



RADIO TEST REPORT

Test Report No. : 10724035H-A-R2

Applicant : Sony Computer Entertainment Inc.
Type of Equipment : Computer Entertainment System
Model No. : CUH-1215A
FCC ID : AK8CUH120W1
Test regulation : FCC Part 15 Subpart C: 2015
*WLAN, Bluetooth (LE) Part
Test Result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 10724035H-A-R1. 10724035H-A-R1 is replaced with this report.

Date of test: March 16 to April 14, 2015

Representative test engineer:

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Approved by:

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NVLAP LAB CODE: 200572-0

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13-EM-F0429

| CONTENTS | PAGE |
|--|-------------|
| SECTION 1: Customer information | 4 |
| SECTION 2: Equipment under test (E.U.T.) | 4 |
| SECTION 3: Test specification, procedures & results | 6 |
| SECTION 4: Operation of E.U.T. during testing | 9 |
| SECTION 5: Conducted Emission | 11 |
| SECTION 6: Radiated Spurious Emission | 12 |
| SECTION 7: Antenna Terminal Conducted Tests | 14 |
| APPENDIX 1: Test data | 15 |
| Conducted Emission | 15 |
| 6dB Bandwidth | 21 |
| Maximum Peak Output Power | 27 |
| Radiated Spurious Emission | 35 |
| Conducted Spurious Emission | 56 |
| Power Density | 60 |
| 99% Occupied Bandwidth | 68 |
| APPENDIX 2: Test instruments | 72 |
| APPENDIX 3: Photographs of test setup | 73 |
| Conducted Emission | 73 |
| Radiated Spurious Emission | 74 |
| Worst Case Position (Horizontal: X-axis/ Vertical:Y-axis)..... | 75 |
| Test Configuration and peripherals | 76 |

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SECTION 1: Customer information

| | |
|------------------|---|
| Company Name | Sony Computer Entertainment Inc. |
| Brand Name | SONY |
| Address | 1-7-1 Konan, Minato-ku, Tokyo, 108-0075 Japan |
| Telephone Number | +81-3-6748-6333 |
| Facsimile Number | +81-3-6748-6383 |
| Contact Person | Kiyoto Sasaki |

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

2.1 Identification of E.U.T.

| | |
|------------------------|---|
| Type of Equipment | Computer Entertainment System |
| Model No | CUH-1215A |
| Serial No | Refer to Clause 4.2 |
| Country of Manufacture | China/Japan |
| Receipt Date of Sample | March 12, 2015 |
| Condition of EUT | Production prototype (Not for Sale: This sample is equivalent to mass-produced items.) |
| Modification of EUT | No modification by the test lab. |

2.2 Product Description

CUH-1215A is the Computer Entertainment System.

List of Model No.:

| Model No. | Product Name | HDD capacity |
|------------|-------------------------------|--------------|
| CUH-1215A* | Computer Entertainment System | 500GB |
| CUH-1215B | Computer Entertainment System | 1TB |

*Tested model

Product Specification

| | |
|--|------------------------|
| Maximum clock frequency in the system | 2.75GHz |
| Clock frequency in the system (radio part) | 40MHz |
| Operating Temperature | 5-35 deg. C |
| Power Supply | AC 100-240V, 50Hz/60Hz |
| Size | 275 x 53x 305 mm |
| Weight | Approx. 2.5kg |

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Radio Specification

WLAN (IEEE802.11b/g/n-20)

| | |
|--------------------------------|------------------------|
| Equipment Type | Transceiver |
| Frequency of Operation | 2412-2462MHz |
| Type of Modulation | DSSS, OFDM |
| Bandwidth & Channel spacing | Less than 20MHz & 5MHz |
| Method of frequency generation | Synthesizer |
| Power Supply (inner) | DC 3.3V/1.8V |
| Antenna Type | IFA (Antenna A/B) |
| Antenna Gain: G _{ANT} | 4.0dBi (Antenna A/B) |
| Directional Gain | 7.01dBi (Antenna A/B) |

Bluetooth (BDR/EDR)

| | |
|--------------------------------|-----------------------------------|
| Equipment Type | Transceiver |
| Frequency of Operation | 2402-2480MHz |
| Type of Modulation | FHSS (GFSK, $\pi/4$ DQPSK, 8DPSK) |
| Bandwidth & Channel spacing | 79MHz & 1MHz |
| Method of frequency generation | Synthesizer |
| Power Supply (inner) | DC 3.3V/1.8V |
| Antenna Type | PIFA |
| Antenna Gain | 5.6dBi (peak) |

Bluetooth (Low Energy)

| | |
|--------------------------------|---------------|
| Equipment Type | Transceiver |
| Frequency of Operation | 2402-2480MHz |
| Type of Modulation | GFSK |
| Bandwidth & Channel spacing | 1MHz & 2MHz |
| Method of frequency generation | Synthesizer |
| Power Supply (inner) | DC 3.3V/1.8V |
| Antenna Type | PIFA |
| Antenna Gain | 5.6dBi (peak) |

This test report applies to WLAN and Bluetooth (Low Energy).

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2015, final revised on January 21, 2015

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

* The EUT complies with FCC Part 15 Subpart B: 2015, final revised on January 21, 2015.

3.2 Procedures and results

| Item | Test Procedure | Specification | Worst margin | Results | Remarks |
|---|---|---|---|----------|--|
| Conducted Emission | FCC: ANSI C63.4:2009 7. AC powerline Conducted Emission measurements ----- IC: RSS-Gen 8.8 | FCC: Section 15.207 ----- IC: RSS-Gen 8.8 | QP 7.0dB, 0.15134MHz, L AV 8.2dB, 0.19047MHz, L | Complied | - |
| 6dB Bandwidth | FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on June 5, 2014)" ----- IC: - | FCC: Section 15.247(a)(2) ----- IC: RSS-210 A8.2(a) | See data. | Complied | Conducted |
| Maximum Peak Output Power | FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on June 5, 2014)" ----- IC: RSS-Gen 6.12 | FCC: Section 15.247(b)(3) ----- IC: RSS-210 A8.4(4) | | Complied | Conducted |
| Power Density | FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on June 5, 2014)" ----- IC: - | FCC: Section 15.247 (e) ----- IC: RSS-210 A8.2(b) | | Complied | Conducted |
| Spurious Emission Restricted Band Edges | FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on June 5, 2014)" ----- IC: RSS-Gen 6.13 | FCC: Section15.247(d) ----- IC: RSS-210 A8.5 RSS-Gen 8.9 RSS-Gen 8.10 | 0.8dB (9848.000MHz, AV, Hori.) (2483.500MHz, AV, Vert.) (2390.000MHz, AV, Hori.) | Complied | Conducted (below 30MHz)/ Radiated (above 30MHz) |

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

* In case any questions arise about test procedure, ANSI C63.4: 2009 is also referred.

FCC 15.31 (e)

This EUT provides stable voltage (DC 3.3V/1.8V) constantly to RF Part regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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

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3.3 Addition to standard

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

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

3.4 Uncertainty

EMI

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

| Test room (semi-anechoic chamber) | Conducted emission (+dB) |
|--------------------------------------|-----------------------------|
| | 150kHz-30MHz |
| No.1 | 3.5dB |
| No.2 | 3.5dB |
| No.3 | 3.4dB |
| No.4 | 3.5dB |

| Test room (semi-anechoic chamber) | Radiated emission | | | | | | |
|--------------------------------------|-------------------|------------------|-----------------|----------------|-----------------|-------------------|-------------------|
| | (3m*)(+dB) | | | | (1m*)(+dB) | | (0.5m*)(+dB) |
| | 9kHz -30MHz | 30MHz -300MHz | 300MHz -1GHz | 1GHz -10GHz | 10GHz -18GHz | 18GHz -26.5GHz | 26.5GHz -40GHz |
| No.1 | 4.3dB | 5.5dB | 6.3dB | 5.5dB | 5.8dB | 5.8dB | 4.3dB |
| No.2 | 4.2dB | 5.4dB | 6.3dB | 5.4dB | 5.7dB | 5.9dB | 5.6dB |
| No.3 | 4.4dB | 5.4dB | 6.4dB | 5.2dB | 5.5dB | 5.8dB | 5.5dB |
| No.4 | 4.7dB | 5.6dB | 6.4dB | 5.3dB | 5.7dB | 5.9dB | 5.5dB |

*3m/1m/0.5m = Measurement distance

| Power meter (+dB) | |
|-------------------|------------|
| Below 1GHz | Above 1GHz |
| 0.7dB | 1.5dB |

| Antenna terminal conducted emission and Power density (+dB) | | | Antenna terminal conducted emission (+dB) | | Channel power (+dB) |
|---|-----------|------------|---|---------------|---------------------|
| Below 1GHz | 1GHz-3GHz | 3GHz-18GHz | 18GHz-26.5GHz | 26.5GHz-40GHz | |
| 1.5dB | 1.7dB | 2.8dB | 2.8dB | 2.9dB | 2.6dB |

Conducted Emission test

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

Radiated emission test (3m)

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

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3.5 Test Location

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| | IC Registration Number | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Other rooms |
|----------------------------|------------------------|----------------------------|--|------------------------|
| No.1 semi-anechoic chamber | 2973C-1 | 19.2 x 11.2 x 7.7m | 7.0 x 6.0m | No.1 Power source room |
| No.2 semi-anechoic chamber | 2973C-2 | 7.5 x 5.8 x 5.2m | 4.0 x 4.0m | - |
| No.3 semi-anechoic chamber | 2973C-3 | 12.0 x 8.5 x 5.9m | 6.8 x 5.75m | No.3 Preparation room |
| No.3 shielded room | - | 4.0 x 6.0 x 2.7m | N/A | - |
| No.4 semi-anechoic chamber | 2973C-4 | 12.0 x 8.5 x 5.9m | 6.8 x 5.75m | No.4 Preparation room |
| No.4 shielded room | - | 4.0 x 6.0 x 2.7m | N/A | - |
| No.5 semi-anechoic chamber | - | 6.0 x 6.0 x 3.9m | 6.0 x 6.0m | - |
| No.6 shielded room | - | 4.0 x 4.5 x 2.7m | 4.0 x 4.5 m | - |
| No.6 measurement room | - | 4.75 x 5.4 x 3.0m | 4.75 x 4.15 m | - |
| No.7 shielded room | - | 4.7 x 7.5 x 2.7m | 4.7 x 7.5m | - |
| No.8 measurement room | - | 3.1 x 5.0 x 2.7m | N/A | - |
| No.9 measurement room | - | 8.0 x 4.6 x 2.8m | 2.4 x 2.4m | - |
| No.11 measurement room | - | 6.2 x 4.7 x 3.0m | 4.8 x 4.6m | - |

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Mode(s)

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

| Mode | Remarks* |
|--|----------------------------|
| IEEE 802.11b (11b) | 2Mbps, PN9 |
| IEEE 802.11g (11g) | 9Mbps, PN9 |
| IEEE 802.11n MIMO 20MHz BW (11n-20) | MCS 0, PN9 |
| Bluetooth Low Energy(BT LE) | Maximum Packet Size, PRBS9 |
| *The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel) | |
| *WLAN antennas (Antenna A and B) transmit simultaneously. Bluetooth antenna also transmits simultaneously with WLAN antennas, and the antennas are not common. There is no correlation between WLAN antennas and Bluetooth antenna. | |
| *Power of the EUT was set by the software as follows; Power settings: WLAN 9(dBm) Bluetooth (LE) Same as production model Software: COpro_DOS_Labtool_Ver2.0.0.68 *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product. | |

*Details of Operating mode for WLAN

| Test Item | Operating Mode | Used Antenna | Tested frequency |
|---|---------------------------------|---|-------------------------------|
| Conducted Emission | 11n-20 Tx *1) *2) | Antenna A+B | 2437MHz |
| Spurious Emission (Conducted) | 11n-20 Tx *1) | Antenna B | 2437MHz |
| 6dB Bandwidth, 99% Occupied Bandwidth | 11b Tx 11g Tx 11n-20 Tx | Antenna A, Antenna B | 2412MHz 2437MHz 2462MHz |
| Maximum Peak Output Power, Power Density | 11b Tx 11g Tx 11n-20 Tx | Antenna A+B, Antenna A, Antenna B | 2412MHz 2437MHz 2462MHz |
| Spurious Emission (Radiated) | 11b Tx *2) 11n-20 Tx *2) *3) | Antenna A+B | 2412MHz 2437MHz 2462MHz |
| *1) The test was performed on the mode as a representative, because it had the highest power at antenna terminal test. *2) The test was performed for both of Power Supply: Chicony and DELTA. *3) The test was performed on 11n-20 Tx mode according to “Section 1 of 6 802.11 a/b/g/n testing- Managing Complex Regulatory Approvals - ” of TCB Council Workshop October 2009, as the 11n-20 Tx mode had higher power than 11g mode at antenna terminal test. | | | |

*Details of Operating mode for BT LE

| Test Item | Operating Mode | Tested frequency |
|--|-----------------------|-------------------------------|
| Conducted Emission *1), 6dB Bandwidth, Maximum Peak Output Power, Power Density, 99% Occupied Bandwidth, Spurious Emission (Radiated *1)/Conducted) | BT LE | 2402MHz 2440MHz 2480MHz |
| *1) The test was performed for both of Power Supply: Chicony and DELTA. | | |

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4.2 Configuration and peripherals

This page has been submitted for a separate exhibit.

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SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane.

The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

For the tests on EUT with other peripherals (as a whole system)

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

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber.

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

Detector : QP and CISPR AV
Measurement range : 0.15-30MHz
Test data : APPENDIX
Test result : Pass

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SECTION 6: Radiated Spurious Emission

Test Procedure

It was measured based on "11.0 Emissions in non-restricted frequency bands" of "558074 D01 DTS Meas Guidance v03r02 (Issued on June 5, 2014)".

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

The height of the measuring antenna varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

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

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

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

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

Test Antennas are used as below;

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

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

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

| | | | | |
|-----------------|---------------|---|--|---|
| Frequency | Below 1GHz | Above 1GHz | | 20dBc |
| Instrument used | Test Receiver | Spectrum Analyzer | | Spectrum Analyzer |
| Detector | QP | PK | AV *1) | PK |
| IF Bandwidth | BW 120kHz | RBW: 1MHz VBW: 3MHz | Average Power Method: <u>WLAN: 12.2.5.1</u> RBW: 1MHz VBW: 3MHz Detector: Power Averaging (RMS) Trace: 100 traces <u>BT(LE): 12.2.5.2</u> Average Power Method: Alternative 1 *1) RBW: 1MHz VBW: 3MHz Detector: Power Averaging (RMS) Trace: 100 traces Duty factor was added to the results. <u>Noise other than RF part</u> RBW: 1MHz VBW: 10Hz | RBW: 100kHz VBW: 300kHz |
| Test Distance | 3m | 3m (below 10GHz), 1m *2) (above 10GHz) | | 3m (below 10GHz), 1m *2) (above 10GHz) |

*1) Average Power Measurement was performed based on 6.0 & 12.2.5 of "558074 D01 DTS Meas Guidance v03r02 (Issued on June 5, 2014)"

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

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

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

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

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SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

| Test | Span | RBW | VBW | Sweep time | Detector | Trace | Instrument used |
|--|---|----------------|--------------------|-------------------|----------------------|--------------|-----------------------------------|
| 6dB Bandwidth | 20MHz / 3MHz | 100kHz | 300kHz | Auto | Peak | Max Hold | Spectrum Analyzer |
| 99% Occupied Bandwidth *1) | Enough width to display emission skirts | 1 to 5% of OBW | Three times of RBW | Auto | Peak | Max Hold | Spectrum Analyzer |
| Maximum Peak Output Power | - | - | - | Auto | Peak/ Average *2) | - | Power Meter (Sensor: 50MHz BW) |
| Peak Power Density | 1.5 times the 6dB Bandwidth | 3kHz | 10kHz | Auto | Peak | Max Hold | Spectrum Analyzer *3) |
| Conducted Spurious Emission *4) | 9kHz to 150kHz | 200Hz | 620Hz | Auto | Peak | Max Hold | Spectrum Analyzer |
| | 150kHz to 30MHz | 9.1kHz | 27kHz | | | | |
| *1) Peak hold was applied as Worst-case measurement. *2) Reference data *3) Section 10.2 Method PKPSD (peak PSD) of "558074 D01 DTS Meas Guidance v03r02 (Issued on June 5, 2014)". *4) 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 low enough as shown in the chart.(9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=9.1kHz). | | | | | | | |

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

Test data : APPENDIX
Test result : Pass

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APPENDIX 1: Test data

Conducted Emission
 (Power Supply: Chicony)

DATA OF CONDUCTED EMISSION TEST

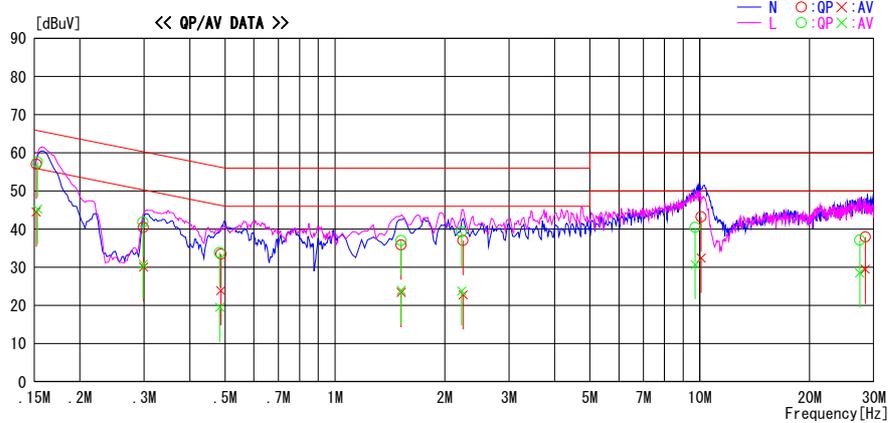
UL Japan, Inc. Ise EMC Lab. No.3 Semi Anechoic Chamber
 Date: 2015/03/25

Report No. : 10724035H

Temp./Humi. : 18deg. C / 32% RH
 Engineer : Takafumi Noguchi

Mode / Remarks : 11n-20 Tx 2437MHz

LIMIT : FCC15.207 QP
 FCC15.207 AV



| Frequency [MHz] | Reading Level | | Corr. Factor | Results | | Limit | | Margin | | Phase |
|--------------------|---------------|--------------|-----------------|--------------|--------------|--------------|--------------|------------|------------|-------|
| | QP [dBuV] | AV [dBuV] | | QP [dBuV] | AV [dBuV] | QP [dBuV] | AV [dBuV] | QP [dB] | AV [dB] | |
| 0.15190 | 43.8 | 31.3 | 13.2 | 57.0 | 44.5 | 65.9 | 55.9 | 8.9 | 11.4 | N |
| 0.29877 | 27.2 | 16.8 | 13.3 | 40.5 | 30.1 | 60.3 | 50.3 | 19.8 | 20.2 | N |
| 0.48723 | 20.2 | 10.6 | 13.3 | 33.5 | 23.9 | 56.2 | 46.2 | 22.7 | 22.3 | N |
| 1.51972 | 22.4 | 10.0 | 13.4 | 35.8 | 23.4 | 56.0 | 46.0 | 20.2 | 22.6 | N |
| 2.24457 | 23.6 | 9.4 | 13.4 | 37.0 | 22.8 | 56.0 | 46.0 | 19.0 | 23.2 | N |
| 10.08585 | 29.2 | 18.4 | 14.0 | 43.2 | 32.4 | 60.0 | 50.0 | 16.8 | 17.6 | N |
| 28.41800 | 23.0 | 14.6 | 14.9 | 37.9 | 29.5 | 60.0 | 50.0 | 22.1 | 20.5 | N |
| 0.15310 | 44.4 | 32.0 | 13.2 | 57.6 | 45.2 | 65.8 | 55.8 | 8.2 | 10.6 | L |
| 0.29815 | 28.5 | 17.5 | 13.3 | 41.8 | 30.8 | 60.3 | 50.3 | 18.5 | 19.5 | L |
| 0.48318 | 20.5 | 6.2 | 13.3 | 33.8 | 19.5 | 56.3 | 46.3 | 22.5 | 26.8 | L |
| 1.51878 | 23.6 | 10.6 | 13.4 | 37.0 | 24.0 | 56.0 | 46.0 | 19.0 | 22.0 | L |
| 2.22405 | 25.9 | 10.4 | 13.4 | 39.3 | 23.8 | 56.0 | 46.0 | 16.7 | 22.2 | L |
| 9.71215 | 26.5 | 16.7 | 14.0 | 40.5 | 30.7 | 60.0 | 50.0 | 19.5 | 19.3 | L |
| 27.44991 | 22.3 | 13.7 | 14.8 | 37.1 | 28.5 | 60.0 | 50.0 | 22.9 | 21.5 | L |

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

Conducted Emission (Power Supply: Chicony)

DATA OF CONDUCTED EMISSION TEST

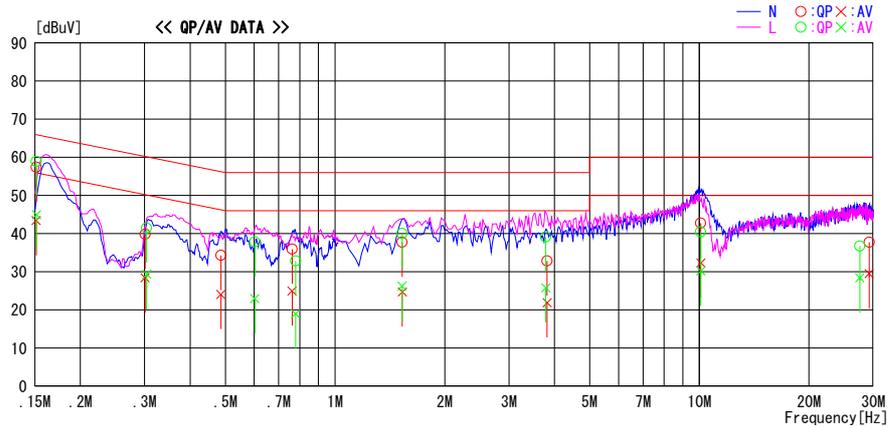
UL Japan, Inc. Ise EMC Lab. No.3 Semi Anechoic Chamber
 Date: 2015/03/25

Report No. : 10724035H

Temp./Humi. : 18deg. C / 32% RH
 Engineer : Takafumi Noguchi

Mode / Remarks : BT LE Tx 2440MHz

LIMIT : FCC15.207 QP
 FCC15.207 AV



| Frequency [MHz] | Reading Level | | Corr. Factor [dB] | Results | | Limit | | Margin | | Phase |
|--------------------|---------------|--------------|-------------------------|--------------|--------------|--------------|--------------|------------|------------|-------|
| | QP [dBuV] | AV [dBuV] | | QP [dBuV] | AV [dBuV] | QP [dBuV] | AV [dBuV] | QP [dB] | AV [dB] | |
| 0.15116 | 44.2 | 30.2 | 13.2 | 57.4 | 43.4 | 65.9 | 55.9 | 8.5 | 12.5 | N |
| 0.30112 | 26.5 | 15.1 | 13.3 | 39.8 | 28.4 | 60.2 | 50.2 | 20.4 | 21.8 | N |
| 0.48575 | 21.0 | 10.8 | 13.3 | 34.3 | 24.1 | 56.2 | 46.2 | 21.9 | 22.1 | N |
| 0.76188 | 22.6 | 11.7 | 13.3 | 35.9 | 25.0 | 56.0 | 46.0 | 20.1 | 21.0 | N |
| 1.52934 | 24.3 | 11.3 | 13.4 | 37.7 | 24.7 | 56.0 | 46.0 | 18.3 | 21.3 | N |
| 3.82096 | 19.2 | 8.3 | 13.6 | 32.8 | 21.9 | 56.0 | 46.0 | 23.2 | 24.1 | N |
| 10.09172 | 28.7 | 18.3 | 14.0 | 42.7 | 32.3 | 60.0 | 50.0 | 17.3 | 17.7 | N |
| 29.25400 | 22.8 | 14.6 | 14.9 | 37.7 | 29.5 | 60.0 | 50.0 | 22.3 | 20.5 | N |
| 0.15134 | 45.7 | 31.8 | 13.2 | 58.9 | 45.0 | 65.9 | 55.9 | 7.0 | 10.9 | L |
| 0.30399 | 28.2 | 16.0 | 13.3 | 41.5 | 29.3 | 60.1 | 50.1 | 18.6 | 20.8 | L |
| 0.60205 | 24.5 | 9.7 | 13.3 | 37.8 | 23.0 | 56.0 | 46.0 | 18.2 | 23.0 | L |
| 0.77947 | 19.5 | 5.7 | 13.3 | 32.8 | 19.0 | 56.0 | 46.0 | 23.2 | 27.0 | L |
| 1.52704 | 26.6 | 12.8 | 13.4 | 40.0 | 26.2 | 56.0 | 46.0 | 16.0 | 19.8 | L |
| 3.78658 | 25.5 | 12.2 | 13.6 | 39.1 | 25.8 | 56.0 | 46.0 | 16.9 | 20.2 | L |
| 10.08300 | 26.5 | 16.2 | 14.0 | 40.5 | 30.2 | 60.0 | 50.0 | 19.5 | 19.8 | L |
| 27.57456 | 21.9 | 13.6 | 14.8 | 36.7 | 28.4 | 60.0 | 50.0 | 23.3 | 21.6 | L |

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

UL Japan, Inc.
Ise EMC Lab.

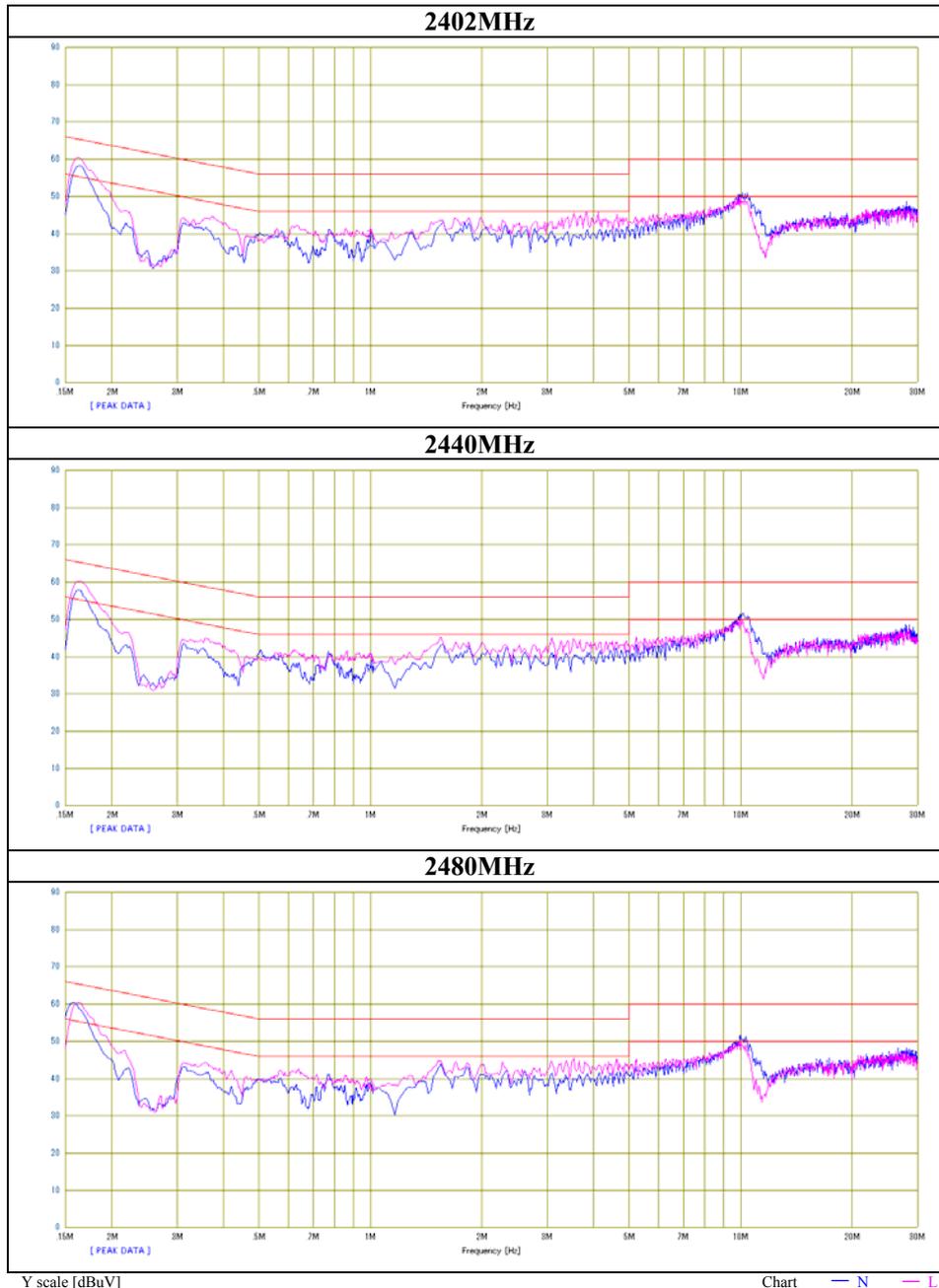
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Emission (Power Supply: Chicony)

| | |
|-----------------------|---|
| Test place | Ise EMC Lab. No.3 Semi Anechoic Chamber |
| Report No. | 10724035H |
| Date | 03/25/2015 |
| Temperature/ Humidity | 18deg. C / 32% RH |
| Engineer | Takafumi Noguchi |
| Mode | BT LE Tx |



Y scale [dBuV]

Chart — N — L

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Conducted Emission (Power Supply: DELTA)

DATA OF CONDUCTED EMISSION TEST

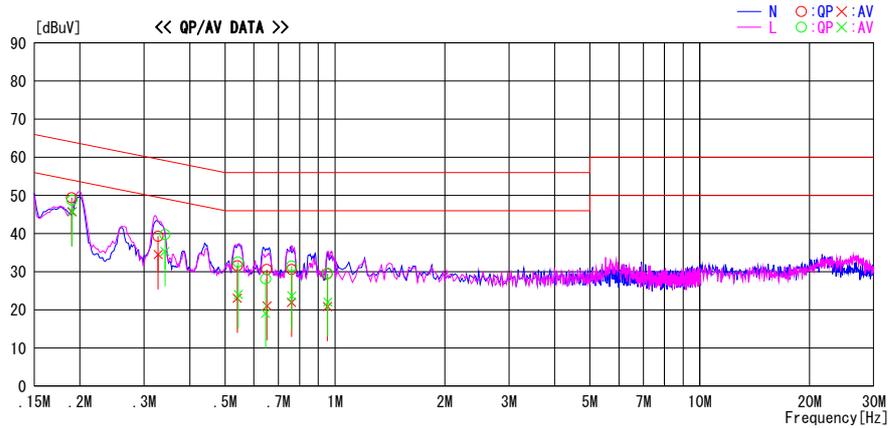
UL Japan, Inc. Ise EMC Lab. No.3 Semi Anechoic Chamber
 Date: 2015/03/25

Report No. : 10724035H

Temp./Humi. : 18deg. C / 32% RH
 Engineer : Takafumi Noguchi

Mode / Remarks : 11n-20 Tx 2437MHz

LIMIT : FCC15.207 QP
 FCC15.207 AV



| Frequency [MHz] | Reading Level | | Corr. Factor [dB] | Results | | Limit | | Margin | | Phase |
|--------------------|---------------|--------------|-------------------------|--------------|--------------|--------------|--------------|------------|------------|-------|
| | QP [dBuV] | AV [dBuV] | | QP [dBuV] | AV [dBuV] | QP [dBuV] | AV [dBuV] | QP [dB] | AV [dB] | |
| 0.18992 | 36.2 | 32.5 | 13.2 | 49.4 | 45.7 | 64.0 | 54.0 | 14.6 | 8.3 | N |
| 0.32768 | 26.0 | 21.2 | 13.3 | 39.3 | 34.5 | 59.5 | 49.5 | 20.2 | 15.0 | N |
| 0.54048 | 18.3 | 9.8 | 13.3 | 31.6 | 23.1 | 56.0 | 46.0 | 24.4 | 22.9 | N |
| 0.65115 | 17.3 | 7.8 | 13.3 | 30.6 | 21.1 | 56.0 | 46.0 | 25.4 | 24.9 | N |
| 0.76036 | 17.3 | 8.7 | 13.3 | 30.6 | 22.0 | 56.0 | 46.0 | 25.4 | 24.0 | N |
| 0.95316 | 16.2 | 7.6 | 13.3 | 29.5 | 20.9 | 56.0 | 46.0 | 26.5 | 25.1 | N |
| 0.19047 | 35.5 | 32.6 | 13.2 | 48.7 | 45.8 | 64.0 | 54.0 | 15.3 | 8.2 | L |
| 0.34225 | 26.4 | 22.0 | 13.3 | 39.7 | 35.3 | 59.1 | 49.1 | 19.4 | 13.8 | L |
| 0.54332 | 19.3 | 10.8 | 13.3 | 32.6 | 24.1 | 56.0 | 46.0 | 23.4 | 21.9 | L |
| 0.64567 | 14.8 | 5.8 | 13.3 | 28.1 | 19.1 | 56.0 | 46.0 | 27.9 | 26.9 | L |
| 0.76161 | 18.2 | 10.4 | 13.3 | 31.5 | 23.7 | 56.0 | 46.0 | 24.5 | 22.3 | L |
| 0.95515 | 16.3 | 8.8 | 13.3 | 29.6 | 22.1 | 56.0 | 46.0 | 26.4 | 23.9 | L |

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

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Ise EMC Lab.

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Conducted Emission (Power Supply: DELTA)

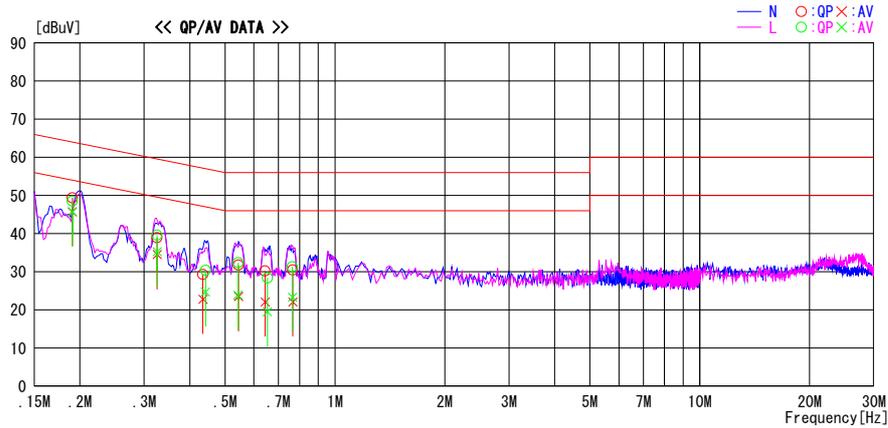
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No. 3 Semi Anechoic Chamber
Date: 2015/03/25

Report No. : 10724035H
Temp./Humi. : 18deg. C / 32% RH
Engineer : Takafumi Noguchi

Mode / Remarks : BT LE Tx 2440MHz

LIMIT : FCC15.207 QP
FCC15.207 AV



| Frequency [MHz] | Reading Level | | Corr. Factor [dB] | Results | | Limit | | Margin | | Phase |
|--------------------|---------------|--------------|-------------------------|--------------|--------------|--------------|--------------|------------|------------|-------|
| | QP [dBuV] | AV [dBuV] | | QP [dBuV] | AV [dBuV] | QP [dBuV] | AV [dBuV] | QP [dB] | AV [dB] | |
| 0.19056 | 36.2 | 32.5 | 13.2 | 49.4 | 45.7 | 64.0 | 54.0 | 14.6 | 8.3 | N |
| 0.32569 | 25.6 | 21.2 | 13.3 | 38.9 | 34.5 | 59.6 | 49.6 | 20.7 | 15.1 | N |
| 0.43444 | 16.0 | 9.5 | 13.3 | 29.3 | 22.8 | 57.2 | 47.2 | 27.9 | 24.4 | N |
| 0.54446 | 18.4 | 10.2 | 13.3 | 31.7 | 23.5 | 56.0 | 46.0 | 24.3 | 22.5 | N |
| 0.64348 | 16.9 | 8.8 | 13.3 | 30.2 | 22.1 | 56.0 | 46.0 | 25.8 | 23.9 | N |
| 0.76641 | 17.2 | 8.8 | 13.3 | 30.5 | 22.1 | 56.0 | 46.0 | 25.5 | 23.9 | N |
| 0.19091 | 35.3 | 32.5 | 13.2 | 48.5 | 45.7 | 64.0 | 54.0 | 15.5 | 8.3 | L |
| 0.32548 | 26.3 | 21.9 | 13.3 | 39.6 | 35.2 | 59.6 | 49.6 | 20.0 | 14.4 | L |
| 0.44200 | 17.1 | 11.4 | 13.3 | 30.4 | 24.7 | 57.0 | 47.0 | 26.6 | 22.3 | L |
| 0.54285 | 19.1 | 10.6 | 13.3 | 32.4 | 23.9 | 56.0 | 46.0 | 23.6 | 22.1 | L |
| 0.65338 | 15.1 | 6.2 | 13.3 | 28.4 | 19.5 | 56.0 | 46.0 | 27.6 | 26.5 | L |
| 0.76465 | 18.0 | 10.0 | 13.3 | 31.3 | 23.3 | 56.0 | 46.0 | 24.7 | 22.7 | L |

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

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Ise EMC Lab.

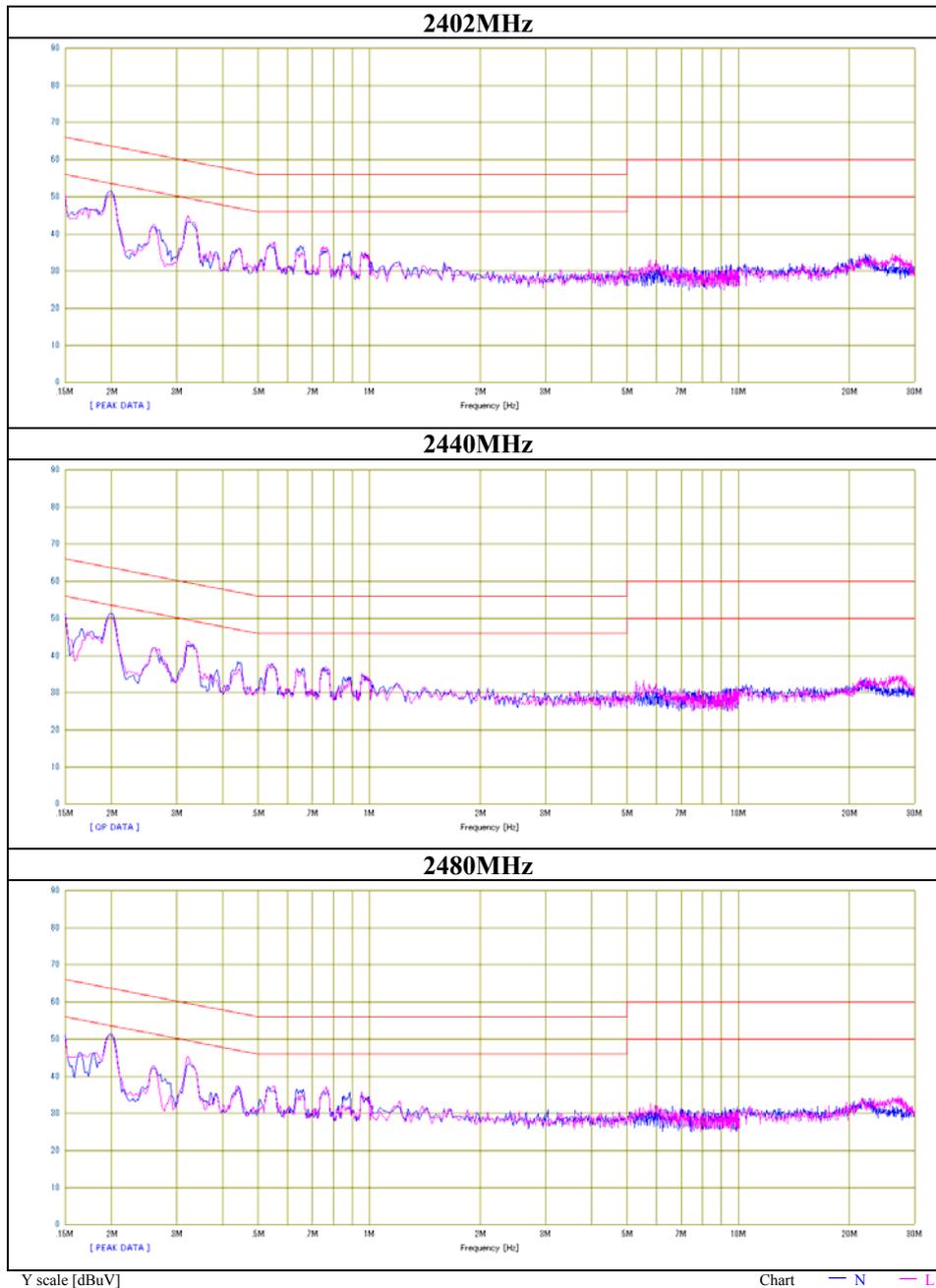
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Emission (Power Supply: DELTA)

| | |
|-----------------------|---|
| Test place | Ise EMC Lab. No.3 Semi Anechoic Chamber |
| Report No. | 10724035H |
| Date | 03/25/2015 |
| Temperature/ Humidity | 18deg. C / 32% RH |
| Engineer | Takafumi Noguchi |
| Mode | BT LE Tx |



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6dB Bandwidth

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/17/2015
Temperature/ Humidity : 22deg. C / 36% RH
Engineer : Shinya Watanabe
Mode : Tx

11b

| Antenna | Frequency [MHz] | 6dB Bandwidth [MHz] | Limit [kHz] |
|---------|-----------------|---------------------|-------------|
| A | 2412 | 9.884 | >500 |
| | 2437 | 9.893 | >500 |
| | 2462 | 9.986 | >500 |
| B | 2412 | 9.744 | >500 |
| | 2437 | 9.896 | >500 |
| | 2462 | 9.833 | >500 |

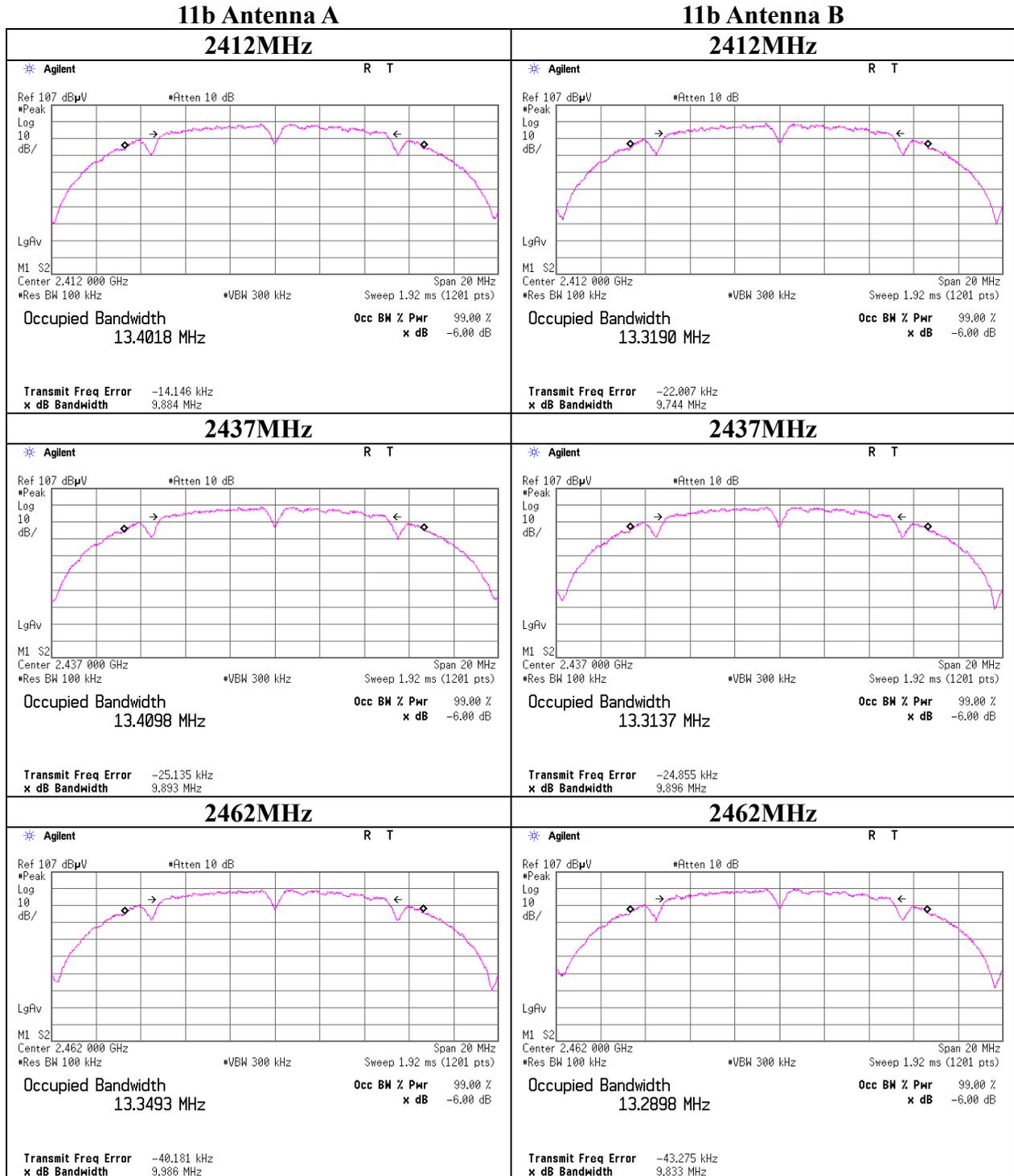
11g

| Antenna | Frequency [MHz] | 6dB Bandwidth [MHz] | Limit [kHz] |
|---------|-----------------|---------------------|-------------|
| A | 2412 | 16.357 | >500 |
| | 2437 | 16.353 | >500 |
| | 2462 | 16.387 | >500 |
| B | 2412 | 16.408 | >500 |
| | 2437 | 16.396 | >500 |
| | 2462 | 16.370 | >500 |

11n-20

| Antenna | Frequency [MHz] | 6dB Bandwidth [MHz] | Limit [kHz] |
|---------|-----------------|---------------------|-------------|
| A | 2412 | 17.567 | >500 |
| | 2437 | 17.542 | >500 |
| | 2462 | 17.560 | >500 |
| B | 2412 | 17.593 | >500 |
| | 2437 | 17.589 | >500 |
| | 2462 | 17.581 | >500 |

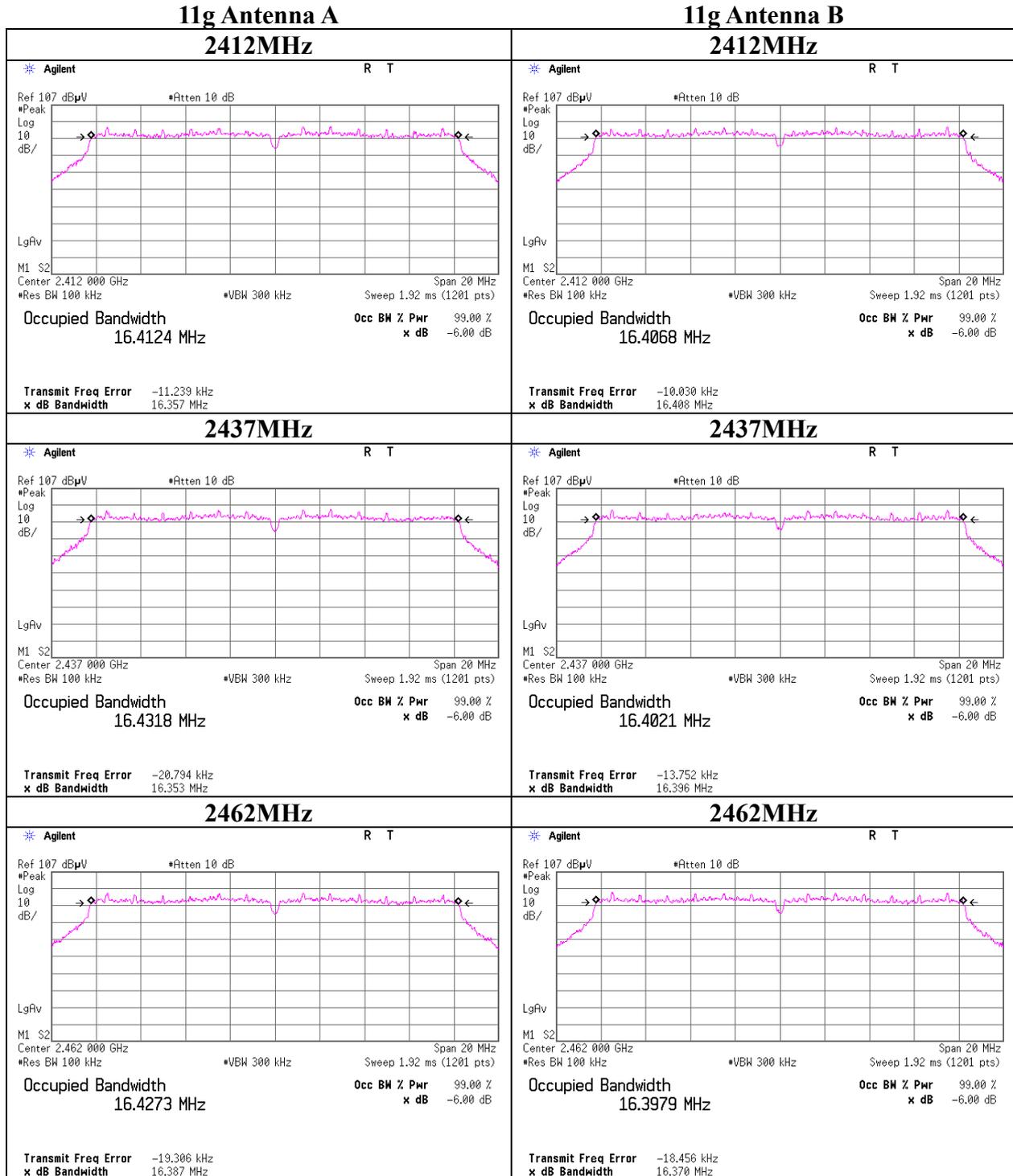
6dB Bandwidth



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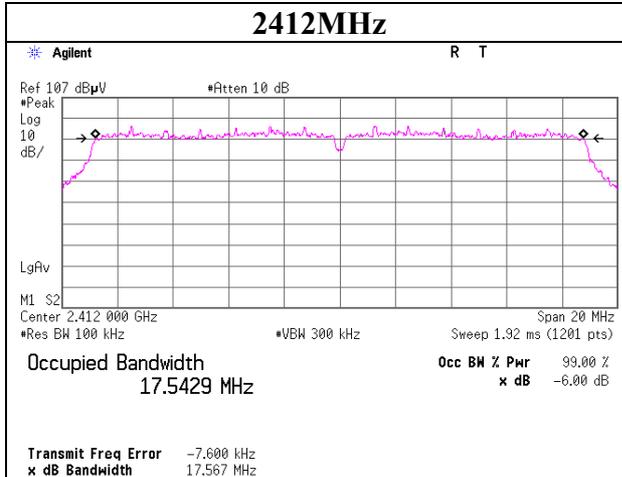
6dB Bandwidth



6dB Bandwidth

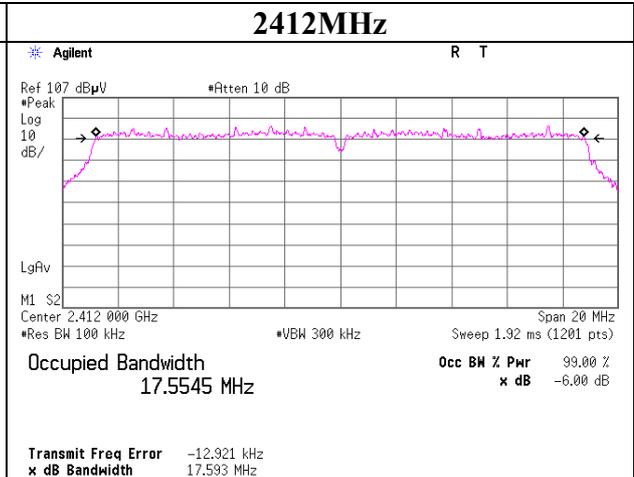
11n-20 Antenna A

2412MHz

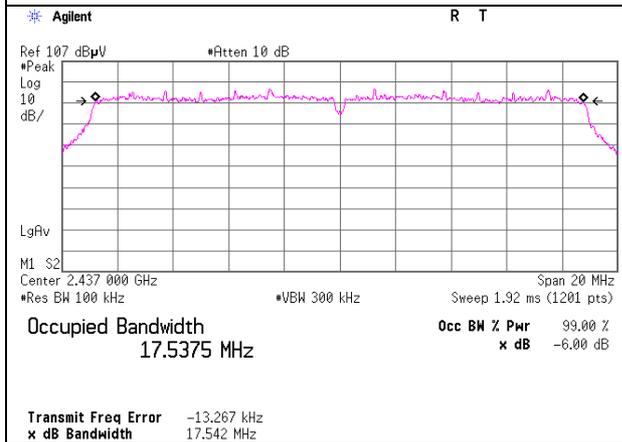


11n-20 Antenna B

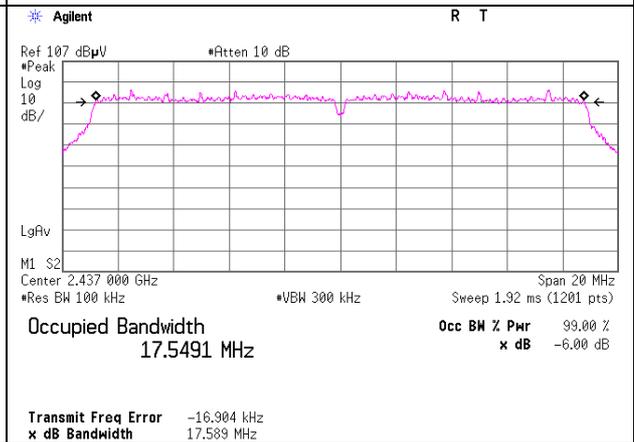
2412MHz



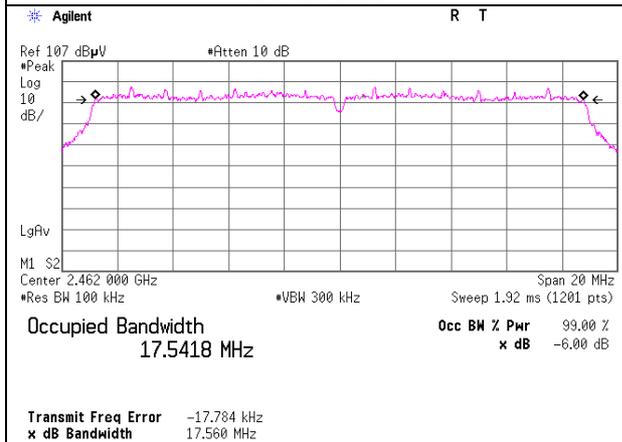
2437MHz



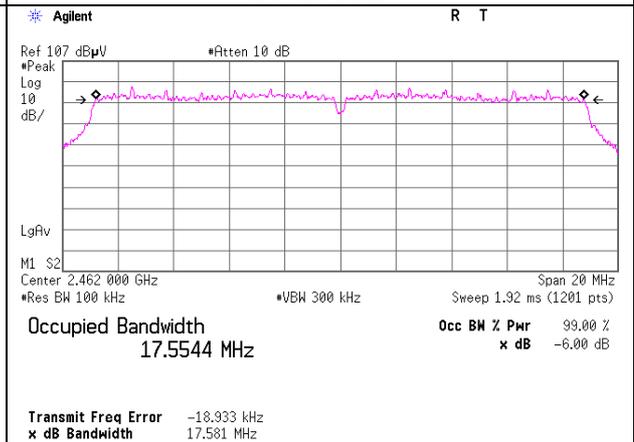
2437MHz



2462MHz



2462MHz



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Ise EMC Lab.

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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

6dB Bandwidth

Test place Ise EMC Lab. No.6 Measurement Room
Report No. 10724035H
Date 03/23/2015
Temperature/ Humidity 22 deg. C / 42% RH
Engineer Ken Fujita
Mode BT LE Tx

| Frequency [MHz] | 6dB Bandwidth [MHz] | Limit [kHz] |
|--------------------|------------------------|----------------|
| 2402 | 0.704 | >500 |
| 2440 | 0.716 | >500 |
| 2480 | 0.719 | >500 |

UL Japan, Inc.

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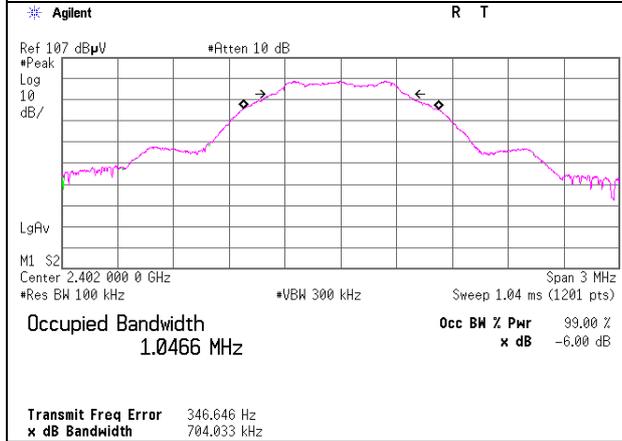
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

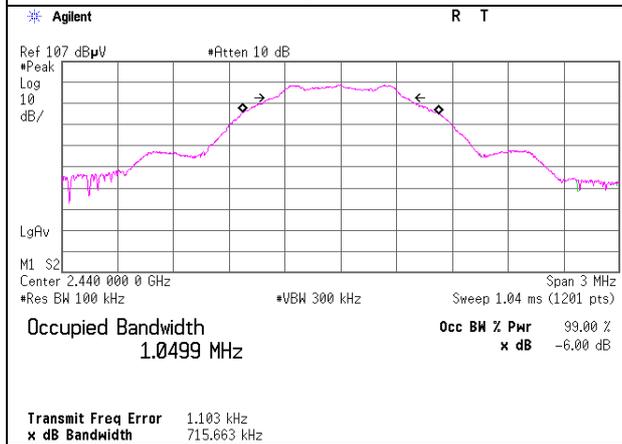
6dB Bandwidth

BT LE

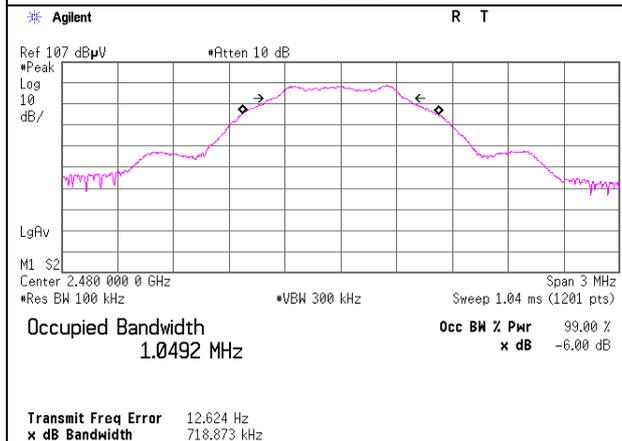
2402MHz



2440MHz



2480MHz



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 Telephone : +81 596 24 8999
 Facsimile : +81 596 24 8124

Maximum Peak Output Power

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/16/2015
Temperature/ Humidity : 23deg. C / 33% RH
Engineer : Shinya Watanabe
Mode : 11b Tx

Antenna A + B

| Freq. [MHz] | Antenna A Result [mW] | Antenna B Result [mW] | Result | | Limit | | Margin [dB] |
|----------------|-----------------------------|-----------------------------|--------|-------|-------|--------|----------------|
| | | | [dBm] | [mW] | [dBm] | [mW] | |
| 2412 | 15.10 | 16.00 | 14.93 | 31.10 | 29.00 | 794.32 | 14.07 |
| 2437 | 16.75 | 16.37 | 15.20 | 33.12 | 29.00 | 794.32 | 13.80 |
| 2462 | 20.04 | 18.92 | 15.91 | 38.96 | 29.00 | 794.32 | 13.09 |

Sample Calculation:

Result = Antenna A + B

*This Limit was reduced by 1dB for directional gain of the antenna/antenna array exceeding 6 dBi.

Antenna A

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | |
|----------------|------------------|-----------------------|----------------|--------|-------|
| | | | | [dBm] | [mW] |
| 2412 | 0.93 | 0.80 | 10.06 | 11.79 | 15.10 |
| 2437 | 1.38 | 0.80 | 10.06 | 12.24 | 16.75 |
| 2462 | 2.16 | 0.80 | 10.06 | 13.02 | 20.04 |

Antenna B

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | |
|----------------|------------------|-----------------------|----------------|--------|-------|
| | | | | [dBm] | [mW] |
| 2412 | 1.18 | 0.80 | 10.06 | 12.04 | 16.00 |
| 2437 | 1.28 | 0.80 | 10.06 | 12.14 | 16.37 |
| 2462 | 1.91 | 0.80 | 10.06 | 12.77 | 18.92 |

Sample Calculation:

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

| Rate [Mbps] | Antenna A Reading Peak | | Antenna B Reading Peak | | Total Reading Power | | Remark [dB] |
|----------------|---------------------------|------|---------------------------|------|------------------------|------|----------------|
| | [dBm] | [mW] | [dBm] | [mW] | [dBm] | [mW] | |
| 1 | 1.06 | 1.28 | 0.98 | 1.25 | 4.03 | 2.53 | |
| 2 | 1.38 | 1.37 | 1.28 | 1.34 | 4.34 | 2.72 | * |
| 5.5 | 0.21 | 1.05 | 0.19 | 1.04 | 3.21 | 2.09 | |
| 11 | 0.56 | 1.14 | 0.41 | 1.10 | 3.50 | 2.24 | |

*: Worst Rate

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

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

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Maximum Peak Output Power

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/16/2015
Temperature/ Humidity : 23deg. C / 33% RH
Engineer : Shinya Watanabe
Mode : 11g Tx

Antenna A + B

| Freq. [MHz] | Antenna A Result [mW] | Antenna B Result [mW] | Result | | Limit | | Margin [dB] |
|----------------|-----------------------------|-----------------------------|--------|--------|-------|--------|----------------|
| | | | [dBm] | [mW] | [dBm] | [mW] | |
| 2412 | 113.24 | 111.69 | 23.52 | 224.93 | 29.00 | 794.32 | 5.48 |
| 2437 | 98.63 | 95.28 | 22.88 | 193.91 | 29.00 | 794.32 | 6.12 |
| 2462 | 112.20 | 94.19 | 23.15 | 206.39 | 29.00 | 794.32 | 5.85 |

Sample Calculation:

Result = Antenna A + B

*This Limit was reduced by 1dB for directional gain of the antenna/antenna array exceeding 6 dBi.

Antenna A

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | |
|----------------|------------------|-----------------------|----------------|--------|--------|
| | | | | [dBm] | [mW] |
| 2412 | 9.68 | 0.80 | 10.06 | 20.54 | 113.24 |
| 2437 | 9.08 | 0.80 | 10.06 | 19.94 | 98.63 |
| 2462 | 9.64 | 0.80 | 10.06 | 20.50 | 112.20 |

Antenna B

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | |
|----------------|------------------|-----------------------|----------------|--------|--------|
| | | | | [dBm] | [mW] |
| 2412 | 9.62 | 0.80 | 10.06 | 20.48 | 111.69 |
| 2437 | 8.93 | 0.80 | 10.06 | 19.79 | 95.28 |
| 2462 | 8.88 | 0.80 | 10.06 | 19.74 | 94.19 |

Sample Calculation:

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

| Rate [Mbps] | Antenna A | | Antenna B | | Total | | Remark |
|----------------|-----------------------|----------------------|-----------------------|----------------------|------------------------|-----------------------|--------|
| | Reading Peak [dBm] | Reading Peak [mW] | Reading Peak [dBm] | Reading Peak [mW] | Reading Power [dBm] | Reading Power [mW] | |
| 6 | 8.90 | 7.76 | 8.84 | 7.66 | 11.88 | 15.42 | |
| 9 | 9.08 | 8.09 | 8.93 | 7.82 | 12.02 | 15.91 | * |
| 12 | 8.30 | 6.76 | 8.29 | 6.75 | 11.31 | 13.51 | |
| 18 | 8.44 | 6.98 | 8.31 | 6.78 | 11.39 | 13.76 | |
| 24 | 8.03 | 6.35 | 7.98 | 6.28 | 11.02 | 12.63 | |
| 36 | 7.75 | 5.96 | 7.59 | 5.74 | 10.68 | 11.70 | |
| 48 | 8.38 | 6.89 | 8.21 | 6.62 | 11.31 | 13.51 | |
| 54 | 8.27 | 6.71 | 8.15 | 6.53 | 11.22 | 13.25 | |

*: Worst Rate

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

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Maximum Peak Output Power

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/16/2015
Temperature/ Humidity : 23deg. C / 33% RH
Engineer : Shinya Watanabe
Mode : 11n-20 Tx

Antenna A + B

| Freq. [MHz] | Antenna A Result [mW] | Antenna B Result [mW] | Result | | Limit | | Margin [dB] |
|----------------|-----------------------------|-----------------------------|--------|--------|-------|--------|----------------|
| | | | [dBm] | [mW] | [dBm] | [mW] | |
| 2412 | 114.82 | 132.74 | 23.94 | 247.56 | 29.00 | 794.32 | 5.06 |
| 2437 | 122.46 | 127.06 | 23.97 | 249.52 | 29.00 | 794.32 | 5.03 |
| 2462 | 128.82 | 111.17 | 23.80 | 239.99 | 29.00 | 794.32 | 5.20 |

Sample Calculation:

Result = Antenna A + B

*This Limit was reduced by 1dB for directional gain of the antenna/antenna array exceeding 6 dBi.

Antenna A

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | |
|----------------|------------------|-----------------------|----------------|--------|--------|
| | | | | [dBm] | [mW] |
| 2412 | 9.74 | 0.80 | 10.06 | 20.60 | 114.82 |
| 2437 | 10.02 | 0.80 | 10.06 | 20.88 | 122.46 |
| 2462 | 10.24 | 0.80 | 10.06 | 21.10 | 128.82 |

Antenna B

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | |
|----------------|------------------|-----------------------|----------------|--------|--------|
| | | | | [dBm] | [mW] |
| 2412 | 10.37 | 0.80 | 10.06 | 21.23 | 132.74 |
| 2437 | 10.18 | 0.80 | 10.06 | 21.04 | 127.06 |
| 2462 | 9.60 | 0.80 | 10.06 | 20.46 | 111.17 |

Sample Calculation:

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

| MCS Number | Antenna A | | Antenna B | | Total | | Remark |
|---------------|--------------|-------|--------------|-------|---------------|-------|--------|
| | Reading Peak | | Reading Peak | | Reading Power | | |
| | [dBm] | [mW] | [dBm] | [mW] | [dBm] | [mW] | |
| 0 | 10.02 | 10.05 | 10.18 | 10.42 | 13.11 | 20.47 | * |
| 1 | 9.27 | 8.45 | 9.32 | 8.55 | 12.31 | 17.00 | |
| 2 | 8.34 | 6.82 | 8.41 | 6.93 | 11.39 | 13.76 | |
| 3 | 8.45 | 7.00 | 8.39 | 6.90 | 11.43 | 13.90 | |
| 4 | 8.69 | 7.40 | 8.73 | 7.46 | 11.72 | 14.86 | |
| 5 | 8.98 | 7.91 | 9.02 | 7.98 | 12.01 | 15.89 | |
| 6 | 8.80 | 7.59 | 8.83 | 7.64 | 11.83 | 15.22 | |
| 7 | 8.51 | 7.10 | 8.55 | 7.16 | 11.54 | 14.26 | |
| 8 | 8.28 | 6.73 | 8.21 | 6.62 | 11.26 | 13.35 | |
| 9 | 7.63 | 5.79 | 8.14 | 6.52 | 10.90 | 12.31 | |
| 10 | 8.31 | 6.78 | 8.35 | 6.84 | 11.34 | 13.62 | |
| 11 | 8.44 | 6.98 | 8.41 | 6.93 | 11.44 | 13.92 | |
| 12 | 8.92 | 7.80 | 8.98 | 7.91 | 11.96 | 15.71 | |
| 13 | 8.09 | 6.44 | 8.36 | 6.85 | 11.24 | 13.30 | |
| 14 | 8.81 | 7.60 | 8.84 | 7.66 | 11.84 | 15.26 | |
| 15 | 8.31 | 6.78 | 8.39 | 6.90 | 11.36 | 13.68 | |

*Worst MCS

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

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Maximum Average Output Power (Reference data for RF EXposure)

Test place Ise EMC Lab. No.6 Measurement Room
Report No. 10724035H
Date 04/14/2015
Temperature/ Humidity 24deg. C / 48% RH
Engineer Takumi Shimada
Mode 11b Tx

Antenna A + B

| Freq. [MHz] | Antenna A Result [mW] | Antenna B Result [mW] | Result | |
|----------------|-----------------------------|-----------------------------|--------|-------|
| | | | [dBm] | [mW] |
| 2412 | 9.57 | 8.93 | 12.67 | 18.50 |
| 2437 | 9.14 | 8.95 | 12.58 | 18.09 |
| 2462 | 9.64 | 9.71 | 12.87 | 19.35 |

Sample Calculation:

Result = Antenna A + B

Antenna A

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | |
|----------------|------------------|-----------------------|----------------|--------|------|
| | | | | [dBm] | [mW] |
| 2412 | -1.05 | 0.80 | 10.06 | 9.81 | 9.57 |
| 2437 | -1.25 | 0.80 | 10.06 | 9.61 | 9.14 |
| 2462 | -1.02 | 0.80 | 10.06 | 9.84 | 9.64 |

Antenna B

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | |
|----------------|------------------|-----------------------|----------------|--------|------|
| | | | | [dBm] | [mW] |
| 2412 | -1.35 | 0.80 | 10.06 | 9.51 | 8.93 |
| 2437 | -1.34 | 0.80 | 10.06 | 9.52 | 8.95 |
| 2462 | -0.99 | 0.80 | 10.06 | 9.87 | 9.71 |

Sample Calculation:

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

| Rate [Mbps] | Antenna A | | Antenna B | | Total | | Remark |
|----------------|--------------------------|------|--------------------------|------|------------------------|------|--------|
| | Reading Average [dBm] | [mW] | Reading Average [dBm] | [mW] | Reading Power [dBm] | [mW] | |
| 1 | -1.56 | 0.70 | -1.45 | 0.72 | 1.51 | 1.41 | |
| 2 | -1.25 | 0.75 | -1.34 | 0.73 | 1.72 | 1.48 | * |
| 5.5 | -2.28 | 0.59 | -2.30 | 0.59 | 0.72 | 1.18 | |
| 11 | -1.98 | 0.63 | -1.99 | 0.63 | 1.03 | 1.27 | |

*: Worst Rate

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

*The test was conducted by the use of Gate function.

Maximum Average Output Power (Reference data for RF EXposure)

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 04/14/2015
Temperature/ Humidity : 24deg. C / 48% RH
Engineer : Takumi Shimada
Mode : 11g Tx

Antenna A + B

| Freq. [MHz] | Antenna A Result [mW] | Antenna B Result [mW] | Result | |
|----------------|-----------------------------|-----------------------------|--------|-------|
| | | | [dBm] | [mW] |
| 2412 | 7.38 | 7.36 | 11.69 | 14.74 |
| 2437 | 7.13 | 7.23 | 11.57 | 14.36 |
| 2462 | 7.83 | 7.71 | 11.92 | 15.54 |

Sample Calculation:
Result = Antenna A + B

Antenna A

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | |
|----------------|------------------|-----------------------|----------------|--------|------|
| | | | | [dBm] | [mW] |
| 2412 | -2.18 | 0.80 | 10.06 | 8.68 | 7.38 |
| 2437 | -2.33 | 0.80 | 10.06 | 8.53 | 7.13 |
| 2462 | -1.92 | 0.80 | 10.06 | 8.94 | 7.83 |

Antenna B

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | |
|----------------|------------------|-----------------------|----------------|--------|------|
| | | | | [dBm] | [mW] |
| 2412 | -2.19 | 0.80 | 10.06 | 8.67 | 7.36 |
| 2437 | -2.27 | 0.80 | 10.06 | 8.59 | 7.23 |
| 2462 | -1.99 | 0.80 | 10.06 | 8.87 | 7.71 |

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

| Rate [Mbps] | Antenna A Reading Average | | Antenna B Reading Average | | Total Reading Power | | Remark [dB] |
|----------------|------------------------------|------|------------------------------|------|------------------------|------|----------------|
| | [dBm] | [mW] | [dBm] | [mW] | [dBm] | [mW] | |
| 6 | -2.53 | 0.56 | -2.32 | 0.59 | 0.59 | 1.14 | |
| 9 | -2.33 | 0.58 | -2.27 | 0.59 | 0.71 | 1.18 | * |
| 12 | -2.51 | 0.56 | -2.29 | 0.59 | 0.61 | 1.15 | |
| 18 | -2.32 | 0.59 | -2.36 | 0.58 | 0.67 | 1.17 | |
| 24 | -2.34 | 0.58 | -2.31 | 0.59 | 0.69 | 1.17 | |
| 36 | -2.29 | 0.59 | -2.34 | 0.58 | 0.70 | 1.17 | |
| 48 | -2.33 | 0.58 | -2.33 | 0.58 | 0.68 | 1.17 | |
| 54 | -2.42 | 0.57 | -2.29 | 0.59 | 0.66 | 1.16 | |

*: Worst Rate
All comparison were carried out on same frequency and measurement factors.

*The test was conducted by the use of Gate function.

Maximum Average Output Power (Reference data for RF EXposure)

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 04/14/2015
Temperature/ Humidity : 24deg. C / 48% RH
Engineer : Takumi Shimada
Mode : 11n-20 Tx

Antenna A + B

| Freq. [MHz] | Antenna A Result [mW] | Antenna B Result [mW] | Result | |
|----------------|-----------------------------|-----------------------------|--------|-------|
| | | | [dBm] | [mW] |
| 2412 | 7.28 | 7.48 | 11.69 | 14.76 |
| 2437 | 7.40 | 7.50 | 11.73 | 14.90 |
| 2462 | 8.39 | 8.36 | 12.24 | 16.75 |

Sample Calculation:

Result = Antenna A + B

Antenna A

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | |
|----------------|------------------|-----------------------|----------------|--------|------|
| | | | | [dBm] | [mW] |
| 2412 | -2.24 | 0.80 | 10.06 | 8.62 | 7.28 |
| 2437 | -2.17 | 0.80 | 10.06 | 8.69 | 7.40 |
| 2462 | -1.62 | 0.80 | 10.06 | 9.24 | 8.39 |

Antenna B

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | |
|----------------|------------------|-----------------------|----------------|--------|------|
| | | | | [dBm] | [mW] |
| 2412 | -2.12 | 0.80 | 10.06 | 8.74 | 7.48 |
| 2437 | -2.11 | 0.80 | 10.06 | 8.75 | 7.50 |
| 2462 | -1.64 | 0.80 | 10.06 | 9.22 | 8.36 |

Sample Calculation:

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

| MCS Number | Antenna A Reading Average | | Antenna B Reading Average | | Total Reading Power | | Remark |
|---------------|------------------------------|------|------------------------------|------|------------------------|------|--------|
| | [dBm] | [mW] | [dBm] | [mW] | [dBm] | [mW] | |
| 0 | -2.17 | 0.61 | -2.11 | 0.62 | 0.87 | 1.22 | * |
| 1 | -2.16 | 0.61 | -2.19 | 0.60 | 0.84 | 1.21 | |
| 2 | -2.19 | 0.60 | -2.15 | 0.61 | 0.84 | 1.21 | |
| 3 | -2.21 | 0.60 | -2.18 | 0.61 | 0.82 | 1.21 | |
| 4 | -2.23 | 0.60 | -2.19 | 0.60 | 0.80 | 1.20 | |
| 5 | -2.25 | 0.60 | -2.21 | 0.60 | 0.78 | 1.20 | |
| 6 | -2.19 | 0.60 | -2.23 | 0.60 | 0.80 | 1.20 | |
| 7 | -2.18 | 0.61 | -2.21 | 0.60 | 0.82 | 1.21 | |
| 8 | -2.19 | 0.60 | -2.24 | 0.60 | 0.80 | 1.20 | |
| 9 | -2.19 | 0.60 | -2.18 | 0.61 | 0.83 | 1.21 | |
| 10 | -2.20 | 0.60 | -2.16 | 0.61 | 0.83 | 1.21 | |
| 11 | -2.16 | 0.61 | -2.18 | 0.61 | 0.84 | 1.21 | |
| 12 | -2.17 | 0.61 | -2.20 | 0.60 | 0.83 | 1.21 | |
| 13 | -2.18 | 0.61 | -2.21 | 0.60 | 0.82 | 1.21 | |
| 14 | -2.19 | 0.60 | -2.23 | 0.60 | 0.80 | 1.20 | |
| 15 | -2.15 | 0.61 | -2.20 | 0.60 | 0.84 | 1.21 | |

*Worst MCS

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

*The test was conducted by the use of Gate function.

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Maximum Peak Output Power

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/23/2015
Temperature/ Humidity : 22 deg. C / 42% RH
Engineer : Ken Fujita
Mode : BT LE Tx

| Freq. [MHz] | Reading Peak [dBm] | Cable Loss [dB] | Atten. [dB] | Result | | Limit | | Margin [dB] |
|----------------|--------------------------|-----------------------|----------------|--------|------|-------|------|----------------|
| | | | | [dBm] | [mW] | [dBm] | [mW] | |
| 2402 | -10.54 | 2.07 | 10.02 | 1.55 | 1.43 | 30.00 | 1000 | 28.45 |
| 2440 | -10.57 | 2.08 | 10.02 | 1.53 | 1.42 | 30.00 | 1000 | 28.47 |
| 2480 | -10.61 | 2.09 | 10.02 | 1.50 | 1.41 | 30.00 | 1000 | 28.50 |

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

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Average Power
(For reporting purpose only)

Test place Ise EMC Lab. No.6 Measurement Room
Report No. 10724035H
Date 03/23/2015
Temperature/ Humidity 22 deg. C / 42% RH
Engineer Ken Fujita
Mode BT LE Tx

| Freq. [MHz] | Reading Average [dBm] | Cable Loss [dB] | Atten. [dB] | Result | |
|----------------|-----------------------------|-----------------------|----------------|--------|------|
| | | | | [dBm] | [mW] |
| 2402 | -12.83 | 2.07 | 10.02 | -0.74 | 0.84 |
| 2440 | -12.87 | 2.08 | 10.02 | -0.77 | 0.84 |
| 2480 | -12.91 | 2.09 | 10.02 | -0.80 | 0.83 |

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

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Radiated Spurious Emission
(Power Supply: Chicony)

Test place Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10724035H
Date 03/20/2015 03/23/2015 03/23/2015
Temperature/ Humidity 20deg. C / 55% RH 20deg. C / 37% RH 20deg. C / 37% RH
Engineer Tomoki Matsui Takafumi Noguchi Keisuke Kawamura
(1-10GHz) (10-18GHz) (18-26.5GHz)
Mode 11b Tx 2412MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-----------------------|
| Hori | 2390.000 | PK | 49.6 | 26.8 | 3.2 | 32.0 | 47.6 | 73.9 | 26.3 | |
| Hori | 2747.733 | PK | 61.0 | 27.1 | 3.5 | 31.7 | 59.9 | 73.9 | 14.0 | |
| Hori | 4824.000 | PK | 40.3 | 30.6 | 5.3 | 31.3 | 44.9 | 73.9 | 29.0 | Floor Noise |
| Hori | 7236.000 | PK | 42.1 | 35.9 | 6.6 | 32.0 | 52.6 | 73.9 | 21.3 | Floor Noise |
| Hori | 9648.000 | PK | 39.9 | 38.5 | 7.0 | 32.4 | 53.0 | 73.9 | 20.9 | Floor Noise |
| Hori | 2390.000 | AV | 40.5 | 26.8 | 3.2 | 32.0 | 38.5 | 53.9 | 15.4 | |
| Hori | 2747.733 | AV | 41.2 | 27.1 | 3.5 | 31.7 | 40.1 | 53.9 | 13.8 | RBW: 1MHz / VBW: 10Hz |
| Hori | 4824.000 | AV | 32.1 | 30.6 | 5.3 | 31.3 | 36.7 | 53.9 | 17.2 | Floor Noise |
| Hori | 7236.000 | AV | 33.8 | 35.9 | 6.6 | 32.0 | 44.3 | 53.9 | 9.6 | Floor Noise |
| Hori | 9648.000 | AV | 32.4 | 38.5 | 7.0 | 32.4 | 45.5 | 53.9 | 8.4 | Floor Noise |
| Vert | 2390.000 | PK | 46.4 | 26.8 | 3.2 | 32.0 | 44.4 | 73.9 | 29.5 | |
| Vert | 2747.733 | PK | 61.3 | 27.1 | 3.5 | 31.7 | 60.2 | 73.9 | 13.7 | |
| Vert | 4824.000 | PK | 41.9 | 30.6 | 5.3 | 31.3 | 46.5 | 73.9 | 27.4 | Floor Noise |
| Vert | 7236.000 | PK | 43.7 | 35.9 | 6.6 | 32.0 | 54.2 | 73.9 | 19.7 | Floor Noise |
| Vert | 9648.000 | PK | 41.0 | 38.5 | 7.0 | 32.4 | 54.1 | 73.9 | 19.8 | Floor Noise |
| Vert | 2390.000 | AV | 38.2 | 26.8 | 3.2 | 32.0 | 36.2 | 53.9 | 17.7 | |
| Vert | 2747.733 | AV | 41.3 | 27.1 | 3.5 | 31.7 | 40.2 | 53.9 | 13.7 | RBW: 1MHz / VBW: 10Hz |
| Vert | 4824.000 | AV | 32.0 | 30.6 | 5.3 | 31.3 | 36.6 | 53.9 | 17.3 | Floor Noise |
| Vert | 7236.000 | AV | 33.8 | 35.9 | 6.6 | 32.0 | 44.3 | 53.9 | 9.6 | Floor Noise |
| Vert | 9648.000 | AV | 32.5 | 38.5 | 7.0 | 32.4 | 45.6 | 53.9 | 8.3 | Floor Noise |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

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

20dBc Data Sheet

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant Factor [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-------------------|-----------|-----------|-----------------|----------------|-------------|---------|
| Hori | 2412.000 | PK | 103.0 | 26.8 | 3.2 | 32.0 | 101.0 | - | - | Carrier |
| Hori | 2396.970 | PK | 52.3 | 26.8 | 3.2 | 32.0 | 50.3 | 81.0 | 30.7 | |
| Hori | 2400.000 | PK | 46.0 | 26.8 | 3.2 | 32.0 | 44.0 | 81.0 | 37.0 | |
| Vert | 2412.000 | PK | 99.3 | 26.8 | 3.2 | 32.0 | 97.3 | - | - | Carrier |
| Vert | 2399.167 | PK | 46.1 | 26.8 | 3.2 | 32.0 | 44.1 | 77.3 | 33.2 | |
| Vert | 2400.000 | PK | 42.1 | 26.8 | 3.2 | 32.0 | 40.1 | 77.3 | 37.2 | |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

UL Japan, Inc.

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Radiated Spurious Emission
(Power Supply: Chicony)

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10724035H
Date : 03/20/2015 03/23/2015 03/23/2015 03/24/2015
Temperature/ Humidity : 20deg. C / 55% RH 20deg. C / 37% RH 20deg. C / 37% RH 18deg. C / 31% RH
Engineer : Takumi Shimada Takafumi Noguchi Keisuke Kawamura Takafumi Noguchi
(1-10GHz) (10-18GHz) (18-26.5GHz) (Below 1GHz)
Mode : BT LE Tx 2402MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Duty Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|------------------|-----------------|----------------|-------------|-------------|
| Hori | 68.936 | QP | 47.8 | 6.2 | 7.6 | 32.1 | - | 29.5 | 40.0 | 10.5 | |
| Hori | 93.924 | QP | 45.8 | 9.1 | 8.0 | 32.2 | - | 30.7 | 43.5 | 12.8 | |
| Hori | 148.496 | QP | 44.5 | 14.9 | 8.6 | 32.2 | - | 35.8 | 43.5 | 7.7 | |
| Hori | 256.658 | QP | 42.8 | 17.5 | 9.5 | 32.0 | - | 37.8 | 46.0 | 8.2 | |
| Hori | 300.009 | QP | 45.7 | 14.7 | 10.0 | 32.0 | - | 38.4 | 46.0 | 7.6 | |
| Hori | 405.008 | QP | 34.2 | 17.6 | 10.6 | 32.0 | - | 30.4 | 46.0 | 15.6 | |
| Hori | 742.477 | QP | 42.0 | 21.2 | 12.6 | 31.9 | - | 43.9 | 46.0 | 2.1 | |
| Hori | 2390.000 | PK | 55.2 | 26.8 | 3.2 | 32.0 | - | 53.2 | 73.9 | 20.7 | |
| Hori | 2749.638 | PK | 62.3 | 27.1 | 3.5 | 31.7 | - | 61.2 | 73.9 | 12.7 | |
| Hori | 4804.000 | PK | 42.2 | 30.6 | 5.2 | 31.3 | - | 46.7 | 73.9 | 27.2 | |
| Hori | 7206.000 | PK | 43.0 | 35.9 | 6.6 | 32.0 | - | 53.5 | 73.9 | 20.4 | |
| Hori | 9608.000 | PK | 42.3 | 38.4 | 7.0 | 32.4 | - | 55.3 | 73.9 | 18.6 | |
| Hori | 2390.000 | AV | 38.4 | 26.8 | 3.2 | 32.0 | 2.0 | 38.4 | 53.9 | 15.5 | *1) |
| Hori | 2749.638 | AV | 41.0 | 27.1 | 3.5 | 31.7 | - | 39.9 | 53.9 | 14.0 | |
| Hori | 4804.000 | AV | 35.9 | 30.6 | 5.2 | 31.3 | 2.0 | 42.4 | 53.9 | 11.5 | |
| Hori | 7206.000 | AV | 34.0 | 35.9 | 6.6 | 32.0 | - | 44.5 | 53.9 | 9.4 | Floor Noise |
| Hori | 9608.000 | AV | 34.4 | 38.4 | 7.0 | 32.4 | - | 47.4 | 53.9 | 6.5 | Floor Noise |
| Vert | 47.373 | QP | 45.1 | 11.5 | 7.3 | 32.2 | - | 31.7 | 40.0 | 8.3 | |
| Vert | 72.932 | QP | 46.8 | 6.3 | 7.7 | 32.1 | - | 28.7 | 40.0 | 11.3 | |
| Vert | 92.698 | QP | 46.1 | 8.9 | 7.9 | 32.2 | - | 30.7 | 43.5 | 12.8 | |
| Vert | 148.497 | QP | 42.5 | 14.9 | 8.6 | 32.2 | - | 33.8 | 43.5 | 9.7 | |
| Vert | 264.359 | QP | 36.0 | 17.9 | 9.7 | 32.0 | - | 31.6 | 46.0 | 14.4 | |
| Vert | 405.008 | QP | 38.0 | 17.6 | 10.6 | 32.0 | - | 34.2 | 46.0 | 11.8 | |
| Vert | 742.476 | QP | 41.3 | 21.2 | 12.6 | 31.9 | - | 43.2 | 46.0 | 2.8 | |
| Vert | 2390.000 | PK | 62.6 | 26.8 | 3.2 | 32.0 | - | 60.6 | 73.9 | 13.3 | |
| Vert | 2748.777 | PK | 61.6 | 27.1 | 3.5 | 31.7 | - | 60.5 | 73.9 | 13.4 | |
| Vert | 4804.000 | PK | 43.7 | 30.6 | 5.2 | 31.3 | - | 48.2 | 73.9 | 25.7 | |
| Vert | 7206.000 | PK | 42.3 | 35.9 | 6.6 | 32.0 | - | 52.8 | 73.9 | 21.1 | |
| Vert | 9608.000 | PK | 43.0 | 38.4 | 7.0 | 32.4 | - | 56.0 | 73.9 | 17.9 | |
| Vert | 2390.000 | AV | 43.9 | 26.8 | 3.2 | 32.0 | 2.0 | 43.9 | 53.9 | 10.0 | *1) |
| Vert | 2748.777 | AV | 38.5 | 27.1 | 3.5 | 31.7 | - | 37.4 | 53.9 | 16.5 | |
| Vert | 4804.000 | AV | 36.1 | 30.6 | 5.2 | 31.3 | 2.0 | 42.6 | 53.9 | 11.3 | |
| Vert | 7206.000 | AV | 33.8 | 35.9 | 6.6 | 32.0 | - | 44.3 | 53.9 | 9.6 | Floor Noise |
| Vert | 9608.000 | AV | 34.2 | 38.4 | 7.0 | 32.4 | - | 47.2 | 53.9 | 6.7 | Floor Noise |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor

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

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

*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant Factor [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-------------------|-----------|-----------|-----------------|----------------|-------------|---------|
| Hori | 2402.000 | PK | 100.0 | 26.8 | 3.2 | 32.0 | 98.0 | - | - | Carrier |
| Hori | 2400.000 | PK | 55.1 | 26.8 | 3.2 | 32.0 | 53.1 | 78.0 | 24.9 | |
| Vert | 2402.000 | PK | 107.2 | 26.8 | 3.2 | 32.0 | 105.2 | - | - | Carrier |
| Vert | 2400.000 | PK | 62.1 | 26.8 | 3.2 | 32.0 | 60.1 | 85.2 | 25.1 | |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

UL Japan, Inc.

Ise EMC Lab.

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Facsimile : +81 596 24 8124

Radiated Spurious Emission
(Power Supply: Chicony)

Test place Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10724035H
Date 03/20/2015 03/23/2015 03/23/2015 03/24/2015
Temperature/ Humidity 20deg. C / 55% RH 20deg. C / 37% RH 20deg. C / 37% RH 18deg. C / 31% RH
Engineer Takumi Shimada Takafumi Noguchi Keisuke Kawamura Keisuke Kawamura
Mode BT LE Tx 2480MHz (1-10GHz) (10-18GHz) (18-26.5GHz) (30M-1000MHz)

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Duty Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|------------------|-----------------|----------------|-------------|-----------------------|
| Hori | 68.551 | QP | 45.7 | 6.3 | 7.6 | 32.1 | - | 27.5 | 40.0 | 12.5 | |
| Hori | 92.691 | QP | 45.6 | 8.9 | 7.9 | 32.2 | - | 30.2 | 43.5 | 13.3 | |
| Hori | 148.503 | QP | 43.2 | 14.9 | 8.6 | 32.2 | - | 34.5 | 43.5 | 9.0 | |
| Hori | 301.167 | QP | 42.9 | 14.7 | 10.0 | 32.0 | - | 35.6 | 46.0 | 10.4 | |
| Hori | 405.090 | QP | 34.2 | 17.6 | 10.6 | 32.0 | - | 30.4 | 46.0 | 15.6 | |
| Hori | 742.489 | QP | 41.2 | 21.2 | 12.6 | 31.9 | - | 43.1 | 46.0 | 2.9 | |
| Hori | 2483.500 | PK | 68.1 | 26.9 | 3.2 | 32.0 | - | 66.2 | 73.9 | 7.7 | |
| Hori | 2749.730 | PK | 63.7 | 27.1 | 3.5 | 31.7 | - | 62.6 | 73.9 | 11.3 | |
| Hori | 4960.000 | PK | 40.9 | 30.9 | 5.2 | 31.2 | - | 45.8 | 73.9 | 28.1 | |
| Hori | 7440.000 | PK | 42.7 | 35.9 | 6.6 | 32.1 | - | 53.1 | 73.9 | 20.8 | Floor Noise |
| Hori | 9920.000 | PK | 42.2 | 38.9 | 7.1 | 32.5 | - | 55.7 | 73.9 | 18.2 | Floor Noise |
| Hori | 2483.500 | AV | 49.0 | 26.9 | 3.2 | 32.0 | 2.0 | 49.1 | 53.9 | 4.8 | *1) |
| Hori | 2749.730 | AV | 40.2 | 27.1 | 3.5 | 31.7 | - | 39.1 | 53.9 | 14.8 | RBW: 1MHz / VBW: 10Hz |
| Hori | 4960.000 | AV | 32.7 | 30.9 | 5.2 | 31.2 | 2.0 | 39.6 | 53.9 | 14.3 | |
| Hori | 7440.000 | AV | 33.7 | 35.9 | 6.6 | 32.1 | - | 44.1 | 53.9 | 9.8 | Floor Noise |
| Hori | 9920.000 | AV | 33.6 | 38.9 | 7.1 | 32.5 | - | 47.1 | 53.9 | 6.8 | Floor Noise |
| Vert | 47.551 | QP | 44.0 | 11.5 | 7.3 | 32.2 | - | 30.6 | 40.0 | 9.4 | |
| Vert | 92.691 | QP | 44.2 | 8.9 | 7.9 | 32.2 | - | 28.8 | 43.5 | 14.7 | |
| Vert | 148.503 | QP | 43.4 | 14.9 | 8.6 | 32.2 | - | 34.7 | 43.5 | 8.8 | |
| Vert | 301.167 | QP | 39.4 | 14.7 | 10.0 | 32.0 | - | 32.1 | 46.0 | 13.9 | |
| Vert | 405.009 | QP | 37.7 | 17.6 | 10.6 | 32.0 | - | 33.9 | 46.0 | 12.1 | |
| Vert | 742.489 | QP | 41.7 | 21.2 | 12.6 | 31.9 | - | 43.6 | 46.0 | 2.4 | |
| Vert | 2483.500 | PK | 69.2 | 26.9 | 3.2 | 32.0 | - | 67.3 | 73.9 | 6.6 | |
| Vert | 2749.688 | PK | 63.1 | 27.1 | 3.5 | 31.7 | - | 62.0 | 73.9 | 11.9 | |
| Vert | 4960.000 | PK | 41.5 | 30.9 | 5.2 | 31.2 | - | 46.4 | 73.9 | 27.5 | |
| Vert | 7440.000 | PK | 42.5 | 35.9 | 6.6 | 32.1 | - | 52.9 | 73.9 | 21.0 | Floor Noise |
| Vert | 9920.000 | PK | 42.7 | 38.9 | 7.1 | 32.5 | - | 56.2 | 73.9 | 17.7 | Floor Noise |
| Vert | 2483.500 | AV | 53.0 | 26.9 | 3.2 | 32.0 | 2.0 | 53.1 | 53.9 | 0.8 | *1) |
| Vert | 2749.688 | AV | 40.3 | 27.1 | 3.5 | 31.7 | - | 39.2 | 53.9 | 14.7 | RBW: 1MHz / VBW: 10Hz |
| Vert | 4960.000 | AV | 33.2 | 30.9 | 5.2 | 31.2 | 2.0 | 40.1 | 53.9 | 13.8 | |
| Vert | 7440.000 | AV | 33.8 | 35.9 | 6.6 | 32.1 | - | 44.2 | 53.9 | 9.7 | Floor Noise |
| Vert | 9920.000 | AV | 33.7 | 38.9 | 7.1 | 32.5 | - | 47.2 | 53.9 | 6.7 | Floor Noise |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor

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

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

*1) Not Out of Band emission(Leakage Power)

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Radiated Spurious Emission
(Power Supply: DELTA)

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10724035H
Date : 03/22/2015 03/23/2015 03/23/2015
Temperature/ Humidity : 20deg. C / 42% RH 20deg. C / 37% RH 20deg. C / 37% RH
Engineer : Keisuke Kawamura Takafumi Noguchi Keisuke Kawamura
(1-10GHz) (10-18GHz) (18-26.5GHz, Below 1GHz)
Mode : 1In-20 Tx 2437MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-----------------------|
| Hori | 31.255 | QP | 37.4 | 17.0 | 7.0 | 32.3 | 29.1 | 40.0 | 10.9 | |
| Hori | 68.977 | QP | 48.8 | 6.2 | 7.6 | 32.1 | 30.5 | 40.0 | 9.5 | |
| Hori | 148.503 | QP | 44.0 | 14.9 | 8.6 | 32.2 | 35.3 | 43.5 | 8.2 | |
| Hori | 256.658 | QP | 35.2 | 17.5 | 9.5 | 32.0 | 30.2 | 46.0 | 15.8 | |
| Hori | 500.000 | QP | 34.8 | 18.2 | 11.2 | 32.1 | 32.1 | 46.0 | 13.9 | |
| Hori | 742.505 | QP | 38.6 | 21.2 | 12.6 | 31.9 | 40.5 | 46.0 | 5.5 | |
| Hori | 2740.171 | PK | 57.3 | 27.1 | 3.5 | 31.7 | 56.2 | 73.9 | 17.7 | |
| Hori | 4874.000 | PK | 40.1 | 30.7 | 5.3 | 31.3 | 44.8 | 73.9 | 29.1 | Floor Noise |
| Hori | 7311.000 | PK | 42.4 | 35.9 | 6.5 | 32.0 | 52.8 | 73.9 | 21.1 | Floor Noise |
| Hori | 9748.000 | PK | 39.8 | 38.7 | 7.1 | 32.4 | 53.2 | 73.9 | 20.7 | Floor Noise |
| Hori | 2740.171 | AV | 41.0 | 27.1 | 3.5 | 31.7 | 39.9 | 53.9 | 14.0 | RBW: 1MHz / VBW: 10Hz |
| Hori | 4874.000 | AV | 32.3 | 30.7 | 5.3 | 31.3 | 37.0 | 53.9 | 16.9 | Floor Noise |
| Hori | 7311.000 | AV | 33.7 | 35.9 | 6.5 | 32.0 | 44.1 | 53.9 | 9.8 | Floor Noise |
| Hori | 9748.000 | AV | 32.1 | 38.7 | 7.1 | 32.4 | 45.5 | 53.9 | 8.4 | Floor Noise |
| Vert | 31.255 | QP | 39.5 | 17.0 | 7.0 | 32.3 | 31.2 | 40.0 | 8.8 | |
| Vert | 43.651 | QP | 42.9 | 12.8 | 7.2 | 32.2 | 30.7 | 40.0 | 9.3 | |
| Vert | 148.503 | QP | 44.7 | 14.9 | 8.6 | 32.2 | 36.0 | 43.5 | 7.5 | |
| Vert | 256.658 | QP | 31.6 | 17.5 | 9.5 | 32.0 | 26.6 | 46.0 | 19.4 | |
| Vert | 500.000 | QP | 35.0 | 18.2 | 11.2 | 32.1 | 32.3 | 46.0 | 13.7 | |
| Vert | 742.505 | QP | 39.9 | 21.2 | 12.6 | 31.9 | 41.8 | 46.0 | 4.2 | |
| Vert | 2740.171 | PK | 56.9 | 27.1 | 3.5 | 31.7 | 55.8 | 73.9 | 18.1 | |
| Vert | 4874.000 | PK | 40.0 | 30.7 | 5.3 | 31.3 | 44.7 | 73.9 | 29.2 | Floor Noise |
| Vert | 7311.000 | PK | 41.1 | 35.9 | 6.5 | 32.0 | 51.5 | 73.9 | 22.4 | Floor Noise |
| Vert | 9748.000 | PK | 42.6 | 38.7 | 7.1 | 32.4 | 56.0 | 73.9 | 17.9 | Floor Noise |
| Vert | 2740.171 | AV | 40.6 | 27.1 | 3.5 | 31.7 | 39.5 | 53.9 | 14.4 | RBW: 1MHz / VBW: 10Hz |
| Vert | 4874.000 | AV | 32.0 | 30.7 | 5.3 | 31.3 | 36.7 | 53.9 | 17.2 | Floor Noise |
| Vert | 7311.000 | AV | 33.9 | 35.9 | 6.5 | 32.0 | 44.3 | 53.9 | 9.6 | Floor Noise |
| Vert | 9748.000 | AV | 32.1 | 38.7 | 7.1 | 32.4 | 45.5 | 53.9 | 8.4 | Floor Noise |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

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

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Ise EMC Lab.

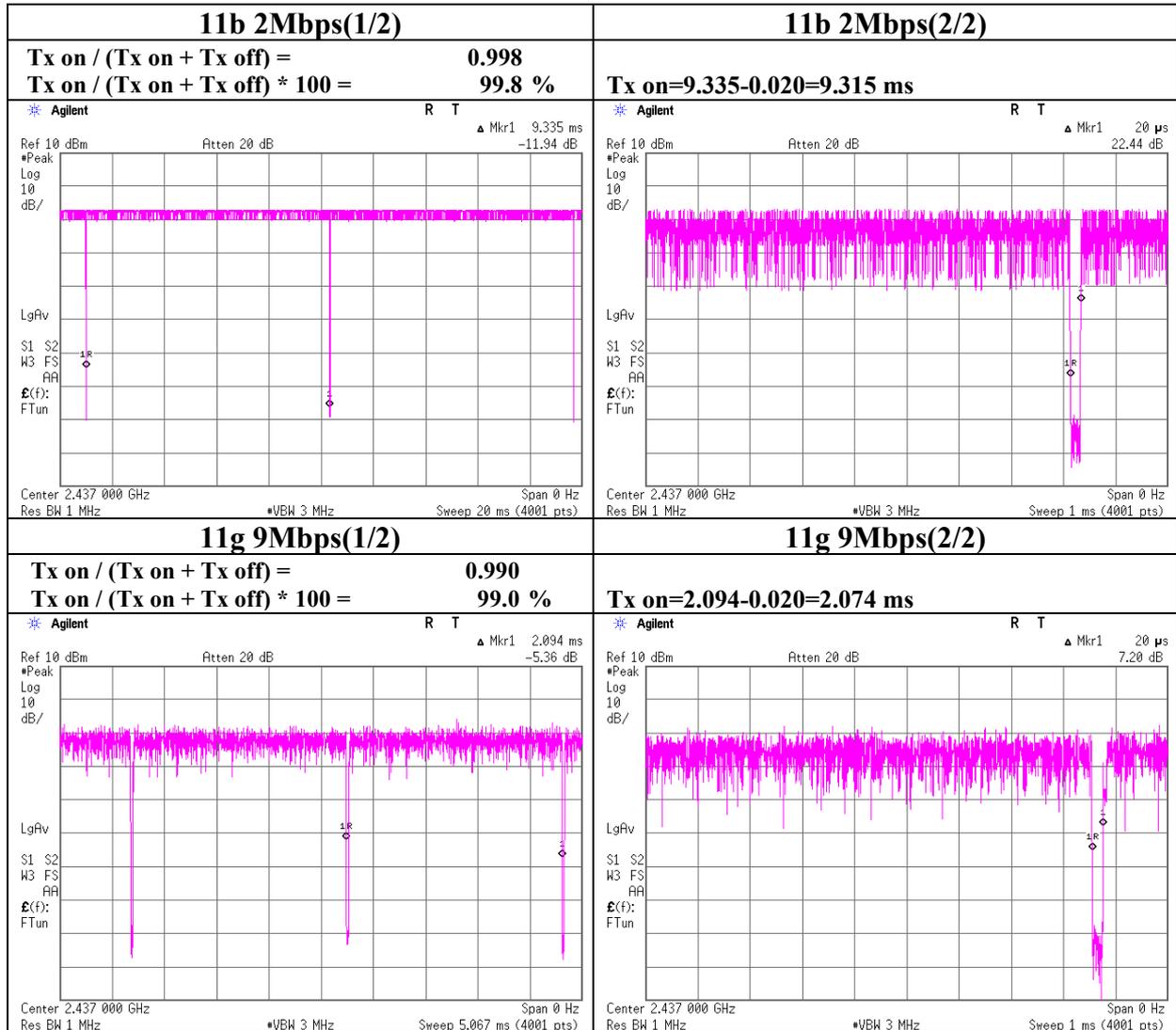
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Facsimile : +81 596 24 8124

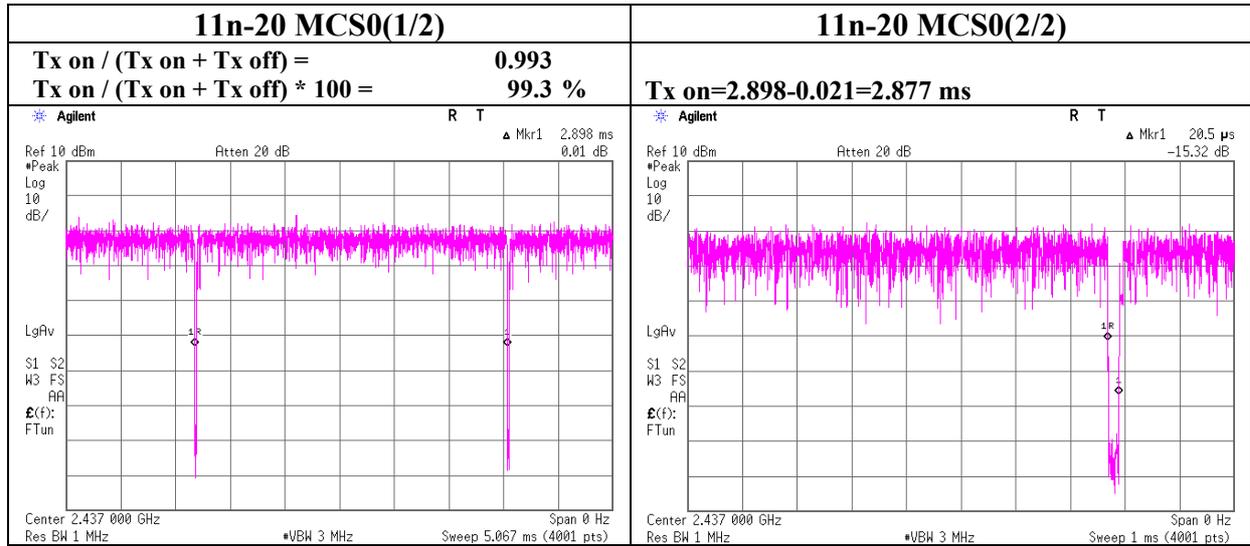
Burst rate confirmation

Test place : Ise EMC Lab. No.6 Measurement Room
 Report No. : 10724035H
 Date : 03/17/2015
 Temperature/ Humidity : 22deg. C / 36% RH
 Engineer : Shinya Watanabe
 Mode : 11b ,11g Tx



Burst rate confirmation

Test place : Ise EMC Lab. No.6 Measurement Room
 Report No. : 10724035H
 Date : 03/17/2015
 Temperature/ Humidity : 22deg. C / 36% RH
 Engineer : Shinya Watanabe
 Mode : 11n-20 Tx



UL Japan, Inc.

Ise EMC Lab.

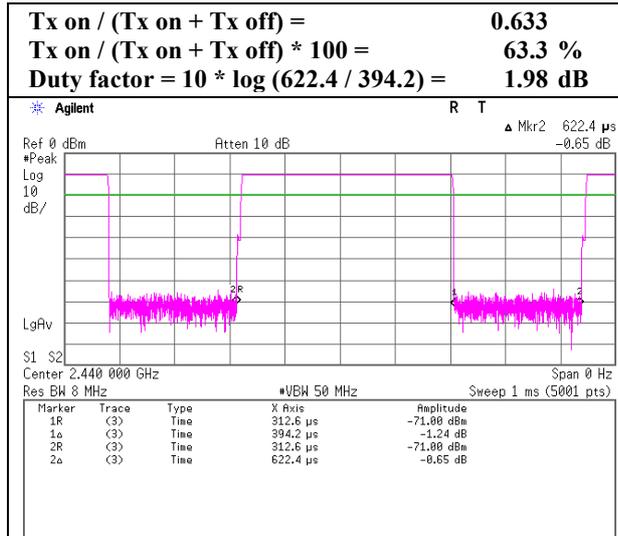
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Burst rate confirmation and Dwell time factor
BT LE

| | |
|-----------------------|------------------------------------|
| Test place | Ise EMC Lab. No.6 Measurement Room |
| Report No. | 10724035H |
| Date | 03/23/2015 |
| Temperature/ Humidity | 22 deg. C / 42% RH |
| Engineer | Ken Fujita |
| Mode | BT LE Tx |



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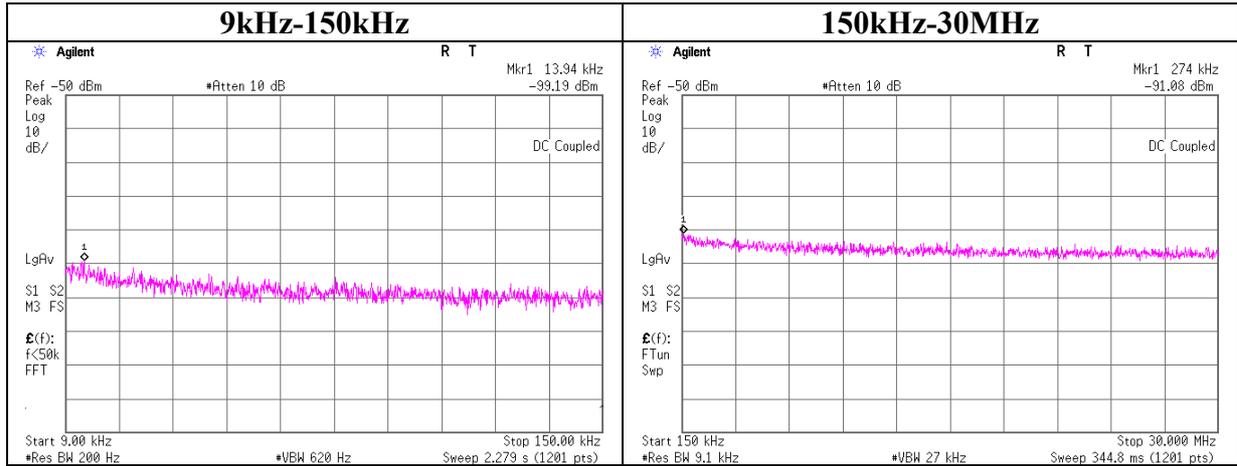
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Conducted Spurious Emission

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/16/2015
Temperature/ Humidity : 23deg. C / 33% RH
Engineer : Shinya Watanabe
Mode : 11n-20 Tx

11n-20 Tx 2437MHz



| Frequency [kHz] | Reading [dBm] | Cable Loss [dB] | Attenuator [dB] | Antenna Gain [dBi] | N (Number of Output) | EIRP [dBm] | Distance [m] | Ground bounce [dB] | E (field strength) [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|-----------------|---------------|-----------------|-----------------|--------------------|----------------------|------------|--------------|--------------------|-----------------------------|----------------|-------------|--------|
| 13.94 | -99.2 | 0.80 | 10.1 | 4.0 | 2 | -81.3 | 300 | 6.0 | -20.1 | 44.7 | 64.8 | |
| 274.00 | -91.1 | 0.80 | 10.1 | 4.0 | 2 | -73.2 | 300 | 6.0 | -12.0 | 18.8 | 30.8 | |

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

$\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain} + 10 * \log(N)$

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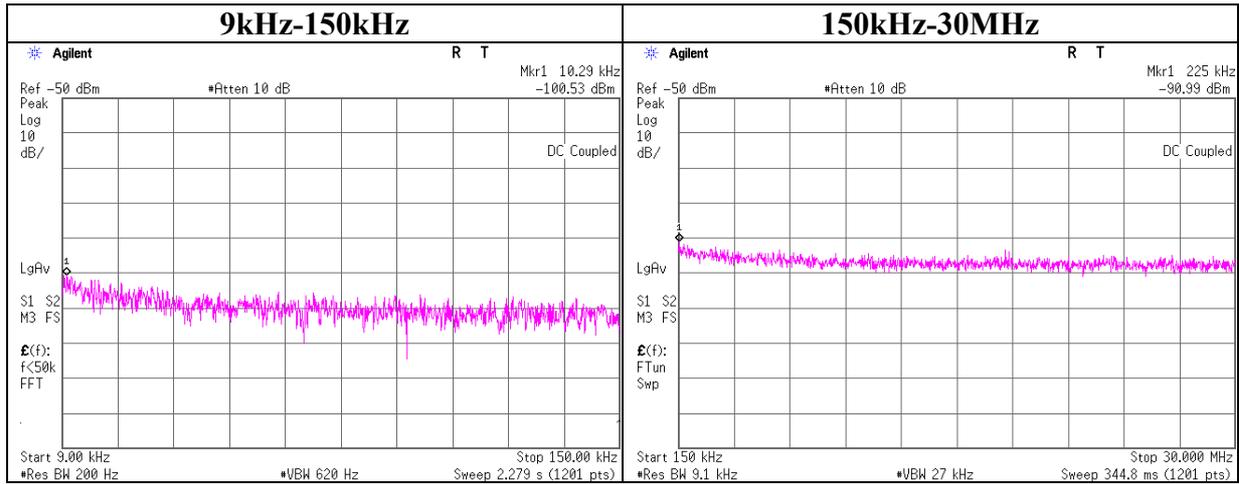
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

| | |
|-----------------------|------------------------------------|
| Test place | Ise EMC Lab. No.6 Measurement Room |
| Report No. | 10724035H |
| Date | 03/23/2015 |
| Temperature/ Humidity | 22 deg. C / 42% RH |
| Engineer | Ken Fujita |
| Mode | BT LE Tx |

BT LE Tx 2402MHz



| Frequency [kHz] | Reading [dBm] | Cable Loss [dB] | Attenuator [dB] | Antenna Gain [dBi] | EIRP [dBm] | Distance [m] | Ground bounce [dB] | E (field strength) [dBuV/m] | Limit [dBuV/m] |
|--------------------|------------------|-----------------------|--------------------|--------------------------|---------------|-----------------|--------------------------|-----------------------------------|-------------------|
| 10.29 | -99.9 | 0.80 | 10.0 | 5.6 | -83.5 | 300.0 | 6.0 | -22.2 | 47.4 |
| 225 | -90.9 | 0.80 | 10.0 | 5.6 | -74.5 | 300.0 | 6.0 | -13.2 | 20.6 |

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

$\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain}$

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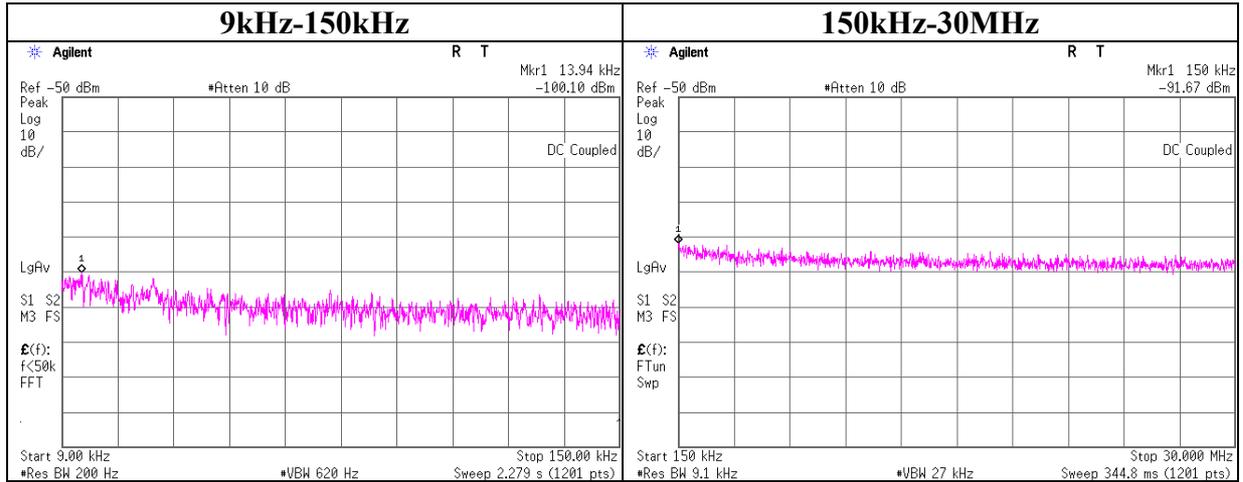
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Facsimile : +81 596 24 8124

Conducted Spurious Emission

| | |
|-----------------------|------------------------------------|
| Test place | Ise EMC Lab. No.6 Measurement Room |
| Report No. | 10724035H |
| Date | 03/23/2015 |
| Temperature/ Humidity | 22 deg. C / 42% RH |
| Engineer | Ken Fujita |
| Mode | BT LE Tx |

BT LE Tx 2440MHz



| Frequency [kHz] | Reading [dBm] | Cable Loss [dB] | Attenuator [dB] | Antenna Gain [dBi] | EIRP [dBm] | Distance [m] | Ground bounce [dB] | E (field strength) [dBuV/m] | Limit [dBuV/m] |
|--------------------|------------------|-----------------------|--------------------|--------------------------|---------------|-----------------|--------------------------|-----------------------------------|-------------------|
| 13.94 | -96.9 | 0.80 | 10.0 | 5.6 | -80.5 | 300.0 | 6.0 | -19.3 | 44.7 |
| 150 | -85.3 | 0.80 | 10.0 | 5.6 | -68.9 | 300.0 | 6.0 | -7.6 | 24.1 |

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

$\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain}$

UL Japan, Inc.

Ise EMC Lab.

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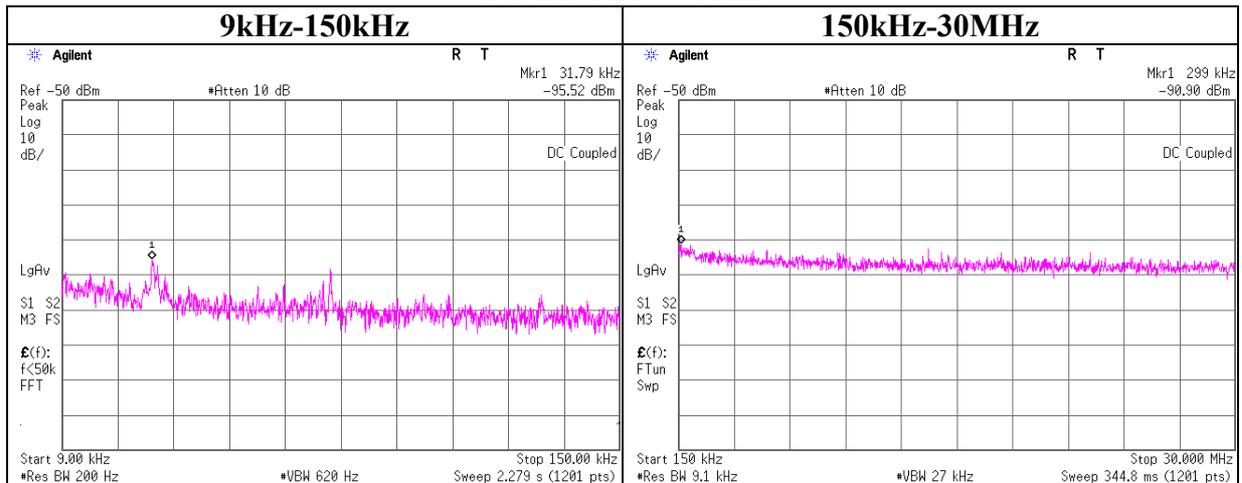
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

| | |
|-----------------------|------------------------------------|
| Test place | Ise EMC Lab. No.6 Measurement Room |
| Report No. | 10724035H |
| Date | 03/23/2015 |
| Temperature/ Humidity | 22 deg. C / 42% RH |
| Engineer | Ken Fujita |
| Mode | BT LE Tx |

BT LE Tx 2480MHz



| Frequency [kHz] | Reading [dBm] | Cable Loss [dB] | Attenuator [dB] | Antenna Gain [dBi] | EIRP [dBm] | Distance [m] | Ground bounce [dB] | E (field strength) [dBuV/m] | Limit [dBuV/m] |
|--------------------|------------------|-----------------------|--------------------|--------------------------|---------------|-----------------|--------------------------|-----------------------------------|-------------------|
| 31.79 | -99.0 | 0.80 | 10.0 | 5.6 | -82.6 | 300.0 | 6.0 | -21.4 | 37.6 |
| 299 | -90.7 | 0.80 | 10.0 | 5.6 | -74.3 | 30.0 | 6.0 | 7.0 | 38.1 |

$E = \text{EIRP} - 20\log(D) + \text{Ground bounce} + 104.8 [\text{dBuV/m}]$
 $\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain}$

UL Japan, Inc.

Ise EMC Lab.

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

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Power Density

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/17/2015
Temperature/ Humidity : 22deg. C / 36% RH
Engineer : Shinya Watanabe
Mode : 11b Tx

Antenna A + B

| Freq. [MHz] | Antenna A | Antenna B | Result | | Limit [dBm] | Margin [dB] |
|----------------|----------------|----------------|--------|------|----------------|----------------|
| | Result [mW] | Result [mW] | [dBm] | [mW] | | |
| 2412.00 | 0.12 | 0.10 | -6.64 | 0.22 | 8.00 | 14.64 |
| 2437.00 | 0.12 | 0.10 | -6.55 | 0.22 | 8.00 | 14.55 |
| 2462.00 | 0.12 | 0.10 | -6.59 | 0.22 | 8.00 | 14.59 |

Sample Calculation:

Result = Antenna A + B

Antenna A

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | | Limit [dBm] | Margin [dB] |
|----------------|------------------|-----------------------|----------------|--------|------|----------------|----------------|
| | | | | [dBm] | [mW] | | |
| 2412.00 | -20.01 | 0.80 | 10.06 | -9.15 | 0.12 | 8.00 | 17.15 |
| 2437.00 | -19.92 | 0.80 | 10.06 | -9.06 | 0.12 | 8.00 | 17.06 |
| 2462.00 | -20.12 | 0.80 | 10.06 | -9.26 | 0.12 | 8.00 | 17.26 |

Antenna B

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | | Limit [dBm] | Margin [dB] |
|----------------|------------------|-----------------------|----------------|--------|------|----------------|----------------|
| | | | | [dBm] | [mW] | | |
| 2412.00 | -21.07 | 0.80 | 10.06 | -10.21 | 0.10 | 8.00 | 18.21 |
| 2437.00 | -20.99 | 0.80 | 10.06 | -10.13 | 0.10 | 8.00 | 18.13 |
| 2462.00 | -20.84 | 0.80 | 10.06 | -9.98 | 0.10 | 8.00 | 17.98 |

Sample Calculation:

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

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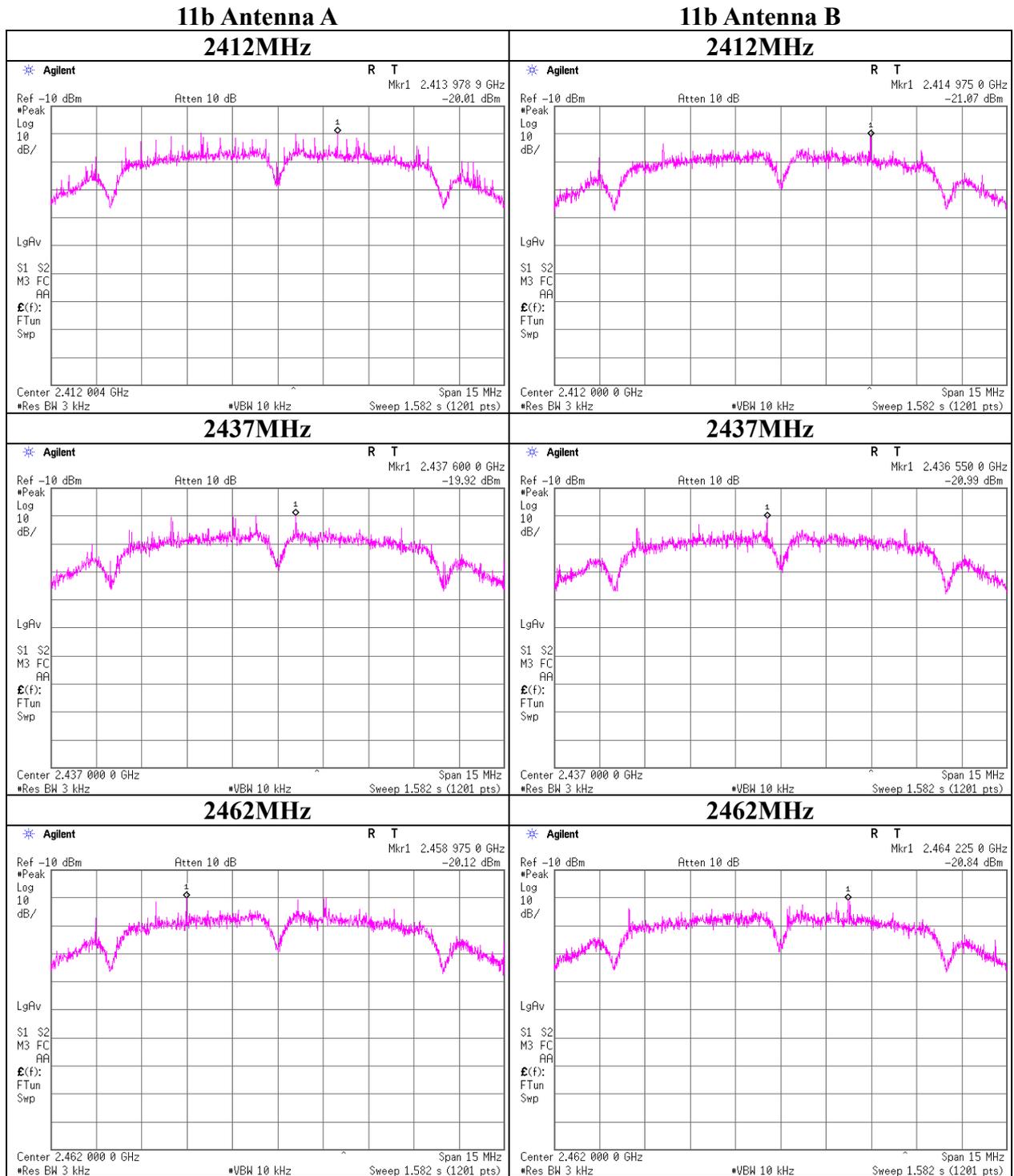
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Power Density



Power Density

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/17/2015
Temperature/ Humidity : 22deg. C / 36% RH
Engineer : Shinya Watanabe
Mode : 11g Tx

Antenna A + B

| Freq. [MHz] | Antenna A Result [mW] | Antenna B Result [mW] | Result | | Limit [dBm] | Margin [dB] |
|----------------|-----------------------------|-----------------------------|--------|------|----------------|----------------|
| | | | [dBm] | [mW] | | |
| 2412.00 | 0.02 | 0.02 | -14.20 | 0.04 | 8.00 | 22.20 |
| 2437.00 | 0.02 | 0.02 | -13.81 | 0.04 | 8.00 | 21.81 |
| 2462.00 | 0.02 | 0.03 | -13.20 | 0.05 | 8.00 | 21.20 |

Sample Calculation:

Result = Antenna A + B

Antenna A

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | | Limit [dBm] | Margin [dB] |
|----------------|------------------|-----------------------|----------------|--------|------|----------------|----------------|
| | | | | [dBm] | [mW] | | |
| 2412.00 | -28.28 | 0.80 | 10.06 | -17.42 | 0.02 | 8.00 | 25.42 |
| 2437.00 | -27.26 | 0.80 | 10.06 | -16.40 | 0.02 | 8.00 | 24.40 |
| 2462.00 | -27.32 | 0.80 | 10.06 | -16.46 | 0.02 | 8.00 | 24.46 |

Antenna B

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | | Limit [dBm] | Margin [dB] |
|----------------|------------------|-----------------------|----------------|--------|------|----------------|----------------|
| | | | | [dBm] | [mW] | | |
| 2412.00 | -27.87 | 0.80 | 10.06 | -17.01 | 0.02 | 8.00 | 25.01 |
| 2437.00 | -28.15 | 0.80 | 10.06 | -17.29 | 0.02 | 8.00 | 25.29 |
| 2462.00 | -26.84 | 0.80 | 10.06 | -15.98 | 0.03 | 8.00 | 23.98 |

Sample Calculation:

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

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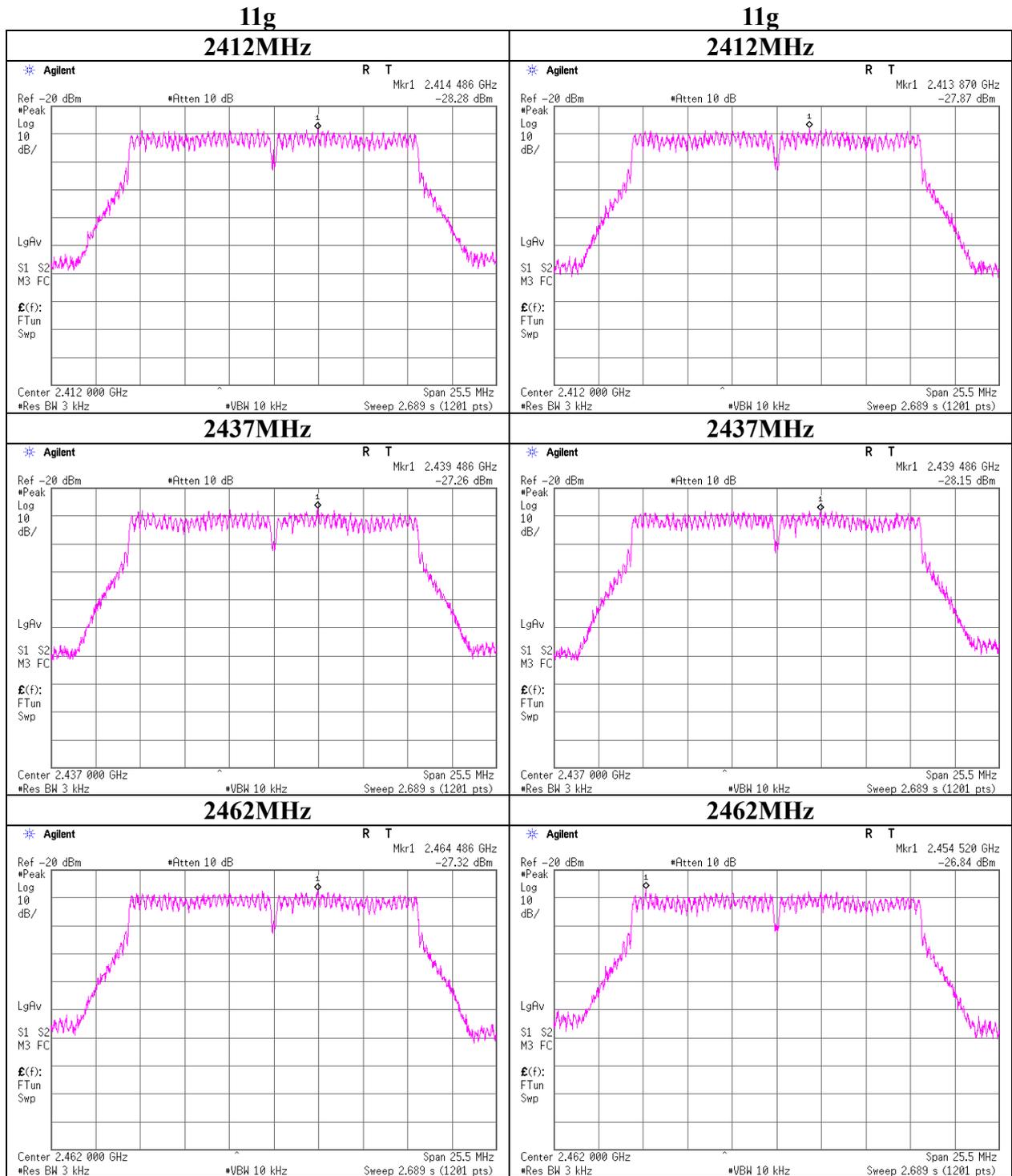
Ise EMC Lab.

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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Power Density



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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Power Density

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 10724035H
Date : 03/17/2015
Temperature/ Humidity : 22deg. C / 36% RH
Engineer : Shinya Watanabe
Mode : 11n-20 Tx

Antenna A + B

| Freq. [MHz] | Antenna A Result [mW] | Antenna B Result [mW] | Result | | Limit [dBm] | Margin [dB] |
|----------------|-----------------------------|-----------------------------|--------|------|----------------|----------------|
| | | | [dBm] | [mW] | | |
| 2412.00 | 0.02 | 0.02 | -13.37 | 0.05 | 8.00 | 21.37 |
| 2437.00 | 0.02 | 0.02 | -13.57 | 0.04 | 8.00 | 21.57 |
| 2462.00 | 0.02 | 0.02 | -13.65 | 0.04 | 8.00 | 21.65 |

Sample Calculation:

Result = Antenna A + B

Antenna A

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | | Limit [dBm] | Margin [dB] |
|----------------|------------------|-----------------------|----------------|--------|------|----------------|----------------|
| | | | | [dBm] | [mW] | | |
| 2412.00 | -27.56 | 0.80 | 10.06 | -16.70 | 0.02 | 8.00 | 24.70 |
| 2437.00 | -27.52 | 0.80 | 10.06 | -16.66 | 0.02 | 8.00 | 24.66 |
| 2462.00 | -27.62 | 0.80 | 10.06 | -16.76 | 0.02 | 8.00 | 24.76 |

Antenna B

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | | Limit [dBm] | Margin [dB] |
|----------------|------------------|-----------------------|----------------|--------|------|----------------|----------------|
| | | | | [dBm] | [mW] | | |
| 2412.00 | -26.95 | 0.80 | 10.06 | -16.09 | 0.02 | 8.00 | 24.09 |
| 2437.00 | -27.37 | 0.80 | 10.06 | -16.51 | 0.02 | 8.00 | 24.51 |
| 2462.00 | -27.42 | 0.80 | 10.06 | -16.56 | 0.02 | 8.00 | 24.56 |

Sample Calculation:

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

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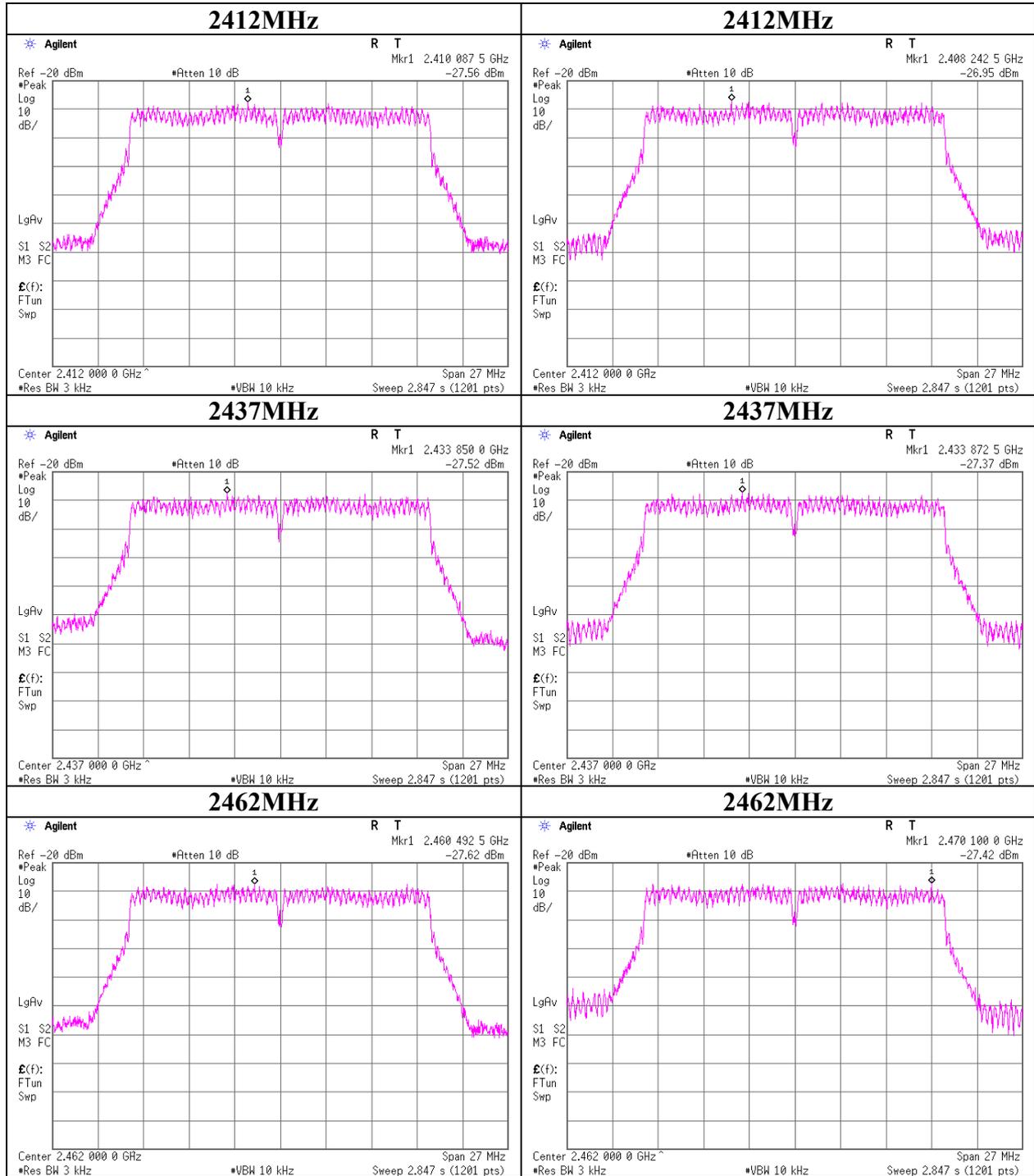
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Facsimile : +81 596 24 8124

Power Density

11n-20 Antenna A

11n-20 Antenna B



Power Density

Test place Ise EMC Lab. No.6 Measurement Room
Report No. 10724035H
Date 03/23/2015
Temperature/ Humidity 22 deg. C / 42% RH
Engineer Ken Fujita
Mode BT LE Tx

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | | Limit [dBm] | Margin [dB] |
|----------------|------------------|-----------------------|----------------|--------|------|----------------|----------------|
| | | | | [dBm] | [mW] | | |
| 2402 | -26.00 | 2.07 | 10.02 | -13.91 | 0.04 | 8.00 | 21.91 |
| 2440 | -26.02 | 2.08 | 10.02 | -13.92 | 0.04 | 8.00 | 21.92 |
| 2480 | -26.18 | 2.09 | 10.02 | -14.07 | 0.04 | 8.00 | 22.07 |

Sample Calculation:

Result = Reading + Cable Loss + Attenuator

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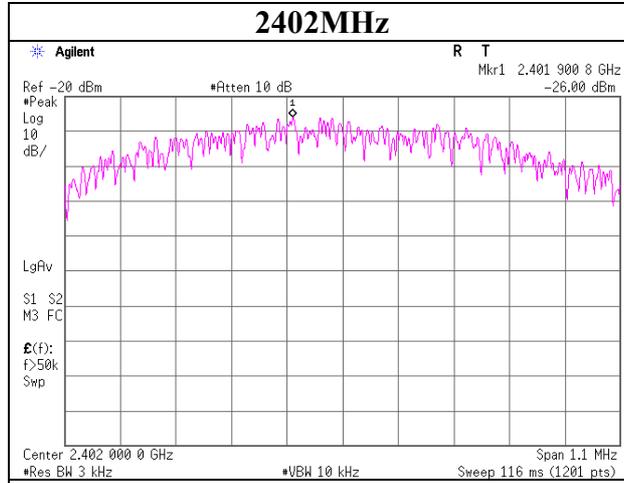
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

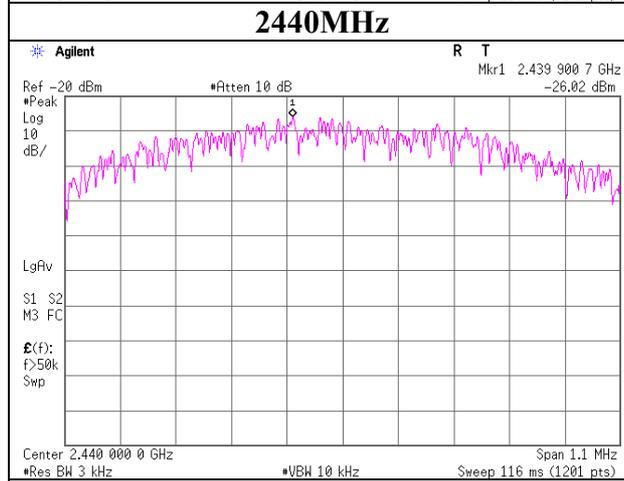
Power Density

BT LE

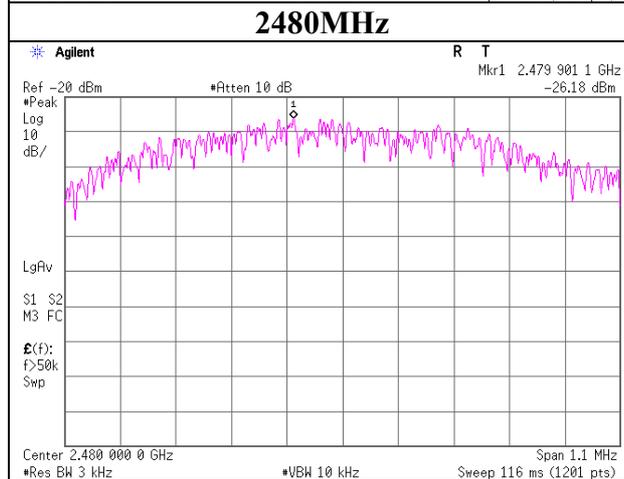
2402MHz



2440MHz



2480MHz



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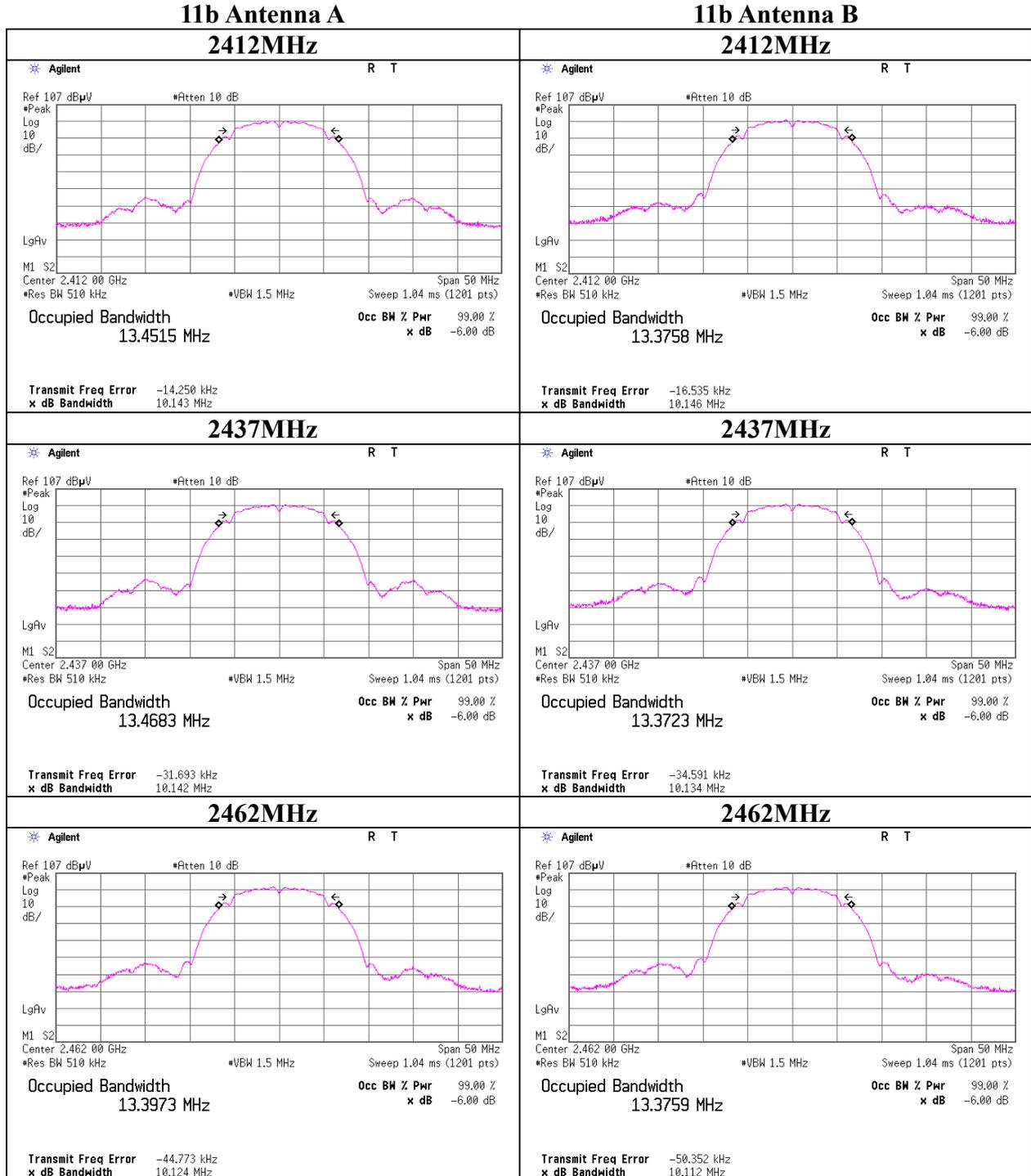
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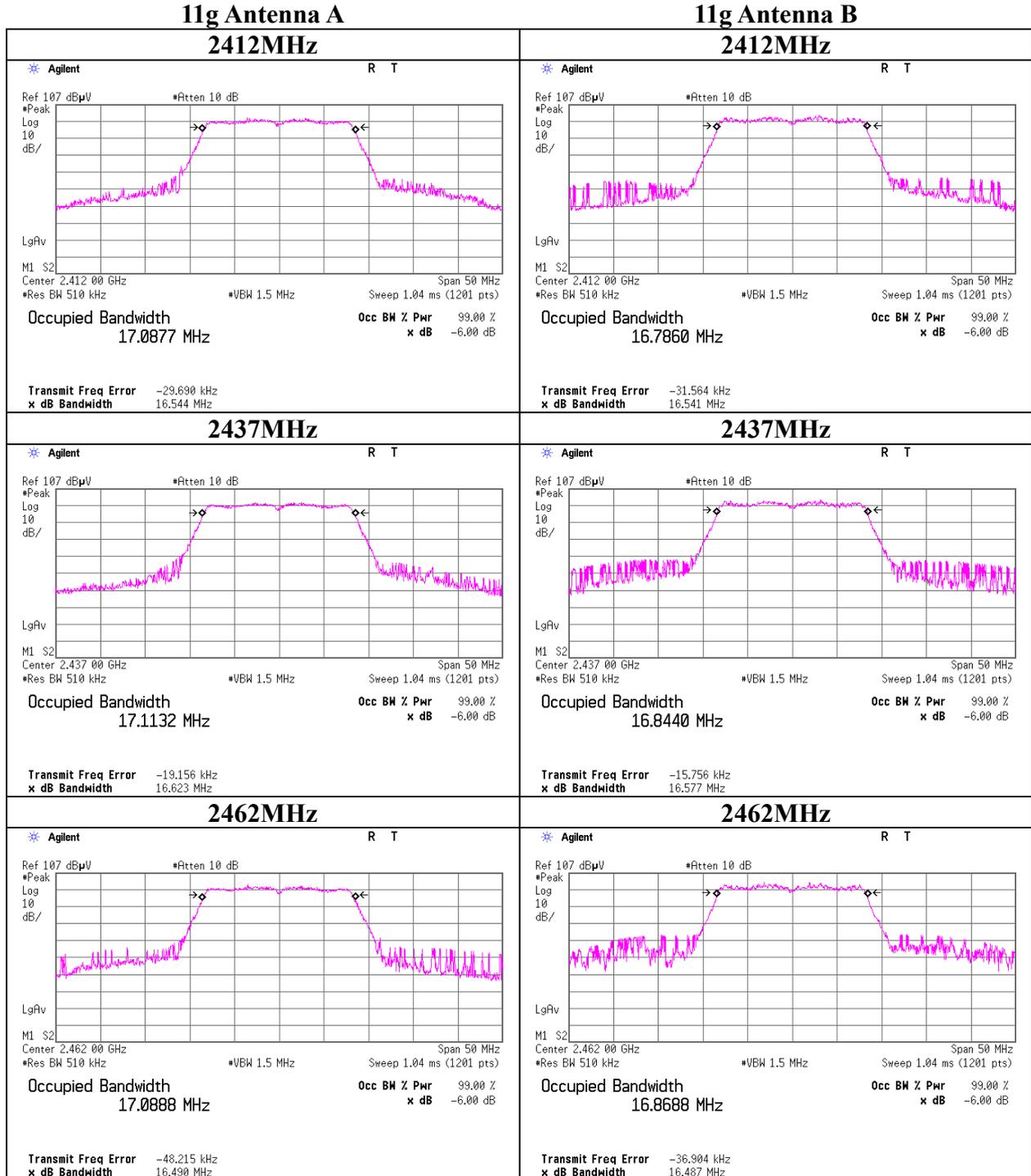
99% Occupied Bandwidth

| | |
|-----------------------|------------------------------------|
| Test place | Ise EMC Lab. No.6 Measurement Room |
| Report No. | 10724035H |
| Date | 03/17/2015 |
| Temperature/ Humidity | 22deg. C / 36% RH |
| Engineer | Shinya Watanabe |
| Mode | 11b Tx |



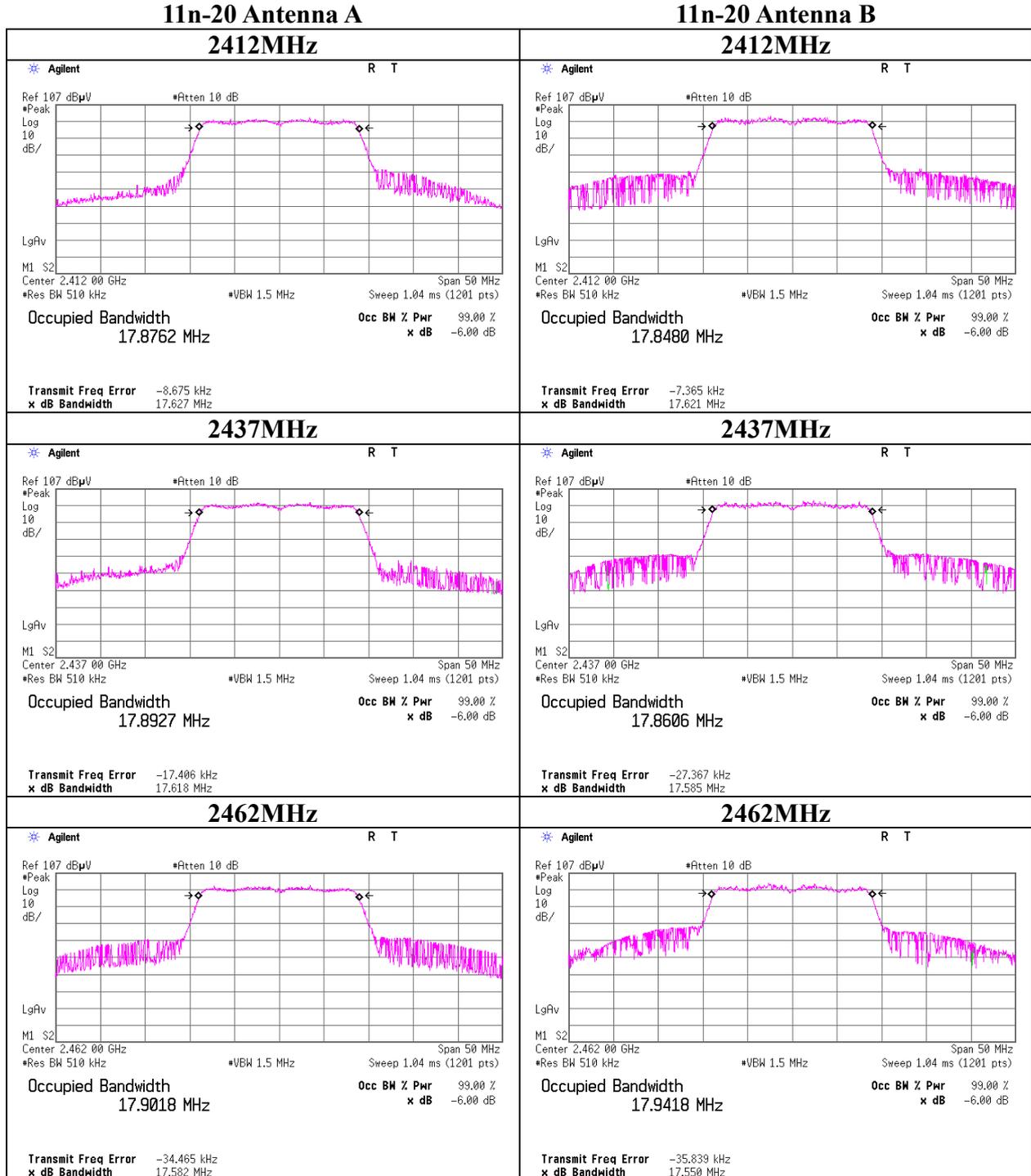
99% Occupied Bandwidth

| | |
|-----------------------|------------------------------------|
| Test place | Ise EMC Lab. No.6 Measurement Room |
| Report No. | 10724035H |
| Date | 03/17/2015 |
| Temperature/ Humidity | 22deg. C / 36% RH |
| Engineer | Shinya Watanabe |
| Mode | 11g Tx |



99% Occupied Bandwidth

| | |
|-----------------------|------------------------------------|
| Test place | Ise EMC Lab. No.6 Measurement Room |
| Report No. | 10724035H |
| Date | 03/17/2015 |
| Temperature/ Humidity | 22deg. C / 36% RH |
| Engineer | Shinya Watanabe |
| Mode | 11n-20 Tx |

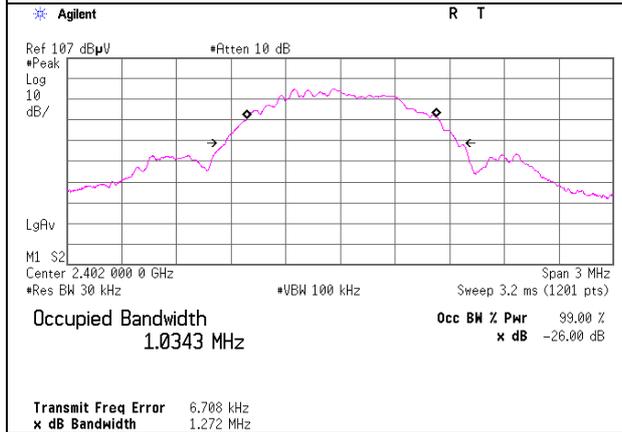


99% Occupied Bandwidth

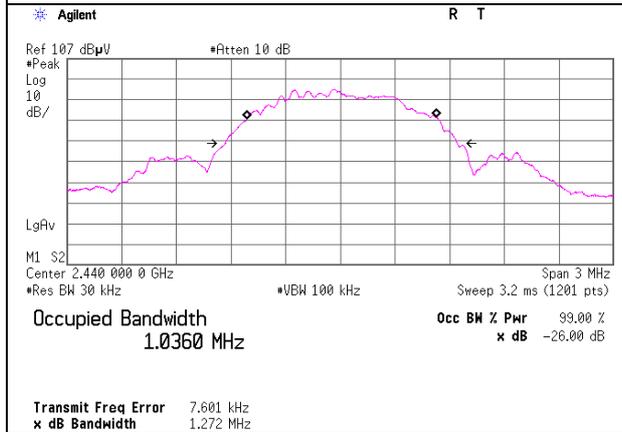
| | |
|-----------------------|------------------------------------|
| Test place | Ise EMC Lab. No.6 Measurement Room |
| Report No. | 10724035H |
| Date | 03/23/2015 |
| Temperature/ Humidity | 22 deg. C / 42% RH |
| Engineer | Ken Fujita |
| Mode | BT LE Tx |

BT LE

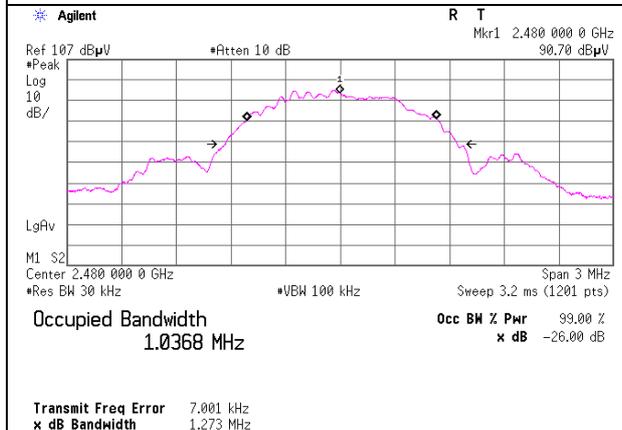
2402MHz



2440MHz



2480MHz



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APPENDIX 2: Test instruments

EMI test equipment

| Control No. | Instrument | Manufacturer | Model No | Serial No | Test Item | Calibration Date * Interval(month) |
|--------------------|-------------------------------|--------------------------|---|--------------------------------|------------------|---|
| MAEC-03 | Semi Anechoic Chamber(NSA) | TDK | Semi Anechoic Chamber 3m | DA-10005 | RE/CE | 2015/02/19 * 12 |
| MOS-13 | Thermo-Hygrometer | Custom | CTH-180 | 1301 | RE/CE | 2015/01/13 * 12 |
| MJM-16 | Measure | KOMELON | KMC-36 | - | RE/CE | - |
| COTS-MEMI | EMI measurement program | TSJ | TEPTO-DV | - | RE/CE | - |
| MSA-03 | Spectrum Analyzer | Agilent | E4448A | MY44020357 | RE | 2014/04/08 * 12 |
| MHA-20 | Horn Antenna 1-18GHz | Schwarzbeck | BBHA9120D | 258 | RE | 2014/05/26 * 12 |
| MCC-167 | Microwave Cable | Junkosha | MWX221 | 1404S374(1m) / 1405S074(5m) | RE | 2014/05/26 * 12 |
| MPA-11 | MicroWave System Amplifier | Agilent | 83017A | MY39500779 | RE | 2015/03/19 * 12 |
| MHF-25 | High Pass Filter 3.5-18.0GHz | UL Japan | HPF SELECTOR | 001 | RE | 2014/09/22 * 12 |
| MHA-16 | Horn Antenna 15-40GHz | Schwarzbeck | BBHA9170 | BBHA9170306 | RE | 2014/05/26 * 12 |
| MTR-08 | Test Receiver | Rohde & Schwarz | ESCI | 100767 | RE/CE | 2014/08/19 * 12 |
| MBA-03 | Biconical Antenna | Schwarzbeck | BBA9106 | 1915 | RE | 2014/10/18 * 12 |
| MLA-03 | Logperiodic Antenna | Schwarzbeck | USLP9143 | 174 | RE | 2014/10/18 * 12 |
| MCC-51 | Coaxial cable | UL Japan | - | - | RE | 2014/07/14 * 12 |
| MAT-70 | Attenuator(6dB) | Agilent | 8491A-006 | MY52460153 | RE | 2014/04/14 * 12 |
| MPA-13 | Pre Amplifier | SONOMA INSTRUMENT | 310 | 260834 | RE | 2015/03/10 * 12 |
| MTW-03 | Torque wrench | HUBER+SUHNER | 74 Z-0-0-21 | 98142 | RE | 2015/01/16 * 36 |
| MAT-20 | Attenuator(10dB)(above 1 GHz) | HIROSE ELECTRIC CO.,LTD. | AT-110 | - | RE | 2015/01/08 * 12 |
| MLS-23 | LISN(AMN) | Schwarzbeck | NSLK8127 | 8127-729 | CE(AE) | 2014/07/10 * 12 |
| MLS-24 | LISN(AMN) | Schwarzbeck | NSLK8127 | 8127-730 | CE(EUT) | 2014/07/10 * 12 |
| MTA-31 | Terminator | TME | CT-01 | - | CE | 2015/01/19 * 12 |
| MCC-112 | Coaxial cable | Fujikura/Suhner/TSJ | 5D-2W(10m)/ SFM141(3m)/sucoform 141-PE(1m)/421- 010(1.5m)/RFM- E321(Switcher) | -/00640 | CE | 2014/07/14 * 12 |
| MAT-66 | Attenuator(13dB) | JFW Industries, Inc. | 50FP-013H2 N | - | CE | 2015/01/29 * 12 |
| MOS-14 | Thermo-Hygrometer | Custom | CTH-201 | 1401 | AT | 2015/01/13 * 12 |
| MSA-13 | Spectrum Analyzer | Agilent | E4440A | MY46185823 | AT | 2014/06/06 * 12 |
| MPM-09 | Power Meter | Anritsu | ML2495A | 6K00003348 | AT | 2014/10/06 * 12 |
| MPSE-12 | Power sensor | Anritsu | MA2411B | 011598 | AT | 2014/10/06 * 12 |
| MCC-138 | Microwave cable | HUBER+SUHNER | SUCOFLEX 102 | 37953/2 | AT | 2014/10/02 * 12 |
| MAT-22 | Attenuator(10dB) 1-18GHz | Orient Microwave | BX10-0476-00 | - | AT | 2015/03/18 * 12 |

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

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

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

Test Item: CE: Conducted Emission test

RE: Radiated Emission test

AT: Antenna Terminal Conducted test

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