



RADIO TEST REPORT

Test Report No. : 10377588H-A-R1

Applicant : OMRON HEALTHCARE Co., Ltd.
Type of Equipment : Activity Monitor
Model No. : HJA-750C
FCC ID : Q6ZHJA750C
Test regulation : FCC Part 15 Subpart C: 2014
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 report is a revised version of 10377588H-A. 10377588H-A is replaced with this report.

Date of test: June 16 and 22, 2014

Representative test engineer:



Keisuke Kawamura
Engineer

Consumer Technology Division

Approved by:



Takayuki Shimada
Engineer
Consumer Technology Division



NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
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<http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap>

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13-EM-F0429

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SECTION 1: Customer information

Company Name : OMRON HEALTHCARE Co., Ltd.
Address : 53 Kunotsubo, Terado-cho, Muko, Kyoto 617-0002 Japan
Telephone Number : +81-75-925-2045
Facsimile Number : +81-75-925-2046
Contact Person : Toshiaki Yuasa

***Remarks:**

OMRON HEALTHCARE Co., Ltd. designates Hashimoto Electronic Industry as manufacturer of the product (Activity Monitor).

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

2.1 Identification of E.U.T.

Type of Equipment : Activity Monitor
Model No. : HJA-750C
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 3.0V
Receipt Date of Sample : June 16, 2014
Country of Mass-production : Japan
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product Description

General Specification

Clock frequency(ies) in the system : 32.768kHz, 2.7MHz, 32MHz

Radio Specification

Bluetooth (Low Energy)

Radio Type : Transceiver
Frequency of Operation : 2402-2480MHz
Modulation : GFSK
Bandwidth & Channel Spacing : 1MHz & 2MHz
Power Supply (radio part input) : DC 2.5V
Antenna type : $\lambda/4$ Monopole Antenna
Antenna Gain : 2.5dBi

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2014, final revised on May 1, 2014 and effective June 2, 2014

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

3.2 Procedures and results

| Item | Test Procedure | Specification | Worst margin | Results | Remarks |
|---|---|---|--------------|---------------------------------------|-----------|
| Conducted Emission | FCC: ANSI C63.4:2003 7. AC powerline Conducted Emission measurements ----- IC: RSS-Gen 7.2.4 | FCC: Section 15.207 ----- IC: RSS-Gen 7.2.4 | N/A | N/A*1) | - |
| 6dB Bandwidth | FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on April 9, 2013)" ----- IC: RSS-Gen 4.6.2 | 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 April 9, 2013)" ----- IC: RSS-Gen 4.8 | 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 April 9, 2013)" ----- 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 April 9, 2013)" ----- IC: RSS-Gen 4.9 | FCC: Section15.247(d) ----- IC: RSS-210 A8.5 RSS-Gen 7.2.3 | | 8.8dB 9920.000MHz, AV, Vert./Hori. | Complied |

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

*1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.

* In case any questions arise about test procedure, ANSI C63.4: 2003 is also referred.

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FCC 15.31 (e)

The test was performed with the New Battery (DC3.0V) and the stable voltage was supplied to the EUT during the tests. Therefore, the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because it is soldered on the circuit board. Therefore the equipment complies with the requirement of 15.203.

3.3 Addition to standard

| Item | Test Procedure | Specification | Worst margin | Results | Remarks |
|------------------------|-------------------|-------------------|--------------|---------|-----------|
| 99% Occupied Bandwidth | IC: RSS-Gen 4.6.1 | IC: RSS-Gen 4.6.1 | 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) | 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 | 4.0dB | 5.1dB | 5.0dB | 5.1dB | 6.0dB | 4.9dB | 4.3dB |
| No.2 | 3.9dB | 5.2dB | 5.0dB | 4.9dB | 5.9dB | 4.7dB | 4.2dB |
| No.3 | 4.3dB | 5.1dB | 5.2dB | 5.2dB | 6.0dB | 4.8dB | 4.2dB |
| No.4 | 4.6dB | 5.2dB | 5.0dB | 5.2dB | 6.0dB | 5.7dB | 4.2dB |

*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 |

Radiated emission test(3m)

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

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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 Data of EMI, Test instruments, and Test set up

Refer to APPENDIX.

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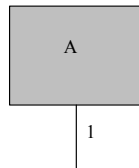
SECTION 4: Operation of E.U.T. during testing

4.1 Operating Mode(s)

Bluetooth Low Energy (BT LE): Transmitting (Tx), Payload: PRBS9

| Test Item | Operating Mode | Tested frequency |
|--|----------------|-------------------------------|
| 6dB Bandwidth Maximum Peak Output Power Power Density Spurious Emission Restricted Band Edges 99% Occupied Bandwidth | BT LE | 2402MHz 2440MHz 2480MHz |
| *Transmitting duty was 100% on all tests. *Power of the EUT was set by the software as follows; Power settings: 0dBm Software: SMartRF studio7 1.16.0 *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. | | |

4.2 Configuration and peripherals



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

Description of EUT

| No. | Item | Model number | Serial number | Manufacturer | Remarks |
|-----|------------------|--------------|----------------------|----------------------------------|---------|
| A | Activity Monitor | HJA-750C | FT-12 *1) 002 *2) | Hashimoto Electronic Industry | EUT |

*1) Used for Radiated Emission test

*2) Used for Antenna Terminal conducted test

List of cables used

| No. | Name | Length (m) | Shield | | Remarks |
|-----|--------------|------------|------------|------------|---------|
| | | | Cable | Connector | |
| 1 | Signal Cable | 0.04 | Unshielded | Unshielded | *1) |

*1) The cable was used as test jig and will not be included in the package of production model.
There was no influence on Spurious emission test.

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SECTION 5: Radiated Spurious Emission

Test Procedure

It was measured based on "11.0 Emissions in non-restricted frequency bands" of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 (Issued on April 9, 2013)".

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, 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 | Below 30MHz | 30MHz to 300MHz | 300MHz to 1GHz | Above 1GHz |
| Antenna Type | Loop | 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.

20dBc was applied to the frequency over the limit of FCC 15.209 / Table 5 of RSS-Gen 7.2.5(IC) and outside the restricted band of FCC15.205 / Table 3 of RSS-Gen 7.2.2 (IC).

| | | | | |
|-----------------|----------------|---|--|---|
| Frequency | Below 1GHz | Above 1GHz | | 20dBc |
| Instrument used | Test Receiver | Spectrum Analyzer | | Spectrum Analyzer |
| Detector | QP | PK | AV | PK |
| IF Bandwidth | BW 120kHz(T/R) | RBW: 1MHz VBW: 3MHz | Average Power Method: 12.2.5.1 *1) RBW: 1MHz VBW: 3MHz Trace: Free Run Detector: Power Averaging (RMS) | RBW: 100kHz VBW: 300kHz (S/A) |
| 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 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 (Issued on April 9, 2013)"

*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, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

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 6: Antenna Terminal Conducted Tests

Test Procedure

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

| Test | Span | RBW | VBW | Sweep time | Detector | Trace | Instrument used |
|---------------------------------|--|-----------------|--------------------|-------------------|----------------------|--------------|-----------------------------------|
| 6dB Bandwidth | 3MHz | 100kHz | 300kHz | Auto | Peak | Max Hold | Spectrum Analyzer |
| 99% Occupied Bandwidth | Enough width to display 20dB Bandwidth | 1 to 3% of Span | Three times of RBW | Auto | Sample | Clear write | Spectrum Analyzer |
| Maximum Peak Output Power | - | - | - | Auto | Peak/ Average *1) | - | Power Meter (Sensor: 50MHz BW) |
| Peak Power Density | 1.5 times the 6dB Bandwidth | 3kHz | 10kHz | 116msec | Peak | Max Hold | Spectrum Analyzer *2) |
| Conducted Spurious Emission *3) | 9kHz to 150kHz | 200Hz | 620Hz | Auto | Peak | Max Hold | Spectrum Analyzer |
| | 150kHz to 30MHz | 9.1kHz | 27kHz | | | | |

*1) Reference data
*2) Section 10.2 Method PKPSD (peak PSD) of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 (Issued on April 9, 2013)".
*3) 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=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**

APPENDIX 1: Data of EMI test

6dB Bandwidth

Test place Ise EMC Lab. No.7 Measurement Room
Report No. 10377588H
Date 06/16/2014
Temperature/ Humidity 21 deg. C / 59% RH
Engineer Shinya Watanabe
Mode LE Tx

| Frequency [MHz] | 6dB Bandwidth [MHz] | Limit [kHz] |
|--------------------|------------------------|----------------|
| 2402 | 0.666 | >500 |
| 2440 | 0.676 | >500 |
| 2480 | 0.678 | >500 |

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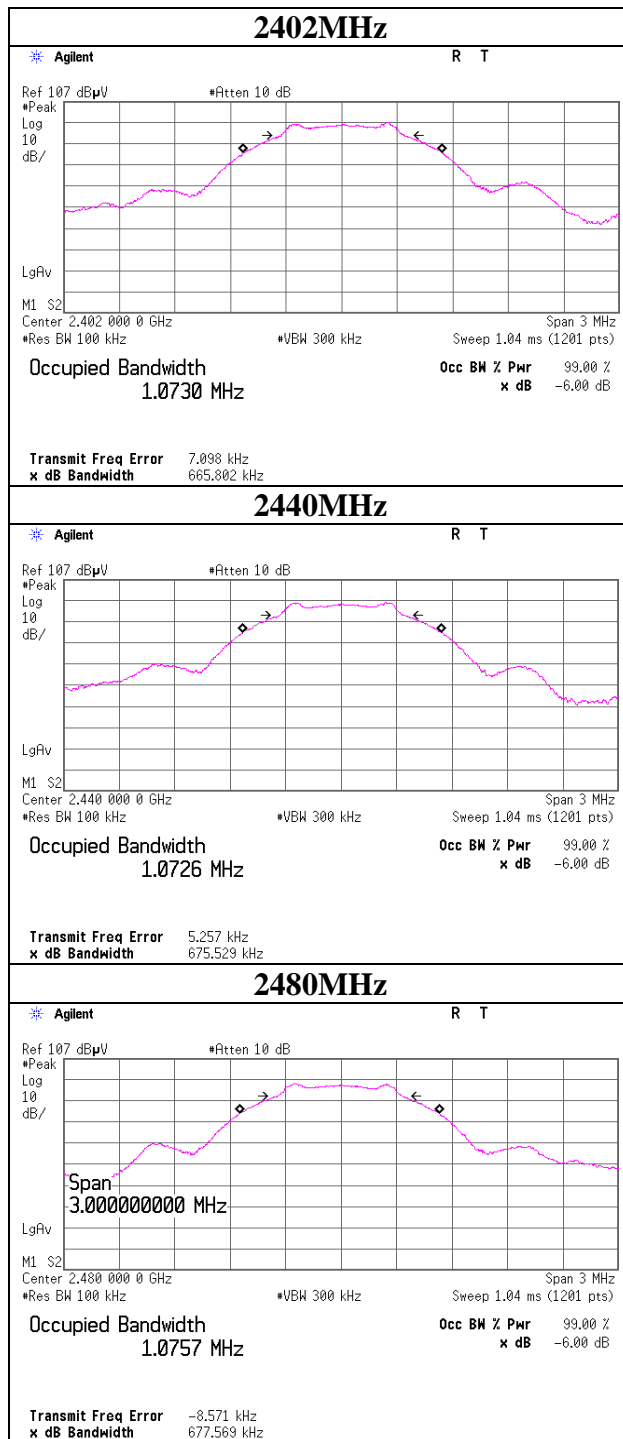
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6dB Bandwidth



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Maximum Peak Output Power

Test place : Ise EMC Lab. No.7 Measurement Room
Report No. : 10377588H
Date : 06/16/2014
Temperature/ Humidity : 21 deg. C / 59% RH
Engineer : Shinya Watanabe
Mode : LE Tx

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | | Limit | | Margin [dB] |
|----------------|------------------|-----------------------|----------------|--------|------|-------|------|----------------|
| | | | | [dBm] | [mW] | [dBm] | [mW] | |
| 2402 | -9.78 | 0.40 | 10.00 | 0.62 | 1.15 | 30.00 | 1000 | 29.38 |
| 2440 | -10.37 | 0.40 | 10.00 | 0.03 | 1.01 | 30.00 | 1000 | 29.97 |
| 2480 | -10.83 | 0.40 | 10.00 | -0.43 | 0.91 | 30.00 | 1000 | 30.43 |

Sample Calculation:

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

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Maximum Average Output Power (Reference data for RF Exposure)

Test place Ise EMC Lab. No.7 Measurement Room
Report No. 10377588H
Date 06/16/2014
Temperature/ Humidity 21 deg. C / 59% RH
Engineer Shinya Watanabe
Mode LE Tx

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result | | Limit | | Margin [dB] |
|----------------|------------------|-----------------------|----------------|--------|------|-------|------|----------------|
| | | | | [dBm] | [mW] | [dBm] | [mW] | |
| 2402 | -10.45 | 0.40 | 10.00 | -0.05 | 0.99 | 30.00 | 1000 | 30.05 |
| 2440 | -11.09 | 0.40 | 10.00 | -0.69 | 0.85 | 30.00 | 1000 | 30.69 |
| 2480 | -11.95 | 0.40 | 10.00 | -1.55 | 0.70 | 30.00 | 1000 | 31.55 |

Sample Calculation:

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

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10377584H
Date : 06/22/2014
Temperature/ Humidity : 22deg. C / 60% RH
Engineer : Keisuke Kawamura
Mode : 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 | 64.651 | QP | 22.8 | 7.3 | 7.6 | 32.2 | - | 5.5 | 40.0 | 34.5 | |
| Hori | 136.651 | QP | 22.1 | 14.3 | 8.5 | 32.1 | - | 12.8 | 43.5 | 30.7 | |
| Hori | 245.099 | QP | 22.1 | 17.2 | 9.5 | 32.0 | - | 16.8 | 46.0 | 29.2 | |
| Hori | 397.999 | QP | 21.9 | 17.5 | 10.5 | 31.9 | - | 18.0 | 46.0 | 28.0 | |
| Hori | 529.832 | QP | 21.9 | 18.6 | 11.4 | 32.0 | - | 19.9 | 46.0 | 26.1 | |
| Hori | 613.833 | QP | 22.0 | 19.6 | 11.9 | 32.0 | - | 21.5 | 46.0 | 24.5 | |
| Hori | 2390.000 | PK | 48.8 | 26.8 | 3.1 | 32.7 | - | 46.0 | 73.9 | 27.9 | |
| Hori | 2400.000 | PK | 50.0 | 26.8 | 3.1 | 32.7 | - | 47.2 | 73.9 | 26.7 | |
| Hori | 4804.000 | PK | 40.2 | 30.6 | 5.1 | 31.8 | - | 44.1 | 73.9 | 29.8 | |
| Hori | 7206.000 | PK | 40.8 | 35.9 | 6.6 | 32.7 | - | 50.6 | 73.9 | 23.3 | |
| Hori | 9608.000 | PK | 41.1 | 38.4 | 7.0 | 33.3 | - | 53.2 | 73.9 | 20.7 | |
| Hori | 2390.000 | AV | 40.9 | 26.8 | 3.1 | 32.7 | 0.0 | 38.1 | 53.9 | 15.8 | |
| Hori | 4804.000 | AV | 31.7 | 30.6 | 5.1 | 31.8 | 0.0 | 35.6 | 53.9 | 18.3 | |
| Hori | 7206.000 | AV | 33.0 | 35.9 | 6.6 | 32.7 | 0.0 | 42.8 | 53.9 | 11.1 | |
| Hori | 9608.000 | AV | 32.6 | 38.4 | 7.0 | 33.3 | 0.0 | 44.7 | 53.9 | 9.2 | |
| Vert | 64.651 | QP | 23.4 | 7.3 | 7.6 | 32.2 | - | 6.1 | 40.0 | 33.9 | |
| Vert | 136.651 | QP | 22.1 | 14.3 | 8.5 | 32.1 | - | 12.8 | 43.5 | 30.7 | |
| Vert | 245.099 | QP | 22.1 | 17.2 | 9.5 | 32.0 | - | 16.8 | 46.0 | 29.2 | |
| Vert | 397.999 | QP | 21.9 | 17.5 | 10.5 | 31.9 | - | 18.0 | 46.0 | 28.0 | |
| Vert | 529.832 | QP | 21.9 | 18.6 | 11.4 | 32.0 | - | 19.9 | 46.0 | 26.1 | |
| Vert | 613.833 | QP | 22.0 | 19.6 | 11.9 | 32.0 | - | 21.5 | 46.0 | 24.5 | |
| Vert | 2390.000 | PK | 48.0 | 26.8 | 3.1 | 32.7 | - | 45.2 | 73.9 | 28.7 | |
| Vert | 2400.000 | PK | 48.4 | 26.8 | 3.1 | 32.7 | - | 45.6 | 73.9 | 28.3 | |
| Vert | 4804.000 | PK | 40.0 | 30.6 | 5.1 | 31.8 | - | 43.9 | 73.9 | 30.0 | |
| Vert | 7206.000 | PK | 40.6 | 35.9 | 6.6 | 32.7 | - | 50.4 | 73.9 | 23.5 | |
| Vert | 9608.000 | PK | 40.0 | 38.4 | 7.0 | 33.3 | - | 52.1 | 73.9 | 21.8 | |
| Vert | 2390.000 | AV | 39.9 | 26.8 | 3.1 | 32.7 | 0.0 | 37.1 | 53.9 | 16.8 | |
| Vert | 4804.000 | AV | 32.0 | 30.6 | 5.1 | 31.8 | 0.0 | 35.9 | 53.9 | 18.0 | |
| Vert | 7206.000 | AV | 33.0 | 35.9 | 6.6 | 32.7 | 0.0 | 42.8 | 53.9 | 11.1 | |
| Vert | 9608.000 | AV | 32.6 | 38.4 | 7.0 | 33.3 | 0.0 | 44.7 | 53.9 | 9.2 | |

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
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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 | 96.5 | 26.8 | 3.1 | 32.7 | 93.7 | - | - | Carrier |
| Hori | 2400.000 | PK | 50.0 | 26.8 | 3.1 | 32.7 | 47.2 | 73.7 | 26.5 | |
| Vert | 2402.000 | PK | 95.8 | 26.8 | 3.1 | 32.7 | 93.0 | - | - | Carrier |
| Vert | 2400.000 | PK | 48.4 | 26.8 | 3.1 | 32.7 | 45.6 | 73.0 | 27.4 | |

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

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Facsimile : +81 596 24 8124

Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10377584H
Date : 06/22/2014
Temperature/ Humidity : 22deg. C / 60% RH
Engineer : Keisuke Kawamura
Mode : LE Tx 2440MHz

| 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 | 64.651 | QP | 22.8 | 7.3 | 7.6 | 32.2 | - | 5.5 | 40.0 | 34.5 | |
| Hori | 136.651 | QP | 22.1 | 14.3 | 8.5 | 32.1 | - | 12.8 | 43.5 | 30.7 | |
| Hori | 245.099 | QP | 22.1 | 17.2 | 9.5 | 32.0 | - | 16.8 | 46.0 | 29.2 | |
| Hori | 397.999 | QP | 21.9 | 17.5 | 10.5 | 31.9 | - | 18.0 | 46.0 | 28.0 | |
| Hori | 529.832 | QP | 21.9 | 18.6 | 11.4 | 32.0 | - | 19.9 | 46.0 | 26.1 | |
| Hori | 613.833 | QP | 22.0 | 19.6 | 11.9 | 32.0 | - | 21.5 | 46.0 | 24.5 | |
| Hori | 4880.000 | PK | 40.2 | 30.8 | 5.2 | 31.7 | - | 44.5 | 73.9 | 29.4 | |
| Hori | 7320.000 | PK | 40.8 | 35.9 | 6.6 | 32.7 | - | 50.6 | 73.9 | 23.3 | |
| Hori | 9760.000 | PK | 41.1 | 38.7 | 7.1 | 33.4 | - | 53.5 | 73.9 | 20.4 | |
| Hori | 4880.000 | AV | 31.7 | 30.8 | 5.2 | 31.7 | 0.0 | 36.0 | 53.9 | 17.9 | |
| Hori | 7320.000 | AV | 33.0 | 35.9 | 6.6 | 32.7 | 0.0 | 42.8 | 53.9 | 11.1 | |
| Hori | 9760.000 | AV | 32.6 | 38.7 | 7.1 | 33.4 | 0.0 | 45.0 | 53.9 | 8.9 | |
| Vert | 64.651 | QP | 23.4 | 7.3 | 7.6 | 32.2 | - | 6.1 | 40.0 | 33.9 | |
| Vert | 136.651 | QP | 22.1 | 14.3 | 8.5 | 32.1 | - | 12.8 | 43.5 | 30.7 | |
| Vert | 245.099 | QP | 22.1 | 17.2 | 9.5 | 32.0 | - | 16.8 | 46.0 | 29.2 | |
| Vert | 397.999 | QP | 21.9 | 17.5 | 10.5 | 31.9 | - | 18.0 | 46.0 | 28.0 | |
| Vert | 529.832 | QP | 21.9 | 18.6 | 11.4 | 32.0 | - | 19.9 | 46.0 | 26.1 | |
| Vert | 613.833 | QP | 22.0 | 19.6 | 11.9 | 32.0 | - | 21.5 | 46.0 | 24.5 | |
| Vert | 4880.000 | PK | 40.0 | 30.8 | 5.2 | 31.7 | - | 44.3 | 73.9 | 29.6 | |
| Vert | 7320.000 | PK | 40.6 | 35.9 | 6.6 | 32.7 | - | 50.4 | 73.9 | 23.5 | |
| Vert | 9760.000 | PK | 40.0 | 38.7 | 7.1 | 33.4 | - | 52.4 | 73.9 | 21.5 | |
| Vert | 4880.000 | AV | 32.0 | 30.8 | 5.2 | 31.7 | 0.0 | 36.3 | 53.9 | 17.6 | |
| Vert | 7320.000 | AV | 33.0 | 35.9 | 6.6 | 32.7 | 0.0 | 42.8 | 53.9 | 11.1 | |
| Vert | 9760.000 | AV | 32.6 | 38.7 | 7.1 | 33.4 | 0.0 | 45.0 | 53.9 | 8.9 | |

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
 26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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Radiated Spurious Emission

Test place : Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. : 10377584H
Date : 06/22/2014
Temperature/ Humidity : 22deg. C / 60% RH
Engineer : Keisuke Kawamura
Mode : LE Tx 2480MHz

| 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 | 64.651 | QP | 22.8 | 7.3 | 7.6 | 32.2 | - | 5.5 | 40.0 | 34.5 | |
| Hori | 136.651 | QP | 22.1 | 14.3 | 8.5 | 32.1 | - | 12.8 | 43.5 | 30.7 | |
| Hori | 245.099 | QP | 22.1 | 17.2 | 9.5 | 32.0 | - | 16.8 | 46.0 | 29.2 | |
| Hori | 397.999 | QP | 21.9 | 17.5 | 10.5 | 31.9 | - | 18.0 | 46.0 | 28.0 | |
| Hori | 529.832 | QP | 21.9 | 18.6 | 11.4 | 32.0 | - | 19.9 | 46.0 | 26.1 | |
| Hori | 613.833 | QP | 22.0 | 19.6 | 11.9 | 32.0 | - | 21.5 | 46.0 | 24.5 | |
| Hori | 2483.500 | PK | 50.8 | 26.9 | 3.1 | 32.7 | - | 48.1 | 73.9 | 25.8 | |
| Hori | 4960.000 | PK | 40.2 | 30.9 | 5.2 | 31.7 | - | 44.6 | 73.9 | 29.3 | |
| Hori | 7440.000 | PK | 40.8 | 35.9 | 6.6 | 32.7 | - | 50.6 | 73.9 | 23.3 | |
| Hori | 9920.000 | PK | 41.1 | 38.9 | 7.1 | 33.5 | - | 53.6 | 73.9 | 20.3 | |
| Hori | 2483.500 | AV | 44.7 | 26.9 | 3.1 | 32.7 | 0.0 | 42.0 | 53.9 | 11.9 | |
| Hori | 4960.000 | AV | 31.7 | 30.9 | 5.2 | 31.7 | 0.0 | 36.1 | 53.9 | 17.8 | |
| Hori | 7440.000 | AV | 33.0 | 35.9 | 6.6 | 32.7 | 0.0 | 42.8 | 53.9 | 11.1 | |
| Hori | 9920.000 | AV | 32.6 | 38.9 | 7.1 | 33.5 | 0.0 | 45.1 | 53.9 | 8.8 | |
| Vert | 64.651 | QP | 23.4 | 7.3 | 7.6 | 32.2 | - | 6.1 | 40.0 | 33.9 | |
| Vert | 136.651 | QP | 22.1 | 14.3 | 8.5 | 32.1 | - | 12.8 | 43.5 | 30.7 | |
| Vert | 245.099 | QP | 22.1 | 17.2 | 9.5 | 32.0 | - | 16.8 | 46.0 | 29.2 | |
| Vert | 397.999 | QP | 21.9 | 17.5 | 10.5 | 31.9 | - | 18.0 | 46.0 | 28.0 | |
| Vert | 529.832 | QP | 21.9 | 18.6 | 11.4 | 32.0 | - | 19.9 | 46.0 | 26.1 | |
| Vert | 613.833 | QP | 22.0 | 19.6 | 11.9 | 32.0 | - | 21.5 | 46.0 | 24.5 | |
| Vert | 2483.500 | PK | 48.9 | 26.9 | 3.1 | 32.7 | - | 46.2 | 73.9 | 27.7 | |
| Vert | 4960.000 | PK | 40.0 | 30.9 | 5.2 | 31.7 | - | 44.4 | 73.9 | 29.5 | |
| Vert | 7440.000 | PK | 40.6 | 35.9 | 6.6 | 32.7 | - | 50.4 | 73.9 | 23.5 | |
| Vert | 9920.000 | PK | 40.0 | 38.9 | 7.1 | 33.5 | - | 52.5 | 73.9 | 21.4 | |
| Vert | 2483.500 | AV | 44.8 | 26.9 | 3.1 | 32.7 | 0.0 | 42.1 | 53.9 | 11.8 | |
| Vert | 4960.000 | AV | 32.0 | 30.9 | 5.2 | 31.7 | 0.0 | 36.4 | 53.9 | 17.5 | |
| Vert | 7440.000 | AV | 33.0 | 35.9 | 6.6 | 32.7 | 0.0 | 42.8 | 53.9 | 11.1 | |
| Vert | 9920.000 | AV | 32.6 | 38.9 | 7.1 | 33.5 | 0.0 | 45.1 | 53.9 | 8.8 | |

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
 26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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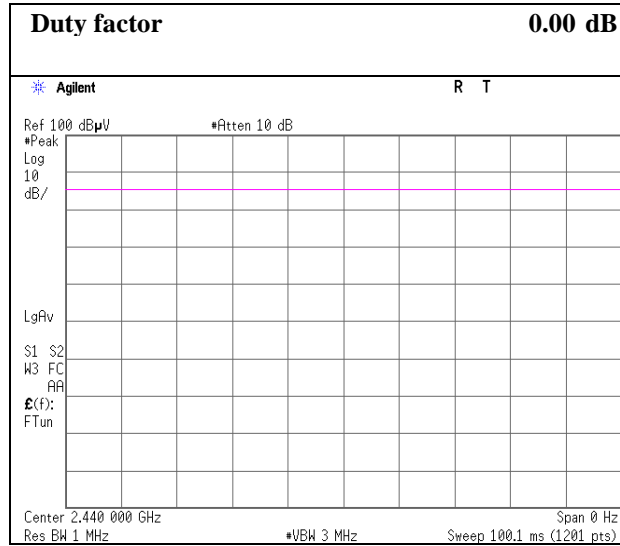
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Telephone : +81 596 24 8999

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Burst rate confirmation

Test place Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10377584H
Date 06/22/2014
Temperature/ Humidity 22deg. C / 60% RH
Engineer Keisuke Kawamura
Mode LE Tx



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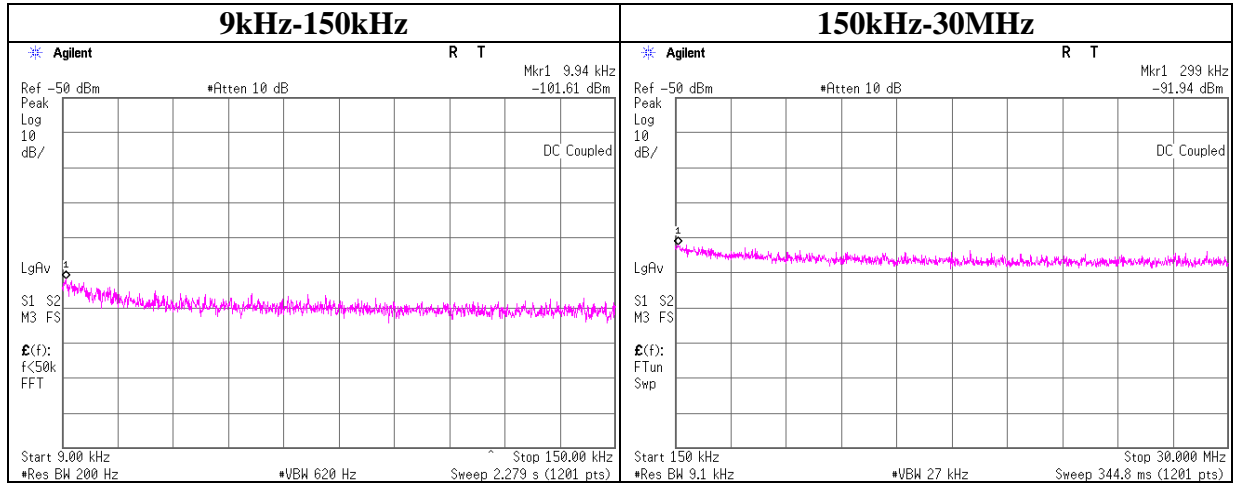
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

| | |
|-----------------------|------------------------------------|
| Test place | Ise EMC Lab. No.7 Measurement Room |
| Report No. | 10377588H |
| Date | 06/16/2014 |
| Temperature/ Humidity | 21 deg. C / 59% RH |
| Engineer | Shinya Watanabe |
| Mode | LE Tx |

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] |
|--------------------|------------------|-----------------------|--------------------|--------------------------|---------------|-----------------|--------------------------|-----------------------------------|-------------------|
| 9.94 | -101.6 | 0.40 | 10.0 | 2.5 | -88.7 | 300.0 | 6.0 | -27.4 | 47.7 |
| 299 | -91.9 | 0.40 | 10.0 | 2.5 | -79.0 | 300.0 | 6.0 | -17.8 | 18.1 |

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

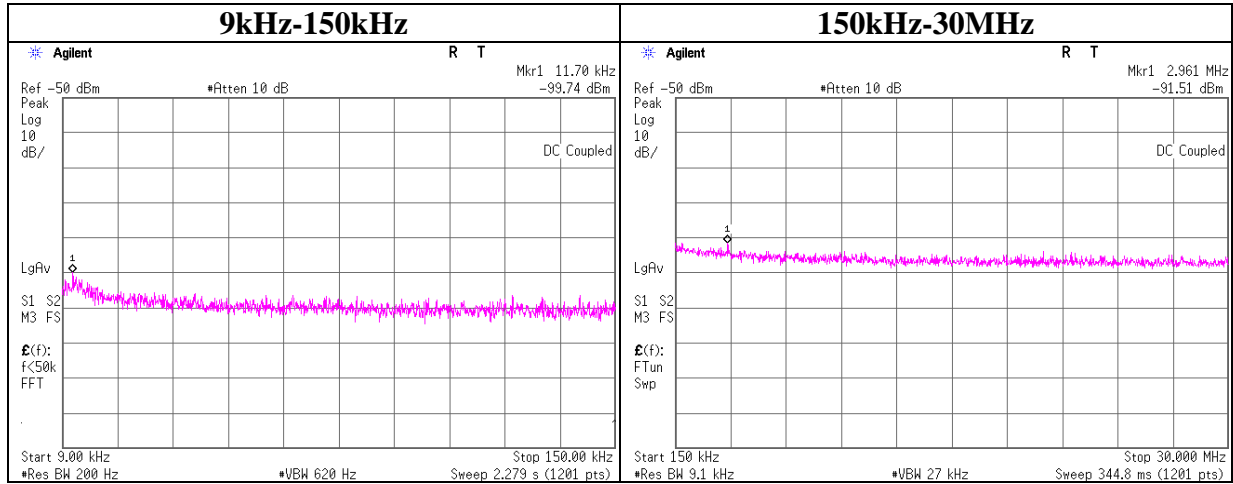
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Conducted Spurious Emission

| | |
|-----------------------|------------------------------------|
| Test place | Ise EMC Lab. No.7 Measurement Room |
| Report No. | 10377588H |
| Date | 06/16/2014 |
| Temperature/ Humidity | 21 deg. C / 59% RH |
| Engineer | Shinya Watanabe |
| Mode | LE Tx |

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] |
|--------------------|------------------|-----------------------|--------------------|--------------------------|---------------|-----------------|--------------------------|-----------------------------------|-------------------|
| 11.70 | -99.7 | 0.40 | 10.0 | 2.5 | -86.8 | 300.0 | 6.0 | -25.6 | 46.2 |
| 2961 | -91.5 | 0.01 | 10.0 | 2.5 | -79.0 | 300.0 | 6.0 | -17.7 | -1.8 |

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

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

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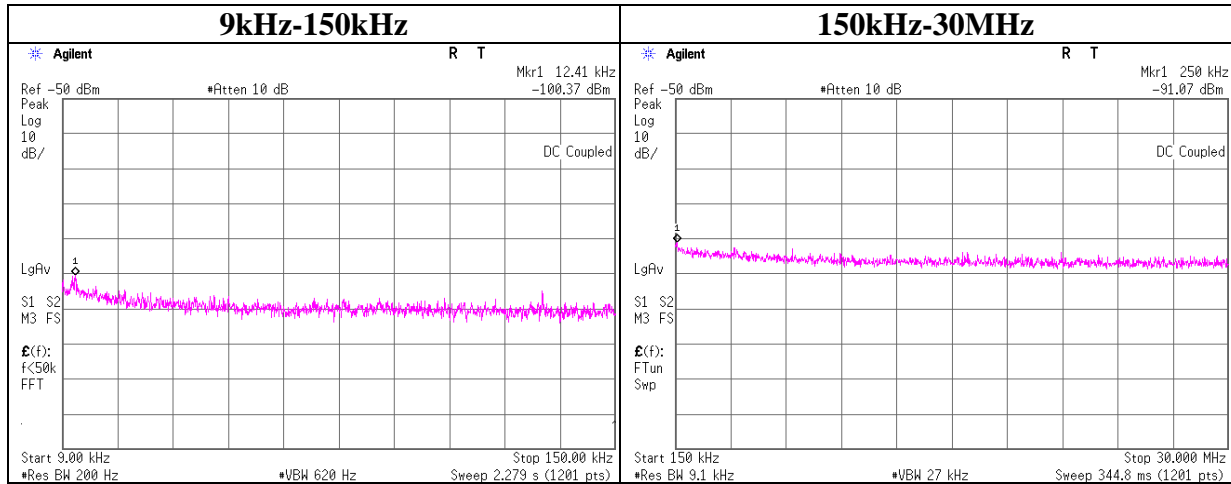
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Spurious Emission

| | |
|-----------------------|------------------------------------|
| Test place | Ise EMC Lab. No.7 Measurement Room |
| Report No. | 10377588H |
| Date | 06/16/2014 |
| Temperature/ Humidity | 21 deg. C / 59% RH |
| Engineer | Shinya Watanabe |
| Mode | LE Tx |

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] |
|--------------------|------------------|-----------------------|--------------------|--------------------------|---------------|-----------------|--------------------------|-----------------------------------|-------------------|
| 12.41 | -100.4 | 0.40 | 10.0 | 2.5 | -87.5 | 300.0 | 6.0 | -26.2 | 45.7 |
| 250 | -91.1 | 0.40 | 10.0 | 2.5 | -78.2 | 300.0 | 6.0 | -16.9 | 19.6 |

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

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

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Power Density

Test place Ise EMC Lab. No.7 Measurement Room
Report No. 10377588H
Date 06/16/2014
Temperature/ Humidity 21 deg. C / 59% RH
Engineer Shinya Watanabe
Mode LE Tx

| Freq. [MHz] | Reading [dBm] | Cable Loss [dB] | Atten. [dB] | Result [dBm] | Limit [dBm] | Margin [dB] |
|----------------|------------------|-----------------------|----------------|-----------------|----------------|----------------|
| 2402.00 | -21.36 | 0.40 | 10.00 | -10.96 | 8.00 | 18.96 |
| 2440.00 | -23.01 | 0.40 | 10.07 | -12.54 | 8.00 | 20.54 |
| 2480.00 | -22.94 | 0.40 | 10.07 | -12.47 | 8.00 | 20.47 |

Sample Calculation:

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

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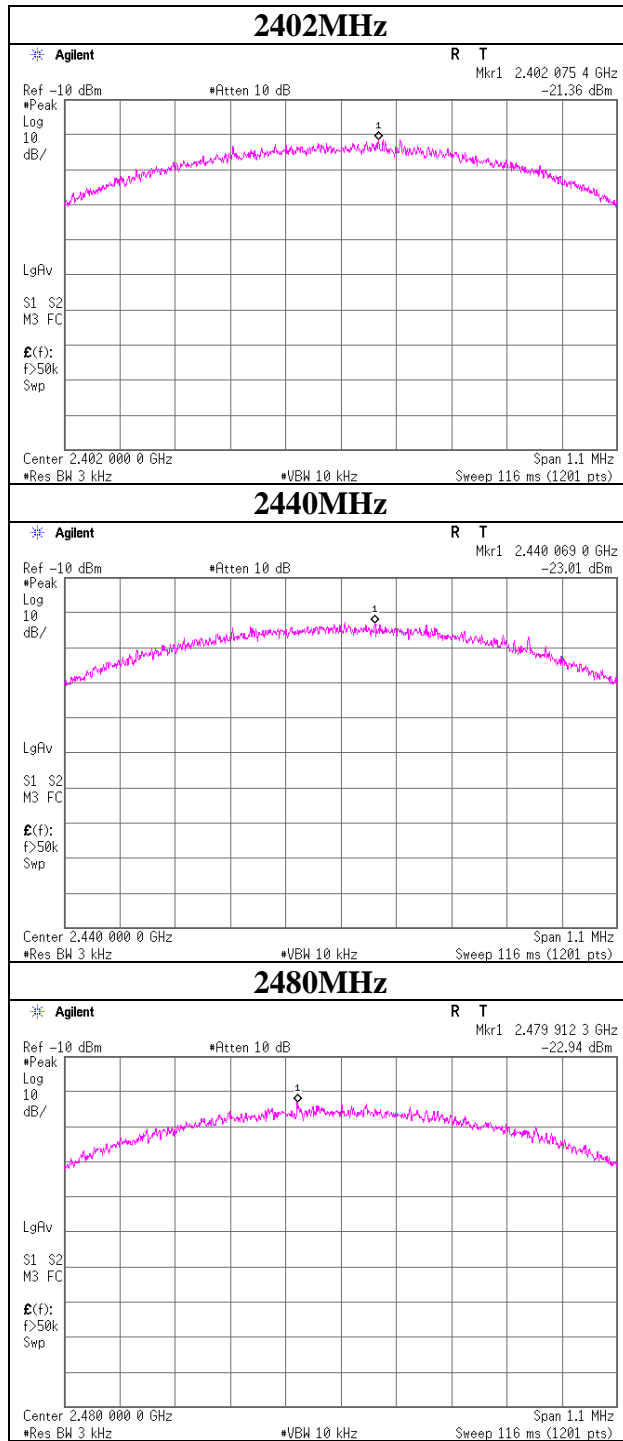
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Power Density



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Ise EMC Lab.

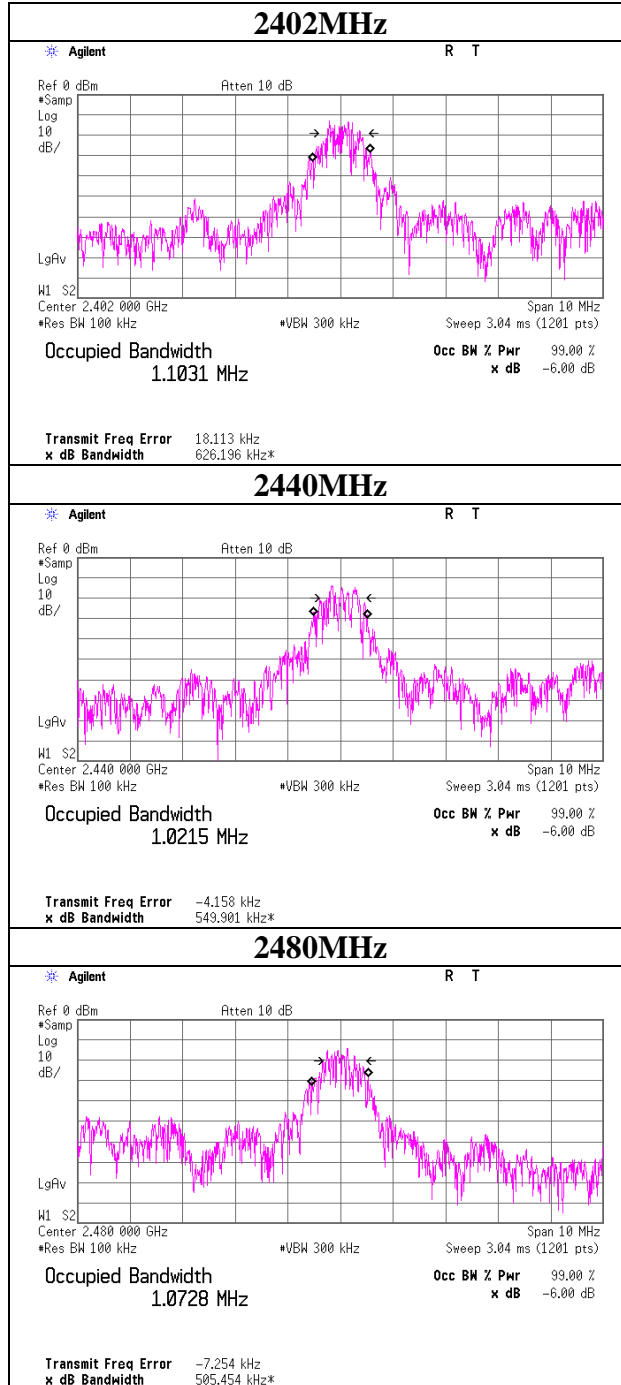
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99% Occupied Bandwidth

| | |
|-----------------------|------------------------------------|
| Test place | Ise EMC Lab. No.7 Measurement Room |
| Report No. | 10377588H |
| Date | 06/16/2014 |
| Temperature/ Humidity | 21 deg. C / 59% RH |
| Engineer | Shinya Watanabe |
| Mode | LE Tx |



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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) |
|-------------|------------------------------|-------------------|--------------------------|--------------------------------|-----------|---------------------------------------|
| MOS-34 | Thermo-Hygrometer | Custom | CTH-201 | 3401 | AT | 2014/02/20 * 12 |
| MRENT-112 | Spectrum Analyzer | Agilent | E4440A | MY48250080 | AT | 2013/10/04 * 12 |
| MPM-08 | Power Meter | Anritsu | ML2495A | 6K00003338 | AT | 2013/10/15 * 12 |
| MPSE-11 | Power sensor | Anritsu | MA2411B | 011737 | AT | 2013/10/15 * 12 |
| MAT-22 | Attenuator(10dB) 1-18GHz | Orient Microwave | BX10-0476-00 | - | AT | 2014/03/13 * 12 |
| MAEC-03 | Semi Anechoic Chamber(NSA) | TDK | Semi Anechoic Chamber 3m | DA-10005 | RE | 2014/02/27 * 12 |
| MOS-13 | Thermo-Hygrometer | Custom | CTH-180 | 1301 | RE | 2014/02/20 * 12 |
| MJM-16 | Measure | KOMELON | KMC-36 | - | RE | - |
| COTS-MEMI | EMI measurement program | TSJ | TEPTO-DV | - | RE | - |
| MRENT-114 | Spectrum Analyzer | Agilent | E4440A | MY46187105 | RE | 2013/11/11 * 12 |
| MTR-08 | Test Receiver | Rohde & Schwarz | ESCI | 100767 | RE | 2013/08/20 * 12 |
| MBA-03 | Biconical Antenna | Schwarzbeck | BBA9106 | 1915 | RE | 2013/10/13 * 12 |
| MLA-03 | Logperiodic Antenna | Schwarzbeck | USLP9143 | 174 | RE | 2013/10/13 * 12 |
| MCC-51 | Coaxial cable | UL Japan | - | - | RE | 2013/07/23 * 12 |
| MAT-70 | Attenuator(6dB) | Agilent | 8491A-006 | MY52460153 | RE | 2014/04/14 * 12 |
| MPA-13 | Pre Amplifier | SONOMA INSTRUMENT | 310 | 260834 | RE | 2014/03/14 * 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 | 2014/03/24 * 12 |
| MHA-16 | Horn Antenna 15-40GHz | Schwarzbeck | BBHA9170 | BBHA9170306 | RE | 2014/05/26 * 12 |
| MHF-25 | High Pass Filter 3.5-18.0GHz | UL Japan | HPF SELECTOR | 001 | RE | 2013/09/01 * 12 |

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

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

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

Test Item: RE: Radiated Emission

AT: Antenna Terminal Conducted test

UL Japan, Inc.

Ise EMC Lab.

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