MILLSWOOD
engineering

Ideal Diode Power Combiner

DATA SHEET

General Description

The Ideal Diode Power Combiner takes two power sources and combines them into one, creating redundancy without sacrificing efficiency.

A power diode may drop a volt or more when carrying 25 Amps. This may not sound like a lot, but at 25 Amps this equates to 25W which is a lot of power to get rid of as heat. The Ideal Diode Power Combiner typically drops less than 100mV at the same current, equating to less than 2.5W.

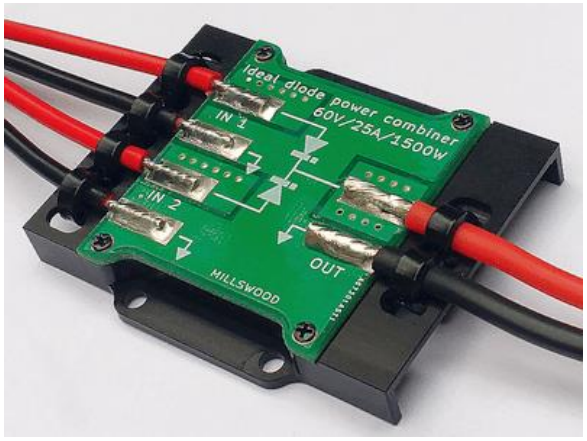


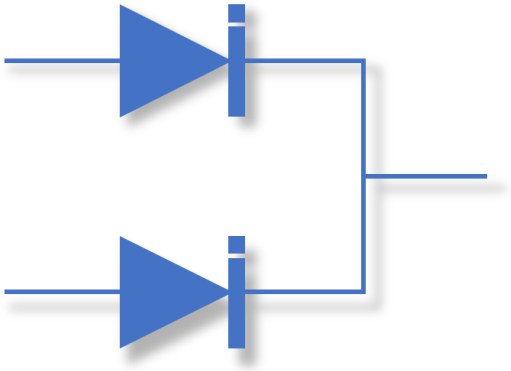
Figure 1 – Ideal Diode Power Combiner

Features

- 60 VDC, 25 Amps (1500W max.)
- Inputs reverse polarity protected and tolerant of transients up to +100V.
- Robust mechanical enclosure with integrated cable strain-relief.
- Conformally-coated PCB for moisture resistance.
- Weight: 30g.
- Dimensions: 60.0 x 49.0 x 8.2mm

Operation

The Ideal Diode Power Combiner works just like a pair of diodes with their cathodes connected together: power enters at the anodes and exits at the cathode.



There is, however, a key difference to be aware of. Unlike diodes – which do not need a ground connection to work correctly – the Ideal Diode Power Combiner must have a ground connection because it contains active devices. A ground terminal is provided for both of the input terminals and also for the output terminal. These are all connected together internally. At least one ground terminal must be connected.

Use with ESCs

One possible application for this device is to power an ESC (Electronic Speed Controller) from a pair of batteries. Be aware that regenerative braking only works if there is a path for regenerated current to make its way back into the batteries, and any sort of diode – real or ideal – in the way will prevent this. Regenerative braking must be turned off in this situation or damage will occur.

Specifications

Electrical:

Voltage	Operational: +6 to +60 VDC Absolute maximum: -60 to +66 VDC
Current	25 Amps continuous
Forward power handling	1500 Watts continuous
Forward voltage drop	200mV maximum (see typical graph below)
Quiescent current consumption	4mA typical

Miscellaneous:

Operating temperature range	-40 to +85°C
Dimensions	60 x 49 x 8.2mm
Weight	30g
Mounting	4 x 3.2mm diameter holes (sized for M3 screws), located on 23 x 43mm rectangle
Connections	6 x gold-plated solder pads, with securing points for individual cable strain reliefs

Typical Characteristics (+25°C)

Voltage drop versus load current: