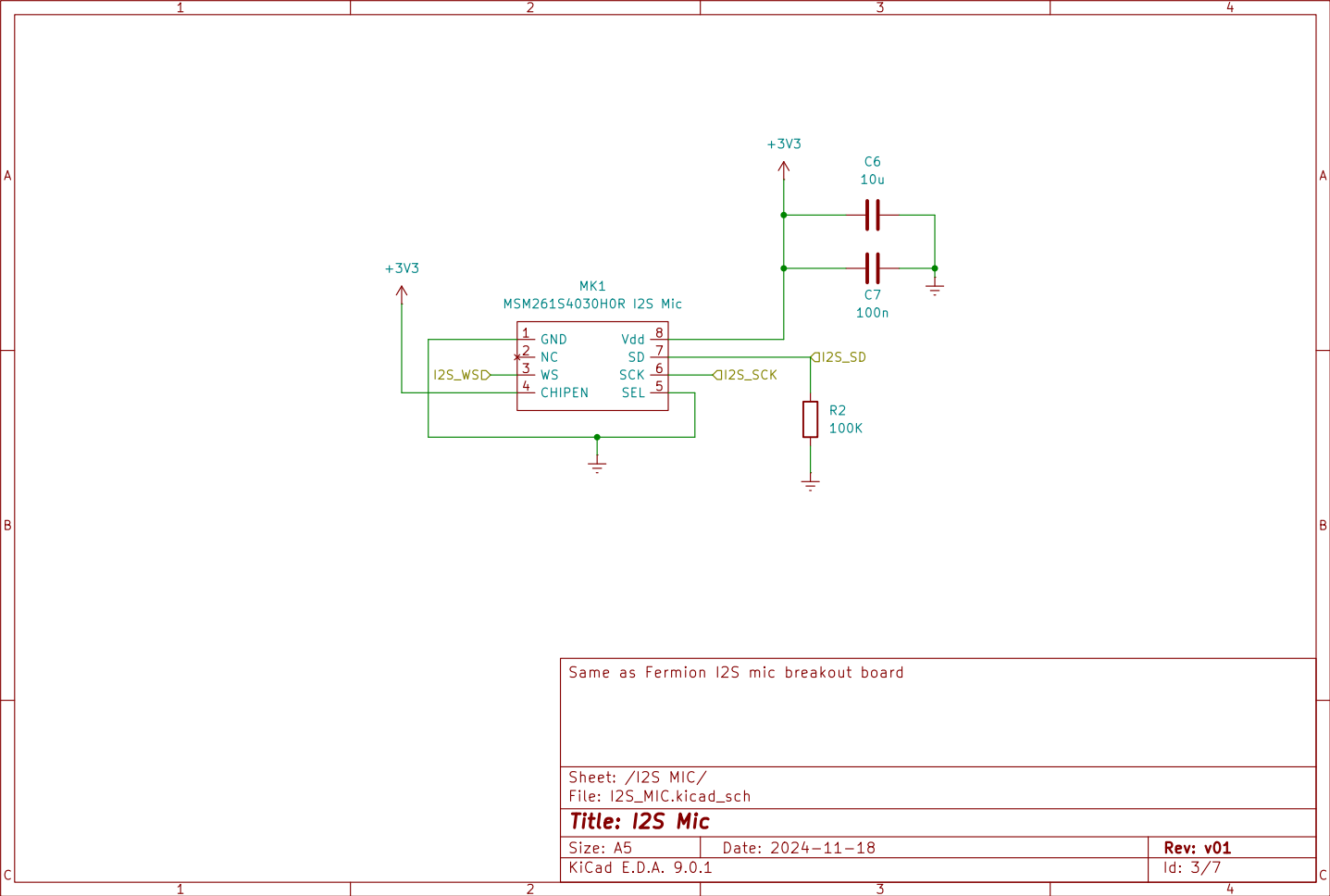


Sheet: /		
File: i2s_specky_matrix.kicad_sch		
Title: Specky Matrix Schematic		
Size: A5	Date: 2025-05-06	Rev: v17
KiCad E.D.A. 9.0.1		Id: 1/7



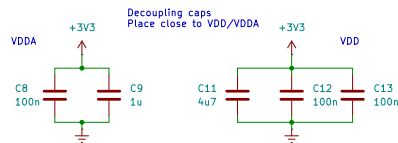
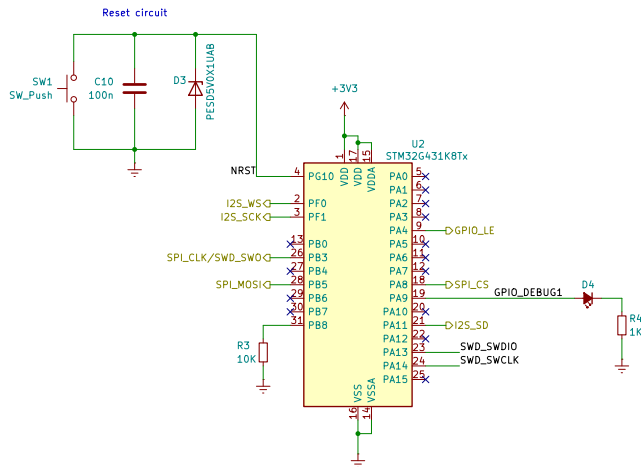
Same as Fermion I2S mic breakout board

Sheet: /I2S MIC/
File: I2S_MIC.kicad_sch

Title: I2S Mic

Size: A5 Date: 2024-11-18
KiCad E.D.A. 9.0.1

Rev: v01
Id: 3/7

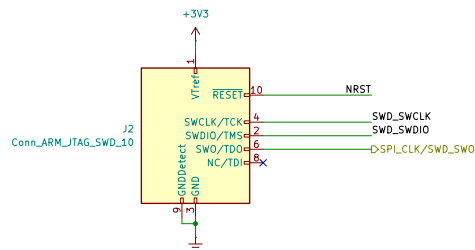


I2S Fsamp calculation: via STM32G431x reference manual

$$Fsamp = FI2sclock / [(64) \cdot (2 / (2SDIV + ODD))]]$$

Currently FI2sclock 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)



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 GND to GND

Sheet: /STM32 MCU/
File: STM32_MCU.kicad_sch

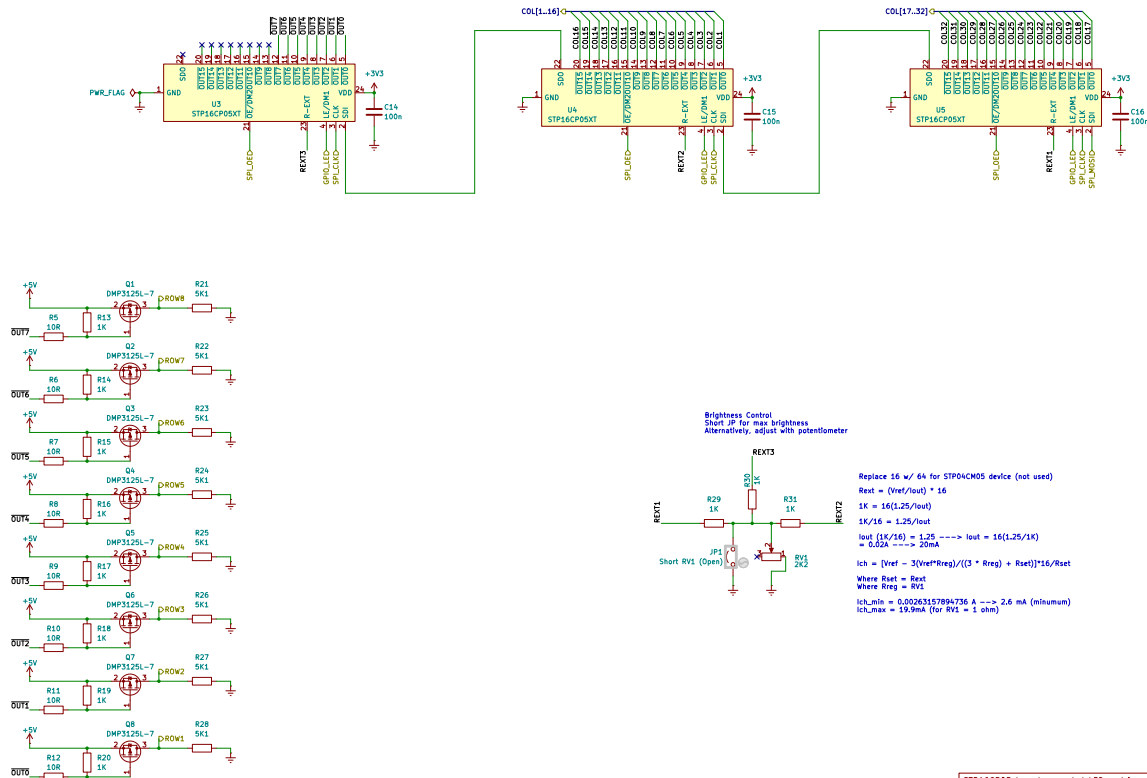
Title: STM32G431Kx Schematic

Size: A4 Date: 2025-05-06
KiCad E.D.A. 9.0.1

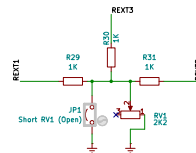
Rev: v05
Id: 4/7

Cascade Direction

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



Brightness Control
Short JP for max brightness
Alternatively, adjust with potentiometer



Replace 16 w/ 6k for STP04CH05 device (not used)
 $R_{set} = (V_{ref}/I_{out}) * 16$
 $1K = 16(1.25/I_{out})$
 $1K/16 = 1.25/I_{out}$
 $I_{out} (1K/16) = 1.25 \rightarrow I_{out} = 16(1.25/1K)$
 $= 0.02A \rightarrow 20mA$
 $I_{ch} = [V_{ref} - 3(V_{ref}/R_{reg})]/[(3 * R_{reg}) + R_{set}]/16/R_{set}$
 Where $R_{set} = R_{set}$
 Where $R_{reg} = Rv1$
 $I_{ch_min} = 0.00263157894736 A \rightarrow 2.6 mA$ (minimum)
 $I_{ch_max} = 19.9mA$ (for $Rv1 = 1 ohm$)

STP16CP05 based cascaded LED matrices

Sheet: /LED DRIVING/

File: LED_DRIVING.kicad_sch

Title: 8x32 LED Matrix

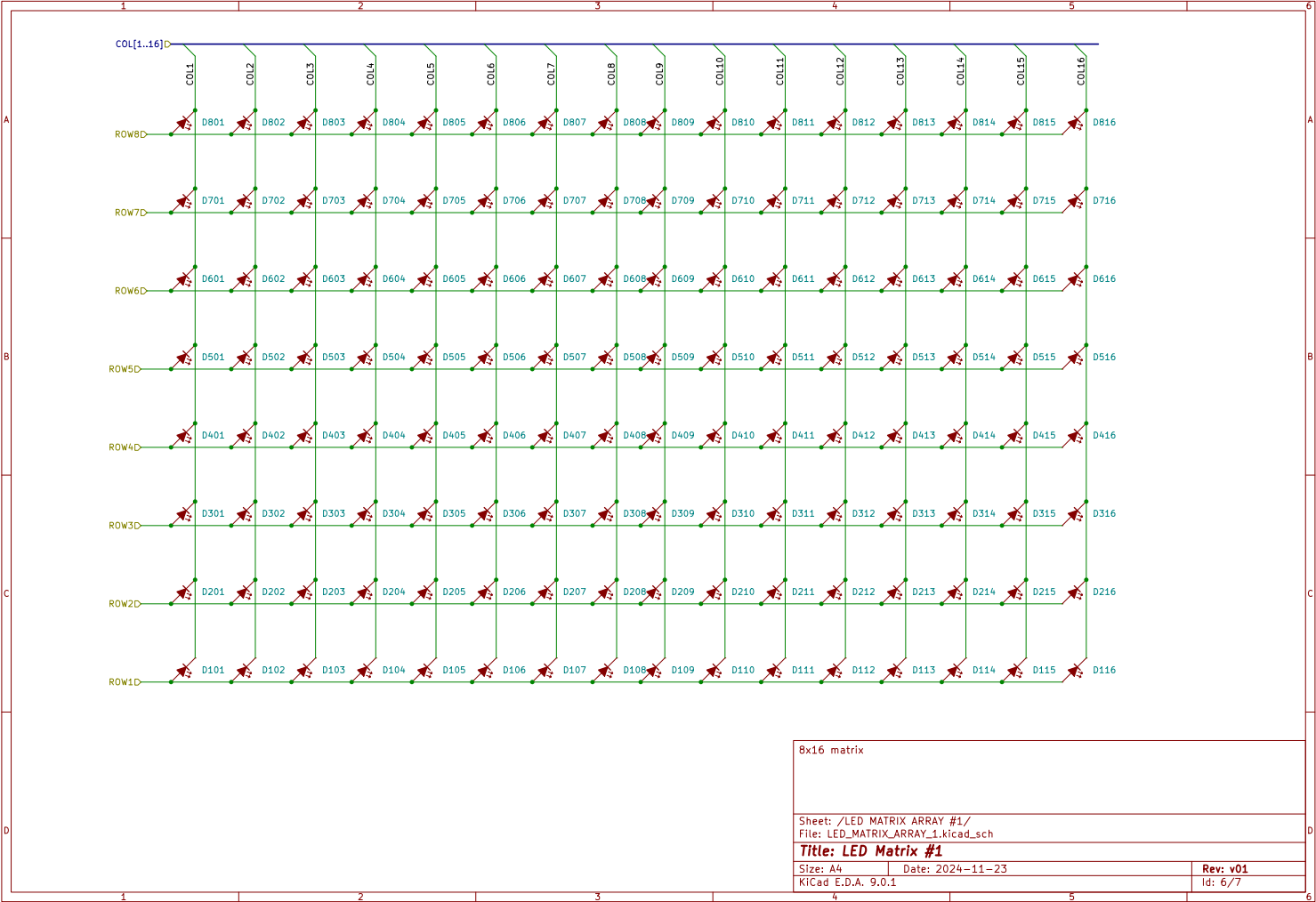
Site: A3

Date: 2024-11-24

KiCad E.D.A. 9.0.1

Rev: v03

Id: 5/7



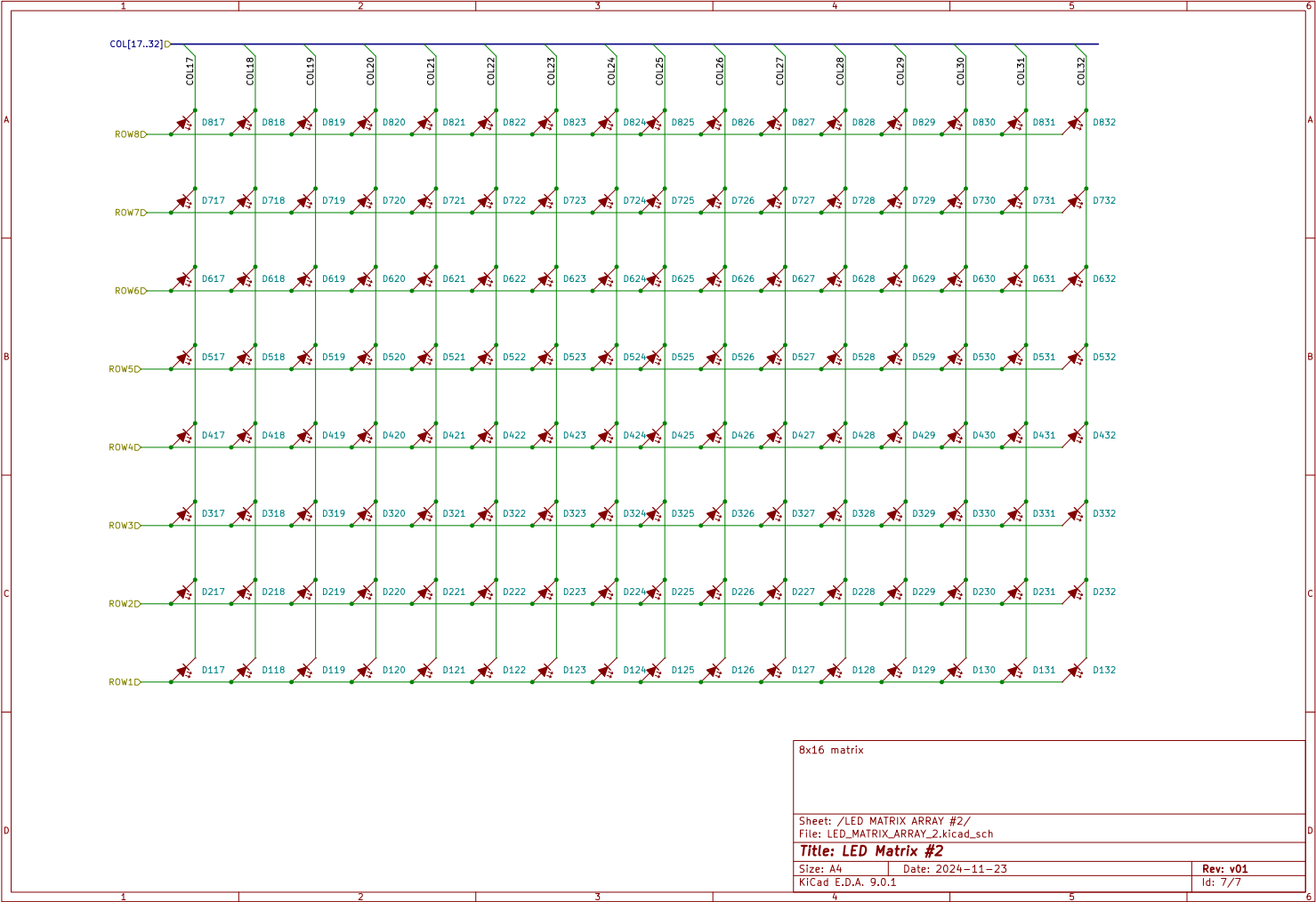
8x16 matrix

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

Title: LED Matrix #1

Size: A4 Date: 2024-11-23
KiCad E.D.A. 9.0.1

Rev: v01
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
KiCad E.D.A. 9.0.1

Rev: v01
Id: 7/7