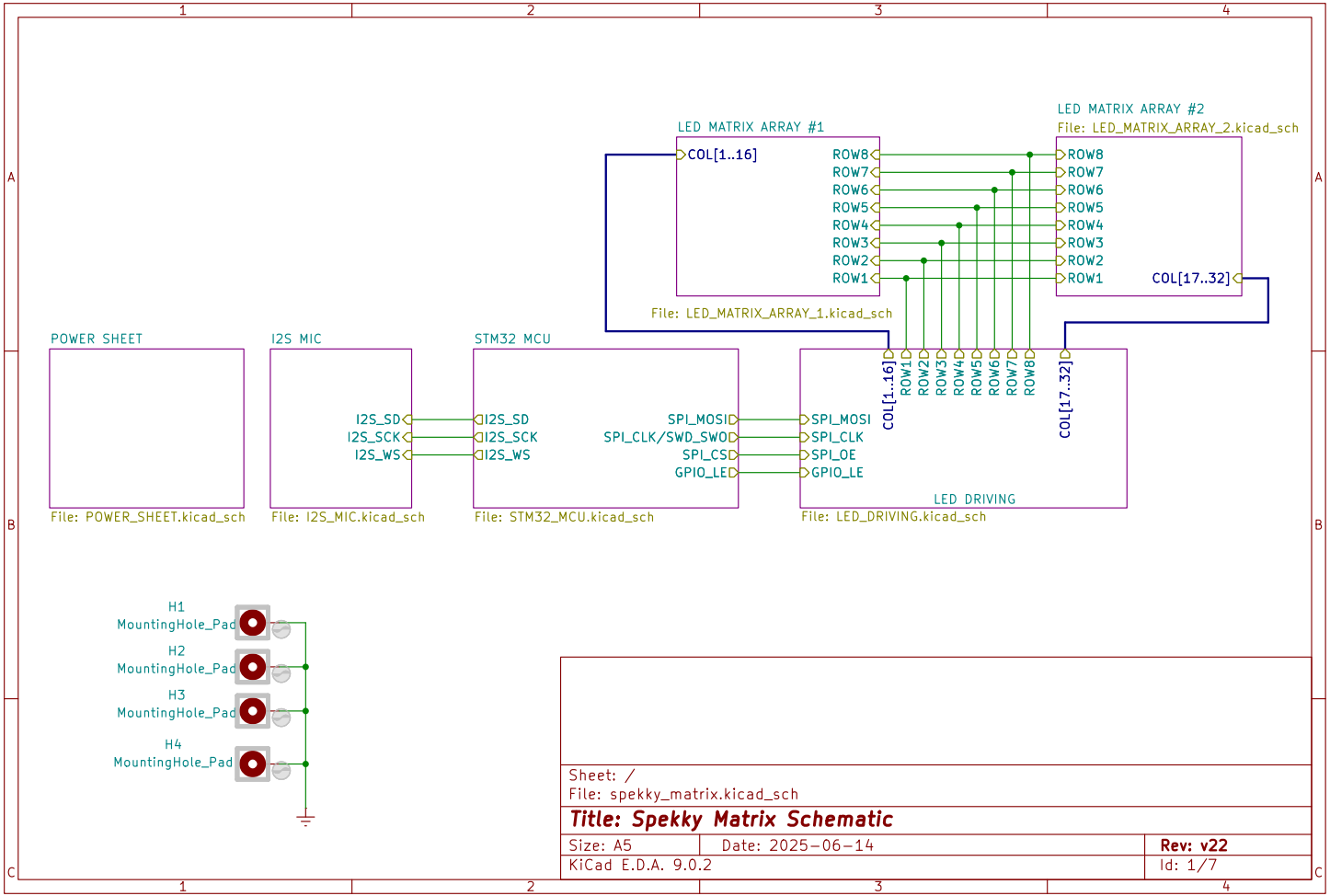
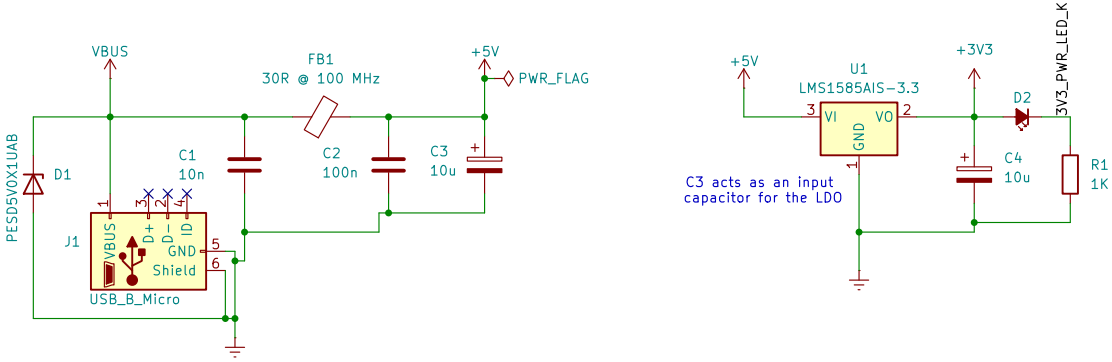

LED MATRIX ARRAY #1
COL[1..16]
ROW8
ROW7
ROW6
ROW5
ROW4
ROW3
ROW2
ROW1
File: LED_MATRIX_ARRAY_1.kicad_sch
LED MATRIX ARRAY #2
File: LED_MATRIX_ARRAY_2.kicad_sch
ROW8
ROW7
ROW6
ROW5
ROW4
ROW3
ROW2
ROW1
COL[17..32]
POWER SHEET
File: POWER_SHEET.kicad_sch
I2S MIC
I2S_SD
I2S_SCK
I2S_WS
File: I2S_MIC.kicad_sch
STM32 MCU
I2S_SD
I2S_SCK
I2S_WS
SPI_MOSI
SPI_CLK/SWD_SWO
SPI_CS
GPIO_LE
File: STM32_MCU.kicad_sch
COL[1..16]
ROW1
ROW2
ROW3
ROW4
ROW5
ROW6
ROW7
ROW8
COL[17..32]
SPI_MOSI
SPI_CLK
SPI_OE
GPIO_LE
LED DRIVING
File: LED_DRIVING.kicad_sch
H1
MountingHole_Pad
H2
MountingHole_Pad
H3
MountingHole_Pad
H4
MountingHole_Pad
Sheet: /
File: spekky_matrix.kicad_sch
Title: Spekky Matrix Schematic
Size: A5
Date: 2025-06-14
Rev: v22
KiCad E.D.A. 9.0.2
Id: 1/7

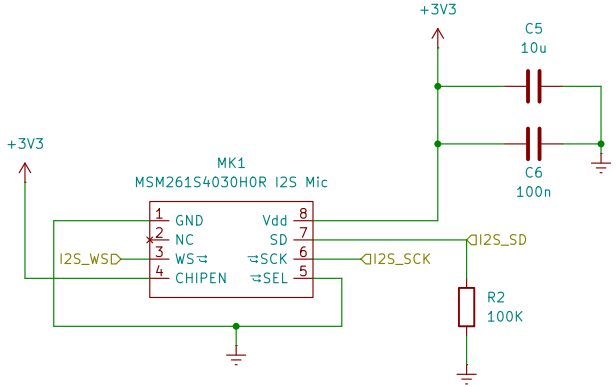


All things power related

Sheet: /POWER SHEET/
File: POWER_SHEET.kicad_sch

Title: Power Sheet

Size: A5	Date: 2025-05-21	**Rev: v07**
KiCad E.D.A. 9.0.2		Id: 2/7

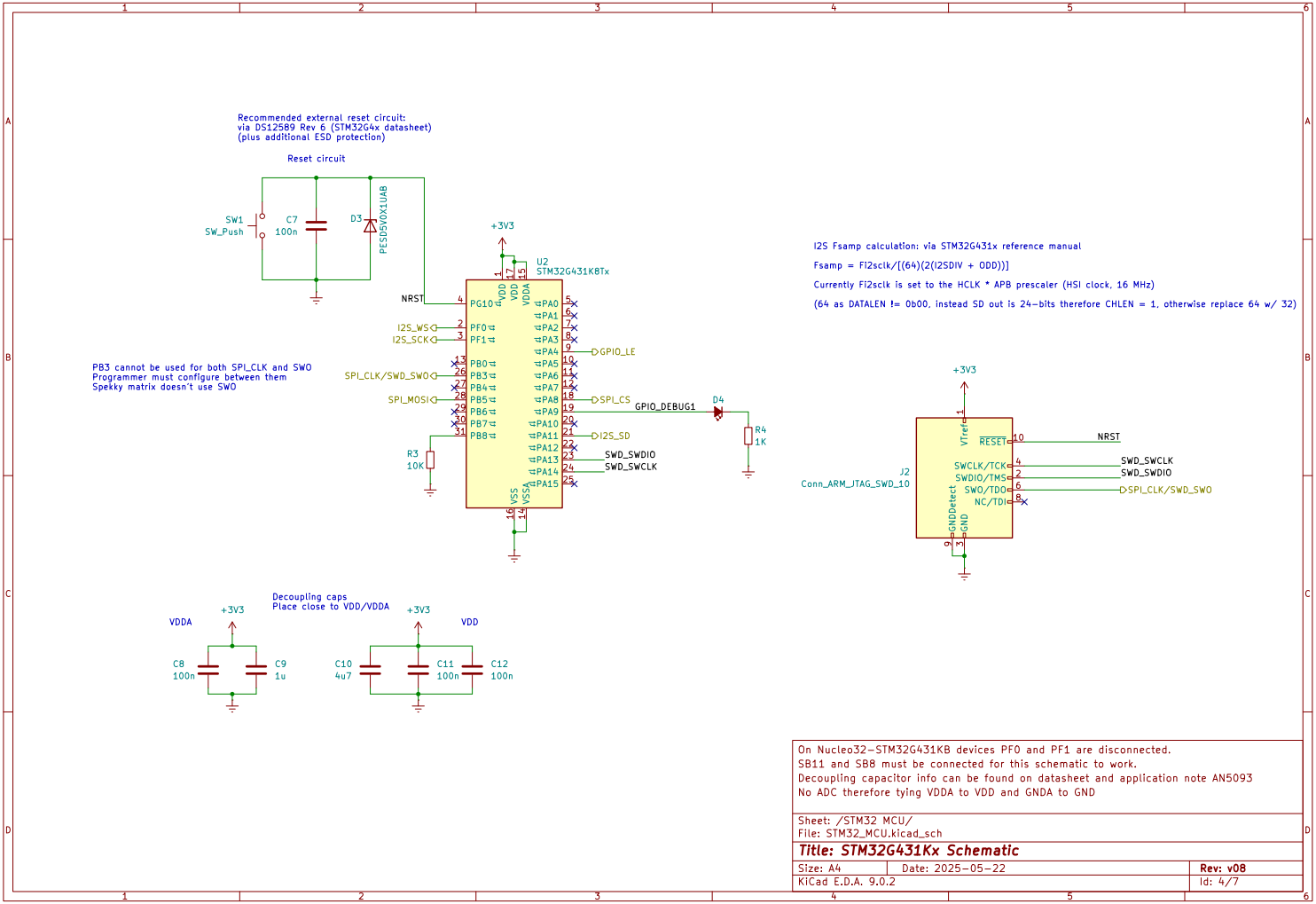


Same as Fermion I2S mic breakout board

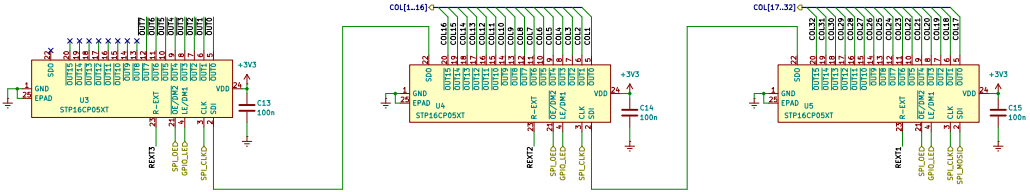
Sheet: /I2S MIC/
File: I2S_MIC.kicad_sch

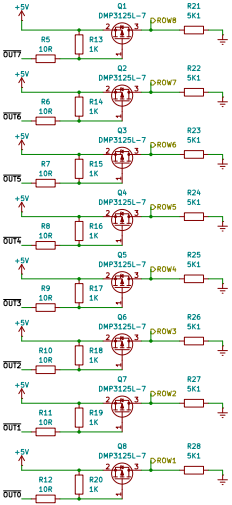
Title: I2S Mic

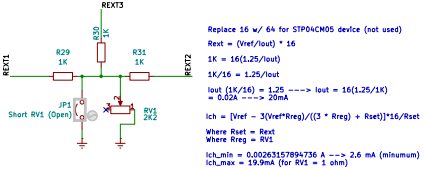
Size: A5	Date: 2025-05-21	**Rev: v02**
KiCad E.D.A. 9.0.2		Id: 3/7


Recommended external reset circuit:
via DS12589 Rev 6 (STM32G4x datasheet)
(plus additional ESD protection)
Reset circuit
SW1
SW_Push
C7
100n
D3
PESD5V0X1UAB
NRST
+3V3
U2
STM32G431KBTx
PG10
PF0
PF1
I2S_WS
I2S_SCK
PB0
PB3
PB4
PB5
PB6
PB7
PB8
SPI_CLK/SWD_SWO
SPI_MOSI
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
PA8
PA9
PA10
PA11
PA12
PA13
PA14
PA15
GPIO_LE
SPI_CS
I2S_SD
SWD_SWDIO
SWD_SWCLK
VDD
VDDA
VSS
VSSA
GPIO_DEBUG1
D4
R4
1K
R3
10K
PB3 cannot be used for both SPI_CLK and SWO
Programmer must configure between them
Spekky matrix doesn't use SWO
I2S Fsamp calculation: via STM32G431x reference manual
Fsamp = Fi2sclk/[(64)(2(I2SDIV + ODD))]
Currently Fi2sclk is set to the HCLK * APB prescaler (HSI clock, 16 MHz)
(64 as DATALEN != 0b00, instead SD out is 24-bits therefore CHLEN = 1, otherwise replace 64 w/ 32)
+3V3
J2
Conn_ARM_JTAG_SWD_10
VTref
RESET
SWCLK/TCK
SWDIO/TMS
SWO/TDO
NC/TDI
GNDDetect
GND
NRST
SWD_SWCLK
SWD_SWDIO
SPI_CLK/SWD_SWO
Decoupling caps
Place close to VDD/VDDA
VDDA
+3V3
C8
100n
C9
1u
VDD
+3V3
C10
4u7
C11
100n
C12
100n
On Nucleo32-STM32G431KB devices PF0 and PF1 are disconnected.
SB11 and SB8 must be connected for this schematic to work.
Decoupling capacitor info can be found on datasheet and application note AN5093
No ADC therefore tying VDDA to VDD and GNDA to GND
Sheet: /STM32 MCU/
File: STM32_MCU.kicad_sch
Title: STM32G431Kx Schematic
Size: A4
Date: 2025-05-22
Rev: v08
KiCad E.D.A. 9.0.2
Id: 4/7

Cascade Direction
Last (in chain) <--- First (in chain)







STP16CP05 based cascaded LED matrices

Sheet: /LED DRIVING/
File: LED_DRIVING.kicad_sch

Title: 8x32 LED Matrix

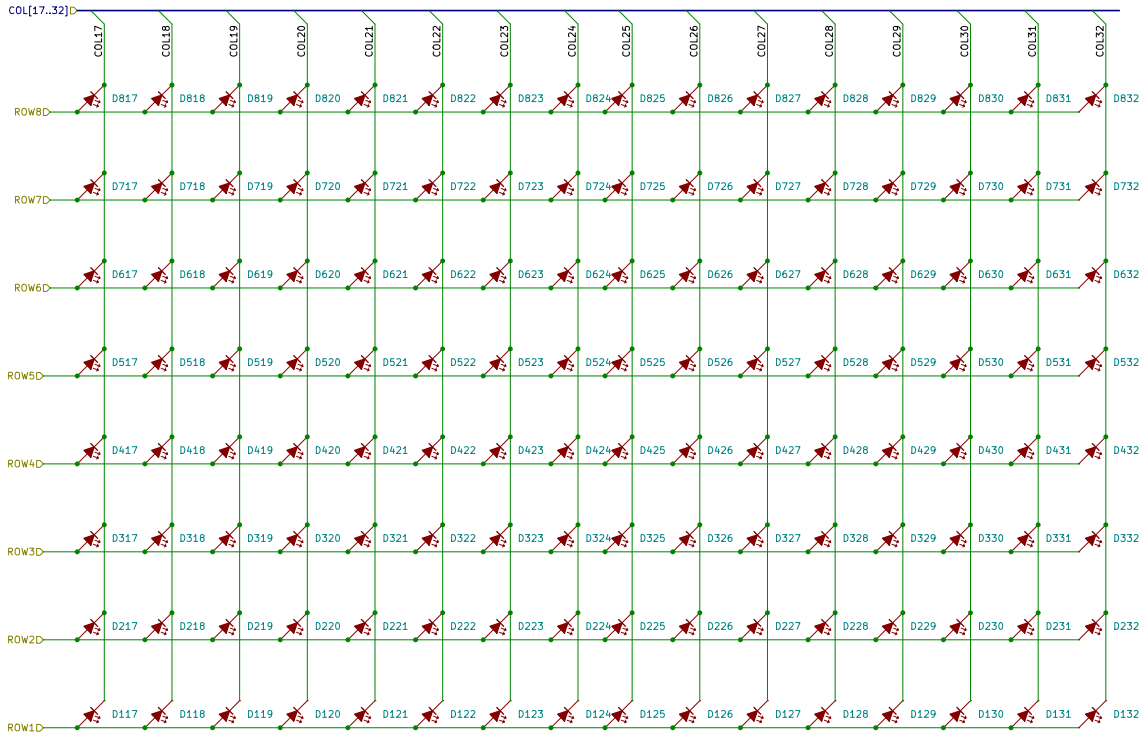
Size: A3	Date: 2025-06-14	Rev: v06
KiCad E.D.A. 9.0.2		Id: 5/7

8x16 matrix

Sheet: /LED MATRIX ARRAY #1/
File: LED_MATRIX_ARRAY_1.kicad_sch

Title: LED Matrix #1

Size: A4	Date: 2024-11-23	**Rev: v01**
KiCad E.D.A. 9.0.2		Id: 6/7



8x16 matrix

Sheet: /LED MATRIX ARRAY #2/
File: LED_MATRIX_ARRAY_2.kicad_sch

Title: LED Matrix #2

Size: A4	Date: 2024-11-23	**Rev: v01**
KiCad E.D.A. 9.0.2		Id: 7/7