



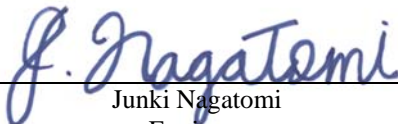
RADIO TEST REPORT

Test Report No. : 14156685H-A

Applicant : NIDEC MOBILITY CORPORATION
Type of EUT : Keyless operation Key(FOB)
Model Number of EUT : GHR-M015
FCC ID : OUCGHR-M015
Test regulation : FCC Part 15 Subpart C: 2021
Test Result : Complied (Refer to SECTION 3)

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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 regulation.
4. The test results in this test report are traceable to the national or international standards.
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6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan, Inc. has been accredited.
9. The information provided from the customer for this report is identified in SECTION 1.

Date of test: January 15 to February 3, 2022

Representative test engineer: 
Junki Nagatomi
Engineer

Approved by: 
Shinichi Miyazono
Engineer



CERTIFICATE 5107.02

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

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REVISION HISTORY

Original Test Report No.: 14156685H-A

| Revision | Test report No. | Date | Page revised | Contents |
|-----------------|-----------------|-------------------|--------------|----------|
| - (Original) | 14156685H-A | February 22, 2022 | - | - |

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Reference: Abbreviations (Including words undescribed in this report)

| | | | |
|----------------|---|---------|--|
| A2LA | The American Association for Laboratory Accreditation | LIMS | Laboratory Information Management System |
| AC | Alternating Current | MCS | Modulation and Coding Scheme |
| AFH | Adaptive Frequency Hopping | MRA | Mutual Recognition Arrangement |
| AM | Amplitude Modulation | N/A | Not Applicable |
| Amp, AMP | Amplifier | NIST | National Institute of Standards and Technology |
| ANSI | American National Standards Institute | NS | No signal detect. |
| Ant, ANT | Antenna | NSA | Normalized Site Attenuation |
| AP | Access Point | OBW | Occupied BandWidth |
| ASK | Amplitude Shift Keying | OFDM | Orthogonal Frequency Division Multiplexing |
| Atten., ATT | Attenuator | P/M | Power meter |
| AV | Average | PCB | Printed Circuit Board |
| BPSK | Binary Phase-Shift Keying | PER | Packet Error Rate |
| BR | Bluetooth Basic Rate | PHY | Physical Layer |
| BT | Bluetooth | PK | Peak |
| BT LE | Bluetooth Low Energy | PN | Pseudo random Noise |
| BW | BandWidth | PRBS | Pseudo-Random Bit Sequence |
| Cal Int | Calibration Interval | PSD | Power Spectral Density |
| CCK | Complementary Code Keying | QAM | Quadrature Amplitude Modulation |
| Ch., CH | Channel | QP | Quasi-Peak |
| CISPR | Comite International Special des Perturbations Radioelectriques | QPSK | Quadrature Phase Shift Keying |
| CW | Continuous Wave | RBW | Resolution BandWidth |
| DBPSK | Differential BPSK | RDS | Radio Data System |
| DC | Direct Current | RE | Radio Equipment |
| D-factor | Distance factor | RF | Radio Frequency |
| DFS | Dynamic Frequency Selection | RMS | Root Mean Square |
| DQPSK | Differential QPSK | RNSS | Radio Navigation Satellite Service |
| DSSS | Direct Sequence Spread Spectrum | RSS | Radio Standards Specifications |
| DUT | Device Under Test | Rx | Receiving |
| EDR | Enhanced Data Rate | SA, S/A | Spectrum Analyzer |
| EIRP, e.i.r.p. | Equivalent Isotropically Radiated Power | SG | Signal Generator |
| EMC | ElectroMagnetic Compatibility | SVSWR | Site-Voltage Standing Wave Ratio |
| EMI | ElectroMagnetic Interference | TR, T/R | Test Receiver |
| EN | European Norm | Tx | Transmitting |
| ERP, e.r.p. | Effective Radiated Power | VBW | Video BandWidth |
| ETSI | European Telecommunications Standards Institute | Vert. | Vertical |
| EU | European Union | WLAN | Wireless LAN |
| EUT | Equipment Under Test | | |
| Fac. | Factor | | |
| FCC | Federal Communications Commission | | |
| FHSS | Frequency Hopping Spread Spectrum | | |
| FM | Frequency Modulation | | |
| Freq. | Frequency | | |
| FSK | Frequency Shift Keying | | |
| GFSK | Gaussian Frequency-Shift Keying | | |
| GNSS | Global Navigation Satellite System | | |
| GPS | Global Positioning System | | |
| Hori. | Horizontal | | |
| ICES | Interference-Causing Equipment Standard | | |
| IEC | International Electrotechnical Commission | | |
| IEEE | Institute of Electrical and Electronics Engineers | | |
| IF | Intermediate Frequency | | |
| ILAC | International Laboratory Accreditation Conference | | |
| ISED | Innovation, Science and Economic Development Canada | | |
| ISO | International Organization for Standardization | | |
| JAB | Japan Accreditation Board | | |
| LAN | Local Area Network | | |

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SECTION 1: Customer information

Company Name : NIDEC MOBILITY CORPORATION
Address : 6368, Nenjo-zaka, Okusa, Komaki-city, Aichi 485-802 Japan
Telephone Number : +81-568-78-6394
Contact Person : Kazushi Yamasaki

The information provided from the customer is as follows;

- Applicant, Type of EUT, Model Number of EUT, FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer information
- SECTION 2: Equipment under test (EUT) other than the Receipt Date
- SECTION 4: Operation of EUT during testing

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

SECTION 2: Equipment under test (EUT)

2.1. Identification of EUT

Type : Keyless operation Key(FOB)
Model Number : GHR-M015
Serial Number : Refer to SECTION 4.2
Receipt Date : January 15, 2022
Condition : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification : No Modification by the test lab.

2.2. Product Description

Model: GHR-M015 (referred to as the EUT in this report) is a Keyless operation Key(FOB).

General Specification

Rating : DC 3.0 V

Radio Specification

Radio Type : Transceiver
Frequency of Operation : 315 MHz
Clock frequency(maximum) : 27.6 MHz (Crystal)
Modulation : FSK (F1D)
Type of Battery : Lithium battery (CR2032)
Antenna type : Pattern Antenna
Receiving frequency of Operation : 125 kHz *1)

*1) The test of receiver part was performed separately from this test report, and the conformability is confirmed.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on May 3, 2021 and effective July 2, 2021

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.231 Periodic operation in the band 40.66-40.70 MHz and above 70 MHz.

*Also the EUT complies with FCC Part 15 Subpart B.

3.2 Procedures and results

| Item | Test Procedure | Specification | Worst margin | Results | Remarks |
|--|--|--|--|-----------------|----------|
| Conducted emission | FCC: ANSI C63.10:2013 6 Standard test methods | FCC: Section 15.207 | N/A | N/A | *1) |
| Automatically Deactivate | FCC: ANSI C63.10:2013 6 Standard test methods | FCC: Section 15.231(a)(1) | N/A | Complied a) | Radiated |
| Electric Field Strength of Fundamental Emission | FCC: ANSI C63.10:2013 6 Standard test methods | FCC: Section 15.231(b) | 0.4 dB 315.000 MHz Horizontal PK with Duty Factor | Complied# b) | Radiated |
| Electric Field Strength of Spurious Emission | FCC: ANSI C63.10:2013 6 Standard test methods | FCC: Section 15.205 Section 15.209 Section 15.231(b) | 0.2 dB 2520.000 MHz Horizontal PK with Duty Factor | Complied# b) | Radiated |
| -20dB Bandwidth | FCC: ANSI C63.10:2013 6 Standard test methods | FCC: Section 15.231(c) | N/A | Complied c) | Radiated |

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.

*1) The test is not applicable since the EUT does not have AC Mains.

a) Refer to APPENDIX 1 (data of Automatically deactivate)

b) Refer to APPENDIX 1 (data of Radiated Emission (Electric Field Strength of Fundamental and Spurious Emission))

c) Refer to APPENDIX 1 (data of -20dB and 99% emission bandwidth)

Symbols:

Complied The data of this test item has enough margin, more than the measurement uncertainty.

Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.

FCC Part 15.31 (e)

The test was performed with the New Battery during the tests.

Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT.

Therefore, the equipment complies with the antenna requirement of Section 15.203.

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3.3 Addition to standard

| Item | Test Procedure | Specification | Worst margin | Results | Remarks |
|------------------------|----------------|---------------|--------------|---------|----------|
| 99% emission bandwidth | RSS-Gen 6.7 | - | N/A | - | Radiated |

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

3.4 Uncertainty

There is no applicable rule of uncertainty in this applied standard. Therefore, the results are derived depending on whether or not laboratory uncertainty is applied.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k=2$.

| Test Item | Frequency range | Uncertainty (+/-) | | |
|---|--------------------|---------------------|------------|--------|
| Conducted emission AMN (LISN) | 0.15 MHz to 30 MHz | 3.3 dB | | |
| Radiated emission | 3 m | 9 kHz to 30 MHz | 3.2 dB | |
| | | 10 m | 3.0 dB | |
| | 3 m | 30 MHz to 200 MHz | Horizontal | 4.8 dB |
| | | | Vertical | 5.0 dB |
| | | 200 MHz to 1000 MHz | Horizontal | 5.1 dB |
| | | | Vertical | 6.2 dB |
| | 10 m | 30 MHz to 200 MHz | Horizontal | 4.8 dB |
| | | | Vertical | 4.8 dB |
| | | 200 MHz to 1000 MHz | Horizontal | 5.0 dB |
| | | | Vertical | 5.0 dB |
| | 3 m | 1 GHz to 6 GHz | 4.9 dB | |
| | | 6 GHz to 18 GHz | 5.2 dB | |
| | 1 m | 10 GHz to 26.5 GHz | 5.4 dB | |
| | | 26.5 GHz to 40 GHz | 5.4 dB | |
| 10 m | 1 GHz to 18 GHz | 5.4 dB | | |
| Automatically Deactivate | - | 0.10 % | | |
| -20 dB Bandwidth / 99% emission bandwidth | - | 0.96 % | | |

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.

*A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 884919

ISED Lab Company Number: 2973C / CAB identifier: JP0002

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| Test site | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Other rooms | Maximum measurement distance |
|----------------------------|----------------------------|--|------------------------|------------------------------|
| No.1 semi-anechoic chamber | 19.2 x 11.2 x 7.7 | 7.0 x 6.0 | No.1 Power source room | 10 m |
| No.2 semi-anechoic chamber | 7.5 x 5.8 x 5.2 | 4.0 x 4.0 | - | 3 m |
| No.3 semi-anechoic chamber | 12.0 x 8.5 x 5.9 | 6.8 x 5.75 | No.3 Preparation room | 3 m |
| No.3 shielded room | 4.0 x 6.0 x 2.7 | N/A | - | - |
| No.4 semi-anechoic chamber | 12.0 x 8.5 x 5.9 | 6.8 x 5.75 | No.4 Preparation room | 3 m |
| No.4 shielded room | 4.0 x 6.0 x 2.7 | N/A | - | - |
| No.5 semi-anechoic chamber | 6.0 x 6.0 x 3.9 | 6.0 x 6.0 | - | - |
| No.5 measurement room | 6.4 x 6.4 x 3.0 | 6.4 x 6.4 | - | - |
| No.6 shielded room | 4.0 x 4.5 x 2.7 | 4.0 x 4.5 | - | - |
| No.6 measurement room | 4.75 x 5.4 x 3.0 | 4.75 x 4.15 | - | - |
| No.7 shielded room | 4.7 x 7.5 x 2.7 | 4.7 x 7.5 | - | - |
| No.8 measurement room | 3.1 x 5.0 x 2.7 | 3.1 x 5.0 | - | - |
| No.9 measurement room | 8.8 x 4.6 x 2.8 | 2.4 x 2.4 | - | - |
| No.10 shielded room | 3.8 x 2.8 x 2.8 | 3.8 x 2.8 | - | - |
| No.11 measurement room | 4.0 x 3.4 x 2.5 | N/A | - | - |
| No.12 measurement room | 2.6 x 3.4 x 2.5 | N/A | - | - |

3.6 Test data, Test instruments, and Test set up

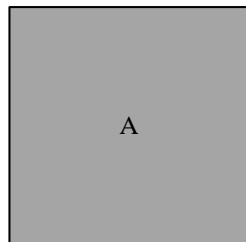
Refer to APPENDIX.

SECTION 4: Operation of EUT during testing

4.1. Operating Mode(s)

| Test Item* | Mode |
|--|-------------------------------|
| Automatically Deactivate | 1) Normal use mode |
| Electric Field Strength of Fundamental Emission Electric Field Strength of Spurious Emission -20 dB Bandwidth and 99% emission bandwidth Duty Cycle | 2) Transmitting mode (Tx) *1) |
| <p>* The system was configured in typical fashion (as a user would normally use it) for testing.</p> <p>*1) The software of this mode is the same as one of normal product, except that EUT continues to transmit when transmitter button is being pressed (For Normal use mode, EUT stops to transmit in a given time, even if transceiver button is being pressed.)</p> <p>* EUT was set by the software as follows; Software: FobCMO_ROMFILLPM_5300 Ver. 5300 (Date: 2022.1.15, Storage location: location: EUT memory)</p> <p>*This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.</p> | |

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

| No. | Item | Model number | Serial number | Manufacturer | Remarks |
|------------|-------------------------------|---------------------|------------------------|-------------------------------|----------------|
| A | Keyless operation Key(FOB) | GHR-M015 | FCC01 *1) FCC02 *2) | NIDEC MOBILITY CORPORATION | EUT |

*1) Used for Normal use mode

*2) Used for Transmitting mode

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SECTION 5: Radiated emission (Fundamental and Spurious Emission)

Test Procedure

[For below 30 MHz]

The noise level was checked by moving a search-coil (Loop Antenna) close to the EUT.

[For 30 MHz to 1 GHz]

EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1 GHz]

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

The measuring antenna height was varied between 1 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

Test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beamwidth of the antenna.

The measurements were performed for both vertical and horizontal antenna polarization.

The radiated emission measurements were made with the following detector function of the test receiver / spectrum analyzer.

Test Antennas are used as below;

| Frequency | Below 30 MHz | 30 MHz to 200 MHz | 200 MHz to 1 GHz | Above 1 GHz |
|--------------|--------------|-------------------|------------------|-------------|
| Antenna Type | Loop | Biconical | Logperiodic | Horn |

| | From 9 kHz to 90 kHz and From 110 kHz to 150 kHz | From 90 kHz to 110 kHz | From 150 kHz to 490 kHz | From 490 kHz to 30 MHz | From 30 MHz to 1 GHz | Above 1 GHz |
|---------------|--|------------------------|-------------------------|------------------------|--------------------------------|--------------------------------|
| Detector Type | Peak | Peak | Peak | Peak | Peak and Peak with Duty factor | Peak and Peak with Duty factor |
| IF Bandwidth | 200 Hz | 200 Hz | 9.1 kHz | 9.1 kHz | 120 kHz | PK: S/A: RBW 1 MHz, VBW: 3 MHz |

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

This EUT has two modes which mechanical key is inserted or not. The worst case was confirmed with and without mechanical key inserted, as a result, the test without mechanical key inserted was the worst case. Therefore, the test without mechanical key inserted was performed only.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

Measurement range : 9 kHz - 3.2 GHz
Test data : APPENDIX
Test result : Pass

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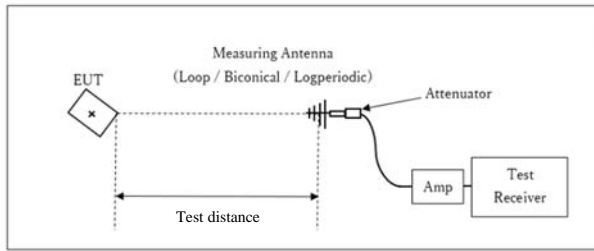
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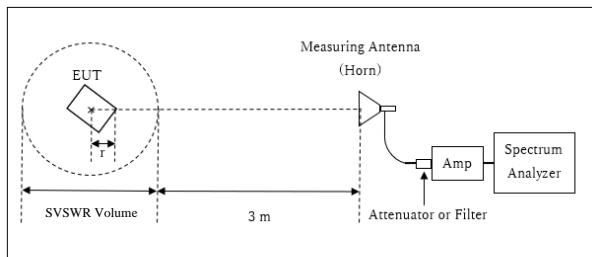
[Test Setup]
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 10 GHz



r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: $20 \times \log(4.00 \text{ m} / 3.0 \text{ m}) = 2.5 \text{ dB}$
 * Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 4.00 \text{ m}$

SVSWR Volume : 2.0 m
 (SVSWR Volume has been calibrated based on CISPR 16-1-4.)
 $r = 0.0 \text{ m}$

* The test was performed with $r = 0.0 \text{ m}$ since EUT is small and it was the rather conservative condition.

SECTION 6: Automatically deactivate

Test Procedure

The measurement was performed with Electric field strength using a spectrum analyzer.

Test data : APPENDIX
Test result : Pass

SECTION 7: -20 dB Bandwidth and 99% emission bandwidth

Test Procedure

The test was measured with a spectrum analyzer using a test fixture.

| Test | Span | RBW | VBW | Sweep | Detector | Trace | Instrument used |
|---|---|-----------------|--------------------|-------|----------|--------------|-------------------|
| -20 dB Bandwidth / 99% emission bandwidth | Enough width to display emission skirts | 1 to 5 % of OBW | Three times of RBW | Auto | Peak *1) | Max Hold *1) | Spectrum Analyzer |

*1) Peak hold was applied as Worst-case measurement.

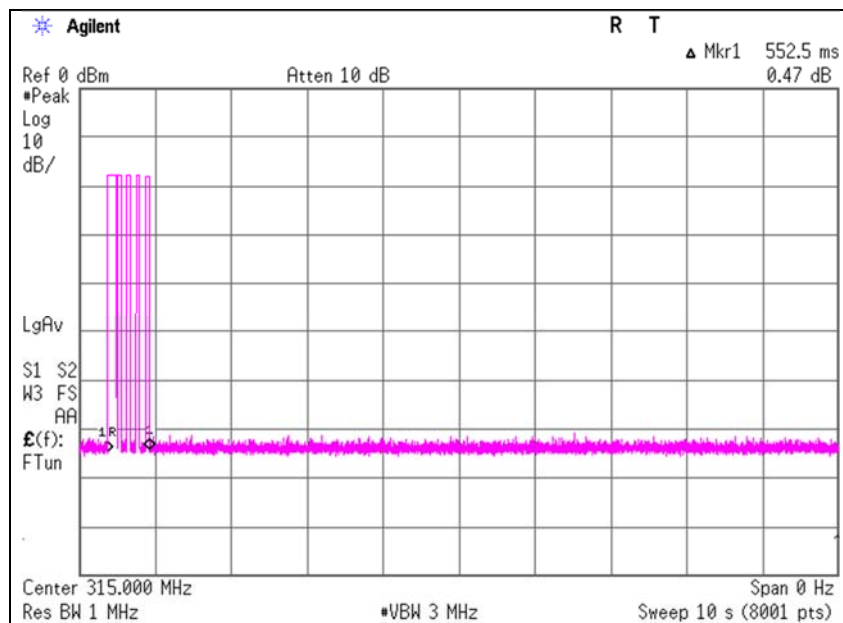
Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

Automatically deactivate

| | |
|------------------------|---------------------|
| Test place | Ise EMC Lab. |
| Semi Anechoic Chamber | No.3 |
| Date | January 15, 2022 |
| Temperature / Humidity | 19 deg. C / 23 % RH |
| Engineer | Junki Nagatomi |
| Mode | Mode 1 |

| Time of Transmitting [sec] | Limit [sec] | Result |
|----------------------------|-------------|--------|
| 0.5525 | 5.00 | Pass |



* The EUT transmits UHF when LF signal is received from a car or a button on the EUT is pressed. In both cases, the UHF transmission is stopped within 5 seconds. So the test was performed by a button-pressed operation as the worst case. (Refer to Theory of operation-specification.)

Radiated Emission (Fundamental and Spurious Emission)

Test place : Ise EMC Lab.
Semi Anechoic Chamber : No.3
Date : January 15, 2022
Temperature / Humidity : 19 deg. C / 23 % RH
Engineer : Junki Nagatomi
Mode : Mode 2

| Polarity [Hori/Vert] | Frequency [MHz] | Reading (PK) [dBuV] | Ant Factor [dB/m] | Loss [dB] | Gain [dB] | Duty Factor [dB] | Result (PK) [dBuV/m] | Result (PK / W) [dBuV/m] | Limit (PK) [dBuV/m] | Limit (AV) [dBuV/m] | Margin (PK) [dB] | Margin (AV) [dB] | Inside or Outside of Restricted Bands | Remarks |
|-------------------------|--------------------|---------------------------|-------------------------|--------------|--------------|------------------------|----------------------------|--------------------------------|---------------------------|---------------------------|------------------------|------------------------|--|-------------|
| Hori. | 315.000 | 78.5 | 14.3 | 10.1 | 27.7 | 0.0 | 75.2 | 75.2 | 95.6 | 75.6 | 20.4 | 0.4 | Carrier | |
| Hori. | 630.000 | 41.9 | 19.5 | 12.2 | 29.2 | 0.0 | 44.4 | 44.4 | 75.6 | 55.6 | 31.2 | 11.2 | Outside | |
| Hori. | 945.000 | 38.4 | 22.1 | 13.8 | 28.7 | 0.0 | 45.6 | 45.6 | 75.6 | 55.6 | 30.0 | 10.0 | Outside | |
| Hori. | 1260.000 | 44.7 | 25.6 | 6.2 | 34.5 | 0.0 | 42.0 | 42.0 | 75.6 | 55.6 | 33.6 | 13.6 | Outside | |
| Hori. | 1575.000 | 42.8 | 25.1 | 5.6 | 33.8 | 0.0 | 39.7 | 39.7 | 73.9 | 53.9 | 34.2 | 14.2 | Inside | Floor noise |
| Hori. | 1890.000 | 47.1 | 25.5 | 5.7 | 33.0 | 0.0 | 45.3 | 45.3 | 75.6 | 55.6 | 30.3 | 10.3 | Outside | |
| Hori. | 2205.000 | 46.4 | 28.3 | 5.7 | 32.7 | 0.0 | 47.7 | 47.7 | 73.9 | 53.9 | 26.2 | 6.2 | Inside | |
| Hori. | 2520.000 | 54.5 | 27.5 | 5.9 | 32.5 | 0.0 | 55.4 | 55.4 | 75.6 | 55.6 | 20.2 | 0.2 | Outside | |
| Hori. | 2835.000 | 48.5 | 28.5 | 6.0 | 32.4 | 0.0 | 50.6 | 50.6 | 73.9 | 53.9 | 23.3 | 3.3 | Inside | |
| Hori. | 3150.000 | 43.5 | 28.7 | 6.1 | 32.2 | 0.0 | 46.1 | 46.1 | 75.6 | 55.6 | 29.5 | 9.5 | Outside | |
| Vert. | 315.000 | 75.2 | 14.3 | 10.1 | 27.7 | 0.0 | 71.9 | 71.9 | 95.6 | 75.6 | 23.7 | 3.7 | Carrier | |
| Vert. | 630.000 | 39.6 | 19.5 | 12.2 | 29.2 | 0.0 | 42.1 | 42.1 | 75.6 | 55.6 | 33.5 | 13.5 | Outside | |
| Vert. | 945.000 | 35.3 | 22.1 | 13.8 | 28.7 | 0.0 | 42.5 | 42.5 | 75.6 | 55.6 | 33.1 | 13.1 | Outside | |
| Vert. | 1260.000 | 45.4 | 25.6 | 6.2 | 34.5 | 0.0 | 42.7 | 42.7 | 75.6 | 55.6 | 32.9 | 12.9 | Outside | |
| Vert. | 1575.000 | 42.8 | 25.1 | 5.6 | 33.8 | 0.0 | 39.7 | 39.7 | 73.9 | 53.9 | 34.2 | 14.2 | Inside | Floor noise |
| Vert. | 1890.000 | 47.5 | 25.5 | 5.7 | 33.0 | 0.0 | 45.7 | 45.7 | 75.6 | 55.6 | 29.9 | 9.9 | Outside | |
| Vert. | 2205.000 | 46.9 | 28.3 | 5.7 | 32.7 | 0.0 | 48.2 | 48.2 | 73.9 | 53.9 | 25.7 | 5.7 | Inside | |
| Vert. | 2520.000 | 53.4 | 27.5 | 5.9 | 32.5 | 0.0 | 54.3 | 54.3 | 75.6 | 55.6 | 21.3 | 1.3 | Outside | |
| Vert. | 2835.000 | 48.7 | 28.5 | 6.0 | 32.4 | 0.0 | 50.8 | 50.8 | 73.9 | 53.9 | 23.1 | 3.1 | Inside | |
| Vert. | 3150.000 | 42.8 | 28.7 | 6.1 | 32.2 | 0.0 | 45.4 | 45.4 | 75.6 | 55.6 | 30.2 | 10.2 | Outside | |

Sample calculation:

Result of PK = Reading + Ant Factor + Loss {Cable + Attenuator + Filter (above 1 GHz) + Distance factor (above 1 GHz)} - Gain (Amplifier)

Result of PK with Duty factor (PK / W) = Reading + Ant Factor + Loss {Cable + Attenuator + Filter (above 1 GHz) + Distance factor (above 1 GHz)} - Gain (Amplifier) + Duty factor (Refer to Duty cycle data sheet)

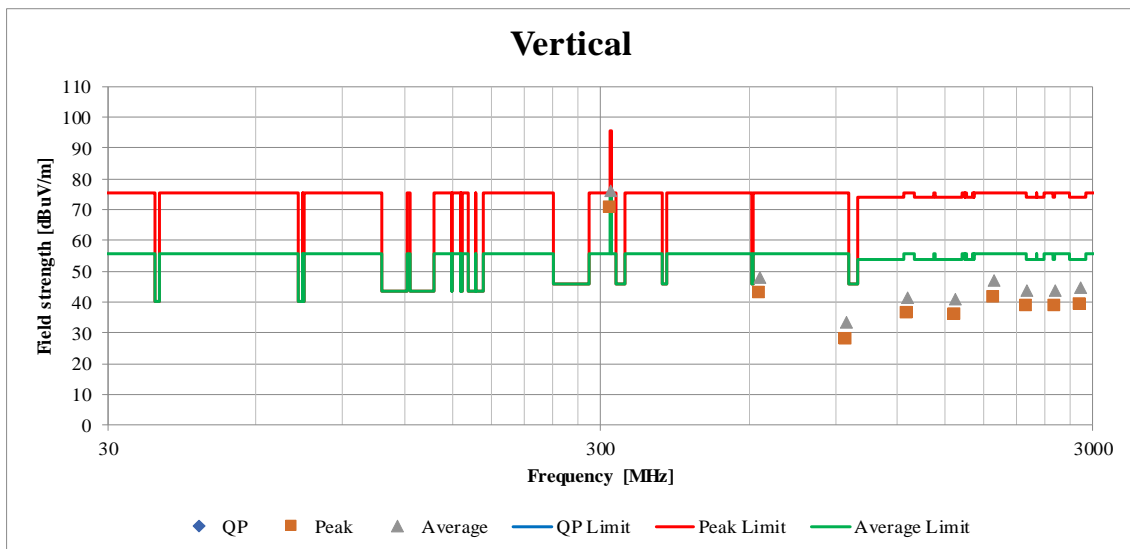
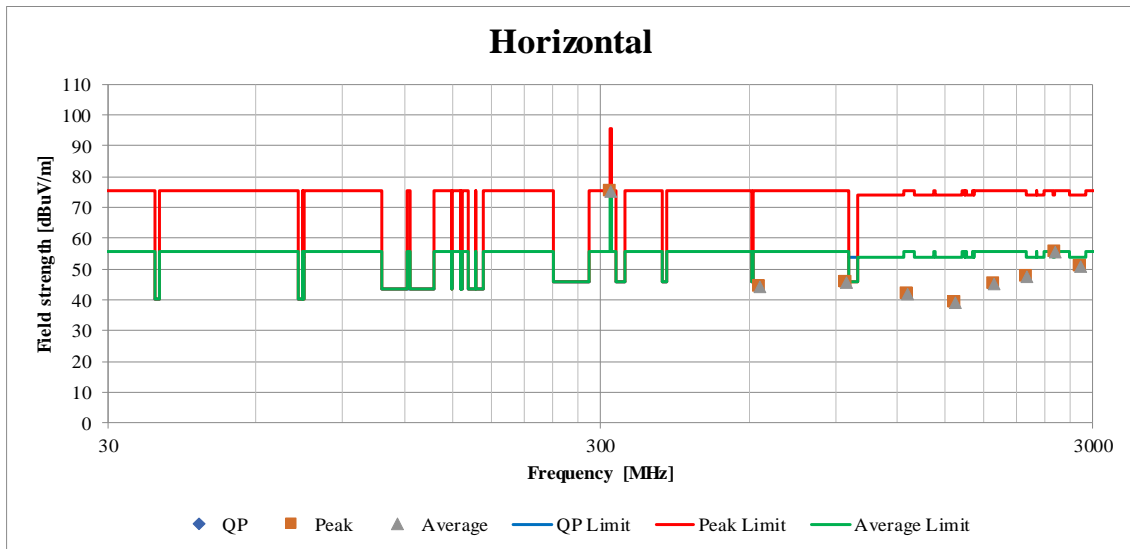
For above 1 GHz: Distance Factor: $20 \times \log(4.0 \text{ m}/3.0 \text{ m}) = 2.50 \text{ dB}$

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

If Gain 0.0 dB shown in the above table, pre-amplifier was not used to avoid the influence of carrier power. The pre-amplifier used for carrier frequency measurement was not saturated.

Radiated Spurious Emission
(Plot data, Worst case for Spurious Emission)

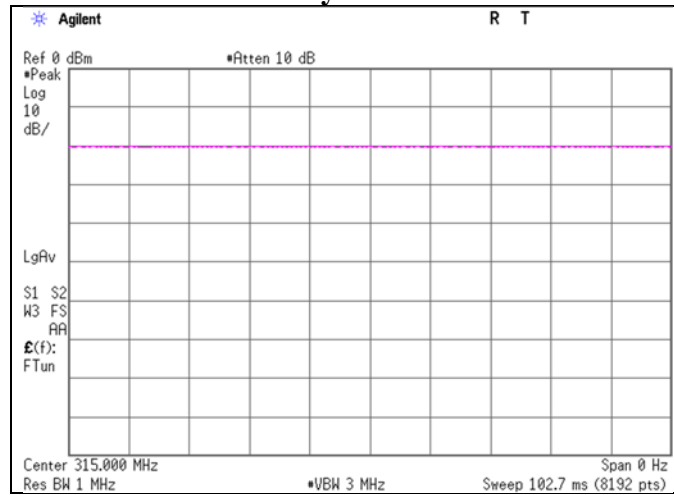
| | |
|------------------------|---------------------|
| Test place | Ise EMC Lab. |
| Semi Anechoic Chamber | No.3 |
| Date | January 15, 2022 |
| Temperature / Humidity | 19 deg. C / 23 % RH |
| Engineer | Junki Nagatomi |
| Mode | Mode 2 |



Duty Cycle

| | |
|------------------------|---------------------|
| Test place | Ise EMC Lab. |
| Semi Anechoic Chamber | No.8 |
| Date | February 3, 2022 |
| Temperature / Humidity | 15 deg. C / 33 % RH |
| Engineer | Junki Nagatomi |
| Mode | Mode 2 |

Duty 100%



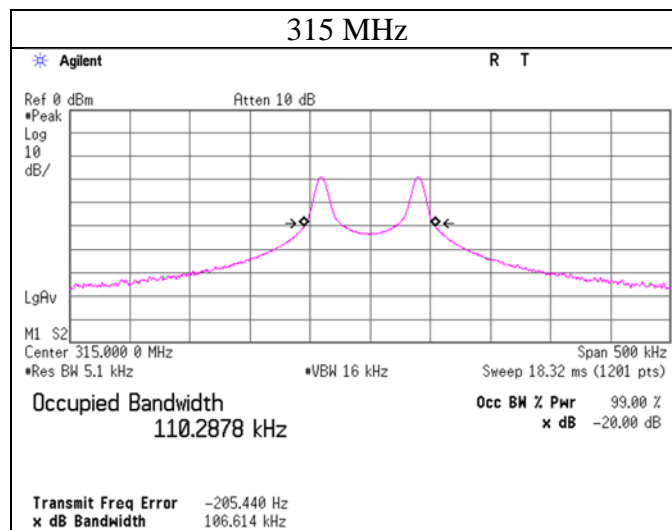
-20 dB Bandwidth / 99% emission bandwidth

| | |
|------------------------|---------------------|
| Test place | Ise EMC Lab. |
| Semi Anechoic Chamber | No.3 |
| Date | January 15, 2022 |
| Temperature / Humidity | 19 deg. C / 23 % RH |
| Engineer | Junki Nagatomi |
| Mode | Mode 2 |

Bandwidth Limit : Fundamental Frequency 315.00 MHz x 0.25% = 787.500 kHz

| -20dB Bandwidth [kHz] | Bandwidth Limit [kHz] | Result |
|--------------------------|--------------------------|--------|
| 106.6140 | 787.500 | Pass |

| 99% emission bandwidth [kHz] | Bandwidth Limit [kHz] | Result |
|---------------------------------|--------------------------|--------|
| 110.2878 | 787.500 | Pass |



APPENDIX 2: Test instruments

Test equipment

| Test Item | Local ID | LIMS ID | Description | Manufacturer | Model | Serial | Last Calibration Date | Cal Int |
|-----------|---------------|---------|-----------------------------------|---------------------------------|--------------------------|---------------------------|-----------------------|---------|
| RE | MAEC-03 | 142008 | AC3_Semi Anechoic Chamber(NSA) | TDK | Semi Anechoic Chamber 3m | DA-10005 | 05/22/2020 | 24 |
| RE | MOS-13 | 141554 | Thermo-Hygrometer | CUSTOM. Inc | CTH-201 | 1301 | 01/10/2022 | 12 |
| RE | MMM-08 | 141532 | DIGITAL HiTESTER | HIOKI E.E. CORPORATION | 3805 | 51201197 | 01/16/2022 | 12 |
| RE | MJM-16 | 142183 | Measure | KOMELON | KMC-36 | - | - | - |
| RE | COTS-MEMI-02 | 178648 | EMI measurement program | TSJ (Techno Science Japan) | TEPTO-DV | - | - | - |
| RE | MAEC-03-SVSWR | 142013 | AC3_Semi Anechoic Chamber(SVSWR) | TDK | Semi Anechoic Chamber 3m | DA-10005 | 04/01/2021 | 24 |
| RE | MAT-95 | 142314 | Attenuator | Pasternack Enterprises | PE7390-6 | D/C 1504 | 06/09/2021 | 12 |
| RE | MBA-08 | 141427 | Biconical Antenna | Schwarzbeck Mess-Elektronik OHG | VHA9103B+ BBA9106 | 08031 | 07/10/2021 | 12 |
| RE | MLA-22 | 141266 | Logperiodic Antenna (200-1000MHz) | Schwarzbeck Mess-Elektronik OHG | VUSLP9111B | 9111B-191 | 08/21/2021 | 12 |
| RE | MPA-24 | 141594 | Pre Amplifier | Keysight Technologies Inc | 8447D | 2944A10150 | 02/18/2021 | 12 |
| RE | MTR-03 | 141942 | Test Receiver | Rohde & Schwarz | ESCI | 100300 | 08/05/2021 | 12 |
| RE | MSA-03 | 141884 | Spectrum Analyzer | Keysight Technologies Inc | E4448A | MY44020357 | 03/10/2021 | 12 |
| RE | MHA-20 | 141507 | Horn Antenna 1-18GHz | Schwarzbeck Mess-Elektronik OHG | BBHA9120D | 258 | 11/09/2021 | 12 |
| RE | MPA-11 | 141580 | MicroWave System Amplifier | Keysight Technologies Inc | 83017A | MY39500779 | 03/03/2021 | 12 |
| RE | MCC-231 | 177964 | Microwave Cable | Junkosha INC. | MMX221 | 1901S329(1m)/1902S579(5m) | 03/04/2021 | 12 |
| RE | MHF-27 | 141297 | High Pass Filter (1.1-10GHz) | TOKYO KEIKI | TF219CD1 | 1001 | 01/23/2022 | 12 |
| RE | MLPA-08 | 202511 | Loop Antenna | UL Japan | - | - | - | - |
| RE | MOS-28 | 141567 | Thermo-Hygrometer | CUSTOM. Inc | CTH-201 | 0008 | 2022/01/10 | 12 |
| RE | MSA-13 | 141900 | Spectrum Analyzer | Keysight Technologies Inc | E4440A | MY46185823 | 2021/09/30 | 12 |

*Hyphens for Last Calibration Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

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: RE: Radiated Emission

UL Japan, Inc.

Ise EMC Lab.

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