Today, time-of-flight (ToF) systems are among the most profitable and innovative imaging technologies. Every major consumer product manufacturer wants to integrate such devices to provide 3D imaging, proximity sensing, ambient light sensing, gesture recognition, and more. STMicroelectronics has been investigating this technology in depth, and now provides several smartphone manufacturers ToF ranging sensors. Apple’s iPhone 7 Plus goes further with a custom proximity sensor, the smallest FlightSense™ device in STMicroelectronics ToF portfolio.

Located in the front of the phone, above the main speaker, the FlightSense™ proximity sensor uses optical land-grid array (LGA) packaging. The custom Apple device measures 2.80 mm x 2.40 mm, half the size of the rest of STMicroelectronics’s portfolio.

This report analyzes the complete microsystem, from the illumination device, which is a Vertical-Cavity Surface-Emitting Laser (VCSEL), to the collector, which is based on STMicroelectronics’ Single Photon Avalanche Diode (SPAD). It includes a complete cost analysis and price estimation of the device based on a detailed description of the package, the ToF detector and the VCSEL.

It also features a complete technology comparison with every product in STMicroelectronics’ ToF portfolio since the first generation, including the VL53L0X and VL6180X, especially looking at the SPAD’s evolution.
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