



CuteCircuit Twirkle Shirt Teardown

Created by Becky Stern



<https://learn.adafruit.com/cutecircuit-twirkle-shirt-teardown>

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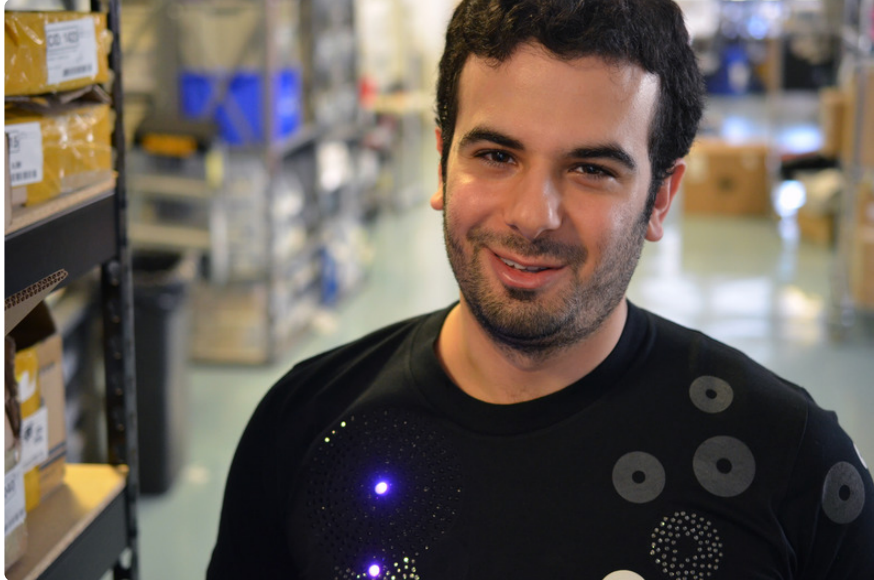
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Inside the Twirkle Shirt

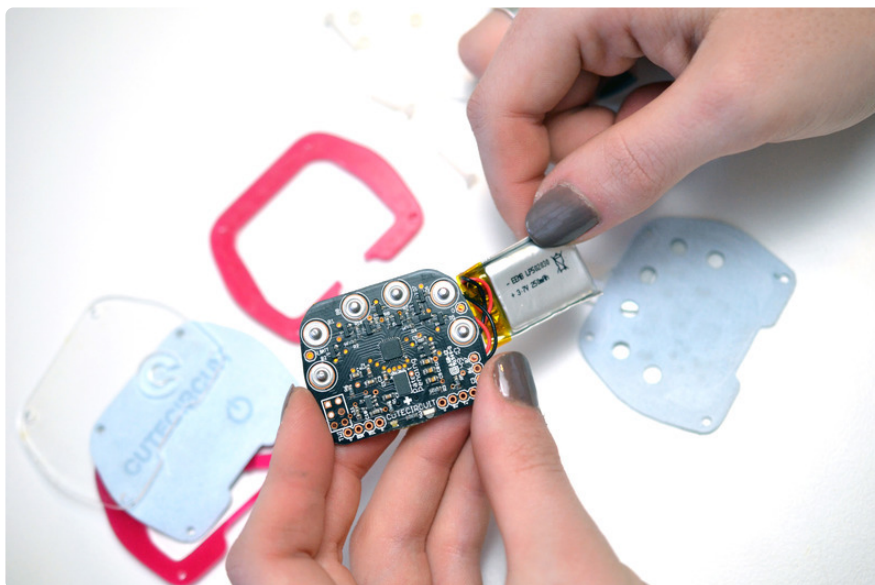
CuteCircuit designed the [Twirkle Shirt \(https://adafru.it/dhs\)](https://adafru.it/dhs) so you can get your glow on in a motion-activated twinkling t-shirt. It's the first commercially available ready-to-wear LED shirt we've seen, and we couldn't wait to open it up to see how it works.



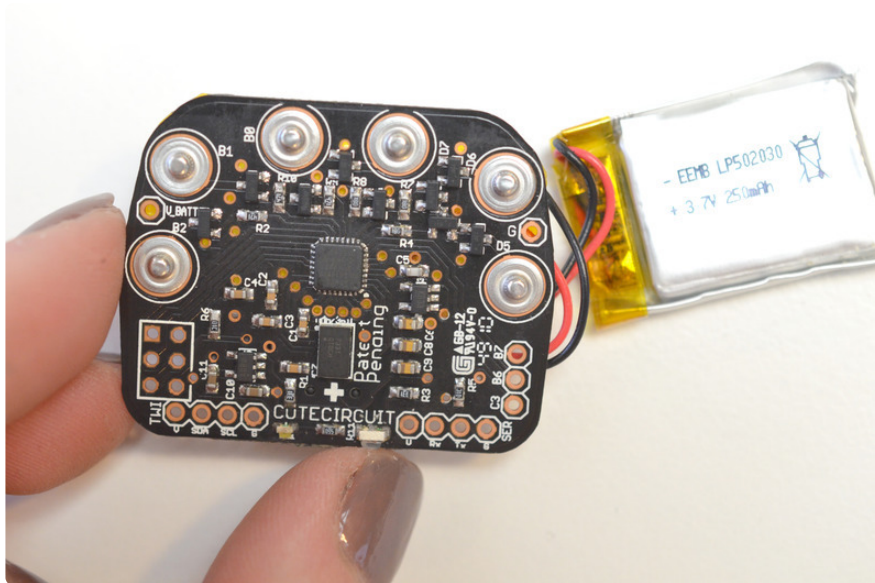
The "Twirkle Brain" acrylic circuit enclosure plugs in to charge via USB. It's got a laser-cut power button tab and laser-engraved microfiber fabric covering the circuit board.



Once the circuit module is charged, it snaps into a pocket inside the front of the t-shirt. The snaps make the connections from the circuit board to the flex circuit board inside the t-shirt.



The enclosure came apart easily-- we removed the nylon screws and nuts with a small flathead screwdriver, and then separated the layers of acrylic and fabric to find the battery and main PCB.

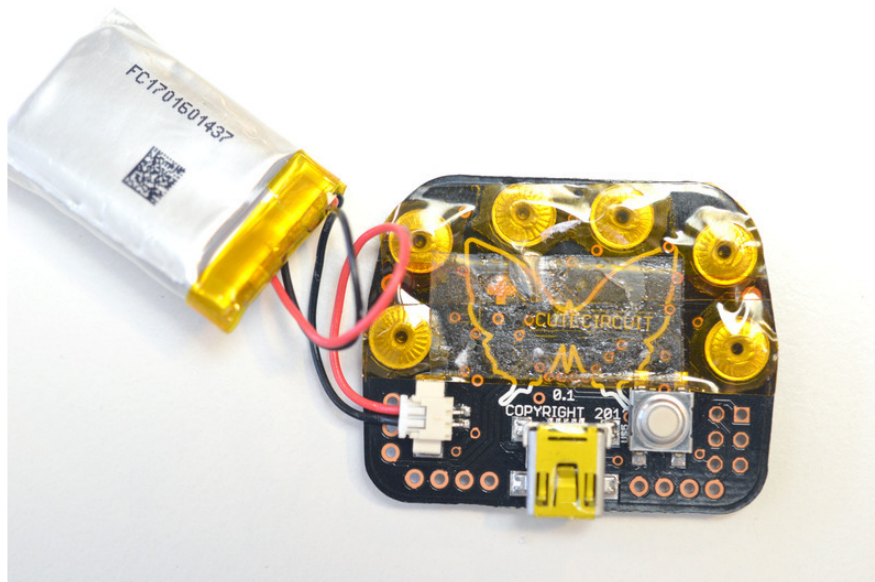


In the center of the circuit board is an Atmega168 microcontroller.

Just below that is a chip marked 7331, which is a triple axis accelerometer.

To the right of the microcontroller is a five-pin chip labeled 33, which is a 3.3v regulator.

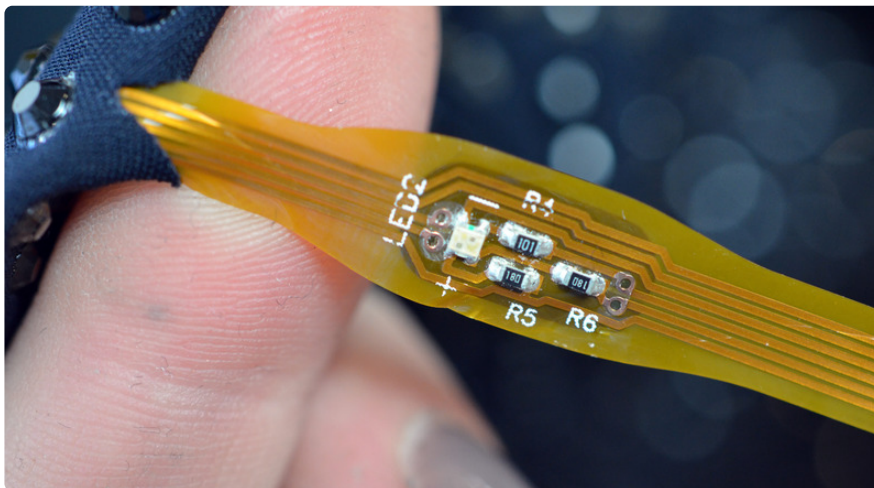
The small parts between the microcontroller and snaps are transistors, most likely for driving extra current to the LEDs.



The back of the board exposes the USB port and rechargeable lipoly battery, as well as the power/reset button.



The long flex PCB was bonded very securely between the knit t-shirt and the applique design. We removed it by cutting along the circuit board's path.



At each white dot on the shirt there is a corresponding tiny RGB LED with appropriate resistors, most likely multiplexed in this long flex circuit.

