# VL53L7CH - VL53L8CH

## 8x8 multizone Time-of-Flight sensors enabling Artificial Intelligence (AI)


### 8x8 multizone ToF sensors with compact normalized histogram (CNH) technology for advanced AI applications

Embedding cutting-edge ST optical metasurface technology, the VL53L7CH and VL53L8CH sensors offer critical data functionality for AI-driven applications. These multizone Time-of-Flight sensors output raw CNH data that AI engines for enhanced depth perception, motion detection, and environmental analysis.

**VL53L7CH FEATURES**

- Ultrawide FoV: 90° (60°x60°)
- Up to 350 cm in dark conditions
- Pin-to-pin compatibility with VL53L5CX and VL53L7CX

**VL53L8CH FEATURES**

- Wide FoV 65° FoV (45°x45°)
- Up to 400 cm in dark conditions
- Up to 285 cm ranging under ambient light
- Low power consumption (down to 1.65 mW)
- Pin-to-pin compatible with VL53L8CX

**COMMON FEATURES**

- Multitarget detection and distance measurement in each zone
- Motion detection with advanced indicators
- Immunity to cover glass crosstalk beyond 60 cm
- Frame rate capability up to 30 Hz

**APPLICATIONS**

- Any AI application leveraging raw histogram data

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## What is CNH ?

The VL53L7CH and VL53L8CH Time-of-Flight sensors can output raw data in a compact and normalized histogram (CNH) format that offers major advantages for data intensive AI applications.
Raw IR signal data from up to 64 (8x8) zones are collected in a maximum of 128 CNH data bins with configurable ranges or widths.
All the CNH data is transmitted to the host at up to 30 Hz, along with the normal ranging distance, signal level, and reflectance data processed by the ToF sensor.

## Multizone object detection

ST's patented algorithms and construction allow the VL53L7CH and VL53L8CH to detect multiple objects within the FoV with depth understanding and motion detection. This ensures immunity to environmental interference and robust performance, with over 60-cm crosstalk immunity.

## Compact design

These sensors are compact and easy to integrate with multiple power supply options.

Their small form factor makes them ideal for embedding behind a variety of cover glass materials.

## Developer resources

Various options are available for VL53L7CH and VL53L8CH Time-of-Flight sensor evaluation: (1) A complete STM32 Nucleo kit with STM32 Nucleo platform and Time-of-Flight sensor expansion board, (2) the dedicated ToF expansion board only, (3) a miniature breakout board that can be integrated in customer designs for testing in real environments, and (4) a GUI to facilitate evaluation and boost application development.

**(1) Complete STM32 Nucleo**

P-NUCLEO-53L7A1
P-NUCLEO-53L8A1

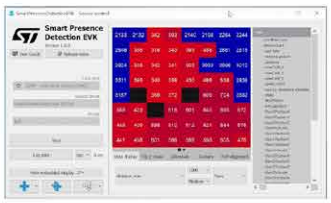
**(2) Time-of-Flight**

X-NUCLEO-53L7A1
X-NUCLEO-53L8A1

**(3) Time-of-Flight**

SATEL-VL53L7CX
SATEL-VL53L8

**(4) Graphical User Interface**




VL53L7CH: STSW-IMG043

## VL53L7CH and VL53L8CH feature table

| Category | VL53L7CH | VL53L8CH |
|---|---|---|
| Field of view | 90° diag. (60°x60°) | 65° diag. (45°x45°) |
| Resolution | Up to 8x8 zones | |
| Processing mode | Compact normalized histogram | |
| Max. Distance ranging | 350 cm | 400 cm |
| Dist. Ranging under ambient* | 65 cm | 285 cm |
| Min. Power consumption** | 8.3 mW | 1.6 mW |
| Common features | Multitarget detection/motion indicator/crosstalk immunity over 60 cm | |
| Module size | 6.4 x 3.0 x 1.6 mm | 6.4 x 3.0 x 1.75 mm |
| Ai-related capabilities | CNH data output enabling AI capabilities | |

*Best conditions using white target (88% reflectance)
**Based on the lowest power consumption configuration



**Order code: FL2504VL53L7CH8**