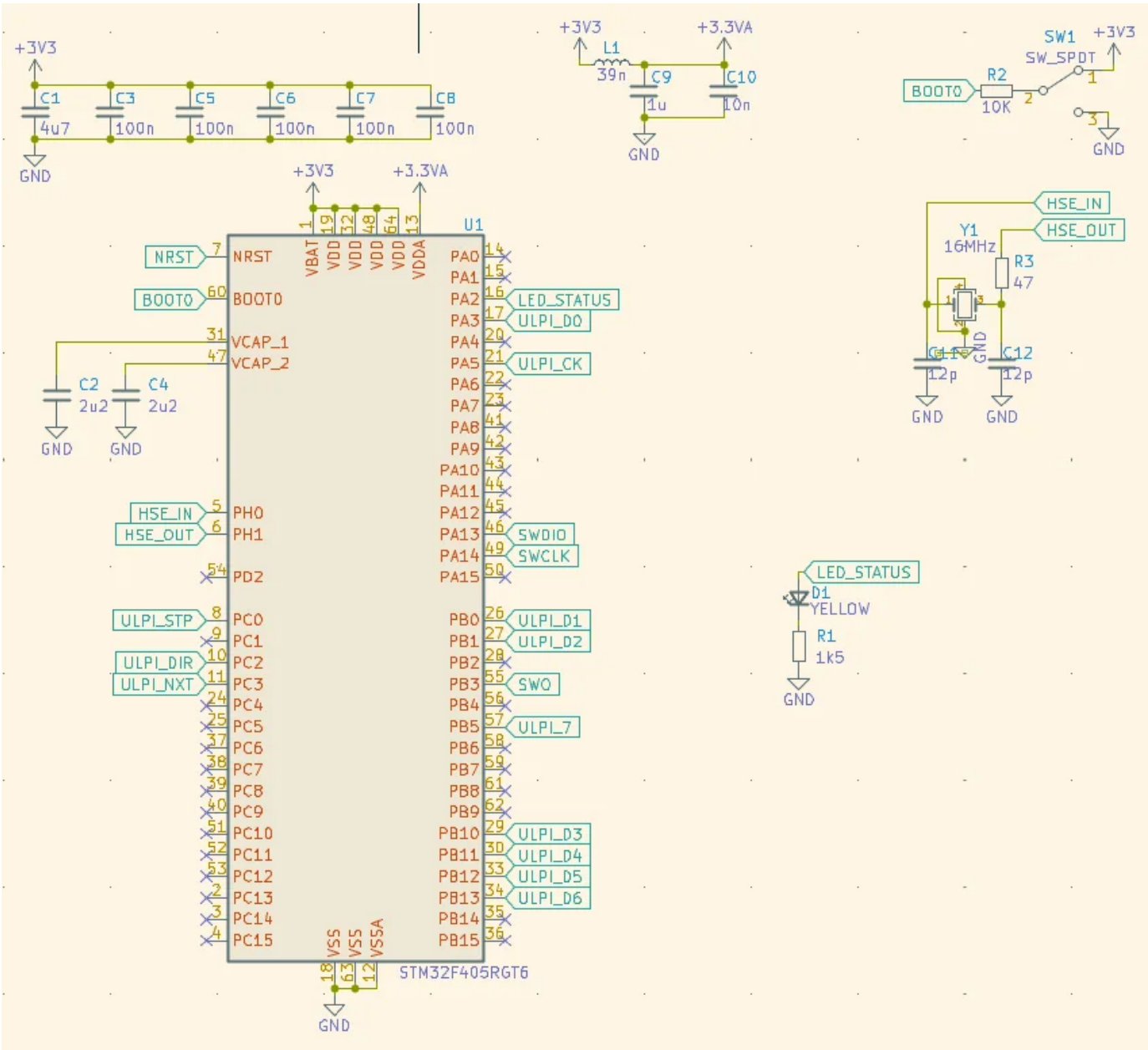
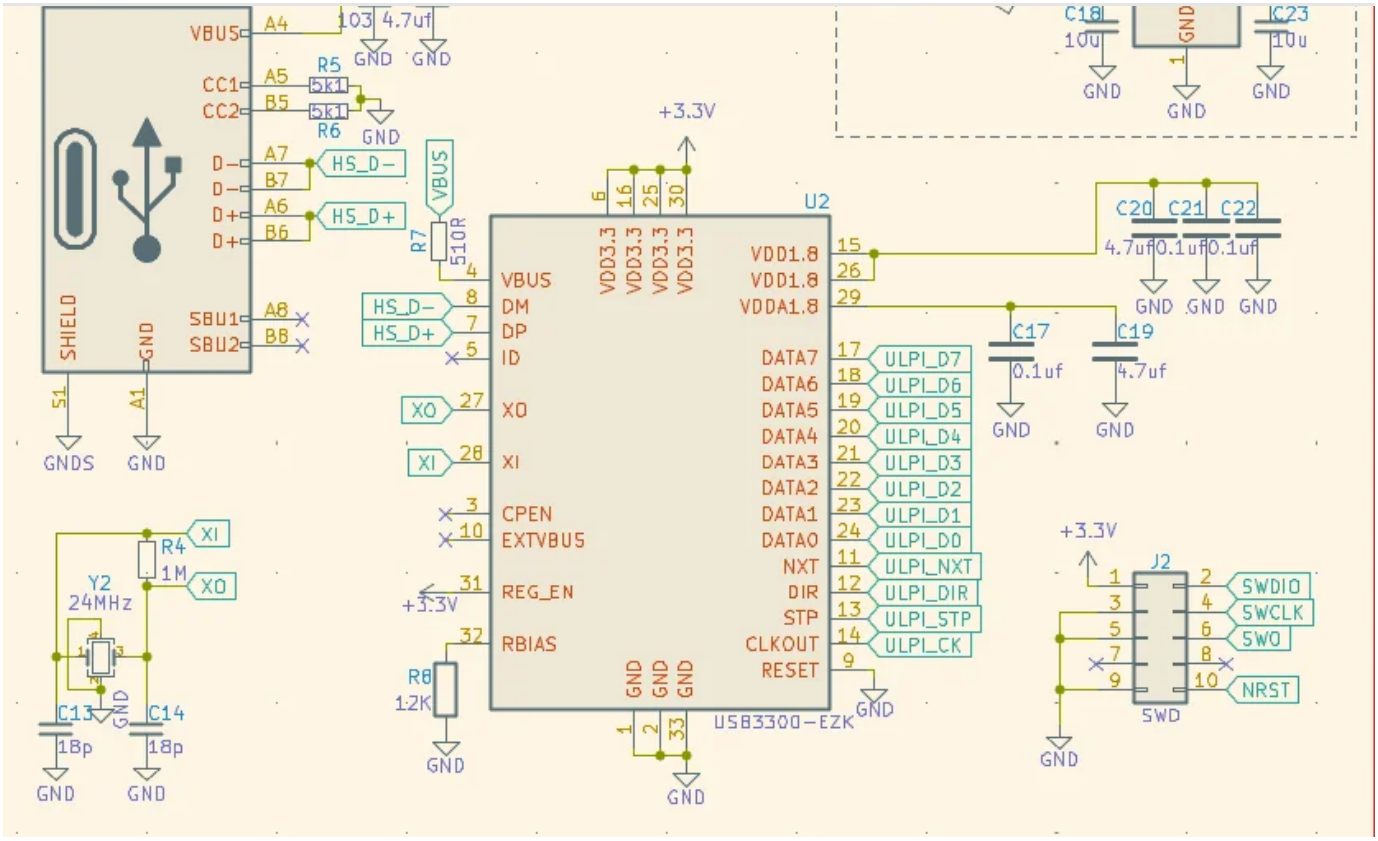
r/PrintedCircuitBoard • 2 yr. ago
_nsfoe

First pcb design (stm32 & usb-c) minimum function check

Hello, I am trying to make my first pcb, this is with a stm32 (stm32f405rg). Before I go on adding extra things I would like to check if what I have now works. What I mainly want to double check is can a usb type c power the mcu and does the mcu work with this schematic. All help is appreciated.



mcu



usb & debug

(Original post r/AskElectronics)

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FunDeckHermit • 2y ago

USB-C connectors with USB2.0 are quite easy to implement. Looks good to me.

Is your 100mA fuse sufficient or do you need a bigger one?

Pin1 of the SWD connector is tied directly to +3.3V. This seems dangerous. Please correct me if I'm wrong. I don't know which debugger you're using. You might want:

- A diode for reverse polarity protection
- Resistor in series to limit short-circuit current
- To feed it into the regulator instead (two diodes, two power paths)

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_nsfoe OP • 2y ago

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dkonigs • 2y ago

Why are you using an external USB controller chip?

The microcontroller you're using already has USB capability built in.

3 Share ...

_nsfoe OP • 2y ago

microcontroller only has USB FS and I need HS.

1 Share ...

dkonigs • 2y ago

Actually, it has both. And the HS support works with both an internal or external PHY.

EDIT: Okay, digging a bit deeper, I think that while external PHY isn't required for the HS controller, it is required for HS speeds.

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_nsfoe OP • 2y ago

May I ask where it says that because I cannot find it anywhere? The only thing I can find (datasheet2.2.31) is that an external PHY is required for HS. It would be a lot easier if this could also be done internally.

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1 more reply

Valuable_Mistake_775 • 2y ago

USB-C 2.0 connections from controller to USB(HS_D+,HS_D-) you should add a small resister in series for the instant current protection and a usb protection IC if u want, other than that for the LDO you need to verify the from the datasheet the exact value of capacitors required and there should be a diode for the reverse polarity protection from the the USB.

2 Share ...

_nsfoe OP • 2y ago

Thank you for your response. I now have a small resistor between them. I had read that the USB3300 already has an ESD protection so I think a usb protection IC is not necessary correct me if I am wrong.

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b_builds • 2y ago

It is good practice to add a 10K or 100K external pull up resistor and decoupling cap on the NRESET pin of the STM32.

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v_Hansel • 2y ago

I think the capacitors like C20 will be electrolytes? Than better use the polarized symbol in the schematic.

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