



life.augmented

Biometric System-on-Cards



Payment and other addressed markets



Payments

- Easy to use. Provides proof of life. Can be used with existing POS
- Suitable for PIN-less operations or in conjunction with PIN code



Access Control

- All physical access-control scenarios
- Government employee



Healthcare

- Multiple uses within the healthcare industry
- Physical and logical access control



Government ID

- Merging of public and private sector services offering a platform to distribute social welfare



IoT

- Centralized authentication platform for automotive sector and smart home

Biometric System-on-Card overview

Biometric System-on-Cards (BSoC)

A smartcard containing a biometric sensor for self authentication, enrollment, template storage and matching within the card

Functions

Fingerprint sample capture
(enrollment / verification)

Feature extraction

Reference template storage
(enrollement)

Template creation for
matching (MOC)

Benefits

Suitable for PIN-less
operations (toll gate, health cards,
contactless transactions)

Usable in conjunction with
PIN code

Easy-to-use (multi-platform
technology, nothing to remember)

Components



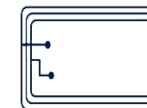
Secure Element
(RF, power mgt, memory, appli software)



Sensors



MCU

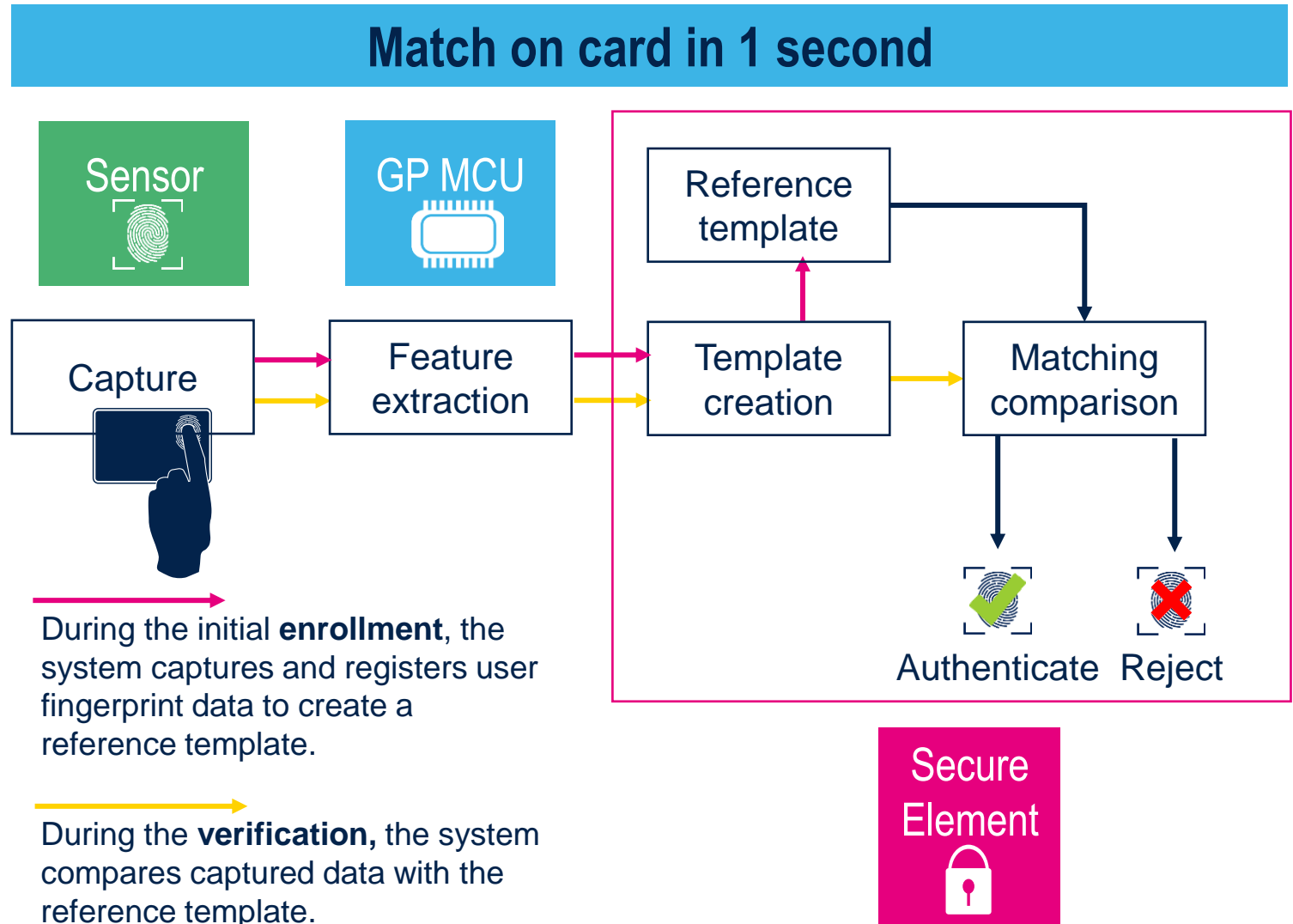


How do biometric SoCs work ?

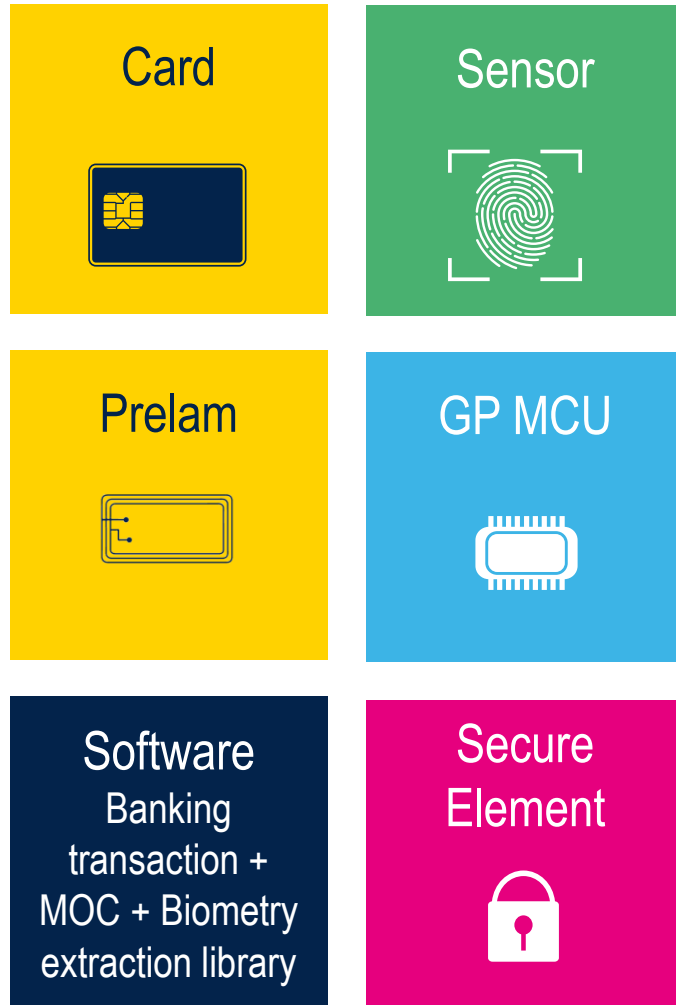
B-SoC follows 4 main steps to perform an authentication:

- **Capture:** a sensor captures the individual's biometrics during the enrollment
- **Feature extraction and template creation:** a microcontroller (1) extracts the biometric data, thereby creating a reference template during the first enrollment or matching.
- **Reference template:** the reference data is securely stored in the SE (secure element) and used at each authentication to make the matching comparison.
- **Matching comparison (match-on-card):** the template is compared to the reference to authenticate or reject the enrollment.

(1) This operation can be managed by the SE when Single chip



Generic technical requirements



- Sensor to capture biometric images
 - Requirements: power constraints, consumption, speed
- GP MCU to extract data from sensor
 - Requirements: computing power for extraction and large memory size
 - Low power modes
 - Scalable power schemes to fit with field values variations
- Secure Element master (transaction + matching)
 - Requirements: RF harvesting, power distribution between different domains
 - Large NVM for template storage and matching algorithms
- Low-power system to be supplied in RF without battery
- ISO and Sensor module + prelam for card connectivity
- Thin and robust package / prelam to simplify card manufacturing and stay compatible with mechanical stress requirements

Ensuring a higher level of security

BSoC technology process

Enrollment

Fingerprint acquisition



In-Card template creation



Template stored in secure element or secure flash



Matching

Fingerprint acquisition



In-Card template creation



In-Card templates matching

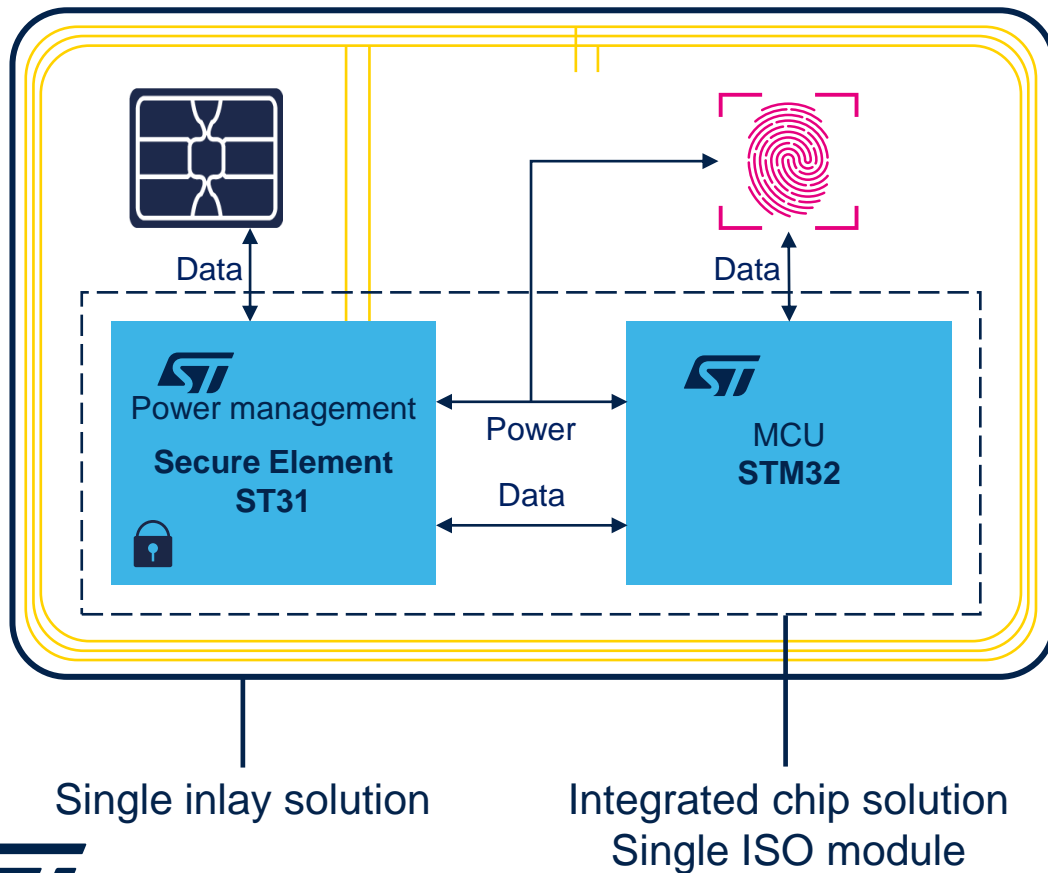


Match result

**Biometric data
are never transferred
to an external terminal**

**Granted unicity – neither
transferable nor duplicable,
lower risk of attacks**

A new authentication technology for payment card embedding the power management system



- ST solution values
 - Energy harvesting and Power domain management (battery-less solution without external Bill Of Material)
 - Secure matching solution
- Targeted architecture
 - ST31 master SE (Payment + Matching) with RF harvesting
 - MCU GP (Data extraction)
- Complete System solution with Partners (Fingerprint sensors & Packaging providers)

Main Drivers

- No requirement to remember PIN
- Provides proof of life
- Can be used with existing POS (same infrastructure)
- Remote enrollment possible for better convenience
- Biometric technology usage adopted by consumers

Thank you

© STMicroelectronics - All rights reserved.

ST logo is a trademark or a registered trademark of STMicroelectronics International NV or its affiliates in the EU and/or other countries.

For additional information about ST trademarks, please refer to www.st.com/trademarks.

All other product or service names are the property of their respective owners.



life.augmented