

## Breakout boards based on VL6180 Time-of-Flight proximity sensor



### Features

- Each breakout board integrates:
  - VL6180 module (proximity sensor)
  - 2.8 V output regulator
- True distance measurement independent of target size and reflectance
- Able to function in multi-module applications
- Divisible board enabling use as mini PCB breakout board, easy to integrate in customer device
- Compatible with X-NUCLEO-6180A1 expansion board
- Up to three VL6180 breakout boards can be plugged into the expansion board through its 2.54 mm connector
- Can be used with STM32 Nucleo board available in the P-NUCLEO-6180A1 pack based on full-feature Nucleo board with STM32F401RE dynamic efficiency ARM® Cortex®-M4 microcontroller

### Description

The VL6180 breakout boards are hardware add-ons for the X-NUCLEO-6180A1 expansion board. Up to three breakout boards can be connected to the X-NUCLEO-6180A1 expansion board, enabling multi sensor applications. Thanks to its 2.8 V regulator, the VL6180 breakout board can be used in any application with a 3.3 to 10 V supply.

The part supporting the VL6180 module, 2.54 mm connector and output regulator is scored, so that developers can break off the mini PCB for use in a 2.8 V supply application using flying leads. This makes it easier to integrate into development and evaluation devices due to its small form factor.

## **1 VL6180 overview**

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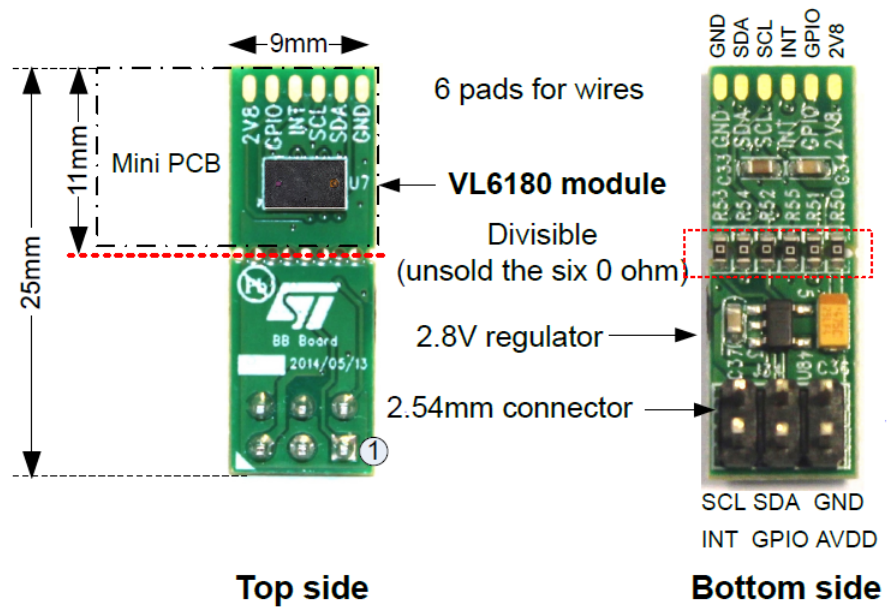
The VL6180 is based on ST's patented FlightSense technology. This is a ground-breaking technology allowing absolute distance to be measured independent of target reflectance. Instead of estimating the distance by measuring the amount of light reflected back from the object (which is significantly influenced by color and surface), the VL6180 precisely measures the time the light takes to travel to the nearest object and reflect back to the sensor (Time-of-Flight).

Combining an IR emitter and a range sensor, the VL6180 is easy to integrate and saves OEMs (original design manufacturing) long and costly optical and mechanical design optimizations. The module is designed for low-power operation. Ranging measurements can be automatically performed at user defined intervals. Multiple threshold and interrupt schemes are supported to minimize host operations.

## 2 Breakout board

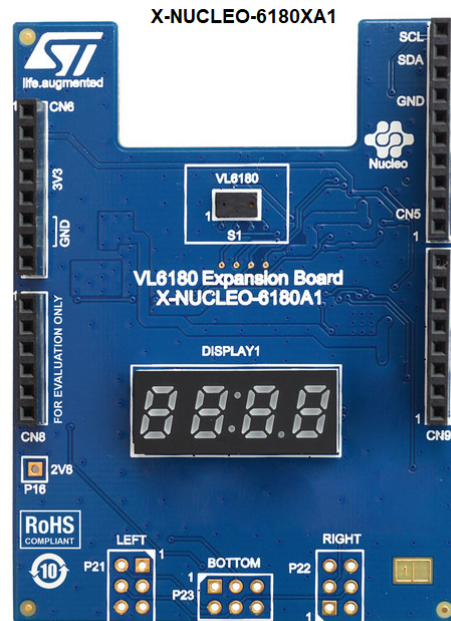
For a 2.8 V supply application, the breakout board can be divided along the red dotted line as shown in the figure below so that only the “mini PCB” is used. This makes it easier to integrate into a customer device due to its small form factor.

**Figure 1. Breakout board layout**



### 3 Connection to X-NUCLEO-6180A1 Nucleo expansion board

**Figure 2.** Connection to X-NUCLEO-6180A1 Nucleo expansion board

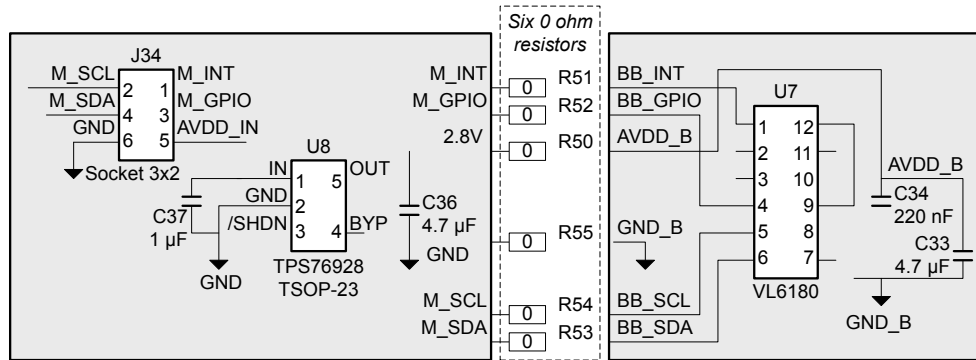


**Up to 3 satellites connected to the expansion board using connectors**

The X-NUCLEO-6180A1 can be used with all STM32 Nucleo families and can be plugged/superposed with other ST Nucleo expansion boards (e.g. Bluetooth, WiFi).

## 4 Schematic and list of material

Figure 3. Breakout schematic and list of material



*U7 is mounted on top side  
Others are mounted on bottom side*

## 5 Ordering information

**Table 1. Order codes**

Order code	Description
VL6180-SATEL	Two VL6180 breakout boards

## Revision history

**Table 2. Document revision history**

Date	Version	Changes
16-Dec-2019	1	Initial release

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