Battery
PWR_SAVE
battery.sch
TODO!!!
PWR_SAVE

Power
PMIC_ON_REQ
PMIC_STBY_REQ
CONN_SD2_RST
power.sch
PMIC_ON_REQ
PMIC_STBY_REQ
CONN_SD2_RST

RTC Battery
I2C2_SDA
I2C2_SCL
rtc.sch
I2C2_SDA
I2C2_SCL

Audio
SAI2_RXDD
SAI2_TXD
SAI2_TXFS
SAI2_TXC
SAI2_MCLK
audio.sch
SAI2_RXD
SAI2_TXD
SAI2_TXFS
SAI2_TXC
SAI2_MCLK

Reset & Watchdog
GPIO1_IO02(nWDOG)
POR_B
PMIC_ON_REQ
watchdog.sch
GPIO1_IO02(nWDOG)
POR_B
PMIC_ON_REQ

"Varicsite recommends using an external low power time keeping circuitry which is (more) power efficient than the SOC RTC core"

SOM_SNVS_3V3
PWR_FLAG
LICELL2

SOM_NVCC_3V3
Max 100mA

J1A

A1	GPIO1_IO00/ENET_PHY_REF_CLK_ROOT/////REF_CLK_32K	A2	ENET_TD1/////GPIO1_IO20/*/ETH_TRX1_P
A3	ENET_TX_CTL/////GPIO1_IO22/*/NC	A4	ENET_TD0/////GPIO1_IO21/*/ETH_TRX1_N
A5	ENET_TXC/////GPIO1_IO23/*/LED_LINK10_100	A6	ENET_TD2/////GPIO1_IO19/*/ETH_TRX0_N
A7	ENET_RXC/////GPIO1_IO25/*/LED_LINK1000	A8	ENET_TD3/////GPIO1_IO18/*/ETH_TRX0_P
A9	ENET_RX_CTL/////GPIO1_IO24/*/LED_ACT	A10	ENET_RD0/////GPIO1_IO26/*/ETH_TRX2_P
A11	ENET_MDIO/////GPIO1_IO17	A12	ENET_RD1/////GPIO1_IO27/*/ETH_TRX2_N
A13	ENET_MDC/////GPIO1_IO16	A14	ENET_RD2/////GPIO1_IO28/*/ETH_TRX3_P
A15	NVCC_SNVS_3V3	A16	ENET_RD3/////GPIO1_IO29/*/ETH_TRX3_N
A17	I2C4_SCL/PWM2_OUT//PCIE1_CLKREQ_B/////GPIO5_IO20	A18	GND
A19	I2C4_SDA/PWM1_OUT//PCIE2_CLKREQ_B/////GPIO5_IO21	A20	ONOFF
A21	GND	A22	PMIC_ON_REQ
A23	BT_HOST_WAKE (A23 used to be CLK2_N)	A24	POR_B power button!
A25	WIFI_HOST_WAKE (A25 used to be CLK2_P)	A26	PMIC_STBY_REQ
A27	NVCC_3V3	A28	CONN_SD2_RST
A29	SD2_WP/////GPIO2_IO20 (A29 used to be CLK1_N)	A30	SD2_RESET_B/////GPIO2_IO19
A31	(A31 used to be CLK1_P)	A32	GND
A33	GND	A34	NAND_DATA01/QSPIA_DATA1/////GPIO3_IO07
A35	NAND_DATA07/QSPIB_DATA3/////GPIO3_IO13	A36	NAND_CE0_B/QSPIA_SS0_B/////GPIO3_IO01
A37	NAND_DATA06/QSPIB_DATA2/////GPIO3_IO12	A38	NAND_READY_B/////GPIO3_IO16
A39	NAND_DATA04/QSPIB_DATA0/////GPIO3_IO10	A40	NAND_DQS/QSPIA_DQS/////GPIO3_IO14
A41	NAND_RE_B/QSPIB_DQS/////GPIO3_IO15	A42	NAND_ALE/QSPIA_SCLK/////GPIO3_IO00
A43	NAND_DATA05/QSPIB_DATA1/////GPIO3_IO11	A44	NAND_WP_B/////GPIO3_IO18
A45	NAND_CLE/QSPIB_SCLK/////GPIO3_IO05	A46	NAND_WE_B/////GPIO3_IO17
A47	NAND_CE2_B/QSPIB_SS0_B/////GPIO3_IO03	A48	NAND_DATA03/QSPIA_DATA3/////GPIO3_IO09
A49	GND	A50	NAND_DATA00/QSPIA_DATA0/////GPIO3_IO06
A51	PCIE1_REF_CLKN	A52	NAND_DATA02/QSPIA_DATA2/////GPIO3_IO08
A53	PCIE1_REF_CLKP	A54	GND
A55	GND	A56	PCIE2_REF_CLKN
A57	PCIE1_TXN	A58	PCIE2_REF_CLKP
A59	PCIE1_TXP	A60	GND
A61	GND	A62	PCIE1_RXN
A63	PCIE2_RXN	A64	PCIE1_RXP
A65	PCIE2_RXP	A66	GND
A67	GND	A68	PCIE2_TXN
A69	CSI_P1_DP3	A70	PCIE2_TXP
A71	CSI_P1_DN3	A72	GND
A73	CSI_P1_DP1	A74	EN_VBAT_3V3
A75	CSI_P1_DN1	A76	SD2_CD_B/////GPIO2_IO12
A77	CSI_P1_DN2	A78	GND
A79	CSI_P1_DP2	A80	SD2_DATA2/////GPIO2_IO17
A81	CSI_P1_DP0	A82	SD2_DATA1/////GPIO2_IO16
A83	CSI_P1_DN0	A84	SD2_CLK/////GPIO2_IO13
A85	GND	A86	SD2_DATA3/////GPIO2_IO18
A87	CSI_P1_CKP	A88	SD2_DATA0/////GPIO2_IO15
A89	CSI_P1_CKN	A90	SD2_CMD/////GPIO2_IO14
			NVCC_SD2_1V8_3V3

NVCC_SD2_1V8_3V3

J1B

B1	JTAG_TCK	B2	SAI3_TXD/GPT1_COMPARE3//SAI5_RXD3/////GPIO5_IO01/*/HPLOUT
B3	JTAG_TMS	B4	SAI3_TXC/GPT1_COMPARE2//SAI5_RXD2/////GPIO5_IO00/*/HPROUT
B5	JTAG_TRST_B	B6	SAI3_RXFS/GPT1_CAPTURE1//SAI5_RXFS/////GPIO4_IO28/*/HPOUTFB
B7	JTAG_TDI	B8	SAI3_RXC/GPT1_CAPTURE2//SAI5_RXC/////GPIO4_IO29/*/LINEIN1_LP
B9	JTAG_TDO	B10	SAI3_TXFS/GPT1_CLK//SAI5_RXD1/////GPIO4_IO31/*/LINEIN1_RP
B11	BOOT_MODE1	B12	AGND
B13	BOOT_MODE0	B14	SAI3_RXD/GPT1_COMPARE1//SAI5_RXD0/////GPIO4_IO30/*/DMIC_CLK
B15	HDMI_DDC_SCL	B16	SAI3_MCLK/PWM4_OUT//SAI5_MCLK/////GPIO5_IO02/*/DMIC_DATA
B17	HDMI_DDC_SDA	B18	GND
B19	HDMI_CEC	B20	ECSPI2_MOSI/UART4_TX/////GPIO5_IO11
B21	HDMI_HPD	B22	ECSPI2_MISO/UART4_CTS_B/////GPIO5_IO12
B23	GND	B24	ECSPI2_SCLK/UART4_RX/////GPIO5_IO10
B25	HDMI_AUX_P	B26	ECSPI2_SS0/UART4_RTS_B/////GPIO5_IO13
B27	HDMI_AUX_N	B28	GPIO1_IO02/WDOG_B
B29	HDMI_TX_M_LN_1	B30	I2C2_SDA/ENET1_1588_EVENT1_OUT/////GPIO5_IO17
B31	HDMI_TX_P_LN_1	B32	I2C2_SCL/ENET1_1588_EVENT1_IN/////GPIO5_IO16
B33	HDMI_TX_P_LN_0	B34	SAI5_RXFS/SAI1_TXD0/////GPIO3_IO19
B35	HDMI_TX_M_LN_0	B36	SAI5_RXD0/SAI1_TXD2/////GPIO3_IO21
B37	HDMI_REFCLK_N	B38	SAI5_RXD2/SAI1_TXD4//SAI1_TXFS///SAI5_TXC/////GPIO3_IO23
B39	HDMI_REFCLK_P	B40	SAI5_RXC/SAI1_TXD1/////GPIO3_IO20
B41	VDD_PHY_1V8	B42	SAI5_RXD1/SAI1_TXD3//SAI1_TXFS///SAI5_TXFS/////GPIO3_IO22
B43	HDMI_TX_P_LN_2	B44	SAI5_RXD3/SAI1_TXD5//SAI1_TXFS///SAI5_TXD0/////GPIO3_IO24
B45	HDMI_TX_M_LN_2	B46	SAI5_MCLK/SAI1_TXC//SAI4_MCLK/////GPIO3_IO25
B47	GND	B48	SAI2_RXFS/SAI5_TXFS/////GPIO4_IO21
B49	HDMI_TX_P_LN_3	B50	SAI2_RXC/SAI5_TXC/////GPIO4_IO22
B51	HDMI_TX_M_LN_3	B52	SAI2_TXFS/SAI5_TXD1/////GPIO4_IO24
B53	GND	B54	SAI2_MCLK/SAI5_MCLK/////GPIO4_IO27
B55	SAI1_RXFS/SAI5_RXFS/////GPIO4_IO00	B56	SAI2_TXC/SAI5_TXD2/////GPIO4_IO25
B57	SAI1_RXC/SAI5_RXC/////GPIO4_IO01	B58	SAI2_RXD0/SAI5_TXD0/////GPIO4_IO23
B59	SAI1_RXD1/SAI5_RXD1/////GPIO4_IO03//////BOOT_CFG01	B60	SAI2_TXD0/SAI5_TXD3/////GPIO4_IO26
B61	SAI1_RXD0/SAI5_RXD0/////GPIO4_IO02//////BOOT_CFG00	B62	SAI1_RXD3/SAI5_RXD3/////GPIO4_IO05//////BOOT_CFG03
B63	SAI1_RXD2/SAI5_RXD2/////GPIO4_IO04//////BOOT_CFG02	B64	SAI1_TXFS/SAI5_TXFS/////GPIO4_IO10
B65	SAI1_RXD4/SAI6_TXC//SAI6_RXC/////GPIO4_IO06//////BOOT_CFG04	B66	SAI1_RXD6/SAI6_TXFS//SAI6_RXFS/////GPIO4_IO08//////BOOT_CFG06
B67	SAI1_TXD1/SAI5_TXD1/////GPIO4_IO13//////BOOT_CFG09	B68	SAI1_RXD7/SAI6_MCLK//SAI1_TXFS///SAI1_TXD4/////GPIO4_IO09//////BOOT_CFG07
B69	SAI1_RXD5/SAI6_TXD0//SAI6_RXD0///SAI1_RXFS/////GPIO4_IO07//////BOOT_CFG05	B70	SAI1_TXD0/SAI5_TXD0/////GPIO4_IO12//////BOOT_CFG08
B71	SAI1_TXD5/SAI6_RXD0//SAI6_TXD0/////GPIO4_IO17//////BOOT_CFG13	B72	SAI1_TXC/SAI5_TXC/////GPIO4_IO11
B73	SAI1_TXD3/SAI5_TXD3/////GPIO4_IO15//////BOOT_CFG11	B74	SAI1_TXD4/SAI6_RXC//SAI6_TXC/////GPIO4_IO16//////BOOT_CFG12
B75	GND	B76	SAI1_TXD7/SAI6_MCLK/////GPIO4_IO19//////BOOT_CFG15
B77	ECSPI1_SCLK/UART3_RX/////GPIO5_IO06	B78	SAI1_TXD2/SAI5_TXD2/////GPIO4_IO14//////BOOT_CFG10
B79	ECSPI1_SS0/UART3_RTS_B/////GPIO5_IO09	B80	SAI1_TXD6/SAI6_RXFS//SAI6_TXFS/////GPIO4_IO18//////BOOT_CFG14
B81	ECSPI1_MISO/UART3_CTS_B/////GPIO5_IO08	B82	SAI1_MCLK/SAI5_MCLK//SAI1_TXC/////GPIO4_IO20
B83	ECSPI1_MOSI/UART3_TX/////GPIO5_IO07	B84	GND
B85	UART2_RXD/ECSPI3_MISO/////GPIO5_IO24	B86	UART2_TXD/ECSPI3_SS0/////GPIO5_IO25
B87	UART3_RXD/UART1_CTS_B/////GPIO5_IO26	B88	UART1_RXD/ECSPI3_SCLK/////GPIO5_IO22
B89	UART3_TXD/UART1_RTS_B/////GPIO5_IO27	B90	UART1_TXD/ECSPI3_MOSI/////GPIO5_IO23

PWR_FLAG
GNDA

BASE_PER_3V3
R1 10k
R2 10k

SAI2_TXFS
SAI2_MCLK
SAI2_TXC
SAI2_RXD
SAI2_TXD

J1C

C1	UART4_TXD/UART2_RTS_B//PCIE2_CLKREQ_B/////GPIO5_IO29	C2	NC/*/LVDS1_TX0_P
C3	UART4_RXD/UART2_CTS_B//PCIE1_CLKREQ_B/////GPIO5_IO28	C4	NC/*/LVDS1_TX0_N
C5	NC/*/LVDS1_TX2_P	C6	NC/*/LVDS1_TX1_P
C7	NC/*/LVDS1_TX2_N	C8	NC/*/LVDS1_TX1_N
C9	GND	C10	GND
C11	NC/*/LVDS1_CLK_P	C12	DSI_TX0_P/*/LVDS2_TX0_P
C13	NC/*/LVDS1_CLK_N	C14	DSI_TX0_N/*/LVDS2_TX0_N
C16	GND	C16	DSI_TX1_P/*/LVDS2_TX1_P
C17	NC/*/LVDS1_TX3_P	C18	DSI_TX1_N/*/LVDS2_TX1_N
C19	NC/*/LVDS1_TX3_N	C20	DSI_TX3_P/*/LVDS2_TX3_P
C21	GND	C22	DSI_TX3_N/*/LVDS2_TX3_N
C23	DSI_TX2_P/*/LVDS2_CLK_P	C24	GND
C25	DSI_TX2_N/*/LVDS2_CLK_N	C26	USB2_VBUS
C27	GND	C28	SPDIF_RX/PWM2_OUT/////GPIO5_IO04
C29	OSI_CLK_N/*/LVDS2_TX2_N	C30	GPIO1_IO11/USB2_OTG_ID/////PMIC_READY
C31	OSI_CLK_P/*/LVDS2_TX2_P	C32	SPDIF_EXT_CLK/PWM1_OUT/////GPIO5_IO05
C33	GND	C34	GND
C35	USB2_RXN	C36	SPDIF_TX/PWM3_OUT/////GPIO5_IO03
C37	USB2_RXP	C38	GPIO1_IO15/USB2_OTG_OC/////PWM4_OUT/////CLKO2
C39	GND	C40	GPIO1_IO13/USB1_OTG_OC/////PWM2_OUT
C41	USB2_TXN	C42	I2C3_SDA/PWM3_OUT//GPT3_CLK/////GPIO5_IO19
C43	USB2_TXP	C44	USB2_ID
C45	GND	C46	I2C3_SCL/PWM4_OUT//GPT2_CLK/////GPIO5_IO18
C47	USB2_DP	C48	GPIO1_IO14/USB2_OTG_PWR/////PWM3_OUT
C49	USB2_DN	C50	GPIO1_IO12/USB1_OTG_PWR
C51	GND	C52	GPIO1_IO10/USB1_OTG_ID
C53	USB1_RXN	C54	GPIO1_IO03/USDHC1_VSELECT/////XTAL_OK
C55	USB1_RXP	C56	USB1_ID
C57	GND	C58	GPIO1_IO06/////SD1_CD_B/////EXT_CLK3
C59	USB1_TXN	C60	GPIO1_IO08/ENET1_1588_EVENT0_IN/////SD2_RESET_B
C61	USB1_TXP	C62	GPIO1_IO05/M4_NMI/////PMIC_READY
C63	GND	C64	GPIO1_IO01/PWM1_OUT/////REF_CLK_24M/////EXT_CLK2
C65	USB1_DP	C66	USB1_VBUS
C67	USB1_DN	C68	GND
C69	VBAT_3V3	C70	CSI_P2_CKN
C71	VBAT	C72	CSI_P2_CKP
C73	VBAT	C74	GND
C75	VBAT	C76	CSI_P2_DN3
C77	VBAT	C78	CSI_P2_DP3
C79	VBAT	C80	CSI_P2_DN1
C81	VBAT	C82	CSI_P2_DP1
C83	VBAT	C84	CSI_P2_DN0
C85	VBAT	C86	CSI_P2_DP0
C87	VBAT	C88	CSI_P2_DN2
C89	VBAT	C90	CSI_P2_DP2

Internal SOM regulator 3.3V output generated from VBAT used to be LICELL

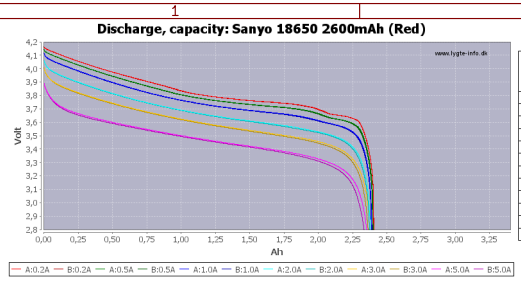
SOM_VBAT_3V3
Max 100mA

SOM_VBAT

Purism SPC
Sheet: /
File: dvk-dart-mx8m.sch

Title: DVK-DART-MX8M

Size: A2	Date: 2018-04-05	Rev: v0.1.0
KiCad E.D.A. kicad 4.0.7		Id: 1/6

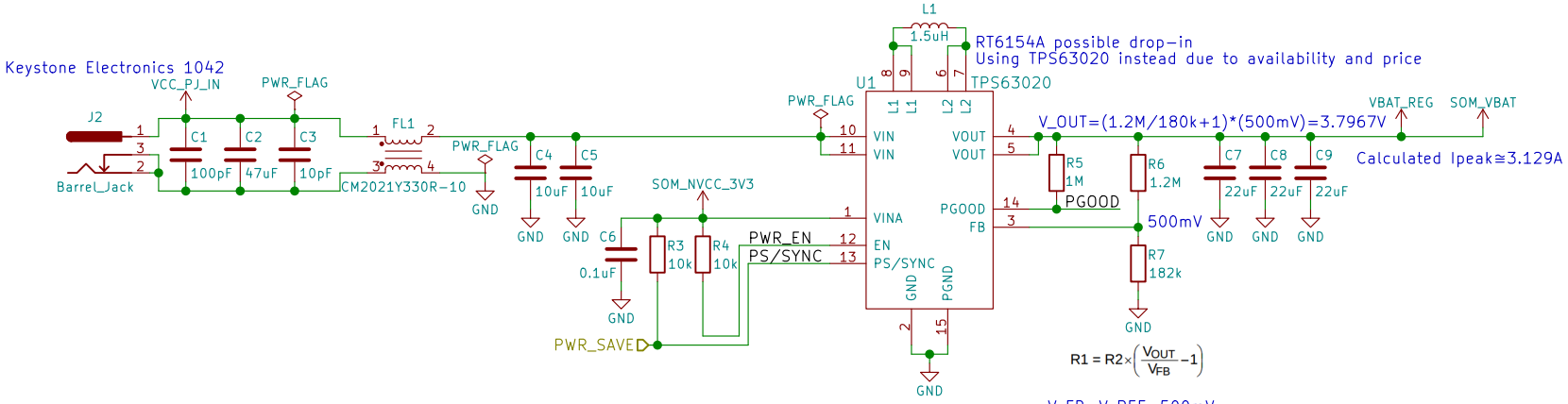


Estimated remaining capacity

Voltage	AW 18650 2600mAh (Black)	Sanyo 18650 2600mAh (Red)	Panasonic CGR18650CH 2250mAh	Panasonic NCR18650A 3100mAh	Panasonic NCR18650B 3400mAh
4.2	100%	100%	100%	100%	100%
4.1	92%	92%	94%	94%	94%
4.0	78%	79%	85%	83%	84%
3.9	61%	63%	76%	73%	74%
3.8	43%	44%	66%	60%	62%
3.7	14%	15%	54%	52%	53%
3.6	3%	5%	26%	38%	39%
3.5	1%	2%	12%	20%	22%
3.4	0%	1%	5%	11%	13%
3.3	0%	0%	2%	1%	3%
3.2	0%	0%	0%	0%	0%

Measured 1 hour after discharge at 1A

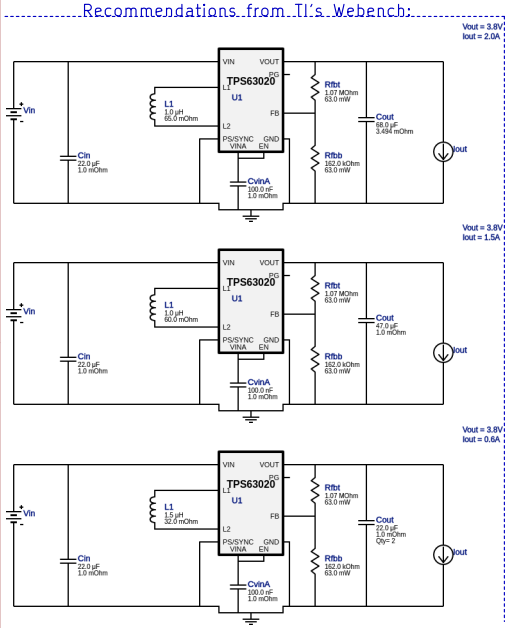
⇒18650 batteries don't reach 3.3V until depleted



$$R1 = R2 \times \left(\frac{V_{OUT}}{V_{FB}} - 1 \right)$$

V_FB=V_REF=500mV
"The typical value of the voltage at the FB pin is 500mV"
"It is recommended to keep the value for [R2] in the range of 200kΩ; lower than 500kΩ"
Their example application circuit uses 180k for R2, therefore:
R2≅200k±20k (±10%) or 180k~220k
Given this, V_OUT≅3.8V, 1.1188M≤R1≤1.452M
The most common value in this range is 1.2M
Making R2≅181.818k or roughly 182k

Recommendations from TI's Webench:

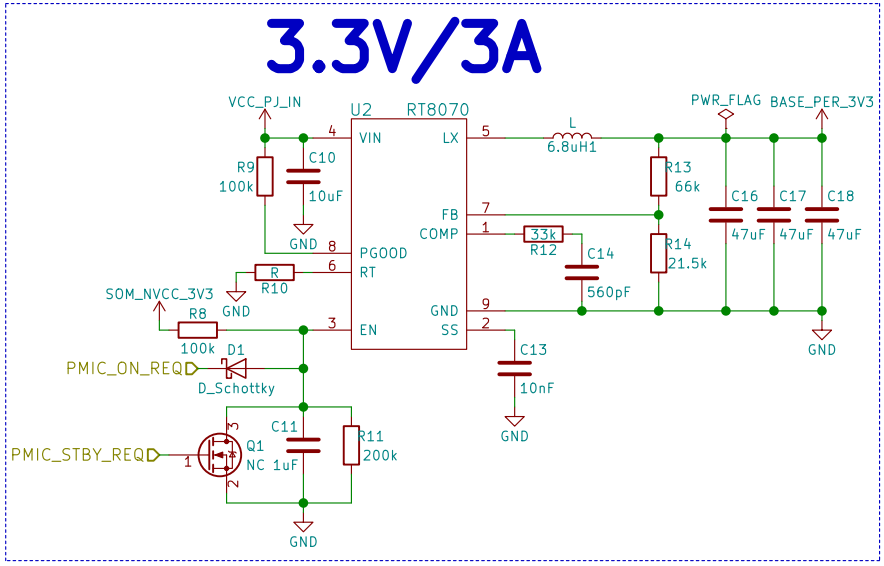


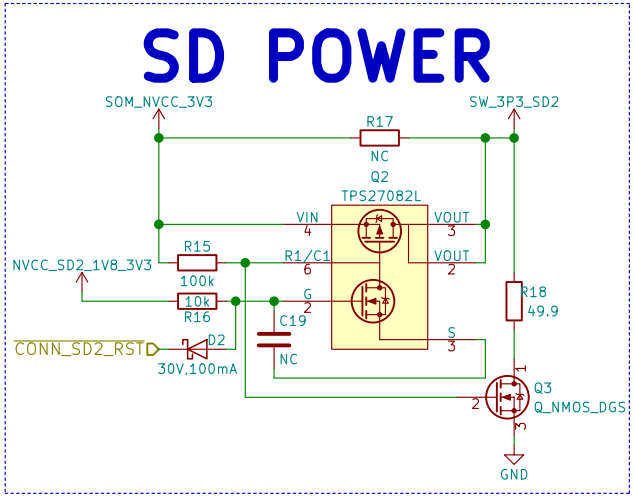
Purism SPC

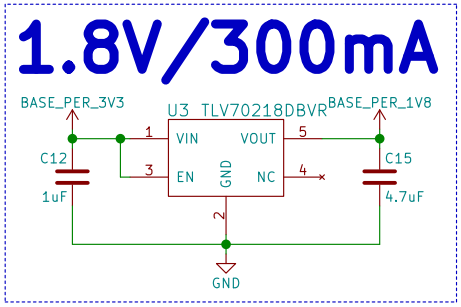
Sheet: /Battery/
File: battery.sch

Title: Battery

Size: A4	Date: 2018-04-05	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 2/6



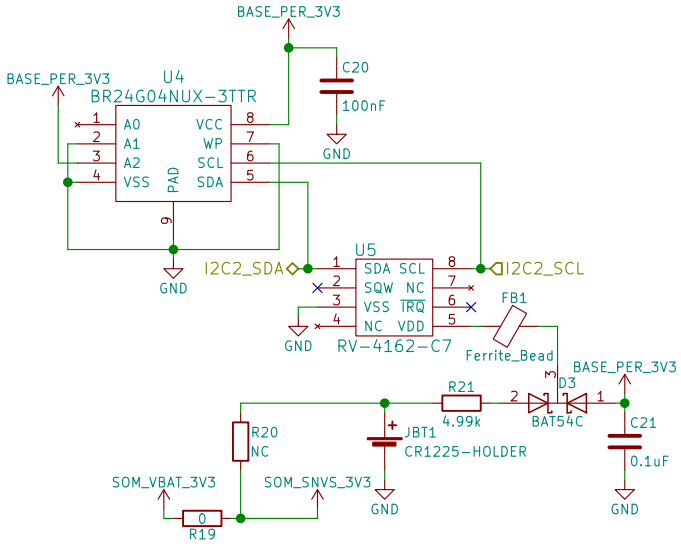




Sheet: /Power/
File: power.sch

Title: Power

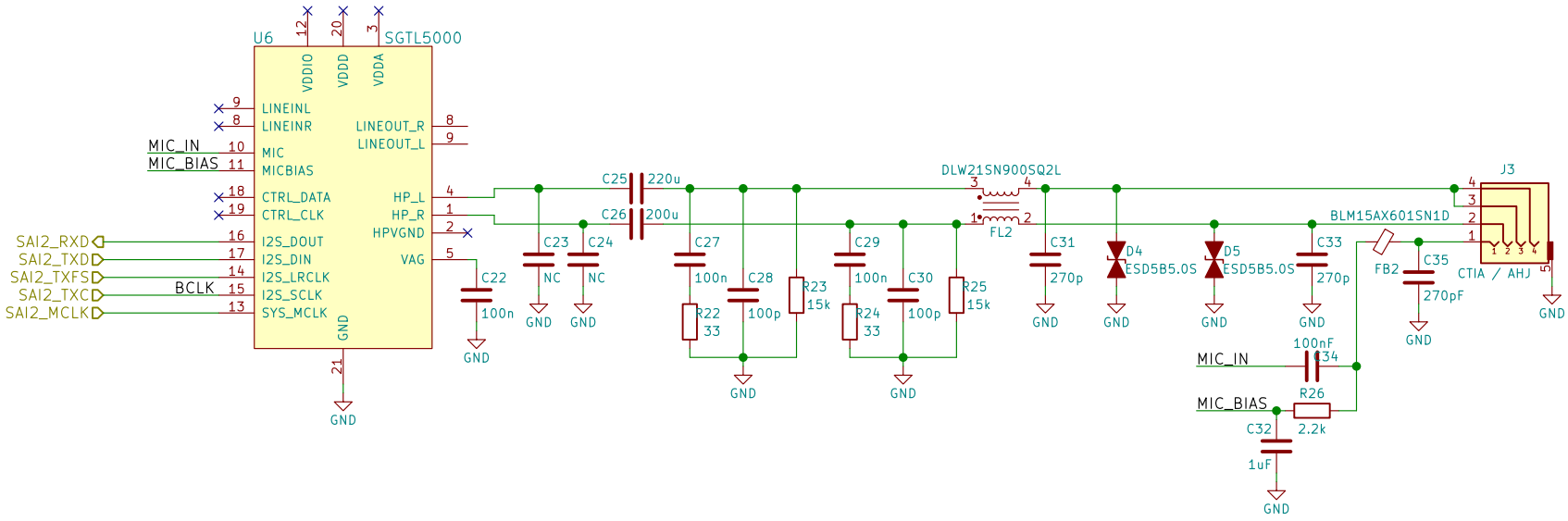
Size: A4	Date: 2018-04-05	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 3/6



Sheet: /RTC Battery/
File: rtc.sch

Title: RTC Battery

Size: A4	Date: 2018-04-05	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 4/6

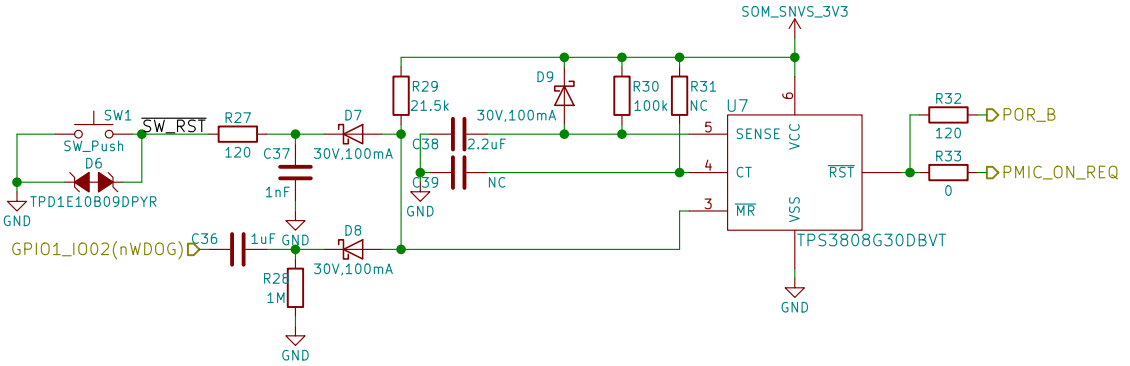


GNU GPLv3
Copyright 2018
Purism SPC

Sheet: /Audio/
File: audio.sch

Title: Audio

Size: A4	Date: 2018-04-05	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 5/6



Sheet: /Reset & Watchdog/
File: watchdog.sch

Title: Reset & Watchdog

Size: A4	Date: 2018-04-05	**Rev: v0.1.0**
KiCad E.D.A. kicad 4.0.7		Id: 6/6