Photonics Lab:

questions: 1 - LI plot, L using Voltage? 2 - responsivity method

**Question 1**

**Enter the value of the resistor you used in series with the LED in the transmitter circuit (enter the value in ohms).**

Answer: 115 ohm

**Question 2**

**Upload a single figure showing the VI plots for both the LED and laser.**



**Question 3**

**Upload a single figure showing the LI plots for both the LED and laser.**



**Question 4**

**Enter the value you found for the threshold current of the laser (enter the value in mA).**

Answer: 18 mA

**Question 5**

**You have measured the LI plots in terms of the photocurrent generated by the photodiode. In order to calculate the optical power reaching the photodiode, you need to know the responsivity of the photodiode (i.e. how much photocurrent is generated for each unit of optical power incident on the photodiode).**

**The responsivity of the photodiode is not given directly in the datasheet, but enough information is given to allow you to estimate it (you need to find several pieces of information and combine them).**

**Using the information on the photodiode datasheet, calculate the the responsivity of the photodiode at the wavelength of the laser diode. Enter your answer in units corresponding to A.W-1.**

A picture containing text, device

Description automatically generated

By these graphs, when wavelength = 650 nm (laser 655nm), the relative spectral sensitivity is around 0.67. And the max sensitivity is at wavelength = 920 nm.

From fig4, gradient, (1, 40), (0.01, 0.4)

Table

Description automatically generated with medium confidence

对于这个photodiode, irradiance = 1 时，功率W = A \* 1mW/cm2 = 1 \* 10-3 \* 7.5 \* 10-2 = 7.5 \* 10-5 (W).

irradiance = 0.01时，功率W = 7.5 \* 10-7 W.

**Question 6**

**Enter the DC offset (Ibias) you set on the signal generator when making the frequency response measurements in Task 3. Enter the value in volts (V).**

offset = 5.7 V

**Question7**

**Enter the a.c. peak-peak drive you set on the signal generator when making the frequency response measurements in Task 3. Enter the value in volts (V).**

Vpp = 0.6 V

**Question 8**

**Upload a single figure showing the frequency response plot for the photonic system using the laser as the transmitter.**