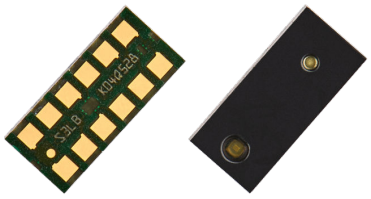
VL53LBCA

Data brief

Low-power and high-performance Time-of-Flight ranging sensor



Product status link
VL53LBCA

Features

- Fully integrated miniature module
  - Emitter: 940 nm invisible vertical-cavity surface-emitting laser (VCSEL) and its analog driver
  - Low-power microcontroller, running advanced digital firmware
  - Size: 4 x 1.8 x 1 mm
- Fast, accurate distance ranging
  - Histogram-based technology
  - Detection range 8 m
  - Cover glass crosstalk and fingerprint smudge immunity at long distances, with patented algorithms using direct Time-of-Flight (ToF)
  - Histogram processing, with the possibility to output distance and raw histograms from the chip
  - Strong performance in outdoor ambient light
- Typical FoV: 25°
- Easy integration
  - Reflowable component
  - Works with many types of cover glass materials
  - I²C and I3C interfaces (up to 12.5 MHz)
  - Xshutdown (reset), interrupt GPIO (general-purpose input/output), and sync GPIO for optimizing the ranging operation
  - Full set of C and Linux software drivers for turnkey ranging

Applications

- Laser assisted AF (autofocus): enhances the image sensor AF system speed and robustness, especially in difficult scenes (low light and low contrast). An ideal companion for PDAF (phase-detection autofocus) sensors.
- Video focus tracking assistance
- Camera selection assistance
- Service robots and vacuum cleaners (wall following and fast obstacle detection)
- Sanitary: robust user detection whatever the target reflectance
- Smart buildings and smart lighting: user detection to wake up devices
- IoT (Internet of Things): user and object detection

Description

The VL53LBCA is a ToF module, featuring a SPAD sensing array, an illumination device, and passive support components. This product is a single-zone ranging device, where both control and data are handled via an I3C/I²C interface. The integrated laser driver can deliver up to 120 mW of optical power from the VCSEL.

Revision history

Table 1. **Document revision history**

Date	Version	Changes
16-Nov-2026	1	Initial release

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