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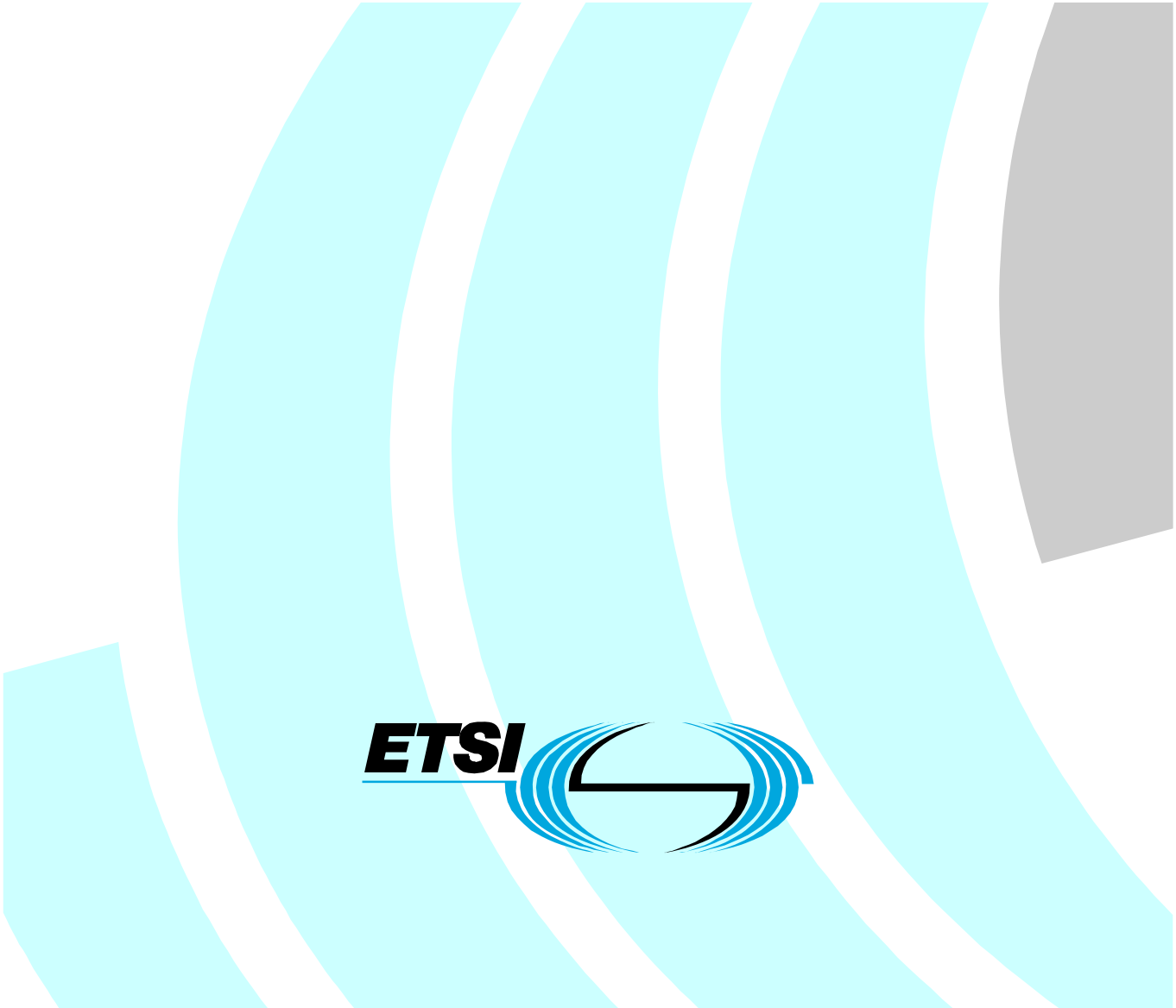
Technical Specification

Smart Cards;
Test specification for the Host Controller Interface (HCI);
Part 2: UICC features
(Release 7)



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Contents

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Foreword

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The present document is part 2 of a multi-part deliverable covering the Test specification for the Host Controller Interface (HCI), as identified below:

Part 1: "Terminal features (Release 7)";

Part 2: "UICC features (Release 7)";

Part 3: "Host Controller features (Release 7)".

Introduction

The present document defines test cases for the UICC relating to the Host Controller Interface (HCI) as specified in TS 102 622 [1].

The aim of the present document is to ensure interoperability between the terminal and the UICC independently of the respective manufacturer, card issuer or operator.

1 Scope

The present document covers the minimum characteristics which are considered necessary for the UICC in order to provide compliance to TS 102 622 [1].

The present document specifies the test cases for:

- the HCI core as described in the first part of TS 102 622 [1];
- the contactless platform as described in the second part of TS 102 622 [1].

Test cases for the terminal relating to TS 102 622 [1] and test cases for the Single Wire Protocol (SWP) covering both terminal and UICC are out of scope of the present document.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

- In the case of a reference to a TC SCP document, a non specific reference implicitly refers to the latest version of that document in the same Release as the present document.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

[1] ETSI TS 102 622: "Smart Cards; UICC - Contactless Front-end (CLF) interface; Host Controller Interface (HCI)".

[2] ETSI TS 102 613: "Smart Cards; UICC - Contactless Front-end (CLF) Interface; Part 1: Physical and data link layer characteristics".

[3] ISO/IEC 18092: "Information technology - Telecommunications and information exchange between systems - Near Field Communication - Interface and Protocol (NFCIP-1)".

[4] ISO/IEC 14443-3: "Identification cards - Contactless integrated circuit(s) cards - Proximity cards - Part 3: Initialization and anticollision".

[5] ISO/IEC 14443-4: "Identification cards - Contactless integrated circuit cards - Proximity cards - Part 4: Transmission Protocol".

[6] ISO/IEC 9646-7: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance Statements".

[7] ETSI TS 102 221: "Smart Cards; UICC-Terminal interface; Physical and logical characteristics.

[8] ETSI TS 102 600: "Smart Cards; UICC-Terminal interface; Characteristics of the USB interface".

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

Not applicable.

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TS 102 622 [1] and the following apply:

allowed error response code: response code which is not ANY_OK and which is allowed for the referenced command as specified in TS 102 622 [1]

non-occurrence RQ: RQ which has been extracted from TS 102 622 [1], but which indicates a situation which should never occur

NOTE: The consequence is that such RQs cannot be explicitly tested.

user: any logical or physical entity which controls the test equipment in a way that it is able to trigger activities of the DUT

3.2 Symbols

For the purposes of the present document, the symbols given in TS 102 622 [1] and the following apply:

$PIPE_0$	the static pipe connected to the link management gate of the device under test.
$PIPE_1$	the static pipe connected to the administration gate of the device under test.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in TS 102 622 [1] and the following apply:

ATQA	Answer To reQuest of type A
ATQB	Answer To reQuest of type B
CLT	ContactLess Tunnelling
DUT	Device Under Test
FFS	For Further Study
FWI	Frame Waiting time Integer
HCI	Host Controller Interface
HCS	Host Controller Simulator
HUT	Host Under Test
ICRx	Initial Condition Requirement (where x is a number)

NOTE: As used in the applicability table; see clauses 4.2 and 4.5.2.

PICC	Proximity Integrated Circuit Card
PUPI	Pseudo-Unique PICC Identifier
RFU	Reserved for Future Use
RO	Read-Only
RQ	conformance Requirement
RW	Read-Write
SAK	Select AcKnowledge
SFGT	Start-up Frame Guard Time
SRx	Static Requirement (where x is a number)

NOTE: As used in the applicability table; see clauses 4.2 and 4.5.2.

TRx Trigger Requirement (where x is a number)

NOTE: As used in the applicability table; see clauses 4.2 and 4.5.2.

WO Write-Only

3.4 Formats

3.4.1 Format of the table of optional features

The columns in table 4.1 have the following meaning.

Column	Meaning
Option	The optional feature supported or not by the DUT.
Status	See clause 3.4.3.
Support	The support columns shall be filled in by the supplier of the implementation. The following common notations, defined in ISO/IEC 9646-7 [6], are used for the support column in table 4.1. Y or y supported by the implementation. N or n not supported by the implementation. N/A, n/a or - no answer required (allowed only if the status is N/A, directly or after evaluation of a conditional status).
Mnemonic	The mnemonic column contains mnemonic identifiers for each item.

3.4.2 Format of the applicability table

The applicability of every test in table 4.2 is formally expressed by the use of Boolean expression defined in the following clause.

The columns in table 4.2 have the following meaning.

Column	Meaning
Clause	The "Clause" column identifies the clause containing the test case referenced in the "Test case number and description" column.
Test case number and description	The "Test case number and description" column gives a reference to the test case number (along with the corresponding description) detailed in the present document and required to validate the DUT.
Release	The "Release" column gives the Release applicable and onwards, for the corresponding test case.
Execution requirements	The usage of the "Execution requirements" column is described in clause 4.5.2.
Rel-x UICC	For a given Release, the corresponding "Rel-x UICC" column lists the tests required for a DUT to be declared compliant to this Release.
Support	The "Support" column is blank in the proforma, and shall be completed by the manufacturer in respect of each particular requirement to indicate the choices, which have been made in the implementation.

3.4.3 Status and Notations

The "Rel-x" columns show the status of the entries as follows:

The following notations, defined in ISO/IEC 9646-7 [6], are used for the status column:

M	mandatory - the capability is required to be supported.
O	optional - the capability may be supported or not.
N/A	not applicable - in the given context, it is impossible to use the capability.
X	prohibited (excluded) - there is a requirement not to use this capability in the given context.
O.i	qualified optional - for mutually exclusive or selectable options from a set. "i" is an integer which identifies an unique group of related optional items and the logic of their selection which is defined immediately following the table.
Ci	conditional - the requirement on the capability ("M", "O", "X" or "N/A") depends on the support of other optional or conditional items. "i" is an integer identifying an unique conditional status expression which is defined immediately following the table. For nested conditional expressions, the syntax "IF ... THEN (IF ... THEN ... ELSE...) ELSE ..." shall be used to avoid ambiguities.

References to items

For each possible item answer (answer in the support column) there exists a unique reference, used, for example, in the conditional expressions. It is defined as the table identifier, followed by a solidus character "/", followed by the item number in the table. If there is more than one support column in a table, the columns shall be discriminated by letters (a, b, etc.), respectively.

EXAMPLE: 4.1/4 is the reference to the answer of item 4 in table 4.1.

4 Test environment

4.1 Table of optional features

The device supplier shall state the support of possible options in table 4.1. See clause 3.4 for the format of table 4.1.

Table 4.1: Options

Item	Option	Status	Support	Mnemonic
1	Link management gate supported	O		O_LINK_MAN
2	WHITELIST contains the H_{ID} of at least one further host	O		O_WHITELIST_NON_EMPTY
3	Data link layer specified in TS 102 613 [2] is being used	O		O_102_613

4.2 Applicability table

Table 4.2 specifies the applicability of each test case to the device under test. See clause 3.4 for the format of table 4.2.

Clause 4.5.2 should be referenced for usage of the execution requirements which are referenced in table 4.2 a) and described in table 4.2 c).

Table 4.2 a): Applicability of tests

Clause	Test case number and description	Release	Execution requirements	Rel-7 UICC	Support
5.1.2.2	Test case 1: processing of RFU host identifier	Rel-7		M	
5.1.3.2	Test case 1: existence of gates	Rel-7		M	
5.1.3.3	Test case 2: processing of RFU gate identifier	Rel-7		M	

Clause	Test case number and description	Release	Execution requirements	Rel-7 UICC	Support
5.1.4.2	Test case 1: static pipe deletion - administration gate	Rel-7		M	
5.1.4.3	Test case 2: static pipe deletion - link management gate	Rel-7		C101	
5.1.4.4	Test case 3: persistence of pipe state	Rel-7		M	
5.1.4.5	Test case 4: initial pipe state	Rel-7		M	
5.1.5.2	Test case 1: registry creation	Rel-7	SR1	M	
5.1.5.3	Test case 2: registry deletion	Rel-7	SR2	M	
5.2.2.2	Test case 1: commands/events on pipe which is not open	Rel-7		M	
5.3.1.2.1.2	Test case 1: ANY_SET_PARAMETER reception - invalid structure	Rel-7	SR3	M	
5.3.1.2.1.3	Test case 2: ANY_SET_PARAMETER reception - RO registry parameter	Rel-7		M	
5.3.1.2.2.2	Test case 1: ANY_GET_PARAMETER reception - invalid structure	Rel-7		M	
5.3.1.2.2.3	Test case 2: ANY_GET_PARAMETER reception - WO registry parameter	Rel-7	SR4	M	
5.3.1.2.3.2	Test case 1: ANY_OPEN_PIPE reception	Rel-7		M	
5.3.1.2.3.3	Test case 2: ANY_OPEN_PIPE transmission	Rel-7	TR1	M	
5.3.1.2.4.2	Test case 1: ANY_CLOSE_PIPE reception	Rel-7		M	
5.3.1.2.4.3	Test case 2: ANY_CLOSE_PIPE transmission	Rel-7	TR2	M	
5.3.2.2	Test case 1: response to unknown command	Rel-7		M	
5.3.2.3	Test case 2: responses received out of order, previous command sent by host controller	Rel-7		M	
5.3.2.4	Test case 3: responses received out of order, previous command sent by host	Rel-7	TR1	M	
5.3.3.2	Test case 1: reception of unknown events	Rel-7		M	
5.4.1.2	Test case 1: command and event support for link management gate	Rel-7		C101	
5.4.1.3	Test case 2: command and event support for host administration gate	Rel-7		M	
5.4.2.1.1.2	Test case 1: SESSION_IDENTITY	Rel-7		M	
5.4.2.1.1.3	Test case 2: WHITELIST	Rel-7	TR3	M	
5.4.2.2.1.2	Test case 1: REC_ERROR	Rel-7	TR4	C101	
5.4.2.2.2.2	Test case 1: REC_ERROR	Rel-7	ICR1	C101	
5.4.2.3.1.2	Test case 1: registry parameters	Rel-7		M	
5.5.1.1.2	Test case 1: ADM_CREATE_PIPE	Rel-7	TR5	M	
5.5.1.1.3	Test case 2: ADM_NOTIFY_PIPE_CREATED from host controller	Rel-7		M	
5.5.1.1.4	Test case 3: ADM_NOTIFY_PIPE_CREATED from other host	Rel-7		C102	
5.5.1.1.5	Test case 4: ADM_NOTIFY_PIPE_CREATED with incorrect destination H_{ID}	Rel-7		M	
5.5.1.1.6	Test case 5: unsuccessful ADM_NOTIFY_PIPE_CREATED	Rel-7	SR5	M	
5.5.1.2.2	Test case 1: sending ADM_DELETE_PIPE	Rel-7	TR6	M	
5.5.1.2.3	Test case 2: receiving ADM_NOTIFY_PIPE_DELETED	Rel-7		M	
5.5.1.3.2	Test case 1: ADM_CLEAR_ALL_PIPE for data link layer specified in TS 102 613 [2]	Rel-7		C103	
5.5.1.3.3	Test case 2: ADM_CLEAR_ALL_PIPE - static pipes, dynamic pipes to host controller	Rel-7		C103	
5.5.1.3.4	Test case 3: ADM_CLEAR_ALL_PIPE - dynamic pipes to other host	Rel-7		C102	
5.5.1.3.5	Test case 4: ADM_CLEAR_ALL_PIPE - registry parameters	Rel-7	ICR1	C101	
5.5.4.2	Test case 1: SESSION_IDENTITY not changed	Rel-7		C103	
5.5.4.3	Test case 2: SESSION_IDENTITY changed	Rel-7		C103	
5.5.5.2	Test case 1: pipe creation from host controller	Rel-7		M	
5.5.5.3	Test case 2: pipe creation from another host	Rel-7		C102	
5.5.5.4	Test case 3: processing of EVT_POST_DATA	Rel-7		M	

Table 4.2 b): Conditional items referenced by table 4.2 a)

Conditional item	Condition	Description
C101	IF 4.1/1 THEN M ELSE N/A	O_LINK_MAN
C102	IF 4.1/2 THEN M ELSE N/A	O_WHITELIST_NON_EMPTY
C103	IF 4.1/3 THEN M ELSE N/A	O_102_613

Table 4.2 c): Execution requirements referenced by table 4.2 a)

Execution requirement	Description
SR1	A gate which accepts multiple dynamic pipes and has a RW registry parameter; the default value of the registry parameter must be known.
SR2	A gate which has a RW registry parameter; the default value of the registry parameter must be known.
SR3	A gate which contains at least one writeable (i.e. RW or WO) registry parameter.
SR4	A gate which contains at least one WO registry parameter.
SR5	A G_{ID} exists which is reserved for proprietary use or is host specific according to table 2 of TS 102 622 [1], and which is not contained in the GATES_LIST of the host.
TR1	Trigger the host to open PIPE_ID_MAN.
TR2	Trigger the host to close PIPE_ID_MAN.
TR3	Trigger the host to write its value of WHITELIST into the registry of the host controller's administration gate.
TR4	Trigger the host to write a value of REC_ERROR into the registry of the host controller's link management gate in order to restart an error rate measure.
TR5	Trigger the host to create a pipe.
TR6	Trigger the host to send ADM_DELETE_PIPE on $PIPE_1$ to delete PIPE_LOOP_BACK.
ICR1	The last value of REC_ERROR in the host's registry for $PIPE_0$ is not '0000'.

NOTE: Clause 4.5.2 should be referenced for the meaning and usage of the execution requirements which are described in table 4.2 c).

4.3 Information to be provided by the device supplier

The device supplier shall provide the information indicated in table 4.3.

Table 4.3: Default configuration

Item	Description	Presence/Value	Status	Mnemonic
1	Indication of presence of VERSION_SW, and value if supported.		M	V_VERSION_SW
2	Indication of presence of VERSION_HARD, and value if supported.		M	V_VERSION_HARD
3	Indication of presence of VENDOR_NAME, and value if supported.		M	V_VENDOR_NAME
4	Indication of presence of MODEL_ID, and value if supported.		M	V_MODEL_ID
5	Indication of presence of HCI_VERSION, and value if supported.		M	V_HCI_VERSION
6	Value of GATES_LIST.		M	V_GATES_LIST
NOTE: Conditional values shall be provided if the corresponding option is supported in the table 4.1.				

4.4 Test equipment

The test equipment shall provide a host controller simulator which is connected to the DUT during test procedure execution, unless otherwise specified. For test cases which require a further host to be present, the test equipment shall further provide a host simulator which is connected to the DUT via the host controller simulator during test procedure execution, unless otherwise specified.

Before execution of each test case, the host network state shall be set back to the state in which it was after the UICC was powered up in full power mode using the default SESSION_IDENTITY (in order to instigate a new HCI session initialization).

With respect to the DUT, the host controller simulator shall act as a valid host controller according to TS 102 622 [1] unless otherwise specified. In particular, the host controller simulator shall ensure that the values of HOST_LIST and GATES_LIST are valid, according to the particular requirements of the test case being executed.

With respect to the DUT, the host simulator shall act as a valid host according to TS 102 622 [1] unless otherwise specified. In particular, the host simulator shall ensure that the value GATES_LIST is valid, according to the particular requirements of the test case being executed.

With respect to the DUT, the host network simulation (i.e. host controller simulator and any host simulators) shall comprise a valid network according to the specific DUT. The details are out of the scope of the present document.

4.4.1 Measurement/setting uncertainties

Void.

4.4.2 Default conditions for DUT operation

Unless otherwise specified, the test equipment shall apply the default conditions described in the following clauses during test procedure execution.

4.4.2.1 General

The test equipment shall treat the identity check mechanism of the lower layer as having passed (see TS 102 622 [1], clause 8.4).

The test equipment shall use the same SESSION_IDENTITY on power up within an individual test case.

4.4.2.2 Status of UICC interfaces

If the data link layer in TS 102 613 [2] is used and the DUT is a UICC, the terminal simulator shall not activate the TS 102 221 [7] interface or the TS 102 600 [8] interface.

4.4.3 Minimum/maximum conditions for DUT operation

Void.

4.4.4 Conventions

Unless otherwise specified, ADM_NOTIFY_PIPE_CREATED is sent by the test equipment with source H_{ID} = H_{ID} of host controller, destination H_{ID} = H_{ID} of host and a currently unused P_{ID}.

If the pipe for a response is not explicitly specified, then the pipe for the response is required to be the pipe on which the preceding command was sent.

4.5 Test execution

4.5.1 Parameter variations

Unless otherwise specified, when the data link layer in TS 102 613 [2] is used, all tests shall be carried out once for each of following parameter variations in addition to the parameter variations specified individually for each test case.

Table 4.5.1: Global parameter variations

Voltage class and power mode	Vcc
B	Default: in the range of 2,90 V to 3,10 V
	Minimum: in the range of 2,70 V to 2,80 V
	Maximum: in the range of 3,20 V to 3,30 V
C, full power	Default: in the range of 1,75 V to 1,85 V
	Minimum: in the range of 1,62 V to 1,67 V
	Maximum: in the range of 1,93 V to 1,98 V
C, low power	Default: in the range of 1,75 V to 1,85 V
	Minimum: in the range of 1,62 V to 1,67 V
	Maximum: in the range of 1,93 V to 1,98 V

The specification of global parameter variations for when other data link layers are used is out of the scope of the present document.

4.5.2 Execution requirements

Table 4.2, "Applicability of tests", specifies "execution requirements" for several test cases. For these test cases, it has not been possible to specify the corresponding test procedure in such a way that it can be guaranteed that the test procedure can be executed against every possible DUT.

Some sample scenarios of test requirements are listed below:

- The test case requires certain state to be present on the DUT in order to test a particular feature, but there is no mandatory requirement in the core specification (TS 102 622 [1]) for this state to be present.
- The test case requires the DUT to perform a particular operation in order to test that feature, but the core specification (TS 102 622 [1]) does not provide a standardized mechanism to trigger that operation to be executed by the DUT.

The test requirements have been split into various categories, as indicated by table 4.2 c):

- Static requirements (SRx): information about, for example, particular gates or registry parameters which can be used in the test procedure execution.
- Trigger requirements (TRx): mechanisms for triggering the DUT to perform certain operations.
- Initial condition requirements (ICRx): information about how to establish initial condition states.

The DUT supplier should make every effort to provide appropriate information or mechanisms to allow these execution requirements to be satisfied for the DUT.

It is recognized that this might not always be possible. For example, if the configuration of the DUT does not allow for the required state to be present; or if it is not possible to provide a particular trigger mechanism for the DUT. In these cases, it is acceptable that the test case is not carried out. However, it should be recognized that the consequence is that the particular feature will not be tested.

4.6 Pass criterion

A test shall only be considered as successful, if the test procedure was carried out successfully under all parameter variations with the DUT respecting all conformance requirements referenced in the test procedure. This is subject to the additional qualifications described in clause 4.6.1.

NOTE: Within the test procedures, the RQs are referenced in the step where they are observable. In some cases this is different from the step where they occur with respect to the DUT.

4.6.1 Unanticipated behaviour from the DUT

In the specification of the test procedures, every attempt has been made to ensure that the interface between the simulator and the DUT is in a known state before and during test procedure execution. However, as the DUT is an autonomous device, it is not possible to fully guarantee this.

If the DUT unexpectedly closes or deletes a pipe which is intended to be used during a subsequent part of the test procedure, this should not be considered as a failure of the DUT, even though the test procedure cannot be completed successfully. Instead, the test procedure should be executed again to attempt to execute the test procedure to completion. If the unexpected behaviour occurs again, further effort should be applied by the tester to attempt to ensure that the unexpected behaviour does not occur.

5 Test cases

5.1 HCI architecture

5.1.1 Overview

Reference: TS 102 622 [1], clause 4.1.

There are no conformance requirements for the UICC for the referenced clause.

5.1.2 Hosts

5.1.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 4.2.

RQ1	A host shall not use host identifiers which are RFU.
RQ2	A host shall reject received host identifiers which are RFU.

NOTE: RQ1 is a non-occurrence RQ.

5.1.2.2 Test case 1: processing of RFU host identifier

5.1.2.2.1 Test execution

The test procedure shall be executed once for each of following parameters:

- Source H_{ID} values of: every H_{ID} value which is RFU as defined in TS 102 622 [1].

5.1.2.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.1.2.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with the specified source H_{ID}, source G_{ID} = '01' and destination G_{ID} = G_{ID} of loop back gate.	
2	HUT → HCS	Send response containing an allowed error response code for the command.	RQ2

5.1.3 Gates

5.1.3.1 Conformance requirements

Reference: TS 102 622 [1], clause 4.3.

RQ1	All hosts shall have one administration gate.
RQ2	All hosts shall have one identity management gate.
RQ3	All hosts shall have one loop back gate.
RQ4	A host shall not use gate identifiers which are RFU.
RQ5	A host shall reject received gate identifiers which are RFU.
RQ6	A host shall not use gate identifiers which are host specific but not yet allocated in TS 102 622 [1].
RQ7	A host shall reject received gate identifiers which are host specific but not yet allocated in TS 102 622 [1].
NOTE:	RQ4 and RQ6 are not tested, as they are non-occurrence RQs.

NOTE: Development of test cases for RQ7 is FFS.

5.1.3.2 Test case 1: existence of gates

5.1.3.2.1 Test execution

5.1.3.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.1.3.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source and destination G_{ID} = G_{ID} of identity management gate; designate the created pipe PIPE_ID_MAN.	
2	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ1, RQ2
3	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_ID_MAN.	
4	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ2
5	HCS → HUT	Send ANY_GET_PARAMETER(GATES_LIST) on PIPE_ID_MAN.	
6	HUT → HCS	Send ANY_OK. Check that the GATES_LIST returned contains the G_{ID} of the identity management gate and the G_{ID} of the loop back gate.	RQ2, RQ3
7	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source G_{ID} = '01' and destination G_{ID} = G_{ID} of the loop back gate; designate the created pipe PIPE_LOOP_BACK.	
8	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ3
9	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_LOOP_BACK.	
10	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ3
11	HCS → HUT	Send EVT_POST_DATA containing '01 02 03 04' on PIPE_LOOP_BACK.	
12	HUT → HCS	Send EVT_POST_DATA containing '01 02 03 04' on PIPE_LOOP_BACK.	RQ3

5.1.3.3 Test case 2: processing of RFU gate identifier

5.1.3.3.1 Test execution

The test procedure shall be executed once for each of following parameters:

- Destination G_{ID} values of: every G_{ID} value which is RFU as defined in TS 102 622 [1].

5.1.3.3.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.1.3.3.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source G_{ID} = G_{ID} of identity management gate and the specified destination G_{ID}.	
2	HUT → HCS	Send response containing an allowed error response code for the command.	RQ5

5.1.4 Pipes

5.1.4.1 Conformance requirements

Reference: TS 102 622 [1], clause 4.4.

RQ1	A host shall not attempt to delete a static pipe.
RQ2	A host shall reject any attempts to delete a static pipe.
RQ3	The state of a pipe (i.e. open or closed) shall remain persistent if the hosts are powered down and up again.
RQ4	The state of a dynamic pipe after creation shall be closed.
RQ5	The initial state of a static pipe shall be closed.
RQ6	A host shall not use pipe identifiers which are RFU.
NOTE: RQ1 and RQ6 are not tested, as they are non-occurrence RQs.	

NOTE: RQ5 is not tested, as it is not clear when the initial state of the static pipe applies.

5.1.4.2 Test case 1: static pipe deletion - administration gate

5.1.4.2.1 Test execution

5.1.4.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.1.4.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_NOTIFY_PIPE_DELETED($PIPE_1$) on $PIPE_1$.	
2	HUT → HCS	Send response containing an allowed error response code for the command.	RQ2

5.1.4.3 Test case 2: static pipe deletion - link management gate

5.1.4.3.1 Test execution

5.1.4.3.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.1.4.3.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_NOTIFY_PIPE_DELETED($PIPE_0$) on $PIPE_1$.	
2	HUT → HCS	Send response containing an allowed error response code for the command.	RQ2

5.1.4.4 Test case 3: persistence of pipe state

5.1.4.4.1 Test execution

5.1.4.4.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.
- A pipe (PIPE_ID_MAN) has been created to the host's identity management gate, and is open.

5.1.4.4.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source G_{ID} = '01' and destination G_{ID} = G_{ID} of the loop back gate; designate the created pipe PIPE_LOOP_BACK.	
2	HUT → HCS	Send ANY_OK.	
3	HCS → HUT	Power down host.	
4	HCS → HUT	Power up host, and proceed until the HCI interface is available.	
5	HCS → HUT	Send ANY_CLOSE_PIPE on $PIPE_1$.	
6	HUT → HCS	Send ANY_OK.	RQ3
7	HCS → HUT	Send ANY_GET_PARAMETER(GATES_LIST) on PIPE_ID_MAN.	
8	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ3
9	HCS → HUT	Send EVT_POST_DATA on PIPE_LOOP_BACK.	
10	HUT → HCS	Send no message on PIPE_LOOP_BACK.	RQ3
11	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_LOOP_BACK.	
12	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ3

5.1.4.5 Test case 4: initial pipe state

5.1.4.5.1 Test execution

5.1.4.5.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.1.4.5.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source G_{ID} = '00' and destination G_{ID} = G_{ID} of identity management gate; designate the created pipe PIPEx.	
2	HUT → HCS	Send ANY_OK.	
3	HCS → HUT	Send ANY_GET_PARAMETER(GATES_LIST) on PIPEx.	
4	HUT → HCS	Send response containing an allowed error response code for the command.	RQ4

5.1.5 Registries

5.1.5.1 Conformance requirements

Reference: TS 102 622 [1], clause 4.5.

RQ1	For all gates defined in TS 102 622 [1], parameter identifiers in the range of '00' to 'EF' are reserved for use in TS 102 622 [1].
RQ2	A new instance of the registry is created for every pipe that connects to the gate.
RQ3	Upon pipe creation all registry parameters with access rights Read-write (RW) or Write-only (WO) shall be set to their default values.
RQ4	Upon pipe creation all read-only (RO) parameters shall be set by the entity managing the registry to an appropriate value which may differ from the default values.
RQ5	When a pipe is deleted its registry instance is also deleted.

NOTE: As the specification of registry parameters is specific to each individual registry, RQ1, RQ3 and RQ4 are not tested in this clause, but are tested in other clauses of the present document for each individual registry.

5.1.5.2 Test case 1: registry creation

5.1.5.2.1 Test execution

Assignment of terms to entities referenced in SR1: G_{ID} of gate = GATE_X, registry parameter identifier = REG_PARAM.

5.1.5.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.1.5.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source G_{ID} = '01' and destination G_{ID} = GATE_X; designate the created pipe PIPEa.	
2	HUT → HCS	Send ANY_OK (parameters are not checked).	
3	HCS → HUT	Send ANY_SET_PARAMETER(REG_PARAM) on PIPEa, with a value different from the default value.	
4	HUT → HCS	Send ANY_OK (parameters are not checked).	
5	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATE on $PIPE_1$, with source G_{ID} = '01' and destination G_{ID} = GATE_X; designate the created pipe PIPEb.	
6	HUT → HCS	Send ANY_OK (parameters are not checked).	
7	HCS → HUT	Send ANY_GET_PARAMETER(REG_PARAM) on PIPEb.	
8	HUT → HCS	Send ANY_OK with parameter value equal to the default value of REG_PARAM.	RQ2
9	HCS → HUT	Send ANY_SET_PARAMETER(REG_PARAM) on PIPEb, with a value different from the default value, and different to the value set in step 3.	
10	HUT → HCS	Send ANY_OK (parameters are not checked).	
11	HCS → HUT	Send ANY_GET_PARAMETER(REG_PARAM) on PIPEa.	
12	HUT → HCS	Send ANY_OK with parameter value equal to the value set in step 3.	RQ2

5.1.5.3 Test case 2: registry deletion

5.1.5.3.1 Test execution

Assignment of terms to entities referenced in SR2: G_{ID} of gate = GATE_X, registry parameter identifier = REG_PARAM.

5.1.5.3.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5. .5.3.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source G_{ID} = '01' and destination G_{ID} = GATE_X; designate the created pipe PIPEa.	
2	HUT → HCS	Send ANY_OK (parameters are not checked).	
3	HCS → HUT	Send ANY_SET_PARAMETER(REG_PARAM) on PIPEa, with a value different from the default value.	
4	HUT → HCS	Send ANY_OK (parameters are not checked).	
5	HCS → HUT	Send ADM_NOTIFY_PIPE_DELETED(PIPEa) on $PIPE_1$.	
6	HUT → HCS	Send ANY_OK (parameters are not checked).	
7	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with G_{ID} = GATE_X; designate the created pipe PIPEb.	
8	HUT → HCS	Send ANY_OK (parameters are not checked).	
9	HCS → HUT	Send ANY_GET_PARAMETER(REG_PARAM) on PIPEb.	
10	HUT → HCS	Send ANY_OK with parameter value equal to the default value of REG_PARAM.	RQ5

5.2 HCP

5.2.1 HCP packets

5.2.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 5.1.

RQ1	All hosts shall use the correct structure for transmitted HCP packets.
RQ2	All hosts shall recognize correctly structured received HCP packets.
RQ3	The destination host forwards the packet to the destination gate.

NOTE 1: RQ1 and RQ2 are implicitly tested by the testing of higher layers in other clauses of the present document.

NOTE 2: RQ3 is internal to the host, and is not tested in this clause. It will be implicitly tested in many other test cases within the present document.

5.2.2 HCP message structure

5.2.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 5.2.

RQ1	All hosts shall use the correct structure for transmitted HCP messages.
RQ2	Type value 3 shall not be used.
RQ3	All hosts shall recognize correctly structured received HCP messages.
RQ4	A gate shall only accept a command or an event on a pipe when the state of that pipe is open unless otherwise stated.
RQ5	A gate shall not send a command or event on a pipe when it is waiting for a response to a previous command on that pipe unless otherwise stated.

NOTE 1: RQ1 and RQ3 are implicitly tested by the testing of higher layers in other clauses of the present document.

NOTE 2: RQ2 and RQ5 are not tested, as they are non-occurrence RQs.

5.2.2.2 Test case 1: commands/events on pipe which is not open

5.2.2.2.1 Test execution

5.2.2.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.2.2.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source and destination G_{ID} = G_{ID} of identity management gate; designate the created pipe PIPE_ID_MAN.	
2	HUT → HCS	Send ANY_OK (parameters are not checked).	
3	HCS → HUT	Send ANY_GET_PARAMETER(GATES_LIST) on PIPE_ID_MAN.	
4	HUT → HCS	Send response containing an allowed error response code for the command.	RQ4
5	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_ID_MAN.	
6	HUT → HCS	Send ANY_OK (parameters are not checked).	
7	HCS → HUT	Send ANY_GET_PARAMETER(GATES_LIST) on PIPE_ID_MAN.	
8	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ4
9	HCS → HUT	Send ANY_CLOSE_PIPE on PIPE_ID_MAN.	
10	HUT → HCS	Send ANY_OK (parameters are not checked).	
11	HCS → HUT	Send ANY_GET_PARAMETER(GATES_LIST) on PIPE_ID_MAN.	
12	HUT → HCS	Send response containing an allowed error response code for the command.	RQ4
13	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source G_{ID} = '00' and destination G_{ID} = G_{ID} of the loop back gate; designate the created pipe PIPE_LOOP_BACK.	
14	HUT → HCS	Send ANY_OK (parameters are not checked).	
15	HCS → HUT	Send EVT_POST_DATA containing '01 02 03 04' on PIPE_LOOP_BACK.	
16	HUT → HCS	Send no message on PIPE_LOOP_BACK.	RQ4
17	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_LOOP_BACK.	
18	HUT → HCS	Send ANY_OK (parameters are not checked).	
19	HCS → HUT	Send EVT_POST_DATA containing '01 02 03 04' on PIPE_LOOP_BACK.	
20	HUT → HCS	Send EVT_POST_DATA containing '01 02 03 04' on PIPE_LOOP_BACK.	RQ4
21	HCS → HUT	Send ANY_CLOSE_PIPE on PIPE_LOOP_BACK.	
22	HUT → HCS	Send ANY_OK (parameters are not checked).	
23	HCS → HUT	Send EVT_POST_DATA containing '01 02 03 04' on PIPE_LOOP_BACK.	
24	HUT → HCS	Send no message on PIPE_LOOP_BACK.	RQ4
25	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_LOOP_BACK.	
26	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ4

5.2.3 Message fragmentation

5.2.3.1 Conformance requirements

Reference: TS 102 622 [1], clause 5.3.

RQ1	Message fragmentation shall be used when the size of the message is larger than supported by the underlying data link layer.
RQ2	Messages shall be fragmented according to the rules specified in TS 102 622 [1].
RQ3	The destination gate is responsible for rebuilding the message from the fragmented messages.
RQ4	If a reset of the underlying data link layer occurs, fragments of a partially received message shall be discarded and a partially sent message shall be re-sent from the beginning.

NOTE: Development of test cases for RQ1, RQ2, RQ3 and RQ4 is FFS.

5.3 Instructions

5.3.1 Commands

5.3.1.1 Overview

5.3.1.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 6.1.1.

RQ1	For all gates, hosts shall not use RFU instruction values ('05' to '0F') in commands.
RQ2	For administration gates, hosts shall not use RFU instruction values ('16' to '3F') in commands.
RQ3	For gates defined in TS 102 622 [1], hosts shall not use instruction values between '10' and '3F' which are not allocated in TS 102 622 [1].

NOTE: RQ1, RQ2 and RQ3 are not tested, as they are non-occurrence RQs.

5.3.1.2 Generic commands

5.3.1.2.1 ANY_SET_PARAMETER

5.3.1.2.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 6.1.2.1.

RQ1	A host shall reject an incorrectly formatted ANY_SET_PARAMETER command.
RQ2	A host shall reject an ANY_SET_PARAMETER command if the access right for the parameter does not allowed writing (i.e. is not RW or WO).
RQ3	A host shall not send an ANY_SET_PARAMETER command if the access right for the parameter does not allow writing (i.e. is not RW or WO).
RQ4	When a host receives a valid ANY_SET_PARAMETER command, it shall write the parameter value into the registry and respond with ANY_OK without any parameters.
RQ5	Whenever a host sends an ANY_SET_PARAMETER command, it shall do so correctly: • It shall only be sent to a gate which supports the command. • It shall always have at least one byte in the command parameters. • The parameter identifier shall match one of those defined for the specific gate. • The parameter value shall be a valid value as defined for the specific gate.

NOTE 1: RQ3 is not tested, as it is a non-occurrence RQ.

NOTE 2: RQ4 and RQ5 are not tested in this clause, as they are effectively tested in other clauses of the present document for each individual registry parameter.

5.3.1.2.1.2 Test case 1: ANY_SET_PARAMETER reception - invalid structure

5.3.1.2.1.2.1 Test execution

Assignment of terms to entities referenced in SR3: G_{ID} of gate = GATE_X.

5.3.1.2.1.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- A pipe (PIPE_X) has been created to the gate with G_{ID} = GATE_X, and is open.

5.3.1.2.1.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ANY_SET_PARAMETER with no parameters on PIPE_X.	
2	HUT → HCS	Send response containing an allowed error response code for the command.	RQ1

5.3.1.2.1.3 Test case 2: ANY_SET_PARAMETER reception - RO registry parameter

5.3.1.2.1.3.1 Test execution

5.3.1.2.1.3.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- A pipe (PIPE_ID_MAN) has been created to the host's identity management gate, and is open.

5.3.1.2.1.3.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ANY_SET_PARAMETER(GATES_LIST) on PIPE_ID_MAN, where the parameter value is equal to the existing value of GATES_LIST in the host's registry.	
2	HUT → HCS	Send response containing an allowed error response code for the command.	RQ2

5.3.1.2.2 ANY_GET_PARAMETER

5.3.1.2.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 6.1.2.2.

RQ1	A host shall reject an incorrectly formatted ANY_GET_PARAMETER command.
RQ2	A host shall reject an ANY_GET_PARAMETER command if the access right for the parameter does not allowed reading (i.e. is not RW or RO).
RQ3	A host shall not send an ANY_GET_PARAMETER command if the access right for the parameter does not allowed reading (i.e. is not RW or RO).
RQ4	When a host receives a valid ANY_GET_PARAMETER command, it shall respond with ANY_OK with the value of the parameter.
RQ5	Whenever a host sends an ANY_GET_PARAMETER command, it shall do so correctly: • It shall only be sent to a gate which supports the command. • It shall always have exactly one byte in the command parameters. • The parameter identifier shall match one of those defined for the specific gate.

NOTE 1: RQ3 is not tested, as it is a non-occurrence RQ.

NOTE 2: RQ4 and RQ5 are not tested, as they are effectively tested in other clauses of the present document for each individual registry parameter.

5.3.1.2.2.2 Test case 1: ANY_GET_PARAMETER reception - invalid structure

5.3.1.2.2.2.1 Test execution

5.3.1.2.2.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- A pipe (PIPE_ID_MAN) has been created to the host's identity management gate, and is open.

5.3.1.2.2.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ANY_GET_PARAMETER with no parameters on PIPE_ID_MAN.	
2	HUT → HCS	Send response containing an allowed error response code for the command.	RQ1
3	HCS → HUT	Send ANY_GET_PARAMETER containing parameters of length 2, with each byte containing the value of the GATES_LIST identifier, on PIPE_ID_MAN.	
4	HUT → HCS	Send response containing an allowed error response code for the command.	RQ1

5.3.1.2.2.3 Test case 2: ANY_GET_PARAMETER reception - WO registry parameter

5.3.1.2.2.3.1 Test execution

Assignment of terms to entities referenced in SR4: G_{ID} of gate = GATE_X, registry parameter identifier = REG_PARAM.

5.3.1.2.2.3.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- A pipe (PIPE_X) has been created to the gate with G_{ID} = GATE_X, and is open.

5.3.1.2.2.3.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ANY_GET_PARAMETER(REG_PARAM) on PIPE_X.	
2	HUT → HCS	Send response containing an allowed error response code for the command.	RQ2

5.3.1.2.3 ANY_OPEN_PIPE

5.3.1.2.3.1 Conformance requirements

Reference: TS 102 622 [1], clause 6.1.2.3.

RQ1	A host shall reject an incorrectly formatted ANY_OPEN_PIPE command.
RQ2	When a host other than the host controller receives a valid ANY_OPEN_PIPE command on a closed pipe, it shall open the pipe and return ANY_OK with a parameter containing the "number of pipes already open on this gate before the execution of the command".
RQ3	When a host sends an ANY_OPEN_PIPE command, it shall contain no command parameters.
RQ4	When a host receives ANY_OK in response to an ANY_OPEN_PIPE command, it shall open the pipe.

NOTE: In TS 102 622 [1], it is not clear whether ANY_OPEN_PIPE is valid over a pipe which is already open. This is therefore not listed as a conformance requirement.

5.3.1.2.3.2 Test case 1: ANY_OPEN_PIPE reception

5.3.1.2.3.2.1 Test execution

5.3.1.2.3.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.3.1.2.3.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ANY_CLOSE_PIPE on $PIPE_1$.	
2	HUT → HCS	Send ANY_OK.	
3	HCS → HUT	Send ANY_OPEN_PIPE with parameter '00' on $PIPE_1$.	
4	HUT → HCS	Send response containing an allowed error response code for the command.	RQ1
5	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source and destination G_{ID} = G_{ID} of identity management gate.	
6	HUT → HCS	Send response containing an allowed error response code for the command.	RQ1
7	HCS → HUT	Send ANY_OPEN_PIPE on $PIPE_1$.	
8	HUT → HCS	Send ANY_OK with parameter '00'.	RQ2
9	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source and destination G_{ID} = G_{ID} of identity management gate; designate the created pipe PIPE_ID_MAN.	
10	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ2
11	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_ID_MAN.	
12	HUT → HCS	Send ANY_OK with a parameter containing the number of pipes already open on this gate before the execution of the command. (See note).	RQ2
13	HCS → HUT	Send ANY_GET_PARAMETER(GATES_LIST) on PIPE_ID_MAN.	
14	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ2
15	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source and destination GID = GID of identity management gate; designate the created pipe PIPE_ID_MAN2.	
16	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ2
17	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_ID_MAN2.	
18	HUT → HCS	Send ANY_OK with a parameter containing the number of pipes already open on this gate before the execution of the command (see note).	RQ2
19	HCS → HUT	Send ANY_CLOSE_PIPE on PIPE_ID_MAN2.	
20	HUT → HCS	Send ANY_OK.	
21	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_ID_MAN2.	
22	HUT → HCS	Send ANY_OK with a parameter containing the number of pipes already open on this gate before the execution of the command. NOTE: the same note as in step 12 applies.	RQ2
23	HCS → HUT	Send ANY_CLOSE_PIPE on PIPE_ID_MAN2.	
24	HUT → HCS	Send ANY_OK.	
25	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_ID_MAN2.	
26	HUT → HCS	Send ANY_OK with a parameter containing the number of pipes already open on this gate before the execution of the command. (See note).	RQ2
27	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source G_{ID} = '01' and destination G_{ID} = G_{ID} of the loop back gate; designate the created pipe PIPE_LOOP_BACK.	
28	HUT → HCS	Send ANY_OK.	
29	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_LOOP_BACK.	
30	HUT → HCS	Send ANY_OK with a parameter containing the number of pipes already open on this gate before the execution of the command (see note).	RQ2

NOTE: The test equipment must calculate the number of pipes already open on the gate before the execution of the command, taking into account any pipes which have been opened by the host.
Example for step 12: if no pipes were opened to the host controller's identity management gate before the execution of the test procedure and no further pipes have been opened by the host, this value would be '00'.

5.3.1.2.3.3 Test case 2: ANY_OPEN_PIPE transmission

5.3.1.2.3.3.1 Test execution

5.3.1.2.3.3.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- A pipe (PIPE_ID_MAN) has been created to the host's identity management gate, and is open.

5.3.1.2.3.3.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ANY_CLOSE_PIPE on PIPE_ID_MAN.	
2	HUT → HCS	Send ANY_OK.	
3	User → HUT	Trigger the host to open PIPE_ID_MAN.	
4	HUT → HCS	Send ANY_OPEN_PIPE on PIPE_ID_MAN.	RQ3
5	HCS → HUT	Send ANY_OK.	
6	HCS → HUT	Send ANY_GET_PARAMETER(GATES_LIST) on PIPE_ID_MAN.	
7	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ4

5.3.1.2.4 ANY_CLOSE_PIPE

5.3.1.2.4.1 Conformance requirements

Reference: TS 102 622 [1], clause 6.1.2.4.

RQ1	A host shall reject an incorrectly formatted ANY_CLOSE_PIPE command.
RQ2	When a host receives a valid ANY_CLOSE_PIPE on an open pipe, it shall close the pipe and respond with ANY_OK and no parameters.
RQ3	When a host sends an ANY_CLOSE_PIPE command, it shall contain no command parameters.
RQ4	When a host receives ANY_OK in response to an ANY_CLOSE_PIPE command, it shall close the pipe.

5.3.1.2.4.2 Test case 1: ANY_CLOSE_PIPE reception

5.3.1.2.4.2.1 Test execution

5.3.1.2.4.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.3.1.2.4.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ANY_CLOSE_PIPE with parameter '00' on $PIPE_1$.	
2	HUT → HCS	Send response containing an allowed error response code for the command.	RQ1
3	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source and destination G_{ID} = G_{ID} of identity management gate; designate the created pipe PIPE_ID_MAN.	
4	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ1
5	HCS → HUT	Send ANY_CLOSE_PIPE on $PIPE_1$.	
6	HUT → HCS	Send ANY_OK with no parameters.	RQ2
7	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source and destination G_{ID} = G_{ID} of identity management gate.	
8	HUT → HCS	Send response containing an allowed error response code for the command.	RQ2
9	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_ID_MAN.	
10	HUT → HCS	Send ANY_OK (parameters are not checked).	
11	HCS → HUT	Send ANY_GET_PARAMETER(GATES_LIST) on PIPE_ID_MAN.	
12	HUT → HCS	Send ANY_OK (parameters are not checked).	
13	HCS → HUT	Send ANY_CLOSE_PIPE on PIPE_ID_MAN.	
14	HUT → HCS	Send ANY_OK with no parameters.	RQ2
15	HCS → HUT	Send ANY_GET_PARAMETER(GATES_LIST) on PIPE_ID_MAN.	
16	HUT → HCS	Send response containing an allowed error response code for the command.	RQ2

5.3.1.2.4.3 Test case 2: ANY_CLOSE_PIPE transmission

5.3.1.2.4.3.1 Test execution

5.3.1.2.4.3.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- A pipe (PIPE_ID_MAN) has been created to the host's identity management gate, and is open.

5.3.1.2.4.3.3 Test procedure

Step	Direction	Description	RQ
1	User → HUT	Trigger the host to close PIPE_ID_MAN.	
2	HUT → HCS	Send ANY_CLOSE_PIPE on PIPE_ID_MAN.	RQ3
3	HCS → HUT	Send ANY_OK.	
4	HCS → HUT	Send ANY_GET_PARAMETER(GATES_LIST) on PIPE_ID_MAN.	
5	HUT → HCS	Send response containing an allowed error response code for the command.	RQ4

5.3.1.3 Administration commands

5.3.1.3.1 ADM_CREATE_PIPE

5.3.1.3.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 6.1.3.1.

NOTE: All conformance requirements for the referenced clause are included in clause 5.5.1.1 of the present document.

5.3.1.3.2 ADM_NOTIFY_PIPE_CREATED

5.3.1.3.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 6.1.3.2.

NOTE: All conformance requirements for the referenced clause are included in clause 5.5.1.1 of the present document.

5.3.1.3.3 ADM_DELETE_PIPE

5.3.1.3.3.1 Conformance requirements

Reference: TS 102 622 [1], clause 6.1.3.3.

NOTE: All conformance requirements for the referenced clause are included in clause 5.5.1.2 of the present document.

5.3.1.3.4 ADM_NOTIFY_PIPE_DELETED

5.3.1.3.4.1 Conformance requirements

Reference: TS 102 622 [1], clause 6.1.3.4.

NOTE: All conformance requirements for the referenced clause are included in clause 5.5.1.2 of the present document.

5.3.1.3.5 ADM_CLEAR_ALL_PIPE

5.3.1.3.5.1 Conformance requirements

Reference: TS 102 622 [1], clause 6.1.3.5.

NOTE: All conformance requirements for the referenced clause are included in clause 5.5.1.3 of the present document.

5.3.1.3.6 ADM_NOTIFY_ALL_PIPE_CLEARED

5.3.1.3.6.1 Conformance requirements

Reference: TS 102 622 [1], clause 6.1.3.6.

NOTE: All conformance requirements for the referenced clause are included in clause 5.5.1.3 of the present document.

5.3.2 Responses

5.3.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 6.2.

RQ1	A response shall be sent to all commands received even to those unknown to the receiving gate.
RQ2	Responses received out of order (i.e. if no command was sent previously) shall be discarded.
RQ3	For a received command which is defined in table 16 in TS 102 622 [1], hosts shall only return a response code which is specified for that command in table 16 in TS 102 622 [1].

NOTE: Development of test cases for RQ3 is FFS.

5.3.2.2 Test case 1: response to unknown command

5.3.2.2.1 Test execution

5.3.2.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.
- A pipe (PIPE_ID_MAN) has been created to the host's identity management gate, and is open.

5.3.2.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send command with an RFU instruction value on $PIPE_1$.	
2	HUT → HCS	Send response (contents are not checked).	RQ1
3	HCS → HUT	Send command with an RFU instruction value on PIPE_ID_MAN.	
4	HUT → HCS	Send response (contents are not checked).	RQ1

5.3.2.3 Test case 2: responses received out of order, previous command sent by host controller

5.3.2.3.1 Test execution

5.3.2.3.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- A pipe (PIPE_ID_MAN) has been created to the host's identity management gate, and is open.

5.3.2.3.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ANY_GET_PARAMETER(GATES_LIST) on PIPE_ID_MAN.	
2	HUT → HCS	Send response with ANY_OK and value of GATES_LIST on PIPE_ID_MAN.	
3	HCS → HUT	Send response with ANY_OK and no parameters on PIPE_ID_MAN.	
4	HUT	No message on PIPE_ID_MAN.	RQ2
5	HCS → HUT	Send ANY_GET_PARAMETER(GATES_LIST) on PIPE_ID_MAN.	
6	HUT → HCS	Send response with ANY_OK and same value of GATES_LIST as in step 2.	RQ2

5.3.2.4 Test case 3: responses received out of order, previous command sent by host

5.3.2.4.1 Test execution

5.3.2.4.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- A pipe (PIPE_ID_MAN) has been created to the host's identity management gate, and is open.

5.3.2.4.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ANY_CLOSE_PIPE on PIPE_ID_MAN.	
2	HUT → HCS	Send ANY_OK.	
3	User → HUT	Trigger the host to open PIPE_ID_MAN.	
4	HUT → HCS	Send ANY_OPEN_PIPE on PIPE_ID_MAN.	
5	HCS → HUT	Send ANY_OK on PIPE_ID_MAN.	
6	HCS → HUT	Send ANY_E_NOK on PIPE_ID_MAN.	
7	HUT	No message on PIPE_ID_MAN.	RQ2
8	HCS → HUT	Send ANY_GET_PARAMETER(GATES_LIST) on PIPE_ID_MAN.	
9	HUT → HCS	Send response with ANY_OK and value of GATES_LIST on PIPE_ID_MAN.	RQ2

5.3.3 Events

5.3.3.1 Conformance requirements

Reference: TS 102 622 [1], clause 6.3.

RQ1	Unknown events received shall be discarded.
RQ2	When the host sends EVT_HCI_END_OF_OPERATION, it shall contain no parameters.
RQ3	For gates defined in TS 102 622 [1], hosts shall not use event values which are not allocated in TS 102 622 [1].

NOTE 1: No RQs are specified for when the host should send EVT_HCI_END_OF_OPERATION, as the conditions for sending this event are internal to the host.

NOTE 2: Development of test cases for RQ2 is FFS.

NOTE 3: RQ3 is not tested, as it is a non-occurrence RQ.

5.3.3.2 Test case 1: reception of unknown events

5.3.3.2.1 Test execution

5.3.3.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- A pipe (PIPE_ID_MAN) has been created to the host's identity management gate, and is open.

5.3.3.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ANY_GET_PARAMETER(GATES_LIST) on PIPE_ID_MAN.	
2	HUT → HCS	Send response with ANY_OK and value of GATES_LIST on PIPE_ID_MAN.	
3	HCS → HUT	Send event with an RFU instruction value on PIPE_ID_MAN.	
4	HCS → HUT	Send ANY_GET_PARAMETER(GATES_LIST) on PIPE_ID_MAN.	
5	HUT → HCS	Send response with ANY_OK and same value of GATES_LIST as in step 2.	RQ1

5.4 GATES and subclauses

5.4.1 GATES

5.4.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 7.

RQ1	Gates shall support the commands and events specified for them in tables 18 and 19 of TS 102 622 [1].

NOTE 1: In this clause, RQ1 is only tested for the management gates. Other clauses may test RQ1 for other gates as applicable.

NOTE 2: ANY_GET_PARAMETER and ANY_SET_PARAMETER are not tested in this clause, as they are tested in the specific clauses for each gate for testing registry parameters.

NOTE 3: ADM_NOTIFY_PIPE_CREATED, ADM_NOTIFY_PIPE_DELETED and ADM_NOTIFY_ALL_PIPE_CLEARED are not tested for the host administration gate, as they are tested in the specific clauses for each command.

NOTE 4: EVT_POST_DATA is not tested for the loop back gate, as it is tested in the clause 5.5.5.

NOTE 5: EVT_HOT_PLUG is not tested for the host administration gate, as the reaction of the host is not specified in TS 102 622 [1].

5.4.1.2 Test case 1: command and event support for link management gate

5.4.1.2.1 Test execution

5.4.1.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_0$ is open.

5.4.1.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ANY_CLOSE_PIPE on $PIPE_0$.	
2	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ1
3	HCS → HUT	Send ANY_OPEN_PIPE on $PIPE_0$.	
4	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ1

5.4.1.3 Test case 2: command and event support for management gates except link management gate

5.4.1.3.1 Test execution

The test procedure shall be executed once for each of following parameters, indicating the pipe to be used in the test procedure:

- $PIPE_1$;
- a pipe which has been created from the host controller's identity management gate to the host's identity management;
- a pipe which has been created from gate with G_{ID} = '01' on the host controller to the host's loop back gate.

5.4.1.3.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- The pipe indicated in the test execution clause is open.

5.4.1.3.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ANY_CLOSE_PIPE on the pipe indicated in the test execution clause.	
2	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ1
3	HCS → HUT	Send ANY_OPEN_PIPE on the pipe indicated in the test execution clause.	
4	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ1

5.4.2 Management gates

5.4.2.1 Administration gates

5.4.2.1.1 Host controller administration gate

5.4.2.1.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 7.1.1.1.

RQ1	The host shall only set values of SESSION_IDENTITY with length 8 bytes.
RQ2	The session identity shall be modified by the host whenever a modification of the configuration is performed by the host.
RQ3	The default value of the session identity shall never be written by a host.
RQ4	The session identity shall use random values.
RQ5	The host shall adhere to the access condition of RO for MAX_PIPE.
RQ6	The host shall only set values of WHITELIST containing valid host identifiers (including proprietary host identifiers but excluding RFU host identifiers) as specified in table 1 in TS 102 622 [1], and not containing the host controller's host identifier and the host's own host identifier; an empty array is allowed.
RQ7	The host shall adhere to the access condition of RO for HOST_LIST.

NOTE 1: RQ2 is not tested in this clause. It is tested in the context of HCI session initialization in clause 5.5.4. As other circumstances in which the host may modify the configuration are not evident, it is not tested further in this clause.

NOTE 2: RQ5 and RQ7 are not tested, as they are non-occurrence RQs.

5.4.2.1.1.2 Test case 1: SESSION_IDENTITY

5.4.2.1.1.2.1 Test execution

Run this test procedure in full power mode only.

5.4.2.1.1.2.2 Initial conditions

- The host is not powered up.

5.4.2.1.1.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Power up host; behave as if lower layer identity check has failed (i.e. enter inhibited state).	
2	HUT ← → HCS	Perform HCI session initialization.	
3	HUT → HCS	Send ANY_SET_PARAMETER(SESSION_IDENTITY) on $PIPE_1$. Check value is 8 bytes long, and is different from the default value.	RQ1, RQ3
4	HCS → HUT	Send ANY_OK.	
5		Execute steps 7 to 12 ten times.	
6	HCS → HUT	Power down host.	
7	HCS → HUT	Power up host; behave as if lower layer identity check has failed (i.e. enter inhibited state).	
8	HUT ← → HCS	Perform HCI session initialization.	
9	HUT → HCS	Send ANY_SET_PARAMETER(SESSION_IDENTITY) on $PIPE_1$. Check value is 8 bytes long, is different from the default value, and is different from any value previously sent by the host in the test procedure.	RQ1, RQ3, RQ4
10	HCS → HUT	Send ANY_OK.	

5.4.2.1.1.3 Test case 2: WHITELIST

5.4.2.1.1.3.1 Test execution

5.4.2.1.1.3.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.4.2.1.1.3.3 Test procedure

Step	Direction	Description	RQ
1	User → HUT	Trigger the host to write its value of WHITELIST into the registry of the host controller's administration gate.	
2	HUT → HCS	Send ANY_SET_PARAMETER(WHITELIST) on $PIPE_1$.	RQ6
3	HCS → HUT	Send ANY_OK.	

5.4.2.1.2 Host administration gate

5.4.2.1.2.1 Conformance requirements

Reference: TS 102 622 [1], clauses 7.1.1.2 and 4.5.

RQ1	4.5	Registry parameters which are in the range of '00' to 'EF' but which are not allocated in TS 102 622 [1] shall not be present in the registry.

NOTE: Development of test cases for RQ1 is FFS.

5.4.2.2 Link management gate

5.4.2.2.1 Host controller link management gate

5.4.2.2.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 7.1.2.1.

RQ1	The host shall only set values of REC_ERROR with length 2 bytes.

5.4.2.2.1.2 Test case 1: REC_ERROR

5.4.2.2.1.2.1 Test execution

5.4.2.2.1.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_0$ is open.

5.4.2.2.1.2.3 Test procedure

Step	Direction	Description	RQ
1	User → HUT	Trigger the host to write a value of REC_ERROR into the registry of the host controller's link management gate in order to restart an error rate measure.	
2	HUT → HCS	Send ANY_SET_PARAMETER(REC_ERROR) on $PIPE_0$.	RQ1
3	HCS → HUT	Send ANY_OK.	

5.4.2.2.2 Host link management gate

5.4.2.2.2.1 Conformance requirements

Reference: TS 102 622 [1], clauses 7.1.2.1 and 4.5.

RQ1	4.5	Registry parameters which are in the range of '00' to 'EF' but which are not allocated in TS 102 622 [1] shall not be present in the registry.
RQ2	7.1.2.1	The host shall use a default value for REC_ERROR of '0000'.
RQ3	7.1.2.1	The host shall apply the access condition of RW to REC_ERROR.
RQ4	7.1.2.1	The host shall only accept values of REC_ERROR of length 2 bytes.

NOTE: Development of test cases for RQ1 is FFS.

5.4.2.2.2.2 Test case 1: REC_ERROR

5.4.2.2.2.2.1 Test execution

5.4.2.2.2.2.2 Initial conditions

- The last value of REC_ERROR in the host's registry for $PIPE_0$ is not '0000'.
- The interface is powered down.

5.4.2.2.2.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Power up host; behave as if lower layer identity check has failed (i.e. enter inhibited state).	
2	HUT ← → HCS	Perform HCI session initialization, up to and including setting new value of SESSION_IDENTITY.	
3	HCS	Wait until the HCI interface is idle; i.e. no further communication is expected.	
4	HCS → HUT	Send ANY_GET_PARAMETER(REC_ERROR) on $PIPE_0$.	
5	HUT → HCS	Send ANY_OK with parameter value '0000' (see note).	RQ2, RQ3
6	HCS → HUT	Send ANY_SET_PARAMETER(REC_ERROR, '0000') on $PIPE_0$.	
7	HUT → HCS	Send ANY_OK.	RQ3
8	HCS → HUT	Send ANY_SET_PARAMETER(REC_ERROR, '000000') on $PIPE_0$.	
9	HUT → HCS	Send response containing an allowed error response code for the command.	RQ4
NOTE: This assumes that the HCI session initialization procedure has not resulted in any errors at the data link layer which would result in the incrementing of REC_ERROR.			

5.4.2.3 Identity management gate

5.4.2.3.1 Local registry

5.4.2.3.1.1 Conformance requirements

Reference: TS 102 622 [1], clauses 7.1.3 and 4.5.

NOTE 1: This clause covers the conformance requirements contained within TS 102 622 [1], clause 7.1.3 for the local registry. The requirements for the remote registry are contained in clause 5.4.2.3.2.

RQ1	4.5	Registry parameters which are in the range of '00' to 'EF' but which are not allocated in TS 102 622 [1] shall not be present in the registry.
RQ2	7.1.3	The registry of the identity management gate shall be persistent.
RQ3	7.1.3	This gate shall be provided by all hosts and the host controller.
RQ4	7.1.3	If present in the host, the host shall use a value for VERSION_SW of length 3 bytes.
RQ5	7.1.3	If present in the host, the host shall apply the access condition of RO to VERSION_SW.

RQ6	7.1.3	If present in the host, the host shall use a value for VERSION_HARD of length 3 bytes.
RQ7	7.1.3	If present in the host, the host shall apply the access condition of RO to VERSION_HARD.
RQ8	7.1.3	If present in the host, the host shall use a value for VERSION_NAME of maximum length 20 bytes with UTF8 coding.
RQ9	7.1.3	If present in the host, the host shall apply the access condition of RO to VERSION_NAME.
RQ10	7.1.3	If present in the host, the host shall use a value for MODEL_ID of length 1 byte.
RQ11	7.1.3	If present in the host, the host shall apply the access condition of RO to MODEL_ID.
RQ12	7.1.3	If present in the host, the host shall apply the access condition of RO to HCI_VERSION.
RQ13	7.1.3	The host shall use a value for GATES_LIST containing the list of all gates that accept dynamic pipes as an array of gate identifiers.
RQ14	7.1.3	The host shall apply the access condition of RO to GATES_LIST.
RQ15	7.1.3	A host according to the present document shall set the HCI_VERSION parameter if provided to '01'.

NOTE 2: Development of test cases for RQ1 is FFS.

NOTE 3: RQ2 is not tested within this clause, as the registry contains no writeable parameters which can be used to test the persistence of the registry.

NOTE 4: RQ3 is also covered in clause 4.3 of TS 102 622 [1], covered by clause 5.1.3 of the present document. This RQ is therefore not tested within this clause, as it is effectively tested in clause 5.1.3.

5.4.2.3.1.2 Test case 1: registry parameters

5.4.2.3.1.2.1 Test execution

The test procedure shall be executed for each of the parameters in the following table:

Registry parameter (designated REG_PARAM)	**Presence**	**Expected value** (designated VALUE)	**Value to be used in ANY_SET_PARAMETER** (designated VALUE_SET)	**RQ to be checked in steps 2 and 6**	**RQ to be checked in step 4**
VERSION_SW	O	V_VERSION_SW	'01 01 01'	RQ4	RQ5
VERSION_HARD	O	V_VERSION_HARD	'01 01 01'	RQ6	RQ7
VERSION_NAME	O	V_VERSION_NAME	'56 65 6E 64 6F 72'	RQ8	RQ9
MODEL_ID	O	V_MODEL_ID	'01'	RQ10	RQ11
HCI_VERSION	O	V_HCI_VERSION	'01'	RQ15	RQ12
GATES_LIST	M	V_GATES_LIST	'04 05'	RQ13	RQ14

5.4.2.3.1.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- A pipe (PIPE_ID_MAN) has been created to the host's identity management gate, and is open.

5.4.2.3.1.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ANY_GET_PARAMETER(REG_PARAM) on PIPE_ID_MAN.	
2	HUT → HCS	If REG_PARAM is supported by the device under test as indicated in table 4.3, send ANY_OK with parameter value equal to VALUE. If REG_PARAM is not supported by the device under test as indicated in table 4.3, send response containing an allowed error response code for the command.	See test execution clause
3	HCS → HUT	Send ANY_SET_PARAMETER(REG_PARAM, VALUE_SET) on PIPE_ID_MAN.	
4	HUT → HCS	Send response containing an allowed error response code for the command.	See test execution clause
5	HCS → HUT	Send ANY_GET_PARAMETER(REG_PARAM) on PIPE_ID_MAN.	
6	HUT → HCS	If REG_PARAM is supported by the device under test as indicated in table 4.3, send ANY_OK with parameter value equal to VALUE. If REG_PARAM is not supported by the device under test as indicated in table 4.3, send response containing an allowed error response code for the command.	See test execution clause

5.4.2.3.2 Remote registry

5.4.2.3.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 7.1.3.

NOTE 1: This clause covers the conformance requirements contained within TS 102 622 [1], clause 7.1.3 for the remote registry. The requirements for the local registry are contained in clause 5.4.2.3.1.

RQ1	The host shall adhere to the access condition of RO for VERSION_SW in the host controller.
RQ2	The host shall adhere to the access condition of RO for VERSION_HARD in the host controller.
RQ3	The host shall adhere to the access condition of RO for VERSION_NAME in the host controller.
RQ4	The host shall adhere to the access condition of RO for MODEL_ID in the host controller.
RQ5	The host shall adhere to the access condition of RO for HCI_VERSION in the host controller.
RQ6	The host shall adhere to the access condition of RO for GATES_LIST in the host controller.
RQ7	Every host shall manage backward compatibility with previous HCI versions and use only commands and parameters defined in the specification having the lower HCI version number between of the 2 hosts involved in a transaction.
RQ8	A host connected to a host with higher HCI version number shall operate according to its own version.

NOTE 2: RQ1, RQ2, RQ3, RQ4, RQ5 and RQ6 are not tested, as they are non-occurrence RQs.

NOTE 3: In the current version of the present document, there are no previous HCI versions. RQ7 is therefore not tested in the current version of the present document.

NOTE 4: Development of test cases for RQ8 is FFS.

5.4.2.4 Loop back gate

5.4.2.4.1 Conformance requirements

Reference: TS 102 622 [1], clauses 7.1.4 and 4.5.

RQ1	4.5	Registry parameters which are in the range of '00' to 'EF' but which are not allocated in TS 102 622 [1] shall not be present in the registry.

NOTE: Development of test cases for RQ1 is FFS.

5.4.3 Generic gates

Reference: TS 102 622 [1], clause 7.2.

There are no conformance requirements for the UICC for the referenced clause.

5.5 HCI procedures

5.5.1 Pipe management

5.5.1.1 Pipe creation

5.5.1.1.1 Conformance requirements

Reference: TS 102 622 [1], clauses 8.1.1, 6.1.3.1 and 6.1.3.2.

RQ1	6.1.3.1	When a host sends an ADM_CREATE_PIPE command, the command parameters shall be 3 bytes long, and contain valid G_{ID}s and H_{ID}.
RQ2	6.1.3.2	When a host receives an ADM_NOTIFY_PIPE_CREATED command, it shall respond with ANY_OK with no parameters if it accepts the pipe.
RQ3	6.1.3.2	If a host receives an ADM_NOTIFY_PIPE_CREATED command containing a destination H_{ID} which is not the H_{ID} of the host, it shall reject the pipe creation.
RQ4	8.1.1	If host B does not accept the creation of the pipe, it shall respond to ADM_NOTIFY_PIPE_CREATED with an appropriate response code.

5.5.1.1.2 Test case 1: ADM_CREATE_PIPE

5.5.1.1.2.1 Test execution

5.5.1.1.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.5.1.1.2.3 Test procedure

Step	Direction	Description	RQ
1	User → HUT	Trigger the host to create a pipe.	
2	HUT → HCS	Send ADM_CREATE_PIPE on $PIPE_1$; designate the created pipe PIPE_ID_MAN.	RQ1
3	HCS → HUT	Send ANY_OK with valid response parameters.	
4	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_ID_MAN.	
5	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ1

5.5.1.1.3 Test case 2: ADM_NOTIFY_PIPE_CREATED from host controller

5.5.1.1.3.1 Test execution

5.5.1.1.3.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.5.1.1.3.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source G_{ID} '01' and destination G_{ID} of the loop back gate; designate the create pipe PIPE_LOOP_BACK.	
2	HUT → HCS	Send ANY_OK with no parameters.	RQ2
3	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_LOOP_BACK.	
4	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ2
5	HCS → HUT	Send EVT_POST_DATA containing '01 02 03 04' on PIPE_LOOP_BACK.	
6	HUT → HCS	Send EVT_POST_DATA containing '01 02 03 04' on PIPE_LOOP_BACK.	RQ2

5.5.1.1.4 Test case 3: ADM_NOTIFY_PIPE_CREATED from other host

5.5.1.1.4.1 Test execution

5.5.1.1.4.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.5.1.1.4.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$ with source H_{ID} equal to a value in the WHITELIST of the host, source G_{ID} = '01' and destination G_{ID} = G_{ID} of the loop back gate; designate the created pipe PIPE_LOOP_BACK.	
2	HUT → HCS	Send ANY_OK with no parameters.	RQ2
3	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_LOOP_BACK.	
4	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ2
5	HCS → HUT	Send EVT_POST_DATA containing '01 02 03 04' on PIPE_LOOP_BACK.	
6	HUT → HCS	Send EVT_POST_DATA containing '01 02 03 04' on PIPE_LOOP_BACK.	RQ2

5.5.1.1.5 Test case 4: ADM_NOTIFY_PIPE_CREATED with incorrect destination H_{ID}

5.5.1.1.5.1 Test execution

5.5.1.1.5.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.5.1.1.5.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$ with destination H_{ID} equal to a proprietary H_{ID} according to table 1 of TS 102 622 [1] but which is not equal to the H_{ID} of the host, with source G_{ID} = '01' and destination G_{ID} = G_{ID} of the loop back gate.	
2	HUT → HCS	Send response containing an allowed error response code for the command.	RQ3

5.5.1.1.6 Test case 5: unsuccessful ADM_NOTIFY_PIPE_CREATED

5.5.1.1.6.1 Test execution

Assignment of terms to entities referenced in SR5: G_{ID} of gate = GATE_UNSUPPORTED.

5.5.1.1.6.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.5.1.1.6.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source G_{ID} = '01' and destination G_{ID} equal to GATE_UNSUPPORTED.	
2	HUT → HCS	Send response containing an allowed error response code for the command.	RQ4

5.5.1.2 Pipe deletion

5.5.1.2.1 Conformance requirements

Reference: TS 102 622 [1], clauses 8.1.2, 6.1.3.3 and 6.1.3.4.

RQ1	6.1.3.3	When a host sends an ADM_DELETE_PIPE command, the command parameters shall be 1 byte long.
RQ2	6.1.3.3	When a host sends an ADM_DELETE_PIPE command, the host that requested the deletion of the pipe shall be the source host or destination host.
RQ3	6.1.3.4	When a host receives a valid ADM_NOTIFY_PIPE_DELETED command, it shall respond with ANY_OK with no parameters.

NOTE: RQ2 is not tested, as it is a non-occurrence RQ.

5.5.1.2.2 Test case 1: sending ADM_DELETE_PIPE

5.5.1.2.2.1 Test execution

5.5.1.2.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.
- A pipe (PIPE_LOOP_BACK) has been created to the host's loop back gate, and is open.

5.5.1.2.2.3 Test procedure

Step	Direction	Description	RQ
1	User → HUT	Trigger the host to send ADM_DELETE_PIPE on $PIPE_1$ to delete PIPE_LOOP_BACK.	
2	HUT → HCS	Send ADM_DELETE_PIPE on $PIPE_1$, with parameter value of length 1 and equal to PIPE_LOOP_BACK.	RQ1
3	HCS → HUT	Send ANY_OK.	
4	HCS → HUT	Send EVT_POST_DATA containing '01 02 03 04' on PIPE_LOOP_BACK.	
5	HUT → HCS	No messages on PIPE_LOOP_BACK.	RQ1
6	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_LOOP_BACK.	
7	HUT → HCS	Send no response, or a response containing an allowed error response code for the command.	RQ1

5.5.1.2.3 Test case 2: receiving ADM_NOTIFY_PIPE_DELETED

5.5.1.2.3.1 Test execution

5.5.1.2.3.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.
- A pipe (PIPE_LOOP_BACK) has been created to the host's loop back gate, and is open.

5.5.1.2.3.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_ NOTIFY_PIPE_DELETED on $PIPE_1$, with parameter value of length 1 and equal to PIPE_LOOP_BACK.	
2	HUT → HCS	Send ANY_OK.	RQ3
3	HCS → HUT	Send EVT_POST_DATA containing '01 02 03 04' on PIPE_LOOP_BACK.	
4	HUT → HCS	No messages on PIPE_LOOP_BACK.	RQ3
5	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_LOOP_BACK.	
6	HUT → HCS	Send no response, or a response containing an allowed error response code for the command.	RQ3

5.5.1.3 Clear all Pipes

5.5.1.3.1 Conformance requirements

Reference: TS 102 622 [1], clauses 8.1.3, 6.1.3.5 and 6.1.3.6.

RQ1	6.1.3.5	When the host sends an ADM_CLEAR_ALL_PIPE command and the data link layer specified in TS 102 613 [2] is used, the command parameters shall be two bytes long.
RQ2	6.1.3.5	When the data link layer specified in TS 102 613 [2] is used, the identity reference data in the ADM_CLEAR_ALL_PIPE command shall contain random elements.
RQ3	6.1.3.5	When the host receives ANY_OK in response to an ADM_CLEAR_ALL_PIPE command, it shall consider that all dynamic pipes connected to it are deleted, all static pipes connected to it are closed, and all registry values related to static pipes connected to it are set to their default values.
RQ4	6.1.3.6	When the host receives a valid ADM_NOTIFY_ALL_PIPE_CLEARED command, and the requesting host is not the host controller, the host shall consider all dynamic pipes between the host and the requesting host to be deleted.
RQ5	6.1.3.6	When the host receives a valid ADM_NOTIFY_ALL_PIPE_CLEARED command, and the requesting host is the host controller, the host shall consider all dynamic pipes between the host controller and the host to be deleted, and all static pipes between the host and the host controller to be closed.
RQ6	6.1.3.6	The host shall respond to an ADM_NOTIFY_ALL_PIPE_CLEARED command with an ANY_OK without parameters.

NOTE: Development of test cases for RQ4, RQ5 and RQ6 is FFS.

5.5.1.3.2 Test case 1: ADM_CLEAR_ALL_PIPE for data link layer specified in TS 102 613

5.5.1.3.2.1 Test execution

Run this test procedure in full power mode only.

5.5.1.3.2.2 Initial conditions

- The host is not powered up.

5.5.1.3.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Power up host; behave as if lower layer identity check has failed (i.e. enter inhibited state).	
2	HUT → HCS	Send ADM_CLEAR_ALL_PIPE on $PIPE_1$, with a parameter value of length 2 bytes (see note).	RQ1
3	HCS → HUT	Send ANY_OK.	
4	HCS	Wait for HCI session initialization to be completed, and for the HCI interface to be idle; i.e. no further communication is expected.	
5		Execute steps 7 to 11 ten times.	
6	HCS → HUT	Power down host.	
7	HCS → HUT	Power up host; behave as if lower layer identity check has failed (i.e. enter inhibited state).	
8	HUT → HCS	Send ADM_CLEAR_ALL_PIPE on $PIPE_1$, with a parameter value of length 2 bytes, and with a value different from any value previously sent by the host in the test procedure (see note).	RQ2
9	HCS → HUT	Send ANY_OK.	
NOTE: Other commands may be sent prior to the ADM_CLEAR_ALL_PIPE command.			

5.5.1.3.3 Test case 2: ADM_CLEAR_ALL_PIPE - static pipes, dynamic pipes to host controller

5.5.1.3.3.1 Test execution

Run this test procedure in full power mode only.

5.5.1.3.3.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.
- A pipe (PIPE_LOOP_BACK) has been created to the host's loop back gate, and is open.

5.5.1.3.3.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Power down host.	
2	HCS → HUT	Power up host; behave as if lower layer identity check has failed (i.e. enter inhibited state).	
3	HUT → HCS	Send ADM_CLEAR_ALL_PIPE on $PIPE_1$; parameter value is not checked (see note 1).	
4	HCS → HUT	Send ANY_OK.	
5	HUT → HCS	Send ANY_OPEN_PIPE on $PIPE_1$.	RQ3
6	HCS → HUT	Send ANY_OK.	
7	HCS	See note 2.	
8	HCS → HUT	Send EVT_POST_DATA containing '01 02 03 04' on PIPE_LOOP_BACK.	
9	HUT → HCS	No messages on PIPE_LOOP_BACK.	RQ3
10	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_LOOP_BACK.	
11	HUT → HCS	Send no response, or a response containing an allowed error response code for the command.	RQ3
NOTE 1: Other commands may be sent prior to the ADM_CLEAR_ALL_PIPE command. NOTE 2: The host controller simulator shall not use PIPE_LOOP_BACK for any subsequent pipe creation.			

5.5.1.3.4 Test case 3: ADM_CLEAR_ALL_PIPE - dynamic pipes to other host

5.5.1.3.4.1 Test execution

Run this test procedure in full power mode only.

5.5.1.3.4.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.
- A pipe (PIPE_LOOP_BACK) has been created from gate '01' on a host whose H_{ID} is in the WHITELIST of the host to the host's loop back gate, and is open.

5.5.1.3.4.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Power down host.	
2	HCS → HUT	Power up host; behave as if lower layer identity check has failed (i.e. enter inhibited state).	
3	HUT → HCS	Send ADM_CLEAR_ALL_PIPE on $PIPE_1$; parameter value is not checked (see note 1).	
4	HCS → HUT	Send ANY_OK.	
5	HCS	See note 2.	
6	HCS → HUT	Send EVT_POST_DATA containing '01 02 03 04' on PIPE_LOOP_BACK.	
7	HUT → HCS	No messages on PIPE_LOOP_BACK.	RQ3
8	HCS → HUT	Send ANY_OPEN_PIPE on PIPE_LOOP_BACK.	
9	HUT → HCS	Send no response, or a response containing an allowed error response code for the command.	RQ3
NOTE 1: Other commands may be sent prior to the ADM_CLEAR_ALL_PIPE command. NOTE 2: The host controller simulator shall not use PIPE_LOOP_BACK for any subsequent pipe creation.			

5.5.1.3.5 Test case 4: ADM_CLEAR_ALL_PIPE - registry parameters

5.5.1.3.5.1 Test execution

5.5.1.3.5.2 Initial conditions

- REC_ERROR in the registry of the host for $PIPE_0$ has a value which is different from the default value.
- The host is not powered up.

5.5.1.3.5.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Power up host; behave as if lower layer identity check has failed (i.e. enter inhibited state).	
2	HUT → HCS	Send ADM_CLEAR_ALL_PIPE on $PIPE_1$; parameter value is not checked (see note 1).	
3	HCS → HUT	Send ANY_OK.	
4	HCS → HUT	Send ANY_OPEN_PIPE on $PIPE_0$.	
5	HUT → HCS	Send ANY_OK (parameters are not checked).	
6	HCS → HUT	Send ANY_GET_PARAMETER(REC_ERROR) on $PIPE_0$.	
7	HUT → HCS	Send ANY_OK with parameter value '0000' (see note 2).	RQ3
NOTE 1: Other commands may be sent prior to the ADM_CLEAR_ALL_PIPE command. NOTE 2: This assumes that the HCI session initialization procedure has not resulted in any errors at the data link layer which would result in the incrementing of REC_ERROR.			

5.5.2 Registry access

Reference: TS 102 622 [1], clause 8.2.

There are no new conformance requirements for the UICC for the referenced clause.

5.5.3 Host and Gate discovery

Reference: TS 102 622 [1], clause 8.3.

There are no conformance requirements for the UICC for the referenced clause.

5.5.4 Session initialization

5.5.4.1 Conformance requirements

Reference: TS 102 622 [1], clause 8.4.

RQ1	The Host shall perform session initialization only if no contactless transaction is pending at startup (e.g. after power up in full-power mode as defined in TS 102 613 [2]).
RQ2	If the data link layer specified in TS 102 613 [2] is being used, then after power up in full-power mode, the host shall perform session initialization.
RQ3	If the returned value of SESSION_IDENTITY equals the previous value stored in the host, the host shall stop the session initialization procedure.
RQ4	If the returned value of SESSION_IDENTITY does not equal the previous value stored in the host, the host needs to reinitialize and it requests the host controller to clear all pipes.
RQ5	In the context of RQ4, after performing any further initializations, the host generates a new session identity and stores its value and stores it in the host controller registry.

NOTE: RQ1 is not tested in this clause, as the only circumstances where no contactless transaction is pending at startup which are defined after power up in full-power mode as defined in TS 102 613 [2], which is dealt with in RQ2.

5.5.4.2 Test case 1: SESSION_IDENTITY not changed

5.5.4.2.1 Test execution

Run this test procedure in full power mode only.

5.5.4.2.2 Initial conditions

- The host is not powered up.

5.5.4.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Power up host.	
2	HUT → HCS	Send ANY_GET_PARAMETER(SESSION_IDENTITY) on $PIPE_1$ (see note).	
3	HCS → HUT	Send ANY_OK with SESSION_IDENTITY.	
4	HUT → ← HCS	Wait for any HCI session initialization to complete.	
5	HCS → HUT	Power down host.	
6	HCS → HUT	Power up host.	
7	HUT → HCS	Send ANY_GET_PARAMETER(SESSION_IDENTITY) on $PIPE_1$ (see note).	RQ2
8	HCS → HUT	Send ANY_OK with the same value of SESSION_IDENTITY as in step 3.	
9	HUT → HCS	Do not send ADM_CLEAR_ALL_PIPE or ANY_SET_PARAMETER(SESSION_IDENTITY).	RQ3
NOTE: Other commands may be sent prior to the ANY_GET_PARAMETER command.			

5.5.4.3 Test case 2: SESSION_IDENTITY changed

5.5.4.3.1 Test execution

Run this test procedure in full power mode only.

5.5.4.3.2 Initial conditions

- The host is not powered up.

5.5.4.3.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Power up host; behave as if lower layer identity check has failed (i.e. enter inhibited state).	
2	HUT → HCS	Send ANY_GET_PARAMETER(SESSION_IDENTITY) on $PIPE_1$ (see note 1).	RQ2
3	HCS → HUT	Send ANY_OK with the value of SESSION_IDENTITY.	
4	HUT → HCS	Send ADM_CLEAR_ALL_PIPE on $PIPE_1$; parameter value is not checked (see note 2)	RQ4
5	HCS → HUT	Send ANY_OK.	
6	HUT → HCS	Send ANY_SET_PARAMETER(SESSION_IDENTITY) on $PIPE_1$ with a different value from that previously used by the host (see note 1).	RQ5
7	HCS → HUT	Send ANY_OK.	
NOTE 1: Other commands may be sent prior to the ANY_GET_PARAMETER command. NOTE 2: other commands may be sent prior to the ADM_CLEAR_ALL_PIPE command.			

5.5.5 Loop back testing

5.5.5.1 Conformance requirements

Reference: TS 102 622 [1], clause 8.5.

RQ1	A host shall accept the creation of a pipe to its loop back gate from any gate in another host.
RQ2	When a host receives the event EVT_POST_DATA on a pipe connected to its loop back gate, it shall send back the event EVT_POST_DATA with same data as received in the received EVT_POST_DATA.
RQ3	The loopback gate shall support at least all messages with size up to 250 bytes.

5.5.5.2 Test case 1: pipe creation from host controller

5.5.5.2.1 Test execution

The test procedure shall be executed once for each of following parameters:

- Source G_{ID} values of: '00', '03', '05', '10', 'AA', 'FF'.

5.5.5.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.5.5.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source G_{ID} as specified and destination G_{ID} = G_{ID} of loop back gate.	
2	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ1

5.5.5.3 Test case 2: pipe creation from another host

5.5.5.2.1 Test execution

The test procedure shall be executed once for each of following parameters:

- Source G_{ID} values of: '00', '03', '05', '10', 'AA', 'FF'.

5.5.5.2.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- $PIPE_1$ is open.

5.5.5.2.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send ADM_NOTIFY_PIPE_CREATED on $PIPE_1$, with source H_{ID} equal to the H_{ID} contained in the host's WHITELIST, source G_{ID} as specified and destination G_{ID} = G_{ID} of loop back gate.	
2	HUT → HCS	Send ANY_OK (parameters are not checked).	RQ1

5.5.5.4 Test case 3: processing of EVT_POST_DATA

5.5.5.4.1 Test execution

The test procedure shall be executed once for each of following parameters:

- EVT_POST_DATA data sizes of: 1 byte, 100 bytes, 250 bytes.

5.5.5.4.2 Initial conditions

- The HCI interface is idle; i.e. no further communication is expected.
- A pipe (PIPE_LOOP_BACK) has been created to the host's loop back gate, and is open.

5.5.5.4.3 Test procedure

Step	Direction	Description	RQ
1	HCS → HUT	Send EVT_POST_DATA on PIPE_LOOP_BACK containing data of the specified size.	
2	HUT → HCS	Send EVT_POST_DATA on PIPE_LOOP_BACK containing the same data as in step 1.	RQ2, RQ3

5.6 Contactless card emulation

5.6.1 Overview

5.6.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.1.

RQ1	For each card RF gate it wants to use, the host has one card application gate.
RQ2	For the contactless platform for card emulation mode the pipes to card RF gates shall be created, opened, closed and deleted by the host.
RQ3	The host shall not create more than one pipe to each RF gate.

NOTE: Development of test cases for above listed RQs is FFS.

5.6.2 Void

Reference: TS 102 622 [1], clause 9.2.

There are no conformance requirements for the UICC for the referenced clause.

5.6.3 Gates

5.6.3.1 Void

Reference: TS 102 622 [1], clause 9.3.1.

There are no conformance requirements for the UICC for the referenced clause.

5.6.3.2 Identity management gate

5.6.3.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.3.2.

RQ1	The host shall adhere to the access condition of RO for LOW_POWER_SUPPORT.

NOTE: Development of test cases for above listed RQs is FFS.

5.6.3.3 Card RF gates

5.6.3.3.1 Overview

Reference: TS 102 622 [1], clause 9.3.3.1.

There are no conformance requirements for the UICC for the referenced clause.

5.6.3.3.2 Commands

5.6.3.3.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.3.3.2.

There are no conformance requirements for the UICC for the referenced clause.

5.6.3.3.3 Events and subclauses

5.6.3.3.3.1 Events

5.6.3.3.3.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.3.3.3.

There are no conformance requirements for the UICC for the referenced clause.

5.6.3.3.3.2 EVT_SEND_DATA

Reference: TS 102 622 [1], clause 9.3.3.3.1.

There are no conformance requirements for the UICC for the referenced clause.

5.6.3.3.4 Registry and subclauses

5.6.3.3.4.1 Registry

5.6.3.3.4.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.3.3.4.

There are no conformance requirements for the UICC for the referenced clause.

5.6.3.3.4.2 RF technology type A

5.6.3.3.4.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.3.3.4.1.

RQ1	The host shall only set values of MODE of 'FF' and '02'.
RQ2	The host shall only set values of UID_REG with length 0, 4, 7 or 10.
RQ3	The host shall adhere to the access condition of WO for UID_REG.
RQ4	The host shall only set values of CID_SUPPORT with value '00' or '01'.
RQ5	The host shall adhere to the access condition of RO for CLT_SUPPORT.
RQ6	The host shall only set values of DATARATE_MAX which codes maximum divisor supported with coding as specified in TS 102 622 [1].

NOTE 1: The conformance to ISO/IEC 14443-3 [4] and ISO/IEC 14443-4 [5] of the values written by the host is out of scope of the present document.

NOTE 2: Development of test cases for above listed RQs is FFS.

5.6.3.3.4.3 RF technology type B

5.6.3.3.4.3.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.3.3.4.2.

RQ1	The host shall only set values of MODE of 'FF' and '02'.
RQ2	The host shall only set values of PUPI_REG with length 0 or 4.
RQ3	The host shall adhere to the access condition of WO for PUPI_REG.
RQ4	The host shall only set values of ATQB with length 4.
RQ5	The host shall only set values of DATARATE_MAX which codes maximum bit rates supported with coding as specified in TS 102 622 [1].

NOTE 1: The conformance to ISO/IEC 14443-3 [4] and ISO/IEC 14443-4 [5] of the values written by the host is out of scope of the present document.

NOTE 2: Development of test cases for above listed RQs is FFS.

5.6.3.3.4.4 RF technology type B'

5.6.3.3.4.4.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.3.3.4.3.

NOTE: Since this technology is not publicly disclosed, no conformance requirements have been established.

5.6.3.3.4.5 RF technology Type F (ISO18092 212 kbps/424 kbps card emulation only)

5.6.3.3.4.5.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.3.3.4.4.

RQ1	The host shall only set values of MODE of 'FF' and '02'.
RQ2	The host shall adhere to the access condition of RO for SPEED_CAP.
RQ3	The host shall adhere to the access condition of RO for CLT_SUPPORT.

NOTE: Development of test cases for above listed RQs is FFS.

5.6.3.4 Card application gates

5.6.3.4.1 Overview

Reference: TS 102 622 [1], clause 9.3.4.1.

There are no conformance requirements for the UICC for the referenced clause.

5.6.3.4.2 Commands

5.6.3.4.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.3.4.2.

There are no conformance requirements for the UICC for the referenced clause.

5.6.3.4.3 Events and subclauses

5.6.3.4.3.1 Events

5.6.3.4.3.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.3.4.3.

RQ1	Each card application gate shall support all events as listed.

NOTE: Development of test cases for above listed RQs is FFS.

5.6.3.4.3.2 EVT_FIELD_ON

5.6.3.4.3.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.3.4.3.1.

There are no conformance requirements for the UICC for the referenced clause (usage of this event is described in clause 9.4 of TS 102 622 [1]).

5.6.3.4.3.3 EVT_CARD_DEACTIVATED

5.6.3.4.3.3.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.3.4.3.2.

There are no conformance requirements for the UICC for the referenced clause (usage of this event is described in clause 9.4 of TS 102 622 [1]).

5.6.3.4.3.4 EVT_CARD_ACTIVATED

5.6.3.4.3.4.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.3.4.3.3.

There are no conformance requirements for the UICC for the referenced clause (usage of this event is described in clause 9.4 of TS 102 622 [1]).

5.6.3.4.3.5 EVT_FIELD_OFF

5.6.3.4.3.5.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.3.4.3.4.

There are no conformance requirements for the UICC for the referenced clause (usage of this event is described in clause 9.4 of TS 102 622 [1]).

5.6.3.4.3.6 EVT_SEND_DATA

5.6.3.4.3.6.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.3.4.3.5.

RQ1	On receiving EVT_SEND_DATA the host shall interpret the last parameter byte as RF error indicator.

NOTE: Development of test cases for above listed RQs is FFS.

5.6.3.4.4 Registry

5.6.3.4.4.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.3.4.4.

RQ1	Registry parameters which are in the range reserved for usage by TS 102 622 [1] but which are not defined in TS 102 622 [1] shall not be present in the registry.

NOTE: Development of test cases for above listed RQs is FFS.

5.6.4 Procedures

5.6.4.1 Use of contactless card application

5.6.4.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.4.1.

RQ1	In the context of a valid contactless card application sequence as specified in TS 102 622 [1], the host shall reply to received C-APDUs contained in EVT_SEND_DATAs by sending the R-APDUs contained in EVT_SEND_DATAs to the card RF gate.
RQ2	The host shall accept an EVT_FIELD_OFF which is received at any time during the sequence.

NOTE: Development of test cases for above listed RQs is FFS.

5.6.4.2 Non ISO/IEC 14443-4 type A

5.6.4.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.4.2.

RQ1	In the context of a valid contactless card application sequence as specified in TS 102 622 [1], the host shall perform communications using the CLT mode as defined in TS 102 613 [2].
RQ2	The host shall accept an EVT_FIELD_OFF which is received at any time during the sequence.

NOTE: Development of test cases for above listed RQs is FFS.

5.6.4.3 Type B' RF technology

5.6.4.3.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.4.3.

NOTE: Since this technology is not publicly disclosed, no conformance requirements have been established.

5.6.4.4 Type F RF technology

5.6.4.4.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.4.4.

RQ1	In the context of a valid contactless card application sequence as specified in TS 102 622 [1], and In case SWP as defined in TS 102 613 [2] is used as a data link layer, the initialization data exchange is performed using CLT as defined in TS 102 613 [2]
RQ2	In the context of a valid contactless card application sequence as specified in TS 102 622 [1], the host shall reply to received ISO/IEC 18092 [3] 212 kbps/424 kbps frames contained in EVT_SEND_DATAs by sending the ISO/IEC 18092 [3] 212 kbps/424 kbps frames contained in EVT_SEND_DATAs to the card RF gate.
RQ3	The host shall accept an EVT_FIELD_OFF which is received at any time during the sequence.

NOTE: Development of test cases for above listed RQs is FFS.

5.6.4.5 Update RF technology settings

5.6.4.5.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.4.5.

There are no conformance requirements for the UICC for the referenced clause.

5.6.4.6 Identity check

5.6.4.6.1 Conformance requirements

Reference: TS 102 622 [1], clause 9.4.6.

There are no conformance requirements for the UICC for the referenced clause.

5.7 Contactless reader

5.7.1 Overview

5.7.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 10.1.

RQ1	For each reader RF gate it wants to use, the host has one reader application gate.
RQ2	The host shall not create more than one pipe to each reader RF gate.

NOTE: Development of test cases for above listed RQs is FFS.

5.7.2 Reader RF gates

5.7.2.1 Overview

Reference: TS 102 622 [1], clause 10.2.1.

There are no conformance requirements for the UICC for the referenced clause.

5.7.2.2 Command

5.7.2.2.1 WR_XCHG_DATA

5.7.2.2.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 10.2.2.1.

RQ1	The host shall have at least one byte in parameter of WR_XCHG_DATA.
RQ2	In the CTR field of WR_XCHG_DATA, bit b8 to b6 shall set to 0.
RQ3	In the CTR field of WR_XCHG_DATA, if bit b5 is set to one, the host shall use timeout value between 0 and 14.
RQ4	On receiving value '00' of RF error indicator, the host shall interpret the received data having no error.
RQ5	On receiving value '01' of RF error indicator, the host shall interpret the received data having an error.

NOTE: Development of test cases for above listed RQs is FFS.

5.7.2.3 Registries

5.7.2.3.1 Type A reader RF gate

5.7.2.3.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 10.2.3.1.

RQ1	The host shall adhere to the access condition of RO for UID.
RQ2	The host shall adhere to the access condition of RO for ATQA.
RQ3	The host shall adhere to the access condition of RO for APPLICATION_DATA.
RQ4	The host shall adhere to the access condition of RO for SAK.
RQ5	The host shall adhere to the access condition of RO for FWI, SFGT.
RQ6	The host shall only set values of DATARATE_MAX as specified in TS 102 622 [1].

NOTE 1: Conformance to ISO/IEC 14443-3 [4] and ISO/IEC 14443-4 [5] of the values written by the host is out of scope of the present document.

NOTE 2: Development of test cases for above listed RQs is FFS.

5.7.2.3.2 Type B reader RF gate

5.7.2.3.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 10.2.3.2.

RQ1	The host shall adhere to the access condition of RO for PUPI.
RQ2	The host shall adhere to the access condition of RO for APPICATION_DATA.
RQ3	The host shall adhere to the access condition of RO for HIGHER_LAYER_RESPONSE.

NOTE 1: Conformance to ISO/IEC 14443-3 [4] and ISO/IEC 14443-4 [5] of the values written by the host is out of scope of the present document.

NOTE 2: Development of test cases for above listed RQs is FFS.

5.7.2.4 Events and subclauses

5.7.2.4.1 Events

5.7.2.4.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 10.2.4.

There are no conformance requirements for the UICC for the referenced clause.

5.7.2.4.2 EVT_READER_REQUESTED

5.7.2.4.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 10.2.4.1.

RQ1	When the host sends EVT_READER_REQUESTED, it shall contain no parameters.

NOTE: Development of test cases for above listed RQs is FFS.

5.7.2.4.3 EVT_END_OPERATION

5.7.2.4.3.1 Conformance requirements

Reference: TS 102 622 [1], clause 10.2.4.2.

There are no conformance requirements for the UICC for the referenced clause.

5.7.2.5 Responses

5.7.2.5.1 Conformance requirements

Reference: TS 102 622 [1], clause 10.2.5.

There are no conformance requirements for the UICC for the referenced clause.

5.7.3 Reader application gates

5.7.3.1 Overview

Reference: TS 102 622 [1], clause 10.3.1.

There are no conformance requirements for the UICC for the referenced clause.

5.7.3.2 Command

5.7.3.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 10.3.2.

There are no conformance requirements for the UICC for the referenced clause.

5.7.3.3 Registry

5.7.3.3.1 Conformance requirements

Reference: TS 102 622 [1], clause 10.3.3.

RQ1	Registry parameters which are in the range reserved for usage by TS 102 622 [1] but which are not defined in TS 102 622 [1] shall not be present in the registry.

NOTE: Development of test cases for above listed RQs is FFS.

5.7.3.4 Events and subclauses

5.7.3.4.1 Events

5.7.3.4.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 10.3.4.

RQ1	The reader application gates support the event name EVT_TARGET_DISCOVERED.

NOTE: Development of test cases for above listed RQs is FFS.

5.7.3.4.2 EVT_TARGET_DISCOVERED

5.7.3.4.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 10.3.4.1.

There are no conformance requirements for the UICC for the referenced clause.

5.7.4 Procedures

5.7.4.1 Use of contactless reader application

5.7.4.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 10.4.1.

RQ1	The host shall send the EVT_READER_REQUESTED event on a single pipe only.
RQ2	In the context of a valid contactless reader application sequence as specified in TS 102 622 [1], the host shall only send WR_XCHG_DATA commands after receiving an EVT_TARGET_DISCOVERED event which indicates that there is a single target in the reader field.
RQ3	In the context of a valid contactless reader application sequence as specified in TS 102 622 [1], if the host receives an EVT_TARGET_DISCOVERED event which indicates that there are several targets in the field, the host shall not send WR_XCHG_DATA commands.
RQ4	If the host sends the EVT_END_OPERATION event, it shall send it on a single pipe only.
RQ5	In the context of a valid contactless reader application sequence as specified in TS 102 622 [1], if the host sends an EVT_END_OPERATION event, it shall not send further WR_XCHG_DATA commands until it has received a further EVT_TARGET_DISCOVERED event.

NOTE: Development of test cases for above listed RQs is FFS.

5.8 Connectivity

5.8.1 Overview

Reference: TS 102 622 [1], clause 11.1.

There are no conformance requirements for the Host for the referenced clause.

5.8.2 Connectivity gate and subclauses

5.8.2.1 Connectivity gate

Reference: TS 102 622 [1], clause 11.2.

There are no conformance requirements for the Host for the referenced clause.

5.8.2.2 Commands

5.8.2.2.1 PRO_HOST_REQUEST

5.8.2.2.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 11.2.1.1.

RQ1	The Host shall not try to interact with any other host except the host controller before receiving the response of PRO_HOST_REQUEST.
RQ2	The Host shall not try to interact with another host if the response of PRO_HOST_REQUEST is not ANY_OK.
RQ3	The Host shall not try to interact with the host after the expired activation duration time.
RQ4	The Host shall not put the host controller or the terminal host in the list of host identifiers.
RQ5	When the Host sends a PRO_HOST_REQUEST, it shall use at least 3 bytes parameters.

NOTE: Development of test cases for above listed RQs is FFS.

5.8.2.3 Events and subclauses

5.8.2.3.1 Events

Reference: TS 102 622 [1], clause 11.2.2.

There are no conformance requirements for the Host for the referenced clause.

5.8.2.3.2 EVT_CONNECTIVITY

5.8.2.3.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 11.2.2.1.

RQ1	When the Host sends EVT_CONNECTIVITY, it shall contain no parameters.

NOTE: Development of test cases for above listed RQs is FFS.

5.8.2.3.3 Void

Reference: TS 102 622 [1], clause 11.2.2.2.

There are no conformance requirements for the Host for the referenced clause.

5.8.2.3.4 EVT_OPERATION_ENDED

5.8.2.3.4.1 Conformance requirements

Reference: TS 102 622 [1], clause 11.2.2.3.

RQ1	When the Host send EVT_OPERATION_ENDED, it shall not contain parameters.
RQ2	The Host shall only EVT_OPERATION_ENDED in the context of a PRO_HOST_REQUEST command.

NOTE: Development of test cases for above listed RQs is FFS.

5.8.2.3.5 EVT_TRANSACTION

5.8.2.3.5.1 Conformance requirements

Reference: TS 102 622 [1], clause 11.2.2.4.

RQ1	When the Host sends the EVT_TRANSACTION, it shall use BER-TLV parameters as defined in TS 102 622 [1].

NOTE: Development of test cases for above listed RQs is FFS.

5.8.2.4 Registry

5.8.2.4.1 Conformance requirements

Reference: TS 102 622 [1], clause 11.2.3.

RQ1	Registry parameters which are in the range reserved for usage by TS 102 622 [1] but which are not defined in TS 102 622 [1] shall not be present in the registry.

NOTE: Development of test cases for above listed RQs is FFS.

5.8.3 Connectivity application gate and subclauses

5.8.3.1 Connectivity application gate

5.8.3.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 11.3.

There are no conformance requirements for the Host for the referenced clause.

5.8.3.2 Commands

5.8.3.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 11.3.1.

There are no conformance requirements for the Host for the referenced clause.

5.8.3.3 Events and subclauses

5.8.3.3.1 Events

5.8.3.3.1.1 Conformance requirements

Reference: TS 102 622 [1], clause 11.3.2.

There are no conformance requirements for the Host for the referenced clause.

5.8.3.3.2 EVT_STANDBY

5.8.3.3.2.1 Conformance requirements

Reference: TS 102 622 [1], clause 11.3.2.1.

RQ1	When the Host receives the EVT_STANDBY, it shall stop any ongoing communication with the other hosts and the host controller within 100 ms.

NOTE: Development of test cases for above listed RQs is FFS.

5.8.3.4 Registry

5.8.3.4.1 Conformance requirements

Reference: TS 102 622 [1], clause 11.3.3.

There are no conformance requirements for the Host for the referenced clause.

5.8.4 Procedures

5.8.4.1 Use of connectivity gate

Reference: TS 102 622 [1], clause 11.4.1.

There are no conformance requirements for the Host for the referenced clause.

Annex A (informative): Change history

The table below indicates all changes that have been incorporated into the present document since it was placed under change control.

Change history								
Date	**Meeting**	**Plenary Doc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**Old**	**New**
2009-07	SCP#42	SCP-090256				Creation of the specification	2.2.0	7.0.0
2010-03	SCP#44	SCP(10)0012	001	-	F	Change of allowed response to command on deleted pipe	7.0.0	7.1.0
2010-03	SCP#44	SCP(10)0012	002	-	F	Change of response to ANY_OPEN_PIPE after pipe created	7.0.0	7.1.0
2010-03	SCP#44	SCP(10)0012	003	-	F	Change of response to ANY_OPEN_PIPE after pipe created	7.0.0	7.1.0
2010-03	SCP#44	SCP(10)0012	004	-	F	Correction of UICC reaction to event sent on closed pipe	7.0.0	7.1.0
2010-03	SCP#44	SCP(10)0012	005	-	F	Remove the step " Change locally stored value of SESSION_IDENTITY" from the related test cases.	7.0.0	7.1.0
2010-07	SCP #45	SCP(10)0121	006	-	F	Correction of test cases 5.4.1.2 applicability	7.1.0	7.2.0
2010-07	SCP #45	SCP(10)0193	007	1	F	Definition of the network's initial state	7.1.0	7.2.0

History

Document history		
V7.0.0	October 2009	Publication
V7.1.0	April 2010	Publication
V7.2.0	October 2010	Publication