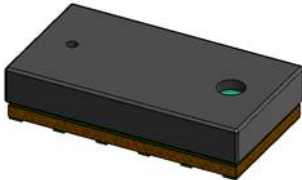# Time-of-Flight ranging sensor with multi target detection

Features

- Fully integrated miniature module
    - Emitter: 940 nm invisible laser (VCSEL) and its analog driver
    - Low-power microcontroller running advanced digital firmware
    - Size: 4.4 x 2.4 x 1 mm
- Fast, accurate distance ranging
    - Histogram based technology
    - Up to 300 cm+ detection with full field of view (FoV)
    - Immune to cover glass cross-talk and fingerprint smudge at long distance with patented algorithms (direct ToF)
    - Dynamic fingerprint smudge compensation
    - Short distance, high accuracy linearity
    - Multi target detection and distance measurement
- Typical full FoV: 25 °
- Easy integration
    - Reflowable component
    - Part-to-part or generic shape crosstalk calibration available
    - Single power supply
    - Works with many types of cover glass materials
    - I²C interface (up to 1 MHz)
    - Xshutdown (reset) and interrupt GPIO to optimize ranging operation
    - C and Linux full set of software drivers for turnkey ranging

Applications

- 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 (user and object detection)
- Laser assisted autofocus (AF): enhances the camera AF system speed and robustness, especially in difficult scenes (low light and low contrast); ideal companion for phase-detection autofocus (PDAF) sensors.
- Video focus tracking assistance

DB4114 - Rev 1 - January 2020
For further information contact your local STMicroelectronics sales office.

www.st.com

Description

The VL53L3CX is the latest Time-of-Flight (ToF) product from STMicroelectronics and embeds ST's third generation FlightSense patented technology. It combines a high performance proximity and ranging sensor, with multi target distance measurements and automatic smudge correction. The miniature reflowable package integrates a single photon avalanche diode (SPAD) array and physical infrared filters to achieve the best ranging performance in various ambient lighting conditions, with a wide range of cover glass windows.

The VL53L3CX combines the benefits of a high-performance proximity sensor, with excellent short distance linearity, together with ranging capability up to 3 m.

With patented algorithms and ingenious module construction, the VL53L3CX is also able to detect different objects within the field of view (FoV) with depth understanding. The ST histogram algorithms allow cover glass crosstalk immunity beyond 80 cm, and dynamic smudge compensation.

1   System block diagram

Figure 1. **VL53L3CX block diagram**
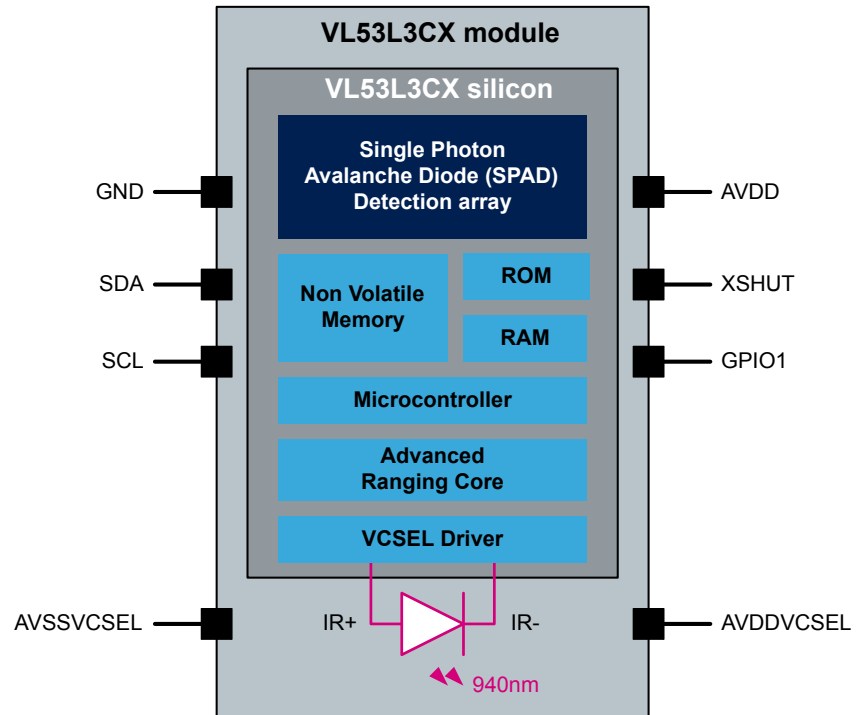
Revision history

Table 1. Document revision history

Date	Version	Changes
23-Jan-2020	1	Initial release

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