as below. Since RSD-500 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.

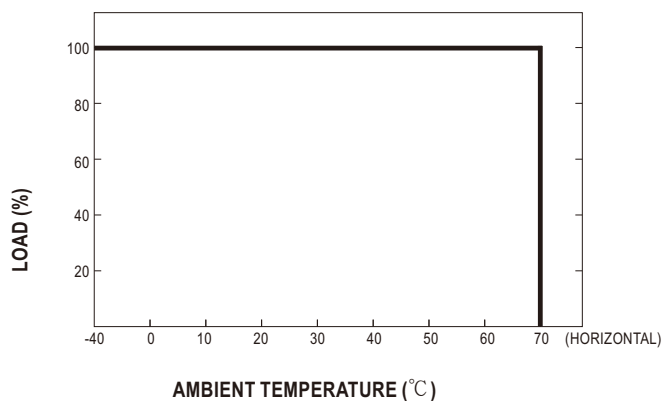


## b. Operate with additional iron plate

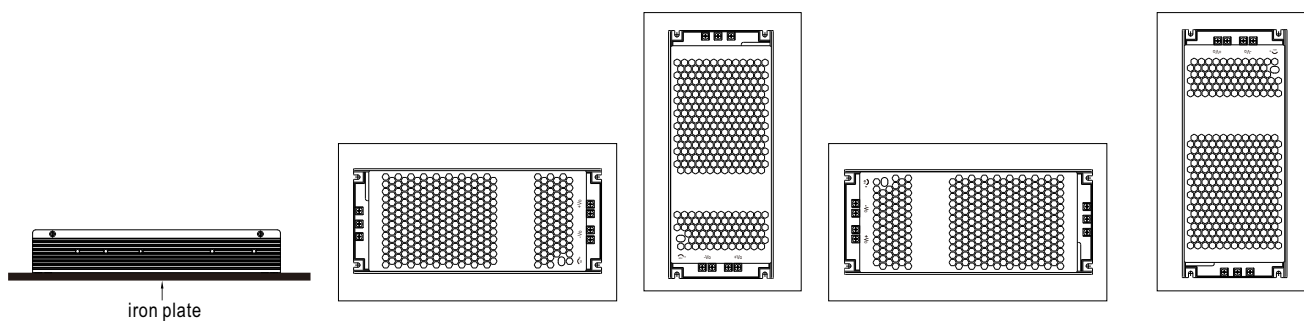
If it is necessary to fulfil the requirements of EN50155 TX level that operate the unit fully-loaded at 70°C, RSD-500 series must be installed onto an iron plate on the bottom. The size of the suggested iron plate is shown as below. In order for optimal thermal performance, the iron plate must have an even & smooth surface and RSD-500 series must be firmly mounted at the center of the iron plate.



The load vs ambient temperature curve is shown as below.



Suitable installation methods are shown as below. Since RSD-500 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.



### ■ Immunity to Environmental Conditions

| Test method                  | Standard                 | Test conditions                                                     | Status |
|------------------------------|--------------------------|---------------------------------------------------------------------|--------|
| Dry Heat Test                | EN 50155 section 13.4.5  | Temperature: 70°C / 85°C<br>Duration: 6 hrs / 10min                 | PASS   |
| Damp Heat Test, Cyclic       | EN 50155 section 13.4.8  | Temperature: 25°C~55°C<br>Humidity: 90%~100% RH<br>Duration: 48 hrs | PASS   |
| Vibration Test               | EN 50155 section 13.4.10 | Temperature: 19°C<br>Humidity: 65%<br>Duration: 10 mins             | PASS   |
| Shock Test                   | EN 50155 section 13.4.10 | Temperature: 21 ± 3°C<br>Humidity: 65 ± 5%<br>Duration: 30ms*18     | PASS   |
| Low Temperature Storage Test | EN 50155 section 13.4.6  | Temperature: -40°C<br>Dwell Time: 16 hrs                            | PASS   |
| Salt Mist Test               | EN 50155 section 13.4.13 | Temperature: 35°C ± 2°C<br>Duration: 96 hrs                         | PASS   |

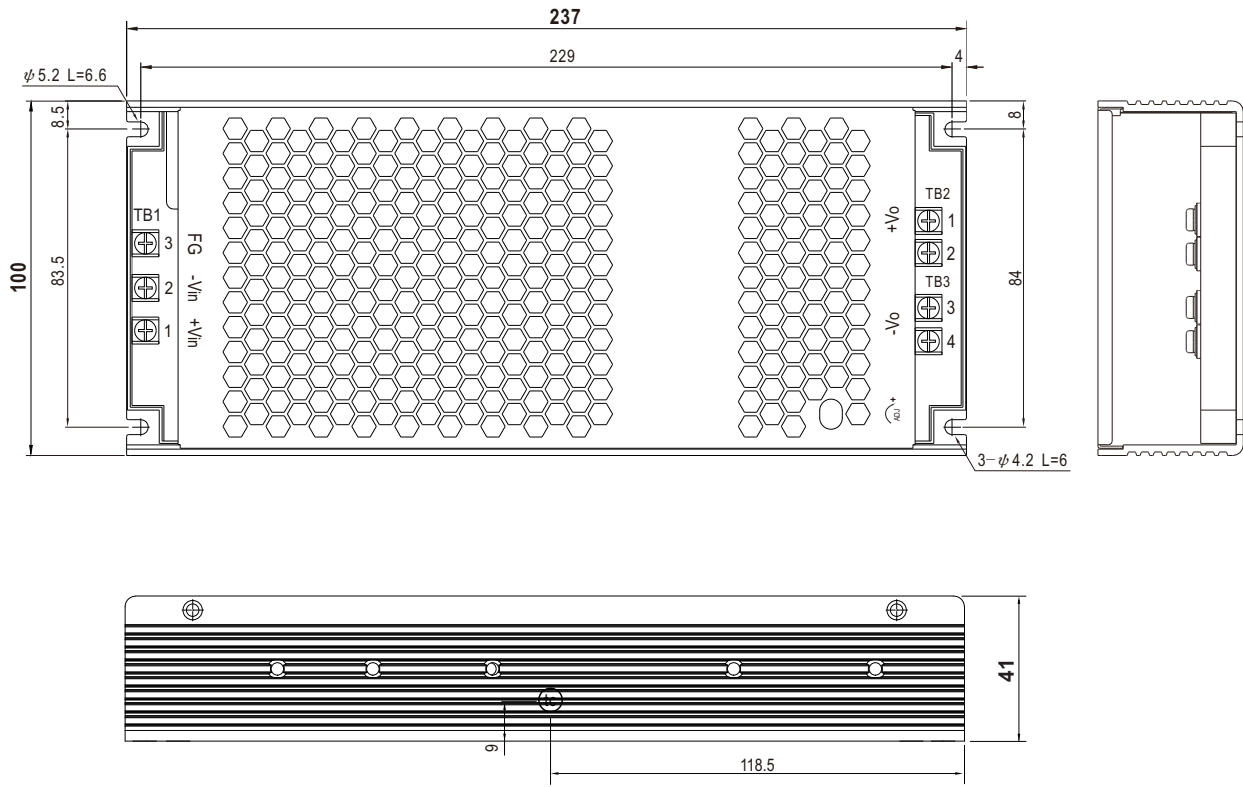
### ■ EN45545-2 Fire Test Conditions

| Test Items      |     |                     |                                        | Hazard Level |      |      |
|-----------------|-----|---------------------|----------------------------------------|--------------|------|------|
| Items           |     | Standard            |                                        | HL1          | HL2  | HL3  |
| PCB             | R22 | Oxygen index test   | EN 45545-2:2020<br>EN ISO 4589-2:2017  | PASS         | PASS | PASS |
|                 |     | Smoke density test  | EN 45545-2:2020<br>EN ISO 5659-2:2017  | PASS         | PASS | PASS |
|                 |     | Smoke toxicity test | EN 45545-2:2020<br>EN 17084:2018       | PASS         | PASS | PASS |
|                 | R24 | Oxygen index test   | EN 45545-2:2020<br>EN ISO 4589-2:2017  | PASS         | PASS | PASS |
|                 | R25 | Glow-wire test      | EN 45545-2:2020<br>EN 60695-2-11:2014  | PASS         | PASS | PASS |
| Potting         | R24 | Oxygen index test   | EN 45545-2:2020<br>EN ISO 4589-2:2017  | PASS         | PASS | PASS |
| Terminal; block | R26 | Vertical flame test | EN 45545-2:2020<br>EN 60695-11-10:2013 | PASS         | PASS | PASS |

## Mechanical Specification

(Unit: mm , tolerance  $\pm 1$ mm)

Case No.270C



•  $\text{tc}$  : Max. Case Temperature

### Input Terminal Pin No. Assignment (TB1)

| Pin No. | Assignment    |
|---------|---------------|
| 1       | DC input +Vin |
| 2       | DC input -Vin |
| 3       | FG $\perp$    |

### Output Terminal Pin No. Assignment (TB2, TB3)

| Pin No. | Assignment    |
|---------|---------------|
| 1       | DC output +Vo |
| 2       | DC output +Vo |
| 3       | DC output -Vo |
| 4       | DC output -Vo |

## Installation Manual

Please refer to : <http://www.meanwell.com/manual.html>