
**Information technology — Biometric
System-on-Card —**

**Part 1:
Core requirements**

Technologies de l'information — Système biométrique sur carte —

Partie 1: Exigences de base

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/IEC 17839-1:2014

<https://standards.iteh.ai/catalog/standards/sist/42d4fc56-2f26-4edd-acc9-e337322dd894/iso-iec-17839-1-2014>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/IEC 17839-1:2014
<https://standards.iteh.ai/catalog/standards/sist/42d4fc56-2f26-4edd-acc9-e337322dd894/iso-iec-17839-1-2014>



COPYRIGHT PROTECTED DOCUMENT

© ISO/IEC 2014

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Symbols and abbreviated terms	2
5 Functional architecture of a Biometric System-on-Card	2
5.1 Biometric System-on-Card comparison	2
5.2 Type S1 Biometric System-on-Card	3
5.3 Type S2 Biometric System-on-Card	3
5.4 Sensor type	4
6 Power supply	4
6.1 Introduction	4
6.2 Contacts	4
6.3 Contactless	4
6.4 Internal Power Supply	4
7 Infrastructure	4
Annex A (informative) Motivations for the specification of type S2	5
Bibliography	6

<https://standards.iteh.ai/catalog/standards/sist/42d4fc56-2f26-4edd-acc9-e337322dd894/iso-iec-17839-1-2014>

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The Committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Cards and personal identification*.

ISO/IEC 17839 consists of the following parts, under the general title *Information technology — Biometric System-on-Card*:

- *Part 1: Core requirements*
- *Part 2: Physical characteristics*
- *Part 3: Logical information interchange mechanism*

Introduction

In the context of this International Standard, a *Biometric System-on-Card* is a portable card size device including the following entities: biometric acquisition, data processing, storage, comparison, decision. It is a functional extension to *on-card biometric comparison* by physically and logically integrating the sensor and signal processing into the card.

ISO/IEC 7816-11,^[1] ISO/IEC 19785-3,^[2] ISO/IEC 19795-7^[3] and ISO/IEC 24787 include technologies with respect to biometric on-card comparison. The Biometric System-on-Card is not yet covered sufficiently. Industry requires a new International Standard for a fully self-contained Biometric System-on-Card to enable interoperability and define minimum quality criteria allowing reliable operation of such a system.

The physical integration of a biometric sensor in an ISO/IEC 7810 card withstanding torsion and bending tests is technically challenging. This International Standard describes two types of Biometric System-on-Card. Type S1 is a fully flexible card compliant with ISO/IEC 7810 while type S2 intentionally deviates from some of the requirements to size and flexibility, keeping the rest of the requirements intact, including the use of a contactless ICC interface.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO/IEC 17839-1:2014](https://standards.iteh.ai/catalog/standards/sist/42d4fc56-2f26-4edd-acc9-e337322dd894/iso-iec-17839-1-2014)

<https://standards.iteh.ai/catalog/standards/sist/42d4fc56-2f26-4edd-acc9-e337322dd894/iso-iec-17839-1-2014>

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

ISO/IEC 17839-1:2014

<https://standards.iteh.ai/catalog/standards/sist/42d4fc56-2f26-4edd-acc9-e337322dd894/iso-iec-17839-1-2014>

Information technology — Biometric System-on-Card —

Part 1: Core requirements

1 Scope

This part of ISO/IEC 17839 establishes

- functional architecture of a Biometric System-on-Card
- definition of type S1 (fully ISO/IEC 7810 compliant) and type S2 implementation of a Biometric System-on-Card
- sensor types in a Biometric System-on-Card
- minimum requirements to a Biometric System-on-Card with respect to
 - discriminative power (i.e. biometric accuracy criteria)
 - interfaces
 - power supply options

The following aspects are out of scope of this International Standard:

- off-card biometric comparison, storage on-card
- work-load sharing implementations
- detailed specification and configuration of individual components

This part of ISO/IEC 17839 provides a functional architectural description of a Biometric System-on-Card and describes how the interfaces are mapped using existing commands and data structures from other International Standards.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 2382-37, *Information technology — Vocabulary — Part 37: Biometrics*

ISO/IEC 7810, *Identification cards — Physical characteristics*

ISO/IEC 7816-1, *Identification cards — Integrated circuit cards — Part 1: Cards with contacts — Physical characteristics*

ISO/IEC 7816-3, *Identification cards — Integrated circuit cards — Part 3: Cards with contacts — Electrical interface and transmission protocols*

ISO/IEC 7816-12, *Identification cards — Integrated circuit cards — Part 12: Cards with contacts — USB electrical interface and operating procedures*

ISO/IEC 14443, *Identification cards — Contactless integrated circuit cards — Proximity cards*

ISO/IEC 15693, *Identification cards — Contactless integrated circuit cards — Vicinity cards*

ISO/IEC 24787, *Information technology — Identification cards — On-card biometric comparison*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 2382-37 and the following apply.

3.1 biometric system-on-card

card size device including biometric acquisition, data processing, storage, comparison and decision to compose a complete biometric verification system

Note 1 to entry: Within the scope of this International Standard, system-on-card (SoC) and Biometric System-on-Card (BSoC) are used interchangeably.

Note 2 to entry: Biometric System-on-Card (BSoC) is an architecture introduced in ISO/IEC 24787.

3.2 storage-on-card

system architecture where biometric reference data is stored in an ICC and compared outside of the ICC used as a portable data carrier

3.3 on-approach

starting the biometric system-on-card comparison by means of an action (button or automatic sensor acquisition) with autonomous power supply before the Biometric System-on-Card gets in range of a contactless field of the target application interfacing device

4 Symbols and abbreviated terms

BSoC Biometric System-on-Card

ICC Integrated Circuit Card

5 Functional architecture of a Biometric System-on-Card

5.1 Biometric System-on-Card comparison

ISO/IEC 24787 describes the approaches for storage-on-card, on-card biometric comparison and Biometric System-on-Card.

A Biometric System-on-Card comparison means the whole biometric sample verification process is performed on the card. The process is schematically represented in [Figure 1](#). To perform a biometric system-on-card comparison, a sensor that is built into the card captures the biometric sample and extracts biometric data. The created biometric data are then used for verification. The verification process is executed on-card. The card's security state is updated once the card finishes the verification. No biometric sample or reference data are transferred to or from the card.

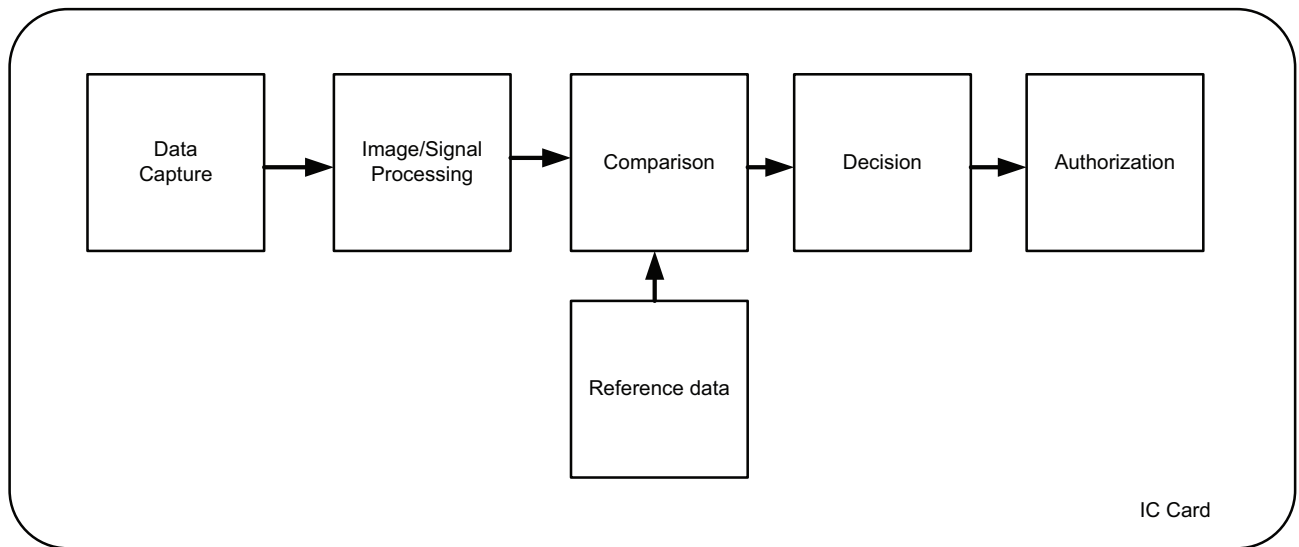


Figure 1 — General architecture for biometric authentication using system-on-card comparison

NOTE The following explanations hold for [Figure 1](#):

Comparison: Algorithmic process to assess the similarity of characteristic features extracted from a current biometric sample with biometric reference data stored in the card – typically resulting in a score.

Decision: Applying the parameters, thresholds and security policy to decide on acceptance or rejection of the biometric system-on-card comparison.

Authorization: Taking appropriate measures based on the outcome of the Decision, which may include changing the security status of the ICC.

5.2 Type S1 Biometric System-on-Card

This International Standard defines two different types of system-on-card: Type S1 and Type S2.

The Type S1 Biometric System-on-Card implements the entities listed in 6.1 while conforming to ISO/IEC 7810 and ISO/IEC 7816-1. The card particularly satisfies the following constraints:

- Dimensions (thickness, width and height) in accordance with the ID-1 format as specified in ISO/IEC 7810
- Card withstands all torsion and bending tests specified in ISO/IEC 7816-1.
- Interface type may be any of the following:
 - Contact interface as specified in ISO/IEC 7816-3
 - USB interface as specified in ISO/IEC 7816-12
 - Contactless interface as specified in ISO/IEC 14443

5.3 Type S2 Biometric System-on-Card

The type S2 Biometric System-on-Card supports only contactless interface specified in ISO/IEC 14443. It intentionally deviates from some of the requirements demanded by ISO/IEC 7816-1 with the following replacement:

- The card thickness is larger than the one defined in ISO/IEC 7810. The exact definition is provided in ISO/IEC 17839-2.