



# EMI TEST REPORT

Test Report No. : 13185291Y-A-R1

**Applicant:** DENSO CORPORATION  
**Type of EUT:** Cockpit Control Unit  
**Model Number of EUT:** DNNS109  
**FCC ID:** HYQDNNS091  
**Test regulation:** FCC Part 15 Subpart B:2019 Class B  
ICES-003 Issue 6: 2016 + Amendment 1: 2017 Class B  
(SMSE-005-19)

**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 regulation.
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. Yokowa EMC Lab.
7. This test report must not be used by the customer to claim product certification, approval, or endorsement by any agency of the Federal Government.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in Section 1.
10. This report is a revised version of 13185291Y-A. 13185291Y-A is replaced with this report.

**Date of test:**

January 7 to 9, 2020

**Representative  
test engineer:**

  
Hiromichi Nakai  
Engineer  
Consumer Technology Division

**Approved by:**

  
Daigo Hamaguchi  
Leader  
Consumer Technology Division

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



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# **REVISION HISTORY**

**Original Test Report No.: 13185291Y-A**

| Revision        | Test report No. | Date                 | Page revised | Contents                               |
|-----------------|-----------------|----------------------|--------------|----------------------------------------|
| -<br>(Original) | 13185291Y-A     | February 19,<br>2020 | -            | -                                      |
| 1               | 13185291Y-A-R1  | February 25,<br>2020 | P.12         | Addition of procedure for test antenna |

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## Reference: Abbreviations (Including words undescribed in this report)

|                |                                                                 |                 |                                                                                |
|----------------|-----------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------|
| AAN            | Asymmetric Artificial Network                                   | ISED            | Innovation, Science and Economic Development Canada                            |
| AC             | Alternating Current                                             | ISN             | Impedance Stabilization Network                                                |
| AM             | Amplitude Modulation                                            | ISO             | International Organization for Standardization                                 |
| AMN            | Artificial Mains Network                                        | JAB             | Japan Accreditation Board                                                      |
| Amp, AMP       | Amplifier                                                       | LAN             | Local Area Network                                                             |
| ANSI           | American National Standards Institute                           | LCL             | Longitudinal Conversion Loss                                                   |
| Ant, ANT       | Antenna                                                         | LIMS            | Laboratory Information Management System                                       |
| AP             | Access Point                                                    | LISN            | Line Impedance Stabilization Network                                           |
| ASK            | Amplitude Shift Keying                                          | MRA             | Mutual Recognition Arrangement                                                 |
| Atten., ATT    | Attenuator                                                      | N/A             | Not Applicable                                                                 |
| AV             | Average                                                         | NIST            | National Institute of Standards and Technology                                 |
| BPSK           | Binary Phase-Shift Keying                                       | NS              | No signal detect.                                                              |
| BR             | Bluetooth Basic Rate                                            | NSA             | Normalized Site Attenuation                                                    |
| BT             | Bluetooth                                                       | NVLAP           | National Voluntary Laboratory Accreditation Program                            |
| BT LE          | Bluetooth Low Energy                                            | OBW             | Occupied Band Width                                                            |
| BW             | BandWidth                                                       | OFDM            | Orthogonal Frequency Division Multiplexing                                     |
| C.F            | Correction Factor                                               | PK              | Peak                                                                           |
| Cal Int        | Calibration Interval                                            | P <sub>LT</sub> | long-term flicker severity                                                     |
| CAV            | CISPR AV                                                        | POHC(A)         | Partial Odd Harmonic Current                                                   |
| CCK            | Complementary Code Keying                                       | Pol., Pola.     | Polarization                                                                   |
| CDN            | Coupling Decoupling Network                                     | PR-ASK          | Phase Reversal ASK                                                             |
| Ch., CH        | Channel                                                         | P <sub>ST</sub> | short-term flicker severity                                                    |
| CISPR          | Comite International Special des Perturbations Radioelectriques | QAM             | Quadrature Amplitude Modulation                                                |
| Corr.          | Correction                                                      | QP              | Quasi-Peak                                                                     |
| CPE            | Customer premise equipment                                      | QPSK            | Quadri-Phase Shift Keying                                                      |
| CW             | Continuous Wave                                                 | r.m.s., RMS     | Root Mean Square                                                               |
| DBPSK          | Differential BPSK                                               | RBW             | Resolution Band Width                                                          |
| DC             | Direct Current                                                  | RE              | Radio Equipment                                                                |
| DET            | Detector                                                        | REV             | Reverse                                                                        |
| Dmax           | maximum absolute voltage change during an observation period    | RF              | Radio Frequency                                                                |
| DQPSK          | Differential QPSK                                               | RFID            | Radio Frequency Identifier                                                     |
| DSSS           | Direct Sequence Spread Spectrum                                 | RSS             | Radio Standards Specifications                                                 |
| EDR            | Enhanced Data Rate                                              | Rx              | Receiving                                                                      |
| e.i.r.p., EIRP | Equivalent Isotropically Radiated Power                         | SINAD           | Ratio of (Signal + Noise + Distortion) to (Noise + Distortion)                 |
| EM clamp       | Electromagnetic clamp                                           | S/N             | Signal to Noise ratio                                                          |
| EMC            | ElectroMagnetic Compatibility                                   | SA, S/A         | Spectrum Analyzer                                                              |
| EMI            | ElectroMagnetic Interference                                    | SG              | Signal Generator                                                               |
| EMS            | ElectroMagnetic Susceptibility                                  | SVSWR           | Site-Voltage Standing Wave Ratio                                               |
| EN             | European Norm                                                   | THC(A)          | Total Harmonic Current                                                         |
| e.r.p., ERP    | Effective Radiated Power                                        | THD(%)          | Total Harmonic Distortion                                                      |
| EU             | European Union                                                  | TR              | Test Receiver                                                                  |
| EUT            | Equipment Under Test                                            | Tx              | Transmitting                                                                   |
| Fac.           | Factor                                                          | VBW             | Video BandWidth                                                                |
| FCC            | Federal Communications Commission                               | Vert.           | Vertical                                                                       |
| FHSS           | Frequency Hopping Spread Spectrum                               | WLAN            | Wireless LAN                                                                   |
| FM             | Frequency Modulation                                            | xDSL            | Generic term for all types of DSL technology<br>(DSL: Digital Subscriber Line) |
| Freq.          | Frequency                                                       |                 |                                                                                |
| FSK            | Frequency Shift Keying                                          |                 |                                                                                |
| Fund           | Fundamental                                                     |                 |                                                                                |
| FWD            | Forward                                                         |                 |                                                                                |
| GFSK           | Gaussian Frequency-Shift Keying                                 |                 |                                                                                |
| GNSS           | Global Navigation Satellite System                              |                 |                                                                                |
| GPS            | Global Positioning System                                       |                 |                                                                                |
| Hori.          | Horizontal                                                      |                 |                                                                                |
| ICES           | Interference-Causing Equipment Standard                         |                 |                                                                                |
| I/O            | Input/Output                                                    |                 |                                                                                |
| IEC            | International Electrotechnical Commission                       |                 |                                                                                |
| IEEE           | Institute of Electrical and Electronics Engineers               |                 |                                                                                |
| IF             | Intermediate Frequency                                          |                 |                                                                                |
| ILAC           | International Laboratory Accreditation Conference               |                 |                                                                                |

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| Antenna terminal voltage                                     |             |
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## **Section 1: Customer information**

Company Name : DENSO CORPORATION

Address : 1-1 Showa-cho, Kariya-shi, Aichi ken, 448-8661 Japan

Telephone Number : +81-566-20-3304

Facsimile Number : +81-566-25-4920

Contact Person : Naoto Makino

The information provided from the customer is as follows;

- Applicant, Type of Equipment, Model No., 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)
- Section 4: Operation of E.U.T. 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 of EUT : Cockpit Control Unit

Model Number of EUT : DNNS109

Serial No. : Refer to Clause 4.2

Rating : DC 13.2 V

Country of Mass-production : Japan

Condition of EUT : Production prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)

Receipt Date of Sample : December 26, 2019  
(Information from test lab.)

Modification of EUT : No modification by the test lab.

### **2.2 Product description**

Model: DNNS109 (referred to as the EUT in this report) is a Cockpit Control Unit.  
The clock frequencies used in the EUT: 2000 MHz

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### Section 3: Test specification, procedures and results

#### 3.1 Test Specification

Test Specification : FCC Part 15 Subpart B  
FCC Part 15 final revised on July 19, 2019 and effective August 19, 2019 except 15.258

Title : FCC 47CFR Part15 Radio Frequency Device  
Subpart B Unintentional Radiators

Test Specification : ICES-003 Issue 6: 2016 + Amendment 1: 2017 (SMSE-005-19)  
Title : Spectrum Management and Telecommunications  
Interference-Causing Equipment Standard  
Information Technology Equipment (Including Digital Apparatus) –  
Limits and Methods of Measurement

#### 3.2 Procedures & results

| Item                                                                                                                                                                                                                                                                                                                                                                                                             | Test Procedure                                                                                       | Limits                                                                                                                                          | Deviation | Worst margin                                                                | Result          | Remarks |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------------------------------------------------------------|-----------------|---------|
| Conducted emission                                                                                                                                                                                                                                                                                                                                                                                               | ANSI C63.4: 2014<br>7. AC powerline<br>conducted emission<br>measurements<br>IEEE 187:2003           | Class B                                                                                                                                         | N/A       | N/A                                                                         | N/A             | *1)     |
| Radiated emission                                                                                                                                                                                                                                                                                                                                                                                                | ANSI C63.4: 2014<br>8. Radiated<br>emission measurements<br>IEEE 187:2003                            | 30 MHz - 88 MHz:<br>100 $\mu$ V/m<br>88 MHz - 216 MHz:<br>150 $\mu$ V/m<br>216 MHz-960 MHz:<br>200 $\mu$ V/m<br>above 960 MHz:<br>500 $\mu$ V/m | N/A       | 1.83 dB<br>(3488.800<br>MHz, Vertical,<br>AV,<br>1. FM Reception<br>(Main)) | Complied#<br>a) | *2)     |
| Antenna Terminal                                                                                                                                                                                                                                                                                                                                                                                                 | ANSI C63.4: 2014<br>12. Measurement of<br>unintentional radiators<br>other than ITE<br>IEEE 187:2003 | 2 nW (at 75 ohm)                                                                                                                                | N/A       | 11.5 dB<br>(2880.000 MHz,<br>1. FM Reception<br>(Sub))                      | Complied<br>b)  | *3)     |
| *1) The test is not applicable since the EUT does not have AC ports.<br>*2) The test mode which applies test procedure of IEEE 187:2003 is outside of JAB accreditation scopes.<br>*3) This test item is outside of JAB accreditation scopes.<br>Note: UL Japan's EMI Work Procedures No. 13-EM-W0420<br>a) Refer to Appendix 2 (data of Radiated emission)<br>b) Refer to Appendix 2 (data of Antenna terminal) |                                                                                                      |                                                                                                                                                 |           |                                                                             |                 |         |
| Symbols:<br>Complied The data of this test item has enough margin, more than the measurement uncertainty.<br>Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.                                                                                                                                                                               |                                                                                                      |                                                                                                                                                 |           |                                                                             |                 |         |

#### 3.3 Addition to standard

No addition, exclusion nor deviation has been made from the standard.

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### 3.4 Confirmation

UL Japan, Inc. hereby confirms that E.U.T., in the configuration tested, complies with the specifications FCC Part 15 Subpart B:2019 Class B and ICES-003 Issue 6: 2016 + Amendment 1: 2017 Class B (SMSE-005-19).

### 3.5 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  $k = 2$ .

#### EMI

|                          | Open area test site             |        |        |        |      | Shielded room |      |   |             | Ucisp<br>(±) |
|--------------------------|---------------------------------|--------|--------|--------|------|---------------|------|---|-------------|--------------|
|                          | No.1                            | No.2   | No.3   | No.1   | No.2 | No.3          | No.7 |   |             |              |
|                          | (±)                             | (±)    | (±)    | (±)    | (±)  | (±)           | (±)  |   |             |              |
| Conducted disturbance    |                                 |        |        |        |      |               |      |   |             |              |
| LISN (AMN)               | 9 kHz - 150 kHz                 | 3.8 dB |        |        |      |               |      |   | 3.8 dB      |              |
|                          | 150 kHz - 30 MHz                | 3.4 dB |        |        |      |               |      |   | 3.4 dB      |              |
| ISN (LCL= 55 dB - 40 dB) | 150 kHz - 30 MHz                | 4.2 dB |        |        |      |               |      |   | 5.0 dB      |              |
| ISN (LCL= 65 dB - 50 dB) | 150 kHz - 30 MHz                | 4.6 dB |        |        |      |               |      |   | 5.0 dB      |              |
| ISN (LCL= 75 dB - 60 dB) | 150 kHz - 30 MHz                | 5.0 dB |        |        |      |               |      |   | 5.0 dB      |              |
| ISN (Screened)           | 150 kHz - 30 MHz                | 3.4 dB |        |        |      |               |      |   | 5.0 dB      |              |
| ISN (75 ohm)             | 150 kHz - 30 MHz                | 3.4 dB |        |        |      |               |      |   | 5.0 dB      |              |
| Current probe            | 150 kHz - 30 MHz                | 2.9 dB |        |        |      |               |      |   | 2.9 dB      |              |
| Capacitive Voltage Probe | 150 kHz - 30 MHz                | 3.9 dB |        |        |      |               |      |   | 3.9 dB      |              |
| Voltage probe            | 150 kHz - 30 MHz                | 2.9 dB |        |        |      |               |      |   | 2.9 dB      |              |
| Radiated disturbance     |                                 |        |        |        |      |               |      |   |             |              |
| 3 m                      | 9 kHz - 30 MHz                  | 3.6 dB | 3.5 dB | 3.5 dB | -    | -             | -    | - | Not Defined |              |
|                          | 30 MHz - 200 MHz (Horizontal)   | 4.5 dB | 4.7 dB | 4.7 dB | -    | -             | -    | - | 6.3 dB      |              |
|                          | 30 MHz - 200 MHz (Vertical)     | 4.6 dB | 4.9 dB | 4.9 dB | -    | -             | -    | - | 6.3 dB      |              |
|                          | 200 MHz - 1000 MHz (Horizontal) | 5.0 dB | 5.1 dB | 5.1 dB | -    | -             | -    | - | 6.3 dB      |              |
|                          | 200 MHz - 1000 MHz (Vertical)   | 6.1 dB | 6.2 dB | 6.2 dB | -    | -             | -    | - | 6.3 dB      |              |
|                          | 1 GHz - 6 GHz                   | 4.8 dB |        |        | -    | -             | -    | - | 5.2 dB      |              |
|                          | 6 GHz - 18 GHz                  | 5.1 dB |        |        | -    | -             | -    | - | 5.5 dB      |              |
| 10 m                     | 9 kHz - 30 MHz                  | 3.3 dB | 3.4 dB | 3.4 dB | -    | -             | -    | - | Not Defined |              |
|                          | 30 MHz - 200 MHz (Horizontal)   | 4.5 dB | 4.7 dB | 4.7 dB | -    | -             | -    | - | 6.3 dB      |              |
|                          | 30 MHz - 200 MHz (Vertical)     | 4.5 dB | 4.7 dB | 4.7 dB | -    | -             | -    | - | 6.3 dB      |              |
|                          | 200 MHz - 1000 MHz (Horizontal) | 4.7 dB | 4.9 dB | 4.9 dB | -    | -             | -    | - | 6.3 dB      |              |
|                          | 200 MHz - 1000 MHz (Vertical)   | 4.8 dB | 4.9 dB | 4.9 dB | -    | -             | -    | - | 6.3 dB      |              |
|                          | 1 GHz - 18 GHz                  | 5.0 dB |        |        | -    | -             | -    | - | Not Defined |              |
| Antenna terminal voltage |                                 |        |        |        |      |               |      |   |             |              |
|                          | 30 MHz - 1000 MHz               | 3.7 dB |        |        |      |               |      |   | Not Defined |              |
|                          | 1 GHz - 2.15 GHz                | 3.8 dB |        |        |      |               |      |   | Not Defined |              |
| Disturbance power        |                                 |        |        |        |      |               |      |   |             |              |
|                          | 30 MHz - 300 MHz                | 3.7 dB |        |        |      |               |      |   | 4.5 dB      |              |

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### 3.6 Test Location

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|                                          | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Other rooms |
|------------------------------------------|----------------------------|------------------------------------------------------------------|-------------|
| No.1 open area test site                 | -                          | 40 x 20                                                          | -           |
| No.2 open area test site                 | -                          | 20 x 18                                                          | -           |
| No.3 open area test site                 | -                          | 20 x 18                                                          | -           |
| No.1 shielded room                       | 5.5 x 6.4 x 2.7            | 5.5 x 6.4                                                        | -           |
| No.2 shielded room                       | 4.5 x 3.6 x 2.7            | 4.5 x 3.6                                                        | -           |
| No.3 shielded room                       | 3.6 x 7.2 x 2.4            | 3.6 x 7.2                                                        | -           |
| No.4 shielded room                       | 5.5 x 5.0 x 2.4            | 4.35 x 3.35                                                      | -           |
| No.5 shielded room                       | 5.5 x 4.3 x 2.5            | 5.54 x 3.0                                                       | -           |
| No.6 shielded room                       | 5.2 x 3.2 x 2.9            | 5.2 x 3.2                                                        | -           |
| No.7 shielded room                       | 9.3 x 3.4 x 2.7            | 9.3 x 3.4                                                        | -           |
| No.1 EMS lab.<br>(Full-anechoic chamber) | 5.0 x 8.0 x 3.5            | -                                                                | -           |
| No.2 EMS lab.<br>(Full-anechoic chamber) | 4.0 x 7.0 x 3.5            | -                                                                | -           |

### 3.7 Test setup, Data of EMI & Test instruments

Refer to Appendix 1 to 3.

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## **Section 4: Operation of EUT during testing**

### **4.1 Operating modes**

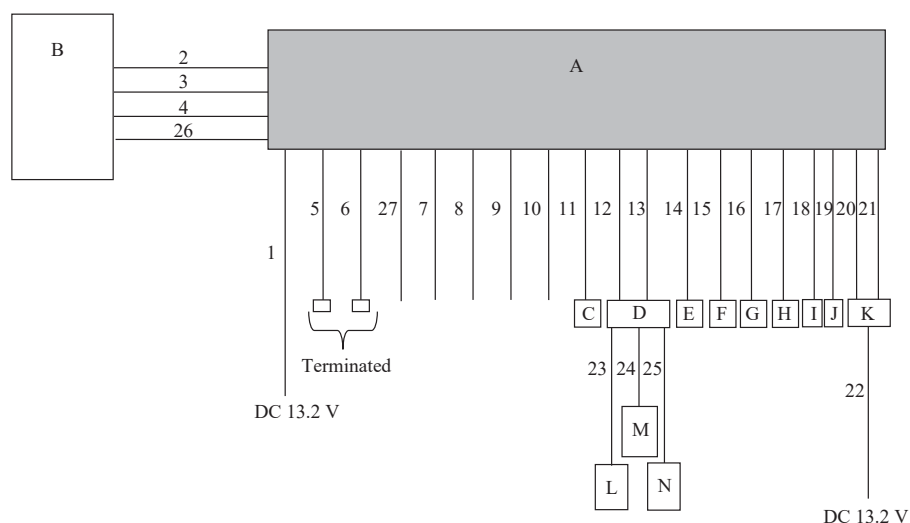
The EUT exercise program used during testing was designed to exercise the various system components in a manner similar to typical use.

Test sequence is used: 1. FM Reception (Main), FM Reception (Sub)

Software: Version 02.00.11

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 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      | Remarks |
|-----|----------------------------|---------------------|---------------|-------------------|---------|
| A   | Cockpit Control Unit       | DNNS109             | 468700-3611   | DENSO CORPORATION | EUT     |
| B   | Center Information Display | -                   | 462200-8510   | DENSO CORPORATION | -       |
| C   | GPS Antenna                | 03590033            | 86277AL150    | YOKOWO            | -       |
| D   | AUX-Box                    | 86257               | FL000         | HOSIDEN           | -       |
| E   | 4Ω Speaker                 | K50                 | No.13         | VISATON           | -       |
| F   | 4Ω Speaker                 | K50                 | No.14         | VISATON           | -       |
| G   | 4Ω Speaker                 | K50                 | No.15         | VISATON           | -       |
| H   | 4Ω Speaker                 | K50                 | No.16         | VISATON           | -       |
| I   | CAN Terminated             | DE-C8-J9            | -             | -                 | -       |
| J   | CAN Terminated             | DE-C8-J9            | -             | -                 | -       |
| K   | Meter                      | TN257550-673        | 85002AN02A    | DENSO CORPORATION | -       |
| L   | USB Memory                 | USM4GU G            | USM15504B     | SONY              | -       |
| M   | Smart phone                | GALAXY NEXUS SC-04D | R2EBB51195E   | SAMSUNG           | -       |
| N   | USB Memory                 | USM4GU L            | 14625B-1      | SONY              | -       |

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**List of cables used**

| No. | Name                    | Length (m) | Shield     |            | Remarks |
|-----|-------------------------|------------|------------|------------|---------|
|     |                         |            | Cable      | Connector  |         |
| 1   | DC Cable                | 1.6        | Unshielded | Unshielded | -       |
| 2   | Bluetooth Antenna Cable | 1.0        | Shielded   | Shielded   | -       |
| 3   | DC + signal Cable       | 1.0        | Unshielded | Unshielded | -       |
| 4   | LVDS Cable              | 1.0        | Shielded   | Shielded   | -       |
| 5   | Antenna Cable           | 2.0        | Shielded   | Shielded   | -       |
| 6   | Antenna Cable           | 2.0        | Shielded   | Shielded   | -       |
| 7   | USB Cable               | 1.6        | Shielded   | Shielded   | -       |
| 8   | USB Cable               | 1.6        | Shielded   | Shielded   | -       |
| 9   | Camera Cable            | 0.9        | Shielded   | Shielded   | -       |
| 10  | Signal Cable            | 1.0        | Unshielded | Unshielded | -       |
| 11  | GPS Cable               | 0.7        | Shielded   | Shielded   | -       |
| 12  | USB Cable               | 1.7        | Shielded   | Shielded   | -       |
| 13  | Signal Cable            | 0.9        | Unshielded | Unshielded | -       |
| 14  | Speaker Cable           | 1.0        | Unshielded | Unshielded | -       |
| 15  | Speaker Cable           | 1.0        | Unshielded | Unshielded | -       |
| 16  | Speaker Cable           | 1.0        | Unshielded | Unshielded | -       |
| 17  | Speaker Cable           | 1.0        | Unshielded | Unshielded | -       |
| 18  | Signal Cable            | 1.0        | Unshielded | Unshielded | -       |
| 19  | Signal Cable            | 1.0        | Unshielded | Unshielded | -       |
| 20  | Signal Cable            | 1.2        | Unshielded | Unshielded | -       |
| 21  | Meter Cable             | 1.7        | Shielded   | Shielded   | -       |
| 22  | DC Cable                | 1.6        | Unshielded | Unshielded | -       |
| 23  | USB Cable               | 2.0        | Shielded   | Shielded   | -       |
| 24  | AUX Cable               | 1.5        | Shielded   | Shielded   | -       |
| 25  | USB Cable               | 2.5        | Shielded   | Shielded   | -       |
| 26  | WLAN Antenna Cable      | 1.0        | Shielded   | Shielded   | -       |
| 27  | WLAN Antenna Cable      | 0.2        | Shielded   | Shielded   | -       |

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## **Section 5: Radiated emission**

### **5.1 Operating environment**

This test was carried out in open area test site.

Temperature : See data

Humidity : See data

### **5.2 Test configuration**

EUT was placed on a table which was consisted by polystyrene foam, polypropylene foam and polycarbonate of nominal size, 1 m by 1.5 m, raised 0.8 m above the conducting ground plane.

The rear of EUT and its peripherals was aligned and flushed with rear of tabletop.

I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle and were hanged 40 cm height to the ground plane. The measurements were performed for vertical or horizontal antenna polarization or both as necessary. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

Photographs of the set up are shown in Appendix 1.

### **5.3 Test conditions**

Frequency range : 30 MHz - 25000 MHz

Test distance : 3 m

EUT position : Table top

### **5.4 Test procedure**

The Radiated Electric Field Strength intensity has been measured on an open test site with a ground plane at a distance of 3 m\*. (30 MHz – 1000 MHz)

\* Measuring distance

The boundary of the EUT is defined by an imaginary circular periphery.

Pre check measurements were performed in shielded room with a search coil / horn antenna at 30 MHz - 25000 MHz to distinguish disturbances of EUT from the ambient noise.

Measurements were performed with quasi-peak detector, average detector and peak detector.

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

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 vertical or horizontal antenna polarization or both as necessary.

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

|                 |                   |                        |
|-----------------|-------------------|------------------------|
| Frequency       | : 30 MHz-1000 MHz | 1000 MHz-25000 MHz *1) |
| Instrument used | : Test Receiver   | Test Receiver          |
| Detector Type   | : QP              | AV PK                  |
| IF Band width   | : 120 kHz         | RBW 1 MHz RBW 1 MHz    |

\*1) The measurement data was adjusted to a 3 m distance using the following Distance Factor.

Distance factor:  $20 \log (\text{Actual distance}/3 \text{ m})$

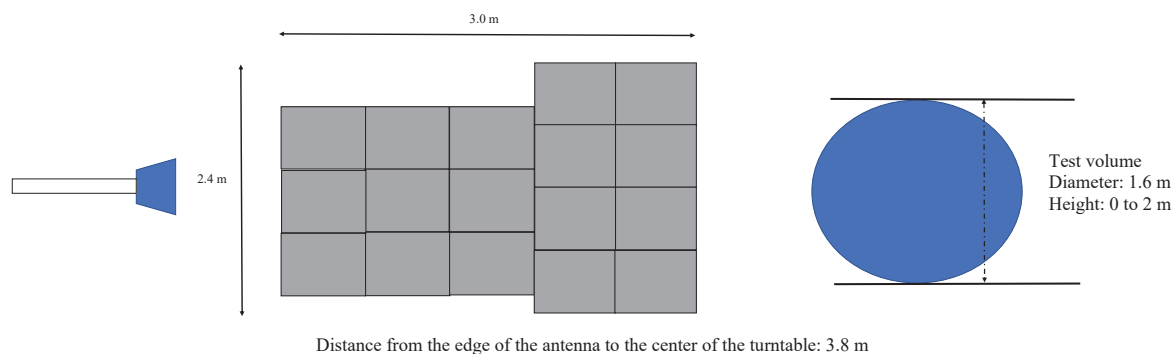
Distance factor and actual distance are shown in Appendix 2.

## 5.5 Results

Summary of the test results: Pass

### Figure. Absorber arrangement

3Site



**UL Japan, Inc.**  
**Yokowa EMC Lab.**

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Facsimile: +81 596 39 0232

## **Section 6 : Antenna terminal voltage**

### **6.1 Operation environment**

The test was carried out in measurement room.

Temperature : See data

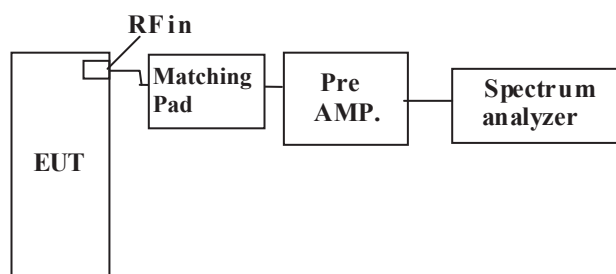
Humidity : See data

### **6.2 Test configuration**

The EUT was placed on a non-metallic platform 0.8 m.

Photographs of the set up are shown in Appendix 1.

**Figure 1. Antenna terminal voltage**  
**30 MHz-25000 MHz**



### **6.3 Test conditions**

Frequency range : 30 MHz - 25000 MHz

EUT position : Table top

### **6.4 Test procedure**

Connect EUT and spectrum analyzer through pre-amplifier. Set EUT to CH investigation mode then measure the voltage of local leakage from antenna terminal. Spectrum analyzer should be hold in maximum mode during the measurement.

Detector Type: Peak (30 MHz - 25000 MHz)

At frequency between 2000 MHz and 25000 MHz, 75/50 ohm conversion loss of impedance is used in speculation.

### **6.5 Results**

Summary of the test results : Pass

## DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site

Date : 01/08/2020

Mode : 1.FM Reception (Main)

Order No. : 13185291

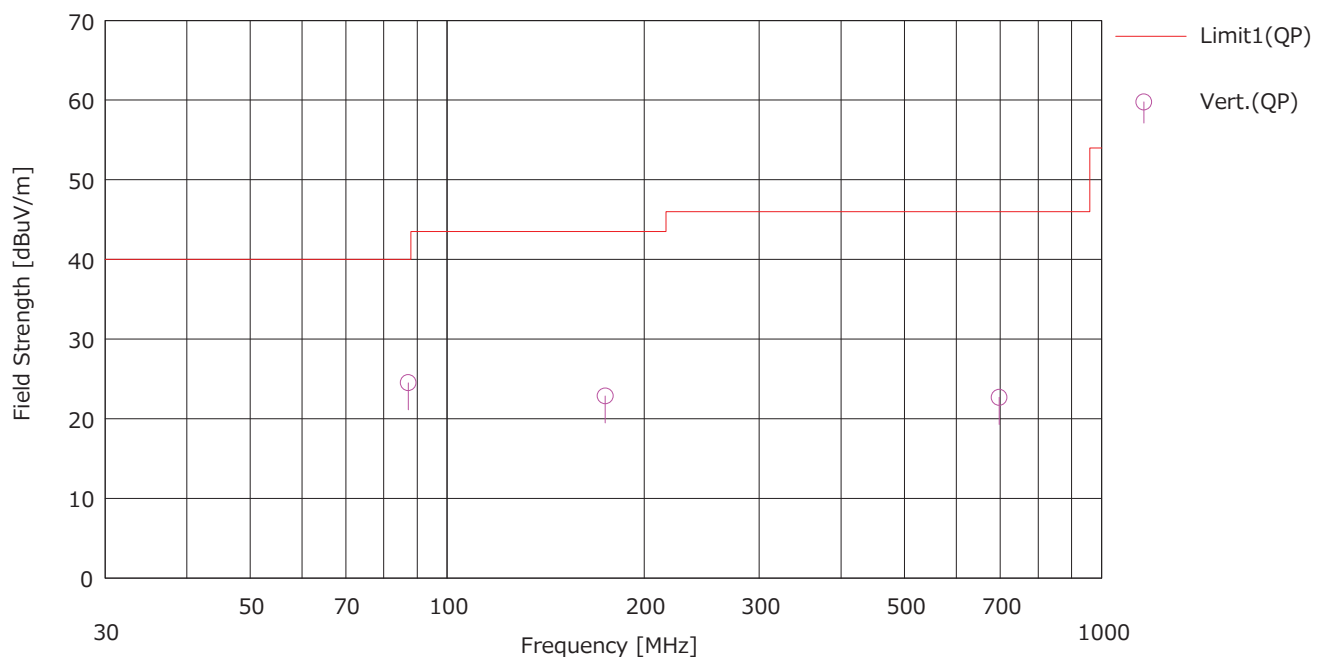
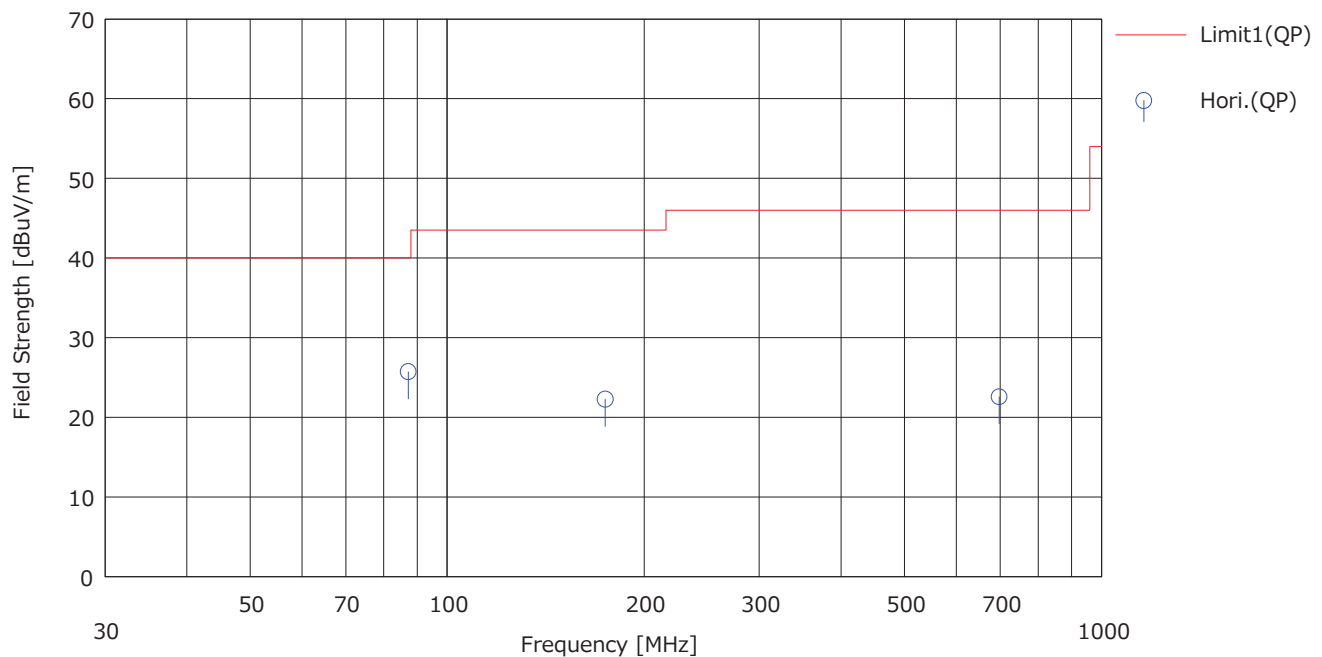
Power : DC 13.2 V

Temp. / Humi. : 20 deg. C / 40 % RH

Remarks : Local (87.0 MHz Receiving)

Limit : FCC Part 15B CLASS B (3m)

Engineer : Seigo Kakehi



# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site  
Date : 01/08/2020

Mode : 1.FM Reception (Main)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 20 deg. C / 40 % RH

Remarks : Local (87.0 MHz Receiving)

Limit : FCC Part 15B CLASS B (3m)

Engineer : Seigo Kakehi

## << QP DATA >>

| No. | Freq.<br>[MHz] | Reading<br><QP><br>[dBuV] | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result<br><QP><br>[dBuV/m] | Limit<br><QP><br>[dBuV/m] | Margn<br><QP><br>[dB] | Pola.<br>[H/V] | Ant.<br>Type | Comment                                              |
|-----|----------------|---------------------------|-------------------|--------------|--------------|---------------|----------------------------|---------------------------|-----------------------|----------------|--------------|------------------------------------------------------|
|     |                |                           |                   |              |              |               |                            |                           |                       |                |              |                                                      |
| 1   | 87.220         | 38.00                     | 9.48              | 7.85         | 29.79        | 0.18          | 25.72                      | 40.00                     | 14.28                 | Hori.          | BA           |                                                      |
| 2   | 87.220         | 36.80                     | 9.48              | 7.85         | 29.79        | 0.18          | 24.52                      | 40.00                     | 15.48                 | Vert.          | BA           |                                                      |
| 3   | 174.440        | 29.40                     | 13.47             | 8.80         | 29.64        | 0.24          | 22.27                      | 43.50                     | 21.23                 | Hori.          | BA           |                                                      |
| 4   | 174.440        | 30.00                     | 13.47             | 8.80         | 29.64        | 0.24          | 22.87                      | 43.50                     | 20.63                 | Vert.          | BA           |                                                      |
| 5   | 261.660        | ---                       | 12.15             | 6.75         | 29.70        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 6   | 261.660        | ---                       | 12.15             | 6.75         | 29.70        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 7   | 348.880        | ---                       | 15.00             | 7.55         | 29.82        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 8   | 348.880        | ---                       | 15.00             | 7.55         | 29.82        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 9   | 436.100        | ---                       | 16.17             | 8.19         | 29.95        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 10  | 436.100        | ---                       | 16.17             | 8.19         | 29.95        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 11  | 523.320        | ---                       | 17.61             | 8.62         | 30.03        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 12  | 523.320        | ---                       | 17.61             | 8.62         | 30.03        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 13  | 610.540        | ---                       | 19.56             | 9.06         | 29.98        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 14  | 610.540        | ---                       | 19.56             | 9.06         | 29.98        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 15  | 697.760        | 23.10                     | 19.85             | 9.54         | 29.92        | 0.00          | 22.57                      | 46.00                     | 23.43                 | Hori.          | LA           |                                                      |
| 16  | 697.760        | 23.20                     | 19.85             | 9.54         | 29.92        | 0.00          | 22.67                      | 46.00                     | 23.33                 | Vert.          | LA           |                                                      |
| 17  | 784.980        | ---                       | 20.77             | 10.04        | 29.74        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 18  | 784.980        | ---                       | 20.77             | 10.04        | 29.74        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 19  | 872.200        | ---                       | 21.81             | 10.53        | 29.33        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 20  | 872.200        | ---                       | 21.81             | 10.53        | 29.33        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 21  | 959.420        | ---                       | 22.13             | 11.04        | 28.91        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 22  | 959.420        | ---                       | 22.13             | 11.04        | 28.91        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |

# DATA OF RADIATED DISTURBANCE TEST

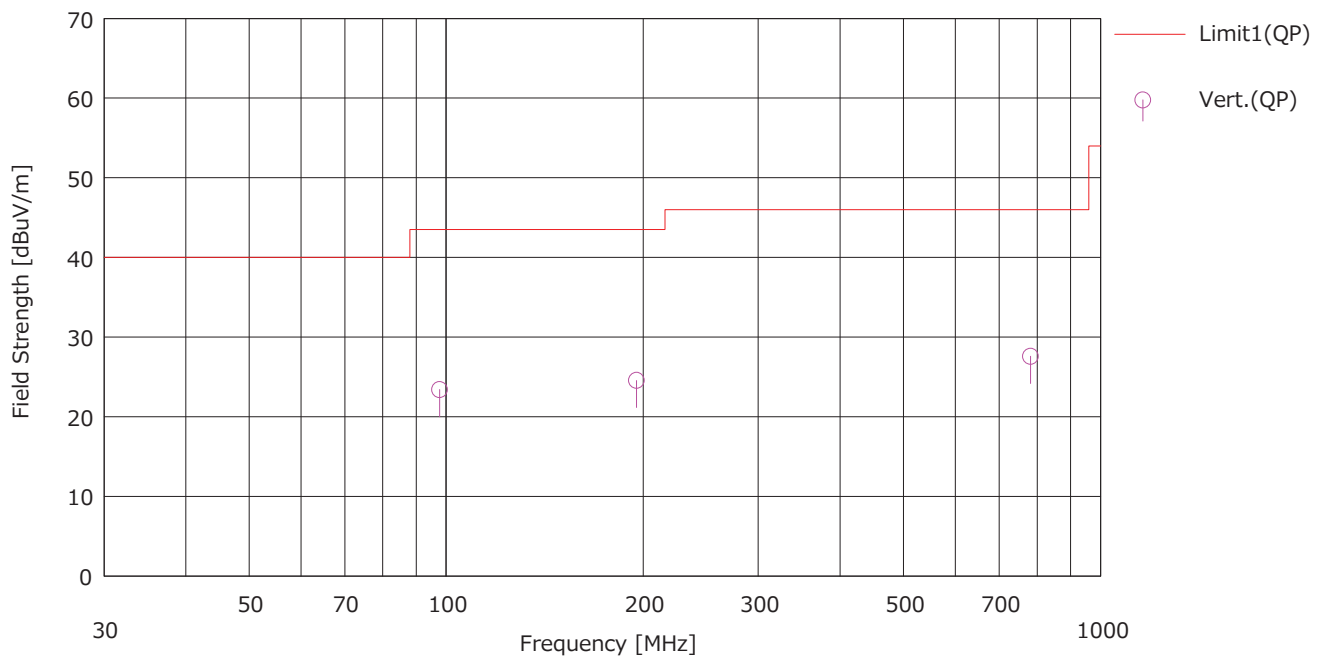
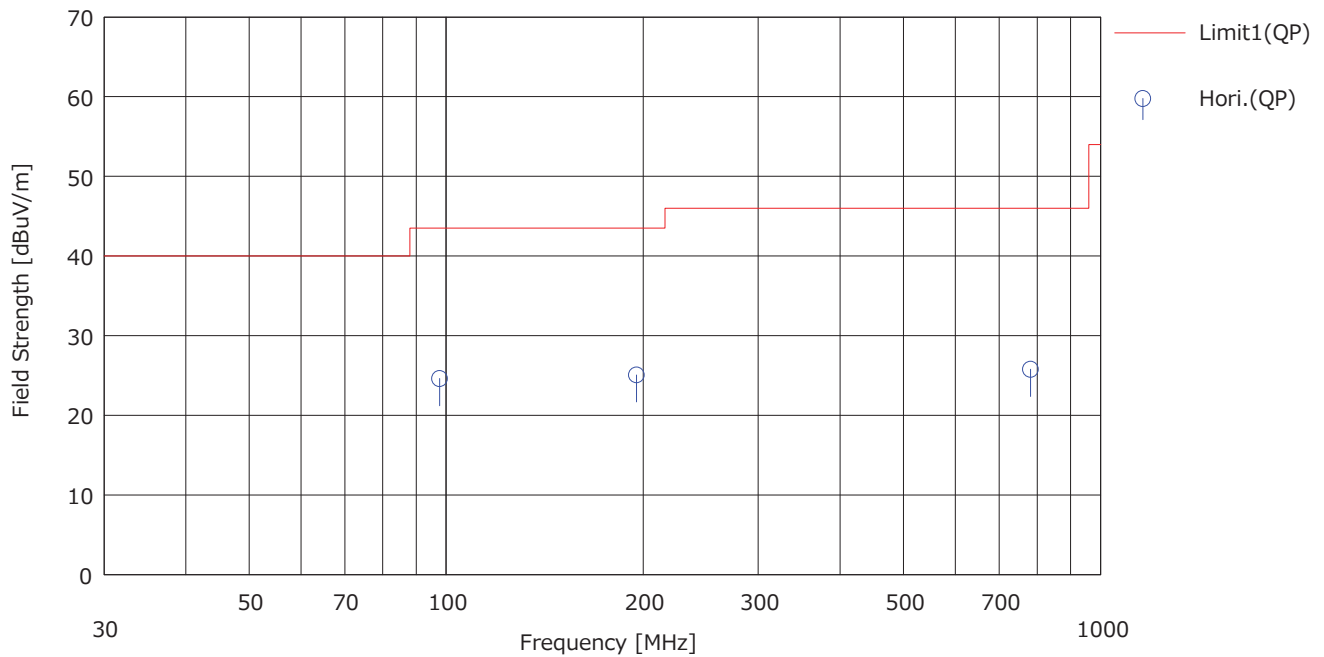
UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site  
Date : 01/08/2020

Mode : 1.FM Reception (Main)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 20 deg. C / 40 % RH

Remarks : Local (97.5 MHz Receiving)

Limit : FCC Part 15B CLASS B (3m)

Engineer : Seigo Kakehi



# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site  
Date : 01/08/2020

Mode : 1.FM Reception (Main)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 20 deg. C / 40 % RH

Remarks : Local (97.5 MHz Receiving)

Limit : FCC Part 15B CLASS B (3m)

Engineer : Seigo Kakehi

## << QP DATA >>

| No. | Freq.<br>[MHz] | Reading<br><QP><br>[dBuV] | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result<br><QP><br>[dBuV/m] | Limit<br><QP><br>[dBuV/m] | Margn<br><QP><br>[dB] | Pola.<br>[H/V] | Ant.<br>Type | Comment                                              |
|-----|----------------|---------------------------|-------------------|--------------|--------------|---------------|----------------------------|---------------------------|-----------------------|----------------|--------------|------------------------------------------------------|
|     |                |                           |                   |              |              |               |                            |                           |                       |                |              |                                                      |
| 1   | 97.720         | 36.10                     | 10.06             | 7.99         | 29.71        | 0.17          | 24.61                      | 43.50                     | 18.89                 | Hori.          | BA           |                                                      |
| 2   | 97.720         | 34.90                     | 10.06             | 7.99         | 29.71        | 0.17          | 23.41                      | 43.50                     | 20.09                 | Vert.          | BA           |                                                      |
| 3   | 195.440        | 31.10                     | 14.60             | 9.01         | 29.62        | -0.03         | 25.06                      | 43.50                     | 18.44                 | Hori.          | BA           |                                                      |
| 4   | 195.440        | 30.60                     | 14.60             | 9.01         | 29.62        | -0.03         | 24.56                      | 43.50                     | 18.94                 | Vert.          | BA           |                                                      |
| 5   | 293.160        | ---                       | 13.38             | 7.05         | 29.74        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 6   | 293.160        | ---                       | 13.38             | 7.05         | 29.74        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 7   | 390.880        | ---                       | 15.38             | 7.93         | 29.89        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 8   | 390.880        | ---                       | 15.38             | 7.93         | 29.89        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 9   | 488.600        | ---                       | 17.39             | 8.44         | 30.03        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 10  | 488.600        | ---                       | 17.39             | 8.44         | 30.03        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 11  | 586.320        | ---                       | 18.94             | 8.93         | 29.99        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 12  | 586.320        | ---                       | 18.94             | 8.93         | 29.99        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 13  | 684.040        | ---                       | 19.69             | 9.47         | 29.93        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 14  | 684.040        | ---                       | 19.69             | 9.47         | 29.93        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 15  | 781.760        | 24.80                     | 20.71             | 10.02        | 29.75        | 0.00          | 25.78                      | 46.00                     | 20.22                 | Hori.          | LA           |                                                      |
| 16  | 781.760        | 26.60                     | 20.71             | 10.02        | 29.75        | 0.00          | 27.58                      | 46.00                     | 18.42                 | Vert.          | LA           |                                                      |
| 17  | 879.480        | ---                       | 21.89             | 10.57        | 29.30        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 18  | 879.480        | ---                       | 21.89             | 10.57        | 29.30        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 19  | 977.200        | ---                       | 22.50             | 11.14        | 28.83        | 0.00          | ---                        | 54.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 20  | 977.200        | ---                       | 22.50             | 11.14        | 28.83        | 0.00          | ---                        | 54.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |

# DATA OF RADIATED DISTURBANCE TEST

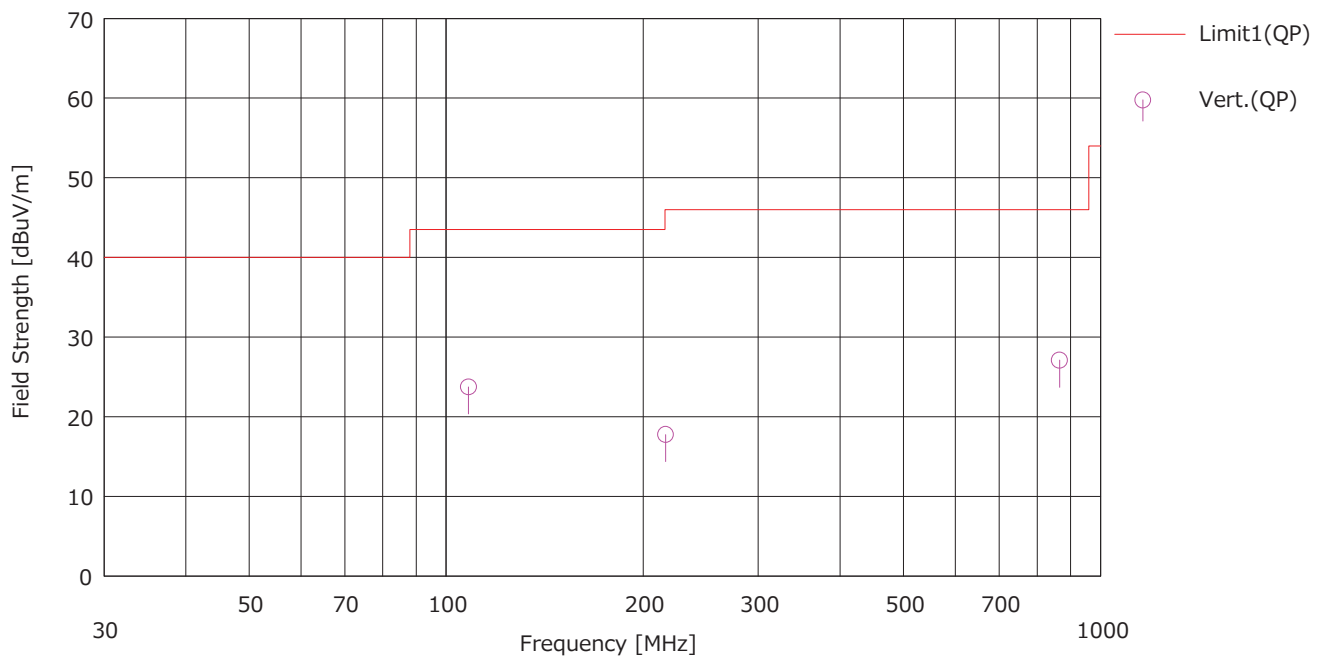
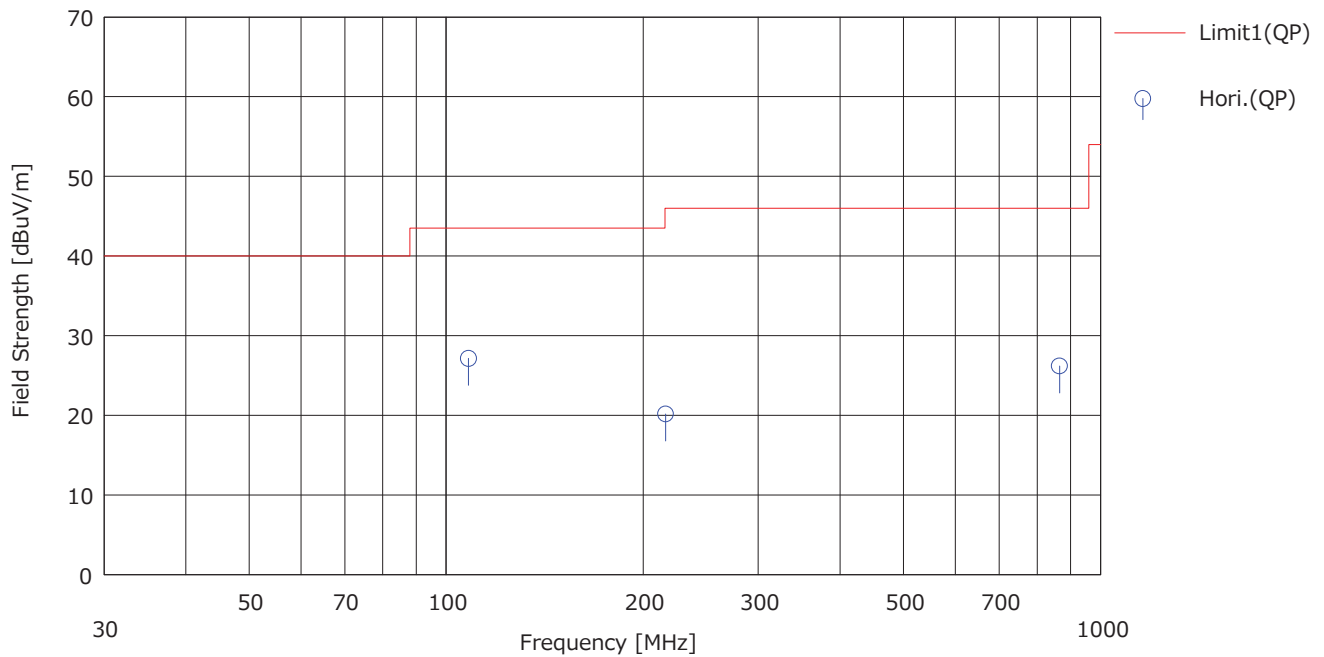
UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site  
Date : 01/08/2020

Mode : 1.FM Reception (Main)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 20 deg. C / 40 % RH

Remarks : Local (108 MHz Receiving)

Limit : FCC Part 15B CLASS B (3m)

Engineer : Seigo Kakehi



# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site  
Date : 01/08/2020

Mode : 1.FM Reception (Main)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 20 deg. C / 40 % RH

Remarks : Local (108 MHz Receiving)

Limit : FCC Part 15B CLASS B (3m)

Engineer : Seigo Kakehi

## << QP DATA >>

| No. | Freq.<br>[MHz] | Reading<br><QP><br>[dBuV] | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result<br><QP><br>[dBuV/m] | Limit<br><QP><br>[dBuV/m] | Margin<br><QP><br>[dB] | Pola.<br>[H/V] | Ant.<br>Type | Comment                                              |
|-----|----------------|---------------------------|-------------------|--------------|--------------|---------------|----------------------------|---------------------------|------------------------|----------------|--------------|------------------------------------------------------|
|     |                |                           |                   |              |              |               |                            |                           |                        |                |              |                                                      |
| 1   | 108.220        | 37.80                     | 10.86             | 8.10         | 29.68        | 0.06          | 27.14                      | 43.50                     | 16.36                  | Hori.          | BA           |                                                      |
| 2   | 108.220        | 34.40                     | 10.86             | 8.10         | 29.68        | 0.06          | 23.74                      | 43.50                     | 19.76                  | Vert.          | BA           |                                                      |
| 3   | 216.440        | 32.50                     | 11.00             | 6.31         | 29.64        | 0.00          | 20.17                      | 46.00                     | 25.83                  | Hori.          | LA           |                                                      |
| 4   | 216.440        | 30.10                     | 11.00             | 6.31         | 29.64        | 0.00          | 17.77                      | 46.00                     | 28.23                  | Vert.          | LA           |                                                      |
| 5   | 324.660        | ---                       | 14.40             | 7.34         | 29.79        | 0.00          | ---                        | 46.00                     | ---                    | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 6   | 324.660        | ---                       | 14.40             | 7.34         | 29.79        | 0.00          | ---                        | 46.00                     | ---                    | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 7   | 432.880        | ---                       | 16.11             | 8.17         | 29.95        | 0.00          | ---                        | 46.00                     | ---                    | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 8   | 432.880        | ---                       | 16.11             | 8.17         | 29.95        | 0.00          | ---                        | 46.00                     | ---                    | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 9   | 541.100        | ---                       | 17.64             | 8.71         | 30.02        | 0.00          | ---                        | 46.00                     | ---                    | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 10  | 541.100        | ---                       | 17.64             | 8.71         | 30.02        | 0.00          | ---                        | 46.00                     | ---                    | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 11  | 649.320        | ---                       | 19.22             | 9.27         | 29.95        | 0.00          | ---                        | 46.00                     | ---                    | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 12  | 649.320        | ---                       | 19.22             | 9.27         | 29.95        | 0.00          | ---                        | 46.00                     | ---                    | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 13  | 757.540        | ---                       | 20.21             | 9.88         | 29.80        | 0.00          | ---                        | 46.00                     | ---                    | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 14  | 757.540        | ---                       | 20.21             | 9.88         | 29.80        | 0.00          | ---                        | 46.00                     | ---                    | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 15  | 865.760        | 23.20                     | 21.87             | 10.49        | 29.37        | 0.00          | 26.19                      | 46.00                     | 19.81                  | Hori.          | LA           |                                                      |
| 16  | 865.760        | 24.10                     | 21.87             | 10.49        | 29.37        | 0.00          | 27.09                      | 46.00                     | 18.91                  | Vert.          | LA           |                                                      |
| 17  | 973.980        | ---                       | 22.37             | 11.12        | 28.84        | 0.00          | ---                        | 54.00                     | ---                    | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 18  | 973.980        | ---                       | 22.37             | 11.12        | 28.84        | 0.00          | ---                        | 54.00                     | ---                    | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |

# DATA OF RADIATED DISTURBANCE TEST

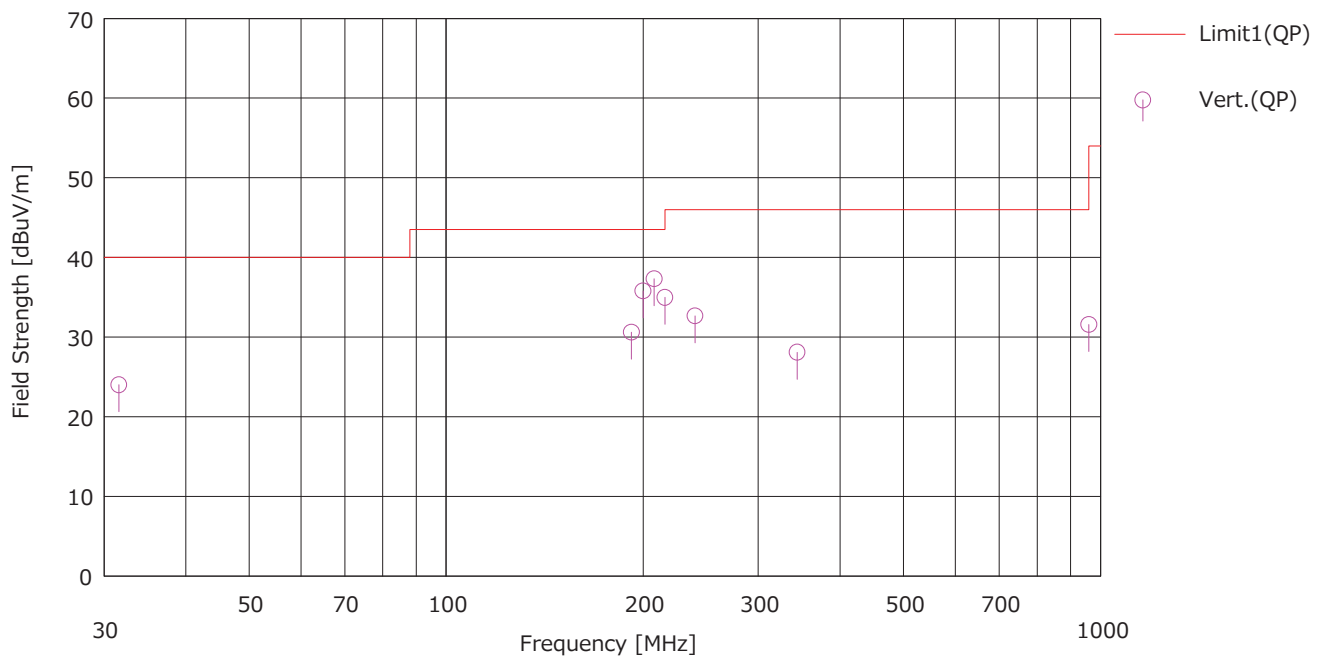
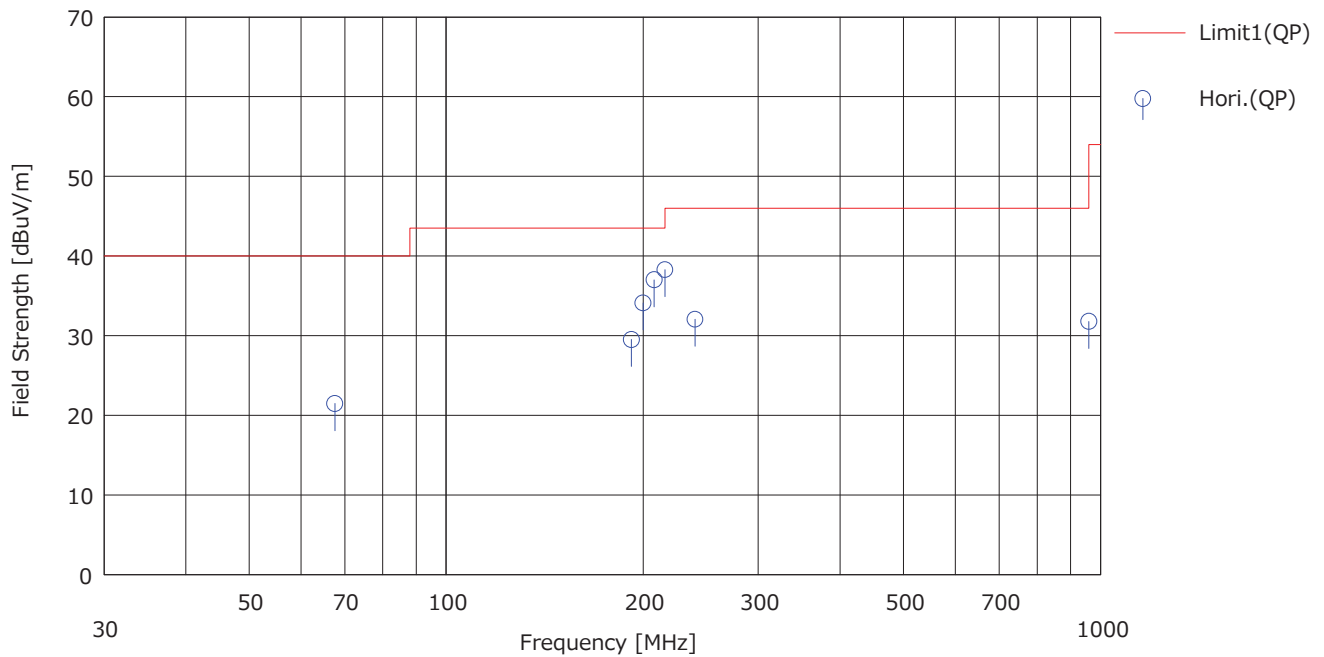
UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site  
Date : 01/08/2020

Mode : 1.FM Reception (Main)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 20 deg. C / 40 % RH

Remarks : -

Limit : FCC Part 15B CLASS B (3m)

Engineer : Hiromichi Nakai



# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site  
Date : 01/08/2020

Mode : 1.FM Reception (Main)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 20 deg. C / 40 % RH

Remarks : -

Limit : FCC Part 15B CLASS B (3m)

Engineer : Hiromichi Nakai

## << QP DATA >>

| No. | Freq.<br>[MHz] | Reading<br><QP> | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result<br><QP> | Limit<br><QP> | Margin<br><QP> | Pola.<br>[H/V] | Ant.<br>Type | Comment |
|-----|----------------|-----------------|-------------------|--------------|--------------|---------------|----------------|---------------|----------------|----------------|--------------|---------|
|     |                | [dBuV]          |                   |              |              |               | [dBuV/m]       | [dBuV/m]      | [dB]           |                |              |         |
| 1   | 31.620         | 33.70           | 13.28             | 7.05         | 29.88        | -0.14         | 24.01          | 40.00         | 15.99          | Vert.          | BA           |         |
| 2   | 67.604         | 34.30           | 9.62              | 7.59         | 29.86        | -0.18         | 21.47          | 40.00         | 18.53          | Hori.          | BA           |         |
| 3   | 191.992        | 35.60           | 14.54             | 8.98         | 29.63        | 0.02          | 29.51          | 43.50         | 13.99          | Hori.          | BA           |         |
| 4   | 191.998        | 36.70           | 14.54             | 8.98         | 29.63        | 0.02          | 30.61          | 43.50         | 12.89          | Vert.          | BA           |         |
| 5   | 200.001        | 47.80           | 11.47             | 6.15         | 29.62        | 0.00          | 35.80          | 43.50         | 7.70           | Vert.          | LA           |         |
| 6   | 200.002        | 46.10           | 11.47             | 6.15         | 29.62        | 0.00          | 34.10          | 43.50         | 9.40           | Hori.          | LA           |         |
| 7   | 208.001        | 49.40           | 11.02             | 6.23         | 29.63        | 0.00          | 37.02          | 43.50         | 6.48           | Hori.          | LA           |         |
| 8   | 208.002        | 49.70           | 11.02             | 6.23         | 29.63        | 0.00          | 37.32          | 43.50         | 6.18           | Vert.          | LA           |         |
| 9   | 215.995        | 47.30           | 11.01             | 6.31         | 29.64        | 0.00          | 34.98          | 43.50         | 8.52           | Vert.          | LA           |         |
| 10  | 216.001        | 50.60           | 11.01             | 6.31         | 29.64        | 0.00          | 38.28          | 46.00         | 7.72           | Hori.          | LA           |         |
| 11  | 240.003        | 43.60           | 11.59             | 6.54         | 29.67        | 0.00          | 32.06          | 46.00         | 13.94          | Hori.          | LA           |         |
| 12  | 240.004        | 44.20           | 11.59             | 6.54         | 29.67        | 0.00          | 32.66          | 46.00         | 13.34          | Vert.          | LA           |         |
| 13  | 344.000        | 35.40           | 15.01             | 7.51         | 29.82        | 0.00          | 28.10          | 46.00         | 17.90          | Vert.          | LA           |         |
| 14  | 959.993        | 27.50           | 22.15             | 11.04        | 28.91        | 0.00          | 31.78          | 46.00         | 14.22          | Hori.          | LA           |         |
| 15  | 959.995        | 27.30           | 22.15             | 11.04        | 28.91        | 0.00          | 31.58          | 46.00         | 14.42          | Vert.          | LA           |         |

# DATA OF RADIATED DISTURBANCE TEST

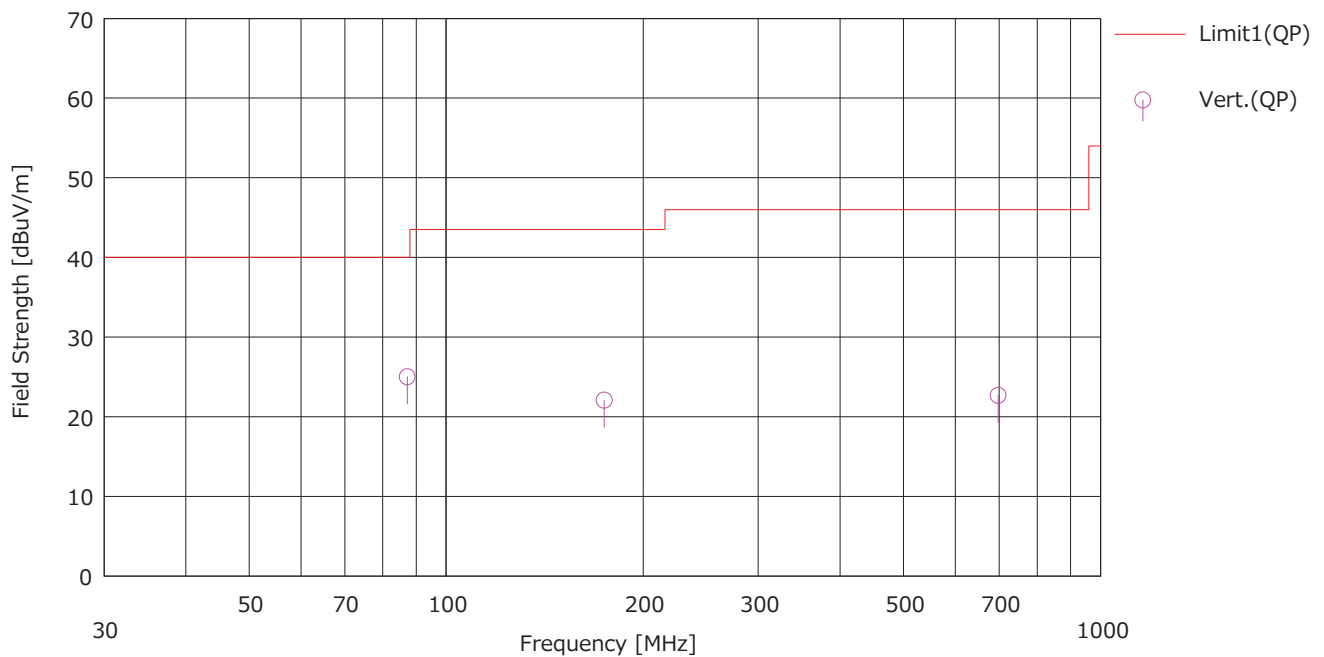
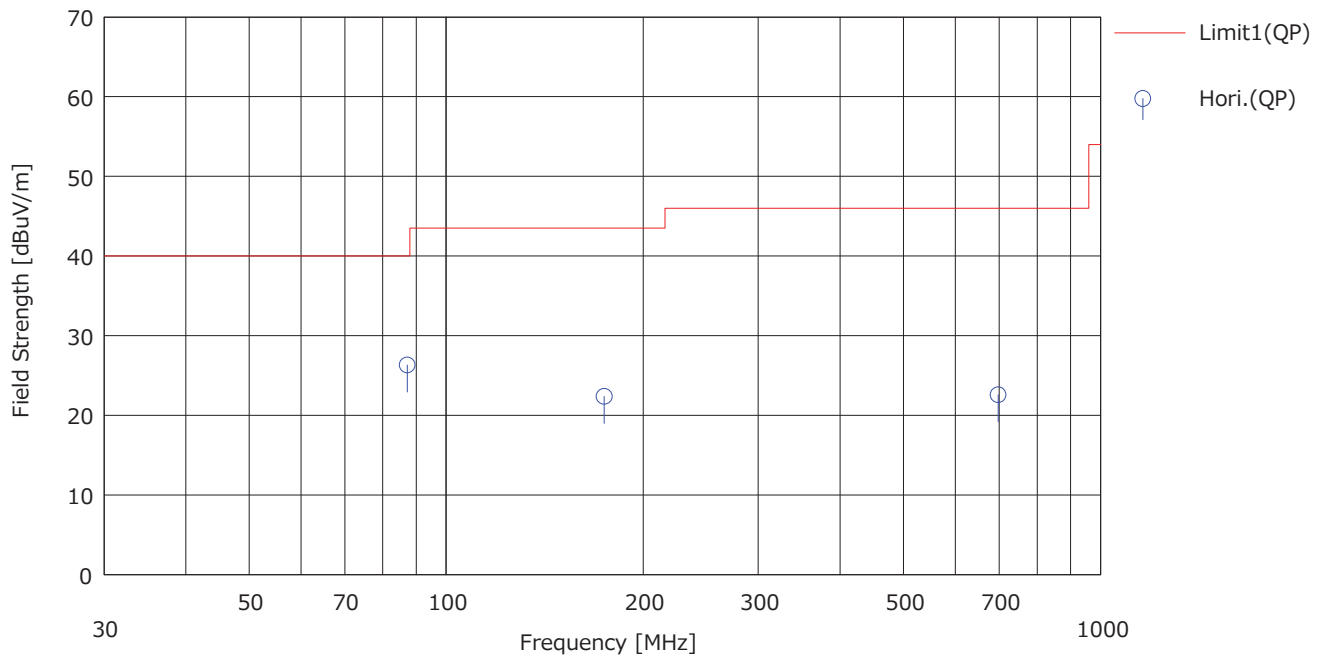
UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site  
Date : 01/08/2020

Mode : 1.FM Reception (SUB)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 20 deg. C / 40 % RH

Remarks : Local (87.0 MHz Receiving)

Limit : FCC Part 15B CLASS B (3m)

Engineer : Seigo Kakehi



# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site  
Date : 01/08/2020

Mode : 1.FM Reception (SUB)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 20 deg. C / 40 % RH

Remarks : Local (87.0 MHz Receiving)

Limit : FCC Part 15B CLASS B (3m)

Engineer : Seigo Kakehi

## << QP DATA >>

| No. | Freq.<br>[MHz] | Reading<br><QP><br>[dBuV] | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result<br><QP><br>[dBuV/m] | Limit<br><QP><br>[dBuV/m] | Margn<br><QP><br>[dB] | Pola.<br>[H/V] | Ant.<br>Type | Comment                                              |
|-----|----------------|---------------------------|-------------------|--------------|--------------|---------------|----------------------------|---------------------------|-----------------------|----------------|--------------|------------------------------------------------------|
|     |                |                           |                   |              |              |               |                            |                           |                       |                |              |                                                      |
| 1   | 87.220         | 38.60                     | 9.48              | 7.85         | 29.79        | 0.18          | 26.32                      | 40.00                     | 13.68                 | Hori.          | BA           |                                                      |
| 2   | 87.220         | 37.30                     | 9.48              | 7.85         | 29.79        | 0.18          | 25.02                      | 40.00                     | 14.98                 | Vert.          | BA           |                                                      |
| 3   | 174.440        | 29.50                     | 13.47             | 8.80         | 29.64        | 0.24          | 22.37                      | 43.50                     | 21.13                 | Hori.          | BA           |                                                      |
| 4   | 174.440        | 29.20                     | 13.47             | 8.80         | 29.64        | 0.24          | 22.07                      | 43.50                     | 21.43                 | Vert.          | BA           |                                                      |
| 5   | 261.660        | ---                       | 12.15             | 6.75         | 29.70        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 6   | 261.660        | ---                       | 12.15             | 6.75         | 29.70        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 7   | 348.880        | ---                       | 15.00             | 7.55         | 29.82        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 8   | 348.880        | ---                       | 15.00             | 7.55         | 29.82        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 9   | 436.100        | ---                       | 16.17             | 8.19         | 29.95        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 10  | 436.100        | ---                       | 16.17             | 8.19         | 29.95        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 11  | 523.320        | ---                       | 17.61             | 8.62         | 30.03        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 12  | 523.320        | ---                       | 17.61             | 8.62         | 30.03        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 13  | 610.540        | ---                       | 19.56             | 9.06         | 29.98        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 14  | 610.540        | ---                       | 19.56             | 9.06         | 29.98        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 15  | 697.760        | 23.10                     | 19.85             | 9.54         | 29.92        | 0.00          | 22.57                      | 46.00                     | 23.43                 | Hori.          | LA           |                                                      |
| 16  | 697.760        | 23.20                     | 19.85             | 9.54         | 29.92        | 0.00          | 22.67                      | 46.00                     | 23.33                 | Vert.          | LA           |                                                      |
| 17  | 784.980        | ---                       | 20.77             | 10.04        | 29.74        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 18  | 784.980        | ---                       | 20.77             | 10.04        | 29.74        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 19  | 872.200        | ---                       | 21.81             | 10.53        | 29.33        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 20  | 872.200        | ---                       | 21.81             | 10.53        | 29.33        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 21  | 959.420        | ---                       | 22.13             | 11.04        | 28.91        | 0.00          | ---                        | 46.00                     | ---                   | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 22  | 959.420        | ---                       | 22.13             | 11.04        | 28.91        | 0.00          | ---                        | 46.00                     | ---                   | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |

# DATA OF RADIATED DISTURBANCE TEST

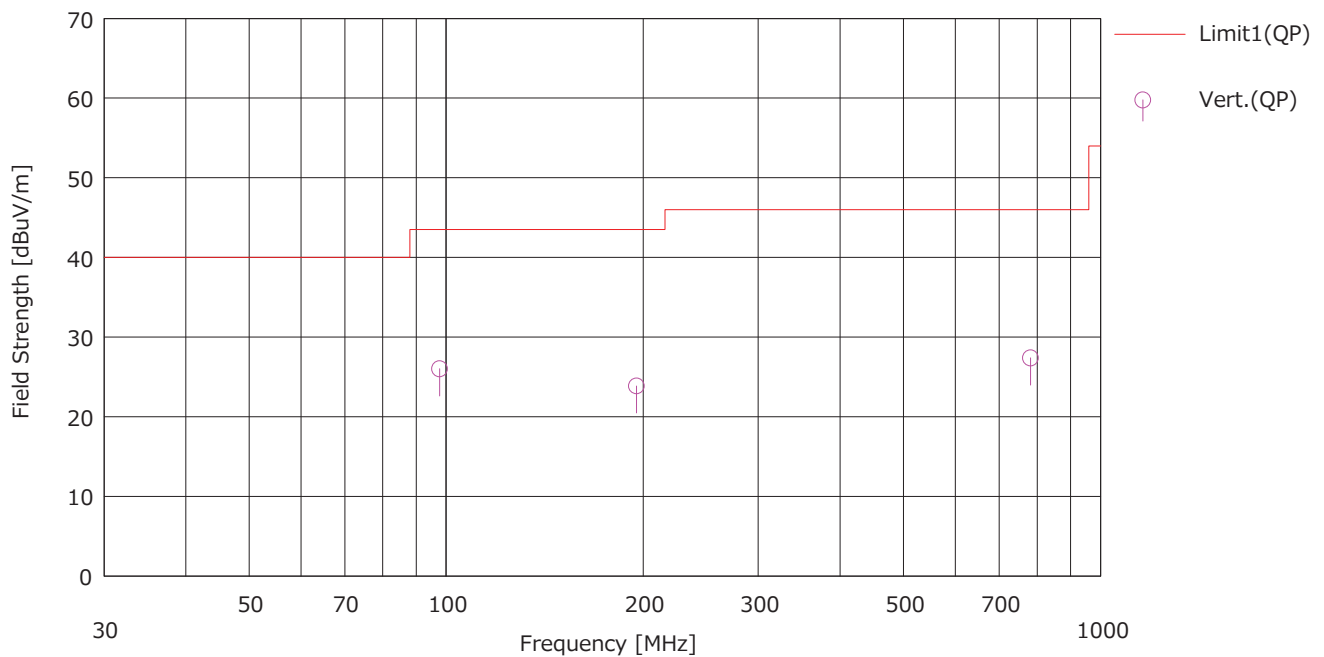
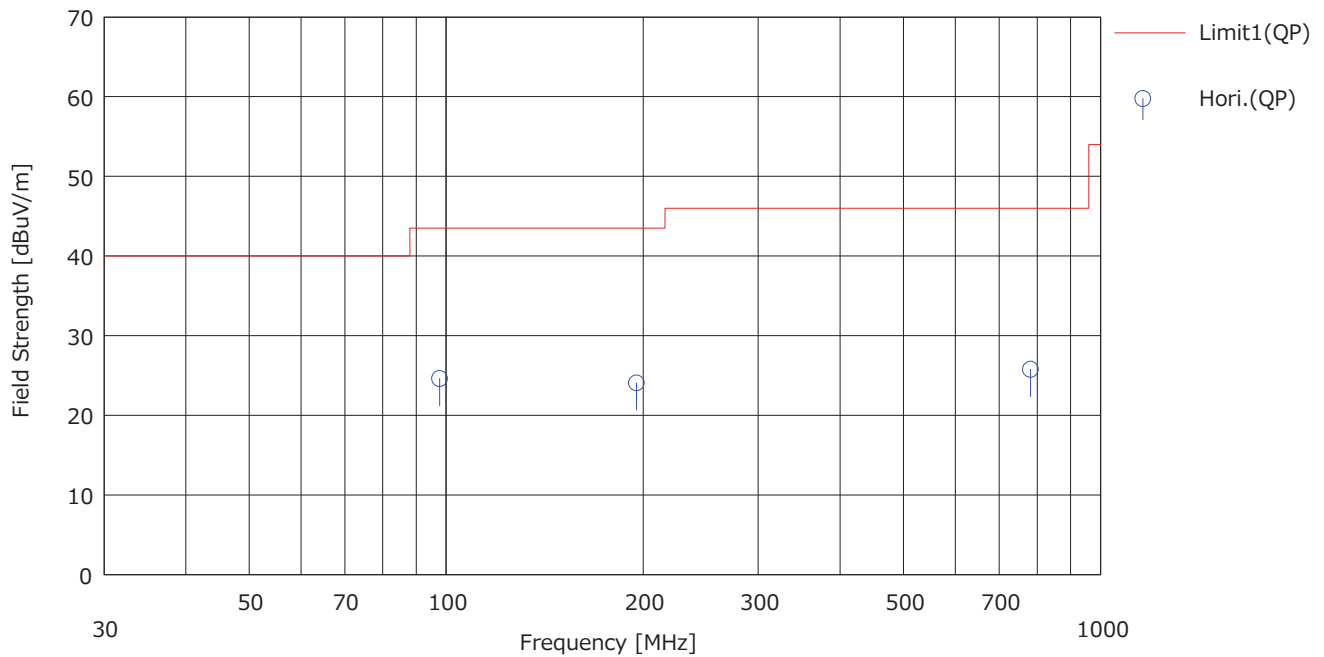
UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site  
Date : 01/08/2020

Mode : 1.FM Reception (Sub)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 20 deg. C / 40 % RH

Remarks : Local (97.5 MHz Receiving)

Limit : FCC Part 15B CLASS B (3m)

Engineer : Seigo Kakehi



# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site  
Date : 01/08/2020

Mode : 1.FM Reception (Sub)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 20 deg. C / 40 % RH

Remarks : Local (97.5 MHz Receiving)

Limit : FCC Part 15B CLASS B (3m)

Engineer : Seigo Kakehi

## << QP DATA >>

| No. | Freq.<br>[MHz] | Reading<br><QP> | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result<br><QP> | Limit<br><QP> | Margn<br><QP> | Pola.<br>[H/V] | Ant.<br>Type | Comment                                              |
|-----|----------------|-----------------|-------------------|--------------|--------------|---------------|----------------|---------------|---------------|----------------|--------------|------------------------------------------------------|
|     |                | [dBuV]          |                   |              |              |               | [dBuV/m]       | [dBuV/m]      | [dB]          |                |              |                                                      |
| 1   | 97.720         | 36.10           | 10.06             | 7.99         | 29.71        | 0.17          | 24.61          | 43.50         | 18.89         | Hori.          | BA           |                                                      |
| 2   | 97.720         | 37.50           | 10.06             | 7.99         | 29.71        | 0.17          | 26.01          | 43.50         | 17.49         | Vert.          | BA           |                                                      |
| 3   | 195.440        | 30.10           | 14.60             | 9.01         | 29.62        | -0.03         | 24.06          | 43.50         | 19.44         | Hori.          | BA           |                                                      |
| 4   | 195.440        | 29.90           | 14.60             | 9.01         | 29.62        | -0.03         | 23.86          | 43.50         | 19.64         | Vert.          | BA           |                                                      |
| 5   | 293.160        | ---             | 13.38             | 7.05         | 29.74        | 0.00          | ---            | 46.00         | ---           | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 6   | 293.160        | ---             | 13.38             | 7.05         | 29.74        | 0.00          | ---            | 46.00         | ---           | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 7   | 390.880        | ---             | 15.38             | 7.93         | 29.89        | 0.00          | ---            | 46.00         | ---           | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 8   | 390.880        | ---             | 15.38             | 7.93         | 29.89        | 0.00          | ---            | 46.00         | ---           | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 9   | 488.600        | ---             | 17.39             | 8.44         | 30.03        | 0.00          | ---            | 46.00         | ---           | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 10  | 488.600        | ---             | 17.39             | 8.44         | 30.03        | 0.00          | ---            | 46.00         | ---           | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 11  | 586.320        | ---             | 18.94             | 8.93         | 29.99        | 0.00          | ---            | 46.00         | ---           | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 12  | 586.320        | ---             | 18.94             | 8.93         | 29.99        | 0.00          | ---            | 46.00         | ---           | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 13  | 684.040        | ---             | 19.69             | 9.47         | 29.93        | 0.00          | ---            | 46.00         | ---           | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 14  | 684.040        | ---             | 19.69             | 9.47         | 29.93        | 0.00          | ---            | 46.00         | ---           | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 15  | 781.760        | 24.80           | 20.71             | 10.02        | 29.75        | 0.00          | 25.78          | 46.00         | 20.22         | Hori.          | LA           |                                                      |
| 16  | 781.760        | 26.40           | 20.71             | 10.02        | 29.75        | 0.00          | 27.38          | 46.00         | 18.62         | Vert.          | LA           |                                                      |
| 17  | 879.480        | ---             | 21.89             | 10.57        | 29.30        | 0.00          | ---            | 46.00         | ---           | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 18  | 879.480        | ---             | 21.89             | 10.57        | 29.30        | 0.00          | ---            | 46.00         | ---           | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 19  | 977.200        | ---             | 22.50             | 11.14        | 28.83        | 0.00          | ---            | 54.00         | ---           | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 20  | 977.200        | ---             | 22.50             | 11.14        | 28.83        | 0.00          | ---            | 54.00         | ---           | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |

# DATA OF RADIATED DISTURBANCE TEST

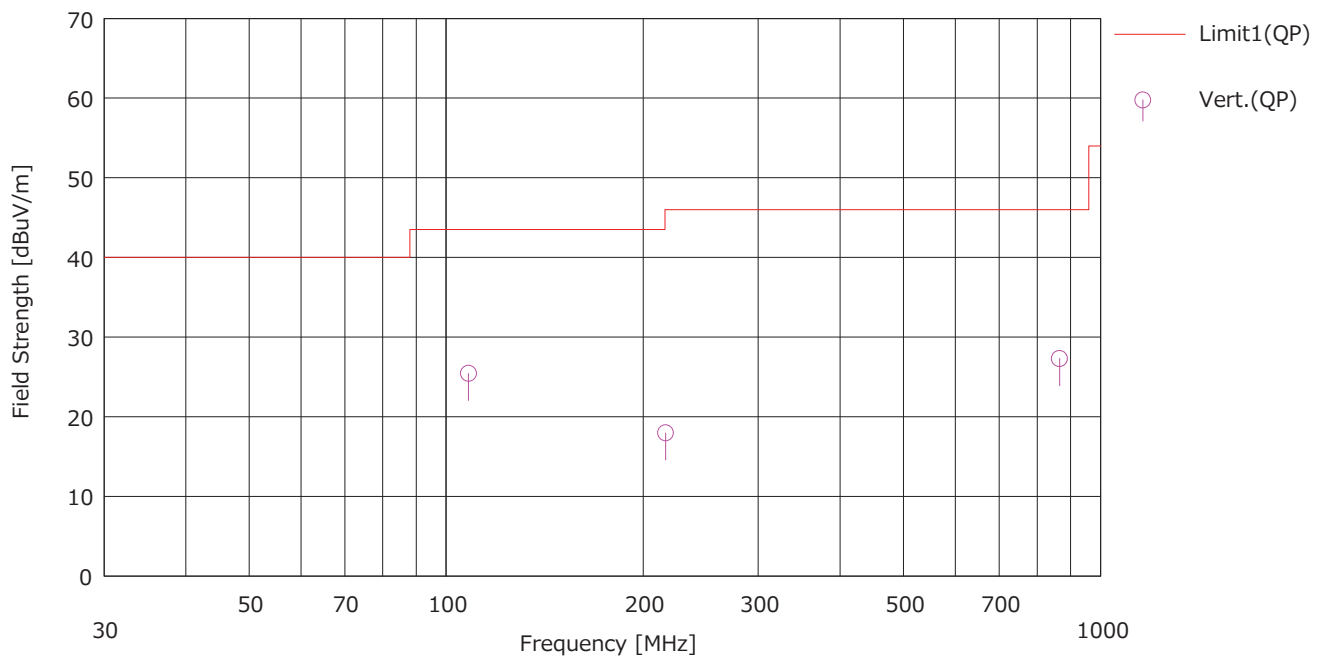
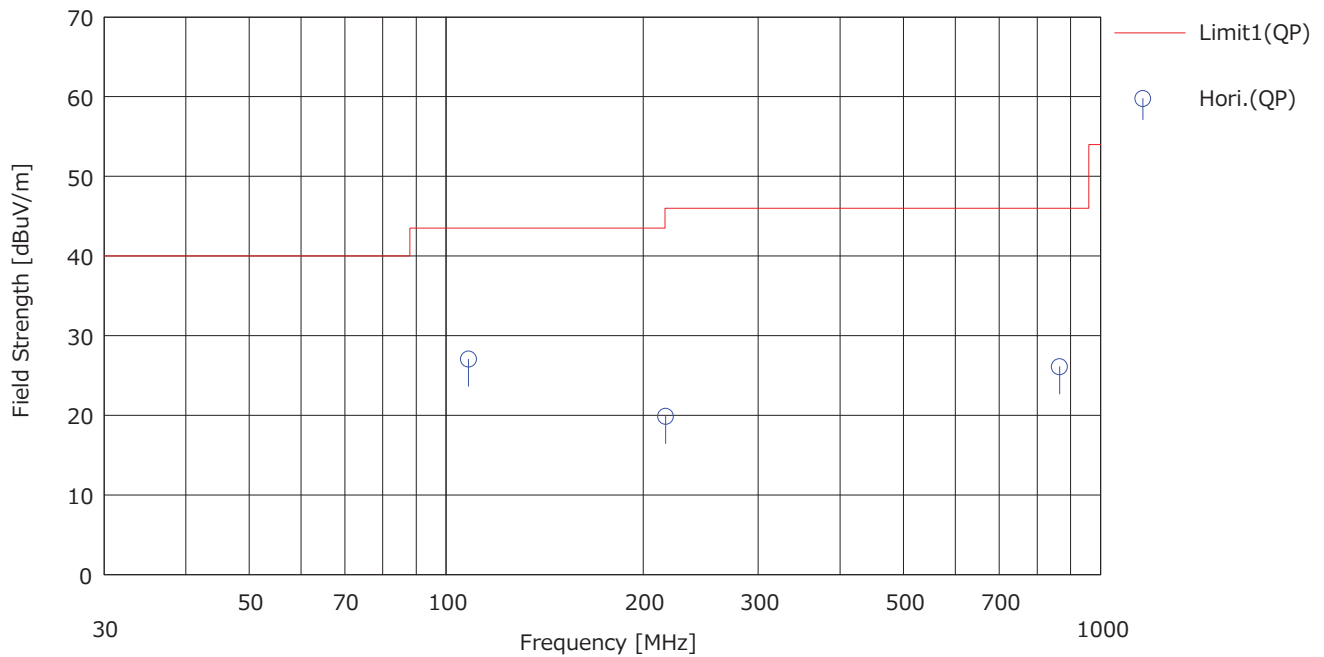
UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site  
Date : 01/08/2020

Mode : 1.FM Reception (Sub)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 20 deg. C / 40 % RH

Remarks : Local (108 MHz Receiving)

Limit : FCC Part 15B CLASS B (3m)

Engineer : Seigo Kakehi



# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site  
Date : 01/08/2020

Mode : 1.FM Reception (Sub)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 20 deg. C / 40 % RH

Remarks : Local (108 MHz Receiving)

Limit : FCC Part 15B CLASS B (3m)

Engineer : Seigo Kakehi

## << QP DATA >>

| No. | Freq.<br>[MHz] | Reading<br><QP><br>[dBuV] | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result<br><QP><br>[dBuV/m] | Limit<br><QP><br>[dBuV/m] | Margin<br><QP><br>[dB] | Pola.<br>[H/V] | Ant.<br>Type | Comment                                              |
|-----|----------------|---------------------------|-------------------|--------------|--------------|---------------|----------------------------|---------------------------|------------------------|----------------|--------------|------------------------------------------------------|
|     |                |                           |                   |              |              |               |                            |                           |                        |                |              |                                                      |
| 1   | 108.220        | 37.70                     | 10.86             | 8.10         | 29.68        | 0.06          | 27.04                      | 43.50                     | 16.46                  | Hori.          | BA           |                                                      |
| 2   | 108.220        | 36.10                     | 10.86             | 8.10         | 29.68        | 0.06          | 25.44                      | 43.50                     | 18.06                  | Vert.          | BA           |                                                      |
| 3   | 216.440        | 32.20                     | 11.00             | 6.31         | 29.64        | 0.00          | 19.87                      | 46.00                     | 26.13                  | Hori.          | LA           |                                                      |
| 4   | 216.440        | 30.30                     | 11.00             | 6.31         | 29.64        | 0.00          | 17.97                      | 46.00                     | 28.03                  | Vert.          | LA           |                                                      |
| 5   | 324.660        | ---                       | 14.40             | 7.34         | 29.79        | 0.00          | ---                        | 46.00                     | ---                    | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 6   | 324.660        | ---                       | 14.40             | 7.34         | 29.79        | 0.00          | ---                        | 46.00                     | ---                    | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 7   | 432.880        | ---                       | 16.11             | 8.17         | 29.95        | 0.00          | ---                        | 46.00                     | ---                    | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 8   | 432.880        | ---                       | 16.11             | 8.17         | 29.95        | 0.00          | ---                        | 46.00                     | ---                    | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 9   | 541.100        | ---                       | 17.64             | 8.71         | 30.02        | 0.00          | ---                        | 46.00                     | ---                    | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 10  | 541.100        | ---                       | 17.64             | 8.71         | 30.02        | 0.00          | ---                        | 46.00                     | ---                    | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 11  | 649.320        | ---                       | 19.22             | 9.27         | 29.95        | 0.00          | ---                        | 46.00                     | ---                    | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 12  | 649.320        | ---                       | 19.22             | 9.27         | 29.95        | 0.00          | ---                        | 46.00                     | ---                    | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 13  | 757.540        | ---                       | 20.21             | 9.88         | 29.80        | 0.00          | ---                        | 46.00                     | ---                    | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 14  | 757.540        | ---                       | 20.21             | 9.88         | 29.80        | 0.00          | ---                        | 46.00                     | ---                    | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 15  | 865.760        | 23.10                     | 21.87             | 10.49        | 29.37        | 0.00          | 26.09                      | 46.00                     | 19.91                  | Hori.          | LA           |                                                      |
| 16  | 865.760        | 24.30                     | 21.87             | 10.49        | 29.37        | 0.00          | 27.29                      | 46.00                     | 18.71                  | Vert.          | LA           |                                                      |
| 17  | 973.980        | ---                       | 22.37             | 11.12        | 28.84        | 0.00          | ---                        | 54.00                     | ---                    | Hori.          | LA           | It has been confirmed that the margin exceeds 20 dB. |
| 18  | 973.980        | ---                       | 22.37             | 11.12        | 28.84        | 0.00          | ---                        | 54.00                     | ---                    | Vert.          | LA           | It has been confirmed that the margin exceeds 20 dB. |

# DATA OF RADIATED DISTURBANCE TEST

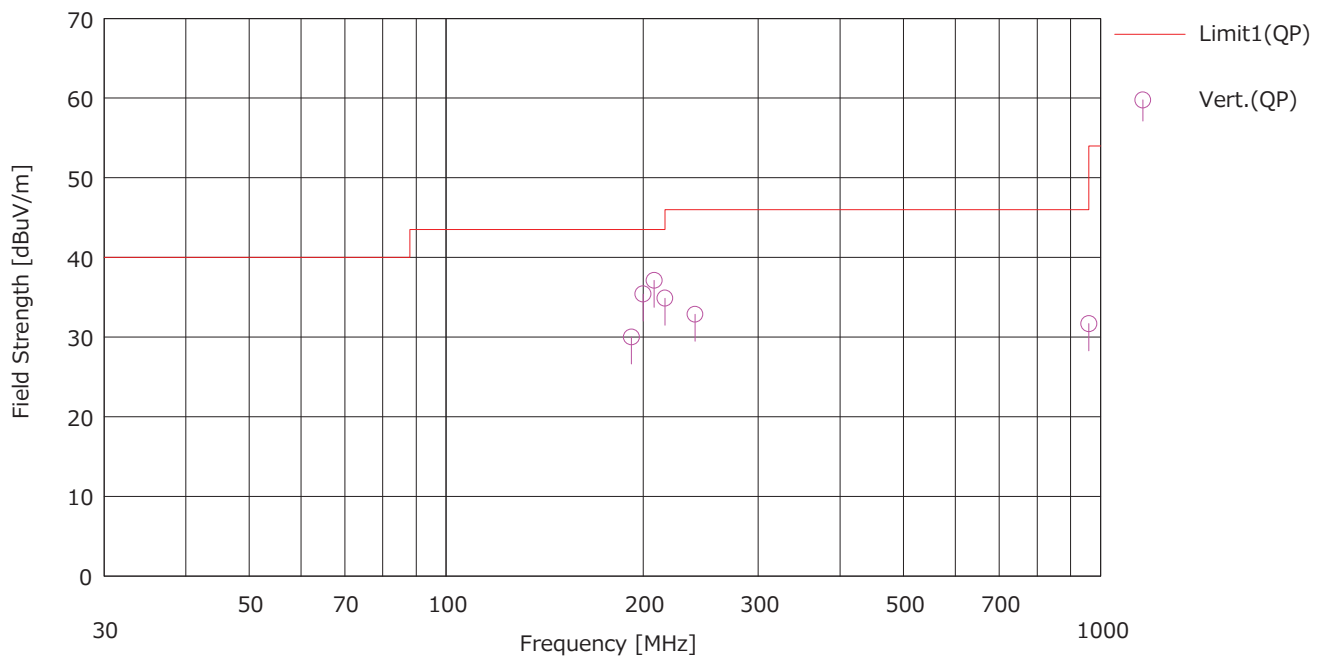
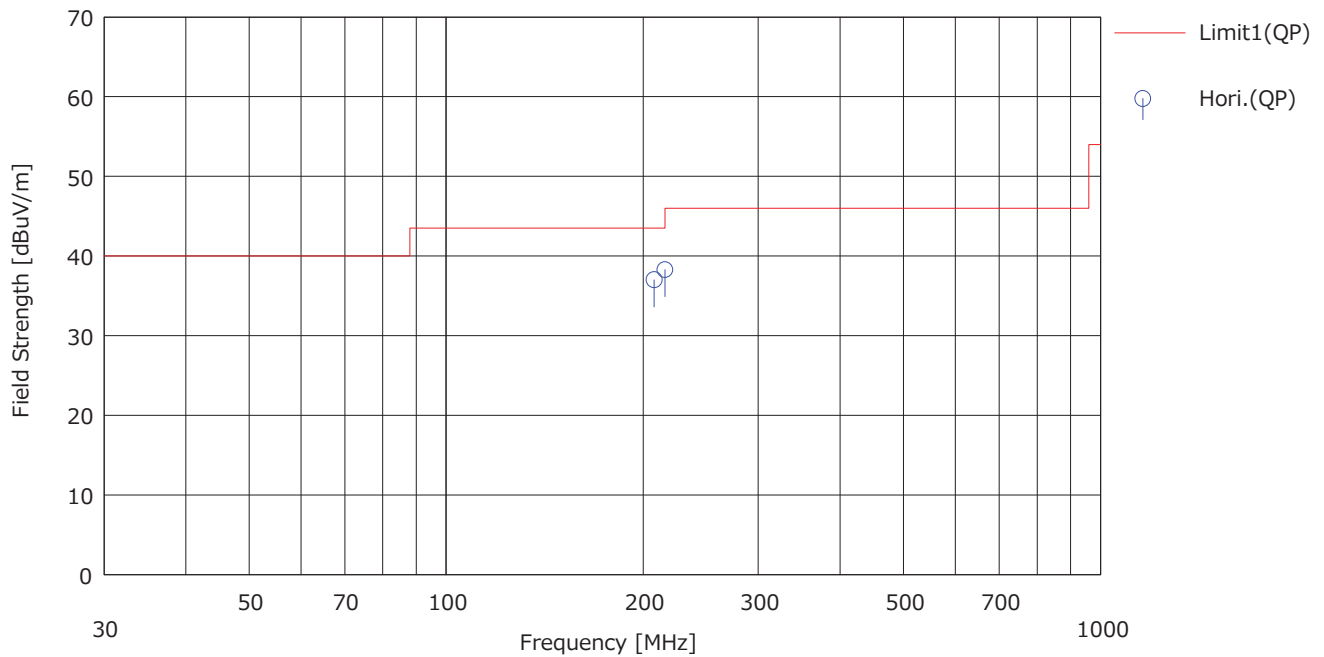
UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site  
Date : 01/08/2020

Mode : 1.FM Reception (SUB)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 20 deg. C / 40 % RH

Remarks : -

Limit : FCC Part 15B CLASS B (3m)

Engineer : Hiromichi Nakai



# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 2 Open area test site  
Date : 01/08/2020

Mode : 1.FM Reception (SUB)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 20 deg. C / 40 % RH

Remarks : -

Limit : FCC Part 15B CLASS B (3m)

Engineer : Hiromichi Nakai

## << QP DATA >>

| No. | Freq.<br>[MHz] | Reading<br><QP> | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result<br><QP> | Limit<br><QP> | Margin<br><QP> | Pola.<br>[H/V] | Ant.<br>Type | Comment |
|-----|----------------|-----------------|-------------------|--------------|--------------|---------------|----------------|---------------|----------------|----------------|--------------|---------|
|     |                | [dBuV]          |                   |              |              |               | [dBuV/m]       | [dBuV/m]      | [dB]           |                |              |         |
| 1   | 191.998        | 36.10           | 14.54             | 8.98         | 29.63        | 0.02          | 30.01          | 43.50         | 13.49          | Vert.          | BA           |         |
| 2   | 200.002        | 47.40           | 11.47             | 6.15         | 29.62        | 0.00          | 35.40          | 43.50         | 8.10           | Vert.          | LA           |         |
| 3   | 207.999        | 49.40           | 11.02             | 6.23         | 29.63        | 0.00          | 37.02          | 43.50         | 6.48           | Hori.          | LA           |         |
| 4   | 208.000        | 49.50           | 11.02             | 6.23         | 29.63        | 0.00          | 37.12          | 43.50         | 6.38           | Vert.          | LA           |         |
| 5   | 216.000        | 47.20           | 11.01             | 6.31         | 29.64        | 0.00          | 34.88          | 43.50         | 8.62           | Vert.          | LA           |         |
| 6   | 216.002        | 50.60           | 11.01             | 6.31         | 29.64        | 0.00          | 38.28          | 46.00         | 7.72           | Hori.          | LA           |         |
| 7   | 240.001        | 44.40           | 11.59             | 6.54         | 29.67        | 0.00          | 32.86          | 46.00         | 13.14          | Vert.          | LA           |         |
| 8   | 959.996        | 27.40           | 22.15             | 11.04        | 28.91        | 0.00          | 31.68          | 46.00         | 14.32          | Vert.          | LA           |         |

# DATA OF RADIATED DISTURBANCE TEST

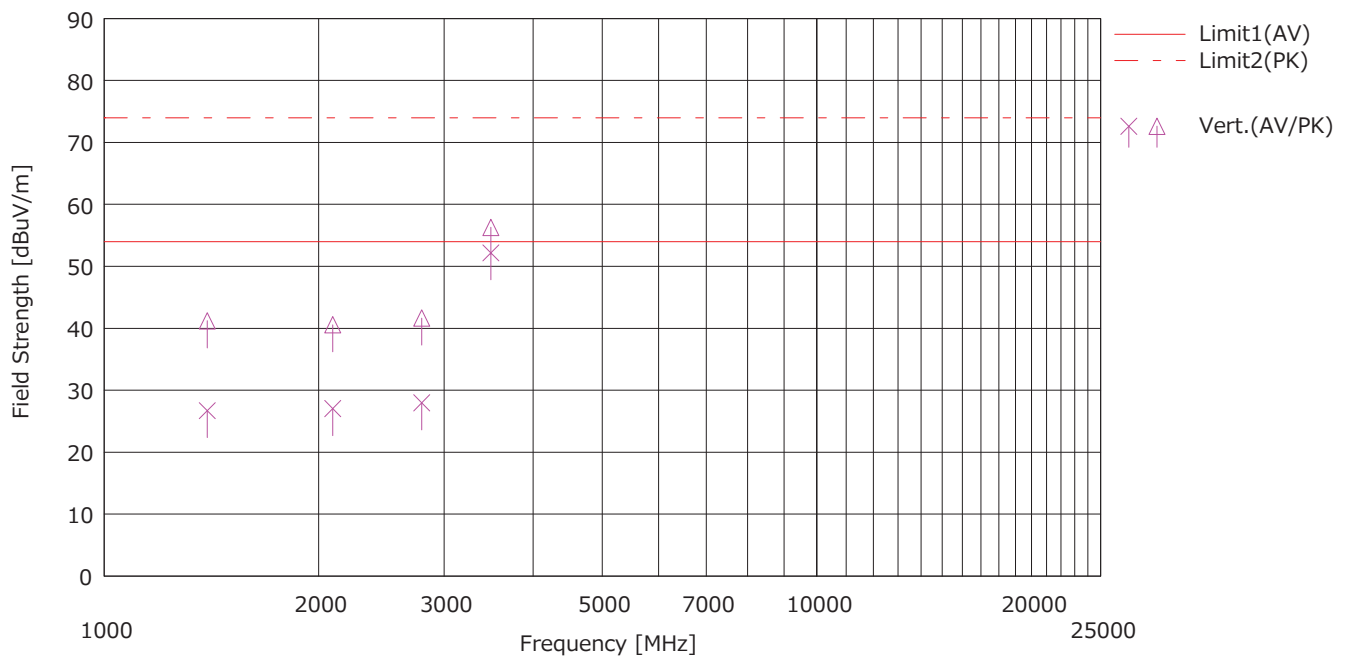
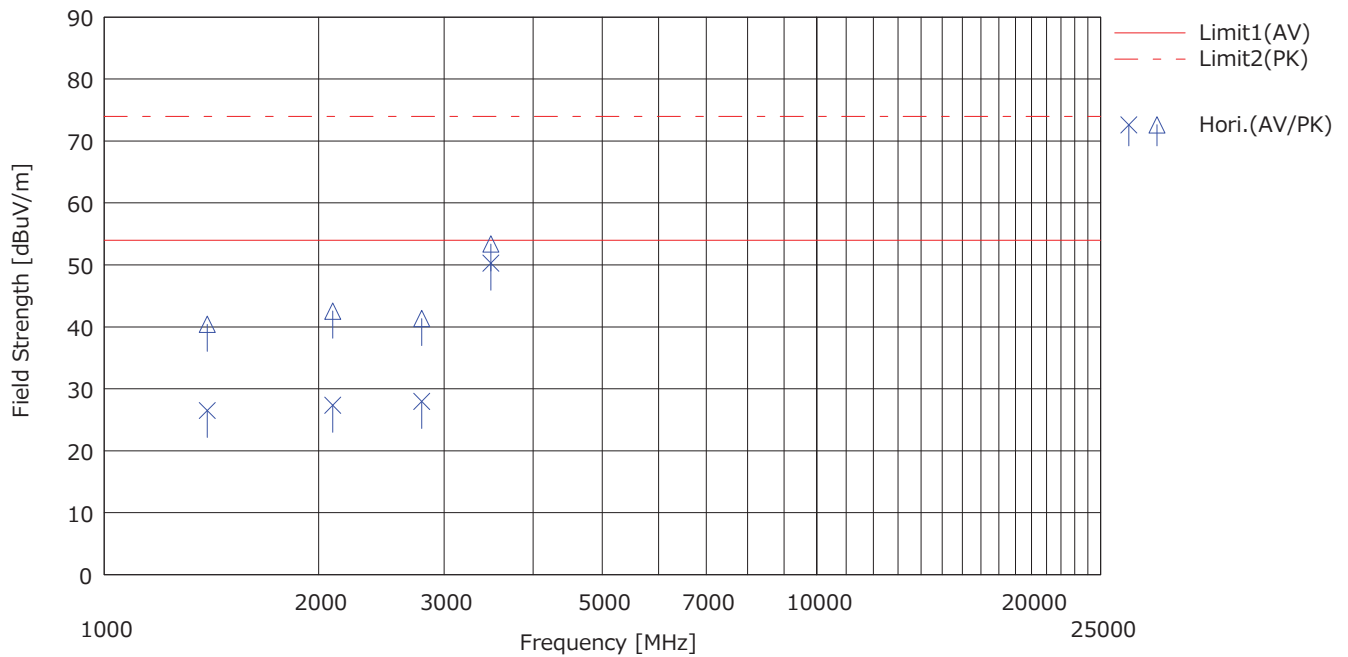
UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site  
Date : 01/09/2020

Mode : 1.FM Reception (Main)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (87.0 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi



# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site

Date : 01/09/2020

Mode : 1.FM Reception (Main)

Order No. : 13185291

Power : DC 13.2 V

Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (87.0 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi

## &lt;&lt; AV/PK DATA &gt;&gt;

| No. | Freq.<br>[MHz] | Reading |        | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result   |          | Limit    |          | Margin |       | Pola.<br>[H/V] | Ant.<br>Type | Comment                   |
|-----|----------------|---------|--------|-------------------|--------------|--------------|---------------|----------|----------|----------|----------|--------|-------|----------------|--------------|---------------------------|
|     |                | (AV)    | (PK)   |                   |              |              |               | (AV)     | (PK)     | (AV)     | (PK)     | (AV)   | (PK)  |                |              |                           |
|     |                | [dBuV]  | [dBuV] |                   |              |              |               | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dB]   | [dB]  |                |              |                           |
| 1   | 1046.640       | ---     | ---    | 24.82             | 1.98         | 40.36        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 2   | 1046.640       | ---     | ---    | 24.82             | 1.98         | 40.36        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 3   | 1133.860       | ---     | ---    | 25.00             | 2.05         | 40.22        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 4   | 1133.860       | ---     | ---    | 25.00             | 2.05         | 40.22        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 5   | 1221.080       | ---     | ---    | 25.40             | 2.12         | 40.08        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 6   | 1221.080       | ---     | ---    | 25.40             | 2.12         | 40.08        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 7   | 1308.300       | ---     | ---    | 25.73             | 2.19         | 39.94        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 8   | 1308.300       | ---     | ---    | 25.73             | 2.19         | 39.94        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 9   | 1395.520       | 36.90   | 50.80  | 25.77             | 3.35         | 39.80        | 0.28          | 26.50    | 40.40    | 54.00    | 74.00    | 27.50  | 33.60 | Hori.          | HA           |                           |
| 10  | 1395.520       | 37.10   | 51.60  | 25.77             | 3.35         | 39.80        | 0.28          | 26.70    | 41.20    | 54.00    | 74.00    | 27.30  | 32.80 | Vert.          | HA           |                           |
| 11  | 1482.740       | ---     | ---    | 25.51             | 2.34         | 39.66        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 12  | 1482.740       | ---     | ---    | 25.51             | 2.34         | 39.66        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 13  | 1569.960       | ---     | ---    | 25.28             | 2.41         | 39.52        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 14  | 1569.960       | ---     | ---    | 25.28             | 2.41         | 39.52        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 15  | 1657.180       | ---     | ---    | 25.02             | 2.48         | 39.38        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 16  | 1657.180       | ---     | ---    | 25.02             | 2.48         | 39.38        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 17  | 1744.400       | ---     | ---    | 25.08             | 2.55         | 39.24        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 18  | 1744.400       | ---     | ---    | 25.08             | 2.55         | 39.24        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 19  | 1831.620       | ---     | ---    | 25.40             | 2.62         | 39.10        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 20  | 1831.620       | ---     | ---    | 25.40             | 2.62         | 39.10        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 21  | 1918.840       | ---     | ---    | 25.73             | 2.69         | 38.96        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 22  | 1918.840       | ---     | ---    | 25.73             | 2.69         | 38.96        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 23  | 2006.060       | ---     | ---    | 26.25             | 2.76         | 38.83        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 24  | 2006.060       | ---     | ---    | 26.25             | 2.76         | 38.83        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 25  | 2093.280       | 34.80   | 50.00  | 26.98             | 4.17         | 38.88        | 0.28          | 27.35    | 42.55    | 54.00    | 74.00    | 26.65  | 31.45 | Hori.          | HA           |                           |
| 26  | 2093.280       | 34.50   | 48.00  | 26.98             | 4.17         | 38.88        | 0.28          | 27.05    | 40.55    | 54.00    | 74.00    | 26.95  | 33.45 | Vert.          | HA           |                           |
| 27  | 2180.500       | ---     | ---    | 28.16             | 2.87         | 38.92        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 28  | 2180.500       | ---     | ---    | 28.16             | 2.87         | 38.92        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 29  | 2267.720       | ---     | ---    | 28.15             | 2.93         | 38.96        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 30  | 2267.720       | ---     | ---    | 28.15             | 2.93         | 38.96        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 31  | 2354.940       | ---     | ---    | 27.74             | 2.98         | 39.01        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 32  | 2354.940       | ---     | ---    | 27.74             | 2.98         | 39.01        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 33  | 2442.160       | ---     | ---    | 27.50             | 3.03         | 39.05        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 34  | 2442.160       | ---     | ---    | 27.50             | 3.03         | 39.05        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 35  | 2529.380       | ---     | ---    | 27.50             | 3.08         | 39.09        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 36  | 2529.380       | ---     | ---    | 27.50             | 3.08         | 39.09        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 37  | 2616.600       | ---     | ---    | 27.80             | 3.14         | 39.14        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 38  | 2616.600       | ---     | ---    | 27.80             | 3.14         | 39.14        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 39  | 2703.820       | ---     | ---    | 28.11             | 3.19         | 39.18        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 40  | 2703.820       | ---     | ---    | 28.11             | 3.19         | 39.18        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 41  | 2791.040       | 33.80   | 47.20  | 28.29             | 4.81         | 39.23        | 0.28          | 27.95    | 41.35    | 54.00    | 74.00    | 26.05  | 32.65 | Hori.          | HA           |                           |
| 42  | 2791.040       | 33.80   | 47.50  | 28.29             | 4.81         | 39.23        | 0.28          | 27.95    | 41.65    | 54.00    | 74.00    | 26.05  | 32.35 | Vert.          | HA           |                           |
| 43  | 2878.260       | ---     | ---    | 28.51             | 3.30         | 39.27        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 44  | 2878.260       | ---     | ---    | 28.51             | 3.30         | 39.27        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 45  | 2965.480       | ---     | ---    | 28.41             | 3.34         | 39.31        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 46  | 2965.480       | ---     | ---    | 28.41             | 3.34         | 39.31        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 47  | 3052.700       | ---     | ---    | 28.63             | 3.40         | 39.30        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 48  | 3052.700       | ---     | ---    | 28.63             | 3.40         | 39.30        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-199.99MHz:BICONICAL, 200MHz-1000MHz:LOGPERIODIC, 1000MHz+:HORN  
 CALCULATION:RESULT = READING + ANT.Fac. + LOSS(CABLE)+S.Fac.(DISTANCE Fac.) - GAIN(AMP). Actual distance: 3.10 m.

# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site  
Date : 01/09/2020

Mode : 1.FM Reception (Main)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (87.0 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi

| No. | Freq.<br>[MHz] | Reading |        | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result   |          | Limit    |          | Margin |       | Pola.<br>[H/V] | Ant.<br>Type | Comment                   |
|-----|----------------|---------|--------|-------------------|--------------|--------------|---------------|----------|----------|----------|----------|--------|-------|----------------|--------------|---------------------------|
|     |                | <AV>    | <PK>   |                   |              |              |               | <AV>     | <PK>     | <AV>     | <PK>     | <AV>   | <PK>  |                |              |                           |
|     |                | [dBuV]  | [dBuV] |                   |              |              |               | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dB]   | [dB]  |                |              |                           |
| 49  | 3139.920       | ---     | ---    | 28.75             | 3.45         | 39.25        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 50  | 3139.920       | ---     | ---    | 28.75             | 3.45         | 39.25        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 51  | 3227.140       | ---     | ---    | 28.52             | 3.51         | 39.21        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 52  | 3227.140       | ---     | ---    | 28.52             | 3.51         | 39.21        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 53  | 3314.360       | ---     | ---    | 28.18             | 3.55         | 39.16        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 54  | 3314.360       | ---     | ---    | 28.18             | 3.55         | 39.16        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 55  | 3401.580       | ---     | ---    | 28.18             | 3.60         | 39.11        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 56  | 3401.580       | ---     | ---    | 28.18             | 3.60         | 39.11        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 57  | 3488.800       | 54.90   | 58.00  | 28.77             | 5.39         | 39.07        | 0.28          | 50.27    | 53.37    | 54.00    | 74.00    | 3.73   | 20.63 | Hori.          | HA           |                           |
| 58  | 3488.800       | 56.80   | 60.90  | 28.77             | 5.39         | 39.07        | 0.28          | 52.17    | 56.27    | 54.00    | 74.00    | 1.83   | 17.73 | Vert.          | HA           |                           |

# DATA OF RADIATED DISTURBANCE TEST

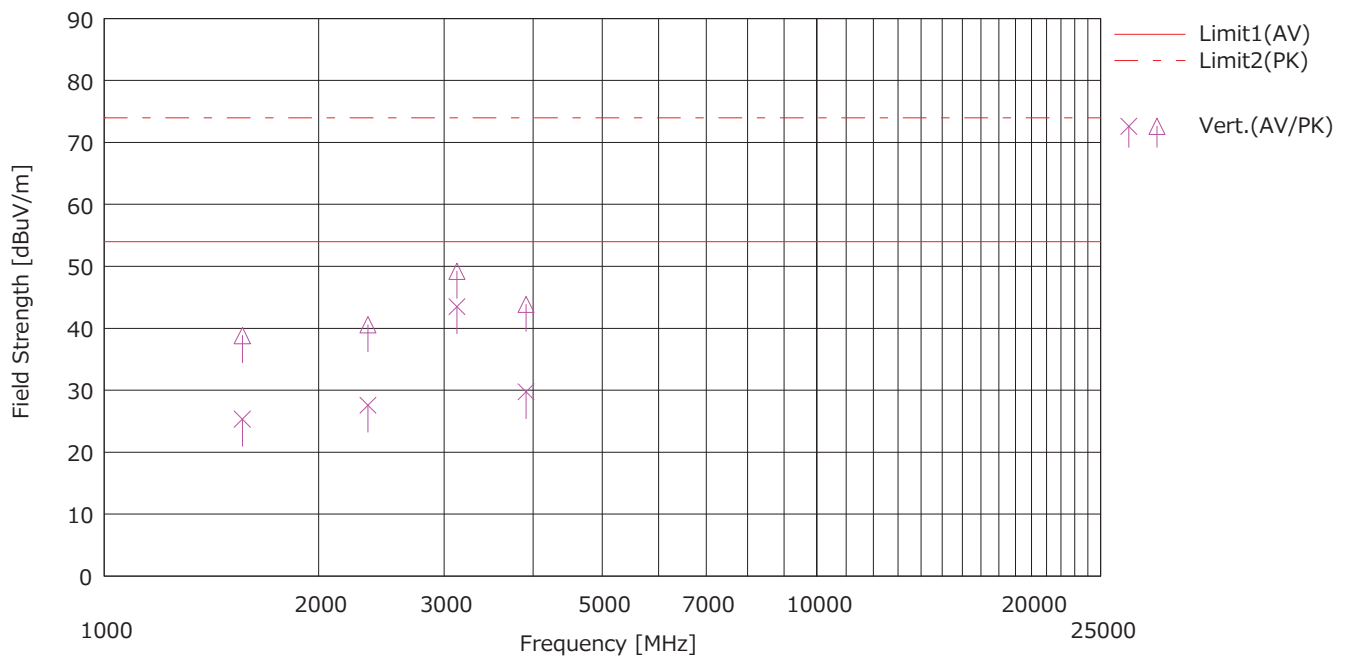
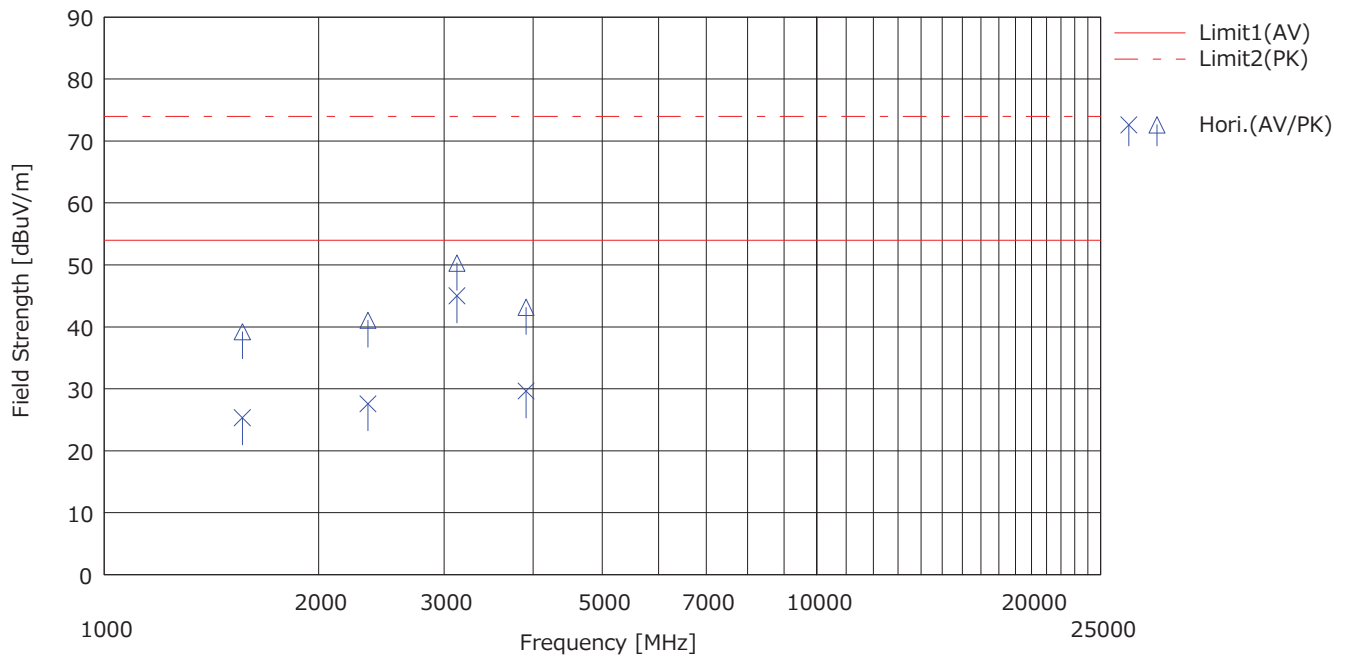
UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site  
Date : 01/09/2020

Mode : 1.FM Reception (Main)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (97.5 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi



# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site

Date : 01/09/2020

Mode : 1.FM Reception (Main)

Order No. : 13185291

Power : DC 13.2 V

Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (97.5 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi

## &lt;&lt; AV/PK DATA &gt;&gt;

| No. | Freq.<br>[MHz] | Reading |        | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result   |          | Limit    |          | Margin |       | Pola<br>[H/V] | Ant.<br>Type | Comment                   |
|-----|----------------|---------|--------|-------------------|--------------|--------------|---------------|----------|----------|----------|----------|--------|-------|---------------|--------------|---------------------------|
|     |                | (AV)    | (PK)   |                   |              |              |               | (AV)     | (PK)     | (AV)     | (PK)     | (AV)   | (PK)  |               |              |                           |
|     |                | [dBuV]  | [dBuV] |                   |              |              |               | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dB]   | [dB]  |               |              |                           |
| 1   | 1074.920       | ---     | ---    | 24.95             | 2.00         | 40.32        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 2   | 1074.920       | ---     | ---    | 24.95             | 2.00         | 40.32        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 3   | 1172.640       | ---     | ---    | 25.15             | 2.08         | 40.16        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 4   | 1172.640       | ---     | ---    | 25.15             | 2.08         | 40.16        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 5   | 1270.360       | ---     | ---    | 25.57             | 2.16         | 40.00        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 6   | 1270.360       | ---     | ---    | 25.57             | 2.16         | 40.00        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 7   | 1368.080       | ---     | ---    | 25.77             | 2.24         | 39.85        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 8   | 1368.080       | ---     | ---    | 25.77             | 2.24         | 39.85        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 9   | 1465.800       | ---     | ---    | 25.63             | 2.32         | 39.69        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 10  | 1465.800       | ---     | ---    | 25.63             | 2.32         | 39.69        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 11  | 1563.520       | 35.70   | 49.60  | 25.31             | 3.56         | 39.53        | 0.28          | 25.32    | 39.22    | 54.00    | 74.00    | 28.68  | 34.78 | Hori.         | HA           |                           |
| 12  | 1563.520       | 35.70   | 49.20  | 25.31             | 3.56         | 39.53        | 0.28          | 25.32    | 38.82    | 54.00    | 74.00    | 28.68  | 35.18 | Vert.         | HA           |                           |
| 13  | 1661.240       | ---     | ---    | 25.02             | 2.48         | 39.38        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 14  | 1661.240       | ---     | ---    | 25.02             | 2.48         | 39.38        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 15  | 1758.960       | ---     | ---    | 25.12             | 2.56         | 39.22        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 16  | 1758.960       | ---     | ---    | 25.12             | 2.56         | 39.22        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 17  | 1856.680       | ---     | ---    | 25.49             | 2.65         | 39.06        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 18  | 1856.680       | ---     | ---    | 25.49             | 2.65         | 39.06        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 19  | 1954.400       | ---     | ---    | 25.93             | 2.72         | 38.90        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 20  | 1954.400       | ---     | ---    | 25.93             | 2.72         | 38.90        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 21  | 2052.120       | ---     | ---    | 26.52             | 2.79         | 38.86        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 22  | 2052.120       | ---     | ---    | 26.52             | 2.79         | 38.86        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 23  | 2149.840       | ---     | ---    | 27.89             | 2.86         | 38.90        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 24  | 2149.840       | ---     | ---    | 27.89             | 2.86         | 38.90        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 25  | 2247.560       | ---     | ---    | 28.24             | 2.91         | 38.95        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 26  | 2247.560       | ---     | ---    | 28.24             | 2.91         | 38.95        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 27  | 2345.280       | 34.10   | 47.60  | 27.78             | 4.41         | 39.00        | 0.28          | 27.57    | 41.07    | 54.00    | 74.00    | 26.43  | 32.93 | Hori.         | HA           |                           |
| 28  | 2345.280       | 34.10   | 47.10  | 27.78             | 4.41         | 39.00        | 0.28          | 27.57    | 40.57    | 54.00    | 74.00    | 26.43  | 33.43 | Vert.         | HA           |                           |
| 29  | 2443.000       | ---     | ---    | 27.50             | 3.03         | 39.05        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 30  | 2443.000       | ---     | ---    | 27.50             | 3.03         | 39.05        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 31  | 2540.720       | ---     | ---    | 27.53             | 3.10         | 39.10        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 32  | 2540.720       | ---     | ---    | 27.53             | 3.10         | 39.10        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 33  | 2638.440       | ---     | ---    | 27.86             | 3.15         | 39.15        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 34  | 2638.440       | ---     | ---    | 27.86             | 3.15         | 39.15        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 35  | 2736.160       | ---     | ---    | 28.11             | 3.21         | 39.20        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 36  | 2736.160       | ---     | ---    | 28.11             | 3.21         | 39.20        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 37  | 2833.880       | ---     | ---    | 28.46             | 3.27         | 39.25        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 38  | 2833.880       | ---     | ---    | 28.46             | 3.27         | 39.25        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 39  | 2931.600       | ---     | ---    | 28.42             | 3.33         | 39.30        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 40  | 2931.600       | ---     | ---    | 28.42             | 3.33         | 39.30        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 41  | 3029.320       | ---     | ---    | 28.57             | 3.38         | 39.31        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 42  | 3029.320       | ---     | ---    | 28.57             | 3.38         | 39.31        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 43  | 3127.040       | 50.10   | 55.40  | 28.77             | 5.10         | 39.26        | 0.28          | 44.99    | 50.29    | 54.00    | 74.00    | 9.01   | 23.71 | Hori.         | HA           |                           |
| 44  | 3127.040       | 48.60   | 54.30  | 28.77             | 5.10         | 39.26        | 0.28          | 43.49    | 49.19    | 54.00    | 74.00    | 10.51  | 24.81 | Vert.         | HA           |                           |
| 45  | 3224.760       | ---     | ---    | 28.53             | 3.50         | 39.21        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 46  | 3224.760       | ---     | ---    | 28.53             | 3.50         | 39.21        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |
| 47  | 3322.480       | ---     | ---    | 28.14             | 3.56         | 39.16        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.         | HA           | the margin exceeds 20 dB. |
| 48  | 3322.480       | ---     | ---    | 28.14             | 3.56         | 39.16        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.         | HA           | the margin exceeds 20 dB. |

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-199.99MHz:BICONICAL, 200MHz-1000MHz:LOGPERIODIC, 1000MHz+:HORN  
 CALCULATION:RESULT = READING + ANT.Fac. + LOSS(CABLE)+S.Fac.(DISTANCE Fac.) - GAIN(AMP). Actual distance: 3.10 m.

# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site  
Date : 01/09/2020

Mode : 1.FM Reception (Main)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (97.5 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi

| No. | Freq.<br>[MHz] | Reading |        | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result   |          | Limit    |          | Margin |       | Pola.<br>[H/V] | Ant.<br>Type | Comment                   |
|-----|----------------|---------|--------|-------------------|--------------|--------------|---------------|----------|----------|----------|----------|--------|-------|----------------|--------------|---------------------------|
|     |                | <AV>    | <PK>   |                   |              |              |               | <AV>     | <PK>     | <AV>     | <PK>     | <AV>   | <PK>  |                |              |                           |
|     |                | [dBuV]  | [dBuV] |                   |              |              |               | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dB]   | [dB]  |                |              |                           |
| 49  | 3420.200       | ---     | ---    | 28.32             | 3.62         | 39.10        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 50  | 3420.200       | ---     | ---    | 28.32             | 3.62         | 39.10        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 51  | 3517.920       | ---     | ---    | 28.89             | 3.67         | 39.05        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 52  | 3517.920       | ---     | ---    | 28.89             | 3.67         | 39.05        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 53  | 3615.640       | ---     | ---    | 29.15             | 3.73         | 39.00        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 54  | 3615.640       | ---     | ---    | 29.15             | 3.73         | 39.00        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 55  | 3713.360       | ---     | ---    | 29.31             | 3.78         | 38.94        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 56  | 3713.360       | ---     | ---    | 29.31             | 3.78         | 38.94        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 57  | 3811.080       | ---     | ---    | 29.55             | 3.84         | 38.89        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 58  | 3811.080       | ---     | ---    | 29.55             | 3.84         | 38.89        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 59  | 3908.800       | 32.80   | 46.30  | 29.68             | 5.72         | 38.84        | 0.28          | 29.64    | 43.14    | 54.00    | 74.00    | 24.36  | 30.86 | Hori.          | HA           |                           |
| 60  | 3908.800       | 32.90   | 47.00  | 29.68             | 5.72         | 38.84        | 0.28          | 29.74    | 43.84    | 54.00    | 74.00    | 24.26  | 30.16 | Vert.          | HA           |                           |

# DATA OF RADIATED DISTURBANCE TEST

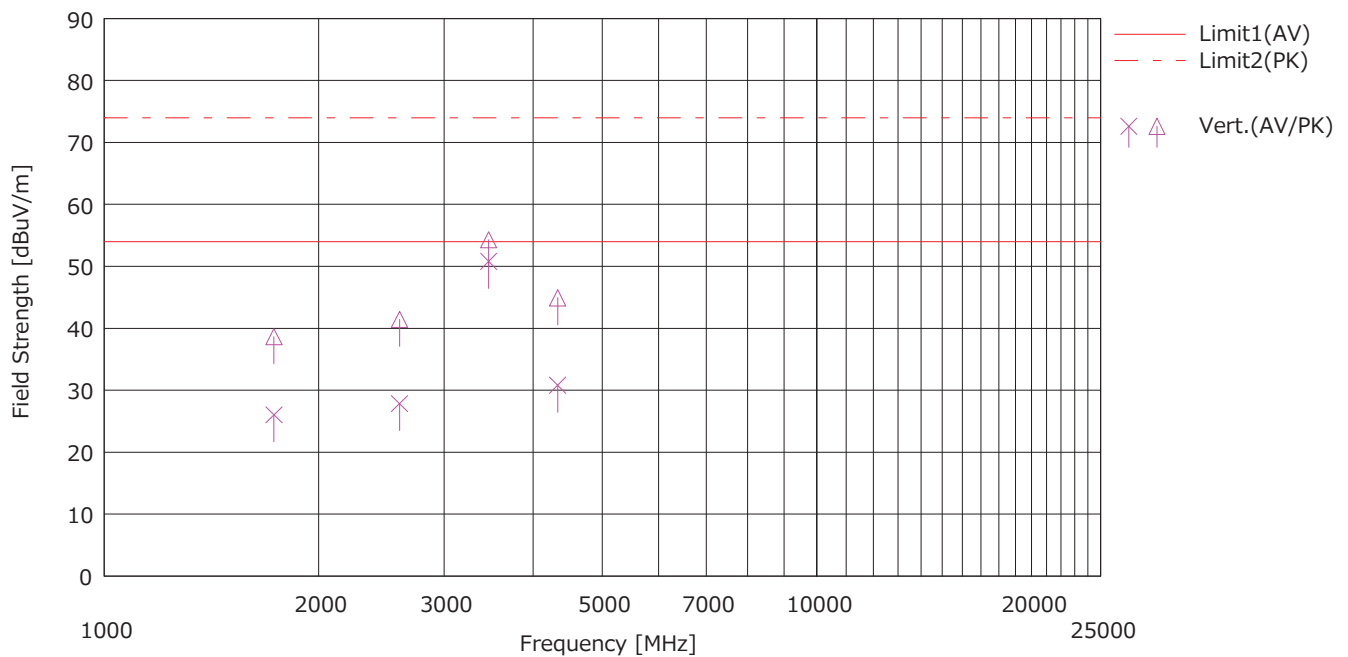
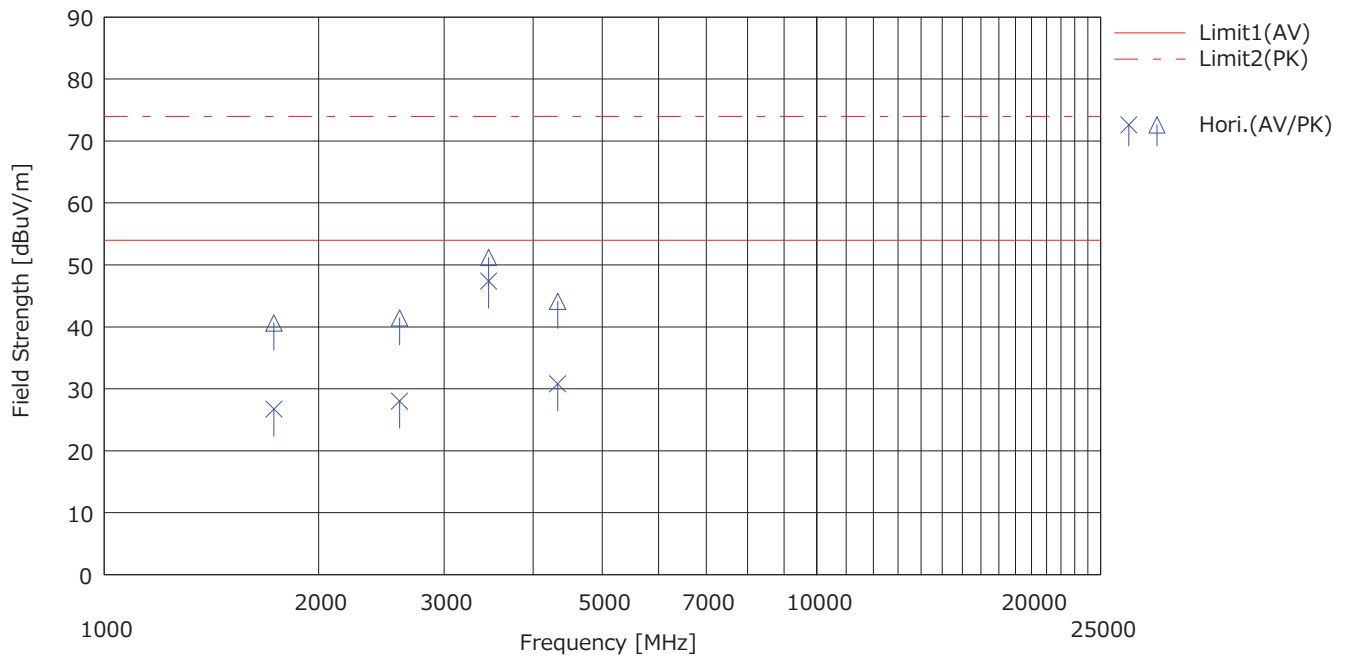
UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site  
Date : 01/09/2020

Mode : 1.FM Reception (Main)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (108 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi



# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site

Date : 01/09/2020

Mode : 1.FM Reception (Main)

Order No. : 13185291

Power : DC 13.2 V

Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (108 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi

## &lt;&lt; AV/PK DATA &gt;&gt;

| No. | Freq.<br>[MHz] | Reading        |                | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result           |                  | Limit            |                  | Margin       |              | Pola.<br>[H/V] | Ant.<br>Type | Comment                   |
|-----|----------------|----------------|----------------|-------------------|--------------|--------------|---------------|------------------|------------------|------------------|------------------|--------------|--------------|----------------|--------------|---------------------------|
|     |                | (AV)<br>[dBuV] | (PK)<br>[dBuV] |                   |              |              |               | (AV)<br>[dBuV/m] | (PK)<br>[dBuV/m] | (AV)<br>[dBuV/m] | (PK)<br>[dBuV/m] | (AV)<br>[dB] | (PK)<br>[dB] |                |              |                           |
|     |                |                |                |                   |              |              |               |                  |                  |                  |                  |              |              |                |              |                           |
| 1   | 1082.200       | ---            | ---            | 24.98             | 2.01         | 40.31        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 2   | 1082.200       | ---            | ---            | 24.98             | 2.01         | 40.31        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 3   | 1190.420       | ---            | ---            | 25.29             | 2.10         | 40.13        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 4   | 1190.420       | ---            | ---            | 25.29             | 2.10         | 40.13        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 5   | 1298.640       | ---            | ---            | 25.71             | 2.18         | 39.96        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 6   | 1298.640       | ---            | ---            | 25.71             | 2.18         | 39.96        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 7   | 1406.860       | ---            | ---            | 25.77             | 2.28         | 39.78        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 8   | 1406.860       | ---            | ---            | 25.77             | 2.28         | 39.78        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 9   | 1515.080       | ---            | ---            | 25.38             | 2.36         | 39.61        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 10  | 1515.080       | ---            | ---            | 25.38             | 2.36         | 39.61        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 11  | 1623.300       | ---            | ---            | 25.09             | 2.45         | 39.44        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 12  | 1623.300       | ---            | ---            | 25.09             | 2.45         | 39.44        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 13  | 1731.520       | 36.90          | 50.80          | 25.05             | 3.75         | 39.26        | 0.28          | 26.72            | 40.62            | 54.00            | 74.00            | 27.28        | 33.38        | Hori.          | HA           |                           |
| 14  | 1731.520       | 36.20          | 48.80          | 25.05             | 3.75         | 39.26        | 0.28          | 26.02            | 38.62            | 54.00            | 74.00            | 27.98        | 35.38        | Vert.          | HA           |                           |
| 15  | 1839.740       | ---            | ---            | 25.43             | 2.63         | 39.09        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 16  | 1839.740       | ---            | ---            | 25.43             | 2.63         | 39.09        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 17  | 1947.960       | ---            | ---            | 25.89             | 2.72         | 38.91        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 18  | 1947.960       | ---            | ---            | 25.89             | 2.72         | 38.91        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 19  | 2056.180       | ---            | ---            | 26.57             | 2.79         | 38.86        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 20  | 2056.180       | ---            | ---            | 26.57             | 2.79         | 38.86        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 21  | 2164.400       | ---            | ---            | 28.02             | 2.86         | 38.91        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 22  | 2164.400       | ---            | ---            | 28.02             | 2.86         | 38.91        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 23  | 2272.620       | ---            | ---            | 28.13             | 2.93         | 38.97        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 24  | 2272.620       | ---            | ---            | 28.13             | 2.93         | 38.97        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 25  | 2380.840       | ---            | ---            | 27.63             | 3.00         | 39.02        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 26  | 2380.840       | ---            | ---            | 27.63             | 3.00         | 39.02        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 27  | 2489.060       | ---            | ---            | 27.44             | 3.07         | 39.07        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 28  | 2489.060       | ---            | ---            | 27.44             | 3.07         | 39.07        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 29  | 2597.280       | 34.50          | 47.90          | 27.74             | 4.64         | 39.13        | 0.28          | 28.03            | 41.43            | 54.00            | 74.00            | 25.97        | 32.57        | Hori.          | HA           |                           |
| 30  | 2597.280       | 34.30          | 47.90          | 27.74             | 4.64         | 39.13        | 0.28          | 27.83            | 41.43            | 54.00            | 74.00            | 26.17        | 32.57        | Vert.          | HA           |                           |
| 31  | 2705.500       | ---            | ---            | 28.11             | 3.19         | 39.18        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 32  | 2705.500       | ---            | ---            | 28.11             | 3.19         | 39.18        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 33  | 2813.720       | ---            | ---            | 28.38             | 3.26         | 39.24        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 34  | 2813.720       | ---            | ---            | 28.38             | 3.26         | 39.24        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 35  | 2921.940       | ---            | ---            | 28.44             | 3.33         | 39.29        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 36  | 2921.940       | ---            | ---            | 28.44             | 3.33         | 39.29        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 37  | 3030.160       | ---            | ---            | 28.58             | 3.38         | 39.31        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 38  | 3030.160       | ---            | ---            | 28.58             | 3.38         | 39.31        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 39  | 3138.380       | ---            | ---            | 28.75             | 3.45         | 39.26        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 40  | 3138.380       | ---            | ---            | 28.75             | 3.45         | 39.26        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 41  | 3246.600       | ---            | ---            | 28.43             | 3.51         | 39.20        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 42  | 3246.600       | ---            | ---            | 28.43             | 3.51         | 39.20        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 43  | 3354.820       | ---            | ---            | 28.03             | 3.58         | 39.14        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 44  | 3354.820       | ---            | ---            | 28.03             | 3.58         | 39.14        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 45  | 3463.040       | 52.20          | 56.00          | 28.62             | 5.37         | 39.08        | 0.28          | 47.39            | 51.19            | 54.00            | 74.00            | 6.61         | 22.81        | Hori.          | HA           |                           |
| 46  | 3463.040       | 55.60          | 59.10          | 28.62             | 5.37         | 39.08        | 0.28          | 50.79            | 54.29            | 54.00            | 74.00            | 3.21         | 19.71        | Vert.          | HA           |                           |
| 47  | 3571.260       | ---            | ---            | 29.05             | 3.70         | 39.02        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 48  | 3571.260       | ---            | ---            | 29.05             | 3.70         | 39.02        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-199.99MHz:BICONICAL, 200MHz-1000MHz:LOGPERIODIC, 1000MHz+:HORN  
 CALCULATION:RESULT = READING + ANT.Fac. + LOSS(CABLE)+S.Fac.(DISTANCE Fac.) - GAIN(AMP). Actual distance: 3.10 m.

# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site  
Date : 01/09/2020

Mode : 1.FM Reception (Main)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (108 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi

| No. | Freq.<br>[MHz] | Reading |        | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result   |          | Limit    |          | Margin |       | Pola.<br>[H/V] | Ant.<br>Type | Comment                   |
|-----|----------------|---------|--------|-------------------|--------------|--------------|---------------|----------|----------|----------|----------|--------|-------|----------------|--------------|---------------------------|
|     |                | <AV>    | <PK>   |                   |              |              |               | <AV>     | <PK>     | <AV>     | <PK>     | <AV>   | <PK>  |                |              |                           |
|     |                | [dBuV]  | [dBuV] |                   |              |              |               | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dB]   | [dB]  |                |              |                           |
| 49  | 3679.480       | ---     | ---    | 29.27             | 3.77         | 38.96        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 50  | 3679.480       | ---     | ---    | 29.27             | 3.77         | 38.96        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 51  | 3787.700       | ---     | ---    | 29.49             | 3.83         | 38.90        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 52  | 3787.700       | ---     | ---    | 29.49             | 3.83         | 38.90        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 53  | 3895.920       | ---     | ---    | 29.69             | 3.89         | 38.85        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 54  | 3895.920       | ---     | ---    | 29.69             | 3.89         | 38.85        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 55  | 4004.140       | ---     | ---    | 29.75             | 3.95         | 38.79        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 56  | 4004.140       | ---     | ---    | 29.75             | 3.95         | 38.79        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 57  | 4112.360       | ---     | ---    | 29.81             | 4.01         | 38.82        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 58  | 4112.360       | ---     | ---    | 29.81             | 4.01         | 38.82        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 59  | 4220.580       | ---     | ---    | 30.13             | 4.05         | 38.85        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 60  | 4220.580       | ---     | ---    | 30.13             | 4.05         | 38.85        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 61  | 4328.800       | 33.00   | 46.30  | 30.37             | 6.03         | 38.87        | 0.28          | 30.81    | 44.11    | 54.00    | 74.00    | 23.19  | 29.89 | Hori.          | HA           |                           |
| 62  | 4328.800       | 33.00   | 47.10  | 30.37             | 6.03         | 38.87        | 0.28          | 30.81    | 44.91    | 54.00    | 74.00    | 23.19  | 29.09 | Vert.          | HA           |                           |

# DATA OF RADIATED DISTURBANCE TEST

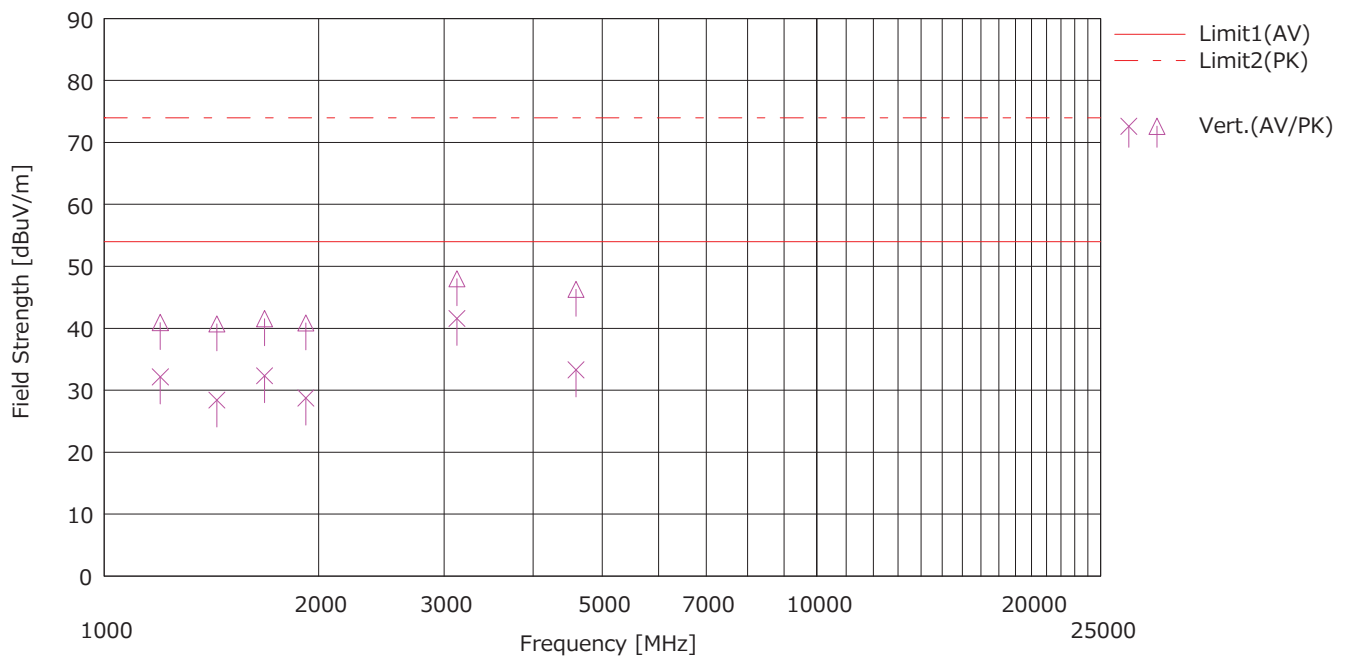
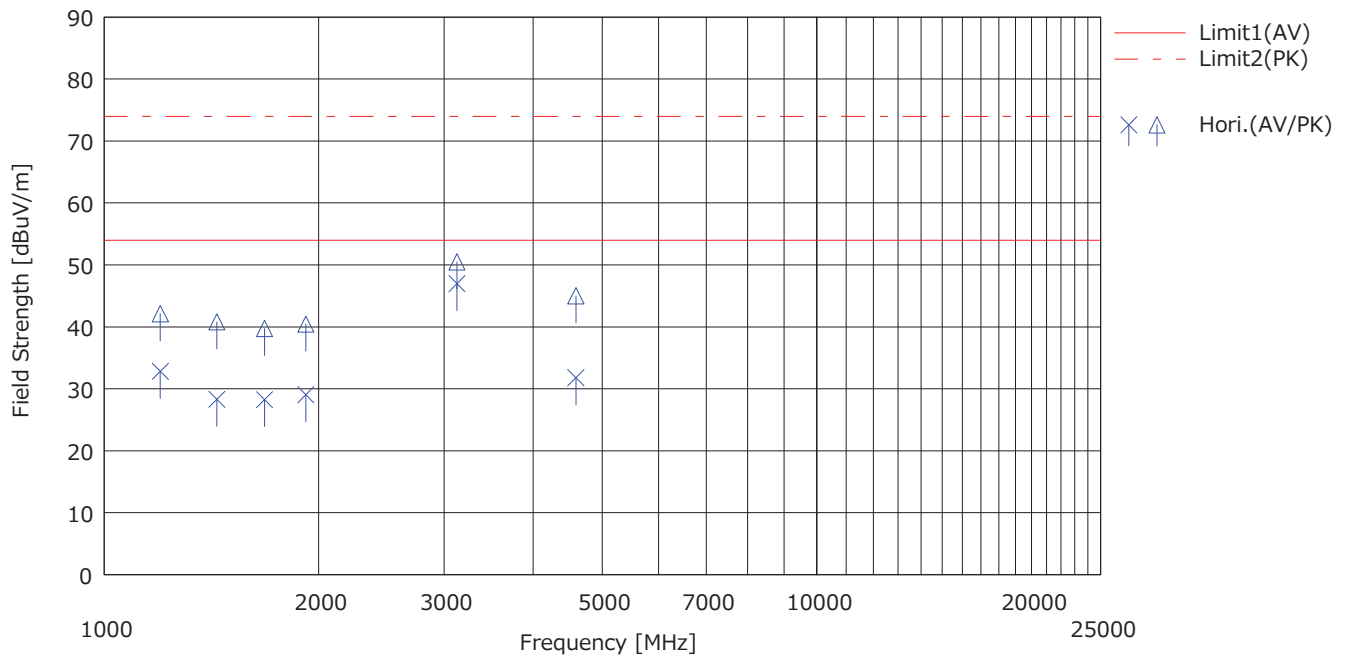
UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site  
Date : 01/09/2020

Mode : 1.FM Reception (Main)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : -

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Jun Ito



# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site  
Date : 01/09/2020

Mode : 1.FM Reception (Main)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : -

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Jun Ito

## << AV/PK DATA >>

| No. | Freq.<br>[MHz] | Reading        |                | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result           |                  | Limit            |                  | Margin       |              | Pola.<br>[H/V] | Ant.<br>Type | Comment |
|-----|----------------|----------------|----------------|-------------------|--------------|--------------|---------------|------------------|------------------|------------------|------------------|--------------|--------------|----------------|--------------|---------|
|     |                | (AV)<br>[dBuV] | (PK)<br>[dBuV] |                   |              |              |               | (AV)<br>[dBuV/m] | (PK)<br>[dBuV/m] | (AV)<br>[dBuV/m] | (PK)<br>[dBuV/m] | (AV)<br>[dB] | (PK)<br>[dB] |                |              |         |
|     |                |                |                |                   |              |              |               |                  |                  |                  |                  |              |              |                |              |         |
| 1   | 1200.006       | 44.20          | 53.50          | 25.36             | 3.11         | 40.12        | 0.28          | 32.83            | 42.13            | 54.00            | 74.00            | 21.17        | 31.87        | Hori.          | HA           |         |
| 2   | 1200.007       | 43.50          | 52.30          | 25.36             | 3.11         | 40.12        | 0.28          | 32.13            | 40.93            | 54.00            | 74.00            | 21.87        | 33.07        | Vert.          | HA           |         |
| 3   | 1440.057       | 38.60          | 51.10          | 25.75             | 3.40         | 39.73        | 0.28          | 28.30            | 40.80            | 54.00            | 74.00            | 25.70        | 33.20        | Hori.          | HA           |         |
| 4   | 1440.062       | 38.70          | 51.00          | 25.75             | 3.40         | 39.73        | 0.28          | 28.40            | 40.70            | 54.00            | 74.00            | 25.60        | 33.30        | Vert.          | HA           |         |
| 5   | 1680.084       | 38.60          | 50.10          | 25.00             | 3.70         | 39.35        | 0.28          | 28.23            | 39.73            | 54.00            | 74.00            | 25.77        | 34.27        | Hori.          | HA           |         |
| 6   | 1680.099       | 42.70          | 51.90          | 25.00             | 3.70         | 39.35        | 0.28          | 32.33            | 41.53            | 54.00            | 74.00            | 21.67        | 32.47        | Vert.          | HA           |         |
| 7   | 1920.050       | 38.00          | 49.40          | 25.74             | 3.99         | 38.96        | 0.28          | 29.05            | 40.45            | 54.00            | 74.00            | 24.95        | 33.55        | Hori.          | HA           |         |
| 8   | 1920.064       | 37.70          | 49.80          | 25.74             | 3.99         | 38.96        | 0.28          | 28.75            | 40.85            | 54.00            | 74.00            | 25.25        | 33.15        | Vert.          | HA           |         |
| 9   | 3127.065       | 52.10          | 55.60          | 28.77             | 5.10         | 39.26        | 0.28          | 46.99            | 50.49            | 54.00            | 74.00            | 7.01         | 23.51        | Hori.          | HA           |         |
| 10  | 3127.072       | 46.70          | 53.10          | 28.77             | 5.10         | 39.26        | 0.28          | 41.59            | 47.99            | 54.00            | 74.00            | 12.41        | 26.01        | Vert.          | HA           |         |
| 11  | 4592.497       | 33.40          | 46.60          | 30.82             | 6.23         | 38.94        | 0.28          | 31.79            | 44.99            | 54.00            | 74.00            | 22.21        | 29.01        | Hori.          | HA           |         |
| 12  | 4593.157       | 34.90          | 47.90          | 30.82             | 6.23         | 38.94        | 0.28          | 33.29            | 46.29            | 54.00            | 74.00            | 20.71        | 27.71        | Vert.          | HA           |         |

# DATA OF RADIATED DISTURBANCE TEST

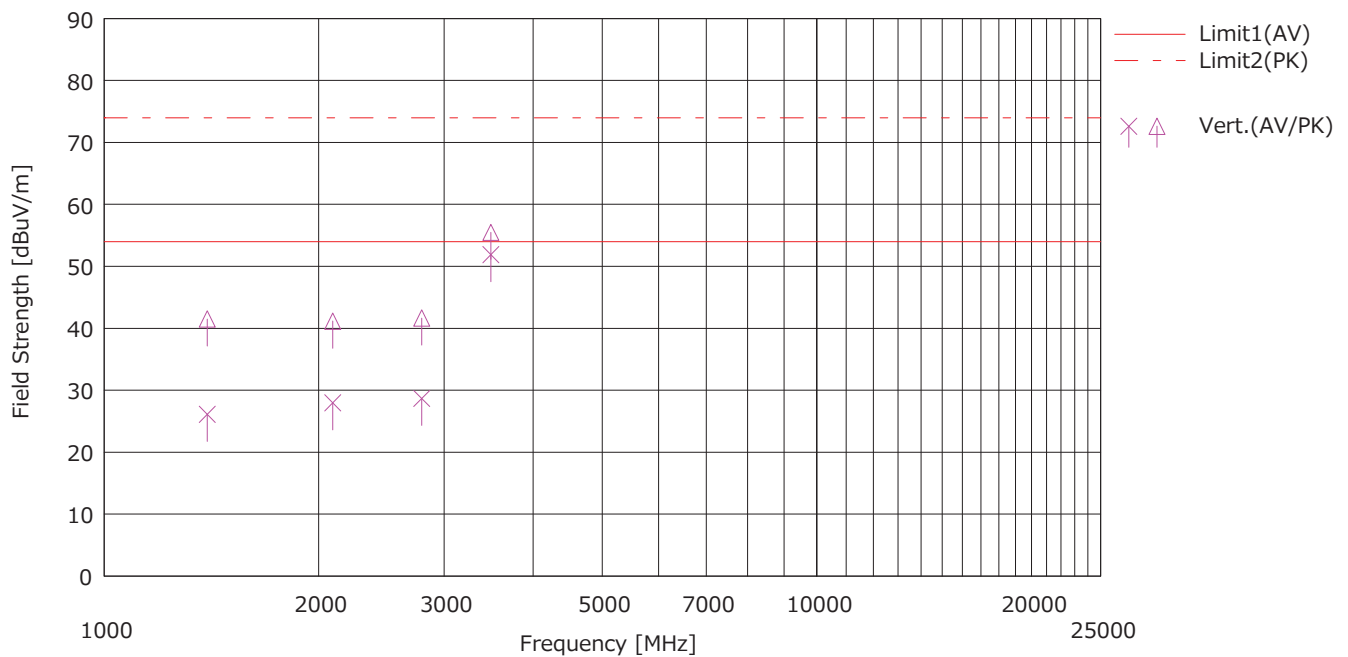
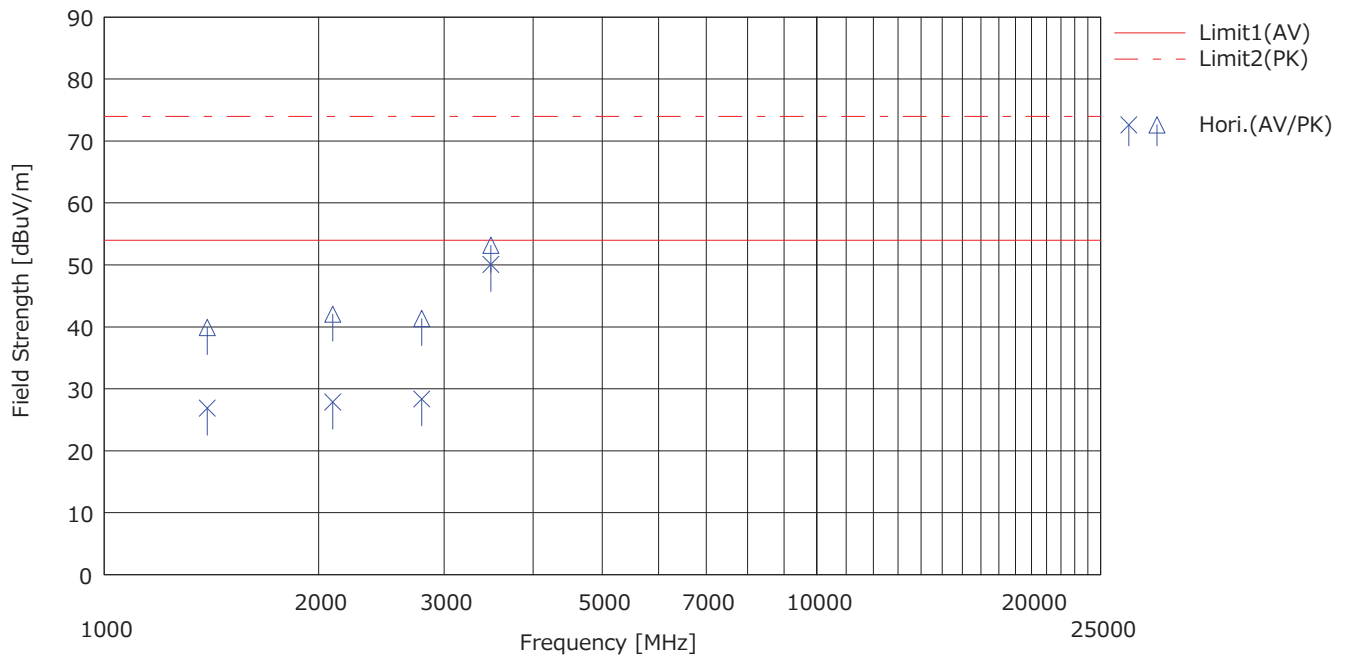
UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site  
Date : 01/09/2020

Mode : 1.FM Reception (Sub)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (87.0 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi



# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site

Date : 01/09/2020

Mode : 1.FM Reception (Sub)

Order No. : 13185291

Power : DC 13.2 V

Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (87.0 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi

## &lt;&lt; AV/PK DATA &gt;&gt;

| No. | Freq.<br>[MHz] | Reading |        | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result   |          | Limit    |          | Margin |       | Pola.<br>[H/V] | Ant.<br>Type | Comment                   |
|-----|----------------|---------|--------|-------------------|--------------|--------------|---------------|----------|----------|----------|----------|--------|-------|----------------|--------------|---------------------------|
|     |                | (AV)    | (PK)   |                   |              |              |               | (AV)     | (PK)     | (AV)     | (PK)     | (AV)   | (PK)  |                |              |                           |
|     |                | [dBuV]  | [dBuV] |                   |              |              |               | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dB]   | [dB]  |                |              |                           |
| 1   | 1046.640       | ---     | ---    | 24.82             | 1.98         | 40.36        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 2   | 1046.640       | ---     | ---    | 24.82             | 1.98         | 40.36        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 3   | 1133.860       | ---     | ---    | 25.00             | 2.05         | 40.22        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 4   | 1133.860       | ---     | ---    | 25.00             | 2.05         | 40.22        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 5   | 1221.080       | ---     | ---    | 25.40             | 2.12         | 40.08        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 6   | 1221.080       | ---     | ---    | 25.40             | 2.12         | 40.08        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 7   | 1308.300       | ---     | ---    | 25.73             | 2.19         | 39.94        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 8   | 1308.300       | ---     | ---    | 25.73             | 2.19         | 39.94        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 9   | 1395.520       | 37.30   | 50.30  | 25.77             | 3.35         | 39.80        | 0.28          | 26.90    | 39.90    | 54.00    | 74.00    | 27.10  | 34.10 | Hori.          | HA           |                           |
| 10  | 1395.520       | 36.50   | 51.90  | 25.77             | 3.35         | 39.80        | 0.28          | 26.10    | 41.50    | 54.00    | 74.00    | 27.90  | 32.50 | Vert.          | HA           |                           |
| 11  | 1482.740       | ---     | ---    | 25.51             | 2.34         | 39.66        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 12  | 1482.740       | ---     | ---    | 25.51             | 2.34         | 39.66        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 13  | 1569.960       | ---     | ---    | 25.28             | 2.41         | 39.52        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 14  | 1569.960       | ---     | ---    | 25.28             | 2.41         | 39.52        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 15  | 1657.180       | ---     | ---    | 25.02             | 2.48         | 39.38        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 16  | 1657.180       | ---     | ---    | 25.02             | 2.48         | 39.38        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 17  | 1744.400       | ---     | ---    | 25.08             | 2.55         | 39.24        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 18  | 1744.400       | ---     | ---    | 25.08             | 2.55         | 39.24        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 19  | 1831.620       | ---     | ---    | 25.40             | 2.62         | 39.10        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 20  | 1831.620       | ---     | ---    | 25.40             | 2.62         | 39.10        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 21  | 1918.840       | ---     | ---    | 25.73             | 2.69         | 38.96        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 22  | 1918.840       | ---     | ---    | 25.73             | 2.69         | 38.96        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 23  | 2006.060       | ---     | ---    | 26.25             | 2.76         | 38.83        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 24  | 2006.060       | ---     | ---    | 26.25             | 2.76         | 38.83        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 25  | 2093.280       | 35.30   | 49.50  | 26.98             | 4.17         | 38.88        | 0.28          | 27.85    | 42.05    | 54.00    | 74.00    | 26.15  | 31.95 | Hori.          | HA           |                           |
| 26  | 2093.280       | 35.40   | 48.60  | 26.98             | 4.17         | 38.88        | 0.28          | 27.95    | 41.15    | 54.00    | 74.00    | 26.05  | 32.85 | Vert.          | HA           |                           |
| 27  | 2180.500       | ---     | ---    | 28.16             | 2.87         | 38.92        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 28  | 2180.500       | ---     | ---    | 28.16             | 2.87         | 38.92        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 29  | 2267.720       | ---     | ---    | 28.15             | 2.93         | 38.96        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 30  | 2267.720       | ---     | ---    | 28.15             | 2.93         | 38.96        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 31  | 2354.940       | ---     | ---    | 27.74             | 2.98         | 39.01        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 32  | 2354.940       | ---     | ---    | 27.74             | 2.98         | 39.01        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 33  | 2442.160       | ---     | ---    | 27.50             | 3.03         | 39.05        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 34  | 2442.160       | ---     | ---    | 27.50             | 3.03         | 39.05        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 35  | 2529.380       | ---     | ---    | 27.50             | 3.08         | 39.09        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 36  | 2529.380       | ---     | ---    | 27.50             | 3.08         | 39.09        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 37  | 2616.600       | ---     | ---    | 27.80             | 3.14         | 39.14        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 38  | 2616.600       | ---     | ---    | 27.80             | 3.14         | 39.14        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 39  | 2703.820       | ---     | ---    | 28.11             | 3.19         | 39.18        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 40  | 2703.820       | ---     | ---    | 28.11             | 3.19         | 39.18        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 41  | 2791.040       | 34.20   | 47.20  | 28.29             | 4.81         | 39.23        | 0.28          | 28.35    | 41.35    | 54.00    | 74.00    | 25.65  | 32.65 | Hori.          | HA           |                           |
| 42  | 2791.040       | 34.50   | 47.50  | 28.29             | 4.81         | 39.23        | 0.28          | 28.65    | 41.65    | 54.00    | 74.00    | 25.35  | 32.35 | Vert.          | HA           |                           |
| 43  | 2878.260       | ---     | ---    | 28.51             | 3.30         | 39.27        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 44  | 2878.260       | ---     | ---    | 28.51             | 3.30         | 39.27        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 45  | 2965.480       | ---     | ---    | 28.41             | 3.34         | 39.31        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 46  | 2965.480       | ---     | ---    | 28.41             | 3.34         | 39.31        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 47  | 3052.700       | ---     | ---    | 28.63             | 3.40         | 39.30        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 48  | 3052.700       | ---     | ---    | 28.63             | 3.40         | 39.30        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-199.99MHz:BICONICAL, 200MHz-1000MHz:LOGPERIODIC, 1000MHz+:HORN  
 CALCULATION:RESULT = READING + ANT.Fac. + LOSS(CABLE)+S.Fac.(DISTANCE Fac.) - GAIN(AMP). Actual distance: 3.10 m.

# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site  
Date : 01/09/2020

Mode : 1.FM Reception (Sub)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (87.0 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi

| No. | Freq.<br>[MHz] | Reading |        | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result   |          | Limit    |          | Margin |       | Pola.<br>[H/V] | Ant.<br>Type | Comment                   |
|-----|----------------|---------|--------|-------------------|--------------|--------------|---------------|----------|----------|----------|----------|--------|-------|----------------|--------------|---------------------------|
|     |                | <AV>    | <PK>   |                   |              |              |               | <AV>     | <PK>     | <AV>     | <PK>     | <AV>   | <PK>  |                |              |                           |
|     |                | [dBuV]  | [dBuV] |                   |              |              |               | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dB]   | [dB]  |                |              |                           |
| 49  | 3139.920       | ---     | ---    | 28.75             | 3.45         | 39.25        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 50  | 3139.920       | ---     | ---    | 28.75             | 3.45         | 39.25        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 51  | 3227.140       | ---     | ---    | 28.52             | 3.51         | 39.21        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 52  | 3227.140       | ---     | ---    | 28.52             | 3.51         | 39.21        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 53  | 3314.360       | ---     | ---    | 28.18             | 3.55         | 39.16        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 54  | 3314.360       | ---     | ---    | 28.18             | 3.55         | 39.16        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 55  | 3401.580       | ---     | ---    | 28.18             | 3.60         | 39.11        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 56  | 3401.580       | ---     | ---    | 28.18             | 3.60         | 39.11        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 57  | 3488.800       | 54.70   | 57.80  | 28.77             | 5.39         | 39.07        | 0.28          | 50.07    | 53.17    | 54.00    | 74.00    | 3.93   | 20.83 | Hori.          | HA           |                           |
| 58  | 3488.800       | 56.50   | 60.10  | 28.77             | 5.39         | 39.07        | 0.28          | 51.87    | 55.47    | 54.00    | 74.00    | 2.13   | 18.53 | Vert.          | HA           |                           |

# DATA OF RADIATED DISTURBANCE TEST

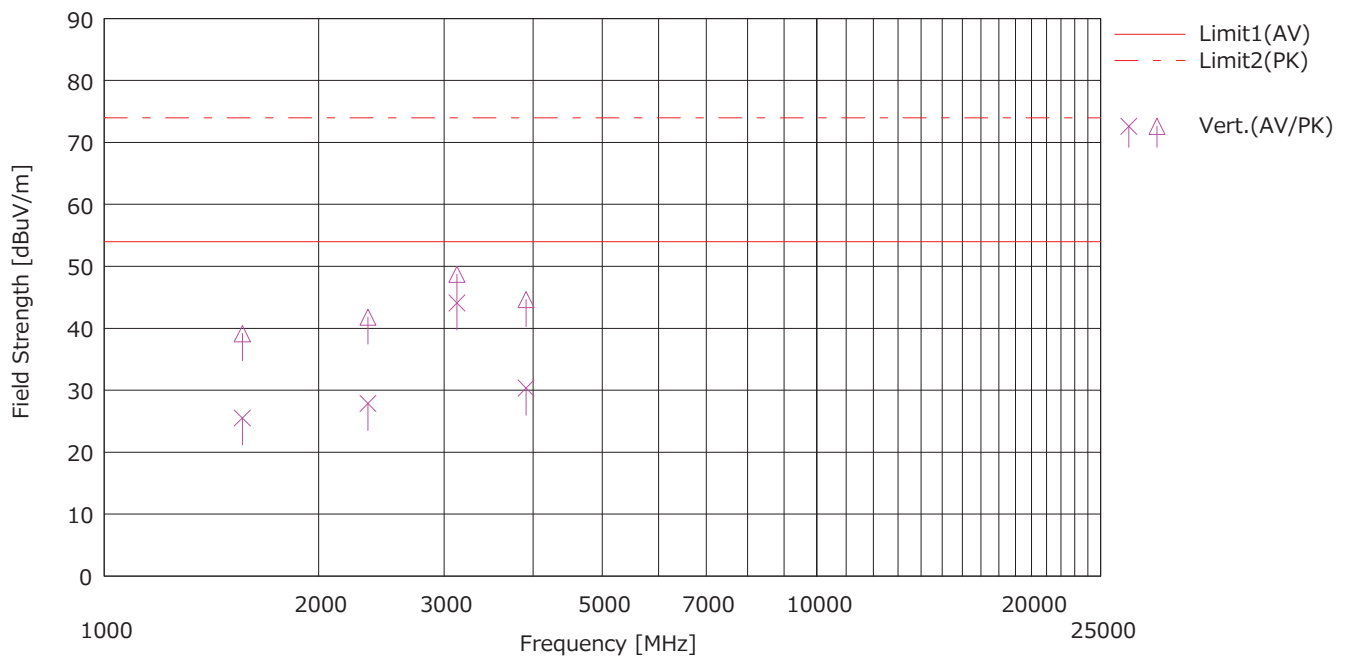
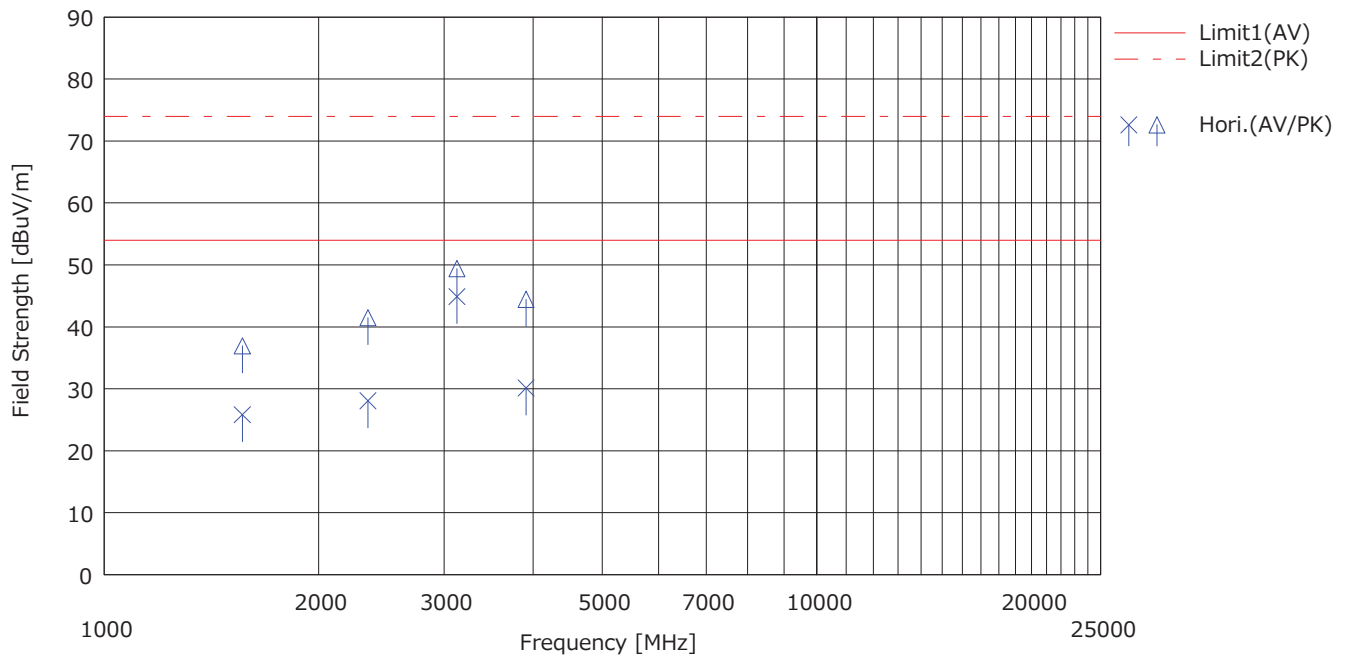
UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site  
Date : 01/09/2020

Mode : 1.FM Reception (Sub)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (97.5 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi



# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site

Date : 01/09/2020

Mode : 1.FM Reception (Sub)

Order No. : 13185291

Power : DC 13.2 V

Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (97.5 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi

## &lt;&lt; AV/PK DATA &gt;&gt;

| No. | Freq.<br>[MHz] | Reading        |                | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result           |                  | Limit            |                  | Margin       |              | Pola<br>[H/V] | Ant.<br>Type | Comment                   |
|-----|----------------|----------------|----------------|-------------------|--------------|--------------|---------------|------------------|------------------|------------------|------------------|--------------|--------------|---------------|--------------|---------------------------|
|     |                | (AV)<br>[dBuV] | (PK)<br>[dBuV] |                   |              |              |               | (AV)<br>[dBuV/m] | (PK)<br>[dBuV/m] | (AV)<br>[dBuV/m] | (PK)<br>[dBuV/m] | (AV)<br>[dB] | (PK)<br>[dB] |               |              |                           |
|     |                |                |                |                   |              |              |               |                  |                  |                  |                  |              |              |               |              |                           |
| 1   | 1074.920       | ---            | ---            | 24.95             | 2.00         | 40.32        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 2   | 1074.920       | ---            | ---            | 24.95             | 2.00         | 40.32        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 3   | 1172.640       | ---            | ---            | 25.15             | 2.08         | 40.16        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 4   | 1172.640       | ---            | ---            | 25.15             | 2.08         | 40.16        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 5   | 1270.360       | ---            | ---            | 25.57             | 2.16         | 40.00        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 6   | 1270.360       | ---            | ---            | 25.57             | 2.16         | 40.00        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 7   | 1368.080       | ---            | ---            | 25.77             | 2.24         | 39.85        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 8   | 1368.080       | ---            | ---            | 25.77             | 2.24         | 39.85        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 9   | 1465.800       | ---            | ---            | 25.63             | 2.32         | 39.69        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 10  | 1465.800       | ---            | ---            | 25.63             | 2.32         | 39.69        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 11  | 1563.520       | 36.20          | 47.30          | 25.31             | 3.56         | 39.53        | 0.28          | 25.82            | 36.92            | 54.00            | 74.00            | 28.18        | 37.08        | Hori.         | HA           |                           |
| 12  | 1563.520       | 35.90          | 49.50          | 25.31             | 3.56         | 39.53        | 0.28          | 25.52            | 39.12            | 54.00            | 74.00            | 28.48        | 34.88        | Vert.         | HA           |                           |
| 13  | 1661.240       | ---            | ---            | 25.02             | 2.48         | 39.38        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 14  | 1661.240       | ---            | ---            | 25.02             | 2.48         | 39.38        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 15  | 1758.960       | ---            | ---            | 25.12             | 2.56         | 39.22        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 16  | 1758.960       | ---            | ---            | 25.12             | 2.56         | 39.22        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 17  | 1856.680       | ---            | ---            | 25.49             | 2.65         | 39.06        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 18  | 1856.680       | ---            | ---            | 25.49             | 2.65         | 39.06        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 19  | 1954.400       | ---            | ---            | 25.93             | 2.72         | 38.90        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 20  | 1954.400       | ---            | ---            | 25.93             | 2.72         | 38.90        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 21  | 2052.120       | ---            | ---            | 26.52             | 2.79         | 38.86        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 22  | 2052.120       | ---            | ---            | 26.52             | 2.79         | 38.86        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 23  | 2149.840       | ---            | ---            | 27.89             | 2.86         | 38.90        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 24  | 2149.840       | ---            | ---            | 27.89             | 2.86         | 38.90        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 25  | 2247.560       | ---            | ---            | 28.24             | 2.91         | 38.95        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 26  | 2247.560       | ---            | ---            | 28.24             | 2.91         | 38.95        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 27  | 2345.280       | 34.60          | 48.00          | 27.78             | 4.41         | 39.00        | 0.28          | 28.07            | 41.47            | 54.00            | 74.00            | 25.93        | 32.53        | Hori.         | HA           |                           |
| 28  | 2345.280       | 34.40          | 48.30          | 27.78             | 4.41         | 39.00        | 0.28          | 27.87            | 41.77            | 54.00            | 74.00            | 26.13        | 32.23        | Vert.         | HA           |                           |
| 29  | 2443.000       | ---            | ---            | 27.50             | 3.03         | 39.05        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 30  | 2443.000       | ---            | ---            | 27.50             | 3.03         | 39.05        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 31  | 2540.720       | ---            | ---            | 27.53             | 3.10         | 39.10        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 32  | 2540.720       | ---            | ---            | 27.53             | 3.10         | 39.10        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 33  | 2638.440       | ---            | ---            | 27.86             | 3.15         | 39.15        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 34  | 2638.440       | ---            | ---            | 27.86             | 3.15         | 39.15        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 35  | 2736.160       | ---            | ---            | 28.11             | 3.21         | 39.20        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 36  | 2736.160       | ---            | ---            | 28.11             | 3.21         | 39.20        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 37  | 2833.880       | ---            | ---            | 28.46             | 3.27         | 39.25        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 38  | 2833.880       | ---            | ---            | 28.46             | 3.27         | 39.25        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 39  | 2931.600       | ---            | ---            | 28.42             | 3.33         | 39.30        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 40  | 2931.600       | ---            | ---            | 28.42             | 3.33         | 39.30        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 41  | 3029.320       | ---            | ---            | 28.57             | 3.38         | 39.31        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 42  | 3029.320       | ---            | ---            | 28.57             | 3.38         | 39.31        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 43  | 3127.040       | 50.00          | 54.50          | 28.77             | 5.10         | 39.26        | 0.28          | 44.89            | 49.39            | 54.00            | 74.00            | 9.11         | 24.61        | Hori.         | HA           |                           |
| 44  | 3127.040       | 49.20          | 53.80          | 28.77             | 5.10         | 39.26        | 0.28          | 44.09            | 48.69            | 54.00            | 74.00            | 9.91         | 25.31        | Vert.         | HA           |                           |
| 45  | 3224.760       | ---            | ---            | 28.53             | 3.50         | 39.21        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 46  | 3224.760       | ---            | ---            | 28.53             | 3.50         | 39.21        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |
| 47  | 3322.480       | ---            | ---            | 28.14             | 3.56         | 39.16        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.         | HA           | the margin exceeds 20 dB. |
| 48  | 3322.480       | ---            | ---            | 28.14             | 3.56         | 39.16        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.         | HA           | the margin exceeds 20 dB. |

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-199.99MHz:BICONICAL, 200MHz-1000MHz:LOGPERIODIC, 1000MHz+:HORN  
 CALCULATION:RESULT = READING + ANT.Fac. + LOSS(CABLE)+S.Fac.(DISTANCE Fac.) - GAIN(AMP). Actual distance: 3.10 m.

# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site  
Date : 01/09/2020

Mode : 1.FM Reception (Sub)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (97.5 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi

| No. | Freq.<br>[MHz] | Reading |        | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result   |          | Limit    |          | Margin |       | Pola.<br>[H/V] | Ant.<br>Type | Comment                   |
|-----|----------------|---------|--------|-------------------|--------------|--------------|---------------|----------|----------|----------|----------|--------|-------|----------------|--------------|---------------------------|
|     |                | <AV>    | <PK>   |                   |              |              |               | <AV>     | <PK>     | <AV>     | <PK>     | <AV>   | <PK>  |                |              |                           |
|     |                | [dBuV]  | [dBuV] |                   |              |              |               | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dB]   | [dB]  |                |              |                           |
| 49  | 3420.200       | ---     | ---    | 28.32             | 3.62         | 39.10        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 50  | 3420.200       | ---     | ---    | 28.32             | 3.62         | 39.10        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 51  | 3517.920       | ---     | ---    | 28.89             | 3.67         | 39.05        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 52  | 3517.920       | ---     | ---    | 28.89             | 3.67         | 39.05        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 53  | 3615.640       | ---     | ---    | 29.15             | 3.73         | 39.00        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 54  | 3615.640       | ---     | ---    | 29.15             | 3.73         | 39.00        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 55  | 3713.360       | ---     | ---    | 29.31             | 3.78         | 38.94        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 56  | 3713.360       | ---     | ---    | 29.31             | 3.78         | 38.94        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 57  | 3811.080       | ---     | ---    | 29.55             | 3.84         | 38.89        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 58  | 3811.080       | ---     | ---    | 29.55             | 3.84         | 38.89        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 59  | 3908.800       | 33.30   | 47.60  | 29.68             | 5.72         | 38.84        | 0.28          | 30.14    | 44.44    | 54.00    | 74.00    | 23.86  | 29.56 | Hori.          | HA           |                           |
| 60  | 3908.800       | 33.50   | 47.80  | 29.68             | 5.72         | 38.84        | 0.28          | 30.34    | 44.64    | 54.00    | 74.00    | 23.66  | 29.36 | Vert.          | HA           |                           |

# DATA OF RADIATED DISTURBANCE TEST

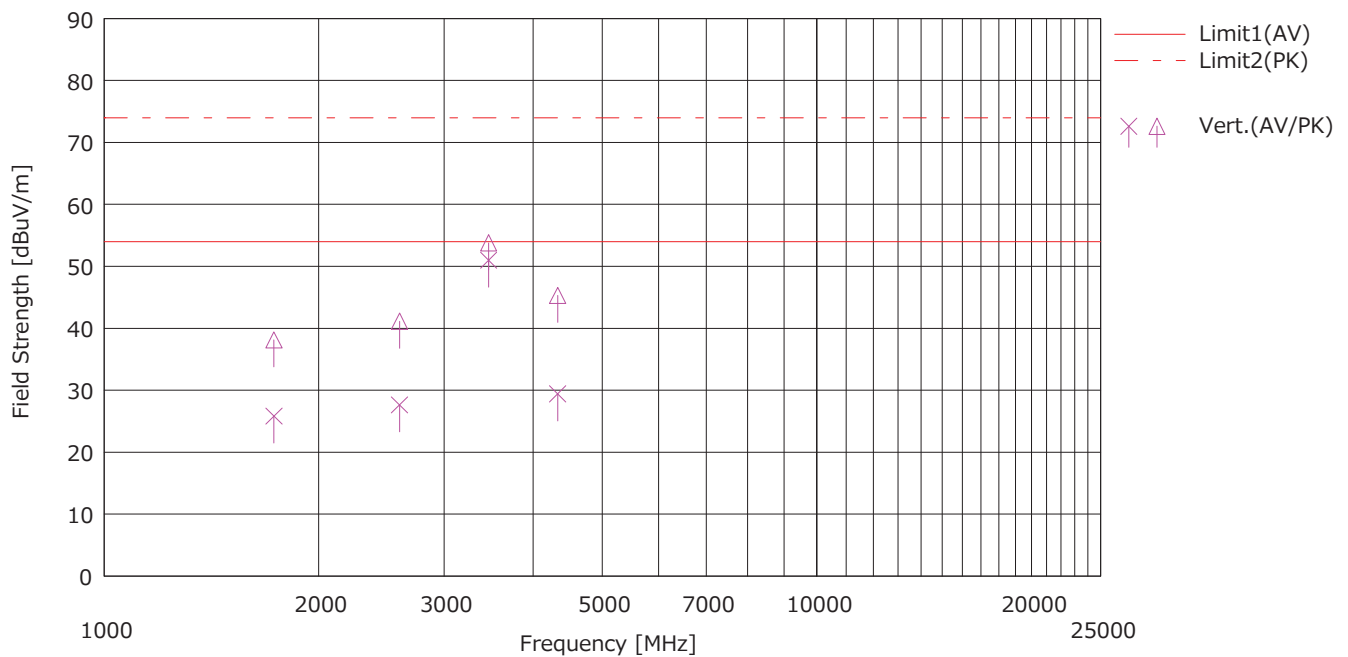
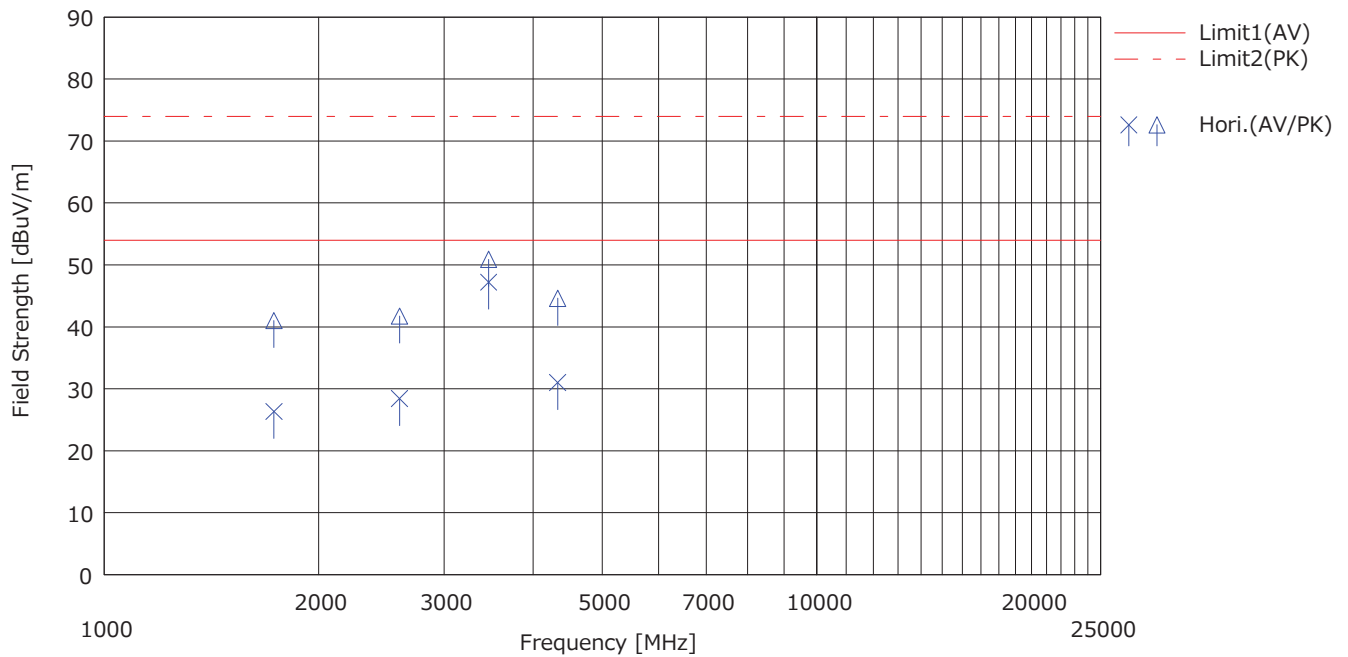
UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site  
Date : 01/09/2020

Mode : 1.FM Reception (Sub)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (108 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi



# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site

Date : 01/09/2020

Mode : 1.FM Reception (Sub)  
 Order No. : 13185291  
 Power : DC 13.2 V  
 Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (108 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi

## &lt;&lt; AV/PK DATA &gt;&gt;

| No. | Freq.<br>[MHz] | Reading        |                | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result           |                  | Limit            |                  | Margin       |              | Pola.<br>[H/V] | Ant.<br>Type | Comment                   |
|-----|----------------|----------------|----------------|-------------------|--------------|--------------|---------------|------------------|------------------|------------------|------------------|--------------|--------------|----------------|--------------|---------------------------|
|     |                | (AV)<br>[dBuV] | (PK)<br>[dBuV] |                   |              |              |               | (AV)<br>[dBuV/m] | (PK)<br>[dBuV/m] | (AV)<br>[dBuV/m] | (PK)<br>[dBuV/m] | (AV)<br>[dB] | (PK)<br>[dB] |                |              |                           |
|     |                |                |                |                   |              |              |               |                  |                  |                  |                  |              |              |                |              |                           |
| 1   | 1082.200       | ---            | ---            | 24.98             | 2.01         | 40.31        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 2   | 1082.200       | ---            | ---            | 24.98             | 2.01         | 40.31        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 3   | 1190.420       | ---            | ---            | 25.29             | 2.10         | 40.13        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 4   | 1190.420       | ---            | ---            | 25.29             | 2.10         | 40.13        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 5   | 1298.640       | ---            | ---            | 25.71             | 2.18         | 39.96        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 6   | 1298.640       | ---            | ---            | 25.71             | 2.18         | 39.96        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 7   | 1406.860       | ---            | ---            | 25.77             | 2.28         | 39.78        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 8   | 1406.860       | ---            | ---            | 25.77             | 2.28         | 39.78        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 9   | 1515.080       | ---            | ---            | 25.38             | 2.36         | 39.61        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 10  | 1515.080       | ---            | ---            | 25.38             | 2.36         | 39.61        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 11  | 1623.300       | ---            | ---            | 25.09             | 2.45         | 39.44        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 12  | 1623.300       | ---            | ---            | 25.09             | 2.45         | 39.44        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 13  | 1731.520       | 36.50          | 51.20          | 25.05             | 3.75         | 39.26        | 0.28          | 26.32            | 41.02            | 54.00            | 74.00            | 27.68        | 32.98        | Hori.          | HA           |                           |
| 14  | 1731.520       | 36.00          | 48.30          | 25.05             | 3.75         | 39.26        | 0.28          | 25.82            | 38.12            | 54.00            | 74.00            | 28.18        | 35.88        | Vert.          | HA           |                           |
| 15  | 1839.740       | ---            | ---            | 25.43             | 2.63         | 39.09        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 16  | 1839.740       | ---            | ---            | 25.43             | 2.63         | 39.09        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 17  | 1947.960       | ---            | ---            | 25.89             | 2.72         | 38.91        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 18  | 1947.960       | ---            | ---            | 25.89             | 2.72         | 38.91        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 19  | 2056.180       | ---            | ---            | 26.57             | 2.79         | 38.86        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 20  | 2056.180       | ---            | ---            | 26.57             | 2.79         | 38.86        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 21  | 2164.400       | ---            | ---            | 28.02             | 2.86         | 38.91        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 22  | 2164.400       | ---            | ---            | 28.02             | 2.86         | 38.91        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 23  | 2272.620       | ---            | ---            | 28.13             | 2.93         | 38.97        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 24  | 2272.620       | ---            | ---            | 28.13             | 2.93         | 38.97        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 25  | 2380.840       | ---            | ---            | 27.63             | 3.00         | 39.02        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 26  | 2380.840       | ---            | ---            | 27.63             | 3.00         | 39.02        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 27  | 2489.060       | ---            | ---            | 27.44             | 3.07         | 39.07        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 28  | 2489.060       | ---            | ---            | 27.44             | 3.07         | 39.07        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 29  | 2597.280       | 34.90          | 48.20          | 27.74             | 4.64         | 39.13        | 0.28          | 28.43            | 41.73            | 54.00            | 74.00            | 25.57        | 32.27        | Hori.          | HA           |                           |
| 30  | 2597.280       | 34.10          | 47.60          | 27.74             | 4.64         | 39.13        | 0.28          | 27.63            | 41.13            | 54.00            | 74.00            | 26.37        | 32.87        | Vert.          | HA           |                           |
| 31  | 2705.500       | ---            | ---            | 28.11             | 3.19         | 39.18        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 32  | 2705.500       | ---            | ---            | 28.11             | 3.19         | 39.18        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 33  | 2813.720       | ---            | ---            | 28.38             | 3.26         | 39.24        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 34  | 2813.720       | ---            | ---            | 28.38             | 3.26         | 39.24        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 35  | 2921.940       | ---            | ---            | 28.44             | 3.33         | 39.29        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 36  | 2921.940       | ---            | ---            | 28.44             | 3.33         | 39.29        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 37  | 3030.160       | ---            | ---            | 28.58             | 3.38         | 39.31        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 38  | 3030.160       | ---            | ---            | 28.58             | 3.38         | 39.31        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 39  | 3138.380       | ---            | ---            | 28.75             | 3.45         | 39.26        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 40  | 3138.380       | ---            | ---            | 28.75             | 3.45         | 39.26        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 41  | 3246.600       | ---            | ---            | 28.43             | 3.51         | 39.20        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 42  | 3246.600       | ---            | ---            | 28.43             | 3.51         | 39.20        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 43  | 3354.820       | ---            | ---            | 28.03             | 3.58         | 39.14        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 44  | 3354.820       | ---            | ---            | 28.03             | 3.58         | 39.14        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |
| 45  | 3463.040       | 52.00          | 55.70          | 28.62             | 5.37         | 39.08        | 0.28          | 47.19            | 50.89            | 54.00            | 74.00            | 6.81         | 23.11        | Hori.          | HA           |                           |
| 46  | 3463.040       | 55.80          | 58.60          | 28.62             | 5.37         | 39.08        | 0.28          | 50.99            | 53.79            | 54.00            | 74.00            | 3.01         | 20.21        | Vert.          | HA           |                           |
| 47  | 3571.260       | ---            | ---            | 29.05             | 3.70         | 39.02        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Hori.          | HA           | the margin exceeds 20 dB. |
| 48  | 3571.260       | ---            | ---            | 29.05             | 3.70         | 39.02        | 0.28          | ---              | ---              | 54.00            | 74.00            | ---          | ---          | Vert.          | HA           | the margin exceeds 20 dB. |

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-199.99MHz:BICONICAL, 200MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN  
 CALCULATION:RESULT = READING + ANT.Fac. + LOSS(CABLE)+S.Fac.(DISTANCE Fac.) - GAIN(AMP). Actual distance: 3.10 m.

# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site  
Date : 01/09/2020

Mode : 1.FM Reception (Sub)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : Local (108 MHz Receiving)

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Seigo Kakehi

| No. | Freq.<br>[MHz] | Reading |        | Ant.Fac<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | S.Fac<br>[dB] | Result   |          | Limit    |          | Margin |       | Pola.<br>[H/V] | Ant.<br>Type | Comment                   |
|-----|----------------|---------|--------|-------------------|--------------|--------------|---------------|----------|----------|----------|----------|--------|-------|----------------|--------------|---------------------------|
|     |                | <AV>    | <PK>   |                   |              |              |               | <AV>     | <PK>     | <AV>     | <PK>     | <AV>   | <PK>  |                |              |                           |
|     |                | [dBuV]  | [dBuV] |                   |              |              |               | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dB]   | [dB]  |                |              |                           |
| 49  | 3679.480       | ---     | ---    | 29.27             | 3.77         | 38.96        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 50  | 3679.480       | ---     | ---    | 29.27             | 3.77         | 38.96        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 51  | 3787.700       | ---     | ---    | 29.49             | 3.83         | 38.90        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 52  | 3787.700       | ---     | ---    | 29.49             | 3.83         | 38.90        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 53  | 3895.920       | ---     | ---    | 29.69             | 3.89         | 38.85        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 54  | 3895.920       | ---     | ---    | 29.69             | 3.89         | 38.85        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 55  | 4004.140       | ---     | ---    | 29.75             | 3.95         | 38.79        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 56  | 4004.140       | ---     | ---    | 29.75             | 3.95         | 38.79        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 57  | 4112.360       | ---     | ---    | 29.81             | 4.01         | 38.82        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 58  | 4112.360       | ---     | ---    | 29.81             | 4.01         | 38.82        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 59  | 4220.580       | ---     | ---    | 30.13             | 4.05         | 38.85        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Hori.          | HA           | the margin exceeds 20 dB. |
| 60  | 4220.580       | ---     | ---    | 30.13             | 4.05         | 38.85        | 0.28          | ---      | ---      | 54.00    | 74.00    | ---    | ---   | Vert.          | HA           | the margin exceeds 20 dB. |
| 61  | 4328.800       | 33.20   | 46.80  | 30.37             | 6.03         | 38.87        | 0.28          | 31.01    | 44.61    | 54.00    | 74.00    | 22.99  | 29.39 | Hori.          | HA           |                           |
| 62  | 4328.800       | 31.60   | 47.50  | 30.37             | 6.03         | 38.87        | 0.28          | 29.41    | 45.31    | 54.00    | 74.00    | 24.59  | 28.69 | Vert.          | HA           |                           |

# DATA OF RADIATED DISTURBANCE TEST

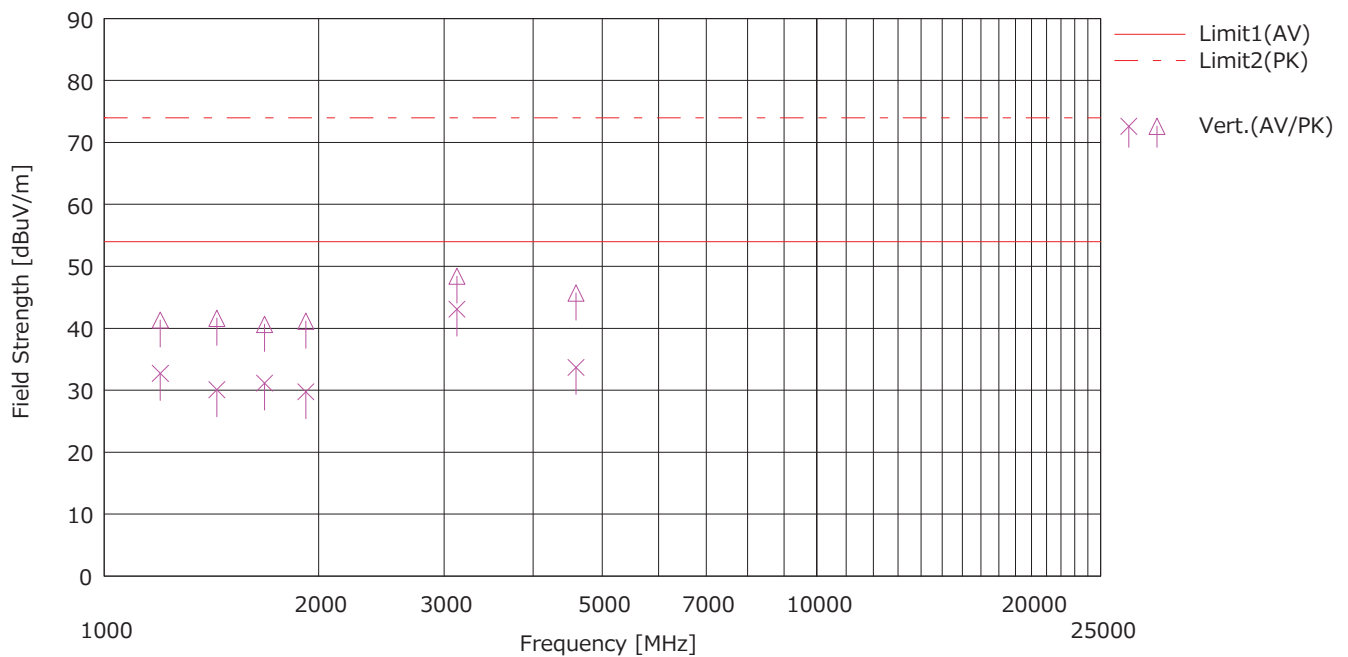
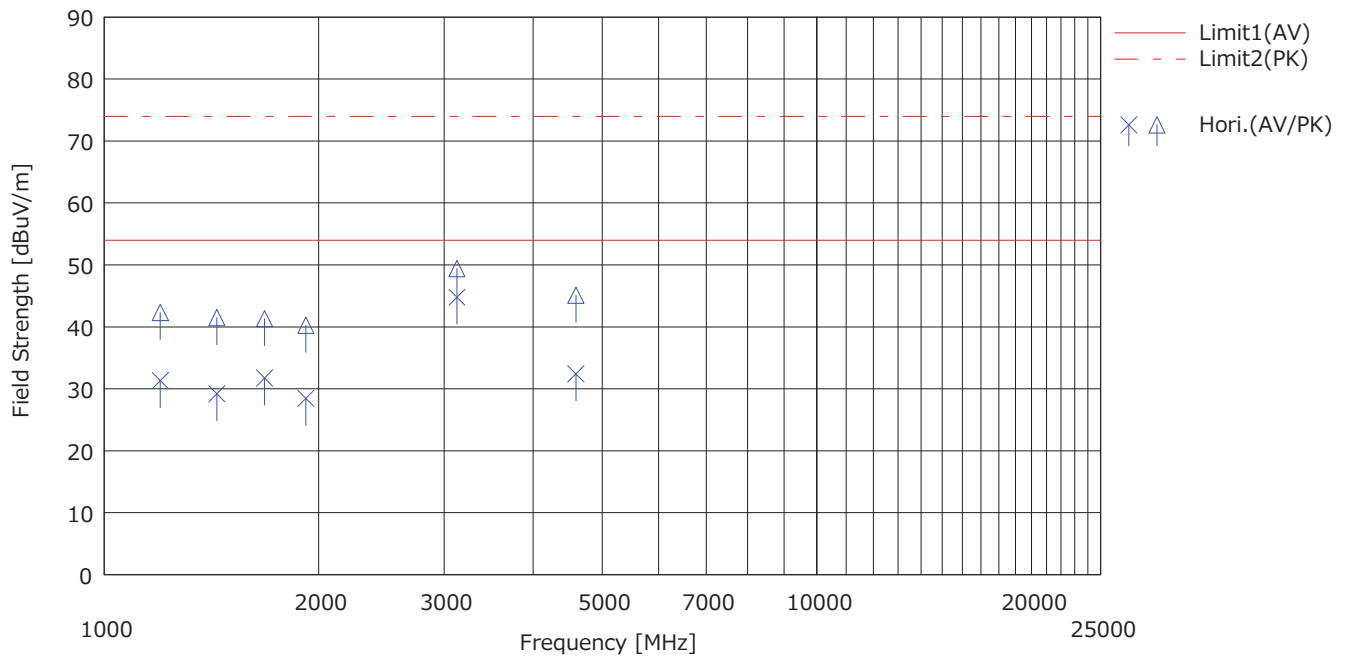
UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site  
Date : 01/09/2020

Mode : 1.FM Reception (SUB)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : -

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Jun Ito



# DATA OF RADIATED DISTURBANCE TEST

UL Japan, Inc. Yokowa EMC Lab. No. 3 Open area test site  
Date : 01/09/2020

Mode : .FM Reception (Sub)  
Order No. : 13185291  
Power : DC 13.2 V  
Temp. / Humi. : 24 deg. C / 31 % RH

Remarks : -

Limit : FCC Part 15B CLASS B (GHz, 3m)

Engineer : Jun Ito

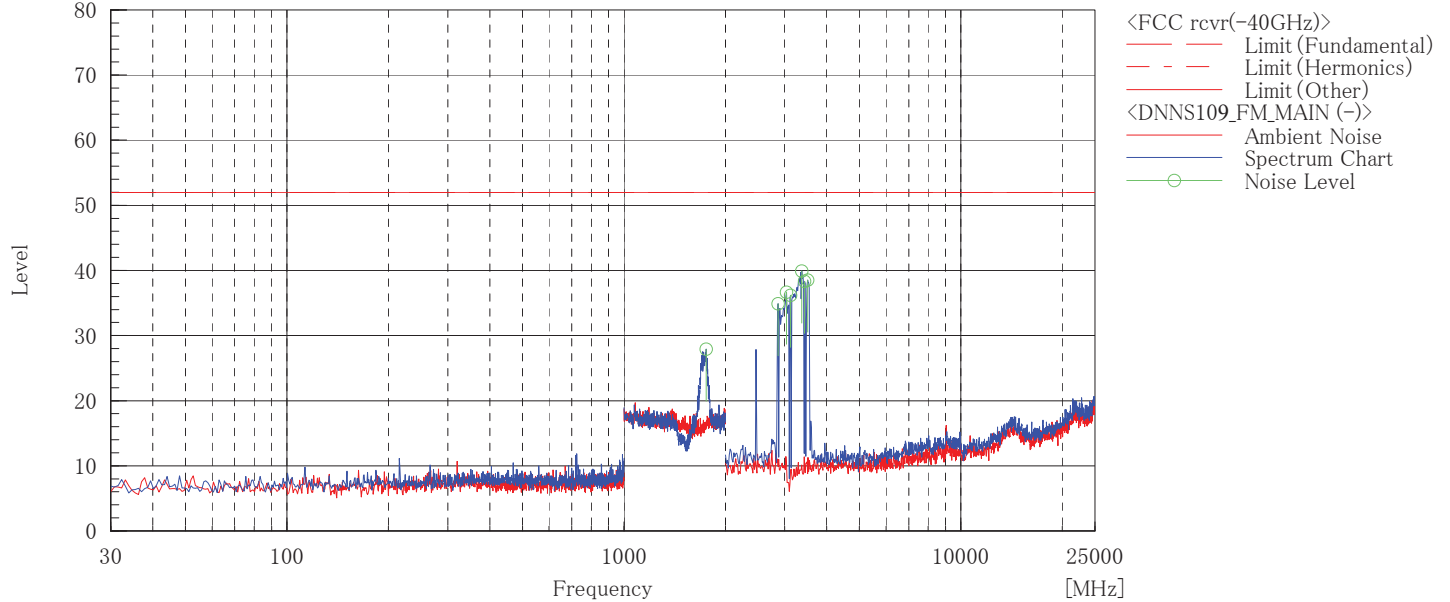
## << AV/PK DATA >>

| No. | Freq.    | Reading |        | Ant.Fac | Loss | Gain  | S.Fac | Result   |          | Limit    |          | Margin |       | Pola  | Ant. Type | Comment |
|-----|----------|---------|--------|---------|------|-------|-------|----------|----------|----------|----------|--------|-------|-------|-----------|---------|
|     |          | (AV)    | (PK)   |         |      |       |       | (AV)     | (PK)     | (AV)     | (PK)     | (AV)   | (PK)  |       |           |         |
|     |          | [dBuV]  | [dBuV] |         |      |       |       | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dBuV/m] | [dB]   | [dB]  |       |           |         |
|     | [MHz]    |         |        | [dB/m]  | [dB] | [dB]  | [dB]  |          |          |          |          |        |       | [H/V] |           |         |
| 1   | 1200.002 | 44.10   | 52.70  | 25.36   | 3.11 | 40.12 | 0.28  | 32.73    | 41.33    | 54.00    | 74.00    | 21.27  | 32.67 | Vert. | HA        |         |
| 2   | 1200.008 | 42.70   | 53.70  | 25.36   | 3.11 | 40.12 | 0.28  | 31.33    | 42.33    | 54.00    | 74.00    | 22.67  | 31.67 | Hori. | HA        |         |
| 3   | 1440.049 | 39.50   | 51.80  | 25.75   | 3.40 | 39.73 | 0.28  | 29.20    | 41.50    | 54.00    | 74.00    | 24.80  | 32.50 | Hori. | HA        |         |
| 4   | 1440.076 | 40.40   | 51.90  | 25.75   | 3.40 | 39.73 | 0.28  | 30.10    | 41.60    | 54.00    | 74.00    | 23.90  | 32.40 | Vert. | HA        |         |
| 5   | 1680.060 | 42.10   | 51.70  | 25.00   | 3.70 | 39.35 | 0.28  | 31.73    | 41.33    | 54.00    | 74.00    | 22.27  | 32.67 | Hori. | HA        |         |
| 6   | 1680.079 | 41.50   | 51.00  | 25.00   | 3.70 | 39.35 | 0.28  | 31.13    | 40.63    | 54.00    | 74.00    | 22.87  | 33.37 | Vert. | HA        |         |
| 7   | 1920.014 | 37.40   | 49.20  | 25.74   | 3.99 | 38.96 | 0.28  | 28.45    | 40.25    | 54.00    | 74.00    | 25.55  | 33.75 | Hori. | HA        |         |
| 8   | 1920.075 | 38.70   | 50.10  | 25.74   | 3.99 | 38.96 | 0.28  | 29.75    | 41.15    | 54.00    | 74.00    | 24.25  | 32.85 | Vert. | HA        |         |
| 9   | 3127.066 | 48.20   | 53.50  | 28.77   | 5.10 | 39.26 | 0.28  | 43.09    | 48.39    | 54.00    | 74.00    | 10.91  | 25.61 | Vert. | HA        |         |
| 10  | 3127.068 | 49.90   | 54.50  | 28.77   | 5.10 | 39.26 | 0.28  | 44.79    | 49.39    | 54.00    | 74.00    | 9.21   | 24.61 | Hori. | HA        |         |
| 11  | 4592.640 | 34.00   | 46.70  | 30.82   | 6.23 | 38.94 | 0.28  | 32.39    | 45.09    | 54.00    | 74.00    | 21.61  | 28.91 | Hori. | HA        |         |
| 12  | 4593.015 | 35.30   | 47.30  | 30.82   | 6.23 | 38.94 | 0.28  | 33.69    | 45.69    | 54.00    | 74.00    | 20.31  | 28.31 | Vert. | HA        |         |

UL Japan, Inc.  
Yokowa No.6 S/R

## &lt;&lt;ANTENNA TERMINAL VOLTAGE TEST&gt;&gt;

01/07/2020

EUT Power : DC 13.2 V  
[dB( $\mu$  V)]Limit : FCC Part15(ANSI C63.4/92)  
Mode : 1.FM Reception (Main)  
Temp./Hum. : 20 deg.C / 40 % RH  
Engineer : Hiromichi Nakai  
Test Room : No.6 Shielded Room

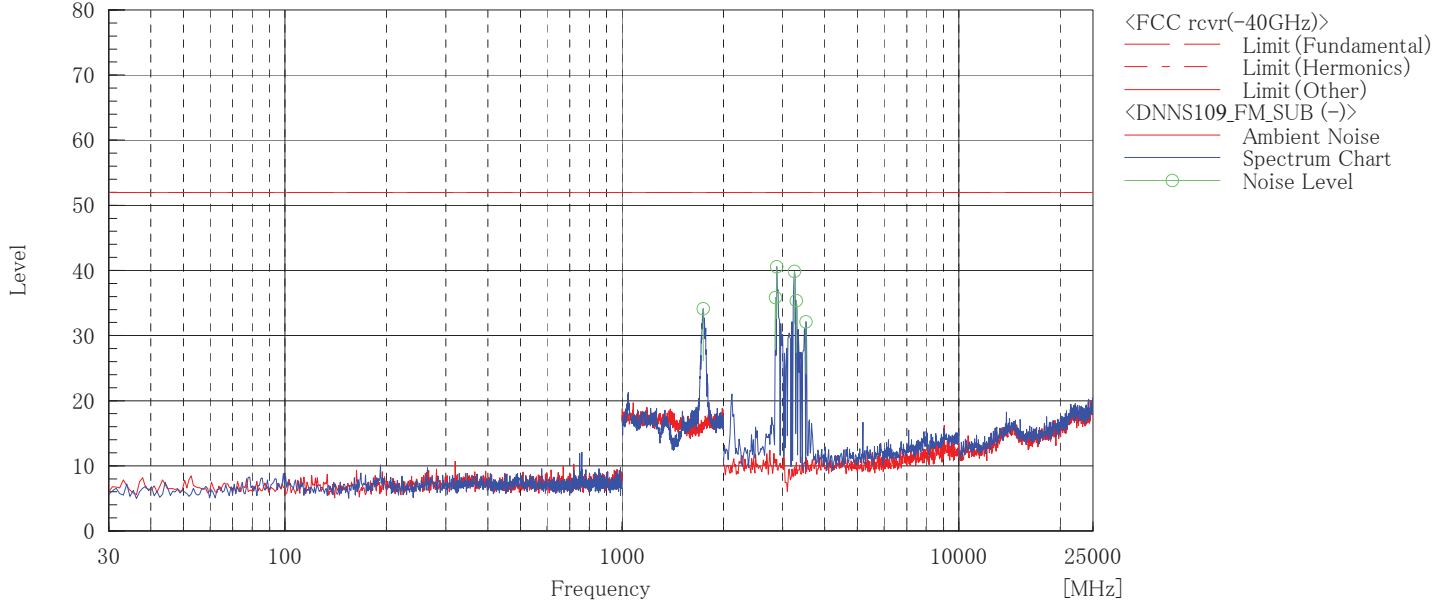
## Spectrum Selection (Peak Value)

| Ch. | No. | Frequency<br>[MHz] | Harm | Reading<br>[dB( $\mu$ V)] | c. f<br>[dB] | Result<br>[dB( $\mu$ V)] | Limit<br>[dB( $\mu$ V)] | Margin<br>[dB] |
|-----|-----|--------------------|------|---------------------------|--------------|--------------------------|-------------------------|----------------|
| —   | 1   | 1753.333           |      | 55.1                      | -27.2        | 27.9                     | 52.0                    | 24.1           |
|     | 2   | 2866.667           |      | 67.8                      | -32.9        | 34.9                     | 52.0                    | 17.1           |
|     | 3   | 3040.000           |      | 69.5                      | -32.8        | 36.7                     | 52.0                    | 15.4           |
|     | 4   | 3120.000           |      | 68.9                      | -32.7        | 36.2                     | 52.0                    | 15.8           |
|     | 5   | 3373.333           |      | 72.4                      | -32.5        | 39.9                     | 52.0                    | 12.1           |
|     | 6   | 3440.000           |      | 70.8                      | -32.4        | 38.4                     | 52.0                    | 13.7           |
|     | 7   | 3506.667           |      | 70.8                      | -32.3        | 38.5                     | 52.0                    | 13.5           |

UL Japan, Inc.  
Yokowa No.6 S/R

## &lt;&lt;ANTENNA TERMINAL VOLTAGE TEST&gt;&gt;

01/07/2020

EUT Power : DC 13.2 V  
[dB( $\mu$  V)]Limit : FCC Part15(ANSI C63.4/92)  
Mode : 1.FM Reception (Sub)  
Temp./Hum. : 20 deg.C / 40 % RH  
Engineer : Hiromichi Nakai  
Test Room : No.6 Shielded Room

## Spectrum Selection (Peak Value)

| Ch. | No. | Frequency<br>[MHz] | Harm | Reading<br>[dB( $\mu$ V)] | c. f<br>[dB] | Result<br>[dB( $\mu$ V)] | Limit<br>[dB( $\mu$ V)] | Margin<br>[dB] |
|-----|-----|--------------------|------|---------------------------|--------------|--------------------------|-------------------------|----------------|
| —   | 1   | 1743.333           |      | 61.3                      | -27.2        | 34.1                     | 52.0                    | 17.9           |
|     | 2   | 2853.333           |      | 68.7                      | -32.9        | 35.8                     | 52.0                    | 16.2           |
|     | 3   | 2880.000           |      | 73.5                      | -32.9        | 40.6                     | 52.0                    | 11.5           |
|     | 4   | 3253.333           |      | 72.5                      | -32.6        | 39.9                     | 52.0                    | 12.1           |
|     | 5   | 3293.333           |      | 67.9                      | -32.5        | 35.4                     | 52.0                    | 16.6           |
|     | 6   | 3520.000           |      | 64.4                      | -32.3        | 32.1                     | 52.0                    | 19.9           |

## **APPENDIX 3**

### **Test Instruments**

**\*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 disturbance**

**AT : Antenna terminal conducted disturbance**

| Test Item | Local ID        | LIMS ID | Description                | Manufacturer                            | Model            | Serial                        | Last Calibration Date | Cal Int |
|-----------|-----------------|---------|----------------------------|-----------------------------------------|------------------|-------------------------------|-----------------------|---------|
| RE        | MCC-218         | 141394  | Microwave Cable            | Junkosha                                | MWX221           | 1607S141(1 m) / 1608S264(5 m) | 2019/09/11            | 12      |
| RE        | TR-13           | 151197  | EMI Test Receiver          | Rohde & Schwarz                         | ESW26            | 101287                        | 2019/08/29            | 12      |
| RE        | DM-03           | 146649  | Tester                     | SANWA                                   | PC500            | 7019229                       | 2019/06/21            | 12      |
| RE        | YJM-15          | 147543  | Measure                    | -                                       | -                | -                             | -                     | -       |
| RE        | SC-03           | 147518  | Search Coil                | UL Japan                                | -                | -                             | -                     | -       |
| RE        | OS-07           | 146989  | Digital Humidity Indicator | SATO                                    | PC-5000TRH-II    | 05A06                         | 2019/01/11            | 12      |
| RE        | HA-05           | 146710  | Broad-Band Horn Antenna    | Schwarzbeck                             | BBHA 9120 D      | 257                           | 2019/04/19            | 12      |
| RE        | YOATS-03(SVSWR) | 147000  | Open area test site        | JSE                                     | 3m,10m           | 3                             | 2019/03/12            | 12      |
| RE        | CC-C14          | 178057  | Microwave Cable            | Huber+Suhner                            | SUCOFLEX 126EA   | 800630 / 126EA                | 2019/03/01            | 12      |
| RE        | CC-C15          | 178392  | Microwave Cable            | Junkosha INC.                           | JUNFLON MWX315   | 1511-023                      | 2019/03/18            | 12      |
| RE        | YAJ-01          | 147319  | Antenna Tilt Jig           | Intelligent System Engineering Co., Ltd | Antenna Tilt Jig | T-0004                        | -                     | -       |
| RE        | MHA-01          | 141510  | Horn Antenna 18-26.5GHz    | EMCO                                    | 3160-09          | 1266                          | 2019/05/17            | 12      |
| RE        | AF-06           | 146601  | Pre Amplifier              | AGILENT                                 | HP8449B          | 3008A01672                    | 2019/11/11            | 12      |
| RE        | TR-12           | 146893  | EMI Test Receiver          | Rohde & Schwarz                         | ESU 26           | 100413                        | 2019/07/26            | 12      |
| RE        | COTS-YW-EMI-TSJ | 146923  | EMI measurement program    | TSJ                                     | TEPTO-DV         | -                             | -                     | -       |

| Test Item | Local ID      | LIMS ID | Description                            | Manufacturer | Model                                        | Serial     | Last Calibration Date | Cal Int |
|-----------|---------------|---------|----------------------------------------|--------------|----------------------------------------------|------------|-----------------------|---------|
| RE        | DM-02         | 146648  | Tester                                 | SANWA        | PC500                                        | 7019227    | 2019/06/21            | 12      |
| RE        | YJM-12        | 147540  | Measure                                | Rubber KOMBE | GW-3H99W                                     | -          | -                     | -       |
| RE        | SC-02         | 147517  | Search Coil                            | UL Japan     | -                                            | -          | -                     | -       |
| RE        | OS-10         | 146984  | Digital Humidity Indicator             | SATO         | PC-5000TRH                                   | B-10       | 2019/04/09            | 12      |
| RE        | AF-03         | 146611  | Pre Amplifier                          | ANRITSU      | MH648A                                       | M97457     | 2019/07/10            | 12      |
| RE        | AT-02         | 146625  | Attenuator                             | ANRITSU      | MP721A                                       | 6200239014 | 2019/07/11            | 12      |
| RE        | AT-40         | 146572  | Attenuator                             | ANRITSU      | MP721B                                       | 6201150481 | 2019/10/18            | 12      |
| RE        | CC-2ORC       | 146806  | Yokowa No.2 open coaxial(0.01-1000MHz) | UL Japan     | CC-21,CC-22,CC-23,CC-24,CC-25,CC-27,SW-21,SW | YO0201     | 2019/10/18            | 12      |
| RE        | YOATS-02(NSA) | 146944  | Open area test site                    | JSE          | 3m、 10m                                      | 2          | 2019/09/16            | 12      |
| RE        | BA-14         | 159920  | Biconical Antenna                      | Schwarzbeck  | VHBB 9124 + BBA 9106                         | 9124-1022  | 2019/03/06            | 12      |
| RE        | LA-15         | 146964  | Logperiodic Antenna                    | Schwarzbeck  | VUSLP9111B                                   | 185        | 2019/03/21            | 12      |
| AT        | BM-1A01       | 146833  | Barometer                              | Sunoh        | SBR121                                       | 2347       | 2018/09/19            | 36      |
| AT        | OS-33         | 146736  | Thermo-Hygrometer                      | CUSTOM       | CTH-201                                      | 510Q06R    | 2019/03/08            | 12      |
| AT        | DM-06         | 146650  | Tester                                 | SANWA        | PC500                                        | 7019239    | 2019/06/21            | 12      |
| AT        | YJM-17        | 147545  | Measure                                | -            | -                                            | -          | -                     | -       |

| Test Item | Local ID   | LIMS ID | Description                           | Manufacturer     | Model      | Serial                 | Last Calibration Date | Cal Int |
|-----------|------------|---------|---------------------------------------|------------------|------------|------------------------|-----------------------|---------|
| AT        | AV17-12    | 148701  | Broadcast Tester                      | Rohde & Schwarz  | SFE        | 2112.4300K02-121168-Li | 2019/08/05            | 12      |
| AT        | APMAT07    | 146634  | Matching Pad                          | TME              | ZT-130     | 500101                 | 2019/10/11            | 12      |
| AT        | IP-08      | 146715  | Power Combiner                        | Mini-Circuit     | ZFRSC-2050 | -                      | 2019/10/11            | 12      |
| AT        | ATS-02     | 160511  | 75Ω Cable                             | UL Japan         | -          | -                      | 2019/11/07            | 12      |
| AT        | SP-03      | 146763  | 50Ω Coaxil Cable(Antenna Terminal)    | UL Japan         | 50-N-N-SP  | YSP03                  | 2019/03/07            | 12      |
| AT        | SP-04      | 146764  | 50Ω Coaxil Cable(Antenna Terminal)    | UL Japan         | 50-N-N-SP  | YSP04                  | 2019/03/07            | 12      |
| AT        | SP-05      | 146765  | 50Ω Coaxil Cable(Antenna Terminal)    | UL Japan         | 50-N-N-SP  | YSP05                  | 2019/03/07            | 12      |
| AT        | KAF-03     | 151789  | Pre Amplifier                         | HEWLETT PACKARD  | 8447D      | 2944A09947             | 2019/03/07            | 12      |
| AT        | AF-04      | 146600  | Pre Amplifier                         | HEWLETT PACKARD  | 8449B      | 3008A01207             | 2019/07/18            | 12      |
| AT        | COTS-YW-AT | 146723  | Software for Antenna Terminal Voltage | Toyo Corporation | -          | -                      | -                     | -       |
| AT        | TR-09      | 146776  | Test Receiver                         | Rohde & Schwarz  | ESCI       | 100769                 | 2019/09/27            | 12      |

**End of Report**