VL53L7CX STM32 Nucleo pack with X-NUCLEO-53L7A1 expansion board and NUCLEO-F401RE development board

Features

- VL53L7CX Time-of-Flight 8x8 multizone ranging sensor with 90° FoV expansion board (X-NUCLEO-53L7A1)
- NUCLEO-F401RE development board
- 0.25, 0.5, and 1 mm spacers to simulate air gaps
- One cover glass 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-53L7A1 is a complete evaluation kit that allows you to learn, evaluate, and develop applications using the VL53L7CX Time-of-Flight 8x8 multizone ranging sensor with 90° FoV.

The VL53L7CH artificial enabler Time-of-Flight sensor is also supported by the X-NUCLEO-53L7A1.

Specifically designed for applications that require an ultrawide FoV, the VL53L7CX Time-of-Flight sensor offers a 90° diagonal FoV.

Based on ST FlightSense technology, the VL53L7CX incorporates an efficient metasurface lens (DOE) placed on the laser emitter, enabling the projection of a 60° x 60° square FoV onto the scene.

Its multizone capability provides a matrix of 8x8 zones (64 zones) and can work at fast speeds (60 Hz) up to 350 cm.

Thanks to the autonomous mode with programmable distance threshold combined with the ultrawide FoV, the VL53L7CX is perfect for any application requiring low-power user detection.

ST patented algorithms and innovative module construction allow the VL53L7CX to detect, in each zone, multiple objects within the FoV with depth understanding.

ST histogram algorithms ensure cover glass crosstalk immunity beyond 60 cm.

Derived from the VL53L7CX, the pinouts and drivers of both sensors are compatible, ensureing a simple migration from one sensor to the other.

Like all Time-of-Flight (ToF) sensors based on ST FlightSense technology, the VL53L7CX records, in each zone, an absolute distance 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	
VL53L7CX STM32 Nucleo pack with X-NUCLEO-53L7A1 expansion board and NUCLEO-F401RE development board	P-NUCLEO-53L7A1
GUI for VL53L7CX expansion boards	STSW-IMG037
Time-of-Flight 8x8 multizone ranging sensor with 90° FoV	VL53L7CXV0GC/1
STM32 Nucleo-64 development board with STM32F401RE MCU	NUCLEO-F401RE
Time-of-Flight 8x8 multizone ranging sensor with 90° FoV expansion board	X-NUCLEO-53L7A1
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 VL53L7CX 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-53L7A1 expansion board

The X-NUCLEO-53L7A1 expansion board allows you to test the VL53L7CX functionality and to program it, to understand how to develop an application using the VL53L7CX. It integrates a 3.3 V voltage regulator to supply the VL53L7CX on the expansion board and the necessary connectivity for the application.

You have to program the NUCLEO-F401RE to control the X-NUCLEO-53L7A1 expansion board.

The X-NUCLEO-53L7A1 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 board support the Arduino UNO revision 3.

3   Optional VL53L7CX breakout board

The SATEL-VL53L7CX is designed to connect remotely the VL53L7CX sensor to any type of electronic controller.

The VL53L7CX breakout boards can be directly plugged onto the VL53L7CX expansion board through two 6-pin connectors or can be connected to the VL53L7CX expansion board through flying wires.

Breakout boards can be purchased separately using the reference: SATEL-VL53L7CX. In this pack, two breakout boards are provided.

4 Schematic diagrams

The P-NUCLEO-53L7A1 kit consists of an X-NUCLEO-53L7A1 expansion board and a NUCLEO-F401RE development board.

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

- X-NUCLEO-53L7A1 schematic diagrams
- NUCLEO-F401RE schematic diagrams

Revision history

Table 1. Document revision history

Date	Revision	Changes
21-Nov-2022	1	Initial release.
03-Mar-2023	2	Updated Section 3 Optional VL53L7CX breakout board
11-Aug-2023	3	Added refererence to VL53L7CH. Updated Description.
21-Nov-2023	4	Updated Section Description.

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