



RADIO TEST REPORT

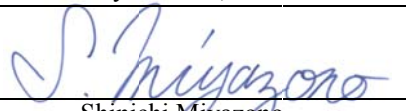
Test Report No. : 11292710H-A-R2

Applicant : Sony Interactive Entertainment Inc.
Type of Equipment : Wireless communication module
Model No. : J20H091
FCC ID : AK8M16DFL1
Test regulation : FCC Part 15 Subpart C: 2016
*Bluetooth part
*Class II permissive change
(Radiated Spurious Emission test only)
Test Result : Complied

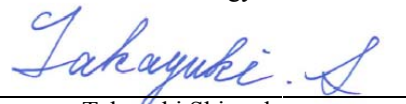
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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not 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 11292710H-A-R1. 11292710H-A-R1 is replaced with this report.

Date of test: May 23 to 31, 2016

Representative test engineer:


Shinichi Miyazono
Engineer
Consumer Technology Division

Approved by:


Takayuki Shimada
Engineer
Consumer Technology Division



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13-EM-F0429

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SECTION 1: Customer information

| | |
|------------------|---|
| Company Name | Sony Interactive 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 | Wireless communication module |
| Model No | J20H091 |
| Serial No | Refer to Clause 4.2 |
| Country of Manufacture | Japan |
| Receipt Date of Sample | May 16, 2016 |
| 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

J20H091 is the Wireless communication module.

Product Specification

| | |
|--|-----------------------------|
| Clock frequency in the system (radio part) | 40MHz |
| Operating Temperature | -10 - +85 deg. C |
| Power Supply | DC 3.3 V, DC 1.8 V |
| Size | 20 x 18 x 3.6 mm, 55pin LGA |

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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 3.3 V / DC 1.8 V / DC 1.1 V |
| Antenna Type | Inv.F (Antenna port WA for 2.4GHz / Antenna port WB) |
| Antenna Gain: G _{ANT} | 2.7dBi (Antenna port WA for 2.4GHz) 6.0dBi (Antenna port WB) |
| Directional Gain *1) | 7.52dBi |

WLAN (IEEE802.11a/11n-20/11ac-20/11n-40/11ac-40/11ac-80)

| | |
|--------------------------------|--|
| Equipment Type | Transceiver |
| Frequency of Operation | W52: 5180-5240MHz W53: 5260-5320MHz W56: 5500-5700MHz W58: 5745-5825MHz |
| Type of Modulation | OFDM |
| Bandwidth & Channel spacing | Less than 20MHz/40MHz/80MHz&20MHz/40MHz/80MHz |
| Method of frequency generation | Synthesizer |
| Power Supply (inner) | DC 3.3 V / DC 1.8 V / DC 1.1 V |
| Antenna Type | Inv.F (Antenna port WA for 5GHz / Antenna port WC for 5GHz) |
| Antenna Gain: G _{ANT} | 4.1dBi (Antenna port WA for 5GHz) 4.9dBi (Antenna port WC for 5GHz) |
| Directional Gain *1) | 7.52dBi |

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 3.3 V / DC 1.8 V / DC 1.1 V |
| Antenna Type | Inv.F (Antenna port WC for 2.4 GHz) |
| Antenna Gain | 3.6dBi (Antenna port WC for 2.4 GHz) |

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 3.3 V / DC 1.8 V / DC 1.1 V |
| Antenna Type | Inv.F (Antenna port WC for 2.4 GHz) |
| Antenna Gain | 3.6dBi (Antenna port WC for 2.4 GHz) |

*1) Directional antenna gain = $10 \log \left(\frac{G_{ANT1}}{10^{20}} + \frac{G_{ANT2}}{10^{20}} \right)^2 / 2$

*This test report applies to Bluetooth.

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<Contents of the change from original model>

Test Report Number of original model is 11155194H-A-R3 (issued by UL Japan, Inc.).

Specification was changed from the original model as follows:

* The form change of the antenna design.

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC part 15 final revised on April 6, 2016.

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

* Also the EUT complies with FCC Part 15 Subpart B.

3.2 Procedures and results

| Item | Test Procedure | Specification | Worst Margin | Results | Remarks |
|---|--|---|------------------------------------|----------|--------------------------------|
| Spurious Emission & Band Edge Compliance | FCC: FCC Public Notice DA 00-705 IC: RSS-Gen 6.13 | FCC: Section15.247(d) IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10 | 17.4 dB 2483.500 MHz, AV, Hori. | Complied | Radiated (above 30 MHz) *1) |
| Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422. *1) Radiated test was selected over 30 MHz based on section 15.247(d). | | | | | |

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

FCC Part 15.31 (e)

The EUT has the power supply regulator. However one of the input voltages to RF part doesn't go through the regulator. The stable voltage will be supplied by the end product, which will be required to have a power supply regulator. Therefore, the EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

The EUT has a unique coupling/antenna connector (U.FL). Therefore the equipment complies with the requirement of 15.203/212.

3.3 Addition to standard

No addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

EMI

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k = 2$.
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| Test distance | Radiated emission (±dB) 9 kHz - 30 MHz |
|---------------|--|
| 3m | 3.8 dB |
| 10m | 3.7 dB |

| Polarity | Radiated emission (Below 1GHz) | | | |
|------------|--------------------------------|---------------|--------------|---------------|
| | (3 m*)(±dB) | | (10 m*)(±dB) | |
| | 30 – 200 MHz | 200 – 1000MHz | 30 – 200 MHz | 200 – 1000MHz |
| Horizontal | 4.9 dB | 5.2 dB | 4.9 dB | 5.0 dB |
| Vertical | 4.6 dB | 5.9 dB | 5.0 dB | 5.0 dB |

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

*Measurement distance

Radiated emission test

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

3.5 Test Location

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

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Mode(s)

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

Details of Operating Mode(s)

| Test Item | Mode | Tested frequency |
|---|----------------------------|----------------------------------|
| Spurious Emission (Radiated) | Tx (Hopping Off) DH5, 3DH5 | 2402 MHz 2441 MHz 2480 MHz |
| <p>*As a result of preliminary test, the formal test was performed with the above modes, which had the maximum payload length (except Dwell time test)</p> <p>*2DH mode (2Mb/s EDR: pi/4DQPSK) was excluded for other tests than power measurement by using 3DH mode (3 Mb/s EDR: 8DPSK) as a representative.</p> <p>* It is considered that the non-tested packet type (e.g. inquiry) can be omitted as it is complied with above all test items based on Bluetooth Core specification.</p> <p>*EUT has the power settings by the software as follows; Power settings: Same as production model Software: Opro_DOS_Labtool_Ver2.0.0.88 *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.</p> | | |

Simultaneously transmission

| Test Item | Mode *1) |
|--|--|
| Spurious Emission (Radiated) | Tx (Hopping Off) 3DH5 2402 MHz + 11n-20 5180 MHz Tx (Hopping Off) 3DH5 2441 MHz + 11n-20 5180 MHz Tx (Hopping Off) 3DH5 2480 MHz + 11n-20 5180 MHz |
| <p>*1) The test was performed on the mode as a representative, because it had the highest power of 5GHz band at antenna terminal test.</p> | |

4.2 Configuration and peripherals

This page has been submitted for a separate exhibit.

SECTION 5: Radiated Spurious Emission

Test Procedure

[For below 1GHz]

EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

[For above 1GHz]

EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 m, raised 1.5 m above the conducting ground plane.

The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

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

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

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

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

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

Test Antennas are used as below;

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

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

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

| | | | | |
|-----------------|---------------|---|------------------------------|---|
| Frequency | Below 1 GHz | Above 1 GHz | | 20 dBc |
| Instrument used | Test Receiver | Spectrum Analyzer | | Spectrum Analyzer |
| Detector | QP | PK | AV | PK |
| IF Bandwidth | BW 120 kHz | RBW: 1 MHz VBW: 3 MHz | RBW: 1 MHz VBW: 10 Hz *1) | RBW: 100 kHz VBW: 300 kHz |
| Test Distance | 3 m | 4.5 m*2) (below 10 GHz), 1 m*3) (above 10 GHz) | | 4.5 m*2) (below 10 GHz), 1 m*3) (above 10 GHz) |

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

*2) Distance Factor: $20 \times \log(4.5 \text{ m} / 3.0 \text{ m}) = 3.53 \text{ dB}$

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

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT (Antenna and Module) 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 : 30 M - 26.5 GHz

Test data : APPENDIX

Test result : Pass

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APPENDIX 1: Test data

Radiated Spurious Emission

Test place Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. 11292710H
Date May 23, 2016 May 30, 2016 May 30, 2016 May 31, 2016
Temperature / Humidity 23 deg. C / 41 % RH 22 deg. C / 71 % RH 23 deg. C / 70 % RH 24deg. C / 62 % RH
Engineer Ken Fujita Shinichi Miyazono Tomoki Matsui Shinichi Miyazono
(1 GHz - 10 GHz) (18 GHz - 26.5 GHz) (10 GHz - 18 GHz) (Below 1GHz)
Mode Tx, Hopping Off, DH5 2402 MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|
| Hori | 37.500 | QP | 21.2 | 15.0 | 7.2 | 32.1 | 11.3 | 40.0 | 28.7 | |
| Hori | 90.319 | QP | 26.3 | 8.4 | 8.0 | 32.1 | 10.6 | 43.5 | 32.9 | |
| Hori | 100.202 | QP | 24.7 | 10.0 | 8.1 | 32.1 | 10.7 | 43.5 | 32.8 | |
| Hori | 310.238 | QP | 25.1 | 13.7 | 10.0 | 31.8 | 17.0 | 46.0 | 29.0 | |
| Hori | 614.000 | QP | 20.7 | 19.2 | 11.9 | 32.2 | 19.6 | 46.0 | 26.4 | |
| Hori | 960.000 | QP | 19.8 | 22.2 | 13.6 | 30.9 | 24.7 | 46.0 | 21.3 | |
| Hori | 2390.000 | PK | 44.0 | 27.9 | 6.8 | 32.1 | 46.6 | 73.9 | 27.3 | |
| Hori | 4804.000 | PK | 41.6 | 32.8 | 8.3 | 31.3 | 51.4 | 73.9 | 22.5 | Floor Noise |
| Hori | 7206.000 | PK | 43.4 | 36.8 | 9.7 | 32.6 | 57.3 | 73.9 | 16.6 | Floor Noise |
| Hori | 9608.000 | PK | 43.1 | 38.1 | 10.4 | 32.6 | 59.0 | 73.9 | 14.9 | Floor Noise |
| Hori | 2390.000 | AV | 25.8 | 27.9 | 6.8 | 32.1 | 28.4 | 53.9 | 25.5 | |
| Hori | 4804.000 | AV | 27.1 | 32.8 | 8.3 | 31.3 | 36.9 | 53.9 | 17.0 | Floor Noise |
| Hori | 7206.000 | AV | 29.2 | 36.8 | 9.7 | 32.6 | 43.1 | 53.9 | 10.8 | Floor Noise |
| Hori | 9608.000 | AV | 28.8 | 38.1 | 10.4 | 32.6 | 44.7 | 53.9 | 9.2 | Floor Noise |
| Vert | 37.500 | QP | 21.2 | 15.0 | 7.2 | 32.1 | 11.3 | 40.0 | 28.7 | |
| Vert | 90.319 | QP | 27.9 | 8.4 | 8.0 | 32.1 | 12.2 | 43.5 | 31.3 | |
| Vert | 100.202 | QP | 23.5 | 10.0 | 8.1 | 32.1 | 9.5 | 43.5 | 34.0 | |
| Vert | 310.238 | QP | 21.5 | 13.7 | 10.0 | 31.8 | 13.4 | 46.0 | 32.6 | |
| Vert | 614.000 | QP | 20.7 | 19.2 | 11.9 | 32.2 | 19.6 | 46.0 | 26.4 | |
| Vert | 960.000 | QP | 19.8 | 22.2 | 13.6 | 30.9 | 24.7 | 46.0 | 21.3 | |
| Vert | 2390.000 | PK | 43.5 | 27.9 | 6.8 | 32.1 | 46.1 | 73.9 | 27.8 | |
| Vert | 4804.000 | PK | 40.2 | 32.8 | 8.3 | 31.3 | 50.0 | 73.9 | 23.9 | Floor Noise |
| Vert | 7206.000 | PK | 43.0 | 36.8 | 9.7 | 32.6 | 56.9 | 73.9 | 17.0 | Floor Noise |
| Vert | 9608.000 | PK | 42.9 | 38.1 | 10.4 | 32.6 | 58.8 | 73.9 | 15.1 | Floor Noise |
| Vert | 2390.000 | AV | 30.1 | 27.9 | 6.8 | 32.1 | 32.7 | 53.9 | 21.2 | |
| Vert | 4804.000 | AV | 28.7 | 32.8 | 8.3 | 31.3 | 38.5 | 53.9 | 15.4 | Floor Noise |
| Vert | 7206.000 | AV | 30.5 | 36.8 | 9.7 | 32.6 | 44.4 | 53.9 | 9.5 | Floor Noise |
| Vert | 9608.000 | AV | 30.4 | 38.1 | 10.4 | 32.6 | 46.3 | 53.9 | 7.6 | Floor Noise |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

20dBc Data Sheet

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant Factor [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-------------------|-----------|-----------|-----------------|----------------|-------------|---------|
| Hori | 2402.000 | PK | 92.0 | 26.9 | 6.8 | 32.0 | 93.7 | - | - | Carrier |
| Hori | 2400.000 | PK | 35.2 | 26.9 | 6.8 | 32.0 | 36.9 | 73.7 | 36.8 | |
| Vert | 2402.000 | PK | 93.6 | 26.9 | 6.8 | 32.0 | 95.3 | - | - | Carrier |
| Vert | 2400.000 | PK | 35.8 | 26.9 | 6.8 | 32.0 | 37.5 | 75.3 | 37.8 | |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

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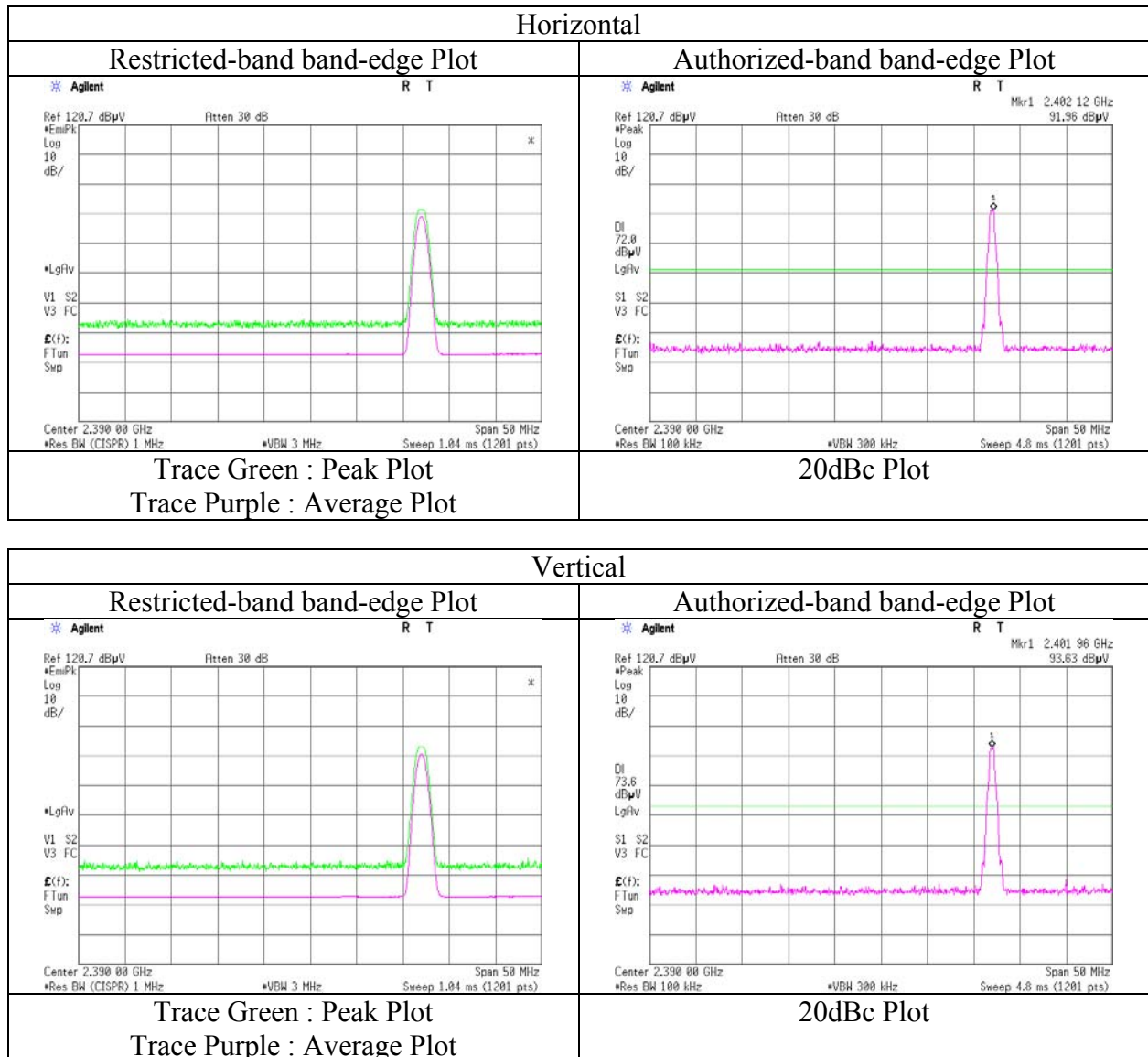
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Radiated Spurious Emission
(Reference Plot for band-edge)

| | |
|------------------------|---|
| Test place | Ise EMC Lab. No.3 Semi Anechoic Chamber |
| Report No. | 11292710H |
| Date | May 23, 2016 |
| Temperature / Humidity | 23 deg. C / 41 % RH |
| Engineer | Ken Fujita |
| | (1 GHz - 10 GHz) |
| Mode | Tx, Hopping Off, DH5 2402 MHz |



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

Radiated Spurious Emission

Test place Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. 11292710H
Date May 23, 2016 May 30, 2016 May 30, 2016 May 31, 2016
Temperature / Humidity 23 deg. C / 41 % RH 22 deg. C / 71 % RH 23 deg. C / 70 % RH 24deg. C / 62 % RH
Engineer Ken Fujita Shinichi Miyazono Tomoki Matsui Shinichi Miyazono
 (1 GHz - 10 GHz) (18 GHz - 26.5 GHz) (10 GHz - 18 GHz) (Below 1GHz)
Mode Tx, Hopping Off, DH5 2441 MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|
| Hori | 37.500 | QP | 21.3 | 15.0 | 7.2 | 32.1 | 11.4 | 40.0 | 28.6 | |
| Hori | 90.490 | QP | 26.3 | 8.4 | 8.0 | 32.1 | 10.6 | 43.5 | 32.9 | |
| Hori | 100.481 | QP | 24.7 | 10.0 | 8.1 | 32.1 | 10.7 | 43.5 | 32.8 | |
| Hori | 310.600 | QP | 24.8 | 13.7 | 10.0 | 31.8 | 16.7 | 46.0 | 29.3 | |
| Hori | 614.000 | QP | 20.6 | 19.2 | 11.9 | 32.2 | 19.5 | 46.0 | 26.5 | |
| Hori | 960.000 | QP | 19.8 | 22.2 | 13.6 | 30.9 | 24.7 | 46.0 | 21.3 | |
| Hori | 4882.000 | PK | 41.1 | 33.1 | 8.4 | 31.3 | 51.3 | 73.9 | 22.6 | Floor Noise |
| Hori | 7323.000 | PK | 43.2 | 36.8 | 9.7 | 32.6 | 57.1 | 73.9 | 16.8 | Floor Noise |
| Hori | 9764.000 | PK | 43.2 | 38.2 | 10.5 | 32.7 | 59.2 | 73.9 | 14.7 | Floor Noise |
| Hori | 4882.000 | AV | 27.0 | 33.1 | 8.4 | 31.3 | 37.2 | 53.9 | 16.7 | Floor Noise |
| Hori | 7323.000 | AV | 29.1 | 36.8 | 9.7 | 32.6 | 43.0 | 53.9 | 10.9 | Floor Noise |
| Hori | 9764.000 | AV | 28.9 | 38.2 | 10.5 | 32.7 | 44.9 | 53.9 | 9.0 | Floor Noise |
| Vert | 37.500 | QP | 21.3 | 15.0 | 7.2 | 32.1 | 11.4 | 40.0 | 28.6 | |
| Vert | 90.490 | QP | 28.0 | 8.4 | 8.0 | 32.1 | 12.3 | 43.5 | 31.2 | |
| Vert | 100.481 | QP | 23.3 | 10.0 | 8.1 | 32.1 | 9.3 | 43.5 | 34.2 | |
| Vert | 310.600 | QP | 21.7 | 13.7 | 10.0 | 31.8 | 13.6 | 46.0 | 32.4 | |
| Vert | 614.000 | QP | 20.6 | 19.2 | 11.9 | 32.2 | 19.5 | 46.0 | 26.5 | |
| Vert | 960.000 | QP | 19.8 | 22.2 | 13.6 | 30.9 | 24.7 | 46.0 | 21.3 | |
| Vert | 4882.000 | PK | 40.3 | 33.1 | 8.4 | 31.3 | 50.5 | 73.9 | 23.4 | Floor Noise |
| Vert | 7323.000 | PK | 43.3 | 36.8 | 9.7 | 32.6 | 57.2 | 73.9 | 16.7 | Floor Noise |
| Vert | 9764.000 | PK | 42.3 | 38.2 | 10.5 | 32.7 | 58.3 | 73.9 | 15.6 | Floor Noise |
| Vert | 4882.000 | AV | 28.5 | 33.1 | 8.4 | 31.3 | 38.7 | 53.9 | 15.2 | Floor Noise |
| Vert | 7323.000 | AV | 30.7 | 36.8 | 9.7 | 32.6 | 44.6 | 53.9 | 9.3 | Floor Noise |
| Vert | 9764.000 | AV | 30.4 | 38.2 | 10.5 | 32.7 | 46.4 | 53.9 | 7.5 | Floor Noise |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.52\text{ dB}$
 10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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

Radiated Spurious Emission

Test place Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. 11292710H
Date May 23, 2016 May 30, 2016 May 30, 2016 May 31, 2016
Temperature / Humidity 23 deg. C / 41 % RH 22 deg. C / 71 % RH 23 deg. C / 70 % RH 24deg. C / 62 % RH
Engineer Ken Fujita Shinichi Miyazono Tomoki Matsui Shinichi Miyazono
(1 GHz - 10 GHz) (18 GHz - 26.5 GHz) (10 GHz - 18 GHz) (Below 1GHz)
Mode Tx, Hopping Off, DH5 2480 MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|
| Hori | 37.500 | QP | 21.3 | 15.0 | 7.2 | 32.1 | 11.4 | 40.0 | 28.6 | |
| Hori | 90.619 | QP | 26.1 | 8.4 | 8.0 | 32.1 | 10.4 | 43.5 | 33.1 | |
| Hori | 100.120 | QP | 24.5 | 10.0 | 8.1 | 32.1 | 10.5 | 43.5 | 33.0 | |
| Hori | 310.500 | QP | 24.7 | 13.7 | 10.0 | 31.8 | 16.6 | 46.0 | 29.4 | |
| Hori | 614.000 | QP | 20.5 | 19.2 | 11.9 | 32.2 | 19.4 | 46.0 | 26.6 | |
| Hori | 960.000 | QP | 19.8 | 22.2 | 13.6 | 30.9 | 24.7 | 46.0 | 21.3 | |
| Hori | 2483.500 | PK | 42.7 | 28.1 | 6.9 | 32.1 | 45.6 | 73.9 | 28.3 | |
| Hori | 4960.000 | PK | 41.8 | 33.4 | 8.4 | 31.2 | 52.4 | 73.9 | 21.5 | Floor Noise |
| Hori | 7440.000 | PK | 43.6 | 36.8 | 9.7 | 32.7 | 57.4 | 73.9 | 16.5 | Floor Noise |
| Hori | 9920.000 | PK | 43.0 | 38.3 | 10.6 | 32.8 | 59.1 | 73.9 | 14.8 | Floor Noise |
| Hori | 2483.500 | AV | 29.7 | 28.1 | 6.9 | 32.1 | 32.6 | 53.9 | 21.3 | Floor Noise |
| Hori | 4960.000 | AV | 27.4 | 33.4 | 8.4 | 31.2 | 38.0 | 53.9 | 15.9 | Floor Noise |
| Hori | 7440.000 | AV | 29.3 | 36.8 | 9.7 | 32.7 | 43.1 | 53.9 | 10.8 | Floor Noise |
| Hori | 9920.000 | AV | 28.5 | 38.3 | 10.6 | 32.8 | 44.6 | 53.9 | 9.3 | Floor Noise |
| Vert | 37.500 | QP | 21.3 | 15.0 | 7.2 | 32.1 | 11.4 | 40.0 | 28.6 | |
| Vert | 90.619 | QP | 27.9 | 8.4 | 8.0 | 32.1 | 12.2 | 43.5 | 31.3 | |
| Vert | 100.120 | QP | 23.4 | 10.0 | 8.1 | 32.1 | 9.4 | 43.5 | 34.1 | |
| Vert | 310.500 | QP | 21.7 | 13.7 | 10.0 | 31.8 | 13.6 | 46.0 | 32.4 | |
| Vert | 614.000 | QP | 20.6 | 19.2 | 11.9 | 32.2 | 19.5 | 46.0 | 26.5 | |
| Vert | 960.000 | QP | 19.8 | 22.2 | 13.6 | 30.9 | 24.7 | 46.0 | 21.3 | |
| Vert | 2483.500 | PK | 42.9 | 28.1 | 6.9 | 32.1 | 45.8 | 73.9 | 28.1 | |
| Vert | 4960.000 | PK | 40.5 | 33.4 | 8.4 | 31.2 | 51.1 | 73.9 | 22.8 | Floor Noise |
| Vert | 7440.000 | PK | 43.3 | 36.8 | 9.7 | 32.7 | 57.1 | 73.9 | 16.8 | Floor Noise |
| Vert | 9920.000 | PK | 42.6 | 38.3 | 10.6 | 32.8 | 58.7 | 73.9 | 15.2 | Floor Noise |
| Vert | 2483.500 | AV | 29.4 | 28.1 | 6.9 | 32.1 | 32.3 | 53.9 | 21.6 | |
| Vert | 4960.000 | AV | 28.9 | 33.4 | 8.4 | 31.2 | 39.5 | 53.9 | 14.4 | Floor Noise |
| Vert | 7440.000 | AV | 30.7 | 36.8 | 9.7 | 32.7 | 44.5 | 53.9 | 9.4 | FloorNoise |
| Vert | 9920.000 | AV | 30.8 | 38.3 | 10.6 | 32.8 | 46.9 | 53.9 | 7.0 | Floor Noise |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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

UL Japan, Inc.

Ise EMC Lab.

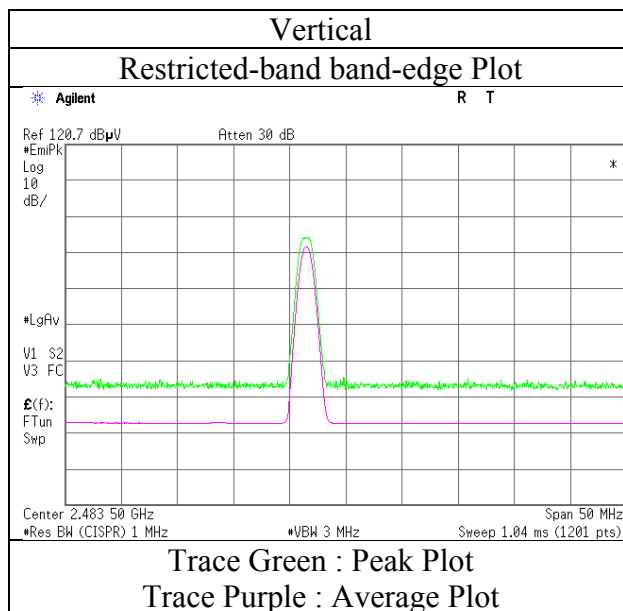
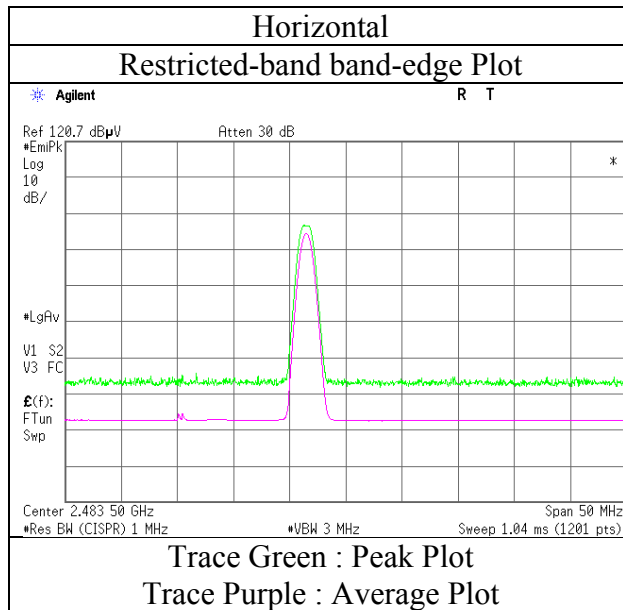
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 11292710H
Date : May 23, 2016
Temperature / Humidity : 23 deg. C / 41 % RH
Engineer : Ken Fujita
(1 GHz - 10 GHz)
Mode : Tx, Hopping Off, DH5 2480 MHz



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

Radiated Spurious Emission

Test place Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. 11292710H
Date May 23, 2016 May 30, 2016 May 30, 2016 May 31, 2016
Temperature / Humidity 23 deg. C / 41 % RH 22 deg. C / 71 % RH 23 deg. C / 70 % RH 24deg. C / 62 % RH
Engineer Ken Fujita Shinichi Miyazono Tomoki Matsui Shinichi Miyazono
 (1 GHz - 10 GHz) (18 GHz - 26.5 GHz) (10 GHz - 18 GHz) (Below 1GHz)
Mode Tx, Hopping Off, 3DH5 2402 MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|
| Hori | 37.500 | QP | 21.2 | 15.0 | 7.2 | 32.1 | 11.3 | 40.0 | 28.7 | |
| Hori | 90.229 | QP | 26.3 | 8.4 | 8.0 | 32.1 | 10.6 | 43.5 | 32.9 | |
| Hori | 100.202 | QP | 24.2 | 10.0 | 8.1 | 32.1 | 10.2 | 43.5 | 33.3 | |
| Hori | 309.438 | QP | 25.1 | 13.7 | 10.0 | 31.8 | 17.0 | 46.0 | 29.0 | |
| Hori | 614.000 | QP | 20.6 | 19.2 | 11.9 | 32.2 | 19.5 | 46.0 | 26.5 | |
| Hori | 960.000 | QP | 19.7 | 22.2 | 13.6 | 30.9 | 24.6 | 46.0 | 21.4 | |
| Hori | 2390.000 | PK | 44.1 | 27.9 | 6.8 | 32.1 | 46.7 | 73.9 | 27.2 | |
| Hori | 4804.000 | PK | 41.3 | 32.8 | 8.3 | 31.3 | 51.1 | 73.9 | 22.8 | Floor Noise |
| Hori | 7206.000 | PK | 43.7 | 36.8 | 9.7 | 32.6 | 57.6 | 73.9 | 16.3 | Floor Noise |
| Hori | 9608.000 | PK | 43.3 | 38.1 | 10.4 | 32.6 | 59.2 | 73.9 | 14.7 | Floor Noise |
| Hori | 2390.000 | AV | 30.2 | 27.9 | 6.8 | 32.1 | 32.8 | 53.9 | 21.1 | |
| Hori | 4804.000 | AV | 27.2 | 32.8 | 8.3 | 31.3 | 37.0 | 53.9 | 16.9 | Floor Noise |
| Hori | 7206.000 | AV | 29.6 | 36.8 | 9.7 | 32.6 | 43.5 | 53.9 | 10.4 | Floor Noise |
| Hori | 9608.000 | AV | 28.9 | 38.1 | 10.4 | 32.6 | 44.8 | 53.9 | 9.1 | Floor Noise |
| Vert | 37.500 | QP | 21.1 | 15.0 | 7.2 | 32.1 | 11.2 | 40.0 | 28.8 | |
| Vert | 90.229 | QP | 27.6 | 8.4 | 8.0 | 32.1 | 11.9 | 43.5 | 31.6 | |
| Vert | 100.202 | QP | 23.2 | 10.0 | 8.1 | 32.1 | 9.2 | 43.5 | 34.3 | |
| Vert | 309.438 | QP | 21.4 | 13.7 | 10.0 | 31.8 | 13.3 | 46.0 | 32.7 | |
| Vert | 614.000 | QP | 20.6 | 19.2 | 11.9 | 32.2 | 19.5 | 46.0 | 26.5 | |
| Vert | 960.000 | QP | 19.7 | 22.2 | 13.6 | 30.9 | 24.6 | 46.0 | 21.4 | |
| Vert | 2390.000 | PK | 43.7 | 27.9 | 6.8 | 32.1 | 46.3 | 73.9 | 27.6 | |
| Vert | 4804.000 | PK | 40.4 | 32.8 | 8.3 | 31.3 | 50.2 | 73.9 | 23.7 | Floor Noise |
| Vert | 7206.000 | PK | 43.3 | 36.8 | 9.7 | 32.6 | 57.2 | 73.9 | 16.7 | Floor Noise |
| Vert | 9608.000 | PK | 42.7 | 38.1 | 10.4 | 32.6 | 58.6 | 73.9 | 15.3 | Floor Noise |
| Vert | 2390.000 | AV | 28.4 | 27.9 | 6.8 | 32.1 | 31.0 | 53.9 | 22.9 | |
| Vert | 4804.000 | AV | 28.8 | 32.8 | 8.3 | 31.3 | 38.6 | 53.9 | 15.3 | Floor Noise |
| Vert | 7206.000 | AV | 30.2 | 36.8 | 9.7 | 32.6 | 44.1 | 53.9 | 9.8 | Floor Noise |
| Vert | 9608.000 | AV | 30.2 | 38.1 | 10.4 | 32.6 | 46.1 | 53.9 | 7.8 | Floor Noise |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
 10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

20dBc Data Sheet

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant Factor [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-------------------|-----------|-----------|-----------------|----------------|-------------|---------|
| Hori | 2402.000 | PK | 94.6 | 26.9 | 6.8 | 32.0 | 96.3 | - | - | Carrier |
| Hori | 2400.000 | PK | 44.6 | 26.9 | 6.8 | 32.0 | 46.3 | 76.3 | 30.0 | |
| Vert | 2402.000 | PK | 92.2 | 26.9 | 6.8 | 32.0 | 93.9 | - | - | Carrier |
| Vert | 2400.000 | PK | 43.2 | 26.9 | 6.8 | 32.0 | 44.9 | 73.9 | 29.0 | |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

UL Japan, Inc.

Ise EMC Lab.

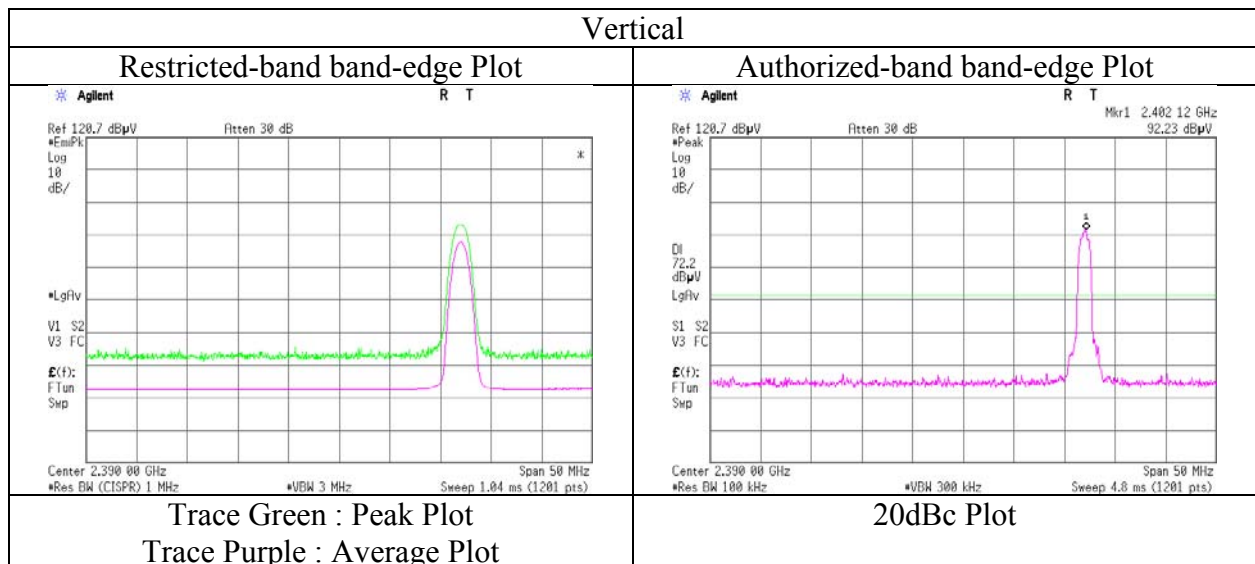
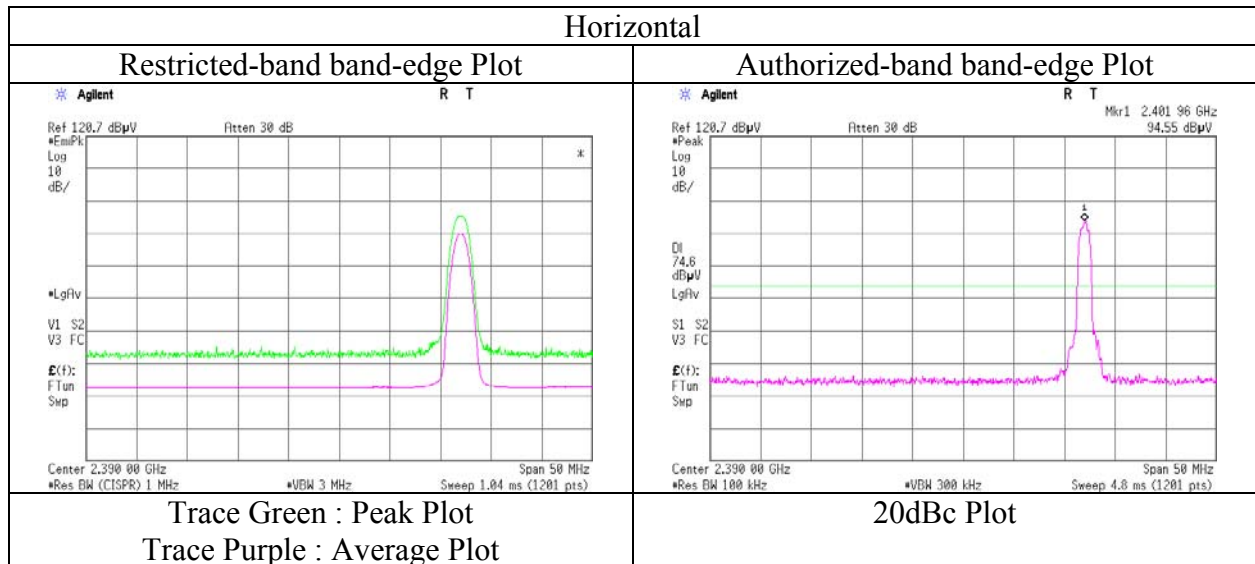
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission
(Reference Plot for band-edge)

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 11292710H
Date : May 23, 2016
Temperature / Humidity : 23 deg. C / 41 % RH
Engineer : Ken Fujita
(1 GHz - 10 GHz)
Mode : Tx, Hopping Off, 3DH5 2402 MHz



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

Radiated Spurious Emission

Test place Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. 11292710H
Date May 23, 2016 May 30, 2016 May 30, 2016 May 31, 2016
Temperature / Humidity 23 deg. C / 41 % RH 22 deg. C / 71 % RH 23 deg. C / 70 % RH 24deg. C / 62 % RH
Engineer Ken Fujita Shinichi Miyazono Tomoki Matsui Shinichi Miyazono
(1 GHz - 10 GHz) (18 GHz - 26.5 GHz) (10 GHz - 18 GHz) (Below 1GHz)
Mode Tx, Hopping Off, 3DH5 2441 MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|
| Hori | 37.500 | QP | 21.2 | 15.0 | 7.2 | 32.1 | 11.3 | 40.0 | 28.7 | |
| Hori | 90.230 | QP | 25.9 | 8.4 | 8.0 | 32.1 | 10.2 | 43.5 | 33.3 | |
| Hori | 100.242 | QP | 24.2 | 10.0 | 8.1 | 32.1 | 10.2 | 43.5 | 33.3 | |
| Hori | 309.440 | QP | 25.0 | 13.7 | 10.0 | 31.8 | 16.9 | 46.0 | 29.1 | |
| Hori | 614.000 | QP | 20.6 | 19.2 | 11.9 | 32.2 | 19.5 | 46.0 | 26.5 | |
| Hori | 960.000 | QP | 19.8 | 22.2 | 13.6 | 30.9 | 24.7 | 46.0 | 21.3 | |
| Hori | 4882.000 | PK | 41.4 | 33.1 | 8.4 | 31.3 | 51.6 | 73.9 | 22.3 | Floor Noise |
| Hori | 7323.000 | PK | 43.3 | 36.8 | 9.7 | 32.6 | 57.2 | 73.9 | 16.7 | Floor Noise |
| Hori | 9764.000 | PK | 43.5 | 38.2 | 10.5 | 32.7 | 59.5 | 73.9 | 14.4 | Floor Noise |
| Hori | 4882.000 | AV | 27.2 | 33.1 | 8.4 | 31.3 | 37.4 | 53.9 | 16.5 | Floor Noise |
| Hori | 7323.000 | AV | 29.4 | 36.8 | 9.7 | 32.6 | 43.3 | 53.9 | 10.6 | Floor Noise |
| Hori | 9764.000 | AV | 28.6 | 38.2 | 10.5 | 32.7 | 44.6 | 53.9 | 9.3 | Floor Noise |
| Vert | 37.500 | QP | 21.2 | 15.0 | 7.2 | 32.1 | 11.3 | 40.0 | 28.7 | |
| Vert | 90.230 | QP | 27.8 | 8.4 | 8.0 | 32.1 | 12.1 | 43.5 | 31.4 | |
| Vert | 100.242 | QP | 23.2 | 10.0 | 8.1 | 32.1 | 9.2 | 43.5 | 34.3 | |
| Vert | 309.440 | QP | 21.3 | 13.7 | 10.0 | 31.8 | 13.2 | 46.0 | 32.8 | |
| Vert | 614.000 | QP | 20.7 | 19.2 | 11.9 | 32.2 | 19.6 | 46.0 | 26.4 | |
| Vert | 960.000 | QP | 19.8 | 22.2 | 13.6 | 30.9 | 24.7 | 46.0 | 21.3 | |
| Vert | 4882.000 | PK | 40.5 | 33.1 | 8.4 | 31.3 | 50.7 | 73.9 | 23.2 | Floor Noise |
| Vert | 7323.000 | PK | 43.4 | 36.8 | 9.7 | 32.6 | 57.3 | 73.9 | 16.6 | Floor Noise |
| Vert | 9764.000 | PK | 42.5 | 38.2 | 10.5 | 32.7 | 58.5 | 73.9 | 15.4 | Floor Noise |
| Vert | 4882.000 | AV | 28.2 | 33.1 | 8.4 | 31.3 | 38.4 | 53.9 | 15.5 | Floor Noise |
| Vert | 7323.000 | AV | 30.9 | 36.8 | 9.7 | 32.6 | 44.8 | 53.9 | 9.1 | Floor Noise |
| Vert | 9764.000 | AV | 30.7 | 38.2 | 10.5 | 32.7 | 46.7 | 53.9 | 7.2 | Floor Noise |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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

Radiated Spurious Emission

Test place Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. 11292710H
Date May 23, 2016 May 30, 2016 May 30, 2016 May 31, 2016
Temperature / Humidity 23 deg. C / 41 % RH 22 deg. C / 71 % RH 23 deg. C / 70 % RH 24deg. C / 62 % RH
Engineer Ken Fujita Shinichi Miyazono Tomoki Matsui Shinichi Miyazono
(1 GHz - 10 GHz) (18 GHz - 26.5 GHz) (10 GHz - 18 GHz) (Below 1GHz)
Mode Tx, Hopping Off, 3DH5 2480 MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|
| Hori | 37.500 | QP | 21.3 | 15.0 | 7.2 | 32.1 | 11.4 | 40.0 | 28.6 | |
| Hori | 90.231 | QP | 26.4 | 8.4 | 8.0 | 32.1 | 10.7 | 43.5 | 32.8 | |
| Hori | 100.211 | QP | 24.3 | 10.0 | 8.1 | 32.1 | 10.3 | 43.5 | 33.2 | |
| Hori | 309.445 | QP | 25.2 | 13.7 | 10.0 | 31.8 | 17.1 | 46.0 | 28.9 | |
| Hori | 614.000 | QP | 20.6 | 19.2 | 11.9 | 32.2 | 19.5 | 46.0 | 26.5 | |
| Hori | 960.000 | QP | 19.8 | 22.2 | 13.6 | 30.9 | 24.7 | 46.0 | 21.3 | |
| Hori | 2483.500 | PK | 48.4 | 28.1 | 6.9 | 32.1 | 51.3 | 73.9 | 22.6 | |
| Hori | 4960.000 | PK | 41.7 | 33.4 | 8.4 | 31.2 | 52.3 | 73.9 | 21.6 | Floor Noise |
| Hori | 7440.000 | PK | 43.5 | 36.8 | 9.7 | 32.7 | 57.3 | 73.9 | 16.6 | Floor Noise |
| Hori | 9920.000 | PK | 43.2 | 38.3 | 10.6 | 32.8 | 59.3 | 73.9 | 14.6 | Floor Noise |
| Hori | 2483.500 | AV | 32.5 | 28.1 | 6.9 | 32.1 | 35.4 | 53.9 | 18.5 | |
| Hori | 4960.000 | AV | 27.7 | 33.4 | 8.4 | 31.2 | 38.3 | 53.9 | 15.6 | Floor Noise |
| Hori | 7440.000 | AV | 29.5 | 36.8 | 9.7 | 32.7 | 43.3 | 53.9 | 10.6 | Floor Noise |
| Hori | 9920.000 | AV | 28.7 | 38.3 | 10.6 | 32.8 | 44.8 | 53.9 | 9.1 | Floor Noise |
| Vert | 37.500 | QP | 21.3 | 15.0 | 7.2 | 32.1 | 11.4 | 40.0 | 28.6 | |
| Vert | 90.231 | QP | 27.5 | 8.4 | 8.0 | 32.1 | 11.8 | 43.5 | 31.7 | |
| Vert | 100.211 | QP | 23.1 | 10.0 | 8.1 | 32.1 | 9.1 | 43.5 | 34.4 | |
| Vert | 309.445 | QP | 21.5 | 13.7 | 10.0 | 31.8 | 13.4 | 46.0 | 32.6 | |
| Vert | 614.000 | QP | 20.7 | 19.2 | 11.9 | 32.2 | 19.6 | 46.0 | 26.4 | |
| Vert | 960.000 | QP | 19.8 | 22.2 | 13.6 | 30.9 | 24.7 | 46.0 | 21.3 | |
| Vert | 2483.500 | PK | 49.3 | 28.1 | 6.9 | 32.1 | 52.2 | 73.9 | 21.7 | |
| Vert | 4960.000 | PK | 40.7 | 33.4 | 8.4 | 31.2 | 51.3 | 73.9 | 22.6 | Floor Noise |
| Vert | 7440.000 | PK | 43.4 | 36.8 | 9.7 | 32.7 | 57.2 | 73.9 | 16.7 | Floor Noise |
| Vert | 9920.000 | PK | 42.4 | 38.3 | 10.6 | 32.8 | 58.5 | 73.9 | 15.4 | Floor Noise |
| Vert | 2483.500 | AV | 31.2 | 28.1 | 6.9 | 32.1 | 34.1 | 53.9 | 19.8 | |
| Vert | 4960.000 | AV | 28.4 | 33.4 | 8.4 | 31.2 | 39.0 | 53.9 | 14.9 | Floor Noise |
| Vert | 7440.000 | AV | 30.9 | 36.8 | 9.7 | 32.7 | 44.7 | 53.9 | 9.2 | Floor Noise |
| Vert | 9920.000 | AV | 30.9 | 38.3 | 10.6 | 32.8 | 47.0 | 53.9 | 6.9 | Floor Noise |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
10 GHz - 26.5 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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

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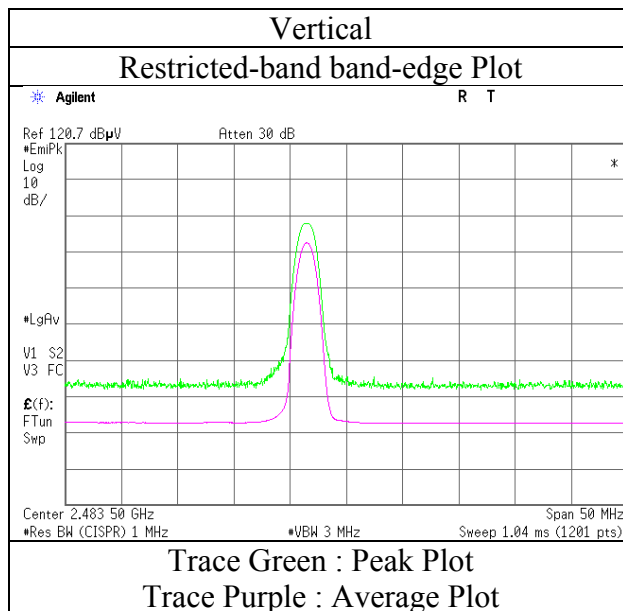
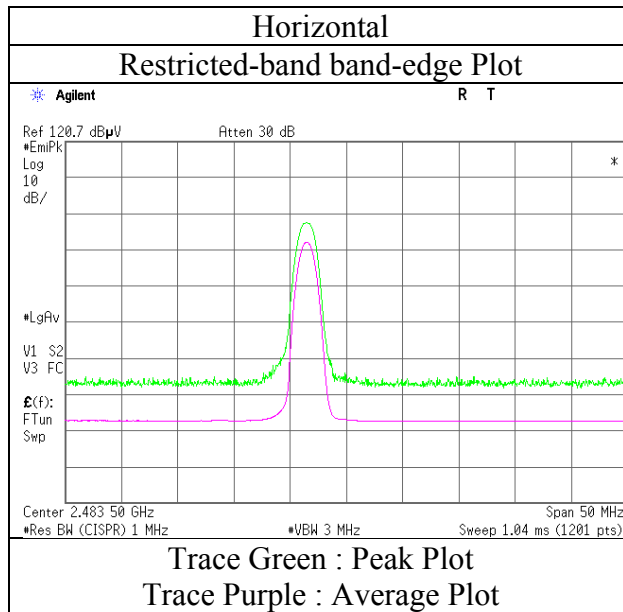
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Facsimile : +81 596 24 8124

Radiated Spurious Emission
(Reference Plot for band-edge)

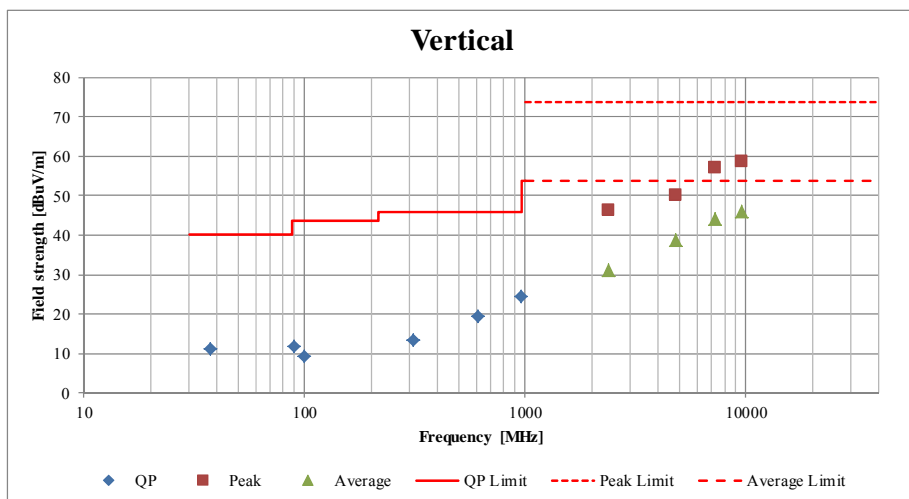
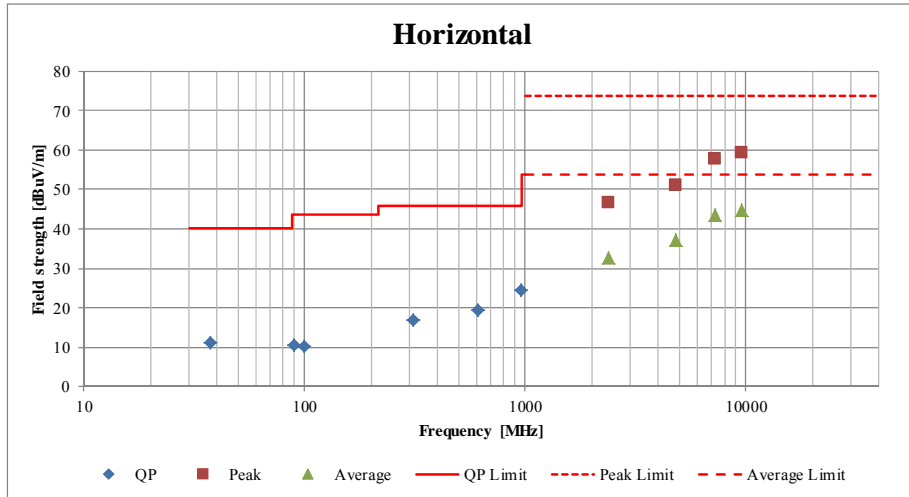
Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 11292710H
Date : May 23, 2016
Temperature / Humidity : 23 deg. C / 41 % RH
Engineer : Ken Fujita
(1 GHz - 10 GHz)
Mode : Tx, Hopping Off, 3DH5 2480 MHz



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

Radiated Spurious Emission
(Plot data, Worst case)

| | | | | |
|------------------------|---|---------------------|---------------------|--------------------|
| Test place | Ise EMC Lab. No.4 Semi Anechoic Chamber | | | |
| Report No. | 11292710H | | | |
| Date | May 23, 2016 | May 30, 2016 | May 30, 2016 | May 31, 2016 |
| Temperature / Humidity | 23 deg. C / 41 % RH | 22 deg. C / 71 % RH | 23 deg. C / 70 % RH | 24deg. C / 62 % RH |
| Engineer | Ken Fujita | Shinichi Miyazono | Tomoki Matsui | Shinichi Miyazono |
| | (1 GHz - 10 GHz) | (18 GHz - 26.5 GHz) | (10 GHz - 18 GHz) | (Below 1GHz) |
| Mode | Tx, Hopping Off, 3DH5 2402 MHz | | | |



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

Radiated Spurious Emission

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 11292710H
Date : May 24, 2016
Temperature / Humidity : 23deg. C / 38 % RH
Engineer : Masafumi Niwa
(1 GHz - 10 GHz)
Mode : Tx 3DH5 2402 MHz and 11n-20 5180MHz

| 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 | 44.4 | 27.9 | 6.8 | 32.1 | 47.0 | 73.9 | 26.9 | |
| Hori | 2390.000 | AV | 30.7 | 27.9 | 6.8 | 32.1 | 33.3 | 53.9 | 20.6 | |
| Vert | 2390.000 | PK | 42.2 | 27.9 | 6.8 | 32.1 | 44.8 | 73.9 | 29.1 | |
| Vert | 2390.000 | AV | 30.0 | 27.9 | 6.8 | 32.1 | 32.6 | 53.9 | 21.3 | |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{m} / 3.0\text{m}) = 3.53\text{ dB}$

20dBc Data Sheet

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant Factor [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-------------------|-----------|-----------|-----------------|----------------|-------------|---------|
| Hori | 2402.000 | PK | 97.3 | 28.0 | 6.8 | 32.1 | 100.0 | - | - | Carrier |
| Hori | 2400.000 | PK | 46.9 | 28.0 | 6.8 | 32.1 | 49.6 | 80.0 | 30.4 | |
| Vert | 2402.000 | PK | 96.2 | 28.0 | 6.8 | 32.1 | 98.9 | - | - | Carrier |
| Vert | 2400.000 | PK | 45.4 | 28.0 | 6.8 | 32.1 | 48.1 | 78.9 | 30.8 | |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{m} / 3.0\text{m}) = 3.53\text{ dB}$

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

Radiated Spurious Emission

Test place Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. 11292710H
Date May 24, 2016 May 30, 2016 May 30, 2016
Temperature / Humidity 23deg. C / 38 % RH 22 deg. C / 71 % RH 23 deg. C / 70 % RH
Engineer Masafumi Niwa Shinichi Miyazono Tomoki Matsui
(1 GHz - 10 GHz) (18 GHz - 26.5 GHz) (10 GHz - 18 GHz and Below 1GHz)
Mode Tx 3DH5 2441 MHz and 11n-20 5180 MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|-------------|
| Hori | 88.180 | QP | 27.6 | 8.0 | 8.0 | 32.1 | 11.5 | 43.5 | 32.0 | |
| Hori | 96.478 | QP | 29.5 | 9.4 | 8.1 | 32.1 | 14.9 | 43.5 | 28.6 | |
| Hori | 143.107 | QP | 22.4 | 14.6 | 8.6 | 32.0 | 13.6 | 43.5 | 29.9 | |
| Hori | 311.200 | QP | 28.4 | 13.7 | 10.0 | 31.9 | 20.2 | 46.0 | 25.8 | |
| Hori | 377.400 | QP | 27.0 | 15.2 | 10.5 | 32.0 | 20.7 | 46.0 | 25.3 | |
| Hori | 960.000 | QP | 21.6 | 22.2 | 13.6 | 30.9 | 26.5 | 46.0 | 19.5 | |
| Hori | 4882.000 | PK | 40.0 | 33.1 | 9.3 | 31.3 | 51.1 | 73.9 | 22.8 | Floor Noise |
| Hori | 7323.000 | PK | 42.2 | 36.8 | 10.4 | 32.6 | 56.8 | 73.9 | 17.1 | Floor Noise |
| Hori | 9764.000 | PK | 41.8 | 38.2 | 11.2 | 32.7 | 58.5 | 73.9 | 15.4 | Floor Noise |
| Hori | 4882.000 | AV | 29.2 | 33.1 | 9.3 | 31.3 | 40.3 | 53.9 | 13.6 | Floor Noise |
| Hori | 7323.000 | AV | 30.7 | 36.8 | 10.4 | 32.6 | 45.3 | 53.9 | 8.6 | Floor Noise |
| Hori | 9764.000 | AV | 30.3 | 38.2 | 11.2 | 32.7 | 47.0 | 53.9 | 6.9 | Floor Noise |
| Vert | 87.720 | QP | 27.5 | 7.9 | 8.0 | 32.1 | 11.3 | 40.0 | 28.7 | |
| Vert | 96.492 | QP | 27.5 | 9.4 | 8.1 | 32.1 | 12.9 | 43.5 | 30.6 | |
| Vert | 143.107 | QP | 22.4 | 14.6 | 8.6 | 32.0 | 13.6 | 43.5 | 29.9 | |
| Vert | 311.200 | QP | 26.0 | 13.7 | 10.0 | 31.9 | 17.8 | 46.0 | 28.2 | |
| Vert | 377.200 | QP | 26.8 | 15.2 | 10.5 | 32.0 | 20.5 | 46.0 | 25.5 | |
| Vert | 960.000 | QP | 21.6 | 22.2 | 13.6 | 30.9 | 26.5 | 46.0 | 19.5 | |
| Vert | 4882.000 | PK | 40.3 | 33.1 | 9.3 | 31.3 | 51.4 | 73.9 | 22.5 | Floor Noise |
| Vert | 7323.000 | PK | 42.7 | 36.8 | 10.4 | 32.6 | 57.3 | 73.9 | 16.6 | Floor Noise |
| Vert | 9764.000 | PK | 42.0 | 38.2 | 11.2 | 32.7 | 58.7 | 73.9 | 15.2 | Floor Noise |
| Vert | 4882.000 | AV | 29.3 | 33.1 | 9.3 | 31.3 | 40.4 | 53.9 | 13.5 | Floor Noise |
| Vert | 7323.000 | AV | 30.7 | 36.8 | 10.4 | 32.6 | 45.3 | 53.9 | 8.6 | Floor Noise |
| Vert | 9764.000 | AV | 30.4 | 38.2 | 11.2 | 32.7 | 47.1 | 53.9 | 6.8 | Floor Noise |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

Distance factor: 1 GHz - 10 GHz 20log (4.5m / 3.0 m) = 3.53 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

Radiated Spurious Emission

Test place Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. 11292710H
Date May 24, 2016
Temperature / Humidity 23deg. C / 38 % RH
Engineer Masafumi Niwa
(1 GHz - 10 GHz)
Mode Tx 3DH5 2480 MHz and 11n-20 5180MHz

| Polarity | Frequency [MHz] | Detector | Reading [dBuV] | Ant.Fac. [dB/m] | Loss [dB] | Gain [dB] | Result [dBuV/m] | Limit [dBuV/m] | Margin [dB] | Remark |
|----------|-----------------|----------|----------------|-----------------|-----------|-----------|-----------------|----------------|-------------|--------|
| Hori | 2483.500 | PK | 48.3 | 28.1 | 6.9 | 32.1 | 51.2 | 73.9 | 22.7 | |
| Hori | 2483.500 | AV | 33.6 | 28.1 | 6.9 | 32.1 | 36.5 | 53.9 | 17.4 | |
| Vert | 2483.500 | PK | 47.9 | 28.1 | 6.9 | 32.1 | 50.8 | 73.9 | 23.1 | |
| Vert | 2483.500 | AV | 33.0 | 28.1 | 6.9 | 32.1 | 35.9 | 53.9 | 18.0 | |

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{m} / 3.0\text{m}) = 3.53\text{ dB}$

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

APPENDIX 2: Test instruments

Test equipment

| Control No. | Instrument | Manufacturer | Model No | Serial No | Test Item | Calibration Date * Interval(month) |
|-------------|----------------------------------|-------------------|--------------------------|---------------------------------|-----------|---------------------------------------|
| MAEC-04 | Semi Anechoic Chamber(NSA) | TDK | Semi Anechoic Chamber 3m | DA-10005 | RE | 2015/10/02 * 12 |
| MOS-15 | Thermo-Hygrometer | Custom | CTH-180 | 1501 | RE | 2016/01/21 * 12 |
| MJM-26 | Measure | KOMELON | KMC-36 | - | RE | - |
| COTS-MEMI | EMI measurement program | TSJ | TEPTO-DV | - | RE | - |
| MSA-03 | Spectrum Analyzer | Agilent | E4448A | MY44020357 | RE | 2016/05/19 * 12 |
| MHA-21 | Horn Antenna 1-18GHz | Schwarzbeck | BBHA9120D | 9120D-557 | RE | 2015/08/10 * 12 |
| MCC-141 | Microwave Cable | Junkosha | MWX221 | 1305S002R(1m) / 1405S146(5m) | RE | 2015/06/22 * 12 |
| MPA-12 | MicroWave System Amplifier | Agilent | 83017A | 00650 | RE | 2015/10/01 * 12 |
| MHA-17 | Horn Antenna 15-40GHz | Schwarzbeck | BBHA9170 | BBHA9170307 | RE | 2015/06/06 * 12 |
| MMM-10 | DIGITAL HiTESTER | Hioki | 3805 | 051201148 | RE | 2016/01/18 * 12 |
| MHF-26 | High Pass Filter 3.5-18.0GHz | UL Japan | HPF SELECTOR | 002 | RE | 2015/09/17 * 12 |
| MTR-10 | EMI Test Receiver | Rohde & Schwarz | ESR26 | 101408 | RE | 2016/01/29 * 12 |
| MBA-05 | Biconical Antenna | Schwarzbeck | BBA9106 | 1302 | RE | 2015/11/02 * 12 |
| MLA-23 | Logperiodic Antenna(200-1000MHz) | Schwarzbeck | VUSLP9111B | 911B-192 | RE | 2016/01/30 * 12 |
| MCC-50 | Coaxial Cable | UL Japan | - | - | RE | 2015/06/19 * 12 |
| MAT-68 | Attenuator | Anritsu | MP721B | 6200961025 | RE | 2015/11/12 * 12 |
| MPA-14 | Pre Amplifier | SONOMA INSTRUMENT | 310 | 260833 | RE | 2016/03/18 * 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: RE: Radiated Emission test

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