

## USB-C Config Channel (CC) and PD Role Controller

**8.1.1 vs 8.1.4 ?**

**fast role swap is optional (good!)**

**PTN5110HQZ**

**U204**

**EN\_SRC**

**EN\_SNK**

**FAULT\_N**

**FRS\_EN**

**DEBUG\_ACCESS**

**ILIM\_5V\_VBUS**

**SLV\_ADDR**

**ALERT\_N**

**I2C\_SCL**

**I2C\_SDA**

**CC1**

**CC2**

**VCONN\_IN**

**GND**

**VBUS**

**3V3\_P**

**+5V**

**C209**

**C210**

**C211**

**C212**

**R213**

**R214**

**R215**

**R216**

**R217**

**R218**

**R219**

**R220**

**R221**

**INTERNAL\_LDO**

**VBUS\_LDO**

**BYPASS**

**VBAT\_LDO**

**USB\_LD\_FLT**

**TPC\_INT**

**3V3\_OUT**



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## Purism SPC

Sheet: /USB-C/

File: usb-c.sch

## Title: USB Type C

Size: A3

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Date: 2018-05-02

#### 4.0.7

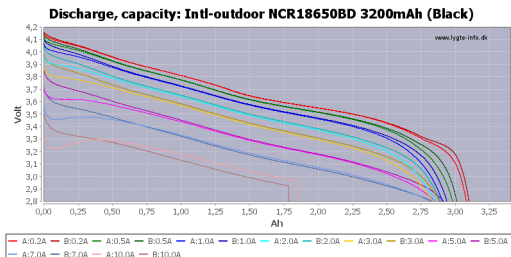
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7

Rev: v0.1.0

d: 2/17

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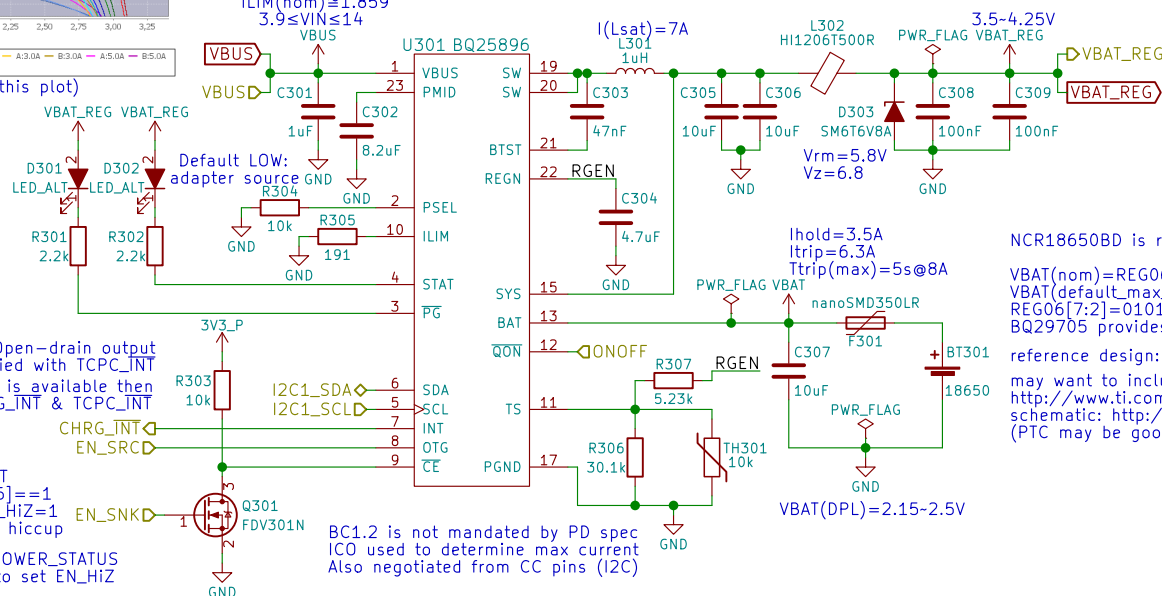


(interpret RSOC% based on this plot)

use AUTO\_DPDM\_EN  
to auto-detect IINLIM

$1.658 \leq I_{LIM} \leq 2.063$   
 $I_{LIM(nom)} \approx 1.859$   
 $3.9 \leq V_{IN} \leq 14$

# Battery Charge Controller



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**Purism SPC**

Sheet: /Battery/

File: battery.sch

**Title: Battery**

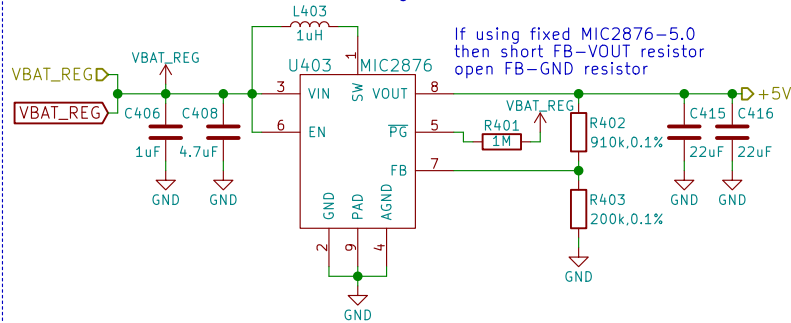
Size: A4 Date: 2018-05-02

KiCad E.D.A. kicad 4.0.7

**Rev: v0.1.0**

Id: 3/17

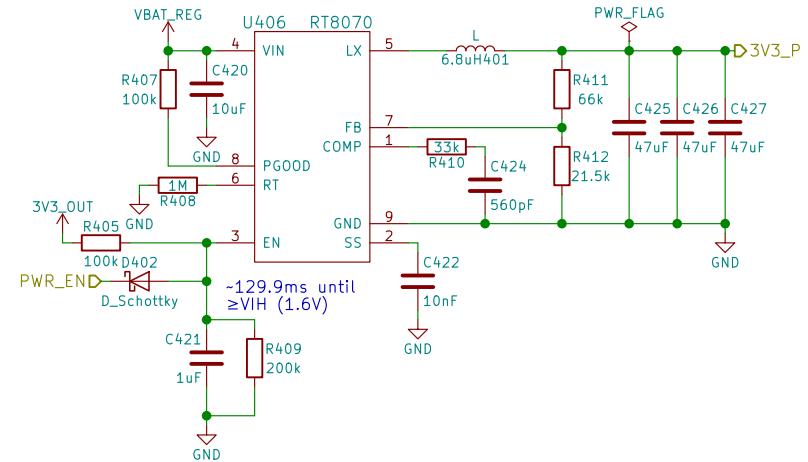
## 5.0V/3.8A



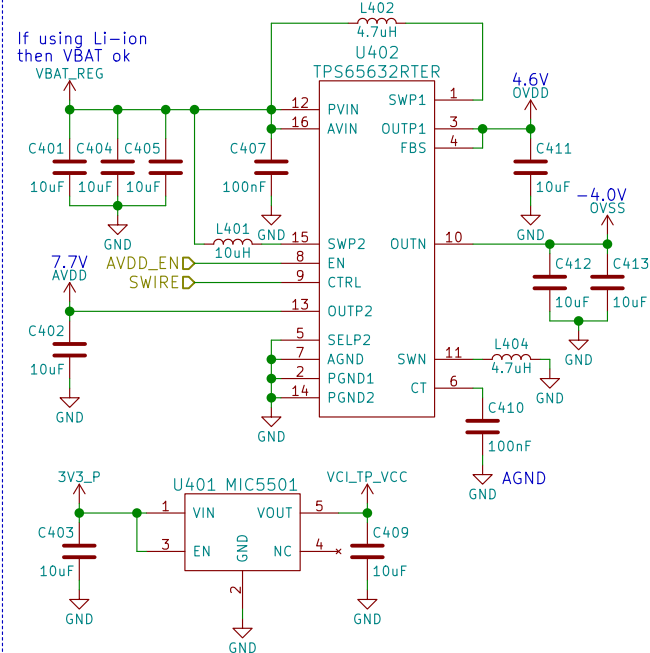
Cheaper, more efficient, smaller, and simpler than RT6150A  
Explicitly mentions USB/smartphone application

## 3.3V/3A

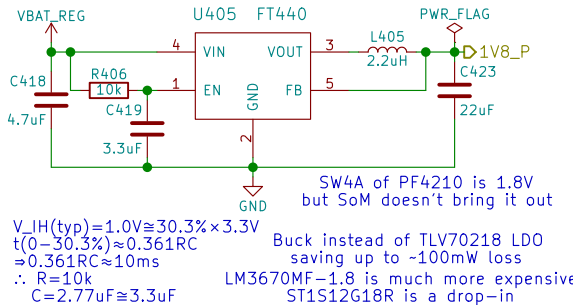
When VBAT can fall below 3.3V use TPS63020 instead!



## AMOLED POWER



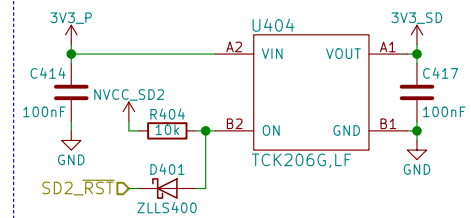
## 1.8V/600mA



$V_{IH}(typ) = 1.0V \approx 30.3\% \times 3.3V$   
 $t(0-30.3\%) \approx 0.361RC$   
 $\approx 0.361 \times 10k \times 10ms$   
 $\therefore R = 10k$   
 $C = 2.77uF \approx 3.3uF$

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

## SD POWER



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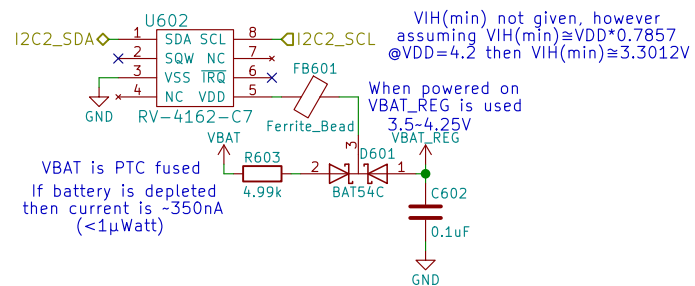
Sheet: /Power/  
 File: power.sch

Title: Power

Size: A4  
 Date: 2018-05-02  
 KiCad E.D.A. kicad 4.0.7

Rev: v0.1.0  
 Id: 4/17





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**Purism SPC**

Sheet: /RTC/  
File: rtc.sch

**Title: RTC**

Size: A4 Date: 2018-05-02

KiCad E.D.A. kicad 4.0.7

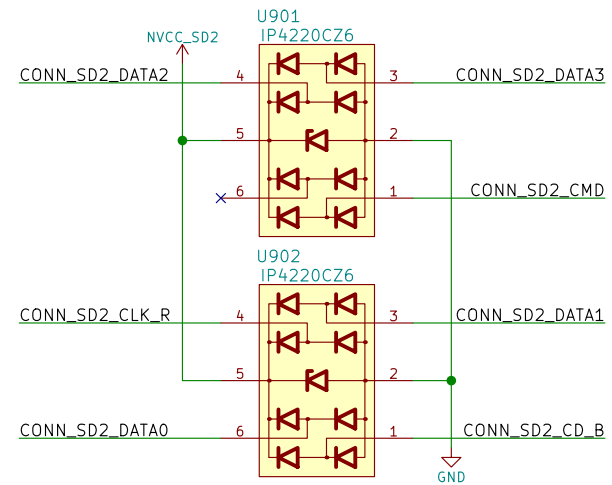
**Rev: v0.1.0**

Id: 6/17

Id: 7/17

Id: 8/17





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**Purism SPC**

Sheet: /uSD Card/

File: sd.sch

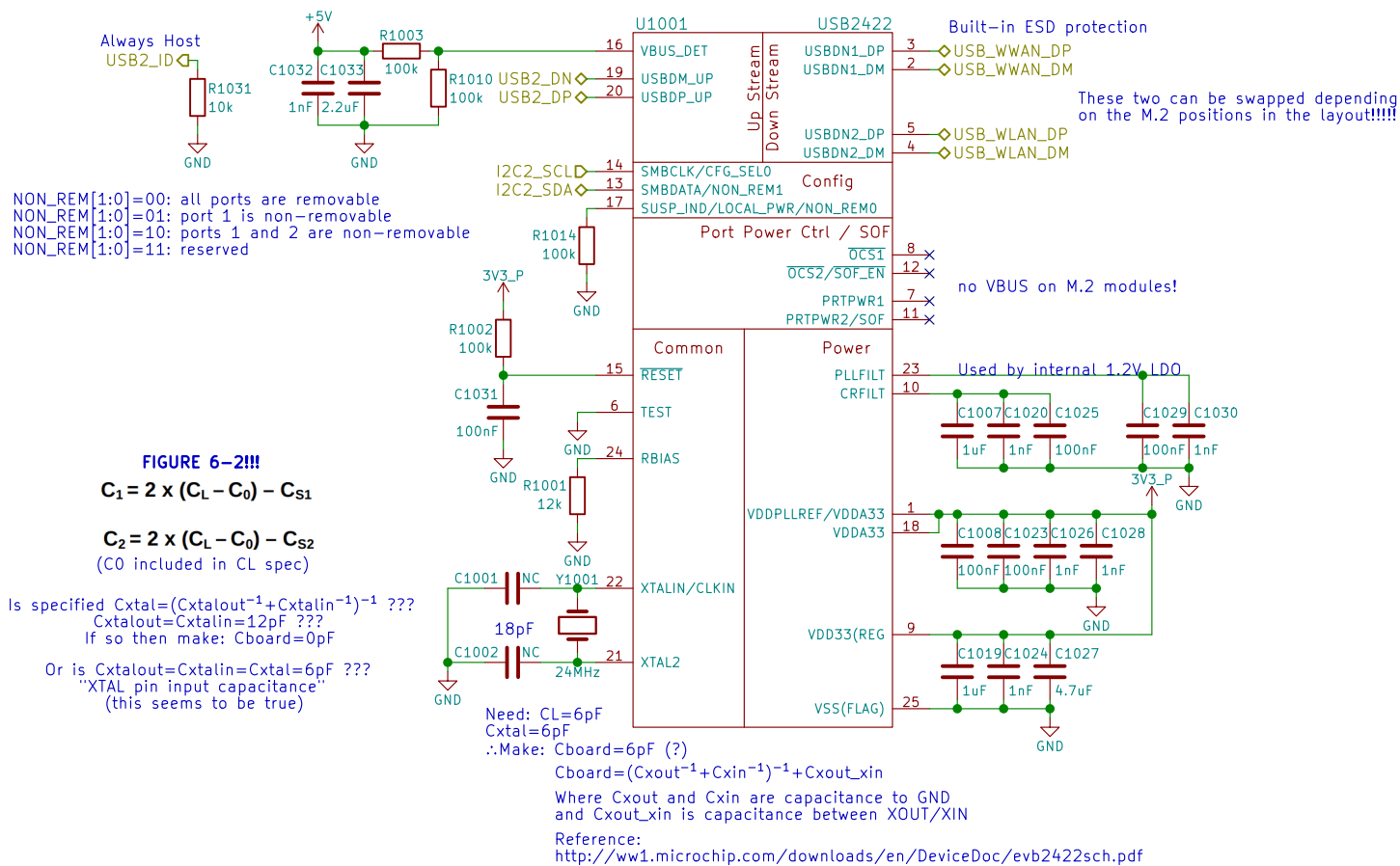
**Title: uSD Card**

Size: A4 Date: 2018-05-02

KiCad E.D.A. kicad 4.0.7

**Rev: v0.1.0**

Id: 9/17



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**Purism SPC**

Sheet: /USB Hub/

File: usb\_hub.sch

**Title:**

Size: A4

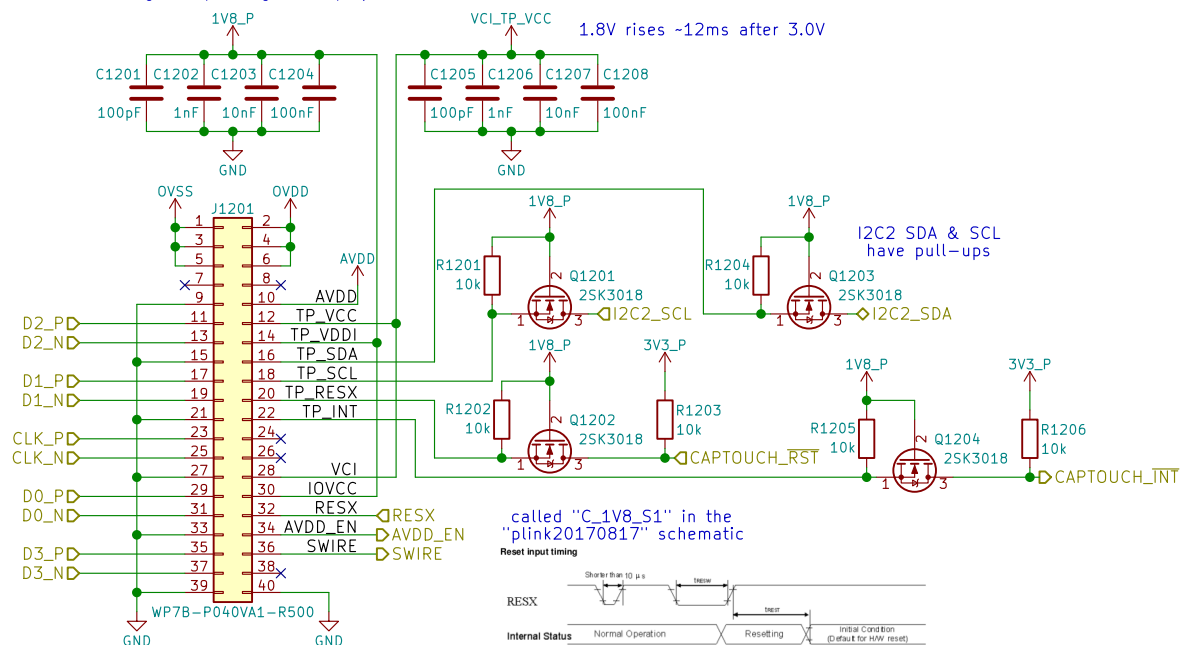
Date: 2018-05-02

**Rev: v0.1.0**

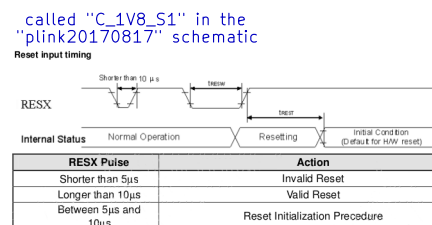
KiCad E.D.A. kicad 4.0.7

Id: 10/17

Using H546DLB01.1 pin assignment may need to be changed depending on display used



TODO: low power state signal??



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**Purism SPC**

Sheet: /MIPI DSI/  
File: mipi\_dsi.sch

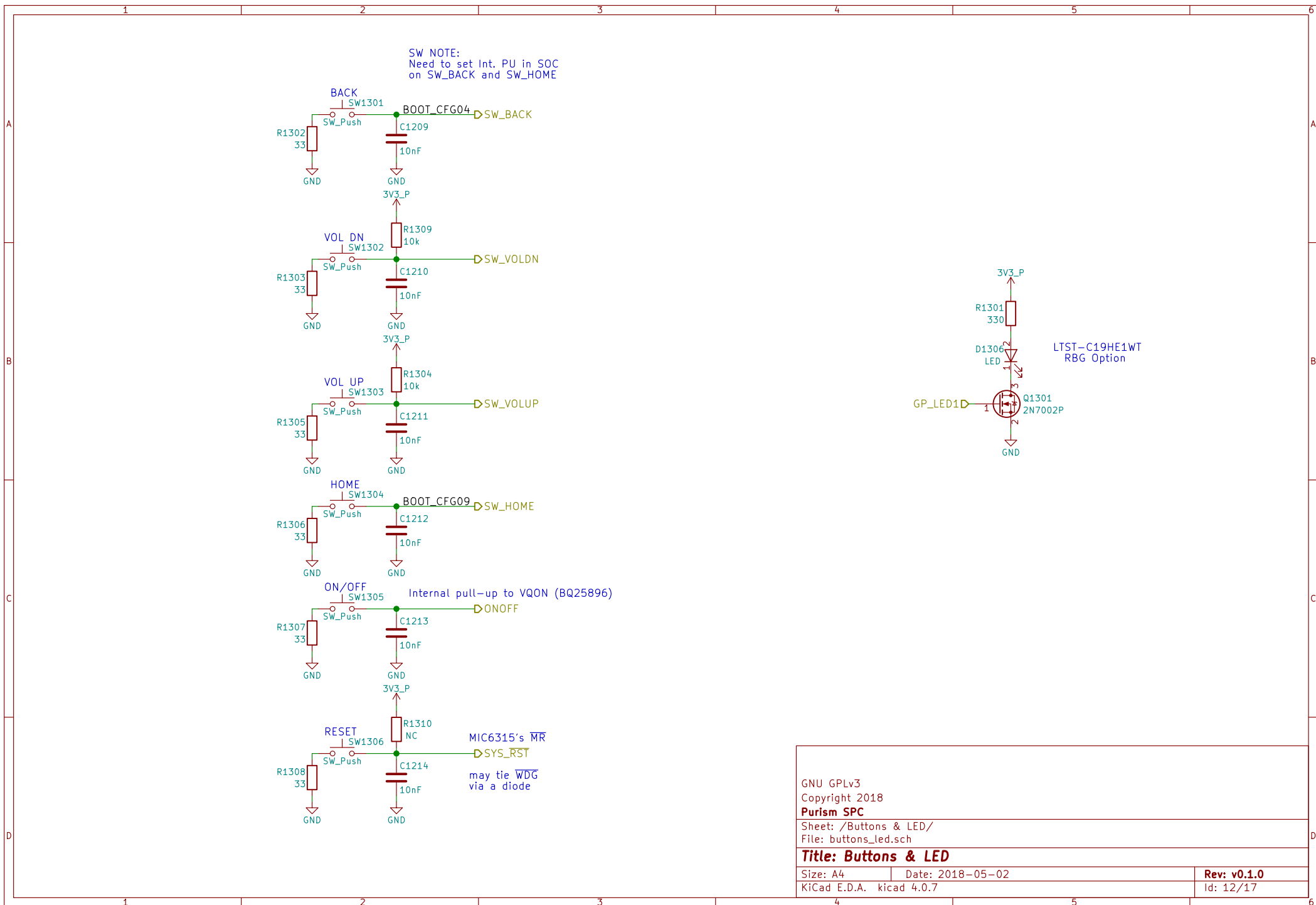
**Title: MIPI DSI**

Size: A4 Date: 2018-05-02

KiCad E.D.A. kicad 4.0.7

**Rev: v0.1.0**

Id: 11/17



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**Purism SPC**

Sheet: /Buttons & LED/  
File: buttons\_led.sch

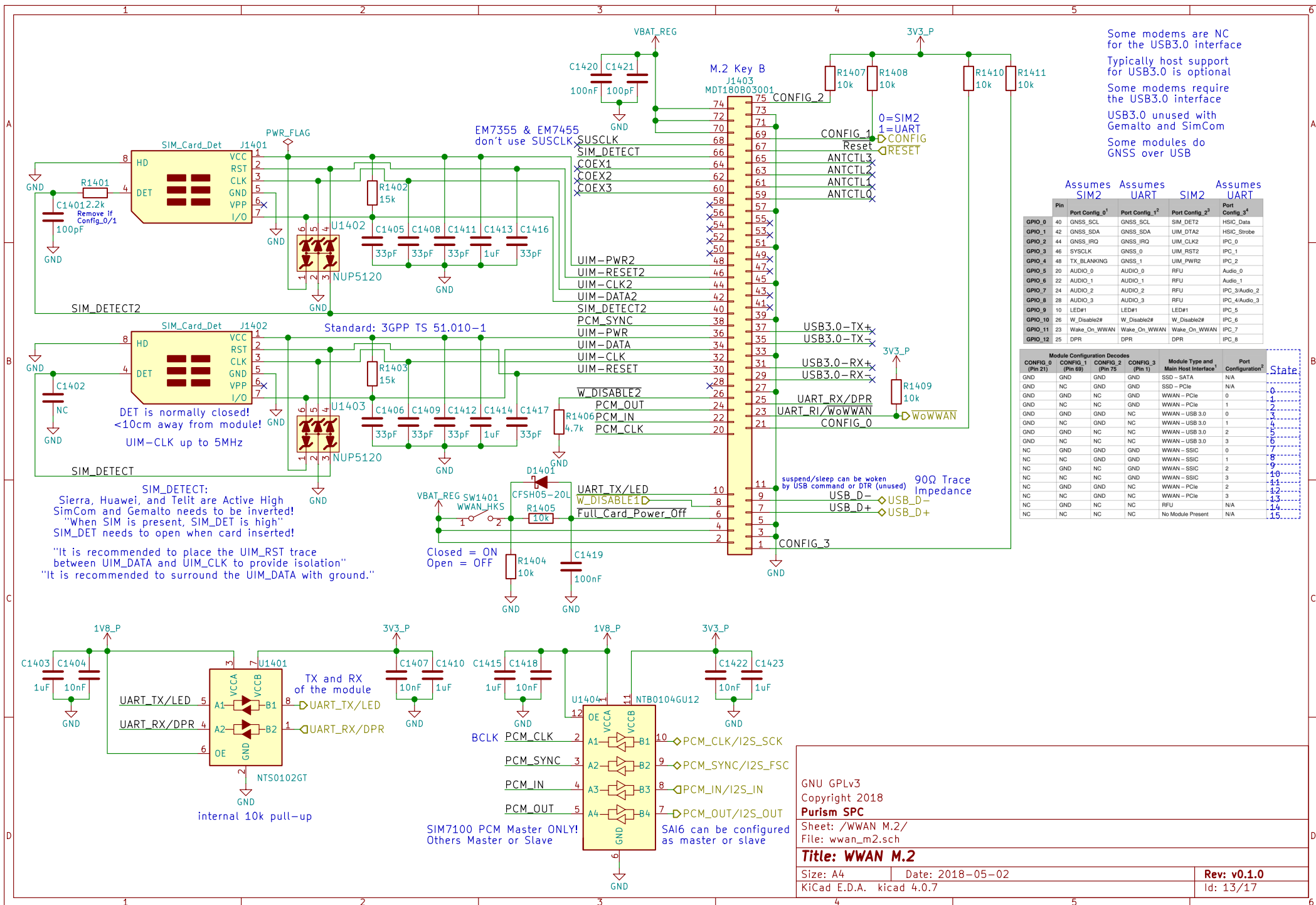
**Title: Buttons & LED**

Size: A4 Date: 2018-05-02

KiCad E.D.A. kicad 4.0.7

**Rev: v0.1.0**

Id: 12/17



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

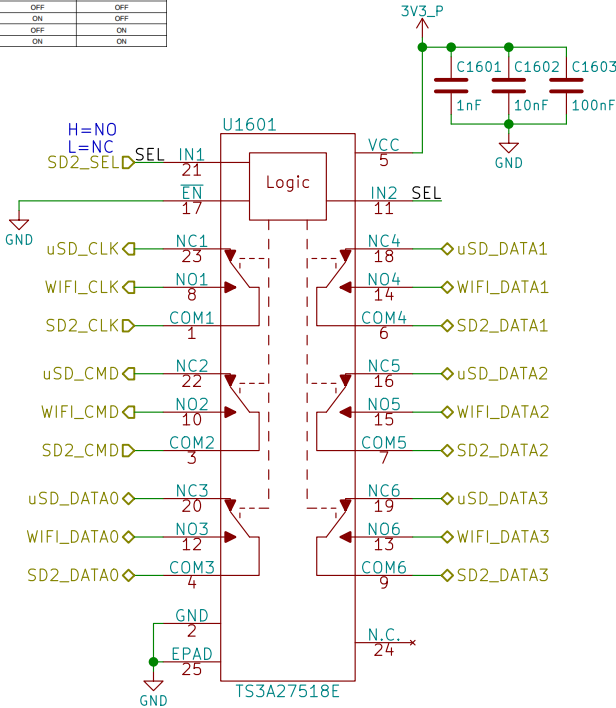
		Assumes SIM2	Assumes UART	Assumes SIM2	Assumes UART
Pin		Port Config. 0 <sup>1</sup>	Port Config. 1 <sup>2</sup>	Port Config. 2 <sup>3</sup>	Port Config. 3 <sup>4</sup>
GPIO_0	40	GNSS_SCL	GNSS_SCL	SIM_DET2	HSIC_Data
GPIO_1	42	GNSS_SDA	GNSS_SDA	UIM_DTA2	HSIC_Strobe
GPIO_2	44	GNSS_IRQ	GNSS_IRQ	UIM_CLK2	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	Module Type and Main Host Interface <sup>1</sup>	Port Configuration <sup>2</sup>	State
CONFIG_0 (Pin 21)	CONFIG_1 (Pin 69)	CONFIG_2 (Pin 75)	CONFIG_3 (Pin 1)		
GND	GND	GND	GND	SSD - SATA	N/A
GND	NC	GND	GND	SSD - PCIe	N/A
GND	GND	NC	GND	WWAN - PCIe	0
GND	NC	NC	GND	WWAN - PCIe	1
GND	GND	GND	NC	WWAN - USB 3.0	2
GND	NC	GND	NC	WWAN - USB 3.0	3
GND	GND	NC	NC	WWAN - USB 3.0	4
GND	NC	NC	NC	WWAN - USB 3.0	5
GND	NC	NC	NC	WWAN - USB 3.0	6
NC	GND	GND	GND	WWAN - SSIC	7
NC	NC	GND	GND	WWAN - SSIC	8
NC	GND	NC	GND	WWAN - SSIC	9
NC	NC	NC	GND	WWAN - SSIC	10
NC	GND	NC	NC	WWAN - PCIe	11
NC	NC	GND	NC	WWAN - PCIe	12
NC	GND	NC	NC	RFU	13
NC	NC	NC	NC	No Module Present	14
NC	NC	NC	NC	No Module Present	15



Can swap around signals in the layout:

EN	IN1	IN2	NC1023 TO COM1023, COM1023 TO NC1023	NC4056 TO COM4056, COM4056 TO NC4056	NC1023 TO COM1023, COM1023 TO NC1023	NC4056 TO COM4056, COM4056 TO NC4056
H	X	X	OFF	OFF	OFF	OFF
L	L	L	ON	ON	OFF	OFF
L	H	L	OFF	ON	ON	OFF
L	L	H	ON	OFF	OFF	ON
L	H	H	OFF	OFF	ON	ON



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**Purism SPC**

Sheet: /SDIO DEMUX/  
File: sdio\_demux.sch

**Title: SDIO Demultiplexer**

Size: A4 Date: 2018-05-02  
KiCad E.D.A. kicad 4.0.7

**Rev: v0.1.0**  
Id: 15/17

# RGMII 10/100/1000 Ethernet

Sheet: /Ethernet/  
File: ethernet.sch

**Title:**

Size: A4	Date:	Rev:
KiCad E.D.A. kicad 4.0.7		Id: 16/17

<b>Title:</b>		
Size: A4	Date:	<b>Rev:</b>
KiCad E.D.A.    kicad 4.0.7		Id: 16/17

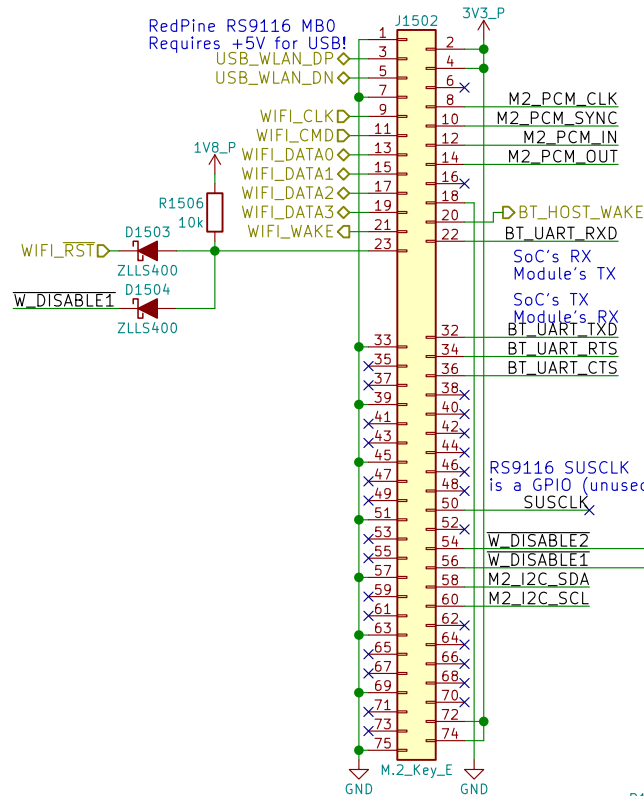
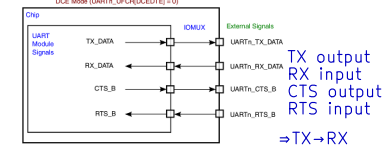


RS9116 NC:  
RTS, CTS, BT\_HOST\_WAKE, WIFI\_WAKE

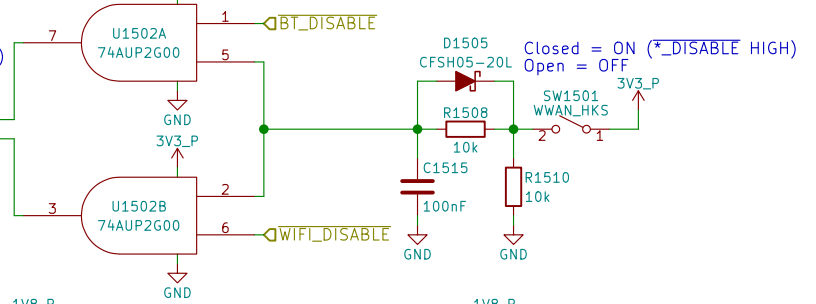
## 6.2 M.2 Signal Directions

Module: Table 23  
Socket: Table 46

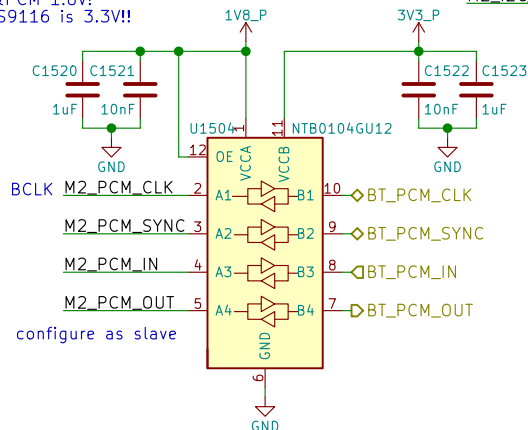
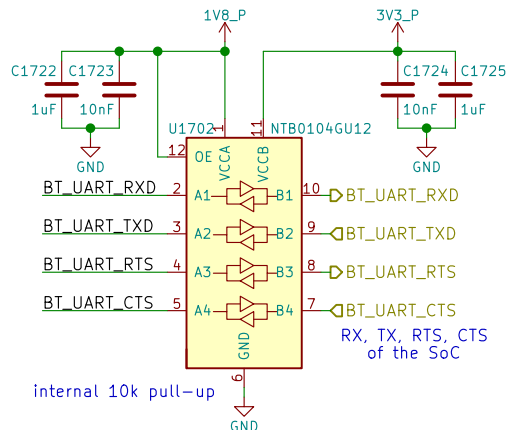
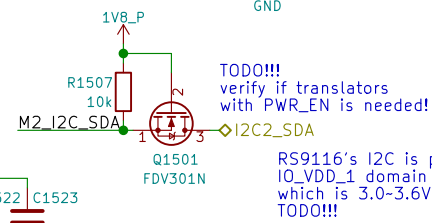
UARTn\_UFCR[DCEDTE]=0 on POR



i.MX8M in DCE mode has  
CTS output, RTS input



TODO:  
M.2 spec defines  
UART&PCM 1.8V!  
but RS9116 is 3.3V!!



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Purism SPC

Sheet: /WLAN+BT M.2/

File: wifi\_bt\_m2.sch

Title: WLAN+BT M.2

Size: A4 Date: 2018-05-02

KiCad E.D.A. kicad 4.0.7

Rev: v0.1.0

Id: 17/17