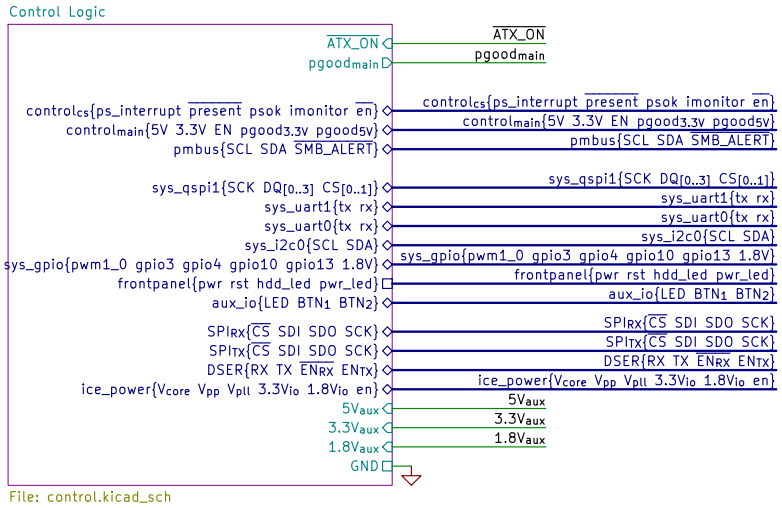
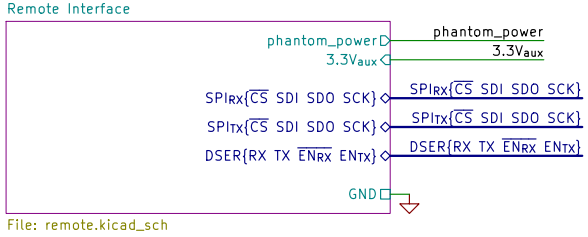
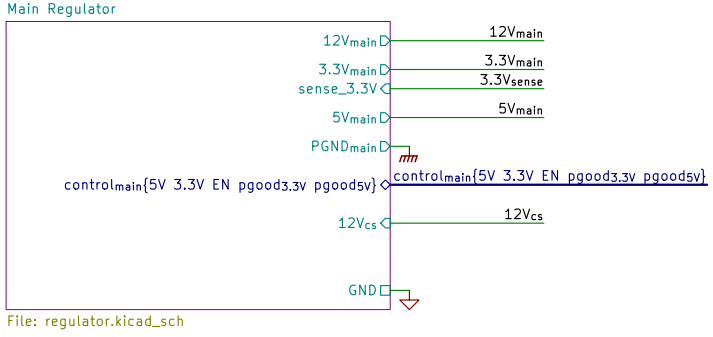
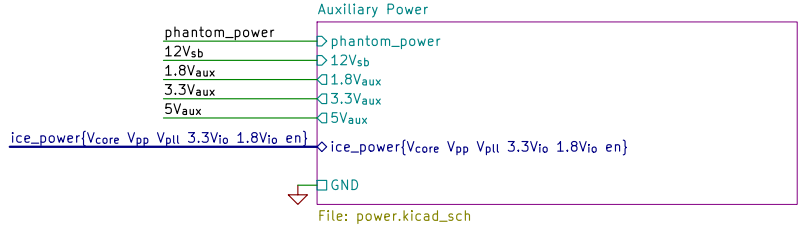
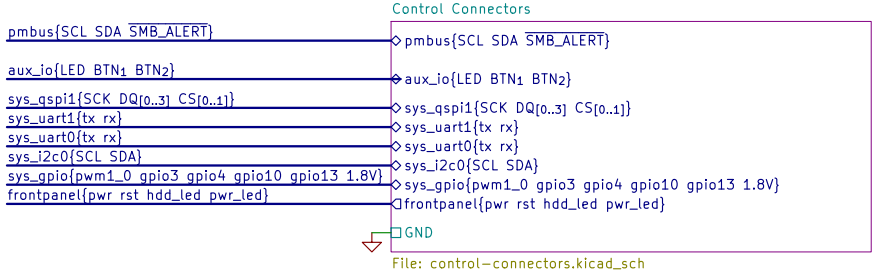
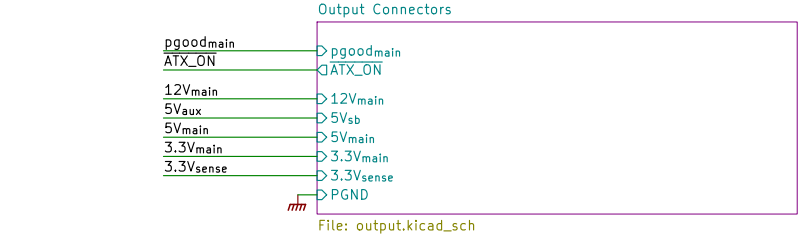

Control Logic
ATX_ON
pgoodmain
controlcs{ps_interrupt present psok imonitor en}
controlmain{5V 3.3V EN pgood3.3v pgood5v}
pmbus{SCL SDA SMB_ALERT}
sys_qspi1{SCK DQ[0..3] CS[0..1]}
sys_uart1{tx rx}
sys_uart0{tx rx}
sys_i2c0{SCL SDA}
sys_gpio{pwm1_0 gpio3 gpio4 gpio10 gpio13 1.8V}
frontpanel{pwr rst hdd_led pwr_led}
aux_io{LED BTN1 BTN2}
SPIRX{CS SDI SDO SCK}
SPITX{CS SDI SDO SCK}
DSER{RX TX ENRX ENTX}
ice_power{Vcore Vpp Vpll 3.3Vio 1.8Vio en}
5Vaux
3.3Vaux
1.8Vaux
GND
File: control.kicad_sch

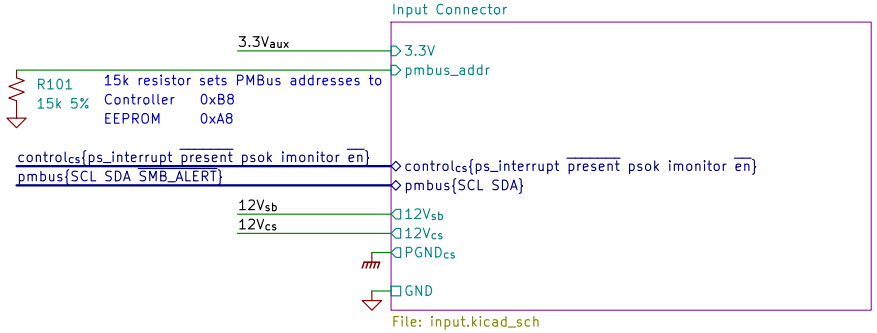

Remote Interface
phantom_power
3.3Vaux
SPIRX{CS SDI SDO SCK}
SPITX{CS SDI SDO SCK}
DSER{RX TX ENRX ENTX}
GND
File: remote.kicad_sch

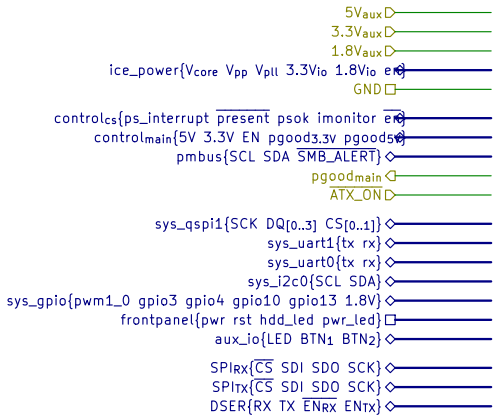

Main Regulator
12Vmain
3.3Vmain
sense_3.3V
5Vmain
PGNDmain
controlmain{5V 3.3V EN pgood3.3v pgood5v}
12Vcs
GND
File: regulator.kicad_sch

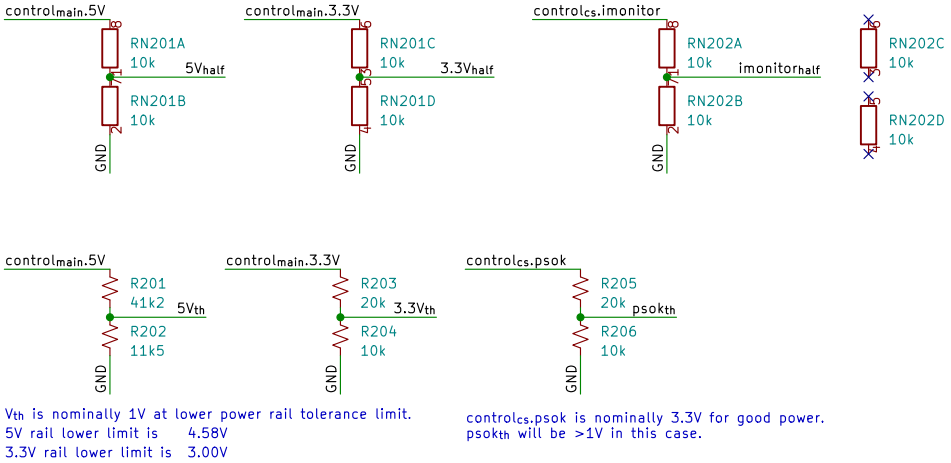

Auxiliary Power
phantom_power
12Vsb
1.8Vaux
3.3Vaux
5Vaux
ice_power{Vcore Vpp Vpll 3.3Vio 1.8Vio en}
GND
File: power.kicad_sch

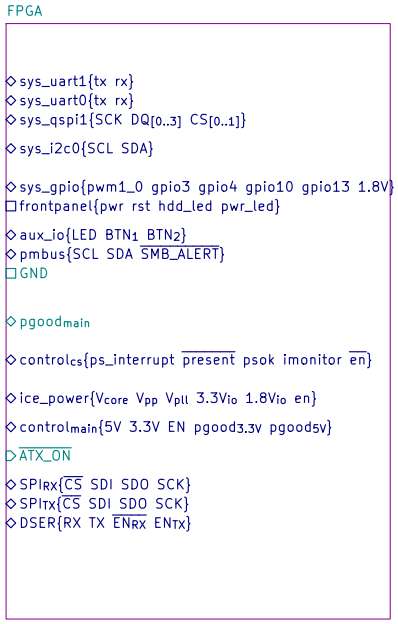

Control Connectors
pmbus{SCL SDA SMB_ALERT}
aux_io{LED BTN1 BTN2}
sys_qspi1{SCK DQ[0..3] CS[0..1]}
sys_uart1{tx rx}
sys_uart0{tx rx}
sys_i2c0{SCL SDA}
sys_gpio{pwm1_0 gpio3 gpio4 gpio10 gpio13 1.8V}
frontpanel{pwr rst hdd_led pwr_led}
GND
File: control-connectors.kicad_sch

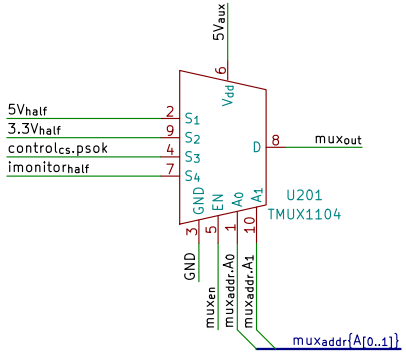

Output Connectors
pgoodmain
ATX_ON
12Vmain
5Vaux
5Vmain
3.3Vmain
3.3Vsense
PGND
File: output.kicad_sch

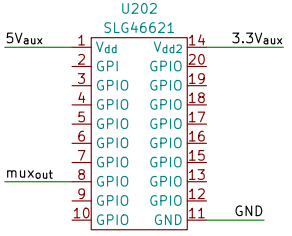

Input Connector
3.3Vaux
R101
15k 5%
15k resistor sets PMBus addresses to
Controller 0xB8
EEPROM 0xA8
controlcs{ps_interrupt present psok imonitor en}
pmbus{SCL SDA SMB_ALERT}
12Vsb
12Vcs
PGNDcs
GND
File: input.kicad_sch

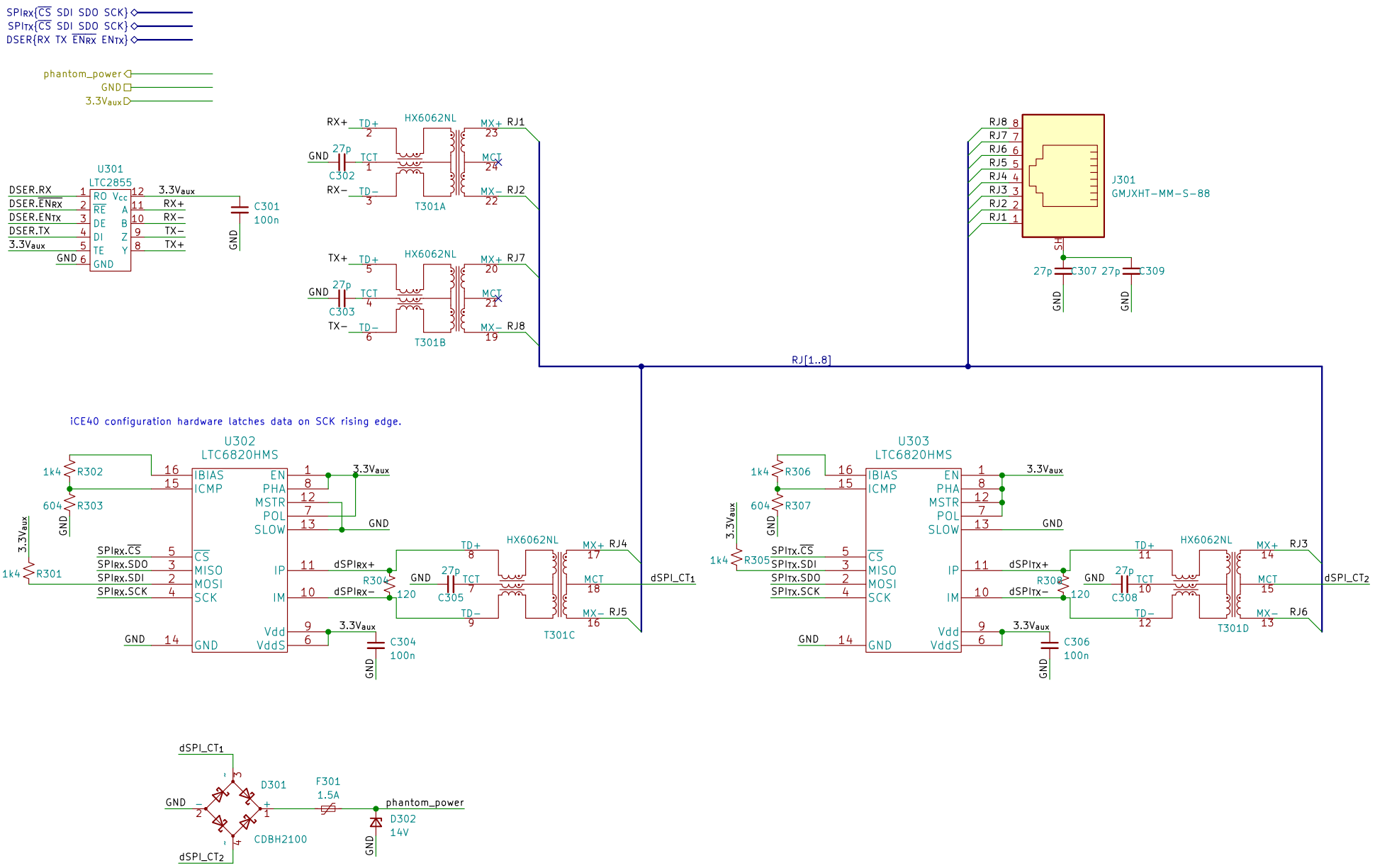

5Vaux
3.3Vaux
1.8Vaux
ice_power{Vcore Vpp Vpll 3.3Vio 1.8Vio en}
GND
controlcs{ps_interrupt present psok imonitor en}
controlmain{5V 3.3V EN pgood3.3V pgood5V}
pmbus{SCL SDA SMB_ALERT}
pgoodmain
ATX_ON
sys_qspi1{SCK DQ[0..3] CS[0..1]}
sys_uart1{tx rx}
sys_uart0{tx rx}
sys_i2c0{SCL SDA}
sys_gpio{pwm1_0 gpio3 gpio4 gpio10 gpio13 1.8V}
frontpanel{pwr rst hdd_led pwr_led}
aux_io{LED BTN1 BTN2}
SPIRX{CS SDI SDO SCK}
SPITX{CS SDI SDO SCK}
DSER{RX TX ENRX ENTX}

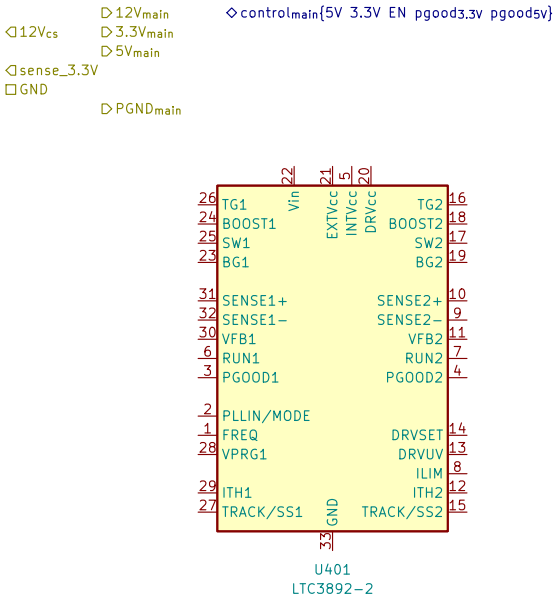

controlmain.5V
RN201A
10k
5Vhalf
RN201B
10k
GND
controlmain.3.3V
RN201C
10k
3.3Vhalf
RN201D
10k
GND
controlcs.imonitor
RN202A
10k
imonitorhalf
RN202B
10k
GND
RN202C
10k
RN202D
10k
controlmain.5V
R201
41k2
5Vth
R202
11k5
GND
controlmain.3.3V
R203
20k
3.3Vth
R204
10k
GND
controlcs.psok
R205
20k
psokth
R206
10k
GND
Vth is nominally 1V at lower power rail tolerance limit.
5V rail lower limit is 4.58V
3.3V rail lower limit is 3.00V
controlcs.psok is nominally 3.3V for good power.
psokth will be >1V in this case.

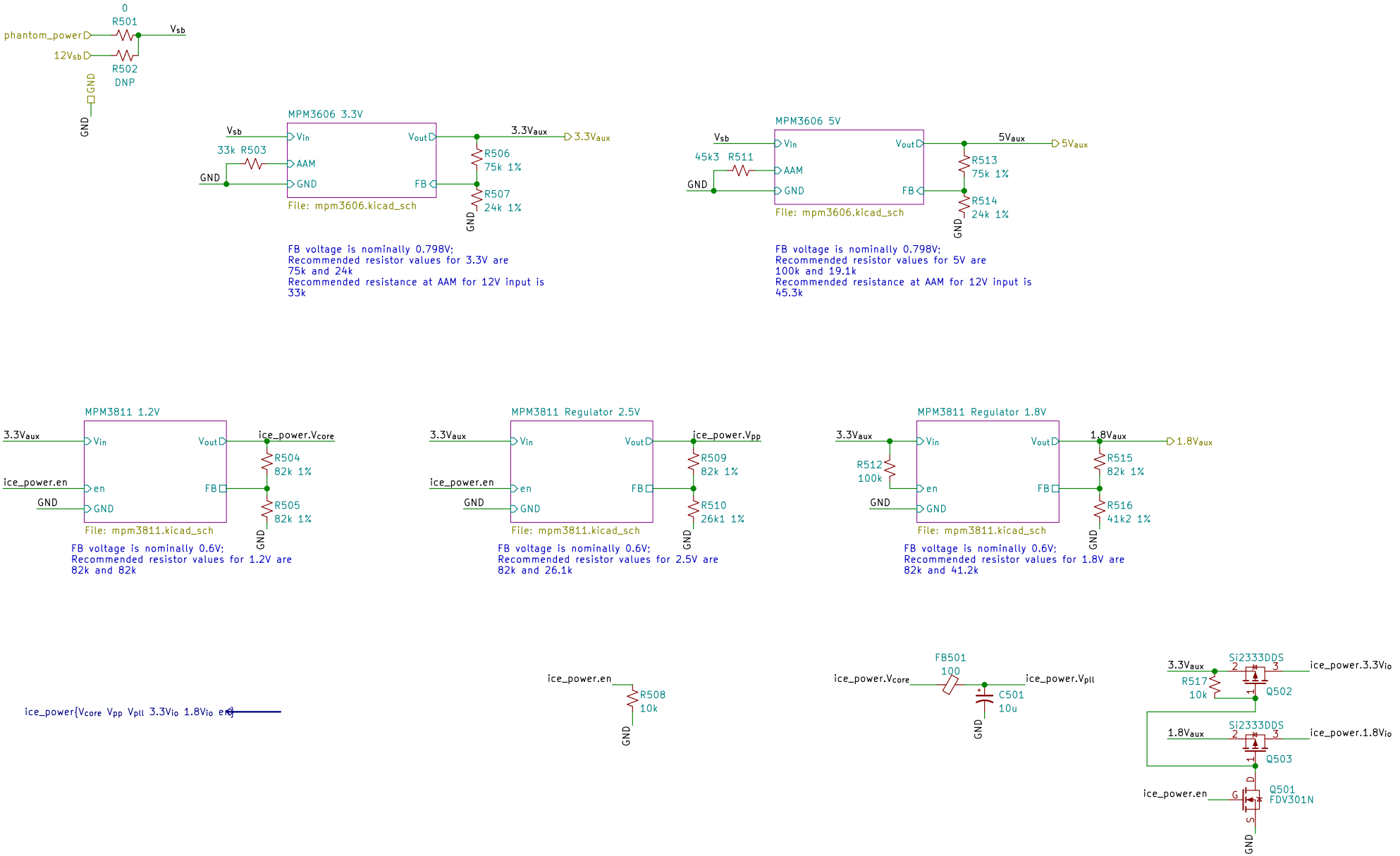

FPGA
sys_uart1{tx rx}
sys_uart0{tx rx}
sys_qspi1{SCK DQ[0..3] CS[0..1]}
sys_i2c0{SCL SDA}
sys_gpio{pwm1_0 gpio3 gpio4 gpio10 gpio13 1.8V}
frontpanel{pwr rst hdd_led pwr_led}
aux_io{LED BTN1 BTN2}
pmbus{SCL SDA SMB_ALERT}
GND
pgoodmain
controlcs{ps_interrupt present psok imonitor en}
ice_power{Vcore Vpp Vpll 3.3Vio 1.8Vio en}
controlmain{5V 3.3V EN pgood3.3V pgood5V}
ATX_ON
SPIRX{CS SDI SDO SCK}
SPITX{CS SDI SDO SCK}
DSER{RX TX ENRX ENTX}
File: ice40hx8k.kicad_sch

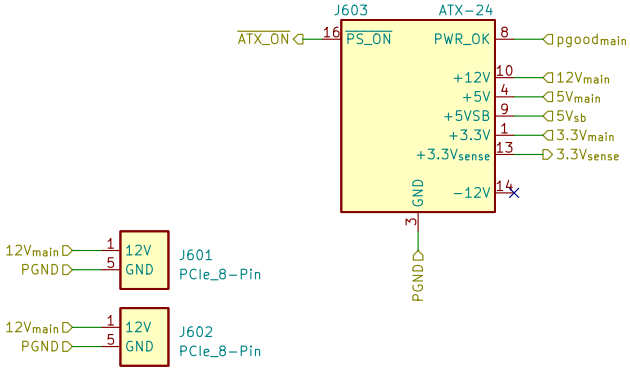

5Vaux
5Vhalf
3.3Vhalf
controlcs.psok
imonitorhalf
S1
S2
S3
S4
Vdd
D
muxout
GND
EN
A0
A1
U201
TMUX1104
muxen
muxaddr.A0
muxaddr.A1
muxaddr{A[0..1]}

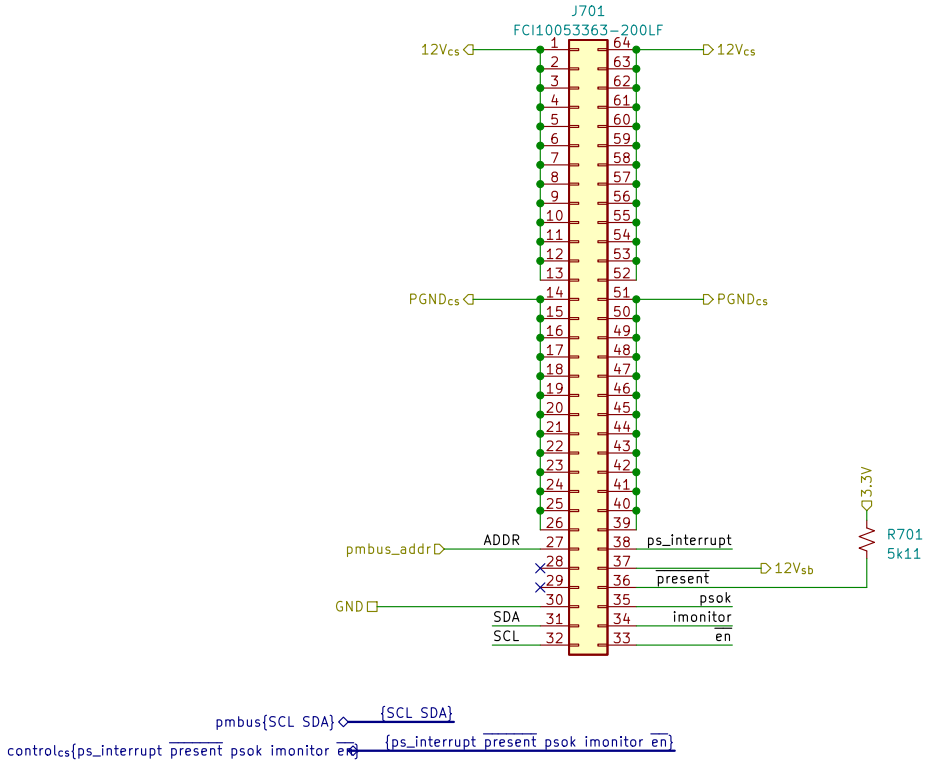

U202
SLG46621
5Vaux
muxout
Vdd
Vdd2
GPI
GPIO
GND
3.3Vaux
GND


SPIRX{CS SDI SDO SCK}
SPITX{CS SDI SDO SCK}
DSER{RX TX ENRX ENTX}
phantom_power
GND
3.3Vaux
U301
LTC2855
DSER.RX
DSER.ENRX
DSER.ENTX
DSER.TX
3.3Vaux
GND
RO Vcc
RE A
DE B
DI Z
TE Y
GND
RX+
RX−
TX+
TX−
C301
100n
HX6062NL
T301A
T301B
C302
C303
27p
TCT
TD+
TD−
MX+ RJ1
MX− RJ2
MX+ RJ7
MX− RJ8
MCT
J301
GMJXHT-MM-S-88
RJ8
RJ7
RJ6
RJ5
RJ4
RJ3
RJ2
RJ1
SH
C307
C309
RJ[1..8]
iCE40 configuration hardware latches data on SCK rising edge.
U302
LTC6820HMS
U303
LTC6820HMS
R302
R303
R301
R306
R307
R305
1k4
604
IBIAS
ICMP
EN
PHA
MSTR
POL
SLOW
CS
MISO
MOSI
SCK
IP
IM
Vdd
VddS
SPIRX.CS
SPIRX.SDO
SPIRX.SDI
SPIRX.SCK
SPITX.CS
SPITX.SDO
SPITX.SDI
SPITX.SCK
dSPIRX+
dSPIRX−
dSPITX+
dSPITX−
R304
R308
120
C305
C308
C304
C306
100n
MX+ RJ4
MX− RJ5
MX+ RJ3
MX− RJ6
T301C
T301D
dSPI_CT1
dSPI_CT2
D301
CDBH2100
F301
1.5A
D302
14V


12V_main
control_main{5V 3.3V EN pgood_3.3v pgood_5v}
12V_cs
3.3V_main
5V_main
sense_3.3V
GND
PGND_main
22
21
5
20
Vin
EXTVcc
INTVcc
DRVcc
26 TG1
24 BOOST1
25 SW1
23 BG1
31 SENSE1+
32 SENSE1−
30 VFB1
6 RUN1
3 PGOOD1
2 PLLIN/MODE
1 FREQ
28 VPRG1
29 ITH1
27 TRACK/SS1
TG2 16
BOOST2 18
SW2 17
BG2 19
SENSE2+ 10
SENSE2− 9
VFB2 11
RUN2 7
PGOOD2 4
DRVSET 14
DRVUV 13
ILIM 8
ITH2 12
TRACK/SS2 15
GND
33
U401
LTC3892−2


0
R501
phantom_power
12Vsb
Vsb
R502
DNP
GND
GND
MPM3606 3.3V
Vsb
33k R503
GND
Vin
AAM
GND
Vout
FB
3.3Vaux
3.3Vaux
R506
75k 1%
R507
24k 1%
GND
File: mpm3606.kicad_sch
FB voltage is nominally 0.798V;
Recommended resistor values for 3.3V are
75k and 24k
Recommended resistance at AAM for 12V input is
33k
MPM3606 5V
Vsb
45k3 R511
GND
Vin
AAM
GND
Vout
FB
5Vaux
5Vaux
R513
75k 1%
R514
24k 1%
GND
File: mpm3606.kicad_sch
FB voltage is nominally 0.798V;
Recommended resistor values for 5V are
100k and 19.1k
Recommended resistance at AAM for 12V input is
45.3k
MPM3811 1.2V
3.3Vaux
ice_power.en
GND
Vin
en
GND
Vout
FB
ice_power.Vcore
R504
82k 1%
R505
82k 1%
GND
File: mpm3811.kicad_sch
FB voltage is nominally 0.6V;
Recommended resistor values for 1.2V are
82k and 82k
MPM3811 Regulator 2.5V
3.3Vaux
ice_power.en
GND
Vin
en
GND
Vout
FB
ice_power.Vpp
R509
82k 1%
R510
26k1 1%
GND
File: mpm3811.kicad_sch
FB voltage is nominally 0.6V;
Recommended resistor values for 2.5V are
82k and 26.1k
MPM3811 Regulator 1.8V
3.3Vaux
R512
100k
GND
Vin
en
GND
Vout
FB
1.8Vaux
1.8Vaux
R515
82k 1%
R516
41k2 1%
GND
File: mpm3811.kicad_sch
FB voltage is nominally 0.6V;
Recommended resistor values for 1.8V are
82k and 41.2k
ice_power{Vcore Vpp Vpll 3.3Vio 1.8Vio en}
ice_power.en
R508
10k
GND
FB501
100
ice_power.Vcore
ice_power.Vpll
C501
10u
GND
3.3Vaux
R517
10k
Si2333DDS
Q502
ice_power.3.3Vio
1.8Vaux
Si2333DDS
Q503
ice_power.1.8Vio
ice_power.en
Q501
FDV301N
GND


J603
ATX-24
ATX_ON
16
PS_ON
PWR_OK
8
pgood_main
+12V
10
12V_main
+5V
4
5V_main
+5VSB
9
5V_sb
+3.3V
1
3.3V_main
+3.3V_sense
13
3.3V_sense
GND
−12V
14
3
PGND
12V_main
1
PGND
5
12V
GND
J601
PCIe_8-Pin
12V_main
1
PGND
5
12V
GND
J602
PCIe_8-Pin


J701
FCI10053363-200LF
12Vcs
12Vcs
PGNDcs
PGNDcs
ADDR
pmbus_addr
ps_interrupt
12Vsb
present
psok
imonitor
en
GND
SDA
SCL
3.3V
R701
5k11
pmbus{SCL SDA}
{SCL SDA}
controlcs{ps_interrupt present psok imonitor en}
{ps_interrupt present psok imonitor en}

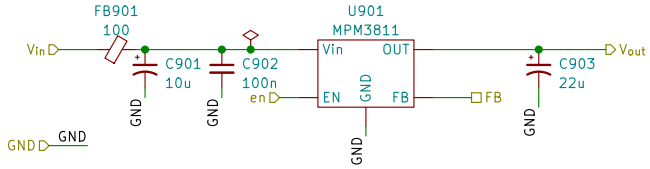
◇ pmbus{SCL SDA $\overline{\text{SMB\_ALERT}}$}

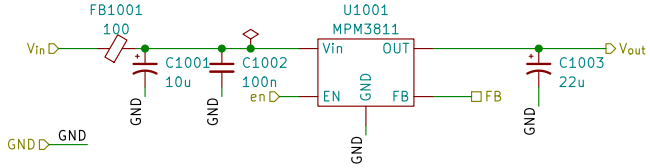
□ GND

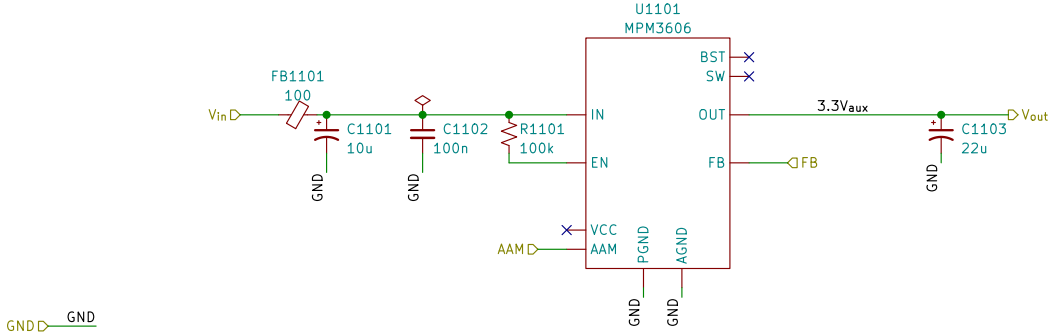
◇ aux_io{LED BTN_1 BTN_2}

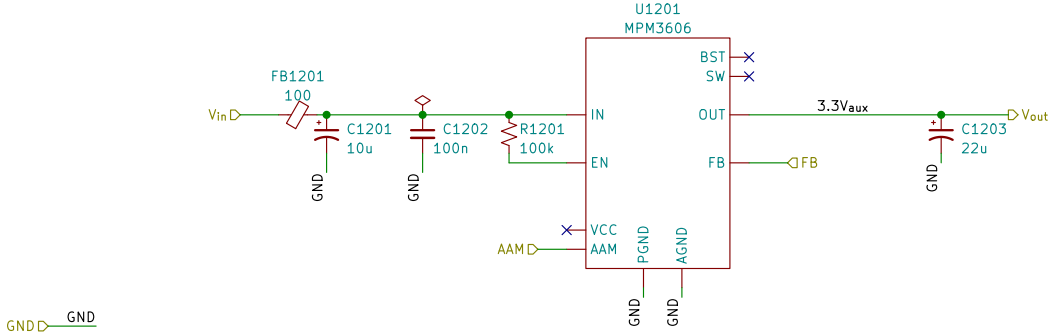
▷ frontpanel{pwr rst hdd_led pwr_led}

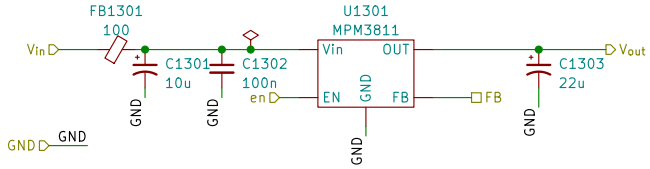
◇ sys_uart0{tx rx}
◇ sys_uart1{tx rx}
◇ sys_i2c0{SCL SDA}
◇ sys_gpio{pwm1_0 gpio3 gpio4 gpio10 gpio13 1.8V}
◇ sys_qspi1{SCK DQ[0..3] CS[0..1]}

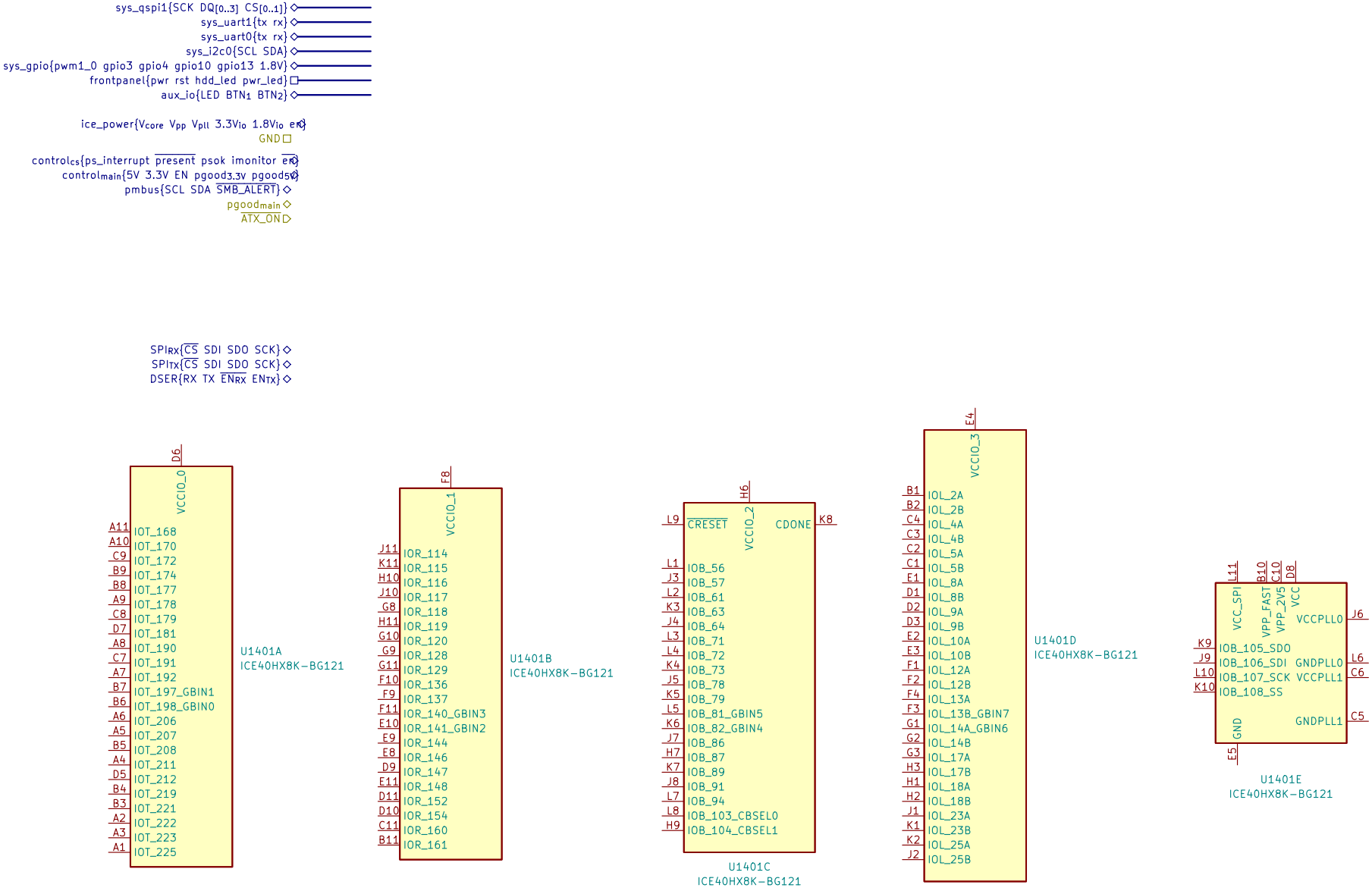

FB901
100
U901
MPM3811
Vin
C901
10u
C902
100n
en
Vin
OUT
EN
GND
FB
C903
22u
Vout
FB
GND
GND
GND
GND
GND
GND


FB1001
100
U1001
MPM3811
Vin
C1001
10u
C1002
100n
en
Vin
OUT
EN
GND
FB
C1003
22u
Vout
FB
GND
GND
GND
GND
GND
GND


U1101
MPM3606
FB1101
100
Vin
C1101
10u
C1102
100n
R1101
100k
IN
EN
BST
SW
OUT
FB
3.3Vaux
C1103
22u
Vout
VCC
AAM
PGND
AGND
GND
GND
GND
GND
GND
GND
GND
FB


U1201
MPM3606
FB1201
100
Vin
C1201
10u
C1202
100n
R1201
100k
IN
EN
BST
SW
OUT
FB
VCC
AAM
PGND
AGND
3.3Vaux
C1203
22u
Vout
GND
GND
GND
GND
GND
GND
AAM
FB


FB1301
100
U1301
MPM3811
Vin
C1301
10u
C1302
100n
en
Vin
OUT
EN
GND
FB
FB
Vout
C1303
22u
GND
GND
GND
GND
GND
GND


sys_qspi1{SCK DQ[0..3] CS[0..1]}
sys_uart1{tx rx}
sys_uart0{tx rx}
sys_i2c0{SCL SDA}
sys_gpio{pwm1_0 gpio3 gpio4 gpio10 gpio13 1.8V}
frontpanel{pwr rst hdd_led pwr_led}
aux_io{LED BTN1 BTN2}
ice_power{Vcore Vpp Vpll 3.3Vio 1.8Vio en}
GND
controlcs{ps_interrupt present psok imonitor en}
controlmain{5V 3.3V EN pgood3.3V pgood5V}
pmbus{SCL SDA SMB_ALERT}
pgoodmain
ATX_ON
SPIRX{CS SDI SDO SCK}
SPITX{CS SDI SDO SCK}
DSER{RX TX ENRX ENTX}
D6
VCCIO_0
A11 IOT_168
A10 IOT_170
C9 IOT_172
B9 IOT_174
B8 IOT_177
A9 IOT_178
C8 IOT_179
D7 IOT_181
A8 IOT_190
C7 IOT_191
A7 IOT_192
B7 IOT_197_GBIN1
B6 IOT_198_GBIN0
A6 IOT_206
A5 IOT_207
B5 IOT_208
A4 IOT_211
D5 IOT_212
B4 IOT_219
B3 IOT_221
A2 IOT_222
A3 IOT_223
A1 IOT_225
U1401A
ICE40HX8K-BG121
F8
VCCIO_1
J11 IOR_114
K11 IOR_115
H10 IOR_116
J10 IOR_117
G8 IOR_118
H11 IOR_119
G10 IOR_120
G9 IOR_128
G11 IOR_129
F10 IOR_136
F9 IOR_137
F11 IOR_140_GBIN3
E10 IOR_141_GBIN2
E9 IOR_144
E8 IOR_146
D9 IOR_147
E11 IOR_148
D11 IOR_152
D10 IOR_154
C11 IOR_160
B11 IOR_161
U1401B
ICE40HX8K-BG121
H6
VCCIO_2
L9 CRESET
CDONE K8
L1 IOB_56
J3 IOB_57
L2 IOB_61
K3 IOB_63
J4 IOB_64
L3 IOB_71
L4 IOB_72
K4 IOB_73
J5 IOB_78
K5 IOB_79
L5 IOB_81_GBIN5
K6 IOB_82_GBIN4
J7 IOB_86
H7 IOB_87
K7 IOB_89
J8 IOB_91
L7 IOB_94
L8 IOB_103_CBSEL0
H9 IOB_104_CBSEL1
U1401C
ICE40HX8K-BG121
E4
VCCIO_3
B1 IOL_2A
B2 IOL_2B
C4 IOL_4A
C3 IOL_4B
C2 IOL_5A
C1 IOL_5B
E1 IOL_8A
D1 IOL_8B
D2 IOL_9A
D3 IOL_9B
E2 IOL_10A
E3 IOL_10B
F1 IOL_12A
F2 IOL_12B
F4 IOL_13A
F3 IOL_13B_GBIN7
G1 IOL_14A_GBIN6
G2 IOL_14B
G3 IOL_17A
H3 IOL_17B
H1 IOL_18A
H2 IOL_18B
J1 IOL_23A
K1 IOL_23B
K2 IOL_25A
J2 IOL_25B
U1401D
ICE40HX8K-BG121
L11
B10
C10
D8
VCC_SPI
VPP_FAST
VPP_2V5
VCC
VCCPLL0 J6
K9 IOB_105_SDO
J9 IOB_106_SDI GNDPLL0 L6
L10 IOB_107_SCK VCCPLL1 C6
K10 IOB_108_SS
GNDPLL1 C5
GND
E5
U1401E
ICE40HX8K-BG121