



ARIB TR-T22

ENGLISH TRANSLATION

DEDICATED SHORT-RANGE
COMMUNICATION (DSRC) BASIC
APPLICATION INTERFACE
TEST ITEMS AND CONDITIONS
FOR LAND MOBILE STATION
COMPATIBILITY CONFIRMATION

ARIB TECHNICAL REPORT

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Foreword

The Association of Radio Industries and Business (ARIB) has been investigating and summarizing the basic technical requirements for establishing standards and technical reports with the participation of the various radio equipment manufacturers, telecommunications companies, broadcasters, and users.

The technical report contained herein will serve as private-sector guideline for the measurement methods and testing methods, etc., in order to ensure the quality and compatibility of radio facilities and equipment for private use based on the publicly established technical standards and private-sector voluntary standards in Japan.

These technical reports are being established principally to define the test items and conditions for Land Mobile Station compatibility confirmation for the “Dedicated Short-Range Communication System Basic Application Interface.” In order to ensure fairness and openness among all parties involved, during drafting stages, we invite radio equipment manufacturers, operators, testing organizations and users both domestically and overseas to participate openly in the activities of the Standard Assembly so as to develop technical reports with the total agreement of all parties involved.

The scope of application of these technical reports covers the minimum requirements for the fundamental items that assure compatibility of Land Mobile Stations with the Base Stations based on Dedicated Short-Range Communication System Basic Application Interface. On the application of this technical report, the test organizations related to operators and radio equipment manufacturers, etc., should use them together with practical guidelines for operators in developing original specifications and systems that fall within the scope of the standards.

We hope that this technical report will aid all parties involved, including radio equipment manufacturers, operators, users, testing organizations and others.

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Chapter 1 General Items

1.1 Overview

Testing in the context of this Technical Report is positioned as the testing and suitability check of a Land Mobile Station in which a DEDICATED SHORT-RANGE COMMUNICATION (DSRC) Basic Application Interface according to the “DEDICATED SHORT-RANGE COMMUNICATION (DSRC) Basic Application Interface Standard” (ARIB STD-T110) is installed (hereafter “Land Mobile Station”). Testing is to be carried out within the scope of basic functions and standardized options defined in the ARIB STD-T110 “DEDICATED SHORT-RANGE COMMUNICATION (DSRC) Basic Application Interface Standard” (ARIB STD-T110). Testing is done under the assumption that the behavior of equipment according to the DEDICATED SHORT-RANGE COMMUNICATION (DSRC) SYSTEM Standard (ARIB STD-T75) and “DEDICATED SHORT-RANGE COMMUNICATION (DSRC) APPLICATION SUB-LAYER Standard” (ARIB STD-T88), and “DEDICATED SHORT-RANGE COMMUNICATION (DSRC) Basic Application Interface Standard” (ARIB STD-T110) is fully confirmed under the responsibility of the Land Mobile Station manufacturer during the development or manufacturing process.

The testing procedures described in this document are designed to be able to be performed in a general testing environment, so that no special demands are placed on the testing entity or the manufacturer with regard to environmental conditions or special functions of the Land Mobile Station.

1.2 Test Classification

When performing testing for compatibility confirmation according to this Technical Report, the Land Mobile Station of the DSRC system under test must in principle fulfill the items and conditions specified in the following technical reports.

- 1) DEDICATED SHORT-RANGE COMMUNICATION (DSRC) SYSTEM TEST ITEMS AND CONDITIONS FOR LAND MOBILE STATION COMPATIBILITY CONFIRMATION
ARIB TR-T16, Latest Version
- 2) TEST ITEMS AND CONDITIONS FOR DEDICATED SHORT-RANGE COMMUNICATION (DSRC) APPLICATION SUB-LAYER LAND MOBILE STATION COMPATIBILITY CONFIRMATION, ARIB TR-T17, Latest Version

Testing according to this Technical Report assumes the DSRC basic application interface test to be a static test performed in a standardized communication environment. The main party that will perform the testing is the Land Mobile Station manufacturer.

By successfully testing the items in the above two technical reports as well as the items described in this Technical Report, the Land Mobile Station of the DSRC system is considered as having been confirmed capable of standard operation.

However, because the tests specified in this Technical Report involve evaluation in a standardized communication environment, it should be kept in mind that conditions in an actual communication environment may differ.

Chapter 2 Configuration for Interoperability Test

2.1 Purpose of Test

The interoperability test system serves for verifying that the Land Mobile Station as manufactured by the Land Mobile Station manufacturer is compliant with the DEDICATED SHORT-RANGE COMMUNICATION (DSRC) Basic Application Interface Standard” (ARIB STD-T110).

2.2 Test Configuration

The interoperability test system is generally called a base station simulator. In this technical report, details such as equipment models used for the testing system are not specified. Rather the system is defined as any testing system that can perform the stipulated functions.

The interoperability test system comprises a test program for testing interoperability of Land Mobile Stations.

As the connection method between the interoperability test system and the Land Mobile Station under test, the following two methods are considered.

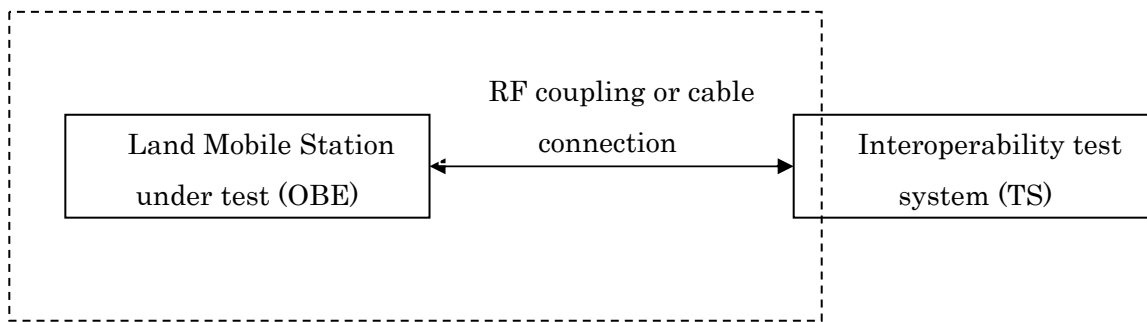
(1) Connection is made by RF coupling or by cable in a shield room or shield box. An example of a testing system with such a configuration is shown in Fig. 2.2-1.

(2) Land Mobile Station under test and testing system are arbitrarily connected by RF coupling. In this case, both of them are equipment in a Dedicated Short-Range Communication System as specified in Article 4-3 of the Radio Law and Article 6-4-7 of the Radio Facility Regulation, both requiring the Technical Standards Conformity Certification. An example of a testing system with such a configuration is shown in Figure 2.2-2.

Regarding the methods of installation and operation of the test system and the Land Mobile Station under test, the Installation and Operational Standard in Annex Q of the ARIB STD-T75 DEDICATED SHORT-RANGE COMMUNICATION (DSRC) SYSTEM standard shall be strictly followed, and consideration shall be given to ensure that no interference and disturbance of other communications occurs.

Each of the two methods of connection mentioned above may be used selectively according to the details of the test.

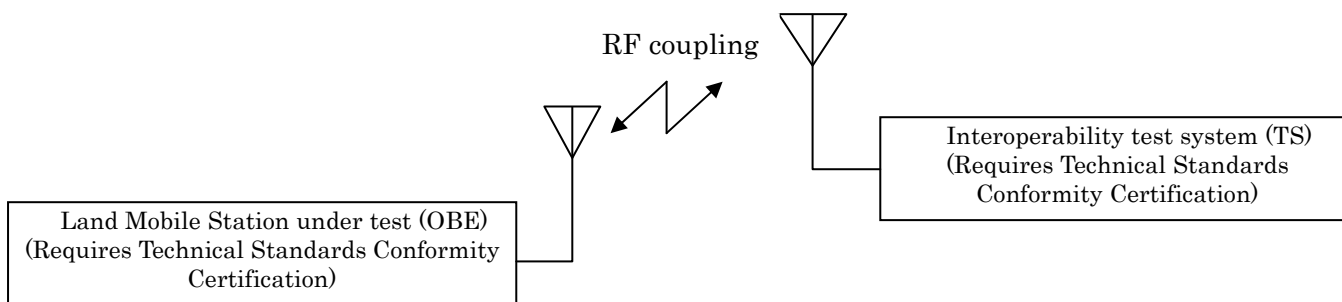
In the remainder of this document, the Land Mobile Station shall be referred to as OBE (On Board Equipment) and the interoperability test system as TS (Test System).



Basic functions of interoperability test system

- Basic application interface test function
 - Test program loading
 - Test result output
- DSRC-SPF test function

Figure 2.2-1 Test configuration example 1



In installation and operation, consideration shall be given to ensure that no interference and disturbance of other communications occurs.

Figure 2.2-2 Test configuration example 2

Chapter 3 interoperability testing

3.1 Test Items and Test Conditions

3.1.1 Test Items

Test items are described as to the operation test and performance test for each function.

For the performance test, only a method of measurement to obtain criteria for numerical value evaluations is described. Conformance of numerical values obtained with this method is not defined.

When there are separate requirements for a given service, performance should be evaluated in accordance with this method of measurement.

3.1.2 Test Items for OBE Instruction Response Application

The items for tests related to the OBE instruction response application to be performed with the TS are listed below.

Test number	Test item
1-1-1	Check communication result notification (normal end, no charge)
1-1-2	Check communication result notification (abnormal end)
1-1-3	Check communication result notification (normal end, with charge)
1-2-1	Check time notification
1-3-1	Check response (when "YES" button is pressed)
1-3-2	Check response (when "NO" button is pressed)
1-3-3	Check response (when no button is pressed)
1-3-4	Check response (when no button interface is present)

3.1.3 Test Items for OBE Memory Access Application

The items for tests related to the OBE memory access application to be performed with the TS are listed below.

Test number	Test item
2-1-1	Check memory resource information acquire processing
2-1-2	Check memory read processing
2-1-3	Check memory write processing
2-1-4	Check bulk memory read processing
2-1-5	Check bulk memory write processing
2-2-1	Check nonvolatile memory write processing (option)
2-3-1	Check memory read processing (no memory tag)
2-3-2	Check memory read processing (protection mode violation)
2-3-3	Check memory read processing (invalid command)
2-3-4	Check memory read processing (write size exceeded)
2-3-5	Check memory read processing (SPF violation)
2-3-6	Check bulk memory read processing (maximum tag number exceeded)
2-4-1	Check memory verification processing (option)
2-4-2	Check memory release processing (option)
2-5-1	Check password protected memory verification processing (option)
2-5-2	Check password protected memory release processing (option)
2-5-3	Check password protected memory read processing (option)
2-5-4	Check password protected memory write processing (option)
2-5-5	Check password protected bulk memory read processing (option)
2-5-6	Check password protected bulk memory write processing (option)
2-6-1	Check memory allocation processing (not enough free memory)
2-6-2	Check password protected memory read processing (password mismatch)

3.1.4 Test Items for IC Card Memory Access Application

The items for tests related to the IC card access application to be performed with the TS are listed below.

Test number	Test item
3-1-1	Check application start request
3-1-2	Check application end request
3-2-1	Check IC card read processing
3-2-2	Check IC card read access time
3-3-1	Check IC card write processing
3-3-2	Check IC card write access time
3-4-1	Check IC card reverse insertion error processing
3-5-1	Check certification information acquiry processing (with certification) Note: Selective item depending on implementation
3-5-2	Check certification information acquiry processing (no certification) Note: Selective item depending on implementation

3.1.5 Test Items for Push-Type Information Delivery Application

The items for tests related to the push-type information delivery application to be performed with the TS are listed below.

Test number	Test item
4-1-1	Check initial connection operation
4-2-1	Check push communication with no confirmation response (individual communication)
4-2-2	Check push communication with no confirmation response (broadcast communication)
4-2-3	Check push communication with confirmation response (response timing switch-over)
4-2-4	Check push communication with confirmation response (same response timing repeat)
4-2-5	Check segment/transfer communication
4-2-6	Check push operation discard communication
4-2-7	Check re-execute request
4-3-1	Check simulated push (option)

3.1.6 Test Items for OBE ID Communication Application

The items for tests related to the OBE ID communication application to be performed with the TS are listed below.

Test number	Test item
5-1-1	Check OBE ID registration processing
5-1-2	Check OBE ID check processing
5-1-3	Check OBE ID delete processing (normal operation)
5-1-4	Check OBE ID delete processing (error operation)
5-1-5	Check OBE ID condition change (at OBE)
5-2-1	Check OBE ID enquiry processing (normal operation)
5-2-2-1	Check OBE ID enquiry processing (error operation 1)
5-2-2-2	Check OBE ID enquiry processing (error operation 2)

3.1.7 Test Items for OBE Basic Indication Response Application

The items for tests related to the OBE basic indication application to be performed with the TS are listed below.

Test number	Test item
6-1-1	Check communication result notification (normal end)
6-1-2	Check communication result notification (abnormal end)
6-1-3	Check communication result and charge notification
6-2-1	Check time notification

3.2 Test Parameters

3.2.1 Interoperability Test Parameters Related to Basic Application Interface

The parameters to be set or registered for testing the basic application interface are as follows. These parameters are applied unless otherwise specified.

The indications <TS>, <OBE>, and <Common> have the following meaning.

<TS>: Parameter set or registered by TS

<OBE>: Parameter set or registered by OBE

<Common>: Parameter set or registered in both TS and OBE

3.2.2 DSRC Related Parameters

3.2.2.1 Layer 1 Parameters

- Frequency used: Select from D1, D2, D3, D4, D5, D6, D7 <TS>
- Communication profile indicates whether ASK or $\pi/4$ shift QPSK defined by communication standard ARIB STD-T75 is used <OBE>

3.2.2.2 Layer 2 Parameters

- Frame class: A or B or C <TS>
- Communication mode: Half duplex communication <TS>
- Communication zone: Standalone <TS>
- Transmitter/receiver identifier TRI: None <TS>
- Time sharing: None <TS>
- Communication area: Class 1 <TS>
- LLC: Type 1 procedure only <Common>
- Link request status identifier ACPI: Authorized <TS>
- Congestion information STA: 100 to 50% <TS>
- Release timer: 0.2 seconds fixed, valid identifier: always valid <TS>
- NRQ_{max}: 127 <OBE>
- Link request limit frequency: RT1=1, RT2, RT3=4, RT4=4 <OBE>
- Priority assignment: Not conducted <Common>
- Scramble: Yes <Common>

3.2.2.3 Layer 7 Parameters

- Concatenation: None <Common>
- Connection procedure: Standard connection <TS>
- EID: Elective number from 4 to 127 <OBE>; 3 in broadcast mode
- FID: 1 <TS>
- PDU number of PDU header: Selective number from 2 to 15 <Common>
- Communication profile: Declared communication profile is selected. <Common>

3.2.3 DSRC Application Sub Layer (DSRC-ASL) Related Parameters

3.2.3.1 ELCP Parameters

- AID: 18 (Multi-purpose information system) <Common>
- ASL base station profile <TS>
- Version information: 0
- Connection management timer: To be set by TS
- ASL-ELCP function identification information: Expanded function according to details of test
- ASL-NCP identification information: Included in localPortControl[1]
- ASL Land Mobile Station profile <OBE>
- Version information: 0
- Land Mobile Station identification information: Specified by OBE
- ASL-ELCP function identification information: Identifier indicating implemented expanded functions
- ASL-NCP identification information: Identifier indicating implemented ASL-NCP (to be included in localPortControl[1])

3.2.3.2 LPCP Parameters

- Access point identifier: 1 <Common>
- List of reception enabled ports: Numbers of reception enabled ports for implemented applications <OBE>

3.3.3.3 LPP Parameters

- Resend function (sender side): Values below indicated at implementation <Common>
- Resend timer timeout value: Set at TS and OBE
- Max. number of resend tries: Set at TS and OBE

- TID: Use 0x0000–0x7FFF for Invoke.req at OBE and 0x8000–0xFFFF for Invoke.req at TS

3.2.4 Basic Application Interface Related Parameters

3.2.4.1 Parameters Common to All Basic Applications

- Enable/disable LPP resend function when sending: Set at TS and OBE <Common>
- LPP initial connection procedure: Normal initial connection procedure of application <TS>

3.2.4.2 OBE Instruction Response Application Related Parameters

- Send source and send target port number: 0x0C09 <Common>
- Check input method available: Declare at time of testing <OBE>

3.2.4.3 OBE memory Access Application Related Parameters

- Send source and send target port number: 0x0C18 <Common>
- LPP ResultTimeout: Set at TS <TS>
- Max. size of operation data when receiving or sending (opCommandBody of OperationCommand): Declare at time of testing <OBE>
- Password function: Declare implementation status at time of testing <OBE>
- Memory allocation/release function: Declare implementation status at time of testing <OBE>

3.2.4.4 IC card Access Application Related Parameters

- Send source and send target port number
If access application for contact-based IC card: 0x0C10 <Common>
If access application for contactless IC card: 0x0C11 <Common>
- EMV certification enable/disable: Declare at time of testing <OBE>

3.2.4.5 Push-Type Information Delivery Application Related Parameters

- Send source and send target port number: 0x0C0A <Common>
- LPP ResultTimeout: Set at TS <TS>
- ClientInformation command for notification of client information: Declare at time of testing <OBE>

3.2.4.6 OBE ID Communication Application Related Parameters

- Send source and send target port number: 0x0C00 <Common>

3.2.4.7 OBE Basic Indication Application Related Parameters

- Send source and send target port number: 0x0C08 <Common>

3.3 Test Details

The steps for testing the interoperability of Land Mobile Radio Stations with the Dedicated Short-Range Communication (DSRC) basic application interface are described below.

3.3.1 Test Procedure for OBE Instruction Response Application

The items for tests related to the OBE instruction response application to be performed with the TS are listed below.

The items are listed separately as test numbers 1-3-1 to 1-3-4, depending on whether the OBE is equipped with buttons, voice recognition, etc. Select the appropriate items accordingly.

- OBE with integrated response input facility: 1-3-1, 1-3-2, 1-3-3
- OBE with response input facility separate from main unit: 1-3-1, 1-3-2, 1-3-3, 1-3-4
- OBE without response input facility: 1-3-4

Table 3-1 OBE instruction response operation test—Communication result notification (normal end, no charge)

Test number	1-1-1	Item name	OBE instruction response operation Check communication result notification (normal end, no charge)
Test overview Check communication result notification operation.			
Test conditions <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. Local port number information for OBE instruction response application must have been exchanged.			
Test procedure <ol style="list-style-type: none"> 1. As OBE instruction information, TS sends OBE indication notification command “indicationRequest” including “transactionResult(0)” to OBE. 2. OBE sends OBE indication response command “indicationResponse” as response to OBE instruction information. 			
Confirmation items <ul style="list-style-type: none"> • Verify that “transactionResult” at OBE is (0), “Service normal end, no charge.” • Verify that TS receives OBE indication response command “indicationResponse.” 			

Table 3-2 OBE instruction response operation test—Communication result notification
(abnormal end)

Test number	1-1-2	Item name	OBE instruction response operation Check communication result notification (abnormal end)
<p>Test overview</p> <ul style="list-style-type: none"> • Check communication result notification operation. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE instruction response application must have been exchanged. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE instruction information, TS sends OBE indication notification command “indicationRequest” including “transactionResult(64)” to OBE. 2. OBE sends OBE indication response command “indicationResponse” as response to OBE instruction information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that “transactionResult” at OBE is (64), “Service abnormal end.” • Verify that TS receives OBE indication response command “indicationResponse.” 			

Table 3-3 OBE instruction response operation test—Communication result notification (normal end, with charge)

Test number	1-1-3	Item name	OBE instruction response operation Check communication result notification (normal end, with charge)
<p>Test overview</p> <ul style="list-style-type: none"> • Check communication result notification operation and charge notification operation. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE instruction response application must have been exchanged. • For the operation test, use the following data as “amount” parameter value. Test data 1: any amount information [3 bytes] 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE instruction information, TS sends OBE indication notification command “indicationRequest” including “transactionResult(128), amount (test data 1)” to OBE. 2. OBE sends OBE indication response command “indicationResponse” as response to OBE instruction information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that “transactionResult” at OBE is (128), “Service normal end, with charge,” and that “amount” value matches test data 1. • Verify that TS receives OBE indication response command “indicationResponse.” 			

Table 3-4 OBE instruction response operation test—Time notification

Test number	1-2-1	Item name	OBE instruction response operation Check time notification
<p>Test overview</p> <ul style="list-style-type: none"> • Check time notification operation. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE instruction response application must have been exchanged. • For the operation test, use the following data as “time” parameter value. Test data 1: any time information [4 bytes] 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE instruction information, TS sends OBE indication notification command “indicationRequest” including “transactionResult(0), time (test data 1)” to OBE. 2. OBE sends OBE indication response command “indicationResponse” as response to OBE instruction information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that “transactionResult” at OBE is (0), “Service normal end, no charge,” and that “time” value matches test data 1. • Verify that TS receives OBE indication response command “indicationResponse.” 			

Table 3-5 OBE instruction response operation test—Response check (“YES” button pressed)

Test number	1-3-1	Item name	OBE instruction response operation Check response (when “YES” button is pressed)
<p>Test overview</p> <ul style="list-style-type: none"> • Check OBE instruction response operation. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • OBE must be equipped with button interface. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE instruction response application must have been exchanged. • For the operation test, use the following data as the number of seconds value for the OBE confirmation request command “confirmationRequest.” <p style="text-align: center;">Test data 1: any number of seconds [1 byte]</p>			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE response confirmation information, TS sends OBE confirmation request command “confirmationRequest” including test data 1 to OBE. 2. At OBE, confirmation button (YES) is pressed within time interval specified by test data 1. OBE sends OBE confirmation response command “confirmationResponse” as response to OBE response confirmation information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives OBE confirmation response command “confirmationResponse,” and that content is (1). 			

Table 3-6 OBE instruction response operation test—Response check (“NO” button pressed)

Test number	1-3-2	Item name	OBE instruction response operation Check response (when “NO” button is pressed)
<p>Test overview</p> <ul style="list-style-type: none"> • Check OBE instruction response operation. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • OBE must be equipped with button interface. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE instruction response application must have been exchanged. • For the operation test, use the following data as the number of seconds value for the OBE confirmation request command “confirmationRequest.” <p style="text-align: center;">Test data 1: any number of seconds [1 byte]</p>			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE response checking information, TS sends OBE confirmation request command “confirmationRequest” including test data 1 to OBE. 2. At OBE, confirmation button (NO) is pressed within time interval specified by test data 1. 3. OBE sends OBE confirmation response command “confirmationResponse” as response to OBE response confirmation information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives OBE confirmation response command “confirmationResponse,” and that content is (2). 			

Table 3-7 OBE instruction response operation test—Response check (no button pressed)

Test number	1-3-3	Item name	OBE instruction response operation Check response (when no button is pressed)
<p>Test overview</p> <ul style="list-style-type: none"> • Check OBE instruction response operation. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • OBE must be equipped with button interface. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE instruction response application must have been exchanged. • For the operation test, use the following data as the number of seconds value for the OBE confirmation request command “confirmationRequest.” <p style="text-align: center;">Test data 11: any number of seconds [1 byte]</p>			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE response checking information, TS sends OBE confirmation request command “confirmationRequest” including test data 11 to OBE. 2. At OBE, no button is pressed within time interval specified by test data 1. 3. OBE sends OBE confirmation response command “confirmationResponse” as response to OBE response confirmation information. 			
<p>Confirmation items</p> <p>Verify that TS receives OBE confirmation response command “confirmationResponse” within the number of seconds specified by test data 1, and that content is (0).</p>			

Table 3-8 OBE instruction response operation test—Response check (no button interface)

Test number	1-3-4	Item name	OBE instruction response operation Check response (when no button interface is present)
<p>Test overview</p> <ul style="list-style-type: none"> • Check OBE instruction response operation. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • OBE must not be equipped with button interface. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE instruction response application must have been exchanged. • For the operation test, use the following data as the number of seconds value for the OBE confirmation request command “confirmationRequest.” <p style="text-align: center;">Test data 1: any number of seconds [1 byte]</p>			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE response checking information, TS sends OBE confirmation request command “confirmationRequest” including test data 1 to OBE. 2. OBE sends OBE denial response command “OBEDenialResponse” as response to OBE response confirmation information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives OBE denial response command “OBEDenialResponse,” and that status is (1). 			

3.3.2 Test Items for OBE Memory Access Application

The items for tests related to the OBE memory access application to be performed with the TS are listed below.

Table 3-9 Memory access operation test—Memory resource information acquiry processing check

Test number	2-1-1	Item name	Memory access operation Check memory resource information acquiry processing
<p>Test overview</p> <ul style="list-style-type: none"> • Check memory resource information acquiry processing 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • TS must declare OBE memory tag resource information to evaluation operator. • For the operation test, use the following data as memory tag setting. Test data 1: any memory tag [8 bytes] 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends memory resource information acquiry command “resourceInfoRequest” including memory tag (test data 1) to OBE. 2. OBE returns memory resource information response command “resourceInfoResponse” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives memory resource information response command “resourceInfoResponse,” and that content matches the declared memory tag resource information. 			

Table 3-10 Memory access operation test—Memory read processing check

Test number	2-1-2	Item name	Memory access operation Check memory read processing
<p>Test overview</p> <ul style="list-style-type: none"> • Check memory read processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • For the operation test, use the following data as memory tag setting. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 2: any store data [variable length] <p>* Set protection mode of data storage memory area to “SPF optional” and “Read enabled.”</p>			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends memory read request command “readRequest” including memory tag (test data 1) to OBE. 2. OBE returns memory read response command “readResponse” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives memory read response command “readResponse,” and that memory tag store data content matches test data 1 and test data 2. 			

Table 3-11 Memory access operation test—Memory write processing check

Test number	2-1-3	Item name	Memory access operation Check memory write processing
<p>Test overview</p> <ul style="list-style-type: none"> • Check memory write processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • For the operation test, use the following data as memory tag setting. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 2: any store data [variable length] * Set protection mode of data storage memory area to “SPF optional” and “Write enabled.” 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends memory write request command “writeRequest” including memory tag (test data 1) and store data (test data 2) to OBE. 2. OBE returns memory write response command “writeResponse” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives memory write response command “writeResponse,” and that memory tag store data content matches test data 1. 			

Table 3-12 Memory access operation test—Bulk memory read processing check

Test number	2-1-4	Item name	Memory access operation Check bulk memory read processing
<p>Test overview</p> <ul style="list-style-type: none"> • Check bulk memory read processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • For the operation test, use the following data as memory tag setting. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 2: any store data [variable length] Test data 3: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 4: any store data [variable length] * Set protection mode of data storage memory area to “SPF optional” and “Read enabled.” 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends bulk memory read request command “readBulkRequest” including memory tag list (test data 1 and test data 3) to OBE. 2. OBE returns bulk memory read response command “readBulkResponse” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives bulk memory read response command “readBulkResponse,” and that memory tag list content matches test data 1 and 2, and test data 3 and 4, respectively. 			

Table 3-13 Memory access operation test—Bulk memory write processing check

Test number	2-1-5	Item name	Memory access operation Check bulk memory write processing
<p>Test overview</p> <ul style="list-style-type: none"> • Check bulk memory read processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • For the operation test, use the following data as memory tag setting. Test data are as follows. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 2: any store data [variable length] Test data 3: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 4: any store data [variable length] * Set protection mode of data storage memory area to “SPF optional” and “Write enabled.” 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends bulk memory write request command “writeBulkRequest” including memory tag list (test data 1 and 2, and test data 3 and 4) to OBE. 2. OBE returns bulk memory write response command “writeBulkResponse” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives bulk memory write response command “writeBulkResponse,” and that memory tag list content matches test data 1 and test data 3. 			

Table 3-14 Memory access operation test—Nonvolatile memory write processing check (option)

Test number	2-2-1	Item name	Memory access operation Check nonvolatile memory write processing (option)
<p>Test overview</p> <ul style="list-style-type: none"> • Check nonvolatile memory write processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • OBE must have a nonvolatile memory area. • For the operation test, use the following data as memory tag setting. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: nonvolatile, management category: OBE) [8 bytes] Test data 2: any store data [variable length] * Set protection mode of data storage memory area to “SPF optional” and “Write enabled.” 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends memory write request command “writeRequest” including memory tag (test data 1) and store data (test data 2) to OBE. 2. OBE returns memory write response command “writeResponse” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives memory write response command “writeResponse,” and that memory tag store data content matches test data 1. 			

Table 3-15 Memory access operation test—Memory read processing check (no memory tag)

Test number	2-3-1	Item name	Memory access operation Check memory read processing (no memory tag)
<p>Test overview</p> <ul style="list-style-type: none"> • Check memory read processing (no memory tag). 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends memory read request command “readRequest” with no memory tag to OBE. 2. OBE sends OBE denial response command “OBEDenialResponse” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives OBE denial response command “OBEDenialResponse,” and that status is (6) “No applicable memory tag.” 			

Table 3-16 Memory access operation test—Memory write processing check (protection mode violation)

Test number	2-3-2	Item name	Memory access operation Check memory read processing (protection mode violation)
<p>Test overview</p> <ul style="list-style-type: none"> • Check memory read processing (protection mode violation). 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • For the operation test, use the following data as memory tag setting. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 2: any store data [variable length] <p>* Set protection mode of data storage memory area to “SPF optional” and “Read prohibited.”</p>			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends memory read request command “readRequest” including memory tag (test data 1) to OBE. 2. OBE sends OBE denial response command “OBEDenialResponse” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives OBE denial response command “OBEDenialResponse,” and that status is (8) “Protection mode violation.” 			

Table 3-17 Memory access operation test—Memory write processing check (invalid command)

Test number	2-3-3	Item name	Memory access operation Check memory read processing (invalid command)
<p>Test overview</p> <ul style="list-style-type: none"> • Check memory read processing (invalid command). 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends memory read request command “readRequest” with invalid OpCommandType to OBE. 2. OBE sends OBE denial response command “OBEDenialResponse” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives OBE denial response command “OBEDenialResponse,” and that status is (16) “Invalid command (cannot interpret).” 			

Table 3-18 Memory access operation test—Memory write processing check (write size exceeded)

Test number	2-3-4	Item name	Memory access operation Check memory read processing (write size exceeded)
<p>Test overview</p> <ul style="list-style-type: none"> • Check memory read processing (write size exceeded). 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • For the operation test, use the following data as memory tag setting. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 2: any store data [variable length] * Set protection mode of data storage memory area to “SPF optional” and “Write enabled,” and set memory allocation size to a smaller value than test data 2. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends memory write request command “writeRequest” including memory tag (test data 1) and store data (test data 2) to OBE. 2. OBE sends OBE denial response command “OBEDenialResponse” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives OBE denial response command “OBEDenialResponse,” and that status is (9) “Access control violation.” 			

Table 3-19 Memory access operation test—Memory write processing check (SPF violation)

Test number	2-3-5	Item name	Memory access operation Check memory write processing (SPF violation)
<p>Test overview</p> <ul style="list-style-type: none"> • Check memory write processing (SPF violation) 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • For the operation test, use the following data as memory tag setting. Test data are as follows. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 2: any store data [variable length] <p>* Set protection mode of data storage memory area to “SPF optional.”</p>			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends memory write request command “writeRequest” including memory tag (test data 1) and store data (test data 2) to OBE. 2. OBE sends OBE denial response command “OBEDenialResponse” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives OBE denial response command “OBEDenialResponse,” and that status is (11) “SPF mode violation.” 			

Table 3-20 Memory access operation test—Bulk memory read processing check (maximum tag number exceeded)

Test number	2-3-6	Item name	Memory access operation Check bulk memory read processing (maximum tag number exceeded)
<p>Test overview</p> <ul style="list-style-type: none"> • Check bulk memory read processing (maximum tag number exceeded). 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • For the operation test, use the following data as memory tag setting. Test data are as follows. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 2: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 3: any memory tag (recording type: volatile, management category: OBE) [8 bytes] <p>* At the OBE, set the maximum number of memory tags for bulk reading to 2.</p>			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends bulk memory read request command “readBulkRequest” including memory tag list (test data 1, test data 2, test data 3) to OBE. 2. OBE sends OBE denial response command “OBEDenialResponse” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives OBE denial response command “OBEDenialResponse,” and that status is (7) “maximum tag number for bulk processing exceeded.” 			

Table 3-21 Memory access operation test—Memory allocation processing check (option)

Test number	2-4-1	Item name	Memory access operation Check memory allocation processing (option)
<p>Test overview</p> <ul style="list-style-type: none"> • Check memory allocation processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • OBE must have memory allocation function. • For the operation test, use the following data as memory allocation setting. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: allocation at RSU possible) [8 bytes] Test data 2: any tag information (protection mode, memory allocation size, initial setting value) [variable length] 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends memory allocation request command “memoryAllocRequest” including memory tag (test data 1) and tag information (test data 2) to OBE. 2. OBE returns memory allocation response command “memoryAllocResponse” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives memory allocation response command “memoryAllocResponse,” and that memory tag content matches test data 1. 			

Table 3-22 Memory access operation test—Memory release processing check (option)

Test number	2-4-2	Item name	Memory access operation Check memory release processing (option)
<p>Test overview</p> <ul style="list-style-type: none"> • Check memory release processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • OBE must have memory release function. • For the operation test, use the following data as memory tag setting. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: allocation at RSU possible) [8 bytes] 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends memory release request command “memoryFreeRequest” including memory tag (test data 1) to OBE. 2. OBE returns memory release response command “memoryFreeResponse” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives memory release response command “memoryFreeResponse,” and that memory tag content matches test data 1. 			

Table 3-23 Memory access operation test—Password protected memory allocation processing check (option)

Test number	2-5-1	Item name	Memory access operation Check password protected memory allocation processing (option)
<p>Test overview</p> <ul style="list-style-type: none"> • Check password protected memory allocation processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • OBE must have memory allocation and password protection functions. • For the operation test, use the following data as password protected memory allocation setting. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: allocation at RSU possible) [8 bytes] Test data 2: any tag information (protection mode, memory allocation size, password, initial setting value) [variable length] 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends password protected memory allocation request command “memoryAllocRequestWithCredence” including memory tag (test data 1) and tag information (test data 2) to OBE. 2. OBE returns password protected memory allocation response command “memoryAllocResponseWithCredence” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives password protected memory allocation response command “memoryAllocResponseWithCredence,” and that memory tag content matches test data 1. 			

Table 3-24 Memory access operation test—Password protected memory release processing check (option)

Test number	2-5-2	Item name	Memory access operation Check password protected memory release processing (option)
<p>Test overview</p> <ul style="list-style-type: none"> • Check password protected memory release processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • OBE must have memory release and password protection functions. • For the operation test, use the following data as password protected memory tag setting. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: allocation at RSU possible) [8 bytes] Test data 2: any memory tag [8 bytes] 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends password protected memory release request command “memoryFreeRequestWithCredence” including memory tag (test data 1) and password information (test data 2) to OBE. 2. OBE returns password protected memory release response command “memoryFreeResponseWithCredence” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives password protected memory release response command “memoryFreeResponseWithCredence,” and that memory tag content matches test data 1. 			

Table 3-25 Memory access operation test—Password protected memory read processing check
(option)

Test number	2-5-3	Item name	Memory access operation Check password protected memory read processing (option)
<p>Test overview</p> <ul style="list-style-type: none"> • Check password protected memory read processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • OBE must have password protection function. • For the operation test, use the following data as password protected memory tag and store data setting. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 2: any password [8 bytes] Test data 3: any store data [variable length] * Set protection mode of data storage memory area to “SPF optional” and “Read enabled.” 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends password protected memory read command “readRequestWithCredence” including memory tag (test data 1) and password (test data 2) to OBE. 2. OBE returns password protected memory read response command “readResponseWithCredence” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives password protected bulk memory read request command “readResponseWithCredence,” and that memory tag store data content matches test data 1 and test data 3. 			

Table 3-26 Memory access operation test—Password protected memory write processing check
(option)

Test number	2-5-4	Item name	Memory access operation Check password protected memory write processing (option)
<p>Test overview</p> <ul style="list-style-type: none"> • Check password protected memory write processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • OBE must have password function. • For the operation test, use the following data as password protected memory tag and store data setting. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 2: any password [8 bytes] Test data 3: any store data [variable length] * Set protection mode of data storage memory area to “SPF optional” and “Write enabled.” 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends password protected bulk memory write request command “writeRequestWithCredence” including memory tag (test data 1), password (test data 2), and store data (test data 3) to OBE. 2. OBE returns password protected memory write response command “writeResponseWithCredence” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives password protected memory write response command “writeResponseWithCredence,” and that memory tag content matches test data 1. 			

Table 3-27 Memory access operation test—Password protected bulk memory read processing check (option)

Test number	2-5-5	Item name	Memory access operation Check password protected bulk memory read processing (option)
<p>Test overview</p> <ul style="list-style-type: none"> Check password protected bulk memory read processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> Basic parameters as listed in section 3.2. DSRC-LPCP/LPP must operate normally. DSRC connection processing must be completed, and communication connection state must have been established. Local port number information for normal memory access port must have been exchanged. OBE must have password function. For the operation test, use the following data as password protection and store data setting. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 2: any password [8 bytes] Test data 3: any store data [variable length] Test data 4: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 5: any password [8 bytes] Test data 6: any store data [variable length] * Set protection mode of data storage memory area to “SPF optional” and “Read enabled.” 			
<p>Test procedure</p> <ol style="list-style-type: none"> As OBE memory access information, TS sends password protected bulk memory read request command “ReadBulkRequestWithCredence” including password protected memory tag list (test data 1,2 and 4,5) to OBE. OBE returns password protected bulk memory read response command “readBulkResponseWithCredence” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> Verify that TS receives password protected bulk memory read response command “readBulkResponseWithCredence,” and that data list content matches test data 1 and 3, and test data 4 and 6, respectively. 			

Table 3-28 Memory access operation test—Password protected bulk memory write processing check (option)

Test number	2-5-6	Item name	Memory access operation Check password protected bulk memory write processing (option)
<p>Test overview</p> <ul style="list-style-type: none"> • Check password protected bulk memory write processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • OBE must have password function. • For the operation test, use the following data as password protected memory tag and store data setting. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 2: any password [8 bytes] Test data 3: any store data [variable length] Test data 4: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 5: any password [8 bytes] Test data 6: any store data [variable length] * Set protection mode of data storage memory area to “SPF optional” and “Write enabled.” 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends password protected bulk memory write request command “writeBulkRequestWithCredence” including password protected data list (test data 1 to 6) to OBE. 2. OBE returns password protected bulk memory write response command “writeBulkResponseWithCredence” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives password protected bulk memory write response command “writeBulkResponseWithCredence,” and that memory tag list content matches test data 1 and test data 4. 			

Table 3-29 Memory access operation test—Check of memory allocation processing in case of insufficient memory (option)

Test number	2-6-1	Item name	Memory access operation Check memory allocation processing (not enough free memory)
<p>Test overview</p> <ul style="list-style-type: none"> • Check memory allocation processing (not enough free memory). 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • OBE must have memory allocation function. • For the operation test, use the following data as memory allocation setting. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: allocation at RSU possible) [8 bytes] Test data 2: any tag information (protection mode, memory allocation size, initial setting value) [variable length] * Set memory allocation size to a larger value than available in volatile memory area for data. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends memory allocation request command “memoryAllocRequest” including memory tag (test data 1) and tag information (test data 2) to OBE. 2. OBE sends OBE denial response command “OBEDenialResponse” as response to OBE memory access information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives OBE denial response command “OBEDenialResponse,” and that status is (5) “Not enough free OBE memory.” 			

Table 3-30 Memory access operation test—Mismatched password memory read processing check (option)

Test number	2-6-2	Item name	Memory access operation Check password protected memory read processing (option) (password mismatch)
<p>Test overview</p> <ul style="list-style-type: none"> • Check password protected memory read processing when password does not match. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for normal memory access port must have been exchanged. • OBE must have password function. • For the operation test, use the following data as password protected memory tag and store data setting. <ul style="list-style-type: none"> Test data 1: any memory tag (recording type: volatile, management category: OBE) [8 bytes] Test data 2: any tag information (protection mode, memory allocation size, password, initial setting value) [variable length] Test data 3: any password [8 bytes] * Set protection mode of data storage memory area to “SPF optional” and “Read enabled.” 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE memory access information, TS sends password protected memory allocation request command “memoryAllocRequestWithCredence” including memory tag (test data 1) and tag information (test data 2) to OBE. 2. OBE returns password protected memory allocation response command “memoryAllocResponseWithCredence” as response to OBE memory access information. 3. As OBE memory access information, TS sends password protected memory read command “readRequestWithCredence” including memory tag (test data 1) and password (test data 3) to OBE. 4. OBE sends OBE denial response command “OBEDenialResponse” as response to OBE 			

memory access information.

Confirmation items

- | |
|---|
| <ul style="list-style-type: none">• Verify that TS receives OBE denial response command “OBEDenialResponse,” and that status is (10) “Password mismatch.” |
|---|

3.3.3 Test Items for IC Card Memory Access Application

The items for tests related to the IC card memory access application are listed below.

Test numbers 3-5-1 and 3-5-2 are selective. Only one of these has to be performed, depending on whether the OBE has EMV certification or not.

- OBE has EMV certification: perform 3-5-1
- OBE does not have EMV certification: perform 3-5-2

The test items of the IC card access application are the same for the contact-based IC card access application and the contactless IC card access application. Simply specify the correct port number in each case. Information about port numbers is given in section 3.2.4.4.

Table 3-31 IC card access operation test—Application start request check

Test number	3-1-1	Item name	IC card access operation Check application start request
<p>Test overview</p> <ul style="list-style-type: none"> • Check IC card access start operation. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • IC card for testing must be set in OBE. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for IC card access application must have been exchanged. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As application start request, TS sends application start request command “initRequest” to OBE. 2. OBE returns application start response command “initResponse” as response to application start request. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives application start response command “initResponse” including ATR information for test IC card. 			

Table 3-32 IC card access operation test—Application end request check

Test number	3-1-2	Item name	IC card access operation Check application end request
<p>Test overview</p> <ul style="list-style-type: none"> • Check IC card access end operation. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • IC card for testing must be set in OBE. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for IC card access application must have been exchanged. • Start request for IC card access application must have been issued. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As application end request, TS sends application end request command “endRequest” to OBE. 2. OBE returns application end response command “endResponse” as response to application end request. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives application end response command “endResponse.” 			

Table 3-33 IC card access operation test—IC card read processing check

Test number	3-2-1	Item name	IC card access operation Check IC card read processing
<p>Test overview</p> <ul style="list-style-type: none"> • Check IC card read processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • IC card for testing must be set in OBE. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for IC card access application must have been exchanged. • Start request for IC card access application must have been issued. • IC card for testing must allow reading of data from specified position. • IC card send command “iCCCommand” must be used for operation testing with the following data. <p style="padding-left: 40px;">Test data 1: ISO/IEC7816-4 compliant Command APDU [variable length ≤ 254 bytes]</p>			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As IC card command message, TS sends IC card send command “iCCCommand” including test data 1 to OBE. 2. OBE gets data corresponding to test data 1 from IC card and returns IC card response send command “iCCResponse” as response to IC card send command. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives IC card response send command “iCCResponse,” and that specified data from IC card are included. 			

Table 3-34 IC card access operation test—IC card read access time check

Test number	3-2-2	Item name	IC card access operation Check IC card read access time
<p>Test overview</p> <ul style="list-style-type: none"> • Check time required for IC card read processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • IC card for testing must be set in OBE. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for IC card access application must have been exchanged. • Start request for IC card access application must have been issued. • IC card for testing must allow reading of data from specified position. • IC card send command “iCCCommand” must be used for operation testing with the following data. <ul style="list-style-type: none"> Test data 1: ISO/IEC7816-4 compliant Command APDU [variable length ≤ 254 bytes] 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As IC card command message, TS sends IC card send command “iCCCommand” including test data 1 to OBE, and records send time as timestamp t1. 2. OBE gets data corresponding to test data 1 from IC card and returns IC card response send command “iCCResponse” as response to IC card command message. 3. TS receives IC card response send command “iCCResponse” from OBE, and records receive time as timestamp t2. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives IC card response send command “iCCResponse,” and that specified data from IC card are included. • Calculate IC card read access time as follows: <ul style="list-style-type: none"> IC card read access time = t2 - t1 • Obtain [10] samples and take the average value as measurement result. 			

Table 3-35 IC card access operation test—IC card write processing check

Test number	3-3-1	Item name	IC card access operation Check IC card write processing
<p>Test overview</p> <ul style="list-style-type: none"> • Check IC card write processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • IC card for testing must be set in OBE. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for IC card access application must have been exchanged. • Start request for IC card access application must have been issued. • IC card for testing must allow writing of data to specified position. • IC card send command “iCCCommand” must be used for operation testing with the following data. <ul style="list-style-type: none"> Test data 1: ISO/IEC7816-4 compliant Command APDU [variable length ≤ 254 bytes] 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As IC card command message, TS sends IC card send command “iCCCommand” including test data 1 to OBE. 2. OBE gets data corresponding to test data 1 from IC card and returns IC card response send command “iCCResponse” as response to IC card command message. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives IC card response send command “iCCResponse.” • Verify that specified data were written to write position on IC card. 			

Table 3-36 IC card access operation test—IC card write access time check

Test number	3-3-2	Item name	IC card access operation Check IC card write access time
<p>Test overview</p> <ul style="list-style-type: none"> • Check time required for IC card write processing. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • IC card for testing must be set in OBE. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for IC card access application must have been exchanged. • Start request for IC card access application must have been issued. • IC card for testing must allow writing of data to specified position. • IC card send command “iCCCommand” must be used for operation testing with the following data. <ul style="list-style-type: none"> Test data 1: ISO/IEC7816-4 compliant Command APDU [variable length ≤ 254 bytes] 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As IC card command message, TS sends IC card send command “iCCCommand” including test data 1 to OBE, and records send time as timestamp t1. 2. OBE gets data corresponding to test data 1 from IC card and returns IC card response send command “iCCResponse” as response to IC card command message. 3. TS receives IC card response send command “iCCResponse” from OBE, and records receive time as timestamp t2. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives IC card response send command “iCCResponse.” • Verify that specified data were written to write position on IC card. • Calculate IC card write access time as follows: <ul style="list-style-type: none"> IC card write access time = t2 - t1 • Obtain [10] samples and take the average value as measurement result. 			

Table 3-37 IC card access operation test—IC card reverse insertion error processing check

Test number	3-4-1	Item name	IC card access operation Check IC card reverse insertion error processing
<p>Test overview</p> <ul style="list-style-type: none"> • Check operation in case of error. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • IC card for testing must be set in reverse in OBE. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for IC card access application must have been exchanged. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As application start request, TS sends application start request command “initRequest” to OBE. 2. OBE sends OBE denial response command “OBEDenialResponse” as response to application start request. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives OBE denial response command “OBEDenialResponse,” and that status is (2). 			

Table 3-38 IC card access operation test—Certification information acquiry processing check
(with certification)

Test number	3-5-1	Item name	IC card access operation Check certification information acquiry processing (with certification)
<p>Test overview</p> <ul style="list-style-type: none"> • Check send/receive of certification information acquiry message for OBE with EMV certification. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for IC card access application must have been exchanged. • OBE used for testing must have obtained EMV certification. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As application start request, TS sends certification information request command “accreditationInfoRequest.” 2. OBE sends certification information request response command “accreditationInfoResponse” as response to application start request. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives certification information request response command “accreditationInfoResponse.” • Verify that received certification information request response command “accreditationInfoResponse” includes certification information, and that EMV certification is set to “Yes.” 			

Table 3-39 IC card access operation test—Certification information acquiry processing check
(no certification)

Test number	3-5-2	Item name	IC card access operation Check certification information acquiry processing (no certification)
<p>Test overview</p> <ul style="list-style-type: none"> • Check send/receive of certification information acquiry message for OBE without EMV certification. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for IC card access application must have been exchanged. • OBE used for testing must not have obtained EMV certification. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As application start request, TS sends certification information request command “accreditationInfoRequest.” 2. OBE sends certification information request response command “accreditationInfoResponse” as response to application start request. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives certification information request response command “accreditationInfoResponse.” • Verify that received certification information request response command “accreditationInfoResponse” includes certification information, and that EMV certification is set to “No.” 			

3.3.4 Test Items for Push-Type Information Delivery Application

The items for tests related to the push-type information delivery application are listed below.

because the push-type information delivery application will handle various kinds of multimedia content, each test item is intended to check reception functionality for about 1000 octets. However, to accommodate also OBEs with a reception capacity for less than that, the test data size is defined as “min(1000, MaxPushBodySize),” allowing selection either of 1000 octets or MaxPushBodySize (maximum content size that can be received by push client).

Test number 4-3-1 is to be performed only for OBEs with IP connectivity test function.

Table 3-40 Push-type information delivery application test—Check initial connection operation

Test number	4-1-1	Item name	Push-type information delivery operation Check initial connection operation
Test overview			
<ul style="list-style-type: none"> • Check initial connection operation of push-type information delivery application 			
Test conditions			
<ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • Push-type information delivery application must be implemented in OBE. • OBE must declare DSRC client resource information. 			
Test procedure			
<ol style="list-style-type: none"> 1. Establish DSRC connection. 2. OBE sends client information notification command “ClientInformation” as DSRC client resource information. 			
Confirmation items			
<ul style="list-style-type: none"> • Verify that TS receives client information notification command “ClientInformation,” and that content matches declared DSRC client resource information. 			

Table 3-41 Push-type information delivery application test—Check push communication with no confirmation response (individual communication)

Test number	4-2-1	Item name	Push-type information delivery operation Check push communication with no confirmation response (individual communication)
<p>Test overview</p> <ul style="list-style-type: none"> • Check operation of push-type information delivery application with push communication requiring no confirmation response (individual communication). 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for push-type information delivery application must have been exchanged. • For the operation test, use the following test data to be sent from TS to OBE. <ul style="list-style-type: none"> Test data 1: Any data for application type / content type included in client information notification command “ClientInformation,” min(1000, MaxPushBodySize) octets. (text-display or browser) // text-plain preferable. Test data 2: Any data converted into content type not included in client information notification command “ClientInformation,” min(1000, MaxPushBodySize). 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. TS sends test data 1 to OBE as push communication with no confirmation response. 2. TS sends test data 2 to OBE as push communication with no confirmation response. 3. OBE returns push delivery abort command “PushAbortOperation.” 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that OBE receives push communication with no confirmation response in step 1, and that it matches test data 1. • Verify that push client in OBE does not execute content in step 2. • Verify that push delivery abort command “PushAbortOperation” received by TS from OBE in step 3 has status code (5) “Cannot process specified ContentType.” 			

Table 3-42 Push-type information delivery application test—Check push communication with no confirmation response (broadcast communication)

Test number	4-2-2	Item name	Push-type information delivery operation Check push communication with no confirmation response (broadcast communication)
<p>Test overview</p> <ul style="list-style-type: none"> Check operation of push-type information delivery application with push communication requiring no confirmation response (broadcast communication). 			
<p>Test conditions</p> <ul style="list-style-type: none"> Basic parameters as listed in section 3.2. DSRC-LPCP/LPP must operate normally. Push-type information delivery application must be implemented in OBE. For the operation test, use the following test data to be sent from TS to OBE. Test data 1: Any data for content type included in DSRC client resource information, min(1000, MaxPushBodySize). (text-display or browser) / text-plain preferable. 			
<p>Test procedure</p> <ol style="list-style-type: none"> TS specifies group broadcast address as link address, and uses LPP broadcast re-execute function (using same handle as argument for Invoke.req) to send test data 1 as push communication with no confirmation response continuously n[2] times. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> Verify that OBE receives one push communication with no confirmation response in step 1, and that it matches test data 1. 			

Table 3-43 Push-type information delivery application test—Check push communication with confirmation response (response timing switch-over)

Test number	4-2-3	Item name	Push-type information delivery operation Check push communication with confirmation response (response timing switch-over)
<p>Test overview</p> <ul style="list-style-type: none"> • Check operation of push-type information delivery application with push communication requiring confirmation. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for push-type information delivery application must have been exchanged. • For the operation test, use the following test data to be sent from TS to OBE. Test data 1: Any data for content type included in DSRC client resource information, min(1000, MaxPushBodySize). (text-display or browser) / text-plain preferable. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. TS sends test data 1 to OBE as push communication with confirmation response, specifying “ResponseTiming(0).” 2. After reception is complete, OBE returns push communication with confirmation response confirmation command “ConfirmedPushResponse.” 3. TS sends test data 1 to OBE as push communication with confirmation response, specifying “ResponseTiming(1).” 4. After transfer is complete, OBE returns push communication with confirmation response confirmation command “ConfirmedPushResponse.” 5. TS sends test data 1 to OBE as push communication with confirmation response, specifying “ResponseTiming(2).” 6. After content execution is complete, OBE returns push communication with confirmation response confirmation command “ConfirmedPushResponse.” 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that OBE receives push communication with confirmation response in steps 1, 3, 5, and that it matches test data 1. • Verify that TS receives confirmation response confirmation command “ConfirmedPushResponse” in steps 2, 4, 6. 			

Table 3-44 Push-type information delivery application test—Check push communication with confirmation response (same response timing repeat)

Test number	4-2-4	Item name	Push-type information delivery operation Check push communication with confirmation response (same response timing repeat)
<p>Test overview</p> <ul style="list-style-type: none"> • Check operation of push-type information delivery application with push communication requiring confirmation. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for push-type information delivery application must have been exchanged. • For the operation test, use the following test data to be sent from TS to OBE. Use different content for test data 1 to test data 3. <ul style="list-style-type: none"> Test data 1: Any data for content type included in DSRC client resource information, min(1000, MaxPushBodySize). (text-display or browser) / text-plain preferable. Test data 2: Any data for content type included in DSRC client resource information, min(1000, MaxPushBodySize). (text-display or browser) / text-plain preferable. Test data 3: Any data for content type included in DSRC client resource information, min(1000, MaxPushBodySize). (text-display or browser) / text-plain preferable. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. TS sends test data 1 to OBE as push communication with confirmation response, specifying “ResponseTiming(1).” 2. After transfer is complete, OBE returns push communication with confirmation response confirmation command “ConfirmedPushResponse.” 3. TS sends test data 2 to OBE as push communication with confirmation response, specifying “ResponseTiming(1).” 4. After transfer is complete, OBE returns push communication with confirmation 			

response confirmation command “ConfirmedPushResponse.”

5. TS sends test data 3 to OBE as push communication with confirmation response, specifying “ResponseTiming(1).”
6. After transfer is complete, OBE returns push communication with confirmation response confirmation command “ConfirmedPushResponse.”

Confirmation items

- Verify that the content execution count in steps 2, 4, 6 matches the send count.

Table 3-45 Push-type information delivery application test—Check segment/transfer communication

Test number	4-2-5	Item name	Push-type information delivery operation Check segment/transfer communication
<p>Test overview</p> <ul style="list-style-type: none"> • Check segment/transfer communication operation of push-type information delivery application. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for push-type information delivery application must have been exchanged. • Push-type information delivery application supporting segment/transfer functions must be implemented in OBE. • For the operation test, use the following test data to be sent from TS to OBE. <ul style="list-style-type: none"> Test data 1: Any data for content type included in DSRC client resource information (declared MaxPushBodySize x 2 octets), but not to exceed MaxContentsSize. (text-display or browser) / text-plain preferable. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. TS sends test data 1 to OBE as push communication with no confirmation response, specifying segment transfer “isSegment(TRUE).” 2. After receiving the first segment, and until the receiving last segment, OBE returns the next segment request command “NextSegmentRequest.” 3. TS receives next segment request command “NextSegmentRequest” and sends next segment. 4. Repeat steps 1 - 3 until last segment. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives next segment request command “NextSegmentRequest” in step 3. • Verify that push client OBE receives segment/transfer push communication in step 4, and that it matches test data 1. 			

Table 3-46 Push-type information delivery application test—Check push operation discard communication

Test number	4-2-6	Item name	Push-type information delivery operation Check push operation discard communication
<p>Test overview</p> <ul style="list-style-type: none"> • Check push operation discard operation of push-type information delivery application. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for push-type information delivery application must have been exchanged. • Push-type information delivery application supporting segment/transfer functions must be implemented in OBE. • For the operation test, use the following test data to be sent from TS to OBE. <ul style="list-style-type: none"> Test data 1: Any data for content type included in DSRC client resource information [declared (MaxPushBodySize x 2) octets]. Not to exceed MaxContentsSize. (text-display or browser) / text-plain preferable. Test data 2: Any data for content type included in DSRC client resource information, min(1000, MaxPushBodySize). (text-display or browser) / text-plain preferable. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. TS sends test data 1 to OBE as push communication with no confirmation response, specifying segment transfer “isSegment(TRUE).” 2. After receiving the segment, OBE returns the next segment request command “NextSegmentRequest.” 3. TS sends push delivery abort command “PushAbortOperation.” 4. TS sends test data 2 to OBE as push communication with confirmation response. 5. After reception is complete, OBE returns push communication with confirmation response confirmation command “ConfirmedPushResponse.” 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that transfer data are discarded and not executed by push client at OBE content in step 3. • Verify that data received by OBE in step 5 match test data 2. 			

Table 3-47 Push-type information delivery application test—Check re-execute request

Test number	4-2-7	Item name	Push-type information delivery operation Check re-execute request
<p>Test overview</p> <ul style="list-style-type: none"> • Check re-execute request operation of push-type information delivery application. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for push-type information delivery application must have been exchanged. • For the operation test, use the following test data to be sent from TS to OBE. <p style="text-align: center;">Test data 1: Any data for content type included in declared content list, min(1000, MaxPushBodySize). (text-display or browser) / text-plain preferable.</p> 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. TS sends test data 1 as push communication with no confirmation response, specifying content data caching “requiredCache(TRUE).” 2. TS sends test data 1 as push communication with confirmation response, specifying content data caching “requiredCache(TRUE)” and re-push operation (Re-PushOperation) for the same PushID as in step 1. 3. After reception is complete, OBE returns push communication confirmation command “ConfirmedPushResponse.” 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that content re-executed or cached by push client at OBE in step 2 matches test data 1. If not cached, verify that TS receives push delivery abort command “PushAbortOperation,” and that status code is (9) “No content to re-execute.” 			

Table 3-48 Push-type information delivery application test—Check simulated push (option)

Test number	4-3-1	Item name	Push-type information delivery operation Check simulated push (option)
<p>Test overview</p> <ul style="list-style-type: none"> • Check simulated push operation of push-type information delivery application. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • Push-type information delivery application must be implemented, and DSRC client resource information must include “browser / DSRC-smart-pull(129).” • IP communication function must be provided at OBE. • When using DSRC as IP communication, regular IP communication must not be established. • For the operation test, use the following test data to be sent from TS to OBE. Test data 1: URL for declared protocol [http] where SP (simulated push content) is located. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. Establish DSRC connection. 2. TS receives client information notification command “ClientInformation” and sends test data 1 as push communication with no confirmation response to OBE. 3. OBE receives test data 1 and established IP communication. 4. OBE obtains content specified by protocol in test data 1. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that client information notification command “ClientInformation” received by TS in sep 2 includes “browser / DSRC-smart-pull(129).” • Verify that data received by OBE in step 3 match test data 1, and that IP communication is established when DSRC is used as IP communication. • Verify that data received by OBE in step 4 is the content specified by test data 1. 			

3.3.5 Test Items for OBE ID Communication Application

The items for tests related to the OBE ID communication application to be performed with the TS are listed below.

When performing the tests, the following points should be observed.

- While performing ID maintenance related tests (test numbers 5-1-1 to 5-1-5), the OBE will be in ID maintenance mode, but the TS must maintain the DSRC connection between TS and OBE without interruption.
- Delete the test purpose ID from the OBE after completing the OBE ID communication application related tests.

Table 3-49 OBE ID communication operation test—Check OBE ID registration processing

Test number	5-1-1	Item name	OBE ID communication operation Check OBE ID registration processing
Test overview			
<ul style="list-style-type: none"> • Check whether OBE ID can be registered in OBE. 			
Test conditions			
<ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE ID communication application must have been exchanged. • For the operation test, use the following OBE ID ID as registration data. Test data 1: applICationServICeProvIDer = [0x0000123456789ABC] IDCondition = 0x4800 (clear text transmission, mutual authentication not required, user verification when sending not required, ID deletion allowed) OBEID = [0x000000112233445566] (MAC-less format) 			
Test procedure			
<ol style="list-style-type: none"> 1. TS sends ID setup request command “IDSetupRequest” to OBE, using test data 1. 2. TS receives ID setup response command “IDSetupResponse” from OBE. 			
Confirmation items			
<ul style="list-style-type: none"> • Verify that data received by TS in step 2 match test data 1. 			

Table 3-50 OBE ID communication operation test—Check OBE ID check processing

Test number	5-1-2	Item name	OBE ID communication operation Check OBE ID check processing
<p>Test overview</p> <ul style="list-style-type: none"> • Check acquirer ID list registered in OBE. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE ID communication application must have been exchanged. • Test number 5-1-1 must have been performed, and OBE ID must have been set up in OBE. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. TS sends registered ID list request command “iDCheckRequest” to OBE. 2. TS receives registered ID list request response command “iDCheckResponse” from OBE. 			
<p>Confirmation items</p> <p>Verify that data received in step 2 match value of “applicAtionServiceProvider” in test data 1 of test number 5-1-1.</p>			

Table 3-51 OBE ID communication operation test—Check OBE ID delete processing (normal operation)

Test number	5-1-3	Item name	OBE ID communication operation Check OBE ID delete processing (normal operation)
<p>Test overview</p> <ul style="list-style-type: none"> • Check that OBE IDs registered in OBE can be deleted in the OBE ID delete enabled condition. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE ID communication application must have been exchanged. • Test number 5-1-1 must have been performed, and OBE ID must have been set up in OBE. • For the operation test, use the following acquirer OBE ID to be deleted. Test data 2: applICationServICeProvIDer = [0x0000123456789ABC] 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. TS sends registered ID delete request command “iDDeleteRequest” to OBE, using test data 2. 2. TS receives registered ID delete request response command “iDDeleteResponse” from OBE. 3. TS sends registered ID list request command “iDCheckRequest” to OBE. 4. TS receives registered ID list request response command “iDCheckResponse” from OBE. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that data received by TS in step 2 match test data 2. • Verify that data received by TS in step 4 match test data 2. 			

Table 3-52 OBE ID communication operation test—Check OBE ID delete processing (error operation)

Test number	5-1-4	Item name	OBE ID communication operation Check OBE ID delete processing (error operation)
<p>Test overview</p> <ul style="list-style-type: none"> • Check that correct operation is performed when attempting to delete an OBE ID not registered in OBE. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE ID communication application must have been exchanged. • For the operation test, use the following acquirer OBE ID to be deleted. Test data 3: applicationServiceProvider = [0x0000CBA987654321] 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. TS sends registered ID delete request command “iDDeleteRequest” to OBE, using test data 3. 2. TS receives OBE denial response command “OBEDenialResponse.” 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that data received by TS in step 3 indicate status 12 (no registered OBE ID). 			

Table 3-53 OBE ID communication operation test—Check OBE ID condition change (at OBE)

Test number	5-1-5	Item name	OBE ID communication operation Check OBE ID condition change (at OBE)
<p>Test overview</p> <ul style="list-style-type: none"> Verify that condition of registered OBE ID can be changed. 			
<p>Test conditions</p> <ul style="list-style-type: none"> Basic parameters as listed in section 3.2. DSRC-LPCP/LPP must operate normally. DSRC connection processing must be completed, and communication connection state must have been established. Local port number information for OBE ID communication application must have been exchanged. For the operation test, use the following data for the ID condition change. <ul style="list-style-type: none"> Test data 4: applICationServICeProvIDer = [0x0000123456789ABC] IDCondition = 0x4000 (clear text transmission, mutual authentication not required, user verification when sending not required, ID deletion not allowed) 			
<p>Test procedure</p> <ol style="list-style-type: none"> Perform test number 5-1-1 and set up an OBE ID in the OBE with deletion allowed. TS sends ID condition change request command “iDConditionChangeRequest” to OBE, with test data 4 as send data, to set condition of registered OBE ID to delete not allowed. TS receives ID condition change request response command “iDConditionChangeResponse” from OBE. TS sends registered ID delete request command “iDDeleteRequest” to OBE, using test data 2 of test number 5-1-3. TS receives OBE denial response command “OBEDenialResponse.” Perform test number 5-1-2. TS receives Check acquirer ID list registered in OBE. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> Verify that data received by TS in step 3 match test data 4. Verify that status of data received by TS in step 5 is 11 (maintenance command failed), indicating that target OBE ID condition was changed to delete not allowed. Verify that data received in step 6 match value of “applICationServICeProvIDer” in test data 2 of test number 5-1-3. 			

Table 3-54 OBE ID communication operation test—Check OBE ID acquiry processing
(normal operation)

Test number	5-2-1	Item name	OBE ID communication operation Check OBE ID acquiry processing (normal operation)
<p>Test overview</p> <ul style="list-style-type: none"> • Check whether TS can get OBE ID from OBE under correct conditions. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE ID communication application must have been exchanged. • Test number 5-1-1 must have been performed, and OBE ID must have been set up in OBE. <p>Having OBE ID in delete not allowed condition as after performing test number 5-1-5 is also permissible.</p>			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. TS sends first ID request command “firstIDRequest” to OBE, using test data 2 test number 5-1-3 as send data. 2. TS receives first ID request response command “firstIDResponse” from OBE. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that data received by TS in step 2 match OBE ID in test data 1 of test number 5-1-1. 			

Table 3-55 OBE ID communication operation test—Check OBE ID acquiry processing (error operation 1)

Test number	5-2-2-1	Item name	OBE ID communication operation Check OBE ID acquiry processing (error operation 1)
<p>Test overview</p> <ul style="list-style-type: none"> • Check that correct operation is performed when TS attempts to acquire an OBE ID not registered in the OBE. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE ID communication application must have been exchanged. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. TS sends first ID request command “firstIDRequest” to OBE, using test data 3 of test number 5-1-4 as send data. 2. TS receives OBE denial response command “OBEDenialResponse.” 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that data received by TS in step 2 indicate status 2 (no registered OBE ID). 			

Table 3-56 OBE ID communication operation test—Check OBE ID acquiry processing (error operation 2)

Test number	5-2-2-2	Item name	OBE ID communication operation Check OBE ID acquiry processing (error operation 2)
<p>Test overview</p> <ul style="list-style-type: none"> • Check that OBE ID that requires encrypted sending cannot be read as clear text. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE ID communication application must have been exchanged. • Test number 5-1-1 must have been performed, and OBE ID must have been set up in OBE. Having OBE ID in delete not allowed condition as after performing test number 5-1-5 is also permissible. • For the operation test, use the following data for the ID status change. <ul style="list-style-type: none"> Test data 5: applICationServICeProvIDer = [0x0000123456789ABC] IDCondition = 0x8800 (encrypted transmission, mutual authentication not required, user verification when sending not required, ID deletion allowed) 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. TS sends ID status change request command “iDConditionChangeRequest” to OBE, with test data 5 as send data, to set status of registered OBE ID to encrypted transmission. 2. TS receives ID status change request response command “iDConditionChangeResponse” from OBE. 3. TS sends first ID request command “firstIDRequest” to OBE, using test data 2 of test number 5-1-3 as send data. 4. TS receives OBE denial response command “OBEDenialResponse.” 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that data received by TS in step 2 match test data 5. • Verify that data received by TS in step 4 indicate status 32 (clear text transmission inhibited). 			

3.3.6 Test Procedure for OBE Basic Indication Application

The items for tests related to the OBE basic indication application to be performed with the TS are listed below.

Table 3-57 OBE basic indication operation test—Check communication result notification
(normal end)

Test number	6-1-1	Item name	OBE basic indication operation Check communication result notification (normal end)
Test overview			
<ul style="list-style-type: none"> • Check communication result notification operation. 			
Test conditions			
<ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE basic indication application must have been exchanged. 			
Test procedure			
<ol style="list-style-type: none"> 1. As OBE instruction information, TS sends OBE indication notification command “bOIRequest” including “transactionResult(0)” to OBE. 2. OBE sends basic indication response command “bOIResponse” as response to OBE instruction information. 			
Confirmation items			
<ul style="list-style-type: none"> • Verify that “transactionResult” at OBE is (0), “Service normal end, no charge.” • Verify that TS receives OBE basic indication response command “bOIResponse.” 			

Table 3-58 OBE basic indication operation test—Check communication result notification
(abnormal end)

Test number	6-1-2	Item name	OBE basic indication operation Check communication result notification (abnormal end)
Test overview			
<ul style="list-style-type: none"> • Check communication result notification operation. 			
Test conditions			
<ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE basic indication application must have been exchanged. 			
Test procedure			
<ol style="list-style-type: none"> 1. As OBE instruction information, TS sends OBE indication notification command “bOIRequest” including “transactionResult(64)” to OBE. 2. OBE sends basic indication response command “bOIResponse” as response to OBE instruction information. 			
Confirmation items			
<ul style="list-style-type: none"> • Verify that “transactionResult” at OBE is (64), “Service abnormal end.” • Verify that TS receives OBE basic indication response command “bOIResponse.” 			

Table 3-59 OBE basic indication operation test—Check communication result and charge notification

Test number	6-1-3	Item name	OBE basic indication operation Check communication result and charge notification
<p>Test overview</p> <ul style="list-style-type: none"> • Check communication result notification operation and charge notification operation. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE basic indication application must have been exchanged. • For the operation test, use the following data as “amount” parameter value. Test data 1: any amount information [3 bytes] 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE instruction information, TS sends OBE basic indication notification command “bOIRequest” including “transactionResult(128), amount (test data 1)” to OBE. 2. OBE sends basic indication response command “bOIResponse” as response to OBE instruction information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that “transactionResult” at OBE is (128), “Service normal end, with charge,” and that “amount” value matches test data 1. • Verify that TS receives OBE basic indication response command “bOIResponse.” 			

Table 3-60 OBE basic indication operation test—Check time notification

Test number	6-2-1	Item name	OBE basic indication operation Check time notification
<p>Test overview</p> <ul style="list-style-type: none"> • Check time notification operation. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • Local port number information for OBE basic indication application must have been exchanged. • For the operation test, use the following data as “time” parameter value. Test data 1: any time information [4 bytes] 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As OBE instruction information, TS sends OBE basic indication notification command “bOIRequest” including “transactionResult(0), time (test data 1)” to OBE. 2. OBE sends basic indication response command “bOIResponse” as response to OBE instruction information. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that “transactionResult” at OBE is (0), “Service normal end, with charge,” and that “time” value matches test data 1. • Verify that TS receives OBE basic indication response command “bOIResponse.” 			

Annex

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Annex 1 Tests Related to DSRC Security Platform (SPF) Interface Specifications

The interoperability confirmation testing steps for the DSRC-SPF interface are listed below.

Annex 1.1 Tests Related to Authentication and Key Exchange Phase

The tests related to the authentication and key exchange phase are as follows.

Annex Table 1-1 DSRC-SPF operation tests—Check normal processing in authentication / key exchange phase

Test number	S-1-1	Item name	DSRC-SPF operation Check normal processing in authentication / key exchange phase
<p>Test overview</p> <ul style="list-style-type: none"> • Check normal processing in authentication / key exchange phase. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-SPF setup in OBE must be completed. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • DSRC-SPF management port number information must have been exchanged. • A security type supported by OBE must be used for operation test. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. TS sends authentication negotiate request command “NegotiateRequest” to OBE. 2. OBE returns authentication negotiate response command “NegotiateResponse” to TS. 3. TS sends authentication / key exchange command along with “SetupMessageRequest” to OBE. 4. OBE returns authentication / key exchange command along with “SetupMessageResponse” to OBE. 5. Steps 3 and 4 are repeated until authentication / key exchange sequence is completed. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that authentication and key exchange are completed normally after step 5. 			

Annex Table 1-2 DSRC-SPF operation tests—Check operation in case of security type error

Test number	S-1-2	Item name	DSRC-SPF operation Check operation in case of security type error
Test overview			
<ul style="list-style-type: none"> • Check operation when unsupported security type is specified. 			
Test conditions			
<ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-SPF setup in OBE must be completed. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • DSRC-SPF management port number information must have been exchanged. • A security type not supported by OBE must be used for operation test. 			
Test procedure			
<ol style="list-style-type: none"> 1. TS sends authentication negotiate request command “NegotiateRequest” to OBE. 2. TS returns authentication failure indication to OBE. 			
Confirmation items			
<ul style="list-style-type: none"> • Verify that OBE properly notifies TS of authentication failure. 			

Annex Table 1-3 DSRC-SPF operation tests—Check reauthentication operation in case of authentication failure

Test number	S-1-3	Item name	DSRC-SPF operation Check reauthentication operation in case of authentication failure
<p>Test overview</p> <ul style="list-style-type: none"> • Check whether reauthentication is possible after an authentication failure. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-SPF setup in OBE must be completed. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • DSRC-SPF management port number information must have been exchanged. • A security type supported by OBE must be used for operation test. • Wrong content must be used for authentication / key exchange command in step 3 of operation test. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. TS sends authentication negotiate request command “NegotiateRequest” to OBE. 2. OBE returns authentication negotiate response command “NegotiateResponse” to TS. 3. TS sends authentication / key exchange command along with “SetupMessageRequest” to OBE. 4. TS returns authentication failure indication to OBE. 5. TS sends authentication negotiate request command “NegotiateRequest” to OBE. 6. OBE returns authentication negotiate response command “NegotiateResponse” to TS. 7. TS sends authentication / key exchange command along with “SetupMessageRequest” to OBE. 8. OBE returns authentication / key exchange command along with “SetupMessageResponse” to OBE. 9. Steps 7 and 8 are repeated until authentication / key exchange sequence is completed. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that OBE properly notifies TS of authentication failure in step 4. • Verify that authentication and key exchange are completed normally after step 9. 			

Annex Table 1-4 DSRC-SPF operation tests—Check reauthentication operation after successful authentication

Test number	S-1-4	Item name	DSRC-SPF operation Check reauthentication operation after successful authentication
Test overview			
<ul style="list-style-type: none"> • Check whether reauthentication is possible after a successful authentication. 			
Test conditions			
<ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-SPF setup in OBE must be completed. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • DSRC-SPF management port number information must have been exchanged. • A security type supported by OBE must be used for operation test. 			
Test procedure			
<ol style="list-style-type: none"> 1. TS sends authentication negotiate request command “NegotiateRequest” to OBE. 2. OBE returns authentication negotiate response command “NegotiateResponse” to TS. 3. TS sends authentication / key exchange command along with “SetupMessageRequest” to OBE. 4. OBE returns authentication / key exchange command along with “SetupMessageResponse” to OBE. 5. Steps 3 and 4 are repeated until authentication / key exchange sequence is completed. 6. TS sends authentication negotiate request command “NegotiateRequest” to OBE. 7. OBE returns authentication negotiate response command “NegotiateResponse” to TS. 8. TS sends authentication / key exchange command along with “SetupMessageRequest” to OBE. 9. OBE returns authentication / key exchange command along with “SetupMessageResponse” to OBE. 10. Steps 8 and 9 are repeated until authentication / key exchange sequence is completed. 			
Confirmation items			
<ul style="list-style-type: none"> • Verify that authentication and key exchange are completed normally after step 5. • Verify that authentication and key exchange are completed normally after step 10. 			

Annex 1.2 Tests Related to Service Session Phase

The tests related to the service session phase are as follows.

Annex Table 1-5 DSRC-SPF operation tests—Check normal processing in service session phase

Test number	S-2-1	Item name	DSRC-SPF operation Check normal processing in service session phase
<p>Test overview</p> <ul style="list-style-type: none"> • Check that application data can be normally sent and received via a secure port after authentication / key exchange has completed successfully. 			
<p>Test conditions</p> <ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-SPF setup in OBE must be completed. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • DSRC-SPF management port number information must have been exchanged. • DSRC-SPF authentication / key exchange must have completed successfully. If not, perform test number S-1-1. • Secure port number information for IC card access application must have been exchanged. • IC card for testing must be set in OBE. 			
<p>Test procedure</p> <ol style="list-style-type: none"> 1. As IC card access application start request, TS sends application start request command “initRequest” to OBE via secure port. 2. OBE returns application start response command “initResponse” via secure port as response to IC card access application start request. 3. As application end request, TS sends IC card access application end request command “endRequest” to OBE via secure port. 4. OBE returns application end response command “endResponse” via secure port as response to IC card access application end request. 			
<p>Confirmation items</p> <ul style="list-style-type: none"> • Verify that TS receives application start response command “initResponse” in step 2, including ATR information for test IC card. • Verify that TS receives application end response command “endResponse” in step 4 and that operation ends normally. 			

Annex Table 1-6 DSRC-SPF operation tests—Check secure port operation when authentication is not completed

Test number	S-2-2	Item name	DSRC-SPF operation Check secure port operation when authentication is not completed
Test overview			
<ul style="list-style-type: none"> • Check that secure port cannot be used when authentication has not been completed. 			
Test conditions			
<ul style="list-style-type: none"> • Basic parameters as listed in section 3.2. • DSRC-SPF setup in OBE must be completed. • DSRC-LPCP/LPP must operate normally. • DSRC connection processing must be completed, and communication connection state must have been established. • DSRC-SPF management port number information must have been exchanged. • Secure port number information for IC card access application must have been exchanged. • IC card for testing must be set in OBE. 			
Test procedure			
<ol style="list-style-type: none"> 1. TS sends authentication negotiate request command “NegotiateRequest” to OBE. 2. OBE returns authentication negotiate response command “NegotiateResponse” to TS. 3. As IC card access application start request, TS sends application start request command “initRequest” to OBE via secure port. 4. OBE returns command to TS indicating that access to secure port of IC card access application is not available. 			
Confirmation items			
<ul style="list-style-type: none"> • Verify that in step 4, OBE returns command to TS indicating that access to secure port of IC card access application is not available. 			

DEDICATED SHORT-RANGE
COMMUNICATION (DSRC) BASIC
APPLICATION INTERFACE
TEST ITEMS AND CONDITIONS
FOR LAND MOBILE STATION
COMPATIBILITY CONFIRMATION

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