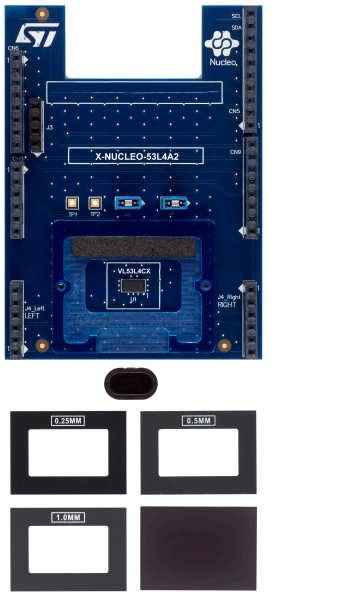
X-NUCLEO-53L4A2

Data brief

Time-of-Flight sensor with extended range measurement expansion board based on the VL53L4CX for STM32 Nucleo



Features

- VL53L4CX Time-of-Flight sensor with extended range measurement
- Accurate absolute ranging distance, independent of the reflectance of the target
- 0.25, 0.5, and 1 mm spacers to simulate air gaps
- Two different cover windows to protect the sensor from the dust
- Compatible with STM32 Nucleo development boards
- Equipped with Arduino UNO R3 connectors
- Full system software supplied, including code examples and graphical user interface
- RoHS, CE, UKCA, and China RoHS compliant

Description

The X-NUCLEO-53L4A2 is an expansion board for any STM32 Nucleo development board equipped with the Arduino R3 connectors. It provides a complete evaluation kit that allows you to learn, evaluate, and develop applications using the VL53L4CX Time-of-Flight sensor with extended range measurement.

The expansion board is delivered with a cover glass holder in which you can fit three different spacers of 0.25, 0.5, and 1 mm height below the cover glass to simulate various air gaps. A small oval cover glass fitting the sensor is included.

Several ST expansion boards can be superposed through the Arduino connectors, which allow, for example, the development of VL53L4CX applications with Bluetooth or Wi-Fi interfaces.

Product summary	
Time-of-Flight sensor with extended range measurement expansion board based on the VL53L4CX for STM32 Nucleo	X-NUCLEO-53L4A2
Time-of-Flight sensor software expansion for STM32Cube	X-CUBE-TOF1
STM32 Nucleo-64 development board with STM32F401RE MCU	NUCLEO-F401RE
Applications	Personal Electronics - Audio and Video Gaming and Drones Virtual - Augmented Reality Wearable

1 Laser safety considerations

The VL53L4CX contains a laser emitter and corresponding drive circuitry.

The laser output is designed to remain within Class 1 laser safety limits under all reasonable foreseeable conditions, including single faults, in compliance with the IEC 60825-1:2014 (third edition).

The laser output remains within Class 1 limits as long as you use the STMicroelectronics recommended device settings and respect the operating conditions specified in the data sheet.

The laser output power must not be increased and no optics should be used with the intention of focusing the laser beam.

Figure 1. Class 1 laser product label

2 Optional VL53L4CX breakout boards

The SATEL-VL53L4CX is designed to connect remotely the VL53L4CX sensor to any type of electronic controller.

Attention: *The VL53L4CX is delivered with a liner to prevent potential foreign material from piercing the module holes during the assembly process. Remove this liner before use.*

The VL53L4CX breakout boards can be directly plugged onto the X-NUCLEO-53L4A2 expansion board through two six-pin connectors (Figure 2) or through flying wires (Figure 3).

You can buy the breakout boards separately as SATEL-VL53L4CX. This order code package includes two breakout boards.

Figure 2. SATEL-VL53L4CX breakout boards connected to the X-NUCLEO-53L4A2 expansion board

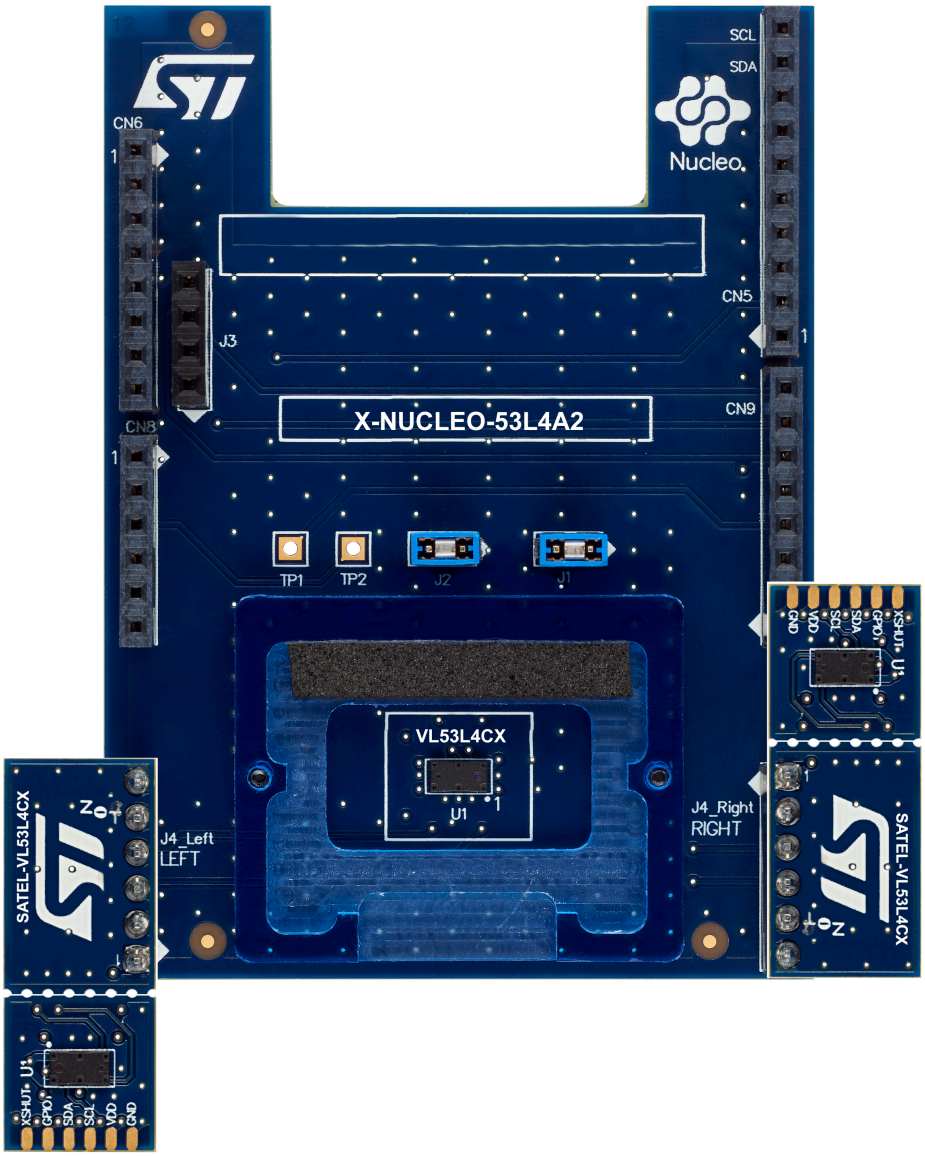
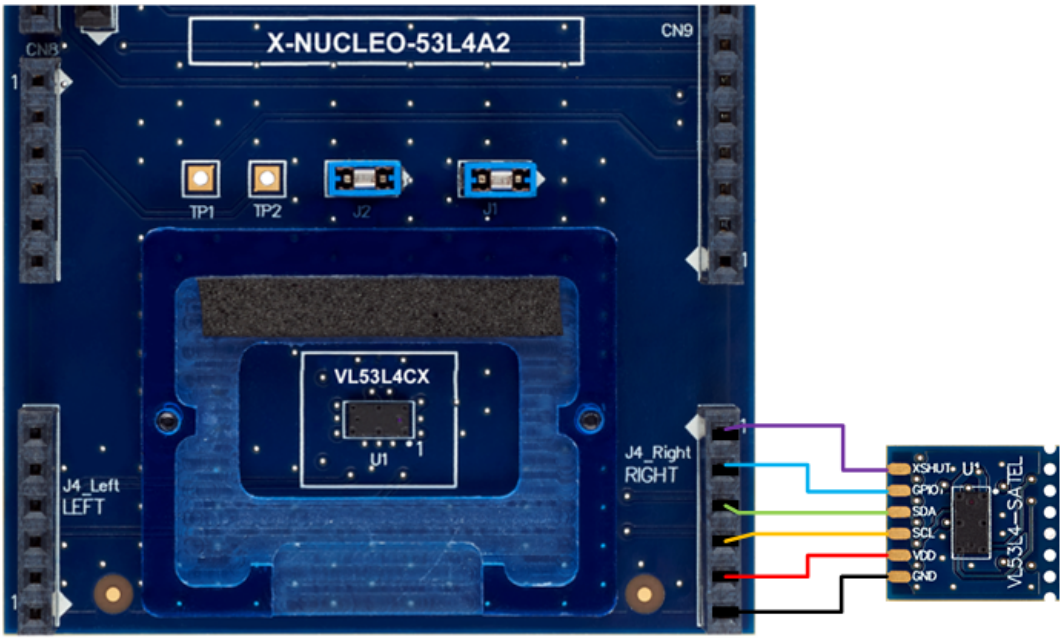


Figure 3. **VL53L4CX mini PCB flying wires connection to X-NUCLEO-53L4A2 expansion board**



3 Simplified schematics

Figure 4. **X-NUCLEO-53L4A2 simplified schematic**

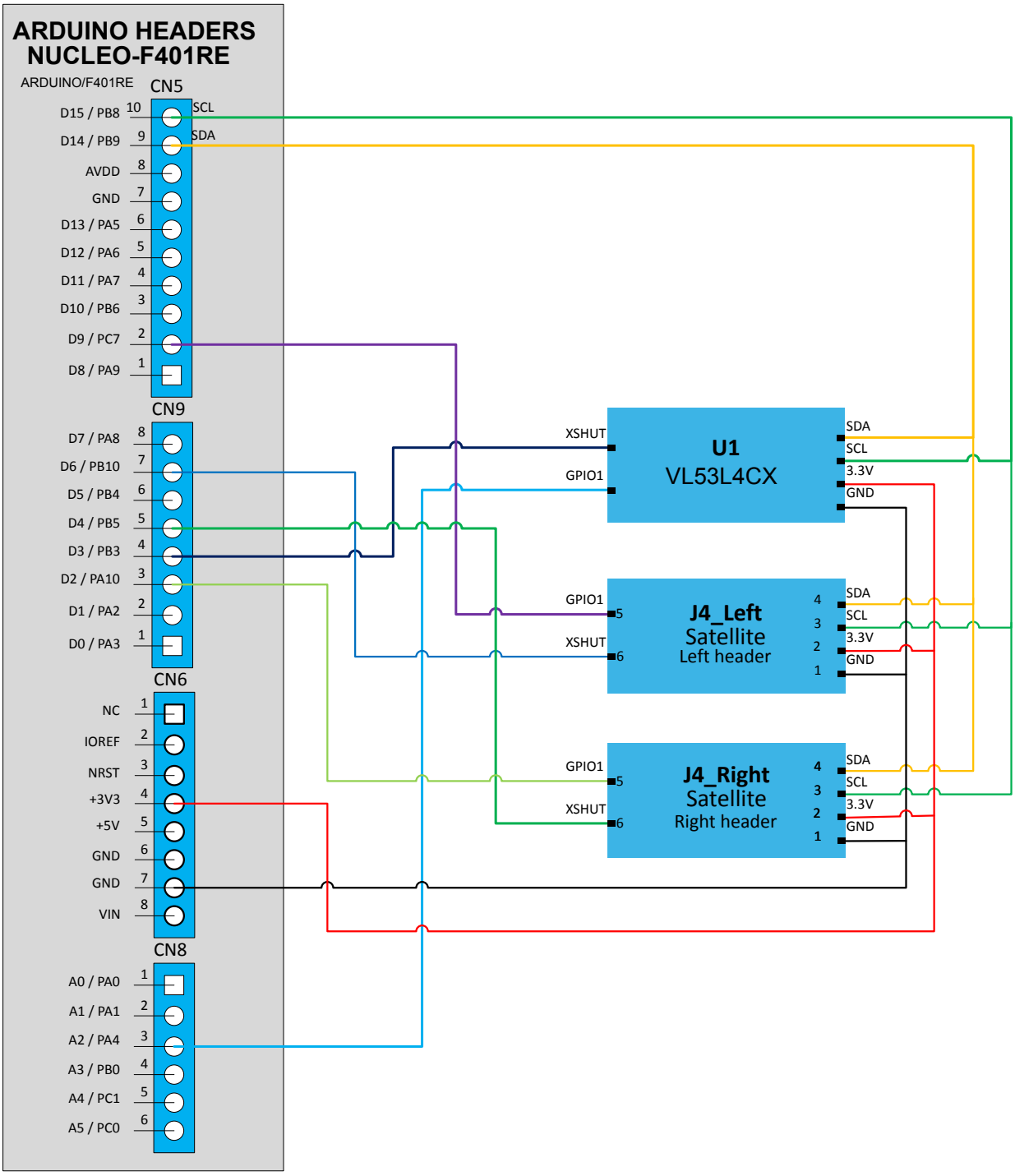
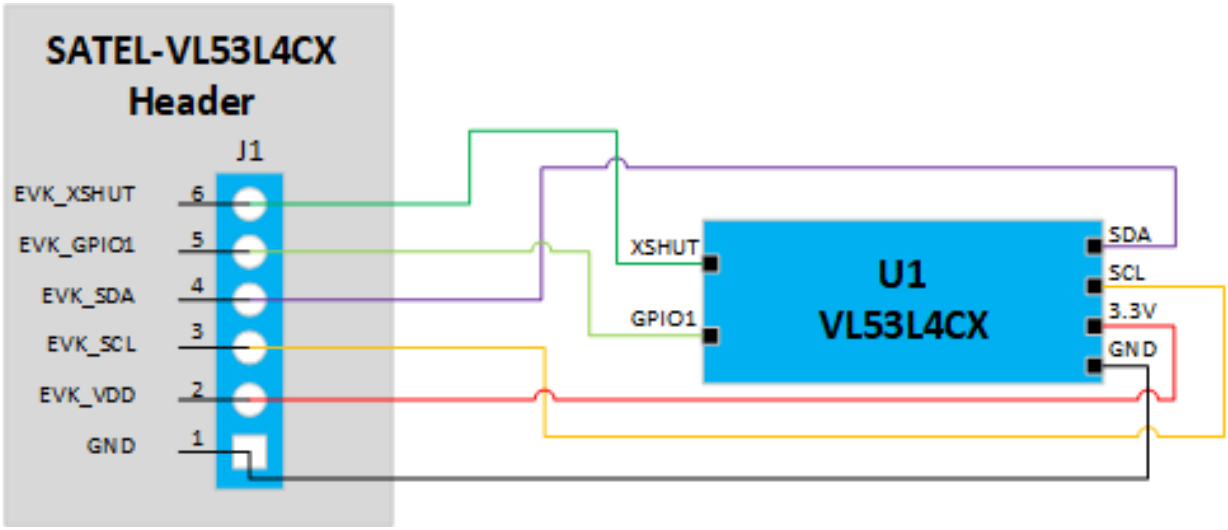
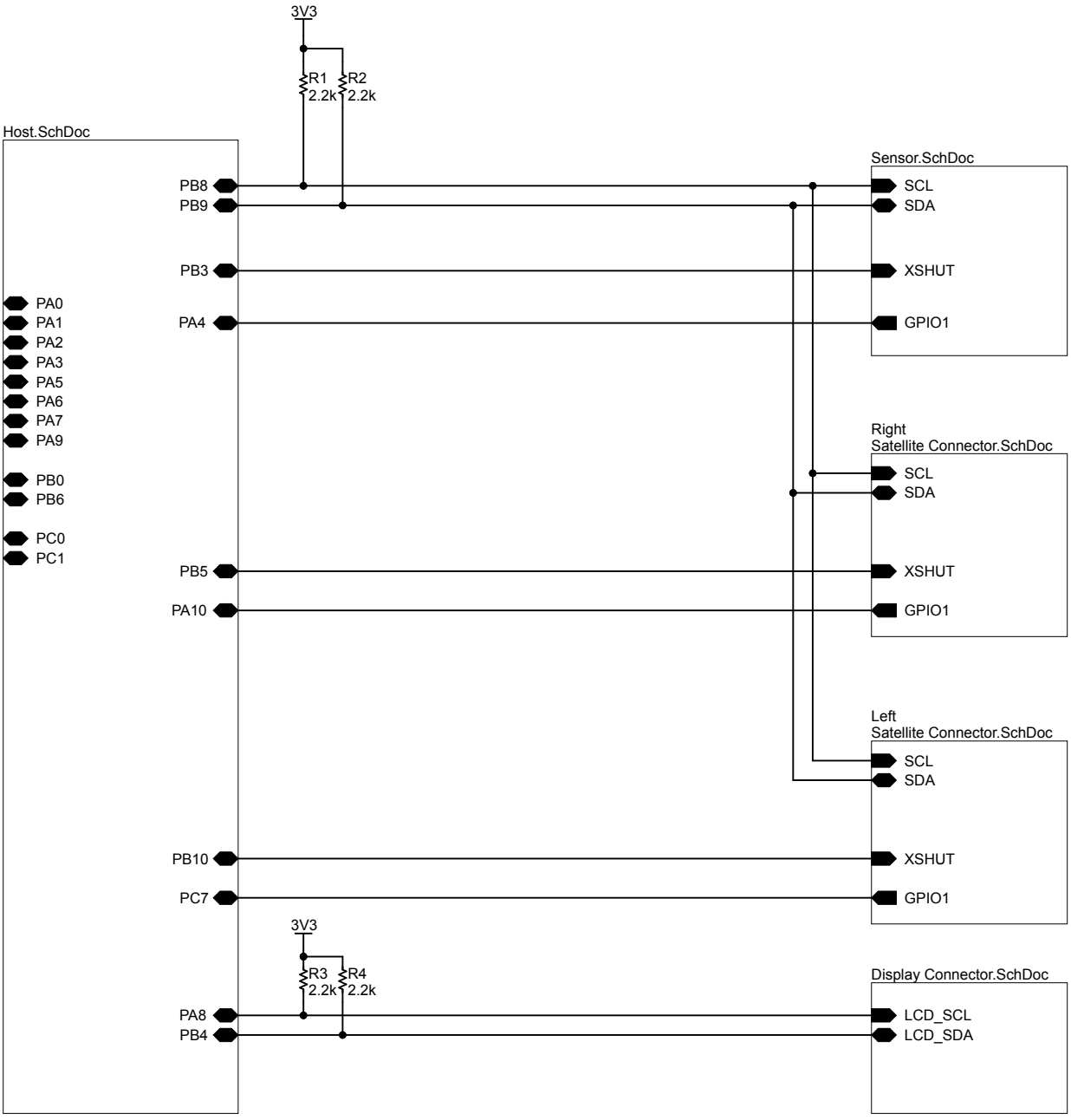


Figure 5. **SATEL-VL53L4CX simplified schematic**



4 Schematic diagrams

Figure 6. **X-NUCLEO-53L4A2 circuit schematic (1 of 6)**



Note: The display connector is an optional connector to connect an SSD1306 I2C OLED display to output the ranging data or other meaningful information if required. The related application note and example code will be available on st.com.

Figure 7. **X-NUCLEO-53L4A2 circuit schematic (2 of 6)**

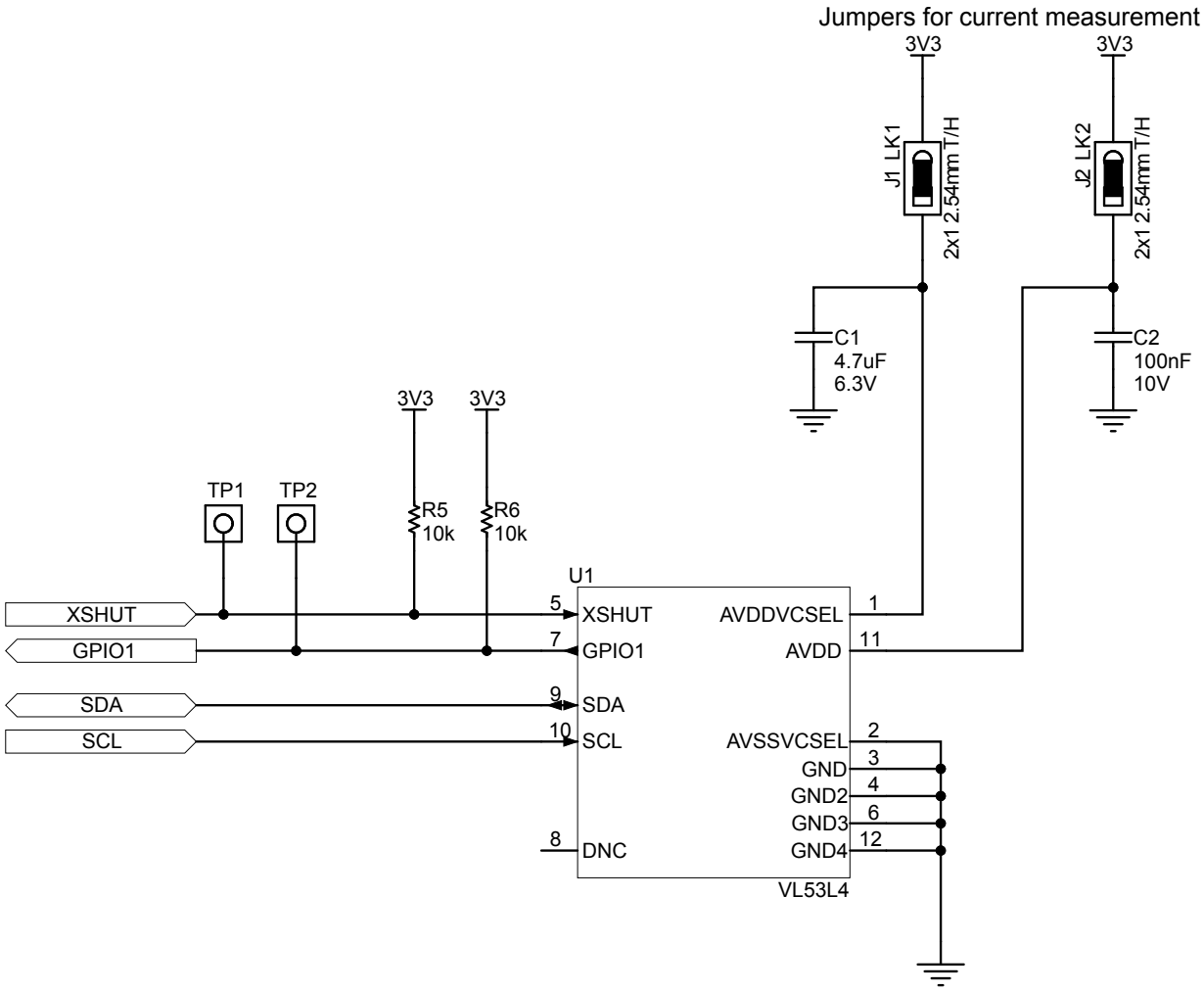


Figure 8. **X-NUCLEO-53L4A2 circuit schematic (3 of 6)**

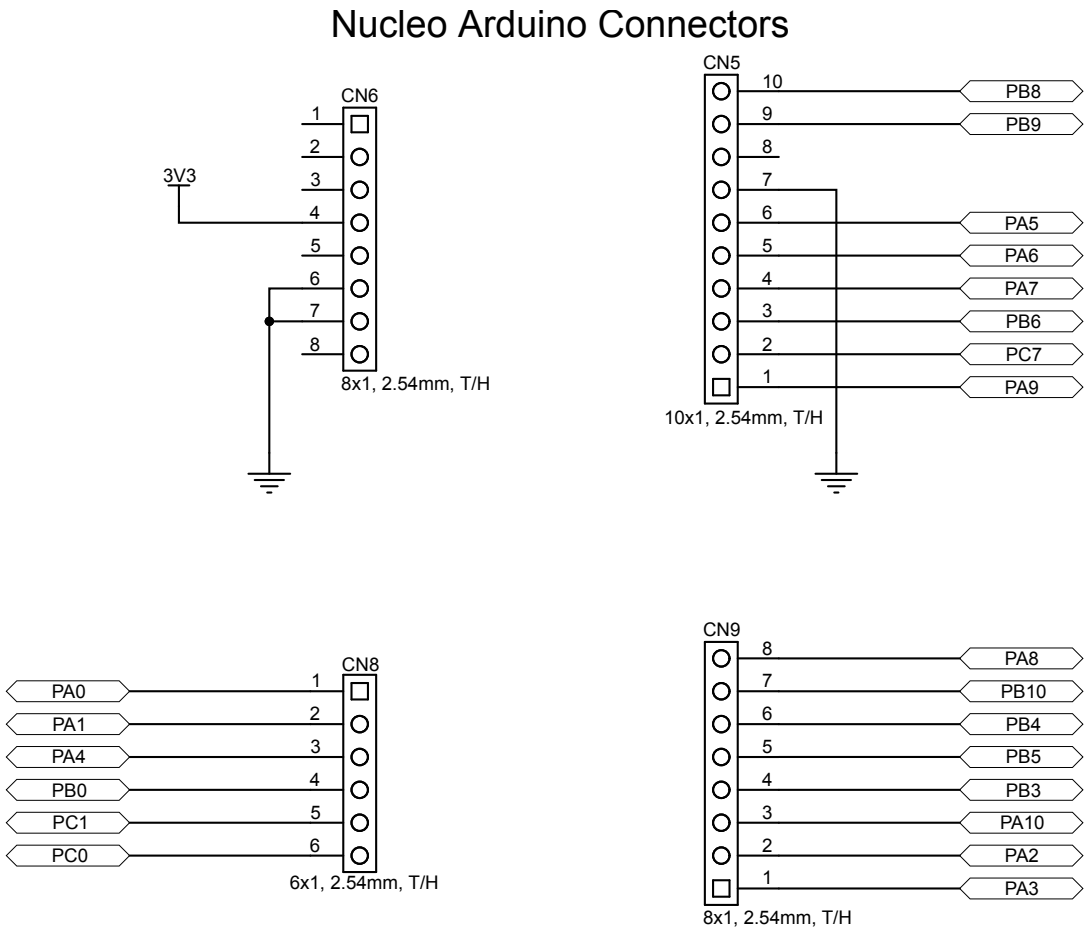


Figure 9. **X-NUCLEO-53L4A2 circuit schematic (4 of 6)**

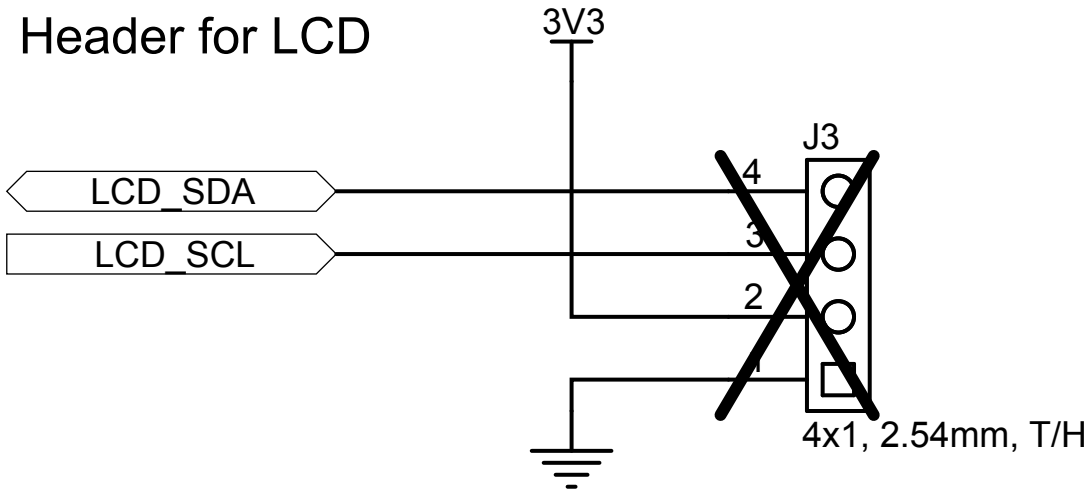


Figure 10. **X-NUCLEO-53L4A2 circuit schematic (5 of 6)**

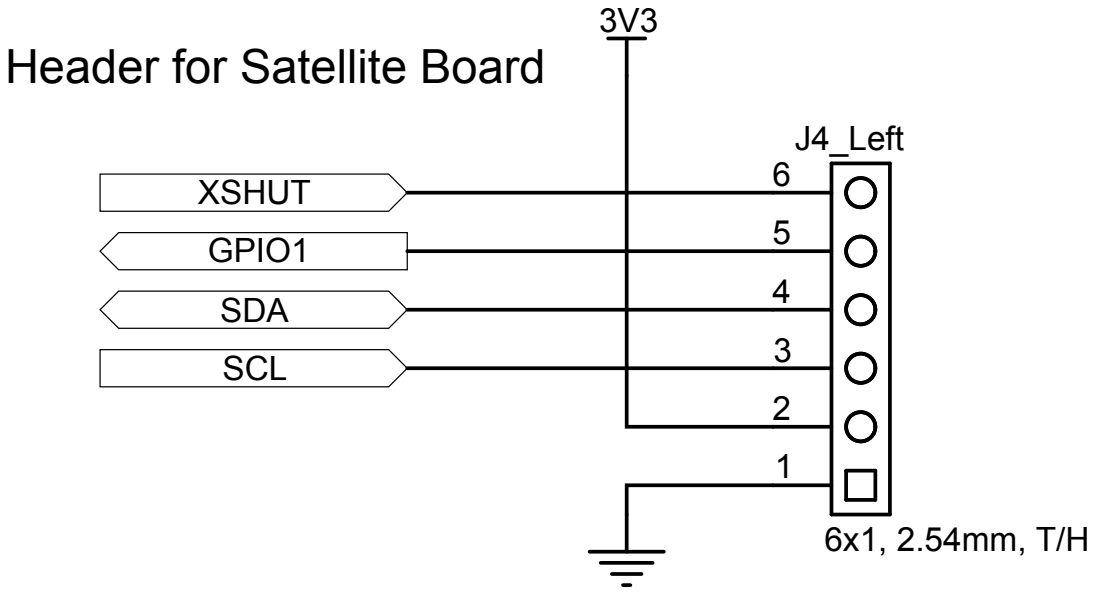
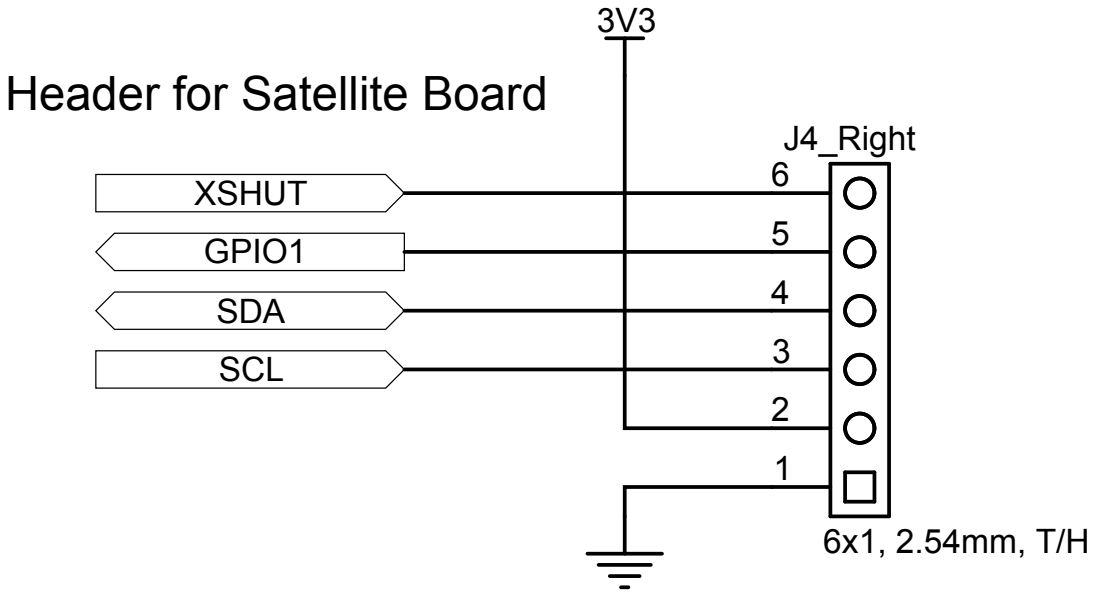


Figure 11. **X-NUCLEO-53L4A2 circuit schematic (6 of 6)**



5 Board versions

Table 1. **X-NUCLEO-53L4A2 versions**

Finished good	Schematic diagrams	Bill of materials
XNUCLEO$53L4A2A (1)	XNUCLEO$53L4A2A schematic diagrams	XNUCLEO$53L4A2A bill of materials

1. *This code identifies the X-NUCLEO-53L4A2 evaluation board first version.*

Revision history

Table 2. **Document revision history**

Date	Revision	Changes
21-Dec-2021	1	Initial release.