



# **RADIO TEST REPORT**

**Test Report No.: 10009516S-A**

**Applicant** : Japan Radio Co., Ltd.  
**Type of Equipment** : Wireless LAN Module  
**Model No.** : CMN-851A  
**FCC ID** : CKECMN851A  
**Test regulation** : FCC Part15 Subpart C: 2012  
**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 limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by any agency of the Federal Government.
6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.

**Date of test:** April 26 to May 15, 2013

**Tested by:**

*M. Hosaka*

Makoto Hosaka  
Engineer of WiSE Japan,  
UL Verification Service

**Approved by :**

*G. Ishiwata*

Go Ishiwata  
Manager of WiSE Japan,  
UL Verification Service



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

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13-EM-F0429

## REVISION HISTORY

# Original Test Report No.: 10009516S-A

[illegible]

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## **SECTION 1: Customer information**

Company Name : Japan Radio Co., Ltd.  
Address : 1-1, Shimorenjaku 5-chome, Mitaka-shi, Tokyo, 181-8510 Japan  
Telephone Number : +81 422 45 9311  
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Contact Person : Shinsuke Miyazaki

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

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

Type of Equipment : Wireless LAN Module  
Model Number : CMN-851A  
Serial Number : Refer to 4.2 in this report.  
Rating : DC3.3V  
Country of Mass-production : Japan  
Condition of EUT : Production prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)  
Receipt Date of Sample : April 23, 2013  
Modification of EUT : No modification by the test lab.

### **2.2 Product description**

Model: CMN-851A (referred to as the EUT in this report) is a Wireless LAN Module.

Clock frequency(ies) in the system : 40MHz

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Radio specification:

|                              |   |                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equipment type               | : | Transceiver                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Frequency of operation *1)   | : | 2.4GHz: 2412-2462MHz (IEEE 802.11b, 11g, 11n-HT20)<br>2422-2452MHz (IEEE 802.11n-HT40)<br>W52: 5180-5240MHz (IEEE 802.11a, 11n-HT20)<br>5190-5230MHz (IEEE 802.11n-HT40)<br>W53: 5260-5320MHz (IEEE 802.11a, 11n-HT20)<br>5270-5310MHz (IEEE 802.11n-HT40)<br>W56: 5500-5700MHz (IEEE 802.11a, 11n-HT20)<br>5510-5670MHz (IEEE 802.11n-HT40)<br>W58: 5745-5825MHz (IEEE 802.11a, 11n-HT20)<br>5755-5795MHz (IEEE 802.11n-HT40) |
| Bandwidth                    | : | 20MHz (IEEE 802.11a/b/g/n), 40MHz (IEEE 802.11n)                                                                                                                                                                                                                                                                                                                                                                               |
| Channel spacing              | : | 5MHz (2.4GHz),<br>20MHz (11a, 11n (HT20, 5GHz)), 40MHz (11n (HT40, 5GHz))                                                                                                                                                                                                                                                                                                                                                      |
| Type of modulation           | : | DSSS, OFDM                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Antenna type                 | : | Dual (2.4GHz band: Planar patch, 5GHz band: Inverted F)                                                                                                                                                                                                                                                                                                                                                                        |
| Antenna gain with cable loss | : | 2.4GHz band: 0.58dBi<br>3.73dBi (Antenna gain) – 3.15dB (cable loss(18ft))<br>5GHz band: -0.98dBi<br>4.06dBi (Antenna gain) – 5.04dB (cable loss(18ft))                                                                                                                                                                                                                                                                        |
| Antenna connector type       | : | Module side: U.FL<br>Antenna side: RP-SMA                                                                                                                                                                                                                                                                                                                                                                                      |
| ITU code                     | : | D1D, G1D                                                                                                                                                                                                                                                                                                                                                                                                                       |

\*1) Refer to the test report 10009516S-B for FCC 15.407.

\* The EUT does not perform simultaneous transmission of 2.4GHz and 5GHz Wireless LAN.

Operation temperature range : 0 to +50 deg.C

FCC 15.31 (e)

The host device provides stable voltage (DC3.3V) constantly to the EUT regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC 15.203

The EUT has a unique coupling/antenna connector. Therefore the equipment complies with the requirement.

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## SECTION 3: Test specification, procedures & results

### 3.1 Test specification

Test specification : Test specification: FCC Part 15 Subpart C: 2012, final revised on December 27, 2012 and effective January 28, 2013  
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators  
Section 15.207 Conducted limits  
Section 15.209 Radiated emission limits, general requirements  
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz

### 3.2 Procedures & Results

| Item                                         | Test Procedure *1) | Specification                   | Remarks              | Deviation | Worst Margin                                                                                                              | Results  |
|----------------------------------------------|--------------------|---------------------------------|----------------------|-----------|---------------------------------------------------------------------------------------------------------------------------|----------|
| Conducted emission                           | ANSI C63.10:2009   | FCC 15.207                      | -                    | N/A       | 7.9dB<br>Freq.: 0.18069MHz<br>Detection: Average<br>Phase: L1<br>Mode: Tx 2412MHz,<br>IEEE 802.11n (HT20)                 | Complied |
| 6dB bandwidth                                | ANSI C63.10:2009   | FCC 15.247 (a)(2)               | Conducted            | N/A       | * See data                                                                                                                | Complied |
| Maximum peak output power                    | ANSI C63.10:2009   | FCC 15.247 (b)(3)               | Conducted            | N/A       |                                                                                                                           | Complied |
| Out of band emission & Restricted band edges | ANSI C63.10:2009   | FCC 15.109, 15.247 (d) & 15.209 | Conducted / Radiated | N/A       | 0.2dB<br>Freq.: 2483.500MHz<br>Polarization: Horizontal<br>Detection: Average<br>Mode: Tx 2452MHz,<br>IEEE 802.11n (HT40) | Complied |
| Power density                                | ANSI C63.10:2009   | FCC 15.247 (e)                  | Conducted            | N/A       | * See data                                                                                                                | Complied |

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

\*1) These tests were also referred to KDB 558074 v03r01 (FCC), "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

### 3.3 Addition to standard

| Item                     | Test Procedure                  | Specification | Remarks   | Worst Margin | Results |
|--------------------------|---------------------------------|---------------|-----------|--------------|---------|
| Occupied Bandwidth (99%) | ANSI C63.10:2009, RSS-Gen 4.6.1 | -             | Conducted | -            | -       |

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

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

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### 3.4 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

| Item                                            | Frequency range | No.1 SAC <sup>*1</sup> /SR <sup>*2</sup><br>(±) | No.2 SAC/SR<br>(±) | No.3 SAC/SR<br>(±) |
|-------------------------------------------------|-----------------|-------------------------------------------------|--------------------|--------------------|
| Conducted emission<br>(AC Mains) LISN           | 150kHz-30MHz    | 3.6 dB                                          | 3.6 dB             | 3.5 dB             |
| Radiated emission<br>(Measurement distance: 3m) | 9kHz-30MHz      | 3.7 dB                                          | 3.7 dB             | 3.6 dB             |
|                                                 | 30MHz-300MHz    | 4.9 dB                                          | 5.1 dB             | 4.9 dB             |
|                                                 | 300MHz-1GHz     | 5.0 dB                                          | 5.2 dB             | 4.9 dB             |
|                                                 | 1GHz-15GHz      | 4.8 dB                                          | 4.8 dB             | 4.9 dB             |
| Radiated emission<br>(Measurement distance: 1m) | 15GHz-18GHz     | 5.6 dB                                          | 5.6 dB             | 5.6 dB             |
|                                                 | 18GHz-40GHz     | 4.6 dB                                          | 4.3 dB             | 4.4 dB             |

\*1: SAC=Semi-Anechoic Chamber

\*2: SR= Shielded Room is applied besides radiated emission

#### Conducted emission test

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

#### Radiated emission test

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

#### Antenna port conducted test

Power measurement uncertainty above 1GHz for this test was: (±) 1.5dB

Spurious emission (Conducted) measurement (below 1GHz) uncertainty for this test was: (±) 1.7dB

Spurious emission (Conducted) measurement (1G-3GHz) uncertainty for this test was: (±) 2.3dB

Spurious emission (Conducted) measurement (3G-18GHz) uncertainty for this test was: (±) 3.0dB

Spurious emission (Conducted) measurement (18G-26.5GHz) uncertainty for this test was: (±) 2.9dB

Bandwidth measurement uncertainty for this test was: (±) 5.4%

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JAB Accreditation No. : RTL02610

|                                                                | FCC<br>Registration<br>No. | IC<br>Registration<br>No. | Width x Depth x<br>Height (m) | Size of reference<br>ground plane (m)<br>/ horizontal<br>conducting plane | Maximum<br>measurement<br>distance |
|----------------------------------------------------------------|----------------------------|---------------------------|-------------------------------|---------------------------------------------------------------------------|------------------------------------|
| <input checked="" type="checkbox"/> No.1 semi-anechoic chamber | 697847                     | 2973D-1                   | 20.6 x 11.3 x 7.65            | 20.6 x 11.3                                                               | 10m                                |
| <input checked="" type="checkbox"/> No.2 semi-anechoic chamber | 697847                     | 2973D-2                   | 20.6 x 11.3 x 7.65            | 20.6 x 11.3                                                               | 10m                                |
| <input type="checkbox"/> No.3 semi-anechoic chamber            | 697847                     | 2973D-3                   | 12.7 x 7.7 x 5.35             | 12.7 x 7.7                                                                | 5m                                 |
| <input type="checkbox"/> No.4 semi-anechoic chamber            | -                          | -                         | 8.1 x 5.1 x 3.55              | 8.1 x 5.1                                                                 | -                                  |
| <input type="checkbox"/> No.1 shielded room                    | -                          | -                         | 6.8 x 4.1 x 2.7               | 6.8 x 4.1                                                                 | -                                  |
| <input checked="" type="checkbox"/> No.2 shielded room         | -                          | -                         | 6.8 x 4.1 x 2.7               | 6.8 x 4.1                                                                 | -                                  |
| <input type="checkbox"/> No.3 shielded room                    | -                          | -                         | 6.3 x 4.7 x 2.7               | 6.3 x 4.7                                                                 | -                                  |
| <input type="checkbox"/> No.4 shielded room                    | -                          | -                         | 4.4 x 4.7 x 2.7               | 4.4 x 4.7                                                                 | -                                  |
| <input checked="" type="checkbox"/> No.5 shielded room         | -                          | -                         | 7.8 x 6.4 x 2.7               | 7.8 x 6.4                                                                 | -                                  |
| <input type="checkbox"/> No.6 shielded room                    | -                          | -                         | 7.8 x 6.4 x 2.7               | 7.8 x 6.4                                                                 | -                                  |
| <input type="checkbox"/> No.7 shielded room                    | -                          | -                         | 2.76 x 3.76 x 2.4             | 2.76 x 3.76                                                               | -                                  |

### 3.6 Test setup, Test data & Test instruments

Refer to APPENDIX 1 to 3.

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

### 4.1 Operating mode

| Test item                          | Mode                                        | Tested frequency          | Worst data mode *1) |
|------------------------------------|---------------------------------------------|---------------------------|---------------------|
| Conducted emission                 | Transmitting IEEE 802.11n (HT20) (MIMO)     | 2412MHz                   | PN9, MCS8           |
| Radiated emission (above 1GHz) *2) | Transmitting IEEE 802.11b                   | 2412MHz, 2437MHz, 2462MHz | PN9, 1Mbps          |
|                                    | Transmitting IEEE 802.11g                   | 2412MHz, 2437MHz, 2462MHz | PN9, 6Mbps          |
|                                    | Transmitting IEEE 802.11n (HT20) (MIMO) *3) | 2412MHz, 2437MHz, 2462MHz | PN9, MCS8           |
|                                    | Transmitting IEEE 802.11n (HT40) (MIMO) *3) | 2422MHz, 2437MHz, 2452MHz | PN9, MCS8           |
|                                    | Transmitting IEEE 802.11a                   | 5745MHz, 5785MHz, 5825MHz | PN9, 9Mbps          |
|                                    | Transmitting IEEE 802.11n (HT20) (MIMO) *3) | 5745MHz, 5785MHz, 5825MHz | PN9, MCS10          |
|                                    | Transmitting IEEE 802.11n (HT40) (MIMO) *3) | 5755MHz, 5795MHz          | PN9, MCS8           |
| Other items                        | Transmitting IEEE 802.11b                   | 2412MHz, 2437MHz, 2462MHz | PN9, 1Mbps          |
|                                    | Transmitting IEEE 802.11g                   | 2412MHz, 2437MHz, 2462MHz | PN9, 6Mbps          |
|                                    | Transmitting IEEE 802.11n (HT20) (SISO)     | 2412MHz, 2437MHz, 2462MHz | PN9, MCS0           |
|                                    | Transmitting IEEE 802.11n (HT20) (MIMO) *3) | 2412MHz, 2437MHz, 2462MHz | PN9, MCS8           |
|                                    | Transmitting IEEE 802.11n (HT40) (SISO)     | 2422MHz, 2437MHz, 2452MHz | PN9, MCS0           |
|                                    | Transmitting IEEE 802.11n (HT40) (MIMO) *3) | 2422MHz, 2437MHz, 2452MHz | PN9, MCS8           |
|                                    | Transmitting IEEE 802.11a                   | 5745MHz, 5785MHz, 5825MHz | PN9, 9Mbps          |
|                                    | Transmitting IEEE 802.11n (HT20) (SISO)     | 5745MHz, 5785MHz, 5825MHz | PN9, MCS0           |
|                                    | Transmitting IEEE 802.11n (HT20) (MIMO) *3) | 5745MHz, 5785MHz, 5825MHz | PN9, MCS10          |
|                                    | Transmitting IEEE 802.11n (HT40) (SISO)     | 5755MHz, 5795MHz          | PN9, MCS0           |
|                                    | Transmitting IEEE 802.11n (HT40) (MIMO) *3) | 5755MHz, 5795MHz          | PN9, MCS8           |
|                                    | Transmitting IEEE 802.11n (HT40) (MIMO) *3) | 5755MHz, 5795MHz          | PN9, MCS8           |

\*1) The worst condition was determined based on the test result of Maximum Peak Output Power.  
\*2) Test operating mode was determined as follows according to “Section 1 of 6 802.11 a/b/g/n testing- Managing Complex Regulatory Approvals - ”of TCB Council Workshop October 2009.  
\*3) As this transmitter has MIMO mode for only MCS8 to MCS15, we need not to consider array gains.

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EUT has the power settings by the software as follows;

Test software: ART v0.9 b34

Power settings: Fixed

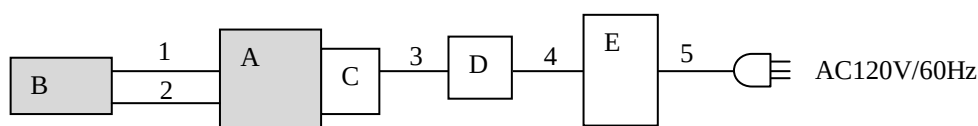
Antenna port used:

|                           | Single output<br>(11a, 11b, 11g, 11n (SISO)) | Multi output<br>(11n (MIMO)) |
|---------------------------|----------------------------------------------|------------------------------|
| Maximum peak output power | - Antenna 1<br>- Antenna 2                   | Antenna 1 + Antenna 2        |
| Radiated emission         | - Antenna 1 *4)                              | Antenna 1 + Antenna 2        |
| Other tests               | - Antenna 1 or Antenna 2 *4)                 | Antenna 1 or Antenna 2 *4)   |

\*4) The worse antenna port was determined based on the test result of Maximum Peak Output Power.

**Justification:** The system was configured in typical fashion (as customer would normally use it) for testing.

## 4.2 Configuration and peripherals



\* Test data was taken under worse case conditions.

### Description of EUT and support equipment

| No. | Item                   | Model number      | Serial number | Manufacturer          | Remarks |
|-----|------------------------|-------------------|---------------|-----------------------|---------|
| A   | Wireless LAN Module    | CMN-851A          | 983109021212  | Japan Radio Co., Ltd. | EUT     |
| B   | AP-Double WiFi Antenna | APP-WW            | -             | Antenna Plus LLC      | EUT     |
| C   | Jig                    | PE-MINI-FLEX8-FH  | -             | -                     | -       |
| D   | Jig                    | -                 | -             | -                     | -       |
| E   | PC                     | HP Compaq dc7800p | JPA831010C    | HP                    | -       |

### List of cables used

| No. | Cable Name | Length (m) | Shield     |            | Remarks |
|-----|------------|------------|------------|------------|---------|
|     |            |            | Cable      | Connector  |         |
| 1   | Coaxial    | 5.5        | Shielded   | Shielded   | -       |
| 2   | Coaxial    | 5.5        | Shielded   | Shielded   | -       |
| 3   | Flat       | 0.2        | Unshielded | Unshielded | -       |
| 4   | HDMI       | 1.4        | Shielded   | Shielded   | -       |
| 5   | AC         | 1.9        | Unshielded | Unshielded | -       |

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## **SECTION 5: Conducted emission**

### **5.1 Operating environment**

Test place : See test data (APPENDIX 1)  
Temperature : See test data (APPENDIX 1)  
Humidity : See test data (APPENDIX 1)

### **5.2 Test configuration**

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 0.8m above the conducting ground plane.

The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity.

The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals was aligned and was flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from LISN.

Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source. All unused 50ohm connectors of the LISN were resistively terminated in 50ohm when not connected to the measuring equipment.

Photographs of the set up are shown in APPENDIX 3.

### **5.3 Test conditions**

Frequency range : 0.15 - 30MHz  
EUT position : Table top

### **5.4 Test procedure**

The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT within a Shielded room.

The EUT was connected to a Line Impedance Stabilization Network (LISN).

An overview sweep with peak detection has been performed.

The measurements had been performed with a quasi-peak detector and if required, a CISPR average detector.

The conducted emission measurements were made with the following detection of the test receiver.

Detection Type : Quasi-Peak/ CISPR Average  
IF Bandwidth : 9kHz

### **5.5 Results**

Summary of the test results : Pass  
Refer to APPENDIX 1

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## SECTION 6: Radiated emission

### 6.1 Operating environment

Test place : See test data (APPENDIX 1)  
Temperature : See test data (APPENDIX 1)  
Humidity : See test data (APPENDIX 1)

### 6.2 Test configuration

EUT was placed on a urethane platform of nominal size, 0.5m by 0.5m, raised 0.8m above the conducting ground plane. The rear of EUT was aligned and flushed with rear of tabletop. Photographs of the set up are shown in APPENDIX 3.

### 6.3 Test conditions

Frequency range : 30MHz to 40GHz  
EUT position : Table top

### 6.4 Test procedure

The Radiated Electric Field Strength intensity has been measured on a semi-anechoic chamber with a ground plane and at a distance of 3m (below 15GHz) / 1m (above 15GHz) (Refer to Figure 1). Measurements were performed with quasi-peak, peak and average detector. The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity. The measurements were performed for both vertical and horizontal antenna polarization.

The radiated emission measurements were made with the following detection.

| Frequency      | 30-1000MHz | 1-40GHz                |                                         | 20dBc                      |
|----------------|------------|------------------------|-----------------------------------------|----------------------------|
| Detection type | Quasi-Peak | Peak                   | Average *1)                             | Peak                       |
| IF Bandwidth   | 120kHz     | RBW: 1MHz<br>VBW: 3MHz | RBW: 1MHz<br>VBW: 3MHz<br>Detector: RMS | RBW: 100kHz<br>VBW: 300kHz |

\*1) Average Power Measurement was measured based on 12.2.5.1 and 12.2.5.2 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

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

#### Worst case:

#### 2.4GHz band

| Subject | Antenna polarization | Carrier | Spurious (Below 1GHz) | Spurious (Above 1GHz) |
|---------|----------------------|---------|-----------------------|-----------------------|
| Module  | Horizontal           | X       | X                     | X                     |
| Antenna |                      | Y       | X                     | Y                     |
| Module  | Vertical             | X       | X                     | X                     |
| Antenna |                      | X       | X                     | X                     |

#### 5GHz band

| Subject | Antenna polarization | Carrier | Spurious (Below 1GHz) | Spurious (Above 1GHz) |
|---------|----------------------|---------|-----------------------|-----------------------|
| Module  | Horizontal           | X       | X                     | X                     |
| Antenna |                      | Z       | X                     | Z                     |
| Module  | Vertical             | X       | X                     | X                     |
| Antenna |                      | X       | X                     | X                     |

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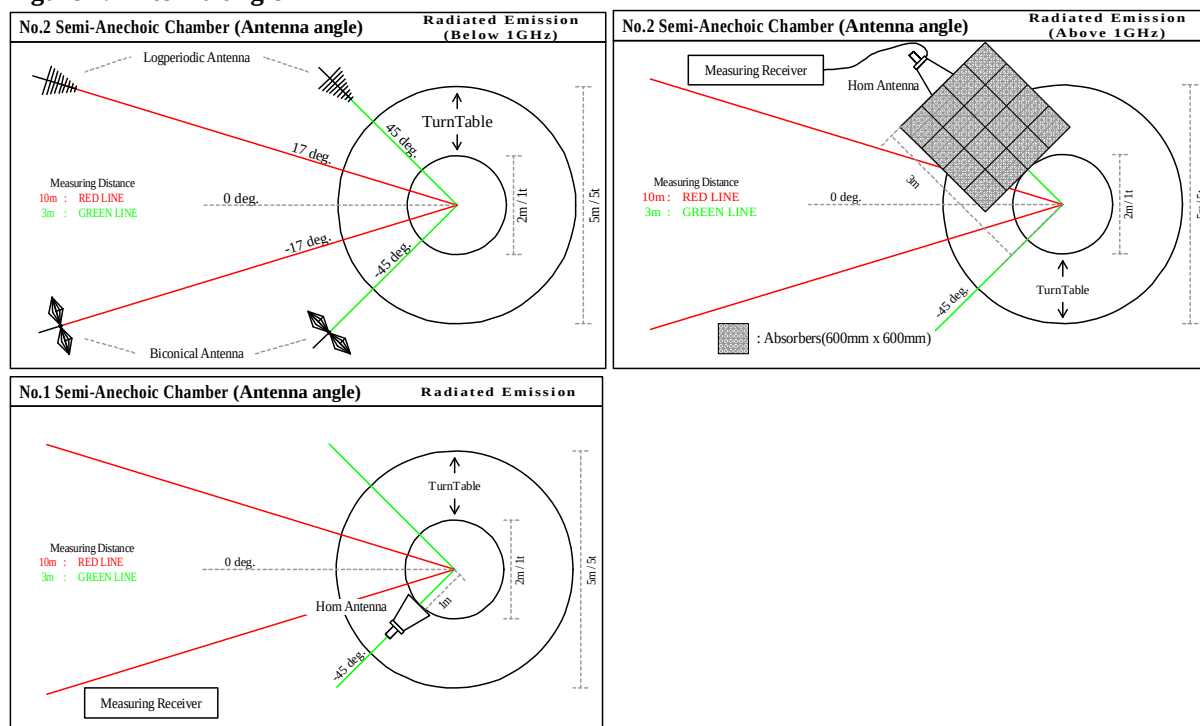
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**Figure 1. Antenna angle**



## 6.5 Band edge

Band edge level at 2390MHz, 2483.5MHz, 5725MHz and 5850MHz is below the limits of FCC 15.209 and band edge level at 2400MHz is below the 20dBc. Refer to the data.

## 6.6 Results

Summary of the test results : Pass  
\* No noise was detected above the 3rd order harmonics.

Refer to APPENDIX 1

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## **SECTION 7: Out of band emissions (Antenna port conducted)**

### **Test procedure**

The Out of Band Emissions was measured with a spectrum analyzer connected to the antenna port. In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement. In the frequency range below 30MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart. (9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=10kHz)

Summary of the test results: Pass  
Refer to APPENDIX 1

## **SECTION 8: 6dB bandwidth & Occupied bandwidth (99%)**

### **Test procedure**

The bandwidth was measured with a spectrum analyzer connected to the antenna port. The test was measured based on Method 8.1 Option 1 and 8.2 Option 2 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

Summary of the test results: Pass  
Refer to APPENDIX 1

## **SECTION 9: Maximum peak output power**

### **Test procedure**

The Maximum Peak Output Power was measured with a power meter connected to the antenna port. The test was measured based on Method 9.1.3 PKPM1 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

Summary of the test results: Pass  
Refer to APPENDIX 1

## **SECTION 10: Peak power density**

### **Test procedure**

The peak power density was measured with a spectrum analyzer connected to the antenna port.

Instrument used : Spectrum Analyzer  
RBW / VBW : 3kHz / 9.1kHz

The test was measured based on Method 10.2 PKPSD of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

Summary of the test results: Pass  
Refer to APPENDIX 1

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## **Contents of APPENDIXES**

### **APPENDIX 1: Data of Radio tests**

Conducted emission  
6dB bandwidth  
Maximum peak output power  
Radiated emission  
Spurious emission (Antenna port conducted)  
Peak power density  
Occupied bandwidth

### **APPENDIX 2: Test instruments**

Test instruments

### **APPENDIX 3: Photographs of test setup**

Conducted emission  
Radiated emission  
Pre-check of the worst position

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# DATA OF CONDUCTED EMISSION TEST

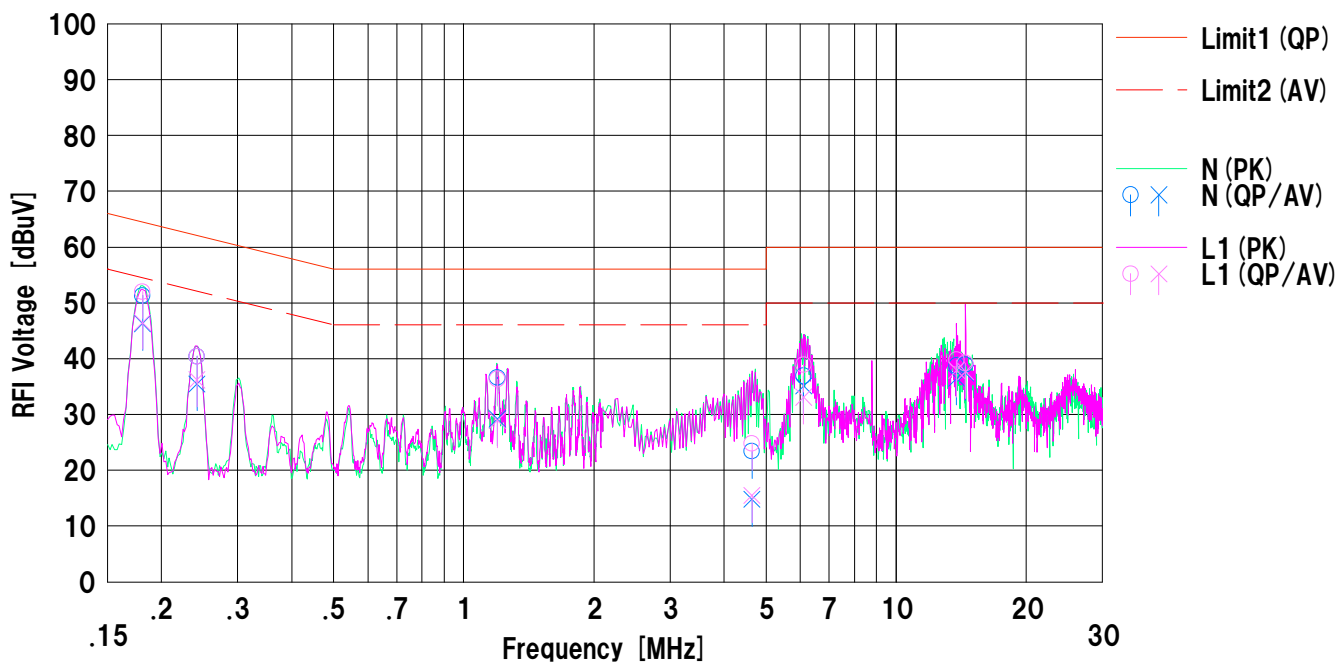
UL Japan,Inc. Shonan EMC Lab. No.2 Shielded Room  
Date : 2013/05/15

Company : Japan Radio Co., Ltd  
Kind of EUT : WLAN MODULE  
Model No. : CMN-851A  
Serial No. : -  
Remarks :

Mode : Tx 11n20-HT 2412MHz  
Order No. : 10009516S  
Power : AC 120V / 60Hz  
Temp./Humi. : 23deg.C. / 45%RH

Limit1 : FCC 15C (15.207) QP  
Limit2 : FCC 15C (15.207) AV

Engineer : Makoto Hosaka



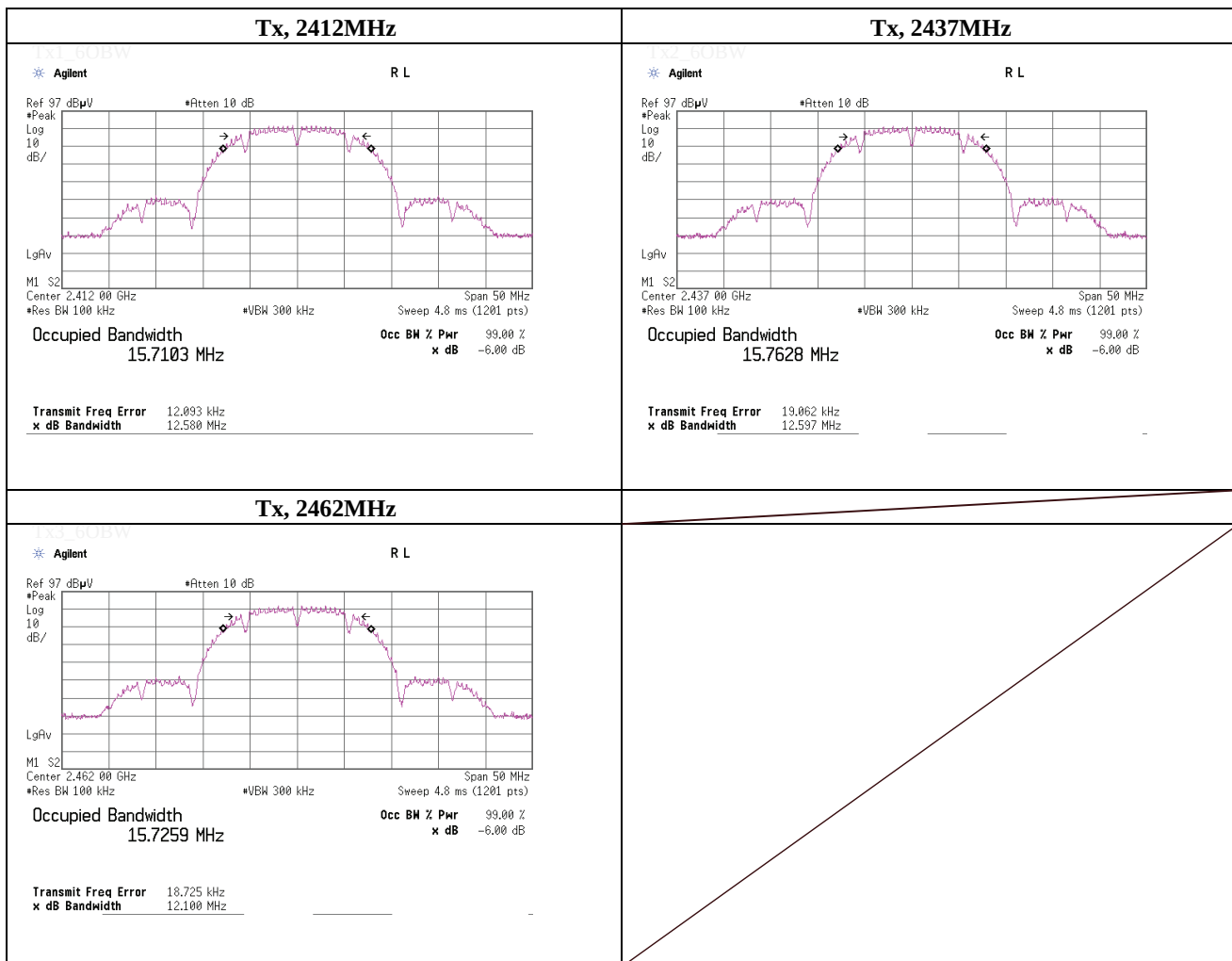
| No. | Freq.<br>[MHz] | Reading        |                | C.Fac | Results        |                | Limit          |                | Margin       |              | Phase | Comment |
|-----|----------------|----------------|----------------|-------|----------------|----------------|----------------|----------------|--------------|--------------|-------|---------|
|     |                | <QP><br>[dBuV] | <AV><br>[dBuV] |       | <QP><br>[dBuV] | <AV><br>[dBuV] | <QP><br>[dBuV] | <AV><br>[dBuV] | <QP><br>[dB] | <AV><br>[dB] |       |         |
| 1   | 0.18069        | 38.7           | 33.7           | 12.6  | 51.3           | 46.3           | 64.4           | 54.4           | 13.1         | 8.1          | N     |         |
| 2   | 0.24154        | 27.8           | 22.9           | 12.6  | 40.4           | 35.5           | 62.0           | 52.0           | 21.6         | 16.5         | N     |         |
| 3   | 1.19624        | 23.9           | 16.5           | 12.7  | 36.6           | 29.2           | 56.0           | 46.0           | 19.4         | 16.8         | N     |         |
| 4   | 4.63697        | 10.6           | 2.0            | 12.8  | 23.4           | 14.8           | 56.0           | 46.0           | 32.6         | 31.2         | N     |         |
| 5   | 6.11169        | 23.9           | 22.1           | 13.0  | 36.9           | 35.1           | 60.0           | 50.0           | 23.1         | 14.9         | N     |         |
| 6   | 13.78827       | 25.3           | 23.1           | 13.4  | 38.7           | 36.5           | 60.0           | 50.0           | 21.3         | 13.5         | N     |         |
| 7   | 14.46138       | 25.5           | 24.0           | 13.4  | 38.9           | 37.4           | 60.0           | 50.0           | 21.1         | 12.6         | N     |         |
| 8   | 0.18069        | 39.4           | 33.9           | 12.6  | 52.0           | 46.5           | 64.4           | 54.4           | 12.4         | 7.9          | L1    |         |
| 9   | 0.24154        | 27.8           | 23.6           | 12.6  | 40.4           | 36.2           | 62.0           | 52.0           | 21.6         | 15.8         | L1    |         |
| 10  | 1.19624        | 23.6           | 16.2           | 12.7  | 36.3           | 28.9           | 56.0           | 46.0           | 19.7         | 17.1         | L1    |         |
| 11  | 4.63697        | 12.0           | 2.7            | 12.8  | 24.8           | 15.5           | 56.0           | 46.0           | 31.2         | 30.5         | L1    |         |
| 12  | 6.11169        | 25.9           | 20.1           | 13.0  | 38.9           | 33.1           | 60.0           | 50.0           | 21.1         | 16.9         | L1    |         |
| 13  | 13.79775       | 26.4           | 24.5           | 13.4  | 39.8           | 37.9           | 60.0           | 50.0           | 20.2         | 12.1         | L1    |         |
| 14  | 14.46138       | 25.8           | 24.3           | 13.4  | 39.2           | 37.7           | 60.0           | 50.0           | 20.8         | 12.3         | L1    |         |



## -6dB Bandwidth

|                        |                                                                    |                    |
|------------------------|--------------------------------------------------------------------|--------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab.                                     | No.5 Shielded Room |
| Date                   | May 2, 2013                                                        |                    |
| Temperature / Humidity | 24deg.C , 40%RH                                                    |                    |
| Engineer               | Makoto Hosaka                                                      |                    |
| Mode                   | Tx, IEEE802.11b , PN9, worst antenna port 1, worst data mode 1Mbps |                    |

| Freq.<br>[MHz] | -6dB Bandwidth<br>[MHz] | Limit<br>[MHz] |
|----------------|-------------------------|----------------|
| 2412.0000      | 12.580                  | > 0.500        |
| 2437.0000      | 12.597                  | > 0.500        |
| 2462.0000      | 12.100                  | > 0.500        |



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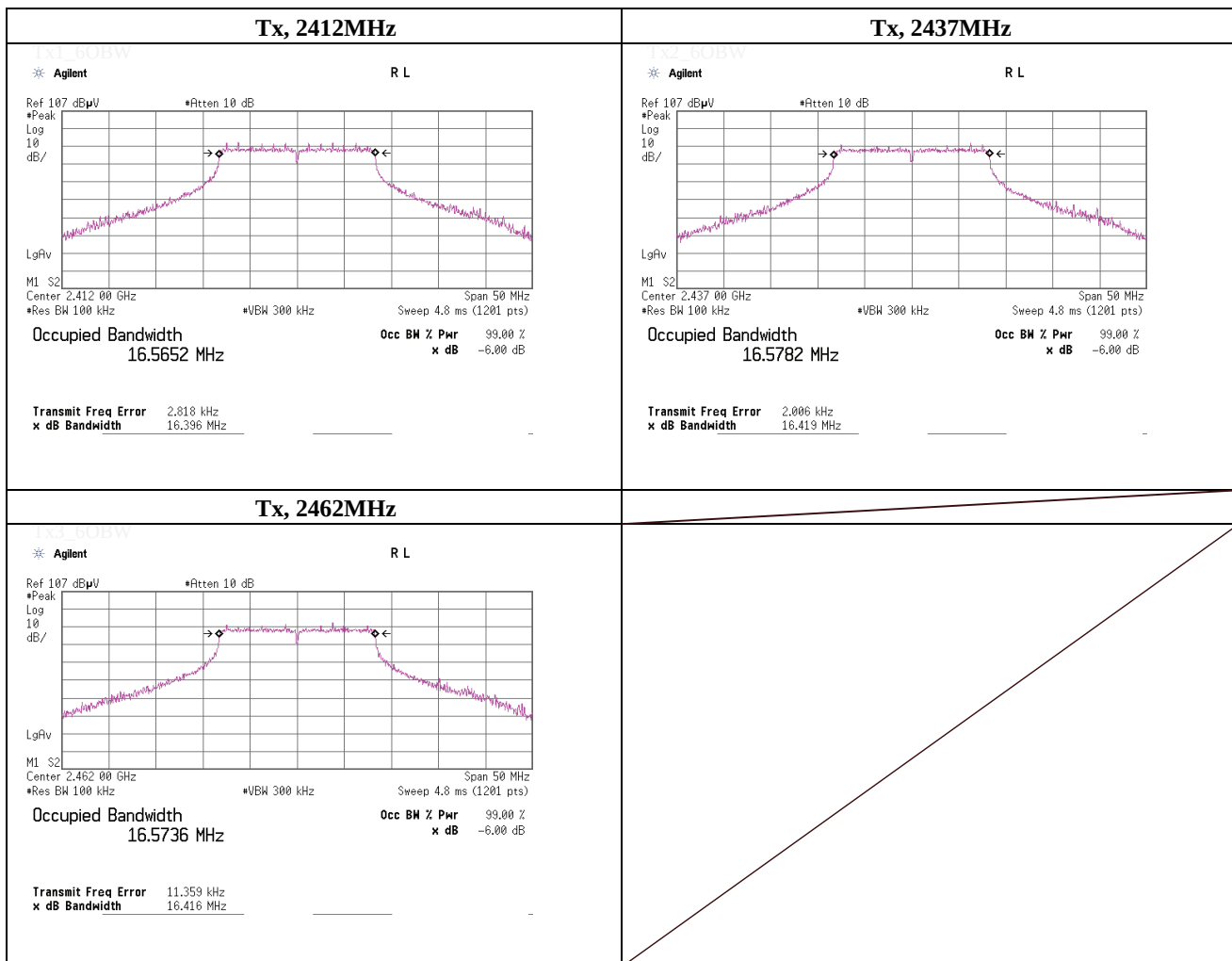
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## -6dB Bandwidth

|                        |                                                                   |                    |
|------------------------|-------------------------------------------------------------------|--------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab.                                    | No.5 Shielded Room |
| Date                   | May 2, 2013                                                       |                    |
| Temperature / Humidity | 24deg.C , 40%RH                                                   |                    |
| Engineer               | Makoto Hosaka                                                     |                    |
| Mode                   | Tx, IEEE802.11g, PN9, worst antenna port 1, worst data mode 6Mbps |                    |

| Freq.<br>[MHz] | -6dB Bandwidth<br>[MHz] | Limit<br>[MHz] |
|----------------|-------------------------|----------------|
| 2412.0000      | 16.396                  | > 0.500        |
| 2437.0000      | 16.419                  | > 0.500        |
| 2462.0000      | 16.416                  | > 0.500        |



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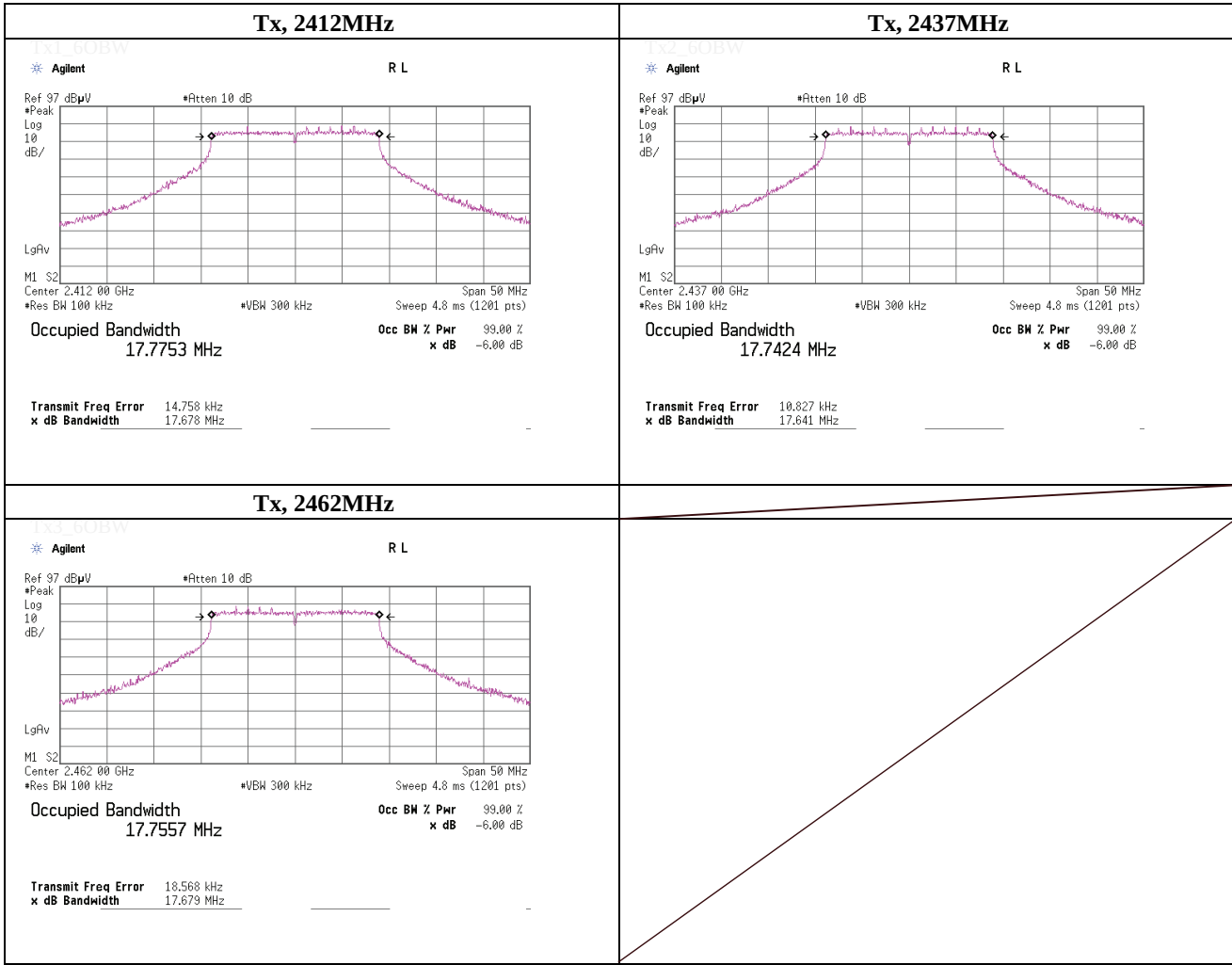
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## -6dB Bandwidth

|                        |                                                                          |                    |
|------------------------|--------------------------------------------------------------------------|--------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab.                                           | No.5 Shielded Room |
| Date                   | May 2, 2013                                                              |                    |
| Temperature / Humidity | 24deg.C , 40%RH                                                          |                    |
| Engineer               | Makoto Hosaka                                                            |                    |
| Mode                   | Tx, IEEE802.11n(HT20), PN9, worst antenna port 1, worst data mode 0(MCS) |                    |

| Freq.<br>[MHz] | -6dB Bandwidth<br>[MHz] | Limit<br>[MHz] |
|----------------|-------------------------|----------------|
| 2412.0000      | 17.678                  | > 0.500        |
| 2437.0000      | 17.641                  | > 0.500        |
| 2462.0000      | 17.679                  | > 0.500        |

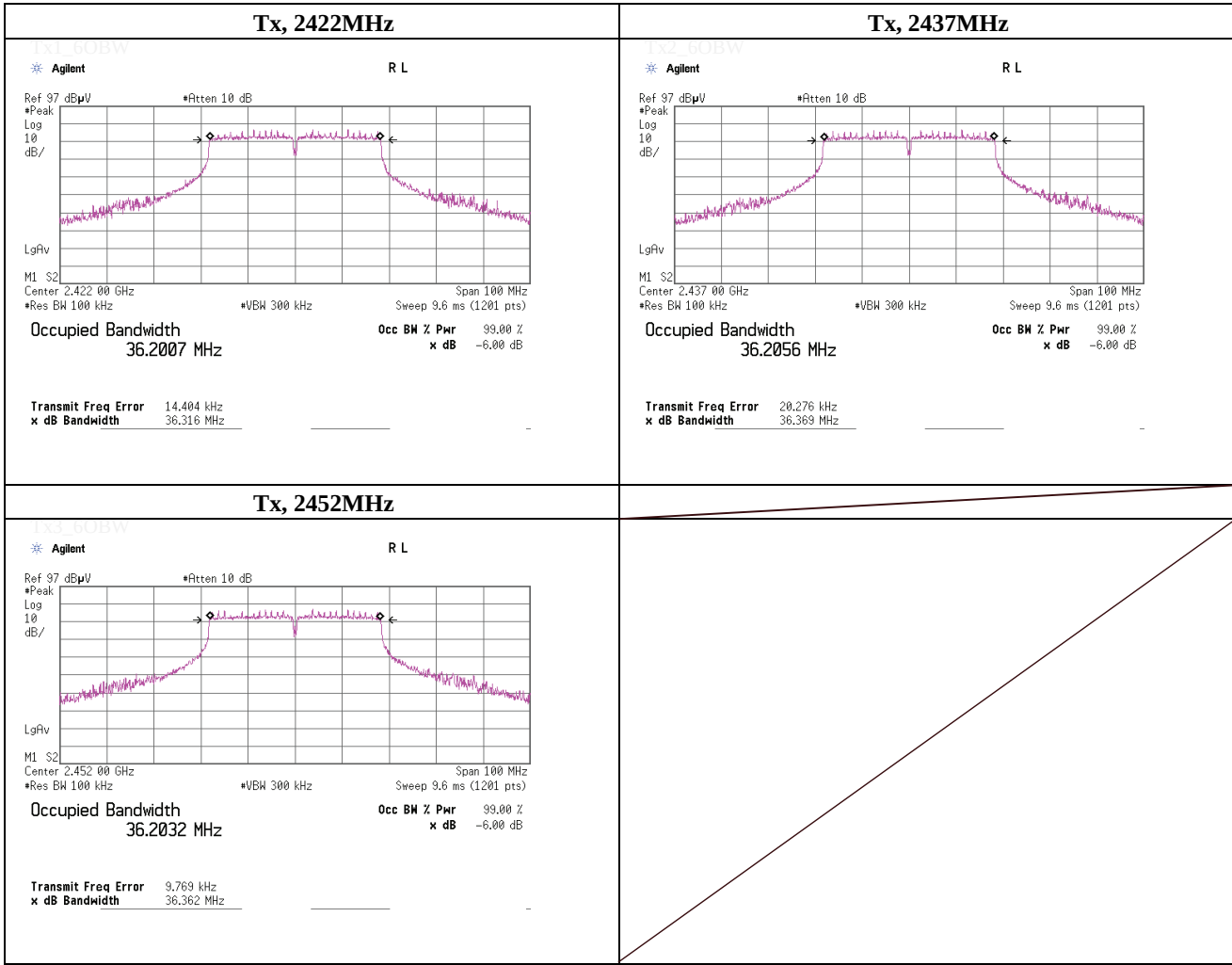


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## -6dB Bandwidth

|                        |                                                                          |                    |
|------------------------|--------------------------------------------------------------------------|--------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab.                                           | No.5 Shielded Room |
| Date                   | May 2, 2013                                                              |                    |
| Temperature / Humidity | 24deg.C , 40%RH                                                          |                    |
| Engineer               | Makoto Hosaka                                                            |                    |
| Mode                   | Tx, IEEE802.11n(HT40), PN9, worst antenna port 1, worst data mode 0(MCS) |                    |

| Freq.<br>[MHz] | -6dB Bandwidth<br>[MHz] | Limit<br>[MHz] |
|----------------|-------------------------|----------------|
| 2422.0000      | 36.316                  | > 0.500        |
| 2437.0000      | 36.369                  | > 0.500        |
| 2452.0000      | 36.362                  | > 0.500        |



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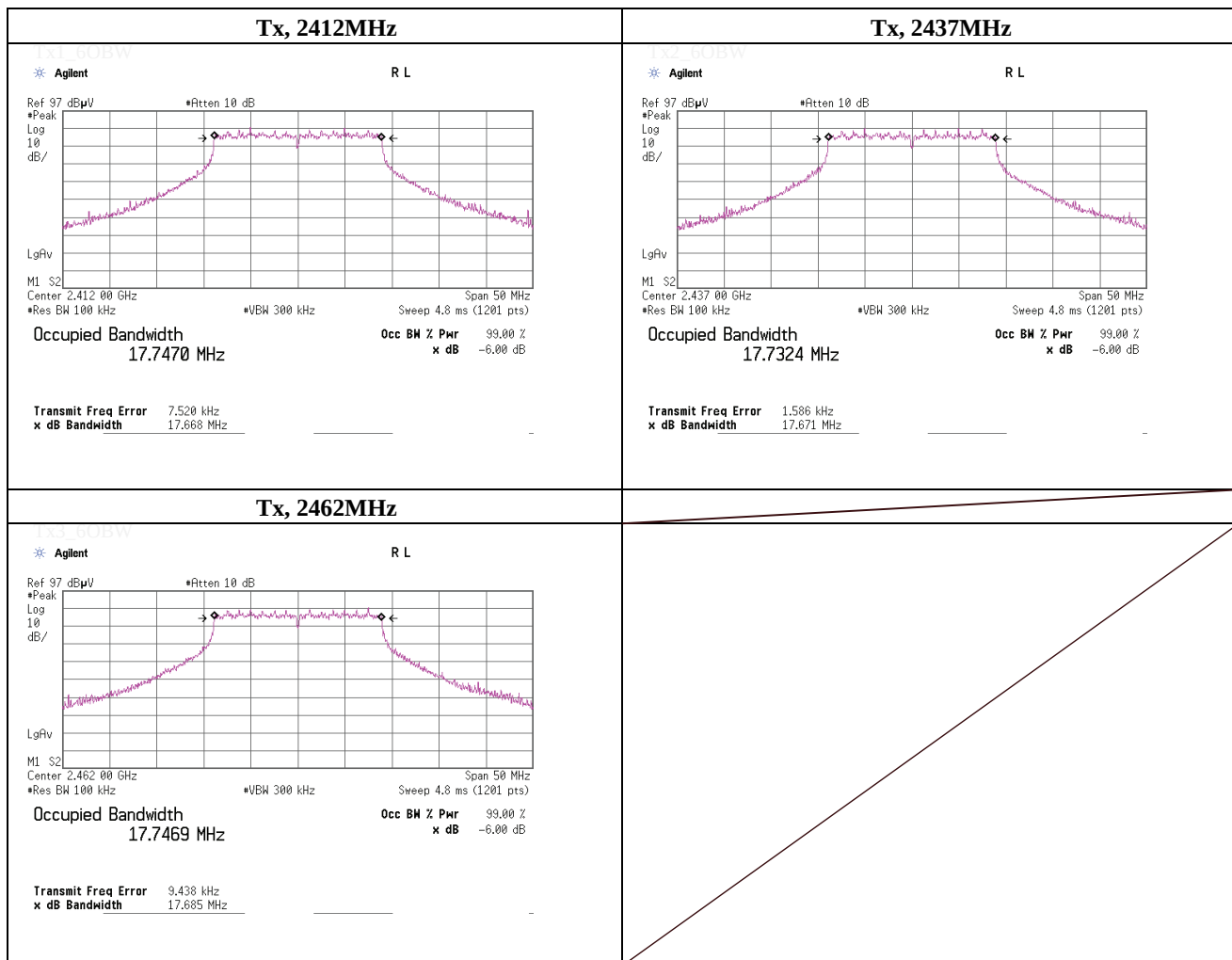
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## -6dB Bandwidth

|                        |                                                                     |                    |
|------------------------|---------------------------------------------------------------------|--------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab.                                      | No.5 Shielded Room |
| Date                   | May 2, 2013                                                         |                    |
| Temperature / Humidity | 24deg.C , 40%RH                                                     |                    |
| Engineer               | Makoto Hosaka                                                       |                    |
| Mode                   | Tx, IEEE802.11n (HT20), PN9, antenna port 1, worst data mode 8(MCS) |                    |

| Freq.<br>[MHz] | -6dB Bandwidth<br>[MHz] | Limit<br>[MHz] |
|----------------|-------------------------|----------------|
| 2412.0000      | 17.668                  | > 0.500        |
| 2437.0000      | 17.671                  | > 0.500        |
| 2462.0000      | 17.685                  | > 0.500        |



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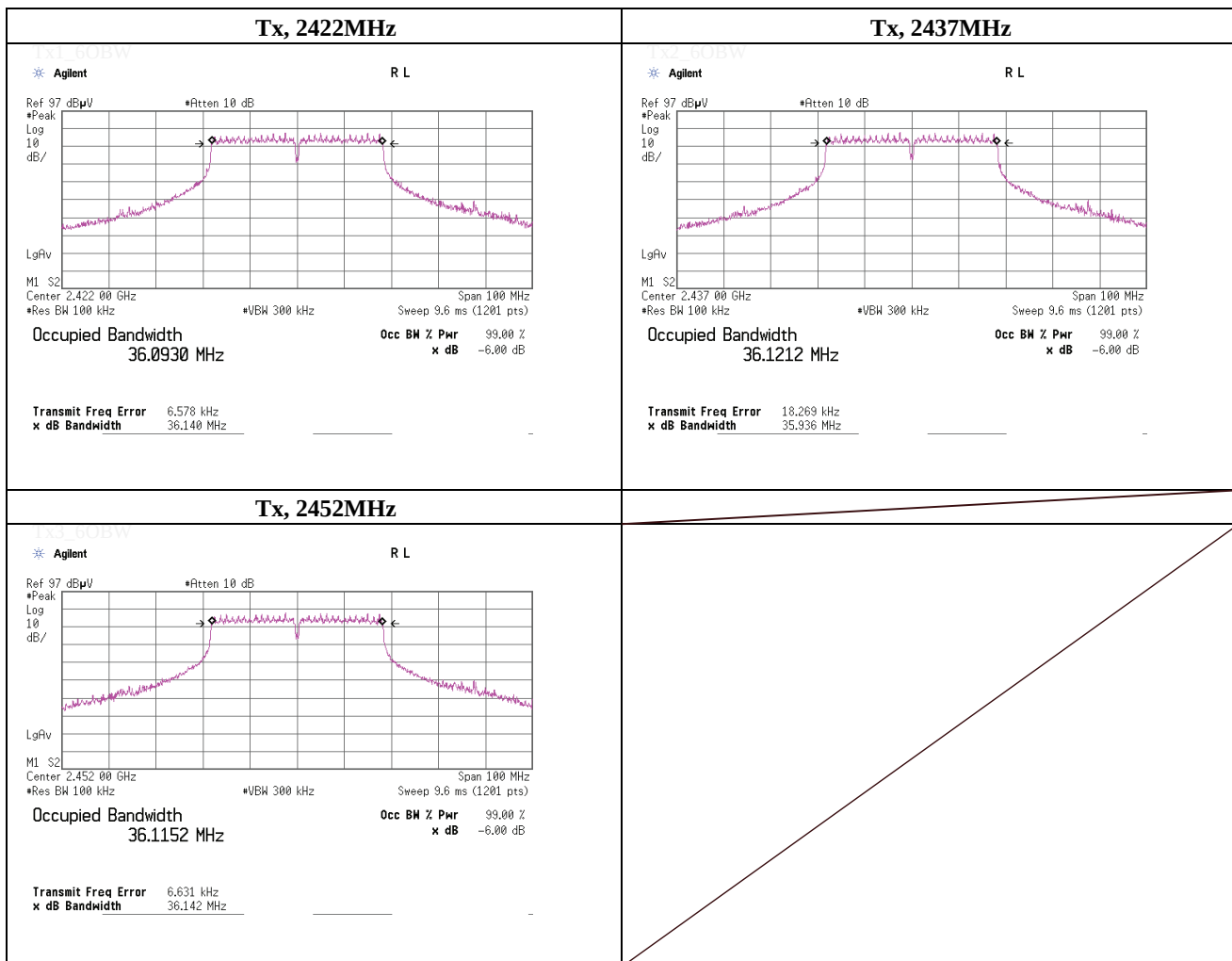
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## -6dB Bandwidth

|                        |                                                                     |                    |
|------------------------|---------------------------------------------------------------------|--------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab.                                      | No.5 Shielded Room |
| Date                   | May 2, 2013                                                         |                    |
| Temperature / Humidity | 24deg.C , 40%RH                                                     |                    |
| Engineer               | Makoto Hosaka                                                       |                    |
| Mode                   | Tx, IEEE802.11n (HT40), PN9, antenna port 1, worst data mode 8(MCS) |                    |

| Freq.<br>[MHz] | -6dB Bandwidth<br>[MHz] | Limit<br>[MHz] |
|----------------|-------------------------|----------------|
| 2422.0000      | 36.140                  | > 0.500        |
| 2437.0000      | 35.936                  | > 0.500        |
| 2452.0000      | 36.142                  | > 0.500        |



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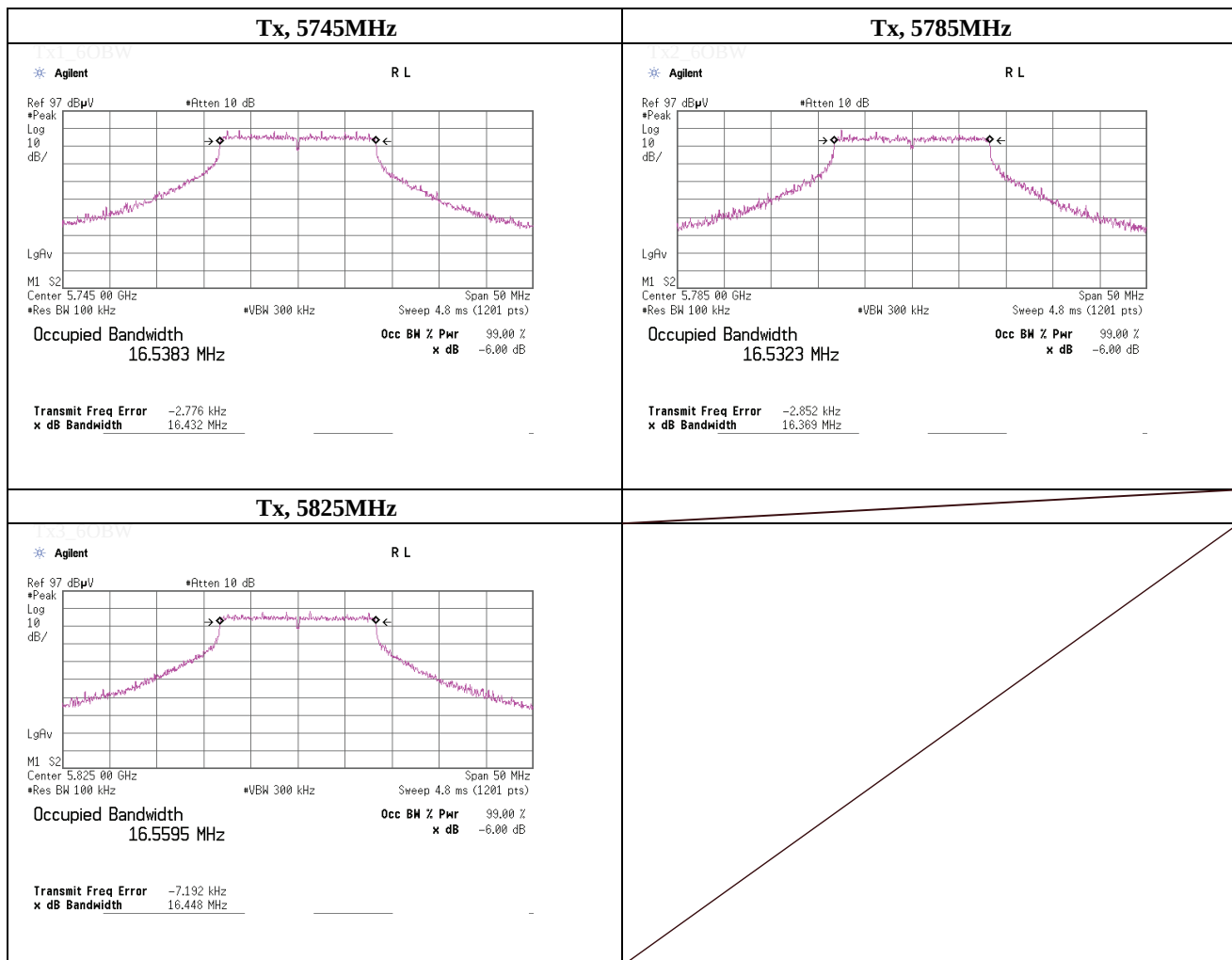
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## -6dB Bandwidth

|                        |                                                                   |                    |
|------------------------|-------------------------------------------------------------------|--------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab.                                    | No.5 Shielded Room |
| Date                   | May 2, 2013                                                       |                    |
| Temperature / Humidity | 24deg.C , 40%RH                                                   |                    |
| Engineer               | Makoto Hosaka                                                     |                    |
| Mode                   | Tx, IEEE802.11a, PN9, worst antenna port 1, worst data mode 9Mbps |                    |

| Freq.<br>[MHz] | -6dB Bandwidth<br>[MHz] | Limit<br>[MHz] |
|----------------|-------------------------|----------------|
| 5745.0000      | 16.432                  | > 0.500        |
| 5785.0000      | 16.369                  | > 0.500        |
| 5825.0000      | 16.448                  | > 0.500        |



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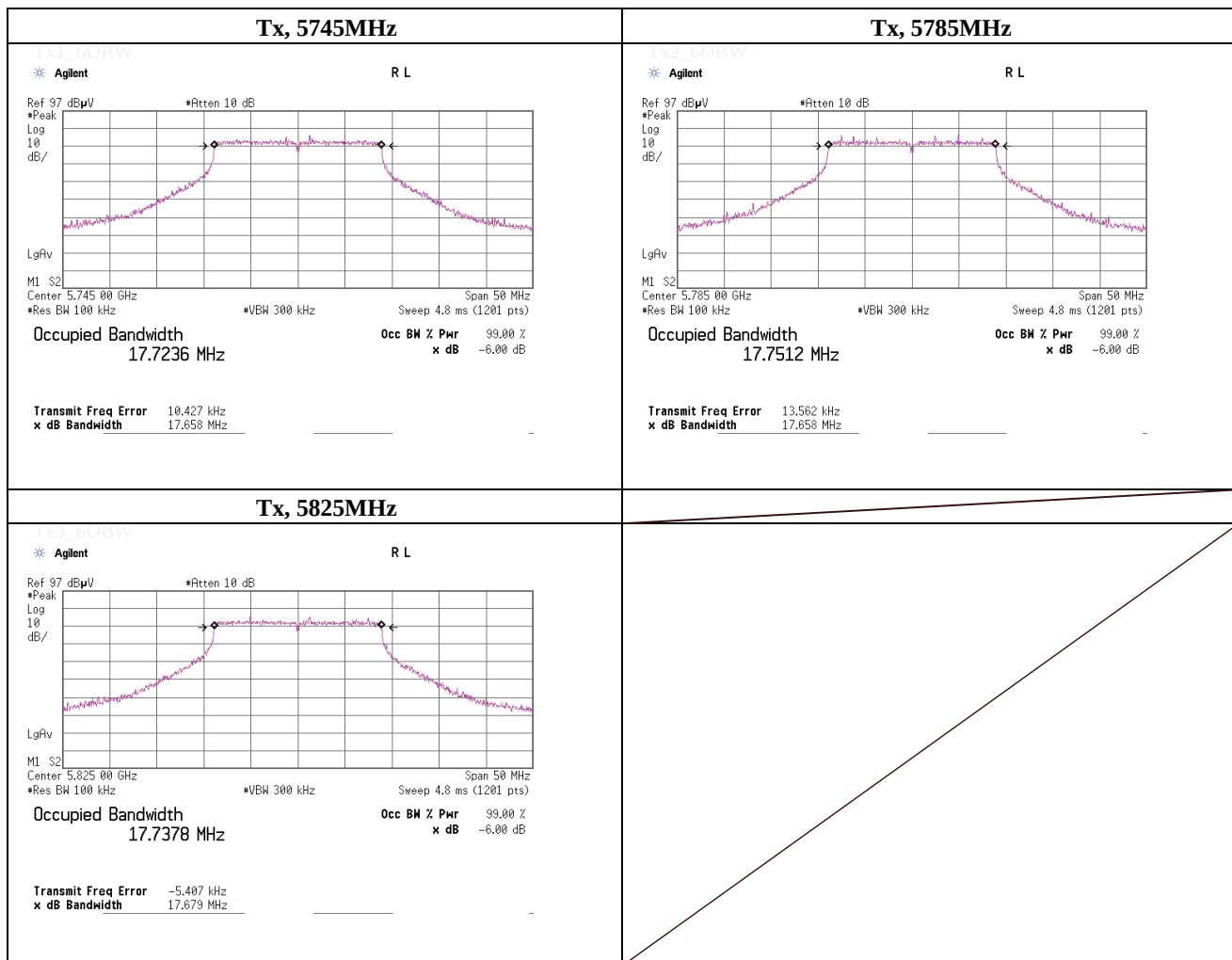
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## -6dB Bandwidth

|                        |                                                                          |                    |
|------------------------|--------------------------------------------------------------------------|--------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab.                                           | No.5 Shielded Room |
| Date                   | May 2, 2013                                                              |                    |
| Temperature / Humidity | 24deg.C , 40%RH                                                          |                    |
| Engineer               | Makoto Hosaka                                                            |                    |
| Mode                   | Tx, IEEE802.11n(HT20), PN9, worst antenna port 2, worst data mode 0(MCS) |                    |

| Freq.<br>[MHz] | -6dB Bandwidth<br>[MHz] | Limit<br>[MHz] |
|----------------|-------------------------|----------------|
| 5745.0000      | 17.658                  | > 0.500        |
| 5785.0000      | 17.658                  | > 0.500        |
| 5825.0000      | 17.679                  | > 0.500        |



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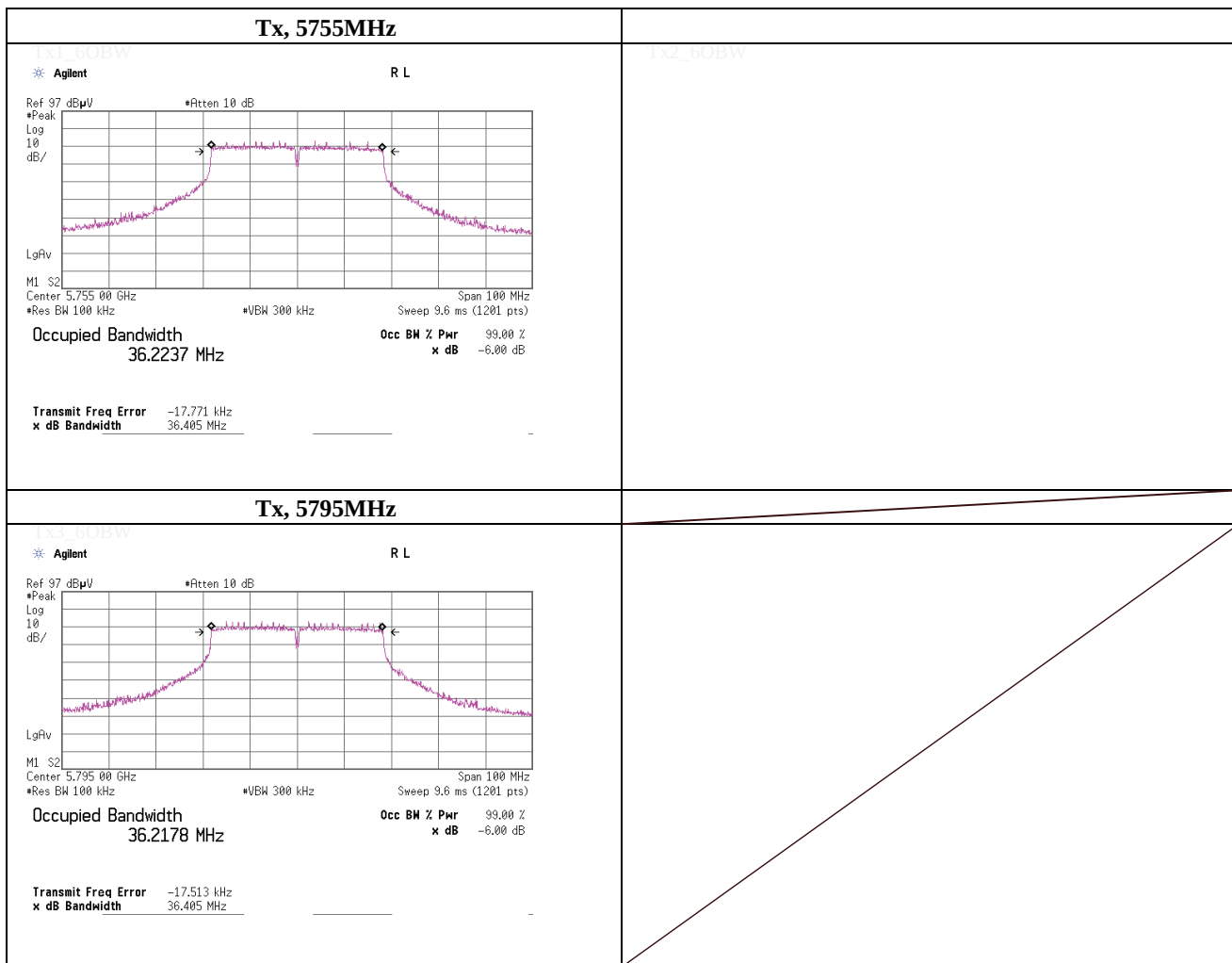
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**-6dB Bandwidth**

|                        |                                                                          |                    |
|------------------------|--------------------------------------------------------------------------|--------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab.                                           | No.5 Shielded Room |
| Date                   | May 2, 2013                                                              |                    |
| Temperature / Humidity | 24deg.C , 40%RH                                                          |                    |
| Engineer               | Makoto Hosaka                                                            |                    |
| Mode                   | Tx, IEEE802.11n(HT40), PN9, worst antenna port 1, worst data mode 0(MCS) |                    |

| Freq.<br>[MHz] | -6dB Bandwidth<br>[MHz] | Limit<br>[MHz] |
|----------------|-------------------------|----------------|
| 5755.0000      | 36.405                  | > 0.500        |
| 5795.0000      | 36.405                  | > 0.500        |

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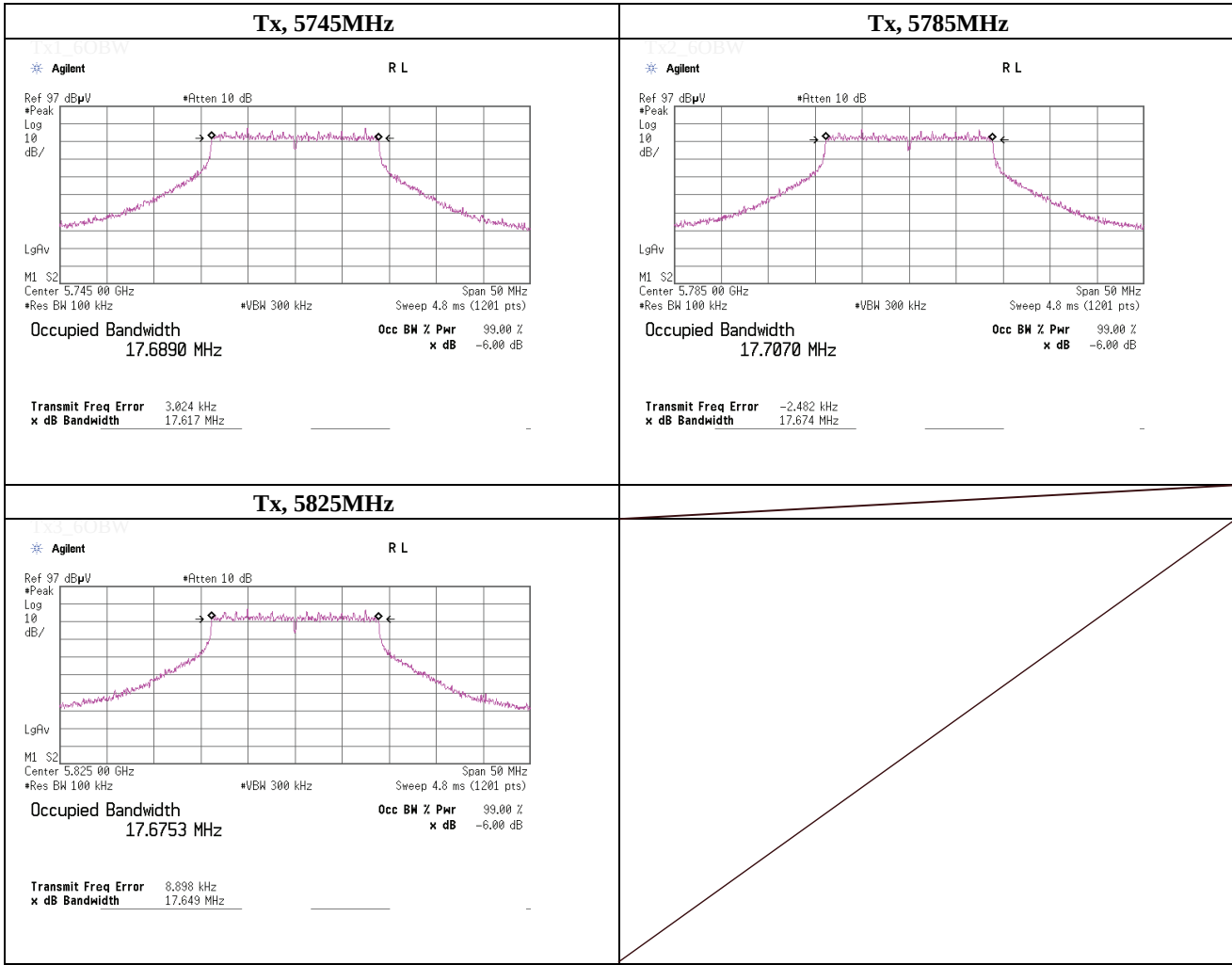
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### -6dB Bandwidth

|                        |                                                                      |                    |
|------------------------|----------------------------------------------------------------------|--------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab.                                       | No.5 Shielded Room |
| Date                   | May 2, 2013                                                          |                    |
| Temperature / Humidity | 24deg.C , 40%RH                                                      |                    |
| Engineer               | Makoto Hosaka                                                        |                    |
| Mode                   | Tx, IEEE802.11n (HT20), PN9, antenna port 1, worst data mode 10(MCS) |                    |

| Freq.<br>[MHz] | -6dB Bandwidth<br>[MHz] | Limit<br>[MHz] |
|----------------|-------------------------|----------------|
| 5745.0000      | 17.617                  | > 0.500        |
| 5785.0000      | 17.674                  | > 0.500        |
| 5825.0000      | 17.649                  | > 0.500        |

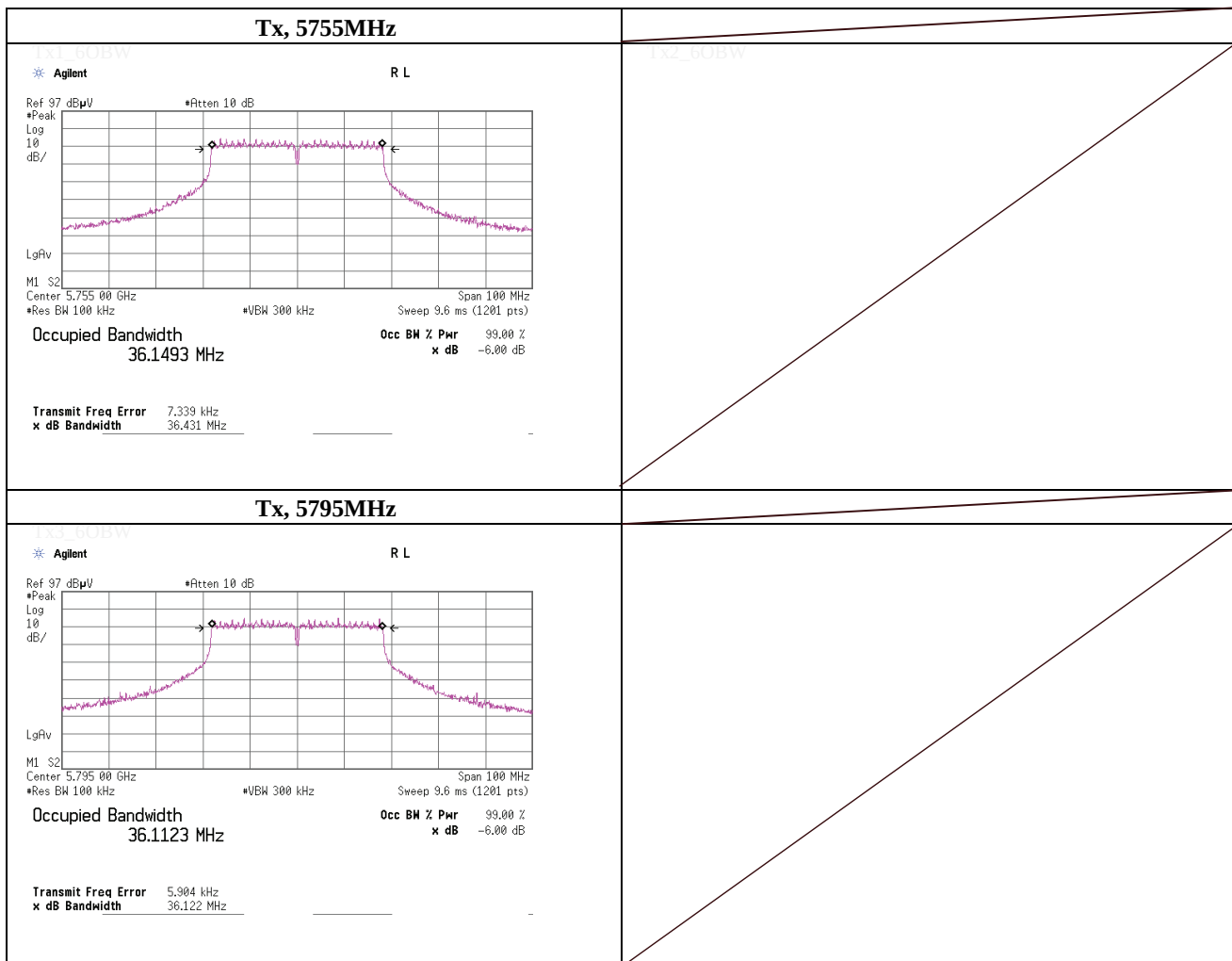


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**-6dB Bandwidth**

|                        |                                                                     |                    |
|------------------------|---------------------------------------------------------------------|--------------------|
| Test place             | UL Japan, Inc. Shonan EMC Lab.                                      | No.5 Shielded Room |
| Date                   | May 2, 2013                                                         |                    |
| Temperature / Humidity | 24deg.C , 40%RH                                                     |                    |
| Engineer               | Makoto Hosaka                                                       |                    |
| Mode                   | Tx, IEEE802.11n (HT40), PN9, antenna port 2, worst data mode 8(MCS) |                    |

| Freq.<br>[MHz] | -6dB Bandwidth<br>[MHz] | Limit<br>[MHz] |
|----------------|-------------------------|----------------|
| 5755.0000      | 36.431                  | > 0.500        |
| 5795.0000      | 36.122                  | > 0.500        |

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Revised date: June 18, 2013

**Maximum Peak Conducted Output Power**

(Method 9.1.3 PKPM1)

Test place                      UL Japan, Inc. Shonan EMC Lab.                      No.5 Shielded Room  
 Date                              April 26, 2013  
 Temperature / Humidity       23deg.C                      , 45%RH  
 Engineer                        Makoto Hosaka  
 Mode                              Tx, IEEE802.11b , PN9,                      worst antenna :                      1                      worst data mode :                      1 Mbps

(\* P/M: Power Meter with power sensor)

| Ch   | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |       | Limit |      | Margin<br>[dB] |
|------|----------------|--------------------------------|-----------------------|------------------------|--------|-------|-------|------|----------------|
|      |                |                                |                       |                        | [dBm]  | [mW]  | [dBm] | [mW] |                |
| Low  | 2412.0         | -5.52                          | 1.50                  | 20.21                  | 16.19  | 41.59 | 30.00 | 1000 | 13.81          |
| Mid  | 2437.0         | -5.56                          | 1.50                  | 20.21                  | 16.15  | 41.21 | 30.00 | 1000 | 13.85          |
| High | 2462.0         | -5.80                          | 1.51                  | 20.21                  | 15.92  | 39.08 | 30.00 | 1000 | 14.08          |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

**[Pre check]****Antenna 1**

|   | Data rate<br>[Mbps] | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result       |       | Limit |      | Margin<br>[dB] |
|---|---------------------|----------------|--------------------------------|-----------------------|------------------------|--------------|-------|-------|------|----------------|
|   |                     |                |                                |                       |                        | [dBm]        | [mW]  | [dBm] | [mW] |                |
| 1 | 1                   | 2412.0         | -5.52                          | 1.50                  | 20.21                  | <b>16.19</b> | 41.59 | 30.00 | 1000 | <b>13.81</b>   |
| 1 | 2                   | 2412.0         | -5.55                          | 1.50                  | 20.21                  | 16.16        | 41.30 | 30.00 | 1000 | 13.84          |
| 1 | 5.5                 | 2412.0         | -5.68                          | 1.50                  | 20.21                  | 16.03        | 40.09 | 30.00 | 1000 | 13.97          |
| 1 | 11                  | 2412.0         | -5.60                          | 1.50                  | 20.21                  | 16.11        | 40.83 | 30.00 | 1000 | 13.89          |
|   |                     |                |                                |                       |                        |              |       |       |      |                |
|   |                     |                |                                |                       |                        |              |       |       |      |                |
|   |                     |                |                                |                       |                        |              |       |       |      |                |
|   |                     |                |                                |                       |                        |              |       |       |      |                |

Worst

**Antenna 2**

|   | Data rate<br>[Mbps] | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |       | Limit |      | Margin<br>[dB] |
|---|---------------------|----------------|--------------------------------|-----------------------|------------------------|--------|-------|-------|------|----------------|
|   |                     |                |                                |                       |                        | [dBm]  | [mW]  | [dBm] | [mW] |                |
| 2 | 1                   | 2412.0         | -6.05                          | 1.52                  | 20.21                  | 15.68  | 36.98 | 30.00 | 1000 | 14.32          |
| 2 | 2                   | 2412.0         | -5.69                          | 1.52                  | 20.21                  | 16.04  | 40.18 | 30.00 | 1000 | 13.96          |
| 2 | 6                   | 2412.0         | -5.83                          | 1.52                  | 20.21                  | 15.90  | 38.90 | 30.00 | 1000 | 14.10          |
| 2 | 11                  | 2412.0         | -5.82                          | 1.52                  | 20.21                  | 15.91  | 38.99 | 30.00 | 1000 | 14.09          |
|   |                     |                |                                |                       |                        |        |       |       |      |                |
|   |                     |                |                                |                       |                        |        |       |       |      |                |
|   |                     |                |                                |                       |                        |        |       |       |      |                |
|   |                     |                |                                |                       |                        |        |       |       |      |                |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

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Revised date: June 18, 2013

**Maximum Peak Conducted Output Power**

(Method 9.1.3 PKPM1)

Test place                      UL Japan, Inc. Shonan EMC Lab.              No.5 Shielded Room  
 Date                              April 26, 2013  
 Temperature / Humidity       23deg.C              , 45%RH  
 Engineer                        Makoto Hosaka  
 Mode                              Tx, IEEE802.11g, PN9,              worst antenna :              1              worst data mode :              6 Mbps

(\* P/M: Power Meter with power sensor)

| Ch   | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|      |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 2412.0         | 1.91                           | 1.50                  | 20.21                  | 23.62  | 230.14 | 30.00 | 1000 | 6.38   |
| Mid  | 2437.0         | 1.87                           | 1.50                  | 20.21                  | 23.58  | 228.03 | 30.00 | 1000 | 6.42   |
| High | 2462.0         | 1.63                           | 1.51                  | 20.21                  | 23.35  | 216.27 | 30.00 | 1000 | 6.65   |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

**[Pre check]****Antenna 1**

|   | Data rate<br>[Mbps] | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result       |        | Limit |      | Margin      |
|---|---------------------|----------------|--------------------------------|-----------------------|------------------------|--------------|--------|-------|------|-------------|
|   |                     |                |                                |                       |                        | [dBm]        | [mW]   | [dBm] | [mW] | [dB]        |
| 1 | 6                   | 2412.0         | 1.91                           | 1.50                  | 20.21                  | <b>23.62</b> | 230.14 | 30.00 | 1000 | <b>6.38</b> |
| 1 | 9                   | 2412.0         | 1.89                           | 1.50                  | 20.21                  | 23.60        | 229.09 | 30.00 | 1000 | 6.40        |
| 1 | 12                  | 2412.0         | 1.69                           | 1.50                  | 20.21                  | 23.40        | 218.78 | 30.00 | 1000 | 6.60        |
| 1 | 18                  | 2412.0         | 1.71                           | 1.50                  | 20.21                  | 23.42        | 219.79 | 30.00 | 1000 | 6.58        |
| 1 | 24                  | 2412.0         | 1.67                           | 1.50                  | 20.21                  | 23.38        | 217.77 | 30.00 | 1000 | 6.62        |
| 1 | 36                  | 2412.0         | 1.54                           | 1.50                  | 20.21                  | 23.25        | 211.35 | 30.00 | 1000 | 6.75        |
| 1 | 48                  | 2412.0         | 1.40                           | 1.50                  | 20.21                  | 23.11        | 204.64 | 30.00 | 1000 | 6.89        |
| 1 | 54                  | 2412.0         | 1.64                           | 1.50                  | 20.21                  | 23.35        | 216.27 | 30.00 | 1000 | 6.65        |

Worst

**Antenna 2**

|   | Data rate<br>[Mbps] | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|---|---------------------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|   |                     |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| 2 | 6                   | 2412.0         | 1.68                           | 1.52                  | 20.21                  | 23.41  | 219.28 | 30.00 | 1000 | 6.59   |
| 2 | 9                   | 2412.0         | 1.59                           | 1.52                  | 20.21                  | 23.32  | 214.78 | 30.00 | 1000 | 6.68   |
| 2 | 12                  | 2412.0         | 1.54                           | 1.52                  | 20.21                  | 23.27  | 212.32 | 30.00 | 1000 | 6.73   |
| 2 | 18                  | 2412.0         | 1.59                           | 1.52                  | 20.21                  | 23.32  | 214.78 | 30.00 | 1000 | 6.68   |
| 2 | 24                  | 2412.0         | 1.49                           | 1.52                  | 20.21                  | 23.22  | 209.89 | 30.00 | 1000 | 6.78   |
| 2 | 36                  | 2412.0         | 1.30                           | 1.52                  | 20.21                  | 23.03  | 200.91 | 30.00 | 1000 | 6.97   |
| 2 | 48                  | 2412.0         | 1.27                           | 1.52                  | 20.21                  | 23.00  | 199.53 | 30.00 | 1000 | 7.00   |
| 2 | 54                  | 2412.0         | 1.47                           | 1.52                  | 20.21                  | 23.20  | 208.93 | 30.00 | 1000 | 6.80   |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

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Revised date: June 18, 2013

**Maximum Peak Conducted Output Power**

(Method 9.1.3 PKPM1)

Test place                      UL Japan, Inc. Shonan EMC Lab.                      No.5 Shielded Room  
 Date                              April 26, 2013  
 Temperature / Humidity       23deg.C                      , 45%RH  
 Engineer                        Makoto Hosaka  
 Mode                              Tx, IEEE802.11n(HT20), PN9,                      worst antenna :                      1                      worst data mode :                      0 (MCS)

(\* P/M: Power Meter with power sensor)

| Ch   | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|      |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 2412.0         | 0.71                           | 1.50                  | 20.21                  | 22.42  | 174.58 | 30.00 | 1000 | 7.58   |
| Mid  | 2437.0         | 0.41                           | 1.50                  | 20.21                  | 22.12  | 162.93 | 30.00 | 1000 | 7.88   |
| High | 2462.0         | 0.39                           | 1.51                  | 20.21                  | 22.11  | 162.55 | 30.00 | 1000 | 7.89   |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

**[Pre check]****Antenna 1**

|   | Mode<br>(MCS) | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result       |        | Limit |      | Margin      |
|---|---------------|----------------|--------------------------------|-----------------------|------------------------|--------------|--------|-------|------|-------------|
|   |               |                |                                |                       |                        | [dBm]        | [mW]   | [dBm] | [mW] | [dB]        |
| 1 | 0             | 2412.0         | 0.71                           | 1.50                  | 20.21                  | <b>22.42</b> | 174.58 | 30.00 | 1000 | <b>7.58</b> |
| 1 | 1             | 2412.0         | 0.47                           | 1.50                  | 20.21                  | 22.18        | 165.20 | 30.00 | 1000 | 7.82        |
| 1 | 2             | 2412.0         | 0.33                           | 1.50                  | 20.21                  | 22.04        | 159.96 | 30.00 | 1000 | 7.96        |
| 1 | 3             | 2412.0         | 0.37                           | 1.50                  | 20.21                  | 22.08        | 161.44 | 30.00 | 1000 | 7.92        |
| 1 | 4             | 2412.0         | 0.40                           | 1.50                  | 20.21                  | 22.11        | 162.55 | 30.00 | 1000 | 7.89        |
| 1 | 5             | 2412.0         | 0.41                           | 1.50                  | 20.21                  | 22.12        | 162.93 | 30.00 | 1000 | 7.88        |
| 1 | 6             | 2412.0         | 0.36                           | 1.50                  | 20.21                  | 22.07        | 161.06 | 30.00 | 1000 | 7.93        |
| 1 | 7             | 2412.0         | -2.72                          | 1.50                  | 20.21                  | 18.99        | 79.25  | 30.00 | 1000 | 11.01       |

Worst

**Antenna 2**

|   | Mode<br>(MCS) | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|---|---------------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|   |               |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| 2 | 0             | 2412.0         | 0.50                           | 1.52                  | 20.21                  | 22.23  | 167.11 | 30.00 | 1000 | 7.77   |
| 2 | 1             | 2412.0         | -0.18                          | 1.52                  | 20.21                  | 21.55  | 142.89 | 30.00 | 1000 | 8.45   |
| 2 | 2             | 2412.0         | -0.11                          | 1.52                  | 20.21                  | 21.62  | 145.21 | 30.00 | 1000 | 8.38   |
| 2 | 3             | 2412.0         | -0.27                          | 1.52                  | 20.21                  | 21.46  | 139.96 | 30.00 | 1000 | 8.54   |
| 2 | 4             | 2412.0         | -0.17                          | 1.52                  | 20.21                  | 21.56  | 143.22 | 30.00 | 1000 | 8.44   |
| 2 | 5             | 2412.0         | -0.18                          | 1.52                  | 20.21                  | 21.55  | 142.89 | 30.00 | 1000 | 8.45   |
| 2 | 6             | 2412.0         | -0.44                          | 1.52                  | 20.21                  | 21.29  | 134.59 | 30.00 | 1000 | 8.71   |
| 2 | 7             | 2412.0         | -3.03                          | 1.52                  | 20.21                  | 18.70  | 74.13  | 30.00 | 1000 | 11.30  |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

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Revised date: June 18, 2013

**Maximum Peak Conducted Output Power**

(Method 9.1.3 PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room  
 Date April 26, 2013  
 Temperature / Humidity 23deg.C , 45%RH  
 Engineer Makoto Hosaka  
 Mode Tx, IEEE802.11n(HT40), PN9, worst antenna : 1 worst data mode : 0 (MCS)

(\* P/M: Power Meter with power sensor)

| Ch   | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|      |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 2422.0         | 1.23                           | 1.50                  | 20.21                  | 22.94  | 196.79 | 30.00 | 1000 | 7.06   |
| Mid  | 2437.0         | 1.19                           | 1.50                  | 20.21                  | 22.90  | 194.98 | 30.00 | 1000 | 7.10   |
| High | 2452.0         | 1.15                           | 1.50                  | 20.21                  | 22.86  | 193.20 | 30.00 | 1000 | 7.14   |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

**[Pre check]****Antenna 1**

|   | Mode<br>(MCS) | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result       |        | Limit |      | Margin      |
|---|---------------|----------------|--------------------------------|-----------------------|------------------------|--------------|--------|-------|------|-------------|
|   |               |                |                                |                       |                        | [dBm]        | [mW]   | [dBm] | [mW] | [dB]        |
| 1 | 0             | 2422.0         | 1.23                           | 1.50                  | 20.21                  | <b>22.94</b> | 196.79 | 30.00 | 1000 | <b>7.06</b> |
| 1 | 1             | 2422.0         | 0.12                           | 1.50                  | 20.21                  | 21.83        | 152.41 | 30.00 | 1000 | 8.17        |
| 1 | 2             | 2422.0         | 0.29                           | 1.50                  | 20.21                  | 22.00        | 158.49 | 30.00 | 1000 | 8.00        |
| 1 | 3             | 2422.0         | 0.36                           | 1.50                  | 20.21                  | 22.07        | 161.06 | 30.00 | 1000 | 7.93        |
| 1 | 4             | 2422.0         | 0.49                           | 1.50                  | 20.21                  | 22.20        | 165.96 | 30.00 | 1000 | 7.80        |
| 1 | 5             | 2422.0         | 0.54                           | 1.50                  | 20.21                  | 22.25        | 167.88 | 30.00 | 1000 | 7.75        |
| 1 | 6             | 2422.0         | 0.22                           | 1.50                  | 20.21                  | 21.93        | 155.96 | 30.00 | 1000 | 8.07        |
| 1 | 7             | 2422.0         | -2.94                          | 1.50                  | 20.21                  | 18.77        | 75.34  | 30.00 | 1000 | 11.23       |

Worst

**Antenna 2**

|   | Mode<br>(MCS) | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|---|---------------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|   |               |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| 2 | 0             | 2422.0         | 0.98                           | 1.52                  | 20.21                  | 22.71  | 186.64 | 30.00 | 1000 | 7.29   |
| 2 | 1             | 2422.0         | 0.26                           | 1.52                  | 20.21                  | 21.99  | 158.12 | 30.00 | 1000 | 8.01   |
| 2 | 2             | 2422.0         | 0.13                           | 1.52                  | 20.21                  | 21.86  | 153.46 | 30.00 | 1000 | 8.14   |
| 2 | 3             | 2422.0         | 0.02                           | 1.52                  | 20.21                  | 21.75  | 149.62 | 30.00 | 1000 | 8.25   |
| 2 | 4             | 2422.0         | 0.31                           | 1.52                  | 20.21                  | 22.04  | 159.96 | 30.00 | 1000 | 7.96   |
| 2 | 5             | 2422.0         | 0.32                           | 1.52                  | 20.21                  | 22.05  | 160.32 | 30.00 | 1000 | 7.95   |
| 2 | 6             | 2422.0         | 0.04                           | 1.52                  | 20.21                  | 21.77  | 150.31 | 30.00 | 1000 | 8.23   |
| 2 | 7             | 2422.0         | -2.78                          | 1.52                  | 20.21                  | 18.95  | 78.52  | 30.00 | 1000 | 11.05  |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

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Revised date: June 18, 2013

**Maximum Peak Conducted Output Power**

(Method 9.1.3 PKPM1)

Test place                      UL Japan, Inc. Shonan EMC Lab.                      No.5 Shielded Room  
 Date                              April 26, 2013  
 Temperature / Humidity       23deg.C                      , 45%RH  
 Engineer                        Makoto Hosaka  
 Mode                              Tx, IEEE802.11n (HT20), PN9,                      worst data mode :                      8 (MCS)

**Antenna 1 + Antenna 2**

| Ch   | Freq.<br>[MHz] | Result<br>Ant 1<br>[mW] | Result<br>Ant 2<br>[mW] |  | Result<br>Ant 1 + Ant 2 |        | Limit |      | Margin |
|------|----------------|-------------------------|-------------------------|--|-------------------------|--------|-------|------|--------|
|      |                |                         |                         |  | [dBm]                   | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 2412.0         | 167.49                  | 156.31                  |  | 25.10                   | 323.81 | 30.00 | 1000 | 4.90   |
| Mid  | 2437.0         | 151.01                  | 157.04                  |  | 24.89                   | 308.04 | 30.00 | 1000 | 5.11   |
| High | 2462.0         | 155.60                  | 142.89                  |  | 24.75                   | 298.49 | 30.00 | 1000 | 5.25   |

**Antenna 1**

(\* P/M: Power Meter with power sensor)

| Ch   | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|      |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 2412.0         | 0.53                           | 1.50                  | 20.21                  | 22.24  | 167.49 | 30.00 | 1000 | 7.76   |
| Mid  | 2437.0         | 0.08                           | 1.50                  | 20.21                  | 21.79  | 151.01 | 30.00 | 1000 | 8.21   |
| High | 2462.0         | 0.20                           | 1.51                  | 20.21                  | 21.92  | 155.60 | 30.00 | 1000 | 8.08   |

**Antenna 2**

(\* P/M: Power Meter with power sensor)

| Ch   | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|      |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 2412.0         | 0.21                           | 1.52                  | 20.21                  | 21.94  | 156.31 | 30.00 | 1000 | 8.06   |
| Mid  | 2437.0         | 0.24                           | 1.51                  | 20.21                  | 21.96  | 157.04 | 30.00 | 1000 | 8.04   |
| High | 2462.0         | -0.17                          | 1.51                  | 20.21                  | 21.55  | 142.89 | 30.00 | 1000 | 8.45   |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

**[Pre check]**

| Mode  | Freq.  | Reading<br>Antenna 1 |      | Reading<br>Antenna 2 |      | Reading<br>Antenna 1 + 2 |      |
|-------|--------|----------------------|------|----------------------|------|--------------------------|------|
| (MCS) | [MHz]  | [dBm]                | [mW] | [dBm]                | [mW] | [dBm]                    | [mW] |
| 8     | 2412.0 | 0.53                 | 1.13 | 0.21                 | 1.05 | 3.38                     | 2.18 |
| 9     | 2412.0 | 0.27                 | 1.06 | 0.07                 | 1.02 | 3.18                     | 2.08 |
| 10    | 2412.0 | 0.20                 | 1.05 | -0.03                | 0.99 | 3.10                     | 2.04 |
| 11    | 2412.0 | 0.03                 | 1.01 | -0.14                | 0.97 | 2.96                     | 1.98 |
| 12    | 2412.0 | -0.05                | 0.99 | -0.10                | 0.98 | 2.94                     | 1.97 |
| 13    | 2412.0 | 0.43                 | 1.10 | -0.24                | 0.95 | 3.12                     | 2.05 |
| 14    | 2412.0 | 0.34                 | 1.08 | -0.17                | 0.96 | 3.10                     | 2.04 |
| 15    | 2412.0 | -2.98                | 0.50 | -2.86                | 0.52 | 0.09                     | 1.02 |

**Worst**

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Revised date: June 18, 2013

**Maximum Peak Conducted Output Power**

(Method 9.1.3 PKPM1)

Test place                      UL Japan, Inc. Shonan EMC Lab.              No.5 Shielded Room  
 Date                              April 26, 2013  
 Temperature / Humidity      23deg.C              , 45%RH  
 Engineer                        Makoto Hosaka  
 Mode                              Tx, IEEE802.11n (HT40), PN9,                              worst data mode :              8 (MCS)

**Antenna 1 + Antenna 2**

| Ch   | Freq.<br>[MHz] | Result<br>Ant 1<br>[mW] | Result<br>Ant 2<br>[mW] |  | Result<br>Ant 1 + Ant 2 |        | Limit |      | Margin |
|------|----------------|-------------------------|-------------------------|--|-------------------------|--------|-------|------|--------|
|      |                |                         |                         |  | [dBm]                   | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 2422.0         | 157.40                  | 156.68                  |  | 24.97                   | 314.07 | 30.00 | 1000 | 5.03   |
| Mid  | 2437.0         | 152.05                  | 142.89                  |  | 24.70                   | 294.94 | 30.00 | 1000 | 5.30   |
| High | 2452.0         | 155.96                  | 141.58                  |  | 24.74                   | 297.53 | 30.00 | 1000 | 5.26   |

**Antenna 1**

(\* P/M: Power Meter with power sensor)

| Ch   | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|      |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 2422.0         | 0.26                           | 1.50                  | 20.21                  | 21.97  | 157.40 | 30.00 | 1000 | 8.03   |
| Mid  | 2437.0         | 0.11                           | 1.50                  | 20.21                  | 21.82  | 152.05 | 30.00 | 1000 | 8.18   |
| High | 2452.0         | 0.22                           | 1.50                  | 20.21                  | 21.93  | 155.96 | 30.00 | 1000 | 8.07   |

**Antenna 2**

(\* P/M: Power Meter with power sensor)

| Ch   | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|      |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 2422.0         | 0.22                           | 1.52                  | 20.21                  | 21.95  | 156.68 | 30.00 | 1000 | 8.05   |
| Mid  | 2437.0         | -0.17                          | 1.51                  | 20.21                  | 21.55  | 142.89 | 30.00 | 1000 | 8.45   |
| High | 2452.0         | -0.21                          | 1.51                  | 20.21                  | 21.51  | 141.58 | 30.00 | 1000 | 8.49   |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

**[Pre check]**

| Mode  | Freq.  | Reading<br>Antenna 1 |      | Reading<br>Antenna 2 |      | Reading<br>Antenna 1 + 2 |      |
|-------|--------|----------------------|------|----------------------|------|--------------------------|------|
| (MCS) | [MHz]  | [dBm]                | [mW] | [dBm]                | [mW] | [dBm]                    | [mW] |
| 8     | 2422.0 | 0.26                 | 1.06 | 0.22                 | 1.05 | 3.25                     | 2.11 |
| 9     | 2422.0 | 0.10                 | 1.02 | -0.08                | 0.98 | 3.02                     | 2.01 |
| 10    | 2422.0 | 0.18                 | 1.04 | 0.14                 | 1.03 | 3.17                     | 2.08 |
| 11    | 2422.0 | 0.20                 | 1.05 | -0.24                | 0.95 | 3.00                     | 1.99 |
| 12    | 2422.0 | 0.14                 | 1.03 | 0.20                 | 1.05 | 3.18                     | 2.08 |
| 13    | 2422.0 | -0.11                | 0.97 | -0.18                | 0.96 | 2.87                     | 1.93 |
| 14    | 2422.0 | 0.03                 | 1.01 | -0.29                | 0.94 | 2.88                     | 1.94 |
| 15    | 2422.0 | -2.48                | 0.56 | -2.29                | 0.59 | 0.63                     | 1.16 |

**Worst**

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**Maximum Peak Conducted Output Power**

(Method 9.1.3 PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room  
 Date April 26, 2013  
 Temperature / Humidity 23deg.C , 45%RH  
 Engineer Makoto Hosaka  
 Mode Tx, IEEE802.11a, PN9, worst antenna : 1 worst data mode : 9 Mbps

(\* P/M: Power Meter with power sensor)

| Ch   | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|      |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 5745.0         | -0.35                          | 2.31                  | 20.09                  | 22.05  | 160.32 | 30.00 | 1000 | 7.95   |
| Mid  | 5785.0         | -0.34                          | 2.32                  | 20.09                  | 22.07  | 161.06 | 30.00 | 1000 | 7.93   |
| High | 5825.0         | -0.60                          | 2.65                  | 20.10                  | 22.15  | 164.06 | 30.00 | 1000 | 7.85   |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

**[Pre check]****Antenna 1**

|   | Data rate<br>[Mbps] | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result       |        | Limit |      | Margin      |
|---|---------------------|----------------|--------------------------------|-----------------------|------------------------|--------------|--------|-------|------|-------------|
|   |                     |                |                                |                       |                        | [dBm]        | [mW]   | [dBm] | [mW] | [dB]        |
| 1 | 6                   | 2412.0         | -0.57                          | 2.31                  | 20.09                  | 21.83        | 152.41 | 30.00 | 1000 | 8.17        |
| 1 | 9                   | 2412.0         | -0.35                          | 2.31                  | 20.09                  | <b>22.05</b> | 160.32 | 30.00 | 1000 | <b>7.95</b> |
| 1 | 12                  | 2412.0         | -0.82                          | 2.31                  | 20.09                  | 21.58        | 143.88 | 30.00 | 1000 | 8.42        |
| 1 | 18                  | 2412.0         | -0.46                          | 2.31                  | 20.09                  | 21.94        | 156.31 | 30.00 | 1000 | 8.06        |
| 1 | 24                  | 2412.0         | -0.76                          | 2.31                  | 20.09                  | 21.64        | 145.88 | 30.00 | 1000 | 8.36        |
| 1 | 36                  | 2412.0         | -0.82                          | 2.31                  | 20.09                  | 21.58        | 143.88 | 30.00 | 1000 | 8.42        |
| 1 | 48                  | 2412.0         | -1.07                          | 2.31                  | 20.09                  | 21.33        | 135.83 | 30.00 | 1000 | 8.67        |
| 1 | 54                  | 2412.0         | -2.42                          | 2.31                  | 20.09                  | 19.98        | 99.54  | 30.00 | 1000 | 10.02       |

Worst

**Antenna 2**

|   | Data rate<br>[Mbps] | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|---|---------------------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|   |                     |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| 2 | 6                   | 2412.0         | -0.92                          | 2.36                  | 20.09                  | 21.53  | 142.23 | 30.00 | 1000 | 8.47   |
| 2 | 9                   | 2412.0         | -0.59                          | 2.36                  | 20.09                  | 21.86  | 153.46 | 30.00 | 1000 | 8.14   |
| 2 | 12                  | 2412.0         | -0.92                          | 2.36                  | 20.09                  | 21.53  | 142.23 | 30.00 | 1000 | 8.47   |
| 2 | 18                  | 2412.0         | -0.82                          | 2.36                  | 20.09                  | 21.63  | 145.55 | 30.00 | 1000 | 8.37   |
| 2 | 24                  | 2412.0         | -0.95                          | 2.36                  | 20.09                  | 21.50  | 141.25 | 30.00 | 1000 | 8.50   |
| 2 | 36                  | 2412.0         | -1.00                          | 2.36                  | 20.09                  | 21.45  | 139.64 | 30.00 | 1000 | 8.55   |
| 2 | 48                  | 2412.0         | -1.18                          | 2.36                  | 20.09                  | 21.27  | 133.97 | 30.00 | 1000 | 8.73   |
| 2 | 54                  | 2412.0         | -2.80                          | 2.36                  | 20.09                  | 19.65  | 92.26  | 30.00 | 1000 | 10.35  |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

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Revised date: June 18, 2013

**Maximum Peak Conducted Output Power**

(Method 9.1.3 PKPM1)

Test place                      UL Japan, Inc. Shonan EMC Lab.              No.5 Shielded Room  
 Date                              April 26, 2013  
 Temperature / Humidity      23deg.C              , 45%RH  
 Engineer                        Makoto Hosaka  
 Mode                              Tx, IEEE802.11n(HT20), PN9,      worst antenna :              2              worst data mode :              0 (MCS)

(\* P/M: Power Meter with power sensor)

| Ch   | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|      |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 5745.0         | -1.51                          | 2.36                  | 20.09                  | 20.94  | 124.17 | 30.00 | 1000 | 9.06   |
| Mid  | 5785.0         | -1.78                          | 2.38                  | 20.09                  | 20.69  | 117.22 | 30.00 | 1000 | 9.31   |
| High | 5825.0         | -2.19                          | 2.42                  | 20.10                  | 20.33  | 107.89 | 30.00 | 1000 | 9.67   |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

**[Pre check]****Antenna 1**

|   | Mode<br>(MCS) | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|---|---------------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|   |               |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| 1 | 0             | 5745.0         | -2.42                          | 2.31                  | 20.09                  | 19.98  | 99.54  | 30.00 | 1000 | 10.02  |
| 1 | 1             | 5745.0         | -2.82                          | 2.31                  | 20.09                  | 19.58  | 90.78  | 30.00 | 1000 | 10.42  |
| 1 | 2             | 5745.0         | -2.79                          | 2.31                  | 20.09                  | 19.61  | 91.41  | 30.00 | 1000 | 10.39  |
| 1 | 3             | 5745.0         | -2.14                          | 2.31                  | 20.09                  | 20.26  | 106.17 | 30.00 | 1000 | 9.74   |
| 1 | 4             | 5745.0         | -2.39                          | 2.31                  | 20.09                  | 20.01  | 100.23 | 30.00 | 1000 | 9.99   |
| 1 | 5             | 5745.0         | -2.54                          | 2.31                  | 20.09                  | 19.86  | 96.83  | 30.00 | 1000 | 10.14  |
| 1 | 6             | 5745.0         | -4.53                          | 2.31                  | 20.09                  | 17.87  | 61.24  | 30.00 | 1000 | 12.13  |
| 1 | 7             | 5745.0         | -4.92                          | 2.31                  | 20.09                  | 17.48  | 55.98  | 30.00 | 1000 | 12.52  |

**Antenna 2**

|   | Mode<br>(MCS) | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result       |        | Limit |      | Margin      |
|---|---------------|----------------|--------------------------------|-----------------------|------------------------|--------------|--------|-------|------|-------------|
|   |               |                |                                |                       |                        | [dBm]        | [mW]   | [dBm] | [mW] | [dB]        |
| 2 | 0             | 5745.0         | -1.51                          | 2.36                  | 20.09                  | <b>20.94</b> | 124.17 | 30.00 | 1000 | <b>9.06</b> |
| 2 | 1             | 5745.0         | -2.39                          | 2.36                  | 20.09                  | 20.06        | 101.39 | 30.00 | 1000 | 9.94        |
| 2 | 2             | 5745.0         | -1.83                          | 2.36                  | 20.09                  | 20.62        | 115.35 | 30.00 | 1000 | 9.38        |
| 2 | 3             | 5745.0         | -2.47                          | 2.36                  | 20.09                  | 19.98        | 99.54  | 30.00 | 1000 | 10.02       |
| 2 | 4             | 5745.0         | -2.52                          | 2.36                  | 20.09                  | 19.93        | 98.40  | 30.00 | 1000 | 10.07       |
| 2 | 5             | 5745.0         | -2.55                          | 2.36                  | 20.09                  | 19.90        | 97.72  | 30.00 | 1000 | 10.10       |
| 2 | 6             | 5745.0         | -4.89                          | 2.36                  | 20.09                  | 17.56        | 57.02  | 30.00 | 1000 | 12.44       |
| 2 | 7             | 5745.0         | -4.52                          | 2.36                  | 20.09                  | 17.93        | 62.09  | 30.00 | 1000 | 12.07       |

**Worst**

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

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Revised date: June 18, 2013

**Maximum Peak Conducted Output Power**

(Method 9.1.3 PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room  
 Date April 26, 2013  
 Temperature / Humidity 23deg.C , 45%RH  
 Engineer Makoto Hosaka  
 Mode Tx, IEEE802.11n(HT40), PN9, worst antenna : 1 worst data mode : 0 (MCS)

(\* P/M: Power Meter with power sensor)

| Ch   | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|      |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 5755.0         | -1.14                          | 2.31                  | 20.09                  | 21.26  | 133.66 | 30.00 | 1000 | 8.74   |
| High | 5795.0         | -1.44                          | 2.32                  | 20.09                  | 20.97  | 125.03 | 30.00 | 1000 | 9.03   |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

**[Pre check]****Antenna 1**

|   | Mode<br>(MCS) | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result       |        | Limit |      | Margin      |
|---|---------------|----------------|--------------------------------|-----------------------|------------------------|--------------|--------|-------|------|-------------|
|   |               |                |                                |                       |                        | [dBm]        | [mW]   | [dBm] | [mW] | [dB]        |
| 1 | 0             | 5755.0         | -1.14                          | 2.31                  | 20.09                  | <b>21.26</b> | 133.66 | 30.00 | 1000 | <b>8.74</b> |
| 1 | 1             | 5755.0         | -2.34                          | 2.31                  | 20.09                  | 20.06        | 101.39 | 30.00 | 1000 | 9.94        |
| 1 | 2             | 5755.0         | -2.54                          | 2.31                  | 20.09                  | 19.86        | 96.83  | 30.00 | 1000 | 10.14       |
| 1 | 3             | 5755.0         | -2.14                          | 2.31                  | 20.09                  | 20.26        | 106.17 | 30.00 | 1000 | 9.74        |
| 1 | 4             | 5755.0         | -2.11                          | 2.31                  | 20.09                  | 20.29        | 106.91 | 30.00 | 1000 | 9.71        |
| 1 | 5             | 5755.0         | -1.94                          | 2.31                  | 20.09                  | 20.46        | 111.17 | 30.00 | 1000 | 9.54        |
| 1 | 6             | 5755.0         | -4.31                          | 2.31                  | 20.09                  | 18.09        | 64.42  | 30.00 | 1000 | 11.91       |
| 1 | 7             | 5755.0         | -4.89                          | 2.31                  | 20.09                  | 17.51        | 56.36  | 30.00 | 1000 | 12.49       |

Worst

**Antenna 2**

|   | Mode<br>(MCS) | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|---|---------------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|   |               |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| 2 | 0             | 5755.0         | -1.29                          | 2.37                  | 20.09                  | 21.17  | 130.92 | 30.00 | 1000 | 8.83   |
| 2 | 1             | 5755.0         | -1.80                          | 2.37                  | 20.09                  | 20.66  | 116.41 | 30.00 | 1000 | 9.34   |
| 2 | 2             | 5755.0         | -2.18                          | 2.37                  | 20.09                  | 20.28  | 106.66 | 30.00 | 1000 | 9.72   |
| 2 | 3             | 5755.0         | -2.18                          | 2.37                  | 20.09                  | 20.28  | 106.66 | 30.00 | 1000 | 9.72   |
| 2 | 4             | 5755.0         | -2.23                          | 2.37                  | 20.09                  | 20.23  | 105.44 | 30.00 | 1000 | 9.77   |
| 2 | 5             | 5755.0         | -2.20                          | 2.37                  | 20.09                  | 20.26  | 106.17 | 30.00 | 1000 | 9.74   |
| 2 | 6             | 5755.0         | -4.15                          | 2.37                  | 20.09                  | 18.31  | 67.76  | 30.00 | 1000 | 11.69  |
| 2 | 7             | 5755.0         | -4.11                          | 2.37                  | 20.09                  | 18.35  | 68.39  | 30.00 | 1000 | 11.65  |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

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Revised date: June 18, 2013

**Maximum Peak Conducted Output Power**

(Method 9.1.3 PKPM1)

Test place                      UL Japan, Inc. Shonan EMC Lab.              No.5 Shielded Room  
 Date                              April 26, 2013  
 Temperature / Humidity      23deg.C              , 45%RH  
 Engineer                        Makoto Hosaka  
 Mode                              Tx, IEEE802.11n (HT20), PN9,                      worst data mode :              10 (MCS)

**Antenna 1 + Antenna 2**

| Ch   | Freq.<br>[MHz] | Result<br>Ant 1<br>[mW] | Result<br>Ant 2<br>[mW] |  | Result<br>Ant 1 + Ant 2 |        | Limit |      | Margin |
|------|----------------|-------------------------|-------------------------|--|-------------------------|--------|-------|------|--------|
|      |                |                         |                         |  | [dBm]                   | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 5745.0         | 111.69                  | 101.86                  |  | 23.29                   | 213.55 | 30.00 | 1000 | 6.71   |
| Mid  | 5785.0         | 95.72                   | 99.54                   |  | 22.91                   | 195.26 | 30.00 | 1000 | 7.09   |
| High | 5825.0         | 93.97                   | 93.97                   |  | 22.74                   | 187.94 | 30.00 | 1000 | 7.26   |

**Antenna 1**

(\* P/M: Power Meter with power sensor)

| Ch   | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|      |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 5745.0         | -1.92                          | 2.31                  | 20.09                  | 20.48  | 111.69 | 30.00 | 1000 | 9.52   |
| Mid  | 5785.0         | -2.60                          | 2.32                  | 20.09                  | 19.81  | 95.72  | 30.00 | 1000 | 10.19  |
| High | 5825.0         | -3.02                          | 2.65                  | 20.10                  | 19.73  | 93.97  | 30.00 | 1000 | 10.27  |

**Antenna 2**

(\* P/M: Power Meter with power sensor)

| Ch   | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|      |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 5745.0         | -2.37                          | 2.36                  | 20.09                  | 20.08  | 101.86 | 30.00 | 1000 | 9.92   |
| Mid  | 5785.0         | -2.49                          | 2.38                  | 20.09                  | 19.98  | 99.54  | 30.00 | 1000 | 10.02  |
| High | 5825.0         | -2.79                          | 2.42                  | 20.10                  | 19.73  | 93.97  | 30.00 | 1000 | 10.27  |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

**[Pre check]**

| Mode  | Freq.  | Reading<br>Antenna 1 |      | Reading<br>Antenna 2 |      | Reading<br>Antenna 1 + 2 |      |
|-------|--------|----------------------|------|----------------------|------|--------------------------|------|
| (MCS) | [MHz]  | [dBm]                | [mW] | [dBm]                | [mW] | [dBm]                    | [mW] |
| 8     | 5745.0 | -2.95                | 0.51 | -2.02                | 0.63 | 0.55                     | 1.14 |
| 9     | 5745.0 | -2.75                | 0.53 | -2.30                | 0.59 | 0.49                     | 1.12 |
| 10    | 5745.0 | -1.92                | 0.64 | -2.37                | 0.58 | 0.87                     | 1.22 |
| 11    | 5745.0 | -2.83                | 0.52 | -2.11                | 0.62 | 0.56                     | 1.14 |
| 12    | 5745.0 | -2.53                | 0.56 | -2.32                | 0.59 | 0.59                     | 1.14 |
| 13    | 5745.0 | -2.11                | 0.62 | -2.20                | 0.60 | 0.86                     | 1.22 |
| 14    | 5745.0 | -4.71                | 0.34 | -4.43                | 0.36 | -1.56                    | 0.70 |
| 15    | 5745.0 | -5.46                | 0.28 | -4.88                | 0.33 | -2.15                    | 0.61 |

Worst

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Revised date: June 18, 2013

**Maximum Peak Conducted Output Power**

(Method 9.1.3 PKPM1)

Test place                      UL Japan, Inc. Shonan EMC Lab.              No.5 Shielded Room  
 Date                              April 26, 2013  
 Temperature / Humidity      23deg.C              , 45%RH  
 Engineer                        Makoto Hosaka  
 Mode                              Tx, IEEE802.11n (HT40), PN9,                      worst data mode :              8 (MCS)

**Antenna 1 + Antenna 2**

| Ch   | Freq.<br>[MHz] | Result<br>Ant 1<br>[mW] | Result<br>Ant 2<br>[mW] |  | Result<br>Ant 1 + Ant 2 |        | Limit |      | Margin |
|------|----------------|-------------------------|-------------------------|--|-------------------------|--------|-------|------|--------|
|      |                |                         |                         |  | [dBm]                   | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 5755.0         | 94.84                   | 111.43                  |  | 23.14                   | 206.27 | 30.00 | 1000 | 6.86   |
| High | 5795.0         | 87.30                   | 100.46                  |  | 22.74                   | 187.76 | 30.00 | 1000 | 7.26   |

**Antenna 1**

(\* P/M: Power Meter with power sensor)

| Ch   | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |       | Limit |      | Margin |
|------|----------------|--------------------------------|-----------------------|------------------------|--------|-------|-------|------|--------|
|      |                |                                |                       |                        | [dBm]  | [mW]  | [dBm] | [mW] | [dB]   |
| Low  | 5755.0         | -2.63                          | 2.31                  | 20.09                  | 19.77  | 94.84 | 30.00 | 1000 | 10.23  |
| High | 5795.0         | -3.00                          | 2.32                  | 20.09                  | 19.41  | 87.30 | 30.00 | 1000 | 10.59  |

**Antenna 2**

(\* P/M: Power Meter with power sensor)

| Ch   | Freq.<br>[MHz] | P/M (Peak)<br>Reading<br>[dBm] | Cable<br>Loss<br>[dB] | Atten.<br>Loss<br>[dB] | Result |        | Limit |      | Margin |
|------|----------------|--------------------------------|-----------------------|------------------------|--------|--------|-------|------|--------|
|      |                |                                |                       |                        | [dBm]  | [mW]   | [dBm] | [mW] | [dB]   |
| Low  | 5755.0         | -1.99                          | 2.37                  | 20.09                  | 20.47  | 111.43 | 30.00 | 1000 | 9.53   |
| High | 5795.0         | -2.45                          | 2.38                  | 20.09                  | 20.02  | 100.46 | 30.00 | 1000 | 9.98   |

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

**[Pre check]**

| Mode  | Freq.  | Reading<br>Antenna 1 |      | Reading<br>Antenna 2 |      | Reading<br>Antenna 1 + 2 |      |
|-------|--------|----------------------|------|----------------------|------|--------------------------|------|
| (MCS) | [MHz]  | [dBm]                | [mW] | [dBm]                | [mW] | [dBm]                    | [mW] |
| 8     | 5755.0 | -2.63                | 0.55 | -1.99                | 0.63 | 0.71                     | 1.18 |
| 9     | 5755.0 | -2.54                | 0.56 | -2.25                | 0.60 | 0.62                     | 1.15 |
| 10    | 5755.0 | -2.71                | 0.54 | -2.21                | 0.60 | 0.56                     | 1.14 |
| 11    | 5755.0 | -2.62                | 0.55 | -2.36                | 0.58 | 0.52                     | 1.13 |
| 12    | 5755.0 | -2.72                | 0.53 | -2.01                | 0.63 | 0.66                     | 1.16 |
| 13    | 5755.0 | -2.88                | 0.52 | -2.56                | 0.55 | 0.29                     | 1.07 |
| 14    | 5755.0 | -5.48                | 0.28 | -4.57                | 0.35 | -1.99                    | 0.63 |
| 15    | 5755.0 | -4.61                | 0.35 | -3.88                | 0.41 | -1.22                    | 0.76 |

**Worst**

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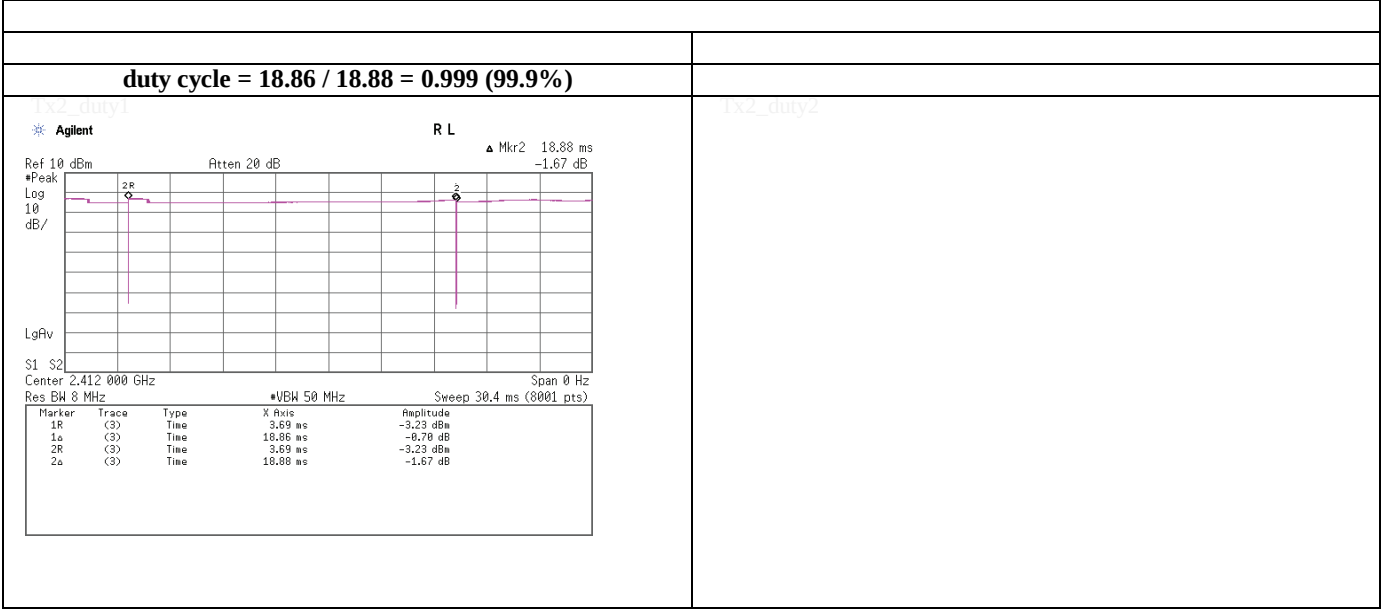
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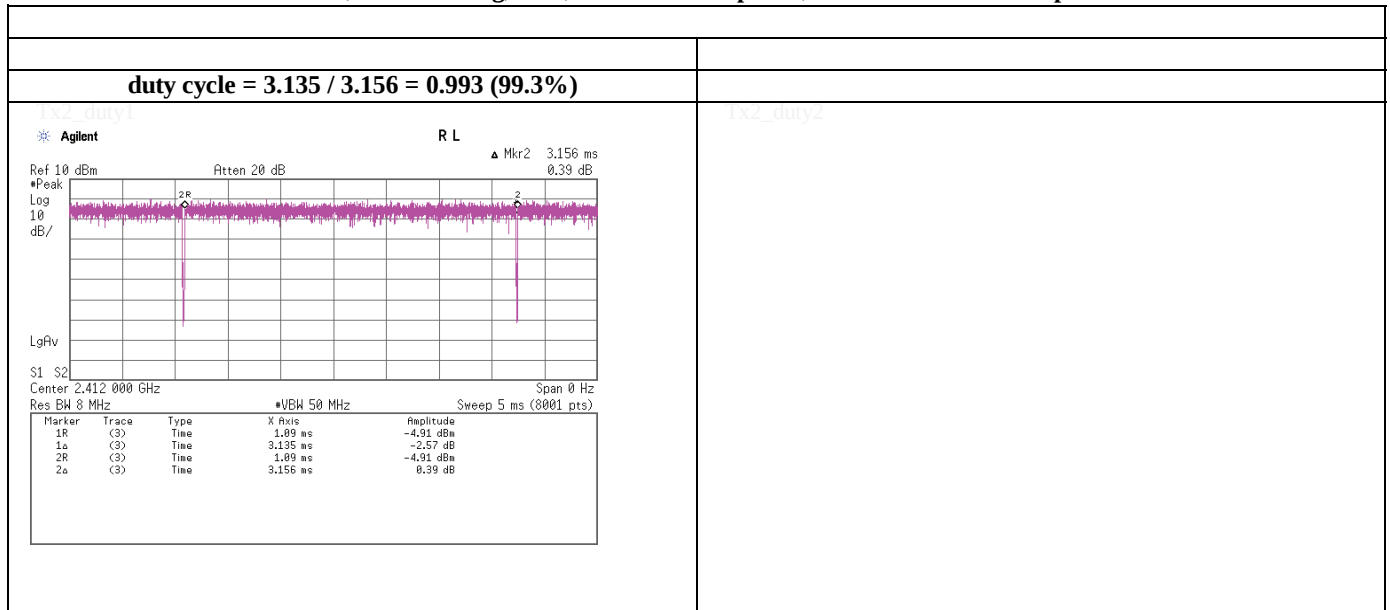
**Burst rate confirmation**

Tx, IEEE802.11b , PN9, worst antenna port 1, worst data mode 1Mbps



## Burst rate confirmation

Tx, IEEE802.11g, PN9, worst antenna port 1, worst data mode 6Mbps



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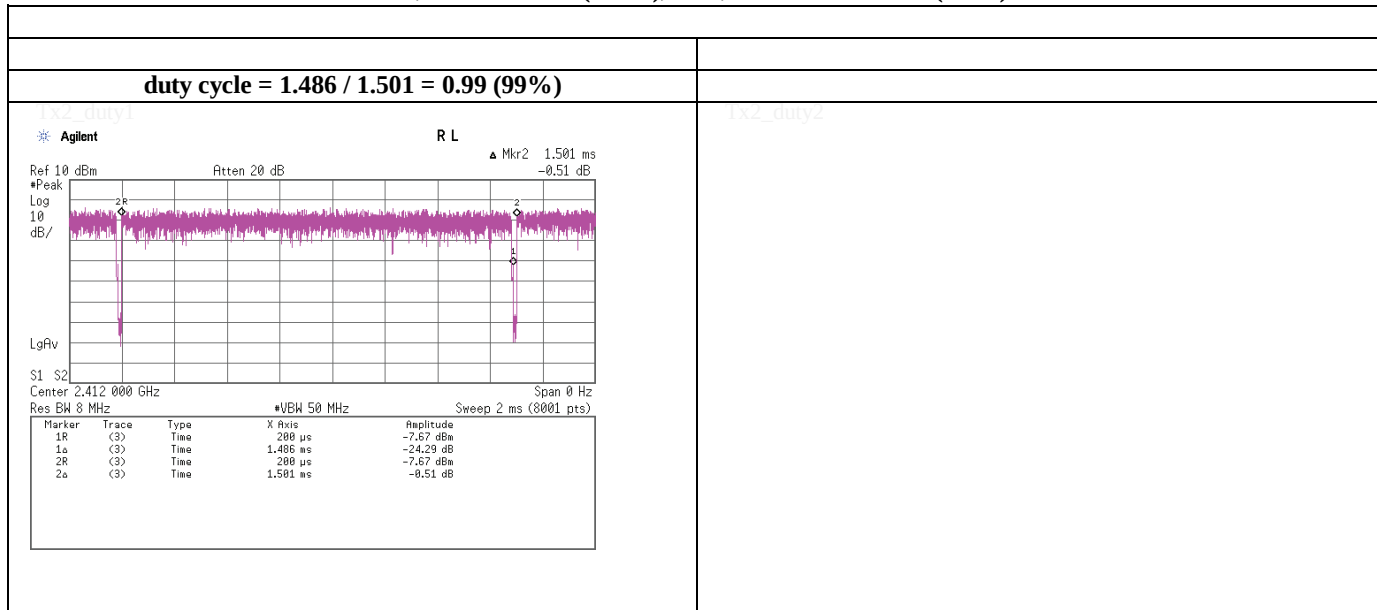
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## Burst rate confirmation

Tx, IEEE802.11n (HT20), PN9, worst data mode 8(MCS)



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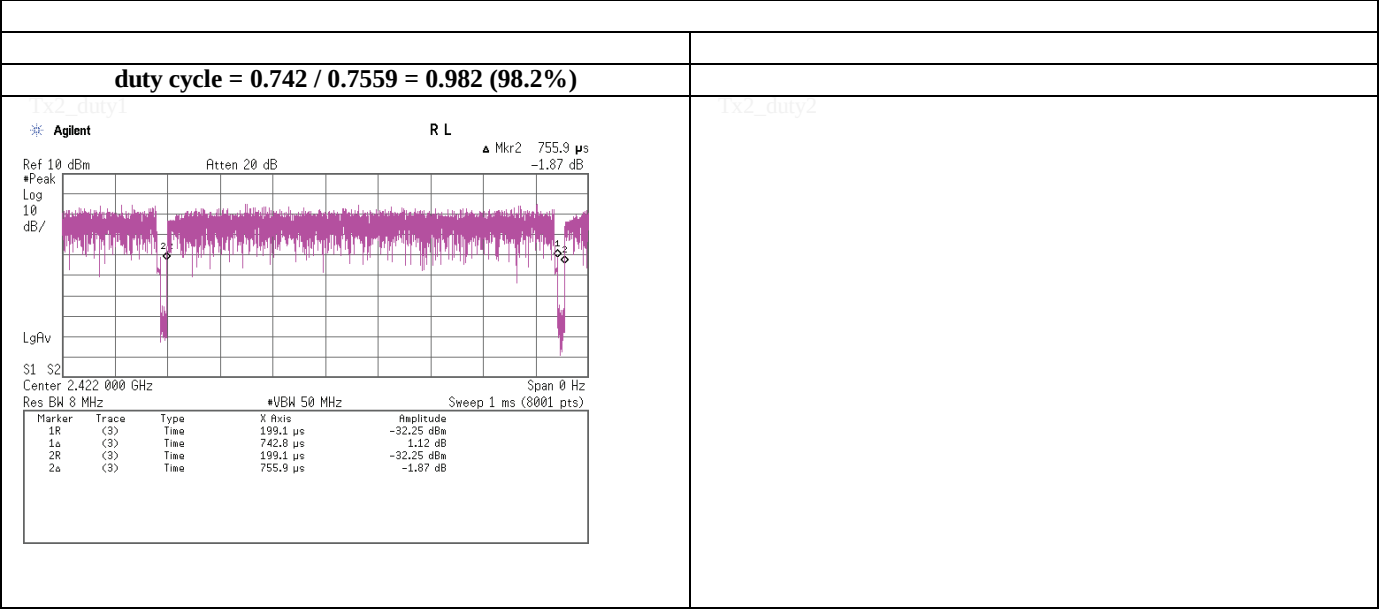
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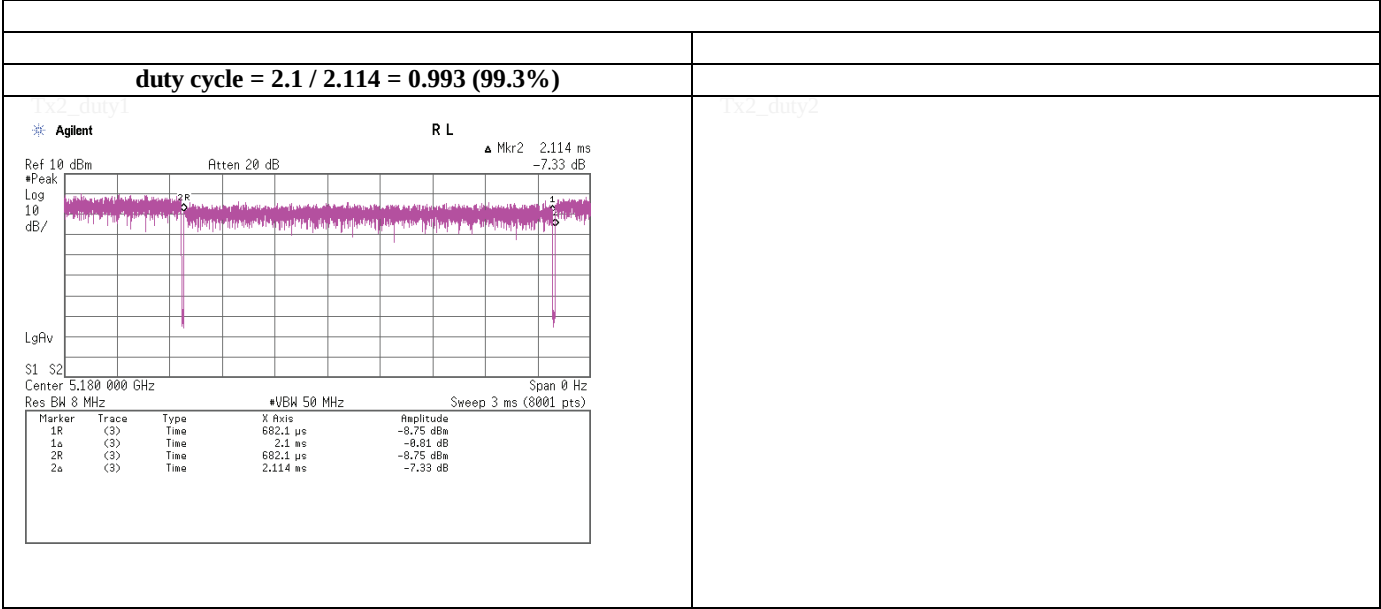
**Burst rate confirmation**

**Tx, IEEE802.11n (HT40), PN9, worst data mode 8(MCS)**



# Burst rate confirmation

Tx, IEEE802.11a, PN9, worst antenna port 1, worst data mode 9Mbps

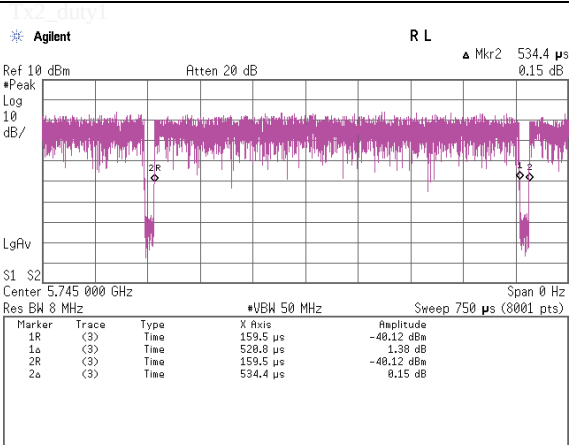


## Duty Factor Calculation chart

Tx, IEEE802.11n (HT20), PN9, worst data mode 10(MCS)

### Duty Factor Calculation

Duty Factor:  $20\log(1/\text{duty cycle}) = 0.2\text{dB}$   
duty cycle =  $0.5208 / 0.5344 = 0.975$  (97.5%)



tx2\_duty2

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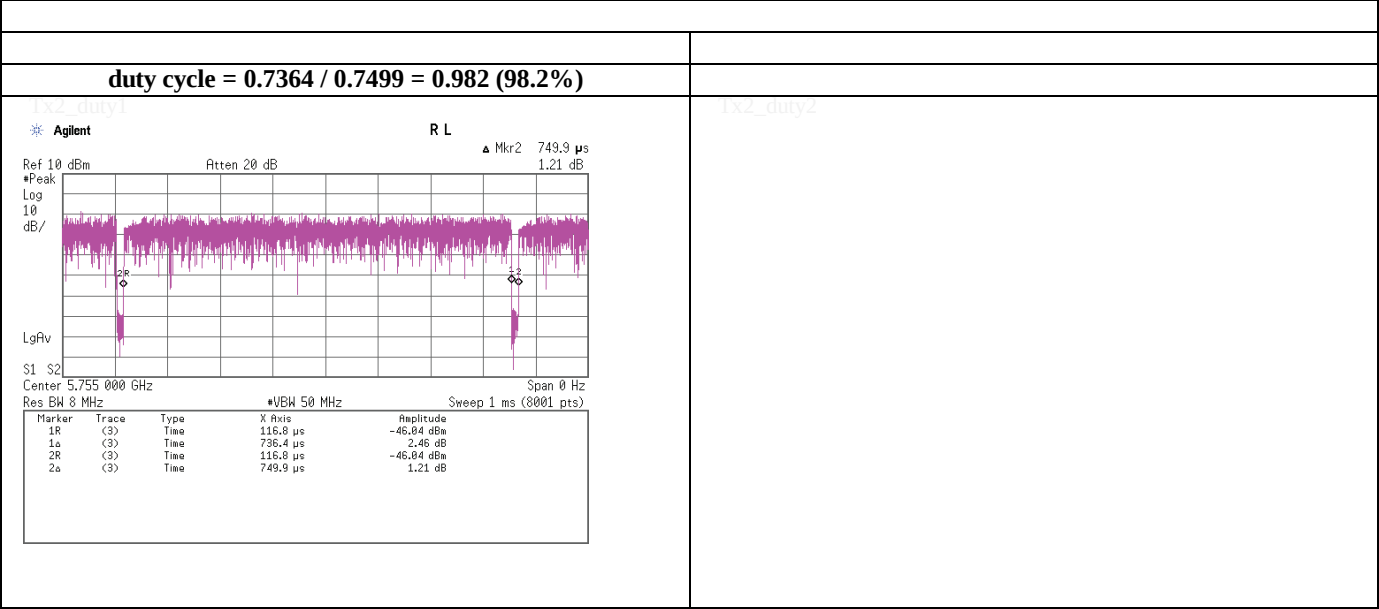
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**Burst rate confirmation**

**Tx, IEEE802.11n (HT40), PN9, worst data mode 8(MCS)**



## Radiated Emission

|                        |                                 |                            |                            |
|------------------------|---------------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber      | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 6, 2013                     | May 7, 2013                | May 8, 2013                |
| Temperature / Humidity | 19 deg.C, 45 %RH                | 22 deg.C, 43 %RH           | 23 deg.C, 30 %RH           |
| Engineer               | Hikaru Shirasawa                | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 2412 MHz<br>Tx, IEEE802.11b |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 2390.000           | PK       | 43.7              | 27.2               | 24.7         | 38.4         | 57.2               | 73.9              | 16.7           | 100            | 0              |        |
| Hori.    | 2496.170           | PK       | 47.8              | 27.4               | 24.8         | 38.3         | 61.7               | 73.9              | 12.2           | 100            | 189            |        |
| Hori.    | 4824.000           | PK       | 45.3              | 30.8               | 7.1          | 37.2         | 46.0               | 73.9              | 27.9           | 100            | 294            |        |
| Hori.    | 7236.000           | PK       | 45.5              | 36.2               | 8.6          | 39.5         | 50.8               | 73.9              | 23.1           | 100            | 0              |        |
| Hori.    | 9648.000           | PK       | 43.4              | 38.3               | 9.8          | 37.3         | 54.2               | 73.9              | 19.7           | 100            | 17             |        |
| Hori.    | 12060.000          | PK       | 43.9              | 39.2               | 11.1         | 38.1         | 56.1               | 73.9              | 17.8           | 100            | 0              |        |
| Hori.    | 2390.000           | AV       | 34.3              | 27.2               | 24.7         | 38.4         | 47.8               | 53.9              | 6.1            | 100            | 0              |        |
| Hori.    | 2496.170           | AV       | 35.9              | 27.4               | 24.8         | 38.3         | 49.8               | 53.9              | 4.1            | 100            | 189            |        |
| Hori.    | 4824.000           | AV       | 37.8              | 30.8               | 7.1          | 37.2         | 38.5               | 53.9              | 15.4           | 100            | 294            |        |
| Hori.    | 7236.000           | AV       | 35.8              | 36.2               | 8.6          | 39.5         | 41.1               | 53.9              | 12.8           | 100            | 0              |        |
| Hori.    | 9648.000           | AV       | 34.1              | 38.3               | 9.8          | 37.3         | 44.9               | 53.9              | 9.0            | 100            | 17             |        |
| Hori.    | 12060.000          | AV       | 34.0              | 39.2               | 11.1         | 38.1         | 46.2               | 53.9              | 7.7            | 100            | 0              |        |
| Vert.    | 2390.000           | PK       | 44.7              | 27.2               | 24.7         | 38.4         | 58.2               | 73.9              | 15.7           | 100            | 0              |        |
| Vert.    | 4824.000           | PK       | 46.5              | 30.8               | 7.1          | 37.2         | 47.2               | 73.9              | 26.7           | 100            | 132            |        |
| Vert.    | 7236.000           | PK       | 46.4              | 36.2               | 8.6          | 39.5         | 51.7               | 73.9              | 22.2           | 100            | 0              |        |
| Vert.    | 9648.000           | PK       | 42.8              | 38.3               | 9.8          | 37.3         | 53.6               | 73.9              | 20.3           | 155            | 269            |        |
| Vert.    | 12060.000          | PK       | 44.0              | 39.2               | 11.1         | 38.1         | 56.2               | 73.9              | 17.7           | 100            | 0              |        |
| Vert.    | 2390.000           | AV       | 34.4              | 27.2               | 24.7         | 38.4         | 47.9               | 53.9              | 6.0            | 100            | 0              |        |
| Vert.    | 4824.000           | AV       | 40.9              | 30.8               | 7.1          | 37.2         | 41.6               | 53.9              | 12.3           | 100            | 132            |        |
| Vert.    | 7236.000           | AV       | 35.5              | 36.2               | 8.6          | 39.5         | 40.8               | 53.9              | 13.1           | 100            | 0              |        |
| Vert.    | 9648.000           | AV       | 34.1              | 38.3               | 9.8          | 37.3         | 44.9               | 53.9              | 9.0            | 155            | 269            |        |
| Vert.    | 12060.000          | AV       | 34.0              | 39.2               | 11.1         | 38.1         | 46.2               | 53.9              | 7.7            | 100            | 0              |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz :  $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$ 

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

### 20dBc Data Sheet (RBW 100kHz, VBW 300kHz)

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|--------|
| Hori.    | 2412.000           | PK       | 83.2              | 27.3               | 24.7         | 38.3         | 96.9               | -                 | -              |        |
| Hori.    | 2400.000           | PK       | 44.3              | 27.3               | 24.7         | 38.4         | 57.9               | 76.9              | 19.0           |        |
| Vert.    | 2412.000           | PK       | 81.1              | 27.3               | 24.7         | 38.3         | 94.8               | -                 | -              |        |
| Vert.    | 2400.000           | PK       | 41.2              | 27.3               | 24.7         | 38.4         | 54.8               | 74.8              | 20.0           |        |

Result = Reading + Ant.Fac. + Loss(Cable+Attenuator+Filter) - Gain(Amplifier)

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## Radiated Emission

|                        |                                 |                            |                            |
|------------------------|---------------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber      | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 6, 2013                     | May 7, 2013                | May 8, 2013                |
| Temperature / Humidity | 19 deg.C, 45 %RH                | 22 deg.C, 43 %RH           | 23 deg.C, 30 %RH           |
| Engineer               | Hikaru Shirasawa                | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 2437 MHz<br>Tx, IEEE802.11b |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 2496.880           | PK       | 47.2              | 27.4               | 24.8         | 38.3         | 61.1               | 73.9              | 12.8           | 100            | 183            |        |
| Hori.    | 4874.000           | PK       | 46.2              | 31.0               | 7.1          | 37.2         | 47.1               | 73.9              | 26.8           | 114            | 233            |        |
| Hori.    | 7311.000           | PK       | 45.7              | 36.2               | 8.6          | 39.6         | 50.9               | 73.9              | 23.0           | 100            | 0              |        |
| Hori.    | 9748.000           | PK       | 44.1              | 38.4               | 9.7          | 37.4         | 54.8               | 73.9              | 19.1           | 100            | 15             |        |
| Hori.    | 12185.000          | PK       | 43.1              | 39.2               | 11.0         | 38.1         | 55.2               | 73.9              | 18.7           | 100            | 0              |        |
| Hori.    | 2496.880           | AV       | 35.8              | 27.4               | 24.8         | 38.3         | 49.7               | 53.9              | 4.2            | 100            | 183            |        |
| Hori.    | 4874.000           | AV       | 38.0              | 31.0               | 7.1          | 37.2         | 38.9               | 53.9              | 15.0           | 114            | 233            |        |
| Hori.    | 7311.000           | AV       | 35.7              | 36.2               | 8.6          | 39.6         | 40.9               | 53.9              | 13.0           | 100            | 0              |        |
| Hori.    | 9748.000           | AV       | 34.2              | 38.4               | 9.7          | 37.4         | 44.9               | 53.9              | 9.0            | 100            | 15             |        |
| Hori.    | 12185.000          | AV       | 33.9              | 39.2               | 11.0         | 38.1         | 46.0               | 53.9              | 7.9            | 100            | 0              |        |
| Vert.    | 4874.000           | PK       | 47.1              | 31.0               | 7.1          | 37.2         | 48.0               | 73.9              | 25.9           | 100            | 131            |        |
| Vert.    | 7311.000           | PK       | 45.1              | 36.2               | 8.6          | 39.6         | 50.3               | 73.9              | 23.6           | 100            | 0              |        |
| Vert.    | 9748.000           | PK       | 43.3              | 38.4               | 9.7          | 37.4         | 54.0               | 73.9              | 19.9           | 100            | 317            |        |
| Vert.    | 12185.000          | PK       | 42.2              | 39.2               | 11.0         | 38.1         | 54.3               | 73.9              | 19.6           | 100            | 0              |        |
| Vert.    | 4874.000           | AV       | 40.7              | 31.0               | 7.1          | 37.2         | 41.6               | 53.9              | 12.3           | 100            | 131            |        |
| Vert.    | 7311.000           | AV       | 35.6              | 36.2               | 8.6          | 39.6         | 40.8               | 53.9              | 13.1           | 100            | 0              |        |
| Vert.    | 9748.000           | AV       | 34.7              | 38.4               | 9.7          | 37.4         | 45.4               | 53.9              | 8.5            | 100            | 317            |        |
| Vert.    | 12185.000          | AV       | 33.4              | 39.2               | 11.0         | 38.1         | 45.5               | 53.9              | 8.4            | 100            | 0              |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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

## Radiated Emission

|                        |                                 |                            |                            |
|------------------------|---------------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber      | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 6, 2013                     | May 7, 2013                | May 8, 2013                |
| Temperature / Humidity | 19 deg.C, 45 %RH                | 22 deg.C, 43 %RH           | 23 deg.C, 30 %RH           |
| Engineer               | Hikaru Shirasawa                | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 2462 MHz<br>Tx, IEEE802.11b |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 2483.500           | PK       | 44.4              | 27.4               | 24.8         | 38.3         | 58.3               | 73.9              | 15.6           | 100            | 0              |        |
| Hori.    | 2495.840           | PK       | 48.4              | 27.4               | 24.8         | 38.3         | 62.3               | 73.9              | 11.6           | 100            | 133            |        |
| Hori.    | 4924.000           | PK       | 46.0              | 31.1               | 7.1          | 37.2         | 47.0               | 73.9              | 26.9           | 100            | 289            |        |
| Hori.    | 7386.000           | PK       | 46.1              | 36.3               | 8.6          | 39.6         | 51.4               | 73.9              | 22.5           | 100            | 0              |        |
| Hori.    | 9848.000           | PK       | 44.0              | 38.6               | 9.6          | 37.5         | 54.7               | 73.9              | 19.2           | 100            | 14             |        |
| Hori.    | 12310.000          | PK       | 43.5              | 39.1               | 10.9         | 38.1         | 55.4               | 73.9              | 18.5           | 100            | 0              |        |
| Hori.    | 2483.500           | AV       | 34.3              | 27.4               | 24.8         | 38.3         | 48.2               | 53.9              | 5.7            | 100            | 0              |        |
| Hori.    | 2495.840           | AV       | 35.8              | 27.4               | 24.8         | 38.3         | 49.7               | 53.9              | 4.2            | 100            | 133            |        |
| Hori.    | 4924.000           | AV       | 39.3              | 31.1               | 7.1          | 37.2         | 40.3               | 53.9              | 13.6           | 100            | 289            |        |
| Hori.    | 7386.000           | AV       | 36.2              | 36.3               | 8.6          | 39.6         | 41.5               | 53.9              | 12.4           | 100            | 0              |        |
| Hori.    | 9848.000           | AV       | 34.8              | 38.6               | 9.6          | 37.5         | 45.5               | 53.9              | 8.4            | 100            | 14             |        |
| Hori.    | 12310.000          | AV       | 34.0              | 39.1               | 10.9         | 38.1         | 45.9               | 53.9              | 8.0            | 100            | 0              |        |
| Vert.    | 2483.500           | PK       | 43.7              | 27.4               | 24.8         | 38.3         | 57.6               | 73.9              | 16.3           | 100            | 130            |        |
| Vert.    | 4924.000           | PK       | 47.3              | 31.1               | 7.1          | 37.2         | 48.3               | 73.9              | 25.6           | 100            | 143            |        |
| Vert.    | 7386.000           | PK       | 45.4              | 36.3               | 8.6          | 39.6         | 50.7               | 73.9              | 23.2           | 100            | 0              |        |
| Vert.    | 9848.000           | PK       | 43.9              | 38.6               | 9.6          | 37.5         | 54.6               | 73.9              | 19.3           | 100            | 317            |        |
| Vert.    | 12310.000          | PK       | 43.3              | 39.1               | 10.9         | 38.1         | 55.2               | 73.9              | 18.7           | 100            | 0              |        |
| Vert.    | 2483.500           | AV       | 34.1              | 27.4               | 24.8         | 38.3         | 48.0               | 53.9              | 5.9            | 100            | 130            |        |
| Vert.    | 4924.000           | AV       | 41.3              | 31.1               | 7.1          | 37.2         | 42.3               | 53.9              | 11.6           | 100            | 143            |        |
| Vert.    | 7386.000           | AV       | 35.6              | 36.3               | 8.6          | 39.6         | 40.9               | 53.9              | 13.0           | 100            | 0              |        |
| Vert.    | 9848.000           | AV       | 34.6              | 38.6               | 9.6          | 37.5         | 45.3               | 53.9              | 8.6            | 100            | 317            |        |
| Vert.    | 12310.000          | AV       | 33.8              | 39.1               | 10.9         | 38.1         | 45.7               | 53.9              | 8.2            | 100            | 0              |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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

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## Radiated Emission

|                        |                                 |                            |                            |
|------------------------|---------------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber      | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 6, 2013                     | May 7, 2013                | May 8, 2013                |
| Temperature / Humidity | 19 deg.C, 45 %RH                | 22 deg.C, 43 %RH           | 23 deg.C, 30 %RH           |
| Engineer               | Hikaru Shirasawa                | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 2412 MHz<br>Tx, IEEE802.11g |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 2390.000           | PK       | 54.2              | 27.2               | 24.7         | 38.4         | 67.7               | 73.9              | 6.2            | 100            | 0              |        |
| Hori.    | 2495.660           | PK       | 47.2              | 27.4               | 24.8         | 38.3         | 61.1               | 73.9              | 12.8           | 100            | 165            |        |
| Hori.    | 4824.000           | PK       | 47.6              | 30.8               | 7.1          | 37.2         | 48.3               | 73.9              | 25.6           | 117            | 299            |        |
| Hori.    | 7236.000           | PK       | 45.8              | 36.2               | 8.6          | 39.5         | 51.1               | 73.9              | 22.8           | 100            | 0              |        |
| Hori.    | 9648.000           | PK       | 43.1              | 38.3               | 9.8          | 37.3         | 53.9               | 73.9              | 20.0           | 100            | 15             |        |
| Hori.    | 12060.000          | PK       | 43.8              | 39.2               | 11.1         | 38.1         | 56.0               | 73.9              | 17.9           | 100            | 0              |        |
| Hori.    | 2390.000           | AV       | 38.1              | 27.2               | 24.7         | 38.4         | 51.6               | 53.9              | 2.3            | 100            | 0              |        |
| Hori.    | 2495.660           | AV       | 35.9              | 27.4               | 24.8         | 38.3         | 49.8               | 53.9              | 4.1            | 100            | 165            |        |
| Hori.    | 4824.000           | AV       | 35.6              | 30.8               | 7.1          | 37.2         | 36.3               | 53.9              | 17.6           | 117            | 299            |        |
| Hori.    | 7236.000           | AV       | 35.9              | 36.2               | 8.6          | 39.5         | 41.2               | 53.9              | 12.7           | 100            | 0              |        |
| Hori.    | 9648.000           | AV       | 33.9              | 38.3               | 9.8          | 37.3         | 44.7               | 53.9              | 9.2            | 100            | 15             |        |
| Hori.    | 12060.000          | AV       | 34.3              | 39.2               | 11.1         | 38.1         | 46.5               | 53.9              | 7.4            | 100            | 0              |        |
| Vert.    | 2390.000           | PK       | 53.1              | 27.2               | 24.7         | 38.4         | 66.6               | 73.9              | 7.3            | 100            | 0              |        |
| Vert.    | 4824.000           | PK       | 48.5              | 30.8               | 7.1          | 37.2         | 49.2               | 73.9              | 24.7           | 100            | 141            |        |
| Vert.    | 7236.000           | PK       | 45.7              | 36.2               | 8.6          | 39.5         | 51.0               | 73.9              | 22.9           | 100            | 0              |        |
| Vert.    | 9648.000           | PK       | 42.6              | 38.3               | 9.8          | 37.3         | 53.4               | 73.9              | 20.5           | 100            | 251            |        |
| Vert.    | 12060.000          | PK       | 43.5              | 39.2               | 11.1         | 38.1         | 55.7               | 73.9              | 18.2           | 100            | 0              |        |
| Vert.    | 2390.000           | AV       | 37.5              | 27.2               | 24.7         | 38.4         | 51.0               | 53.9              | 2.9            | 100            | 0              |        |
| Vert.    | 4824.000           | AV       | 37.2              | 30.8               | 7.1          | 37.2         | 37.9               | 53.9              | 16.0           | 100            | 141            |        |
| Vert.    | 7236.000           | AV       | 35.7              | 36.2               | 8.6          | 39.5         | 41.0               | 53.9              | 12.9           | 100            | 0              |        |
| Vert.    | 9648.000           | AV       | 33.9              | 38.3               | 9.8          | 37.3         | 44.7               | 53.9              | 9.2            | 100            | 251            |        |
| Vert.    | 12060.000          | AV       | 34.0              | 39.2               | 11.1         | 38.1         | 46.2               | 53.9              | 7.7            | 100            | 0              |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz :  $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$ 

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

### 20dBc Data Sheet (RBW 100kHz, VBW 300kHz)

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|--------|
| Hori.    | 2412.000           | PK       | 84.2              | 27.3               | 24.7         | 38.3         | 97.9               | -                 | -              |        |
| Hori.    | 2400.000           | PK       | 56.5              | 27.3               | 24.7         | 38.4         | 70.1               | 77.9              | 7.8            |        |
| Vert.    | 2412.000           | PK       | 82.2              | 27.3               | 24.7         | 38.3         | 95.9               | -                 | -              |        |
| Vert.    | 2400.000           | PK       | 54.8              | 27.3               | 24.7         | 38.4         | 68.4               | 75.9              | 7.5            |        |

Result = Reading + Ant.Fac. + Loss(Cable+Attenuator+Filter) - Gain(Amplifier)

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## Radiated Emission

|                        |                                 |                            |                            |
|------------------------|---------------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber      | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 6, 2013                     | May 7, 2013                | May 8, 2013                |
| Temperature / Humidity | 19 deg.C, 45 %RH                | 22 deg.C, 43 %RH           | 23 deg.C, 30 %RH           |
| Engineer               | Hikaru Shirasawa                | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 2437 MHz<br>Tx, IEEE802.11g |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 2495.530           | PK       | 47.8              | 27.4               | 24.8         | 38.3         | 61.7               | 73.9              | 12.2           | 100            | 164            |        |
| Hori.    | 4874.000           | PK       | 45.7              | 31.0               | 7.1          | 37.2         | 46.6               | 73.9              | 27.3           | 100            | 158            |        |
| Hori.    | 7311.000           | PK       | 45.7              | 36.2               | 8.6          | 39.6         | 50.9               | 73.9              | 23.0           | 100            | 0              |        |
| Hori.    | 9748.000           | PK       | 43.2              | 38.4               | 9.7          | 37.4         | 53.9               | 73.9              | 20.0           | 100            | 15             |        |
| Hori.    | 12185.000          | PK       | 44.5              | 39.2               | 11.0         | 38.1         | 56.6               | 73.9              | 17.3           | 100            | 0              |        |
| Hori.    | 2495.530           | AV       | 35.6              | 27.4               | 24.8         | 38.3         | 49.5               | 53.9              | <b>4.4</b>     | 100            | 164            |        |
| Hori.    | 4874.000           | AV       | 34.2              | 31.0               | 7.1          | 37.2         | 35.1               | 53.9              | 18.8           | 100            | 158            |        |
| Hori.    | 7311.000           | AV       | 35.7              | 36.2               | 8.6          | 39.6         | 40.9               | 53.9              | 13.0           | 100            | 0              |        |
| Hori.    | 9748.000           | AV       | 34.1              | 38.4               | 9.7          | 37.4         | 44.8               | 53.9              | 9.1            | 100            | 15             |        |
| Hori.    | 12185.000          | AV       | 33.9              | 39.2               | 11.0         | 38.1         | 46.0               | 53.9              | 7.9            | 100            | 0              |        |
| Vert.    | 4874.000           | PK       | 49.6              | 31.0               | 7.1          | 37.2         | 50.5               | 73.9              | 23.4           | 100            | 141            |        |
| Vert.    | 7311.000           | PK       | 44.9              | 36.2               | 8.6          | 39.6         | 50.1               | 73.9              | 23.8           | 100            | 0              |        |
| Vert.    | 9748.000           | PK       | 44.1              | 38.4               | 9.7          | 37.4         | 54.8               | 73.9              | 19.1           | 120            | 267            |        |
| Vert.    | 12185.000          | PK       | 43.0              | 39.2               | 11.0         | 38.1         | 55.1               | 73.9              | 18.8           | 100            | 0              |        |
| Vert.    | 4874.000           | AV       | 36.8              | 31.0               | 7.1          | 37.2         | 37.7               | 53.9              | 16.2           | 100            | 141            |        |
| Vert.    | 7311.000           | AV       | 35.8              | 36.2               | 8.6          | 39.6         | 41.0               | 53.9              | 12.9           | 100            | 0              |        |
| Vert.    | 9748.000           | AV       | 34.8              | 38.4               | 9.7          | 37.4         | 45.5               | 53.9              | 8.4            | 120            | 267            |        |
| Vert.    | 12185.000          | AV       | 33.9              | 39.2               | 11.0         | 38.1         | 46.0               | 53.9              | 7.9            | 100            | 0              |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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

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## Radiated Emission

|                        |                                 |                            |                            |
|------------------------|---------------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber      | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 6, 2013                     | May 7, 2013                | May 8, 2013                |
| Temperature / Humidity | 19 deg.C, 45 %RH                | 22 deg.C, 43 %RH           | 23 deg.C, 30 %RH           |
| Engineer               | Hikaru Shirasawa                | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 2462 MHz<br>Tx, IEEE802.11g |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 2483.500           | PK       | 57.3              | 27.4               | 24.8         | 38.3         | 71.2               | 73.9              | 2.7            | 100            | 0              |        |
| Hori.    | 2495.000           | PK       | 47.1              | 27.4               | 24.8         | 38.3         | 61.0               | 73.9              | 12.9           | 100            | 166            |        |
| Hori.    | 4924.000           | PK       | 46.3              | 31.1               | 7.1          | 37.2         | 47.3               | 73.9              | 26.6           | 100            | 152            |        |
| Hori.    | 7386.000           | PK       | 45.5              | 36.3               | 8.6          | 39.6         | 50.8               | 73.9              | 23.1           | 100            | 0              |        |
| Hori.    | 9848.000           | PK       | 43.8              | 38.6               | 9.6          | 37.5         | 54.5               | 73.9              | 19.4           | 100            | 14             |        |
| Hori.    | 12310.000          | PK       | 43.2              | 39.1               | 10.9         | 38.1         | 55.1               | 73.9              | 18.8           | 100            | 0              |        |
| Hori.    | 2483.500           | AV       | 39.6              | 27.4               | 24.8         | 38.3         | 53.5               | 53.9              | <b>0.4</b>     | 100            | 0              |        |
| Hori.    | 2495.000           | AV       | 35.5              | 27.4               | 24.8         | 38.3         | 49.4               | 53.9              | 4.5            | 100            | 166            |        |
| Hori.    | 4924.000           | AV       | 35.8              | 31.1               | 7.1          | 37.2         | 36.8               | 53.9              | 17.1           | 100            | 152            |        |
| Hori.    | 7386.000           | AV       | 35.6              | 36.3               | 8.6          | 39.6         | 40.9               | 53.9              | 13.0           | 100            | 0              |        |
| Hori.    | 9848.000           | AV       | 34.4              | 38.6               | 9.6          | 37.5         | 45.1               | 53.9              | 8.8            | 100            | 14             |        |
| Hori.    | 12310.000          | AV       | 33.8              | 39.1               | 10.9         | 38.1         | 45.7               | 53.9              | 8.2            | 100            | 0              |        |
| Vert.    | 2483.500           | PK       | 56.3              | 27.4               | 24.8         | 38.3         | 70.2               | 73.9              | 3.7            | 111            | 133            |        |
| Vert.    | 4924.000           | PK       | 46.6              | 31.1               | 7.1          | 37.2         | 47.6               | 73.9              | 26.3           | 100            | 163            |        |
| Vert.    | 7386.000           | PK       | 45.0              | 36.3               | 8.6          | 39.6         | 50.3               | 73.9              | 23.6           | 100            | 0              |        |
| Vert.    | 9848.000           | PK       | 43.2              | 38.6               | 9.6          | 37.5         | 53.9               | 73.9              | 20.0           | 135            | 261            |        |
| Vert.    | 12310.000          | PK       | 43.7              | 39.1               | 10.9         | 38.1         | 55.6               | 73.9              | 18.3           | 100            | 0              |        |
| Vert.    | 2483.500           | AV       | 38.1              | 27.4               | 24.8         | 38.3         | 52.0               | 53.9              | 1.9            | 100            | 0              |        |
| Vert.    | 4924.000           | AV       | 35.9              | 31.1               | 7.1          | 37.2         | 36.9               | 53.9              | 17.0           | 100            | 163            |        |
| Vert.    | 7386.000           | AV       | 35.6              | 36.3               | 8.6          | 39.6         | 40.9               | 53.9              | 13.0           | 100            | 0              |        |
| Vert.    | 9848.000           | AV       | 35.0              | 38.6               | 9.6          | 37.5         | 45.7               | 53.9              | 8.2            | 135            | 261            |        |
| Vert.    | 12310.000          | AV       | 33.7              | 39.1               | 10.9         | 38.1         | 45.6               | 53.9              | 8.3            | 100            | 0              |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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

## Radiated Emission

|                        |                                      |                            |                            |                  |
|------------------------|--------------------------------------|----------------------------|----------------------------|------------------|
| Test place             | No.2 Semi Anechoic Chamber           | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |                  |
| Date                   | May 3, 2013                          | May 7, 2013                | May 8, 2013                | May 14, 2013     |
| Temperature / Humidity | 21 deg.C, 40 %RH                     | 22 deg.C, 43 %RH           | 23 deg.C, 30 %RH           | 25 deg.C, 40 %RH |
| Engineer               | Makoto Hosaka                        | Makoto Hosaka              | Makoto Hosaka              | Makoto Hosaka    |
| Mode                   | Tx, 2412 MHz<br>Tx, IEEE802.11n HT20 |                            |                            |                  |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 299.263            | QP       | 34.5              | 18.9               | 11.0         | 31.7         | 32.7               | 46.0              | 13.3           | 163            | 164            |        |
| Hori.    | 335.989            | QP       | 48.9              | 14.9               | 7.6          | 31.6         | 39.8               | 46.0              | 6.2            | 100            | 28             |        |
| Hori.    | 899.921            | QP       | 32.3              | 22.9               | 10.2         | 30.9         | 34.5               | 46.0              | 11.5           | 100            | 90             |        |
| Hori.    | 2390.000           | PK       | 48.9              | 27.2               | 24.7         | 38.4         | 62.4               | 73.9              | 11.5           | 100            | 0              |        |
| Hori.    | 2488.900           | PK       | 48.5              | 27.4               | 24.8         | 38.3         | 62.4               | 73.9              | 11.5           | 148            | 142            |        |
| Hori.    | 4824.000           | PK       | 42.9              | 30.8               | 7.1          | 37.2         | 43.6               | 73.9              | 30.3           | 100            | 280            |        |
| Hori.    | 7236.000           | PK       | 44.9              | 36.2               | 8.6          | 39.5         | 50.2               | 73.9              | 23.7           | 100            | 0              |        |
| Hori.    | 9648.000           | PK       | 41.1              | 38.3               | 9.8          | 37.3         | 51.9               | 73.9              | 22.0           | 100            | 0              |        |
| Hori.    | 12060.000          | PK       | 42.9              | 39.2               | 11.1         | 38.1         | 55.1               | 73.9              | 18.8           | 100            | 0              |        |
| Hori.    | 2390.000           | AV       | 36.2              | 27.2               | 24.7         | 38.4         | 49.7               | 53.9              | 4.2            | 100            | 0              |        |
| Hori.    | 2488.900           | AV       | 35.8              | 27.4               | 24.8         | 38.3         | 49.7               | 53.9              | 4.2            | 148            | 142            |        |
| Hori.    | 4824.000           | AV       | 33.9              | 30.8               | 7.1          | 37.2         | 34.6               | 53.9              | 19.3           | 100            | 280            |        |
| Hori.    | 7236.000           | AV       | 35.2              | 36.2               | 8.6          | 39.5         | 40.5               | 53.9              | 13.4           | 100            | 0              |        |
| Hori.    | 9648.000           | AV       | 32.9              | 38.3               | 9.8          | 37.3         | 43.7               | 53.9              | 10.2           | 100            | 0              |        |
| Hori.    | 12060.000          | AV       | 34.0              | 39.2               | 11.1         | 38.1         | 46.2               | 53.9              | 7.7            | 100            | 0              |        |
| Vert.    | 70.373             | QP       | 41.6              | 6.7                | 7.4          | 31.9         | 23.8               | 40.0              | 16.2           | 100            | 329            |        |
| Vert.    | 99.753             | QP       | 43.2              | 10.6               | 8.1          | 31.9         | 30.0               | 43.5              | 13.5           | 100            | 108            |        |
| Vert.    | 144.000            | QP       | 41.3              | 14.9               | 8.8          | 31.8         | 33.2               | 43.5              | 10.3           | 100            | 133            |        |
| Vert.    | 199.453            | QP       | 33.5              | 16.9               | 9.4          | 31.8         | 28.0               | 43.5              | 15.5           | 100            | 81             |        |
| Vert.    | 2390.000           | PK       | 46.9              | 27.2               | 24.7         | 38.4         | 60.4               | 73.9              | 13.5           | 100            | 227            |        |
| Vert.    | 4824.000           | PK       | 43.9              | 30.8               | 7.1          | 37.2         | 44.6               | 73.9              | 29.3           | 100            | 135            |        |
| Vert.    | 7236.000           | PK       | 45.2              | 36.2               | 8.6          | 39.5         | 50.5               | 73.9              | 23.4           | 100            | 0              |        |
| Vert.    | 9648.000           | PK       | 41.5              | 38.3               | 9.8          | 37.3         | 52.3               | 73.9              | 21.6           | 100            | 0              |        |
| Vert.    | 12060.000          | PK       | 42.9              | 39.2               | 11.1         | 38.1         | 55.1               | 73.9              | 18.8           | 100            | 0              |        |
| Vert.    | 2390.000           | AV       | 35.1              | 27.2               | 24.7         | 38.4         | 48.6               | 53.9              | 5.3            | 100            | 227            |        |
| Vert.    | 4824.000           | AV       | 34.4              | 30.8               | 7.1          | 37.2         | 35.1               | 53.9              | 18.8           | 100            | 135            |        |
| Vert.    | 7236.000           | AV       | 35.4              | 36.2               | 8.6          | 39.5         | 40.7               | 53.9              | 13.2           | 100            | 0              |        |
| Vert.    | 9648.000           | AV       | 32.8              | 38.3               | 9.8          | 37.3         | 43.6               | 53.9              | 10.3           | 100            | 0              |        |
| Vert.    | 12060.000          | AV       | 34.1              | 39.2               | 11.1         | 38.1         | 46.3               | 53.9              | 7.6            | 100            | 0              |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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

**20dBc Data Sheet (RBW 100kHz, VBW 300kHz)**

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|--------|
| Hori.    | 2412.000           | PK       | 85.2              | 27.3               | 24.7         | 38.3         | 98.9               | -                 | -              |        |
| Hori.    | 2400.000           | PK       | 55.2              | 27.3               | 24.7         | 38.4         | 68.8               | 78.9              | 10.1           |        |
| Vert.    | 2412.000           | PK       | 84.2              | 27.3               | 24.7         | 38.3         | 97.9               | -                 | -              |        |
| Vert.    | 2400.000           | PK       | 52.2              | 27.3               | 24.7         | 38.4         | 65.8               | 77.9              | 12.1           |        |

Result = Reading + Ant.Fac. + Loss(Cable+Attenuator+Filter) - Gain(Amplifier)

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## Radiated Emission

|                        |                                      |                            |                            |
|------------------------|--------------------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber           | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 3, 2013                          | May 7, 2013                | May 8, 2013                |
| Temperature / Humidity | 21 deg.C, 40 %RH                     | 22 deg.C, 43 %RH           | 23 deg.C, 30 %RH           |
| Engineer               | Makoto Hosaka                        | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 2437 MHz<br>Tx, IEEE802.11n HT20 |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 4874.000           | PK       | 42.8              | 31.0               | 7.1          | 37.2         | 43.7               | 73.9              | 30.2           | 100            | 335            |        |
| Hori.    | 7311.000           | PK       | 44.6              | 36.2               | 8.6          | 39.6         | 49.8               | 73.9              | 24.1           | 100            | 0              |        |
| Hori.    | 9748.000           | PK       | 41.5              | 38.4               | 9.7          | 37.4         | 52.2               | 73.9              | 21.7           | 100            | 0              |        |
| Hori.    | 12185.000          | PK       | 42.5              | 39.2               | 11.0         | 38.1         | 54.6               | 73.9              | 19.3           | 100            | 0              |        |
| Hori.    | 4874.000           | AV       | 33.9              | 31.0               | 7.1          | 37.2         | 34.8               | 53.9              | 19.1           | 100            | 335            |        |
| Hori.    | 7311.000           | AV       | 35.8              | 36.2               | 8.6          | 39.6         | 41.0               | 53.9              | 12.9           | 100            | 0              |        |
| Hori.    | 9748.000           | AV       | 33.0              | 38.4               | 9.7          | 37.4         | 43.7               | 53.9              | 10.2           | 100            | 0              |        |
| Hori.    | 12185.000          | AV       | 33.8              | 39.2               | 11.0         | 38.1         | 45.9               | 53.9              | 8.0            | 100            | 0              |        |
| Vert.    | 4874.000           | PK       | 43.2              | 31.0               | 7.1          | 37.2         | 44.1               | 73.9              | 29.8           | 100            | 133            |        |
| Vert.    | 7311.000           | PK       | 44.1              | 36.2               | 8.6          | 39.6         | 49.3               | 73.9              | 24.6           | 100            | 0              |        |
| Vert.    | 9748.000           | PK       | 42.3              | 38.4               | 9.7          | 37.4         | 53.0               | 73.9              | 20.9           | 100            | 0              |        |
| Vert.    | 12185.000          | PK       | 43.3              | 39.2               | 11.0         | 38.1         | 55.4               | 73.9              | 18.5           | 100            | 0              |        |
| Vert.    | 4874.000           | AV       | 34.0              | 31.0               | 7.1          | 37.2         | 34.9               | 53.9              | 19.0           | 100            | 133            |        |
| Vert.    | 7311.000           | AV       | 35.6              | 36.2               | 8.6          | 39.6         | 40.8               | 53.9              | 13.1           | 100            | 0              |        |
| Vert.    | 9748.000           | AV       | 33.3              | 38.4               | 9.7          | 37.4         | 44.0               | 53.9              | 9.9            | 100            | 0              |        |
| Vert.    | 12185.000          | AV       | 34.2              | 39.2               | 11.0         | 38.1         | 46.3               | 53.9              | 7.6            | 100            | 0              |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz :  $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$ 

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

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## Radiated Emission

|                        |                                      |                            |                            |
|------------------------|--------------------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber           | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 3, 2013                          | May 7, 2013                | May 8, 2013                |
| Temperature / Humidity | 21 deg.C, 40 %RH                     | 22 deg.C, 43 %RH           | 23 deg.C, 30 %RH           |
| Engineer               | Makoto Hosaka                        | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 2462 MHz<br>Tx, IEEE802.11n HT20 |                            |                            |

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

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Height [cm] | Angle [deg] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|-------------|--------|
| Hori.    | 2483.500        | PK       | 51.2           | 27.4            | 24.8      | 38.3      | 65.1            | 73.9           | 8.8         | 100         | 0           |        |
| Hori.    | 4924.000        | PK       | 42.7           | 31.1            | 7.1       | 37.2      | 43.7            | 73.9           | 30.2        | 100         | 234         |        |
| Hori.    | 7386.000        | PK       | 44.1           | 36.3            | 8.6       | 39.6      | 49.4            | 73.9           | 24.5        | 100         | 0           |        |
| Hori.    | 9848.000        | PK       | 42.4           | 38.6            | 9.6       | 37.5      | 53.1            | 73.9           | 20.8        | 100         | 0           |        |
| Hori.    | 12310.000       | PK       | 42.5           | 39.1            | 10.9      | 38.1      | 54.4            | 73.9           | 19.5        | 100         | 0           |        |
| Hori.    | 2483.500        | AV       | 37.6           | 27.4            | 24.8      | 38.3      | 51.5            | 53.9           | 2.4         | 100         | 0           |        |
| Hori.    | 4924.000        | AV       | 33.8           | 31.1            | 7.1       | 37.2      | 34.8            | 53.9           | 19.1        | 100         | 234         |        |
| Hori.    | 7386.000        | AV       | 35.6           | 36.3            | 8.6       | 39.6      | 40.9            | 53.9           | 13.0        | 100         | 0           |        |
| Hori.    | 9848.000        | AV       | 33.3           | 38.6            | 9.6       | 37.5      | 44.0            | 53.9           | 9.9         | 100         | 0           |        |
| Hori.    | 12310.000       | AV       | 34.1           | 39.1            | 10.9      | 38.1      | 46.0            | 53.9           | 7.9         | 100         | 0           |        |
| Vert.    | 2483.500        | PK       | 50.3           | 27.4            | 24.8      | 38.3      | 64.2            | 73.9           | 9.7         | 100         | 229         |        |
| Vert.    | 4924.000        | PK       | 43.9           | 31.1            | 7.1       | 37.2      | 44.9            | 73.9           | 29.0        | 100         | 135         |        |
| Vert.    | 7386.000        | PK       | 45.3           | 36.3            | 8.6       | 39.6      | 50.6            | 73.9           | 23.3        | 100         | 0           |        |
| Vert.    | 9848.000        | PK       | 42.0           | 38.6            | 9.6       | 37.5      | 52.7            | 73.9           | 21.2        | 100         | 0           |        |
| Vert.    | 12310.000       | PK       | 44.3           | 39.1            | 10.9      | 38.1      | 56.2            | 73.9           | 17.7        | 100         | 0           |        |
| Vert.    | 2483.500        | AV       | 36.5           | 27.4            | 24.8      | 38.3      | 50.4            | 53.9           | 3.5         | 100         | 229         |        |
| Vert.    | 4924.000        | AV       | 34.6           | 31.1            | 7.1       | 37.2      | 35.6            | 53.9           | 18.3        | 100         | 135         |        |
| Vert.    | 7386.000        | AV       | 36.2           | 36.3            | 8.6       | 39.6      | 41.5            | 53.9           | 12.4        | 100         | 0           |        |
| Vert.    | 9848.000        | AV       | 33.2           | 38.6            | 9.6       | 37.5      | 43.9            | 53.9           | 10.0        | 100         | 0           |        |
| Vert.    | 12310.000       | AV       | 34.0           | 39.1            | 10.9      | 38.1      | 45.9            | 53.9           | 8.0         | 100         | 0           |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz :  $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$ 

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

## Radiated Emission

|                        |                                      |                            |                            |
|------------------------|--------------------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber           | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 3, 2013                          | May 7, 2013                | May 8, 2013                |
| Temperature / Humidity | 21 deg.C, 40 %RH                     | 22 deg.C, 43 %RH           | 23 deg.C, 30 %RH           |
| Engineer               | Makoto Hosaka                        | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 2422 MHz<br>Tx, IEEE802.11n HT40 |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 2390.000           | PK       | 55.0              | 27.2               | 24.7         | 38.4         | 68.5               | 73.9              | 5.4            | 100            | 0              |        |
| Hori.    | 4844.000           | PK       | 45.3              | 30.9               | 7.1          | 37.2         | 46.1               | 73.9              | 27.8           | 100            | 335            |        |
| Hori.    | 7266.000           | PK       | 44.0              | 36.2               | 8.6          | 39.5         | 49.3               | 73.9              | 24.6           | 100            | 0              |        |
| Hori.    | 9688.000           | PK       | 42.1              | 38.3               | 9.7          | 37.3         | 52.8               | 73.9              | 21.1           | 100            | 0              |        |
| Hori.    | 12110.000          | PK       | 43.4              | 39.2               | 11.1         | 38.1         | 55.6               | 73.9              | 18.3           | 100            | 0              |        |
| Hori.    | 2390.000           | AV       | 39.1              | 27.2               | 24.7         | 38.4         | 52.6               | 53.9              | 1.3            | 100            | 0              |        |
| Hori.    | 4844.000           | AV       | 33.6              | 30.9               | 7.1          | 37.2         | 34.4               | 53.9              | 19.5           | 100            | 335            |        |
| Hori.    | 7266.000           | AV       | 35.6              | 36.2               | 8.6          | 39.5         | 40.9               | 53.9              | 13.0           | 100            | 0              |        |
| Hori.    | 9688.000           | AV       | 33.0              | 38.3               | 9.7          | 37.3         | 43.7               | 53.9              | 10.2           | 100            | 0              |        |
| Hori.    | 12110.000          | AV       | 34.5              | 39.2               | 11.1         | 38.1         | 46.7               | 53.9              | 7.2            | 100            | 0              |        |
| Vert.    | 2390.000           | PK       | 51.5              | 27.2               | 24.7         | 38.4         | 65.0               | 73.9              | 8.9            | 100            | 224            |        |
| Vert.    | 4844.000           | PK       | 43.6              | 30.9               | 7.1          | 37.2         | 44.4               | 73.9              | 29.5           | 100            | 144            |        |
| Vert.    | 7266.000           | PK       | 44.8              | 36.2               | 8.6          | 39.5         | 50.1               | 73.9              | 23.8           | 100            | 0              |        |
| Vert.    | 9688.000           | PK       | 42.4              | 38.3               | 9.7          | 37.3         | 53.1               | 73.9              | 20.8           | 154            | 314            |        |
| Vert.    | 12110.000          | PK       | 43.4              | 39.2               | 11.1         | 38.1         | 55.6               | 73.9              | 18.3           | 100            | 0              |        |
| Vert.    | 2390.000           | AV       | 37.4              | 27.2               | 24.7         | 38.4         | 50.9               | 53.9              | 3.0            | 100            | 224            |        |
| Vert.    | 4844.000           | AV       | 33.5              | 30.9               | 7.1          | 37.2         | 34.3               | 53.9              | 19.6           | 100            | 144            |        |
| Vert.    | 7266.000           | AV       | 35.5              | 36.2               | 8.6          | 39.5         | 40.8               | 53.9              | 13.1           | 100            | 0              |        |
| Vert.    | 9688.000           | AV       | 33.1              | 38.3               | 9.7          | 37.3         | 43.8               | 53.9              | 10.1           | 154            | 314            |        |
| Vert.    | 12110.000          | AV       | 34.1              | 39.2               | 11.1         | 38.1         | 46.3               | 53.9              | 7.6            | 100            | 0              |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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

**20dBc Data Sheet (RBW 100kHz, VBW 300kHz)**

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|--------|
| Hori.    | 2422.000           | PK       | 83.1              | 27.3               | 24.7         | 38.3         | 96.8               | -                 | -              |        |
| Hori.    | 2400.000           | PK       | 53.9              | 27.3               | 24.7         | 38.4         | 67.5               | 76.8              | 9.3            |        |
| Vert.    | 2422.000           | PK       | 81.5              | 27.3               | 24.7         | 38.3         | 95.2               | -                 | -              |        |
| Vert.    | 2400.000           | PK       | 50.9              | 27.3               | 24.7         | 38.4         | 64.5               | 75.2              | 10.7           |        |

Result = Reading + Ant.Fac. + Loss(Cable+Attenuator+Filter) - Gain(Amplifier)

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## Radiated Emission

|                        |                                      |                            |                            |
|------------------------|--------------------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber           | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 3, 2013                          | May 7, 2013                | May 8, 2013                |
| Temperature / Humidity | 21 deg.C, 40 %RH                     | 22 deg.C, 43 %RH           | 23 deg.C, 30 %RH           |
| Engineer               | Makoto Hosaka                        | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 2437 MHz<br>Tx, IEEE802.11n HT40 |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 4874.000           | PK       | 42.4              | 31.0               | 7.1          | 37.2         | 43.3               | 73.9              | 30.6           | 112            | 278            |        |
| Hori.    | 7311.000           | PK       | 44.3              | 36.2               | 8.6          | 39.6         | 49.5               | 73.9              | 24.4           | 100            | 0              |        |
| Hori.    | 9748.000           | PK       | 42.0              | 38.4               | 9.7          | 37.4         | 52.7               | 73.9              | 21.2           | 100            | 0              |        |
| Hori.    | 12185.000          | PK       | 43.2              | 39.2               | 11.0         | 38.1         | 55.3               | 73.9              | 18.6           | 100            | 0              |        |
| Hori.    | 4874.000           | AV       | 33.6              | 31.0               | 7.1          | 37.2         | 34.5               | 53.9              | 19.4           | 112            | 278            |        |
| Hori.    | 7311.000           | AV       | 35.6              | 36.2               | 8.6          | 39.6         | 40.8               | 53.9              | 13.1           | 100            | 0              |        |
| Hori.    | 9748.000           | AV       | 33.3              | 38.4               | 9.7          | 37.4         | 44.0               | 53.9              | 9.9            | 100            | 0              |        |
| Hori.    | 12185.000          | AV       | 34.1              | 39.2               | 11.0         | 38.1         | 46.2               | 53.9              | 7.7            | 100            | 0              |        |
| Vert.    | 4874.000           | PK       | 44.7              | 31.0               | 7.1          | 37.2         | 45.6               | 73.9              | 28.3           | 100            | 113            |        |
| Vert.    | 7311.000           | PK       | 44.6              | 36.2               | 8.6          | 39.6         | 49.8               | 73.9              | 24.1           | 100            | 0              |        |
| Vert.    | 9748.000           | PK       | 42.0              | 38.4               | 9.7          | 37.4         | 52.7               | 73.9              | 21.2           | 100            | 0              |        |
| Vert.    | 12185.000          | PK       | 43.9              | 39.2               | 11.0         | 38.1         | 56.0               | 73.9              | 17.9           | 100            | 0              |        |
| Vert.    | 4874.000           | AV       | 33.5              | 31.0               | 7.1          | 37.2         | 34.4               | 53.9              | 19.5           | 100            | 113            |        |
| Vert.    | 7311.000           | AV       | 35.6              | 36.2               | 8.6          | 39.6         | 40.8               | 53.9              | 13.1           | 100            | 0              |        |
| Vert.    | 9748.000           | AV       | 32.9              | 38.4               | 9.7          | 37.4         | 43.6               | 53.9              | 10.3           | 100            | 0              |        |
| Vert.    | 12185.000          | AV       | 34.0              | 39.2               | 11.0         | 38.1         | 46.1               | 53.9              | 7.8            | 100            | 0              |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz :  $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$ 

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



## Radiated Emission

|                        |                                      |                            |                            |
|------------------------|--------------------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber           | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 3, 2013                          | May 7, 2013                | May 8, 2013                |
| Temperature / Humidity | 21 deg.C, 40 %RH                     | 22 deg.C, 43 %RH           | 23 deg.C, 30 %RH           |
| Engineer               | Makoto Hosaka                        | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 2452 MHz<br>Tx, IEEE802.11n HT40 |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 2483.500           | PK       | 55.7              | 27.4               | 24.8         | 38.3         | 69.6               | 73.9              | 4.3            | 100            | 0              |        |
| Hori.    | 4904.000           | PK       | 43.4              | 31.1               | 7.1          | 37.2         | 44.4               | 73.9              | 29.5           | 100            | 280            |        |
| Hori.    | 7356.000           | PK       | 44.7              | 36.3               | 8.5          | 39.6         | 49.9               | 73.9              | 24.0           | 100            | 0              |        |
| Hori.    | 9808.000           | PK       | 42.4              | 38.5               | 9.7          | 37.5         | 53.1               | 73.9              | 20.8           | 100            | 0              |        |
| Hori.    | 12260.000          | PK       | 43.3              | 39.2               | 10.9         | 38.1         | 55.3               | 73.9              | 18.6           | 100            | 0              |        |
| Hori.    | 2483.500           | AV       | 39.8              | 27.4               | 24.8         | 38.3         | 53.7               | 53.9              | 0.2            | 100            | 0              |        |
| Hori.    | 4904.000           | AV       | 34.6              | 31.1               | 7.1          | 37.2         | 35.6               | 53.9              | 18.3           | 100            | 280            |        |
| Hori.    | 7356.000           | AV       | 36.0              | 36.3               | 8.5          | 39.6         | 41.2               | 53.9              | 12.7           | 100            | 0              |        |
| Hori.    | 9808.000           | AV       | 33.0              | 38.5               | 9.7          | 37.5         | 43.7               | 53.9              | 10.2           | 100            | 0              |        |
| Hori.    | 12260.000          | AV       | 34.5              | 39.2               | 10.9         | 38.1         | 46.5               | 53.9              | 7.4            | 100            | 0              |        |
| Vert.    | 2483.500           | PK       | 53.6              | 27.4               | 24.8         | 38.3         | 67.5               | 73.9              | 6.4            | 100            | 227            |        |
| Vert.    | 4904.000           | PK       | 42.8              | 31.1               | 7.1          | 37.2         | 43.8               | 73.9              | 30.1           | 100            | 159            |        |
| Vert.    | 7356.000           | PK       | 45.6              | 36.3               | 8.5          | 39.6         | 50.8               | 73.9              | 23.1           | 100            | 0              |        |
| Vert.    | 9808.000           | PK       | 42.2              | 38.5               | 9.7          | 37.5         | 52.9               | 73.9              | 21.0           | 100            | 0              |        |
| Vert.    | 12260.000          | PK       | 43.9              | 39.2               | 10.9         | 38.1         | 55.9               | 73.9              | 18.0           | 100            | 0              |        |
| Vert.    | 2483.500           | AV       | 38.9              | 27.4               | 24.8         | 38.3         | 52.8               | 53.9              | 1.1            | 100            | 227            |        |
| Vert.    | 4904.000           | AV       | 34.0              | 31.1               | 7.1          | 37.2         | 35.0               | 53.9              | 18.9           | 100            | 159            |        |
| Vert.    | 7356.000           | AV       | 36.2              | 36.3               | 8.5          | 39.6         | 41.4               | 53.9              | 12.5           | 100            | 0              |        |
| Vert.    | 9808.000           | AV       | 33.0              | 38.5               | 9.7          | 37.5         | 43.7               | 53.9              | 10.2           | 100            | 0              |        |
| Vert.    | 12260.000          | AV       | 34.4              | 39.2               | 10.9         | 38.1         | 46.4               | 53.9              | 7.5            | 100            | 0              |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz :  $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$ 

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

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## Radiated Emission

|                        |                                 |                            |                            |                            |
|------------------------|---------------------------------|----------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber      | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 6, 2013                     | May 7, 2013                | May 9, 2013                | May 10, 2013               |
| Temperature / Humidity | 19 deg.C, 45 %RH                | 22 deg.C, 43 %RH           | 25 deg.C, 40 %RH           | 24 deg.C, 41 %RH           |
| Engineer               | Hikaru Shirasawa                | Makoto Hosaka              | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 5745 MHz<br>Tx, IEEE802.11a |                            |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 3830.000           | PK       | 45.2              | 29.4               | 15.8         | 37.9         | 52.5               | 73.9              | 21.4           | 100            | 350            |        |
| Hori.    | 5725.000           | PK       | 52.6              | 32.3               | 17.1         | 37.7         | 64.3               | 73.9              | 9.6            | 100            | 16             |        |
| Hori.    | 7660.000           | PK       | 47.4              | 36.6               | 8.6          | 39.5         | 53.1               | 73.9              | 20.8           | 100            | 97             |        |
| Hori.    | 11490.000          | PK       | 44.5              | 39.8               | 9.8          | 38.9         | 55.2               | 73.9              | 18.7           | 100            | 354            |        |
| Hori.    | 3830.000           | AV       | 34.6              | 29.4               | 15.8         | 37.9         | 41.9               | 53.9              | 12.0           | 100            | 350            |        |
| Hori.    | 5725.000           | AV       | 36.8              | 32.3               | 17.1         | 37.7         | 48.5               | 53.9              | 5.4            | 100            | 16             |        |
| Hori.    | 7660.000           | AV       | 38.4              | 36.6               | 8.6          | 39.5         | 44.1               | 53.9              | 9.8            | 100            | 97             |        |
| Hori.    | 11490.000          | AV       | 34.6              | 39.8               | 9.8          | 38.9         | 45.3               | 53.9              | 8.6            | 100            | 354            |        |
| Vert.    | 3830.000           | PK       | 44.3              | 29.4               | 15.8         | 37.9         | 51.6               | 73.9              | 22.3           | 100            | 9              |        |
| Vert.    | 5725.000           | PK       | 50.1              | 32.3               | 17.1         | 37.7         | 61.8               | 73.9              | 12.1           | 100            | 66             |        |
| Vert.    | 7660.000           | PK       | 46.9              | 36.6               | 8.6          | 39.5         | 52.6               | 73.9              | 21.3           | 100            | 349            |        |
| Vert.    | 11490.000          | PK       | 44.5              | 39.8               | 9.8          | 38.9         | 55.2               | 73.9              | 18.7           | 115            | 97             |        |
| Vert.    | 3830.000           | AV       | 34.3              | 29.4               | 15.8         | 37.9         | 41.6               | 53.9              | 12.3           | 100            | 9              |        |
| Vert.    | 5725.000           | AV       | 36.8              | 32.3               | 17.1         | 37.7         | 48.5               | 53.9              | 5.4            | 100            | 66             |        |
| Vert.    | 7660.000           | AV       | 37.9              | 36.6               | 8.6          | 39.5         | 43.6               | 53.9              | 10.3           | 100            | 349            |        |
| Vert.    | 11490.000          | AV       | 34.2              | 39.8               | 9.8          | 38.9         | 44.9               | 53.9              | 9.0            | 115            | 97             |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz :  $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$ 

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

## Radiated Emission

|                        |                                 |                            |                            |                            |
|------------------------|---------------------------------|----------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber      | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 6, 2013                     | May 7, 2013                | May 9, 2013                | May 10, 2013               |
| Temperature / Humidity | 19 deg.C, 45 %RH                | 22 deg.C, 43 %RH           | 25 deg.C, 40 %RH           | 24 deg.C, 41 %RH           |
| Engineer               | Hikaru Shirasawa                | Makoto Hosaka              | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 5785 MHz<br>Tx, IEEE802.11a |                            |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 3856.670           | PK       | 43.9              | 29.4               | 15.8         | 37.8         | 51.3               | 73.9              | 22.6           | 100            | 357            |        |
| Hori.    | 7713.330           | PK       | 46.9              | 36.7               | 8.6          | 39.4         | 52.8               | 73.9              | 21.1           | 100            | 95             |        |
| Hori.    | 11570.000          | PK       | 43.5              | 39.8               | 9.9          | 38.8         | 54.4               | 73.9              | 19.5           | 100            | 7              |        |
| Hori.    | 3856.670           | AV       | 34.3              | 29.4               | 15.8         | 37.8         | 41.7               | 53.9              | 12.2           | 100            | 357            |        |
| Hori.    | 7713.330           | AV       | 38.0              | 36.7               | 8.6          | 39.4         | 43.9               | 53.9              | 10.0           | 100            | 95             |        |
| Hori.    | 11570.000          | AV       | 34.3              | 39.8               | 9.9          | 38.8         | 45.2               | 53.9              | 8.7            | 100            | 7              |        |
| Vert.    | 3856.670           | PK       | 43.2              | 29.4               | 15.8         | 37.8         | 50.6               | 73.9              | 23.3           | 100            | 6              |        |
| Vert.    | 7713.330           | PK       | 46.9              | 36.7               | 8.6          | 39.4         | 52.8               | 73.9              | 21.1           | 100            | 262            |        |
| Vert.    | 11570.000          | PK       | 44.3              | 39.8               | 9.9          | 38.8         | 55.2               | 73.9              | 18.7           | 100            | 8              |        |
| Vert.    | 3856.670           | AV       | 34.0              | 29.4               | 15.8         | 37.8         | 41.4               | 53.9              | 12.5           | 100            | 6              |        |
| Vert.    | 7713.330           | AV       | 37.6              | 36.7               | 8.6          | 39.4         | 43.5               | 53.9              | 10.4           | 100            | 262            |        |
| Vert.    | 11570.000          | AV       | 34.6              | 39.8               | 9.9          | 38.8         | 45.5               | 53.9              | <b>8.4</b>     | 100            | 8              |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz :  $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$ 

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

## Radiated Emission

|                        |                                 |                            |                            |                            |
|------------------------|---------------------------------|----------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber      | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 6, 2013                     | May 7, 2013                | May 9, 2013                | May 10, 2013               |
| Temperature / Humidity | 19 deg.C, 45 %RH                | 22 deg.C, 43 %RH           | 25 deg.C, 40 %RH           | 24 deg.C, 41 %RH           |
| Engineer               | Hikaru Shirasawa                | Makoto Hosaka              | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 5825 MHz<br>Tx, IEEE802.11a |                            |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 3883.330           | PK       | 44.3              | 29.4               | 15.8         | 37.8         | 51.7               | 73.9              | 22.2           | 100            | 0              |        |
| Hori.    | 5850.000           | PK       | 45.1              | 32.7               | 17.2         | 37.9         | 57.1               | 73.9              | 16.8           | 100            | 262            |        |
| Hori.    | 7766.670           | PK       | 46.0              | 36.8               | 8.6          | 39.3         | 52.1               | 73.9              | 21.8           | 100            | 95             |        |
| Hori.    | 11650.000          | PK       | 44.2              | 39.7               | 10.0         | 38.6         | 55.3               | 73.9              | 18.6           | 100            | 4              |        |
| Hori.    | 3883.330           | AV       | 34.2              | 29.4               | 15.8         | 37.8         | 41.6               | 53.9              | 12.3           | 100            | 0              |        |
| Hori.    | 5850.000           | AV       | 34.8              | 32.7               | 17.2         | 37.9         | 46.8               | 53.9              | 7.1            | 100            | 262            |        |
| Hori.    | 7766.670           | AV       | 36.9              | 36.8               | 8.6          | 39.3         | 43.0               | 53.9              | 10.9           | 100            | 95             |        |
| Hori.    | 11650.000          | AV       | 35.2              | 39.7               | 10.0         | 38.6         | 46.3               | 53.9              | 7.6            | 100            | 4              |        |
| Vert.    | 3883.330           | PK       | 43.7              | 29.4               | 15.8         | 37.8         | 51.1               | 73.9              | 22.8           | 100            | 328            |        |
| Vert.    | 5850.000           | PK       | 44.2              | 32.7               | 17.2         | 37.9         | 56.2               | 73.9              | 17.7           | 100            | 136            |        |
| Vert.    | 7766.670           | PK       | 47.1              | 36.8               | 8.6          | 39.3         | 53.2               | 73.9              | 20.7           | 100            | 258            |        |
| Vert.    | 11650.000          | PK       | 44.8              | 39.7               | 10.0         | 38.6         | 55.9               | 73.9              | 18.0           | 100            | 4              |        |
| Vert.    | 3883.330           | AV       | 34.2              | 29.4               | 15.8         | 37.8         | 41.6               | 53.9              | 12.3           | 100            | 328            |        |
| Vert.    | 5850.000           | AV       | 35.2              | 32.7               | 17.2         | 37.9         | 47.2               | 53.9              | <b>6.7</b>     | 100            | 136            |        |
| Vert.    | 7766.670           | AV       | 37.7              | 36.8               | 8.6          | 39.3         | 43.8               | 53.9              | 10.1           | 100            | 258            |        |
| Vert.    | 11650.000          | AV       | 34.4              | 39.7               | 10.0         | 38.6         | 45.5               | 53.9              | 8.4            | 100            | 4              |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz :  $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$ 

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

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## Radiated Emission

|                        |                                      |                            |                            |                            |
|------------------------|--------------------------------------|----------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber           | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 4, 2013                          | May 7, 2013                | May 9, 2013                | May 10, 2013               |
| Temperature / Humidity | 20 deg.C, 41 %RH                     | 22 deg.C, 43 %RH           | 25 deg.C, 40 %RH           | 24 deg.C, 41 %RH           |
| Engineer               | Makoto Hosaka                        | Makoto Hosaka              | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 5745 MHz<br>Tx, IEEE802.11n HT20 |                            |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 3830.000           | PK       | 44.5              | 29.4               | 15.8         | 37.9         | 51.8               | 73.9              | 22.1           | 125            | 0              |        |
| Hori.    | 5725.000           | PK       | 46.1              | 32.3               | 17.1         | 37.7         | 57.8               | 73.9              | 16.1           | 100            | 195            |        |
| Hori.    | 7660.000           | PK       | 47.0              | 36.6               | 8.6          | 39.5         | 52.7               | 73.9              | 21.2           | 114            | 100            |        |
| Hori.    | 11490.000          | PK       | 44.1              | 39.8               | 9.8          | 38.9         | 54.8               | 73.9              | 19.1           | 116            | 252            |        |
| Hori.    | 3830.000           | AV       | 35.2              | 29.4               | 15.8         | 37.9         | 42.5               | 53.9              | 11.4           | 125            | 0              |        |
| Hori.    | 5725.000           | AV       | 35.7              | 32.3               | 17.1         | 37.7         | 47.4               | 53.9              | 6.5            | 100            | 195            |        |
| Hori.    | 7660.000           | AV       | 38.3              | 36.6               | 8.6          | 39.5         | 44.0               | 53.9              | 9.9            | 114            | 100            |        |
| Vert.    | 3830.000           | PK       | 44.8              | 29.4               | 15.8         | 37.9         | 52.1               | 73.9              | 21.8           | 100            | 277            |        |
| Vert.    | 5725.000           | PK       | 46.1              | 32.3               | 17.1         | 37.7         | 57.8               | 73.9              | 16.1           | 100            | 0              |        |
| Vert.    | 7660.000           | PK       | 46.3              | 36.6               | 8.6          | 39.5         | 52.0               | 73.9              | 21.9           | 100            | 343            |        |
| Vert.    | 11490.000          | PK       | 45.1              | 39.8               | 9.8          | 38.9         | 55.8               | 73.9              | 18.1           | 100            | 286            |        |
| Vert.    | 3830.000           | AV       | 35.5              | 29.4               | 15.8         | 37.9         | 42.8               | 53.9              | 11.1           | 100            | 277            |        |
| Vert.    | 5725.000           | AV       | 35.8              | 32.3               | 17.1         | 37.7         | 47.5               | 53.9              | <b>6.4</b>     | 100            | 0              |        |
| Vert.    | 7660.000           | AV       | 37.9              | 36.6               | 8.6          | 39.5         | 43.6               | 53.9              | 10.3           | 100            | 343            |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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

**Average measurement value with duty factor**

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Duty<br>Factor<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|------------------------|--------------------|-------------------|----------------|--------|
| Hori.    | 11490.000          | AV       | 34.2              | 39.8               | 9.8          | 38.9         | 0.2                    | 45.1               | 53.9              | 8.8            |        |
| Vert.    | 11490.000          | AV       | 34.6              | 39.8               | 9.8          | 38.9         | 0.2                    | 45.5               | 53.9              | <b>8.4</b>     |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier) + Duty factor

\*12.2.5.2 was applied to AV detection, since the duty cycle is less than 98% and video triggering or signal gating cannot be used.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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

## Radiated Emission

|                        |                                      |                            |                            |                            |
|------------------------|--------------------------------------|----------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber           | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 4, 2013                          | May 7, 2013                | May 9, 2013                | May 10, 2013               |
| Temperature / Humidity | 20 deg.C, 41 %RH                     | 22 deg.C, 43 %RH           | 25 deg.C, 40 %RH           | 24 deg.C, 41 %RH           |
| Engineer               | Makoto Hosaka                        | Makoto Hosaka              | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 5785 MHz<br>Tx, IEEE802.11n HT20 |                            |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 3856.670           | PK       | 45.1              | 29.4               | 15.8         | 37.8         | 52.5               | 73.9              | 21.4           | 100            | 349            |        |
| Hori.    | 7713.330           | PK       | 47.4              | 36.7               | 8.6          | 39.4         | 53.3               | 73.9              | 20.6           | 104            | 94             |        |
| Hori.    | 11570.000          | PK       | 44.0              | 39.8               | 9.9          | 38.8         | 54.9               | 73.9              | 19.0           | 109            | 0              |        |
| Hori.    | 3856.670           | AV       | 35.9              | 29.4               | 15.8         | 37.8         | 43.3               | 53.9              | 10.6           | 100            | 349            |        |
| Hori.    | 7713.330           | AV       | 39.3              | 36.7               | 8.6          | 39.4         | 45.2               | 53.9              | 8.7            | 104            | 94             |        |
| Vert.    | 3856.670           | PK       | 44.4              | 29.4               | 15.8         | 37.8         | 51.8               | 73.9              | 22.1           | 100            | 105            |        |
| Vert.    | 7713.330           | PK       | 47.0              | 36.7               | 8.6          | 39.4         | 52.9               | 73.9              | 21.0           | 109            | 258            |        |
| Vert.    | 11570.000          | PK       | 45.5              | 39.8               | 9.9          | 38.8         | 56.4               | 73.9              | 17.5           | 128            | 283            |        |
| Vert.    | 3856.670           | AV       | 35.4              | 29.4               | 15.8         | 37.8         | 42.8               | 53.9              | 11.1           | 100            | 105            |        |
| Vert.    | 7713.330           | AV       | 38.6              | 36.7               | 8.6          | 39.4         | 44.5               | 53.9              | 9.4            | 109            | 258            |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz :  $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$ 

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

**Average measurement value with duty factor**

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Duty<br>Factor<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|------------------------|--------------------|-------------------|----------------|--------|
| Hori.    | 11570.000          | AV       | 34.5              | 39.8               | 9.9          | 38.8         | 0.2                    | 45.6               | 53.9              | 8.3            |        |
| Vert.    | 11570.000          | AV       | 35.2              | 39.8               | 9.9          | 38.8         | 0.2                    | 46.3               | 53.9              | 7.6            |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier) + Duty factor

\*12.2.5.2 was applied to AV detection, since the duty cycle is less than 98% and video triggering or signal gating cannot be used.

Distance factor : 15GHz -40GHz :  $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$ 

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

## Radiated Emission

|                        |                                      |                            |                            |                            |
|------------------------|--------------------------------------|----------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber           | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 4, 2013                          | May 7, 2013                | May 9, 2013                | May 10, 2013               |
| Temperature / Humidity | 20 deg.C, 41 %RH                     | 22 deg.C, 43 %RH           | 25 deg.C, 40 %RH           | 24 deg.C, 41 %RH           |
| Engineer               | Makoto Hosaka                        | Makoto Hosaka              | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 5825 MHz<br>Tx, IEEE802.11n HT20 |                            |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 3883.330           | PK       | 44.6              | 29.4               | 15.8         | 37.8         | 52.0               | 73.9              | 21.9           | 100            | 337            |        |
| Hori.    | 5850.000           | PK       | 44.2              | 32.7               | 17.2         | 37.9         | 56.2               | 73.9              | 17.7           | 100            | 0              |        |
| Hori.    | 7766.670           | PK       | 46.6              | 36.8               | 8.6          | 39.3         | 52.7               | 73.9              | 21.2           | 100            | 93             |        |
| Hori.    | 11650.000          | PK       | 44.7              | 39.7               | 10.0         | 38.6         | 55.8               | 73.9              | 18.1           | 100            | 9              |        |
| Hori.    | 3883.330           | AV       | 35.4              | 29.4               | 15.8         | 37.8         | 42.8               | 53.9              | 11.1           | 100            | 337            |        |
| Hori.    | 5850.000           | AV       | 34.6              | 32.7               | 17.2         | 37.9         | 46.6               | 53.9              | 7.3            | 100            | 0              |        |
| Hori.    | 7766.670           | AV       | 38.0              | 36.8               | 8.6          | 39.3         | 44.1               | 53.9              | 9.8            | 100            | 93             |        |
| Vert.    | 3883.330           | PK       | 44.5              | 29.4               | 15.8         | 37.8         | 51.9               | 73.9              | 22.0           | 100            | 291            |        |
| Vert.    | 5850.000           | PK       | 44.4              | 32.7               | 17.2         | 37.9         | 56.4               | 73.9              | 17.5           | 100            | 0              |        |
| Vert.    | 7766.670           | PK       | 46.1              | 36.8               | 8.6          | 39.3         | 52.2               | 73.9              | 21.7           | 100            | 270            |        |
| Vert.    | 11650.000          | PK       | 45.9              | 39.7               | 10.0         | 38.6         | 57.0               | 73.9              | 16.9           | 123            | 284            |        |
| Vert.    | 3883.330           | AV       | 35.5              | 29.4               | 15.8         | 37.8         | 42.9               | 53.9              | 11.0           | 100            | 291            |        |
| Vert.    | 5850.000           | AV       | 34.8              | 32.7               | 17.2         | 37.9         | 46.8               | 53.9              | 7.1            | 100            | 0              |        |
| Vert.    | 7766.670           | AV       | 37.6              | 36.8               | 8.6          | 39.3         | 43.7               | 53.9              | 10.2           | 100            | 270            |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz :  $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$ 

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

## Average measurement value with duty factor

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Duty<br>Factor<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|------------------------|--------------------|-------------------|----------------|--------|
| Hori.    | 11650.000          | AV       | 34.9              | 39.7               | 10.0         | 38.6         | 0.2                    | 46.2               | 53.9              | 7.7            |        |
| Vert.    | 11650.000          | AV       | 35.8              | 39.7               | 10.0         | 38.6         | 0.2                    | 47.1               | 53.9              | 6.8            |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier) + Duty factor

\*12.2.5.2 was applied to AV detection, since the duty cycle is less than 98% and video triggering or signal gating cannot be used.

Distance factor : 15GHz -40GHz :  $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$ 

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

## Radiated Emission

|                        |                                      |                            |                            |                            |
|------------------------|--------------------------------------|----------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber           | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 4, 2013                          | May 8, 2013                | May 9, 2013                | May 10, 2013               |
| Temperature / Humidity | 20 deg.C, 41 %RH                     | 22 deg.C, 30 %RH           | 25 deg.C, 40 %RH           | 24 deg.C, 41 %RH           |
| Engineer               | Makoto Hosaka                        | Makoto Hosaka              | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 5755 MHz<br>Tx, IEEE802.11n HT40 |                            |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 3836.670           | PK       | 44.0              | 29.4               | 15.8         | 37.9         | 51.3               | 73.9              | 22.6           | 100            | 331            |        |
| Hori.    | 5725.000           | PK       | 51.6              | 32.3               | 17.1         | 37.7         | 63.3               | 73.9              | 10.6           | 100            | 191            |        |
| Hori.    | 7673.330           | PK       | 47.7              | 36.6               | 8.6          | 39.5         | 53.4               | 73.9              | 20.5           | 102            | 95             |        |
| Hori.    | 11510.000          | PK       | 45.1              | 39.8               | 9.9          | 38.9         | 55.9               | 73.9              | 18.0           | 162            | 8              |        |
| Hori.    | 3836.670           | AV       | 35.2              | 29.4               | 15.8         | 37.9         | 42.5               | 53.9              | 11.4           | 100            | 331            |        |
| Hori.    | 5725.000           | AV       | 38.4              | 32.3               | 17.1         | 37.7         | 50.1               | 53.9              | 3.8            | 100            | 191            |        |
| Hori.    | 7673.330           | AV       | 39.5              | 36.6               | 8.6          | 39.5         | 45.2               | 53.9              | 8.7            | 102            | 95             |        |
| Hori.    | 11510.000          | AV       | 34.1              | 39.8               | 9.9          | 38.9         | 44.9               | 53.9              | 9.0            | 162            | 8              |        |
| Vert.    | 3836.670           | PK       | 44.1              | 29.4               | 15.8         | 37.9         | 51.4               | 73.9              | 22.5           | 126            | 82             |        |
| Vert.    | 5725.000           | PK       | 52.7              | 32.3               | 17.1         | 37.7         | 64.4               | 73.9              | 9.5            | 100            | 91             |        |
| Vert.    | 7673.330           | PK       | 46.4              | 36.6               | 8.6          | 39.5         | 52.1               | 73.9              | 21.8           | 119            | 259            |        |
| Vert.    | 11510.000          | PK       | 44.2              | 39.8               | 9.9          | 38.9         | 55.0               | 73.9              | 18.9           | 125            | 280            |        |
| Vert.    | 3836.670           | AV       | 35.0              | 29.4               | 15.8         | 37.9         | 42.3               | 53.9              | 11.6           | 126            | 82             |        |
| Vert.    | 5725.000           | AV       | 38.7              | 32.3               | 17.1         | 37.7         | 50.4               | 53.9              | 3.5            | 100            | 91             |        |
| Vert.    | 7673.330           | AV       | 38.3              | 36.6               | 8.6          | 39.5         | 44.0               | 53.9              | 9.9            | 119            | 259            |        |
| Vert.    | 11510.000          | AV       | 34.4              | 39.8               | 9.9          | 38.9         | 45.2               | 53.9              | 8.7            | 125            | 280            |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz :  $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$ 

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



## Radiated Emission

|                        |                                      |                            |                            |                            |
|------------------------|--------------------------------------|----------------------------|----------------------------|----------------------------|
| Test place             | No.2 Semi Anechoic Chamber           | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber | No.1 Semi Anechoic Chamber |
| Date                   | May 4, 2013                          | May 8, 2013                | May 9, 2013                | May 10, 2013               |
| Temperature / Humidity | 20 deg.C, 41 %RH                     | 22 deg.C, 30 %RH           | 25 deg.C, 40 %RH           | 24 deg.C, 41 %RH           |
| Engineer               | Makoto Hosaka                        | Makoto Hosaka              | Makoto Hosaka              | Makoto Hosaka              |
| Mode                   | Tx, 5795 MHz<br>Tx, IEEE802.11n HT40 |                            |                            |                            |

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

| Polarity | Frequency<br>[MHz] | Detector | Reading<br>[dBuV] | Ant.Fac.<br>[dB/m] | Loss<br>[dB] | Gain<br>[dB] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Height<br>[cm] | Angle<br>[deg] | Remark |
|----------|--------------------|----------|-------------------|--------------------|--------------|--------------|--------------------|-------------------|----------------|----------------|----------------|--------|
| Hori.    | 3863.330           | PK       | 44.1              | 29.4               | 15.8         | 37.8         | 51.5               | 73.9              | 22.4           | 107            | 354            |        |
| Hori.    | 5850.000           | PK       | 44.1              | 32.7               | 17.2         | 37.9         | 56.1               | 73.9              | 17.8           | 100            | 257            |        |
| Hori.    | 7726.670           | PK       | 47.4              | 36.7               | 8.6          | 39.4         | 53.3               | 73.9              | 20.6           | 100            | 94             |        |
| Hori.    | 11590.000          | PK       | 44.2              | 39.7               | 9.9          | 38.7         | 55.1               | 73.9              | 18.8           | 100            | 9              |        |
| Hori.    | 3863.330           | AV       | 35.2              | 29.4               | 15.8         | 37.8         | 42.6               | 53.9              | 11.3           | 107            | 354            |        |
| Hori.    | 5850.000           | AV       | 34.8              | 32.7               | 17.2         | 37.9         | 46.8               | 53.9              | 7.1            | 100            | 257            |        |
| Hori.    | 7726.670           | AV       | 38.9              | 36.7               | 8.6          | 39.4         | 44.8               | 53.9              | 9.1            | 100            | 94             |        |
| Hori.    | 11590.000          | AV       | 34.4              | 39.7               | 9.9          | 38.7         | 45.3               | 53.9              | 8.6            | 100            | 9              |        |
| Vert.    | 3863.330           | PK       | 44.3              | 29.4               | 15.8         | 37.8         | 51.7               | 73.9              | 22.2           | 100            | 279            |        |
| Vert.    | 5850.000           | PK       | 44.2              | 32.7               | 17.2         | 37.9         | 56.2               | 73.9              | 17.7           | 100            | 293            |        |
| Vert.    | 7726.670           | PK       | 46.8              | 36.7               | 8.6          | 39.4         | 52.7               | 73.9              | 21.2           | 108            | 267            |        |
| Vert.    | 11590.000          | PK       | 44.9              | 39.7               | 9.9          | 38.7         | 55.8               | 73.9              | 18.1           | 100            | 282            |        |
| Vert.    | 3863.330           | AV       | 35.7              | 29.4               | 15.8         | 37.8         | 43.1               | 53.9              | 10.8           | 100            | 279            |        |
| Vert.    | 5850.000           | AV       | 34.6              | 32.7               | 17.2         | 37.9         | 46.6               | 53.9              | 7.3            | 100            | 293            |        |
| Vert.    | 7726.670           | AV       | 38.9              | 36.7               | 8.6          | 39.4         | 44.8               | 53.9              | 9.1            | 108            | 267            |        |
| Vert.    | 11590.000          | AV       | 35.0              | 39.7               | 9.9          | 38.7         | 45.9               | 53.9              | 8.0            | 100            | 282            |        |

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

Distance factor : 15GHz -40GHz :  $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$ 

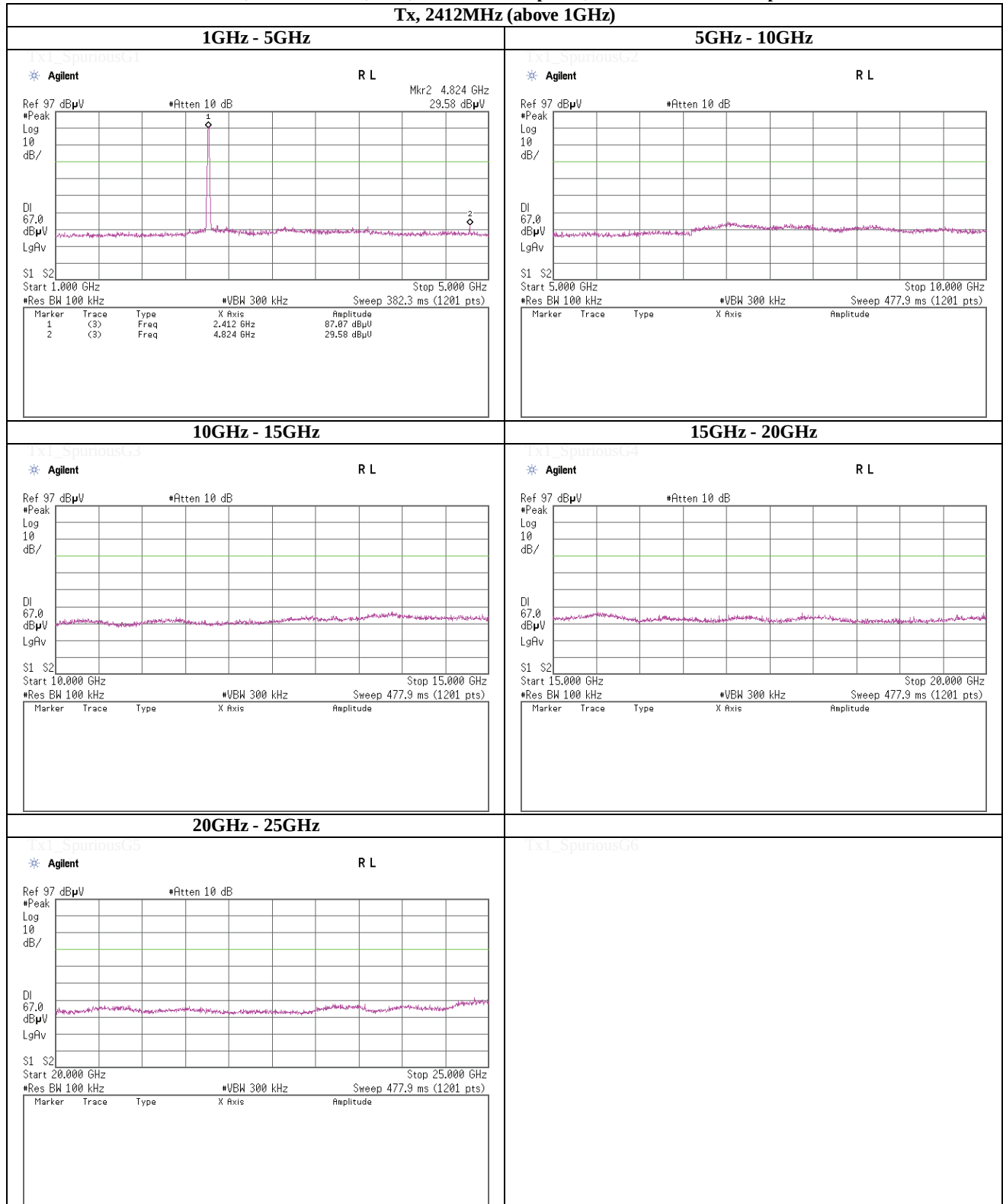
\*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

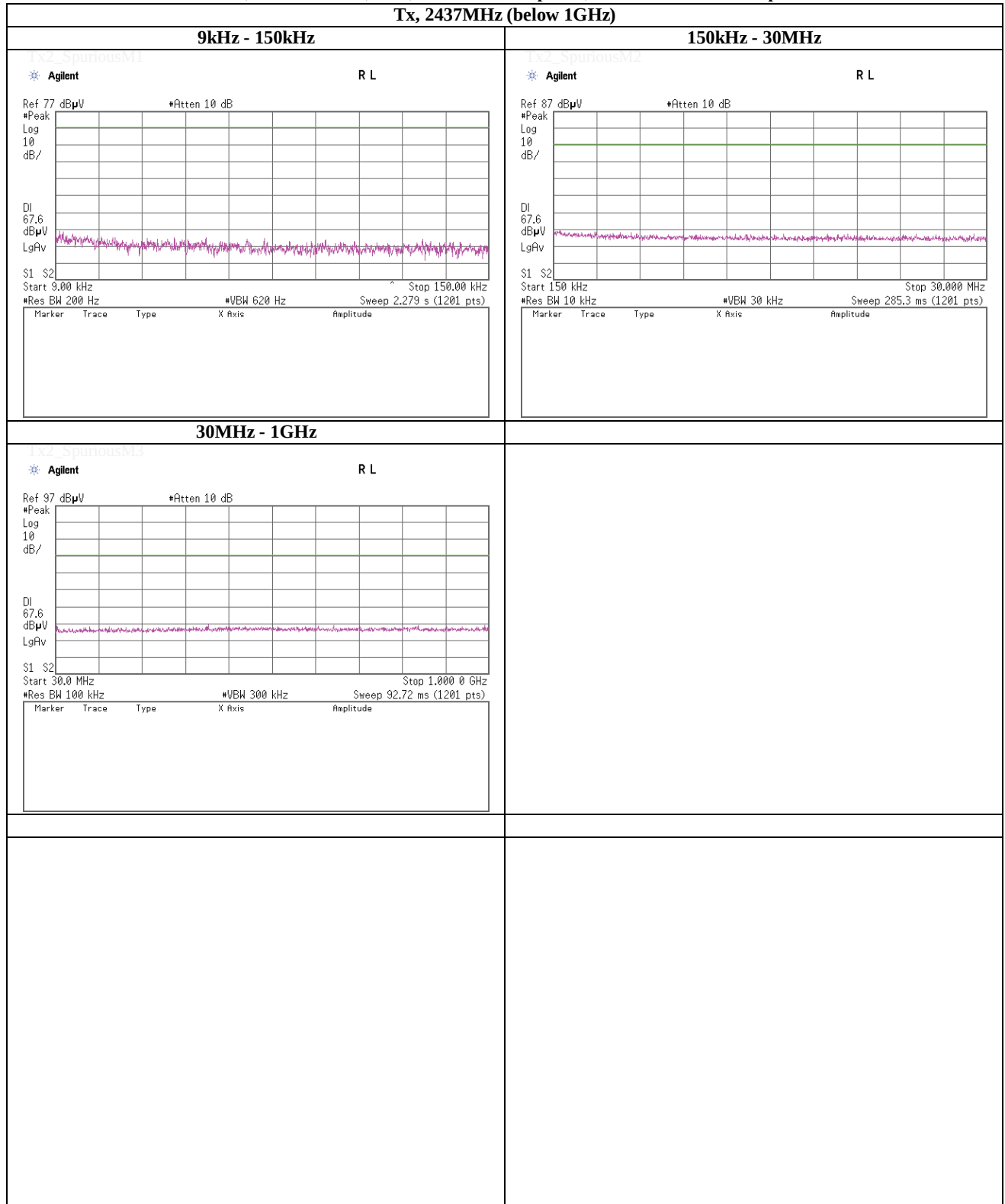
**(Reference chart) Spurious emission (Conducted)****Tx, IEEE802.11b , PN9, worst antenna port 1, worst data mode 1Mbps****Tx, 2412MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**(Reference chart) Spurious emission (Conducted)****Tx, IEEE802.11b , PN9, worst antenna port 1, worst data mode 1Mbps****Tx, 2412MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

**(Reference chart) Spurious emission (Conducted)****Tx, IEEE802.11b , PN9, worst antenna port 1, worst data mode 1Mbps****Tx, 2437MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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

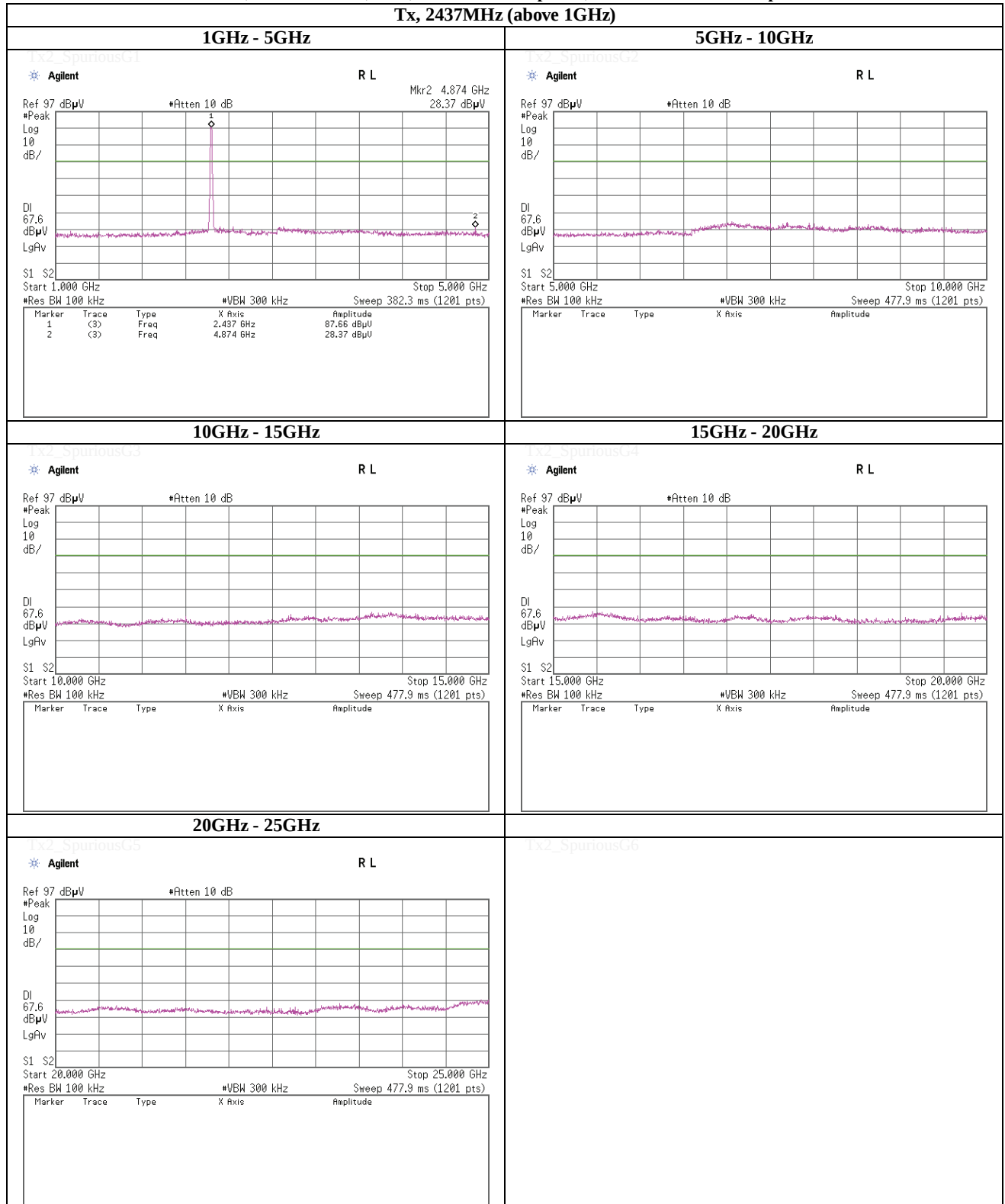
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**(Reference chart) Spurious emission (Conducted)**

Tx, IEEE802.11b , PN9, worst antenna port 1, worst data mode 1Mbps

Tx, 2437MHz (above 1GHz)



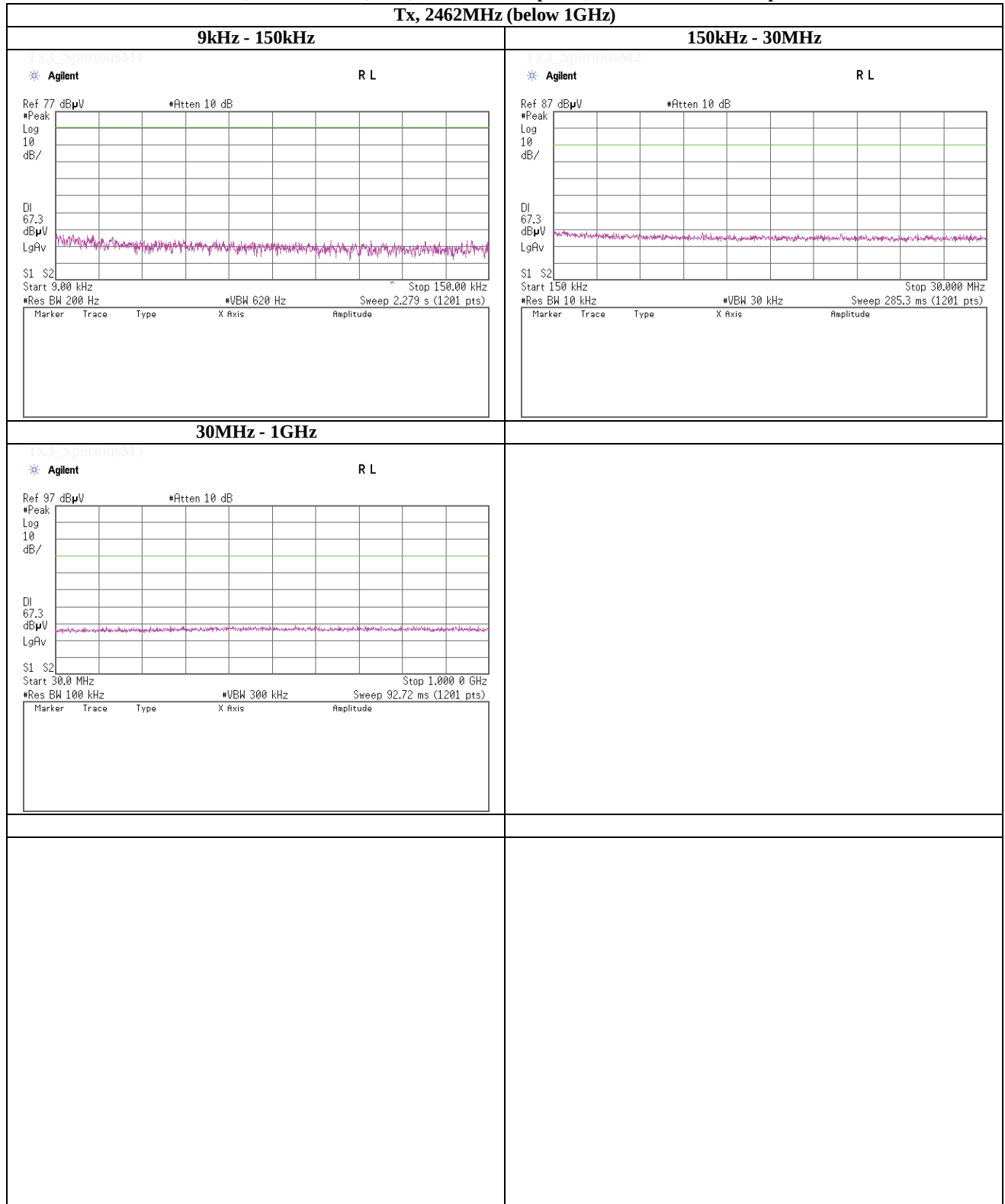
UL Japan, Inc.

Shonan EMC Lab.

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Telephone : +81 463 50 6400

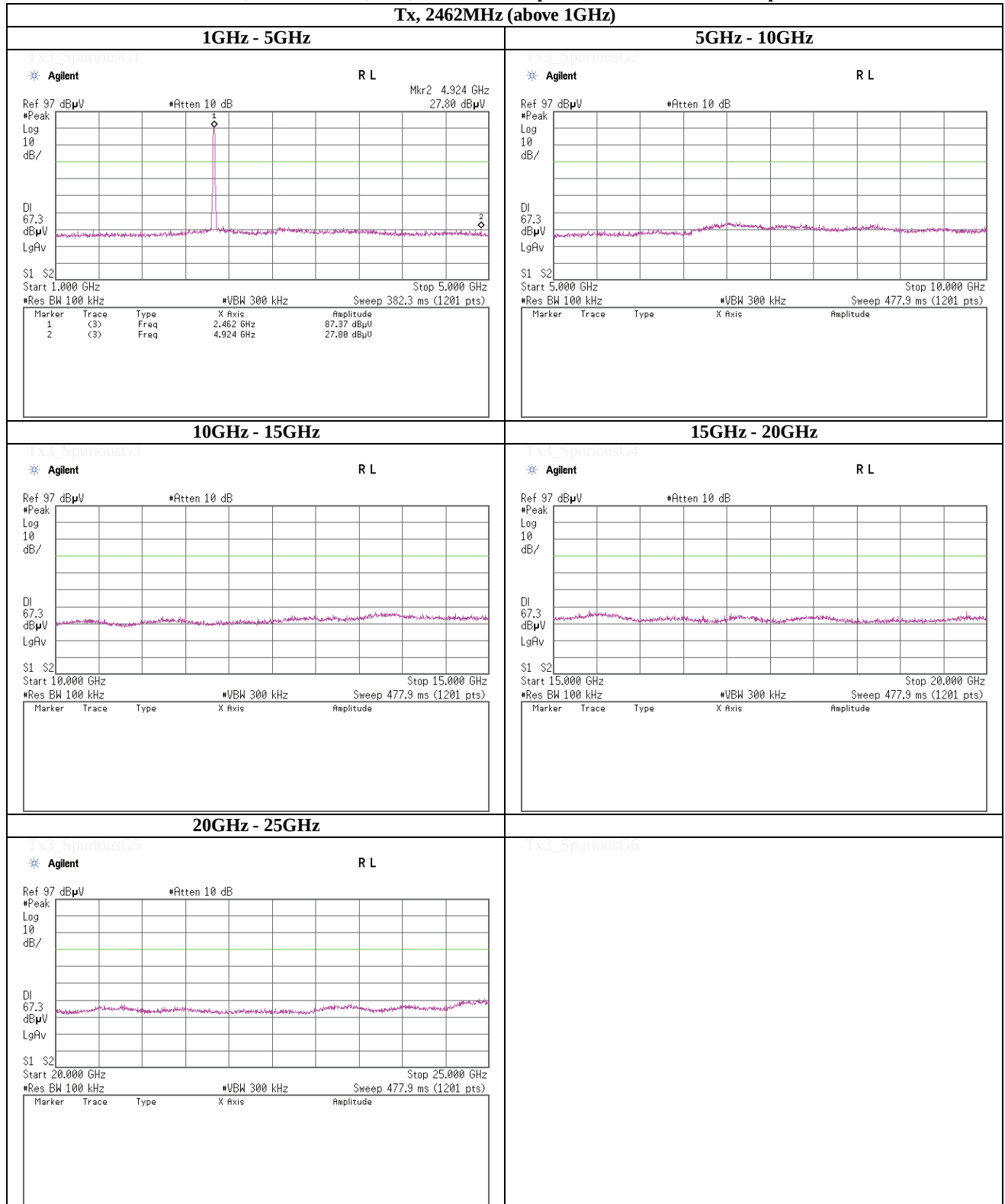
Facsimile : +81 463 50 6401

**(Reference chart) Spurious emission (Conducted)****Tx, IEEE802.11b , PN9, worst antenna port 1, worst data mode 1Mbps****Tx, 2462MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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

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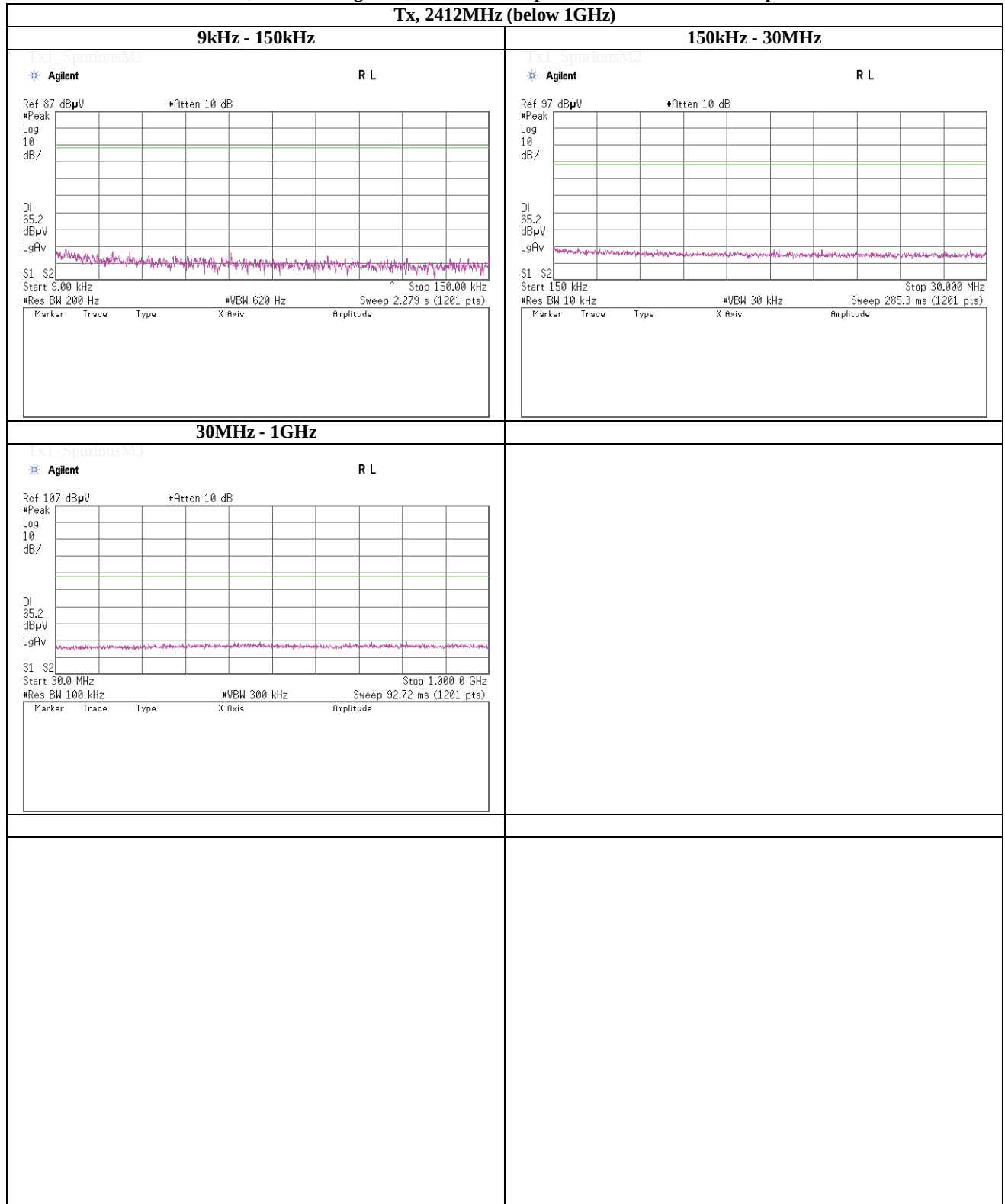
Facsimile : +81 463 50 6401

**(Reference chart) Spurious emission (Conducted)****Tx, IEEE802.11b , PN9, worst antenna port 1, worst data mode 1Mbps****Tx, 2462MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

**(Reference chart) Spurious emission (Conducted)**

Tx, IEEE802.11g, PN9, worst antenna port 1, worst data mode 6Mbps

Tx, 2412MHz (below 1GHz)

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Telephone : +81 463 50 6400

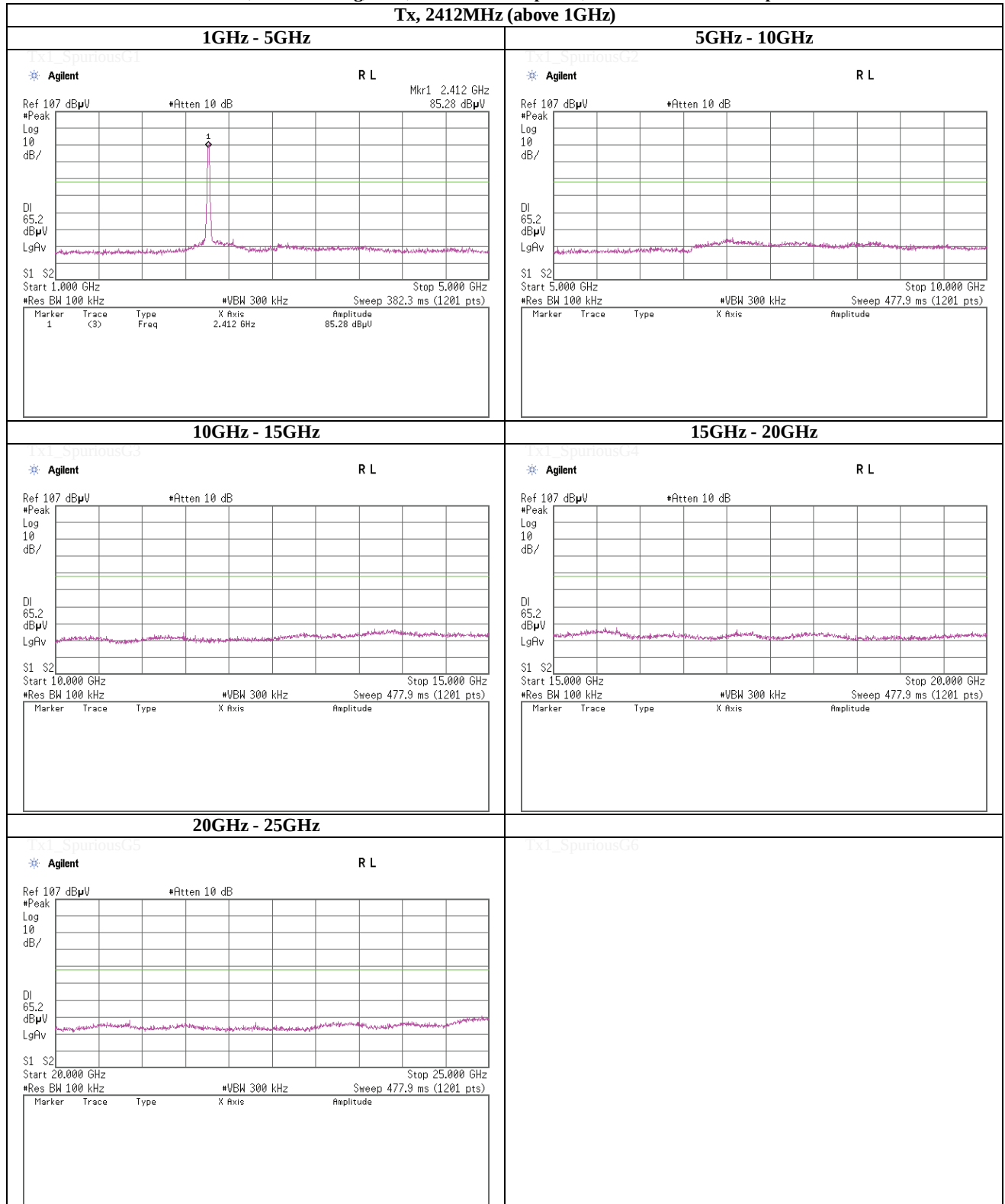
Facsimile : +81 463 50 6401



**(Reference chart) Spurious emission (Conducted)**

Tx, IEEE802.11g, PN9, worst antenna port 1, worst data mode 6Mbps

Tx, 2412MHz (above 1GHz)

**UL Japan, Inc.****Shonan EMC Lab.**

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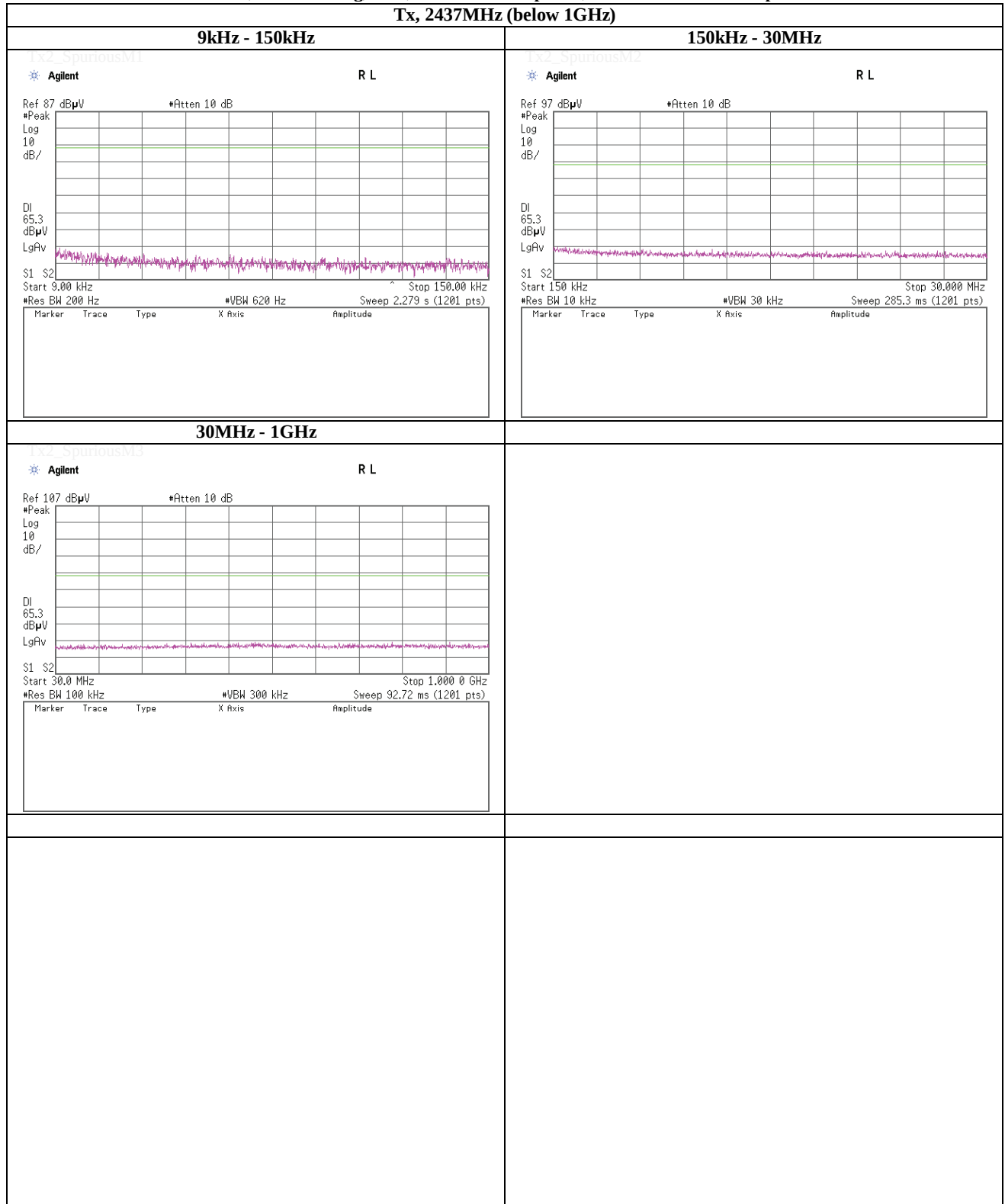
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**(Reference chart) Spurious emission (Conducted)**

Tx, IEEE802.11g, PN9, worst antenna port 1, worst data mode 6Mbps

Tx, 2437MHz (below 1GHz)

**UL Japan, Inc.****Shonan EMC Lab.**

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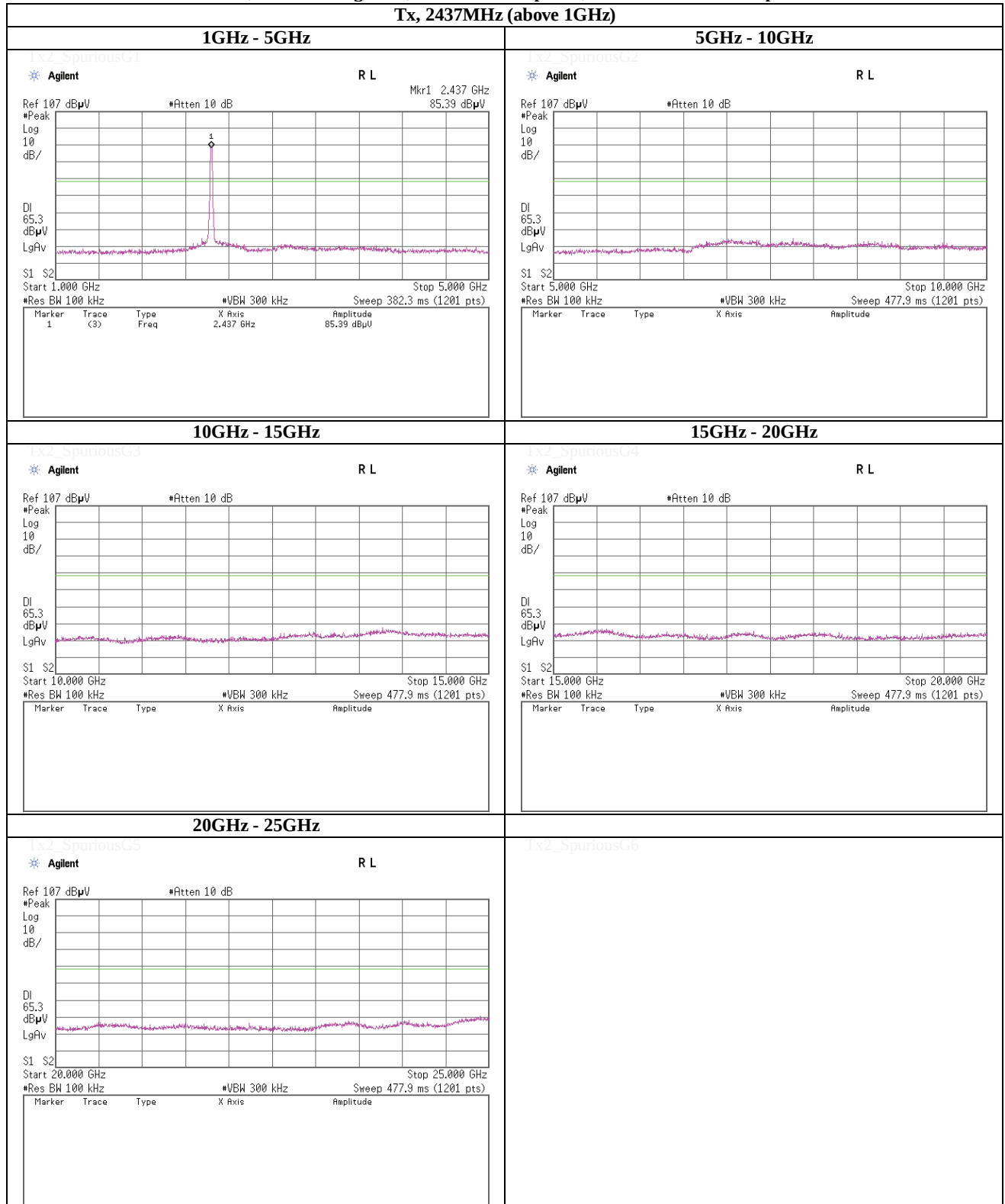
Telephone : +81 463 50 6400

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**(Reference chart) Spurious emission (Conducted)**

Tx, IEEE802.11g, PN9, worst antenna port 1, worst data mode 6Mbps

Tx, 2437MHz (above 1GHz)



UL Japan, Inc.

Shonan EMC Lab.

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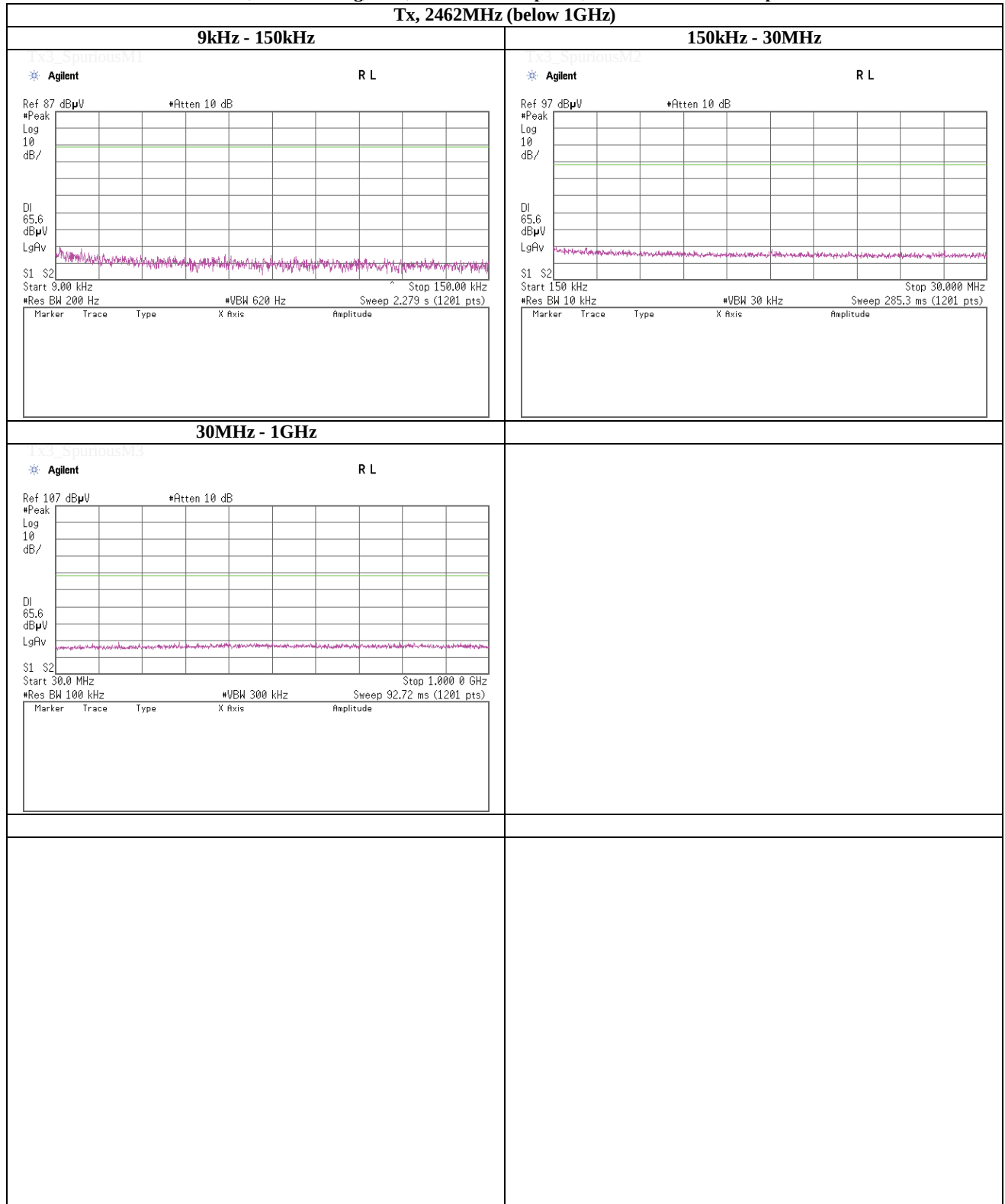
Telephone : +81 463 50 6400

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**(Reference chart) Spurious emission (Conducted)**

Tx, IEEE802.11g, PN9, worst antenna port 1, worst data mode 6Mbps

Tx, 2462MHz (below 1GHz)

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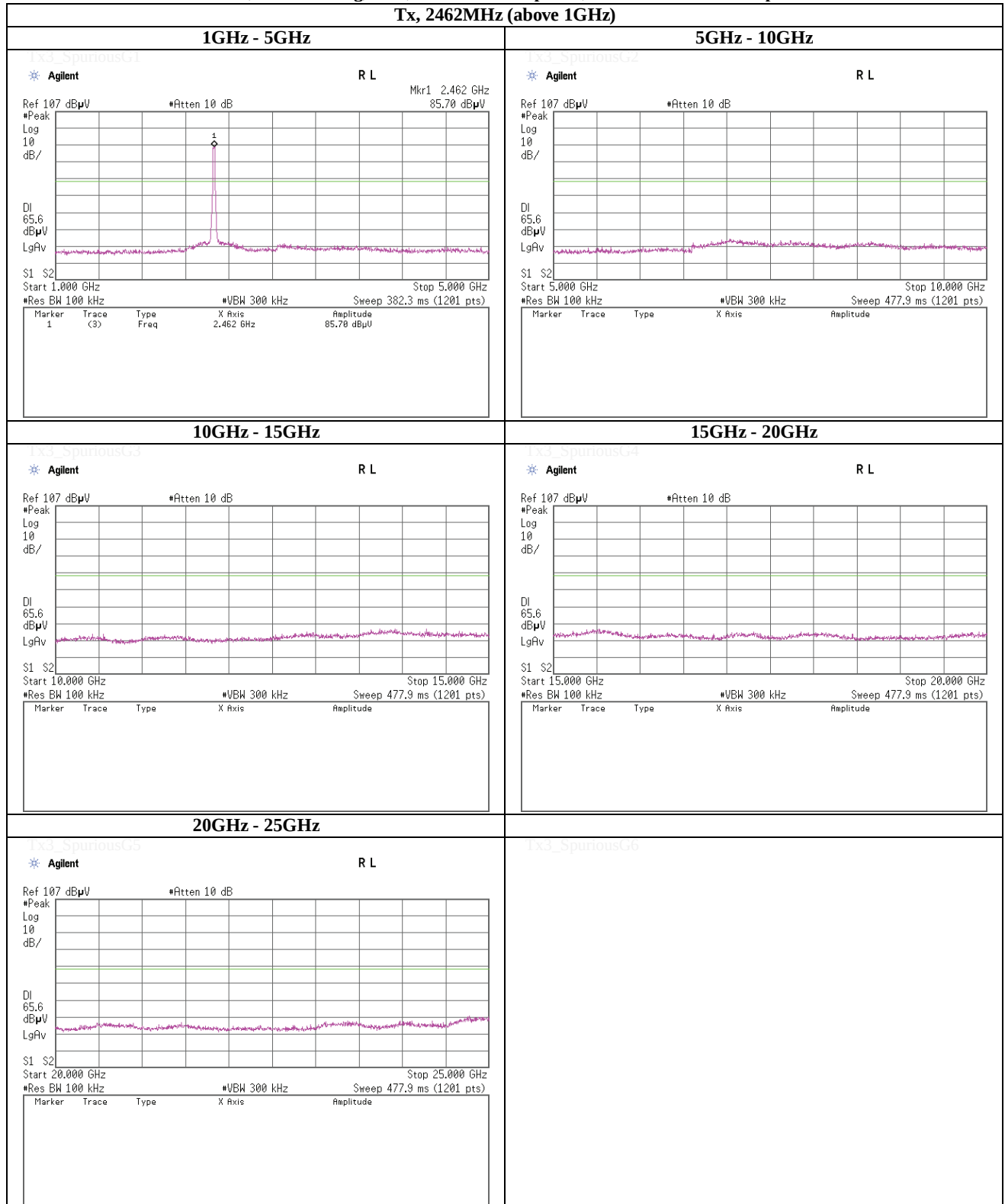
Telephone : +81 463 50 6400

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**(Reference chart) Spurious emission (Conducted)**

Tx, IEEE802.11g, PN9, worst antenna port 1, worst data mode 6Mbps

Tx, 2462MHz (above 1GHz)



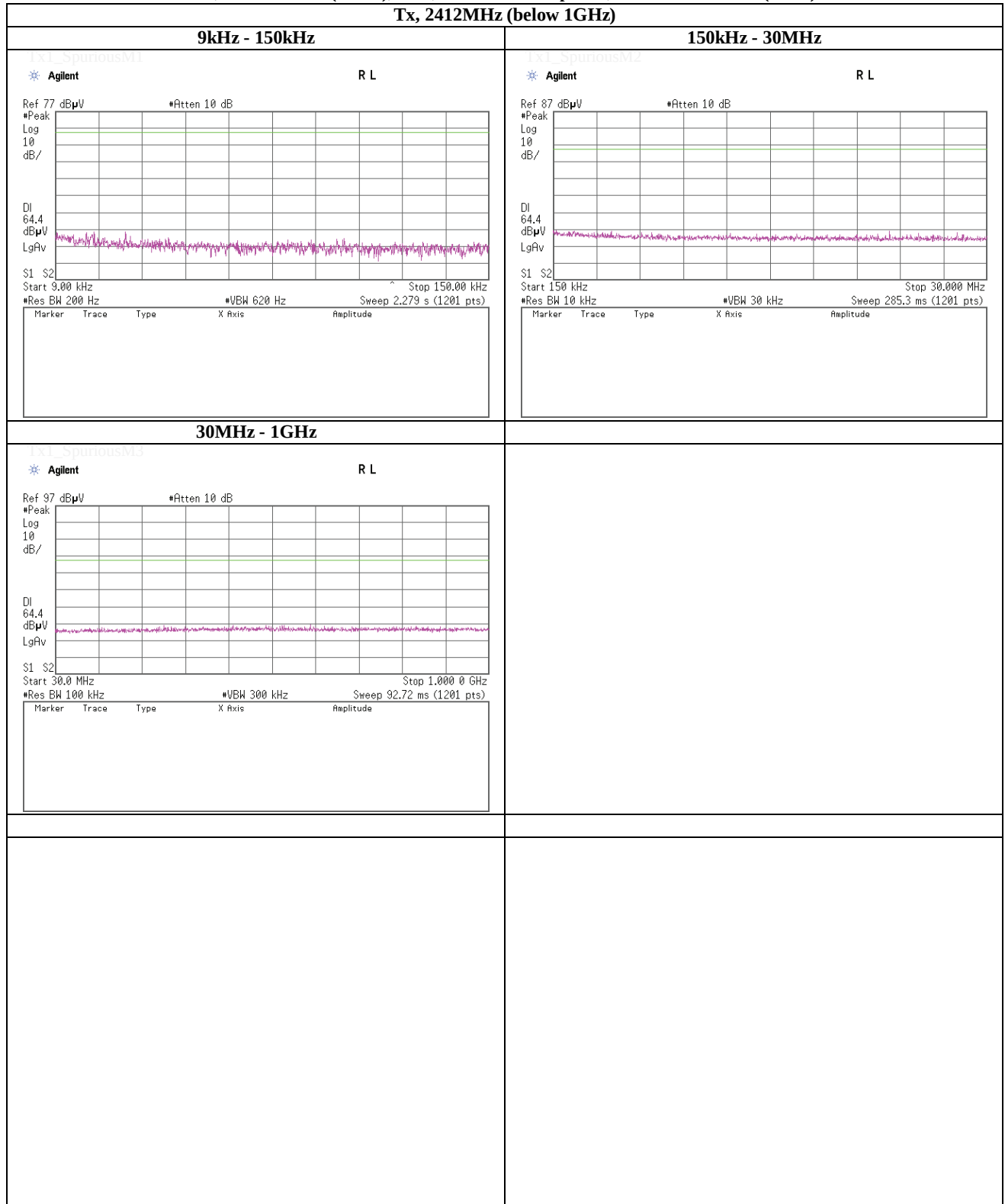
UL Japan, Inc.

Shonan EMC Lab.

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Telephone : +81 463 50 6400

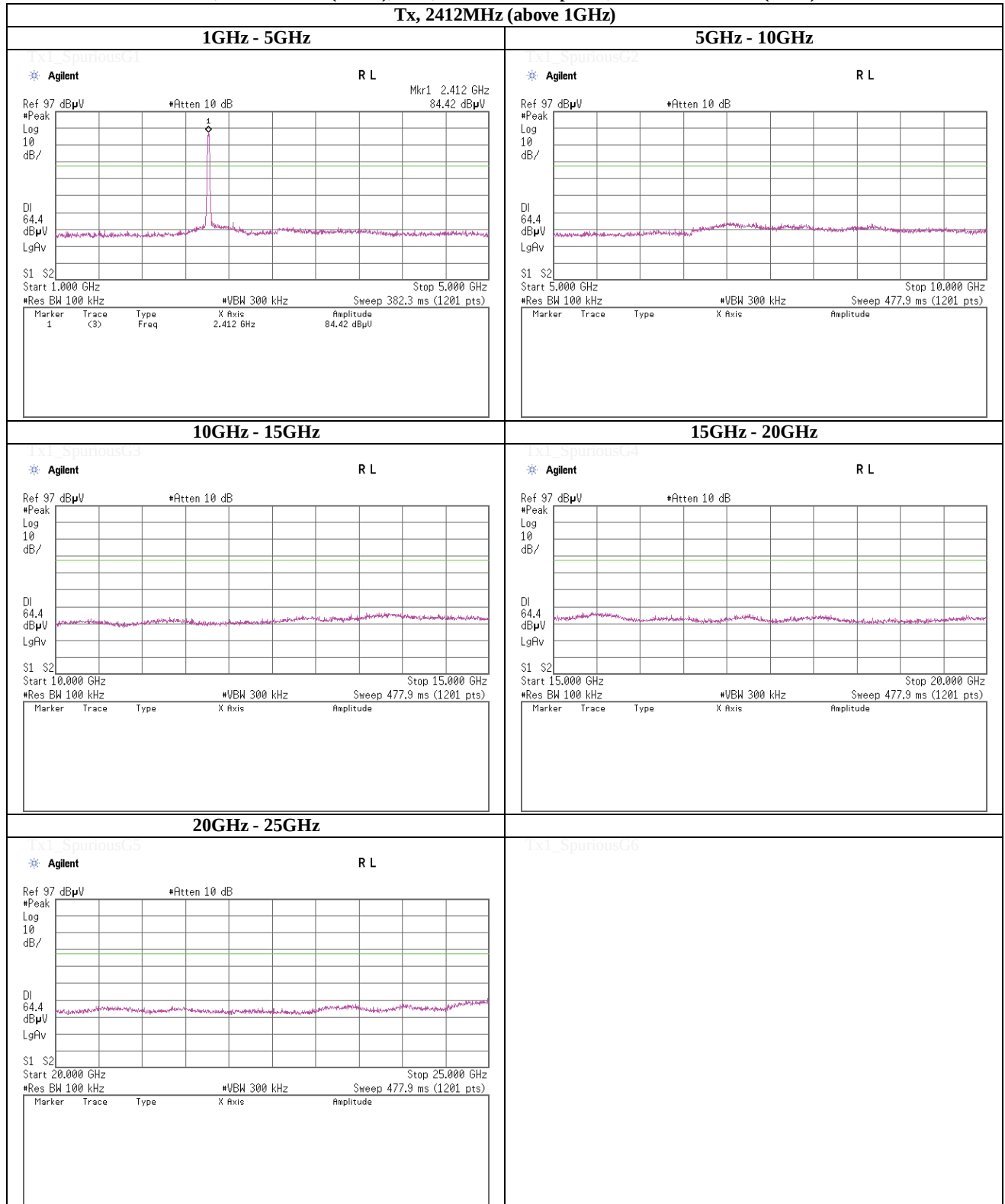
Facsimile : +81 463 50 6401

**(Reference chart) Spurious emission (Conducted)****Tx, IEEE802.11n(HT20), PN9, worst antenna port 1, worst data mode 0(MCS)****Tx, 2412MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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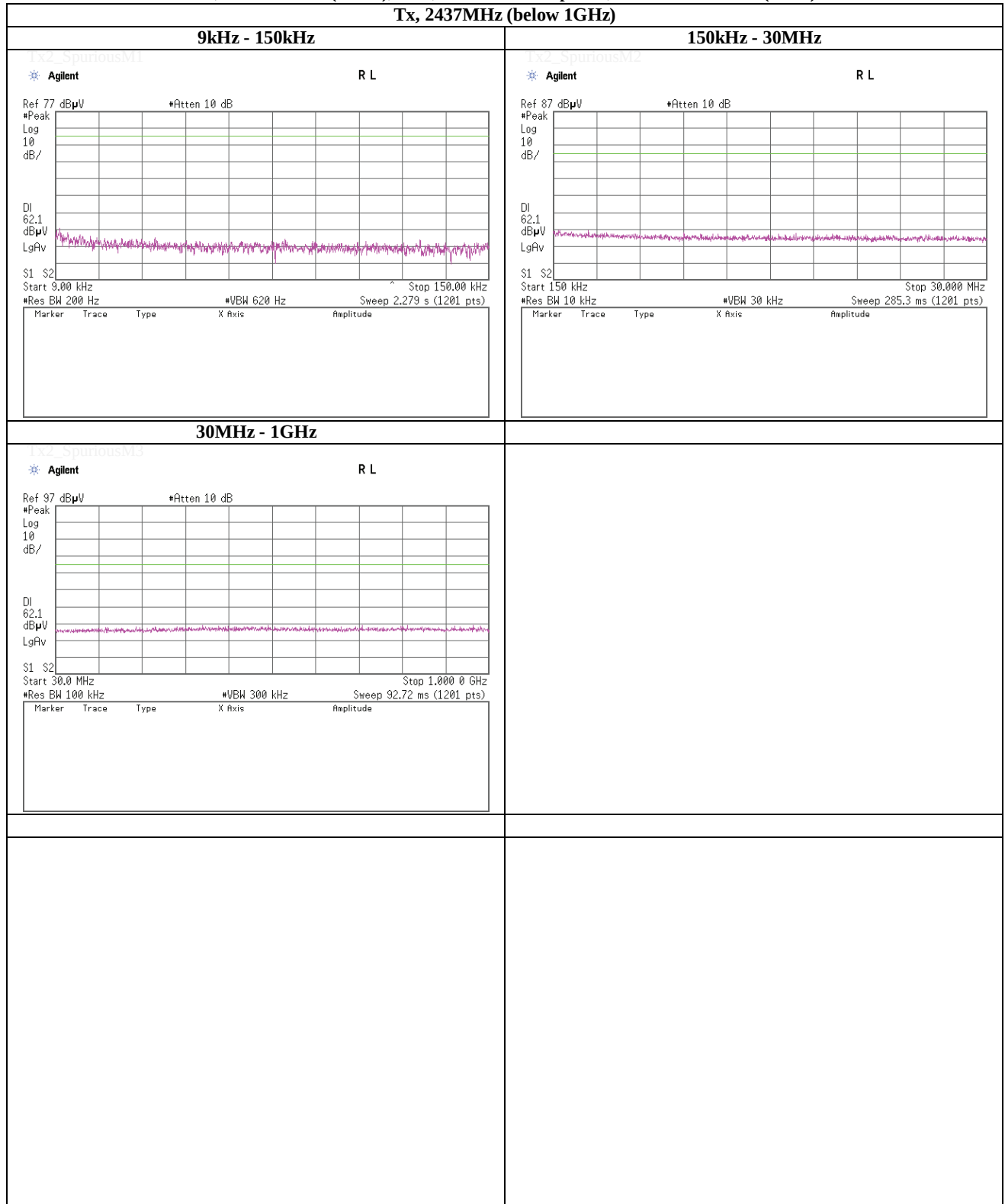
Facsimile : +81 463 50 6401

**(Reference chart) Spurious emission (Conducted)****Tx, IEEE802.11n(HT20), PN9, worst antenna port 1, worst data mode 0(MCS)****Tx, 2412MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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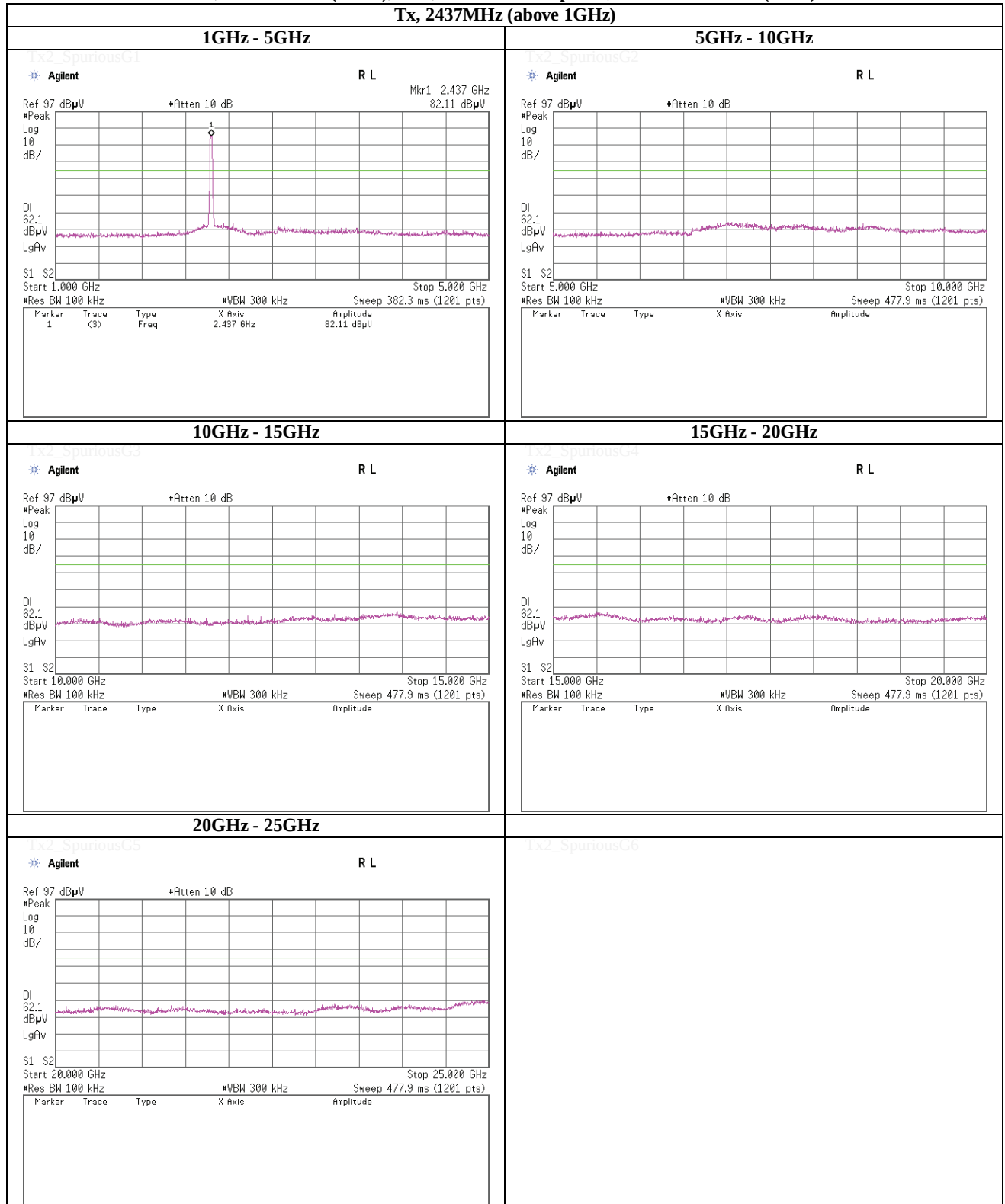
**(Reference chart) Spurious emission (Conducted)****Tx, IEEE802.11n(HT20), PN9, worst antenna port 1, worst data mode 0(MCS)****Tx, 2437MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

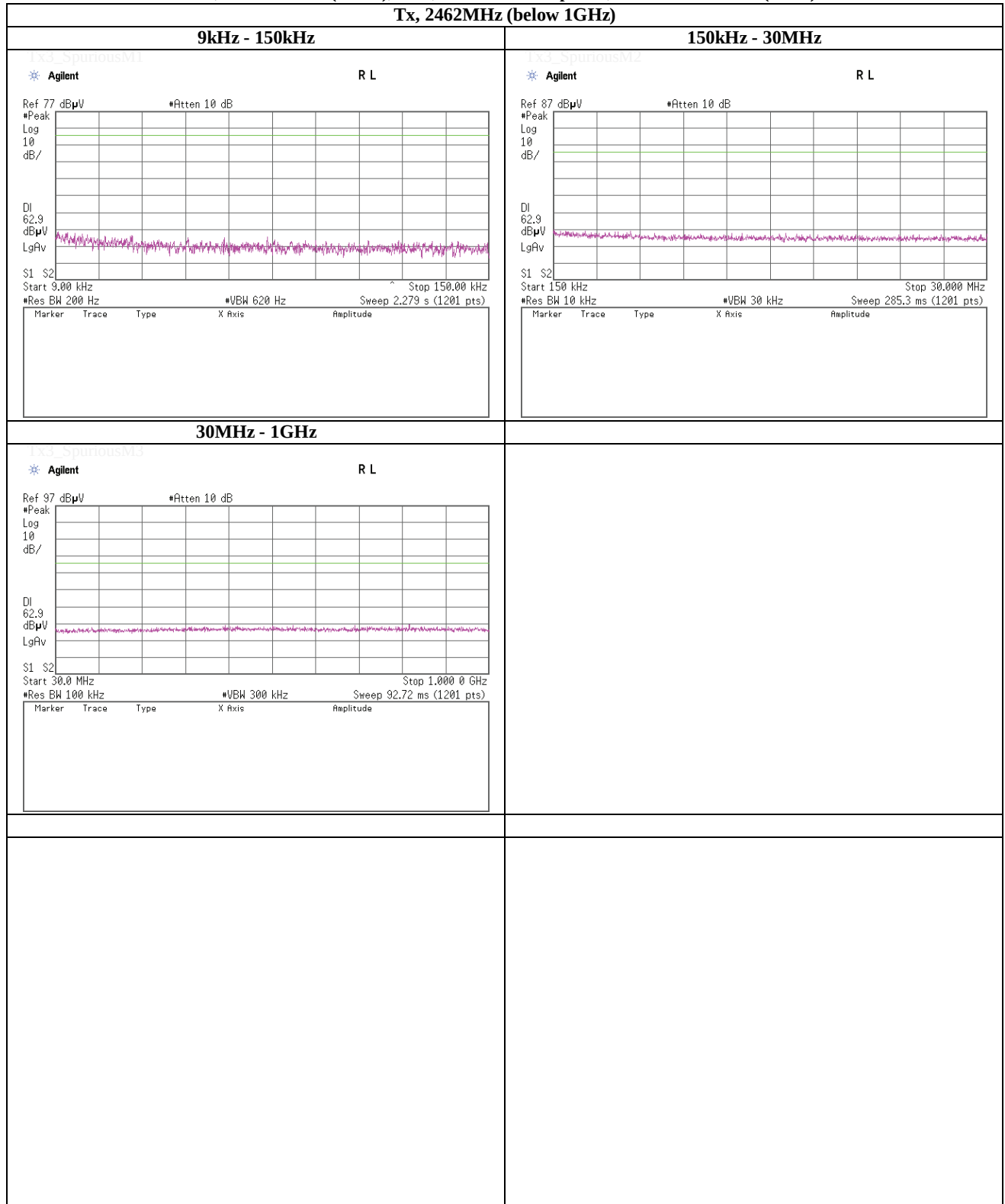
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

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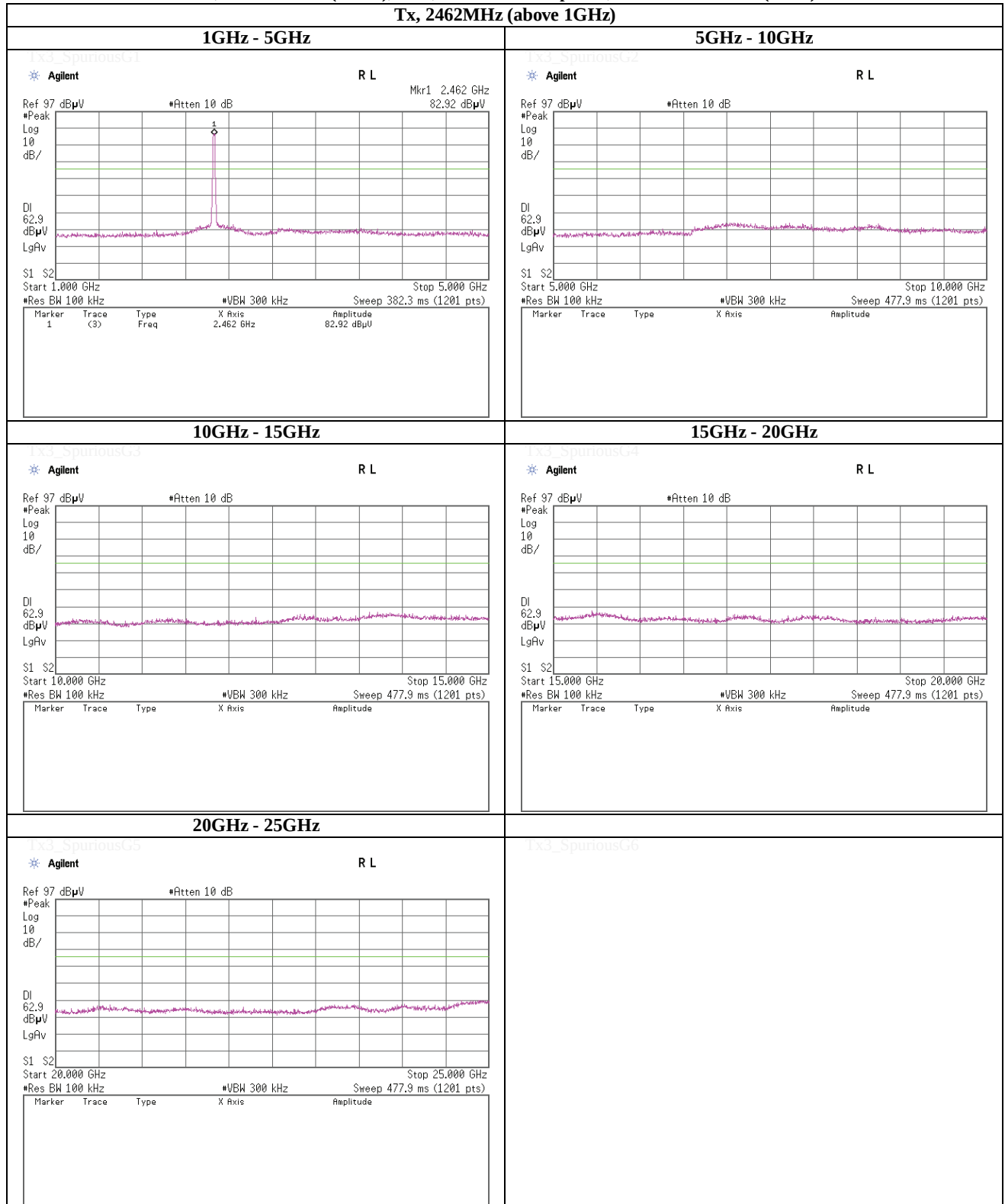
**(Reference chart) Spurious emission (Conducted)****Tx, IEEE802.11n(HT20), PN9, worst antenna port 1, worst data mode 0(MCS)****Tx, 2437MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

**(Reference chart) Spurious emission (Conducted)****Tx, IEEE802.11n(HT20), PN9, worst antenna port 1, worst data mode 0(MCS)****Tx, 2462MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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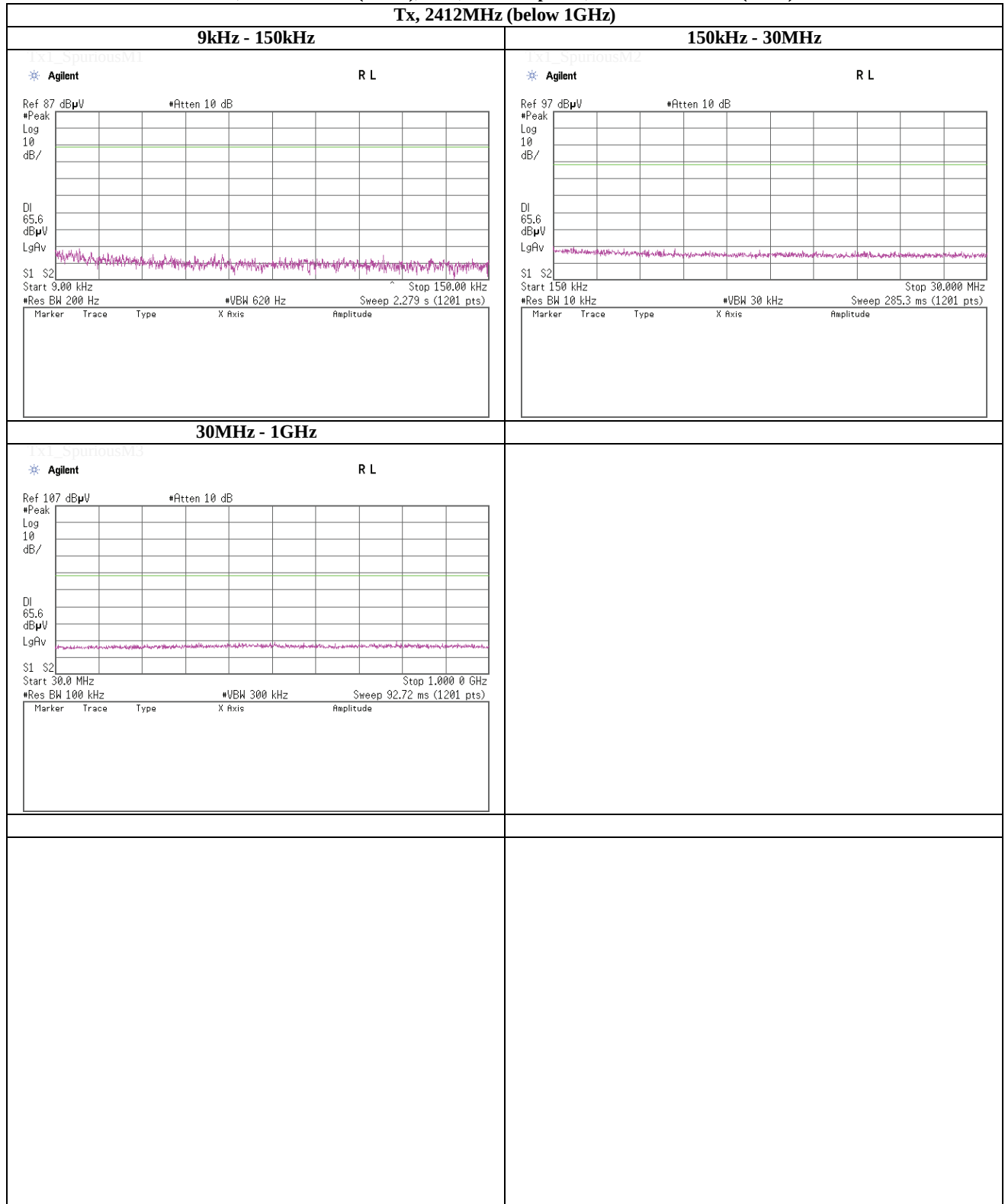
Facsimile : +81 463 50 6401

**(Reference chart) Spurious emission (Conducted)****Tx, IEEE802.11n(HT20), PN9, worst antenna port 1, worst data mode 0(MCS)****Tx, 2462MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

**Spurious emission (Conducted)**

Tx, IEEE802.11n (HT20), PN9, antenna port 1, worst data mode 8(MCS)

Tx, 2412MHz (below 1GHz)

**UL Japan, Inc.****Shonan EMC Lab.**

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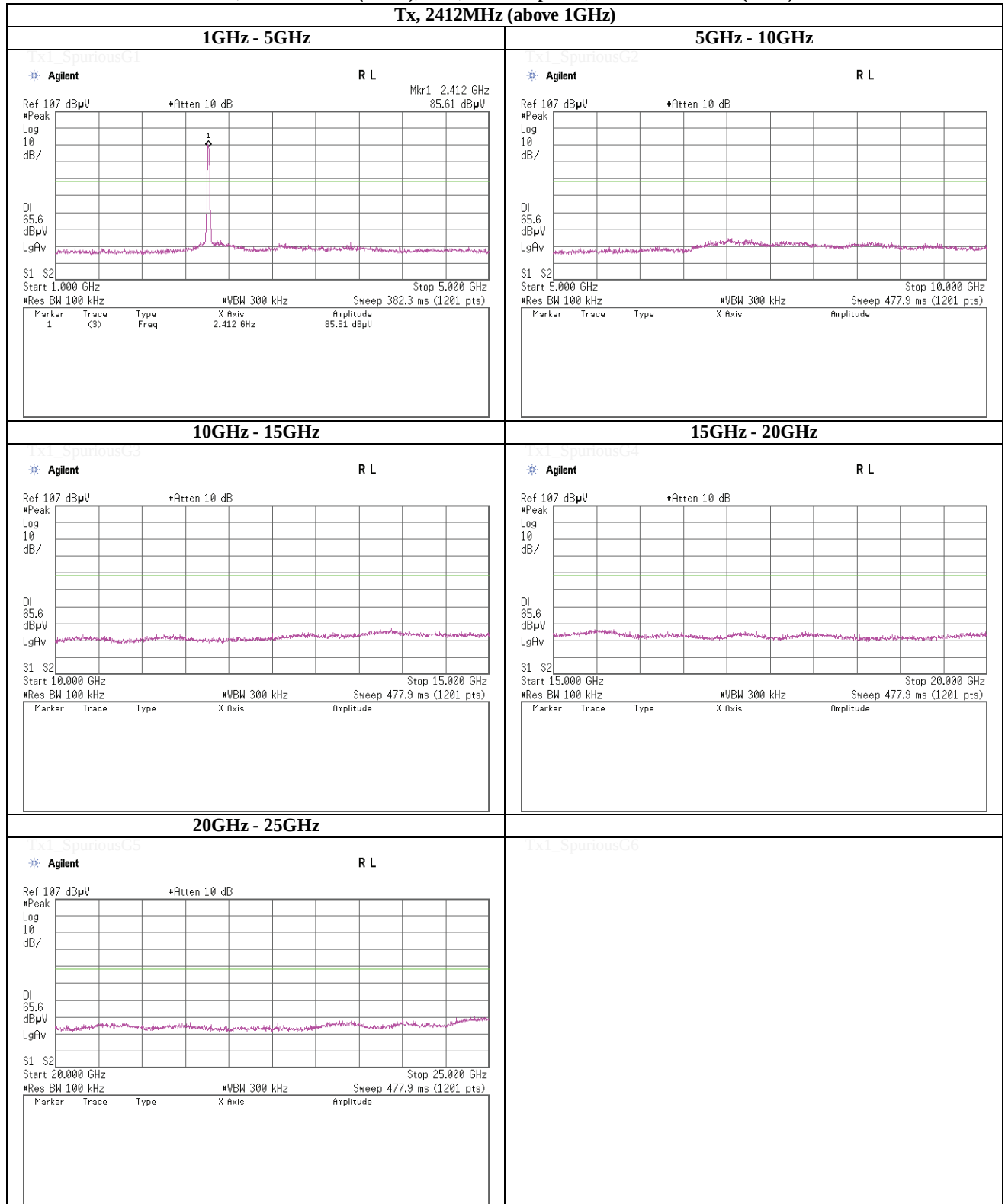
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Conducted)**

Tx, IEEE802.11n (HT20), PN9, antenna port 1, worst data mode 8(MCS)

Tx, 2412MHz (above 1GHz)

**UL Japan, Inc.****Shonan EMC Lab.**

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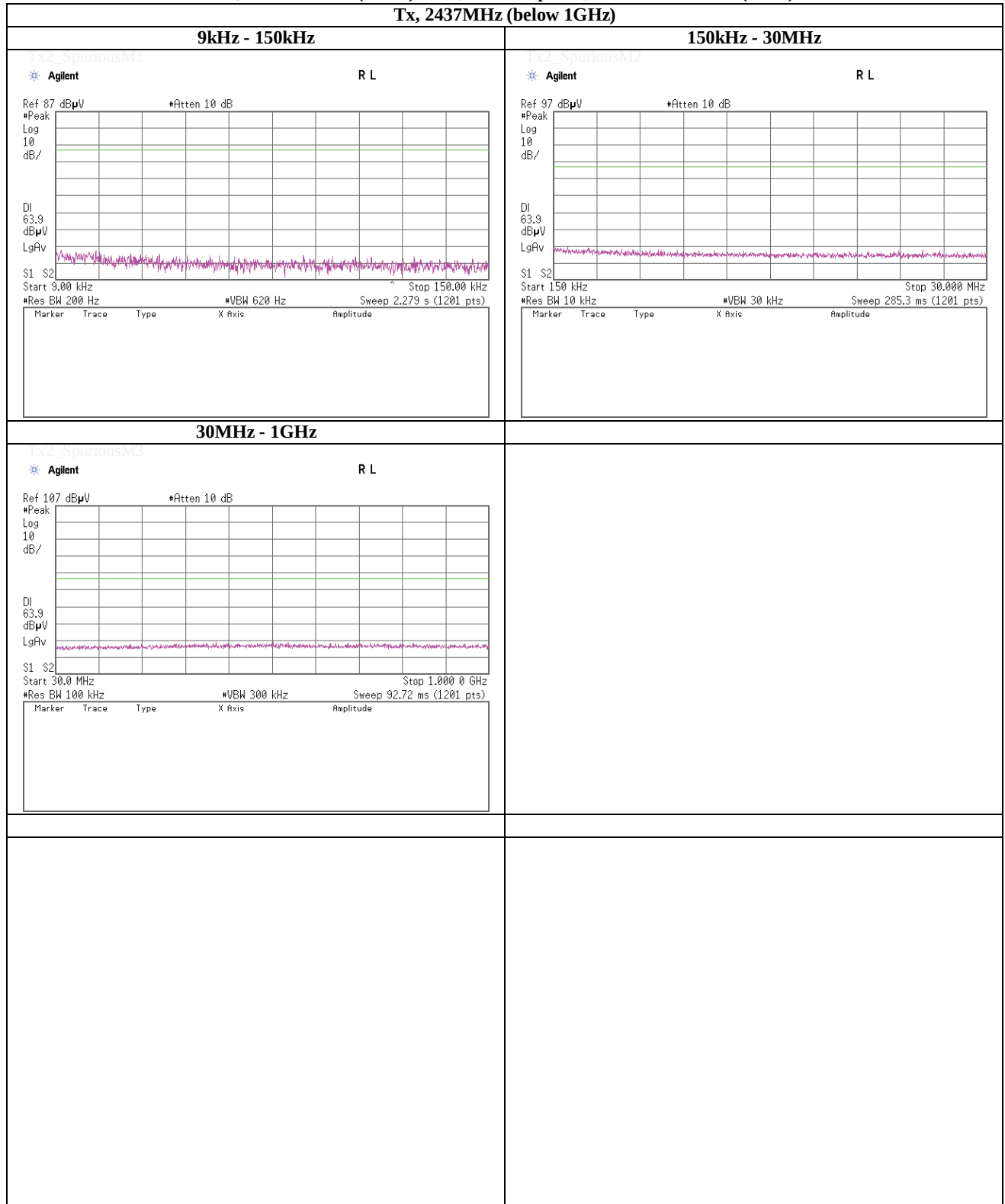
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Conducted)**

Tx, IEEE802.11n (HT20), PN9, antenna port 1, worst data mode 8(MCS)

Tx, 2437MHz (below 1GHz)

**UL Japan, Inc.****Shonan EMC Lab.**

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

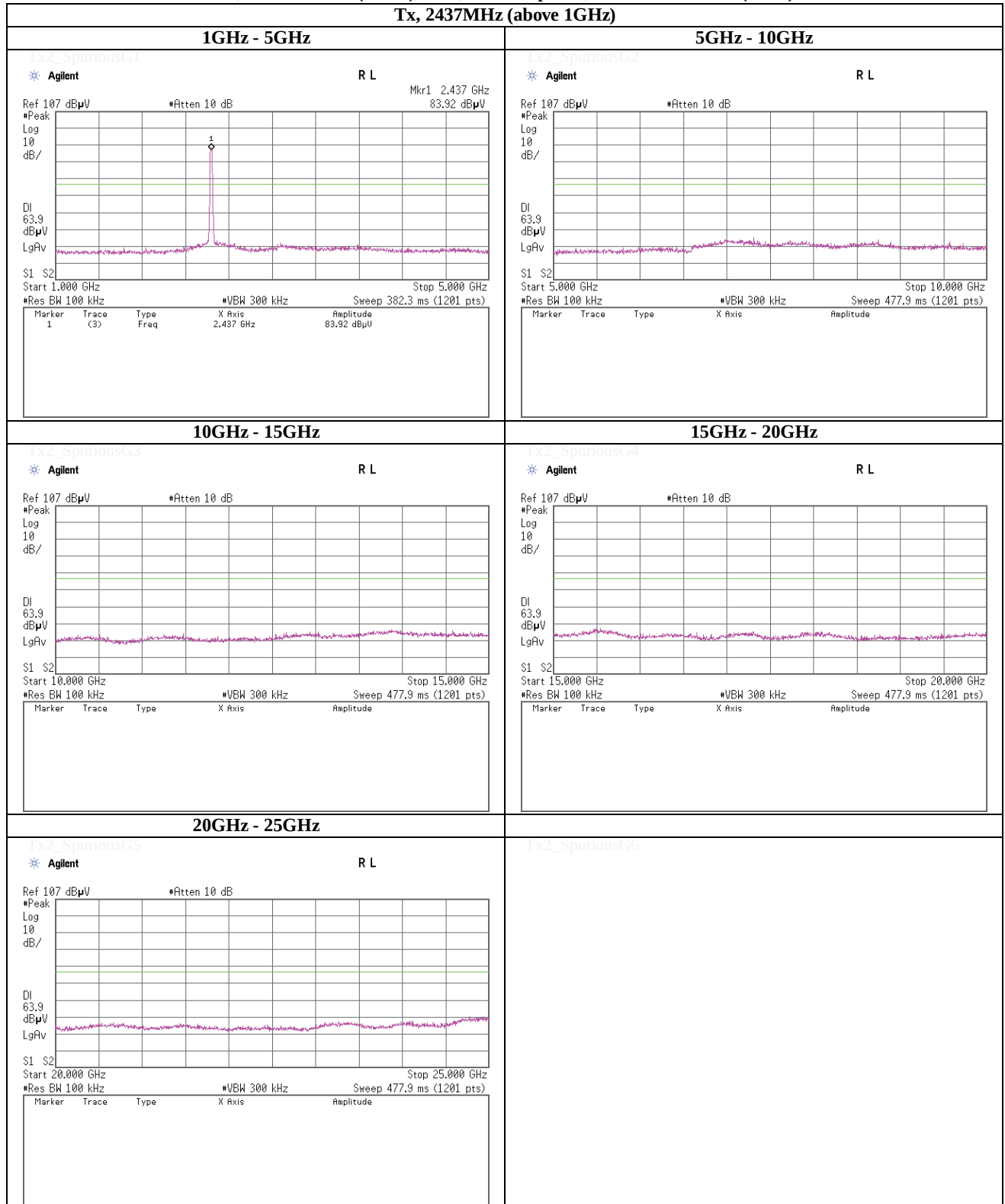
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Conducted)**

Tx, IEEE802.11n (HT20), PN9, antenna port 1, worst data mode 8(MCS)

Tx, 2437MHz (above 1GHz)



UL Japan, Inc.

Shonan EMC Lab.

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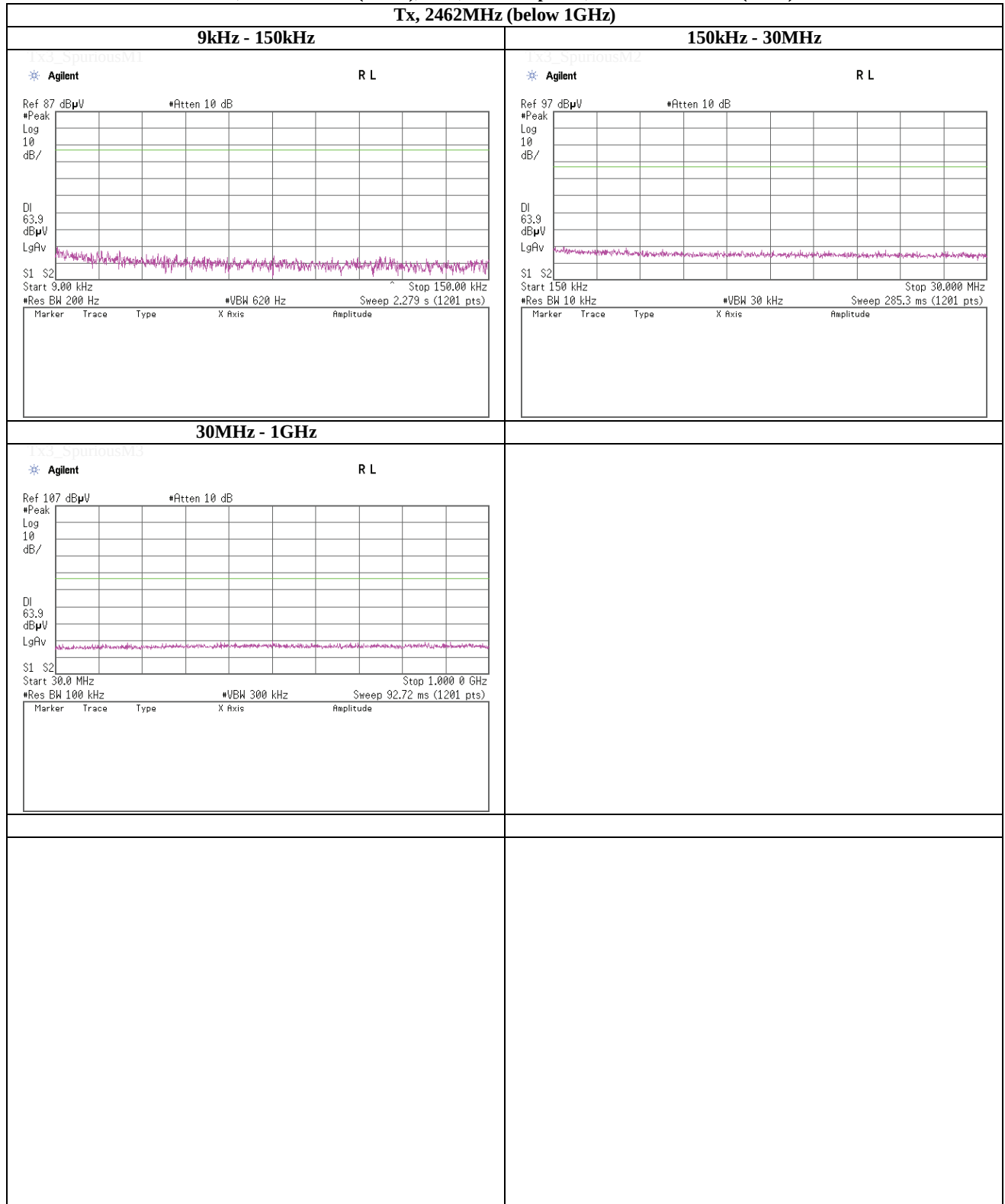
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Conducted)**

Tx, IEEE802.11n (HT20), PN9, antenna port 1, worst data mode 8(MCS)

Tx, 2462MHz (below 1GHz)

**UL Japan, Inc.****Shonan EMC Lab.**

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

Telephone : +81 463 50 6400

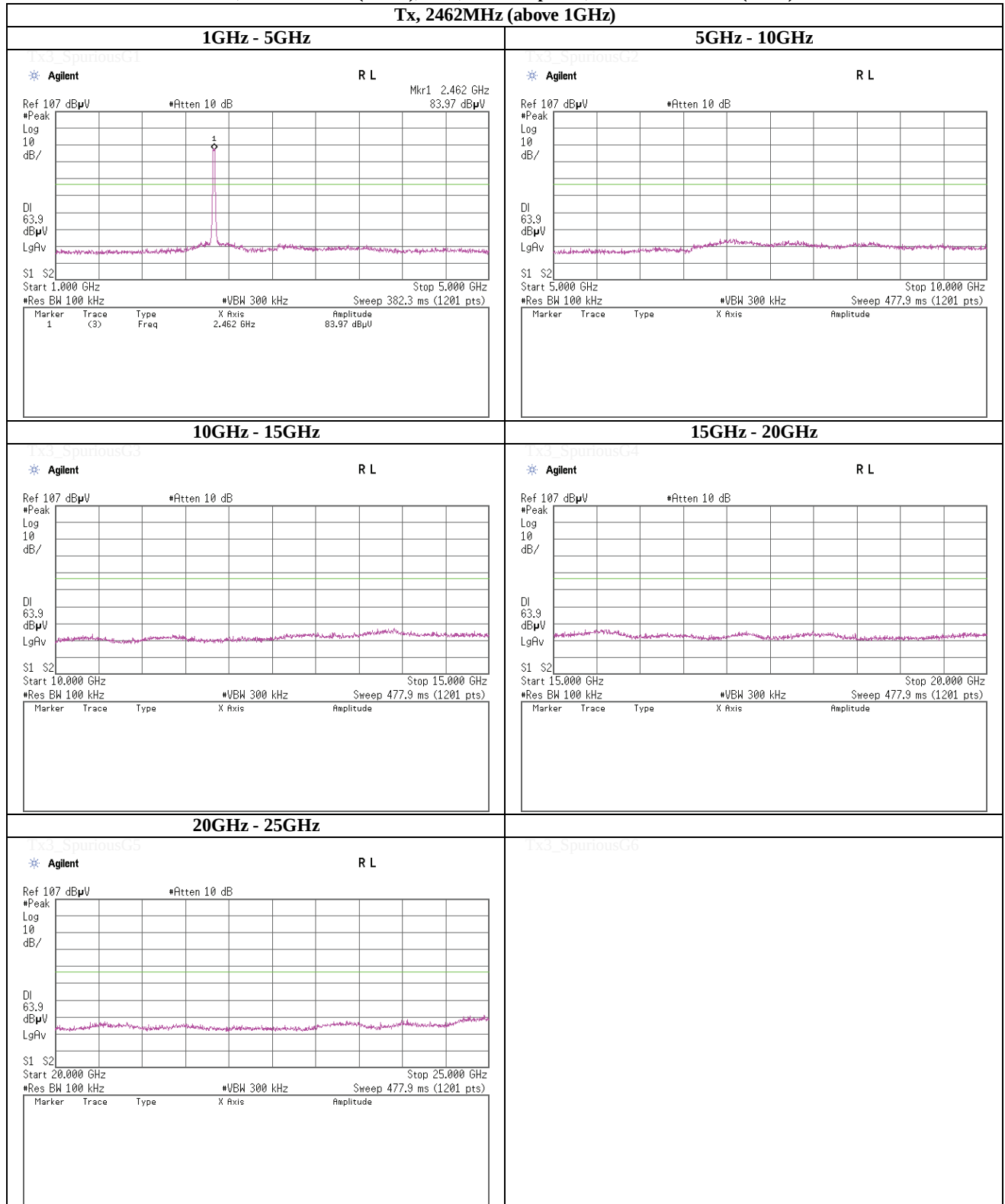
Facsimile : +81 463 50 6401



**Spurious emission (Conducted)**

Tx, IEEE802.11n (HT20), PN9, antenna port 1, worst data mode 8(MCS)

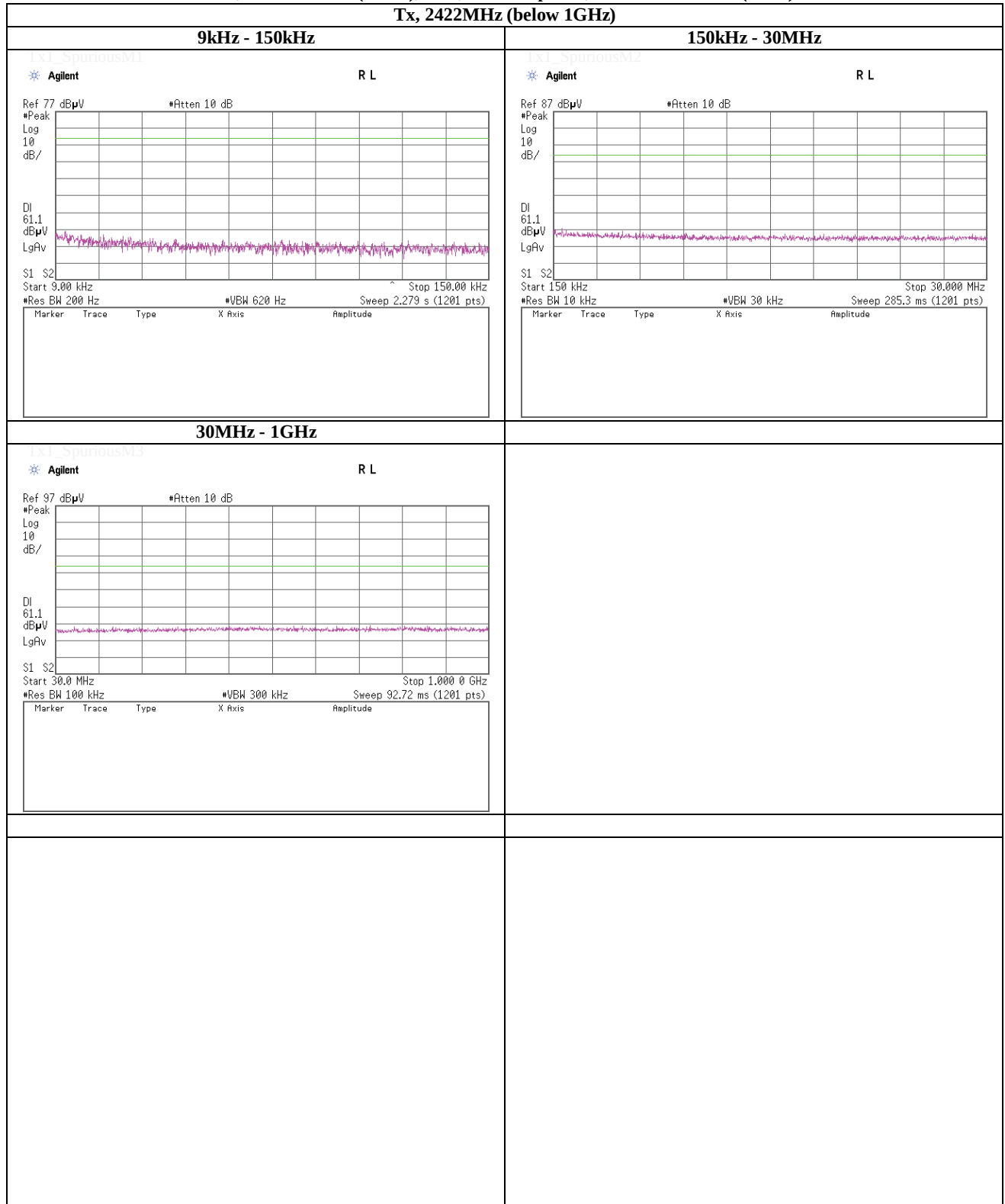
Tx, 2462MHz (above 1GHz)

**UL Japan, Inc.****Shonan EMC Lab.**

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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Conducted)****Tx, IEEE802.11n (HT40), PN9, antenna port 1, worst data mode 8(MCS)****Tx, 2422MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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

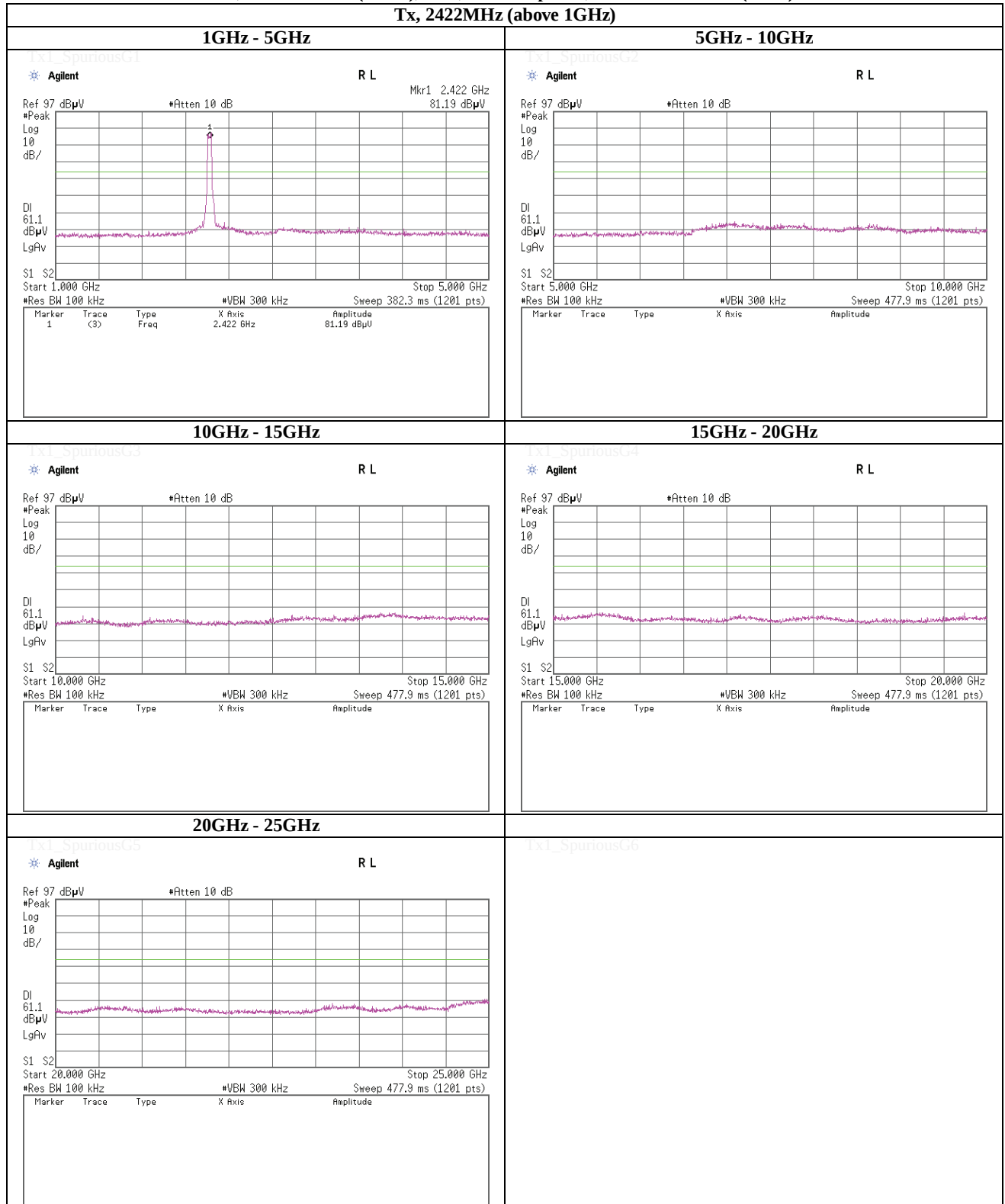
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Conducted)**

Tx, IEEE802.11n (HT40), PN9, antenna port 1, worst data mode 8(MCS)

Tx, 2422MHz (above 1GHz)



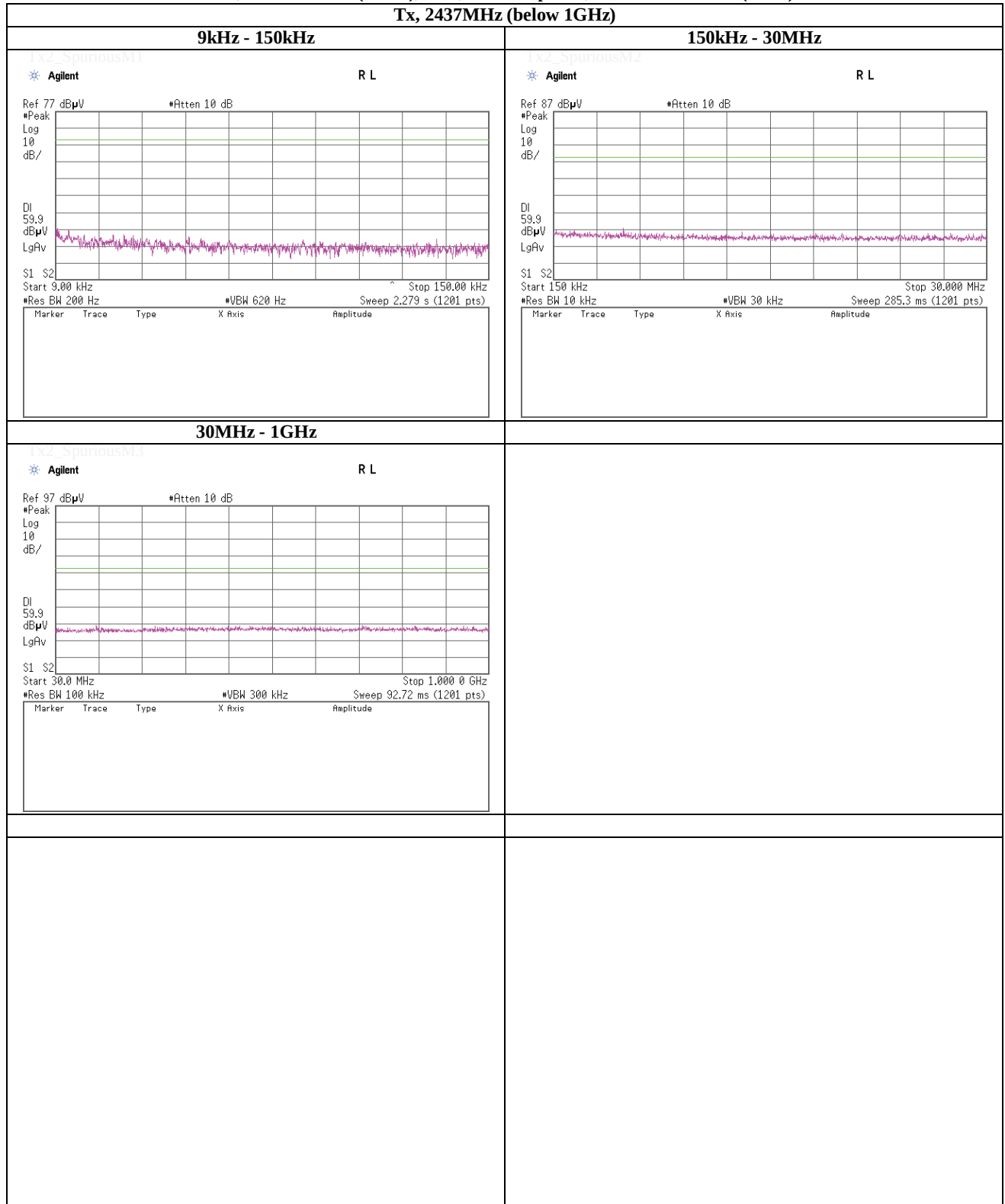
UL Japan, Inc.

Shonan EMC Lab.

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

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Conducted)****Tx, IEEE802.11n (HT40), PN9, antenna port 1, worst data mode 8(MCS)****Tx, 2437MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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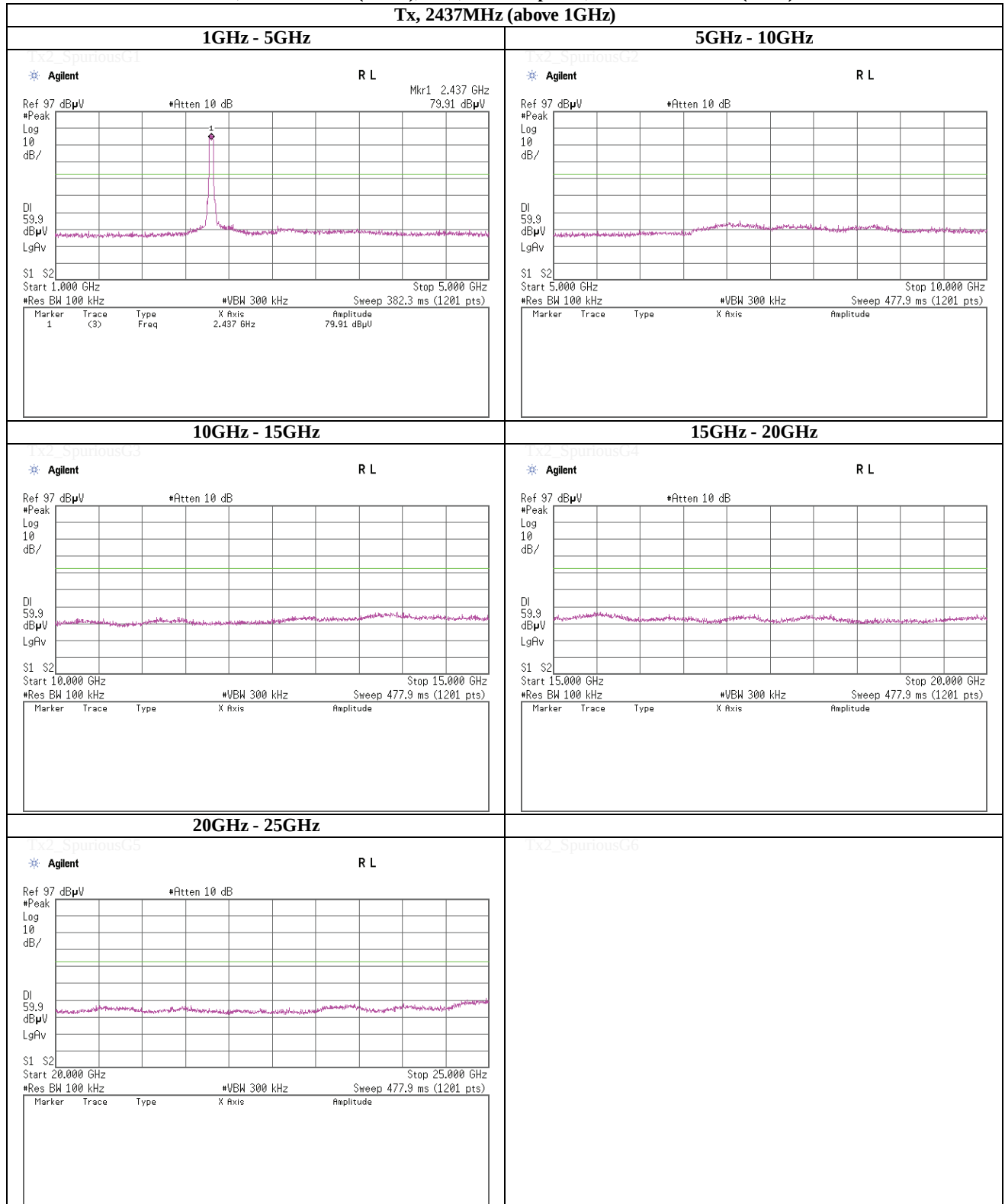
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Conducted)**

Tx, IEEE802.11n (HT40), PN9, antenna port 1, worst data mode 8(MCS)

Tx, 2437MHz (above 1GHz)



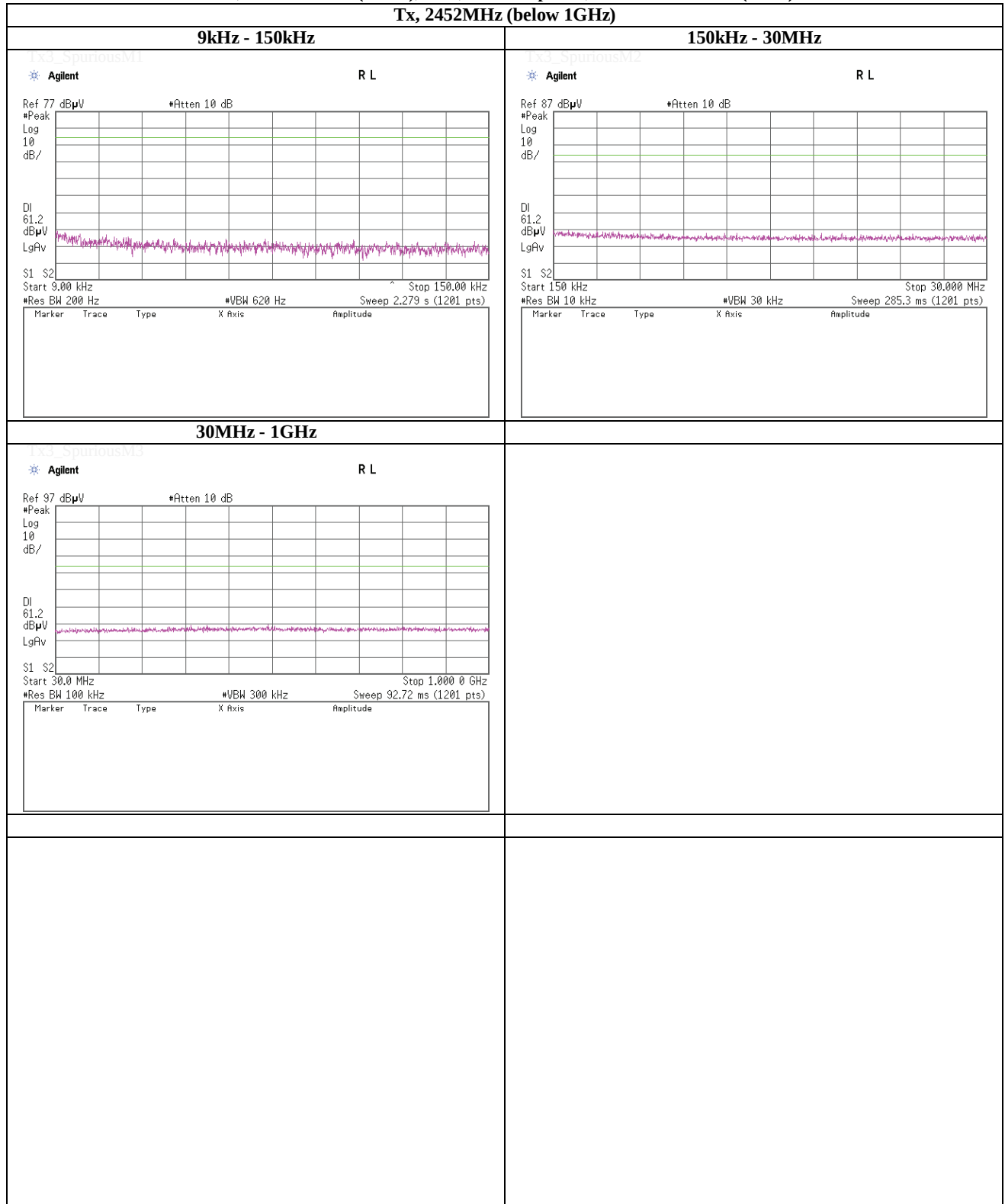
UL Japan, Inc.

Shonan EMC Lab.

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

Telephone : +81 463 50 6400

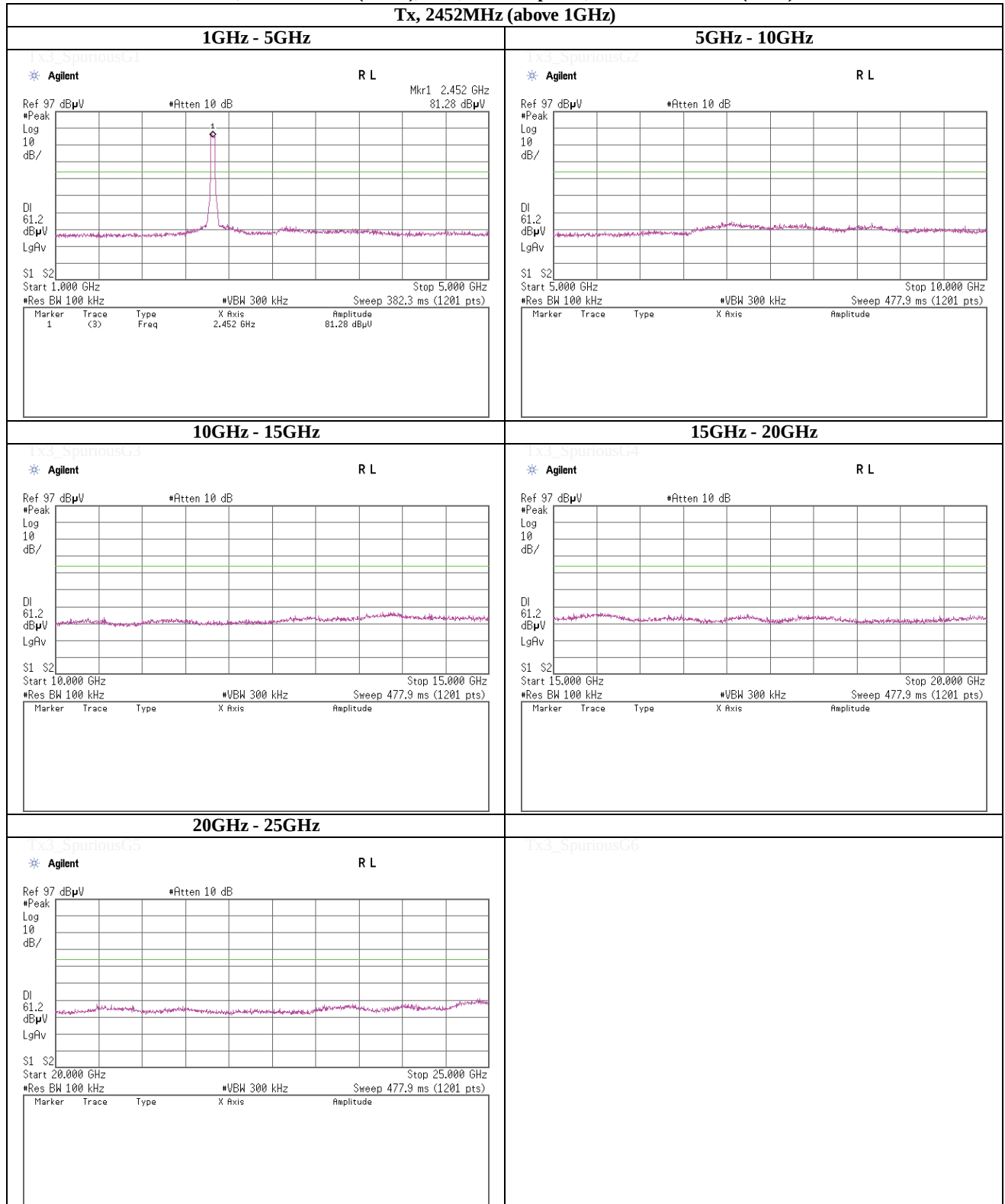
Facsimile : +81 463 50 6401

**Spurious emission (Conducted)****Tx, IEEE802.11n (HT40), PN9, antenna port 1, worst data mode 8(MCS)****Tx, 2452MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

**Spurious emission (Conducted)**

Tx, IEEE802.11n (HT40), PN9, antenna port 1, worst data mode 8(MCS)

Tx, 2452MHz (above 1GHz)

**UL Japan, Inc.****Shonan EMC Lab.**

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

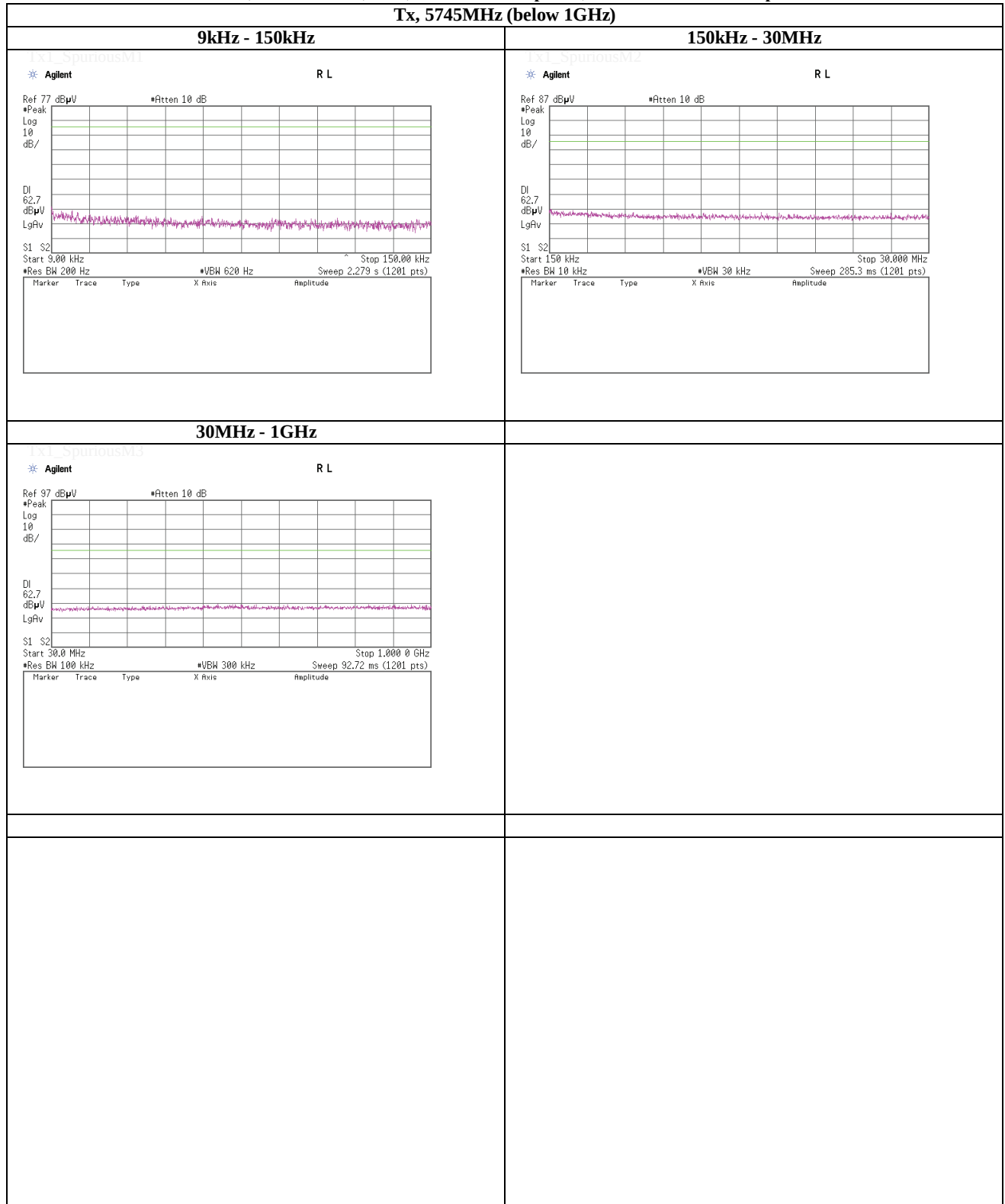
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**(Reference chart) Spurious emission (Conducted)**

Tx, IEEE802.11a, PN9, worst antenna port 1, worst data mode 9Mbps

Tx, 5745MHz (below 1GHz)

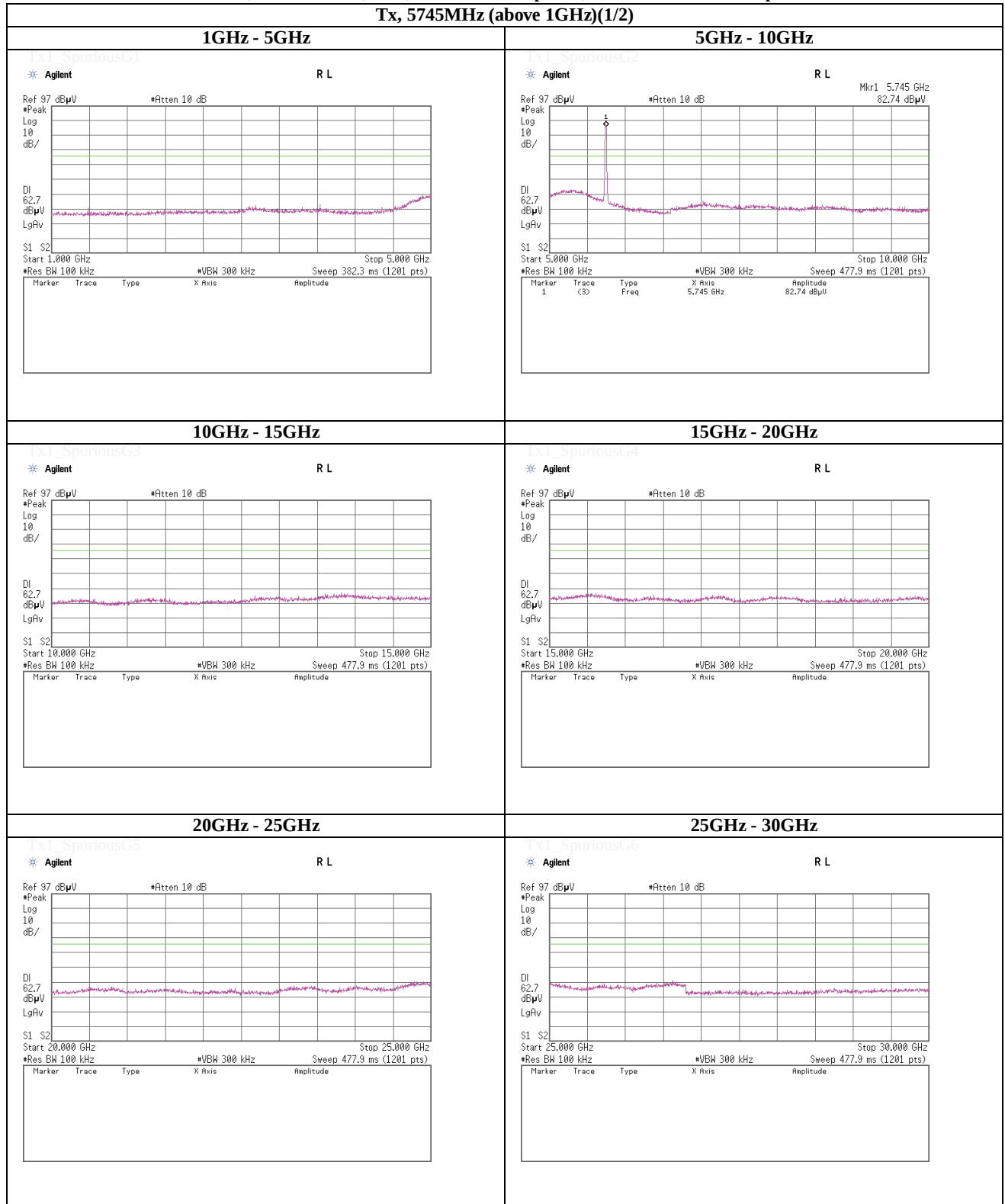
**UL Japan, Inc.****Shonan EMC Lab.**

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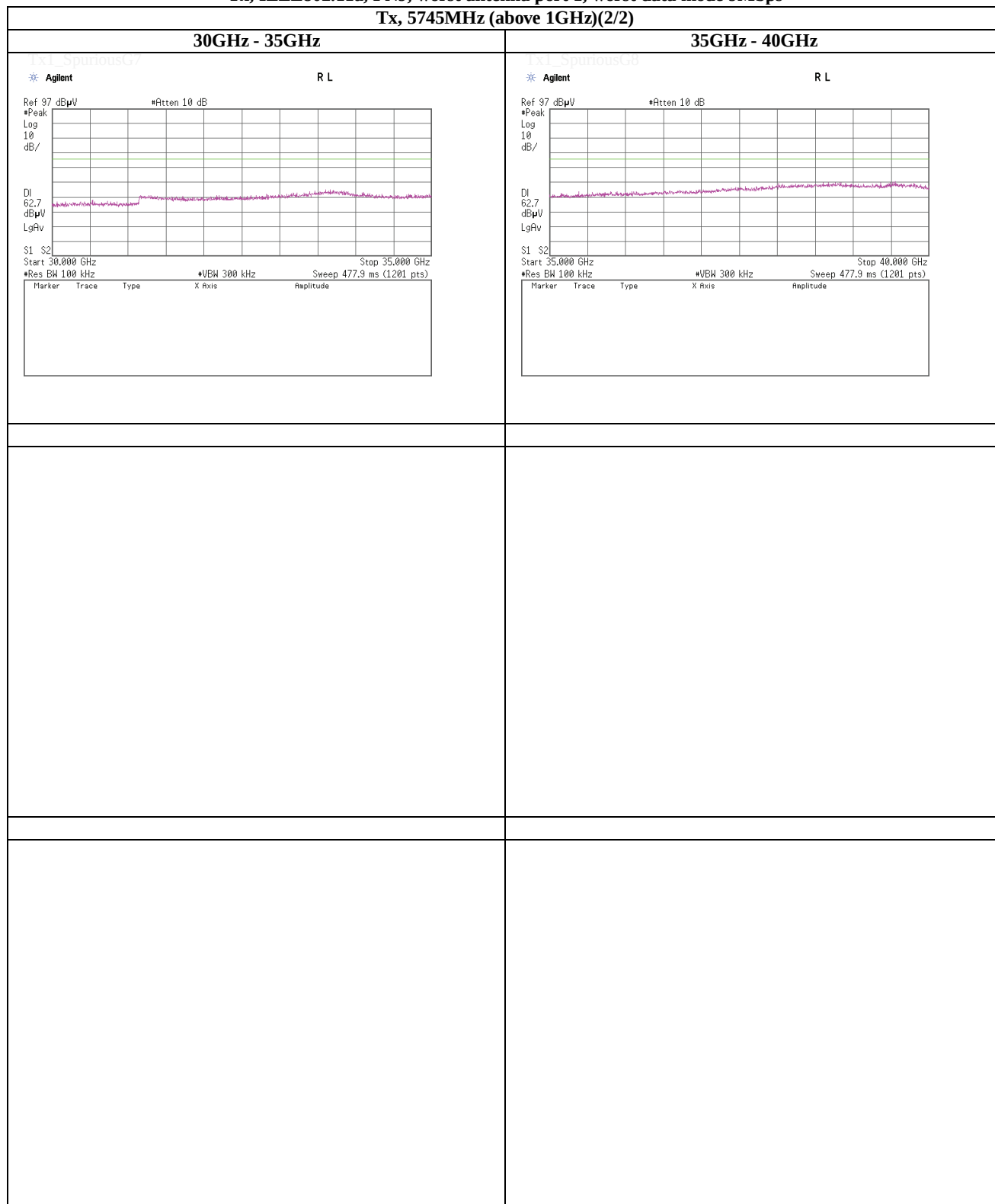


**(Reference chart) Spurious emission (Conducted)****Tx, IEEE802.11a, PN9, worst antenna port 1, worst data mode 9Mbps****Tx, 5745MHz (above 1GHz)(1/2)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

**(Reference chart) Spurious emission (Conducted)**

Tx, IEEE802.11a, PN9, worst antenna port 1, worst data mode 9Mbps

**Tx, 5745MHz (above 1GHz)(2/2)**



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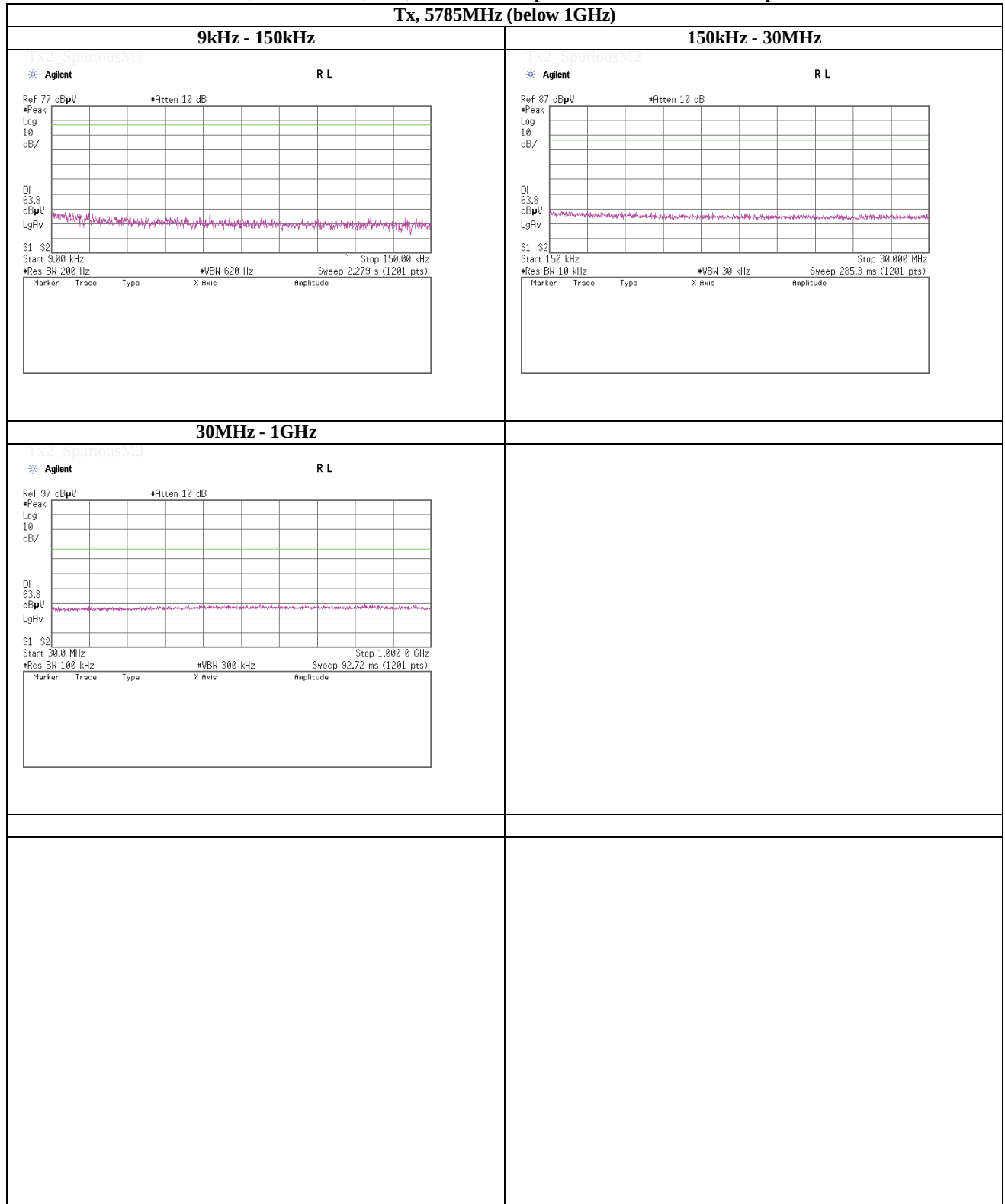
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**(Reference chart) Spurious emission (Conducted)**

Tx, IEEE802.11a, PN9, worst antenna port 1, worst data mode 9Mbps

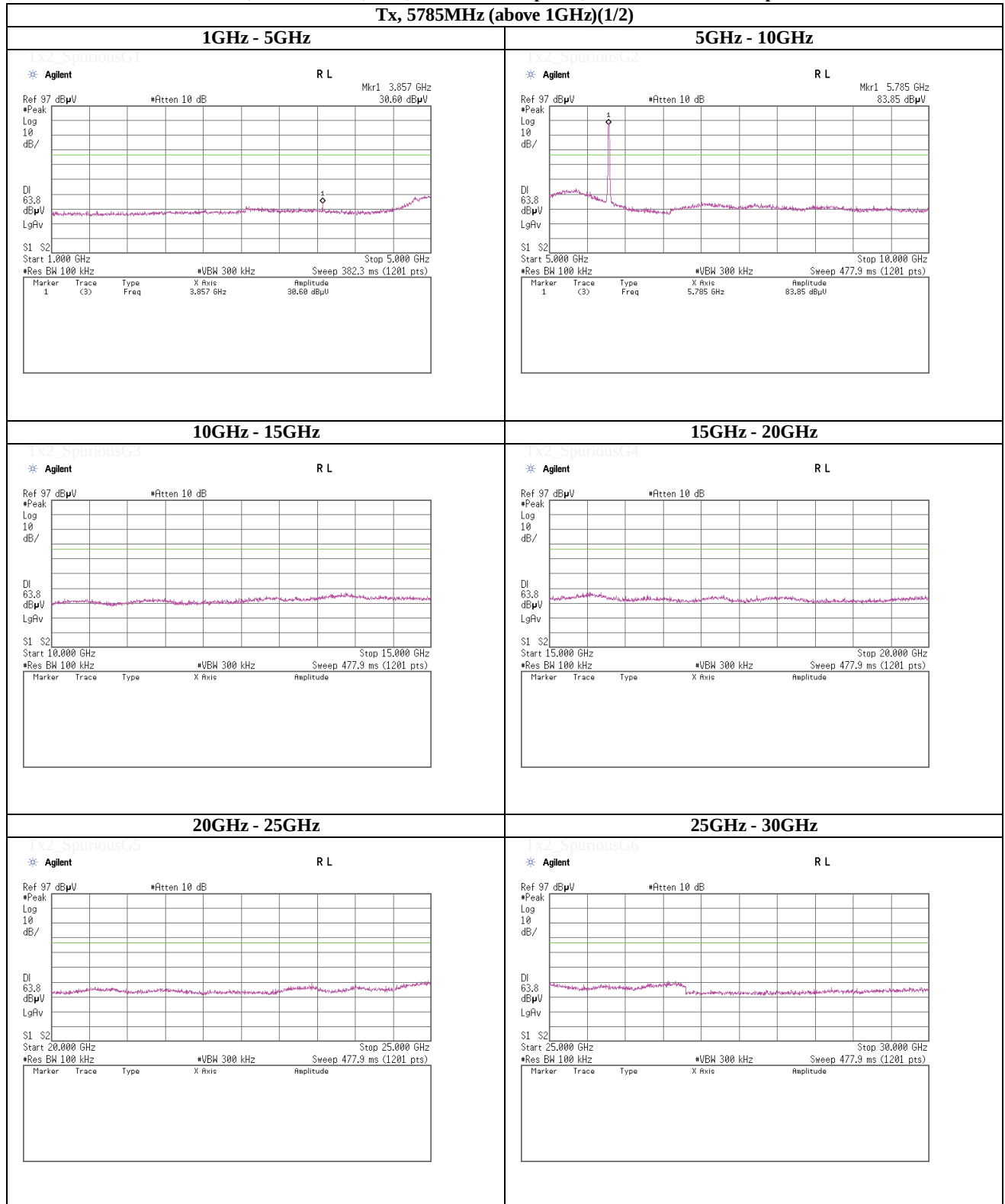
Tx, 5785MHz (below 1GHz)

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**(Reference chart) Spurious emission (Conducted)****Tx, IEEE802.11a, PN9, worst antenna port 1, worst data mode 9Mbps****Tx, 5785MHz (above 1GHz)(1/2)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**