Power Pins

There's three power voltages, the USB input for charging the battery (4.75-5.25V whatever is coming out of the USB port), the battery itself (3-4.2V) and the output (5-5.2V)

- **USB** - this is the micro USB 5V power pin. It's the pin that is used to charge the battery, NOT the output power! You can use this if you want to grab power from the microUSB port when it is plugged in
- **BAT** - this is the battery input, connected directly to the JST connector. For most Lithium batteries, this will range from 3.0V when near-dead to 4.2V when fully-charged. Higher voltages will let you draw more current and in general, are more efficient. Try to keep the wires going to this pin nice and short - 3" or less is best!
- **VS** - this is the load shared output from the battery charger. When there is 5V coming in from the micro-B USB power plug, this pin will have approx 5V on it (less a little due to the internal resistance of the charger chip's MOSFET). When there's no USB charging, the Vs pin will be the same voltage as the Bat pin.
- **GND** - this is the power ground. This boost converter is not 'isolated' - the ground input is the same as the ground output
- **5V** - this is the boosted output. When the board is running, the voltage will be 5.2V approximately. It may dip down to 5V as the current draw starts to go up (over 500mA). When the board is disabled, this output is 'floating' but you should still try not to apply a voltage to it while the board is disabled. There's a blue LED connected to this pin which will let you know when there's power output

Control Pins

There's two 'control' pins.

- **EN** - this is the 'enable' pin. By default it is pulled 'high' to **VS**. To turn off the booster, connect this pin to ground. The switch can be as small as you like, it is just a signal. Contrast this to an inline power switch which would have to be able to handle up to 2A of current! When the chip is disabled the output is completely disconnected from the input.
- **LBO** - not a leveraged buy out! this is the **Low Battery Output**. By default it is pulled high to **BAT** but when the charger detects a low voltage (under 3.2V) the pin will drop down to 0V. You can use this to signal when its time to shut down or alert the user that the battery is low. There is also a red LED connected to this pin.

LEDs

There are **four** onboard LEDs.

- The **Blue** LED sits next to the USB connector socket, and indicates the 5V output power state.
- The **Red** LED is next to the battery JST port and indicates when the battery voltage is below 3.2VDC (Low Battery Output)
- The **Yellow** LED is next to the microUSB connector and indicates when the battery is being charged
- The **Green** LED is also next to the microUSB connector and indicates when the battery is done charging (all full)

Battery and USB connection

You can connect a battery to the breakout strip or to the JST connector. All of Adafruit batteries come with JST cables that will plug in nicely so we strongly suggest that. **Watch the polarity of the cable!** the + and - markings next to the JST will let you know which way is which.

The USB connector can be soldered on to create a portable 'USB power pack'. The two data lines on USB have resistor dividers that match Apple charger values for 1A charge rate so that you can plug any iOS device in to charge. 99% of other phones, devices and tables are totally cool with these resistors as well. You can always short the D+ and D- lines if you happen to have a phone that wants shorted data lines.

If you don't want a USB connector attached, there are two holes that are designed for a 3.5mm spaced terminal block (not included)