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TEST REPORT

Test Report No.: 1-8095/14-01-03

Test Laboratory

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Test Standards

NFC RFID Schutzhüllen Test	Testaufbau für Shieldings für RFID Karten
ISO/IEC 10373-6:2011	Identification cards – Test methods – Part6: Proximity cards

Test Item

Kind of test item:	**RFID Shielding**
Model name:	**Kartenschutztasche (holds up to 4 cards)**
S/N serial number:	n/a, 5 identical samples (except for the colors) were provided for testing (referred to as “Sample 6” to “Sample 10” within this document)
Product version:	n/a

This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test Report authorised:

Digitally signed by Thomas Velhagen
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Thomas Velhagen
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Test performed:

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Oliver Altmeyer
Consultant

1 Table of Contents

2 General Information

2.1 Notes

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2.2 Application Details

Date of receipt of order:	2014-06-06
Date of receipt of test item:	2014-05-26
Start of test:	2014-06-10
End of test:	2014-06-10
Person(s) present during the test:	---

3 Test Standards

Test Standard	Version	Test Standard Description
NFC RFID Schutzhüllen Test	2014-05-08	Testaufbau für Shieldings für RFID Karten
ISO/IEC 10373-6:2011	2011-01-15	Identification cards – Test methods – Part6: Proximity cards, second edition

4 Test Environment

Temperature:	+ 22 °C
Relative humidity content:	not relevant for this kind of testing
Air pressure:	not relevant for this kind of testing
Power supply:	230 V / 50 Hz

5 Summary of Measurement Results

☒	**No deviations from the technical specifications were ascertained**
☐	There were deviations from the technical specifications ascertained

Clause	Tested Characteristic	Verdict
7.1	Field Strength Measurement Inside RFID Shielding	Pass

Note: Explanation of the verdicts
Pass: The DUT fulfils the requirements of the test standards in Chapter 3.
Fail: The DUT does not fulfil the requirements of the test standards in Chapter 3.

6 Test Set-up and Test Procedure

The following devices are to be used:

- Signal generator (or contactless reader simulator)
- RF amplifier
- Test PCD assembly 1 (low data rate) as defined in ISO/IEC 10373-6:2011, including a calibration coil 1
- Second calibration coil 1
- Oscilloscope (incl. adequate probe) for field strength measurement
- Adequate cabling

All listed devices are to be used as defined in ISO/IEC 10373-6:2011.

In order to perform the test, the following steps are required:

- Put the second calibration coil in DUT position on the Test PCD assembly
- Set field strength to 12 A/m (as measured on the first calibration coil)
- Verify that the field strength measured by the second calibration coil also is 12 A/m
- Put the second calibration coil inside the DUT and place the “combined” device in DUT position on the Test PCD assembly; first and second calibration coil have to be adjusted in parallel
- Re-adjust field strength to 12 A/m if necessary
- Measure the field strength at the second calibration coil
- Rotate the combined device (DUT + second calibration coil) and repeat the measurement

Note: A more detailed description of test set-up and test procedure is given in the referenced test standards (see Chapter 3 for details).

Note: All test equipment is listed in detail in Chapter 8.

7 Detailed Test Results

7.1 Field Strength Measurement Inside RFID Shielding

Measurement:
The purpose of this test is to verify that the DUT is an effective RFID shielding.

Measurement Parameters:
Temperature: RT
Number of Samples: 5

Limits:
For method of measurement see Chapter 6. In order to pass the test, the measured field strength at the second calibration coil must never exceed 250 A/m.

Results:

First variation: DUT empty except for calibration coil	Measured field strength [mA/m] at second calibration coil in ...		
	... first position	... second position	Verdict
Sample 6	37	35	Pass
Sample 7	64	52	Pass
Sample 8	69	47	Pass
Sample 9	50	39	Pass
Sample 10	55	35	Pass

Second variation: DUT contains 3 smart cards and a calibration coil	Measured field strength [mA/m] at second calibration coil in ...		
	... first position	... second position	Verdict
Sample 6	110	88	Pass
Sample 7	119	116	Pass
Sample 8	116	100	Pass
Sample 9	114	95	Pass
Sample 10	112	92	Pass

Note: As there is a significant difference in thickness – depending on the number of cards (up to 4 are possible) – it was decided to perform the measurement procedure under two different conditions. In order to pass the test as a whole, both conditions must have a “Pass” result.

Note: Independent from the testing condition, the DUT was always kept completely closed during the test.

Aggregate Test Case Result: The result of the measurement is “Pass”.

8 Test Equipment

To simplify the identification of the test equipment and/or ancillaries which were used, the reporting of the relevant test cases only refer to the test item number as specified in the table below.

No	Equipment	Type	Manufacturer	INV. No CETECOM
1	Contactless Reader Simulator	MP300 TCL1	MICROPROSS	300003383
2	RF Amplifier	MPRFA	MICROPROSS	300004681
3	ISO 10373-6 Test Apparatus		CETECOM	400000150
4	Oscilloscope	DPO 4034	Tektronix	300003740
5	Control PC		F+W	300003781
6	Calibration Coil		CETECOM	400000323
7	ePassport Software	ePP	CETECOM	400000338

9 Observations

No observations exceeding those reported with the single test cases have been made.

Annex A: Photo Documentation

Photo 1: ISO/IEC 10373-6 Test PCD assembly

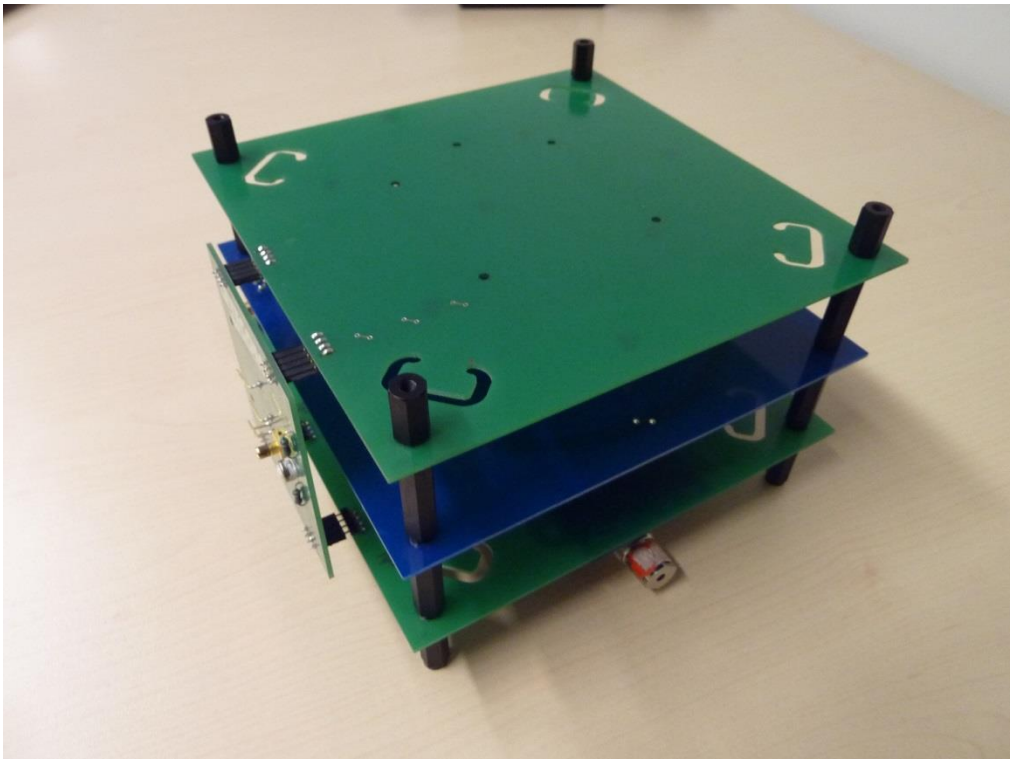


Photo 2: Second calibration coil

Photo 3: DUT in first test position

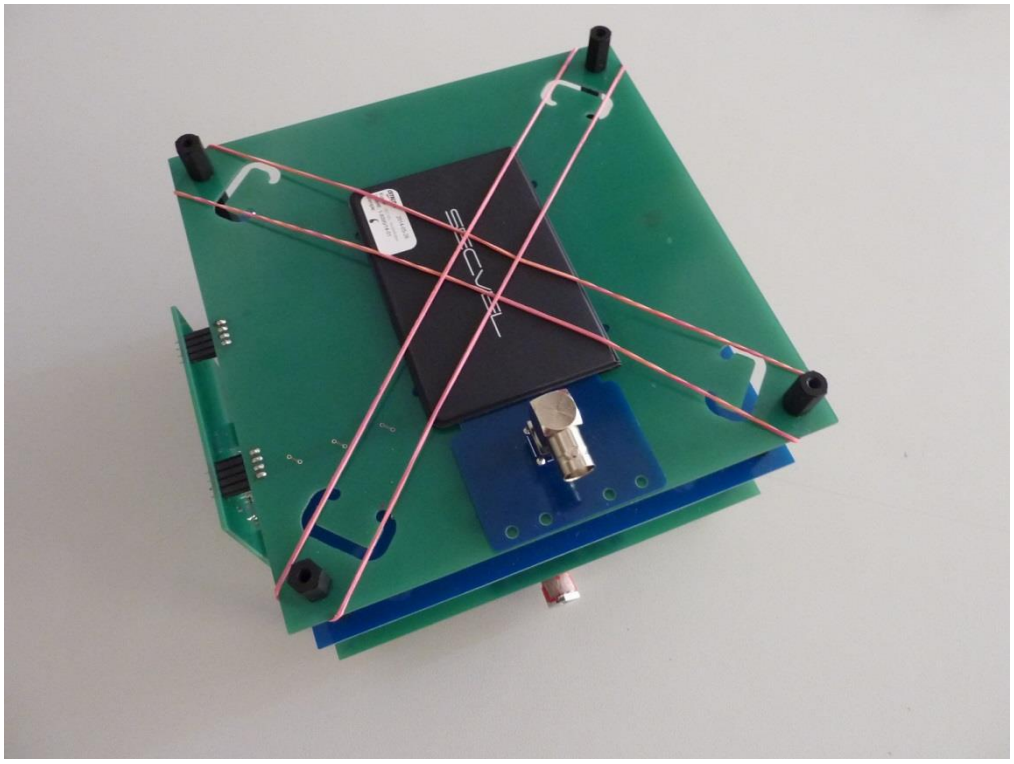


Photo 4: DUT in second test position (rotated by 90°)

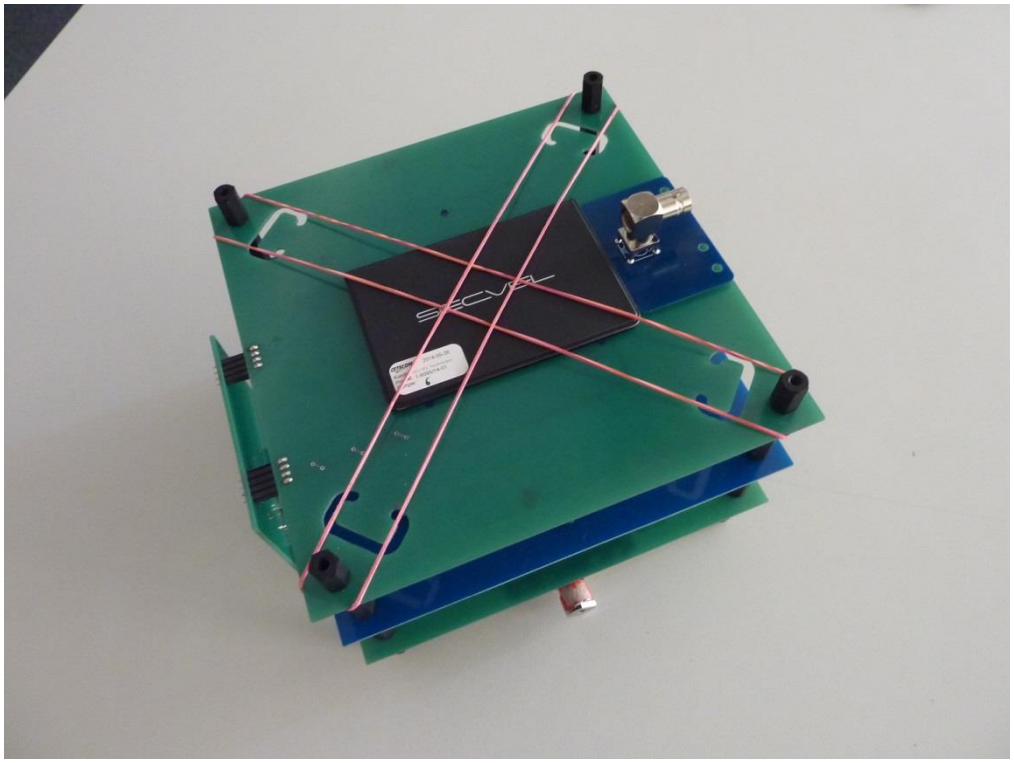
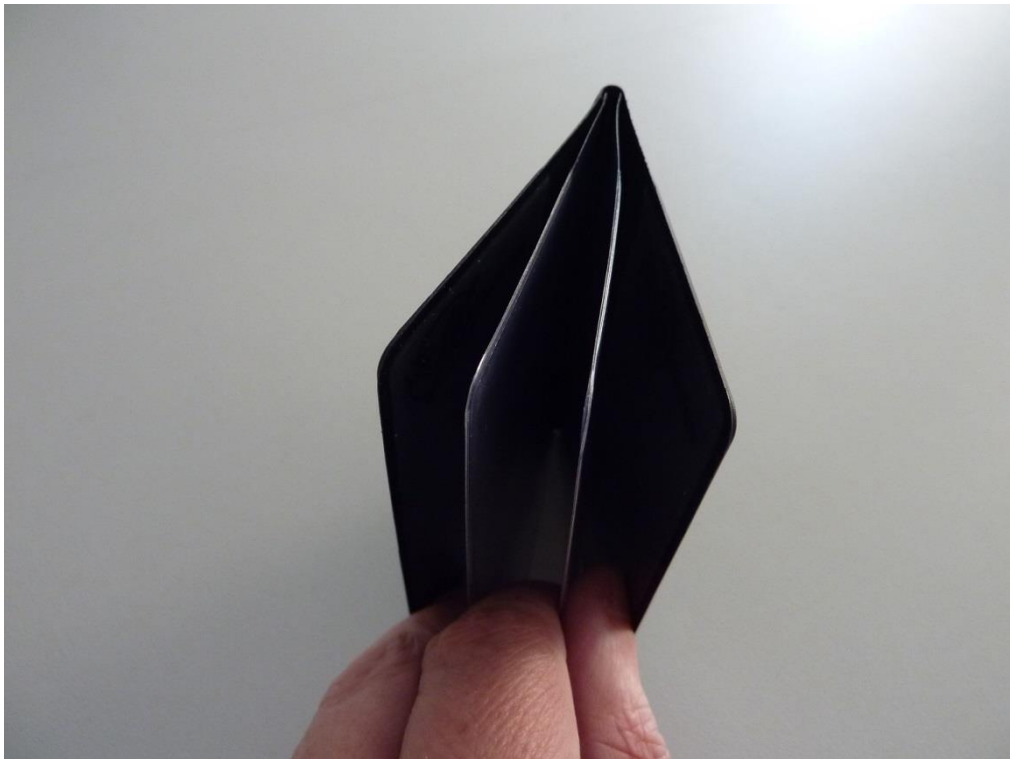


Photo 5: DUT overview

Photo 6: DUT opened



Annex B: Document History

Version	Applied Changes	Date of Release
	Draft Release	2014-06-11
	Initial Release	2014-06-12

Annex C: Further Information

Glossary

DUT - Device under Test
Inv. No. - Inventory number
n/a - Not applicable
S/N - Serial Number
RFID - Radio Frequency Identification
RT - Room Temperature