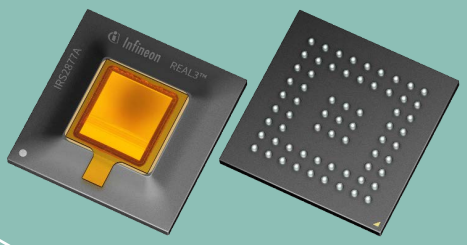


Product brief

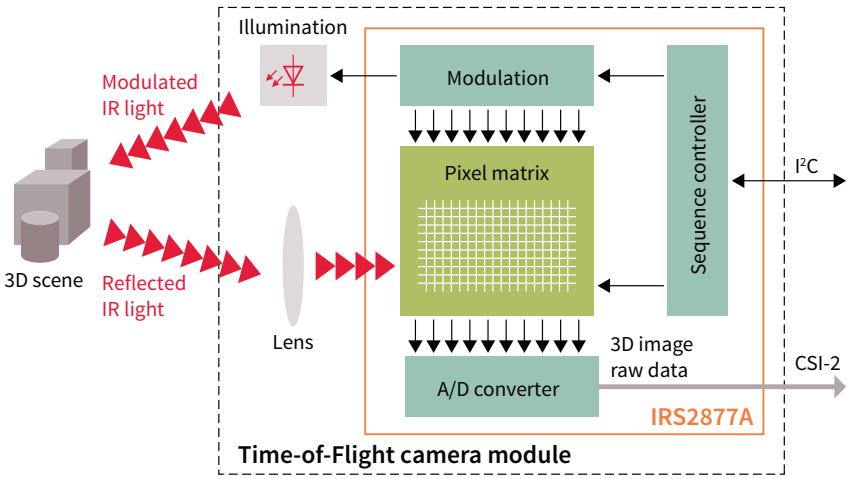
REAL3™ image sensor IRS2877A(S)

3D Time-of-Flight single-chip for automotive

IRS2877A is an automotive qualified member of Infineon's REAL3™ Time-of-Flight (ToF) imager family. It offers VGA system resolution at a tiny 4 mm image circle enabling lens sizes known from mobile phones. This huge miniaturization step in combination with the high system resolution allows to realize innovative automotive use-cases in a cost efficient way: new features and services like secure face authentication with anti-spoofing in combination with standard driver monitoring features, wide field-of-view in-cabin sensing cameras as well as functional safety use-cases (ISO 26262 (ASIL-B) compliant design).

Key features

- Time-of-Flight single-chip including illumination control and digital data output
- VGA system resolution (640 x 480 pixels) based on 640 x 240 twin pixels arranged in an innovative array avoiding pixel crosstalk and enabling high performant VGA system resolution at a small 4 mm image circle
- Patented Suppression of Background Illumination (SBI) circuitry in every pixel for best sunlight robustness
- Spread Spectrum Clock (SSC) to avoid interference with other ToF systems
- Up to 100 MHz VCSEL modulation frequency
- Fast global shutter readout with CSI-2 data interface (2x 1 Gbit)
- Flexible imager operation after each frame: adaptation of frame rate, exposure time or modulation frequency
- Optical PG-LFBGA-65 package, 9 x 9 mm
- AEC-Q100 grade 2 qualification, T_{Amb} = -40...+105°C
- ISO 26262 ASIL-B compliant variant IRS2877AS



Key benefits

- Small form factor with high pixel resolution
  - 4 mm image circle at VGA system resolution
  - Two standard supply rails only
  - Partly integrated eye-safety circuitry
- Best performance in strong sunlight conditions
  - 5th generation ToF pixel design
  - Suppression of Background Illumination (SBI) circuitry
- Reliable mass production
  - Standard soldering process: plastic BGA package without need of underfiller material
  - AEC-Q100 grade 2 qualified
  - Fast and easy once-in-a-lifetime camera calibration

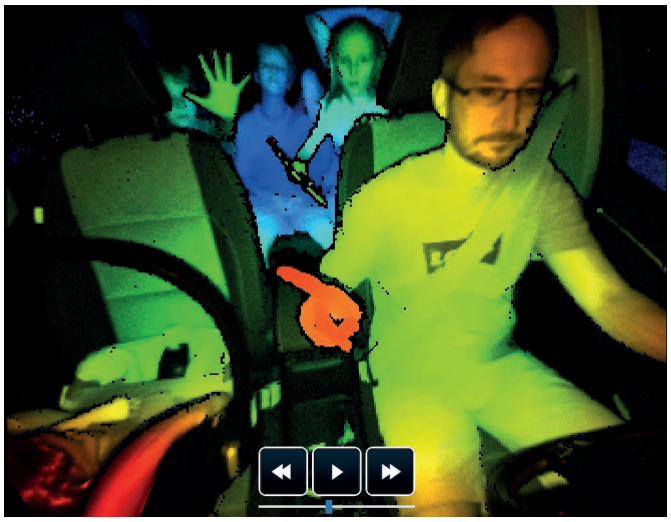
Key applications

- Car in-cabin sensing
- Driver monitoring
- Occupant monitoring, classification & tracking
- Smart airbags
- Secure 3D face authentication
- Short range car exterior (< 5 m)

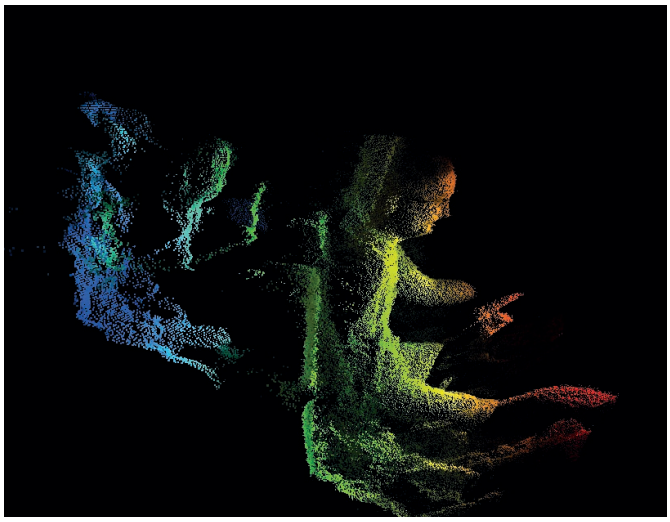
ISO 26262 compliant

www.infineon.com/real3-automotive

Indirect Time-of-Flight technology provides depth and amplitude information for every pixel using modulated infrared light. The emitted light illuminates the whole scene and the ToF imager captures the reflected light. The measured phase difference between emitted and received light and the amplitude values provide highly reliable distance information and simultaneously a gray scale picture of the complete scene under all ambient light conditions – at night, in sunlight and heavily changing light conditions. Additional benefits to other depth sensing technologies are the simple and robust design of a ToF camera module without the need of any mechanical baseline, a fast camera calibration for easy and robust mass production and a comparatively lean computational load of the application processor.



Front view – ToF data as an overlay of depth and amplitude data



Rotated side view – ToF data as 3D pointcloud

Color-coded distance visualization: red = close; blue = far

Product variants

Product type	System resolution	Description	Package
IRS2877A	640 x 480 pixel (~307k pixel)	Single-chip ToF sensor, AEC-Q100 grade 2 qualified	PG-LFBGA-65
IRS2877AS	640 x 480 pixel (~307k pixel)	Single-chip ToF sensor, AEC-Q100 grade 2 qualified, ISO 26262 (ASIL-B) compliant	PG-LFBGA-65

Ordering details on request

Evaluation tools

To evaluate Infineon's REAL3™ Time-of-Flight technology, a set of 3D reference cameras is available. In order to support you with the best camera suitable to your requirements, please contact Infineon or our development partner pmd technologies ag (www.pmdtec.com).

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