
**Identification cards — Contactless
integrated circuit cards — Vicinity
cards —**

**Part 2:
Air interface and initialization**

*Cartes d'identification — Cartes à circuit(s) intégré(s) sans contact —
Cartes de voisinage —*

Partie 2: Interface et initialisation dans l'air

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

This document is a preview generated by EVS

© ISO/IEC 2006

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing 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.....	1
4 Symbols and abbreviated terms	2
4.1 Abbreviated terms	2
4.2 Symbols	2
5 Initial dialogue for vicinity cards.....	2
6 Power transfer	3
6.1 Frequency	3
6.2 Operating field.....	3
7 Communications signal interface VCD to VICC	3
7.1 Modulation.....	3
7.2 Data rate and data coding.....	5
7.3 VCD to VICC frames.....	7
8 Communications signal interface VICC to VCD	9
8.1 Load modulation	9
8.2 Subcarrier	9
8.3 Data rates.....	9
8.4 Bit representation and coding.....	10
8.5 VICC to VCD frames.....	11
Annex A (informative) Standards compatibility	14

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 15693-2 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 15693-2:2000), of which it constitutes a minor revision. It also incorporates Technical Corrigendum ISO/IEC 15693-2:2000/Cor.1:2001.

ISO/IEC 15693 consists of the following parts, under the general title *Identification cards — Contactless integrated circuit cards — Vicinity cards*:

- *Part 1: Physical characteristics*
- *Part 2: Air interface and initialization*
- *Part 3: Anticollision and transmission protocol*

Introduction

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

This part of ISO/IEC 15693 defines the electrical characteristics of the contactless interface between a vicinity card and a vicinity coupling device. The interface includes power and bi-directional communications.

This part of ISO/IEC 15693 does not preclude the incorporation of other standard technologies on the card.

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

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 patents.

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

The holders of these patent rights have assured ISO and IEC that they are willing to negotiate licences under reasonable and nondiscriminatory terms and conditions with applicants throughout the world. In this respect, the statements of the holders of these patent rights are registered with the ISO and IEC. Information may be obtained from the following companies.

Contact	Subclause in this part of ISO/IEC 15693
<i>Infineon Technologies AG</i> <i>P O Box 800949</i> <i>D-81609 Munich</i> <i>Germany</i> <i>Koninklijke Philips Electronics N.V.</i> <i>Prof. Holstlaan 6</i> <i>6566 AA Eindhoven</i> <i>The Netherlands</i> <i>Omron Corporation</i> <i>Intellectual Property Group</i> <i>20 Igadera, Shimokaiinji,</i> <i>Nagaokakyo-City</i> <i>Kyoto, 617-8510 Japan</i>	7.2, Data rate and data coding
<i>EM Microelectronic-Marin SA</i> <i>IP Management</i> <i>Rue des Sors 3</i> <i>CH-2074 Marin</i>	7.2, Data rate and data coding 7.3, VCD to VICC frames
<i>Texas Instruments</i> <i>Deutschland GmbH</i> <i>D-85350 Freising</i> <i>Germany</i>	8.2, Subcarrier 8.3, Data rates

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified above. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

This document is a preview generated by EVS

Identification cards — Contactless integrated circuit cards — Vicinity cards —

Part 2: Air interface and initialization

1 Scope

This part of ISO/IEC 15693 specifies the nature and characteristics of the fields to be provided for power and bi-directional communications between vicinity coupling devices (VCDs) and vicinity cards (VICCs).

This part of ISO/IEC 15693 is to be used in conjunction with other parts of ISO/IEC 15693.

This part of ISO/IEC 15693 does not specify the means of generating coupling fields, nor the means of compliance with electromagnetic radiation and human exposure regulations which can vary according to country regulations and/or standards.

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 10373-7, *Identification cards — Test methods — Part 7: Vicinity cards*

ISO/IEC 15693-1, *Identification cards — Contactless integrated circuit(s) cards — Vicinity cards — Part 1: Physical characteristics*

ISO/IEC 15693-3, *Identification cards — Contactless integrated circuit(s) cards — Vicinity cards — Part 3: Anticollision and transmission protocol*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 15693-1 and the following apply.

3.1

modulation index

index equal to $[a-b]/[a+b]$ where a and b are the peak and minimum signal amplitude, respectively

NOTE The value of the index may be expressed as a percentage.

3.2

subcarrier

signal of frequency f_s used to modulate the carrier of frequency f_c