
**Electronic fee collection — Test
procedures for user and fixed
equipment —**

**Part 2:
Conformance test for the onboard unit
application interface**

*Perception du télépéage — Modes opératoires relatifs aux équipements
embarqués et aux équipements fixes —*

*Partie 2: Essai de conformité de l'interface d'application de l'unité
embarquée*



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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of document:

- an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;
- an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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

ISO/TS 14907-2 was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

This second edition cancels and replaces the first edition (ISO/TS 14907-2:2006), which has been technically revised.

ISO/TS 14907 consists of the following parts, under the general title *Electronic fee collection — Test procedures for user and fixed equipment*:

- *Part 1: Description of test procedures*
- *Part 2: Conformance test for the onboard unit application interface*

Introduction

This part of ISO/TS 14907 describes tests that verify OBU conformance of implementations of functions and data structures for EFC applications.

Electronic fee collection — Test procedures for user and fixed equipment —

Part 2: Conformance test for the onboard unit application interface

1 Scope

This part of ISO/TS 14907 describes tests that verify on-board unit (OBU) conformance of implementations of functions and data structures, as defined in the implementation conformance statement based on ISO 14906:2011, for electronic fee collection (EFC) applications. After the tests of isolated data items and functions (C.1-C.2), an example is given for testing of a complete EFC transaction (C.3).

The scope of this part of ISO/TS 14907 comprises definitions of OBU conformance assessment tests of

- basic dedicated short-range communication (DSRC) L7 functionality,
- EFC application functions,
- EFC attributes (i.e. EFC application information),
- the addressing procedures of EFC attributes and (hardware) components [e.g. integrated circuit cards (ICC) and man-machine interfaces (MMI)],
- the EFC transaction model, which defines the common elements and steps of any EFC transaction, and
- the behaviour of the interface so as to support interoperability on an EFC-DSRC application interface level, see Figure 1.

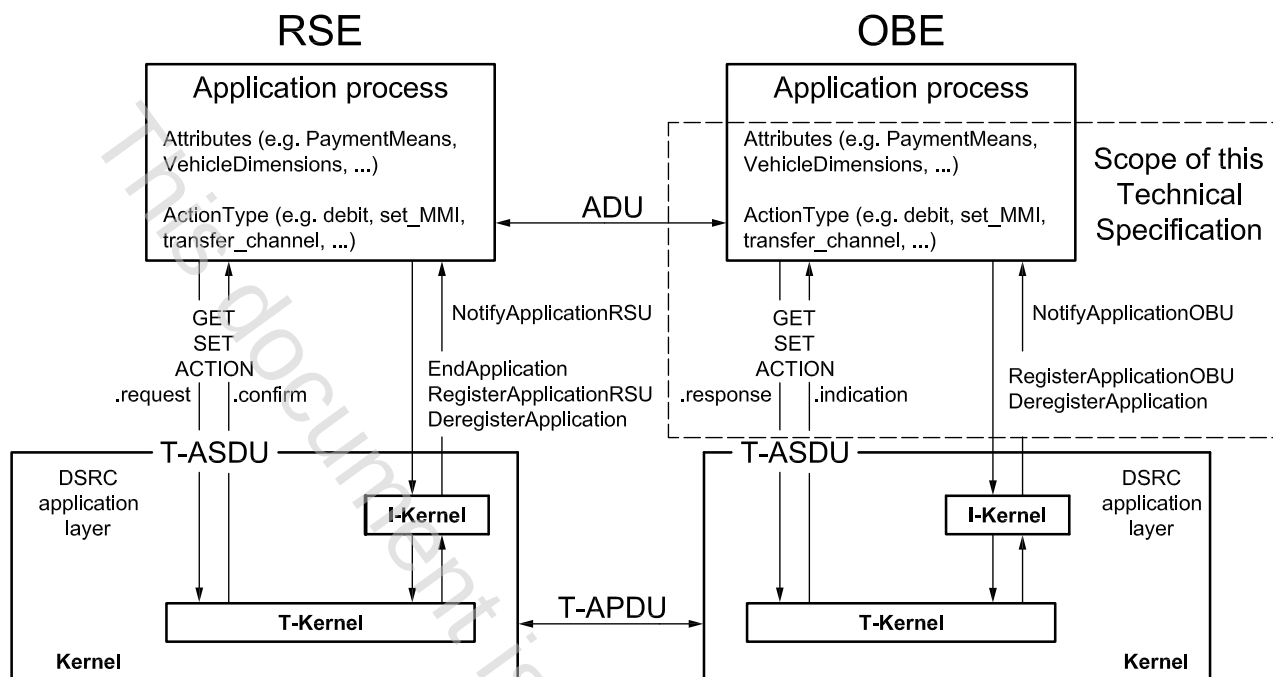


Figure 1 — The EFC application interface

The purpose of this part of ISO/TS 14907 is to define tests that

- assess OBU capabilities,
- assess OBU behaviour,
- serve as a guide for OBU conformance evaluation and type approval,
- achieve comparability between the results of the corresponding tests applied in different places at different times, and
- facilitate communications between parties.

Whereas this part of ISO/TS 14907 defines examples of test cases for DSRC and EFC functionality in Annex C, it does not intend to specify a complete test suite for a certain implementation. To compose a test suite for a specific EFC implementation, the test cases may have to be modified and new test cases may have to be defined and added in order for the conformance test to be complete. It can be useful to take into account the following considerations when defining a complete test suite

- small range: “exhaustive testing” of critical interoperability/compatibility features,
- large range: testing of boundaries and random values, and
- composite types: testing of individual items in sequence or parallel.

Figure 2 shows the overall procedure of conformance testing.

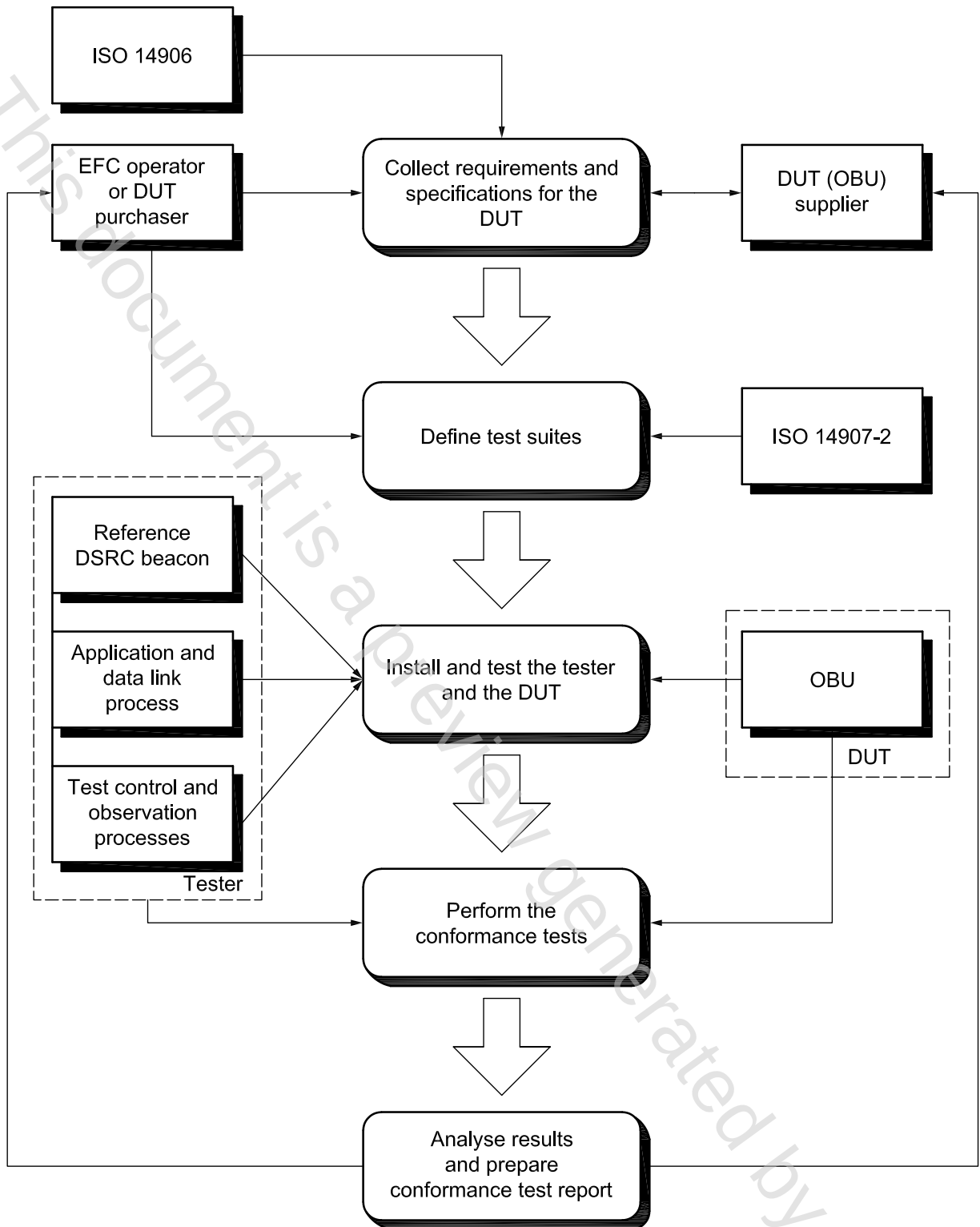


Figure 2 — Conformance testing process

Figure 3 gives a more detailed picture of the interface between the entity performing the conformance test and the supplier of the Device Under Test (DUT). By the EFC application specification, the implementation conformance statement pro forma and the implementation extra information for testing pro forma the supplier is requested to provide the DUT (OBU), containing the Implementation Under Test (IUT), as well as the documentation needed to perform the tests. More details on the content of the different documents are given in Clause 5 on OBU and supporting information.

NOTE 1 The Device Under Test contains the Implementation Under Test.

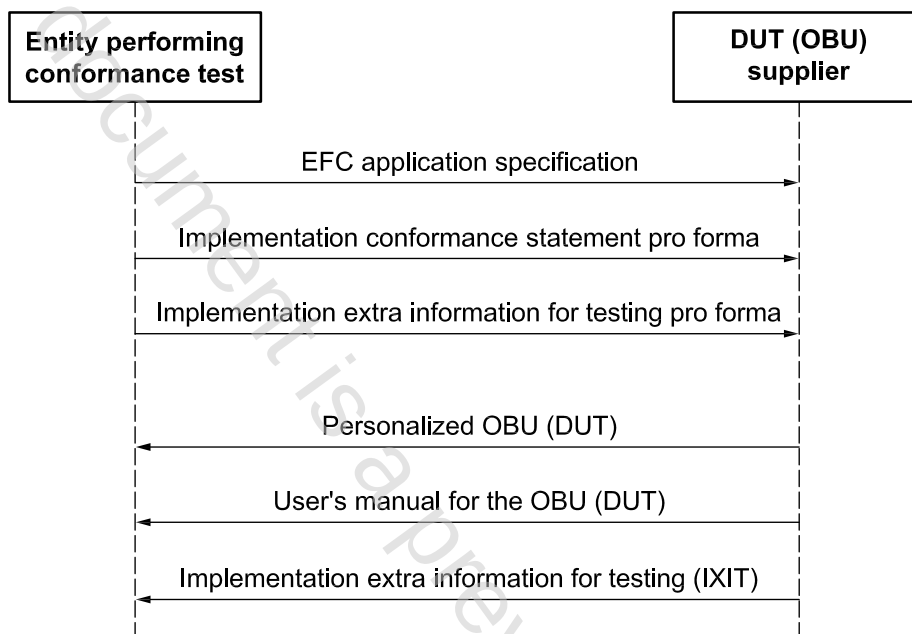


Figure 3 — Documentation DUT supplier

It is outside the scope of this part of ISO/TS 14907 to define tests that assess

- performance,
- robustness, and
- reliability of an implementation.

NOTE 2 ISO/TS 14907-1 defines test procedures that are aimed at assessing performance, robustness and reliability of EFC equipment and systems.

NOTE 3 The ISO/IEC 10373 family of International Standards defines test methods for proximity, vicinity, integrated circuits(s) cards and related devices that may be relevant for OBUs that support such cards.

Annex D provides an informative overview of Japanese OBE conformance tests that are based on ISO/TS 14907 suite of standards, in order to illustrate how these can be applied in practice.

2 Normative references

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

ISO 14906:2011, *Electronic fee collection — Application interface definition for dedicated short-range communication*

EN 12834, *Road transport and traffic telematics — Dedicated short-range communication (DSRC) — DSRC application layer*

3 Terms and definitions

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

3.1

access credentials

data that is transferred to on-board equipment (OBE) in order to establish the claimed identity of a roadside equipment (RSE) application process entity

[ISO 14906:2011, definition 3.1]

NOTE The access credentials carry information needed to fulfil access conditions in order to perform the operation on the addressed element in the OBE. The access credentials can carry passwords as well as cryptographic based information such as authenticators.

3.2

action

function that an application process resident at the roadside equipment (RSE) can invoke in order to make the on-board equipment (OBE) execute a specific operation during the transaction

[ISO 14906:2011, definition 3.2]

3.3

attribute

application information formed by one or by a sequence of data elements, and that is managed by different actions used for implementation of a transaction

[ISO 14906:2011, definition 3.3]

3.4

authenticator

data appended to, or a cryptographic transformation of, a data unit that allows a recipient of the data unit to prove the source and/or the integrity of the data unit and protect against forgery

[ISO 14906:2011, definition 3.4]

3.5

channel

information transfer path

[ISO/IEC 7498-2:1989, definition 3.3.13 and ISO 14906:2011, definition 3.5]

3.6

component

logical and physical entity composing an on-board equipment (OBE), supporting a specific functionality

[ISO 14906:2011, definition 3.6]