

ISO/IEC FCD 15693-1
ISO/IEC JTC1/SC17 N 1355

Identification cards —

Contactless integrated circuit(s) cards —

Vicinity Integrated Circuit(s) Card

Part 1: Physical characteristics

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Foreword:

ISO (the International Organisation 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 15693-1 was prepared by Joint Technical Committee ISO/IEC/JTC1, *Information Technology*.

ISO/IEC 15693 consists of the following parts, under the general title *Identification cards – Contactless integrated circuit(s) cards – Vicinity Cards*:

-Part 1: *Physical characteristics*

-Part 2: *Radio frequency Power, Signal interface, Initialisation, and Anticollision*

-Part 3: *TBD Transmission Protocols*

Introduction

ISO/IEC 15693 is one of a series of International Standards describing the parameters for identification cards defined in ISO 7810 and the use of such cards for international interchange.

This part of ISO/IEC 15693 describes the Physical characteristics of vicinity cards.

This International Standard does not preclude the incorporation of other standard technologies on the card, such as those referenced in the informative annex.

Contactless Card Standards cover a variety of types as embodied in ISO/IEC 10536 (Close coupled cards), ISO/IEC 14443 (Proximity cards), ISO/IEC 15693 (Vicinity cards). These are intended for operation when very near, nearby and at a longer distance from associated coupling devices respectively.

Identification Cards — Contactless Integrated Circuit(s) Cards —

Part 1: Physical Characteristics

1 Scope

This part of ISO/IEC 15693 specifies the physical characteristics of contactless integrated circuit(s) cards, - Vicinity Cards, (VICC). It applies to identification cards of the ID-1 card type operating in vicinity of a coupling device.

This part of ISO/IEC 15693 shall be used in conjunction later parts of ISO/IEC 15693, which are in development.

Other types of contactless integrated circuit(s) cards, formats or interfaces, which operate at various distances, were developed (ISO/IEC 10536 and 14443) and may be developed in the future, which may require other international standards to be written.

2 Normative reference(s)

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 15693. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 14443 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 7810:1995, *Identification cards – Physical characteristics*

ISO/IEC 10373: *Identification cards – Test methods*

3 Definitions, abbreviations and symbols

3.1

Definitions

For the purposes of this part of ISO/IEC 15693, the following definitions apply:

3.1.1

Integrated circuit(s) (IC):

Electronic component(s) designed to perform processing and memory functions.

3.1.2

Contactless:

Pertaining to the achievement of signal exchange with and supplying power to the card without the use of galvanic elements.

3.1.3

Contactless integrated circuit(s) card:

An ID-1 card type (as specified in ISO/IEC 7810) into which integrated circuit(s) have been placed and in which communication to such integrated circuit(s) is done in contactless manner.

3.1.4

Vicinity Cards; Vicinity Integrated Circuit(s) Cards (VICC):

An ID-1 card type into which integrated circuit(s) and a coupling means have been placed and in which communication to such integrated circuit(s) is done by inductive coupling in the vicinity of a coupling device.

3.1.5

Vicinity coupling device (VCD):

The reader/writer device that uses inductive coupling to provide power to the VICC and also to control the data exchange with the VICC.

4 Physical characteristics

4.1 General

The VICC shall have physical characteristics according to the requirements specified for ID-1 cards in ISO/IEC 7810.

4.2 Dimensions

The nominal dimensions of the VICC shall be as specified in ISO/IEC 7810 for ID-1 cards.

4.3 Additional characteristics

4.3.1 Ultra-violet light

This part of the ISO/IEC 15693 excludes requirements for protection of VICC against the effects of ultra-violet light levels greater than those in ordinary daylight at sea level. Where greater protection is needed it shall be the responsibility of the card manufacturer to provide it and to state the tolerable level of ultra-violet light.

4.3.2 X-rays

The VICC shall continue to operate as intended after exposure of either VICC face to medium-energy X-radiation, with energy 100 keV, of a cumulative dose of 0.1 Gy per year.

Note This corresponds to approximately twice the maximum annual recommended dose to which humans may be exposed.

4.3.3 Dynamic bending stress

The VICC shall continue to operate as intended after testing in accordance with the test methods described in ISO/IEC 10373 where the maximum deflection about the short and long cards axis are $h_wA = 20\text{mm}$ and $h_wB = 10\text{mm}$

4.3.4 Dynamic torsional stress

The VICC shall continue to operate as intended after testing in accordance with the test methods described in ISO/IEC 10373 with the angle of rotation, $\alpha = 15^\circ$

4.3.5 Alternating magnetic field

- a) The VICC shall continue to operate as intended after exposure to a magnetic field of average level given in Table 1.

Table 1 – Frequency vs Magnetic Field Strength

Frequency Range (MHz)	Average Magnetic Field Strength (A/m)	Averaging Time (minutes)
0,3 - 3,0	1,63	6
3,0 - 30	4,98/f	6
30 - 300	0,163	6

f - frequency in MHz

The peak level of the magnetic field is limited to 30 times the average level.

- b) The VICC shall continue to operate as intended after exposure to a magnetic field of 12 A/m at 13,56 MHz.

4.3.6 Alternating electric field

After exposure to electric field strength conditions defined in Table 1, the VICC shall continue to operate as intended.

The VICC shall continue to operate as intended after exposure to a electric field of average level given in Table 2.

Table 2 – Frequency vs Electric Field Strength

Frequency Range (MHz)	Average Electric Field Strength (V/m)	Averaging Time (minutes)
0,3 - 3,0	0,614	6
3,0 - 30	1842/f	6
30 - 300	61,4	6

f - frequency in MHz

The peak level of the electric field is limited to 30 times the average level.

4.3.7 Static electricity

The VICC shall continue to operate as intended after testing in accordance with the Test Methods described in ISO/IEC 10373 (IEC 1000-4-2:1995) where the test voltage is 6KV.

4.3.8 Static magnetic field

After exposure of the VICC to a static 640 kA/m magnetic field, the contactless interface and the integrated circuits shall continue to operate as intended.

Warning Note: *The data content of a magnetic stripe might be erased by such a field.*

4.3.9 Operating temperature

The VICC shall operate as intended over an ambient temperature range of 0°C to 50°C.

Annex A **(Informative)**

Standards compatibility and Surface quality

A.1 Standards compatibility

This standard does not preclude the addition of other existing card standards on the VICC. Restrictions may apply to embossing of the PICC.

Warning Note : Restrictions may apply to embossing of the VICC.

A.2 Surface quality for printing

Where there is a requirement to customise the VICC after the manufacturing process by overprinting, care should be taken to ensure the areas used for printing are of sufficient quality appropriate to the printing technique or printer used.

Annex B (Informative)

Hole slot

When a slot is optionally implemented the slot size and slot location should be as shown in either Figure B.1 or Figure B.2.

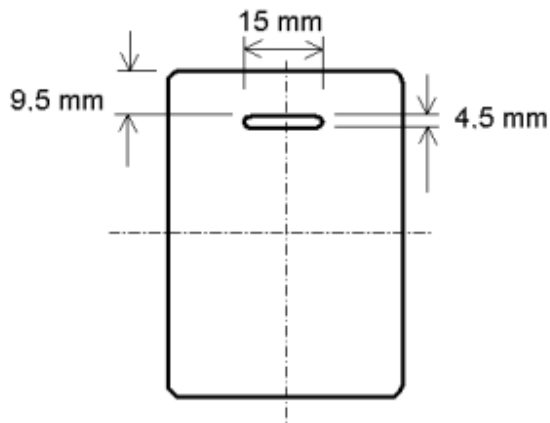


Figure B.1 – Hole Slot for Portrait Orientation

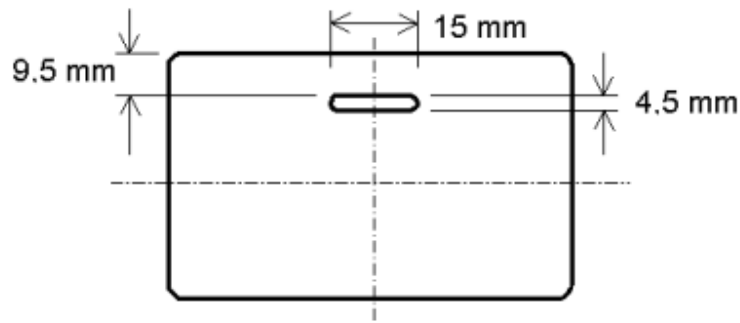


Figure B.2 – Hole Slot for Landscape Orientation

The VICC IC(s) and inductive coupling element shall be positioned such that either slot as shown in Figure B.1 – Hole Slot for Portrait Orientation and Figure B.2 – Hole Slot for Landscape Orientation can be implemented without interference to either the IC(s) or inductive coupling element.

Annex C (Informative)

Bibliography

Bibliography of other ISO/IEC card standards.

- [1] ISO/IEC 7811-1:1995, *Identification cards — Recording technique — Part 1: Embossing.*
- [2] ISO/IEC 7811-2:1995, *Identification cards — Recording technique — Part 2: Magnetic stripe.*
- [3] ISO/IEC 7811-3:1995, *Identification cards — Recording technique — Part 3: Location of embossed character on ID-1 cards.*
- [4] ISO/IEC 7811-4:1995, *Identification cards — Recording technique — Part 4: Location of read-only magnetic tracks — Track 1 and 2.*
- [5] ISO/IEC 7811-5:1995, *Identification cards — Recording technique — Part 5: Location of read-write magnetic track — Track 3.*
- [6] ISO/IEC 7812-1:1993, *Identification cards — Identification of issuers — Part 1: Numbering system.*
- [7] ISO/IEC 7812-2:1993, *Identification cards — Identification of issuers — Part 2: Application and registration procedures.*
- [8] ISO/IEC 7813 :1995, *Identification cards — Financial transaction cards.*
- [9] ISO/IEC 7816-1:1987, *Identification cards — Integrated circuit(s) card with contacts — Part 1: Physical characteristics.*
- [10] ISO/IEC 7816-2:1988, *Identification cards — Integrated circuit(s) card with contacts — Part 2: Dimensions and location of the contacts.*
- [11] ISO/IEC 7816-3:1989, *Identification cards — Integrated circuit(s) card with contacts — Part 3: Electronic signals and transmission protocols.*
- [12] ISO/IEC 10536-1:1992, *Identification cards — Contactless integrated circuit(s) cards — Part 1: Physical characteristics.*
- [13] ISO/IEC 10536-2:1995, *Identification cards — Contactless integrated circuit(s) cards — Part 2: Dimensions and location of coupling areas.*
- [14] ISO/IEC 14443-1:199X, *Identification cards — Contactless integrated circuit(s) cards — Part 1: Physical characteristics.*