



60W DIN Rail Type DC-DC Converter

DDR-60 series

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勝特力電材超市-光復店 886-3-5729570  
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<http://www.100y.com.tw>

User's Manual



## Feature

- Width only 52.5mm (3SU)
- 4:1 ultra wide input range
- -40~+85°C wide working temperature
- No minimum load required
- DC output adjustable ( $\pm 10\%$ )
- Cooling by free air convection
- Can be installed on DIN rail TS-35/7.5 or 15
- Protections: Short circuit / Overload / Over voltage /  
Input reverse polarity /  
Input under voltage protection
- 4KVdc I/O isolation(Reinforced isolation)
- 3 years warranty

## Applications

- Industrial control system
- Semi-conductor fabrication equipment
- Factory automation
- Electro-mechanical
- Wireless network
- Telecom or datacom system

## GTIN CODE

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

## Description

DDR-60 series is a 60W DIN Rail type DC-DC converter with main features including DIN rail-type easy installation, ultra slim width (52.5mm), 4:1 ultra wide input voltage, -40~+85°C wide operating temperature, 4KVdc I/O isolation, adjustable output voltage ( $\pm 10\%$ ) and full protective functions...etc.

This series has two input options: 9~36V / 18~75V and various output options: 5V / 12V / 15V / 24V and can be used for industrial control, security control, communication system and other fields. Suitable applications are DC buck/boost regulator, increasing system insulation level and voltage drop compensation along cable...etc.

## Model Encoding

DDR - 60 G - 24

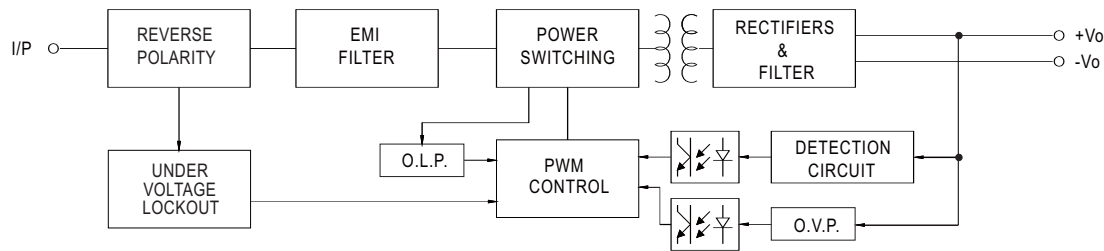
- Output voltage(5/12/15/24Vdc)
- Input voltage (G: 9~36Vdc, L: 18~75Vdc)
- Rated wattage
- Series name



## SPECIFICATION

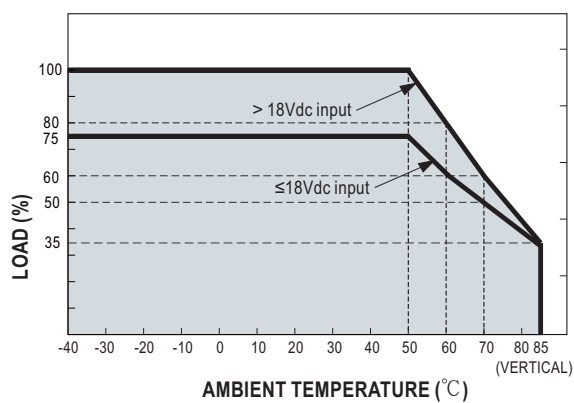
| MODEL                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | DDR-60G-5                                                                                                                             | DDR-60G-12        | DDR-60G-15     | DDR-60G-24                  | DDR-60L-5                                             | DDR-60L-12               | DDR-60L-15     | DDR-60L-24 |  |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------|-----------------------------|-------------------------------------------------------|--------------------------|----------------|------------|--|
| OUTPUT                           | DC VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 5V                                                                                                                                    | 12V               | 15V            | 24V                         | 5V                                                    | 12V                      | 15V            | 24V        |  |
|                                  | RATED CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 10.8A                                                                                                                                 | 5A                | 4A             | 2.5A                        | 12A                                                   | 5A                       | 4A             | 2.5A       |  |
|                                  | CURRENT RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0 ~ 10.8A                                                                                                                             | 0 ~ 5A            | 0 ~ 4A         | 0 ~ 2.5A                    | 0 ~ 12A                                               | 0 ~ 5A                   | 0 ~ 4A         | 0 ~ 2.5A   |  |
|                                  | RATED POWER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 54W                                                                                                                                   | 60W               | 60W            | 60W                         | 60W                                                   | 60W                      | 60W            | 60W        |  |
|                                  | RIPPLE & NOISE (max.) Note.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 60mVp-p                                                                                                                               | 75mVp-p           | 75mVp-p        | 100mVp-p                    | 60mVp-p                                               | 75mVp-p                  | 75mVp-p        | 100mVp-p   |  |
|                                  | VOLTAGE ADJ. RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 4.5 ~ 5.5V                                                                                                                            | 9 ~ 13.2V         | 13.5 ~ 16.5V   | 21.6 ~ 28V                  | 4.5 ~ 5.5V                                            | 9 ~ 13.2V                | 13.5 ~ 16.5V   | 21.6 ~ 28V |  |
|                                  | VOLTAGE TOLERANCE Note.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ±2.0%                                                                                                                                 | ±2.0%             | ±2.0%          | ±2.0%                       | ±2.0%                                                 | ±2.0%                    | ±2.0%          | ±2.0%      |  |
|                                  | LINE REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ±0.5%                                                                                                                                 | ±0.5%             | ±0.5%          | ±0.5%                       | ±0.5%                                                 | ±0.5%                    | ±0.5%          | ±0.5%      |  |
|                                  | LOAD REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ±1.5%                                                                                                                                 | ±0.5%             | ±0.5%          | ±0.5%                       | ±1.5%                                                 | ±0.5%                    | ±0.5%          | ±0.5%      |  |
|                                  | SETUP, RISE TIME                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 120ms, 85ms at full load                                                                                                              |                   |                |                             |                                                       |                          |                |            |  |
|                                  | HOLD UP TIME (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | G-type: 5ms@24Vdc input                                                                                                               |                   |                |                             |                                                       | L-type: 10ms@48Vdc input |                |            |  |
| EXTERNAL CAPACITANCE LOAD (Max.) | 6800 μF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4700 μF                                                                                                                               | 3300 μF           | 2200 μF        | 6800 μF                     | 4700 μF                                               | 3300 μF                  | 2200 μF        |            |  |
| INPUT                            | VOLTAGE RANGE Note.4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 9 ~ 36Vdc                                                                                                                             |                   |                |                             |                                                       | 18 ~ 75Vdc               |                |            |  |
|                                  | EFFICIENCY (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 87.5%                                                                                                                                 | 91%               | 91%            | 91%                         | 87.5%                                                 | 91%                      | 92%            | 92%        |  |
|                                  | DC CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3A /24Vdc                                                                                                                             |                   |                |                             |                                                       | 1.5A/48Vdc               |                |            |  |
|                                  | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 5.75 ~ 7V                                                                                                                             | 13.8 ~ 16.2V      | 17.25 ~ 20.25V | 28.8 ~ 34V                  | 5.75 ~ 7V                                             | 13.8 ~ 16.2V             | 17.25 ~ 20.25V | 28.8 ~ 34V |  |
|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Protection type : Shut down o/p voltage, re-power on to recover                                                                       |                   |                |                             |                                                       |                          |                |            |  |
|                                  | REVERSE POLARITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | By internal MOSFET, no damage, recovers automatically after fault condition removed                                                   |                   |                |                             |                                                       |                          |                |            |  |
|                                  | UNDER VOLTAGE LOCKOUT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 24Vin (G-type):Power ON≥9V , OFF≤8.5V<br>48Vin (L-type):Power ON≥18V , OFF≤17V                                                        |                   |                |                             |                                                       |                          |                |            |  |
| ENVIRONMENT                      | WORKING TEMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -40 ~ +85℃ (Refer to "Derating Curve")                                                                                                |                   |                |                             |                                                       |                          |                |            |  |
|                                  | WORKING HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 5 ~ 95% RH non-condensing                                                                                                             |                   |                |                             |                                                       |                          |                |            |  |
|                                  | STORAGE TEMP., HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | -40 ~ +85℃, 5 ~ 95% RH non-condensing                                                                                                 |                   |                |                             |                                                       |                          |                |            |  |
|                                  | TEMP. COEFFICIENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ±0.03%/℃ (0 ~60℃ )                                                                                                                    |                   |                |                             |                                                       |                          |                |            |  |
|                                  | VIBRATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Component:10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes; Mounting: Compliance to IEC60068-2-6                          |                   |                |                             |                                                       |                          |                |            |  |
| SAFETY & EMC<br>(Note 5)         | OPERATING ALTITUDE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 5000 meters                                                                                                                           |                   |                |                             |                                                       |                          |                |            |  |
|                                  | SAFETY STANDARDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | IEC 62368-1, UL 62368-1, AS/NZS 62368-1, EAC TP TC 004 approved                                                                       |                   |                |                             |                                                       |                          |                |            |  |
|                                  | WITHSTAND VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | I/P-O/P:4KVdc                                                                                                                         |                   |                |                             |                                                       |                          |                |            |  |
|                                  | ISOLATION RESISTANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | I/P-O/P>100M Ohms / 500Vdc / 25℃ / 70% RH                                                                                             |                   |                |                             |                                                       |                          |                |            |  |
|                                  | EMC EMISSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Parameter                                                                                                                             | Standard          |                |                             | Test Level / Note                                     |                          |                |            |  |
|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Conducted                                                                                                                             | BS EN/EN55032     |                |                             | Class A                                               |                          |                |            |  |
|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Radiated                                                                                                                              | BS EN/EN55032     |                |                             | Class A for 1m I/O cable , Class B for 30cm I/O cable |                          |                |            |  |
|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Voltage Flicker                                                                                                                       | BS EN/EN61000-3-3 |                |                             | -----                                                 |                          |                |            |  |
|                                  | EMC IMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | BS EN/EN55035 , BS EN/EN61000-6-2(BS EN/EN50082-2)                                                                                    |                   |                |                             |                                                       |                          |                |            |  |
|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Parameter                                                                                                                             | Standard          |                |                             | Test Level / Note                                     |                          |                |            |  |
|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ESD                                                                                                                                   | BS EN/EN61000-4-2 |                |                             | Level 3, 8KV air ; Level 3, 6KV contact; criteria A   |                          |                |            |  |
|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Radiated                                                                                                                              | BS EN/EN61000-4-3 |                |                             | Level 3, 10V/m ; criteria A                           |                          |                |            |  |
|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | EFT / Burst                                                                                                                           | BS EN/EN61000-4-4 |                |                             | Level 3, 2KV ; criteria A                             |                          |                |            |  |
|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Surge                                                                                                                                 | BS EN/EN61000-4-5 |                |                             | Level 3, 1KV/Line-Line ; criteria A                   |                          |                |            |  |
|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Conducted                                                                                                                             | BS EN/EN61000-4-6 |                |                             | Level 3, 10V ; criteria A                             |                          |                |            |  |
| Magnetic Field                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | BS EN/EN61000-4-8                                                                                                                     |                   |                | Level 4, 30A/m ; criteria A |                                                       |                          |                |            |  |
| OTHERS                           | MTBF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3261.6K hrs min. Telcordia SR-332 (Bellcore) ; 611.1K hrs min. MIL-HDBK-217F (25℃)                                                    |                   |                |                             |                                                       |                          |                |            |  |
|                                  | DIMENSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 52.5*90*54.5mm (W*H*D)                                                                                                                |                   |                |                             |                                                       |                          |                |            |  |
|                                  | PACKING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 216g; 60pcs/14Kg/0.97CUFT                                                                                                             |                   |                |                             |                                                       |                          |                |            |  |
| NOTE                             | 1. All parameters NOT specially mentioned are measured at normal input (G:24Vdc, L:48Vdc), 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 0.1 μ F & 47 μ F parallel capacitor.<br>3. Tolerance : includes set up tolerance, line regulation and load regulation.<br>4. Derating may be needed under low input voltage. Please check the derating curve for more details.<br>5.The power supply is considered as an independent unit, but the final equipment still need to re-confirm that the whole system complies with the EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies."<br>(as available on <a href="https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf">https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf</a> )<br>6. The ambient temperature derating of 3.5℃/1000m with fanless models and of 5℃/1000m with fan models for operating altitude higher than 2000m(6500ft).<br>※ Product Liability Disclaimer : For detailed information, please refer to <a href="https://www.meanwell.com/serviceDisclaimer.aspx">https://www.meanwell.com/serviceDisclaimer.aspx</a> |                                                                                                                                       |                   |                |                             |                                                       |                          |                |            |  |

## Block Diagram

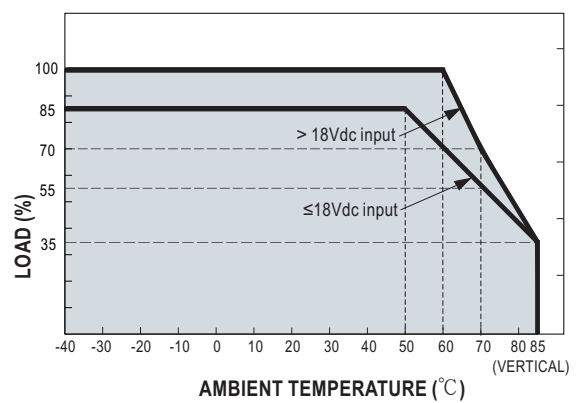


## Derating Curve

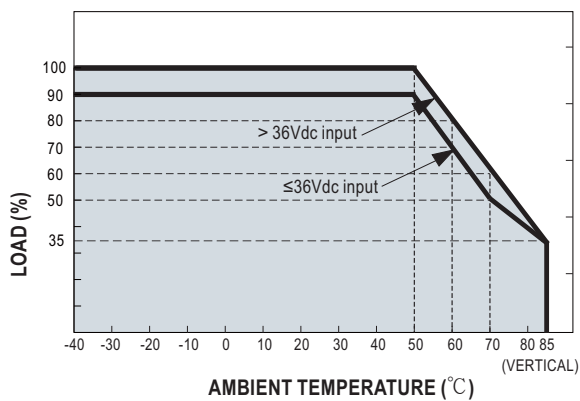
### DDR-60G-5



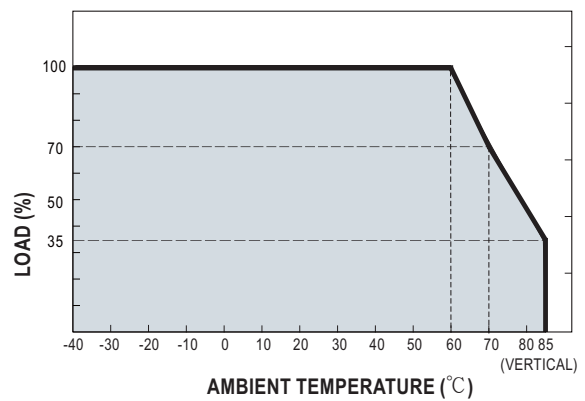
### DDR-60G-12/15/24



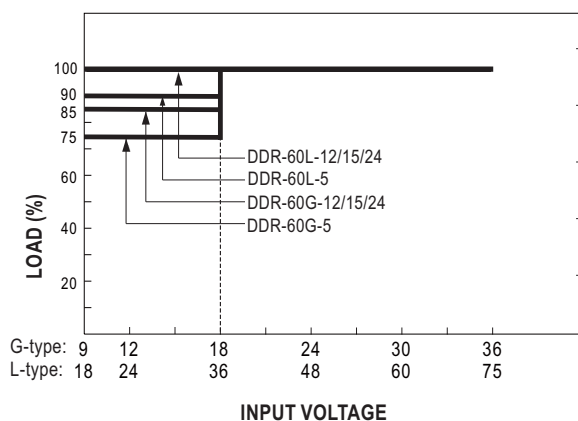
### DDR-60L-5



### DDR-60L-12/15/24



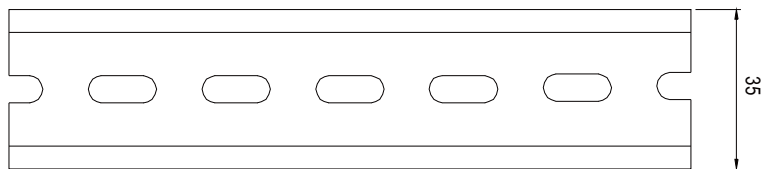
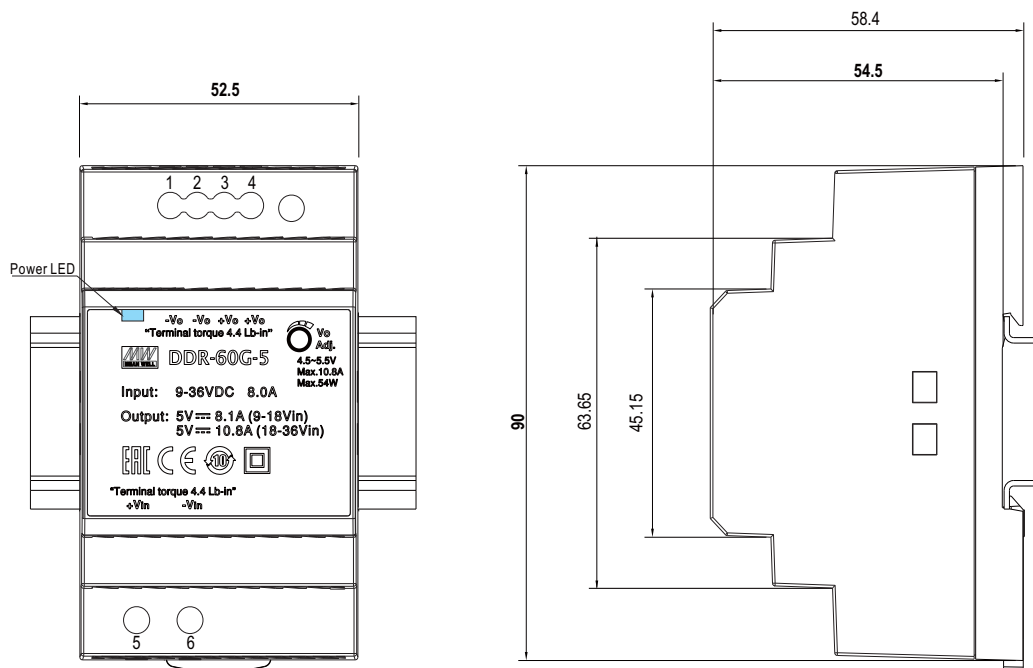
## Output derating VS input voltage



## Mechanical Specification

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

Case No. DDR-60



ADMISSIBLE DIN-RAIL: TS35/7.5 OR TS35/15

| Pin No. | Assignment    |
|---------|---------------|
| 1,2     | DC output -Vo |
| 3,4     | DC output +Vo |
| 5       | DC input +Vin |
| 6       | DC input -Vin |

## Installation Manual

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

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