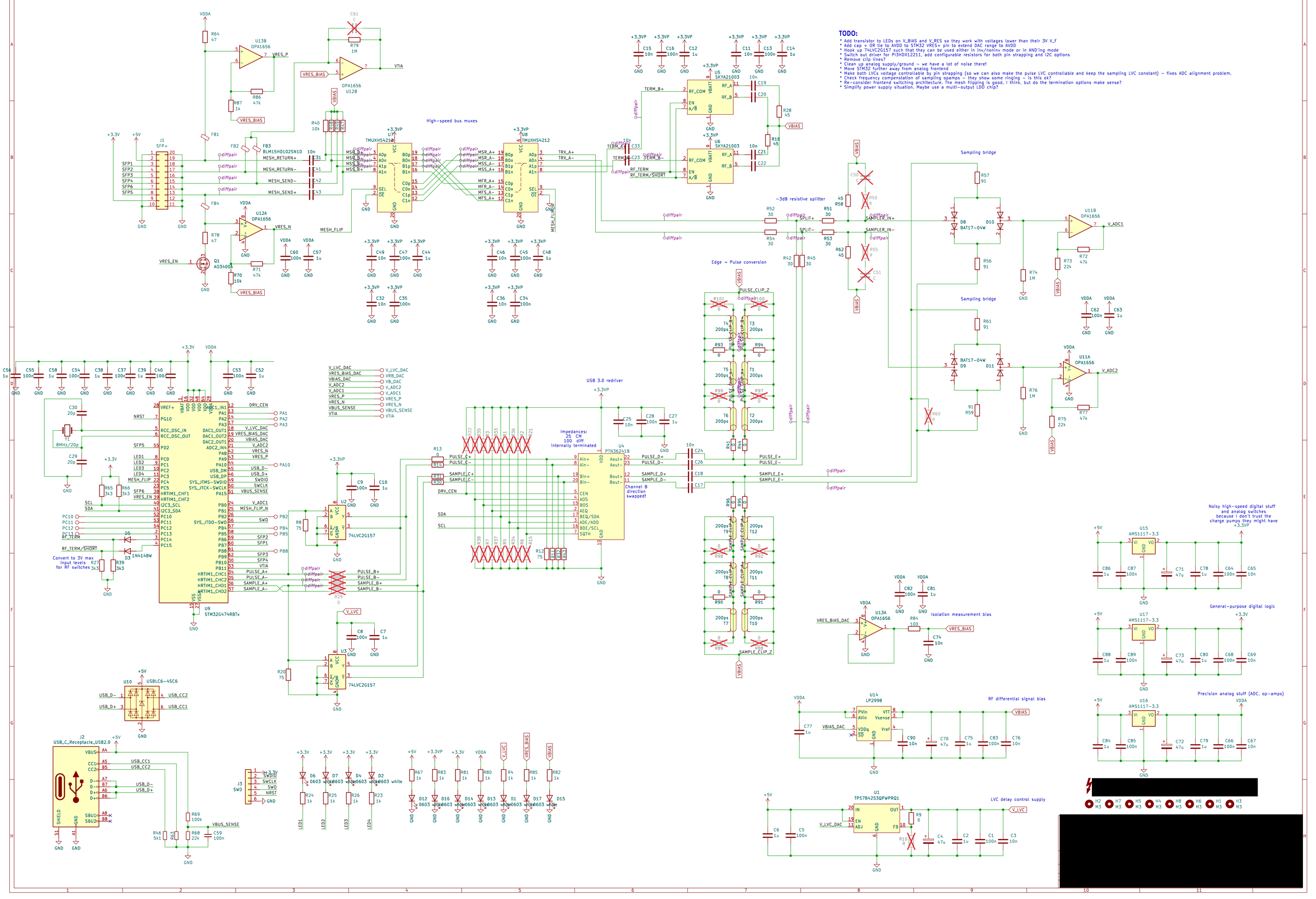
TODO:
* Add transistor to LEDs on V_BIAS and V_RES so they work with voltages lower than their 3V V_F
* Add cap + OR tie to AVDD to STM32 VRES+ pin to extend DAC range to AVDD
* Hook up 74LVC2G157 such that they can be used either in inv/noninv mode or in AND'ing mode
* Switch out driver for PI3HDX12211, add configurable resistors for both pin strapping and I2C options
* Remove clip lines?
* Clean up analog supply/ground — we have a lot of noise there!
* Move STM32 further away from analog frontend
* Make both LVCs voltage controllable by pin strapping (so we can also make the pulse LVC controllable and keep the sampling LVC constant) — fixes ADC alignment problem.
* Check frequency compenstation of sampling opamps — they show some ringing — is this ok?
* Re-consider frontend switching architecture. The mesh flipping is good, I think, but do the termination options make sense?
* Simplify power supply situation. Maybe use a multi-output LDO chip?
High-speed bus muxes
-3dB resistive splitter
Edge → Pulse conversion
Sampling bridge
Sampling bridge
USB 3.0 redriver
Impedances:
25 CM
100 diff
internally terminated
Channel B
direction
swapped!
Isolation measurement bias
RF differential signal bias
LVC delay control supply
Noisy high-speed digital stuff
and analog switches
because I don't trust the
charge pumps they might have
General-purpose digital logic
Precision analog stuff (ADC, op-amps)
Convert to 3V max
input levels
for RF switches
VDDA
+3.3V
+5V
GND
VBIAS
VRES_BIAS
VRES_EN
MESH_FLIP
MESH_RETURN+
MESH_RETURN−
MESH_SEND−
MESH_SEND+
RF_TERM
RF_TERM/SHORT
SCL
SDA
USB_D−
USB_D+
USB_CC1
USB_CC2
VBUS_SENSE
DRV_CEN
V_LVC
V_ADC1
V_ADC2
VRES_P
VRES_N
VTIA
VBUS_SENSE
V_LVC_DAC
VRB_DAC
VB_DAC
VBIAS_DAC
VRES_BIAS_DAC
PULSE_CLIP_Z
SAMPLE_CLIP_A
SAMPLE_CLIP_B
SAMPLE_CLIP_Z
SAMPLE_IN+
SAMPLE_IN−
SPLIT+
SPLIT−
TERM_A
TERM_B
TERM_C
RF_TERM
PULSE_A+
PULSE_A−
PULSE_B+
PULSE_B−
PULSE_C+
PULSE_C−
PULSE_D+
PULSE_D−
PULSE_E+
PULSE_E−
SAMPLE_A+
SAMPLE_A−
SAMPLE_B+
SAMPLE_B−
SAMPLE_C+
SAMPLE_C−
SAMPLE_D+
SAMPLE_D−
SAMPLE_E+
SAMPLE_E−
MSR_A+
MSR_A−
MSS_A+
MSS_A−
MFR_A+
MFR_A−
MFS_A+
MFS_A−
MSR_B+
MSS_B+
TRX_A+
TRX_A−
SFP1
SFP2
SFP3
SFP4
SFP5
SFP6
LED1
LED2
LED3
LED4
SWDIO
SWCLK
SWO
NRST
PA1
PA2
PA3
PA10
PB2
PB4
PB5
PB8
SFP2
SFP1
SFP3
SFP4
V_ADC1
MESH_FLIP_N
VTIA
PULSE_A+
PULSE_A−
SAMPLE_A+
SAMPLE_A−
PULSE_B+
PULSE_B−
SAMPLE_B+
SAMPLE_B−
V_LVC_DAC
VRB_DAC
VBIAS_DAC
V_ADC2
V_ADC1
VRES_P
VRES_N
VBUS_SENSE
VTIA
R64 47
R79 1M
C61 C
RB6 47k
R87 1k
R40 10k
R41 10k
R42 10k
R43 10k
FB1
FB2
FB3 BLM15HD102SN1D
FB4
R78 47
R70 10k
R71 47k
Q1 AO3400A
R65 3k3
R66 3k3
R27 3k3
R39 3k3
D3 1N4148W
D5
R69 100k
R46 5k1
R63
R68 22k
C59 100n
R8 75
R20 75
R12 75
R13 0
R14
R34
R30
R29 0
R22
R35
R33
R31
R36
R32
R21
R38
R37
R39
R34
R15
R44
R43
R45
R42 30
R54 30
R52 30
R53 30
R51 30
R62 45
R58 45
R50 R
R55 R
C50 C
C51 C
R28 45
R18 45
R57 91
R56 91
R74 1M
R73 22k
R72 47k
R61 91
R59 91
R76 1M
R75 22k
R77 47k
R60 R
R96
R95
R98
R92
R97
R94
R93
R99
R100
R101
R91
R90
R88
R89
R41
R44
R60 R
R9 0
R10 R
R83 1k
R81 1k
R80 1k
R4 1k
R85 1k
R82 1k
R67 1k
R24 1k
R25 1k
R26 1k
R23 1k
R84 100
R64 47
R78 47
R70 10k
R71 47k
R27 3k3
R39 3k3
R65 3k3
R66 3k3
R69 100k
R46 5k1
R63
R68 22k
R8 75
R20 75
R12 75
R13 0
R14
R34
R30
R29 0
R42 30
R54 30
R52 30
R53 30
R51 30
R62 45
R58 45
R28 45
R18 45
R57 91
R56 91
R74 1M
R73 22k
R72 47k
R61 91
R59 91
R76 1M
R75 22k
R77 47k
R60 R
R96
R95
R98
R92
R97
R94
R93
R99
R100
R101
R91
R90
R88
R89
R41
R44
R60 R
R9 0
R10 R
R83 1k
R81 1k
R80 1k
R4 1k
R85 1k
R82 1k
R67 1k
R24 1k
R25 1k
R26 1k
R23 1k
R84 100
C56 1u
C55 100n
C58 1u
C54 100n
C38 1u
C37 100n
C39 1u
C40 100n
C53 100n
C52 1u
C30 20p
C29 20p
Y1 8MHz/20p
C9 100n
C10 1u
C8 100n
C7 1u
C49 10n
C47 100n
C44 1u
C46 10n
C45 100n
C48 1u
C32 10n
C35 100n
C36 10n
C34 100n
C60 100n
C57 1u
C15 10n
C16 100n
C12 1u
C11 10n
C13 100n
C14 1u
C19 10n
C20
C33 10n
C23
C31 10n
C41
C42
C43
C24 10n
C26
C18
C17
C25 10n
C28 100n
C27 1u
C62 100n
C63 1u
C82 100n
C81 1u
C74 10n
C77 1u
C90 10n
C70 47u
C75 1u
C83 100n
C76 10n
C6 1u
C5 100n
C4 47u
C2 1u
C1 100n
C3 10n
C86 1u
C87 100n
C71 47u
C78 1u
C64 100n
C65 10n
C88 1u
C89 100n
C73 47u
C80 1u
C68 100n
C69 10n
C84 1u
C85 100n
C72 47u
C79 1u
C66 100n
C67 10n
U13B OPA1656
U12B OPA1656
U12A OPA1656
U11B OPA1656
U11A OPA1656
U13A OPA1656
U5 SKYA21003
U6 SKYA21003
U7 TMUXHS4212
U8 TMUXHS4212
U4 PTN36241B
U2 74LVC2G157
U3 74LVC2G157
U9 STM32G474RBTx
U10 USBLC6-4SC6
U14 LP2998
U1 TPS7B4253QPWPRQ1
U15 AMS1117-3.3
U17 AMS1117-3.3
U16 AMS1117-3.3
D8 BAT17-04W
D10 BAT17-04W
D9 BAT17-04W
D11 BAT17-04W
D6 0603 white
D7 0603 white
D4 0603 white
D2 0603 white
D12 0603 white
D16 0603 white
D14 0603 white
D13 0603 white
D1 0603 white
D17 0603 white
D15 0603 white
T4 200ps
T3 200ps
T5 200ps
T1 200ps
T6 200ps
T2 200ps
T8 200ps
T12 200ps
T9 200ps
T11 200ps
T7 200ps
T10 200ps
J1 SFP+
J2 USB_C_Receptacle_USB2.0
J3 SWD
Y1 8MHz/20p
H2 M3
H7 M3
H5 M3
H4 M3
H8 M3
H6 M3
H1 M3
H3 M3