

PG0_FMC_A10	56	PG0/FMC_A10
PG1_FMC_A11	57	PG1/FMC_A11
PG2_FMC_A12	87	PG2/FMC_A12
PG3_FMC_A13	88	PG3/FMC_A13
PG4_FMC_BA0	89	PG4/FMC_A14/FMC_BA0
PG5_FMC_BA1	90	PG5/FMC_A15/FMC_BA1
PG6_GREEN_LED	91	PG6/DCML_D12/FMC_INT2
PG7	92	DCML_D13/FMC_INT3/USART6_CK
PG8_FMC_SDCLK	93	PG8/ETH_PPS_OUT/FMC_SDCLK/SPI6_NSS/USART6_RTS
PG9_USART6_RX	124	PG9/DAC_EXTI9/DCML_VSYNC/FMC_NCE3/FMC_NE2/USART6_RX
PG10	125	DCML_D2/FMC_NCE4_1/FMC_NE3
PG11_GPDIO	126	PG11/ADC1_EXTI11/ADC2_EXTI11/ADC3_EXTI11/DCML_D3/ETH_TX_EN/FMC_NCE4_2
PG12_GPDIO	127	PG12/FMC_NE4/SPI6_MISO/USART6_RTS
PG13_2141_FLG	128	PG13/ETH_TXD0/FMC_A24/SPI6_SCK/USART6_CTS
PG14_MIDI_TX	129	PG14/ETH_TXD1/FMC_A25/SPI6_MOSI/USART6_TX
PG15_FMC_CAS	132	PG15/ADC1_EXTI15/ADC2_EXTI15/ADC3_EXTI15/DCML_D13/FMC_SDNCA5/USART6_CTS
PF0_FMC_A0	10	PF0/FMC_A0/I2C2_SDA
PF1_FMC_A1	11	PF1/FMC_A1/I2C2_SCL
PF2_FMC_A2	12	PF2/FMC_A2/I2C2_SMBA
PF3_FMC_A3	13	PF3/ADC3_IN9/FMC_A3
PF4_FMC_A4	14	PF4/ADC3_IN14/FMC_A4
PF5_FMC_A5	15	PF5/ADC3_IN15/FMC_A5
PF6_GPDIO	18	PF6/ADC3_IN4/FMC_NIORD/SAI1_SD_B/SPI5_NSS/TIM10_CH1/UART7_RX
PF7_GPDIO	19	PF7/ADC3_IN5/FMC_NREG/SAI1_MCLK_B/SPI5_SCK/TIM11_CH1/UART7_TX
PF8_GPDIO	20	PF8/ADC3_IN6/FMC_NIOWR/SAI1_SCK_B/SPI5_MISO/TIM13_CH1
PF9_GPDIO	21	PF9/ADC3_IN7/DAC_EXTI9/FMC_CD/SAI1_FS_B/SPI5_MOSI/TIM14_CH1
PF10_V_SUPERVISOR	22	PF10/ADC3_IN8/DCML_D11/FMC_INTR
PF11_FMC_RAS	49	PF11/ADC1_EXTI11/ADC2_EXTI11/ADC3_EXTI11/DCML_D12/FMC_SDNRA5/SPI5_MOSI
PF12_FMC_A6	50	PF12/FMC_A6
PF13_FMC_A7	53	PF13/FMC_A7
PF14_FMC_A8	54	PF14/FMC_A8
PF15_FMC_A9	55	PF15/ADC1_EXTI15/ADC2_EXTI15/ADC3_EXTI15/FMC_A9
PE0_FMC_NBL0	141	PE0/DCML_D2/FMC_NBL0/TIM4_ETR/UART8_RX
PE1_FMC_NBL1	142	PE1/DCML_D3/FMC_NBL1/UART8_TX
PE2	1	PE2/ETH_TXD3/FMC_A23/SAI1_MCLK_A/SPI4_SCK/SYS_TRACECLK
PE3_I2S_RX	2	PE3/FMC_A19/SAI1_SD_B/SYS_TRACED0
PE4_I2S_LRCLK	3	PE4/DCML_D4/FMC_A20/SAI1_FS_A/SPI4_NSS/SYS_TRACED1
PE5_I2S_BCLK	4	PE5/DCML_D6/FMC_A21/SAI1_SCK_A/SPI4_MISO/SYS_TRACED2/TIM9_CH1
PE6_I2S_TX	5	PE6/DCML_D7/FMC_A22/SAI1_SD_A/SPI4_MOSI/SYS_TRACED3/TIM9_CH2
PE7_FMC_D4	58	PE7/FMC_D4/FMC_DA4/TIM1_ETR/UART7_RX
PE8_FMC_D5	59	PE8/FMC_D5/FMC_DA5/TIM1_CH1N/UART7_TX
PE9_FMC_D6	60	PE9/DAC_EXTI9/FMC_D6/FMC_DA6/TIM1_CH1
PE10_FMC_D7	63	PE10/FMC_D7/FMC_DA7/TIM1_CH2N
PE11_FMC_D8	64	PE11/ADC1_EXTI11/ADC2_EXTI11/ADC3_EXTI11/FMC_D8/FMC_DAB/SPI4_NSS/TIM1_CH2
PE12_FMC_D9	65	PE12/FMC_D9/FMC_DA9/SPI4_SCK/TIM1_CH3N
PE13_FMC_D10	66	PE13/FMC_D10/FMC_DA10/SPI4_MISO/TIM1_CH3
PE14_FMC_D11	67	PE14/FMC_D11/FMC_DA11/SPI4_MOSI/TIM1_CH4
PE15_FMC_D12	68	PE15/ADC1_EXTI15/ADC2_EXTI15/ADC3_EXTI15/FMC_D12/FMC_DA12/TIM1_BKIN



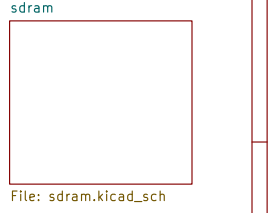
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ADC1_IN1/ADC2_IN1/ADC3_IN1/ETH_REF_CLK/ETH_RX_CLK/TIM2_CH2/TIM5_CH2/UART4_RX/USART2_RTS/PA1	35	PA1_ADC1	pwm
ADC1_IN2/ADC2_IN2/ADC3_IN2/ETH_MDIO/TIM2_CH3/TIM5_CH3/TIM9_CH1/USART2_TX/PA2	36	PA2_ADC2	UART_TX pwm
ADC1_IN3/ADC2_IN3/ADC3_IN3/ETH_COL/TIM2_CH4/TIM5_CH4/TIM9_CH2/USART2_RX/USB_OTG_HS_ULPI_D0/PA3	37	PA3_ADC3	UART_RX pwm
ADC1_IN4/ADC2_IN4/DAC_OUT1/DCML_HSYNC/I2S3_WS/SPI1_NSS/SPI3_NSS/USART2_CK/USB_OTG_HS_SOF/PA4	40	PA4_ADC4	DAC1 / SPL_NSS
ADC1_IN5/ADC2_IN5/DAC_OUT2/SPI1_SCK/TIM2_CH1/TIM2_ETR/TIM8_CH1N/USB_OTG_HS_ULPI_CK/PA5	41	PA5_ADC5	DAC2 / SPL_SCK pwm
ADC1_IN6/ADC2_IN6/DCML_PIXCK/SPI1_MISO/TIM13_CH1/TIM1_BKIN/TIM3_CH1/TIM8_BKIN/PA6	42	PA6_ADC6	SPL_MISO pwm
ADC1_IN7/ADC2_IN7/ETH_CR5_DV/ETH_RX_DV/SPI1_MOSI/TIM14_CH1/TIM1_CH1N/TIM3_CH2/TIM8_CH1N/PA7	43	PA7_ADC7	SPL_MOSI pwm
I2C3_SCL/RCC_MCO_1/TIM1_CH1/USART1_CK/USB_OTG_FS_SOF/PA8	100	PA8_I2S_MCLK	
DAC_EXTI9/DCML_D0/I2C3_SMBA/TIM1_CH2/USART1_TX/USB_OTG_FS_VBUS/PA9	101	PA9_GPDIO	pwm
DCML_D1/TIM1_CH3/USART1_RX/USB_OTG_FS_ID/PA10	102	PA10_S2	
ADC1_EXTI11/ADC2_EXTI11/ADC3_EXTI11/CAN1_RX/TIM1_CH4/USART1_CTS/USB_OTG_FS_DM/PA11	104	PA11_OTG_FS_D-	
CAN1_TX/TIM1_ETR/USART1_RTS/USB_OTG_FS_DP/PA12	103	PA12_OTG_FS_D+	
SYS_JTMS-SWDIO/PA13	105	PA13_SWDIO	
SYS_JTCK-SWCLK/PA14	109	PA14_SWCLK	
ADC1_EXTI15/ADC2_EXTI15/ADC3_EXTI15/I2S3_WS/SPI1_NSS/SPI3_NSS/SYS_JTDI/TIM2_CH1/TIM2_ETR/PA15	110	PA15_GPDIO	pwm
ADC1_IN8/ADC2_IN8/ETH_RXD2/TIM1_CH2N/TIM3_CH3/TIM8_CH2N/USB_OTG_HS_ULPI_D1/PB0	46	PB0_ADC8	pwm
ADC1_IN9/ADC2_IN9/ETH_RXD3/TIM1_CH3N/TIM3_CH4/TIM8_CH3N/USB_OTG_HS_ULPI_D2/PB1	47	PB1_ADC9	pwm
BOOT1/PB2	48		
I2S3_CK/SPI1_SCK/SPI3_SCK/SYS_JTDO-SWO/TIM2_CH2/PB3	133	PB3_GPDIO	pwm
I2S3_ext_SD/SPI1_MISO/SPI3_MISO/SYS_JTRST/TIM3_CH1/PB4	134	PB4_GPDIO	pwm
DCML_VSYNC/FMC_NL/I2C1_SDA/TIM4_CH2/USART1_RX/PB7	135	PB5_BOOT0_S1	
CAN2_TX/DCML_D5/FMC_SDNE1/I2C1_SCL/TIM4_CH1/USART1_TX/PB6	136	PB6_GPDIO	pwm
CAN1_RX/DCML_D6/ETH_TXD3/I2C1_SCL/SDIO_D4/TIM10_CH1/TIM4_CH3/PB8	137	PB7_GPDIO	pwm
CAN1_TX/DAC_EXTI9/DCML_D7/I2C1_SDA/I2S2_WS/SDIO_D5/SPI2_NSS/TIM11_CH1/TIM4_CH4/PB9	138	PB8_GPDIO	pwm
ETH_RX_ER/I2C2_SCL/I2S2_CK/SPI2_SCK/TIM2_CH3/USART3_TX/USB_OTG_HS_ULPI_D7/PB5	140	PB9_GPDIO	pwm
ADC1_EXTI11/ADC2_EXTI11/ADC3_EXTI11/ETH_TX_EN/I2C2_SDA/TIM2_CH4/USART3_RX/USB_OTG_HS_ULPI_D4/PB11	69		
CAN2_RX/ETH_TXD0/I2C2_SMBA/I2S2_WS/SPI2_NSS/TIM1_BKIN/USART3_CK/USB_OTG_HS_ID/USB_OTG_HS_ULPI_D5/PB12	70	HPH7->PB10_I2C3->I2C2_SCL	
CAN2_TX/ETH_TXD1/I2S2_CK/SPI2_SCK/TIM1_CH1N/USART3_CTS/USB_OTG_HS_ULPI_D6/USB_OTG_HS_VBUS/PB13	71	HPH8->PB11_I2C3->I2C2_SDA	
I2S2_ext_SD/SPI2_MISO/TIM12_CH1/TIM1_CH2N/TIM8_CH2N/USART3_RTS/USB_OTG_HS_DM/PB14	73	PB12_GPDIO	
ADC1_EXTI15/ADC2_EXTI15/ADC3_EXTI15/I2S2_SD/RTC_REFIN/SPI2_MOSI/TIM12_CH2/TIM1_CH3N/TIM8_CH3N/USB_OTG_HS_DP/PB15	74	PB13_GPDIO	pwm
ADC1_IN10/ADC2_IN10/ADC3_IN10/FMC_SDNWE/USB_OTG_HS_ULPI_STP/PC0	75	PB14_OTG_HS_D-	
ADC1_IN11/ADC2_IN11/ADC3_IN11/ETH_MDC/PC1	76	PB15_OTG_HS_D+	
ADC1_IN12/ADC2_IN12/ADC3_IN12/ETH_TXD2/FMC_SDNE0/I2S2_ext_SD/SPI2_MISO/USB_OTG_HS_ULPI_DIR/PC2	26	HPH5->PC0_FMC_SDNWE	
ADC1_IN13/ADC2_IN13/ADC3_IN13/ETH_TX_CLK/FMC_SDCKE0/I2S2_SD/SPI2_MOSI/USB_OTG_HS_ULPI_NXT/PC3	27	PC1_ADC10	
ADC1_IN14/ADC2_IN14/ETH_RXD0/PC4	28	HPH3->PC2_FMC_SDNE0	
ADC1_IN15/ADC2_IN15/ETH_RXD1/PC5	29	HPH2->PC3_FMC_SDCKE0	
DCML_D0/I2S2_MCK/SDIO_D6/TIM3_CH1/TIM8_CH1/USART6_TX/PC6	44	PC4_ADC11	
DCML_D1/I2S3_MCK/SDIO_D7/TIM3_CH2/TIM8_CH2/USART6_RX/PC7	45	PC5_ADC12	
DCML_D2/SDIO_D0/TIM3_CH3/TIM8_CH3/USART6_CK/PC8	96	PC6_RED_LED	pwm
DAC_EXTI9/DCML_D3/I2C3_SDA/I2S_CKIN/RCC_MCO_2/SDIO_D1/TIM3_CH4/TIM8_CH4/PC9	97	PC7_GPDIO	pwm
DCML_D8/I2S3_CK/SDIO_D2/SPI3_SCK/UART4_TX/USART3_TX/PC10	98	PC8_SDIO_D0	
ADC1_EXTI11/ADC2_EXTI11/ADC3_EXTI11/DCML_D4/I2S3_ext_SD/SDIO_D3/SPI3_MISO/UART4_RX/USART3_RX/PC11	99	PC9_SDIO_D1	
DCML_D9/I2S3_SD/SDIO_CK/SPI3_MOSI/USART5_TX/USART3_CK/PC12	111	PC10_SDIO_D2	
RTC_AF1/PE13	112	PC11_SDIO_D3	
RCC_OS632_IN/PC14	113	PC12_SDIO_CK	
ADG1_EXTI15/ADC2_EXTI15/ADC3_EXTI15/RCC_OS632_OUT/PE15	7		
CAN1_RX/FMC_D2/FMC_DA2/PD0	114	PD0_FMC_D2	
CAN1_TX/FMC_D3/FMC_DA3/PD1	115	PD1_FMC_D3	
DCML_D11/SDIO_CMD/TIM3_ETR/USART5_RX/PD2	116	PD2_SDIO_CMD	
DCML_D5/FMC_CLK/I2S2_CK/SPI2_SCK/USART2_CTS/PD3	117	PD3_GPDIO	
FMC_NOE/USART2_RTS/PD4	118	PD4_GPDIO	
FMC_NWE/USART2_TX/PD5	119	PD5_GPDIO	
DCML_D10/FMC_NWAIT/I2S3_SD/SAI1_SD_A/SPI3_MOSI/USART2_RX/PD6	122	PD6_GPDIO	
FMC_NCE2/FMC_NE1/USART2_CK/PD7	123	PD7_2141_EN	
FMC_D13/FMC_DA13/USART3_TX/PD8	77	PD8_FMC_D13	
DAC_EXTI9/FMC_D14/FMC_DA14/USART3_RX/PD9	78	PD9_FMC_D14	
FMC_D15/FMC_DA15/USART3_CK/PD10	79	PD10_FMC_D15	
ADC1_EXTI11/ADC2_EXTI11/ADC3_EXTI11/FMC_A16/FMC_CLE/USART3_CTS/PD11	80		
FMC_A17/FMC_ALE/TIM4_CH1/USART3_RTS/PD12	81	PD12_SPILINK_SELECT	
FMC_A18/TIM4_CH2/PD13	82	PD13_SD_DETECT	
FMC_D0/FMC_DA0/TIM4_CH3/PD14	85	PD14_FMC_D0	
ADC1_EXTI15/ADC2_EXTI15/ADC3_EXTI15/FMC_D1/FMC_DA1/TIM4_CH4/PD15	86	PD15_FMC_D1	



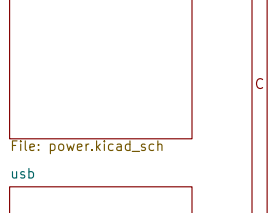
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File: power.kicad_sch



File: usb.kicad_sch



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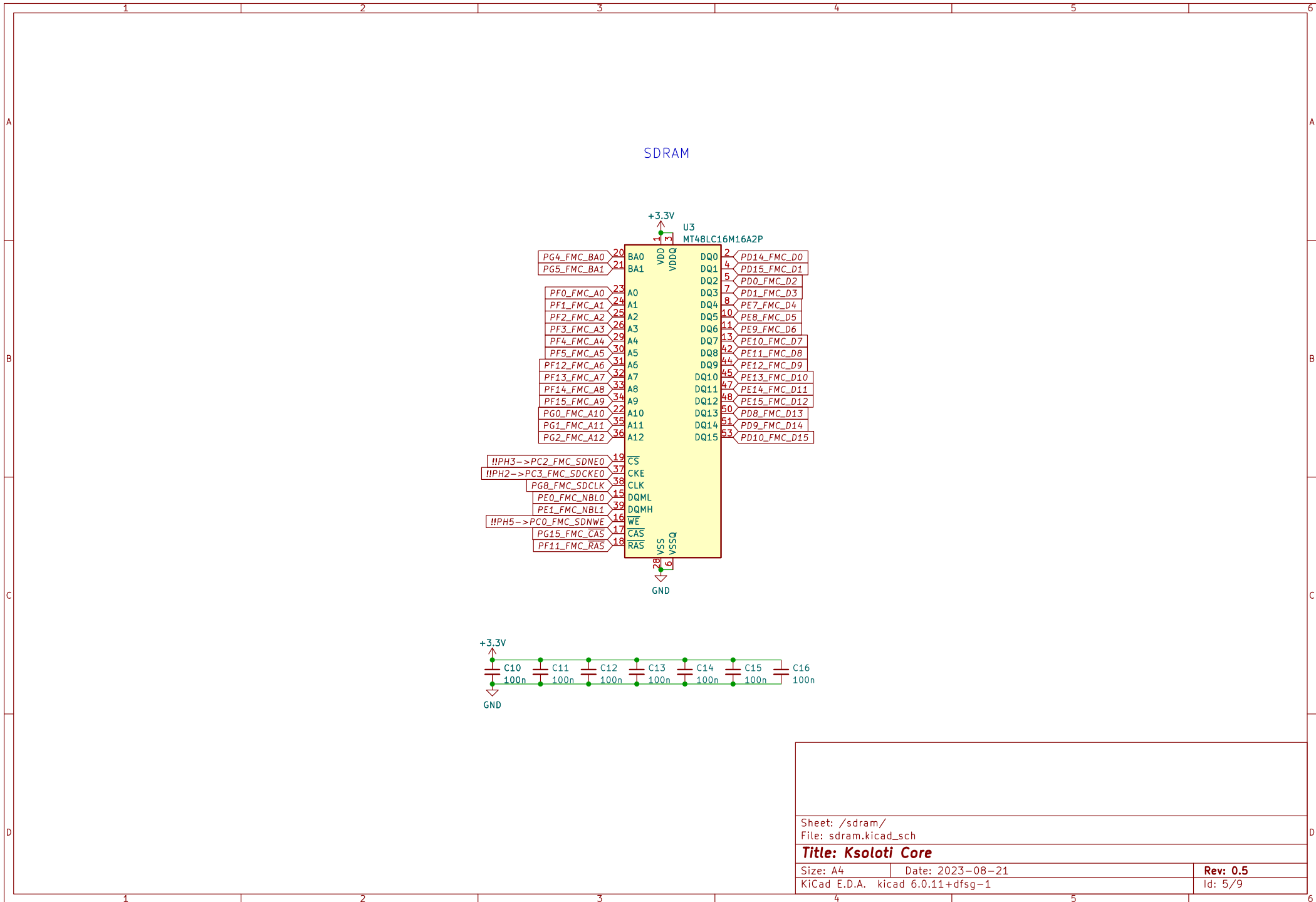
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CHANGELOG

changelog

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 Size: A3 Date: 2023-08-21 Rev: 0.5
 KiCad E.D.A. kicad 6.0.11+dfsg-1 Id: 1/9



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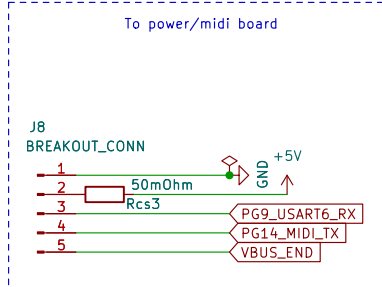
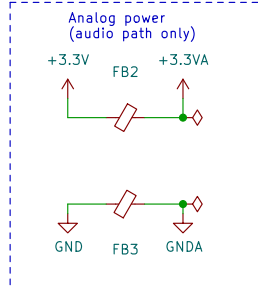
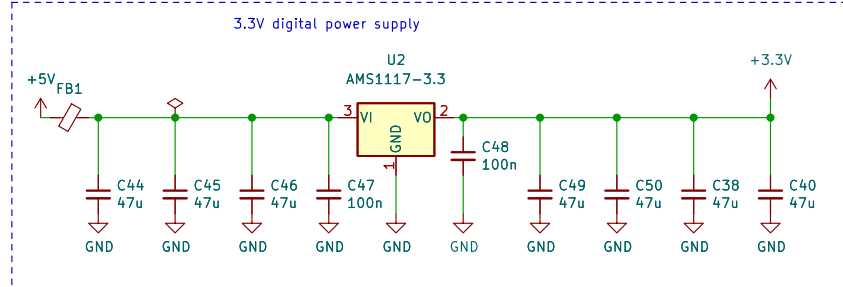
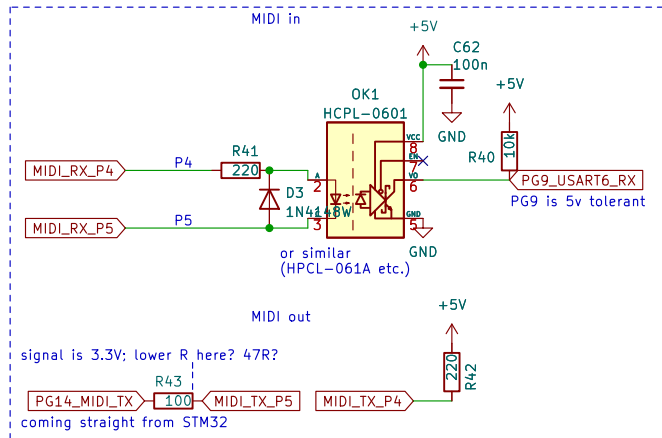
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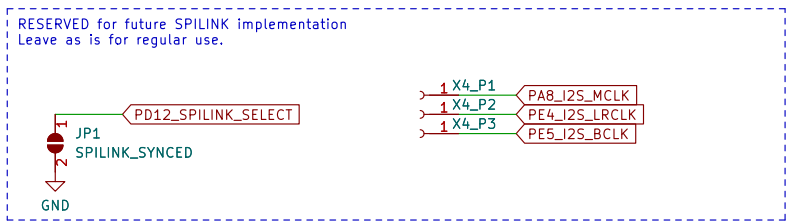
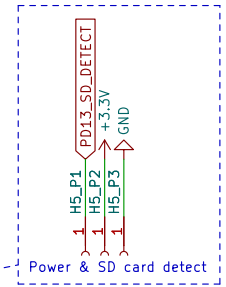
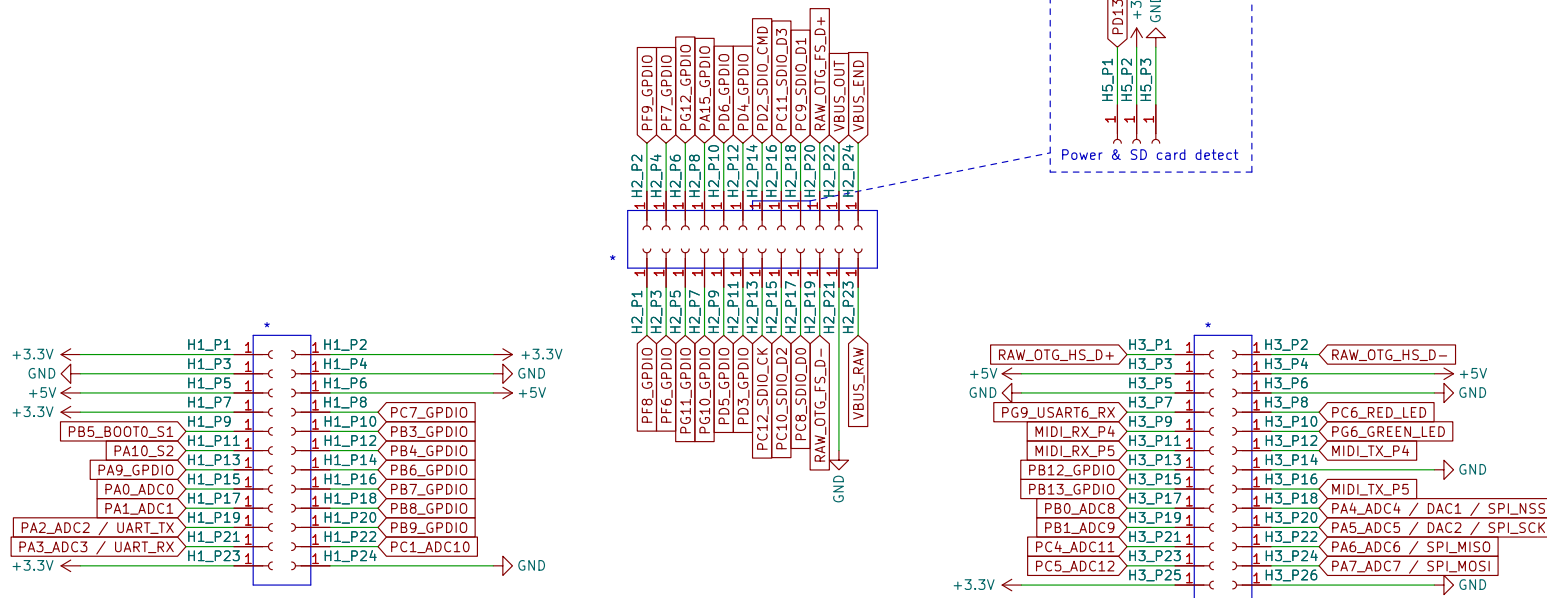
Rev: 0.5

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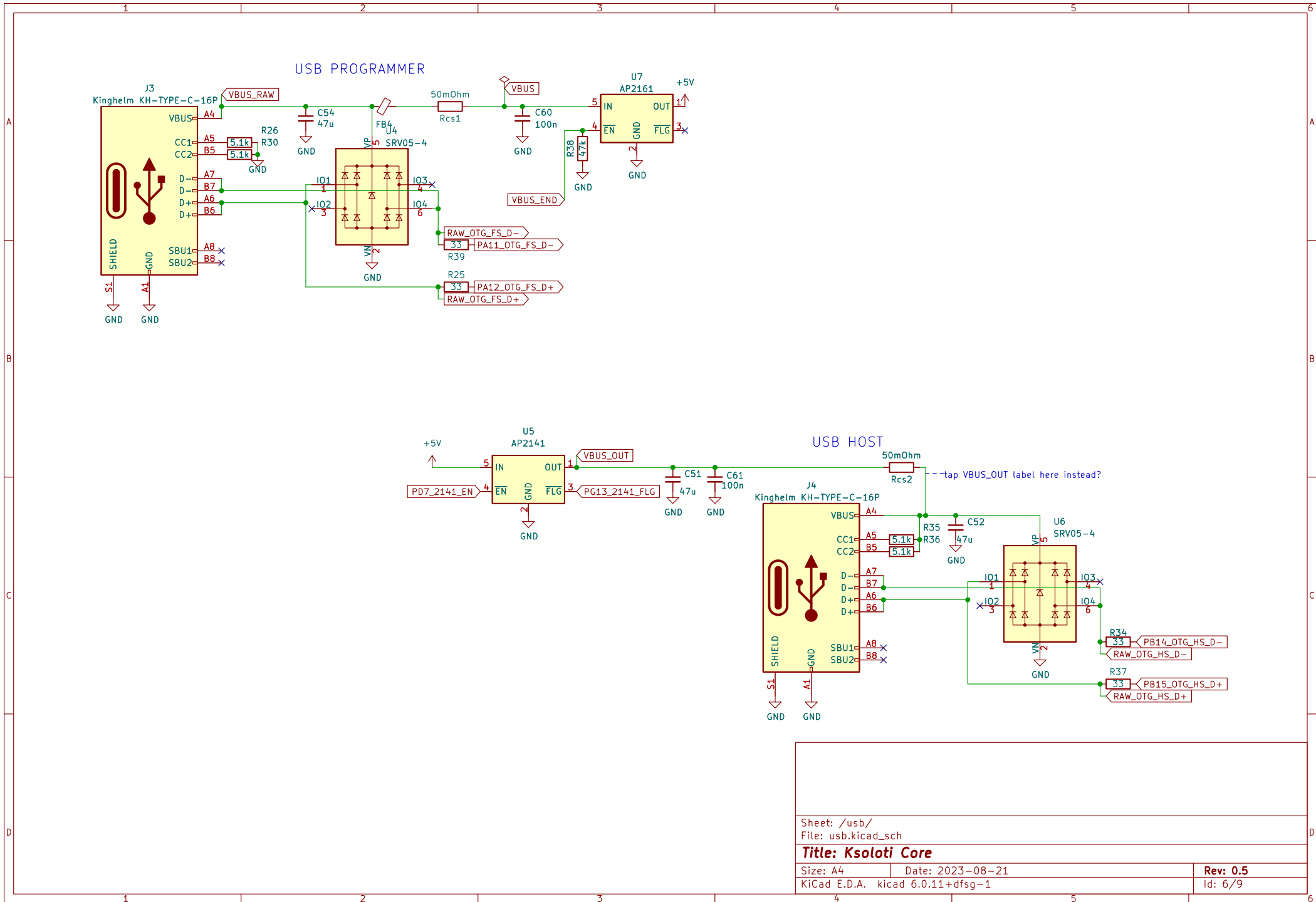


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	Id: 5/9

"GPIO" headers (PCB component side view)

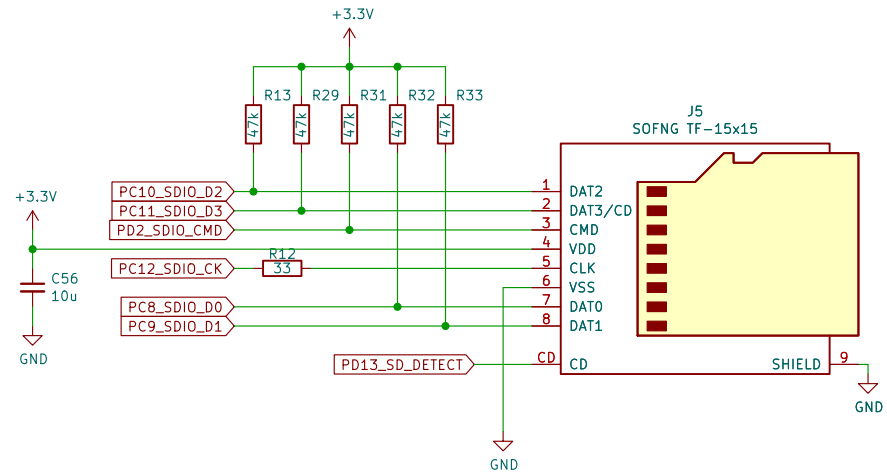


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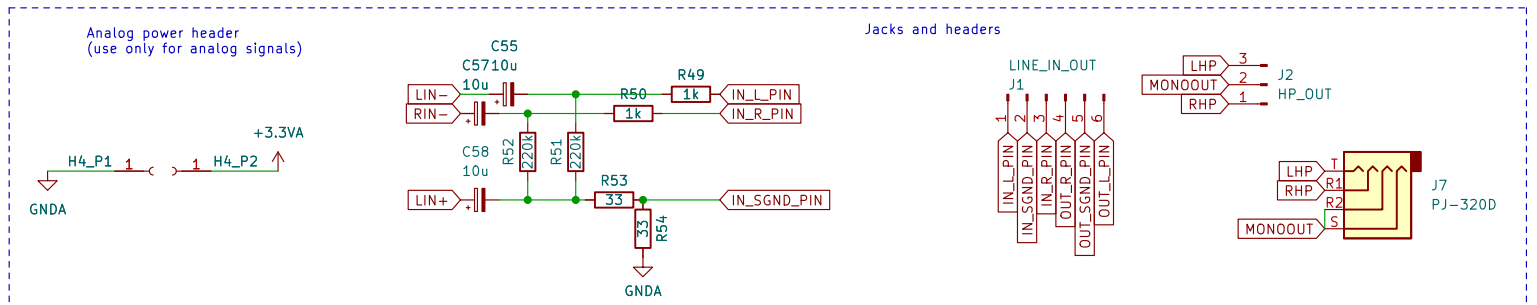
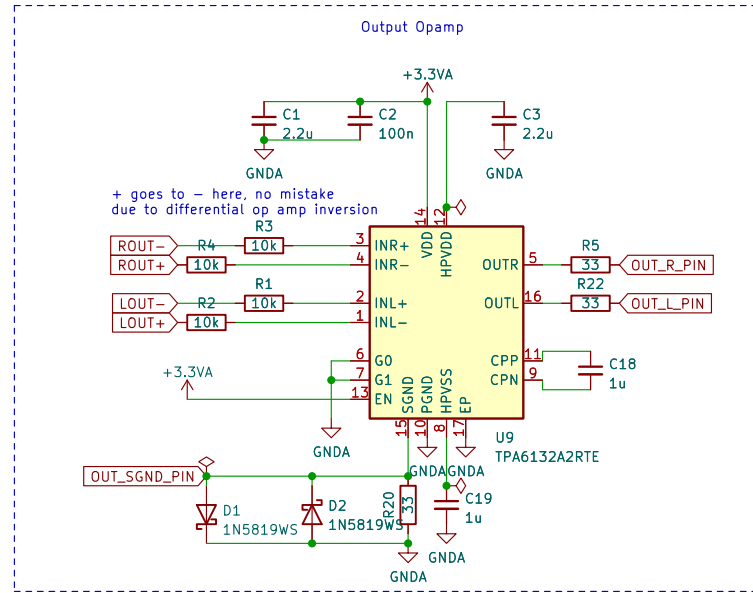
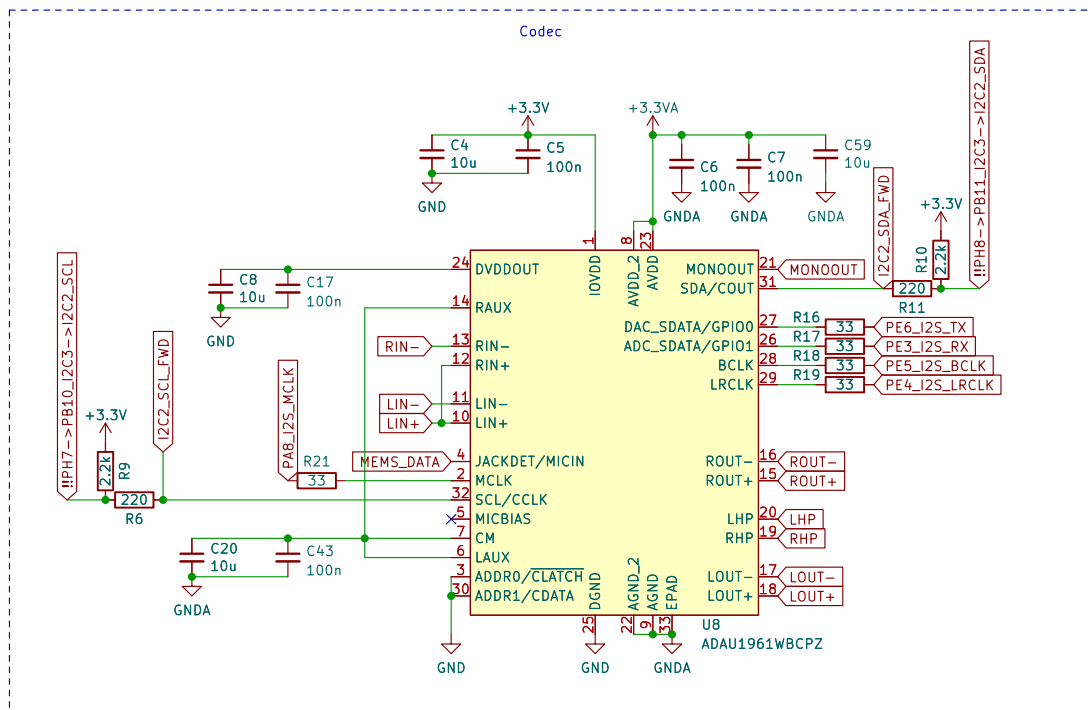


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	Id: 6/9

Micro SD card



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Title: Ksoloti Core

Size: A4 Date: 2023-08-21

KiCad E.D.A. kicad 6.0.11+dfsg-1

Rev: 0.5

Id: 8/9

v0.1 done -- prototype ordered 2023/04/13

v0.2 done -- prototype ordered 2023/04/26

Changes in v0.2:

- (even) higher series resistors for LEDs
- break out PA15 as GPDIO17, PD3 as GPDIO18
- combine S1/BOOT0 pin and GPDIO2 (PB5)
- untent some vias to make them usable as test points
- move SD card slot to make space for mounting hole
- add fiducials and M2.5 mounting holes
- add footprint for SMD 3.5mm headphone jack (PJ-320D) on bottom
- add digital PDM microphone connected to SPI3 (I2S3)
- pull PG3 up to VDD to have a way in firmware to check board version
- change HP output pinout so that it matches line out. One thing less that could go wrong!

v0.3 done -- prototype ordered 2023/06/21

Changes in v0.3:

- Break out PA9 as GPDIO19, PC7 as GPDIO20, PB12 as GPDIO21, PB13 as GPDIO22 (was running out of PWMable and general digital pins)
- Increase capacitors on 5V rail (3.3V regulator input) and 3.3V output to avoid MCU reset due to power drop when connecting external 5V while core is powered via USB.
- Connect both physical legs of each SMD switch to their respective nets (not just to one physical leg of each side)
- Increase mounting holes to M3, squeeze in two more mounting holes - total 4 now
- Modify footprints of electrolytic caps so that they can alternatively accomodate 1206 ceramic caps
- Remove via "untent" test points - they were creating risks when hand soldering ICs
- Reroute PDM mic to interface directly with the codec. Now the codec can be setup in your patch to take either the mono mic or the stereo line in as input.
- Add expansion header for optional second digital microphone
- Move power-midi board connector J11 north by 2.54mm (to align with new power-midi board)
- Revise ferrite beads (some unnecessary)
- Revise 3.3V versus 3.3VA (3.3VA and GND now reserved for audio and codec only, 3.3V and GND for digital and now also for STM32 ADC/DAC), add dedicated pins for 3.3VA and GND in the codec section, should they be required for your shenanigans.
- Add H3_P25 and H3_P26 so that 3.3V is available on the right header.
- Make 5V available on the left header.
- Add current sensing resistors to 5V in, USB port in, and USB host out, to be able to measure current requirements.
- Add MIDI out circuit. MIDI output can now be used out of the box by connecting a connector to the header.
- Add optional MIDI in circuit on the back side of the PCB. Users can solder the respective parts and get MIDI input by soldering a DIN or TRS connector to the header.

v0.4 done -- prototype ordered 2023/08/11

Changes in v0.4:

- Change R43 (MIDI out) from 220R to 100R.
- Adjust 3.3V zone around U2 (3.3V regulator).
- Adjust keepout zone around Y1 (8Mhz crystal).
- Move USB sockets north by 0.5mm to let them poke through panels. Note that this will increase overall Y-dimension of the board to ca. 90mm.
- Add SPILINK master/sync jumper (JP1) and "Multiprocessor Sync" header (X4). RESERVED for future SPILINK implementation. Leave as is for regular use.
- Change header pinout so that related pins are next to each other:
 - * H3: Move SD card pins together. Move PF6..9 pins so that they are together with the other GPDIO pins.
 - * Move MIDI-related pins together.
 - * Move SW1, SW2 position and header pins together.
 - * Align pins in order where possible (PA0..3, PA4..7 etc.)
- Add 10k pull-down resistor to Switch 2.

v0.5 done -- ordered 2023/09/22

Changes in v0.5:

- Remove PDM mic, add optional gyroscope/acceleroscope via I2C2.
- Rename MIDI pins to Mlx, MOx.
- Fix swapped labeling of LED1 and LED2 to conform with Axo tradition. Rename LED pins to L1G and L2R to indicate color.
- Add 47uF caps C38, C40 to 3.3V rail for more stability when USB or external power is (accidentally) unplugged

Sheet: /changelog/
File: changelog.kicad_sch

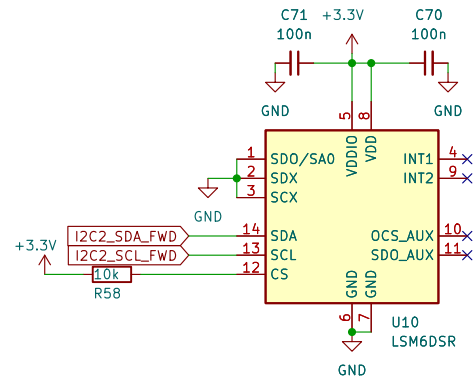
Title: Ksoloti Core

Size: A4 Date: 2023-08-21

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Sheet: /gyroscope/
 File: gyroscope.kicad_sch

Title: Ksoloti Core

Size: A4 Date: 2023-08-21

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