INTERNATIONAL STANDARD

ISO/IEC 7816-2

Second edition
2007-10-15

Identification cards — Integrated circuit cards —

Part 2: Cards with contacts — Dimensions and location of the contacts

Cartes d'identification — Cartes à circuit intégré —

Partie 2: Cartes à contacts — Dimensions et emplacements des contacts

Reference number
ISO/IEC 7816-2:2007(E)

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Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. 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.

ISO/IEC 7816-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Cards and personal identification*.

This second edition cancels and replaces the first edition (ISO/IEC 7816-2:1999), which has been technically revised. It also incorporates material extracted from ISO/IEC 7816-2:1999/Amd.1:2004.

ISO/IEC 7816 consists of the following parts, under the general title *Identification cards — Integrated circuit cards*:

— *Part 1: Cards with contacts — Physical characteristics*

— *Part 2: Cards with contacts — Dimensions and location of the contacts*

— *Part 3: Cards with contacts — Electrical interface and transmission protocols*

— *Part 4: Organization, security and commands for interchange*

— *Part 5: Registration of application providers*

— *Part 6: Interindustry data elements for interchange*

— *Part 7: Interindustry commands for Structured Card Query Language (SCQL)*

— *Part 8: Commands for security operations*

— *Part 9: Commands for card management*

— *Part 10: Cards with contacts — Electronic signals and answer to reset for synchronous cards*

— *Part 11: Personal verification through biometric methods*

— *Part 12: Cards with contacts — USB electrical interface and operating procedures*

— *Part 13: Commands for application management in a multi-application environment*

— *Part 15: Cryptographic information application*

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Introduction

This part of ISO/IEC 7816 is one of a series of standards defining the parameters for integrated circuit cards with contacts and the use of such cards for international interchange.

These cards are identification cards intended for information exchange negotiated between the outside and the integrated circuit in the card. As a result of an information exchange, the card delivers information (computation results, stored data) and/or modifies its content (data storage, event memorization).

The International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) draw attention to the fact that it is claimed that compliance with this document may involve the use of the following patents.

Title	Owner	Patent number
Data transmission method and card therefore	Axalto SA	ZL99810776.X DE699 13 166.9 ES 2212604 T3 GR3048211 JP2002 – 525720 EP1110173 US6840454 WO 00/16255

The patent rights concern the assignment of contacts to a differential pair, e.g. USB bus signals D+ and D–.

ISO and IEC take no position concerning the evidence, validity and scope of these patent rights.

The holder of these patent rights has assured ISO and IEC that he is willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of these patent rights is registered with ISO and IEC. Information may be obtained from:

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92542 Montrouge Cedex
France
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Identification cards — Integrated circuit cards —

Part 2:
Cards with contacts — Dimensions and location of the contacts

1 Scope

This part of ISO/IEC 7816 specifies the dimensions and locations for each of the contacts on an integrated circuit card of an ID-1 card type. It also provides information on the way to identify which standards define the use of the contacts.

This part of ISO/IEC 7816 is to be used in conjunction with ISO/IEC 7816-1.

2 Normative references

The following referenced documents are indispensable for the application 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 7810:2003, *Identification cards — Physical characteristics*

ISO/IEC 7816-3:2006, *Identification cards — Integrated circuit cards — Part 3: Cards with contacts — Electrical interface and transmission protocols*

ISO/IEC 7816-10:1999, *Identification cards — Integrated circuit(s) cards with contacts — Part 10: Electronic signals and answer to reset for synchronous cards*

ISO/IEC 7816-12:2005, *Identification cards — Integrated circuit cards — Part 12: Cards with contacts — USB electrical interface and operating procedures*

ISO/IEC 10373-3:2001, *Identification cards — Tests methods — Part 3: Integrated circuit(s) cards with contacts and related interface devices*

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3 Dimensions of the contacts

The shape and the surface of the conductive zones which include each contact are not defined in this part of ISO/IEC 7816.

Each contact shall have a minimum rectangular surface area not less than the dimensions specified in Figure 1.

This part of ISO/IEC 7816 does not define the maximum dimensions or shape of the contacts except for the requirement that each contact shall be electrically isolated from the other contacts.

Dimensions in millimetres

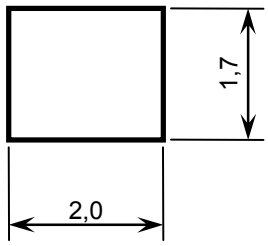


Figure 1 — Minimum dimensions of the contacts

4 Number and location of the contacts

This part of ISO/IEC 7816 defines eight contacts, referred to as C1 to C8.

The minimum rectangular surface area of the contacts is located as shown in Figure 2.

The contacts shall be located on the front of the card (see Clause 5). The dimensions are referenced to the left and upper edges of the front surface of the card as defined in ISO/IEC 7810.

See ISO/IEC 10373-3 for the test method.

Each numbered contact shall be assigned as specified in ISO/IEC 7816-3, ISO/IEC 7816-10 and ISO/IEC 7816-12.

Unused contact areas shall be either non-conductive or electrically isolated from any other contact area in order to avoid potential short circuit in interface devices.

It is recommended that electrical isolation is provided according to Annex B.

The usage of all contacts is assigned by ISO/IEC JTC 1/SC 17. Further information about the usage of these contacts is given in the documents that are referenced in Table A.1. Any use of contacts should not induce any damage on integrated circuit cards or interface devices.

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Dimensions in millimetres

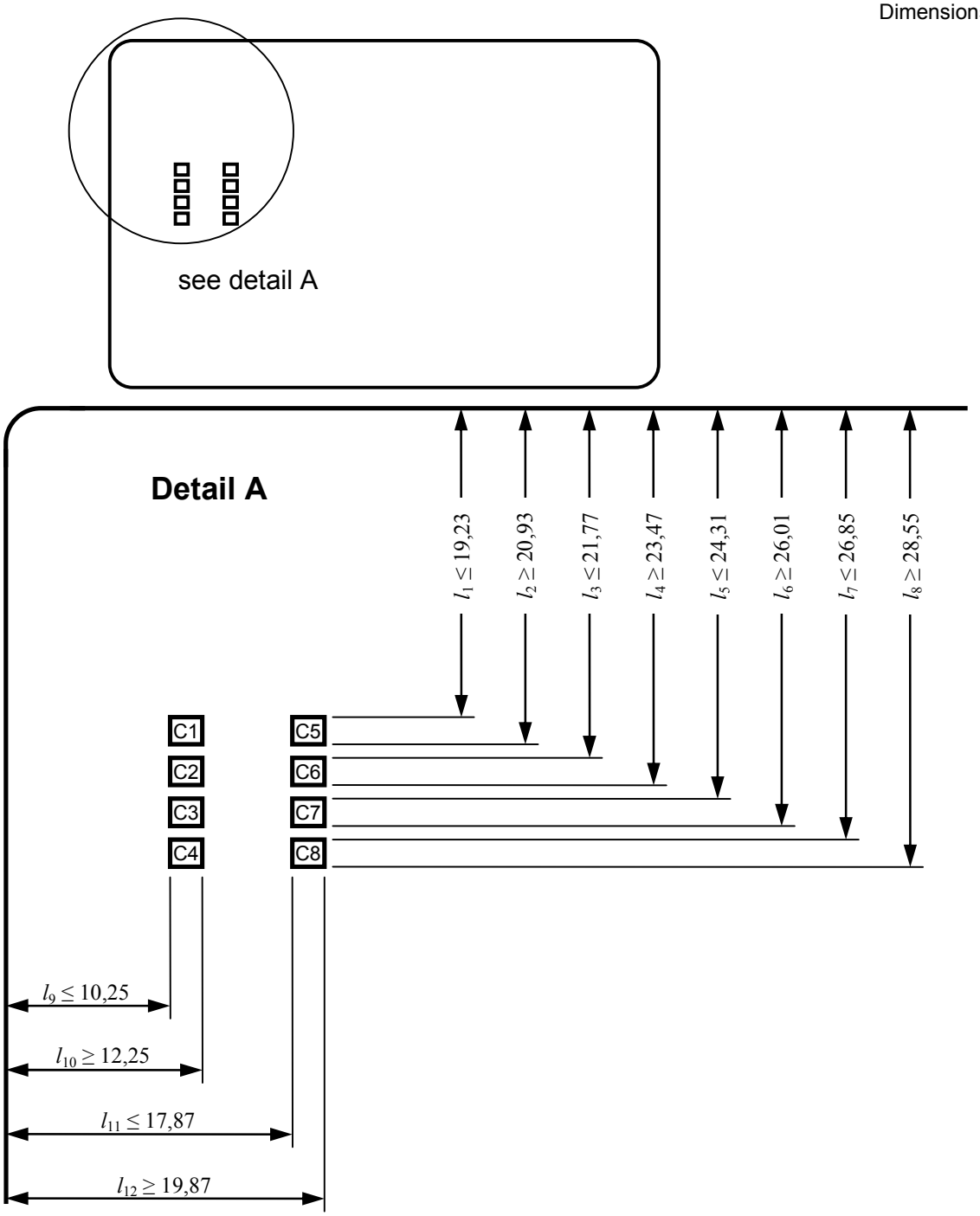


Figure 2 — Location of the contacts

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5 Location of contacts relative to other technologies

Figure 3 shows the relative locations of the technologies. Embossing (ISO/IEC 7811-1), when present, shall be located on the same side as the contacts. Magnetic stripe (ISO/IEC 7811-2 and ISO/IEC 7811-6), when present, shall be located on the opposite side to the contacts (see ISO/IEC 7810).

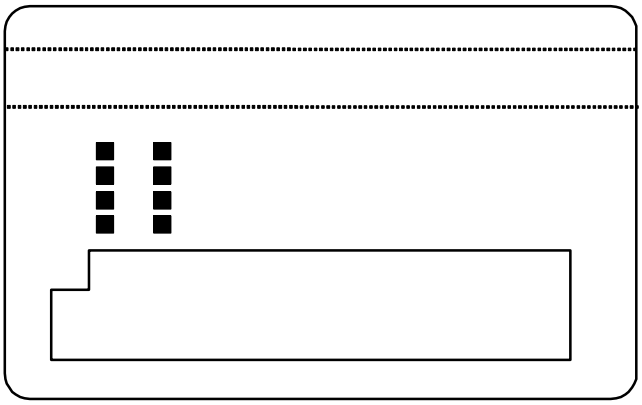


Figure 3 — Front side of the card

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Annex A
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Usage of the contacts

The following table shows in which part of ISO/IEC 7816 the corresponding contact is assigned.

Table A.1 — ISO/IEC 7816 part defining assignment

Contact no.	ISO/IEC 7816-3	ISO/IEC 7816-10	ISO/IEC 7816-12
C1	X	X	X
C2	X	X	
C3	X	X	
C4		X	X
C5	X	X	X
C6	X		
C7	X	X	
C8			X

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Annex B
(informative)

Location of possible conductive zones

Up to 1990, a transitional position of the contact was defined in ISO/IEC 7816-2. As a result, terminals were deployed which accept cards with contacts in either position. The purpose of this annex is to highlight this fact and allow manufacturers (essentially card manufacturers) to take this into account. In this respect, the electrical isolation of zones Z*x* (*x* = 1…8) should be provided.

Dimensions in millimetres

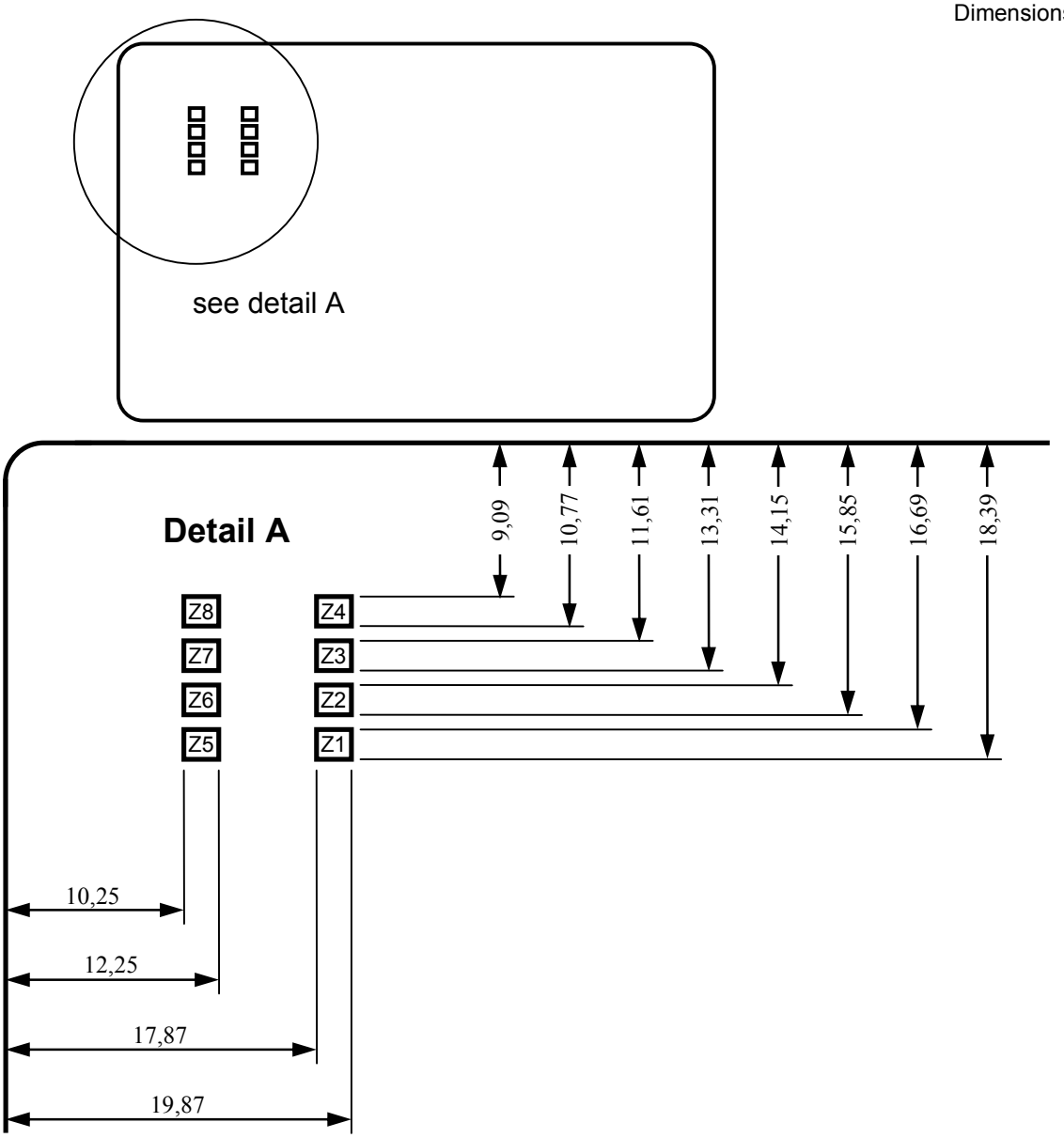


Figure B.1 — Location of possible conductive zones

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Bibliography

[1] ISO/IEC 7811-1:2002, *Identification cards — Recording technique — Part 1: Embossing*

[2] ISO/IEC 7811-2:2001, *Identification cards — Recording technique — Part 2: Magnetic stripe — Low coercivity*

[3] ISO/IEC 7811-6:2001, *Identification cards — Recording technique — Part 2: Magnetic stripe — High coercivity*

[4] ISO/IEC 7816-1:1998, *Identification cards — Integrated circuit(s) cards with contacts — Part 1: Physical characteristics*

[5] ISO/IEC 7816-1:1998/Amd.1:2003, *Identification cards — Integrated circuit(s) cards with contacts — Part 1: Physical characteristics — Amendment 1: Maximum height of the IC contact surface*

[6] Universal Serial Bus Revision 2.0 Specification, April 27, 2000

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