1.1

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Comp** | **Meas R Multimeter**  **[kOhm]** | **Meas V Multimeter [V]** | **Meas I Multimeter [mA]** | **Calc R=V/I [Ohm]** | **Calc P=VI [mW]** | **Simulated V QUCS [V]** | **Simulated I QUCS [mA]** | **Simulated P QUCS [mW]** |
| R1 | 21.4 | 4.33 | 0.202 | 0.202 | 0.874 | 4.62 | 0.215 | 0.996 |
| R2 | 2.15 | 0.377 | 0.175 | 0.175 | 0.0660 | 0.382 | 0.178 | 0.067 |
| R3 | 9.88 | 0.342 | 0.0346 | 0.0346 | 3.38 | 0.378 | 0.038 | 0.014 |
| R4 | 0.996 | 0.034 | 0.0341 | 0.0341 | 0.00116 | 0.00381 | 0.038 | 0.145 |
| Arduino 5V | Not applicable | 4.92 | 0.200 | Not applicable | -0.984 | 5 | 0.215 | -1.08 |

1.2.2

V\_TH = 5.01 V

V\_L = 4.98 V

R\_L = 216 Ohms

R\_TH = (V\_TH – V\_L) / (V\_L / R\_L)

R\_TH = (5.01 – 4.98) / (4.98 / 216)

R\_TH = 1.30 Ohms

1.2.3.

V\_TH = 4.99 V

V\_L = 4.32 V

R\_L = 216 Ohms

R\_TH = (V\_TH – V\_L) / (V\_L / R\_L)

R\_TH = (4.99 – 4.32) / (4.32 / 216)

R\_TH = 33.5 Ohms

1.3.1

Yes the LED shines

V\_R = 3.01 V

V\_LED = 1.98 V

I\_LED = I\_R = V\_R / R = 3.01 V / 216 Ohms = 0.0139 A

P\_LED = V\_LED \* I\_LED = 1.98 V \* 0.0139 A = 0.0275 W

1.3.2

Yes the LED shines

V\_R = 2.29 V

V\_LED = 2.69 V

I\_LED = 2.29 V / 216 Ohms = 0.0106 A

P\_LED = 2.69 V \* 0.0106 A = 0.0285 W

1.3.3.

It seems like the yellow LED only shines, but the blue one is in reality shining very softly, since it still has some current flowing through it.

1.3.4.

Both LEDs shine. This is because the amount of current going through them is equal since they are in series. This is according to KCL, since there is no other node at which the current can go.