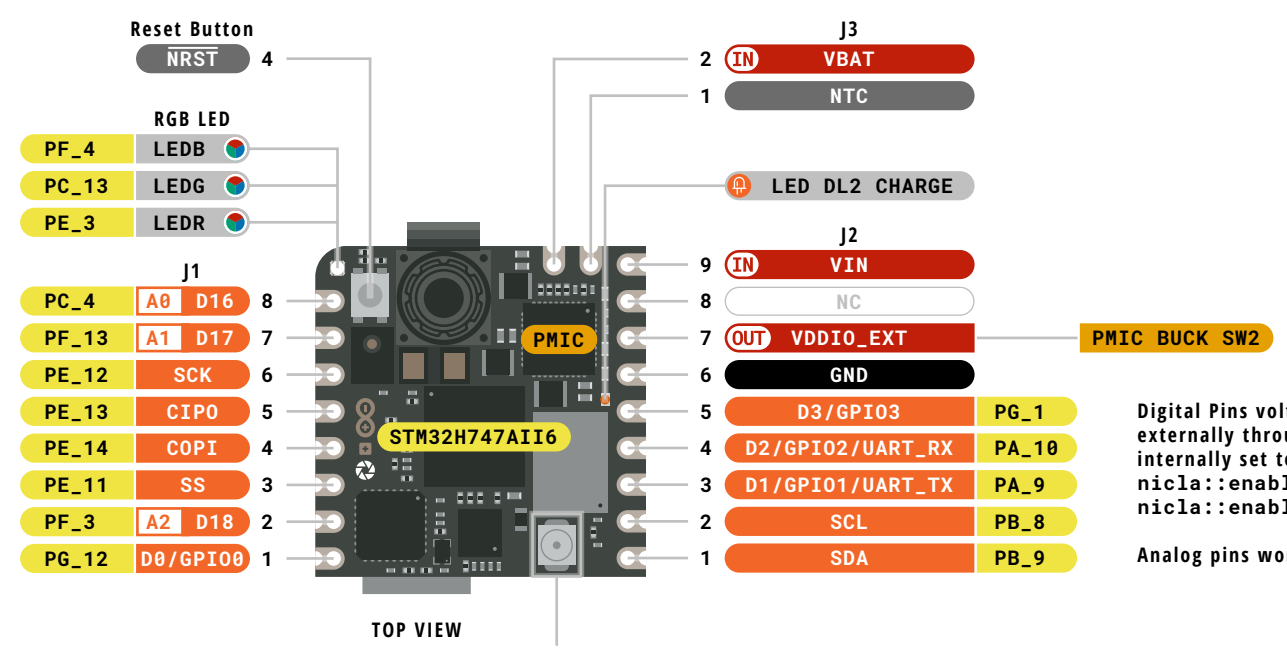Li-Po
3.7 V

If the battery has NTC cable,
connects it to the NTC pin J3-1

TOP VIEW

(i)

The battery also connects
with the Battery Connector J4
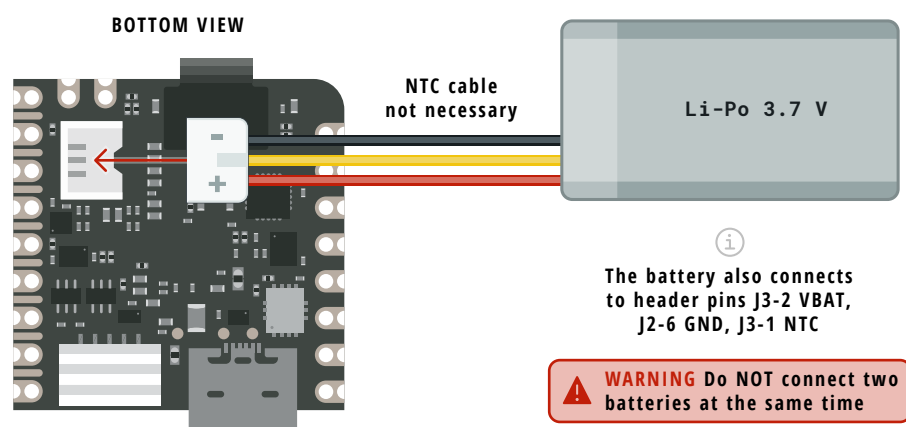on the bottom of the board

⚠ **WARNING** Do NOT connect two
batteries at the same time

Reset Button
NRST — 4

J3
2 — IN VBAT
1 — NTC

RGB LED
PF_4 — LEDB ●
PC_13 — LEDG ●
PE_3 — LEDR ●

🔒 LED DL2 CHARGE

J1
PC_4 — A0 D16 — 8
PF_13 — A1 D17 — 7
PE_12 — SCK — 6
PE_13 — CIPO — 5
PE_14 — COPI — 4
PE_11 — SS — 3
PF_3 — A2 D18 — 2
PG_12 — D0/GPIO0 — 1

STM32H747AII6

PMIC

TOP VIEW

J2
9 — IN VIN
8 — NC
7 — OUT VDDIO_EXT — PMIC BUCK SW2
6 — GND
5 — D3/GPIO3 — PG_1
4 — D2/GPIO2/UART_RX — PA_10
3 — D1/GPIO1/UART_TX — PA_9
2 — SCL — PB_8
1 — SDA — PB_9

Digital Pins voltage level can be forced
externally through VDDIO_EXT or
internally set to 3.3V or 1.8V with:
nicla::enable3V3LDO() and
nicla::enable1V8LDO() respectively.

Analog pins work only at 1.8V

Connect the provided WiFi/Bluetooth
Antenna (MOLEX 2.4/5GHz) with the
Micro UFL connector on the Nicla Vision

BOTTOM VIEW

NTC cable
not necessary

Li-Po 3.7 V

(i) The battery also connects
to header pins J3-2 VBAT,
J2-6 GND, J3-1 NTC

(i)

The battery also connects
to header pins J3-2 VBAT,
J2-6 GND, J3-1 NTC

⚠ **WARNING** Do NOT connect two
batteries at the same time

Legend:

■ Power

IN Power Input

OUT Power Output

■ Ground

■ GPIO Digital External

☐ Analog External

■ Main Part

■ Secondary Part

■ Internal Component

■ Other Pins (Reset, System
Control, Debugging)

🔒 LED

● RGB LED

☐ Other

⚠ **MAXIMUM** GPIOs are driven by
bidirectional translators powered
by VDDIO_EXT. These translators
are meant for low power and can
only drive very limited current.
Please check translator datasheet
for details.
VDDIO_EXT is software
programmable between 1.8 and 3.3V

(i) CIPO/COPI have previously been
referred to as MISO/MOSI

∞ **NICLA**
ARDUINO **VISION**

WARNING VOTP_PMIC must be left unconnected, used only for factory programming

Pads between the headers of J2, from P1 to P8, are test pins

It is possible to connect to these without soldering by connecting a 50 mil header

J2

	VOTP_PMIC	P8
	+1V8	P7
PB_3	TDO/SWO	P6
NRST	RESET	P5
PA_14	TCK/SCK	P4
PA_13	TMS/SWD	P3
PF_1	SCL_PMIC	P2
PF_0	SDA_PMIC	P1

BOTTOM VIEW

Test Points

+3V3

D_P

D_N

NTC cable not necessary

Li-Po 3.7 V

The battery also connects to header pins J3-2 VBAT, J2-6 GND, J3-1 NTC

MAXIMUM GPIOs are driven by bidirectional translators powered by VDDIO_EXT. These translators are meant for low power and can only drive very limited current. Please check translator datasheet for details.
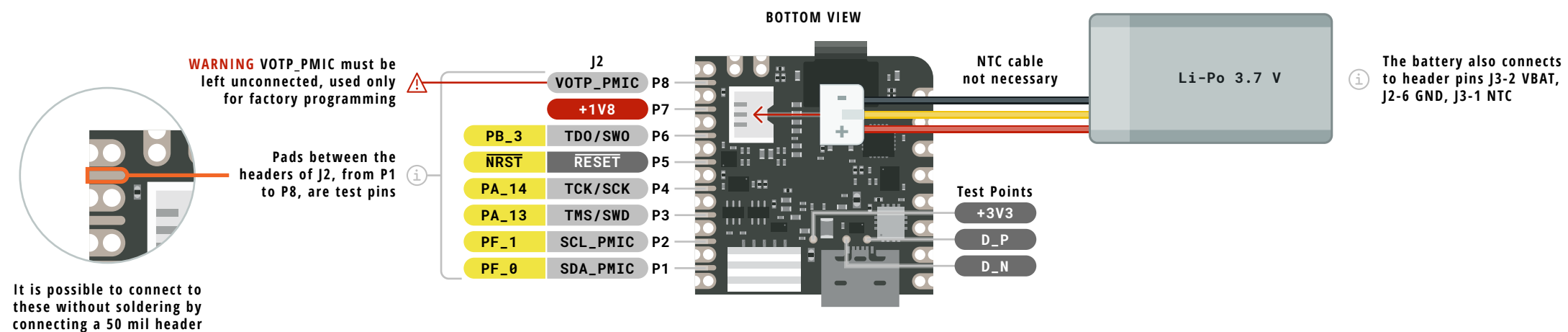VDDIO_EXT is software programmable between 1.8 and 3.3V

CIPO/COPI have previously been referred to as MISO/MOSI

NICLA VISION

ARDUINO

WARNING!

Advanced Section

The following information is for advanced use only and may not be officially supported by Arduino software

Reset Button

| NRST | 4 |

RGB LED

PF_4	LEDB ●
PC_13	LEDG ●
PE_3	LEDR ●

J1

Level Shifter
U11 TXB0108YZPR

B5	PC_4	A0	D16	8
B5	PF_13	A1	D17	7
B5	PE_12	SCK		6
B6	PE_13	CIPO		5
B7	PE_14	COPI		4
B8	PE_11	SS		3
	PF_3	A2	D18	2
B1	PG_12	D0/GPIO0		1

TOP VIEW

STM32H747AII6

PMIC

Connect the provided WiFi/Bluetooth
Antenna (MOLEX 2.4/5GHz) with the
Micro UFL connector on the Nicla Vision

Battery Fuel Gauge
U19 MAX17262REWL+T

J3

| 2 | IN | VBAT | | A2 BATT |
| 1 | | NTC | | 32 THM/38 NT2P7 |

| | ⚡ | LED DL2 CHARGE | VSYS | 40 CHGB |

J2

9	IN	VIN		
8		NC		
7	OUT	VDDIO_EXT		PMIC BUCK SW2
6		GND		
5		D3/GPIO3	PG_1	B4
4		D2/GPIO2/UART_RX	PA_10	B3
3		D1/GPIO1/UART_TX	PA_9	B2
2		SCL	PB_8	B3
1		SDA	PB_9	B2

Level Shifter
U11 TXB0108YZPR

Level Shifter
U12 NTS0304EUKZ

Digital Pins voltage level can be forced
externally through VDDIO_EXT or
internally set to 3.3V or 1.8V with:
nicla::enable3V3LDO() and
nicla::enable1V8LDO() respectively.

Analog pins work only at 1.8V

+1V8   VDDIO_EXT
                (+3V3)

| Level Shifter |
| U11 TXB0108YZPR |

NICLA VISION   HEADERS
(INTERNAL)   (EXTERNAL)

| Level Shifter |
| U12 NTS0304EUKZ |

Legend:

■ Power   IN Power Input
                OUT Power Output
■ Ground

■ GPIO Digital External
□ Analog External
■ Main Part
■ Secondary Part
■ Internal Component
■ Other Pins (Reset, System
   Control, Debugging)

⚡ LED
● RGB LED
□ Other

ARDUINO   NICLA
           VISION

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Microcontroller U1H STM32H747AII6

Pin	Level Shifters	ADC/DAC	I2C/I2S	SPI	UART/USART	TIMER	HRTIM (high resolution timer)
NRST							
PB_3						TIM2_CH2	HRTIM_FLT4
PG_1	J2-5 GPIO3 / U11-A4						
PA_14							
PA_10	J2-4 GPIO2 / U11-A3				UART1_RX	TIM1_CH3	HRTIM_CHC2
PA_13							
PA_9	J2-3 GPIO1 / U11-A2				UART1_TX	TIM1_CH2	HRTIM_CHC1
PF_1							
PB_8	J2-2 SCL / U12-A3		I2C1_SCL		UART4_RX	TIM16_CH1/TIM4_CH3	
PF_0							
PB_9	J2-1 SDA / U12-A2		I2C1_SDA		UART4_TX	TIM17_CH1/TIM4_CH4	
PC_4	J1-8 A0	ADC12_INP4					
PF_13	J1-7 A1	ADC2_INP2					
PE_12	J1-6 SCLK / U11-A5			SPI4_SCK		TIM1_CH3N	
PE_13	J1-5 CIPO / U11-A6			SPI4_CIPO		TIM1_CH3	
PE_14	J1-4 COPI / U11-A7			SPI4_COPI		TIM1_CH4	
PE_11	J1-3 CS / U11-A8			SPI4_NSS		TIM1_CH2	
PF_3	J1-2 A2	ADC3_INP5					
PG_12	J1-1 GPIO0 / U11-A1					HRTIM_EEV5	LPTIM (low power timer) LPTIM1_IN1

WiFi/BLE U9 LBEE5KL1DX-883

#	Signal	Main Part	I2C/I2S	UART/USART
2	RX	PB_6		USART1_TX
3	TX	PB_7		USART1_RX
4	CTS	PA_12		USART1_RTS
5	RTS	PA_11		USART1_CTS
8	BT_PCMSYNC	PA_15	I2S3_WS	
9	BT_PCMIN	PB_2	I2S3_SDO	
10	BT_PCMOUT	PC_11	I2S3_SDI	
11	BT_PCMCLK	PC_10	I2S3_CK	
24	DATA0	PB_14		
26	DATA1	PB_15		
23	DATA2	PG_11		
25	DATA3	PB_4		
20	CLK	PD_6		
22	CMD	PD_7		
37	LPO IN	PC_14-OSC32_IN		
27	WL_WAKE_H	PD_15		
39	BT_WAKE_D	PE_9		
38	BT_WAKE_H	PD_14		
41	ANT	J6-U.FL-R-SMT-1		
14	BT_ON	PF_14		
28	WL_ON	PG_4		

J1

Pin	Signal
8	A0 / D16
7	A1 / D17
6	SCK
5	CIPO
4	COPI
3	SS
2	A2 / D18
1	D0/GPIO0

J3

Pin	Signal
2	IN VBAT
1	NTC

J2

Pin	Signal
9	IN VIN
8	NC
7	OUT VDDIO_EXT
6	GND
5	D3/GPIO3
4	D2/GPIO2/UART_RX
3	D1/GPIO1/UART_TX
2	SCL
1	SDA

Connect the provided WiFi/Bluetooth Antenna (MOLEX 2.4/5GHz) with the Micro UFL connector on the Nicla Vision

Legend:

- Power
- IN Power Input
- OUT Power Output
- Ground
- GPIO Digital External
- Analog External
- Main Part
- Secondary Part
- Internal Component
- Other Pins (Reset, System Control, Debugging)
- I2C
- SPI
- UART/USART
- Other SERIAL Communication
- Analog
- PWM/Timer
- D Default
- LED
- RGB LED
- Other

MAXIMUM GPIOs are driven by bidirectional translators powered by VDDIO_EXT. These translators are meant for low power and can only drive very limited current. Please check translator datasheet for details.
VDDIO_EXT is software programmable between 1.8 and 3.3V

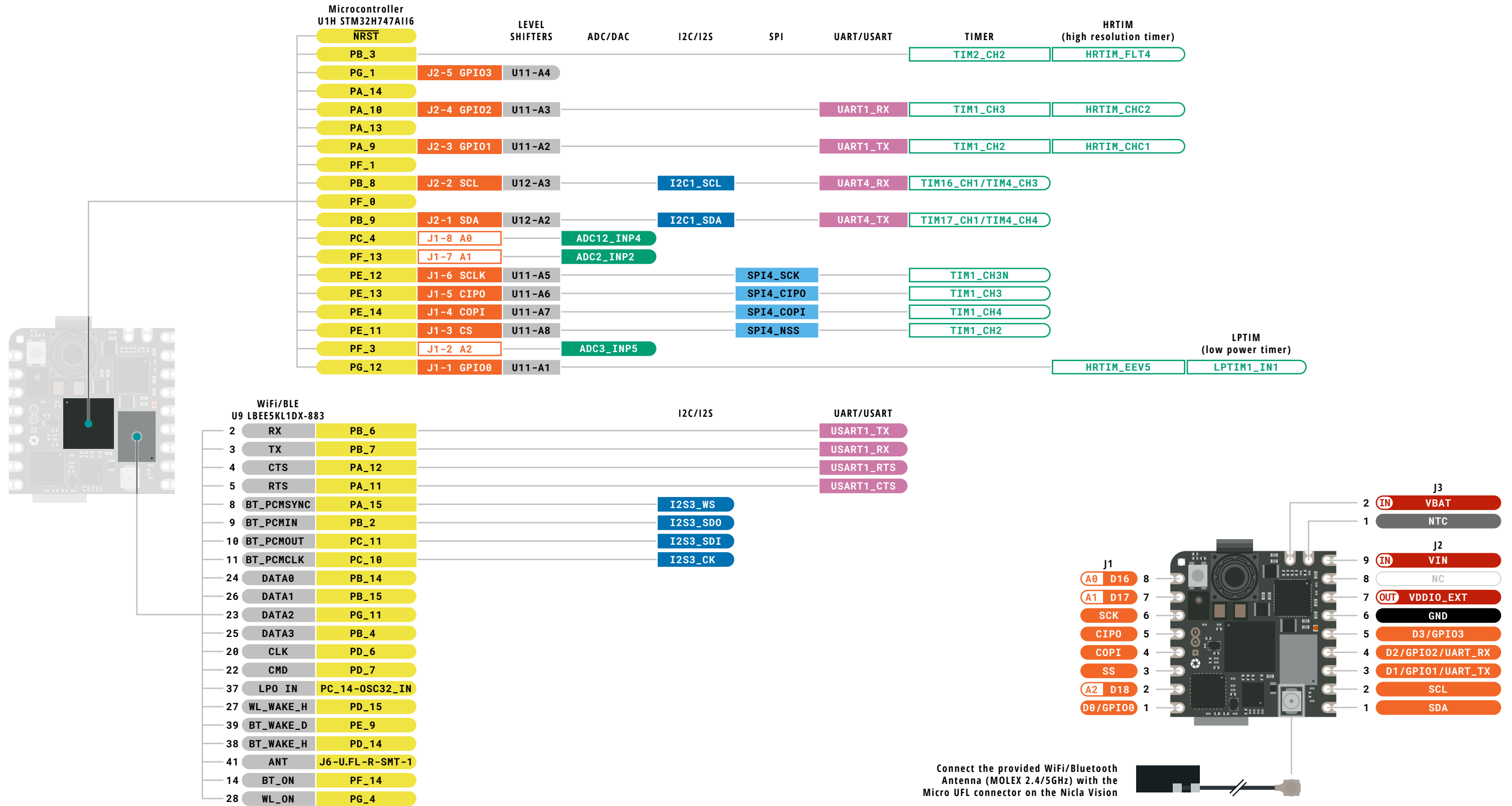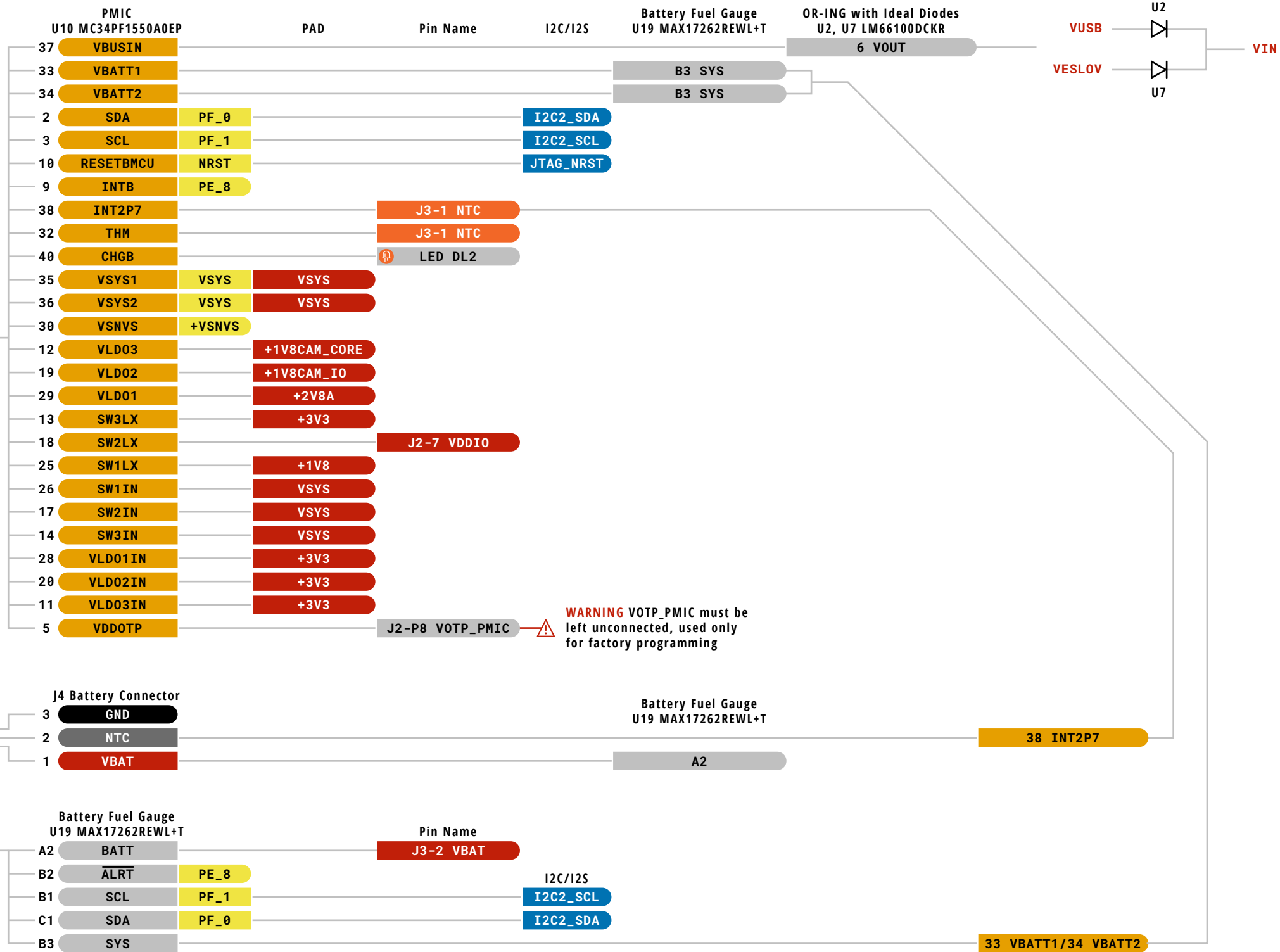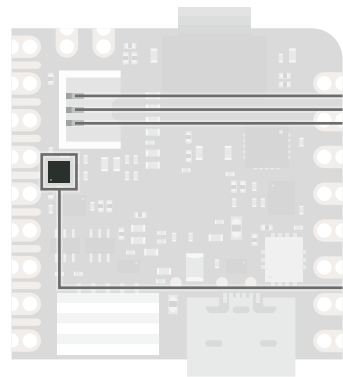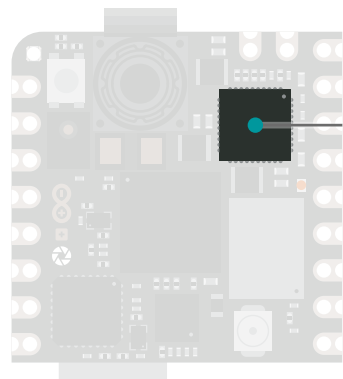CIPO/COPI have previously been referred to as MISO/MOSI

ARDUINO NICLA VISION

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PMIC
U10 MC34PF1550A0EP

PAD **Pin Name** **I2C/I2S**

Battery Fuel Gauge
U19 MAX17262REWL+T

OR-ING with Ideal Diodes
U2, U7 LM66100DCKR

Pin	PMIC	PAD	Pin Name	I2C/I2S
37	VBUSIN			
33	VBATT1			
34	VBATT2			
2	SDA	PF_0		I2C2_SDA
3	SCL	PF_1		I2C2_SCL
10	RESETBMCU	NRST		JTAG_NRST
9	INTB	PE_8		
38	INT2P7		J3-1 NTC	
32	THM		J3-1 NTC	
40	CHGB		LED DL2	
35	VSYS1	VSYS	VSYS	
36	VSYS2	VSYS	VSYS	
30	VSNVS	+VSNVS		
12	VLDO3		+1V8CAM_CORE	
19	VLDO2		+1V8CAM_IO	
29	VLDO1		+2V8A	
13	SW3LX		+3V3	
18	SW2LX		J2-7 VDDIO	
25	SW1LX		+1V8	
26	SW1IN		VSYS	
17	SW2IN		VSYS	
14	SW3IN		VSYS	
28	VLDO1IN		+3V3	
20	VLDO2IN		+3V3	
11	VLDO3IN		+3V3	
5	VDDOTP		J2-P8 VOTP_PMIC	

6 VOUT

B3 SYS
B3 SYS

VUSB — U2
VESLOV — U7
VIN

⚠ **WARNING** VOTP_PMIC must be left unconnected, used only for factory programming

J4 Battery Connector

Pin		
3	GND	
2	NTC	
1	VBAT	

Battery Fuel Gauge
U19 MAX17262REWL+T

38 INT2P7

A2

Battery Fuel Gauge
U19 MAX17262REWL+T

Pin Name **I2C/I2S**

Pin		PAD	Pin Name	I2C/I2S
A2	BATT		J3-2 VBAT	
B2	ALRT	PE_8		
B1	SCL	PF_1		I2C2_SCL
C1	SDA	PF_0		I2C2_SDA
B3	SYS			

33 VBATT1/34 VBATT2

Legend:

■ Power	IN Power Input	
	OUT Power Output	
■ Ground		

■ GPIO Digital External	
▭ Analog External	
■ Main Part	
■ Secondary Part	
■ Internal Component	
■ Other Pins (Reset, System Control, Debugging)	

■ I2C	D Default	
■ SPI	D Default	
■ UART/USART	D Default	
▭ Other SERIAL Communication		
■ Analog	D Default	
▭ PWM/Timer		

⊕ LED	
⊙ RGB LED	
▭ Other	

⚠ **MAXIMUM** GPIOs are driven by bidirectional translators powered by VDDIO_EXT. These translators are meant for low power and can only drive very limited current. Please check translator datasheet for details.
VDDIO_EXT is software programmable between 1.8 and 3.3V

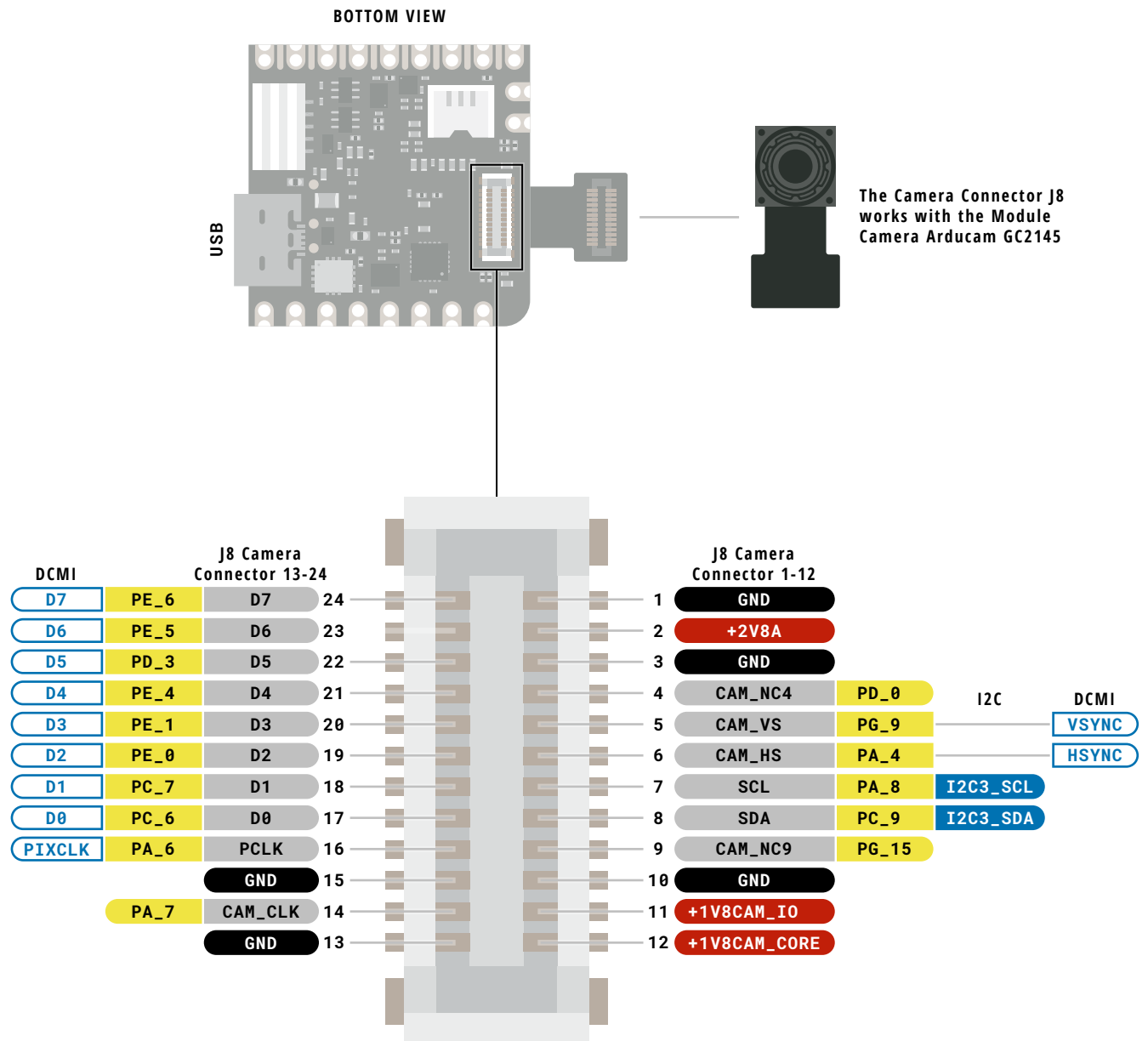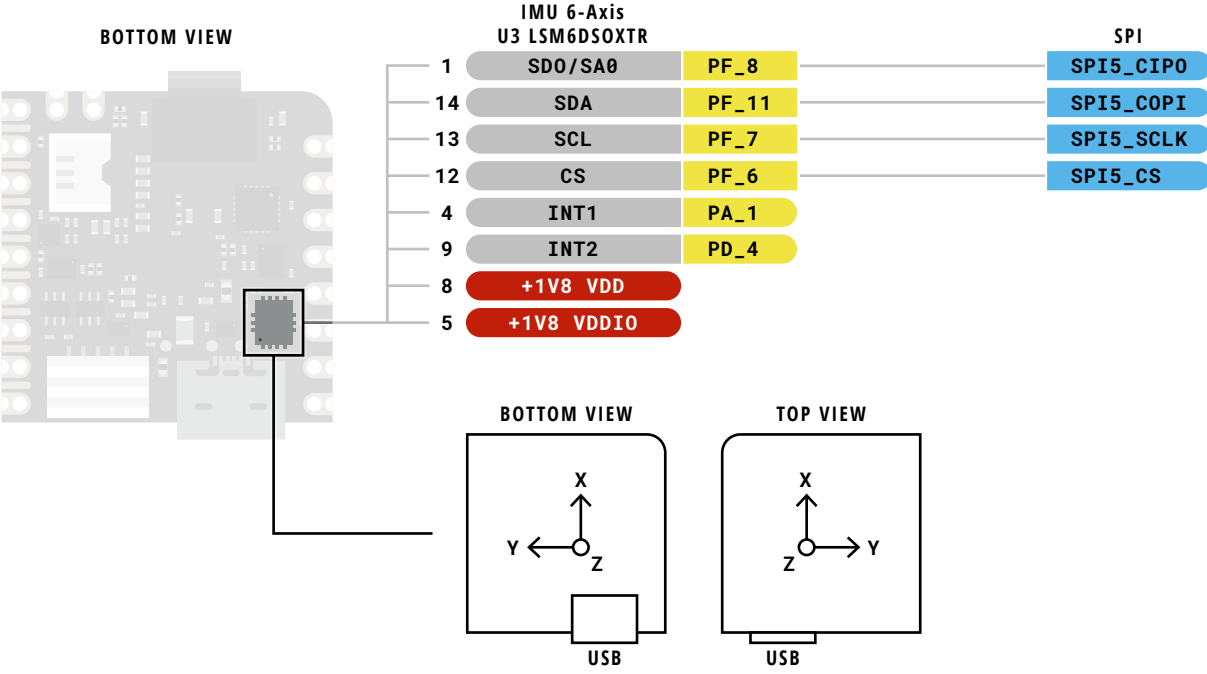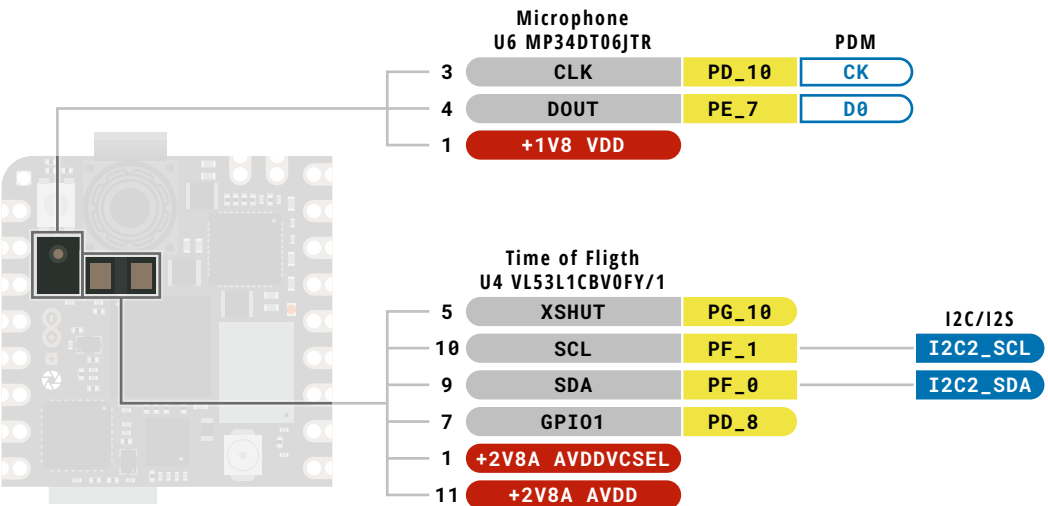ℹ CIPO/COPI have previously been referred to as MISO/MOSI

ARDUINO **NICLA VISION**

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Microphone
U6 MP34DT06JTR

			PDM
3	CLK	PD_10	CK
4	DOUT	PE_7	D0
1	+1V8 VDD		

Time of Fligth
U4 VL53L1CBV0FY/1

			I2C/I2S
5	XSHUT	PG_10	
10	SCL	PF_1	I2C2_SCL
9	SDA	PF_0	I2C2_SDA
7	GPIO1	PD_8	
1	+2V8A AVDDVCSEL		
11	+2V8A AVDD		

IMU 6-Axis
U3 LSM6DSOXTR

BOTTOM VIEW

			SPI
1	SDO/SA0	PF_8	SPI5_CIPO
14	SDA	PF_11	SPI5_COPI
13	SCL	PF_7	SPI5_SCLK
12	CS	PF_6	SPI5_CS
4	INT1	PA_1	
9	INT2	PD_4	
8	+1V8 VDD		
5	+1V8 VDDIO		

BOTTOM VIEW | **TOP VIEW**

X Y Z USB | X Z Y USB

BOTTOM VIEW

USB

The Camera Connector J8 works with the Module Camera Arducam GC2145

J8 Camera Connector 13-24

DCMI				
D7	PE_6	D7	24	
D6	PE_5	D6	23	
D5	PD_3	D5	22	
D4	PE_4	D4	21	
D3	PE_1	D3	20	
D2	PE_0	D2	19	
D1	PC_7	D1	18	
D0	PC_6	D0	17	
PIXCLK	PA_6	PCLK	16	
		GND	15	
	PA_7	CAM_CLK	14	
		GND	13	

J8 Camera Connector 1-12

				I2C	DCMI
1	GND				
2	+2V8A				
3	GND				
4	CAM_NC4	PD_0			
5	CAM_VS	PG_9			VSYNC
6	CAM_HS	PA_4			HSYNC
7	SCL	PA_8	I2C3_SCL		
8	SDA	PC_9	I2C3_SDA		
9	CAM_NC9	PG_15			
10	GND				
11	+1V8CAM_IO				
12	+1V8CAM_CORE				

USB

BOTTOM VIEW

Legend:

- Power
- IN Power Input
- OUT Power Output
- Ground
- GPIO Digital External
- Analog External
- Main Part
- Secondary Part
- Internal Component
- Other Pins (Reset, System Control, Debugging)
- I2C — D Default
- SPI — D Default
- UART/USART — D Default
- Other SERIAL Communication
- Analog — D Default
- PWM/Timer
- LED
- RGB LED
- Other

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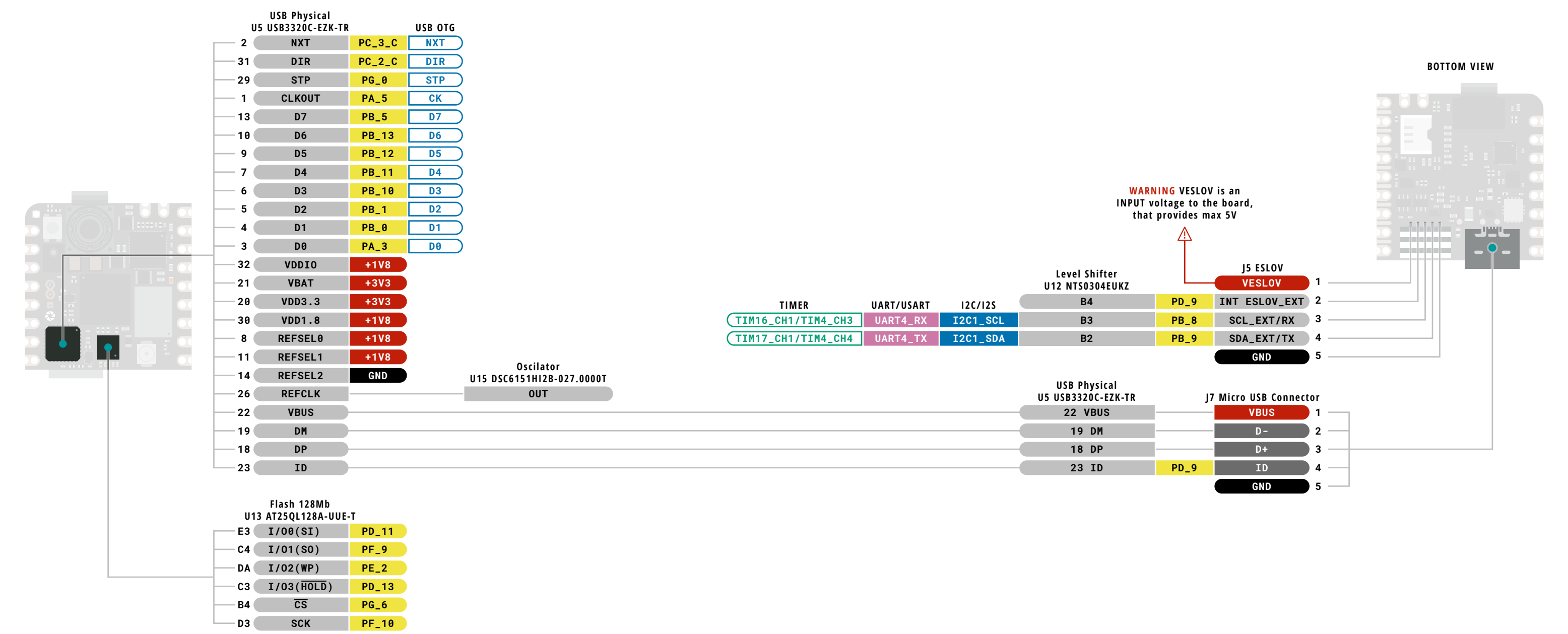ⓘ CIPO/COPI have previously been referred to as MISO/MOSI

USB Physical
U5 USB3320C-EZK-TR

Pin	Name	Signal	USB OTG
2	NXT	PC_3_C	NXT
31	DIR	PC_2_C	DIR
29	STP	PG_0	STP
1	CLKOUT	PA_5	CK
13	D7	PB_5	D7
10	D6	PB_13	D6
9	D5	PB_12	D5
7	D4	PB_11	D4
6	D3	PB_10	D3
5	D2	PB_1	D2
4	D1	PB_0	D1
3	D0	PA_3	D0
32	VDDIO	+1V8	
21	VBAT	+3V3	
20	VDD3.3	+3V3	
30	VDD1.8	+1V8	
8	REFSEL0	+1V8	
11	REFSEL1	+1V8	
14	REFSEL2	GND	
26	REFCLK		
22	VBUS		
19	DM		
18	DP		
23	ID		

Oscilator
U15 DSC6151HI2B-027.0000T
OUT

Flash 128Mb
U13 AT25QL128A-UUE-T

Pin	Name	Signal
E3	I/O0(SI)	PD_11
C4	I/O1(SO)	PF_9
DA	I/O2(WP)	PE_2
C3	I/O3(HOLD)	PD_13
B4	CS	PG_6
D3	SCK	PF_10

Level Shifter
U12 NTS0304EUKZ

TIMER	UART/USART	I2C/I2S			
TIM16_CH1/TIM4_CH3	UART4_RX	I2C1_SCL	B4	PD_9	INT ESLOV_EXT
TIM17_CH1/TIM4_CH4	UART4_TX	I2C1_SDA	B3	PB_8	SCL_EXT/RX
			B2	PB_9	SDA_EXT/TX
					GND

WARNING VESLOV is an INPUT voltage to the board, that provides max 5V

J5 ESLOV

	Signal	Pin
	VESLOV	1
PD_9	INT ESLOV_EXT	2
PB_8	SCL_EXT/RX	3
PB_9	SDA_EXT/TX	4
	GND	5

USB Physical
U5 USB3320C-EZK-TR

		J7 Micro USB Connector	
22 VBUS		VBUS	1
19 DM		D-	2
18 DP		D+	3
23 ID	PD_9	ID	4
		GND	5

BOTTOM VIEW

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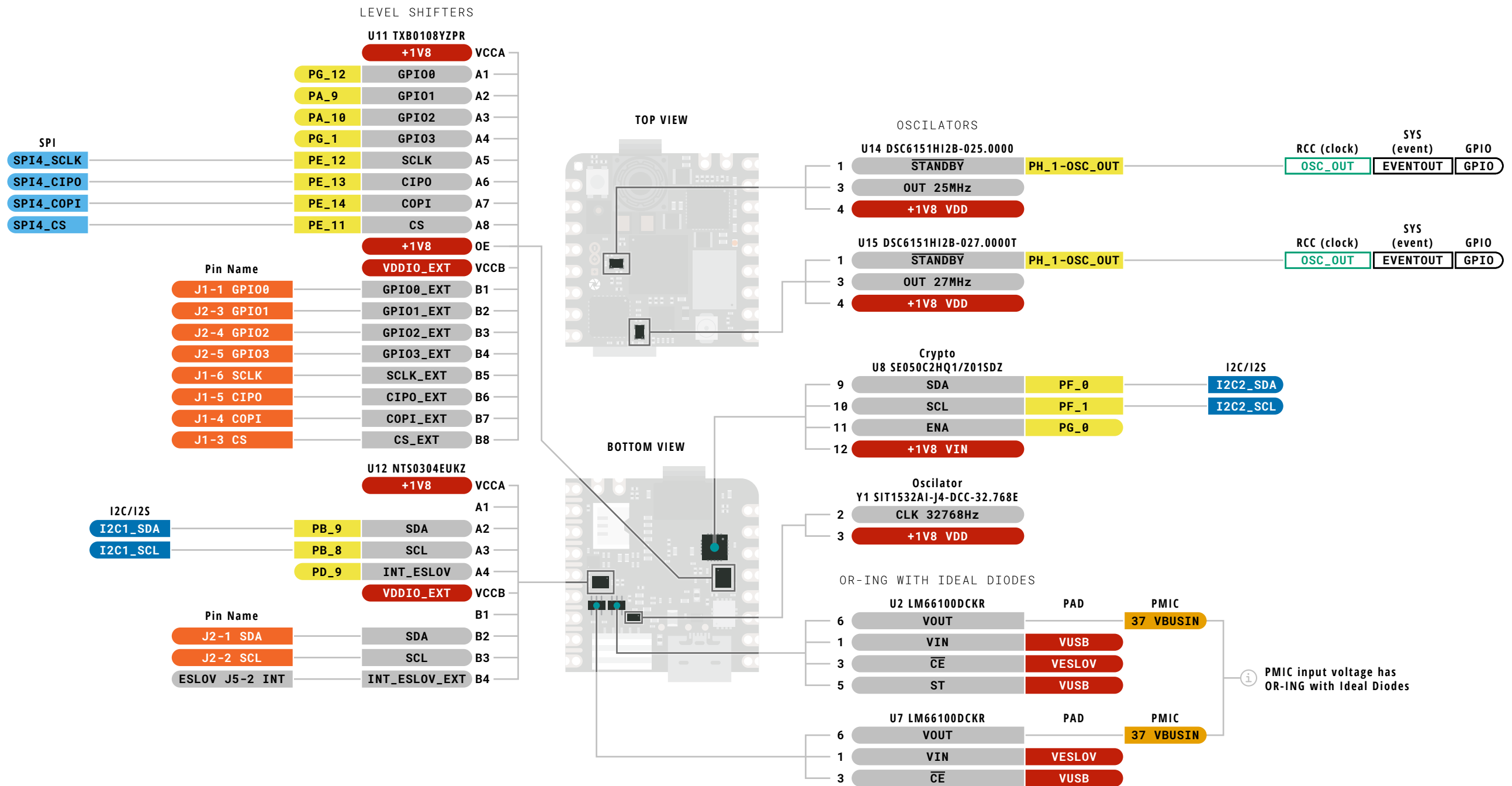VDDIO_EXT is software programmable between 1.8 and 3.3V

ⓘ CIPO/COPI have previously been referred to as MISO/MOSI

ARDUINO
NICLA VISION

LEVEL SHIFTERS

U11 TXB0108YZPR

	Pin	Internal	
	+1V8		VCCA
PG_12		GPIO0	A1
PA_9		GPIO1	A2
PA_10		GPIO2	A3
PG_1		GPIO3	A4
PE_12		SCLK	A5
PE_13		CIPO	A6
PE_14		COPI	A7
PE_11		CS	A8
	+1V8		OE
	VDDIO_EXT		VCCB

SPI
- SPI4_SCLK
- SPI4_CIPO
- SPI4_COPI
- SPI4_CS

Pin Name

Pin Name	Internal	
J1-1 GPIO0	GPIO0_EXT	B1
J2-3 GPIO1	GPIO1_EXT	B2
J2-4 GPIO2	GPIO2_EXT	B3
J2-5 GPIO3	GPIO3_EXT	B4
J1-6 SCLK	SCLK_EXT	B5
J1-5 CIPO	CIPO_EXT	B6
J1-4 COPI	COPI_EXT	B7
J1-3 CS	CS_EXT	B8

U12 NTS0304EUKZ

	Pin	Internal	
	+1V8		VCCA
			A1
PB_9		SDA	A2
PB_8		SCL	A3
PD_9		INT_ESLOV	A4
	VDDIO_EXT		VCCB

I2C/I2S
- I2C1_SDA
- I2C1_SCL

Pin Name

Pin Name	Internal	
		B1
J2-1 SDA	SDA	B2
J2-2 SCL	SCL	B3
ESLOV J5-2 INT	INT_ESLOV_EXT	B4

TOP VIEW

BOTTOM VIEW

OSCILLATORS

U14 DSC6151HI2B-025.0000

			RCC (clock)	SYS (event)	GPIO
1	STANDBY	PH_1-OSC_OUT	OSC_OUT	EVENTOUT	GPIO
3	OUT 25MHz				
4	+1V8 VDD				

U15 DSC6151HI2B-027.0000T

			RCC (clock)	SYS (event)	GPIO
1	STANDBY	PH_1-OSC_OUT	OSC_OUT	EVENTOUT	GPIO
3	OUT 27MHz				
4	+1V8 VDD				

Crypto
U8 SE050C2HQ1/Z01SDZ

			I2C/I2S
9	SDA	PF_0	I2C2_SDA
10	SCL	PF_1	I2C2_SCL
11	ENA	PG_0	
12	+1V8 VIN		

Oscilator
Y1 SIT1532AI-J4-DCC-32.768E

2	CLK 32768Hz
3	+1V8 VDD

OR-ING WITH IDEAL DIODES

U2 LM66100DCKR

		PAD	PMIC
6	VOUT		37 VBUSIN
1	VIN	VUSB	
3	CE	VESLOV	
5	ST	VUSB	

U7 LM66100DCKR

		PAD	PMIC
6	VOUT		37 VBUSIN
1	VIN	VESLOV	
3	CE	VUSB	

ⓘ PMIC input voltage has OR-ING with Ideal Diodes

Legend:

- **Power**
- **IN** Power Input
- **OUT** Power Output
- **Ground**
- **GPIO Digital External**
- **Analog External**
- **Main Part**
- **Secondary Part**
- **Internal Component**
- **Other Pins (Reset, System Control, Debugging)**
- **I2C** — **D** Default
- **SPI** — **D** Default
- **UART/USART** — **D** Default
- **Other SERIAL Communication**
- **Analog** — **D** Default
- **PWM/Timer**
- **LED**
- **RGB LED**
- **Other**

ARDUINO — NICLA VISION