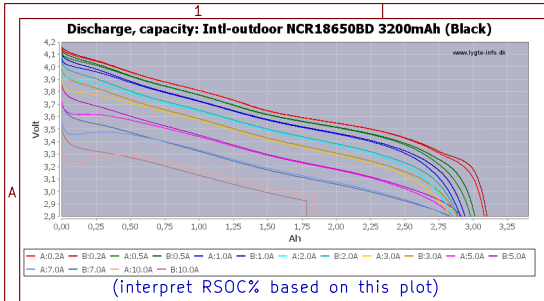
Battery
I2C1_SDA
I2C1_SCL
CHRG_INT
EN_SRC
EN_SNK
ONOFF
battery.sch
Power
PWR_EN
SD2_RST
POR_B
SWIRE
AVDD_EN
power.sch
Boot Config
BOOT_CFG00
BOOT_CFG01
BOOT_CFG02
BOOT_CFG03
BOOT_CFG04
BOOT_CFG05
BOOT_CFG06
BOOT_CFG07
BOOT_CFG08
BOOT_CFG09
BOOT_CFG10
BOOT_CFG11
BOOT_CFG12
BOOT_CFG13
BOOT_CFG14
BOOT_CFG15
BOOT_MODE0
BOOT_MODE1
boot.sch
RTC Battery
I2C2_SDA
I2C2_SCL
rtc.sch
UART Debug
UART1_TXD
UART1_RXD
uart.sch
JTAG
JTAG_TMS
JTAG_TCK
JTAG_TDO
JTAG_TDI
POR_B
JTAG_TRST
jtag.sch
uSD Card
CONN_SD2_DATA1
CONN_SD2_DATA0
CONN_SD2_CMD
CONN_SD2_DATA3
CONN_SD2_DATA2
CONN_SD2_CLK
CONN_SD2_CD_B
sd.sch
USB-C
USB1_VBUS
USB1_ID
USB1_SS_SEL
USB1_DP
USB1_DN
USB1_TXP
USB1_TXN
USB1_RXP
USB1_RXN
TCPC_INT
I2C1_SDA
I2C1_SCL
EN_SNK
EN_SRC
usb-c.sch
USB Hub
FLT_PORT1
EN_PORT1
usb_hub.sch
MIPI DSI
D0_P
D0_N
D1_P
D1_N
D2_P
D2_N
D3_P
D3_N
CLK_P
CLK_N
RESX
AVDD_EN
SWIRE
I2C2_SDA
I2C2_SCL
CAPTOUCH_INT
CAPTOUCH_RST
mipi_dsi.sch
Buttons & LED
SW_BACK
SW_VOLDN
SW_VOLUP
SW_HOME
ONOFF
SYS_RST
GP_LED1
buttons_led.sch
WWAN M.2
CONFIG
WoWWAN
W_DISABLE1
RESET
UART_TX/LED
UART_RX/DPR
USB_D+
USB_D-
PCM_CLK/I2S_SCK
PCM_SYNC/I2S_FSC
PCM_IN/I2S_IN
PCM_OUT/I2S_OUT
wwan_m2.sch
Audio
SAI2_RXD
SAI2_TXD
SAI2_TXFS
SAI2_TXC
SAI2_MCLK
audio.sch
I2C1_SDA
I2C1_SCL
TCPC_INT
EN_SRC
EN_SNK
ONOFF
PWR_EN TODO!!!
SD2_RST
POR_B
SWIRE
AVDD_EN
SAI1_RXD0(GPIO4_IO02)
SAI1_RXD1(GPIO4_IO03)
SAI1_RXD2(GPIO4_IO04)
SAI1_RXD3(GPIO4_IO05) CAPTOUCH_RST
SAI1_RXD4(GPIO4_IO06) SW_BACK
SAI1_RXD5(GPIO4_IO07) SAI6_TXD0
SAI1_RXD6(GPIO4_IO08) SAI6_TXFS/RXFS
SAI1_RXD7(GPIO4_IO09)
SAI1_TXD0(GPIO4_IO12)
SAI1_TXD1(GPIO4_IO13) SW_HOME
SAI1_TXD2(GPIO4_IO14)
SAI1_TXD3(GPIO4_IO15)
SAI1_TXD4(GPIO4_IO16) SAI6_TXC/RXC
SAI1_TXD5(GPIO4_IO17) SAI6_RXD0
SAI1_TXD6(GPIO4_IO18)
SAI1_TXD7(GPIO4_IO19)
BOOT_MODE0
BOOT_MODE1
I2C2_SDA
I2C2_SCL
UART1_TXD
UART1_RXD
JTAG_TMS
JTAG_TCK
JTAG_TDO
JTAG_TDI
POR_B
JTAG_TRST
CONN_SD2_DATA1
CONN_SD2_DATA0
CONN_SD2_CMD
CONN_SD2_DATA3
CONN_SD2_DATA2
CONN_SD2_CLK
CONN_SD2_CD_B
USB1_VBUS
USB1_ID
USB1_SS_SEL
USB1_DP
USB1_DN
USB1_TXP
USB1_TXN
USB1_RXP
USB1_RXN
TCPC_INT
I2C1_SDA
I2C1_SCL
EN_SNK
EN_SRC
FLT_PORT1
EN_PORT1
DSI_DP0
DSI_DN0
DSI_DP1
DSI_DN1
DSI_DP2
DSI_DN2
DSI_DP3
DSI_DN3
DSI_CKP
DSI_CKN
DSI_BL_PWM
AVDD_EN
SWIRE
I2C2_SDA
I2C2_SCL
CAPTOUCH_INT
SAI1_RXD3(GPIO4_IO05)
SAI1_RXD4(GPIO4_IO06) used to be:
BTN1 SAI1_TXD3(GPIO4_IO15)
BTN2 SAI1_TXD6(GPIO4_IO18)
SAI1_TXD1(GPIO4_IO13)
ONOFF
SYS_RST
GPIO1_IO13 SAI1_RXD1(GPIO4_IO03)
SAI5_RXC(GPIO3_IO20)
GPIO3_IO08
WWAN_DISABLE GPIO3_IO04
GPIO3_IO09
UART3_RXD
UART3_TXD
WWAN_USB_D+
WWAN_USB_D-
SAI1_TXD4(GPIO4_IO16) SAI6_TXC/RXC!!!
SAI1_RXD6(GPIO4_IO08) SAI6_TXFS/RXFS!!!
SAI1_RXD5(GPIO4_IO07) SAI6_TXD0!!!
SAI1_TXD5(GPIO4_IO17) SAI6_RXD0!!!
SAI2_RXD
SAI2_TXD
SAI2_TXFS
SAI2_TXC
SAI2_MCLK
J101A
SD2_RST
SD2_DATA3
SD2_DATA2
SD2_DATA1
SD2_DATA0
SD2_CMD
SD2_CD_B
SD2_CLK
TCPC_INT
USB1_SS_SEL
CAPTOUCH_INT
IMX8M-SOM
GND
J101B
GPIO3_IO09
GPIO3_IO08
PWR_FLAG 3V3_OUT
PWR_FLAG NVCC_SD2
DSI_DP2
DSI_DN2
DSI_DP0
DSI_DN0
DSI_CKN
DSI_CKP
DSI_DP1
DSI_DN1
DSI_DP3
DSI_DN3
+5V
C101 22uF
C102 22uF
C103 0.1uF
C104 0.1uF
C105 22uF
C106 22uF
J101C
BOOT_MODE0
BOOT_MODE1
JTAG_TDI
JTAG_TMS
JTAG_TRST
JTAG_TDO
JTAG_TCK
SAI1_TXC
J102
TEST_1P
DSI_BL_PWM
WDG
PWR_EN
SAI1_RXD1(GPIO4_IO03)
SAI5_RXC(GPIO3_IO20)
SAI1_RXD0(GPIO4_IO02)
GPIO1_IO13
SAI1_RXD4(GPIO4_IO06)
SAI1_RXD3(GPIO4_IO05)
BTN1
SAI1_RXD2(GPIO4_IO04)
SAI2_TXFS
SAI2_RXD
SAI1_RXD6(GPIO4_IO08)
SAI2_TXC
BTN2
SAI2_MCLK
J101D
SAI2_TXD
SAI1_RXD7(GPIO4_IO09)
I2C2_SCL
3V3_OUT
R102 10k
R103 10k
R104 10k
R101 10k
SAI1_RXD5(GPIO4_IO07)
SAI1_TXD0(GPIO4_IO12)
ONOFF
I2C2_SDA
SAI1_TXD1(GPIO4_IO13)
SYS_RST
I2C1_SCL
I2C1_SDA
SAI1_TXD3(GPIO4_IO15)
SAI1_TXD4(GPIO4_IO16)
SAI1_TXD7(GPIO4_IO19)
UART3_TXD
SAI1_TXD5(GPIO4_IO17)
POR_B
UART1_RXD
SAI1_TXD2(GPIO4_IO14)
SAI1_TXD6(GPIO4_IO18)
UART3_RXD
UART1_TXD
USB1_VBUS
USB1_ID
USB1_RXN
USB1_RXP
USB1_TXN
USB1_TXP
USB1_DN
USB1_DP

Sheet: /
File: dvk-mx8m-bsb.sch

Title: DVK-MX8M-BSB

Size: A2	Date: 2018-04-19	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 1/14



(interpret RSOC% based on this plot)

use AUTO_DPDM_EN
to auto-detect IINLIM

1.658≤ILIM≤2.063
ILIM(nom)≅1.859
3.9≤VIN≤14

U201 BQ25896

I(Lsat)=7A

3.5~4.25V

Default LOW
adapter source

Ihold=3.5A
Itrip=6.3A
Ttrip(max)=5s@8A

Vrm=5.8V
Vz=6.8

VBAT(DPL)=2.15~2.5V

NCR18650BD is recommended

VBAT(nom)=REG06[7:2]
VBAT(default_max_ovp)=(REG06[7:2]×1.005)×1.04=4.3982016V
REG06[7:2]=010111⇒VBAT(max_ovp)=4.3814784
BQ29705 provides 4.425V as OVP!!!

reference design: http://www.ti.com/lit/ug/sluuba2b/sluuba2b.pdf

may want to include BQ29705 protection as in:
http://www.ti.com/lit/ug/tiducl1/tiducl1.pdf
schematic: http://www.ti.com/lit/df/tidrp70/tidrp70.pdf
(PTC may be good enough)

Open-drain output
tied with TCPC_INT

This disables charging
but maybe not VBUS->VOUT
if PTN5110HQ's FAULT_STATUS[6]==1
(Force Off VBUS bit) then set EN_HiZ=1
EN_HiZ may be auto-set when in hiccup

Reading PTN5110HQ's CC_STATUS and POWER_STATUS
registers will tell TCPM (i.MX8M) when to set EN_HiZ

Also, reading PTN5110HQ's CC_STATUS and POWER_STATUS
registers will tell TCPM (i.MX8M) when to set OTG_CONFIG=1
(this will also happen when PTN5110HQ sets EN_SRC HIGH)

BC1.2 is not mandated by PD spec
ICO used to determine max current
Also negotiated from CC pins (I2C)

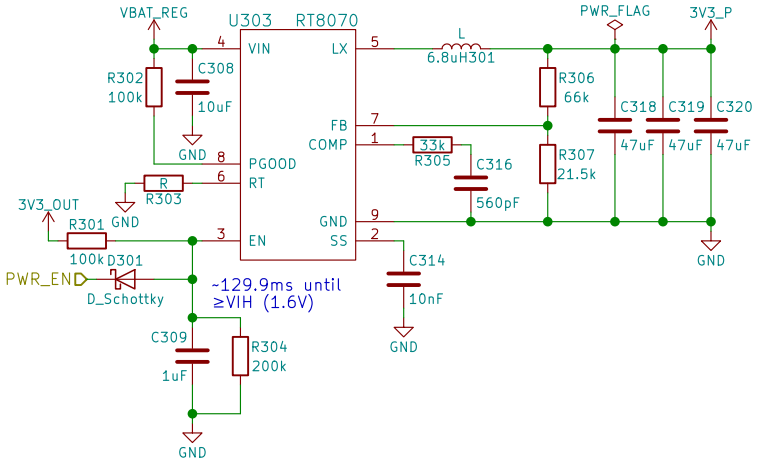
Sheet: /Battery/
File: battery.sch

Title: Battery

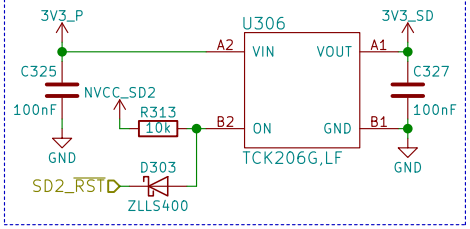
Size: A4	Date: 2018-04-19	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 2/14

3.3V/3A

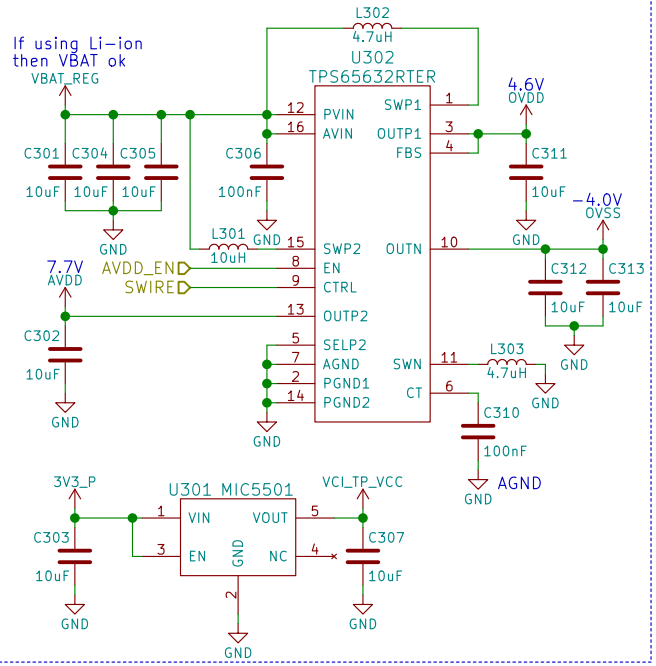
When VBAT can fall below 3.3V use TPS63020 instead!



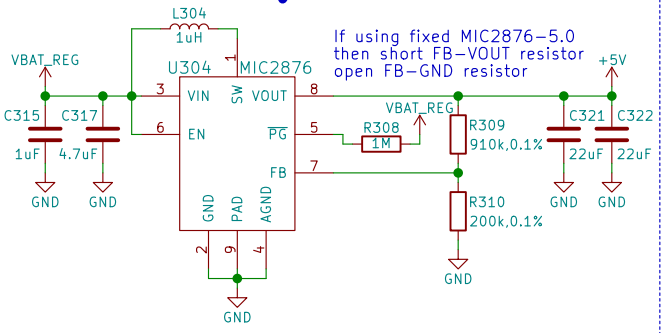
SD POWER



AMOLED POWER

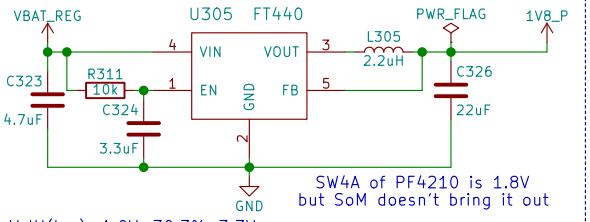


5.0V/3.8A



Cheaper, more efficient, smaller, and simpler than RT6150A
Explicitly mentions USB/smartphone application

1.8V/600mA



SW4A of PF4210 is 1.8V
but SoM doesn't bring it out

V_IH(typ)=1.0V≅30.3%×3.3V
t(0-30.3%)≈0.361RC
⇒0.361RC≈10ms
∴ R=10k
C=2.77uF≅3.3uF

Buck instead of TLV70218 LDO
saving up to ~100mW loss
LM3670MF-1.8 is much more expensive
ST1S12G18R is a drop-in

Purism SPC

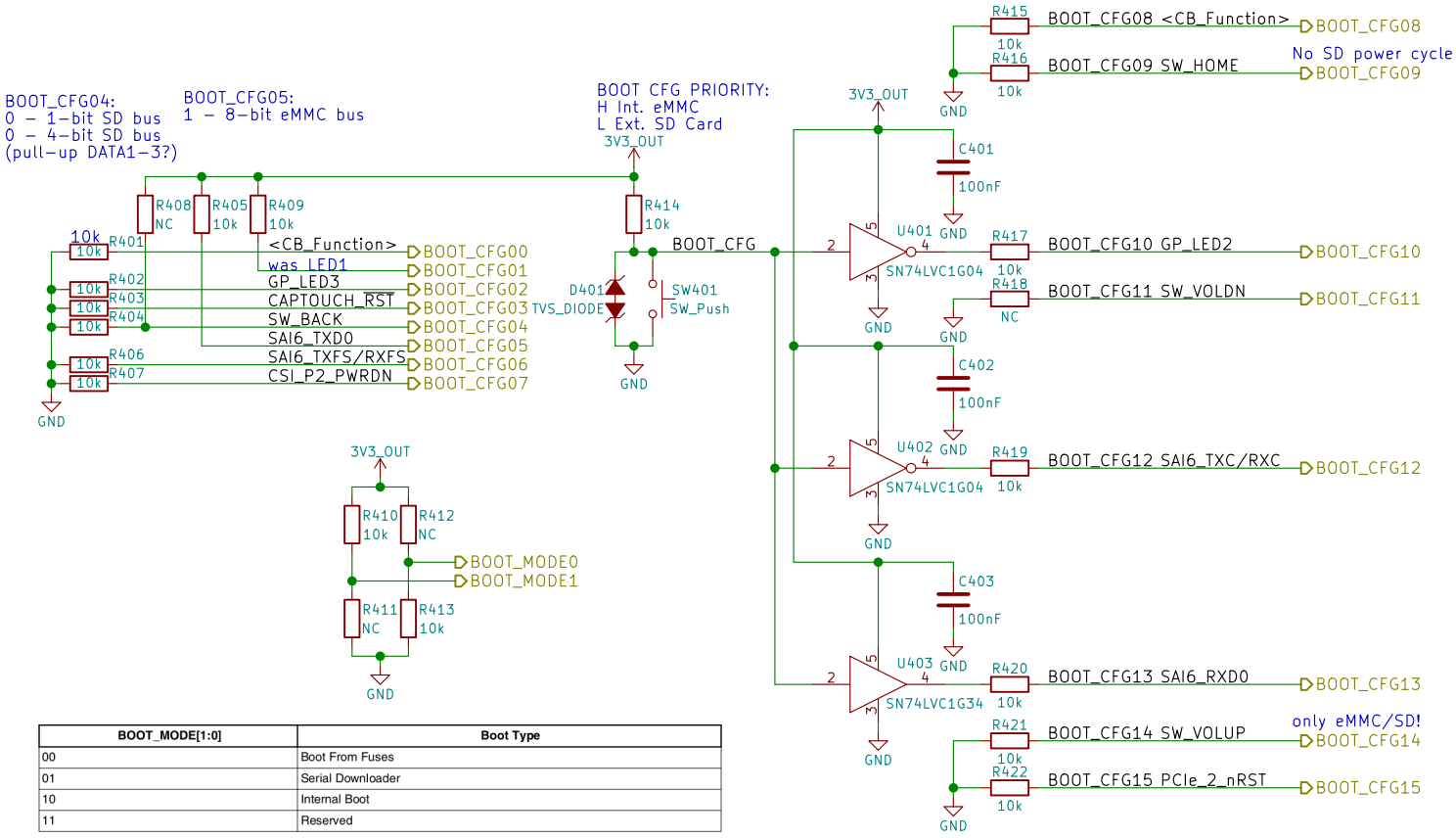
Sheet: /Power/
File: power.sch

Title: Power

Size: A4	Date: 2018-04-19	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 3/14

BOOT_CFG[14:12]	Boot device
001	SD/eSD
010	MMC/eMMC
011	NAND

Fuse	Config	Definition	GPIO[1]	Shipped value	Settings
BOOT_CFG[11:10]	OEM	USDHC port selection	Yes	00	00 - USDHC-1 01 - USDHC-2 10 - USDHC-3 else - reserved

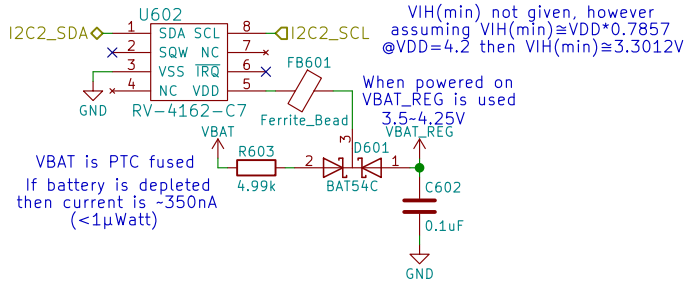


BOOT_MODE[1:0]	Boot Type
00	Boot From Fuses
01	Serial Downloader
10	Internal Boot
11	Reserved

Sheet: /Boot Config/
File: boot.sch

Title: Boot Configuration

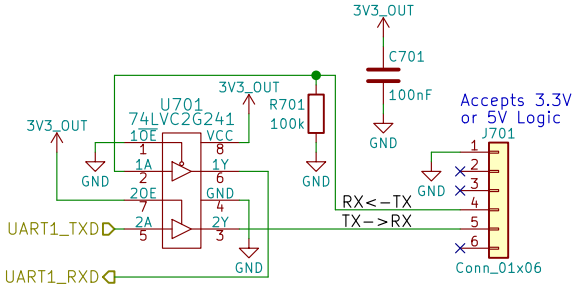
Size: A4	Date: 2018–04–19	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 4/14



Sheet: /RTC Battery/
File: rtc.sch

Title: RTC Battery

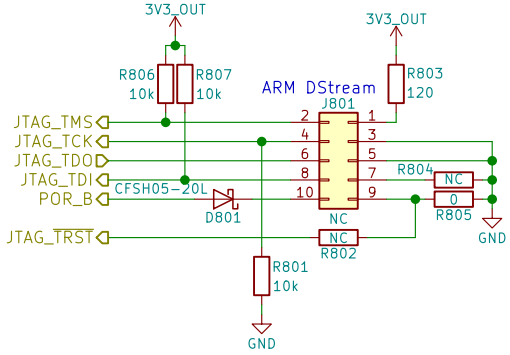
Size: A4	Date: 2018-04-19	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 5/14



Sheet: /UART Debug/
File: uart.sch

Title: UART Debug

Size: A4	Date: 2018-04-19	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 6/14

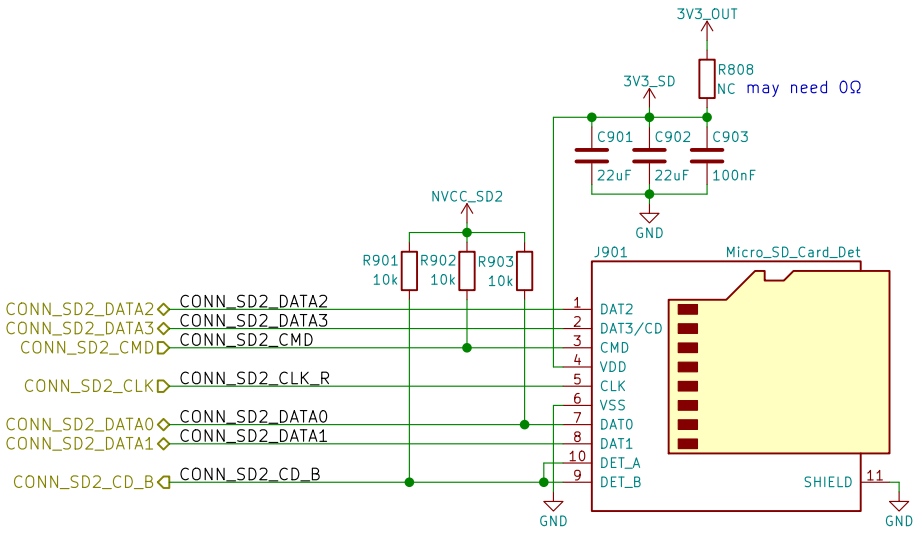


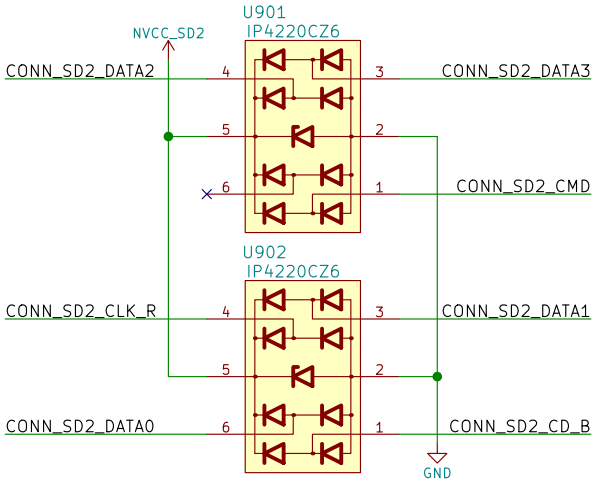
Purism SPC

Sheet: /JTAG/
File: jtag.sch

Title: JTAG

Size: A4	Date: 2018-04-19	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 7/14

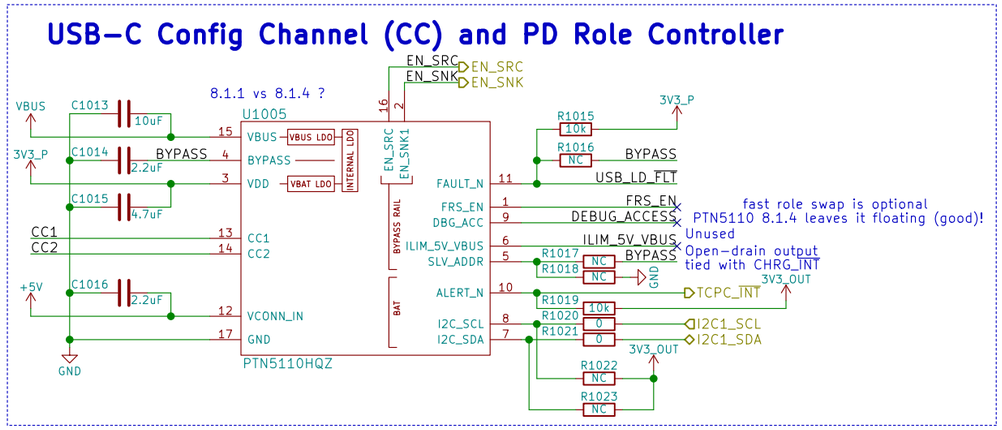


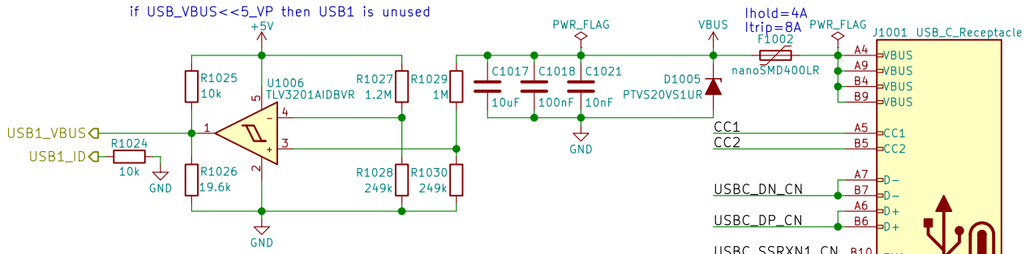


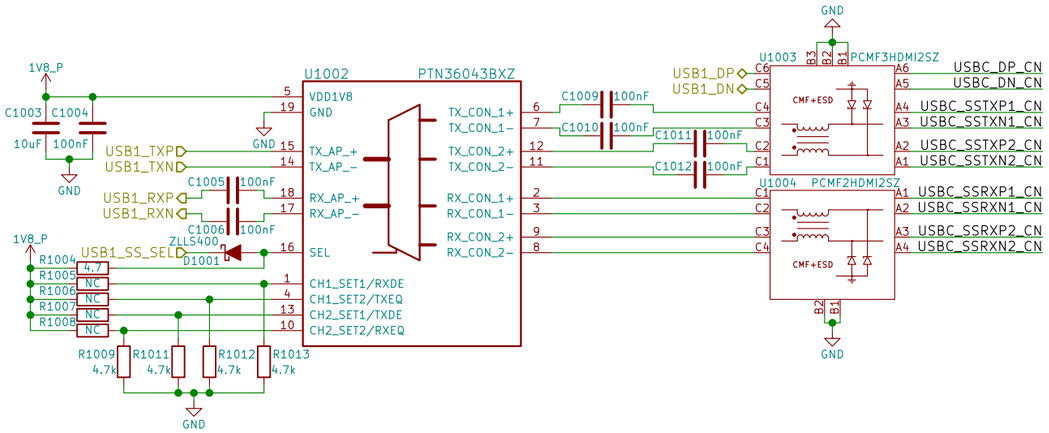
Sheet: /uSD Card/
File: sd.sch

Title: uSD Card

Size: A4	Date: 2018-04-19	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 8/14





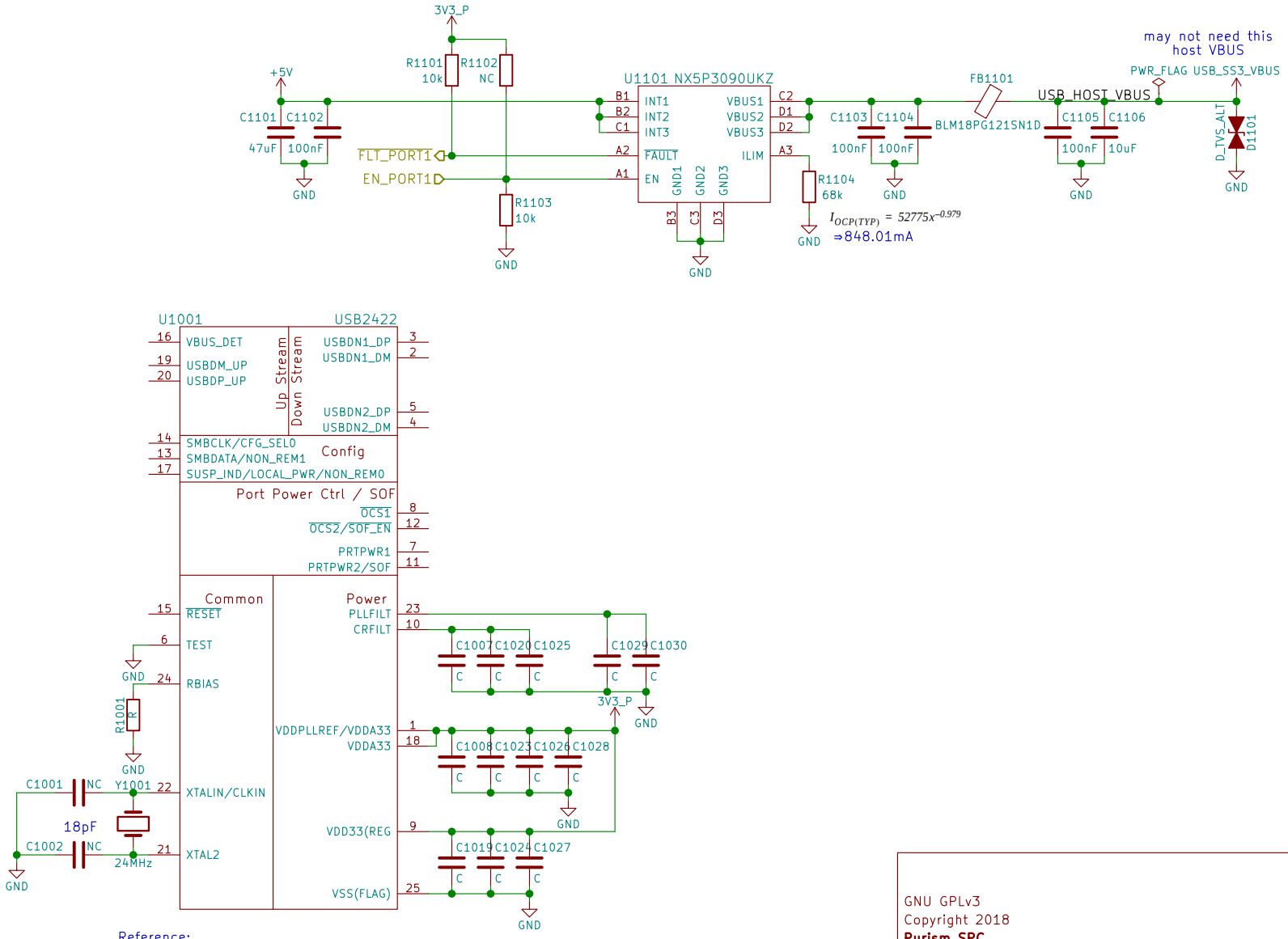


GNU GPLv3
Copyright 2018
Purism SPC

Sheet: /USB-C/
File: usb-c.sch

Title: USB Type C

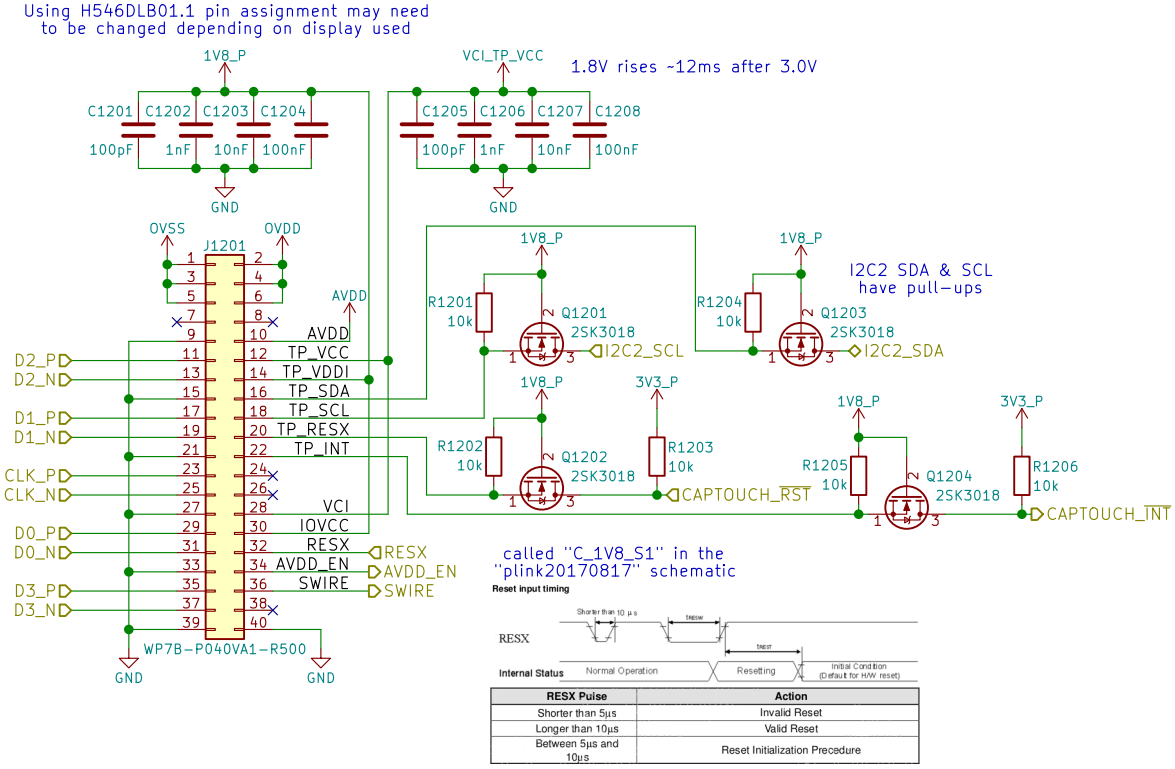
Size: A3	Date: 2018-04-19	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 9/14



Sheet: /USB Hub/
File: usb_hub.sch

Title:

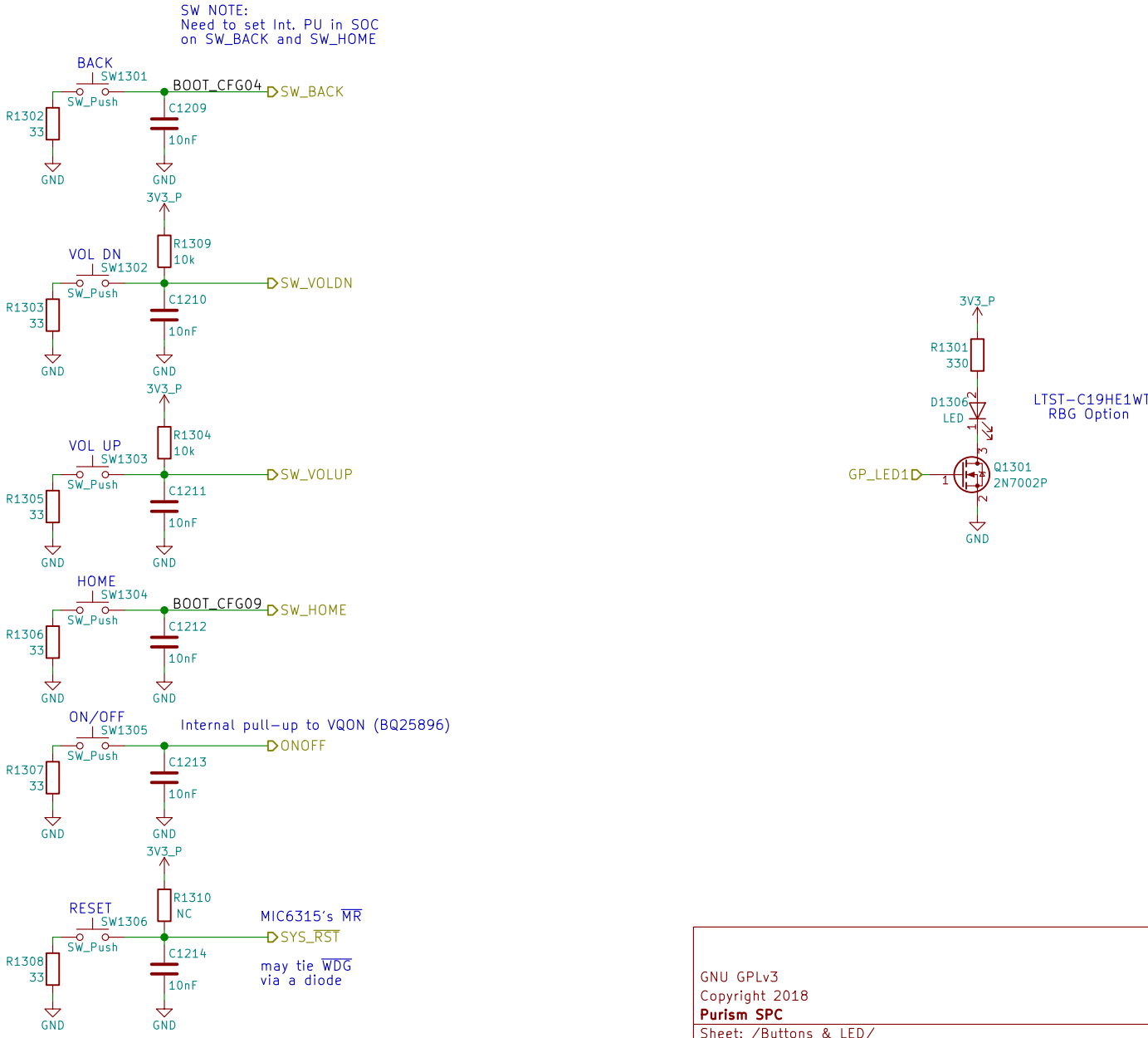
Size: A4	Date: 2018-04-19	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 10/14



Sheet: /MIPI DSI/
File: mipi_dsi.sch

Title: MIPI DSI

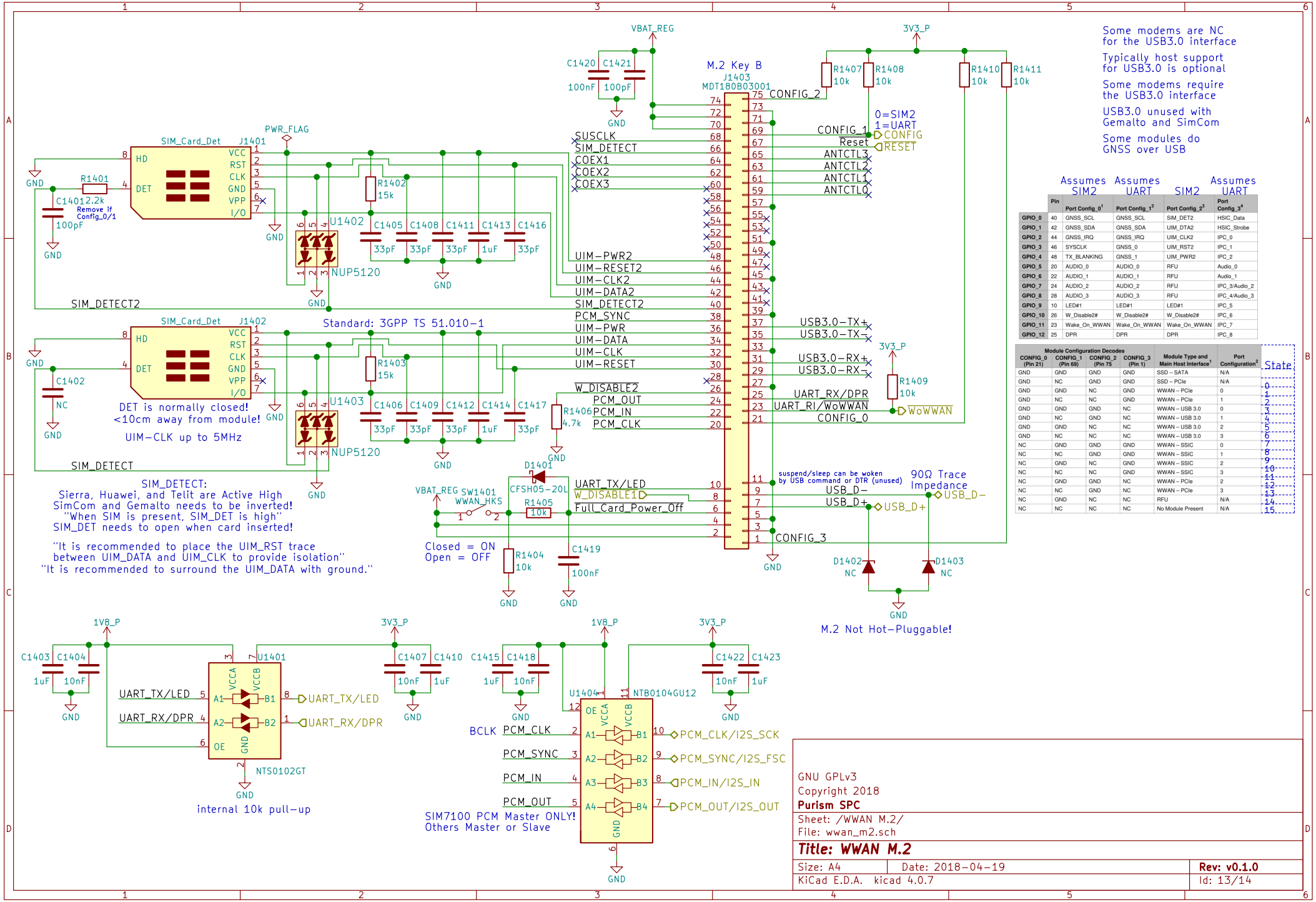
Size: A4	Date: 2018-04-19	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 11/14



Sheet: /Buttons & LED/
File: buttons_led.sch

Title: Buttons & LED

Size: A4	Date: 2018-04-19	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 12/14



Some modems are NC for the USB3.0 interface

Typically host support for USB3.0 is optional

Some modems require the USB3.0 interface

USB3.0 unused with Gemalto and SimCom

Some modules do GNSS over USB

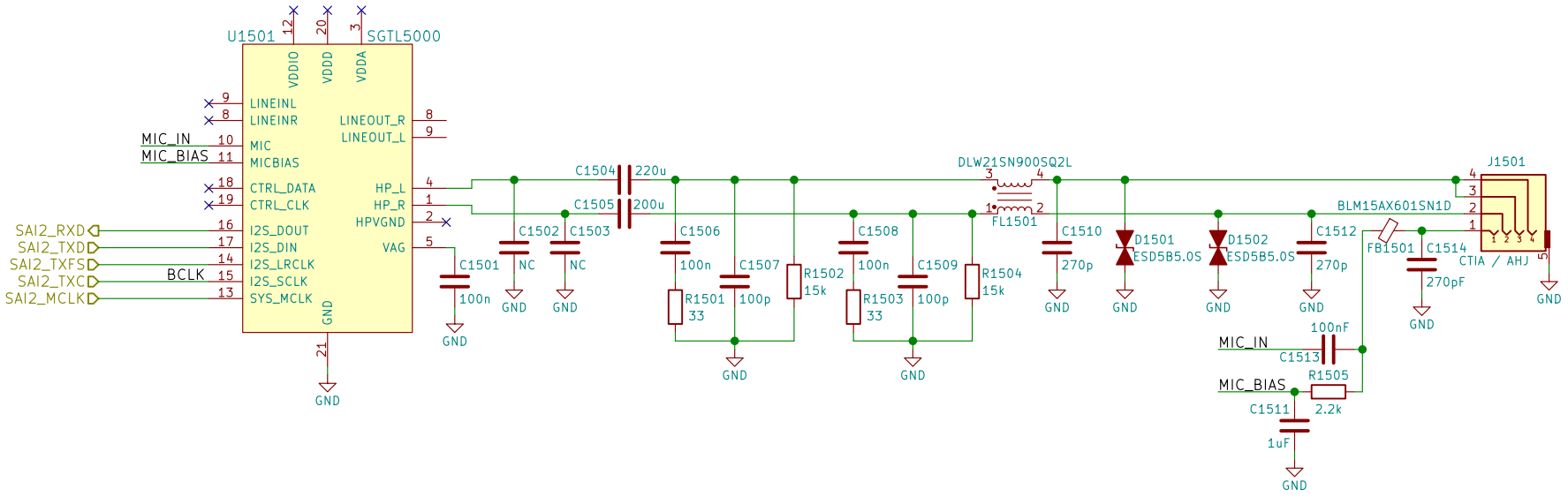
		Assumes SIM2	Assumes UART	Assumes SIM2	Assumes UART
	Pin	Port Config_0[1]	Port Config_1[2]	Port Config_2[3]	Port Config_3[4]
GPIO_0	40	GNSS_SCL	GNSS_SCL	SIM_DET2	HSIC_Data
GPIO_1	42	GNSS_SDA	GNSS_SDA	UIM_DTA2	HSIC_Strobe
GPIO_2	44	GNSS_IRQ	GNSS_IRQ	UIM_CLK2	IPC_0
GPIO_3	46	SYSCLK	GNSS_0	UIM_RST2	IPC_1
GPIO_4	48	TX_BLANKING	GNSS_1	UIM_PWR2	IPC_2
GPIO_5	20	AUDIO_0	AUDIO_0	RFU	Audio_0
GPIO_6	22	AUDIO_1	AUDIO_1	RFU	Audio_1
GPIO_7	24	AUDIO_2	AUDIO_2	RFU	IPC_3/Audio_2
GPIO_8	28	AUDIO_3	AUDIO_3	RFU	IPC_4/Audio_3
GPIO_9	10	LED#1	LED#1	LED#1	IPC_5
GPIO_10	26	W_Disable2#	W_Disable2#	W_Disable2#	IPC_6
GPIO_11	23	Wake_On_WWAN	Wake_On_WWAN	Wake_On_WWAN	IPC_7
GPIO_12	25	DPR	DPR	DPR	IPC_8

Module Configuration Decodes						State
CONFIG_0 (Pin 21)	CONFIG_1 (Pin 69)	CONFIG_2 (Pin 75)	CONFIG_3 (Pin 1)	Module Type and Main Host Interface[1]	Port Configuration[2]	
GND	GND	GND	GND	SSD – SATA	N/A	
GND	NC	GND	GND	SSD – PCIe	N/A	
GND	GND	NC	GND	WWAN – PCIe	0	0
GND	NC	NC	GND	WWAN – PCIe	1	1
GND	GND	GND	NC	WWAN – USB 3.0	0	2
GND	NC	GND	NC	WWAN – USB 3.0	1	3
GND	GND	NC	NC	WWAN – USB 3.0	2	4
GND	NC	NC	NC	WWAN – USB 3.0	3	5
NC	GND	GND	GND	WWAN – SSIC	0	6
NC	NC	GND	GND	WWAN – SSIC	1	7
NC	GND	NC	GND	WWAN – SSIC	2	8
NC	NC	NC	GND	WWAN – SSIC	3	9
NC	GND	GND	NC	WWAN – PCIe	2	10
NC	NC	GND	NC	WWAN – PCIe	3	11
NC	GND	NC	NC	RFU	N/A	12
NC	NC	NC	NC	No Module Present	N/A	13
						14
						15

Sheet: /WWAN M.2/
File: wwan_m2.sch

Title: WWAN M.2

Size: A4 | Date: 2018-04-19 | **Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7 | Id: 13/14



Sheet: /Audio/
File: audio.sch

Title: Audio

Size: A4	Date: 2018-04-19	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 14/14