PROJECT REPORT

PORTABLE LAPTOP AND DESKTOP USB HUB

Date : 3rd Jan 2023

THEORY

- Laptops, Macbook's specially do not have a lot of USB ports.
- For instance the MacBook Air m1 is the most affordable one I the m1 range but it has only 2 type C ports capable of data and power transfer.
- But at times there can be a shortage of ports, for which people generally use port extender Las called as a usb hub.
- A usb hub takes power and data from the main usb connected to the laptop or desktop and then distributes it to the necessary addresses.
- An additional advantage is that we can have variety of usb ports like usb type A is good for high speed and high power charge and most of the wired and wireless mouse and keyboard are available only in USB-A.
- So having a laptop with only 2 USB-C ports I decided to make myself a PCB to connect multiple ports to my laptop.
- For this particular design I am using the main port to be USB-C and it is connected to 2 USB-A 2nd generation, 2 USB-A 3rd generation (much faster data transfer), 2 micro USB ports and 2 mini USB ports.
- All of them are capable of both high speed data and power transfer.

HARDWARE

MATERIALS NEEDED :

- USB 2.0
- USB 3.0
- Micro USB
- Mini USB
- SL2.1A
- USB-C

STAGE 1 : - (MAKING THE SCHEMATIC AND DESIGNING THE BOARD FILE.)

❖ **STEP 1:**

- Find the appropriate footprints, or u can make them by your self.
- I am using Eagle CAD software to make this PCB.
- Make the schematic as shown.
- For this we can have only smd or surface mount components so we will not be able to change the layers while routing.
- We will have to use via in this context to solve the issue of the trace overlapping.
- The board is designed like a pen drive so that when we do for 3-d printing we can get a perfectly mountable usb hub.
- U can give as many as indication led as u want but I am adding only one on the VBUS pin to indicate if the board is powered or not.

———————x———————