

VL53L1CB

Extended distance Time-of-Flight ranging sensor



Time-of-Flight ranging sensor with advanced multi-zone and multi-object detection

The VL53L1CB is the new Time-of-Flight sensor based on the ST patented **FlightSense™** technology. The sensor is able to range up to 8m independent of the target color or material. The ST Histogram algorithm permits detection of different targets within the Field-of-View (FoV). The algorithm also provides immunity to cover glass cross-talk beyond 80cm. The SPAD array zone selection allows advanced multi-zone scanning. The VL53L1CB also has a programmable FoV from 15° to 27° dependent on the size of the SPAD array zone selection.

KEY FEATURES & BENEFITS

- Long distance measurement up to 8m
- Multi-target distance measurement based on ST Histogram patented algorithms
- Immunity to cover glass cross-talk beyond 80cm
- Automatic fingerprint smudge compensation
- SPAD array zone selection for FoV reduction
- Integrated lens for long distance ranging
- Advanced multi-zone scanning

KEY APPLICATIONS

- Presence user detection
- Obstacle detection
- Accurate objects distance scanning
- Power saving
- Basic gesture recognition



Technology

The VL53L1CB is a state-of-the-art Time-of-Flight sensor enhancing STMicroelectronics' **FlightSense™** product family. Housed in an all-in-one reflowable package, it integrates a SPAD (single photon avalanche diode) array, physical infrared filters and optics to achieve the best ranging performance in various ambient lighting conditions, with a wide range of cover windows.

Unlike conventional IR sensors, the VL53L1CB 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 8m and can work at high speed (60Hz), which makes it very useful for fast application such as gesture recognition or industrial use-cases.

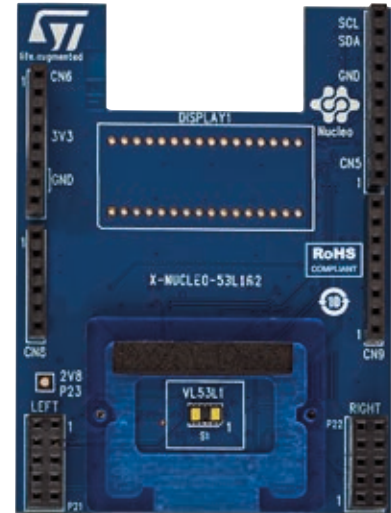
With patented algorithms and innovative module construction, the VL53L1CB is able to detect different objects within the field-of-view with depth understanding at 60Hz. Scene browsing and multi-zone detection is also possible, this is enabled by the Application Programming Interface (API) which provides a sequential multi-zone scan.

Module design

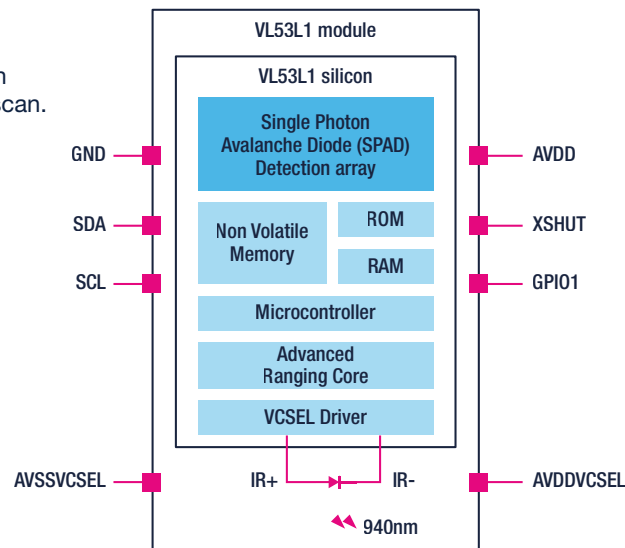
The VL53L1CB is "industrial design friendly"! It is a stand-alone, all-in-one ultra small form factor module of 4.9 x 2.5 x 1.56 mm, which can be hidden behind a wide variety of cover windows and reflowed on a motherboard or a flex PCB.

The VL53L1CB is pin-to-pin compatible with previous generation VL53L0X and VL53L1X, which enables a natural evolution to this new generation.

VL53L1CB evaluation kit X-NUCLEO-53L1A2



System Block Diagram



Product details

Part number	Package size	Operating range	Power consumption	Supply voltage	Optimum operating temperature
VL53L1CBV0FY/1	4.9 x 2.5 x 1.56 mm	Up to 8m	Hardware standby (typ.): 5 μ A Ranging: <1 mW (*)	2.6 to 3.5 V	+ 20 to +85° C

* Power consumption for Presence detection, no target, 1Hz, 20 ms ranging operation



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