



Qualcomm® Fingerprint Sensors

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@qualcomm



New Premium Tier Smartphone designs mandate new requirements

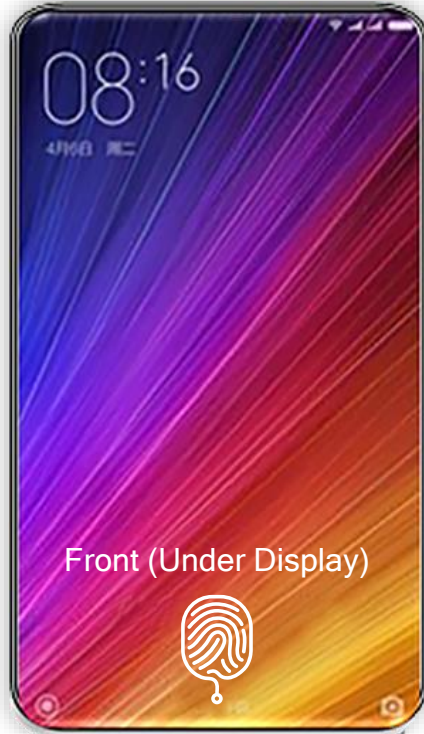
Introduction of Bezel-Less Waterproof Smartphones



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

Under Display

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



Back
(Aluminum and Glass)

Under Metal & Glass

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



Under Glass

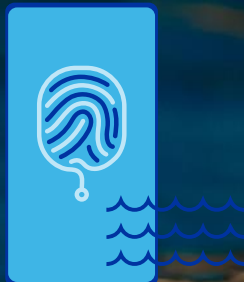
- Mid and Low Tier Phones
- Platen: Glass up to 800 μm

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
for Display, Metal and Glass

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



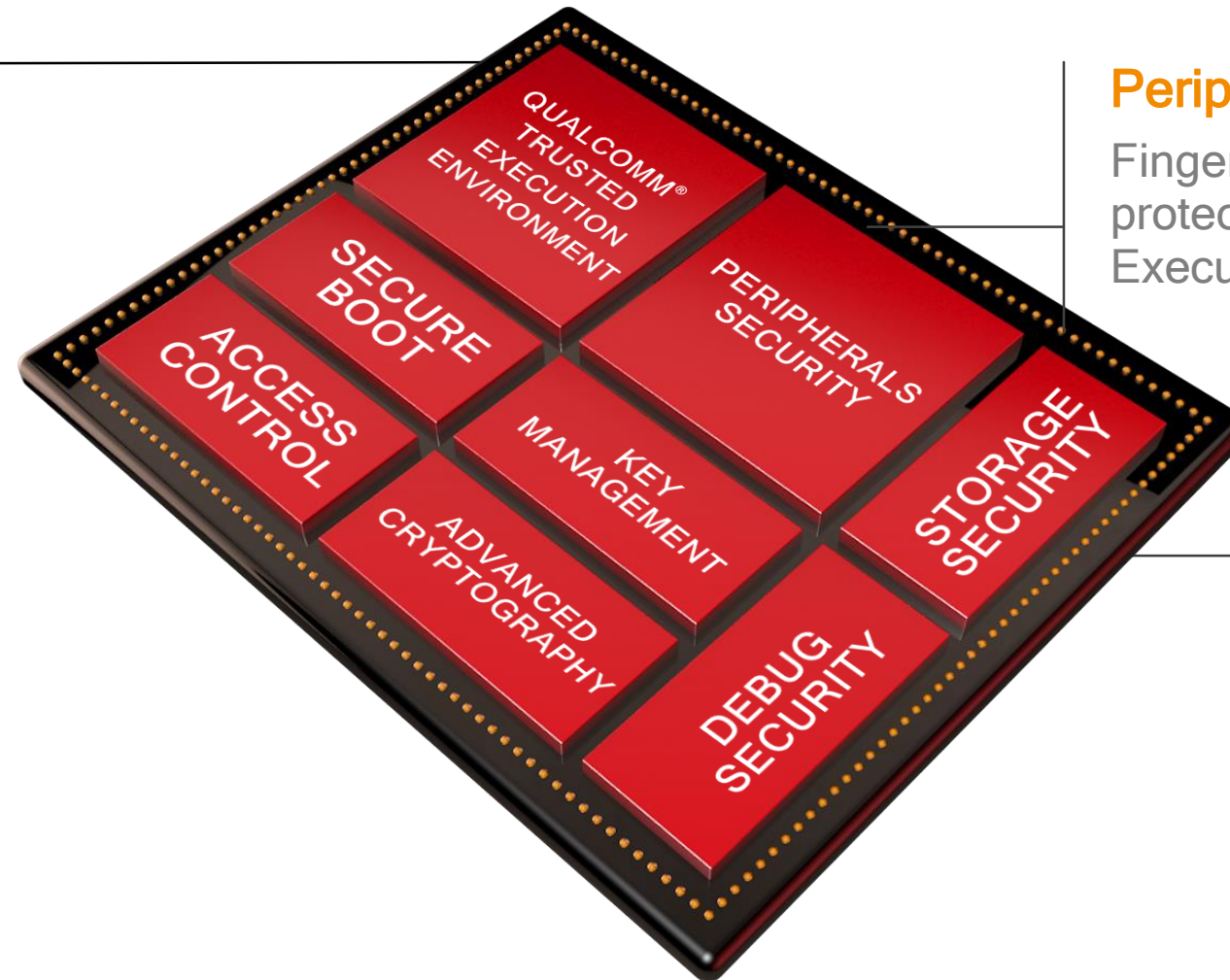
Integration with Snapdragon™ Processor Security Foundation

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

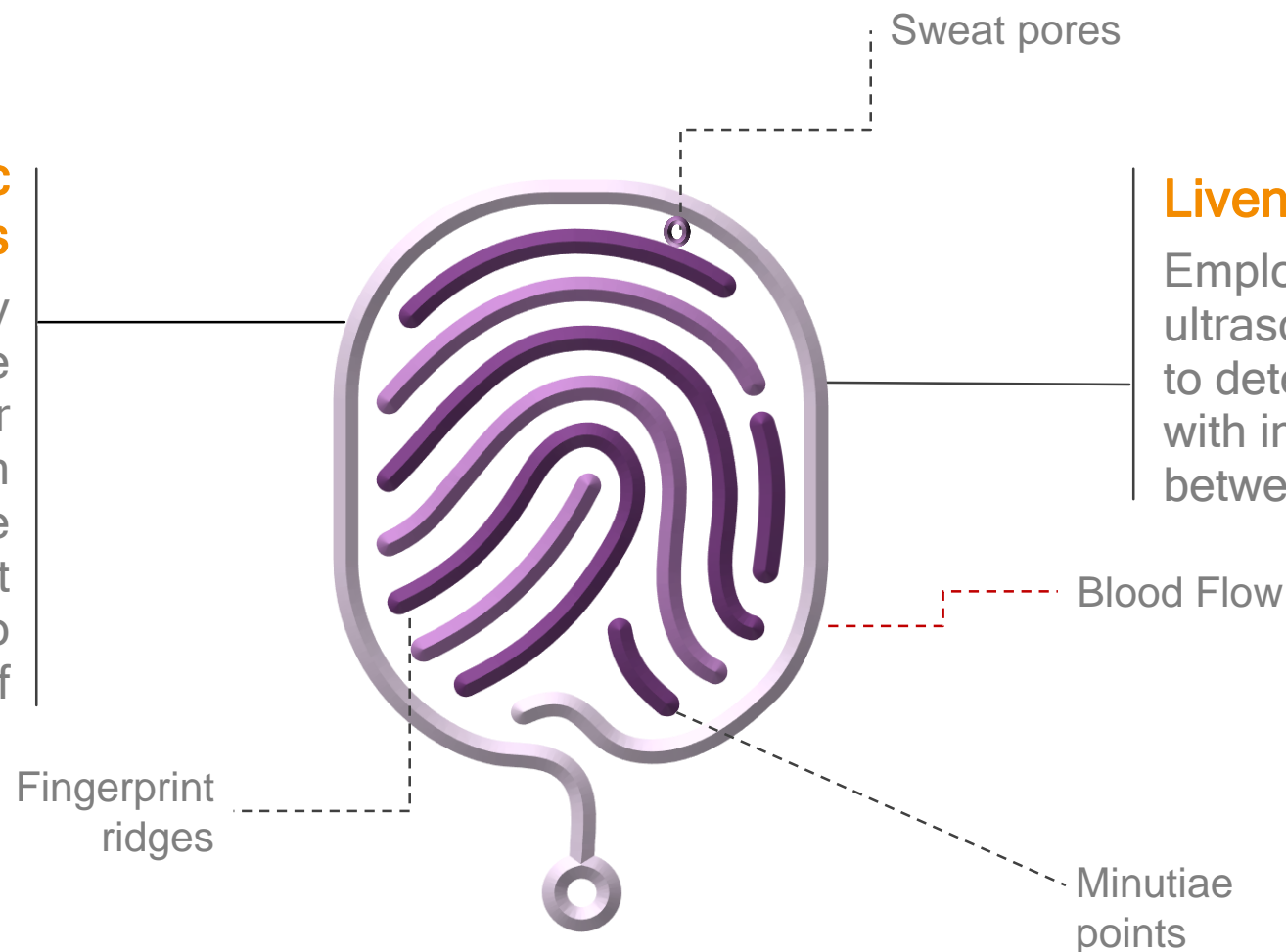
Storage Security

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



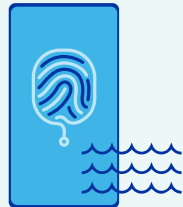
Liveness

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

Under Water



Superior Robustness

Contaminants
Wet Fingers



Additional Features

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

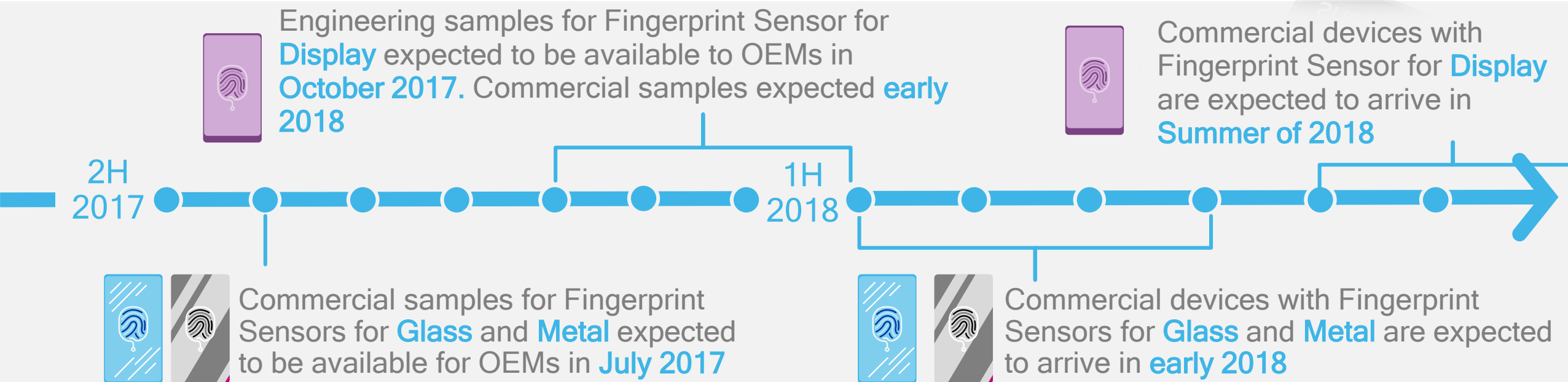
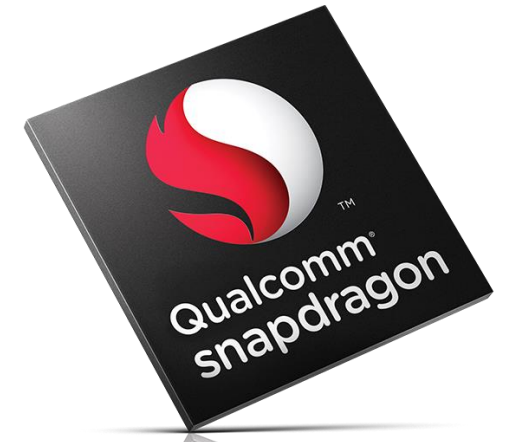


First commercially announced multi-functional ultrasonic solution capable of scanning through OLED displays up to 1200 μm for enrolling, matching, heart beat, blood flow, gestures

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**



Thank you

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