



# **RADIO TEST REPORT**

**Test Report No. : 13568152S-O-R1**

**Applicant** : KONICA MINOLTA, INC.  
**Type of EUT** : SKR 3000  
**Model Number of EUT** : P-75  
**FCC ID** : YR7SKR3000P7  
**Test regulation** : FCC Part 15 Subpart E: 2021  
**Test item** : Radiated emission test  
**Test Result** : Complied (Refer to SECTION 3.2)

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
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6. This test report covers Radio technical requirements.  
It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in SECTION 1.
10. This report is a revised version of 13568152S-O. 13568152S-O is replaced with this report.

**Date of test:** January 5 to 12, 2021

**Representative test engineer:**   
Yosuke Murakami  
Engineer

**Approved by:**   
Toyokazu Imamura  
Leader



CERTIFICATE 1266.03

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

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# REVISION HISTORY

## Original Test Report No.: 13568152S-O

| Revision     | Test report No. | Date          | Page revised                                                                                                  | Contents                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------|-----------------|---------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| - (Original) | 13568152S-O     | March 1, 2021 | -                                                                                                             | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 1            | 13568152S-O-R1  | May 26, 2021  | 6                                                                                                             | Update of "Worst margin":<br>Spurious Emission Restricted Band Edge:<br>From "6.4 dB" to "6.6 dB"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|              |                 |               | 13                                                                                                            | Correction of formula for 1 GHz - 10 GHz:<br>From<br>"Distance Factor: $20 \times \log (3.77 \text{ m} / 3.0 \text{ m}) = 1.99 \text{ dB}$<br>* Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.77 \text{ m}$<br>SVSWR Volume : 2.0 m<br>(SVSWR Volume has been calibrated based on CISPR 16-1- 4.)<br>$r = 0.19 \text{ m}$ "<br>to<br>"Distance Factor: $20 \times \log (3.68 \text{ m} / 3.0 \text{ m}) = 1.77 \text{ dB}$<br>* Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.68 \text{ m}$<br>SVSWR Volume : 2.0 m<br>(SVSWR Volume has been calibrated based on CISPR 16-1- 4.)<br>$r = 0.32 \text{ m}$ "<br><br>Correction of Antenna polarization:<br>From "Spurious (1 GHz -2.8 GHz)" to "Spurious (1 GHz -6.4 GHz)",<br>From "Spurious (2.8 GHz -10 GHz)" to "Spurious (6.4 GHz -10 GHz)", |
|              |                 |               | 14,16-17,<br>19,21-22,<br>24,26-27,<br>29,31-32,<br>34,36-37,<br>39,41-42,<br>44,46-47,<br>49,51-52,<br>54,56 | Replacement of Test data by correction of Distance Factor for 1 GHz - 10 GHz:<br>From " $20 \times \log (3.77 \text{ m} / 3.0 \text{ m}) = 1.99 \text{ dB}$ "<br>to " $20 \times \log (3.68 \text{ m} / 3.0 \text{ m}) = 1.77 \text{ dB}$ "                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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

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

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| <b>CONTENTS</b>                                                            | <b>PAGE</b> |
|----------------------------------------------------------------------------|-------------|
| <b>SECTION 1: Customer information.....</b>                                | <b>5</b>    |
| <b>SECTION 2: Equipment under test (EUT).....</b>                          | <b>5</b>    |
| <b>SECTION 3: Test specification, procedures &amp; results.....</b>        | <b>6</b>    |
| <b>SECTION 4: Operation of EUT during testing.....</b>                     | <b>9</b>    |
| <b>SECTION 5: Radiated Spurious Emission and Band Edge Compliance.....</b> | <b>11</b>   |
| <b>APPENDIX 1: Test data .....</b>                                         | <b>14</b>   |
| Radiated Spurious Emission .....                                           | 14          |
| <b>APPENDIX 2: Test instruments .....</b>                                  | <b>59</b>   |
| <b>APPENDIX 3: Photographs of test setup .....</b>                         | <b>60</b>   |
| Radiated Spurious Emission .....                                           | 60          |
| Worst Case Position .....                                                  | 61          |

## **SECTION 1: Customer information**

Company Name : KONICA MINOLTA, INC.  
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 Contact Person : Yukihiro Niekawa

The information provided from the customer is as follows;

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

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

## **SECTION 2: Equipment under test (EUT)**

### **2.1 Identification of EUT**

Type : SKR 3000  
 Model Number : P-75  
 Serial Number : Refer to SECTION 4.2  
 Rating : DC 15 V  
 Receipt Date : November 24, 2020  
 Country of Mass-production : Japan  
 Condition : Production prototype  
 (Not for Sale: This sample is equivalent to mass-produced items.)  
 Modification : No Modification by the test lab.

### **2.2 Product Description**

Model: P-75 (referred to as the EUT in this report) is SKR 3000.

Clock frequency(ies) in the system : 532 MHz

Radio Specification:

Equipment Type : Transceiver

| Type of radio          | IEEE802.11b                                                                                                                                         | IEEE802.11g                         | IEEE802.11a                                                                      | IEEE802.11n (20 M band)                                                                               | IEEE802.11n (40 M band)                                                          |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| Frequency of operation | 2412 MHz-2462 MHz                                                                                                                                   | 2412 MHz-2462 MHz                   | 5180 MHz-5240 MHz<br>5260 MHz-5320 MHz<br>5500 MHz-5700 MHz<br>5745 MHz-5825 MHz | 2412 MHz-2462 MHz<br>5180 MHz-5240 MHz<br>5260 MHz-5320 MHz<br>5500 MHz-5700 MHz<br>5745 MHz-5825 MHz | 5190 MHz-5230 MHz<br>5270 MHz-5310 MHz<br>5510 MHz-5670 MHz<br>5755 MHz-5795 MHz |
| Type of modulation     | DSSS (CCK, DQPSK, DBPSK)                                                                                                                            | OFDM-CCK (64QAM, 16QAM, QPSK, BPSK) | OFDM (64QAM, 16QAM, QPSK, BPSK)                                                  |                                                                                                       | OFDM (BPSK, QPSK, 16QAM, 64QAM)                                                  |
| Channel spacing        | 5 MHz                                                                                                                                               |                                     | 20 MHz                                                                           | 2.4 GHz band: 5 MHz<br>5 GHz band: 20 MHz                                                             | 40 MHz                                                                           |
| Antenna type           | [Main Antenna ( chain 0) /Sub Antenna ( chain 1)]<br>PIFA (Planar Inverted F Antenna)                                                               |                                     |                                                                                  |                                                                                                       |                                                                                  |
| Antenna Gain           | Main Antenna ( chain 0) -1.95 dBi (2.4 GHz Band), -0.98 dBi (5 GHz Band)<br>Sub Antenna ( chain 1) -2.21 dBi (2.4 GHz Band), -1.54 dBi (5 GHz Band) |                                     |                                                                                  |                                                                                                       |                                                                                  |
| Antenna Connector type | [Main Antenna ( chain 0) /Sub Antenna ( chain 1) ]<br>Connector; PCB side: U.FL, Antenna side: soldered                                             |                                     |                                                                                  |                                                                                                       |                                                                                  |

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## **SECTION 3: Test specification, procedures & results**

### **3.1 Test Specification**

Test Specification : FCC Part 15 Subpart E  
FCC Part 15 final revised on January 12, 2021 and effective February 11, 2021

Title : FCC 47 CFR Part 15 Radio Frequency Device Subpart E  
Unlicensed National Information Infrastructure Devices  
Section 15.407 General technical requirements

\* The revisions do not affect the test result conducted before its effective date.

\* The customer has declared that the EUT has complies with FCC Part 15 Subpart B as SDoC.

### **3.2 Procedures and results**

| Item                                   | Test Procedure                                                                  | Specification                                                                                              | Worst margin                                               | Results        | Remarks                            |
|----------------------------------------|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------|------------------------------------|
| Conducted Emission                     | <b>FCC:</b> ANSI C63.10-2013<br><b>ISED:</b> RSS-Gen 8.8                        | <b>FCC:</b> 15.407 (b) (6) / 15.207<br><b>ISED:</b> RSS-Gen 8.8                                            | -                                                          | N/A            | *1)                                |
| 26 dB Emission Bandwidth               | <b>FCC:</b> KDB Publication Number 789033<br><b>ISED:</b> -                     | <b>FCC:</b> 15.407 (a) (1) (2) (3)<br><b>ISED:</b> -                                                       | -                                                          | N/A            | *2)                                |
| Maximum Conducted Output Power         | <b>FCC:</b> KDB Publication Number 789033<br><b>ISED:</b> -                     | <b>FCC:</b> 15.407 (a) (1) (2) (3)<br><b>ISED:</b> RSS-247 6.2.1.1<br>6.2.2.1<br>6.2.3.1<br>6.2.4.1        | -                                                          | N/A            | *2)                                |
| Maximum Power Spectral Density         | <b>FCC:</b> KDB Publication Number 789033<br><b>ISED:</b> -                     | <b>FCC :</b> 15.407 (a) (1) (2) (3)<br><b>ISED:</b> RSS-247 6.2.1.1<br>6.2.2.1<br>6.2.3.1<br>6.2.4.1       | -                                                          | N/A            | *2)                                |
| Spurious Emission Restricted Band Edge | <b>FCC:</b> ANSI C63.10-2013<br>KDB Publication Number 789033<br><b>ISED:</b> - | <b>FCC:</b> 15.407 (b), 15.205 and 15.209<br><b>ISED:</b> RSS-247 6.2.1.2<br>6.2.2.2<br>6.2.3.2<br>6.2.4.2 | 6.6 dB 5460 MHz<br>AV, Horizontal<br>Tx 11n-40<br>5510 MHz | Complied<br>a) | Conducted<br>(< 30 MHz)<br>*2) *3) |
| 6 dB Emission Bandwidth                | <b>FCC:</b> ANSI C63.10-2013<br><b>ISED:</b> -                                  | <b>FCC:</b> 15.407 (e)<br><b>ISED:</b> RSS-247 6.2.4.1                                                     | -                                                          | N/A            | *2)                                |

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

\*1) The test is not applicable since the EUT has no AC mains. Wireless LAN does not operate during charging.

\*2) For these items, refer to the test report: 13568152S-L. The test was carried out with the same module (SX-SDMAN2) which is installed in the EUT.

\*3) Radiated test was selected over 30 MHz based on FCC 15.407 (b) and KDB 789033 D02 G.3.b).

a) Refer to APPENDIX 1 (data of Radiated Spurious Emission).

Symbols:

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

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

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

\* For test report(s) referred in this report, the latest version (including any revisions) is always referred.

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

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

#### **FCC Part 15.203 Antenna requirement**

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

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### 3.3 Addition to standard

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

### 3.4 Uncertainty

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

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor  $k=2$ .  
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| Item                                             | Frequency range | Uncertainty (+/-) |                |                |                |
|--------------------------------------------------|-----------------|-------------------|----------------|----------------|----------------|
|                                                  |                 | No. 1 SAC / SR    | No. 2 SAC / SR | No. 3 SAC / SR | No. 4,5,6,8 SR |
| Conducted emission (AC Mains) LISN               | 150 kHz-30 MHz  | 2.6 dB            | 2.6 dB         | 2.56dB         | 2.9 dB         |
| Radiated emission<br>(Measurement distance: 3 m) | 9 kHz-30 MHz    | 3.0 dB            | 2.7 dB         | 2.7 dB         | -              |
|                                                  | 30 MHz-200 MHz  | 4.6 dB            | 4.6 dB         | 4.6 dB         | -              |
|                                                  | 200 MHz-1 GHz   | 6.0 dB            | 6.0 dB         | 6.0 dB         | -              |
|                                                  | 1 GHz-6 GHz     | 4.8 dB            | 4.8 dB         | 4.8 dB         | -              |
|                                                  | 6 GHz-18 GHz    | 5.4 dB            | 5.4 dB         | 5.4 dB         | -              |
|                                                  | 18 GHz-40 GHz   | 5.3 dB            | 5.3 dB         | 5.3 dB         | -              |
| Radiated emission<br>(Measurement distance: 1 m) | 1 GHz-18 GHz    | 5.7 dB            | 5.7 dB         | 5.7 dB         | -              |
|                                                  | 18 GHz-40 GHz   | 5.6 dB            | 5.6 dB         | 5.6 dB         | -              |

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

### 3.5 Test Location

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A2LA Certificate Number: 1266.03

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

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

### 3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

## SECTION 4: Operation of EUT during testing

### 4.1 Operating Mode(s)

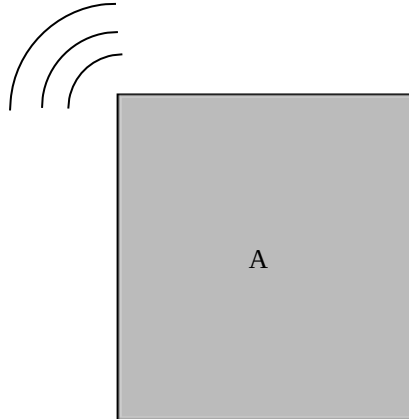
Test operating mode was determined as follows according to “Section 1 of 6 802.11 a/b/g/n testing - Managing Complex Regulatory Approvals - ” of TCB Council Workshop October 2009.

| Mode                                                                                                                                                                                                                 | Remarks*              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| IEEE 802.11a (11a)                                                                                                                                                                                                   | 18 Mbps, PN9          |
| IEEE 802.11n MIMO 20 MHz BW (11n-20)                                                                                                                                                                                 | MCS 11 (Long GI), PN9 |
| IEEE 802.11n SISO 20 MHz BW (11n-20)                                                                                                                                                                                 | MCS 2 (Long GI), PN9  |
| IEEE 802.11n MIMO 40 MHz BW (11n-40)                                                                                                                                                                                 | MCS 10 (Long GI), PN9 |
| IEEE 802.11n SISO 40 MHz BW (11n-40)                                                                                                                                                                                 | MCS 2 (Long GI), PN9  |
| *The worst antenna (Ant: x) and condition was determined based on the test result of Maximum Conducted Output Power. (Report No. 13568152S-L)                                                                        |                       |
| *Power of the EUT was set by the software as follows;<br>Power settings: 8 dBm<br>Software: Wireless authentication test tool: Version 1.3.0.3, Date: 2017.4.18<br>(Storage location: Driven by connected PC)        |                       |
| *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. |                       |

\*The details of Operation mode(s)

| Test Item                                                                                               | Operating Mode    | Tested Antenna *2) | Tested Frequency     |             |                                  |                                  |
|---------------------------------------------------------------------------------------------------------|-------------------|--------------------|----------------------|-------------|----------------------------------|----------------------------------|
|                                                                                                         |                   |                    | Lower Band           | Middle Band | Additional Band                  | Upper Band                       |
| Radiated Spurious Emission (Below 1 GHz)                                                                | 11n-20 (MIMO) *1) | Main + Sub         | 5180 MHz             | -           | -                                | -                                |
| Radiated Spurious Emission (Above 1 GHz)                                                                | 11a               | Sub                | 5180 MHz<br>5240 MHz | 5320 MHz    | 5500 MHz<br>5580 MHz<br>5700 MHz | 5745 MHz<br>5785 MHz<br>5825 MHz |
|                                                                                                         | 11n-20 (MIMO)     | Main + Sub         | 5180 MHz<br>5240 MHz | 5320 MHz    | 5500 MHz<br>5580 MHz<br>5700 MHz | 5745 MHz<br>5785 MHz<br>5825 MHz |
|                                                                                                         | 11n-40(MIMO)      | Main + Sub         | 5190 MHz<br>5230 MHz | 5310 MHz    | 5510 MHz<br>5550 MHz<br>5670 MHz | 5755 MHz<br>5795 MHz             |
| *1) The mode was tested as a representative, because it had the highest power at antenna terminal test. |                   |                    |                      |             |                                  |                                  |
| *2) The test was performed with the antenna that had higher power as a representative.                  |                   |                    |                      |             |                                  |                                  |

## 4.2 Configuration and peripherals



### Description of EUT

| No. | Item     | Model number | Serial number | Manufacturer           | Remarks |
|-----|----------|--------------|---------------|------------------------|---------|
| A   | SKR 3000 | P-75         | A9YH-S003     | KONICA<br>MINOLTA Inc. | EUT     |

## **SECTION 5: Radiated Spurious Emission and Band Edge Compliance**

### **Test Procedure**

#### **< Below 1GHz >**

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

#### **< Above 1GHz >**

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

The 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.

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

The measurements were performed for both vertical and horizontal antenna polarization 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 1GHz >**

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

#### **< Above 1GHz >**

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).

For W58 Bandedge

-27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge in the section 15.407(b)(4)(i).

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:

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

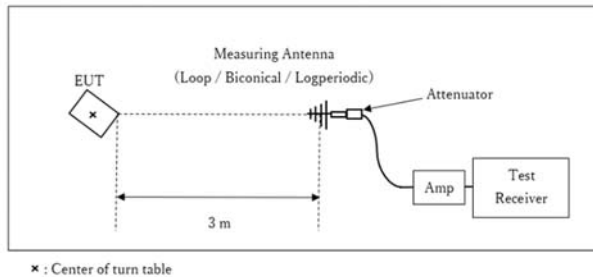
**Test Antennas are used as below;**

|              |                   |                  |             |
|--------------|-------------------|------------------|-------------|
| 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 VB *1)<br>RBW: 1 MHz<br>VBW: 1/T MHz<br>(T: Burst length, refer to Appendix<br>[Report No. 13568152S-L])<br>Detector: Peak<br>Trace mode: Max hold |

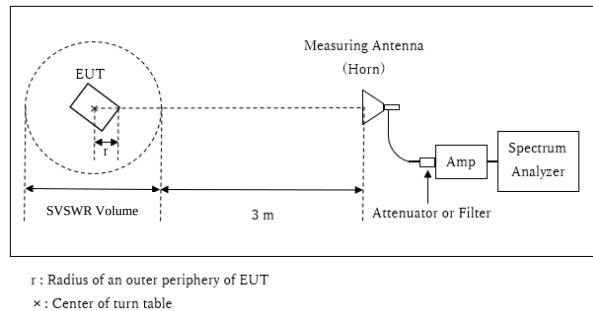
\*1) The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".

#### Below 1 GHz



Test Distance: 3 m

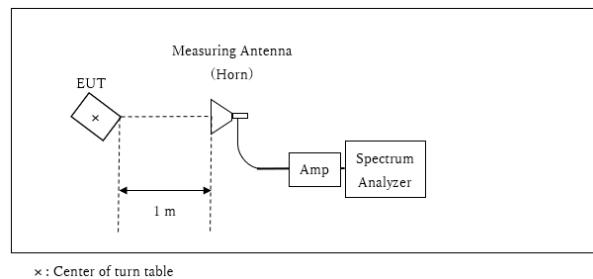
#### 1 GHz - 10 GHz



Distance Factor:  $20 \times \log (3.68 \text{ m} / 3.0 \text{ m}) = 1.77 \text{ dB}$   
\* Test Distance:  $(3 + \text{SVSWR Volume} / 2) - r = 3.68 \text{ m}$

SVSWR Volume : 2.0 m  
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)  
 $r = 0.32 \text{ m}$

#### 10 GHz - 40 GHz



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

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

| Antenna polarization | Carrier | Spurious (30 MHz - 1 GHz) | Spurious (1 GHz - 6.4 GHz) | Spurious (6.4 GHz - 10 GHz) | Spurious (10 GHz - 18 GHz) | Spurious (18 GHz - 26.5 GHz) | Spurious (26.5 GHz - 40 GHz) |
|----------------------|---------|---------------------------|----------------------------|-----------------------------|----------------------------|------------------------------|------------------------------|
| Horizontal           | Z       | Y                         | Z                          | X                           | X                          | X                            | X                            |
| Vertical             | X       | Z                         | X                          | X                           | X                          | X                            | X                            |

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

Measurement range : 30 MHz - 40 GHz  
Test data : APPENDIX  
Test result : Pass

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**Shonan EMC Lab.**

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## APPENDIX 1: Test data

### Radiated Spurious Emission

|                        |                   |                    |                      |                      |
|------------------------|-------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.   |                    |                      |                      |
| Semi Anechoic Chamber  | 1                 | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021   | January 10, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH  | 25 deg.C, 31 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Toshinori Yamada  | Kenichi Adachi     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz ) | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11a 5180 MHz   |                    |                      |                      |

#### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 5150.000        | PK       | 45.11          | 32.25           | 16.76     | 39.72     | 1.77                 | 56.17           | 73.9           | 17.7        | 231         | 81           | -             |
| Hori.    | 15540.000       | PK       | 46.39          | 39.60           | 12.67     | 39.13     | -9.54                | 49.99           | 73.9           | 23.9        | 150         | 0            | -             |
| Hori.    | 5150.000        | AV       | 34.14          | 32.25           | 16.76     | 39.72     | 1.77                 | 45.20           | 53.9           | 8.7         | 231         | 81           | VBW : 1.5 kHz |
| Hori.    | 15540.000       | AV       | 34.99          | 39.60           | 12.67     | 39.13     | -9.54                | 38.59           | 53.9           | 15.3        | 150         | 0            | VBW : 1.5 kHz |
| Vert.    | 5150.000        | PK       | 45.46          | 32.25           | 16.76     | 39.72     | 1.77                 | 56.52           | 73.9           | 17.3        | 102         | 7            | -             |
| Vert.    | 15540.000       | PK       | 45.95          | 39.60           | 12.67     | 39.13     | -9.54                | 49.55           | 73.9           | 24.3        | 150         | 0            | -             |
| Vert.    | 5150.000        | AV       | 34.25          | 32.25           | 16.76     | 39.72     | 1.77                 | 45.31           | 53.9           | 8.5         | 102         | 7            | VBW : 1.5 kHz |
| Vert.    | 15540.000       | AV       | 35.01          | 39.60           | 12.67     | 39.13     | -9.54                | 38.61           | 53.9           | 15.2        | 150         | 0            | VBW : 1.5 kHz |

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

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

Distance factor : 1 GHz - 10 GHz : 20log (3.68 m / 3.0 m) = 1.77 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

#### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 10360.000       | PK       | 45.74          | 36.57           | 9.99      | 39.88     | -9.54                | 42.88           | -52.35              | -27.0       | 25.3        | 150         | 0            | -      |
| Vert.    | 10360.000       | PK       | 45.86          | 36.57           | 9.99      | 39.88     | -9.54                | 43.00           | -52.23              | -27.0       | 25.2        | 150         | 0            | -      |

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

Result (EIRP [dBm]) = 10 \* LOG ( (10 ^ (Electric Field Strength [dBuV/m] / 20) ) \* 10 ^ (-6) \* Distance : 3 [m] ) ^ 2 / 30 \* 10 ^ 3

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

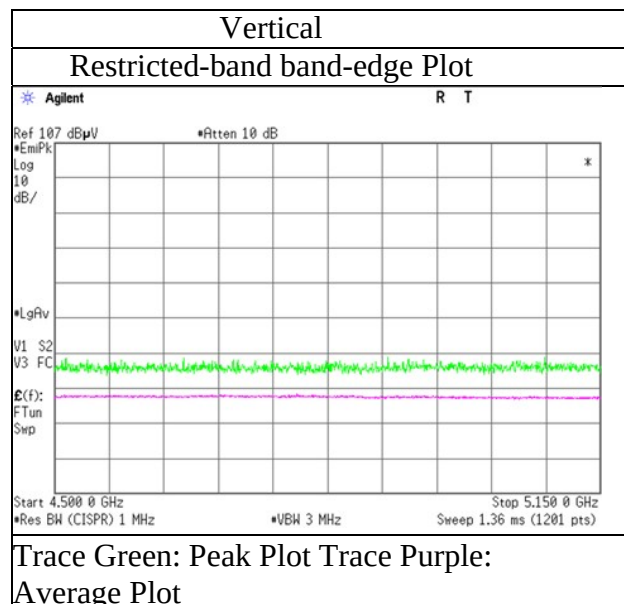
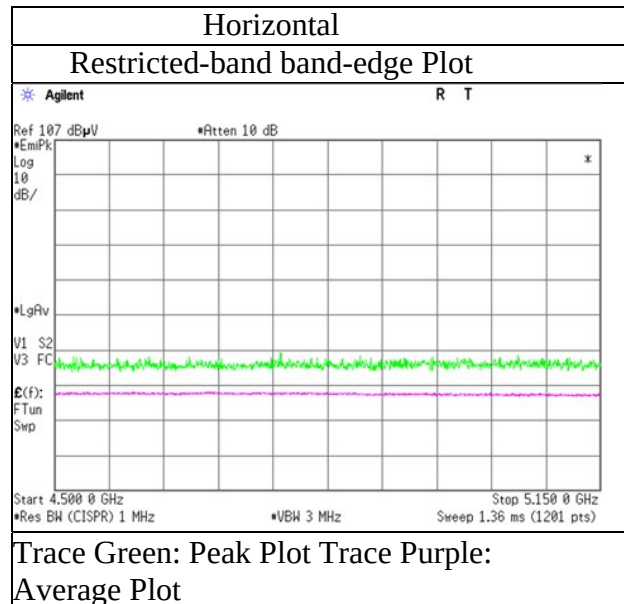
Distance factor : 1 GHz - 10 GHz : 20log (3.68 m / 3.0 m) = 1.77 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Toshinori Yamada  
Tx 11a 5180 MHz



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

## Radiated Spurious Emission

|                        |                   |                    |                      |                      |
|------------------------|-------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.   |                    |                      |                      |
| Semi Anechoic Chamber  | 1                 | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021   | January 10, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH  | 25 deg.C, 31 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Toshinori Yamada  | Kenichi Adachi     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz ) | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11a 5240 MHz   |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 15720.000       | PK       | 46.41          | 39.85           | 12.65     | 39.37     | -9.54                | 50.00           | 73.9           | 23.9        | 150         | 0            | -             |
| Hori.    | 15720.000       | AV       | 34.62          | 39.85           | 12.65     | 39.37     | -9.54                | 38.21           | 53.9           | 15.6        | 150         | 0            | VBW : 1.5 kHz |
| Vert.    | 15720.000       | PK       | 45.06          | 39.85           | 12.65     | 39.37     | -9.54                | 48.65           | 73.9           | 25.2        | 150         | 0            | -             |
| Vert.    | 15720.000       | AV       | 34.68          | 39.85           | 12.65     | 39.37     | -9.54                | 38.27           | 53.9           | 15.6        | 150         | 0            | VBW : 1.5 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 10480.000       | PK       | 45.96          | 36.73           | 10.03     | 40.11     | -9.54                | 43.07           | -52.16              | -27.0       | 25.1        | 150         | 0            | -      |
| Vert.    | 10480.000       | PK       | 45.35          | 36.73           | 10.03     | 40.11     | -9.54                | 42.46           | -52.77              | -27.0       | 25.7        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \text{LOG}((10^{\wedge}(\text{Electric Field Strength [dBuV/m]} / 20)) * 10^{\wedge}(-6) * \text{Distance} : 3\text{ [m]})^{\wedge}2 / 30 * 10^{\wedge}3)$

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

## Radiated Spurious Emission

|                        |                   |                    |                      |                      |
|------------------------|-------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.   |                    |                      |                      |
| Semi Anechoic Chamber  | 1                 | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021   | January 10, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH  | 25 deg.C, 31 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Toshinori Yamada  | Kenichi Adachi     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz ) | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11a 5320 MHz   |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 5350.000        | PK       | 45.84          | 31.99           | 16.91     | 39.74     | 1.77                 | 56.77           | 73.9           | 17.1        | 220         | 88           | -             |
| Hori.    | 10640.000       | PK       | 45.26          | 37.39           | 10.12     | 40.02     | -9.54                | 43.21           | 73.9           | 30.6        | 150         | 0            | -             |
| Hori.    | 15960.000       | PK       | 45.77          | 40.19           | 12.62     | 39.70     | -9.54                | 49.34           | 73.9           | 24.5        | 150         | 0            | -             |
| Hori.    | 5350.000        | AV       | 34.68          | 31.99           | 16.91     | 39.74     | 1.77                 | 45.61           | 53.9           | 8.2         | 220         | 88           | VBW : 1.5 kHz |
| Hori.    | 10640.000       | AV       | 34.46          | 37.39           | 10.12     | 40.02     | -9.54                | 32.41           | 53.9           | 21.4        | 150         | 0            | VBW : 1.5 kHz |
| Hori.    | 15960.000       | AV       | 34.47          | 40.19           | 12.62     | 39.70     | -9.54                | 38.04           | 53.9           | 15.8        | 150         | 0            | VBW : 1.5 kHz |
| Vert.    | 5350.000        | PK       | 46.25          | 31.99           | 16.91     | 39.74     | 1.77                 | 57.18           | 73.9           | 16.7        | 146         | 16           | -             |
| Vert.    | 10640.000       | PK       | 45.12          | 37.39           | 10.12     | 40.02     | -9.54                | 43.07           | 73.9           | 30.8        | 150         | 0            | -             |
| Vert.    | 15960.000       | PK       | 45.87          | 40.19           | 12.62     | 39.70     | -9.54                | 49.44           | 73.9           | 24.4        | 150         | 0            | -             |
| Vert.    | 5350.000        | AV       | 34.44          | 31.99           | 16.91     | 39.74     | 1.77                 | 45.37           | 53.9           | 8.5         | 146         | 16           | VBW : 1.5 kHz |
| Vert.    | 10640.000       | AV       | 34.62          | 37.39           | 10.12     | 40.02     | -9.54                | 32.57           | 53.9           | 21.3        | 150         | 0            | VBW : 1.5 kHz |
| Vert.    | 15960.000       | AV       | 34.42          | 40.19           | 12.62     | 39.70     | -9.54                | 37.99           | 53.9           | 15.9        | 150         | 0            | VBW : 1.5 kHz |

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

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

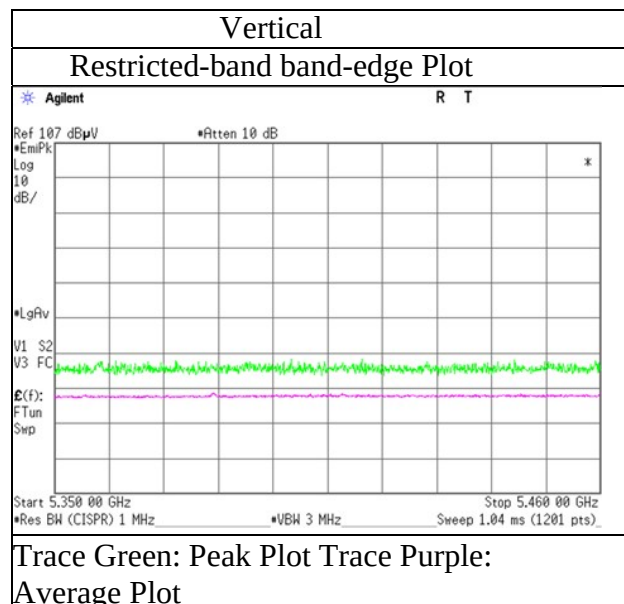
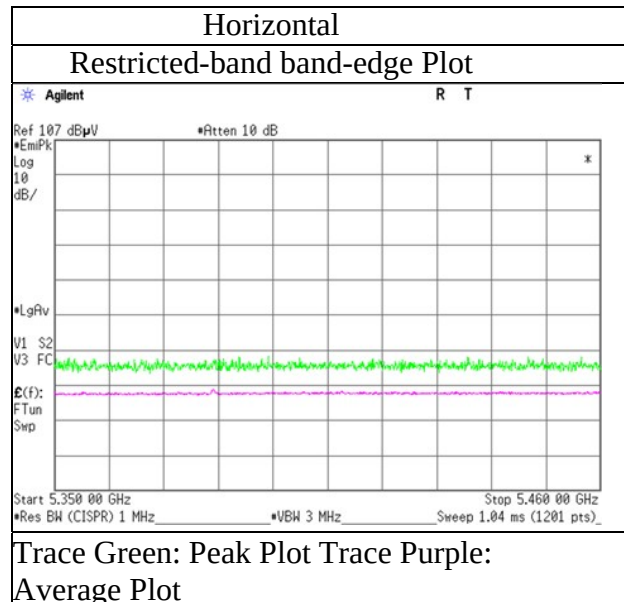
Distance factor : 1 GHz - 10 GHz : 20log (3.68 m / 3.0 m) = 1.77 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Toshinori Yamada  
Tx 11a 5320 MHz



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

Final result of restricted band edge was shown in tabular data.

**UL Japan, Inc.**

**Shonan EMC Lab.**

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Telephone : +81 463 50 6400

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## Radiated Spurious Emission

|                        |                   |                    |                      |                      |
|------------------------|-------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.   |                    |                      |                      |
| Semi Anechoic Chamber  | 1                 | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021   | January 10, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH  | 25 deg.C, 31 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Toshinori Yamada  | Kenichi Adachi     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz ) | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11a 5500 MHz   |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 5460.000        | PK       | 46.60          | 32.22           | 16.99     | 39.75     | 1.77                 | 57.83           | 73.9           | 16.0        | 218         | 81           | -             |
| Hori.    | 11000.000       | PK       | 46.60          | 37.63           | 10.32     | 39.68     | -9.54                | 45.33           | 73.9           | 28.5        | 150         | 0            | -             |
| Hori.    | 5460.000        | AV       | 35.25          | 32.22           | 16.99     | 39.75     | 1.77                 | 46.48           | 53.9           | 7.4         | 218         | 81           | VBW : 1.5 kHz |
| Hori.    | 11000.000       | AV       | 34.80          | 37.63           | 10.32     | 39.68     | -9.54                | 33.53           | 53.9           | 20.3        | 150         | 0            | VBW : 1.5 kHz |
| Vert.    | 5460.000        | PK       | 46.03          | 32.22           | 16.99     | 39.75     | 1.77                 | 57.26           | 73.9           | 16.6        | 149         | 15           | -             |
| Vert.    | 11000.000       | PK       | 46.69          | 37.63           | 10.32     | 39.68     | -9.54                | 45.42           | 73.9           | 28.4        | 150         | 0            | -             |
| Vert.    | 5460.000        | AV       | 35.09          | 32.22           | 16.99     | 39.75     | 1.77                 | 46.32           | 53.9           | 7.5         | 149         | 15           | VBW : 1.5 kHz |
| Vert.    | 11000.000       | AV       | 34.85          | 37.63           | 10.32     | 39.68     | -9.54                | 33.58           | 53.9           | 20.3        | 150         | 0            | VBW : 1.5 kHz |

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

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

Distance factor : 1 GHz - 10 GHz : 20log (3.68 m / 3.0 m) = 1.77 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5330.009        | PK       | 46.42          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.28           | -37.95              | -27.0       | 10.9        | 146         | 75           | -      |
| Hori.    | 5470.000        | PK       | 45.92          | 32.24           | 16.99     | 39.75     | 1.77                 | 57.17           | -38.06              | -27.0       | 11.0        | 218         | 81           | -      |
| Hori.    | 16500.000       | PK       | 46.49          | 40.10           | 13.34     | 40.47     | -9.54                | 49.92           | -45.31              | -27.0       | 18.3        | 150         | 0            | -      |
| Vert.    | 5329.995        | PK       | 46.16          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.02           | -38.21              | -27.0       | 11.2        | 147         | 5            | -      |
| Vert.    | 5470.000        | PK       | 45.85          | 32.24           | 16.99     | 39.75     | 1.77                 | 57.10           | -38.13              | -27.0       | 11.1        | 149         | 15           | -      |
| Vert.    | 16500.000       | PK       | 46.72          | 40.10           | 13.34     | 40.47     | -9.54                | 50.15           | -45.08              | -27.0       | 18.0        | 150         | 0            | -      |

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

Result (EIRP [dBm]) = 10 \* LOG ( (10 ^ (Electric Field Strength [dBuV/m] / 20) \* 10 ^ (-6) \* Distance : 3 [m] ) ^ 2 / 30 \* 10 ^ 3)

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

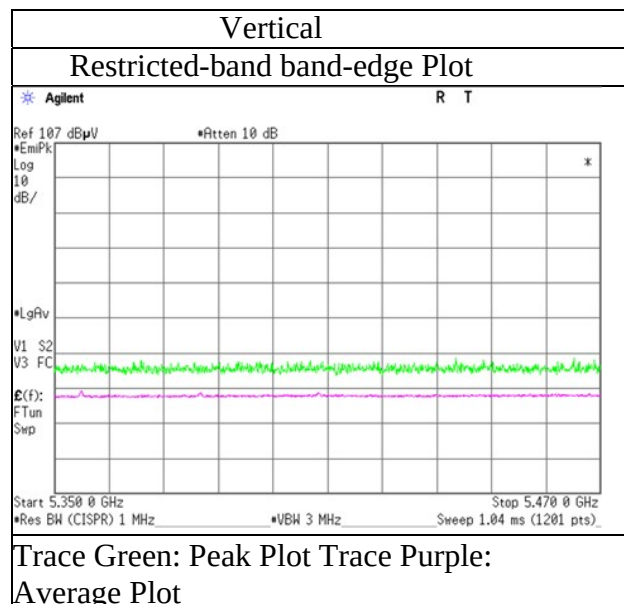
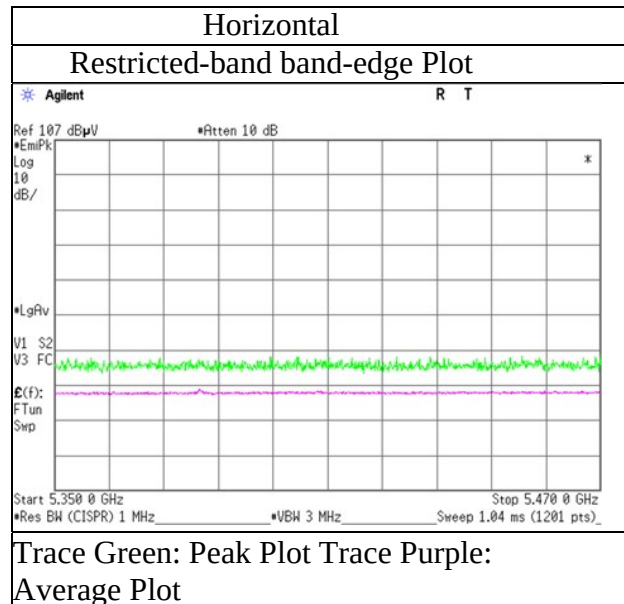
Distance factor : 1 GHz - 10 GHz : 20log (3.68 m / 3.0 m) = 1.77 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Toshinori Yamada  
Tx 11a 5500 MHz



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

Final result of restricted band edge was shown in tabular data.

**UL Japan, Inc.**

**Shonan EMC Lab.**

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Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |                   |                    |                      |                      |
|------------------------|-------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.   |                    |                      |                      |
| Semi Anechoic Chamber  | 1                 | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021   | January 10, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH  | 25 deg.C, 31 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Toshinori Yamada  | Kenichi Adachi     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz ) | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11a 5580 MHz   |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 11160.000       | PK       | 45.31          | 37.52           | 10.39     | 39.61     | -9.54                | 44.07           | 73.9           | 29.8        | 150         | 0            | -             |
| Hori.    | 11160.000       | AV       | 34.55          | 37.52           | 10.39     | 39.61     | -9.54                | 33.31           | 53.9           | 20.5        | 150         | 0            | VBW : 1.5 kHz |
| Vert.    | 11160.000       | PK       | 45.96          | 37.52           | 10.39     | 39.61     | -9.54                | 44.72           | 73.9           | 29.1        | 150         | 0            | -             |
| Vert.    | 11160.000       | AV       | 34.64          | 37.52           | 10.39     | 39.61     | -9.54                | 33.40           | 53.9           | 20.5        | 150         | 0            | VBW : 1.5 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5329.995        | PK       | 46.82          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.68           | -37.55              | -27.0       | 10.5        | 147         | 77           | -      |
| Hori.    | 16740.000       | PK       | 45.36          | 39.75           | 13.40     | 40.11     | -9.54                | 48.86           | -46.37              | -27.0       | 19.3        | 150         | 0            | -      |
| Vert.    | 5329.994        | PK       | 46.32          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.18           | -38.05              | -27.0       | 11.0        | 148         | 4            | -      |
| Vert.    | 16740.000       | PK       | 45.27          | 39.75           | 13.40     | 40.11     | -9.54                | 48.77           | -46.46              | -27.0       | 19.4        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \log(10^{\wedge}(\text{Electric Field Strength [dBuV/m]} / 20) * 10^{\wedge}(-6) * \text{Distance : 3 [m]} )^{\wedge}2 / 30 * 10^{\wedge}3)$

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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## Radiated Spurious Emission

|                        |                   |                    |                      |                      |
|------------------------|-------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.   |                    |                      |                      |
| Semi Anechoic Chamber  | 1                 | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021   | January 10, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH  | 25 deg.C, 31 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Toshinori Yamada  | Kenichi Adachi     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz ) | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11a 5700 MHz   |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark       |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|--------------|
| Hori.    | 11400.000       | PK       | 45.22          | 38.10           | 10.53     | 39.50     | -9.54                | 44.81           | 73.9           | 29.0        | 150         | 0            | -            |
| Hori.    | 11400.000       | AV       | 34.04          | 38.10           | 10.53     | 39.50     | -9.54                | 33.63           | 53.9           | 20.2        | 150         | 0            | VBW : 1.5kHz |
| Vert.    | 11400.000       | PK       | 45.94          | 38.10           | 10.53     | 39.50     | -9.54                | 45.53           | 73.9           | 28.3        | 150         | 0            | -            |
| Vert.    | 11400.000       | AV       | 34.30          | 38.10           | 10.53     | 39.50     | -9.54                | 33.89           | 53.9           | 20.0        | 150         | 0            | VBW : 1.5kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5329.996        | PK       | 46.92          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.78           | -37.45              | -27.0       | <b>10.4</b> | 147         | 78           | -      |
| Hori.    | 5725.000        | PK       | 45.72          | 32.64           | 17.16     | 39.92     | 1.77                 | 57.37           | -37.86              | -27.0       | 10.8        | 142         | 96           | -      |
| Hori.    | 17100.000       | PK       | 45.63          | 39.90           | 13.51     | 39.41     | -9.54                | 50.09           | -45.14              | -27.0       | 18.1        | 150         | 0            | -      |
| Vert.    | 5329.999        | PK       | 46.89          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.75           | -37.48              | -27.0       | <b>10.4</b> | 147         | 5            | -      |
| Vert.    | 5725.000        | PK       | 45.39          | 32.64           | 17.16     | 39.92     | 1.77                 | 57.04           | -38.19              | -27.0       | 11.1        | 144         | 6            | -      |
| Vert.    | 17100.000       | PK       | 45.99          | 39.90           | 13.51     | 39.41     | -9.54                | 50.45           | -44.78              | -27.0       | 17.7        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \log((10^{\wedge}(\text{Electric Field Strength [dBuV/m]} / 20)) * 10^{\wedge}(-6) * \text{Distance : } 3[\text{m}])^{\wedge}2 / 30 * 10^{\wedge}3)$

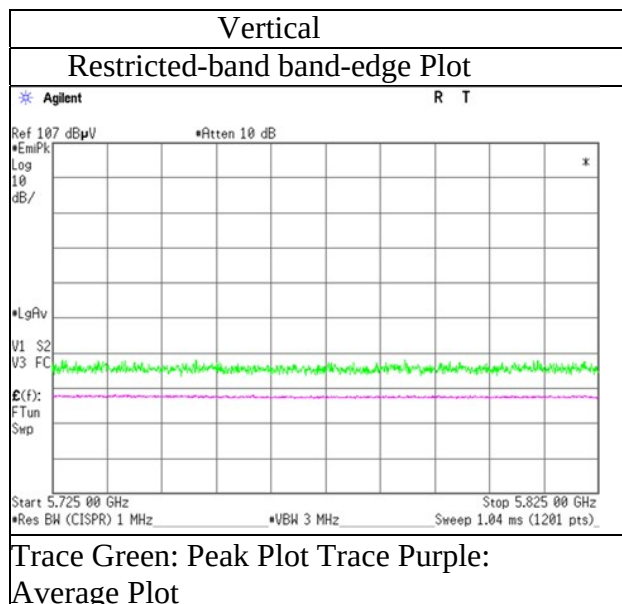
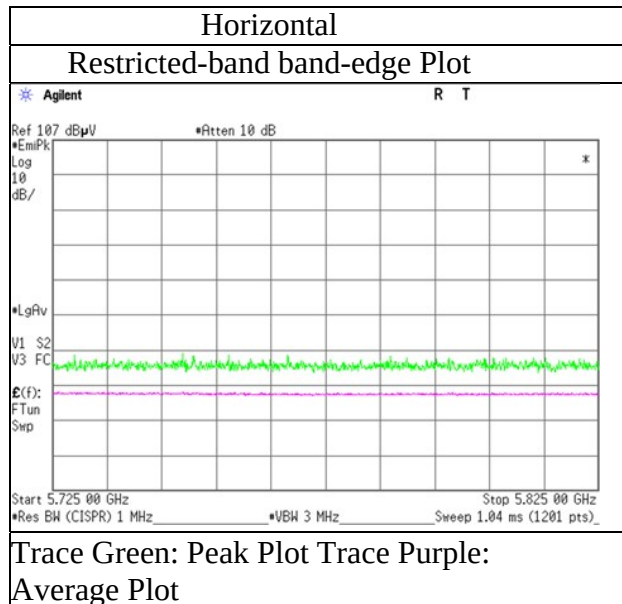
\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20 dB).

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Toshinori Yamada  
Tx 11a 5700 MHz



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

**UL Japan, Inc.**

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## Radiated Spurious Emission

|                        |                   |                    |                      |                      |   |
|------------------------|-------------------|--------------------|----------------------|----------------------|---|
| Test place             | Shonan EMC Lab.   | 1                  | 1                    | 1                    | 1 |
| Semi Anechoic Chamber  | 1                 |                    |                      |                      |   |
| Date                   | January 6, 2021   | January 10, 2021   | January 5, 2021      | January 5, 2021      |   |
| Temperature / Humidity | 21 deg.C, 32 %RH  | 25 deg.C, 31 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |   |
| Engineer               | Toshinori Yamada  | Kenichi Adachi     | Toshinori Yamada     | Takahiro Kawakami    |   |
|                        | ( 1 GHz -10 GHz ) | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |   |
| Mode                   | Tx 11a 5745 MHz   |                    |                      |                      |   |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 11490.000       | PK       | 44.24          | 38.26           | 10.58     | 39.46     | -9.54                | 44.08           | 73.9           | 29.8        | 150         | 0            | -             |
| Hori.    | 11490.000       | AV       | 33.78          | 38.26           | 10.58     | 39.46     | -9.54                | 33.62           | 53.9           | 20.2        | 150         | 0            | VBW : 1.5 kHz |
| Vert.    | 11490.000       | PK       | 44.28          | 38.26           | 10.58     | 39.46     | -9.54                | 44.12           | 73.9           | 29.7        | 150         | 0            | -             |
| Vert.    | 11490.000       | AV       | 32.42          | 38.26           | 10.58     | 39.46     | -9.54                | 32.26           | 53.9           | 21.6        | 150         | 0            | VBW : 1.5 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5329.990        | PK       | 47.73          | 31.94           | 16.88     | 39.73     | 1.77                 | 58.59           | -36.64              | -27.0       | 9.6         | 146         | 74           | -      |
| Hori.    | 5650.000        | PK       | 46.40          | 32.44           | 17.11     | 39.86     | 1.77                 | 57.86           | -37.37              | -27.0       | 10.3        | 100         | 75           | -      |
| Hori.    | 5700.000        | PK       | 45.66          | 32.56           | 17.14     | 39.90     | 1.77                 | 57.23           | -38.00              | 10.0        | 48.0        | 100         | 75           | -      |
| Hori.    | 5720.000        | PK       | 46.30          | 32.62           | 17.15     | 39.92     | 1.77                 | 57.92           | -37.31              | 15.6        | 52.9        | 100         | 75           | -      |
| Hori.    | 5725.000        | PK       | 46.33          | 32.64           | 17.16     | 39.92     | 1.77                 | 57.98           | -37.25              | 27.0        | 64.2        | 100         | 75           | -      |
| Hori.    | 17235.000       | PK       | 45.72          | 40.18           | 13.57     | 39.01     | -9.54                | 50.92           | -44.31              | -27.0       | 17.3        | 150         | 0            | -      |
| Vert.    | 5329.970        | PK       | 46.91          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.77           | -37.46              | -27.0       | 10.4        | 158         | 4            | -      |
| Vert.    | 5650.000        | PK       | 45.26          | 32.44           | 17.11     | 39.86     | 1.77                 | 56.72           | -38.51              | -27.0       | 11.5        | 148         | 353          | -      |
| Vert.    | 5700.000        | PK       | 45.56          | 32.56           | 17.14     | 39.90     | 1.77                 | 57.13           | -38.10              | 10.0        | 48.1        | 148         | 353          | -      |
| Vert.    | 5720.000        | PK       | 46.08          | 32.62           | 17.15     | 39.92     | 1.77                 | 57.70           | -37.53              | 15.6        | 53.1        | 148         | 353          | -      |
| Vert.    | 5725.000        | PK       | 46.04          | 32.64           | 17.16     | 39.92     | 1.77                 | 57.69           | -37.54              | 27.0        | 64.5        | 148         | 353          | -      |
| Vert.    | 17235.000       | PK       | 45.27          | 40.18           | 13.57     | 39.01     | -9.54                | 50.47           | -44.76              | -27.0       | 17.7        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \text{LOG} ( (10^{\wedge} (\text{Electric Field Strength [dBuV/m]} / 20) * 10^{\wedge} (-6) * \text{Distance : 3 [m]} )^{\wedge} 2 / 30 * 10^{\wedge} 3 )$

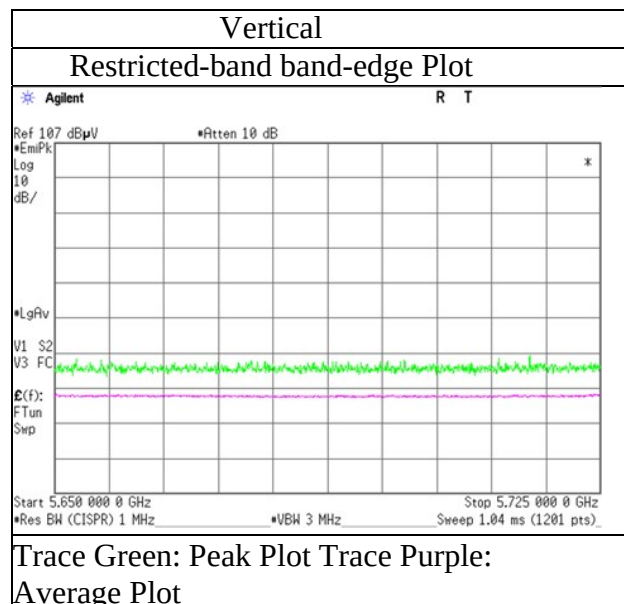
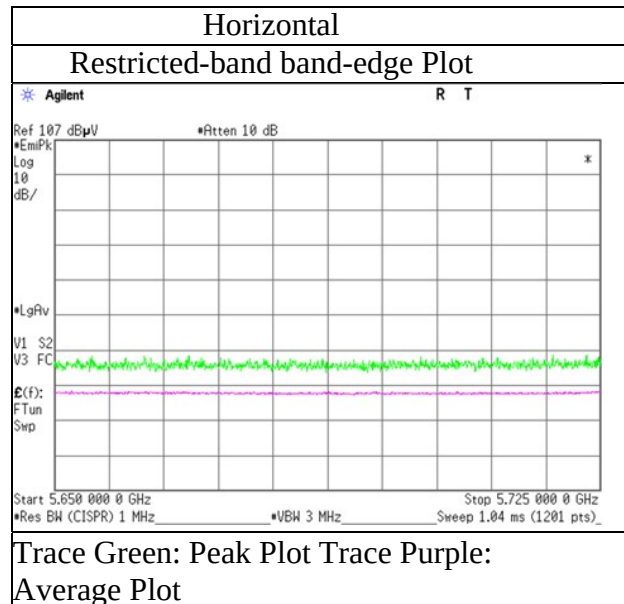
\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20 dB).

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Toshinori Yamada  
Tx 11a 5745 MHz



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

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Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |                   |                    |                      |                      |
|------------------------|-------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.   |                    |                      |                      |
| Semi Anechoic Chamber  | 1                 | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021   | January 10, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH  | 25 deg.C, 31 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Toshinori Yamada  | Kenichi Adachi     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz ) | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11a 5785 MHz   |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|---------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 11570.000       | PK       | 44.21         | 38.31           | 10.62     | 39.41     | -9.54                | 44.19           | 73.9           | 29.7        | 150         | 0            | -             |
| Hori.    | 11570.000       | AV       | 32.45         | 38.31           | 10.62     | 39.41     | -9.54                | 32.43           | 53.9           | 21.4        | 150         | 0            | VBW : 1.5 kHz |
| Vert.    | 11570.000       | PK       | 44.50         | 38.31           | 10.62     | 39.41     | -9.54                | 44.48           | 73.9           | 29.4        | 150         | 0            | -             |
| Vert.    | 11570.000       | AV       | 32.34         | 38.31           | 10.62     | 39.41     | -9.54                | 32.32           | 53.9           | 21.5        | 150         | 0            | VBW : 1.5 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$

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

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5329.946        | PK       | 48.48          | 31.94           | 16.88     | 39.73     | 1.77                 | 59.34           | -35.89              | -27.0       | 8.8         | 147         | 75           | -      |
| Hori.    | 17355.000       | PK       | 45.32          | 40.39           | 13.61     | 38.65     | -9.54                | 51.13           | -44.10              | -27.0       | 17.1        | 150         | 0            | -      |
| Vert.    | 5329.942        | PK       | 46.73          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.59           | -37.64              | -27.0       | 10.6        | 156         | 4            | -      |
| Vert.    | 17355.000       | PK       | 45.40          | 40.39           | 13.61     | 38.65     | -9.54                | 51.21           | -44.02              | -27.0       | 17.0        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \log(10^{\wedge}(\text{Electric Field Strength [dBuV/m]} / 20) * 10^{\wedge}(-6) * \text{Distance} : 3 [\text{m}])^{\wedge}2 / 30 * 10^{\wedge}3)$

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$

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

## Radiated Spurious Emission

|                        |                   |                    |                      |                      |
|------------------------|-------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.   |                    |                      |                      |
| Semi Anechoic Chamber  | 1                 | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021   | January 10, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH  | 25 deg.C, 31 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Toshinori Yamada  | Kenichi Adachi     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz ) | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11a 5825 MHz   |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 11650.000       | PK       | 45.39          | 38.35           | 10.68     | 39.34     | -9.54                | 45.54           | 73.9           | 28.3        | 150         | 0            | -             |
| Hori.    | 11650.000       | AV       | 33.23          | 38.35           | 10.68     | 39.34     | -9.54                | 33.38           | 53.9           | 20.5        | 150         | 0            | VBW : 1.5 kHz |
| Vert.    | 11650.000       | PK       | 44.90          | 38.35           | 10.68     | 39.34     | -9.54                | 45.05           | 73.9           | 28.8        | 150         | 0            | -             |
| Vert.    | 11650.000       | AV       | 33.18          | 38.35           | 10.68     | 39.34     | -9.54                | 33.33           | 53.9           | 20.5        | 150         | 0            | VBW : 1.5 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$

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

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5329.944        | PK       | 47.45          | 31.94           | 16.88     | 39.73     | 1.77                 | 58.31           | -36.92              | -27.0       | 9.9         | 149         | 73           | -      |
| Hori.    | 5850.000        | PK       | 46.64          | 32.91           | 17.24     | 40.02     | 1.77                 | 58.54           | -36.69              | 27.0        | 63.6        | 121         | 87           | -      |
| Hori.    | 5855.000        | PK       | 45.25          | 32.92           | 17.24     | 40.02     | 1.77                 | 57.16           | -38.07              | 15.6        | 53.6        | 121         | 87           | -      |
| Hori.    | 5875.000        | PK       | 45.19          | 32.95           | 17.27     | 40.04     | 1.77                 | 57.14           | -38.09              | 10.0        | 48.0        | 121         | 87           | -      |
| Hori.    | 5925.000        | PK       | 45.09          | 32.99           | 17.29     | 40.07     | 1.77                 | 57.07           | -38.16              | -27.0       | 11.1        | 121         | 87           | -      |
| Hori.    | 17475.000       | PK       | 44.63          | 40.51           | 13.66     | 38.29     | -9.54                | 50.97           | -44.26              | -27.0       | 17.2        | 150         | 0            | -      |
| Vert.    | 5329.948        | PK       | 47.03          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.89           | -37.34              | -27.0       | 10.3        | 156         | 5            | -      |
| Vert.    | 5850.000        | PK       | 45.43          | 32.91           | 17.24     | 40.02     | 1.77                 | 57.33           | -37.90              | 27.0        | 64.9        | 147         | 354          | -      |
| Vert.    | 5855.000        | PK       | 45.61          | 32.92           | 17.24     | 40.02     | 1.77                 | 57.52           | -37.71              | 15.6        | 53.3        | 147         | 354          | -      |
| Vert.    | 5875.000        | PK       | 45.93          | 32.95           | 17.27     | 40.04     | 1.77                 | 57.88           | -37.35              | 10.0        | 47.3        | 147         | 354          | -      |
| Vert.    | 5925.000        | PK       | 44.90          | 32.99           | 17.29     | 40.07     | 1.77                 | 56.88           | -38.35              | -27.0       | 11.3        | 147         | 354          | -      |
| Vert.    | 17475.000       | PK       | 44.36          | 40.51           | 13.66     | 38.29     | -9.54                | 50.70           | -44.53              | -27.0       | 17.5        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \text{LOG}((10^{\wedge}(\text{Electric Field Strength [dBuV/m]} / 20)) * 10^{\wedge}(-6) * \text{Distance : 3 [m]})^{\wedge}2 / 30 * 10^{\wedge}3)$

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

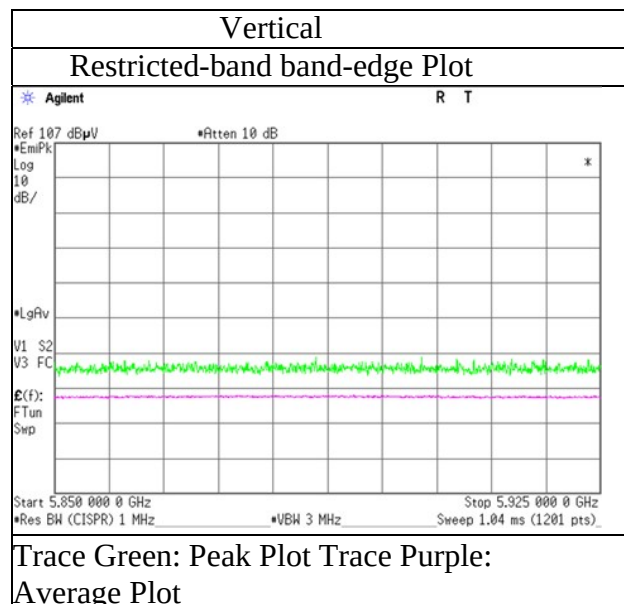
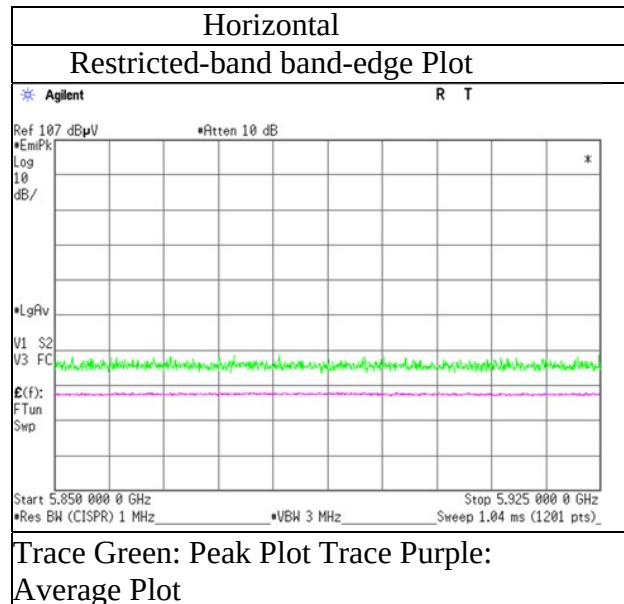
Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$

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

## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Toshinori Yamada  
Tx 11a 5825 MHz



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

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## Radiated Spurious Emission

|                        |                    |                   |                    |                      |                      |
|------------------------|--------------------|-------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.    |                   |                    |                      |                      |
| Semi Anechoic Chamber  | 1                  | 1                 | 1                  | 1                    | 1                    |
| Date                   | January 12, 2021   | January 6, 2021   | January 11, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 24 deg.C, 29 %RH   | 21 deg.C, 32 %RH  | 20 deg.C, 30 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Yosuke Murakami    | Toshinori Yamada  | Yasumasa Owaki     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 30 MHz -1 GHz )  | ( 1 GHz -10 GHz ) | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-20 5180 MHz |                   |                    |                      |                      |

### (below 1 GHz and above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Distance<br>Factor [dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg.] | Remark        |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|-------------------------|--------------------|-------------------|----------------|----------------|-----------------|---------------|
| Hori.    | 249.994            | QP       | 32.00             | 11.78              | 6.20         | 31.76        | 0.00                    | 18.22              | 46.0              | 27.7           | 152            | 355             | -             |
| Hori.    | 449.994            | QP       | 37.20             | 16.45              | 7.47         | 31.93        | 0.00                    | 29.19              | 46.0              | 16.8           | 165            | 143             | -             |
| Hori.    | 549.995            | QP       | 30.00             | 17.81              | 8.02         | 32.09        | 0.00                    | 23.74              | 46.0              | 22.2           | 119            | 353             | -             |
| Hori.    | 799.987            | QP       | 24.40             | 20.74              | 9.18         | 32.03        | 0.00                    | 22.29              | 46.0              | 23.7           | 100            | 104             | -             |
| Hori.    | 849.995            | QP       | 25.50             | 21.49              | 9.43         | 31.72        | 0.00                    | 24.70              | 46.0              | 21.3           | 100            | 14              | -             |
| Hori.    | 899.981            | QP       | 25.60             | 22.07              | 9.64         | 31.49        | 0.00                    | 25.82              | 46.0              | 20.1           | 144            | 94              | -             |
| Hori.    | 949.990            | QP       | 26.20             | 22.07              | 9.81         | 31.12        | 0.00                    | 26.96              | 46.0              | 19.0           | 106            | 188             | -             |
| Hori.    | 5150.000           | PK       | 45.59             | 32.25              | 16.76        | 39.72        | 1.77                    | 56.65              | 73.9              | 17.2           | 216            | 69              | -             |
| Hori.    | 15540.000          | PK       | 46.25             | 39.60              | 12.67        | 39.13        | -9.54                   | 49.85              | 73.9              | 24.0           | 150            | 0               | -             |
| Hori.    | 5150.000           | AV       | 35.02             | 32.25              | 16.76        | 39.72        | 1.77                    | 46.08              | 53.9              | 7.8            | 216            | 69              | VBW : 3.6 kHz |
| Hori.    | 15540.000          | AV       | 35.66             | 39.60              | 12.67        | 39.13        | -9.54                   | 39.26              | 53.9              | 14.6           | 150            | 0               | VBW : 3.6 kHz |
| Vert.    | 250.000            | QP       | 27.80             | 11.78              | 6.20         | 31.76        | 0.00                    | 14.02              | 46.0              | 31.9           | 227            | 167             | -             |
| Vert.    | 449.997            | QP       | 37.10             | 16.45              | 7.47         | 31.93        | 0.00                    | 29.09              | 46.0              | 16.9           | 112            | 102             | -             |
| Vert.    | 549.996            | QP       | 31.40             | 17.81              | 8.02         | 32.09        | 0.00                    | 25.14              | 46.0              | 20.8           | 162            | 106             | -             |
| Vert.    | 799.988            | QP       | 23.90             | 20.74              | 9.18         | 32.03        | 0.00                    | 21.79              | 46.0              | 24.2           | 100            | 292             | -             |
| Vert.    | 849.985            | QP       | 25.20             | 21.49              | 9.43         | 31.72        | 0.00                    | 24.40              | 46.0              | 21.6           | 148            | 299             | -             |
| Vert.    | 899.992            | QP       | 26.60             | 22.07              | 9.64         | 31.49        | 0.00                    | 26.82              | 46.0              | 19.1           | 135            | 291             | -             |
| Vert.    | 949.988            | QP       | 25.60             | 22.07              | 9.81         | 31.12        | 0.00                    | 26.36              | 46.0              | 19.6           | 124            | 293             | -             |
| Vert.    | 5150.000           | PK       | 45.22             | 32.25              | 16.76        | 39.72        | 1.77                    | 56.28              | 73.9              | 17.6           | 153            | 11              | -             |
| Vert.    | 15540.000          | PK       | 45.98             | 39.60              | 12.67        | 39.13        | -9.54                   | 49.58              | 73.9              | 24.3           | 150            | 0               | -             |
| Vert.    | 5150.000           | AV       | 35.27             | 32.25              | 16.76        | 39.72        | 1.77                    | 46.33              | 53.9              | 7.5            | 153            | 11              | VBW : 3.6 kHz |
| Vert.    | 15540.000          | AV       | 35.31             | 39.60              | 12.67        | 39.13        | -9.54                   | 38.91              | 53.9              | 14.9           | 150            | 0               | VBW : 3.6 kHz |

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

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

Distance factor : 1 GHz - 10 GHz : 20log (3.68 m / 3.0 m) = 1.77 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Distance<br>Factor [dB] | Result<br>[dBuV/m] | Result (EIRP)<br>[dBm] | Limit<br>[dBm] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg.] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|-------------------------|--------------------|------------------------|----------------|----------------|----------------|-----------------|--------|
| Hori.    | 10360.000          | PK       | 46.73             | 36.57              | 9.99         | 39.88        | -9.54                   | 43.87              | -51.36                 | -27.0          | 24.3           | 150            | 0               | -      |
| Vert.    | 10360.000          | PK       | 46.32             | 36.57              | 9.99         | 39.88        | -9.54                   | 43.46              | -51.77                 | -27.0          | 24.7           | 150            | 0               | -      |

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

Result (EIRP [dBm]) = 10 \* LOG ( (10 ^ (Electric Field Strength [dBuV/m] / 20) \* 10 ^ (-6) \* Distance : 3 [m] ) ^ 2 / 30 \* 10 ^ 3 )

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

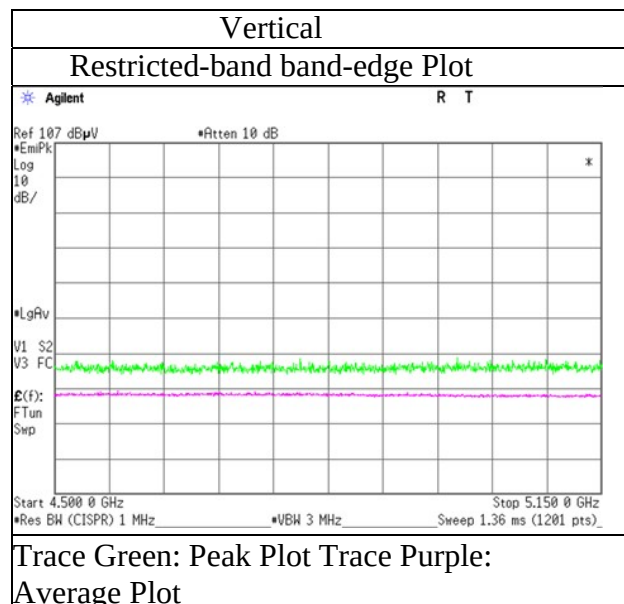
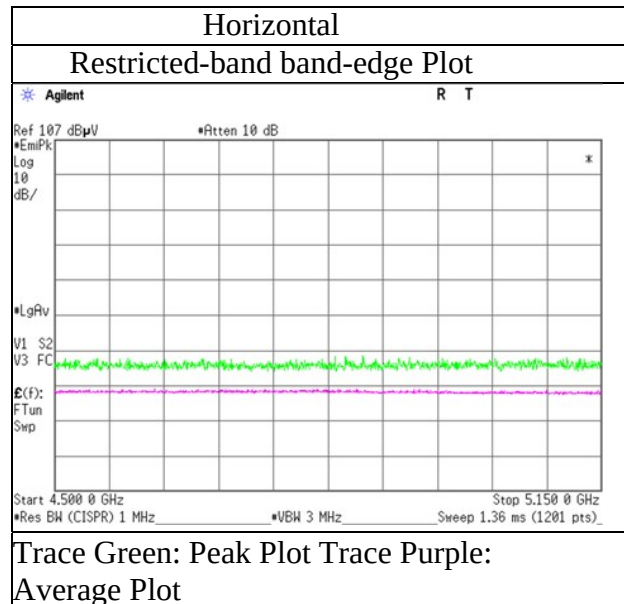
Distance factor : 1 GHz - 10 GHz : 20log (3.68 m / 3.0 m) = 1.77 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Toshinori Yamada  
Tx 11n-20 5180 MHz



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

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## Radiated Spurious Emission

|                        |                    |                    |                      |                      |
|------------------------|--------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.    |                    |                      |                      |
| Semi Anechoic Chamber  | 1                  | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021    | January 11, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH   | 20 deg.C, 30 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Toshinori Yamada   | Yasumasa Owaki     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz )  | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-20 5240 MHz |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 15720.000       | PK       | 45.79          | 39.85           | 12.65     | 39.37     | -9.54                | 49.38           | 73.9           | 24.5        | 150         | 0            | -             |
| Hori.    | 15720.000       | AV       | 35.28          | 39.85           | 12.65     | 39.37     | -9.54                | 38.87           | 53.9           | 15.0        | 150         | 0            | VBW : 3.6 kHz |
| Vert.    | 15720.000       | PK       | 45.61          | 39.85           | 12.65     | 39.37     | -9.54                | 49.20           | 73.9           | 24.7        | 150         | 0            | -             |
| Vert.    | 15720.000       | AV       | 35.20          | 39.85           | 12.65     | 39.37     | -9.54                | 38.79           | 53.9           | 15.1        | 150         | 0            | VBW : 3.6 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 10480.000       | PK       | 45.96          | 36.73           | 10.03     | 40.11     | -9.54                | 43.07           | -52.16              | -27.0       | 25.1        | 150         | 0            | -      |
| Vert.    | 10480.000       | PK       | 45.77          | 36.73           | 10.03     | 40.11     | -9.54                | 42.88           | -52.35              | -27.0       | 25.3        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \text{LOG}((10^{\wedge}(\text{Electric Field Strength [dBuV/m]} / 20)) * 10^{\wedge}(-6) * \text{Distance} : 3\text{ [m]})^{\wedge}2 / 30 * 10^{\wedge}3)$

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

## Radiated Spurious Emission

|                        |                    |                    |                      |                      |
|------------------------|--------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.    |                    |                      |                      |
| Semi Anechoic Chamber  | 1                  | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021    | January 11, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH   | 20 deg.C, 30 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Toshinori Yamada   | Yasumasa Owaki     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz )  | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-20 5320 MHz |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Distance<br>Factor [dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg.] | Remark        |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|-------------------------|--------------------|-------------------|----------------|----------------|-----------------|---------------|
| Hori.    | 5350.000           | PK       | 45.93             | 31.99              | 16.91        | 39.74        | 1.77                    | 56.86              | 73.9              | 17.0           | 210            | 80              | -             |
| Hori.    | 10640.000          | PK       | 45.74             | 37.39              | 10.12        | 40.02        | -9.54                   | 43.69              | 73.9              | 30.2           | 150            | 0               | -             |
| Hori.    | 15960.000          | PK       | 46.50             | 40.19              | 12.62        | 39.70        | -9.54                   | 50.07              | 73.9              | 23.8           | 150            | 0               | -             |
| Hori.    | 5350.000           | AV       | 35.09             | 31.99              | 16.91        | 39.74        | 1.77                    | 46.02              | 53.9              | 7.8            | 210            | 80              | VBW : 3.6 kHz |
| Hori.    | 10640.000          | AV       | 34.95             | 37.39              | 10.12        | 40.02        | -9.54                   | 32.90              | 53.9              | 21.0           | 150            | 0               | VBW : 3.6 kHz |
| Hori.    | 15960.000          | AV       | 35.25             | 40.19              | 12.62        | 39.70        | -9.54                   | 38.82              | 53.9              | 15.0           | 150            | 0               | VBW : 3.6 kHz |
| Vert.    | 5350.000           | PK       | 46.03             | 31.99              | 16.91        | 39.74        | 1.77                    | 56.96              | 73.9              | 16.9           | 114            | 86              | -             |
| Vert.    | 10640.000          | PK       | 45.20             | 37.39              | 10.12        | 40.02        | -9.54                   | 43.15              | 73.9              | 30.7           | 150            | 0               | -             |
| Vert.    | 15960.000          | PK       | 45.49             | 40.19              | 12.62        | 39.70        | -9.54                   | 49.06              | 73.9              | 24.8           | 150            | 0               | -             |
| Vert.    | 5350.000           | AV       | 35.58             | 31.99              | 16.91        | 39.74        | 1.77                    | 46.51              | 53.9              | 7.3            | 114            | 86              | VBW : 3.6 kHz |
| Vert.    | 10640.000          | AV       | 34.81             | 37.39              | 10.12        | 40.02        | -9.54                   | 32.76              | 53.9              | 21.1           | 150            | 0               | VBW : 3.6 kHz |
| Vert.    | 15960.000          | AV       | 35.08             | 40.19              | 12.62        | 39.70        | -9.54                   | 38.65              | 53.9              | 15.2           | 150            | 0               | VBW : 3.6 kHz |

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

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

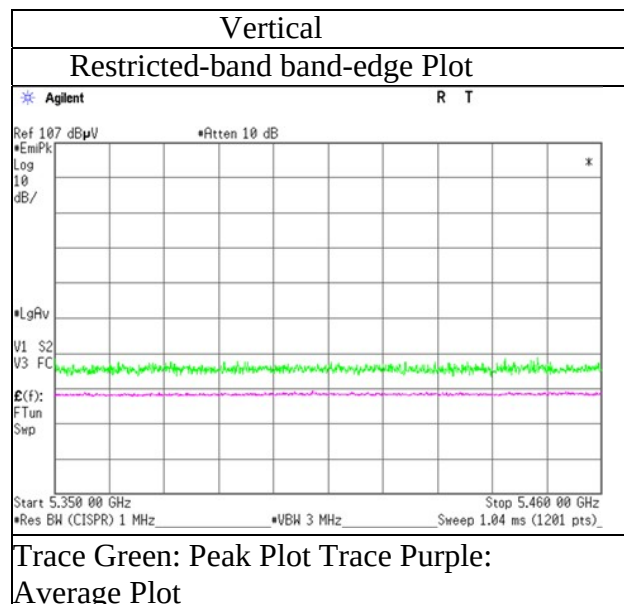
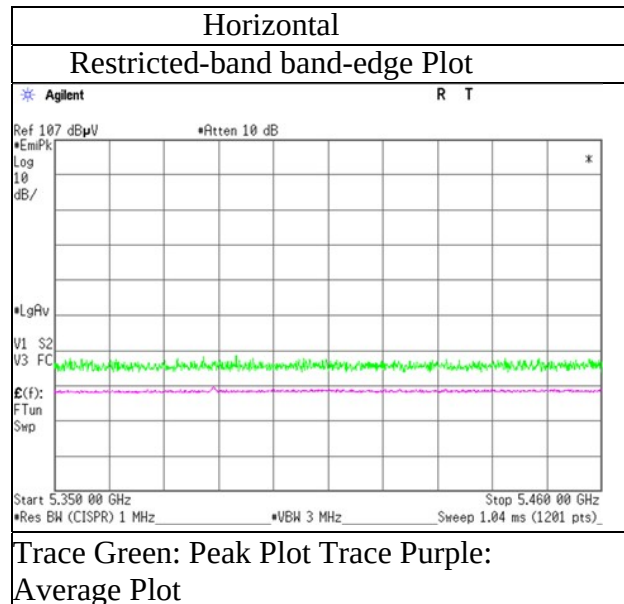
Distance factor : 1 GHz - 10 GHz : 20log (3.68 m / 3.0 m) = 1.77 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Toshinori Yamada  
Tx 11n-20 5320 MHz



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

**UL Japan, Inc.**

**Shonan EMC Lab.**

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## Radiated Spurious Emission

|                        |                    |                    |                      |                      |
|------------------------|--------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.    |                    |                      |                      |
| Semi Anechoic Chamber  | 1                  | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021    | January 11, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH   | 20 deg.C, 30 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Takahiro Kawakami  | Yasumasa Owaki     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz )  | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-20 5500 MHz |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 5460.000        | PK       | 45.97          | 32.22           | 16.99     | 39.75     | 1.77                 | 57.20           | 73.9           | 16.7        | 195         | 105          | -             |
| Hori.    | 11000.000       | PK       | 47.34          | 37.63           | 10.32     | 39.68     | -9.54                | 46.07           | 73.9           | 27.8        | 150         | 0            | -             |
| Hori.    | 5460.000        | AV       | 35.85          | 32.22           | 16.99     | 39.75     | 1.77                 | 47.08           | 53.9           | 6.8         | 195         | 105          | VBW : 3.6 kHz |
| Hori.    | 11000.000       | AV       | 35.46          | 37.63           | 10.32     | 39.68     | -9.54                | 34.19           | 53.9           | 19.7        | 150         | 0            | VBW : 3.6 kHz |
| Vert.    | 5460.000        | PK       | 46.41          | 32.22           | 16.99     | 39.75     | 1.77                 | 57.64           | 73.9           | 16.2        | 239         | 94           | -             |
| Vert.    | 11000.000       | PK       | 46.52          | 37.63           | 10.32     | 39.68     | -9.54                | 45.25           | 73.9           | 28.6        | 150         | 0            | -             |
| Vert.    | 5460.000        | AV       | 35.70          | 32.22           | 16.99     | 39.75     | 1.77                 | 46.93           | 53.9           | 6.9         | 239         | 94           | VBW : 3.6 kHz |
| Vert.    | 11000.000       | AV       | 35.55          | 37.63           | 10.32     | 39.68     | -9.54                | 34.28           | 53.9           | 19.6        | 150         | 0            | VBW : 3.6 kHz |

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

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

Distance factor : 1 GHz - 10 GHz : 20log (3.68 m / 3.0 m) = 1.77 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5329.897        | PK       | 47.56          | 31.94           | 16.88     | 39.73     | 1.77                 | 58.42           | -36.81              | -27.0       | 9.8         | 215         | 82           | -      |
| Hori.    | 5470.000        | PK       | 46.25          | 32.24           | 16.99     | 39.75     | 1.77                 | 57.50           | -37.73              | -27.0       | 10.7        | 195         | 105          | -      |
| Hori.    | 16500.000       | PK       | 46.82          | 40.10           | 13.34     | 40.47     | -9.54                | 50.25           | -44.98              | -27.0       | 17.9        | 150         | 0            | -      |
| Vert.    | 5329.931        | PK       | 46.24          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.10           | -38.13              | -27.0       | 11.1        | 226         | 16           | -      |
| Vert.    | 5470.000        | PK       | 46.23          | 32.24           | 16.99     | 39.75     | 1.77                 | 57.48           | -37.75              | -27.0       | 10.7        | 239         | 94           | -      |
| Vert.    | 16500.000       | PK       | 45.80          | 40.10           | 13.34     | 40.47     | -9.54                | 49.23           | -46.00              | -27.0       | 19.0        | 150         | 0            | -      |

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

Result (EIRP [dBm]) = 10 \* LOG ( (10 ^ (Electric Field Strength [dBuV/m] / 20) ) \* 10 ^ (-6) \* Distance : 3 [m] ) ^ 2 / 30 \* 10 ^ 3 )

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

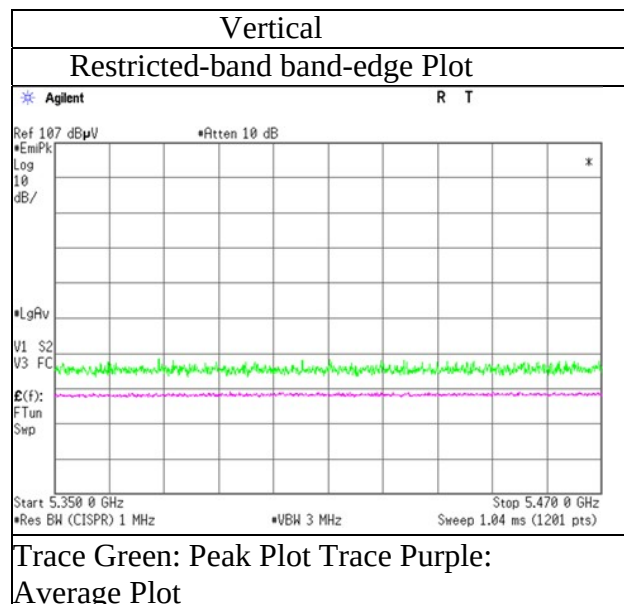
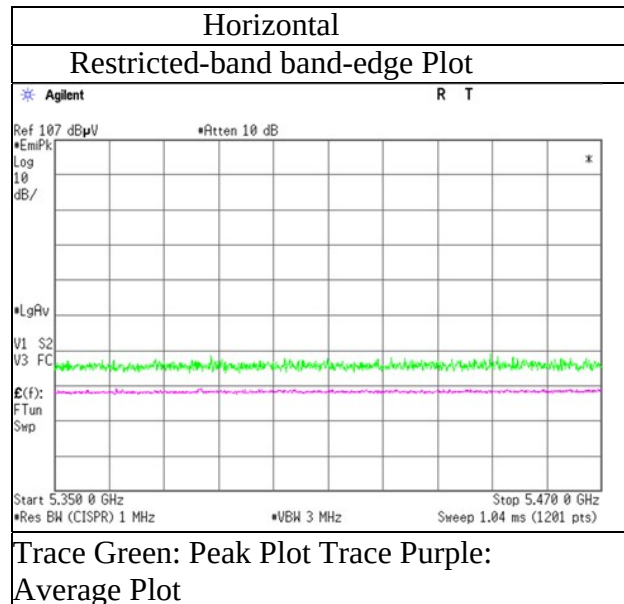
Distance factor : 1 GHz - 10 GHz : 20log (3.68 m / 3.0 m) = 1.77 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Takahiro Kawakami  
Tx 11n-20 5500 MHz



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

Final result of restricted band edge was shown in tabular data.

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## Radiated Spurious Emission

|                        |                    |                    |                      |                      |
|------------------------|--------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.    |                    |                      |                      |
| Semi Anechoic Chamber  | 1                  | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021    | January 11, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH   | 20 deg.C, 30 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Takahiro Kawakami  | Yasumasa Owaki     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz )  | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-20 5580 MHz |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 11160.000       | PK       | 46.81          | 37.52           | 10.39     | 39.61     | -9.54                | 45.57           | 73.9           | 28.3        | 150         | 0            | -             |
| Hori.    | 11160.000       | AV       | 35.31          | 37.52           | 10.39     | 39.61     | -9.54                | 34.07           | 53.9           | 19.8        | 150         | 0            | VBW : 3.6 kHz |
| Vert.    | 11160.000       | PK       | 46.15          | 37.52           | 10.39     | 39.61     | -9.54                | 44.91           | 73.9           | 28.9        | 150         | 0            | -             |
| Vert.    | 11160.000       | AV       | 35.46          | 37.52           | 10.39     | 39.61     | -9.54                | 34.22           | 53.9           | 19.6        | 150         | 0            | VBW : 3.6 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$

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

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5329.962        | PK       | 47.63          | 31.94           | 16.88     | 39.73     | 1.77                 | 58.49           | -36.74              | -27.0       | 9.7         | 165         | 60           | -      |
| Hori.    | 16740.000       | PK       | 45.51          | 39.75           | 13.40     | 40.11     | -9.54                | 49.01           | -46.22              | -27.0       | 19.2        | 150         | 0            | -      |
| Vert.    | 5329.767        | PK       | 47.01          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.87           | -37.36              | -27.0       | 10.3        | 259         | 186          | -      |
| Vert.    | 16740.000       | PK       | 44.83          | 39.75           | 13.40     | 40.11     | -9.54                | 48.33           | -46.90              | -27.0       | 19.9        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \text{LOG} ( (10^{\wedge} (\text{Electric Field Strength [dBuV/m]} / 20) * 10^{\wedge} (-6) * \text{Distance} : 3 [\text{m}] )^{\wedge} 2 / 30 * 10^{\wedge} 3 )$

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$

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

**UL Japan, Inc.**

**Shonan EMC Lab.**

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## Radiated Spurious Emission

|                        |                    |                    |                      |                      |
|------------------------|--------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.    |                    |                      |                      |
| Semi Anechoic Chamber  | 1                  | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021    | January 11, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH   | 20 deg.C, 30 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Takahiro Kawakami  | Yasumasa Owaki     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz )  | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-20 5700 MHz |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 11400.000       | PK       | 45.71          | 38.10           | 10.53     | 39.50     | -9.54                | 45.30           | 73.9           | 28.6        | 150         | 0            | -             |
| Hori.    | 11400.000       | AV       | 34.29          | 38.10           | 10.53     | 39.50     | -9.54                | 33.88           | 53.9           | 20.0        | 150         | 0            | VBW : 3.6 kHz |
| Vert.    | 11400.000       | PK       | 46.27          | 38.10           | 10.53     | 39.50     | -9.54                | 45.86           | 73.9           | 28.0        | 150         | 0            | -             |
| Vert.    | 11400.000       | AV       | 34.55          | 38.10           | 10.53     | 39.50     | -9.54                | 34.14           | 53.9           | 19.7        | 150         | 0            | VBW : 3.6 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5329.977        | PK       | 47.69          | 31.94           | 16.88     | 39.73     | 1.77                 | 58.55           | -36.68              | -27.0       | 9.6         | 263         | 74           | -      |
| Hori.    | 5725.000        | PK       | 46.66          | 32.64           | 17.16     | 39.92     | 1.77                 | 58.31           | -36.92              | -27.0       | 9.9         | 139         | 102          | -      |
| Hori.    | 17100.000       | PK       | 45.50          | 39.90           | 13.51     | 39.41     | -9.54                | 49.96           | -45.27              | -27.0       | 18.2        | 150         | 0            | -      |
| Vert.    | 5329.969        | PK       | 47.39          | 31.94           | 16.88     | 39.73     | 1.77                 | 58.25           | -36.98              | -27.0       | 9.9         | 256         | 358          | -      |
| Vert.    | 5725.000        | PK       | 46.43          | 32.64           | 17.16     | 39.92     | 1.77                 | 58.08           | -37.15              | -27.0       | 10.1        | 259         | 98           | -      |
| Vert.    | 17100.000       | PK       | 44.66          | 39.90           | 13.51     | 39.41     | -9.54                | 49.12           | -46.11              | -27.0       | 19.1        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \log((10^{\wedge}(\text{Electric Field Strength [dBuV/m]} / 20)) * 10^{\wedge}(-6) * \text{Distance : } 3[\text{m}])^{\wedge}2 / 30 * 10^{\wedge}3)$

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

**UL Japan, Inc.**

**Shonan EMC Lab.**

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

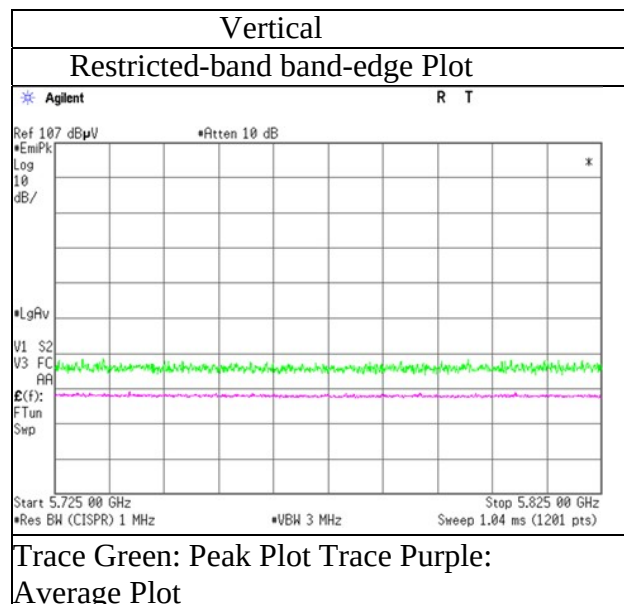
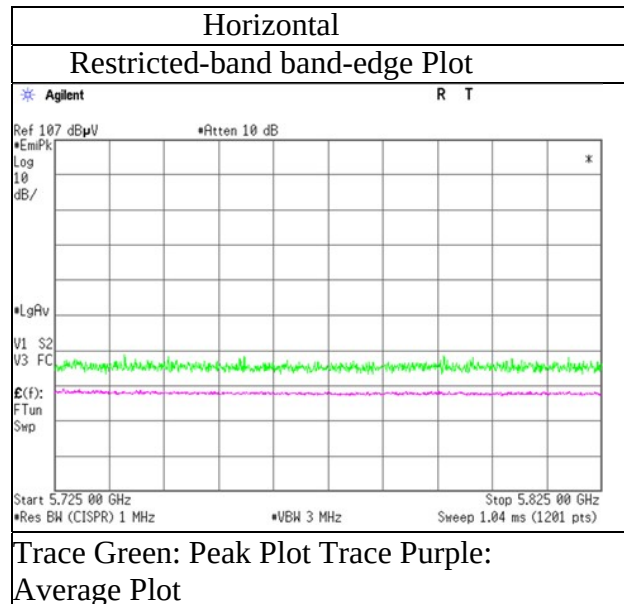
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Facsimile : +81 463 50 6401

## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Takahiro Kawakami  
Tx 11n-20 5700 MHz



\* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

Final result of restricted band edge was shown in tabular data.

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## Radiated Spurious Emission

|                        |                    |                    |                      |                      |
|------------------------|--------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.    |                    |                      |                      |
| Semi Anechoic Chamber  | 1                  | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021    | January 11, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH   | 20 deg.C, 30 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Takahiro Kawakami  | Yasumasa Owaki     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz )  | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-20 5745 MHz |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 11490.000       | PK       | 44.21          | 38.26           | 10.58     | 39.46     | -9.54                | 44.05           | 73.9           | 29.8        | 150         | 0            | -             |
| Hori.    | 11490.000       | AV       | 33.43          | 38.26           | 10.58     | 39.46     | -9.54                | 33.27           | 53.9           | 20.6        | 150         | 0            | VBW : 3.6 kHz |
| Vert.    | 11490.000       | PK       | 44.06          | 38.26           | 10.58     | 39.46     | -9.54                | 43.90           | 73.9           | 30.0        | 150         | 0            | -             |
| Vert.    | 11490.000       | AV       | 33.63          | 38.26           | 10.58     | 39.46     | -9.54                | 33.47           | 53.9           | 20.4        | 150         | 0            | VBW : 3.6 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5329.996        | PK       | 46.89          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.75           | -37.48              | -27.0       | 10.4        | 193         | 87           | -      |
| Hori.    | 5650.000        | PK       | 45.94          | 32.44           | 17.11     | 39.86     | 1.77                 | 57.40           | -37.83              | -27.0       | 10.8        | 145         | 103          | -      |
| Hori.    | 5700.000        | PK       | 46.26          | 32.56           | 17.14     | 39.90     | 1.77                 | 57.83           | -37.40              | 10.0        | 47.4        | 145         | 103          | -      |
| Hori.    | 5720.000        | PK       | 46.92          | 32.62           | 17.15     | 39.92     | 1.77                 | 58.54           | -36.69              | 15.6        | 52.2        | 145         | 103          | -      |
| Hori.    | 5725.000        | PK       | 51.20          | 32.64           | 17.16     | 39.92     | 1.77                 | 62.85           | -32.38              | 27.0        | 59.3        | 145         | 103          | -      |
| Hori.    | 17235.000       | PK       | 45.57          | 40.18           | 13.57     | 39.01     | -9.54                | 50.77           | -44.46              | -27.0       | 17.4        | 150         | 0            | -      |
| Vert.    | 5329.000        | PK       | 47.96          | 31.94           | 16.88     | 39.73     | 1.77                 | 58.82           | -36.41              | -27.0       | 9.4         | 125         | 1            | -      |
| Vert.    | 5650.000        | PK       | 46.22          | 32.44           | 17.11     | 39.86     | 1.77                 | 57.68           | -37.55              | -27.0       | 10.5        | 102         | 91           | -      |
| Vert.    | 5700.000        | PK       | 46.10          | 32.56           | 17.14     | 39.90     | 1.77                 | 57.67           | -37.56              | 10.0        | 47.5        | 102         | 91           | -      |
| Vert.    | 5720.000        | PK       | 46.24          | 32.62           | 17.15     | 39.92     | 1.77                 | 57.86           | -37.37              | 15.6        | 52.9        | 102         | 91           | -      |
| Vert.    | 5725.000        | PK       | 51.19          | 32.64           | 17.16     | 39.92     | 1.77                 | 62.84           | -32.39              | 27.0        | 59.3        | 102         | 91           | -      |
| Vert.    | 17235.000       | PK       | 45.22          | 40.18           | 13.57     | 39.01     | -9.54                | 50.42           | -44.81              | -27.0       | 17.8        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \text{LOG}((10^{\wedge}(\text{Electric Field Strength [dBuV/m]} / 20)) * 10^{\wedge}(-6) * \text{Distance : 3 [m]})^{\wedge}2 / 30 * 10^{\wedge}3)$

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

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**Shonan EMC Lab.**

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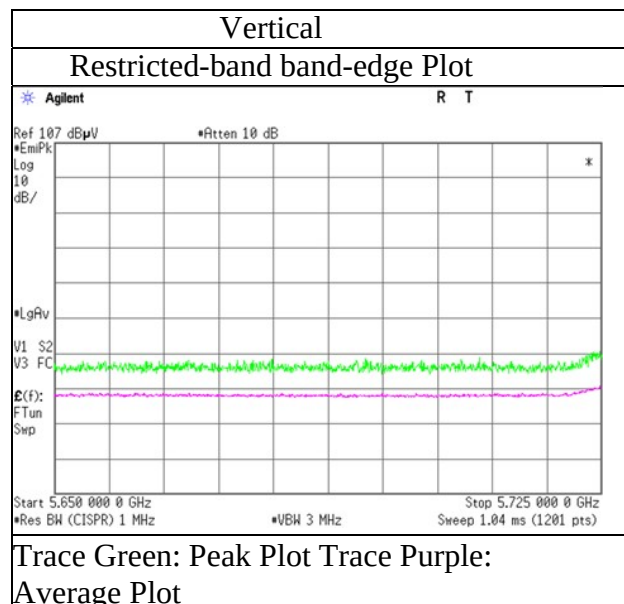
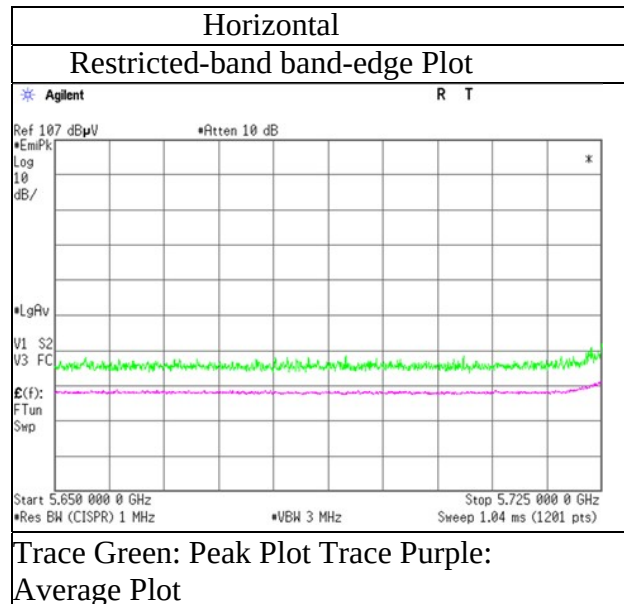
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## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Takahiro Kawakami  
Tx 11n-20 5745 MHz



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

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## Radiated Spurious Emission

|                        |                    |                    |                      |                      |
|------------------------|--------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.    |                    |                      |                      |
| Semi Anechoic Chamber  | 1                  | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021    | January 11, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH   | 20 deg.C, 30 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Takahiro Kawakami  | Yasumasa Owaki     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz )  | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-20 5785 MHz |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 11570.000       | PK       | 43.60          | 38.31           | 10.62     | 39.41     | -9.54                | 43.58           | 73.9           | 30.3        | 150         | 0            | -             |
| Hori.    | 11570.000       | AV       | 33.19          | 38.31           | 10.62     | 39.41     | -9.54                | 33.17           | 53.9           | 20.7        | 150         | 0            | VBW : 3.6 kHz |
| Vert.    | 11570.000       | PK       | 43.36          | 38.31           | 10.62     | 39.41     | -9.54                | 43.34           | 73.9           | 30.5        | 150         | 0            | -             |
| Vert.    | 11570.000       | AV       | 33.20          | 38.31           | 10.62     | 39.41     | -9.54                | 33.18           | 53.9           | 20.7        | 150         | 0            | VBW : 3.6 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$

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

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5329.991        | PK       | 46.74          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.60           | -37.63              | -27.0       | 10.6        | 107         | 100          | -      |
| Hori.    | 17355.000       | PK       | 45.21          | 40.39           | 13.61     | 38.65     | -9.54                | 51.02           | -44.21              | -27.0       | 17.2        | 150         | 0            | -      |
| Vert.    | 5329.909        | PK       | 47.43          | 31.94           | 16.88     | 39.73     | 1.77                 | 58.29           | -36.94              | -27.0       | 9.9         | 168         | 8            | -      |
| Vert.    | 17355.000       | PK       | 45.33          | 40.39           | 13.61     | 38.65     | -9.54                | 51.14           | -44.09              | -27.0       | 17.0        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \log(10^{\wedge}(\text{Electric Field Strength [dBuV/m]} / 20) * 10^{\wedge}(-6) * \text{Distance : 3 [m]} )^{\wedge}2 / 30 * 10^{\wedge}3)$

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$

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

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## Radiated Spurious Emission

|                        |                    |                    |                      |                      |
|------------------------|--------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.    |                    |                      |                      |
| Semi Anechoic Chamber  | 1                  | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021    | January 11, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH   | 20 deg.C, 30 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Takahiro Kawakami  | Yasumasa Owaki     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz )  | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-20 5825 MHz |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 11650.000       | PK       | 44.38          | 38.35           | 10.68     | 39.34     | -9.54                | 44.53           | 73.9           | 29.3        | 150         | 0            | -             |
| Hori.    | 11650.000       | AV       | 33.55          | 38.35           | 10.68     | 39.34     | -9.54                | 33.70           | 53.9           | 20.2        | 150         | 0            | VBW : 3.6 kHz |
| Vert.    | 11650.000       | PK       | 44.36          | 38.35           | 10.68     | 39.34     | -9.54                | 44.51           | 73.9           | 29.3        | 150         | 0            | -             |
| Vert.    | 11650.000       | AV       | 33.43          | 38.35           | 10.68     | 39.34     | -9.54                | 33.58           | 53.9           | 20.3        | 150         | 0            | VBW : 3.6 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5329.570        | PK       | 47.40          | 31.94           | 16.88     | 39.73     | 1.77                 | 58.26           | -36.97              | -27.0       | 9.9         | 164         | 97           | -      |
| Hori.    | 5850.000        | PK       | 45.95          | 32.91           | 17.24     | 40.02     | 1.77                 | 57.85           | -37.38              | 27.0        | 64.3        | 151         | 104          | -      |
| Hori.    | 5855.000        | PK       | 45.76          | 32.92           | 17.24     | 40.02     | 1.77                 | 57.67           | -37.56              | 15.6        | 53.1        | 151         | 104          | -      |
| Hori.    | 5875.000        | PK       | 46.02          | 32.95           | 17.27     | 40.04     | 1.77                 | 57.97           | -37.26              | 10.0        | 47.2        | 151         | 104          | -      |
| Hori.    | 5925.000        | PK       | 45.78          | 32.99           | 17.29     | 40.07     | 1.77                 | 57.76           | -37.47              | -27.0       | 10.4        | 151         | 104          | -      |
| Hori.    | 17475.000       | PK       | 44.25          | 40.51           | 13.66     | 38.29     | -9.54                | 50.59           | -44.64              | -27.0       | 17.6        | 150         | 0            | -      |
| Vert.    | 5329.655        | PK       | 47.14          | 31.94           | 16.88     | 39.73     | 1.77                 | 58.00           | -37.23              | -27.0       | 10.2        | 135         | 357          | -      |
| Vert.    | 5850.000        | PK       | 45.73          | 32.91           | 17.24     | 40.02     | 1.77                 | 57.63           | -37.60              | 27.0        | 64.6        | 100         | 97           | -      |
| Vert.    | 5855.000        | PK       | 46.03          | 32.92           | 17.24     | 40.02     | 1.77                 | 57.94           | -37.29              | 15.6        | 52.8        | 100         | 97           | -      |
| Vert.    | 5875.000        | PK       | 46.50          | 32.95           | 17.27     | 40.04     | 1.77                 | 58.45           | -36.78              | 10.0        | 46.7        | 100         | 97           | -      |
| Vert.    | 5925.000        | PK       | 46.53          | 32.99           | 17.29     | 40.07     | 1.77                 | 58.51           | -36.72              | -27.0       | 9.7         | 100         | 97           | -      |
| Vert.    | 17475.000       | PK       | 45.25          | 40.51           | 13.66     | 38.29     | -9.54                | 51.59           | -43.64              | -27.0       | 16.6        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \text{LOG} ( (10^{\wedge} (\text{Electric Field Strength [dBuV/m]} / 20) * 10^{\wedge} (-6) * \text{Distance : 3 [m]} )^{\wedge} 2 / 30 * 10^{\wedge} 3 )$

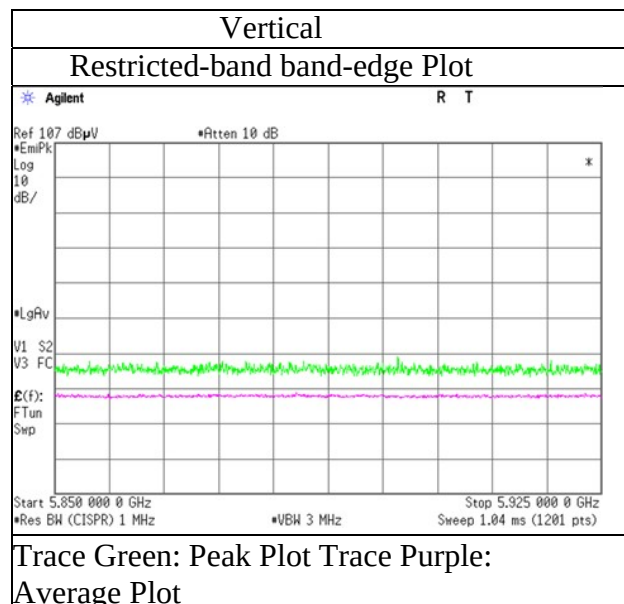
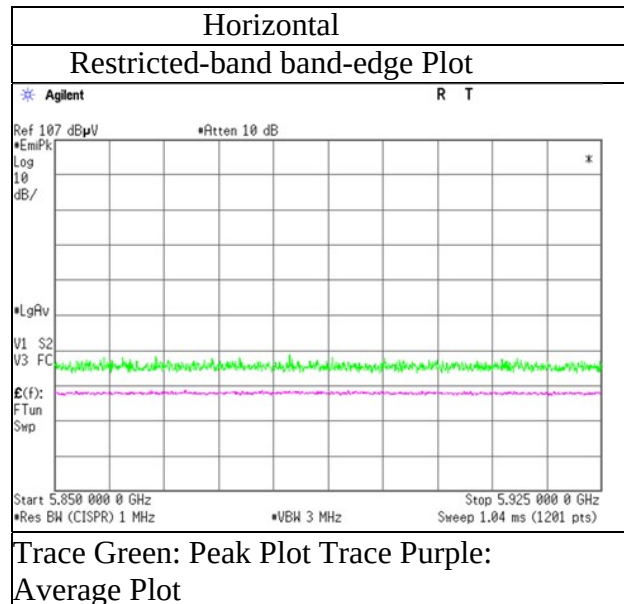
\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20 dB).

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Takahiro Kawakami  
Tx 11n-20 5825 MHz



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

**UL Japan, Inc.**

**Shonan EMC Lab.**

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## Radiated Spurious Emission

|                        |                    |                    |                      |                      |
|------------------------|--------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.    |                    |                      |                      |
| Semi Anechoic Chamber  | 1                  | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021    | January 11, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH   | 20 deg.C, 30 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Takahiro Kawakami  | Yasumasa Owaki     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz )  | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-40 5190 MHz |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 5150.000        | PK       | 46.03          | 32.25           | 16.76     | 39.72     | 1.77                 | 57.09           | 73.9           | 16.8        | 255         | 77           | -             |
| Hori.    | 15570.000       | PK       | 46.25          | 39.68           | 12.66     | 39.17     | -9.54                | 49.88           | 73.9           | 24.0        | 150         | 0            | -             |
| Hori.    | 5150.000        | AV       | 35.57          | 32.25           | 16.76     | 39.72     | 1.77                 | 46.63           | 53.9           | 7.2         | 255         | 77           | VBW : 5.6 kHz |
| Hori.    | 15570.000       | AV       | 36.60          | 39.68           | 12.66     | 39.17     | -9.54                | 40.23           | 53.9           | 13.6        | 150         | 0            | VBW : 5.6 kHz |
| Vert.    | 5150.000        | PK       | 46.02          | 32.25           | 16.76     | 39.72     | 1.77                 | 57.08           | 73.9           | 16.8        | 301         | 98           | -             |
| Vert.    | 15570.000       | PK       | 46.66          | 39.68           | 12.66     | 39.17     | -9.54                | 50.29           | 73.9           | 23.6        | 150         | 0            | -             |
| Vert.    | 5150.000        | AV       | 35.99          | 32.25           | 16.76     | 39.72     | 1.77                 | 47.05           | 53.9           | 6.8         | 301         | 98           | VBW : 5.6 kHz |
| Vert.    | 15570.000       | AV       | 36.34          | 39.68           | 12.66     | 39.17     | -9.54                | 39.97           | 53.9           | 13.9        | 150         | 0            | VBW : 5.6 kHz |

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

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

Distance factor : 1 GHz - 10 GHz : 20log (3.68 m / 3.0 m) = 1.77 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 10380.000       | PK       | 46.62          | 36.57           | 10.01     | 39.92     | -9.54                | 43.74           | -51.49              | -27.0       | 24.4        | 150         | 0            | -      |
| Vert.    | 10380.000       | PK       | 45.77          | 36.57           | 10.01     | 39.92     | -9.54                | 42.89           | -52.34              | -27.0       | 25.3        | 150         | 0            | -      |

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

Result (EIRP [dBm]) = 10 \* LOG ( (10 ^ (Electric Field Strength [dBuV/m] / 20) ) \* 10 ^ (-6) \* Distance : 3 [m] ) ^ 2 / 30 \* 10 ^ 3

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

Distance factor : 1 GHz - 10 GHz : 20log (3.68 m / 3.0 m) = 1.77 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

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**Shonan EMC Lab.**

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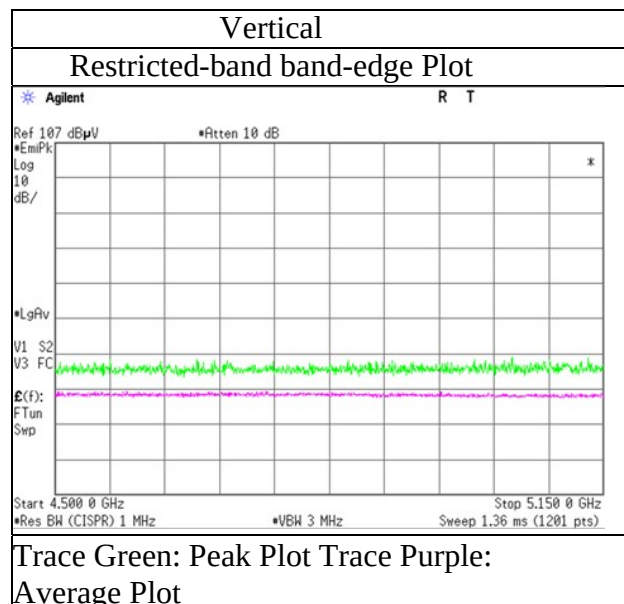
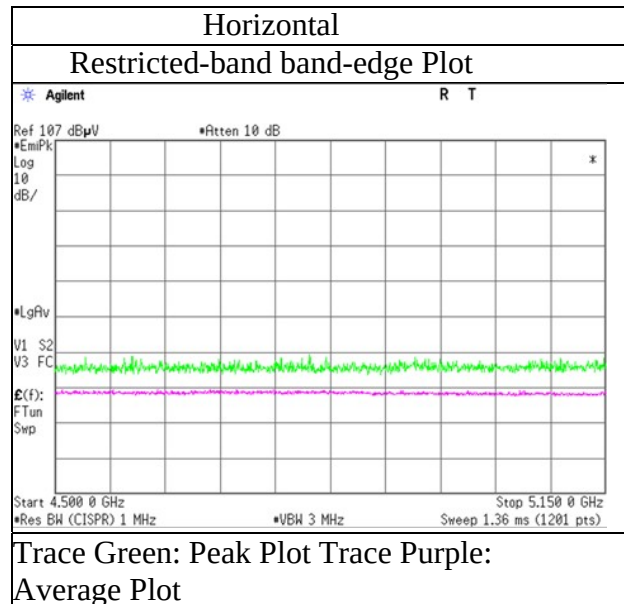
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## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Takahiro Kawakami  
Tx 11n-40 5190 MHz



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

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## Radiated Spurious Emission

|                        |                    |                    |                      |                      |
|------------------------|--------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.    |                    |                      |                      |
| Semi Anechoic Chamber  | 1                  | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021    | January 11, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH   | 20 deg.C, 30 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Takahiro Kawakami  | Yasumasa Owaki     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz )  | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-40 5230 MHz |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 15690.000       | PK       | 46.20          | 39.82           | 12.65     | 39.33     | -9.54                | 49.80           | 73.9           | 24.1        | 150         | 0            | -             |
| Hori.    | 15690.000       | AV       | 36.27          | 39.82           | 12.65     | 39.33     | -9.54                | 39.87           | 53.9           | 14.0        | 150         | 0            | VBW : 5.6 kHz |
| Vert.    | 15690.000       | PK       | 46.15          | 39.82           | 12.65     | 39.33     | -9.54                | 49.75           | 73.9           | 24.1        | 150         | 0            | -             |
| Vert.    | 15690.000       | AV       | 35.69          | 39.82           | 12.65     | 39.33     | -9.54                | 39.29           | 53.9           | 14.6        | 150         | 0            | VBW : 5.6 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 10460.000       | PK       | 46.72          | 36.69           | 10.03     | 40.07     | -9.54                | 43.83           | -51.40              | -27.0       | 24.4        | 150         | 0            | -      |
| Vert.    | 10460.000       | PK       | 46.35          | 36.69           | 10.03     | 40.07     | -9.54                | 43.46           | -51.77              | -27.0       | 24.7        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \log((10^{\wedge}(\text{Electric Field Strength [dBuV/m]} / 20)) * 10^{\wedge}(-6) * \text{Distance} : 3\text{ [m]})^{\wedge}2 / 30 * 10^{\wedge}3)$

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

## Radiated Spurious Emission

|                        |                    |                    |                      |                      |
|------------------------|--------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.    |                    |                      |                      |
| Semi Anechoic Chamber  | 1                  | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021    | January 11, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH   | 20 deg.C, 30 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Takahiro Kawakami  | Yasumasa Owaki     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz )  | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-40 5310 MHz |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Distance<br>Factor [dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg.] | Remark        |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|-------------------------|--------------------|-------------------|----------------|----------------|-----------------|---------------|
| Hori.    | 5350.000           | PK       | 46.04             | 31.99              | 16.91        | 39.74        | 1.77                    | 56.97              | 73.9              | 16.9           | 196            | 70              | -             |
| Hori.    | 10620.000          | PK       | 46.44             | 37.30              | 10.11        | 40.04        | -9.54                   | 44.27              | 73.9              | 29.6           | 150            | 0               | -             |
| Hori.    | 15930.000          | PK       | 45.71             | 40.17              | 12.63        | 39.66        | -9.54                   | 49.31              | 73.9              | 24.5           | 150            | 0               | -             |
| Hori.    | 5350.000           | AV       | 35.75             | 31.99              | 16.91        | 39.74        | 1.77                    | 46.68              | 53.9              | 7.2            | 196            | 70              | VBW : 5.6 kHz |
| Hori.    | 10620.000          | AV       | 35.56             | 37.30              | 10.11        | 40.04        | -9.54                   | 33.39              | 53.9              | 20.5           | 150            | 0               | VBW : 5.6 kHz |
| Hori.    | 15930.000          | AV       | 35.81             | 40.17              | 12.63        | 39.66        | -9.54                   | 39.41              | 53.9              | 14.4           | 150            | 0               | VBW : 5.6 kHz |
| Vert.    | 5350.000           | PK       | 46.20             | 31.99              | 16.91        | 39.74        | 1.77                    | 57.13              | 73.9              | 16.7           | 112            | 95              | -             |
| Vert.    | 10620.000          | PK       | 45.24             | 37.30              | 10.11        | 40.04        | -9.54                   | 43.07              | 73.9              | 30.8           | 150            | 0               | -             |
| Vert.    | 15930.000          | PK       | 46.10             | 40.17              | 12.63        | 39.66        | -9.54                   | 49.70              | 73.9              | 24.2           | 150            | 0               | -             |
| Vert.    | 5350.000           | AV       | 35.95             | 31.99              | 16.91        | 39.74        | 1.77                    | 46.88              | 53.9              | 7.0            | 112            | 95              | VBW : 5.6 kHz |
| Vert.    | 10620.000          | AV       | 35.78             | 37.30              | 10.11        | 40.04        | -9.54                   | 33.61              | 53.9              | 20.2           | 150            | 0               | VBW : 5.6 kHz |
| Vert.    | 15930.000          | AV       | 35.82             | 40.17              | 12.63        | 39.66        | -9.54                   | 39.42              | 53.9              | 14.4           | 150            | 0               | VBW : 5.6 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$

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

**UL Japan, Inc.**

**Shonan EMC Lab.**

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

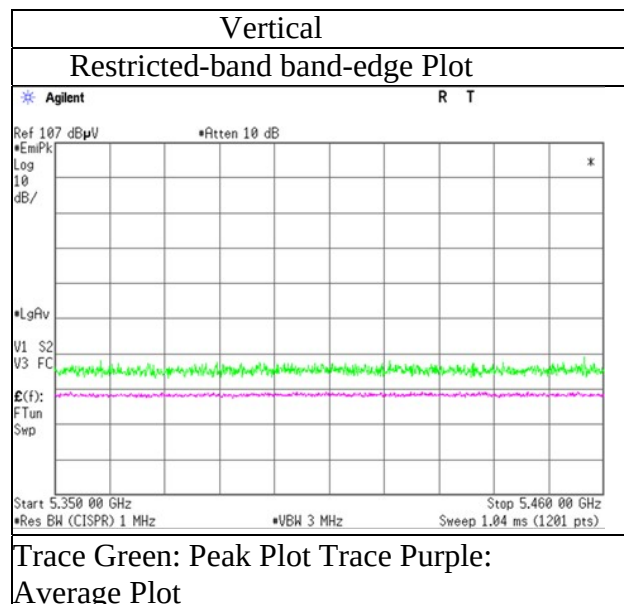
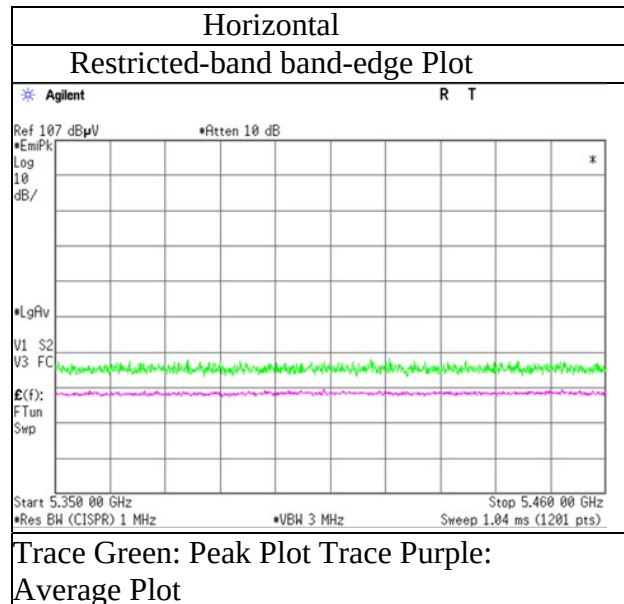
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Takahiro Kawakami  
Tx 11n-40 5310 MHz



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

**UL Japan, Inc.**

**Shonan EMC Lab.**

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

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |                    |                    |                      |                      |
|------------------------|--------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.    |                    |                      |                      |
| Semi Anechoic Chamber  | 1                  | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021    | January 11, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH   | 20 deg.C, 30 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Takahiro Kawakami  | Yasumasa Owaki     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz )  | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-40 5510 MHz |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 5460.000        | PK       | 46.31          | 32.22           | 16.99     | 39.75     | 1.77                 | 57.54           | 73.9           | 16.3        | 102         | 71           | -             |
| Hori.    | 11020.000       | PK       | 47.09          | 37.58           | 10.33     | 39.67     | -9.54                | 45.79           | 73.9           | 28.1        | 150         | 0            | -             |
| Hori.    | 5460.000        | AV       | 35.76          | 32.22           | 16.99     | 39.75     | 1.77                 | 46.99           | 53.9           | 6.9         | 102         | 71           | VBW : 5.6 kHz |
| Hori.    | 11020.000       | AV       | 35.97          | 37.58           | 10.33     | 39.67     | -9.54                | 34.67           | 53.9           | 19.2        | 150         | 0            | VBW : 5.6 kHz |
| Vert.    | 5460.000        | PK       | 46.21          | 32.22           | 16.99     | 39.75     | 1.77                 | 57.44           | 73.9           | 16.4        | 268         | 93           | -             |
| Vert.    | 11020.000       | PK       | 46.43          | 37.58           | 10.33     | 39.67     | -9.54                | 45.13           | 73.9           | 28.7        | 150         | 0            | -             |
| Vert.    | 5460.000        | AV       | 36.00          | 32.22           | 16.99     | 39.75     | 1.77                 | 47.23           | 53.9           | 6.6         | 268         | 93           | VBW : 5.6 kHz |
| Vert.    | 11020.000       | AV       | 35.76          | 37.58           | 10.33     | 39.67     | -9.54                | 34.46           | 53.9           | 19.4        | 150         | 0            | VBW : 5.6 kHz |

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

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

Distance factor : 1 GHz - 10 GHz : 20log (3.68 m / 3.0 m) = 1.77 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5330.018        | PK       | 47.44          | 31.94           | 16.88     | 39.73     | 1.77                 | 58.30           | -36.93              | -27.0       | 9.9         | 238         | 63           | -      |
| Hori.    | 5470.000        | PK       | 46.79          | 32.24           | 16.99     | 39.75     | 1.77                 | 58.04           | -37.19              | -27.0       | 10.1        | 102         | 71           | -      |
| Hori.    | 16530.000       | PK       | 45.66          | 40.05           | 13.35     | 40.42     | -9.54                | 49.10           | -46.13              | -27.0       | 19.1        | 150         | 0            | -      |
| Vert.    | 5329.988        | PK       | 47.04          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.90           | -37.33              | -27.0       | 10.3        | 118         | 358          | -      |
| Vert.    | 5470.000        | PK       | 47.06          | 32.24           | 16.99     | 39.75     | 1.77                 | 58.31           | -36.92              | -27.0       | 9.9         | 268         | 93           | -      |
| Vert.    | 16530.000       | PK       | 45.23          | 40.05           | 13.35     | 40.42     | -9.54                | 48.67           | -46.56              | -27.0       | 19.5        | 150         | 0            | -      |

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

Result (EIRP [dBm]) = 10 \* LOG ( (10 ^ (Electric Field Strength [dBuV/m] / 20) ) \* 10 ^ (-6) \* Distance : 3 [m] ) ^ 2 / 30 \* 10 ^ 3 )

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

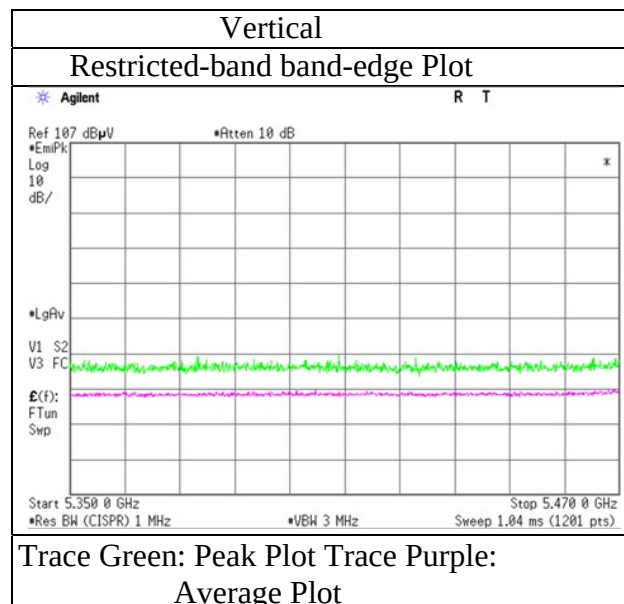
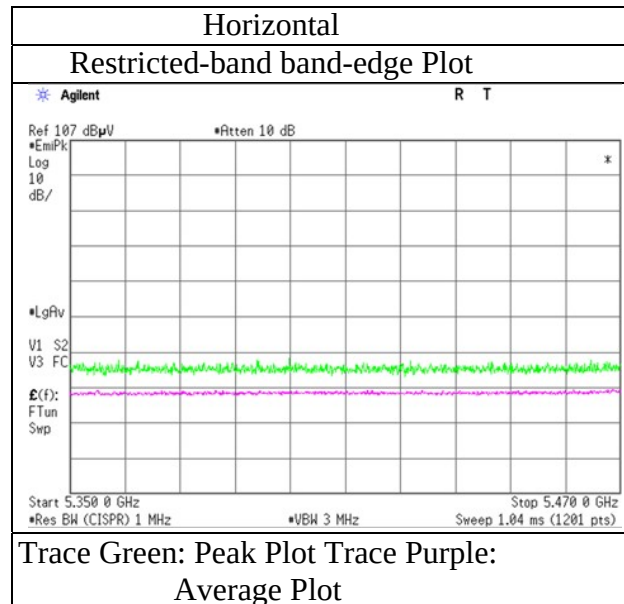
Distance factor : 1 GHz - 10 GHz : 20log (3.68 m / 3.0 m) = 1.77 dB

10 GHz - 40 GHz : 20log (1.0 m / 3.0 m) = -9.54 dB

## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Takahiro Kawakami  
Tx 11n-40 5510 MHz



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

**UL Japan, Inc.**

**Shonan EMC Lab.**

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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |                    |                    |                      |                      |
|------------------------|--------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.    |                    |                      |                      |
| Semi Anechoic Chamber  | 1                  | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021    | January 11, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH   | 20 deg.C, 30 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Takahiro Kawakami  | Yasumasa Owaki     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz )  | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-40 5550 MHz |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 11100.000       | PK       | 46.47          | 37.49           | 10.37     | 39.64     | -9.54                | 45.15           | 73.9           | 28.7        | 150         | 0            | -             |
| Hori.    | 11100.000       | AV       | 36.18          | 37.49           | 10.37     | 39.64     | -9.54                | 34.86           | 53.9           | 19.0        | 150         | 0            | VBW : 5.6 kHz |
| Vert.    | 11100.000       | PK       | 46.21          | 37.49           | 10.37     | 39.64     | -9.54                | 44.89           | 73.9           | 29.0        | 150         | 0            | -             |
| Vert.    | 11100.000       | AV       | 36.30          | 37.49           | 10.37     | 39.64     | -9.54                | 34.98           | 53.9           | 18.9        | 150         | 0            | VBW : 5.6 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$

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

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5330.058        | PK       | 46.57          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.43           | -37.80              | -27.0       | 10.8        | 161         | 0            | -      |
| Hori.    | 16650.000       | PK       | 45.25          | 39.86           | 13.38     | 40.24     | -9.54                | 48.71           | -46.52              | -27.0       | 19.5        | 150         | 0            | -      |
| Vert.    | 5329.992        | PK       | 47.42          | 31.94           | 16.88     | 39.73     | 1.77                 | 58.28           | -36.95              | -27.0       | <b>9.9</b>  | 267         | 356          | -      |
| Vert.    | 16650.000       | PK       | 46.31          | 39.86           | 13.38     | 40.24     | -9.54                | 49.77           | -45.46              | -27.0       | 18.4        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \log(10^{\wedge}(\text{Electric Field Strength [dBuV/m]} / 20) * 10^{\wedge}(-6) * \text{Distance} : 3 [\text{m}])^{\wedge}2 / 30 * 10^{\wedge}3)$

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$

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

## Radiated Spurious Emission

|                        |                    |                    |                      |                      |
|------------------------|--------------------|--------------------|----------------------|----------------------|
| Test place             | Shonan EMC Lab.    |                    |                      |                      |
| Semi Anechoic Chamber  | 1                  | 1                  | 1                    | 1                    |
| Date                   | January 6, 2021    | January 11, 2021   | January 5, 2021      | January 5, 2021      |
| Temperature / Humidity | 21 deg.C, 32 %RH   | 20 deg.C, 30 %RH   | 21 deg.C, 30 %RH     | 24 deg.C, 29 %RH     |
| Engineer               | Takahiro Kawakami  | Yasumasa Owaki     | Toshinori Yamada     | Takahiro Kawakami    |
|                        | ( 1 GHz -10 GHz )  | ( 10 GHz -18 GHz ) | ( 18 GHz -26.5 GHz ) | ( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-40 5670 MHz |                    |                      |                      |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 11340.000       | PK       | 45.07          | 37.97           | 10.51     | 39.53     | -9.54                | 44.48           | 73.9           | 29.4        | 150         | 0            | -             |
| Hori.    | 11340.000       | AV       | 35.10          | 37.97           | 10.51     | 39.53     | -9.54                | 34.51           | 53.9           | 19.3        | 150         | 0            | VBW : 5.6 kHz |
| Vert.    | 11340.000       | PK       | 45.14          | 37.97           | 10.51     | 39.53     | -9.54                | 44.55           | 73.9           | 29.3        | 150         | 0            | -             |
| Vert.    | 11340.000       | AV       | 35.27          | 37.97           | 10.51     | 39.53     | -9.54                | 34.68           | 53.9           | 19.2        | 150         | 0            | VBW : 5.6 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5329.909        | PK       | 47.09          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.95           | -37.28              | -27.0       | 10.2        | 199         | 72           | -      |
| Hori.    | 5725.000        | PK       | 45.93          | 32.64           | 17.16     | 39.92     | 1.77                 | 57.58           | -37.65              | -27.0       | 10.6        | 136         | 103          | -      |
| Hori.    | 17010.000       | PK       | 45.40          | 39.75           | 13.48     | 39.68     | -9.54                | 49.41           | -45.82              | -27.0       | 18.8        | 150         | 0            | -      |
| Vert.    | 5330.024        | PK       | 46.98          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.84           | -37.39              | -27.0       | 10.3        | 225         | 356          | -      |
| Vert.    | 5725.000        | PK       | 46.64          | 32.64           | 17.16     | 39.92     | 1.77                 | 58.29           | -36.94              | -27.0       | 9.9         | 262         | 98           | -      |
| Vert.    | 17010.000       | PK       | 45.27          | 39.75           | 13.48     | 39.68     | -9.54                | 49.28           | -45.95              | -27.0       | 18.9        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \log((10^{\wedge}(\text{Electric Field Strength [dBuV/m]} / 20)) * 10^{\wedge}(-6) * \text{Distance : } 3[\text{m}])^{\wedge}2 / 30 * 10^{\wedge}3)$

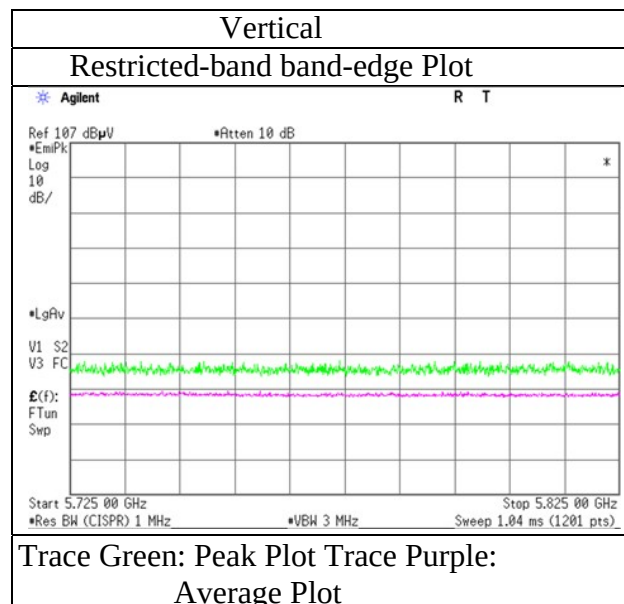
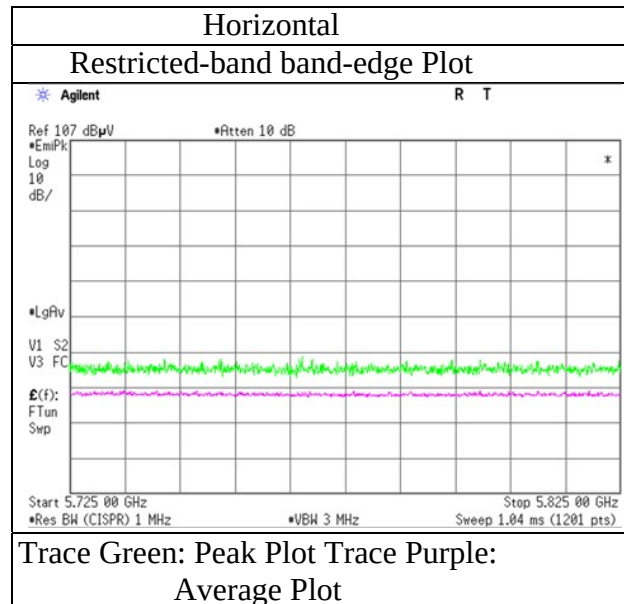
\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20 dB).

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Takahiro Kawakami  
Tx 11n-40 5670 MHz



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

**UL Japan, Inc.**

**Shonan EMC Lab.**

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Telephone : +81 463 50 6400

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## Radiated Spurious Emission

|                        |                                        |                                      |                                          |                                           |
|------------------------|----------------------------------------|--------------------------------------|------------------------------------------|-------------------------------------------|
| Test place             | Shonan EMC Lab.                        |                                      |                                          |                                           |
| Semi Anechoic Chamber  | 1                                      | 1                                    | 1                                        | 1                                         |
| Date                   | January 8, 2021                        | January 11, 2021                     | January 5, 2021                          | January 5, 2021                           |
| Temperature / Humidity | 20 deg.C, 29 %RH                       | 20 deg.C, 30 %RH                     | 21 deg.C, 30 %RH                         | 24 deg.C, 29 %RH                          |
| Engineer               | Yohsuke Matsuzawa<br>( 1 GHz -10 GHz ) | Yasumasa Owaki<br>( 10 GHz -18 GHz ) | Toshinori Yamada<br>( 18 GHz -26.5 GHz ) | Takahiro Kawakami<br>( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-40 5755 MHz                     |                                      |                                          |                                           |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 11510.000       | PK       | 44.23          | 38.27           | 10.58     | 39.45     | -9.54                | 44.09           | 73.9           | 29.8        | 150         | 0            | -             |
| Hori.    | 11510.000       | AV       | 33.77          | 38.27           | 10.58     | 39.45     | -9.54                | 33.63           | 53.9           | 20.2        | 150         | 0            | VBW : 5.6 kHz |
| Vert.    | 11510.000       | PK       | 43.92          | 38.27           | 10.58     | 39.45     | -9.54                | 43.78           | 73.9           | 30.1        | 150         | 0            | -             |
| Vert.    | 11510.000       | AV       | 33.72          | 38.27           | 10.58     | 39.45     | -9.54                | 33.58           | 53.9           | 20.3        | 150         | 0            | VBW : 5.6 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5329.939        | PK       | 46.05          | 31.94           | 16.88     | 39.73     | 1.77                 | 56.91           | -38.32              | -27.0       | 11.3        | 149         | 74           | -      |
| Hori.    | 5650.000        | PK       | 44.56          | 32.44           | 17.11     | 39.86     | 1.77                 | 56.02           | -39.21              | -27.0       | 12.2        | 137         | 103          | -      |
| Hori.    | 5700.000        | PK       | 46.13          | 32.56           | 17.14     | 39.90     | 1.77                 | 57.70           | -37.53              | 10.0        | 47.5        | 137         | 103          | -      |
| Hori.    | 5720.000        | PK       | 48.76          | 32.62           | 17.15     | 39.92     | 1.77                 | 60.38           | -34.85              | 15.6        | 50.4        | 137         | 103          | -      |
| Hori.    | 5723.724        | PK       | 50.72          | 32.63           | 17.16     | 39.92     | 1.77                 | 62.36           | -32.87              | 24.1        | 56.9        | 137         | 103          | -      |
| Hori.    | 5725.000        | PK       | 49.86          | 32.64           | 17.16     | 39.92     | 1.77                 | 61.51           | -33.72              | 27.0        | 60.7        | 137         | 103          | -      |
| Hori.    | 17265.000       | PK       | 45.26          | 40.22           | 13.57     | 38.92     | -9.54                | 50.59           | -44.64              | -27.0       | 17.6        | 150         | 0            | -      |
| Vert.    | 5329.939        | PK       | 47.03          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.89           | -37.34              | -27.0       | 10.3        | 163         | 359          | -      |
| Vert.    | 5650.000        | PK       | 45.44          | 32.44           | 17.11     | 39.86     | 1.77                 | 56.90           | -38.33              | -27.0       | 11.3        | 108         | 96           | -      |
| Vert.    | 5700.000        | PK       | 45.22          | 32.56           | 17.14     | 39.90     | 1.77                 | 56.79           | -38.44              | 10.0        | 48.4        | 108         | 96           | -      |
| Vert.    | 5720.000        | PK       | 47.72          | 32.62           | 17.15     | 39.92     | 1.77                 | 59.34           | -35.89              | 15.6        | 51.4        | 108         | 96           | -      |
| Vert.    | 5723.776        | PK       | 49.71          | 32.63           | 17.16     | 39.92     | 1.77                 | 61.35           | -33.88              | 24.3        | 58.1        | 108         | 96           | -      |
| Vert.    | 5725.000        | PK       | 49.31          | 32.64           | 17.16     | 39.92     | 1.77                 | 60.96           | -34.27              | 27.0        | 61.2        | 108         | 96           | -      |
| Vert.    | 17265.000       | PK       | 45.98          | 40.22           | 13.57     | 38.92     | -9.54                | 51.31           | -43.92              | -27.0       | 16.9        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \log((10^{\wedge}(\text{Electric Field Strength [dBuV/m]} / 20)) * 10^{\wedge}(-6) * \text{Distance : } 3[\text{m}])^{\wedge}2 / 30 * 10^{\wedge}3)$

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

**UL Japan, Inc.**

**Shonan EMC Lab.**

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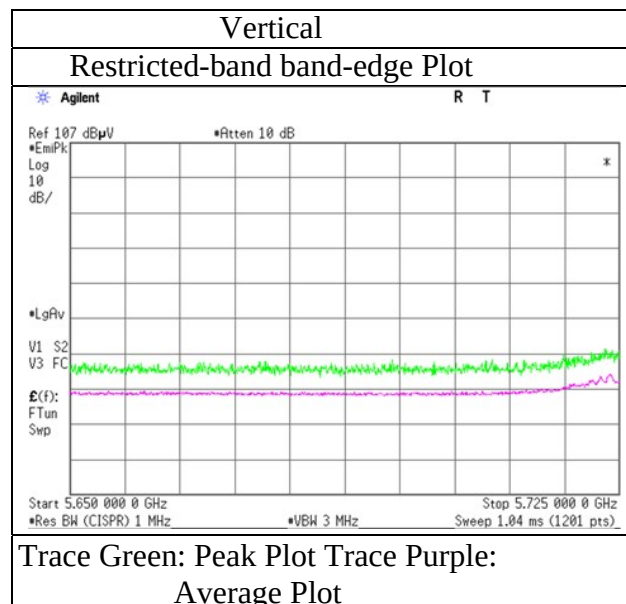
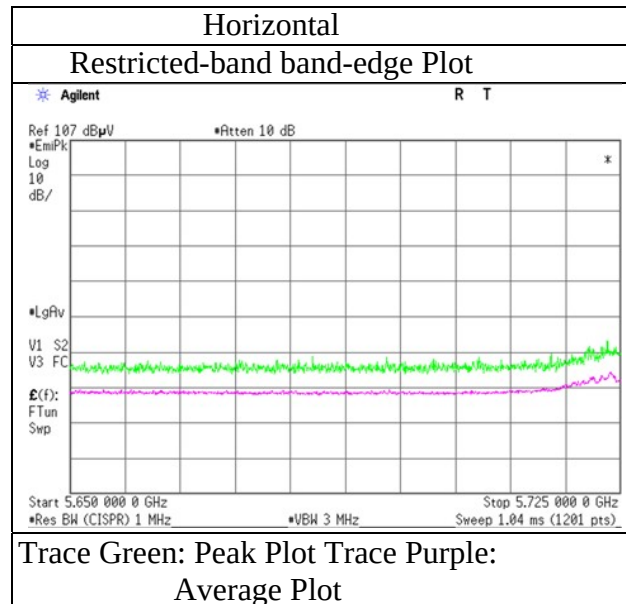
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## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 8, 2021  
20 deg.C, 29 %RH  
Yohsuke Matsuzawa  
Tx 11n-40 5755 MHz



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

**UL Japan, Inc.**

**Shonan EMC Lab.**

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

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Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |                                        |                                      |                                          |                                           |
|------------------------|----------------------------------------|--------------------------------------|------------------------------------------|-------------------------------------------|
| Test place             | Shonan EMC Lab.                        |                                      |                                          |                                           |
| Semi Anechoic Chamber  | 1                                      | 1                                    | 1                                        | 1                                         |
| Date                   | January 8, 2021                        | January 11, 2021                     | January 5, 2021                          | January 5, 2021                           |
| Temperature / Humidity | 20 deg.C, 29 %RH                       | 20 deg.C, 30 %RH                     | 21 deg.C, 30 %RH                         | 24 deg.C, 29 %RH                          |
| Engineer               | Yohsuke Matsuzawa<br>( 1 GHz -10 GHz ) | Yasumasa Owaki<br>( 10 GHz -18 GHz ) | Toshinori Yamada<br>( 18 GHz -26.5 GHz ) | Takahiro Kawakami<br>( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-40 5795 MHz                     |                                      |                                          |                                           |

### (above 1 GHz Inside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg.] | Remark        |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|----------------|-------------|-------------|--------------|---------------|
| Hori.    | 11590.000       | PK       | 44.11          | 38.33           | 10.64     | 39.39     | -9.54                | 44.15           | 73.9           | 29.7        | 150         | 0            | -             |
| Hori.    | 11590.000       | AV       | 33.82          | 38.33           | 10.64     | 39.39     | -9.54                | 33.86           | 53.9           | 20.0        | 150         | 0            | VBW : 5.6 kHz |
| Vert.    | 11590.000       | PK       | 44.13          | 38.33           | 10.64     | 39.39     | -9.54                | 44.17           | 73.9           | 29.7        | 150         | 0            | -             |
| Vert.    | 11590.000       | AV       | 33.64          | 38.33           | 10.64     | 39.39     | -9.54                | 33.68           | 53.9           | 20.2        | 150         | 0            | VBW : 5.6 kHz |

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

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

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

### (Calculation) (above 1 GHz Outside of the restricted band)

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Distance Factor [dB] | Result [dBuV/m] | Result (EIRP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|---------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5329.961        | PK       | 46.48          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.34           | -37.89              | -27.0       | 10.8        | 148         | 88           | -      |
| Hori.    | 5850.000        | PK       | 45.77          | 32.91           | 17.24     | 40.02     | 1.77                 | 57.67           | -37.56              | 27.0        | 64.5        | 147         | 106          | -      |
| Hori.    | 5855.000        | PK       | 45.29          | 32.92           | 17.24     | 40.02     | 1.77                 | 57.20           | -38.03              | 15.6        | 53.6        | 147         | 106          | -      |
| Hori.    | 5875.000        | PK       | 45.18          | 32.95           | 17.27     | 40.04     | 1.77                 | 57.13           | -38.10              | 10.0        | 48.1        | 147         | 106          | -      |
| Hori.    | 5925.000        | PK       | 45.19          | 32.99           | 17.29     | 40.07     | 1.77                 | 57.17           | -38.06              | -27.0       | 11.0        | 147         | 106          | -      |
| Hori.    | 17385.000       | PK       | 45.11          | 40.41           | 13.63     | 38.56     | -9.54                | 51.05           | -44.18              | -27.0       | 17.1        | 150         | 0            | -      |
| Vert.    | 5329.970        | PK       | 46.44          | 31.94           | 16.88     | 39.73     | 1.77                 | 57.30           | -37.93              | -27.0       | 10.9        | 162         | 357          | -      |
| Vert.    | 5850.000        | PK       | 44.90          | 32.91           | 17.24     | 40.02     | 1.77                 | 56.80           | -38.43              | 27.0        | 65.4        | 100         | 94           | -      |
| Vert.    | 5855.000        | PK       | 45.83          | 32.92           | 17.24     | 40.02     | 1.77                 | 57.74           | -37.49              | 15.6        | 53.0        | 100         | 94           | -      |
| Vert.    | 5875.000        | PK       | 45.51          | 32.95           | 17.27     | 40.04     | 1.77                 | 57.46           | -37.77              | 10.0        | 47.7        | 100         | 94           | -      |
| Vert.    | 5925.000        | PK       | 45.46          | 32.99           | 17.29     | 40.07     | 1.77                 | 57.44           | -37.79              | -27.0       | 10.7        | 100         | 94           | -      |
| Vert.    | 17385.000       | PK       | 45.27          | 40.41           | 13.63     | 38.56     | -9.54                | 51.21           | -44.02              | -27.0       | 17.0        | 150         | 0            | -      |

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

Result (EIRP [dBm]) =  $10 * \text{LOG} ( (10^{\wedge} (\text{Electric Field Strength [dBuV/m]} / 20) * 10^{\wedge} (-6) * \text{Distance : 3 [m]} )^{\wedge} 2 / 30 * 10^{\wedge} 3 )$

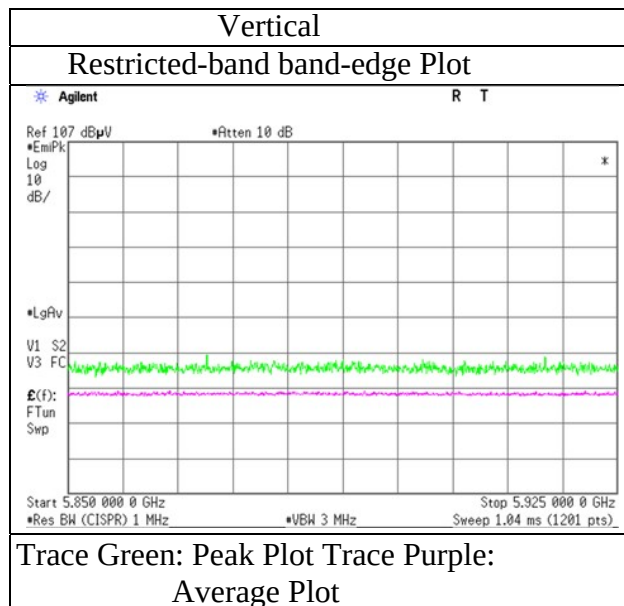
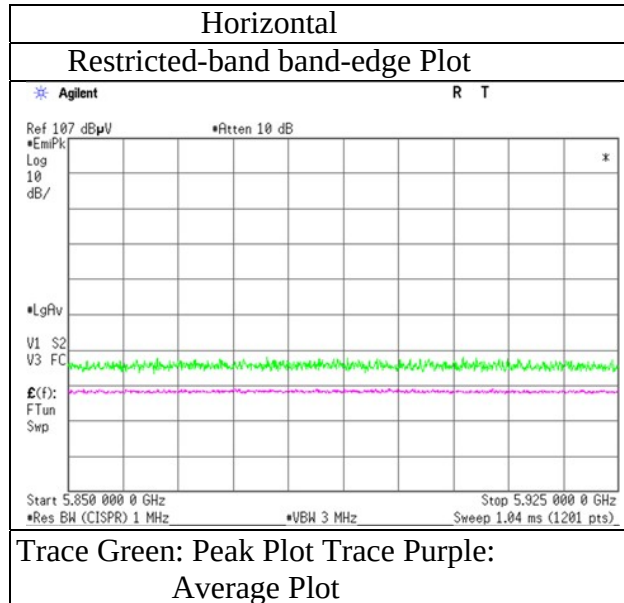
\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20 dB).

Distance factor : 1 GHz - 10 GHz :  $20\log(3.68\text{ m} / 3.0\text{ m}) = 1.77\text{ dB}$   
10 GHz - 40 GHz :  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.54\text{ dB}$

## Radiated Spurious Emission

Test place  
Semi Anechoic Chamber  
Date  
Temperature / Humidity  
Engineer  
Mode

Shonan EMC Lab.  
1  
January 6, 2021  
21 deg.C, 32 %RH  
Takahiro Kawakami  
Tx 11n-40 5795 MHz



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

**UL Japan, Inc.**

**Shonan EMC Lab.**

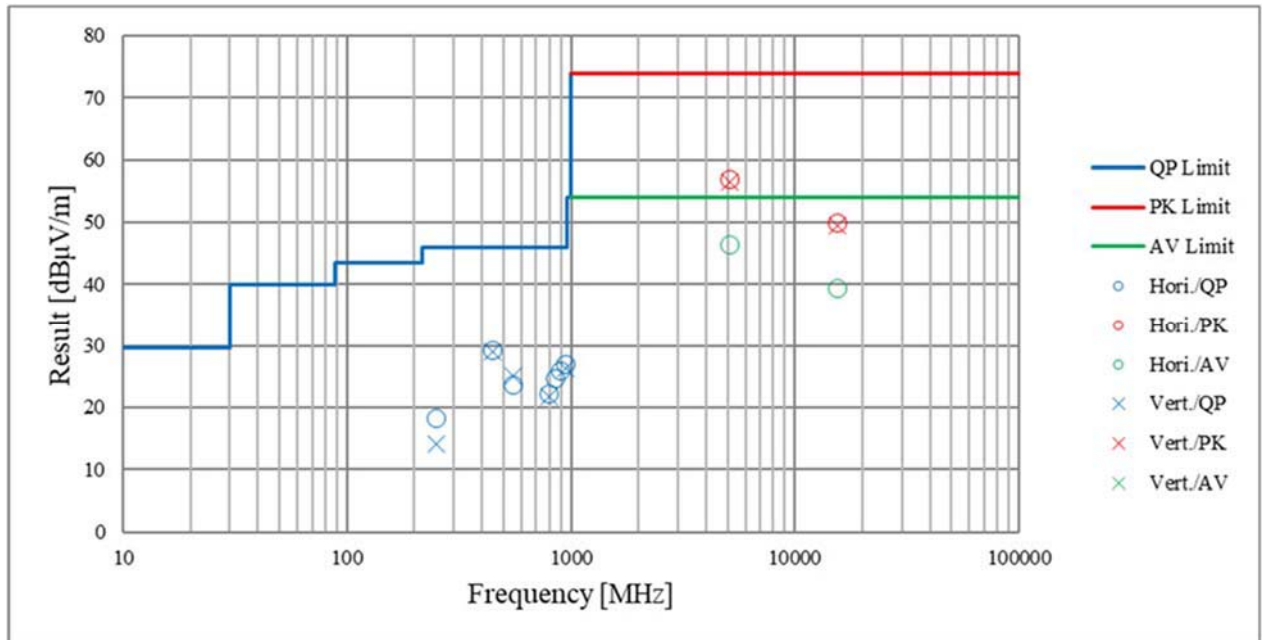
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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

|                        |                                      |                                       |                                      |                                          |                                           |
|------------------------|--------------------------------------|---------------------------------------|--------------------------------------|------------------------------------------|-------------------------------------------|
| Test place             | Shonan EMC Lab.                      |                                       |                                      |                                          |                                           |
| Semi Anechoic Chamber  | 1                                    | 1                                     | 1                                    | 1                                        | 1                                         |
| Date                   | January 12, 2021                     | January 6, 2021                       | January 11, 2021                     | January 5, 2021                          | January 5, 2021                           |
| Temperature / Humidity | 24 deg.C, 29 %RH                     | 21 deg.C, 32 %RH                      | 20 deg.C, 30 %RH                     | 21 deg.C, 30 %RH                         | 24 deg.C, 29 %RH                          |
| Engineer               | Yosuke Murakami<br>( 30 MHz -1 GHz ) | Toshinori Yamada<br>( 1 GHz -10 GHz ) | Yasumasa Owaki<br>( 10 GHz -18 GHz ) | Toshinori Yamada<br>( 18 GHz -26.5 GHz ) | Takahiro Kawakami<br>( 26.5 GHz -40 GHz ) |
| Mode                   | Tx 11n-20 5180 MHz                   |                                       |                                      |                                          |                                           |



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

## APPENDIX 2: Test instruments

### Test equipment

| Test Item | Local ID                       | LIMS ID | Description               | Manufacturer                                 | Model                                        | Serial                  | Last Calibration Date | Cal Int |
|-----------|--------------------------------|---------|---------------------------|----------------------------------------------|----------------------------------------------|-------------------------|-----------------------|---------|
| RE        | COTS-SEMI-5                    | 170932  | EMI Software              | TSJ (Techno Science Japan)                   | TEPTO-DV3(RE,CE,ME,PE)                       | -                       | -                     | -       |
| RE        | KAT6-04                        | 144899  | Attenuator                | Inmet                                        | 18N-6dB                                      | -                       | 2020/12/10            | 12      |
| RE        | KJM-09                         | 145929  | Measure                   | KOMELON                                      | KMC-36                                       | -                       | -                     | -       |
| RE        | KSA-08                         | 145089  | Spectrum Analyzer         | Keysight Technologies Inc                    | E4446A                                       | MY46180525              | 2020/11/24            | 12      |
| RE        | SAEC-01(NSA)                   | 145597  | Semi-Anechoic Chamber     | TDK                                          | SAEC-01(NSA)                                 | 1                       | 2020/04/08            | 12      |
| RE        | SAEC-01(SVSWR)                 | 145561  | Semi-Anechoic Chamber     | TDK                                          | SAEC-01(SVSWR)                               | 1                       | 2020/05/04            | 12      |
| RE        | SAF-01                         | 145003  | Pre Amplifier             | SONOMA                                       | 310N                                         | 290211                  | 2020/02/19            | 12      |
| RE        | SAF-04                         | 145127  | Pre Amplifier             | Toyo Corporation                             | TPA0118-36                                   | 2072554                 | 2020/06/02            | 12      |
| RE        | SAF-09                         | 145008  | Pre Amplifier             | Toyo Corporation                             | HAP18-26W                                    | 18                      | 2020/09/02            | 12      |
| RE        | SAF-10                         | 145129  | Pre Amplifier             | Toyo Corporation                             | HAP26-40W                                    | 10                      | 2020/03/03            | 12      |
| RE        | SAT10-06                       | 145137  | Attenuator                | Keysight Technologies Inc                    | 8493C-010                                    | 74865                   | 2020/10/05            | 12      |
| RE        | SAT3-09                        | 144959  | Attenuator                | JFW                                          | 50HF-003N                                    | -                       | 2020/08/18            | 12      |
| RE        | SBA-01                         | 145161  | Biconical Antenna         | Schwarzbeck Mess - Elektronik                | BBA9106                                      | 91032664                | 2020/04/04            | 12      |
| RE        | SCC-A1/A3/A5/A7/A8/A13/SRSE-01 | 144967  | Coaxial Cable&RF Selector | Fujikura/Fujikura/Suhner/Suhner/Suhner/T OYO | 8D2W/12DSFA/141P E/141PE/141PE/141P E/NS4906 | -/0901-269(RF Selector) | 2020/04/12            | 12      |
| RE        | SCC-A2/A4/A6/A7/A8/A13/SRSE-01 | 144968  | Coaxial Cable&RF Selector | Fujikura/Fujikura/Suhner/Suhner/Suhner/T OYO | 8D2W/12DSFA/141P E/141PE/141PE/141P E/NS4906 | -/0901-269(RF Selector) | 2020/04/12            | 12      |
| RE        | SCC-G05                        | 145039  | Coaxial Cable             | Junkosha                                     | J12J102207-00                                | APR-30-15-037           | 2020/01/31            | 12      |
| RE        | SCC-G19                        | 145178  | Coaxial Cable             | Suhner                                       | SUCOFLEX 102A                                | 1188/2A                 | 2020/03/04            | 12      |
| RE        | SCC-G41                        | 151617  | Coaxial Cable             | Junkosha                                     | MWX221-01000NFSNMS/B                         | 1612S006                | 2020/01/08            | 12      |
| RE        | SCC-G62                        | 196985  | Coaxial Cable             | HUBER+SUNER                                  | SUCOFLEX 102                                 | 803650/2                | 2020/03/10            | 12      |
| RE        | SCC-G68                        | 200008  | Coaxial Cable             | HUBER+SUNER                                  | SUCOFLEX 104                                 | 575616/4                | 2020/07/07            | 12      |
| RE        | SFL-03                         | 145377  | Highpass Filter           | MICRO-TRONICS                                | HPM50112                                     | 28                      | 2020/10/05            | 12      |
| RE        | SHA-01                         | 145383  | Horn Antenna              | Schwarzbeck Mess - Elektronik                | BBHA9120D                                    | 9120D-725               | 2020/05/27            | 12      |
| RE        | SHA-05                         | 145513  | Horn Antenna              | ETS LINDGREN                                 | 3160-09                                      | 00094867                | 2020/06/15            | 12      |
| RE        | SHA-06                         | 145514  | Horn Antenna              | ETS LINDGREN                                 | 3160-10                                      | 00092383                | 2020/07/16            | 12      |
| RE        | SHA-08                         | 194683  | Horn Antenna              | Schwarzbeck Mess - Elektronik                | BBHA 9120 C                                  | 694                     | 2020/02/17            | 12      |
| RE        | SLA-05                         | 145527  | Logperiodic Antenna       | Schwarzbeck Mess - Elektronik                | VUSLP9111B                                   | 193                     | 2020/04/04            | 12      |
| RE        | SOS-20                         | 191837  | Humidity Indicator        | CUSTOM. Inc                                  | CTH-201                                      | -                       | 2020/09/28            | 12      |
| RE        | STR-01                         | 145790  | Test Receiver             | Rohde & Schwarz                              | ESU40                                        | 100093                  | 2020/04/24            | 12      |
| RE        | STS-01                         | 145792  | Digital Hitester          | HIOKI E.E. CORPORATION                       | 3805-50                                      | 80997812                | 2020/10/19            | 12      |

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

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

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

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

Test item: RE: Radiated Emission

UL Japan, Inc.

Shonan EMC Lab.

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