

Ultrawide Time-of-Flight 8x8 multizone ranging sensor



Product status link

[VL53L7CA](#)

Features

- Fast and accurate multizone distance ranging sensor with 90° wide field of view (FoV):
 - 60° x 60° square FoV (90° diagonal).
 - Multizone ranging output with either 4x4 or 8x8 separate zones.
 - Up to 350 cm ranging.
 - Multitarget detection and distance measurement in each zone.
 - 60 Hz frame rate capability.
 - Histogram processing and algorithmic compensation, which minimizes or removes the impact of cover glass crosstalk.
- Fully integrated miniature module, with:
 - An emitter of 940 nm invisible light vertical-cavity surface-emitting laser (VCSEL), and integrated analog driver.
 - Diffractive optical elements (DOE) on both the transmitter and receiver that enable square FoV.
 - A receiving array of single photon avalanche diodes (SPADs).
 - Low-power microcontroller running firmware.
 - A size of 6.4 x 3.0 x 1.6 mm.
- Easy integration for:
 - A single reflowable component.
 - Flexible power supply options. They include a single 3.3 V or 2.8 V operation, or a combination of either 3.3 V or 2.8 V AVDD with 1.8 V IOVDD.
 - Compatibility with a wide range of cover glass materials.

Description

The VL53L7CA is a state of the art, second generation, multizone, Time-of-Flight (ToF), laser-ranging, sensor enhancing the STMicroelectronics' FlightSense product family. Housed in a miniature reflowable package, it integrates a SPAD array, enhanced VCSEL, physical infrared filters, and STMicroelectronics' latest meta-surface optical technology. All this achieves the best ranging performance in various ambient lighting conditions, with a range of cover glass materials. The use of a diffractive optical element above the VCSEL allows a square FoV to be projected onto the scene. The reflection of this light is focused by the receiver lens onto a SPAD array.

This second generation product offers half the typical power consumption, or twice the ranging performance compared to the previous generation.

Unlike conventional IR sensors, the VL53L7CA uses STMicroelectronics' latest generation, direct ToF technology. It allows absolute distance measurement whatever the target color and reflectance. It also provides accurate ranging up to 350 cm and can work at fast speeds (60 Hz). The enhanced design makes it the most power-efficient, high performance, multipoint, miniature, ToF sensor on the market.

With patented algorithms and ingenious module construction, the VL53L7CA is also able to detect multiple objects within the FoV. This sensor has depth information for a quicker touch-to-focus, or minidepth map creation.

Revision history

Table 1. Document revision history

Date	Version	Changes
07-Jun-2023	1	Initial release

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