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Identification cards — Test methods —

Part 6: Proximity cards

AMENDMENT 5: Bit rates of *fc*/64, *fc*/32 and *fc*/16

Cartes d'identification — Méthodes d'essai —
Partie 6: Cartes de proximité

AMENDEMENT 5: Débits binaires de fc*/64,* fc*/32 et* fc*/16*

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Foreword

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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.

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Amendment 5 to ISO/IEC 10373-6:2001 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Cards and personal identification.*

Identification cards — Test methods —

Part 6:
Proximity cards

AMENDMENT 5: Bit rates of *fc*/64, *fc*/32 and *fc*/16

Page 2, 7.1.1 of ISO/IEC 10373-6:2001/Amd.2:2003

Add the following note at the end of the subclause:

"NOTE No load modulation test is required for bit rates of *fc*/64, *fc*/32 and *fc*/16."

Page 4, 7.2.2 of ISO/IEC 10373-6:2001/Amd.2:2003

Replace the existing text with the following:

"Tables 1 to 4 define additional test conditions to be applied for type A PICCs for different bit rates.

NOTE The definitions for timing parameters related to the amplitude are different between *fc*/128 and higher bit rates, see the future Amendment 2 to ISO/IEC 14443-2:2001."

Page 4, 7.2.2 of ISO/IEC 10373-6:2001/Amd.2:2003

Replace the title of Table 1 with the following: "**Table 1 – Additional test conditions for a bit rate of *fc*/128**"

Page 4, 7.2.2 of ISO/IEC 10373-6:2001/Amd.2:2003

Insert the following table and note after Table 1:

Table 2 — Additional test conditions for a bit rate of *fc*/64

Condition	*H* (A/m)	t1	t2	t3	a
1	1,5	20/*fc*	14/*fc*	6/*fc*	0,2
2	1,5	20/*fc*	16/*fc*	7/*fc*	≤ 0,05
3	4,5	20/*fc*	14/*fc*	6/*fc*	0,2
4	4,5	20/*fc*	16/*fc*	7/*fc*	≤ 0,05
5	7,5	20/*fc*	14/*fc*	6/*fc*	0,2
6	7,5	20/*fc*	16/*fc*	7/*fc*	≤ 0,05

NOTE The timing t3 for all higher bit rates is defined in 8.1.2.2.

Page 4, 7.2.2 of ISO/IEC 10373-6:2001/Amd.2:2003

Insert the following table after the new Table 2:

Table 3 — Additional test conditions for a bit rate of *fc*/32

Condition	*H* (A/m)	t1	t2	t3	a
1	1,5	10/*fc*	6/*fc*	6/*fc*	0,35
2	1,5	10/*fc*	7/*fc*	7/*fc*	≤ 0,15
3	4,5	10/*fc*	6/*fc*	6/*fc*	0,35
4	4,5	10/*fc*	7/*fc*	7/*fc*	≤ 0,15
5	7,5	10/*fc*	6/*fc*	6/*fc*	0,35
6	7,5	10/*fc*	7/*fc*	7/*fc*	≤ 0,15

Page 4, 7.2.2 of ISO/IEC 10373-6:2001/Amd.2:2003

Insert the following table after Table 3:

Table 4 — Additional test conditions for a bit rate of *fc*/16

Condition	*H* (A/m)	t1	t2	t3	a
1	1,5	5/*fc*	3/*fc*	6/*fc*	0,6
2	1,5	5/*fc*	3/*fc*	7/*fc*	≤ 0,3
3	4,5	5/*fc*	3/*fc*	6/*fc*	0,6
4	4,5	5/*fc*	3/*fc*	7/*fc*	≤ 0,3
5	7,5	5/*fc*	3/*fc*	6/*fc*	0,6
6	7,5	5/*fc*	3/*fc*	7/*fc*	≤ 0,3

Page 4, 7.2.2.1 of ISO/IEC 10373-6:2001/Amd.2:2003

Replace the existing text with the following:

"Under the conditions defined in Table 1 the PICC shall answer to a REQA with ATQA.

A PICC supporting the optional *fc*/64 bit rate shall operate under the conditions defined in Table 2 after selection of a bit rate of *fc*/64. This PICC shall respond correctly to an I-block transmitted at a bit rate of *fc*/64.

A PICC supporting the optional *fc*/32 bit rate shall operate under the conditions defined in Table 3 after selection of a bit rate of *fc*/32. The PICC shall respond correctly to an I-block transmitted at a bit rate of *fc*/32.

A PICC supporting the optional *fc*/16 bit rate shall operate under the conditions defined in Table 4 after selection of a bit rate of *fc*/16. The PICC shall respond correctly to an I-block transmitted at a bit rate of *fc*/16."

Page 4, 7.2.2.2 of ISO/IEC 10373-6:2001/Amd.2:2003

Replace the existing text with the following:

"The test report shall confirm the intended operation at the mandatory *fc*/128 bit rate under the conditions defined in Table 1. For PICCs supporting one or more of the optional high bit rates the test report shall confirm the intended operation at the supported bit rates under the conditions defined in 7.2.2.1."

Page 4, 7.2.3 of ISO/IEC 10373-6:2001/Amd.2:2003

Replace the existing text with the following:

"Tables 5 to 7 define additional test conditions to be applied for type B PICCs for different bit rates.

Page 4, 7.2.3 of ISO/IEC 10373-6:2001/Amd.2:2003

Replace the title of Table 2 (renumbered to Table 5) with the following: "**Table 5 – Additional test condition for bit rates of *fc*/128 and *fc*/64**"

Page 4, 7.2.3 of ISO/IEC 10373-6:2001/Amd.2:2003

Insert the following table after Table 5:

Table 6 — Additional test conditions for a bit rate of *fc*/32

Condition	*H* (A/m)	m *(%)*	t_r, t_f (µs)
1	1,5	8	1
2	1,5	14	1
3	4,5	8	1
4	4,5	14	1
5	7,5	8	1
6	7,5	14	1

Page 4, 7.2.3 of ISO/IEC 10373-6:2001/Amd.2:2003

Insert the following table after Table 6:

Table 7 — Additional test conditions for a bit rate of *fc*/16

Condition	*H* (A/m)	m (%)	t_r, t_f (µs)
1	1,5	8	0,8
2	1,5	14	0,8
3	4,5	8	0,8
4	4,5	14	0,8
5	7,5	8	0,8
6	7,5	14	0,8

Page 5, 7.2.3.1 of ISO/IEC 10373-6:2001/Amd.2:2003

Replace the existing text with the following:

"Under the conditions defined in Table 5 the PICC operating at a bit rate of *fc*/128 shall answer to a REQB with ATQB.

A PICC supporting the optional *fc*/64 bit rate shall operate under the conditions defined in Table 5 after selection of a bit rate of *fc*/64. This PICC shall respond correctly to an I-block transmitted at a bit rate of *fc*/64.

A PICC supporting the optional *fc*/32 bit rate shall operate under the conditions defined in Table 6 after selection of a bit rate of *fc*/32. The PICC shall respond correctly to an I-block transmitted at a bit rate of *fc*/32.

A PICC supporting the optional *fc*/16 bit rate shall operate under the conditions defined in Table 7 after selection of a bit rate of *fc*/16. The PICC shall respond correctly to an I-block transmitted at a bit rate of *fc*/16."

Page 5, 7.2.3.2 of ISO/IEC 10373-6:2001/Amd.2:2003

Replace the existing text with the following:

"The test report shall confirm the intended operation at the mandatory *fc*/128 bit rate under the conditions defined in Table 5. For PICCs supporting one or more of the optional high bit rates the test report shall confirm the intended operation at the supported bit rates under the conditions defined in 7.2.3.1."

Page 14, A.2

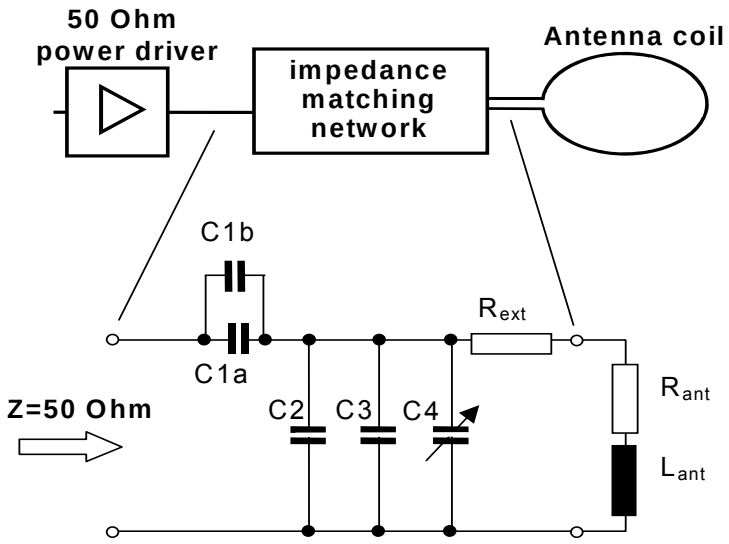
Insert new A.2.1 after the notes and before Figure A.3 with the following title and move the existing Figure A.3 into new A.2.1:

"A.2.1 Impedance matching network for a bit rate of *fc*/128"

Change the title of Figure A.3 to "**Figure A.3 – Impedance matching network for a bit rate of *fc*/128**"

Page 14, A.2

Insert new A.2.2 after new A.2.1 with the title "**A.2.2 Impedance matching network for bit rates of *fc*/64, *fc*/32 and *fc*/16**" and insert the following figure into new A.2.2:



Component Table:

	Value	Unit	Remarks
C1a	56	pF	Voltage range 200V
C1b	5,6	pF	Voltage range 200V
C2	180	pF	Voltage range 200V
C3	15	pF	Voltage range 200V
C4	2-27	pF	Voltage range 200V
Rext	2	Ohm	Power range 8 W

NOTE This impedance matching network is designed for tests up to 7,5 A/m.

Figure A.4 — Impedance matching network for bit rates of *fc*/64, *fc*/32 and *fc*/16

Last page

Add the following new Annex J:

Annex J
(normative)

High bit rate selection test methods for PCD

J.1 Apparatus

In this test the PCD-test-apparatus shall be configurable to change the bit rate during the test procedure. Tester shall be able to measure the bit rate used by the PCD on each stage of this test procedure.

J.2 Procedure

Place the PCD-test-apparatus into the field of the PCD.

J.2.1 Procedure for Type A

The following procedure shall be repeated for all values of interface byte TA(1) defined in Table J.1:

a) Run through activation sequence as defined in ISO/IEC 14443-3.

b) The PCD shall send a RATS command as defined in ISO/IEC 14443-4.

c) The PCD-test-apparatus answers with a valid ATS including TA(1) according to Table J.1.

d) The PCD may optionally send a PPS with a valid parameter setting for PPS1 byte according to Table J.1.

e) If the PCD has sent a PPS then the PCD-test-apparatus acknowledges the received PPS with a valid PPS response.

f) The PCD shall send $I(0)_0$ block using the bit rate selected.

NOTE This block may also be $I(1)_0$, or R(NACK) in case of PICC presence check method 2a.

g) The PCD-test-apparatus sends a valid response using the bit rate selected. Check, if the answer from the PCD-test apparatus is accepted by the PCD.

Table J.1 — Correct behaviour of PCD after ATS with TA(1)

TA(1)	Valid parameter setting for PPS1
(10000000)b	(00000000)b [a]
(10010001)b	(00000101)b, (00000000)b
(10100010)b	(00001010)b, (00000000)b
(10110011)b	(00000101)b, (00001010)b, (00000000)b
(11000100)b	(00001111)b, (00000000)b
(11010101)b	(00000101)b, (00001111)b, (00000000)b
(11100110)b	(00001010)b, (00001111)b, (00000000)b

TA(1)	Valid parameter setting for PPS1
(11110111)b	(00000101)b, (00001010)b, (00001111)b, (00000000)b
(00000000)b	(00000000)b [a]
(00000001)b	(00000001)b, (00000000)b
(00000010)b	(00000010)b, (00000000)b
(00000011)b	(00000001)b, (00000010)b, (00000000)b
(00000100)b	(00000011)b, (00000000)b
(00000101)b	(00000001)b, (00000011)b, (00000000)b
(00000110)b	(00000010)b, (00000011)b, (00000000)b
(00000111)b	(00000001)b, (00000010)b, (00000011)b, (00000000)b
(00010000)b	(00000000)b (00000100)b
(00010001)b	(00000001)b, (00000000)b (00000101)b, (00000100)b
(00010010)b	(00000010)b, (00000000)b (00000110)b, (00000100)b
(00010011)b	(00000001)b, (00000010)b, (00000000)b (00000101)b, (00000110)b, (00000100)b
(00010100)b	(00000011)b, (00000000)b (00000111)b, (00000100)b
(00010101)b	(00000001)b, (00000011)b, (00000000)b (00000101)b, (00000111)b, (00000100)b
(00010110)b	(00000010)b, (00000011)b, (00000000)b (00000110)b, (00000111)b, (00000100)b
(00010111)b	(00000001)b, (00000010)b, (00000011)b, (00000000)b (00000101)b, (00000110)b, (00000111)b, (00000100)b
(00100000)b	(00000000)b (00001000)b
(00100001)b	(00000001)b, (00000000)b (00001001)b, (00001000)b
(00100010)b	(00000010)b, (00000000)b (00001010)b, (00001000)b
(00100011)b	(00000001)b, (00000010)b, (00000000)b (00001001)b, (00001010)b, (00001000)b
(00100100)b	(00000011)b, (00000000)b (00001011)b, (00001000)b
(00100101)b	(00000001)b, (00000011)b, (00000000)b (00001001)b, (00001011)b, (00001000)b
(00100110)b	(00000010)b, (00000011)b, (00000000)b (00001010)b, (00001011)b, (00001000)b
(00100111)b	(00000001)b, (00000010)b, (00000011)b, (00000000)b (00001001)b, (00001010)b, (00001011)b, (00001000)b
(00110000)b	(00000000)b (00000100)b (00001000)b
(00110001)b	(00000001)b, (00000000)b (00000101)b, (00000100)b (00001001)b, (00001000)b

TA(1)	Valid parameter setting for PPS1
(00110010)b	(00000010)b, (00000000)b (00000110)b, (00000100)b (00001010)b, (00001000)b
(00110011)b	(00000001)b, (00000010)b, (00000000)b (00000101)b, (00000110)b, (00000100)b (00001001)b, (00001010)b, (00001000)b
(00110100)b	(00000011)b, (00000000)b (00000111)b, (00000100)b (00001011)b, (00001000)b
(00110101)b	(00000001)b, (00000011)b, (00000000)b (00000101)b, (00000111)b, (00000100)b (00001001)b, (00001011)b, (00001000)b
(00110110)b	(00000010)b, (00000011)b, (00000000)b (00000110)b, (00000111)b, (00000100)b (00001010)b, (00001011)b, (00001000)b
(00110111)b	(00000001)b, (00000010)b, (00000011)b, (00000000)b (00000101)b, (00000110)b, (00000111)b, (00000100)b (00001001)b, (00001010)b, (00001011)b, (00001000)b
(01000000)b	(00000000)b (00001100)b
(01000001)b	(00000001)b, (00000000)b (00001101)b, (00001100)b
(01000010)b	(00000010)b, (00000000)b (00001110)b, (00001100)b
(01000011)b	(00000001)b, (00000010)b, (00000000)b (00001101)b, (00001110)b, (00001100)b
(01000100)b	(00000011)b, (00000000)b (00001111)b, (00001100)b
(01000101)b	(00000001)b, (00000011)b, (00000000)b (00001101)b, (00001111)b, (00001100)b
(01000110)b	(00000010)b, (00000011)b, (00000000)b (00001110)b, (00001111)b, (00001100)b
(01000111)b	(00000001)b, (00000010)b, (00000011)b, (00000000)b (00001101)b, (00001110)b, (00001111)b, (00001100)b
(01010000)b	(00000000)b (00000100)b (00001100)b
(01010001)b	(00000001)b, (00000000)b (00000101)b, (00000100)b (00001101)b, (00001100)b
(01010010)b	(00000010)b, (00000000)b (00000110)b, (00000100)b (00001110)b, (00001100)b
(01010011)b	(00000001)b, (00000010)b, (00000000)b (00000101)b, (00000110)b, (00000100)b (00001101)b, (00001110)b, (00001100)b
(01010100)b	(00000011)b, (00000000)b (00000111)b, (00000100)b (00001111)b, (00001100)b