

# INTERNATIONAL STANDARD

# ISO/IEC 10373-7

Third edition  
2019-10

---

---

## **Cards and security devices for personal identification — Test methods —**

### **Part 7: Contactless vicinity objects**

*Cartes et dispositifs de sécurité pour l'identification personnelle —  
Méthodes d'essai —*

*Partie 7: Objets sans contact de voisinage*



Reference number  
ISO/IEC 10373-7:2019(E)

© ISO/IEC 2019



**COPYRIGHT PROTECTED DOCUMENT**

© ISO/IEC 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, 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  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

<b>Foreword</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative reference(s)</b> .....	<b>1</b>
<b>3 Terms, definitions, symbols and abbreviated terms</b> .....	<b>1</b>
3.1 Terms and definitions.....	1
3.2 Symbols and abbreviated terms.....	2
<b>4 Default items applicable to the test methods</b> .....	<b>2</b>
4.1 Test environment.....	2
4.2 Pre-conditioning.....	2
4.3 Default tolerance.....	2
4.4 Spurious inductance.....	2
4.5 Total measurement uncertainty.....	2
<b>5 Static electricity test</b> .....	<b>3</b>
<b>6 Test apparatus and test circuits</b> .....	<b>3</b>
6.1 General.....	3
6.2 Calibration coil card.....	3
6.2.1 General.....	3
6.2.2 Size of the calibration coil card.....	3
6.2.3 Thickness and material of the calibration coil card.....	3
6.2.4 Coil characteristics.....	3
6.3 Test VCD assembly.....	4
6.3.1 General.....	4
6.3.2 Test VCD antenna.....	5
6.3.3 Sense coils.....	6
6.3.4 Assembly of test VCD.....	6
6.4 Reference VICCs.....	6
6.4.1 General.....	6
6.4.2 Reference VICC for VCD power.....	7
6.4.3 Reference VICC for load modulation test.....	7
6.4.4 Dimensions of the reference VICCs.....	7
6.4.5 Thickness of the reference VICC board.....	7
6.4.6 Coil characteristics.....	7
6.5 Digital sampling oscilloscope.....	8
<b>7 Functional test — VICC</b> .....	<b>8</b>
7.1 Purpose.....	8
7.2 Test procedure.....	8
7.3 Test report.....	8
<b>8 Functional test — VCD</b> .....	<b>9</b>
8.1 VCD field strength and power transfer.....	9
8.1.1 Purpose.....	9
8.1.2 Test procedure.....	9
8.1.3 Test report.....	9
8.2 Modulation index and waveform.....	10
8.2.1 Purpose.....	10
8.2.2 Test procedure.....	10
8.2.3 Test report.....	10
8.3 Load modulation reception.....	10
<b>9 Additional test methods</b> .....	<b>10</b>
9.1 Additional VICC test methods.....	10
9.2 Additional VCD test methods.....	10
<b>Annex A (normative) Test VCD antenna</b> .....	<b>11</b>

<b>Annex B</b> (informative) <b>Test VCD antenna tuning</b> .....	<b>14</b>
<b>Annex C</b> (normative) <b>Sense coil</b> .....	<b>17</b>
<b>Annex D</b> (normative) <b>Reference VICC for VCD power test</b> .....	<b>19</b>
<b>Annex E</b> (informative) <b>Reference VICC for load modulation test</b> .....	<b>21</b>
<b>Annex F</b> (informative) <b>Program for evaluation of the spectrum</b> .....	<b>23</b>
<b>Annex G</b> (normative) <b>Additional VICC test methods</b> .....	<b>27</b>
<b>Annex H</b> (normative) <b>Additional VCD test methods</b> .....	<b>49</b>
<b>Bibliography</b> .....	<b>51</b>

## 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](http://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](http://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 of 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 [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

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

This third edition cancels and replaces the second edition (ISO/IEC 10373-7:2008), which has been technically revised.

The main changes compared to the previous edition are as follows:

- [Annex G](#) and [Annex H](#) have been added.

A list of all parts in the ISO/IEC 10373 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at <https://www.iso.org/members.html>.

[This is a preview - click here to buy the full publication](#)

# Cards and security devices for personal identification — Test methods —

## Part 7: Contactless vicinity objects

### 1 Scope

The ISO/IEC 10373 series defines test methods for characteristics of identification cards according to the definition given in ISO/IEC 7810. Each test method is cross-referenced to one or more base standards, which can be ISO/IEC 7810 or one or more of the supplementary standards that define the information storage technologies employed in identification card applications.

NOTE 1 Criteria for acceptability do not form part of the ISO/IEC 10373 series, but can be found in the International Standards mentioned above.

NOTE 2 Test methods defined in the ISO/IEC 10373 series are intended to be performed separately. A given card is not required to pass through all the tests sequentially.

This document deals with test methods, which are specific to contactless integrated circuit card (vicinity card) technology. ISO/IEC 10373-1 deals with test methods which are common to one or more ICC technologies and other parts in the ISO/IEC 10373 series deal with other technology-specific tests.

Unless otherwise specified, the tests in this document apply exclusively to vicinity cards defined in ISO/IEC 15693-1, ISO/IEC 15693-2 and ISO/IEC 15693-3.

### 2 Normative reference(s)

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 15693-1:2018, *Cards and security devices for personal identification — Contactless vicinity objects — Part 1: Physical characteristics*

ISO/IEC 15693-2:2019, *Cards and security devices for personal identification — Contactless vicinity objects — Part 2: Air interface and initialization*

ISO/IEC 15693-3:2019, *Cards and security devices for personal identification — Contactless vicinity objects — Part 3: Anticollision and transmission protocol*