P R
B X

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1. Assembling and Installation method

1.1 Mounting method

ECD250D/ECD350D series shall be mounted to a heatsink or structure which has sufficient thermal capacity to cool the power supply.

It has 10 of 4.5mm diameter mounting holes, to keep uniform thermal conductivity.

It is recommended mounting the unit on metal enclosure which has sufficient thickness to avoid unexpected mechanical stress on the unit. When it is mounted on thin or unstable surface, make sure mechanical robustness of the system.

A thermal interface material such as a thermal pad or thermal grease shall be used to ensure proper cooling of the unit.

1.2 Installation to fulfil EMC requirement

Input cables should be twisted and places as close to the metal enclosure of final application as possible.

Output cables of positive (+) and negative (-) should be twisted and separated from input cables as much as possible.

When function pins are connected to a user accessible point (i.e., panel switch, indicator circuit etc.), ensure they must be protected from electrostatic discharging.

2. Operating temperature area (Derating)

ECD250D and ECD350D intended to be used with conduction cooling. For reliable and safe operation, follow the operating temperature area shown in Fig. 2.1.

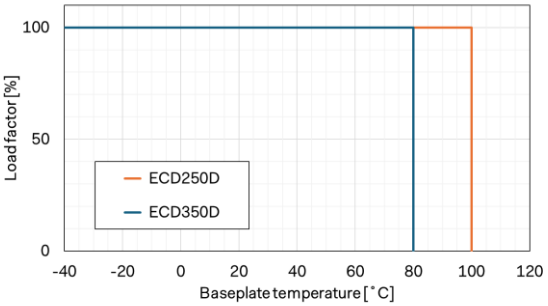

Fig. 2.1 Operating temperature area (Conduction)

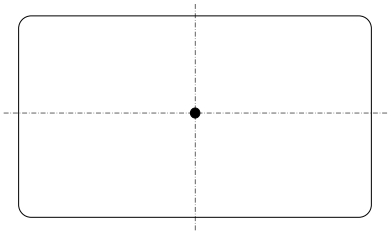

Fig. 2.2 Measurement point of baseplate (Bottom view)

ECD250D and 350D can be used with convection cooling.
Fig. 2.3 and Fig. 2.4 shows reference derating curve with convection cooling. And Fig. 2.5 shows test condition with convection cooling.
Keep baseplate temperature within Fig.2.1 even convection cooling.

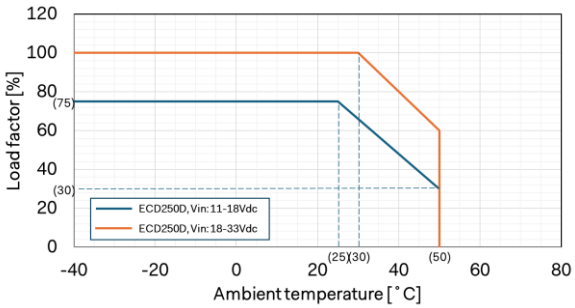

Fig. 2.3 Reference derating curve (ECD250D, convection)

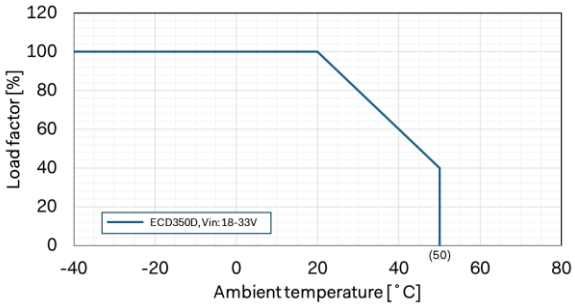

Fig. 2.4 Reference derating curve (ECD350D, convection)

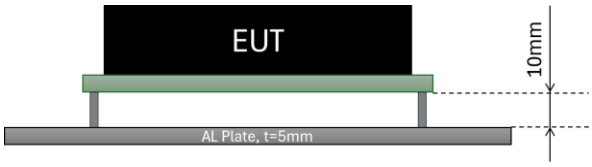

Fig. 2.5 Convection cooling test condition (reference)

3. Pin assignment of connector

Connector placement is shown in Fig. 3.1.
And pin assignment and mating connector type are shown in Table 3.1.

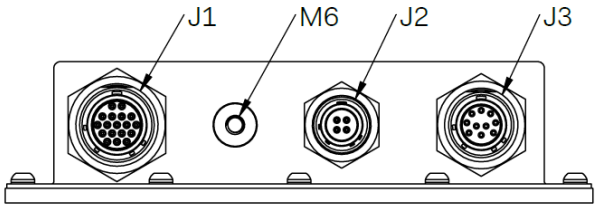

Fig.3.1 Connector placement (front view)

Table 3.1 Pin assignment and mating connector type

J1 Input	
Mating connector D38999/26FD18SN	
A, B, C, D, E, N, P, R, U	+Vin
F, G, H, J, K, L, M, S, T	-Vin

J2 Signal	
Mating connector D38999/26FB4PN	
A	PG
B	PGG
C	RC
D	RCG

J3 Output	
Mating connector D38999/26FC98PN	
A, B, C, D, E	+Vout
F, G, H, J, K	-Vout

4. Series operation

Series operation is possible by connecting the output of two or more power supplies as shown in Fig. 4.1.

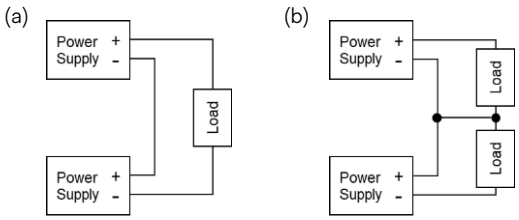

Fig. 4.1 Example of Series operation

Output current in series connection should be lower than the lowest rated current in each unit.

When one of unit's output becomes short circuit in series operation, high voltage may be applied to rest of units. To avoid further damages, consider adding a protection method that immediately stops operation.

Make sure that the combined total output voltage is less than 120VDC.

5. Functions

5.1 Input voltage range

Table 5.1 shows the input voltage range of ECD250D and ECD350D series.

Table 5.1 Input voltage range

Models	Input voltage range [VDC]	Turn on [VDC]	Turn off [VDC]	Hysteresis [VDC]
ECD250D12	11-33 *1	11	9	2
ECD350D28	18-33	16	12	4

*1 ECD250D12 can be operated at 9V input voltage continuously after the unit start operation. Contact us for details.

5.2 Inrush current limiting

There is built-in inrush current limiting circuit.

5.3 Over current protection

Over Current Protection (OCP) is built in. It works at 105% of the rated current or higher.

When the output voltage drops after OCP works, the unit enters a "hiccup mode". The output voltage recovers automatically when the fault caused by over current is corrected.

5.4 Over voltage protection

Over Voltage Protection (OVP) is built in. The output voltage shuts down when over voltage protection is in operation. When over voltage protection is activated, shut down the input voltage and wait for 60 seconds or more.

Warning :

Devices inside the unit might fail when voltage more than rated output voltage is applied to the output of the unit. This could happen when the customer tests the function of overvoltage protection of the unit.

5.5 Thermal Protection

When the baseplate temperature exceeds the temperature specified in derating curve in Fig. 2.1, thermal protection will be activated and shut down the output.

The output recovers automatically when the power supply is cooled down sufficiently.

5.6 Remote ON/OFF

Remote ON/OFF function is built in. Remote ON/OFF is operated by applying a voltage between RC and RCG terminals. It requires external voltage source or connect from input voltage.

Examples of ON/OFF circuit are shown in Fig. 5.1 and Table 5.2.

When Remote ON/OFF function isn't used, keep RC and RCG open.

When the output shuts off by activating over voltage protection, it can be recovered by toggling Remote ON/OFF signal.

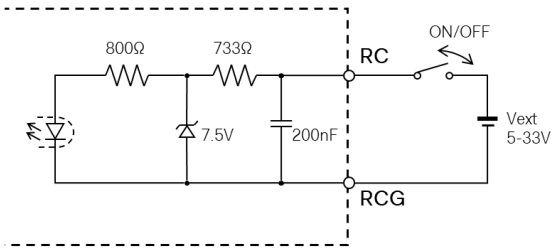

Fig. 5.1 Example of connecting remote control

Table 5.2 Specification of Remote Control

No.	Item	Connection
1	Figure	Fig. 5.1
2	Reference pin	RCG
3	Output ON	SW OPEN
4	Output OFF	SW SHORT

5.7 Power good (PG)

By using power good signal (PG), it is possible to check the status of the output voltage of the unit.

Impedance between PG and PGG becomes high by open collector circuit when the output voltage is lower than -5% of rated output voltage.

Details of PG signal circuit are shown in Fig. 5.2 and Table 5.3.

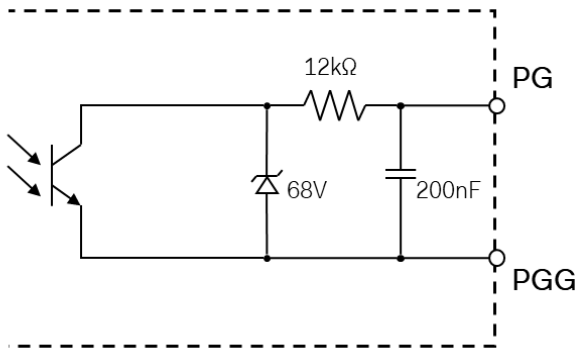

Fig. 5.2 Internal circuit of PG

Table 5.3 Specification of PG

No.	Item	PG
1	Function	Normal operation "Low"
		Abnormal operation "Open Collector"
2	Reference pin	PGG
3	Output voltage < -5% of rated output voltage	Open collector
4	Output voltage ≥ -5% of rated output voltage	Impedance between PG-PGG: 12kΩ
5	Maximum sink current	1mA max
6	Maximum applied voltage	35V max

6. Compliance

6.1 MIL-STD-1275

The unit has been verified according to MIL-STD-1275D, E and F. Table 6.1 shows the compliance matrix.

Table 6.1 Compliance matrix for MIL-STD-1275D, E and F

Test item	1275D	1275E	1275F
Steady State	Pass	Pass	Pass
Spikes	Pass	*1	Pass
Surges	Pass	Pass	Pass
Injected ripple	Pass	Pass	Pass
Starting disturbance (Cranking)	*2	Pass	Pass
Reverse polarity	Pass	Pass	Pass

*1 It may requires some impedances on input.
*2 MAX and MIN voltage levels are different from E and F, so the unit may not pass the test at rated output power.

7. Warranty

Warranty term is 3 years.