

# ETSI TS 102 486-2-3 V1.2.1 (2008-10)

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*Technical Specification*

**Intelligent Transport Systems (ITS);  
Road Transport and Traffic Telematics (RTTT);  
Test specifications for Dedicated Short  
Range Communication (DSRC) transmission equipment;  
Part 2: DSRC application layer;  
Sub-Part 3: Abstract Test Suite (ATS)  
and partial PIXIT proforma**

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Reference

RTS/ITS-0040010

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Keywords

ATS, ITS, DSRC, protocol, testing, TTCN, PIXIT

**ETSI**

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° 7803/88

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## Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Intelligent Transport System(ITS).

The present document is part 2, sub-part 3 of a multi-part deliverable covering Intelligent Transport Systems (ITS); Dedicated Short Range Communication (DSRC); Data Link Control (DLC) layer as identified below:

Part 1: "DSRC data link layer: medium access and logical link control";

**Part 2: "DSRC application layer":**

Sub-part 1: "Protocol Implementation Conformance Statement (PICS) proforma specification";

Sub-part 2: "Test Suite Structure and Test Purposes (TSS&TP)";

**Sub-part 3: "Abstract Test Suite (ATS) and partial PIXIT proforma".**

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# 1 Scope

The present document (TS) contains the Abstract Test Suite (ATS) and partial PIXIT proforma to test the Dedicated Short Range Communication (DSRC); Application layer.

The objective of the present document is to provide a basis for conformance tests for DSRC equipment giving a high probability of inter-operability between different manufacturer's equipment.

The ISO standard for the methodology of conformance testing (ISO/IEC 9646-1 [6], ISO/IEC 9646-2 [7] and ISO/IEC 9646-3 [8]) are used as a basis for the test methodology.

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# 2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
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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 indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

- [1] CEN EN 12834 (2003): "Road transport and traffic telematics - Dedicated Short Range Communication (DSRC) - DSRC application layer".
- [2] CEN EN 12795 (2003): "Road transport and traffic telematics - Dedicated Short Range Communication (DSRC) - DSRC data link layer: medium access and logical link control".
- [3] CEN EN 12253 (2003): "Road transport and traffic telematics - Dedicated short-range communication - Physical layer using microwave at 5,8 GHz".
- [4] CEN EN 13372 (2003): "Road transport and traffic telematics (RTTT) - Dedicated short-range communication - Profiles for RTTT".
- [5] ETSI ETS 300 406: "Methods for Testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

- [6] ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".
- [7] ISO/IEC 9646-2: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite Specification".
- [8] ISO/IEC 9646-3: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The Tree and Tabular Combined Notation (TTCN)".
- [9] ISO/IEC 9646-6: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 6: Protocol Profile Test Specification".
- [10] ISO/IEC 9646-7: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 7: Implementation Conformance statement".
- [11] ISO 14906:2004: "Road transport and traffic telematics -- Electronic fee collection -- Application interface definition for dedicated short-range communication".

## 2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

- [i.1] ETSI TS 102 178: "Broadband Radio Access Networks (BRAN); HiperMAN; Data Link Control (DLC) layer".

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## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in ISO/IEC 9646-7 [10], EN 12253 [3], EN 12834 [1] and EN 13372 [4] apply.

### 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in ISO/IEC 9646-1 [6], ISO/IEC 9646-6 [9], ISO/IEC 9646-7 [10], TS 102 178 [i.1], EN 12834 [1] and the following apply:

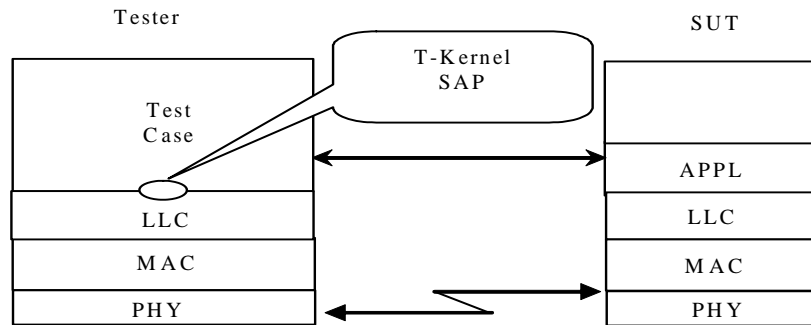
ASP	Abstract Service Primitive
ATM	Abstract Test Method
ATS	Abstract Test Suite
BI	Invalid Behaviour
BV	Valid Behaviour
CM	Co-ordination Message
IUT	Implementation Under Test
SAP	Service Access Point
SUT	System Under Test
TTCN	Tree and Tabular Combined Notation
UT	Upper Tester



## 4 Abstract Test Method (ATM)

This clause describes the ATM used to test the DSRC Application layer at the OBU side and at the RSU side.

### 4.1 Test architecture



**Figure 1: Test architecture for DSRC Application layer**

A single party testing concept is used, which consists of the following abstract testing parts:

- Tester:** A test machine that is running a TTCN engine allowing parallel testing and having a standard DSRC LLC, MAC and Physical layer.
- SUT:** System under test: Can be RSU or OBU Implementation.
- Test Case:** A standard TTCN test case.
- APPL:** A standard DSRC Application to be tested.
- LLC:** A standard DSRC LLC layer.
- MAC:** A standard DSRC MAC layer.
- T-Kernel-SAP:** A SAP between T-Kernel and B/I-Kernel, i.e. above T-Kernel encoding/decoding function.

## 5 Untestable Test Purposes (TP)

This clause gives a list of TPs which are not implemented in the Abstract Test Suites due to the chosen Abstract Test Method or other restrictions.

**Table 1: Untestable TPs**

Test purpose	Reason

## 6 ATS conventions

The ATS conventions are intended to give a better understanding of the ATS but they also describe the conventions made for the development of the ATS. These conventions shall be considered during any later maintenance or further development of the ATS.

The ATS conventions contain two clauses, the naming conventions and the implementation conventions. The naming conventions describe the structure of the naming of all ATS elements. The implementation conventions describe the functional structure of the ATS.

To define the ATS, the guidelines of the document ETS 300 406 [5] was considered.

## 6.1 Naming conventions

### 6.1.1 Declarations part

This clause describes the naming conventions chosen for the elements of the ATS declarations part.

#### 6.1.1.1 General

The following general rules apply for the names given in the declarations part.

Names of ASN.1 types imported from the base standard are preserved.

Predefined types (e.g. BITSTRING [8]) are never used in structured type definitions, ASP type definitions or PDU type definitions. Simple types are used instead.

All declarations in the test suite are listed in alphabetical order. A different order of listing should be used for only maintenance reasons.

#### 6.1.1.2 Test suite operations

The test suite operation identifiers are prefixed with "TSO\_".

EXAMPLE: TSO\_substring.

#### 6.1.1.3 Test suite parameter declarations

If the test suite parameter references a Protocol Implementation Conformance Statement (PICS) item, the test suite parameter identifiers are prefixed "TSPC\_".

EXAMPLE 1: TPC\_extended\_rf\_carriers.

If the test suite parameter references a PIXIT item, the suite parameter identifiers are prefixed "TSPX\_".

EXAMPLE 2: TSP\_pmid.

If the test suite parameter represents a system parameter, the complete name defined in the protocol is used.

#### 6.1.1.4 Test case selection expression definition

The test case selection expression identifiers begin with the prefix "SEL\_".

#### 6.1.1.5 Test suite constant declarations

The test suite constant identifiers are prefixed "TSC\_".

If the test suite constant represents a system parameter, the complete name defined in the protocol is used.

#### 6.1.1.6 Test suite variable declarations

The test suite variable identifiers are prefixed "TSV\_".

Complete names as defined in the protocol are used.

#### 6.1.1.7 Test case variable declarations

The test case variable identifiers are prefixed "TCV\_".

Complete names as defined in the protocol are used.

### 6.1.1.8 Timer declarations

Timers begin with the prefix "T\_".

### 6.1.1.9 ASP type definitions

The general conventions in clause 6.1.1.1 applies. All capital letters shall be used.

The identifier of an ASP type uses the same name as the name defined in the protocol.

### 6.1.1.10 PDU type definitions

The general conventions in clause 6.1.1.1 applies. All capital letters shall be used.

The identifier of a PDU type uses the same name as the name defined in the protocol.

### 6.1.1.11 Co-ordination Message (CM) type definitions

All capital letters shall be used.

### 6.1.1.12 Alias definitions

Alias definitions are not used.

## 6.1.2 Constraints part

This clause describes the naming conventions chosen for the elements of the ATS constraints part.

### 6.1.2.1 General

Constraints shall be written with all lowercase letters.

## 6.1.3 Dynamic part

This clause describes the naming conventions used for the elements of the ATS dynamic part.

### 6.1.3.1 General

All test cases shall be listed in the order in which they appear in the Test Suite Structure (TSS) and TP document.

### 6.1.3.2 Test Case (TC) identifier

The identifier of the test case is built in a similar way as for the test purpose.

The identifier of a TC is built according to table 2.

**Table 2: TC naming convention**

Identifier:	TC_<layer>_<sut>_<x>_<nn>		
	<layer>	AL_T	Application Layer – T-Kernel
		AL_I	Application Layer – I-Kernel
	<sut> = type of SUT	OBU	On Board Unit
		RSU	Road Side Unit
	x = Type of testing	BV	Valid Behaviour Tests
		BI	Invalid Behaviour Tests
	<nn> = sequential number	(01-99)	Test Purpose Number

EXAMPLE: TP identifier: TP/AL-T/OBU/BV/01  
TC identifier: TC\_AL\_T\_OBU\_BV\_01.

### 6.1.3.3 Test step identifier

The test step identifier is built of substrings in lowercase letters, preceded by a string of uppercase letters. The substrings are joined by underscore characters. The first substring indicates the main function of the test step; e.g. PR for preamble, PO for postamble, LTS for local tree and STP for general test step. The second substring indicates the purpose of the step.

EXAMPLE: STP\_emulate\_mac.

### 6.1.3.4 Default identifier

The default identifiers begin with the prefix "DF\_", followed by a string in lowercase letters.

## 6.2 Implementation conventions

### 6.2.1 Declaration part

The comment line of single element TTCN tables (e.g. test suite constants) is used to give a reference where the format and content of the element is described in the relevant protocol document. Any particularity of the element format or content is described in the comment line.

The detailed comments are used to describe any peculiarity of the table.

In the ASP, PDU, and CM type declarations, the comments column is used to identify if a parameter (in ASPs) or field (in PDUs) is mandatory or optional:

- M: mandatory;
- O: optional.

In the ASP and PDU declarations the comments column is further used to give information about the parameter / field value, in particular if the parameter/field contains a fixed spare value.

### 6.2.2 Constraint part

The ASPs and PDUs are defined in a way that all relevant parameters/fields are parameterized. That improves the transparency of the constraints in the dynamic part, as all values which are relevant for the test are always present.

Generally no modified constraints are used. This allows an easier reuse and adaptation of constraints if they are reused in other test specifications.

The detailed comments footer is used to describe any particularity of the table.

### 6.2.3 Dynamic part

All events which are defined as a conformance requirement by the TP, causes a preliminary verdict PASS if the requirement is met.

The preamble, the test body and the postamble have different defaults, which allows a specific verdict handling, e.g. only INCONC verdicts are assigned in the preamble.

Except for local trees, test steps do not contain a default. Then there are no restrictions regarding the error handling.

Tps which are listed in the untestable TP list in clause 5 are not considered in the ATS, thus these TC identifiers are missing in the ATS and the numbering of the TCs is not always continuous.

---

## Annex A (normative): Abstract Test Suite (ATS) for Application OBU

This ATS has been produced using the Tree and Tabular Combined Notation (TTCN) according to ISO/IEC 9646-3 [8].

The ATS was developed on a separate TTCN software tool and therefore the TTCN tables are not completely referenced in the table of contents. The ATS itself contains a test suite overview part which provides additional information and references.

---

### A.1 The TTCN Graphical form (TTCN.GR)

The TTCN.GR representation of this ATS is contained in an Adobe Portable Document Format™ file (APPL\_OBU.pdf contained in archive ts\_1024860203v010201p0.zip) which accompanies the present document.

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### A.2 The TTCN Machine Processable form (TTCN.MP)

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (APPL\_OBU.mp contained in archive ts\_1024860203v010201p0.zip) which accompanies the present document.

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## Annex B (normative): Abstract Test Suite (ATS) for Application RSU

This ATS has been produced using the Tree and Tabular Combined Notation (TTCN) according to ISO/IEC 9646-3 [8].

The ATS was developed on a separate TTCN software tool and therefore the TTCN tables are not completely referenced in the table of contents. The ATS itself contains a test suite overview part which provides additional information and references.

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### B.1 The TTCN Graphical form (TTCN.GR)

The TTCN.GR representation of this ATS is contained in an Adobe Portable Document Format™ file (APPL-RSU.pdf contained in archive ts\_1024860203v010201p0.zip) which accompanies the present document.

---

### B.2 The TTCN Machine Processable form (TTCN.MP)

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (APPL-RSU.mp contained in archive ts\_1024860203v010201p0.zip) which accompanies the present document.

---

## Annex C (normative): Partial PIXIT proforma for Application OBU

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the PIXIT proforma in this annex so that it can be used for its intended purposes and may further publish the completed PIXIT.
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The PIXIT Proforma is based on ISO/IEC 9646-6 [9]. Any additional information needed can be found in this international standard document.

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### C.1 Identification summary

**Table C.1**

PIXIT Number:	
Test Laboratory Name:	
Date of Issue:	
Issued to:	

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### C.2 ATS summary

**Table C.2**

Protocol Specification:	EN 12834 [1]
Protocol to be tested:	
ATS Specification:	Annex A
Abstract Test Method:	Clause 4

---

### C.3 Test laboratory

**Table C.3**

Test Laboratory Identification:	
Test Laboratory Manager:	
Means of Testing:	
SAP Address:	

---

### C.4 Client identification

**Table C.4**

Client Identification:	
Client Test manager:	
Test Facilities required:	

## C.5 SUT

Table C.5

Name:	
Version:	
SCS Number:	
Machine configuration:	
Operating System Identification:	
IUT Identification:	
PICS Reference for IUT:	
Limitations of the SUT:	
Environmental Conditions:	

## C.6 Protocol layer information

### C.6.1 Protocol identification

Table C.6

Name:	DSRC Application layer
Version:	
PICS References:	

### C.6.2 IUT information

Table C.7: IUT information

Item	Name	Type	Value	Comment
1	TSPX_ACTION_1_BC_init_Prompt	TextString		Used in TC_AL_T_OBU_BV_11 Prompt for test operator to acknowledge performance of TSPX_ACTION_1_BC_init_req.
2	TSPX_ACTION_1_BC_init_req	T_APDU		Used in TC_AL_T_OBU_BV_11 ACTION command with FlowControl=1 and Mode=FALSE, send with BC LID after OBU initialized. Result of ACTION to be observable by test operator.
3	TSPX_ACTION_1_BC_Prompt	TextString		Used in TC_AL_T_OBU_BV_12 Prompt for test operator to acknowledge performance of TSPX_ACTION_1_BC_req.
4	TSPX_ACTION_1_BC_req	T_APDU		TC_AL_T_OBU_BV_12: ACTION command with FlowControl=1 and Mode=FALSE send with BC LID without OBU being initialized. Result of ACTION to be observable by test operator.
5	TSPX_ACTION_1_Prompt	TextString		Used in TC_AL_T_OBU_BV_10 Prompt for test operator to acknowledge performance of TSPX_ACTION_1_req.



Item	Name	Type	Value	Comment
6	TSPX_ACTION_1_req	T_APDU		Used in TC_AL_T_OBU_BV_10 ACTION command with FlowControl=1 and Mode=FALSE. Result of ACTION to be observable by test operator.
7	TSPX_ACTION_4_Prompt	TextString		Used in TC_AL_T_OBU_BV_09 Prompt for test operator to acknowledge performance of TSPX_ACTION_4_req.
8	TSPX_ACTION_4_req	T_APDU		Used in TC_AL_T_OBU_BV_09 ACTION command with FlowControl=4 and Mode=FALSE. Result of ACTION to be observable by test operator.
9	TSPX_ACTION_7_req	T_APDU		Used in TC_AL_T_OBU_BI_03 and TC_AL_T_OBU_BV_08: ACTION command with FlowControl=7 and Mode=TRUE.
10	TSPX_ACTION_7_rsp	T_APDU		ACTION response to TSPX_ACTION_7_req.
11	TSPX_APDU_7a_EIDa_req	T_APDU		Used in TC_AL_T_OBU_BI_03, TC_AL_T_OBU_BV_13 and TC_AL_T_OBU_BV_14: APDU with FlowControl=7 and Mode=TRUE.
12	TSPX_APDU_7a_EIDa_rsp	T_APDU		Response to TSPX_APDU_7a_EIDa_req.
13	TSPX_APDU_7a_EIDb_req	T_APDU		Used in TC_AL_T_OBU_BV_14 APDU with FlowControl=7 and Mode=TRUE.
14	TSPX_APDU_7a_EIDb_rsp	T_APDU		Response to TSPX_APDU_7a_EIDb_req.
15	TSPX_APDU_7b_EIDa_req	T_APDU		Used in TC_AL_T_OBU_BV_14 APDU with FlowControl=7 and Mode=TRUE.
16	TSPX_APDU_7b_EIDa_rsp	T_APDU		Response to TSPX_APDU_7b_EIDa_req.
17	TSPX_APDU_7b_EIDb_req	T_APDU		Used in TC_AL_T_OBU_BV_14 APDU with FlowControl=7 and Mode=TRUE.
18	TSPX_APDU_7b_EIDb_rsp	T_APDU		Response to TSPX_APDU_7b_EIDb_req.
19	TSPX_APDU_chain_7_req	Seq_Message		Used in TC_AL_T_OBU_BV_16 Set of at least two concatenated and chained APDUs with FlowControl=7. No error expected.
20	TSPX_APDU_chain_7_rsp	Seq_Message		Response to TSPX_APDU_chain_7_req.
21	TSPX_APDU_chain_error_7_req	Seq_Message		Used in TC_AL_T_OBU_BI_06: Sequence of at least two concatenated and chained APDUs with FlowControl=7, where one APDU is not applicable at the IUT causing a chaining error.

Item	Name	Type	Value	Comment
22	TSPX_APDU_chain_error_7_rsp	Seq_Message		Response to TSPX_APDU_chain_7_req. Response shall contain a ReturnStatus not equal to noError, accessDenied or chainingError, corresponding to the erroneous APDU, and a ReturnStatus of chainingError corresponding to the valid, chained APDU.
23	TSPX_attributes_1	Attributes		Used in TC_AL_T_OBU_BV_05 Attribute to be used in SET and GET with FlowControl=1 and TSPX_default_EID_1.
24	TSPX_attributes_1_a	Attributes		Used in TC_AL_T_OBU_BV_05 Attribute to be used in SET and GET with FlowControl=1 and TSPX_default_EID_1.
25	TSPX_attributes_4	Attributes		TC_AL_T_OBU_BV_04 Attribute to be used in SET and GET with FlowControl=4 and TSPX_default_EID_4.
26	TSPX_attributes_4_a	Attributes		TC_AL_T_OBU_BV_04 Attribute to be used in SET and GET with FlowControl=4 and TSPX_default_EID_4.
27	TSPX_attributes_7	Attributes		Used in TC_AL_T_OBU_BV_01, TC_AL_T_OBU_BI_01, TC_AL_T_OBU_BV_02, TC_AL_T_OBU_BV_03: Attribute to be used in SET and GET with FlowControl=7 and TSPX_default_EID_7.
28	TSPX_attributes_7_a	Attributes		Used in TC_AL_T_OBU_BI_01, TC_AL_T_OBU_BV_03: Attribute to be used in SET and GET with FlowControl=7 and TSPX_default_EID_7.
29	TSPX_attributes_BC_1	Attributes		Used in TC_AL_T_OBU_BV_06 and TC_AL_T_OBU_BV_07: Attribute to be used in SET and GET with FlowControl=1 and TSPX_default_EID_BC_1. BC address for SET.
30	TSPX_attributes_BC_1_a	Attributes		Used in TC_AL_T_OBU_BV_06 and TC_AL_T_OBU_BV_07: Attribute to be used in SET and GET with FlowControl=1 and TSPX_default_EID_BC_1. BC address for SET.
31	TSPX_Default_applicationID	DSRCApplicationEntityID		Used in STP_OBU_wakeup, STP_default_BST_VST, STP_default_initialization, STP_two_apps_BST_VST, TC_AL_I_OBU_BV_01, TC_AL_I_OBU_BI_01, TC_AL_T_OBU_BI_02, TC_AL_I_OBU_BI_02, TC_AL_I_OBU_BV_03, TC_AL_T_OBU_BI_04, TC_AL_I_OBU_BV_04, TC_AL_I_OBU_BV_05, TC_AL_I_OBU_BV_07: Declared value that will be acceptable for the IUT.

Item	Name	Type	Value	Comment
32	TSPX_default_eid_1	Dsrc_EID		EID as used together with TSPX_attributes_1, TSPX_attributes_1_a.
33	TSPX_default_eid_4	Dsrc_EID		EID as used together with TSPX_attributes_4, TSPX_attributes_4_a.
34	TSPX_default_eid_7	Dsrc_EID		EID as used together with TSPX_attributes_7, TSPX_attributes_7_a.
35	TSPX_default_eid_BC_1	Dsrc_EID		EID as used together with TSPX_attributes_BC_1, TSPX_attributes_BC_1_a.
36	TSPX_Default_profile	Profile		Profile supported by OBU under test.
37	TSPX_first_private_APDU_req	T_APDU		Used in STP_default_first_private_request: First APDU sent to OBU under test after reception of VST.
38	TSPX_first_private_APDU_rsp	T_APDU		Response to TSPX_first_private_APDU_req.
39	TSPX_first_private_FlowControl	INTEGER		FlowControl used for transmission of TSPX_first_private_APDU_req.
40	TSPX_IndividualID1	Integer_134217727		Valid value as declared.
41	TSPX_IndividualID2	Integer_134217727		Valid value as declared.
42	TSPX_ManufacturerID1	Integer_65535		Valid manufacturerID of the OBU under test.
43	TSPX_ManufacturerID2	Integer_65535		Other manufacturerID.
44	TSPX_profile_A	Profile		This profile shall be supported by the OBU under test.
45	TSPX_profile_B	Profile		This profile shall be supported by the OBU under test.
46	TSPX_profile_C	Profile		This profile must not be supported by the OBU under test.
47	TSPX_profile_D	Profile		This profile must not be supported by the OBU under test.
48	TSPX_Second_applicationID	DSRCApplicationEntityID		Used in STP_two_apps_BST_VST: aid supported by the OBU under test. Should be different to TSPX_Default_applicationID.
49	TSPX_Tref	Time		Reference time for use in BST time handling test. Note: This is only reasonable in case the OBU under test retrieves time of reception of a BST from the time element inside the BST.
50	TSPX_Unsupported_applicationID_a	DSRCApplicationEntityID		Used in TC_AL_I_OBU_BI_02 and TC_AL_I_OBU_BV_07: aid not supported by the OBU under test, and different to TSPX_Unsupported_applicationID_b.
51	TSPX_Unsupported_applicationID_b	DSRCApplicationEntityID		Used in TC_AL_I_OBU_BI_02 and TC_AL_I_OBU_BV_07: aid not supported by the OBU under test, and different to TSPX_Unsupported_applicationID_a.
52	TSPX_wait_for_private_uplink_duration	INTEGER		Duration of timer T_wait_for_private_uplink, in ms. Suggested value: 5 ms.

Item	Name	Type	Value	Comment
53	TSPX_wakeup_duration	INTEGER		Duration of timer T_wakeup, in ms. Suggested value: 10 ms.

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## Annex D (normative): Partial PIXIT proforma for Application RSU

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the PIXIT proforma in this annex so that it can be used for its intended purposes and may further publish the completed PIXIT.

The PIXIT Proforma is based on ISO/IEC 9646-6 [9]. Any additional information needed can be found in this international standard document.

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### D.1 Identification summary

**Table D.1**

PIXIT Number:	
Test Laboratory Name:	
Date of Issue:	
Issued to:	

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### D.2 ATS summary

**Table D.2**

Protocol Specification:	EN 12834 [1]
Protocol to be tested:	
ATS Specification:	Annex B
Abstract Test Method:	Clause 4

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### D.3 Test laboratory

**Table D.3**

Test Laboratory Identification:	
Test Laboratory Manager:	
Means of Testing:	
SAP Address:	

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### D.4 Client identification

**Table D.4**

Client Identification:	
Client Test manager:	
Test Facilities required:	

## D.5 SUT

Table D.5

Name:	
Version:	
SCS Number:	
Machine configuration:	
Operating System Identification:	
IUT Identification:	
PICS Reference for IUT:	
Limitations of the SUT:	
Environmental Conditions:	

## D.6 Protocol layer information

### D.6.1 Protocol identification

Table D.6

Name:	DSRC MAC layer
Version:	
PICS References:	

### D.6.2 IUT information

Table D.7: IUT information

Item	Name	Type	Value	Comment
1	TSPX_APDU_7a_EIDa_req	T_APDUUs		Used in TC_AL_T_RSU_BI_02 and TC_AL_T_RSU_BI_03: APDU with FlowControl=7 and Mode=TRUE.
2	TSPX_APDU_7a_EIDa_rsp	T_APDUUs		Response to TSPX_APDU_7a_EIDa_req.
3	TSPX_APDU_7b_EIDa_req	T_APDUUs		Used in TC_AL_T_RSU_BI_02 and TC_AL_T_RSU_BI_03: APDU with FlowControl=7 and Mode=TRUE.
4	TSPX_Default_applicationID	DSRCApplicationEntityID		Used in STP_RX_BST_DEF_APPS_ID, TC_AL_I_RSU_BI_01, TC_AL_I_RSU_BI_02, TC_AL_I_RSU_BV_02, TC_AL_I_RSU_BV_03: aid value that will be acceptable for the RSU under test, as used in TSPX_default_ApplicationList_BST and TSPX_default_ApplicationList_VST.

Item	Name	Type	Value	Comment
5	TSPX_Default_profile	Profile		Used in: STP_Init_Application_Failure, STP_RX_BST_DEF_APPS_ID, TC_AL_T_RSU_BI_01, TC_AL_I_RSU_BI_01, TC_AL_I_RSU_BI_02, TC_AL_I_RSU_BV_02, TC_AL_I_RSU_BV_03 profile value that will be acceptable for the RSU under test.
6	TSPX_TX_RX_LTA_TimeOut	INTEGER		Time in milli-seconds waiting for reception of next command frame to be received from RSU under test upon transmission of response frame.
7	TSPX_Tester_Wait_FOR_RX_TimeOut			Time in milli-seconds waiting for reception of frame to be received from RSU under test upon IMPLICIT_SEND.
8	TSPX_defaultObeConfiguration	ObeConfiguration		Default ObeConfiguration to be used
9	TSPX_default_ApplicationList_BST	ApplicationList		Default application list in BST. Shall contain TSPX_Default_applicationID!
10	TSPX_default_ApplicationList_VST	ApplicationList		Default application list in VST as valid response to TSPX_default_ApplicationList_BST. Shall contain TSPX_default_EFC_Context_Mark and TSPX_default_eid
11	TSPX_default_EFC_Context_Mark	EFC_Context_Mark_octetstring		Default instance of ISO 14906 [11] application Only octetstring [2] is implemented so far. efcontextis defined in ISO 14906 [11], but likely never used As used in TSPX_default_ApplicationList_VST.
12	TSPX_default_eid	Dsrc_EID		Default EID as used in TSPX_default_ApplicationList_VST.
13	TSPX_profile_A	Profile		This profile shall be supported by the RSU under test.
14	TSPX_profile_B	Profile		This profile shall be supported by the RSU under test.
15	TSPX_profile_C	Profile		This profile must not be supported by the RSU under test.
16	TSPX_second_eid	Dsrc_EID		Second EID. Value is not important, as never evaluated at RSU under test. Used in VST together with TSPX_Default_applicationID and TSPX_default_EFC_Context_Mark as a valid response to BST.
17	TSPX_unknown_EFC_Context_Mark	EFC_Context_Mark_octetstring		EFC context not supported at RSU under test.
18	TSPX_unknown_applicationID	DSRCApplicationEntityID		aid not supported at RSU under test.
19	TSPX_second_EFC_Context_Mark	EFC_Context_Mark_octetstring		Second, known EFC Context Mark supported at RSU, if 2 applications supported.

## Annex E (normative): PCTR Proforma for Application OBU

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of this TS may freely reproduce the PCTR proforma in this annex so that it can be used for its intended purposes and may further publish the completed PCTR.

The PCTR proforma is based on ISO/IEC 9646-6 [9]. Any needed additional information can be found in the present document.

### E.1 Identification summary

#### E.1.1 Protocol conformance test report

**Table E.1**

PCTR Number:	
PCTR Date:	
Corresponding SCTR Number:	
Corresponding SCTR Date:	
Test Laboratory Identification:	
Test Laboratory Manager:	
Signature:	

#### E.1.2 IUT identification

**Table E.2**

Name:	
Version:	
Protocol specification:	
PICS:	
Previous PCTR if any:	

#### E.1.3 Testing environment

**Table E.3**

PIXIT Number:	
ATS Specification:	
Abstract Test Method:	Remote test method, Embedded variant with notional UT
Means of Testing identification:	
Date of testing:	
Conformance Log reference(s):	
Retention Date for Log reference(s):	



## E.1.4 Limits and reservation

Additional information relevant to the technical contents or further use of the test report, or the rights and obligations of the test laboratory and the client, may be given here. Such information may include restriction on the publication of the report.

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## E.1.5 Comments

Additional comments may be given by either the client or the test laboratory on any of the contents of the PCTR, for example, to note disagreement between the two parties.

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## E.2 IUT Conformance status

This IUT has or has not been shown by conformance assessment to be non conforming to the specified protocol specification.

*Strike the appropriate words in this sentence. If the PICS for this IUT is consistent with the static conformance requirements (as specified in clause E.3) and there are no "FAIL" verdicts to be recorded (in clause E.6) strike the words "has or", otherwise strike the words "or has not".*

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## E.3 Static conformance summary

The PICS for this IUT is or is not consistent with the static conformance requirements in the specified protocol.

*Strike the appropriate words in this sentence.*

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## E.4 Dynamic conformance summary

The test campaign did or did not reveal errors in the IUT.

*Strike the appropriate words in this sentence. If there are no "FAIL" verdicts to be recorded (in clause E.6) strike the words "did or" otherwise strike the words "or did not".*

Summary of the results of groups of test:

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## E.5 Static conformance review report

If clause E.3 indicates non-conformance, this clause itemizes the mismatches between the PICS and the static conformance requirements of the specified protocol specification.

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## E.6 Test campaign report

Table E.4

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in clause E.7)
TC_AL_I_OBU_BV_01	Yes/No	Yes/No		
TC_AL_I_OBU_BV_02	Yes/No	Yes/No		
TC_AL_I_OBU_BV_03	Yes/No	Yes/No		
TC_AL_I_OBU_BV_04	Yes/No	Yes/No		
TC_AL_I_OBU_BV_05	Yes/No	Yes/No		Note: Test is not applicable for equipment compliant to EN 13372 [4].
TC_AL_I_OBU_BV_07	Yes/No	Yes/No		
TC_AL_I_OBU_BV_09	Yes/No	Yes/No		Test applies only for equipment compliant to EN 13372 [4].
TC_AL_I_OBU_BI_01	Yes/No	Yes/No		
TC_AL_I_OBU_BI_02	Yes/No	Yes/No		
TC_AL_T_OBU_BV_01	Yes/No	Yes/No		
TC_AL_T_OBU_BV_02	Yes/No	Yes/No		
TC_AL_T_OBU_BV_03	Yes/No	Yes/No		
TC_AL_T_OBU_BV_04	Yes/No	Yes/No		
TC_AL_T_OBU_BV_05	Yes/No	Yes/No		
TC_AL_T_OBU_BV_06	Yes/No	Yes/No		
TC_AL_T_OBU_BV_07	Yes/No	Yes/No		
TC_AL_T_OBU_BV_08	Yes/No	Yes/No		
TC_AL_T_OBU_BV_09	Yes/No	Yes/No		
TC_AL_T_OBU_BV_10	Yes/No	Yes/No		
TC_AL_T_OBU_BV_11	Yes/No	Yes/No		
TC_AL_T_OBU_BV_12	Yes/No	Yes/No		
TC_AL_T_OBU_BV_13	Yes/No	Yes/No		
TC_AL_T_OBU_BV_14	Yes/No	Yes/No		
TC_AL_T_OBU_BV_16	Yes/No	Yes/No		
TC_AL_T_OBU_BI_01	Yes/No	Yes/No		
TC_AL_T_OBU_BI_02	Yes/No	Yes/No		
TC_AL_T_OBU_BI_03	Yes/No	Yes/No		
TC_AL_T_OBU_BI_04	Yes/No	Yes/No		
TC_AL_T_OBU_BI_06	Yes/No	Yes/No		

## E.7 Observations

Additional information relevant to the technical content of the PCTR is given here.

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## Annex F (normative): PCTR Proforma for Application RSU

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the PCTR proforma in this annex so that it can be used for its intended purposes and may further publish the completed PCTR.

The PCTR proforma is based on ISO/IEC 9646-6 [9]. Any needed additional information can be found in the present document.

### F.1 Identification summary

#### F.1.1 Protocol conformance test report

**Table F.1**

PCTR Number:	
PCTR Date:	
Corresponding SCTR Number:	
Corresponding SCTR Date:	
Test Laboratory Identification:	
Test Laboratory Manager:	
Signature:	

#### F.1.2 IUT identification

**Table F.2**

Name:	
Version:	
Protocol specification:	
PICS:	
Previous PCTR if any:	

#### F.1.3 Testing environment

**Table F.3**

PIXIT Number:	
ATS Specification:	
Abstract Test Method:	Remote test method, Embedded variant with notional UT
Means of Testing identification:	
Date of testing:	
Conformance Log reference(s):	
Retention Date for Log reference(s):	

## F.1.4 Limits and reservation

Additional information relevant to the technical contents or further use of the test report, or the rights and obligations of the test laboratory and the client, may be given here. Such information may include restriction on the publication of the report.

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## F.1.5 Comments

Additional comments may be given by either the client or the test laboratory on any of the contents of the PCTR, for example, to note disagreement between the two parties.

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## F.2 IUT Conformance status

This IUT has or has not been shown by conformance assessment to be non conforming to the specified protocol specification.

*Strike the appropriate words in this sentence. If the PICS for this IUT is consistent with the static conformance requirements (as specified in clause F.3) and there are no "FAIL" verdicts to be recorded (in clause F.6) strike the words "has or", otherwise strike the words "or has not".*

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## F.3 Static conformance summary

The PICS for this IUT is or is not consistent with the static conformance requirements in the specified protocol.

*Strike the appropriate words in this sentence.*

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## F.4 Dynamic conformance summary

The test campaign did or did not reveal errors in the IUT.

*Strike the appropriate words in this sentence. If there are no "FAIL" verdicts to be recorded (in clause F.6) strike the words "did or" otherwise strike the words "or did not".*

Summary of the results of groups of test:

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## F.5 Static conformance review report

If clause F.3 indicates non-conformance, this clause itemizes the mismatches between the PICS and the static conformance requirements of the specified protocol specification.

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## F.6 Test campaign report

Table F.4

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in clause F.7)
TC_AL_I_RSU_BV_01	Yes/No	Yes/No		
TC_AL_I_RSU_BV_02	Yes/No	Yes/No		
TC_AL_I_RSU_BV_03	Yes/No	Yes/No		
TC_AL_I_RSU_BV_04	Yes/No	Yes/No		
TC_AL_I_RSU_BI_01	Yes/No	Yes/No		
TC_AL_I_RSU_BI_02	Yes/No	Yes/No		
TC_AL_I_RSU_BI_03	Yes/No	Yes/No		
TC_AL_I_RSU_BI_04	Yes/No	Yes/No		
TC_AL_T_RSU_BV_01	Yes/No	Yes/No		
TC_AL_T_RSU_BV_02	Yes/No	Yes/No		
TC_AL_T_RSU_BV_03	Yes/No	Yes/No		
TC_AL_T_RSU_BI_01	Yes/No	Yes/No		

## F.7 Observations

Additional information relevant to the technical content of the PCTR is given here.

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## Annex G (normative): Profile requirements for Application OBU

All lists of test cases defined in this annex are specified according to EN 13372 [4].

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### G.1 Generic test cases

The following list of test cases indicates the generic test cases and therefore relevant for the profile:

All except TC\_AL\_I\_OBU\_BV\_05 and TC\_AL\_I\_OBU\_BV\_06, which do not apply.

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### G.2 Specific test cases

The following list of test cases indicates the specific test cases that are relevant for the profile:

TC\_AL\_I\_OBU\_BV\_09

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### G.3 Non relevant test cases

The following list of test cases indicates the test cases that are not relevant for the profile:



## G.4 Modified test campaign report

Table G.1

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in clause E.7)
TC_AL_I_OBU_BV_01	Yes/No	Yes/No		
TC_AL_I_OBU_BV_02	Yes/No	Yes/No		
TC_AL_I_OBU_BV_03	Yes/No	Yes/No		
TC_AL_I_OBU_BV_04	Yes/No	Yes/No		
TC_AL_I_OBU_BV_07	Yes/No	Yes/No		
TC_AL_I_OBU_BV_09	Yes/No	Yes/No		
TC_AL_I_OBU_BI_01	Yes/No	Yes/No		
TC_AL_I_OBU_BI_02	Yes/No	Yes/No		
TC_AL_T_OBU_BV_01	Yes/No	Yes/No		
TC_AL_T_OBU_BV_02	Yes/No	Yes/No		
TC_AL_T_OBU_BV_03	Yes/No	Yes/No		
TC_AL_T_OBU_BV_04	Yes/No	Yes/No		
TC_AL_T_OBU_BV_05	Yes/No	Yes/No		
TC_AL_T_OBU_BV_06	Yes/No	Yes/No		
TC_AL_T_OBU_BV_07	Yes/No	Yes/No		
TC_AL_T_OBU_BV_08	Yes/No	Yes/No		
TC_AL_T_OBU_BV_09	Yes/No	Yes/No		
TC_AL_T_OBU_BV_10	Yes/No	Yes/No		
TC_AL_T_OBU_BV_11	Yes/No	Yes/No		
TC_AL_T_OBU_BV_12	Yes/No	Yes/No		
TC_AL_T_OBU_BV_13	Yes/No	Yes/No		
TC_AL_T_OBU_BV_14	Yes/No	Yes/No		
TC_AL_T_OBU_BV_16	Yes/No	Yes/No		
TC_AL_T_OBU_BI_01	Yes/No	Yes/No		
TC_AL_T_OBU_BI_02	Yes/No	Yes/No		
TC_AL_T_OBU_BI_03	Yes/No	Yes/No		
TC_AL_T_OBU_BI_04	Yes/No	Yes/No		
TC_AL_T_OBU_BI_06	Yes/No	Yes/No		

## G.5 Observations

Additional information relevant to the technical content of the PCTR is given here.

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## Annex H (normative): Profile requirements for Application RSU

All lists of test cases defined in this annex are specified according to EN 13372 [4].

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### H.1 Generic test cases

The following list of test test cases indicates the generic test cases and therefore relevant for the profile.

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### H.2 Specific test cases

The following list of test test cases indicates the specific test cases that are relevant for the profile.

None.

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### H.3 Non relevant test cases

The following list of test test cases indicates the test cases that are not relevant for the profile.

---

### H.4 Modified test campaign report

Table H.1

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in clause F.7)
TC_AL_I_RSU_BV_01	Yes/No	Yes/No		
TC_AL_I_RSU_BV_02	Yes/No	Yes/No		
TC_AL_I_RSU_BV_03	Yes/No	Yes/No		
TC_AL_I_RSU_BV_04	Yes/No	Yes/No		
TC_AL_I_RSU_BI_01	Yes/No	Yes/No		
TC_AL_I_RSU_BI_02	Yes/No	Yes/No		
TC_AL_I_RSU_BI_03	Yes/No	Yes/No		
TC_AL_I_RSU_BI_04	Yes/No	Yes/No		
TC_AL_T_RSU_BV_01	Yes/No	Yes/No		
TC_AL_T_RSU_BV_02	Yes/No	Yes/No		
TC_AL_T_RSU_BV_03	Yes/No	Yes/No		
TC_AL_T_RSU_BI_01	Yes/No	Yes/No		

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### H.5 Observations

Additional information relevant to the technical content of the PCTR is given here.

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## Annex I (informative): Bibliography

ETSI ETR 022: "Advanced Testing Methods (ATM); Vocabulary of terms used in communications protocols conformance testing".

ISO/IEC 9646-4: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 4: Test realization".

ISO/IEC 9646-5: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 5: Requirements on test laboratories and clients for the Conformance Assessment process".

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## History

<b>Document history</b>		
V1.1.1	August 2006	Publication
V1.2.1	October 2008	Publication