



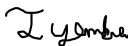
RADIO TEST REPORT

Test Report No. : 13063555S-C-R2

Applicant : PIONEER CORPORATION
Type of Equipment : RDS AV RECEIVER
Model No. : DMH-WC6600NEX
FCC ID : AJDK112
Test regulation : FCC Part 15 Subpart E: 2019
*Wireless LAN U-NII part
Test items : Antenna Terminal Conducted Tests
Test result : Complied (Refer to SECTION 3.2)

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
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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. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in SECTION 1.
10. This report is a revised version of 13063555S-C-R1. 13063555S-C-R1 is replaced with this report.

Date of test: September 27 to October 29, 2019

Representative test engineer: 
Toshinori Yamada
Engineer
Consumer Technology Division

Approved by: 
Kazutaka Takeyama
Engineer
Consumer Technology Division



CERTIFICATE 1266.03

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

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REVISION HISTORY

Original Test Report No.: 13063555S-C

| Revision | Test report No. | Date | Page revised | Contents |
|--------------|-----------------|-------------------|--------------|---|
| - (Original) | 13063555S-C | January 16, 2020 | - | - |
| 1 | 13063555S-C-R1 | February 4, 2020 | P.1 | Addition of: *Wireless LAN U-NII part Addition of: Test items: Antenna Terminal Conducted Tests |
| | | | P.6 | Modification of product description from: is a RDS AV RECEIVER to: is an RDS AV RECEIVER |
| | | | P.6 | Removed from Clock frequency (ies) in the system: “Bluetooth Wi-Fi module: 32.768 kHz” |
| | | | P.7 | Modification of the reference test report number from: No.13063556M-C to: No.13063556M-C-R1 |
| | | | P.14, P.16 | Removed unnecessary ruled lines |
| | | | P.24 | Modification of mode from: 11ac-20 MICS 0 to: 11n-20 MICS 0 |
| 2 | 13063555S-C-R2 | February 13, 2020 | P.7 | Modification of the reference test report number from: No.13063556M-C-R1 to: No.13063556M-C-R2 |

Reference: Abbreviations (Including words undescribed in this report)

| | | | |
|----------------|---|---------|---|
| A2LA | The American Association for Laboratory Accreditation | MCS | Modulation and Coding Scheme |
| AC | Alternating Current | MRA | Mutual Recognition Arrangement |
| AFH | Adaptive Frequency Hopping | N/A | Not Applicable |
| AM | Amplitude Modulation | NIST | National Institute of Standards and Technology |
| Amp, AMP | Amplifier | NS | No signal detect. |
| ANSI | American National Standards Institute | NSA | Normalized Site Attenuation |
| Ant, ANT | Antenna | NVLAP | National Voluntary Laboratory Accreditation Program |
| AP | Access Point | OBW | Occupied Band Width |
| ASK | Amplitude Shift Keying | OFDM | Orthogonal Frequency Division Multiplexing |
| Atten., ATT | Attenuator | P/M | Power meter |
| AV | Average | PCB | Printed Circuit Board |
| BPSK | Binary Phase-Shift Keying | PER | Packet Error Rate |
| BR | Bluetooth Basic Rate | PHY | Physical Layer |
| BT | Bluetooth | PK | Peak |
| BT LE | Bluetooth Low Energy | PN | Pseudo random Noise |
| BW | BandWidth | PRBS | Pseudo-Random Bit Sequence |
| Cal Int | Calibration Interval | PSD | Power Spectral Density |
| CCK | Complementary Code Keying | QAM | Quadrature Amplitude Modulation |
| Ch., CH | Channel | QP | Quasi-Peak |
| CISPR | Comite International Special des Perturbations Radioelectriques | QPSK | Quadri-Phase Shift Keying |
| CW | Continuous Wave | RBW | Resolution Band Width |
| DBPSK | Differential BPSK | RDS | Radio Data System |
| DC | Direct Current | RE | Radio Equipment |
| D-factor | Distance factor | RF | Radio Frequency |
| DFS | Dynamic Frequency Selection | RMS | Root Mean Square |
| DQPSK | Differential QPSK | RSS | Radio Standards Specifications |
| DSSS | Direct Sequence Spread Spectrum | Rx | Receiving |
| EDR | Enhanced Data Rate | SA, S/A | Spectrum Analyzer |
| EIRP, e.i.r.p. | Equivalent Isotropically Radiated Power | SG | Signal Generator |
| EMC | ElectroMagnetic Compatibility | SGI | Short Guard Interval |
| EMI | ElectroMagnetic Interference | SVSWR | Site-Voltage Standing Wave Ratio |
| EN | European Norm | TR | Test Receiver |
| ERP, e.r.p. | Effective Radiated Power | Tx | Transmitting |
| EU | European Union | VBW | Video BandWidth |
| EUT | Equipment Under Test | Vert. | Vertical |
| Fac. | Factor | WLAN | Wireless LAN |
| FCC | Federal Communications Commission | | |
| FHSS | Frequency Hopping Spread Spectrum | | |
| FM | Frequency Modulation | | |
| Freq. | Frequency | | |
| FSK | Frequency Shift Keying | | |
| GFSK | Gaussian Frequency-Shift Keying | | |
| GNSS | Global Navigation Satellite System | | |
| GPS | Global Positioning System | | |
| Hori. | Horizontal | | |
| ICES | Interference-Causing Equipment Standard | | |
| IEC | International Electrotechnical Commission | | |
| IEEE | Institute of Electrical and Electronics Engineers | | |
| IF | Intermediate Frequency | | |
| ILAC | International Laboratory Accreditation Conference | | |
| ISED | Innovation, Science and Economic Development Canada | | |
| ISO | International Organization for Standardization | | |
| JAB | Japan Accreditation Board | | |
| LAN | Local Area Network | | |
| LIMS | Laboratory Information Management System | | |

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SECTION 1: Customer information

| | | |
|------------------|---|---|
| Company Name | : | PIONEER CORPORATION |
| Address | : | 25-1, Yamada, Kawagoe-shi, Saitama, 350-8555, JAPAN |
| Telephone Number | : | +81-49-228-7681 |
| Facsimile Number | : | +81-49-228-6172 |
| Contact Person | : | Shigeru Yoshida |

The information provided from the customer is as follows;

- Applicant, Type of Equipment, Model No., FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer information
- SECTION 2: Equipment under test (E.U.T.)
- SECTION 4: Operation of E.U.T. during testing

* The laboratory is exempted from liability of any test results affected from the above information in SECTION 2 and 4.

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

2.1 Identification of E.U.T.

| | | |
|--|---|---|
| Type of Equipment | : | RDS AV RECEIVER |
| Model No. | : | DMH-WC6600NEX |
| Serial No. | : | Refer to SECTION 4.2 |
| Rating | : | DC 14.4 V (DC 10.8 V to 15.1 V) |
| Receipt Date of Sample (Information from test lab.) | : | September 18, 2019 |
| Country of Mass-production | : | Thailand |
| 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

Model: DMH-WC6600NEX (referred to as the EUT in this report) is an RDS AV RECEIVER.

General Specification

The clock frequencies used in the EUT:

| | | |
|------------------------------------|---|---|
| Clock frequency(ies) in the system | : | DC-DC CONVERTER 1008 kHz / 700.5 kHz, 365.8 kHz / 413.9 kHz |
| | | FM/AM TUNER 55.467 MHz (VCO: 5.9904 GHz / 6.2208 GHz) |
| | | MAIN PROCESSOR 24 MHz |
| | | SYSTEM MICRO COMPUTER 12.5 MHz |
| | | LCD BACK LIGHT 515.7 kHz / 476.6 kHz |
| | | LINE AMPLIFIER 515.7 kHz / 476.6 kHz |
| | | CHIPS 26 MHz, 32.768 kHz, 10 MHz |
| | | HDMI RECEIVER 27 MHz |
| | | VIDEO DECODER 32 MHz |

Radio Specification

| | | |
|------------------------|---|--|
| Radio Type | : | Transceiver |
| Frequency of Operation | : | 2.4 GHz: 2402 MHz - 2480 MHz (Bluetooth BDR/EDR, Bluetooth Low Energy) 2412 MHz - 2462 MHz (IEEE 802.11b/g/n) |
| | | 5 GHz: 5745 MHz (IEEE 802.11a/n-20) 5755 MHz (IEEE 802.11n-40/ac-40) 5775 MHz (IEEE 802.11ac-80) |
| Modulation | : | DSSS (IEEE 802.11b), OFDM (IEEE 802.11g/n/a/ac) FHSS (Bluetooth BDR/EDR) GFSK (Bluetooth Low Energy) |
| Power Supply (inner) | : | DC 3.3 V/1.8 V |
| Antenna type | : | Monopole Antenna |
| Antenna Gain | : | 2.4 GHz: -14.5 dBi (Bluetooth BDR/EDR, Bluetooth Low Energy) -11.2 dBi (IEEE 802.11b/g/n) |
| | | 5 GHz: -13.2 dBi |
| Operating Temperature | : | -10 deg. C to +60 deg. C |

GNSS

| | | |
|------------------------|---|--|
| Radio Type | : | Receiver |
| Frequency of Operation | : | GPS: 1575.42 MHz GLONASS: 1598.025 MHz - 1605.375 MHz Galileo: 1575.42 MHz |
| Antenna type | : | External Antenna |
| Antenna Gain | : | 2.0 dBi (Elevation Angle:90 deg.) -6.0 dBi (Elevation Angle:10 deg.) |

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart E
FCC Part 15 final revised on July 19, 2019 and effective August 19, 2019 except 15.258

Title : FCC 47 CFR Part 15 Radio Frequency Device Subpart E
Unlicensed National Information Infrastructure Devices
Section 15.407 General technical requirements

*The customer has declared that the EUT has complies with FCC Part 15 Subpart B as SDoC.

3.2 Procedures and results

| Item *3) | Test Procedure | Specification | Worst margin | Results | Remarks |
|---|---|--|--------------|-------------|---|
| Conducted Emission | FCC: ANSI C63.10-2013 ISED: RSS-Gen 8.8 | FCC: 15.407 (b) (6) / 15.207 ISED: RSS-Gen 8.8 | N/A | N/A | - *1) |
| 26 dB Emission Bandwidth | FCC: KDB Publication Number 789033 ISED: - | FCC: 15.407 (a) (1) (2) (3) ISED: - | See data | N/A | Conducted |
| Maximum Conducted Output Power | FCC: KDB Publication Number 789033 ISED: - | FCC: 15.407 (a) (1) (2) (3) ISED: RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1 | | Complied a) | Conducted |
| Maximum Power Spectral Density | FCC: KDB Publication Number 789033 ISED: - | FCC : 15.407 (a) (1) (2) (3) ISED: RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1 | | Complied b) | Conducted |
| Spurious Emission Restricted Band Edge | FCC: ANSI C63.10-2013 KDB Publication Number 789033 ISED: - | FCC: 15.407 (b), 15.205 and 15.209 ISED: RSS-247 6.2.1.2 6.2.2.2 6.2.3.2 6.2.4.2 | See data | Complied c) | Conducted (< 30 MHz) / Radiated (> 30 MHz) *2) |
| 6 dB Emission Bandwidth | FCC: ANSI C63.10-2013 ISED: - | FCC: 15.407 (e) ISED: RSS-247 6.2.4.1 | See data | Complied d) | Conducted |
| 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 does not have AC power ports. *2) For the Radiated spurious emission test, refer to test report No.13063556M-C-R2. *3) DFS test is not applicable since the EUT does not operate in the 5.25 GHz -5.35 GHz and 5.47 GHz -5.725 GHz bands. a) Refer to APPENDIX 1 (data of Maximum Conducted Output Power) b) Refer to APPENDIX 1 (data of Maximum Power Spectral Density) c) Refer to APPENDIX 1 (data of Radiated Spurious Emission) d) Refer to APPENDIX 1 (data of 6 dB Bandwidth) Symbols: Complied The data of this test item has enough margin, more than the measurement uncertainty. Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration. | | | | | |

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

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FCC Part 15.31 (e)

This EUT provides stable voltage constantly to the wireless transmitter regardless of input voltage. Instead of a new battery, DC power supply was used for the test. That does not affect the test result, Therefore 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.

3.3 Addition to standard

| Item | Test Procedure | Specification | Worst margin | Results | Remarks |
|---|----------------|---------------|--------------|---------|-----------|
| 99 % Occupied Bandwidth | RSS-Gen 6.7 | ISED: - | N/A | - a) | Conducted |
| a) Refer to APPENDIX 1 (data of 6 dB Bandwidth and 99 % Occupied Bandwidth) | | | | | |

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

3.4 Uncertainty

There is no applicable rule of uncertainty in this applied standard. Therefore, the following results are derived depending on whether or not laboratory uncertainty is applied.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k=2$.
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| Antenna terminal test | Uncertainty (+/-) |
|---|-------------------|
| Power Measurement above 1 GHz (Average Detector)_SPM-06 | 0.98 dB |
| Power Measurement above 1 GHz (Peak Detector)_SPM-06 | 1.75 dB |
| Power Measurement above 1 GHz (Average Detector)_SPM-07 | 0.89 dB |
| Power Measurement above 1 GHz (Peak Detector)_SPM-07 | 1.12 dB |
| Power Measurement above 1 GHz (Average Detector)_SPM-13 | 1.06 dB |
| Power Measurement above 1 GHz (Peak Detector)_SPM-13 | 1.24 dB |
| Spurious emission (Conducted) below 1GHz | 0.9 dB |
| Spurious emission (Conducted) 1 GHz-3 GHz | 0.9 dB |
| Spurious emission (Conducted) 3 GHz-18 GHz | 2.9 dB |
| Spurious emission (Conducted) 18 GHz-26.5 GHz | 2.6 dB |
| Spurious emission (Conducted) 26.5 GHz-40 GHz | 2.0 dB |
| Bandwidth Measurement | 0.07 % |
| Duty cycle and Time Measurement | 0.262 % |

3.5 Test Location

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A2LA Certificate Number: 1266.03 (FCC Test Firm Registration Number: 626366, ISED Lab Company Number: 2973D)

| Test site | Width x Depth x Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Maximum measurement distance |
|----------------------------|----------------------------|--|------------------------------|
| No.1 Semi-anechoic chamber | 20.6 x 11.3 x 7.65 | 20.6 x 11.3 | 10 m |
| No.2 Semi-anechoic chamber | 20.6 x 11.3 x 7.65 | 20.6 x 11.3 | 10 m |
| No.3 Semi-anechoic chamber | 12.7 x 7.7 x 5.35 | 12.7 x 7.7 | 5 m |
| No.4 Semi-anechoic chamber | 8.1 x 5.1 x 3.55 | 8.1 x 5.1 | - |
| No.1 Shielded room | 6.8 x 4.1 x 2.7 | 6.8 x 4.1 | - |
| No.2 Shielded room | 6.8 x 4.1 x 2.7 | 6.8 x 4.1 | - |
| No.3 Shielded room | 6.3 x 4.7 x 2.7 | 6.3 x 4.7 | - |
| No.4 Shielded room | 4.4 x 4.7 x 2.7 | 4.4 x 4.7 | - |
| No.5 Shielded room | 7.8 x 6.4 x 2.7 | 7.8 x 6.4 | - |
| No.6 Shielded room | 7.8 x 6.4 x 2.7 | 7.8 x 6.4 | - |
| No.8 shielded room | 3.45 x 5.5 x 2.4 | 3.45 x 5.5 | - |
| No.1 Measurement room | 2.55 x 4.1 x 2.5 | - | - |

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)

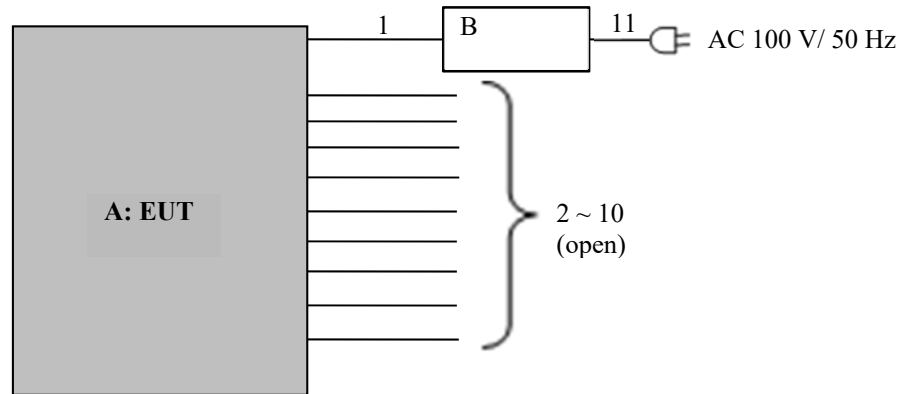
Test operating mode was determined as follows according to “Section 1 of 6 802.11 a/b/g/n testing - Managing Complex Regulatory Approvals -” of TCB Council Workshop October 2009 and also was judged the necessity of 802.11ac mode by the pre-test.

| Mode | Remarks* |
|--|----------------------|
| IEEE 802.11a (11a) | 9 Mbps, PN9 |
| IEEE 802.11n 20 MHz BW (11n-20) | MCS 5 (SGI OFF), PN9 |
| IEEE 802.11n 40 MHz BW (11n-40) | MCS 2 (SGI OFF), PN9 |
| IEEE 802.11ac 40 MHz BW (11ac-40) | MCS 1 (SGI OFF), PN9 |
| IEEE 802.11ac 80 MHz BW (11ac-80) | MCS 2 (SGI OFF), PN9 |
| *The worst condition was determined based on the test result of Maximum Conducted Output Power. | |
| *Power of the EUT was set by the software as follows; Power settings: 11a:11 dBm 11n-20: 11 dBm 11n-40: 10 dBm 11ac-40: 9 dBm 11ac-80: 8 dBm Software: SoC : 0.0601400 SYS : 7.13 *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. | |

*The details of Operation mode(s)

| Test Item | Operating Mode | Tested Frequency | | | |
|---|----------------|------------------|-------------|-----------------|------------|
| | | Lower Band | Middle Band | Additional Band | Upper Band |
| 99 % Occupied Bandwidth, Maximum Conducted Output Power, Maximum Power Spectral Density 6 dB Bandwidth | 11a Tx | - | - | - | 5745 MHz |
| | 11n-20 Tx | - | - | - | 5755 MHz |
| | 11n-40 Tx | - | - | - | 5775 MHz |
| | 11ac-40 Tx | - | - | - | 5775 MHz |
| Conducted Spurious Emission | 11n-20 Tx *1) | - | - | - | 5745 MHz |
| *1) The mode was tested as a representative, because it had the highest power at antenna terminal test. | | | | | |

4.2 Configuration and peripherals



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

Description of EUT and Support equipment

| No. | Item | Model number | Serial number | Manufacturer | Remark |
|-----|-----------------|----------------|---------------|---------------------|--------|
| A | RDS AV RECEIVER | DHM-WC6600 NEX | SGTM000034UC | Pioneer Corporation | EUT |
| B | DC Power Supply | PAN 35-10A | DE001677 | Kikusui | - |

List of cables used

| No. | Name | Length (m) | Shield | | Remark |
|-----|------------------------|------------|------------|------------|--------|
| | | | Cable | Connector | |
| 1 | DC (+B, ACC, GND) | 0.15 + 2.4 | Unshielded | Unshielded | - |
| 2 | Speaker Front L | 0.15 | Unshielded | Unshielded | - |
| 3 | Speaker Front R | 0.15 | Unshielded | Unshielded | - |
| 4 | Speaker Rear L | 0.15 | Unshielded | Unshielded | - |
| 5 | Speaker Rear R | 0.15 | Unshielded | Unshielded | - |
| 6 | System Remote Control | 0.15 | Unshielded | Unshielded | - |
| 7 | ILL + | 0.15 | Unshielded | Unshielded | - |
| 8 | Reverse Gear Signal In | 0.15 | Unshielded | Unshielded | - |
| 9 | Parking Brake | 2.0 | Unshielded | Unshielded | - |
| 10 | Car Speed Signal In | 0.15 | Unshielded | Unshielded | - |
| 11 | AC | 2.0 | Unshielded | Unshielded | - |

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SECTION 5: 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 and Test method |
|--------------------------------|---|-------------------|--------------|------------|---------------------------------|-------------|--|
| 99 % Occupied Bandwidth *1) | Enough width to display emission skirts | 1 % to 5 % of OBW | ≥ 3 RBW | Auto | Peak | Max Hold | Spectrum Analyzer |
| 6 dB Bandwidth | Enough to capture the emission | 100 kHz | 300 kHz | Auto | Peak | Max Hold | Spectrum Analyzer |
| Maximum Conducted Output Power | - | - | - | Auto | Average | - | Power Meter (Sensor: 160 MHz BW) (Method PM) |
| Maximum Power Spectral Density | Encompass the entire EBW | 100 kHz *2) | ≥ 3 RBW | Auto | RMS Power Averaging (100 times) | Clear Write | Spectrum Analyzer |
| Conducted Spurious Emission*3) | 9 kHz – 150 kHz | 200 Hz | 620 Hz | Auto | Peak | Max Hold | Spectrum Analyzer |
| | 150 kHz – 30 MHz | 10 kHz | 30 kHz | | | | |

* The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".

*1) Peak hold was applied as Worst-case measurement.

*2) KDB 789033 D02 says that RBW is set to be 500 kHz for 5.725 GHz-5.850 GHz, but it is not possible with spectrum analyzer, so RBW Correction Factor ($10 \log(500 \text{ kHz} / 100 \text{ kHz})$) was added to the test result.

*3) In the frequency range below 30 MHz, 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. (9 kHz-150 kHz: RBW = 200 Hz, 150 kHz-30 MHz: RBW = 10 kHz)

The test results and limit are rounded off to two decimals place, so some differences might be observed.
The equipment and cables were not used for factor 0 dB of the data sheets.

Test data : **APPENDIX**

Test result : **Pass**

APPENDIX 1: Test data

99 % Occupied Bandwidth

Report No. 13063555S-C-R2
Test place Shonan EMC Lab. No.6 Shielded Room
Date October 29, 2019
Temperature / Humidity 23 deg. C / 45 % RH
Engineer Toshinori Yamada
Mode Tx

11a

| Tested Frequency [MHz] | 99 % Occupied Bandwidth [MHz] | Limit [MHz] |
|------------------------------|-------------------------------------|----------------|
| 5745 | 17.2999 | - |

11n-20 SGI OFF

| Tested Frequency [MHz] | 99 % Occupied Bandwidth [MHz] | Limit [MHz] |
|------------------------------|-------------------------------------|----------------|
| 5745 | 18.0633 | - |

11n-40 SGI OFF

| Tested Frequency [MHz] | 99 % Occupied Bandwidth [MHz] | Limit [MHz] |
|------------------------------|-------------------------------------|----------------|
| 5755 | 36.4987 | - |

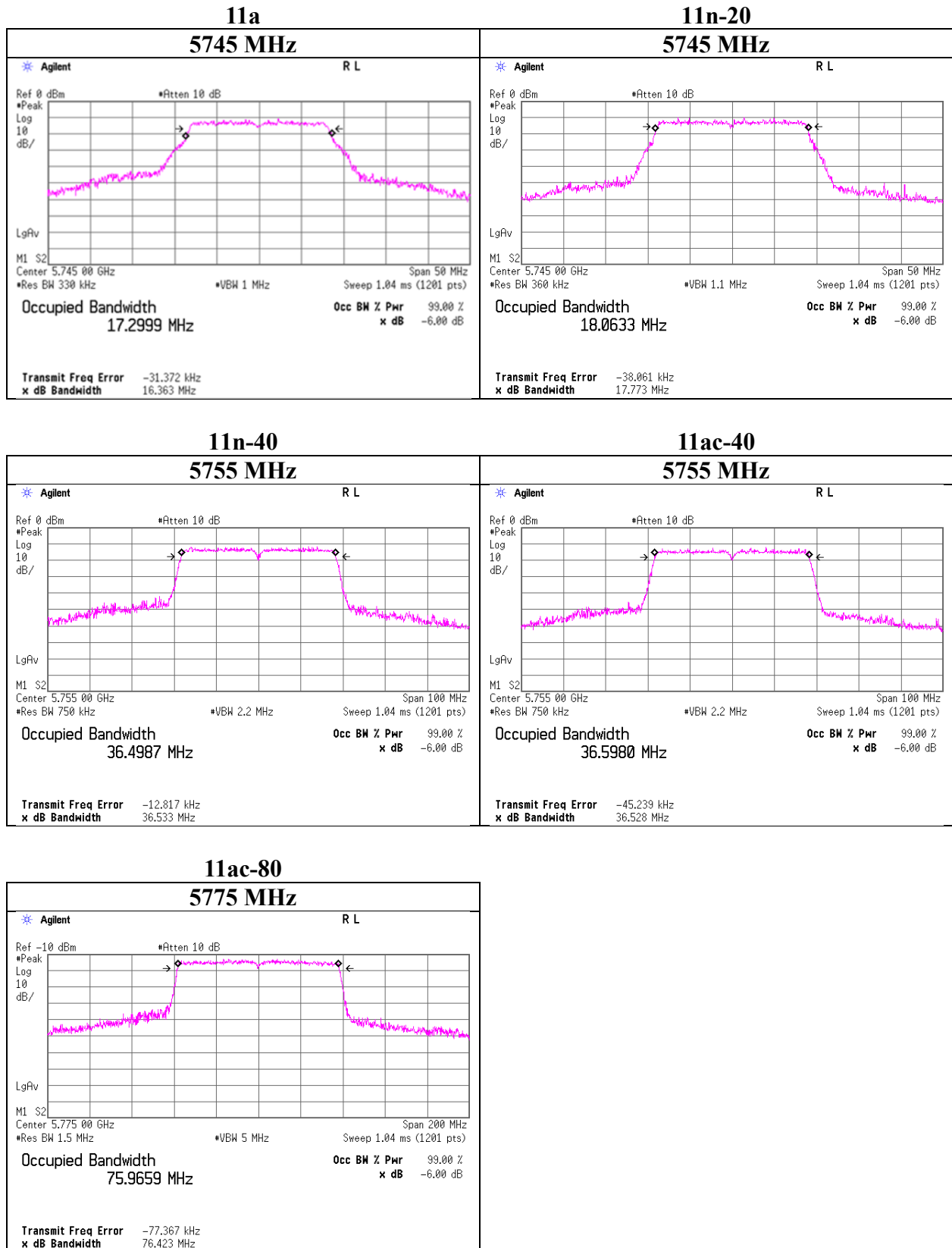
11ac-40 SGI OFF

| Tested Frequency [MHz] | 99 % Occupied Bandwidth [MHz] | Limit [MHz] |
|------------------------------|-------------------------------------|----------------|
| 5755 | 36.5980 | - |

11ac-80 SGI OFF

| Tested Frequency [MHz] | 99 % Occupied Bandwidth [MHz] | Limit [MHz] |
|------------------------------|-------------------------------------|----------------|
| 5775 | 75.9659 | - |

99 % Occupied Bandwidth



6 dB Bandwidth

Report No. 13063555S-C-R2
Test place Shonan EMC Lab. No.6 Shielded Room
Date October 29, 2019
Temperature / Humidity 23 deg. C / 45 % RH
Engineer Toshinori Yamada
Mode Tx

11a

| Tested Frequency [MHz] | 6 dB Bandwidth [MHz] | Limit [MHz] |
|------------------------------|----------------------------|----------------|
| 5745 | 16.389 | > 0.500 |

11n-20 SGI OFF

| Tested Frequency [MHz] | 6 dB Bandwidth [MHz] | Limit [MHz] |
|------------------------------|----------------------------|----------------|
| 5745 | 17.738 | > 0.500 |

11n-40 SGI OFF

| Tested Frequency [MHz] | 6 dB Bandwidth [MHz] | Limit [MHz] |
|------------------------------|----------------------------|----------------|
| 5755 | 36.359 | > 0.500 |

11ac-40 SGI OFF

| Tested Frequency [MHz] | 6 dB Bandwidth [MHz] | Limit [MHz] |
|------------------------------|----------------------------|----------------|
| 5755 | 36.427 | > 0.500 |

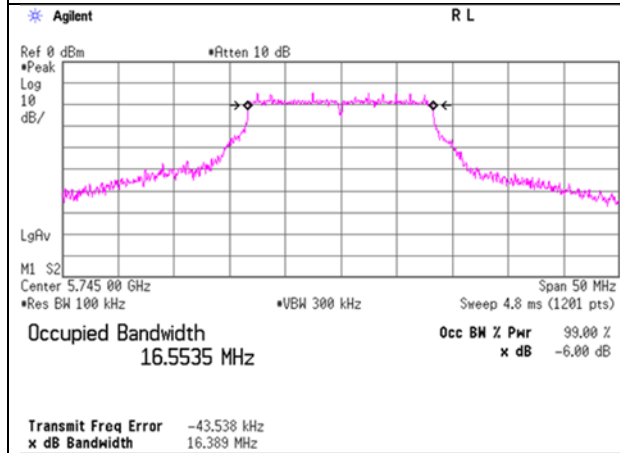
11ac-80 SGI OFF

| Tested Frequency [MHz] | 6 dB Bandwidth [MHz] | Limit [MHz] |
|------------------------------|----------------------------|----------------|
| 5775 | 75.744 | > 0.500 |

6 dB Bandwidth

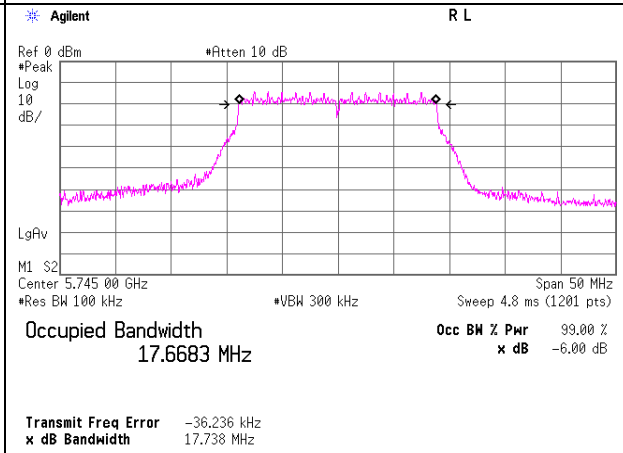
11a

5745 MHz



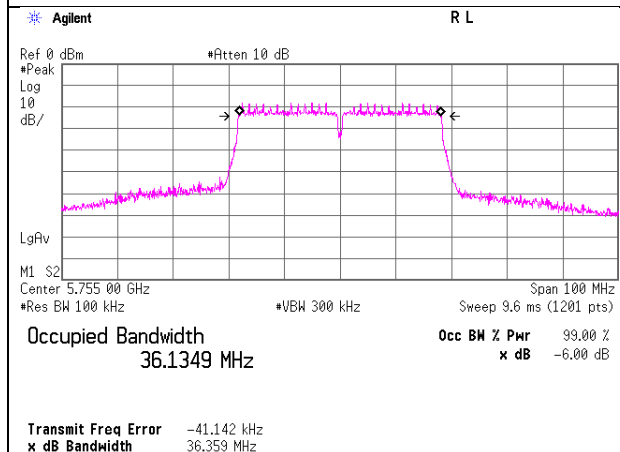
11n-20

5745 MHz



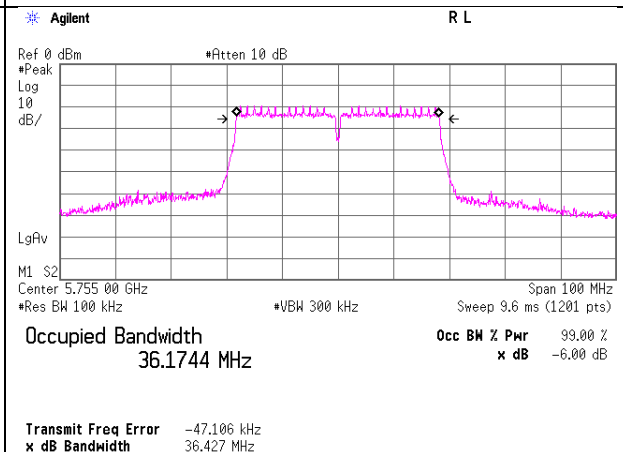
11n-40

5755 MHz



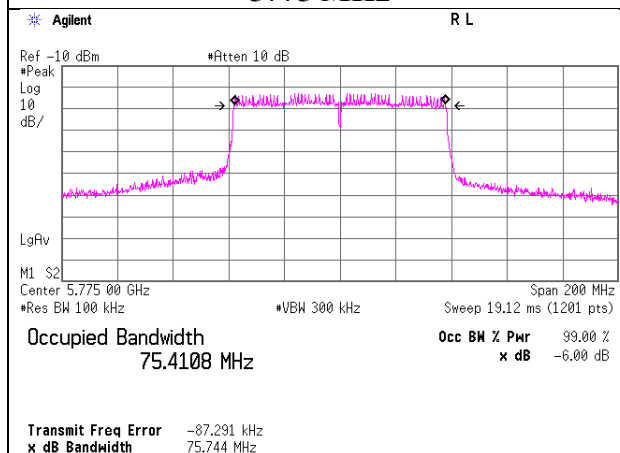
11ac-40

5755 MHz



11ac-80

5775 MHz



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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Maximum Conducted Output Power

Report No. 13063555S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 27, 2019
Temperature / Humidity 26 deg. C / 45 % RH
Engineer Makoto Hosaka
Mode Tx

11a Applied limit: 15.407, mobile and portable client device

| Tested Frequency | Power Meter Reading | Cable Loss | Atten. Loss | Duty Factor | Antenna Gain | 99% OBW (B for 1C) | Conducted Power | | | | e.i.r.p. | | | |
|---------------------|---------------------------|---------------|----------------|----------------|-----------------|--------------------------|-----------------|-------|--------|-------|----------|-------|--------|-------|
| | | | | | | | Result | Limit | Margin | | Result | Limit | Margin | |
| [MHz] | [dBm] | [dB] | [dB] | [dB] | [dBi] | [MHz] | [dBm] | [mW] | [dBm] | [dB] | [dBm] | [mW] | [dBm] | [dB] |
| 5745 | -3.13 | 3.33 | 9.95 | 0.39 | -13.2 | 17.300 | 10.54 | 11.32 | 30.00 | 19.46 | -2.66 | 0.54 | 36.00 | 38.66 |

11n-20 SGI OFF Applied limit: 15.407, mobile and portable client device

| Tested Frequency | Power Meter Reading | Cable Loss | Atten. Loss | Duty Factor | Antenna Gain | 99% OBW (B for 1C) | Conducted Power | | | | e.i.r.p. | | | |
|---------------------|---------------------------|---------------|----------------|----------------|-----------------|--------------------------|-----------------|-------|-------|--------|----------|------|-------|--------|
| | | | | | | | Result | | Limit | Margin | Result | | Limit | Margin |
| | | | | | | | [dBm] | [mW] | [dBm] | [dB] | [dBm] | [mW] | [dBm] | [dB] |
| [MHz] | [dBm] | [dB] | [dB] | [dB] | [dBi] | [MHz] | [dBm] | [mW] | [dBm] | [dB] | [dBm] | [mW] | [dBm] | [dB] |
| 5745 | -4.49 | 3.33 | 9.95 | 1.76 | -13.2 | 18.063 | 10.55 | 11.35 | 30.00 | 19.45 | -2.65 | 0.54 | 36.00 | 38.65 |

11n-40 SGI OFF Applied limit: 15.407, mobile and portable client device

| Tested Frequency | Power Meter Reading | Cable Loss | Atten. Loss | Duty Factor | Antenna Gain | 99% OBW (B for 1C) | Conducted Power | | | | e.i.r.p. | | | |
|---------------------|---------------------------|---------------|----------------|----------------|-----------------|--------------------------|-----------------|------|-------|--------|----------|------|-------|--------|
| | | | | | | | Result | | Limit | Margin | Result | | Limit | Margin |
| | | | | | | | [dBm] | [mW] | [dBm] | [dB] | [dBm] | [mW] | [dBm] | [dB] |
| [MHz] | [dBm] | [dB] | [dB] | [dB] | [dBi] | [MHz] | [dBm] | [mW] | [dBm] | [dB] | [dBm] | [mW] | [dBm] | [dB] |
| 5755 | -6.74 | 3.33 | 9.95 | 1.46 | -13.2 | 36.499 | 8.00 | 6.31 | 30.00 | 22.00 | -5.20 | 0.30 | 36.00 | 41.20 |

11ac-40 SGI OFF Applied limit: 15.407, mobile and portable client device

| Tested Frequency | Power Meter Reading | Cable Loss | Atten. Loss | Duty Factor | Antenna Gain | 99% OBW (B for 1C) | Conducted Power | | | | e.i.r.p. | | | |
|---------------------|---------------------------|---------------|----------------|----------------|-----------------|------------------------------|-----------------|------|-------|--------|----------|------|-------|--------|
| | | | | | | | Result | | Limit | Margin | Result | | Limit | Margin |
| | | | | | | | [dBm] | [mW] | [dBm] | [dB] | [dBm] | [mW] | [dBm] | [dB] |
| 5755 | -6.00 | 3.33 | 9.95 | 1.15 | -13.2 | 36.598 | 8.43 | 6.97 | 30.00 | 21.57 | -4.77 | 0.33 | 36.00 | 40.77 |

11ac-80 SGI OFF Applied limit: 15.407, mobile and portable client device

| Tested Frequency | Power Meter Reading | Cable Loss | Atten. Loss | Duty Factor | Antenna Gain | 99% OBW (B for IC) | Conducted Power | | | | e.i.r.p. | | | |
|------------------|---------------------|------------|-------------|-------------|--------------|-----------------------|-----------------|------|-------|--------|----------|------|-------|--------|
| | | | | | | | Result | | Limit | Margin | Result | | Limit | Margin |
| | | | | | | | [dBm] | [mW] | [dBm] | [dB] | [dBm] | [mW] | [dBm] | [dB] |
| 5775 | -8.20 | 3.34 | 9.95 | 2.48 | -13.2 | 75.966 | 7.57 | 5.71 | 30.00 | 22.43 | -5.63 | 0.27 | 36.00 | 41.63 |

Sample Calculation:

Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

Maximum Conducted Output Power

Report No. 13063555S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 27, 2019
Temperature / Humidity 26 deg. C / 45 % RH
Engineer Makoto Hosaka
Mode Tx 11a

5745 MHz

| Mode | Rate Mbps | Reading (timed average) [dBm] | Duty factor [dB] | Burst power [dBm] | Remarks |
|------|--------------|-------------------------------------|------------------------|-------------------------|---------|
| 11a | 6 | -3.18 | 0.29 | -2.89 | |
| | 9 | -3.13 | 0.39 | -2.74 | * |
| | 12 | -3.39 | 0.56 | -2.83 | |
| | 18 | -3.56 | 0.72 | -2.84 | |
| | 24 | -3.74 | 0.92 | -2.82 | |
| | 36 | -4.16 | 1.41 | -2.75 | |
| | 48 | -4.68 | 1.74 | -2.94 | |
| | 54 | -4.79 | 1.86 | -2.93 | |

* Worst rate

Sample Calculation:

$$\text{Burst power} = \text{Reading (timed average)} + \text{Duty factor}$$

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

Maximum Conducted Output Power

| | |
|------------------------|------------------------------------|
| Report No. | 13063555S-C-R2 |
| Test place | Shonan EMC Lab. No.5 Shielded Room |
| Date | September 27, 2019 |
| Temperature / Humidity | 26 deg. C / 45 % RH |
| Engineer | Makoto Hosaka |
| Mode | Tx 11n-20 |

5745 MHz

| Mode | Rate Mbps | Reading (timed average) [dBm] | Duty factor [dB] | Burst power [dBm] | Remarks |
|-------------------|--------------|-------------------------------------|------------------------|-------------------------|---------|
| 11n-20 SGI OFF | 0 | -3.06 | 0.31 | -2.75 | |
| | 1 | -3.35 | 0.59 | -2.76 | |
| | 2 | -3.62 | 0.75 | -2.87 | |
| | 3 | -3.77 | 0.95 | -2.82 | |
| | 4 | -4.24 | 1.41 | -2.83 | |
| | 5 | -4.49 | 1.76 | -2.73 | * |
| | 6 | -4.67 | 1.82 | -2.85 | |
| | 7 | -4.78 | 1.96 | -2.82 | |
| 11n-20 SGI ON | 0 | -3.13 | 0.34 | -2.79 | |
| | 1 | -3.39 | 0.64 | -2.75 | |
| | 2 | -3.79 | 0.91 | -2.88 | |
| | 3 | -3.89 | 1.15 | -2.74 | |
| | 4 | -4.36 | 1.51 | -2.85 | |
| | 5 | -4.70 | 1.84 | -2.86 | |
| | 6 | -4.83 | 2.00 | -2.83 | |
| | 7 | -4.99 | 2.11 | -2.88 | |

* Worst rate

Sample Calculation:

$$\text{Burst power} = \text{Reading (timed average)} + \text{Duty factor}$$

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

Maximum Conducted Output Power

| | |
|------------------------|------------------------------------|
| Report No. | 13063555S-C-R2 |
| Test place | Shonan EMC Lab. No.5 Shielded Room |
| Date | September 27, 2019 |
| Temperature / Humidity | 26 deg. C / 45 % RH |
| Engineer | Makoto Hosaka |
| Mode | Tx 11n-40 |

5755 MHz

| Mode | Rate Mbps | Reading (timed average) [dBm] | Duty factor [dB] | Burst power [dBm] | Remarks |
|-------------------|--------------|-------------------------------------|------------------------|-------------------------|---------|
| 11n-40 SGI OFF | 0 | -4.41 | 0.60 | -3.81 | |
| | 1 | -5.04 | 1.09 | -3.95 | |
| | 2 | -5.12 | 1.46 | -3.66 | * |
| | 3 | -5.73 | 1.76 | -3.97 | |
| | 4 | -6.20 | 2.04 | -4.16 | |
| | 5 | -6.53 | 2.63 | -3.90 | |
| | 6 | -6.65 | 2.74 | -3.91 | |
| | 7 | -6.85 | 2.90 | -3.95 | |
| 11n-40 SGI ON | 0 | -4.68 | 0.73 | -3.95 | |
| | 1 | -5.18 | 1.18 | -4.00 | |
| | 2 | -5.60 | 1.57 | -4.03 | |
| | 3 | -5.90 | 1.92 | -3.98 | |
| | 4 | -6.25 | 2.34 | -3.91 | |
| | 5 | -6.67 | 2.81 | -3.86 | |
| | 6 | -6.74 | 2.94 | -3.80 | |
| | 7 | -6.94 | 3.08 | -3.86 | |

* Worst rate

Sample Calculation:

$$\text{Burst power} = \text{Reading (timed average)} + \text{Duty factor}$$

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

Maximum Conducted Output Power

| | |
|------------------------|------------------------------------|
| Report No. | 13063555S-C-R2 |
| Test place | Shonan EMC Lab. No.5 Shielded Room |
| Date | September 27, 2019 |
| Temperature / Humidity | 26 deg. C / 45 % RH |
| Engineer | Makoto Hosaka |
| Mode | Tx 11ac-40 |

5755 MHz

| Mode | Rate Mbps | Reading (timed average) [dBm] | Duty factor [dB] | Burst power [dBm] | Remarks |
|--------------------|--------------|-------------------------------------|------------------------|-------------------------|---------|
| 11ac-40 SGI OFF | 0 | -5.73 | 0.66 | -5.07 | |
| | 1 | -6.00 | 1.15 | -4.85 | * |
| | 2 | -6.53 | 1.57 | -4.96 | |
| | 3 | -6.71 | 1.84 | -4.87 | |
| | 4 | -7.54 | 2.34 | -5.20 | |
| | 5 | -7.63 | 2.43 | -5.20 | |
| | 6 | -7.96 | 2.85 | -5.11 | |
| | 7 | -7.96 | 3.00 | -4.96 | |
| | 8 | -8.12 | 3.25 | -4.87 | |
| | 9 | -8.40 | 3.25 | -5.15 | |
| 11ac-40 SGI ON | 0 | -5.86 | 0.66 | -5.20 | |
| | 1 | -6.50 | 1.15 | -5.35 | |
| | 2 | -6.85 | 1.57 | -5.28 | |
| | 3 | -7.08 | 1.68 | -5.40 | |
| | 4 | -7.58 | 2.34 | -5.24 | |
| | 5 | -7.93 | 2.43 | -5.50 | |
| | 6 | -8.12 | 2.87 | -5.25 | |
| | 7 | -8.24 | 3.01 | -5.23 | |
| | 8 | -8.39 | 3.25 | -5.14 | |
| | 9 | -8.72 | 3.25 | -5.47 | |

* Worst rate

Sample Calculation:

$$\text{Burst power} = \text{Reading (timed average)} + \text{Duty factor}$$

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

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Facsimile : +81 463 50 6401

Maximum Conducted Output Power

| | |
|------------------------|------------------------------------|
| Report No. | 13063555S-C-R2 |
| Test place | Shonan EMC Lab. No.5 Shielded Room |
| Date | September 27, 2019 |
| Temperature / Humidity | 26 deg. C / 45 % RH |
| Engineer | Makoto Hosaka |
| Mode | Tx 11ac-80 |

5775 MHz

| Mode | Rate Mbps | Reading (timed average) [dBm] | Duty factor [dB] | Burst power [dBm] | Remarks |
|--------------------|--------------|-------------------------------------|------------------------|-------------------------|---------|
| 11ac-80 SGI OFF | 0 | -7.00 | 1.11 | -5.89 | |
| | 1 | -7.84 | 1.92 | -5.92 | |
| | 2 | -8.20 | 2.48 | -5.72 | * |
| | 3 | -8.88 | 2.81 | -6.07 | |
| | 4 | -9.01 | 3.25 | -5.76 | |
| | 5 | -9.30 | 3.52 | -5.78 | |
| | 6 | -9.72 | 3.68 | -6.04 | |
| | 7 | -9.70 | 3.78 | -5.92 | |
| | 8 | -9.82 | 3.85 | -5.97 | |
| | 9 | -9.88 | 3.85 | -6.03 | |
| 11ac-80 SGI ON | 0 | -7.27 | 1.21 | -6.06 | |
| | 1 | -8.03 | 1.92 | -6.11 | |
| | 2 | -8.64 | 2.48 | -6.16 | |
| | 3 | -9.08 | 2.81 | -6.27 | |
| | 4 | -9.56 | 3.25 | -6.31 | |
| | 5 | -9.82 | 3.52 | -6.30 | |
| | 6 | -9.95 | 3.68 | -6.27 | |
| | 7 | -10.18 | 3.80 | -6.38 | |
| | 8 | -10.33 | 3.85 | -6.48 | |
| | 9 | -10.39 | 3.59 | -6.80 | |

* Worst rate

Sample Calculation:

$$\text{Burst power} = \text{Reading (timed average)} + \text{Duty factor}$$

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

Average Output Power (Reference data for RF Exposure)

| | |
|------------------------|------------------------------------|
| Report No. | 13063555S-C-R2 |
| Test place | Shonan EMC Lab. No.5 Shielded Room |
| Date | September 27, 2019 |
| Temperature / Humidity | 26 deg. C / 45 % RH |
| Engineer | Makoto Hosaka |
| Mode | Tx |

11a

| Tested Frequency | Power Meter Reading | Cable Loss | Atten. Loss | Result (Timed average) | |
|------------------|---------------------|------------|-------------|------------------------|-------|
| [MHz] | [dBm] | [dB] | [dB] | [dBm] | [mW] |
| 5745 | -3.13 | 3.33 | 9.95 | 10.15 | 10.35 |

11n-20 SGIOFF

| Tested Frequency | Power Meter Reading | Cable Loss | Atten. Loss | Result (Timed average) | |
|------------------|---------------------|------------|-------------|------------------------|------|
| [MHz] | [dBm] | [dB] | [dB] | [dBm] | [mW] |
| 5745 | -4.49 | 3.33 | 9.95 | 8.79 | 7.57 |

11n-40 SGIOFF

| Tested Frequency | Power Meter Reading | Cable Loss | Atten. Loss | Result (Timed average) | |
|------------------|---------------------|------------|-------------|------------------------|------|
| [MHz] | [dBm] | [dB] | [dB] | [dBm] | [mW] |
| 5755 | -5.12 | 3.33 | 9.95 | 8.16 | 6.55 |

11ac-40 SGIOFF

| Tested Frequency | Power Meter Reading | Cable Loss | Atten. Loss | Result (Timed average) | |
|------------------|---------------------|------------|-------------|------------------------|------|
| [MHz] | [dBm] | [dB] | [dB] | [dBm] | [mW] |
| 5755 | -6.00 | 3.33 | 9.95 | 7.28 | 5.35 |

11ac-80 SGIOFF

| Tested Frequency | Power Meter Reading | Cable Loss | Atten. Loss | Result (Timed average) | |
|------------------|---------------------|------------|-------------|------------------------|------|
| [MHz] | [dBm] | [dB] | [dB] | [dBm] | [mW] |
| 5775 | -8.20 | 3.34 | 9.95 | 5.09 | 3.23 |

Sample Calculation:

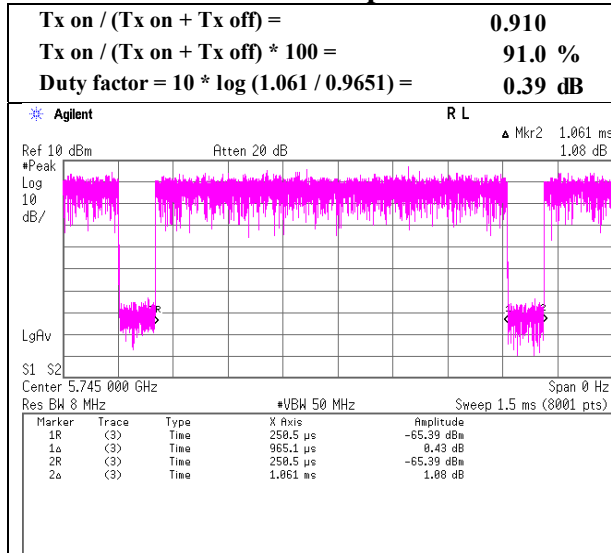
Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

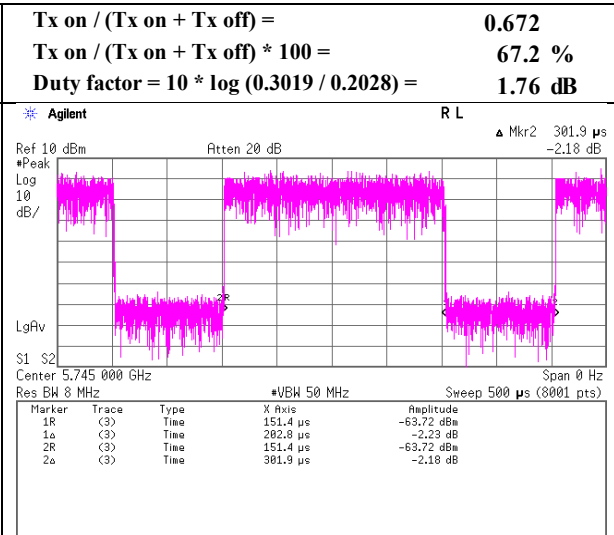
Burst rate confirmation

Report No. 13063555S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 27, 2019
Temperature / Humidity 26 deg. C / 45 % RH
Engineer Makoto Hosaka
Mode Tx

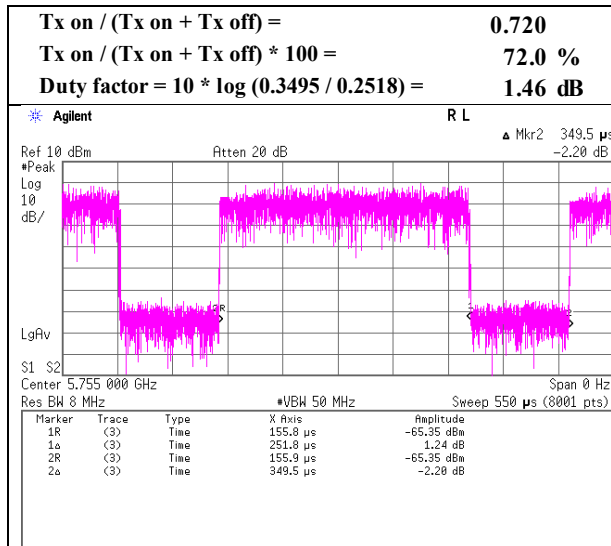
11a 9 Mbps



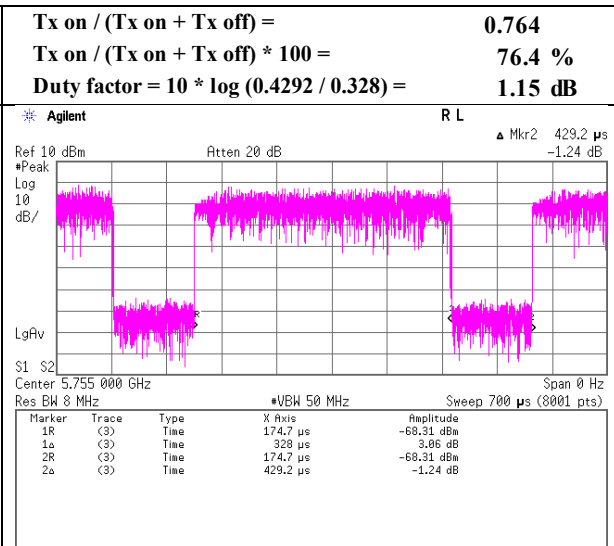
11n-20 MCS 5



11n-40 MCS 2



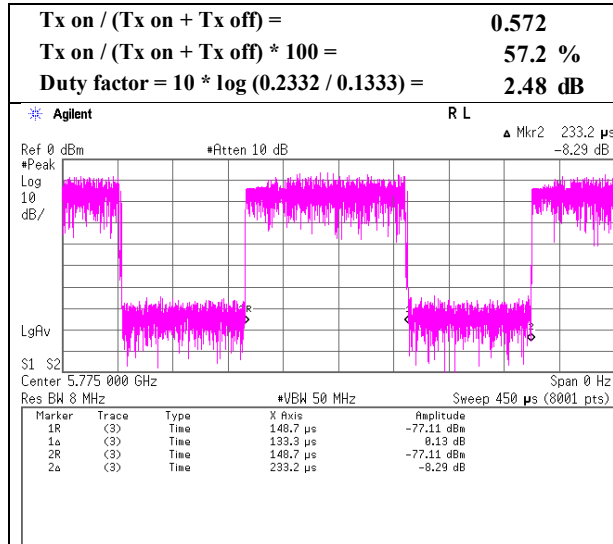
11ac-40 MCS 1



Burst rate confirmation

| | |
|------------------------|------------------------------------|
| Report No. | 13063555S-C-R2 |
| Test place | Shonan EMC Lab. No.5 Shielded Room |
| Date | September 27, 2019 |
| Temperature / Humidity | 26 deg. C / 45 % RH |
| Engineer | Makoto Hosaka |
| Mode | Tx |

11ac-80 MCS 2



Maximum Power Spectral Density

Report No. 13063555S-C-R2
Test place Shonan EMC Lab. No.6 Shielded Room
Date October 29, 2019
Temperature / Humidity 23 deg. C / 45 % RH
Engineer Toshinori Yamada
Mode Tx

11a

Applied limit: 15.407, mobile and portable client device

| Tested Frequency [MHz] | PSD Reading [dBm /MHz] | Cable Loss [dB] | Atten. Loss [dB] | Duty Factor [dB] | Antenna Gain [dBi] | RBW Correction Factor [dB] | PSD (Conducted) | | | PSD (e.i.r.p.) | | |
|---------------------------|---------------------------|--------------------|---------------------|---------------------|-----------------------|-------------------------------|----------------------|---------------------|----------------|----------------------|---------------------|----------------|
| | | | | | | | Result [dBm /MHz] | Limit [dBm /MHz] | Margin [dB] | Result [dBm /MHz] | Limit [dBm /MHz] | Margin [dB] |
| 5745 | -23.00 | 2.04 | 9.95 | 0.39 | -13.2 | 6.99 | -3.63 | 30.00 | 33.63 | -16.83 | 36.00 | 52.83 |

11n-20 SGI OFF

Applied limit: 15.407, mobile and portable client device

| Tested Frequency [MHz] | PSD Reading [dBm /MHz] | Cable Loss [dB] | Atten. Loss [dB] | Duty Factor [dB] | Antenna Gain [dBi] | RBW Correction Factor [dB] | PSD (Conducted) | | | PSD (e.i.r.p.) | | |
|---------------------------|---------------------------|--------------------|---------------------|---------------------|-----------------------|-------------------------------|----------------------|---------------------|----------------|----------------------|---------------------|----------------|
| | | | | | | | Result [dBm /MHz] | Limit [dBm /MHz] | Margin [dB] | Result [dBm /MHz] | Limit [dBm /MHz] | Margin [dB] |
| 5745 | -23.71 | 2.04 | 9.95 | 1.76 | -13.2 | 6.99 | -2.97 | 30.00 | 32.97 | -16.17 | 36.00 | 52.17 |

11n-40 SGI OFF

Applied limit: 15.407, mobile and portable client device

| Tested Frequency [MHz] | PSD Reading [dBm /MHz] | Cable Loss [dB] | Atten. Loss [dB] | Duty Factor [dB] | Antenna Gain [dBi] | RBW Correction Factor [dB] | PSD (Conducted) | | | PSD (e.i.r.p.) | | |
|---------------------------|---------------------------|--------------------|---------------------|---------------------|-----------------------|-------------------------------|----------------------|---------------------|----------------|----------------------|---------------------|----------------|
| | | | | | | | Result [dBm /MHz] | Limit [dBm /MHz] | Margin [dB] | Result [dBm /MHz] | Limit [dBm /MHz] | Margin [dB] |
| 5755 | -27.91 | 2.05 | 9.95 | 1.46 | -13.2 | 6.99 | -7.46 | 30.00 | 37.46 | -20.66 | 36.00 | 56.66 |

11ac-40 SGI OFF

Applied limit: 15.407, mobile and portable client device

| Tested Frequency [MHz] | PSD Reading [dBm /MHz] | Cable Loss [dB] | Atten. Loss [dB] | Duty Factor [dB] | Antenna Gain [dBi] | RBW Correction Factor [dB] | PSD (Conducted) | | | PSD (e.i.r.p.) | | |
|---------------------------|---------------------------|--------------------|---------------------|---------------------|-----------------------|-------------------------------|----------------------|---------------------|----------------|----------------------|---------------------|----------------|
| | | | | | | | Result [dBm /MHz] | Limit [dBm /MHz] | Margin [dB] | Result [dBm /MHz] | Limit [dBm /MHz] | Margin [dB] |
| 5755 | -29.00 | 2.05 | 9.95 | 1.15 | -13.2 | 6.99 | -8.86 | 30.00 | 38.86 | -22.06 | 36.00 | 58.06 |

11ac-80 SGI OFF

Applied limit: 15.407, mobile and portable client device

| Tested Frequency [MHz] | PSD Reading [dBm /MHz] | Cable Loss [dB] | Atten. Loss [dB] | Duty Factor [dB] | Antenna Gain [dBi] | RBW Correction Factor [dB] | PSD (Conducted) | | | PSD (e.i.r.p.) | | |
|---------------------------|---------------------------|--------------------|---------------------|---------------------|-----------------------|-------------------------------|----------------------|---------------------|----------------|----------------------|---------------------|----------------|
| | | | | | | | Result [dBm /MHz] | Limit [dBm /MHz] | Margin [dB] | Result [dBm /MHz] | Limit [dBm /MHz] | Margin [dB] |
| 5775 | -32.93 | 2.05 | 9.95 | 2.48 | -13.2 | 6.99 | -11.46 | 30.00 | 41.46 | -24.66 | 36.00 | 60.66 |

Sample Calculation:

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = $10 \cdot \log(\text{Specified bandwidth} / \text{Measured bandwidth})$

PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

The conducted PSD limit was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. (All frequencies for FCC, 5725 MHz-5850 MHz for IC)

UL Japan, Inc.

Shonan EMC Lab.

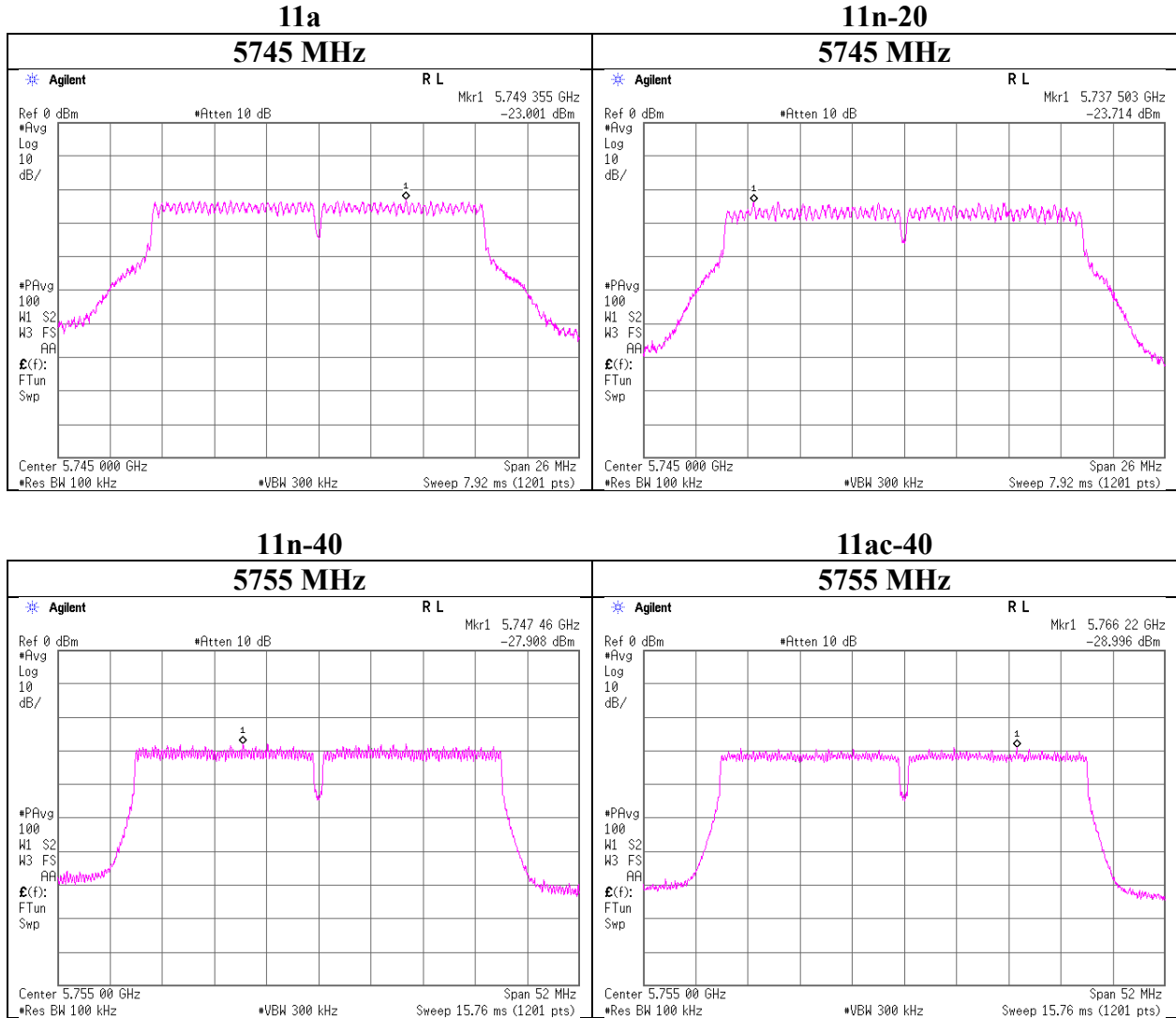
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Maximum Power Spectral Density

| | |
|------------------------|------------------------------------|
| Report No. | 13063555S-C-R2 |
| Test place | Shonan EMC Lab. No.6 Shielded Room |
| Date | October 29, 2019 |
| Temperature / Humidity | 23 deg. C / 45 % RH |
| Engineer | Toshinori Yamada |
| Mode | Tx |



UL Japan, Inc.

Shonan EMC Lab.

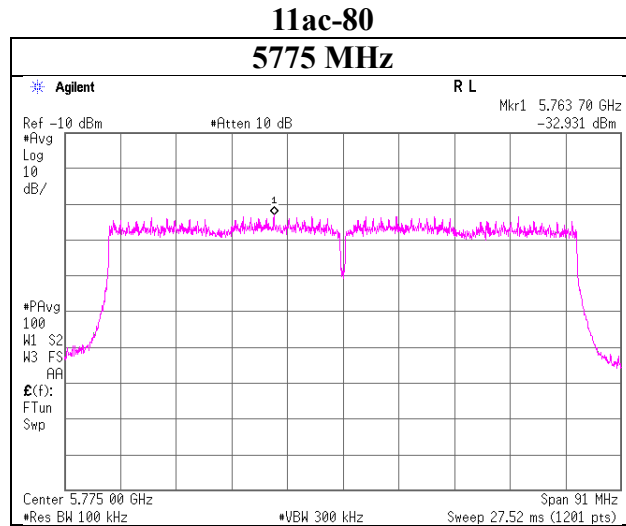
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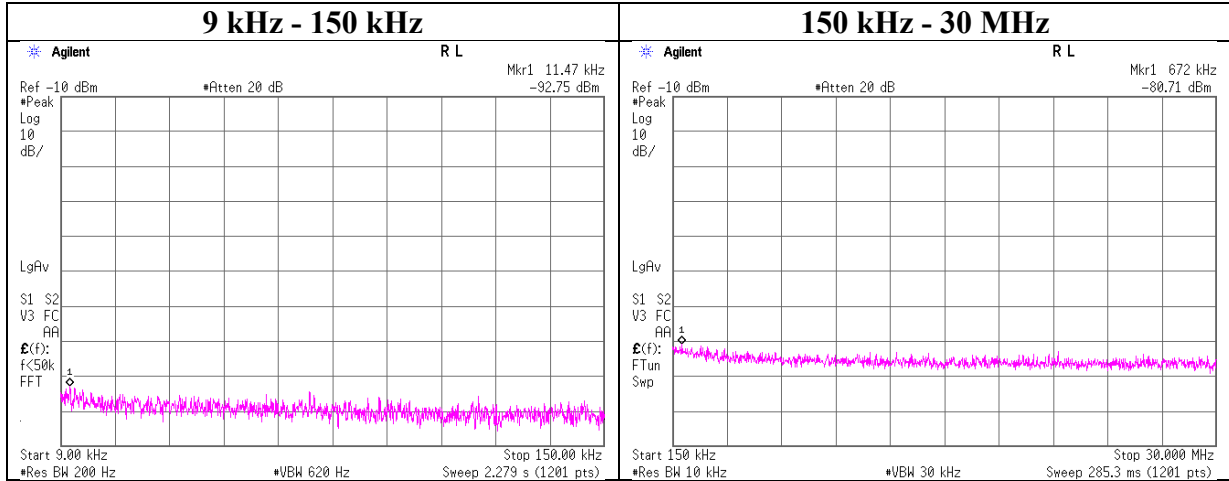
Maximum Power Spectral Density

Report No. 13063555S-C-R2
Test place Shonan EMC Lab. No.6 Shielded Room
Date October 29, 2019
Temperature / Humidity 23 deg. C / 45 % RH
Engineer Toshinori Yamada
Mode Tx



Conducted Spurious Emission

Report No. 13063555S-C-R2
Test place Shonan EMC Lab. No.6 Shielded Room
Date October 29, 2019
Temperature / Humidity 23 deg. C / 45 % RH
Engineer Toshinori Yamada
Mode Tx 11n-20, 5745 MHz



| 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 |
|--------------------|------------------|-----------------------|--------------------|---------------------------|----------------------------|---------------|-----------------|--------------------------|-----------------------------------|-------------------|----------------|--------|
| 11.47 | -92.8 | 1.16 | 10.6 | 2.0 | 1 | -79.0 | 300 | 6.0 | -17.8 | 46.4 | 64.2 | |
| 672.00 | -80.7 | 1.16 | 10.6 | 2.0 | 1 | -67.0 | 30 | 6.0 | 14.3 | 31.0 | 16.7 | |

$E [dBuV/m] = EIRP [dBm] - 20 \log (Distance [m]) + Ground\ bounce [dB] + 104.8 [dBuV/m]$

$EIRP [dBm] = Reading [dBm] + Cable\ loss [dB] + Attenuator\ Loss [dB] + Antenna\ gain [dBi] + 10 * \log (N)$

N: Number of output

*2.0 dBi was applied to the test result based on KDB 789033 since antenna gain was less than 2.0 dBi.

APPENDIX 2: Test instruments

Test Instruments

| Local ID | Test Name | LIMS ID | Description | Manufacturer | Model | Serial | Last Calibration Date | Calibration Due Date | Calibration Interval (Month) |
|----------|-----------|---------|--------------------|-----------------------------------|------------------------------|-------------------|-----------------------|----------------------|------------------------------|
| KTS-06 | AT | 145110 | Digital Tester | SANWA | PC500 | 7019240 | 2019/4/2 | 2020/4/30 | 12 |
| KTS-07 | AT | 145111 | Digital Tester | SANWA | PC500 | 7019232 | 2019/10/1 | 2020/10/31 | 12 |
| SAT10-09 | AT | 145132 | Attenuator | Weinschel Corp. | 54A-10 | W5692 | 2019/11/5 | 2020/11/30 | 12 |
| SAT10-12 | AT | 151609 | Attenuator | Weinschel Corp. | 54A-10 | 81601 | 2019/3/27 | 2020/3/31 | 12 |
| SCC-G32 | AT | 145183 | Coaxial Cable | Junkosha | MWX241-02 000KMSKMS | OCT-09-13 -005 | 2018/11/25 | 2019/11/30 | 12 |
| SCC-G37 | AT | 151614 | Coaxial Cable | Junkosha | MWX241-01 000KMSKMS /B | 1612Q035 | 2018/12/25 | 2019/12/31 | 12 |
| SOS-09 | AT | 146318 | Humidity Indicator | A&D | AD-5681 | 4061484 | 2018/12/5 | 2019/12/31 | 12 |
| SOS-18 | AT | 175822 | Humidity Indicator | CUSTOM | CTH-201 | - | 2018/12/5 | 2019/12/31 | 12 |
| SPM-13 | AT | 169910 | Power Meter | EMC Instruments Corporation | 8990B | MY510004 48 | 2019/3/6 | 2020/3/31 | 12 |
| SPSS-06 | AT | 169911 | Power sensor | EMC Instruments Corporation | N1923A | MY572700 04 | 2019/3/6 | 2020/3/31 | 12 |
| SRENT-15 | AT | 160899 | Spectrum Analyzer | AGILENT (KEYSIGHT) | E4440A | MY461855 16 | 2019/1/21 | 2020/1/31 | 12 |
| SSA-02 | AT | 145800 | Spectrum Analyzer | AGILENT | E4448A | MY482501 06 | 2019/4/4 | 2020/4/30 | 12 |
| STM-G10 | AT | 171617 | Terminator | Weinschel - API Technologies Corp | M1459A | 92420 | 2019/7/4 | 2020/7/31 | 12 |

*Hyphens for Last Calibration Date, Calibration Due Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

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:

AT: Antenna Terminal Conducted test

UL Japan, Inc.

Shonan EMC Lab.

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