

All things power related

Sheet: /POWER SHEET/
File: POWER_SHEET.kicad_sch

Title: Power Sheet

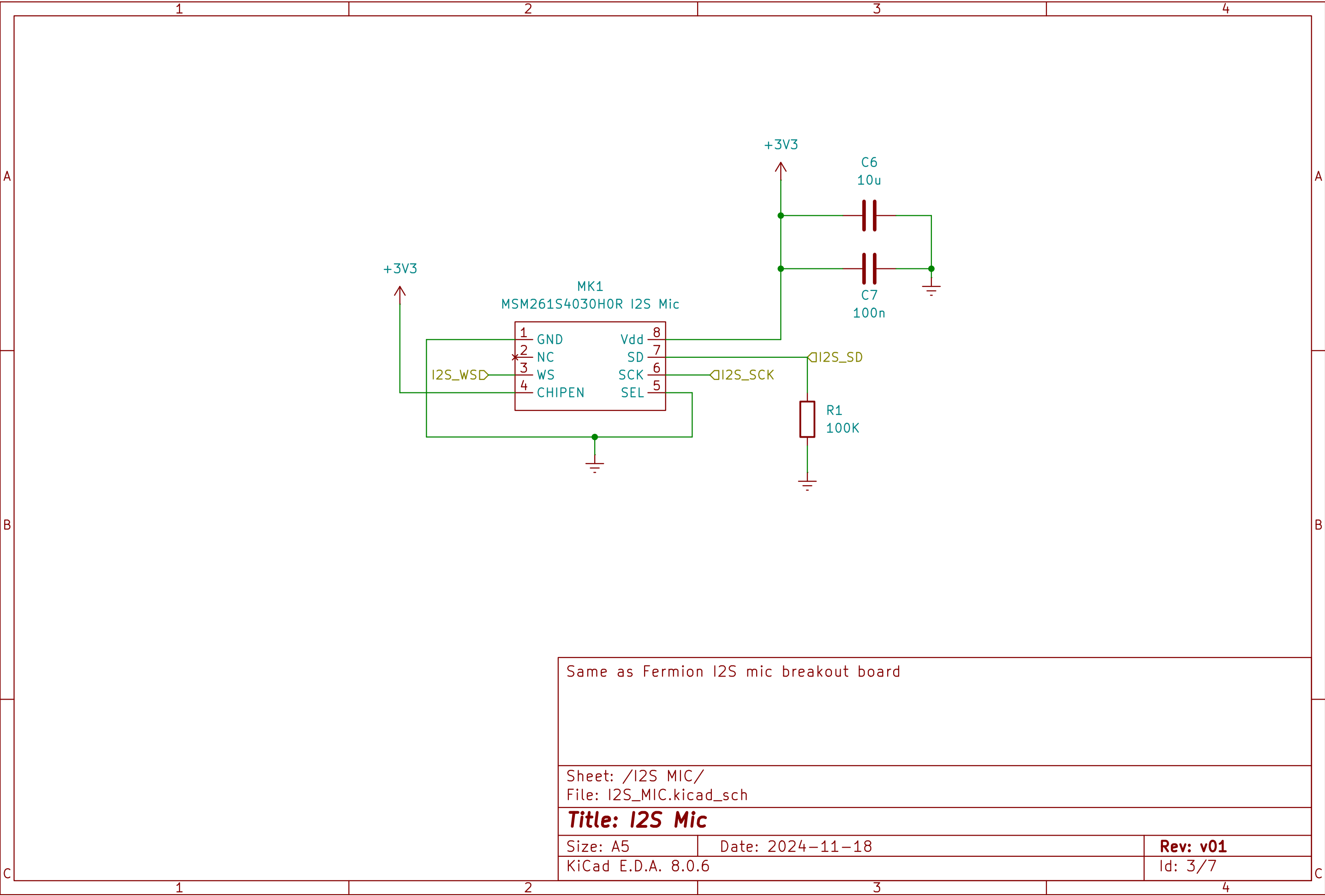
Size: A5

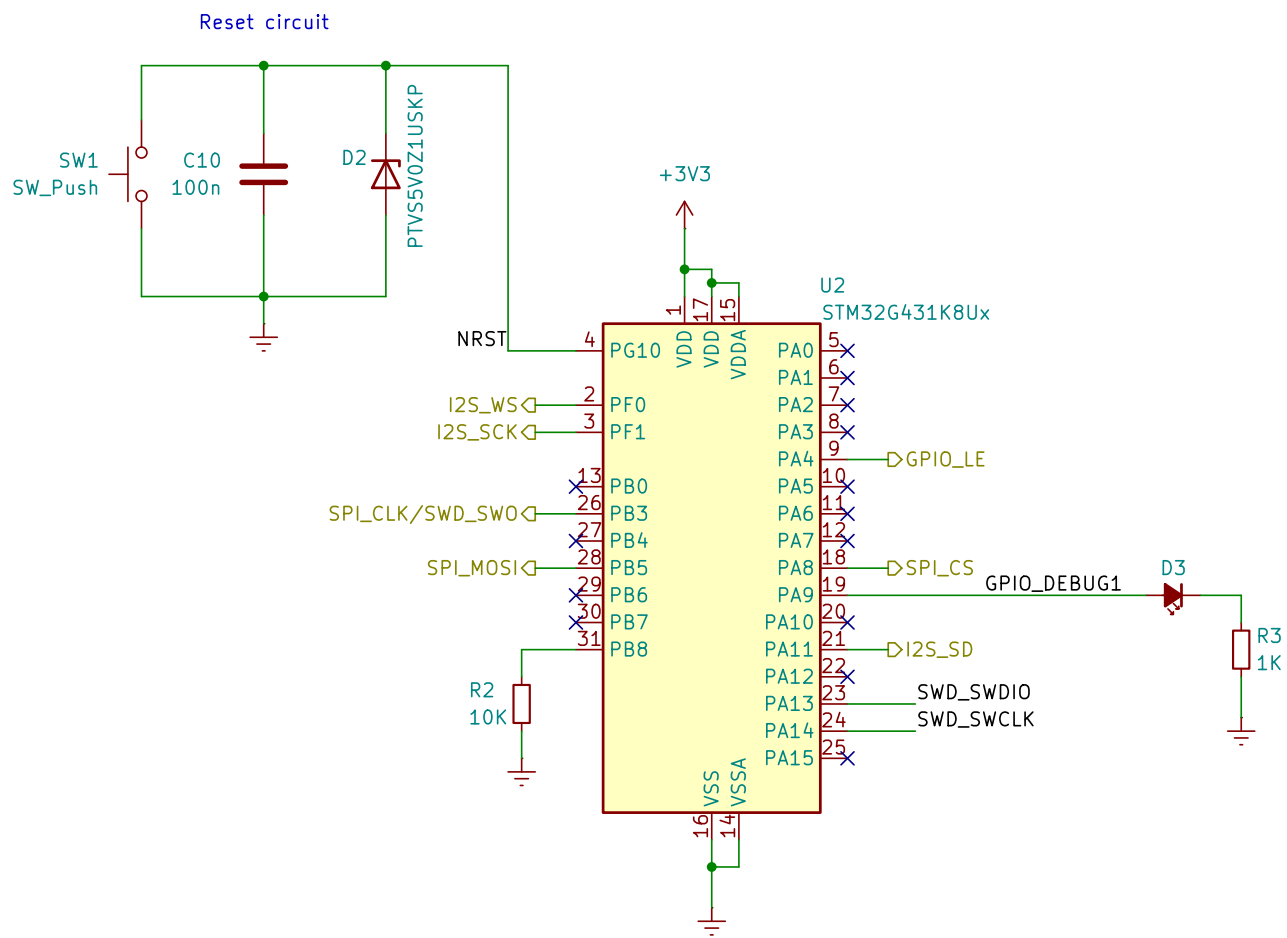
Date: 2024-11-26

Rev: v03

KiCad E.D.A. 8.0.6

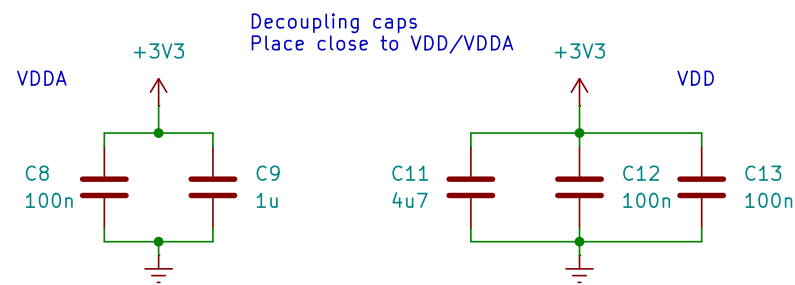
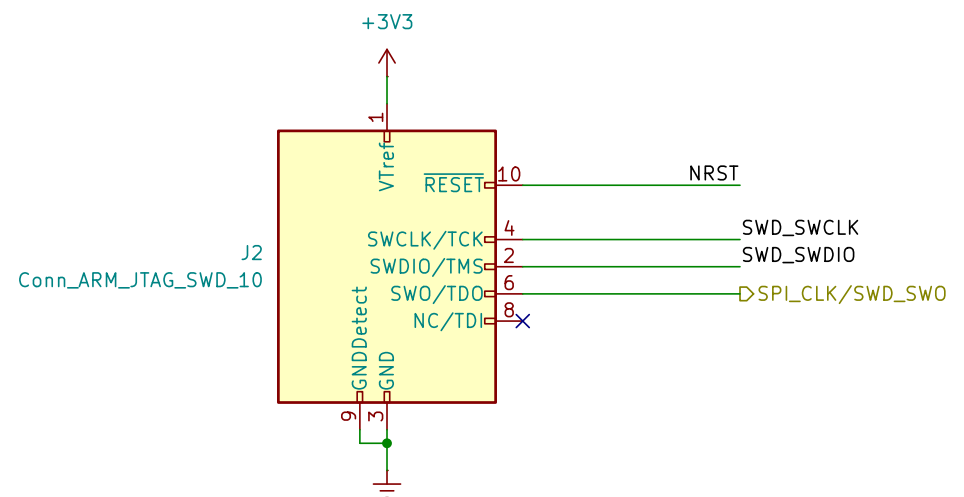
Id: 2/7





I2S Fsamp calculation: via STM32G431x reference manual
$$Fsamp = \frac{Fi2sclk}{[(64)(2(I2SDIV + ODD))]}$$

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)



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: STM32G431KB Schematic

Size: A4	Date: 2024-11-24	Rev: v03
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Cascade Direction
Last (in chain) <--- First (in chain)

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

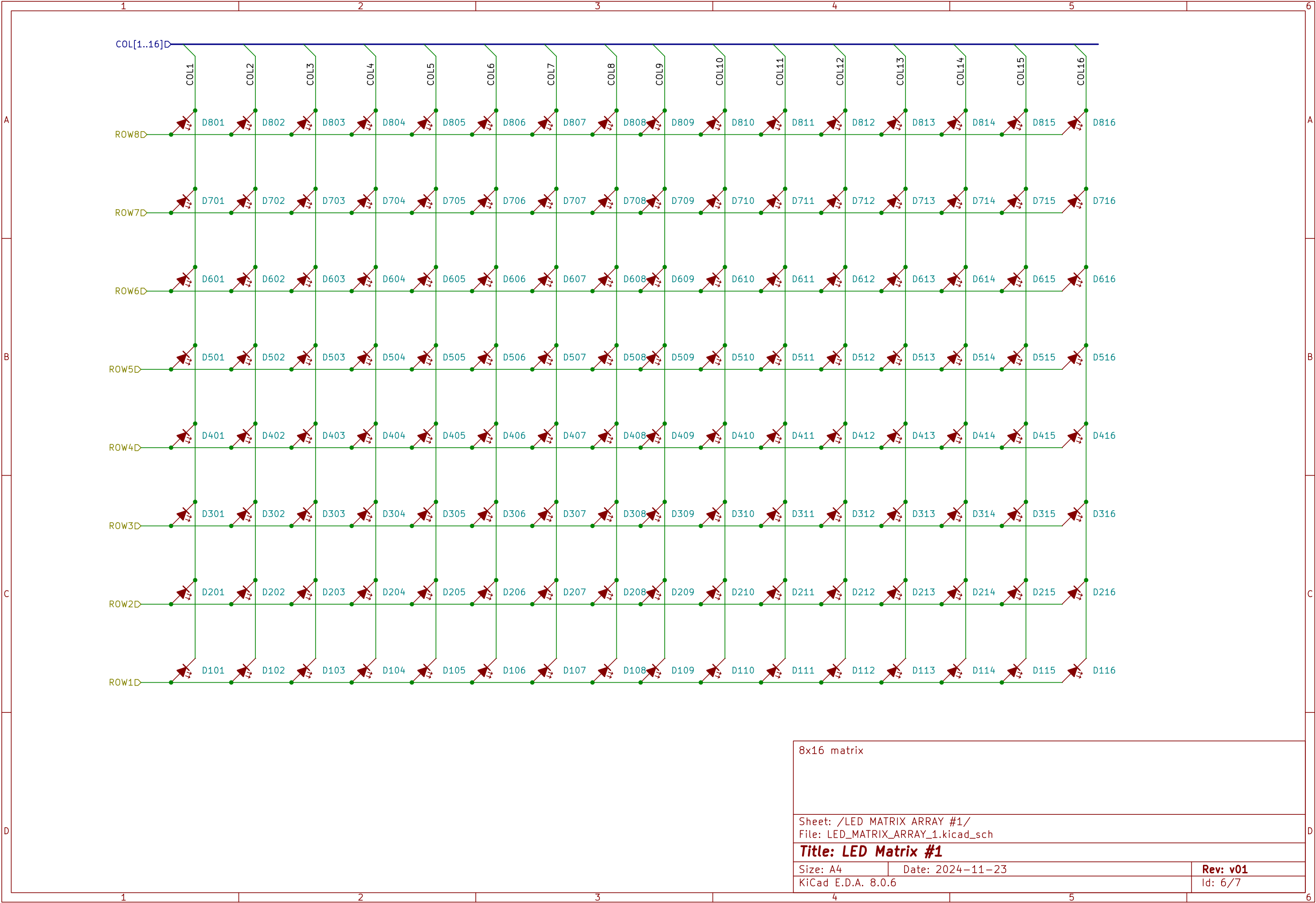
Replace 16 w/ 64 for STP04CM05 device (not used)
 $R_{ext} = (V_{ref}/I_{out}) * 16$
 $1K = 16(1.25/I_{out})$
 $1K/16 = 1.25/I_{out}$
 $I_{out} (1K/16) = 1.25 \rightarrow I_{out} = 16(1.25/1K)$
 $= 0.02A \rightarrow 20mA$

$I_{ch} = [V_{ref} - 3(V_{ref}*R_{reg})/((3 * R_{reg}) + R_{set})]*16/R_{set}$
Where $R_{set} = R_{ext}$
Where $R_{reg} = RV1$

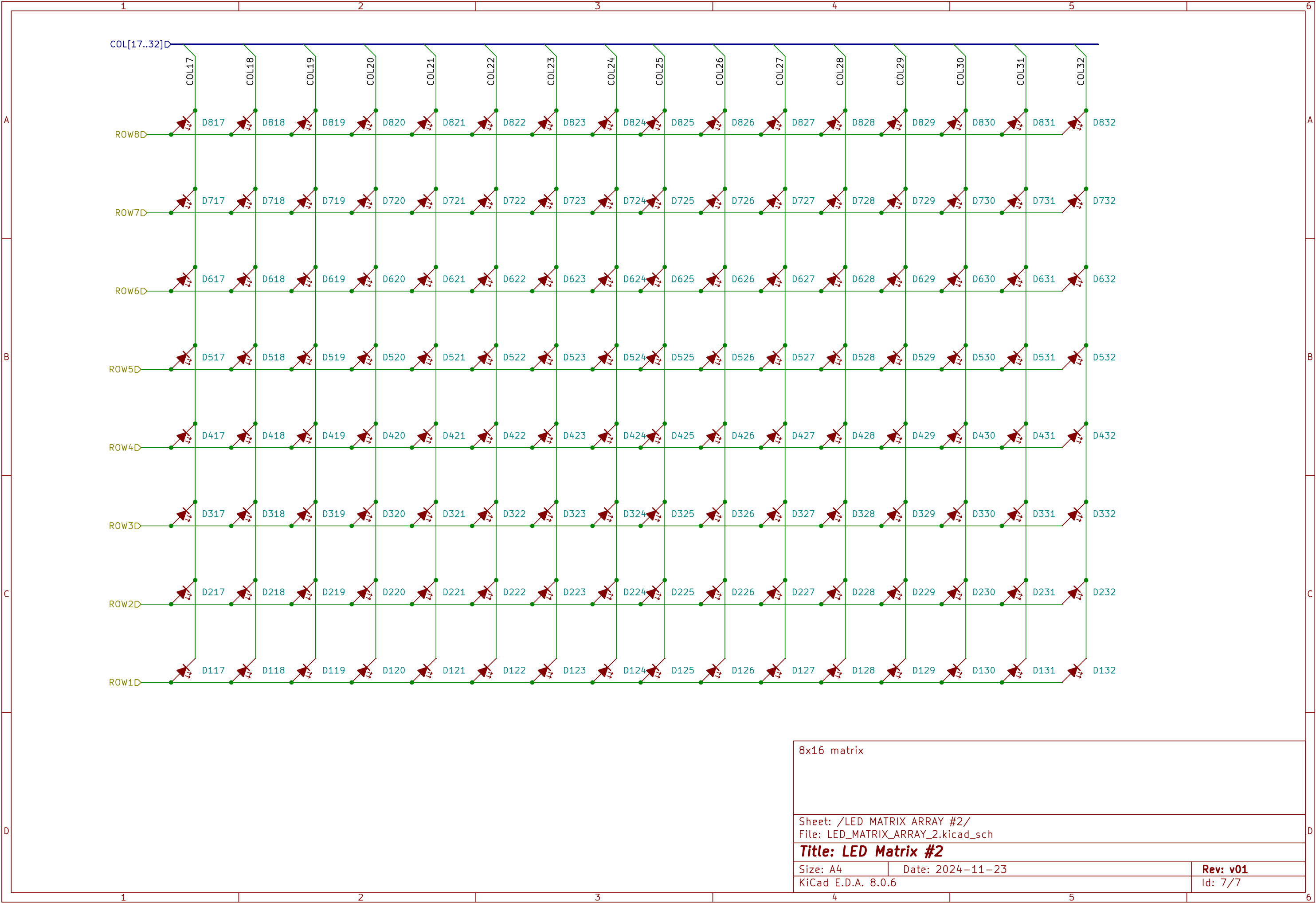
$I_{ch_min} = 0.00263157894736 A \rightarrow 2.6 mA$ (minimum)
 $I_{ch_max} = 19.9mA$ (for $RV1 = 1 ohm$)

STP16CP05 based cascaded LED matrices		
Sheet: /LED DRIVING/ File: LED_DRIVING.kicad_sch		
Title: 8x32 LED Matrix		
Size: A3	Date: 2024-11-24	Rev: v03
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STP16CP05 based cascaded LED matrices	
Sheet: /LED DRIVING/ File: LED_DRIVING.kicad_sch	
Title: 8x32 LED Matrix	
Size: A3	Date: 2024-11-24
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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
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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. 8.0.6		Id: 7/7