



# RADIO TEST REPORT

## Test Report No. 14630442S-A-R1

|                     |                                         |
|---------------------|-----------------------------------------|
| Customer            | Sony Group Corporation                  |
| Description of EUT  | Wireless Noise Canceling Stereo Headset |
| Model Number of EUT | YY2963                                  |
| FCC ID              | AK8YY2963                               |
| Test Regulation     | FCC Part 15 Subpart C                   |
| Test Result         | Complied (Refer to SECTION 3)           |
| Issue Date          | February 17, 2023                       |
| Remarks             | Bluetooth (BR / EDR) parts              |

### Representative Test Engineer

T. Suzuki

Takahiro Suzuki  
Engineer

### Approved By

T. Imamura

Toyokazu Imamura  
Leader



CERTIFICATE 1266.03

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

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- The information provided from the customer for this report is identified in Section 1.
- For test report(s) referred in this report, the latest version (including any revisions) is always referred.

## **REVISION HISTORY**

### **Original Test Report No.: 14630442S-A**

This report is a revised version of 14630442S-A. 14630442S-A is replaced with this report.

| Revision        | Test Report No. | Date              | Page Revised Contents                                                                                                                                                                                                                                 |
|-----------------|-----------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -<br>(Original) | 14630442S-A     | January 31, 2023  | -                                                                                                                                                                                                                                                     |
| 1               | 14630442S-A-R1  | February 17, 2023 | Page 5<br>Corrected the test date<br>from December 26 to January 17, 2022<br>to December 26, 2022 to January 17, 2023.<br><br>Page 10<br>Corrected USB Cable and Connector information in the<br>List of Cables Used from “Unshielded” to “Shielded”. |

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

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

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| <b>CONTENTS</b>                                                               | <b>PAGE</b> |
|-------------------------------------------------------------------------------|-------------|
| <b>SECTION 1: Customer Information .....</b>                                  | <b>5</b>    |
| <b>SECTION 2: Equipment Under Test (EUT).....</b>                             | <b>5</b>    |
| <b>SECTION 3: Test Specification, Procedures &amp; Results .....</b>          | <b>6</b>    |
| <b>SECTION 4: Operation of EUT during testing.....</b>                        | <b>9</b>    |
| <b>SECTION 5: Radiated Spurious Emission .....</b>                            | <b>11</b>   |
| <b>SECTION 6: Antenna Terminal Conducted Tests.....</b>                       | <b>13</b>   |
| <b>APPENDIX 1: Test data .....</b>                                            | <b>14</b>   |
| 20dB Bandwidth, 99%Occupied Bandwidth and Carrier Frequency Separation .....  | 14          |
| Number of Hopping Frequency .....                                             | 18          |
| Dwell time.....                                                               | 20          |
| Maximum Peak Output Power/Average Power(Reference data for RF Exposure) ..... | 23          |
| Radiated Spurious Emission .....                                              | 25          |
| Conducted Spurious Emission .....                                             | 47          |
| Conducted Emission Band Edge compliance .....                                 | 53          |
| <b>APPENDIX 2: Test Instruments.....</b>                                      | <b>55</b>   |
| <b>APPENDIX 3: Photographs of Test Setup .....</b>                            | <b>57</b>   |
| Radiated Spurious Emission .....                                              | 57          |
| Pre-check of Worst Case Position.....                                         | 58          |
| Antenna Terminal Conducted Tests.....                                         | 59          |

## **SECTION 1: Customer Information**

|                |                                              |
|----------------|----------------------------------------------|
| Company Name   | Sony Group Corporation                       |
| Address        | 1-7-1 Konan Minato-ku, Tokyo, 108-0075 Japan |
| Contact Person | Kazuhiko Nagano                              |

The information provided from the customer is as follows;

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

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

## **SECTION 2: Equipment Under Test (EUT)**

### **2.1 Identification of EUT**

|               |                                                                                            |
|---------------|--------------------------------------------------------------------------------------------|
| Description   | Wireless Noise Canceling Stereo Headset                                                    |
| Model Number  | YY2963                                                                                     |
| Serial Number | Refer to SECTION 4.2                                                                       |
| Condition     | Engineering prototype<br>(Not for Sale: This sample is equivalent to mass-produced items.) |
| Modification  | No Modification by the test lab                                                            |
| Receipt Date  | December 20, 2022                                                                          |
| Test Date     | January 16, 2023 *Antenna Terminal Conducted tests only                                    |
|               | December 26, 2022 to January 17, 2023                                                      |

### **2.2 Product Description**

#### **General Specification**

|                       |                        |
|-----------------------|------------------------|
| Rating                | DC 3.85 V (Battery)    |
| Operating temperature | 0 deg. C to +40 deg. C |

#### **Radio Specification**

##### **Bluetooth (BR / EDR)**

|                        |                                    |
|------------------------|------------------------------------|
| Equipment Type         | Transceiver                        |
| Frequency of Operation | 2402 MHz to 2480 MHz               |
| Type of Modulation     | FHSS (GFSK, $\pi/4$ DQPSK, 8 DPSK) |
| Antenna Gain           | -3 dBi                             |

##### **Bluetooth (Low Energy)**

|                        |                      |
|------------------------|----------------------|
| Equipment Type         | Transceiver          |
| Frequency of Operation | 2402 MHz to 2480 MHz |
| Type of Modulation     | GFSK                 |
| Antenna Gain           | -3 dBi               |

## SECTION 3: Test Specification, Procedures & Results

### 3.1 Test Specification

|                    |                                                                                                                                                                                                              |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Specification | FCC Part 15 Subpart C<br>The latest version on the first day of the testing period                                                                                                                           |
| Title              | FCC 47 CFR Part 15 Radio Frequency Device Subpart C Intentional Radiators<br>Section 15.207 Conducted limits<br>Section 15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz,<br>and 5725-5850 MHz |

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

### 3.2 Procedures and Results

| Item                                                                                                                                                                                                                                                                                                                                                                                                                | Test Procedure                                                           | Specification                                                             | Worst Margin                                                                        | Results          | Remarks                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------|-------------------------------------------------|
| Conducted Emission                                                                                                                                                                                                                                                                                                                                                                                                  | FCC: ANSI C63.10-2013<br>6. Standard test methods<br>ISED: RSS-Gen 8.8   | FCC: Section 15.207<br>ISED: RSS-Gen 8.8                                  | N/A                                                                                 | N/A              | *1)                                             |
| Carrier Frequency Separation                                                                                                                                                                                                                                                                                                                                                                                        | FCC: KDB 558074 D01<br>15.247 Meas Guidance v05r02<br>ISED: -            | FCC: Section15.247(a)(1)<br>ISED: RSS-247 5.1 (b)                         | See data.                                                                           | Complied a)      | Conducted                                       |
| 20dB Bandwidth                                                                                                                                                                                                                                                                                                                                                                                                      | FCC: KDB 558074 D01<br>15.247 Meas Guidance v05r02<br>ISED: -            | FCC: Section15.247(a)(1)<br>ISED: RSS-247 5.1 (a)                         |                                                                                     | Complied a)      | Conducted                                       |
| Number of Hopping Frequency                                                                                                                                                                                                                                                                                                                                                                                         | FCC: KDB 558074 D01<br>15.247 Meas Guidance v05r02<br>ISED: -            | FCC: Section15.247(a)(1)(iii)<br>ISED: RSS-247 5.1 (d)                    |                                                                                     | Complied b)      | Conducted                                       |
| Dwell time                                                                                                                                                                                                                                                                                                                                                                                                          | FCC: KDB 558074 D01<br>15.247 Meas Guidance v05r02<br>ISED: -            | FCC: Section15.247(a)(1)(iii)<br>ISED: RSS-247 5.1 (d)                    |                                                                                     | Complied c)      | Conducted                                       |
| Maximum Peak Output Power                                                                                                                                                                                                                                                                                                                                                                                           | FCC: KDB 558074 D01<br>15.247 Meas Guidance v05r02<br>ISED: RSS-Gen 6.12 | FCC: Section15.247(b)(1)<br>ISED: RSS-247 5.4 (b)                         |                                                                                     | Complied d)      | Conducted                                       |
| Spurious Emission & Band Edge Compliance                                                                                                                                                                                                                                                                                                                                                                            | FCC: KDB 558074 D01<br>15.247 Meas Guidance v05r02<br>ISED: RSS-Gen 6.13 | FCC: Section15.247(d)<br>ISED: RSS-247 5.5<br>RSS-Gen 8.9<br>RSS-Gen 8.10 | 13.2 dB<br>2483.500 MHz, AV, Hori.,<br>Mode: Tx Hopping Off,<br>DH5 2480 MHz, Right | Complied e) / f) | Conducted/<br>Radiated<br>(above 30 MHz)<br>*2) |
| Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003593.<br>* In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred.<br><br>*1) The test was not applicable since the Bluetooth does not operate during charging.<br>*2) Radiated test was selected over 30 MHz based on section 15.247(d).                                      |                                                                          |                                                                           |                                                                                     |                  |                                                 |
| a) Refer to APPENDIX 1 (data of 20dB Bandwidth, 99%Occupied Bandwidth and Carrier Frequency Separation)<br>b) Refer to APPENDIX 1 (data of Number of Hopping Frequency)<br>c) Refer to APPENDIX 1 (data of Dwell time)<br>d) Refer to APPENDIX 1 (data of Maximum Peak Output Power)<br>e) Refer to APPENDIX 1 (data of Conducted Spurious Emission)<br>f) Refer to APPENDIX 1 (data of Radiated Spurious Emission) |                                                                          |                                                                           |                                                                                     |                  |                                                 |

#### FCC Part 15.31 (e)

This EUT provides the stable voltage constantly to RF Part regardless of input voltage.  
Therefore, this EUT complies with the requirement.

#### FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT.  
Therefore, the equipment complies with the antenna requirement of Section 15.203.

### 3.3 Addition to Standard

| Item                   | Test Procedure    | Specification | Worst Margin | Results     | Remarks   |
|------------------------|-------------------|---------------|--------------|-------------|-----------|
| 99% Occupied Bandwidth | ISED: RSS-Gen 6.7 | ISED: -       | N/A          | Complied a) | Conducted |

a) Refer to APPENDIX 1 (data of 20dB Bandwidth, 99%Occupied Bandwidth and Carrier Frequency Separation)

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

### 3.4 Uncertainty

Measurement uncertainty is not taken into account when stating conformity with a specified requirement.

Note: When margins obtained from test results are less than the measurement uncertainty, the test results may exceed the limit.

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

| Item                                             | Frequency range | Uncertainty (+/-) |
|--------------------------------------------------|-----------------|-------------------|
| Conducted emission (AC Mains) LISN               | 150 kHz-30 MHz  | 3.1 dB            |
| Radiated emission<br>(Measurement distance: 3 m) | 9 kHz-30 MHz    | 3.3 dB            |
|                                                  | 30 MHz-200 MHz  | 4.8 dB            |
|                                                  | 200 MHz-1 GHz   | 6.1 dB            |
|                                                  | 1 GHz-6 GHz     | 4.7 dB            |
|                                                  | 6 GHz-18 GHz    | 5.3 dB            |
|                                                  | 18 GHz-40 GHz   | 5.5 dB            |
| Radiated emission<br>(Measurement distance: 1 m) | 1 GHz-18 GHz    | 5.6 dB            |
|                                                  | 18 GHz-40 GHz   | 5.8 dB            |

| Antenna terminal test                                      | Uncertainty (+/-) |
|------------------------------------------------------------|-------------------|
| Power Measurement above 1 GHz (Average Detector)_SPM-06    | 1.3 dB            |
| Power Measurement above 1 GHz (Peak Detector)_SPM-06       | 2.1 dB            |
| Power Measurement above 1 GHz (Average Detector)_SPM-07    | 1.1 dB            |
| Power Measurement above 1 GHz (Peak Detector)_SPM-07       | 1.2 dB            |
| Power Measurement above 1 GHz (Average Detector)_SPM-13    | 1.1 dB            |
| Power Measurement above 1 GHz (Peak Detector)_SPM-13       | 1.4 dB            |
| Spurious emission (Conducted) below 1 GHz                  | 0.8 dB            |
| Conducted emissions Power Density Measurement 1 GHz-3 GHz  | 0.9 dB            |
| Conducted emissions Power Density Measurement 3 GHz-18 GHz | 2.4 dB            |
| Spurious emission (Conducted) 18 GHz-26.5 GHz              | 2.4 dB            |
| Spurious emission (Conducted) 26.5 GHz-40 GHz              | 2.2 dB            |
| Bandwidth Measurement                                      | 0.012 %           |
| Duty cycle and Time Measurement                            | 0.27 %            |
| Temperature_SCH-01                                         | 0.87 deg.C.       |
| Humidity_SCH-01                                            | 3.5 %             |
| Temperature_SCH-02                                         | 2.0 deg.C.        |
| Humidity_SCH-02                                            | 6.7 %             |
| Voltage                                                    | 0.97 %            |

### 3.5 Test Location

UL Japan, Inc. Shonan EMC Lab.

1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 Japan

Telephone: +81-463-50-6400

A2LA Certificate Number: 1266.03

(FCC test firm registration number: 626366, ISED lab company number: 2973D / CAB identifier: JP0001)

| Test site                  | IC Registration Number | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Maximum measurement distance |
|----------------------------|------------------------|----------------------------|------------------------------------------------------------------|------------------------------|
| No.1 Semi-anechoic chamber | 2973D-1                | 20.6 x 11.3 x 7.65         | 20.6 x 11.3                                                      | 10 m                         |
| No.2 Semi-anechoic chamber | 2973D-2                | 20.6 x 11.3 x 7.65         | 20.6 x 11.3                                                      | 10 m                         |
| No.3 Semi-anechoic chamber | 2973D-3                | 12.7 x 7.7 x 5.35          | 12.7 x 7.7                                                       | 5 m                          |
| No.4 Semi-anechoic chamber | -                      | 8.1 x 5.1 x 3.55           | 8.1 x 5.1                                                        | -                            |
| No.1 Shielded room         | -                      | 6.8 x 4.1 x 2.7            | 6.8 x 4.1                                                        | -                            |
| No.2 Shielded room         | -                      | 6.8 x 4.1 x 2.7            | 6.8 x 4.1                                                        | -                            |
| No.3 Shielded room         | -                      | 6.3 x 4.7 x 2.7            | 6.3 x 4.7                                                        | -                            |
| No.4 Shielded room         | -                      | 4.4 x 4.7 x 2.7            | 4.4 x 4.7                                                        | -                            |
| No.5 Shielded room         | -                      | 7.8 x 6.4 x 2.7            | 7.8 x 6.4                                                        | -                            |
| No.6 Shielded room         | -                      | 7.8 x 6.4 x 2.7            | 7.8 x 6.4                                                        | -                            |
| No.8 Shielded room         | -                      | 3.45 x 5.5 x 2.4           | 3.45 x 5.5                                                       | -                            |
| No.1 Measurement room      | -                      | 2.55 x 4.1 x 2.5           | -                                                                | -                            |

### 3.6 Test Data, Test Instruments, and Test Set Up

Refer to APPENDIX.

## SECTION 4: Operation of EUT during testing

### 4.1 Operating Mode(s)

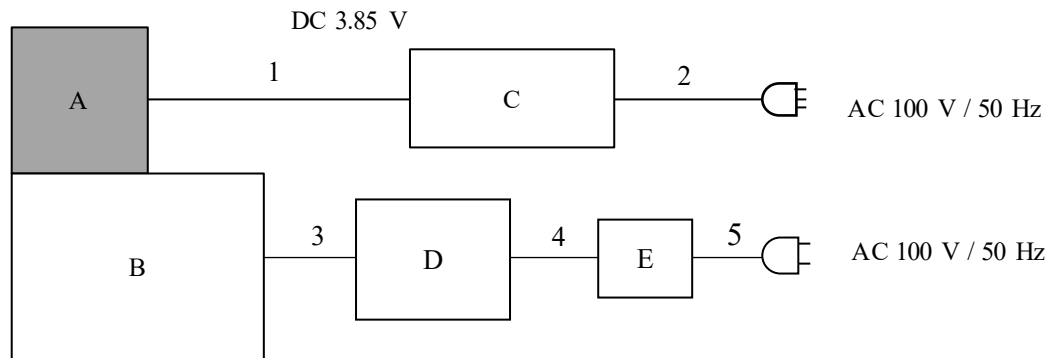
| Mode                                                                                                                                                                                                                                                                                                                                                                                                                              | Remarks*                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Bluetooth (BT)                                                                                                                                                                                                                                                                                                                                                                                                                    | BR / EDR, Payload: PRBS9 |
| <p>*EUT has the power settings by the software as follows;<br/> Power Setting: 55<br/> Software: BT Test Tool Version: 0.04<br/> (Date: 2022.10.31, Storage location: Driven by connected PC)</p> <p>*This setting of software is the worst case.<br/> Any conditions under the normal use do not exceed the condition of setting.<br/> In addition, end users cannot change the settings of the output power of the product.</p> |                          |

#### Details of Operating Mode(s)

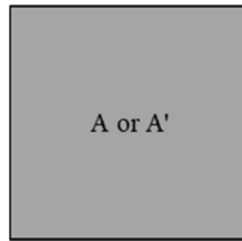
| Test Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Mode                                    | Hopping            | Tested Frequency                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|--------------------|----------------------------------|
| Radiated Spurious Emission (Below 1 GHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Tx DH5 *1)                              | Off                | 2402 MHz                         |
| Radiated Spurious Emission (Above 1 GHz),<br>Conducted Spurious Emission                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Tx DH5<br>Tx 3DH5                       | Off                | 2402 MHz<br>2441 MHz<br>2480 MHz |
| Carrier Frequency Separation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Tx DH5<br>Tx 3DH5                       | On                 | 2402 MHz<br>2441 MHz<br>2480 MHz |
| 20dB Bandwidth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Tx DH5<br>Tx 3DH5                       | Off                | 2402 MHz<br>2441 MHz<br>2480 MHz |
| Number of Hopping Frequency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Tx DH5<br>Tx 3DH5                       | On                 | -                                |
| Dwell time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Tx DH1, DH3, DH5<br>Tx 3DH1, 3DH3, 3DH5 | On                 | -                                |
| Maximum Peak Output Power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Tx DH5<br>Tx 2DH5<br>Tx 3DH5            | Off                | 2402 MHz<br>2441 MHz<br>2480 MHz |
| Band Edge Compliance<br>(Conducted)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Tx DH5<br>Tx 3DH5                       | On<br>-----<br>Off | 2402 MHz<br>2480 MHz             |
| 99% Occupied Bandwidth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Tx DH5<br>Tx 3DH5                       | On<br>-----<br>Off | 2402 MHz<br>2441 MHz<br>2480 MHz |
| <p>*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test)<br/> *2DH mode (2Mb/s EDR: pi/4DQPSK) was excluded for other tests than power measurement by using 3DH mode (3 Mb/s EDR: 8DPSK) as a representative.<br/> *It is considered that the non-tested packet type (e.g. inquiry) can be omitted as it is complied with above all the test items based on Bluetooth Core specification.</p> <p>*1) Conducted emissions and Spurious emissions for frequencies below 1 GHz were limited to the channel that had the highest power during the antenna terminal test, as preliminary testing indicated that changing the operating frequency had no significant impact on the emissions in those frequency bands.</p> |                                         |                    |                                  |

## 4.2 Configuration and Peripherals

[Antenna Terminal Conducted tests]



[Radiated Emission test]



### Description of EUT and Support Equipment

| No. | Item                                    | Model number  | Serial Number           | Manufacturer | Remarks     |
|-----|-----------------------------------------|---------------|-------------------------|--------------|-------------|
| A   | Wireless Noise Canceling Stereo Headset | YY2963        | 1300870 *1)             | SONY         | EUT (Left)  |
|     |                                         |               | 1300740 *2)             | SONY         | EUT (Left)  |
| A'  | Wireless Noise Canceling Stereo Headset | YY2963        | 1300870 *1)             | SONY         | EUT (Right) |
|     |                                         |               | 1300740 *2)             | SONY         | EUT (Right) |
| B   | Case                                    | YY2963        | 1300870                 | SONY         | -           |
| C   | Power Supply (DC)                       | PW18-2ATP     | 19050351                | TEXIO        | -           |
| D   | Laptop Computer                         | ThinkPad L580 | PF-1LTWLZ               | LENOVO       | -           |
| E   | AC Adapter                              | ADLX45YLC2A   | 8SSA10E75842L1CZ94J0D3R | LENOVO       | -           |

\*1) For the Antenna Terminal Conducted tests

\*2) For the Radiated Emission test

### List of Cables Used

| No. | Name | Length (m) | Shield     |            | Remarks |
|-----|------|------------|------------|------------|---------|
|     |      |            | Cable      | Connector  |         |
| 1   | DC   | 0.1        | Unshielded | Unshielded | -       |
| 2   | AC   | 1.5        | Unshielded | Unshielded | -       |
| 3   | USB  | 0.2        | Shielded   | Shielded   | -       |
| 4   | DC   | 1.8        | Unshielded | Unshielded | -       |
| 5   | AC   | 0.9        | Unshielded | Unshielded | -       |

## **SECTION 5: Radiated Spurious Emission**

### **Test Procedure**

[For below 1 GHz]

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1 GHz]

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

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

### **Test Antennas are used as below;**

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

In any 100 kHz bandwidth outside the restricted band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

### **20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9 (ISED) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (ISED).**

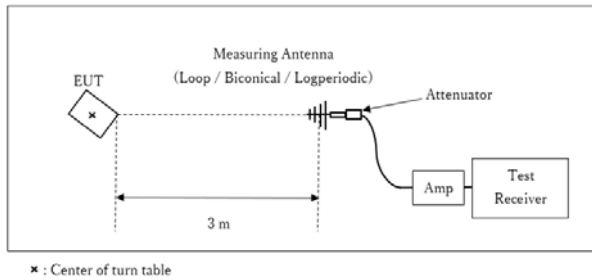
|                 |               |                          |                                                                                                          |                              |
|-----------------|---------------|--------------------------|----------------------------------------------------------------------------------------------------------|------------------------------|
| Frequency       | Below 1 GHz   | Above 1 GHz              |                                                                                                          | 20 dBc                       |
| Instrument used | Test Receiver | Spectrum Analyzer *a)    |                                                                                                          | Spectrum Analyzer            |
| Detector        | QP            | PK                       | AV *1)                                                                                                   | PK                           |
| IF Bandwidth    | BW 120 kHz    | RBW: 1 MHz<br>VBW: 3 MHz | RBW: 1 MHz<br>VBW: 1/T<br>(T: burst length, refer to<br>Burst rate confirmation sheet)<br>Detector: Peak | RBW: 100 kHz<br>VBW: 300 kHz |

\*1) Average Power Measurement was performed based on KDB 558074 D01 15.247 Meas Guidance v05r02.

\*a) The Spectrum Analyzer was used in 3 dB resolution bandwidth.

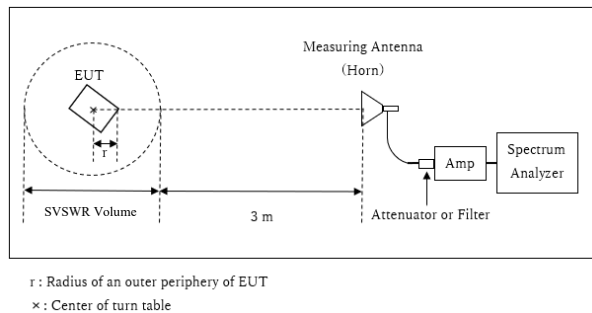
**Figure 2: Test Setup**

Below 1 GHz



Test Distance: 3 m

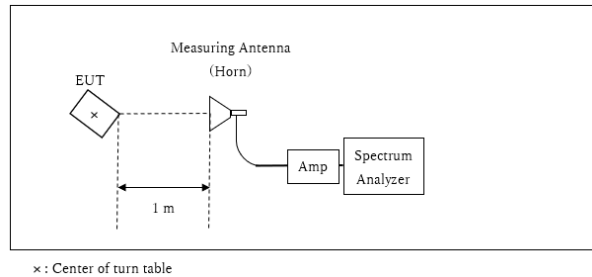
1 GHz to 10 GHz



Distance Factor:  $20 \times \log (3.99 \text{ m} / 3.0 \text{ m}) = 2.48 \text{ dB}$   
\* Test Distance:  $(3 + \text{SVSWR Volume} / 2) - r = 3.99 \text{ m}$

SVSWR Volume : 2.0 m  
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)  
 $r = 0.01 \text{ m}$

10 GHz to 26.5 GHz



Distance Factor:  $20 \times \log (1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$   
\*Test Distance: 1 m

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

|             |            | Below 30 MHz | 1-2.8 GHz | 2.8-10 GHz | 10-18 GHz | 18-26.5 GHz |
|-------------|------------|--------------|-----------|------------|-----------|-------------|
| EUT (Left)  | Horizontal | X            | X         | X          | X         | X           |
|             | Vertical   | X            | Z         | X          | X         | X           |
| EUT (Right) | Horizontal | X            | X         | X          | X         | X           |
|             | Vertical   | X            | Y         | X          | X         | X           |

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

**Measurement Range** : 30 MHz to 26.5 GHz  
**Test Data** : APPENDIX  
**Test Result** : Pass

## SECTION 6: Antenna Terminal Conducted Tests

### Test Procedure

The tests were made with below setting connected to the antenna port.  
The antenna terminal conducted test was performed only for the left side as representative.

| Test                                             | Span                                    | RBW             | VBW                | Sweep time                                                     | Detector         | Trace       | Instrument Used                  |
|--------------------------------------------------|-----------------------------------------|-----------------|--------------------|----------------------------------------------------------------|------------------|-------------|----------------------------------|
| 20dB Bandwidth                                   | 3 MHz                                   | 30 kHz          | 100 kHz            | Auto                                                           | Peak             | Max Hold    | Spectrum Analyzer                |
| 99% Occupied Bandwidth *1)                       | Enough width to display emission skirts | 1 to 5 % of OBW | Three times of RBW | Auto                                                           | Peak             | Max Hold    | Spectrum Analyzer                |
| Maximum Peak Output Power                        | -                                       | -               | -                  | Auto                                                           | Peak Average *2) | -           | Power Meter (Sensor: 160 MHz BW) |
| Carrier Frequency Separation                     | 3 MHz                                   | 100 kHz         | 300 kHz            | Auto                                                           | Peak             | Max Hold    | Spectrum Analyzer                |
| Number of Hopping Frequency                      | 30 MHz                                  | 100 kHz         | 300 kHz            | Auto                                                           | Peak             | Max Hold    | Spectrum Analyzer                |
| Dwell Time                                       | Zero Span                               | 100 kHz, 1 MHz  | 300 kHz, 3 MHz     | As necessary capture the entire dwell time per hopping channel | Peak             | Clear Write | Spectrum Analyzer                |
| Conducted Spurious Emission *3) *4)              | 9 kHz to 150 kHz                        | 200 Hz          | 620 Hz             | Auto                                                           | Peak             | Max Hold    | Spectrum Analyzer                |
|                                                  | 150 kHz to 30 MHz                       | 10 kHz          | 30 kHz             |                                                                |                  |             |                                  |
|                                                  | 30 MHz to 25 GHz                        | 100 kHz         | 300 kHz            |                                                                |                  |             |                                  |
| Conducted Spurious Emission Band Edge compliance | 10 MHz                                  | 100 kHz         | 300 kHz            | Auto                                                           | Peak             | Max Hold    | Spectrum Analyzer                |

\*1) Peak hold was applied as Worst-case measurement.  
 \*2) Reference data  
 \*3) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.  
 Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.  
 \*4) The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ohms. For example, the measurement at frequency 9 kHz resulted in a level of 45.5 dBuV/m, which is equivalent to  $45.5 - 51.5 = -6.0$  dBuA/m, which has the same margin, 3 dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

The test results and limit are rounded off to two decimals place, so some differences might be observed.  
The equipment and cables were not used for factor 0 dB of the data sheets.

**Test Data** : APPENDIX  
**Test Result** : Pass

## **APPENDIX 1: Test data**

### **20dB Bandwidth, 99% Occupied Bandwidth and Carrier Frequency Separation**

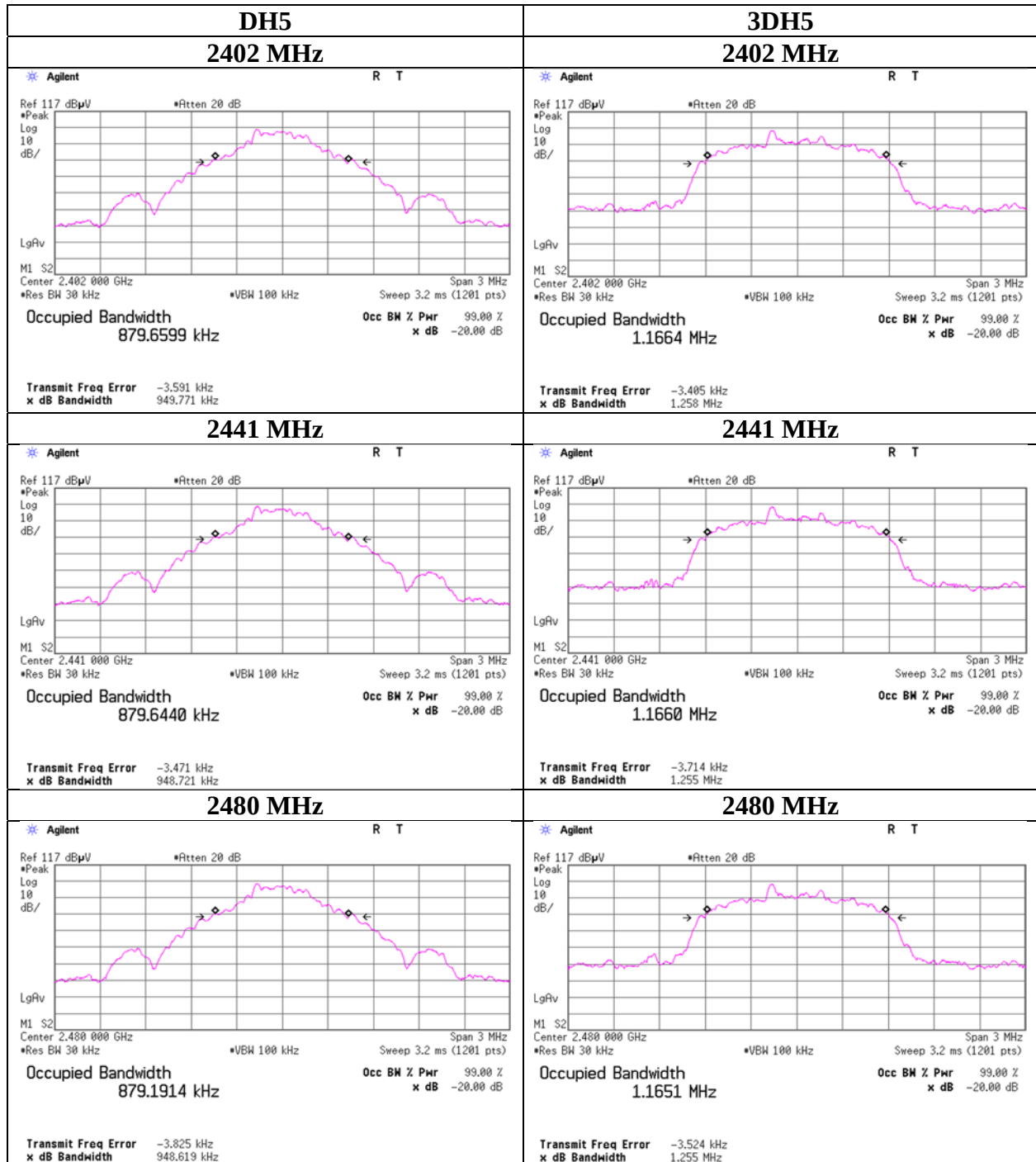
|                        |                                    |                     |
|------------------------|------------------------------------|---------------------|
| Test place             | Shonan EMC Lab. No.5 Shielded Room |                     |
| Date                   | December 29, 2022                  | January 5, 2023     |
| Temperature / Humidity | 23 deg. C / 38 % RH                | 23 deg. C / 35 % RH |
| Engineer               | Yohsuke Matsuzawa                  | Yohsuke Matsuzawa   |
| Mode                   | Tx, Hopping Off, Tx, Hopping On    |                     |

| Mode | Freq.<br>[MHz] | 20 dB Bandwidth<br>[MHz] | 99 % Occupied<br>Bandwidth<br>[kHz] | Carrier Frequency<br>Separation<br>[MHz] | Limit for Carrier<br>Frequency separation<br>[MHz] |
|------|----------------|--------------------------|-------------------------------------|------------------------------------------|----------------------------------------------------|
| DH5  | 2402.0         | 0.950                    | 879.7                               | 1.000                                    | $\geq 0.633$                                       |
| DH5  | 2441.0         | 0.949                    | 879.6                               | 1.000                                    | $\geq 0.633$                                       |
| DH5  | 2480.0         | 0.949                    | 879.2                               | 1.000                                    | $\geq 0.633$                                       |
| DH5  | Hopping On     | -                        | 78650.2                             | -                                        | -                                                  |
| 3DH5 | 2402.0         | 1.258                    | 1166.4                              | 1.000                                    | $\geq 0.839$                                       |
| 3DH5 | 2441.0         | 1.255                    | 1166.0                              | 1.000                                    | $\geq 0.837$                                       |
| 3DH5 | 2480.0         | 1.255                    | 1165.1                              | 1.000                                    | $\geq 0.837$                                       |
| 3DH5 | Hopping On     | -                        | 78717.0                             | -                                        | -                                                  |

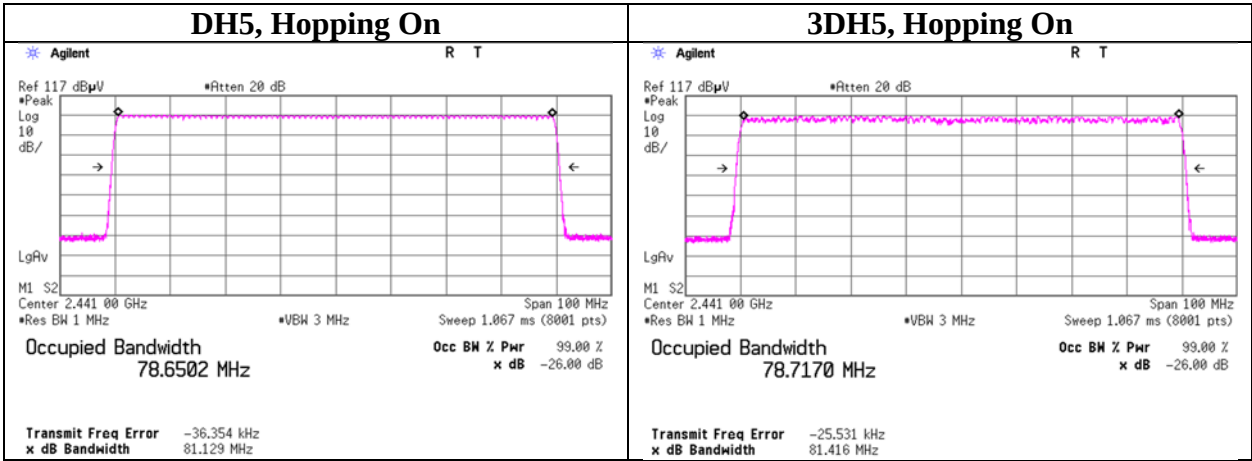
Limit: Two-thirds of 20 dB Bandwidth or 25 kHz (whichever is greater).

No limit applies to 20 dB Bandwidth.

## 20dB Bandwidth and 99% Occupied Bandwidth



20dB Bandwidth and 99% Occupied Bandwidth



The figure displays six Agilent spectrum analyzer plots arranged in a 3x2 grid, showing the frequency response of a signal source at different frequencies: 2402 MHz, 2441 MHz, and 2480 MHz. Each plot includes the following information:

- Top Left:** Agilent logo and frequency label (2402 MHz, 2441 MHz, or 2480 MHz).
- Top Right:** Reference level (Ref 112 dBμV), Attenuation (Atten 20 dB), Marker 1 (Mkr1 1.000 0 MHz), and Peak level (Peak Log 5 dB/).
- Plot Area:** A pink trace showing the signal spectrum. The y-axis is labeled 'LgRv' and the x-axis is labeled 'Center' followed by the frequency (e.g., 2.402 750 0 GHz). The plot also shows 'Span 3 MHz', 'Res BW 100 kHz', and 'Sweep 1.04 ms (1201 pts)'.
- Bottom Left:** Labels for the signal source (S1 S2 V3 FC) and the frequency (f>50k Swp).
- Bottom Right:** Labels for the signal source (S1 S2 V3 FC) and the frequency (f>50k Swp).

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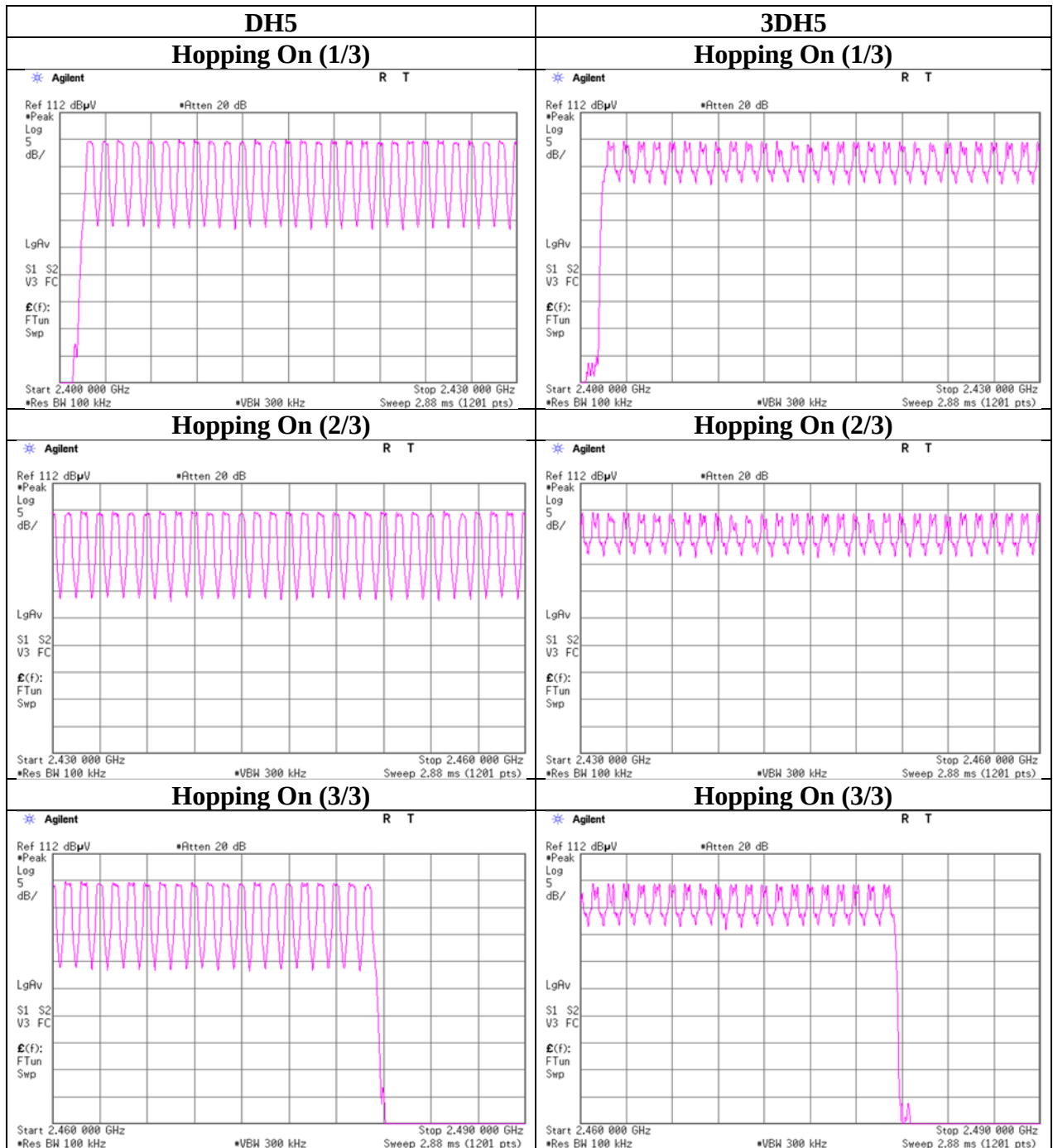
### **Number of Hopping Frequency**

|                        |                                            |
|------------------------|--------------------------------------------|
| Test place             | Shonan EMC Lab. No.5 Semi Anechoic Chamber |
| Date                   | January 5, 2023                            |
| Temperature / Humidity | 23 deg. C / 35 % RH                        |
| Engineer               | Yohsuke Matsuzawa                          |
| Mode                   | Tx, Hopping Off                            |

| Mode | Number of channel<br>[channels] | Limit<br>[channels] |
|------|---------------------------------|---------------------|
| DH5  | 79                              | $\geq 15$           |
| 3DH5 | 79                              | $\geq 15$           |

Test was not performed at AFH mode whose number of hopping channel is  
20 channels because this Bluetooth radio is in compliance of Bluetooth Specification.

### Number of Hopping Frequency



## Dwell time

|                        |                                    |
|------------------------|------------------------------------|
| Test place             | Shonan EMC Lab. No.5 Shielded Room |
| Date                   | January 17, 2023                   |
| Temperature / Humidity | 25 deg. C / 50 % RH                |
| Engineer               | Takahiro Kawakami                  |
| Mode                   | Tx, Hopping Off                    |

| Mode | Number of transmission<br>in a 31.6 (79 Hopping x 0.4) | Length of<br>transmission<br>[ms] | Result<br>[ms] | Limit<br>[ms] |
|------|--------------------------------------------------------|-----------------------------------|----------------|---------------|
| DH1  | 51.0 times / 5 s x 31.6 s = 323 times                  | 0.389                             | 126            | 400           |
| DH3  | 26.0 times / 5 s x 31.6 s = 165 times                  | 1.645                             | 271            | 400           |
| DH5  | 17.0 times / 5 s x 31.6 s = 108 times                  | 2.895                             | 313            | 400           |
| 3DH1 | 51.0 times / 5 s x 31.6 s = 323 times                  | 0.390                             | 126            | 400           |
| 3DH3 | 25.8 times / 5 s x 31.6 s = 164 times                  | 1.641                             | 269            | 400           |
| 3DH5 | 17.2 times / 5 s x 31.6 s = 109 times                  | 2.898                             | 316            | 400           |

Sample Calculation

Result = Number of transmission x Length of transmission

\*Average data of 5 tests.

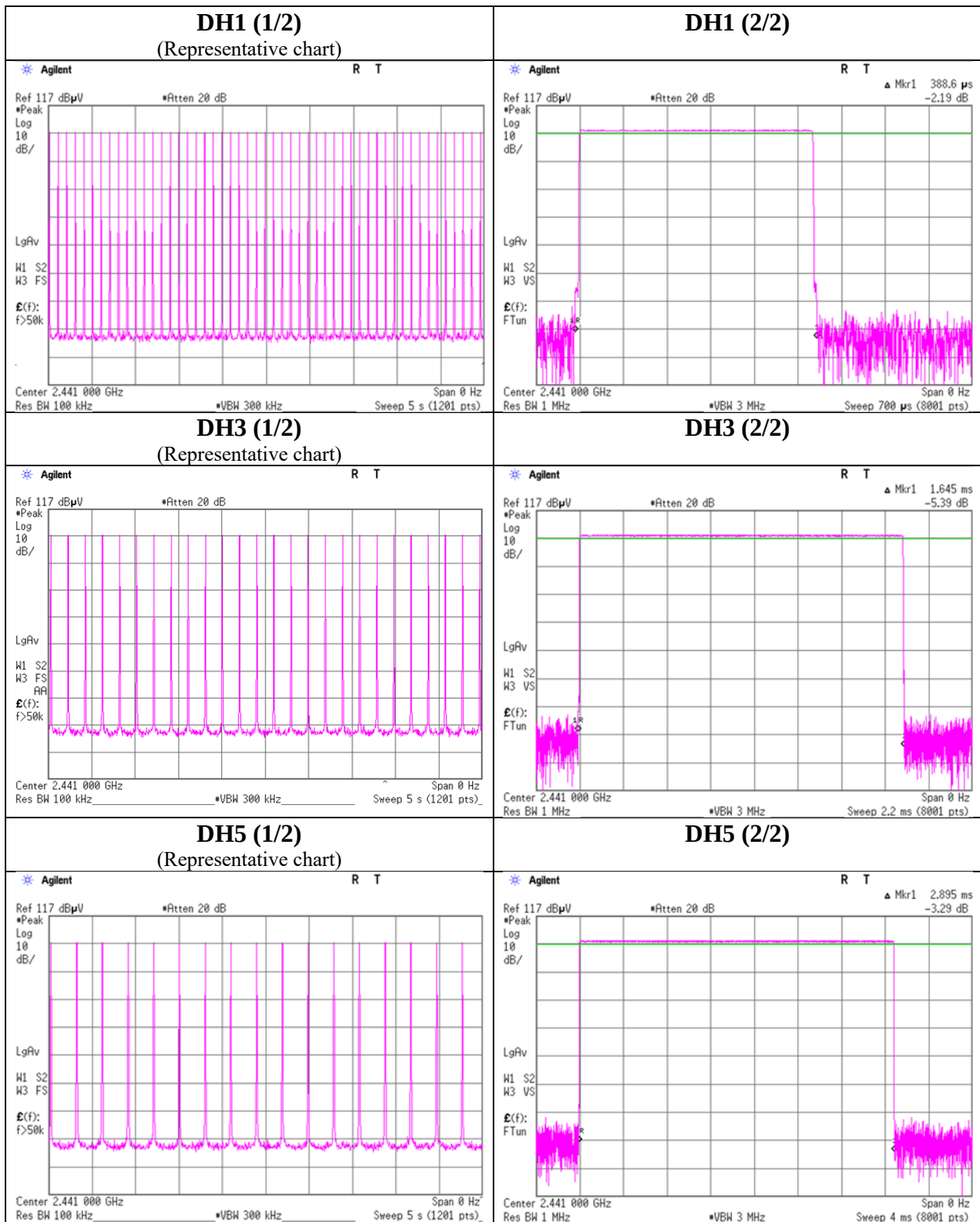
| Mode | Sampling [times] |    |    |    |    | Average<br>[times] |
|------|------------------|----|----|----|----|--------------------|
|      | 1                | 2  | 3  | 4  | 5  |                    |
| DH1  | 51               | 51 | 51 | 51 | 51 | 51                 |
| DH3  | 26               | 26 | 27 | 26 | 25 | 26                 |
| DH5  | 17               | 17 | 17 | 17 | 17 | 17                 |
| 3DH1 | 51               | 50 | 51 | 52 | 51 | 51                 |
| 3DH3 | 26               | 26 | 25 | 26 | 26 | 25.8               |
| 3DH5 | 17               | 17 | 18 | 17 | 17 | 17.2               |

Sample Calculation

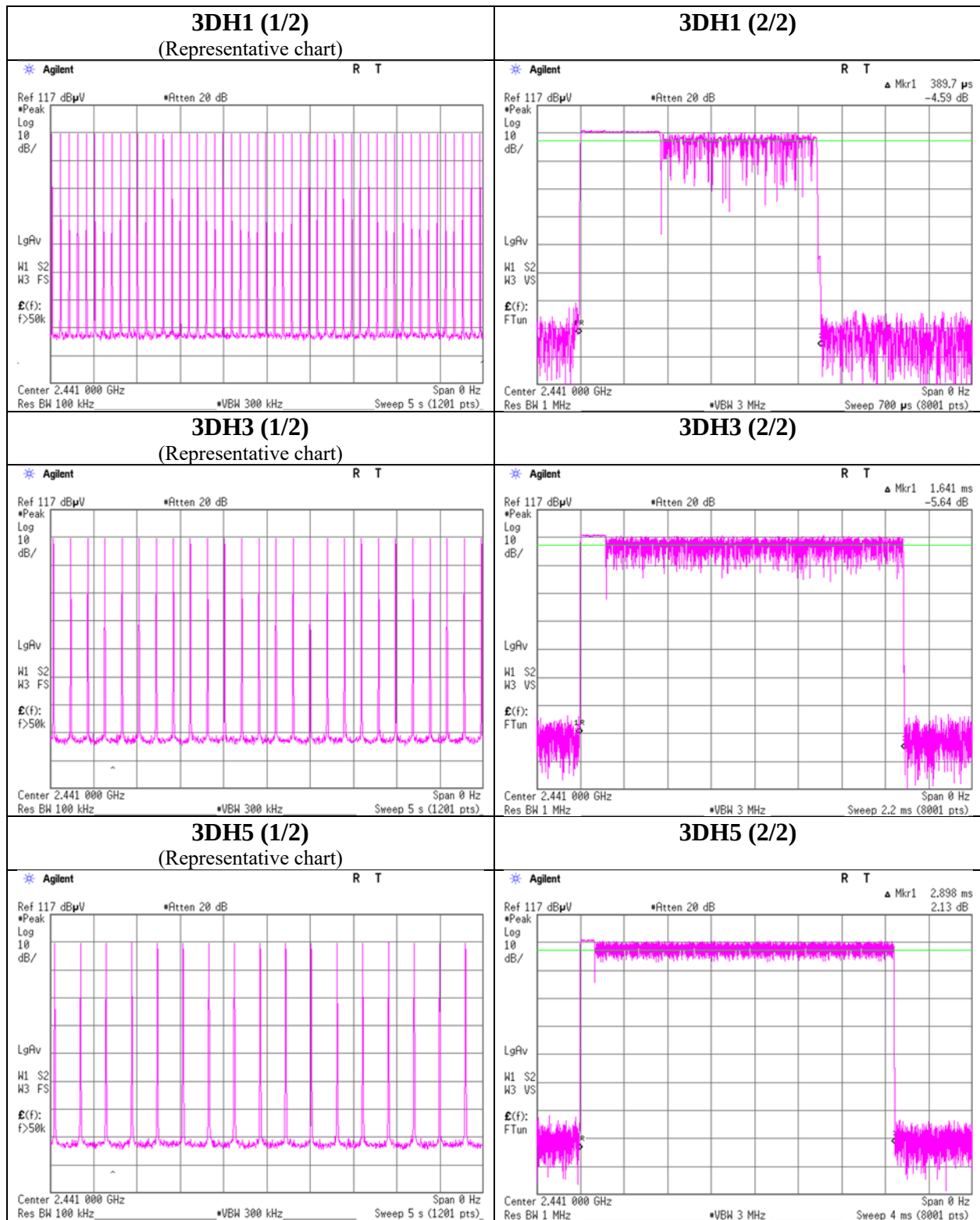
Average = Summation (Sampling 1 to 5) / 5

This device complies with the Bluetooth protocol for FHSS operation, employing a pseudo random channel selection and hopping rate to ensure that the occupancy time in  $N \times 0.4$  s, where  $N$  is the number of channels being used in the hopping sequence ( $20 \leq N \leq 79$ ), is always less than 0.4 s regardless of packet size. This is confirmed in the test report for  $N = 79$ .

## Dwell time



## Dwell time



## Maximum Peak Output Power/Average Power(Reference data for RF Exposure)

Test place Shonan EMC Lab. No.5 Shielded Room  
Date January 16, 2023  
Temperature / Humidity 25 deg. C / 50 % RH  
Engineer Takahiro Kawakami  
Mode Tx, Hopping Off

### Maximum peak output power

| Mode | Freq.<br>[MHz] | Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Conducted Power |       |       |      |                | e.i.r.p. for RSS-247     |        |      |       |      |                |
|------|----------------|------------------|-----------------------|------------------------|-----------------|-------|-------|------|----------------|--------------------------|--------|------|-------|------|----------------|
|      |                |                  |                       |                        | Result          |       | Limit |      | Margin<br>[dB] | Antenna<br>Gain<br>[dBi] | Result |      | Limit |      | Margin<br>[dB] |
|      |                |                  |                       |                        | [dBm]           | [mW]  | [dBm] | [mW] |                |                          | [dBm]  | [mW] | [dBm] | [mW] |                |
| DH5  | 2402           | 1.54             | 1.25                  | 9.88                   | 12.67           | 18.49 | 20.97 | 125  | 8.30           | -3.00                    | 9.67   | 9.27 | 36.02 | 4000 | 26.35          |
| DH5  | 2441           | 1.44             | 1.26                  | 9.88                   | 12.58           | 18.11 | 20.97 | 125  | 8.39           | -3.00                    | 9.58   | 9.08 | 36.02 | 4000 | 26.44          |
| DH5  | 2480           | 1.06             | 1.26                  | 9.89                   | 12.21           | 16.63 | 20.97 | 125  | 8.76           | -3.00                    | 9.21   | 8.34 | 36.02 | 4000 | 26.81          |
| 2DH5 | 2402           | 1.07             | 1.25                  | 9.88                   | 12.20           | 16.60 | 20.97 | 125  | 8.77           | -3.00                    | 9.20   | 8.32 | 36.02 | 4000 | 26.82          |
| 2DH5 | 2441           | 0.97             | 1.26                  | 9.88                   | 12.11           | 16.26 | 20.97 | 125  | 8.86           | -3.00                    | 9.11   | 8.15 | 36.02 | 4000 | 26.91          |
| 2DH5 | 2480           | 0.75             | 1.26                  | 9.89                   | 11.90           | 15.49 | 20.97 | 125  | 9.07           | -3.00                    | 8.90   | 7.76 | 36.02 | 4000 | 27.12          |
| 3DH5 | 2402           | 1.28             | 1.25                  | 9.88                   | 12.41           | 17.42 | 20.97 | 125  | 8.56           | -3.00                    | 9.41   | 8.73 | 36.02 | 4000 | 26.61          |
| 3DH5 | 2441           | 1.21             | 1.26                  | 9.88                   | 12.35           | 17.18 | 20.97 | 125  | 8.62           | -3.00                    | 9.35   | 8.61 | 36.02 | 4000 | 26.67          |
| 3DH5 | 2480           | 0.95             | 1.26                  | 9.89                   | 12.10           | 16.22 | 20.97 | 125  | 8.87           | -3.00                    | 9.10   | 8.13 | 36.02 | 4000 | 26.92          |

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Test was not performed at AFH mode, because the decrease of number of channel (min: 20 ch) at AFH mode does not influence on the output power and bandwidth of the EUT.  
As this device had AFH mode and frequency separation could not meet the requirement of over 20 dB BW without 2/3 relaxation, 125 mW power limit was applied to it.

### Average power (Reference data for RF Exposure)

| Mode | Freq.<br>[MHz] | Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result<br>(Time average) |       | Duty<br>factor<br>[dB] | Result<br>(Burst power average) |       |
|------|----------------|------------------|-----------------------|------------------------|--------------------------|-------|------------------------|---------------------------------|-------|
|      |                |                  |                       |                        | [dBm]                    | [mW]  |                        | [dBm]                           | [mW]  |
|      |                |                  |                       |                        | [dBm]                    | [mW]  | [dB]                   | [dBm]                           | [mW]  |
| DH5  | 2402           | 0.01             | 1.25                  | 9.88                   | 11.14                    | 13.00 | 1.12                   | 12.26                           | 16.83 |
| DH5  | 2441           | -0.10            | 1.26                  | 9.88                   | 11.04                    | 12.71 | 1.12                   | 12.16                           | 16.45 |
| DH5  | 2480           | -0.31            | 1.26                  | 9.89                   | 10.84                    | 12.13 | 1.12                   | 11.96                           | 15.71 |
| 2DH5 | 2402           | -2.57            | 1.25                  | 9.88                   | 8.56                     | 7.18  | 1.12                   | 9.68                            | 9.28  |
| 2DH5 | 2441           | -2.70            | 1.26                  | 9.88                   | 8.44                     | 6.98  | 1.12                   | 9.56                            | 9.03  |
| 2DH5 | 2480           | -2.98            | 1.26                  | 9.89                   | 8.17                     | 6.56  | 1.12                   | 9.29                            | 8.49  |
| 3DH5 | 2402           | -2.56            | 1.25                  | 9.88                   | 8.57                     | 7.19  | 1.12                   | 9.69                            | 9.31  |
| 3DH5 | 2441           | -2.69            | 1.26                  | 9.88                   | 8.45                     | 7.00  | 1.12                   | 9.57                            | 9.06  |
| 3DH5 | 2480           | -2.96            | 1.26                  | 9.89                   | 8.19                     | 6.59  | 1.12                   | 9.31                            | 8.53  |

Sample Calculation:

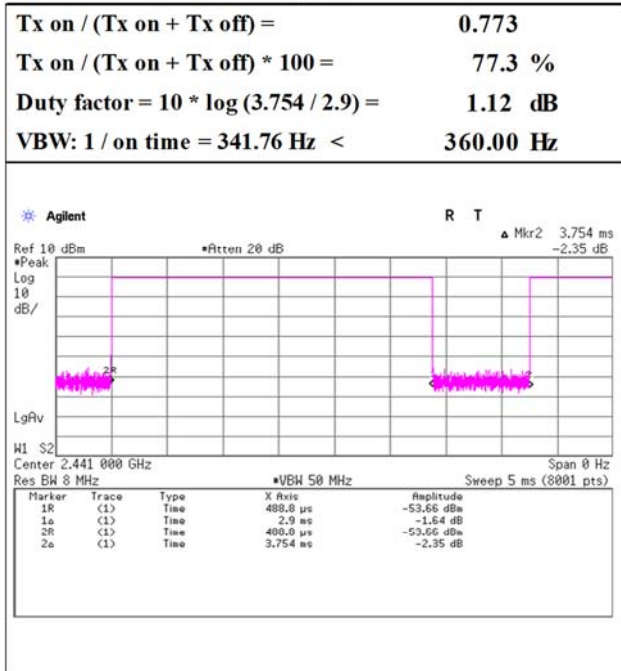
Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

Result (Burst power average) = Result (Time average) + Duty factor

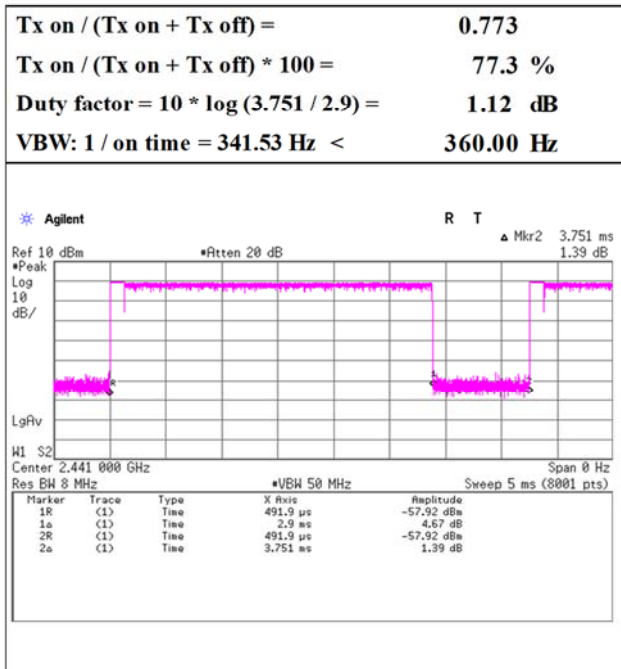
## Burst Rate Confirmation

|                        |                                            |
|------------------------|--------------------------------------------|
| Test place             | Shonan EMC Lab. No.5 Semi Anechoic Chamber |
| Date                   | January 5, 2023                            |
| Temperature / Humidity | 23 deg. C / 35 % RH                        |
| Engineer               | Yohsuke Matsuzawa                          |
| Mode                   | Tx, Hopping Off                            |

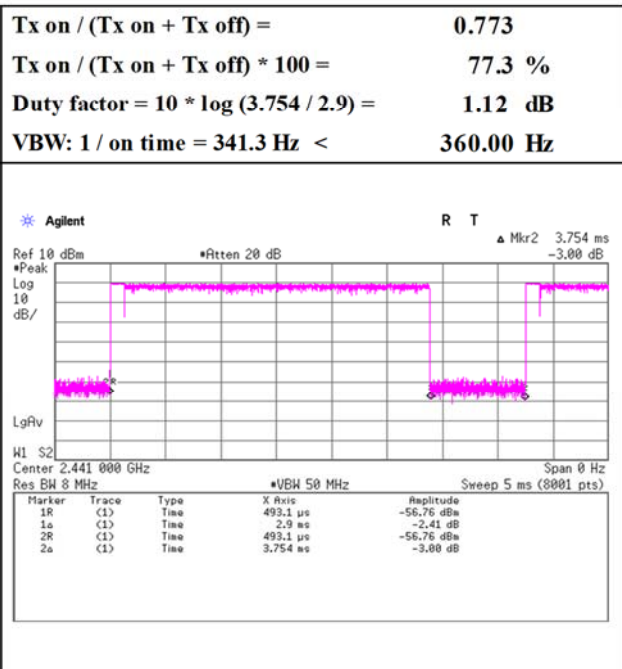
### DH5



### 2DH5



### 3DH5



**Radiated Spurious Emission**

|                        |                                     |                    |                     |                      |
|------------------------|-------------------------------------|--------------------|---------------------|----------------------|
| Test place             | Shonan EMC Lab.                     |                    |                     |                      |
| Semi Anechoic Chamber  | No.2                                | No.3               | No.3                | No.2                 |
| Date                   | January 10, 2023                    | December 26, 2022  | January 16, 2023    | January 5, 2023      |
| Temperature / Humidity | 21 deg.C, 30 %RH                    | 22 deg.C, 23 %RH   | 24 deg.C, 36 %RH    | 20 deg.C, 27 %RH     |
| Engineer               | Kouki Yamada                        | Miku Ikudome       | Yusuke Tanikawara   | Takahiro Kawakami    |
|                        | ( 30 MHz -1 GHz )                   | ( 1 GHz -2.8 GHz ) | ( 2.8 GHz -10 GHz ) | ( 10 GHz -26.5 GHz ) |
| Mode                   | Tx, Hopping Off, DH5 2402 MHz, Left |                    |                     |                      |

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg] | Remark                  |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|-------------|-------------------------|
| Hori.    | 32.125          | QP       | 21.60          | 18.01           | 6.88      | 31.93     | 0.00                 | 14.56           | 40.0           | 25.4        | 100         | 0           | -                       |
| Hori.    | 915.597         | QP       | 19.70          | 22.29           | 9.79      | 30.78     | 0.00                 | 21.00           | 46.0           | 25.0        | 100         | 0           | -                       |
| Hori.    | 2390.000        | PK       | 47.27          | 28.18           | 14.48     | 41.63     | 2.48                 | 50.78           | 73.9           | 23.1        | 208         | 49          | -                       |
| Hori.    | 4804.000        | PK       | 48.75          | 31.54           | 6.95      | 42.87     | 2.48                 | 46.85           | 73.9           | 27.0        | 150         | 0           | -                       |
| Hori.    | 7206.000        | PK       | 47.86          | 37.37           | 8.41      | 43.39     | 2.48                 | 52.73           | 73.9           | 21.1        | 150         | 0           | -                       |
| Hori.    | 9608.000        | PK       | 47.73          | 38.89           | 9.68      | 43.21     | 2.48                 | 55.57           | 73.9           | 18.3        | 150         | 0           | -                       |
| Hori.    | 2390.000        | AV       | 35.37          | 28.18           | 14.48     | 41.63     | 2.48                 | 38.88           | 53.9           | 15.0        | 208         | 49          | VBW:360 Hz              |
| Hori.    | 4804.000        | AV       | 37.47          | 31.54           | 6.95      | 42.87     | 2.48                 | 35.57           | 53.9           | 18.3        | 150         | 0           | VBW: 360Hz, Floor Noise |
| Hori.    | 7206.000        | AV       | 37.46          | 37.37           | 8.41      | 43.39     | 2.48                 | 42.33           | 53.9           | 11.5        | 150         | 0           | VBW: 360Hz, Floor Noise |
| Hori.    | 9608.000        | AV       | 37.02          | 38.89           | 9.68      | 43.21     | 2.48                 | 44.86           | 53.9           | <b>9.0</b>  | 150         | 0           | VBW: 360Hz, Floor Noise |
| Vert.    | 30.446          | QP       | 20.90          | 18.68           | 6.83      | 31.93     | 0.00                 | 14.48           | 40.0           | 25.5        | 100         | 0           | -                       |
| Vert.    | 34.846          | QP       | 21.40          | 16.93           | 6.95      | 31.93     | 0.00                 | 13.35           | 40.0           | 26.6        | 100         | 0           | -                       |
| Vert.    | 179.460         | QP       | 21.00          | 16.00           | 8.81      | 31.81     | 0.00                 | 14.00           | 43.5           | 29.5        | 100         | 0           | -                       |
| Vert.    | 190.865         | QP       | 21.10          | 16.43           | 8.84      | 31.80     | 0.00                 | 14.57           | 43.5           | 28.9        | 100         | 0           | -                       |
| Vert.    | 942.406         | QP       | 20.00          | 22.02           | 9.92      | 30.65     | 0.00                 | 21.29           | 46.0           | 24.7        | 100         | 0           | -                       |
| Vert.    | 2390.000        | PK       | 47.69          | 28.18           | 14.48     | 41.63     | 2.48                 | 51.20           | 73.9           | 22.7        | 234         | 100         | -                       |
| Vert.    | 4804.000        | PK       | 48.92          | 31.54           | 6.95      | 42.87     | 2.48                 | 47.02           | 73.9           | 26.8        | 150         | 0           | -                       |
| Vert.    | 7206.000        | PK       | 48.60          | 37.37           | 8.41      | 43.39     | 2.48                 | 53.47           | 73.9           | 20.4        | 150         | 0           | -                       |
| Vert.    | 9608.000        | PK       | 47.54          | 38.89           | 9.68      | 43.21     | 2.48                 | 55.38           | 73.9           | 18.5        | 150         | 0           | -                       |
| Vert.    | 2390.000        | AV       | 35.49          | 28.18           | 14.48     | 41.63     | 2.48                 | 39.00           | 53.9           | 14.9        | 234         | 100         | VBW:360 Hz              |
| Vert.    | 4804.000        | AV       | 37.49          | 31.54           | 6.95      | 42.87     | 2.48                 | 35.59           | 53.9           | 18.3        | 150         | 0           | VBW: 360Hz, Floor Noise |
| Vert.    | 7206.000        | AV       | 37.56          | 37.37           | 8.41      | 43.39     | 2.48                 | 42.43           | 53.9           | 11.4        | 150         | 0           | VBW: 360Hz, Floor Noise |
| Vert.    | 9608.000        | AV       | 36.97          | 38.89           | 9.68      | 43.21     | 2.48                 | 44.81           | 53.9           | <b>9.0</b>  | 150         | 0           | VBW: 360Hz, Floor Noise |

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz :  $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$ 10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$ 

\*These results have sufficient margin without taking account Duty cycle correction factor.

**20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)**

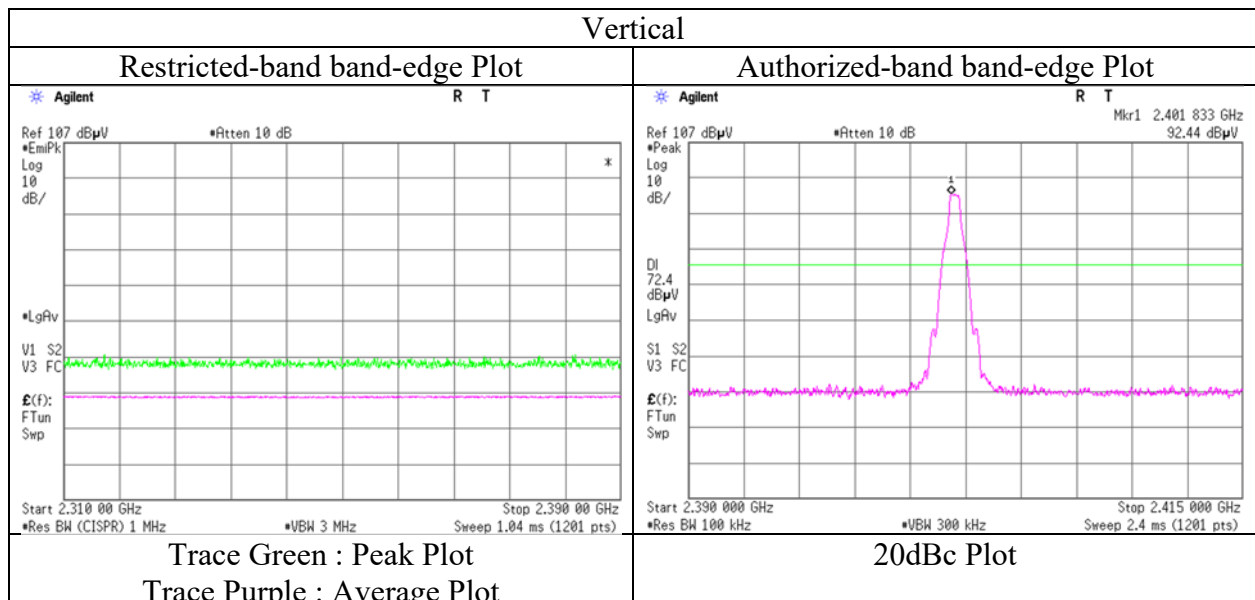
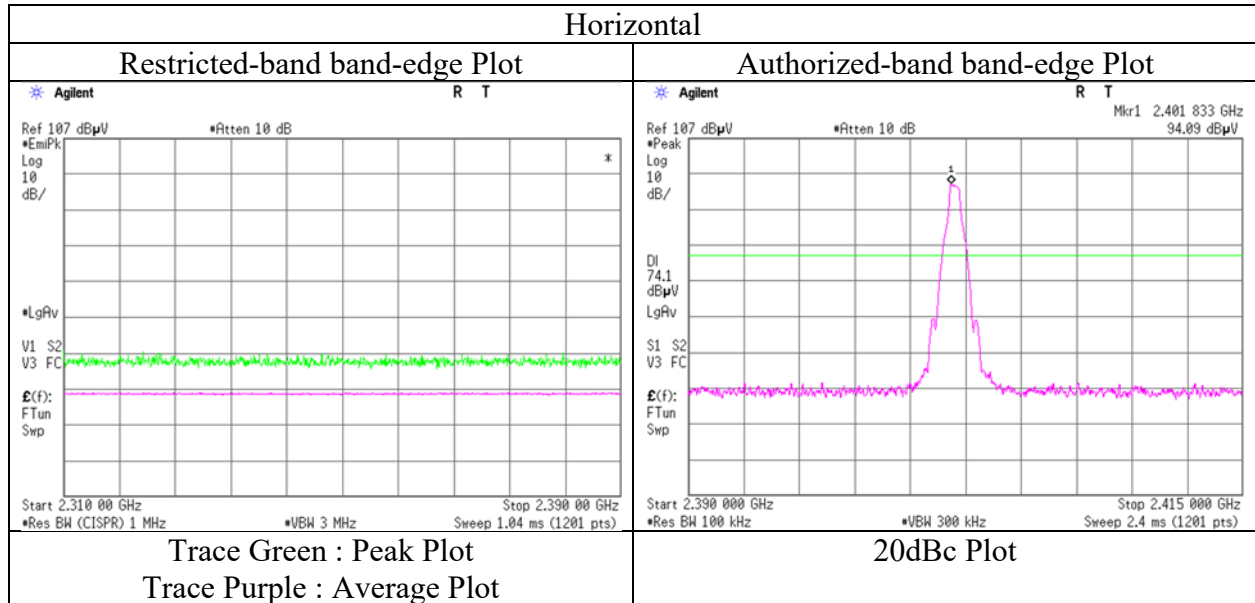
| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark  |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|---------|
| Hori.    | 2402.000        | PK       | 94.26          | 28.17           | 14.50     | 41.64     | 2.48                 | 97.77           | -              | -           | Carrier |
| Hori.    | 2400.000        | PK       | 39.97          | 28.17           | 14.50     | 41.64     | 2.48                 | 43.48           | 77.7           | 34.2        | -       |
| Vert.    | 2402.000        | PK       | 93.37          | 28.17           | 14.50     | 41.64     | 2.48                 | 96.88           | -              | -           | Carrier |
| Vert.    | 2400.000        | PK       | 40.07          | 28.17           | 14.50     | 41.64     | 2.48                 | 43.58           | 76.8           | 33.2        | -       |

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz :  $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$ 10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

## Radiated Spurious Emission (Reference Plot for band-edge)

|                        |                                     |
|------------------------|-------------------------------------|
| Test place             | Shonan EMC Lab.                     |
| Semi Anechoic Chamber  | No.3                                |
| Date                   | December 26, 2022                   |
| Temperature / Humidity | 22 deg.C, 23 %RH                    |
| Engineer               | Miku Ikudome                        |
|                        | ( 1 GHz -2.8 GHz )                  |
| Mode                   | Tx, Hopping Off, DH5 2402 MHz, Left |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

|                        |                                     |                     |                      |
|------------------------|-------------------------------------|---------------------|----------------------|
| Test place             | Shonan EMC Lab.                     |                     |                      |
| Semi Anechoic Chamber  | No.3                                | No.3                | No.2                 |
| Date                   | December 26, 2022                   | January 16, 2023    | January 5, 2023      |
| Temperature / Humidity | 22 deg.C, 23 %RH                    | 24 deg.C, 36 %RH    | 20 deg.C, 27 %RH     |
| Engineer               | Miku Ikudome                        | Yusuke Tanikawara   | Takahiro Kawakami    |
|                        | ( 1 GHz -2.8 GHz )                  | ( 2.8 GHz -10 GHz ) | ( 10 GHz -26.5 GHz ) |
| Mode                   | Tx, Hopping Off, DH5 2441 MHz, Left |                     |                      |

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Distance<br>Factor [dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark                   |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|-------------------------|--------------------|-------------------|----------------|----------------|----------------|--------------------------|
| Hori.    | 4882.000           | PK       | 47.97             | 31.64              | 6.99         | 42.83        | 2.48                    | 46.25              | 73.9              | 27.6           | 150            | 0              | -                        |
| Hori.    | 7323.000           | PK       | 47.81             | 37.46              | 8.46         | 43.52        | 2.48                    | 52.69              | 73.9              | 21.2           | 150            | 0              | -                        |
| Hori.    | 9764.000           | PK       | 47.66             | 39.18              | 9.76         | 43.02        | 2.48                    | 56.06              | 73.9              | 17.8           | 150            | 0              | -                        |
| Hori.    | 4882.000           | AV       | 37.36             | 31.64              | 6.99         | 42.83        | 2.48                    | 35.64              | 53.9              | 18.2           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Hori.    | 7323.000           | AV       | 37.59             | 37.46              | 8.46         | 43.52        | 2.48                    | 42.47              | 53.9              | 11.4           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Hori.    | 9764.000           | AV       | 37.23             | 39.18              | 9.76         | 43.02        | 2.48                    | 45.63              | 53.9              | <b>8.2</b>     | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 4882.000           | PK       | 48.53             | 31.64              | 6.99         | 42.83        | 2.48                    | 46.81              | 73.9              | 27.0           | 150            | 0              | -                        |
| Vert.    | 7323.000           | PK       | 48.21             | 37.46              | 8.46         | 43.52        | 2.48                    | 53.09              | 73.9              | 20.8           | 150            | 0              | -                        |
| Vert.    | 9764.000           | PK       | 48.06             | 39.18              | 9.76         | 43.02        | 2.48                    | 56.46              | 73.9              | 17.4           | 150            | 0              | -                        |
| Vert.    | 4882.000           | AV       | 37.21             | 31.64              | 6.99         | 42.83        | 2.48                    | 35.49              | 53.9              | 18.4           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 7323.000           | AV       | 37.61             | 37.46              | 8.46         | 43.52        | 2.48                    | 42.49              | 53.9              | 11.4           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 9764.000           | AV       | 37.27             | 39.18              | 9.76         | 43.02        | 2.48                    | 45.67              | 53.9              | <b>8.2</b>     | 150            | 0              | VBW: 360 Hz, Floor Noise |

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz :  $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

\*These results have sufficient margin without taking account Duty cycle correction factor.

## Radiated Spurious Emission

|                        |                                     |                     |                      |
|------------------------|-------------------------------------|---------------------|----------------------|
| Test place             | Shonan EMC Lab.                     |                     |                      |
| Semi Anechoic Chamber  | No.3                                | No.3                | No.2                 |
| Date                   | December 26, 2022                   | January 16, 2023    | January 5, 2023      |
| Temperature / Humidity | 22 deg.C, 23 %RH                    | 24 deg.C, 36 %RH    | 20 deg.C, 27 %RH     |
| Engineer               | Miku Ikudome                        | Yusuke Tanikawara   | Takahiro Kawakami    |
|                        | ( 1 GHz -2.8 GHz )                  | ( 2.8 GHz -10 GHz ) | ( 10 GHz -26.5 GHz ) |
| Mode                   | Tx, Hopping Off, DH5 2480 MHz, Left |                     |                      |

(\* P.K: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg] | Remark                   |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|-------------|--------------------------|
| Hori.    | 2483.500        | PK       | 49.98          | 28.08           | 14.60     | 41.68     | 2.48                 | 53.46           | 73.9           | 20.4        | 260         | 18          | -                        |
| Hori.    | 4960.000        | PK       | 48.23          | 31.81           | 7.05      | 42.80     | 2.48                 | 46.77           | 73.9           | 27.1        | 150         | 0           | -                        |
| Hori.    | 7440.000        | PK       | 47.75          | 37.61           | 8.51      | 43.65     | 2.48                 | 52.70           | 73.9           | 21.2        | 150         | 0           | -                        |
| Hori.    | 9920.000        | PK       | 48.23          | 39.03           | 9.83      | 42.82     | 2.48                 | 56.75           | 73.9           | 17.1        | 150         | 0           | -                        |
| Hori.    | 2483.500        | AV       | 35.86          | 28.08           | 14.60     | 41.68     | 2.48                 | 39.34           | 53.9           | 14.5        | 260         | 18          | VBW:360 Hz               |
| Hori.    | 4960.000        | AV       | 37.25          | 31.81           | 7.05      | 42.80     | 2.48                 | 35.79           | 53.9           | 18.1        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Hori.    | 7440.000        | AV       | 37.19          | 37.61           | 8.51      | 43.65     | 2.48                 | 42.14           | 53.9           | 11.7        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Hori.    | 9920.000        | AV       | 36.97          | 39.03           | 9.83      | 42.82     | 2.48                 | 45.49           | 53.9           | <b>8.4</b>  | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Vert.    | 2483.500        | PK       | 47.83          | 28.08           | 14.60     | 41.68     | 2.48                 | 51.31           | 73.9           | 22.5        | 111         | 307         | -                        |
| Vert.    | 4960.000        | PK       | 48.10          | 31.81           | 7.05      | 42.80     | 2.48                 | 46.64           | 73.9           | 27.2        | 150         | 0           | -                        |
| Vert.    | 7440.000        | PK       | 48.01          | 37.61           | 8.51      | 43.65     | 2.48                 | 52.96           | 73.9           | 20.9        | 150         | 0           | -                        |
| Vert.    | 9920.000        | PK       | 48.21          | 39.03           | 9.83      | 42.82     | 2.48                 | 56.73           | 73.9           | 17.1        | 150         | 0           | -                        |
| Vert.    | 2483.500        | AV       | 35.77          | 28.08           | 14.60     | 41.68     | 2.48                 | 39.25           | 53.9           | 14.6        | 111         | 307         | VBW:360 Hz               |
| Vert.    | 4960.000        | AV       | 37.19          | 31.81           | 7.05      | 42.80     | 2.48                 | 35.73           | 53.9           | 18.1        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Vert.    | 7440.000        | AV       | 37.31          | 37.61           | 8.51      | 43.65     | 2.48                 | 42.26           | 53.9           | 11.6        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Vert.    | 9920.000        | AV       | 36.89          | 39.03           | 9.83      | 42.82     | 2.48                 | 45.41           | 53.9           | <b>8.4</b>  | 150         | 0           | VBW: 360 Hz, Floor Noise |

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

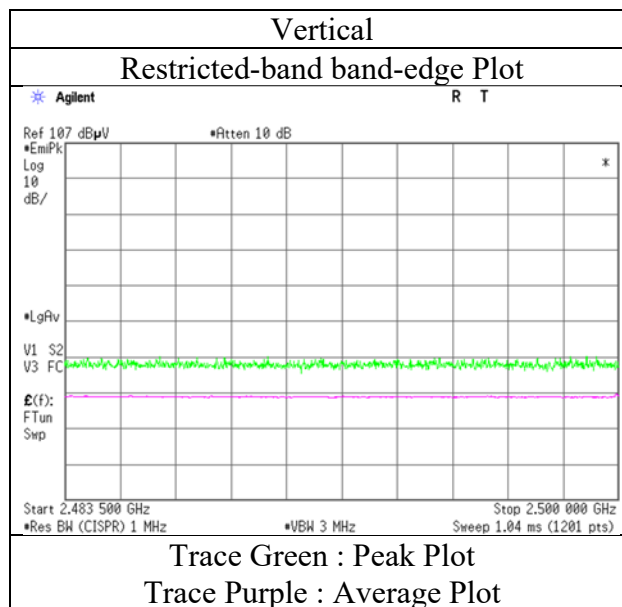
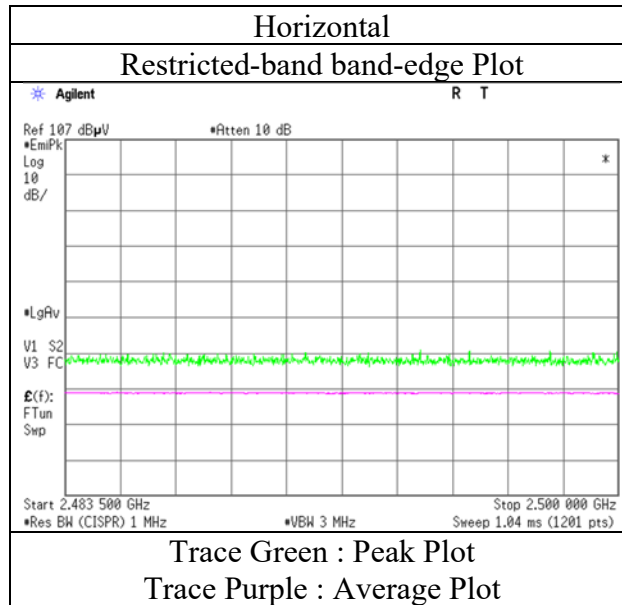
Distance factor : 1 GHz - 10 GHz :  $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

\*These results have sufficient margin without taking account Duty cycle correction factor.

### Radiated Spurious Emission (Reference Plot for band-edge)

|                        |                                     |
|------------------------|-------------------------------------|
| Test place             | Shonan EMC Lab.                     |
| Semi Anechoic Chamber  | No.3                                |
| Date                   | December 26, 2022                   |
| Temperature / Humidity | 22 deg.C, 23 %RH                    |
| Engineer               | Miku Ikudome                        |
|                        | ( 1 GHz -2.8 GHz )                  |
| Mode                   | Tx, Hopping Off, DH5 2480 MHz, Left |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.  
Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

|                        |                                     |                     |                      |
|------------------------|-------------------------------------|---------------------|----------------------|
| Test place             | Shonan EMC Lab.                     |                     |                      |
| Semi Anechoic Chamber  | No.3                                | No.3                | No.2                 |
| Date                   | January 13, 2023                    | January 16, 2023    | January 5, 2023      |
| Temperature / Humidity | 23 deg.C, 33 %RH                    | 24 deg.C, 36 %RH    | 20 deg.C, 27 %RH     |
| Engineer               | Takahiro Suzuki                     | Yusuke Tanikawara   | Takahiro Kawakami    |
|                        | ( 1 GHz -2.8 GHz )                  | ( 2.8 GHz -10 GHz ) | ( 10 GHz -26.5 GHz ) |
| Mode                   | Tx, Hopping Off, 3DH5 2402 MHz,Left |                     |                      |

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg] | Remark                   |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|-------------|--------------------------|
| Hori.    | 2390.000        | PK       | 49.16          | 28.18           | 14.49     | 41.63     | 2.48                 | 52.68           | 73.9           | 21.2        | 245         | 73          | -                        |
| Hori.    | 4804.000        | PK       | 48.35          | 31.54           | 6.95      | 42.87     | 2.48                 | 46.45           | 73.9           | 27.4        | 150         | 0           | -                        |
| Hori.    | 7206.000        | PK       | 48.04          | 37.37           | 8.41      | 43.39     | 2.48                 | 52.91           | 73.9           | 20.9        | 150         | 0           | -                        |
| Hori.    | 9608.000        | PK       | 47.71          | 38.89           | 9.68      | 43.21     | 2.48                 | 55.55           | 73.9           | 18.3        | 150         | 0           | -                        |
| Hori.    | 2390.000        | AV       | 35.52          | 28.18           | 14.49     | 41.63     | 2.48                 | 39.04           | 53.9           | 14.8        | 245         | 73          | VBW:360 Hz               |
| Hori.    | 4804.000        | AV       | 37.37          | 31.54           | 6.95      | 42.87     | 2.48                 | 35.47           | 53.9           | 18.4        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Hori.    | 7206.000        | AV       | 37.46          | 37.37           | 8.41      | 43.39     | 2.48                 | 42.33           | 53.9           | 11.5        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Hori.    | 9608.000        | AV       | 36.91          | 38.89           | 9.68      | 43.21     | 2.48                 | 44.75           | 53.9           | 9.1         | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Vert.    | 2390.000        | PK       | 49.37          | 28.18           | 14.49     | 41.63     | 2.48                 | 52.89           | 73.9           | 21.0        | 260         | 268         | -                        |
| Vert.    | 4804.000        | PK       | 47.74          | 31.54           | 6.95      | 42.87     | 2.48                 | 45.84           | 73.9           | 28.0        | 150         | 0           | -                        |
| Vert.    | 7206.000        | PK       | 49.11          | 37.37           | 8.41      | 43.39     | 2.48                 | 53.98           | 73.9           | 19.9        | 150         | 0           | -                        |
| Vert.    | 9608.000        | PK       | 49.08          | 38.89           | 9.68      | 43.21     | 2.48                 | 56.92           | 73.9           | 16.9        | 150         | 0           | -                        |
| Vert.    | 2390.000        | AV       | 35.61          | 28.18           | 14.49     | 41.63     | 2.48                 | 39.13           | 53.9           | 14.7        | 260         | 268         | VBW:360 Hz               |
| Vert.    | 4804.000        | AV       | 37.29          | 31.54           | 6.95      | 42.87     | 2.48                 | 35.39           | 53.9           | 18.5        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Vert.    | 7206.000        | AV       | 37.30          | 37.37           | 8.41      | 43.39     | 2.48                 | 42.17           | 53.9           | 11.7        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Vert.    | 9608.000        | AV       | 36.84          | 38.89           | 9.68      | 43.21     | 2.48                 | 44.68           | 53.9           | 9.2         | 150         | 0           | VBW: 360 Hz, Floor Noise |

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz :  $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

\*These results have sufficient margin without taking account Duty cycle correction factor.

### 20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark  |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|---------|
| Hori.    | 2402.000        | PK       | 92.07          | 28.17           | 14.51     | 41.64     | 2.48                 | 95.59           | -              | -           | Carrier |
| Hori.    | 2400.000        | PK       | 39.19          | 28.17           | 14.51     | 41.64     | 2.48                 | 42.71           | 75.5           | 32.7        | -       |
| Vert.    | 2402.000        | PK       | 93.03          | 28.17           | 14.51     | 41.64     | 2.48                 | 96.55           | -              | -           | Carrier |
| Vert.    | 2400.000        | PK       | 38.81          | 28.17           | 14.51     | 41.64     | 2.48                 | 42.33           | 76.5           | 34.1        | -       |

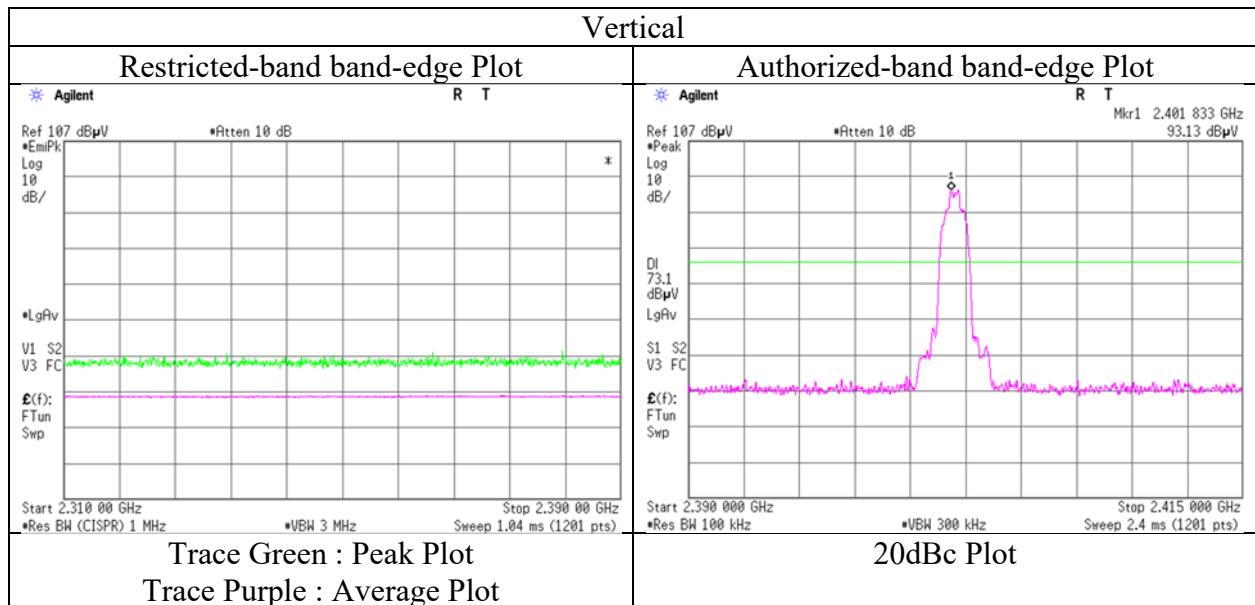
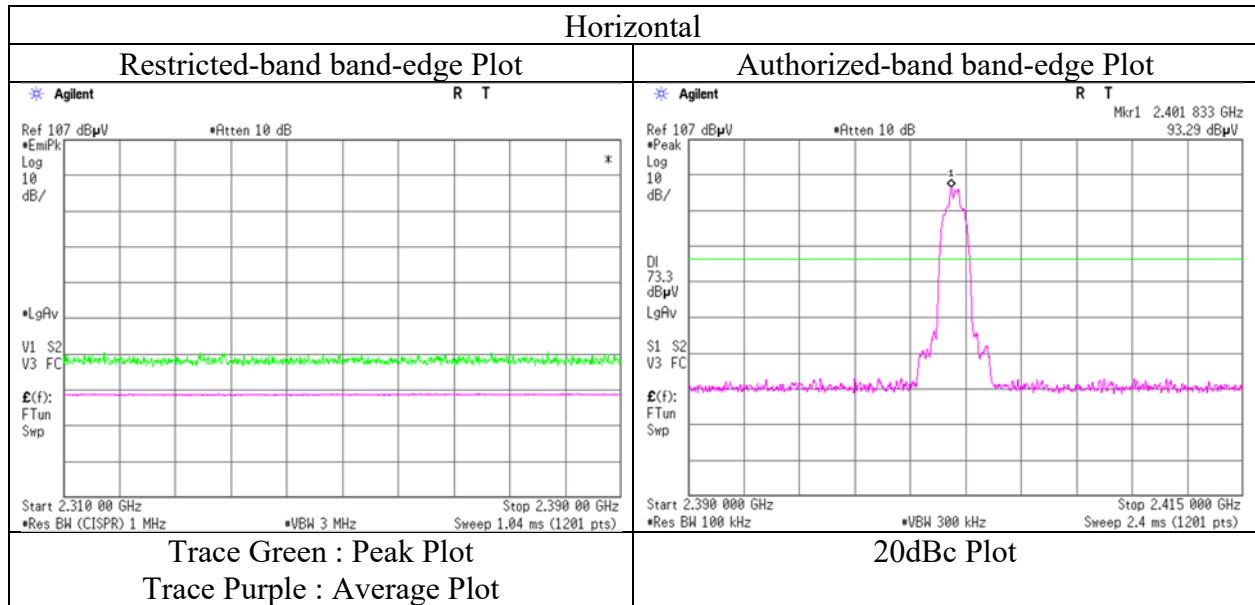
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz :  $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

**Radiated Spurious Emission**  
**(Reference Plot for band-edge)**

|                        |                                      |
|------------------------|--------------------------------------|
| Test place             | Shonan EMC Lab.                      |
| Semi Anechoic Chamber  | No.3                                 |
| Date                   | January 13, 2023                     |
| Temperature / Humidity | 23 deg.C, 33 %RH                     |
| Engineer               | Takahiro Suzuki                      |
|                        | ( 1 GHz -2.8 GHz )                   |
| Mode                   | Tx, Hopping Off, 3DH5 2402 MHz, Left |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.  
Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

|                        |                                      |                     |                      |
|------------------------|--------------------------------------|---------------------|----------------------|
| Test place             | Shonan EMC Lab.                      |                     |                      |
| Semi Anechoic Chamber  | No.3                                 | No.3                | No.2                 |
| Date                   | January 13, 2023                     | January 16, 2023    | January 5, 2023      |
| Temperature / Humidity | 23 deg.C, 33 %RH                     | 24 deg.C, 36 %RH    | 20 deg.C, 27 %RH     |
| Engineer               | Takahiro Suzuki                      | Yusuke Tanikawara   | Takahiro Kawakami    |
|                        | ( 1 GHz -2.8 GHz )                   | ( 2.8 GHz -10 GHz ) | ( 10 GHz -26.5 GHz ) |
| Mode                   | Tx, Hopping Off, 3DH5 2441 MHz, Left |                     |                      |

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Distance<br>Factor [dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark                   |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|-------------------------|--------------------|-------------------|----------------|----------------|----------------|--------------------------|
| Hori.    | 4882.000           | PK       | 47.61             | 31.64              | 6.99         | 42.83        | 2.48                    | 45.89              | 73.9              | 28.0           | 150            | 0              | -                        |
| Hori.    | 7323.000           | PK       | 48.75             | 37.46              | 8.46         | 43.52        | 2.48                    | 53.63              | 73.9              | 20.2           | 150            | 0              | -                        |
| Hori.    | 9764.000           | PK       | 48.28             | 39.18              | 9.76         | 43.02        | 2.48                    | 56.68              | 73.9              | 17.2           | 150            | 0              | -                        |
| Hori.    | 4882.000           | AV       | 37.11             | 31.64              | 6.99         | 42.83        | 2.48                    | 35.39              | 53.9              | 18.5           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Hori.    | 7323.000           | AV       | 37.51             | 37.46              | 8.46         | 43.52        | 2.48                    | 42.39              | 53.9              | 11.5           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Hori.    | 9764.000           | AV       | 37.21             | 39.18              | 9.76         | 43.02        | 2.48                    | 45.61              | 53.9              | 8.2            | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 4882.000           | PK       | 47.99             | 31.64              | 6.99         | 42.83        | 2.48                    | 46.27              | 73.9              | 27.6           | 150            | 0              | -                        |
| Vert.    | 7323.000           | PK       | 48.23             | 37.46              | 8.46         | 43.52        | 2.48                    | 53.11              | 73.9              | 20.7           | 150            | 0              | -                        |
| Vert.    | 9764.000           | PK       | 48.76             | 39.18              | 9.76         | 43.02        | 2.48                    | 57.16              | 73.9              | 16.7           | 150            | 0              | -                        |
| Vert.    | 4882.000           | AV       | 37.20             | 31.64              | 6.99         | 42.83        | 2.48                    | 35.48              | 53.9              | 18.4           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 7323.000           | AV       | 37.38             | 37.46              | 8.46         | 43.52        | 2.48                    | 42.26              | 53.9              | 11.6           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 9764.000           | AV       | 37.31             | 39.18              | 9.76         | 43.02        | 2.48                    | 45.71              | 53.9              | <b>8.1</b>     | 150            | 0              | VBW: 360 Hz, Floor Noise |

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz :  $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

\*These results have sufficient margin without taking account Duty cycle correction factor.

## Radiated Spurious Emission

|                        |                                      |                     |                      |
|------------------------|--------------------------------------|---------------------|----------------------|
| Test place             | Shonan EMC Lab.                      |                     |                      |
| Semi Anechoic Chamber  | No.3                                 | No.3                | No.2                 |
| Date                   | January 13, 2023                     | January 16, 2023    | January 5, 2023      |
| Temperature / Humidity | 23 deg.C, 33 %RH                     | 24 deg.C, 36 %RH    | 20 deg.C, 27 %RH     |
| Engineer               | Takahiro Suzuki                      | Yusuke Tanikawara   | Takahiro Kawakami    |
|                        | ( 1 GHz -2.8 GHz )                   | ( 2.8 GHz -10 GHz ) | ( 10 GHz -26.5 GHz ) |
| Mode                   | Tx, Hopping Off, 3DH5 2480 MHz, Left |                     |                      |

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Distance<br>Factor [dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark                   |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|-------------------------|--------------------|-------------------|----------------|----------------|----------------|--------------------------|
| Hori.    | 2483.500           | PK       | 49.64             | 28.08              | 14.61        | 41.68        | 2.48                    | 53.13              | 73.9              | 20.7           | 163            | 188            | -                        |
| Hori.    | 4960.000           | PK       | 47.79             | 31.81              | 7.05         | 42.80        | 2.48                    | 46.33              | 73.9              | 27.5           | 150            | 0              | -                        |
| Hori.    | 7440.000           | PK       | 47.73             | 37.61              | 8.51         | 43.65        | 2.48                    | 52.68              | 73.9              | 21.2           | 150            | 0              | -                        |
| Hori.    | 9920.000           | PK       | 47.53             | 39.03              | 9.83         | 42.82        | 2.48                    | 56.05              | 73.9              | 17.8           | 150            | 0              | -                        |
| Hori.    | 2483.500           | AV       | 35.83             | 28.08              | 14.61        | 41.68        | 2.48                    | 39.32              | 53.9              | 14.5           | 163            | 188            | VBW:360 Hz               |
| Hori.    | 4960.000           | AV       | 37.19             | 31.81              | 7.05         | 42.80        | 2.48                    | 35.73              | 53.9              | 18.1           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Hori.    | 7440.000           | AV       | 37.35             | 37.61              | 8.51         | 43.65        | 2.48                    | 42.30              | 53.9              | 11.6           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Hori.    | 9920.000           | AV       | 37.14             | 39.03              | 9.83         | 42.82        | 2.48                    | 45.66              | 53.9              | 8.2            | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 2483.500           | PK       | 49.89             | 28.08              | 14.61        | 41.68        | 2.48                    | 53.38              | 73.9              | 20.5           | 115            | 260            | -                        |
| Vert.    | 4960.000           | PK       | 48.31             | 31.81              | 7.05         | 42.80        | 2.48                    | 46.85              | 73.9              | 27.0           | 150            | 0              | -                        |
| Vert.    | 7440.000           | PK       | 48.29             | 37.61              | 8.51         | 43.65        | 2.48                    | 53.24              | 73.9              | 20.6           | 150            | 0              | -                        |
| Vert.    | 9920.000           | PK       | 47.26             | 39.03              | 9.83         | 42.82        | 2.48                    | 55.78              | 73.9              | 18.1           | 150            | 0              | -                        |
| Vert.    | 2483.500           | AV       | 35.72             | 28.08              | 14.61        | 41.68        | 2.48                    | 39.21              | 53.9              | 14.6           | 115            | 260            | VBW:360 Hz               |
| Vert.    | 4960.000           | AV       | 37.13             | 31.81              | 7.05         | 42.80        | 2.48                    | 35.67              | 53.9              | 18.2           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 7440.000           | AV       | 37.21             | 37.61              | 8.51         | 43.65        | 2.48                    | 42.16              | 53.9              | 11.7           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 9920.000           | AV       | 36.92             | 39.03              | 9.83         | 42.82        | 2.48                    | 45.44              | 53.9              | 8.4            | 150            | 0              | VBW: 360 Hz, Floor Noise |

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

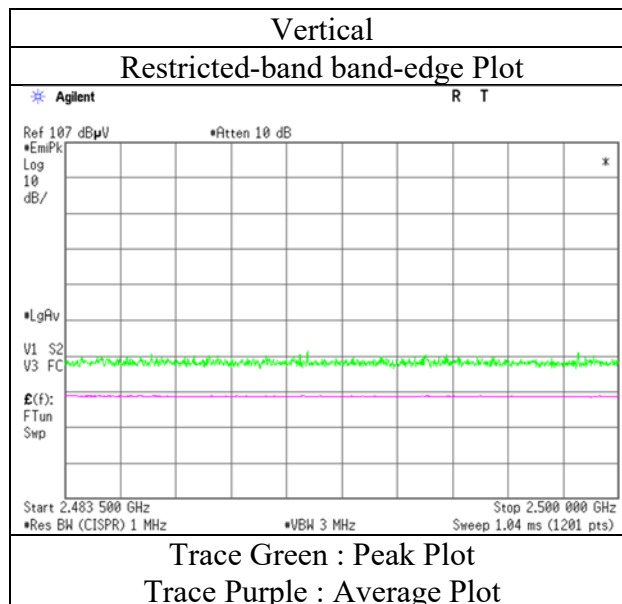
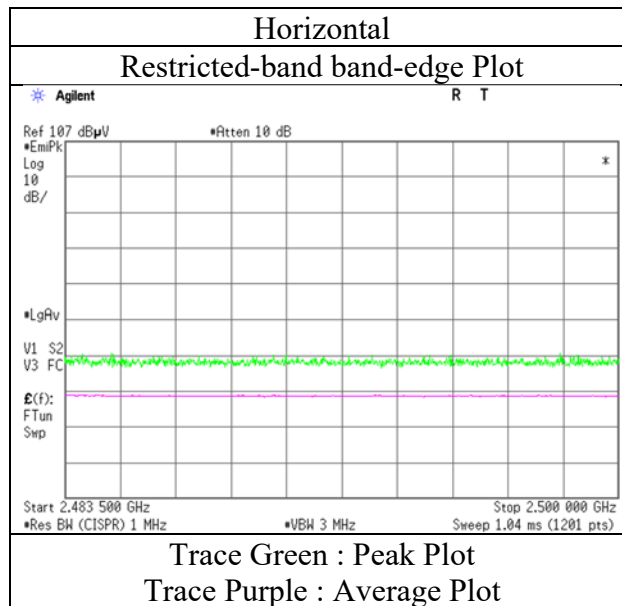
Distance factor : 1 GHz - 10 GHz :  $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

\*These results have sufficient margin without taking account Duty cycle correction factor.

### Radiated Spurious Emission (Reference Plot for band-edge)

|                        |                                      |
|------------------------|--------------------------------------|
| Test place             | Shonan EMC Lab.                      |
| Semi Anechoic Chamber  | No.3                                 |
| Date                   | January 13, 2023                     |
| Temperature / Humidity | 23 deg.C, 33 %RH                     |
| Engineer               | Takahiro Suzuki                      |
|                        | ( 1 GHz -2.8 GHz )                   |
| Mode                   | Tx, Hopping Off, 3DH5 2480 MHz, Left |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.  
Final result of restricted band edge was shown in tabular data.

**Radiated Spurious Emission**

|                        |                                      |                    |                     |                      |
|------------------------|--------------------------------------|--------------------|---------------------|----------------------|
| Test place             | Shonan EMC Lab.                      |                    |                     |                      |
| Semi Anechoic Chamber  | No.2                                 | No.3               | No.3                | No.2                 |
| Date                   | January 10, 2023                     | December 26, 2022  | January 16, 2023    | January 5, 2023      |
| Temperature / Humidity | 21 deg.C, 30 %RH                     | 22 deg.C, 23 %RH   | 24 deg.C, 36 %RH    | 20 deg.C, 27 %RH     |
| Engineer               | Kouki Yamada                         | Miku Ikudome       | Yusuke Tanikawara   | Takahiro Kawakami    |
|                        | ( 30 MHz -1 GHz )                    | ( 1 GHz -2.8 GHz ) | ( 2.8 GHz -10 GHz ) | ( 10 GHz -26.5 GHz ) |
| Mode                   | Tx, Hopping Off, DH5 2402 MHz, Right |                    |                     |                      |

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg] | Remark                   |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|-------------|--------------------------|
| Hori.    | 31.340          | QP       | 22.00          | 18.32           | 6.85      | 31.93     | 0.00                 | 15.24           | 40.0           | 24.7        | 100         | 0           | -                        |
| Hori.    | 190.080         | QP       | 21.10          | 16.45           | 8.83      | 31.80     | 0.00                 | 14.58           | 43.5           | 28.9        | 100         | 0           | -                        |
| Hori.    | 921.106         | QP       | 19.50          | 22.26           | 9.82      | 30.75     | 0.00                 | 20.83           | 46.0           | 25.1        | 100         | 0           | -                        |
| Hori.    | 2390.000        | PK       | 48.13          | 28.18           | 14.48     | 41.63     | 2.48                 | 51.64           | 73.9           | 22.2        | 208         | 209         | -                        |
| Hori.    | 4804.000        | PK       | 49.51          | 31.54           | 6.95      | 42.87     | 2.48                 | 47.61           | 73.9           | 26.2        | 150         | 0           | -                        |
| Hori.    | 7206.000        | PK       | 48.61          | 37.37           | 8.41      | 43.39     | 2.48                 | 53.48           | 73.9           | 20.4        | 150         | 0           | -                        |
| Hori.    | 9608.000        | PK       | 48.07          | 38.89           | 9.68      | 43.21     | 2.48                 | 55.91           | 73.9           | 17.9        | 150         | 0           | -                        |
| Hori.    | 2390.000        | AV       | 37.04          | 28.18           | 14.48     | 41.63     | 2.48                 | 40.55           | 53.9           | 13.3        | 208         | 209         | VBW:360 Hz               |
| Hori.    | 4804.000        | AV       | 36.95          | 31.54           | 6.95      | 42.87     | 2.48                 | 35.05           | 53.9           | 18.8        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Hori.    | 7206.000        | AV       | 37.06          | 37.37           | 8.41      | 43.39     | 2.48                 | 41.93           | 53.9           | 11.9        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Hori.    | 9608.000        | AV       | 36.71          | 38.89           | 9.68      | 43.21     | 2.48                 | 44.55           | 53.9           | <b>9.3</b>  | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Vert.    | 31.340          | QP       | 21.80          | 18.32           | 6.85      | 31.93     | 0.00                 | 15.04           | 40.0           | 24.9        | 100         | 0           | -                        |
| Vert.    | 34.548          | QP       | 21.50          | 17.04           | 6.94      | 31.93     | 0.00                 | 13.55           | 40.0           | 26.4        | 100         | 0           | -                        |
| Vert.    | 44.514          | QP       | 21.40          | 13.28           | 7.19      | 31.92     | 0.00                 | 9.95            | 40.0           | 30.0        | 100         | 0           | -                        |
| Vert.    | 193.647         | QP       | 21.00          | 16.53           | 8.86      | 31.80     | 0.00                 | 14.59           | 43.5           | 28.9        | 100         | 0           | -                        |
| Vert.    | 946.005         | QP       | 19.50          | 21.98           | 9.94      | 30.63     | 0.00                 | 20.79           | 46.0           | 25.2        | 100         | 0           | -                        |
| Vert.    | 2390.000        | PK       | 49.27          | 28.18           | 14.48     | 41.63     | 2.48                 | 52.78           | 73.9           | 21.1        | 206         | 319         | -                        |
| Vert.    | 4804.000        | PK       | 48.17          | 31.54           | 6.95      | 42.87     | 2.48                 | 46.27           | 73.9           | 27.6        | 150         | 0           | -                        |
| Vert.    | 7206.000        | PK       | 48.65          | 37.37           | 8.41      | 43.39     | 2.48                 | 53.52           | 73.9           | 20.3        | 150         | 0           | -                        |
| Vert.    | 9608.000        | PK       | 48.63          | 38.89           | 9.68      | 43.21     | 2.48                 | 56.47           | 73.9           | 17.4        | 150         | 0           | -                        |
| Vert.    | 2390.000        | AV       | 36.97          | 28.18           | 14.48     | 41.63     | 2.48                 | 40.48           | 53.9           | 13.4        | 206         | 319         | VBW:360 Hz               |
| Vert.    | 4804.000        | AV       | 36.98          | 31.54           | 6.95      | 42.87     | 2.48                 | 35.08           | 53.9           | 18.8        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Vert.    | 7206.000        | AV       | 37.05          | 37.37           | 8.41      | 43.39     | 2.48                 | 41.92           | 53.9           | 11.9        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Vert.    | 9608.000        | AV       | 36.71          | 38.89           | 9.68      | 43.21     | 2.48                 | 44.55           | 53.9           | <b>9.3</b>  | 150         | 0           | VBW: 360 Hz, Floor Noise |

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz :  $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$ 10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$ 

\*These results have sufficient margin without taking account Duty cycle correction factor.

**20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)**

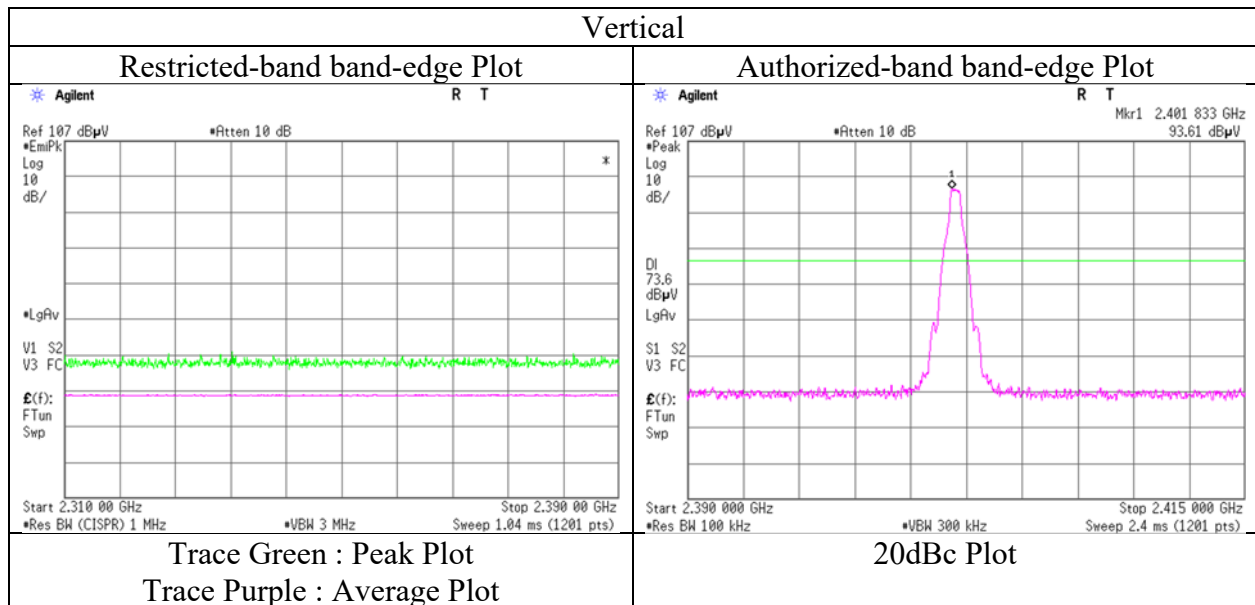
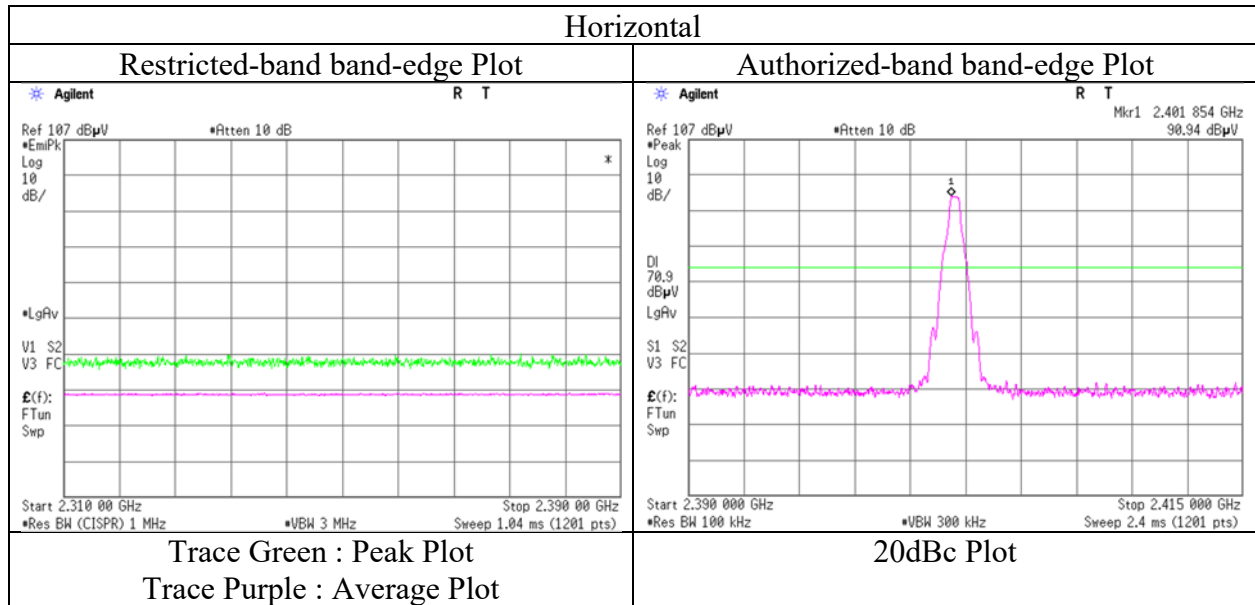
| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark  |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|---------|
| Hori.    | 2402.000        | PK       | 92.82          | 28.17           | 14.50     | 41.64     | 2.48                 | 96.33           | -              | -           | Carrier |
| Hori.    | 2400.000        | PK       | 38.28          | 28.17           | 14.50     | 41.64     | 2.48                 | 41.79           | 76.3           | 34.5        | -       |
| Vert.    | 2402.000        | PK       | 93.26          | 28.17           | 14.50     | 41.64     | 2.48                 | 96.77           | -              | -           | Carrier |
| Vert.    | 2400.000        | PK       | 38.31          | 28.17           | 14.50     | 41.64     | 2.48                 | 41.82           | 76.7           | 34.8        | -       |

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz :  $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$ 10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

**Radiated Spurious Emission**  
**(Reference Plot for band-edge)**

|                        |                                      |
|------------------------|--------------------------------------|
| Test place             | Shonan EMC Lab.                      |
| Semi Anechoic Chamber  | No.3                                 |
| Date                   | December 26, 2022                    |
| Temperature / Humidity | 22 deg.C, 23 %RH                     |
| Engineer               | Miku Ikudome                         |
|                        | ( 1 GHz -2.8 GHz )                   |
| Mode                   | Tx, Hopping Off, DH5 2402 MHz, Right |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.  
Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

|                        |                                      |                     |                      |
|------------------------|--------------------------------------|---------------------|----------------------|
| Test place             | Shonan EMC Lab.                      |                     |                      |
| Semi Anechoic Chamber  | No.3                                 | No.3                | No.2                 |
| Date                   | December 26, 2022                    | January 16, 2023    | January 5, 2023      |
| Temperature / Humidity | 22 deg.C, 23 %RH                     | 24 deg.C, 36 %RH    | 20 deg.C, 27 %RH     |
| Engineer               | Miku Ikudome                         | Yusuke Tanikawara   | Takahiro Kawakami    |
|                        | ( 1 GHz -2.8 GHz )                   | ( 2.8 GHz -10 GHz ) | ( 10 GHz -26.5 GHz ) |
| Mode                   | Tx, Hopping Off, DH5 2441 MHz, Right |                     |                      |

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Distance<br>Factor [dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark                   |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|-------------------------|--------------------|-------------------|----------------|----------------|----------------|--------------------------|
| Hori.    | 4882.000           | PK       | 47.94             | 31.64              | 6.99         | 42.83        | 2.48                    | 46.22              | 73.9              | 27.6           | 150            | 0              | -                        |
| Hori.    | 7323.000           | PK       | 48.13             | 37.46              | 8.46         | 43.52        | 2.48                    | 53.01              | 73.9              | 20.8           | 150            | 0              | -                        |
| Hori.    | 9764.000           | PK       | 48.53             | 39.18              | 9.76         | 43.02        | 2.48                    | 56.93              | 73.9              | 16.9           | 150            | 0              | -                        |
| Hori.    | 4882.000           | AV       | 37.14             | 31.64              | 6.99         | 42.83        | 2.48                    | 35.42              | 53.9              | 18.4           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Hori.    | 7323.000           | AV       | 37.36             | 37.46              | 8.46         | 43.52        | 2.48                    | 42.24              | 53.9              | 11.6           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Hori.    | 9764.000           | AV       | 37.38             | 39.18              | 9.76         | 43.02        | 2.48                    | 45.78              | 53.9              | 8.1            | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 4882.000           | PK       | 48.07             | 31.64              | 6.99         | 42.83        | 2.48                    | 46.35              | 73.9              | 27.5           | 150            | 0              | -                        |
| Vert.    | 7323.000           | PK       | 48.02             | 37.46              | 8.46         | 43.52        | 2.48                    | 52.90              | 73.9              | 21.0           | 150            | 0              | -                        |
| Vert.    | 9764.000           | PK       | 48.75             | 39.18              | 9.76         | 43.02        | 2.48                    | 57.15              | 73.9              | 16.7           | 150            | 0              | -                        |
| Vert.    | 4882.000           | AV       | 37.09             | 31.64              | 6.99         | 42.83        | 2.48                    | 35.37              | 53.9              | 18.5           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 7323.000           | AV       | 37.42             | 37.46              | 8.46         | 43.52        | 2.48                    | 42.30              | 53.9              | 11.6           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 9764.000           | AV       | 37.47             | 39.18              | 9.76         | 43.02        | 2.48                    | 45.87              | 53.9              | <b>8.0</b>     | 150            | 0              | VBW: 360 Hz, Floor Noise |

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz :  $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

\*These results have sufficient margin without taking account Duty cycle correction factor.

## Radiated Spurious Emission

|                        |                                      |                     |                      |
|------------------------|--------------------------------------|---------------------|----------------------|
| Test place             | Shonan EMC Lab.                      |                     |                      |
| Semi Anechoic Chamber  | No.3                                 | No.3                | No.2                 |
| Date                   | December 26, 2022                    | January 16, 2023    | January 5, 2023      |
| Temperature / Humidity | 22 deg.C, 23 %RH                     | 24 deg.C, 36 %RH    | 20 deg.C, 27 %RH     |
| Engineer               | Miku Ikudome                         | Yusuke Tanikawara   | Takahiro Kawakami    |
|                        | ( 1 GHz -2.8 GHz )                   | ( 2.8 GHz -10 GHz ) | ( 10 GHz -26.5 GHz ) |
| Mode                   | Tx, Hopping Off, DH5 2480 MHz, Right |                     |                      |

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg] | Remark                   |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|-------------|--------------------------|
| Hori.    | 2483.500        | PK       | 49.22          | 28.08           | 14.60     | 41.68     | 2.48                 | 52.70           | 73.9           | 21.2        | 161         | 5           | -                        |
| Hori.    | 4960.000        | PK       | 48.01          | 31.81           | 7.05      | 42.80     | 2.48                 | 46.55           | 73.9           | 27.3        | 150         | 0           | -                        |
| Hori.    | 7440.000        | PK       | 48.05          | 37.61           | 8.51      | 43.65     | 2.48                 | 53.00           | 73.9           | 20.9        | 150         | 0           | -                        |
| Hori.    | 9920.000        | PK       | 48.24          | 39.03           | 9.83      | 42.82     | 2.48                 | 56.76           | 73.9           | 17.1        | 150         | 0           | -                        |
| Hori.    | 2483.500        | AV       | 37.21          | 28.08           | 14.60     | 41.68     | 2.48                 | 40.69           | 53.9           | 13.2        | 161         | 5           | VBW:360 Hz               |
| Hori.    | 4960.000        | AV       | 37.35          | 31.81           | 7.05      | 42.80     | 2.48                 | 35.89           | 53.9           | 18.0        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Hori.    | 7440.000        | AV       | 37.24          | 37.61           | 8.51      | 43.65     | 2.48                 | 42.19           | 53.9           | 11.7        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Hori.    | 9920.000        | AV       | 36.93          | 39.03           | 9.83      | 42.82     | 2.48                 | 45.45           | 53.9           | 8.4         | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Vert.    | 2483.500        | PK       | 48.50          | 28.08           | 14.60     | 41.68     | 2.48                 | 51.98           | 73.9           | 21.9        | 112         | 83          | -                        |
| Vert.    | 4960.000        | PK       | 47.87          | 31.81           | 7.05      | 42.80     | 2.48                 | 46.41           | 73.9           | 27.4        | 150         | 0           | -                        |
| Vert.    | 7440.000        | PK       | 47.93          | 37.61           | 8.51      | 43.65     | 2.48                 | 52.88           | 73.9           | 21.0        | 150         | 0           | -                        |
| Vert.    | 9920.000        | PK       | 48.56          | 39.03           | 9.83      | 42.82     | 2.48                 | 57.08           | 73.9           | 16.8        | 150         | 0           | -                        |
| Vert.    | 2483.500        | AV       | 37.06          | 28.08           | 14.60     | 41.68     | 2.48                 | 40.54           | 53.9           | 13.3        | 112         | 83          | VBW:360 Hz               |
| Vert.    | 4960.000        | AV       | 37.10          | 31.81           | 7.05      | 42.80     | 2.48                 | 35.64           | 53.9           | 18.2        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Vert.    | 7440.000        | AV       | 37.19          | 37.61           | 8.51      | 43.65     | 2.48                 | 42.14           | 53.9           | 11.7        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Vert.    | 9920.000        | AV       | 37.00          | 39.03           | 9.83      | 42.82     | 2.48                 | 45.52           | 53.9           | 8.3         | 150         | 0           | VBW: 360 Hz, Floor Noise |

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

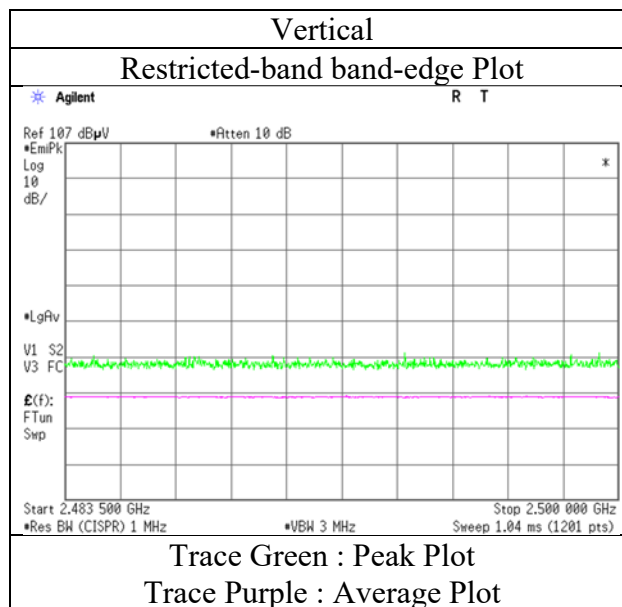
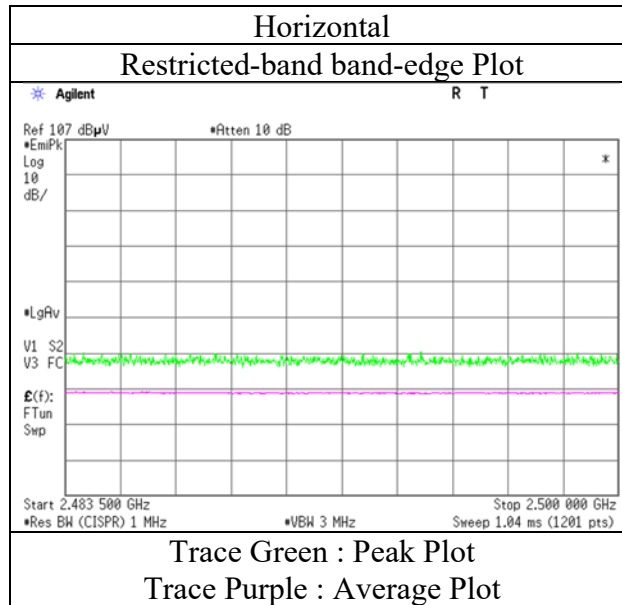
Distance factor : 1 GHz - 10 GHz :  $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

\*These results have sufficient margin without taking account Duty cycle correction factor.

### Radiated Spurious Emission (Reference Plot for band-edge)

|                        |                                      |
|------------------------|--------------------------------------|
| Test place             | Shonan EMC Lab.                      |
| Semi Anechoic Chamber  | No.3                                 |
| Date                   | December 26, 2022                    |
| Temperature / Humidity | 22 deg.C, 23 %RH                     |
| Engineer               | Miku Ikudome                         |
|                        | ( 1 GHz -2.8 GHz )                   |
| Mode                   | Tx, Hopping Off, DH5 2480 MHz, Right |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.  
Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

|                        |                                       |                     |                      |
|------------------------|---------------------------------------|---------------------|----------------------|
| Test place             | Shonan EMC Lab.                       |                     |                      |
| Semi Anechoic Chamber  | No.3                                  | No.3                | No.2                 |
| Date                   | January 12, 2023                      | January 16, 2023    | January 5, 2023      |
| Temperature / Humidity | 22 deg.C, 32 %RH                      | 24 deg.C, 36 %RH    | 20 deg.C, 27 %RH     |
| Engineer               | Takahiro Suzuki                       | Yusuke Tanikawara   | Takahiro Kawakami    |
|                        | ( 1 GHz -2.8 GHz )                    | ( 2.8 GHz -10 GHz ) | ( 10 GHz -26.5 GHz ) |
| Mode                   | Tx, Hopping Off, 3DH5 2402 MHz, Right |                     |                      |

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg] | Remark                   |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|-------------|--------------------------|
| Hori.    | 2390.000        | PK       | 49.91          | 28.18           | 14.49     | 41.63     | 2.48                 | 53.43           | 73.9           | 20.4        | 148         | 119         | -                        |
| Hori.    | 4804.000        | PK       | 49.00          | 31.54           | 6.95      | 42.87     | 2.48                 | 47.10           | 73.9           | 26.8        | 150         | 0           | -                        |
| Hori.    | 7206.000        | PK       | 48.54          | 37.37           | 8.41      | 43.39     | 2.48                 | 53.41           | 73.9           | 20.4        | 150         | 0           | -                        |
| Hori.    | 9608.000        | PK       | 48.18          | 38.89           | 9.68      | 43.21     | 2.48                 | 56.02           | 73.9           | 17.8        | 150         | 0           | -                        |
| Hori.    | 2390.000        | AV       | 35.60          | 28.18           | 14.49     | 41.63     | 2.48                 | 39.12           | 53.9           | 14.7        | 148         | 119         | VBW:360 Hz               |
| Hori.    | 4804.000        | AV       | 37.34          | 31.54           | 6.95      | 42.87     | 2.48                 | 35.44           | 53.9           | 18.4        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Hori.    | 7206.000        | AV       | 37.35          | 37.37           | 8.41      | 43.39     | 2.48                 | 42.22           | 53.9           | 11.6        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Hori.    | 9608.000        | AV       | 36.98          | 38.89           | 9.68      | 43.21     | 2.48                 | 44.82           | 53.9           | 9.0         | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Vert.    | 2390.000        | PK       | 49.15          | 28.18           | 14.49     | 41.63     | 2.48                 | 52.67           | 73.9           | 21.2        | 162         | 14          | -                        |
| Vert.    | 4804.000        | PK       | 48.32          | 31.54           | 6.95      | 42.87     | 2.48                 | 46.42           | 73.9           | 27.4        | 150         | 0           | -                        |
| Vert.    | 7206.000        | PK       | 48.67          | 37.37           | 8.41      | 43.39     | 2.48                 | 53.54           | 73.9           | 20.3        | 150         | 0           | -                        |
| Vert.    | 9608.000        | PK       | 48.40          | 38.89           | 9.68      | 43.21     | 2.48                 | 56.24           | 73.9           | 17.6        | 150         | 0           | -                        |
| Vert.    | 2390.000        | AV       | 35.54          | 28.18           | 14.49     | 41.63     | 2.48                 | 39.06           | 53.9           | 14.8        | 162         | 14          | VBW:360 Hz               |
| Vert.    | 4804.000        | AV       | 37.34          | 31.54           | 6.95      | 42.87     | 2.48                 | 35.44           | 53.9           | 18.4        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Vert.    | 7206.000        | AV       | 37.28          | 37.37           | 8.41      | 43.39     | 2.48                 | 42.15           | 53.9           | 11.7        | 150         | 0           | VBW: 360 Hz, Floor Noise |
| Vert.    | 9608.000        | AV       | 37.48          | 38.89           | 9.68      | 43.21     | 2.48                 | 45.32           | 53.9           | 8.5         | 150         | 0           | VBW: 360 Hz, Floor Noise |

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz :  $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

\*These results have sufficient margin without taking account Duty cycle correction factor.

### 20 dBc Data Sheet (RBW 100 kHz, VBW 300 kHz)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark  |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|---------|
| Hori.    | 2402.000        | PK       | 91.25          | 28.17           | 14.51     | 41.64     | 2.48                 | 94.77           | -              | -           | Carrier |
| Hori.    | 2400.000        | PK       | 39.75          | 28.17           | 14.51     | 41.64     | 2.48                 | 43.27           | 74.7           | 31.4        | -       |
| Vert.    | 2402.000        | PK       | 90.84          | 28.17           | 14.51     | 41.64     | 2.48                 | 94.36           | -              | -           | Carrier |
| Vert.    | 2400.000        | PK       | 39.31          | 28.17           | 14.51     | 41.64     | 2.48                 | 42.83           | 74.3           | 31.4        | -       |

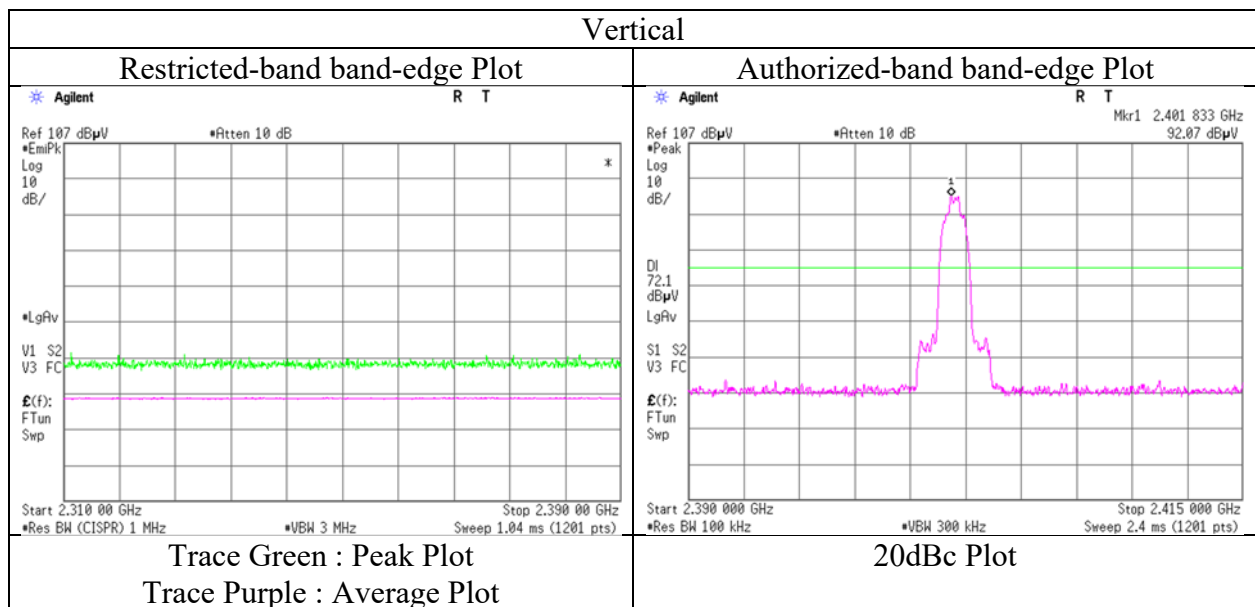
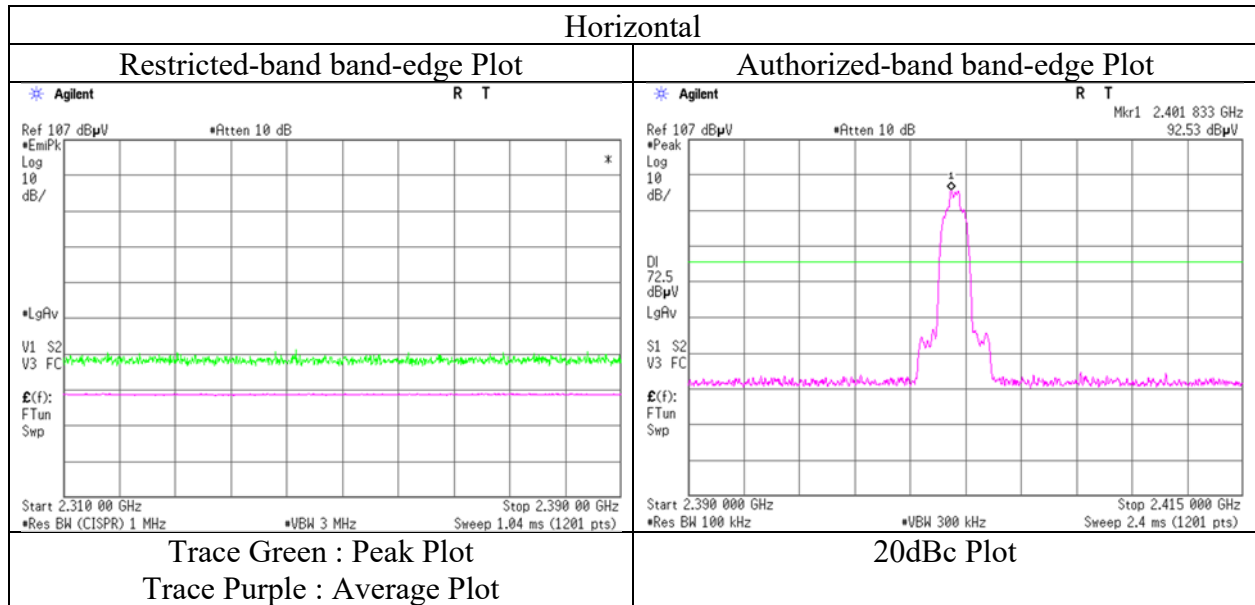
Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz :  $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

**Radiated Spurious Emission**  
**(Reference Plot for band-edge)**

|                        |                                       |
|------------------------|---------------------------------------|
| Test place             | Shonan EMC Lab.                       |
| Semi Anechoic Chamber  | No.3                                  |
| Date                   | January 12, 2023                      |
| Temperature / Humidity | 22 deg.C, 32 %RH                      |
| Engineer               | Takahiro Suzuki                       |
|                        | ( 1 GHz -2.8 GHz )                    |
| Mode                   | Tx, Hopping Off, 3DH5 2402 MHz, Right |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.  
Final result of restricted band edge was shown in tabular data.

## Radiated Spurious Emission

|                        |                                       |                     |                      |
|------------------------|---------------------------------------|---------------------|----------------------|
| Test place             | Shonan EMC Lab.                       |                     |                      |
| Semi Anechoic Chamber  | No.3                                  | No.3                | No.2                 |
| Date                   | January 12, 2023                      | January 16, 2023    | January 5, 2023      |
| Temperature / Humidity | 22 deg.C, 32 %RH                      | 24 deg.C, 36 %RH    | 20 deg.C, 27 %RH     |
| Engineer               | Takahiro Suzuki                       | Yusuke Tanikawara   | Takahiro Kawakami    |
|                        | ( 1 GHz -2.8 GHz )                    | ( 2.8 GHz -10 GHz ) | ( 10 GHz -26.5 GHz ) |
| Mode                   | Tx, Hopping Off, 3DH5 2441 MHz, Right |                     |                      |

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Distance<br>Factor [dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark                   |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|-------------------------|--------------------|-------------------|----------------|----------------|----------------|--------------------------|
| Hori.    | 4882.000           | PK       | 48.05             | 31.64              | 6.99         | 42.83        | 2.48                    | 46.33              | 73.9              | 27.5           | 150            | 0              | -                        |
| Hori.    | 7323.000           | PK       | 48.84             | 37.46              | 8.46         | 43.52        | 2.48                    | 53.72              | 73.9              | 20.1           | 150            | 0              | -                        |
| Hori.    | 9764.000           | PK       | 48.53             | 39.18              | 9.76         | 43.02        | 2.48                    | 56.93              | 73.9              | 16.9           | 150            | 0              | -                        |
| Hori.    | 4882.000           | AV       | 36.47             | 31.64              | 6.99         | 42.83        | 2.48                    | 34.75              | 53.9              | 19.1           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Hori.    | 7323.000           | AV       | 36.86             | 37.46              | 8.46         | 43.52        | 2.48                    | 41.74              | 53.9              | 12.1           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Hori.    | 9764.000           | AV       | 36.83             | 39.18              | 9.76         | 43.02        | 2.48                    | 45.23              | 53.9              | 8.6            | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 4882.000           | PK       | 48.55             | 31.64              | 6.99         | 42.83        | 2.48                    | 46.83              | 73.9              | 27.0           | 150            | 0              | -                        |
| Vert.    | 7323.000           | PK       | 49.01             | 37.46              | 8.46         | 43.52        | 2.48                    | 53.89              | 73.9              | 20.0           | 150            | 0              | -                        |
| Vert.    | 9764.000           | PK       | 48.58             | 39.18              | 9.76         | 43.02        | 2.48                    | 56.98              | 73.9              | 16.9           | 150            | 0              | -                        |
| Vert.    | 4882.000           | AV       | 36.38             | 31.64              | 6.99         | 42.83        | 2.48                    | 34.66              | 53.9              | 19.2           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 7323.000           | AV       | 36.78             | 37.46              | 8.46         | 43.52        | 2.48                    | 41.66              | 53.9              | 12.2           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 9764.000           | AV       | 37.06             | 39.18              | 9.76         | 43.02        | 2.48                    | 45.46              | 53.9              | <b>8.4</b>     | 150            | 0              | VBW: 360 Hz, Floor Noise |

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

Distance factor : 1 GHz - 10 GHz :  $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

\*These results have sufficient margin without taking account Duty cycle correction factor.

## Radiated Spurious Emission

|                        |                                       |                     |                      |
|------------------------|---------------------------------------|---------------------|----------------------|
| Test place             | Shonan EMC Lab.                       |                     |                      |
| Semi Anechoic Chamber  | No.3                                  | No.3                | No.2                 |
| Date                   | January 12, 2023                      | January 16, 2023    | January 5, 2023      |
| Temperature / Humidity | 22 deg.C, 32 %RH                      | 24 deg.C, 36 %RH    | 20 deg.C, 27 %RH     |
| Engineer               | Takahiro Suzuki                       | Yusuke Tanikawara   | Takahiro Kawakami    |
|                        | ( 1 GHz -2.8 GHz )                    | ( 2.8 GHz -10 GHz ) | ( 10 GHz -26.5 GHz ) |
| Mode                   | Tx, Hopping Off, 3DH5 2480 MHz, Right |                     |                      |

(\* PK: Peak, AV: Average, QP: Quasi-Peak)

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Distance<br>Factor [dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark                   |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|-------------------------|--------------------|-------------------|----------------|----------------|----------------|--------------------------|
| Hori.    | 2483.500           | PK       | 48.86             | 28.08              | 14.61        | 41.68        | 2.48                    | 52.35              | 73.9              | 21.5           | 205            | 2              | -                        |
| Hori.    | 4960.000           | PK       | 48.10             | 31.81              | 7.05         | 42.80        | 2.48                    | 46.64              | 73.9              | 27.2           | 150            | 0              | -                        |
| Hori.    | 7440.000           | PK       | 48.01             | 37.61              | 8.51         | 43.65        | 2.48                    | 52.96              | 73.9              | 20.9           | 150            | 0              | -                        |
| Hori.    | 9920.000           | PK       | 49.03             | 39.03              | 9.83         | 42.82        | 2.48                    | 57.55              | 73.9              | 16.3           | 150            | 0              | -                        |
| Hori.    | 2483.500           | AV       | 35.65             | 28.08              | 14.61        | 41.68        | 2.48                    | 39.14              | 53.9              | 14.7           | 205            | 2              | VBW:360 Hz               |
| Hori.    | 4960.000           | AV       | 36.97             | 31.81              | 7.05         | 42.80        | 2.48                    | 35.51              | 53.9              | 18.3           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Hori.    | 7440.000           | AV       | 37.22             | 37.61              | 8.51         | 43.65        | 2.48                    | 42.17              | 53.9              | 11.7           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Hori.    | 9920.000           | AV       | 36.98             | 39.03              | 9.83         | 42.82        | 2.48                    | 45.50              | 53.9              | 8.4            | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 2483.500           | PK       | 49.21             | 28.08              | 14.61        | 41.68        | 2.48                    | 52.70              | 73.9              | 21.2           | 143            | 118            | -                        |
| Vert.    | 4960.000           | PK       | 47.81             | 31.81              | 7.05         | 42.80        | 2.48                    | 46.35              | 73.9              | 27.5           | 150            | 0              | -                        |
| Vert.    | 7440.000           | PK       | 48.53             | 37.61              | 8.51         | 43.65        | 2.48                    | 53.48              | 73.9              | 20.4           | 150            | 0              | -                        |
| Vert.    | 9920.000           | PK       | 48.21             | 39.03              | 9.83         | 42.82        | 2.48                    | 56.73              | 73.9              | 17.1           | 150            | 0              | -                        |
| Vert.    | 2483.500           | AV       | 35.61             | 28.08              | 14.61        | 41.68        | 2.48                    | 39.10              | 53.9              | 14.8           | 143            | 118            | VBW:360 Hz               |
| Vert.    | 4960.000           | AV       | 37.03             | 31.81              | 7.05         | 42.80        | 2.48                    | 35.57              | 53.9              | 18.3           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 7440.000           | AV       | 37.13             | 37.61              | 8.51         | 43.65        | 2.48                    | 42.08              | 53.9              | 11.8           | 150            | 0              | VBW: 360 Hz, Floor Noise |
| Vert.    | 9920.000           | AV       | 36.92             | 39.03              | 9.83         | 42.82        | 2.48                    | 45.44              | 53.9              | 8.4            | 150            | 0              | VBW: 360 Hz, Floor Noise |

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18 GHz)) - Gain(Amplifier) + Distance factor

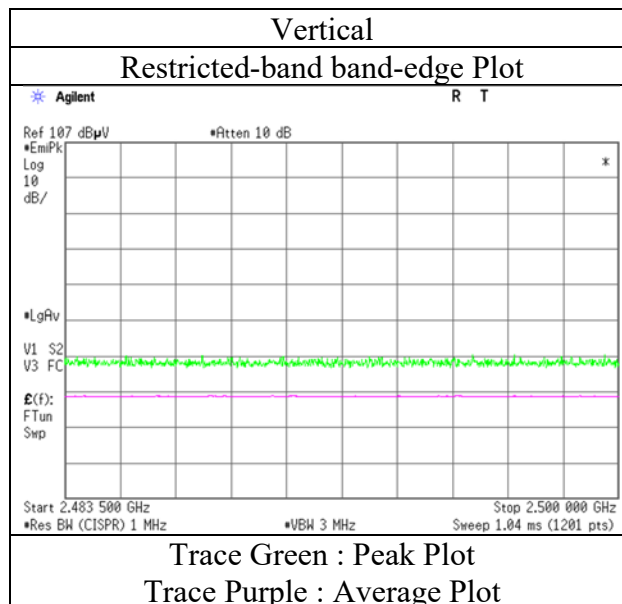
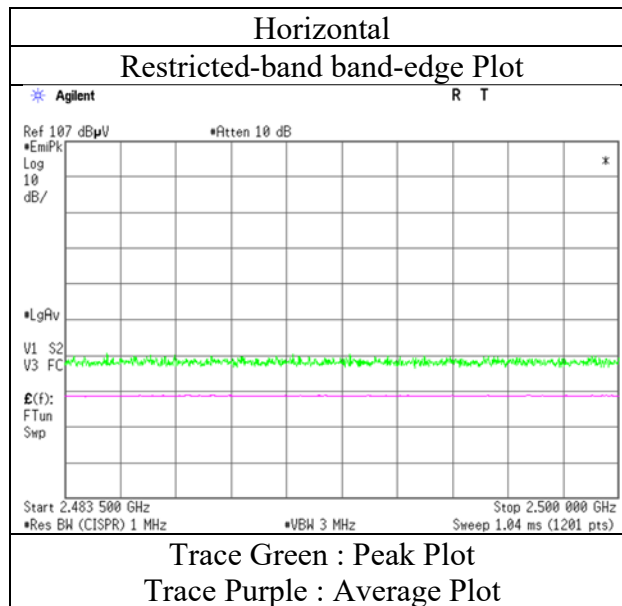
Distance factor : 1 GHz - 10 GHz :  $20\log(3.99\text{ m} / 3.0\text{ m}) = 2.48\text{ dB}$

10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

\*These results have sufficient margin without taking account Duty cycle correction factor.

## Radiated Spurious Emission (Reference Plot for band-edge)

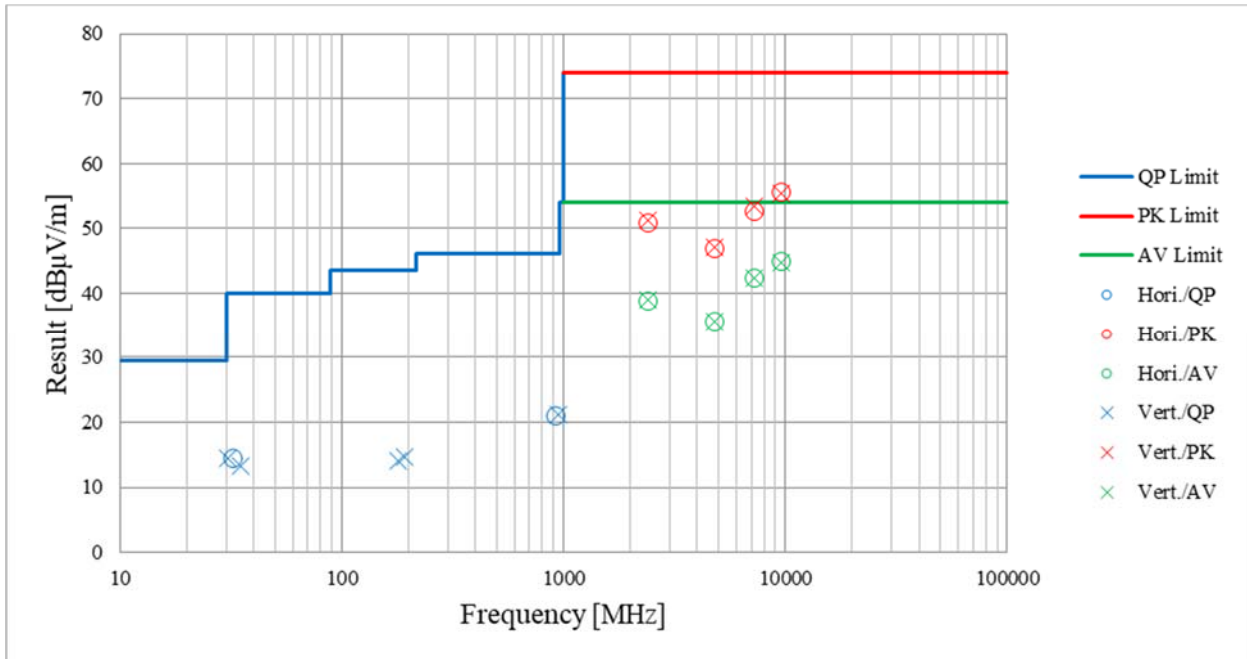
|                        |                                       |
|------------------------|---------------------------------------|
| Test place             | Shonan EMC Lab.                       |
| Semi Anechoic Chamber  | No.3                                  |
| Date                   | January 12, 2023                      |
| Temperature / Humidity | 22 deg.C, 32 %RH                      |
| Engineer               | Takahiro Suzuki                       |
|                        | ( 1 GHz -2.8 GHz )                    |
| Mode                   | Tx, Hopping Off, 3DH5 2480 MHz, Right |



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.  
Final result of restricted band edge was shown in tabular data.

**Radiated Spurious Emission**  
**(Plot data, Worst case mode for Maximum Peak Output Power)**

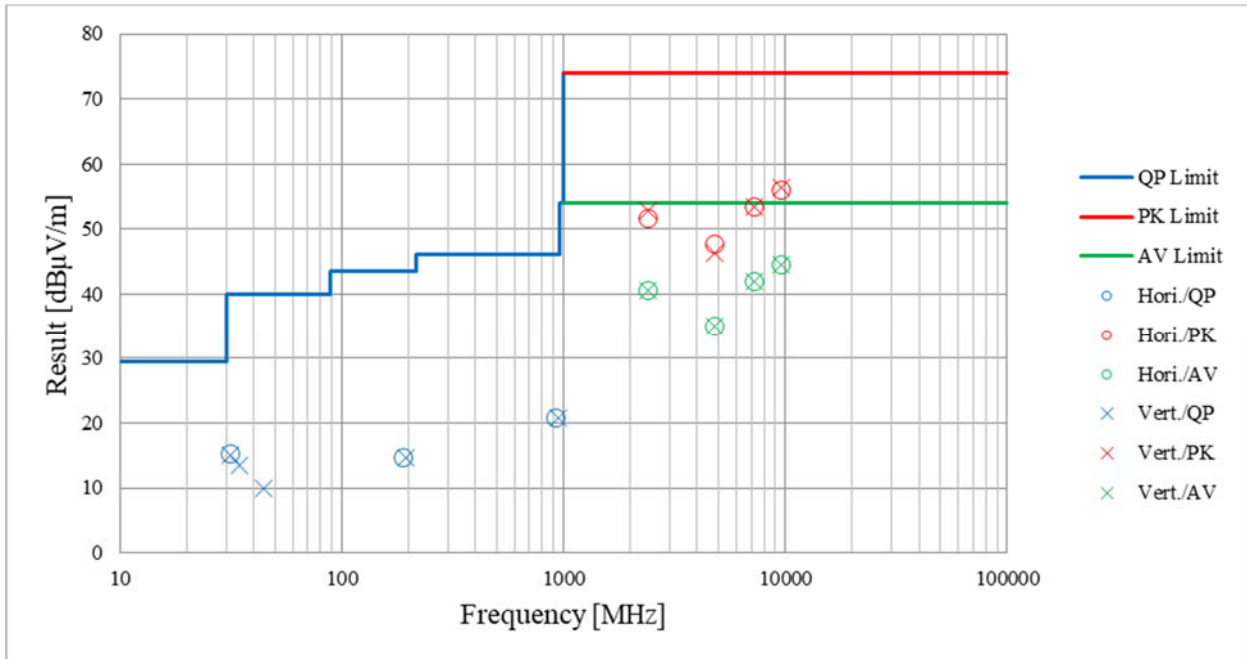
|                        |                                     |                    |                     |                      |
|------------------------|-------------------------------------|--------------------|---------------------|----------------------|
| Test place             | Shonan EMC Lab.                     |                    |                     |                      |
| Semi Anechoic Chamber  | No.2                                | No.3               | No.3                | No.2                 |
| Date                   | January 10, 2023                    | December 26, 2022  | January 16, 2023    | January 5, 2023      |
| Temperature / Humidity | 21 deg.C, 30 %RH                    | 22 deg.C, 23 %RH   | 24 deg.C, 36 %RH    | 20 deg.C, 27 %RH     |
| Engineer               | Kouki Yamada                        | Miku Ikudome       | Yusuke Tanikawara   | Takahiro Kawakami    |
|                        | ( 30 MHz -1 GHz )                   | ( 1 GHz -2.8 GHz ) | ( 2.8 GHz -10 GHz ) | ( 10 GHz -26.5 GHz ) |
| Mode                   | Tx, Hopping Off, DH5 2402 MHz, Left |                    |                     |                      |



\*These plots data contains sufficient number to show the trend of characteristic features for EUT.

**Radiated Spurious Emission**  
**(Plot data, Worst case mode for Maximum Peak Output Power)**

|                        |                                      |                    |                     |                      |
|------------------------|--------------------------------------|--------------------|---------------------|----------------------|
| Test place             | Shonan EMC Lab.                      |                    |                     |                      |
| Semi Anechoic Chamber  | No.2                                 | No.3               | No.3                | No.2                 |
| Date                   | January 10, 2023                     | December 26, 2022  | January 16, 2023    | January 5, 2023      |
| Temperature / Humidity | 21 deg.C, 30 %RH                     | 22 deg.C, 23 %RH   | 24 deg.C, 36 %RH    | 20 deg.C, 27 %RH     |
| Engineer               | Kouki Yamada                         | Miku Ikudome       | Yusuke Tanikawara   | Takahiro Kawakami    |
|                        | ( 30 MHz -1 GHz )                    | ( 1 GHz -2.8 GHz ) | ( 2.8 GHz -10 GHz ) | ( 10 GHz -26.5 GHz ) |
| Mode                   | Tx, Hopping Off, DH5 2402 MHz, Right |                    |                     |                      |

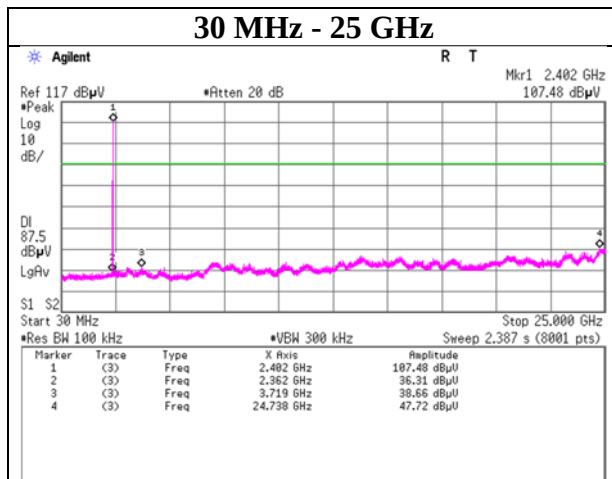
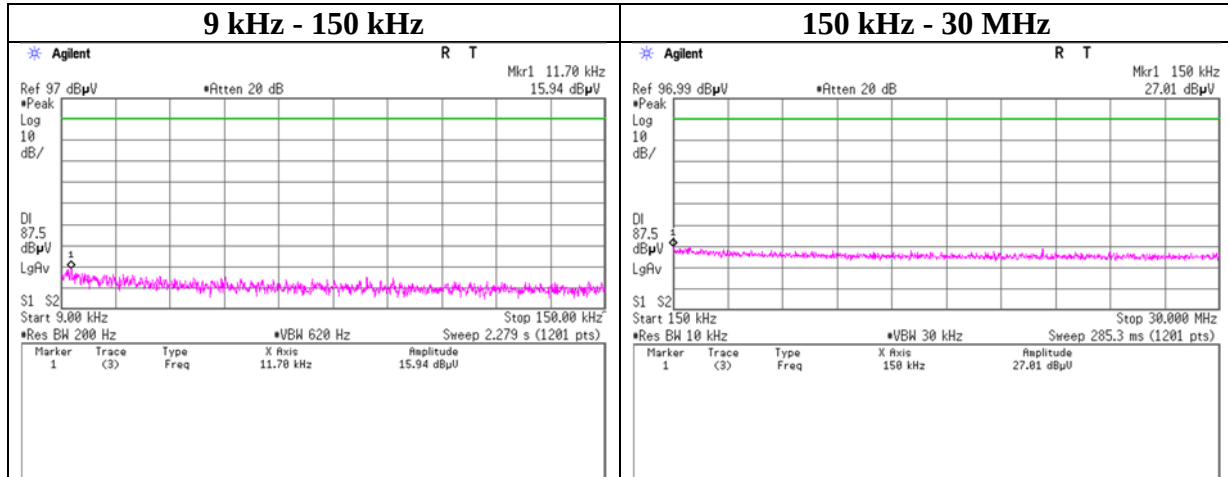


\*These plots data contains sufficient number to show the trend of characteristic features for EUT.

## Conducted Spurious Emission

|                        |                                            |
|------------------------|--------------------------------------------|
| Test place             | Shonan EMC Lab. No.5 Semi Anechoic Chamber |
| Date                   | January 17, 2023                           |
| Temperature / Humidity | 24 deg. C / 49 % RH                        |
| Engineer               | Takahiro Kawakami                          |
| Mode                   | Tx, Hopping Off, DH5                       |

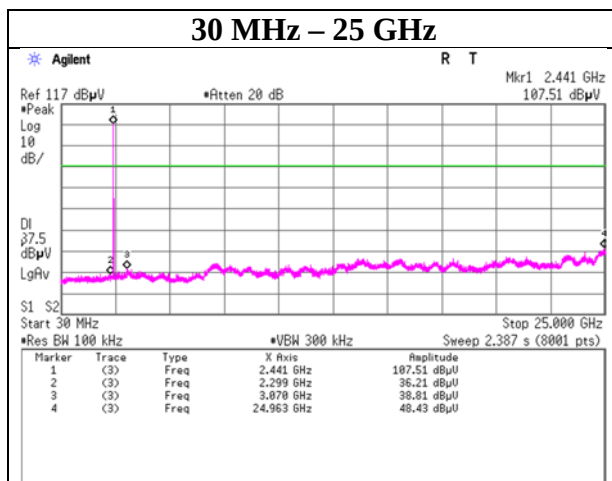
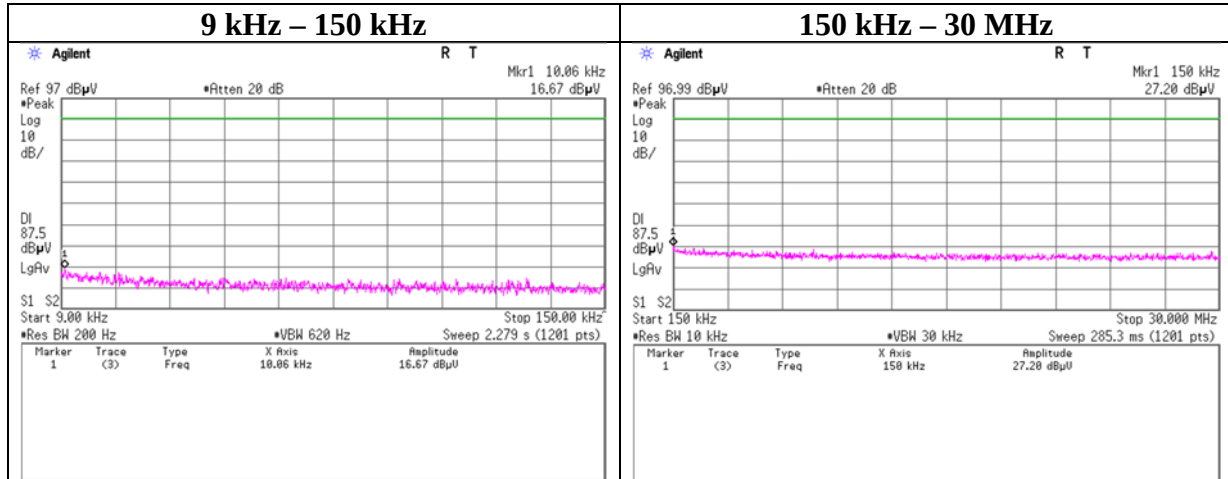
### 2402 MHz



## Conducted Spurious Emission

|                        |                                            |
|------------------------|--------------------------------------------|
| Test place             | Shonan EMC Lab. No.5 Semi Anechoic Chamber |
| Date                   | January 17, 2023                           |
| Temperature / Humidity | 24 deg. C / 49 % RH                        |
| Engineer               | Takahiro Kawakami                          |
| Mode                   | Tx, Hopping Off, DH5                       |

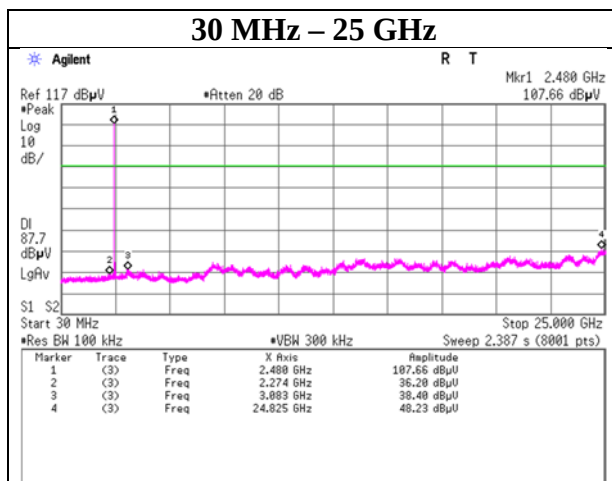
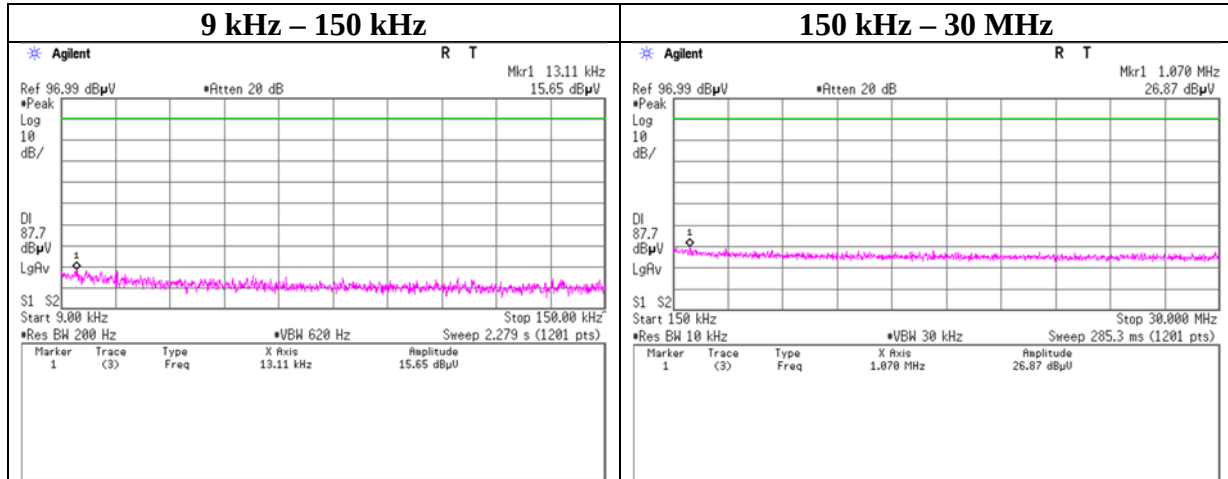
### 2441 MHz



## Conducted Spurious Emission

|                        |                                            |
|------------------------|--------------------------------------------|
| Test place             | Shonan EMC Lab. No.5 Semi Anechoic Chamber |
| Date                   | January 17, 2023                           |
| Temperature / Humidity | 24 deg. C / 49 % RH                        |
| Engineer               | Takahiro Kawakami                          |
| Mode                   | Tx, Hopping Off, DH5                       |

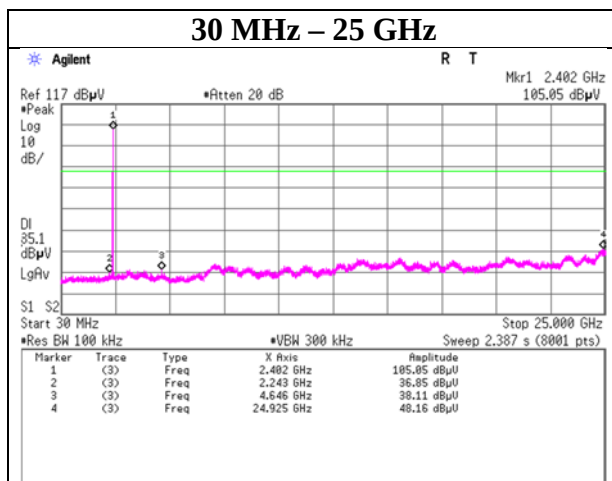
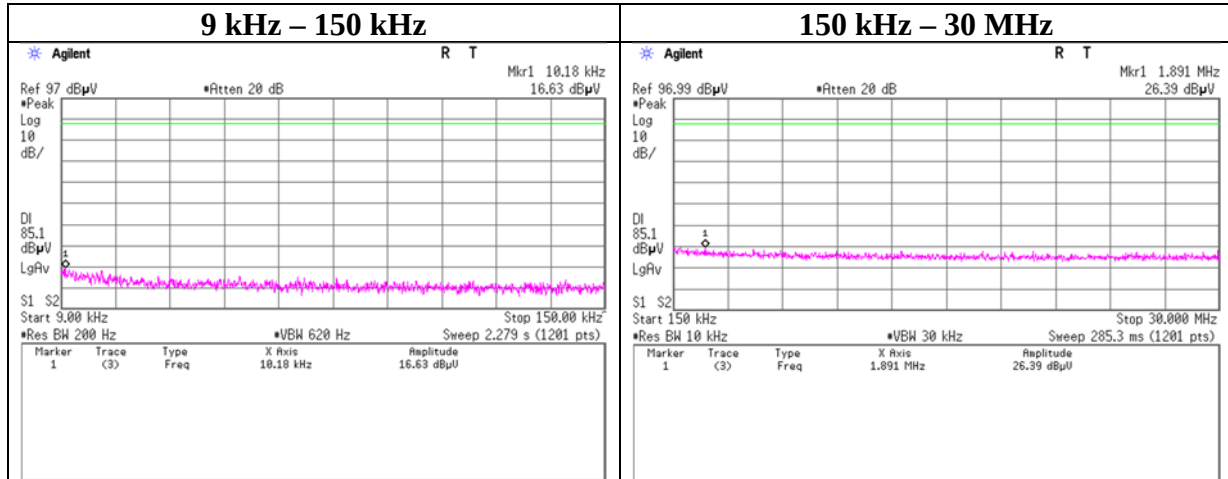
### 2480 MHz



## Conducted Spurious Emission

|                        |                                            |
|------------------------|--------------------------------------------|
| Test place             | Shonan EMC Lab. No.5 Semi Anechoic Chamber |
| Date                   | January 17, 2023                           |
| Temperature / Humidity | 24 deg. C / 49 % RH                        |
| Engineer               | Takahiro Kawakami                          |
| Mode                   | Tx, Hopping Off, 3DH5                      |

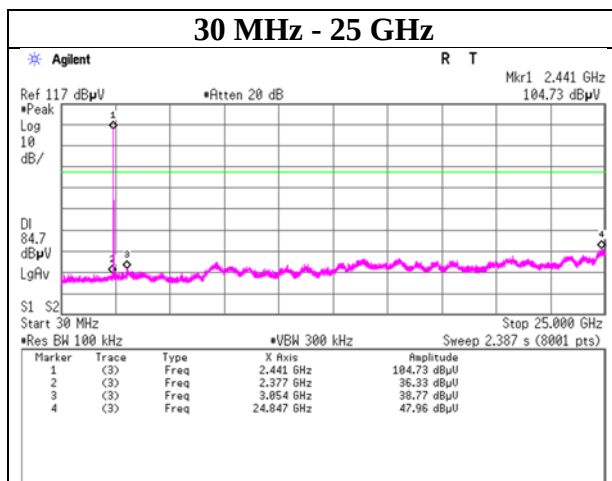
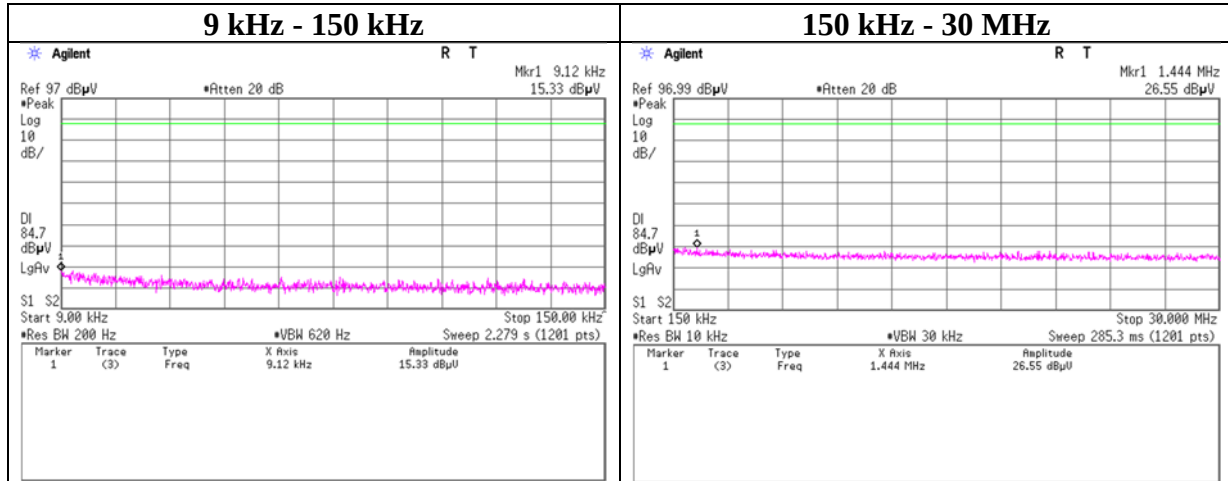
### 2402 MHz



## Conducted Spurious Emission

|                        |                                            |
|------------------------|--------------------------------------------|
| Test place             | Shonan EMC Lab. No.5 Semi Anechoic Chamber |
| Date                   | January 17, 2023                           |
| Temperature / Humidity | 24 deg. C / 49 % RH                        |
| Engineer               | Takahiro Kawakami                          |
| Mode                   | Tx, Hopping Off, 3DH5                      |

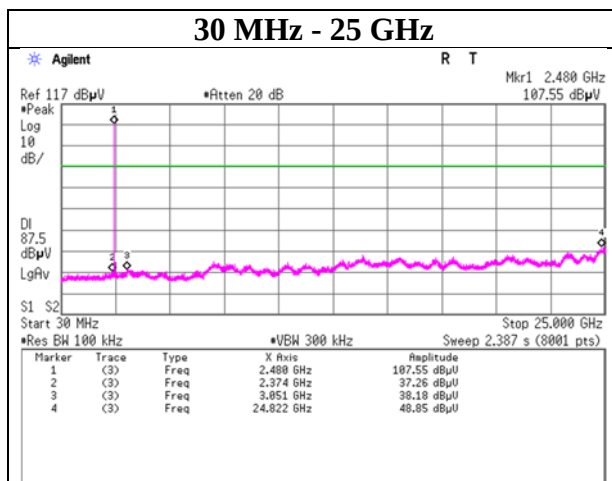
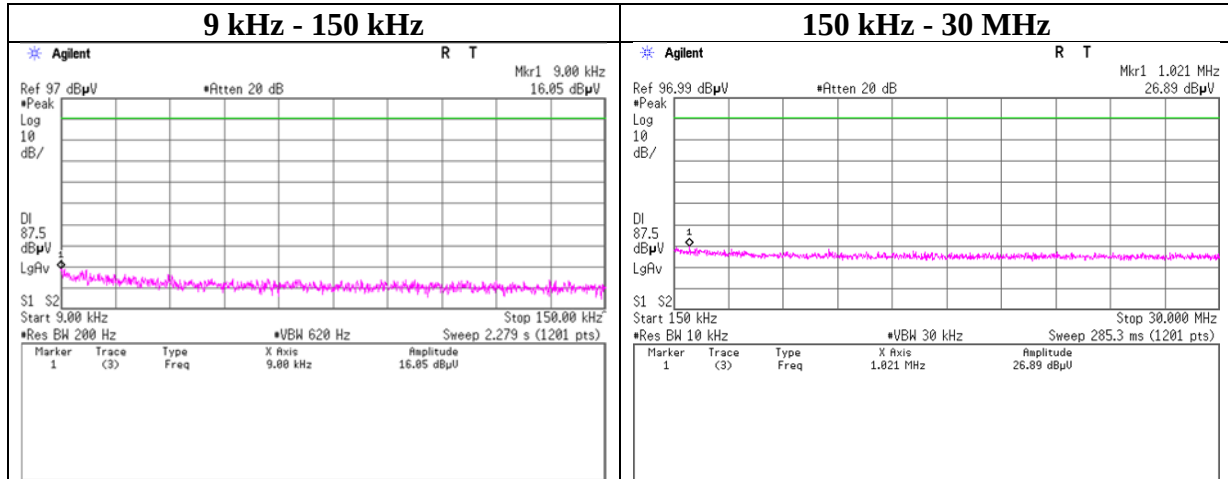
### 2441 MHz



## Conducted Spurious Emission

|                        |                                            |
|------------------------|--------------------------------------------|
| Test place             | Shonan EMC Lab. No.5 Semi Anechoic Chamber |
| Date                   | January 17, 2023                           |
| Temperature / Humidity | 24 deg. C / 49 % RH                        |
| Engineer               | Takahiro Kawakami                          |
| Mode                   | Tx, Hopping Off, 3DH5                      |

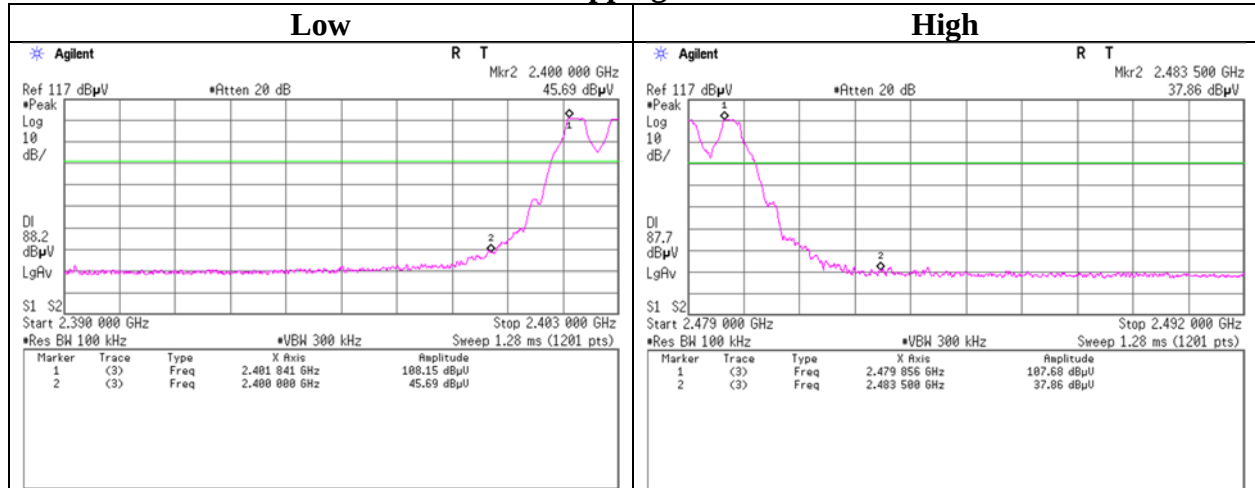
### 2480 MHz



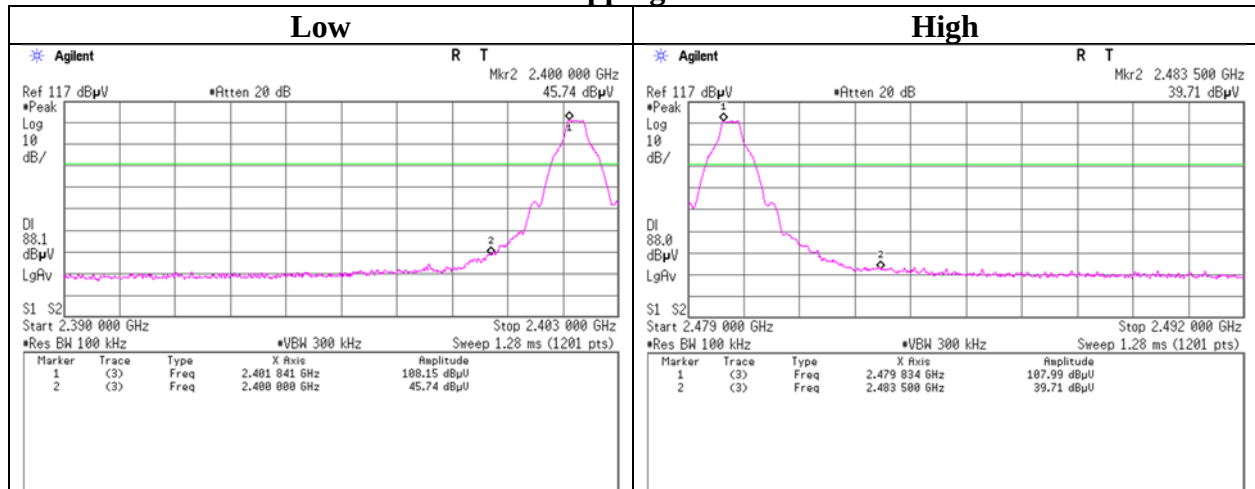
## Conducted Emission Band Edge compliance

Test place Shonan EMC Lab. No.5 Semi Anechoic Chamber  
Date January 17, 2023  
Temperature / Humidity 24 deg. C / 49 % RH  
Engineer Takahiro Kawakami  
Mode Tx DH5

### Hopping On



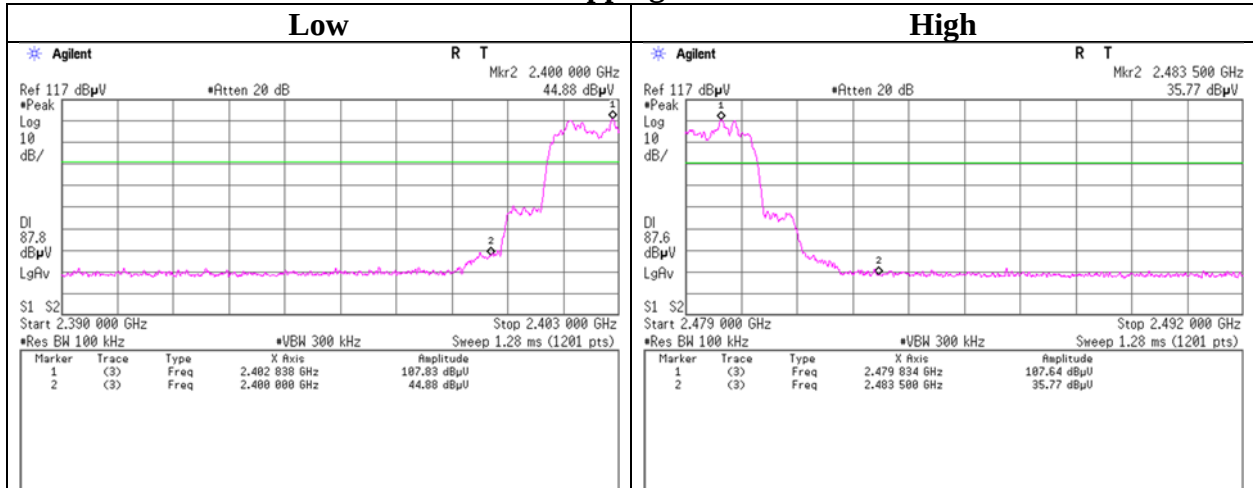
### Hopping Off



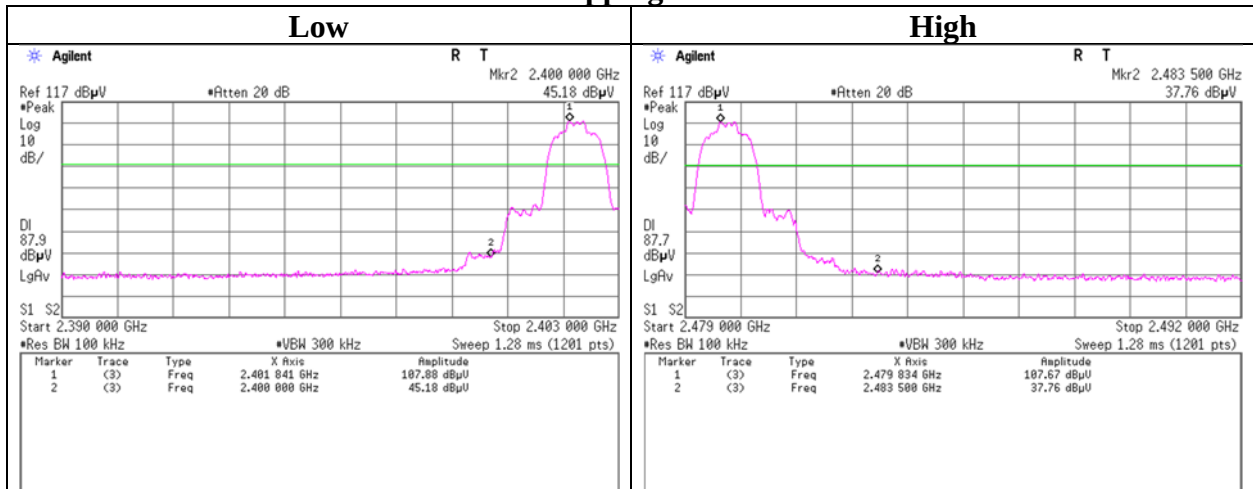
## Conducted Emission Band Edge compliance

Test place                      Shonan EMC Lab. No.5 Semi Anechoic Chamber  
Date                              January 17, 2023  
Temperature / Humidity      24 deg. C / 49 % RH  
Engineer                        Takahiro Kawakami  
Mode                              Tx 3DH5

### Hopping On



### Hopping Off



## APPENDIX 2: Test Instruments

### Test Equipment (1/2)

| Test Item | Local ID                       | LIMS ID | Description               | Manufacturer                                | Model                                | Serial                  | Last Calibration Date | Cal Int |
|-----------|--------------------------------|---------|---------------------------|---------------------------------------------|--------------------------------------|-------------------------|-----------------------|---------|
| AT        | SAT10-22                       | 204926  | Attenuator                | Weinschel Corp.                             | 54A-10                               | 109971                  | 2022/02/21            | 12      |
| AT        | SCC-G64                        | 196945  | Coaxial Cable             | Huber+Suhner                                | SUCOFLEX 102                         | 803414/2                | 2022/03/01            | 12      |
| AT        | SOS-27                         | 191845  | Thermo-Hygro meter        | CUSTOM. Inc                                 | CTH-201                              | -                       | 2022/08/08            | 12      |
| AT        | SPM-13                         | 169910  | Power Meter               | Keysight Technologies Inc                   | 8990B                                | MY51000448              | 2022/11/08            | 12      |
| AT        | SPSS-06                        | 169911  | Power sensor              | Keysight Technologies Inc                   | N1923A                               | MY57270004              | 2022/11/08            | 12      |
| AT        | SRENT-09                       | 150461  | Spectrum Analyzer         | Keysight Technologies Inc                   | E4440A                               | MY46186392              | 2022/03/14            | 12      |
| AT        | STS-05                         | 146212  | Digital Hitester          | HIOKI E.E. CORPORATION                      | 3805-50                              | 80997828                | 2022/09/20            | 12      |
| RE        | COTS-SEMI-5                    | 170932  | EMI Software              | TSJ (Techno Science Japan)                  | TEPTO-DV3(RE,CE,ME,PE)               | -                       | -                     | -       |
| RE        | KJM-02                         | 146432  | Measure                   | TAJIMA                                      | GL19-55                              | -                       | -                     | -       |
| RE        | KSA-08                         | 145089  | Spectrum Analyzer         | Keysight Technologies Inc                   | E4446A                               | MY46180525              | 2022/11/01            | 12      |
| RE        | SAEC-02(NSA)                   | 145563  | Semi-Anechoic Chamber     | TDK                                         | SAEC-02(NSA)                         | 2                       | 2022/03/20            | 12      |
| RE        | SAEC-03(SVSWR)                 | 145566  | Semi-Anechoic Chamber     | TDK                                         | SAEC-03(SVSWR)                       | 3                       | 2022/05/18            | 12      |
| RE        | SAF-02                         | 145004  | Pre Amplifier             | SONOMA                                      | 310N                                 | 290212                  | 2022/02/24            | 12      |
| RE        | SAF-05                         | 145128  | Pre Amplifier             | Toyo Corporation                            | TPA0118-36                           | 1440490                 | 2022/05/12            | 12      |
| RE        | SAF-06                         | 145005  | Pre Amplifier             | Toyo Corporation                            | TPA0118-36                           | 1440491                 | 2022/02/04            | 12      |
| RE        | SAF-08                         | 145007  | Pre Amplifier             | Toyo Corporation                            | HAP18-26W                            | 19                      | 2022/03/03            | 12      |
| RE        | SAT10-05                       | 145136  | Attenuator                | Keysight Technologies Inc                   | 8493C-010                            | 74864                   | 2022/10/20            | 12      |
| RE        | SAT10-06                       | 145137  | Attenuator                | Keysight Technologies Inc                   | 8493C-010                            | 74865                   | 2022/10/20            | 12      |
| RE        | SAT3-11                        | 150921  | Attenuator                | JFW                                         | 50HF-003N                            | -                       | 2022/02/21            | 12      |
| RE        | SAT6-14                        | 167095  | Attenuator                | JFW                                         | 50HF-006N                            | -                       | 2022/02/21            | 12      |
| RE        | SBA-02                         | 145022  | Biconical Antenna         | Schwarzbeck Mess-Elektronik OHG             | BBA9106                              | 91032665                | 2022/04/16            | 12      |
| RE        | SCC-B1/B3/B5/B7/B8/B13/SRSE-02 | 144975  | Coaxial Cable&RF Selector | Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO | 8D2W/12DSFA/141PE/141PE/141PE/NS4906 | -/0901-270(RF Selector) | 2022/04/20            | 12      |
| RE        | SCC-B2/B4/B6/B7/B8/B13/SRSE-02 | 144976  | Coaxial Cable&RF Selector | Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO | 8D2W/12DSFA/141PE/141PE/141PE/NS4906 | -/0901-270(RF Selector) | 2022/04/20            | 12      |

## Test Equipment (2/2)

| Test Item | Local ID | LIMS ID | Description         | Manufacturer                       | Model                | Serial         | Last Calibration Date | Cal Int |
|-----------|----------|---------|---------------------|------------------------------------|----------------------|----------------|-----------------------|---------|
| RE        | SCC-G15  | 145176  | Coaxial Cable       | Suhner                             | SUCOFLEX 102         | 32703/2        | 2022/03/03            | 12      |
| RE        | SCC-G40  | 166491  | Coaxial Cable       | Junkosha                           | MWX221-01000NFSNMS/B | 1612S005       | 2022/01/06            | 12      |
| RE        | SCC-G43  | 156380  | Coaxial Cable       | Huber+Suhner                       | SUCOFLEX_104_E       | SN MY 13406/4E | 2022/05/20            | 12      |
| RE        | SCC-G44  | 168300  | Coaxial Cable       | Huber+Suhner                       | SUCOFLEX 104         | 800375/4A      | 2022/11/10            | 12      |
| RE        | SCC-G50  | 178573  | Coaxial Cable       | Huber+Suhner                       | SUCOFLEX_104_E       | MY13407/4E     | 2022/03/03            | 12      |
| RE        | SCC-G51  | 178572  | Coaxial Cable       | Huber+Suhner                       | SUCOFLEX 104         | 800288 /4A     | 2022/03/03            | 12      |
| RE        | SCC-G57  | 179540  | Coaxial Cable       | Huber+Suhner                       | SUCOFLEX 102         | 802815/2       | 2022/05/12            | 12      |
| RE        | SCC-G69  | 200009  | Coaxial Cable       | Huber+Suhner                       | SUCOFLEX 104         | 575617/4       | 2022/07/21            | 12      |
| RE        | SFL-02   | 145301  | Highpass Filter     | MICRO-TRONICS                      | HPM50111             | 51             | 2022/10/20            | 12      |
| RE        | SFL-18   | 145305  | Highpass Filter     | MICRO-TRONICS                      | HPM50111             | 119            | 2022/03/02            | 12      |
| RE        | SHA-03   | 145501  | Horn Antenna        | Schwarzbeck<br>Mess-Elektronik OHG | BBHA9120D            | 9120D-739      | 2022/03/16            | 12      |
| RE        | SHA-04   | 145512  | Horn Antenna        | ETS-Lindgren                       | 3160-09              | 00094868       | 2022/06/06            | 12      |
| RE        | SHA-09   | 194684  | Horn Antenna        | Schwarzbeck<br>Mess-Elektronik OHG | BBHA 9120 C          | 695            | 2022/03/10            | 12      |
| RE        | SJM-20   | 207277  | Measuring           | ASKUL                              | -                    | -              | -                     | -       |
| RE        | SLA-06   | 145528  | Logperiodic Antenna | Schwarzbeck<br>Mess-Elektronik OHG | VUSLP9111B           | 195            | 2022/04/16            | 12      |
| RE        | SOS-21   | 191838  | Thermo-Hygrometer   | CUSTOM. Inc                        | CTH-201              | -              | 2022/08/08            | 12      |
| RE        | SOS-23   | 191840  | Thermo-Hygrometer   | CUSTOM. Inc                        | CTH-201              | -              | 2022/08/08            | 12      |
| RE        | SSA-03   | 145801  | Spectrum Analyzer   | Keysight Technologies Inc          | E4448A               | MY48250152     | 2022/08/04            | 12      |
| RE        | STR-07   | 146209  | Test Receiver       | Rohde & Schwarz                    | ESU26                | 100484         | 2022/09/14            | 12      |
| RE        | STR-08   | 150463  | Test Receiver       | Rohde & Schwarz                    | ESW44                | 101581         | 2022/03/02            | 12      |
| RE        | STS-02   | 145793  | Digital Hitester    | HIOKI E.E.<br>CORPORATION          | 3805-50              | 80997819       | 2022/04/07            | 12      |
| RE        | STS-03   | 146210  | Digital Hitester    | HIOKI E.E.<br>CORPORATION          | 3805-50              | 80997823       | 2022/09/20            | 12      |

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

The expiration date of the calibration is the end of the expired month.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

Test item: RE: Radiated Emission  
AT: Antenna Terminal Conducted