<https://www.arrow.com/en/categories/leds-and-led-lighting/led-indication/leds>

<https://www.arrow.com/en/categories/leds-and-led-lighting/led-indication/leds?page=1&promoGroupLevel=pl&perPage=25&filters=Dominant%20Wavelength:525;>

Narrow-band LEDs with similar luminous intensity:

-> Check the lens appearance specifications:

-> Luminous intensity similar.

-> Wavelength - 520nm and 560 nm.

-> SMD or DIP.

-> If SMD how to focus light as a beam.

3D model:

* V3.1:
  + ~~Add NeuRonICS Lab.~~
  + ~~Space for USB. 12.5 x 8 mm~~
  + ~~Resize the Inner cavity model.~~
  + ~~Resize the M3 screw holes.~~
  + ~~Footprint of the LED board and the detector board.~~
  + Lid: tighten it.
  + ~~Edges more curved on both sides.~~ Did just one more side.
  + ~~Check the light square before - Good getting the square beam of light.~~
  + Any other features to look aesthetic.
* V3.2:
  + Change the cavity with screw fitting. -- This is fine for now. Later maybe.
    - Print this separately for checking the cavity of the test tube.
    - Later: Reduce the small spaces.
    - Screws are fitting good. For Later thread maybe.
  + ~~NeuRonICs size should be equal to venom.~~
  + ~~Align the Cavity with the lid hole.~~

**LEDs, wavelength and luminous intensities:**

*First order:*

|  |  |  |  |
| --- | --- | --- | --- |
| Component | Luminous Intensity(mcd) | Mouser Link | Qty |
| LED - SMD - 520nm | 450 mcd | [Link](https://www.mouser.in/ProductDetail/Wurth-Elektronik/150080GS75000?qs=sGAEpiMZZMseGfSY3csMkWdJa7STmGtdxLVWEDoSWxG0F2GTBV6kRA%3D%3D) | 10 |
| LED - SMD- 525nm | 340 mcd | [Link](https://www.mouser.in/ProductDetail/Dialight/599-0181-007F?qs=sGAEpiMZZMseGfSY3csMkdgyOOAg6kv2Lur%2FJB2rkKya%2FVf8zXs1Tg%3D%3D) | 10 |
| LED - SMD- 555nm | 4.5 mcd | [Link](https://www.mouser.in/ProductDetail/Bivar/SM0805PGC?qs=sGAEpiMZZMseGfSY3csMkRDxXrk%2F%2FsW3Ak1S9Ci06C4%3D) | 10 |
| LED - SMD - 560nm | 4 mcd | [Link](https://www.mouser.in/ProductDetail/ROHM-Semiconductor/SML-H12P8TT86C?qs=sGAEpiMZZMseGfSY3csMkdgyOOAg6kv2AjU0FCyxnx3%252BdF5lPJ4eFQ%3D%3D) | 10 |
| LED - SMD - 565nm | 10 mcd | [Link](https://www.mouser.in/ProductDetail/Lumex/SML-LX0805GC-TR?qs=sGAEpiMZZMseGfSY3csMkW2UPVQWgWXnF7a8MfCoRrI%3D) | 10 |
| Resistor - SMD- 100 ohm1206 |  | [Link](https://www.mouser.in/ProductDetail/Vishay-Dale/RCS1206100RFKEA?qs=sGAEpiMZZMtlubZbdhIBIAh%252BOLxU8fCrR7sEhdjQHj0%3D) | 10 |
| Resistor - SMD-150 ohm 1206 |  | [Link](https://www.mouser.in/ProductDetail/Vishay-Dale/RCS1206150RFKEA?qs=sGAEpiMZZMtlubZbdhIBIAh%252BOLxU8fCrx5x0i%252BJhCPw%3D) | 10 |
| Capacitor - SMD- 0.1uF 0805 |  | [Link](https://www.mouser.in/ProductDetail/Taiyo-Yuden/TMF212B7104MGHT?qs=sGAEpiMZZMsh%252B1woXyUXj3%2F0vCYPokIkjkG4m3f2Yp8%3D) | 10 |
| TCS3200 - Color light to frequency converter. |  | [Link](https://www.mouser.in/ProductDetail/ams/TCS3200D-TR?qs=sGAEpiMZZMvaelWNQAznkVDXmuGu5Gi9) | 5 |

*Second order:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Wavelength | Luminous Intensity | Manufacturer Number | Quantity | Mouser Link |
| 525 nm | 150 mcd | 859-LTST-C170TGKT | 10 | [Link](https://www.mouser.in/ProductDetail/859-LTST-C170TGKT) |
| 630 nm | 150 mcd | 604-APTD2012LSURCK | 10 | [Link](https://www.mouser.in/ProductDetail/604-APTD2012LSURCK) |
| 562 nm (0603) | 82 mcd | 327-VFHL1116P4BX3CTR | 5 | [Link](https://www.mouser.in/ProductDetail/327-VFHL1116P4BX3CTR) |
| 528 nm (0603) | 90 mcd | 720-LTL29SN2Q125Z | 5 | [Link](https://www.mouser.in/ProductDetail/720-LTL29SN2Q125Z) |
| 605 nm | 150 mcd | 604-APT2012LSECKJ4RV | 5 | [Link](https://www.mouser.in/ProductDetail/604-APT2012LSECKJ4RV) |

Problem: Resistor for 630nm! -> 2k IS NEEDED -> you have 1k so just use a wire to short on 1k to other 1k.

Third order:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Wavelength | Luminous Intensity | Manufacturer Number | Quantity | Mouser Link |
| 642nm | 80mcd | 598-8110-102F | 10 | [Link](https://www.mouser.in/ProductDetail/Dialight/598-8110-102F?qs=Te4RMVqx8WLRPJkTI3mDJA%3D%3D) |
| 660nm | 100mcd | SML-LXFM0603SRC-TR | 10 | [Link](https://www.mouser.in/ProductDetail/Dialight/598-8110-102F?qs=Te4RMVqx8WLRPJkTI3mDJA%3D%3D) |

*Scripts for plots and averaging:* https://colab.research.google.com/drive/1RDzzlXy0TrXJwmM4R60sGGzhkmMovc6T#scrollTo=2AHoIRS3nakt

*Results from the device:*

Send graphs for this: DATA analysis properly.

*COVID results using the device.*

|  |  |  |
| --- | --- | --- |
| *Tube contents* | *f(520nm wavelength)* | *f(630nm wavelength)* |
| *Control* | 4118 | 5293 |
| *Positive* | 6984 | 6264 |
| *Negative* | 5220 | 5964 |
| *Without tube* | 1406 | 1342 |

*Venom results using a Venom-D prototype device.*

*Samples test 2:*

|  |  |  |
| --- | --- | --- |
| *Tube contents* | *f(520nm wavelength)* | *f(630nm wavelength)* |
| *Positive* | 5368 | 6625 |
| *Negative* | 6002 | 5620 |
| *Without tube* | 1406 | 1342 |

*Samples test 3:*

|  |  |  |
| --- | --- | --- |
| *Tube contents* | *f(520nm wavelength)* | *f(630nm wavelength)* |
| *Positive* | 5719 | 7241 |
| *Negative* | 6966 | 4430 |
| *Without tube* | 1305 | 1390 |

*To do :*

* Order more LEDs.
  + Check the near intensity.
  + Footprint.
  + Current limiting resistor.
  + 650nm, 675nm, 700nm, 725nm, 750nm, 775nm, 800nm(check near if it’s not there!)
  + Maybe order also 500nm, 475nm, 450nm, 425nm, 400nm.
* Check with different LEDs and interpolate the results. Use a good current limiting resistor for equal intensity and solder it on to the board.
* Tune to minimize the delta from 50 to 5! i.e make the readings of the both the wavelengths same in the device without anything.