



# RADIO TEST REPORT

**Test Report No. : 11107783H-A-R1**

**Applicant** : FUJITSU TEN LIMITED  
**Type of Equipment** : Car Navigation  
**Model No.** : FT0103A  
**FCC ID** : BABFT0103A  
**Test regulation** : FCC Part 15 Subpart C: 2015  
\*Bluetooth part  
**Test Result** : Complied

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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 above regulation.
4. The test results in this 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 NVLAP, NIST, or 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. This report is a revised version of 11107783H-A. 11107783H-A is replaced with this report.

**Date of test:** January 21 to 25, 2016

**Representative test engineer:**

  
Yutaka Yoshida

Engineer  
Consumer Technology Division

**Approved by:**

  
Takahiro Hatakeda

Leader  
Consumer Technology Division



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**UL Japan, Inc.**

**Ise EMC Lab.**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

13-EM-F0429

## REVISION HISTORY

Original Test Report No.: 11107783H-A

| Revision        | Test report No. | Date                | Page revised                   | Contents  |
|-----------------|-----------------|---------------------|--------------------------------|---|
| -<br>(Original) | 11107783H-A     | February 8,<br>2016 | -                              | -   |
| 1               | 11107783H-A-R1  | March 28,<br>2016   | P.23, 25,<br>26, 28, 30,<br>31 | -Correction of calculating formula<br>-Addition of explanatory note for test data |
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## **SECTION 1: Customer information**

Company Name : FUJITSU TEN LIMITED  
Address : 2-28, Goshō-dori 1-Chome, Hyogo-ku, Kobe 652-8510, JAPAN  
Telephone Number : +81-78-682-2159  
Facsimile Number : +81-78-671-7160  
Contact Person : Fukii Daisuke

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

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

Type of Equipment : Car Navigation  
Model No. : FT0103A  
Serial No. : Refer to Section 4, Clause 4.2  
Rating : DC 12.0 V  
Receipt Date of Sample : December 24, 2015  
Country of Mass-production : Mexico  
Condition of EUT : Production prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)  
Modification of EUT : No Modification by the test lab

### **2.2 Product Description**

#### **General Specification**

Clock frequency(ies) in the system : 26 MHz, Main: 792 MHz, WLAN : 24.75 MHz, Bluetooth : 1.833 MHz

#### **Radio Specification**

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

Radio Type : Transceiver  
Frequency of Operation : 2412 MHz - 2462 MHz  
Modulation : DSSS  
Power Supply (radio part input) : DC 3.3 V  
Antenna type : Inverted F Antenna  
Antenna Gain : -0.08 dBi (Max)

##### **[Bluetooth (Ver. 3.0 with EDR function)]**

Radio Type : Transceiver  
Frequency of Operation : 2402 MHz - 2480 MHz  
Modulation : FHSS  
Power Supply (radio part input) : DC 3.3 V  
Antenna type : Surface Mountable Dielectric Chip Antenna  
Antenna Gain : 1.1 dBi (Max)

\*This test report applies for Bluetooth.

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**UL Japan, Inc.**

**Ise EMC Lab.**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

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

### **3.1 Test Specification**

Test Specification : FCC Part 15 Subpart C: 2015, final revised on November 23, 2015  
\*Some parts are effective on and after December 17, 2015 or December 23, 2015. The revision does not affect the test specification applied to the EUT.

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators  
Section 15.207 Conducted limits  
Section 15.247 Operation within the bands 902-928MHz,  
2400-2483.5MHz, and 5725-5850MHz

### **3.2 Procedures and results**

| Item                                     | Test Procedure   | Specification   | Worst Margin                               | Results  | Remarks   |
|--|--|---|--|----------|---|
| Conducted Emission                       | FCC: ANSI C63.10-2013<br>6. Standard test methods<br>IC: RSS-Gen 8.8 | FCC: Section 15.207<br>IC: RSS-Gen 8.8                                  | -  | N/A *1)  | -   |
| Carrier Frequency Separation             | FCC: FCC Public Notice<br>DA 00-705<br>IC: -                         | FCC: Section15.247(a)(1)<br>IC: RSS-247 5.1 (2)                         | See data.                                  | Complied | Conducted                                       |
| 20dB Bandwidth                           | FCC: FCC Public Notice<br>DA 00-705<br>IC: -                         | FCC: Section15.247(a)(1)<br>IC: RSS-247 5.1 (1)                         |  | Complied | Conducted                                       |
| Number of Hopping Frequency              | FCC: FCC Public Notice<br>DA 00-705<br>IC: -                         | FCC: Section15.247(a)(1)(iii)<br>IC: RSS-247 5.1 (4)                    |  | Complied | Conducted                                       |
| Dwell time                               | FCC: FCC Public Notice<br>DA 00-705<br>IC: -                         | FCC: Section15.247(a)(1)(iii)<br>IC: RSS-247 5.1 (4)                    |  | Complied | Conducted                                       |
| Maximum Peak Output Power                | FCC: FCC Public Notice<br>DA 00-705<br>IC: RSS-Gen 6.12              | FCC: Section15.247(a)(b)(1)<br>IC: RSS-247 5.4 (2)                      |  | Complied | Conducted                                       |
| Spurious Emission & Band Edge Compliance | FCC: FCC Public Notice<br>DA 00-705<br>IC: RSS-Gen 6.13              | FCC: Section15.247(d)<br>IC: RSS-247 5.5<br>RSS-Gen 8.9<br>RSS-Gen 8.10 | 6.9 dB<br>1920.003 MHz, AV,<br>Horizontal. | Complied | Conducted/<br>Radiated<br>(above 30 MHz)<br>*2) |

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.  
\*1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.  
\*2) Radiated test was selected over 30 MHz based on section 15.247(d).

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

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

The EUT provides stable voltage (DC3.3V) constantly to the wireless transmitter regardless of input voltage. 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**

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

**UL Japan, Inc.**

**Ise EMC Lab.**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

### 3.3 Addition to standard

| Item                   | Test Procedure  | Specification | Worst margin | Results | Remarks   |
|------------------------|-----------------|---------------|--------------|---------|-----------|
| 99% Occupied Bandwidth | IC: RSS-Gen 6.6 | IC: -         | N/A          | -       | Conducted |

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

### 3.4 Uncertainty

#### EMI

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor  $k = 2$ .  
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| Polarity   | Radiated emission (Below 1GHz) |               |              |               |
|------------|--------------------------------|---------------|--------------|---------------|
|            | (3 m*)(±dB)                    |               | (10 m*)(±dB) |               |
|            | 30 – 300 MHz                   | 300 – 1000MHz | 30 – 300 MHz | 300 – 1000MHz |
| Horizontal | 4.8 dB                         | 5.2 dB        | 4.8 dB       | 5.0 dB        |
| Vertical   | 4.5 dB                         | 5.9 dB        | 4.8 dB       | 5.1 dB        |

| Radiated emission |           |               |               |              |
|-------------------|-----------|---------------|---------------|--------------|
| (3 m*)(±dB)       |           | (1 m*)(±dB)   | (0.5 m*)(±dB) | (10 m*)(±dB) |
| 1 – 6GHz          | 6 – 18GHz | 10 – 26.5 GHz | 26.5 – 40GHz  | 1 -18 GHz    |
| 5.1 dB            | 5.3 dB    | 5.1 dB        | 5.1 dB        | 5.3 dB       |

\*Measurement distance

#### Radiated emission test

The data listed in this test report has enough margin, more than the site margin.

### 3.5 Test Location

UL Japan, Inc. Ise EMC Lab. \*NVLAP Lab. code: 200572-0  
 4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN  
 Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124

| Test site                  | IC Registration Number | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Other rooms            | Maximum measurement distance |
|----------------------------|------------------------|----------------------------|--|------------------------|------------------------------|
| No.1 semi-anechoic chamber | 2973C-1                | 19.2 x 11.2 x 7.7          | 7.0 x 6.0  | No.1 Power source room | 10 m                         |
| No.2 semi-anechoic chamber | 2973C-2                | 7.5 x 5.8 x 5.2            | 4.0 x 4.0  | -                      | 3 m                          |
| No.3 semi-anechoic chamber | 2973C-3                | 12.0 x 8.5 x 5.9           | 6.8 x 5.75   | No.3 Preparation room  | 3 m                          |
| No.3 shielded room         | -                      | 4.0 x 6.0 x 2.7            | N/A  | -                      | -                            |
| No.4 semi-anechoic chamber | 2973C-4                | 12.0 x 8.5 x 5.9           | 6.8 x 5.75   | No.4 Preparation room  | 3 m                          |
| No.4 shielded room         | -                      | 4.0 x 6.0 x 2.7            | N/A  | -                      | -                            |
| No.5 semi-anechoic chamber | -                      | 6.0 x 6.0 x 3.9            | 6.0 x 6.0  | -                      | -                            |
| No.6 shielded room         | -                      | 4.0 x 4.5 x 2.7            | 4.0 x 4.5  | -                      | -                            |
| No.6 measurement room      | -                      | 4.75 x 5.4 x 3.0           | 4.75 x 4.15  | -                      | -                            |
| No.7 shielded room         | -                      | 4.7 x 7.5 x 2.7            | 4.7 x 7.5  | -                      | -                            |
| No.8 measurement room      | -                      | 3.1 x 5.0 x 2.7            | N/A  | -                      | -                            |
| No.9 measurement room      | -                      | 8.8 x 4.6 x 2.8            | 2.4 x 2.4  | -                      | -                            |
| No.11 measurement room     | -                      | 6.2 x 4.7 x 3.0            | 4.8 x 4.6  | -                      | -                            |

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

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

Refer to APPENDIX.

## **SECTION 4: Operation of E.U.T. during testing**

### **4.1 Operating Mode(s)**

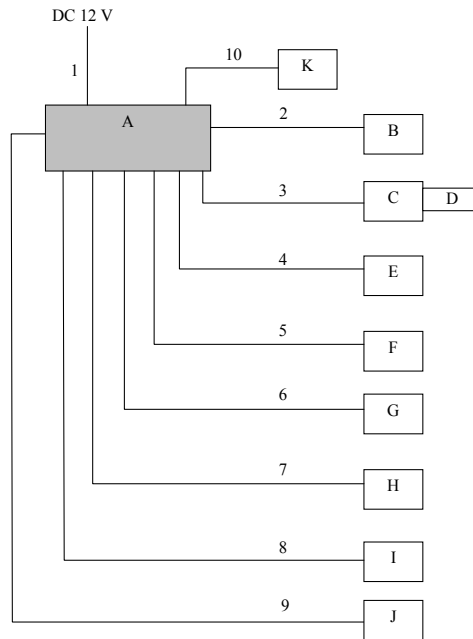
Bluetooth (BT): Transmitting (Tx), Payload: PRBS9

Details of Operating Mode(s)

| <b>Test Item</b>   | <b>Mode</b>   | <b>Tested frequency</b>          |
|--|---|----------------------------------|
| Spurious Emission<br>(Conducted/Radiated)  | Tx (Hopping Off) DH5, 3DH5                              | 2402 MHz<br>2441 MHz<br>2480 MHz |
| Carrier Frequency Separation   | Tx (Hopping On/Off) DH5, 3DH5                           | 2402 MHz<br>2441 MHz<br>2480 MHz |
| 20dB Bandwidth   | Tx (Hopping On/Off) DH5, 3DH5                           | 2402 MHz<br>2441 MHz<br>2480 MHz |
| Number of Hopping Frequency  | Tx (Hopping On) DH5, 3DH5                               | -                                |
| Dwell time   | Tx (Hopping On),<br>-DH1, DH3, DH5<br>-3DH1, 3DH3, 3DH5 | -                                |
| Maximum Peak Output Power  | Tx (Hopping Off) DH5, 2DH5, 3DH5                        | 2402 MHz<br>2441 MHz<br>2480 MHz |
| Band Edge Compliance<br>(Conducted)  | Tx DH5, 3DH5<br>-Hopping On<br>-Hopping Off             | 2402 MHz<br>2480 MHz             |
| 99% Occupied Bandwidth   | Tx DH5, 3DH5<br>-Hopping On<br>-Hopping Off             | 2402 MHz<br>2441 MHz<br>2480 MHz |
| <p>*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test)</p> <p>*2DH mode (2Mb/s EDR: pi/4DQPSK) was excluded for other tests than power measurement by using 3DH mode (3 Mb/s EDR: 8DPSK) as a representative.</p> <p>* It is considered that the non-tested packet type (e.g. inquiry) can be omitted as it is complied with above all test items based on Bluetooth Core specification.</p> <p>*EUT has the power settings by the software as follows;<br/> Power settings: Same as production model<br/> Software: Diag. mode(BT Certification mode)<br/> *This setting of software is the worst case.</p> <p>Any conditions under the normal use do not exceed the condition of setting.<br/> In addition, end users cannot change the settings of the output power of the product.</p> |   |                                  |



## 4.2 Configuration and peripherals



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

### Description of EUT and Support equipment

| No. | Item            | Model number | Serial number                | Manufacturer        | Remarks |
|-----|-----------------|--------------|------------------------------|---------------------|---------|
| A   | Car Navigation  | FT0103A      | MMA00021 *1)<br>MMA00031 *2) | FUJITSU TEN LIMITED | EUT     |
| B   | Radio ANT-AMP   | -            | -                            | FUJITSU TEN LIMITED | -       |
| C   | USB Connector   | 86190-30020  | 10078                        | FUJITSU TEN LIMITED | -       |
| D   | USB Memory      | PD07-WH      | 090000000014303              | KINGMAX             | -       |
| E   | Steering Switch | -            | -                            | -                   | -       |
| F   | Camera          | 86790-58111  | 36C00633                     | -                   | -       |
| G   | Mic             | -            | -                            | -                   | -       |
| H   | Speaker         | SGS-1601     | 153000-154                   | FUJITSU TEN LIMITED | -       |
| I   | Speaker         | 5GS-1630     | 153000-3500141               | FUJITSU TEN LIMITED | -       |
| K   | GPS Antenna     | -            | -                            | FUJITSU TEN LIMITED | -       |
| J   | Switch          | -            | -                            | -                   | -       |

\*1) Used for Antenna Terminal conducted tests

\*2) Used for Radiated Emission test

### List of cables used

| No. | Name                | Length (m) | Shield     |            | Remarks |
|-----|---------------------|------------|------------|------------|---------|
|     |                     |            | Cable      | Connector  |         |
| 1   | DC Cable            | 4.0        | Unshielded | Unshielded | -       |
| 2   | FM/AM Antenna Cable | 2.5        | Shielded   | Shielded   | -       |
| 3   | Signal Cable        | 2.0        | Shielded   | Shielded   | -       |
| 4   | Steering SW Cable   | 2.8        | Unshielded | Unshielded | -       |
| 5   | Camera Cable        | 2.8        | Unshielded | Unshielded | -       |
| 6   | Mic Cable           | 2.8        | Unshielded | Unshielded | -       |
| 7   | Speaker Cable       | 2.8        | Unshielded | Unshielded | -       |
| 8   | Speaker Cable       | 2.8        | Unshielded | Unshielded | -       |
| 9   | Signal Cable        | 2.8        | Unshielded | Unshielded | -       |
| 10  | GPS Antenna Cable   | 7.0        | Shielded   | Shielded   | -       |

**UL Japan, Inc.**

**Ise EMC Lab.**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

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

### **Test Procedure**

[For below 1GHz]

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

[For 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.

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

|              |                   |                  |             |
|--------------|-------------------|------------------|-------------|
| Frequency    | 30 MHz to 300 MHz | 300 MHz to 1 GHz | Above 1 GHz |
| Antenna Type | Biconical         | Logperiodic      | Horn        |

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

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

|                 |               |   |                              |   |
|-----------------|---------------|---|------------------------------|---|
| Frequency       | Below 1 GHz   | Above 1 GHz                                       |                              | 20 dBc  |
| Instrument used | Test Receiver | Spectrum Analyzer                                 |                              | Spectrum Analyzer                                 |
| Detector        | QP            | PK  | AV                           | PK  |
| IF Bandwidth    | BW 120 kHz    | RBW: 1 MHz<br>VBW: 3 MHz                          | RBW: 1 MHz<br>VBW: 10 Hz *1) | RBW: 100 kHz<br>VBW: 300 kHz                      |
| Test Distance   | 3 m           | 4.4 m*2) (below 10 GHz),<br>1 m*3) (above 10 GHz) |                              | 4.4 m*2) (below 10 GHz),<br>1 m*3) (above 10 GHz) |

\*1) Although DA 00-705 accepts VBW = 10 Hz for AV measurements, it was confirmed that superfluous smoothing was not performed.

\*2) Distance Factor:  $20 \times \log(4.4 \text{ m} / 3.0 \text{ m}) = 3.3 \text{ dB}$

\*3) Distance Factor:  $20 \times \log(1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$

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

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

**Measurement range** : 30 M - 26.5 GHz  
**Test data** : APPENDIX  
**Test result** : Pass

**UL Japan, Inc.**

**Ise EMC Lab.**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## **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                |
|---|---|-----------------|--------------------|--|------------------|-------------|--------------------------------|
| 20dB Bandwidth  | 3 MHz                                   | 30 kHz          | 100 kHz            | Auto   | Peak             | Max Hold    | Spectrum Analyzer              |
| 99% Occupied Bandwidth *1)  | Enough width to display emission skirts | 1 to 5 % of OBW | Three times of RBW | Auto   | Peak             | Max Hold    | Spectrum Analyzer              |
| Maximum Peak Output Power   | -                                       | -               | -                  | Auto   | Peak Average *3) | -           | Power Meter (Sensor: 50MHz BW) |
| Carrier Frequency Separation  | 3 MHz                                   | 30 kHz          | 100 kHz            | Auto   | Peak             | Max Hold    | Spectrum Analyzer              |
| Number of Hopping Frequency   | 30 MHz                                  | 300 kHz         | 1 MHz              | Auto   | Peak             | Max Hold    | Spectrum Analyzer              |
| Dwell Time  | Zero Span                               | 100 kHz, 1 MHz  | 300 kHz, 3 MHz     | As necessary capture the entire dwell time per hopping channel | Peak             | Clear Write | Spectrum Analyzer              |
| Conducted Spurious Emission *2)   | 9 kHz to 150 kHz                        | 200 Hz          | 620 Hz             | Auto   | Peak             | Max Hold    | Spectrum Analyzer              |
|   | 150 kHz to 30 MHz                       | 9.1 kHz         | 27 kHz             |  |                  |             |                                |
|   | 30 MHz to 25 GHz                        | 100 kHz         | 300 kHz            |  |                  |             |                                |
| Conducted Spurious Emission Band Edge compliance  | 10 MHz                                  | 100 kHz         | 300 kHz            | Auto   | Peak             | Max Hold    | Spectrum Analyzer              |
| *1) Peak hold was applied as Worst-case measurement.<br>*2) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.<br>Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.<br>(9 kHz -150 kHz: RBW = 200 Hz, 150 kHz - 30 MHz: RBW = 9.1 kHz)<br>*3) Reference data |   |                 |                    |  |                  |             |                                |

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

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

## APPENDIX 1: Test data

### 20dB Bandwidth and Carrier Frequency Separation

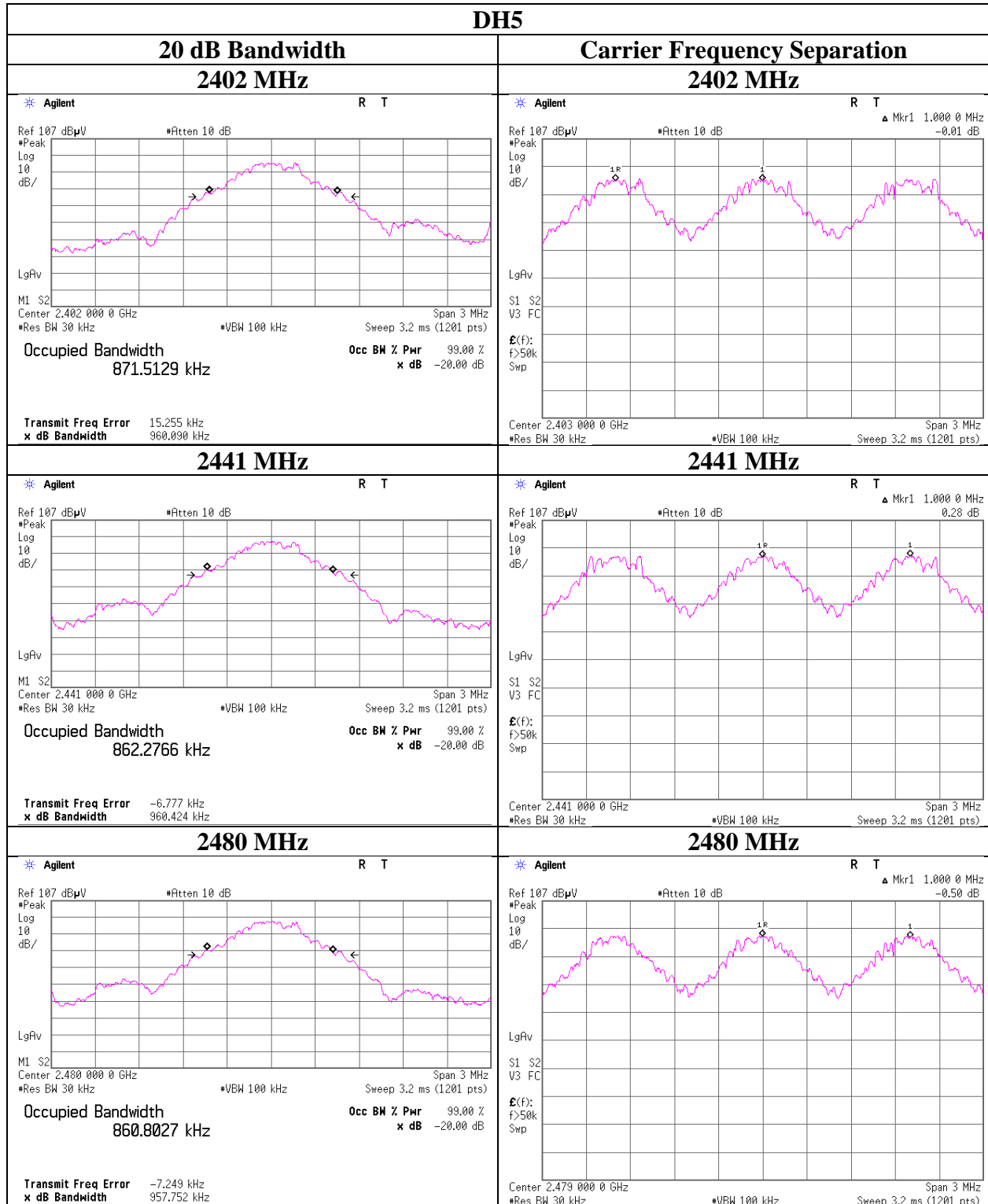
Test place Ise EMC Lab. No.6 Measurement Room  
Report No. 11107783H  
Date January 21, 2016  
Temperature / Humidity 25 deg. C / 22 % RH  
Engineer Yutaka Yoshida  
Mode Tx (Hopping on/off) DH5/3DH5

| Mode | Freq.<br>[MHz] | 20dB Bandwidth<br>[MHz] | Carrier Frequency<br>Separation<br>[MHz] | Limit for Carrier<br>Frequency separation<br>[MHz] |
|------|----------------|-------------------------|--|--|
| DH5  | 2402.0         | 0.960                   | 1.000                                    | $\geq 0.640$                                       |
| DH5  | 2441.0         | 0.960                   | 1.000                                    | $\geq 0.640$                                       |
| DH5  | 2480.0         | 0.958                   | 1.000                                    | $\geq 0.639$                                       |
| 3DH5 | 2402.0         | 1.282                   | 1.000                                    | $\geq 0.855$                                       |
| 3DH5 | 2441.0         | 1.285                   | 1.000                                    | $\geq 0.857$                                       |
| 3DH5 | 2480.0         | 1.285                   | 1.000                                    | $\geq 0.857$                                       |

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

No limit applies to 20dB Bandwidth.

## 20dB Bandwidth and Carrier Frequency Separation



**UL Japan, Inc.**

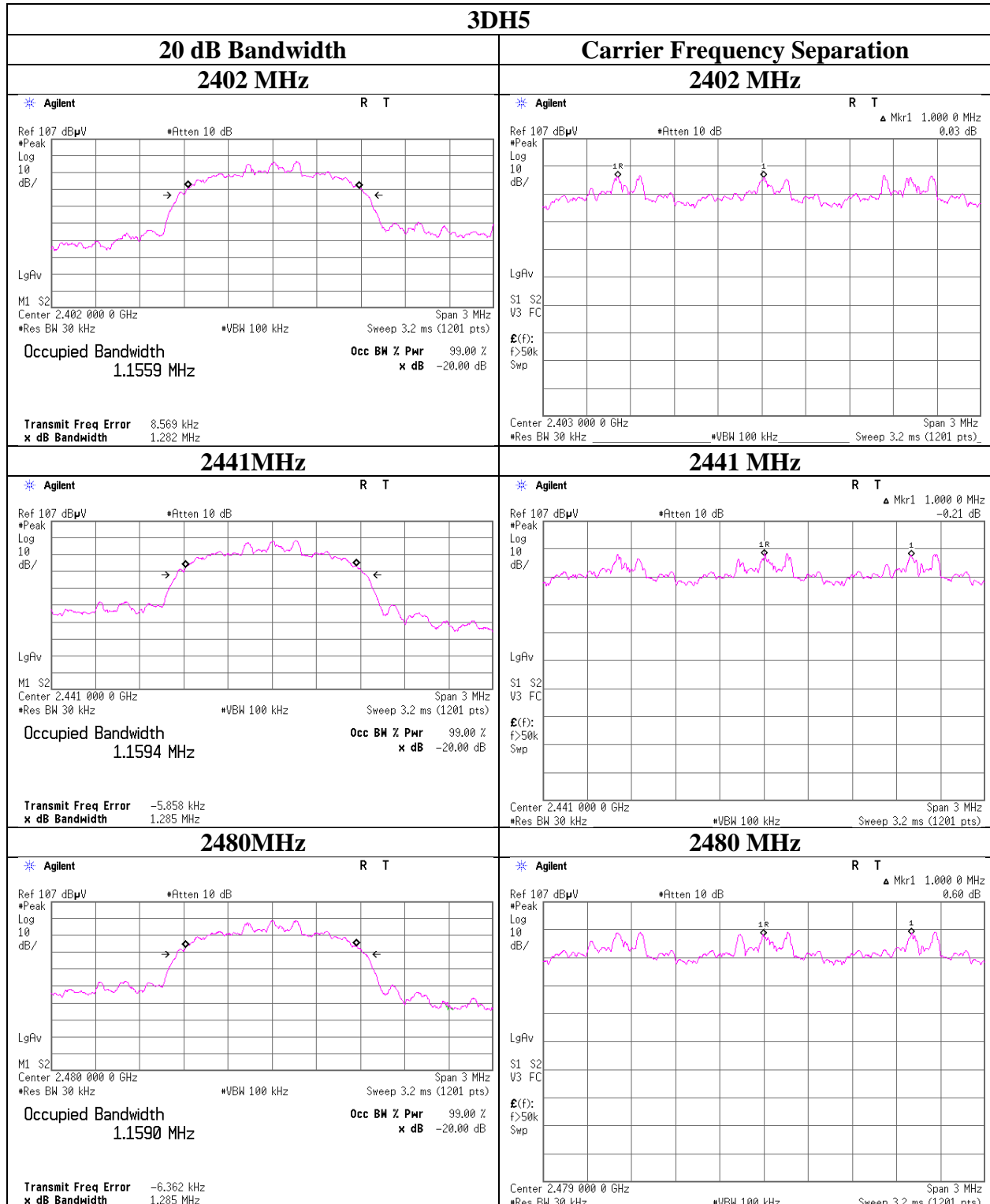
**Ise EMC Lab.**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## 20dB Bandwidth and Carrier Frequency Separation



**UL Japan, Inc.**

**Ise EMC Lab.**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

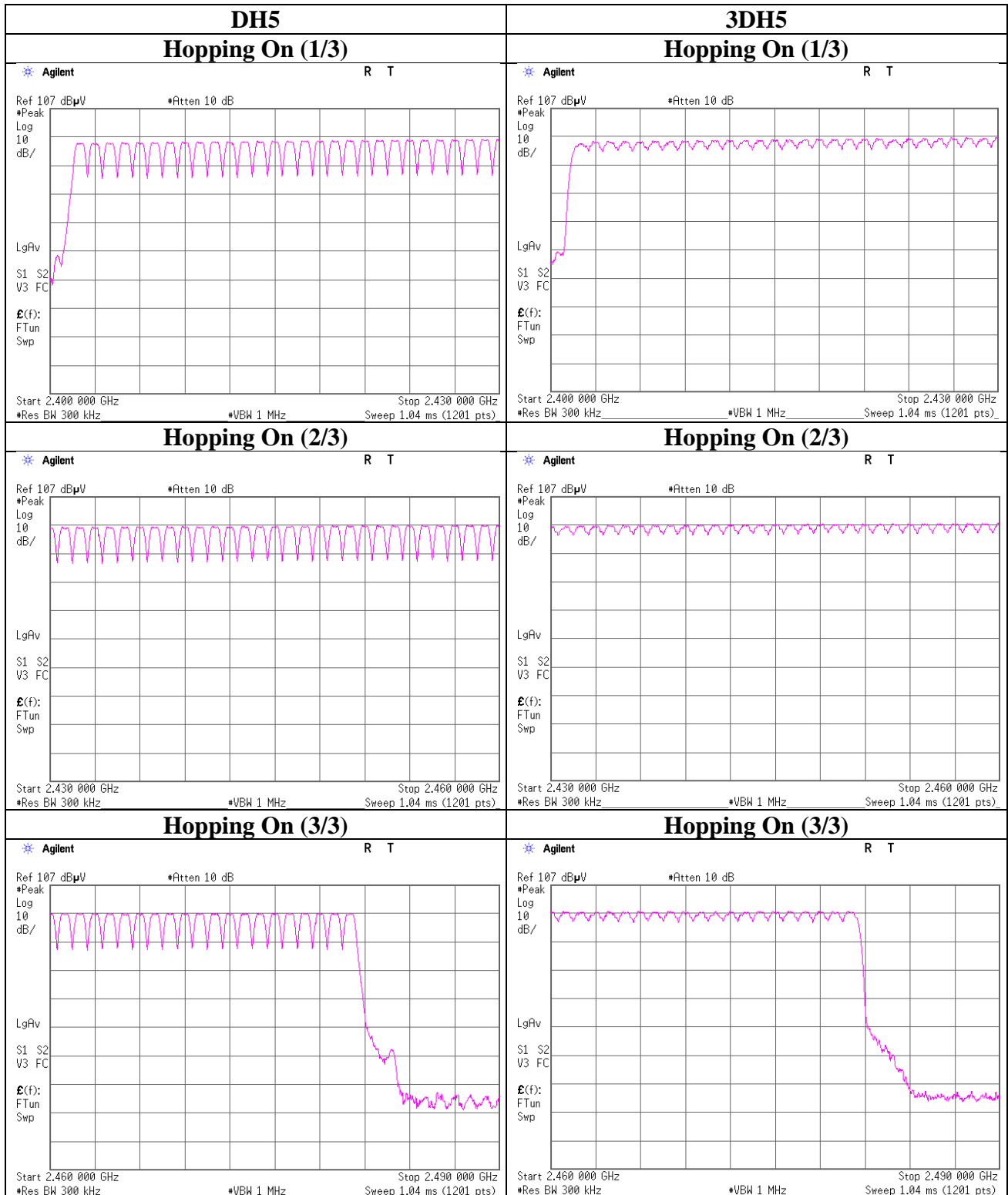
### Number of Hopping Frequency

Test place Ise EMC Lab. No.6 Measurement Room  
Report No. 11107783H  
Date January 21, 2016  
Temperature / Humidity 25 deg. C / 22 % RH  
Engineer Yutaka Yoshida  
Mode Tx, Hopping On

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

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

### Number of Hopping Frequency



**UL Japan, Inc.**

**Ise EMC Lab.**

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

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Facsimile : +81 596 24 8124



### Dwell time

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11107783H  
 Date : January 21, 2016  
 Temperature / Humidity : 25 deg. C / 22 % RH  
 Engineer : Yutaka Yoshida  
 Mode : Tx, Hopping On

| Mode | Number of transmission<br>in a 31.6(79 Hopping x 0.4)<br>/ 12.8 (32 Hopping x 0.4) second period | Length of<br>transmission<br>[msec] | Result<br>[msec] | Limit<br>[msec] |
|------|--|-------------------------------------|------------------|-----------------|
| DH1  | 50.6 times / 5 sec. x 31.6 sec. = 320 times  | 0.420                               | 134              | 400             |
| DH3  | 25.2 times / 5 sec. x 31.6 sec. = 160 times  | 1.682                               | 269              | 400             |
| DH5  | 17.0 times / 5 sec. x 31.6 sec. = 108 times  | 2.936                               | 317              | 400             |
| 3DH1 | 50.8 times / 5 sec. x 31.6 sec. = 322 times  | 0.432                               | 139              | 400             |
| 3DH3 | 25.6 times / 5 sec. x 31.6 sec. = 162 times  | 1.685                               | 273              | 400             |
| 3DH5 | 16.8 times / 5 sec. x 31.6 sec. = 107 times  | 2.944                               | 315              | 400             |

Sample Calculation

Result = Number of transmission x Length of transmission

\*Average data of 5 tests.

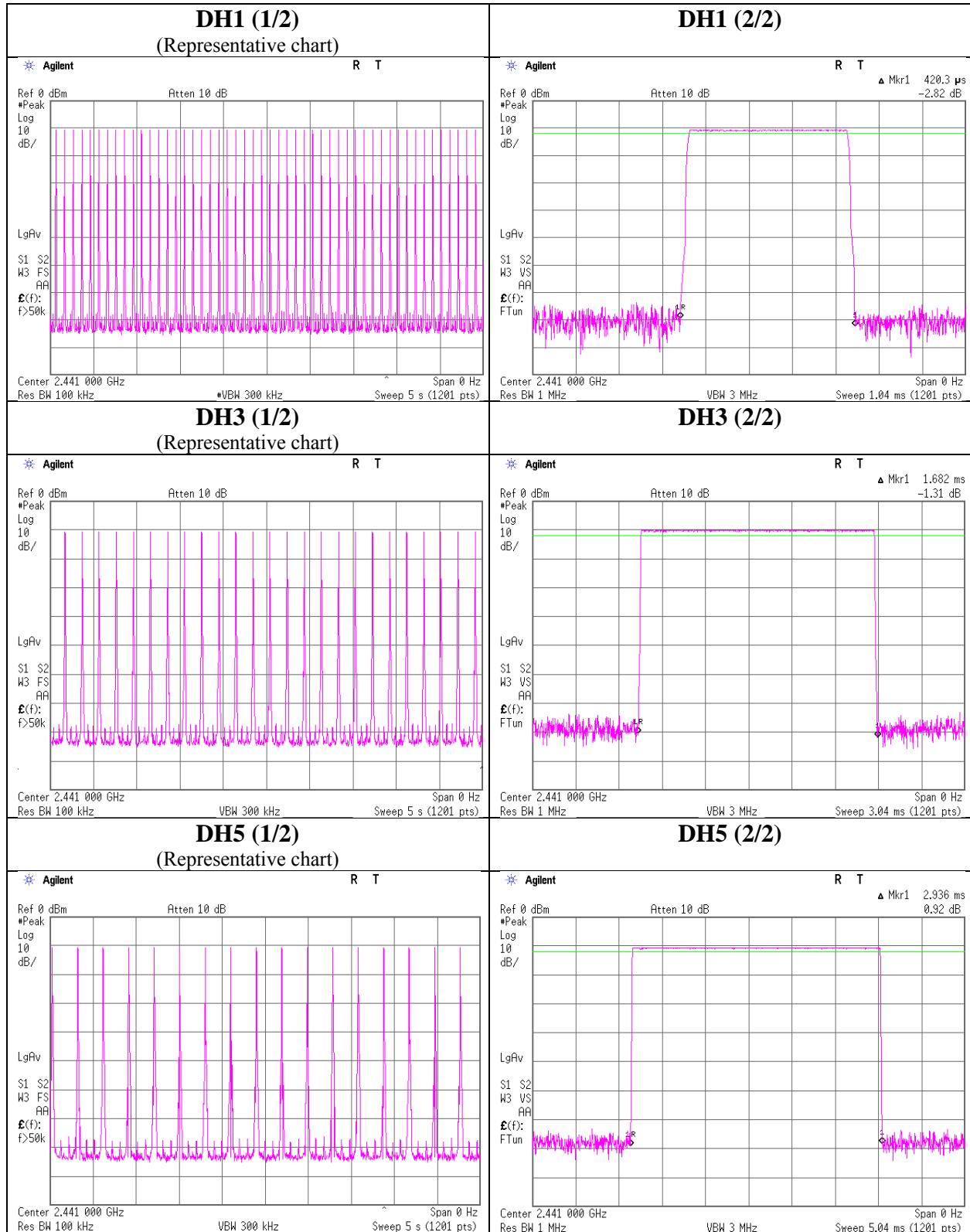
| Mode | Sampling [times] |    |    |    |    | Average<br>[times] |
|------|------------------|----|----|----|----|--------------------|
|      | 1                | 2  | 3  | 4  | 5  |                    |
| DH1  | 50               | 51 | 50 | 51 | 51 | 50.6               |
| DH3  | 25               | 25 | 25 | 26 | 25 | 25.2               |
| DH5  | 17               | 17 | 17 | 17 | 17 | 17                 |
| 3DH1 | 51               | 51 | 51 | 50 | 51 | 50.8               |
| 3DH3 | 25               | 26 | 26 | 26 | 25 | 25.6               |
| 3DH5 | 16               | 17 | 17 | 17 | 17 | 16.8               |

Sample Calculation

Average = Summation (Sampling 1 to 5) / 5

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

**Dwell time**



**UL Japan, Inc.**

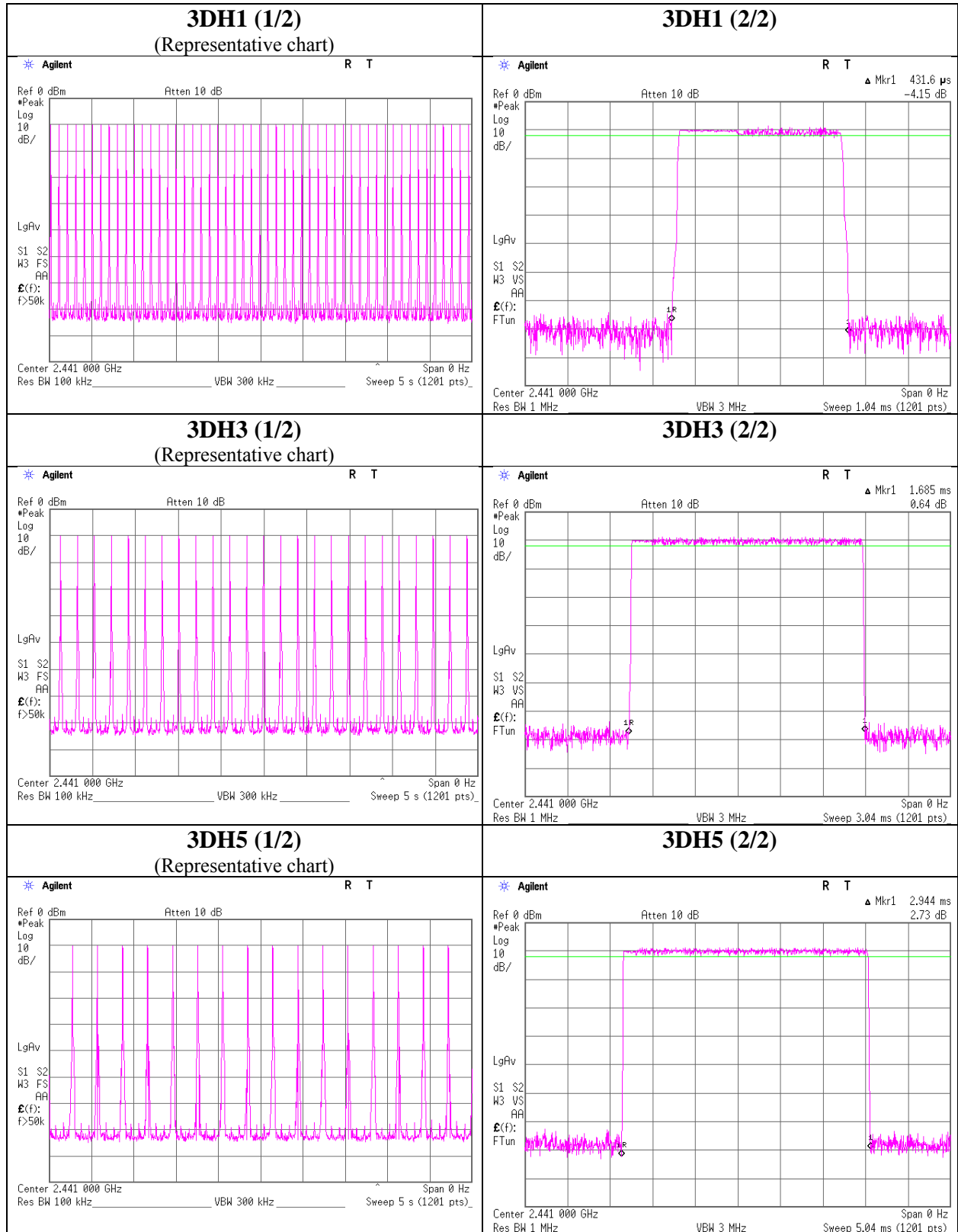
**Ise EMC Lab.**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

**Dwell time**



**UL Japan, Inc.**

**Ise EMC Lab.**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## Maximum Peak Output Power

Test place Ise EMC Lab. No.6 Measurement Room  
Report No. 11107783H  
Date January 21, 2016  
Temperature / Humidity 25 deg. C / 22 % RH  
Engineer Yutaka Yoshida  
Mode Tx, Hopping Off

| Mode | Freq.<br>[MHz] | Reading<br>PK<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |      | Limit |      | Margin<br>[dB] |
|------|----------------|------------------------|-----------------------|------------------------|--------|------|-------|------|----------------|
|      |                |                        |                       |                        | [dBm]  | [mW] | [dBm] | [mW] |                |
| DH5  | 2402.0         | -12.02                 | 2.33                  | 9.74                   | 0.05   | 1.01 | 20.96 | 125  | 20.91          |
| DH5  | 2441.0         | -10.46                 | 2.34                  | 9.74                   | 1.63   | 1.45 | 20.96 | 125  | 19.33          |
| DH5  | 2480.0         | -9.25                  | 2.35                  | 9.74                   | 2.85   | 1.93 | 20.96 | 125  | 18.11          |
| 2DH5 | 2402.0         | -10.45                 | 2.33                  | 9.74                   | 1.62   | 1.45 | 20.96 | 125  | 19.34          |
| 2DH5 | 2441.0         | -8.70                  | 2.34                  | 9.74                   | 3.39   | 2.18 | 20.96 | 125  | 17.57          |
| 2DH5 | 2480.0         | -8.12                  | 2.35                  | 9.74                   | 3.98   | 2.50 | 20.96 | 125  | 16.98          |
| 3DH5 | 2402.0         | -10.16                 | 2.33                  | 9.74                   | 1.91   | 1.55 | 20.96 | 125  | 19.05          |
| 3DH5 | 2441.0         | -8.45                  | 2.34                  | 9.74                   | 3.64   | 2.31 | 20.96 | 125  | 17.32          |
| 3DH5 | 2480.0         | -7.83                  | 2.35                  | 9.74                   | 4.27   | 2.67 | 20.96 | 125  | 16.69          |

Sample Calculation:

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

Test was not performed at AFH mode, because the decrease of number of channel (min: 20ch) at AFH mode does not influence on the output power and bandwidth of the EUT.

As this device had AFH mode and frequency separation could not meet the requirement of over 20dB BW without 2/3 relaxation, 125mW power limit was applied to it.

**Average Output Power**  
**(Reference data for RF Exposure / SAR testing)**

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11107783H  
 Date : January 21, 2016  
 Temperature / Humidity : 25 deg. C / 22 % RH  
 Engineer : Yutaka Yoshida  
 Mode : Tx, Hopping Off

| Mode | Freq.<br>[MHz] | Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result<br>(Frame power) |      | Duty<br>factor<br>[dB] | Result<br>(Burst power) |      |
|------|----------------|------------------|-----------------------|------------------------|-------------------------|------|------------------------|-------------------------|------|
|      |                |                  |                       |                        | [dBm]                   | [mW] |                        | [dBm]                   | [mW] |
| DH5  | 2402.0         | -13.75           | 2.33                  | 9.74                   | -1.68                   | 0.68 | 1.08                   | -0.60                   | 0.87 |
| DH5  | 2441.0         | -12.05           | 2.34                  | 9.74                   | 0.03                    | 1.01 | 1.08                   | 1.11                    | 1.29 |
| DH5  | 2480.0         | -10.83           | 2.35                  | 9.74                   | 1.26                    | 1.34 | 1.08                   | 2.34                    | 1.72 |
| 2DH5 | 2402.0         | -14.50           | 2.33                  | 9.74                   | -2.43                   | 0.57 | 1.07                   | -1.36                   | 0.73 |
| 2DH5 | 2441.0         | -12.61           | 2.34                  | 9.74                   | -0.53                   | 0.89 | 1.07                   | 0.54                    | 1.13 |
| 2DH5 | 2480.0         | -11.92           | 2.35                  | 9.74                   | 0.17                    | 1.04 | 1.07                   | 1.24                    | 1.33 |
| 3DH5 | 2402.0         | -14.48           | 2.33                  | 9.74                   | -2.41                   | 0.57 | 1.07                   | -1.34                   | 0.73 |
| 3DH5 | 2441.0         | -12.59           | 2.34                  | 9.74                   | -0.51                   | 0.89 | 1.07                   | 0.56                    | 1.14 |
| 3DH5 | 2480.0         | -11.92           | 2.35                  | 9.74                   | 0.17                    | 1.04 | 1.07                   | 1.24                    | 1.33 |

Sample Calculation:

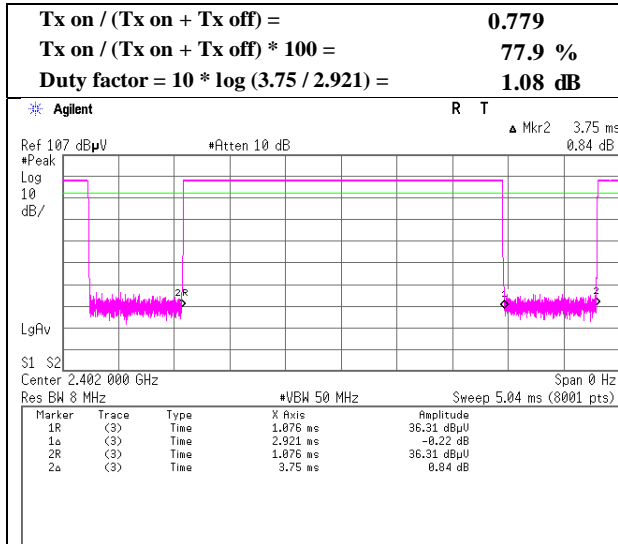
Result (Frame power) = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

Result (Burst power) = Frame power + Duty factor

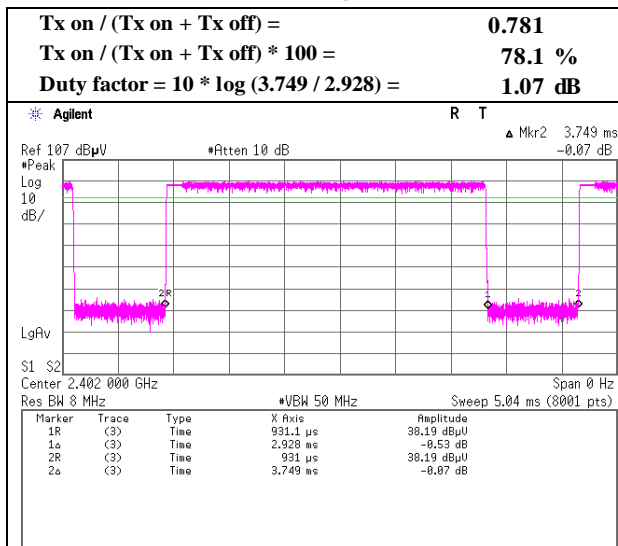
### Burst Rate Confirmation

|                        |                                    |
|------------------------|------------------------------------|
| Test place             | Ise EMC Lab. No.6 Measurement Room |
| Report No.             | 11107783H                          |
| Date                   | January 21, 2016                   |
| Temperature / Humidity | 25 deg. C / 22 % RH                |
| Engineer               | Yutaka Yoshida                     |
| Mode                   | Tx, Hopping Off                    |

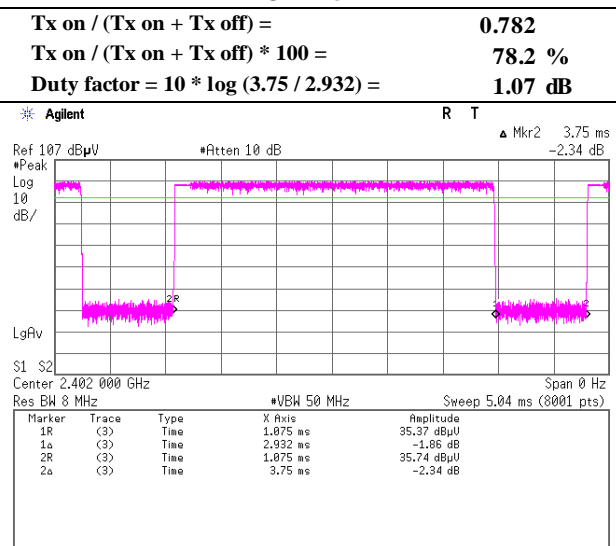
#### DH5



#### 2DH5



#### 3DH5



## Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 11107783H  
Date : January 24, 2016      January 25, 2016  
Temperature / Humidity : 20 deg. C / 27 % RH      20 deg. C / 37 % RH  
Engineer : Yuta Moriya      Kazuya Yoshioka  
            (1-26.5GHz)      (30-1000MHz)  
Mode : Tx, Hopping Off, DH5 2402 MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark      |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|
| Hori     | 160.512         | QP       | 36.6           | 15.4            | 8.7       | 32.2      | 28.5            | 43.5           | 15.0        |             |
| Hori     | 246.935         | QP       | 41.1           | 17.2            | 9.5       | 32.0      | 35.8            | 46.0           | 10.2        |             |
| Hori     | 479.970         | QP       | 38.5           | 17.8            | 11.1      | 32.1      | 35.3            | 46.0           | 10.7        |             |
| Hori     | 592.142         | QP       | 31.4           | 19.2            | 11.7      | 32.1      | 30.2            | 46.0           | 15.8        |             |
| Hori     | 666.170         | QP       | 30.3           | 20.1            | 12.1      | 32.2      | 30.3            | 46.0           | 15.7        |             |
| Hori     | 925.232         | QP       | 25.5           | 22.6            | 13.4      | 30.9      | 30.6            | 46.0           | 15.4        |             |
| Hori     | 1920.003        | PK       | 50.4           | 26.4            | 6.3       | 32.6      | 50.5            | 73.9           | 23.4        |             |
| Hori     | 2390.000        | PK       | 42.6           | 26.9            | 6.6       | 32.0      | 44.1            | 73.9           | 29.8        |             |
| Hori     | 4804.000        | PK       | 40.8           | 31.8            | 8.8       | 31.3      | 50.1            | 73.9           | 23.8        | Floor Noise |
| Hori     | 7206.000        | PK       | 41.8           | 36.0            | 10.0      | 32.0      | 55.8            | 73.9           | 18.1        | Floor Noise |
| Hori     | 9608.000        | PK       | 42.2           | 38.2            | 10.8      | 32.4      | 58.8            | 73.9           | 15.1        | Floor Noise |
| Hori     | 1920.003        | AV       | 46.9           | 26.4            | 6.3       | 32.6      | 47.0            | 53.9           | 6.9         |             |
| Hori     | 2390.000        | AV       | 29.8           | 26.9            | 6.6       | 32.0      | 31.3            | 53.9           | 22.6        |             |
| Hori     | 4804.000        | AV       | 29.7           | 31.8            | 8.8       | 31.3      | 39.0            | 53.9           | 14.9        | Floor Noise |
| Hori     | 7206.000        | AV       | 30.2           | 36.0            | 10.0      | 32.0      | 44.2            | 53.9           | 9.7         | Floor Noise |
| Hori     | 9608.000        | AV       | 30.5           | 38.2            | 10.8      | 32.4      | 47.1            | 53.9           | 6.8         | Floor Noise |
| Vert     | 154.332         | QP       | 34.5           | 15.1            | 8.6       | 32.2      | 26.0            | 43.5           | 17.5        |             |
| Vert     | 246.958         | QP       | 41.9           | 17.2            | 9.5       | 32.0      | 36.6            | 46.0           | 9.4         |             |
| Vert     | 480.002         | QP       | 32.4           | 17.8            | 11.1      | 32.1      | 29.2            | 46.0           | 16.8        |             |
| Vert     | 592.140         | QP       | 35.9           | 19.2            | 11.7      | 32.1      | 34.7            | 46.0           | 11.3        |             |
| Vert     | 666.162         | QP       | 36.3           | 20.1            | 12.1      | 32.2      | 36.3            | 46.0           | 9.7         |             |
| Vert     | 925.232         | QP       | 29.3           | 22.6            | 13.4      | 30.9      | 34.4            | 46.0           | 11.6        |             |
| Vert     | 1920.003        | PK       | 48.2           | 26.4            | 6.3       | 32.6      | 48.3            | 73.9           | 25.6        |             |
| Vert     | 2390.000        | PK       | 42.9           | 26.9            | 6.6       | 32.0      | 44.4            | 73.9           | 29.5        |             |
| Vert     | 4804.000        | PK       | 40.8           | 31.8            | 8.8       | 31.3      | 50.1            | 73.9           | 23.8        | Floor Noise |
| Vert     | 7206.000        | PK       | 41.9           | 36.0            | 10.0      | 32.0      | 55.9            | 73.9           | 18.0        | Floor Noise |
| Vert     | 9608.000        | PK       | 42.3           | 38.2            | 10.8      | 32.4      | 58.9            | 73.9           | 15.0        | Floor Noise |
| Vert     | 1920.003        | AV       | 42.8           | 26.4            | 6.3       | 32.6      | 42.9            | 53.9           | 11.0        |             |
| Vert     | 2390.000        | AV       | 28.4           | 26.9            | 6.6       | 32.0      | 29.9            | 53.9           | 24.0        |             |
| Vert     | 4804.000        | AV       | 29.6           | 31.8            | 8.8       | 31.3      | 38.9            | 53.9           | 15.0        | Floor Noise |
| Vert     | 7206.000        | AV       | 30.3           | 36.0            | 10.0      | 32.0      | 44.3            | 53.9           | 9.6         | Floor Noise |
| Vert     | 9608.000        | AV       | 30.5           | 38.2            | 10.8      | 32.4      | 47.1            | 53.9           | 6.8         | Floor Noise |

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

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

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor:      1 GHz - 10 GHz      20log (4.4 m / 3.0 m) = 3.3 dB  
                                 10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

### 20dBc Data Sheet

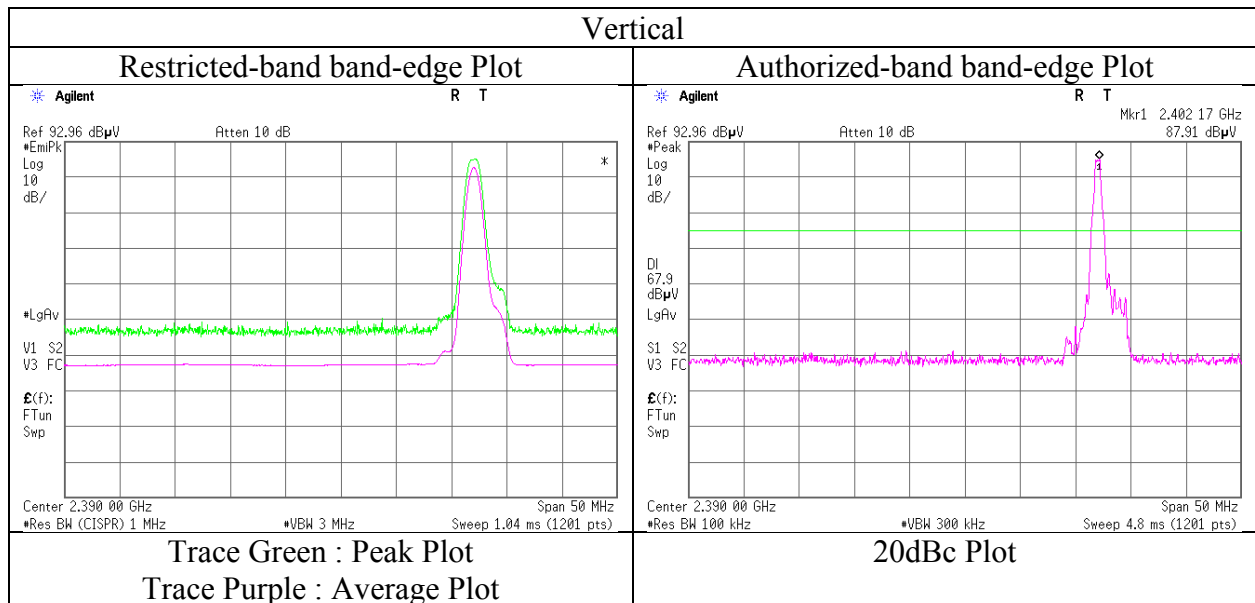
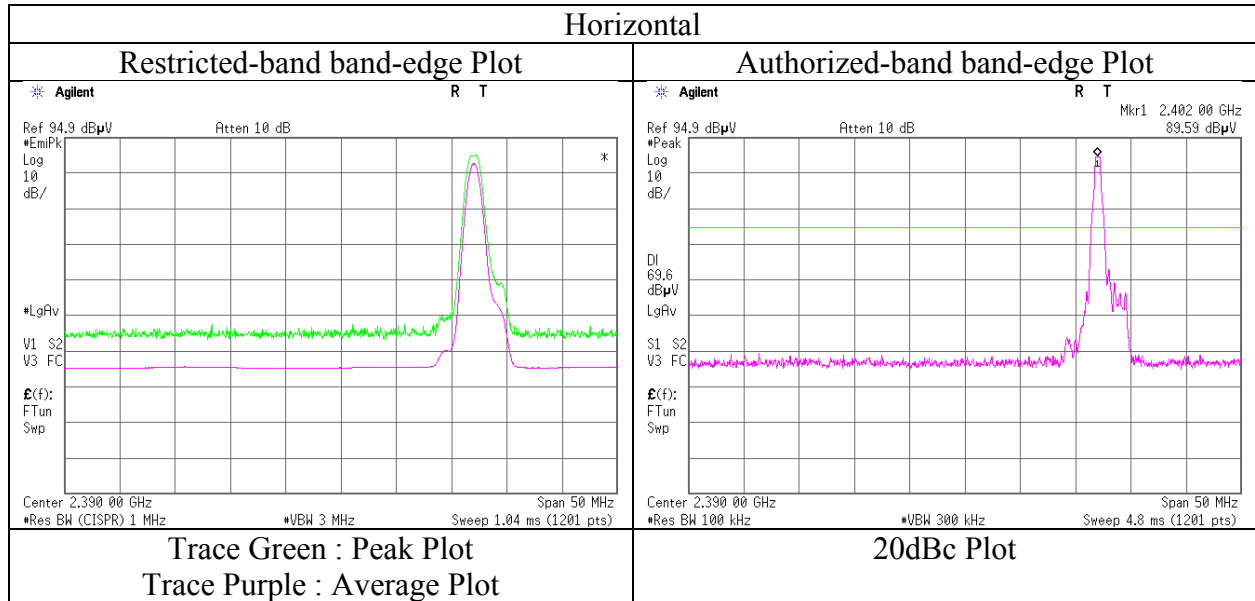
| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant Factor [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark  |
|----------|-----------------|----------|----------------|-------------------|-----------|-----------|-----------------|----------------|-------------|---------|
| Hori     | 2402.000        | PK       | 89.6           | 26.9              | 6.6       | 32.0      | 91.1            | -              | -           | Carrier |
| Hori     | 2400.000        | PK       | 42.2           | 26.9              | 6.6       | 32.0      | 43.7            | 71.1           | 27.4        |         |
| Vert     | 2402.000        | PK       | 87.9           | 26.9              | 6.6       | 32.0      | 89.4            | -              | -           | Carrier |
| Vert     | 2400.000        | PK       | 40.9           | 26.9              | 6.6       | 32.0      | 42.4            | 69.4           | 27.0        |         |

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

\*These results have sufficient margin without taking account Dwell time factor.

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

|                        |   |
|------------------------|---|
| Test place             | Ise EMC Lab. No.3 Semi Anechoic Chamber |
| Report No.             | 11107783H                               |
| Date                   | January 24, 2016                        |
| Temperature / Humidity | 20 deg. C / 27 % RH                     |
| Engineer               | Yuta Moriya                             |
|                        | (1-10GHz)                               |
| Mode                   | Tx, Hopping Off, DH5 2402 MHz           |



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

**UL Japan, Inc.**

**Ise EMC Lab.**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124



## Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 11107783H  
Date : January 24, 2016      January 25, 2016  
Temperature / Humidity : 20 deg. C / 27 % RH      20 deg. C / 37 % RH  
Engineer : Yuta Moriya      Kazuya Yoshioka  
            (1-26.5GHz)      (30-1000MHz)  
Mode : Tx, Hopping Off, DH5 2441 MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark      |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|
| Hori     | 160.517         | QP       | 36.0           | 15.4            | 8.7       | 32.2      | 27.9            | 43.5           | 15.6        |             |
| Hori     | 246.952         | QP       | 44.0           | 17.2            | 9.5       | 32.0      | 38.7            | 46.0           | 7.3         |             |
| Hori     | 479.997         | QP       | 38.7           | 17.8            | 11.1      | 32.1      | 35.5            | 46.0           | 10.5        |             |
| Hori     | 592.129         | QP       | 31.5           | 19.2            | 11.7      | 32.1      | 30.3            | 46.0           | 15.7        |             |
| Hori     | 666.170         | QP       | 30.8           | 20.1            | 12.1      | 32.2      | 30.8            | 46.0           | 15.2        |             |
| Hori     | 740.172         | QP       | 30.8           | 21.1            | 12.5      | 31.9      | 32.5            | 46.0           | 13.5        |             |
| Hori     | 1920.078        | PK       | 50.4           | 26.4            | 6.3       | 32.6      | 50.5            | 73.9           | 23.4        |             |
| Hori     | 4882.000        | PK       | 41.0           | 31.9            | 8.8       | 31.3      | 50.4            | 73.9           | 23.5        | Floor Noise |
| Hori     | 7323.000        | PK       | 41.6           | 36.0            | 10.1      | 32.0      | 55.7            | 73.9           | 18.2        | Floor Noise |
| Hori     | 9764.000        | PK       | 42.1           | 38.2            | 10.8      | 32.5      | 58.6            | 73.9           | 15.3        | Floor Noise |
| Hori     | 1920.078        | AV       | 46.4           | 26.4            | 6.3       | 32.6      | 46.5            | 53.9           | 7.4         |             |
| Hori     | 4882.000        | AV       | 29.6           | 31.9            | 8.8       | 31.3      | 39.0            | 53.9           | 14.9        | Floor Noise |
| Hori     | 7323.000        | AV       | 30.2           | 36.0            | 10.1      | 32.0      | 44.3            | 53.9           | 9.6         | Floor Noise |
| Hori     | 9764.000        | AV       | 30.4           | 38.2            | 10.8      | 32.5      | 46.9            | 53.9           | 7.0         | Floor Noise |
| Vert     | 154.307         | QP       | 35.1           | 15.1            | 8.6       | 32.2      | 26.6            | 43.5           | 16.9        |             |
| Vert     | 246.949         | QP       | 43.3           | 17.2            | 9.5       | 32.0      | 38.0            | 46.0           | 8.0         |             |
| Vert     | 481.120         | QP       | 33.3           | 17.9            | 11.2      | 32.1      | 30.3            | 46.0           | 15.7        |             |
| Vert     | 592.143         | QP       | 35.6           | 19.2            | 11.7      | 32.1      | 34.4            | 46.0           | 11.6        |             |
| Vert     | 666.155         | QP       | 36.3           | 20.1            | 12.1      | 32.2      | 36.3            | 46.0           | 9.7         |             |
| Vert     | 740.185         | QP       | 32.9           | 21.1            | 12.5      | 31.9      | 34.6            | 46.0           | 11.4        |             |
| Vert     | 1920.078        | PK       | 47.9           | 26.4            | 6.3       | 32.6      | 48.0            | 73.9           | 25.9        |             |
| Vert     | 4882.000        | PK       | 48.9           | 31.9            | 8.8       | 31.3      | 58.3            | 73.9           | 15.6        | Floor Noise |
| Vert     | 7323.000        | PK       | 42.4           | 36.0            | 10.1      | 32.0      | 56.5            | 73.9           | 17.4        | Floor Noise |
| Vert     | 9764.000        | PK       | 42.2           | 38.2            | 10.8      | 32.5      | 58.7            | 73.9           | 15.2        | Floor Noise |
| Vert     | 1920.078        | AV       | 43.1           | 26.4            | 6.3       | 32.6      | 43.2            | 53.9           | 10.7        |             |
| Vert     | 4882.000        | AV       | 29.5           | 31.9            | 8.8       | 31.3      | 38.9            | 53.9           | 15.0        | Floor Noise |
| Vert     | 7323.000        | AV       | 30.1           | 36.0            | 10.1      | 32.0      | 44.2            | 53.9           | 9.7         | Floor Noise |
| Vert     | 9764.000        | AV       | 30.5           | 38.2            | 10.8      | 32.5      | 47.0            | 53.9           | 6.9         | Floor Noise |

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

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

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 1 GHz - 10 GHz  $20\log(4.4\text{ m} / 3.0\text{ m}) = 3.3\text{ dB}$   
10 GHz - 26.5 GHz  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

\*These results have sufficient margin without taking account Dwell time factor.

## Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 11107783H  
Date : January 24, 2016      January 25, 2016  
Temperature / Humidity : 20 deg. C / 27 % RH      20 deg. C / 37 % RH  
Engineer : Yuta Moriya      Kazuya Yoshioka  
            (1-26.5GHz)      (30-1000MHz)  
Mode : Tx, Hopping Off, DH5 2480 MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark      |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|
| Hori     | 160.503         | QP       | 36.2           | 15.4            | 8.7       | 32.2      | 28.1            | 43.5           | 15.4        |             |
| Hori     | 246.930         | QP       | 43.9           | 17.2            | 9.5       | 32.0      | 38.6            | 46.0           | 7.4         |             |
| Hori     | 370.417         | QP       | 34.0           | 16.6            | 10.4      | 32.0      | 29.0            | 46.0           | 17.0        |             |
| Hori     | 479.971         | QP       | 38.2           | 17.8            | 11.1      | 32.1      | 35.0            | 46.0           | 11.0        |             |
| Hori     | 617.373         | QP       | 31.2           | 19.6            | 11.9      | 32.1      | 30.6            | 46.0           | 15.4        |             |
| Hori     | 666.156         | QP       | 31.0           | 20.1            | 12.1      | 32.2      | 31.0            | 46.0           | 15.0        |             |
| Hori     | 1920.003        | PK       | 50.3           | 26.4            | 6.3       | 32.6      | 50.4            | 73.9           | 23.5        |             |
| Hori     | 2483.500        | PK       | 44.9           | 26.9            | 6.6       | 32.0      | 46.4            | 73.9           | 27.5        |             |
| Hori     | 4960.000        | PK       | 40.7           | 32.1            | 8.7       | 31.2      | 50.3            | 73.9           | 23.6        | Floor Noise |
| Hori     | 7440.000        | PK       | 41.9           | 36.0            | 10.0      | 32.1      | 55.8            | 73.9           | 18.1        | Floor Noise |
| Hori     | 9920.000        | PK       | 42.3           | 38.2            | 10.9      | 32.5      | 58.9            | 73.9           | 15.0        | Floor Noise |
| Hori     | 1920.003        | AV       | 46.5           | 26.4            | 6.3       | 32.6      | 46.6            | 53.9           | 7.3         |             |
| Hori     | 2483.500        | AV       | 30.4           | 26.9            | 6.6       | 32.0      | 31.9            | 53.9           | 22.0        |             |
| Hori     | 4960.000        | AV       | 29.8           | 32.1            | 8.7       | 31.2      | 39.4            | 53.9           | 14.5        | Floor Noise |
| Hori     | 7440.000        | AV       | 30.1           | 36.0            | 10.0      | 32.1      | 44.0            | 53.9           | 9.9         | Floor Noise |
| Hori     | 9920.000        | AV       | 30.6           | 38.2            | 10.9      | 32.5      | 47.2            | 53.9           | 6.7         | Floor Noise |
| Vert     | 154.318         | QP       | 32.5           | 15.1            | 8.6       | 32.2      | 24.0            | 43.5           | 19.5        |             |
| Vert     | 172.848         | QP       | 33.5           | 15.9            | 8.8       | 32.2      | 26.0            | 43.5           | 17.5        |             |
| Vert     | 246.943         | QP       | 44.0           | 17.2            | 9.5       | 32.0      | 38.7            | 46.0           | 7.3         |             |
| Vert     | 592.149         | QP       | 34.8           | 19.2            | 11.7      | 32.1      | 33.6            | 46.0           | 12.4        |             |
| Vert     | 666.153         | QP       | 36.1           | 20.1            | 12.1      | 32.2      | 36.1            | 46.0           | 9.9         |             |
| Vert     | 740.172         | QP       | 32.5           | 21.1            | 12.5      | 31.9      | 34.2            | 46.0           | 11.8        |             |
| Vert     | 1920.003        | PK       | 47.8           | 26.4            | 6.3       | 32.6      | 47.9            | 73.9           | 26.1        |             |
| Vert     | 2483.500        | PK       | 44.2           | 26.9            | 6.6       | 32.0      | 45.7            | 73.9           | 28.2        |             |
| Vert     | 4960.000        | PK       | 40.9           | 32.1            | 8.7       | 31.2      | 50.5            | 73.9           | 23.4        | Floor Noise |
| Vert     | 7440.000        | PK       | 41.6           | 36.0            | 10.0      | 32.1      | 55.5            | 73.9           | 18.4        | Floor Noise |
| Vert     | 9920.000        | PK       | 42.3           | 38.2            | 10.9      | 32.5      | 58.9            | 73.9           | 15.0        | Floor Noise |
| Vert     | 1920.003        | AV       | 41.9           | 26.4            | 6.3       | 32.6      | 42.0            | 53.9           | 11.9        |             |
| Vert     | 2483.500        | AV       | 30.8           | 26.9            | 6.6       | 32.0      | 32.3            | 53.9           | 21.6        |             |
| Vert     | 4960.000        | AV       | 29.5           | 32.1            | 8.7       | 31.2      | 39.1            | 53.9           | 14.8        | Floor Noise |
| Vert     | 7440.000        | AV       | 30.3           | 36.0            | 10.0      | 32.1      | 44.2            | 53.9           | 9.7         | Floor Noise |
| Vert     | 9920.000        | AV       | 30.4           | 38.2            | 10.9      | 32.5      | 47.0            | 53.9           | 6.9         | Floor Noise |

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

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

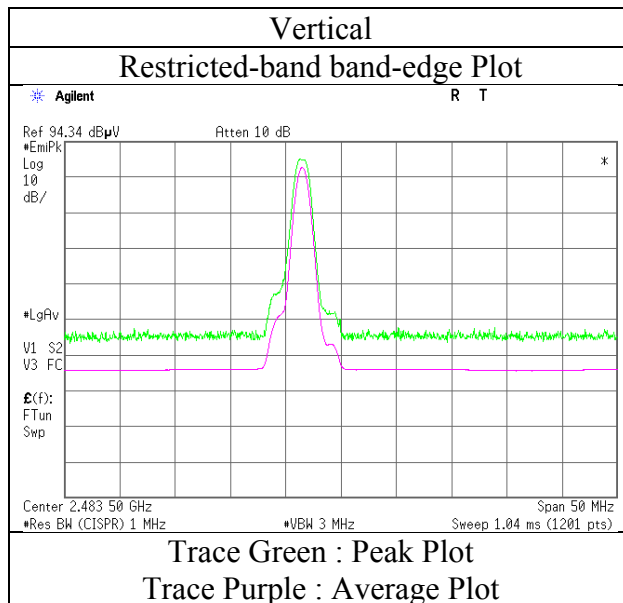
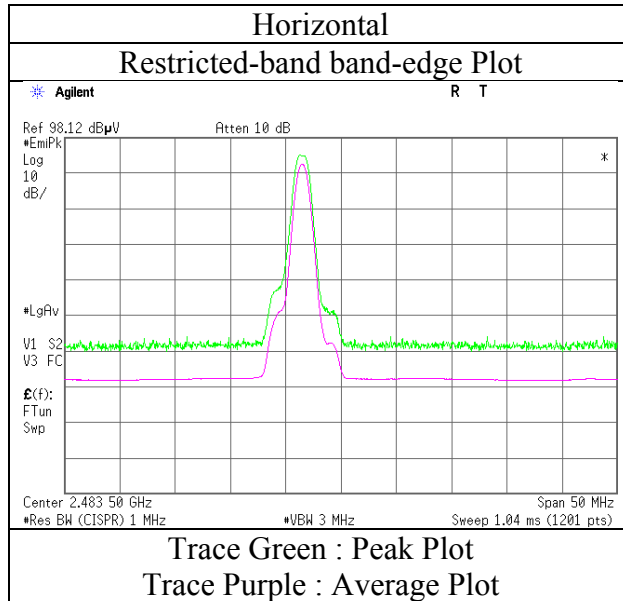
\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor:      1 GHz - 10 GHz      20log (4.4 m / 3.0 m) = 3.3 dB  
                                 10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

\*These results have sufficient margin without taking account Dwell time factor.

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

|                        |   |
|------------------------|---|
| Test place             | Ise EMC Lab. No.3 Semi Anechoic Chamber |
| Report No.             | 11107783H                               |
| Date                   | January 24, 2016                        |
| Temperature / Humidity | 20 deg. C / 27 % RH                     |
| Engineer               | Yuta Moriya<br>(1-10GHz)                |
| Mode                   | Tx, Hopping Off, DH5 2480 MHz           |



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

## Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 11107783H  
Date : January 24, 2016      January 25, 2016  
Temperature / Humidity : 20 deg. C / 27 % RH      20 deg. C / 37 % RH  
Engineer : Yuta Moriya      Kazuya Yoshioka  
              (1-26.5GHz)      (30-1000MHz)  
Mode : Tx, Hopping Off, 3DH5 2402 MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark      |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|
| Hori     | 160.505         | QP       | 36.2           | 15.4            | 8.7       | 32.2      | 28.1            | 43.5           | 15.4        |             |
| Hori     | 246.939         | QP       | 43.5           | 17.2            | 9.5       | 32.0      | 38.2            | 46.0           | 7.8         |             |
| Hori     | 370.417         | QP       | 33.7           | 16.6            | 10.4      | 32.0      | 28.7            | 46.0           | 17.3        |             |
| Hori     | 480.003         | QP       | 38.2           | 17.8            | 11.1      | 32.1      | 35.0            | 46.0           | 11.0        |             |
| Hori     | 617.353         | QP       | 32.8           | 19.6            | 11.9      | 32.1      | 32.2            | 46.0           | 13.8        |             |
| Hori     | 666.159         | QP       | 30.2           | 20.1            | 12.1      | 32.2      | 30.2            | 46.0           | 15.8        |             |
| Hori     | 1919.943        | PK       | 50.5           | 26.4            | 6.3       | 32.6      | 50.6            | 73.9           | 23.3        |             |
| Hori     | 2390.000        | PK       | 42.3           | 26.9            | 6.6       | 32.0      | 43.8            | 73.9           | 30.2        |             |
| Hori     | 4804.000        | PK       | 40.9           | 31.8            | 8.8       | 31.3      | 50.2            | 73.9           | 23.7        | Floor Noise |
| Hori     | 7206.000        | PK       | 41.9           | 36.0            | 10.0      | 32.0      | 55.9            | 73.9           | 18.0        | Floor Noise |
| Hori     | 9608.000        | PK       | 42.2           | 38.2            | 10.8      | 32.4      | 58.8            | 73.9           | 15.1        | Floor Noise |
| Hori     | 1919.943        | AV       | 46.6           | 26.4            | 6.3       | 32.6      | 46.7            | 53.9           | 7.2         |             |
| Hori     | 2390.000        | AV       | 28.3           | 26.9            | 6.6       | 32.0      | 29.8            | 53.9           | 24.1        |             |
| Hori     | 4804.000        | AV       | 29.8           | 31.8            | 8.8       | 31.3      | 39.1            | 53.9           | 14.8        | Floor Noise |
| Hori     | 7206.000        | AV       | 30.1           | 36.0            | 10.0      | 32.0      | 44.1            | 53.9           | 9.8         | Floor Noise |
| Hori     | 9608.000        | AV       | 30.4           | 38.2            | 10.8      | 32.4      | 47.0            | 53.9           | 6.9         | Floor Noise |
| Vert     | 154.307         | QP       | 34.6           | 15.1            | 8.6       | 32.2      | 26.1            | 43.5           | 17.4        |             |
| Vert     | 246.954         | QP       | 42.7           | 17.2            | 9.5       | 32.0      | 37.4            | 46.0           | 8.6         |             |
| Vert     | 407.112         | QP       | 34.0           | 17.4            | 10.7      | 32.0      | 30.1            | 46.0           | 15.9        |             |
| Vert     | 592.152         | QP       | 34.4           | 19.2            | 11.7      | 32.1      | 33.2            | 46.0           | 12.8        |             |
| Vert     | 666.158         | QP       | 35.9           | 20.1            | 12.1      | 32.2      | 35.9            | 46.0           | 10.1        |             |
| Vert     | 740.186         | QP       | 31.8           | 21.1            | 12.5      | 31.9      | 33.5            | 46.0           | 12.5        |             |
| Vert     | 1919.943        | PK       | 46.5           | 26.4            | 6.3       | 32.6      | 46.6            | 73.9           | 27.3        |             |
| Vert     | 2390.000        | PK       | 42.3           | 26.9            | 6.6       | 32.0      | 43.8            | 73.9           | 30.1        |             |
| Vert     | 4804.000        | PK       | 40.8           | 31.8            | 8.8       | 31.3      | 50.1            | 73.9           | 23.8        | Floor Noise |
| Vert     | 7206.000        | PK       | 41.7           | 36.0            | 10.0      | 32.0      | 55.7            | 73.9           | 18.2        | Floor Noise |
| Vert     | 9608.000        | PK       | 42.2           | 38.2            | 10.8      | 32.4      | 58.8            | 73.9           | 15.1        | Floor Noise |
| Vert     | 1919.943        | AV       | 39.4           | 26.4            | 6.3       | 32.6      | 39.5            | 53.9           | 14.4        |             |
| Vert     | 2390.000        | AV       | 29.8           | 26.9            | 6.6       | 32.0      | 31.3            | 53.9           | 22.6        |             |
| Vert     | 4804.000        | AV       | 29.7           | 31.8            | 8.8       | 31.3      | 39.0            | 53.9           | 14.9        | Floor Noise |
| Vert     | 7206.000        | AV       | 30.2           | 36.0            | 10.0      | 32.0      | 44.2            | 53.9           | 9.7         | Floor Noise |
| Vert     | 9608.000        | AV       | 30.5           | 38.2            | 10.8      | 32.4      | 47.1            | 53.9           | 6.8         | Floor Noise |

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

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

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 1 GHz - 10 GHz 20log (4.4 m / 3.0 m) = 3.3 dB  
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

### 20dBc Data Sheet

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant Factor [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark  |
|----------|-----------------|----------|----------------|-------------------|-----------|-----------|-----------------|----------------|-------------|---------|
| Hori     | 2402.000        | PK       | 90.0           | 26.9              | 6.6       | 32.0      | 91.5            | -              | -           | Carrier |
| Hori     | 2400.000        | PK       | 41.5           | 26.9              | 6.6       | 32.0      | 43.0            | 71.5           | 28.5        |         |
| Vert     | 2402.000        | PK       | 88.3           | 26.9              | 6.6       | 32.0      | 89.8            | -              | -           | Carrier |
| Vert     | 2400.000        | PK       | 40.4           | 26.9              | 6.6       | 32.0      | 41.9            | 69.8           | 27.9        |         |

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

\*These results have sufficient margin without taking account Dwell time factor.

**UL Japan, Inc.**

**Ise EMC Lab.**

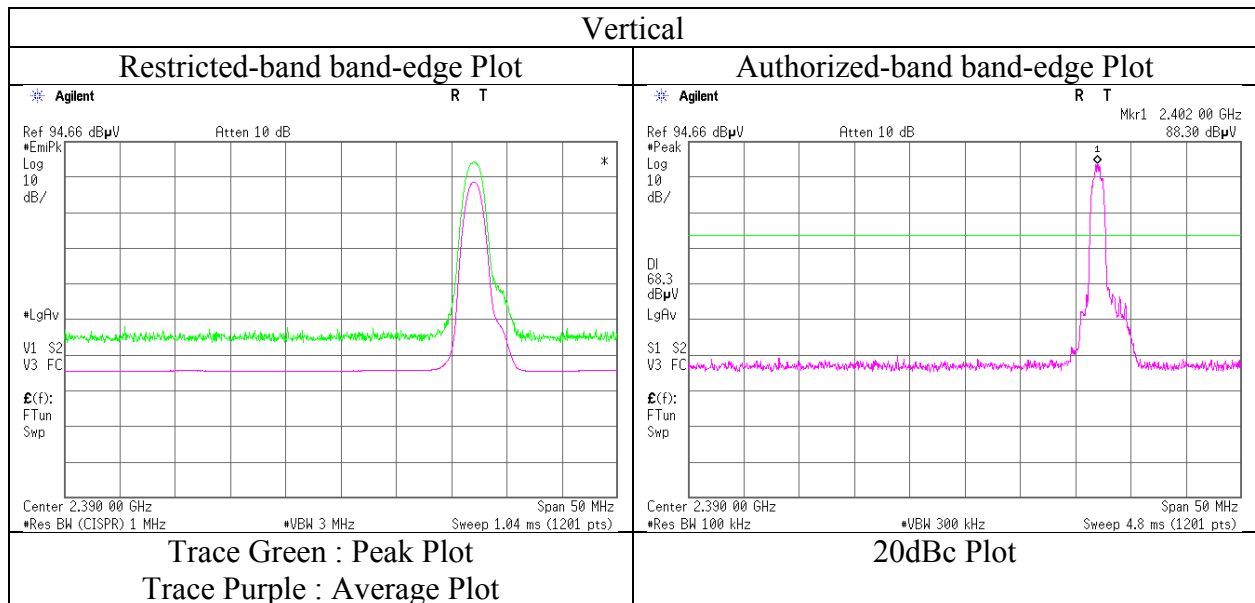
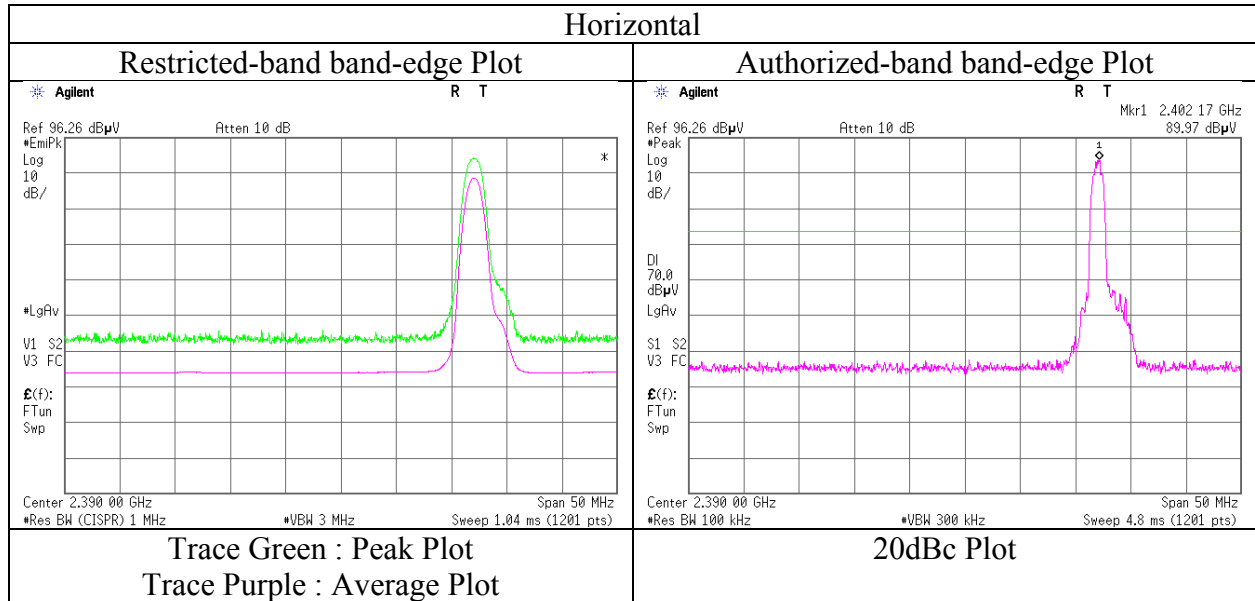
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

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

|                        |   |
|------------------------|---|
| Test place             | Ise EMC Lab. No.3 Semi Anechoic Chamber |
| Report No.             | 11107783H                               |
| Date                   | January 24, 2016                        |
| Temperature / Humidity | 20 deg. C / 27 % RH                     |
| Engineer               | Yuta Moriya<br>(1-10GHz)                |
| Mode                   | Tx, Hopping Off, 3DH5 2402 MHz          |



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

**UL Japan, Inc.**

**Ise EMC Lab.**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 11107783H  
Date : January 24, 2016      January 25, 2016  
Temperature / Humidity : 20 deg. C / 27 % RH      20 deg. C / 37 % RH  
Engineer : Yuta Moriya      Kazuya Yoshioka  
              (1-26.5GHz)      (30-1000MHz)  
Mode : Tx, Hopping Off, 3DH5 2441 MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark      |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|
| Hori     | 160.533         | QP       | 35.1           | 15.4            | 8.7       | 32.2      | 27.0            | 43.5           | 16.5        |             |
| Hori     | 246.943         | QP       | 43.5           | 17.2            | 9.5       | 32.0      | 38.2            | 46.0           | 7.8         |             |
| Hori     | 370.407         | QP       | 33.8           | 16.6            | 10.4      | 32.0      | 28.8            | 46.0           | 17.2        |             |
| Hori     | 479.992         | QP       | 38.2           | 17.8            | 11.1      | 32.1      | 35.0            | 46.0           | 11.1        |             |
| Hori     | 617.333         | QP       | 32.2           | 19.6            | 11.9      | 32.1      | 31.6            | 46.0           | 14.4        |             |
| Hori     | 666.167         | QP       | 30.5           | 20.1            | 12.1      | 32.2      | 30.5            | 46.0           | 15.6        |             |
| Hori     | 1919.885        | PK       | 50.0           | 26.4            | 6.3       | 32.6      | 50.1            | 73.9           | 23.8        |             |
| Hori     | 4882.000        | PK       | 40.8           | 31.9            | 8.8       | 31.3      | 50.2            | 73.9           | 23.7        | Floor Noise |
| Hori     | 7323.000        | PK       | 41.5           | 36.0            | 10.1      | 32.0      | 55.6            | 73.9           | 18.3        | Floor Noise |
| Hori     | 9764.000        | PK       | 42.2           | 38.2            | 10.8      | 32.5      | 58.7            | 73.9           | 15.2        | Floor Noise |
| Hori     | 1919.885        | AV       | 46.2           | 26.4            | 6.3       | 32.6      | 46.3            | 53.9           | 7.6         |             |
| Hori     | 4882.000        | AV       | 29.7           | 31.9            | 8.8       | 31.3      | 39.1            | 53.9           | 14.8        | Floor Noise |
| Hori     | 7323.000        | AV       | 30.1           | 36.0            | 10.1      | 32.0      | 44.2            | 53.9           | 9.7         | Floor Noise |
| Hori     | 9764.000        | AV       | 30.5           | 38.2            | 10.8      | 32.5      | 47.0            | 53.9           | 6.9         | Floor Noise |
| Vert     | 154.370         | QP       | 32.5           | 15.1            | 8.6       | 32.2      | 24.0            | 43.5           | 19.5        |             |
| Vert     | 160.513         | QP       | 34.4           | 15.4            | 8.7       | 32.2      | 26.3            | 43.5           | 17.2        |             |
| Vert     | 246.933         | QP       | 43.1           | 17.2            | 9.5       | 32.0      | 37.8            | 46.0           | 8.2         |             |
| Vert     | 592.136         | QP       | 34.8           | 19.2            | 11.7      | 32.1      | 33.6            | 46.0           | 12.4        |             |
| Vert     | 666.166         | QP       | 35.9           | 20.1            | 12.1      | 32.2      | 35.9            | 46.0           | 10.1        |             |
| Vert     | 740.192         | QP       | 32.0           | 21.1            | 12.5      | 31.9      | 33.7            | 46.0           | 12.3        |             |
| Vert     | 1919.885        | PK       | 47.2           | 26.4            | 6.3       | 32.6      | 47.3            | 73.9           | 26.6        |             |
| Vert     | 4882.000        | PK       | 40.7           | 31.9            | 8.8       | 31.3      | 50.1            | 73.9           | 23.8        | Floor Noise |
| Vert     | 7323.000        | PK       | 42.2           | 36.0            | 10.1      | 32.0      | 56.3            | 73.9           | 17.6        | Floor Noise |
| Vert     | 9764.000        | PK       | 42.2           | 38.2            | 10.8      | 32.5      | 58.7            | 73.9           | 15.2        | Floor Noise |
| Vert     | 1919.885        | AV       | 42.4           | 26.4            | 6.3       | 32.6      | 42.5            | 53.9           | 11.4        |             |
| Vert     | 4882.000        | AV       | 29.6           | 31.9            | 8.8       | 31.3      | 39.0            | 53.9           | 14.9        | Floor Noise |
| Vert     | 7323.000        | AV       | 30.1           | 36.0            | 10.1      | 32.0      | 44.2            | 53.9           | 9.7         | Floor Noise |
| Vert     | 9764.000        | AV       | 30.5           | 38.2            | 10.8      | 32.5      | 47.0            | 53.9           | 6.9         | Floor Noise |

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

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

\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 1 GHz - 10 GHz  $20\log(4.4\text{ m} / 3.0\text{ m}) = 3.3\text{ dB}$   
10 GHz - 26.5 GHz  $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

\*These results have sufficient margin without taking account Dwell time factor.

## Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber  
Report No. : 11107783H  
Date : January 24, 2016      January 25, 2016  
Temperature / Humidity : 20 deg. C / 27 % RH      20 deg. C / 37 % RH  
Engineer : Yuta Moriya      Kazuya Yoshioka  
            (1-26.5GHz)      (30-1000MHz)  
Mode : Tx, Hopping Off, 3DH5 2480 MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark      |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|
| Hori     | 160.513         | QP       | 35.9           | 15.4            | 8.7       | 32.2      | 27.8            | 43.5           | 15.7        |             |
| Hori     | 172.862         | QP       | 34.2           | 15.9            | 8.8       | 32.2      | 26.7            | 43.5           | 16.8        |             |
| Hori     | 246.947         | QP       | 43.1           | 17.2            | 9.5       | 32.0      | 37.8            | 46.0           | 8.2         |             |
| Hori     | 370.407         | QP       | 33.9           | 16.6            | 10.4      | 32.0      | 28.9            | 46.0           | 17.1        |             |
| Hori     | 480.022         | QP       | 38.1           | 17.8            | 11.1      | 32.1      | 34.9            | 46.0           | 11.1        |             |
| Hori     | 666.162         | QP       | 30.8           | 20.1            | 12.1      | 32.2      | 30.8            | 46.0           | 15.2        |             |
| Hori     | 1920.171        | PK       | 50.2           | 26.4            | 6.3       | 32.6      | 50.3            | 73.9           | 23.6        |             |
| Hori     | 2483.500        | PK       | 44.6           | 26.9            | 6.6       | 32.0      | 46.1            | 73.9           | 27.8        |             |
| Hori     | 4960.000        | PK       | 40.8           | 32.1            | 8.7       | 31.2      | 50.4            | 73.9           | 23.5        | Floor Noise |
| Hori     | 7440.000        | PK       | 41.8           | 36.0            | 10.0      | 32.1      | 55.7            | 73.9           | 18.2        | Floor Noise |
| Hori     | 9920.000        | PK       | 42.2           | 38.2            | 10.9      | 32.5      | 58.8            | 73.9           | 15.1        | Floor Noise |
| Hori     | 1920.171        | AV       | 46.2           | 26.4            | 6.3       | 32.6      | 46.3            | 53.9           | 7.6         |             |
| Hori     | 2483.500        | AV       | 29.9           | 26.9            | 6.6       | 32.0      | 31.4            | 53.9           | 22.5        |             |
| Hori     | 4960.000        | AV       | 29.9           | 32.1            | 8.7       | 31.2      | 39.5            | 53.9           | 14.4        | Floor Noise |
| Hori     | 7440.000        | AV       | 30.2           | 36.0            | 10.0      | 32.1      | 44.1            | 53.9           | 9.8         | Floor Noise |
| Hori     | 9920.000        | AV       | 30.5           | 38.2            | 10.9      | 32.5      | 47.1            | 53.9           | 6.8         | Floor Noise |
| Vert     | 154.325         | QP       | 32.7           | 15.1            | 8.6       | 32.2      | 24.2            | 43.5           | 19.3        |             |
| Vert     | 246.951         | QP       | 43.0           | 17.2            | 9.5       | 32.0      | 37.7            | 46.0           | 8.3         |             |
| Vert     | 592.139         | QP       | 34.8           | 19.2            | 11.7      | 32.1      | 33.6            | 46.0           | 12.4        |             |
| Vert     | 666.154         | QP       | 36.0           | 20.1            | 12.1      | 32.2      | 36.0            | 46.0           | 10.0        |             |
| Vert     | 740.190         | QP       | 31.6           | 21.1            | 12.5      | 31.9      | 33.3            | 46.0           | 12.7        |             |
| Vert     | 777.191         | QP       | 32.0           | 21.7            | 12.7      | 31.7      | 34.7            | 46.0           | 11.3        |             |
| Vert     | 1920.171        | PK       | 48.3           | 26.4            | 6.3       | 32.6      | 48.4            | 73.9           | 25.5        |             |
| Vert     | 2483.500        | PK       | 43.5           | 26.9            | 6.6       | 32.0      | 45.0            | 73.9           | 28.9        |             |
| Vert     | 4960.000        | PK       | 40.8           | 32.1            | 8.7       | 31.2      | 50.4            | 73.9           | 23.5        | Floor Noise |
| Vert     | 7440.000        | PK       | 41.8           | 36.0            | 10.0      | 32.1      | 55.7            | 73.9           | 18.2        | Floor Noise |
| Vert     | 9920.000        | PK       | 42.1           | 38.2            | 10.9      | 32.5      | 58.7            | 73.9           | 15.2        | Floor Noise |
| Vert     | 1920.171        | AV       | 43.3           | 26.4            | 6.3       | 32.6      | 43.4            | 53.9           | 10.5        |             |
| Vert     | 2483.500        | AV       | 29.1           | 26.9            | 6.6       | 32.0      | 30.6            | 53.9           | 23.3        |             |
| Vert     | 4960.000        | AV       | 29.6           | 32.1            | 8.7       | 31.2      | 39.2            | 53.9           | 14.7        | Floor Noise |
| Vert     | 7440.000        | AV       | 30.3           | 36.0            | 10.0      | 32.1      | 44.2            | 53.9           | 9.7         | Floor Noise |
| Vert     | 9920.000        | AV       | 30.6           | 38.2            | 10.9      | 32.5      | 47.2            | 53.9           | 6.7         | Floor Noise |

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

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

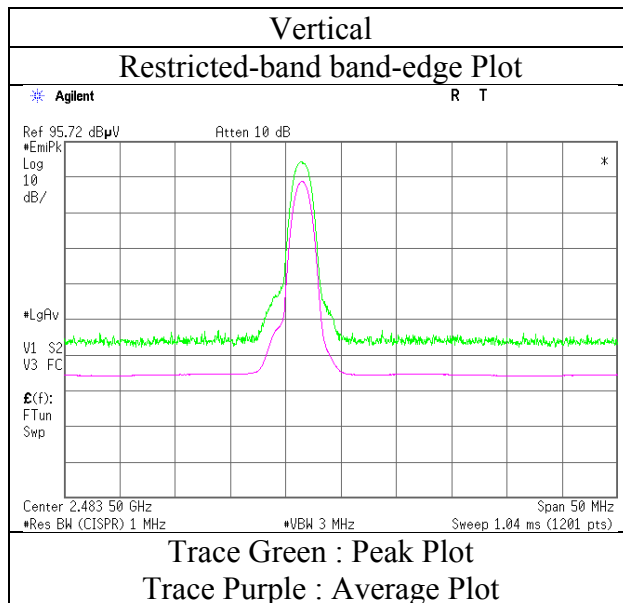
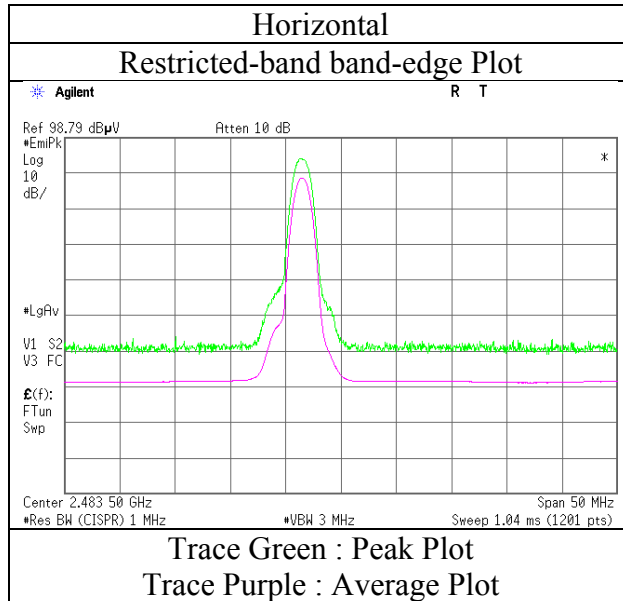
\*The 10th harmonic was not seen so the result was its base noise level.

Distance factor:    1 GHz - 10 GHz    20log (4.4 m / 3.0 m) = 3.3 dB  
                          10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

\*These results have sufficient margin without taking account Dwell time factor.

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

|                        |   |
|------------------------|---|
| Test place             | Ise EMC Lab. No.3 Semi Anechoic Chamber |
| Report No.             | 11107783H                               |
| Date                   | January 24, 2016                        |
| Temperature / Humidity | 20 deg. C / 27 % RH                     |
| Engineer               | Yuta Moriya<br>(1-10GHz)                |
| Mode                   | Tx, Hopping Off, 3DH5 2480 MHz          |

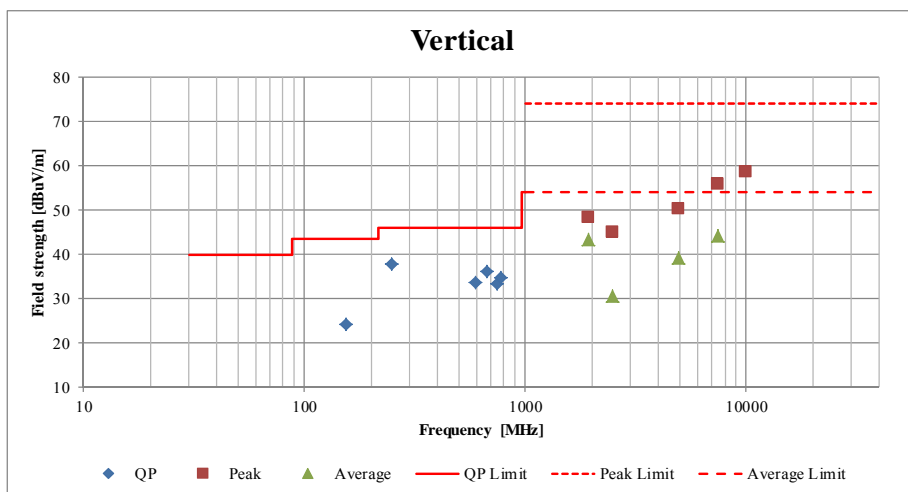
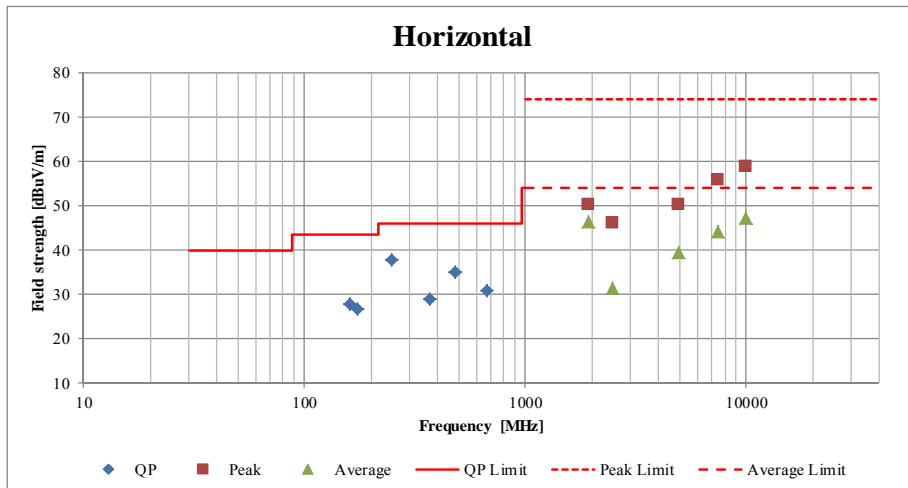


\* Final result of restricted band edge was shown in tabular data.



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

|                        |   |                     |
|------------------------|---|---------------------|
| Test place             | Ise EMC Lab. No.3 Semi Anechoic Chamber |                     |
| Report No.             | 11107783H                               |                     |
| Date                   | January 24, 2016                        | January 25, 2016    |
| Temperature / Humidity | 20 deg. C / 27 % RH                     | 20 deg. C / 37 % RH |
| Engineer               | Yuta Moriya                             | Kazuya Yoshioka     |
|                        | (1-26.5GHz)                             | (30-1000MHz)        |
| Mode                   | Tx, Hopping Off, 3DH5 2480 MHz          |                     |



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

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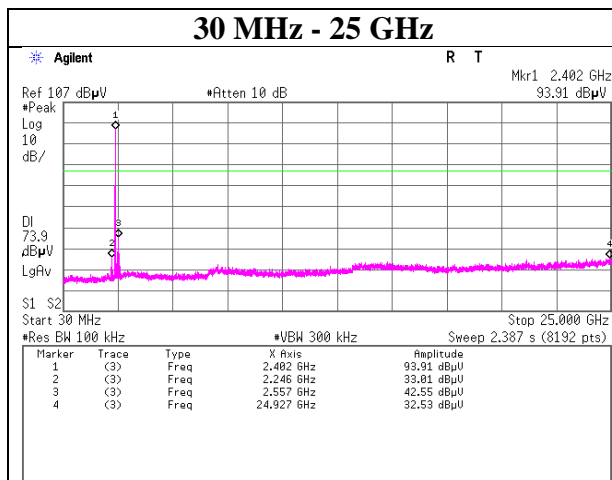
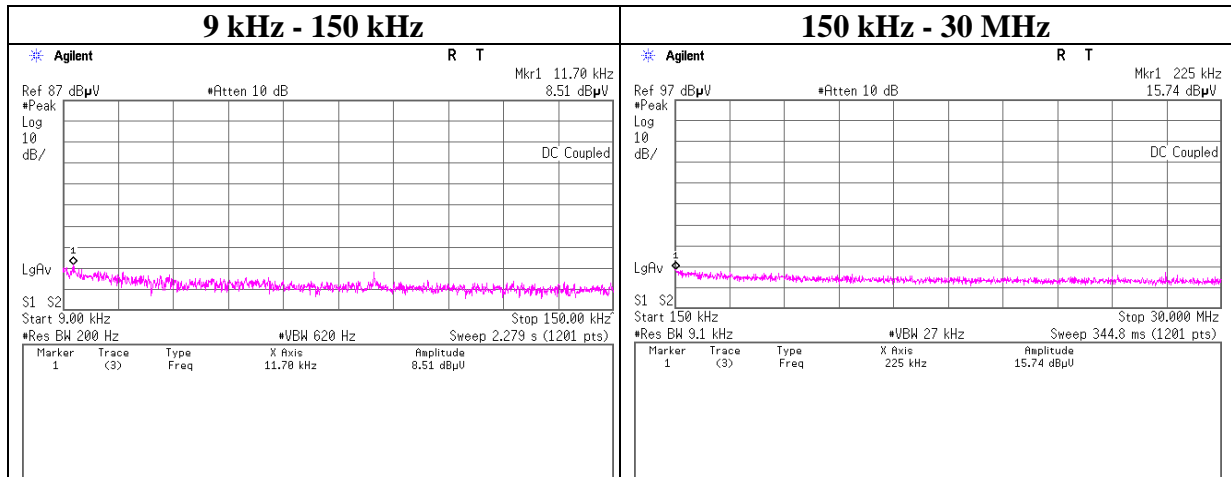
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## Conducted Spurious Emission

|                        |                                    |
|------------------------|------------------------------------|
| Test place             | Ise EMC Lab. No.6 Measurement Room |
| Report No.             | 11107783H                          |
| Date                   | January 21, 2016                   |
| Temperature / Humidity | 25 deg. C / 22 % RH                |
| Engineer               | Yutaka Yosihda                     |
| Mode                   | Tx, Hopping Off, DH5               |

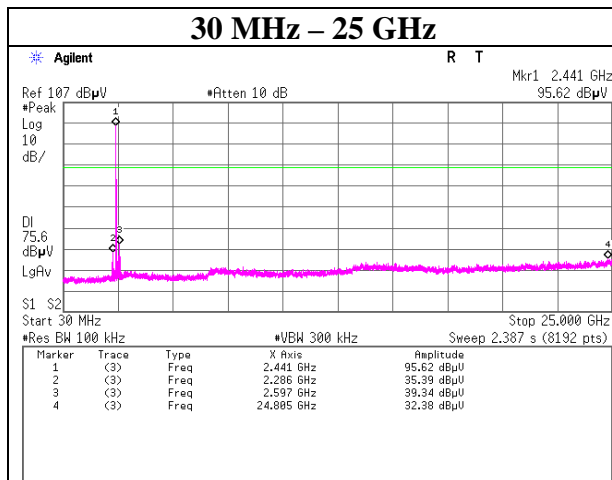
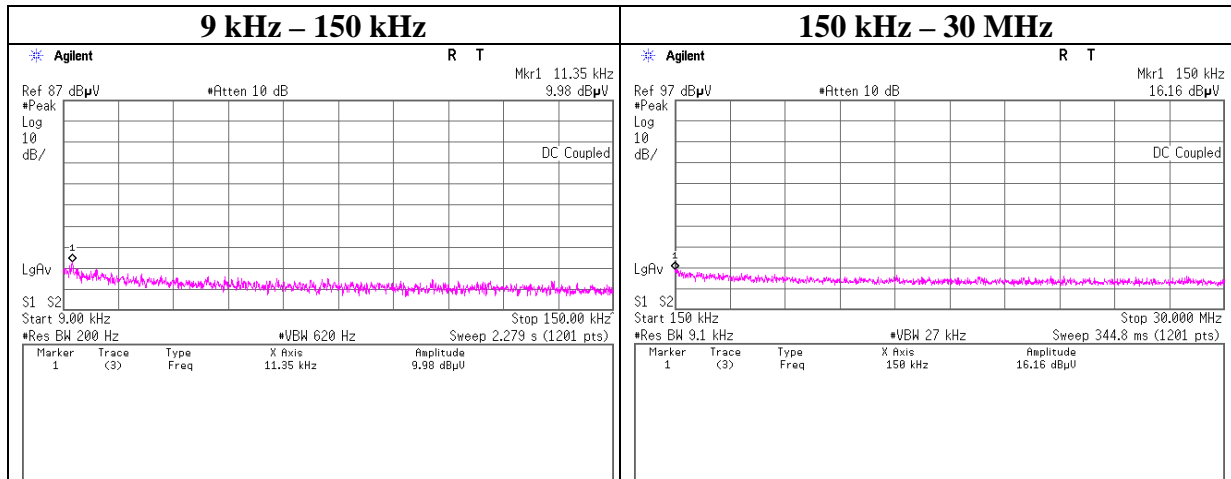
### 2402 MHz



## Conducted Spurious Emission

|                        |                                    |
|------------------------|------------------------------------|
| Test place             | Ise EMC Lab. No.6 Measurement Room |
| Report No.             | 11107783H                          |
| Date                   | January 21, 2016                   |
| Temperature / Humidity | 25 deg. C / 22 % RH                |
| Engineer               | Yutaka Yoshida                     |
| Mode                   | Tx, Hopping Off, DH5               |

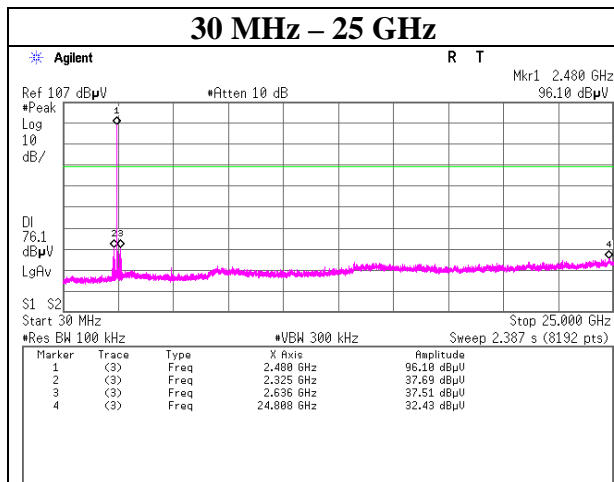
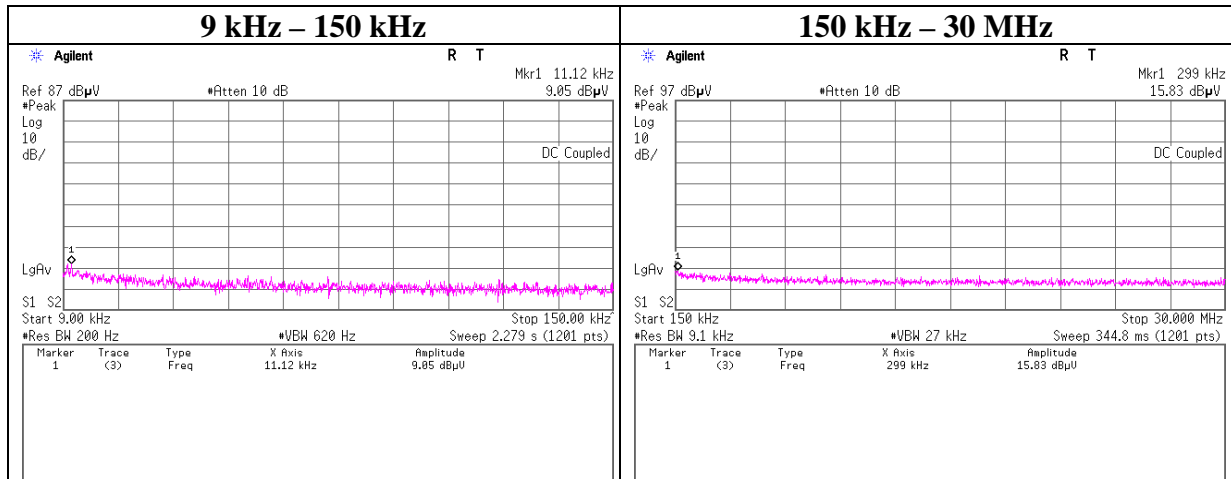
### 2441 MHz



## Conducted Spurious Emission

|                        |                                    |
|------------------------|------------------------------------|
| Test place             | Ise EMC Lab. No.6 Measurement Room |
| Report No.             | 11107783H                          |
| Date                   | January 21, 2016                   |
| Temperature / Humidity | 25 deg. C / 22 % RH                |
| Engineer               | Yutaka Yoshida                     |
| Mode                   | Tx, Hopping Off, DH5               |

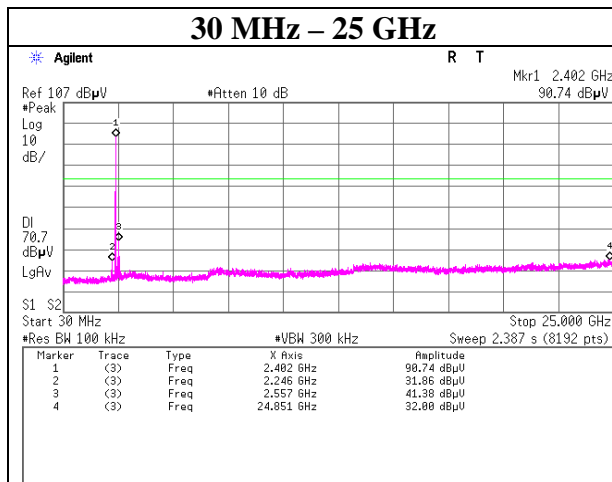
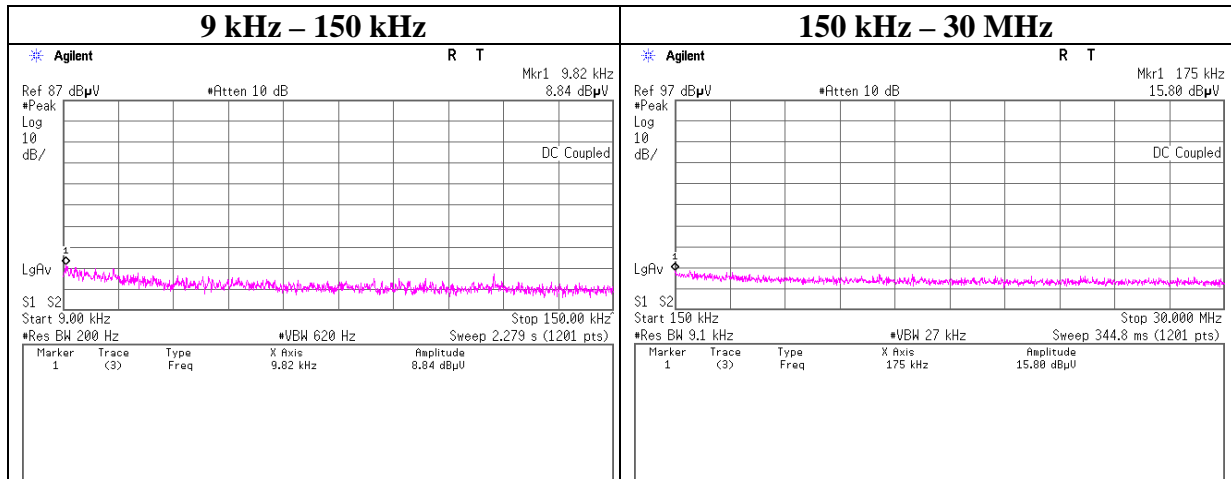
### 2480 MHz



## Conducted Spurious Emission

|                        |                                    |
|------------------------|------------------------------------|
| Test place             | Ise EMC Lab. No.6 Measurement Room |
| Report No.             | 11107783H                          |
| Date                   | January 21, 2016                   |
| Temperature / Humidity | 22 deg. C / 25 % RH                |
| Engineer               | Yutaka Yoshida                     |
| Mode                   | Tx, Hopping Off, 3DH5              |

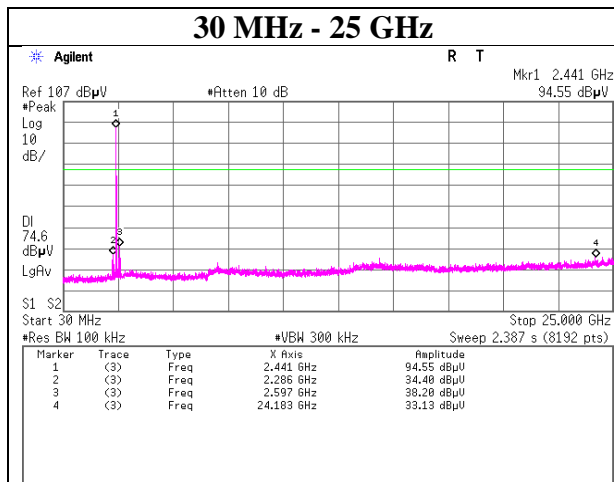
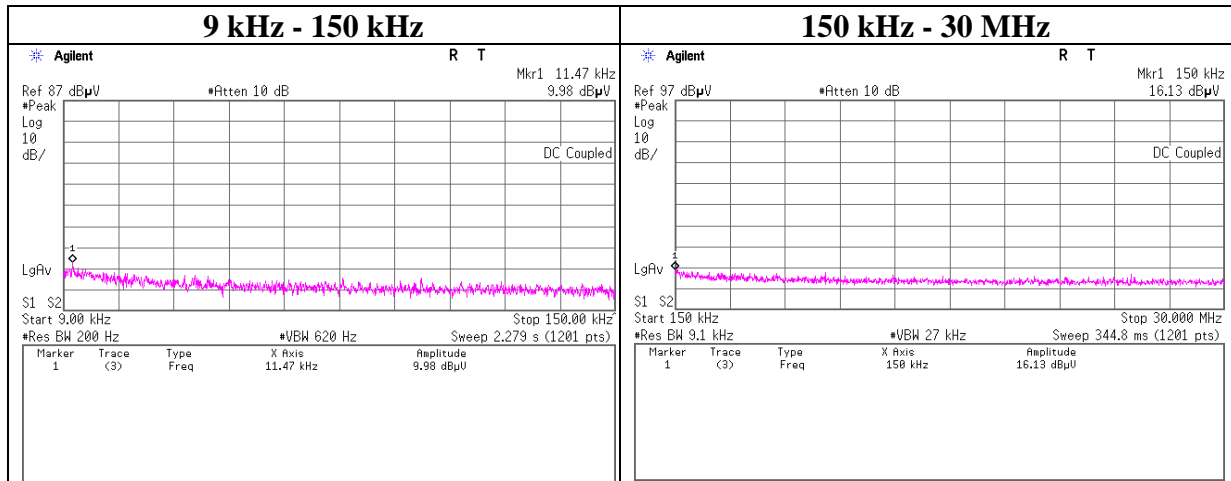
### 2402 MHz



## Conducted Spurious Emission

|                        |                                    |
|------------------------|------------------------------------|
| Test place             | Ise EMC Lab. No.6 Measurement Room |
| Report No.             | 11107783H                          |
| Date                   | January 21, 2016                   |
| Temperature / Humidity | 22 deg. C / 25 % RH                |
| Engineer               | Yutaka Yoshida                     |
| Mode                   | Tx, Hopping Off, 3DH5              |

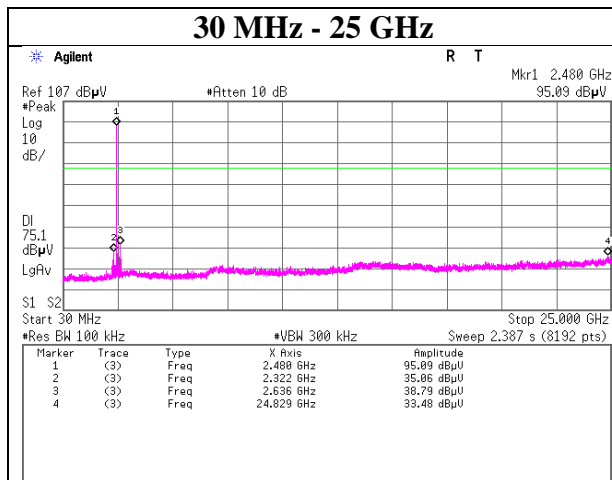
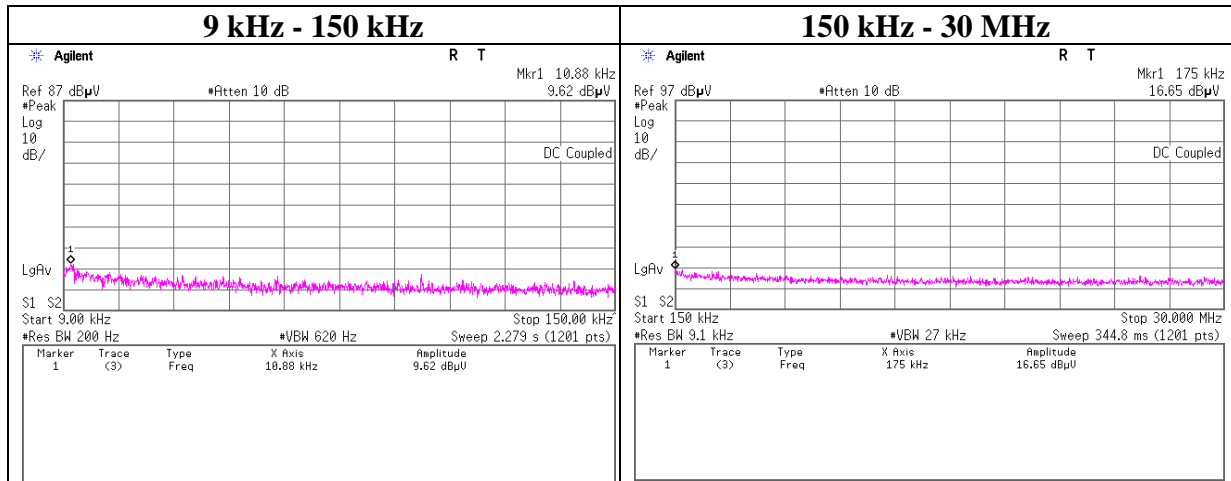
### 2441 MHz



## Conducted Spurious Emission

|                        |                                    |
|------------------------|------------------------------------|
| Test place             | Ise EMC Lab. No.6 Measurement Room |
| Report No.             | 11107783H                          |
| Date                   | January 21, 2016                   |
| Temperature / Humidity | 22 deg. C / 25 % RH                |
| Engineer               | Yutaka Yoshida                     |
| Mode                   | Tx, Hopping Off, 3DH5              |

### 2480 MHz



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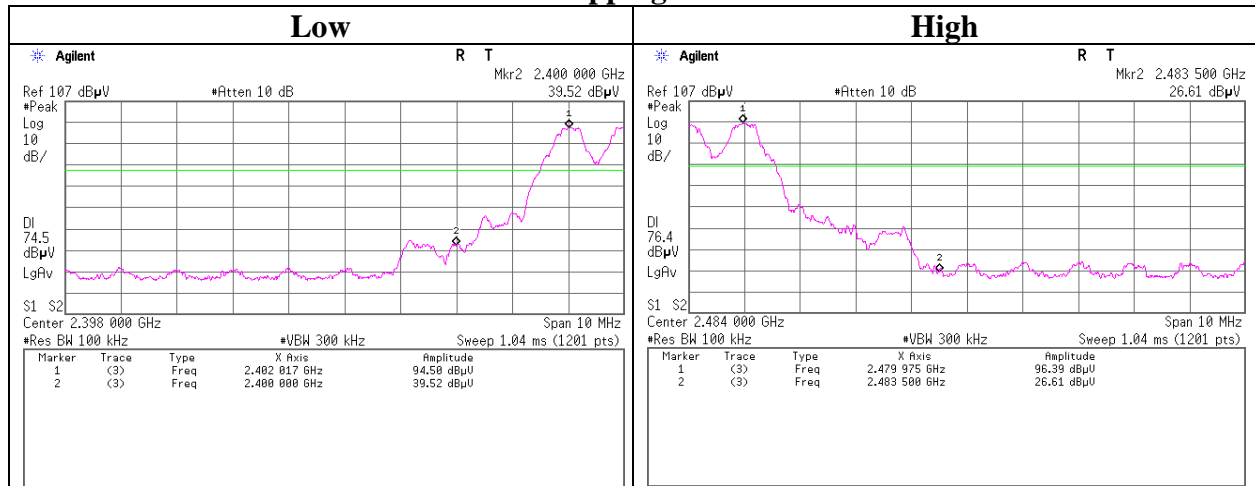
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

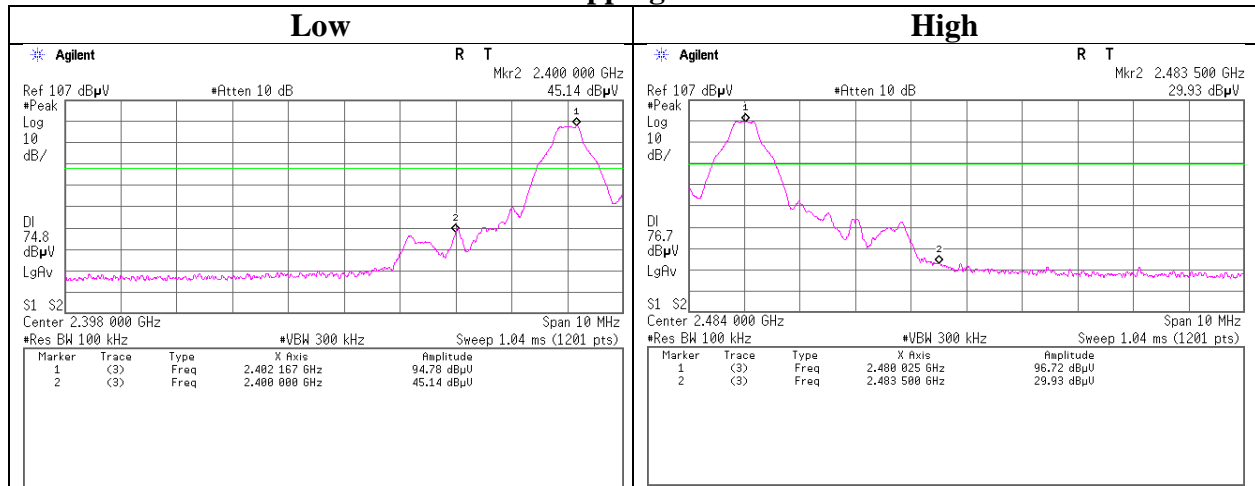
## Conducted Emission Band Edge compliance

|                        |                                    |
|------------------------|------------------------------------|
| Test place             | Ise EMC Lab. No.6 Measurement Room |
| Report No.             | 11107783H                          |
| Date                   | January 21, 2016                   |
| Temperature / Humidity | 22 deg. C / 25 % RH                |
| Engineer               | Yutaka Yoshida                     |
| Mode                   | Tx DH5                             |

### Hopping On



### Hopping Off



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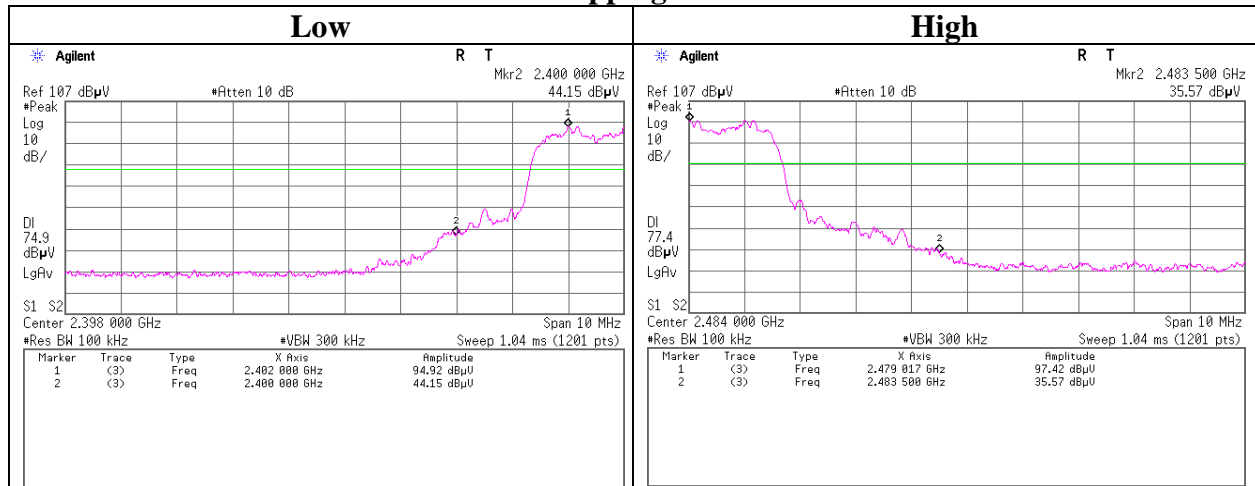
Facsimile : +81 596 24 8124



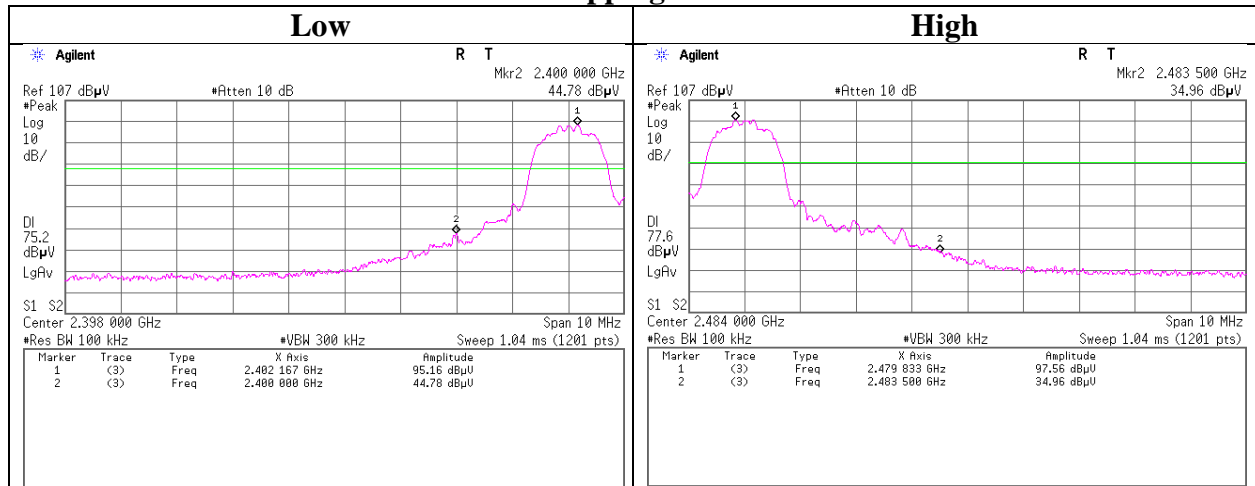
## Conducted Emission Band Edge compliance

|                        |                                    |
|------------------------|------------------------------------|
| Test place             | Ise EMC Lab. No.6 Measurement Room |
| Report No.             | 11107783H                          |
| Date                   | January 21, 2016                   |
| Temperature / Humidity | 22 deg. C / 25 % RH                |
| Engineer               | Yutaka Yoshida                     |
| Mode                   | Tx 3DH5                            |

### Hopping On

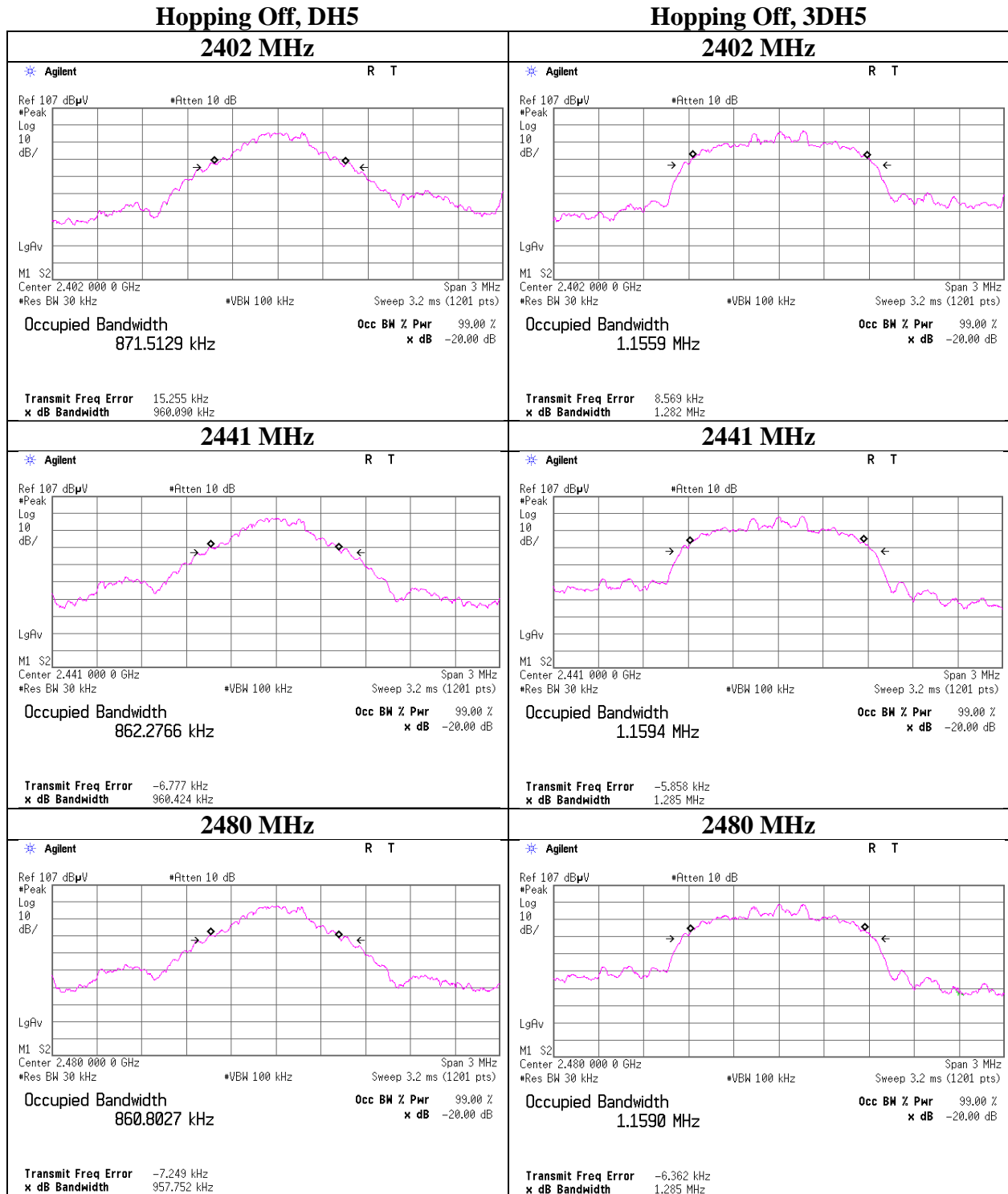


### Hopping Off



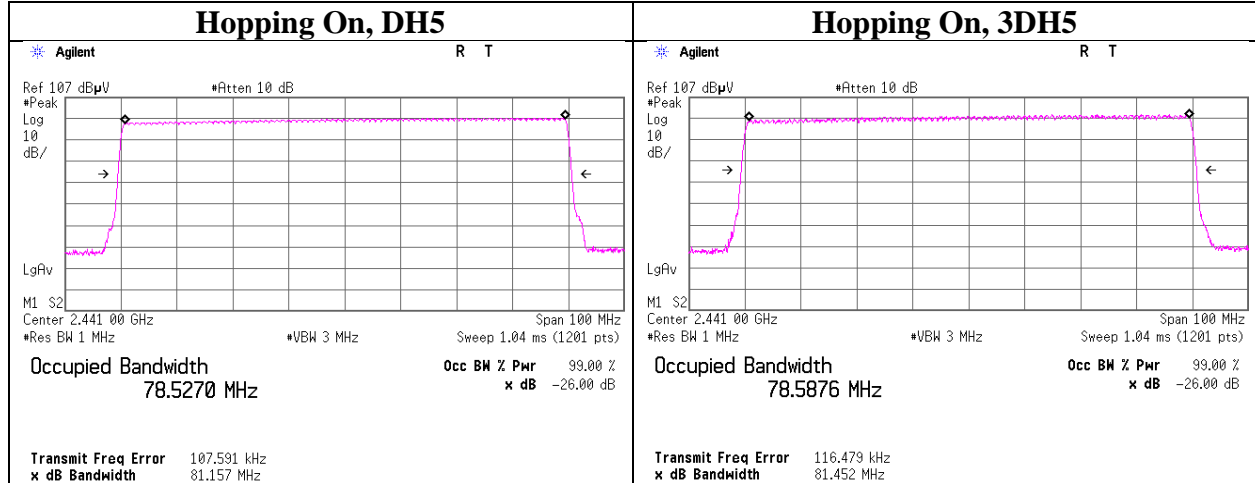
## 99% Occupied Bandwidth

|                        |                                    |
|------------------------|------------------------------------|
| Test place             | Ise EMC Lab. No.6 Measurement Room |
| Report No.             | 11107783H                          |
| Date                   | January 21, 2016                   |
| Temperature / Humidity | 22 deg. C / 25 % RH                |
| Engineer               | Yutaka Yoshida                     |
| Mode                   | Tx Hopping Off                     |



## 99% Occupied Bandwidth

|                        |                                    |
|------------------------|------------------------------------|
| Test place             | Ise EMC Lab. No.6 Measurement Room |
| Report No.             | 11107783H                          |
| Date                   | January 21, 2016                   |
| Temperature / Humidity | 22 deg. C / 25 % RH                |
| Engineer               | Yutaka Yoshida                     |
| Mode                   | Tx Hopping On                      |



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

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## **APPENDIX 2: Test instruments**

### **Test equipment**

| Control No. | Instrument                      | Manufacturer         | Model No                    | Serial No                      | Test Item | Calibration Date *<br>Interval(month) |
|-------------|---------------------------------|----------------------|-----------------------------|--------------------------------|-----------|---------------------------------------|
| MSA-13      | Spectrum Analyzer               | Agilent              | E4440A                      | MY46185823                     | AT        | 2015/06/02 * 12                       |
| MPM-13      | Power Meter                     | Anritsu              | ML2495A                     | 0824014                        | AT        | 2015/11/11 * 12                       |
| MPSE-18     | Power sensor                    | Anritsu              | MA2411B                     | 0738174                        | AT        | 2015/11/11 * 12                       |
| MCC-66      | Microwave Cable<br>1G-40GHz     | Suhner               | SUCOFLEX102                 | 28636/2                        | AT        | 2015/04/02 * 12                       |
| MAT-88      | Attenuator                      | Weinschel Associates | WA56-10                     | 56100304                       | AT        | 2015/06/01 * 12                       |
| MOS-23      | Thermo-Hygrometer               | Custom               | CTH-201                     | 0004                           | AT        | 2015/12/08 * 12                       |
| MAEC-03     | Semi Anechoic<br>Chamber(NSA)   | TDK                  | Semi Anechoic<br>Chamber 3m | DA-10005                       | RE        | 2015/10/01 * 12                       |
| MOS-13      | Thermo-Hygrometer               | Custom               | CTH-180                     | 1301                           | RE        | 2016/01/21 * 12                       |
| MJM-16      | Measure                         | KOMELON              | KMC-36                      | -                              | RE        | -                                     |
| COTS-MEMI   | EMI measurement<br>program      | TSJ                  | TEPTO-DV                    | -                              | RE        | -                                     |
| MSA-03      | Spectrum Analyzer               | Agilent              | E4448A                      | MY44020357                     | RE        | 2015/05/18 * 12                       |
| MHA-20      | Horn Antenna 1-18GHz            | Schwarzbeck          | BBHA9120D                   | 258                            | RE        | 2015/05/18 * 12                       |
| MCC-167     | Microwave Cable                 | Junkosha             | MWX221                      | 1404S374(1m) /<br>1405S074(5m) | RE        | 2015/05/21 * 12                       |
| MPA-11      | MicroWave System<br>Amplifier   | Agilent              | 83017A                      | MY39500779                     | RE        | 2015/03/19 * 12                       |
| MHA-16      | Horn Antenna 15-40GHz           | Schwarzbeck          | BBHA9170                    | BBHA9170306                    | RE        | 2015/05/19 * 12                       |
| MMM-08      | DIGITAL HiTESTER                | Hioki                | 3805                        | 051201197                      | RE        | 2016/01/13 * 12                       |
| MHF-25      | High Pass Filter<br>3.5-18.0GHz | UL Japan             | HPF SELECTOR                | 001                            | RE        | 2015/09/16 * 12                       |
| MTR-08      | Test Receiver                   | Rohde & Schwarz      | ESCI                        | 100767                         | RE        | 2015/09/02 * 12                       |
| MBA-03      | Biconical Antenna               | Schwarzbeck          | BBA9106                     | 1915                           | RE        | 2015/10/11 * 12                       |
| MLA-03      | Logperiodic Antenna             | Schwarzbeck          | USLP9143                    | 174                            | RE        | 2015/10/11 * 12                       |
| MCC-51      | Coaxial cable                   | UL Japan             | -                           | -                              | RE        | 2015/07/13 * 12                       |
| MAT-70      | Attenuator(6dB)                 | Agilent              | 8491A-006                   | MY52460153                     | RE        | 2015/04/08 * 12                       |
| MPA-13      | Pre Amplifier                   | SONOMA<br>INSTRUMENT | 310                         | 260834                         | RE        | 2015/03/10 * 12                       |

**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 test  
AT: Antenna Terminal Conducted test**

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**Ise EMC Lab.**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124