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Version：V1.00

Ideal Diode

（EK-iD40V/60V/80V/100V/150V/200V 150A 2in1）

Product Datasheet

Shenzhen Enerkey BMS Power Technology Co., LTD

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Product Name	Ideal Diode
Product Model	EK-iD40V/60V/80V/100V/150V/200V 150A 2in1
Version	V1.0
Operating Voltage Range	40V/60V/80V/100V/150V/200V
Working Continuous Current	150A
Function	Anti-reverse connection protection/anti-reverse flooding
Effective Date	2025/05/13

Product Change History			
Version	Date	Description of changes	Approval
V1.0	2025-05-13	Initial release	

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Contents

1. Overview

This specification describes in detail the main electrical characteristics, application range, limit parameters, product size and other characteristics of the ideal diode module. Compared with Schottky diodes, this module can provide a lower loss path, and in high-power applications, this can provide a more efficient solution and save valuable circuit board space by reducing the need for heat dissipation. Designed to provide stable current output and prevent current backflow, it is suitable for a variety of application scenarios, such as battery-powered equipment, multi-way power supply parallel use, etc.

2. Technology Parameters

2.1 Electrical Characteristics

①. Forward voltage (Vf): Under rated forward current, the forward voltage of the ideal diode module is extremely low, almost close to zero, ensuring extremely low power consumption and efficient energy conversion

②. Reverse breakdown voltage (Vbr): Under the specified reverse voltage, the module can reliably block the current and prevent circuit damage. The reverse breakdown voltage meets the high industry standards to ensure stable operation of the equipment.

③. Forward current (If): The ideal diode module can withstand a high forward current while maintaining a low forward voltage to meet the needs of different application scenarios.

④. Reverse leakage current (Ir): Under reverse voltage, the leakage current of the module is extremely low, effectively reducing energy loss and improving system efficiency.

2.2 Limit parameters

①. Maximum forward current (Table 2.0): Exceeding this current value may cause module damage or performance degradation.

②. Maximum reverse voltage (Table 2.0): Exceeding this voltage value may cause module breakdown or damage.

③. Maximum operating temperature (Table 2.0): The module can work normally below this temperature, and exceeding it may cause performance degradation or damage.

▲Note that in actual applications, all operations should be performed within the extreme parameter range to avoid damaging the module or reducing its performance

Table 2.0

Product Model	Maximum Positive Current (A)	Maximum Reverse Voltage (V)	Maximum operating temperature（℃）	Static operating current（mA）
EK-iD40V150A	300	40	105	0.6～1.5mA
EK-iD60V150A	300	60	105	0.6～1.5mA
EK-iD80V150A	300	80	105	0.6～1.5mA
EK-iD100V150A	300	100	105	0.6～1.5mA
EK-iD150V150A	300	150	105	0.6～1.5mA
EK-iD200V150A	300	200	105	0.6～1.5mA

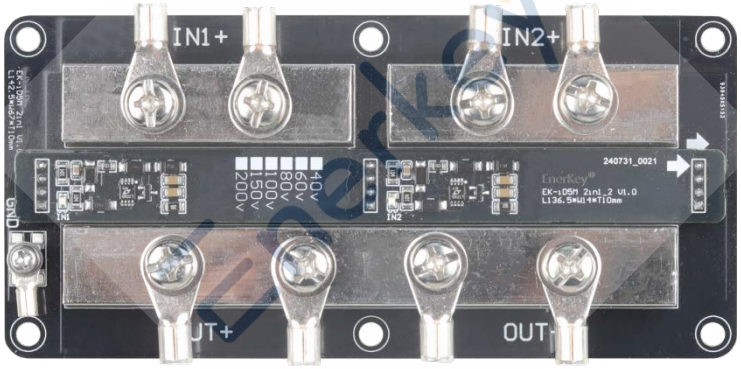
3. Scope of application

①. Battery-powered equipment: This module can be used in battery-powered equipment to effectively prevent battery reverse connection and over-discharge, and improve the stability and safety of the equipment.
②. Use of multiple power supplies in parallel: In the scenario where multiple power supplies are used in parallel, this module can prevent current backflow and ensure stable power supply between the power supplies. It has protection against reverse connection of positive and negative poles and will not burn the module.

△ It is mostly used for solar panel backflow prevention (anti-backflow prevention); battery charging backflow prevention (anti-backflow prevention); DC-DC constant voltage and constant current module output backflow prevention (anti-backflow prevention); other occasions where backflow prevention (anti-backflow prevention) is required.

4. Product Photo

4.1 Product appearance



Special note:
All shipped products are coated with conformal coating.

4.2 Accessories

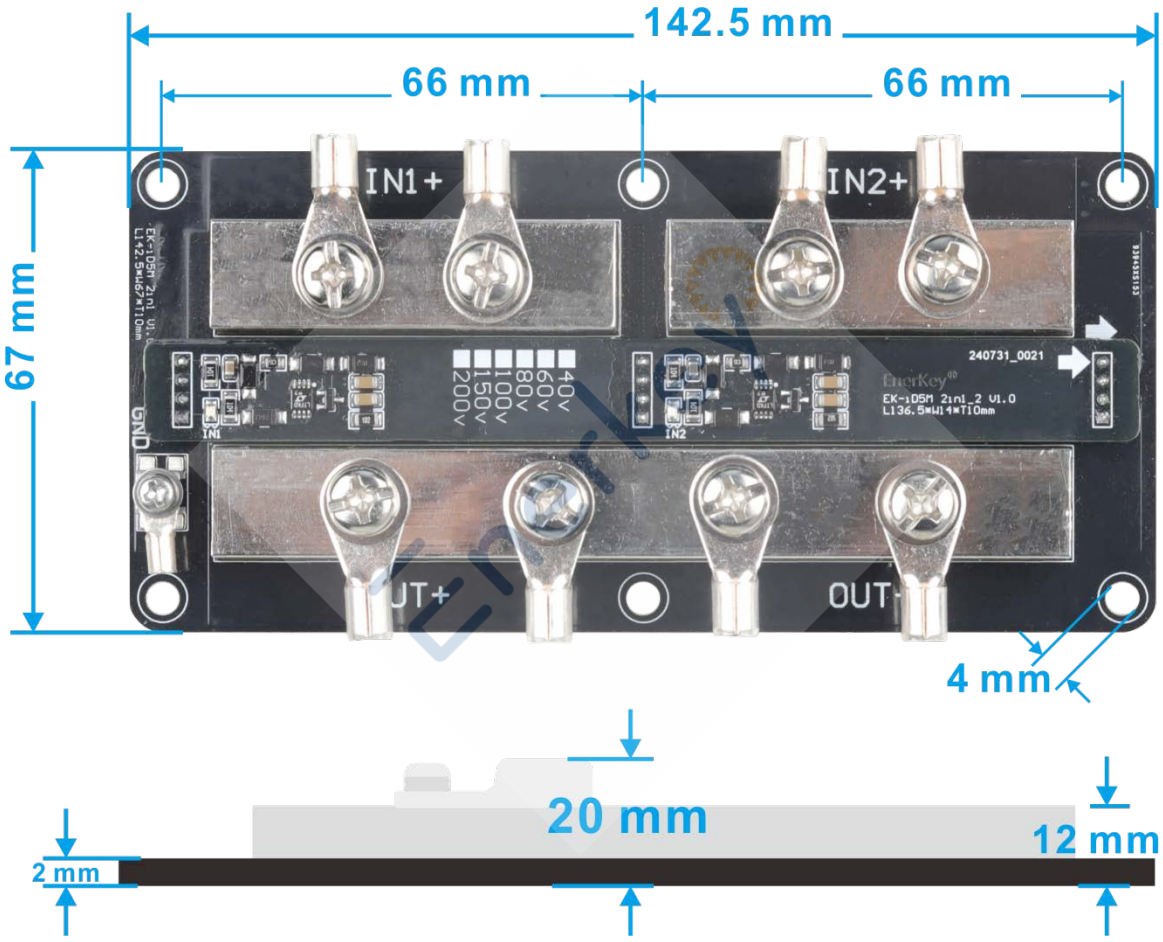
Accessories Specifications					
Material Model	Material	Hole diameter	Screw holes	Terminal length	Quantity

OTZ6-5 Terminal ear	Cu	6.4MM	6MM	25MM	8
OTZ2.5-3 Terminal ear	Cu	2.9MM	3.2MM	15MM	1
M6 screw	Nickel-plated iron	-	-	-	8
M3 Round head screw	Nickel-plated iron	-	-	-	1

5. Product size diagram

5.1 Dimensions

(Unspecified tolerance：±0.15，Unit: mm)



5.2 PCB Specifications

PCB Specifications			
Material	Aluminum substrate	Layer	1 layer
PCB thickness	2±0.10	Copper(CU)	3.0 oz
Pads plating	Lead-free HASL	Plate Thickness	

Solder	Black	Silkscreen	White

6. Product principle

6.1 Ideal diode principle

The input and output are equivalent to diodes, as shown in "Figure 5.1.1".
When the output voltage is detected to be greater than the input, the output is immediately turned off. The detection value is 15mV, and the response speed is very fast.

Simplified schematic diagram of ideal diode

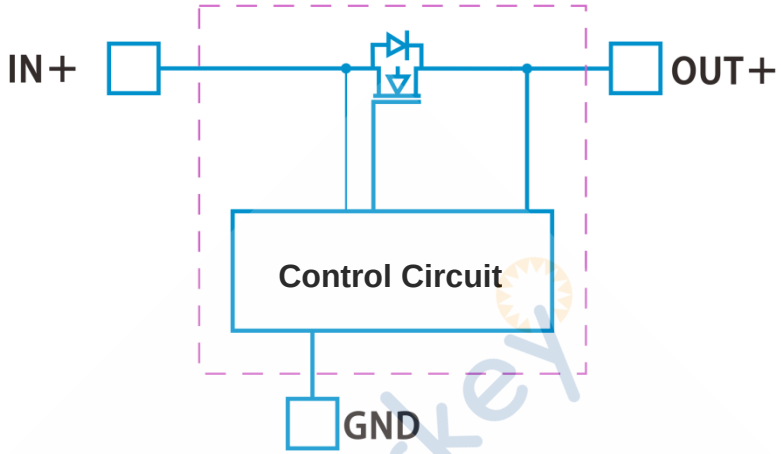


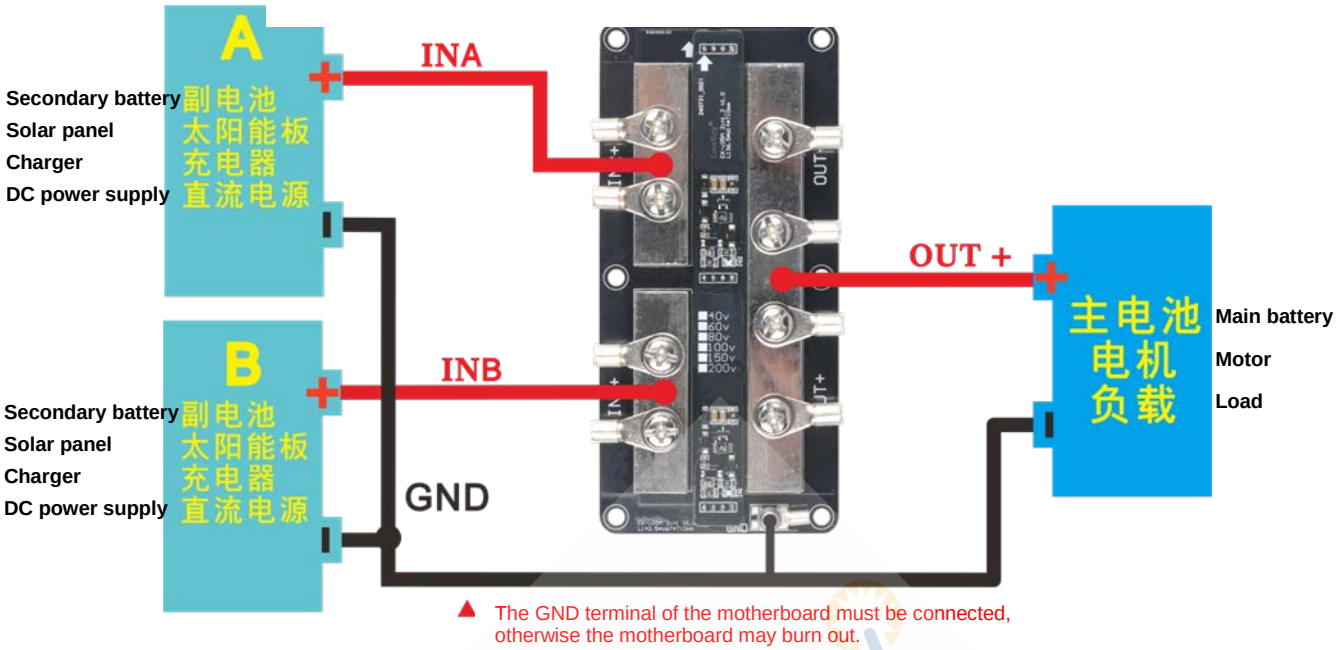
Figure 5.1.1

6.2 Special Notes

①. The module will not burn if the positive and negative poles are connected in reverse, which improves the safety of installation.
②. As the name implies, the ideal diode is a diode with ultra-low internal resistance. The conduction voltage drop of ordinary diodes is above 0.6V, and the conduction voltage drop of ideal diodes is almost negligible.
③. The copper foil layer and the aluminum base layer of the aluminum substrate PCB wiring are insulated and withstand 1000V. There is no need to worry about breakdown problems. The thermal conductivity is 20 times faster than that of FR4 glass fiber, and it can be directly attached to the large heat sink.
④. This ideal diode module cannot be used in rectifier circuits!

7. Product Wiring Diagram

Ideal Diode 150A 2in1-Wire Diagram



8. Environmental material requirements

The contents of this datasheet comply with the requirements of the EU RoHS Directive, and the content of hazardous substances meets the following standards:

Harmful Substance	Limit standard (mg/kg)
Lead (Pb)	1000
Cadmium (Cd)	100
Mercury (Hg)	1000
Hexavalent chromium (Cr6+)	1000
Polybrominated biphenyls (PBB)	1000
Polybrominated diphenyl ethers (PBDE)	1000

Secondary battery
Solar panel
Charger
DC power supply

9. Safety protection measures, transportation and storage

9.1 Safety protection measures

Ideal diodes do not have high voltage and will not cause electric shock to the body.
Do not repair ideal diodes when powered on. All repairs should be performed by qualified maintenance personnel.
If the working voltage set by the manufacturer is changed, the safety certificate is no longer applicable.
When using, please pay attention to the insulation treatment of the product to avoid short circuit.
Pay attention to ESD protection during the use of this product.
This product complies with our company's thrust standards: 0402 components ≥1.0KgF; 0603 components ≥1.5KgF; IC and MOS tubes ≥2.0KgF

9.2 Packaging and shipping

PCBA and PCBA are separated and packed with anti-static bubble bags.
The packed products can be transported by common transportation tools without being directly affected by rain and snow and violent collision and bumps.
It is not allowed to be placed together with corrosive substances such as acids and alkalis during transportation.

9.3 Storage

Packaged products should be stored in a permanent warehouse with a temperature of 0℃~35℃ and a relative humidity of no more than 80%.
The warehouse should be free of acid, alkali and corrosive gases, strong mechanical vibration and impact, and no strong magnetic field.