



**EN:** This Datasheet is presented by the manufacturer.

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## Features

- Compliance to EN50155 and EN45545-2 railway standard
- Ultra compact and 1U low profile(25mm)
- 4:1 wide input range
- No minimum load required
- Protections: Short circuit / Overload / Over voltage / Input reverse polarity
- 4000VDC I/O isolation (reinforced isolation)
- Half encapsulated , cooling by free air convection
- -40~+70°C wide working temperature
- Built-in constant current limiting circuit
- LED indicator for power on
- 3 years warranty



## Applications

- Bus, tram, metro or railway system
- Wireless network
- Telecom or datacom system
- Highly vibrating, highly dusty, extremely low or high temperature harsh environment

## Description

RSD-30 is a 30W enclosed type DC-DC reliable railway converter. This series is compliant with EN50155/ IEC60571 railway standard, constituting three types of models with 4:1 wide but different input ranges 9~36V/18~72V/40~160V, suitable for railway and all kinds of transportation systems exploiting the frequently used standard input voltages such as 12V, 24V, 36V, 48V, 72V, 96V and 110V. Various output voltages, 3.3V, 5V, 12V and 24V are available for selection.

This series has the capability of working under -40~+70°C, low ripple and noise, supreme EMC characteristics, 4KVDC I/P-OP, low enclosure profile 25mm 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 - 30G - 5**

Output voltage (3.3/5/12/24Vdc)

Input voltage (G: 9~36Vdc, L: 18~72Vdc, H: 40~160Vdc)

Rated wattage

Series name



## SPECIFICATION

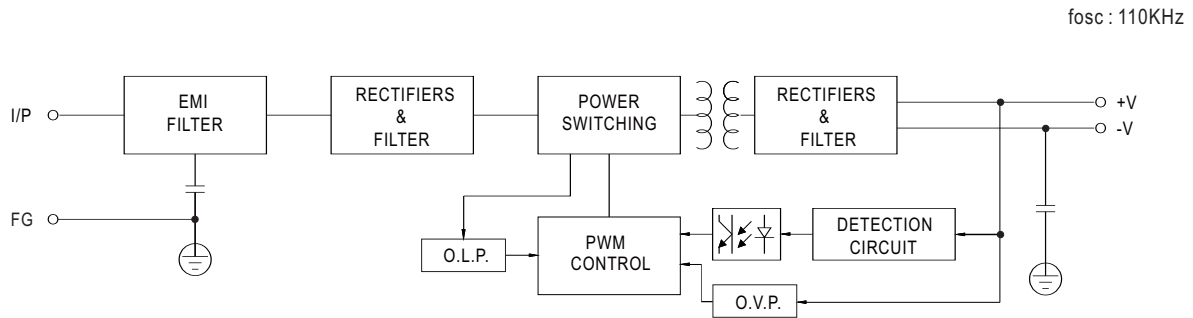
| MODEL                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | RSD-30G-3.3                                                                                                                           | RSD-30G-5 | RSD-30G-12   | RSD-30G-24   | RSD-30L-3.3 | RSD-30L-5 | RSD-30L-12                                      | RSD-30L-24   |  |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|--------------|-------------|-----------|-------------------------------------------------|--------------|--|
| OUTPUT                   | DC VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3.3V                                                                                                                                  | 5V        | 12V          | 24V          | 3.3V        | 5V        | 12V                                             | 24V          |  |
|                          | RATED CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 6A                                                                                                                                    | 6A        | 2.5A         | 1.25A        | 6A          | 6A        | 2.5A                                            | 1.25A        |  |
|                          | CURRENT RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 0 ~ 6A                                                                                                                                | 0 ~ 6A    | 0 ~ 2.5A     | 0 ~ 1.25A    | 0 ~ 6A      | 0 ~ 6A    | 0 ~ 2.5A                                        | 0 ~ 1.25A    |  |
|                          | RATED POWER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 19.8W                                                                                                                                 | 30W       | 30W          | 30W          | 19.8W       | 30W       | 30W                                             | 30W          |  |
|                          | RIPPLE & NOISE (max.) <small>Note.2</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 70mVp-p                                                                                                                               | 70mVp-p   | 60mVp-p      | 50mVp-p      | 70mVp-p     | 70mVp-p   | 60mVp-p                                         | 50mVp-p      |  |
|                          | VOLTAGE TOLERANCE <small>Note.3</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ±2.0%                                                                                                                                 | ±2.0%     | ±2.0%        | ±2.0%        | ±2.0%       | ±2.0%     | ±2.0%                                           | ±2.0%        |  |
|                          | LINE REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ±0.5%                                                                                                                                 | ±0.5%     | ±0.3%        | ±0.2%        | ±0.5%       | ±0.5%     | ±0.3%                                           | ±0.2%        |  |
|                          | LOAD REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ±0.5%                                                                                                                                 | ±0.5%     | ±0.3%        | ±0.2%        | ±0.5%       | ±0.5%     | ±0.3%                                           | ±0.2%        |  |
|                          | SETUP, RISE TIME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 120ms, 85ms at full load                                                                                                              |           |              |              |             |           |                                                 |              |  |
| HOLD UP TIME (Typ.)      | G type comply with S1 level(3ms) @full load,S2 level(10ms) @80% load; L type comply with S2 level(10ms) @full load                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                       |           |              |              |             |           |                                                 |              |  |
| INPUT                    | VOLTAGE RANGE CONTINUOUS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 9 ~ 36VDC                                                                                                                             |           |              |              | 18 ~ 72VDC  |           |                                                 |              |  |
|                          | EFFICIENCY (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 84%                                                                                                                                   | 85%       | 86.5%        | 89%          | 84%         | 86%       | 90%                                             | 91%          |  |
|                          | DC CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1.1A/24V                                                                                                                              | 1.5A/24V  |              |              | 0.52A/48V   | 0.8A/48V  |                                                 |              |  |
|                          | INRUSH CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 20A/24VDC                                                                                                                             |           |              |              | 20A/48VDC   |           |                                                 |              |  |
| PROTECTION               | OVERLOAD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 105 ~ 135% rated output power<br>Protection type : Constant current limiting, recovers automatically after fault condition is removed |           |              |              |             |           |                                                 |              |  |
|                          | OVER VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 3.8 ~ 4.5V                                                                                                                            | 5.75 ~ 7V | 13.8 ~ 16.2V | 27.6 ~ 32.4V | 3.8 ~ 4.5V  | 5.75 ~ 7V | 13.8 ~ 16.2V                                    | 27.6 ~ 32.4V |  |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Protection type : Shut down o/p voltage, re-power on to recover                                                                       |           |              |              |             |           |                                                 |              |  |
| ENVIRONMENT              | WORKING TEMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -40 ~ +55℃ (no derating) ; +70℃ @ 60% load by free air convection ; +70℃ (no derating with external base plate)                       |           |              |              |             |           |                                                 |              |  |
|                          | WORKING HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5 ~ 95% RH non-condensing                                                                                                             |           |              |              |             |           |                                                 |              |  |
|                          | STORAGE TEMP., HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | -40 ~ +85℃, 10 ~ 95% RH non-condensing                                                                                                |           |              |              |             |           |                                                 |              |  |
|                          | TEMP. COEFFICIENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ±0.03%/℃ (0 ~ 50℃)                                                                                                                    |           |              |              |             |           |                                                 |              |  |
|                          | VIBRATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes ; Mounting : compliance to IEC61373                                      |           |              |              |             |           |                                                 |              |  |
| SAFETY & EMC<br>(Note 4) | SAFETY STANDARDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Meet IEC60950-1 (LVD)                                                                                                                 |           |              |              |             |           |                                                 |              |  |
|                          | 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                                                                                                                             |           |              |              | EN55032     |           | Class A                                         |              |  |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Radiated                                                                                                                              |           |              |              | EN55032     |           | Class B                                         |              |  |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Harmonic Current                                                                                                                      |           |              |              | EN6100-3-2  |           | Class A                                         |              |  |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Voltage Flicker                                                                                                                       |           |              |              | EN6100-3-3  |           | -----                                           |              |  |
|                          | EMC IMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Parameter                                                                                                                             |           |              |              | Standard    |           | Test Level / Note                               |              |  |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ESD                                                                                                                                   |           |              |              | EN61000-4-2 |           | Level 3, ±8KV air ; Level 3, ±6KV contact       |              |  |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Radiated Field                                                                                                                        |           |              |              | EN61000-4-3 |           | Level X                                         |              |  |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | EFT / Burst                                                                                                                           |           |              |              | EN61000-4-4 |           | Level 3, 2KV at power<br>Level 4, 2KV at signal |              |  |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Surge                                                                                                                                 |           |              |              | EN61000-4-5 |           | Level 3,1KV Line-Line, Level 3, 2KV Line-Earth  |              |  |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Conducted                                                                                                                             |           |              |              | EN61000-4-6 |           | Level 3                                         |              |  |
| RAILWAY STANDARD         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Compliance to EN45545-2 for fire protection ; Meet EN50155 / IEC60571 including IEC61373 for shock & vibration, EN50121-3-2 for EMC   |           |              |              |             |           |                                                 |              |  |
| OTHERS                   | MTBF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 396.9K hrs min. MIL-HDBK-217F (25℃)                                                                                                   |           |              |              |             |           |                                                 |              |  |
|                          | DIMENSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 113*60*25mm (L*W*H)                                                                                                                   |           |              |              |             |           |                                                 |              |  |
|                          | PACKING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.25Kg; 56pcs/15Kg/0.83CUFT                                                                                                           |           |              |              |             |           |                                                 |              |  |
| NOTE                     | <div>1. All parameters NOT specially mentioned are measured at 24,48VDC input, 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 0.1uf &amp; 47uf parallel capacitor.</div> <div>3. Tolerance : includes set up tolerance, line regulation and load regulation.</div> <div>4. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on <a href="http://www.meanwell.com">http://www.meanwell.com</a>)</div> <div>5. Strongly recommended that external output capacitance should not exceed 5000uF.</div> |                                                                                                                                       |           |              |              |             |           |                                                 |              |  |



## SPECIFICATION

| MODEL                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | RSD-30H-3.3                                                                                                                           | RSD-30H-5   | RSD-30H-12                                      | RSD-30H-24   |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------|--------------|
| OUTPUT                   | DC VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 3.3V                                                                                                                                  | 5V          | 12V                                             | 24V          |
|                          | RATED CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 6A                                                                                                                                    | 6A          | 2.5A                                            | 1.25A        |
|                          | CURRENT RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0 ~ 6A                                                                                                                                | 0 ~ 6A      | 0 ~ 2.5A                                        | 0 ~ 1.25A    |
|                          | RATED POWER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 19.8W                                                                                                                                 | 30W         | 30W                                             | 30W          |
|                          | RIPPLE & NOISE (max.) <small>Note.2</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 70mVp-p                                                                                                                               | 70mVp-p     | 60mVp-p                                         | 50mVp-p      |
|                          | VOLTAGE TOLERANCE <small>Note.3</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ±2.0%                                                                                                                                 | ±2.0%       | ±2.0%                                           | ±2.0%        |
|                          | LINE REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ±0.5%                                                                                                                                 | ±0.5%       | ±0.3%                                           | ±0.2%        |
|                          | LOAD REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ±0.5%                                                                                                                                 | ±0.5%       | ±0.3%                                           | ±0.2%        |
|                          | SETUP, RISE TIME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 120ms, 85ms at full load                                                                                                              |             |                                                 |              |
| HOLD UP TIME (Typ.)      | H-type comply with S2 level(10ms) @ full load                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                       |             |                                                 |              |
| INPUT                    | VOLTAGE RANGE CONTINUOUS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 40 ~ 160VDC                                                                                                                           |             |                                                 |              |
|                          | EFFICIENCY (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 87%                                                                                                                                   | 89%         | 89%                                             | 89%          |
|                          | DC CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0.23A/110V                                                                                                                            | 0.35A/110V  |                                                 |              |
|                          | INRUSH CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 20A/110VDC                                                                                                                            |             |                                                 |              |
| PROTECTION               | OVERLOAD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 105 ~ 135% rated output power<br>Protection type : Constant current limiting, recovers automatically after fault condition is removed |             |                                                 |              |
|                          | OVER VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3.8 ~ 4.5V                                                                                                                            | 5.75 ~ 7V   | 13.8 ~ 16.2V                                    | 27.6 ~ 32.4V |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Protection type : Shut down o/p voltage, re-power on to recover                                                                       |             |                                                 |              |
| ENVIRONMENT              | WORKING TEMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -40 ~ +55℃ (no derating) ; +70℃ @ 60% load by free air convection ; +70℃ (no derating with external base plate)                       |             |                                                 |              |
|                          | WORKING HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 5 ~ 95% RH non-condensing                                                                                                             |             |                                                 |              |
|                          | STORAGE TEMP., HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | -40 ~ +85℃, 10 ~ 95% RH non-condensing                                                                                                |             |                                                 |              |
|                          | TEMP. COEFFICIENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ±0.03%/℃ (0 ~ 50℃)                                                                                                                    |             |                                                 |              |
|                          | VIBRATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes ; Mounting : compliance to IEC61373                                      |             |                                                 |              |
| SAFETY & EMC<br>(Note 4) | SAFETY STANDARDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Meet IEC60950-1 (LVD)                                                                                                                 |             |                                                 |              |
|                          | 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                                                                                                                             | EN55032     | Class A                                         |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Radiated                                                                                                                              | EN55032     | Class B                                         |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Harmonic Current                                                                                                                      | EN6100-3-2  | Class A                                         |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Voltage Flicker                                                                                                                       | EN6100-3-3  | -----                                           |              |
|                          | EMC IMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Parameter                                                                                                                             | Standard    | Test Level / Note                               |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ESD                                                                                                                                   | EN61000-4-2 | Level 3, ±8KV air ; Level 3, ±6KV contact       |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Radiated Field                                                                                                                        | EN61000-4-3 | Level X                                         |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | EFT / Burst                                                                                                                           | EN61000-4-4 | Level 3, 2KV at power<br>Level 4, 2KV at signal |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Surge                                                                                                                                 | EN61000-4-5 | Level 3,1KV Line-Line, Level 3, 2KV Line-Earth  |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Conducted                                                                                                                             | EN61000-4-6 | Level 3                                         |              |
|                          | RAILWAY STANDARD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Compliance to EN45545-2 for fire protection ; Meet EN50155 / IEC60571 including IEC61373 for shock & vibration, EN50121-3-2 for EMC   |             |                                                 |              |
| OTHERS                   | MTBF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 396.9K hrs min. MIL-HDBK-217F (25℃)                                                                                                   |             |                                                 |              |
|                          | DIMENSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 113*60*25mm (L*W*H)                                                                                                                   |             |                                                 |              |
|                          | PACKING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.25Kg; 56pcs/15Kg/0.83CUFT                                                                                                           |             |                                                 |              |
| NOTE                     | 1. All parameters NOT specially mentioned are measured at 110VDC input, rated load and 25℃ of ambient temperature.<br>2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.<br>3. Tolerance : includes set up tolerance, line regulation and load regulation.<br>4. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on <a href="http://www.meanwell.com">http://www.meanwell.com</a> )<br>5. Strongly recommended that external output capacitance should not exceed 5000uF. |                                                                                                                                       |             |                                                 |              |

## Block Diagram



## Input Fuse

There is one fuse connected in series to the positive input line, which is used to protect against abnormal surge. Fuse specifications of each model are shown as below.

| Type | Fuse Type | Reference and Rating    |
|------|-----------|-------------------------|
| G    | Time-Lag  | CONQUE MST, 6.3A, 250V  |
| L    | Time-Lag  | CONQUE MST, 3.15A, 250V |
| H    | Time-Lag  | CONQUE MST, 2A, 250V    |

## 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.

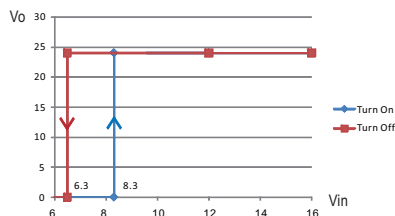
## Input Range and Transient Ability

The series has a wide range input capability. With  $\pm 40\%$  of rated input voltage, it can withstand that for 1 second.

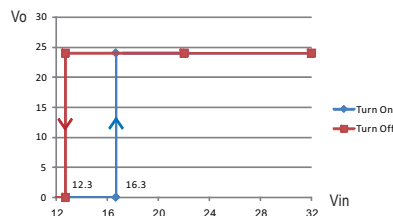
## Input Under-Voltage Protection

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.

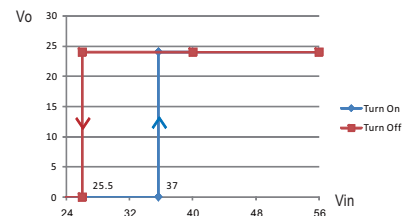
RSD-30G-24



RSD-30L-24



RSD-30H-24



## Inrush Current

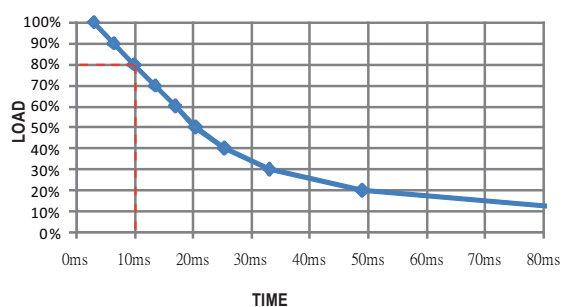
Inrush current is suppressed by a resistor during the initial start-up, and then the resistor is bypassed by a MOSFET to reduce power consumption after accomplishing the start-up.

## ■ Hold-up Time

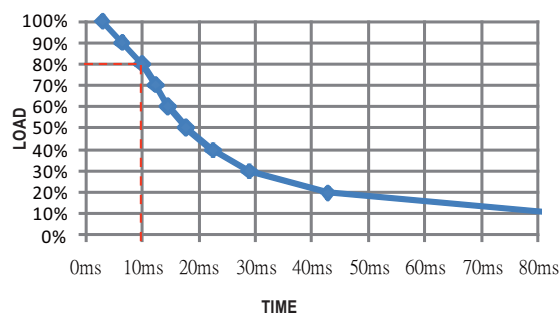
H type is in compliance with S2 level (10ms), while G and L types are in compliance with S1 level (3ms) at full load output condition.

To fulfil the requirements of S2 level (10ms), G types require de-rating their output load to 80%, please refer to the curve diagrams below.

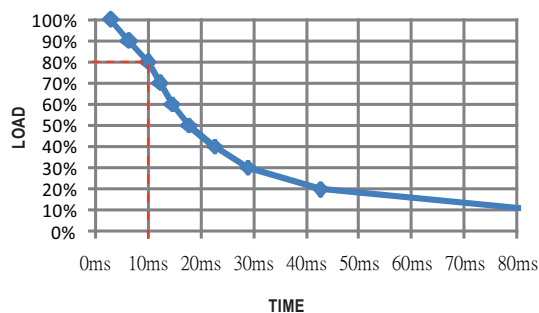
RSD-30G-3.3



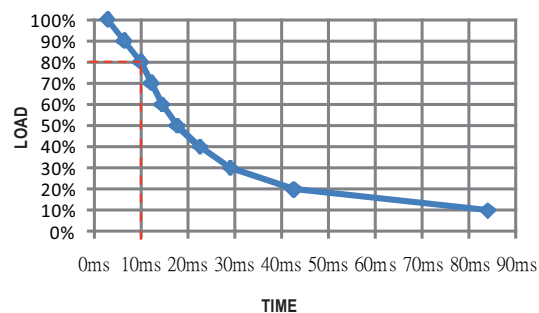
RSD-30G-5



RSD-30G-12



RSD-30G-24



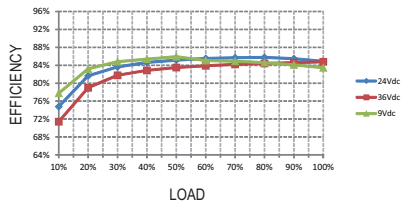
## ■ Output Voltage Adjustment

This function is optional, which the standard product does not have it. If you do need the function, please contact MW for details.

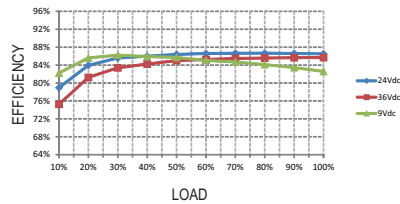
## Efficiency vs Load & Vin Curve

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

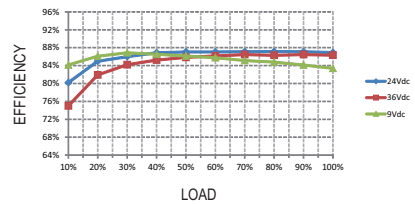
RSD-30G-3.3



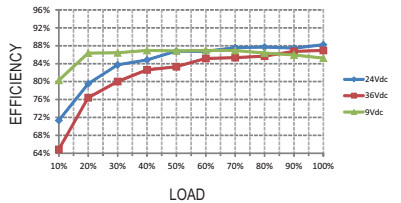
RSD-30G-5



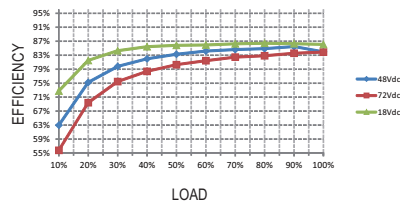
RSD-30G-12



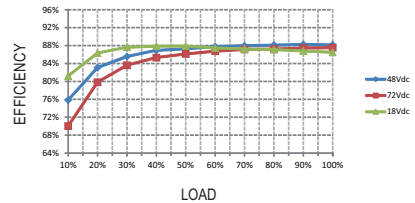
RSD-30G-24



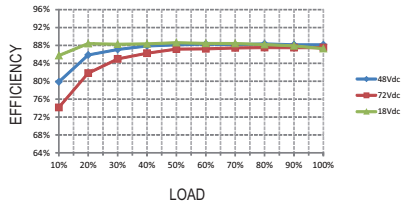
RSD-30L-3.3



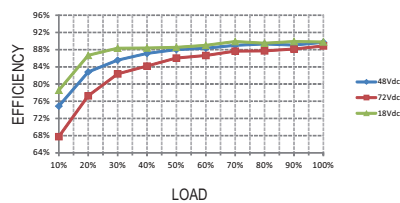
RSD-30L-5



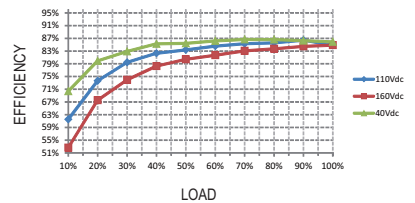
RSD-30L-12



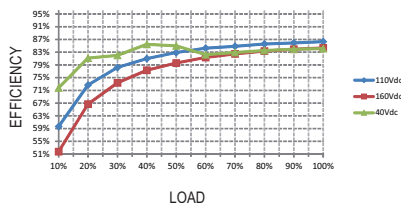
RSD-30L-24



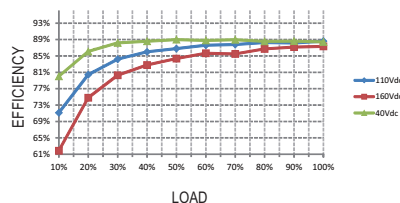
RSD-30H-3.3



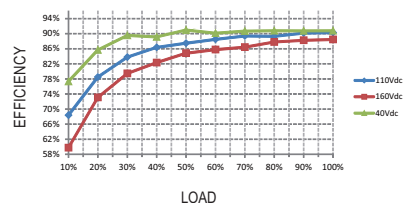
RSD-30H-5



RSD-30H-12



RSD-30H-24

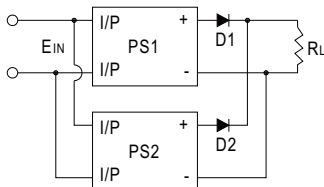


## Parallel and Series Connection

### A. Operation in Parallel

Since RSD-30 series don't have built-in parallel circuit, it can only use external circuits to achieve the redundant operation but not increase the current rating.

1. Add a diode at the positive-output of each power supply (as shown as below), the current rating of the diode should be larger than the maximum output current rating and attached to a suitable heat sink. This is only for redundant use (increase the reliability of the system) and users have to check suitability of the circuit by themselves.

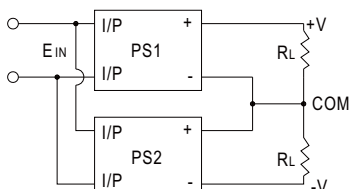


2. When using S.P.S. in parallel connection, the leakage current will increase at the same time. This could pose as a shock hazard for the user. So please contact the supplier if you have this kind of application.

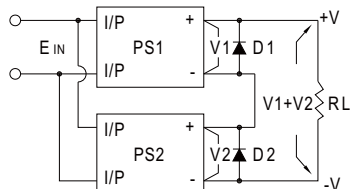
### B. Operation in Series

RSD-30 can be operated in series. Here are the methods of doing it:

1. Positive and negative terminals are connected as shown as below. According to the connection, you can get the positive and negative output voltages for your loads.

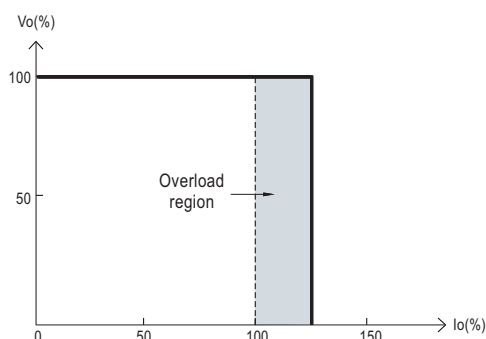


2. Increase the output voltage (current does not change). Because RSD-30 series have no reverse blocking diode in the unit, you should add an external blocking diode to prevent the damage of every unit while starting up. The voltage rating of the external diode should be larger than  $V1+V2$  (as shown 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.

## LED Indicator

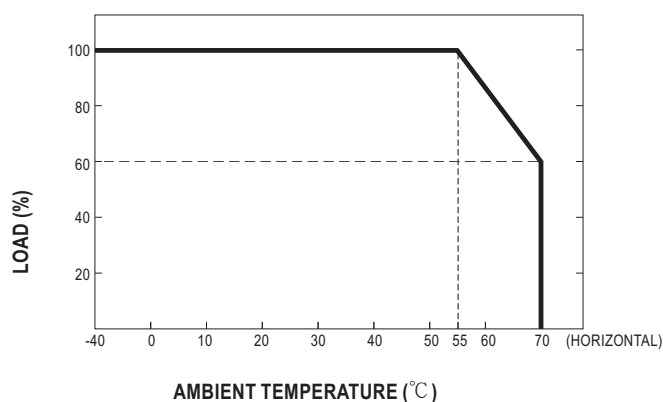
Equipped with a built-in LED indicator, the converter provides an easy way for users to check its condition through the LED indicator.

Green : normal operation; No signal: no power or failure.

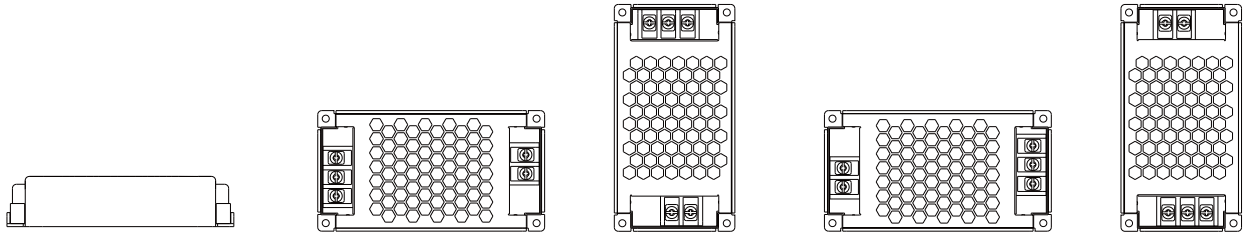
## Derating Curve

### 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 55~70°C, please refer to the de-rating curve as below.

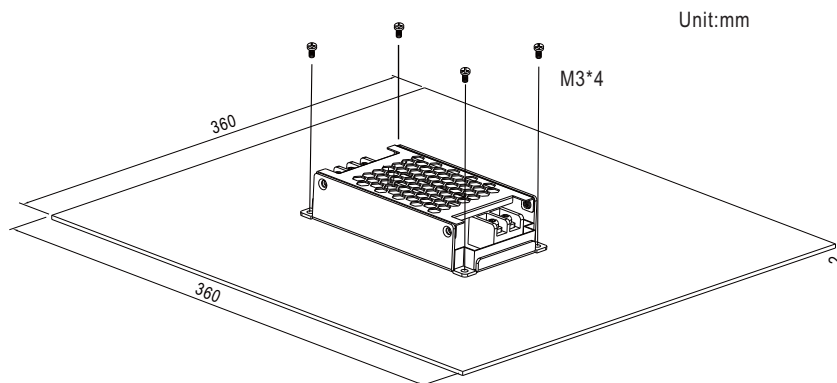


Suitable installation methods are shown as below. Since RSD-30 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.

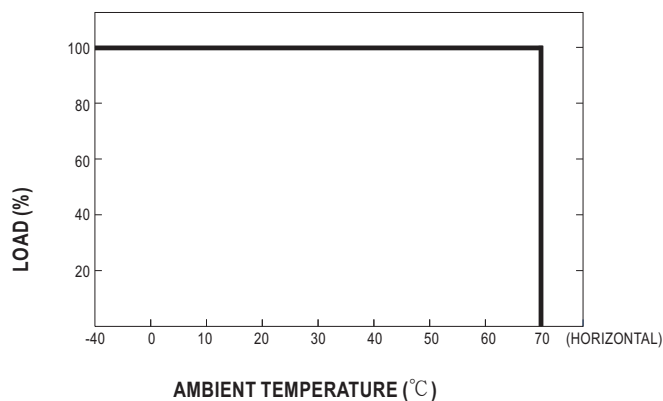


## b. Operate with additional iron plate

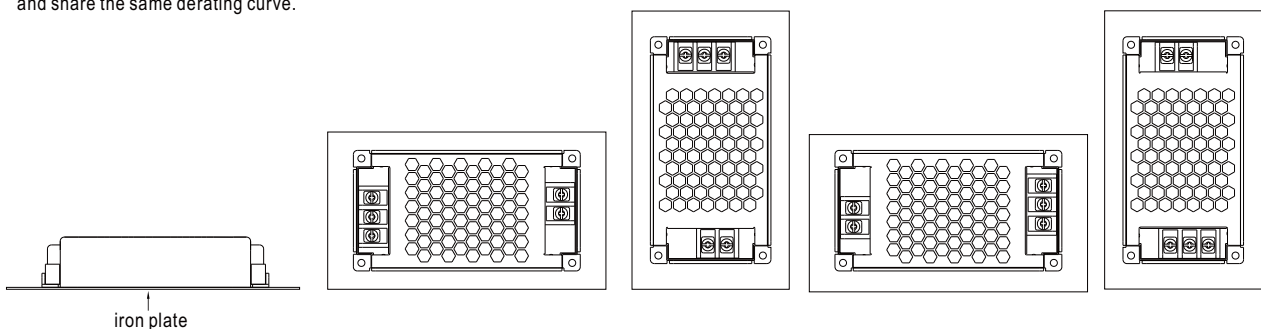
If it is necessary to fulfil the requirements of EN50155 TX level that operate the unit fully-loaded at 70°C, RSD-30 series must be installed onto an iron plate on the bottom. The size of the suggested iron plate is shown as below. In order for optimal thermal performance, the iron plate must have an even & smooth surface and RSD-30 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-30 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

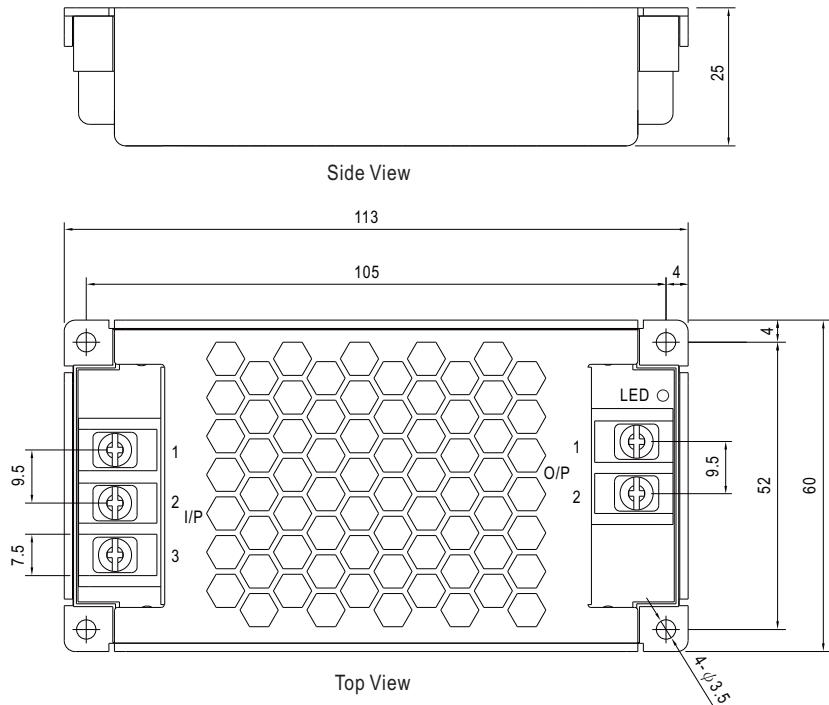
| Test method                  | Standard                                                                                                                          | Test conditions                                                     | Status    |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-----------|
| Cooling Test                 | EN 50155 section 12.2.3 (Column 2, Class TX)<br>EN 60068-2-1                                                                      | Temperature: -40°C<br>Dwell Time: 2 hrs/cycle                       | No damage |
| Dry Heat Test                | EN 50155 section 12.2.4 (Column 2, Class TX)<br>EN 50155 section 12.2.4 (Column 3, Class TX & Column 4, Class TX)<br>EN 60068-2-2 | Temperature: 70°C / 85°C<br>Duration: 6 hrs / 10min                 | PASS      |
| Damp Heat Test, Cyclic       | EN 50155 section 12.2.5<br>EN 60068-2-30                                                                                          | Temperature: 25°C~55°C<br>Humidity: 90%~100% RH<br>Duration: 48 hrs | PASS      |
| Vibration Test               | EN 50155 section 12.2.11<br>EN 61373                                                                                              | Temperature: 19°C<br>Humidity: 65%<br>Duration: 10 mins             | PASS      |
| Increased Vibration Test     | EN 50155 section 12.2.11<br>EN 61373                                                                                              | Temperature: 19°C<br>Humidity: 65%<br>Duration: 5 hrs               | PASS      |
| Shock Test                   | EN 50155 section 12.2.11<br>EN 61373                                                                                              | Temperature: 21 ± 3°C<br>Humidity: 65 ± 5%<br>Duration: 30ms*18     | PASS      |
| Low Temperature Storage Test | EN 50155 section 12.2.3 (Column 2, Class TX)<br>EN 60068-2-1                                                                      | Temperature: -40°C<br>Dwell Time: 16 hrs                            | PASS      |
| Salt Mist Test               | EN 50155 section 12.2.10 (Class ST4)                                                                                              | Temperature: 35°C ± 2°C<br>Duration: 96 hrs                         | PASS      |

### ■ EN45545-2 Fire Test Conditions

| Test Items |                     |                                               | Hazard Level |      |      |
|------------|---------------------|-----------------------------------------------|--------------|------|------|
|            | Items               | Standard                                      | HL1          | HL2  | HL3  |
| R24        | Oxygen index test   | EN 45545-2:2013+A1:2015<br>EN ISO 4589-2:1996 | PASS         | PASS | PASS |
| R25        | Glow-wire test      | EN 45545-2:2013+A1:2015<br>EN 60695-2-11:2000 | PASS         | PASS | PASS |
| R26        | Vertical flame test | EN 45545-2:2013+A1:2015<br>EN 60695-11:2003   | PASS         | PASS | PASS |

## Mechanical Specification

Case No.253A Unit:mm



Input Terminal Pin No. Assignment :

| Pin No. | Assignment  |
|---------|-------------|
| 1       | DC INPUT V+ |
| 2       | DC INPUT V- |
| 3       | FG $\perp$  |

Output Terminal Pin No. Assignment :

| Pin No. | Assignment   |
|---------|--------------|
| 1       | DC OUTPUT -V |
| 2       | DC OUTPUT +V |

## Installation Manual

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