Qualcomm® Fingerprint Sensors

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New Premium Tier Smartphone designs mandate new requirements

Introduction of Bezel-Less Waterproof Smartphones

Introducing new Qualcomm® Fingerprint Sensors for Display, Metal and Glass

Under Display

- Premium Tier Phones
- Platen: OLED up to 1200 µm

Under Metal & Glass

- High Tier Phones
- Platen: Glass up to 800 µm or Aluminum up to 650 µm

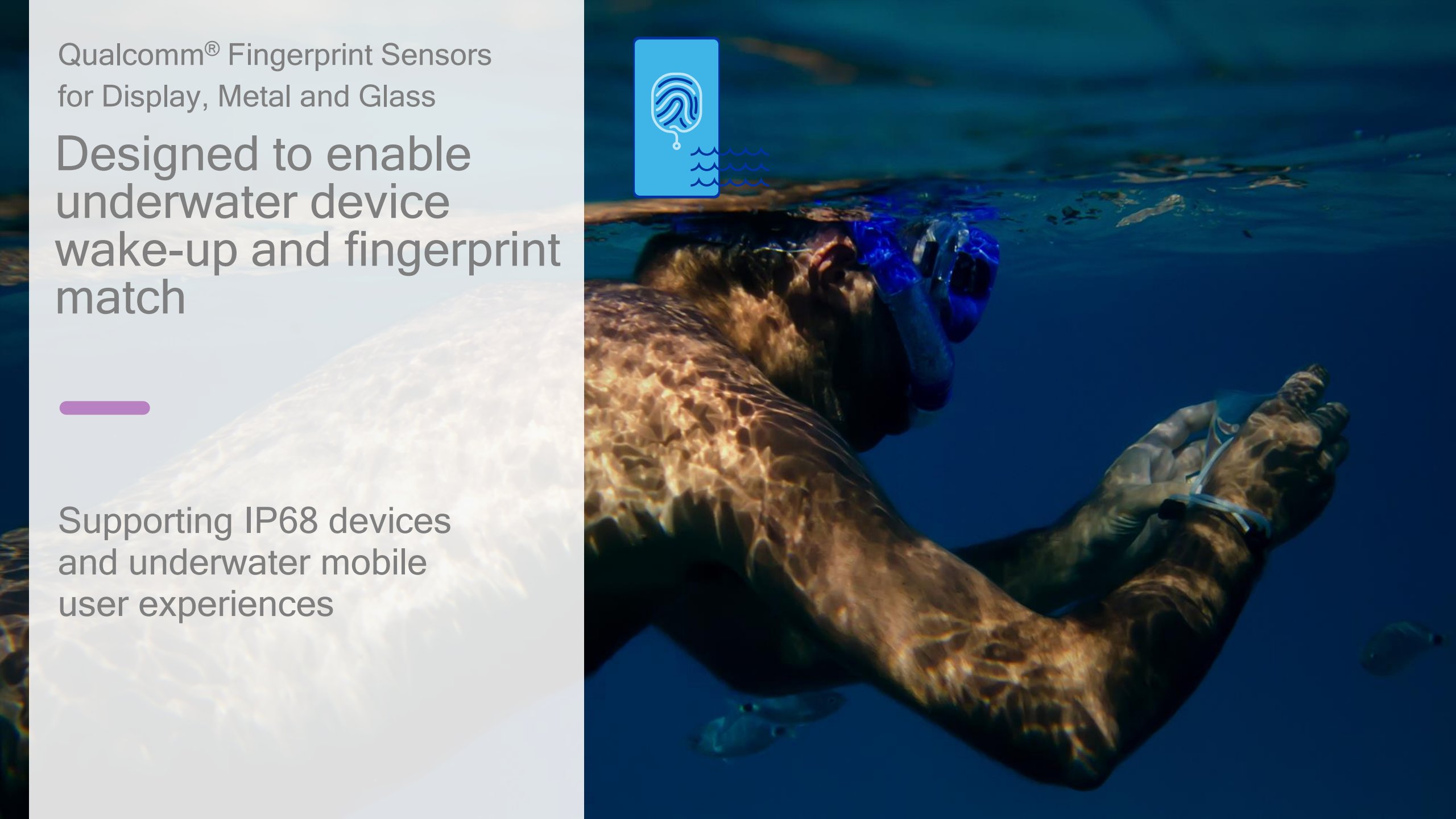
Under Glass

- Mid and Low Tier Phones
- Platen: Glass up to 800 µm

Qualcomm® Fingerprint Sensors
for Display, Metal and Glass

Designed to enable underwater device wake-up and fingerprint match

Supporting IP68 devices and underwater mobile user experiences



Qualcomm® Fingerprint Sensors for Display, Metal and Glass

Powerful ultrasonics

All 3 of the ultrasonic-based sensors are engineered to easily power through common contaminants like water and oil, supporting consistent, reliable authentication.

Qualcomm® Fingerprint Sensors
for Display, Metal and Glass

Supports heartbeat and blood flow

Heartbeat detection is performed by the same sensor--no separate sensor is needed.

Detection of heartbeat and blood flow combine with existing human tissue impedance measurement designed to offer powerful liveness detection, and improved mobile authentication.

Qualcomm® Fingerprint Sensors
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Detection of directional gestures

A finger swipe over the sensor in a particular direction can be mapped to a specific UI function, supporting alternative forms of navigation

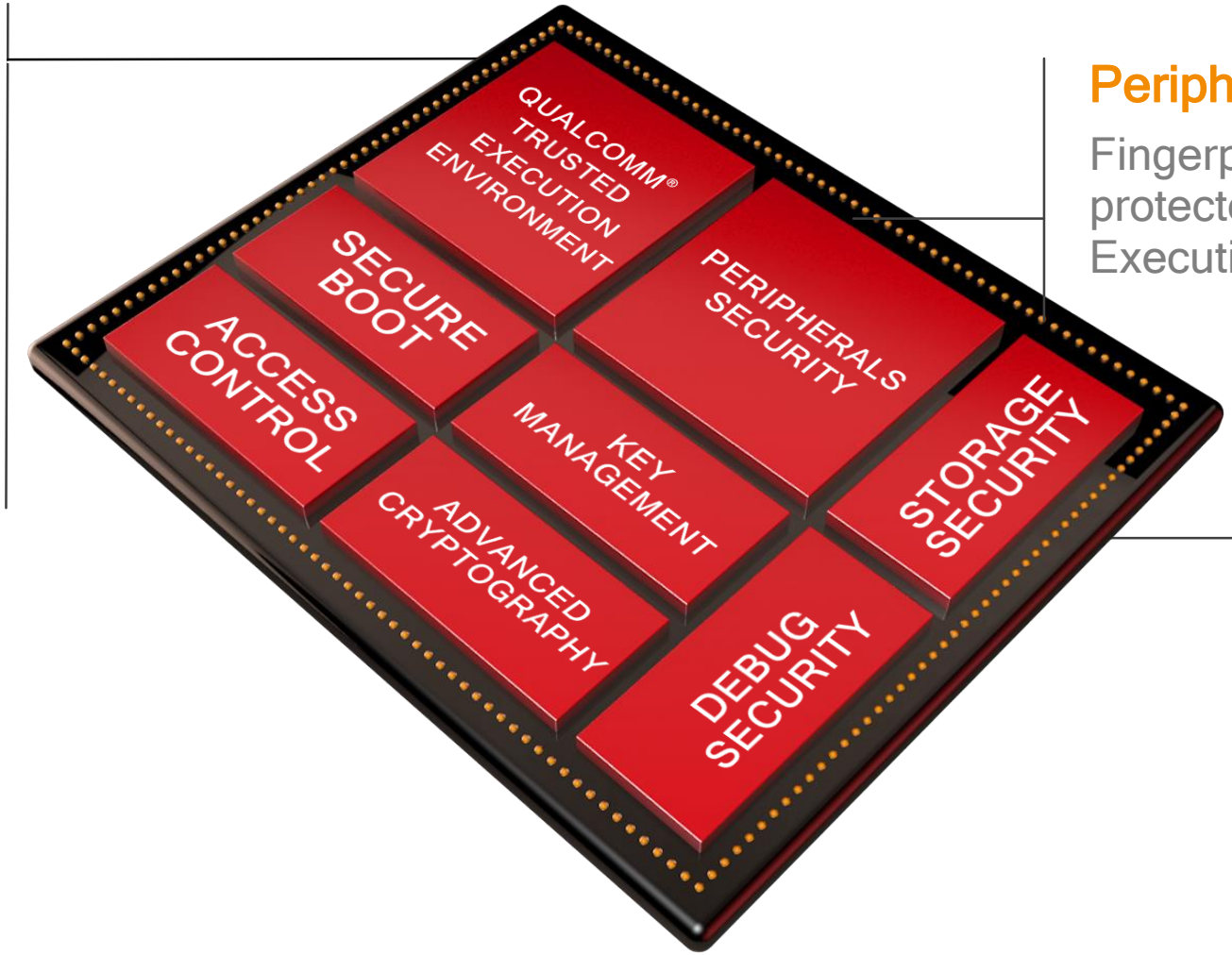
Integration with Snapdragon™ Processor Security Foundation

Qualcomm Trusted Execution Environment

Trusted operations include

Algorithms for Fingerprint Scanning, Enrollment, & Matching as well as Payment Transactions

Based on ARM's TrustZone architecture



Peripherals Security

Fingerprint Sensor SPI port protected by the Trusted Execution Environment

Storage Security

File System Security for encrypted storage of Fingerprint Templates

More Authentication Security – Anti-spoofing

3 Dimensional Acoustic Details

Ultrasonic-based technology captures detail within the outer layers of the skin for complete accurate detection of fingerprint ridges, unique characteristics and sweat pores, making it difficult to spoof

Liveness

Employs unique properties of ultrasonic acoustical imaging to detect Blood Flow along with impedance differences between fingers and spoofs

Benefits to OEMs, carriers and consumers

New Experiences	Superior Robustness	Additional Features
Under Water 	Contaminants Wet Fingers 	Blood Flow Heart beat Gestures 

Qualcomm® Fingerprint Sensors for Display, Metal and Glass

Mobile Industry Leadership

First commercially announced mobile solution to scan through up to 800 µm of cover glass and up to 650 µm of aluminum

First commercially announced integrated ultrasonic-based mobile solution to detect heart beat, blood flow and gestures

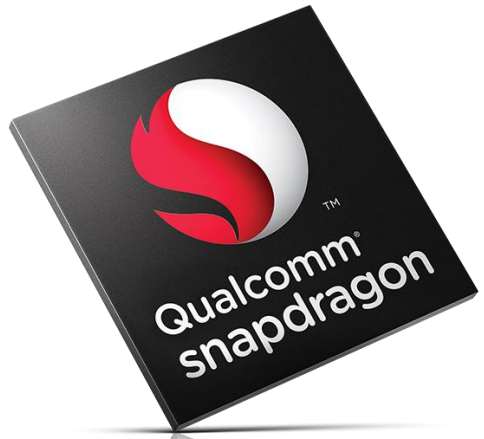
First commercially announced multi-functional ultrasonic solution capable of scanning through OLED displays up to 1200 µm for enrolling, matching, heart beat, blood flow, gestures

Qualcomm® Fingerprint Sensors for Display, Metal and Glass

Availability

Compatible with the recently announced **Qualcomm® Snapdragon™ 660** and **630** mobile platforms

Designed to be compatible with future Qualcomm® Snapdragon™ mobile platforms, including **Qualcomm® Snapdragon™ 800 series**, **600 series**, **400 series** and **200 series** mobile platforms, as well as **non-Snapdragon platforms**



Engineering samples for Fingerprint Sensor for **Display** expected to be available to OEMs in **October 2017.** Commercial samples expected **early 2018**

Commercial devices with Fingerprint Sensor for **Display** are expected to arrive in **Summer of 2018**

2H 2017

1H 2018

Commercial samples for Fingerprint Sensors for **Glass** and **Metal** expected to be available for OEMs in **July 2017**

Commercial devices with Fingerprint Sensors for **Glass** and **Metal** are expected to arrive in **early 2018**

Thank you

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