

It's just a USB2-HS hub.
It has leds and per port power switching though,

Power
Input

power_input

File: power_input.kicad_sch

upstream-config-leds

Upstream,
hub config

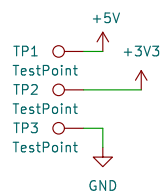
File: upstream-config-leds.kicad_sch

downstream-port-power

Downstream

File: downstream-port-power.kicad_sch

- H1 MountingHole
- H2 MountingHole
- H3 MountingHole
- H4 MountingHole



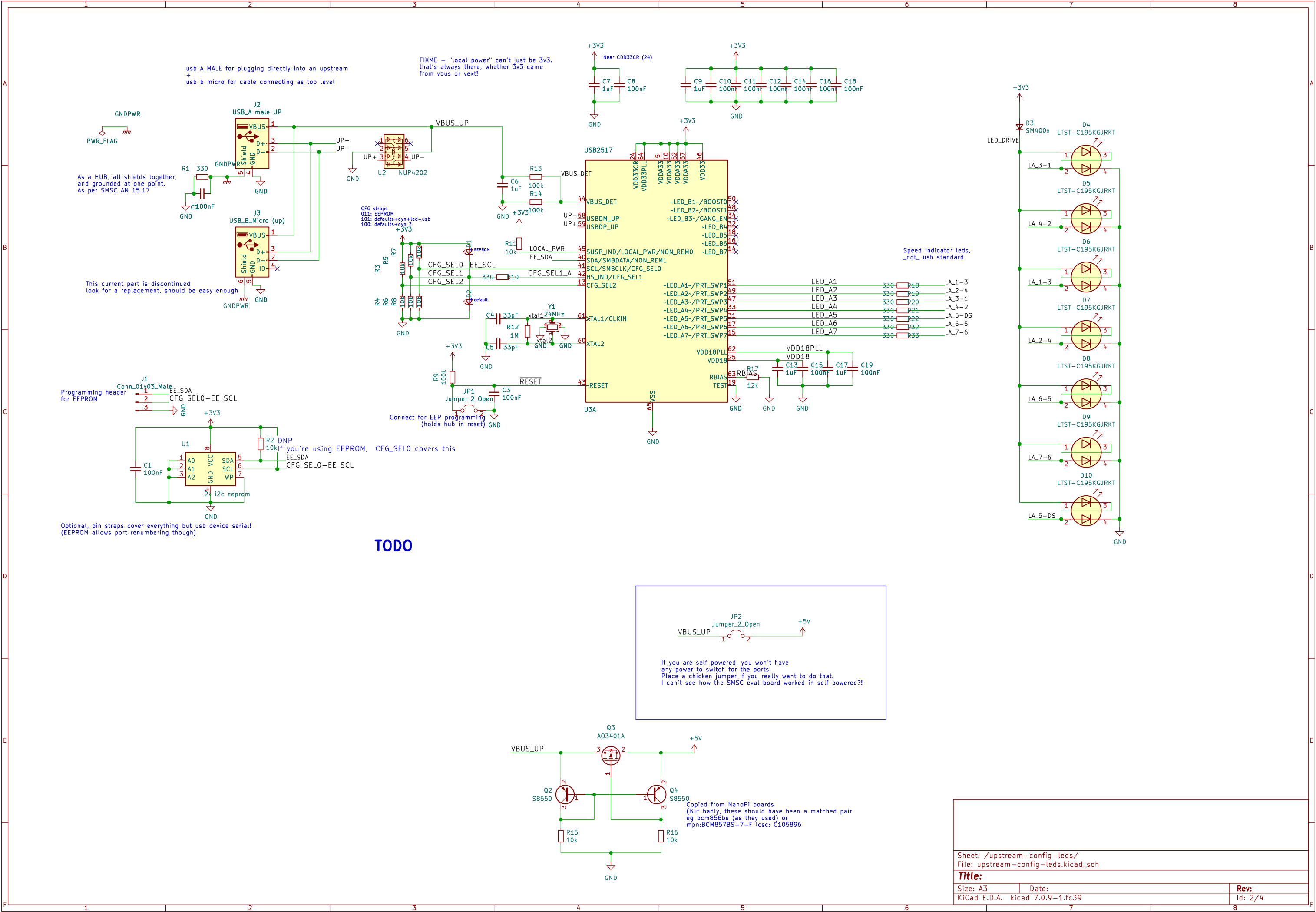
github.com/karlp/hubbish
one up, one down
three double ports for test targets w/ user usb
intended for controlling libopencm3 regression test boards

Sheet: /
File: r2022-10.kicad_sch

Title: Hubbish: Cascading per port controllable USB hub

Size: A4 Date: 2022-10-26
KiCad E.D.A. kicad 7.0.9-1.fc39

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U3B USB2517	
USBDM_DN1/PRT_DIS_M1	1 U3-
USBDP_DN1/PRT_DIS_P1	2 U3+
PRT_PWR1	29 EN3
-OCS1	28 OC3
USBDM_DN2/PRT_DIS_M2	3 U4-
USBDP_DN2/PRT_DIS_P2	4 U4+
PRT_PWR2	26 EN4
-OCS2	27 OC4
USBDM_DN3/PRT_DIS_M3	6 U1-
USBDP_DN3/PRT_DIS_P3	7 U1+
PRT_PWR3	23 EN1
-OCS3	22 OC1
USBDM_DN4/PRT_DIS_M4	8 U2-
USBDP_DN4/PRT_DIS_P4	9 U2+
PRT_PWR4	20 EN2
-OCS4	21 OC2
USBDM_DN5/PRT_DIS_M5	11 DS-
USBDP_DN5/PRT_DIS_P5	12 DS+
PRT_PWR5	30 EN_DS
-OCS5	35 OC_DS
USBDM_DN6/PRT_DIS_M6	53 U5-
USBDP_DN6/PRT_DIS_P6	54 U5+
PRT_PWR6	39 EN5
-OCS6	38 OC5
USBDM_DN7/PRT_DIS_M7	55 U6-
USBDP_DN7/PRT_DIS_P7	56 U6+
PRT_PWR7	36 EN6
-OCS7	37 OC6

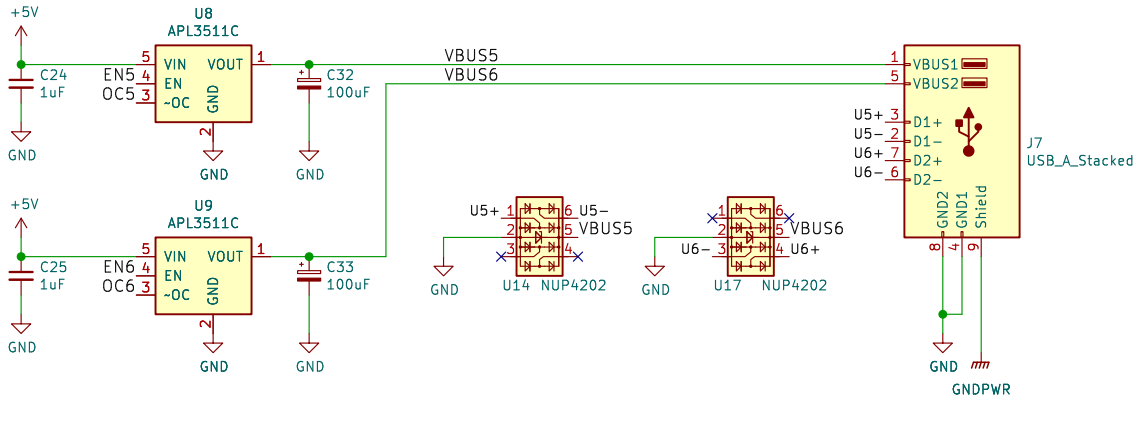
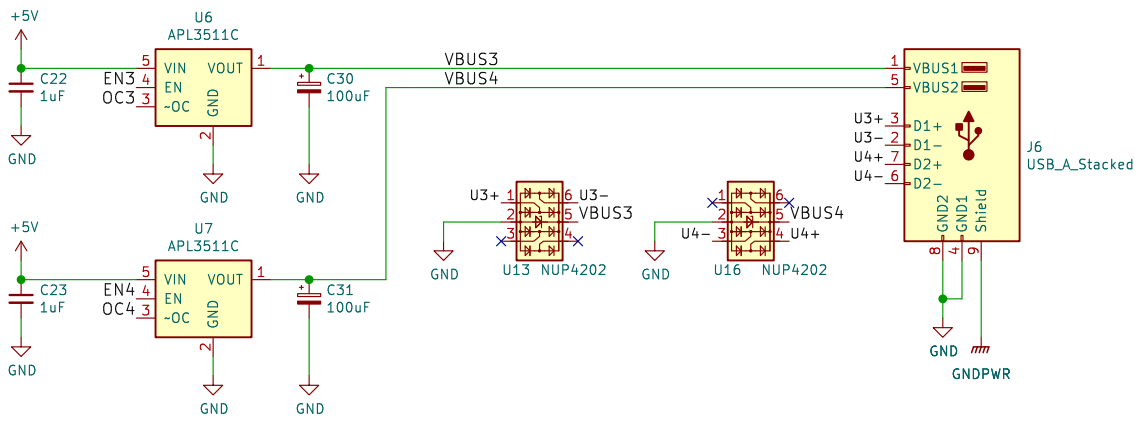
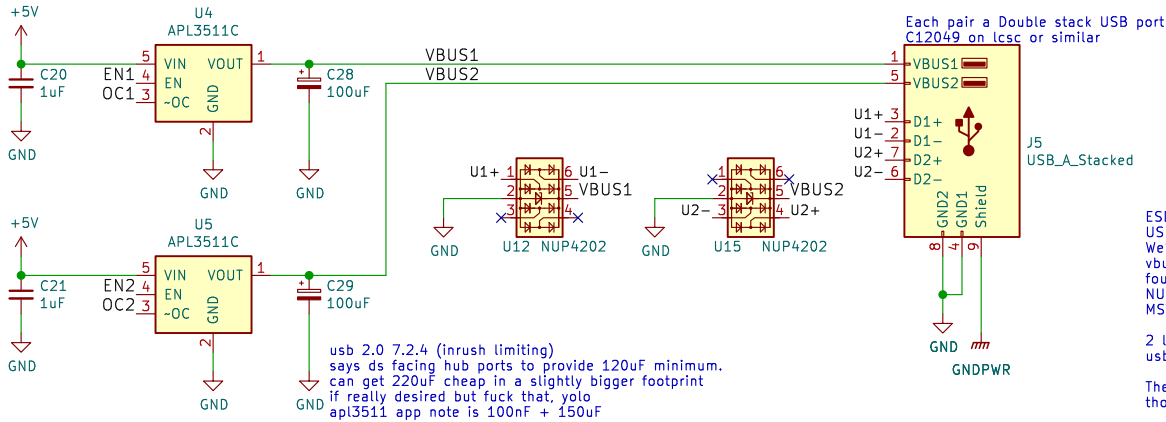
Port numbering is wonky, but made the layout nice.
If you want nice numbers, place the eeprom and use the port map registers.

Note:
The hub supports active high power controllers only!

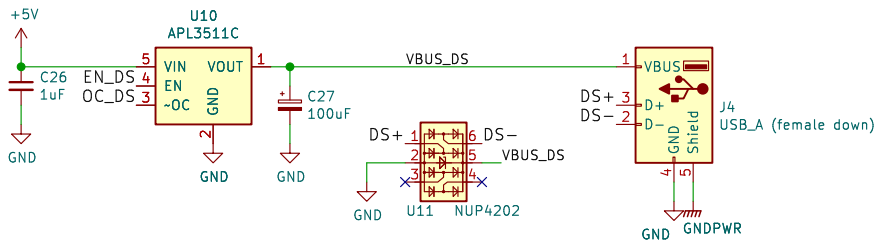
SY6288CAAC is 2A, pin compat
AP22802A is 2A, pin compat

APL3511C is 1A, if you want more power, APL3511A is 2A limited
Pin Compatible:
Diodes AP22811AW5 (2A) (W5 is case, sot23, A is active high)
Diodes AP2171DWG and AP2171WG (1A) (W is case)
AP2151 is 0.8A, (0.5A constant...)
STPS2171STR (1A)
TPS2069C - 1.5A
TPS2065C - 1A

Replacements for power switches:
(sot-23-5, with fault/OC, en active high)
SY6288xAAC (x = A/C == 0.6A / 2A)
TM16263xH (x = A/C == 2A/ 1.5A)



Downstream port for cascading to another hub
Power switching as well, because why not!



Sheet: /downstream-port-power/
File: downstream-port-power.kicad_sch

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6-24V DC input.
6 DS ports * 1A * 5V = ~30W supply
Regulated 5V output is provided back out on pins.
If you're adventurous you can supply there instead...

It's suggested that 30V is too low for 24V reverse pol prot.
Perhaps, DPAK? many big fat options there?

NCE60P25K
NCE60P50K
NCE01P18K
IRFR9024NTRPBF
IRFR5410TRPBF
IRFR5305TRPBF
NCE40P70K
WSF15P10

$V_{ds} \geq 30V$, $I_{max} \geq 8A$ or so

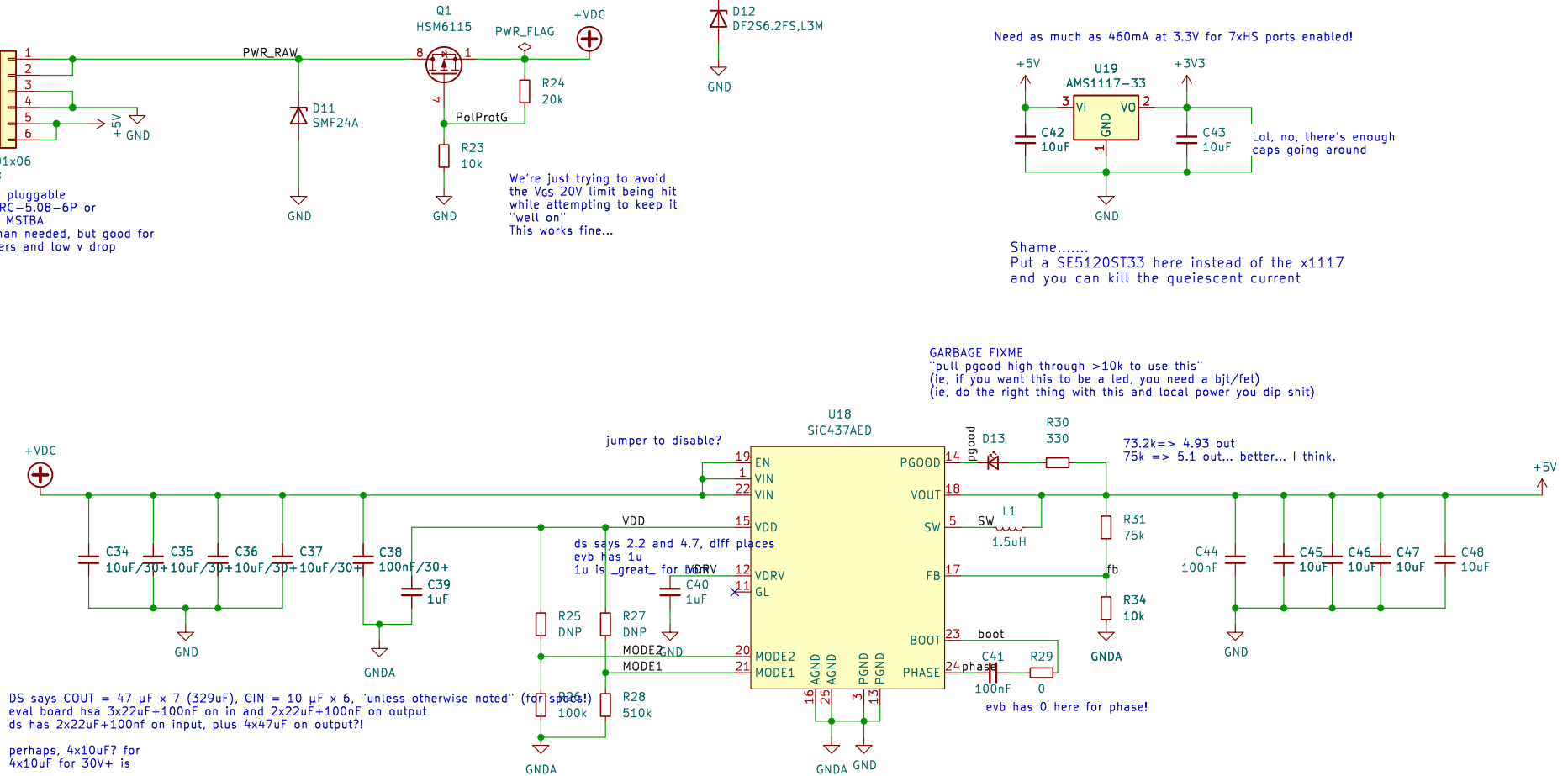
We want a low breakdown voltage here,
"normal" 5V tvs diodes will protect too late
Must breakdown at ~6V to even have a _chance_
This is bogus though, no part will be
able to handle the current here, I think
we should just drop this

Need as much as 460mA at 3.3V for 7xHS ports enabled!

Lol, no, there's enough
caps going around

Shame.....
Put a SE5120ST33 here instead of the x1117
and you can kill the quiescent current

GARBAGE FIXME
"pull pgood high through >10k to use this"
(ie. if you want this to be a led, you need a bjt/fet)
(ie. do the right thing with this and local power you dip shit)



DS says $C_{OUT} = 47 \mu F \times 7$ (329uF), $C_{IN} = 10 \mu F \times 6$, "unless otherwise noted" (for spec!)
eval board has 3x22uF+100nF on in and 2x22uF+100nF on output
ds has 2x22uF+100nF on input, plus 4x47uF on output?!
perhaps, 4x10uF? for
4x10uF for 30V+ is

mode1: 100k for 500kHz, 200k for 750kHz, 500k for 1MHz
mode2: 100k for OCP at 9.7A, 200k for OCP at 14A, 500k for OCP at 18A.

Mode1 to ground: skip, to vdd:forced ccm
Mode2 to ground: Softstart=3ms, to vdd, 6ms

Conclusion: default SS 3ms, skip mode, 1MHz, OCP at 9.7A

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