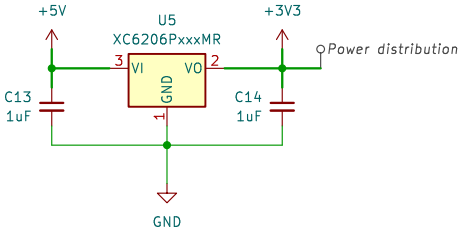
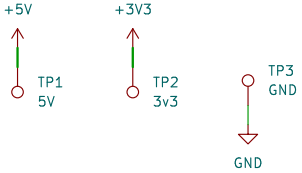
Abs max 500mA, 200mA rated,
so fine for our use.
Trise at 25C ambient at full load is ~
Pd at 5.25-3.3@200mA is 400mW. sheet gives ~about that as abs max,
but, 5-3.3@100mA is only half that, so... all good.





usb

3.3V consumption == 0

File: usb.kicad_sch

keys_mcu

CAN_SHUTDOWN

3.3v consumption = ~98 at maxxx

CANFD_RX
CANFD_TX

File: keys_mcu.kicad_sch

can

CAN_D
CAN_R

BONUS
3.3v consumption = ~8mA

CAN_SHUTDOWN

File: can.kicad_sch

http://github.com/karlp/das-kb4-bara2
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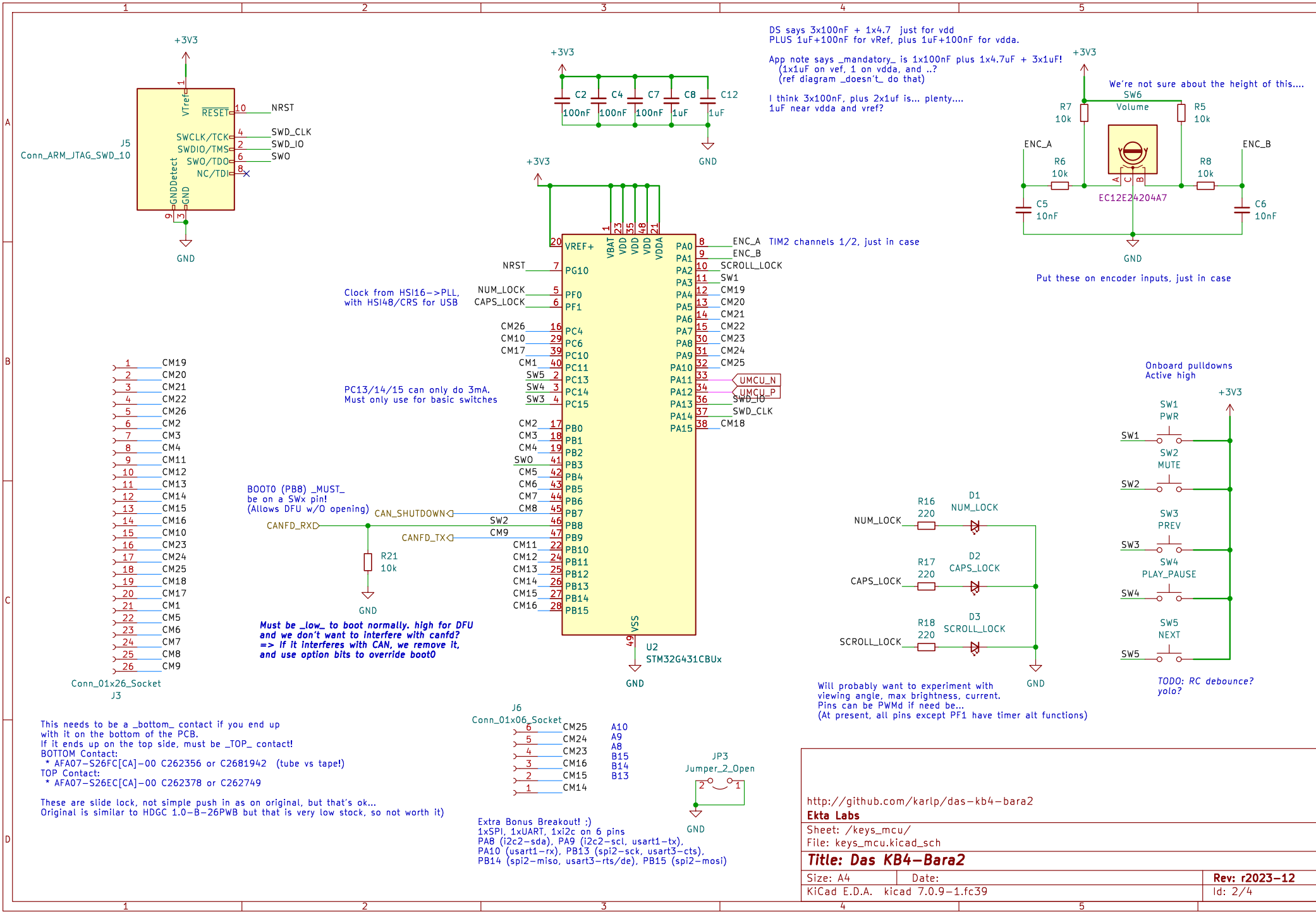
Sheet: /
File: das-kb4-bara2.kicad_sch

Title: Das KB4-Bara2

Size: A4	Date:	**Rev: r2023-12**
KiCad E.D.A. kicad 7.0.9-1.fc39		Id: 1/4


+3V3
J5
Conn_ARM_JTAG_SWD_10
VTref
RESET
NRST
SWCLK/TCK
SWD_CLK
SWDIO/TMS
SWD_IO
SWO/TDO
SWO
NC/TDI
GNDDetect
GND
C2 100nF
C4 100nF
C7 100nF
C8 1uF
C12 1uF
DS says 3x100nF + 1x4.7 just for vdd
PLUS 1uF+100nF for vRef, plus 1uF+100nF for vdda.
App note says _mandatory_ is 1x100nF plus 1x4.7uF + 3x1uF!
(1x1uF on vef, 1 on vdda, and ..?
(ref diagram _doesn't_ do that)
I think 3x100nF, plus 2x1uf is... plenty....
1uF near vdda and vref?
We're not sure about the height of this....
SW6
Volume
R7 10k
R5 10k
R6 10k
R8 10k
ENC_A
ENC_B
EC12E24204A7
C5 10nF
C6 10nF
Put these on encoder inputs, just in case
VREF+
VBAT
VDD
VDDA
NRST
PG10
Clock from HSI16->PLL,
with HSI48/CRS for USB
NUM_LOCK
CAPS_LOCK
PF0
PF1
PC13/14/15 can only do 3mA.
Must only use for basic switches
SW5
SW4
SW3
PA0 ENC_A
PA1 ENC_B
PA2 SCROLL_LOCK
PA3 SW1
PA4 CM19
PA5 CM20
PA6 CM21
PA7 CM22
PA8 CM23
PA9 CM24
PA10 CM25
PA11 UMCU_N
PA12 UMCU_P
PA13 SWD_IO
PA14 SWD_CLK
PA15 CM18
TIM2 channels 1/2, just in case
CM26 CM10 CM17 CM1
CM2 CM3 CM4 SWO CM5 CM6 CM7 CM8 CM9
CM11 CM12 CM13 CM14 CM15 CM16
PB0 PB1 PB2 PB3 PB4 PB5 PB6 PB7 PB8 PB9 PB10 PB11 PB12 PB13 PB14 PB15
VSS
U2
STM32G431CBUx
BOOT0 (PB8) _MUST_
be on a SWx pin!
(Allows DFU w/O opening)
CAN_SHUTDOWN
CANFD_RX
CANFD_TX
R21 10k
Must be _low_ to boot normally. high for DFU
and we don't want to interfere with canfd?
=> If it interferes with CAN, we remove it,
and use option bits to override boot0
Onboard pulldowns
Active high
SW1 PWR
SW2 MUTE
SW3 PREV
SW4 PLAY_PAUSE
SW5 NEXT
TODO: RC debounce?
yolo?
R16 220
R17 220
R18 220
D1 NUM_LOCK
D2 CAPS_LOCK
D3 SCROLL_LOCK
Will probably want to experiment with
viewing angle, max brightness, current.
Pins can be PWMd if need be...
(At present, all pins except PF1 have timer alt functions)
J3
Conn_01x26_Socket
CM19 CM20 CM21 CM22 CM26 CM2 CM3 CM4 CM11 CM12 CM13 CM14 CM15 CM16 CM10 CM23 CM24 CM25 CM18 CM17 CM1 CM5 CM6 CM7 CM8 CM9
This needs to be a _bottom_ contact if you end up
with it on the bottom of the PCB.
If it ends up on the top side, must be _TOP_ contact!
BOTTOM Contact:
* AFA07-S26FC[CA]-00 C262356 or C2681942 (tube vs tape!)
TOP Contact:
* AFA07-S26EC[CA]-00 C262378 or C262749
These are slide lock, not simple push in as on original, but that's ok...
Original is similar to HDGC 1.0-B-26PWB but that is very low stock, so not worth it)
J6
Conn_01x06_Socket
CM25 A10
CM24 A9
CM23 A8
CM16 B15
CM15 B14
CM14 B13
Extra Bonus Breakout! ;)
1xSPI, 1xUART, 1xi2c on 6 pins
PA8 (i2c2-sda), PA9 (i2c2-scl, usart1-tx),
PA10 (usart1-rx), PB13 (spi2-sck, usart3-cts),
PB14 (spi2-miso, usart3-rts/de), PB15 (spi2-mosi)
JP3
Jumper_2_Open
http://github.com/karlp/das-kb4-bara2
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Sheet: /keys_mcu/
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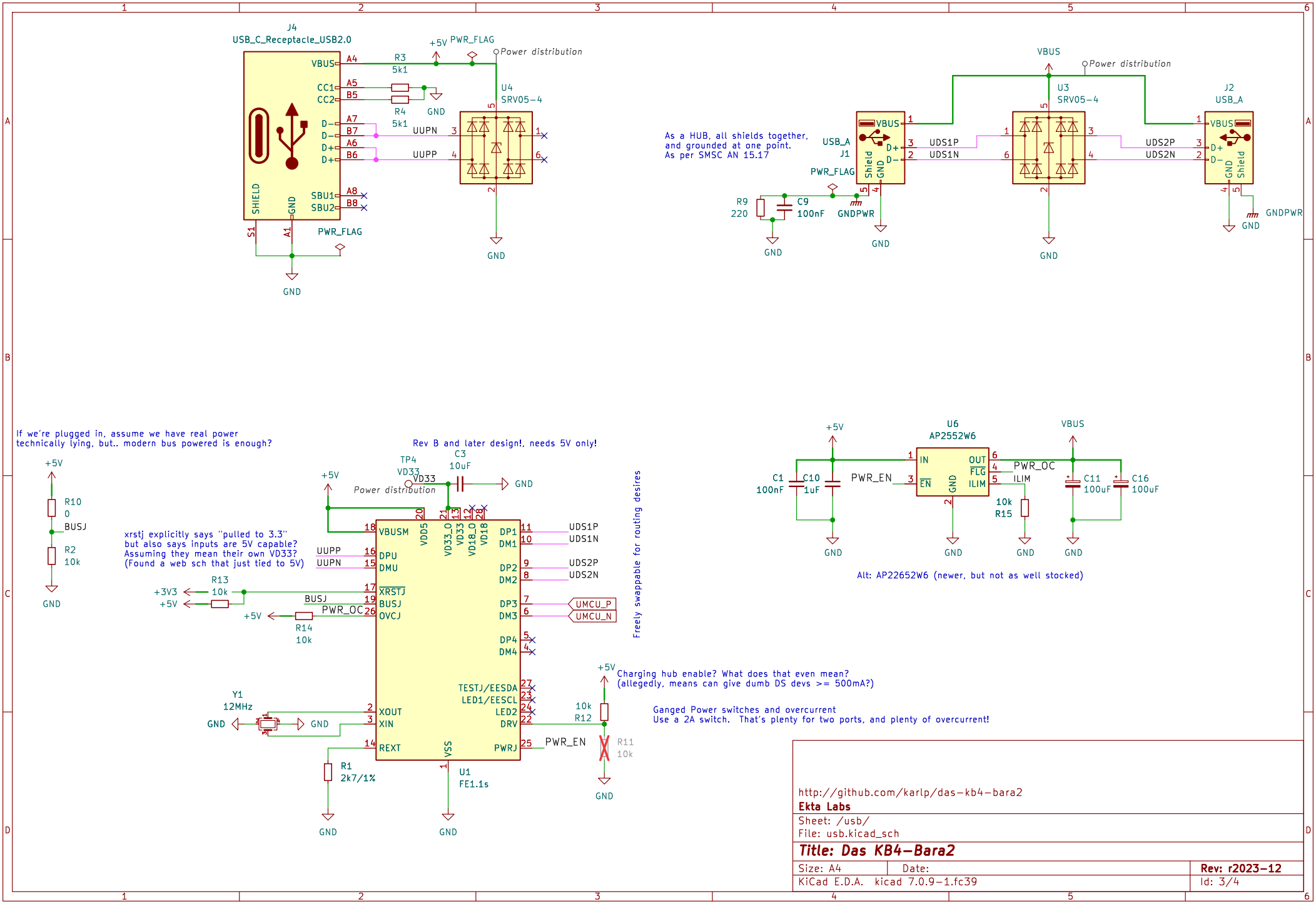
J4
USB_C_Receptacle_USB2.0
VBUS
CC1
CC2
D−
D−
D+
D+
SHIELD
GND
SBU1
SBU2
S1
A1
A4
A5
B5
A7
B7
A6
B6
A8
B8
R3
5k1
R4
5k1
+5V
PWR_FLAG
Power distribution
U4
SRV05−4
UUPN
UUPP
GND
PWR_FLAG
GND
As a HUB, all shields together,
and grounded at one point.
As per SMSC AN 15.17
USB_A
J1
VBUS
D+
D−
Shield
GND
PWR_FLAG
R9
220
C9
100nF
GNDPWR
GND
VBUS
Power distribution
U3
SRV05−4
UDS1P
UDS1N
UDS2P
UDS2N
GND
J2
USB_A
VBUS
D+
D−
GND
Shield
GNDPWR
GND
If we're plugged in, assume we have real power
technically lying, but.. modern bus powered is enough?
+5V
R10
0
BUSJ
R2
10k
GND
xrstj explicitly says "pulled to 3.3"
but also says inputs are 5V capable?
Assuming they mean their own VD33?
(Found a web sch that just tied to 5V)
Rev B and later design!, needs 5V only!
TP4
VD33
C3
10uF
+5V
Power distribution
GND
VBUSM
DPU
DMU
XRSTJ
BUSJ
OVCJ
VDD5
VD33_0
VD33
VD18_0
VD18
DP1
DM1
DP2
DM2
DP3
DM3
DP4
DM4
UDS1P
UDS1N
UDS2P
UDS2N
UMCU_P
UMCU_N
UUPP
UUPN
R13
10k
+3V3
+5V
BUSJ
PWR_OC
+5V
R14
10k
Freely swappable for routing desires
Y1
12MHz
GND
GND
XOUT
XIN
REXT
VSS
TESTJ/EESDA
LED1/EESCL
LED2
DRV
PWRJ
PWR_EN
R1
2k7/1%
U1
FE1.1s
GND
GND
+5V
Charging hub enable? What does that even mean?
(allegedly, means can give dumb DS devs >= 500mA?)
10k
R12
Ganged Power switches and overcurrent
Use a 2A switch. That's plenty for two ports, and plenty of overcurrent!
R11
10k
GND
+5V
U6
AP2552W6
VBUS
C1
100nF
C10
1uF
PWR_EN
IN
EN
GND
OUT
FLG
ILIM
PWR_OC
ILIM
10k
R15
C11
100uF
C16
100uF
GND
GND
GND
GND
Alt: AP22652W6 (newer, but not as well stocked)
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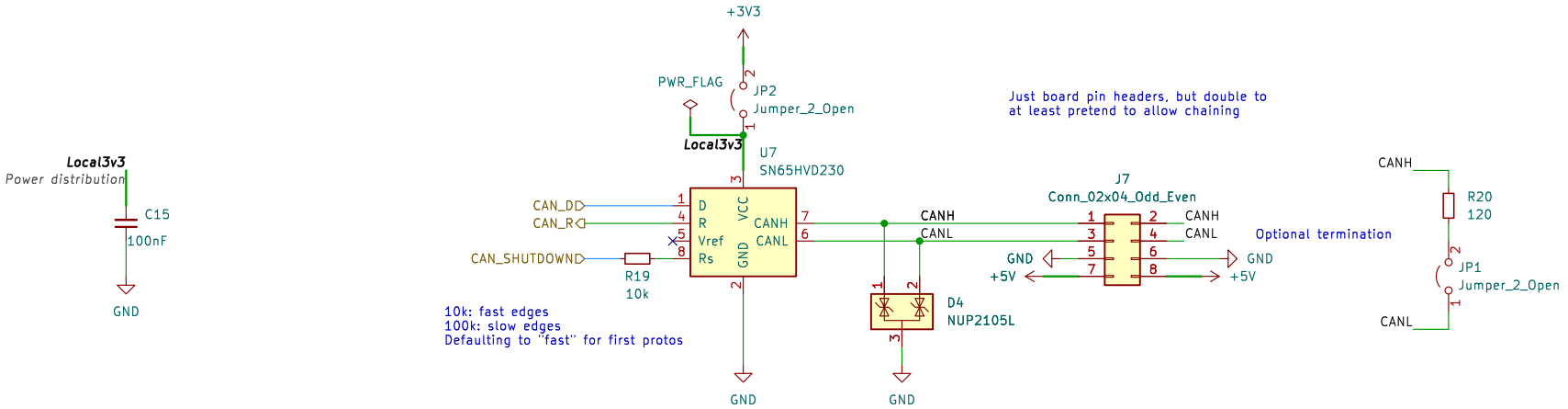
BoNuS!!!1!!!

Adding CAN-FD, so that prototype boards can be used for more than one thing.

There's not enough IOs to do CAN _plus_ keyboard and, the HVD230 part only shuts down _transmitter_ when shutdown is high, so provide a local hard jumper for 3v3?



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