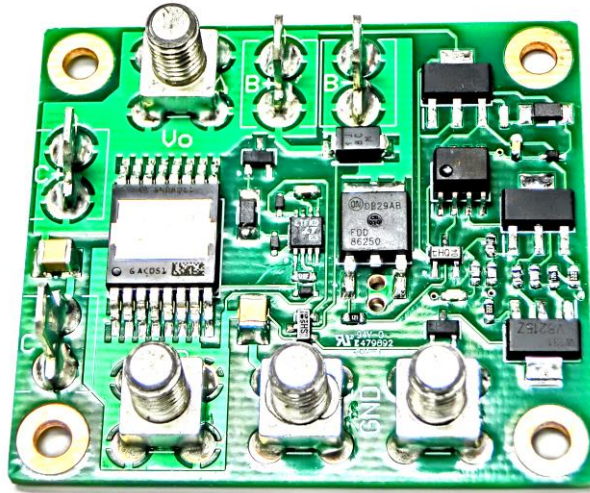


## High Current Clamp Module – QCI-CLHO-01



The high current open frame clamp circuit is designed to handle up to 50A at up to 72v for the load, and to handle 20A clamping currents (with somewhat higher peaks). An external capacitor is required between the C+ and C- terminals to allow the clamp to switch on and off at 1 kHz maximum for both thermal and EMI purposes. An external brake resistor is required between B+ and B- and should have a value that limits the maximum current to 40A at the highest operating voltage. The average braking current should be less than 10A to limit heating of the clamp transistor.

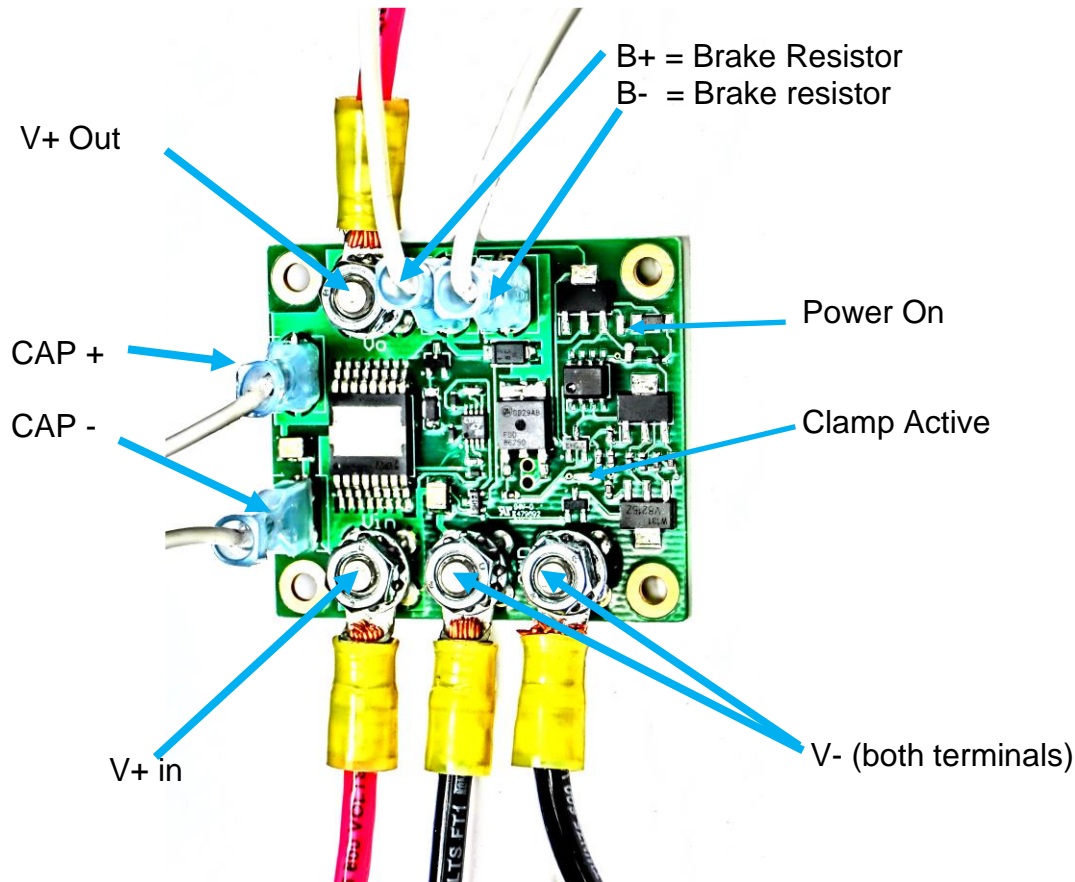
The forward active diode is designed to operate at approximately 40mV, rising to approximately 50mV at 50A (2.5W). An optional heatsink may be affixed to the top side of the main transistor if required to reduce temperature in your application.

The Pictures show the clamp without the optional heatsink attached to the main transistor.

## Product Overview

The High Current clamp is designed to handle 50A at up to 72v for the driver and up to 15A RMS, 40A peak clamping current. An "Ideal" diode circuit biases the isolation FET to approximately 40mV drop to substantially reduce the heating over the use of a conventional diode isolation. The FET is nominally 1.1 milliohm, so the drop reaches approximately 55mV at 50A. The clamp circuit monitors the difference between the input and output voltage and turns on the clamp resistor when the output voltage is approximately 2v higher than the input voltage and turns off the clamp when the output voltage goes below .5v higher than the input voltage.

## Pin-out Descriptions



The input power supply positive lead connects to V+ in, and the negative lead connects to V- (either). The load is connected between V+ out and V-. A capacitor should be tied between Cap+ and CAP-. The value should be sized to according to the maximum regeneration current. For a 1 kHz operation of the clamp circuit, which allows ~ 2v rise before operating,  $C = I * T/V$  At 20A, .001 sec (1 kHz), and 2 V rise,  $C = 20 * .001/2 = 10,000 \text{ uF}$ . The voltage should be at least 20% more than the supply voltage for safety.

The screw terminals are 5 x 0.8 mm. The lug should be against the base of the screw, with a washer and lock washer and nut or a washer and a MEP nut. The Fast-on connectors are 0.187 inch wide.

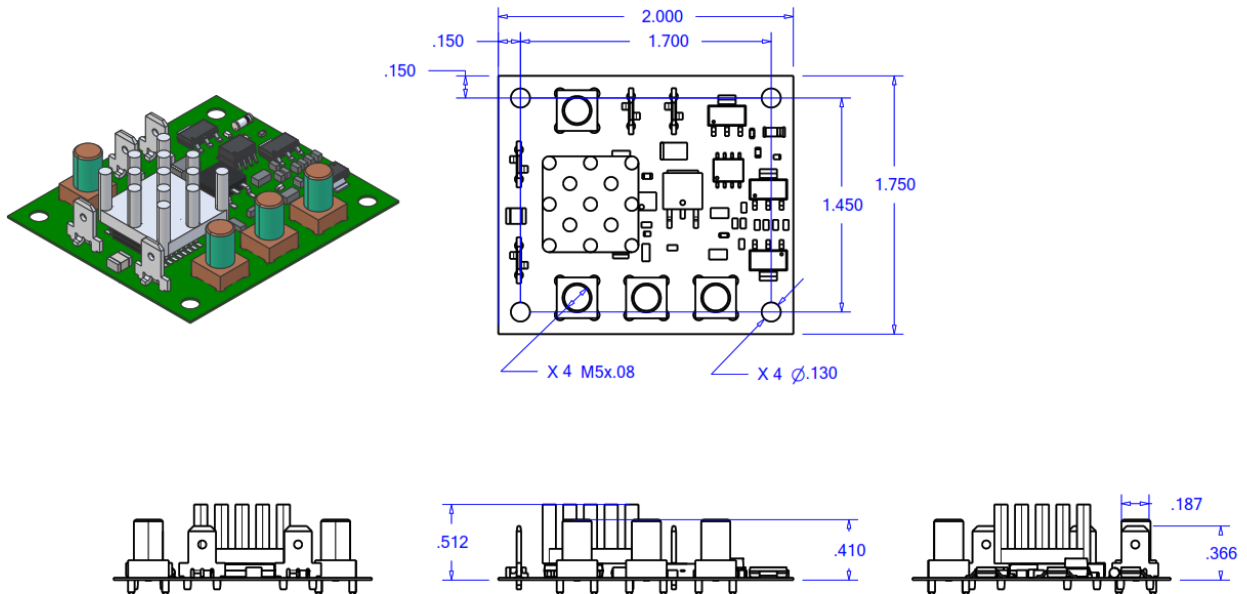
The board needs to spaced away from and/or insulated from the mounting surface. The stud and fast-on connectors extend slightly through the PCB.

Two LEDs indicate board operation. One lights whenever power is present, the second lights while the load is being actively clamped. Locations are shown above.

The picture shows the clamp without the optional heatsink attached to the main transistor

## Mechanical drawing

(This view includes the optional heatsink on the main transistor)



Shown with optional heatsink (Wakefield d10650-40). Affix heatsink using thermal epoxy or thermal double sided tape if heatsinking is needed in your application.