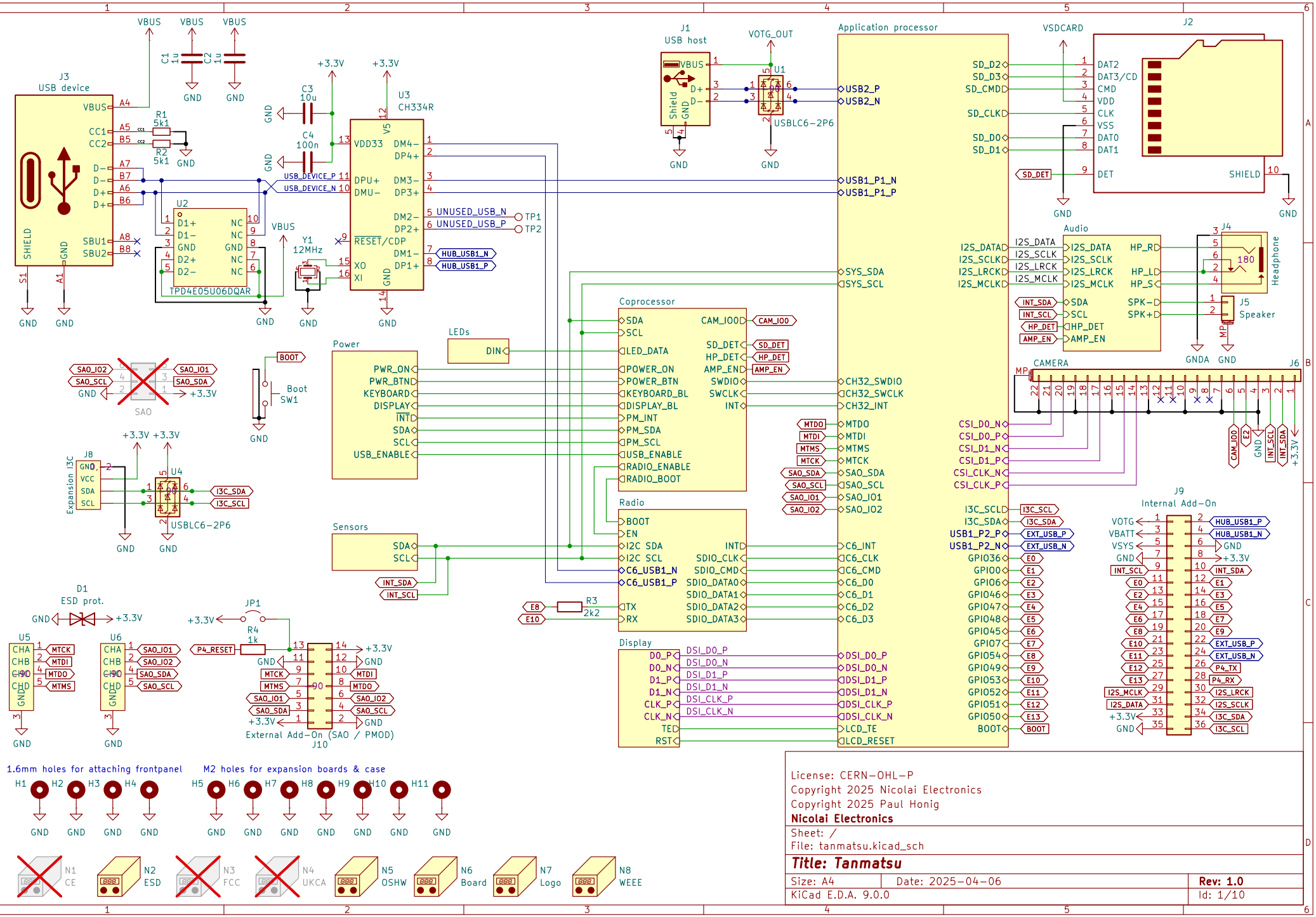
J3
USB device
J1
USB host
U1
USBLC6-2P6
U2
TPD4E05U06DQAR
U3
CH334R
Y1
12MHz
R1
5k1
R2
5k1
C1
1u
C2
1u
C3
10u
C4
100n
Application processor
USB2_P
USB2_N
USB1_P1_N
USB1_P1_P
SYS_SDA
SYS_SCL
CH32_SWDIO
CH32_SWCLK
CH32_INT
VSDCARD
J2
SD_D2
SD_D3
SD_CMD
SD_CLK
SD_D0
SD_D1
SD_DET
Audio
I2S_DATA
I2S_SCLK
I2S_LRCK
I2S_MCLK
HP_R
HP_L
HP_S
SPK-
SPK+
J4
Headphone
J5
Speaker
CAMERA
J6
CSI_D0_N
CSI_D0_P
CSI_D1_N
CSI_D1_P
CSI_CLK_N
CSI_CLK_P
Coprocessor
Power
LEDs
Radio
Sensors
Display
Boot
SW1
SAO
J8
Expansion I3C
USBLC6-2P6
D1
ESD prot.
U5
U6
JP1
R4
1k
R3
2k2
External Add-On (SAO / PMOD)
J10
J9
Internal Add-On
1.6mm holes for attaching frontpanel
M2 holes for expansion boards & case
H1
H2
H3
H4
H5
H6
H7
H8
H9
H10
H11
N1
CE
N2
ESD
N3
FCC
N4
UKCA
N5
OSHW
N6
Board
N7
Logo
N8
WEEE
License: CERN-OHL-P
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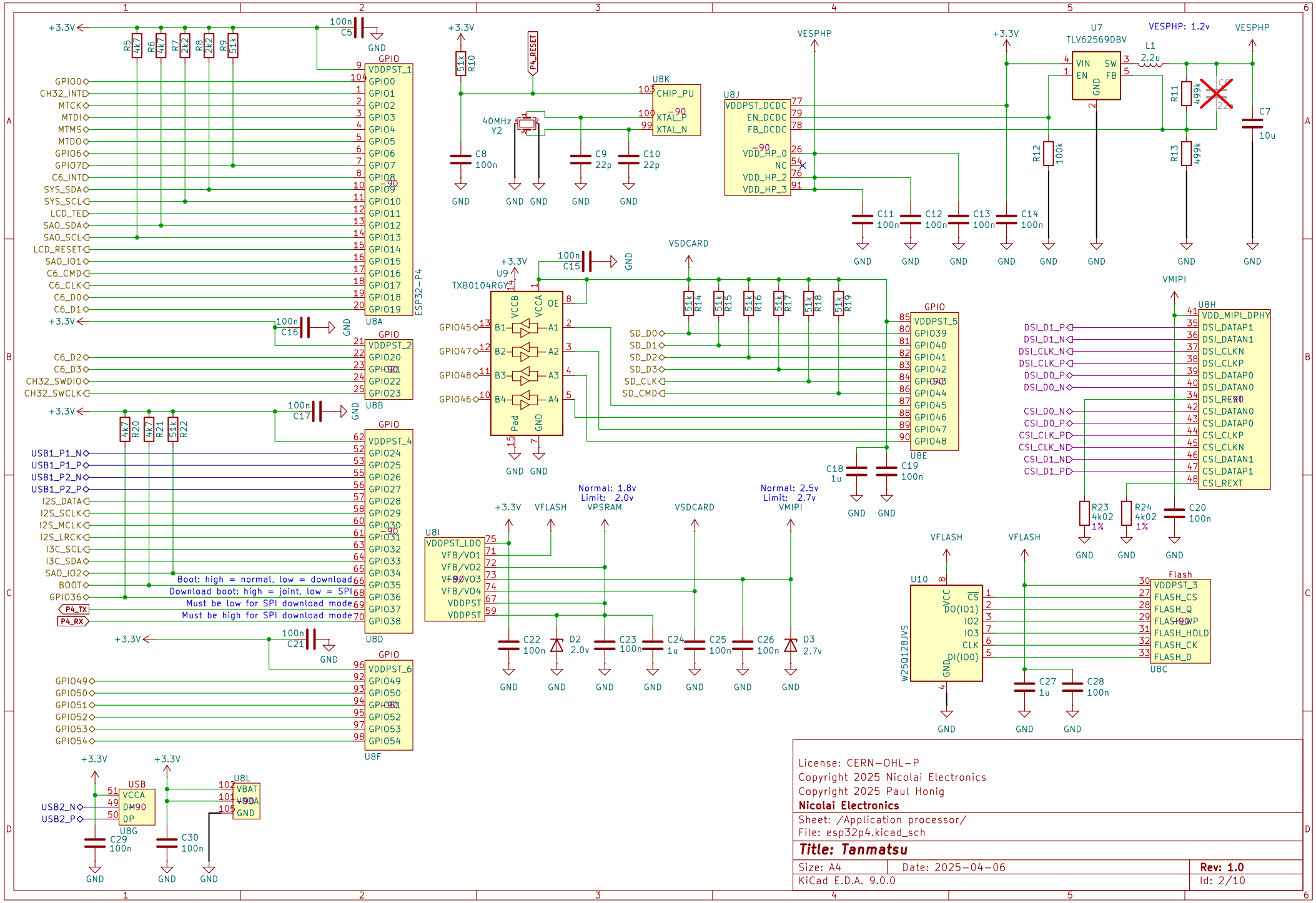
Nicolai Electronics
Sheet: /
File: tanmatsu.kicad_sch
Title: Tanmatsu
Size: A4
Date: 2025-04-06
Rev: 1.0
KiCad E.D.A. 9.0.0
Id: 1/10


+3.3V
R5 4k7
R6 4k7
R7 2k2
R8 2k2
R9 51k
100n C5
GND
GPIO
VDDPST_1
GPIO0
GPIO1
GPIO2
GPIO3
GPIO4
GPIO5
GPIO6
GPIO7
GPIO8
GPIO9
GPIO10
GPIO11
GPIO12
GPIO13
GPIO14
GPIO15
GPIO16
GPIO17
GPIO18
GPIO19
ESP32-P4
U8A
GPIO0
CH32_INT
MTCK
MTDI
MTMS
MTDO
GPIO6
GPIO7
C6_INT
SYS_SDA
SYS_SCL
LCD_TE
SAO_SDA
SAO_SCL
LCD_RESET
SAO_IO1
C6_CMD
C6_CLK
C6_D0
C6_D1
100n C16
VDDPST_2
GPIO20
GPIO21
GPIO22
GPIO23
U8B
C6_D2
C6_D3
CH32_SWDIO
CH32_SWCLK
100n C17
R20 4k7
R21 4k7
R22 51k
VDDPST_4
GPIO24
GPIO25
GPIO26
GPIO27
GPIO28
GPIO29
GPIO30
GPIO31
GPIO32
GPIO33
GPIO34
GPIO35
GPIO36
GPIO37
GPIO38
U8D
USB1_P1_N
USB1_P1_P
USB1_P2_N
USB1_P2_P
I2S_DATA
I2S_SCLK
I2S_MCLK
I2S_LRCK
I3C_SCL
I3C_SDA
SAO_IO2
BOOT
GPIO36
P4_TX
P4_RX
Boot: high = normal, low = download
Download boot: high = joint, low = SPI
Must be low for SPI download mode
Must be high for SPI download mode
100n C21
VDDPST_6
GPIO49
GPIO50
GPIO51
GPIO52
GPIO53
GPIO54
U8F
USB
VCCA
DM90
DP
U8G
USB2_N
USB2_P
C29 100n
C30 100n
U8L
VBAT
VDDA
GND
51k R10
P4_RESET
U8K
CHIP_PU
XTAL_P
XTAL_N
40MHz Y2
C8 100n
C9 22p
C10 22p
U8J
VDDPST_DCDC
EN_DCDC
FB_DCDC
VDD_HP_0
NC
VDD_HP_2
VDD_HP_3
VESPHP
C11 100n
C12 100n
C13 100n
C14 100n
U7
TLV62569DBV
VIN
SW
EN
FB
L1 2.2u
R11 499k
R12 100k
R13 499k
C7 10u
VESPHP: 1.2v
U9
TXB0104RGY
VCCB
VCCA
OE
B1
B2
B3
B4
A1
A2
A3
A4
Pad
100n C15
VSDCARD
R14 51k
R15 51k
R16 51k
R17 51k
R18 51k
R19 51k
SD_D0
SD_D1
SD_D2
SD_D3
SD_CLK
SD_CMD
GPIO45
GPIO47
GPIO48
GPIO46
VDDPST_5
GPIO39
GPIO40
GPIO41
GPIO42
GPIO43
GPIO44
GPIO45
GPIO46
GPIO47
GPIO48
U8E
C18 1u
C19 100n
U8H
VDD_MIPI_DPHY
DSI_DATAP1
DSI_DATAN1
DSI_CLKN
DSI_CLKP
DSI_DATAP0
DSI_DATAN0
DSI_REXT
CSI_DATAN0
CSI_DATAP0
CSI_CLKP
CSI_CLKN
CSI_DATAN1
CSI_DATAP1
CSI_REXT
DSI_D1_P
DSI_D1_N
DSI_CLK_N
DSI_CLK_P
DSI_D0_P
DSI_D0_N
CSI_D0_N
CSI_D0_P
CSI_CLK_P
CSI_CLK_N
CSI_D1_N
CSI_D1_P
R23 4k02 1%
R24 4k02 1%
C20 100n
VMIPI
U8I
VDDPST_LDO
VFB/VO1
VFB/VO2
VFB/VO3
VFB/VO4
VDDPST
Normal: 1.8v
Limit: 2.0v
VPSRAM
Normal: 2.5v
Limit: 2.7v
VFLASH
C22 100n
D2 2.0v
C23 100n
C24 1u
C25 100n
C26 100n
D3 2.7v
U10
W25Q128JVS
CS
DO(IO1)
IO2
IO3
CLK
DI(IO0)
GND
VCC
Flash
VDDPST_3
FLASH_CS
FLASH_Q
FLASH_WP
FLASH_HOLD
FLASH_CK
FLASH_D
U8C
C27 1u
C28 100n
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Copyright 2025 Nicolai Electronics
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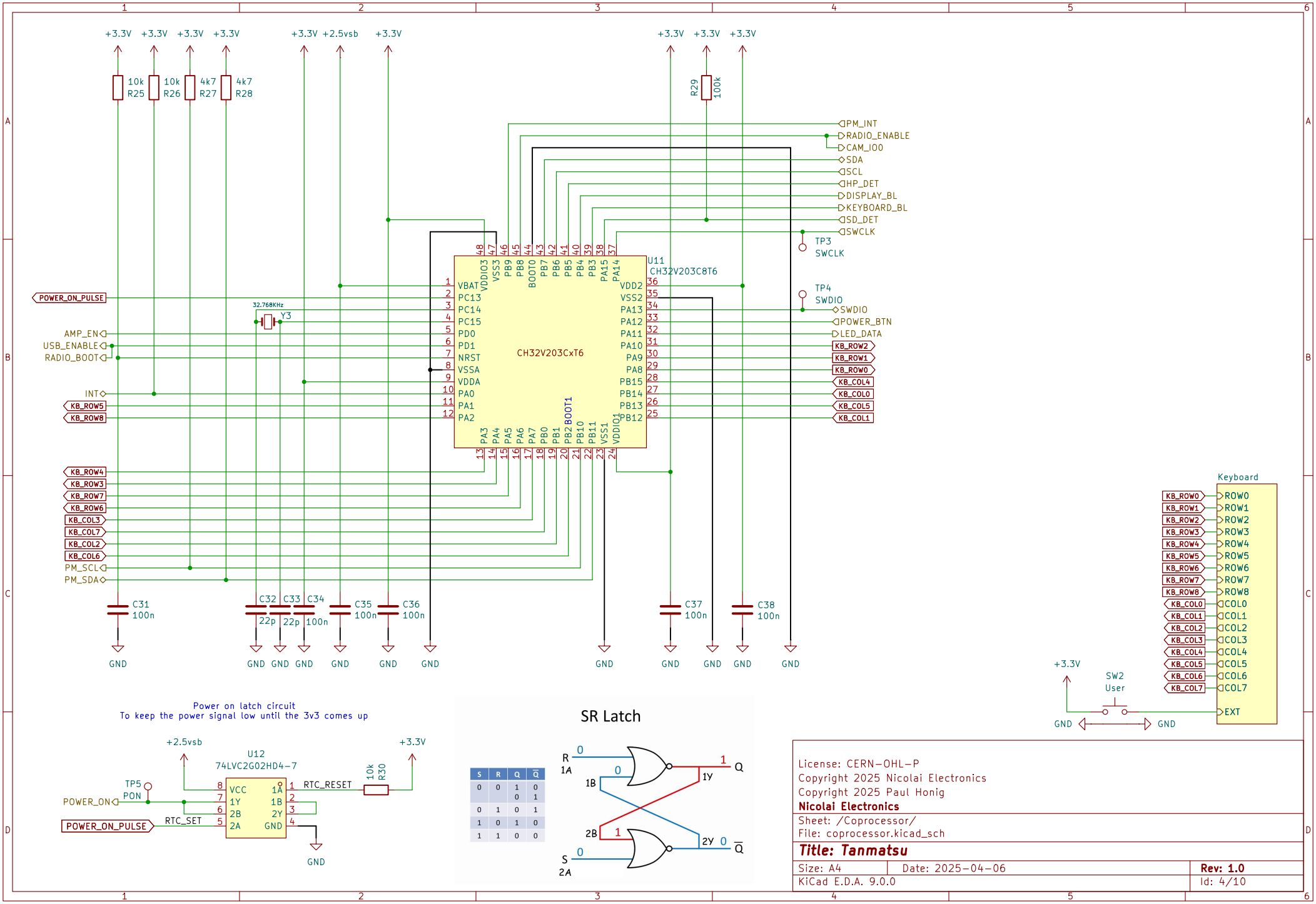
Nicolai Electronics
Sheet: /Application processor/
File: esp32p4.kicad_sch
Title: Tanmatsu
Size: A4
Date: 2025-04-06
Rev: 1.0
KiCad E.D.A. 9.0.0
Id: 2/10


+3.3V
10k R25
10k R26
4k7 R27
4k7 R28
+2.5vsb
R29 100k
PM_INT
RADIO_ENABLE
CAM_IO0
SDA
SCL
HP_DET
DISPLAY_BL
KEYBOARD_BL
SD_DET
SWCLK
TP3 SWCLK
TP4 SWDIO
SWDIO
POWER_BTN
LED_DATA
U11 CH32V203C8T6
CH32V203CxT6
POWER_ON_PULSE
32.768KHz
Y3
AMP_EN
USB_ENABLE
RADIO_BOOT
INT
KB_ROW5
KB_ROW8
KB_ROW4
KB_ROW3
KB_ROW7
KB_ROW6
KB_COL3
KB_COL7
KB_COL2
KB_COL6
PM_SCL
PM_SDA
C31 100n
C32 22p
C33 22p
C34 100n
C35 100n
C36 100n
C37 100n
C38 100n
GND
Keyboard
ROW0
ROW1
ROW2
ROW3
ROW4
ROW5
ROW6
ROW7
ROW8
COL0
COL1
COL2
COL3
COL4
COL5
COL6
COL7
EXT
SW2 User
Power on latch circuit
To keep the power signal low until the 3v3 comes up
U12 74LVC2G02HD4-7
TP5 PON
POWER_ON
RTC_SET
RTC_RESET
10k R30
SR Latch
S R Q Q̄
R 1A
S 2A
1B
2B
1Y
2Y
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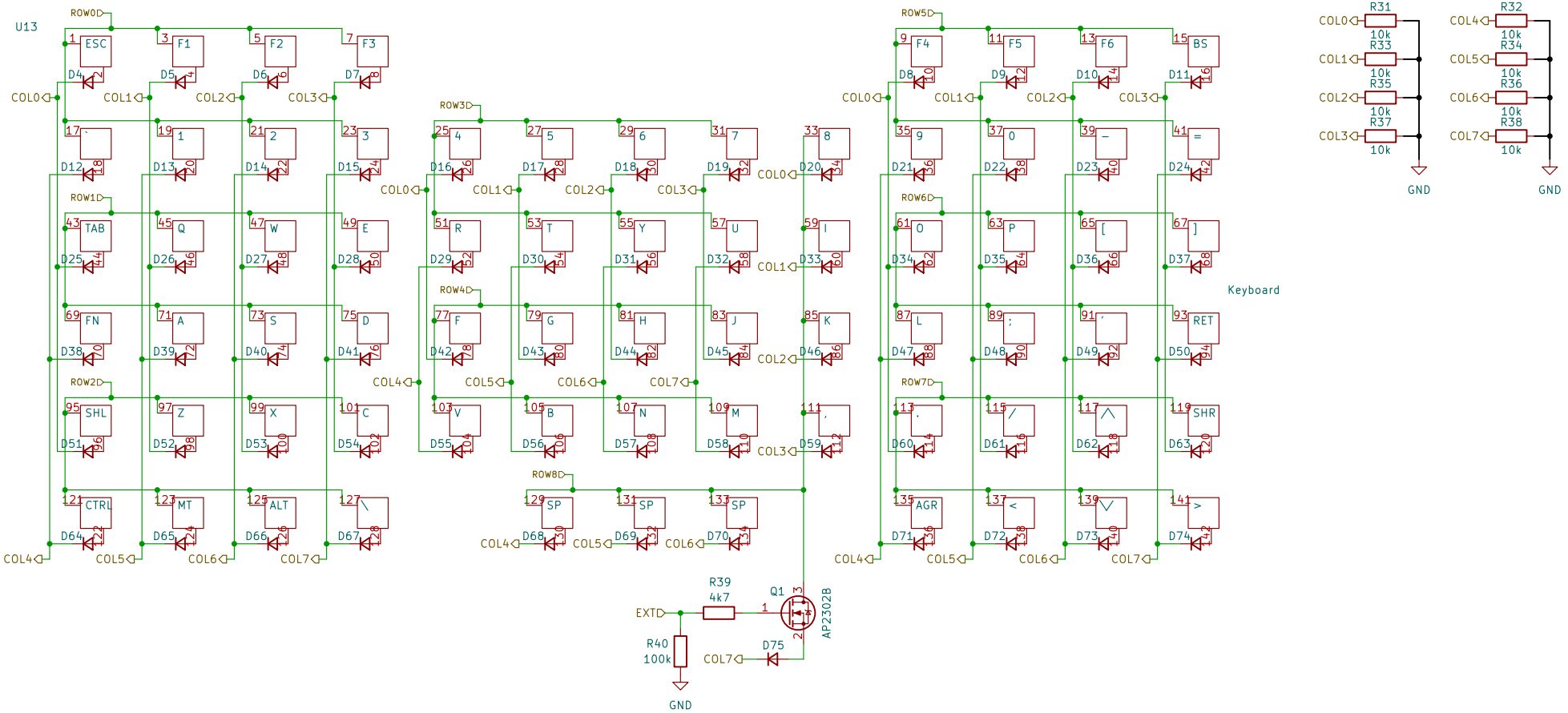
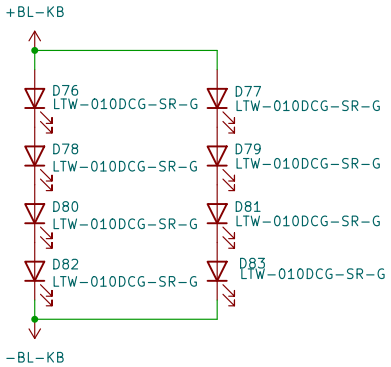
Nicolai Electronics
Sheet: /Coprocessor/
File: coprocessor.kicad_sch
Title: Tanmatsu
Size: A4
Date: 2025-04-06
Rev: 1.0
KiCad E.D.A. 9.0.0
Id: 4/10



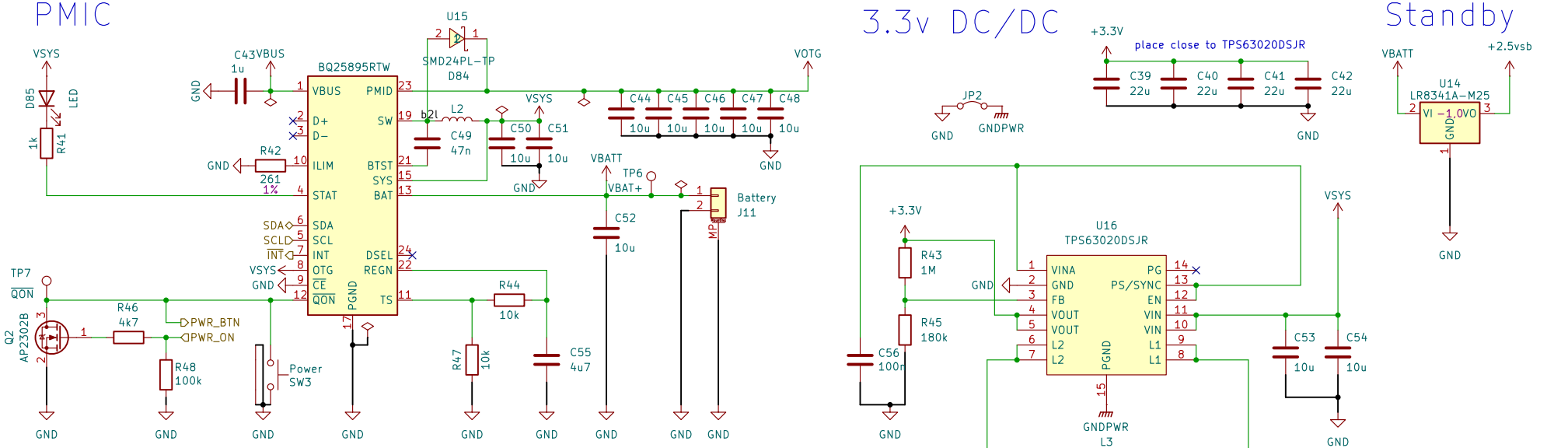


Nicolai Electronics

Sheet: /Coprocessor/Keyboard/
File: keyboard_matrix.kicad_sch

Title: Tanmatsu

Size: A4	Date: 2025-04-06	**Rev: 1.0**
KiCad E.D.A. 9.0.0		Id: 5/10

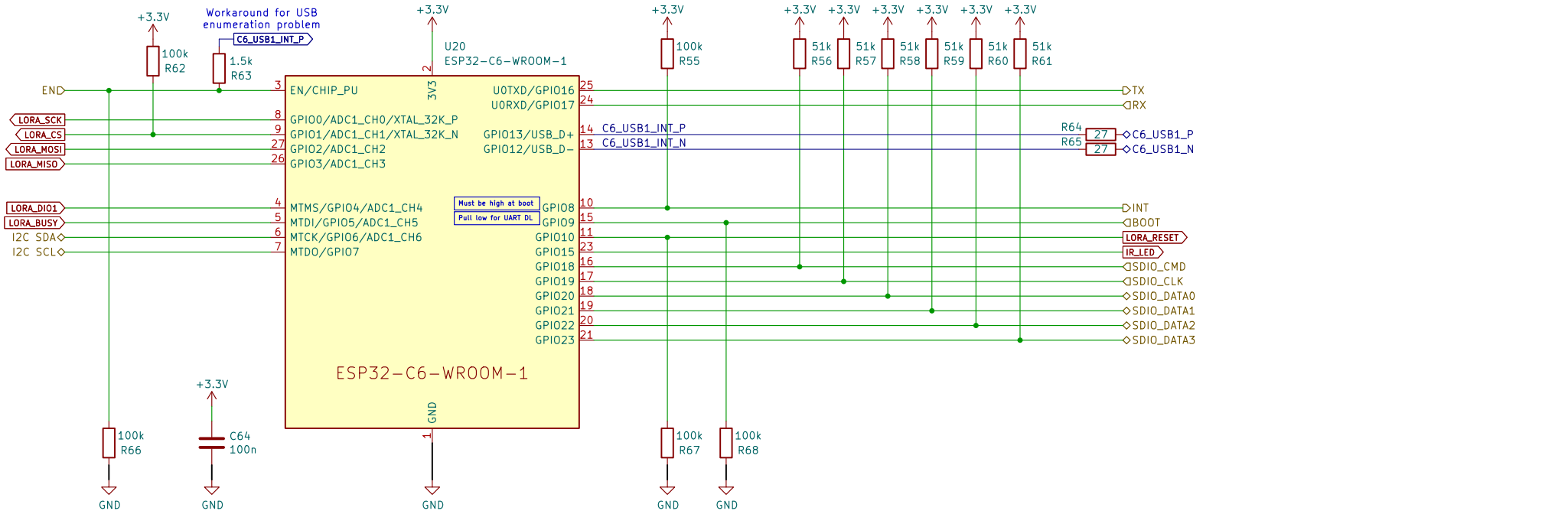


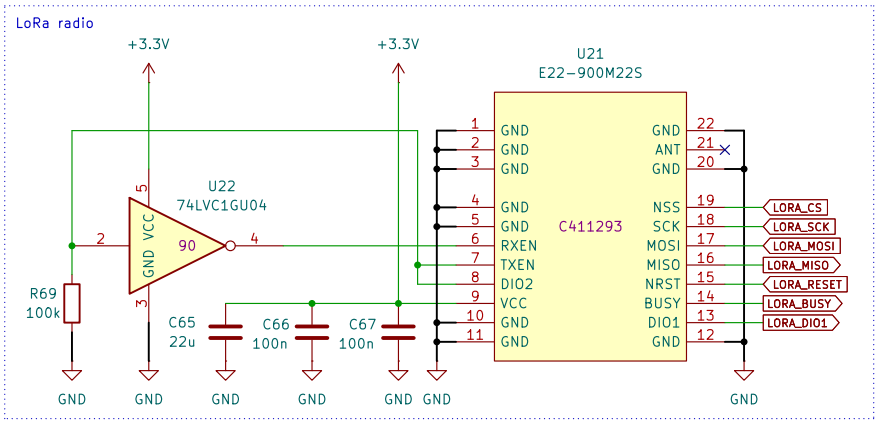
Nicolai Electronics

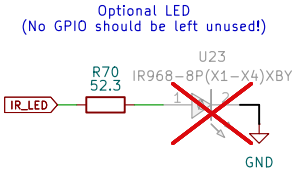
Sheet: /Power/
File: power.kicad_sch

Title: Tanmatsu

Size: A4	Date: 2025-04-06	**Rev: 1.0**
KiCad E.D.A. 9.0.0		Id: 6/10







Bootstrapping pins:
- GPIO8: Has to be high at power on
- GPIO9: Connect to pull-up resistor, pull to GND to start download mode

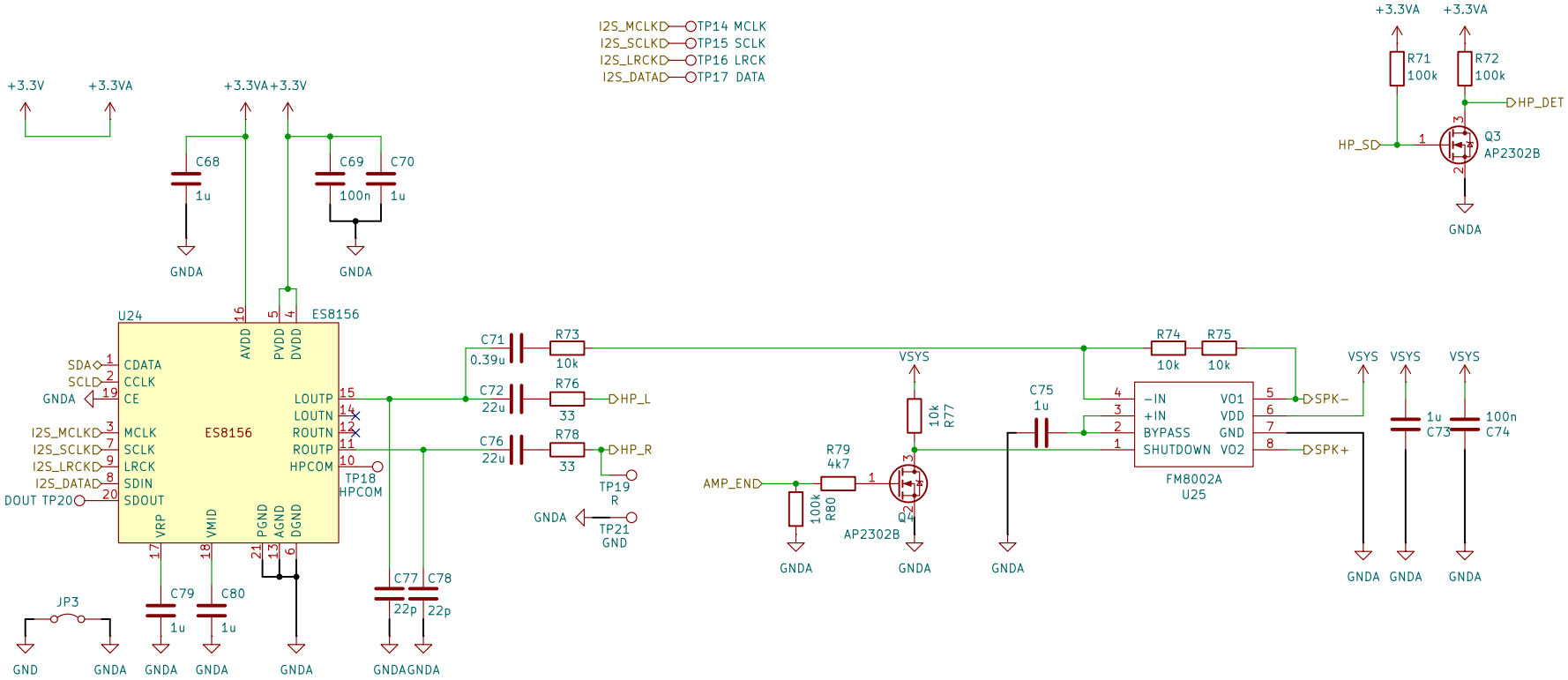
Low power peripherals:
- UART: RX on GPIO4, TX on GPIO5
- I2C: SDA on GPIO6, SCL on GPIO7

Nicolai Electronics

Sheet: /Radio/
File: radio.kicad_sch

Title: Tanmatsu

Size: A4	Date: 2025-04-06	**Rev: 1.0**
KiCad E.D.A. 9.0.0		Id: 7/10

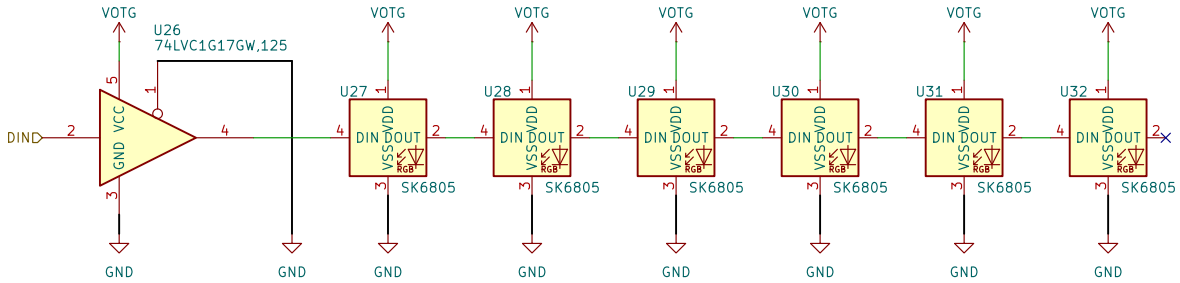


Nicolai Electronics

Sheet: /Audio/
File: audio.kicad_sch

Title: Tanmatsu

Size: A4	Date: 2025-04-06	**Rev: 1.0**
KiCad E.D.A. 9.0.0		Id: 8/10



Nicolai Electronics

Sheet: /LEDs/
File: leds.kicad_sch

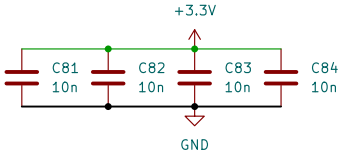
Title: Tanmatsu

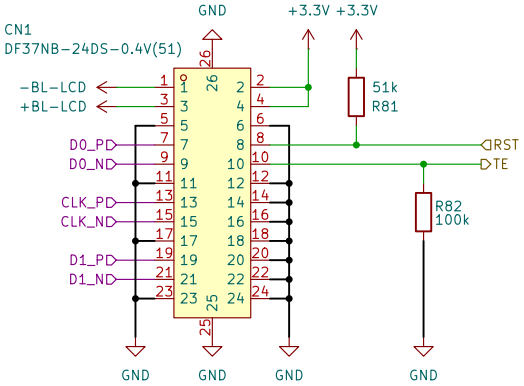
Size: A4	Date: 2025-04-06	**Rev: 1.0**
KiCad E.D.A. 9.0.0		Id: 9/10

!! The Footprint is numbered criss cross, in the display datasheet it's not.

In the display datasheet:
start, top left 1 down to 12
then, right bottom up 13 to 24.

So some mapping needs to be done here, if another footprint is inserted here.



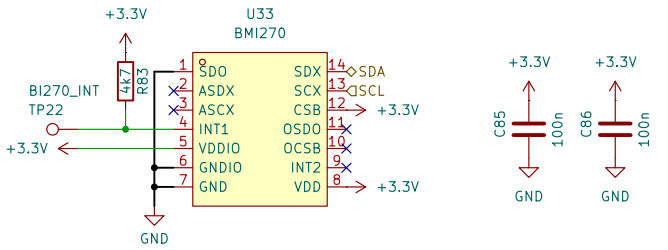


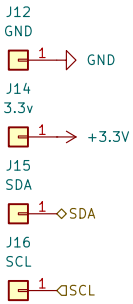
Nicolai Electronics

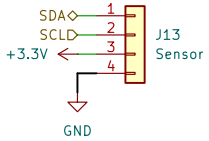
Sheet: /Display/
File: display.kicad_sch

Title: Tanmatsu

Size: A4	Date: 2025-04-06	**Rev: 1.0**
KiCad E.D.A. 9.0.0		Id: 10/10







Nicolai Electronics

Sheet: /Sensors/
File: sensors.kicad_sch

Title: Tanmatsu

Size: A4	Date: 2025-04-06	**Rev: 1.0**
KiCad E.D.A. 9.0.0		Id: 11/10