

Important things about the IBT 2 motor driver

- The heatsink is mounted to the back of the circuit board, so heat has to transfer through the board. This does not have to be a problem, but there are a few in this case. First of all the heatsink could potentially create a short circuit between the two chips on the board if there was a scratch on its normally anodized surface. Also the heat transfer is not optimal because no thermal interface material has been applied. Therefore I strongly recommend you put a thermal pad in between the heatsink and the board. This both enhances the thermal performance and eliminates the short circuit risk.
- The board uses two BTS7960 devices, which are both a half-bridge device. Together they make one full H-bridge. These devices are controlled via two input signals: EN and PWM. The EN signal enables the device, the PWM signal **selects** which side of the bridge is on. If PWM = HIGH the **high** side switch is on, if PWM = LOW the **low** side switch is on. This means, if both EN signals to your IBT2 are HIGH, and both PWM signals are LOW, both low side switches are on. This is a short circuit path through your ground rail. That isn't a problem if it happens *during* the spwm generation, since it will only be for less than one millisecond at a time, however, if your program leaves the devices in this state for a longer time, the grid supply voltage will fry your H-bridge. Double check your code that this situation never occurs, I burned up my devices this way because I forgot. If your inverter shuts down, your code should not only stop the PWM signals, it *must also disable the EN signals*.
- The BTS7960 has an adjustable slew rate, which is done by connecting a resistor to its SR pin. On the IBT 2 module I had, there was a 10k resistor connected to this pin, giving a low slew rate of only about 6V/us. This means at 24V, once switching operation takes 4 microseconds, which is long and wastes power. Therefore I recommend you solder some jumper wires on to bypass these resistors, connecting the SR pin directly to ground. This sets the slew rate to the fastest option available, which is about 11V/us. Still not great but better than a kick in the nuts. (The relatively slow switch speed of the BTS7960 is the reason my inverter "only" switches at 10kHz.)