# Photodiode

current (650 nm)  length  width  area

$$_{ph}i := 0.45 \ \frac{A}{W}$$

$$_{ph}l := 0.09 \ in$$

$$_{ph}w := 0.09 \ in$$

$$_{ph}a := _{ph}l \cdot _{ph}w = 5.226 \ mm^2$$

# Sun

photo current at $1000 \ \dfrac{W}{m^2}$ (650 nm)

$$P_{sun} := 1000 \ \frac{W}{m^2}$$

$$_{ph}i_{sun} := P_{sun} \cdot _{ph}i \cdot _{ph}a = 2.352 \ mA$$

# OPT101

$$V_{opt101} := 5.0 \ V$$

resistor required

$$_{ph}r_{gain} := \frac{V_{opt101}}{_{ph}i_{sun}} = 2.126 \ k\Omega$$

$$_{ph}c_{gain} := 79 \ pF - \frac{23}{50} \ \frac{pF}{k\Omega} \cdot _{ph}r_{gain} = 78.022 \ pF$$

i have $2.2 \ k\Omega$ resistors

$$r := 2.2 \ k\Omega$$

maximum measurable power with 5v0

$$_{max}P_{sun} := \frac{V_{opt101}}{r \cdot _{ph}i \cdot _{ph}a} = 966.457 \ \frac{W}{m^2}$$

$$V_{opt101} := 3.3 \ V$$

maximum measurable power with 3v3 and 2k2 ohm resistor

$$_{max}P_{sun} := \frac{V_{opt101}}{r \cdot _{ph}i \cdot _{ph}a} = 637.861 \ \frac{W}{m^2}$$

resistor required for full power measure at 3v3

$$_{ph}r_{gain} := \frac{V_{opt101}}{_{ph}i_{sun}} = 1.403 \ k\Omega$$

$$_{ph}c_{gain} := 79 \ pF - \frac{23}{50} \ \frac{pF}{k\Omega} \cdot _{ph}r_{gain} = 78.354 \ pF$$