# EMS TEST REPORT

## Test Report No. : 12798096M-B

| | | |
|---|---|---|
| **Applicant** | : | **JVC KENWOOD Corporation** |
| **Type of Equipment** | : | **GPS Navigation System** |
| **Model No.** | : | **DNX7190DABS** |
| **Test standard** | : | **EN 55035:2017** |
| **Test Result** | : | **Complied (Refer to Section 3.2)** |

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above standard.
4. The test results in this test report are traceable to the national or international standards.
5. This test report covers EMC technical requirements. It does not cover administrative issues such as Manual or non-EMC test related Requirements. (if applicable)
6. The all test items in this test report are conducted by UL Japan, Inc. Kashima EMC Lab.
7. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
8. The information provided from the customer for this report is identified in Section 1.

**Date of test:** April 2 – 10, 2019

**Representative test operator:**

Kazuaki Suzuki
Engineer
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**Approved by :**

Tomoyuki Yamashita
Leader
Consumer Technology Division

RTL02610

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☒ There is no testing item of "Non-accreditation"

# REVISION HISTORY

## Original Test Report No.: 12798096M-B

| Revision | Test report No. | Date | Page revised | Contents |
|---|---|---|---|---|
| - (Original) | 12798096M-B | April 26, 2019 | - | - |

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**CONTENTS** **PAGE**

**SECTION 1: Customer information** ..... 4
**SECTION 2: Equipment under test (E.U.T.)** ..... 4
**SECTION 3: Test specification, methods and prosedures** ..... 5
**SECTION 4: Operation of E.U.T. during testing** ..... 9
**SECTION 5: Electrostatic discharge** ..... 12
**SECTION 6: Continuous RF electromagnetic field disturbances** ..... 13
**SECTION 7: Electrical fast transient/Burst** ..... 16
**SECTION 8: Continuous induced RF disturbances** ..... 17
**APPENDIX 1: Photographs of test setup** ..... 19
**APPENDIX 2: Test Data** ..... 27
**APPENDIX 3: Test instruments** ..... 33

## SECTION 1: Customer information

| | | |
|---|---|---|
| Company Name | : | JVC KENWOOD Corporation |
| Address | : | 2967-3, Ishikawa-machi, Hachioji, Tokyo 192-8525 Japan |
| Telephone Number | : | +81-42-646-5525 |
| Facsimile Number | : | +81-42-646-1440 |
| Contact Person | : | Seigo Tsutsumi |

The information provided from the customer is as follows:
- Applicant, Type of Equipment, Model No. on the cover page and other relevant pages
- Section 1: Customer information
- Section 2: Equipment under test (E.U.T.)
- Section 4: Operation of E.U.T. during testing

* The laboratory is exempted from liability of any test results affected from the information in Section 2 and 4.

## SECTION 2: Equipment under test (E.U.T.)

### 2.1 Identification of E.U.T.

| | | |
|---|---|---|
| Type of Equipment | : | GPS Navigation System |
| Model No. | : | DNX7190DABS |
| Serial No. | : | Refer to Section 4, Clause 4.2 |
| Rating | : | DC 12 V |
| Receipt Date of Sample (Information from test lab.) | : | April 2, 2019 |
| Country of Mass-production | : | Indonesia |
| Condition of EUT | : | Production prototype (Not for Sale: This sample is equivalent to mass-produced items.) |
| Size | : | 178 x 160 x 100 (Width x Length x Height (mm)) |
| Modification of EUT | : | No Modification by the test lab. |

### 2.2 Product description

Model: DNX7190DABS (referred to as the EUT in this report) is a GPS Navigation System.

The maximum clock frequencies used in the E.U.T.: 6.2208 GHz

**Radio Specification**
**[Bluetooth]**

| Type of radio | Bluetooth (BDR/EDR) |
|---|---|
| Frequency of operation | 2402 MHz - 2480 MHz |
| Type of modulation | FHSS |
| Channel spacing | 1 MHz |

| | |
|---|---|
| Antenna type | Chip Antenna |
| Antenna Gain | -2.3 dBi |
| Power Supply (radio art input) | DC 3.6 V/ 3.3 V/1.8 V |
| Clock frequency (Maximum) | 37.4 MHz |

# SECTION 3: Test specification, methods and prosedures

## 3.1 Test specification

**EMS**

**Title** : EN 55035: 2017
Electromagnetic compatibility of multimedia equipment
- Immunity requirements

**Purpose of test** : Compliance with the harmonized RE directive 2014/53/EU.

## 3.2 Procedures & results

**EMS**
**Enclosure ports**

| Item | Test Procedure | Specification | Criterion | Actual Performance | Result |
|---|---|---|---|---|---|
| Power frequency magnetic field | EN 61000-4-8: 2010 | 50 Hz or 60 Hz,<br>1.0 A/m(r.m.s.) | A | N/A *1) | N/A |
| Continuous RF electromagnetic field disturbances | EN 61000-4-3: 2006 +A1:2008+A2: 2010 | 80 MHz - 1000 MHz<br>3.0 V/m<br>(unmodulated, r.m.s.)<br>AM, 1 kHz, 80 % | A | 80 MHz - 1000 MHz<br>3.0 V/m<br>(unmodulated, r.m.s.)<br>AM, 1 kHz, 80 % *2) | Complied a) |
| | | Spot Frequency<br>1800 MHz, 2600 MHz,<br>3500 MHz, 5000 MHz,<br>(±1 %)<br>3.0 V/m<br>(unmodulated, r.m.s.)<br>AM, 1 kHz, 80 % | A | Spot Frequency<br>1800 MHz, 2600 MHz,<br>3500 MHz, 5000 MHz,<br>3.0 V/m<br>(unmodulated, r.m.s.)<br>AM, 1 kHz, 80 % *2) | Complied a) |
| Electrostatic discharges | EN 61000-4-2: 2009 | ± 4kV contact discharge<br>± 8kV air discharge | B | ± 4 kV contact discharge<br>± 2 kV, ± 4 kV, ± 8 kV<br>air discharge | Complied b) |

Note: UL Japan, Inc.'s EMS Work Procedure 13-EM-W0417.
*1) The test was not applicable because of the customer's request.
*2) The test on a broadcast reception function was not applicable because it includes Annex A, Group 2.

a) Refer to Appendix 2 (data of Continuous RF electromagnetic field disturbances)
b) Refer to Appendix 2 (data of Electrostatic discharges)

**EMS**
**DC network power ports**

| Item | Test Procedure | Specification | Criterion | Actual Performance | Result |
|---|---|---|---|---|---|
| Continuous induced RF disturbances | EN 61000-4-6: 2014 | 0.15 MHz - 10 MHz: 3.0 V | A | 0.15 MHz - 10 MHz: 3.0 V *1) | Complied c) |
| | | 10 MHz - 30 MHz:<br>3.0 V - 1.0 V | | 10 MHz - 30 MHz<br>3.0 V - 1.0 V *1) | |
| | | 30 MHz - 80 MHz: 1.0 V<br>(unmodulated, r.m.s.)<br>AM, 1 kHz, 80 % | | 30 MHz - 80 MHz: 1.0 V<br>(unmodulated, r.m.s.)<br>AM 1 kHz, 80 % *1) | |
| Surges | EN 61000-4-5: 2014 +A1: 2017 | ± 0.5 kV (Line to Earth)<br>± 0.5 kV (Line to Line)<br>1.2/50 µs (8/20 µs) | B | N/A *2) | N/A |
| Electrical fast transients/burst | EN 61000-4-4: 2012 | ± 0.5 kV<br>5/50 ns, 5 kHz | B | ± 0.5 kV<br>5/50 ns, 5 kHz *3) | Complied d) |

Note: UL Japan, Inc.'s EMS Work Procedure 13-EM-W0417.
*1) The test on a broadcast reception function was not applicable because it includes Annex A, Group 2.
*2) The test was not applicable since the EUT is mounted in the vehicle and essentially it is not affected by Surge.
*3) The test on a broadcast reception function was not applicable because of the customer's request.

c) Refer to Appendix 2 (data of Continuous induced RF disturbances)
d) Refer to Appendix 2 (data of Electrical fast transients/burst)

**EMS**
**Analogue / Digital data ports**

| Item | Test Procedure | Specification | Criterion | Actual Performance | Result |
|---|---|---|---|---|---|
| Continuous induced RF disturbances | EN 61000-4-6: 2014 | 0.15 MHz - 10 MHz<br>3.0 V | A | 0.15 MHz - 10 MHz<br>3.0 V *1) | Complied e) |
| | | 10 MHz - 30 MHz<br>3.0 V - 1.0 V | | 10 MHz - 30 MHz<br>3.0 V - 1.0 V *1) | |
| | | 30 MHz - 80 MHz<br>1.0 V<br>(unmodulated, r.m.s.)<br>AM, 1 kHz, 80 % | | 30 MHz - 80 MHz<br>1.0 V<br>(unmodulated, r.m.s.)<br>AM, 1 kHz, 80 % *1) | |
| Broadband impulse noise disturbances, Repetitive | EN 61000-4-6: 2014 | 0.15 MHz - 0.5 MHz<br>107 dBμV | A | N/A *2) | N/A |
| | | 0.5 MHz - 10 MHz<br>107 dBμV - 36 dBμV | | | |
| | | 10 MHz - 30 MHz<br>36 dBμV - 30 dBμV | | | |
| | | Brust duration 0.7 ms<br>Burst Period 10 (50 Hz) | | | |
| Broadband impulse noise disturbances, Isolated | EN 61000-4-6: 2014 | 0.15 MHz – 30 MHz<br>110 dBμV | B | N/A *2) | N/A |
| | | Brust duration<br>0.24 ms, 10 ms, 300 ms | | | |
| Surges | EN 61000-4-5: 2014<br>+A1: 2017 | <u>Unshieldedsymmetrical port</u><br>Not primary protected:<br>± 1.0 kV<br>(Line to Ground)<br>Primary protected:<br>± 1.0 kV, 4.0 kV<br>(Line to Grond)<br>10/700 μs (5/320 μs)<br><u>Coaxial or shielded port</u><br>± 0.5 kV (Shield to Ground)<br>1.2/50 μs (8/20 μs) | B | N/A *3) | N/A |
| Electrical fast transients/burst | EN 61000-4-4: 2012 | ± 0.5 kV<br>5/50 ns, 5 kHz | B | ± 0.5 kV<br>5/50 ns, 5 kHz *4) | Complied *f) |

Note: UL Japan, Inc.'s EMS Work Procedure 13-EM-W0417.
*1) The test on a broadcast reception function was not applicable because it includes Annex A, Group 2.
*2) The test was not applicable since the EUT does not have CPE xDSL ports.
*3) The test was not applicable since the EUT is mounted in the vehicle and essentially it is not affected by Surge.
*4) The test on a broadcast reception function was not applicable because of the customer's request.

e) Refer to Appendix 2 (data of Continuous induced RF disturbances)
f) Refer to Appendix 2 (data of Electrical fast transients/burst)

## 3.3 Addition, deviation, exclusion to standards

| Test Item | Listed of Standard *1) | Applied Test Procedure |
|---|---|---|
| Continuous induced RF disturbances | EN 61000-4-6:2009 | EN 61000-4-6:2014 |

*1. Annex ZA of EN 55035.

Other than above, no addition, exclusion nor deviation has been made from the standard.

## 3.4 Confirmation

**UL Japan, Inc. hereby confirms that E.U.T., in the configuration tested, complies with the specifications EN 55035: 2017.**

## 3.5 Performance criteria

**EN 55035:2017**

| | |
|---|---|
| A | The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended.<br>The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.<br><br>For Continuous RF electromagnetic field disturbances and Continuous induced RF disturbances<br>The equipment shall continue to operate as intended during the test.<br>Measured electrical interference ratio<br>Unless otherwise specified in this standard, the criterion of compliance with the requirement is a wanted to unwanted audio signal ratio of > -20dB. |
| B | During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.<br><br>After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.<br><br>If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended. |
| C | Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed.<br><br>Information stored in non-volatile memory, or protected by a battery backup, shall not be lost. |

For the EUT, the client has decided that the performance criteria defined in EN 55035 should be applied as follows:

| | |
|---|---|
| A | The equipment shall continue to operate as intended during and after the test without operator intervention.<br>The measured acoustic interference ratio and/or the measured electrical interference ratio during the test shall be -20dB or better. |
| B | The equipment shall continue to operate as intended after the test with operator intervention.<br>During the application of the disturbance, degradation of performance is allowed.<br>However, no unintended change of actual operating state or stored data is allowed to persist after the test. |
| C | Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use. |

## 3.6 Uncertainty

**EMS**

These tests are qualitative tests and uncertainties do not apply directly to the results.
The uncertainty of the applied EMS testing is within the tolerance specified by the each standard.

## 3.7 Test Location

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JAB Accreditation No. RTL02610

| Test site | ISED Assigned Code | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Maximum measurement distance |
|---|---|---|---|---|
| No.1 Open site | 4659A-1 | 6.0 x 5.5 x 2.5 | 20 x 40 | 10 m |
| No.5 Open site | 4659A-5 | 8.6 x 7.1 x 2.4 | 18 x 23 | 10 m |
| No.1 Shielded room | 4659A-1 | 5.4 x 4.5 x 2.3 | - | - |
| No.3 Shielded room | - | 5.4 x 3.6 x 2.3 | - | - |
| No.4 Shielded Room | - | 6.1 x 6.1 x 3.1 | - | - |
| No.5 Shielded Room | 4659A-5 | 4.2 x 3.1 x 2.5 | - | - |
| No.3 Fully Anechoic Chamber | - | 7.0 x 3.5 x 3.5 | - | - |
| No.6 Semi-anechoic Chamber | 4659A-6 | 8.5 x 5.5 x 5.2 | - | 3 m |
| No.10 Semi-anechoic Chamber | 4659A-10 | 18.4 x 9.9 x 7.7 | - | 10 m |
| No.11 Semi-anechoic Chamber | 4659A-7 | 9.0 x 6.5 x 5.2 | - | 3 m |
| No.1 Measurement room | - | 5.0 x 3.7 x 2.6 | - | - |
| No.2 Measurement room | - | 4.3 x 4.4 x 2.7 | - | - |
| No.3 Measurement room | - | 4.5 x 5.3 x 2.7 | - | - |

## 3.8 Test setup, Test Data & Test instruments

Refer to Appendix.

# SECTION 4: Operation of E.U.T. during testing

## 4.1 Operating Modes

The EUT exercise program used during testing was designed to exercise the various system components in a manner similar to typical use.

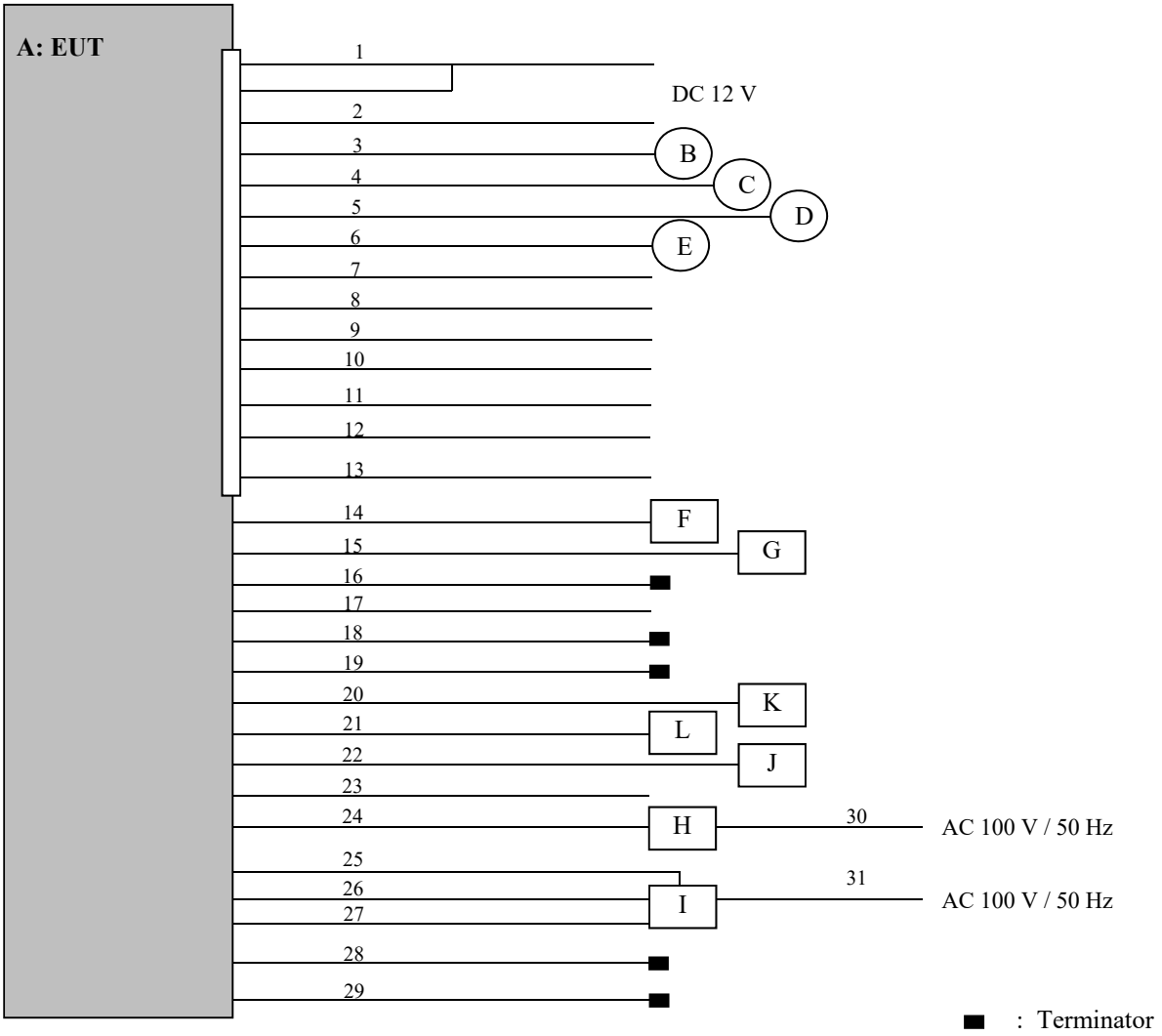
The mode(s) :
1. Av in
2. USB Play
3. Front Camera in
4. HDMI in
5. DVD Play

Software(s) :

| | | |
|---|---|---|
| SoC | : | 1.0.0509.4000 |
| Syscom | : | 1.0.0209.3100 |
| Panel | : | 1.0.0179.3700 |

Justification : The system was configured in typical fashion (as a customer would normally use it) for testing.

## 4.2 Configuration and peripherals




Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

**Description of EUT and Support equipment**

| No. | Item | Model number | Serial number | Manufacturer | Remark |
|---|---|---|---|---|---|
| **A** | **GPS Navigation System** | **DNX7190DABS** | **PE-X0024** | **JVC KENWOOD Corporation** | **EUT** |
| **B** | Speaker | KFC-RS101 | - | KENWOOD | - |
| **C** | Speaker | KFC-RS101 | - | KENWOOD | - |
| **D** | Speaker | KFC-RS101 | - | KENWOOD | - |
| **E** | Speaker | KFC-RS101 | - | KENWOOD | - |
| **F** | USB Memory | - | D332B29 | SP Silicon Power | - |
| **G** | USB Memory | USM4GM | 12523CNEN1 | Sony | - |
| **H** | Blu-ray Disc Player | BDP-320 | IKMP005496JP | Pioneer | - |
| **I** | HDD & DVD Video Recorder | RD-S502 | PL18502473 | TOSHIBA | - |
| **J** | DAB Antenna | - | - | JVC KENWOOD Corporation | - |
| **K** | GPS Antenna | - | - | JVC KENWOOD Corporation | - |
| **L** | Microphone | - | - | JVC KENWOOD Corporation | - |

**List of cables used**

| No. | Name | Length (m) | Cable Shield | Connector Shield | Remark |
|---|---|---|---|---|---|
| 1 | ACC, B+ | 0.1+2.9 | Unshielded | Unshielded | - |
| 2 | GND | 0.1+2.9 | Unshielded | Unshielded | - |
| 3 | Speaker Front Left | 1.8+0.2 | Unshielded | Unshielded | - |
| 4 | Speaker Front Right | 1.8+0.2 | Unshielded | Unshielded | - |
| 5 | Speaker Rear Left | 1.8+0.2 | Unshielded | Unshielded | - |
| 6 | Speaker Rear Right | 1.8+0.2 | Unshielded | Unshielded | - |
| 7 | ILLUMI | 0.1+1.4 | Unshielded | Unshielded | - |
| 8 | ANT CONT | 0.1+1.4 | Unshielded | Unshielded | - |
| 9 | P.CONT | 0.1+1.4 | Unshielded | Unshielded | - |
| 10 | REMOTE CONT | 0.1+1.4 | Unshielded | Unshielded | - |
| 11 | PRK SW | 0.1+2.0 | Unshielded | Unshielded | - |
| 12 | REVERSE | 0.1+1.4 | Unshielded | Unshielded | - |
| 13 | MUTE | 0.1+1.4 | Unshielded | Unshielded | - |
| 14 | USB 1 | 0.2+1.0 | Shielded | Shielded | - |
| 15 | USB 2 | 0.2+1.0 | Shielded | Shielded | - |
| 16 | FM/AM Antenna | 0.1+1.0 | Shielded | Shielded | - |
| | | 1.0+1.0 | Shielded | Shielded | For EFTB |
| 17 | AV-OUT AUDIO | 1.0 | Shielded | Shielded | - |
| | | 1.0+1.0 | Shielded | Shielded | For EFTB |
| 18 | AV OUT REAR | 1.2 | Shielded | Shielded | - |
| | | 1.0+2.0 | Shielded | Shielded | For EFTB |
| | | 3.0 | Shielded | Shielded | For CS |
| 19 | AV OUT SW | 1.2 | Shielded | Shielded | - |
| | | 1.0+2.0 | Shielded | Shielded | For EFTB |
| | | 3.0 | Shielded | Shielded | For CS |
| 20 | GPS | 3.5 | Shielded | Shielded | - |
| 21 | Microphone | 3.0 | Shielded | Shielded | - |
| 22 | DAB | 3.5 | Shielded | Shielded | - |
| 23 | EXT IF | 1.0 | Shielded | Shielded | - |
| 24 | HDMI | 2.9 | Shielded | Shielded | - |
| 25 | AV-IN | 1.5 | Shielded | Shielded | - |
| 26 | AV OUT FRONT | 1.2 | Shielded | Shielded | - |
| | | 1.2+2.0 | Shielded | Shielded | For EFTB |
| | | 3.0 | Shielded | Shielded | For CS |
| 27 | REAR VIEW CAMERA | 0.2+1.1 | Shielded | Shielded | - |
| | | 0.2+2.0 | Shielded | Shielded | For EFTB and CS |
| 28 | VIDEO OUT | 0.2+1.1 | Shielded | Shielded | - |
| | | 0.2+2.0 | Shielded | Shielded | For EFTB |
| | | 0.2+3.0 | Shielded | Shielded | For CS |
| 29 | FRONT VIEW CAMERA | 0.2+1.1 | Shielded | Shielded | - |
| | | 0.2+2.0 | Shielded | Shielded | For EFTB |
| | | 0.2+3.0 | Shielded | Shielded | For CS |
| 30 | AC | 2.0 | Unshielded | Unshielded | - |
| 31 | AC | 1.6 | Unshielded | Unshielded | - |

# SECTION 5: Electrostatic discharge

## 5.1 Operating environment

| | | |
|---|---|---|
| Test room | : | Refer to data |
| Temperature | : | Refer to data |
| Humidity | : | Refer to data |
| Atmosphere | : | Refer to data |

## 5.2 Test configuration

The EUT was placed on the 0.5 mm thick insulating support above the horizontal coupling plane (HCP) in size of 1.6 x 0.8 m that was set on a wooden table height of 0.8 m on the reference ground plane.
Photographs of the set up are shown in Appendix 1.

## 5.3 Test conditions

| | | |
|---|---|---|
| Test levels | : | ±4 kV for indirect discharge<br>±4 kV for direct discharge<br>±2 kV, ±4 kV and ±8 kV for air discharge |
| Performance criterion | : | B |
| Number of discharges | : | Total 20 times<br>(10 times for each polarity and on each test point for indirect and direct)<br>Total 20 times<br>(10 times for each polarity and on each test point for air discharge.) |
| Test points | : | Refer to Appendix 1. |
| EUT position | : | Table top |
| EUT operation mode | : | See Clause 4.1 |

## 5.4 Test procedure

Discharges were fired beginning with Contact 4 kV/Air 2 kV at each selected test points.
Each 10 discharges were applied to both of negative and positive polarity about contact discharge testing.
Also each 10 discharges were applied to both of negative and positive polarity about air discharge testing.
The performance of the EUT was monitored continuously.

## 5.5 Results

| | | |
|---|---|---|
| Summary of the test results | : | Pass |

# SECTION 6: Continuous RF electromagnetic field disturbances

## 6.1 Operating environment

| | | |
|---|---|---|
| Test room | : | Refer to data |
| Temperature | : | Refer to data |
| Humidity | : | Refer to data |
| Atmosphere | : | Refer to data |

## 6.2 Test configuration

The EUT was placed on a non-metallic table height of 0.8 m above the reference ground plane.
The test was carried out with the front, rear, right, and left of the EUT facing the antenna.

Photographs of the set up are shown in Appendix 1.

## 6.3 Test condition

| | | |
|---|---|---|
| Frequency range | : | 80 MHz -1000 MHz |
| Frequency Spot | : | 1800 MHz, 2600 MHz, 3500 MHz, 5000 MHz |
| Test level | : | 3.0 V/m |
| Modulation | : | 80 % AM, 1 kHz frequency |
| Performance criterion | : | A |
| Frequency step size | : | 1 % |
| Dwell time | : | 1 sec. |
| Field orientation | : | Horizontal and Vertical |
| Antenna distance | : | 2.0 m (80 MHz - 1000 MHz, 3500 MHz, 5000 MHz)<br>3.0 m (1800 MHz, 2600 MHz) |
| Antenna height | : | 1.55 m |
| Antenna | : | Bilog antenna (below 1 GHz)<br>Horn antenna (above 1 GHz) |
| EUT position | : | Table top |
| EUT operation mode | : | See Clause 4.1 |

## 6.4 Generation of the electromagnetic field

The electromagnetic field is generated from a signal generator controlled by a computer.
The output power is amplified and then radiated from Bilog and Horn antenna.
At every test frequency the field strength is checked prior to the actual test by placing the field sensor at the same distance from and in the same relative location to, the field generating antenna, as will be used by the EUT.

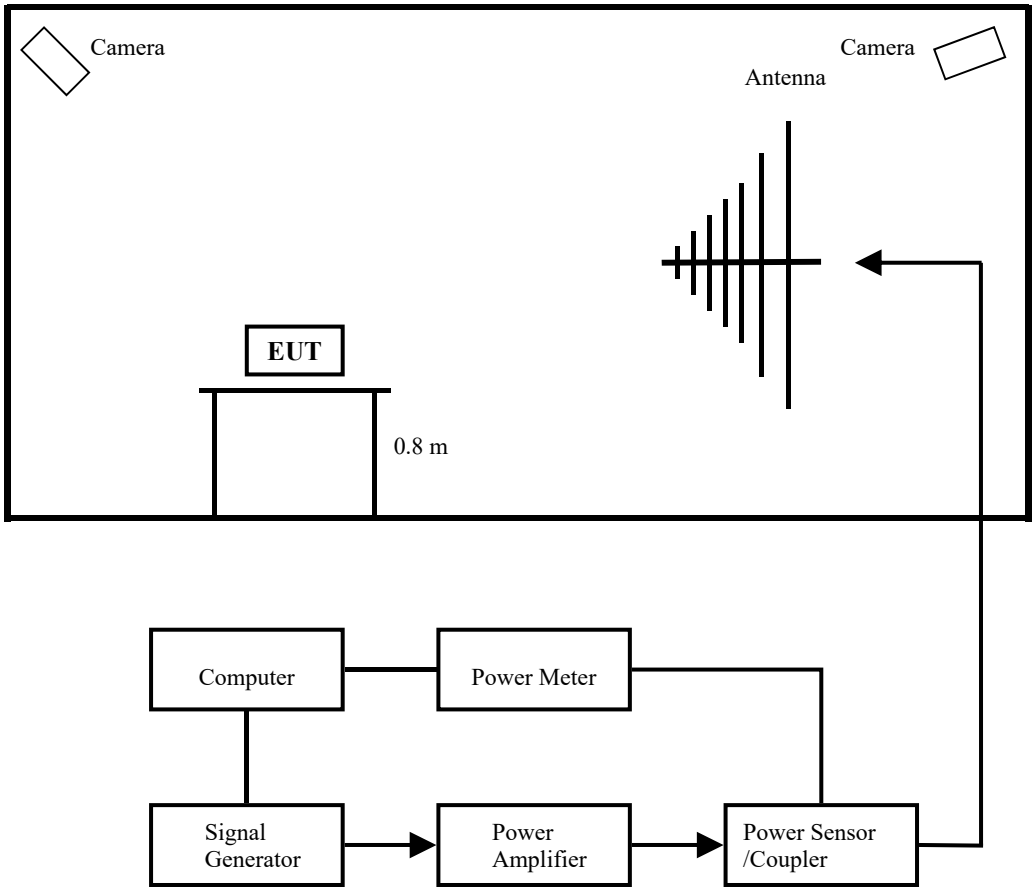
## 6.5 Test procedure

During test, the verification of performance was established by monitoring the EUT with a video camera.
Also the audio of the EUT was monitored by an audio analyzer.
The test was covered the complete frequency span; two polarization and specified sides of the EUT facing the antenna.

## 6.6 Results

Summary of the test results : Pass

**RS test system:**



**Tested frequency list: 80 MHz - 1000 MHz**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 80.000 | 101.578 | 128.977 | 163.769 | 207.940 | 264.026 | 335.243 | 425.670 | 540.490 | 686.280 | 871.396 |
| 80.800 | 102.594 | 130.267 | 165.407 | 210.019 | 266.666 | 338.595 | 429.927 | 545.895 | 693.143 | 880.110 |
| 81.608 | 103.620 | 131.570 | 167.061 | 212.119 | 269.333 | 341.981 | 434.226 | 551.354 | 700.074 | 888.911 |
| 82.424 | 104.656 | 132.886 | 168.732 | 214.240 | 272.026 | 345.401 | 438.568 | 556.868 | 707.075 | 897.800 |
| 83.248 | 105.703 | 134.215 | 170.419 | 216.382 | 274.746 | 348.855 | 442.954 | 562.437 | 714.146 | 906.778 |
| 84.080 | 106.760 | 135.557 | 172.123 | 218.546 | 277.493 | 352.344 | 447.384 | 568.061 | 721.287 | 915.846 |
| 84.921 | 107.828 | 136.913 | 173.844 | 220.731 | 280.268 | 355.867 | 451.858 | 573.742 | 728.500 | 925.004 |
| 85.770 | 108.906 | 138.282 | 175.582 | 222.938 | 283.071 | 359.426 | 456.377 | 579.479 | 735.785 | 934.254 |
| 86.628 | 109.995 | 139.665 | 177.338 | 225.167 | 285.902 | 363.020 | 460.941 | 585.274 | 743.143 | 943.597 |
| 87.494 | 111.095 | 141.062 | 179.111 | 227.419 | 288.761 | 366.650 | 465.550 | 591.127 | 750.574 | 953.033 |
| 88.369 | 112.206 | 142.473 | 180.902 | 229.693 | 291.649 | 370.316 | 470.206 | 597.038 | 758.080 | 962.563 |
| 89.253 | 113.328 | 143.898 | 182.711 | 231.990 | 294.565 | 374.019 | 474.908 | 603.008 | 765.661 | 972.189 |
| 90.146 | 114.461 | 145.337 | 184.538 | 234.310 | 297.511 | 377.759 | 479.657 | 609.038 | 773.318 | 981.911 |
| 91.047 | 115.606 | 146.790 | 186.383 | 236.653 | 300.486 | 381.537 | 484.454 | 615.128 | 781.051 | 991.730 |
| 91.957 | 116.762 | 148.258 | 188.247 | 239.020 | 303.491 | 385.352 | 489.299 | 621.279 | 788.862 | 1000.000 |
| 92.877 | 117.930 | 149.741 | 190.129 | 241.410 | 306.526 | 389.206 | 494.192 | 627.492 | 796.751 | |
| 93.806 | 119.109 | 151.238 | 192.030 | 243.824 | 309.591 | 393.098 | 499.134 | 633.767 | 804.719 | |
| 94.744 | 120.300 | 152.750 | 193.950 | 246.262 | 312.687 | 397.029 | 504.125 | 640.105 | 812.766 | |
| 95.691 | 121.503 | 154.278 | 195.890 | 248.725 | 315.814 | 400.999 | 509.166 | 646.506 | 820.894 | |
| 96.648 | 122.718 | 155.821 | 197.849 | 251.212 | 318.972 | 405.009 | 514.258 | 652.971 | 829.103 | |
| 97.614 | 123.945 | 157.379 | 199.827 | 253.724 | 322.162 | 409.059 | 519.401 | 659.501 | 837.394 | |
| 98.590 | 125.184 | 158.953 | 201.825 | 256.261 | 325.384 | 413.150 | 524.595 | 666.096 | 845.768 | |
| 99.576 | 126.436 | 160.543 | 203.843 | 258.824 | 328.638 | 417.282 | 529.841 | 672.757 | 854.226 | |
| 100.572 | 127.700 | 162.148 | 205.881 | 261.412 | 331.924 | 421.455 | 535.139 | 679.485 | 862.768 | |

**Spot Frequency**

| |
|---|
| 1800.000 |
| 2600.000 |
| 3500.000 |
| 5000.000 |

# SECTION 7: Electrical fast transient/Burst

## 7.1 Operating environment

| | | |
|---|---|---|
| Test room | : | Refer to data |
| Temperature | : | Refer to data |
| Humidity | : | Refer to data |
| Atmosphere | : | Refer to data |

## 7.2 Test configuration

The EUT was placed on a non-metallic pallet height of 0.1 m above the reference ground plane.
Photographs of the set up are shown in Appendix 1.

## 7.3 Test conditions

| | | |
|---|---|---|
| Test level | : | ±0.5 kV/DC network<br>±0.5 kV/Signal line |
| Performance criterion | : | B |
| Repetition rate | : | 5 kHz |
| Application method | : | Direct injection<br>Clamp injection |
| Duration of each test | : | 1 min. |
| EUT position | : | Floor standing |
| EUT operation mode | : | See Clause 4.1 |

## 7.4 Test procedure

The test voltage was applied to the each line for 1.0 minute.
The performance of the EUT was monitored continuously.

## 7.5 Results

Summary of the test results : Pass

# SECTION 8: Continuous induced RF disturbances

## 8.1 Operating environment

| | | |
|---|---|---|
| Test room | : | Refer to data |
| Temperature | : | Refer to data |
| Humidity | : | Refer to data |
| Atmosphere | : | Refer to data |

## 8.2 Test configuration

The EUT was placed on a non-metallic pallet height of 0.1 m above the reference ground plane.
Photographs of the set up are shown in Appendix 1.

## 8.3 Test condition

| | | |
|---|---|---|
| Frequency range | : | 0.15 MHz - 10 MHz<br>10 MHz - 30 MHz<br>30 MHz - 80 MHz |
| Test level | : | 3.0 V (0.15 MHz - 10 MHz)<br>3.0 V to 1.0 V (10 MHz - 30 MHz)<br>1.0 V (30 MHz - 80 MHz) |
| Modulation | : | 80 % AM, 1 kHz frequency |
| Performance criterion | : | A |
| Frequency step size | : | 1 % |
| Dwell time | : | 1 sec. |
| EUT position | : | Floor standing |
| EUT operation mode | : | See Clause 4.1 |

## 8.4 Test procedure

The performance of the EUT was monitored continuously.

## 8.5 Results

| | | |
|---|---|---|
| Summary of the test results | : | Pass |

**Tested frequency list: 0.15 MHz - 80 MHz**

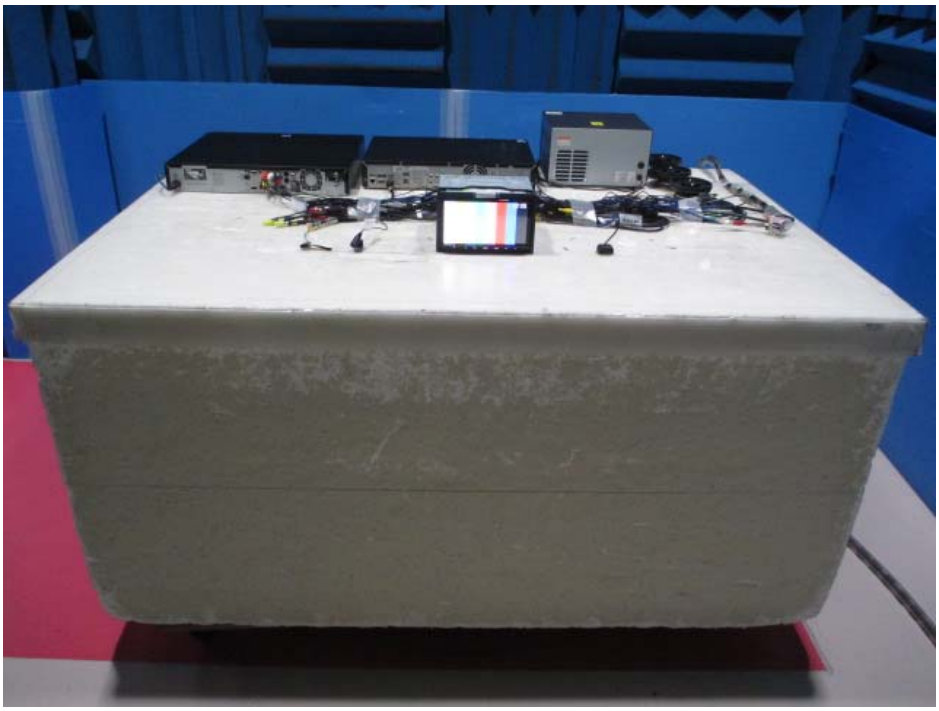
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.15000 | 0.24644 | 0.40497 | 0.66571 | 1.09454 | 1.79980 | 2.95967 | 4.86724 | 8.00450 | 13.16409 | 21.64979 | 35.60561 | 58.55778 |
| 0.15150 | 0.24890 | 0.40901 | 0.67236 | 1.10548 | 1.81779 | 2.98926 | 4.91591 | 8.08454 | 13.29573 | 21.86628 | 35.96166 | 59.14335 |
| 0.15301 | 0.25138 | 0.41310 | 0.67908 | 1.11653 | 1.83596 | 3.01915 | 4.96506 | 8.16538 | 13.42868 | 22.08494 | 36.32127 | 59.73478 |
| 0.15454 | 0.25389 | 0.41723 | 0.68587 | 1.12769 | 1.85431 | 3.04934 | 5.01471 | 8.24703 | 13.56296 | 22.30578 | 36.68448 | 60.33212 |
| 0.15608 | 0.25642 | 0.42140 | 0.69272 | 1.13896 | 1.87285 | 3.07983 | 5.06485 | 8.32950 | 13.69858 | 22.52883 | 37.05132 | 60.93544 |
| 0.15764 | 0.25898 | 0.42561 | 0.69964 | 1.15034 | 1.89157 | 3.11062 | 5.11549 | 8.41279 | 13.83556 | 22.75411 | 37.42183 | 61.54479 |
| 0.15921 | 0.26156 | 0.42986 | 0.70663 | 1.16184 | 1.91048 | 3.14172 | 5.16664 | 8.49691 | 13.97391 | 22.98165 | 37.79604 | 62.16023 |
| 0.16080 | 0.26417 | 0.43415 | 0.71369 | 1.17345 | 1.92958 | 3.17313 | 5.21830 | 8.58187 | 14.11364 | 23.21146 | 38.17400 | 62.78183 |
| 0.16240 | 0.26681 | 0.43849 | 0.72082 | 1.18518 | 1.94887 | 3.20486 | 5.27048 | 8.66768 | 14.25477 | 23.44357 | 38.55574 | 63.40964 |
| 0.16402 | 0.26947 | 0.44287 | 0.72802 | 1.19703 | 1.96835 | 3.23690 | 5.32318 | 8.75435 | 14.39731 | 23.67800 | 38.94129 | 64.04373 |
| 0.16566 | 0.27216 | 0.44729 | 0.73530 | 1.20900 | 1.98803 | 3.26926 | 5.37641 | 8.84189 | 14.54128 | 23.91478 | 39.33070 | 64.68416 |
| 0.16731 | 0.27488 | 0.45176 | 0.74265 | 1.22109 | 2.00791 | 3.30195 | 5.43017 | 8.93030 | 14.68669 | 24.15392 | 39.72400 | 65.33100 |
| 0.16898 | 0.27762 | 0.45627 | 0.75007 | 1.23330 | 2.02798 | 3.33496 | 5.48447 | 9.01960 | 14.83355 | 24.39545 | 40.12124 | 65.98431 |
| 0.17066 | 0.28039 | 0.46083 | 0.75757 | 1.24563 | 2.04825 | 3.36830 | 5.53931 | 9.10979 | 14.98188 | 24.63940 | 40.52245 | 66.64415 |
| 0.17236 | 0.28319 | 0.46543 | 0.76514 | 1.25808 | 2.06873 | 3.40198 | 5.59470 | 9.20088 | 15.13169 | 24.88579 | 40.92767 | 67.31059 |
| 0.17408 | 0.28602 | 0.47008 | 0.77279 | 1.27066 | 2.08941 | 3.43599 | 5.65064 | 9.29288 | 15.28300 | 25.13464 | 41.33694 | 67.98369 |
| 0.17582 | 0.28888 | 0.47478 | 0.78051 | 1.28336 | 2.11030 | 3.47034 | 5.70714 | 9.38580 | 15.43583 | 25.38598 | 41.75030 | 68.66352 |
| 0.17757 | 0.29176 | 0.47952 | 0.78831 | 1.29619 | 2.13140 | 3.50504 | 5.76421 | 9.47965 | 15.59018 | 25.63983 | 42.16780 | 69.35015 |
| 0.17934 | 0.29467 | 0.48431 | 0.79619 | 1.30915 | 2.15271 | 3.54009 | 5.82185 | 9.57444 | 15.74608 | 25.89622 | 42.58947 | 70.04365 |
| 0.18113 | 0.29761 | 0.48915 | 0.80415 | 1.32224 | 2.17423 | 3.57549 | 5.88006 | 9.67018 | 15.90354 | 26.15518 | 43.01536 | 70.74408 |
| 0.18294 | 0.30058 | 0.49404 | 0.81219 | 1.33546 | 2.19597 | 3.61124 | 5.93886 | 9.76688 | 16.06257 | 26.41673 | 43.44551 | 71.45152 |
| 0.18476 | 0.30358 | 0.49898 | 0.82031 | 1.34881 | 2.21792 | 3.64735 | 5.99824 | 9.86454 | 16.22319 | 26.68089 | 43.87996 | 72.16603 |
| 0.18660 | 0.30661 | 0.50396 | 0.82851 | 1.36229 | 2.24009 | 3.68382 | 6.05822 | 9.96318 | 16.38542 | 26.94769 | 44.31875 | 72.88769 |
| 0.18846 | 0.30967 | 0.50899 | 0.83679 | 1.37591 | 2.26249 | 3.72065 | 6.11880 | 10.06281 | 16.54927 | 27.21716 | 44.76193 | 73.61656 |
| 0.19034 | 0.31276 | 0.51407 | 0.84515 | 1.38966 | 2.28511 | 3.75785 | 6.17998 | 10.16343 | 16.71476 | 27.48933 | 45.20954 | 74.35272 |
| 0.19224 | 0.31588 | 0.51921 | 0.85360 | 1.40355 | 2.30796 | 3.79542 | 6.24177 | 10.26506 | 16.88190 | 27.76422 | 45.66163 | 75.09624 |
| 0.19416 | 0.31903 | 0.52440 | 0.86213 | 1.41758 | 2.33103 | 3.83337 | 6.30418 | 10.36771 | 17.05071 | 28.04186 | 46.11824 | 75.84720 |
| 0.19610 | 0.32222 | 0.52964 | 0.87075 | 1.43175 | 2.35434 | 3.87170 | 6.36722 | 10.47138 | 17.22121 | 28.32227 | 46.57942 | 76.60567 |
| 0.19806 | 0.32544 | 0.53493 | 0.87945 | 1.44606 | 2.37788 | 3.91041 | 6.43089 | 10.57609 | 17.39342 | 28.60549 | 47.04521 | 77.37172 |
| 0.20004 | 0.32869 | 0.54027 | 0.88824 | 1.46052 | 2.40165 | 3.94951 | 6.49519 | 10.68185 | 17.56735 | 28.89154 | 47.51566 | 78.14543 |
| 0.20204 | 0.33197 | 0.54567 | 0.89712 | 1.47512 | 2.42566 | 3.98900 | 6.56014 | 10.78866 | 17.74302 | 29.18045 | 47.99081 | 78.92688 |
| 0.20406 | 0.33528 | 0.55112 | 0.90609 | 1.48987 | 2.44991 | 4.02889 | 6.62574 | 10.89654 | 17.92045 | 29.47225 | 48.47071 | 79.71614 |
| 0.20610 | 0.33863 | 0.55663 | 0.91515 | 1.50476 | 2.47440 | 4.06917 | 6.69199 | 11.00550 | 18.09965 | 29.76697 | 48.95541 | 80.00000 |
| 0.20816 | 0.34201 | 0.56219 | 0.92430 | 1.51980 | 2.49914 | 4.10986 | 6.75890 | 11.11555 | 18.28064 | 30.06463 | 49.44496 | |
| 0.21024 | 0.34543 | 0.56781 | 0.93354 | 1.53499 | 2.52413 | 4.15095 | 6.82648 | 11.22670 | 18.46344 | 30.36527 | 49.93940 | |
| 0.21234 | 0.34888 | 0.57348 | 0.94287 | 1.55033 | 2.54937 | 4.19245 | 6.89474 | 11.33896 | 18.64807 | 30.66892 | 50.43879 | |
| 0.21446 | 0.35236 | 0.57921 | 0.95229 | 1.56583 | 2.57486 | 4.23437 | 6.96368 | 11.45234 | 18.83455 | 30.97560 | 50.94317 | |
| 0.21660 | 0.35588 | 0.58500 | 0.96181 | 1.58148 | 2.60060 | 4.27671 | 7.03331 | 11.56686 | 19.02289 | 31.28535 | 51.45260 | |
| 0.21876 | 0.35943 | 0.59085 | 0.97142 | 1.59729 | 2.62660 | 4.31947 | 7.10364 | 11.68252 | 19.21311 | 31.59820 | 51.96712 | |
| 0.22094 | 0.36302 | 0.59675 | 0.98113 | 1.61326 | 2.65286 | 4.36266 | 7.17467 | 11.79934 | 19.40524 | 31.91418 | 52.48679 | |
| 0.22314 | 0.36665 | 0.60271 | 0.99094 | 1.62939 | 2.67938 | 4.40628 | 7.24641 | 11.91733 | 19.59929 | 32.23332 | 53.01165 | |
| 0.22537 | 0.37031 | 0.60873 | 1.00084 | 1.64568 | 2.70617 | 4.45034 | 7.31887 | 12.03650 | 19.79528 | 32.55565 | 53.54176 | |
| 0.22762 | 0.37401 | 0.61481 | 1.01084 | 1.66213 | 2.73323 | 4.49484 | 7.39205 | 12.15686 | 19.99323 | 32.88120 | 54.07717 | |
| 0.22989 | 0.37775 | 0.62095 | 1.02094 | 1.67875 | 2.76056 | 4.53978 | 7.46597 | 12.27842 | 20.19316 | 33.21001 | 54.61794 | |
| 0.23218 | 0.38152 | 0.62715 | 1.03114 | 1.69553 | 2.78816 | 4.58517 | 7.54062 | 12.40120 | 20.39509 | 33.54211 | 55.16411 | |
| 0.23450 | 0.38533 | 0.63342 | 1.04145 | 1.71248 | 2.81604 | 4.63102 | 7.61602 | 12.52521 | 20.59904 | 33.87753 | 55.71575 | |
| 0.23684 | 0.38918 | 0.63975 | 1.05186 | 1.72960 | 2.84420 | 4.67733 | 7.69218 | 12.65046 | 20.80503 | 34.21630 | 56.27290 | |
| 0.23920 | 0.39307 | 0.64614 | 1.06237 | 1.74689 | 2.87264 | 4.72410 | 7.76910 | 12.77696 | 21.01308 | 34.55846 | 56.83562 | |
| 0.24159 | 0.39700 | 0.65260 | 1.07299 | 1.76435 | 2.90136 | 4.77134 | 7.84679 | 12.90472 | 21.22321 | 34.90404 | 57.40397 | |
| 0.24400 | 0.40097 | 0.65912 | 1.08371 | 1.78199 | 2.93037 | 4.81905 | 7.92525 | 13.03376 | 21.43544 | 35.25308 | 57.97800 | |

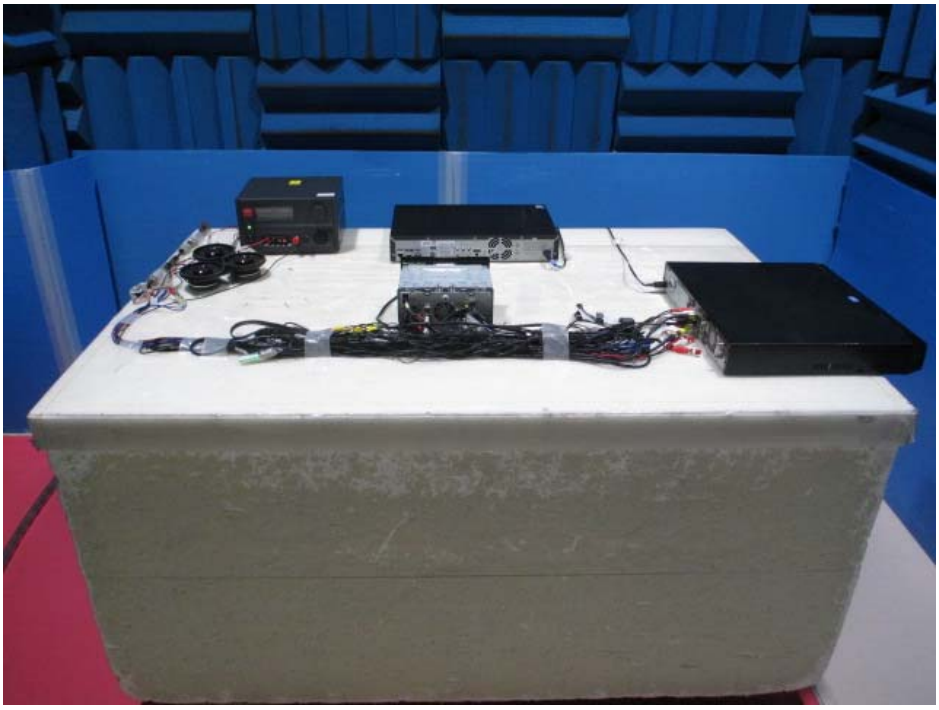
## APPENDIX 1: Photographs of test setup

**Electrostatic discharges**

**Continuous RF electromagnetic field disturbances**

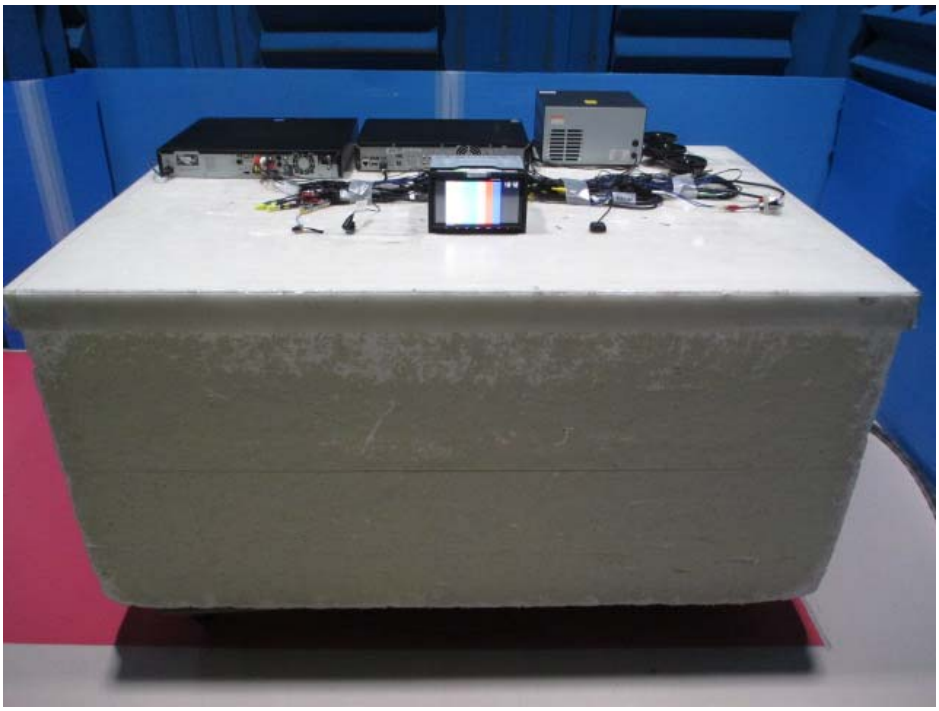
DVD Play, HDMI in, AV in, USB Play (Audio output function tests)

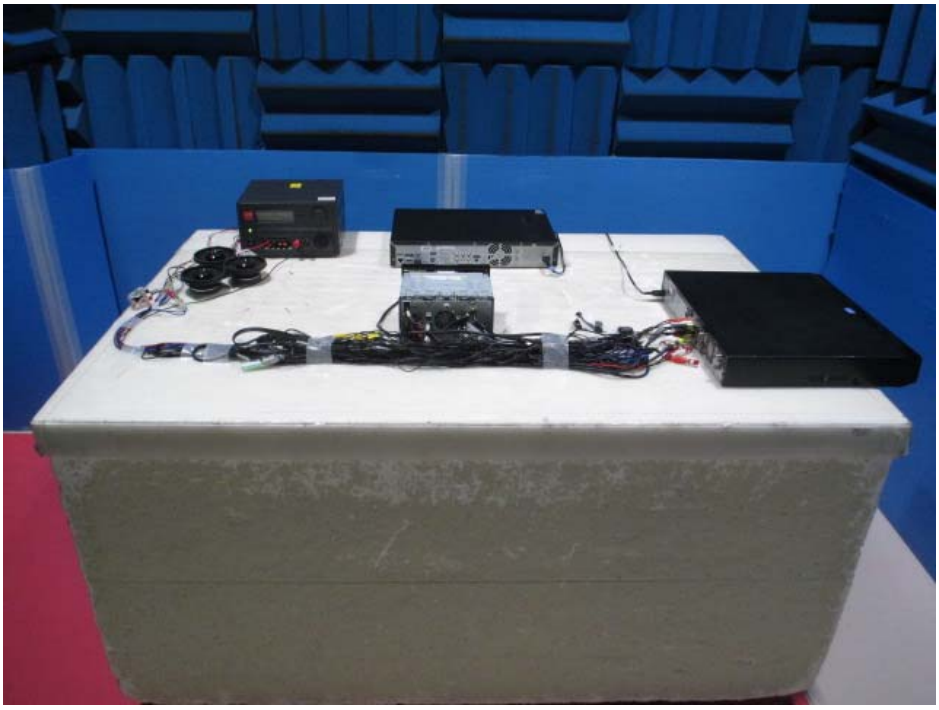




**Continuous RF electromagnetic field disturbances**

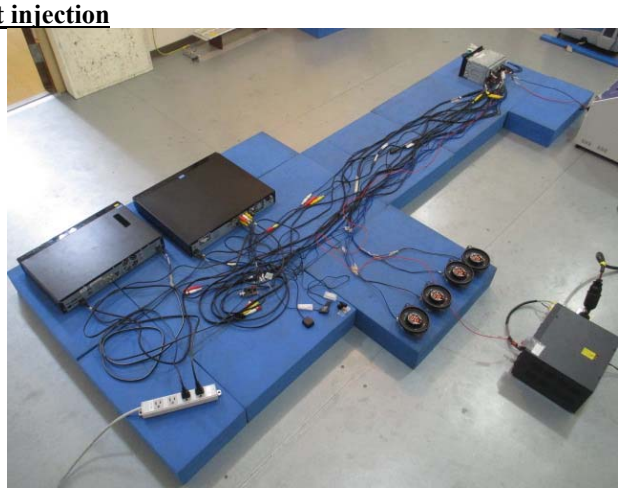
Front Camera in



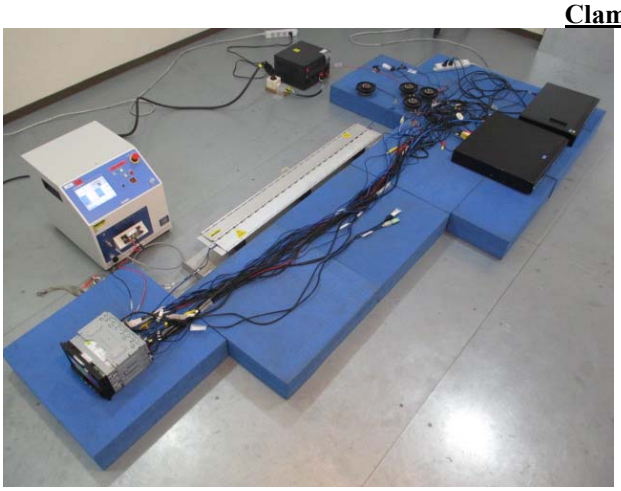


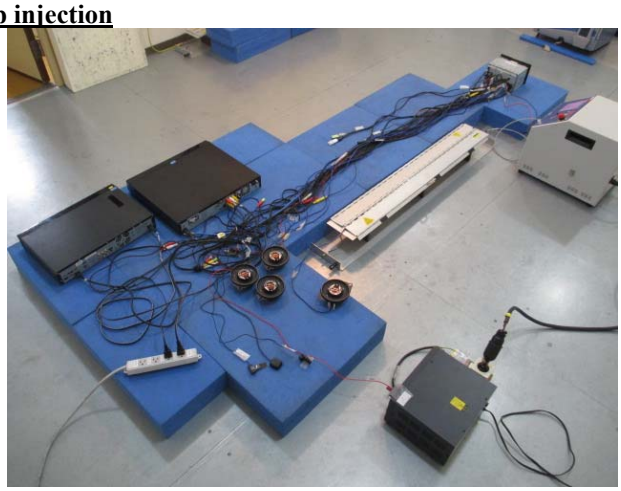
**Electrical fast transient/Burst**

**Direct injection**



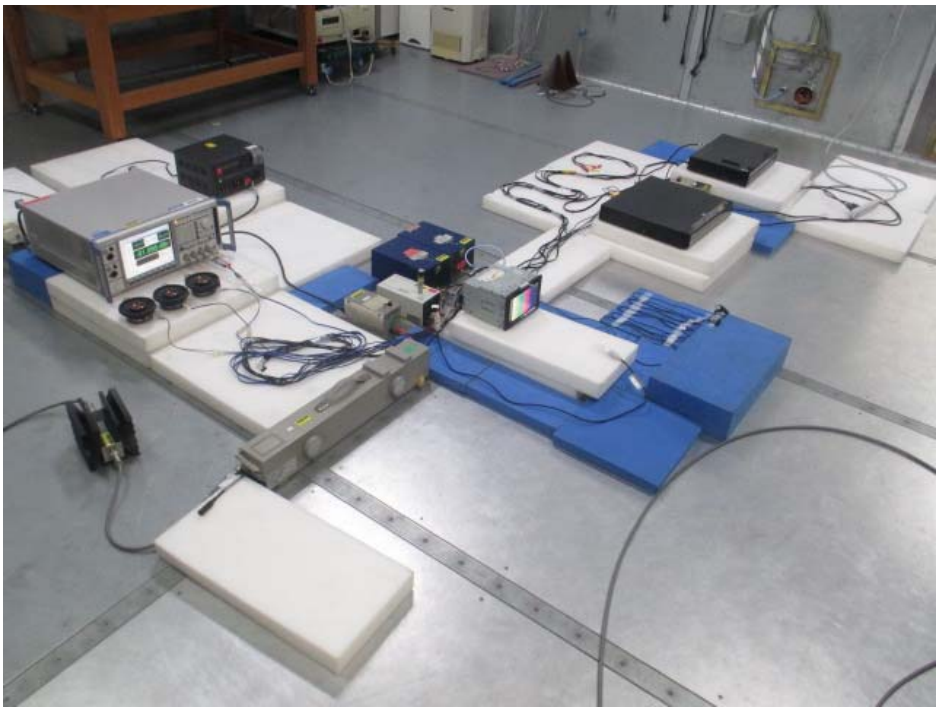
**Clamp injection**

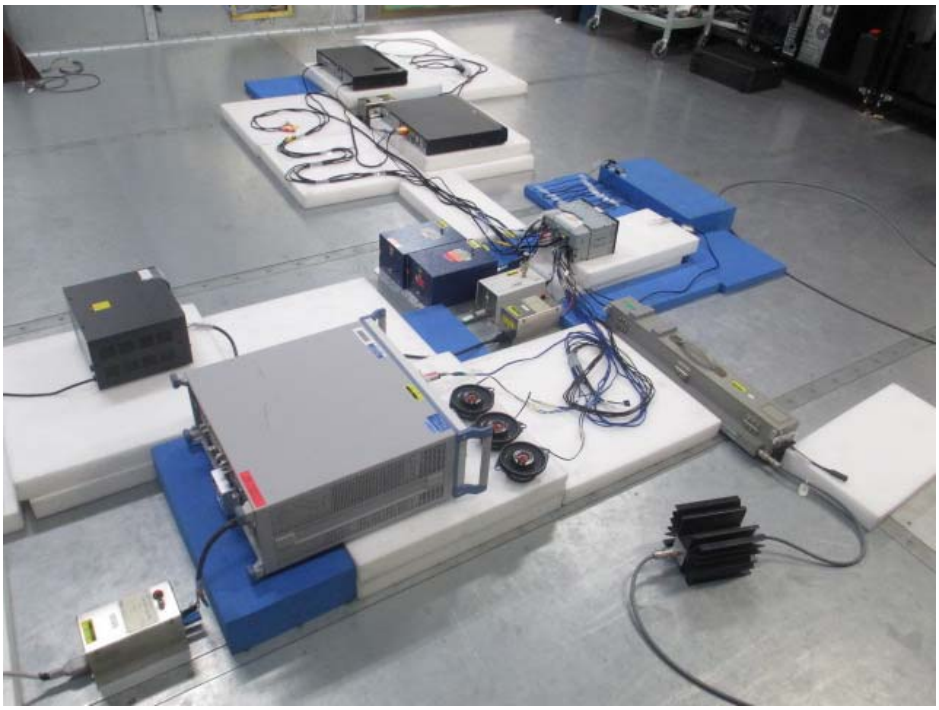




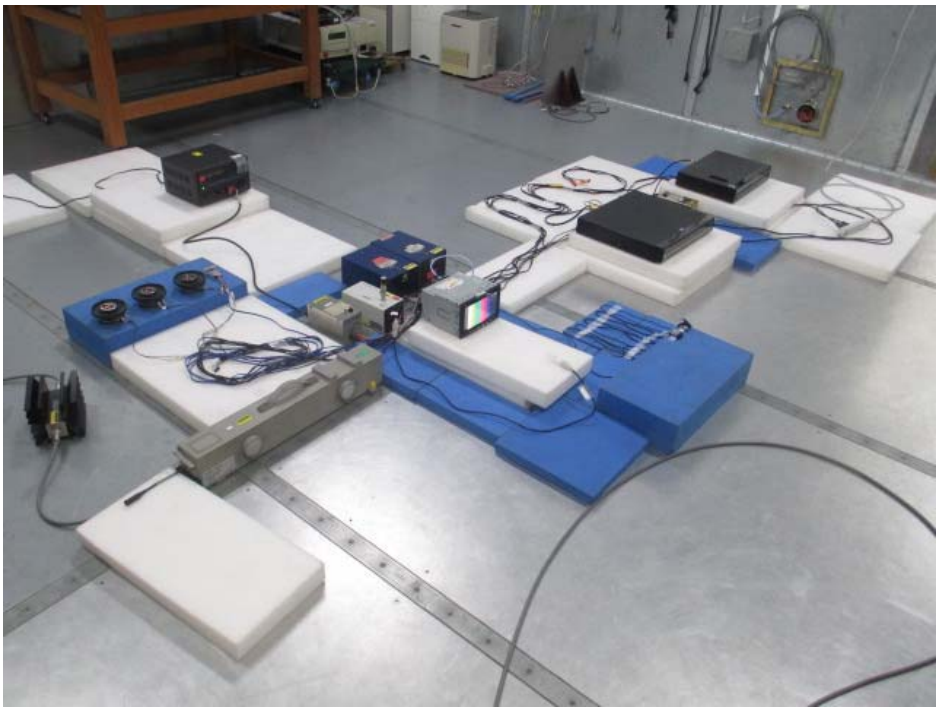
**Continuous induced RF disturbances**

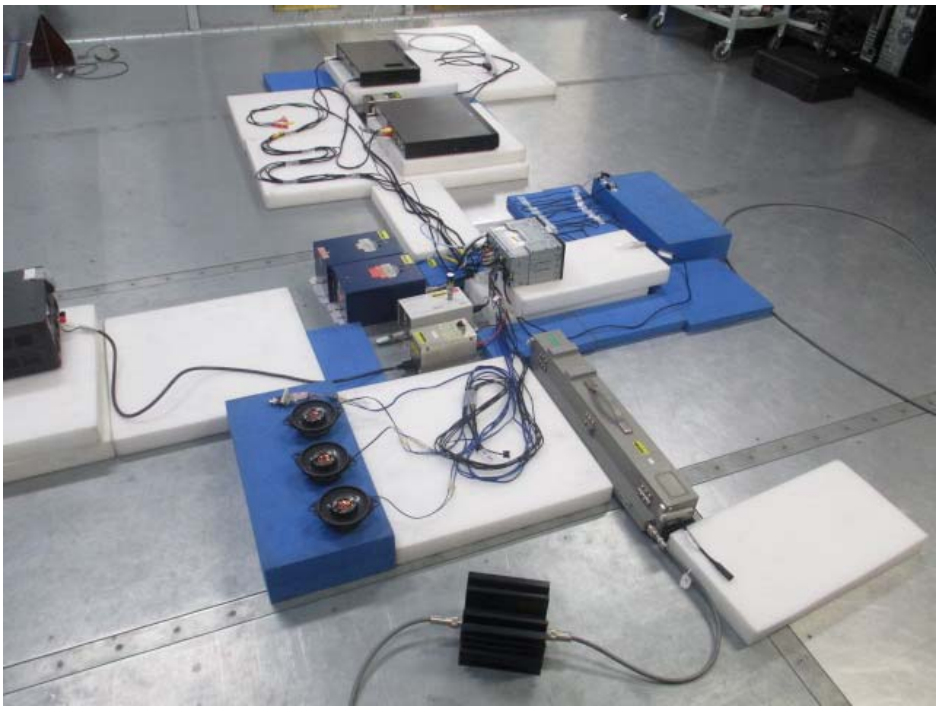
DVD Play, HDMI in, AV in, USB Play (Audio output function tests)



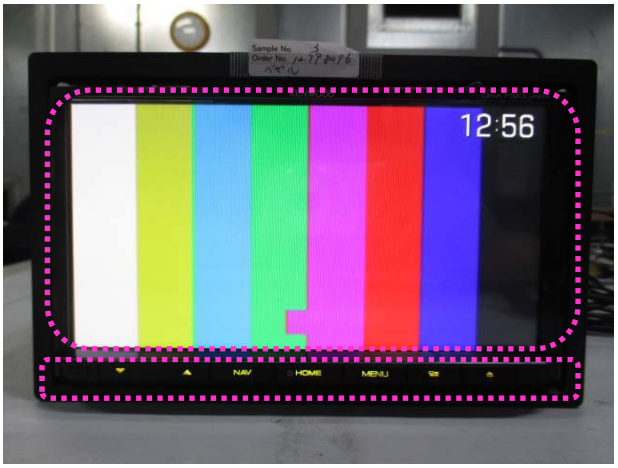


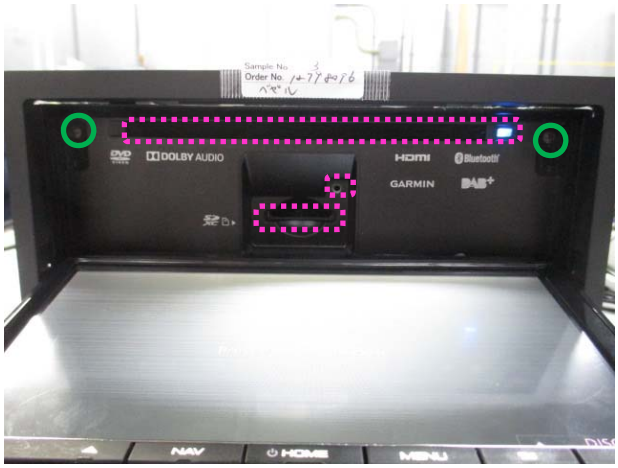
**Continuous induced RF disturbances**
Front Camera in

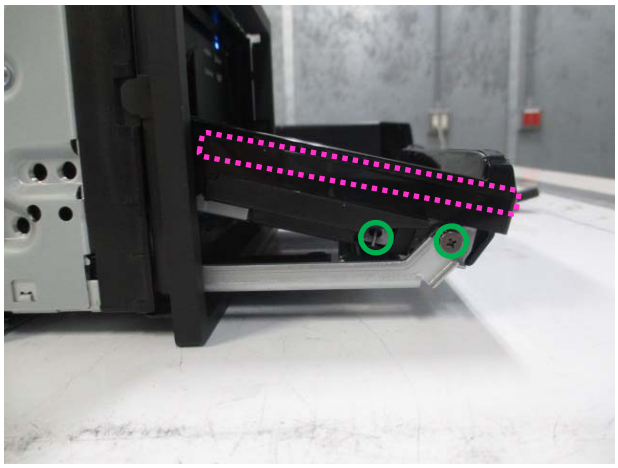


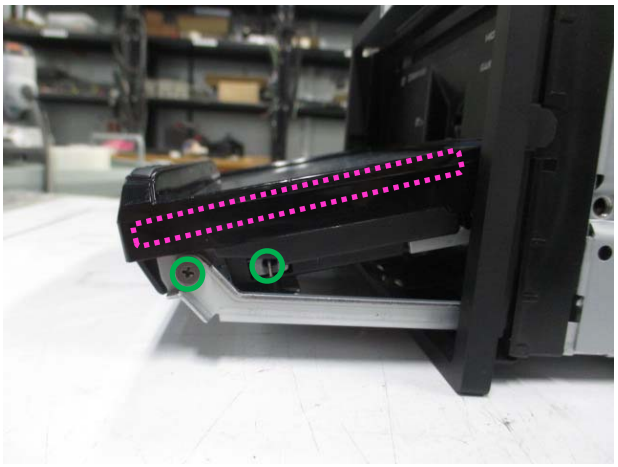


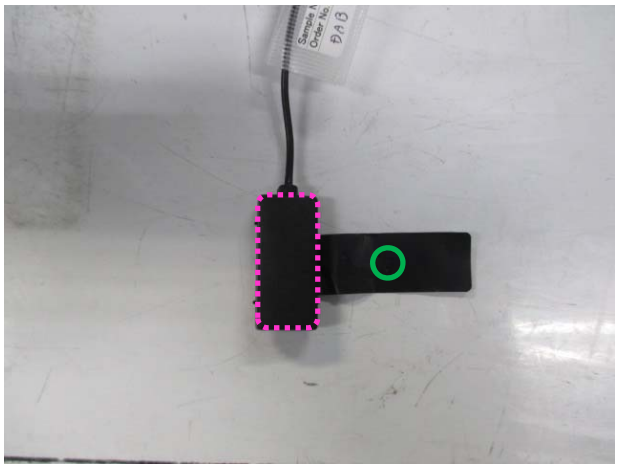
**Selected test points for Electrostatic discharge**



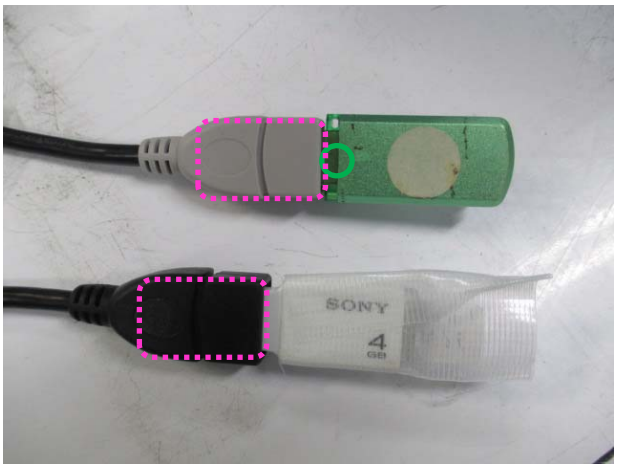






: Contact discharge
: Air discharge

**Selected test points for Electrostatic discharge**




: Contact discharge
: Air discharge

# Electrostatic discharge

UL Japan, Inc. Kashima EMC Lab.
Test Room : No.4 Shielded room
Order No. : 12798096M

Company : JVC KENWOOD CORPORATION
Equipment : GPS Navigation System
Model No. : DNX7190DABS
Serial No. : PE-X0024
Test Mode : DVD Play/HDMI in/AV in/USB Play/Front Camera in
Power : DC 12 V
Standard : EN 55035
: EN 61000-4-2
Criterion : B

Date of test. : April 02, 2019
Temp. / Humid. : 21 deg.C / 42 %RH
Atmosphere : 1014 hPa

Engineer : Kazuaki Suzuki

EUT Setup : ☑ Table Top (Non-metallic table height of 0.8 m)
☐ Floor Standing (Non-metallic pallet height of 0.1 m)
EUT Type : ☑ Grounded ☐ Ungrounded (*1)

*1 ☐ Remained the cable with bleeder resistors (2x470 kΩ) on the EUT during the ESD test.
☐ The enough time interval b/w discharge.
☐ Touching of the EUT with a grounded brush with bleeder resistors (2x470 kΩ) in the grounding cable.
☐ An air-ionizer.

Contact discharge method (HCP, VCP) : Number of discharges for each polarity at each test point. ☑ 10 ☐ 25

| Test Level Polarity | | Front HCP | Front VCP | Rear HCP | Rear VCP | Right HCP | Right VCP | Left HCP | Left VCP | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.0 kV | + | Pass | Pass | Pass | Pass | Pass | Pass | Pass | Pass | | | | | |
| | - | Pass | Pass | Pass | Pass | Pass | Pass | Pass | Pass | | | | | |
| kV | + | | | | | | | | | | | | | |
| | - | | | | | | | | | | | | | |
| kV | + | | | | | | | | | | | | | |
| | - | | | | | | | | | | | | | |
| kV | + | | | | | | | | | | | | | |
| | - | | | | | | | | | | | | | |

Contact discharge method (Direct) : Number of discharges for each polarity at each test point. ☑ 10 ☐ 25

| Test Level Polarity | | Test Points | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|
| 4.0 kV | + | Pass | | | | | | Refer to "Selected test points" |
| | - | Pass | | | | | | |
| kV | + | | | | | | | |
| | - | | | | | | | |
| kV | + | | | | | | | |
| | - | | | | | | | |
| kV | + | | | | | | | |
| | - | | | | | | | |

Air Discharge method : Number of discharges for each polarity at each test point. ☑ 10

| Test Level Polarity | | Test Points | | | | | | Remarks |
|---|---|---|---|---|---|---|---|---|
| 2.0 kV | + | Pass | | | | | | Refer to "Selected test points" |
| | - | Pass | | | | | | |
| 4.0 kV | + | Pass | | | | | | |
| | - | Pass | | | | | | |
| 8.0 kV | + | Pass | | | | | | |
| | - | Pass | | | | | | |
| kV | + | | | | | | | |
| | - | | | | | | | |

Summary of the test results :
It was returned to normal operation after the test.

**Test Result:** ☑ **Pass** ☐ **Fail**

# Radio frequency electromagnetic field

| | | |
|---|---|---|
| UL Japan, Inc. | | Kashima EMC Lab. |
| Test Room | : | No.3 Fully-anechoic chamber |
| Order No. | : | 12798096M |

| | | |
|---|---|---|
| Company | : | JVC KENWOOD CORPORATION |
| Equipment | : | GPS Navigation System |
| Model No. | : | DNX7190DABS |
| Serial No. | : | PE-X0024 |
| Test Mode | : | Front Camera in |
| Power | : | DC 12 V |
| Standard | : | EN 55035 |
| | : | EN 61000-4-3 |
| Criterion | : | A |

| | | |
|---|---|---|
| Date of test. | : | April 03, 04, 2019 |
| Temp. / Humid. | : | 20, 22 deg.C / 41, 43 %RH |
| Atmosphere | : | 1015, 1011 hPa |
| Engineer | : | Kazuaki Suzuki |
| | : | Makoto Ebato |

EUT Setup : ☑ Table Top (Non-metallic table height of 0.8 m)
☐ Floor Standing (Non-metallic pallet height of 0.1 m)

Freqency step size : 1 %

Dwell time : 1 sec

| Freq. Range | | 80 - 1000 MHz | 1800, 2600 MHz | 3500, 5000 MHz | Remarks |
|---|---|---|---|---|---|
| Test level | | 3 V/m | 3 V/m | 3 V/m | |
| Modulation | | ☑ AM 80% 1 kHz<br>☐ Pulse Hz %<br>☐ Unmodulated | ☑ AM 80% 1 kHz<br>☐ Pulse Hz %<br>☐ Unmodulated | ☑ AM 80% 1 kHz<br>☐ Pulse Hz %<br>☐ Unmodulated | |
| Antenna | Height | 1.55 m | 1.55 m | 1.55 m | |
| | Distance | 2 m | 3 m | 2 m | |
| Note | | | | | |
| ☑ Front | Hor. | Pass | Pass | Pass | |
| | Ver. | Pass | Pass | Pass | |
| ☑ Rear | Hor. | Pass | Pass | Pass | |
| | Ver. | Pass | Pass | Pass | |
| ☑ Right | Hor. | Pass | Pass | Pass | |
| | Ver. | Pass | Pass | Pass | |
| ☑ Left | Hor. | Pass | Pass | Pass | |
| | Ver. | Pass | Pass | Pass | |
| ☐ Top | Hor. | | | | |
| | Ver. | | | | |
| ☐ Bottom | Hor. | | | | |
| | Ver. | | | | |

**Test Result:** ☑ **Pass** ☐ **Fail**

# Radio frequency electromagnetic field

| | | |
|---|---|---|
| UL Japan, Inc. | | Kashima EMC Lab. |
| Test Room | : | No.3 Fully-anechoic chamber |
| Order No. | : | 12798096M |

| | | |
|---|---|---|
| Company | : | JVC KENWOOD CORPORATION |
| Equipment | : | GPS Navigation System |
| Model No. | : | DNX7190DABS |
| Serial No. | : | PE-X0024 |
| Test Mode | : | DVD Play/HDMI in/AV in/USB Play |
| Power | : | DC 12 V |
| Standard | : | EN 55035 |
| | : | EN 61000-4-3 |
| Criterion | : | A |

| | | |
|---|---|---|
| Date of test. | : | April 03, 04, 2019 |
| Temp. / Humid. | : | 20, 22 deg.C / 41, 43 %RH |
| Atmosphere | : | 1015, 1011 hPa |
| Engineer | : | Kazuaki Suzuki |
| | : | Makoto Ebato |

EUT Setup : ☑ Table Top (Non-metallic table height of 0.8 m)
☐ Floor Standing (Non-metallic pallet height of 0.1 m)

Freqency step size : 1 %

Dwell time : 1 sec

| Freq. Range | | 80 - 1000 MHz | 1800, 2600 MHz | 3500, 5000 MHz | Remarks |
|---|---|---|---|---|---|
| Test level | | 3 V/m | 3 V/m | 3 V/m | |
| Modulation | | ☑ AM 80% 1 kHz<br>☐ Pulse Hz %<br>☐ Unmodulated | ☑ AM 80% 1 kHz<br>☐ Pulse Hz %<br>☐ Unmodulated | ☑ AM 80% 1 kHz<br>☐ Pulse Hz %<br>☐ Unmodulated | |
| Antenna | Height | 1.55 m | 1.55 m | 1.55 m | |
| | Distance | 2 m | 3 m | 2 m | |
| | | [Initial S/N] : Front Left Aidio Out DVD Play : 89.410dB/ HDMI in : 89.361dB<br>AV in : 89.496dB / USB Play : 90.144dB (Output : 1.4V 4Ω) | | | |

| | | | | | |
|---|---|---|---|---|---|
| ☑ Front | Hor. | Pass | Pass | Pass | [Worst S/N]<br>DVD Play : 31.365dB<br>(139.665MHz, Front, Horizontal)<br><br>HDMI in : 31.205dB<br>(139.665MHz, Front, Horizontal)<br><br>AV in : 31.548dB<br>(139.665MHz, Front, Horizontal)<br><br>USB Play : 31.402dB<br>(139.665MHz, Front, Horizontal) |
| | Ver. | Pass | Pass | Pass | |
| ☑ Rear | Hor. | Pass | Pass | Pass | |
| | Ver. | Pass | Pass | Pass | |
| ☑ Right | Hor. | Pass | Pass | Pass | |
| | Ver. | Pass | Pass | Pass | |
| ☑ Left | Hor. | Pass | Pass | Pass | |
| | Ver. | Pass | Pass | Pass | |
| ☐ Top | Hor. | | | | |
| | Ver. | | | | |
| ☐ Bottom | Hor. | | | | |
| | Ver. | | | | |

**Test Result:** ☑ **Pass** ☐ **Fail**

# Electrical fast transient/Burst

| | | |
|---|---|---|
| UL Japan, Inc. | | Kashima EMC Lab. |
| Test Room | : | No.3 Shielded room |
| Order No. | : | 12798096M |

| | | |
|---|---|---|
| Company | : | JVC KENWOOD CORPORATION |
| Equipment | : | GPS Navigation System |
| Model No. | : | DNX7190DABS |
| Serial No. | : | PE-X0024 |
| Test Mode | : | DVD Play/HDMI in/AV in/USB Play/Front Camera in |
| Power | : | DC 12 V |
| Standard | : | EN 55035 |
| | : | EN 61000-4-4 |
| Criterion | : | B |

| | | |
|---|---|---|
| Date of test. | : | April 04, 2019 |
| Temp. / Humid. | : | 22 deg.C / 43 %RH |
| Atmosphere | : | 1011 hPa |
| Engineer | : | Kazuaki Suzuki |

EUT Setup : ☐ Table Top (Non-metallic table height of 0.8 m)
☑ Floor Standing (Non-metallic pallet height of 0.1 m)

Elevated Ground Plane : ☑ Not used ☐ Used (*1 Refer to line name)

Duration : 1 min

| Line / Injection | ☐ AC | | ☑ DC / | | ☑ CDN | | ☐ Clamp | | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Test level | 0.5 | kV | | kV | | kV | | kV | |
| Repetation rate | 5 | kHz | | kHz | | kHz | | kHz | |
| Polarity | + | - | + | - | + | - | + | - | |
| + - | Pass | Pass | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

| Line / Injection | ☑ Signal Line | | / | | ☑ Clamp | | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| Test level | 0.5 | kV | | kV | | kV | | kV | |
| Repetation rate | 5 | kHz | | kHz | | kHz | | kHz | |
| Polarity | + | - | + | - | + | - | + | - | |
| Harness(Other) ☐ *1 | Pass | Pass | | | | | | | |
| Speaker Front (Left) ☐ *1 | Pass | Pass | | | | | | | |
| Speaker Front (Right) ☐ *1 | Pass | Pass | | | | | | | |
| Speaker Rear ☐ *1 | Pass | Pass | | | | | | | |
| HDMI ☐ *1 | Pass | Pass | | | | | | | |
| AV-In ☐ *1 | Pass | Pass | | | | | | | |
| GPS ☐ *1 | Pass | Pass | | | | | | | |
| MIC ☐ *1 | Pass | Pass | | | | | | | |
| LR ☐ *1 | Pass | Pass | | | | | | | |
| AV-Out ☐ *1 | Pass | Pass | | | | | | | |
| Front Camera ☐ *1 | Pass | Pass | | | | | | | |
| Rear Camera ☐ *1 | Pass | Pass | | | | | | | |
| Video ☐ *1 | Pass | Pass | | | | | | | |
| EXT I/F ☐ *1 | Pass | Pass | | | | | | | |
| FM/AM Antenna ☐ *1 | Pass | Pass | | | | | | | |
| DAB ☐ *1 | Pass | Pass | | | | | | | |
| ☐ *1 | | | | | | | | | |

Summary of the test results :
It was returned to normal operation after the test.

**Test Result:** ☑ **Pass** ☐ **Fail**

# Continuous induced RF disturbances

| | | |
|---|---|---|
| UL Japan, Inc. | | Kashima EMC Lab. |
| Test Room | : | No.4 Shielded room |
| Order No. | : | 12798096M |

| | | |
|---|---|---|
| Company | : | JVC KENWOOD CORPORATION |
| Equipment | : | GPS Navigation System |
| Model No. | : | DNX7190DABS |
| Serial No. | : | PE-X0024 |
| Test Mode | : | Front Camera in |
| Power | : | DC 12 V |
| Standard | : | EN 55035 |
| | : | EN 61000-4-6 |
| Criterion | : | A |

| | | |
|---|---|---|
| Date of test. | : | April 08, 09, 10 ,2019 |
| Temp. | : | 21, 24, 23 deg.C |
| Humid. | : | 42, 41, 43 %RH |
| Atmosphere | : | 1008, 1012, 1013 hPa |
| Engineer | : | Kento Enomoto |

EUT Setup : ☑ Floor Standing (Non-metallic pallet height of 0.1 m)
Elevated Ground Plane : ☑ Not used ☐ Used (*1 Refer to line name)
Frequency step size : 1 %
Dwell time : 1 sec

| Freq. Range | 0.,15 - 10 MHz | 10 - 30 MHz | 30 - 80 MHz | Remarks |
|---|---|---|---|---|
| Test level | 3 V | 3-1 V | 1 V | |
| Modulation | ☑ AM 80% 1 kHz<br>☐ Pulse Hz %<br>☐ Unmodulated | ☑ AM 80% 1 kHz<br>☐ Pulse Hz %<br>☐ Unmodulated | ☑ AM 80% 1 kHz<br>☐ Pulse Hz %<br>☐ Unmodulated | |
| Note | | | | |
| DC Line ☐ *1 | Pass | Pass | Pass | ☑ CDN M2<br>☐ EM Clamp |
| Harness(Other) ☐ *1 | Pass | Pass | Pass | ☐ CDN<br>☑ EM Clamp |
| Speaker Front (Left) ☐ *1 | Pass | Pass | Pass | ☐ CDN<br>☑ EM Clamp |
| Speaker Front (Right) ☐ *1 | Pass | Pass | Pass | ☐ CDN<br>☑ EM Clamp |
| Speaker Rear ☐ *1 | Pass | Pass | Pass | ☐ CDN<br>☑ EM Clamp |
| HDMI ☐ *1 | Pass | Pass | Pass | ☐ CDN<br>☑ EM Clamp |
| AV-In ☐ *1 | Pass | Pass | Pass | ☐ CDN<br>☑ EM Clamp |
| GPS ☐ *1 | Pass | Pass | Pass | ☐ CDN<br>☑ EM Clamp |
| MIC ☐ *1 | Pass | Pass | Pass | ☐ CDN<br>☑ EM Clamp |
| LR ☐ *1 | Pass | Pass | Pass | ☐ CDN<br>☑ EM Clamp |
| AV-Out ☐ *1 | Pass | Pass | Pass | ☐ CDN<br>☑ EM Clamp |
| Front Camera ☐ *1 | Pass *1) | Pass | Pass | ☐ CDN<br>☑ EM Clamp |
| Rear Camera ☐ *1 | Pass | Pass | Pass | ☐ CDN<br>☑ EM Clamp |
| Video ☐ *1 | Pass | Pass | Pass | ☐ CDN<br>☑ EM Clamp |
| EXT I/F ☐ *1 | Pass | Pass | Pass | ☐ CDN<br>☑ EM Clamp |
| FM/AM Antenna ☐ *1 | Pass | Pass | Pass | ☑ CDN BNC-75<br>☐ EM Clamp |
| DAB ☐ *1 | Pass | Pass | Pass | ☑ CDN BNC-50<br>☐ EM Clamp |

*1) When noise was applied, a horizon bar appeared on the screen.



**Test Result:** ☑ **Pass** ☐ **Fail**

# Continuous induced RF disturbances

| | | |
|---|---|---|
| UL Japan, Inc. | | Kashima EMC Lab. |
| Test Room | : | No.4 Shielded room |
| Order No. | : | 12798096M |

| | | |
|---|---|---|
| Company | : | JVC KENWOOD CORPORATION |
| Equipment | : | GPS Navigation System |
| Model No. | : | DNX7190DABS |
| Serial No. | : | PE-X0024 |
| Test Mode | : | DVD Play/HDMI in/AV in/USB Play |
| Power | : | DC 12 V |
| Standard | : | EN 55035 |
| | : | EN 61000-4-6 |
| Criterion | : | A |

| | | |
|---|---|---|
| Date of test. | : | April 08, 09, 10 ,2019 |
| Temp. | : | 21, 24, 23 deg.C |
| Humid. | : | 42, 41, 43 %RH |
| Atmosphere | : | 1008, 1012, 1013 hPa |
| Engineer | : | Kento Enomoto |

EUT Setup : ☑ Floor Standing (Non-metallic pallet height of 0.1 m)
Elevated Ground Plane : ☑ Not used ☐ Used (*1 Refer to line name)
Frequency step size : 1 %
Dwell time : 1 sec

| Freq. Range | 0.,15 - 10 MHz | 10 - 30 MHz | 30 - 80 MHz | Remarks |
|---|---|---|---|---|
| Test level | 3 V | 3-1 V | 1 V | |
| Modulation | ☑ AM 80% 1 kHz<br>☐ Pulse Hz %<br>☐ Unmodulated | ☑ AM 80% 1 kHz<br>☐ Pulse Hz %<br>☐ Unmodulated | ☑ AM 80% 1 kHz<br>☐ Pulse Hz %<br>☐ Unmodulated | |
| Note | [Initial S/N]:Front Left Audio Out HDMI in: 91.033dB/ AV in: 90:218dB/ USB Play: 90.310dB/ DVD Play: 90.512dB (Output : 1.4V, 4Ω) | | | |

| | | | | | |
|---|---|---|---|---|---|
| DC Line ☐ *1 | Pass | Pass | Pass | ☑ CDN M2<br>☐ EM Clamp | [Worst S/N]<br>HDMI in:<br>30.890 dB<br>(2.653MHz,<br>Speaker Front<br>Left)<br><br>AV in:<br>30.763 dB<br>(2.761MHz,<br>Speaker Front<br>Left)<br><br>USB Play:<br>30.966 dB<br>(2.706MHz,<br>Speaker Front<br>Left)<br><br>DVD Play:<br>30.928 dB<br>(2.653MHz,<br>Speaker Front<br>Left) |
| Harness(Other) ☐ *1 | Pass | Pass | Pass | ☐ CDN ____<br>☑ EM Clamp | |
| Speaker Front (Left) ☐ *1 | Pass | Pass | Pass | ☐ CDN ____<br>☑ EM Clamp | |
| Speaker Front (Right) ☐ *1 | Pass | Pass | Pass | ☐ CDN ____<br>☑ EM Clamp | |
| Speaker Rear ☐ *1 | Pass | Pass | Pass | ☐ CDN ____<br>☑ EM Clamp | |
| HDMI ☐ *1 | Pass | Pass | Pass | ☐ CDN ____<br>☑ EM Clamp | |
| AV-In ☐ *1 | Pass | Pass | Pass | ☐ CDN ____<br>☑ EM Clamp | |
| GPS ☐ *1 | Pass | Pass | Pass | ☐ CDN ____<br>☑ EM Clamp | |
| MIC ☐ *1 | Pass | Pass | Pass | ☐ CDN ____<br>☑ EM Clamp | |
| LR ☐ *1 | Pass | Pass | Pass | ☐ CDN ____<br>☑ EM Clamp | |
| AV-Out ☐ *1 | Pass | Pass | Pass | ☐ CDN ____<br>☑ EM Clamp | |
| Front Camera ☐ *1 | Pass | Pass | Pass | ☐ CDN ____<br>☑ EM Clamp | |
| Rear Camera ☐ *1 | Pass | Pass | Pass | ☐ CDN ____<br>☑ EM Clamp | |
| Video ☐ *1 | Pass | Pass | Pass | ☐ CDN ____<br>☑ EM Clamp | |
| EXT I/F ☐ *1 | Pass | Pass | Pass | ☐ CDN ____<br>☑ EM Clamp | |
| FM/AM Antenna ☐ *1 | Pass | Pass | Pass | ☑ CDN BNC-75<br>☐ EM Clamp | |
| DAB ☐ *1 | Pass | Pass | Pass | ☑ CDN BNC-50<br>☐ EM Clamp | |



**Test Result:** ☑ **Pass** ☐ **Fail**

**Order Number** 12798096M

| Test Name | LIMS ID | Description | Manufacturer | Model | Serial | Last Calibration Date | Calibration Due Date | Calibration Interval (Month) |
|---|---|---|---|---|---|---|---|---|
| ESD | 143420 | ESD Simulator | NOISEKEN | ESS-S3011 | ESS1273 920 | 2018/09/18 | 2019/09/30 | 12 |
| ESD | 143395 | ESD GUN | NOISEKEN | GT-30R | ESS1273 950 | 2018/09/18 | 2019/09/30 | 12 |
| ESD | 144799 | Horizontal Coupling Plane | UL Kashima | - | - | - | - | - |
| ESD | 144802 | Vertical Coupling Plane | UL Kashima | - | - | - | - | - |
| RS | 143573 | Power Meter | Rohde & Schwarz | NAP | 842377/ 018 | 2018/05/31 | 2019/05/31 | 12 |
| RS | 143595 | Power Head | Rohde & Schwarz | NAP-Z5 | 841835/ 012 | 2018/05/31 | 2019/05/31 | 12 |
| RS | 144325 | BiLog Antenna | Teseq | CBL6141B | 32458 | - | - | - |
| RS | 143680 | Signal Generator | Rohde & Schwarz | SMB100A | 100991 | 2018/04/25 | 2019/04/30 | 12 |
| RS | 144689 | Power Amplifier | PRANA | AP32MT225 | 1103-10 68 | 2018/11/28 | 2019/11/30 | 12 |
| RS(GHz) | 143569 | Power Meter | Rohde & Schwarz | NRT | 834787/ 029 | 2018/08/31 | 2019/08/31 | 12 |
| RS(GHz) | 143592 | Power Sensor | Rohde & Schwarz | NRT-Z43 | 834023/ 017 | 2018/08/31 | 2019/08/31 | 12 |
| RS(GHz) | 143587 | Power Meter | ANRITSU | ML2488B | 1213008 | 2018/10/12 | 2019/10/31 | 12 |
| RS(GHz) | 143584 | Power Sensor | ANRITSU | SC7816 | 1204066 | 2018/10/12 | 2019/10/31 | 12 |
| RS(GHz) | 143603 | Power Sensor | ANRITSU | SC7816 | 1204067 | 2018/10/12 | 2019/10/31 | 12 |
| RS(GHz) | 144670 | Power Amplifier | OPHIR | 5172(F) | 1037 | 2019/03/19 | 2020/03/31 | 12 |
| RS(GHz) | 144809 | Double Ridged Horn | ETS LINDGREN | 3115 | 001431 57 | - | - | - |
| RS(GHz) | 158635 | Power Amplifier | R&K | GA252M602-4444R | B50343 | 2018/04/14 | 2019/04/30 | 12 |
| EFT/B | 143559 | BURST Generator | NOISEKEN | FNS-AX3 A16A | FNS0890 757 | 2019/02/27 | 2020/02/28 | 12 |
| EFT/B | 143011 | Coupling Clamp | NOISEKEN | 15-00001A | none | 2018/10/23 | 2019/10/31 | 12 |
| CS | 144658 | Power Amplifier | KALMUS | R250LC | 1/1/7475 | 2019/03/19 | 2020/03/31 | 12 |
| CS | 143676 | Signal Generator | Rohde & Schwarz | SMB100A | 100770 | 2018/06/25 | 2019/06/30 | 12 |
| CS | 143574 | Power Meter | Rohde & Schwarz | NRVD | 101441 | 2018/12/17 | 2019/12/30 | 12 |
| CS | 143469 | 10V Insertion | Rohde & Schwarz | URV5-Z2 | 100155 | 2018/12/17 | 2019/12/30 | 12 |
| CS | 143474 | 100V Insertion | Rohde & Schwarz | URV5-Z4 | 100001 | 2018/12/17 | 2019/12/30 | 12 |
| CS | 143014 | CDN | Luthi Electronik | M2/M3 | 642 | 2018/04/03 | 2019/04/30 | 12 |
| CS | 142975 | CDN | Luthi Electronik | M2/M3 | 644 | 2018/04/03 | 2019/04/30 | 12 |
| CS | 142976 | CDN | Luthi Electronik | M2/M3 | 645 | 2018/04/03 | 2019/04/30 | 12 |
| CS | 142977 | CDN | Luthi Electronik | M2/M3 | 647 | 2018/04/03 | 2019/04/30 | 12 |
| CS | 143191 | CDN | Teseq | CDN USB/p | 32223 | 2018/04/03 | 2019/04/30 | 12 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CS | 146950 | Coupling decoupling network | FCC | TSCDN-S1-BNC-75 | 4008 | 2018/11/12 | 2019/11/30 | 12 |
| CS | 145455 | Coupling Decoupling Network | FCC | TSCDN-C1-BNC50 | 9219 | 2018/11/12 | 2019/11/30 | 12 |
| CS | 143738 | Terminator | Pasternack | PE6187 | none | 2018/06/19 | 2019/06/30 | 12 |
| CS | 144187 | Terminator | Pasternack | PE6187 | none | 2018/06/19 | 2019/06/30 | 12 |
| CS | 143413 | EM clamp | Luthi Electronik | EM101 | 35222 | 2018/04/11 | 2019/04/30 | 12 |
| EMS | 143665 | Ruler | TAJIMA | L19-55 | - | - | - | - |
| EMS | 143536 | Temperature & Humidity Indicator | A&D | AD-5681 | 6878024 | 2018/07/18 | 2019/07/31 | 12 |
| EMS | 144210 | Digital Multimeter | Fluke Corporation | 112 | 89790193 | 2018/10/01 | 2019/10/31 | 12 |
| EMS | 143127 | Barometer | OTA | No.11 | 15410 | 2018/11/25 | 2021/11/30 | 36 |

The expiration date of the calibration is the end of the expired month.
As for some calibrations performed after the tested dates,
those test equipment have been controlled by means of an unbroken chains of calibrations.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

Test Item:
ESD: Electrostatic discharge
RS: Radiated RF electromagnetic field
EFT/B: Electrical fast transient burst
CS: Radio-frequency conducted disturbances

End of Report