



## Features

- Compliance to EN50155 and EN45545-2 railway standard
- Width only 32mm
- 2:1 wide input range
- -40~+70°C wide working temperature
- 150% peak load capability
- DC output adjustable
- 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

- Bus, tram, metro or railway system
- Industrial control system
- Semi-conductor fabrication equipment
- Factory automation
- Electro-mechanical
- Wireless network
- Telecom or datacom system

## Description

DDR-120 series is a 120W DIN Rail type DC-DC converter with main features including DIN rail-type easy installation, ultra slim width (32mm), 2:1 wide input voltage, fanless design, -40~+70°C wide operating temperature, 4KVdc I/O isolation, 150% peak load, adjustable output voltage and full protective functions.

This series of models has various input options: 9~18V / 16.8~33.6V / 33.6~67.2V / 67.2~154V and various output options: 12V / 24V / 48V and can be used for industrial & railway control, security control, communication system and other fields. Suitable applications include DC buck/boost regulator, increasing system insulation level and voltage drop compensation along cable...etc.

## Model Encoding

DDR - 120 **A** - **24**

- Output voltage(12/24/48Vdc)
- Input voltage (A: 9~18Vdc, B:16.8~33.6Vdc, C:33.6~67.2Vdc, D:67.2~154Vdc)
- Rated wattage
- Series name



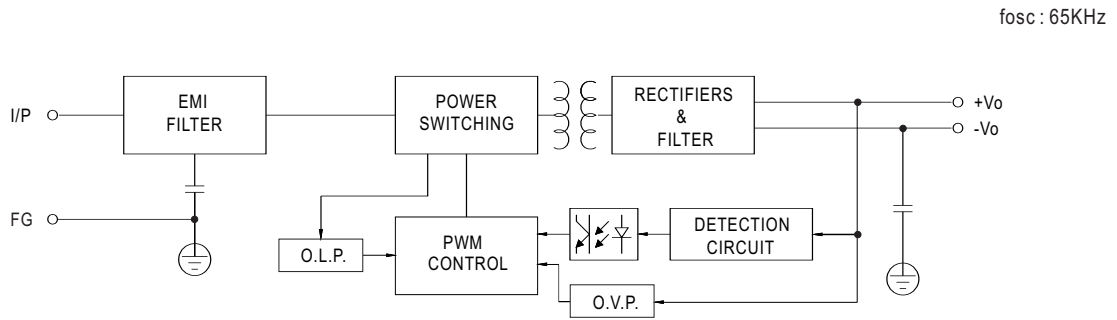
## SPECIFICATION

| MODEL                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | DDR-120A-12                                                                                                                                               | DDR-120A-24  | DDR-120A-48  | DDR-120B-12                                                                     | DDR-120B-24                                                   | DDR-120B-48    |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|---------------------------------------------------------------------------------|---------------------------------------------------------------|----------------|
| OUTPUT                   | DC VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 12V                                                                                                                                                       | 24V          | 48V          | 12V                                                                             | 24V                                                           | 48V            |
|                          | RATED CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 8.3A                                                                                                                                                      | 4.2A         | 2.1A         | 10A                                                                             | 5A                                                            | 2.5A           |
|                          | CURRENT RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0 ~ 8.3A                                                                                                                                                  | 0 ~ 4.2A     | 0 ~ 2.1A     | 0 ~ 10A                                                                         | 0 ~ 5A                                                        | 0 ~ 2.5A       |
|                          | RATED POWER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 99.6W                                                                                                                                                     | 100.8W       | 100.8W       | 120W                                                                            | 120W                                                          | 120W           |
|                          | PEAK CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 12.45A                                                                                                                                                    | 6.3A         | 3.15A        | 15A                                                                             | 7.5A                                                          | 3.75A          |
|                          | PEAK POWER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Note.5 150W (3sec.)                                                                                                                                       |              |              |                                                                                 | 180W (3sec.)                                                  |                |
|                          | RIPPLE & NOISE (max.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Note.2 50mVp-p                                                                                                                                            | 50mVp-p      | 50mVp-p      | 50mVp-p                                                                         | 50mVp-p                                                       | 50mVp-p        |
|                          | VOLTAGE ADJ. RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 9 ~ 14V                                                                                                                                                   | 24 ~ 28V     | 48 ~ 56V     | 9 ~ 14V                                                                         | 24 ~ 28V                                                      | 48 ~ 56V       |
|                          | VOLTAGE TOLERANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Note.3 ± 1.0%                                                                                                                                             | ± 1.0%       | ± 1.0%       | ± 1.0%                                                                          | ± 1.0%                                                        | ± 1.0%         |
|                          | LINE REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ± 0.5%                                                                                                                                                    | ± 0.5%       | ± 0.5%       | ± 0.5%                                                                          | ± 0.5%                                                        | ± 0.5%         |
| LOAD REGULATION          | ± 1.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ± 1.0%                                                                                                                                                    | ± 1.0%       | ± 1.0%       | ± 1.0%                                                                          | ± 1.0%                                                        |                |
| SETUP, RISE TIME         | 500ms, 60ms @12Vdc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                           |              |              | 500ms, 60ms @24Vdc                                                              |                                                               |                |
| HOLD UP TIME (Typ.)      | Please refer to page 7 Hold up Time( Load de-rating curve )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                           |              |              |                                                                                 |                                                               |                |
| INPUT                    | VOLTAGE RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Note.4 9 ~ 18Vdc                                                                                                                                          | 9 ~ 18Vdc    | 9 ~ 18Vdc    | 16.8 ~ 33.6Vdc                                                                  | 16.8 ~ 33.6Vdc                                                | 16.8 ~ 33.6Vdc |
|                          | EFFICIENCY (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 88.5%                                                                                                                                                     | 88.5%        | 88.5%        | 89%                                                                             | 89.5%                                                         | 91%            |
|                          | DC CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 11.2A @12Vdc                                                                                                                                              |              |              | 5.6A @24Vdc                                                                     |                                                               |                |
|                          | INRUSH CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 5A @12Vdc                                                                                                                                                 |              |              | 5A @ 24Vdc                                                                      |                                                               |                |
|                          | INTERRUPTION OF VOLTAGE SUPPLY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | EN50155:2007-comply with 3ms@ full load                                                                                                                   |              |              | EN50155:2007-comply with S1 level (6ms) @ full load, S2 level (10ms) @ 70% load |                                                               |                |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | EN50155:2017-comply with S1 level                                                                                                                         |              |              | EN50155:2017-comply with S1 level                                               |                                                               |                |
| PROTECTION               | OVERLOAD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Normally works within 150% rated output power for more than 3 seconds and then constant current protection 105~135% rated output power with auto-recovery |              |              |                                                                                 |                                                               |                |
|                          | OVER VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 14.4 ~ 16.8V                                                                                                                                              | 28.8 ~ 33.6V | 57.6 ~ 67.2V | 14.4 ~ 16.8V                                                                    | 28.8 ~ 33.6V                                                  | 57.6 ~ 67.2V   |
|                          | REVERSE POLARITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | By internal MOSFET, no damage, recovers automatically after fault condition removed                                                                       |              |              |                                                                                 |                                                               |                |
|                          | UNDER VOLTAGE LOCKOUT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 12Vin (A - type) :Power ON≥9V , OFF≤8.5V                                                                                                                  |              |              | 24Vin (B - type) :Power ON≥16.8V , OFF≤16.5V                                    |                                                               |                |
| ENVIRONMENT              | WORKING TEMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | -40 ~ +70℃ (Refer to "Derating Curve")                                                                                                                    |              |              |                                                                                 |                                                               |                |
|                          | WORKING HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 5 ~ 95% RH non-condensing                                                                                                                                 |              |              |                                                                                 |                                                               |                |
|                          | STORAGE TEMP., HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -40 ~ +85℃ , 5 ~ 95% RH non-condensing                                                                                                                    |              |              |                                                                                 |                                                               |                |
|                          | TEMP. COEFFICIENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ±0.03%/℃ (0 ~ 55℃ )                                                                                                                                       |              |              |                                                                                 |                                                               |                |
|                          | VIBRATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Component:10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes; Mounting: Compliance to IEC61373                                                  |              |              |                                                                                 |                                                               |                |
|                          | OPERATING ALTITUDE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2000 meters                                                                                                                                               |              |              |                                                                                 |                                                               |                |
| SAFETY & EMC<br>(Note 6) | SAFETY STANDARDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | IEC 62368-1 (LVD), EAC TP TC 004, AS/NZS 62368.1 approved; Design refer to UL508                                                                          |              |              |                                                                                 |                                                               |                |
|                          | 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 B                                                       |                |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Radiated                                                                                                                                                  | EN55032      |              |                                                                                 | Class B                                                       |                |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Voltage Flicker                                                                                                                                           | EN61000-3-3  |              |                                                                                 | -----                                                         |                |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Harmonic Current                                                                                                                                          | -----        |              |                                                                                 | -----                                                         |                |
|                          | EMC IMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | EN55024 , EN61000-6-2(EN50082-2)                                                                                                                          |              |              |                                                                                 |                                                               |                |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Parameter                                                                                                                                                 | Standard     |              |                                                                                 | Test Level / Note                                             |                |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ESD                                                                                                                                                       | EN61000-4-2  |              |                                                                                 | Level 3, 8KV air ; Level 3, 6KV contact; criteria A           |                |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Radiated                                                                                                                                                  | EN61000-4-3  |              |                                                                                 | Level 3, 10V/m ; criteria A                                   |                |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | EFT / Burst                                                                                                                                               | EN61000-4-4  |              |                                                                                 | Level 3, 2KV ; criteria A                                     |                |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Surge                                                                                                                                                     | EN61000-4-5  |              |                                                                                 | Level 3, 1KV/Line-Line ;Level 3, 2KV/Line-Line-FG ;criteria A |                |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Conducted                                                                                                                                                 | EN61000-4-6  |              |                                                                                 | Level 3, 10V ; criteria A                                     |                |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Magnetic Field                                                                                                                                            | EN61000-4-8  |              |                                                                                 | Level 4, 30A/m ; criteria A                                   |                |
|                          | RAILWAY STANDARD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Compliance to EN45545-2 for fire protection ; Meet EN50155 / IEC60571 including IEC61373 for shock & vibration, EN50121-3-2 for EMC (except for 9~18Vin)  |              |              |                                                                                 |                                                               |                |
| OTHERS                   | MTBF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 214.6K hrs min. MIL-HDBK-217F (25℃)                                                                                                                       |              |              |                                                                                 |                                                               |                |
|                          | DIMENSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 32*125.2*102mm (W*H*D)                                                                                                                                    |              |              |                                                                                 |                                                               |                |
|                          | PACKING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 510g; 28pcs/15.3Kg/1.22CUFT                                                                                                                               |              |              |                                                                                 |                                                               |                |
| NOTE                     | 1. All parameters NOT specially mentioned are measured at normal input (A:12Vdc , B:24Vdc) , 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. 3 seconds max., please refer to peak loading curves.<br>6. The power supply is considered as an independent unit, but the final equipment still need to re-confirm that the whole system complies with the EMC directives. For guidance on how to perform these EMC tests, please refer to “EMI testing of component power supplies.” (as available on <a href="http://www.meanwell.com">http://www.meanwell.com</a> )<br>7. 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). |                                                                                                                                                           |              |              |                                                                                 |                                                               |                |

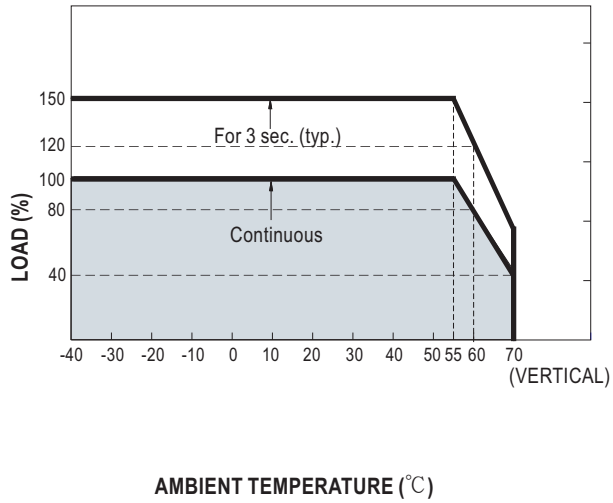
# SPECIFICATION

| MODEL                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | DDR-120C-12                                                                                                                                               | DDR-120C-24    | DDR-120C-48         | DDR-120D-12                                          | DDR-120D-24                                                   | DDR-120D-48   |              |              |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------|------------------------------------------------------|---------------------------------------------------------------|---------------|--------------|--------------|
| OUTPUT                   | DC VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 12V                                                                                                                                                       | 24V            | 48V                 | 12V                                                  | 24V                                                           | 48V           |              |              |
|                          | RATED CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 10A                                                                                                                                                       | 5A             | 2.5A                | 10A                                                  | 5A                                                            | 2.5A          |              |              |
|                          | CURRENT RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0 ~ 10A                                                                                                                                                   | 0 ~ 5A         | 0 ~ 2.5A            | 0 ~ 10A                                              | 0 ~ 5A                                                        | 0 ~ 2.5A      |              |              |
|                          | RATED POWER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 120W                                                                                                                                                      | 120W           | 120W                | 120W                                                 | 120W                                                          | 120W          |              |              |
|                          | PEAK CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 15A                                                                                                                                                       | 7.5A           | 3.75A               | 15A                                                  | 7.5A                                                          | 3.75A         |              |              |
|                          | PEAK POWER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Note.5 180W (3sec.)                                                                                                                                       |                |                     |                                                      |                                                               |               |              |              |
|                          | RIPPLE & NOISE (max.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Note.2 50mVp-p                                                                                                                                            | 50mVp-p        | 50mVp-p             | 50mVp-p                                              | 50mVp-p                                                       | 50mVp-p       |              |              |
|                          | VOLTAGE ADJ. RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 9 ~ 14V                                                                                                                                                   | 24 ~ 28V       | 48 ~ 56V            | 9 ~ 14V                                              | 24 ~ 28V                                                      | 48 ~ 56V      |              |              |
|                          | VOLTAGE TOLERANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Note.3 ± 1.0%                                                                                                                                             | ± 1.0%         | ± 1.0%              | ± 1.0%                                               | ± 1.0%                                                        | ± 1.0%        |              |              |
|                          | LINE REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ± 0.5%                                                                                                                                                    | ± 0.5%         | ± 0.5%              | ± 0.5%                                               | ± 0.5%                                                        | ± 0.5%        |              |              |
|                          | LOAD REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ± 1.0%                                                                                                                                                    | ± 1.0%         | ± 1.0%              | ± 1.0%                                               | ± 1.0%                                                        | ± 1.0%        |              |              |
| SETUP, RISE TIME         | 500ms, 60ms @48Vdc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                           |                | 500ms, 60ms @110Vdc |                                                      |                                                               |               |              |              |
| HOLD UP TIME (Typ.)      | Please refer to page 7 Hold up Time( Load de-rating curve )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                           |                |                     |                                                      |                                                               |               |              |              |
| INPUT                    | VOLTAGE RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Note.4 33.6 ~ 67.2Vdc                                                                                                                                     | 33.6 ~ 67.2Vdc | 33.6 ~ 67.2Vdc      | 67.2 ~ 154Vdc                                        | 67.2 ~ 154Vdc                                                 | 67.2 ~ 154Vdc |              |              |
|                          | EFFICIENCY (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 89.5%                                                                                                                                                     | 91%            | 92%                 | 89.5%                                                | 91%                                                           | 91.5%         |              |              |
|                          | DC CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2.8A @48Vdc                                                                                                                                               |                |                     | 1.3A @110Vdc                                         |                                                               |               |              |              |
|                          | INRUSH CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 5A @48Vdc                                                                                                                                                 |                |                     | 5A @110Vdc                                           |                                                               |               |              |              |
|                          | INTERRUPTION OF VOLTAGE SUPPLY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | EN50155:2007-comply with S1 level (6ms) @ full load, S2 level (10ms) @ 60% load                                                                           |                |                     | EN50155:2007-comply with S2 level (10ms) @ full load |                                                               |               |              |              |
| PROTECTION               | OVERLOAD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | EN50155:2017-comply with S1 level                                                                                                                         |                |                     |                                                      |                                                               |               |              |              |
|                          | OVER VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | EN50155:2017-comply with S1 level                                                                                                                         |                |                     |                                                      |                                                               |               |              |              |
|                          | REVERSE POLARITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Normally works within 150% rated output power for more than 3 seconds and then constant current protection 105~135% rated output power with auto-recovery |                |                     |                                                      |                                                               |               |              |              |
|                          | UNDER VOLTAGE LOCKOUT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 14.4 ~ 16.8V                                                                                                                                              |                |                     | 28.8 ~ 33.6V                                         | 57.6 ~ 67.2V                                                  | 14.4 ~ 16.8V  | 28.8 ~ 33.6V | 57.6 ~ 67.2V |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Protection type : Shut down o/p voltage, re-power on to recover                                                                                           |                |                     |                                                      |                                                               |               |              |              |
| ENVIRONMENT              | WORKING TEMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | By internal MOSFET, no damage, recovers automatically after fault condition removed                                                                       |                |                     |                                                      |                                                               |               |              |              |
|                          | WORKING HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 48Vin (C - type):Power ON≥33.6V , OFF≤33V                                                                                                                 |                |                     | 110Vin (D - type):Power ON≥67.2V , OFF≤65V           |                                                               |               |              |              |
|                          | STORAGE TEMP., HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 48Vin (C - type):Power ON≥33.6V , OFF≤33V                                                                                                                 |                |                     |                                                      |                                                               |               |              |              |
|                          | TEMP. COEFFICIENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 110Vin (D - type):Power ON≥67.2V , OFF≤65V                                                                                                                |                |                     |                                                      |                                                               |               |              |              |
|                          | VIBRATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | EN50155:2007-comply with S1 level (6ms) @ full load, S2 level (10ms) @ 60% load                                                                           |                |                     |                                                      |                                                               |               |              |              |
|                          | OPERATING ALTITUDE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | EN50155:2017-comply with S1 level                                                                                                                         |                |                     |                                                      |                                                               |               |              |              |
| SAFETY & EMC<br>(Note 6) | SAFETY STANDARDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | IEC 62368-1 (LVD), EAC TP TC 004, AS/NZS 62368.1 approved; Design refer to UL508                                                                          |                |                     |                                                      |                                                               |               |              |              |
|                          | 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°C / 70% RH                                                                                               |                |                     |                                                      |                                                               |               |              |              |
|                          | EMC EMISSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Parameter                                                                                                                                                 | Standard       |                     |                                                      | Test Level / Note                                             |               |              |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Conducted                                                                                                                                                 | EN55032        |                     |                                                      | Class B                                                       |               |              |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Radiated                                                                                                                                                  | EN55032        |                     |                                                      | Class B                                                       |               |              |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Voltage Flicker                                                                                                                                           | EN61000-3-3    |                     |                                                      | -----                                                         |               |              |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Harmonic Current                                                                                                                                          | -----          |                     |                                                      | -----                                                         |               |              |              |
|                          | EMC IMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | EN55024 , EN61000-6-2(EN50082-2)                                                                                                                          |                |                     |                                                      |                                                               |               |              |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Parameter                                                                                                                                                 | Standard       |                     |                                                      | Test Level / Note                                             |               |              |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ESD                                                                                                                                                       | EN61000-4-2    |                     |                                                      | Level 3, 8KV air ; Level 3, 6KV contact; criteria A           |               |              |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Radiated                                                                                                                                                  | EN61000-4-3    |                     |                                                      | Level 3, 10V/m ; criteria A                                   |               |              |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | EFT / Burst                                                                                                                                               | EN61000-4-4    |                     |                                                      | Level 3, 2KV ; criteria A                                     |               |              |              |
|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Surge                                                                                                                                                     | EN61000-4-5    |                     |                                                      | Level 3, 1KV/Line-Line ;Level 3, 2KV/Line-Line-FG ;criteria A |               |              |              |
| Conducted                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | EN61000-4-6                                                                                                                                               |                |                     | Level 3, 10V ; criteria A                            |                                                               |               |              |              |
| Magnetic Field           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | EN61000-4-8                                                                                                                                               |                |                     | Level 4, 30A/m ; criteria A                          |                                                               |               |              |              |
| RAILWAY STANDARD         | Compliance to EN45545-2 for fire protection ; Meet EN50155 / IEC60571 including IEC61373 for shock & vibration, EN50121-3-2 for EMC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                           |                |                     |                                                      |                                                               |               |              |              |
| OTHERS                   | MTBF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 214.6K hrs min. MIL-HDBK-217F (25°C)                                                                                                                      |                |                     |                                                      |                                                               |               |              |              |
|                          | DIMENSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 32*125.2*102mm (W*H*D)                                                                                                                                    |                |                     |                                                      |                                                               |               |              |              |
|                          | PACKING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 510g; 28pcs/15.3Kg/1.22CUFT                                                                                                                               |                |                     |                                                      |                                                               |               |              |              |
| NOTE                     | 1. All parameters NOT specially mentioned are measured at normal input (C:48Vdc , D:110Vdc) , rated load and 25°C 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. 3 seconds max., please refer to peak loading curves.<br>6. The power supply is considered as an independent unit, but the final equipment still need to re-confirm that the whole system complies with the EMC directives. For guidance on how to perform these EMC tests, please refer to “EMI testing of component power supplies.” (as available on <a href="http://www.meanwell.com">http://www.meanwell.com</a> )<br>7. The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft). |                                                                                                                                                           |                |                     |                                                      |                                                               |               |              |              |

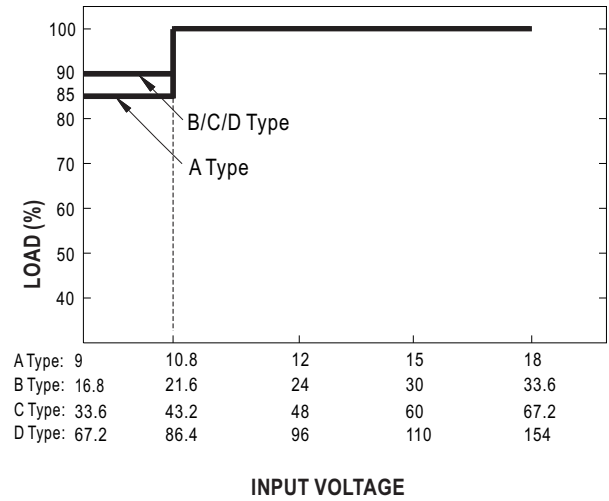
## Block Diagram



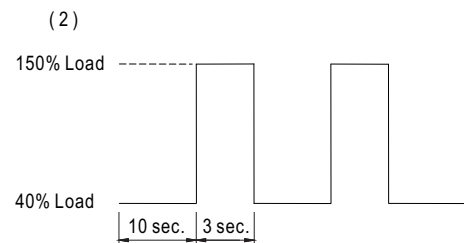
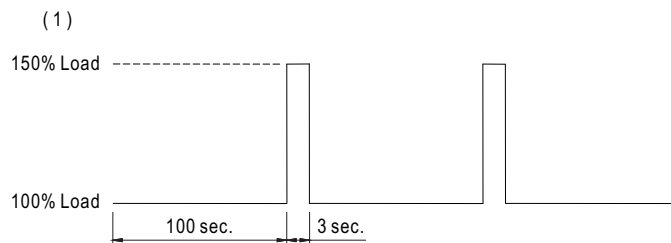
## Derating Curve



## Output derating VS input voltage



## Peak Loading



### Input Fuse

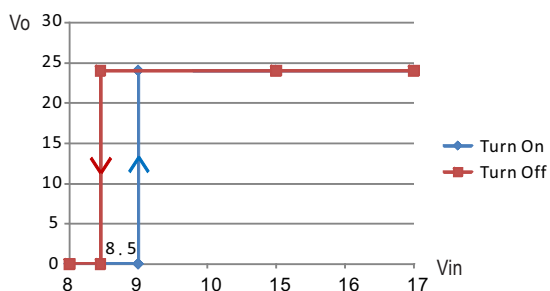
There is a fuse connected in series to the positive input line, which is used to protect against abnormal surge. Fuse specifications of each model are shown as below.

| Type | Fuse Type | Reference and Rating      |
|------|-----------|---------------------------|
| A    | Time-Lag  | Conquer MST, 10A, 250V *2 |
| B    | Time-Lag  | Conquer MST, 8A, 250V *2  |
| C    | Time-Lag  | Conquer MST, 8A, 250V *1  |
| D    | Time-Lag  | Conquer MST, 4A, 250V *1  |

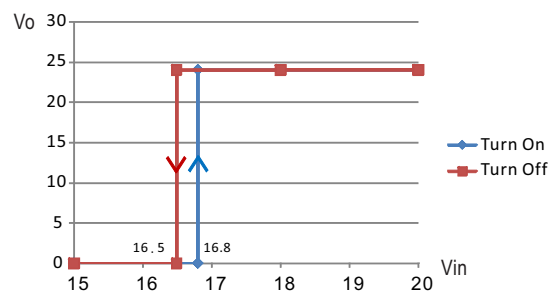
### Input Under-Voltage Protection

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

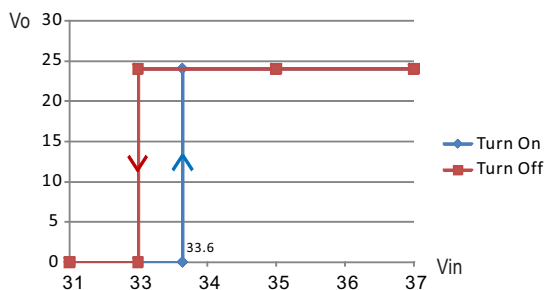
DDR-120A-24



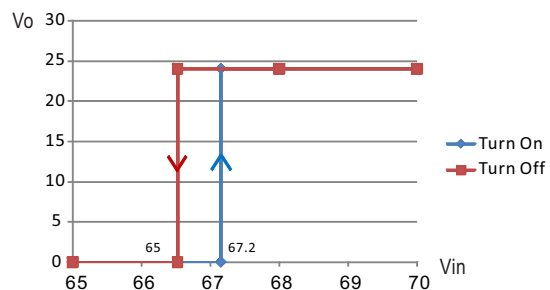
DDR-120B-24



DDR-120C-24



DDR-120D-24



### ■ Input Reverse Polarity Protection

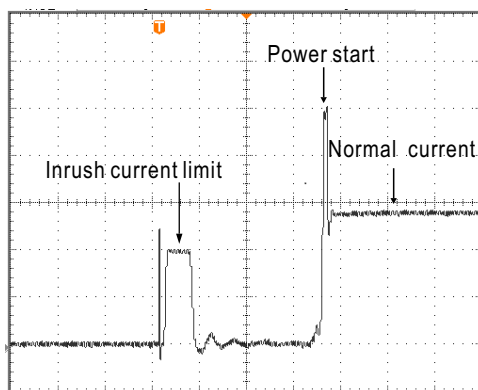
There is a MOSFET connected in series to the negative input line. If the input polarity is connected reversely, the MOSFET opens and there will be no output to protect the unit.

### ■ Input Range and Transient Ability

The series has a wide range input capability. With -30% / +40% of rated input voltage(except A Type), it can withstand that for 1 second.

### ■ Inrush Current

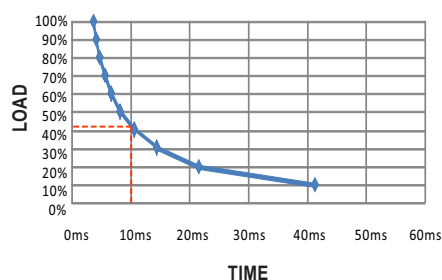
Inrush current is suppressed by a current limit circuit during the initial start-up, and then the circuit is bypassed by a MOSFET to reduce power consumption after accomplishing the start-up.



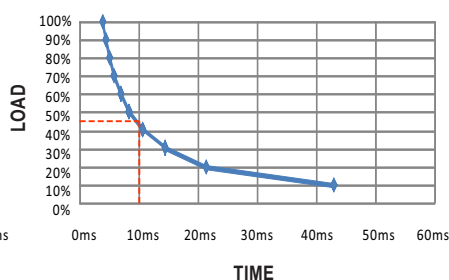
## ■ Hold-up Time

- EN50155: 2007 version -D type is in compliance with S2 level (10ms), while A types are in compliance with S1 level (3ms) at full load output condition. To fulfil the requirements of S2 level (10ms), B types require de-rating their output load to 70%, C types require de-rating their output load to 60%, please refer to the curve diagrams below.

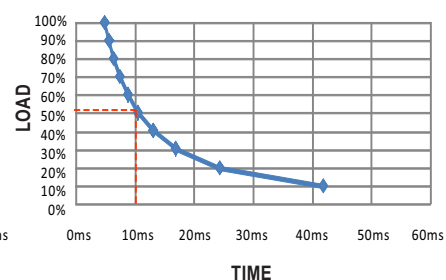
DDR-120A-12



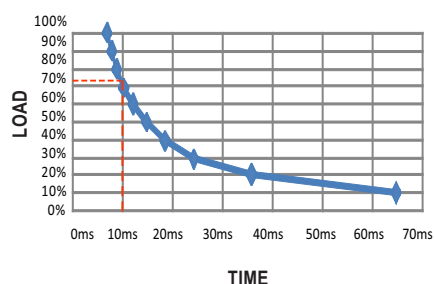
DDR-120A-24



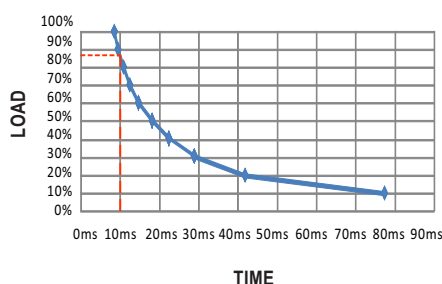
DDR-120A-48



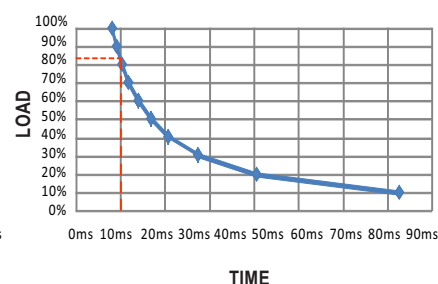
DDR-120B-12



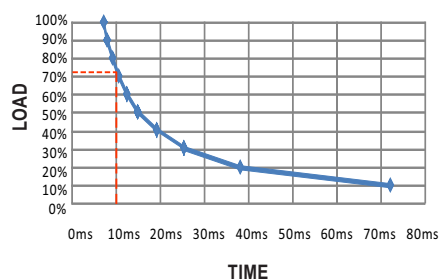
DDR-120B-24



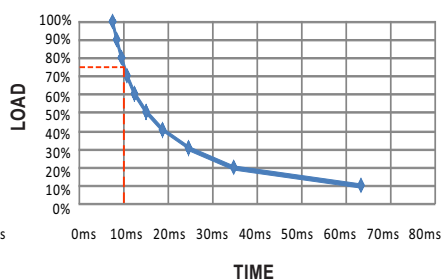
DDR-120B-48



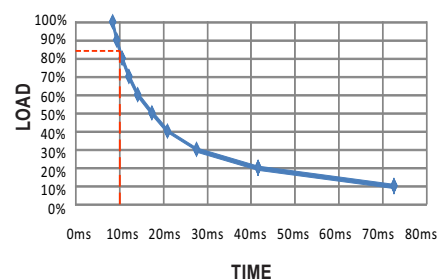
DDR-120C-12



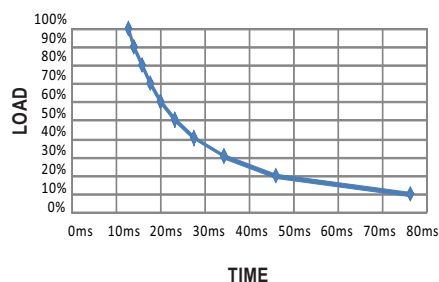
DDR-120C-24



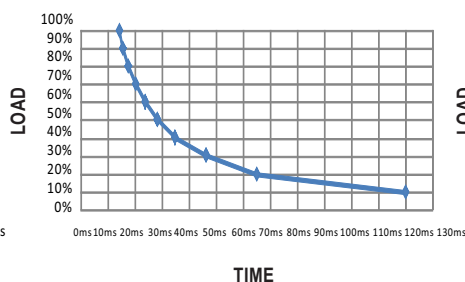
DDR-120C-48



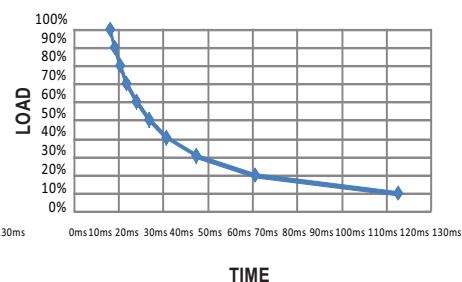
DDR-120D-12



DDR-120D-24



DDR-120D-48

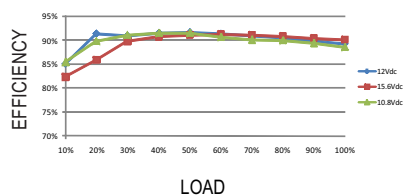


- EN50155: 2017 version - Comply with S1 level (6ms)

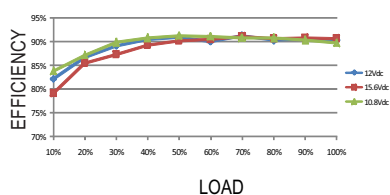
## ■ Efficiency vs Load & Vin Curve

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

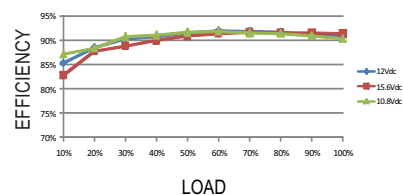
### DDR-120A-12



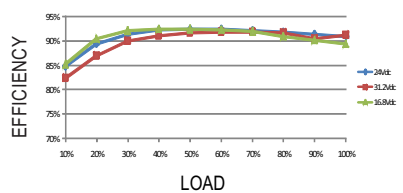
### DDR-120A-24



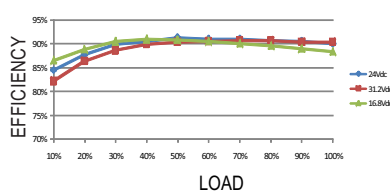
### DDR-120A-48



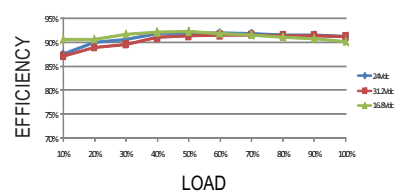
### DDR-120B-12



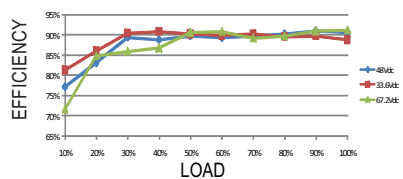
### DDR-120B-24



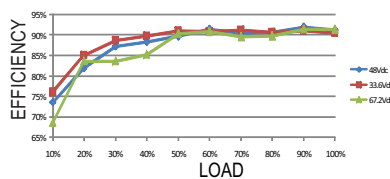
### DDR-120B-48



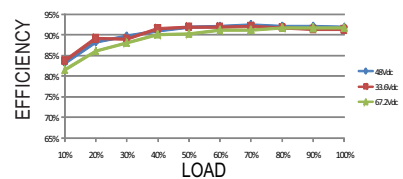
### DDR-120C-12



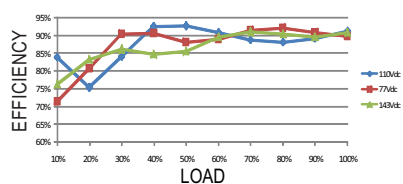
### DDR-120C-24



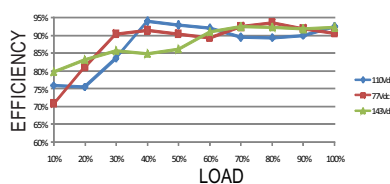
### DDR-120C-48



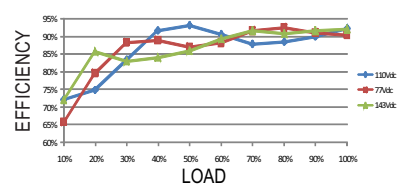
### DDR-120D-12



### DDR-120D-24



### DDR-120D-48





## ■ Immunity to Environmental Conditions

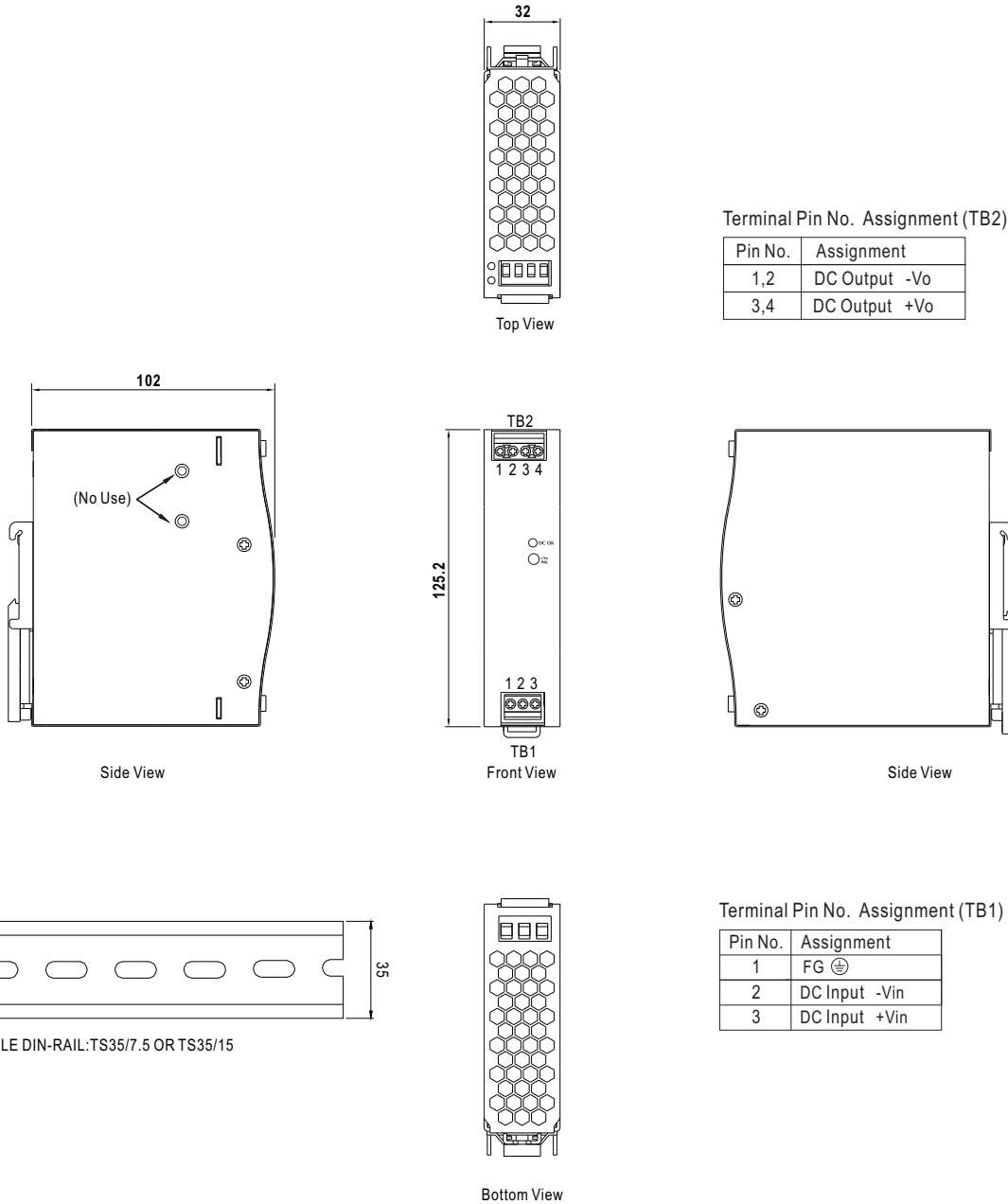
| Test method                  | Standard                                                                                                                          | Test conditions                                                     | Status    |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|-----------|
| 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  |
| R22        | Oxygen index test   | EN 45545-2:2013<br>EN ISO 4589-2:1996 | PASS         | PASS | PASS |
|            | Smoke density test  | EN 45545-2:2013<br>EN ISO 5659-2:2006 | PASS         | PASS | PASS |
|            | Smoke toxicity test | EN 45545-2:2013<br>NF X70-100:2006    | PASS         | PASS | PASS |
| R24        | Oxygen index test   | EN 45545-2:2013<br>EN ISO 4589-2:1996 | PASS         | PASS | PASS |
| R25        | Glow-wire test      | EN 45545-2:2013<br>EN 60695-2-11:2000 | PASS         | PASS | PASS |
| R26        | Vertical flame test | EN 45545-2:2013<br>EN 60695-11:2003   | PASS         | PASS | PASS |

## Mechanical Specification

Case No. Unit:mm



## Installation Manual

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