If you think this sheet is boring, take it up with ANTTO!

upstream-config-leds

File: upstream-config-leds.sch

Feeling uppitty, into configuration and the world at large?

H1 H2 H3 H4

MountingHole

downstream-port-power

File: downstream-port-power.sch

Feeling down, feeling like power switching and chunks of metal?

one up, one down
three double ports for discos w/ user usb
intended for controlling libopencm3 regression test boards

Sheet: /
File: usb-test-harness.sch

Title: Cascading per port controllable USB hub

Size: A4	Date: 2019-12-03	**Rev:**
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usb A MALE for plugging directly into an upstream
+
usb b micro for cable connecting as top level

J8
USB_A male UP

VBUS_UP

UP+
UP−

As a HUB, all shields together,
and grounded at one point.
As per SMSC AN 15.17

R21 330
C32 .1uF
GNDPWR

J9
USB_B_Micro (up)

GNDPWR

Near CDD33CR (24)

+3V3
C6 1uF
C7 .1uF
C8 1uF
C9 .1uF
C10 .1uF
C11 .1uF
C13 .1uF
C15 .1uF
C17 .1uF
GND

C3 2.2uF
R11 100k
R12 100k
VBUS_DET

CFG straps
011: EEPROM
101: defaults+dyn+led=usb
100: defaults+dyn ?

R7 10k
R5 10k
R3 10k
R4 10k
R6 10k
R8 10k
CFG_SEL0
CFG_SEL1
CFG_SEL2
D21 EEPROM
D22 default

R2 10k
LOCAL_PWR
EE_SDA
EE_SCL
CFG_SEL1_A
330 R10

C4 33pF
C5 33pF
XTAL1
Y1 24MHz
XTAL2

R9 100k
RESET
JP1 Jumper_NO_Small
C2 .1uF

Connect for EEP programming
(holds hub in reset)

U3A
USB2517

VDD33CR
VDD33PLL
VDDA33
VBUS_DET
UP−
UP+
USBDM_UP
USBDP_UP
SUSP_IND/LOCAL_PWR/NON_REM0
SDA/SMBDATA/NON_REM1
SCL/SMBCLK/CFG_SEL0
HS_IND/CFG_SEL1
CFG_SEL2
XTAL1/CLKIN
XTAL2
RESET
LED_B1/BOOST0
LED_B2/BOOST1
LED_B3/GANG_EN
LED_B4
LED_B5
LED_B6
LED_B7
LED_A1/PRT_SWP1
LED_A2/PRT_SWP2
LED_A3/PRT_SWP3
LED_A4/PRT_SWP4
LED_A5/PRT_SWP5
LED_A6/PRT_SWP6
LED_A7/PRT_SWP7
VDD18PLL
VDD18
RBIAS
TEST
VSS

Speed indicator leds,
not usb standard

LED_A1 330 R14 LA_1−3
LED_A2 330 R15 LA_2−4
LED_A3 330 R16 LA_3−1
LED_A4 330 R17 LA_4−2
LED_A5 330 R18 LA_5−DS
LED_A6 330 R19 LA_6−6
LED_A7 330 R20 LA_7−5

VDD18PLL
VDD18
C12 1uF
C14 .1uF
C16 1uF
C18 .1uF
R13 12k RBIAS

D9 D_Small
LED_DRIVE

D18 LTST−C295KGKRKT
LA_3−1
D19 LTST−C295KGKRKT
LA_4−2
D3 LTST−C295KGKRKT
LA_1−3
D4 LTST−C295KGKRKT
LA_2−4
D5 LTST−C295KGKRKT
LA_7−5
D6 LTST−C295KGKRKT
LA_6−6
D7 LTST−C295KGKRKT
LA_5−DS

J5
Conn_01x03_Male
Programming header
for EEPROM
EE_SDA
EE_SCL

U1
A0 A1 A2 GND VCC SDA SCL WP
2k i2c eeprom
C1 .1uF
R1 DNP 10k
If you're using EEPROM, CFG_SEL0 covers this

Optional, pin straps cover everything but usb device serial!

TPS54820 or
MP9477 or
SC6001 with external fets (fuck no!)
(6 DS ports * 1A * 5V minimum)

+VDC
V_EXT J3

Missing:
* ESD protection on input terminals?
* lots of stuff?
* switch connectors to cheap 5mm pitch
* input caps on 5V?!

NOT TODO
* 24V−>5V on board, too much work

Screw terminals for external regulated 5V input
Future versions may include the 20−30W
buck regulator and allow "any" input voltage

5V_RAW J1
GND J2

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

U2
SE5120ST33
VI GND VO

AP1509/XL1509 are "sexy"
but just use a SOT223−standard linear.
(but not xxx1117! too much power waste!)

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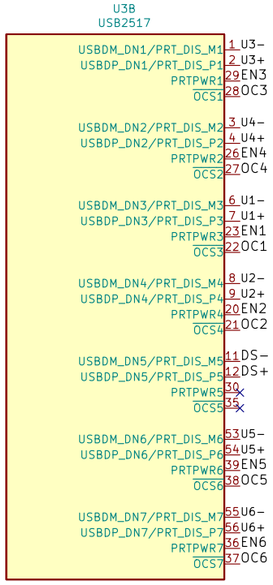
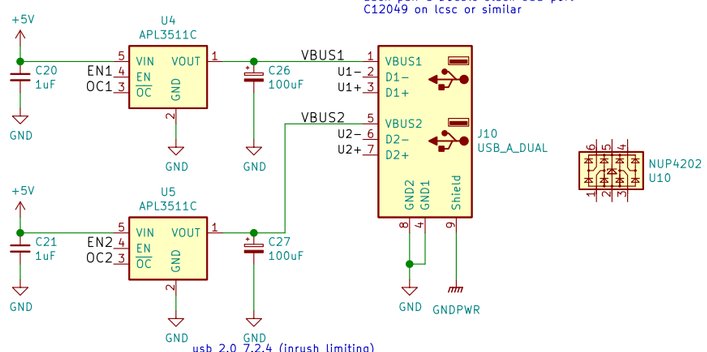


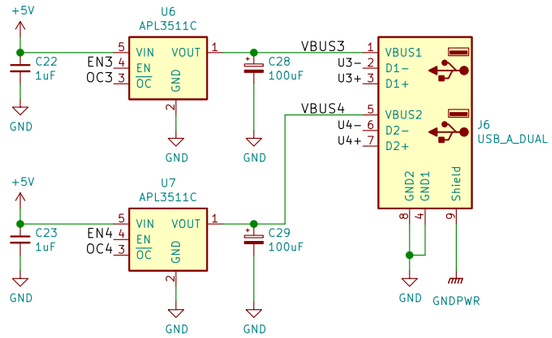
Unfortunately, port numbering won't make much sense.

APL3511C is 1A, if you want more power, APL3511A is 2A limited

Each pair a Double stack USB port
C12049 on lcsc or similar

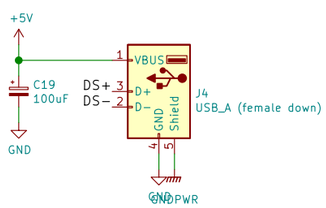


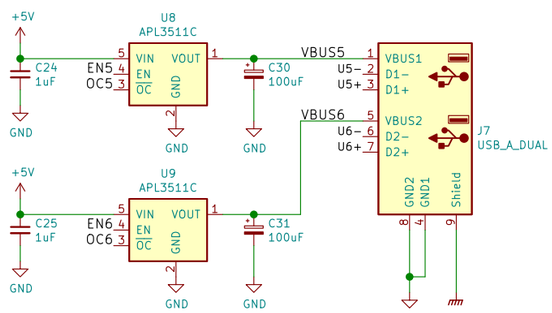
usb 2.0 7.2.4 (inrush limiting)
says ds facing hub ports to provide 120uF minimum.
can get 220uF cheap in a slightly bigger footprint
if really desired but fuck that, yolo
apl3511 app note is 100nF + 150uF



NUP4202 or USBLC6−4xx or ??

Downstream port for cascading to another hub





Sheet: /downstream−port−power/
File: downstream−port−power.sch

Title:

Size: A3	Date:	**Rev:**
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