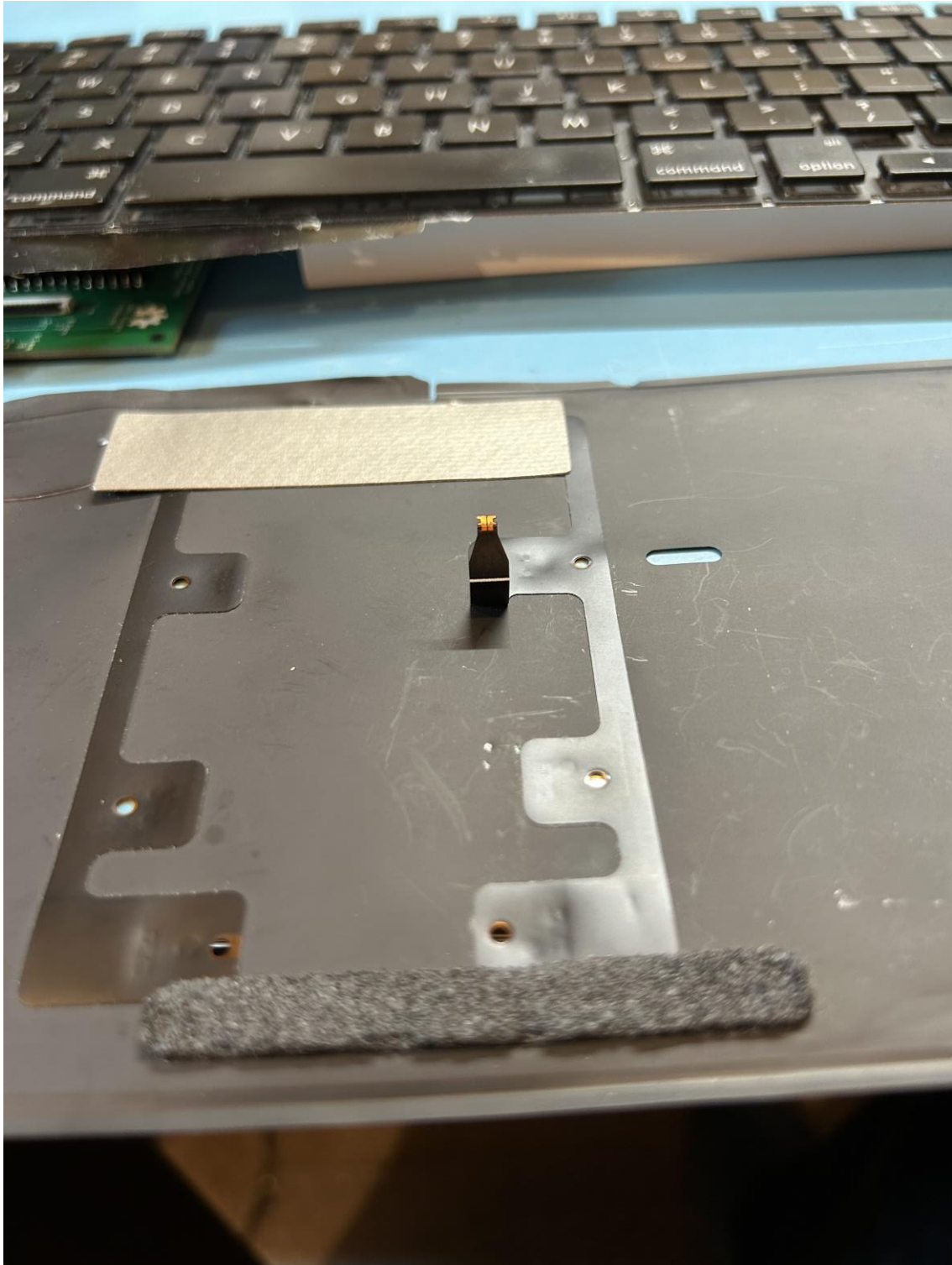
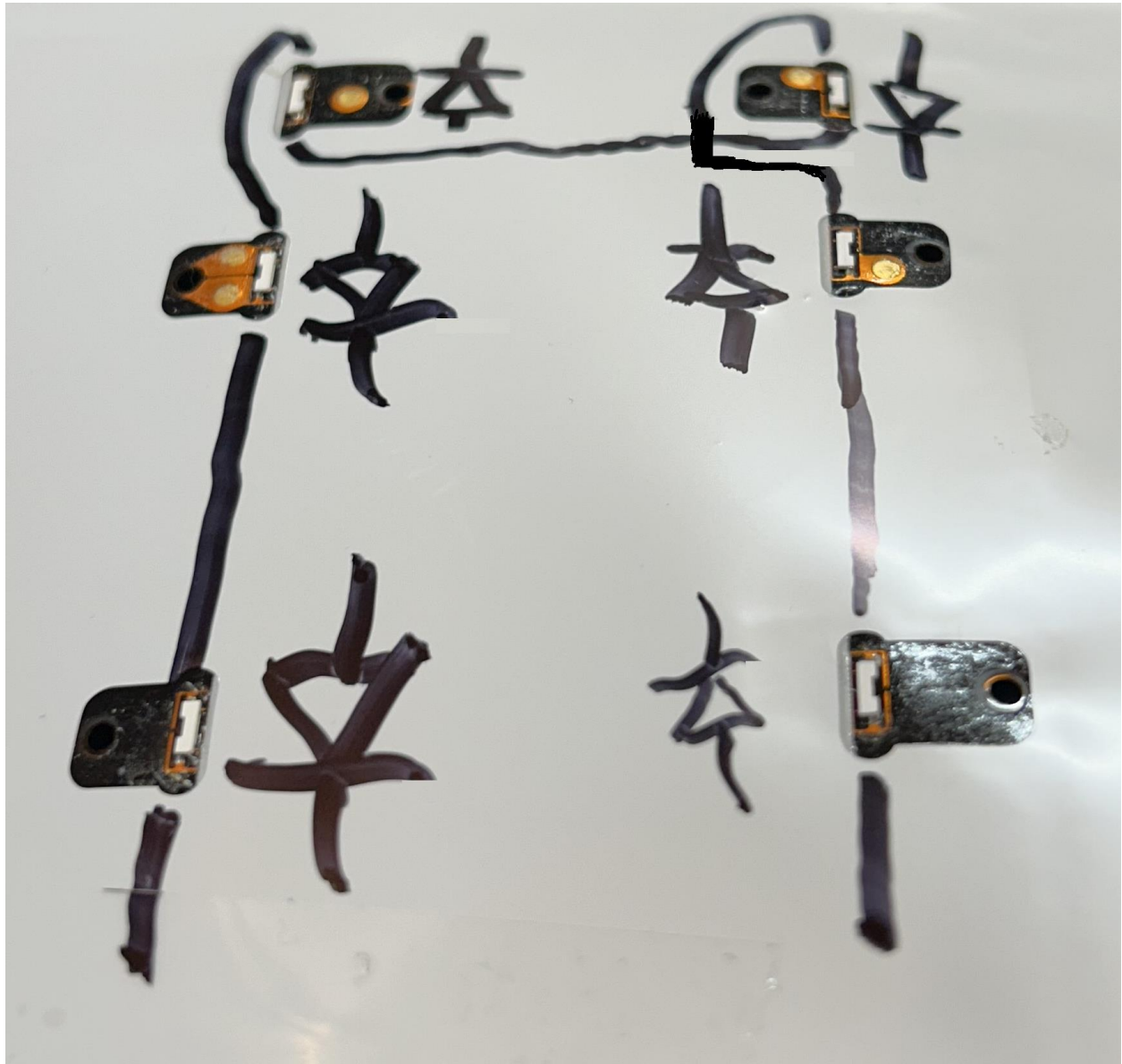


The MacBook Pro Model A1286 15" keyboard has a backlight on a sheet of plastic with a 2 pin FPC cable that went to the motherboard (see below). I unsoldered the FPC connector from the motherboard and soldered 2 wires to it for bench testing.



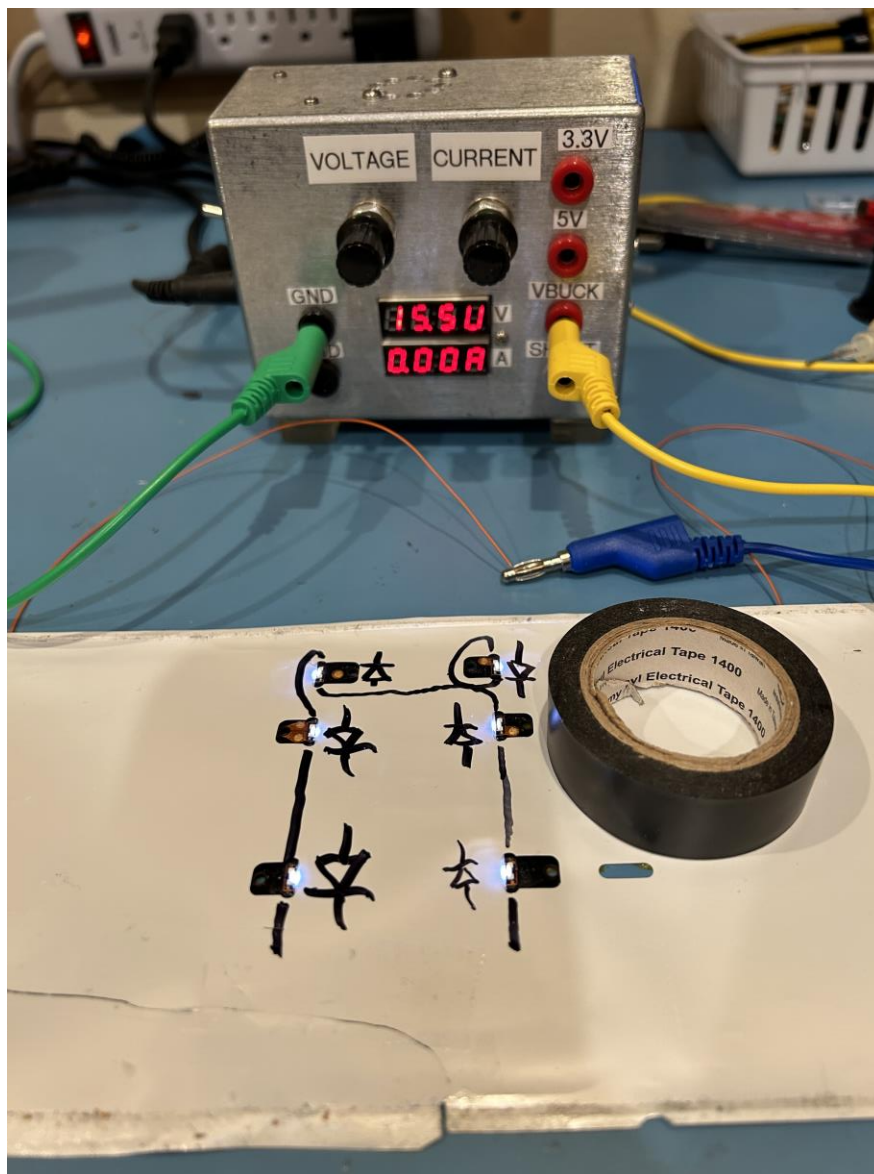
The LEDs are soldered to the flexible printed circuit taped to the other side of the plastic sheet as shown below. I used my ohm meter in diode mode to map out how they were wired and then drew the schematic.



Backlight Voltage & Current from min to max brightness using a variable power supply and Fluke 87 to measure current (setup shown below).

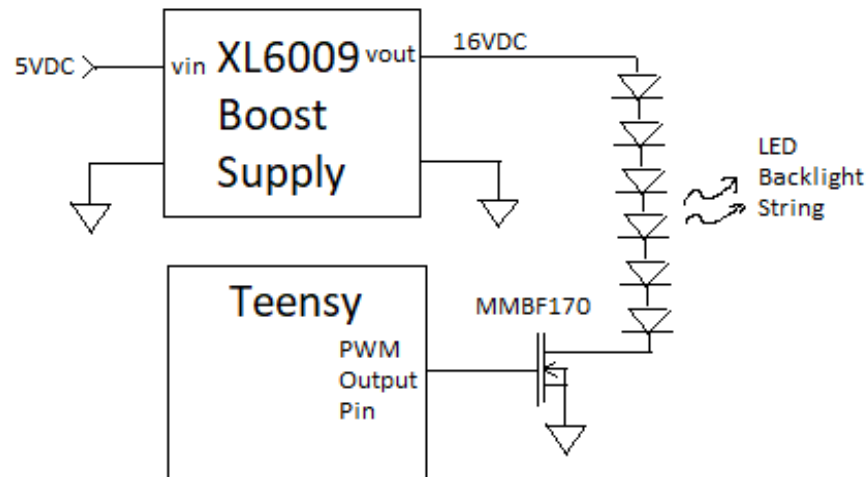
Voltage into diode string	Current thru diodes	Brightness
14VDC	3uA	Barely perceptible
14.5VDC	22uA	Low level
15VDC	80uA	Med level
15.5VDC	600uA	High level
16VDC	2mA	Very Bright

At 16VDC overall, each diode measures 2.65 volts.



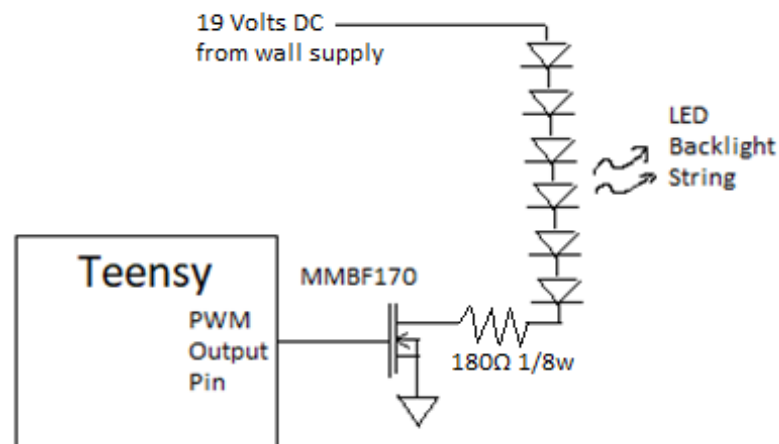
A circuit for controlling the backlight brightness is shown below. A variable boost regulator will take USB 5 volts up to 16 volts DC for connection to the top LED's anode. The bottom LED's cathode is fed to the drain of a MMBF170 N-Channel FET. The gate of the FET is controlled by one of the PWM capable I/O pins of the Teensy.

## Keyboard Backlight Control



If the 19VDC laptop battery charger supply voltage is available, the boost supply is not needed. Use a 180 ohm 1/8 Watt resistor to drop 3 volts for the diode string as shown below.

## Keyboard Backlight Control



The Teensy 4.1 USB Keyboard code with backlight control is called "Macbook\_Pro\_A1286\_15in\_backlight.ino" at my [repo](#).