

# **RADIO TEST REPORT**

**Test Report No. : 12952598S-C-R1**

**Applicant** : **Panasonic Corporation**  
**Type of Equipment** : **AV Control Unit for In-Vehicle Infotainment**  
**Model No.** : **AM1904**  
**FCC ID** : **ACJ932AM1904**  
**Test regulation** : **FCC Part 15 Subpart E: 2019**  
**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.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by any agency of the Federal Government.
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. Kashima 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 12952598S-C. 12952598S-C is replaced with this report.

**Date of test:** September 24 to October 3, 2019

**Representative test engineer:**

*T. Yamada*

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Engineer  
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**Approved by:**

*S. Takano*

Shinichi Takano  
Engineer  
Consumer Technology Division



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.: 12952598S-C**

| Revision     | Test report No. | Date             | Page revised | Contents                                                                                |
|--------------|-----------------|------------------|--------------|-----------------------------------------------------------------------------------------|
| - (Original) | 12952598S-C     | January 24, 2020 | -            | -                                                                                       |
| 1            | 12952598S-C-R1  | January 28, 2020 | P.9          | Addition of Software information:<br>(Date: 2019.9.24, Storage<br>location: EUT memory) |

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## 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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## **SECTION 1: Customer information**

|                  |   |                                                                        |
|------------------|---|------------------------------------------------------------------------|
| Company Name     | : | Panasonic Corporation                                                  |
| Address          | : | 4261 Ikonobe-cho, Tsuzuki-ku, Yokohama-shi, Kanagawa 224-8520<br>Japan |
| Telephone Number | : | +81-50-3689-7389                                                       |
| Facsimile Number | : | +81-45-931-0806                                                        |
| Contact Person   | : | Yoshinori Nagatani                                                     |

The information provided from the customer is as follows;

- Applicant, Type of Equipment, Model No., FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer information
- SECTION 2: Equipment under test (E.U.T.)
- SECTION 4: Operation of E.U.T. during testing
- \* The laboratory is exempted from liability of any test results affected from the above information in SECTION 2 and 4.

## **SECTION 2: Equipment under test (E.U.T.)**

### **2.1 Identification of E.U.T.**

|                                                        |   |                                                                                            |
|--------------------------------------------------------|---|--------------------------------------------------------------------------------------------|
| Type of Equipment                                      | : | AV Control Unit for In-Vehicle Infotainment                                                |
| Model No.                                              | : | AM1904                                                                                     |
| Serial No.                                             | : | Refer to SECTION 4.2                                                                       |
| Rating                                                 | : | DC 13.2 V                                                                                  |
| Receipt Date of Sample<br>(Information from test lab.) | : | September 6, 2019                                                                          |
| Country of Mass-production                             | : | Thailand, Mexico                                                                           |
| Condition of EUT                                       | : | Engineering prototype<br>(Not for Sale: This sample is equivalent to mass-produced items.) |
| Modification of EUT                                    | : | No Modification by the test lab.                                                           |

### **2.2 Product Description**

Model: AM1904 (referred to as the EUT in this report) is a AV Control Unit for In-Vehicle Infotainment.

## **Radio Specification**

### **Bluetooth (BDR / EDR function)**

|                          |   |                     |
|--------------------------|---|---------------------|
| Radio Type               | : | Transceiver         |
| Frequency of Operation   | : | 2402 MHz - 2480 MHz |
| Modulation               | : | FHSS                |
| Antenna type             | : | Pattern antenna     |
| Antenna Gain             | : | 2 dBi               |
| Clock frequency (Maxmum) | : | 48 MHz              |

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

|                        |   |                                                               |
|------------------------|---|---------------------------------------------------------------|
| Radio Type             | : | Transceiver                                                   |
| Frequency of Operation | : | 2412 MHz - 2462 MHz, 5180 MHz - 5240 MHz, 5745 MHz - 5825 MHz |
| Modulation             | : | DSSS, OFDM                                                    |
| Antenna type           | : | Pattern antenna                                               |
| Antenna Gain           | : | 2 dBi (2.4 GHz), 6 dBi (5 GHz)                                |

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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 July 19, 2019 and effective August 19, 2019 except 15.258

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

### 3.2 Procedures and results

| Item                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Test Procedure                                                    | Specification                                                                                | Worst margin                                                         | Results           | Remarks                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------------|---------------------------------------------------------|
| Conducted Emission                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | FCC: ANSI C63.10-2013<br>ISED: RSS-Gen 8.8                        | FCC: 15.407 (b) (6) / 15.207<br>ISED: RSS-Gen 8.8                                            | N/A                                                                  | N/A               | N/A *1)                                                 |
| 26 dB Emission Bandwidth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | FCC: KDB Publication Number 789033<br>ISED: -                     | FCC: 15.407 (a) (1) (2) (3)<br>ISED: -                                                       | See data                                                             | N/A a)            | Conducted                                               |
| Maximum Conducted Output Power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | FCC: KDB Publication Number 789033<br>ISED: -                     | FCC: 15.407 (a) (1) (2) (3)<br>ISED: RSS-247 6.2.1.1<br>6.2.2.1<br>6.2.3.1<br>6.2.4.1        |                                                                      | Complied b)       | Conducted                                               |
| Maximum Power Spectral Density                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | FCC: KDB Publication Number 789033<br>ISED: -                     | FCC: 15.407 (a) (1) (2) (3)<br>ISED: RSS-247 6.2.1.1<br>6.2.2.1<br>6.2.3.1<br>6.2.4.1        |                                                                      | N/A c)            | Conducted                                               |
| Spurious Emission Restricted Band Edge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | FCC: ANSI C63.10-2013<br>KDB Publication Number 789033<br>ISED: - | FCC: 15.407 (b), 15.205 and 15.209<br>ISED: RSS-247 6.2.1.2<br>6.2.2.2<br>6.2.3.2<br>6.2.4.2 | 3.8 dB<br>5150.000 MHz,<br>AV, Vert.<br>Mode: Tx 11ac-80<br>5210 MHz | Complied# d) / e) | Conducted (< 30 MHz)<br>/<br>Radiated (> 30 MHz)<br>*2) |
| 6 dB Emission Bandwidth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | FCC: ANSI C63.10-2013<br>ISED: -                                  | FCC: 15.407 (e)<br>ISED: RSS-247 6.2.4.1                                                     | See data                                                             | Complied f)       | Conducted                                               |
| Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.<br>*1) The test is not applicable since the EUT does not have AC power ports.<br>*2) Radiated test was selected over 30 MHz based on section FCC 15.407 (b) and KDB 789033 D02 G.3.b).<br><br>a) Refer to APPENDIX 1 (data of 26 dB Emission Bandwidth and 99 % Occupied Bandwidth)<br>b) Refer to APPENDIX 1 (data of Maximum Conducted Output Power)<br>c) Refer to APPENDIX 1 (data of Maximum Power Spectral Density)<br>d) Refer to APPENDIX 1 (data of Radiated Spurious Emission)<br>e) Refer to APPENDIX 1 (data of Conducted Spurious Emission)<br>f) Refer to APPENDIX 1 (data of 6 dB Bandwidth)<br><br>Symbols:<br>Complied The data of this test item has enough margin, more than the measurement uncertainty.<br>Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration. |                                                                   |                                                                                              |                                                                      |                   |                                                         |

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

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

The equipment provides the wireless transmitter with stable power supply.

Instead of a new battery, DC power supply was used for the test. That does not affect the test result, therefore the EUT complies with the requirement.

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

The equipment and its antenna comply with the requirement since the antenna is built in the equipment and it cannot be replaced by end users. Therefore, the equipment complies with the antenna requirement of Section 15.203.

## **3.3 Addition to standard**

| Item                                                                                  | Test Procedure | Specification | Worst margin | Results | Remarks   |
|---------------------------------------------------------------------------------------|----------------|---------------|--------------|---------|-----------|
| 99 % Occupied Band Width                                                              | RSS-Gen 6.7    | ISED: -       | N/A          | -<br>a) | Conducted |
| a) Refer to APPENDIX 1 (data of 26 dB Emission Bandwidth and 99 % Occupied Bandwidth) |                |               |              |         |           |

Other than above, 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 following 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         | 2.5 dB         | 2.6 dB         |
| Radiated emission<br>(Measurement distance: 3 m) | 9 kHz-30 MHz    | 3.0 dB            | 3.0 dB         | 3.0 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     | 4.9 dB            | 4.9 dB         | 4.9 dB         | -              |
|                                                  | 6 GHz-18 GHz    | 5.5 dB            | 5.5 dB         | 5.5 dB         | -              |
|                                                  | 18 GHz-40 GHz   | 5.4 dB            | 5.4 dB         | 5.4 dB         | -              |
| Radiated emission<br>(Measurement distance: 1 m) | 1 GHz-18 GHz    | 5.8 dB            | 5.8 dB         | 5.8 dB         | -              |
|                                                  | 18 GHz-40 GHz   | 5.7 dB            | 5.7 dB         | 5.7 dB         | -              |

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

| Antenna terminal test                                   | Uncertainty (+/-) |
|---------------------------------------------------------|-------------------|
| Power Measurement above 1 GHz (Average Detector)_SPM-06 | 0.98 dB           |
| Power Measurement above 1 GHz (Peak Detector)_SPM-06    | 1.75 dB           |
| Power Measurement above 1 GHz (Average Detector)_SPM-07 | 0.89 dB           |
| Power Measurement above 1 GHz (Peak Detector)_SPM-07    | 1.12 dB           |
| Power Measurement above 1 GHz (Average Detector)_SPM-13 | 1.06 dB           |
| Power Measurement above 1 GHz (Peak Detector)_SPM-13    | 1.24 dB           |
| Spurious emission (Conducted) below 1GHz                | 0.9 dB            |
| Spurious emission (Conducted) 1 GHz-3 GHz               | 0.9 dB            |
| Spurious emission (Conducted) 3 GHz-18 GHz              | 2.9 dB            |
| Spurious emission (Conducted) 18 GHz-26.5 GHz           | 2.6 dB            |
| Spurious emission (Conducted) 26.5 GHz-40 GHz           | 2.0 dB            |
| Bandwidth Measurement                                   | 0.07 %            |
| Duty cycle and Time Measurement                         | 0.262 %           |
| Temperature                                             | 0.95 deg.C.       |
| Voltage                                                 | 0.83 %            |

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### 3.5 Test Location

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A2LA Certificate Number: 1266.03 (FCC Test Firm Registration Number: 626366, ISED Lab Company Number: 2973D)

| Test site                  | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Maximum measurement distance |
|----------------------------|----------------------------|------------------------------------------------------------------|------------------------------|
| No.1 Semi-anechoic chamber | 20.6 x 11.3 x 7.65         | 20.6 x 11.3                                                      | 10 m                         |
| No.2 Semi-anechoic chamber | 20.6 x 11.3 x 7.65         | 20.6 x 11.3                                                      | 10 m                         |
| No.3 Semi-anechoic chamber | 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 E.U.T. 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 and also was judged the necessity of 802.11ac mode by the pre-test.

| Mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Remarks*               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| IEEE 802.11a (11a)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 24 Mbps, PN9           |
| IEEE 802.11n 20 MHz BW (11n-20)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | MCS 6 (800 ns GI), PN9 |
| IEEE 802.11ac 20 MHz BW (11ac-20)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | MCS 7 (800 ns GI), PN9 |
| IEEE 802.11n 40 MHz BW (11n-40)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | MCS 5 (800 ns GI), PN9 |
| IEEE 802.11ac 40 MHz BW (11ac-40)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | MCS 5 (800 ns GI), PN9 |
| IEEE 802.11ac 80 MHz BW (11ac-80)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | MCS 8 (800 ns GI), PN9 |
| *The worst condition was determined based on the test result of Maximum Conducted Output Power.                                                                                                                                                                                                                                                                                                                                                                                                                                   |                        |
| *Power of the EUT was set by the software as follows;<br>Power settings: 11a: 9 dBm,<br>11n-20: 8dBm,<br>11ac-20: 8 dBm(MCS 0-7), 7 dBm(MCS 8),<br>11n-40: 8 dBm,<br>11ac-40: 8 dBm(MCS 0-7), 5 dBm(MCS 8-9),<br>11ac-80: 5 dBm<br>Software: 03218<br>(Date: 2019.9.24, Storage location: EUT memory)<br><br>*This setting of software is the worst case.<br>Any conditions under the normal use do not exceed the condition of setting.<br>In addition, end users cannot change the settings of the output power of the product. |                        |

\*The details of Operation mode(s)

| Test Item                                                                                                                                                                                                             | Operating Mode | Tested Frequency |             |                 |            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------|-------------|-----------------|------------|
|                                                                                                                                                                                                                       |                | Lower Band       | Middle Band | Additional Band | Upper Band |
| 99 % Occupied Bandwidth,<br>Maximum Conducted Output Power,<br>Maximum Power Spectral Density                                                                                                                         | 11a            | 5180 MHz         | -           | -               | 5745 MHz   |
|                                                                                                                                                                                                                       | 11n-20         | 5220 MHz         | -           | -               | 5785 MHz   |
|                                                                                                                                                                                                                       | 11ac-20        | 5240 MHz         | -           | -               | 5825 MHz   |
|                                                                                                                                                                                                                       | 11n-40         | 5190 MHz         | -           | -               | 5755 MHz   |
|                                                                                                                                                                                                                       | 11ac-40        | 5230 MHz         | -           | -               | 5795 MHz   |
| 6 dB Bandwidth                                                                                                                                                                                                        | 11ac-80        | 5210 MHz         | -           | -               | 5775 MHz   |
|                                                                                                                                                                                                                       | 11a            | -                | -           | -               | 5745 MHz   |
|                                                                                                                                                                                                                       | 11n-20         | -                | -           | -               | 5785 MHz   |
|                                                                                                                                                                                                                       | 11ac-20        | -                | -           | -               | 5825 MHz   |
|                                                                                                                                                                                                                       | 11n-40         | -                | -           | -               | 5755 MHz   |
| Radiated Spurious Emission<br>(Below 1 GHz)                                                                                                                                                                           | 11ac-40        | -                | -           | -               | 5795 MHz   |
|                                                                                                                                                                                                                       | 11ac-80        | -                | -           | -               | 5775 MHz   |
|                                                                                                                                                                                                                       | 11a *1)        | -                | -           | -               | 5825 MHz   |
|                                                                                                                                                                                                                       | 11a            | 5180 MHz         | -           | -               | 5745 MHz   |
|                                                                                                                                                                                                                       | 11n-20         | 5220 MHz         | -           | -               | 5785 MHz   |
| Radiated Spurious Emission<br>(Above 1 GHz)                                                                                                                                                                           | 11ac-20        | 5240 MHz         | -           | -               | 5825 MHz   |
|                                                                                                                                                                                                                       | 11n-40         | 5190 MHz         | -           | -               | 5755 MHz   |
|                                                                                                                                                                                                                       | 11ac-40        | 5230 MHz         | -           | -               | 5795 MHz   |
|                                                                                                                                                                                                                       | 11ac-80        | 5210 MHz         | -           | -               | 5775 MHz   |
|                                                                                                                                                                                                                       | 11ac-20        | 5180 MHz         | -           | -               | 5745 MHz   |
| Radiated Spurious Emission<br>(Above 1 GHz, only Band edge)                                                                                                                                                           | 11ac-40        | 5240 MHz         | -           | -               | 5825 MHz   |
|                                                                                                                                                                                                                       | 11ac-20        | 5190 MHz         | -           | -               | 5755 MHz   |
|                                                                                                                                                                                                                       | 11ac-40        | 5230 MHz         | -           | -               | 5795 MHz   |
| Conducted Spurious Emission                                                                                                                                                                                           | 11a *1)        | -                | -           | -               | 5825 MHz   |
| *1) The mode was tested as a representative, because it had the highest power at antenna terminal test.<br>The test was conducted in Upper Band as a representative, since there was no difference between the bands. |                |                  |             |                 |            |

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## 4.2 Configuration and peripherals

This page has been submitted for separate exhibit (refer to APPENDIX 4).

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

### **Test Procedure**

< Below 1GHz >

EUT was placed on a urethane platform of nominal size, 2.0 m by 1.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

< Above 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 and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

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

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

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

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

< Below 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:

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

Test Antennas are used as below;

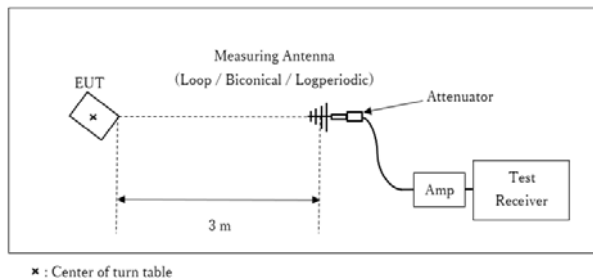
|              |                   |                  |             |
|--------------|-------------------|------------------|-------------|
| Frequency    | 30 MHz to 200 MHz | 200 MHz to 1 GHz | Above 1 GHz |
| Antenna Type | Biconical         | Logperiodic      | Horn        |

|                 |               |                          |                                                                                                                                 |
|-----------------|---------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 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>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".

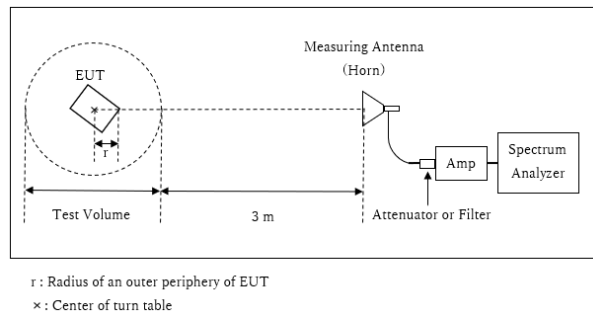
Figure 1: Test Setup

Below 1 GHz



Test Distance: 3 m

1 GHz - 13 GHz



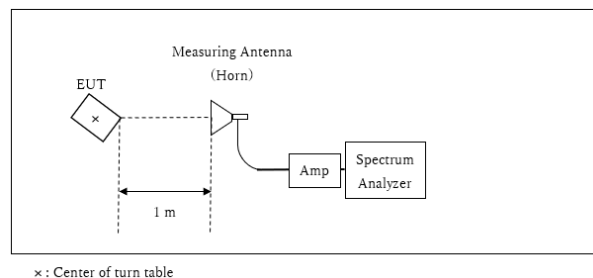
Distance Factor:  $20 \times \log (3.94 \text{ m} / 3.0 \text{ m}) = 2.36 \text{ dB}$

\* Test Distance:  $(3 + \text{Test Volume} / 2) - r = 3.94 \text{ m}$

Test Volume : 2.0 m

(Test Volume has been calibrated based on CISPR 16-1-4.)  
 $r = 0.06 \text{ m}$

13 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 0 deg. and 28 deg. of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

**Worst case:**

| Antenna polarization | Carrier (Band edge) | Spurious    |                 |                  |                 |                 |
|----------------------|---------------------|-------------|-----------------|------------------|-----------------|-----------------|
|                      |                     | Below 1 GHz | Above 1 GHz     |                  |                 |                 |
|                      |                     |             | 1 GHz - 6.5 GHz | 6.5 GHz - 13 GHz | 13 GHz - 18 GHz | 18 GHz - 40 GHz |
| Horizontal           | 28 deg.             | 0 deg.      | 28 deg.         | 28 deg.          | 28 deg.         | 0 deg.          |
| Vertical             | 28 deg.             | 0 deg.      | 28 deg.         | 28 deg.          | 28 deg.         | 0 deg.          |

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

## **SECTION 6: Antenna Terminal Conducted Tests**

### **Test Procedure**

The tests were made with below setting connected to the antenna port.

| Test                           | Span                                    | RBW                  | VBW          | Sweep time | Detector                        | Trace       | Instrument used and Test method             |
|--------------------------------|-----------------------------------------|----------------------|--------------|------------|---------------------------------|-------------|---------------------------------------------|
| 99 % Occupied Bandwidth *1)    | Enough width to display emission skirts | 1 % to 5 % of OBW    | $\geq 3$ RBW | Auto       | Peak                            | Max Hold    | Spectrum Analyzer                           |
| 6 dB Bandwidth                 | Enough to capture the emission          | 100 kHz              | 300 kHz      | Auto       | Peak                            | Max Hold    | Spectrum Analyzer                           |
| Maximum Conducted Output Power | -                                       | -                    | -            | Auto       | Average                         | -           | Power Meter (Sensor: 80 MHz BW) (Method PM) |
| Maximum Power Spectral Density | Encompass the entire EBW                | 1 MHz or 100 kHz *2) | $\geq 3$ RBW | Auto       | RMS Power Averaging (100 times) | Clear Write | Spectrum Analyzer                           |
| Conducted Spurious Emission*3) | 9 kHz – 150 kHz                         | 200 Hz               | 620 Hz       | Auto       | Peak                            | Max Hold    | Spectrum Analyzer                           |
|                                | 150 kHz – 30 MHz                        | 10 kHz               | 30 kHz       |            |                                 |             |                                             |

\* 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".

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

\*2) KDB 789033 D02 says that RBW is set to be 500 kHz for 5.725 GHz-5.850 GHz, but it is not possible with spectrum analyzer, so RBW Correction Factor ( $10 \log(500 \text{ kHz} / 100 \text{ kHz})$ ) was added to the test result.

\*3) In the frequency range below 30 MHz, RBW was narrowed to separate the noise contents.

Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart. (9 kHz-150 kHz: RBW = 200 Hz, 150 kHz-30 MHz: RBW = 10 kHz)

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

**Test data** : APPENDIX  
**Test result** : Pass

## **APPENDIX 1: Test data**

### **99 % Occupied Bandwidth**

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 26, 2019  
Temperature / Humidity 26 deg. C / 45 % RH  
Engineer Toshinori Yamada  
Mode Tx

11a

| Tested<br>Frequency<br>[MHz] | 99 % Occupied<br>Bandwidth<br>[kHz] |
|------------------------------|-------------------------------------|
| 5180                         | 16840.1                             |
| 5220                         | 16843.8                             |
| 5240                         | 16831.1                             |
| 5745                         | 16847.4                             |
| 5785                         | 16829.6                             |
| 5825                         | 16851.5                             |

11n-20

| Tested<br>Frequency<br>[MHz] | 99 % Occupied<br>Bandwidth<br>[kHz] |
|------------------------------|-------------------------------------|
| 5180                         | 17999.2                             |
| 5220                         | 18022.8                             |
| 5240                         | 18014.6                             |
| 5745                         | 18001.1                             |
| 5785                         | 17995.7                             |
| 5825                         | 18030.3                             |

11ac-20

| Tested<br>Frequency<br>[MHz] | 99 % Occupied<br>Bandwidth<br>[kHz] |
|------------------------------|-------------------------------------|
| 5180                         | 18061.3                             |
| 5220                         | 18049.5                             |
| 5240                         | 17969.6                             |
| 5745                         | 18042.0                             |
| 5785                         | 18027.6                             |
| 5825                         | 18018.2                             |

## **99 % Occupied Bandwidth**

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 26, 2019  
Temperature / Humidity 26 deg. C / 45 % RH  
Engineer Toshinori Yamada  
Mode Tx

11n-40

| Tested<br>Frequency<br>[MHz] | 99 % Occupied<br>Bandwidth<br>[kHz] |
|------------------------------|-------------------------------------|
| 5190                         | 36854.1                             |
| 5230                         | 36785.8                             |
| 5755                         | 36849.3                             |
| 5795                         | 36855.2                             |

11ac-40

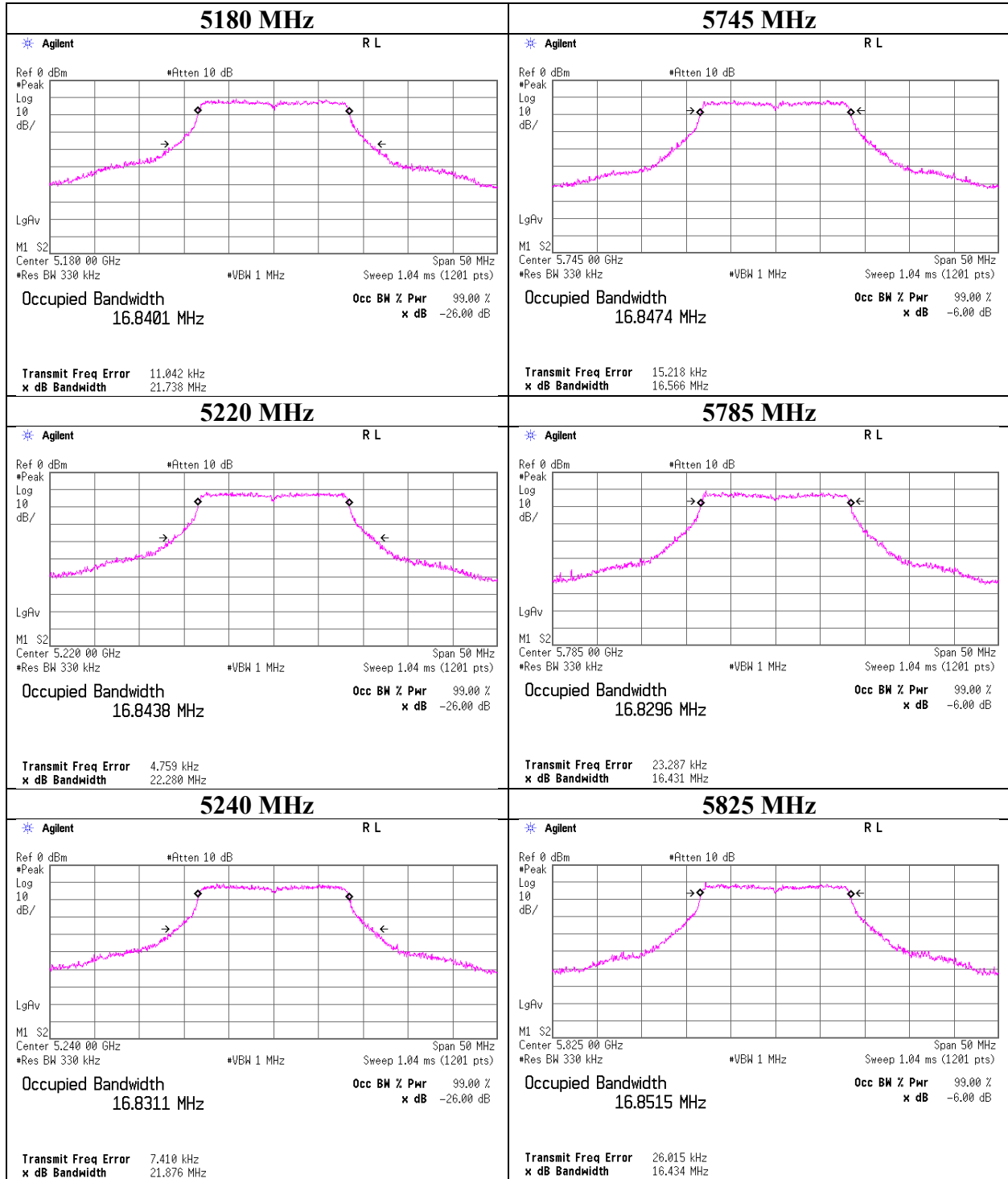
| Tested<br>Frequency<br>[MHz] | 99 % Occupied<br>Bandwidth<br>[kHz] |
|------------------------------|-------------------------------------|
| 5190                         | 36843.5                             |
| 5230                         | 36819.9                             |
| 5755                         | 36915.9                             |
| 5795                         | 36874.0                             |

11ac-80

| Tested<br>Frequency<br>[MHz] | 99 % Occupied<br>Bandwidth<br>[kHz] |
|------------------------------|-------------------------------------|
| 5210                         | 76549.3                             |
| 5775                         | 76460.8                             |

## 99 % Occupied Bandwidth

11a



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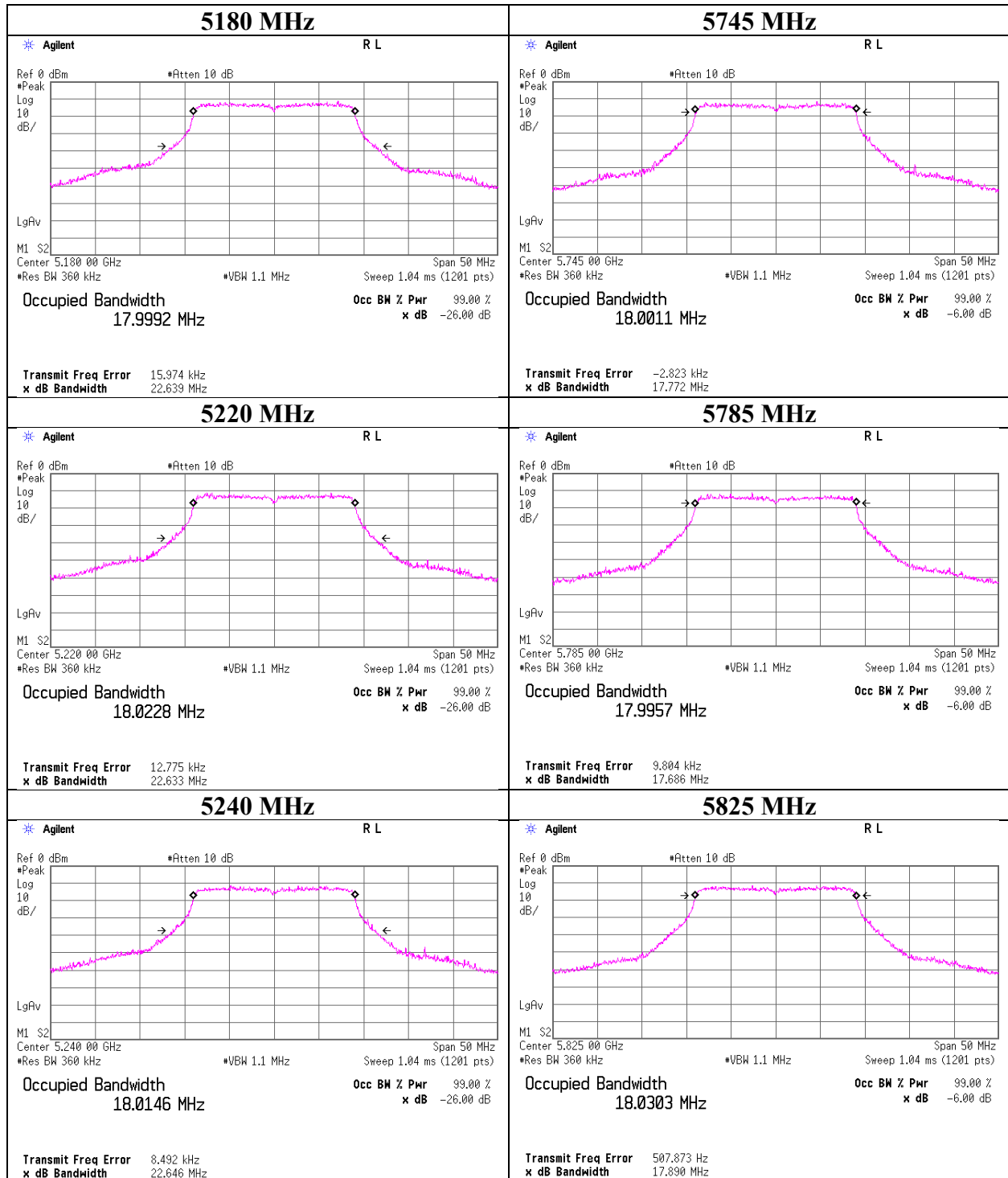
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## 99 % Occupied Bandwidth

**11n-20**



**UL Japan, Inc.**

**Shonan EMC Lab.**

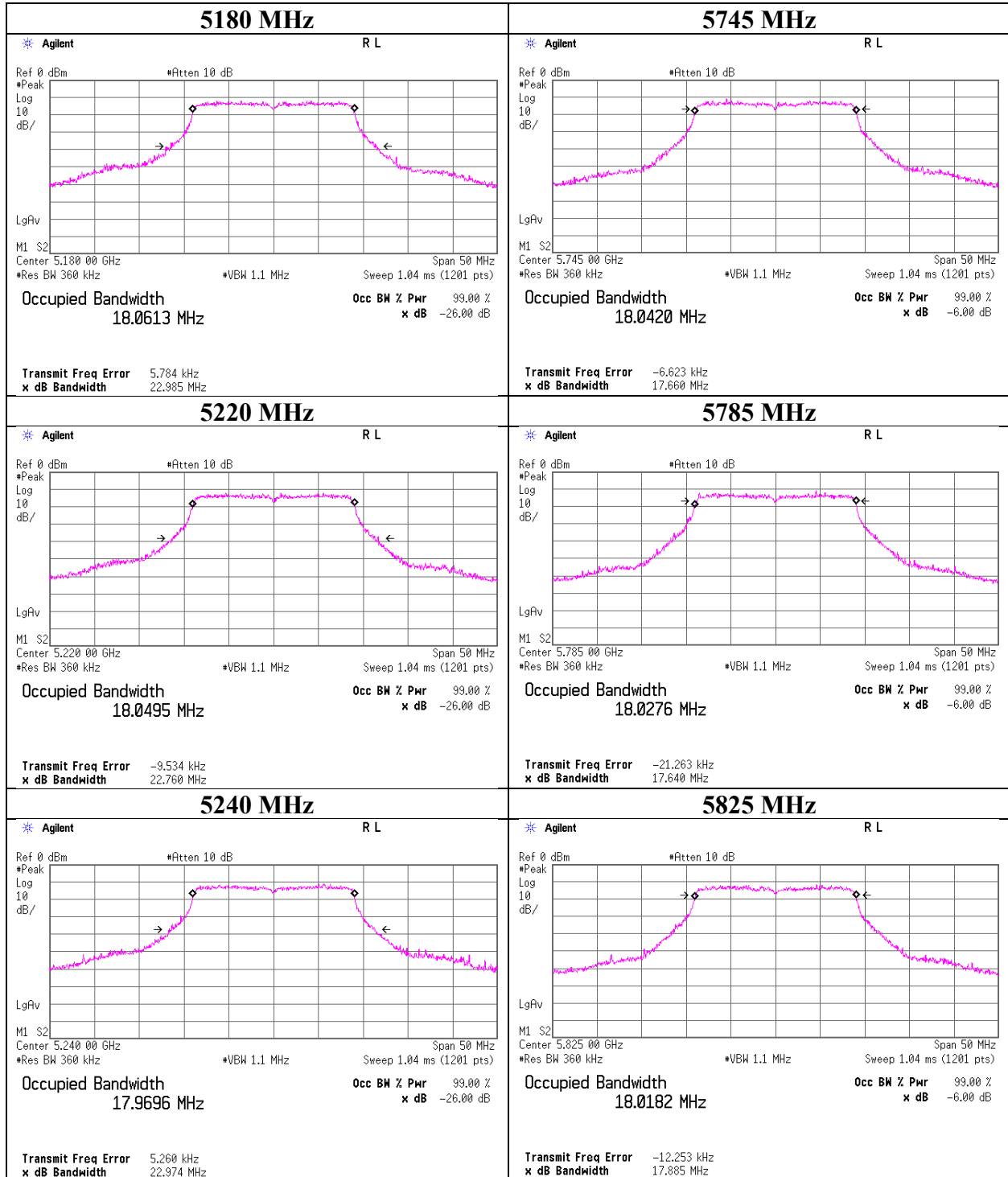
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## 99 % Occupied Bandwidth

### 11ac-20



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Shonan EMC Lab.

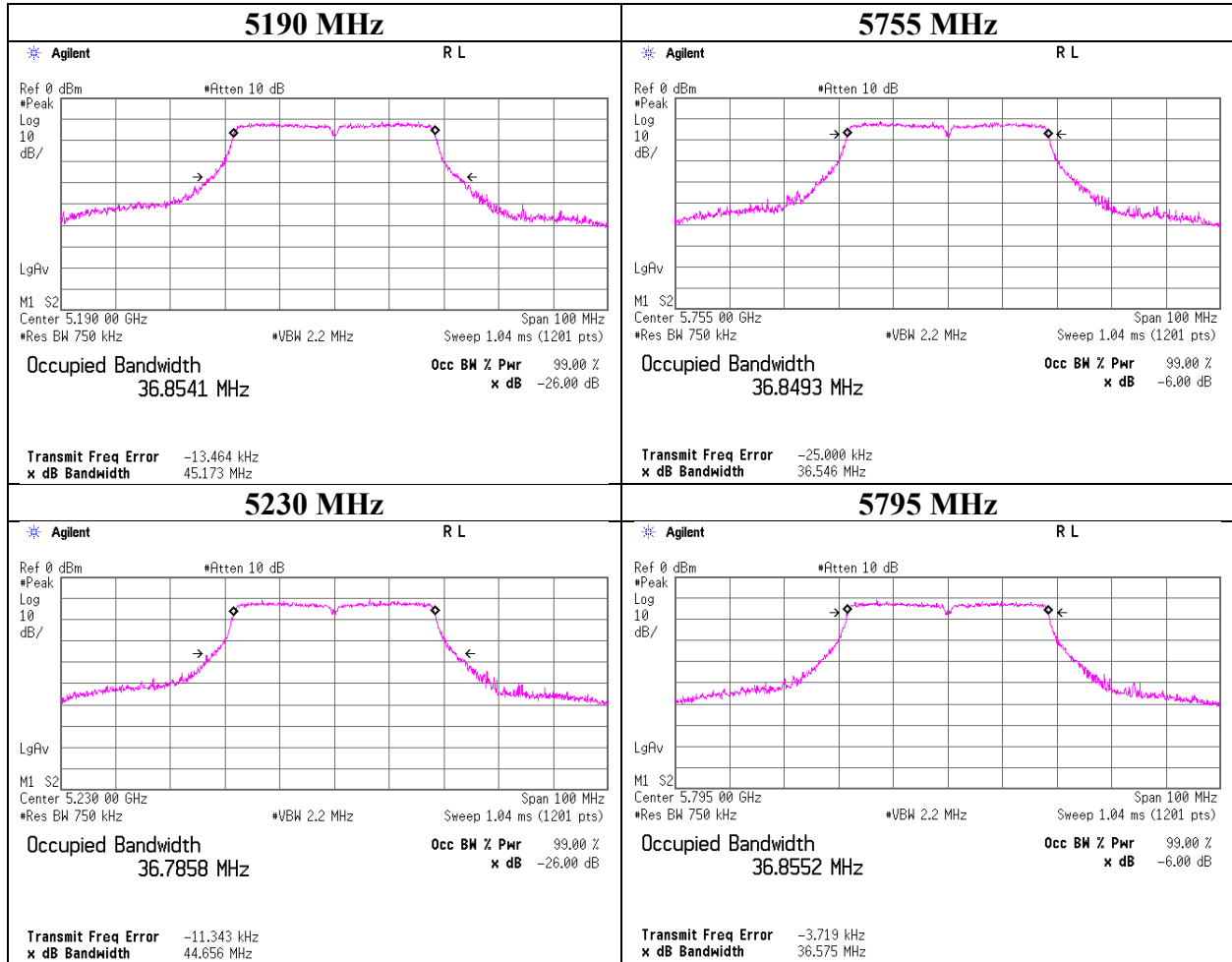
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## 99 % Occupied Bandwidth

11n-40



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Shonan EMC Lab.

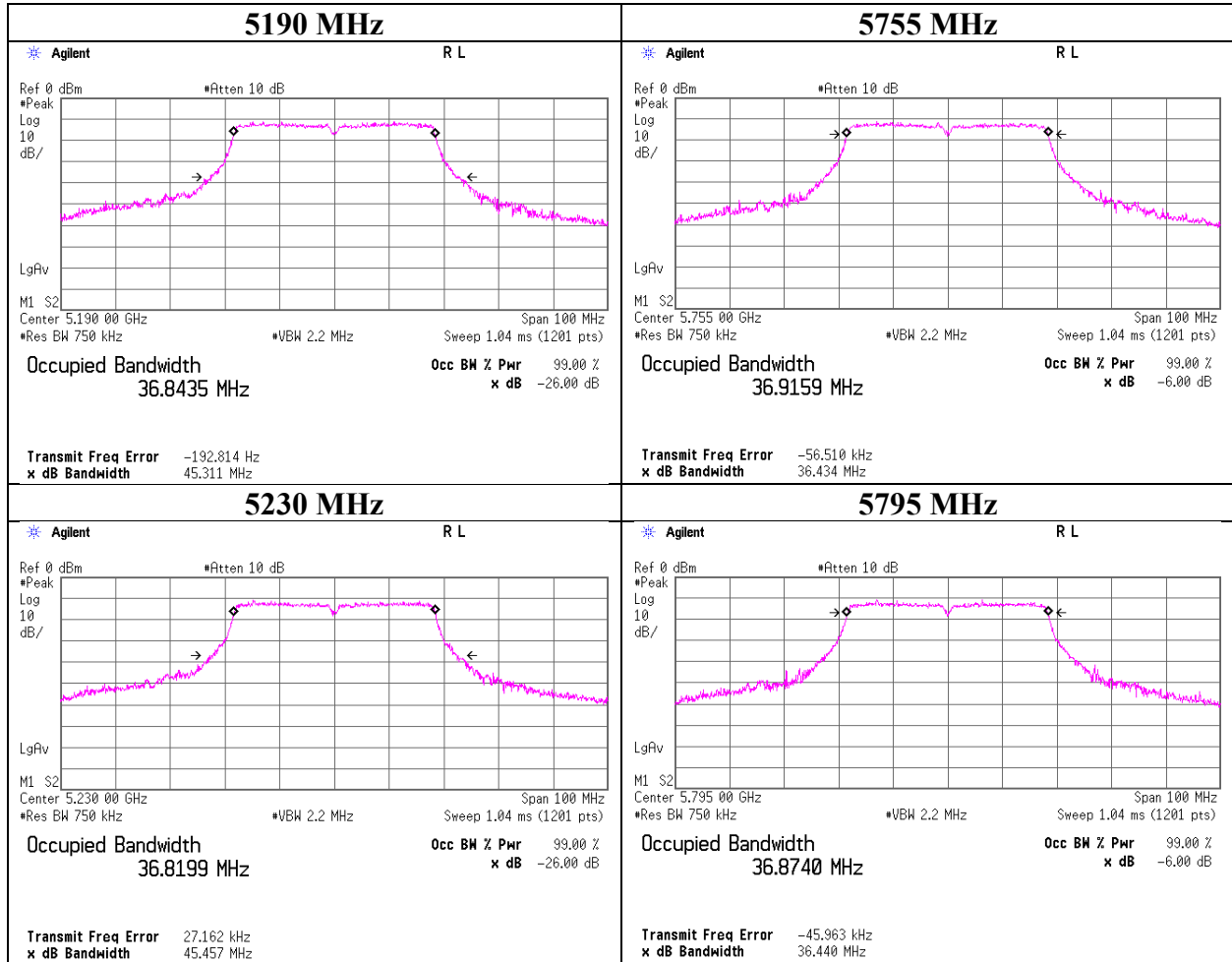
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## 99 % Occupied Bandwidth

### 11ac-40



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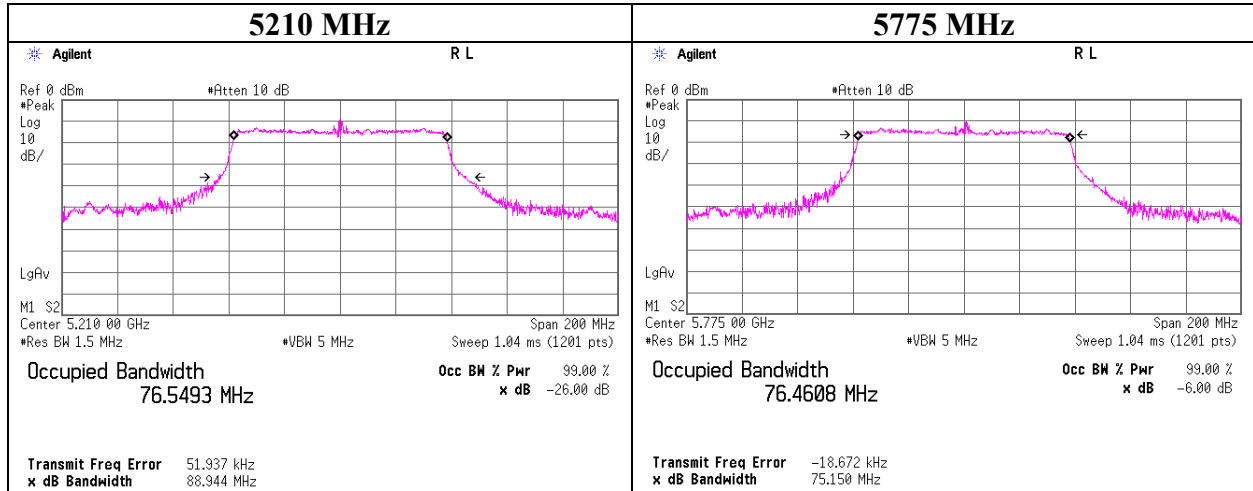
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## 99 % Occupied Bandwidth

### 11ac-80



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Telephone : +81 463 50 6400

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## **6 dB Bandwidth**

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 26, 2019  
Temperature / Humidity 26 deg. C / 45 % RH  
Engineer Toshinori Yamada  
Mode Tx

11a

| Tested<br>Frequency<br>[MHz] | 6 dB<br>Bandwidth<br>[MHz] | Limit<br>[MHz] |
|------------------------------|----------------------------|----------------|
| 5745                         | 16.490                     | > 0.500        |
| 5785                         | 16.514                     | > 0.500        |
| 5825                         | 16.489                     | > 0.500        |

11n-20

| Tested<br>Frequency<br>[MHz] | 6 dB<br>Bandwidth<br>[MHz] | Limit<br>[MHz] |
|------------------------------|----------------------------|----------------|
| 5745                         | 17.776                     | > 0.500        |
| 5785                         | 17.744                     | > 0.500        |
| 5825                         | 17.765                     | > 0.500        |

11ac-20

| Tested<br>Frequency<br>[MHz] | 6 dB<br>Bandwidth<br>[MHz] | Limit<br>[MHz] |
|------------------------------|----------------------------|----------------|
| 5745                         | 17.704                     | > 0.500        |
| 5785                         | 17.765                     | > 0.500        |
| 5825                         | 17.732                     | > 0.500        |

11n-40

| Tested<br>Frequency<br>[MHz] | 6 dB<br>Bandwidth<br>[MHz] | Limit<br>[MHz] |
|------------------------------|----------------------------|----------------|
| 5755                         | 36.556                     | > 0.500        |
| 5795                         | 36.542                     | > 0.500        |

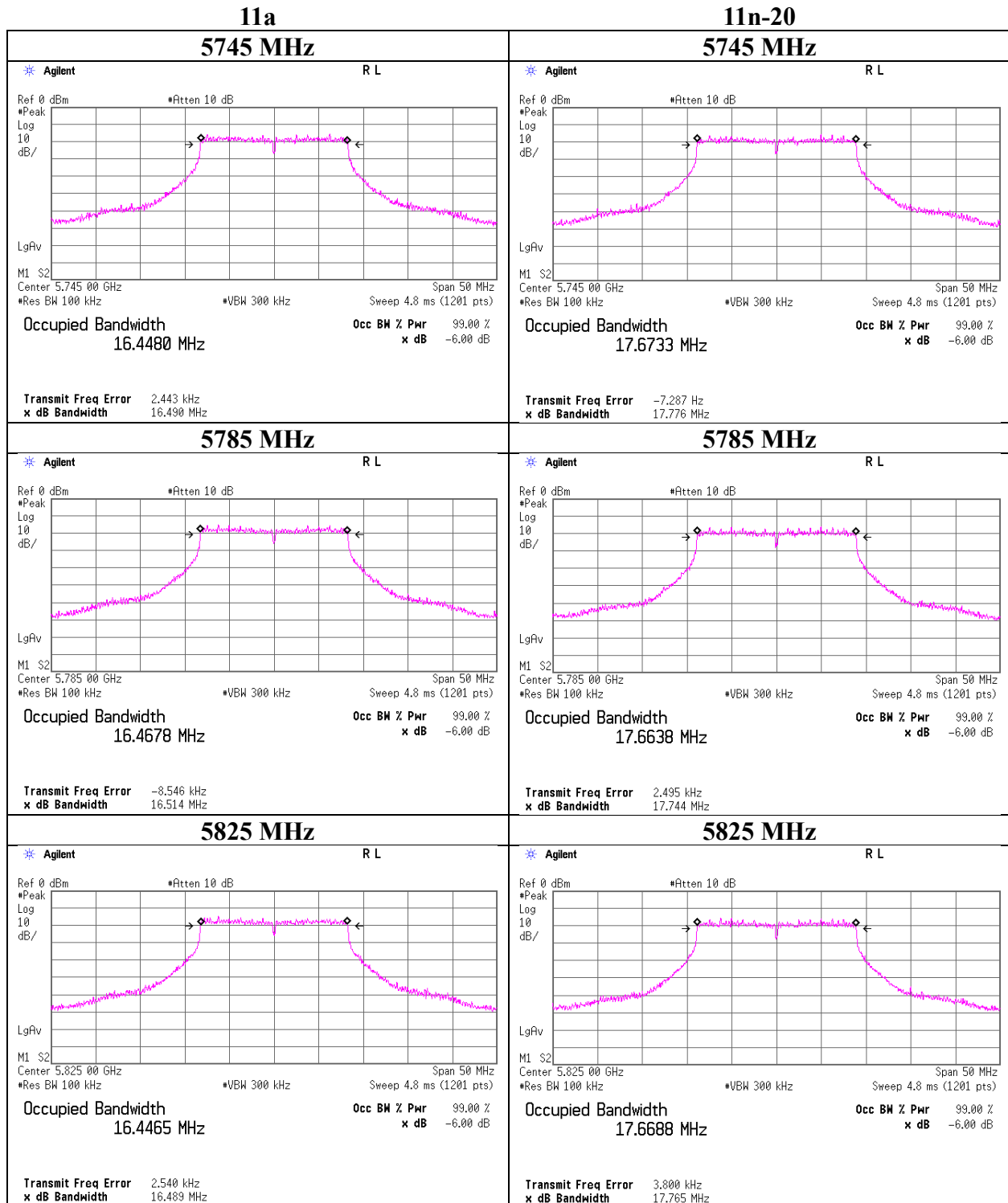
11ac-40

| Tested<br>Frequency<br>[MHz] | 6 dB<br>Bandwidth<br>[MHz] | Limit<br>[MHz] |
|------------------------------|----------------------------|----------------|
| 5755                         | 36.569                     | > 0.500        |
| 5795                         | 36.564                     | > 0.500        |

11ac-80

| Tested<br>Frequency<br>[MHz] | 6 dB<br>Bandwidth<br>[MHz] | Limit<br>[MHz] |
|------------------------------|----------------------------|----------------|
| 5775                         | 76.530                     | > 0.500        |

## 6 dB Bandwidth



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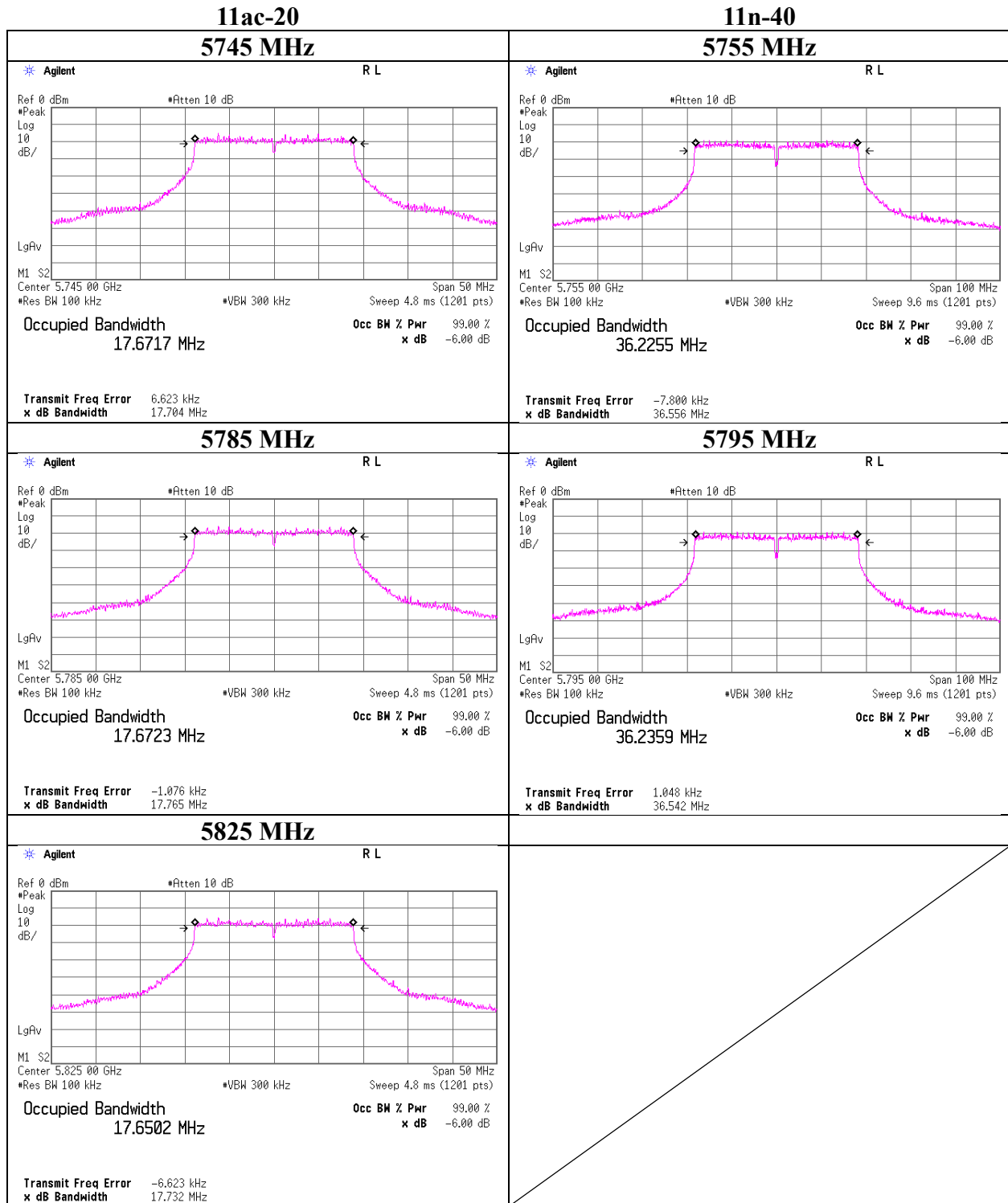
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## 6 dB Bandwidth



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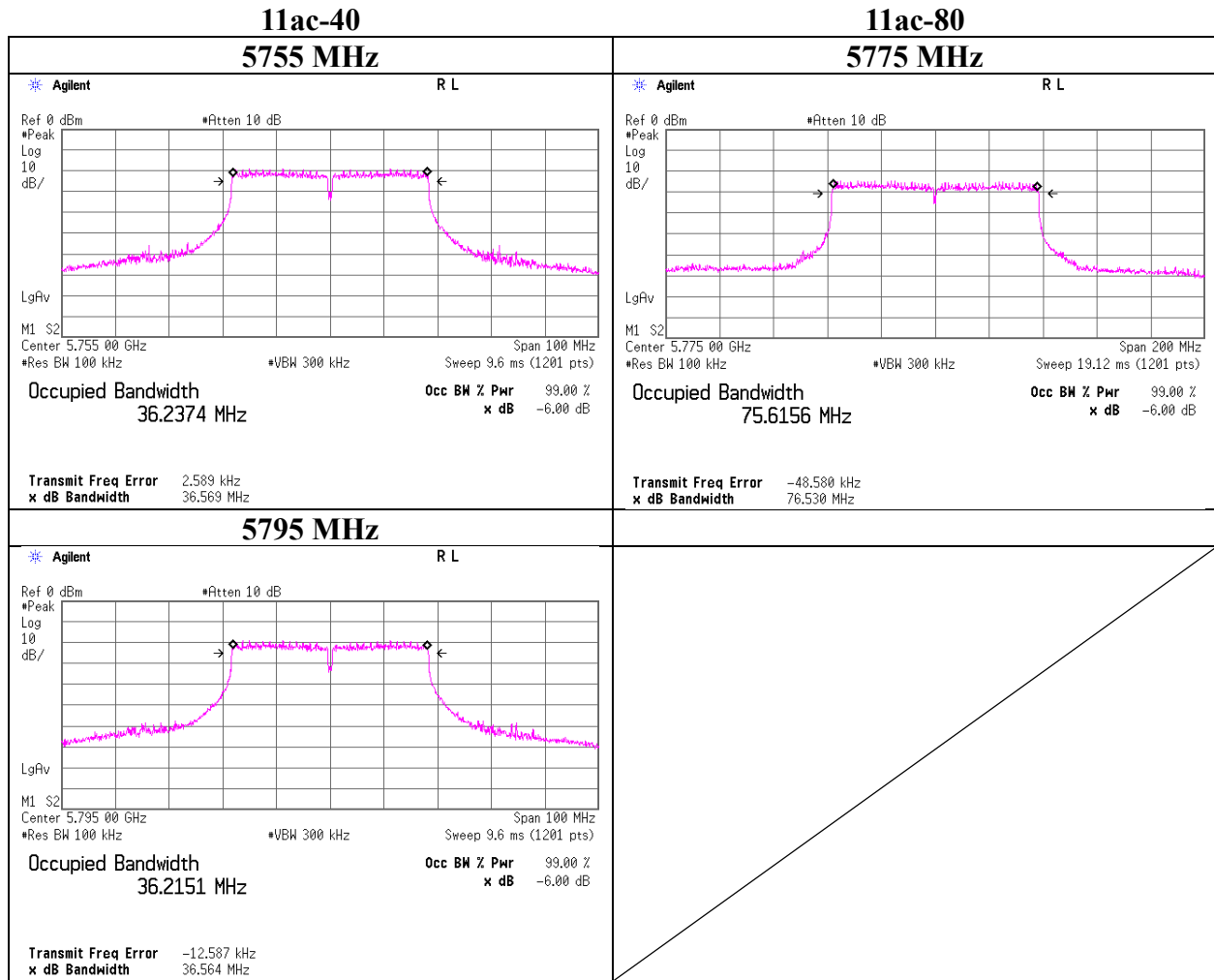
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## 6 dB Bandwidth



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Facsimile : +81 463 50 6401

## Maximum Conducted Output Power

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 26, 2019  
Temperature / Humidity 26 deg. C / 45 % RH  
Engineer Toshinori Yamada  
Mode Tx

### 11a

Applied limit: 15.407, mobile and portable client device

| Tested Frequency<br>[MHz] | Power Meter Reading<br>[dBm] | Cable Loss<br>[dB] | Atten. Loss<br>[dB] | Duty Factor<br>[dB] | Antenna Gain<br>[dBi] | 26 dB EBW<br>(B for FCC)<br>[MHz] | 99% OBW<br>(B for IC)<br>[MHz] | Conducted Power |       |        |       | e.i.r.p. |       |        |       |
|---------------------------|------------------------------|--------------------|---------------------|---------------------|-----------------------|-----------------------------------|--------------------------------|-----------------|-------|--------|-------|----------|-------|--------|-------|
|                           |                              |                    |                     |                     |                       |                                   |                                | Result          | Limit | Margin |       | Result   | Limit | Margin |       |
|                           |                              |                    |                     |                     |                       |                                   |                                | [dBm]           | [mW]  | [dBm]  | [dB]  | [dBm]    | [mW]  | [dBm]  | [dB]  |
| 5180                      | -3.95                        | 2.78               | 9.83                | 0.07                | 6.0                   | -                                 | 16.840                         | 8.73            | 7.46  | 23.97  | 15.24 | 14.73    | 29.72 | 29.97  | 15.24 |
| 5220                      | -3.95                        | 2.78               | 9.83                | 0.07                | 6.0                   | -                                 | 16.844                         | 8.73            | 7.46  | 23.97  | 15.24 | 14.73    | 29.72 | 29.97  | 15.24 |
| 5240                      | -4.04                        | 2.78               | 9.83                | 0.07                | 6.0                   | -                                 | 16.831                         | 8.64            | 7.31  | 23.97  | 15.33 | 14.64    | 29.11 | 29.97  | 15.33 |
| 5745                      | -4.58                        | 2.83               | 9.75                | 0.07                | 6.0                   | -                                 | 16.847                         | 8.07            | 6.41  | 30.00  | 21.93 | 14.07    | 25.53 | 36.00  | 21.93 |
| 5785                      | -4.55                        | 2.84               | 9.74                | 0.07                | 6.0                   | -                                 | 16.830                         | 8.10            | 6.46  | 30.00  | 21.90 | 14.10    | 25.70 | 36.00  | 21.90 |
| 5825                      | -4.32                        | 2.84               | 9.73                | 0.07                | 6.0                   | -                                 | 16.851                         | 8.32            | 6.79  | 30.00  | 21.68 | 14.32    | 27.04 | 36.00  | 21.68 |

Sample Calculation:

Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

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

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

\*[U-NII-1 band for FCC]

Although the EUT operates on Master mode, more stringent limit for Client device was applied.

Also, the maximum e.i.r.p. Result is less than 125 mW (21 dBm).

### 11n-20

Applied limit: 15.407, mobile and portable client device

| Tested Frequency<br>[MHz] | Power Meter Reading<br>[dBm] | Cable Loss<br>[dB] | Atten. Loss<br>[dB] | Duty Factor<br>[dB] | Antenna Gain<br>[dBi] | 26 dB EBW<br>(B for FCC)<br>[MHz] | 99% OBW<br>(B for IC)<br>[MHz] | Conducted Power |       |        |       | e.i.r.p. |       |        |       |
|---------------------------|------------------------------|--------------------|---------------------|---------------------|-----------------------|-----------------------------------|--------------------------------|-----------------|-------|--------|-------|----------|-------|--------|-------|
|                           |                              |                    |                     |                     |                       |                                   |                                | Result          | Limit | Margin |       | Result   | Limit | Margin |       |
|                           |                              |                    |                     |                     |                       |                                   |                                | [dBm]           | [mW]  | [dBm]  | [dB]  | [dBm]    | [mW]  | [dBm]  | [dB]  |
| 5180                      | -5.09                        | 2.78               | 9.83                | 0.17                | 6.0                   | -                                 | 17.999                         | 7.69            | 5.87  | 23.97  | 16.28 | 13.69    | 23.39 | 29.97  | 16.28 |
| 5220                      | -5.15                        | 2.78               | 9.83                | 0.17                | 6.0                   | -                                 | 18.023                         | 7.63            | 5.79  | 23.97  | 16.34 | 13.63    | 23.07 | 29.97  | 16.34 |
| 5240                      | -5.02                        | 2.78               | 9.83                | 0.17                | 6.0                   | -                                 | 18.015                         | 7.76            | 5.97  | 23.97  | 16.21 | 13.76    | 23.77 | 29.97  | 16.21 |
| 5745                      | -5.54                        | 2.83               | 9.75                | 0.17                | 6.0                   | -                                 | 18.001                         | 7.21            | 5.26  | 30.00  | 22.79 | 13.21    | 20.94 | 36.00  | 22.79 |
| 5785                      | -5.58                        | 2.84               | 9.74                | 0.17                | 6.0                   | -                                 | 17.996                         | 7.17            | 5.21  | 30.00  | 22.83 | 13.17    | 20.75 | 36.00  | 22.83 |
| 5825                      | -5.45                        | 2.84               | 9.73                | 0.17                | 6.0                   | -                                 | 18.030                         | 7.29            | 5.36  | 30.00  | 22.71 | 13.29    | 21.33 | 36.00  | 22.71 |

Sample Calculation:

Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

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

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

\*[U-NII-1 band for FCC]

Although the EUT operates on Master mode, more stringent limit for Client device was applied.

Also, the maximum e.i.r.p. Result is less than 125 mW (21 dBm).

### 11ac-20

Applied limit: 15.407, mobile and portable client device

| Tested Frequency<br>[MHz] | Power Meter Reading<br>[dBm] | Cable Loss<br>[dB] | Atten. Loss<br>[dB] | Duty Factor<br>[dB] | Antenna Gain<br>[dBi] | 26 dB EBW<br>(B for FCC)<br>[MHz] | 99% OBW<br>(B for IC)<br>[MHz] | Conducted Power |       |        |       | e.i.r.p. |       |        |       |
|---------------------------|------------------------------|--------------------|---------------------|---------------------|-----------------------|-----------------------------------|--------------------------------|-----------------|-------|--------|-------|----------|-------|--------|-------|
|                           |                              |                    |                     |                     |                       |                                   |                                | Result          | Limit | Margin |       | Result   | Limit | Margin |       |
|                           |                              |                    |                     |                     |                       |                                   |                                | [dBm]           | [mW]  | [dBm]  | [dB]  | [dBm]    | [mW]  | [dBm]  | [dB]  |
| 5180                      | -5.12                        | 2.78               | 9.83                | 0.19                | 6.0                   | -                                 | 18.061                         | 7.68            | 5.86  | 23.97  | 16.29 | 13.68    | 23.33 | 29.97  | 16.29 |
| 5220                      | -5.17                        | 2.78               | 9.83                | 0.19                | 6.0                   | -                                 | 18.050                         | 7.63            | 5.79  | 23.97  | 16.34 | 13.63    | 23.07 | 29.97  | 16.34 |
| 5240                      | -5.07                        | 2.78               | 9.83                | 0.19                | 6.0                   | -                                 | 17.970                         | 7.73            | 5.93  | 23.97  | 16.24 | 13.73    | 23.60 | 29.97  | 16.24 |
| 5745                      | -5.59                        | 2.83               | 9.75                | 0.19                | 6.0                   | -                                 | 18.042                         | 7.18            | 5.22  | 30.00  | 22.82 | 13.18    | 20.80 | 36.00  | 22.82 |
| 5785                      | -5.73                        | 2.84               | 9.74                | 0.19                | 6.0                   | -                                 | 18.028                         | 7.04            | 5.06  | 30.00  | 22.96 | 13.04    | 20.14 | 36.00  | 22.96 |
| 5825                      | -5.44                        | 2.84               | 9.73                | 0.19                | 6.0                   | -                                 | 18.018                         | 7.32            | 5.40  | 30.00  | 22.68 | 13.32    | 21.48 | 36.00  | 22.68 |

Sample Calculation:

Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

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

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

\*[U-NII-1 band for FCC]

Although the EUT operates on Master mode, more stringent limit for Client device was applied.

Also, the maximum e.i.r.p. Result is less than 125 mW (21 dBm).

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## Maximum Conducted Output Power

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 26, 2019  
Temperature / Humidity 26 deg. C / 45 % RH  
Engineer Toshinori Yamada  
Mode Tx

### 11n-40

Applied limit: 15.407, mobile and portable client device

| Tested Frequency | Power Meter Reading | Cable Loss | Atten. Loss | Duty Factor | Antenna Gain | 26 dB EBW<br>(B for FCC) | 99% OBW<br>(B for IC) | Conducted Power |       |        |        | e.i.r.p. |        |       |       |
|------------------|---------------------|------------|-------------|-------------|--------------|--------------------------|-----------------------|-----------------|-------|--------|--------|----------|--------|-------|-------|
|                  |                     |            |             |             |              |                          |                       | Result          | Limit | Margin | Result | Limit    | Margin |       |       |
| [MHz]            | [dBm]               | [dB]       | [dB]        | [dB]        | [dBi]        | [MHz]                    | [mW]                  | [dBm]           | [mW]  | [dBm]  | [dB]   | [dBm]    | [mW]   | [dBm] | [dB]  |
| 5190             | -5.14               | 2.78       | 9.83        | 0.30        | 6.0          | -                        | 36.854                | 7.77            | 5.98  | 23.97  | 16.20  | 13.77    | 23.82  | 29.97 | 16.20 |
| 5230             | -5.19               | 2.78       | 9.83        | 0.30        | 6.0          | -                        | 36.786                | 7.72            | 5.92  | 23.97  | 16.25  | 13.72    | 23.55  | 29.97 | 16.25 |
| 5755             | -5.63               | 2.83       | 9.74        | 0.30        | 6.0          | -                        | 36.849                | 7.24            | 5.30  | 30.00  | 22.76  | 13.24    | 21.09  | 36.00 | 22.76 |
| 5795             | -5.77               | 2.84       | 9.74        | 0.30        | 6.0          | -                        | 36.855                | 7.11            | 5.14  | 30.00  | 22.89  | 13.11    | 20.46  | 36.00 | 22.89 |

Sample Calculation:

Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

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

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

\*[U-NII-1 band for FCC]

Although the EUT operates on Master mode, more stringent limit for Client device was applied.

Also, the maximum e.i.r.p. Result is less than 125 mW (21 dBm).

### 11ac-40

Applied limit: 15.407, mobile and portable client device

| Tested Frequency | Power Meter Reading | Cable Loss | Atten. Loss | Duty Factor | Antenna Gain | 26 dB EBW<br>(B for FCC) | 99% OBW<br>(B for IC) | Conducted Power |       |        |        | e.i.r.p. |        |       |       |
|------------------|---------------------|------------|-------------|-------------|--------------|--------------------------|-----------------------|-----------------|-------|--------|--------|----------|--------|-------|-------|
|                  |                     |            |             |             |              |                          |                       | Result          | Limit | Margin | Result | Limit    | Margin |       |       |
| [MHz]            | [dBm]               | [dB]       | [dB]        | [dB]        | [dBi]        | [MHz]                    | [MHz]                 | [dBm]           | [mW]  | [dBm]  | [dB]   | [dBm]    | [mW]   | [dBm] | [dB]  |
| 5190             | -5.15               | 2.78       | 9.83        | 0.30        | 6.0          | -                        | 36.844                | 7.76            | 5.97  | 23.97  | 16.21  | 13.76    | 23.77  | 29.97 | 16.21 |
| 5230             | -5.19               | 2.78       | 9.83        | 0.30        | 6.0          | -                        | 36.820                | 7.72            | 5.92  | 23.97  | 16.25  | 13.72    | 23.55  | 29.97 | 16.25 |
| 5755             | -5.65               | 2.83       | 9.74        | 0.30        | 6.0          | -                        | 36.916                | 7.22            | 5.27  | 30.00  | 22.78  | 13.22    | 20.99  | 36.00 | 22.78 |
| 5795             | -5.74               | 2.84       | 9.74        | 0.30        | 6.0          | -                        | 36.874                | 7.14            | 5.18  | 30.00  | 22.86  | 13.12    | 20.61  | 36.00 | 22.86 |

Sample Calculation:

Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

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

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

\*[U-NII-1 band for FCC]

Although the EUT operates on Master mode, more stringent limit for Client device was applied.

Also, the maximum e.i.r.p. Result is less than 125 mW (21 dBm).

### 11ac-80

Applied limit: 15.407, mobile and portable client device

| Tested Frequency | Power Meter Reading | Cable Loss | Atten. Loss | Duty Factor | Antenna Gain | 26 dB EBW<br>(B for FCC) | 99% OBW<br>(B for IC) | Conducted Power |      |       |        | e.i.r.p. |       |       |        |
|------------------|---------------------|------------|-------------|-------------|--------------|--------------------------|-----------------------|-----------------|------|-------|--------|----------|-------|-------|--------|
|                  |                     |            |             |             |              |                          |                       | Result          |      | Limit | Margin | Result   |       | Limit | Margin |
| [MHz]            | [dBm]               | [dB]       | [dB]        | [dB]        | [dBi]        | [MHz]                    | [MHz]                 | [dBm]           | [mW] | [dBm] | [dB]   | [dBm]    | [mW]  | [dBm] | [dB]   |
| 5210             | -8.59               | 2.78       | 9.83        | 0.86        | 6.0          | -                        | 76.549                | 4.88            | 3.08 | 23.97 | 19.09  | 10.88    | 12.25 | 29.97 | 19.09  |
| 5775             | -9.23               | 2.84       | 9.74        | 0.86        | 6.0          | -                        | 76.461                | 4.21            | 2.64 | 30.00 | 25.79  | 10.21    | 10.50 | 36.00 | 25.79  |

Sample Calculation:

Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

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

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

\*[U-NII-1 band for FCC]

Although the EUT operates on Master mode, more stringent limit for Client device was applied.

Also, the maximum e.i.r.p. Result is less than 125 mW (21 dBm).

## Maximum Conducted Output Power

|                        |                                    |
|------------------------|------------------------------------|
| Report No.             | 12952598S-C-R1                     |
| Test place             | Shonan EMC Lab. No.5 Shielded Room |
| Date                   | September 24, 2019                 |
| Temperature / Humidity | 25 deg. C / 54 % RH                |
| Engineer               | Hosaka Makoto                      |
| Mode                   | Tx                                 |

### 11a 5180 MHz

| Mode | Rate<br>Mbps | Reading<br>(timed average)<br>[dBm] | Duty<br>factor<br>[dB] | Burst<br>power<br>[dBm] | Remarks |
|------|--------------|-------------------------------------|------------------------|-------------------------|---------|
| 11a  | 6            | -4.29                               | 0.02                   | -4.27                   |         |
|      | 9            | -4.33                               | 0.02                   | -4.31                   |         |
|      | 12           | -4.33                               | 0.03                   | -4.30                   |         |
|      | 18           | -4.36                               | 0.05                   | -4.31                   |         |
|      | 24           | -3.95                               | 0.07                   | -3.88                   | *       |
|      | 36           | -4.02                               | 0.11                   | -3.91                   |         |
|      | 48           | -4.06                               | 0.14                   | -3.92                   |         |
|      | 54           | -4.10                               | 0.15                   | -3.95                   |         |

\* Worst rate

Sample Calculation:

$$\text{Burst power} = \text{Reading (timed average)} + \text{Duty factor}$$

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

### 11n-20 5180 MHz

| Mode                  | MCS<br>Number | Reading<br>(timed average)<br>[dBm] | Duty<br>factor<br>[dB] | Burst<br>power<br>[dBm] | Remarks |
|-----------------------|---------------|-------------------------------------|------------------------|-------------------------|---------|
| 11n-20<br>(800 ns GI) | 0             | -5.56                               | 0.02                   | -5.54                   |         |
|                       | 1             | -5.58                               | 0.04                   | -5.54                   |         |
|                       | 2             | -5.58                               | 0.06                   | -5.52                   |         |
|                       | 3             | -5.04                               | 0.08                   | -4.96                   |         |
|                       | 4             | -5.06                               | 0.11                   | -4.95                   |         |
|                       | 5             | -5.10                               | 0.15                   | -4.95                   |         |
|                       | 6             | -5.09                               | 0.17                   | -4.92                   | *       |
|                       | 7             | -5.13                               | 0.19                   | -4.94                   |         |
| 11n-20<br>(400 ns GI) | 0             | -5.57                               | 0.02                   | -5.55                   |         |
|                       | 1             | -5.57                               | 0.03                   | -5.54                   |         |
|                       | 2             | -5.59                               | 0.06                   | -5.53                   |         |
|                       | 3             | -5.04                               | 0.08                   | -4.96                   |         |
|                       | 4             | -5.05                               | 0.11                   | -4.94                   |         |
|                       | 5             | -5.10                               | 0.15                   | -4.95                   |         |
|                       | 6             | -5.11                               | 0.17                   | -4.94                   |         |
|                       | 7             | -5.12                               | 0.19                   | -4.93                   |         |

\* Worst rate

Sample Calculation:

$$\text{Burst power} = \text{Reading (timed average)} + \text{Duty factor}$$

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

## Maximum Conducted Output Power

|                        |                                    |
|------------------------|------------------------------------|
| Report No.             | 12952598S-C-R1                     |
| Test place             | Shonan EMC Lab. No.5 Shielded Room |
| Date                   | September 24, 2019                 |
| Temperature / Humidity | 25 deg. C / 54 % RH                |
| Engineer               | Hosaka Makoto                      |
| Mode                   | Tx                                 |

### 11ac-20 5180 MHz

| Mode                   | MCS Number | Reading<br>(timed average)<br>[dBm] | Duty factor<br>[dB] | Burst power<br>[dBm] | Remarks |
|------------------------|------------|-------------------------------------|---------------------|----------------------|---------|
| 11ac-20<br>(800 ns GI) | 0          | -5.55                               | 0.02                | -5.53                |         |
|                        | 1          | -5.58                               | 0.04                | -5.54                |         |
|                        | 2          | -5.62                               | 0.06                | -5.56                |         |
|                        | 3          | -5.02                               | 0.08                | -4.94                |         |
|                        | 4          | -5.09                               | 0.11                | -4.98                |         |
|                        | 5          | -5.09                               | 0.15                | -4.94                |         |
|                        | 6          | -5.13                               | 0.17                | -4.96                |         |
|                        | 7          | -5.12                               | 0.19                | -4.93                | *       |
|                        | 8          | -6.14                               | 0.22                | -5.92                |         |
| 11ac-20<br>(400 ns GI) | 0          | -5.55                               | 0.02                | -5.53                |         |
|                        | 1          | -5.58                               | 0.04                | -5.54                |         |
|                        | 2          | -5.62                               | 0.06                | -5.56                |         |
|                        | 3          | -5.04                               | 0.08                | -4.96                |         |
|                        | 4          | -5.10                               | 0.11                | -4.99                |         |
|                        | 5          | -5.11                               | 0.15                | -4.96                |         |
|                        | 6          | -5.11                               | 0.17                | -4.94                |         |
|                        | 7          | -5.15                               | 0.19                | -4.96                |         |
|                        | 8          | -6.18                               | 0.22                | -5.96                |         |

\* Worst rate

Sample Calculation:

$$\text{Burst power} = \text{Reading (timed average)} + \text{Duty factor}$$

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

## Maximum Conducted Output Power

|                        |                                    |
|------------------------|------------------------------------|
| Report No.             | 12952598S-C-R1                     |
| Test place             | Shonan EMC Lab. No.5 Shielded Room |
| Date                   | September 24, 2019                 |
| Temperature / Humidity | 25 deg. C / 54 % RH                |
| Engineer               | Hosaka Makoto                      |
| Mode                   | Tx                                 |

### 11n-40 5190 MHz

| Mode                  | MCS Number | Reading<br>(timed average)<br>[dBm] | Duty factor<br>[dB] | Burst power<br>[dBm] | Remarks |
|-----------------------|------------|-------------------------------------|---------------------|----------------------|---------|
| 11n-40<br>(800 ns GI) | 0          | -4.99                               | 0.04                | -4.95                |         |
|                       | 1          | -5.03                               | 0.08                | -4.95                |         |
|                       | 2          | -5.08                               | 0.12                | -4.96                |         |
|                       | 3          | -4.99                               | 0.14                | -4.85                |         |
|                       | 4          | -5.10                               | 0.23                | -4.87                |         |
|                       | 5          | -5.14                               | 0.30                | -4.84                | *       |
|                       | 6          | -5.18                               | 0.32                | -4.86                |         |
|                       | 7          | -5.22                               | 0.37                | -4.85                |         |
| 11n-40<br>(400 ns GI) | 0          | -5.00                               | 0.04                | -4.96                |         |
|                       | 1          | -5.04                               | 0.08                | -4.96                |         |
|                       | 2          | -5.08                               | 0.12                | -4.96                |         |
|                       | 3          | -5.01                               | 0.16                | -4.85                |         |
|                       | 4          | -5.11                               | 0.23                | -4.88                |         |
|                       | 5          | -5.15                               | 0.27                | -4.88                |         |
|                       | 6          | -5.20                               | 0.32                | -4.88                |         |
|                       | 7          | -5.23                               | 0.37                | -4.86                |         |

\* Worst rate

Sample Calculation:

$$\text{Burst power} = \text{Reading (timed average)} + \text{Duty factor}$$

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

## Maximum Conducted Output Power

|                        |                                    |
|------------------------|------------------------------------|
| Report No.             | 12952598S-C-R1                     |
| Test place             | Shonan EMC Lab. No.5 Shielded Room |
| Date                   | September 24, 2019                 |
| Temperature / Humidity | 25 deg. C / 54 % RH                |
| Engineer               | Hosaka Makoto                      |
| Mode                   | Tx                                 |

### 11ac-40 5190 MHz

| Mode                   | MCS Number | Reading<br>(timed average)<br>[dBm] | Duty factor<br>[dB] | Burst power<br>[dBm] | Remarks |
|------------------------|------------|-------------------------------------|---------------------|----------------------|---------|
| 11ac-40<br>(800 ns GI) | 0          | -4.98                               | 0.04                | -4.94                |         |
|                        | 1          | -5.02                               | 0.08                | -4.94                |         |
|                        | 2          | -5.06                               | 0.12                | -4.94                |         |
|                        | 3          | -5.05                               | 0.16                | -4.89                |         |
|                        | 4          | -5.09                               | 0.23                | -4.86                |         |
|                        | 5          | -5.15                               | 0.30                | -4.85                | *       |
|                        | 6          | -5.20                               | 0.34                | -4.86                |         |
|                        | 7          | -5.22                               | 0.35                | -4.87                |         |
|                        | 8          | -8.12                               | 0.44                | -7.68                |         |
|                        | 9          | -8.19                               | 0.43                | -7.76                |         |
| 11ac-40<br>(400 ns GI) | 0          | -5.00                               | 0.04                | -4.96                |         |
|                        | 1          | -5.03                               | 0.08                | -4.95                |         |
|                        | 2          | -5.07                               | 0.12                | -4.95                |         |
|                        | 3          | -5.05                               | 0.16                | -4.89                |         |
|                        | 4          | -5.09                               | 0.23                | -4.86                |         |
|                        | 5          | -5.18                               | 0.30                | -4.88                |         |
|                        | 6          | -5.19                               | 0.33                | -4.86                |         |
|                        | 7          | -5.24                               | 0.37                | -4.87                |         |
|                        | 8          | -8.09                               | 0.39                | -7.70                |         |
|                        | 9          | -8.19                               | 0.48                | -7.71                |         |

\* Worst rate

Sample Calculation:

$$\text{Burst power} = \text{Reading (timed average)} + \text{Duty factor}$$

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

## Maximum Conducted Output Power

|                        |                                    |
|------------------------|------------------------------------|
| Report No.             | 12952598S-C-R1                     |
| Test place             | Shonan EMC Lab. No.5 Shielded Room |
| Date                   | September 24, 2019                 |
| Temperature / Humidity | 25 deg. C / 54 % RH                |
| Engineer               | Hosaka Makoto                      |
| Mode                   | Tx                                 |

### 11ac-80 5210 MHz

| Mode                   | MCS Number | Reading<br>(timed average)<br>[dBm] | Duty factor<br>[dB] | Burst power<br>[dBm] | Remarks |
|------------------------|------------|-------------------------------------|---------------------|----------------------|---------|
| 11ac-80<br>(800 ns GI) | 0          | -8.08                               | 0.09                | -7.99                |         |
|                        | 1          | -8.12                               | 0.17                | -7.95                |         |
|                        | 2          | -8.22                               | 0.25                | -7.97                |         |
|                        | 3          | -8.10                               | 0.32                | -7.78                |         |
|                        | 4          | -8.22                               | 0.42                | -7.80                |         |
|                        | 5          | -8.36                               | 0.61                | -7.75                |         |
|                        | 6          | -8.41                               | 0.65                | -7.76                |         |
|                        | 7          | -8.48                               | 0.69                | -7.79                |         |
|                        | 8          | -8.59                               | 0.86                | -7.73                | *       |
|                        | 9          | -8.60                               | 0.83                | -7.77                |         |
| 11ac-80<br>(400 ns GI) | 0          | -8.06                               | 0.09                | -7.97                |         |
|                        | 1          | -8.14                               | 0.17                | -7.97                |         |
|                        | 2          | -8.23                               | 0.22                | -8.01                |         |
|                        | 3          | -8.09                               | 0.29                | -7.80                |         |
|                        | 4          | -8.24                               | 0.42                | -7.82                |         |
|                        | 5          | -8.38                               | 0.61                | -7.77                |         |
|                        | 6          | -8.43                               | 0.64                | -7.79                |         |
|                        | 7          | -8.48                               | 0.69                | -7.79                |         |
|                        | 8          | -8.62                               | 0.86                | -7.76                |         |
|                        | 9          | -8.57                               | 0.83                | -7.74                |         |

\* Worst rate

Sample Calculation:

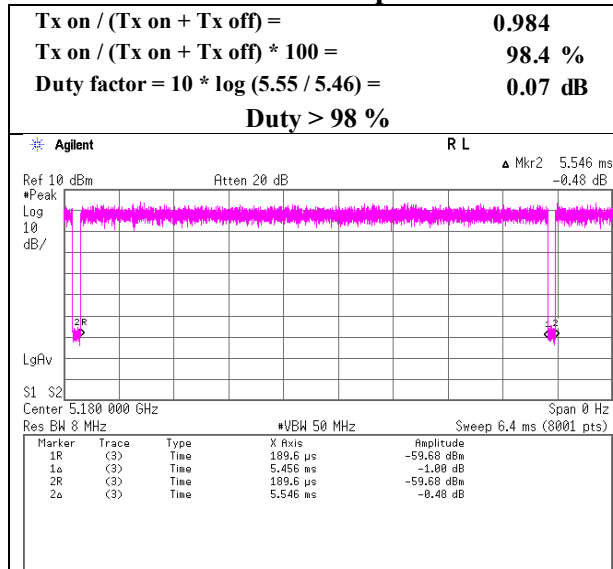
Burst power = Reading (timed average) + Duty factor

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

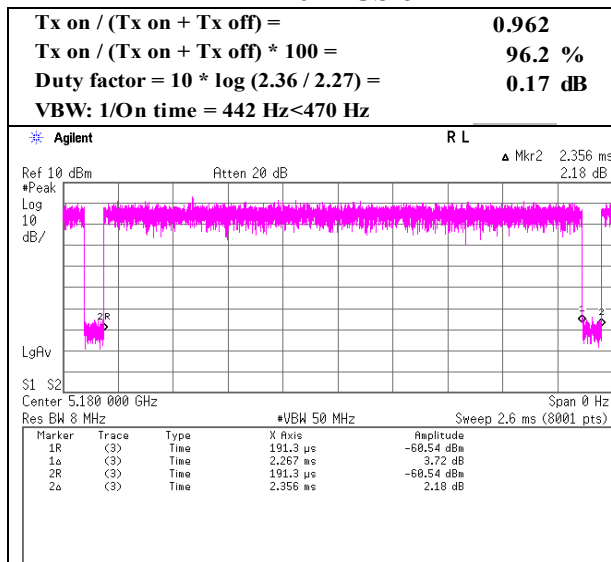
## Burst rate confirmation

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 24, 2019  
Temperature / Humidity 25 deg. C / 54 % RH  
Engineer Hosaka Makoto  
Mode Tx

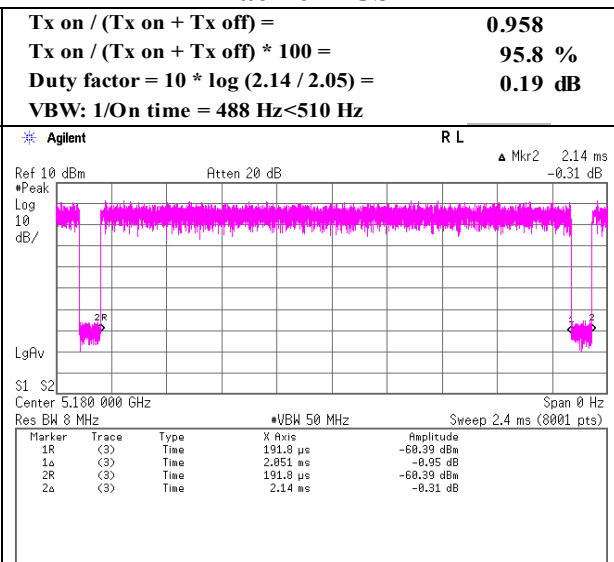
### 11a 24 Mbps



### 11n-20 MCS 6



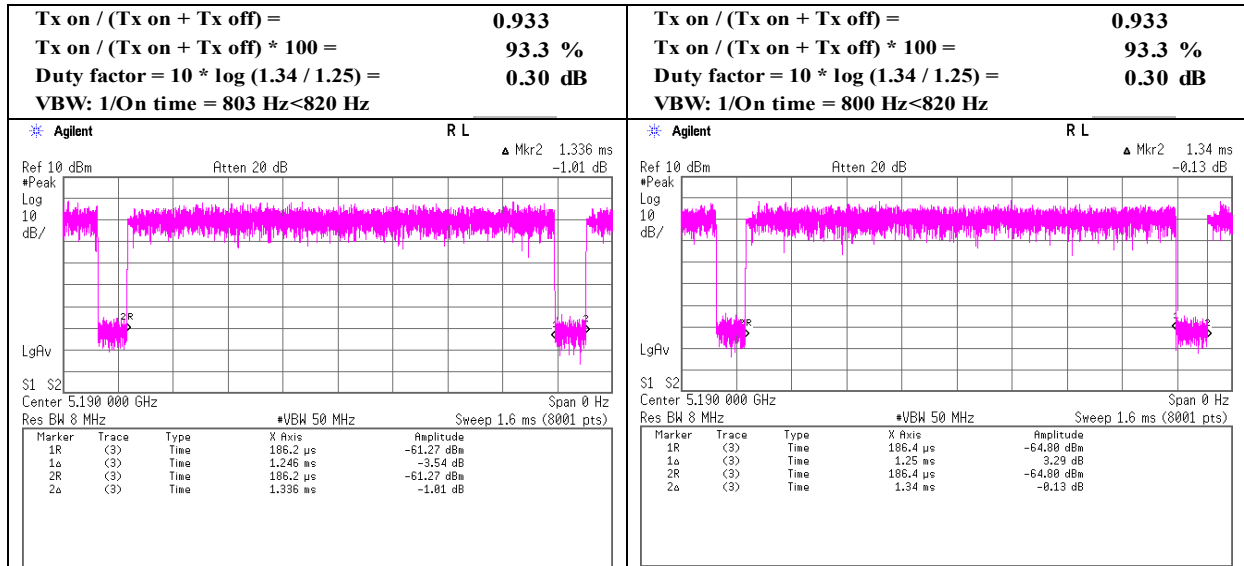
### 11ac-20 MCS 7



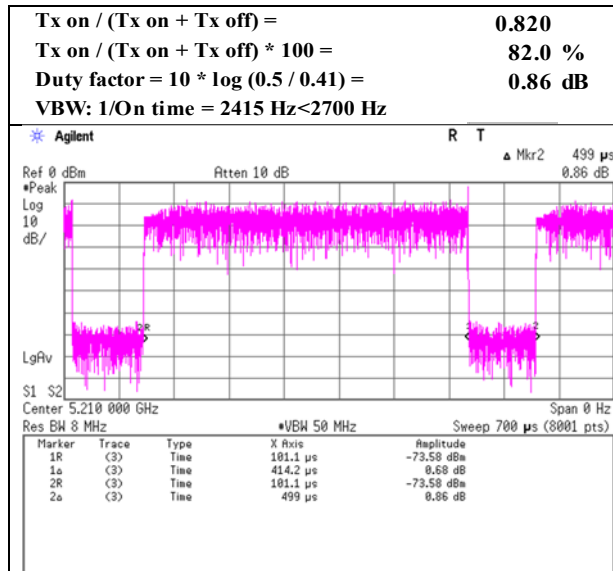
## Burst rate confirmation

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 24, 2019  
Temperature / Humidity 25 deg. C / 54 % RH  
Engineer Hosaka Makoto  
Mode Tx

### 11n-40 MCS 5



### 11ac-80 MCS 8



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## Maximum Power Spectral Density

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 26, 2019  
Temperature / Humidity 26 deg. C / 45 % RH  
Engineer Toshinori Yamada  
Mode Tx 11a

Applied limit: 15.407, mobile and portable client device

| Tested<br>Frequency<br>[MHz] | PSD<br>Reading<br>[dBm<br>/MHz] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Duty<br>Factor<br>[dB] | Antenna<br>Gain<br>[dBi] | RBW<br>Correction<br>Factor<br>[dB] | PSD (Conducted)         |                        |                | PSD (e.i.r.p.)          |                        |                |
|------------------------------|---------------------------------|-----------------------|------------------------|------------------------|--------------------------|-------------------------------------|-------------------------|------------------------|----------------|-------------------------|------------------------|----------------|
|                              |                                 |                       |                        |                        |                          |                                     | Result<br>[dBm<br>/MHz] | Limit<br>[dBm<br>/MHz] | Margin<br>[dB] | Result<br>[dBm<br>/MHz] | Limit<br>[dBm<br>/MHz] | Margin<br>[dB] |
| 5180                         | -14.37                          | 2.78                  | 9.83                   | 0.07                   | 6.0                      | 0.00                                | -1.69                   | 11.00                  | 12.69          | 4.31                    | 17.00                  | 12.69          |
| 5220                         | -14.38                          | 2.78                  | 9.83                   | 0.07                   | 6.0                      | 0.00                                | -1.70                   | 11.00                  | 12.70          | 4.30                    | 17.00                  | 12.70          |
| 5240                         | -14.41                          | 2.78                  | 9.83                   | 0.07                   | 6.0                      | 0.00                                | -1.73                   | 11.00                  | 12.73          | 4.27                    | 17.00                  | 12.73          |
| 5745                         | -23.88                          | 2.00                  | 9.75                   | 0.07                   | 6.0                      | 6.99                                | -5.07                   | 30.00                  | 35.07          | 0.93                    | 36.00                  | 35.07          |
| 5785                         | -23.64                          | 1.87                  | 9.74                   | 0.07                   | 6.0                      | 6.99                                | -4.96                   | 30.00                  | 34.96          | 1.04                    | 36.00                  | 34.96          |
| 5825                         | -23.47                          | 1.74                  | 9.73                   | 0.07                   | 6.0                      | 6.99                                | -4.94                   | 30.00                  | 34.94          | 1.06                    | 36.00                  | 34.94          |

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor =  $10 * \log (\text{Specified bandwidth} / \text{Measured bandwidth})$

PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

**UL Japan, Inc.**

**Shonan EMC Lab.**

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## Maximum Power Spectral Density

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 26, 2019  
Temperature / Humidity 26 deg. C / 45 % RH  
Engineer Toshinori Yamada  
Mode Tx 11n-20

Applied limit: 15.407, mobile and portable client device

| Tested<br>Frequency<br>[MHz] | PSD<br>Reading<br>[dBm<br>/MHz] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Duty<br>Factor<br>[dB] | Antenna<br>Gain<br>[dBi] | RBW<br>Correction<br>Factor<br>[dB] | PSD (Conducted)         |                        |                | PSD (e.i.r.p.)          |                        |                |
|------------------------------|---------------------------------|-----------------------|------------------------|------------------------|--------------------------|-------------------------------------|-------------------------|------------------------|----------------|-------------------------|------------------------|----------------|
|                              |                                 |                       |                        |                        |                          |                                     | Result<br>[dBm<br>/MHz] | Limit<br>[dBm<br>/MHz] | Margin<br>[dB] | Result<br>[dBm<br>/MHz] | Limit<br>[dBm<br>/MHz] | Margin<br>[dB] |
| 5180                         | -15.79                          | 2.78                  | 9.83                   | 0.17                   | 6.0                      | 0.00                                | -3.01                   | 11.00                  | 14.01          | 2.99                    | 17.00                  | 14.01          |
| 5220                         | -15.97                          | 2.78                  | 9.83                   | 0.17                   | 6.0                      | 0.00                                | -3.19                   | 11.00                  | 14.19          | 2.81                    | 17.00                  | 14.19          |
| 5240                         | -15.97                          | 2.78                  | 9.83                   | 0.17                   | 6.0                      | 0.00                                | -3.19                   | 11.00                  | 14.19          | 2.81                    | 17.00                  | 14.19          |
| 5745                         | -25.33                          | 2.83                  | 9.75                   | 0.17                   | 6.0                      | 6.99                                | -5.59                   | 30.00                  | 35.59          | 0.41                    | 36.00                  | 35.59          |
| 5785                         | -24.80                          | 2.84                  | 9.74                   | 0.17                   | 6.0                      | 6.99                                | -5.06                   | 30.00                  | 35.06          | 0.94                    | 36.00                  | 35.06          |
| 5825                         | -24.52                          | 2.84                  | 9.73                   | 0.17                   | 6.0                      | 6.99                                | -4.79                   | 30.00                  | 34.79          | 1.21                    | 36.00                  | 34.79          |

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor =  $10 * \log (\text{Specified bandwidth} / \text{Measured bandwidth})$

PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

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## Maximum Power Spectral Density

|                        |                                    |
|------------------------|------------------------------------|
| Report No.             | 12952598S-C-R1                     |
| Test place             | Shonan EMC Lab. No.5 Shielded Room |
| Date                   | September 26, 2019                 |
| Temperature / Humidity | 26 deg. C / 45 % RH                |
| Engineer               | Toshinori Yamada                   |
| Mode                   | Tx 11ac-20                         |

Applied limit: 15.407, mobile and portable client device

| Tested Frequency<br>[MHz] | PSD Reading<br>[dBm /MHz] | Cable Loss<br>[dB] | Atten. Loss<br>[dB] | Duty Factor<br>[dB] | Antenna Gain<br>[dBi] | RBW Correction Factor<br>[dB] | PSD (Conducted)      |                     |                | PSD (e.i.r.p.)       |                     |                |
|---------------------------|---------------------------|--------------------|---------------------|---------------------|-----------------------|-------------------------------|----------------------|---------------------|----------------|----------------------|---------------------|----------------|
|                           |                           |                    |                     |                     |                       |                               | Result<br>[dBm /MHz] | Limit<br>[dBm /MHz] | Margin<br>[dB] | Result<br>[dBm /MHz] | Limit<br>[dBm /MHz] | Margin<br>[dB] |
| 5180                      | -15.57                    | 2.78               | 9.83                | 0.19                | 6.0                   | 0.00                          | -2.77                | 11.00               | 13.77          | 3.23                 | 17.00               | 13.77          |
| 5220                      | -15.88                    | 2.78               | 9.83                | 0.19                | 6.0                   | 0.00                          | -3.08                | 11.00               | 14.08          | 2.92                 | 17.00               | 14.08          |
| 5240                      | -15.52                    | 2.78               | 9.83                | 0.19                | 6.0                   | 0.00                          | -2.72                | 11.00               | 13.72          | 3.29                 | 17.00               | 13.72          |
| 5745                      | -25.19                    | 2.83               | 9.75                | 0.19                | 6.0                   | 6.99                          | -5.43                | 30.00               | 35.43          | 0.57                 | 36.00               | 35.43          |
| 5785                      | -25.16                    | 2.84               | 9.74                | 0.19                | 6.0                   | 6.99                          | -5.40                | 30.00               | 35.40          | 0.60                 | 36.00               | 35.40          |
| 5825                      | -24.85                    | 2.84               | 9.73                | 0.19                | 6.0                   | 6.99                          | -5.10                | 30.00               | 35.10          | 0.90                 | 36.00               | 35.10          |

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor =  $10 * \log (\text{Specified bandwidth} / \text{Measured bandwidth})$

PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

**UL Japan, Inc.**

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## Maximum Power Spectral Density

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 26, 2019  
Temperature / Humidity 26 deg. C / 45 % RH  
Engineer Toshinori Yamada  
Mode Tx 11n-40

Applied limit: 15.407, mobile and portable client device

| Tested<br>Frequency<br>[MHz] | PSD<br>Reading<br>[dBm<br>/MHz] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Duty<br>Factor<br>[dB] | Antenna<br>Gain<br>[dBi] | RBW<br>Correction<br>Factor<br>[dB] | PSD (Conducted)         |                        |                | PSD (e.i.r.p.)          |                        |                |
|------------------------------|---------------------------------|-----------------------|------------------------|------------------------|--------------------------|-------------------------------------|-------------------------|------------------------|----------------|-------------------------|------------------------|----------------|
|                              |                                 |                       |                        |                        |                          |                                     | Result<br>[dBm<br>/MHz] | Limit<br>[dBm<br>/MHz] | Margin<br>[dB] | Result<br>[dBm<br>/MHz] | Limit<br>[dBm<br>/MHz] | Margin<br>[dB] |
| 5190                         | -18.97                          | 2.78                  | 9.83                   | 0.30                   | 6.0                      | 0.00                                | -6.06                   | 11.00                  | 17.06          | -0.05                   | 17.00                  | 17.06          |
| 5230                         | -18.86                          | 2.78                  | 9.83                   | 0.30                   | 6.0                      | 0.00                                | -5.95                   | 11.00                  | 16.95          | 0.05                    | 17.00                  | 16.95          |
| 5745                         | -28.53                          | 2.83                  | 9.74                   | 0.30                   | 6.0                      | 6.99                                | -8.67                   | 30.00                  | 38.67          | -2.67                   | 36.00                  | 38.67          |
| 5825                         | -28.42                          | 2.84                  | 9.74                   | 0.30                   | 6.0                      | 6.99                                | -8.55                   | 30.00                  | 38.55          | -2.55                   | 36.00                  | 38.55          |

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor =  $10 * \log (\text{Specified bandwidth} / \text{Measured bandwidth})$

PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

**UL Japan, Inc.**

**Shonan EMC Lab.**

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## Maximum Power Spectral Density

|                        |                                    |
|------------------------|------------------------------------|
| Report No.             | 12952598S-C-R1                     |
| Test place             | Shonan EMC Lab. No.5 Shielded Room |
| Date                   | September 26, 2019                 |
| Temperature / Humidity | 26 deg. C / 45 % RH                |
| Engineer               | Toshinori Yamada                   |
| Mode                   | Tx 11ac-40                         |

Applied limit: 15.407, mobile and portable client device

| Tested Frequency<br>[MHz] | PSD Reading<br>[dBm /MHz] | Cable Loss<br>[dB] | Atten. Loss<br>[dB] | Duty Factor<br>[dB] | Antenna Gain<br>[dBi] | RBW Correction Factor<br>[dB] | PSD (Conducted)      |                     |                | PSD (e.i.r.p.)       |                     |                |
|---------------------------|---------------------------|--------------------|---------------------|---------------------|-----------------------|-------------------------------|----------------------|---------------------|----------------|----------------------|---------------------|----------------|
|                           |                           |                    |                     |                     |                       |                               | Result<br>[dBm /MHz] | Limit<br>[dBm /MHz] | Margin<br>[dB] | Result<br>[dBm /MHz] | Limit<br>[dBm /MHz] | Margin<br>[dB] |
| 5190                      | -18.65                    | 2.78               | 9.83                | 0.30                | 6.0                   | 0.00                          | -5.74                | 11.00               | 16.74          | 0.26                 | 17.00               | 16.74          |
| 5230                      | -19.03                    | 2.78               | 9.83                | 0.30                | 6.0                   | 0.00                          | -6.12                | 11.00               | 17.12          | -0.12                | 17.00               | 17.12          |
| 5755                      | -28.48                    | 2.83               | 9.74                | 0.30                | 6.0                   | 6.99                          | -8.62                | 30.00               | 38.62          | -2.62                | 36.00               | 38.62          |
| 5795                      | -28.57                    | 2.84               | 9.74                | 0.30                | 6.0                   | 6.99                          | -8.70                | 30.00               | 38.70          | -2.70                | 36.00               | 38.70          |

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor =  $10 * \log (\text{Specified bandwidth} / \text{Measured bandwidth})$

PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

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## Maximum Power Spectral Density

|                        |                                    |
|------------------------|------------------------------------|
| Report No.             | 12952598S-C-R1                     |
| Test place             | Shonan EMC Lab. No.5 Shielded Room |
| Date                   | September 26, 2019                 |
| Temperature / Humidity | 26 deg. C / 45 % RH                |
| Engineer               | Toshinori Yamada                   |
| Mode                   | Tx 11ac-80                         |

Applied limit: 15.407, mobile and portable client device

| Tested<br>Frequency<br>[MHz] | PSD<br>Reading<br>[dBm<br>/MHz] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Duty<br>Factor<br>[dB] | Antenna<br>Gain<br>[dBi] | RBW<br>Correction<br>Factor<br>[dB] | PSD (Conducted)         |                        |                | PSD (e.i.r.p.)          |                        |                |
|------------------------------|---------------------------------|-----------------------|------------------------|------------------------|--------------------------|-------------------------------------|-------------------------|------------------------|----------------|-------------------------|------------------------|----------------|
|                              |                                 |                       |                        |                        |                          |                                     | Result<br>[dBm<br>/MHz] | Limit<br>[dBm<br>/MHz] | Margin<br>[dB] | Result<br>[dBm<br>/MHz] | Limit<br>[dBm<br>/MHz] | Margin<br>[dB] |
| 5210                         | -25.17                          | 2.78                  | 9.83                   | 0.86                   | 6.0                      | 0.00                                | -11.70                  | 11.00                  | 22.70          | -5.70                   | 17.00                  | 22.70          |
| 5775                         | -34.76                          | 2.84                  | 9.74                   | 0.86                   | 6.0                      | 6.99                                | -14.33                  | 30.00                  | 44.33          | -8.33                   | 36.00                  | 44.33          |

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor =  $10 * \log (\text{Specified bandwidth} / \text{Measured bandwidth})$

PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

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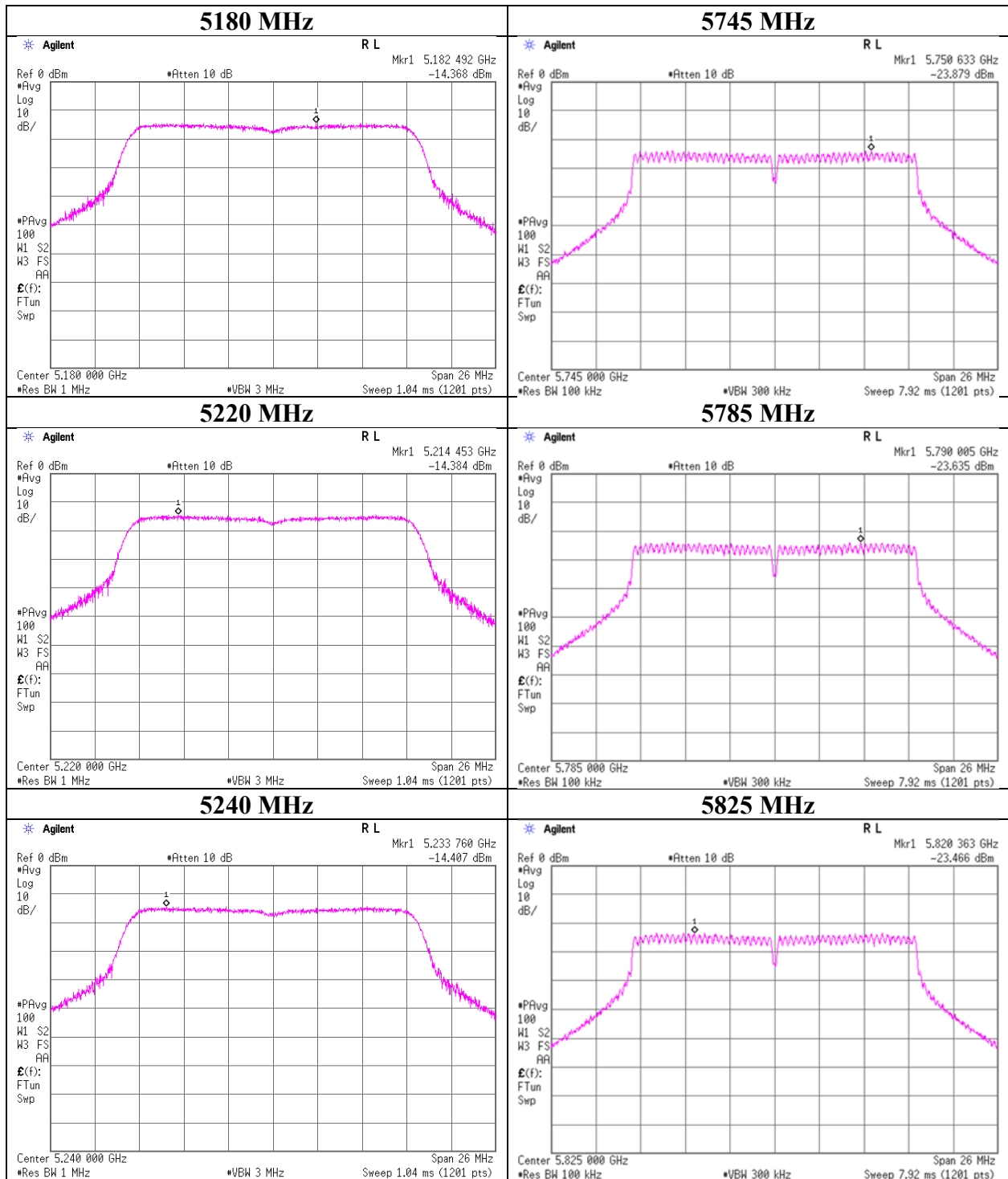
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## Maximum Power Spectral Density

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 26, 2019  
Temperature / Humidity 26 deg. C / 45 % RH  
Engineer Toshinori Yamada  
Mode Tx 11a

11a



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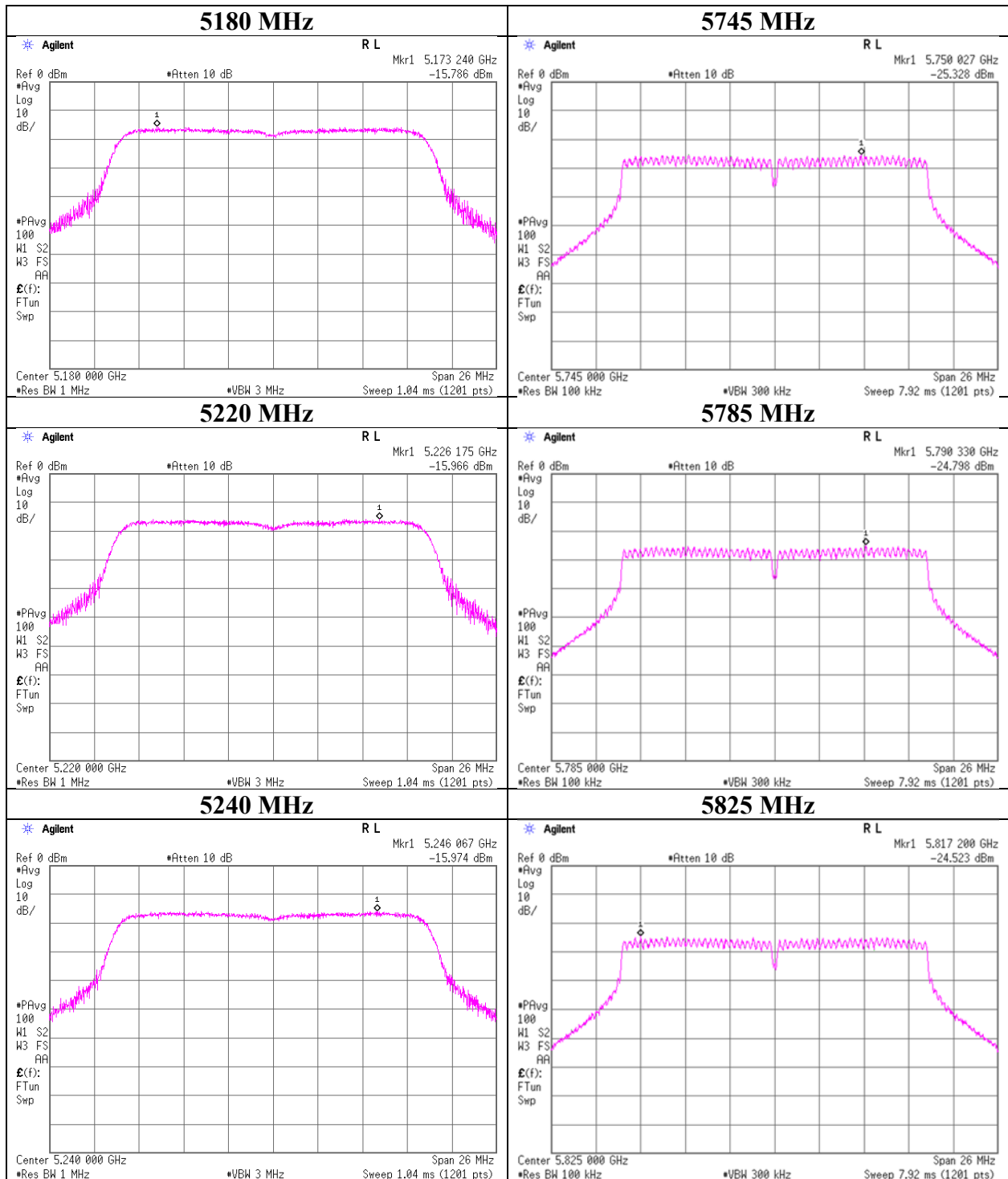
Telephone : +81 463 50 6400

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## Maximum Power Spectral Density

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 26, 2019  
Temperature / Humidity 26 deg. C / 45 % RH  
Engineer Toshinori Yamada  
Mode Tx 11n-20

11n-20



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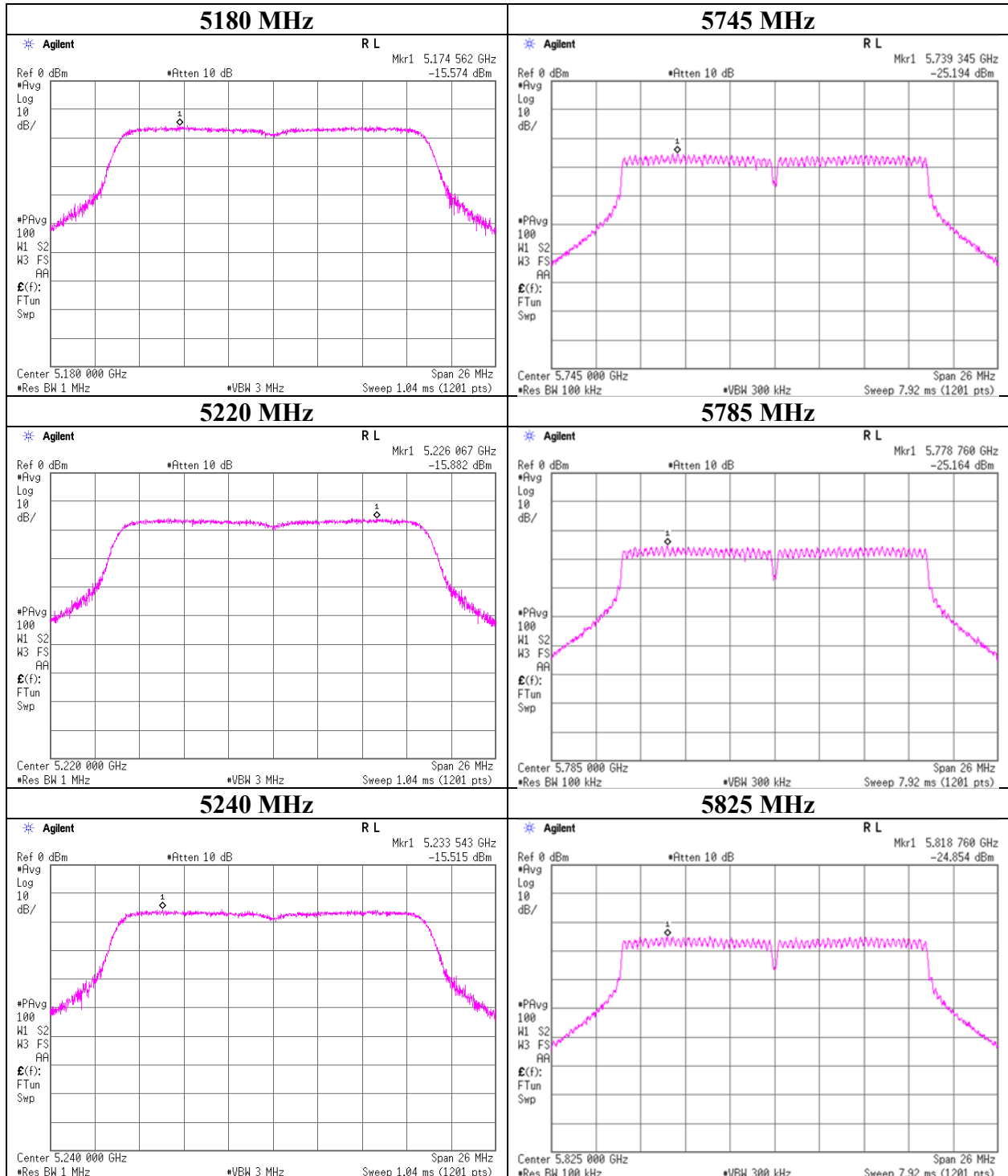
Telephone : +81 463 50 6400

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## Maximum Power Spectral Density

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 26, 2019  
Temperature / Humidity 26 deg. C / 45 % RH  
Engineer Toshinori Yamada  
Mode Tx 11ac-20

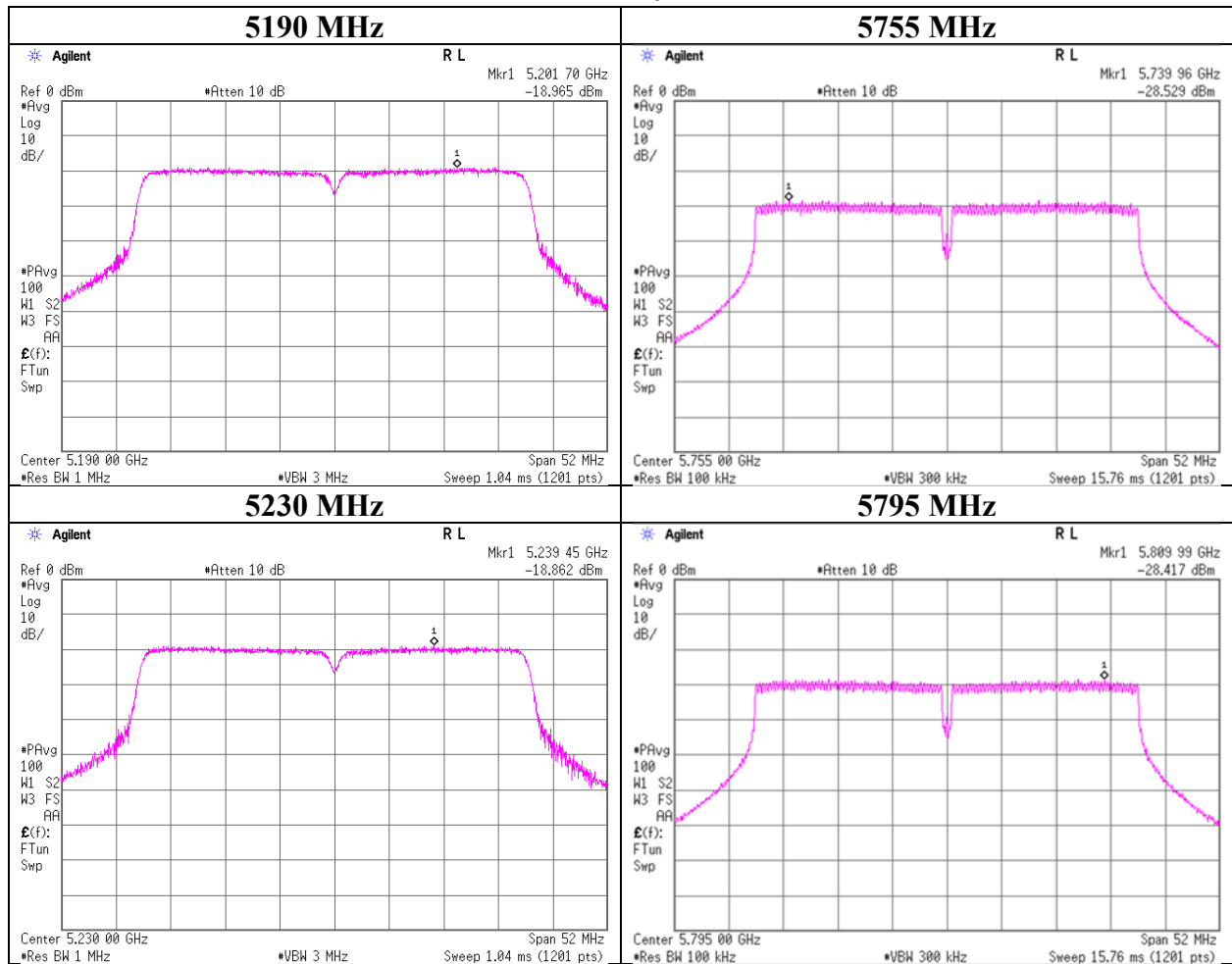
### 11ac-20



## Maximum Power Spectral Density

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 26, 2019  
Temperature / Humidity 26 deg. C / 45 % RH  
Engineer Toshinori Yamada  
Mode Tx 11n-40

### 11n-40



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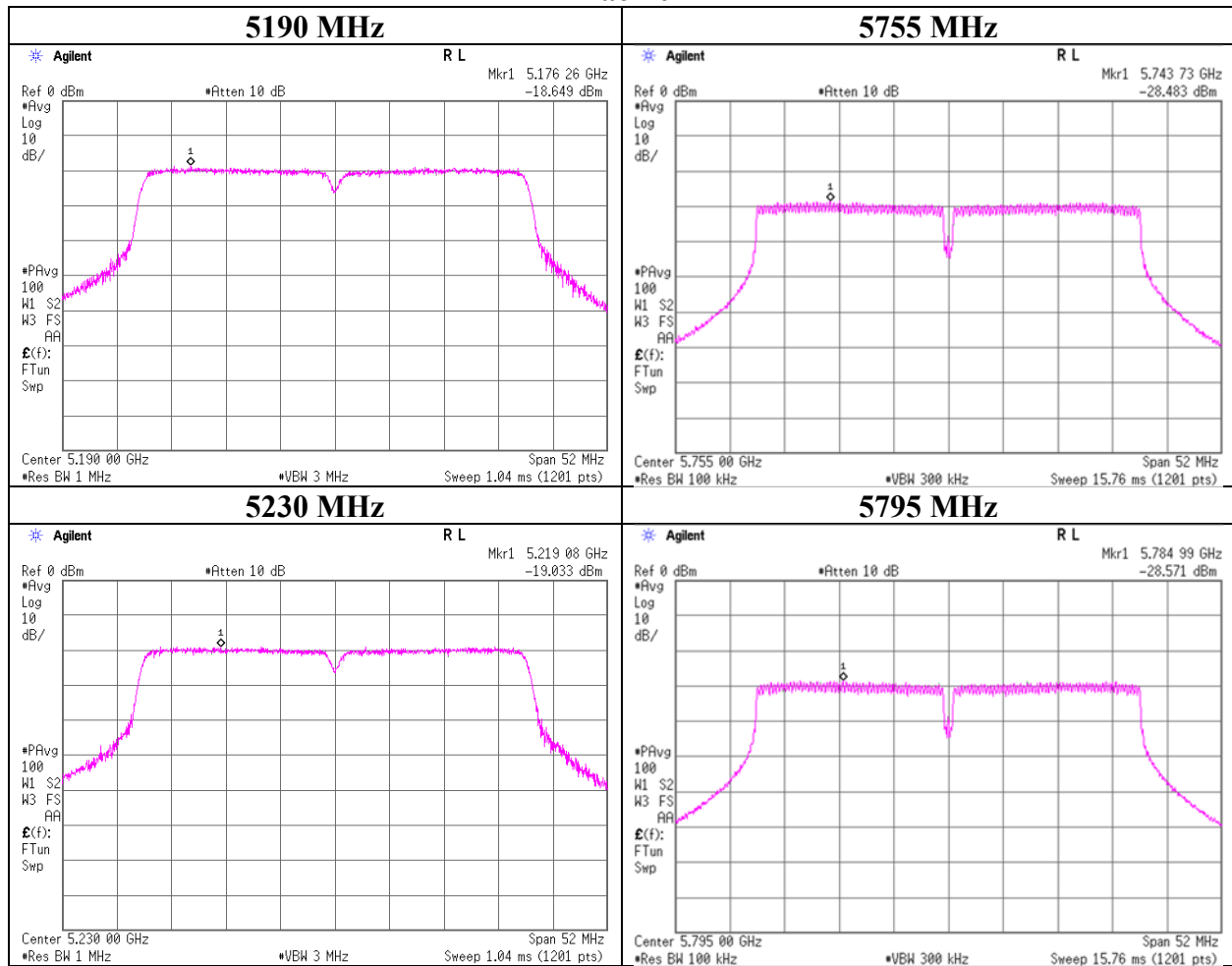
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Maximum Power Spectral Density

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 26, 2019  
Temperature / Humidity 26 deg. C / 45 % RH  
Engineer Toshinori Yamada  
Mode Tx 11ac-40

### 11ac-40



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Shonan EMC Lab.

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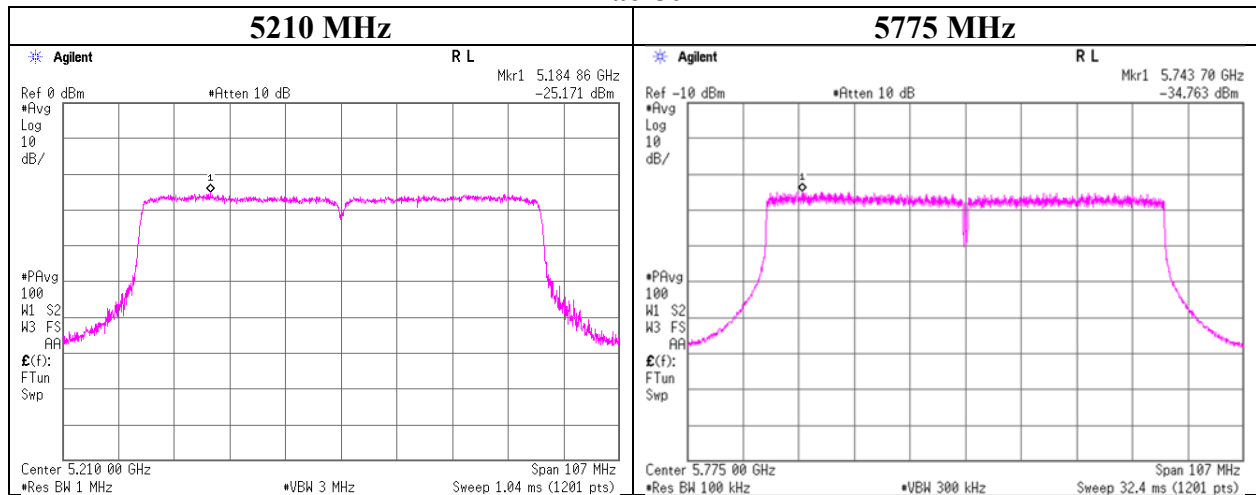
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## Maximum Power Spectral Density

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 26, 2019  
Temperature / Humidity 26 deg. C / 45 % RH  
Engineer Toshinori Yamada  
Mode Tx 11ac-80

### 11ac-80



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## Radiated Spurious Emission

|                        |                                    |                                   |                                  |                                    |
|------------------------|------------------------------------|-----------------------------------|----------------------------------|------------------------------------|
| Report No.             | 12952598S-C-R1                     |                                   |                                  |                                    |
| Test place             | Shonan EMC Lab.                    |                                   |                                  |                                    |
| Semi Anechoic Chamber  | 1                                  | 1                                 | 1                                | 3                                  |
| Date                   | September 26, 2016                 | September 27, 2016                | September 28, 2019               | October 1, 2019                    |
| Temperature / Humidity | 25 deg. C / 46 % RH                | 22 deg. C / 50 % RH               | 24 deg. C / 47 % RH              | 24 deg. C / 53 % RH                |
| Engineer               | Hiromasa Sato<br>(1 GHz – 6.4 GHz) | Kazuya Noda<br>(6.4 GHz – 13 GHz) | Kazuya Noda<br>(13 GHz – 18 GHz) | Hiromasa Sato<br>(18 GHz – 40 GHz) |
| Mode                   | Tx 11a 5180 MHz                    |                                   |                                  |                                    |

### (above 1GHz 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       | 46.01          | 32.30           | 16.89     | 39.73     | 2.36                 | 57.83           | 73.9           | 16.0        | 194         | 309          |           |
| Hori.    | 15540.000       | PK       | 45.72          | 38.72           | 12.67     | 39.18     | -9.54                | 48.39           | 73.9           | 25.5        | 134         | 29           |           |
| Hori.    | 20720.000       | PK       | 47.05          | 40.30           | 14.18     | 47.34     | -9.54                | 44.65           | 73.9           | 29.2        | 151         | 138          |           |
| Hori.    | 5150.000        | AV       | 34.19          | 32.30           | 16.89     | 39.73     | 2.36                 | 46.01           | 53.9           | 7.8         | 194         | 309          | VBW:10 Hz |
| Hori.    | 15540.000       | AV       | 34.33          | 38.72           | 12.67     | 39.18     | -9.54                | 37.00           | 53.9           | 16.9        | 134         | 29           | VBW:10 Hz |
| Hori.    | 20720.000       | AV       | 42.43          | 40.30           | 14.18     | 47.34     | -9.54                | 40.03           | 53.9           | 13.8        | 151         | 138          | VBW:10 Hz |
| Vert.    | 5150.000        | PK       | 46.74          | 64.00           | 16.89     | 39.73     | 2.36                 | 58.56           | 73.9           | 15.3        | 286         | 323          |           |
| Vert.    | 15540.000       | PK       | 45.75          | 38.72           | 12.67     | 39.18     | -9.54                | 48.42           | 73.9           | 25.4        | 116         | 359          |           |
| Vert.    | 20720.000       | PK       | 48.38          | 40.30           | 14.18     | 47.34     | -9.54                | 45.98           | 73.9           | 27.9        | 149         | 346          |           |
| Vert.    | 5150.000        | AV       | 34.27          | 32.30           | 16.89     | 39.73     | 2.36                 | 46.09           | 53.9           | 7.8         | 286         | 323          | VBW:10 Hz |
| Vert.    | 15540.000       | AV       | 34.41          | 38.72           | 12.67     | 39.18     | -9.54                | 37.08           | 53.9           | 16.8        | 116         | 359          | VBW:10 Hz |
| Vert.    | 20720.000       | AV       | 44.46          | 40.30           | 14.18     | 47.34     | -9.54                | 42.06           | 53.9           | 11.8        | 149         | 346          | VBW:10 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 6906.667        | PK       | 58.39          | 35.92           | 7.72      | 42.69     | 2.36                 | 61.70           | -33.52              | -27.00      | 6.5         | 219         | 294          |        |
| Hori.    | 10360.000       | PK       | 44.49          | 39.13           | 9.92      | 39.93     | 2.36                 | 55.97           | -39.25              | -27.00      | 12.2        | 131         | 228          |        |
| Vert.    | 6906.667        | PK       | 56.05          | 35.92           | 7.72      | 42.69     | 2.36                 | 59.36           | -35.86              | -27.00      | 8.8         | 397         | 265          |        |
| Vert.    | 10360.000       | PK       | 44.85          | 39.13           | 9.92      | 39.93     | 2.36                 | 56.33           | -38.89              | -27.00      | 11.8        | 183         | 14           |        |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

**UL Japan, Inc.**

**Shonan EMC Lab.**

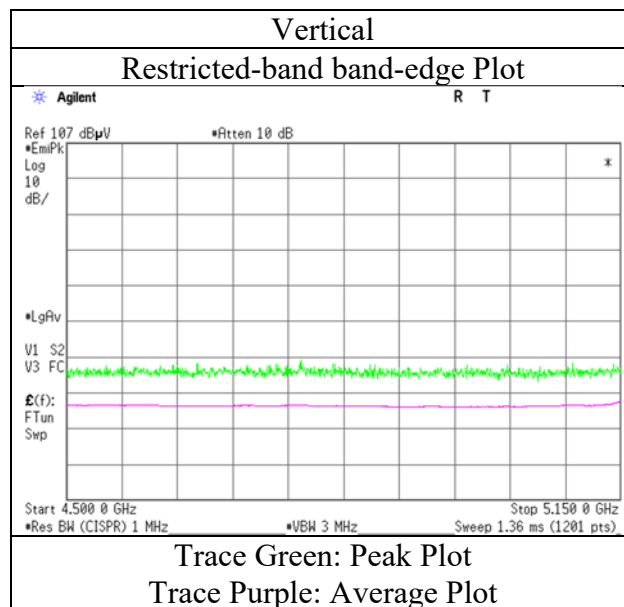
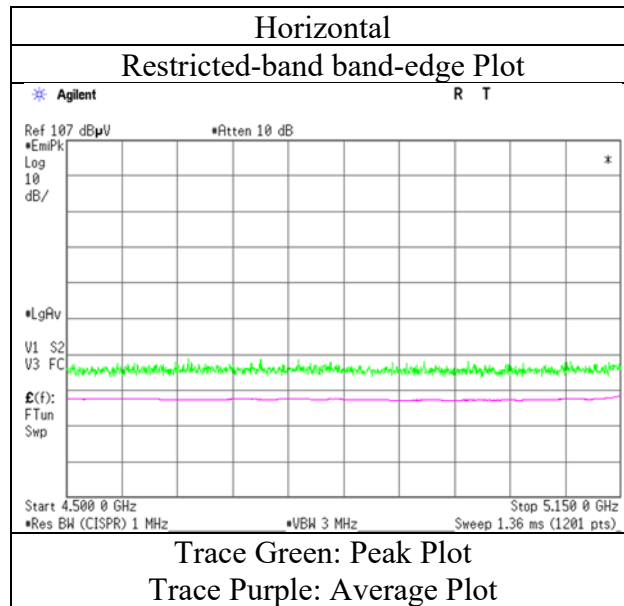
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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## Radiated Spurious Emission

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date September 26, 2016  
Temperature / Humidity 25 deg. C / 46 % RH  
Engineer Hiromasa Sato  
(1 GHz – 6.4 GHz)  
Mode 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.

**UL Japan, Inc.**

**Shonan EMC Lab.**

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## Radiated Spurious Emission

|                        |                     |                     |                     |
|------------------------|---------------------|---------------------|---------------------|
| Report No.             | 12952598S-C-R1      |                     |                     |
| Test place             | Shonan EMC Lab.     |                     |                     |
| Semi Anechoic Chamber  | 1                   | 1                   | 3                   |
| Date                   | September 27, 2016  | September 28, 2019  | October 1, 2019     |
| Temperature / Humidity | 25 deg. C / 46 % RH | 24 deg. C / 47 % RH | 24 deg. C / 53 % RH |
| Engineer               | Hiromasa Sato       | Kazuya Noda         | Hiromasa Sato       |
|                        | (1 GHz – 13 GHz)    | (13 GHz – 18 GHz)   | (18 GHz – 40 GHz)   |
| Mode                   | Tx 11a 5220 MHz     |                     |                     |

### (above 1GHz 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.    | 15660.000       | PK       | 45.94          | 38.41           | 12.73     | 39.34     | -9.54                | 48.20           | 73.9           | 25.7        | 131         | 22           |           |
| Hori.    | 20880.000       | PK       | 46.18          | 40.30           | 14.20     | 47.25     | -9.54                | 43.89           | 73.9           | 30.0        | 156         | 47           |           |
| Hori.    | 15660.000       | AV       | 34.02          | 38.41           | 12.73     | 39.34     | -9.54                | 36.28           | 53.9           | 17.6        | 131         | 22           | VBW:10 Hz |
| Hori.    | 20880.000       | AV       | 40.84          | 40.30           | 14.20     | 47.25     | -9.54                | 38.55           | 53.9           | 15.3        | 156         | 47           | VBW:10 Hz |
| Vert.    | 15660.000       | PK       | 46.24          | 38.41           | 12.73     | 39.34     | -9.54                | 48.50           | 73.9           | 25.4        | 119         | 356          |           |
| Vert.    | 20880.000       | PK       | 46.89          | 40.30           | 14.20     | 47.25     | -9.54                | 44.60           | 73.9           | 29.3        | 194         | 16           |           |
| Vert.    | 15660.000       | AV       | 34.15          | 38.41           | 12.73     | 39.34     | -9.54                | 36.41           | 53.9           | 17.4        | 119         | 356          | VBW:10 Hz |
| Vert.    | 20880.000       | AV       | 42.15          | 40.30           | 14.20     | 47.25     | -9.54                | 39.86           | 53.9           | 14.0        | 194         | 16           | VBW:10 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 6960.000        | PK       | 56.18          | 36.28           | 7.71      | 42.59     | 2.36                 | 59.94           | -35.28              | -27.0       | 8.2         | 148         | 297          |        |
| Hori.    | 10440.000       | PK       | 45.66          | 39.40           | 9.93      | 40.10     | 2.36                 | 57.25           | -37.97              | -27.0       | 10.9        | 263         | 258          |        |
| Vert.    | 6960.000        | PK       | 53.01          | 36.28           | 7.71      | 42.59     | 2.36                 | 56.77           | -38.45              | -27.0       | 11.4        | 281         | 272          |        |
| Vert.    | 10440.000       | PK       | 45.37          | 39.40           | 9.93      | 40.10     | 2.36                 | 56.96           | -38.26              | -27.0       | 11.2        | 168         | 302          |        |

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

Result(EIRP[dBm])= $10\cdot\log(\{10^{\frac{1}{2}} \cdot \text{Electric Field Strength [dBuV/m]} / 20\} \cdot 10^{-6} \cdot \text{Distance:3[m]}^2 / 30) \cdot 10^3$

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

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

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## Radiated Spurious Emission

|                        |                     |                     |                     |                     |
|------------------------|---------------------|---------------------|---------------------|---------------------|
| Report No.             | 12952598S-C-R1      |                     |                     |                     |
| Test place             | Shonan EMC Lab.     |                     |                     |                     |
| Semi Anechoic Chamber  | 1                   | 1                   | 1                   | 3                   |
| Date                   | September 27, 2016  | September 27, 2016  | September 28, 2019  | October 1, 2019     |
| Temperature / Humidity | 25 deg. C / 46 % RH | 22 deg. C / 50 % RH | 24 deg. C / 47 % RH | 24 deg. C / 53 % RH |
| Engineer               | Hiromasa Sato       | Kazuya Noda         | Kazuya Noda         | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   | (6.4 GHz – 13 GHz)  | (13 GHz – 18 GHz)   | (18 GHz – 40 GHz)   |
| Mode                   | Tx 11a 5240 MHz     |                     |                     |                     |

### (above 1GHz 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       | 44.54          | 31.99           | 16.95     | 39.76     | 2.36                 | 56.08           | 73.9           | 17.8        | 190         | 311          |           |
| Hori.    | 15720.000       | PK       | 45.69          | 38.28           | 12.74     | 39.42     | -9.54                | 47.75           | 73.9           | 26.1        | 129         | 23           |           |
| Hori.    | 20960.000       | PK       | 45.55          | 40.30           | 14.21     | 47.20     | -9.54                | 43.32           | 73.9           | 30.5        | 155         | 52           |           |
| Hori.    | 5350.000        | AV       | 33.15          | 31.99           | 16.95     | 39.76     | 2.36                 | 44.69           | 53.9           | 9.2         | 190         | 311          | VBW:10 Hz |
| Hori.    | 15720.000       | AV       | 34.35          | 38.28           | 12.74     | 39.42     | -9.54                | 36.41           | 53.9           | 17.4        | 129         | 23           | VBW:10 Hz |
| Hori.    | 20960.000       | AV       | 40.04          | 40.30           | 14.21     | 47.20     | -9.54                | 37.81           | 53.9           | 16.0        | 155         | 52           | VBW:10 Hz |
| Vert.    | 5350.000        | PK       | 45.43          | 31.99           | 16.95     | 39.76     | 2.36                 | 56.97           | 73.9           | 16.9        | 272         | 320          |           |
| Vert.    | 15720.000       | PK       | 46.14          | 38.28           | 12.74     | 39.42     | -9.54                | 48.20           | 73.9           | 25.7        | 118         | 358          |           |
| Vert.    | 20960.000       | PK       | 46.15          | 40.30           | 14.21     | 47.20     | -9.54                | 43.92           | 73.9           | 29.9        | 194         | 15           |           |
| Vert.    | 5350.000        | AV       | 33.10          | 31.99           | 16.95     | 39.76     | 2.36                 | 44.64           | 53.9           | 9.2         | 272         | 320          | VBW:10 Hz |
| Vert.    | 15720.000       | AV       | 34.45          | 38.28           | 12.74     | 39.42     | -9.54                | 36.51           | 53.9           | 17.3        | 118         | 358          | VBW:10 Hz |
| Vert.    | 20960.000       | AV       | 42.09          | 40.30           | 14.21     | 47.20     | -9.54                | 39.86           | 53.9           | 14.0        | 194         | 15           | VBW:10 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 6986.667        | PK       | 55.40          | 36.44           | 7.71      | 42.54     | 2.36                 | 59.37           | -35.85              | -27.0       | 8.8         | 212         | 291          |        |
| Hori.    | 10480.000       | PK       | 44.98          | 39.47           | 9.94      | 40.18     | 2.36                 | 56.57           | -38.65              | -27.0       | 11.6        | 157         | 227          |        |
| Vert.    | 6986.667        | PK       | 53.76          | 36.44           | 7.71      | 42.54     | 2.36                 | 57.73           | -37.49              | -27.0       | 10.4        | 397         | 265          |        |
| Vert.    | 10480.000       | PK       | 45.52          | 39.47           | 9.94      | 40.18     | 2.36                 | 57.11           | -38.11              | -27.0       | 11.1        | 173         | 53           |        |

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)

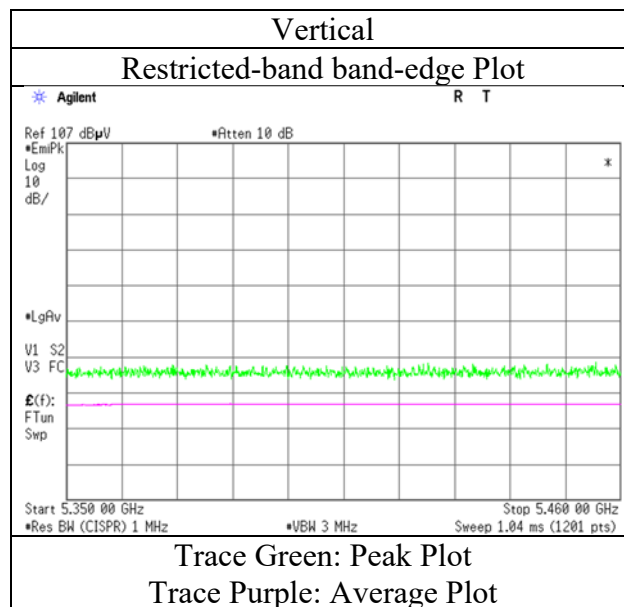
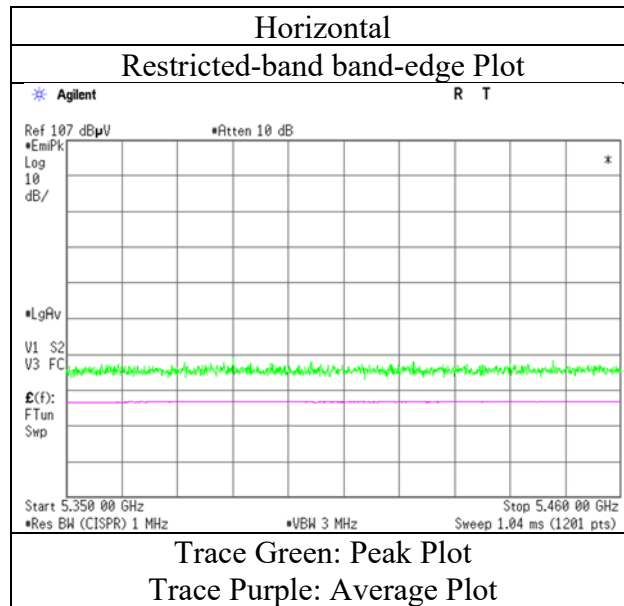
\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 27, 2016  |
| Temperature / Humidity | 25 deg. C / 46 % RH |
| Engineer               | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | Tx 11a 5240 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

|                        |                     |                     |                     |                     |
|------------------------|---------------------|---------------------|---------------------|---------------------|
| Report No.             | 12952598S-C-R1      |                     |                     |                     |
| Test place             | Shonan EMC Lab.     |                     |                     |                     |
| Semi Anechoic Chamber  | 1                   | 1                   | 1                   | 3                   |
| Date                   | September 26, 2016  | September 27, 2016  | September 28, 2019  | October 1, 2019     |
| Temperature / Humidity | 25 deg. C / 46 % RH | 25 deg. C / 46 % RH | 24 deg. C / 47 % RH | 24 deg. C / 53 % RH |
| Engineer               | Hiromasa Sato       | Hiromasa Sato       | Kazuya Noda         | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   | (6.4 GHz – 13 GHz)  | (13 GHz – 18 GHz)   | (18 GHz – 40 GHz)   |
| Mode                   | Tx 11a 5745 MHz     |                     |                     |                     |

### (above 1GHz 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.    | 7660.000        | PK       | 50.57          | 37.34           | 8.11      | 43.33     | 2.36                 | 55.05           | 73.9           | 18.8        | 250         | 0            |           |
| Hori.    | 11490.000       | PK       | 44.36          | 40.15           | 10.55     | 39.44     | 2.36                 | 57.98           | 73.9           | 15.9        | 262         | 261          |           |
| Hori.    | 22980.000       | PK       | 44.24          | 40.46           | 15.01     | 47.59     | -9.54                | 42.58           | 73.9           | 31.3        | 147         | 24           |           |
| Hori.    | 7660.000        | AV       | 38.66          | 37.34           | 8.11      | 43.33     | 2.36                 | 43.14           | 53.9           | 10.7        | 250         | 0            | VBW:10 Hz |
| Hori.    | 11490.000       | AV       | 33.63          | 40.15           | 10.55     | 39.44     | 2.36                 | 47.25           | 53.9           | 6.6         | 262         | 261          | VBW:10 Hz |
| Hori.    | 22980.000       | AV       | 35.26          | 40.46           | 15.01     | 47.59     | -9.54                | 33.60           | 53.9           | 20.3        | 147         | 24           | VBW:10 Hz |
| Vert.    | 7660.000        | PK       | 50.50          | 37.34           | 8.11      | 43.33     | 2.36                 | 54.98           | 73.90          | 18.9        | 397         | 306          |           |
| Vert.    | 11490.000       | PK       | 45.17          | 40.15           | 10.55     | 39.44     | 2.36                 | 58.79           | 73.90          | 15.1        | 168         | 201          |           |
| Vert.    | 22980.000       | PK       | 45.26          | 40.46           | 15.01     | 47.59     | -9.54                | 43.60           | 73.90          | 30.3        | 146         | 344          |           |
| Vert.    | 7660.000        | AV       | 37.60          | 37.34           | 8.11      | 43.33     | 2.36                 | 42.08           | 53.90          | 11.8        | 397         | 306          | VBW:10 Hz |
| Vert.    | 11490.000       | AV       | 33.98          | 40.15           | 10.55     | 39.44     | 2.36                 | 47.60           | 53.90          | 6.3         | 168         | 201          | VBW:10 Hz |
| Vert.    | 22980.000       | AV       | 36.39          | 40.46           | 15.01     | 47.59     | -9.54                | 34.73           | 53.90          | 19.1        | 146         | 344          | VBW:10 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz : 20log (3.94 m / 3.0 m) = 2.36 dB

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

### (Calculation) (above 1GHz 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.    | 5650.000        | PK       | 44.51          | 32.43           | 17.06     | 39.90     | 2.36                 | 56.46           | -38.76              | -27.0       | 11.7        | 331         | 226          |        |
| Hori.    | 5700.000        | PK       | 45.72          | 32.57           | 17.08     | 39.94     | 2.36                 | 57.79           | -37.43              | 10.0        | 47.4        | 331         | 226          |        |
| Hori.    | 5720.000        | PK       | 46.61          | 32.63           | 17.08     | 39.95     | 2.36                 | 58.73           | -36.49              | 15.6        | 52.0        | 331         | 226          |        |
| Hori.    | 5725.000        | PK       | 55.28          | 32.65           | 17.09     | 39.96     | 2.36                 | 67.42           | -27.80              | 27.0        | 54.8        | 331         | 226          |        |
| Hori.    | 17235.000       | PK       | 45.73          | 41.83           | 13.33     | 38.97     | -9.54                | 52.38           | -42.84              | -27.0       | 15.8        | 133         | 21           |        |
| Vert.    | 5650.000        | PK       | 45.13          | 32.43           | 17.06     | 39.90     | 2.36                 | 57.08           | -38.14              | -27.0       | 11.1        | 327         | 321          |        |
| Vert.    | 5700.000        | PK       | 45.23          | 32.57           | 17.08     | 39.94     | 2.36                 | 57.30           | -37.92              | 10.0        | 47.9        | 327         | 321          |        |
| Vert.    | 5720.000        | PK       | 45.32          | 32.63           | 17.08     | 39.95     | 2.36                 | 57.44           | -37.78              | 15.6        | 53.3        | 327         | 321          |        |
| Vert.    | 5725.000        | PK       | 47.78          | 32.65           | 17.09     | 39.96     | 2.36                 | 59.92           | -35.30              | 27.0        | 62.3        | 327         | 321          |        |
| Vert.    | 17235.000       | PK       | 45.71          | 41.83           | 13.33     | 38.97     | -9.54                | 52.36           | -42.86              | -27.0       | 15.8        | 120         | 357          |        |

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 20dB).

Distance factor : 1 GHz - 13 GHz : 20log (3.94 m / 3.0 m) = 2.36 dB

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

**UL Japan, Inc.**

**Shonan EMC Lab.**

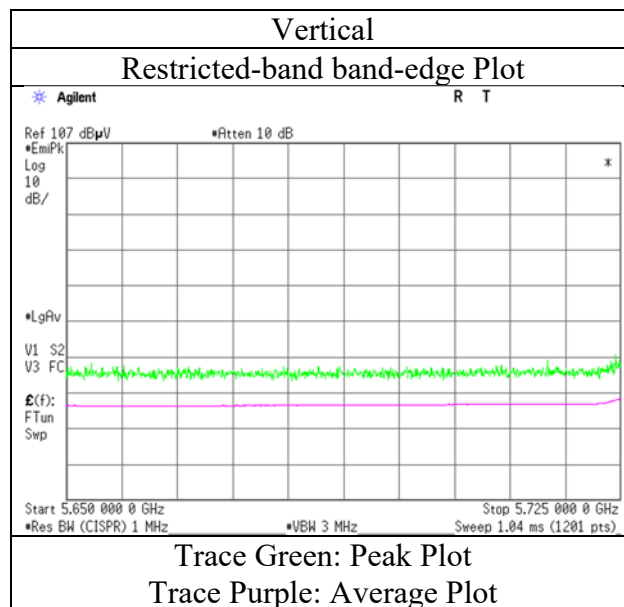
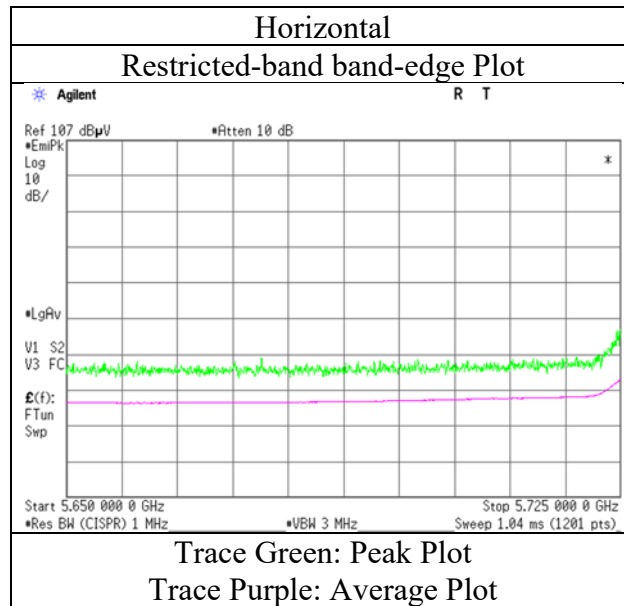
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Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 26, 2016  |
| Temperature / Humidity | 25 deg. C / 46 % RH |
| Engineer               | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | 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.

## Radiated Spurious Emission

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1 1 3  
Date September 27, 2016 September 28, 2019 October 1, 2019  
Temperature / Humidity 25 deg. C / 46 % RH 24 deg. C / 47 % RH 24 deg. C / 53 % RH  
Engineer Hiromasa Sato Kazuya Noda Hiromasa Sato  
(1 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 40 GHz)  
Mode Tx 11a 5785 MHz

### (above 1GHz 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.    | 7713.334        | PK       | 52.03          | 37.37           | 8.12      | 43.27     | 2.36                 | 56.61           | 73.9           | 17.2        | 244         | 0            |           |
| Hori.    | 11570.000       | PK       | 45.19          | 40.07           | 10.58     | 39.38     | 2.36                 | 58.82           | 73.9           | 15.0        | 255         | 318          |           |
| Hori.    | 7713.334        | AV       | 39.32          | 37.37           | 8.12      | 43.27     | 2.36                 | 43.90           | 53.9           | 10.0        | 244         | 0            | VBW:10 Hz |
| Hori.    | 11570.000       | AV       | 33.93          | 40.07           | 10.58     | 39.38     | 2.36                 | 47.56           | 53.9           | 6.3         | 255         | 318          | VBW:10 Hz |
| Vert.    | 7713.334        | PK       | 51.97          | 37.37           | 8.12      | 43.27     | 2.36                 | 56.55           | 73.9           | 17.3        | 241         | 52           |           |
| Vert.    | 11570.000       | PK       | 44.23          | 40.07           | 10.58     | 39.38     | 2.36                 | 57.86           | 73.9           | 16.0        | 186         | 208          |           |
| Vert.    | 7713.334        | AV       | 38.46          | 37.37           | 8.12      | 43.27     | 2.36                 | 43.04           | 53.9           | 10.8        | 241         | 52           | VBW:10 Hz |
| Vert.    | 11570.000       | AV       | 34.02          | 40.07           | 10.58     | 39.38     | 2.36                 | 47.65           | 53.9           | 6.2         | 186         | 208          | VBW:10 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 17355.000       | PK       | 44.70          | 42.90           | 13.32     | 38.60     | -9.54                | 52.78           | -42.44              | -27.0       | 15.4        | 134         | 26           |        |
| Hori.    | 23140.000       | PK       | 44.44          | 40.44           | 15.10     | 47.39     | -9.54                | 43.05           | -52.17              | -27.0       | 25.1        | 146         | 29           |        |
| Vert.    | 17355.000       | PK       | 44.85          | 42.90           | 13.32     | 38.60     | -9.54                | 52.93           | -42.29              | -27.0       | 15.2        | 119         | 357          |        |
| Vert.    | 23140.000       | PK       | 45.35          | 40.44           | 15.10     | 47.39     | -9.54                | 43.96           | -51.26              | -27.0       | 24.2        | 190         | 14           |        |

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

Result(EIRP[dBm]) =  $10 \cdot \log \left( \left( \left\{ 10^{\frac{1}{2}} \cdot \left( \frac{\text{Electric Field Strength [dBuV/m]}{20} \right) \cdot 10^{-6} \right\} \cdot \text{Distance}[\text{m}] \right)^2 / 30 \right) \cdot 10^3$

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

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

## Radiated Spurious Emission

|                        |                     |                     |                     |                     |                     |
|------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Report No.             | 12952598S-C-R1      |                     |                     |                     |                     |
| Test place             | Shonan EMC Lab.     |                     |                     |                     |                     |
| Semi Anechoic Chamber  | 2                   | 1                   | 1                   | 1                   | 3                   |
| Date                   | October 3, 2019     | September 26, 2016  | September 27, 2016  | September 28, 2019  | October 1, 2019     |
| Temperature / Humidity | 21 deg. C / 61 % RH | 25 deg. C / 46 % RH | 22 deg. C / 50 % RH | 24 deg. C / 47 % RH | 24 deg. C / 53 % RH |
| Engineer               | Kazuya Noda         | Hiromasa Sato       | Kazuya Noda         | Kazuya Noda         | Hiromasa Sato       |
|                        | (30 MHz - 1000 MHz) | (1 GHz - 6.4 GHz)   | (6.4 GHz - 13 GHz)  | (13 GHz - 18 GHz)   | (18 GHz - 40 GHz)   |
| Mode                   | Tx 11a 5825 MHz     |                     |                     |                     |                     |

### (below 1GHz and above 1GHz 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.    | 114.048         | QP       | 41.00          | 12.39           | 8.01      | 31.87     | 0.00                 | 29.53           | 43.5           | 13.9        | 273         | 227          |           |
| Hori.    | 116.165         | QP       | 43.90          | 12.70           | 8.03      | 31.87     | 0.00                 | 32.76           | 43.5           | 10.7        | 277         | 224          |           |
| Hori.    | 118.280         | QP       | 42.10          | 12.87           | 8.04      | 31.87     | 0.00                 | 31.14           | 43.5           | 12.3        | 270         | 250          |           |
| Hori.    | 122.488         | QP       | 40.90          | 13.25           | 8.10      | 31.86     | 0.00                 | 30.39           | 43.5           | 13.1        | 268         | 239          |           |
| Hori.    | 124.611         | QP       | 44.30          | 13.56           | 8.15      | 31.86     | 0.00                 | 34.15           | 43.5           | 9.3         | 252         | 241          |           |
| Hori.    | 135.175         | QP       | 42.50          | 14.18           | 8.38      | 31.85     | 0.00                 | 33.21           | 43.5           | 10.2        | 263         | 242          |           |
| Hori.    | 552.964         | QP       | 35.10          | 17.90           | 8.32      | 31.66     | 0.00                 | 29.66           | 46.0           | 16.3        | 100         | 277          |           |
| Hori.    | 11650.000       | PK       | 44.63          | 39.84           | 10.59     | 39.33     | 2.36                 | 58.09           | 73.9           | 15.8        | 244         | 256          |           |
| Hori.    | 11650.000       | AV       | 33.62          | 39.84           | 10.59     | 39.33     | 2.36                 | 47.08           | 53.9           | 6.8         | 244         | 256          | VBW:10 Hz |
| Vert.    | 32.746          | QP       | 32.90          | 17.61           | 6.90      | 31.93     | 0.00                 | 25.48           | 40.0           | 14.5        | 100         | 7            |           |
| Vert.    | 135.176         | QP       | 38.90          | 14.18           | 8.38      | 31.85     | 0.00                 | 29.61           | 43.5           | 13.8        | 100         | 136          |           |
| Vert.    | 541.975         | QP       | 38.10          | 17.72           | 8.27      | 31.65     | 0.00                 | 32.44           | 46.0           | 13.5        | 123         | 250          |           |
| Vert.    | 11650.000       | PK       | 45.10          | 39.84           | 10.59     | 39.33     | 2.36                 | 58.56           | 73.9           | 15.3        | 170         | 257          |           |
| Vert.    | 11650.000       | AV       | 33.32          | 39.84           | 10.59     | 39.33     | 2.36                 | 46.78           | 53.9           | 7.1         | 170         | 257          | VBW:10 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 5850.000        | PK       | 47.40          | 33.01           | 17.13     | 40.05     | 2.36                 | 59.85           | -35.37              | 27.0        | 62.3        | 243         | 333          |        |
| Hori.    | 5855.000        | PK       | 47.15          | 33.02           | 17.13     | 40.06     | 2.36                 | 59.60           | -35.62              | 15.6        | 51.2        | 243         | 333          |        |
| Hori.    | 5875.000        | PK       | 46.03          | 33.06           | 17.14     | 40.07     | 2.36                 | 58.52           | -36.70              | 10.0        | 46.7        | 243         | 333          |        |
| Hori.    | 5925.000        | PK       | 45.73          | 33.16           | 17.16     | 40.11     | 2.36                 | 58.30           | -36.92              | -27.0       | 9.9         | 243         | 333          |        |
| Hori.    | 7766.667        | PK       | 51.85          | 37.45           | 8.13      | 43.22     | 2.36                 | 56.57           | -38.65              | -27.0       | 11.6        | 189         | 0            |        |
| Hori.    | 17475.000       | PK       | 43.92          | 43.72           | 13.31     | 38.24     | -9.54                | 53.17           | -42.05              | -27.0       | 15.0        | 133         | 19           |        |
| Hori.    | 23300.000       | PK       | 45.74          | 40.46           | 15.22     | 47.21     | -9.54                | 44.67           | -50.55              | -27.0       | 23.5        | 297         | 33           |        |
| Vert.    | 5850.000        | PK       | 45.37          | 33.01           | 17.13     | 40.05     | 2.36                 | 57.82           | -37.40              | 27.0        | 64.4        | 350         | 320          |        |
| Vert.    | 5855.000        | PK       | 45.25          | 33.02           | 17.13     | 40.06     | 2.36                 | 57.70           | -37.52              | 15.6        | 53.1        | 350         | 320          |        |
| Vert.    | 5875.000        | PK       | 45.31          | 33.06           | 17.14     | 40.07     | 2.36                 | 57.80           | -37.42              | 10.0        | 47.4        | 350         | 320          |        |
| Vert.    | 5925.000        | PK       | 45.91          | 33.16           | 17.16     | 40.11     | 2.36                 | 58.48           | -36.74              | -27.0       | 9.7         | 350         | 320          |        |
| Vert.    | 7766.667        | PK       | 51.49          | 37.45           | 8.13      | 43.22     | 2.36                 | 56.21           | -39.01              | -27.0       | 12.0        | 157         | 49           |        |
| Vert.    | 17475.000       | PK       | 44.41          | 43.72           | 13.31     | 38.24     | -9.54                | 53.66           | -41.56              | -27.0       | 14.5        | 122         | 358          |        |
| Vert.    | 23300.000       | PK       | 47.30          | 40.46           | 15.22     | 47.21     | -9.54                | 46.23           | -48.99              | -27.0       | 21.9        | 243         | 13           |        |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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**Shonan EMC Lab.**

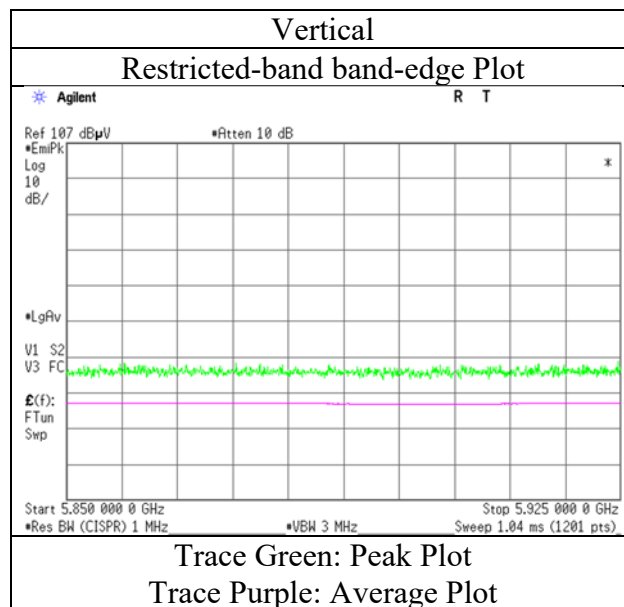
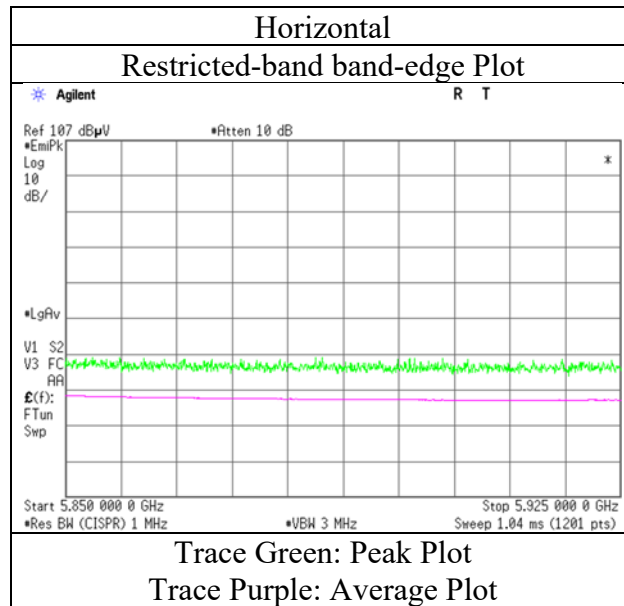
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## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 26, 2016  |
| Temperature / Humidity | 25 deg. C / 46 % RH |
| Engineer               | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | 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.

## Radiated Spurious Emission

|                        |                     |                     |                     |                     |
|------------------------|---------------------|---------------------|---------------------|---------------------|
| Report No.             | 12952598S-C-R1      |                     |                     |                     |
| Test place             | Shonan EMC Lab.     |                     |                     |                     |
| Semi Anechoic Chamber  | 1                   | 1                   | 1                   | 3                   |
| Date                   | September 26, 2016  | September 27, 2016  | September 28, 2019  | October 1, 2019     |
| Temperature / Humidity | 25 deg. C / 46 % RH | 22 deg. C / 50 % RH | 24 deg. C / 47 % RH | 24 deg. C / 53 % RH |
| Engineer               | Hiromasa Sato       | Kazuya Noda         | Kazuya Noda         | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   | (6.4 GHz – 13 GHz)  | (13 GHz – 18 GHz)   | (18 GHz – 40 GHz)   |
| Mode                   | Tx 11n-20 5180 MHz  |                     |                     |                     |

### (above 1GHz 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       | 46.02          | 32.30           | 16.89     | 39.73     | 2.36                 | 57.84           | 73.9           | 16.0        | 229         | 329          |            |
| Hori.    | 15540.000       | PK       | 45.95          | 38.72           | 12.67     | 39.18     | -9.54                | 48.62           | 73.9           | 25.2        | 133         | 25           |            |
| Hori.    | 20720.000       | PK       | 47.82          | 40.30           | 14.18     | 47.34     | -9.54                | 45.42           | 73.9           | 28.4        | 160         | 114          |            |
| Hori.    | 5150.000        | AV       | 34.93          | 32.30           | 16.89     | 39.73     | 2.36                 | 46.75           | 53.9           | 7.1         | 229         | 329          | VBW:470 Hz |
| Hori.    | 15540.000       | AV       | 34.03          | 38.72           | 12.67     | 39.18     | -9.54                | 36.70           | 53.9           | 17.2        | 133         | 25           | VBW:470 Hz |
| Hori.    | 20720.000       | AV       | 42.03          | 40.30           | 14.18     | 47.34     | -9.54                | 39.63           | 53.9           | 14.2        | 160         | 114          | VBW:470 Hz |
| Vert.    | 5150.000        | PK       | 46.41          | 32.30           | 16.89     | 39.73     | 2.36                 | 58.23           | 73.9           | 15.6        | 286         | 323          |            |
| Vert.    | 15540.000       | PK       | 45.84          | 38.72           | 12.67     | 39.18     | -9.54                | 48.51           | 73.9           | 25.3        | 122         | 359          |            |
| Vert.    | 20720.000       | PK       | 48.64          | 40.30           | 14.18     | 47.34     | -9.54                | 46.24           | 73.9           | 27.6        | 155         | 345          |            |
| Vert.    | 5150.000        | AV       | 34.68          | 32.30           | 16.89     | 39.73     | 2.36                 | 46.50           | 53.9           | 7.4         | 286         | 323          | VBW:470 Hz |
| Vert.    | 15540.000       | AV       | 33.95          | 38.72           | 12.67     | 39.18     | -9.54                | 36.62           | 53.9           | 17.2        | 122         | 359          | VBW:470 Hz |
| Vert.    | 20720.000       | AV       | 44.78          | 40.30           | 14.18     | 47.34     | -9.54                | 42.38           | 53.9           | 11.5        | 155         | 345          | VBW:470 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 6906.667        | PK       | 56.99          | 35.92           | 7.72      | 42.69     | 2.36                 | 60.30           | -34.92              | -27.0       | 7.9         | 221         | 291          |        |
| Hori.    | 10360.000       | PK       | 44.06          | 39.13           | 9.92      | 39.93     | 2.36                 | 55.54           | -39.68              | -27.0       | 12.6        | 231         | 267          |        |
| Vert.    | 6906.667        | PK       | 54.70          | 35.92           | 7.72      | 42.69     | 2.36                 | 58.01           | -37.21              | -27.0       | 10.2        | 396         | 263          |        |
| Vert.    | 10360.000       | PK       | 45.46          | 39.13           | 9.92      | 39.93     | 2.36                 | 56.94           | -38.28              | -27.0       | 11.2        | 194         | 318          |        |

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

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

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

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

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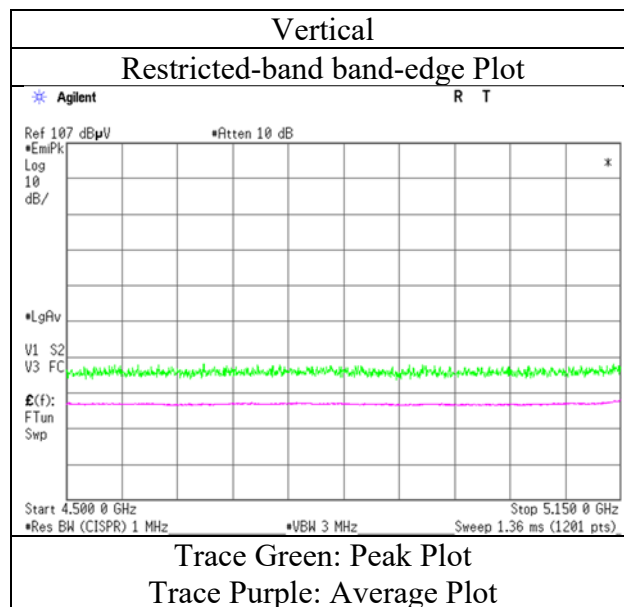
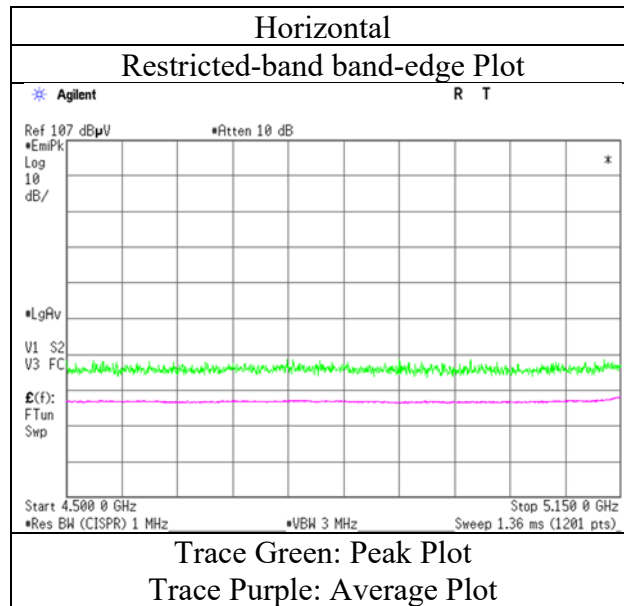
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## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 26, 2016  |
| Temperature / Humidity | 25 deg. C / 46 % RH |
| Engineer               | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | 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.

**UL Japan, Inc.**

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## Radiated Spurious Emission

|                        |                     |                     |                     |
|------------------------|---------------------|---------------------|---------------------|
| Report No.             | 12952598S-C-R1      |                     |                     |
| Test place             | Shonan EMC Lab.     |                     |                     |
| Semi Anechoic Chamber  | 1                   | 1                   | 3                   |
| Date                   | September 27, 2016  | September 28, 2019  | October 1, 2019     |
| Temperature / Humidity | 25 deg. C / 46 % RH | 24 deg. C / 47 % RH | 24 deg. C / 53 % RH |
| Engineer               | Hiromasa Sato       | Kazuya Noda         | Hiromasa Sato       |
|                        | (1 GHz – 13 GHz)    | (13 GHz – 18 GHz)   | (18 GHz – 40 GHz)   |
| Mode                   | Tx 11n-20 5220 MHz  |                     |                     |

### (above 1GHz 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.    | 15660.000       | PK       | 45.85          | 38.41           | 12.73     | 39.34     | -9.54                | 48.11           | 73.9           | 25.7        | 166         | 41           |            |
| Hori.    | 20880.000       | PK       | 46.85          | 40.30           | 14.20     | 47.25     | -9.54                | 44.56           | 73.9           | 29.3        | 161         | 48           |            |
| Hori.    | 15660.000       | AV       | 34.14          | 38.41           | 12.73     | 39.34     | -9.54                | 36.40           | 53.9           | 17.5        | 166         | 41           | VBW:470 Hz |
| Hori.    | 20880.000       | AV       | 42.16          | 40.30           | 14.20     | 47.25     | -9.54                | 39.87           | 53.9           | 14.0        | 161         | 48           | VBW:470 Hz |
| Vert.    | 15660.000       | PK       | 45.64          | 38.41           | 12.73     | 39.34     | -9.54                | 47.90           | 73.9           | 26.0        | 119         | 2            |            |
| Vert.    | 20880.000       | PK       | 47.55          | 40.30           | 14.20     | 47.25     | -9.54                | 45.26           | 73.9           | 28.6        | 195         | 15           |            |
| Vert.    | 15660.000       | AV       | 34.09          | 38.41           | 12.73     | 39.34     | -9.54                | 36.35           | 53.9           | 17.5        | 119         | 2            | VBW:470 Hz |
| Vert.    | 20880.000       | AV       | 42.33          | 40.30           | 14.20     | 47.25     | -9.54                | 40.04           | 53.9           | 13.8        | 195         | 15           | VBW:470 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 6960.000        | PK       | 56.13          | 36.28           | 7.71      | 42.59     | 2.36                 | 59.89           | -35.33              | -27.0       | 8.3         | 220         | 290          |        |
| Hori.    | 10440.000       | PK       | 45.12          | 39.40           | 9.93      | 40.10     | 2.36                 | 56.71           | -38.51              | -27.0       | 11.5        | 262         | 250          |        |
| Vert.    | 6960.000        | PK       | 54.43          | 36.28           | 7.71      | 42.59     | 2.36                 | 58.19           | -37.03              | -27.0       | 10.0        | 343         | 264          |        |
| Vert.    | 10440.000       | PK       | 44.24          | 39.40           | 9.93      | 40.10     | 2.36                 | 55.83           | -39.39              | -27.0       | 12.3        | 247         | 288          |        |

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

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

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

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

13 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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## Radiated Spurious Emission

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1 1 1 3  
Date September 27, 2016 September 27, 2016 September 28, 2019 October 1, 2019  
Temperature / Humidity 25 deg. C / 46 % RH 22 deg. C / 50 % RH 24 deg. C / 47 % RH 24 deg. C / 53 % RH  
Engineer Hiromasa Sato Kazuya Noda Kazuya Noda Hiromasa Sato  
(1 GHz – 6.4 GHz) (6.4 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 40 GHz)  
Mode Tx 11n-20 5240 MHz

### (above 1GHz 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       | 45.09          | 31.99           | 16.95     | 39.76     | 2.36                 | 56.63           | 73.9           | 17.2        | 242         | 296          |            |
| Hori.    | 15720.000       | PK       | 45.83          | 38.28           | 12.74     | 39.42     | -9.54                | 47.89           | 73.9           | 26.0        | 193         | 51           |            |
| Hori.    | 20960.000       | PK       | 46.03          | 40.30           | 14.21     | 47.20     | -9.54                | 43.80           | 73.9           | 30.1        | 158         | 51           |            |
| Hori.    | 5350.000        | AV       | 33.73          | 31.99           | 16.95     | 39.76     | 2.36                 | 45.27           | 53.9           | 8.6         | 242         | 296          | VBW:470 Hz |
| Hori.    | 15720.000       | AV       | 34.53          | 38.28           | 12.74     | 39.42     | -9.54                | 36.59           | 53.9           | 17.3        | 193         | 51           | VBW:470 Hz |
| Hori.    | 20960.000       | AV       | 40.83          | 40.30           | 14.21     | 47.20     | -9.54                | 38.60           | 53.9           | 15.3        | 158         | 51           | VBW:470 Hz |
| Vert.    | 5350.000        | PK       | 44.91          | 31.99           | 16.95     | 39.76     | 2.36                 | 56.45           | 73.9           | 17.4        | 219         | 327          |            |
| Vert.    | 15720.000       | PK       | 45.91          | 38.28           | 12.74     | 39.42     | -9.54                | 47.97           | 73.9           | 25.9        | 123         | 351          |            |
| Vert.    | 20960.000       | PK       | 46.33          | 40.30           | 14.21     | 47.20     | -9.54                | 44.10           | 73.9           | 29.8        | 195         | 16           |            |
| Vert.    | 5350.000        | AV       | 33.28          | 31.99           | 16.95     | 39.76     | 2.36                 | 44.82           | 53.9           | 9.0         | 219         | 327          | VBW:470 Hz |
| Vert.    | 15720.000       | AV       | 34.47          | 38.28           | 12.74     | 39.42     | -9.54                | 36.53           | 53.9           | 17.3        | 123         | 351          | VBW:470 Hz |
| Vert.    | 20960.000       | AV       | 42.32          | 40.30           | 14.21     | 47.20     | -9.54                | 40.09           | 53.9           | 13.8        | 195         | 16           | VBW:470 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 6986.667        | PK       | 55.17          | 36.44           | 7.71      | 42.54     | 2.36                 | 59.14           | -36.08              | -27.0       | 9.0         | 233         | 281          |        |
| Hori.    | 10480.000       | PK       | 44.65          | 39.47           | 9.94      | 40.18     | 2.36                 | 56.24           | -38.98              | -27.0       | 11.9        | 258         | 241          |        |
| Vert.    | 6986.667        | PK       | 53.48          | 36.44           | 7.71      | 42.54     | 2.36                 | 57.45           | -37.77              | -27.0       | 10.7        | 340         | 255          |        |
| Vert.    | 10480.000       | PK       | 45.23          | 39.47           | 9.94      | 40.18     | 2.36                 | 56.82           | -38.40              | -27.0       | 11.4        | 171         | 330          |        |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

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**Shonan EMC Lab.**

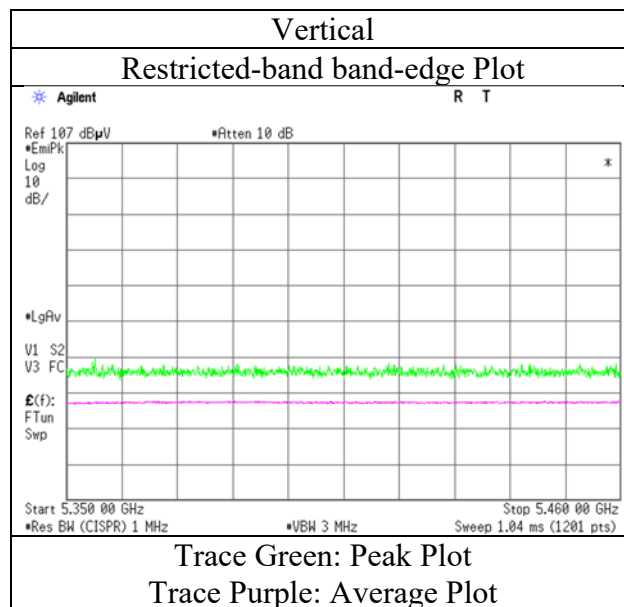
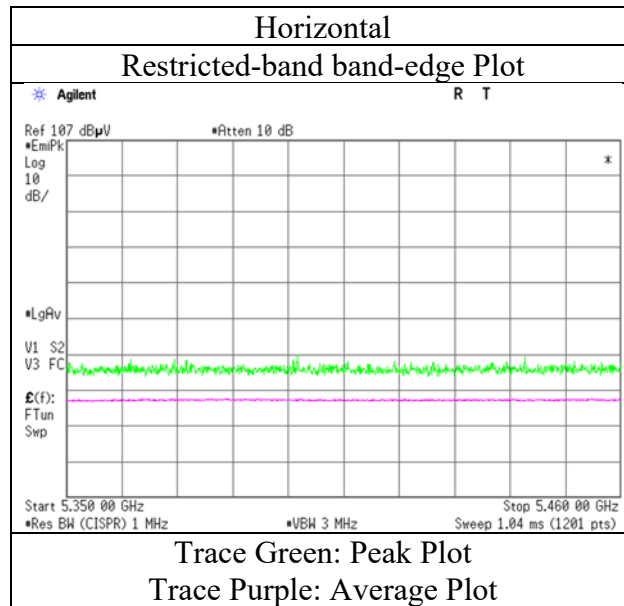
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## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 27, 2016  |
| Temperature / Humidity | 25 deg. C / 46 % RH |
| Engineer               | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | Tx 11n-20 5240 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

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1 1 1 3  
Date September 26, 2016 September 27, 2016 September 28, 2019 October 1, 2019  
Temperature / Humidity 25 deg. C / 46 % RH 25 deg. C / 46 % RH 24 deg. C / 47 % RH 24 deg. C / 53 % RH  
Engineer Hiromasa Sato Hiromasa Sato Kazuya Noda Hiromasa Sato  
(1 GHz – 6.4 GHz) (6.4 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 40 GHz)  
Mode Tx 11n-20 5745 MHz

### (above 1GHz 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.    | 7660.000        | PK       | 50.91          | 37.34           | 8.11      | 43.33     | 2.36                 | 55.39           | 73.9           | 18.5        | 368         | 307          |            |
| Hori.    | 11490.000       | PK       | 44.27          | 40.15           | 10.55     | 39.44     | 2.36                 | 57.89           | 73.9           | 16.0        | 241         | 263          |            |
| Hori.    | 22980.000       | PK       | 44.97          | 40.46           | 15.01     | 47.59     | -9.54                | 43.31           | 73.9           | 30.5        | 146         | 25           |            |
| Hori.    | 7660.000        | AV       | 38.13          | 37.34           | 8.11      | 43.33     | 2.36                 | 42.61           | 53.9           | 11.2        | 368         | 307          | VBW:470 Hz |
| Hori.    | 11490.000       | AV       | 34.18          | 40.15           | 10.55     | 39.44     | 2.36                 | 47.80           | 53.9           | 6.1         | 241         | 263          | VBW:470 Hz |
| Hori.    | 22980.000       | AV       | 36.45          | 40.46           | 15.01     | 47.59     | -9.54                | 34.79           | 53.9           | 19.1        | 146         | 25           | VBW:470 Hz |
| Vert.    | 7660.000        | PK       | 50.90          | 37.34           | 8.11      | 43.33     | 2.36                 | 55.38           | 73.9           | 18.5        | 250         | 0            |            |
| Vert.    | 11490.000       | PK       | 45.39          | 40.15           | 10.55     | 39.44     | 2.36                 | 59.01           | 73.9           | 14.8        | 173         | 302          |            |
| Vert.    | 22980.000       | PK       | 46.41          | 40.46           | 15.01     | 47.59     | -9.54                | 44.75           | 73.9           | 29.1        | 148         | 350          |            |
| Vert.    | 7660.000        | AV       | 39.47          | 37.34           | 8.11      | 43.33     | 2.36                 | 43.95           | 53.9           | 9.9         | 250         | 0            | VBW:470 Hz |
| Vert.    | 11490.000       | AV       | 34.03          | 40.15           | 10.55     | 39.44     | 2.36                 | 47.65           | 53.9           | 6.2         | 173         | 302          | VBW:470 Hz |
| Vert.    | 22980.000       | AV       | 37.86          | 40.46           | 15.01     | 47.59     | -9.54                | 36.20           | 53.9           | 17.7        | 148         | 350          | VBW:470 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 5650.000        | PK       | 44.79          | 32.43           | 17.06     | 39.90     | 2.36                 | 56.74           | -38.48              | -27.0       | 11.4        | 254         | 323          |        |
| Hori.    | 5700.000        | PK       | 45.18          | 32.57           | 17.08     | 39.94     | 2.36                 | 57.25           | -37.97              | 10.0        | 47.9        | 254         | 323          |        |
| Hori.    | 5720.000        | PK       | 45.89          | 32.63           | 17.08     | 39.95     | 2.36                 | 58.01           | -37.21              | 15.6        | 52.8        | 254         | 323          |        |
| Hori.    | 5725.000        | PK       | 51.85          | 32.65           | 17.09     | 39.96     | 2.36                 | 63.99           | -31.23              | 27.0        | 58.2        | 254         | 323          |        |
| Hori.    | 17235.000       | PK       | 44.96          | 41.83           | 13.33     | 38.97     | -9.54                | 51.61           | -43.61              | -27.0       | 16.6        | 171         | 8            |        |
| Vert.    | 5650.000        | PK       | 44.84          | 32.43           | 17.06     | 39.90     | 2.36                 | 56.79           | -38.43              | -27.0       | 11.4        | 218         | 320          |        |
| Vert.    | 5700.000        | PK       | 44.62          | 32.57           | 17.08     | 39.94     | 2.36                 | 56.69           | -38.53              | 10.0        | 48.5        | 218         | 320          |        |
| Vert.    | 5720.000        | PK       | 45.22          | 32.63           | 17.08     | 39.95     | 2.36                 | 57.34           | -37.88              | 15.6        | 53.4        | 218         | 320          |        |
| Vert.    | 5725.000        | PK       | 47.71          | 32.65           | 17.09     | 39.96     | 2.36                 | 59.85           | -35.37              | 27.0        | 62.3        | 218         | 320          |        |
| Vert.    | 17235.000       | PK       | 44.93          | 41.83           | 13.33     | 38.97     | -9.54                | 51.58           | -43.64              | -27.0       | 16.6        | 171         | 8            |        |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

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**Shonan EMC Lab.**

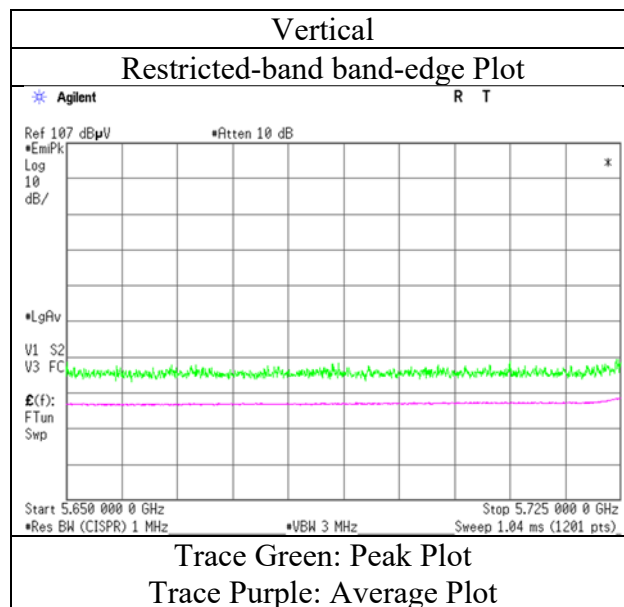
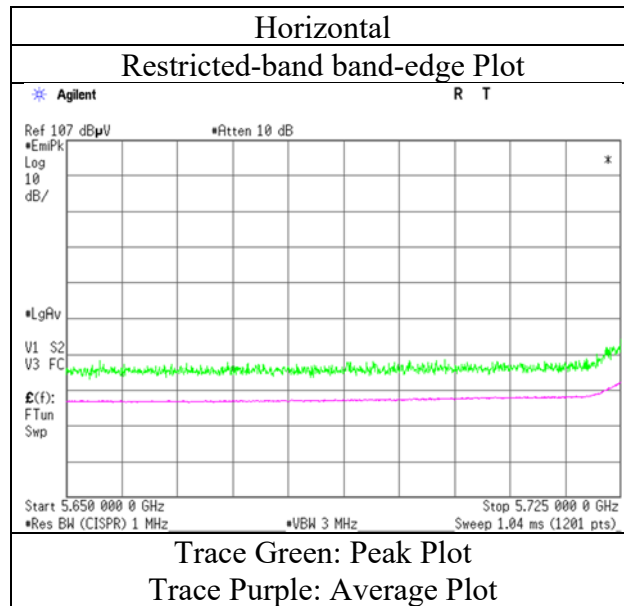
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Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 26, 2016  |
| Temperature / Humidity | 25 deg. C / 46 % RH |
| Engineer               | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | 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.

## Radiated Spurious Emission

|                        |                     |                     |                     |
|------------------------|---------------------|---------------------|---------------------|
| Report No.             | 12952598S-C-R1      |                     |                     |
| Test place             | Shonan EMC Lab.     |                     |                     |
| Semi Anechoic Chamber  | 1                   | 1                   | 3                   |
| Date                   | September 27, 2016  | September 28, 2019  | October 1, 2019     |
| Temperature / Humidity | 25 deg. C / 46 % RH | 24 deg. C / 47 % RH | 24 deg. C / 53 % RH |
| Engineer               | Hiromasa Sato       | Kazuya Noda         | Hiromasa Sato       |
|                        | (1 GHz – 13 GHz)    | (13 GHz – 18 GHz)   | (18 GHz – 40 GHz)   |
| Mode                   | Tx 11n-20 5785 MHz  |                     |                     |

### (above 1GHz 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.    | 7713.334        | PK       | 51.42          | 37.37           | 8.12      | 43.27     | 2.36                 | 56.00           | 73.9           | 17.9        | 309         | 358          |            |
| Hori.    | 11570.000       | PK       | 44.60          | 40.07           | 10.58     | 39.38     | 2.36                 | 58.23           | 73.9           | 15.6        | 281         | 246          |            |
| Hori.    | 7713.334        | AV       | 39.94          | 37.37           | 8.12      | 43.27     | 2.36                 | 44.52           | 53.9           | 9.3         | 309         | 358          | VBW:470 Hz |
| Hori.    | 11570.000       | AV       | 34.11          | 40.07           | 10.58     | 39.38     | 2.36                 | 47.74           | 53.9           | 6.1         | 281         | 246          | VBW:470 Hz |
| Vert.    | 7713.334        | PK       | 50.95          | 37.37           | 8.12      | 43.27     | 2.36                 | 55.53           | 73.9           | 18.3        | 176         | 100          |            |
| Vert.    | 11570.000       | PK       | 44.50          | 40.07           | 10.58     | 39.38     | 2.36                 | 58.13           | 73.9           | 15.7        | 166         | 283          |            |
| Vert.    | 7713.334        | AV       | 38.99          | 37.37           | 8.12      | 43.27     | 2.36                 | 43.57           | 53.9           | 10.3        | 176         | 100          | VBW:470 Hz |
| Vert.    | 11570.000       | AV       | 34.03          | 40.07           | 10.58     | 39.38     | 2.36                 | 47.66           | 53.9           | 6.2         | 166         | 283          | VBW:470 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 17355.000       | PK       | 45.77          | 42.90           | 13.32     | 38.60     | -9.54                | 53.85           | -41.37              | -27.0       | 14.3        | 176         | 35           |        |
| Hori.    | 23140.000       | PK       | 45.14          | 40.44           | 15.10     | 47.39     | -9.54                | 43.75           | -51.47              | -27.0       | 24.4        | 143         | 25           |        |
| Vert.    | 17355.000       | PK       | 45.82          | 42.90           | 13.32     | 38.60     | -9.54                | 53.90           | -41.32              | -27.0       | 14.3        | 111         | 357          |        |
| Vert.    | 23140.000       | PK       | 45.40          | 40.44           | 15.10     | 47.39     | -9.54                | 44.01           | -51.21              | -27.0       | 24.2        | 145         | 32           |        |

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

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

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

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

13 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

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1 1 1 3  
Date September 26, 2016 September 27, 2016 September 28, 2019 October 1, 2019  
Temperature / Humidity 25 deg. C / 46 % RH 25 deg. C / 46 % RH 24 deg. C / 47 % RH 24 deg. C / 53 % RH  
Engineer Hiromasa Sato Hiromasa Sato Kazuya Noda Hiromasa Sato  
(1 GHz – 6.4 GHz) (6.4 GHz – 13 GHz) (13 GHz – 18 GHz) (18 GHz – 40 GHz)  
Mode Tx 11n-20 5825 MHz

### (above 1GHz 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.    | 7766.667        | PK       | 51.89          | 37.45           | 8.13      | 43.22     | 2.36                 | 56.61           | 73.9           | 17.2        | 193         | 346          |            |
| Hori.    | 11650.000       | PK       | 44.24          | 39.84           | 10.59     | 39.33     | 2.36                 | 57.70           | 73.9           | 16.2        | 265         | 277          |            |
| Hori.    | 7766.667        | AV       | 39.66          | 37.45           | 8.13      | 43.22     | 2.36                 | 44.38           | 53.9           | 9.5         | 193         | 346          | VBW:470 Hz |
| Hori.    | 11650.000       | AV       | 33.71          | 39.84           | 10.59     | 39.33     | 2.36                 | 47.17           | 53.9           | 6.7         | 265         | 277          | VBW:470 Hz |
| Vert.    | 7766.667        | PK       | 50.29          | 37.45           | 8.13      | 43.22     | 2.36                 | 55.01           | 73.9           | 18.8        | 268         | 53           |            |
| Vert.    | 11650.000       | PK       | 44.91          | 39.84           | 10.59     | 39.33     | 2.36                 | 58.37           | 73.9           | 15.5        | 173         | 308          |            |
| Vert.    | 7766.667        | AV       | 39.30          | 37.45           | 8.13      | 43.22     | 2.36                 | 44.02           | 53.9           | 9.8         | 268         | 53           | VBW:470 Hz |
| Vert.    | 11650.000       | AV       | 33.65          | 39.84           | 10.59     | 39.33     | 2.36                 | 47.11           | 53.9           | 6.7         | 173         | 308          | VBW:470 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 5850.000        | PK       | 46.35          | 33.01           | 17.13     | 40.05     | 2.36                 | 58.80           | -36.42              | 27.0        | 63.4        | 244         | 325          |        |
| Hori.    | 5855.000        | PK       | 46.83          | 33.02           | 17.13     | 40.06     | 2.36                 | 59.28           | -35.94              | 15.6        | 51.5        | 244         | 325          |        |
| Hori.    | 5875.000        | PK       | 46.23          | 33.06           | 17.14     | 40.07     | 2.36                 | 58.72           | -36.50              | 10.0        | 46.5        | 244         | 325          |        |
| Hori.    | 5925.000        | PK       | 45.44          | 33.16           | 17.16     | 40.11     | 2.36                 | 58.01           | -37.21              | -27.0       | 10.2        | 244         | 325          |        |
| Hori.    | 17475.000       | PK       | 44.12          | 43.72           | 13.31     | 38.24     | -9.54                | 53.37           | -41.85              | -27.0       | 14.8        | 147         | 20           |        |
| Hori.    | 23300.000       | PK       | 45.11          | 40.46           | 15.22     | 47.21     | -9.54                | 44.04           | -51.18              | -27.0       | 24.1        | 301         | 34           |        |
| Vert.    | 5850.000        | PK       | 44.97          | 33.01           | 17.13     | 40.05     | 2.36                 | 57.42           | -37.80              | 27.0        | 64.8        | 312         | 320          |        |
| Vert.    | 5855.000        | PK       | 44.71          | 33.02           | 17.13     | 40.06     | 2.36                 | 57.16           | -38.06              | 15.6        | 53.6        | 312         | 320          |        |
| Vert.    | 5875.000        | PK       | 45.50          | 33.06           | 17.14     | 40.07     | 2.36                 | 57.99           | -37.23              | 10.0        | 47.2        | 312         | 320          |        |
| Vert.    | 5925.000        | PK       | 45.91          | 33.16           | 17.16     | 40.11     | 2.36                 | 58.48           | -36.74              | -27.0       | 9.7         | 312         | 320          |        |
| Vert.    | 17475.000       | PK       | 44.27          | 43.72           | 13.31     | 38.24     | -9.54                | 53.52           | -41.70              | -27.0       | 14.7        | 120         | 356          |        |
| Vert.    | 23300.000       | PK       | 47.33          | 40.46           | 15.22     | 47.21     | -9.54                | 46.26           | -48.96              | -27.0       | 21.9        | 218         | 14           |        |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

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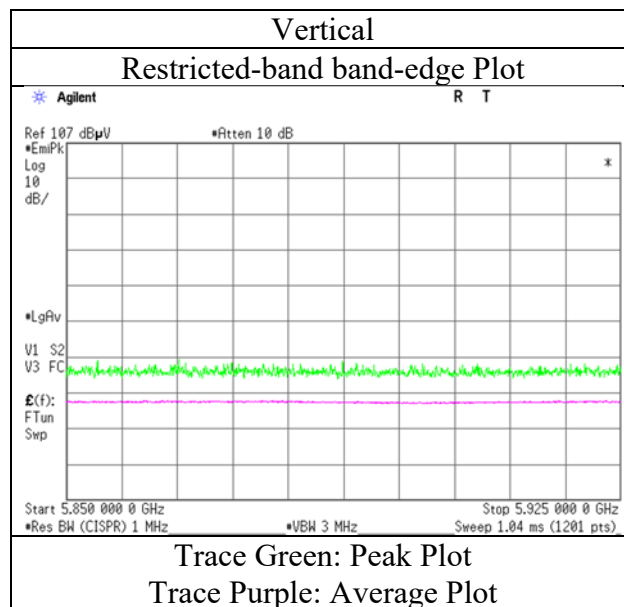
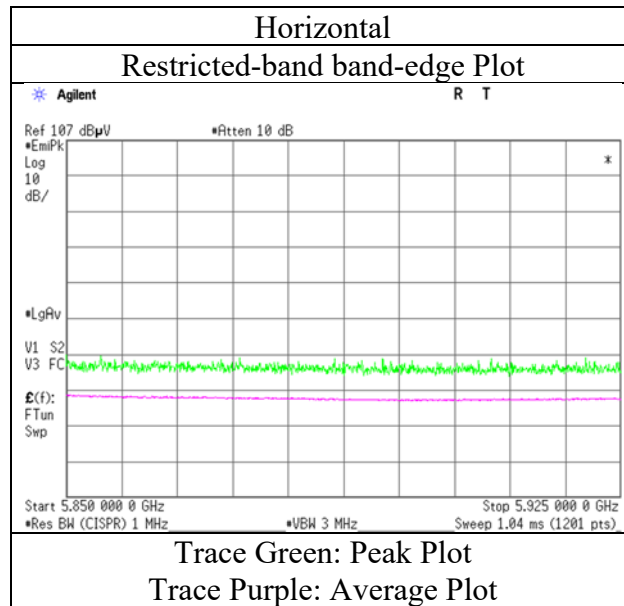
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 26, 2016  |
| Temperature / Humidity | 25 deg. C / 46 % RH |
| Engineer               | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | 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.

## Radiated Spurious Emission

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date September 26, 2016  
Temperature / Humidity 25 deg. C / 46 % RH  
Engineer Hiromasa Sato  
(1 GHz – 6.4 GHz)  
Mode Tx 11ac-20 5180 MHz

### (above 1GHz 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.    | 5150.000           | PK       | 46.86             | 32.30              | 16.89        | 39.73        | 2.36                    | 58.68              | 73.9              | 15.2           | 241            | 327             | VBW:510 Hz |
| Hori.    | 5150.000           | AV       | 34.77             | 32.30              | 16.89        | 39.73        | 2.36                    | 46.59              | 53.9              | 7.3            | 241            | 327             |            |
| Vert.    | 5150.000           | PK       | 45.60             | 32.30              | 16.89        | 39.73        | 2.36                    | 57.42              | 73.9              | 16.4           | 252            | 327             | VBW:510 Hz |
| Vert.    | 5150.000           | AV       | 34.57             | 32.30              | 16.89        | 39.73        | 2.36                    | 46.39              | 53.9              | 7.5            | 252            | 327             |            |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

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**Shonan EMC Lab.**

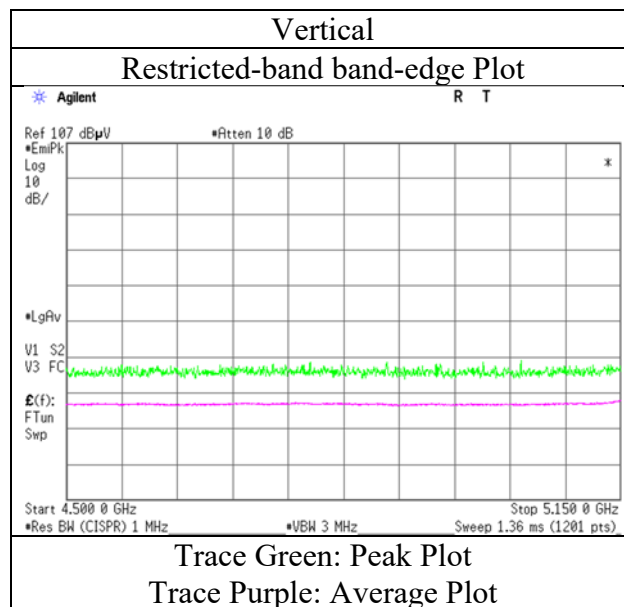
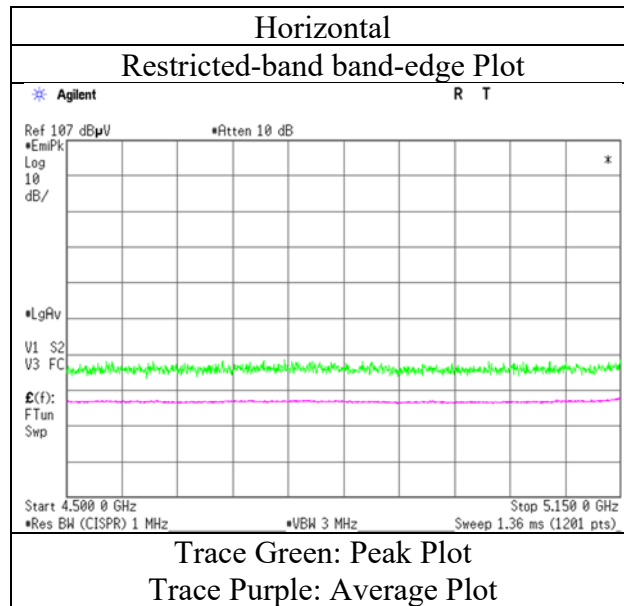
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 26, 2016  |
| Temperature / Humidity | 25 deg. C / 46 % RH |
| Engineer               | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | Tx 11ac-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.

## Radiated Spurious Emission

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date September 27, 2016  
Temperature / Humidity 25 deg. C / 46 % RH  
Engineer Hiromasa Sato  
(1 GHz – 6.4 GHz)  
Mode Tx 11ac-20 5240 MHz

### (above 1GHz 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       | 44.86             | 31.99              | 16.95        | 39.76        | 2.36                    | 56.40              | 73.9              | 17.5           | 198            | 304             | VBW:510 Hz |
| Hori.    | 5350.000           | AV       | 33.84             | 31.99              | 16.95        | 39.76        | 2.36                    | 45.38              | 53.9              | 8.5            | 198            | 304             |            |
| Vert.    | 5350.000           | PK       | 44.16             | 31.99              | 16.95        | 39.76        | 2.36                    | 55.70              | 73.9              | 18.2           | 248            | 325             | VBW:510 Hz |
| Vert.    | 5350.000           | AV       | 33.27             | 31.99              | 16.95        | 39.76        | 2.36                    | 44.81              | 53.9              | 9.0            | 248            | 325             |            |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

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**Shonan EMC Lab.**

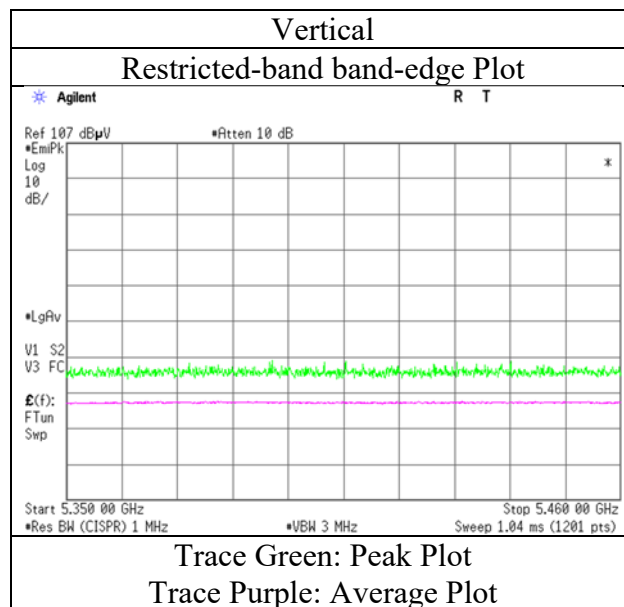
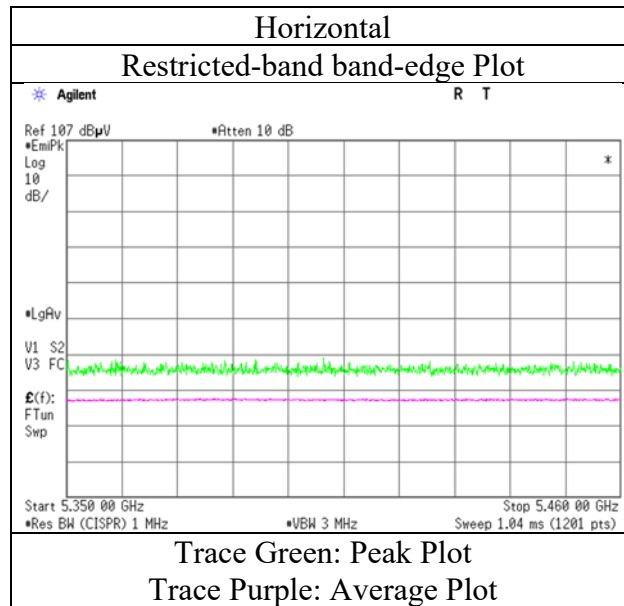
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## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 27, 2016  |
| Temperature / Humidity | 25 deg. C / 46 % RH |
| Engineer               | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | Tx 11ac-20 5240 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

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date September 26, 2016  
Temperature / Humidity 25 deg. C / 46 % RH  
Engineer Hiromasa Sato  
(1 GHz – 6.4 GHz)  
Mode Tx 11ac-20 5745 MHz

### (Calculation) (above 1GHz 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 (ERP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|--------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5650.000        | PK       | 45.18          | 32.43           | 17.06     | 39.90     | 2.36                 | 57.13           | -38.09             | -27.0       | <b>11.0</b> | 252         | 326          |        |
| Hori.    | 5700.000        | PK       | 45.80          | 32.57           | 17.08     | 39.94     | 2.36                 | 57.87           | -37.35             | 10.0        | 47.3        | 252         | 326          |        |
| Hori.    | 5720.000        | PK       | 46.75          | 32.63           | 17.08     | 39.95     | 2.36                 | 58.87           | -36.35             | 15.6        | 51.9        | 252         | 326          |        |
| Hori.    | 5725.000        | PK       | 53.50          | 32.65           | 17.09     | 39.96     | 2.36                 | 65.64           | -29.58             | 27.0        | 56.5        | 252         | 326          |        |
| Vert.    | 5650.000        | PK       | 44.69          | 32.43           | 17.06     | 39.90     | 2.36                 | 56.64           | -38.58             | -27.0       | 11.5        | 222         | 318          |        |
| Vert.    | 5700.000        | PK       | 45.19          | 32.57           | 17.08     | 39.94     | 2.36                 | 57.26           | -37.96             | 10.0        | 47.9        | 222         | 318          |        |
| Vert.    | 5720.000        | PK       | 44.44          | 32.63           | 17.08     | 39.95     | 2.36                 | 56.56           | -38.66             | 15.6        | 54.2        | 222         | 318          |        |
| Vert.    | 5725.000        | PK       | 47.42          | 32.65           | 17.09     | 39.96     | 2.36                 | 59.56           | -35.66             | 27.0        | 62.6        | 222         | 318          |        |

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

Result(ERP[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 20dB).

Distance factor : 1 GHz - 13 GHz : 20log (3.94 m / 3.0 m) = 2.36 dB

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

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**Shonan EMC Lab.**

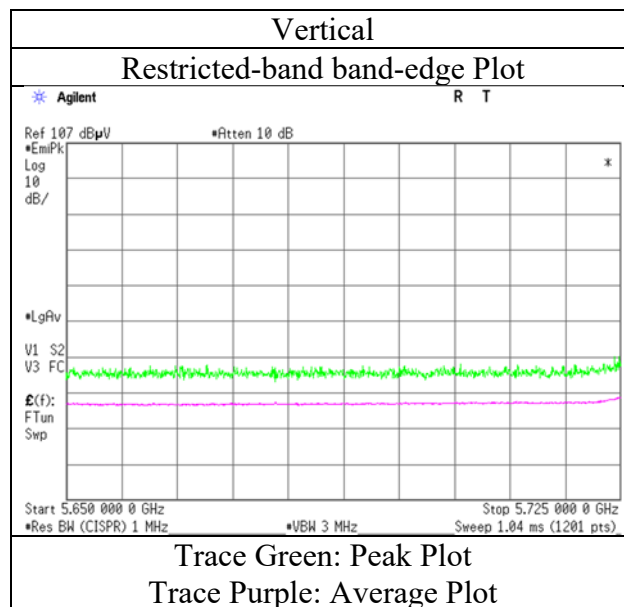
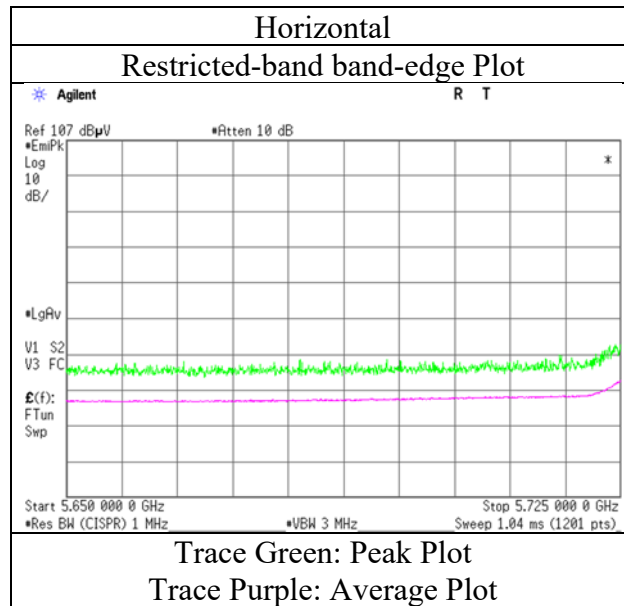
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 26, 2016  |
| Temperature / Humidity | 25 deg. C / 46 % RH |
| Engineer               | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | Tx 11ac-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.

## Radiated Spurious Emission

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date September 26, 2016  
Temperature / Humidity 25 deg. C / 46 % RH  
Engineer Hiromasa Sato  
(1 GHz – 6.4 GHz)  
Mode Tx 11ac-20 5825 MHz

### (Calculation) (above 1GHz 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 (ERP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|--------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5850.000        | PK       | 47.74          | 33.01           | 17.13     | 40.05     | 2.36                 | 60.19           | -35.03             | 27.0        | 62.0        | 256         | 329          |        |
| Hori.    | 5855.000        | PK       | 46.02          | 33.02           | 17.13     | 40.06     | 2.36                 | 58.47           | -36.75             | 15.6        | 52.3        | 256         | 329          |        |
| Hori.    | 5875.000        | PK       | 46.19          | 33.06           | 17.14     | 40.07     | 2.36                 | 58.68           | -36.54             | 10.0        | 46.5        | 256         | 329          |        |
| Hori.    | 5925.000        | PK       | 45.26          | 33.16           | 17.16     | 40.11     | 2.36                 | 57.83           | -37.39             | -27.0       | <b>10.3</b> | 256         | 329          |        |
| Vert.    | 5850.000        | PK       | 44.53          | 33.01           | 17.13     | 40.05     | 2.36                 | 56.98           | -38.24             | 27.0        | 65.2        | 235         | 313          |        |
| Vert.    | 5855.000        | PK       | 44.23          | 33.02           | 17.13     | 40.06     | 2.36                 | 56.68           | -38.54             | 15.6        | 54.1        | 235         | 313          |        |
| Vert.    | 5875.000        | PK       | 44.33          | 33.06           | 17.14     | 40.07     | 2.36                 | 56.82           | -38.40             | 10.0        | 48.4        | 235         | 313          |        |
| Vert.    | 5925.000        | PK       | 44.71          | 33.16           | 17.16     | 40.11     | 2.36                 | 57.28           | -37.94             | -27.0       | 10.9        | 235         | 313          |        |

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

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

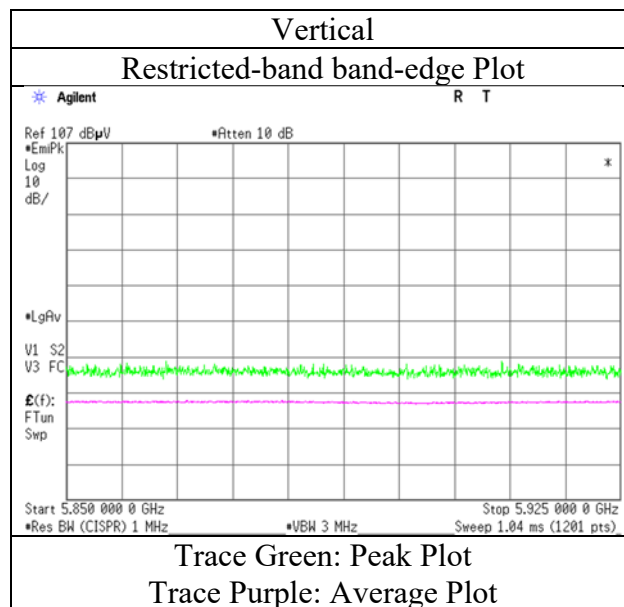
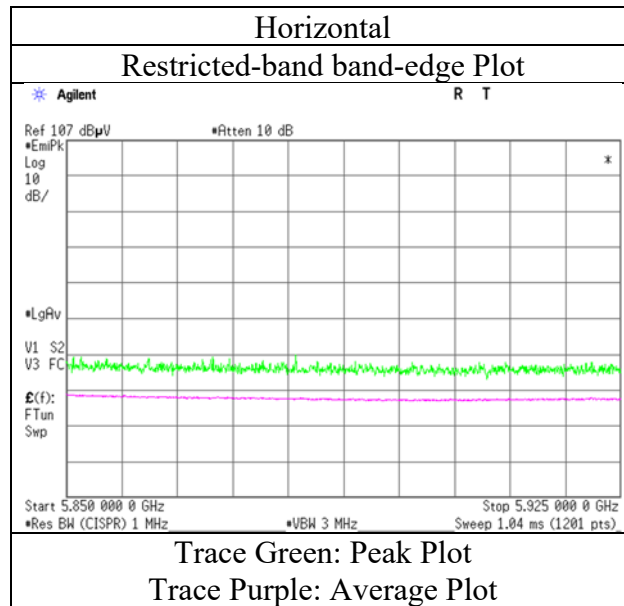
\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor : 1 GHz - 13 GHz : 20log (3.94 m / 3.0 m) = 2.36 dB

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

## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 26, 2016  |
| Temperature / Humidity | 25 deg. C / 46 % RH |
| Engineer               | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | Tx 11ac-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.

## Radiated Spurious Emission

|                        |                     |                     |                     |
|------------------------|---------------------|---------------------|---------------------|
| Report No.             | 12952598S-C-R1      |                     |                     |
| Test place             | Shonan EMC Lab.     |                     |                     |
| Semi Anechoic Chamber  | 1                   | 1                   | 3                   |
| Date                   | September 27, 2016  | September 28, 2019  | October 1, 2019     |
| Temperature / Humidity | 22 deg. C / 50 % RH | 24 deg. C / 47 % RH | 24 deg. C / 53 % RH |
| Engineer               | Kazuya Noda         | Kazuya Noda         | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   | (6.4 GHz – 18 GHz)  | (18 GHz – 40 GHz)   |
| Mode                   | Tx 11n-40 5190 MHz  |                     |                     |

### (above 1GHz 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       | 50.32          | 32.30           | 16.89     | 39.73     | 2.36                 | 62.14           | 73.9           | 11.7        | 197         | 307          |            |
| Hori.    | 15570.000       | PK       | 45.81          | 38.63           | 12.69     | 39.22     | -9.54                | 48.37           | 73.9           | 25.5        | 137         | 26           |            |
| Hori.    | 20760.000       | PK       | 46.82          | 40.31           | 14.18     | 47.31     | -9.54                | 44.46           | 73.9           | 29.4        | 151         | 138          |            |
| Hori.    | 5150.000        | AV       | 37.75          | 32.30           | 16.89     | 39.73     | 2.36                 | 49.57           | 53.9           | 4.3         | 197         | 307          | VBW:820 Hz |
| Hori.    | 15570.000       | AV       | 35.04          | 38.63           | 12.69     | 39.22     | -9.54                | 37.60           | 53.9           | 16.3        | 137         | 26           | VBW:820 Hz |
| Hori.    | 20760.000       | AV       | 41.70          | 40.31           | 14.18     | 47.31     | -9.54                | 39.34           | 53.9           | 14.5        | 151         | 138          | VBW:820 Hz |
| Vert.    | 5150.000        | PK       | 50.29          | 32.30           | 16.89     | 39.73     | 2.36                 | 62.11           | 73.9           | 11.7        | 229         | 324          |            |
| Vert.    | 15570.000       | PK       | 45.67          | 38.63           | 12.69     | 39.22     | -9.54                | 48.23           | 73.9           | 25.6        | 131         | 355          |            |
| Vert.    | 20760.000       | PK       | 47.86          | 40.31           | 14.18     | 47.31     | -9.54                | 45.50           | 73.9           | 28.4        | 151         | 344          |            |
| Vert.    | 5150.000        | AV       | 37.47          | 32.30           | 16.89     | 39.73     | 2.36                 | 49.29           | 53.9           | 4.6         | 229         | 324          | VBW:820 Hz |
| Vert.    | 15570.000       | AV       | 34.95          | 38.63           | 12.69     | 39.22     | -9.54                | 37.51           | 53.9           | 16.3        | 131         | 355          | VBW:820 Hz |
| Vert.    | 20760.000       | AV       | 43.66          | 40.31           | 14.18     | 47.31     | -9.54                | 41.30           | 53.9           | 12.6        | 151         | 344          | VBW:820 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 6920.000        | PK       | 56.60          | 36.02           | 7.71      | 42.66     | 2.36                 | 60.03           | -35.19              | -27.0       | 8.1         | 226         | 296          |        |
| Hori.    | 10380.000       | PK       | 45.78          | 39.20           | 9.92      | 39.97     | 2.36                 | 57.29           | -37.93              | -27.0       | 10.9        | 161         | 229          |        |
| Vert.    | 6920.000        | PK       | 53.76          | 36.02           | 7.71      | 42.66     | 2.36                 | 57.19           | -38.03              | -27.0       | 11.0        | 333         | 261          |        |
| Vert.    | 10380.000       | PK       | 46.61          | 39.20           | 9.92      | 39.97     | 2.36                 | 58.12           | -37.10              | -27.0       | 10.1        | 134         | 302          |        |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

**UL Japan, Inc.**

**Shonan EMC Lab.**

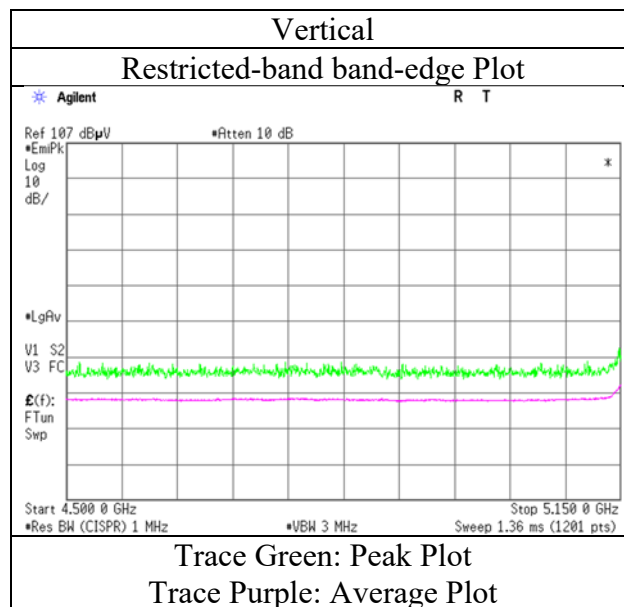
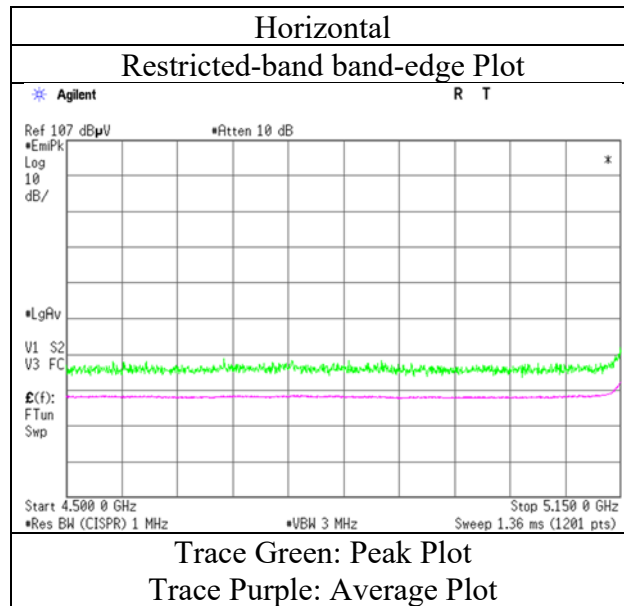
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 27, 2016  |
| Temperature / Humidity | 22 deg. C / 50 % RH |
| Engineer               | Kazuya Noda         |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | 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.

**UL Japan, Inc.**

**Shonan EMC Lab.**

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

Telephone : +81 463 50 6400

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## Radiated Spurious Emission

|                        |                     |                     |                     |
|------------------------|---------------------|---------------------|---------------------|
| Report No.             | 12952598S-C-R1      |                     |                     |
| Test place             | Shonan EMC Lab.     |                     |                     |
| Semi Anechoic Chamber  | 1                   | 1                   | 3                   |
| Date                   | September 27, 2016  | September 28, 2019  | October 1, 2019     |
| Temperature / Humidity | 22 deg. C / 50 % RH | 24 deg. C / 47 % RH | 24 deg. C / 53 % RH |
| Engineer               | Kazuya Noda         | Kazuya Noda         | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   | (6.4 GHz – 18 GHz)  | (18 GHz – 40 GHz)   |
| Mode                   | Tx 11n-40 5230 MHz  |                     |                     |

### (above 1GHz 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       | 46.09          | 31.99           | 16.95     | 39.76     | 2.36                 | 57.63           | 73.9           | 16.2        | 248         | 325          |            |
| Hori.    | 15690.000       | PK       | 45.51          | 38.32           | 12.73     | 39.38     | -9.54                | 47.64           | 73.9           | 26.2        | 133         | 29           |            |
| Hori.    | 20920.000       | PK       | 46.28          | 40.29           | 14.21     | 47.22     | -9.54                | 44.02           | 73.9           | 29.8        | 158         | 52           |            |
| Hori.    | 5350.000        | AV       | 34.17          | 31.99           | 16.95     | 39.76     | 2.36                 | 45.71           | 53.9           | 8.1         | 248         | 325          | VBW:820 Hz |
| Hori.    | 15690.000       | AV       | 34.40          | 38.32           | 12.73     | 39.38     | -9.54                | 36.53           | 53.9           | 17.3        | 133         | 29           | VBW:820 Hz |
| Hori.    | 20920.000       | AV       | 41.53          | 40.29           | 14.21     | 47.22     | -9.54                | 39.27           | 53.9           | 14.6        | 158         | 52           | VBW:820 Hz |
| Vert.    | 5350.000        | PK       | 45.78          | 31.99           | 16.95     | 39.76     | 2.36                 | 57.32           | 73.9           | 16.5        | 236         | 323          |            |
| Vert.    | 15690.000       | PK       | 46.02          | 38.32           | 12.73     | 39.38     | -9.54                | 48.15           | 73.9           | 25.7        | 109         | 357          |            |
| Vert.    | 20920.000       | PK       | 46.65          | 40.29           | 14.21     | 47.22     | -9.54                | 44.39           | 73.9           | 29.5        | 196         | 15           |            |
| Vert.    | 5350.000        | AV       | 34.10          | 31.99           | 16.95     | 39.76     | 2.36                 | 45.64           | 53.9           | 8.2         | 236         | 323          | VBW:820 Hz |
| Vert.    | 15690.000       | AV       | 34.56          | 38.32           | 12.73     | 39.38     | -9.54                | 36.69           | 53.9           | 17.2        | 109         | 357          | VBW:820 Hz |
| Vert.    | 20920.000       | AV       | 42.31          | 40.29           | 14.21     | 47.22     | -9.54                | 40.05           | 53.9           | 13.8        | 196         | 15           | VBW:820 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 6973.333        | PK       | 55.85          | 36.37           | 7.72      | 42.57     | 2.36                 | 59.73           | -35.49              | -27.0       | 8.4         | 229         | 296          |        |
| Hori.    | 10460.000       | PK       | 46.62          | 39.44           | 9.95      | 40.14     | 2.36                 | 58.23           | -36.99              | -27.0       | 9.9         | 107         | 229          |        |
| Vert.    | 6973.333        | PK       | 53.46          | 36.37           | 7.72      | 42.57     | 2.36                 | 57.34           | -37.88              | -27.0       | 10.8        | 332         | 262          |        |
| Vert.    | 10460.000       | PK       | 46.31          | 39.44           | 9.95      | 40.14     | 2.36                 | 57.92           | -37.30              | -27.0       | 10.3        | 111         | 306          |        |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

**UL Japan, Inc.**

**Shonan EMC Lab.**

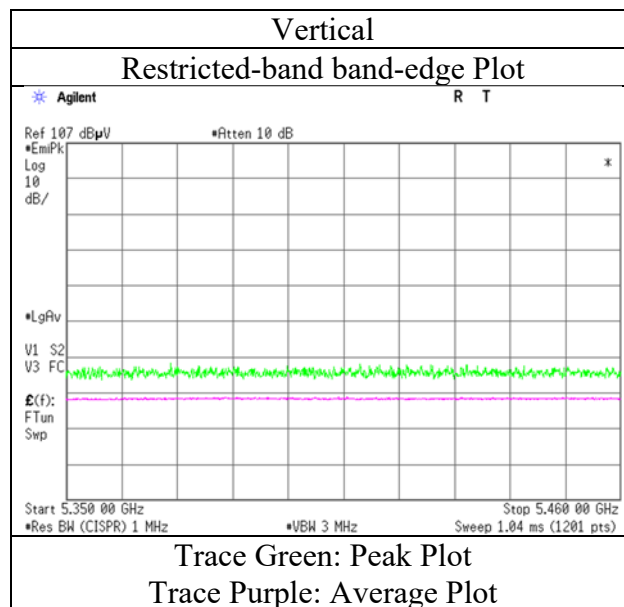
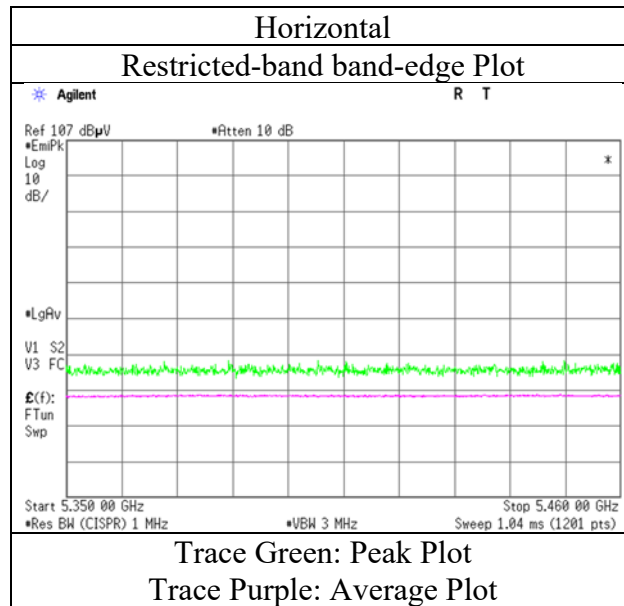
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 27, 2016  |
| Temperature / Humidity | 22 deg. C / 50 % RH |
| Engineer               | Kazuya Noda         |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | Tx 11n-40 5230 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

|                        |                     |                     |                     |
|------------------------|---------------------|---------------------|---------------------|
| Report No.             | 12952598S-C-R1      |                     |                     |
| Test place             | Shonan EMC Lab.     |                     |                     |
| Semi Anechoic Chamber  | 1                   | 1                   | 3                   |
| Date                   | September 27, 2016  | September 28, 2019  | October 1, 2019     |
| Temperature / Humidity | 22 deg. C / 50 % RH | 24 deg. C / 47 % RH | 24 deg. C / 53 % RH |
| Engineer               | Kazuya Noda         | Kazuya Noda         | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   | (6.4 GHz – 18 GHz)  | (18 GHz – 40 GHz)   |
| Mode                   | Tx 11n-40 5755 MHz  |                     |                     |

### (above 1GHz 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.    | 7673.333        | PK       | 50.73          | 37.35           | 8.12      | 43.32     | 2.36                 | 55.24           | 73.9           | 18.6        | 201         | 2            |            |
| Hori.    | 11510.000       | PK       | 45.33          | 40.16           | 10.56     | 39.42     | 2.36                 | 58.99           | 73.9           | 14.9        | 159         | 224          |            |
| Hori.    | 23020.000       | PK       | 45.77          | 40.46           | 15.02     | 47.54     | -9.54                | 44.17           | 73.9           | 29.7        | 146         | 25           |            |
| Hori.    | 7673.333        | AV       | 39.96          | 37.35           | 8.12      | 43.32     | 2.36                 | 44.47           | 53.9           | 9.4         | 201         | 2            | VBW:820 Hz |
| Hori.    | 11510.000       | AV       | 33.74          | 40.16           | 10.56     | 39.42     | 2.36                 | 47.40           | 53.9           | 6.5         | 159         | 224          | VBW:820 Hz |
| Hori.    | 23020.000       | AV       | 36.05          | 40.46           | 15.02     | 47.54     | -9.54                | 34.45           | 53.9           | 19.4        | 146         | 25           | VBW:820 Hz |
| Vert.    | 7673.333        | PK       | 50.58          | 37.35           | 8.12      | 43.32     | 2.36                 | 55.09           | 73.9           | 18.8        | 248         | 276          |            |
| Vert.    | 11510.000       | PK       | 45.28          | 40.16           | 10.56     | 39.42     | 2.36                 | 58.94           | 73.9           | 14.9        | 127         | 305          |            |
| Vert.    | 23020.000       | PK       | 45.14          | 40.46           | 15.02     | 47.54     | -9.54                | 43.54           | 73.9           | 30.3        | 178         | 348          |            |
| Vert.    | 7673.333        | AV       | 38.94          | 37.35           | 8.12      | 43.32     | 2.36                 | 43.45           | 53.9           | 10.4        | 248         | 276          | VBW:820 Hz |
| Vert.    | 11510.000       | AV       | 33.71          | 40.16           | 10.56     | 39.42     | 2.36                 | 47.37           | 53.9           | 6.5         | 127         | 305          | VBW:820 Hz |
| Vert.    | 23020.000       | AV       | 37.64          | 40.46           | 15.02     | 47.54     | -9.54                | 36.04           | 53.9           | 17.8        | 178         | 348          | VBW:820 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 5650.000        | PK       | 45.19          | 32.43           | 17.06     | 39.90     | 2.36                 | 57.14           | -38.08              | -27.0       | 11.0        | 212         | 329          |        |
| Hori.    | 5700.000        | PK       | 47.01          | 32.57           | 17.08     | 39.94     | 2.36                 | 59.08           | -36.14              | 10.0        | 46.1        | 212         | 329          |        |
| Hori.    | 5720.000        | PK       | 52.74          | 32.63           | 17.08     | 39.95     | 2.36                 | 64.86           | -30.36              | 15.6        | 45.9        | 212         | 329          |        |
| Hori.    | 5725.000        | PK       | 54.34          | 32.65           | 17.09     | 39.96     | 2.36                 | 66.48           | -28.74              | 27.0        | 55.7        | 212         | 329          |        |
| Hori.    | 17265.000       | PK       | 45.61          | 42.12           | 13.34     | 38.88     | -9.54                | 52.65           | -42.57              | -27.0       | 15.5        | 142         | 25           |        |
| Vert.    | 5650.000        | PK       | 45.56          | 32.43           | 17.06     | 39.90     | 2.36                 | 57.51           | -37.71              | -27.0       | 10.7        | 230         | 318          |        |
| Vert.    | 5700.000        | PK       | 45.68          | 32.57           | 17.08     | 39.94     | 2.36                 | 57.75           | -37.47              | 10.0        | 47.4        | 230         | 318          |        |
| Vert.    | 5720.000        | PK       | 46.15          | 32.63           | 17.08     | 39.95     | 2.36                 | 58.27           | -36.95              | 15.6        | 52.5        | 230         | 318          |        |
| Vert.    | 5725.000        | PK       | 47.21          | 32.65           | 17.09     | 39.96     | 2.36                 | 59.35           | -35.87              | 27.0        | 62.8        | 230         | 318          |        |
| Vert.    | 17265.000       | PK       | 45.51          | 42.12           | 13.34     | 38.88     | -9.54                | 52.55           | -42.67              | -27.0       | 15.6        | 109         | 355          |        |

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

Result(EIRP[dBm]) =  $10 \cdot \log \left( \left( \{ 10^{\frac{1}{2}} \cdot \text{Electric Field Strength [dBuV/m]} / 20 \} \cdot 10^{-6} \right) \cdot \text{Distance:3[m]}^2 \right) / 30 \cdot 10^3$

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

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

**UL Japan, Inc.**

**Shonan EMC Lab.**

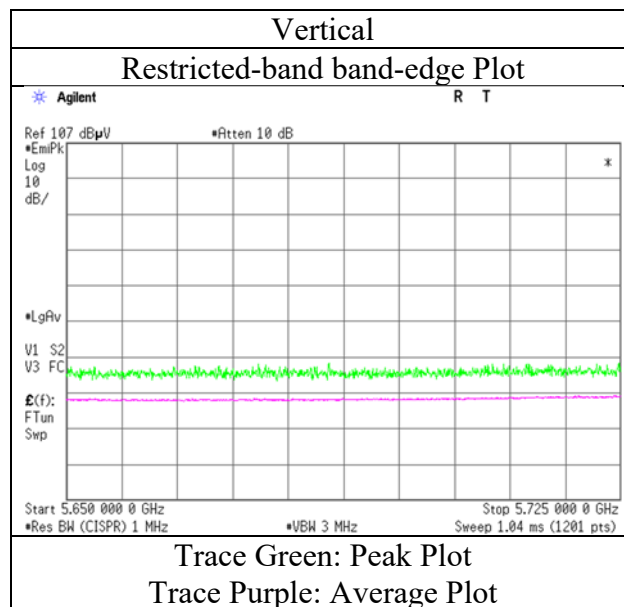
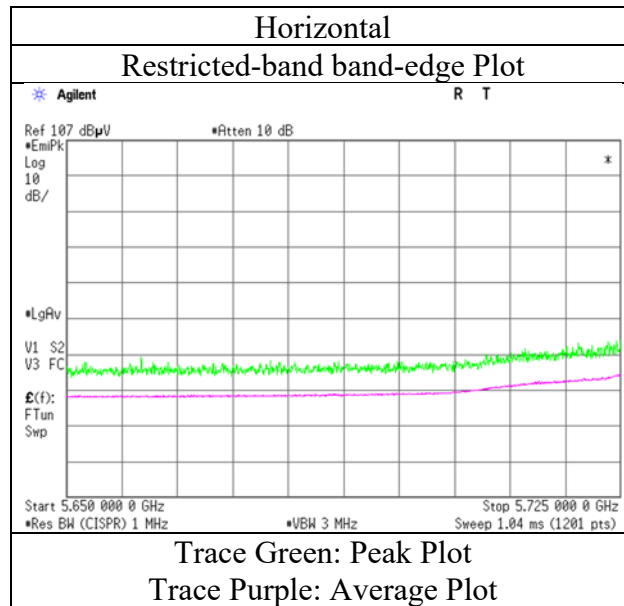
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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 27, 2016  |
| Temperature / Humidity | 22 deg. C / 50 % RH |
| Engineer               | Kazuya Noda         |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | 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.

## Radiated Spurious Emission

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1 1 3  
Date September 27, 2016 September 28, 2019 October 1, 2019  
Temperature / Humidity 22 deg. C / 50 % RH 24 deg. C / 47 % RH 24 deg. C / 53 % RH  
Engineer Kazuya Noda Kazuya Noda Hiromasa Sato  
(1 GHz – 6.4 GHz) (6.4 GHz – 18 GHz) (18 GHz – 40 GHz)  
Mode Tx 11n-40 5795 MHz

### (above 1GHz 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.    | 7726.667        | PK       | 50.78          | 37.39           | 8.12      | 43.26     | 2.36                 | 55.39           | 73.9           | 18.5        | 189         | 34           |            |
| Hori.    | 11590.000       | PK       | 45.33          | 40.03           | 10.58     | 39.37     | 2.36                 | 58.93           | 73.9           | 14.9        | 207         | 198          |            |
| Hori.    | 7726.667        | AV       | 39.72          | 37.39           | 8.12      | 43.26     | 2.36                 | 44.33           | 53.9           | 9.5         | 189         | 34           | VBW:820 Hz |
| Hori.    | 11590.000       | AV       | 33.61          | 40.03           | 10.58     | 39.37     | 2.36                 | 47.21           | 53.9           | 6.6         | 207         | 198          | VBW:820 Hz |
| Vert.    | 7726.667        | PK       | 50.43          | 37.39           | 8.12      | 43.26     | 2.36                 | 55.04           | 73.9           | 18.8        | 270         | 301          |            |
| Vert.    | 11590.000       | PK       | 45.11          | 40.03           | 10.58     | 39.37     | 2.36                 | 58.71           | 73.9           | 15.1        | 168         | 311          |            |
| Vert.    | 7726.667        | AV       | 39.10          | 37.39           | 8.12      | 43.26     | 2.36                 | 43.71           | 53.9           | 10.1        | 270         | 301          | VBW:820 Hz |
| Vert.    | 11590.000       | AV       | 33.56          | 40.03           | 10.58     | 39.37     | 2.36                 | 47.16           | 53.9           | 6.7         | 168         | 311          | VBW:820 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 5850.000        | PK       | 46.14          | 33.01           | 17.13     | 40.05     | 2.36                 | 58.59           | -36.63              | -27.0       | 9.6         | 211         | 328          |        |
| Hori.    | 5855.000        | PK       | 45.50          | 33.02           | 17.13     | 40.06     | 2.36                 | 57.95           | -37.27              | 10.0        | 47.2        | 211         | 328          |        |
| Hori.    | 5875.000        | PK       | 46.47          | 33.06           | 17.14     | 40.07     | 2.36                 | 58.96           | -36.26              | 15.6        | 51.8        | 211         | 328          |        |
| Hori.    | 5925.000        | PK       | 45.73          | 33.16           | 17.16     | 40.11     | 2.36                 | 58.30           | -36.92              | 27.0        | 63.9        | 211         | 328          |        |
| Hori.    | 17385.000       | PK       | 44.82          | 43.16           | 13.33     | 38.51     | -9.54                | 53.26           | -41.96              | -27.0       | 14.9        | 152         | 16           |        |
| Hori.    | 23180.000       | PK       | 45.66          | 40.45           | 15.14     | 47.35     | -9.54                | 44.36           | -50.86              | -27.0       | 23.8        | 151         | 29           |        |
| Vert.    | 5850.000        | PK       | 46.92          | 33.01           | 17.13     | 40.05     | 2.36                 | 59.37           | -35.85              | -27.0       | 8.8         | 214         | 312          |        |
| Vert.    | 5855.000        | PK       | 46.50          | 33.02           | 17.13     | 40.06     | 2.36                 | 58.95           | -36.27              | 10.0        | 46.2        | 214         | 312          |        |
| Vert.    | 5875.000        | PK       | 46.38          | 33.06           | 17.14     | 40.07     | 2.36                 | 58.87           | -36.35              | 15.6        | 51.9        | 214         | 312          |        |
| Vert.    | 5925.000        | PK       | 46.44          | 33.16           | 17.16     | 40.11     | 2.36                 | 59.01           | -36.21              | 27.0        | 63.2        | 214         | 312          |        |
| Vert.    | 17385.000       | PK       | 44.93          | 43.16           | 13.33     | 38.51     | -9.54                | 53.37           | -41.85              | -27.0       | 14.8        | 114         | 355          |        |
| Vert.    | 23180.000       | PK       | 45.29          | 40.45           | 15.14     | 47.35     | -9.54                | 43.99           | -51.23              | -27.0       | 24.2        | 187         | 14           |        |

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

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

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

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

**UL Japan, Inc.**

**Shonan EMC Lab.**

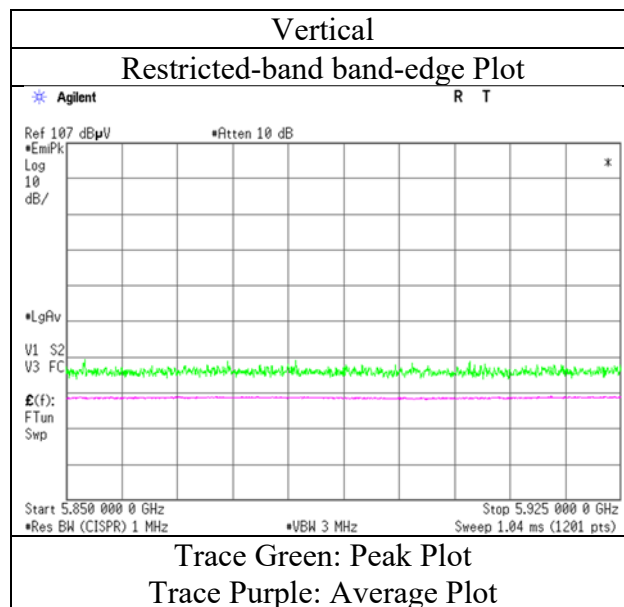
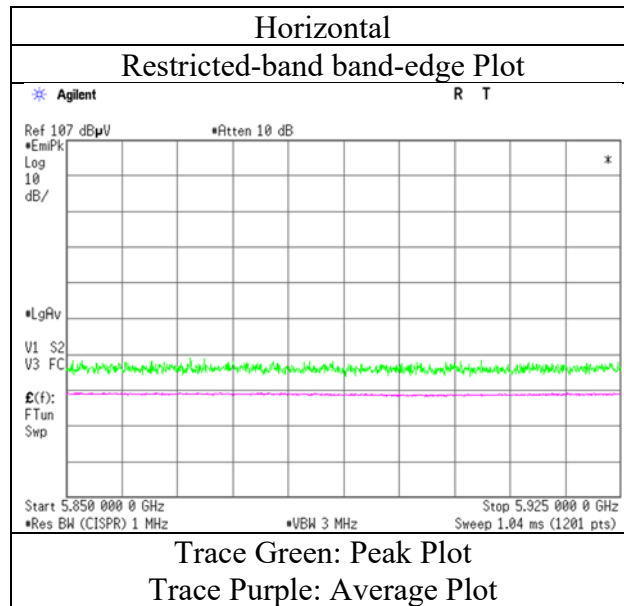
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 27, 2016  |
| Temperature / Humidity | 22 deg. C / 50 % RH |
| Engineer               | Kazuya Noda         |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | 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.

## Radiated Spurious Emission

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date September 27, 2016  
Temperature / Humidity 22 deg. C / 50 % RH  
Engineer Kazuya Noda  
(1 GHz – 6.4 GHz)  
Mode Tx 11ac-40 5190 MHz

### (above 1GHz 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.    | 5150.000           | PK       | 50.29             | 32.30              | 16.89        | 39.73        | 2.36                    | 62.11              | 73.9              | 11.7           | 193            | 306             |            |
| Hori.    | 5150.000           | AV       | 37.61             | 32.30              | 16.89        | 39.73        | 2.36                    | 49.43              | 53.9              | 4.4            | 193            | 306             | VBW:820 Hz |
| Vert.    | 5150.000           | PK       | 50.61             | 32.30              | 16.89        | 39.73        | 2.36                    | 62.43              | 73.9              | 11.4           | 211            | 323             |            |
| Vert.    | 5150.000           | AV       | 37.25             | 32.30              | 16.89        | 39.73        | 2.36                    | 49.07              | 53.9              | 4.8            | 211            | 323             | VBW:820 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

**UL Japan, Inc.**

**Shonan EMC Lab.**

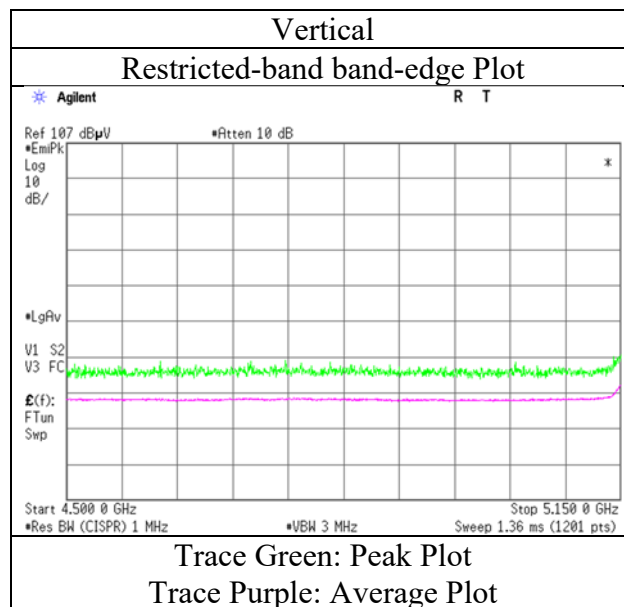
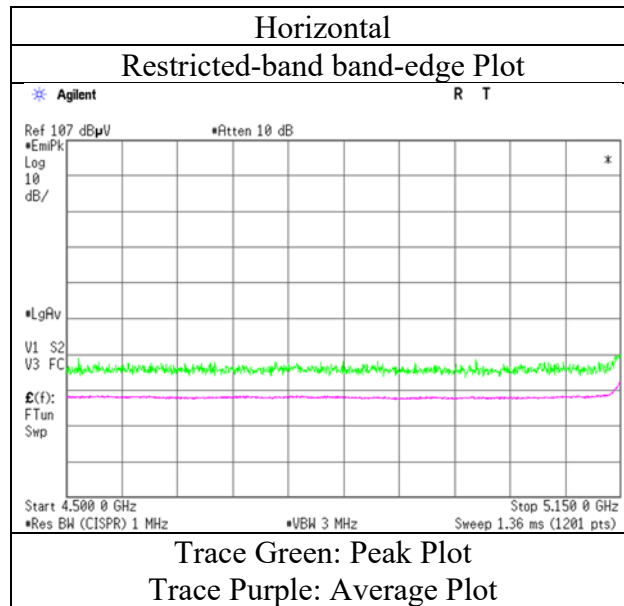
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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Radiated Spurious Emission

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date September 27, 2016  
Temperature / Humidity 22 deg. C / 50 % RH  
Engineer Kazuya Noda  
(1 GHz – 6.4 GHz)  
Mode Tx 11ac-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.

**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

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 27, 2016  |
| Temperature / Humidity | 22 deg. C / 50 % RH |
| Engineer               | Kazuya Noda         |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | Tx 11ac-40 5230 MHz |

### (above 1GHz 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       | 45.91             | 31.99              | 16.95        | 39.76        | 2.36                    | 57.45              | 73.9              | 16.4           | 193            | 306             |            |
| Hori.    | 5350.000           | AV       | 34.11             | 31.99              | 16.95        | 39.76        | 2.36                    | 45.65              | 53.9              | 8.2            | 193            | 306             | VBW:820 Hz |
| Vert.    | 5350.000           | PK       | 45.49             | 31.99              | 16.95        | 39.76        | 2.36                    | 57.03              | 73.9              | 16.8           | 211            | 323             |            |
| Vert.    | 5350.000           | AV       | 34.16             | 31.99              | 16.95        | 39.76        | 2.36                    | 45.70              | 53.9              | 8.2            | 211            | 323             | VBW:820 Hz |

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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

**UL Japan, Inc.**

**Shonan EMC Lab.**

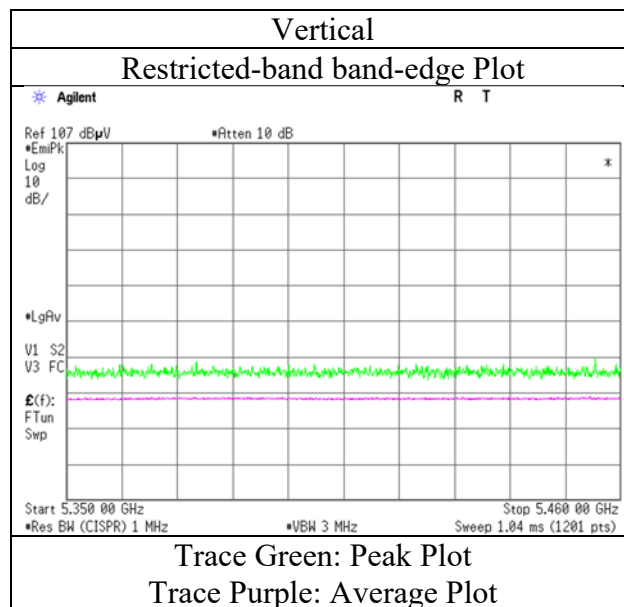
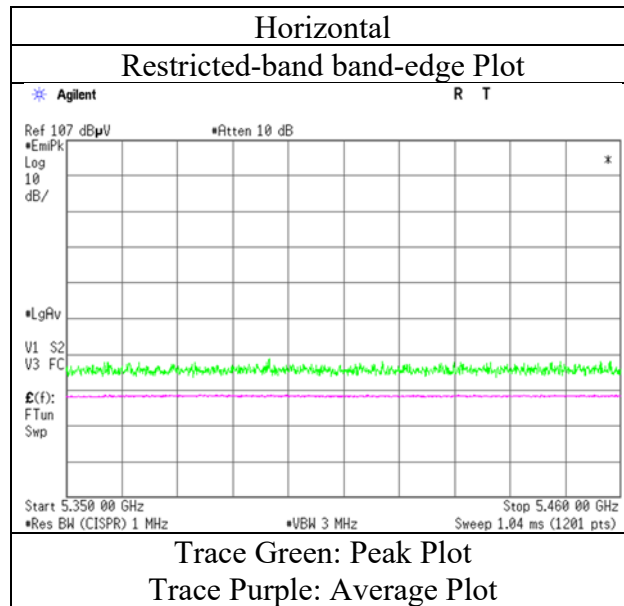
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 27, 2016  |
| Temperature / Humidity | 22 deg. C / 50 % RH |
| Engineer               | Kazuya Noda         |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | Tx 11ac-40 5230 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

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date September 27, 2016  
Temperature / Humidity 22 deg. C / 50 % RH  
Engineer Kazuya Noda  
(1 GHz – 6.4 GHz)  
Mode Tx 11ac-40 5755 MHz

### (Calculation) (above 1GHz 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 (ERP) [dBm] | Limit [dBm] | Margin [dB] | Height [cm] | Angle [deg.] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|----------------------|-----------------|--------------------|-------------|-------------|-------------|--------------|--------|
| Hori.    | 5650.000        | PK       | 45.59          | 32.43           | 17.06     | 39.90     | 2.36                 | 57.54           | -37.68             | -27.0       | <b>10.6</b> | 217         | 329          |        |
| Hori.    | 5700.000        | PK       | 46.49          | 32.57           | 17.08     | 39.94     | 2.36                 | 58.56           | -36.66             | 10.0        | 46.6        | 217         | 329          |        |
| Hori.    | 5720.000        | PK       | 53.89          | 32.63           | 17.08     | 39.95     | 2.36                 | 66.01           | -29.21             | 15.6        | 44.8        | 217         | 329          |        |
| Hori.    | 5725.000        | PK       | 54.86          | 32.65           | 17.09     | 39.96     | 2.36                 | 67.00           | -28.22             | 27.0        | 55.2        | 217         | 329          |        |
| Vert.    | 5650.000        | PK       | 45.37          | 32.43           | 17.06     | 39.90     | 2.36                 | 57.32           | -37.90             | -27.0       | 10.9        | 211         | 316          |        |
| Vert.    | 5700.000        | PK       | 46.01          | 32.57           | 17.08     | 39.94     | 2.36                 | 58.08           | -37.14             | 10.0        | 47.1        | 211         | 316          |        |
| Vert.    | 5720.000        | PK       | 47.86          | 32.63           | 17.08     | 39.95     | 2.36                 | 59.98           | -35.24             | 15.6        | 50.8        | 211         | 316          |        |
| Vert.    | 5725.000        | PK       | 48.34          | 32.65           | 17.09     | 39.96     | 2.36                 | 60.48           | -34.74             | 27.0        | 61.7        | 211         | 316          |        |

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

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

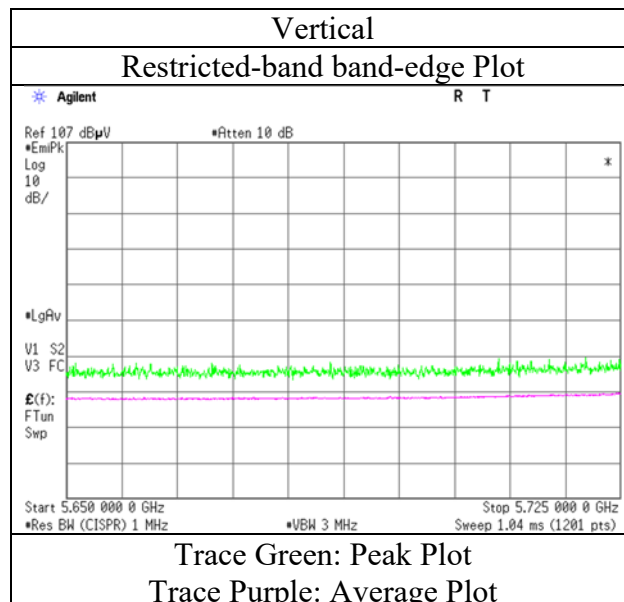
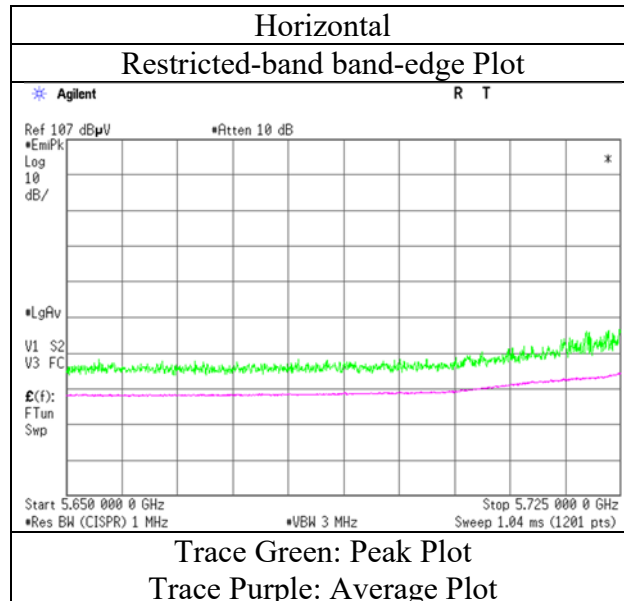
\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

Distance factor : 1 GHz - 13 GHz : 20log (3.94 m / 3.0 m) = 2.36 dB

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

## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 27, 2016  |
| Temperature / Humidity | 22 deg. C / 50 % RH |
| Engineer               | Kazuya Noda         |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | Tx 11ac-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.

## Radiated Spurious Emission

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab.  
Semi Anechoic Chamber 1  
Date September 27, 2016  
Temperature / Humidity 22 deg. C / 50 % RH  
Engineer Kazuya Noda  
(1 GHz – 6.4 GHz)  
Mode Tx 11ac-40 5795 MHz

### (Calculation) (above 1GHz 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.    | 5850.000        | PK       | 47.61          | 33.01           | 17.13     | 40.05     | 2.36                 | 60.06           | -35.16              | 27.0        | 62.1        | 236         | 328          |        |
| Hori.    | 5855.000        | PK       | 46.47          | 33.02           | 17.13     | 40.06     | 2.36                 | 58.92           | -36.30              | 15.6        | 51.9        | 236         | 328          |        |
| Hori.    | 5875.000        | PK       | 45.90          | 33.06           | 17.14     | 40.07     | 2.36                 | 58.39           | -36.83              | 10.0        | 46.8        | 236         | 328          |        |
| Hori.    | 5925.000        | PK       | 45.96          | 33.16           | 17.16     | 40.11     | 2.36                 | 58.53           | -36.69              | -27.0       | <b>9.6</b>  | 236         | 328          |        |
| Vert.    | 5850.000        | PK       | 46.02          | 33.01           | 17.13     | 40.05     | 2.36                 | 58.47           | -36.75              | 27.0        | 63.7        | 212         | 315          |        |
| Vert.    | 5855.000        | PK       | 45.75          | 33.02           | 17.13     | 40.06     | 2.36                 | 58.20           | -37.02              | 15.6        | 52.6        | 212         | 315          |        |
| Vert.    | 5875.000        | PK       | 45.76          | 33.06           | 17.14     | 40.07     | 2.36                 | 58.25           | -36.97              | 10.0        | 46.9        | 212         | 315          |        |
| Vert.    | 5925.000        | PK       | 45.89          | 33.16           | 17.16     | 40.11     | 2.36                 | 58.46           | -36.76              | -27.0       | 9.7         | 212         | 315          |        |

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 20dB).

Distance factor : 1 GHz - 13 GHz : 20log (3.94 m / 3.0 m) = 2.36 dB

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

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**Shonan EMC Lab.**

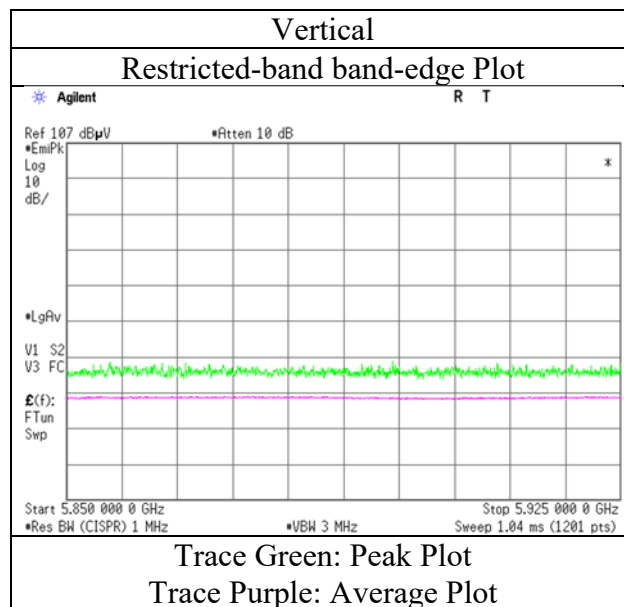
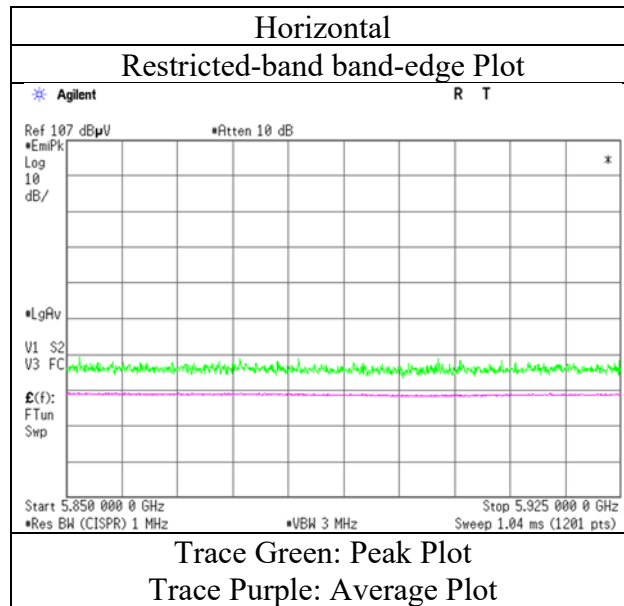
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Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 27, 2016  |
| Temperature / Humidity | 22 deg. C / 50 % RH |
| Engineer               | Kazuya Noda         |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | Tx 11ac-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

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |                     |                     |                     |
|------------------------|---------------------|---------------------|---------------------|
| Report No.             | 12952598S-C-R1      |                     |                     |
| Test place             | Shonan EMC Lab.     |                     |                     |
| Semi Anechoic Chamber  | 1                   | 1                   | 3                   |
| Date                   | September 27, 2016  | September 28, 2019  | October 1, 2019     |
| Temperature / Humidity | 22 deg. C / 50 % RH | 24 deg. C / 47 % RH | 24 deg. C / 53 % RH |
| Engineer               | Kazuya Noda         | Kazuya Noda         | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   | (6.4 GHz – 18 GHz)  | (18 GHz – 40 GHz)   |
| Mode                   | Tx 11ac-80 5210 MHz |                     |                     |

### (above 1GHz 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       | 52.57          | 32.26           | 16.34     | 43.04     | 2.36                 | 60.49           | 73.9           | 13.4        | 175         | 304          |             |
| Hori.    | 5350.000        | PK       | 49.23          | 31.98           | 16.41     | 43.21     | 2.36                 | 56.77           | 73.9           | 17.1        | 175         | 304          |             |
| Hori.    | 15630.000       | PK       | 45.44          | 38.51           | 12.71     | 39.30     | -9.54                | 47.82           | 73.9           | 26.0        | 144         | 31           |             |
| Hori.    | 20840.000       | PK       | 46.44          | 40.31           | 14.19     | 47.27     | -9.54                | 44.13           | 73.9           | 29.7        | 157         | 47           |             |
| Hori.    | 5150.000        | AV       | 41.71          | 32.26           | 16.34     | 43.04     | 2.36                 | 49.63           | 53.9           | 4.2         | 175         | 304          | VBW:2.7 kHz |
| Hori.    | 5350.000        | AV       | 38.53          | 31.98           | 16.41     | 43.21     | 2.36                 | 46.07           | 53.9           | 7.8         | 175         | 304          | VBW:2.7 kHz |
| Hori.    | 15630.000       | AV       | 35.21          | 38.51           | 12.71     | 39.30     | -9.54                | 37.59           | 53.9           | 16.3        | 144         | 31           | VBW:2.7 kHz |
| Hori.    | 20840.000       | AV       | 41.90          | 40.31           | 14.19     | 47.27     | -9.54                | 39.59           | 53.9           | 14.3        | 157         | 47           | VBW:2.7 kHz |
| Vert.    | 5150.000        | PK       | 53.50          | 32.26           | 16.34     | 43.04     | 2.36                 | 61.42           | 73.9           | 12.4        | 254         | 320          |             |
| Vert.    | 5350.000        | PK       | 49.93          | 31.98           | 16.41     | 43.21     | 2.36                 | 57.47           | 73.9           | 16.4        | 254         | 320          |             |
| Vert.    | 15630.000       | PK       | 45.51          | 38.51           | 12.71     | 39.30     | -9.54                | 47.89           | 73.9           | 26.0        | 118         | 359          |             |
| Vert.    | 20840.000       | PK       | 47.11          | 40.31           | 14.19     | 47.27     | -9.54                | 44.80           | 73.9           | 29.1        | 151         | 342          |             |
| Vert.    | 5150.000        | AV       | 42.14          | 32.26           | 16.34     | 43.04     | 2.36                 | 50.06           | 53.9           | 3.8         | 254         | 320          | VBW:2.7 kHz |
| Vert.    | 5350.000        | AV       | 38.97          | 31.98           | 16.41     | 43.21     | 2.36                 | 46.51           | 53.9           | 7.3         | 254         | 320          | VBW:2.7 kHz |
| Vert.    | 15630.000       | AV       | 35.24          | 38.51           | 12.71     | 39.30     | -9.54                | 37.62           | 53.9           | 16.2        | 118         | 359          | VBW:2.7 kHz |
| Vert.    | 20840.000       | AV       | 42.64          | 40.31           | 14.19     | 47.27     | -9.54                | 40.33           | 53.9           | 13.5        | 151         | 342          | VBW:2.7 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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 6946.667        | PK       | 56.78          | 36.19           | 7.71      | 42.62     | 2.36                 | 60.42           | -34.80              | -27.0       | 7.8         | 218         | 292          |        |
| Hori.    | 10420.000       | PK       | 45.79          | 39.34           | 9.94      | 40.05     | 2.36                 | 57.38           | -37.84              | -27.0       | 10.8        | 143         | 229          |        |
| Vert.    | 6946.667        | PK       | 54.47          | 36.19           | 7.71      | 42.62     | 2.36                 | 58.11           | -37.11              | -27.0       | 10.1        | 270         | 301          |        |
| Vert.    | 10420.000       | PK       | 45.96          | 39.34           | 9.94      | 40.05     | 2.36                 | 57.55           | -37.67              | -27.0       | 10.6        | 104         | 303          |        |

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

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

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

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

**UL Japan, Inc.**

**Shonan EMC Lab.**

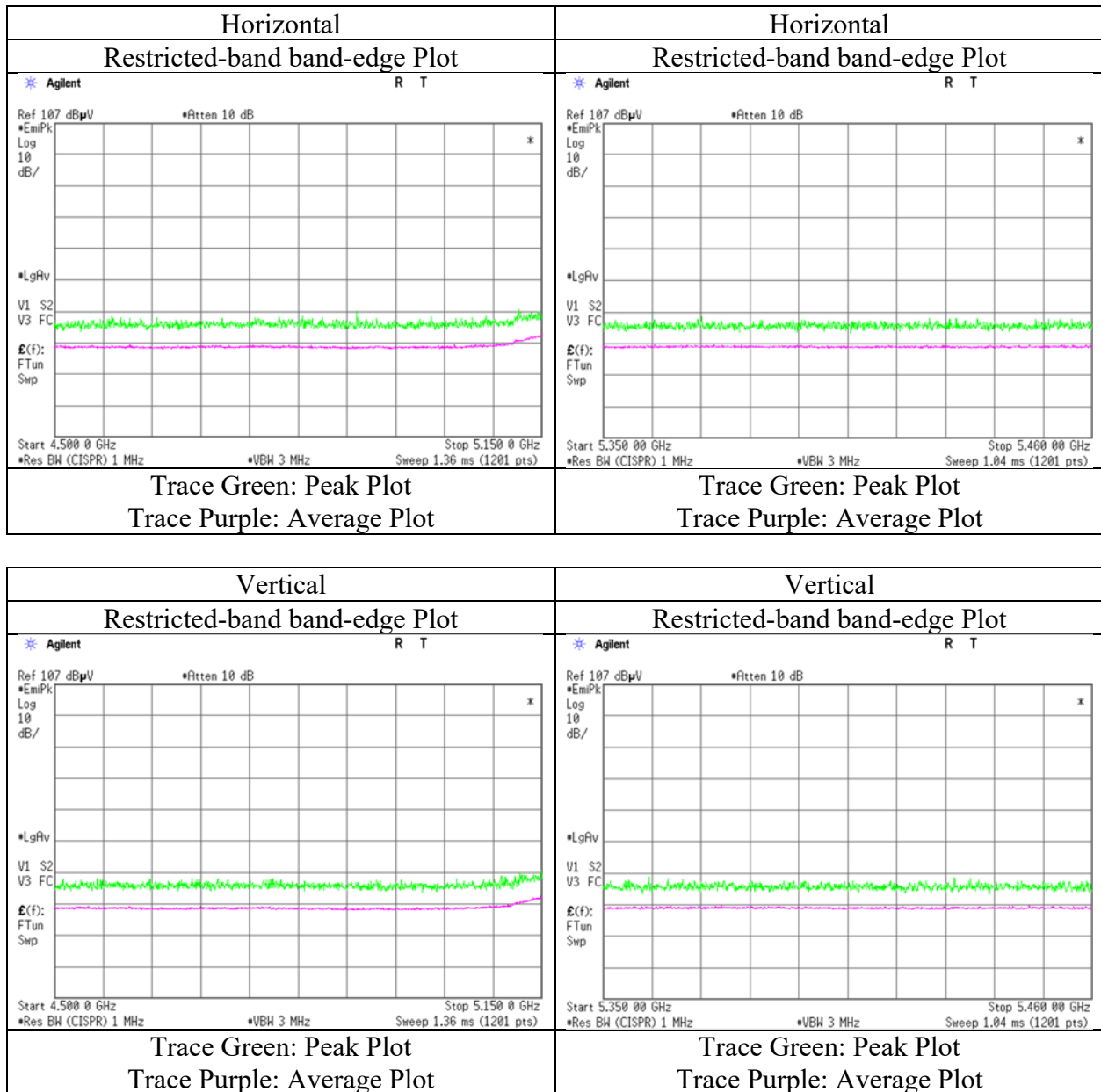
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Facsimile : +81 463 50 6401

## Radiated Spurious Emission

|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 27, 2016  |
| Temperature / Humidity | 22 deg. C / 50 % RH |
| Engineer               | Kazuya Noda         |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | Tx 11ac-80 5210 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

|                        |                     |                     |                     |
|------------------------|---------------------|---------------------|---------------------|
| Report No.             | 12952598S-C-R1      |                     |                     |
| Test place             | Shonan EMC Lab.     |                     |                     |
| Semi Anechoic Chamber  | 1                   | 1                   | 3                   |
| Date                   | September 27, 2016  | September 28, 2019  | October 1, 2019     |
| Temperature / Humidity | 22 deg. C / 50 % RH | 24 deg. C / 47 % RH | 24 deg. C / 53 % RH |
| Engineer               | Kazuya Noda         | Kazuya Noda         | Hiromasa Sato       |
|                        | (1 GHz – 6.4 GHz)   | (6.4 GHz – 18 GHz)  | (18 GHz – 40 GHz)   |
| Mode                   | Tx 11ac-80 5775 MHz |                     |                     |

### (above 1GHz 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.    | 7700.000        | PK       | 51.29          | 37.35           | 8.11      | 43.29     | 2.36                 | 55.82           | 73.9           | 18.0        | 218         | 292          |             |
| Hori.    | 11550.000       | PK       | 44.17          | 40.11           | 10.56     | 39.40     | 2.36                 | 57.80           | 73.9           | 16.1        | 154         | 254          |             |
| Hori.    | 17325.000       | PK       | 44.98          | 42.63           | 13.32     | 38.70     | -9.54                | 52.69           | 73.9           | 21.2        | 165         | 15           |             |
| Hori.    | 23100.000       | PK       | 44.46          | 40.46           | 15.08     | 47.44     | -9.54                | 43.02           | 73.9           | 30.8        | 149         | 29           |             |
| Hori.    | 7700.000        | AV       | 41.76          | 37.35           | 8.11      | 43.29     | 2.36                 | 46.29           | 53.9           | 7.6         | 218         | 292          | VBW:2.7 kHz |
| Hori.    | 11550.000       | AV       | 34.35          | 40.11           | 10.56     | 39.40     | 2.36                 | 47.98           | 53.9           | 5.9         | 154         | 254          | VBW:2.7 kHz |
| Hori.    | 17325.000       | AV       | 34.90          | 42.63           | 13.32     | 38.70     | -9.54                | 42.61           | 53.9           | 11.2        | 165         | 15           | VBW:2.7 kHz |
| Hori.    | 23100.000       | AV       | 35.46          | 40.46           | 15.08     | 47.44     | -9.54                | 34.02           | 53.9           | 19.8        | 149         | 29           | VBW:2.7 kHz |
| Vert.    | 7700.000        | PK       | 50.97          | 37.35           | 8.11      | 43.29     | 2.36                 | 55.50           | 73.9           | 18.4        | 210         | 359          |             |
| Vert.    | 11550.000       | PK       | 44.49          | 40.11           | 10.56     | 39.40     | 2.36                 | 58.12           | 73.9           | 15.7        | 100         | 0            |             |
| Vert.    | 17325.000       | PK       | 45.02          | 42.63           | 13.32     | 38.70     | -9.54                | 52.73           | 73.9           | 21.1        | 123         | 359          |             |
| Vert.    | 23100.000       | PK       | 45.62          | 40.46           | 15.08     | 47.44     | -9.54                | 44.18           | 73.9           | 29.7        | 148         | 348          |             |
| Vert.    | 7700.000        | AV       | 39.98          | 37.35           | 8.11      | 43.29     | 2.36                 | 44.51           | 53.9           | 9.3         | 210         | 359          | VBW:2.7 kHz |
| Vert.    | 11550.000       | AV       | 33.46          | 40.11           | 10.56     | 39.40     | 2.36                 | 47.09           | 53.9           | 6.8         | 100         | 0            | VBW:2.7 kHz |
| Vert.    | 17325.000       | AV       | 34.93          | 42.63           | 13.32     | 38.70     | -9.54                | 42.64           | 53.9           | 11.2        | 123         | 359          | VBW:2.7 kHz |
| Vert.    | 23100.000       | AV       | 37.64          | 40.46           | 15.08     | 47.44     | -9.54                | 36.20           | 53.9           | 17.7        | 148         | 348          | VBW:2.7 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 20dB).

Distance factor : 1 GHz - 13 GHz :  $20\log(3.94\text{ m} / 3.0\text{ m}) = 2.36\text{ dB}$

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

### (Calculation) (above 1GHz 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.    | 5650.000        | PK       | 46.08          | 32.43           | 17.06     | 39.90     | 2.36                 | 58.03           | -37.19              | -27.0       | 10.1        | 222         | 328          |        |
| Hori.    | 5700.000        | PK       | 48.95          | 32.57           | 17.08     | 39.94     | 2.36                 | 61.02           | -34.20              | 10.0        | 44.2        | 222         | 328          |        |
| Hori.    | 5720.000        | PK       | 52.01          | 32.63           | 17.08     | 39.95     | 2.36                 | 64.13           | -31.09              | 15.6        | 46.6        | 222         | 328          |        |
| Hori.    | 5725.000        | PK       | 54.94          | 32.65           | 17.09     | 39.96     | 2.36                 | 67.08           | -28.14              | 27.0        | 55.1        | 222         | 328          |        |
| Hori.    | 5850.000        | PK       | 47.01          | 33.01           | 17.13     | 40.05     | 2.36                 | 59.46           | -35.76              | 27.0        | 62.7        | 222         | 328          |        |
| Hori.    | 5855.000        | PK       | 46.91          | 33.02           | 17.13     | 40.06     | 2.36                 | 59.36           | -35.86              | 15.6        | 51.4        | 222         | 328          |        |
| Hori.    | 5875.000        | PK       | 45.52          | 33.06           | 17.14     | 40.07     | 2.36                 | 58.01           | -37.21              | 10.0        | 47.2        | 222         | 328          |        |
| Hori.    | 5925.000        | PK       | 45.89          | 33.16           | 17.16     | 40.11     | 2.36                 | 58.46           | -36.76              | -27.0       | 9.7         | 222         | 328          |        |
| Vert.    | 5650.000        | PK       | 45.10          | 32.43           | 17.06     | 39.90     | 2.36                 | 57.05           | -38.17              | -27.0       | 11.1        | 211         | 317          |        |
| Vert.    | 5700.000        | PK       | 44.92          | 32.57           | 17.08     | 39.94     | 2.36                 | 56.99           | -38.23              | 10.0        | 48.2        | 211         | 317          |        |
| Vert.    | 5720.000        | PK       | 45.58          | 32.63           | 17.08     | 39.95     | 2.36                 | 57.70           | -37.52              | 15.6        | 53.1        | 211         | 317          |        |
| Vert.    | 5725.000        | PK       | 45.91          | 32.65           | 17.09     | 39.96     | 2.36                 | 58.05           | -37.17              | 27.0        | 64.1        | 211         | 317          |        |
| Vert.    | 5850.000        | PK       | 45.42          | 33.01           | 17.13     | 40.05     | 2.36                 | 57.87           | -37.35              | 27.0        | 64.3        | 211         | 317          |        |
| Vert.    | 5855.000        | PK       | 45.17          | 33.02           | 17.13     | 40.06     | 2.36                 | 57.62           | -37.60              | 15.6        | 53.2        | 211         | 317          |        |
| Vert.    | 5875.000        | PK       | 45.28          | 33.06           | 17.14     | 40.07     | 2.36                 | 57.77           | -37.45              | 10.0        | 47.4        | 211         | 317          |        |
| Vert.    | 5925.000        | PK       | 45.41          | 33.16           | 17.16     | 40.11     | 2.36                 | 57.98           | -37.24              | -27.0       | 10.2        | 211         | 317          |        |

**UL Japan, Inc.**

**Shonan EMC Lab.**

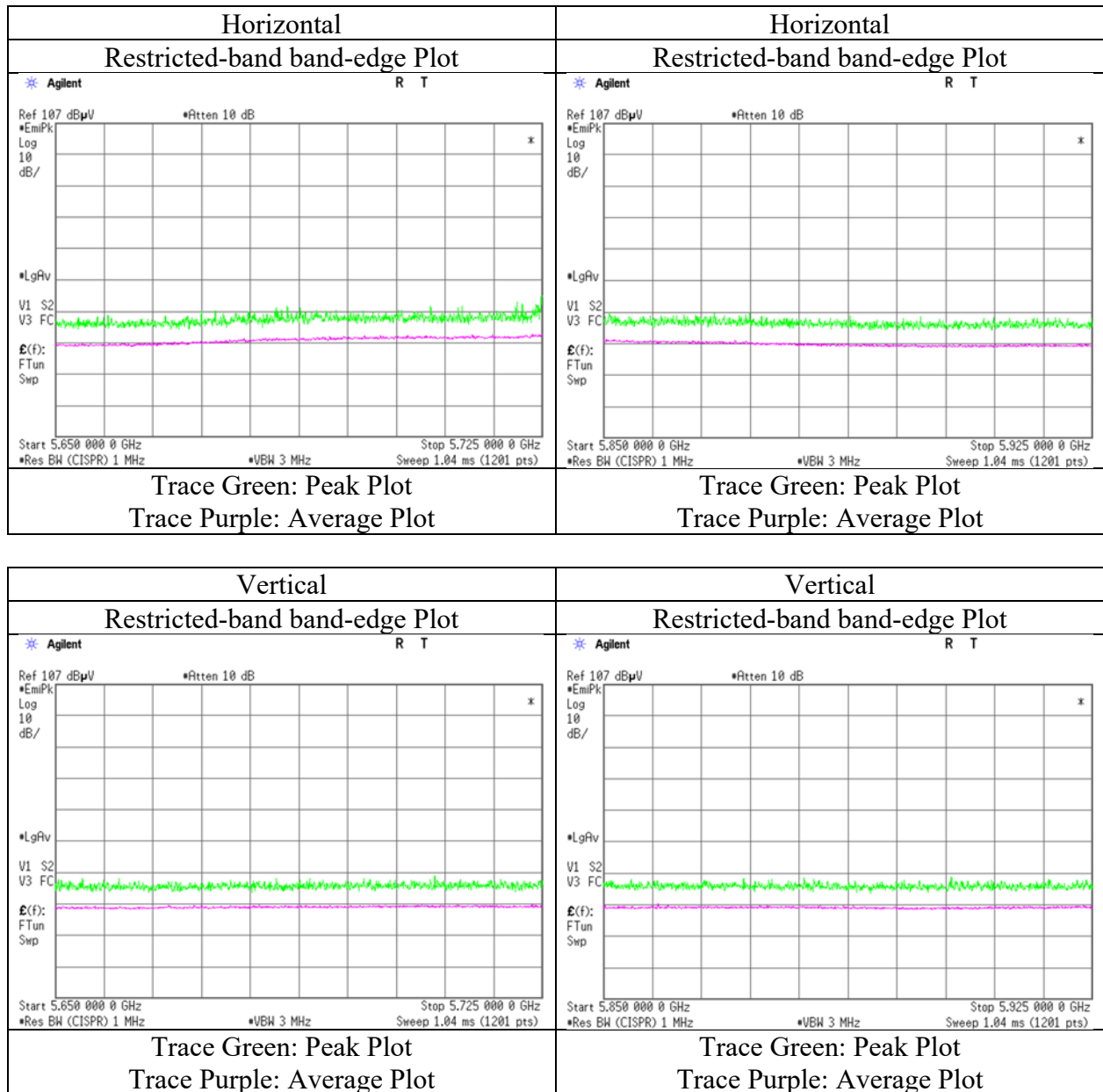
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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## Radiated Spurious Emission

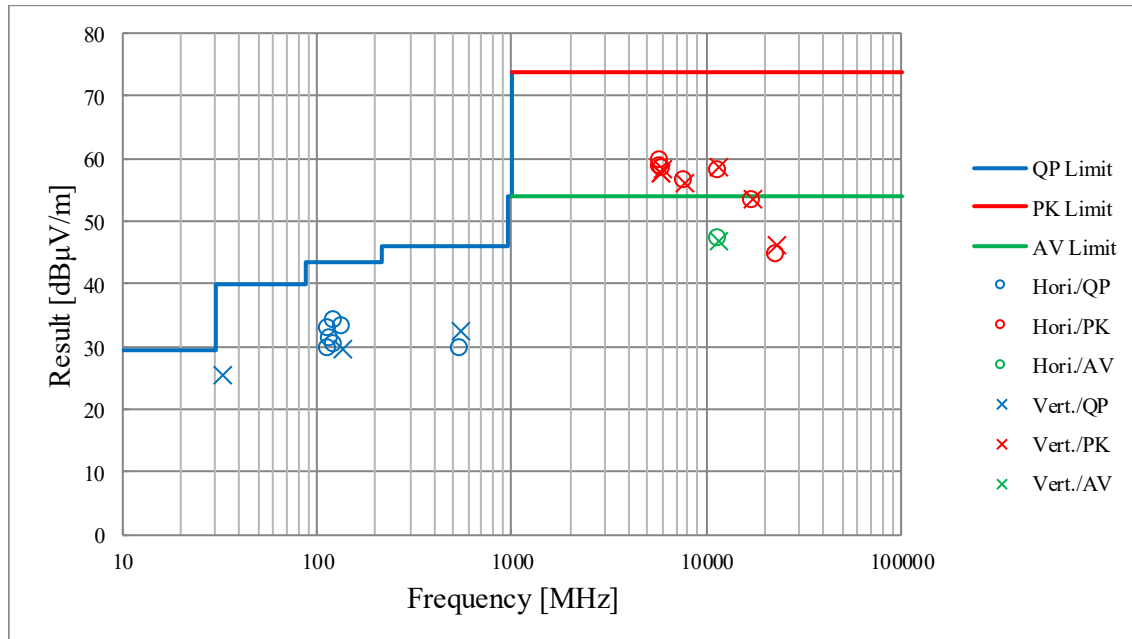
|                        |                     |
|------------------------|---------------------|
| Report No.             | 12952598S-C-R1      |
| Test place             | Shonan EMC Lab.     |
| Semi Anechoic Chamber  | 1                   |
| Date                   | September 27, 2016  |
| Temperature / Humidity | 22 deg. C / 50 % RH |
| Engineer               | Kazuya Noda         |
|                        | (1 GHz – 6.4 GHz)   |
| Mode                   | Tx 11ac-80 5775 MHz |



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

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

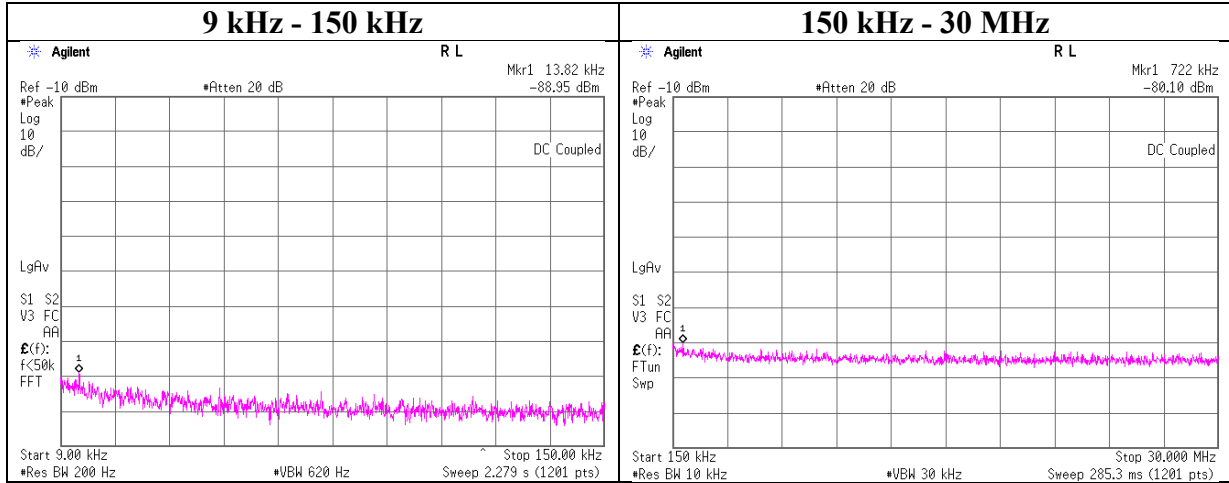
|                        |                                    |                                    |                                   |                                  |                                    |
|------------------------|------------------------------------|------------------------------------|-----------------------------------|----------------------------------|------------------------------------|
| Report No.             | 12952598S-C-R1                     |                                    |                                   |                                  |                                    |
| Test place             | Shonan EMC Lab.                    |                                    |                                   |                                  |                                    |
| Semi Anechoic Chamber  | 2                                  | 1                                  | 1                                 | 1                                | 3                                  |
| Date                   | October 3, 2019                    | September 26, 2016                 | September 27, 2016                | September 28, 2019               | October 1, 2019                    |
| Temperature / Humidity | 21 deg. C / 61 % RH                | 25 deg. C / 46 % RH                | 22 deg. C / 50 % RH               | 24 deg. C / 47 % RH              | 24 deg. C / 53 % RH                |
| Engineer               | Kazuya Noda<br>(30 MHz - 1000 MHz) | Hiromasa Sato<br>(1 GHz - 6.4 GHz) | Kazuya Noda<br>(6.4 GHz - 13 GHz) | Kazuya Noda<br>(13 GHz - 18 GHz) | Hiromasa Sato<br>(18 GHz - 40 GHz) |
| Mode                   | Tx 11a 5825 MHz                    |                                    |                                   |                                  |                                    |



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

## Conducted Spurious Emission

Report No. 12952598S-C-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date September 26, 2019  
Temperature / Humidity 26 deg. C / 45 % RH  
Engineer Toshinori Yamada  
Mode Tx 11a 5825 MHz



| Frequency<br>[kHz] | Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Attenuator<br>[dB] | Antenna<br>Gain<br>[dBi] | N<br>(Number<br>of Output) | EIRP<br>[dBm] | Distance<br>[m] | Ground<br>bounce<br>[dB] | E<br>(field strength)<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Remark |
|--------------------|------------------|-----------------------|--------------------|--------------------------|----------------------------|---------------|-----------------|--------------------------|-----------------------------------|-------------------|----------------|--------|
| 13.82              | -89.0            | 2.78                  | 9.8                | 6.0                      | 1                          | -70.3         | 300             | 6.0                      | -9.1                              | 44.7              | 53.8           | -      |
| 722.00             | -80.1            | 2.78                  | 9.8                | 6.0                      | 1                          | -61.5         | 30              | 6.0                      | 19.8                              | 30.4              | 10.6           | -      |

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

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

N: Number of output

## APPENDIX 2: Test instruments

### Test Instruments

| Local ID                       | Test Name | LIMS ID | Description               | Manufacturer                         | Model                               | Serial                  | Last Calibration Date | Calibration Due Date | Calibration Interval (Month) |
|--------------------------------|-----------|---------|---------------------------|--------------------------------------|-------------------------------------|-------------------------|-----------------------|----------------------|------------------------------|
| KSA-08                         | AT        | 145089  | Spectrum Analyzer         | AGILENT                              | E4446A                              | MY46180525              | 2018/10/7             | 2019/10/31           | 12                           |
| KTS-07                         | AT        | 145111  | Digital Tester            | SANWA                                | PC500                               | 7019232                 | 2019/10/1             | 2020/10/31           | 12                           |
| SAT10-09                       | AT        | 145132  | Attenuator                | Weinschel Corp.                      | 54A-10                              | W5692                   | 2018/11/25            | 2019/11/30           | 12                           |
| SCC-G31                        | AT        | 145042  | Coaxial Cable             | Junkosha                             | MWX241-01000KMSK MS                 | OCT-08-13-046           | 2019/4/16             | 2020/4/30            | 12                           |
| SOS-09                         | AT        | 146318  | Humidity Indicator        | A&D                                  | AD-5681                             | 4061484                 | 2018/12/5             | 2019/12/31           | 12                           |
| SOS-19                         | AT        | 175823  | Humidity Indicator        | CUSTOM                               | CTH-201                             | -                       | 2018/12/5             | 2019/12/31           | 12                           |
| SPM-07                         | AT        | 146247  | Power Meter               | AGILENT                              | 8990B                               | MY5100272               | 2019/7/16             | 2020/7/31            | 12                           |
| SPSS-04                        | AT        | 146310  | Power sensor              | AGILENT                              | N1923A                              | MY5326009               | 2019/7/16             | 2020/7/31            | 12                           |
| SRENT-09                       | AT        | 150461  | Spectrum Analyzer         | AGILENT (KEYSIGHT)                   | E4440A                              | MY46186392              | 2019/1/3              | 2020/1/31            | 12                           |
| COTS-SEMI-5                    | RE        | 170932  | EMI Software              | TSJ                                  | TEPTO-DV3(RE,CE,ME,PE)              | -                       | -                     | -                    | -                            |
| KJM-02                         | RE        | 146432  | Measure                   | TAJIMA                               | GL19-55                             | -                       | -                     | -                    | -                            |
| KJM-09                         | RE        | 145929  | Measure                   | KOMELON                              | KMC-36                              | -                       | -                     | -                    | -                            |
| SAEC-01(SVSWR)                 | RE        | 145561  | Semi-Anechoic Chamber     | TDK                                  | SAEC-01(SVSWR)                      | 1                       | 2019/5/6              | 2020/5/30            | 12                           |
| SAEC-02(NSA)                   | RE        | 145563  | Semi-Anechoic Chamber     | TDK                                  | SAEC-02(NSA)                        | 2                       | 2019/4/4              | 2020/4/30            | 12                           |
| SAEC-03(SVSWR)                 | RE        | 145566  | Semi-Anechoic Chamber     | TDK                                  | SAEC-03(SVSWR)                      | 3                       | 2019/5/3              | 2020/5/31            | 12                           |
| SAF-02                         | RE        | 145004  | Pre Amplifier             | SONOMA                               | 310N                                | 290212                  | 2019/2/5              | 2020/2/29            | 12                           |
| SAF-04                         | RE        | 145127  | Pre Amplifier             | Toyo Corporation                     | TPA0118-36                          | 2072554                 | 2019/6/4              | 2020/6/30            | 12                           |
| SAF-08                         | RE        | 145007  | Pre Amplifier             | Toyo Corporation                     | HAP18-26W                           | 19                      | 2019/3/5              | 2020/3/31            | 12                           |
| SAF-10                         | RE        | 145129  | Pre Amplifier             | Toyo Corporation                     | HAP26-40W                           | 10                      | 2019/3/22             | 2020/3/31            | 12                           |
| SAT10-05                       | RE        | 145136  | Attenuator(above 1GHz)    | AGILENT                              | 8493C-010                           | 74864                   | 2018/11/25            | 2019/11/30           | 12                           |
| SAT3-11                        | RE        | 150921  | Attenuator                | JFW                                  | 50HF-003N                           | -                       | 2019/1/25             | 2020/1/31            | 12                           |
| SAT6-14                        | RE        | 167095  | Attenuator                | JFW                                  | 50HF-006N                           | -                       | 2019/2/5              | 2020/2/29            | 12                           |
| SBA-02                         | RE        | 145022  | Biconical Antenna         | Schwarzbeck                          | BBA9106                             | 91032665                | 2019/4/1              | 2020/4/30            | 12                           |
| SCC-B1/B3/B5/B7/B8/B13/SRSE-02 | RE        | 144975  | Coaxial Cable&RF Selector | Fujikura/Fujikura/Suhner/Suhner/TOYO | 8D2W/12DSF A/141PE/141PE/141PE/141P | -/0901-270(RF Selector) | 2019/4/19             | 2020/4/30            | 12                           |
| SCC-B2/B4/B6/B7/B8/B13/SRSE-02 | RE        | 144976  | Coaxial Cable&RF Selector | Fujikura/Fujikura/Suhner/Suhner/TOYO | 8D2W/12DSF A/141PE/141PE/141PE/141P | -/0901-270(RF Selector) | 2019/4/19             | 2020/4/30            | 12                           |
| SCC-G05                        | RE        | 145039  | Coaxial Cable             | Junkosha                             | J12J102207-00                       | APR-30-15-037           | 2019/1/25             | 2020/1/31            | 12                           |
| SCC-G15                        | RE        | 145176  | Coaxial Cable             | Suhner                               | SUCOFLEX 102                        | 32703/2                 | 2019/3/27             | 2020/3/31            | 12                           |
| SCC-G40                        | RE        | 166491  | Coaxial Cable             | Junkosha                             | MWX221-01000NFSN MS/B               | 1612S005                | 2019/1/25             | 2020/1/31            | 12                           |
| SCC-G56                        | RE        | 179539  | Coaxial Cable             | Huber+Suhner                         | SUCOFLEX 104                        | 803289/4                | 2019/5/16             | 2020/5/31            | 12                           |

| Local ID | Test Name | LIMS ID | Description         | Manufacturer    | Model        | Serial     | Last Calibration Date | Calibration Due Date | Calibration Interval (Month) |
|----------|-----------|---------|---------------------|-----------------|--------------|------------|-----------------------|----------------------|------------------------------|
| SCC-G57  | RE        | 179540  | Coaxial Cable       | Huber+Suhner    | SUCOFLEX 102 | 802815/2   | 2019/5/16             | 2020/5/31            | 12                           |
| SFL-03   | RE        | 145377  | Highpass Filter     | MICRO-TRONICS   | HPM50112     | 28         | 2018/11/16            | 2019/11/30           | 12                           |
| SHA-01   | RE        | 145383  | Horn Antenna        | Schwarzbeck     | BBHA9120D    | 9120D-725  | 2019/5/9              | 2020/5/31            | 12                           |
| SHA-04   | RE        | 145512  | Horn Antenna        | ETS LINDGREN    | 3160-09      | 00094868   | 2019/6/26             | 2020/6/30            | 12                           |
| SHA-06   | RE        | 145514  | Horn Antenna        | ETS LINDGREN    | 3160-10      | 00092383   | 2019/6/26             | 2020/6/30            | 12                           |
| SJM-09   | RE        | 145336  | Measure             | PROMART         | SEN1935      | -          | -                     | -                    | -                            |
| SLA-06   | RE        | 145528  | Logperiodic Antenna | Schwarzbeck     | VUSLP9111B   | 195        | 2019/4/1              | 2020/4/30            | 12                           |
| SOS-01   | RE        | 146316  | Humidity Indicator  | A&D             | AD-5681      | 4062555    | 2018/10/25            | 2019/10/31           | 12                           |
| SOS-03   | RE        | 146317  | Humidity Indicator  | A&D             | AD-5681      | 4063325    | 2018/10/25            | 2019/10/31           | 12                           |
| SOS-05   | RE        | 146293  | Humidity Indicator  | A&D             | AD-5681      | 4062518    | 2018/10/25            | 2019/10/31           | 12                           |
| SSA-03   | RE        | 145801  | Spectrum Analyzer   | AGILENT         | E4448A       | MY48250152 | 2019/8/8              | 2020/8/31            | 12                           |
| STR-07   | RE        | 146209  | Test Receiver       | Rohde & Schwarz | ESU26        | 100484     | 2019/9/13             | 2020/9/30            | 12                           |
| STR-08   | RE        | 150463  | Test Receiver       | Rohde & Schwarz | ESW44        | 101581     | 2018/11/28            | 2019/11/30           | 12                           |
| STS-01   | RE        | 145792  | Digital Hitester    | HIOKI           | 3805-50      | 80997812   | 2019/10/1             | 2020/10/31           | 12                           |
| STS-02   | RE        | 145793  | Digital Hitester    | HIOKI           | 3805-50      | 80997819   | 2019/4/2              | 2020/4/30            | 12                           |
| STS-03   | RE        | 146210  | Digital Hitester    | HIOKI           | 3805-50      | 80997823   | 2019/10/1             | 2020/10/31           | 12                           |

\*Hyphens for Last Calibration Date, Calibration Due 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.

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

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

Test item:

RE: Radiated Emission

AT: Antenna Terminal Conducted test

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