VL53L0X

World smallest Time-of-Flight (ToF) laser ranging sensor

Data brief

Features

- Fully integrated miniature module
  - 940nm Laser VCSEL
  - VCSEL driver
  - Ranging sensor with advanced embedded microcontroller
  - 4.4 x 2.4 x 1.0mm
- Fast, accurate distance ranging
  - Measures absolute range up to 2m
  - Reported range is independent of the target reflectance
  - Operates in high IR ambient light levels
  - Advanced embedded optical cross-talk compensation to simplify cover glass selection
- Eye safe
  - Class 1 laser device compliant with latest standard IEC 60825-1:2014 - 3rd edition
- Easy integration
  - Single reflowable component
  - No additional optics
  - Single power supply
  - I2C interface for device control and data transfer
  - Xshutdown (Reset) and interrupt GPIO

Applications

- User detection for Personal Computers/ Laptops/Tablets and IoT (Energy saving)
- Robotics (obstacle detection)
- White goods (hand detection in automatic faucets, soap dispensers etc...)
- 1D gesture recognition
- Laser assisted Auto-Focus. Enhances and speeds-up camera AF system performance, especially in difficult scenes (low light levels, low contrast) or fast moving video mode.
- Smart-phones advanced proximity sensor (distance in mm)
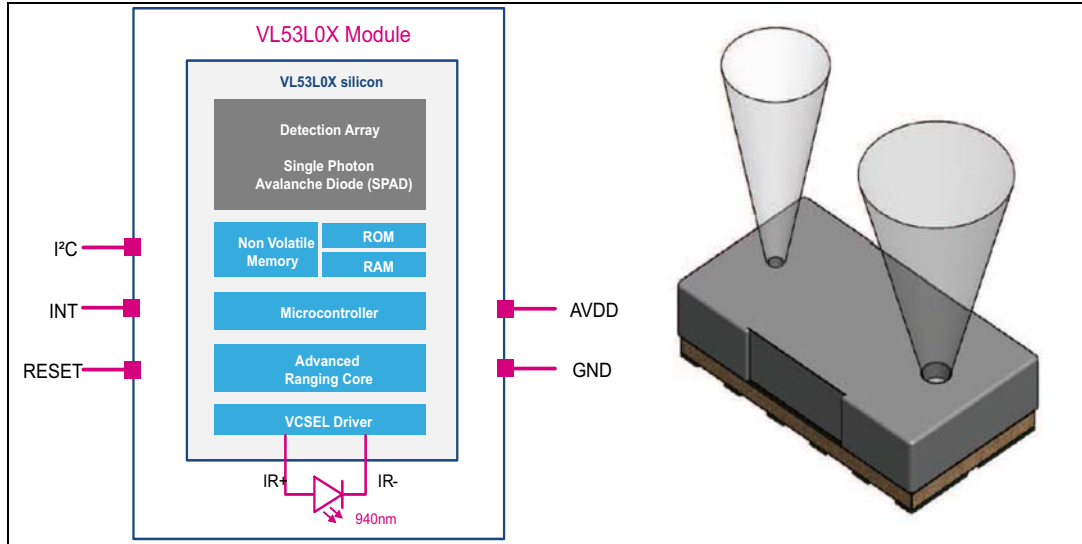
Description

The VL53L0X is a new generation Time-of-Flight (ToF) laser-ranging module housed in the smallest package on the market today, providing accurate distance measurement whatever the target reflectance, unlike conventional technologies. It can measure absolute distances up to 2m in less than 30ms, setting a new benchmark in ranging performance levels, opening the door to various new applications.

The VL53L0X integrates a leading-edge SPAD array (Single Photon Avalanche Diodes) and embeds ST's second generation FlightSense™ patented technology.

The VL53L0X's 940nm VCSEL emitter (Vertical Cavity Surface-Emitting Laser), is totally invisible to the human eye and when coupled with physical Infrared filters enables longer ranging distance, higher immunity to ambient light and better robustness to cover-glass optical cross-talk.

www.st.com

Technical specification

Figure 1. VL53L0X block diagram and drawing

Ordering information

VL53L0X is currently available in the following format. More detailed information is available on request.

Table 1. Delivery format

Order code	Description
VL53L0CXV0DH/1	Tape and reel - VL53L0X with liner

EcoPack

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK® is an ST trademark.

Revision history

Table 2. Document revision history

Date	Revision	Changes
15 Feb 2016	1	Initial release.
24 Feb 2016	2	Add liner information in Table 1
2 May 2016	3	Update Description section

IMPORTANT NOTICE – PLEASE READ CAREFULLY