

New generation Time-of-Flight Ranging sensor with advanced multi-zone and multi-object detection

Data brief



Features

- Fully integrated miniature module
 - Emitter: 940nm invisible laser (VCSEL) and its analog driver
 - Receiving array with integrated lens
 - Low-power micro-controller running advanced digital firmware
 - Size: 4.9 x 2.5 x 1.56mm
- Fast, accurate distance ranging
 - 400cm+ detection with full FoV
 - 60Hz ranging capable up to 300cm
 - Immune to coverglass cross-talk and fingerprint smudge at long distance with patented algorithms (direct ToF)
 - Multi-object detection capable
 - Multi-zone scanning with selectable array (2x2, 3x3, 4x4, or defined by user through software)
- Easy integration
 - Single reflowable component
 - Single power supply 2v8
 - Works with many types of cover glasses materials
 - I²C interface (up to 1MHz)
 - Xshutdown (Reset) and interrupt GPIO
 - Full set of Software driver (Linux and Android compatible) for turnkey ranging

Applications

- Laser assisted Auto-Focus: enhances the camera AF system speed and robustness, especially in difficult scenes (low light and low contrast). Ideal companion for PDAF sensors.
- Video focus tracking assistance at 60Hz
- Scene understanding with multi-object detection: “choose the focus point”
- Dual camera stereoscopy and 3D depth assistance thanks to multi-zone measurement
- Presence detection (autonomous timed mode), typically to lock/unlock and power on/off devices like notebooks, tablets or white goods

Description

The VL53L1 is a state-of-art Time-of-Flight (ToF) laser-ranging miniature sensor, enhancing the ST *FlightSense™* product family. Housed in a miniature and reflowable package, it integrates a SPAD (Single Photon Avalanche Diodes) array, physical infrared filters and optics to achieve the best ranging performance in various ambient lighting conditions, with range of cover glass options.

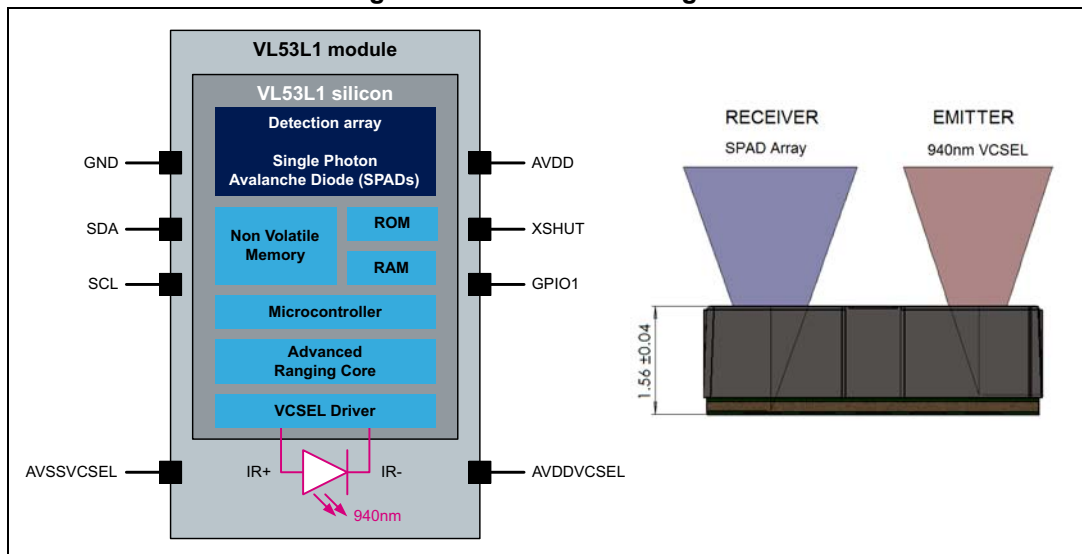
Unlike conventional IR sensors, VL53L1 uses ST’s latest generation direct ToF technology which allows absolute distance measurement whatever the target color and reflectance. It provides accurate ranging up to 4m and can work at fast speed (60Hz), which makes it the fastest miniature ToF sensor on the market.

With patented algorithms and ingenious module construction, VL53L1 is also able to detect different objects within the Field-of-View with depth information (histogram) at 60Hz.

Scene browsing and multi-zone detection is now possible with VL53L1, thanks to software customizable detection array for quicker “touch-to-focus” or mini depth-map use cases.

Technical specification

Figure 1. VL53L1 block diagram



Ordering information

Table 1. Ordering information

Sales type	Package	Packing
VL53L1CBV0FY/1	Optical LGA12 with liner	Tape and reel (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
14-Feb-2017	1	Initial release.
17-Feb-2017	2	update Table 1: Ordering information

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