

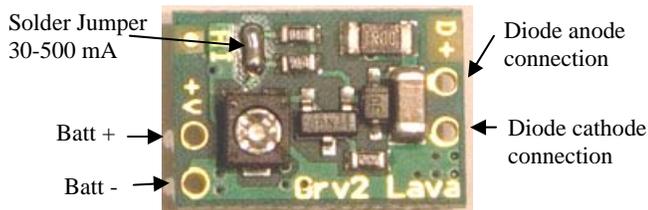
# Groove2 Manual

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The Groove2 Driver is an inexpensive linear current regulator that can be powered by battery combinations which result in a Voltage from  $V_{Out}+1.2V$  to 12V DC. The driver operates as a current regulated source, limiting the output voltage below the battery voltage as necessary to meet the current output setting. In operation, the driver will drain the power source until its voltage reaches  $V_{Out} + 1.2V$  and then the output current will decrease as the battery further drains until it reaches near  $V_{Out}$ , and very little current is delivered to the load. At this point, the battery should be recharged. For applications where buck/boost voltage or boost only is required, see the FlexDrive and MicroBoost Drivers.



**Warning:** This driver is a current source mode driver. Do not disconnect the laser diode while operating, diode damage may result. Use secure solder joints for laser diode connection.



Parameter	Specification	Unit
Input Voltage Range	$V_{Out}+1.2 - 12$	V
Output Voltage Range	1.8 - 10	V
Output Current Range	25-500	mA
Dropout Voltage	1.2	V
Maximum reverse Voltage	12	V

(Photo of bottom of Groove2.)

## Current Setting:

The Groove2 has 2 output current ranges, low 25-200mA and high 30-500mA. By default the driver is in the low range. High range is selected by soldering a bridge (solder blob) across the round gold solder pads marked 'HI'. Each range listed is approximate, there is slight variation from unit to unit so test the closest range to your desired current and move up or down range if necessary. To adjust and set the driver current, a dummy load is required. A series of 3 to 6 1N4001 diodes (depending on your laser diode Voltage) and a 1 to 0.2 ohm resistor is recommended for use as a dummy load. Use the Voltage across the dummy load resistor to determine current, or put your multi-meter in current mode in series with the dummy load. Output current is adjusted via the potentiometer trimmer. An insulated screwdriver and a light touch are recommended for adjustment.

## Powering the driver:

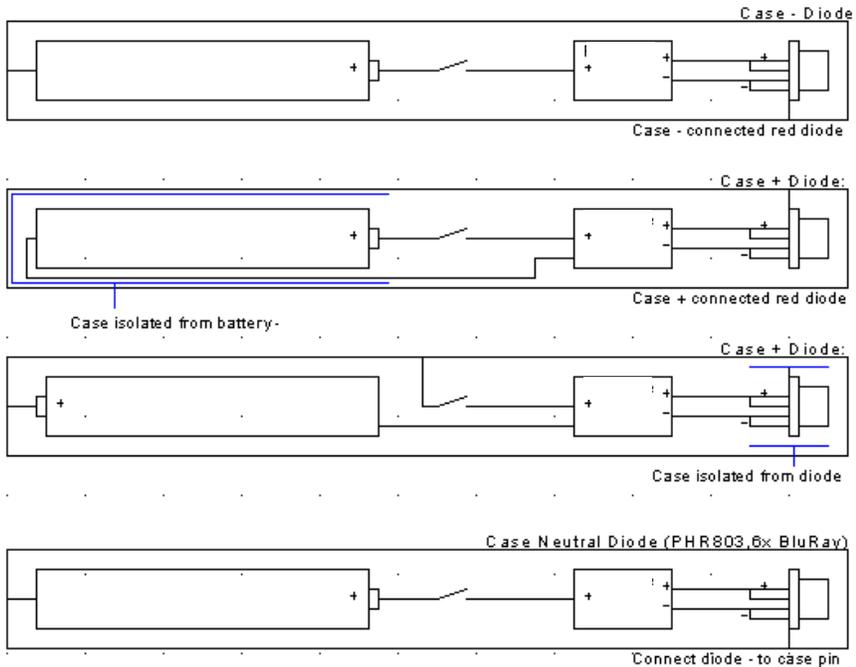
Verify that your power source does not exceed the maximum operating Voltage of the driver. Remember that battery voltage is often specified as a nominal voltage, so a fully charged 3.6V li-ion carries 4.2V and a fully charged 12V car battery carries 13.5V.

The Groove2 contains built-in battery reverse polarity protection, so putting the batteries in backwards will not damage the driver or diode.

The battery negative (-) connection and the diode - (cathode) connections are continuous. As such, if the battery - is connected to the laser casing at the battery, and the laser diode cathode is connected to the casing as well, only the diode cathode lead needs to be connected to the driver to complete the circuit for both battery (-) and diode (-) connections.

The Groove2 has a built-in thermal protection mechanism that decreases the output current when the driver gets too hot. The Groove2 will operate within this limit with a continuous power dissipation of 0.75W or under in a 25C environment. If your application requires higher continuous power dissipation from the Groove2, additional heatsinking is suggested. For common momentary high power dissipation applications such as laser pointers, typical operation will not require a heatsink.

## Wiring Diagrams for FlexDrive with Various Diodes:



VISIBLE AND/OR INVISIBLE LASER  
RADIATION -  
AVOID DIRECT EXPOSURE TO BEAM



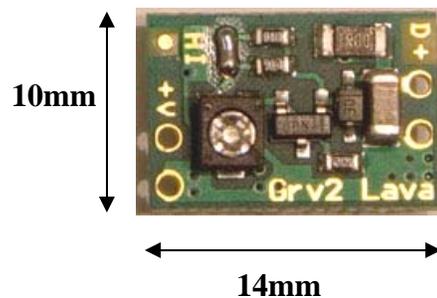
CLASS IIIb LASER PRODUCT

### Warning!

This manual assumes use of a laser output power below 5mW. If your laser product optical output is greater than 5mW and sold in the U.S., you must adhere to CDRH regulations which may require additional wiring including interlocks.

### Driver Fitment:

The Groove2 can fit in most laser cases including AAA powered lasers and even inside the 'Aixiz' modules. Care should be taken not to allow the driver to contact conductive sides of the laser casing. In the event that the casing does come close to the driver, you can wrap the driver in a single layer of insulating electrical tape to prevent shorts to the casing.



(Photo of Bottom of Groove2.)

### Soldering Precautions:

Always solder using a static draining soldering iron, in a static free location with an anti-static wrist strap or other static-draining bodily contact. Use a fine-tipped soldering iron when soldering leads to the driver, and when soldering the lower range solder jumpers. Use caution not to create a solder bridge to nearby adjacent components except as stated below: For highest margin of error, solder the diode to the driver on the bottom side where a solder bridge to the adjacent capacitor is acceptable, also solder the battery connections also on the bottom side where there is the most working space.

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