VL53L4ED STM32 Nucleo pack with X-NUCLEO-53L4A3 expansion board and NUCLEO-F401RE development board

Features

- VL53L4ED Time-of-Flight sensor with extended range measurement expansion board (X-NUCLEO-53L4A3)
- NUCLEO-F401RE development board
- 0.25, 0.5, and 1 mm spacers to simulate air gaps
- Two different cover glasses to protect the sensor from the dust
- 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 P-NUCLEO-53L4A3 is a complete evaluation kit that allows you to learn, evaluate, and develop applications using the VL53L4ED Time-of-Flight sensor with extended range measurement.

Specifically designed for long-range, multitarget measurements, the VL53L4ED provides very accurate distance measurements up to 6 m with excellent results over short distances.

A new generation laser emitter with 18° FoV improves the performance under the ambient light.

Thanks to ST patented algorithms and innovative module construction, the VL53L4ED is also able to detect multiple objects within the FoV with depth understanding.

ST histogram algorithms ensure cover glass crosstalk immunity beyond 80 cm and dynamic smudge compensation for targets below 80 cm.

Like all Time-of-Flight sensors based on ST FlightSense technology, the VL53L4ED records an absolute distance measurement regardless of the target color and reflectance.

The NUCLEO-F401RE STM32 Nucleo development board provides an affordable and flexible way for users to try out new ideas and build prototypes with any STM32 microcontroller, choosing from the various combinations of performance, power consumption, and features.

Product summary	
VL53L4ED STM32 Nucleo pack with X-NUCLEO-53L4A3 expansion board and NUCLEO-F401RE development board	P-NUCLEO-53L4A3
P-NUCLEO-53L4A3 pack graphical user interface (GUI)	STSW-IMG030
Time-of-Flight high accuracy proximity sensor	VL53L4EDV0DH/1
STM32 Nucleo-64 development board with STM32F401RE MCU	NUCLEO-F401RE
Time-of-Flight sensor with extended range measurement expansion board based on the VL53L4ED for STM32 Nucleo	X-NUCLEO-53L4A3
Applications	Personal Electronics - Audio and Video/ Gaming and Drones/ Virtual - Augmented Reality/Wearable

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For further information contact your local STMicroelectronics sales office.

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1 Laser safety considerations

The VL53L4ED contains a laser emitter and the 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 X-NUCLEO-53L4A3 expansion board

The X-NUCLEO-53L4A3 expansion board allows you to test the VL53L4ED functionality and to program it, to understand how to develop an application using the VL53L4ED. It integrates a 3.3 V voltage regulator to supply the VL53L4ED on the expansion board and the necessary connectivity for the application.

You have to program the NUCLEO-F401RE development board to control the X-NUCLEO-53L4A3 expansion board.

X-NUCLEO-53L4A3 expansion board and the NUCLEO-F401RE are connected through the Arduino compatible connectors CN5, CN6, CN8, and CN9.

The Arduino connectors on the NUCLEO-F401RE support the Arduino Uno revision 3.

3 Optional VL53L4ED breakout board

The SATEL-VL53L4ED is designed to connect remotely the VL53L4ED sensor to any type of electronic controller.

The VL53L4ED breakout boards can be directly plugged onto the VL53L4ED expansion board through two 6-pin connectors or can be connected to the VL53L4ED expansion board through flying wires.

Breakout boards can be purchased separately using the reference: SATEL-VL53L4ED. In this pack, two breakout boards are provided.

4 Schematic diagrams

The P-NUCLEO-53L4A3 kit consists of an X-NUCLEO-53L4A3 expansion board and a NUCLEO-F401RE development board.

You can find the related schematic diagrams at the following links:

- X-NUCLEO-53L4A3 schematic diagrams
- NUCLEO-F401RE schematic diagrams

5 Board versions

Table 1. P-NUCLEO-53L4A3 versions

PCB version	Schematic diagrams	Bill of materials
P$NUCLEO-53L4A3A [1]	P$NUCLEO-53L4A3- schematic diagrams	P$NUCLEO-53L4A3-bill of materials

1.   *This code identifies the P-NUCLEO-53L4A3 expansion board first version. It is printed on the board PCB.*

Revision history

Table 2. Document revision history

Date	Revision	Changes
26-Jan-2024	1	Initial release.

IMPORTANT NOTICE – READ CAREFULLY