Multi-zone Time-of-Flight Sensors
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- Supporting up to 8x8 zones
- 940 nm Class 1 eye-safe VCSEL, high-sensitivity SPAD array, precision TDCs and a low-power microcontroller sub-system in a highly integrated modular package
- User adjustable field-of-view
- Embedded histogram processing offers accurate ranging up to a distance of 5 meters and enables the system to detect multiple objects per zone and provides tolerance to smudge
- Incorporates advanced algorithms and wafer level optical filters to offer superior sunlight performance
TMF8820/21/28
Multi-zone Time-of-Flight Sensors

General Description
The TMF882X family of devices includes a direct time-of-flight (dToF) sensor in a single modular package with associated VCSEL. The dToF device is based on SPADs, TDCs and histogram technology and achieves 5000 mm detection range. Due to its lens on the SPAD, select devices support 3x3, 4x4, 3x6 and 8x8 multi-zone data and a very wide, dynamically adjustable, field of view.

A multi-lens-array (MLA) inside the package above the VCSEL widens the FoI (field of illumination). All processing of the raw data is performed on-chip and the TMF882X devices provide distance information together with confidence values through its I2C interface.

Block Diagram

Features
- Multi-zone Time-of-Flight Measurement
  - TMF8820 (3x3)
  - TMF8821 (3x3, 3x6, 4x4)
  - TMF8828 (3x3, 3x6, 4x4, 8x8)
- Histogram algorithm-based architecture
- 940 nm VCSEL, TDC, SPAD and a low-power microcontroller sub-system in a highly integrated modular package
- Ultra low-power consumption
- Standby current only 8µA
- Dynamically adjustable FOV up to 63º
- Class 1 eye safety certification
- Size: 2.0 x 4.6 x 1.4 mm

Benefits
- Small footprint fits within narrow bezel applications and minimizes board size
- Multi-zone and adjustable FOV enable a variety of applications
- Within 3% of measurement (accuracy); no multipath and no multiple object problems
- Output distance value and confidence level through I2C directly without any external data processing.
- Macro object focusing - dynamically adjustable

Applications
- Distance measurement for camera autofocus (LDAF)
- Presence detection and gesture
- Object detection and collision avoidance
- Liquid level monitoring
- Keystone correction
- Light curtain

Ordering information

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