

# RADIO TEST REPORT

## Test Report No. 15474876H-A-R3

|                     |                                     |
|---------------------|-------------------------------------|
| Customer            | DENSO CORPORATION                   |
| Description of EUT  | Cockpit Control Unit                |
| Model Number of EUT | DNNS125                             |
| FCC ID              | HYQDNNS125                          |
| Test Regulation     | FCC Part 15 Subpart C               |
| Test Result         | Complied                            |
| Issue Date          | December 11, 2024                   |
| Remarks             | Wireless LAN (2.4 GHz band) part(s) |

### Representative Test Engineer



Nachi Konegawa  
Engineer

### Approved By



Ryota Yamanaka  
Engineer



CERTIFICATE 5107.02

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

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## **REVISION HISTORY**

### **Original Test Report No.: 15474876H-A**

This report is a revised version of 15474876H-A-R2. 15474876H-A-R2 is replaced with this report.

| Revision        | Test Report No. | Date                 | Page Revised Contents                                                                                                                                  |
|-----------------|-----------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| -<br>(Original) | 15474876H-A     | September 6,<br>2024 | -                                                                                                                                                      |
| 1               | 15474876H-A-R1  | October 25, 2024     | P.6 and correspondence page<br>Correction of Antenna gain for 2.4 GHz band:<br>WLAN: from 1.10 dBi to 1.78 dBi<br>Bluetooth: from 1.10 dBi to 1.83 dBi |
| 1               | 15474876H-A-R1  | October 25, 2024     | P.10<br>Correction of Worst rate for 11n-20 from MCS 6<br>to MCS 14                                                                                    |
| 1               | 15474876H-A-R1  | October 25, 2024     | P.26<br>Deletion of Rate check data for 11n-20 (MIMO)<br>MCS 0 to 7                                                                                    |
| 1               | 15474876H-A-R1  | October 25, 2024     | P.28<br>Correction of Duty factor for 11g, and<br>recalculation the Result                                                                             |
| 1               | 15474876H-A-R1  | October 25, 2024     | P.41, 44<br>Correction of duty factor, and re calculation the<br>results.                                                                              |
| 1               | 15474876H-A-R1  | October 25, 2024     | P.30<br>Correction of Duty factor calculation for<br>11g 6 Mbps                                                                                        |
| 1               | 15474876H-A-R1  | October 25, 2024     | P.36<br>Addition of 20dBc data sheet                                                                                                                   |
| 2               | 15474876H-A-R2  | December 5,<br>2024  | P.5, 24, 25, 26<br>Retest of Rate Check, addition of test date and<br>test instruments                                                                 |
| 3               | 15474876H-A-R3  | December 11,<br>2024 | P.24<br>Addition of notes for Rate check                                                                                                               |

## 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>7</b>    |
| <b>SECTION 4: Operation of EUT during testing .....</b>              | <b>10</b>   |
| <b>SECTION 5: Radiated Spurious Emission.....</b>                    | <b>15</b>   |
| <b>SECTION 6: Antenna Terminal Conducted Tests .....</b>             | <b>18</b>   |
| <b>APPENDIX 1: Test Data .....</b>                                   | <b>19</b>   |
| 99 % Occupied Bandwidth and 6 dB Bandwidth.....                      | 19          |
| Maximum Peak Output Power .....                                      | 24          |
| Average Output Power.....                                            | 27          |
| Radiated Spurious Emission.....                                      | 31          |
| Conducted Spurious Emission.....                                     | 47          |
| Power Density .....                                                  | 48          |
| <b>APPENDIX 2: Test Instruments .....</b>                            | <b>52</b>   |
| <b>APPENDIX 3: Photographs of Test Setup .....</b>                   | <b>54</b>   |
| Radiated Spurious Emission.....                                      | 54          |
| Antenna Terminal Conducted Tests .....                               | 55          |

## **SECTION 1: Customer Information**

|                  |                                                      |
|------------------|------------------------------------------------------|
| Company Name     | DENSO CORPORATION                                    |
| Address          | 1-1 Showa-cho, Kariya-shi, Aichi ken, 448-8661 Japan |
| Telephone Number | +81-70-2236-5904                                     |
| Contact Person   | Naoto Makino                                         |

The information provided by 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

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

### **2.1 Identification of EUT**

|               |                                                                                           |
|---------------|-------------------------------------------------------------------------------------------|
| Description   | Cockpit Control Unit                                                                      |
| Model Number  | DNNS125                                                                                   |
| Serial Number | Refer to SECTION 4.2                                                                      |
| Condition     | Production prototype<br>(Not for Sale: This sample is equivalent to mass-produced items.) |
| Modification  | No Modification by the test lab                                                           |
| Receipt Date  | May 31, 2024                                                                              |
| Test Date     | June 4 to December 4, 2024                                                                |

### **2.2 Product Description**

#### **General Specification**

|                       |                         |
|-----------------------|-------------------------|
| Rating                | DC 13.2 V               |
| Operating temperature | -30 deg. C to 65 deg. C |

## Radio Specification

This report contains data provided by the customer which can impact the validity of results. UL Japan, Inc. is only responsible for the validity of results after the integration of the data provided by the customer. The data provided by the customer is marked "a)" in the table below.

### WLAN (IEEE802.11b/11g/11n-20)

|                            |                       |                      |
|----------------------------|-----------------------|----------------------|
| Equipment Type             | Transceiver           |                      |
| Frequency of Operation     | 2412 MHz to 2462 MHz  |                      |
| Type of Modulation         | DSSS, OFDM            |                      |
| Antenna Gain <sup>a)</sup> | Main Antenna: Chain 0 | Sub Antenna: Chain 1 |
|                            | 1.78 dBi              | 1.78 dBi             |

### 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 Type               | External Antenna                   |  |
| Antenna Gain <sup>a)</sup> | 1.83 dBi                           |  |

### WLAN (IEEE802.11a/11n-20/11ac-20/11n-40/11ac-40/11ac-80)

|                            |                                 |                                              |
|----------------------------|---------------------------------|----------------------------------------------|
| Equipment Type             | Transceiver                     |                                              |
| Frequency of Operation     | 20 MHz Band                     | 5180 MHz to 5240 MHz<br>5745 MHz to 5825 MHz |
|                            | 40 MHz Band                     | 5190 MHz to 5230 MHz<br>5755 MHz to 5795 MHz |
|                            | 80 MHz Band                     | 5210 MHz<br>5775 MHz                         |
| Type of Modulation         | OFDM                            |                                              |
| Antenna Gain <sup>a)</sup> | Main Antenna: Chain 0           | Sub Antenna: Chain 1                         |
|                            | 0.30 dBi (5180 MHz to 5240 MHz) | 0.30 dBi (5180 MHz to 5240 MHz)              |
|                            | 0.99 dBi (5745 MHz to 5825 MHz) | 0.99 dBi (5745 MHz to 5825 MHz)              |

### AM/FM (incl. RDS)

|                        |                     |  |
|------------------------|---------------------|--|
| Equipment Type         | Receiver            |  |
| Frequency of Operation | 522 kHz to 1710 kHz |  |
|                        | 87 MHz to 108 MHz   |  |

FM tuner specification Intermediate frequency: 220 kHz

## 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 |

### 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      | *1)                                                         |
| 6dB Bandwidth                           | FCC: KDB 558074 D01<br>15.247<br>Meas Guidance v05r02<br>ISED: -            | FCC: Section 15.247(a)(2)<br>ISED: RSS-247 5.2(a)                          | See data.                             | Complied | Conducted                                                   |
| Maximum Peak Output Power               | FCC: KDB 558074 D01<br>15.247<br>Meas Guidance v05r02<br>ISED: RSS-Gen 6.12 | FCC: Section 15.247(b)(3)<br>ISED: RSS-247 5.4(d)                          |                                       | Complied | Conducted                                                   |
| Power Density                           | FCC: KDB 558074 D01<br>15.247<br>Meas Guidance v05r02<br>ISED: -            | FCC: Section 15.247(e)<br>ISED: RSS-247 5.2(b)                             |                                       | Complied | Conducted                                                   |
| Spurious Emission Restricted Band Edges | FCC: KDB 558074 D01<br>15.247<br>Meas Guidance v05r02<br>ISED: RSS-Gen 6.13 | FCC: Section 15.247(d)<br>ISED: RSS-247 5.5<br>RSS-Gen 8.9<br>RSS-Gen 8.10 | 0.9 dB<br>3509.1 MHz,<br>AV, Vertical | Complied | Conducted (below 30 MHz)/<br>Radiated (above 30 MHz)<br>*2) |

Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003593.

\* In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred.

\*1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.

\*2) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 15.247 Meas Guidance v05r02 8.5 and 8.6.

#### **FCC Part 15.31 (e)**

This EUT provides stable voltage constantly to the wireless transmitter regardless of input voltage. Instead of a new battery, DC power supply was used for the test. 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 vehicle. 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          | -       | Conducted |

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  $k = 2$ .

#### Radiated emission

| Measurement distance | Frequency range     |            | Unit | Calculated Uncertainty (+/-) |
|----------------------|---------------------|------------|------|------------------------------|
| 3 m                  | 9 kHz to 30 MHz     |            | dB   | 3.3                          |
| 10 m                 |                     |            | dB   | 3.1                          |
| 3 m                  | 30 MHz to 200 MHz   | Horizontal | dB   | 4.7                          |
|                      |                     | Vertical   | dB   | 4.7                          |
|                      | 200 MHz to 1000 MHz | Horizontal | dB   | 4.8                          |
|                      |                     | Vertical   | dB   | 6.0                          |
| 10 m                 | 30 MHz to 200 MHz   | Horizontal | dB   | 5.2                          |
|                      |                     | Vertical   | dB   | 5.1                          |
|                      | 200 MHz to 1000 MHz | Horizontal | dB   | 5.2                          |
|                      |                     | Vertical   | dB   | 5.2                          |
| 3 m                  | 1 GHz to 6 GHz      |            | dB   | 5.0                          |
|                      | 6 GHz to 18 GHz     |            | dB   | 5.2                          |
| 1 m                  | 10 GHz to 18 GHz    |            | dB   | 5.3                          |
|                      | 18 GHz to 26.5 GHz  |            | dB   | 5.2                          |
|                      | 26.5 GHz to 40 GHz  |            | dB   | 4.7                          |
| 0.5 m                | 26.5 GHz to 40 GHz  |            | dB   | 4.8                          |

#### Antenna Terminal Conducted

| Item                                                                | Unit   | Calculated Uncertainty (+/-) |
|---------------------------------------------------------------------|--------|------------------------------|
| Antenna terminated conducted emission / Power density / Burst power | dB     | 3.47                         |
| Adjacent channel power (ACP)                                        | dB     | 2.28                         |
| Bandwidth (OBW)                                                     | %      | 0.96                         |
| Time readout (time span upto 100 msec)                              | %      | 0.11                         |
| Time readout (time span upto 1000 msec)                             | %      | 0.11                         |
| Time readout (time span upto 60 sec)                                | %      | 0.02                         |
| Power measurement (Power meter < 8 GHz)                             | dB     | 1.46                         |
| Power measurement (Call box < 6 GHz)                                | dB     | 1.69                         |
| Frequency readout (Frequency counter)                               | ppm    | 0.67                         |
| Frequency readout (Spectrum analyzer frequency readout function)    | ppm    | 2.13                         |
| Temperature (constant temperature bath)                             | deg. C | 0.69                         |
| Humidity (constant temperature bath)                                | %RH    | 2.98                         |
| Modulation characteristics                                          | %      | 6.93                         |
| Frequency for mobile                                                | ppm    | 0.08                         |
| Contention-based protocol                                           | dB     | 2.26                         |

### 3.5 Test Location

UL Japan, Inc. Ise EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 Japan

Telephone: +81-596-24-8999

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

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

| Test site                  | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Other rooms            | Maximum measurement distance |
|----------------------------|----------------------------|------------------------------------------------------------------|------------------------|------------------------------|
| No.1 semi-anechoic chamber | 19.2 x 11.2 x 7.7          | 7.0 x 6.0                                                        | No.1 Power source room | 10 m                         |
| No.2 semi-anechoic chamber | 7.5 x 5.8 x 5.2            | 4.0 x 4.0                                                        | -                      | 3 m                          |
| No.3 semi-anechoic chamber | 12.0 x 8.5 x 5.9           | 6.8 x 5.75                                                       | No.3 Preparation room  | 3 m                          |
| No.3 shielded room         | 4.0 x 6.0 x 2.7            | N/A                                                              | -                      | -                            |
| No.4 semi-anechoic chamber | 12.0 x 8.5 x 5.9           | 6.8 x 5.75                                                       | No.4 Preparation room  | 3 m                          |
| No.4 shielded room         | 4.0 x 6.0 x 2.7            | N/A                                                              | -                      | -                            |
| No.5 semi-anechoic chamber | 6.0 x 6.0 x 3.9            | 6.0 x 6.0                                                        | -                      | -                            |
| No.5 measurement room      | 6.4 x 6.4 x 3.0            | 6.4 x 6.4                                                        | -                      | -                            |
| No.6 shielded room         | 4.0 x 4.5 x 2.7            | 4.0 x 4.5                                                        | -                      | -                            |
| No.6 measurement room      | 4.75 x 5.4 x 3.0           | 4.75 x 4.15                                                      | -                      | -                            |
| No.7 shielded room         | 4.7 x 7.5 x 2.7            | 4.7 x 7.5                                                        | -                      | -                            |
| No.8 measurement room      | 3.1 x 5.0 x 2.7            | 3.1 x 5.0                                                        | -                      | -                            |
| No.9 measurement room      | 8.8 x 4.6 x 2.8            | 2.4 x 2.4                                                        | -                      | -                            |
| No.10 shielded room        | 3.8 x 2.8 x 2.8            | 3.8 x 2.8                                                        | -                      | -                            |
| No.11 measurement room     | 4.0 x 3.4 x 2.5            | N/A                                                              | -                      | -                            |
| No.12 measurement room     | 2.6 x 3.4 x 2.5            | N/A                                                              | -                      | -                            |
| Large Chamber              | 16.9 x 22.1 x 10.17        | 16.9 x 22.1                                                      | -                      | 10 m                         |
| Small Chamber              | 5.3 x 6.69 x 3.59          | 5.3 x 6.69                                                       | -                      | -                            |

### 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)

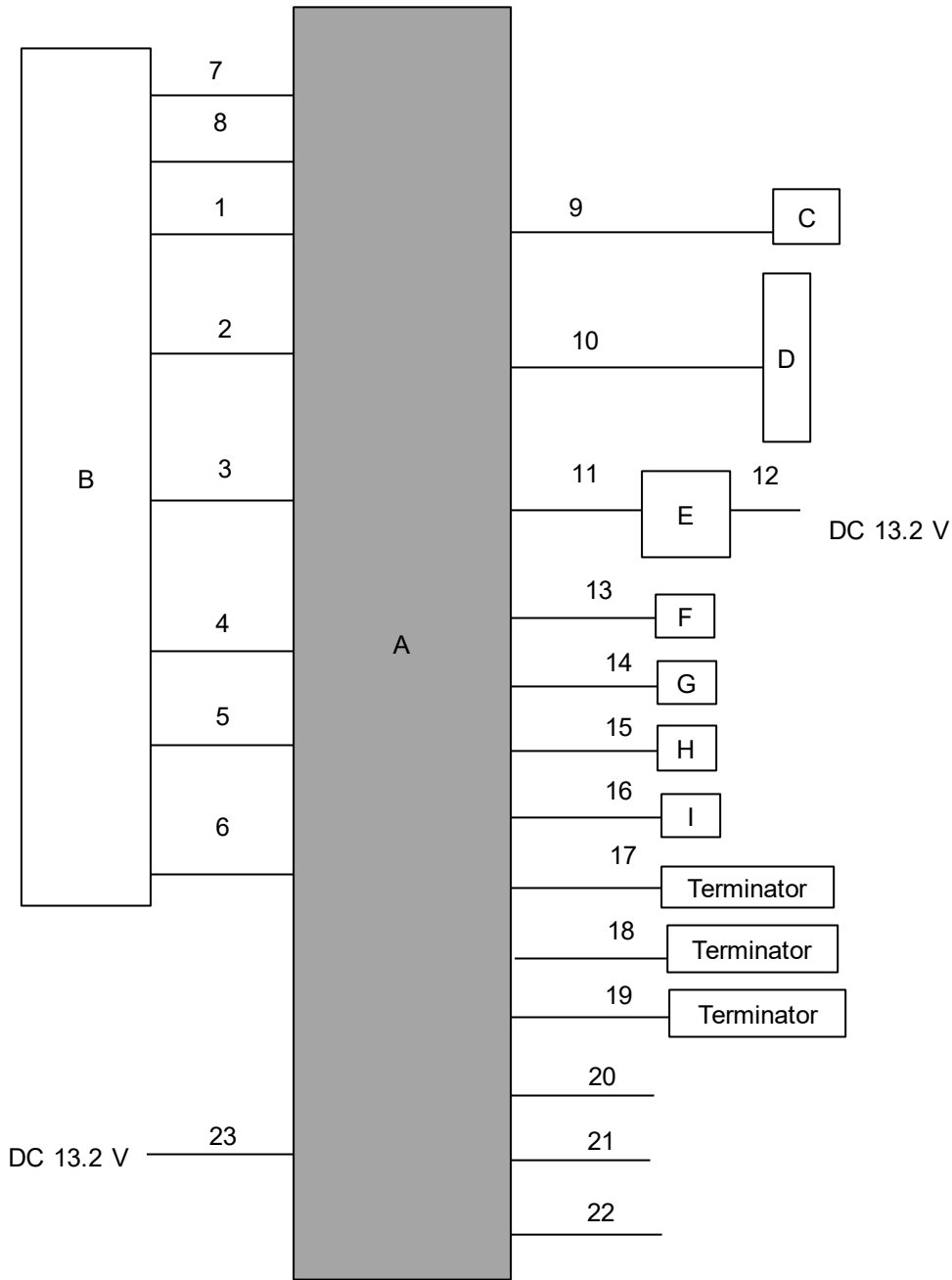
| Mode                                                                                                                                                                                                                                                                                                                                                                                                        | Remarks*     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| IEEE 802.11b (11b)                                                                                                                                                                                                                                                                                                                                                                                          | 2 Mbps, PN9  |
| IEEE 802.11g (11g)                                                                                                                                                                                                                                                                                                                                                                                          | 54 Mbps, PN9 |
| IEEE 802.11n MIMO 20 MHz BW (11n-20)                                                                                                                                                                                                                                                                                                                                                                        | MCS 14, PN9  |
| *The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel)                                                                                                                                                                                                                                                                                                     |              |
| *Power of the EUT was set by the software as follows;<br>Power Setting: 11b: 14 dBm<br>11g, 11n-20: 11 dBm<br>Software: MSoc Version: F67WHM010-708<br>(Date: November 12, 2020, Storage location: EUT memory)                                                                                                                                                                                              |              |
| *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.<br>Test operating mode was determined as follows according to "Section 1 of 6 802.11 a/b/g/n testing - Managing Complex Regulatory Approvals - " of TCB Council Workshop October 2009. |              |

\*The Details of Operating Mode(s)

| Test Item                                                                                                                             | Operating Mode   | Tested Antenna | Tested Frequency                 |
|---------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------|----------------------------------|
| Radiated Spurious Emission (Below 1 GHz)<br>Conducted Spurious Emission                                                               | Tx 11n-20 *1)    | 0              | 2462 MHz                         |
| Radiated Spurious Emission (Above 1 GHz),<br>6dB Bandwidth,<br>Maximum Peak Output Power,<br>Power Density,<br>99% Occupied Bandwidth | Tx 11b<br>Tx 11g | 0              | 2412 MHz<br>2437 MHz<br>2462 MHz |
|                                                                                                                                       | Tx 11n-20        | 0, 1           | 2412 MHz<br>2437 MHz<br>2462 MHz |
| *1) The mode was tested as a representative, because it had the highest power at antenna terminal test.                               |                  |                |                                  |

4.2 Configuration and Peripherals

For Radiated Emission



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

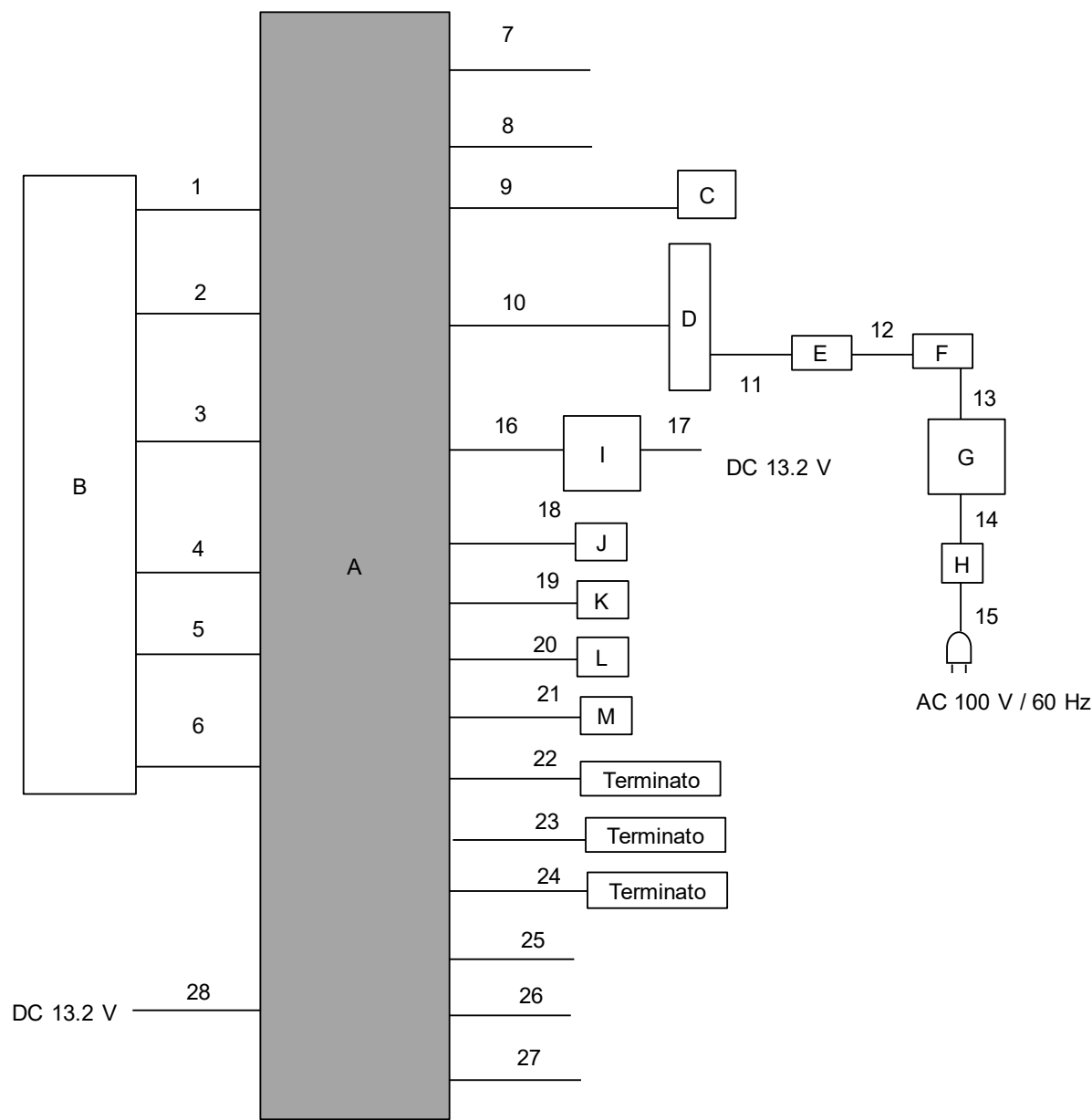
#### Description of EUT and Support Equipment

| No. | Item                 | Model number        | Serial Number                | Manufacturer         | Remarks |
|-----|----------------------|---------------------|------------------------------|----------------------|---------|
| A   | Cockpit Control Unit | DNNS125             | 0468726400500243000<br>00000 | DENSO<br>CORPORATION | EUT     |
| B   | Display (CID)        | DNNS132-2           | 86412FN450                   | DENSO<br>CORPORATION | -       |
| C   | Mic                  | -                   | -                            | Panasonic            | -       |
| D   | USB BOX              | 86257AN00A          | No.7                         | SUBARU               | -       |
| E   | Meter                | TN257550-6773       | 85002AN02A                   | DENSO<br>CORPORATION | -       |
| F   | Speaker              | SPEAKER ASSY<br>4FD | -                            | FOSTER               | -       |
| G   | Speaker              | SPEAKER ASSY<br>4FD | -                            | FOSTER               | -       |
| H   | Speaker              | SPEAKER ASSY<br>4RD | -                            | FOSTER               | -       |
| I   | Speaker              | SPEAKER ASSY<br>4RD | -                            | FOSTER               | -       |

#### List of Cables Used

| No. | Name          | Length (m) | Shield     |            | Remarks |
|-----|---------------|------------|------------|------------|---------|
|     |               |            | Cable      | Connector  |         |
| 1   | DC Cable      | 0.2        | Unshielded | Unshielded | -       |
| 2   | Signal Cable  | 0.2        | Unshielded | Unshielded | -       |
| 3   | GND Cable     | 0.2        | Unshielded | Unshielded | -       |
| 4   | GND Cable     | 0.2        | Unshielded | Unshielded | -       |
| 5   | GND Cable     | 0.2        | Unshielded | Unshielded | -       |
| 6   | GND Cable     | 0.2        | Unshielded | Unshielded | -       |
| 7   | RF Cable      | 0.1        | Shielded   | Shielded   | -       |
| 8   | RF Cable      | 0.1        | Shielded   | Shielded   | -       |
| 9   | Mic Cable     | 1.0        | Unshielded | Unshielded | -       |
| 10  | Signal Cable  | 0.5        | Unshielded | Unshielded | -       |
| 11  | Signal Cable  | 1.0        | Unshielded | Unshielded | -       |
| 12  | DC Cable      | 2.5        | Unshielded | Unshielded | -       |
| 13  | Speaker Cable | 2.0        | Unshielded | Unshielded | -       |
| 14  | Speaker Cable | 2.0        | Unshielded | Unshielded | -       |
| 15  | Speaker Cable | 2.0        | Unshielded | Unshielded | -       |
| 16  | Speaker Cable | 2.0        | Unshielded | Unshielded | -       |
| 17  | Antenna Cable | 1.5        | Shielded   | Shielded   | -       |
| 18  | Antenna Cable | 1.5        | Shielded   | Shielded   | -       |
| 19  | Antenna Cable | 1.0        | Shielded   | Shielded   | -       |
| 20  | Signal Cable  | 1.0        | Unshielded | Unshielded | -       |
| 21  | Signal Cable  | 1.0        | Unshielded | Unshielded | -       |
| 22  | Signal Cable  | 1.0        | Unshielded | Unshielded | -       |
| 23  | DC Cable      | 2.5        | Unshielded | Unshielded | -       |

For Antenna Terminal Conducted test



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

#### Description of EUT and Support Equipment

| No. | Item                 | Model number        | Serial Number                | Manufacturer         | Remarks |
|-----|----------------------|---------------------|------------------------------|----------------------|---------|
| A   | Cockpit Control Unit | DNNS125             | 046872640050024330<br>100091 | DENSO<br>CORPORATION | EUT     |
| B   | Display (CID)        | DNNS132-2           | 86412FN450                   | DENSO<br>CORPORATION | -       |
| C   | Mic                  | -                   | -                            | Panasonic            | -       |
| D   | USB BOX              | 86257AN00A          | No.7                         | SUBARU               | -       |
| E   | USB-LAN Adapter      | LUA3-U2-ATX         | 26495680506450               | BUFFALO INC.         | -       |
| F   | USB-LAN Adapter      | LUA3-U2-ATX         | 26495680506351               | BUFFALO INC.         | -       |
| G   | Laptop PC            | PR63PBAA337AD7X     | 6F053983H                    | TOSHIBA              | -       |
| H   | AC Adapter           | PA51770-1ACA        | G71C000GZ120                 | TOSHIBA              | -       |
| I   | Meter                | TN257550-6773       | 85002AN02A                   | DENSO<br>CORPORATION | -       |
| J   | Speaker              | SPEAKER ASSY 4FD    | -                            | FOSTER               | -       |
| K   | Speaker              | SPEAKER ASSY 4FD    | -                            | FOSTER               | -       |
| L   | Speaker              | SPEAKER ASSY<br>4RD | -                            | FOSTER               | -       |
| M   | Speaker              | SPEAKER ASSY<br>4RD | -                            | FOSTER               | -       |

#### List of Cables Used

| No. | Name          | Length (m) | Shield     |            | Remarks |
|-----|---------------|------------|------------|------------|---------|
|     |               |            | Cable      | Connector  |         |
| 1   | DC Cable      | 0.2        | Unshielded | Unshielded | -       |
| 2   | Signal Cable  | 0.2        | Unshielded | Unshielded | -       |
| 3   | GND Cable     | 0.2        | Unshielded | Unshielded | -       |
| 4   | GND Cable     | 0.2        | Unshielded | Unshielded | -       |
| 5   | GND Cable     | 0.2        | Unshielded | Unshielded | -       |
| 6   | GND Cable     | 0.2        | Unshielded | Unshielded | -       |
| 7   | RF Cable      | 0.1        | Shielded   | Shielded   | -       |
| 8   | RF Cable      | 0.1        | Shielded   | Shielded   | -       |
| 9   | Mic Cable     | 1.0        | Unshielded | Unshielded | -       |
| 10  | Signal Cable  | 0.5        | Unshielded | Unshielded | -       |
| 11  | USB Cable     | 0.2        | Shielded   | Shielded   | -       |
| 12  | LAN Cable     | 1.5        | Unshielded | Unshielded | -       |
| 13  | USB Cable     | 0.2        | Shielded   | Shielded   | -       |
| 14  | DC Cable      | 1.3        | Unshielded | Unshielded | -       |
| 15  | AC Cable      | 0.8        | Unshielded | Unshielded | -       |
| 16  | Signal Cable  | 1.0        | Unshielded | Unshielded | -       |
| 17  | DC Cable      | 2.5        | Unshielded | Unshielded | -       |
| 18  | Speaker Cable | 2.0        | Unshielded | Unshielded | -       |
| 19  | Speaker Cable | 2.0        | Unshielded | Unshielded | -       |
| 20  | Speaker Cable | 2.0        | Unshielded | Unshielded | -       |
| 21  | Speaker Cable | 2.0        | Unshielded | Unshielded | -       |
| 22  | Antenna Cable | 1.5        | Shielded   | Shielded   | -       |
| 23  | Antenna Cable | 1.5        | Shielded   | Shielded   | -       |
| 24  | Antenna Cable | 1.0        | Shielded   | Shielded   | -       |
| 25  | Signal Cable  | 1.0        | Unshielded | Unshielded | -       |
| 26  | Signal Cable  | 1.0        | Unshielded | Unshielded | -       |
| 27  | Signal Cable  | 1.0        | Unshielded | Unshielded | -       |
| 28  | DC Cable      | 2.5        | Unshielded | Unshielded | -       |

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

### **Test Procedure**

It was measured based on "8.5 and 8.6 of KDB 558074 D01 15.247 Meas Guidance v05r02".

[For below 1 GHz]

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

[For above 1 GHz]

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

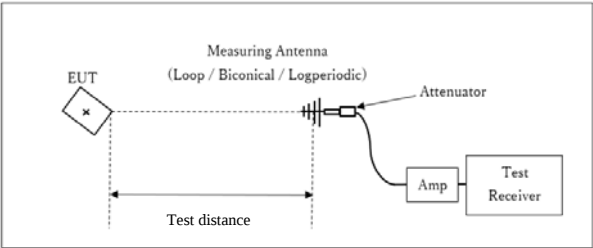
In any 100 kHz bandwidth outside the restricted band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired 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        |                                                                                                                                                                                                                                             | Spectrum Analyzer            |
| Detector        | QP            | PK                       | AV                                                                                                                                                                                                                                          | PK                           |
| IF Bandwidth    | BW 120 kHz    | RBW: 1 MHz<br>VBW: 3 MHz | <u>11.12.2.5.1</u><br>RBW: 1 MHz<br>VBW: 3 MHz<br>Detector:<br>Power Averaging (RMS)<br>Trace: 100 traces<br><u>11.12.2.5.2</u><br>The duty cycle was less than 98% for detected noise, a duty factor was added to the 11.12.2.5.1 results. | RBW: 100 kHz<br>VBW: 300 kHz |

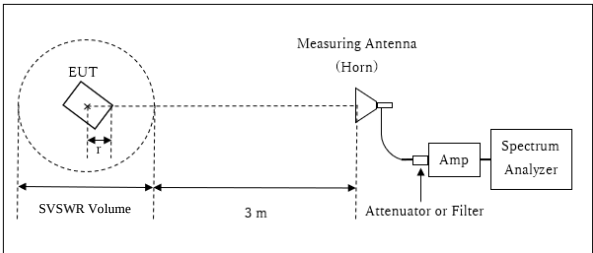
Figure 1: Test Setup

Below 1 GHz



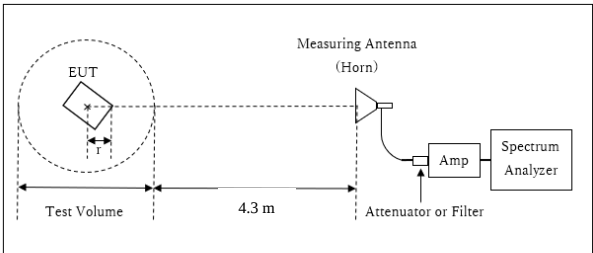
Test Distance: 3 m

1 GHz to 6 GHz



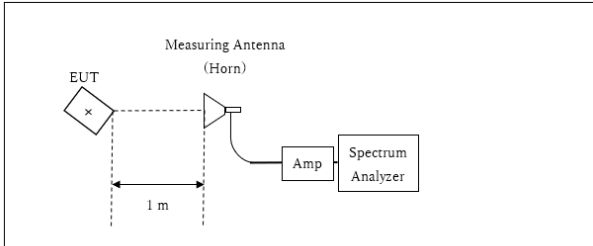
[1 GHz to 6 GHz]  
Distance Factor:  $20 \times \log (3.8 \text{ m} / 3.0 \text{ m}) = 2.06 \text{ dB}$   
\* Test Distance:  $(3 + \text{SVSWR Volume} / 2) - r = 3.8 \text{ m}$   
  
SVSWR Volume : 2.0 m  
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)  
 $r = 0.2 \text{ m}$

6 GHz to 10 GHz



Distance Factor:  $20 \times \log (4.8 \text{ m} / 3.0 \text{ m}) = 4.09 \text{ dB}$   
\* Test Distance:  $(4.3 + \text{SVSWR Volume} / 2) - r = 4.8 \text{ m}$   
  
SVSWR Volume : 1.4 m  
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)  
 $r = 0.2 \text{ m}$

10 GHz to 26.5 GHz



Distance Factor:  $20 \times \log (1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$   
\*Test Distance: 1 m

The test was made on EUT at the normal use position.

Test results are rounded off and limit are rounded down, 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.

| Test                                | Span                                    | RBW              | VBW                | Sweep time | Detector             | Trace    | Instrument Used                    |
|-------------------------------------|-----------------------------------------|------------------|--------------------|------------|----------------------|----------|------------------------------------|
| 6dB Bandwidth                       | 20 MHz                                  | 100 kHz          | 300 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/<br>Average *2) | -        | Power Meter<br>(Sensor: 50 MHz BW) |
| Peak Power Density                  | 1.5 times the 6dB Bandwidth             | 3 kHz            | 10 kHz             | Auto       | Peak                 | Max Hold | Spectrum Analyzer *3)              |
| Conducted Spurious Emission *4) *5) | 9 kHz to 150 kHz<br>150 kHz to 30 MHz   | 200 Hz<br>10 kHz | 620 Hz<br>30 kHz   | Auto       | Peak                 | Max Hold | Spectrum Analyzer                  |

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

\*2) Reference data

\*3) Section 11.10.2 Method PKPSD (peak PSD) of "ANSI C63.10-2013".

\*4) 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.

(9 kHz - 150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 10 kHz)

\*5) 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.

Test results are rounded off and limit are rounded down, 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

### 99 % Occupied Bandwidth and 6 dB Bandwidth

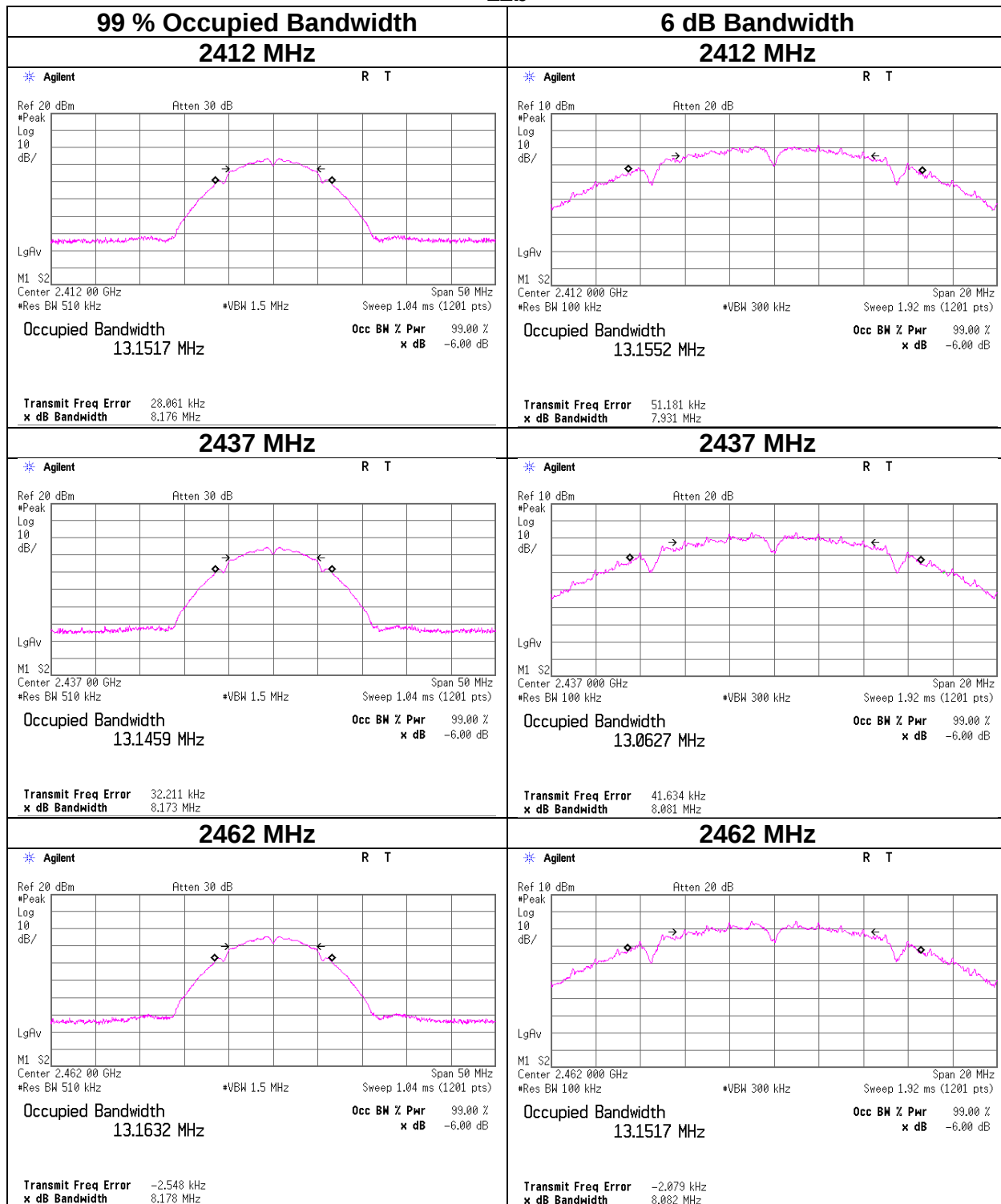
Test place                      Ise EMC Lab. No.4 Measurement Room  
Date                              June 6, 2024  
Temperature / Humidity      22 deg. C / 60 % RH  
Engineer                        Hiroki Numata  
Mode                              Tx

| Mode | Frequency<br>[MHz] | 99% Occupied<br>Bandwidth<br>[kHz] | 6dB Bandwidth<br>[MHz] | Limit for<br>6dB Bandwidth<br>[MHz] |
|------|--------------------|------------------------------------|------------------------|-------------------------------------|
| 11b  | 2412               | 13151.7                            | 7.931                  | > 0.5000                            |
|      | 2437               | 13145.9                            | 8.081                  | > 0.5000                            |
|      | 2462               | <b>13163.2</b>                     | 8.082                  | > 0.5000                            |
| 11g  | 2412               | 17057.9                            | 16.494                 | > 0.5000                            |
|      | 2437               | <b>17135.8</b>                     | 16.495                 | > 0.5000                            |
|      | 2462               | 17104.8                            | 16.503                 | > 0.5000                            |

| Mode   | Antenna | Frequency<br>[MHz] | 99 % Occupied<br>Bandwidth<br>[kHz] | 6 dB Bandwidth<br>[MHz] | Limit for<br>6 dB Bandwidth<br>[kHz] |
|--------|---------|--------------------|-------------------------------------|-------------------------|--------------------------------------|
| 11n-20 | 0       | 2412               | 18186.3                             | 17.701                  | > 500                                |
|        |         | 2437               | 18169.1                             | 17.701                  | > 500                                |
|        |         | 2462               | <b>18192.9</b>                      | 17.704                  | > 500                                |
|        | 1       | 2412               | 18133.3                             | 17.678                  | > 500                                |
|        |         | 2437               | 18183.8                             | 17.673                  | > 500                                |
|        |         | 2462               | 18124.8                             | 17.685                  | > 500                                |

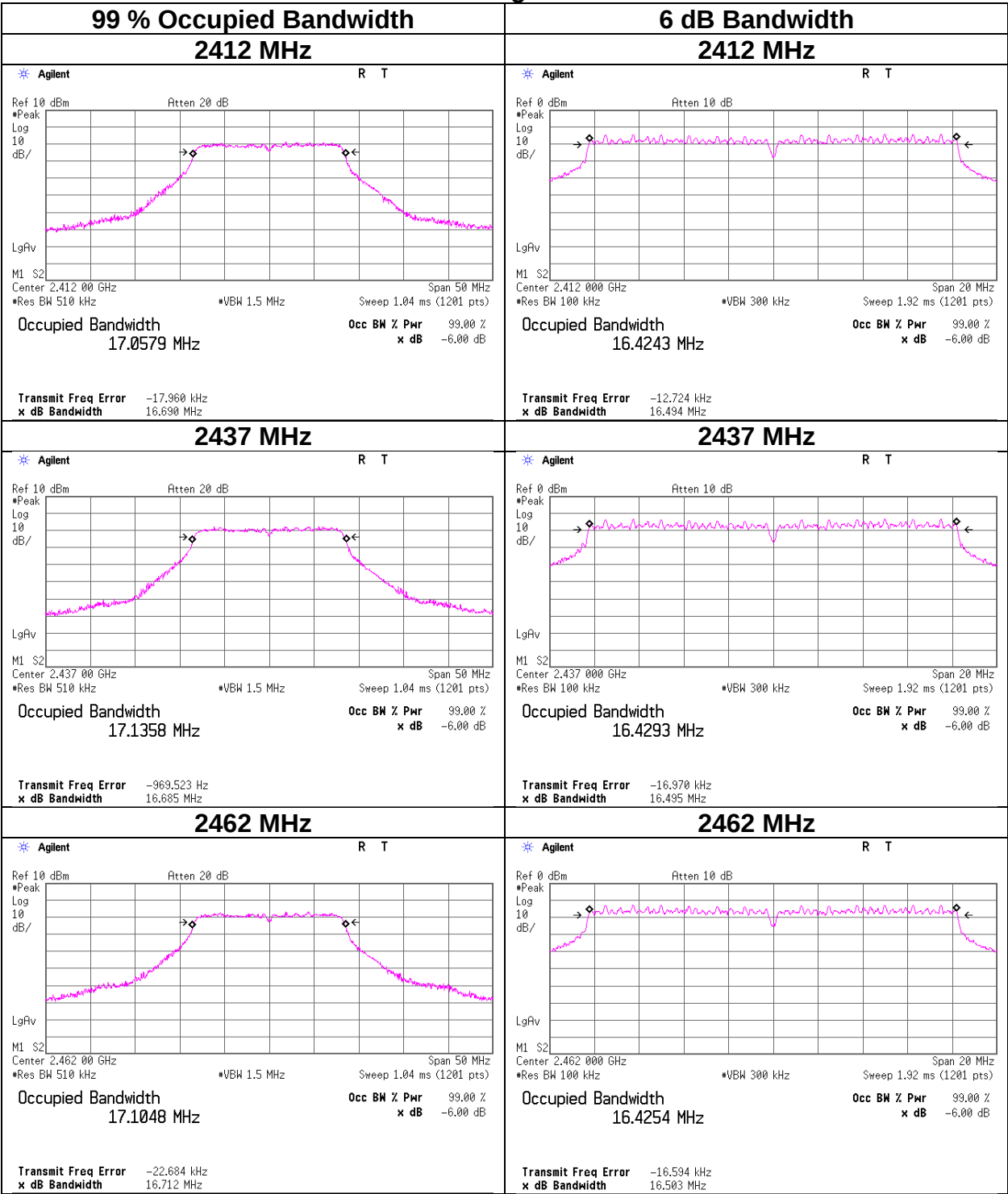
## 99 % Occupied Bandwidth and 6 dB Bandwidth

11b



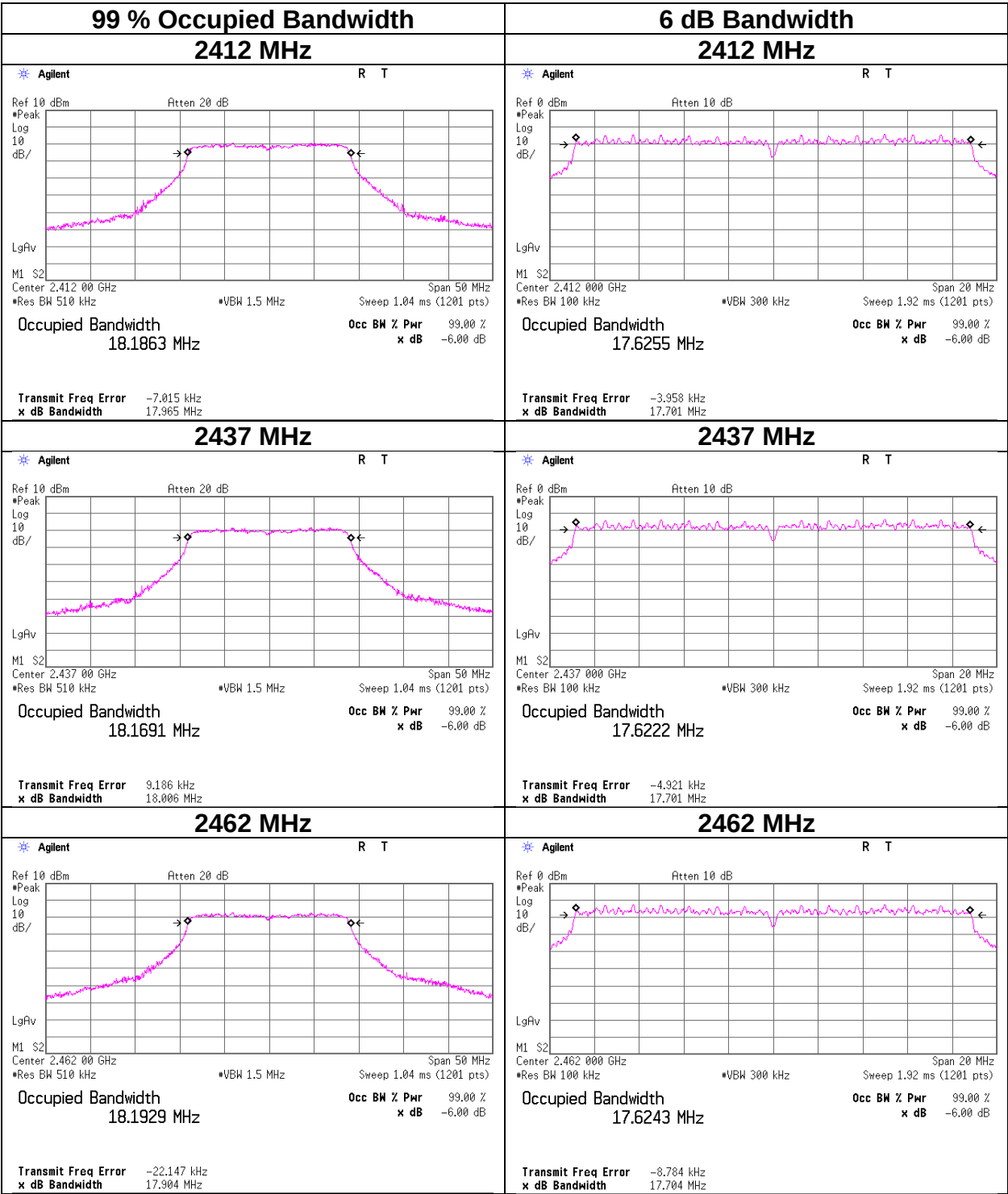
99 % Occupied Bandwidth and 6 dB Bandwidth

11g



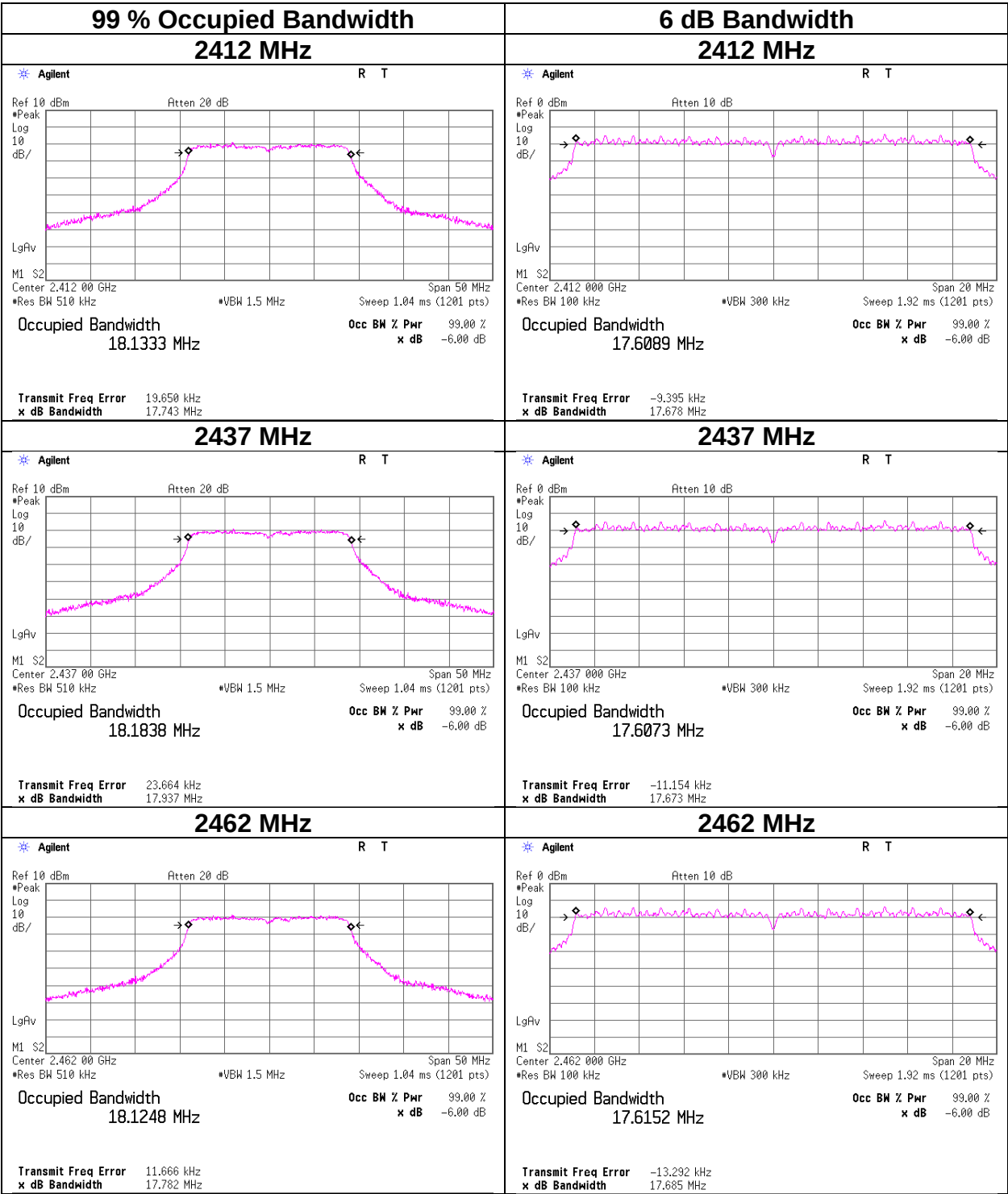
**99 % Occupied Bandwidth and 6 dB Bandwidth**

**11n-20 Antenna 0**



**99 % Occupied Bandwidth and 6 dB Bandwidth**

**11n-20 Antenna 1**



Maximum Peak Output Power

Test place                      Ise EMC Lab. No.6 Measurement Room  
Date                              June 4, 2024                      June 5, 2024                      December 4, 2024  
Temperature / Humidity      22 deg. C / 41 % RH          21 deg. C / 56 % RH          23 deg. C / 41 % RH  
Engineer                        Kiyoshiro Okazaki              Hiroki Numata                  Takafumi Noguchi  
Mode                              Tx 11b

| Antenna 0 |         |            |             | Conducted Power |       |       |      |        | e.i.r.p. for RSS-247 |        |       |       |      |        |
|-----------|---------|------------|-------------|-----------------|-------|-------|------|--------|----------------------|--------|-------|-------|------|--------|
| Freq.     | Reading | Cable Loss | Atten. Loss | Result          |       | Limit |      | Margin | Antenna Gain         | Result |       | Limit |      | Margin |
| [MHz]     | [dBm]   | [dB]       | [dB]        | [dBm]           | [mW]  | [dBm] | [mW] | [dB]   | [dBi]                | [dBm]  | [mW]  | [dBm] | [mW] | [dB]   |
| 2412      | 2.79    | 2.53       | 10.03       | 15.35           | 34.25 | 30.00 | 1000 | 14.65  | 1.78                 | 17.13  | 51.61 | 36.02 | 4000 | 18.89  |
| 2437      | 3.76    | 2.54       | 10.03       | 16.33           | 42.93 | 30.00 | 1000 | 13.67  | 1.78                 | 18.11  | 64.67 | 36.02 | 4000 | 17.91  |
| 2462      | 4.76    | 2.54       | 10.03       | 17.33           | 54.04 | 30.00 | 1000 | 12.67  | 1.78                 | 19.11  | 81.42 | 36.02 | 4000 | 16.91  |

Sample Calculation:  
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss  
e.i.r.p. Result = Conducted Power Result + Antenna Gain

2437 MHz

| Rate   | Reading<br>Antenna 0 | Reading<br>Antenna 1 | Remark |
|--------|----------------------|----------------------|--------|
| [Mbps] | [dBm]                | [dBm]                |        |
| 1      | 5.33                 | 4.49                 |        |
| 2      | 5.47                 | 4.51                 | *      |
| 5.5    | 5.46                 | 4.52                 |        |
| 11     | 5.37                 | 4.54                 |        |

\*: Worst Rate  
All comparison were carried out on same frequency and measurement factors.

Maximum Peak Output Power

|                        |                                    |                     |                     |
|------------------------|------------------------------------|---------------------|---------------------|
| Test place             | Ise EMC Lab. No.6 Measurement Room |                     |                     |
| Date                   | June 4, 2024                       | June 5, 2024        | December 4, 2024    |
| Temperature / Humidity | 22 deg. C / 41 % RH                | 21 deg. C / 56 % RH | 23 deg. C / 41 % RH |
| Engineer               | Kiyoshiro Okazaki                  | Hiroki Numata       | Takafumi Noguchi    |
| Mode                   | Tx 11g                             |                     |                     |

| Antenna 0      |                  |                       |                        | Conducted Power |        |       |      |        | e.i.r.p. for RSS-247     |        |        |       |      |        |
|----------------|------------------|-----------------------|------------------------|-----------------|--------|-------|------|--------|--------------------------|--------|--------|-------|------|--------|
| Freq.<br>[MHz] | Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result          |        | Limit |      | Margin | Antenna<br>Gain<br>[dBi] | Result |        | Limit |      | Margin |
|                |                  |                       |                        | [dBm]           | [mW]   | [dBm] | [mW] |        |                          | [dBm]  | [mW]   | [dBm] | [mW] |        |
| 2412           | 6.34             | 2.53                  | 10.03                  | 18.90           | 77.62  | 30.00 | 1000 | 11.10  | 1.78                     | 20.68  | 116.95 | 36.02 | 4000 | 15.34  |
| 2437           | 7.65             | 2.54                  | 10.03                  | 20.22           | 105.20 | 30.00 | 1000 | 9.78   | 1.78                     | 22.00  | 158.49 | 36.02 | 4000 | 14.02  |
| 2462           | 8.32             | 2.54                  | 10.03                  | 20.89           | 122.74 | 30.00 | 1000 | 9.11   | 1.78                     | 22.67  | 184.93 | 36.02 | 4000 | 13.35  |

Sample Calculation:  
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss  
e.i.r.p. Result = Conducted Power Result + Antenna Gain

2437 MHz

| Rate   | Reading            | Reading            | Remark |
|--------|--------------------|--------------------|--------|
| [Mbps] | Antenna 0<br>[dBm] | Antenna 1<br>[dBm] |        |
| 6      | 5.85               | 5.04               |        |
| 9      | 6.01               | 5.24               |        |
| 12     | 6.39               | 5.60               |        |
| 18     | 6.23               | 5.48               |        |
| 24     | 8.77               | 8.17               |        |
| 36     | 8.67               | 8.12               |        |
| 48     | 8.75               | 8.04               |        |
| 54     | 8.79               | 8.30               | *      |

\*: Worst Rate  
All comparison were carried out on same frequency and measurement factors.

## Maximum Peak Output Power

Test place                      Ise EMC Lab. No.4 Measurement Room  
Date                                June 5, 2024  
Temperature / Humidity        21 deg. C / 56 % RH  
Engineer                         Hiroki Numata  
Mode                                Tx 11n-20

| Antenna 0 + Antenna 1 |                 |                 | Conducted Power |        |       |      |        | e.i.r.p. for RSS-247 |           |        |        |       |         |        |
|-----------------------|-----------------|-----------------|-----------------|--------|-------|------|--------|----------------------|-----------|--------|--------|-------|---------|--------|
| Freq.                 | Antenna 0       | Antenna 1       | Result          |        | Limit |      | Margin | Antenna 0            | Antenna 1 | Result |        | Limit |         | Margin |
|                       | Conducted Power | Conducted Power |                 |        |       |      |        | e.i.r.p.             | e.i.r.p.  |        |        |       |         |        |
| [MHz]                 | [mW]            | [mW]            | [dBm]           | [mW]   | [dBm] | [mW] | [dB]   | Result               | Result    | [dBm]  | [mW]   | [dBm] | [mW]    | [dB]   |
| 2412                  | 88.72           | 81.66           | 22.31           | 170.37 | 30.00 | 1000 | 7.69   | 133.66               | 123.03    | 24.09  | 256.69 | 36.02 | 4000.00 | 11.93  |
| 2437                  | 104.47          | 83.18           | 22.73           | 187.65 | 30.00 | 1000 | 7.27   | 157.40               | 125.31    | 24.51  | 282.71 | 36.02 | 4000.00 | 11.51  |
| 2462                  | 124.45          | 89.95           | 23.31           | 214.40 | 30.00 | 1000 | 6.69   | 187.50               | 135.52    | 25.09  | 323.02 | 36.02 | 4000.00 | 10.93  |

Sample Calculation:

Conducted Power Result = Antenna 0 Conducted Power Result + Antenna 1 Conducted Power Result

e.i.r.p. Result = Antenna 0 e.i.r.p. Result + Antenna 1 e.i.r.p. Result

| Freq.<br>[MHz] | Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Conducted Power<br>Result |        | Antenna<br>Gain<br>[dBi] | e.i.r.p.<br>Result |        |
|----------------|------------------|-----------------------|------------------------|---------------------------|--------|--------------------------|--------------------|--------|
|                |                  |                       |                        | [dBm]                     | [mW]   |                          | [dBm]              | [mW]   |
| 2412           | 6.92             | 2.53                  | 10.03                  | 19.48                     | 88.72  | 1.78                     | 21.26              | 133.66 |
| 2437           | 7.62             | 2.54                  | 10.03                  | 20.19                     | 104.47 | 1.78                     | 21.97              | 157.40 |
| 2462           | 8.38             | 2.54                  | 10.03                  | 20.95                     | 124.45 | 1.78                     | 22.73              | 187.50 |

| Freq.<br>[MHz] | Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Conducted Power<br>Result |       | Antenna<br>Gain<br>[dBi] | e.i.r.p.<br>Result |        |
|----------------|------------------|-----------------------|------------------------|---------------------------|-------|--------------------------|--------------------|--------|
|                |                  |                       |                        | [dBm]                     | [mW]  |                          | [dBm]              | [mW]   |
| 2412           | 6.56             | 2.53                  | 10.03                  | 19.12                     | 81.66 | 1.78                     | 20.90              | 123.03 |
| 2437           | 6.63             | 2.54                  | 10.03                  | 19.20                     | 83.18 | 1.78                     | 20.98              | 125.31 |
| 2462           | 6.97             | 2.54                  | 10.03                  | 19.54                     | 89.95 | 1.78                     | 21.32              | 135.52 |

Sample Calculation:

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

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

2412 MHz

| Tx   | MCS<br>Number | Antenna 0 |      | Antenna 1 |      | Total<br>Reading Power |      | Remark |
|------|---------------|-----------|------|-----------|------|------------------------|------|--------|
|      |               | [dBm]     | [mW] | [dBm]     | [mW] | [dBm]                  | [mW] |        |
| SISO | 0             | 3.25      | 2.11 | -         | -    | 3.25                   | 2.11 |        |
|      | 1             | 3.54      | 2.26 | -         | -    | 3.54                   | 2.26 |        |
|      | 2             | 3.57      | 2.28 | -         | -    | 3.57                   | 2.28 |        |
|      | 3             | 5.61      | 3.64 | -         | -    | 5.61                   | 3.64 |        |
|      | 4             | 5.90      | 3.89 | -         | -    | 5.90                   | 3.89 |        |
|      | 5             | 6.01      | 3.99 | -         | -    | 6.01                   | 3.99 |        |
|      | 6             | 6.81      | 4.80 | -         | -    | 6.81                   | 4.80 |        |
|      | 7             | 6.04      | 4.02 | -         | -    | 6.04                   | 4.02 |        |
|      | 0             | -         | -    | 3.21      | 2.09 | 3.21                   | 2.09 |        |
|      | 1             | -         | -    | 3.52      | 2.25 | 3.52                   | 2.25 |        |
|      | 2             | -         | -    | 3.55      | 2.26 | 3.55                   | 2.26 |        |
|      | 3             | -         | -    | 5.67      | 3.69 | 5.67                   | 3.69 |        |
|      | 4             | -         | -    | 5.77      | 3.78 | 5.77                   | 3.78 |        |
|      | 5             | -         | -    | 5.80      | 3.80 | 5.80                   | 3.80 |        |
|      | 6             | -         | -    | 6.76      | 4.74 | 6.76                   | 4.74 |        |
| MIMO | 7             | -         | -    | 5.68      | 3.70 | 5.68                   | 3.70 |        |
|      | 8             | 3.43      | 2.20 | 3.41      | 2.19 | 6.43                   | 4.40 |        |
|      | 9             | 3.44      | 2.21 | 3.44      | 2.21 | 6.45                   | 4.42 |        |
|      | 10            | 3.77      | 2.38 | 3.41      | 2.19 | 6.60                   | 4.58 |        |
|      | 11            | 6.06      | 4.04 | 5.82      | 3.82 | 8.95                   | 7.86 |        |
|      | 12            | 5.79      | 3.79 | 5.90      | 3.89 | 8.86                   | 7.68 |        |
|      | 13            | 5.78      | 3.78 | 5.69      | 3.71 | 8.75                   | 7.49 |        |
|      | 14            | 6.17      | 4.14 | 5.99      | 3.97 | 9.09                   | 8.11 | *      |
|      | 15            | 6.10      | 4.07 | 5.81      | 3.81 | 8.97                   | 7.88 |        |

\*Worst MCS

All comparison were carried out on same frequency and measurement factors.

## Average Output Power (Reference data for RF Exposure)

|                        |                                    |
|------------------------|------------------------------------|
| Test place             | Ise EMC Lab. No.6 Measurement Room |
| Date                   | June 6, 2024                       |
| Temperature / Humidity | 22 deg. C / 60 % RH                |
| Engineer               | Hiroki Numata                      |
| Mode                   | Tx                                 |

### 11b 1 Mbps

| 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]         |
| 2412           | 0.37             | 2.53                  | 10.03                  | 12.93                    | 19.63        | 0.04                   | 12.97                           | 19.82        |
| 2437           | 1.24             | 2.53                  | 10.03                  | 13.80                    | 23.99        | 0.04                   | 13.84                           | 24.21        |
| 2462           | 2.28             | 2.53                  | 10.03                  | <b>14.84</b>             | <b>30.48</b> | 0.04                   | <b>14.88</b>                    | <b>30.76</b> |

### 11g 6 Mbps

| 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]         |
| 2412           | -3.08            | 2.53                  | 10.03                  | 9.48                     | 8.87         | 0.28                   | 9.76                            | 9.46         |
| 2437           | -2.21            | 2.53                  | 10.03                  | 10.35                    | 10.84        | 0.28                   | 10.63                           | 11.56        |
| 2462           | -1.27            | 2.53                  | 10.03                  | <b>11.29</b>             | <b>13.46</b> | 0.28                   | <b>11.57</b>                    | <b>14.35</b> |

Sample Calculation:

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

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

**The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.**

## Average Output Power (Reference data for RF Exposure)

|                        |                                    |
|------------------------|------------------------------------|
| Test place             | Ise EMC Lab. No.6 Measurement Room |
| Date                   | June 6, 2024                       |
| Temperature / Humidity | 22 deg. C / 60 % RH                |
| Engineer               | Hiroki Numata                      |
| Mode                   | Tx 11n-20                          |

Antenna 0 + Antenna 1 MCS0

| Freq.<br>[MHz] | Antenna 0<br>Result<br>[mW] | Antenna 1<br>Result<br>[mW] | Result<br>(Burst average) |              |
|----------------|-----------------------------|-----------------------------|---------------------------|--------------|
|                |                             |                             | [dBm]                     | [mW]         |
| 2412           | 8.71                        | 7.52                        | 12.10                     | 16.23        |
| 2437           | 10.33                       | 8.04                        | 12.64                     | 18.36        |
| 2462           | 13.37                       | 8.99                        | <b>13.49</b>              | <b>22.36</b> |

Antenna 0

| 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]         |
| 2412           | -3.49            | 2.53                  | 10.03                  | 9.07                     | 8.07         | 0.33                   | 9.40                            | 8.71         |
| 2437           | -2.76            | 2.54                  | 10.03                  | 9.81                     | 9.57         | 0.33                   | 10.14                           | 10.33        |
| 2462           | -1.64            | 2.54                  | 10.03                  | <b>10.93</b>             | <b>12.39</b> | 0.33                   | <b>11.26</b>                    | <b>13.37</b> |

Antenna 1

| 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]        |
| 2412           | -4.13            | 2.53                  | 10.03                  | 8.43                     | 6.97        | 0.33                   | 8.76                            | 7.52        |
| 2437           | -3.85            | 2.54                  | 10.03                  | 8.72                     | 7.45        | 0.33                   | 9.05                            | 8.04        |
| 2462           | -3.36            | 2.54                  | 10.03                  | <b>9.21</b>              | <b>8.34</b> | 0.33                   | <b>9.54</b>                     | <b>8.99</b> |

Sample Calculation:

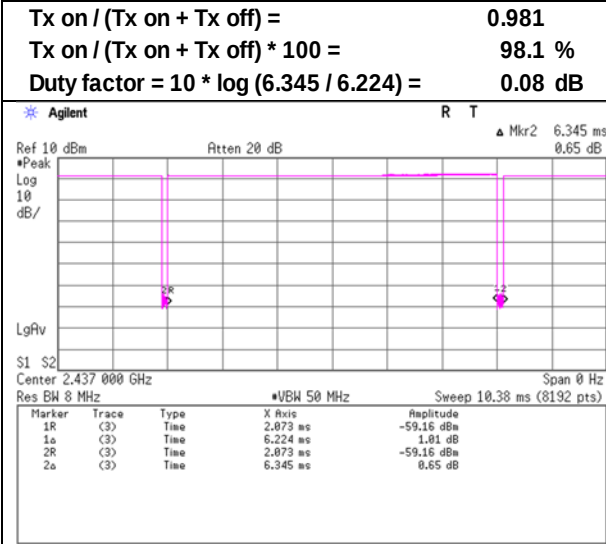
Result (Time average) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

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

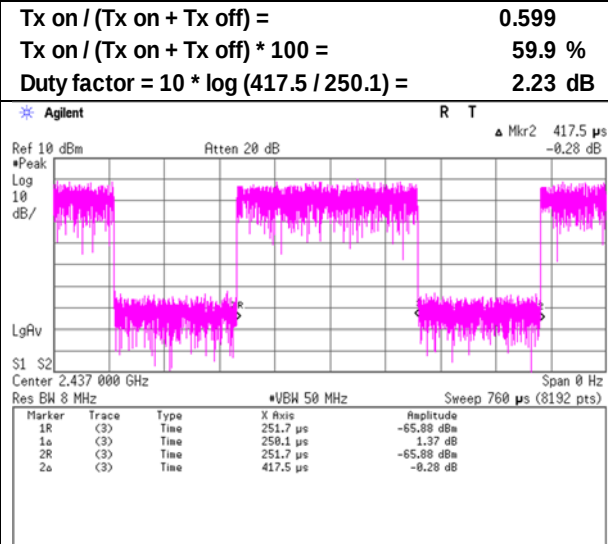
**Burst rate confirmation**

Test place                      Ise EMC Lab. No.3 Semi Anechoic Chamber  
Date                              June 5, 2024  
Temperature / Humidity      23 deg. C / 53 % RH  
Engineer                        Nachi Konegawa  
Mode                              Tx

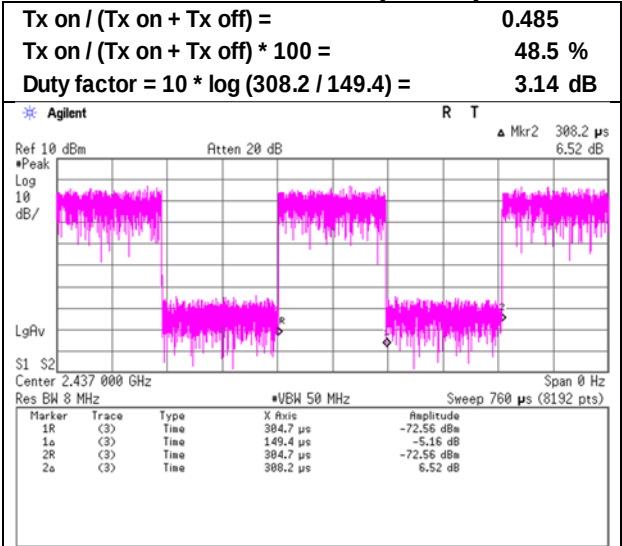
**11b 2 Mbps**



**11g 54 Mbps**



**11n-20 MCS 14 (MIMO)**

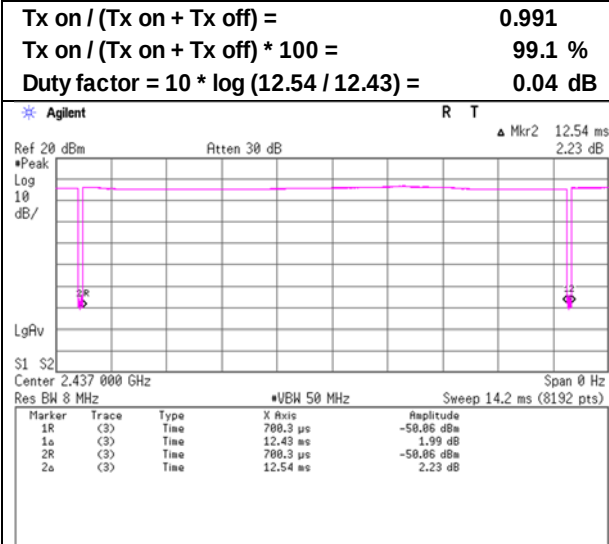


\* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

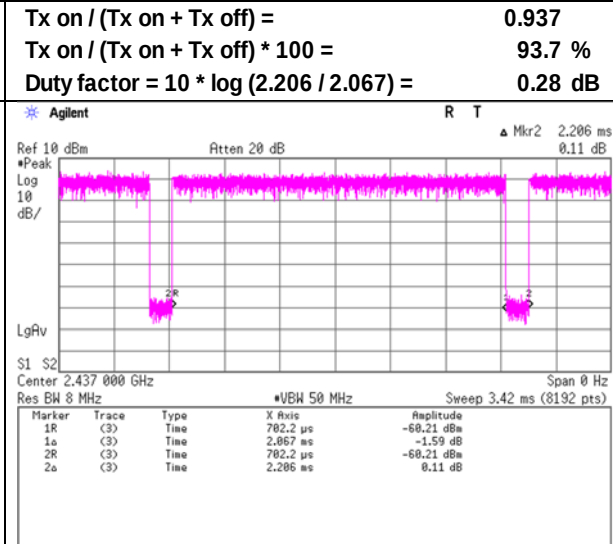
**Burst rate confirmation**

|                        |                                    |
|------------------------|------------------------------------|
| Test place             | Ise EMC Lab. No.4 Measurement Room |
| Date                   | June 6, 2024                       |
| Temperature / Humidity | 22 deg. C / 60 % RH                |
| Engineer               | Hiroki Numata                      |
| Mode                   | Tx                                 |

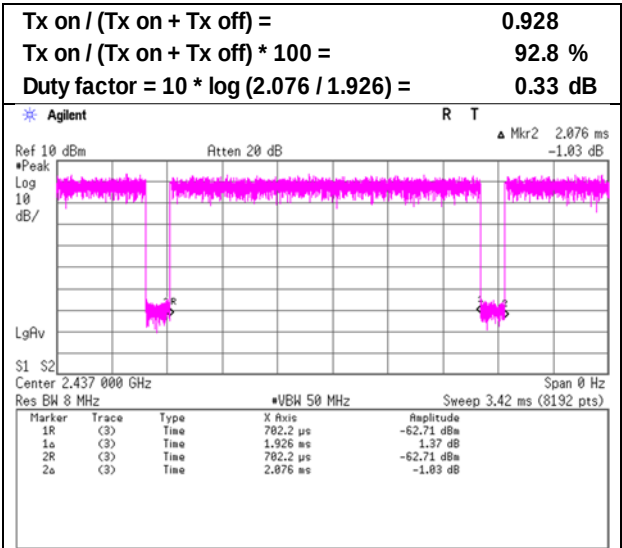
**11b 1 Mbps**



**11g 6 Mbps**



**11n-20 MCS 0**



\* Since the burst rate is not different between the channels, the data has been obtained on the representative channel.

**Radiated Spurious Emission**

|                        |                     |                     |
|------------------------|---------------------|---------------------|
| Test place             | Ise EMC Lab.        | No.4                |
| Semi Anechoic Chamber  | No.3                | No.4                |
| Date                   | June 5, 2024        | June 10, 2024       |
| Temperature / Humidity | 23 deg. C / 53 % RH | 24 deg. C / 55 % RH |
| Engineer               | Nachi Konegawa      | Junki Nagatomi      |
|                        | (1 GHz to 6 GHz)    | (6 GHz to 26.5 GHz) |
| Mode                   | Tx 11b 2412 MHz     |                     |

| Polarity    | Frequency | Reading<br>(QP / PK) | Reading<br>(AV) | Ant.<br>Factor | Loss | Gain | Duty<br>Factor | Result<br>(QP / PK) | Result<br>(AV) | Limit<br>(QP / PK) | Limit<br>(AV) | Margin<br>(QP / PK) | Margin<br>(AV) | Remark      |
|-------------|-----------|----------------------|-----------------|----------------|------|------|----------------|---------------------|----------------|--------------------|---------------|---------------------|----------------|-------------|
| [Hori/Vert] | [MHz]     | [dBuV]               | [dBuV]          | [dB/m]         | [dB] | [dB] | [dB]           | [dBuV/m]            | [dBuV/m]       | [dBuV/m]           | [dBuV/m]      | [dB]                | [dB]           |             |
| Hori.       | 2390.0    | 47.3                 | 38.6            | 27.5           | 5.1  | 32.2 | 0.1            | 47.7                | 39.0           | 73.9               | 53.9          | 26.2                | 14.9           | *1)         |
| Hori.       | 3509.1    | 49.6                 | 47.5            | 28.8           | 7.1  | 31.7 | -              | 53.8                | 51.7           | 73.9               | 53.9          | 20.1                | 2.2            |             |
| Hori.       | 4824.0    | 40.7                 | 32.2            | 31.4           | 7.2  | 31.2 | -              | 48.1                | 39.6           | 73.9               | 53.9          | 25.8                | 14.4           | Floor noise |
| Hori.       | 7236.0    | 40.7                 | 32.2            | 35.6           | 11.0 | 32.1 | -              | 55.2                | 46.7           | 73.9               | 53.9          | 18.7                | 7.2            | Floor noise |
| Hori.       | 9648.0    | 41.2                 | 31.7            | 35.8           | 12.1 | 32.3 | -              | 56.7                | 47.2           | 73.9               | 53.9          | 17.2                | 6.7            | Floor noise |
| Vert.       | 2390.0    | 45.1                 | 35.9            | 27.5           | 5.1  | 32.2 | 0.1            | 45.4                | 36.3           | 73.9               | 53.9          | 28.5                | 17.6           | *1)         |
| Vert.       | 3509.1    | 52.1                 | 48.7            | 28.8           | 7.1  | 31.7 | -              | 56.3                | 52.9           | 73.9               | 53.9          | 17.6                | 1.0            |             |
| Vert.       | 4824.0    | 40.7                 | 32.2            | 31.4           | 7.2  | 31.2 | -              | 48.1                | 39.6           | 73.9               | 53.9          | 25.8                | 14.4           | Floor noise |
| Vert.       | 7236.0    | 40.8                 | 32.2            | 35.6           | 11.0 | 32.1 | -              | 55.3                | 46.7           | 73.9               | 53.9          | 18.6                | 7.2            | Floor noise |
| Vert.       | 9648.0    | 41.3                 | 31.7            | 35.8           | 12.1 | 32.3 | -              | 56.8                | 47.2           | 73.9               | 53.9          | 17.1                | 6.7            | Floor noise |

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)  
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor  
\*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).  
\*QP detector was used up to 1GHz.  
\*1) Not Out of Band emission(Leakage Power)

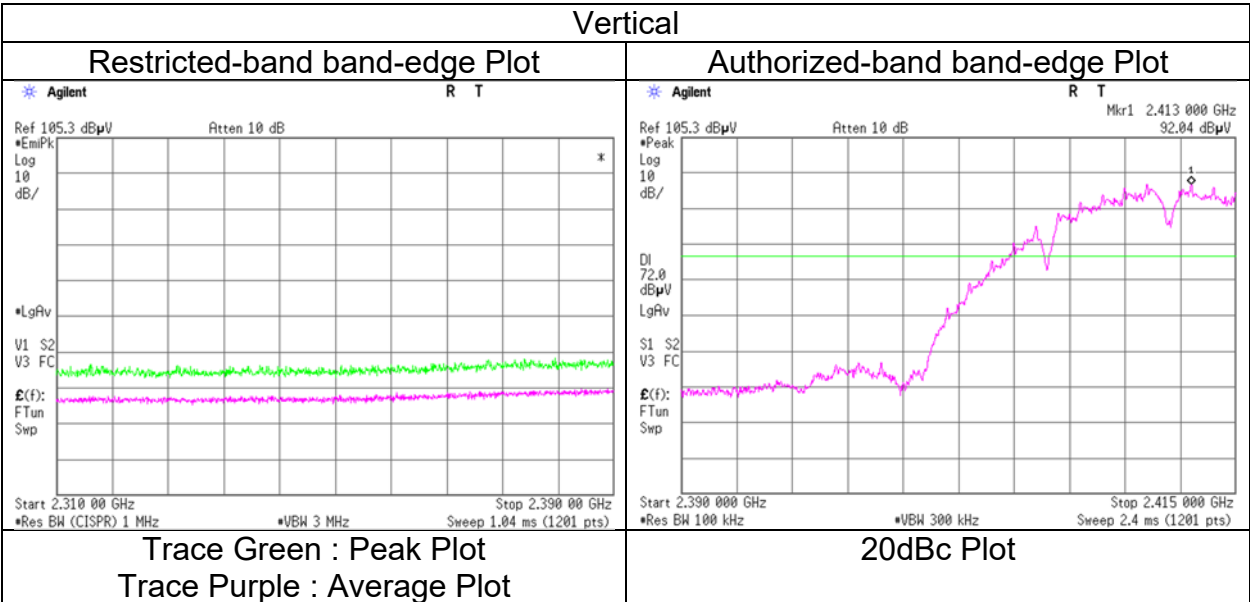
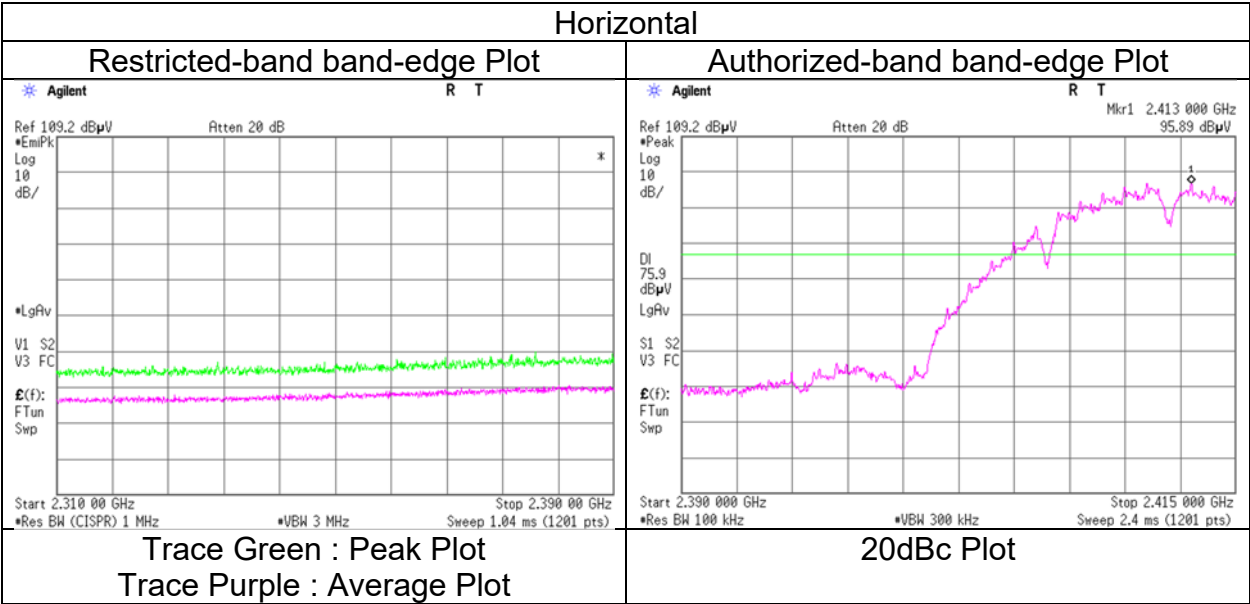
**20dBc Data Sheet**

| Polarity    | Frequency | Reading<br>(PK) | Ant<br>Factor | Loss | Gain | Result   | Limit    | Margin | Remark  |
|-------------|-----------|-----------------|---------------|------|------|----------|----------|--------|---------|
| [Hori/Vert] | [MHz]     | [dBuV]          | [dB/m]        | [dB] | [dB] | [dBuV/m] | [dBuV/m] | [dB]   |         |
| Hori.       | 2412.0    | 95.9            | 27.5          | 5.1  | 32.2 | 96.2     | -        | -      | Carrier |
| Hori.       | 2400.0    | 40.0            | 27.5          | 5.1  | 32.2 | 40.4     | 76.2     | 35.8   |         |
| Vert.       | 2412.0    | 92.0            | 27.5          | 5.1  | 32.2 | 92.4     | -        | -      | Carrier |
| Vert.       | 2400.0    | 37.5            | 27.5          | 5.1  | 32.2 | 37.9     | 72.4     | 34.5   |         |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)  
Distance factor:      1 GHz - 6 GHz      20log (3.8 m / 3.0 m) = 2.06 dB  
                              6 GHz - 10 GHz      20log (4.8 m / 3.0 m) = 4.09 dB  
                              10 GHz - 26.5 GHz      20log (1.0 m / 3.0 m) = -9.5 dB

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

|                        |                     |
|------------------------|---------------------|
| Test place             | Ise EMC Lab.        |
| Semi Anechoic Chamber  | No.3                |
| Date                   | June 5, 2024        |
| Temperature / Humidity | 23 deg. C / 53 % RH |
| Engineer               | Nachi Konegawa      |
|                        | (1 GHz to 6 GHz)    |
| Mode                   | Tx 11b 2412 MHz     |



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

## Radiated Spurious Emission

|                        |                     |                     |
|------------------------|---------------------|---------------------|
| Test place             | Ise EMC Lab.        | No.4                |
| Semi Anechoic Chamber  | No.3                | June 10, 2024       |
| Date                   | June 5, 2024        | 24 deg. C / 55 % RH |
| Temperature / Humidity | 23 deg. C / 53 % RH | Junki Nagatomi      |
| Engineer               | Nachi Konegawa      | (6 GHz to 26.5 GHz) |
|                        | (1 GHz to 6 GHz)    |                     |
| Mode                   | Tx 11b 2437 MHz     |                     |

| Polarity    | Frequency | Reading   | Reading | Ant.   | Loss | Gain | Duty | Result    | Result   | Limit     | Limit    | Margin    | Margin | Remark      |
|-------------|-----------|-----------|---------|--------|------|------|------|-----------|----------|-----------|----------|-----------|--------|-------------|
| [Hori/Vert] | [MHz]     | (QP / PK) | (AV)    | Factor | [dB] | [dB] | [dB] | (QP / PK) | (AV)     | (QP / PK) | (AV)     | (QP / PK) | (AV)   |             |
|             |           | [dBuV]    | [dBuV]  | [dB/m] |      |      |      | [dBuV/m]  | [dBuV/m] | [dBuV/m]  | [dBuV/m] | [dB]      | [dB]   |             |
| Hori.       | 3509.1    | 49.7      | 47.6    | 28.8   | 7.1  | 31.7 | -    | 53.9      | 51.8     | 73.9      | 53.9     | 20.0      | 2.1    |             |
| Hori.       | 4874.0    | 40.8      | 32.1    | 31.4   | 7.2  | 31.2 | -    | 48.2      | 39.5     | 73.9      | 53.9     | 25.7      | 14.4   | Floor noise |
| Hori.       | 7311.0    | 43.0      | 32.4    | 35.5   | 11.0 | 32.1 | -    | 57.4      | 46.8     | 73.9      | 53.9     | 16.5      | 7.1    | Floor noise |
| Hori.       | 9748.0    | 42.6      | 31.0    | 36.0   | 12.1 | 32.4 | -    | 58.3      | 46.7     | 73.9      | 53.9     | 15.6      | 7.2    | Floor noise |
| Vert.       | 3509.1    | 52.1      | 48.8    | 28.8   | 7.1  | 31.7 | -    | 56.3      | 53.0     | 73.9      | 53.9     | 17.6      | 0.9    |             |
| Vert.       | 4874.0    | 40.8      | 32.1    | 31.4   | 7.2  | 31.2 | -    | 48.2      | 39.5     | 73.9      | 53.9     | 25.7      | 14.4   | Floor noise |
| Vert.       | 7311.0    | 43.1      | 32.4    | 35.5   | 11.0 | 32.1 | -    | 57.6      | 46.8     | 73.9      | 53.9     | 16.3      | 7.1    | Floor noise |
| Vert.       | 9748.0    | 43.6      | 31.0    | 36.0   | 12.1 | 32.4 | -    | 59.4      | 46.7     | 73.9      | 53.9     | 14.6      | 7.2    | Floor noise |

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)  
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor  
\*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).  
\*QP detector was used up to 1GHz.

|                  |                   |                                 |
|------------------|-------------------|---------------------------------|
| Distance factor: | 1 GHz - 6 GHz     | 20log (3.8 m / 3.0 m) = 2.06 dB |
|                  | 6 GHz - 10 GHz    | 20log (4.8 m / 3.0 m) = 4.09 dB |
|                  | 10 GHz - 26.5 GHz | 20log (1.0 m / 3.0 m) = -9.5 dB |

**Radiated Spurious Emission**

|                        |                     |                     |
|------------------------|---------------------|---------------------|
| Test place             | Ise EMC Lab.        |                     |
| Semi Anechoic Chamber  | No.3                | No.4                |
| Date                   | June 5, 2024        | June 10, 2024       |
| Temperature / Humidity | 23 deg. C / 53 % RH | 24 deg. C / 55 % RH |
| Engineer               | Nachi Konegawa      | Junki Nagatomi      |
|                        | (1 GHz to 6 GHz)    | (6 GHz to 26.5 GHz) |
| Mode                   | Tx 11b 2462 MHz     |                     |

| Polarity    | Frequency | Reading   | Reading | Ant.   | Loss | Gain | Duty   | Result    | Result   | Limit     | Limit    | Margin    | Margin | Remark      |
|-------------|-----------|-----------|---------|--------|------|------|--------|-----------|----------|-----------|----------|-----------|--------|-------------|
| [Hori/Vert] | [MHz]     | (QP / PK) | (AV)    | Factor |      |      | Factor | (QP / PK) | (AV)     | (QP / PK) | (AV)     | (QP / PK) | (AV)   |             |
|             |           | [dBuV]    | [dBuV]  | [dB/m] | [dB] | [dB] | [dB]   | [dBuV/m]  | [dBuV/m] | [dBuV/m]  | [dBuV/m] | [dB]      | [dB]   |             |
| Hori.       | 2483.5    | 49.0      | 40.1    | 27.4   | 5.1  | 32.2 | 0.1    | 49.3      | 40.5     | 73.9      | 53.9     | 24.7      | 13.4   | *1)         |
| Hori.       | 3509.1    | 49.5      | 47.4    | 28.8   | 7.1  | 31.7 | -      | 53.7      | 51.6     | 73.9      | 53.9     | 20.2      | 2.3    |             |
| Hori.       | 4924.0    | 40.9      | 31.9    | 31.5   | 7.2  | 31.1 | -      | 48.4      | 39.4     | 73.9      | 53.9     | 25.5      | 14.5   | Floor noise |
| Hori.       | 7386.0    | 42.4      | 31.9    | 35.5   | 11.1 | 32.1 | -      | 56.8      | 46.3     | 73.9      | 53.9     | 17.1      | 7.6    | Floor noise |
| Hori.       | 9848.0    | 41.8      | 31.6    | 36.1   | 12.2 | 32.4 | -      | 57.6      | 47.5     | 73.9      | 53.9     | 16.3      | 6.4    | Floor noise |
| Vert.       | 2483.5    | 45.1      | 36.7    | 27.4   | 5.1  | 32.2 | 0.1    | 45.4      | 37.1     | 73.9      | 53.9     | 28.5      | 16.9   | *1)         |
| Vert.       | 3509.1    | 52.2      | 48.6    | 28.8   | 7.1  | 31.7 | -      | 56.4      | 52.8     | 73.9      | 53.9     | 17.5      | 1.2    |             |
| Vert.       | 4924.0    | 40.9      | 31.9    | 31.5   | 7.2  | 31.1 | -      | 48.4      | 39.4     | 73.9      | 53.9     | 25.5      | 14.5   | Floor noise |
| Vert.       | 7386.0    | 42.5      | 31.9    | 35.5   | 11.1 | 32.1 | -      | 56.9      | 46.3     | 73.9      | 53.9     | 17.0      | 7.6    | Floor noise |
| Vert.       | 9848.0    | 41.7      | 31.6    | 36.1   | 12.2 | 32.4 | -      | 57.5      | 47.5     | 73.9      | 53.9     | 16.4      | 6.4    | Floor noise |

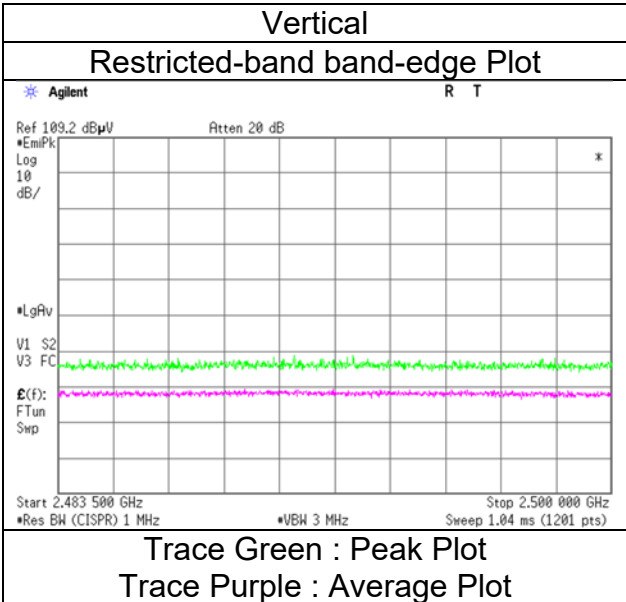
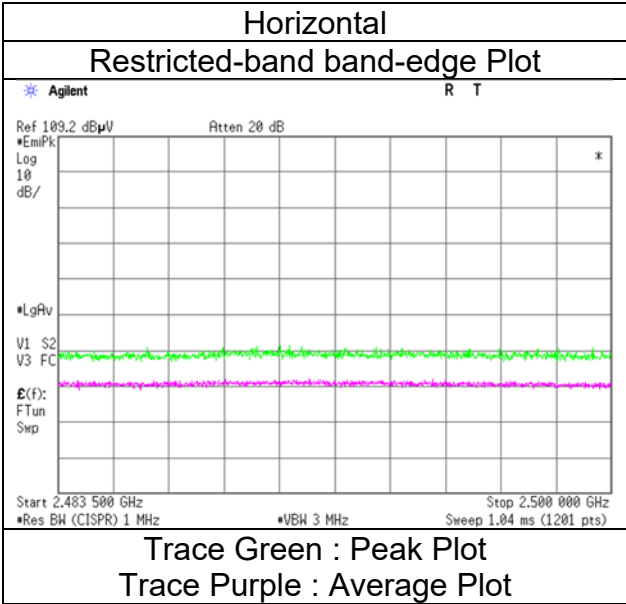
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)  
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor  
\*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).  
\*QP detector was used up to 1GHz.  
\*1) Not Out of Band emission(Leakage Power)

Distance factor:      1 GHz - 6 GHz              20log (3.8 m / 3.0 m) = 2.06 dB  
                                 6 GHz - 10 GHz            20log (4.8 m / 3.0 m) = 4.09 dB  
                                 10 GHz - 26.5 GHz           20log (1.0 m / 3.0 m) = -9.5 dB

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

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
  
Mode

Ise EMC Lab.  
No.3  
June 5, 2024  
23 deg. C / 53 % RH  
Nachi Konegawa  
(1 GHz to 6 GHz)  
Tx 11b 2462 MHz



\* 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             | Ise EMC Lab.        |                      |                     |
| Semi Anechoic Chamber  | No.3                | No.4                 | No.3                |
| Date                   | June 5, 2024        | June 10, 2024        | June 12, 2024       |
| Temperature / Humidity | 23 deg. C / 53 % RH | 24 deg. C / 55 % RH  | 21 deg. C / 59 % RH |
| Engineer               | Nachi Konegawa      | Junki Nagatomi       | Hiroyuki Furutaka   |
|                        | (1 GHz to 6 GHz)    | (10 GHz to 26.5 GHz) | (6 GHz to 10 GHz)   |
| Mode                   | Tx 11g 2412 MHz     |                      |                     |

| Polarity    | Frequency | Reading<br>(QP / PK) | Reading<br>(AV) | Ant.<br>Factor | Loss | Gain | Duty<br>Factor | Result<br>(QP / PK) | Result<br>(AV) | Limit<br>(QP / PK) | Limit<br>(AV) | Margin<br>(QP / PK) | Margin<br>(AV) | Remark      |
|-------------|-----------|----------------------|-----------------|----------------|------|------|----------------|---------------------|----------------|--------------------|---------------|---------------------|----------------|-------------|
| [Hori/Vert] | [MHz]     | [dBuV]               | [dBuV]          | [dB/m]         | [dB] | [dB] | [dB]           | [dBuV/m]            | [dBuV/m]       | [dBuV/m]           | [dBuV/m]      | [dB]                | [dB]           |             |
| Hori.       | 2390.0    | 50.6                 | 39.4            | 27.5           | 5.1  | 32.2 | 2.2            | 51.0                | 42.0           | 73.9               | 53.9          | 22.9                | 11.9           | *1)         |
| Hori.       | 3509.1    | 49.7                 | 47.6            | 28.8           | 7.1  | 31.7 | -              | 53.9                | 51.8           | 73.9               | 53.9          | 20.0                | 2.1            |             |
| Hori.       | 4824.0    | 40.8                 | 32.1            | 31.4           | 7.2  | 31.2 | -              | 48.2                | 39.5           | 73.9               | 53.9          | 25.7                | 14.4           | Floor noise |
| Hori.       | 7236.0    | 42.5                 | 33.6            | 35.6           | 10.3 | 32.0 | -              | 56.4                | 47.5           | 73.9               | 53.9          | 17.5                | 6.4            | Floor noise |
| Hori.       | 9648.0    | 42.4                 | 33.9            | 35.7           | 10.9 | 32.7 | -              | 56.3                | 47.8           | 73.9               | 53.9          | 17.6                | 6.1            | Floor noise |
| Vert.       | 2390.0    | 50.5                 | 38.5            | 27.5           | 5.1  | 32.2 | 2.2            | 50.9                | 41.1           | 73.9               | 53.9          | 23.0                | 12.8           | *1)         |
| Vert.       | 3509.1    | 52.1                 | 48.7            | 28.8           | 7.1  | 31.7 | -              | 56.3                | 52.9           | 73.9               | 53.9          | 17.6                | 1.0            |             |
| Vert.       | 4824.0    | 40.8                 | 32.1            | 31.4           | 7.2  | 31.2 | -              | 48.2                | 39.5           | 73.9               | 53.9          | 25.7                | 14.4           | Floor noise |
| Vert.       | 7236.0    | 42.2                 | 33.4            | 35.6           | 10.3 | 32.0 | -              | 56.1                | 47.3           | 73.9               | 53.9          | 17.8                | 6.6            | Floor noise |
| Vert.       | 9648.0    | 41.8                 | 33.9            | 35.7           | 10.9 | 32.7 | -              | 55.7                | 47.8           | 73.9               | 53.9          | 18.2                | 6.1            | Floor noise |

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)  
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor  
\*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).  
\*QP detector was used up to 1GHz.  
\*1) Not Out of Band emission(Leakage Power)

**20dBc Data Sheet**

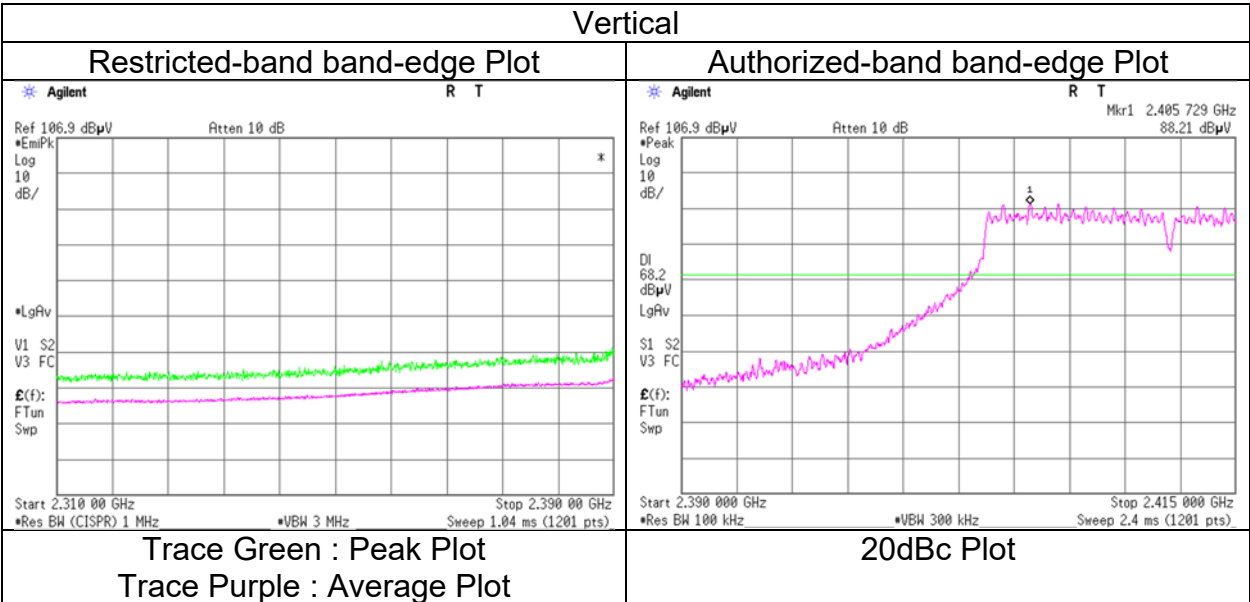
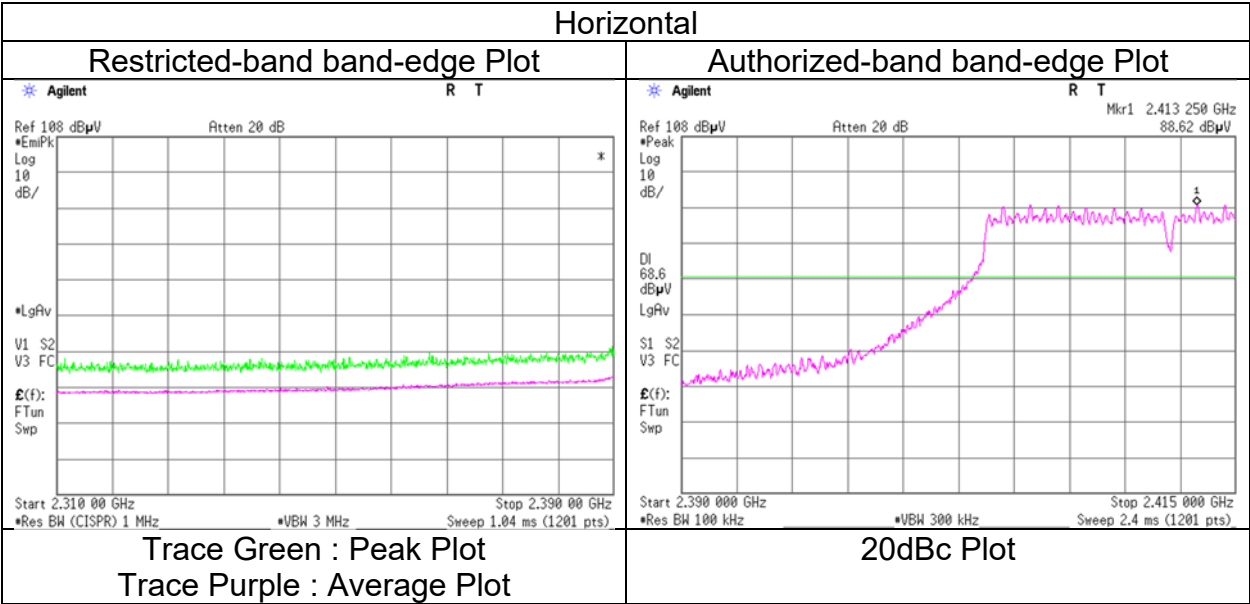
| Polarity    | Frequency | Reading<br>(PK) | Ant<br>Factor | Loss | Gain | Result   | Limit    | Margin | Remark  |
|-------------|-----------|-----------------|---------------|------|------|----------|----------|--------|---------|
| [Hori/Vert] | [MHz]     | [dBuV]          | [dB/m]        | [dB] | [dB] | [dBuV/m] | [dBuV/m] | [dB]   |         |
| Hori.       | 2412.0    | 88.6            | 27.5          | 5.1  | 32.2 | 88.9     | -        | -      | Carrier |
| Hori.       | 2400.0    | 55.2            | 27.5          | 5.1  | 32.2 | 55.5     | 68.9     | 13.4   |         |
| Vert.       | 2412.0    | 88.2            | 27.5          | 5.1  | 32.2 | 88.5     | -        | -      | Carrier |
| Vert.       | 2400.0    | 55.0            | 27.5          | 5.1  | 32.2 | 55.3     | 68.5     | 13.2   |         |

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

Distance factor:      1 GHz - 6 GHz      20log (3.8 m / 3.0 m) = 2.06 dB  
                              6 GHz - 10 GHz      20log (4.8 m / 3.0 m) = 4.09 dB  
                              10 GHz - 26.5 GHz      20log (1.0 m / 3.0 m) = -9.5 dB

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

|                        |                     |
|------------------------|---------------------|
| Test place             | Ise EMC Lab.        |
| Semi Anechoic Chamber  | No.3                |
| Date                   | June 5, 2024        |
| Temperature / Humidity | 23 deg. C / 53 % RH |
| Engineer               | Nachi Konegawa      |
|                        | (1 GHz to 6 GHz)    |
| Mode                   | Tx 11g 2412 MHz     |



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

**Radiated Spurious Emission**

|                        |                                    |                                        |                                        |
|------------------------|------------------------------------|----------------------------------------|----------------------------------------|
| Test place             | Ise EMC Lab.                       |                                        |                                        |
| Semi Anechoic Chamber  | No.3                               | No.4                                   | No.3                                   |
| Date                   | June 5, 2024                       | June 10, 2024                          | June 12, 2024                          |
| Temperature / Humidity | 23 deg. C / 53 % RH                | 24 deg. C / 55 % RH                    | 21 deg. C / 59 % RH                    |
| Engineer               | Nachi Konegawa<br>(1 GHz to 6 GHz) | Junki Nagatomi<br>(10 GHz to 26.5 GHz) | Hiroyuki Furutaka<br>(6 GHz to 10 GHz) |
| Mode                   | Tx 11g 2437 MHz                    |                                        |                                        |

| Polarity    | Frequency | Reading   | Reading | Ant.   | Loss | Gain | Duty   | Result    | Result   | Limit     | Limit    | Margin    | Margin | Remark      |
|-------------|-----------|-----------|---------|--------|------|------|--------|-----------|----------|-----------|----------|-----------|--------|-------------|
| [Hori/Vert] | [MHz]     | (QP / PK) | (AV)    | Factor | [dB] | [dB] | Factor | (QP / PK) | (AV)     | (QP / PK) | (AV)     | (QP / PK) | (AV)   |             |
|             |           | [dBuV]    | [dBuV]  | [dB/m] |      |      | [dB]   | [dBuV/m]  | [dBuV/m] | [dBuV/m]  | [dBuV/m] | [dB]      | [dB]   |             |
| Hori.       | 3509.1    | 49.7      | 47.6    | 28.8   | 7.1  | 31.7 | -      | 53.9      | 51.8     | 73.9      | 53.9     | 20.0      | 2.1    |             |
| Hori.       | 4874.0    | 40.8      | 32.1    | 31.4   | 7.2  | 31.2 | -      | 48.2      | 39.5     | 73.9      | 53.9     | 25.7      | 14.4   | Floor noise |
| Hori.       | 7311.0    | 41.8      | 33.4    | 35.6   | 10.3 | 32.0 | -      | 55.7      | 47.3     | 73.9      | 53.9     | 18.2      | 6.6    | Floor noise |
| Hori.       | 9748.0    | 41.6      | 33.3    | 35.9   | 10.9 | 32.7 | -      | 55.7      | 47.4     | 73.9      | 53.9     | 18.2      | 6.5    | Floor noise |
| Vert.       | 3509.1    | 52.2      | 48.8    | 28.8   | 7.1  | 31.7 | -      | 56.4      | 53.0     | 73.9      | 53.9     | 17.5      | 0.9    |             |
| Vert.       | 4874.0    | 40.8      | 32.1    | 31.4   | 7.2  | 31.2 | -      | 48.2      | 39.5     | 73.9      | 53.9     | 25.7      | 14.4   | Floor noise |
| Vert.       | 7311.0    | 41.8      | 33.5    | 35.6   | 10.3 | 32.0 | -      | 55.7      | 47.4     | 73.9      | 53.9     | 18.2      | 6.5    | Floor noise |
| Vert.       | 9748.0    | 41.7      | 33.4    | 35.9   | 10.9 | 32.7 | -      | 55.8      | 47.5     | 73.9      | 53.9     | 18.1      | 6.4    | Floor noise |

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)  
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor  
\*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).  
\*QP detector was used up to 1GHz.

Distance factor:      1 GHz - 6 GHz      20log (3.8 m / 3.0 m) = 2.06 dB  
                              6 GHz - 10 GHz      20log (4.8 m / 3.0 m) = 4.09 dB  
                              10 GHz - 26.5 GHz      20log (1.0 m / 3.0 m) = -9.5 dB

**Radiated Spurious Emission**

|                        |                     |                      |                     |
|------------------------|---------------------|----------------------|---------------------|
| Test place             | Ise EMC Lab.        |                      |                     |
| Semi Anechoic Chamber  | No.3                | No.4                 | No.3                |
| Date                   | June 5, 2024        | June 10, 2024        | June 12, 2024       |
| Temperature / Humidity | 23 deg. C / 53 % RH | 24 deg. C / 55 % RH  | 21 deg. C / 59 % RH |
| Engineer               | Nachi Konegawa      | Junki Nagatomi       | Hiroyuki Furutaka   |
|                        | (1 GHz to 6 GHz)    | (10 GHz to 26.5 GHz) | (6 GHz to 10 GHz)   |
| Mode                   | Tx 11g 2462 MHz     |                      |                     |

| Polarity    | Frequency | Reading<br>(QP / PK) | Reading<br>(AV) | Ant.<br>Factor | Loss | Gain | Duty<br>Factor | Result<br>(QP / PK) | Result<br>(AV) | Limit<br>(QP / PK) | Limit<br>(AV) | Margin<br>(QP / PK) | Margin<br>(AV) | Remark      |
|-------------|-----------|----------------------|-----------------|----------------|------|------|----------------|---------------------|----------------|--------------------|---------------|---------------------|----------------|-------------|
| [Hori/Vert] | [MHz]     | [dBuV]               | [dBuV]          | [dB/m]         | [dB] | [dB] | [dB]           | [dBuV/m]            | [dBuV/m]       | [dBuV/m]           | [dBuV/m]      | [dB]                | [dB]           |             |
| Hori.       | 2483.5    | 53.2                 | 41.9            | 27.4           | 5.1  | 32.2 | 2.2            | 53.5                | 44.4           | 73.9               | 53.9          | 20.4                | 9.5            | *1)         |
| Hori.       | 3509.1    | 49.7                 | 47.6            | 28.8           | 7.1  | 31.7 | -              | 53.9                | 51.8           | 73.9               | 53.9          | 20.0                | 2.1            |             |
| Hori.       | 4924.0    | 40.9                 | 31.9            | 31.5           | 7.2  | 31.1 | -              | 48.4                | 39.4           | 73.9               | 53.9          | 25.5                | 14.5           | Floor noise |
| Hori.       | 7386.0    | 41.7                 | 33.6            | 35.5           | 10.4 | 32.1 | -              | 55.5                | 47.4           | 73.9               | 53.9          | 18.4                | 6.5            | Floor noise |
| Hori.       | 9848.0    | 42.3                 | 33.6            | 36.0           | 11.0 | 32.7 | -              | 56.6                | 47.9           | 73.9               | 53.9          | 17.3                | 6.0            | Floor noise |
| Vert.       | 2483.5    | 49.4                 | 38.5            | 27.4           | 5.1  | 32.2 | 2.2            | 49.7                | 41.0           | 73.9               | 53.9          | 24.2                | 12.9           | *1)         |
| Vert.       | 3509.1    | 52.1                 | 48.7            | 28.8           | 7.1  | 31.7 | -              | 56.3                | 52.9           | 73.9               | 53.9          | 17.6                | 1.0            |             |
| Vert.       | 4924.0    | 40.9                 | 31.9            | 31.5           | 7.2  | 31.1 | -              | 48.4                | 39.4           | 73.9               | 53.9          | 25.5                | 14.5           | Floor noise |
| Vert.       | 7386.0    | 41.8                 | 33.7            | 35.5           | 10.4 | 32.1 | -              | 55.6                | 47.5           | 73.9               | 53.9          | 18.3                | 6.4            | Floor noise |
| Vert.       | 9848.0    | 42.4                 | 33.6            | 36.0           | 11.0 | 32.7 | -              | 56.7                | 47.9           | 73.9               | 53.9          | 17.2                | 6.0            | Floor noise |

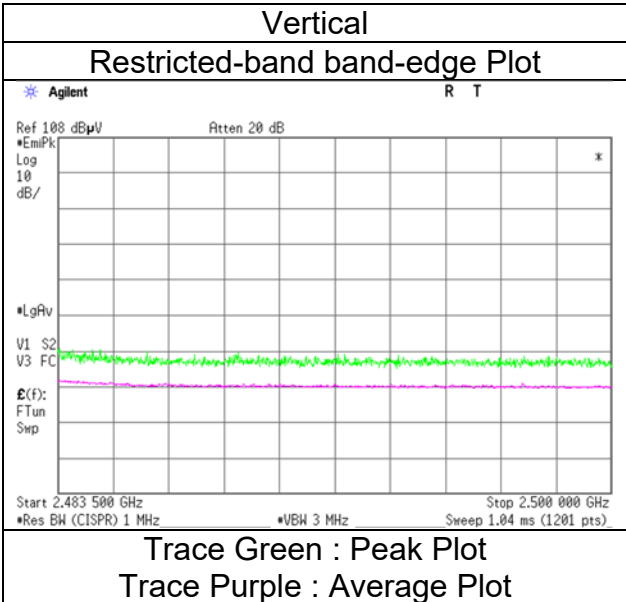
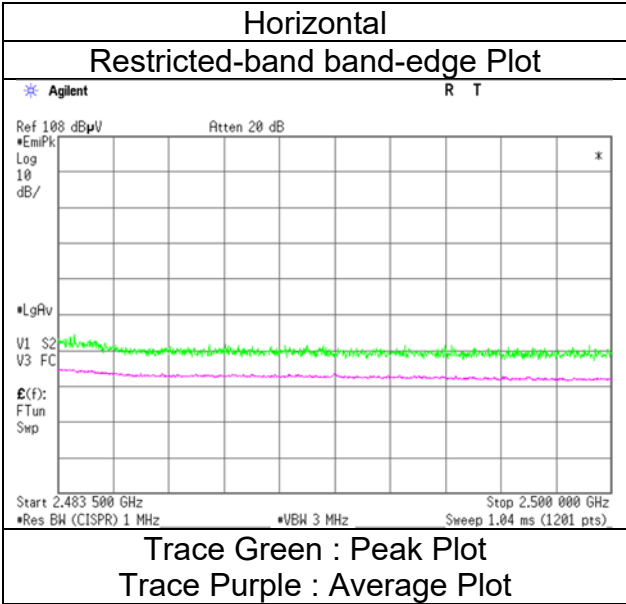
Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)  
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor  
\*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).  
\*QP detector was used up to 1GHz.  
\*1) Not Out of Band emission(Leakage Power)

Distance factor:      1 GHz - 6 GHz      20log (3.8 m / 3.0 m) = 2.06 dB  
                                 6 GHz - 10 GHz      20log (4.8 m / 3.0 m) = 4.09 dB  
                                 10 GHz - 26.5 GHz      20log (1.0 m / 3.0 m) = -9.5 dB

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

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Ise EMC Lab.  
No.3  
June 5, 2024  
23 deg. C / 53 % RH  
Nachi Konegawa  
(1 GHz to 6 GHz)  
Tx 11g 2462 MHz



\* 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             | Ise EMC Lab.                       |                                        |                                        |
| Semi Anechoic Chamber  | No.3                               | No.4                                   | No.3                                   |
| Date                   | June 5, 2024                       | June 10, 2024                          | June 12, 2024                          |
| Temperature / Humidity | 23 deg. C / 53 % RH                | 24 deg. C / 55 % RH                    | 21 deg. C / 59 % RH                    |
| Engineer               | Nachi Konegawa<br>(1 GHz to 6 GHz) | Junki Nagatomi<br>(10 GHz to 26.5 GHz) | Hiroyuki Furutaka<br>(6 GHz to 10 GHz) |
| Mode                   | Tx 11n-20 2412 MHz                 |                                        |                                        |

| Polarity    | Frequency | Reading<br>(QP / PK) | Reading<br>(AV) | Ant.<br>Factor | Loss | Gain | Duty<br>Factor | Result<br>(QP / PK) | Result<br>(AV) | Limit<br>(QP / PK) | Limit<br>(AV) | Margin<br>(QP / PK) | Margin<br>(AV) | Remark      |
|-------------|-----------|----------------------|-----------------|----------------|------|------|----------------|---------------------|----------------|--------------------|---------------|---------------------|----------------|-------------|
| [Hori/Vert] | [MHz]     | [dBuV]               | [dBuV]          | [dB/m]         | [dB] | [dB] | [dB]           | [dBuV/m]            | [dBuV/m]       | [dBuV/m]           | [dBuV/m]      | [dB]                | [dB]           |             |
| Hori.       | 2390.0    | 50.7                 | 38.3            | 27.5           | 5.1  | 32.2 | 3.1            | 51.1                | 41.8           | 73.9               | 53.9          | 22.8                | 12.1           | *1)         |
| Hori.       | 3509.1    | 49.6                 | 47.6            | 28.8           | 7.1  | 31.7 | -              | 53.8                | 51.8           | 73.9               | 53.9          | 20.1                | 2.1            |             |
| Hori.       | 4824.0    | 40.8                 | 32.1            | 31.4           | 7.2  | 31.2 | -              | 48.2                | 39.5           | 73.9               | 53.9          | 25.7                | 14.4           | Floor noise |
| Hori.       | 7236.0    | 42.6                 | 33.7            | 35.6           | 10.3 | 32.0 | -              | 56.5                | 47.6           | 73.9               | 53.9          | 17.4                | 6.3            | Floor noise |
| Hori.       | 9648.0    | 42.3                 | 33.8            | 35.7           | 10.9 | 32.7 | -              | 56.2                | 47.7           | 73.9               | 53.9          | 17.7                | 6.2            | Floor noise |
| Vert.       | 2390.0    | 48.5                 | 37.7            | 27.5           | 5.1  | 32.2 | 3.1            | 48.8                | 41.2           | 73.9               | 53.9          | 25.1                | 12.7           | *1)         |
| Vert.       | 3509.1    | 52.2                 | 48.8            | 28.8           | 7.1  | 31.7 | -              | 56.4                | 53.0           | 73.9               | 53.9          | 17.5                | 0.9            |             |
| Vert.       | 4824.0    | 40.8                 | 32.1            | 31.4           | 7.2  | 31.2 | -              | 48.2                | 39.5           | 73.9               | 53.9          | 25.7                | 14.4           | Floor noise |
| Vert.       | 7236.0    | 42.3                 | 33.5            | 35.6           | 10.3 | 32.0 | -              | 56.2                | 47.4           | 73.9               | 53.9          | 17.7                | 6.5            | Floor noise |
| Vert.       | 9648.0    | 42.2                 | 33.8            | 35.7           | 10.9 | 32.7 | -              | 56.1                | 47.7           | 73.9               | 53.9          | 17.8                | 6.2            | Floor noise |

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)  
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor  
\*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).  
\*QP detector was used up to 1GHz.  
\*1) Not Out of Band emission(Leakage Power)

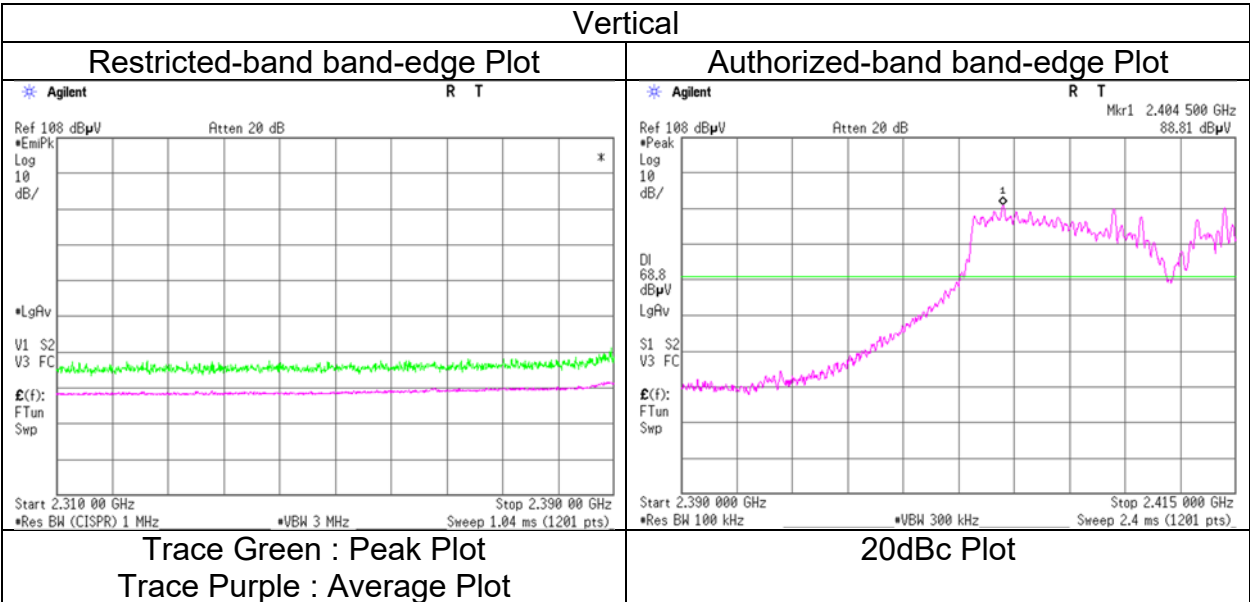
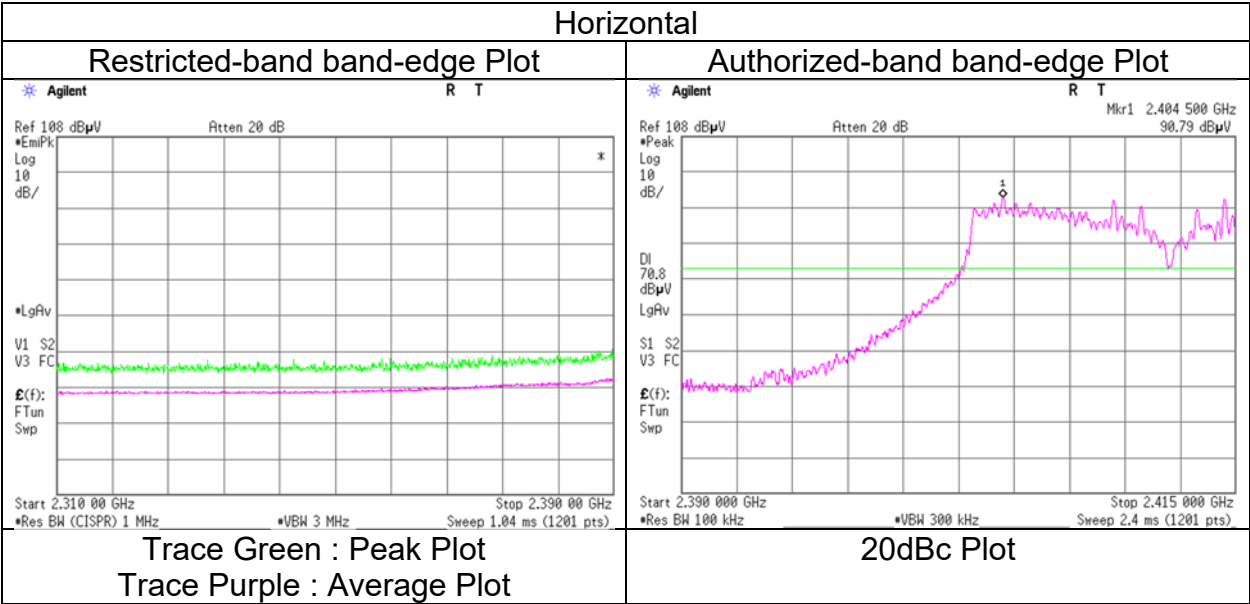
20dBc Data Sheet

| Polarity    | Frequency | Reading<br>(PK) | Ant<br>Factor | Loss | Gain | Result   | Limit    | Margin | Remark  |
|-------------|-----------|-----------------|---------------|------|------|----------|----------|--------|---------|
| [Hori/Vert] | [MHz]     | [dBuV]          | [dB/m]        | [dB] | [dB] | [dBuV/m] | [dBuV/m] | [dB]   |         |
| Hori.       | 2412.0    | 90.8            | 27.5          | 5.1  | 32.2 | 91.1     | -        | -      | Carrier |
| Hori.       | 2400.0    | 56.6            | 27.5          | 5.1  | 32.2 | 57.0     | 71.1     | 14.1   |         |
| Vert.       | 2412.0    | 88.8            | 27.5          | 5.1  | 32.2 | 89.1     | -        | -      | Carrier |
| Vert.       | 2400.0    | 54.1            | 27.5          | 5.1  | 32.2 | 54.5     | 69.1     | 14.7   |         |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)  
Distance factor:  
1 GHz - 6 GHz      20log (3.8 m / 3.0 m) = 2.06 dB  
6 GHz - 10 GHz    20log (4.8 m / 3.0 m) = 4.09 dB  
10 GHz - 26.5 GHz   20log (1.0 m / 3.0 m) = -9.5 dB

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

|                        |                     |
|------------------------|---------------------|
| Test place             | Ise EMC Lab.        |
| Semi Anechoic Chamber  | No.3                |
| Date                   | June 5, 2024        |
| Temperature / Humidity | 23 deg. C / 53 % RH |
| Engineer               | Nachi Konegawa      |
|                        | (1 GHz to 6 GHz)    |
| Mode                   | Tx 11n-20 2412 MHz  |



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

**Radiated Spurious Emission**

|                        |                                    |                                        |                                        |
|------------------------|------------------------------------|----------------------------------------|----------------------------------------|
| Test place             | Ise EMC Lab.                       |                                        |                                        |
| Semi Anechoic Chamber  | No.3                               | No.4                                   | No.3                                   |
| Date                   | June 5, 2024                       | June 10, 2024                          | June 12, 2024                          |
| Temperature / Humidity | 23 deg. C / 53 % RH                | 24 deg. C / 55 % RH                    | 21 deg. C / 59 % RH                    |
| Engineer               | Nachi Konegawa<br>(1 GHz to 6 GHz) | Junki Nagatomi<br>(10 GHz to 26.5 GHz) | Hiroyuki Furutaka<br>(6 GHz to 10 GHz) |
| Mode                   | Tx 11n-20 2437 MHz                 |                                        |                                        |

| Polarity    | Frequency | Reading<br>(QP / PK) | Reading<br>(AV) | Ant.<br>Factor | Loss | Gain | Duty<br>Factor | Result<br>(QP / PK) | Result<br>(AV) | Limit<br>(QP / PK) | Limit<br>(AV) | Margin<br>(QP / PK) | Margin<br>(AV) | Remark      |
|-------------|-----------|----------------------|-----------------|----------------|------|------|----------------|---------------------|----------------|--------------------|---------------|---------------------|----------------|-------------|
| [Hori/Vert] | [MHz]     | [dBuV]               | [dBuV]          | [dB/m]         | [dB] | [dB] | [dB]           | [dBuV/m]            | [dBuV/m]       | [dBuV/m]           | [dBuV/m]      | [dB]                | [dB]           |             |
| Hori.       | 3509.1    | 49.7                 | 47.6            | 28.8           | 7.1  | 31.7 | -              | 53.9                | 51.8           | 73.9               | 53.9          | 20.0                | 2.1            |             |
| Hori.       | 4874.0    | 40.8                 | 32.1            | 31.4           | 7.2  | 31.2 | -              | 48.2                | 39.5           | 73.9               | 53.9          | 25.7                | 14.4           | Floor noise |
| Hori.       | 7311.0    | 41.9                 | 33.5            | 35.6           | 10.3 | 32.0 | -              | 55.8                | 47.4           | 73.9               | 53.9          | 18.1                | 6.5            | Floor noise |
| Hori.       | 9748.0    | 41.5                 | 33.2            | 35.9           | 10.9 | 32.7 | -              | 55.6                | 47.3           | 73.9               | 53.9          | 18.3                | 6.6            | Floor noise |
| Vert.       | 3509.1    | 52.1                 | 48.7            | 28.8           | 7.1  | 31.7 | -              | 56.3                | 52.9           | 73.9               | 53.9          | 17.6                | 1.0            |             |
| Vert.       | 4874.0    | 40.8                 | 32.1            | 31.4           | 7.2  | 31.2 | -              | 48.2                | 39.5           | 73.9               | 53.9          | 25.7                | 14.4           | Floor noise |
| Vert.       | 7311.0    | 41.7                 | 33.5            | 35.6           | 10.3 | 32.0 | -              | 55.6                | 47.4           | 73.9               | 53.9          | 18.3                | 6.5            | Floor noise |
| Vert.       | 9748.0    | 41.6                 | 33.3            | 35.9           | 10.9 | 32.7 | -              | 55.7                | 47.4           | 73.9               | 53.9          | 18.2                | 6.5            | Floor noise |

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)  
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor  
\*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).  
\*QP detector was used up to 1GHz.

Distance factor:      1 GHz - 6 GHz      20log (3.8 m / 3.0 m) = 2.06 dB  
                              6 GHz - 10 GHz      20log (4.8 m / 3.0 m) = 4.09 dB  
                              10 GHz - 26.5 GHz      20log (1.0 m / 3.0 m) = -9.5 dB

**Radiated Spurious Emission**

|                        |                                    |                                        |                                                         |
|------------------------|------------------------------------|----------------------------------------|---------------------------------------------------------|
| Test place             | Ise EMC Lab.                       |                                        |                                                         |
| Semi Anechoic Chamber  | No.3                               | No.4                                   | No.3                                                    |
| Date                   | June 5, 2024                       | June 10, 2024                          | June 12, 2024                                           |
| Temperature / Humidity | 23 deg. C / 53 % RH                | 24 deg. C / 55 % RH                    | 21 deg. C / 59 % RH                                     |
| Engineer               | Nachi Konegawa<br>(1 GHz to 6 GHz) | Junki Nagatomi<br>(10 GHz to 26.5 GHz) | Hiroyuki Furutaka<br>(6 GHz to 10 GHz)<br>(Below 1 GHz) |
| Mode                   | Tx 11n-20 2462 MHz                 |                                        |                                                         |

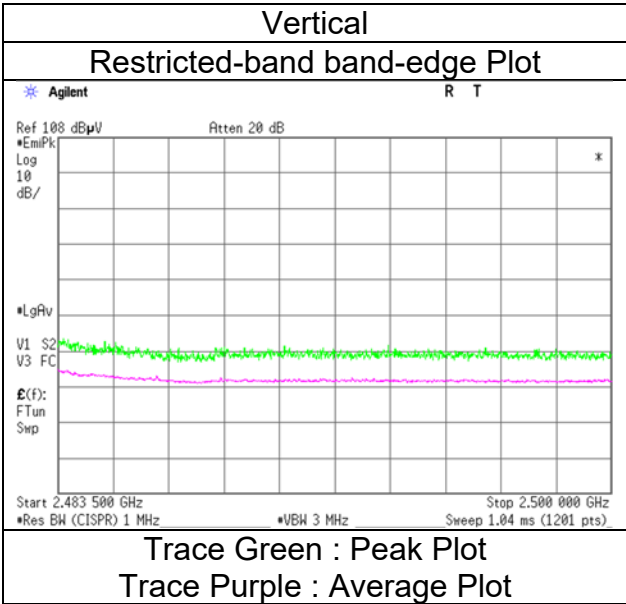
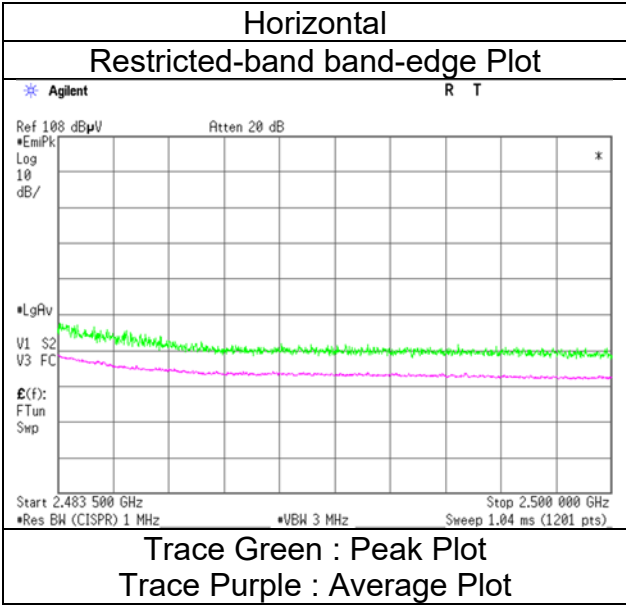
| Polarity    | Frequency | Reading             | Reading        | Ant.             | Loss | Gain | Duty | Result                | Result           | Limit                 | Limit            | Margin            | Margin       | Remark      |
|-------------|-----------|---------------------|----------------|------------------|------|------|------|-----------------------|------------------|-----------------------|------------------|-------------------|--------------|-------------|
| [Hori/Vert] | [MHz]     | (QP / PK)<br>[dBuV] | (AV)<br>[dBuV] | Factor<br>[dB/m] | [dB] | [dB] | [dB] | (QP / PK)<br>[dBuV/m] | (AV)<br>[dBuV/m] | (QP / PK)<br>[dBuV/m] | (AV)<br>[dBuV/m] | (QP / PK)<br>[dB] | (AV)<br>[dB] |             |
| Hori.       | 128.5     | 30.3                | -              | 13.5             | 8.2  | 32.1 | -    | 19.9                  | -                | 43.5                  | -                | 23.6              | -            |             |
| Hori.       | 203.7     | 36.1                | -              | 11.6             | 8.9  | 32.1 | -    | 24.6                  | -                | 43.5                  | -                | 19.0              | -            |             |
| Hori.       | 240.3     | 41.8                | -              | 11.5             | 9.2  | 32.0 | -    | 30.4                  | -                | 46.0                  | -                | 15.6              | -            |             |
| Hori.       | 374.3     | 34.7                | -              | 15.0             | 10.2 | 32.0 | -    | 27.9                  | -                | 46.0                  | -                | 18.1              | -            |             |
| Hori.       | 423.7     | 31.9                | -              | 16.2             | 10.5 | 32.0 | -    | 26.5                  | -                | 46.0                  | -                | 19.5              | -            |             |
| Hori.       | 502.8     | 28.6                | -              | 17.8             | 10.9 | 32.0 | -    | 25.3                  | -                | 46.0                  | -                | 20.7              | -            |             |
| Hori.       | 2483.5    | 56.8                | 44.5           | 27.4             | 5.1  | 32.2 | 3.1  | 57.1                  | 47.9             | 73.9                  | 53.9             | 16.8              | 6.0          | *1)         |
| Hori.       | 3509.1    | 49.7                | 47.5           | 28.8             | 7.1  | 31.7 | -    | 53.9                  | 51.7             | 73.9                  | 53.9             | 20.1              | 2.2          |             |
| Hori.       | 4924.0    | 40.9                | 31.9           | 31.5             | 7.2  | 31.1 | -    | 48.4                  | 39.4             | 73.9                  | 53.9             | 25.5              | 14.5         | Floor noise |
| Hori.       | 7386.0    | 41.8                | 33.5           | 35.5             | 10.4 | 32.1 | -    | 55.6                  | 47.3             | 73.9                  | 53.9             | 18.3              | 6.6          | Floor noise |
| Hori.       | 9848.0    | 42.2                | 33.5           | 36.0             | 11.0 | 32.7 | -    | 56.5                  | 47.8             | 73.9                  | 53.9             | 17.4              | 6.1          | Floor noise |
| Vert.       | 99.1      | 39.3                | -              | 10.2             | 7.9  | 32.2 | -    | 25.2                  | -                | 43.5                  | -                | 18.3              | -            |             |
| Vert.       | 116.4     | 33.8                | -              | 12.6             | 8.1  | 32.1 | -    | 22.3                  | -                | 43.5                  | -                | 21.2              | -            |             |
| Vert.       | 120.0     | 33.7                | -              | 12.9             | 8.1  | 32.1 | -    | 22.5                  | -                | 43.5                  | -                | 21.0              | -            |             |
| Vert.       | 131.3     | 32.2                | -              | 13.7             | 8.2  | 32.1 | -    | 22.0                  | -                | 43.5                  | -                | 21.5              | -            |             |
| Vert.       | 207.2     | 35.4                | -              | 11.5             | 8.9  | 32.1 | -    | 23.7                  | -                | 43.5                  | -                | 19.8              | -            |             |
| Vert.       | 363.0     | 31.2                | -              | 15.1             | 10.1 | 32.0 | -    | 24.3                  | -                | 46.0                  | -                | 21.7              | -            |             |
| Vert.       | 2483.5    | 51.2                | 41.8           | 27.4             | 5.1  | 32.2 | 3.1  | 51.5                  | 45.3             | 73.9                  | 53.9             | 22.4              | 8.6          | *1)         |
| Vert.       | 3509.1    | 52.1                | 48.7           | 28.8             | 7.1  | 31.7 | -    | 56.3                  | 52.9             | 73.9                  | 53.9             | 17.6              | 1.0          |             |
| Vert.       | 4924.0    | 40.9                | 31.9           | 31.5             | 7.2  | 31.1 | -    | 48.4                  | 39.4             | 73.9                  | 53.9             | 25.5              | 14.5         | Floor noise |
| Vert.       | 7386.0    | 41.7                | 33.6           | 35.5             | 10.4 | 32.1 | -    | 55.5                  | 47.4             | 73.9                  | 53.9             | 18.4              | 6.5          | Floor noise |
| Vert.       | 9848.0    | 42.3                | 33.5           | 36.0             | 11.0 | 32.7 | -    | 56.6                  | 47.8             | 73.9                  | 53.9             | 17.3              | 6.1          | Floor noise |

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)  
Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor  
\*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).  
\*QP detector was used up to 1GHz.  
\*1) Not Out of Band emission(Leakage Power)

Distance factor:      1 GHz - 6 GHz              20log (3.8 m / 3.0 m) = 2.06 dB  
                                 6 GHz - 10 GHz            20log (4.8 m / 3.0 m) = 4.09 dB  
                                 10 GHz - 26.5 GHz        20log (1.0 m / 3.0 m) = -9.5 dB

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

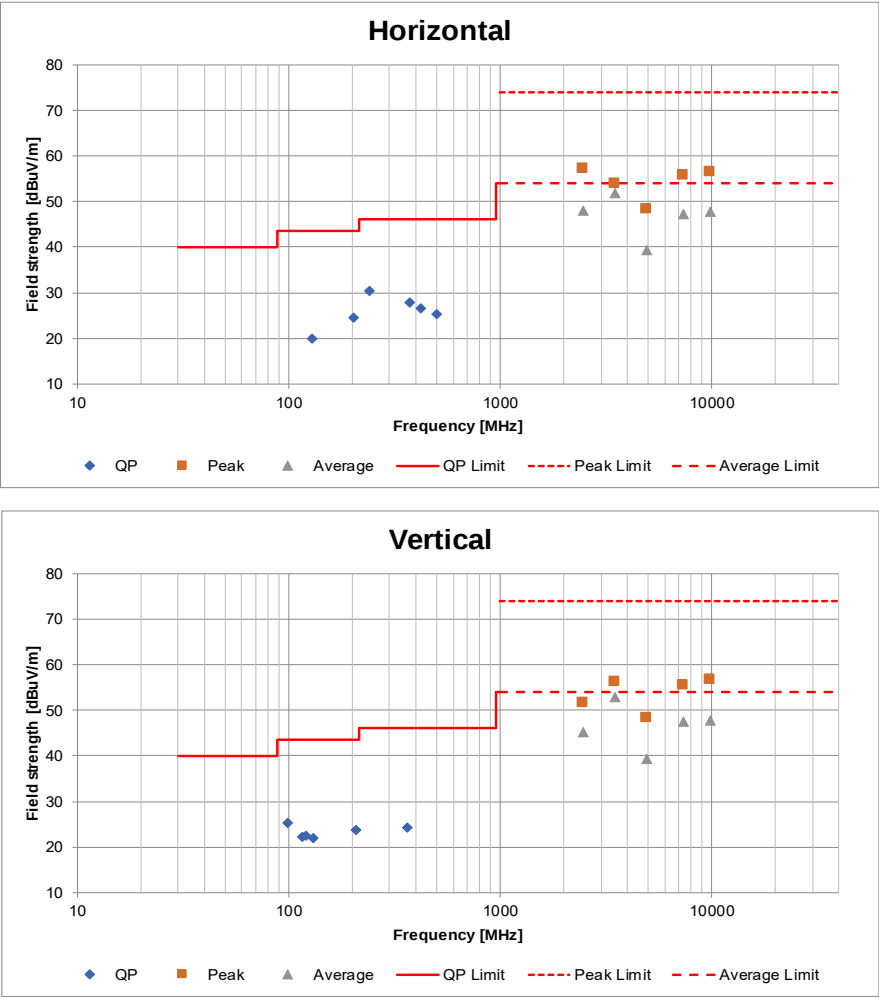
|                        |                     |
|------------------------|---------------------|
| Test place             | Ise EMC Lab.        |
| Semi Anechoic Chamber  | No.3                |
| Date                   | June 5, 2024        |
| Temperature / Humidity | 23 deg. C / 53 % RH |
| Engineer               | Nachi Konegawa      |
|                        | (1 GHz to 6 GHz)    |
| Mode                   | Tx 11n-20 2462 MHz  |



\* 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             | Ise EMC Lab.                       | No.4                 | No.3                               |
| Semi Anechoic Chamber  | No.3                               | June 10, 2024        | June 12, 2024                      |
| Date                   | June 5, 2024                       | 24 deg. C / 55 % RH  | 21 deg. C / 59 % RH                |
| Temperature / Humidity | 23 deg. C / 53 % RH                | Junki Nagatomi       | Hiroyuki Furutaka                  |
| Engineer               | Nachi Konegawa<br>(1 GHz to 6 GHz) | (10 GHz to 26.5 GHz) | (6 GHz to 10 GHz)<br>(Below 1 GHz) |
| Mode                   | Tx 11n-20 2462 MHz                 |                      |                                    |

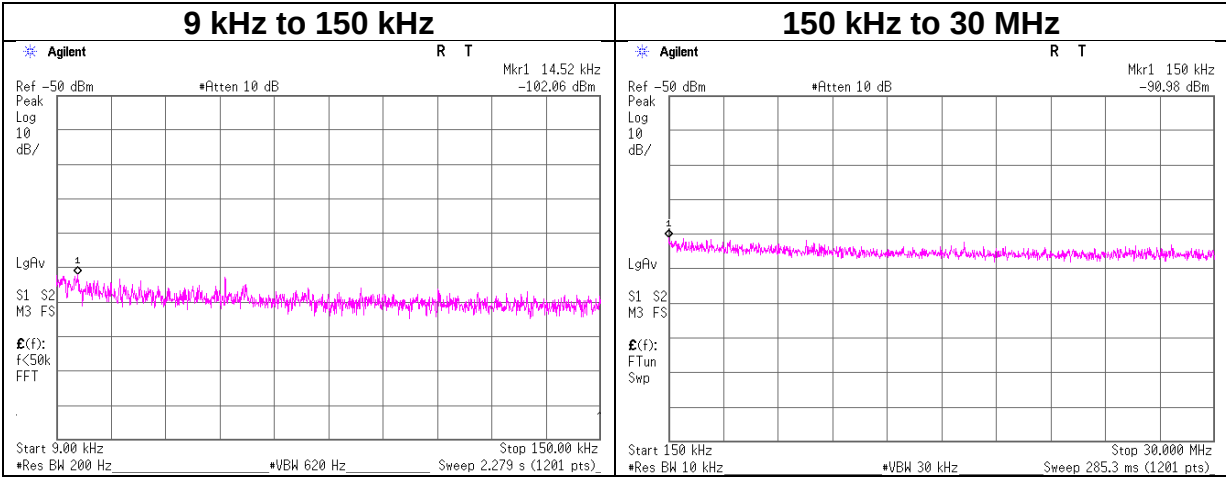


\*These plots data contain sufficient number to show the trend of characteristic features for EUT.

Conducted Spurious Emission

Test place  
Date  
Temperature / Humidity  
Engineer  
Mode

Ise EMC Lab. No.4 Measurement Room  
June 6, 2024  
22 deg. C / 60 % RH  
Hiroki Numata  
Tx 11n-20 2462 MHz



| Frequency | Reading | Cable Loss | Attenuator Loss | Antenna Gain* | N                  | EIRP  | Distance | Ground bounce | E                         | Limit    | Margin | Remark |
|-----------|---------|------------|-----------------|---------------|--------------------|-------|----------|---------------|---------------------------|----------|--------|--------|
| [kHz]     | [dBm]   | [dB]       | [dB]            | [dBi]         | (Number of Output) | [dBm] | [m]      | [dB]          | (field strength) [dBuV/m] | [dBuV/m] | [dB]   |        |
| 14.52     | -102.1  | 1.53       | 9.8             | 2.0           | 2                  | -85.7 | 300      | 6.0           | -24.4                     | 44.3     | 68.7   |        |
| 150.00    | -91.0   | 1.53       | 9.9             | 2.0           | 2                  | -74.6 | 300      | 6.0           | -13.3                     | 24.0     | 37.3   |        |

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 \* log (N)

N: Number of output

\*2.0 dBi was applied to the test result based on ANSI C63.10 since antenna gain was less than 2.0 dBi.

## Power Density

Test place  
Date  
Temperature / Humidity  
Engineer  
Mode

Ise EMC Lab. No.4 Measurement Room  
June 6, 2024  
22 deg. C / 60 % RH  
Hiroki Numata  
Tx

11b Antenna 0

| Freq.<br>[MHz] | Reading<br>[dBm / 3 kHz] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result<br>[dBm / 3 kHz] | Limit<br>[dBm / 3 kHz] | Margin<br>[dB] |
|----------------|--------------------------|-----------------------|------------------------|-------------------------|------------------------|----------------|
| 2412           | -8.66                    | 2.53                  | 10.03                  | 3.90                    | 8.00                   | 4.10           |
| 2437           | -7.79                    | 2.54                  | 10.03                  | 4.78                    | 8.00                   | 3.22           |
| 2462           | -5.77                    | 2.54                  | 10.03                  | <b>6.80</b>             | 8.00                   | 1.20           |

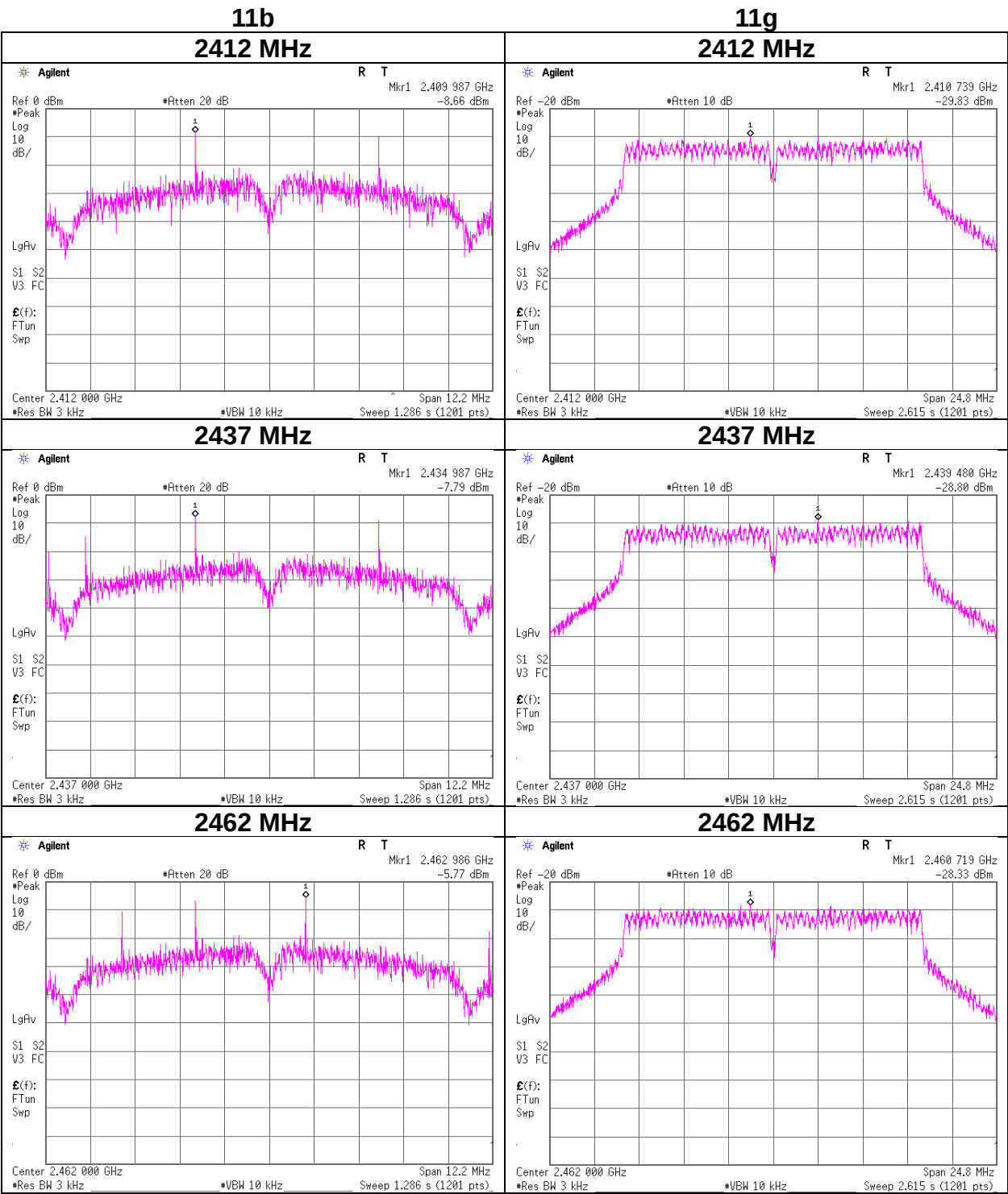
11g Antenna 0

| Freq.<br>[MHz] | Reading<br>[dBm / 3 kHz] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result<br>[dBm / 3 kHz] | Limit<br>[dBm / 3 kHz] | Margin<br>[dB] |
|----------------|--------------------------|-----------------------|------------------------|-------------------------|------------------------|----------------|
| 2412           | -29.83                   | 2.53                  | 10.03                  | -17.27                  | 8.00                   | 25.27          |
| 2437           | -28.80                   | 2.54                  | 10.03                  | -16.23                  | 8.00                   | 24.23          |
| 2462           | -28.33                   | 2.54                  | 10.03                  | <b>-15.76</b>           | 8.00                   | 23.76          |

Sample Calculation:

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

Power Density



## Power Density

|                        |                                    |
|------------------------|------------------------------------|
| Test place             | Ise EMC Lab. No.4 Measurement Room |
| Date                   | June 6, 2024                       |
| Temperature / Humidity | 22 deg. C / 60 % RH                |
| Engineer               | Hiroki Numata                      |
| Mode                   | Tx                                 |

Antenna 0 +1

| Freq. | Antenna 1<br>Result | Antenna 2<br>Result | Result        |              | Limit         | Margin |
|-------|---------------------|---------------------|---------------|--------------|---------------|--------|
| [MHz] | [mW / 3 kHz]        | [mW / 3 kHz]        | [dBm / 3 kHz] | [mW / 3 kHz] | [dBm / 3 kHz] | [dB]   |
| 2412  | 0.029               | 0.025               | -12.65        | 0.054        | 8.00          | 20.65  |
| 2437  | 0.030               | 0.021               | -12.93        | 0.051        | 8.00          | 20.93  |
| 2462  | 0.032               | 0.036               | <b>-11.69</b> | <b>0.068</b> | 8.00          | 19.69  |

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

| Freq. | Reading       | Cable Loss | Atten. Loss | Result        |              | Limit         | Margin |
|-------|---------------|------------|-------------|---------------|--------------|---------------|--------|
| [MHz] | [dBm / 3 kHz] | [dB]       | [dB]        | [dBm / 3 kHz] | [mW / 3 kHz] | [dBm / 3 kHz] | [dB]   |
| 2412  | -27.95        | 2.53       | 10.03       | -15.39        | 0.029        | 8.00          | 23.39  |
| 2437  | -27.78        | 2.54       | 10.03       | -15.21        | 0.030        | 8.00          | 23.21  |
| 2462  | -27.51        | 2.54       | 10.03       | -14.94        | 0.032        | 8.00          | 22.94  |

Antenna 1

| Freq. | Reading       | Cable Loss | Atten. Loss | Result        |              | Limit         | Margin |
|-------|---------------|------------|-------------|---------------|--------------|---------------|--------|
| [MHz] | [dBm / 3 kHz] | [dB]       | [dB]        | [dBm / 3 kHz] | [mW / 3 kHz] | [dBm / 3 kHz] | [dB]   |
| 2412  | -28.51        | 2.53       | 10.03       | -15.95        | 0.025        | 8.00          | 23.95  |
| 2437  | -29.40        | 2.54       | 10.03       | -16.83        | 0.021        | 8.00          | 24.83  |
| 2462  | -27.05        | 2.54       | 10.03       | -14.48        | 0.036        | 8.00          | 22.48  |

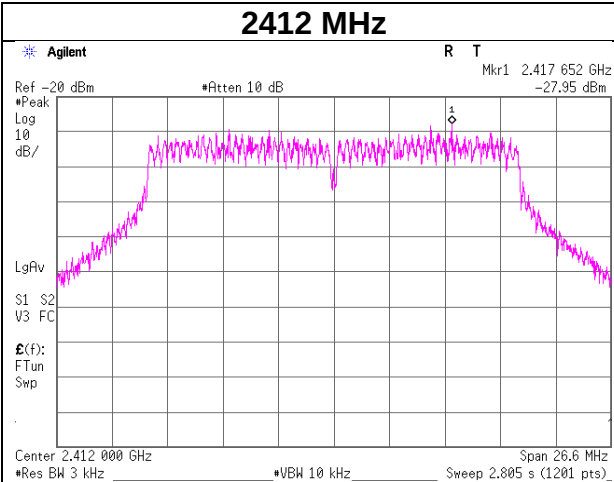
Sample Calculation:

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

Power Density

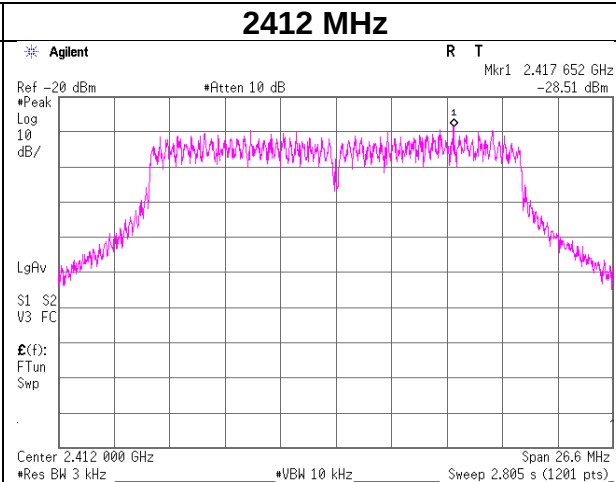
11n-20 Antenna 0

2412 MHz

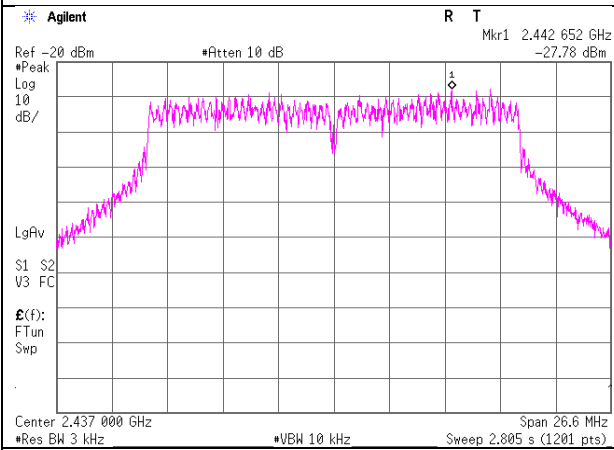


11n-20 Antenna 1

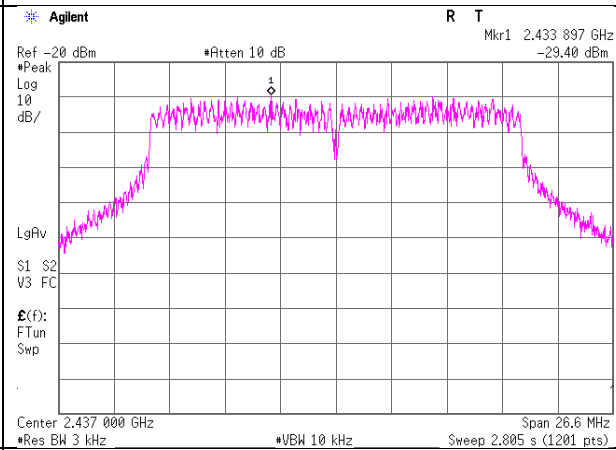
2412 MHz



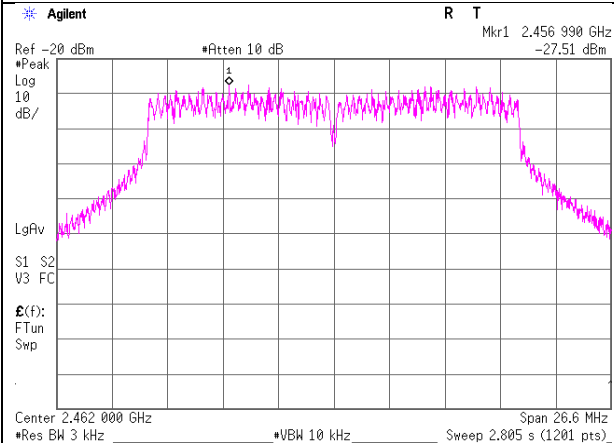
2437 MHz



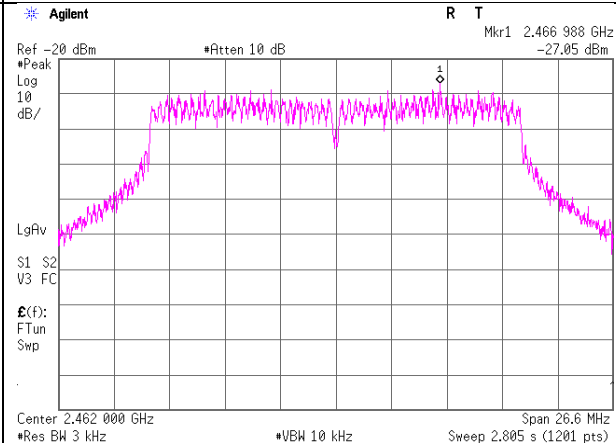
2437 MHz



2462 MHz



2462 MHz



## APPENDIX 2: Test Instruments

### Test Equipment (1/2)

| Test Item | LIMS ID | Description                       | Manufacturer                    | Model                                      | Serial                    | Last Calibration Date | Cal Int |
|-----------|---------|-----------------------------------|---------------------------------|--------------------------------------------|---------------------------|-----------------------|---------|
| RE        | 141232  | High Pass Filter 3.5-18.0GHz      | UL-ISE                          | HPF SELECTOR                               | 001                       | 09/13/2024            | 12      |
| RE        | 141266  | Logperiodic Antenna (200-1000MHz) | Schwarzbeck Mess-Elektronik OHG | VUSLP9111B                                 | 9111B-191                 | 08/23/2024            | 12      |
| RE        | 141296  | High Pass Filter 3.5-18.0GHz      | UL-ISE                          | HPF SELECTOR                               | 002                       | 09/11/2024            | 12      |
| RE        | 141323  | Coaxial cable                     | UL-ISE                          | -                                          | -                         | 09/13/2024            | 12      |
| RE        | 141424  | Biconical Antenna                 | Schwarzbeck Mess-Elektronik OHG | VHA9103+BBA9106                            | 1915                      | 03/15/2024            | 12      |
| RE        | 141506  | Horn Antenna 15-40GHz             | Schwarzbeck Mess-Elektronik OHG | BBHA9170                                   | BBHA9170307               | 08/07/2024            | 12      |
| RE        | 141507  | Horn Antenna 1-18GHz              | Schwarzbeck Mess-Elektronik OHG | BBHA9120D                                  | 258                       | 11/11/2024            | 12      |
| RE        | 141508  | Horn Antenna 1-18GHz              | Schwarzbeck Mess-Elektronik OHG | BBHA9120D                                  | 557                       | 05/17/2024            | 12      |
| RE        | 141532  | DIGITAL HiTESTER                  | HIOKI E.E. CORPORATION          | 3805                                       | 051201197                 | 01/31/2024            | 12      |
| RE        | 141545  | DIGITAL HiTESTER                  | HIOKI E.E. CORPORATION          | 3805                                       | 51201148                  | 02/01/2024            | 12      |
| RE        | 141580  | MicroWave System Amplifier        | Keysight Technologies Inc       | 83017A                                     | MY39500779                | 03/08/2024            | 12      |
| RE        | 141581  | MicroWave System Amplifier        | Keysight Technologies Inc       | 83017A                                     | 00650                     | 10/30/2024            | 12      |
| RE        | 141582  | Pre Amplifier                     | SONOMA INSTRUMENT               | 310                                        | 260834                    | 02/17/2024            | 12      |
| RE        | 141884  | Spectrum Analyzer                 | Keysight Technologies Inc       | E4448A                                     | MY44020357                | 05/09/2024            | 12      |
| RE        | 141903  | Spectrum Analyzer                 | Keysight Technologies Inc       | E4440A                                     | MY46186390                | 01/26/2024            | 12      |
| RE        | 142008  | AC3_Semi Anechoic Chamber(NSA)    | TDK                             | Semi Anechoic Chamber 3m                   | DA-10005                  | 12/11/2023            | 24      |
| RE        | 142013  | AC3_Semi Anechoic Chamber(SVSWR)  | TDK                             | Semi Anechoic Chamber 3m                   | DA-10005                  | 04/12/2023            | 24      |
| RE        | 142017  | AC4_Semi Anechoic Chamber(SVSWR)  | TDK                             | Semi Anechoic Chamber 3m                   | DA-10005                  | 04/14/2023            | 24      |
| RE        | 142037  | Horn Antenna                      | Custom Microwave Inc.           | HO6R                                       | -                         | 09/03/2024            | 12      |
| RE        | 142183  | Measure                           | KOMELON                         | KMC-36                                     | -                         | 10/21/2024            | 12      |
| RE        | 142230  | Measure, Tape, Steel              | KOMELON                         | KMC-36                                     | -                         | -                     | -       |
| RE        | 142314  | Attenuator                        | Pasternack Enterprises          | PE7390-6                                   | D/C 1504                  | 06/06/2024            | 12      |
| RE        | 178648  | EMI measurement program           | TSJ (Techno Science Japan)      | TEPTO-DV                                   | -                         | -                     | -       |
| RE        | 213780  | EMI Test Receiver                 | Rohde & Schwarz                 | ESW8                                       | 103079                    | 01/30/2024            | 12      |
| RE        | 234602  | Microwave Cable                   | Huber+Suhner                    | SF126E/11PC35/11PC35/1000M, 5000M          | 537063/126E / 537074/126E | 03/08/2024            | 12      |
| RE        | 244709  | Thermo-Hygrometer                 | HIOKI E.E. CORPORATION          | LR5001                                     | 231202103                 | 01/25/2024            | 12      |
| RE        | 244710  | Thermo-Hygrometer                 | HIOKI E.E. CORPORATION          | LR5001                                     | 231202104                 | 01/25/2024            | 12      |
| RE        | 245787  | Double Ridge Horn Antenna         | Schwarzbeck Mess-Elektronik OHG | BBHA 9120 C                                | 689                       | 03/06/2024            | 12      |
| RE        | 245788  | Double Ridge Horn Antenna         | Schwarzbeck Mess-Elektronik OHG | BBHA 9120 C                                | 690                       | 03/06/2024            | 12      |
| RE        | 246001  | Microwave Cable                   | Huber+Suhner                    | SF103/11PC35/11PC35/1000mm / SF126E/5000mm | 800673(1m) / 610204(5m)   | 03/06/2024            | 12      |

## Test Equipment (2/2)

| Test Item | LIMS ID | Description                            | Manufacturer              | Model                           | Serial      | Last Calibration Date | Cal Int |
|-----------|---------|----------------------------------------|---------------------------|---------------------------------|-------------|-----------------------|---------|
| AT        | 141156  | Attenuator(10dB)                       | Weinschel Corp            | 2                               | BL1173      | 11/11/2024            | 12      |
| AT        | 141172  | Attenuator(6dB)<br>(above1GHz)         | HIROSE ELECTRIC CO.,LTD.  | AT-106                          | -           | 12/02/2024            | 12      |
| AT        | 141327  | Coaxial Cable                          | UL-ISE                    | -                               | -           | 02/09/2024            | 12      |
| AT        | 141328  | Microwave Cable<br>1G-40GHz            | Suhner                    | SUCOFLEX102                     | 28636/2     | 04/01/2024            | 12      |
| AT        | 141333  | Attenuator(10dB)                       | Suhner                    | 6810.19.A                       | -           | 12/02/2024            | 12      |
| AT        | 141395  | Coaxial Cable                          | UL-ISE                    | -                               | -           | 11/21/2023            | 12      |
| AT        | 141558  | Digital Tester(TRUE<br>RMS MULTIMETER) | Fluke Corporation         | 115                             | 17930030    | 05/17/2024            | 12      |
| AT        | 141805  | Power Meter                            | Anritsu Corporation       | ML2495A                         | 6K00003338  | 08/22/2024            | 12      |
| AT        | 141810  | Power Meter                            | Anritsu Corporation       | ML2495A                         | 824014      | 12/12/2023            | 12      |
| AT        | 141830  | Power sensor                           | Anritsu Corporation       | MA2411B                         | 738285      | 05/22/2024            | 12      |
| AT        | 141832  | Power sensor                           | Anritsu Corporation       | MA2411B                         | 738174      | 12/12/2023            | 12      |
| AT        | 141840  | Power sensor                           | Anritsu Corporation       | MA2411B                         | 011737      | 08/22/2024            | 12      |
| AT        | 141903  | Spectrum Analyzer                      | Keysight Technologies Inc | E4440A                          | MY46186390  | 01/26/2024            | 12      |
| AT        | 141978  | Spectrum Analyzer                      | Keysight Technologies Inc | E4448A                          | MY46180899  | 05/09/2024            | 12      |
| AT        | 197219  | Microwave cable                        | Huber+Suhner              | SF126E/11PC35/<br>11PC35/2000MM | 536999/126E | 03/19/2024            | 12      |
| AT        | 244709  | Thermo-Hygrometer                      | HIOKI E.E.<br>CORPORATION | LR5001                          | 231202103   | 01/25/2024            | 12      |
| AT        | 244710  | Thermo-Hygrometer                      | HIOKI E.E.<br>CORPORATION | LR5001                          | 231202104   | 01/25/2024            | 12      |
| AT        | 244712  | Thermo-Hygrometer                      | HIOKI E.E.<br>CORPORATION | LR5001                          | 231202106   | 01/25/2024            | 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:

AT: Antenna Terminal Conducted test

RE: Radiated Emission