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Cards and security devices for personal identification — Contactless proximity objects —

Part 1: Physical characteristics

Cartes et dispositifs de sécurité pour l'identification personnelle — Objets sans contact de proximité —

Partie 1: Caractéristiques physiques

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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 (http://www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Cards and security devices for personal identification*.

This fourth edition cancels and replaces the third edition (ISO/IEC 14443-1:2016), which has been technically revised.

A list of all the parts in the ISO/IEC 14443 series, can be found on the ISO website.

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Introduction

Contactless card standards encompass a variety of types as embodied in the ISO/IEC 10536 series of standards (close-coupled cards), the ISO/IEC 14443 series of standards (Contactless proximity objects) and the ISO/IEC 15693 series of standards (Contactless vicinity objects). These device types are intended, respectively, for operation when very near, nearby and at a longer distance from associated coupling devices.

The ISO/IEC 14443 series of standards defines the technology-specific requirements for identification cards conforming to ISO/IEC 7810 and thin flexible cards conforming to ISO/IEC 15457-1 and the use of such cards to facilitate international interchange. However, it also recognizes that the technology offers the possibility that proximity objects may be provided in forms other than that of the International Standard card formats. Furthermore, it does not preclude the incorporation of other standard technologies on the card, such as those referenced in the Bibliography.

The ISO/IEC 14443 series of standards accommodates the operation of proximity cards in the presence of other contactless cards conforming to the ISO/IEC 10536 series of standards and the ISO/IEC 15693 series of standards.

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Cards and security devices for personal identification — Contactless proximity objects —

Part 1: Physical characteristics

1 Scope

This document defines the physical characteristics of proximity cards (PICCs).

It is intended to be used in conjunction with other parts of ISO/IEC 14443.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

ISO/IEC 14443-2:2016, *Identification cards — Contactless integrated circuit cards — Proximity cards — Part 2: Radio frequency power and signal interface*

ISO/IEC 15457-1, *Identification cards — Thin flexible cards — Part 1: Physical characteristics*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 7810, ISO/IEC 15457-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
integrated circuit
IC
electronic component designed to perform processing and/or memory functions

3.2
contactless
achievement of signal exchange with, and supply of power to, the card without the use of galvanic elements

Note 1 to entry: It is also the absence of an ohmic path from the external interfacing equipment to the integrated circuit(s) contained within the card.

3.3
contactless integrated circuit card
card into which *integrated circuit* (3.1) and coupling means have been placed, such that communication to such integrated circuit is done in a *contactless* (3.2) manner

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3.4
operate as intended
operates in the manner described by the manufacturer's specification in accordance with ISO/IEC 14443

3.5
PICC
contactless integrated circuit card (3.3) or other object with which communication and power transfer are done by inductive coupling in proximity of a coupling device

Note 1 to entry: Commonly called a proximity card.

3.6
PICC antenna zone
for each class a zone defined by an external geometrical shape and when defined an internal geometrical shape

3.7
PICC class
combination of antenna dimension and loading effect

Note 1 to entry: See Annex A.

4 Physical characteristics

4.1 General

The PICC may be in the form of a card compliant with ISO/IEC 7810 or ISO/IEC 15457-1, or an object of any other dimension.

4.2 Antenna

If the PICC dimensions are not compliant with ISO/IEC 7810 or ISO/IEC 15457-1, the dimensions of the PICC antenna shall not exceed 86 mm × 54 mm × 3 mm.

NOTE This antenna size restriction stems from the fact that the radio frequency power and signal interface defined in ISO/IEC 14443-2 and its test methods in ISO/IEC 10373-6 are based on ID-1 cards.

4.3 Additional requirements for PICC classes

It has been established that the use of a prescribed PICC class within an industry sector may enhance interoperability within that sector. The use of a PICC class is optional. If used, PICCs shall comply with the requirements given in Annex A.

4.4 Alternating magnetic field

If the PICC meets the requirements of one particular class as specified in Annex A, then the PICC, whichever form the PICC has according to 4.1, shall continue to operate as intended after continuous exposure to a magnetic field of an average level of 4/3 times H_{max} at 13,56 MHz as specified in ISO/IEC 14443-2:2016, 6.2 for this class. The averaging time is 30 s and the maximum level of the magnetic field is limited to 8/5 times H_{max}.

If the PICC does not claim to meet the requirements of one particular class as specified in Annex A, then the PICC, whichever form the PICC has according to 4.1, shall continue to operate as intended after continuous exposure to a magnetic field of an average level of 10 A/m (rms) at 13,56 MHz. The averaging time is 30 s and the maximum level of the magnetic field is limited to 12 A/m (rms).

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