BSI Standards Publication

Electronic fee collection — Evaluation of on-board and roadside equipment for conformity to EN 15509

Part 2: Abstract test suite

bsi.

National foreword

This British Standard is the UK implementation of EN 15876-2:2016. It supersedes BS EN 15876-2:2011 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/278, Intelligent transport systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

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EUROPEAN STANDARD

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EN 15876-2

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English Version

Electronic fee collection - Evaluation of on-board and roadside equipment for conformity to EN 15509 - Part 2: Abstract test suite

Perception de télépéage - Evaluation de conformité de l'équipement embarqué et de l'équipement au sol à l'EN 15509 - Partie 2: Suite d'essais abstraite

Elektronische Gebührenerhebung - Konformitätsprüfung von Fahrzeuggeräten und straßenseitigen Einrichtungen nach EN 15509 - Teil 2: Zusammengefasstes Prüfprogramm

This European Standard was approved by CEN on 5 September 2016.

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Contents

Page

European foreword

This document (EN 15876-2:2016) has been prepared by Technical Committee CEN/TC 278 "Intelligent Transport Systems", the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2017, and conflicting national standards shall be withdrawn at the latest by April 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

This document supersedes EN 15876-2:2011.

This edition incorporates the following main technical changes compared to the previous version:

— amendments to reflect changes to the underlying "requirements standard" (i.e. EN 15509:2014), notably the amended definition of vehicle licence plate number;

— amendments of terms, in order to reflect the harmonization of terms across electronic fee collection (EFC) standards.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

CEN/TC 278 (WG 1) has produced a set of standards that support interoperable DSRC-EFC-systems (e.g. EN ISO 14906), a "toolbox" for defining EFC-application transaction, and CEN ISO/TS 14907-2 (EFC conformance test for the on-board unit application interface). However, these standards are only of an enabling nature and do not guarantee unambiguous technical interoperability. Therefore the standard profile Electronic fee collection – Interoperable application profile for DSRC (EN 15509) was developed to support technical interoperability between EFC-systems.

This document forms Part 2 of a two-part European Standard:

1 EN 15876-1, *Electronic fee collection — Evaluation of on-board and roadside equipment for conformity to EN 15509 — Part 1: Test suite structure and test purposes*

2 EN 15876-2, *Electronic fee collection — Evaluation of on-board and roadside equipment for conformity to EN 15509 — Part 2: Abstract test suite*

Part 1 of the standard defines the test suite structure and the test purposes for conformity evaluation of OBEs and RSE designed for compliance with the requirements set in EN 15509. A test standard for evaluation of conformity of on-board and roadside equipment is a necessary element for coherent, practical and effective appraisal of products' compliance to EN 15509.

Part 2 of the European Standard (this standard) provides the Abstract Test Suite (ATS), which are translations of the "human-readable" TSS&TP suite into Tree and Tabular Combined Notation (TTCN). The ATS is based on the TTCN test script language that is suitable for implementation in computer-aided test tools and for specification of test cases and steps for assessment of protocol and application behaviour. TTCN is a widespread dedicated test programming language for compliance testing and is standardized in ISO/IEC 9646-3. The TTCN language is supported by modern automated tools that accelerate software design, implementation and testing.

Together, the two parts of EN 15876 provide the necessary foundation for implementation of the interoperability requirements as stated in EN 15509:

— industry is provided with an easy-to-use toolbox for product assessment;

— operators can easily assess conformity to EN 15509 and reference to the standard in tendering processes;

— authorities and joint undertakings may reference to the test standard when stating interoperability requirements;

— certification organisations are given an effective tool for certification of products.

This part of EN 15876 is based on:

— EN 15509:2014,

— the set of dedicated short range communication (DSRC) standards defining the communication stack, and

— ISO/IEC 9646.

1 Scope

This European Standard specifies the abstract test suite (ATS) to evaluate the conformity of on-board equipment (OBE) and roadside equipment (RSE) to EN 15509 in accordance with the test suite structure and test purposes defined in EN 15876-1:2016.

The objective of the present document is to provide a basis for conformance tests for DSRC equipment (OBE and RSE) to support interoperability between different equipment supplied by different manufacturers.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ETSI/TS 102 486-2-3, V1.2.1 (2008-10), *Electromagnetic compatibility and Radio spectrum Matters (ERM); 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*

3 Terms and definitions

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

3.1
attribute
addressable package of data consisting of a single data element or structured sequences of data elements

[ISO 17575-1:2016, 3.1]

3.2
authenticator
data, possibly encrypted, that is used for authentication

[EN 15509:2014, 3.3]

3.3
data group
collection of closely related attributes

[ISO 17575-1:2016, 3.10]

3.4
element
DSRC directory containing application information in form of attributes

[ISO 14906:2011, 3.11]

3.5
implementation conformance statement
statement of capabilities and options that have been implemented defining to what extent it is compliant with a given specification

3.6
implementation conformance statement proforma
document, in the form of a questionnaire, which when completed for an implementation or system becomes an implementation conformance statement (ICS)

[ISO/IEC 9646-1:1994, 3.3.40]

3.7
implementation extra information for testing
statement containing all of the information related to the implementation under test (IUT) and its corresponding system under test (SUT) which will enable the testing laboratory to run an appropriate test suite against that IUT

[SOURCE: ISO 19105:2000, 3.20]

3.8
implementation extra information for testing proforma
document, in the form of a questionnaire, which when completed for an implementation under test (IUT) becomes an implementation extra information for testing (IXIT)

[SOURCE: ISO/IEC 9646-1:1994, 3.3.42, modified]

3.9
on-board equipment
all required equipment on-board a vehicle for performing required EFC functions and communication services

3.10
roadside equipment
equipment located along the road, either fixed or mobile

[SOURCE: EN ISO 14906:2011, 3.17]

3.11
tester
combination of equipment, humans and processes able to perform specified conformance tests

[EN 15876-1:2016, 3.12]

3.12
transaction
whole of the exchange of information between two physically separated communication facilities

[ISO 17575-1:2016, 3.21]

4 Abbreviations

For the purpose of this document, the following abbreviations apply throughout the document unless otherwise specified.

ADU   Application Data Unit (ISO 14906)

APDU   Application Protocol Data Unit (ISO 14906)

AP   Application Process (ISO 14906)

ASN.1	Abstract Syntax Notation One (ISO/IEC 8824-1)
ASP	Application Service Point
ATS	Abstract Test Suite
BI	Beviour Invalid (i.e. Invalid Behaviour tests)
B-Kernel	Broadcast Kernel
BST	Beacon Service Table (ISO 14906)
BV	Behaviour Valid (i.e. Valid Behaviour tests)
cf	Confirm (ISO 14906)
CM	Co-ordination Message
DLC	Data Link Control
DSRC	Dedicated Short-Range communication (ISO 14906)
DUT	Device Under Test (CEN ISO/TS 14907-2)
EID	Element Identifier (ISO 14906)
EFC	Electronic Fee Collection (ISO 17573)
EVENT-RT	EVENT-REPORT (EN 12834)
ICS	Implementation Conformance Statement (EN 15509)
IUT	Implementation Under Test (ISO/TS 14907-1)
IXIT	Implementation eXtra Information for Testing (CEN ISO/TS 14907-2)
LLC	Logical Link Control (EN 12795)
MAC	Medium Access Control (EN 12795)
OBE	On-board equipment
OBU	On-board unit
PDU	Protocol Data Unit (ISO 14906)
RSE	Road-side equipment
TC	Test Case
TP	Test Purpose
TSS	Test Suite Structure (EN 15876-1)
VST	Vehicle Service Table (ISO 14906)

5 Abstract Test Method (ATM)

5.1 General

This clause describes the abstract test method (ATM) used to test the layers at the OBE side and at the RSE side.

5.2 Test architecture

ETSI/TS 102 486-1-3:2009, Clause 4 and ETSI/TS 102 486-2-3:2009, Clause 4 describe the test architecture for their respective layers for testing. As test purposes (TPs) from ETSI/TS 102 486-1-3

and ETSI/TS 102 486-2-3 are referenced to in EN 15876-1, the test architectures presented there are also relevant for the corresponding test cases (TCs). For all specific TPs introduced in EN 15876-1, the test architecture defined in ETSI/TS 102 486-2-3 is relevant too.

6 Untestable Test Purposes (TP)

This clause gives a list of TPs, which are not implemented in the abstract test suite (ATS) due to the chosen abstract test method (ATM) or other restrictions.

NOTE   The abbreviation OBU, rather than OBE, is used in the naming of test purposes for historical reasons and for direct correspondence with ETSI/TS 102 486-1-3, ETSI/TS 102 486-2-3 and EN 15876-1.

Table 1 — Untestable TPs

Test purpose	Reason
TP/PHY/OBU/BV/01	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/OBU/BV/02	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/OBU/BV/03	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/OBU/BV/04	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/OBU/BV/05	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/OBU/BV/06	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/OBU/BV/07	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/OBU/BV/08	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/OBU/BV/09	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/RSE/BV/01	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/RSE/BV/02	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/RSE/BV/03	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/RSE/BV/04	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/RSE/BV/05	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.

TP/PHY/RSE/BV/06	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/RSE/BV/07	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/RSE/BV/08	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/RSE/BV/09	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/RSE/BV/10	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/RSE/BV/11	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.
TP/PHY/RSE/BV/12	Physical layer tests are to be performed in a radio wave lab. They do not form part of the ATS.

7 Abstract test suite (ATS) conventions

7.1 General

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.

7.2 Naming conventions

7.2.1 Declarations part

7.2.1.1 General

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

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 as defined in ISO/IEC 9646-5) are never used in structured type definitions, application service point (ASP) type definitions or protocol type unit (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.

7.2.1.2 Test suite operations

The test suite operation identifiers are prefixed with "TSO_".

EXAMPLE   TSO_substring.

7.2.1.3 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   TSPC_extended_rf_carriers.

If the test suite parameter references a PIXIT item, the suite parameter identifiers are prefixed "TSPX_".

EXAMPLE 2   TSPX_pmid.

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

7.2.1.4 Test case selection expression definition

The test case selection expression identifiers begin with the prefix "SEL_".

7.2.1.5 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.

7.2.1.6 Test suite variable declarations

The test suite variable identifiers are prefixed "TSV_".

Complete names as defined in the protocol are used.

7.2.1.7 Test case variable declarations

The test case variable identifiers are prefixed "TCV_".

Complete names as defined in the protocol are used.

7.2.1.8 Timer declarations

Timers begin with the prefix "T_".

7.2.1.9 Application service point (ASP) type definition

The general conventions in 7.2.1.1 apply for application service point (ASP) type definitions. All capital letters shall be used.

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

7.2.1.10 PDU type definitions

The general conventions in 7.2.1.1 apply for protocol data unit (PDU) type definitions. All capital letters shall be used.

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

7.2.1.11 Co-ordination message (CM) type definitions

All capital letters shall be used for coordination message (CM) type definitions.

7.2.1.12 Alias definitions

Alias definitions are not used.

7.2.2 Constraints part

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

Constraints shall be written with all lowercase letters.

7.2.3 Dynamic part

7.2.3.1 General

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

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

7.2.3.2 Test Case (TC) identifier

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

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

NOTE   The abbreviation OBU, rather than OBE, is used in the naming of test cases for historical reasons and for direct correspondence with ETSI/TS 102 486-1-3, ETSI/TS 102 486-2-3 and EN 15876-1.

Table 2 — TC naming convention

Identifier:	TC_<layer>_<dut>_<x>_<nn>		
	<layer>	AP-0BAS	Application layer – I Kernel support Security level 0
		AP-1BAS	Application layer – I Kernel support Security level 1
		...	...
	<dut> = type of DUT	OBU	On Board Equipment
		RSE	Roadside Equipment
	x = Type of testing	BV	Valid Behaviour Tests
		BI	Invalid Behaviour Tests
	<nn> = sequential number	(01-99)	Test Purpose Number

EXAMPLE 1   TP identifier: TP/AP-0DAT/OBU/BV/01

EXAMPLE 2   TC identifier: TC_AP_0DAT_OBU_BV_01

7.2.3.3 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.

7.2.3.4 Default identifier

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

7.3 Implementation conventions

7.3.1 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.

7.3.2 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.

7.3.3 Dynamic part

All events, which are defined as a conformance requirement by the TP, cause 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 6 are not considered in the ATS, thus these TC identifiers are missing in the ATS and the numbering of the TCs may not always be continuous.

Annex A
(normative)

Abstract Test Suite (ATS) for On-Board Equipment

A.1 Introduction

This ATS has been produced using the Tree and Tabular Combined Notation (TTCN) according to ISO/IEC 9646-3. 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 that provides additional information and references.

A.2 TTCN Graphical form (TTCN.GR)

The TTCN.GR representation of this ATS is contained in an HTML file (EN_15876-2_AP_OBE.html contained in the folder "OBE" in the archive CEN15876-2(2016)v2.zip) which accompanies the present document.

NOTE 1   The above referenced file (i.e. CEN15876-2(2016)v2.zip) is freely available for download via a hyperlink at www.itsstandards.eu/index.php/efc#EFCstandards.

NOTE 2   The SHA-256 cryptographic hash digest of the above referenced file is da2fb67a1684d0862ef8c5850c26219723f3a585f78fc716e32103bf0c412062, which can be used to verify its integrity. The SHA-256 algorithm is specified in NIST 180-4 [reference 22]. Software for this type of computation is freely available for download on the web, for example OpenHashtool and RHash. Be aware that pasting the text of the file into one of the hash digest computation pages available on the web may result in a non-matching hash digest due to changes in the underlying coding.

Where an abstract test suite (ATS in TTCN-2) is published in both graphical and machine processable format these two forms shall be considered equivalent. In the event that there appears to be syntactical or semantic differences between the two then the problem shall be resolved and the erroneous format (whichever it is) shall be corrected.

A.3 TTCN Machine Processable form (TTCN.MP)

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (EN_15876-2_AP_OBE.mp contained in the folder "OBE" in the archive CEN15876-2(2016)v2.zip) which accompanies the present document.

Where an Abstract Test Suite (in TTCN-2) is published in both graphical and machine processable format these two forms shall be considered equivalent. In the event that there appears to be syntactical or semantic differences between the two then the problem shall be resolved and the erroneous format (whichever it is) shall be corrected.

Annex B
(normative)

Abstract Test Suite (ATS) for Roadside Equipment

B.1 Introduction

This ATS has been produced using the Tree and Tabular Combined Notation (TTCN) according to ISO/IEC 9646-3. 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 that provides additional information and references.

B.2 TTCN Graphical form (TTCN.GR)

The TTCN.GR representation of this ATS is contained in an HTML file (EN_15876-2_AP_RSE.html contained in the folder "RSE" in the archive CEN15876-2(2016)v2.zip) which accompanies the present document.

NOTE 1   The above referenced file (i.e. CEN15876-2(2016)v2.zip) is freely available for download via a hyperlink at www.itsstandards.eu/index.php/efc#EFCstandards.

NOTE 2   The SHA-256 cryptographic hash digest of the above referenced file is da2fb67a1684d0862ef8c5850c26219723f3a585f78fc716e32103bf0c412062, which can be used to verify its integrity. The SHA-256 algorithm is specified in NIST 180-4 [reference 22]. Software for this type of computation is freely available for download on the web, for example OpenHashtool and RHash. Be aware that pasting the text of the file into one of the hash digest computation pages available on the web may result in a non-matching hash digest due to changes in the underlying coding.

Where an Abstract Test Suite (in TTCN-2) is published in both graphical and machine processable format these two forms shall be considered equivalent. In the event that there appears to be syntactical or semantic differences between the two then the problem shall be resolved and the erroneous format (whichever it is) shall be corrected.

B.3 TTCN Machine Processable form (TTCN.MP)

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (EN_15876-2_AP_RSE.mp contained in the folder "RSE" in the archive CEN15876-2(2016)v2.zip) which accompanies the present document.

Where an abstract test suite (ATS in TTCN-2) is published in both graphical and machine processable format these two forms shall be considered equivalent. In the event that there appears to be syntactical or semantic differences between the two then the problem shall be resolved and the erroneous format (whichever it is) shall be corrected.

Annex C
(normative)

Partial PIXIT Proforma for On-Board Equipment

C.1 Introduction

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

C.2 Identification summary

Table C.1 — Identification summary

PIXIT N-number:	
Test laboratory name:	
Date of issue:	
Issued to:	

C.3 ATS summary

Table C.2 — ATS summary

Protocol specification:	
Protocol to be tested:	
ATS specification:	
Abstract Test Method:	

C.4 Test laboratory

Table C.3 — Test laboratory

Test laboratory identification:	
Test laboratory manager:	
Means of testing:	
Service access point address:	

C.5 Client identification

Table C.4 — Client identification

Client identification:	
Client test manager:	
Test facilities required:	

C.6 DUT

Table C.5 — DUT

Name:	
Version:	
Semiconductor characterisation system number:	
Machine configuration:	
Operating system identification:	
DUT identification:	
PICS reference for DUT:	
Limitations of the DUT:	
Environmental conditions:	

C.7 Protocol layer information

C.7.1 Protocol identification

Table C.6 — Protocol identification

Name:	
Version:	
PICS references:	

C.7.2 DUT information

The DUT information shall be provided by the manufacturer of the DUT in an ASCII file. The DUT information required can be found in the HTML file EN_15876-2_AP_OBU.html in the Declarations Part, subsection Test Suite Parameter Declarations.

Annex D
(normative)

Partial PIXIT Proforma for Roadside Equipment

D.1 Introduction

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

D.2 Identification summary

Table D.1 — Identification summary

PIXIT number:	
Test laboratory name:	
Date of issue:	
Issued to:	

D.3 ATS summary

Table D.2 — ATS summary

Protocol specification:	
Protocol to be tested:	
ATS specification:	
Abstract Test Method:	

D.4 Test laboratory

Table D.3 — Test laboratory

Test laboratory identification:	
Test laboratory manager:	
Means of testing:	
Service access point address:	

D.5 Client identification

Table D.4 — Client identification

Client identification:	
Client test manager:	
Test facilities required:	

D.6 DUT

Table D.5 — DUT

Name:	
Version:	
Semiconductor characterisation system number:	
Machine configuration:	
Operating system identification:	
DUT identification:	
PICS reference for DUT:	
Limitations of the DUT:	
Environmental conditions:	

D.7 Protocol layer information

D.7.1 Protocol identification

Table D.6 — Protocol identification

Name:	
Version:	
PICS references:	

D.7.2 DUT information

The DUT information shall be provided by the manufacturer of the DUT in an ASCII file. The DUT information required can be found in the HTML file EN_15876-2_AP_RSE.html in the Declarations Part, subsection Test Suite Parameter Declarations.

Bibliography

[1] EN 15509, *Electronic fee collection — Interoperability application profile for DSRC*

[2] EN 15876-1, *Electronic fee collection — Evaluation of on-board and roadside equipment for conformity to EN 15509 — Part 1: Test suite structure and test purposes*

[3] ETSI EN 300 674-1, *Electromagnetic compatibility and Radio Spectrum Matters (ERM); Road Transport and Traffic Telematics (RTTT); Dedicated Short Range Communication (DSRC) transmission equipment (500 kbit/s / 250 kbit/s) operating in the 5,8 GHz Industrial, Scientific and Medical (ISM) band; Part 1: General characteristics and test methods for Road Side Units (RSU) and On-Board Units (OBU)*

[4] ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*

[5] ISO 14816, *Road transport and traffic telematics — Automatic vehicle and equipment identification — Numbering and data structure*

[6] ISO 14906, *Electronic fee collection — Application interface definition for dedicated short-range communication*

[7] CEN ISO/TS 14907-2, *Electronic fee collection - Test procedures for user and fixed equipment - Part 2: Conformance test for the on-board unit application interface (ISO/TS 14907-2)*

[8] ISO 19105:2000, *Geographic information — Conformance and testing*

[9] ISO/IEC 9646-1, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 1: General concepts*

[10] ISO/IEC 9646-2, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 2: Abstract Test Suite specification*

[11] ISO/IEC 9646-3, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 3: The Tree and Tabular Combined Notation (TTCN)*

[12] ISO/IEC 9646-4, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 4: Test realization*

[13] 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*

[14] ISO/IEC 9646-6, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 6: Protocol profile test specification*

[15] ISO/IEC 9646-7, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 7: Implementation Conformance Statements*

[16] ETSI/TS 102 486-1-2, *Intelligent Transport Systems (ITS); Road Transport and Traffic Telematics (RTTT); Test specifications for Dedicated Short Range Communication (DSRC) transmission*

equipment; Part 1: DSRC data link layer: medium access and logical link control; Sub-Part 2: Test Suite Structure and Test Purposes (TSS&TP)

[17] ETSI/TS 102 486-1-3, *Ver. 1.2.2 (2009-05), Intelligent Transport Systems (ITS); Road Transport and Traffic Telematics (RTTT); Test specifications for Dedicated Short Range Communication (DSRC) transmission equipment; Part 1: DSRC data link layer: medium access and logical link control; Sub-Part 3: Abstract Test Suite (ATS) and partial PIXIT proforma*

[18] ETSI/TS 102 486-2-2, *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 2: Test Suite Structure and Test Purposes (TSS&TP)*

[19] EN 12834:2003, *Road transport and traffic telematics — Dedicated Short Range Communication (DSRC) — DSRC application layer*

[20] EN 12795:2003, *Road transport and traffic telematics — Dedicated Short Range Communication (DSRC) — DSRC data link layer: medium access and logical link control*

[21] National Institute of Standards and Technology (http://www.nist.gov), Federal Information Processing Standards (FIPS) 180-4 "*Secure Hash Standard (SHS)", August 2015*

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