

**Standard** ECMA-415

1<sup>st</sup> Edition / December 2016

**NFC-SEC Test Methods**

**Standard**



**COPYRIGHT PROTECTED DOCUMENT**

## Contents

Page

1	Scope .....	1
2	Conformance .....	1
3	Normative references .....	1
4	Terms and definitions .....	2
4.1	digital certificate (certificate).....	2
4.2	Name.....	2
4.3	Recipient.....	2
4.4	Sender.....	2
4.5	test report .....	2
5	Conventions and notations .....	2
6	Acronyms .....	2
7	NFC-SEC-TEST apparatus .....	3
7.1	General .....	3
7.2	Apparatus for testing the Sender .....	4
7.3	Apparatus for testing the Recipient .....	4
7.4	NFC-SEC-01 emulation .....	4
7.5	NFC-SEC-02 emulation .....	4
7.6	NFC-SEC-03 emulation .....	4
7.7	NFC-SEC-04 emulation .....	4
8	Test rules.....	4
8.1	General test rules .....	4
8.2	Test scenario and report.....	5
8.3	RFU bits .....	5
8.4	Test scenarios .....	5
9	Test methods for NFC-SEC-01 .....	6
9.1	Recipient test methods .....	6
9.1.1	List of protocol test methods .....	6
9.1.2	NFC-SEC-PDU format.....	7
9.1.3	Logical operation of the Transport Protocol .....	7
9.2	Sender test methods .....	9
9.2.1	List of protocol test methods .....	9
9.2.2	NFC-SEC-PDU format.....	9
9.2.3	Logical operation of the Transport Protocol .....	10
10	Test methods for NFC-SEC-02 .....	12
10.1	Recipient test methods .....	12
10.2	Sender test methods .....	12
10.2.1	ACT_REQ PDUs.....	12
10.2.2	ENC PDUs.....	13
11	Test methods for NFC-SEC-03 .....	13
11.1	Recipient test methods .....	13
11.1.1	List of protocol test methods .....	13
11.1.2	NFC-SEC-PDU format.....	14
11.1.3	Logical operation of the Transport Protocol .....	14
11.2	Sender test methods .....	15
11.2.1	List of protocol test methods .....	15
11.2.2	NFC-SEC-PDU format.....	16
11.2.3	Logical operation of the Transport Protocol .....	16

11.2.4	Logical operation of the TTP Transport Protocol.....	18
12	Test methods for NFC-SEC-04 .....	18
12.1	Recipient test methods .....	18
12.1.1	List of protocol test methods .....	18
12.1.2	Logical operation of the Transport Protocol .....	18
12.2	Sender test methods .....	19
12.2.1	List of protocol test methods .....	20
12.2.2	Logical operation of the Transport Protocol .....	20
Annex A	(informative) Test report template for Recipient tests .....	23
A.1	Test report template for Recipient tests of NFC-SEC-01 .....	23
A.2	Test report template for Recipient tests of NFC-SEC-02.....	24
A.3	Test report template for Recipient tests of NFC-SEC-03.....	24
A.4	Test report template for Recipient tests of NFC-SEC-04.....	25
Annex B	(informative) Test report template for Sender tests .....	27
B.1	Test report template for Sender tests of NFC-SEC-01 .....	27
B.2	Test report template for Sender tests of NFC-SEC-02 .....	28
B.3	Test report template for Sender tests of NFC-SEC-03 .....	30
B.4	Test report template for Sender tests of NFC-SEC-04.....	31

## Introduction

The NFC Security Test (NFC-SEC-TEST) standard specifies the definitions, rules and methods for the NFC-SEC-TEST standard and the necessary test apparatus. It corresponds to ISO/IEC 13157 series (ECMA-385, ECMA-386, ECMA-409, ECMA-410 and ECMA-411) of NFC-SEC standards which specify:

- NFC-SEC secure channel and shared secret services and protocol for NFCIP-1, and
- mechanisms for those services.

ISO/IEC 13157 series of NFC-SEC consist of the following standards:

- ISO/IEC 13157-1: *Information technology -- Telecommunications and information exchange between systems -- NFC Security -- Part 1: NFC-SEC NFCIP-1 security services and protocol* (ECMA-385)
- ISO/IEC 13157-2: *Information technology -- Telecommunications and information exchange between systems -- NFC Security -- Part 2: NFC-SEC cryptography standard using ECDH and AES* (NFC-SEC-01, ECMA-386)
- ISO/IEC 13157-3: *Information technology -- Telecommunications and information exchange between systems -- NFC Security -- Part 3: NFC-SEC cryptography standard using ECDH-256 and AES-GCM* (NFC-SEC-02, ECMA-409)
- ISO/IEC 13157-4: *Information technology -- Telecommunications and information exchange between systems -- NFC Security -- Part 4: NFC-SEC entity authentication and key agreement using asymmetric cryptography* (NFC-SEC-03, ECMA-410)
- ISO/IEC 13157-5: *Information technology -- Telecommunications and information exchange between systems -- NFC Security -- Part 5: NFC-SEC entity authentication and key agreement using symmetric cryptography* (NFC-SEC-04, ECMA-411)

Compliance with this Standard may involve the use of a patent. Ecma International takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured Ecma International that he/she is willing to negotiate licences either free of charge or under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with Ecma International. Information may be obtained from: <http://www.ecma-international.org/publications/files/ECMA-ST/EcmaPATENT/EcmaListofPatentStatements.htm>

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. Ecma International shall not be held responsible for identifying any or all such patent rights.

This Ecma Standard was developed by Technical Committee 47 and was adopted by the General Assembly of December 2016.

**"COPYRIGHT NOTICE**

© 2016 Ecma International

*This document may be copied, published and distributed to others, and certain derivative works of it may be prepared, copied, published, and distributed, in whole or in part, provided that the above copyright notice and this Copyright License and Disclaimer are included on all such copies and derivative works. The only derivative works that are permissible under this Copyright License and Disclaimer are:*

- (i) works which incorporate all or portion of this document for the purpose of providing commentary or explanation (such as an annotated version of the document),*
- (ii) works which incorporate all or portion of this document for the purpose of incorporating features that provide accessibility,*
- (iii) translations of this document into languages other than English and into different formats and*
- (iv) works by making use of this specification in standard conformant products by implementing (e.g. by copy and paste wholly or partly) the functionality therein.*

*However, the content of this document itself may not be modified in any way, including by removing the copyright notice or references to Ecma International, except as required to translate it into languages other than English or into a different format.*

*The official version of an Ecma International document is the English language version on the Ecma International website. In the event of discrepancies between a translated version and the official version, the official version shall govern.*

*The limited permissions granted above are perpetual and will not be revoked by Ecma International or its successors or assigns.*

*This document and the information contained herein is provided on an "AS IS" basis and ECMA INTERNATIONAL DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY OWNERSHIP RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE."*

# NFC-SEC Test Methods

## 1 Scope

This Standard specifies the definitions, rules and methods for the NFC-SEC-TEST standard and the necessary test apparatus. The test report templates are provided in Annexes A and B.

## 2 Conformance

In addition to conforming to ISO/IEC 22536 (ECMA-356) and ISO/IEC 23917 (ECMA-362), conforming implementations of ECMA-386, ECMA-409, ECMA-410 and ECMA-411 shall pass all respective normative test cases and requirements specified herein using the test apparatus and rules of this Standard. Test results should be recorded using Annex A and Annex B of this Standard.

## 3 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 9646 (all parts), *Information technology -- Open Systems Interconnection -- Conformance Testing Methodology and Framework*

ISO/IEC 9798-1:2010, *Information technology -- Security techniques -- Entity authentication -- Part 1: General*

ISO/IEC 13157-1:2014, *Information technology -- Telecommunications and information exchange between systems -- NFC Security -- Part 1: NFC-SEC NFCIP-1 security services and protocol (ECMA-385)*

ISO/IEC 13157-2:2016, *Information technology -- Telecommunications and information exchange between systems -- NFC Security -- Part 2: NFC-SEC cryptography standard using ECDH and AES (ECMA-386)*

ISO/IEC 13157-3:2016, *Information technology -- Telecommunications and information exchange between systems -- NFC Security -- Part 3: NFC-SEC cryptography standard using ECDH-256 and AES-GCM (ECMA-409)*

ISO/IEC 13157-4:2016, *Information technology -- Telecommunications and information exchange between systems -- NFC Security -- Part 4: NFC-SEC entity authentication and key agreement using asymmetric cryptography (ECMA-410)*

ISO/IEC 13157-5:2016, *Information technology -- Telecommunications and information exchange between systems -- NFC Security -- Part 5: NFC-SEC entity authentication and key agreement using symmetric cryptography (ECMA-411)*

ISO/IEC 18092, *Information technology -- Telecommunications and information exchange between systems -- Near Field Communication -- Interface and Protocol (NFCIP-1) (ECMA-340)*

ISO/IEC 22536, *Information technology -- Telecommunications and information exchange between systems -- Near Field Communication Interface and Protocol (NFCIP-1) -- RF Interface Test Methods (ECMA-356)*

ISO/IEC 23917, *Information technology -- Telecommunications and information exchange between systems -- NFCIP-1 -- Protocol Test Methods (ECMA-362)*

## 4 Terms and definitions

For the purposes of this Standard, the following terms and definitions apply.

**4.1 digital certificate (certificate)**  
public key information of an entity signed by the certification authority and thereby rendered unforgeable

[ISO/IEC 9798-1]

**4.2 name**  
the names of basic elements for test case, e.g. specific fields that are written with a capital initial letter

**4.3 recipient**  
NFC-SEC entity that receives ACT\_REQ

[ISO/IEC 13157-1]

**4.4 sender**  
NFC-SEC entity that sends ACT\_REQ

[ISO/IEC 13157-1]

**4.5 test report**  
report for the test, that includes amongst other information: supplier, device ID, test suite, test name, test result, the number of passed tests versus the total number of tests, the number of different samples and the date of the tests, see Annexes A and B

## 5 Conventions and notations

Clause 5 of ISO/IEC 13157-2 (ECMA-386) applies.

## 6 Acronyms

For the purposes of this Standard, the following acronyms following apply.

A106	Active communication mode at 106 kbps
A212	Active communication mode at 212 kbps
A424	Active communication mode at 424 kbps
IUT	Implementation Under Test
I/O	Input and Output
LT	Lower Tester
NEAU	NFC Entity Authentication
NEAU-A	NEAU using Asymmetric Cryptography
NEAU-S	NEAU using Symmetric Cryptography
NFC-SEC	NFC Security
NFC-SEC-TEST	NFC-SEC Test
P <sub>xx</sub>	DEP_REQ or DEP_RES PDU coded as Protected PDU and PNI set to xx.



P106	Passive communication mode at 106 kbps
P212	Passive communication mode at 212 kbps
P424	Passive communication mode at 424 kbps
RTO	Response Timeout
SCH	Secure Channel Service
SEP	Secure Exchange Protocol
SSE	Shared Secret Service
TB-PDU	Transmission Block – Protocol Data Unit
TM-SDU	Test Management – Service Data Unit
UT	Upper Tester

## 7 NFC-SEC-TEST apparatus

### 7.1 General

The concepts and abstract model of ISO/IEC 9646 are used to verify that the operation of an Implementation Under Test (IUT) is compliant to any standard of the ISO/IEC 13157 series of NFC-SEC standards.

The NFC-SEC-TEST apparatus consists of an Upper Tester (UT) and a Lower Tester (LT) as illustrated in Figure 1.

To communicate with the IUT, e.g. to establish the shared secret on the IUT, the UT and IUT exchange TM-SDUs. The SDU definition and the interface between UT and IUT are out of scope of this Standard.

The NFC-SEC-TEST apparatus shall provide different test modes. Each test mode is capable to emulate a conformant implementation by sending and receiving respectively interpreting the specified PDUs of any of ISO/IEC 13157-2 (NFC-SEC-01), ISO/IEC 13157-3 (NFC-SEC-02), ISO/IEC 13157-4 (NFC-SEC-03) and ISO/IEC 13157-5 (NFC-SEC-04).

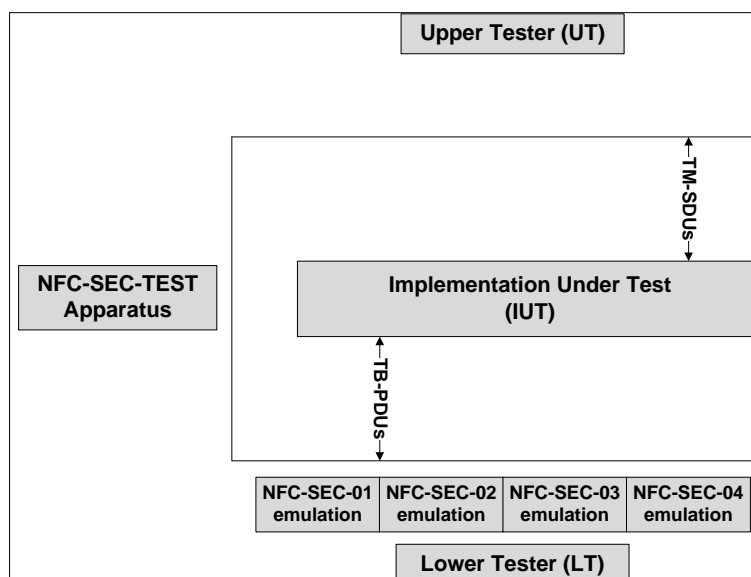


Figure 1 — NFC-SEC-TEST apparatus

## 7.2 Apparatus for testing the Sender

The NFC-SEC-TEST apparatus tests the IUT when operating as a Sender by emulating a Recipient.

The NFC-SEC-TEST apparatus shall execute the SEP and perform data exchange commands.

The NFC-SEC-TEST apparatus for testing the IUT when operating as the Sender consists of two parts.

- The UT configures the Sender and instructs the Sender to send commands. This Standard does not specify how the UT controls the IUT.
- The LT emulates the Recipient protocol, and occasionally uses incorrect messages to perform negative tests.

## 7.3 Apparatus for testing the Recipient

The NFC-SEC-TEST apparatus tests the IUT when operating as a Recipient by emulating a Sender.

The NFC-SEC-TEST apparatus shall execute the SEP activation and perform data exchange commands and occasionally uses incorrect messages to perform negative tests.

## 7.4 NFC-SEC-01 emulation

LT using NFC-SEC-01 Emulation to interact with the IUT If the PID in NFC-SEC-PDU equals to 01.

## 7.5 NFC-SEC-02 emulation

LT using NFC-SEC-02 Emulation to interact with the IUT If the PID in NFC-SEC-PDU equals to 02.

## 7.6 NFC-SEC-03 emulation

LT using NFC-SEC-03 Emulation to interact with the IUT If the PID in NFC-SEC-PDU equals to 03.

## 7.7 NFC-SEC-04 emulation

LT using NFC-SEC-04 Emulation to interact with the IUT If the PID in NFC-SEC-PDU equals to 04.

# 8 Test rules

## 8.1 General test rules

An IUT when operating as a Sender sends an ACT\_REQ as the first message and the LT sends an ACT\_RES.

An IUT when operating as a Sender sends a VFY\_REQ and the LT sends a VFY\_RES.

An IUT when operating as a Sender sends ENC and the LT receives and analyses it.

An IUT when operating as a Sender sends TMN and the LT receives and analyses it.

An IUT when operating as a Sender sends ERROR and the LT receives and analyses it.

An IUT when operating as a Recipient sends an ACT\_RES after the LT sent the ACT\_REQ.

An IUT when operating as a Recipient sends a VFY\_RES after the LT sent the VFY\_REQ.

NOTE Testing the format of DEP\_REQ and DEP\_RES Protected PDUs as specified in ECMA-340 is outside the scope of this Standard.

## 8.2 Test scenario and report

Testing the IUT requires test scenarios to be executed. Each test scenario specifies a sequence of PDUs to be exchanged between the Sender and the Recipient.

The result of the test scenario should be documented in a test report as defined in Annexes A and B.

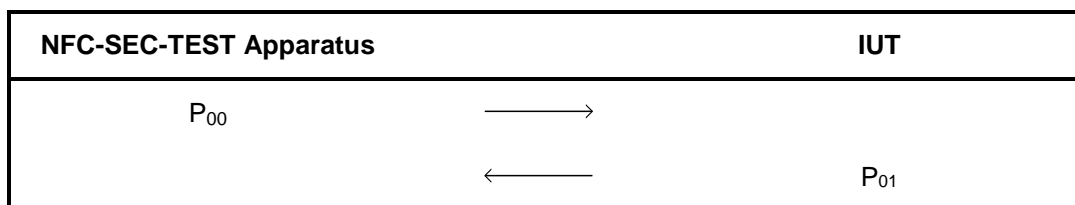
## 8.3 RFU bits

A test shall fail in case an RFU field is not set to its default value.

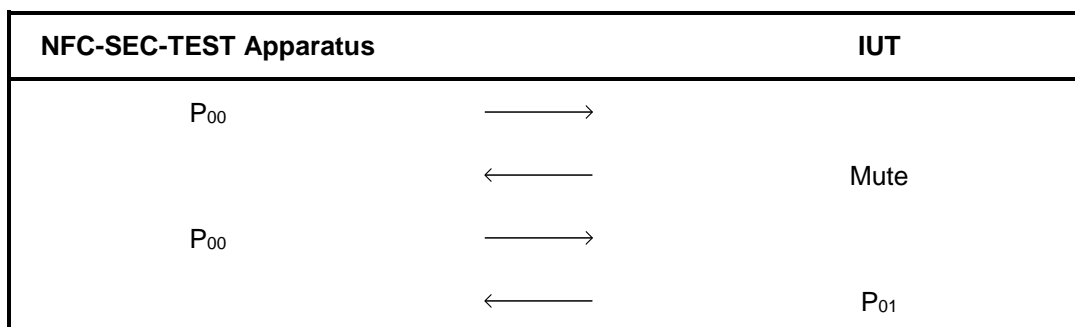
## 8.4 Test scenarios

The IUT shall answer/request as specified in the scenarios, optionally inserting one or more RTO PDUs before responding with the PDU as specified in the scenarios.

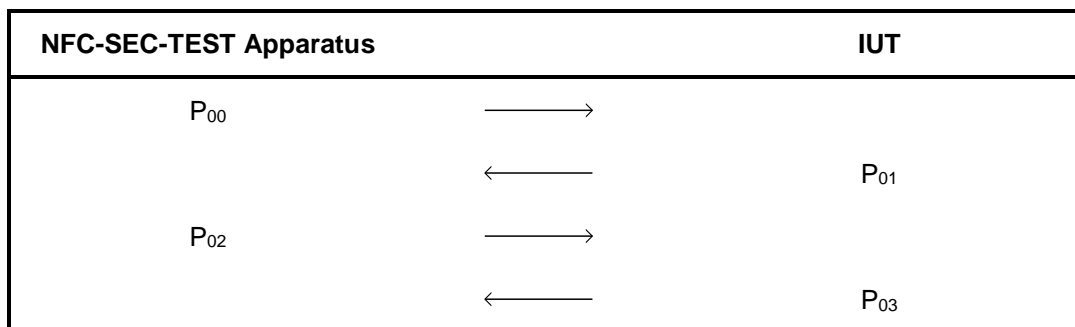
*Scenario R 1 — DEP\_REQ Protected PDU, correct transaction, Recipient test*



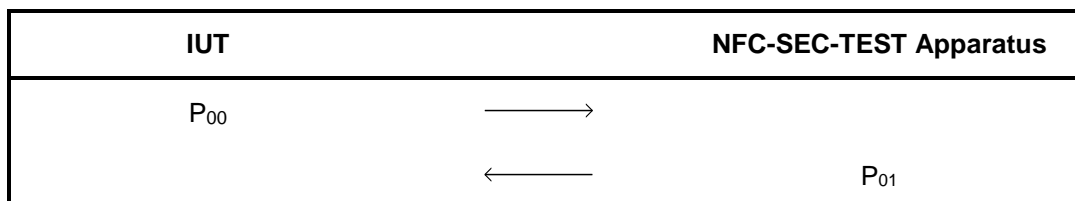
*Scenario R 2 — DEP\_REQ Protected PDU, erroneous transaction, Recipient test*



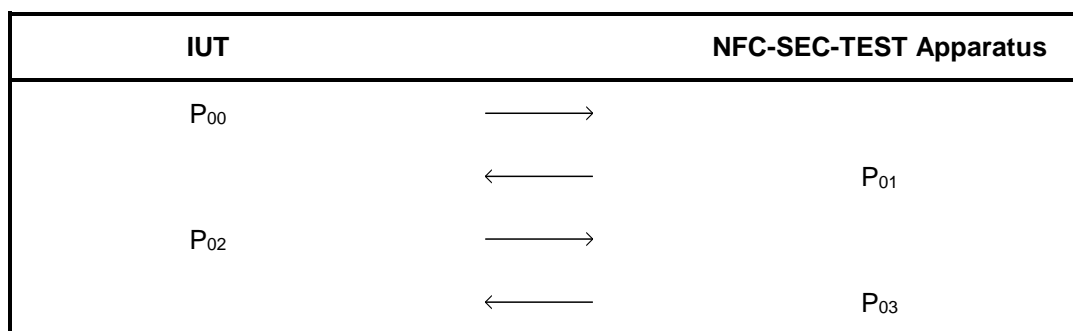
*Scenario R 3 — DEP\_REQ Protected PDU, extended transaction, Recipient test*



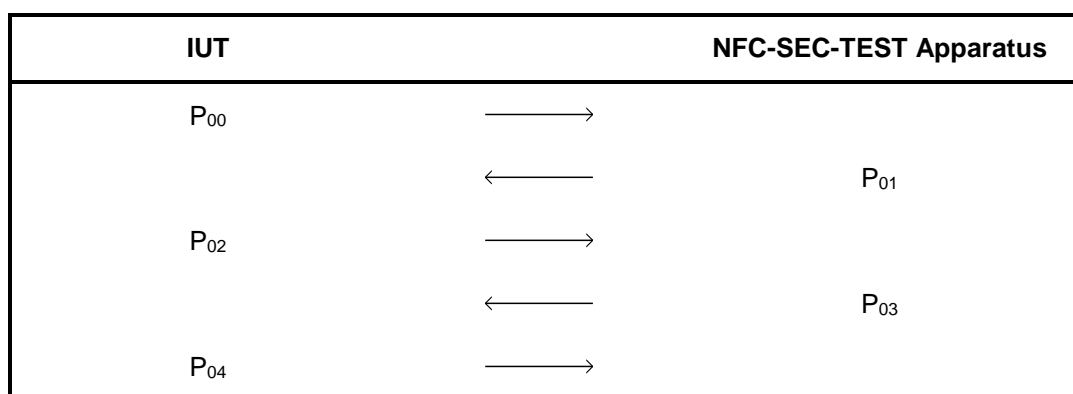
*Scenario R 4 — DEP\_REQ Protected PDU, correct transaction, Sender test*



Scenario R 5 — DEP\_REQ Protected PDU, extended transaction, Sender test



Scenario R 6 — DEP\_REQ Protected PDU, extended transaction, TMN and ENC test



## 9 Test methods for NFC-SEC-01

### 9.1 Recipient test methods

This subclause lists all the required protocol test methods for recipients.

#### 9.1.1 List of protocol test methods

To test Recipients supporting SSE and SCH, the test methods listed in table 1 shall be executed.

Table 1 — NFC-SEC-PDUs

Clause	Test method		Corresponding requirement	
	Name		Base standard	Clause(s)
9.1.2	NFC-SEC PDU format		ECMA-385	11

For all Recipients, the test methods listed in table 2 shall be executed.

Table 2 — Logical operation of the Transport Protocol

Clause	Test method		Corresponding requirement	
	Name		Base standard	Clause(s)
9.1.3.1	Handling of ACT_REQ PDUs		ECMA-386	11.2.2
9.1.3.2	Handling of VFY_REQ PDUs		ECMA-386	11.4.2

### 9.1.2 NFC-SEC-PDU format

The purpose of this test is to determine if the PDU formats of NFC-SEC-PDUs are correct (see ECMA-385 clause 11).

NOTE The PDU format is correct when it contains all mandatory and any of the allowed field values and RFU bits are set to default value.

#### 9.1.2.1 Procedure

Repeat steps a) to d) for the SSE transformation.

- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits  $H_{min}$  and  $H_{max}$  and verify that the field strength does not influence the test results.
- c) Execute scenario R 1, receive the ACT\_REQ PDU in DEP\_REQ and send ACT\_RES PDU in DEP\_RES.
- d) Execute scenario R 2, receive the VFY\_REQ PDU in DEP\_REQ in the first PDU exchange and receive the ACT\_REQ PDU in DEP\_REQ and send ACT\_RES PDU in DEP\_RES in the second PDU exchange.

#### 9.1.2.2 Test report

The test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics:

Characteristic	Expected result for $P_{01}$ in R 1
SEP	Conforming to ECMA-385, 11.1
PID	Conforming to ECMA-385, 11.2
NFC-SEC Payload	Conforming to ECMA-385, 11.3
	<b>Expected result for <math>P_{01}</math> in R 2</b>
SEP	Conforming to ECMA-385, 11.1
PID	Conforming to ECMA-385, 11.2
NFC-SEC Payload	Conforming to ECMA-385, 11.3

### 9.1.3 Logical operation of the Transport Protocol

#### 9.1.3.1 Handling of ACT\_REQ PDUs

The purpose of this test is to determine the correct handling of the ACT\_REQ of the IUT.

##### 9.1.3.1.1 Procedure

Repeat steps a) to d) for the SSE transformation for each bit rate.

- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits  $H_{min}$  and  $H_{max}$  and verify that the field strength does not influence the test results.
- c) Apply the test scenario R 1, receive the ACT\_REQ PDU in DEP\_REQ and send ACT\_RES PDU in DEP\_RES.
- d) Analyse if the ACT\_RES from the IUT is according to scenario R 1.

### 9.1.3.1.2 Report

The test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	11000001
PID	Ignored
NFC-SEC Payload	QB  NB, see ECMA-386, 11.2.2, step 4

### 9.1.3.2 Handling of VFY\_REQ PDUs

The purpose of this test is to determine the correct handling of the VFY\_REQ of the IUT.

#### 9.1.3.2.1 Procedure

Repeat steps a) to d) for the SSE transformation for each bit rate.

- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits Hmin and Hmax and verify that the field strength does not influence the test results.
- c) Apply the test scenario R 3.
  - 1) Receive the ACT\_REQ PDU in DEP\_REQ and send the ACT\_RES PDU in DEP\_RES.
  - 2) Receive the VFY\_REQ PDU in DEP\_REQ and send the VFY\_RES PDU in DEP\_RES.
- d) Analyse if VFY\_RES from the IUT is correct.

#### 9.1.3.2.2 Report

The test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	11000011
PID	Ignored
NFC-SEC Payload	MacTagB, see ECMA-386, 11.4.2, step 4

### 9.1.3.3 ERROR PDUs

The purpose of this test is to determine the correct format and content of ERROR PDUs from the IUT.

#### 9.1.3.3.1 Procedure

Repeat steps a) to d) for the SSE or SCH transformation for each bit rate.

- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits Hmin and Hmax and verify that the field strength does not influence the test results.
- c) Apply the test scenario R 1, and insert a wrong PID into ACT\_REQ.

d) Analyse if ERROR from the IUT is correct.

### 9.1.3.3.2 Report

The test report shall indicate whether the IUT behaves correctly for the following characteristics:

Characteristic	Expected result
SEP	00xx1111
PID	Ignored
NFC-SEC Payload	Zero-terminated octet string

## 9.2 Sender test methods

This subclause lists all the required protocol test methods for senders.

### 9.2.1 List of protocol test methods

To test Senders supporting SSE and SCH, the test methods listed in table 3 shall be executed.

**Table 3 — NFC-SEC-PDUs**

Clause	Test method	Corresponding requirement	
	Name	Base standard	Clause(s)
9.2.2	PDU format	ECMA-385	11

For all Senders, the test methods listed in table 4 shall be executed.

**Table 4 — Logical operation of the Transport Protocol**

Clause	Test method	Corresponding requirement	
	Name	Base standard	Clause(s)
9.2.3.1	ACT_REQ PDUs	ECMA-386	11.2.1
9.2.3.2	VFY_REQ PDUs	ECMA-386	11.4.1
9.2.3.3	ENC PDUs	ECMA-386	12.2.1
9.2.3.4	TMN PDUs	ECMA-385	11.4

### 9.2.2 NFC-SEC-PDU format

The purpose of this test is to determine the PDU formats of NFC-SEC-PDUs are correct (see ECMA-385 clause 11).

NOTE The PDU format is correct when it contains all mandatory and any of the allowed field values and RFU bits are set to default value.

#### 9.2.2.1 Procedure

Repeat steps a) to c) for the SSE transformation.

- Place the IUT into the operating volume.
- Generate an RF-field between the limits Hmin and Hmax and verify that the field strength does not influence the test results.
- Execute scenario R 4, send the ACT\_REQ PDU in DEP\_REQ and Receive ACT\_RES PDU in DEP\_RES.

### 9.2.2.2 Test report

The test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics:

Characteristic	Expected result for P <sub>00</sub> in R4
SEP	Conforming to ECMA-385, 11.1
PID	Conforming to ECMA-385, 11.2
NFC-SEC Payload	Conforming to ECMA-385, 11.3

### 9.2.3 Logical operation of the Transport Protocol

#### 9.2.3.1 ACT\_REQ PDUs

The purpose of this test is to determine the correct format and content of ACT\_REQ PDUs from the IUT.

##### 9.2.3.1.1 Procedure

Repeat steps a) to d) for the SSE transformation for each bit rate.

- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits H<sub>min</sub> and H<sub>max</sub> and verify that the field strength does not influence the test results.
- c) Apply the test scenario R 4, send ACT\_REQ PDU in DEP\_REQ.
- d) Analyse if ACT\_REQ from the IUT is correct.

##### 9.2.3.1.2 Report

The test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	00000000
PID	1
NFC-SEC Payload	QA  NA, see ECMA-386, 11.2.1, step 3

#### 9.2.3.2 VFY\_REQ PDUs

The purpose of this test is to determine the correct format and content of VFY\_REQ PDUs of the IUT.

##### 9.2.3.2.1 Procedure

Repeat steps a) to d) for the SSE transformation for each bit rate.

- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits H<sub>min</sub> and H<sub>max</sub> and verify that the field strength does not influence the test results.



- c) Apply the test scenario R 5.
- 1) Send the ACT\_REQ PDU in DEP\_REQ and receive the response ACT\_RES in DEP\_RES.
  - 2) Send the VFY\_REQ PDU in DEP\_REQ.
- d) Analyse if VFY\_REQ from the IUT is correct.

#### 9.2.3.2.2 Report

The test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics:

Characteristic	Expected result
SEP	00000010
PID	Ignored
NFC-SEC Payload	MacTagA, see ECMA-386, 11.4.1, step 2

#### 9.2.3.3 ENC PDUs

The purpose of this test is to determine the correct format and content of ENC PDUs from the IUT.

##### 9.2.3.3.1 Procedure

Repeat steps a) to d) for the SCH transformation for each bit rate.

- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits Hmin and Hmax and verify that the field strength does not influence the test results.
- c) Apply the test scenario R 6, send ENC PDU in DEP\_REQ of P<sub>04</sub>.
- d) Analyse if ENC from the IUT is correct.

##### 9.2.3.3.2 Report

The test report shall indicate whether the IUT behaves correctly for SCH and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	00010100
PID	Ignored
NFC-SEC Payload	SNV  DataLen  EncData  Mac, see ECMA-386, 12.2.1, step 6.

#### 9.2.3.4 TMN PDUs

The purpose of this test is to determine the correct format and content of TMN PDUs from the IUT.

##### 9.2.3.4.1 Procedure

Repeat steps a) to d) for the SSE of SCH transformation for each bit rate.

- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits Hmin and Hmax and verify that the field strength does not influence the test results.
- c) Apply the test scenario R 6, send TMN PDU in DEP\_REQ in P<sub>04</sub>.
- d) Analyse if the TMN from the IUT is correct.

**9.2.3.4.2 Report**

The test report shall indicate whether the IUT behaves correctly for the following characteristics:

Characteristic	Expected result
SEP	00xx0110
PID	Ignored
NFC-SEC Payload	Ignored

**10 Test methods for NFC-SEC-02**

**10.1 Recipient test methods**

9.1 of this Standard applies.

**10.2 Sender test methods**

9.2 of this Standard applies when the contents of ACT\_REQ PDUs and ENC PDUs are replaced as specified in this subclause.

**10.2.1 ACT\_REQ PDUs**

The purpose of this test is to determine the correct format and content of ACT\_REQ PDUs from the IUT.

**10.2.1.1 Procedure**

Repeat steps a) to d) for the SSE transformation for each bit rate.

- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits Hmin and Hmax and verify that the field strength does not influence the test results.
- c) Apply the test scenario R 4, send ACT\_REQ PDU in DEP\_REQ.
- d) Analyse if ACT\_REQ from the IUT is correct.

**10.2.1.2 Report**

The test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	00000000
PID	2
NFC-SEC Payload	See ECMA-409 clause 11

## 10.2.2 ENC PDUs

The purpose of this test is to determine the correct format and content of ENC PDUs from the IUT.

### 10.2.2.1 Procedure

Repeat steps a) to d) for the SCH transformation for each bit rate.

- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits Hmin and Hmax and verify that the field strength does not influence the test results.
- c) Apply the test scenario R 6, send ENC PDU in DEP\_REQ of P<sub>04</sub>.
- d) Analyse if ENC from the IUT is correct.

### 10.2.2.2 Report

The test report shall indicate whether the IUT behaves correctly for SCH and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	00010100
PID	Ignored
NFC-SEC Payload	S3    S2    S1    AuthEncData, see ECMA-409, 12.2.1, step 7.

## 11 Test methods for NFC-SEC-03

### 11.1 Recipient test methods

This subclause lists all the required protocol test methods for recipients.

#### 11.1.1 List of protocol test methods

To test Recipients supporting SSE and SCH, the test methods listed in table 5 shall be executed.

**Table 5 — NFC-SEC-PDUs**

Clause	Test method		Corresponding requirement	
	Name	Base standard	Clause(s)	
11.1.2	NFC-SEC PDU format	ECMA-385	11	

For all Recipients, the test methods listed in table 6 shall be executed.

**Table 6 — Logical operation of the Transport Protocol**

Clause	Test method Name	Corresponding requirement	
		Base standard	Clause(s)
11.1.3.1	Handling of ACT_REQ PDUs	ECMA-410	10.1.4 10.2.4
11.1.3.2	Handling of VFY_REQ PDUs	ECMA-410	10.1.4 10.2.4
11.1.3.3	ERROR PDUs	ECMA-385	11.5

### 11.1.2 NFC-SEC-PDU format

9.1.2 of this Standard applies.

### 11.1.3 Logical operation of the Transport Protocol

#### 11.1.3.1 Handling of ACT\_REQ PDUs

The purpose of this test is to determine the correct handling of the ACT\_REQ of the IUT.

##### 11.1.3.1.1 Procedure

Repeat steps a) to d) for the SSE transformation with and without involving TTP and for each bit rate.

- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits Hmin and Hmax and verify that the field strength does not influence the test results.
- c) Apply the test scenario R 1, receive the ACT\_REQ PDU in DEP\_REQ and send ACT\_RES PDU in DEP\_RES.
- d) Analyse if the ACT\_RES from the IUT is correct.

##### 11.1.3.1.2 Report

For NEAU-A mechanism involving a TTP, the test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	11000001
PID	Ignored
NFC-SEC Payload	TTP  NB  NA'   CertB  QB  SigB, see ECMA-410, 10.1.4, step 6

For NEAU-A mechanism without involving a TTP, the test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	11000001
PID	Ignored
NFC-SEC Payload	TTP  NB  NA'   CertB  QB  SigB, see ECMA-410, 10.2.4, step 7

### 11.1.3.2 Handling of VFY\_REQ PDUs

The purpose of this test is to determine the correct handling of the VFY\_REQ of the IUT.

#### 11.1.3.2.1 Procedure

Repeat steps a) to d) for the SSE transformation for each bit rate.

- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits Hmin and Hmax and verify that the field strength does not influence the test results.
- c) Apply the test scenario R 3.
  - 1) Receive the ACT\_REQ PDU in DEP\_REQ and send the ACT\_RES PDU in DEP\_RES.
  - 2) Receive the VFY\_REQ PDU in DEP\_REQ and send the VFY\_RES PDU in DEP\_RES.

NOTE When involving a TTP, the validity of the certificates of Sender A and Recipient B should be checked, (refer to 10.1 of ECMA-410) by the TTP following c).1) and before c).2).

- d) Analyse if VFY\_RES from the IUT is correct.

#### 11.1.3.2.2 Report

For NEAU-A mechanism involving a TTP, the test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	11000011
PID	Ignored
NFC-SEC Payload	MacTag <sub>B</sub> , see ECMA-410, 10.1.4, step 15

For NEAU-A mechanism without involving a TTP, the test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	11000011
PID	Ignored
NFC-SEC Payload	MacTag <sub>B</sub> , see ECMA-410, 10.2.4, step 16

### 11.1.3.3 ERROR PDUs

9.1.3.3 of this Standard applies.

## 11.2 Sender test methods

This subclause lists all required protocol test methods for senders.

### 11.2.1 List of protocol test methods

To test Senders supporting SSE and SCH the test methods listed in table 7 shall be executed.

**Table 7 — NFC-SEC-PDUs**

Clause	Test method	Corresponding requirement	
	Name	Base standard	Clause(s)
11.2.2	PDU format	ECMA-385	11

For all Senders, the test methods listed in table 8 shall be executed.

**Table 8 — Logical operation of the Transport Protocol**

Clause	Test method	Corresponding requirement	
	Name	Base standard	Clause(s)
11.2.3.1	ACT_REQ PDUs	ECMA-410	10.1.3 10.2.3
11.2.3.2	VFY_REQ PDUs	ECMA-410	10.1.3 10.2.3
11.2.3.3	ENC PDUs	ECMA-409	12.2.1
11.2.3.4	TMN PDUs	ECMA-385	11.4
11.2.4.1	TAEP_REQ PDU	ECMA-410	10.1.5

### 11.2.2 NFC-SEC-PDU format

9.2.2 of this Standard applies.

### 11.2.3 Logical operation of the Transport Protocol

#### 11.2.3.1 ACT\_REQ PDUs

The purpose of this test is to determine the correct format and content of ACT\_REQ PDUs from the IUT.

##### 11.2.3.1.1 Procedure

Repeat steps a) to d) for the SSE transformation for each bit rate.

- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits Hmin and Hmax and verify that the field strength does not influence the test results.
- c) Apply the test scenario R 4, send ACT\_REQ PDU in DEP\_REQ.
- d) Analyse if ACT\_REQ from the IUT is correct.

##### 11.2.3.1.2 Report

For NEAU-A mechanism involving a TTP, the test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	00000000
PID	3
NFC-SEC Payload	TTP  NA  Cert <sub>A</sub> , see ECMA-410, 10.1.3, step 3

For NEAU-A mechanism without involving a TTP, the test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	00000000
PID	3
NFC-SEC Payload	TTP  NA  Cert <sub>A</sub> , see ECMA-410, 10.2.3, step 3

### 11.2.3.2 VFY\_REQ PDUs

The purpose of this test is to determine the correct format and content of VFY\_REQ PDUs of the IUT.

#### 11.2.3.2.1 Procedure

Repeat steps a) to d) for the SSE transformation for each bit rate.

- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits Hmin and Hmax and verify that the field strength does not influence the test results.
- c) Apply the test scenario R 5.
  - 1) Send the ACT\_REQ PDU in DEP\_REQ and receive ACT\_RES in DEP\_RES.
  - 2) Send the VFY\_REQ PDU in DEP\_REQ.
- d) Analyse if VFY\_REQ from the IUT is correct.

#### 11.2.3.2.2 Report

For NEAU-A mechanism involving a TTP, the test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	00000010
PID	Ignored
NFC-SEC Payload	NA  NB'  QA  Res <sub>A</sub> '  Res <sub>B</sub> '  Sig <sub>TTP</sub> '  Sig <sub>A</sub>   MacTag <sub>A</sub> , see ECMA-410, 10.1.3, step 17

For NEAU-A mechanism without involving a TTP, the test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	00000010
PID	Ignored
NFC-SEC Payload	NA  NB'  QA  Sig <sub>A</sub>   MacTag <sub>A</sub> , see ECMA-410, 10.2.3, step 14

### 11.2.3.3 ENC PDUs

10.2.2 of this Standard applies.

#### 11.2.3.4 TMN PDUs

9.2.3.4 of this Standard applies.

### 11.2.4 Logical operation of the TTP Transport Protocol

#### 11.2.4.1 TAEP\_REQ PDUs

The purpose of this test is to determine the correct format and content of TAEP\_REQ PDUs from the IUT.

##### 11.2.4.1.1 Procedure

Perform steps a) to c) for the TTP transformation.

- a) Place the IUT into the operating volume.
- b) Send TAEP\_REQ PDU.
- c) Analyse if TAEP\_REQ from the IUT is correct.

##### 11.2.4.1.2 Report

The test report shall indicate whether the IUT behaves correctly for the following characteristics:

Characteristic	Expected result
TAEP Payload	NA'    NB'    CertA'    CertB', see ECMA-410, 10.1.5, step 1

## 12 Test methods for NFC-SEC-04

### 12.1 Recipient test methods

This subclause lists all the required protocol test methods for recipients.

#### 12.1.1 List of protocol test methods

To test Recipients supporting SSE and SCH, the test methods listed in table 5 shall be executed.

For all Recipients, the test methods listed in table 9 shall be executed.

**Table 9 — Logical operation of the Transport Protocol**

Clause	Test method Name	Corresponding requirement	
		Base standard	Clause(s)
12.1.2.1	Handling of ACT_REQ PDUs	ECMA-411	10.4
12.1.2.2	Handling of VFY_REQ PDUs	ECMA-411	10.4
11.1.3.3	ERROR PDUs	ECMA-385	11.5

#### 12.1.2 Logical operation of the Transport Protocol

##### 12.1.2.1 Handling of ACT\_REQ PDUs

The purpose of this test is to determine the correct handling of the ACT\_REQ of the IUT.

##### 12.1.2.1.1 Procedure

Repeat steps a) to d) for the SSE transformation for each bit rate.



- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits Hmin and Hmax and verify that the field strength does not influence the test results.
- c) Apply the test scenario R 1, receive the ACT\_REQ PDU in DEP\_REQ and send ACT\_RES PDU in DEP\_RES.
- d) Analyse if the ACT\_RES from the IUT is correct.

#### 12.1.2.1.2 Report

The test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	11000001
PID	Ignored
NFC-SEC Payload	NB  NA'  EncData <sub>R</sub>   MAC <sub>R</sub> , see ECMA-411, 10.4, step 5

#### 12.1.2.2 Handling of VFY\_REQ PDUs

The purpose of this test is to determine the correct handling of the VFY\_REQ of the IUT.

##### 12.1.2.2.1 Procedure

Repeat steps a) to d) for the SSE transformation for each bit rate.

- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits Hmin and Hmax and verify that the field strength does not influence the test results.
- c) Apply the test scenario R 3.
  - 1) Receive the ACT\_REQ PDU in DEP\_REQ and send the ACT\_RES PDU in DEP\_RES.
  - 2) Receive the VFY\_REQ PDU in DEP\_REQ and send the VFY\_RES PDU in DEP\_RES.
- d) Analyse if the VFY\_RES from the IUT is correct.

##### 12.1.2.2.2 Report

The test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	11000011
PID	Ignored
NFC-SEC Payload	MacTag <sub>B</sub> , see ECMA-411, 10.4, step 10

## 12.2 Sender test methods

This subclause lists all required protocol test methods for senders.

### 12.2.1 List of protocol test methods

To test Senders supporting SSE and SCH, the test methods listed in table 7 shall be executed.

For all Senders, the test methods listed in table 10 shall be executed.

**Table 10 — Logical operation of the Transport Protocol**

Clause	Test method Name	Corresponding requirement	
		Base standard	Clause(s)
12.2.2.1	ACT_REQ PDUs	ECMA-411	10.3
12.2.2.2	VFY_REQ PDUs	ECMA-411	10.3
11.2.3.3	ENC PDUs	ECMA-409	12.2.1
11.2.3.4	TMN PDUs	ECMA-385	11.4

### 12.2.2 Logical operation of the Transport Protocol

#### 12.2.2.1 ACT\_REQ PDUs

The purpose of this test is to determine the correct format and content of ACT\_REQ PDUs from the IUT.

##### 12.2.2.1.1 Procedure

Repeat steps a) to d) for the SSE transformation for each bit rate.

- a) Place the IUT into the operating volume.
- b) Generate an RF-field between the limits Hmin and Hmax and verify that the field strength does not influence the test results.
- c) Apply the test scenario R 4, send ACT\_REQ PDU in DEP\_REQ.
- d) Analyse if ACT\_REQ from the IUT is correct.

##### 12.2.2.1.2 Report

The test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	00000000
PID	4
NFC-SEC Payload	NA, see ECMA-411, 10.3, step 2

#### 12.2.2.2 VFY\_REQ PDUs

The purpose of this test is to determine the correct format and content of VFY\_REQ PDUs of the IUT.

##### 12.2.2.2.1 Procedure

Repeat steps a) to d) for the SSE transformation for each bit rate.

- a) Place the IUT into the operating volume.

- b) Generate an RF-field between the limits Hmin and Hmax and verify that the field strength does not influence the test results.
- c) Apply the test scenario R 5.
  - 1) Send the ACT\_REQ PDU in DEP\_REQ and receive ACT\_RES in DEP\_RES.
  - 2) Send the VFY\_REQ PDU in DEP\_REQ.
- d) Analyse if VFY\_REQ from the IUT is correct.

#### 12.2.2.2.2 Report

The test report shall indicate whether the IUT behaves correctly for SSE and shall include results for the following characteristics for each bit rate:

Characteristic	Expected result
SEP	00000010
PID	Ignored
NFC-SEC Payload	NA  NB'  EncDatas  MACs  MacTag <sub>A</sub> , see ECMA-411, 10.3, step 8



## Annex A (informative)

### Test report template for Recipient tests

#### A.1 Test report template for Recipient tests of NFC-SEC-01

Supplier:

Product:

**Table A.1 — Test report template for Recipient tests of NFC-SEC-01**

9.1 Recipient test methods						
No	Test name	Expected result	Reference chapter in ECMA Standards	Scenario number	Condition	Test results PASS/FAIL
1	<a href="#">9.1.2 NFC-SEC-PDU format</a>	The test passes if IUT behaves as described in the scenario.	ECMA-385 Clause 11	R 1, R 2	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
2	<a href="#">9.1.3.1 Handling of ACT_REQ PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-386 11.2.2	R 1	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
3	<a href="#">9.1.3.2 Handling of VFY_REQ PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-386 11.4.2	R 3	P106	
					P212	
					P424	
					A106	
					A212	

					A424	
4	<a href="#">9.1.3.3 Handling of ERROR PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-385 11.5	R 1	P106	
					P212	
					P424	
					A106	
					A212	
					A424	

## A.2 Test report template for Recipient tests of NFC-SEC-02

Clause A.1 of this Standard applies.

## A.3 Test report template for Recipient tests of NFC-SEC-03

Supplier:

Product:

**Table A.2 — Test report template for Recipient tests of NFC-SEC-03**

11.1 Recipient test methods						
No	Test name	Expected result	Reference chapter in ECMA Standards	Scenario number	Condition	Test results PASS/FAIL
1	<a href="#">11.1.2 NFC-SEC-PDU format</a>	The test passes if IUT behaves as described in the scenario.	ECMA-385 Clause 11	R 1, R 2	P106	
					P212	
					P424	
					A106	
					A212	
					A424	

2	<a href="#">11.1.3.1 Handling of ACT_REQ PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-410 10.1.4, 10.2.4	R 1	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
3	<a href="#">11.1.3.2 Handling of VFY_REQ PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-410 10.1.4, 10.2.4	R 3	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
4	<a href="#">11.1.3.3 Handling of ERROR PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-385 11.5	R 1	P106	
					P212	
					P424	
					A106	
					A212	
					A424	

#### A.4 Test report template for Recipient tests of NFC-SEC-04

Supplier:

Product:

Table A.3 — Test report template for Recipient tests of NFC-SEC-04

12.1 Recipient test methods						
No	Test name	Expected result	Reference chapter in ECMA Standards	Scenario number	Condition	Test results PASS/FAIL
1	<a href="#">11.1.2 NFC-SEC-PDU format</a>	The test passes if IUT behaves as described in the scenario.	ECMA-385 Clause 11	R 1, R 2	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
2	<a href="#">12.1.2.1 Handling of ACT_REQ PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-411 10.4	R 1	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
3	<a href="#">12.1.2.2 Handling of VFY_REQ PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-411 10.4	R 3	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
4	<a href="#">11.1.3.3 Handling of ERROR PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-385 11.5	R 1	P106	
					P212	
					P424	
					A106	
					A212	
					A424	



## Annex B (informative)

### Test report template for Sender tests

#### B.1 Test report template for Sender tests of NFC-SEC-01

Supplier:

Product:

**Table B.1 — Test report template for Sender tests of NFC-SEC-01**

<b>9.2 Sender test methods</b>						
No	Test name	Expected result	Reference chapter in ECMA Standards	Scenario number	Condition	Test results PASS/FAIL
1	<a href="#">9.2.2 PDU format</a>	The test passes if IUT behaves as described in the scenario.	ECMA-385 Clause 11	R 4	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
2	<a href="#">9.2.3.1 ACT_REQ PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-386 11.2.1	R 4	P106	
					P212	
					P424	
					A106	
					A212	
					A424	

3	<a href="#">9.2.3.2 VFY_REQ PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-386 11.4.1	R 5	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
4	<a href="#">9.2.3.3 ENC PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-386 12.2.1	R 6	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
5	<a href="#">9.2.3.4 TMN PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-385 11.4	R 6	P106	
					P212	
					P424	
					A106	
					A212	
					A424	

## B.2 Test report template for Sender tests of NFC-SEC-02

Supplier:

Product:

Table B.2 — Test report template for Sender tests of NFC-SEC-02

10.2 Sender test methods						
No	Test name	Expected result	Reference chapter in ECMA Standards	Scenario number	Condition	Test results PASS/FAIL
1	<a href="#">9.2.2 PDU format</a>	The test passes if IUT behaves as described in the scenario.	ECMA-385 Clause 11	R 4	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
2	<a href="#">10.2.1 ACT_REQ PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-409 Clause 11	R 4	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
3	<a href="#">9.2.3.2 VFY_REQ PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-386 11.4.1	R 5	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
4	<a href="#">10.2.2 ENC PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-409 12.2.1	R 6	P106	
					P212	
					P424	
					A106	
					A212	
					A424	

5	<a href="#">9.2.3.4 TMN PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-385 11.4	R 6	P106	
					P212	
					P424	
					A106	
					A212	
					A424	

### B.3 Test report template for Sender tests of NFC-SEC-03

Supplier:

Product:

**Table B.3 — Test report template for Sender tests of NFC-SEC-03**

11.2. Sender test methods						
No	Test name	Expected result	Reference chapter in ECMA Standards	Scenario number	Condition	Test results PASS/FAIL
1	<a href="#">11.2.2 PDU format</a>	The test passes if IUT behaves as described in the scenario.	ECMA-385 Clause 11	R 1	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
2	<a href="#">11.2.3.1 ACT_REQ PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-410 10.1.3, 10.2.3	R 4	P106	
					P212	
					P424	
					A106	
					A212	
					A424	

3	<a href="#">11.2.3.2 VFY_REQ PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-410 10.1.3, 10.2.3	R 5	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
4	<a href="#">11.2.3.3 ENC PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-409 12.2.1	R 6	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
5	<a href="#">11.2.3.4 TMN PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-385 11.4	R 6	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
6	<a href="#">11.2.4.1 TAEP_REQ PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-410 10.1.5	/	P424	
					A106	
					A212	
					A424	
					P106	
					P212	

#### B.4 Test report template for Sender tests of NFC-SEC-04

Supplier:

Product:

Table B.4 — Test report template for Sender tests of NFC-SEC-04

12.2. Sender test methods						
No	Test name	Expected result	Reference chapter in ECMA Standards	Scenario number	Condition	Test results PASS/FAIL
1	<a href="#">11.2.2 PDU format</a>	The test passes if IUT behaves as described in the scenario.	ECMA-385 Clause 11	R 1	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
2	<a href="#">12.2.2.1 ACT_REQ PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-411 10. 3	R 4	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
3	<a href="#">12.2.2.2 VFY_REQ PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-411 10.3	R 5	P106	
					P212	
					P424	
					A106	
					A212	
					A424	
4	<a href="#">11.2.3.3 ENC PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-409 12.2.1	R 6	P106	
					P212	
					P424	
					A106	
					A212	
					A424	

5	<a href="#">11.2.3.4 TMN PDUs</a>	The test passes if IUT behaves as described in the scenario.	ECMA-385 11.4	R 6	P106	
					P212	
					P424	
					A106	
					A212	
					A424	

