# RADIO TEST REPORT

## Test Report No. 15247953H-B-R1

| | |
|---|---|
| **Customer** | **Silex Technology, Inc.** |
| **Description of EUT** | **Low Latency Wireless Device** |
| **Model Number of EUT** | **LLW-4250** |
| **FCC ID** | **N6C-LLW4250** |
| **Test Regulation** | **FCC Part 15 Subpart E** |
| **Test Result** | **Complied** |
| **Issue Date** | **August 26, 2024** |
| **Remarks** | **WLAN (5 GHz band) part**<br>**Except for DFS test** |

| Representative Test Engineer | Approved By |
|---|---|
|  |  |
| Tomoya Sone<br>Engineer | Satofumi Matsuyama<br>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. 15247953H-B

This report is a revised version of 15247953H-B. 15247953H-B is replaced with this report

| Revision | Test Report No. | Date | Page Revised Contents |
|---|---|---|---|
| - (Original) | 15247953H-B-R1 | August 8, 2024 | - |
| 1 | 15247953H-B-R1 | August 26, 2024 | p.6, 11 Modified Antenna numbers:<br>Antenna 0, 1, 2, 3 → Antenna 1, 2, 3, 4 |
| 1 | 15247953H-B-R1 | August 26, 2024 | p.11 Modified tested frequency for Maximum Conducted Output Power and Maximum Power Spectral Density:<br>5220 MHz → 5200 MHz |
| 1 | 15247953H-B-R1 | August 26, 2024 | p.11, 21 Modified tested frequency for 99 % Occupied Bandwidth: 5220 MHz → 5200 MHz |
| 1 | 15247953H-B-R1 | August 26, 2024 | p.46 Modified tested frequency:<br>5720 MHz → 5725 MHz |

## 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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# SECTION 1: Customer Information

| | |
|---|---|
| Company Name | Silex Technology, Inc. |
| Address | 2-3-1 Hikaridai, Seika-cho, Soraku-gun, Kyoto 619-0237, Japan |
| Telephone Number | +81-774-98-3878 |
| Contact Person | Keisuke Ishiro |

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 | Low Latency Wireless Device |
| Model Number | LLW-4250 |
| 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 | April 22, 2024 |
| Test Date | April 23 to May 28, 2024 |

## 2.2 Product Description

**General Specification**

| | |
|---|---|
| Rating | DC 12 V (AC Adapter Input),<br>DC 24 V (DC Power Input),<br>DC 48 V (PoE Input) |
| Operating temperature | 0 deg. C to 40 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[a)] | 1.5 dBi (Antenna 1, 2, 3, 4) |

**WLAN (IEEE802.11a/11n-20)**

| | | | |
|---|---|---|---|
| Equipment Type | Transceiver | | |
| Frequency of Operation | 5180 MHz to 5240 MHz<br>5260 MHz to 5320 MHz<br>5500 MHz to 5700 MHz<br>5745 MHz to 5825 MHz | | |
| Type of Modulation | OFDM | | |
| Antenna Gain[a)] | 1.6 dBi | 5180 MHz to 5240 MHz | (Antenna 1, 2, 3, 4) |
| | 1.7 dBi | 5260 MHz to 5320 MHz | (Antenna 1, 2, 3, 4) |
| | 1.7 dBi | 5500 MHz to 5700 MHz | (Antenna 1, 2, 3, 4) |
| | 1.6 dBi | 5745 MHz to 5825 MHz | (Antenna 1, 2, 3, 4) |

*The Antenna 3 and 4 are only used to detect DFS Rader signals and not to transmit them.

# SECTION 3: Test specification, Procedures & Results

## 3.1 Test Specification

| | |
|---|---|
| Test Specification | FCC Part 15 Subpart E<br>The latest version on the first day of the testing period |
| Title | FCC 47 CFR Part 15 Radio Frequency Device Subpart E<br>Unlicensed National Information Infrastructure Devices<br>Section 15.407 General technical requirements |

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

## 3.2 Procedures and Results

| Item | Test Procedure | Specification | Worst Margin | Results | Remarks |
|---|---|---|---|---|---|
| Conducted Emission | **FCC:** ANSI C63.10-2013<br>**ISED:** RSS-Gen 8.8 | **FCC:** 15.407 (b) (6) / 15.207<br>**ISED:** RSS-Gen 8.8 | 6.50 dB,<br>0.49658 MHz,<br>L, AV | Complied | - |
| 26 dB Emission Bandwidth | **FCC:** KDB Publication Number 789033<br>**ISED:** - | **FCC:** 15.407 (a) (1) (2) (3)<br>**ISED:** - | See data | Complied | Conducted |
| Maximum Conducted Output Power | **FCC:** KDB Publication Number 789033<br>**ISED:** - | **FCC:** 15.407 (a) (1) (2) (3)<br>**ISED:** RSS-247 6.2.1.1<br>6.2.2.1<br>6.2.3.1<br>6.2.4.1 | | Complied | Conducted |
| Maximum Power Spectral Density | **FCC:** KDB Publication Number 789033<br>**ISED:** - | **FCC :** 15.407 (a) (1) (2) (3)<br>**ISED:** RSS-247 6.2.1.1<br>6.2.2.1<br>6.2.3.1<br>6.2.4.1 | | Complied | Conducted |
| Spurious Emission Restricted Band Edge | **FCC:** ANSI C63.10-2013 KDB Publication Number 789033<br>**ISED:** - | **FCC:** 15.407 (b), 15.205 and 15.209<br>**ISED:** RSS-247 6.2.1.2<br>6.2.2.2<br>6.2.3.2<br>6.2.4.2 | 0.5 dB<br>68.4 MHz,<br>QP, Vert. | Complied | Conducted (< 30 MHz) / Radiated (> 30 MHz) *1) |
| 6 dB Emission Bandwidth | **FCC:** ANSI C63.10-2013<br>**ISED:** - | **FCC:** 15.407 (e)<br>**ISED:** RSS-247 6.2.4.1 | See data | Complied | Conducted |

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) Radiated test was selected over 30 MHz based on RSS-247 6.2 and KDB 789033 D02 G.3.b).

**FCC Part 15.31 (e)**
This EUT provides the stable voltage constantly to RF Module part regardless of input voltage. Therefore, this EUT complies with the requirement.

**FCC Part 15.203 Antenna requirement**
The EUT has a unique coupling/antenna connector (Revers SMA). Therefore the equipment complies with the requirement of 15.203.

## 3.3 Addition to Standard

| Item | Test Procedure | Specification | Worst Margin | Results | Remarks |
|---|---|---|---|---|---|
| 99 % Occupied Band Width | **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.

**Conducted emission**

| Item | Frequency range | Unit | Calculated Uncertainty (+/-) |
|---|---|---|---|
| AMN (LISN) | 0.15 MHz to 30 MHz | dB | 3.3 |

**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 | - | - |

* Size of vertical conducting plane (for Conducted Emission test): 2.0 x 3.0 m for No.1, No.2, No.3, No.4, and No.5 semi-anechoic chambers and No.3 and No.4 shielded rooms.

## 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 802.11a (11a) | 6 Mbps, PN9 |
| IEEE 802.11n MIMO 20 MHz BW (11n-20) | MCS 9, PN9 |
| *Transmitting duty was 100 % on all tests.<br>*The worst antenna and condition was determined based on the test result of Maximum Conducted Output Power. | |
| *Power of the EUT was set by the software as follows;<br>Power Setting: Refer to the following table<br>Software: Tera Term Version: 4.106<br>(Date: 2024.04.11, Storage location: Driven by connected PC)<br><br>*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>*The power setting below is adjusted for testing so that the maximum power of EUT's product specification will be outputted. Therefore, the below power is different from the production model. | |

[Power Setting]

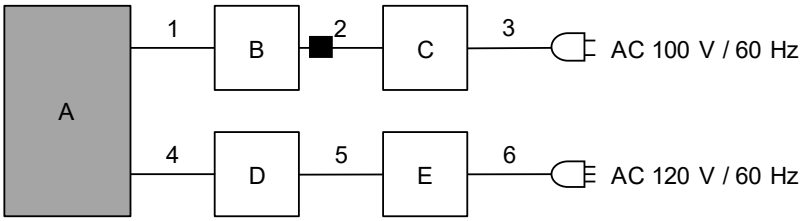
| Mode | Ch | Frequency | Power Setting [dBm] |
|---|---|---|---|
| 11a | 36 | 5180 MHz | 16 |
| | 40 | 5200 MHz | |
| | 48 | 5240 MHz | 17 |
| | 52 | 5260 MHz | |
| | 60 | 5300 MHz | |
| | 64 | 5320 MHz | 17.5 |
| | 100 | 5500 MHz | 17 |
| | 116 | 5580 MHz | 17.5 |
| | 120 | 5600 MHz | |
| | 140 | 5700 MHz | |
| | 149 | 5745 MHz | 18.5 |
| | 157 | 5785 MHz | |
| | 165 | 5825 MHz | |
| 11n-20 | 36 | 5180 MHz | 16 |
| | 40 | 5200 MHz | 15.5 |
| | 48 | 5240 MHz | 16 |
| | 52 | 5260 MHz | |
| | 60 | 5300 MHz | 15.5 |
| | 64 | 5320 MHz | |
| | 100 | 5500 MHz | 15 |
| | 116 | 5580 MHz | 14.5 |
| | 120 | 5600 MHz | |
| | 140 | 5700 MHz | 15 |
| | 149 | 5745 MHz | |
| | 157 | 5785 MHz | 14.5 |
| | 165 | 5825 MHz | 15 |

*The Details of Operation Mode(s)

| Test Item | Operating Mode | Tested Antenna | Tested Frequency | | | |
|---|---|---|---|---|---|---|
| | | | Lower Band | Middle Band | Additional Band | Upper Band |
| Conducted emission | Tx 11n-20 *1) | 1 + 2 | - | 5320 MHz | - | - |
| 26 dB Emission Bandwidth | Tx 11a<br>Tx 11n-20 | 1 | - | 5260 MHz<br>5300 MHz<br>5320 MHz | 5500 MHz<br>5580 MHz<br>5700 MHz | - |
| Maximum Conducted Output Power | Tx 11a | 1 | 5180 MHz<br>5200 MHz<br>5240 MHz | 5260 MHz<br>5300 MHz<br>5320 MHz | 5500 MHz<br>5580 MHz<br>5700 MHz | 5745 MHz<br>5785 MHz<br>5825 MHz |
| | Tx 11n-20 | 1 + 2 | | | | |
| Maximum Power Spectral Density | Tx 11n-20 | 1 + 2 | 5180 MHz<br>5200 MHz<br>5240 MHz | 5260 MHz<br>5300 MHz<br>5320 MHz | 5500 MHz<br>5580 MHz<br>5700 MHz | 5745 MHz<br>5785 MHz<br>5825 MHz |
| 99 % Occupied Bandwidth | Tx 11a<br>Tx 11n-20 | 1 | 5180 MHz<br>5200 MHz<br>5240 MHz | 5260 MHz<br>5300 MHz<br>5320 MHz | 5500 MHz<br>5580 MHz<br>5700 MHz | 5745 MHz<br>5785 MHz<br>5825 MHz |
| 6 dB Bandwidth | Tx 11a<br>Tx 11n-20 | 1 | - | - | - | 5745 MHz<br>5785 MHz<br>5825 MHz |
| Radiated Spurious Emission (Below 1 GHz) | Tx 11n-20 *1) | 1 + 2 | - | 5320 MHz | - | - |
| Radiated Spurious Emission (Above 1 GHz) | Tx 11n-20 *1) | 1 + 2 | 5180 MHz<br>5240 MHz | 5320 MHz | 5500 MHz<br>5580 MHz<br>5700 MHz | 5745 MHz<br>5785 MHz<br>5825 MHz |
| Conducted Spurious Emission | Tx 11n-20 *1) | 1 | - | 5320 MHz | - | - |
| *1) The mode was tested as a representative, because it had the highest power at antenna terminal test. | | | | | | |

## 4.2 Configuration and Peripherals

**Conducted Emission test**




■ : Standard Ferrite Core

* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.
* The power supply for the following three systems and pre-checked as follows.
(1) Power supply using AC adapter (120 V)
(2) Power supply using AC adapter (240 V)
(3) DC 24 V power supply (via regulated power supply (120 V))
(4) PoE power supply from LAN Hub (120 V)
From the result of pre-check, the test configuration for this test is as above.

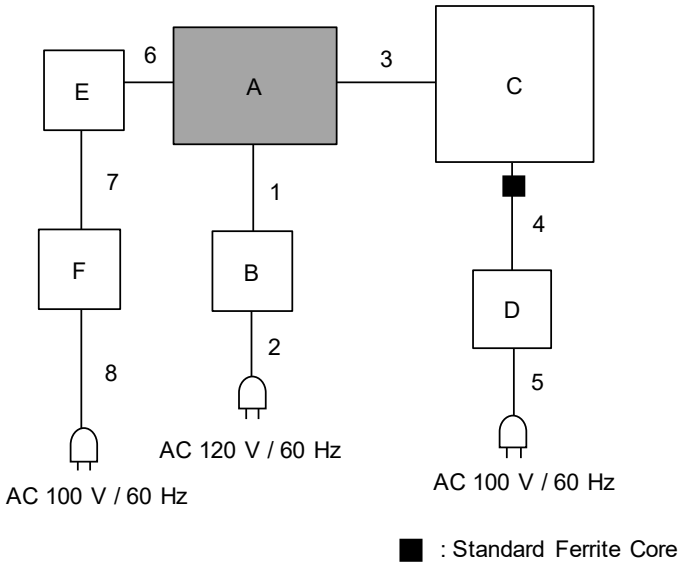
**Description of EUT and Support Equipment**

| No. | Item | Model Number | Serial Number | Manufacturer | Remarks |
|---|---|---|---|---|---|
| A | Low Latency Wireless Device | LLW-4250 | 84253FED6E78 | Silex Technology, Inc. | EUT |
| B | Laptop PC | CF-SV8RDCVS | 0FKSC24469 | Panasonic Corporation | - |
| C | AC Adapter | CF-AA6532A M1 | 6532AM120422507A | Panasonic Corporation | - |
| D | 5-Port Gigabit Desktop Switch with 4-Port PoE+ | TL-SG1005P | 22150D7003448 | tp-link | - |
| E | AC Adapter | T535131-2-DT | 200037-15 | tp-link | - |

**List of Cables Used**

| No. | Name | Length (m) | Shield | | Remarks |
|---|---|---|---|---|---|
| | | | Cable | Connector | |
| 1 | LAN Cable | 1.6 | Unshielded | Unshielded | - |
| 2 | DC Cable | 0.9 | Unshielded | Unshielded | - |
| 3 | AC Cable | 0.8 | Unshielded | Unshielded | - |
| 4 | LAN Cable | 1.6 | Unshielded | Unshielded | - |
| 5 | DC Cable | 1.2 | Unshielded | Unshielded | - |
| 6 | AC Cable | 1.0 | Unshielded | Unshielded | - |

**Radiated Emission test**




* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.
* The power supply for the following three systems and pre-checked as follows.
(1) Power supply using AC adapter (120 V)
(2) DC 24 V power supply
(3) PoE power supply from LAN Hub
Above 1 GHz was (1) AC 120 V powered, as shown in the above configuration diagram.
Item B, cable1 and cable2 were not used for (3) PoE power supply in Below 1 GHz.

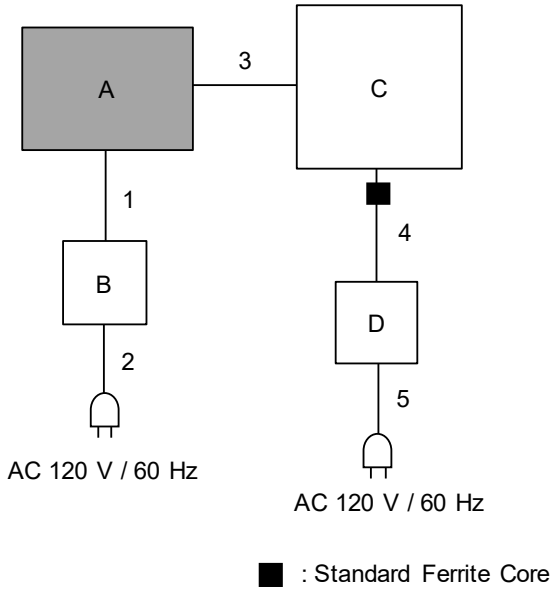
**Description of EUT and Support Equipment**

| No. | Item | Model Number | Serial Number | Manufacturer | Remarks |
|---|---|---|---|---|---|
| A | Low Latency Wireless Device | LLW-4250 | 84253FED6E78 | Silex Technology, Inc. | EUT |
| B | AC Adapter | ATS036T-A120 | 151273-11 | Adapter Technology Co., Ltd. | - |
| C | Laptop PC | CF-SV8RDCVS | 0HKSC51454 | Panasonic Corporation | - |
| D | AC Adapter | CF-AA65D2A M1 | 65D2AM120Y033282WWA | Panasonic Corporation | - |
| E | 5-Port Gigabit Desktop Switch with 4-Port PoE+ | TL-SG1005P | 22150D7003448 | tp-link | - |
| F | AC Adapter | T535131-2-DT | 200037-15 | tp-link | - |

**List of Cables Used**

| No. | Name | Length (m) | Shield | | Remarks |
|---|---|---|---|---|---|
| | | | Cable | Connector | |
| 1 | DC Cable | 1.5 | Unshielded | Unshielded | - |
| 2 | AC Cable | 0.9 | Unshielded | Unshielded | - |
| 3 | LAN Cable | 1.5 | Unshielded | Unshielded | - |
| 4 | DC Cable | 0.9 | Unshielded | Unshielded | - |
| 5 | AC Cable | 0.8 | Unshielded | Unshielded | - |
| 6 | LAN Cable | 1.6 | Unshielded | Unshielded | - |
| 7 | DC Cable | 1.2 | Unshielded | Unshielded | - |
| 8 | AC Cable | 1.5 | Unshielded | Unshielded | - |

**Antenna Terminal Conducted Tests**




* 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 | Low Latency Wireless Device | LLW-4250 | 84253FED6E78 | Silex Technology, Inc. | EUT |
| B | AC Adapter | ATS036T-A120 | 151273-11 | Adapter Technology Co., Ltd. | - |
| C | Laptop PC | CF-SV8RDCVS | 0HKSC51454 | Panasonic Corporation | - |
| D | AC Adapter | CF-AA6532A M1 | 6532AM120720658A | Panasonic Corporation | - |

**List of Cables Used**

| No. | Name | Length (m) | Shield | | Remarks |
|---|---|---|---|---|---|
| | | | Cable | Connector | |
| 1 | DC Cable | 1.5 | Unshielded | Unshielded | - |
| 2 | AC Cable | 0.9 | Unshielded | Unshielded | - |
| 3 | LAN Cable | 1.5 | Unshielded | Unshielded | - |
| 4 | DC Cable | 0.9 | Unshielded | Unshielded | - |
| 5 | AC Cable | 0.8 | Unshielded | Unshielded | - |

## SECTION 5: Conducted Emission

**Test Procedure and Conditions**

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.
The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals was aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN) and excess AC cable was bundled in center.

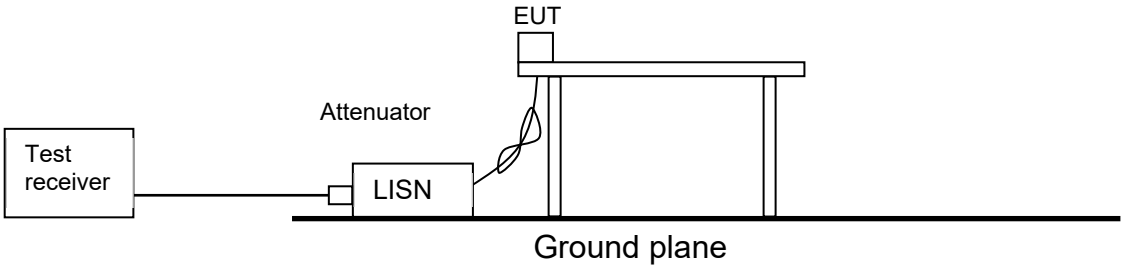
For the tests on EUT with other peripherals (as a whole system)
I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. All unused 50 ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber.
The EUT was connected to a LISN (AMN) via AC adapter and PoE HUB.
An overview sweep with peak detection has been performed.

Test results are rounded off and limit are rounded down, so some differences might be observed.

**Detector : QP and CISPR Average**
**Measurement Range : 0.15 MHz to 30 MHz**
**Test Data : APPENDIX**
**Test Result : Pass**

**Figure 1: Test Setup**



# SECTION 6: Radiated Spurious Emission and Band Edge Compliance

**Test Procedure**

< 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.

< 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.

< Below 1 GHz >

The result also satisfied with the general limits specified in section 15.209 (a).

< Above 1 GHz >

Inside of restricted bands (Section 15.205):

Apply to limit in the Section 15.209 (a).

Outside of the restricted bands:

Apply to limit 68.2 dBuV/m, 3 m (-27 dBm e.i.r.p.*) in the Section 15.407 (b) (1) (2) (3).

Restricted band edge:

Apply to limit in the Section 15.209 (a).
Since this limit is severer than the limit of the inside of restricted bands.

*Electric field strength to e.i.r.p. conversion:

$E = \frac{1000000\sqrt{30P}}{3}$ (uV/m) :*P* is the e.i.r.p. (Watts)

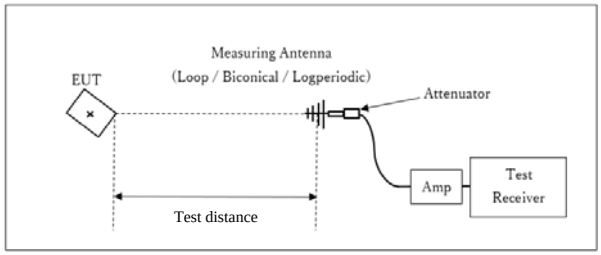
**Test Antennas are used as below;**

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

| Frequency | Below 1 GHz | Above 1 GHz | |
|---|---|---|---|
| Instrument Used | Test Receiver | Spectrum Analyzer | |
| Detector | QP | Peak | Average |
| IF Bandwidth | BW: 120 kHz | RBW: 1 MHz<br>VBW: 3 MHz | Method AD<br>RBW: 1 MHz<br>VBW: 3 MHz<br>Detector: Power Averaging (RMS)<br>Trace: ≥ 100 traces<br>If duty cycle was less than 98%, a duty factor was added to the results. |

**Figure 2: Test Setup**

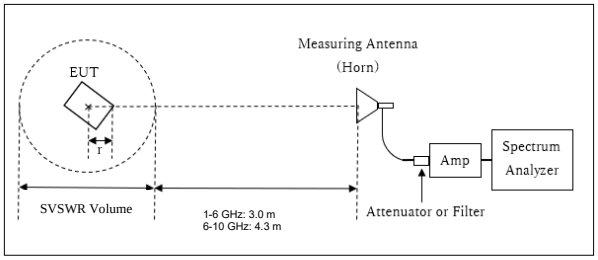
Below 1 GHz




× : Center of turn table

Test Distance: 3 m

1 GHz to 10 GHz




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

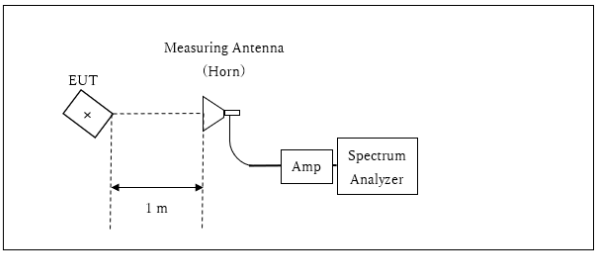
**[1 GHz to 6 GHz]**
Distance Factor: 20 x log (3.75 m / 3.0 m) = 1.94 dB
* Test Distance: (3 + SVSWR Volume /2) - r = 3.75 m

SVSWR Volume : 2.0 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
r = 0.25 m

**[6 GHz to 10 GHz]**
Distance Factor: 20 x log (4.75 m / 3.0 m) = 4.00 dB
* Test Distance: (4.3 + SVSWR Volume /2) - r = 4.75 m

SVSWR Volume : 1.4 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
r = 0.25 m

10 GHz to 40 GHz




× : Center of turn table

Distance Factor: 20 x log (1.0 m / 3.0 m) = -9.5 dB
*Test Distance: 1 m

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

Test results are rounded off and limit are rounded down, so some differences might be observed.

**Measurement Range : 30 MHz to 40 GHz**
**Test Data : APPENDIX**
**Test Result : Pass**

# SECTION 7: 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 and Test method |
|---|---|---|---|---|---|---|---|
| 26 dB Bandwidth | Enough to capture the emission | Close to 1 % of EBW | > RBW | Auto | Peak | Max Hold | Spectrum Analyzer |
| 99 % Occupied Bandwidth *1) | Enough width to display emission skirts | 1 % to 5 % of OBW | ≥ 3 RBW | Auto | Peak | Max Hold | Spectrum Analyzer |
| 6 dB Bandwidth | Enough to capture the emission | 100 kHz | 300 kHz | Auto | Peak | Max Hold | Spectrum Analyzer |
| Maximum Conducted Output Power | - | - | - | Auto | Average | - | Power Meter (Sensor: 80 MHz BW) (Method PM-G) |
| Maximum Power Spectral Density | Encompass the entire EBW | 1 MHz or 470 kHz *2) | ≥ 3 RBW | Auto | RMS Power Averaging (200 times) | Clear Write | Spectrum Analyzer |
| Conducted Spurious Emission*3) *4) | 9 kHz to 150 kHz | 200 Hz | 620 Hz | Auto | Peak | Max Hold | Spectrum Analyzer |
| | 150 kHz to 30 MHz | 10 kHz | 30 kHz | | | | |

*1) Peak hold was applied as Worst-case measurement.
*2) KDB 789033 D02 says that RBW is set to be 500 kHz for 5.725 GHz to 5.850 GHz, but it is not possible with spectrum analyzer, so RBW Correction Factor (10 log(500 kHz / 470 kHz)) was added to the test result.
*3) In the frequency range below 30 MHz, 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 to 150 kHz: RBW = 200 Hz, 150 kHz to 30 MHz: RBW = 10 kHz)
*4) The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ohmes. 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.

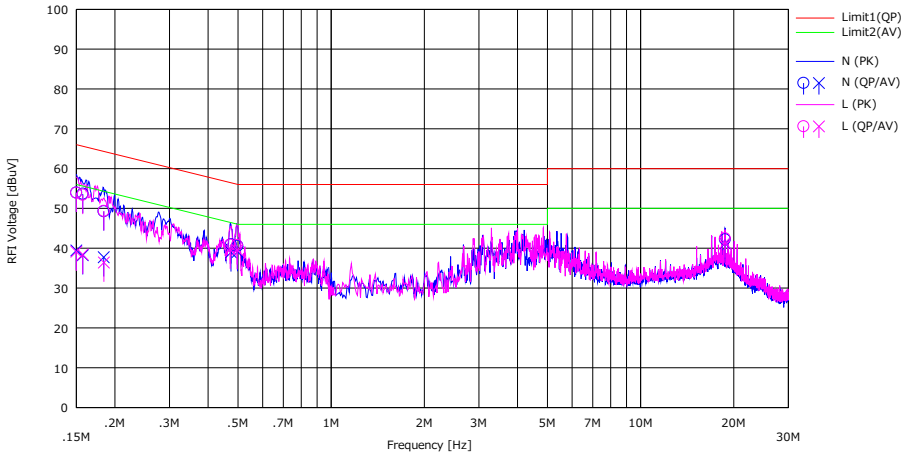
**Test Data : APPENDIX**
**Test Result : Pass**

# APPENDIX 1: Test Data

## Conducted Emission

| | |
|---|---|
| Test place | Ise EMC Lab. No.4 Semi Anechoic Chamber |
| Date | May 28, 2024 |
| Temperature / Humidity | 22 deg. C / 60 % RH |
| Engineer | Yuichiro Yamazaki |
| Mode | Tx 11n-20 5320 MHz |

Limit : FCC_Part 15 Subpart E(15.207)




| No. | Freq. | Reading | | LISN | LOSS | Results | | Limit | | Margin | | Phase | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 〈QP〉 | 〈AV〉 | | | 〈QP〉 | 〈AV〉 | 〈QP〉 | 〈AV〉 | 〈QP〉 | 〈AV〉 | | |
| | [MHz] | [dBuV] | [dBuV] | [dB] | [dB] | [dBuV] | [dBuV] | [dBuV] | [dBuV] | [dB] | [dB] | | |
| 1 | 0.15000 | 40.70 | 26.20 | 0.06 | 13.18 | 53.94 | 39.44 | 66.00 | 56.00 | 12.06 | 16.56 | N | |
| 2 | 0.15735 | 40.40 | 25.00 | 0.06 | 13.18 | 53.64 | 38.24 | 65.60 | 55.60 | 11.96 | 17.36 | N | |
| 3 | 0.18404 | 36.00 | 24.50 | 0.06 | 13.18 | 49.24 | 37.74 | 64.30 | 54.30 | 15.06 | 16.56 | N | |
| 4 | 0.47433 | 27.70 | 25.70 | 0.06 | 13.22 | 40.98 | 38.98 | 56.44 | 46.44 | 15.46 | 7.46 | N | |
| 5 | 0.49809 | 27.30 | 25.80 | 0.06 | 13.22 | 40.58 | 39.08 | 56.03 | 46.03 | 15.45 | 6.95 | N | |
| 6 | 18.74431 | 28.00 | 27.00 | 0.37 | 13.85 | 42.22 | 41.22 | 60.00 | 50.00 | 17.78 | 8.78 | N | |
| 7 | 0.15000 | 40.70 | 25.90 | 0.03 | 13.18 | 53.91 | 39.11 | 66.00 | 56.00 | 12.09 | 16.89 | L | |
| 8 | 0.15730 | 40.20 | 25.20 | 0.03 | 13.18 | 53.41 | 38.41 | 65.61 | 55.61 | 12.20 | 17.20 | L | |
| 9 | 0.18413 | 36.10 | 23.20 | 0.04 | 13.18 | 49.32 | 36.42 | 64.30 | 54.30 | 14.98 | 17.88 | L | |
| 10 | 0.47165 | 27.60 | 26.40 | 0.04 | 13.22 | 40.86 | 39.66 | 56.48 | 46.48 | 15.62 | 6.82 | L | |
| 11 | 0.49658 | 27.50 | 26.30 | 0.04 | 13.22 | 40.76 | 39.56 | 56.06 | 46.06 | 15.30 | 6.50 | L | |
| 12 | 18.73931 | 28.20 | 27.10 | 0.40 | 13.85 | 42.45 | 41.35 | 60.00 | 50.00 | 17.55 | 8.65 | L | |

CHART: WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + C.F (LISN + CABLE + ATT)
Except for the above table: adequate margin data below the limits.

# 26 dB Emission Bandwidth and 99 % Occupied Bandwidth

| | |
|---|---|
| Test place | Ise EMC Lab. No.8 Measurement Room |
| Date | May 23, 2024 |
| Temperature / Humidity | 25 deg. C / 57 % RH |
| Engineer | Shousei Hamaguchi |
| Mode | Tx |

11a

| Antenna | Tested Frequency [MHz] | 26 dB Emission Bandwidth [MHz] | 99 % Occupied Bandwidth [kHz] |
|---|---|---|---|
| Antenna 1 | 5180 | - | 16552.4 |
| | 5200 | - | 16556.8 |
| | 5240 | - | ***16688.5*** |
| | 5260 | 22.037 | ***16686.1*** |
| | 5300 | 21.405 | 16523.6 |
| | 5320 | 21.321 | 16512.3 |
| | 5500 | 21.767 | 16598.2 |
| | 5580 | 22.672 | 16593.7 |
| | 5700 | 22.082 | ***16628.9*** |
| | 5745 | - | 16569.8 |
| | 5785 | - | 16601.1 |
| | 5825 | - | ***16777.4*** |

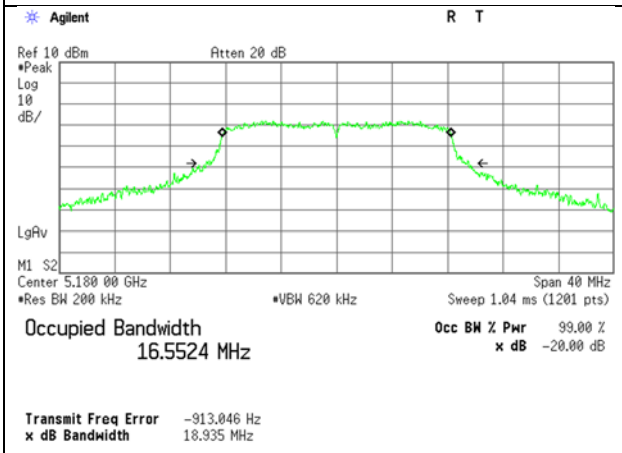
11n-20

| Antenna | Tested Frequency [MHz] | 26 dB Emission Bandwidth [MHz] | 99 % Occupied Bandwidth [kHz] |
|---|---|---|---|
| Antenna 1 | 5180 | - | 17695.4 |
| | 5200 | - | ***17697.3*** |
| | 5240 | - | 17671.9 |
| | 5260 | 22.302 | ***17695.8*** |
| | 5300 | 21.610 | 17690.8 |
| | 5320 | 22.093 | 17694.8 |
| | 5500 | 22.198 | 17688.6 |
| | 5580 | 22.463 | ***17698.5*** |
| | 5700 | 21.676 | 17686.9 |
| | 5745 | - | 17687.2 |
| | 5785 | - | 17674.3 |
| | 5825 | - | ***17696.6*** |

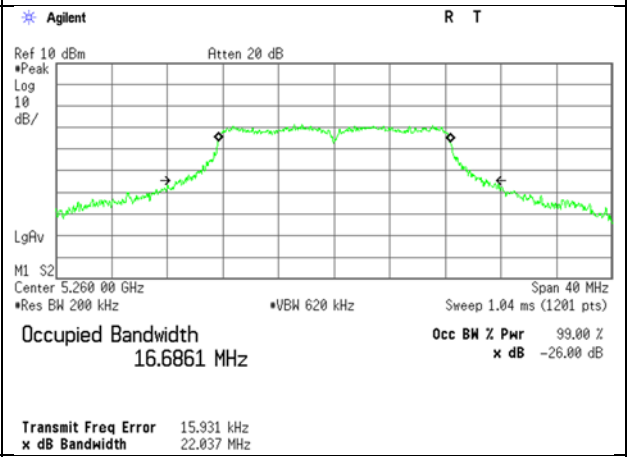
# 26 dB Emission Bandwidth and 99 % Occupied Bandwidth

## 11a, Antenna 1

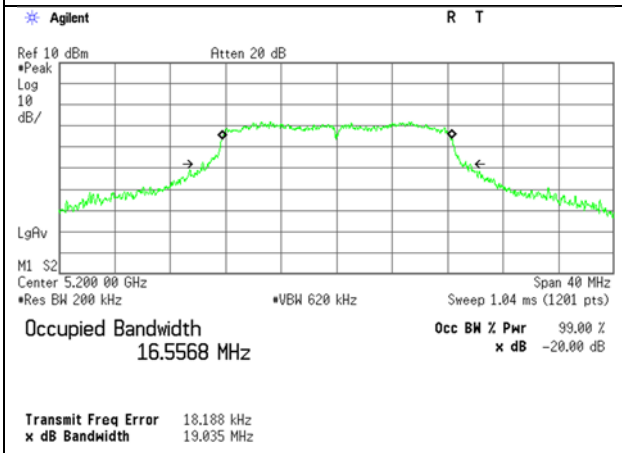
### 5180 MHz



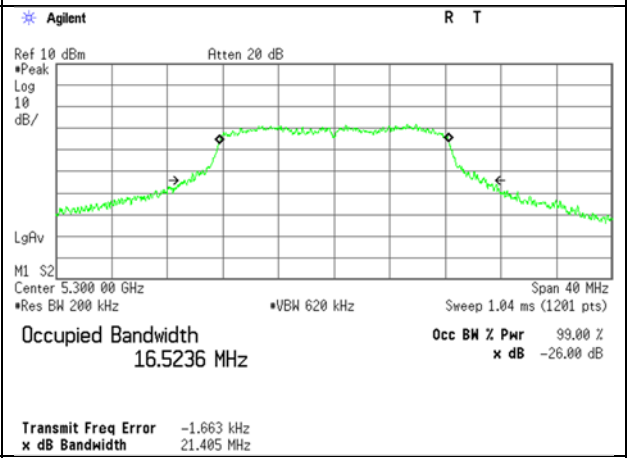

### 5260 MHz



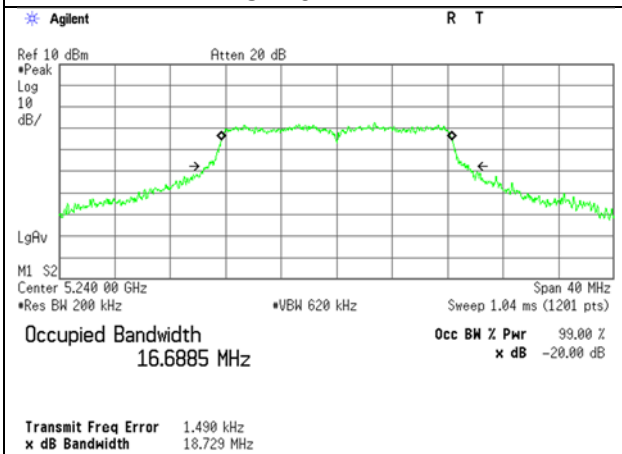

### 5200 MHz



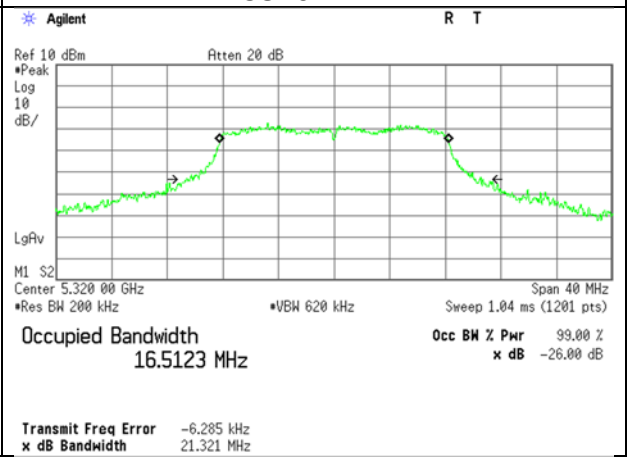

### 5300 MHz




### 5240 MHz



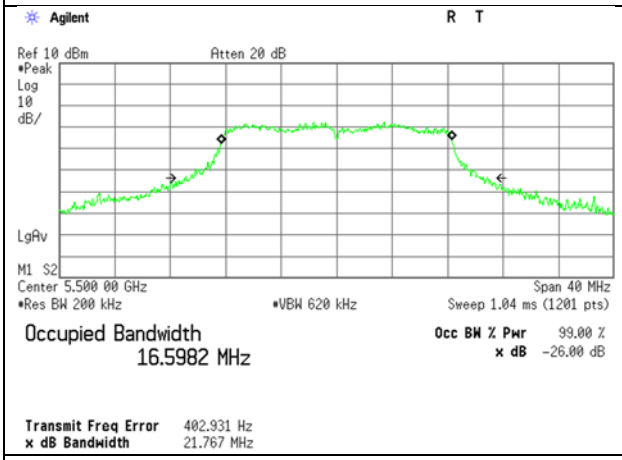

### 5320 MHz



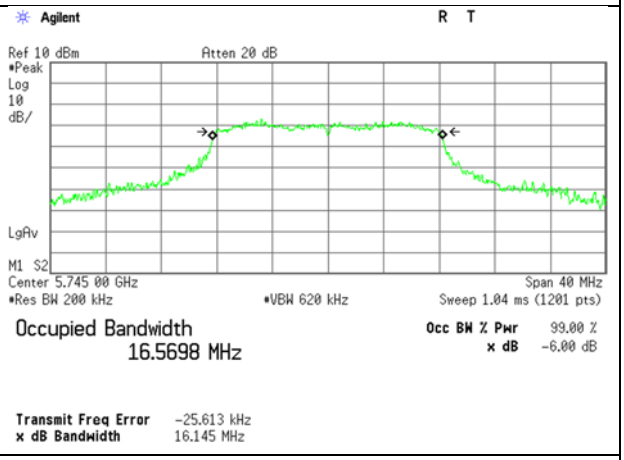
# 26 dB Emission Bandwidth and 99 % Occupied Bandwidth

## 11a, Antenna 1

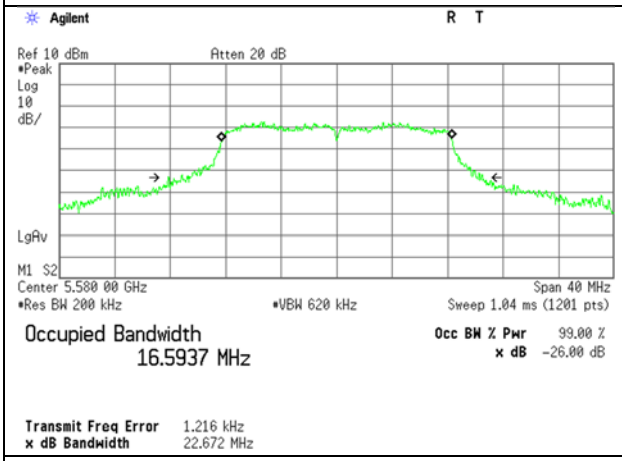
### 5500 MHz



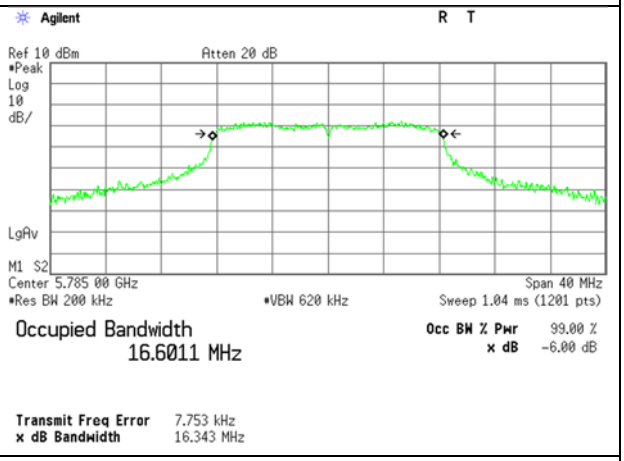

### 5745 MHz



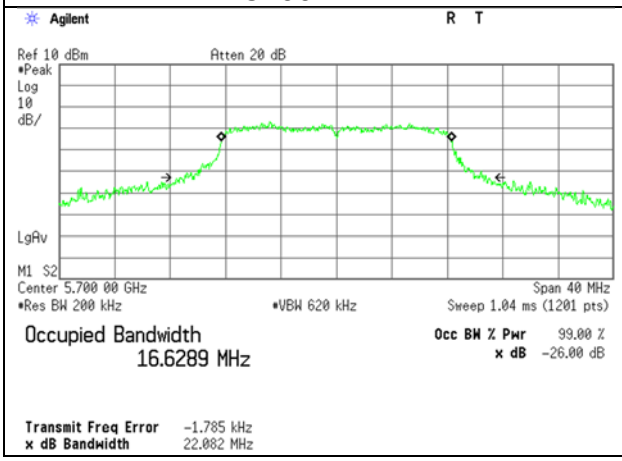

### 5580 MHz



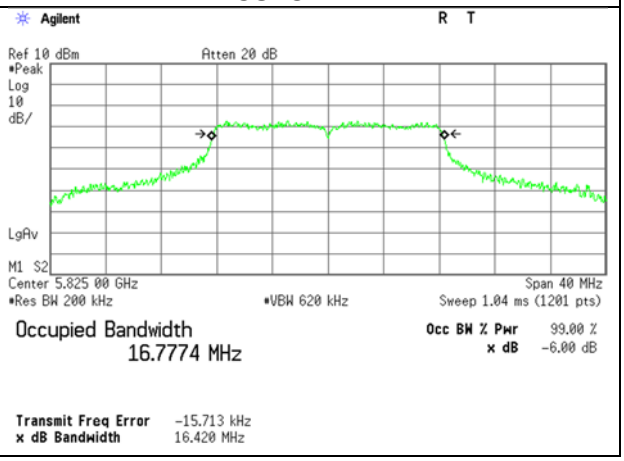

### 5785 MHz




### 5700 MHz



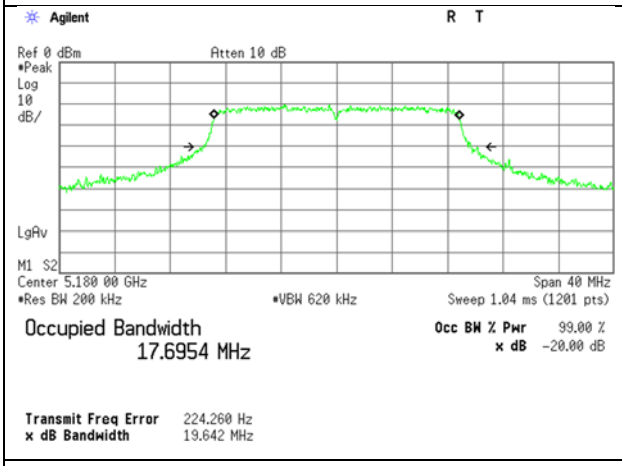

### 5825 MHz



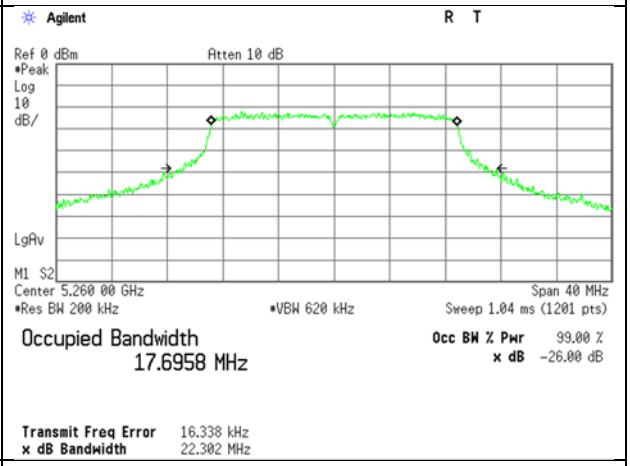
# 26 dB Emission Bandwidth and 99 % Occupied Bandwidth

## 11n-20, Antenna 1

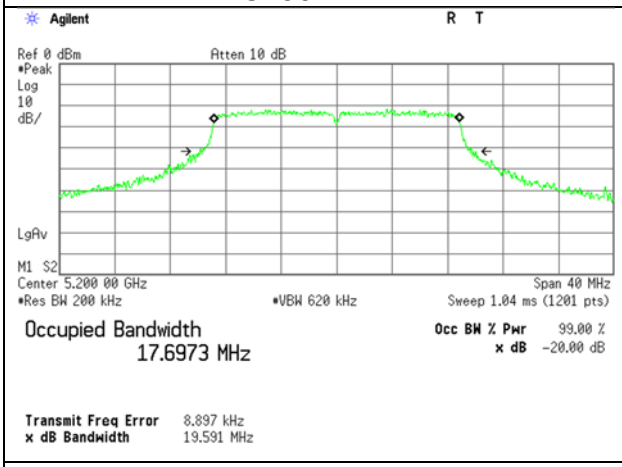
### 5180 MHz



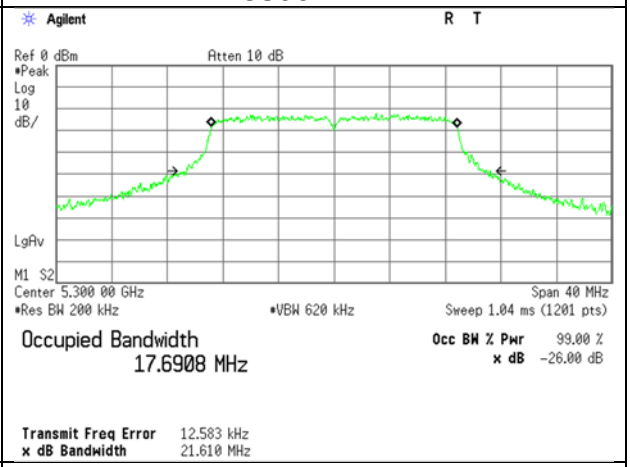

### 5260 MHz



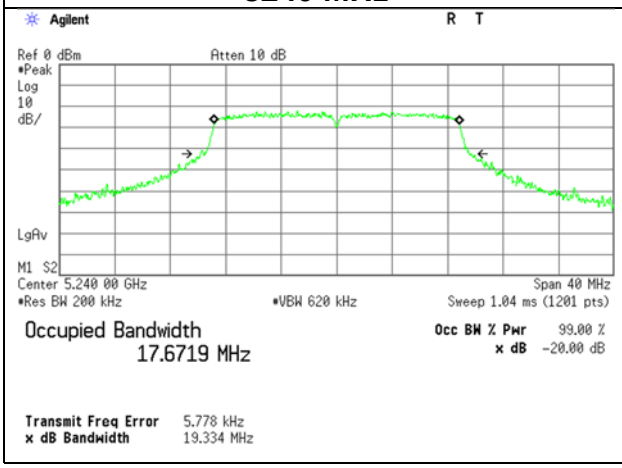

### 5200 MHz



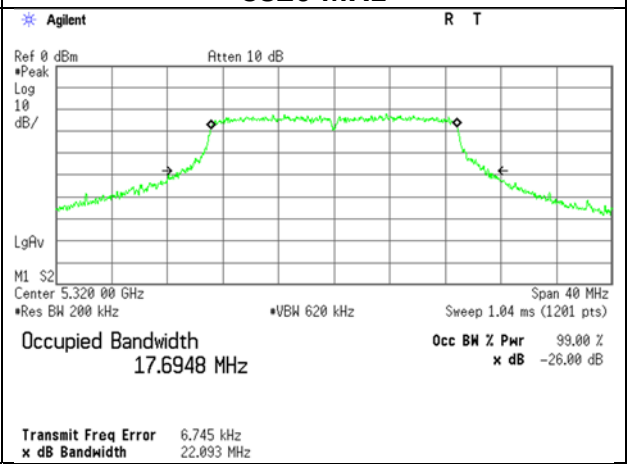

### 5300 MHz




### 5240 MHz



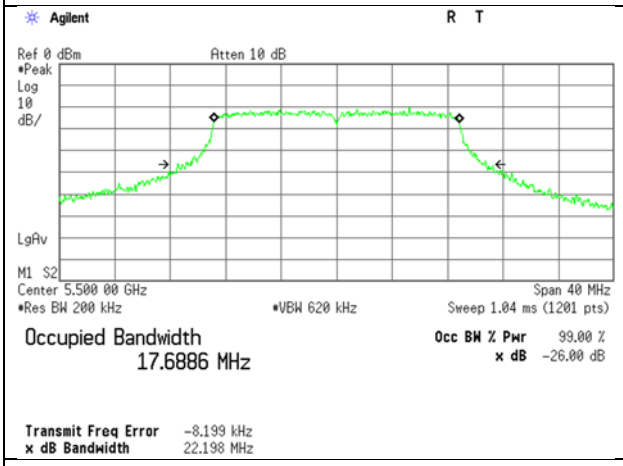

### 5320 MHz



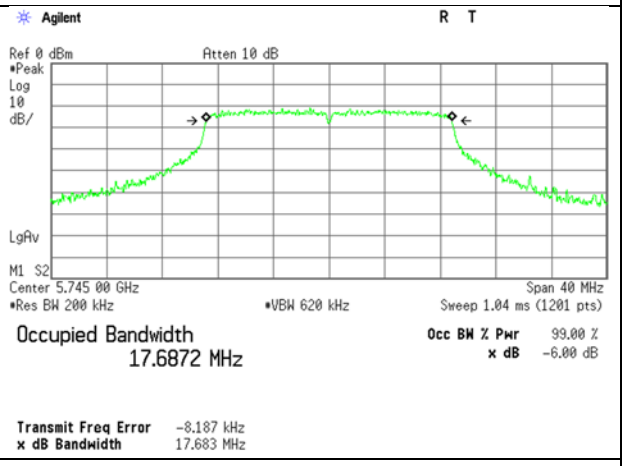
# 26 dB Emission Bandwidth and 99 % Occupied Bandwidth

## 11n-20, Antenna 1

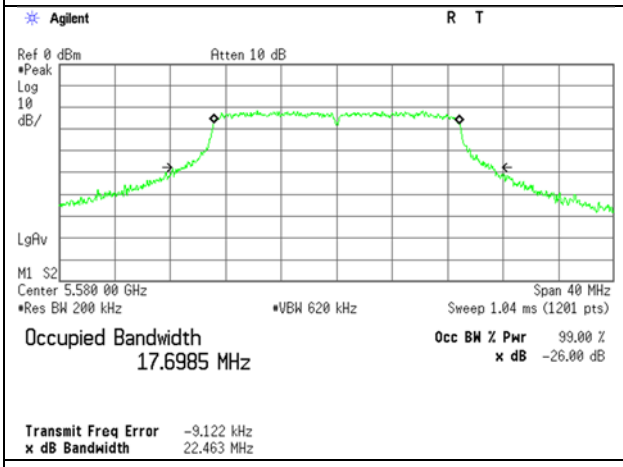
### 5500 MHz



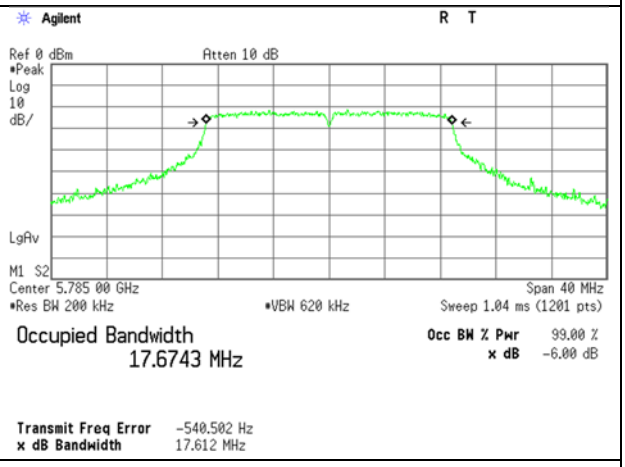

### 5745 MHz



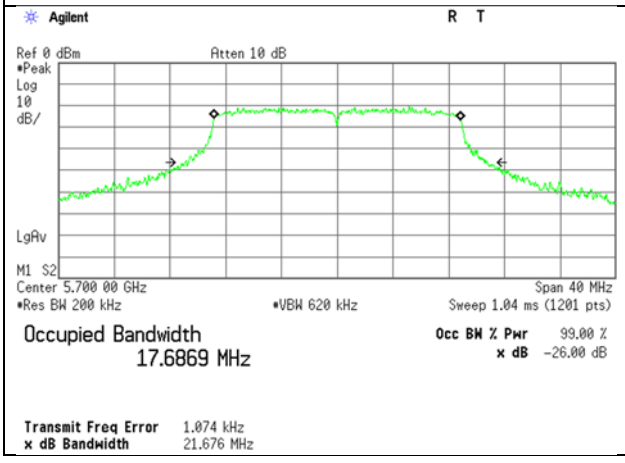

### 5580 MHz



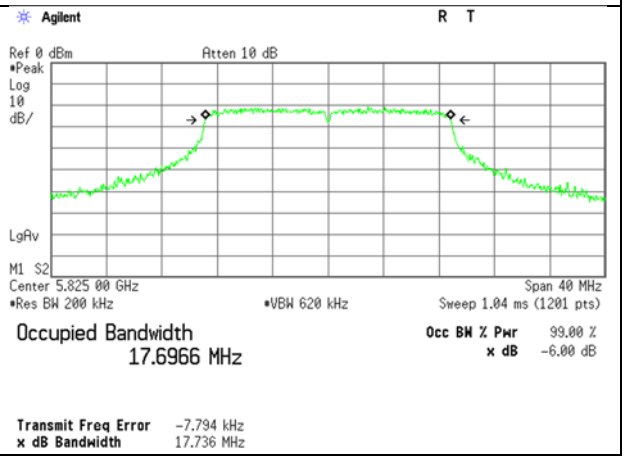

### 5785 MHz




### 5700 MHz




### 5825 MHz



# 6 dB Bandwidth

| | |
|---|---|
| Test place | Ise EMC Lab. No.8 Measurement Room |
| Date | May 23, 2024 |
| Temperature / Humidity | 25 deg. C / 57 % RH |
| Engineer | Shousei Hamaguchi |
| Mode | Tx |

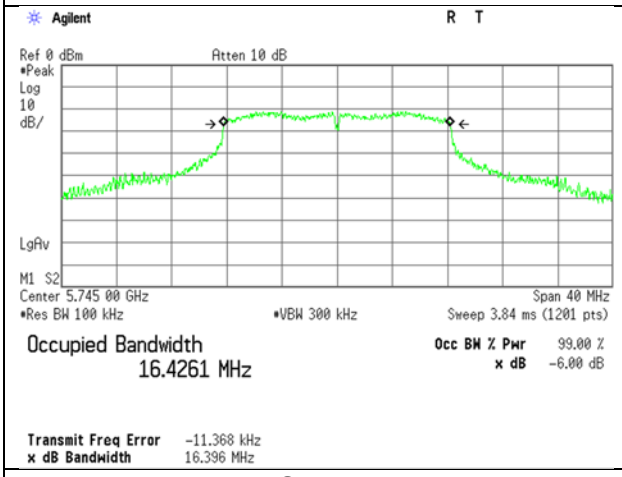
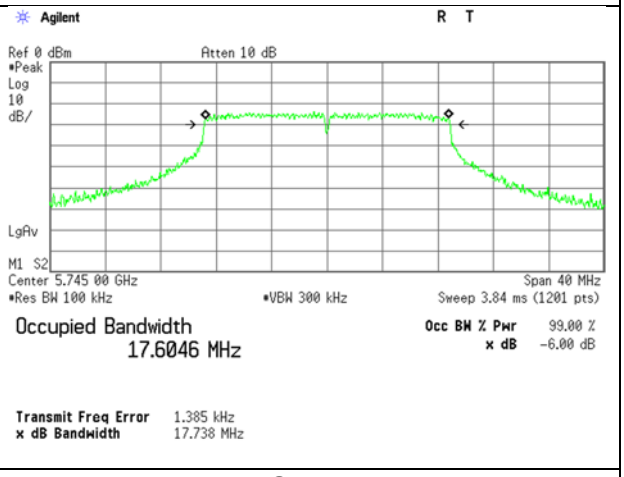
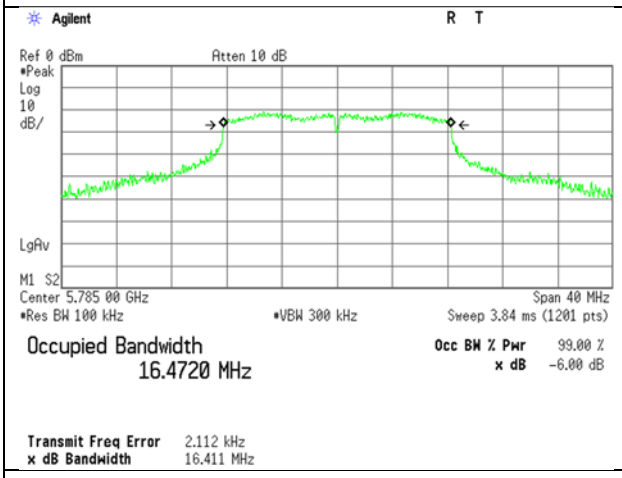
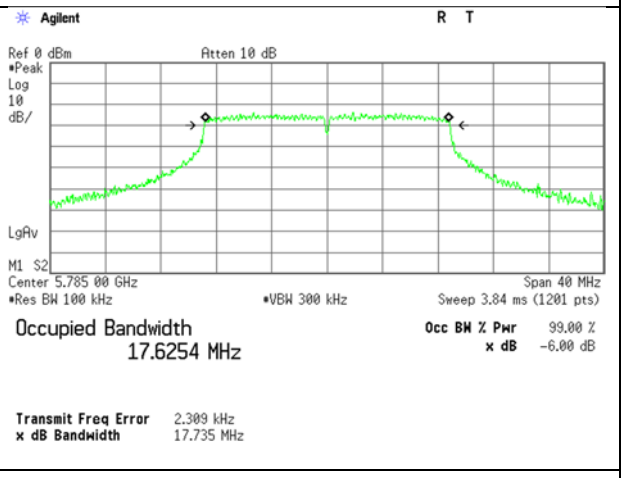
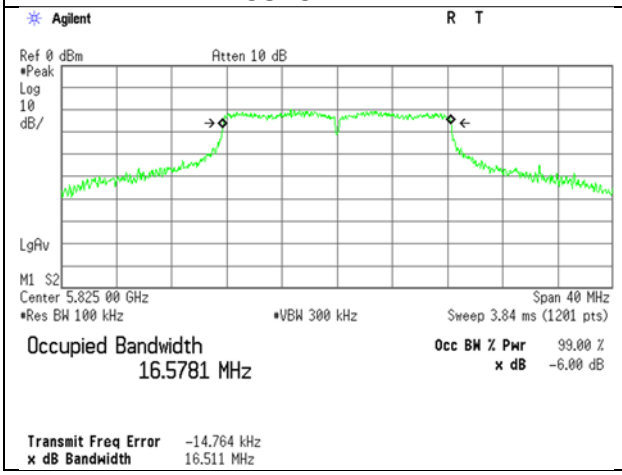
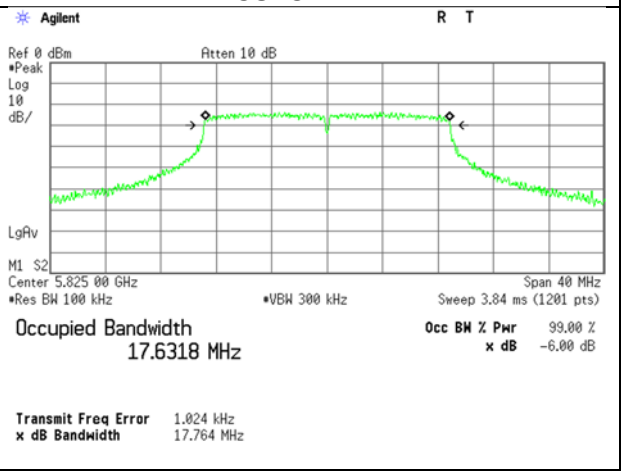
11a

| Antenna | Tested Frequency [MHz] | 6 dB Bandwidth [MHz] | Limit [MHz] |
|---|---|---|---|
| Antenna 1 | 5745 | 16.396 | > 0.500 |
| | 5785 | 16.411 | > 0.500 |
| | 5825 | 16.511 | > 0.500 |

11n-20

| Antenna | Tested Frequency [MHz] | 6 dB Bandwidth [MHz] | Limit [MHz] |
|---|---|---|---|
| Antenna 1 | 5745 | 17.738 | > 0.500 |
| | 5785 | 17.735 | > 0.500 |
| | 5825 | 17.764 | > 0.500 |

# 6 dB Bandwidth

| 11a, Antenna 1 | 11n-20, Antenna 1 |
|---|---|
| **5745 MHz** | **5745 MHz** |
|  |  |
| **5785 MHz** | **5785 MHz** |
|  |  |
| **5825 MHz** | **5825 MHz** |
|  |  |

# Maximum Conducted Output Power

| | |
|---|---|
| Test place | Ise EMC Lab. No.4 Measurement Room |
| Date | April 25, 2024 |
| Temperature / Humidity | 22 deg. C / 50 % RH |
| Engineer | Junki Nagatomi |
| Mode | Tx 11a |

Applied limit: 15.407, access point

| Tested Frequency | Power Meter Reading | Cable Loss | Atten. Loss | Duty Factor | Antenna Gain | 26 dB EBW (B for FCC) | 99% OBW (B for IC) | Conducted Power Result | | Limit | Margin | e.i.r.p. Result | | Limit | Margin |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [MHz] | [dBm] | [dB] | [dB] | [dB] | [dBi] | [MHz] | [MHz] | [dBm] | [mW] | [dBm] | [dB] | [dBm] | [mW] | [dBm] | [dB] |
| 5180 | -7.65 | 2.03 | 20.18 | 0.00 | 1.6 | - | 16.552 | 14.56 | 28.58 | 30.00 | 15.44 | 16.16 | 41.30 | 36.00 | 19.84 |
| 5200 | -7.59 | 2.03 | 20.18 | 0.00 | 1.6 | - | 16.557 | ***14.62*** | ***28.97*** | 30.00 | 15.38 | ***16.22*** | ***41.88*** | 36.00 | 19.78 |
| 5240 | -7.68 | 2.04 | 20.18 | 0.00 | 1.6 | - | 16.689 | 14.54 | 28.44 | 30.00 | 15.46 | 16.14 | 41.11 | 36.00 | 19.86 |
| 5260 | -7.56 | 2.04 | 20.20 | 0.00 | 1.7 | 22.037 | 16.686 | ***14.68*** | ***29.38*** | 23.97 | 9.29 | ***16.38*** | ***43.45*** | 29.97 | 13.59 |
| 5300 | -7.58 | 2.05 | 20.20 | 0.00 | 1.7 | 21.405 | 16.524 | 14.67 | 29.31 | 23.97 | 9.30 | 16.37 | 43.35 | 29.97 | 13.60 |
| 5320 | -7.71 | 2.06 | 20.20 | 0.00 | 1.7 | 21.321 | 16.512 | 14.55 | 28.51 | 23.97 | 9.42 | 16.25 | 42.17 | 29.97 | 13.72 |
| 5500 | -7.59 | 2.09 | 20.20 | 0.00 | 1.7 | 21.767 | 16.598 | 14.70 | 29.51 | 23.97 | 9.27 | 16.40 | 43.65 | 29.97 | 13.57 |
| 5580 | -7.48 | 2.11 | 20.20 | 0.00 | 1.7 | 22.672 | 16.594 | 14.83 | 30.41 | 23.97 | 9.14 | 16.53 | 44.98 | 29.97 | 13.44 |
| 5700 | -7.66 | 2.13 | 20.20 | 0.00 | 1.7 | 22.082 | 16.629 | 14.67 | 29.31 | 23.97 | 9.30 | 16.37 | 43.35 | 29.97 | 13.60 |
| 5745 | 2.31 | 2.14 | 10.08 | 0.00 | 1.6 | - | 16.570 | 14.53 | 28.38 | 30.00 | 15.47 | 16.13 | 41.02 | 36.00 | 19.87 |
| 5785 | 2.50 | 2.15 | 10.08 | 0.00 | 1.6 | - | 16.601 | 14.73 | 29.72 | 30.00 | 15.27 | 16.33 | 42.95 | 36.00 | 19.67 |
| 5825 | 2.69 | 2.16 | 10.08 | 0.00 | 1.6 | - | 16.777 | ***14.93*** | ***31.12*** | 30.00 | 15.07 | ***16.53*** | ***44.98*** | 36.00 | 19.47 |

Sample Calculation:
Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor
e.i.r.p. Result = Conducted Power Result + Antenna Gain
Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower
Conducted Power Limit (5725 MHz-5850 MHz) = 1W

# Maximum Conducted Output Power

| | |
|---|---|
| Test place | Ise EMC Lab. No.8 Measurement Room |
| Date | May 14, 2024 |
| Temperature / Humidity | 21 deg. C / 39 % RH |
| Engineer | Tomoya Sone |
| Mode | Tx 11n-20 (MIMO) |

**Antenna 1+2** Applied limit: 15.407, access point

| Tested | 26 dB | 99% | Conducted power | | | | | | e.i.r.p. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency | EBW | OBW | Antenna | | | Result | Limit | Margin | Antenna | | | Result | Limit | Margin |
| | (B for FCC) | (B for IC) | 1 | 2 | Sum | | | | 1 | 2 | Sum | | | |
| [MHz] | [MHz] | [MHz] | [mW] | [mW] | [mW] | [dBm] | [dBm] | [dB] | [mW] | [mW] | [mW] | [dBm] | [dBm] | [dB] |
| 5180 | - | 17.695 | 42.95 | 31.92 | 74.87 | 18.74 | 30.00 | 11.26 | 62.09 | 46.13 | 108.22 | 20.34 | 36.00 | 15.66 |
| 5200 | - | 17.697 | 40.55 | 34.67 | ***75.22*** | ***18.76*** | 30.00 | 11.24 | 58.61 | 50.12 | ***108.73*** | ***20.36*** | 36.00 | 15.64 |
| 5240 | - | 17.672 | 36.14 | 35.56 | 71.70 | 18.56 | 30.00 | 11.44 | 52.24 | 51.40 | 103.64 | 20.16 | 36.00 | 15.84 |
| 5260 | 22.302 | 17.696 | 35.48 | 38.28 | 73.76 | 18.68 | 23.97 | 5.29 | 52.48 | 56.62 | 109.10 | 20.38 | 29.97 | 9.59 |
| 5300 | 21.61 | 17.691 | 36.22 | 35.16 | 71.38 | 18.54 | 23.97 | 5.43 | 53.58 | 52.00 | 105.58 | 20.24 | 29.97 | 9.73 |
| 5320 | 22.093 | 17.695 | 37.76 | 37.50 | ***75.25*** | ***18.77*** | 23.97 | 5.20 | 55.85 | 55.46 | ***111.31*** | ***20.47*** | 29.97 | 9.50 |
| 5500 | 22.198 | 17.689 | 34.43 | 31.05 | ***65.48*** | ***18.16*** | 23.97 | 5.81 | 50.93 | 45.92 | ***96.85*** | ***19.86*** | 29.97 | 10.11 |
| 5580 | 22.463 | 17.699 | 31.11 | 32.73 | 63.84 | 18.05 | 23.97 | 5.92 | 46.02 | 48.42 | 94.43 | 19.75 | 29.97 | 10.22 |
| 5700 | 21.676 | 17.687 | 32.14 | 32.51 | 64.65 | 18.11 | 23.97 | 5.86 | 47.53 | 48.08 | 95.62 | 19.81 | 29.97 | 10.16 |
| 5745 | - | 17.687 | 29.72 | 33.88 | 63.60 | 18.03 | 30.00 | 11.97 | 42.95 | 48.98 | 91.93 | 19.63 | 36.00 | 16.37 |
| 5785 | - | 17.674 | 32.36 | 33.57 | ***65.93*** | ***18.19*** | 30.00 | 11.81 | 46.77 | 48.53 | ***95.30*** | ***19.79*** | 36.00 | 16.21 |
| 5825 | - | 17.697 | 34.51 | 30.20 | 64.71 | 18.11 | 30.00 | 11.89 | 49.89 | 43.65 | 93.54 | 19.71 | 36.00 | 16.29 |

| | | **Antenna 1** | | | | | | **Antenna 2** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tested | Duty | Power | Cable | Atten. | Antenna | Result | | Power | Cable | Atten. | Antenna | Result | |
| Frequency | Factor | Meter Reading | Loss | Loss | Gain | Cond. Power | e.i.r.p. | Meter Reading | Loss | Loss | Gain | Cond. Power | e.i.r.p. |
| [MHz] | [dB] | [dBm] | [dB] | [dB] | [dBi] | [dBm] | [dBm] | [dBm] | [dB] | [dB] | [dBi] | [dBm] | [dBm] |
| 5180 | 0.00 | -5.35 | 1.50 | 20.18 | 1.60 | 16.33 | 17.93 | -6.64 | 1.50 | 20.18 | 1.60 | 15.04 | 16.64 |
| 5200 | 0.00 | -5.60 | 1.50 | 20.18 | 1.60 | 16.08 | 17.68 | -6.28 | 1.50 | 20.18 | 1.60 | 15.40 | 17.00 |
| 5240 | 0.00 | -6.10 | 1.50 | 20.18 | 1.60 | 15.58 | 17.18 | -6.17 | 1.50 | 20.18 | 1.60 | 15.51 | 17.11 |
| 5260 | 0.00 | -6.21 | 1.51 | 20.20 | 1.70 | 15.50 | 17.20 | -5.88 | 1.51 | 20.20 | 1.70 | 15.83 | 17.53 |
| 5300 | 0.00 | -6.12 | 1.51 | 20.20 | 1.70 | 15.59 | 17.29 | -6.25 | 1.51 | 20.20 | 1.70 | 15.46 | 17.16 |
| 5320 | 0.00 | -5.94 | 1.51 | 20.20 | 1.70 | 15.77 | 17.47 | -5.97 | 1.51 | 20.20 | 1.70 | 15.74 | 17.44 |
| 5500 | 0.00 | -6.36 | 1.53 | 20.20 | 1.70 | 15.37 | 17.07 | -6.81 | 1.53 | 20.20 | 1.70 | 14.92 | 16.62 |
| 5580 | 0.00 | -6.82 | 1.55 | 20.20 | 1.70 | 14.93 | 16.63 | -6.60 | 1.55 | 20.20 | 1.70 | 15.15 | 16.85 |
| 5700 | 0.00 | -6.71 | 1.58 | 20.20 | 1.70 | 15.07 | 16.77 | -6.66 | 1.58 | 20.20 | 1.70 | 15.12 | 16.82 |
| 5745 | 0.00 | -7.07 | 1.60 | 20.20 | 1.60 | 14.73 | 16.33 | -6.50 | 1.60 | 20.20 | 1.60 | 15.30 | 16.90 |
| 5785 | 0.00 | -6.71 | 1.61 | 20.20 | 1.60 | 15.10 | 16.70 | -6.55 | 1.61 | 20.20 | 1.60 | 15.26 | 16.86 |
| 5825 | 0.00 | -6.44 | 1.62 | 20.20 | 1.60 | 15.38 | 16.98 | -7.02 | 1.62 | 20.20 | 1.60 | 14.80 | 16.40 |

Sample Calculation:
Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor
e.i.r.p. Result = Conducted Power Result + Antenna Gain
Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower
Conducted Power Limit (5725 MHz-5850 MHz) = 1W

# Maximum Conducted Output Power

| | |
|---|---|
| Test place | Ise EMC Lab. No.4 Measurement Room |
| Date | April 23, 2024 |
| Temperature / Humidity | 22 deg. C / 35 % RH |
| Engineer | Junki Nagatomi |
| Mode | Tx 11a |

**5500 MHz** Antenna 1

| Mode | Rate<br>Mbps | Reading (timed average) [dBm] | Duty factor [dB] | Burst power [dBm] | Remarks |
|---|---|---|---|---|---|
| 11a | 6 | -6.03 | 0.00 | -6.03 | * |
| | 9 | -6.93 | 0.00 | -6.93 | |
| | 12 | -6.79 | 0.00 | -6.79 | |
| | 18 | -6.90 | 0.00 | -6.90 | |
| | 24 | -6.73 | 0.00 | -6.73 | |
| | 36 | -6.79 | 0.00 | -6.79 | |
| | 48 | -6.81 | 0.00 | -6.81 | |
| | 54 | -6.49 | 0.00 | -6.49 | |

**5500 MHz** Antenna 2

| Mode | Rate<br>Mbps | Reading (timed average) [dBm] | Duty factor [dB] | Burst power [dBm] | Remarks |
|---|---|---|---|---|---|
| 11a | 6 | -7.54 | 0.00 | -7.54 | |

* Worst rate

Sample Calculation:

Burst power = Reading (timed average) + Duty factor

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

# Maximum Conducted Output Power

| | |
|---|---|
| Test place | Ise EMC Lab. No.4 Measurement Room |
| Date | April 23, 2024 |
| Temperature / Humidity | 22 deg. C / 35 % RH |
| Engineer | Junki Nagatomi |
| Mode | Tx 11n-20 |

**5500 MHz**

| Mode | MCS Number | Reading (timed average) Antenna | | | | | | Duty factor | Burst power Antenna | | | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 [dBm] | 2 [dBm] | 1 [mW] | 2 [mW] | 1+2 [mW] | 1+2 [dBm] | [dB] | 1 [dBm] | 2 [dBm] | 1+2 [dBm] | |
| 11n-20 | 0 | 0.08 | 0.39 | 1.02 | 1.09 | - | - | 0.00 | 0.08 | 0.39 | - | |
| | 1 | 0.50 | 0.77 | 1.12 | 1.19 | - | - | 0.00 | 0.50 | 0.77 | - | |
| | 2 | -0.48 | -0.21 | 0.90 | 0.95 | - | - | 0.00 | -0.48 | -0.21 | - | |
| | 3 | -0.51 | -0.31 | 0.89 | 0.93 | - | - | 0.00 | -0.51 | -0.31 | - | |
| | 4 | -0.33 | -0.26 | 0.93 | 0.94 | - | - | 0.00 | -0.33 | -0.26 | - | |
| | 5 | -0.16 | -0.10 | 0.96 | 0.98 | - | - | 0.00 | -0.16 | -0.10 | - | |
| | 6 | -0.22 | -0.09 | 0.95 | 0.98 | - | - | 0.00 | -0.22 | -0.09 | - | |
| | 7 | -0.23 | -0.13 | 0.95 | 0.97 | - | - | 0.00 | -0.23 | -0.13 | - | |
| | 8 | -0.07 | -1.24 | 0.98 | 0.75 | 1.74 | 2.39 | 0.00 | -0.07 | -1.24 | 2.39 | |
| | 9 | 0.09 | -0.74 | 1.02 | 0.84 | 1.86 | 2.71 | 0.00 | 0.09 | -0.74 | 2.71 | * |
| | 10 | -0.42 | -1.22 | 0.91 | 0.76 | 1.66 | 2.21 | 0.00 | -0.42 | -1.22 | 2.21 | |
| | 11 | -0.43 | -1.14 | 0.91 | 0.77 | 1.67 | 2.24 | 0.00 | -0.43 | -1.14 | 2.24 | |
| | 12 | -0.46 | -1.17 | 0.90 | 0.76 | 1.66 | 2.21 | 0.00 | -0.46 | -1.17 | 2.21 | |
| | 13 | 0.02 | -0.71 | 1.00 | 0.85 | 1.85 | 2.68 | 0.00 | 0.02 | -0.71 | 2.68 | |
| | 14 | 0.00 | -0.75 | 1.00 | 0.84 | 1.84 | 2.65 | 0.00 | 0.00 | -0.75 | 2.65 | |
| | 15 | -0.06 | -0.72 | 0.99 | 0.85 | 1.83 | 2.63 | 0.00 | -0.06 | -0.72 | 2.63 | |

* Worst rate

Sample Calculation:

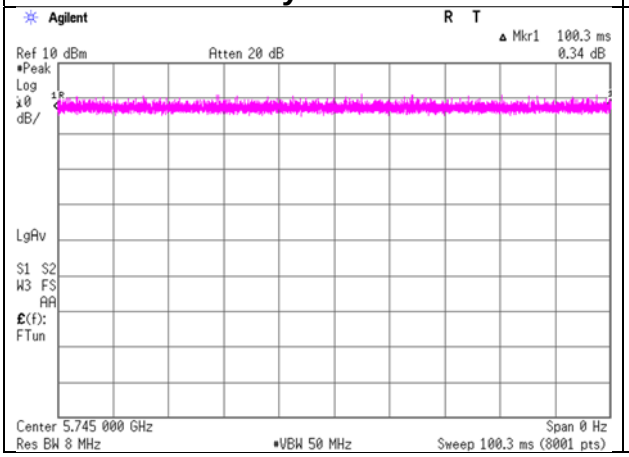
Burst power = Reading (timed average) + Duty factor

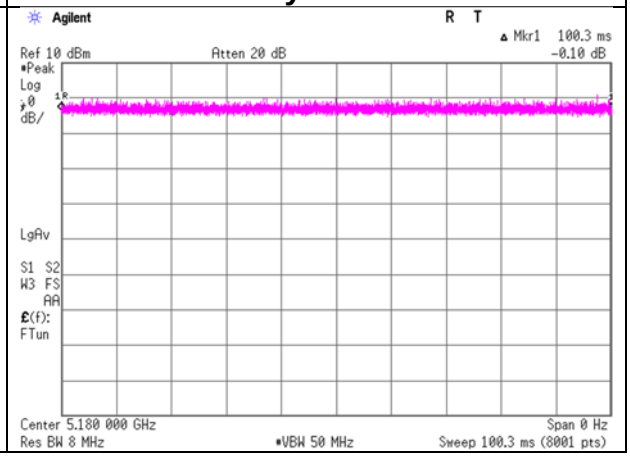
All comparison were carried out on same frequency and measurement factors.

# Burst rate confirmation

| | |
|---|---|
| Test place | Ise EMC Lab. No.8 Measurement Room |
| Date | May 23, 2024 |
| Temperature / Humidity | 25 deg. C / 57 % RH |
| Engineer | Shousei Hamaguchi |
| Mode | Tx |

| 11a 6 Mbps | 11n-20 MCS 9 |
|---|---|
| Duty 100 % | Duty 100 % |



# Maximum Power Spectral Density

| | |
|---|---|
| Test place | Ise EMC Lab. No.8 Measurement Room |
| Date | May 23, 2024 |
| Temperature / Humidity | 25 deg. C / 57 % RH |
| Engineer | Shousei Hamaguchi |
| Mode | Tx 11n-20 |

**Antenna 1+Antenna 2** Applied limit: 15.407, access point

| Tested Frequency | PSD (Conducted) | | | | | | PSD (e.i.r.p.) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Antenna | | | Result | Limit | Margin | Antenna | | | Result | Limit | Margin |
| | 1 | 2 | Sum | | | | 1 | 2 | Sum | | | |
| [MHz] | [mW/MHz] | [mW/MHz] | [mW/MHz] | [dBm/MHz] | [dBm/MHz] | [dB] | [mW/MHz] | [mW/MHz] | [mW/MHz] | [dBm/MHz] | [dBm/MHz] | [dB] |
| 5180 | 1.81 | 2.32 | 4.13 | ***6.15*** | 17.00 | 10.85 | 2.61 | 3.35 | 5.96 | ***7.75*** | 23.00 | 15.25 |
| 5200 | 1.41 | 1.77 | 3.19 | 5.03 | 17.00 | 11.97 | 2.04 | 2.56 | 4.61 | 6.63 | 23.00 | 16.37 |
| 5240 | 1.14 | 1.94 | 3.09 | 4.90 | 17.00 | 12.10 | 1.65 | 2.81 | 4.46 | 6.50 | 23.00 | 16.50 |
| 5260 | 0.93 | 1.79 | 2.72 | ***4.34*** | 11.00 | 6.66 | 1.38 | 2.64 | 4.02 | ***6.04*** | 17.00 | 10.96 |
| 5300 | 0.79 | 1.61 | 2.41 | 3.81 | 11.00 | 7.19 | 1.18 | 2.38 | 3.56 | 5.51 | 17.00 | 11.49 |
| 5320 | 0.91 | 1.69 | 2.60 | 4.15 | 11.00 | 6.85 | 1.35 | 2.49 | 3.85 | 5.85 | 17.00 | 11.15 |
| 5500 | 0.56 | 1.36 | 1.91 | 2.82 | 11.00 | 8.18 | 0.82 | 2.00 | 2.83 | 4.52 | 17.00 | 12.48 |
| 5580 | 0.59 | 1.39 | 1.98 | 2.96 | 11.00 | 8.04 | 0.87 | 2.05 | 2.93 | 4.66 | 17.00 | 12.34 |
| 5700 | 0.82 | 1.21 | 2.03 | 3.07 | 11.00 | 7.93 | 1.21 | 1.79 | 3.00 | 4.77 | 17.00 | 12.23 |
| 5745 | 0.39 | 0.77 | 1.17 | ***0.67*** | 30.00 | 29.33 | 0.57 | 1.12 | 1.69 | ***2.27*** | 36.00 | 33.73 |
| 5785 | 0.41 | 0.66 | 1.07 | 0.31 | 30.00 | 29.69 | 0.59 | 0.96 | 1.55 | 1.91 | 36.00 | 34.09 |
| 5825 | 0.50 | 0.62 | 1.12 | 0.51 | 30.00 | 29.49 | 0.72 | 0.90 | 1.63 | 2.11 | 36.00 | 33.89 |

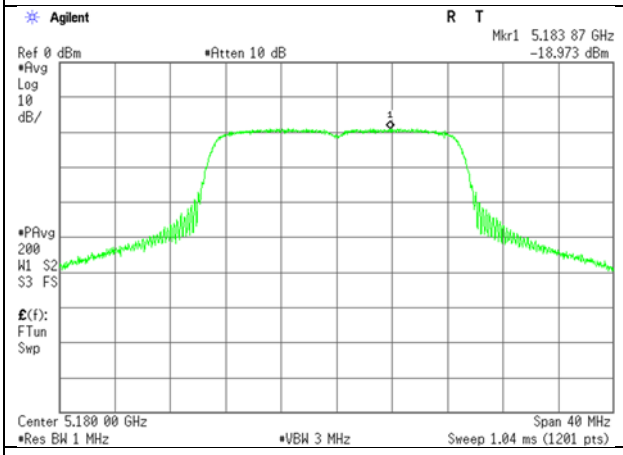
| | | | **Antenna 1** | | | | | | **Antenna 2** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tested Frequency | Duty Factor | RBW Correction Factor | PSD Reading | Cable Loss | Atten. Loss | Antenna Gain | PSD Result | | PSD Reading | Cable Loss | Atten. Loss | Antenna Gain | PSD Result | |
| | | | | | | | Cond. | e.i.r.p. | | | | | Cond. | e.i.r.p. |
| [MHz] | [dB] | [dB] | [dBm/MHz] | [dB] | [dB] | [dBi] | [dBm/MHz] | [dBm/MHz] | [dBm/MHz] | [dB] | [dB] | [dBi] | [dBm/MHz] | [dBm/MHz] |
| 5180 | 0.00 | 0.00 | -18.97 | 1.50 | 20.04 | 1.60 | 2.57 | 4.17 | -17.89 | 1.50 | 20.04 | 1.60 | 3.65 | 5.25 |
| 5200 | 0.00 | 0.00 | -20.04 | 1.50 | 20.04 | 1.60 | 1.51 | 3.11 | -19.06 | 1.50 | 20.04 | 1.60 | 2.49 | 4.09 |
| 5240 | 0.00 | 0.00 | -20.95 | 1.50 | 20.04 | 1.60 | 0.59 | 2.19 | -18.65 | 1.50 | 20.04 | 1.60 | 2.89 | 4.49 |
| 5260 | 0.00 | 0.00 | -21.87 | 1.51 | 20.04 | 1.70 | -0.32 | 1.38 | -19.03 | 1.51 | 20.04 | 1.70 | 2.52 | 4.22 |
| 5300 | 0.00 | 0.00 | -22.55 | 1.51 | 20.04 | 1.70 | -1.00 | 0.70 | -19.48 | 1.51 | 20.04 | 1.70 | 2.07 | 3.77 |
| 5320 | 0.00 | 0.00 | -21.94 | 1.51 | 20.04 | 1.70 | -0.39 | 1.31 | -19.28 | 1.51 | 20.04 | 1.70 | 2.27 | 3.97 |
| 5500 | 0.00 | 0.00 | -24.11 | 1.53 | 20.04 | 1.70 | -2.54 | -0.84 | -20.25 | 1.53 | 20.04 | 1.70 | 1.32 | 3.02 |
| 5580 | 0.00 | 0.00 | -23.88 | 1.55 | 20.04 | 1.70 | -2.29 | -0.59 | -20.16 | 1.55 | 20.04 | 1.70 | 1.43 | 3.13 |
| 5700 | 0.00 | 0.00 | -22.50 | 1.58 | 20.05 | 1.70 | -0.87 | 0.83 | -20.81 | 1.58 | 20.05 | 1.70 | 0.82 | 2.52 |
| 5745 | 0.00 | 0.27 | -25.98 | 1.60 | 20.05 | 1.60 | -4.06 | -2.46 | -23.03 | 1.60 | 20.05 | 1.60 | -1.11 | 0.49 |
| 5785 | 0.00 | 0.27 | -25.79 | 1.61 | 20.05 | 1.60 | -3.86 | -2.26 | -23.72 | 1.61 | 20.05 | 1.60 | -1.79 | -0.19 |
| 5825 | 0.00 | 0.27 | -24.95 | 1.62 | 20.05 | 1.60 | -3.01 | -1.41 | -23.98 | 1.62 | 20.05 | 1.60 | -2.04 | -0.44 |

Sample Calculation:
PSD: Power Spectral Density
The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.
RBW Correction Factor = 10 * log (Specified bandwidth / Measured bandwidth)
PSD Result (Conducted) = Reading + Cable Loss + Atten. Loss + Duty Factor + RBW Correction Factor
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

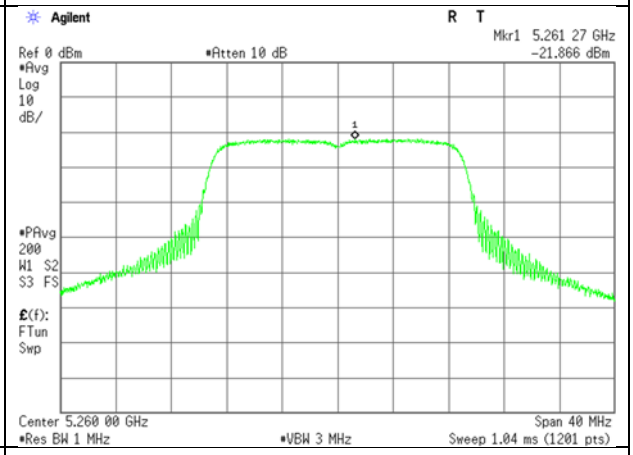
# Maximum Power Spectral Density

## 11n-20, Antenna 1

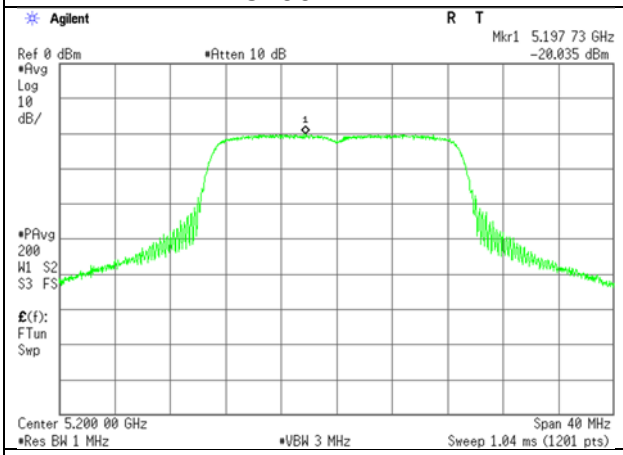
### 5180 MHz



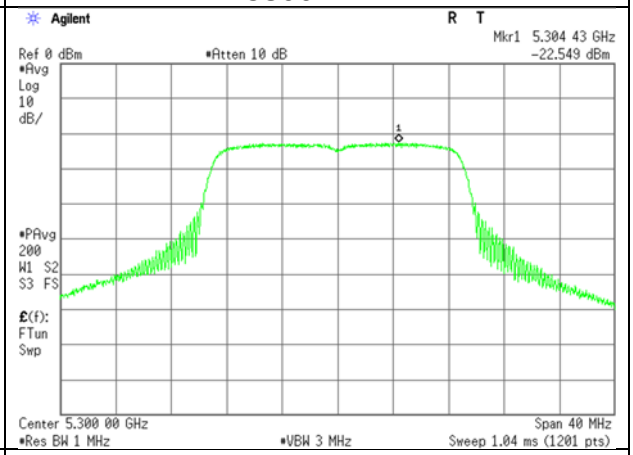

### 5260 MHz



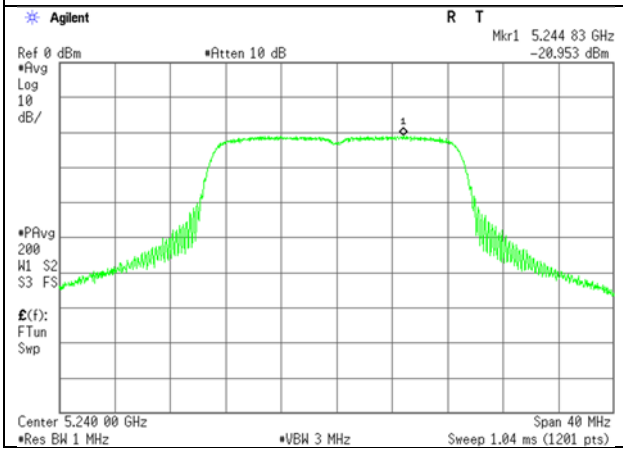

### 5200 MHz



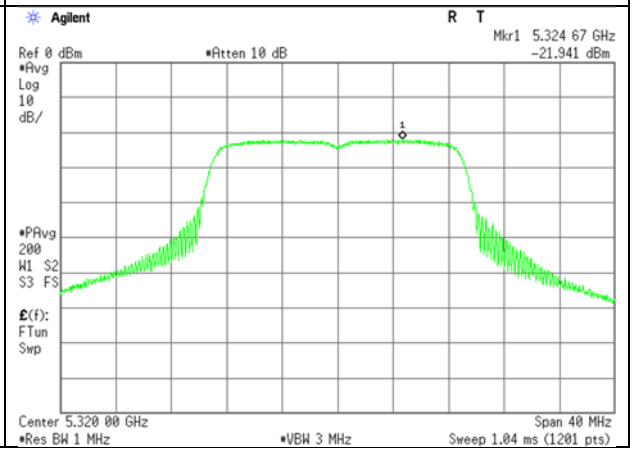

### 5300 MHz




### 5240 MHz



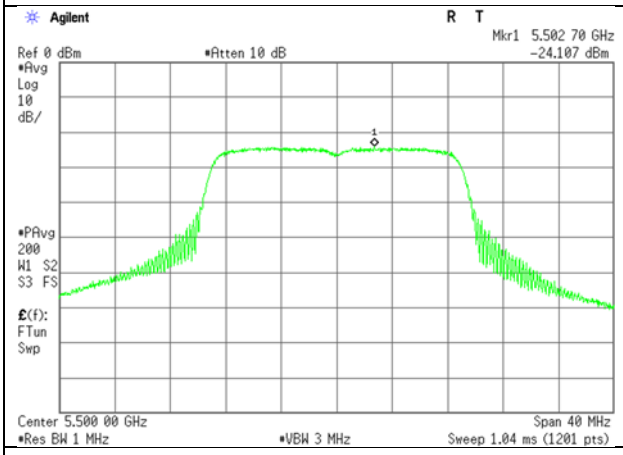

### 5320 MHz



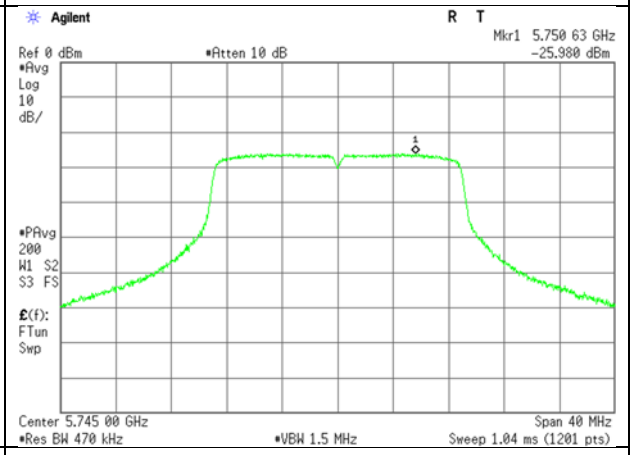
# Maximum Power Spectral Density

## 11n-20, Antenna 1

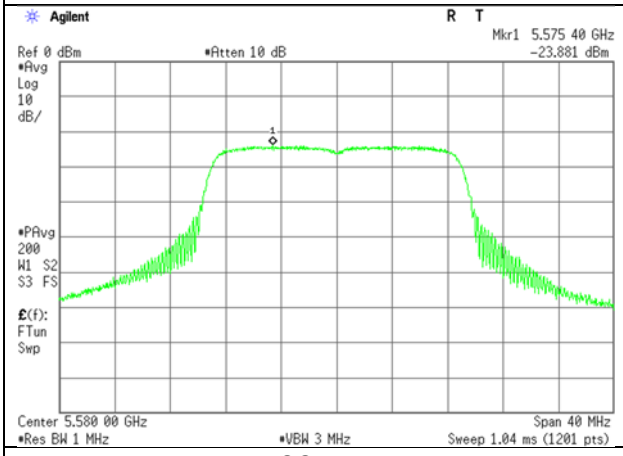
### 5500 MHz



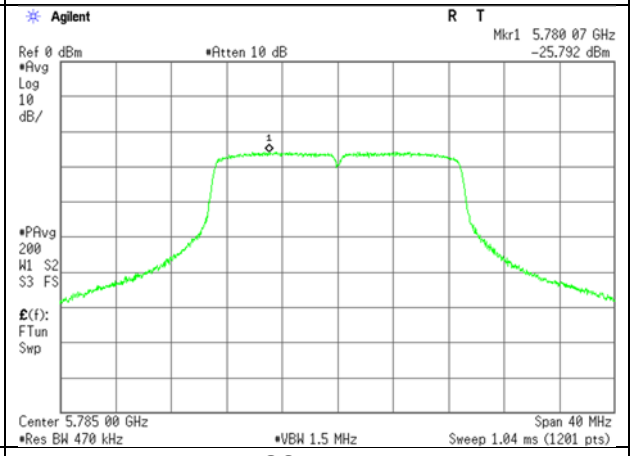

### 5745 MHz



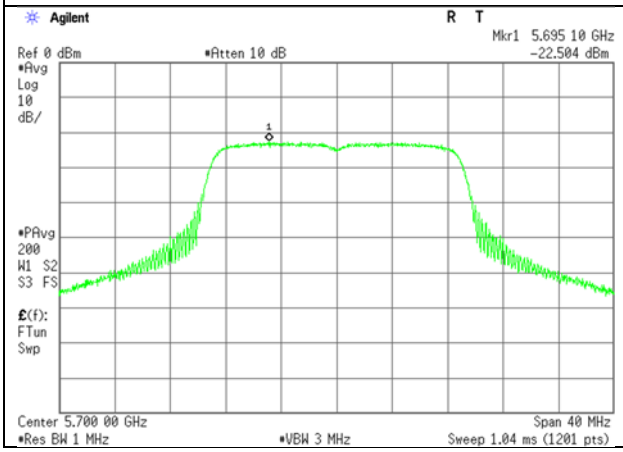

### 5580 MHz



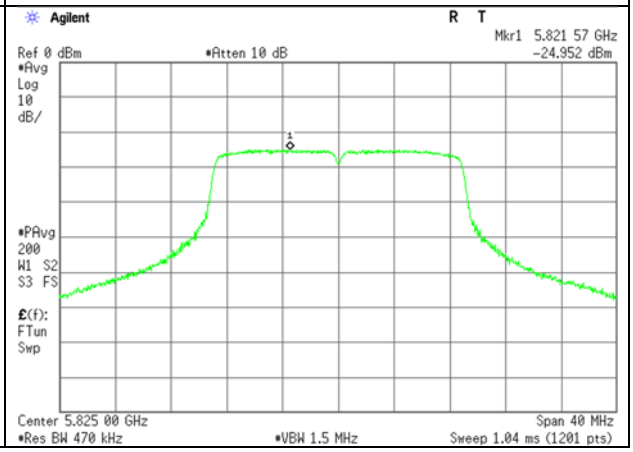

### 5785 MHz




### 5700 MHz



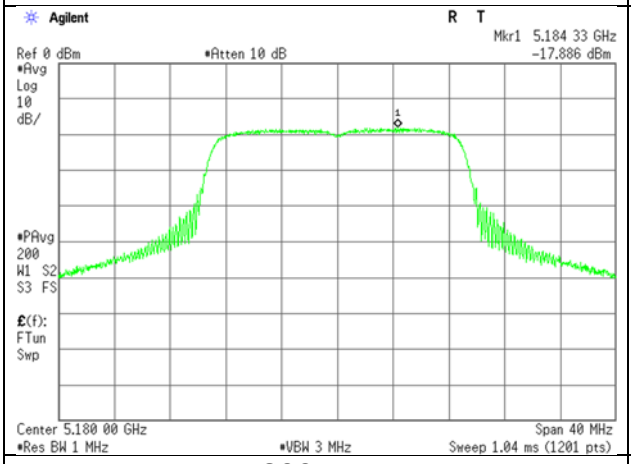

### 5825 MHz



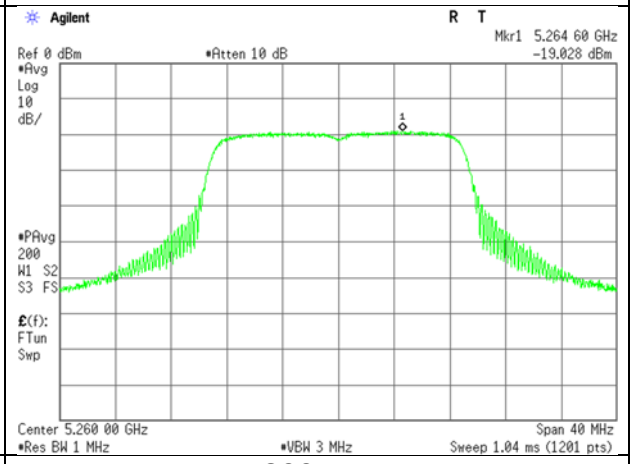
# Maximum Power Spectral Density

## 11n-20, Antenna 2

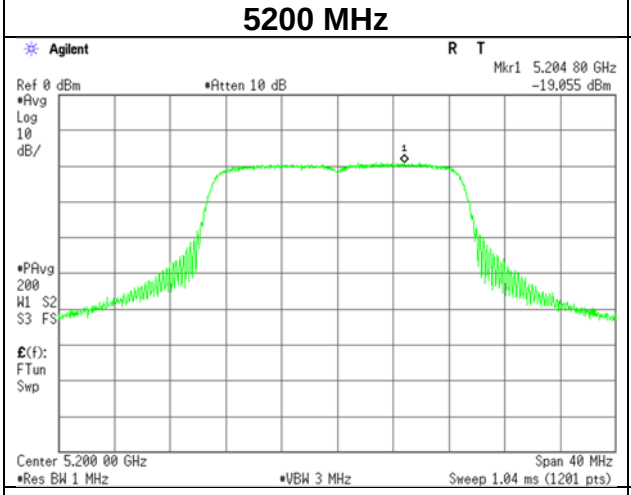
### 5180 MHz



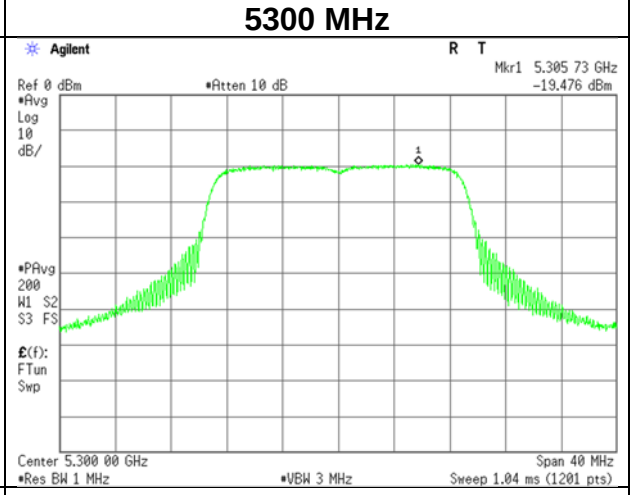

### 5260 MHz



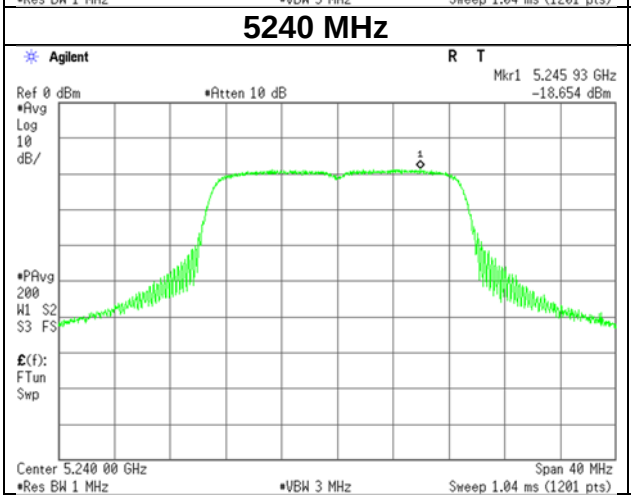

### 5200 MHz



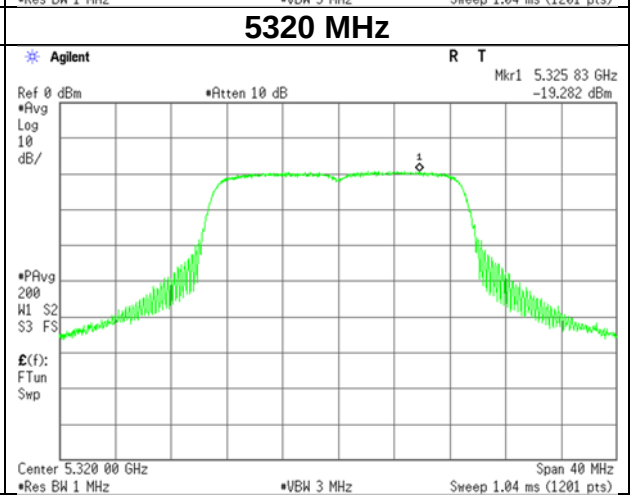

### 5300 MHz




### 5240 MHz



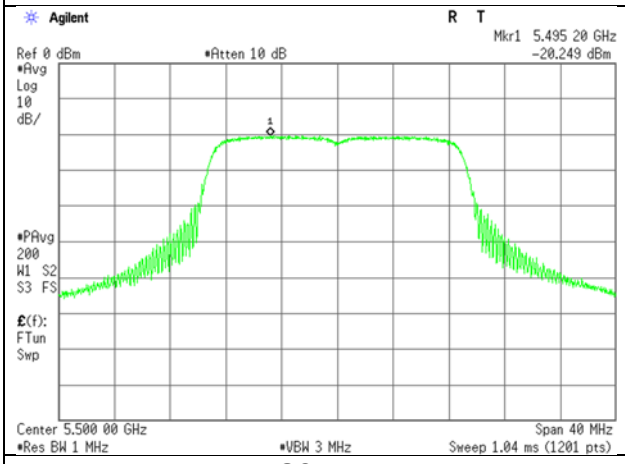

### 5320 MHz



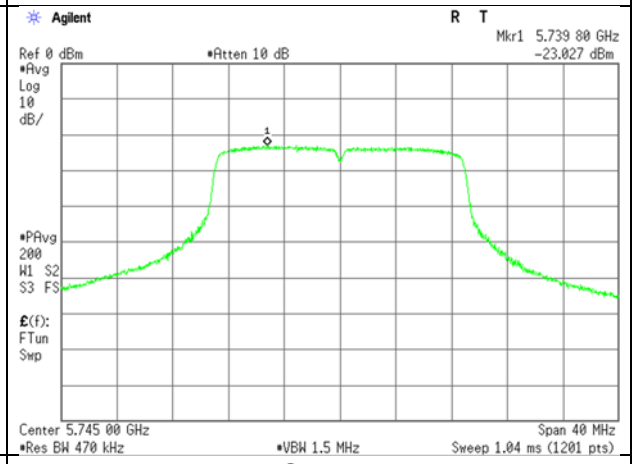
# Maximum Power Spectral Density

## 11n-20, Antenna 2

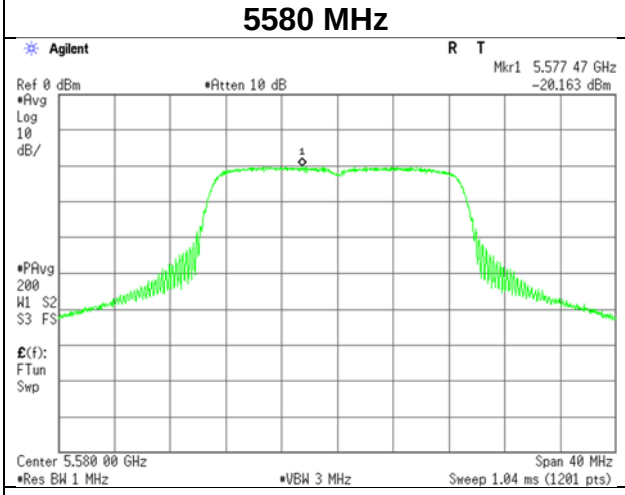
### 5500 MHz



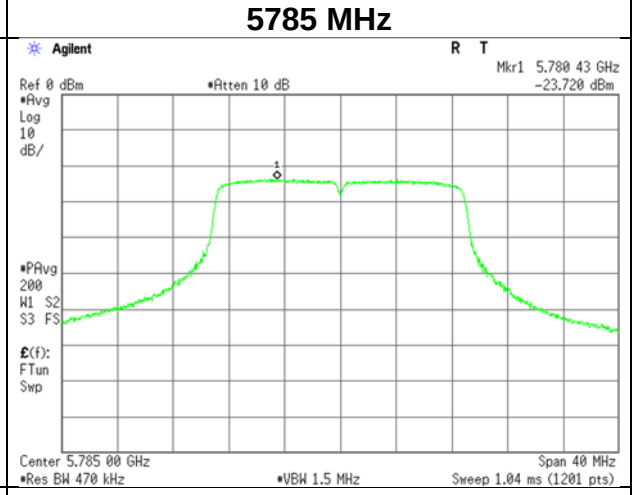

### 5745 MHz



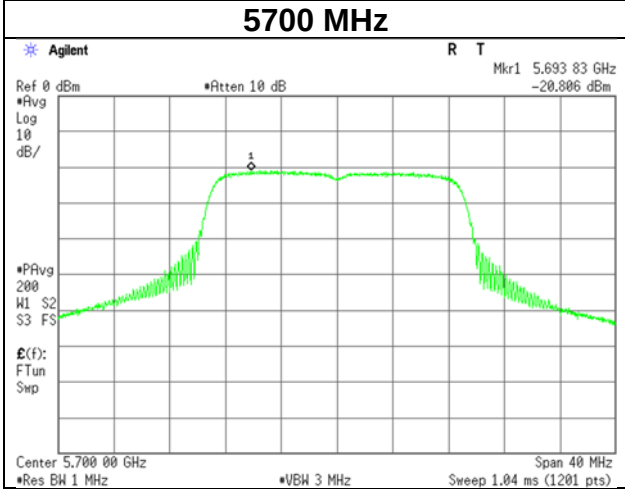

### 5580 MHz



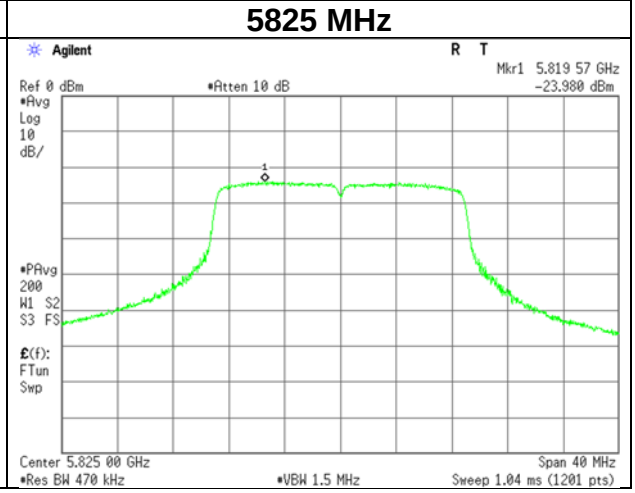

### 5785 MHz




### 5700 MHz




### 5825 MHz



# Radiated Spurious Emission

| | | | | |
|---|---|---|---|---|
| Test place | Ise EMC Lab. | | | |
| Semi Anechoic Chamber | No.4 | No.4 | No.4 | No.4 |
| Date | May 14, 2024 | May 14, 2024 | May 17, 2024 | May 19, 2024 |
| Temperature / Humidity | 20 deg. C / 55 % RH | 23 deg. C / 41 % RH | 20 deg. C / 46 % RH | 23 deg. C / 48 % RH |
| Engineer | Tomoya Sone | Takumi Nishida | Tomoya Sone | Tomoya Sone |
| | (1 GHz to 6 GHz) | (6 GHz to 10 GHz) | (10 GHz to 18 GHz) | (Above 18 GHz) |
| Mode | Tx 11n-20 5180 MHz | | | |

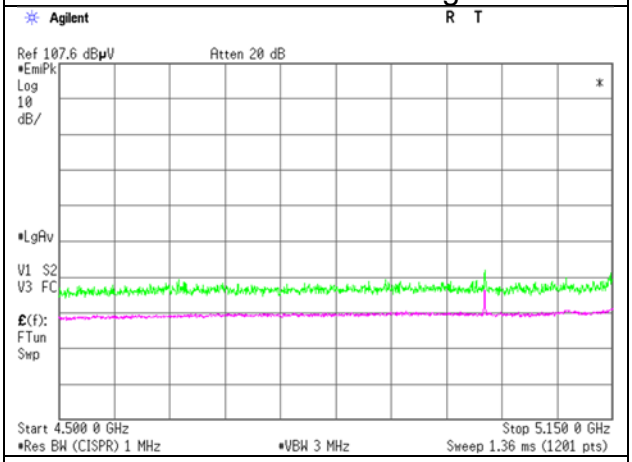
| Polarity [Hori/Vert] | Frequency [MHz] | Reading (QP / PK) [dBuV] | Reading (AV) [dBuV] | Ant. Factor [dB/m] | Loss [dB] | Gain [dB] | Duty Factor [dB] | Result (QP / PK) [dBuV/m] | Result (AV) [dBuV/m] | Limit (QP / PK) [dBuV/m] | Limit (AV) [dBuV/m] | Margin (QP / PK) [dB] | Margin (AV) [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hori. | 5000.0 | 49.4 | 44.7 | 31.8 | 5.8 | 30.8 | - | 56.3 | 51.6 | 73.9 | 53.9 | 17.6 | 2.3 | |
| Hori. | 5150.0 | 53.7 | 36.4 | 31.9 | 5.9 | 30.9 | - | 60.7 | 43.4 | 73.9 | 53.9 | 13.2 | 10.5 | |
| Hori. | 10360.0 | 50.8 | - | 35.9 | -1.7 | 32.6 | - | 52.5 | - | 68.2 | - | 15.7 | - | |
| Hori. | 15540.0 | 42.8 | 35.3 | 39.3 | -0.2 | 32.2 | - | 49.6 | 42.1 | 73.9 | 53.9 | 24.3 | 11.8 | Floor noise |
| Vert. | 5000.0 | 49.9 | 45.3 | 31.8 | 5.8 | 30.8 | - | 56.8 | 52.2 | 73.9 | 53.9 | 17.1 | 1.7 | |
| Vert. | 5150.0 | 52.1 | 35.5 | 31.9 | 5.9 | 30.9 | - | 59.0 | 42.4 | 73.9 | 53.9 | 14.9 | 11.5 | |
| Vert. | 10360.0 | 47.2 | - | 35.9 | -1.7 | 32.6 | - | 48.9 | - | 68.2 | - | 19.3 | - | |
| Vert. | 15540.0 | 42.7 | 32.2 | 39.3 | -0.2 | 32.2 | - | 49.5 | 39.0 | 73.9 | 53.9 | 24.4 | 14.9 | 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.

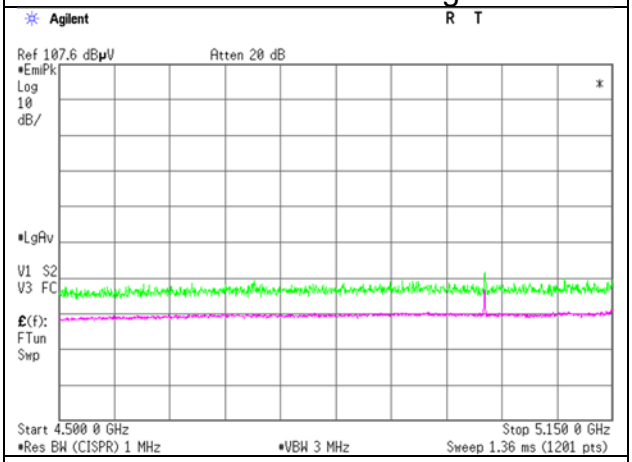
| | | |
|---|---|---|
| Distance factor: | 1 GHz - 6 GHz | 20log (3.75 m / 3.0 m) = 1.94 dB |
| | 6 GHz - 10 GHz | 20log (4.75 m / 3.0 m) = 4 dB |
| | 10 GHz - 40 GHz | 20log (1.0 m / 3.0 m) = -9.5 dB |

# Radiated Spurious Emission

| | |
|---|---|
| Test place | Ise EMC Lab. |
| Semi Anechoic Chamber | No.4 |
| Date | May 14, 2024 |
| Temperature / Humidity | 20 deg. C / 55 % RH |
| Engineer | Tomoya Sone |
| | (1 GHz to 6 GHz) |
| Mode | Tx 11n-20 5180 MHz |

| Horizontal |
|---|
| Restricted-band band-edge Plot |
|  |
| Trace Green: Peak Plot<br>Trace Purple: Average Plot |



| Vertical |
|---|
| Restricted-band band-edge Plot |
|  |
| Trace Green: Peak Plot<br>Trace Purple: Average Plot |



* 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.4 | No.4 | No.4 | No.4 |
| Date | May 14, 2024 | May 14, 2024 | May 17, 2024 | May 19, 2024 |
| Temperature / Humidity | 20 deg. C / 55 % RH | 23 deg. C / 41 % RH | 20 deg. C / 46 % RH | 23 deg. C / 48 % RH |
| Engineer | Tomoya Sone | Takumi Nishida | Tomoya Sone | Tomoya Sone |
| | (1 GHz to 6 GHz) | (6 GHz to 10 GHz) | (10 GHz to 18 GHz) | (Above 18 GHz) |
| Mode | Tx 11n-20 5240 MHz | | | |

| Polarity [Hori/Vert] | Frequency [MHz] | Reading (QP / PK) [dBuV] | Reading (AV) [dBuV] | Ant. Factor [dB/m] | Loss [dB] | Gain [dB] | Duty Factor [dB] | Result (QP / PK) [dBuV/m] | Result (AV) [dBuV/m] | Limit (QP / PK) [dBuV/m] | Limit (AV) [dBuV/m] | Margin (QP / PK) [dB] | Margin (AV) [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hori. | 5000.0 | 48.1 | 44.0 | 31.8 | 5.8 | 30.8 | - | 55.0 | 50.9 | 73.9 | 53.9 | 18.9 | 3.0 | |
| Hori. | 10480.0 | 49.9 | - | 36.1 | -1.6 | 32.6 | - | 51.6 | - | 68.2 | - | 16.6 | - | |
| Hori. | 15720.0 | 42.7 | 34.9 | 39.5 | -0.2 | 32.2 | - | 49.7 | 41.9 | 73.9 | 53.9 | 24.2 | 12.0 | Floor noise |
| Vert. | 5000.0 | 47.3 | 42.5 | 31.8 | 5.8 | 30.8 | - | 54.1 | 49.3 | 73.9 | 53.9 | 19.8 | 4.6 | |
| Vert. | 10480.0 | 45.3 | - | 36.1 | -1.6 | 32.6 | - | 47.1 | - | 68.2 | - | 21.1 | - | |
| Vert. | 15720.0 | 42.4 | 35.1 | 39.5 | -0.2 | 32.2 | - | 49.5 | 42.1 | 73.9 | 53.9 | 24.5 | 11.8 | 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 (3.75 m / 3.0 m) = 1.94 dB |
| | 6 GHz - 10 GHz | 20log (4.75 m / 3.0 m) = 4 dB |
| | 10 GHz - 40 GHz | 20log (1.0 m / 3.0 m) = -9.5 dB |

# Radiated Spurious Emission

| | | | | |
|---|---|---|---|---|
| Test place | Ise EMC Lab. | | | |
| Semi Anechoic Chamber | No.4 | No.4 | No.4 | No.4 |
| Date | May 14, 2024 | May 17, 2024 | May 19, 2024 | May 19, 2024 |
| Temperature / Humidity | 23 deg. C / 41 % RH | 20 deg. C / 46 % RH | 23 deg. C / 48 % RH | 22 deg. C / 57 % RH |
| Engineer | Takumi Nishida | Tomoya Sone | Tomoya Sone | Yuichiro Yamazaki |
| | (1 GHz to 10 GHz) | (10 GHz to 18 GHz) | (Above 18 GHz) | (Below 1 GHz) |
| Mode | Tx 11n-20 5320 MHz | | | |

| Polarity [Hori/Vert] | Frequency [MHz] | Reading (QP / PK) [dBuV] | Reading (AV) [dBuV] | Ant. Factor [dB/m] | Loss [dB] | Gain [dB] | Duty Factor [dB] | Result (QP / PK) [dBuV/m] | Result (AV) [dBuV/m] | Limit (QP / PK) [dBuV/m] | Limit (AV) [dBuV/m] | Margin (QP / PK) [dB] | Margin (AV) [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hori. | 68.4 | 43.9 | - | 6.5 | 7.5 | 32.1 | - | 25.8 | - | 40.0 | - | 14.2 | - | |
| Hori. | 140.6 | 33.9 | - | 14.6 | 8.2 | 32.0 | - | 24.6 | - | 43.5 | - | 18.9 | - | |
| Hori. | 163.5 | 34.3 | - | 15.6 | 8.4 | 32.0 | - | 26.3 | - | 43.5 | - | 17.2 | - | |
| Hori. | 300.0 | 43.5 | - | 13.7 | 9.6 | 32.0 | - | 34.7 | - | 46.0 | - | 11.3 | - | |
| Hori. | 625.0 | 33.9 | - | 19.4 | 11.4 | 32.3 | - | 32.4 | - | 46.0 | - | 13.6 | - | |
| Hori. | 875.0 | 29.6 | - | 21.9 | 12.2 | 31.3 | - | 32.4 | - | 46.0 | - | 13.6 | - | |
| Hori. | 5000.0 | 48.4 | 44.0 | 31.8 | 5.8 | 30.8 | - | 55.3 | 50.8 | 73.9 | 53.9 | 18.6 | 3.1 | |
| Hori. | 5350.0 | 45.5 | 37.1 | 31.7 | 6.0 | 30.9 | - | 52.3 | 43.9 | 73.9 | 53.9 | 21.6 | 10.0 | |
| Hori. | 10640.0 | 45.2 | 36.4 | 36.7 | -1.6 | 32.7 | - | 47.6 | 38.7 | 73.9 | 53.9 | 26.3 | 15.2 | |
| Hori. | 15960.0 | 42.5 | 34.8 | 39.9 | -0.3 | 32.3 | - | 49.9 | 42.2 | 73.9 | 53.9 | 24.0 | 11.7 | Floor noise |
| Vert. | 38.6 | 45.3 | - | 15.4 | 7.2 | 32.1 | - | 35.8 | - | 40.0 | - | 4.2 | - | |
| Vert. | 50.2 | 49.2 | - | 11.1 | 7.3 | 32.1 | - | 35.5 | - | 40.0 | - | 4.5 | - | |
| Vert. | 68.4 | 57.6 | - | 6.5 | 7.5 | 32.1 | - | 39.5 | - | 40.0 | - | 0.5 | - | |
| Vert. | 125.0 | 41.4 | - | 13.4 | 8.1 | 32.1 | - | 30.8 | - | 43.5 | - | 12.7 | - | |
| Vert. | 140.6 | 39.1 | - | 14.6 | 8.2 | 32.0 | - | 29.8 | - | 43.5 | - | 13.7 | - | |
| Vert. | 163.5 | 39.3 | - | 15.6 | 8.4 | 32.0 | - | 31.3 | - | 43.5 | - | 12.2 | - | |
| Vert. | 5000.0 | 46.7 | 43.2 | 31.8 | 5.8 | 30.8 | - | 53.5 | 50.1 | 73.9 | 53.9 | 20.4 | 3.8 | |
| Vert. | 5350.0 | 45.5 | 36.9 | 31.7 | 6.0 | 30.9 | - | 52.2 | 43.6 | 73.9 | 53.9 | 21.7 | 10.3 | |
| Vert. | 10640.0 | 44.2 | 34.7 | 36.7 | -1.6 | 32.7 | - | 46.5 | 37.1 | 73.9 | 53.9 | 27.4 | 16.8 | |
| Vert. | 15960.0 | 42.4 | 34.5 | 39.9 | -0.3 | 32.3 | - | 49.8 | 42.0 | 73.9 | 53.9 | 24.1 | 11.9 | 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.

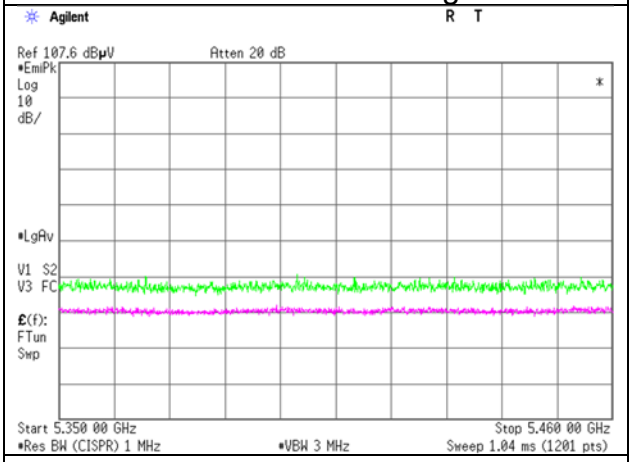
| | | |
|---|---|---|
| Distance factor: | 1 GHz - 6 GHz | 20log (3.75 m / 3.0 m) = 1.94 dB |
| | 6 GHz - 10 GHz | 20log (4.75 m / 3.0 m) = 4 dB |
| | 10 GHz - 40 GHz | 20log (1.0 m / 3.0 m) = -9.5 dB |

# Radiated Spurious Emission

| | |
|---|---|
| Test place | Ise EMC Lab. |
| Semi Anechoic Chamber | No.4 |
| Date | May 14, 2024 |
| Temperature / Humidity | 23 deg. C / 41 % RH |
| Engineer | Takumi Nishida |
| Mode | Tx 11n-20 5320 MHz |

Horizontal

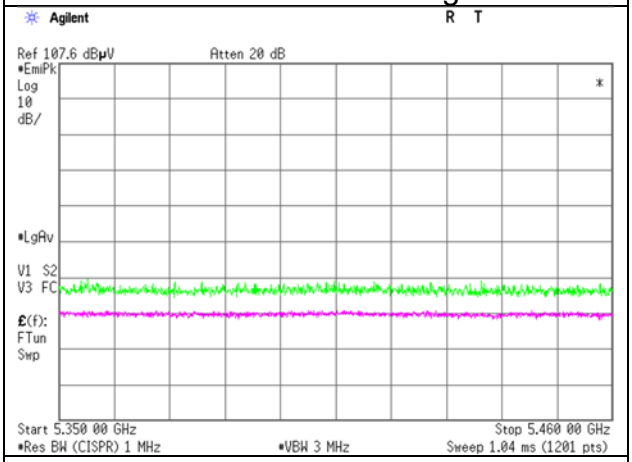
Restricted-band band-edge Plot




Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot




Trace Green: Peak Plot
Trace Purple: Average Plot

* 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.4 | No.4 | No.4 |
| Date | May 14, 2024 | May 17, 2024 | May 19, 2024 |
| Temperature / Humidity | 23 deg. C / 41 % RH | 20 deg. C / 46 % RH | 23 deg. C / 48 % RH |
| Engineer | Takumi Nishida | Tomoya Sone | Tomoya Sone |
| | (1 GHz to 10 GHz) | (10 GHz to 18 GHz) | (Above 18 GHz) |
| Mode | Tx 11n-20 5500 MHz | | |

| Polarity [Hori/Vert] | Frequency [MHz] | Reading (QP / PK) [dBuV] | Reading (AV) [dBuV] | Ant. Factor [dB/m] | Loss [dB] | Gain [dB] | Duty Factor [dB] | Result (QP / PK) [dBuV/m] | Result (AV) [dBuV/m] | Limit (QP / PK) [dBuV/m] | Limit (AV) [dBuV/m] | Margin (QP / PK) [dB] | Margin (AV) [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hori. | 5000.0 | 48.3 | 43.8 | 31.8 | 5.8 | 30.8 | - | 55.1 | 50.6 | 73.9 | 53.9 | 18.8 | 3.3 | |
| Hori. | 5460.0 | 44.3 | 35.7 | 31.8 | 6.1 | 30.9 | - | 51.2 | 42.7 | 68.2 | 53.9 | 17.0 | 11.2 | |
| Hori. | 5470.0 | 45.5 | - | 31.8 | 6.1 | 30.9 | - | 52.5 | - | 68.2 | - | 15.7 | - | |
| Hori. | 11000.0 | 46.0 | 36.9 | 37.4 | -1.5 | 32.8 | - | 49.1 | 40.0 | 73.9 | 53.9 | 24.8 | 13.9 | |
| Hori. | 16500.0 | 42.5 | - | 39.9 | -0.1 | 32.3 | - | 49.9 | - | 68.2 | - | 18.4 | - | Floor noise |
| Vert. | 5000.0 | 46.8 | 43.4 | 31.8 | 5.8 | 30.8 | - | 53.7 | 50.3 | 73.9 | 53.9 | 20.2 | 3.6 | |
| Vert. | 5460.0 | 43.0 | 34.8 | 31.8 | 6.1 | 30.9 | - | 50.0 | 41.8 | 68.2 | 53.9 | 18.3 | 12.1 | |
| Vert. | 5470.0 | 46.0 | - | 31.8 | 6.1 | 30.9 | - | 53.0 | - | 68.2 | - | 15.2 | - | |
| Vert. | 11000.0 | 42.8 | 34.6 | 37.4 | -1.5 | 32.8 | - | 45.9 | 37.7 | 73.9 | 53.9 | 28.0 | 16.2 | |
| Vert. | 16500.0 | 43.3 | - | 39.9 | -0.1 | 32.3 | - | 50.7 | - | 68.2 | - | 17.5 | - | 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.

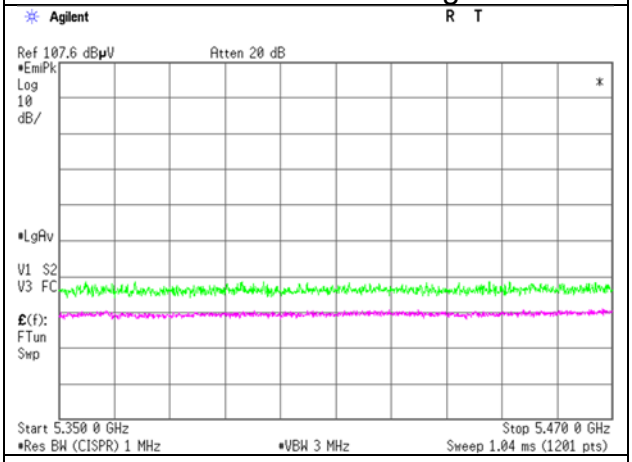
| | | |
|---|---|---|
| Distance factor: | 1 GHz - 6 GHz | 20log (3.75 m / 3.0 m) = 1.94 dB |
| | 6 GHz - 10 GHz | 20log (4.75 m / 3.0 m) = 4 dB |
| | 10 GHz - 40 GHz | 20log (1.0 m / 3.0 m) = -9.5 dB |

# Radiated Spurious Emission

| | |
|---|---|
| Test place | Ise EMC Lab. |
| Semi Anechoic Chamber | No.4 |
| Date | May 14, 2024 |
| Temperature / Humidity | 23 deg. C / 41 % RH |
| Engineer | Takumi Nishida |
| Mode | Tx 11n-20 5500 MHz |

Horizontal

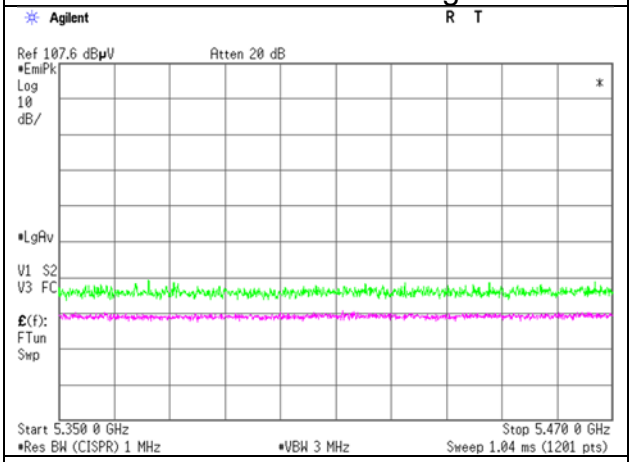
Restricted-band band-edge Plot




Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot




Trace Green: Peak Plot
Trace Purple: Average Plot

* 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.4 | No.4 | No.4 |
| Date | May 14, 2024 | May 17, 2024 | May 19, 2024 |
| Temperature / Humidity | 23 deg. C / 41 % RH | 20 deg. C / 46 % RH | 23 deg. C / 48 % RH |
| Engineer | Takumi Nishida | Tomoya Sone | Tomoya Sone |
| | (1 GHz to 10 GHz) | (10 GHz to 18 GHz) | (Above 18 GHz) |
| Mode | Tx 11n-20 5580 MHz | | |

| Polarity [Hori/Vert] | Frequency [MHz] | Reading (QP / PK) [dBuV] | Reading (AV) [dBuV] | Ant. Factor [dB/m] | Loss [dB] | Gain [dB] | Duty Factor [dB] | Result (QP / PK) [dBuV/m] | Result (AV) [dBuV/m] | Limit (QP / PK) [dBuV/m] | Limit (AV) [dBuV/m] | Margin (QP / PK) [dB] | Margin (AV) [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hori. | 5000.0 | 48.0 | 43.7 | 31.8 | 5.8 | 30.8 | - | 54.9 | 50.5 | 73.9 | 53.9 | 19.0 | 3.4 | |
| Hori. | 11160.0 | 45.5 | 37.0 | 37.3 | -1.5 | 32.8 | - | 48.5 | 40.0 | 73.9 | 53.9 | 25.4 | 13.9 | |
| Hori. | 16740.0 | 42.7 | - | 39.6 | -0.1 | 32.3 | - | 49.9 | - | 68.2 | - | 18.4 | - | Floor noise |
| Vert. | 5000.0 | 46.5 | 43.2 | 31.8 | 5.8 | 30.8 | - | 53.4 | 50.1 | 73.9 | 53.9 | 20.5 | 3.8 | |
| Vert. | 11160.0 | 43.2 | 35.5 | 37.3 | -1.5 | 32.8 | - | 46.2 | 38.5 | 73.9 | 53.9 | 27.7 | 15.4 | |
| Vert. | 16740.0 | 42.5 | - | 39.6 | -0.1 | 32.3 | - | 49.7 | - | 68.2 | - | 18.5 | - | 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 (3.75 m / 3.0 m) = 1.94 dB |
| | 6 GHz - 10 GHz | 20log (4.75 m / 3.0 m) = 4 dB |
| | 10 GHz - 40 GHz | 20log (1.0 m / 3.0 m) = -9.5 dB |

# Radiated Spurious Emission

| | | | |
|---|---|---|---|
| Test place | Ise EMC Lab. | | |
| Semi Anechoic Chamber | No.4 | No.4 | No.4 |
| Date | May 14, 2024 | May 17, 2024 | May 19, 2024 |
| Temperature / Humidity | 23 deg. C / 41 % RH | 20 deg. C / 46 % RH | 23 deg. C / 48 % RH |
| Engineer | Takumi Nishida | Tomoya Sone | Tomoya Sone |
| | (1 GHz to 10 GHz) | (10 GHz to 18 GHz) | (Above 18 GHz) |
| Mode | Tx 11n-20 5700 MHz | | |

| Polarity [Hori/Vert] | Frequency [MHz] | Reading (QP / PK) [dBuV] | Reading (AV) [dBuV] | Ant. Factor [dB/m] | Loss [dB] | Gain [dB] | Duty Factor [dB] | Result (QP / PK) [dBuV/m] | Result (AV) [dBuV/m] | Limit (QP / PK) [dBuV/m] | Limit (AV) [dBuV/m] | Margin (QP / PK) [dB] | Margin (AV) [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hori. | 5000.0 | 48.1 | 43.6 | 31.8 | 5.8 | 30.8 | - | 55.0 | 50.4 | 73.9 | 53.9 | 18.9 | 3.5 | |
| Hori. | 5725.0 | 54.4 | - | 32.0 | 6.2 | 31.0 | - | 61.5 | - | 68.2 | - | 6.7 | - | |
| Hori. | 11400.0 | 44.7 | 36.1 | 37.6 | -1.5 | 32.7 | - | 48.1 | 39.5 | 73.9 | 53.9 | 25.8 | 14.4 | |
| Hori. | 17100.0 | 40.4 | - | 39.7 | 0.0 | 32.4 | - | 47.7 | - | 68.2 | - | 20.5 | - | Floor noise |
| Vert. | 5000.0 | 46.3 | 43.6 | 31.8 | 5.8 | 30.8 | - | 53.2 | 50.5 | 73.9 | 53.9 | 20.7 | 3.4 | |
| Vert. | 5725.0 | 51.6 | - | 32.0 | 6.2 | 31.0 | - | 58.6 | - | 68.2 | - | 9.6 | - | |
| Vert. | 11400.0 | 42.0 | 34.4 | 37.6 | -1.5 | 32.7 | - | 45.5 | 37.9 | 73.9 | 53.9 | 28.4 | 16.0 | |
| Vert. | 17100.0 | 40.7 | - | 39.7 | 0.0 | 32.4 | - | 48.0 | - | 68.2 | - | 20.3 | - | 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.

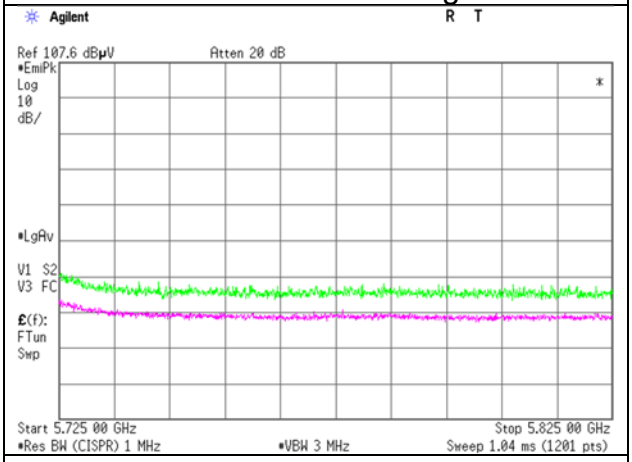
| | | |
|---|---|---|
| Distance factor: | 1 GHz - 6 GHz | 20log (3.75 m / 3.0 m) = 1.94 dB |
| | 6 GHz - 10 GHz | 20log (4.75 m / 3.0 m) = 4 dB |
| | 10 GHz - 40 GHz | 20log (1.0 m / 3.0 m) = -9.5 dB |

# Radiated Spurious Emission

| | |
|---|---|
| Test place | Ise EMC Lab. |
| Semi Anechoic Chamber | No.4 |
| Date | May 14, 2024 |
| Temperature / Humidity | 23 deg. C / 41 % RH |
| Engineer | Takumi Nishida |
| Mode | Tx 11n-20 5700 MHz |

Horizontal

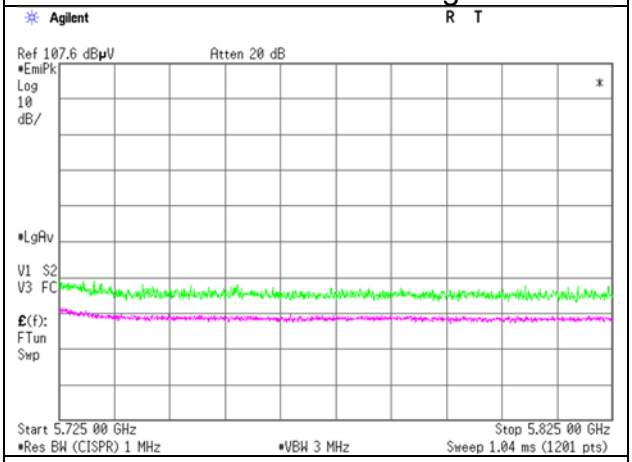
Restricted-band band-edge Plot




Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot




Trace Green: Peak Plot
Trace Purple: Average Plot

* 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.4 | No.4 | No.4 |
| Date | May 14, 2024 | May 17, 2024 | May 19, 2024 |
| Temperature / Humidity | 23 deg. C / 41 % RH | 20 deg. C / 46 % RH | 23 deg. C / 48 % RH |
| Engineer | Takumi Nishida | Tomoya Sone | Tomoya Sone |
| | (1 GHz to 10 GHz) | (10 GHz to 18 GHz) | (Above 18 GHz) |
| Mode | Tx 11n-20 5745 MHz | | |

| Polarity [Hori/Vert] | Frequency [MHz] | Reading (QP / PK) [dBuV] | Reading (AV) [dBuV] | Ant. Factor [dB/m] | Loss [dB] | Gain [dB] | Duty Factor [dB] | Result (QP / PK) [dBuV/m] | Result (AV) [dBuV/m] | Limit (QP / PK) [dBuV/m] | Limit (AV) [dBuV/m] | Margin (QP / PK) [dB] | Margin (AV) [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hori. | 5000.0 | 48.1 | 43.9 | 31.8 | 5.8 | 30.8 | - | 55.0 | 50.8 | 73.9 | 53.9 | 18.9 | 3.1 | |
| Hori. | 5650.0 | 45.7 | - | 31.8 | 6.1 | 31.0 | - | 52.6 | - | 68.2 | - | 15.6 | - | |
| Hori. | 5700.0 | 45.9 | - | 31.9 | 6.2 | 31.0 | - | 52.9 | - | 105.2 | - | 52.3 | - | |
| Hori. | 5720.0 | 52.7 | - | 32.0 | 6.2 | 31.0 | - | 59.8 | - | 110.8 | - | 51.0 | - | |
| Hori. | 5725.0 | 58.6 | - | 32.0 | 6.2 | 31.0 | - | 65.8 | - | 122.2 | - | 56.4 | - | |
| Hori. | 11490.0 | 48.1 | 40.0 | 37.7 | -1.5 | 32.7 | - | 51.6 | 43.5 | 73.9 | 53.9 | 22.3 | 10.4 | |
| Hori. | 17235.0 | 39.4 | - | 39.8 | 0.0 | 32.4 | - | 46.9 | - | 68.2 | - | 21.3 | - | Floor noise |
| Vert. | 5000.0 | 46.7 | 43.4 | 31.8 | 5.8 | 30.8 | - | 53.6 | 50.3 | 73.9 | 53.9 | 20.3 | 3.6 | |
| Vert. | 5650.0 | 43.1 | - | 31.8 | 6.1 | 31.0 | - | 50.0 | - | 68.2 | - | 18.2 | - | |
| Vert. | 5700.0 | 44.3 | - | 31.9 | 6.2 | 31.0 | - | 51.4 | - | 105.2 | - | 53.8 | - | |
| Vert. | 5720.0 | 51.5 | - | 32.0 | 6.2 | 31.0 | - | 58.6 | - | 110.8 | - | 52.2 | - | |
| Vert. | 5725.0 | 56.2 | - | 32.0 | 6.2 | 31.0 | - | 63.4 | - | 122.2 | - | 58.9 | - | |
| Vert. | 11490.0 | 43.5 | 35.3 | 37.7 | -1.5 | 32.7 | - | 47.0 | 38.9 | 73.9 | 53.9 | 26.9 | 15.1 | |
| Vert. | 17235.0 | 39.2 | - | 39.8 | 0.0 | 32.4 | - | 46.7 | - | 68.2 | - | 21.5 | - | 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.

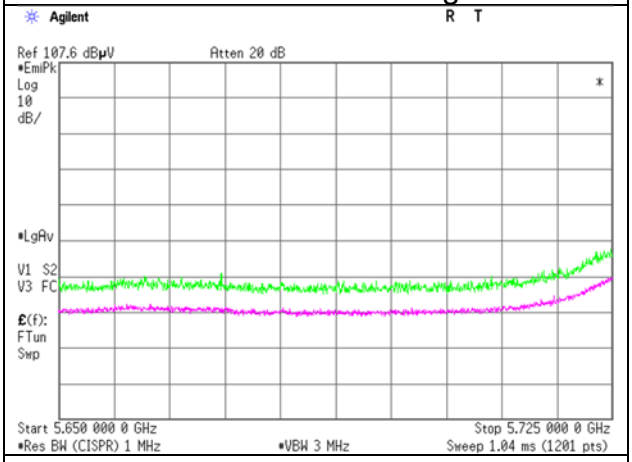
| | | |
|---|---|---|
| Distance factor: | 1 GHz - 6 GHz | 20log (3.75 m / 3.0 m) = 1.94 dB |
| | 6 GHz - 10 GHz | 20log (4.75 m / 3.0 m) = 4 dB |
| | 10 GHz - 40 GHz | 20log (1.0 m / 3.0 m) = -9.5 dB |

# Radiated Spurious Emission

| | |
|---|---|
| Test place | Ise EMC Lab. |
| Semi Anechoic Chamber | No.4 |
| Date | May 14, 2024 |
| Temperature / Humidity | 23 deg. C / 41 % RH |
| Engineer | Takumi Nishida |
| Mode | Tx 11n-20 5745 MHz |

Horizontal

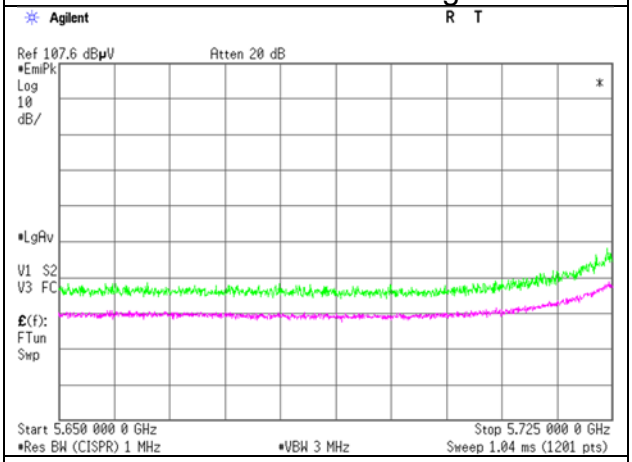
Restricted-band band-edge Plot




Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot




Trace Green: Peak Plot
Trace Purple: Average Plot

* 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.4 | No.4 | No.4 |
| Date | May 14, 2024 | May 17, 2024 | May 19, 2024 |
| Temperature / Humidity | 23 deg. C / 41 % RH | 20 deg. C / 46 % RH | 23 deg. C / 48 % RH |
| Engineer | Takumi Nishida | Tomoya Sone | Tomoya Sone |
| | (1 GHz to 10 GHz) | (10 GHz to 18 GHz) | (Above 18 GHz) |
| Mode | Tx 11n-20 5785 MHz | | |

| Polarity [Hori/Vert] | Frequency [MHz] | Reading (QP / PK) [dBuV] | Reading (AV) [dBuV] | Ant. Factor [dB/m] | Loss [dB] | Gain [dB] | Duty Factor [dB] | Result (QP / PK) [dBuV/m] | Result (AV) [dBuV/m] | Limit (QP / PK) [dBuV/m] | Limit (AV) [dBuV/m] | Margin (QP / PK) [dB] | Margin (AV) [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hori. | 5000.0 | 48.3 | 43.7 | 31.8 | 5.8 | 30.8 | - | 55.2 | 50.6 | 73.9 | 53.9 | 18.7 | 3.3 | |
| Hori. | 11570.0 | 45.8 | 38.4 | 37.7 | -1.5 | 32.7 | - | 49.4 | 42.0 | 73.9 | 53.9 | 24.5 | 11.9 | |
| Hori. | 17355.0 | 42.7 | - | 39.9 | 0.1 | 32.4 | - | 50.3 | - | 68.2 | - | 17.9 | - | Floor noise |
| Vert. | 5000.0 | 46.6 | 43.2 | 31.8 | 5.8 | 30.8 | - | 53.4 | 50.1 | 73.9 | 53.9 | 20.5 | 3.8 | |
| Vert. | 11570.0 | 43.7 | 35.1 | 37.7 | -1.5 | 32.7 | - | 47.2 | 38.7 | 73.9 | 53.9 | 26.7 | 15.2 | |
| Vert. | 17355.0 | 43.0 | - | 39.9 | 0.1 | 32.4 | - | 50.7 | - | 68.2 | - | 17.5 | - | 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 (3.75 m / 3.0 m) = 1.94 dB |
| | 6 GHz - 10 GHz | 20log (4.75 m / 3.0 m) = 4 dB |
| | 10 GHz - 40 GHz | 20log (1.0 m / 3.0 m) = -9.5 dB |

# Radiated Spurious Emission

| | | | |
|---|---|---|---|
| Test place | Ise EMC Lab. | | |
| Semi Anechoic Chamber | No.4 | No.4 | No.4 |
| Date | May 14, 2024 | May 17, 2024 | May 19, 2024 |
| Temperature / Humidity | 23 deg. C / 41 % RH | 20 deg. C / 46 % RH | 23 deg. C / 48 % RH |
| Engineer | Takumi Nishida | Tomoya Sone | Tomoya Sone |
| | (1 GHz to 10 GHz) | (10 GHz to 18 GHz) | (Above 18 GHz) |
| Mode | Tx 11n-20 5825 MHz | | |

| Polarity [Hori/Vert] | Frequency [MHz] | Reading (QP / PK) [dBuV] | Reading (AV) [dBuV] | Ant. Factor [dB/m] | Loss [dB] | Gain [dB] | Duty Factor [dB] | Result (QP / PK) [dBuV/m] | Result (AV) [dBuV/m] | Limit (QP / PK) [dBuV/m] | Limit (AV) [dBuV/m] | Margin (QP / PK) [dB] | Margin (AV) [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hori. | 5000.0 | 48.3 | 43.7 | 31.8 | 5.8 | 30.8 | - | 55.2 | 50.6 | 73.9 | 53.9 | 18.7 | 3.3 | |
| Hori. | 5850.0 | 50.5 | - | 32.3 | 6.2 | 31.1 | - | 57.9 | - | 122.2 | - | 64.3 | - | |
| Hori. | 5855.0 | 46.8 | - | 32.3 | 6.2 | 31.1 | - | 54.2 | - | 110.8 | - | 56.6 | - | |
| Hori. | 5875.0 | 42.8 | - | 32.3 | 6.2 | 31.1 | - | 50.2 | - | 105.2 | - | 55.0 | - | |
| Hori. | 5925.0 | 40.6 | - | 32.4 | 6.2 | 31.1 | - | 48.1 | - | 68.2 | - | 20.1 | - | |
| Hori. | 11650.0 | 48.0 | 41.3 | 37.7 | -1.5 | 32.6 | - | 51.6 | 44.9 | 73.9 | 53.9 | 22.3 | 9.0 | |
| Hori. | 17475.0 | 42.8 | - | 40.0 | 0.1 | 32.4 | - | 50.5 | - | 68.2 | - | 17.7 | - | Floor noise |
| Vert. | 5000.0 | 46.3 | 43.6 | 31.8 | 5.8 | 30.8 | - | 53.2 | 50.4 | 73.9 | 53.9 | 20.7 | 3.5 | |
| Vert. | 5850.0 | 45.0 | - | 32.3 | 6.2 | 31.1 | - | 52.4 | - | 122.2 | - | 69.8 | - | |
| Vert. | 5855.0 | 42.8 | - | 32.3 | 6.2 | 31.1 | - | 50.3 | - | 110.8 | - | 60.5 | - | |
| Vert. | 5875.0 | 42.0 | - | 32.3 | 6.2 | 31.1 | - | 49.5 | - | 105.2 | - | 55.7 | - | |
| Vert. | 5925.0 | 40.2 | - | 32.4 | 6.2 | 31.1 | - | 47.8 | - | 68.2 | - | 20.4 | - | |
| Vert. | 11650.0 | 44.1 | 36.2 | 37.7 | -1.5 | 32.6 | - | 47.7 | 39.9 | 73.9 | 53.9 | 26.2 | 14.1 | |
| Vert. | 17475.0 | 42.6 | - | 40.0 | 0.1 | 32.4 | - | 50.4 | - | 68.2 | - | 17.9 | - | 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.

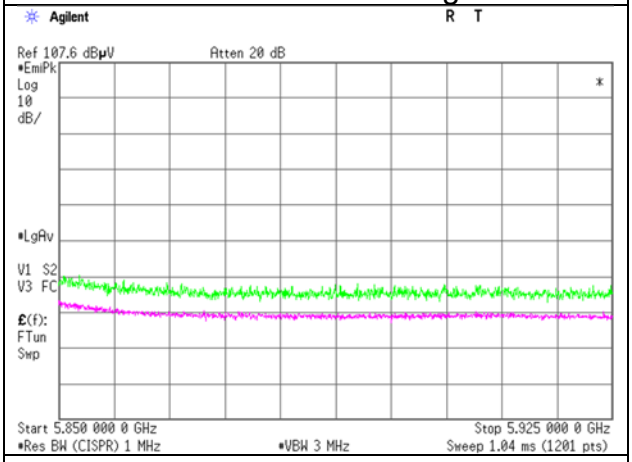
| | | |
|---|---|---|
| Distance factor: | 1 GHz - 6 GHz | 20log (3.75 m / 3.0 m) = 1.94 dB |
| | 6 GHz - 10 GHz | 20log (4.75 m / 3.0 m) = 4 dB |
| | 10 GHz - 40 GHz | 20log (1.0 m / 3.0 m) = -9.5 dB |

# Radiated Spurious Emission

| | |
|---|---|
| Test place | Ise EMC Lab. |
| Semi Anechoic Chamber | No.4 |
| Date | May 14, 2024 |
| Temperature / Humidity | 23 deg. C / 41 % RH |
| Engineer | Takumi Nishida |
| Mode | Tx 11n-20 5825 MHz |

Horizontal

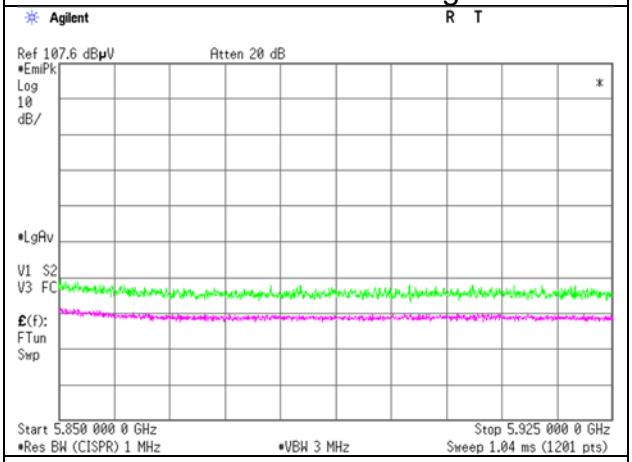
Restricted-band band-edge Plot




Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot

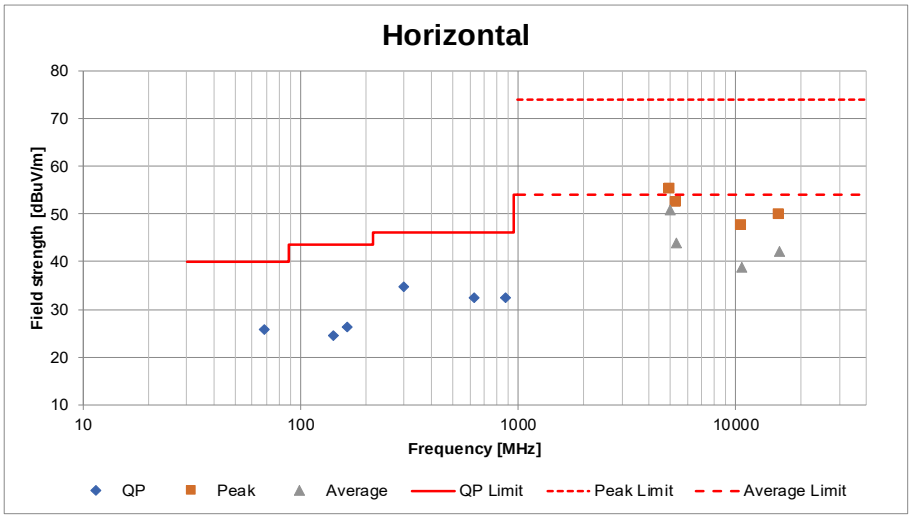


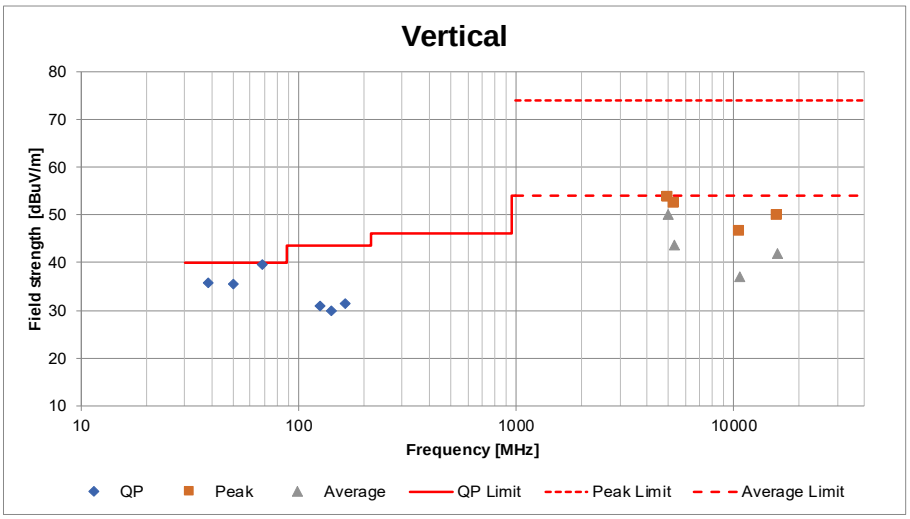

Trace Green: Peak Plot
Trace Purple: Average Plot

* 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 Conducted Output Power)

| | | | | |
|---|---|---|---|---|
| Test place | Ise EMC Lab. | | | |
| Semi Anechoic Chamber | No.4 | No.4 | No.4 | No.4 |
| Date | May 14, 2024 | May 17, 2024 | May 19, 2024 | May 19, 2024 |
| Temperature / Humidity | 23 deg. C / 41 % RH | 20 deg. C / 46 % RH | 23 deg. C / 48 % RH | 22 deg. C / 57 % RH |
| Engineer | Takumi Nishida | Tomoya Sone | Tomoya Sone | Yuichiro Yamazaki |
| | (1 GHz to 10 GHz) | (10 GHz to 18 GHz) | (Above 18 GHz) | (Below 1 GHz) |
| Mode | Tx 11n-20 5320 MHz | | | |



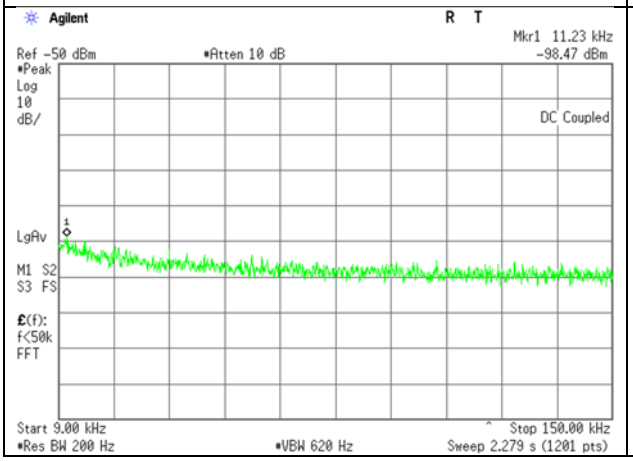




*These plots data contains sufficient number to show the trend of characteristic features for EUT.

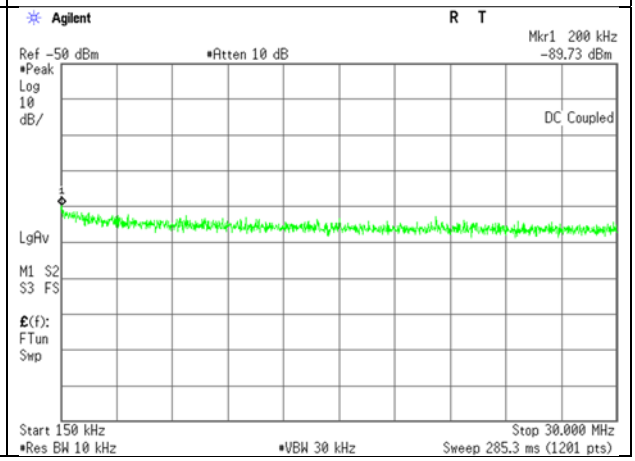
# Conducted Spurious Emission

| | |
|---|---|
| Test place | Ise EMC Lab. No.8 Measurement Room |
| Date | May 23, 2024 |
| Temperature / Humidity | 25 deg. C / 57 % RH |
| Engineer | Shousei Hamaguchi |
| Mode | Tx 11n-20 5320 MHz |

## 9 kHz to 150 kHz




## 150 kHz to 30 MHz




| Frequency [kHz] | Reading [dBm] | Cable Loss [dB] | Attenuator [dB] | Antenna Gain* [dBi] | N (Number of Output) | EIRP [dBm] | Distance [m] | Ground bounce [dB] | E (field strength) [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11.23 | -98.5 | 0.00 | 19.9 | 2.0 | 2 | -73.6 | 300 | 6.0 | -12.3 | 46.5 | 58.8 | |
| 200.00 | -89.7 | 0.01 | 19.9 | 2.0 | 2 | -64.8 | 300 | 6.0 | -3.6 | 21.5 | 25.1 | |

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 KDB 789033 since antenna gain was less than 2.0 dBi.

# APPENDIX 2: Test Instruments

## Test Equipment (1/2)

| Test Item | LIMS ID | Description | Manufacturer | Model | Serial | Last Calibration Date | Cal Int |
|---|---|---|---|---|---|---|---|
| CE | 141217 | Coaxial cable | Fujikura/Suhner/TSJ | 5D-2W/SFM141/421-010/sucoform141-PE/RFM-E121(SW) | -/04178 | 06/14/2024 | 12 |
| CE | 141248 | Attenuator | JFW Industries, Inc. | 50FP-013H2 N | - | 12/08/2023 | 12 |
| CE | 141357 | LISN(AMN) | Schwarzbeck Mess-Elektronik OHG | NSLK8127 | 8127-729 | 07/09/2024 | 12 |
| CE | 141358 | LISN(AMN) | Schwarzbeck Mess-Elektronik OHG | NSLK8127 | 8127-730 | 07/09/2024 | 12 |
| CE | 141545 | DIGITAL HiTESTER | HIOKI E.E. CORPORATION | 3805 | 51201148 | 02/01/2024 | 12 |
| CE | 141938 | Terminator | TME | CT-01BP | - | 12/04/2023 | 12 |
| CE | 141949 | Test Receiver | Rohde & Schwarz | ESCI | 100767 | 06/05/2024 | 12 |
| CE | 142011 | AC4_Semi Anechoic Chamber(NSA) | TDK | Semi Anechoic Chamber 3m | DA-10005 | 12/13/2023 | 24 |
| CE | 142230 | Measure, Tape, Steel | KOMELON | KMC-36 | - | - | - |
| CE | 178648 | EMI measurement program | TSJ (Techno Science Japan) | TEPTO-DV | - | - | - |
| CE | 244710 | Thermo-Hygrometer | HIOKI E.E. CORPORATION | LR5001 | 231202104 | 01/25/2024 | 12 |
| RE | 141227 | Microwave Cable | Junkosha | MMX221-00500DMSDMS | 1502S305 | 03/04/2024 | 12 |
| RE | 141267 | Logperiodic Antenna(200-1000MHz) | Schwarzbeck Mess-Elektronik OHG | VUSLP9111B | 9111B-192 | 09/21/2023 | 12 |
| RE | 141294 | High Pass Filter 7-20GHz | TOKIMEC | TF37NCCC | 603 | 02/15/2024 | 12 |
| RE | 141331 | Attenuator(6dB) | TME | UFA-01 | - | 02/17/2024 | 12 |
| RE | 141397 | Coaxial Cable | UL Japan | - | - | 11/22/2023 | 12 |
| RE | 141425 | Biconical Antenna | Schwarzbeck Mess-Elektronik OHG | VHA9103+BBA9106 | VHA 91031302 | 08/10/2023 | 12 |
| RE | 141506 | Horn Antenna 15-40GHz | Schwarzbeck Mess-Elektronik OHG | BBHA9170 | BBHA9170307 | 08/09/2023 | 12 |
| RE | 141512 | Horn Antenna 1-18GHz | Schwarzbeck Mess-Elektronik OHG | BBHA9120D | 254 | 10/17/2023 | 12 |
| RE | 141517 | Horn Antenna 26.5-40GHz | ETS-Lindgren | 3160-10 | 152399 | 11/20/2023 | 12 |
| RE | 141545 | DIGITAL HiTESTER | HIOKI E.E. CORPORATION | 3805 | 51201148 | 02/01/2024 | 12 |
| RE | 141581 | MicroWave System Amplifier | Keysight Technologies Inc | 83017A | 00650 | 10/05/2023 | 12 |
| RE | 141583 | Pre Amplifier | SONOMA INSTRUMENT | 310 | 260833 | 04/04/2024 | 12 |
| RE | 141588 | Pre Amplifier | L3 Narda-MITEQ | AMF-6F-2600400-33-8P / AMF-4F-2600400-33-8P | 1871355 /1871328 | 01/22/2024 | 12 |
| RE | 141978 | Spectrum Analyzer | Keysight Technologies Inc | E4448A | MY46180899 | 05/09/2024 | 12 |
| RE | 142011 | AC4_Semi Anechoic Chamber(NSA) | TDK | Semi Anechoic Chamber 3m | DA-10005 | 12/13/2023 | 24 |
| RE | 142017 | AC4_Semi Anechoic Chamber(SVSWR) | TDK | Semi Anechoic Chamber 3m | DA-10005 | 04/14/2023 | 24 |
| RE | 142230 | Measure, Tape, Steel | KOMELON | KMC-36 | - | - | - |
| RE | 160324 | Coaxial Cable | Huber+Suhner | SUCOFLEX 102A | MY009/2A | 10/05/2023 | 12 |
| RE | 178648 | EMI measurement program | TSJ (Techno Science Japan) | TEPTO-DV | - | - | - |
| RE | 234602 | Microwave Cable | Huber+Suhner | SF126E/11PC35/11PC35/1000M,5000M | 537063/126E / 537074/126E | 03/08/2024 | 12 |
| RE | 244710 | Thermo-Hygrometer | HIOKI E.E. CORPORATION | LR5001 | 231202104 | 01/25/2024 | 12 |
| RE | 245788 | Double Ridge Horn Antenna | Schwarzbeck Mess-Elektronik OHG | BBHA 9120 C | 690 | 03/06/2024 | 12 |
| AT | 141171 | Attenuator(20dB)_DC-1GHz_N | Weinschel Corp | MODEL 1 | BG0143 | 12/06/2023 | 12 |

## Test Equipment (2/2)

| Test Item | LIMS ID | Description | Manufacturer | Model | Serial | Last Calibration Date | Cal Int |
|---|---|---|---|---|---|---|---|
| AT | 141327 | Coaxial Cable | UL Japan | - | - | 02/09/2024 | 12 |
| AT | 141329 | Microwave Cable 1G-40GHz | Suhner | SUCOFLEX102 | 28635/2 | 04/08/2024 | 12 |
| AT | 141333 | Attenuator(10dB) | Suhner | 6810.19.A | - | 12/11/2023 | 12 |
| AT | 141334 | Attenuator(10dB) | Suhner | 6810.19.A | - | 12/12/2023 | 12 |
| AT | 141366 | Attenuator | Weinschel Associates | WA56-20 | 56200213 | 05/28/2024 | 12 |
| AT | 141545 | DIGITAL HiTESTER | HIOKI E.E. CORPORATION | 3805 | 51201148 | 02/01/2024 | 12 |
| AT | 141557 | DIGIITAL HiTESTER | HIOKI E.E. CORPORATION | 3805 | 070900530 | 01/31/2024 | 12 |
| AT | 141807 | Dual Power Meter | Hewlett Packard | E4419A (=EPM-442A) | GB37170359 | 08/24/2023 | 12 |
| AT | 141810 | Power Meter | Anritsu Corporation | ML2495A | 824014 | 12/12/2023 | 12 |
| AT | 141824 | Power Sensor | Hewlett Packard | ECP-E18A (=E4412A) | US37181068 | 08/24/2023 | 12 |
| AT | 141832 | Power sensor | Anritsu Corporation | MA2411B | 738174 | 12/12/2023 | 12 |
| AT | 141900 | Spectrum Analyzer | Keysight Technologies Inc | E4440A | MY46185823 | 06/16/2023 | 12 |
| AT | 142230 | Measure, Tape, Steel | KOMELON | KMC-36 | - | - | - |
| AT | 197219 | Microwave cable | Huber+Suhner | SF126E/11PC35/11PC35/2000MM | 536999/126E | 03/19/2024 | 12 |
| AT | 244710 | Thermo-Hygrometer | HIOKI E.E. CORPORATION | LR5001 | 231202104 | 01/25/2024 | 12 |
| AT | 244711 | Thermo-Hygrometer | HIOKI E.E. CORPORATION | LR5001 | 231202105 | 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**
**CE: Conducted Emission**
**RE: Radiated Emission**