Mobile FeliCa RF Performance Certification Specification

Ver.2.84

April 1, 2026

Mobile FeliCa Technical Communications Committee

Revision History

Ver. No.	Date issued	Description of Revisions
1.0	Oct. 1, 2012	First edition
1.1	Apr. 1, 2013	P1 New members of the Mobile FeliCa Technical Communications Committee are added. P5 Test fee is changed.
1.2	Sep. 1, 2013	P1 New members of the Mobile FeliCa Technical Communications Committee are added. P5 Notification operation of the Test Results is changed.
1.21	May 1, 2014	Address of Certification Administrator is changed
1.22	Jun. 1, 2014	The contact is changed from the Certification Administrator to the Certification Laboratory ・Application Form ・Addition of Product Models ・Notification of the Test Results ・Contact for any questions
2.0	Jan. 1, 2015	Changes are made to the following items since test items are added: ・Test fee ・Test Period ・Testing Reader/Writer and Communication Performance Measurement Software ・Measurement Center Point, X-Axis Direction, and Y-Axis Direction of the Testing Reader/Writer ・Performance Test with an Actual Terminal
2.1	Mar.16, 2016	P4 Name of the Certification Administrator is changed. P9 Measurement condition is modified (30 minutes→10minutes) P10 Test type is modified (L-class Reader/writer is removed) P21 Pass criteria are modified. P32 Attachment C is modified
2.2	May 1, 2017	The Reader/Writer for testing is changed * RC-S462B is replaced to RC-S012B.
2.21	Jun. 1, 2017	Member of the Mobile FeliCa Technical Communications Committee is changed. Section 3.3, 3.4 are changed. Attachment A, B and C are changed.
2.3	Jan. 1, 2018	Section 6.5.1 is changed.
2.4	Jun. 1, 2018	Section 6.4.2 is removed S-Class reader/writer is moved to Section 6.5.1. Section 6.5.3.3.1 and 6.5.3.3.2 are added. Attachment A is changed Attachment D is added.

2.5	Nov. 1, 2018	Section 3.1 is changed. Attachment A and C are changed.
2.51	July 1,2019	The certification laboratory contact information was changed.
2.52	Sep. 1, 2019	Section 4.4 is changed. The modification of the test samples after starting the certification test is abolished.
2.6	Jan. 1, 2020	Replace The E-money terminal. Section 6.1, 6.2.8 and 6.5.3.4 are changed.
2.61	Jan 8, 2020	Section 6.2.8 is changed.
2.7	April 1, 2020	Merge Basic Sequence Test into FeliCa RF Performance Certification. Changes due to Web application system introduction. Figure 6-12,6-13,6-14 are modified.
2.71	Dec. 1, 2020	Section 6.5.2 is changed.
2.72	April 1, 2021	Name of Certification Administrator is changed. Section 4.1 is changed. Attachment A is changed.
2.8	Oct. 1, 2021	Addition of conditions for the number of test samples Added communication performance (reference measurement) with Multi e-money terminals (JT-R600CR-00 and M010). Replacing ticket gates with EG20 for measuring the communication performance of ticket gates. The contact surface verification test was replaced with a ticket gate EG2. Added a check of the contact surface with the bus reader/writer unit (RC-S011C) (reference measurement). Reorganized chapters to increase the number of test items.
2.81	Apr. 1, 2022	Change reference measurement in Ver.2.8 to pass/fail study
2.82	July 1, 2023	Name of Certification Administrator is changed.
2.83	July 1, 2024	Attachment A is changed.
2.84	April 1, 2026	Addition of rules for wearable devices and clarification of term definitions 5.3 Definition of terms related to the testing method 6.2.4 to 6.2.11 Addition of how to place wearable devices Attachment C Addition of application flow for wearable devices

Contents

Preface

This document outlines the mobile FeliCa RF performance certification test (abbreviated to certification test hereafter).

The certification test verifies the RF performance and basic sequence processing capability of the mobile products.
Certification test details are based on discussions by members of the Mobile FeliCa Technical Communications Committee.

- The following companies are members of the Mobile FeliCa Technical Communications Committee:
  AEON Co., Ltd.
  East Japan Railway Company
  FeliCa Networks, Inc.
  JCB Co., Ltd.
  KDDI Corporation
  NTT Docomo, Inc.
  PASMO Co., Ltd.
  Rakuten Edy, Inc.
  Seven Card Service Co., Ltd.
  SoftBank Corp.
  Sony Corporation
  Sumitomo Mitsui Card Co., Ltd.
  West Japan Railway Company

(Company names are in alphabetical order)

The following chapters specify the contents, methodology, evaluation criteria, test environment, and test procedures of the certification test.

1. Purpose of the Certification Test

The certification test is intended to establish shared communication performance standards for FeliCa equipment and to create a mechanism for enhancing interconnectivity between FeliCa equipment. The overriding purpose of the certification test is to enable service providers and end users to receive the full benefit of services using FeliCa technology with assurance.

2. Positioning of the Certification Test

The standards defined for the certification test do not certify the interoperability of marketed FeliCa equipment.
The certification test verifies product samples submitted by manufacturers in a testing environment specified for the certification test to determine whether the samples meet the communication performance standards defined for the certification test.
Therefore, achieving passing results in the certification test does not mean that all of the products in the same product series have been tested and have passed the certification test.
Warranties on the products tested shall conform to the warranty conditions originally established by the individual manufacturers.

3. Products to Be Tested

3.1. Products Subject to Testing

The certification test is intended for mobile products, in which FeliCa IC certified by FeliCa Networks is embedded.

3.2. Product Models to Be Tested

Applicants for product testing must submit each model of a product for the certification test.

3.3. Updated Products

A manufacturer must resubmit a product that has already passed the certification test if any hardware or software modifications that might affect FeliCa RF communication performance or basic sequence processing capability or both have been made to the product.

3.4. Addition of Product Models

When a manufacturer adds a new product model to a product series whose models have already passed the certification test, the manufacturer need not to apply the new model for certification testing if it has the same RF communication performance and basic sequence processing capability as the product that has already passed the certification test and the manufacturer can guarantee the fact. Instead, the manufacturer is only required to apply an Added Product Model for the new model.
For details, see *4.6Addition of Product Models*.

4. Application

When applying for the certification test, please carefully note the following.

4.1. Application Details

Application deadline

At least four weeks before your desired certification test date (product samples must be submitted at the same time)

It is possible to apply 60 days before the desired certification test date. Please kindly note that the desired certification test date is not guaranteed even if the application is made earlier.

How to application

Please apply from the following page.

https://www.FeliCaTech.org/mobile/application.html

Materials to be submitted

- Test samples:
  - Three units of the product being tested (one maximum-frequency sample, one standard-frequency sample, and one minimum-frequency sample). However, for products with a continuous operation time of 1 hour or more and 2 hours or less in the certification test, add one more unit for each frequency and therefore submit a total of six units.
    - ✧ At least one of the above three or six units of the product is formatted for mobile terminal evaluation for Basic Sequence Test. Please specify the product formatted for mobile terminal evaluation.
    - ✧ For the format for mobile terminal evaluation, contact FeliCa Networks, Inc.
    - ✧ Since the certification test requires continuous operation for more than 1 hour, the certification may be refused or discontinued for products with continuous operation for less than 1 hour.
    - ✧ Handling of measurement methods and results when a total of six units are submitted
      - Under 2.04 of the Attachment A: Terms and Conditions, all production lots of the subject products that have passed the certification are deemed to meet the Mobile FeliCa RF Performance specification. Since the two resonant frequencies submitted are treated as the same performance, the laboratory selects one of each resonant frequency for evaluation in combination with the test reader/writer. The number of samples used for combinatorial evaluation and pass/fail judgment will not differ from the case when three units are submitted.
      - There will be two test samples at each resonant frequency in the laboratory, but even if the measurement result of one arbitrarily used sample is fail, additional tests or repeat tests using the other sample will not be conducted.
  - Battery Charger: Three or Six units according to the submitted sample
  - Accessories: Three or Six units according to the submitted sample

* Submit to the Certification Laboratory after your application was accepted.

Note: Of all the manufactured units of the product being tested, the maximum-frequency sample must be the sample of the product that has minimally the highest resonance frequency value, the minimum-frequency sample must be the sample of the product that has the lowest resonance frequency value, and the standard-frequency sample must be the sample of the product that has a resonance frequency value between the highest resonance frequency value and the lowest resonance frequency value.

Certification Administrator

Sony Corporation
FeliCa Certification Section, Development Department, Enterprise Solutions Business Unit

Certification Laboratory (Subcontract Laboratory of Sony)

Sony Global Manufacturing & Operations Corporation
FeliCa Certification Test Team
Quality Assurance Department
Address: 8-4 Shiomi, Kisarazu-shi, Chiba Prefecture, 292-0834, JAPAN
E-mail: sgmo-felica-kentei@sony.com

Test fee

The test fee is 600,000 yen, excluding tax.

If you have any questions, please contact the Certification Laboratory.
If you wish to retake the certification test on a sample of the same product, please submit a new certification test application.

4.2. Certification Test Start Date

After the application for the certification test is received, the Certification Laboratory will notify the applicant within three business days of the day the test is to start.

4.3. Test Period

If the test samples and other required materials are adequate and all measurement results meet pass-level requirements, the certification test will take eight business days, excluding the day on which the test samples are received.

4.4. Notification of the Test Results

If the Certification Laboratory determines that any test results are below pass-level requirements, the Certification Laboratory will immediately report the test results to the applicant. Regardless of the test results, the Certification Laboratory will email the Certification Test Results Report to the applicant within three business days following the last day of the test period.
For products that pass the certification test, the Certification Laboratory will email the Mobile FeliCa RF Performance Certificate issued by Certification Administrator to the applicant about the seventh day

following the last day of the test period.

4.5. Handling of Test Data and Submitted Product Samples

The Certification Administrator and Certification Laboratory will handle the test data and information that it obtains as a result of certification testing in accordance with the Terms and Conditions for Mobile FeliCa RF Performance Certification Test (for the Mobile Product). (See *Attachment A: Terms and Conditions.)*

The Certification Laboratory will return the product samples submitted for testing to the applicant within seven business days following the last day of the test period.

4.6. Addition of Product Models

A manufacturer that adds a new product model to a product series whose models have already passed the certification test, the manufacturer need not to apply the new model for certification testing if it has the same RF communication performance and basic sequence performance capability as the product that has already passed the certification test and the manufacturer can guarantee the fact. Instead, the manufacturer is only required to apply an Added Product Model for the new model.
The product model for different Telecommunication Carrier is also available.

How to application

Please apply from the following page.
https://www.FeliCaTech.org/mobile/application.html

Application fee

There is no application fee for adding product models.

If you have any questions, please contact the Certification Laboratory.

5. Methodology

5.1. Test Environment

The certification test will be conducted in the following test environment:
Temperature: 20°C to 30°C
Relative humidity: 25% to 70%

5.2. Equipment Used in the Test

The following figure shows the equipment configuration used in the test.

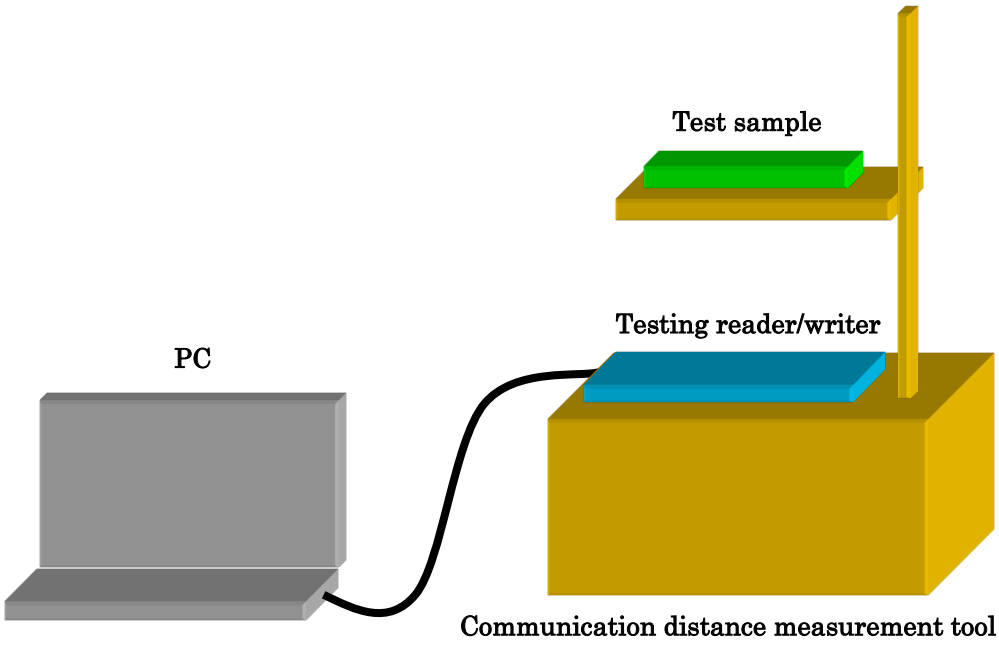
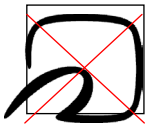


Figure 5-1 Equipment Configuration for the Test

5.3. Definitions of Terms Related to the Testing Method

The following table defines the terms related to the certification test.

Terms	Description
Measurement center point	The measurement center point of the test sample shall be one of the following points that is judged to be reasonable. 1. The measurement center point of the test sample is the intersection of the diagonals of a square imposed on the Mobile Contactless IC Communication Mark on the product.  is a trademark of FeliCa Networks, Inc. Figure 5-2 Measurement Center Point of the Test Sample 2. The measurement-center point of a wearable device, etc., where the Mobile Contactless IC Communication Mark is not displayed on the product, shall be the position on the test sample specified by the application manufacturer. However, the measuring center point of the wearable device is basically set on the liquid crystal face where the watch face is displayed, regardless of the presence or absence of the Mobile Contactless IC Communication Mark. In order to set the measurement center point to a position other than the liquid crystal surface side at the time of the application for the certification from the applicant, the certification test shall be carried out at the designated measurement center point only when there is a declaration that the approval of East Japan Railway Company has been obtained. The measurement center point of the testing reader/writer is described in *6.2Measuring the Center Point, X-Axis Direction, and Y-Axis Direction of Testing Reader/Writer*.
X axis, Y axis	The +X direction of the test sample shall be the X axis that passes the measurement center point of the test sample and is parallel to the long side the direction of the test sample. And the +X direction shall be the direction specified by the application manufacturer, etc. A reference example is shown in Figure 5-3. However, the X-axis of the wearable device may also be an axis parallel to the short side direction passing through the measurement center point of the test sample and should be in a common direction for all test readers/writers. A reference example is shown in Figure 5-4. The positive directions of the X and Y axes of the testing reader/writer are described in *6.2Measuring the Center Point, X-Axis Direction, and Y-Axis Direction of Testing Reader/Writer*. In the +Z direction of the testing reader/writer, the Z axis is an axis perpendicular to the plane composed of the X-axis and Y-axis of each testing reader/writer.
Center	In centering, the communication distance measuring tool is used to align the measurement center point of the test sample with that of the testing reader/writer.
Offset	Offset of the X and Y axis refers to moving the test sample in the X-axis direction (or Y-axis direction) parallel to the X axis (or Y axis) of the testing reader/writer. A reference example is shown in Figure 5-5.

Angle	The angle is 0 degrees when the +X direction of the test sample and each testing reader/writer are installed in the same direction. The rotation direction of the angle is defined as the direction in which the test sample is rotated clockwise. As an example, an angle of 90 degrees is a state in which the test sample is rotated 90 degrees clockwise from a state of an angle of 0 degrees. A reference example is shown in Figure 5-6.
Maximum communication distance	When the test sample and the testing reader/writer are moved closer together during measurement, the maximum communication distance is the distance at which the specified success rate is first obtained.
Communication hole	A communication hole is an area whose success rate is less than the specified level at a distance from 0mm to the maximum communication distance. Communication holes do not include areas with a width of less than 1mm. Note, however, that even an area with a width of less than 1 mm is regarded as a communication hole if the measured success rate of the area is below the specified level when the test sample is positioned at a distance of 0mm from the end-product reader/writer.
Success rate	The success rate is the ratio of successful communications to the number of Polling command executions. Unless otherwise specified, the success rate requirement specified for the certification test is at least 99% (communication must be successful at least 99 times while the Polling command is executed 100 times).
Sequence-enabled area	Area in which the sequence is successful five times in a row between the 0mm height to the maximum communication distance. An area in which the sequence is not successful and is 1mm wide or more is not regarded as a sequence-enabled area.

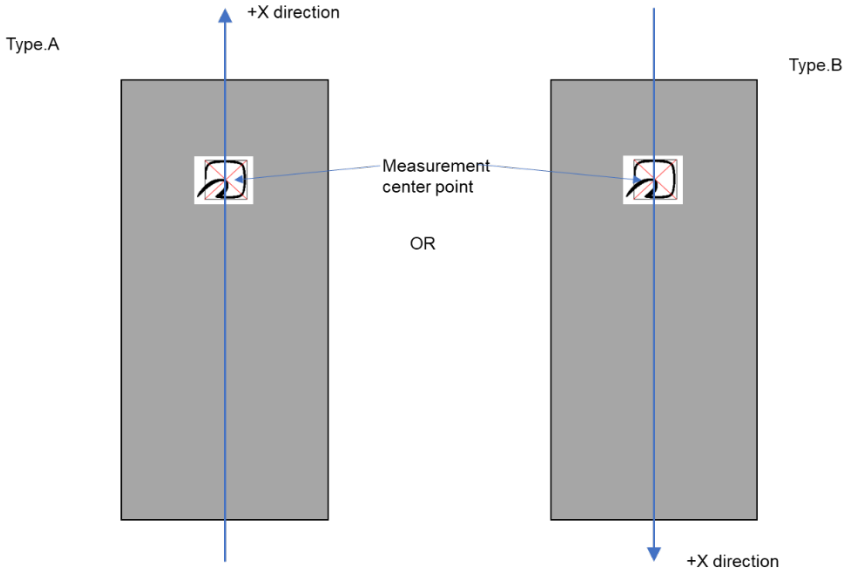


Figure 5-3　+X direction of Smartphone

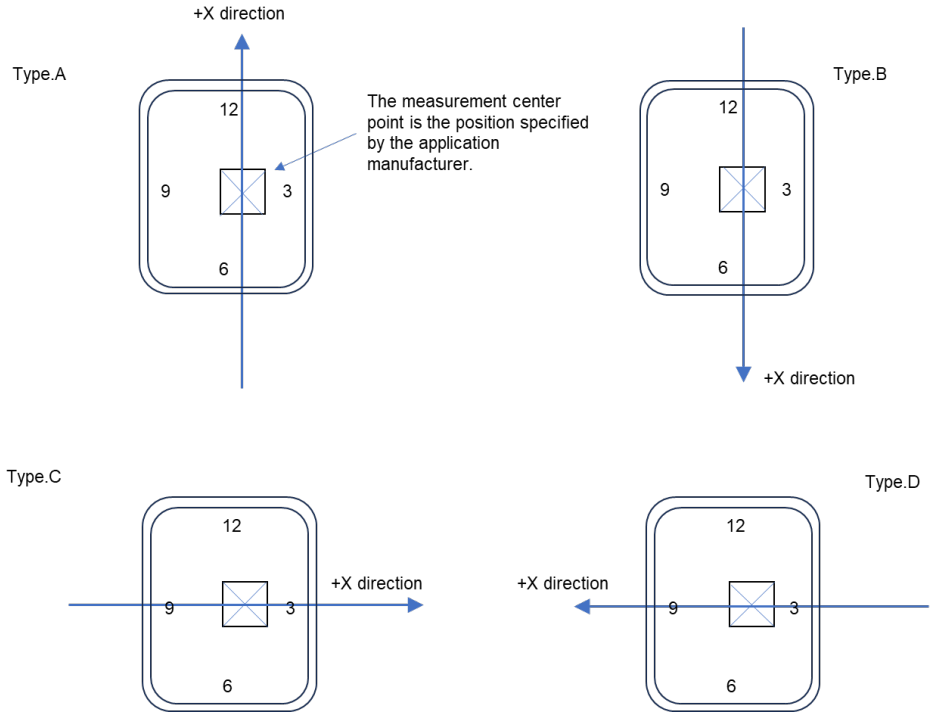


Figure 5-4 +X direction of wearable device

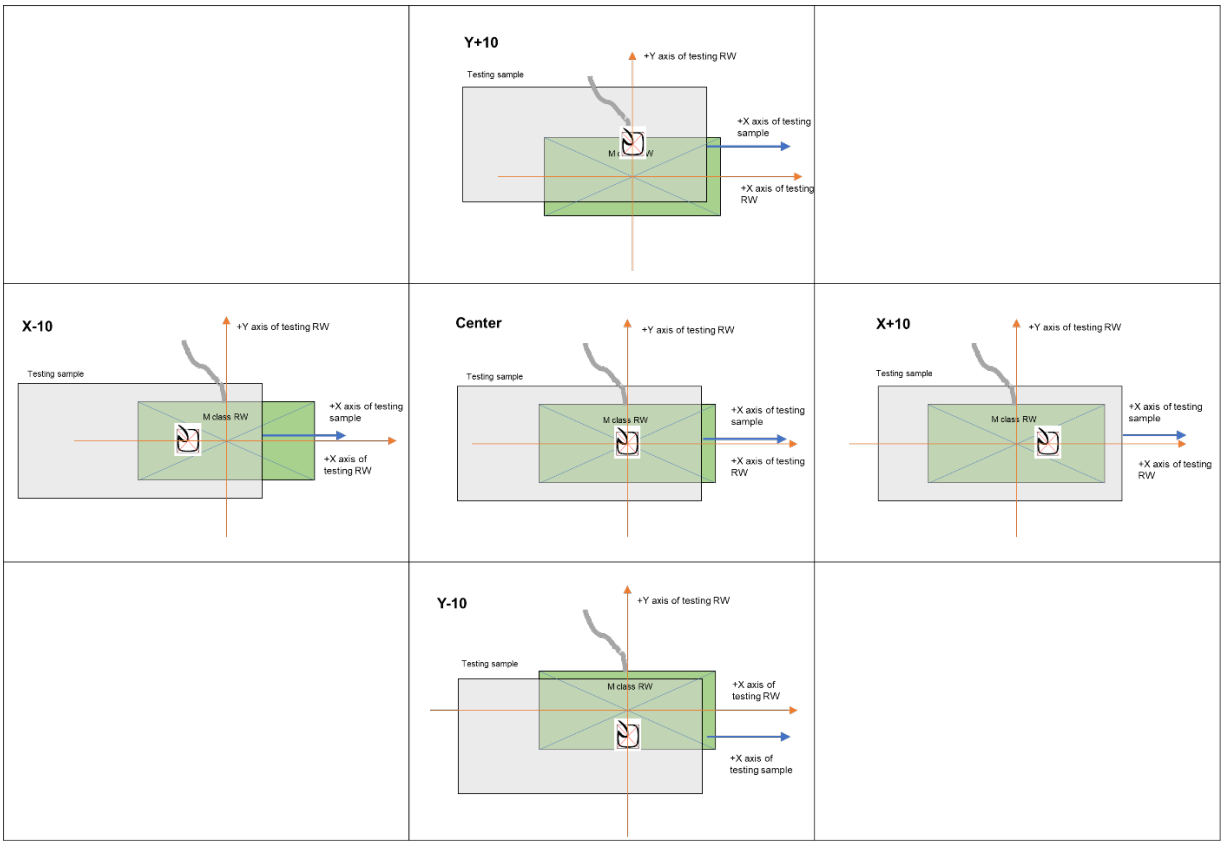


Figure 5-5 Offset example

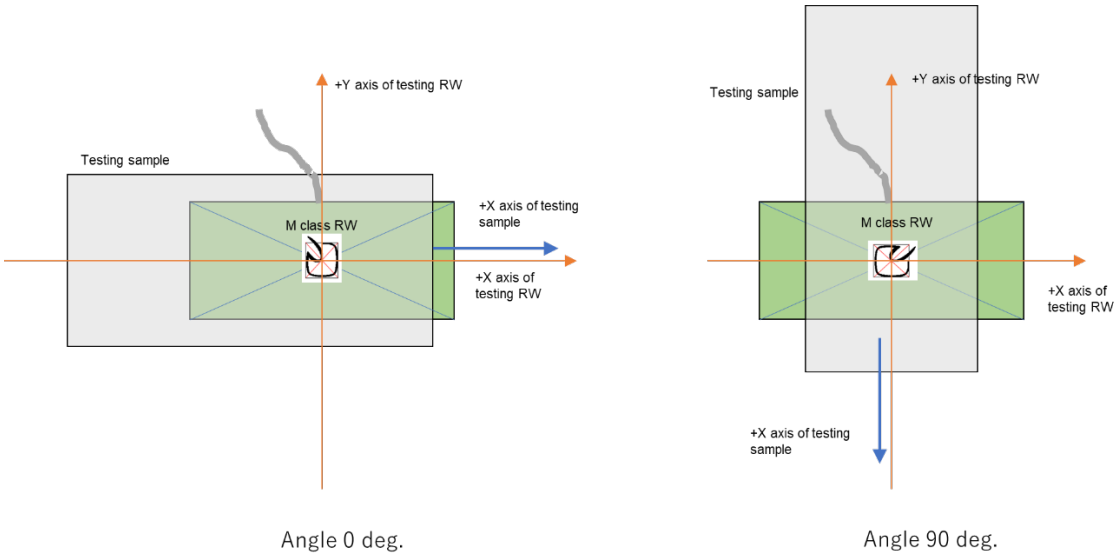


Figure 5-6 Angle example

5.4. Communication Performance Measurement Procedure

Measurement conditions

To ensure stable measurement results, the test will begin 10 minutes after the testing reader/writer is turned on.

Also, the test will be conducted in an environment that eliminates effects caused by metallic objects, electrical interference, and other factors on FeliCa RF communication performance.

Measuring the communication distance and communication holes

(1) The test sample will be placed stably on the measuring surface of the testing reader/writer in close contact with the surface while its measurement center point is aligned with that of the testing reader/writer. The distance of the test sample in this position will be treated as 0mm. If the test sample cannot be placed in close contact with the measuring surface of the testing reader/writer, the test sample will be positioned on a plane that extends from the measuring surface of the testing reader/writer, creating the effect of close contact with the measuring surface.

(2) The position of the test sample will be adjusted for centering, offset, and rotation.

(3) The communication distance measurement tool will be used to move the test sample to a position where it exceeds the maximum communication distance.

(4) The communication performance measurement software will be used to execute the Polling command from the testing reader/writer.

(5) The communication distance measurement tool will be used to move the test sample downward in order to determine the maximum communication distance.

(6) The test sample will be moved from the maximum communication distance to a distance of 0mm in 1mm steps to locate any communication holes.

(7) Measurement RF performance:
Steps (2) to (6) will be repeated until measurement at all measurement points has been completed.

(8) Measurement basic sequence processing capability:
The communication distance measurement tool will be used to position the test sample at the maximum communication distance.

(9) The sequence software will be used to execute the sequence from the testing reader/writer.

(10) The communication distance measurement tool will be used to move the test sample downward from the maximum communication distance to a distance of 0mm in 1mm steps to determine the sequence-enabled area.

6. Test Items

6.1. Reader/Writer and Communication Performance Measurement Software for Testing

No.	Test Item	Testing reader/writer	Communication performance measurement software
1	M-class reader/writer	Sony RC-S012B (Ordinary)	Communication performance test software (for serial interface)
2	S-class reader/writer	Sony RC-S380 (Ordinary)	Communication performance test software (for USB interface)
3	Edy terminal	Edy terminal for touch operation (Ordinary)	Communication performance test software (for Edy terminal)
4	Multi e-money terminal	JT-R600CR (Ordinary)	Built-in main unit. Controlled by terminal software.
5	Multi e-money terminal	M010 (Ordinary)	Miura FeliCa RW Poller
6	Gate EG20	Gate EG20 (RC-S011C) (maximum-, standard-, and minimum-frequency samples)	Communication performance test software (for serial interface)
7	Contact surface for Gate EG2	Gate EG2 (RC-S470C) (standard-frequency samples)	Communication performance test software (for serial interface)
8	Contact surface for Bus reader	Bus reader unit (RC-S470C) (standard-frequency samples)	Communication performance test software (for serial interface)
9	Contact surface Bus reader	Bus reader unit (RC-S011C) (maximum-, standard-, and minimum-frequency samples)	Communication performance test software (for serial interface)
10	Car-mounted reader used in public transport	Car-mounted reader (VT-9271A) (maximum-, standard-, and minimum-frequency samples)	Communication performance test software (for car-mounted reader (VT-9271A))
11	E-money terminal used in public transport	BT2 e-money terminal unit (JT-R591CR-10) (maximum-, standard-, and minimum-frequency samples)	Communication performance test software (for e-money terminal (JT-R591CR-10))
12	Basic Sequence Test	Sony RC-S012B (Ordinary)	Communication performance test software (for serial interface). Sequence software (for serial interface)

*multi e-money terminal: the payment reader/writer compatible with multiple e-money brands

Notes:

- For more information about Sony's reader/writers, contact an exclusive Sony distributor of FeliCa products.
- For the Edy terminal for touch operation, contact Rakuten Edy, Inc.
- For terminals and software for testing Suica, contact East Japan Railway Company.

- The testing reader/writers in the above table are products designed for use in Japan. Anyone who intends to use any of these products outside Japan must assume responsibility for compliance with the laws of the country where the product will be used.
- To automate measurement, communication performance measurement software turns on and off the carrier wave when the measurement point moves in the testing environment (excluding the tests for car-mounted reader (VT-9271A) and BT2 e-money terminal unit (VT-9290A-U)).

6.2. Measuring the Center Point, X-Axis Direction, and Y-Axis Direction of Testing Reader/Writer

This section describes measurement of the center point, X-axis direction, and Y-axis direction of each type of testing reader/writer.

6.2.1. RC-S012B Measurement Center Point, X-Axis Direction, and Y-Axis Direction

Measurement center point: The intersection of two diagonal lines traversing the RC-S012B's antenna board.
X-axis and Y-axis directions: Shown in Figure 6-1.

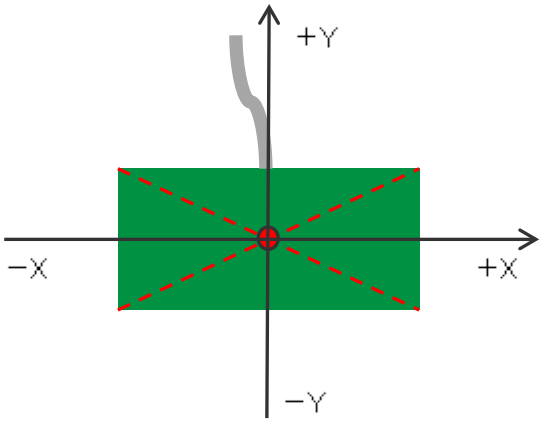


Figure 6-1 RC-012B X-Axis and Y-Axis Directions

6.2.2. RC-S380 Measurement Center Point, X-Axis Direction, and Y-Axis Direction

Measurement center point: Center of the circular section at the center of the RC-S380.
X-axis and Y-axis directions: Shown in Figure 6-2.

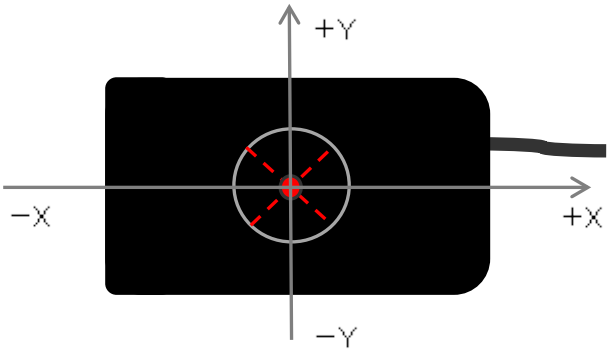
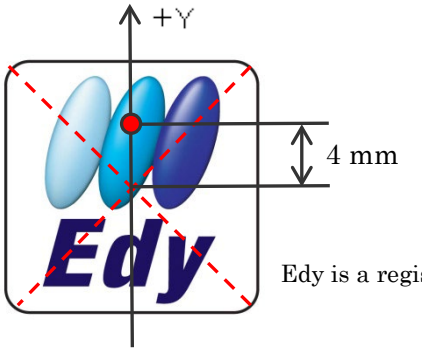


Figure 6-2 RC-S380 X-Axis and Y-Axis Directions

6.2.3. Measurement Center Point, X-Axis Direction, and Y-Axis Direction of the Edy Terminal for Touch Operation

Measurement center point: Shown in Figure 6-3.

X-axis and Y-axis directions: Shown in Figure 6-4.



Edy is a registered trademark of Rakuten Edy, Inc.

Figure 6-3 Measurement Center Point of the Edy Terminal for Touch Operation

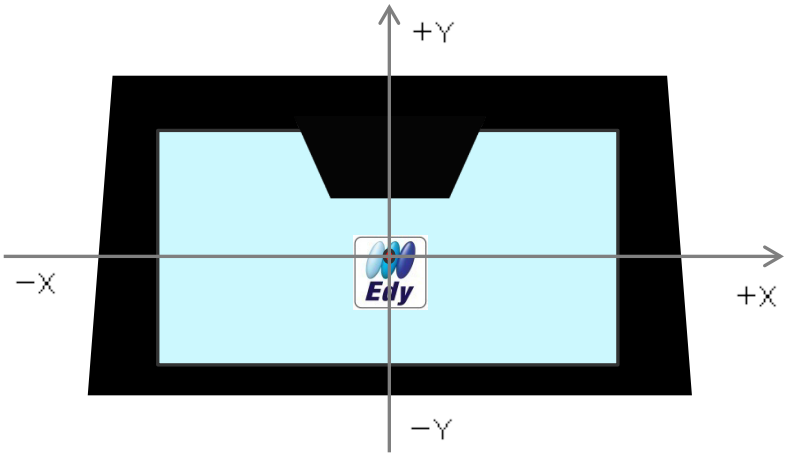


Figure 6-4 X-Axis and Y-Axis Directions of the Edy Terminal for Touch Operation

6.2.4. Measurement Center Point, X-Axis Direction, and Y-Axis Direction of JT-R600CR

The 0-degree direction of the test sample in relation to the reader/writer is the direction opposite to the microphone of the test sample. The 0-degree direction of the wearable device follows the angle in "5.3Definitions of Terms Related to the Testing Method".
Measurement center point: The center of the mobile contactless IC communication mark on the surface.
X-axis and Y-axis directions: Shown in Figure 6-5.

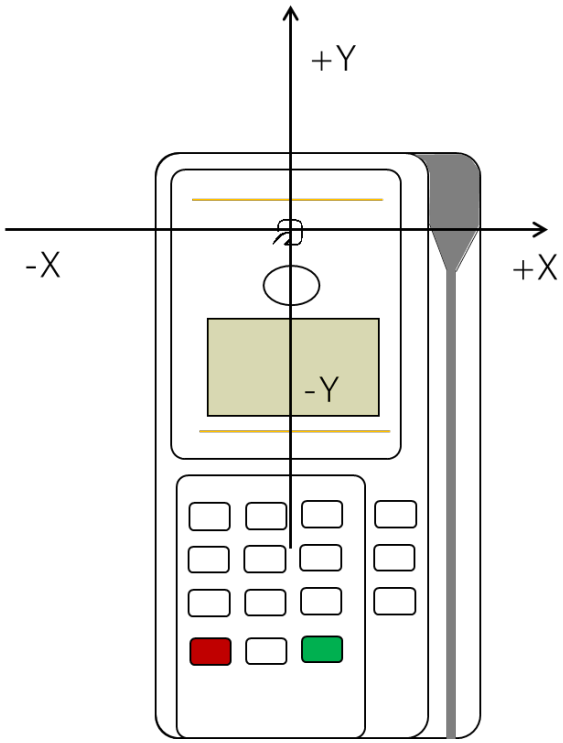


Figure 6-5 X-Axis and Y-Axis Directions of JT-R600CR

6.2.5. Measurement Center Point, X-Axis Direction, and Y-Axis Direction of M010

The 0-degree direction of the test sample in relation to the reader/writer is the direction opposite to the microphone of the test sample. The 0-degree direction of the wearable device follows the angle in "5.3Definitions of Terms Related to the Testing Method".

Measurement center point: The center of the mobile contactless IC communication mark of the sticker on the display.

M010 treats the position of the top surface of the keypad as a height of 0mm.

X-axis and Y-axis directions: Shown in Figure 6-6.

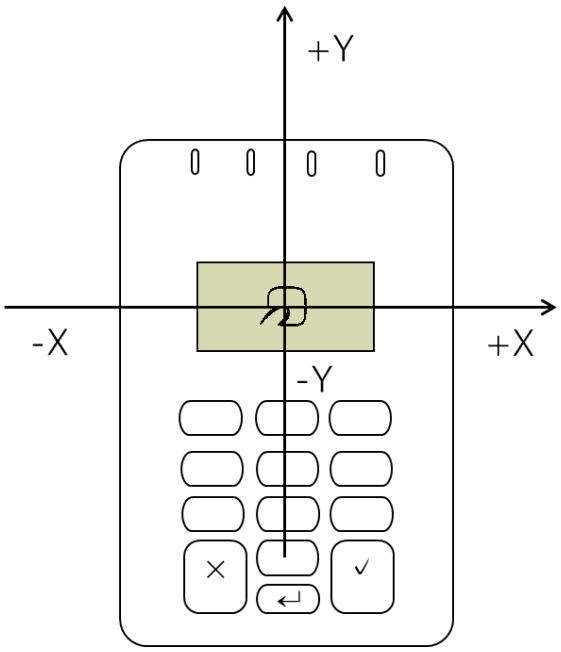


Figure 6-6 X-Axis and Y-Axis Directions of M010

6.2.6. Measurement Center Point, X-Axis Direction, and Y-Axis Direction of Gate EG20 (RC-S011C)

The 0-degree direction of the test sample in relation to the reader/writer is the direction opposite to the microphone of the test sample. The 0-degree direction of the wearable device follows the angle in "5.3Definitions of Terms Related to the Testing Method".

Measurement center point: The intersection of lines connecting triangle marks (△) in the guidance display.

X-axis and Y-axis directions: Shown in Figure 6-7.

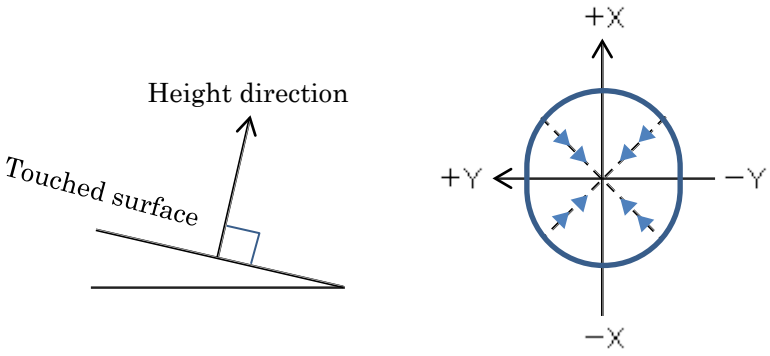


Figure 6-7 X-Axis and Y-Axis Directions of Gate EG20

6.2.7. Measurement Center Point, X-Axis Direction, and Y-Axis Direction of Gate EG2 (RC-S470C)

The 0-degree direction of the test sample in relation to the reader/writer is the direction opposite to the microphone of the test sample. The 0-degree direction of the wearable device follows the angle in "5.3Definitions of Terms Related to the Testing Method".

Measurement center point: The center of the mobile contactless IC communication mark in the guidance display.

X-axis and Y-axis directions: Shown in Figure 6-8.

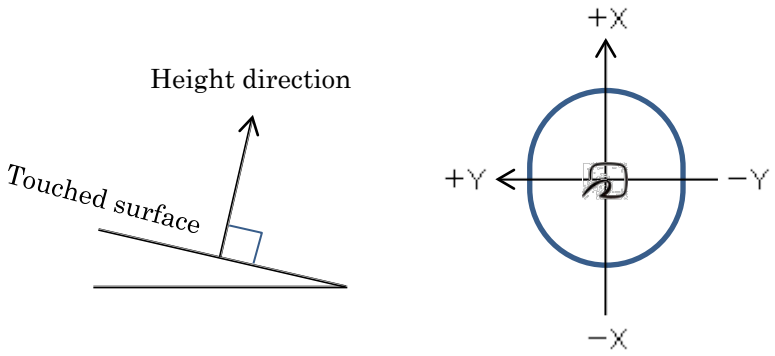


Figure 6-8 X-Axis and Y-Axis Directions of Gate EG2

6.2.8. Measurement Center Point, X-Axis Direction, and Y-Axis Direction of the Bus Reader Unit (RC-S470C)

The 0-degree direction of the test sample in relation to the reader/writer is the direction opposite to the microphone of the test sample. The 0-degree direction of the wearable device follows the angle in "5.3Definitions of Terms Related to the Testing Method".
Measurement center point: The intersection of lines connecting triangle marks (△) in the guidance display.
X-axis and Y-axis directions: Shown in Figure 6-9.

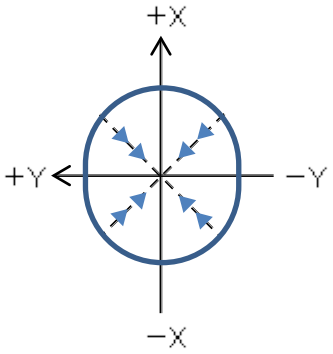


Figure 6-9 X-Axis and Y-Axis Directions of the Bus Reader/Writer Unit (RC-S470C)

6.2.9. Measurement Center Point, X-Axis Direction, and Y-Axis Direction of the Bus Reader Unit (RC-S011C)

The 0-degree direction of the test sample in relation to the reader/writer is the direction opposite to the microphone of the test sample. The 0-degree direction of the wearable device follows the angle in "5.3Definitions of Terms Related to the Testing Method".
Measurement center point: The intersection of lines connecting triangle marks (△) in the guidance display.
X-axis and Y-axis directions: Shown in Figure 6-10.

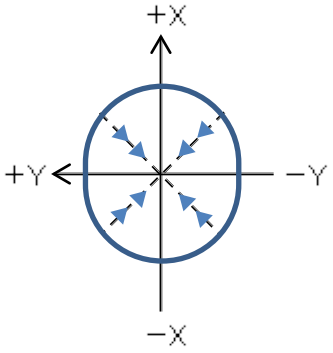


Figure 6-10 X-Axis and Y-Axis Directions of the Bus Reader/Writer Unit (RC-S011C)

6.2.10. Measurement Center Point, X-Axis Direction, and Y-Axis Direction of the Car-Mounted Reader (VT-9271A)

The 0-degree direction of the test sample in relation to the reader/writer is the direction opposite to the microphone of the test sample. The 0-degree direction of the wearable device follows the angle in "5.3Definitions of Terms Related to the Testing Method".

Measurement center point:

- 80mm from the left end of the metal plate and 70mm from the LED section when the reader/writer is at the left end.
- 80mm from the right end of the metal plate and 70mm from the LED section when the reader/writer is at the right end.

X-axis and Y-axis directions: Shown in Figure 6-11.

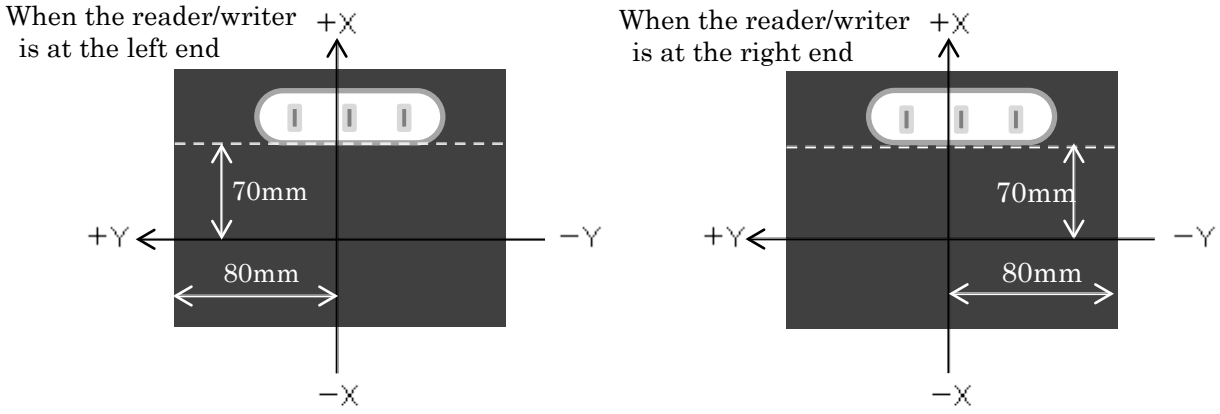


Figure 6-11 X-Axis and Y-Axis Directions of the Car-Mounted Reader (VT-9271A)

For measurement, all of the five car-mounted readers are used and the car-mounted reader to be measured is placed furthest from the main car-mounted reader with a power.

6.2.11. Measurement Center Point, X-Axis Direction, and Y-Axis Direction of the BT2 E-money Terminal Unit (JT-R591CR-10)

The 0-degree direction of the test sample in relation to the reader/writer is the direction opposite to the microphone of the test sample. The 0-degree direction of the wearable device follows the angle in "5.3Definitions of Terms Related to the Testing Method".
Measurement center point: The center of the circular section of the E-money Terminal.
X-axis and Y-axis directions: Shown in Figure 6-12.

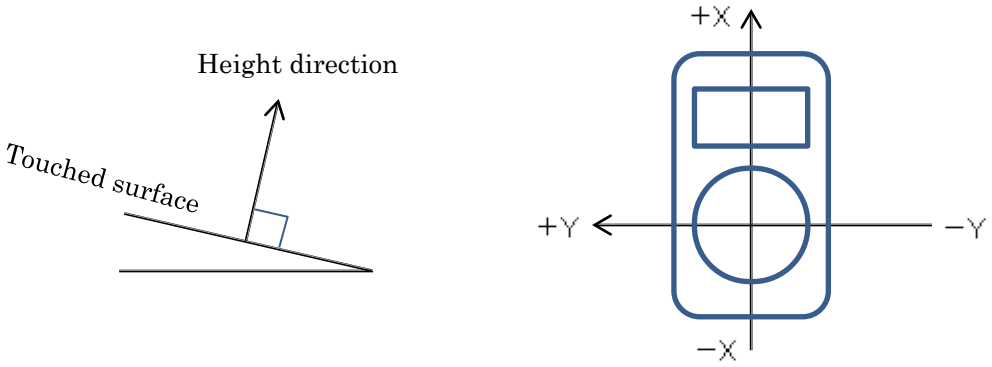


Figure 6-12 X-Axis and Y-Axis Directions of the E-money Terminal (JT-R591CR-10)

6.3. Structure of the Certification Test

The certification test consists of multiple parts: a basic performance test, a performance test with an actual terminal and basic sequence test.
The test sample passes the certification test when it meets the standards set for all test items.

6.4. Basic Performance Test

The basic performance test is conducted to verify that the test sample has the communication performance required for all mobile wallet services.
The basic performance test consists of the following type of testing:

- Performance of the communication with M-class reader/writer

6.4.1. Performance of Communication with the M-Class Reader/Writer

This test tests the following items according to the measurement procedure described in *5.4Communication Performance Measurement Procedure*.

No.	Test Item	Pass criteria
1	Communication distance (Center at 0 and 90 degree)	Maximum communication distance of 30mm or more at all measurement points
2	Communication holes (Center at 0 and 90 degree)	No communication hole at any measurement point within a distance of 0mm to 20mm

Combination of test samples and testing reader/writers (Yes: Performed, －: Not performed)

	Ordinary reader/writer
Maximum-frequency sample	Yes
Standard-frequency sample	Yes
Minimum-frequency sample	Yes

6.5. Performance Test with an Actual Terminal

The performance test with an actual terminal is conducted to verify that the test sample has the communication performance required for a specific service.
The performance test with an actual terminal consists of the following 4 types of testing:

- Performance of the communication with S-class reader/writer
- Performance of communication with an Edy terminal
- Performance of the communication with multi e-money reader/writer
- Performance of communication with a Suica terminal

6.5.1. Performance of Communication with the S-Class Reader/Writer

This test tests the following items according to the measurement procedure described in *5.4Communication Performance Measurement Procedure*.

No.	Test Item	Pass criteria
1	Communication distance (Center, XY±10mm offset in X and Y directions at 0 degree)	There must be two or less communication holes point out of five points at center and XY±10mm at 0mm height of the reader/writer.

Combination of test samples and testing reader/writers (Yes: Performed, －: Not performed)

	Ordinary reader/writer
Maximum-frequency sample	Yes
Standard-frequency sample	Yes
Minimum-frequency sample	Yes

6.5.2. Performance of Communication with an Edy Terminal

This test tests the following items according to the measurement procedure described in *5.4Communication Performance Measurement Procedure*.

If you do not plan to implement the Rakuten Edy service on your “wearable device”, the performance of communication test with an “Edy terminal” is optional.

No.	Test Item	Pass criteria
1	Communication distance (Center at 0 and 90 degree)	Maximum communication distance of 30mm or more
2	Communication holes (Center, XY±10mm offset in X and Y directions at 0 and 90 degree)	Center: There must be no communication holes within 6mm to 30mm height of the reader/writer. However, any communication holes of less than 3mm are allowed. Center and offset *: There must be two or less communication holes point out of five points at center and XY±10mm at 0, 1, 2, 3, 4, 5mm height of the reader/writer. (See Figure 6-13, Figure 6-14)

Note: The success rate for this item shall be 95% or more.

*Communication holes at center and offsets are judged just at each measurement point by the success rate without taking their height into consideration.

Important:

- The "wearable device" of the Mobile FeliCa RF Performance Certification will only be omitted from the test with the Edy terminal if the applicant declares that the Rakuten Edy service is not scheduled to be implemented. If there is no declaration and the acceptance criteria for communication performance with the Edy terminal is failure, the certification test is judged to be unacceptable. If you wish to reapply to the test after failed, the applicant is required to apply for

certification and test fee again.

- After the start of the certification test or receiving the notification of failure, certification administrator and laboratory will take the following actions even if we receive the notification from the applicant that "there is no plan to implement the service of Rakuten Edy". Please be careful when applying.
  - Except for the test results with the Edy terminal, we do not change to pass the test.
  - At the time of re-certification, re-measurement will be performed according to the application. And we will not use the previous measurement results.

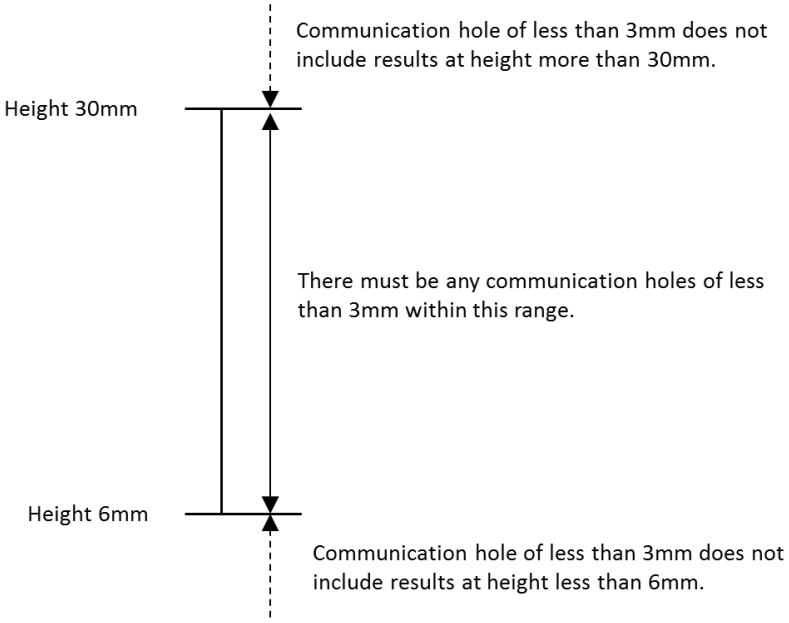


Figure 6-13 Example1: Pass/Fail Criteria for Center

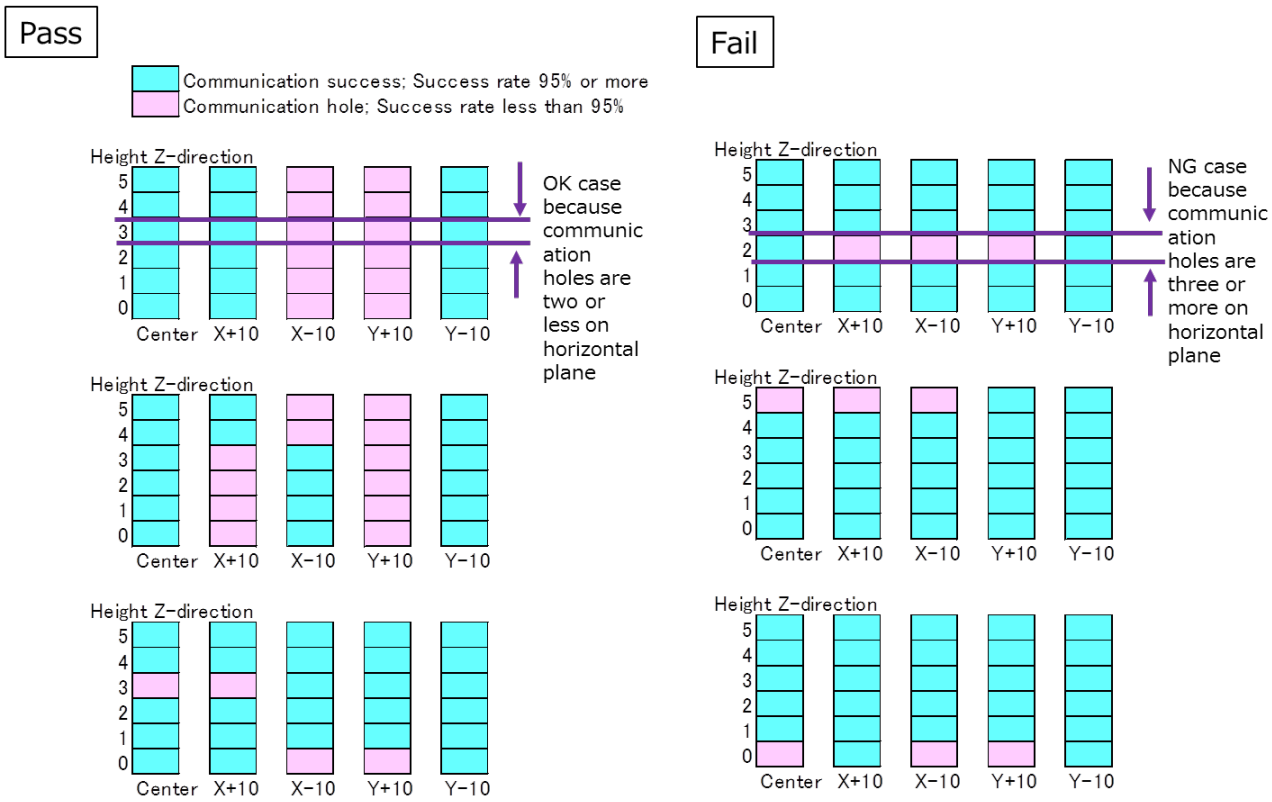


Figure 6-14 Example2: Pass/Fail Criteria for Center, Offset

Combination of test samples and testing reader/writers (Yes: Performed, －: Not performed)

	Ordinary reader/writer
Maximum-frequency sample	Yes
Standard-frequency sample	Yes
Minimum-frequency sample	Yes

6.5.3. Verifying the Operation of the Multi E-money Terminal (JT-R600CR and M010)

This test tests the following items according to the measurement procedure described in *5.4Communication Performance Measurement Procedure*.

No.	Test Item	Pass criteria
1	Communication distance (Center at 0 degree)	The maximum communication distance shall be 15mm or more.
2	Number of communication holes (Center, XY±10 mm at 0 degree)	Center: There must be no communication holes within 0mm to 15mm of the reader/writer. However, any communication holes of less than 3mm are allowed. Center and offset: There must be no communication holes at 0mm height of the reader/writer. Two or less communication holes out of five points at center and XY±10 mm are allowed.

Combination of test samples and testing reader/writers (Yes: Performed, －: Not performed)

	Ordinary reader/writer
Maximum-frequency sample	Yes
Standard-frequency sample	Yes
Minimum-frequency sample	Yes

6.5.4. Performance of Communication with a Suica Terminal

6.5.4.1. Measuring the Performance of Communication with a Gate

6.5.4.1.1. Measuring the Maximum Communication Distance

This test tests the following items according to the measurement procedure described in *5.4Communication Performance Measurement Procedure*.

No.	Test Item	Pass criteria
1	Communication distance (Center at 0 degree)	85mm or more with a standard-frequency reader/writer 80mm or more with a maximum-frequency reader/writer 75mm or more with a minimum-frequency reader/writer

Combination of test samples and testing reader/writers (Yes: Performed, －: Not performed)

	Minimum-frequency reader/writer	Standard-frequency reader/writer	Maximum-frequency reader/writer
Maximum-frequency sample	－	Yes	Yes
Standard-frequency sample	－	Yes	－
Minimum-frequency sample	Yes	Yes	－

6.5.4.1.2. Measuring Communication Holes - Measuring a Wide Range

This test tests the following items according to the measurement procedure described in *5.4Communication Performance Measurement Procedure*.

No.	Test Item	Pass criteria
1	Communication holes (Center, X±10, 20, 30, 40, 50, 60, 70 mm (side lobes are not tested) at 0 degree) *Side lobe: Communication area in the measured X plane in the direction opposite to X=0 mm from the termination of the communication area with its maximum area around X=0 mm (point where the positive and negative inclination of the boundary between the communication area and communication holes changes. See *Attachment B: Side lobe area*)	Center: There must be no communication holes from the 0mm height to the maximum communication distance pass criteria for all reader/writers. However, any communication holes which are 2mm or less wide are allowed from the 30mm height to the maximum communication distance pass criteria. Center and offset: Within each rectangular area consisting of 9 points (3-by-3 matrix), three or more consecutive communication hole points shall not exist in the X-direction. The effective vertical range above each X point is from the 0mm point to the maximum communication distance point (which is the shorter of the maximum communication distance pass criteria and the maximum measured communication distance) for all reader/writers. (See Figure 6-15, Figure 6-16, Figure 6-17)

Note: The success rate shall be 100% when polling is performed 10 times for this item.

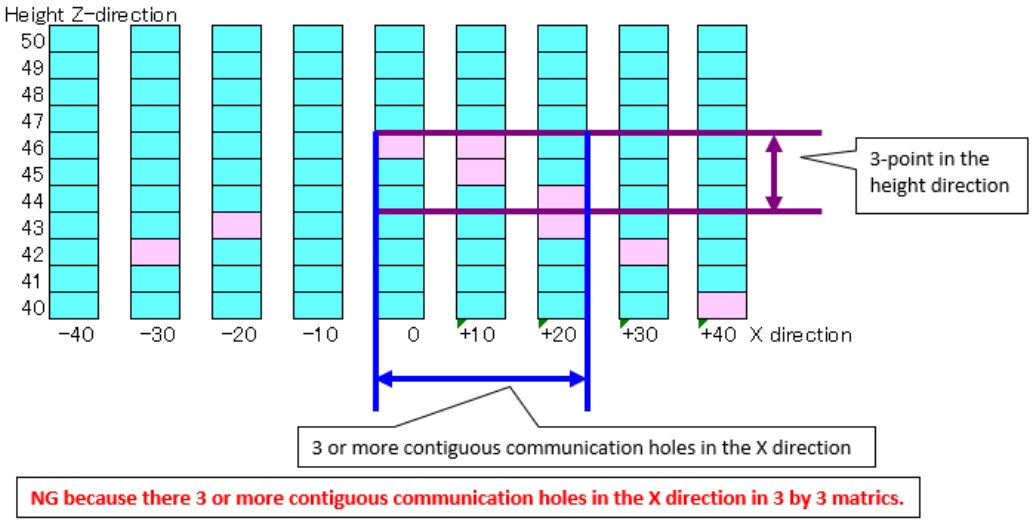


Figure 6-15 Enlarged View of the Communication Hole Graph (NG Pattern 1)

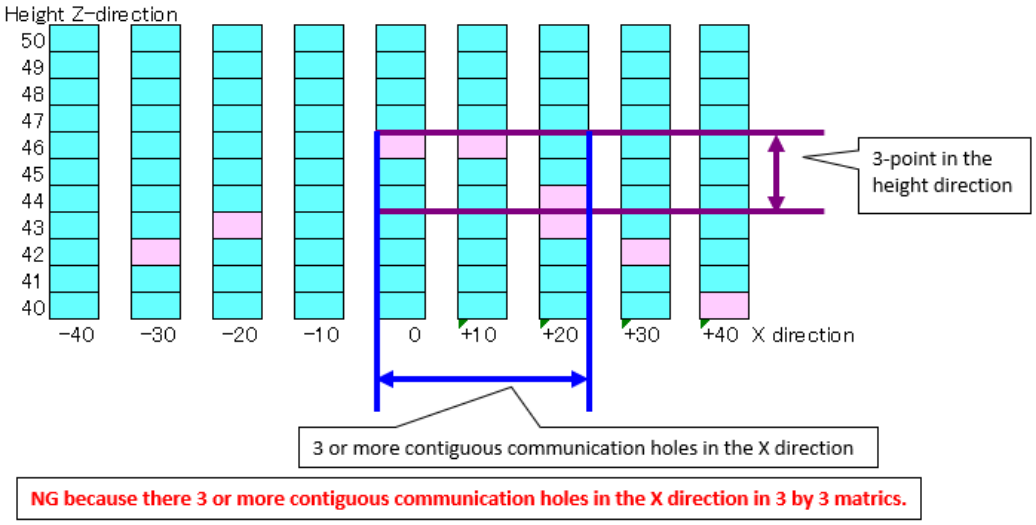


Figure 6-16 Enlarged View of the Communication Hole Graph (NG Pattern 2)

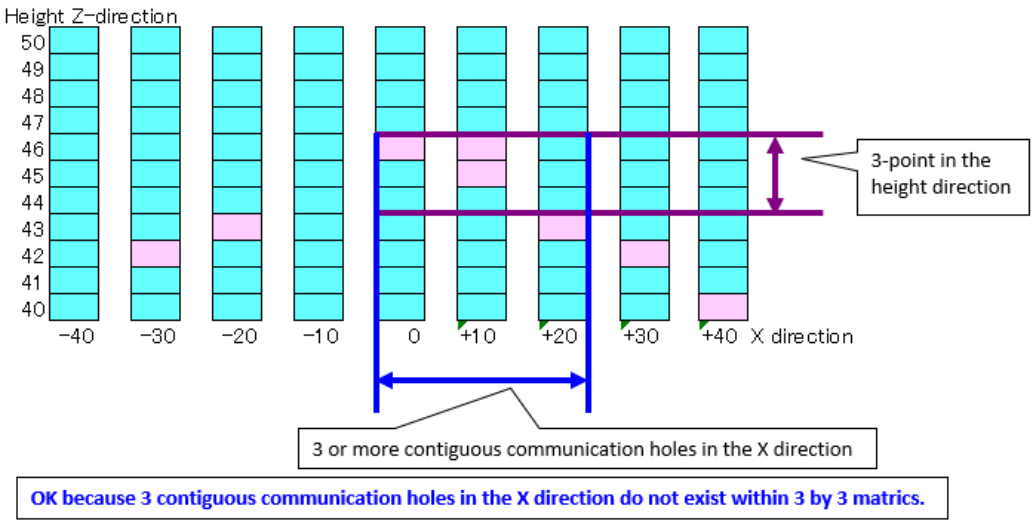


Figure 6-17 Enlarged View of the Communication Hole Graph (OK Pattern)

Combination of test samples and testing reader/writers (Yes: Performed, —: Not performed)

	Minimum-frequency reader/writer	Standard-frequency reader/writer	Maximum-frequency reader/writer
Maximum-frequency sample	—	Yes	Yes
Standard-frequency sample	—	Yes	—
Minimum-frequency sample	Yes	Yes	—

6.5.4.1.3. Measuring Communication Holes - Measuring the Center Area

This test tests the following items according to the measurement procedure described in *5.4Communication Performance Measurement Procedure*.

No.	Test Item	Pass criteria
1	Communication holes (Center, X±5, 10, 15, 20mm at 0 degree)	There must be no communication holes within 0mm to 20mm height of the reader/writer. Note that, at a height of 0mm, not even one communication hole with a width of less than 1mm is allowed.

Combination of test samples and testing reader/writers (Yes: Performed, —: Not performed)

	Minimum-frequency reader/writer	Standard-frequency reader/writer	Maximum-frequency reader/writer
Maximum-frequency sample	Yes	—	Yes
Standard-frequency sample	Yes	—	Yes
Minimum-frequency sample	Yes	—	Yes

6.5.4.2. Verifying the Contact Surface

This test tests the following items according to the measurement procedure described in *5.4Communication Performance Measurement Procedure*.

No.	Test Item	Pass criteria
1	Communication holes (Center at 0 degree)	There must be no communication holes at 0mm height of the reader/writer. Note that, at a height of 0mm, not even one communication hole with a width of less than 1mm is allowed.

Combination of test samples and testing reader/writers for Gate EG2 (RC-S470C) and Bus reader unit(RC-S470C) (Yes: Performed, －: Not performed)

	Minimum-frequency reader/writer	Standard-frequency reader/writer	Maximum-frequency reader/writer
Maximum-frequency sample	－	Yes	－
Standard-frequency sample	－	Yes	－
Minimum-frequency sample	－	Yes	－

Combination of test samples and testing reader/writers for Bus reader unit(RC-S011C) (Yes: Performed, －: Not performed)

	Minimum-frequency reader/writer	Standard-frequency reader/writer	Maximum-frequency reader/writer
Maximum-frequency sample	Yes	－	Yes
Standard-frequency sample	－	Yes	－
Minimum-frequency sample	Yes	－	Yes

6.5.4.3. Verifying the Operation of the Car-Mounted Reader (VT-9271A)

For the test sample that uses the active load modulation (ALM) technology in the FeliCa RF communication, the communication performance measurement described in Section 6.5.4.3.1 and the out-of-range communication measurement described in Section 6.5.4.3.2 are performed. For the test sample that does not use the ALM technology, only the communication performance measurement described in Section 6.5.4.3.1 is performed.

6.5.4.3.1. Measuring the Communication Performance

This test tests the following items according to the measurement procedure described in *5.4Communication Performance Measurement Procedure*.

No.	Test Item	Pass criteria
1	Communication distance (Center at 0 degree)	The maximum communication distance shall be 15mm or more.
2	Communication holes (Center, XY±10mm at 0 degree)	Center: There must be no communication holes within 0mm to 15mm of the reader/writer. However, any communication holes of less than 3mm are allowed. Center and offset: There must be no communication holes at 0mm height of the reader/writer. However two or less communication holes out of five points at center and XY±10mm are allowed.

Note: The success rate for this item shall be 95% or more.

Combination of test samples and testing reader/writers (Yes: Performed, －: Not performed)

	Minimum-frequency reader/writer	Standard-frequency reader/writer	Maximum-frequency reader/writer
Maximum-frequency sample	Yes	－	Yes
Standard-frequency sample	－	Yes	－
Minimum-frequency sample	Yes	－	Yes

6.5.4.3.2. Out-of-Range Communication Measurement

This test tests the following items.

No.	Test Item	Pass criteria
1	Out-of-range area (Center, XY±15mm at 0 degree) Test overview Place the test sample on the right side of the reader/writer, and send the Polling command from the left side of the reader/writer. Evaluation details It is checked if communication is not set up (the LED does not light) from an out-of-range area (left side of the reader/writer). The Polling command is executed 100 times. If communication is set up more than ten times from an out-of-range area, it is called “out-of-range communication setup”.	There must be two or less out-of-range communication setup points out of five points at center and XY±15mm at 0mm and 10mm height of the reader/writer. (See Figure 6-18, Figure 6-19)

Combination of test samples and testing reader/writers (Yes: Performed, —: Not performed)

	Minimum-frequency reader/writer	Standard-frequency reader/writer	Maximum-frequency reader/writer
Maximum-frequency sample	—	—	—
Standard-frequency sample	—	Yes	—
Minimum-frequency sample	—	—	—

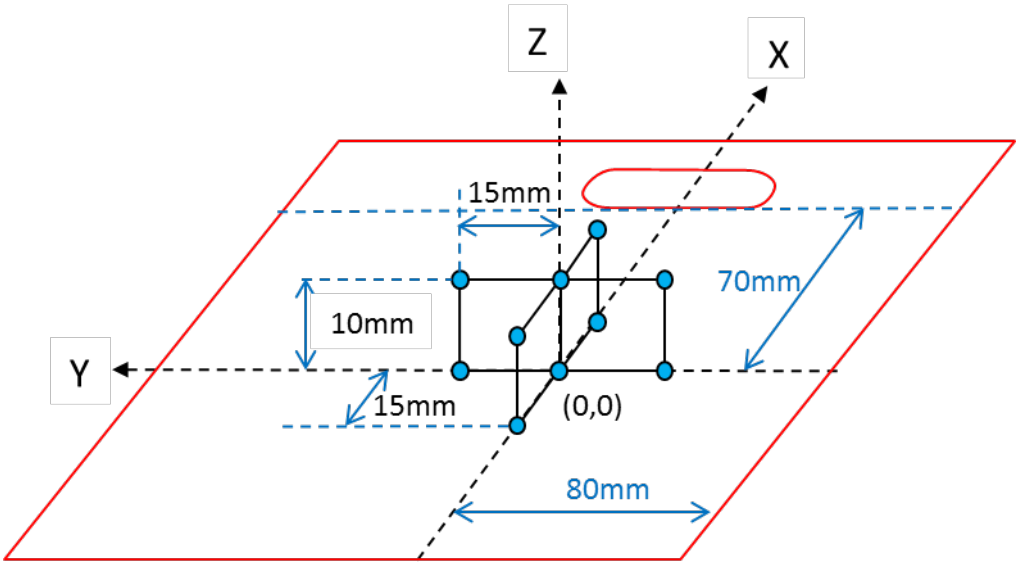


Figure 6-18 Out-of-range communication measurement points

Pass point

Fail point

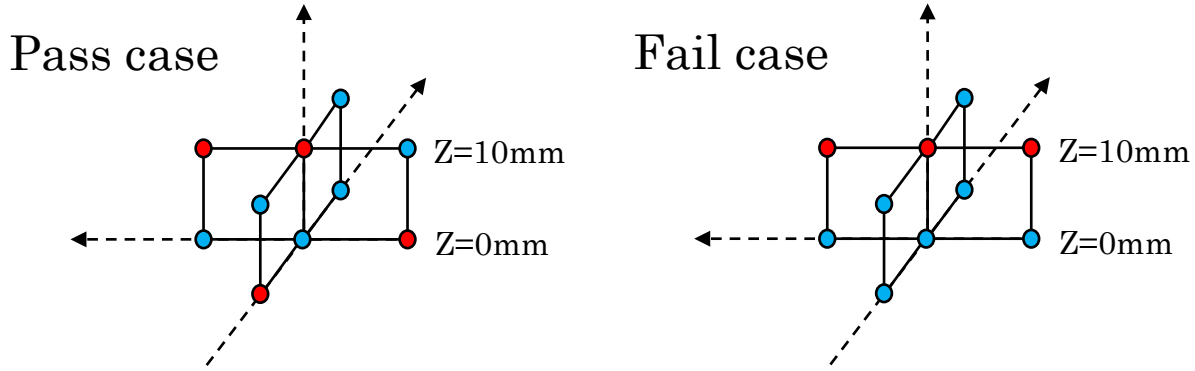


Figure 6-19 Pass/Fail criteria of Out-of-range communication measurement (example)

6.5.4.4. Verifying the Operation of the BT2 E-money Terminal Unit (JT-R591CR-10)

This test tests the following items according to the measurement procedure described in *5.4Communication Performance Measurement Procedure*.

No.	Test Item	Pass criteria
1	Communication distance (Center at 0 degree)	The maximum communication distance shall be 15mm or more.
2	Number of communication holes (Center, XY±10 mm at 0 degree)	Center: There must be no communication holes within 0mm to 15mm of the reader/writer. However, any communication holes of less than 3mm are allowed. Center and offset: There must be no communication holes at 0mm height of the reader/writer. Two or less communication holes out of five points at center and XY±10 mm are allowed.

Note: The success rate for this item shall be 95% or more.

Combination of test samples and testing reader/writers (Yes: Performed, －: Not performed)

	Minimum-frequency reader/writer	Standard-frequency reader/writer	Maximum-frequency reader/writer
Maximum-frequency sample	Yes	－	Yes
Standard-frequency sample	－	Yes	－
Minimum-frequency sample	Yes	－	Yes

6.6. Basic Sequence Test

6.6.1. Sequence Software Specifications

The specifications for the sequence software are as follows:

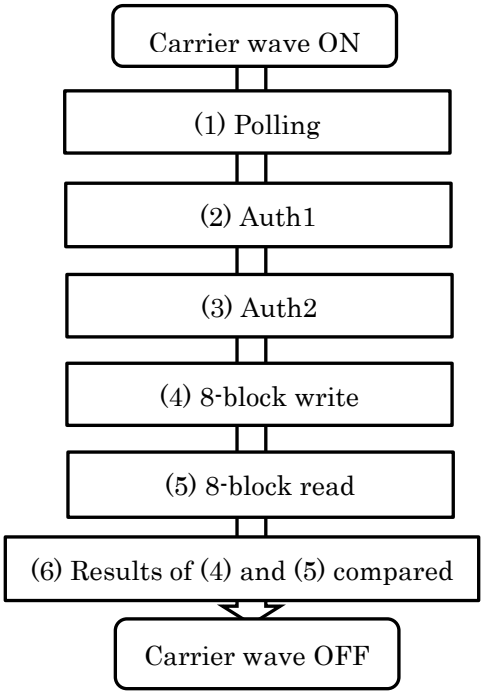


Figure 6-20 Sequence Software

The above sequence is performed for every millisecond. This measurement is carried out five times in a row.

An area in which the sequence is successful five times in a row is regarded as a sequence-enabled area.

6.6.2. Pass Criteria

The table below shows the pass criteria of this test.

No.	Measurement point	Pass criteria
1	Center at 0-degree	The sequence shall be processed properly in the communication area.

Attachment A: Terms and Conditions

Terms and Conditions for Mobile FeliCa RF Performance Certification Test (for Mobile Product)

The following terms and conditions (the "Terms and Conditions") apply with respect to the "Mobile FeliCa RF Certification Test" of your Product (hereinafter defined) conducted by Sony Corporation ("Sony"). The Terms and Conditions apply to individual applications for the "Mobile FeliCa RF Certification Test" submitted on the Mobile FeliCa RF Performance Certification Test Application Form. These Terms and Conditions become an agreement with respect to the "Mobile FeliCa RF Certification Test" (the "Agreement") between you and Sony upon Sony's acceptance of your application for the "Mobile FeliCa RF Certification Test" submitted in accordance with Section 2.01 hereof (such acceptance date is referred to as "Effective Date").

ARTICLE I. DEFINITIONS

The following terms as used in these Terms and Conditions shall have the meanings set forth below.

(1) "FeliCa IC" shall mean IC chips for Mobile Product that is certified by FeliCa Networks.
(2) "Mobile Product" shall mean a mobile device (i) which has communication function and (ii) which is sold, rented, leased or otherwise provided with the trademarks of either Telecommunication Carriers, third party or your company.
(3) "Telecommunication Carrier" shall mean a provider of trans receiver functionalities via mobile communication system to users of mobile devices that are sold, rented, leased or otherwise provided to them with such providers' trademarks.
(4) "Product" shall mean the Mobile Product in which FeliCa IC is embedded.
(5) "Mobile FeliCa RF Certification Test" or "Test" shall mean the certification test conducted by Sony to determine whether your Product manufactured for a Telecommunication Carrier, third party or your company meets the standards and/ or requirements (including the standards and/ or requirements for the basic sequence, the "Certification Standards") for Mobile Products set forth in the "Mobile FeliCa RF Performance Certification Specification" (the "Certification Specification") made by Mobile FeliCa Technical Communications Committee.
(6) "Test Institute" shall mean the third-party agency that Sony designates as an institute who conducts the Mobile Felica RF Certification Test.

ARTICLE II. CERTIFICATION TEST

2.01 An application for the Mobile FeliCa RF Certification Test shall be made for each model of your Product, in accordance with the provisions of the Certification Specification. Your application is deemed to be accepted unless it is rejected by Sony with reasonable cause within five (5) business days (of Sony in Japan) from the date of submission of your application. You shall arrange the test schedule with the Test Institute directly.

2.02 You must submit three (3) samples of your Product. After the completion of the Mobile FeliCa RF Certification Test, Sony will return such samples to you. Sony shall not be responsible for any damages to the samples in connection with the Mobile FeliCa RF Certification Test of the Products performed by Sony.

2.03 Sony will, after the Agreement becomes effective and Sony receives the samples set forth in

Section 2.02 above, promptly conduct the Mobile FeliCa RF Certification Test in accordance with the Certification Specification and notify you the results thereof. Upon passing of the Mobile FeliCa RF Certification Test, Sony will issue a pass certificate (the "Pass Certificate") with respect to the specific model of the Product for which the samples were provided.

2.04 If (i) you request to add a new Product model which has not yet passed the Test but has the same RF communication performance and the sequence processing function under the same measurement conditions as the Product which has passed the Test to a Product series whose models have already passed the Test, by means separately designated by Sony, and (ii) Sony approves such request by the form separately designated by Sony, then such a new Product model is deemed to have passed the Test without being Tested, provided that you warrant such sameness of the RF communication performance and the sequence processing function thereto.

2.05 The Pass Certificate shall be valid for ten (10) years from the date of issuance (the "Term"), unless invalidated by Sony pursuant to these Terms and Conditions. The Term will be indicated on the Pass Certificate. Provided that the Term of the Pass Certificate for a new Product model which has been added in as set forth the Section 2.04 (without being Tested) shall be the same period with the Term of the model of Products which has actually passed the Test.

ARTICLE III. EFFECT OF THE PASS CERTIFICATE

3.01 During the Term of the Pass Certificate, you may publicly announce or indicate that the applicable model of the Product has passed the Mobile FeliCa RF Certification Test. Such announcement or indication must include the name of the certification test, the version of the Certification Specification and the applicable model name of the Product, all exactly as set forth on the Pass Certificate.

3.02 Sony reserves the right to cancel the rights granted to you under Section 3.01 immediately if you fail to comply with the requirements set forth in Section 3.01.

3.03 In response to your request by means separately designated by Sony, Sony may list on its Web site your name along with the model name and other information of your Product that has passed the Mobile FeliCa RF Certification Test.

3.04 Your announcement or indication permitted under Section 3.01 shall be made only with respect to the model of the Product that has passed the Mobile FeliCa RF Certification Test.

3.05 Upon expiration or termination of the Term of the Pass Certificate, you will no longer have the rights granted to you under Section 3.01.

ARTICLE IV. FEES

4.01 In consideration for the completion of the Mobile FeliCa RF Certification Test, you shall pay to Sony the fees in the amount of six hundred thousand (600,000) Japanese Yen (not including any applicable taxes). The payment of the fees and any applicable taxes shall be made to Sony in Japanese Yen by means of wire transfer remittance into a bank account designated by Sony, at least one (1) week prior to the estimated date of sample submission as agreed by you and the Test Institution. Sony may withhold performance as set forth in Section 2.03 until receipt of such payment.

4.02 Notwithstanding the provisions of Section 4.01 above, if the number of your applications pursuant to Section 2.01 exceeds more than ten (10) within the same fiscal year, regarding the eleventh (11th) and subsequent applications within the fiscal year, in consideration for the completion of the FeliCa Reader/Writer RF Performance Certification Test, you shall pay to Sony the fees in the amount of five hundred forty thousand (540,000) Japanese Yen (not including any applicable taxes) in accordance with the procedures set forth in the Section 4.01 above. In this Section, a fiscal year means the twelve (12)-month period starting on April 1st of the applicable year and ending on March 31st of the following year.

4.03 The fees paid to Sony hereunder are non-refundable.

ARTICLE V. CHANGES AND INVALIDATION

5.01 The Pass Certificate is valid only with respect to the Product model that is identical to the sample Product model that passed the Mobile FeliCa RF Certification Test. To obtain the Pass Certificate for any other Product model, you must separately apply for and pass the Mobile FeliCa RF Certification Test with respect to such other Product model.

5.02 If you make modifications to the Product, such modified Product is not deemed to be passed the Test and the Pass Certificate is no longer valid for such modified Product even if the model of the Product is the same as the Product which has passed the Test and you need to apply for the Test for such modified Product. Notwithstanding above, if (i) you notify Sony of such modification in the form separately designated by Sony and (ii) Sony, at its sole discretion, determined and approved that such modification does not affect the RF communication performance and the sequence processing function, and (iii) you warrant the same RF communication performance and the sequence processing function under the same measurement conditions as the Product without such modification, then you do not need to re-apply for the Test despite of the modification to the Product.

5.03 Sony may amend or update the Certification Standards at its discretion from time to time in part or in whole. In such event, Sony will update the version number of the Certification Specification, and you may, at your option, apply for the Mobile FeliCa RF Certification Test under the updated Certification Specification in order to obtain a Pass Certificate under the updated Certification Specification. However, any amendment or the update to the Certification Standards will not affect the validity of any Pass Certificate issued under previous version(s) of the Certification Specification.

5.04 If Sony finds that, as to any Product that has passed the Mobile FeliCa RF Certification Test, such Product made available in the market does not meet the Certification Standards applied at the time of the issuance of the relevant Pass Certificate, Sony may, at its option, invalidate such Pass Certificate.

5.05 If you make any public announcement or indication with respect to your Product pursuant to Section 3.01 (i) without having re-applied or passed the Mobile FeliCa RF Certification Test even though you have made one or more modifications to your Product that require re-application for the Mobile FeliCa RF Certification Test pursuant to Section 5.01, or (ii) without notifying Sony of modification to the Product or without receiving Sony's approval pursuant to Section 5.02 or (iii) under any updated version of the Certification Specification when you have not passed the Mobile FeliCa RF Certification Test under such updated version of the Certification Specification, Sony may, at its option, immediately invalidate the relevant Pass Certificate.

ARTICLE VI. CONFIDENTIALITY

6.01 You and Sony (each, a "Party" and collectively, the "Parties") shall each maintain as confidential and shall not disclose to any third party any technical, business or other proprietary information of the other Party disclosed during the course of the Mobile FeliCa RF Certification Test (the "Confidential Information") without the prior written consent of such other Party, for three (3) years after such disclosure. Further, Sony will not use your Confidential Information for any purpose other than the purposes contemplated under these Terms and Conditions.

6.02 Notwithstanding the provisions of Section 6.01, such restrictions shall not apply to any portion of the Confidential Information which a Party can prove:

(a) was part of the public domain at the time of disclosure;
(b) was previously known to the receiving Party at the time of disclosure;
(c) subsequently becomes part of the public domain through no fault of the receiving Party or its employees; or
(d) is rightfully obtained by the receiving Party from a third-party source without any restriction on disclosure or use; or
(e) is independently ascertainable or developed by the receiving Party who have not had access to the Confidential Information.

6.03 If the receiving Party is required to disclose any of the Confidential Information of the other Party by government authorities or required by law, ordinance, rule, regulation or court order applicable to the receiving Party, notwithstanding the provisions of Section 6.01, the receiving Party may so disclose such Confidential Information; provided that the receiving Party shall take reasonable steps to obtain confidential treatment of such Confidential Information and shall make reasonable efforts to give the other Party prior written notice of such requirement together with a copy of the information to be disclosed.

6.04 Notwithstanding the provisions of Section 6.01, Sony may disclose your Confidential Information to the Test Institute, the subcontractors set forth in Section 11.03 and Sony's affiliates for the purposes contemplated under these Terms and Conditions. In such case, Sony shall cause the Test Institute, the subcontractors and the affiliates to be bound by the obligations no less restrictive than those of Sony under the provisions of Section 6.01. Failure by the Test Institute, the subcontractors or the affiliates to observe such obligations shall constitute a breach of this Agreement by Sony.

ARTICLE VII. WARRANTIES AND LIMITATION OF LIABILITY

7.01 SONY MAKES NO REPRESENTATION OR WARRANTIES, EXPRESSLY OR BY IMPLICATION, STATUTORY OR OTHERWISE, IN CONNECTION WITH PASSING OF THE MOBILE FELICA RF CERTIFICATION TEST, INCLUDING BUT NOT LIMITED TO REPRESENTATIONS OR WARRANTIES OF QUALITY, FUNCTIONALITY, PERFORMANCE, SAFETY, UTILITY, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF YOUR PRODUCT.

7.02 IN NO EVENT SHALL SONY BE LIABLE TO YOU OR ANY THIRD PARTY FOR ANY DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OR LOSSES WHATSOEVER UNDER ANY CIRCUMSTANCES (INCLUDING BUT NOT LIMITED TO DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION OR OTHER PECUNIARY LOSS) THAT ARISE IN CONNECTION WITH THE PRODUCTS THAT HAVE PASSED THE MOBILE FELICA RF CERTIFICATION TEST, EVEN IF SONY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

ARTICLE VIII. EXCLUSION OF ANTISOCIAL FORCES

8.01 Each of you and Sony represents and warrants that, as of the execution date and during the term of this Agreement, it, as well as its officers and persons substantially involved in its management, do not fall under the category of the Anti-Social Forces and any of the following items (In this ARTICLE VIII, "Anti-Social Forces" means organized crime groups ("bouryokudan"), members of organized crime groups ("bouryokudan-in"), individuals who left an organized crime group within the past 5 years, quasi-members of any organized crime group ("bouryokudan junkosei-in"), enterprises affiliated with organized crime groups ("bouryokudan kankei kigyo"), corporate extortionists ("sokai-ya"), corporate swindlers acting under the pretext of conducting social movements or political activities ("shakai undou hyoubou goro", "seiji undou hyoubou goro"), groups of individuals specialized in intellectual crimes ("tokushu chinou bouryoku shudan"), individuals closely affiliated to any organized crime groups ("bouryokudan missetsu-kankeisha"), and others as being equivalent thereto.):

(a) having a relationship which can be recognized that the Antisocial Forces controls the management;
(b) having a relationship which can be recognized that the Antisocial Forces is substantially involved in the management;
(c) having a relationship which can be recognized that it unjustly exploits the Antisocial Forces, such as for the purpose of gaining wrongful interests for itself or a third party or causing damage to a third party;
(d) having a relationship which can be recognized that it is involved with the Antisocial Forces, such as in the cases of providing funds or other convenience and facilities, knowing that the receiver falls under the Antisocial Forces; and
(e) having a socially condemnable relationship between its officers and persons substantially involved in its management and the Antisocial Forces.

8.02 Each of you and Sony represents and warrants that it will not conduct or cause a third party to conduct even one of the following acts in connection with this Agreement:

(a) violent demands;
(b) unreasonable demands beyond legal liability;
(c) an act of threatening behavior or violence;
(d) an act of spreading rumors, damaging the reputation of the other Party by using fraudulent means or force, or obstructing the business of the other Party; and
(e) any other act equivalent to the preceding items.

8.03 In the event that each of you and Sony breaches any of the representations and warranties set forth in the preceding two sections, the other Party may terminate this Agreement without giving any notice and demand to the breaching party.

8.04 The Party who terminates this Agreement pursuant to the preceding section shall not be liable to compensate the breaching Party in any way, even if any damage is caused to the breaching Party as a result of or in connection with such termination of this Agreement.

8.05 In the event that each of you and Sony breaches any of the representations and warranties set forth in the Section 8.01 and 8.02, all obligations of the breaching Party under this Agreement shall become immediately due and performed in accordance with the request by the other Party.

ARTICLE IX. TERM

9.01 This Agreement shall become effective as from the Effective Date and thereafter shall remain in effect (unless terminated earlier as set forth in this Agreement) until either the Mobile FeliCa RF Certification Test shall have been completed or the payment for the Mobile FeliCa RF Certification Test shall have been completed pursuant to Section 4.01 or 4.02, whichever comes later.

9.01 Each Party reserves the right to terminate the Agreement immediately without any notice or demand in the event that:

(a) the other Party is adjudicated a bankrupt, makes assignment for the benefit of its creditors; takes advantage of any insolvency act; or is the subject of a case for its liquidation or reorganization under any law;
(b) the other Party breaches any provision of these Terms and Conditions and does not cure such breach within thirty (30) days after receipt of notice thereof; or
(c) the other Party ceases to function as a going concern or to conduct its operations in the normal course of business.
(d) the other Party uses the Mobile FeliCa RF Certification Test and/or Product illegally or against public policy.

9.02 Sony reserves the right to invalidate the Pass Certificate issued to you hereunder immediately without notice or demand in the event that you fail to make any payment required under the Agreement for more than two (2) months from the due date.

9.03 In the event that the Agreement becomes terminable by Sony under this Article IX, all of your obligations under the Agreement shall immediately accelerate.

9.04 Section 2.02, 2.04 and 2.05, Article III, Section 4.03, Articles V, VI and VII, Sections 8.04 and 8.05, and Articles X and XI shall survive any expiration or termination of theAgreement.

ARTICLE X. NO ASSIGNMENT

10.01 You may not assign transfer or mortgage any of your rights and obligations hereunder without the prior written consent of Sony.

ARTICLE XI. MISCELLANEOUS

11.01 Sony may, at any time with prior notice to you, cease to conduct the Mobile FeliCa RF Certification Test or assign or transfer its rights and obligations hereunder with respect to the Mobile FeliCa RF Certification Test to a third party in part or in whole, and you shall not object to any of such assignment or transfer.

11.02 You must observe and comply with all relevant laws, ordinances, rules and regulations of relevant countries in performing your obligations and exercising your rights hereunder.

11.03 Sony may use subcontractors to conduct the Test.

11.04 These Terms and Conditions and the Agreement shall be governed by the laws of Japan. If any

provision of these Terms and Conditions is held by a court or other tribunal of competent jurisdiction to be invalid or unenforceable, that provision of these Terms and Conditions shall be enforced to the maximum extent permissible so as to effect the intent of the parties hereto, and the reminder of these Terms and Conditions shall continue in full force and effect.

11.05 In the event of any dispute arising out of or in connection with these Terms and Conditions or the Agreement, which cannot be amicably settled by the Parties, the Parties shall submit any such disputes to the Tokyo District Court in Japan as the court of first instance. Any counter-claim shall be filed with the court with which the original action is filed. The Parties agree that the judgment, decree or order rendered by a court of last resort or a court of lower jurisdiction from which no appeal has been taken in Japan shall be final and binding upon both Parties.

Published on July 1, 2024

Attachment B: Side lobe area

This section provides a supplementary explanation about the side lobe described in Section 6.5.4.1.2 “Measuring Communication Holes - Measuring a Wide Range”.

- Side lobe area

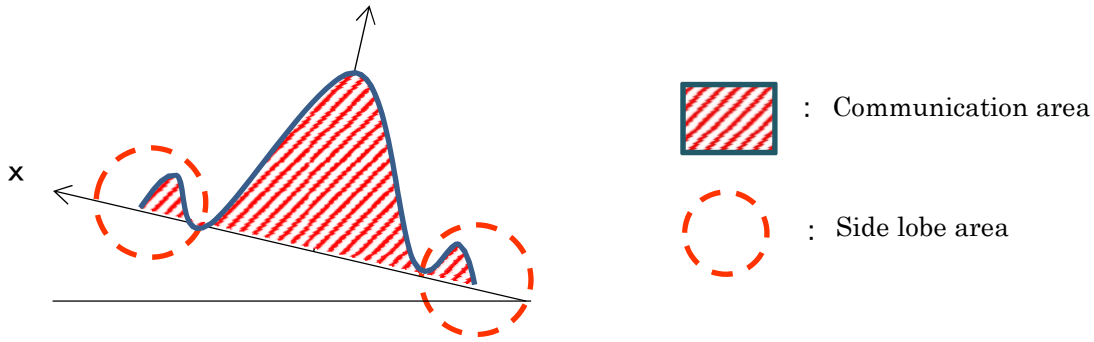


Figure 1 Side lobe area

- Boundary between the communication area and the side lobe area

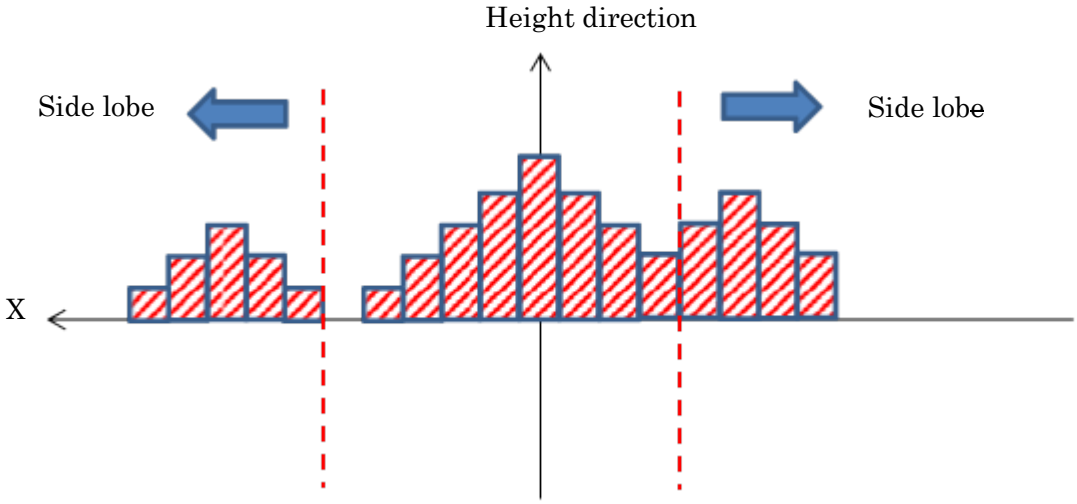


Figure 2 Boundary between the communication area and the side lobe area

Attachment C: Wearable device application flow

We have summarized the application flow for wearable devices, so please use it as a reference when applying for certification.

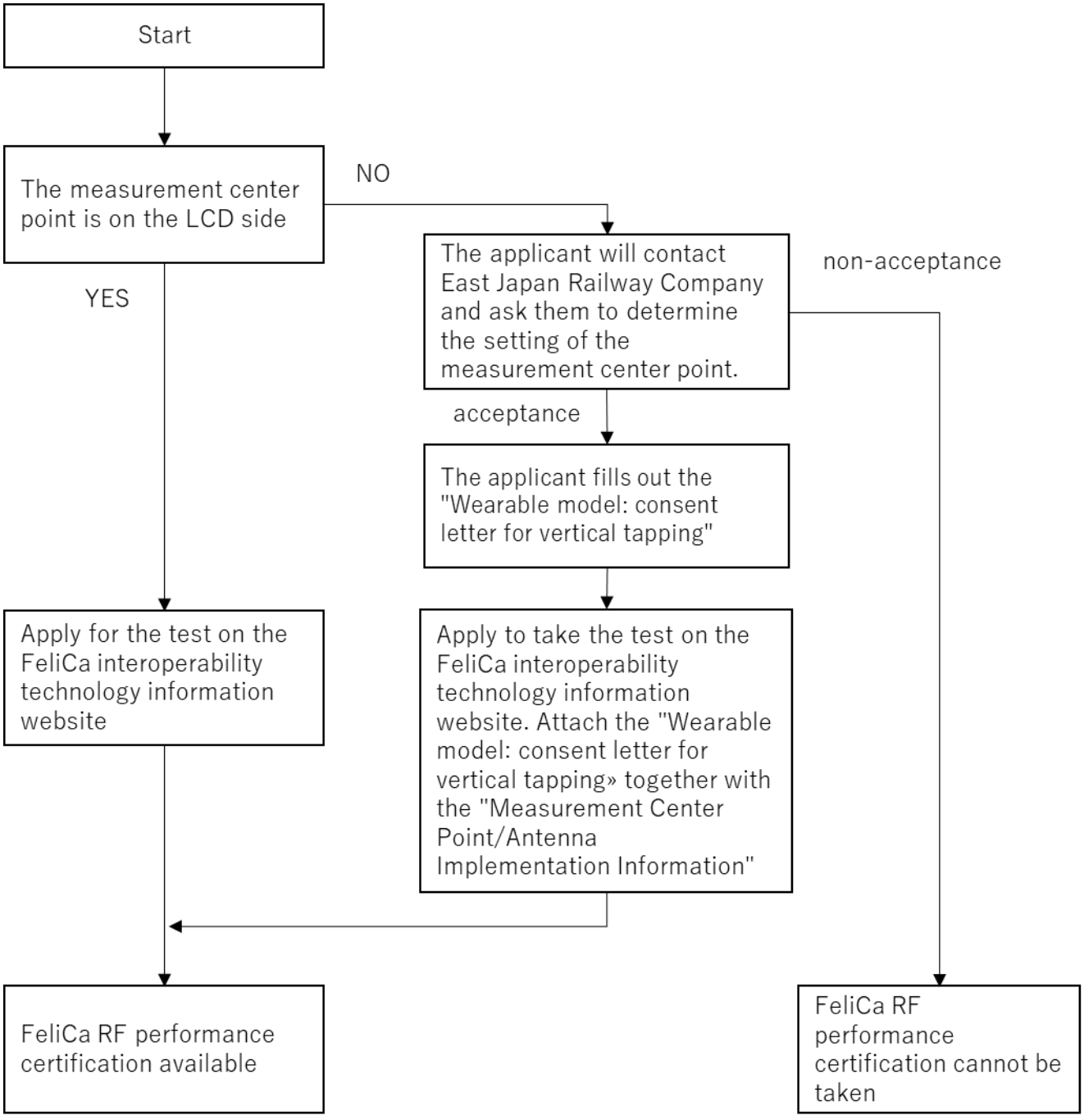


Figure 9-1