



# RADIO TEST REPORT

**Test Report No. : 11228681H-R1**

**Applicant** : PANASONIC CORPORATION OF NORTH AMERICA  
**Type of Equipment** : Wireless Module  
**Model No.** : WL15A  
**FCC ID** : ACJ9TGWL15A  
**Test regulation** : FCC Part 15 Subpart E: 2015  
**Test Result** : Complied

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2. The results in this report apply only to the sample tested.
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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. This report is a revised version of 11228681H. 11228681H is replaced with this report.

**Date of test:** April 14 to 17, 2016

**Representative test engineer:**

*T. Nakagawa*

Tomohisa Nakagawa  
Engineer  
Consumer Technology Division

**Approved by:**

*T. Hatakeda*

Takahiro Hatakeda  
Leader  
Consumer Technology Division



NVLAP LAB CODE: 200572-0

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**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

13-EM-F0429



<b>CONTENTS</b>	<b>PAGE</b>
<b>SECTION 1: Customer information.....</b>	<b>4</b>
<b>SECTION 2: Equipment under test (E.U.T.).....</b>	<b>4</b>
<b>SECTION 3: Test specification, procedures &amp; results.....</b>	<b>5</b>
<b>SECTION 4: Operation of E.U.T. during testing.....</b>	<b>8</b>
<b>SECTION 5: Conducted Emission.....</b>	<b>11</b>
<b>SECTION 6: Radiated Spurious Emission and Band Edge Compliance.....</b>	<b>12</b>
<b>SECTION 7: Antenna Terminal Conducted Tests.....</b>	<b>14</b>
<b>APPENDIX 1: Test data .....</b>	<b>15</b>
Conducted Emission .....	15
99 % Occupied Bandwidth.....	16
6 dB Bandwidth .....	19
Maximum Conducted Output Power .....	22
Maximum Power Spectral Density .....	50
Radiated Spurious Emission .....	57
Conducted Spurious Emission .....	69
<b>APPENDIX 2: Test instruments .....</b>	<b>70</b>
<b>APPENDIX 3: Photographs of test setup .....</b>	<b>71</b>
Conducted Emission .....	71
Radiated Spurious Emission .....	72
Worst Case Position.....	73

## **SECTION 1: Customer information**

Company Name : PANASONIC CORPORATION OF NORTH AMERICA  
Address : Two Riverfront Plaza, 9th Floor, Newark, NJ 07102-5490

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

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

Type of Equipment : Wireless Module  
Model No. : WL15A  
Serial No. : Refer to Section 4, Clause 4.2  
Receipt Date of Sample : April 5, 2016  
Modification of EUT : No Modification by the test lab

### **2.2 Product Description**

Model: WL15A (referred to as the EUT in this report) is a Wireless Module.

### **Radio Specification**

Tx Frequency Bands	802.11a/b/g/n/ac: 2412 - 2472 MHz, b / g / HT20 / HT40 5180 - 5240 MHz, a / HT20 / HT40 / HT80 5260 - 5320 MHz, a / HT20 / HT40 / HT80 5500 - 5720 MHz, a / HT20 / HT40 / HT80 5745 - 5825 MHz, a / HT20 / HT40 / HT80 Bluetooth: 2402 - 2480 MHz
Modulation	802.11a/b/g/n/ac : BPSK, QPSK, CCK, 16-QAM and 64-QAM and 256-QAM Bluetooth 4.0+LE: GFSK, DQPSK, 8-DPSK

## SECTION 3: Test specification, procedures & results

### 3.1 Test Specification

Test Specification : FCC Part 15 Subpart E: 2015, final revised on November 23, 2015  
\*Some parts are effective on and after December 17, 2015 or December 23, 2015. The revision does not affect the test specification applied to the EUT.

Title : FCC 47CFR Part15 Radio Frequency Device Subpart E  
Unlicensed National Information Infrastructure Devices  
Section 15.407 General technical requirements

### 3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013	FCC: 15.407 (b) (6) / 15.207	QP 20.9 dB, 0.39960 MHz, L AV 18.2 dB, 0.19510 MHz, L	Complied	-
	IC: RSS-Gen 8.8	IC: RSS-Gen 8.8			
26 dB Emission Bandwidth	FCC: KDB Publication Number 789033 D02 v01r02 662911 D01 v02r01 662911 D02 v01	FCC: 15.407 (a) (1) (2) (3)	See data	N/A	Conducted
	IC: -	IC: -			
Maximum Conducted Output Power	FCC: KDB Publication Number 789033 D02 v01r02 662911 D01 v02r01 662911 D02 v01	FCC: 15.407 (a) (1) (2) (3)	See data	Complied	Conducted
	IC: -	IC: RSS-247 6.2.1 (1) 6.2.2 (1) 6.2.3 (1) 6.2.4 (1)			
Maximum Power Spectral Density	FCC: KDB Publication Number 789033 D02 v01r02 662911 D01 v02r01 662911 D02 v01	FCC : 15.407 (a) (1) (2) (3)	See data	Complied	Conducted
	IC: -	IC: RSS-247 6.2.1 (1) 6.2.2 (1) 6.2.3 (1) 6.2.4 (1)			
Spurious Emission Restricted Band Edge	FCC: KDB Publication Number 789033 D02 v01r02 662911 D01 v02r01 662911 D02 v01	FCC: 15.407 (b), 15.205 and 15.209	0.6 dB 4958.507 MHz, AV, Vert.	Complied	Conducted (< 30 MHz) / Radiated (> 30 MHz) *1)
	IC: -	IC: RSS-247 6.2.1 (2) 6.2.2 (2) 6.2.3 (2) 6.2.4 (2)			
6 dB Emission Bandwidth	FCC: ANSI C63.10-2013	FCC: 15.407 (e)	See data	Complied	Conducted
	IC: -	IC: RSS-247 6.2.4 (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 FCC 15.407 (b) and KDB 789033 D02 G.3.b).

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

### 3.3 Addition to standard

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

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

**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

### 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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Antenna terminal test Uncertainty (+/-)							
Power meter		Conducted emission and Power density			Conducted emission		Channel power
Below 1 GHz	Above 1 GHz	Below 1 GHz	1 GHz - 3 GHz	3 GHz - 18 GHz	18 GHz - 26.5 GHz	26.5 GHz - 40 GHz	
0.9 dB	1.0 dB	1.4 dB	1.7 dB	2.8 dB	2.8 dB	2.9 dB	

Frequency range	Conducted emission using AMN(LISN) (+dB)
0.009 – 0.15MHz	3.5 dB
0.15 – 30MHz	2.9 dB

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	4.8 dB	5.2 dB	4.8 dB	5.0 dB
Vertical	4.5 dB	5.9 dB	4.8 dB	5.1 dB

Radiated emission				
(3 m*)(+dB)		(1 m*)(+dB)	(0.5 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

#### Conducted Emission test

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

#### Radiated emission test

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

### 3.5 Test Location

UL Japan, Inc. Ise EMC Lab. \*NVLAP Lab. code: 200572-0  
 4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN  
 Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124

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 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.

## **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.

<b>Mode</b>	<b>Remarks*</b>
IEEE 802.11a (11a)	54 Mbps, PN9
IEEE 802.11n SISO 20 MHz BW (11n-20)	MCS7, PN9
IEEE 802.11ac SISO 20 MHz BW (11ac-20)	VHT8, PN9
IEEE 802.11n MIMO 20 MHz BW (11n-20)	MCS15, PN9
IEEE 802.11ac MIMO 20 MHz BW (11ac-20)	VHT8, PN9
IEEE 802.11n SISO 40 MHz BW (11n-40)	MCS7, PN9
IEEE 802.11ac SISO 40 MHz BW (11ac-40)	VHT9, PN9
IEEE 802.11n MIMO 40 MHz BW (11n-40)	MCS15, PN9
IEEE 802.11ac MIMO 40 MHz BW (11ac-40)	VHT9, PN9
IEEE 802.11ac SISO 80 MHz BW (11ac-80)	VHT9, PN9
IEEE 802.11ac MIMO 80 MHz BW (11ac-80)	VHT9, PN9

\*Above worst rate was decided based on a maximum conducted output power rate check (reference data) result.

\*The details of Operation mode(s)

Test Item	Operating Mode	Tested Antenna	Tested Frequency
			Upper Band
Conducted Emission, Radiated Spurious Emission (Below 1 GHz), Conducted Spurious Emission *1)	11ac-80 Tx *2)	A+B	5775 MHz
99 % Occupied Bandwidth, 6 dB Bandwidth *1)	11a Tx 11ac-20 Tx	B	5745 MHz 5785 MHz 5825 MHz
	11ac-40 Tx	B	5755 MHz 5795 MHz
	11ac-80 Tx	B	5775 MHz
Maximum Power Spectral Density *1)	11a Tx	A, B	5745 MHz 5785 MHz 5825 MHz
	11ac-20 Tx	A+B	5745 MHz 5785 MHz 5825 MHz
	11ac-40 Tx	A+B	5755 MHz 5795 MHz
	11ac-80 Tx	A+B	5775 MHz
Maximum Conducted Output Power *1)	11a Tx	A, B	5745 MHz 5785 MHz 5825 MHz
	11n-20 Tx 11ac-20 Tx	A, B, A+B	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx 11ac-40 Tx	A, B, A+B	5755 MHz 5795 MHz
	11ac-80 Tx	A, B, A+B	5775 MHz
Radiated Spurious Emission (Above 1 GHz) *1)	11ac-20 Tx	A+B *3)	5745 MHz 5785 MHz 5825 MHz
	11ac-40 Tx	A+B *3)	5755 MHz 5795 MHz
	11ac-80 Tx	A+B *3)	5775 MHz
*1) The test was only performed with UNII-3 band. *2) The test was performed with the worst case. The highest mode in Maximum conducted output power result was selected as the worst case. The highest rate in Maximum conducted output power rate check (reference data) result was selected as the worst case. *3) After the comparison MIMO and SISO in pre-check, test was performed with MIMO as a representative as it had worst case.			

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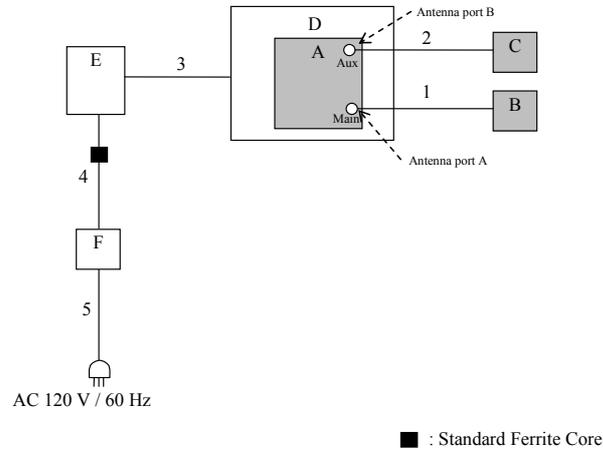
**Ise EMC Lab.**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## 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	Remarks
A	Wireless Module	WL15A	L11112	Panasonic	EUT
B	Main antenna	DFUP2464	-	Panasonic	EUT
C	Aux antenna	DFUP2534	-	Panasonic	EUT
D	Jig board	-	-	-	-
E	Jig	-	C151215-022-006-004	Panasonic	-
F	AC Adapter	CF-AA5713A	5713AM315922801C	Panasonic	-

### List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Antenna Cable	0.80	Unshielded	Unshielded	-
2	Antenna Cable	0.50	Unshielded	Unshielded	-
3	Signal Cable	0.15	Unshielded	Unshielded	-
4	DC Cable	1.45	Unshielded	Unshielded	-
5	AC Cable	1.80	Unshielded	Unshielded	-

## **SECTION 5: Conducted Emission**

### **Test Procedure and conditions**

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

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

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

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

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

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

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

## **SECTION 6: Radiated Spurious Emission and Band Edge Compliance**

### **Test Procedure**

[For below 1GHz]

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 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.

< Above 1GHz >

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 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.

< Below 1GHz >

The result also satisfied with the general limits specified in section 15.209 (a).

< Above 1GHz >

Inside of restricted bands (Section 15.205):

Apply to limit in the Section 15.209 (a).

Outside of the restricted bands:

Apply to limit 68.2 dBuV/m, 3 m (-27 dBm e.i.r.p. \*) in the Section 15.407 (b) (1) (2) (3).

-27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge in the KDB926956 D01.

Restricted band edge:

Apply to limit in the Section 15.209 (a).

Since this limit is severer than the limit of the inside of restricted bands.

\*Electric field strength to e.i.r.p. conversion:

$$E = \frac{1000000\sqrt{30P}}{3} \text{ (uV/m)} \quad :P \text{ is the e.i.r.p. (Watts)}$$

**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

Frequency	Below 1 GHz	Above 1 GHz	
Instrument used	Test Receiver	Spectrum Analyzer	
Detector	QP	Peak	Average
IF Bandwidth	BW: 120 kHz	RBW: 1 MHz VBW: 3 MHz	Method AD *1) RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: ≥ 100 traces Duty factor was added to the results.
Test Distance	3 m	3.9 m *2) (below 10 GHz), 1 m *3) (above 10 GHz), 0.5 m *4) (above 26.5 GHz)	

\*1) The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v01r02 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E (Issued on April 8, 2016)".

\*2) Distance Factor:  $20 \times \log(3.9 \text{ m}/3.0 \text{ m}) = 2.28 \text{ dB}$

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

\*4) Distance Factor:  $20 \times \log(0.5 \text{ m}/3.0 \text{ m}) = -15.6 \text{ dB}$

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

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

**Measurement range : 30 MHz-40 GHz**  
**Test data : APPENDIX**  
**Test result : Pass**

**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

## **SECTION 7: Antenna Terminal Conducted Tests**

### **Test Procedure**

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used 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: 80 MHz BW) (Method PM-G)
Maximum Power Spectral Density	Encompass the entire EBW	470 kHz *2)	≥ 3 RBW	Auto	RMS Power Averaging (200 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	9.1 kHz	27 kHz				

\* The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v01r02 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E (Issued on April 8, 2016)".

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

\*2) FCC standard 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  $10\log(500\text{ kHz}/470\text{ kHz})$  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 low enough as shown in the chart. (9 kHz-150 kHz: RBW = 200 Hz, 150 kHz-30 MHz: RBW = 9.1 kHz).

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

**Test data : APPENDIX**  
**Test result : Pass**

**APPENDIX 1: Test data**

**Conducted Emission**

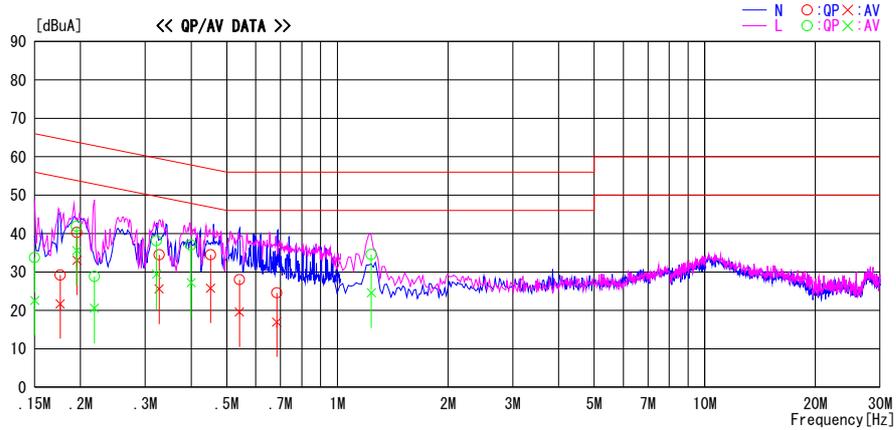
**DATA OF CONDUCTED EMISSION TEST**

UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber  
 Date : 2016/04/17

Report No. : 11228681H  
 Temp./Humi. : 22deg. C / 49% RH  
 Engineer : Tomoki Matsui

Mode / Remarks : Tx 11ac-80 5775MHz

LIMIT : FCC15.207 QP  
 FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuA]	AV [dBuA]	QP [dBuA]	AV [dBuA]	QP [dB]	AV [dB]		
0.15000	20.5	9.4	13.2	33.7	22.6	66.0	56.0	32.3	33.4	L	
0.17615	16.0	8.5	13.2	29.2	21.7	64.7	54.7	35.5	33.0	N	
0.19545	27.1	19.9	13.2	40.3	33.1	63.8	53.8	23.5	20.7	N	
0.19510	28.7	22.4	13.2	41.9	35.6	63.8	53.8	21.9	18.2	L	
0.21800	15.5	7.3	13.3	28.8	20.6	62.9	52.9	34.1	32.3	L	
0.32740	21.2	12.3	13.3	34.5	25.6	59.5	49.5	25.0	23.9	N	
0.32180	24.8	16.1	13.3	38.1	29.4	59.7	49.7	21.6	20.3	L	
0.39960	23.7	13.9	13.3	37.0	27.2	57.9	47.9	20.9	20.7	L	
0.45160	21.2	12.5	13.3	34.5	25.8	56.8	46.8	22.3	21.0	N	
0.54148	14.7	6.3	13.3	28.0	19.6	56.0	46.0	28.0	26.4	N	
0.68380	11.2	3.6	13.4	24.6	17.0	56.0	46.0	31.4	29.0	N	
1.23760	21.2	11.2	13.4	34.6	24.6	56.0	46.0	21.4	21.4	L	

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

### 99 % Occupied Bandwidth

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 14, 2016  
 Temperature / Humidity : 23deg. C / 45 % RH  
 Engineer : Tomohisa Nakagawa  
 Mode : Tx

#### 11a 54Mbps

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
Antenna B	5745	-	16.572	-
	5785	-	16.591	-
	5825	-	16.544	-

#### 11ac-20 MIMO VHT8

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
Antenna B	5745	-	17.746	-
	5785	-	17.756	-
	5825	-	17.704	-

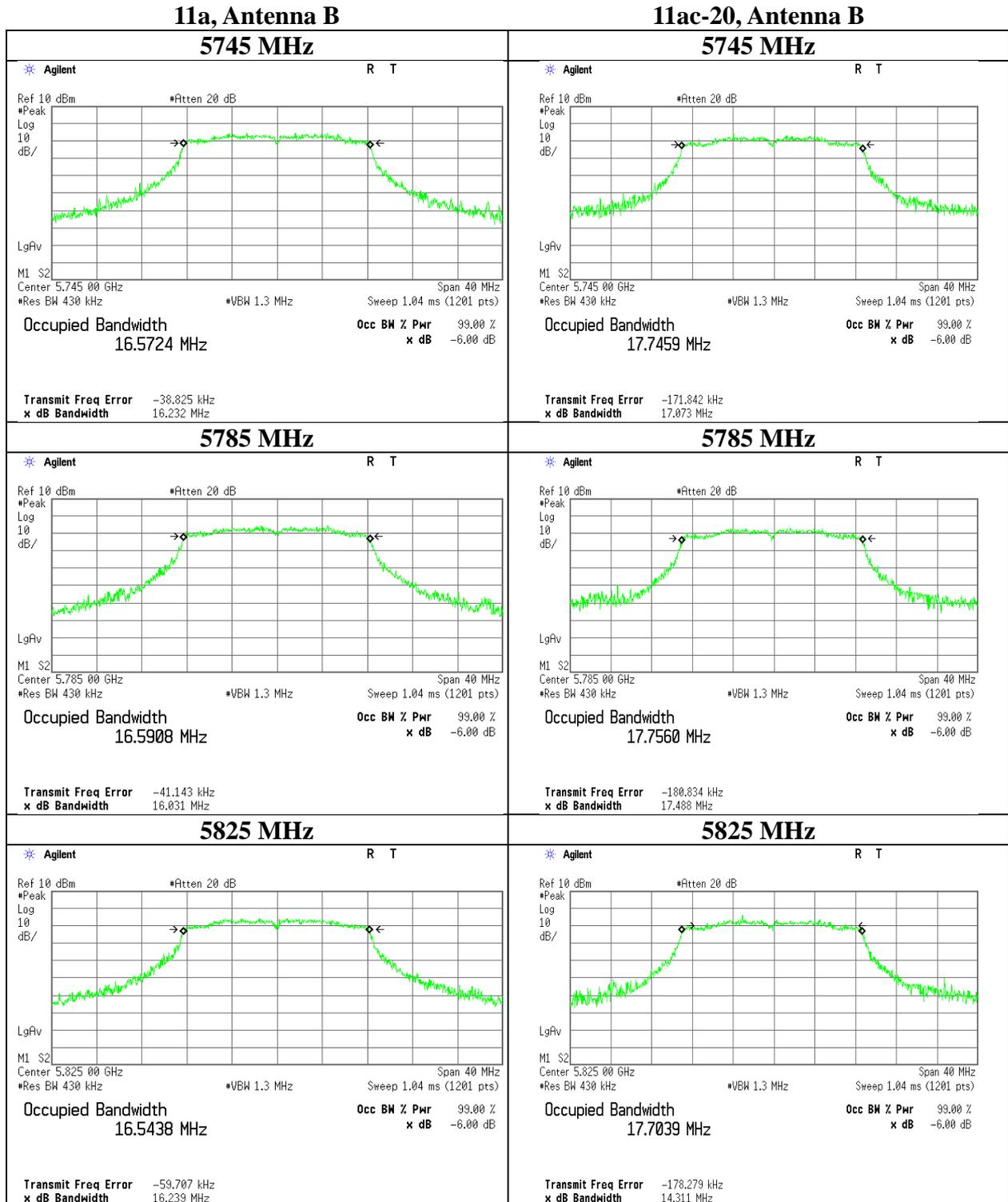
#### 11ac-40 MIMO VHT9

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
Antenna B	5755	-	36.101	-
	5795	-	36.100	-

#### 11ac-80 MIMO VHT9

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
Antenna B	5775	-	74.880	-

## 99 % Occupied Bandwidth



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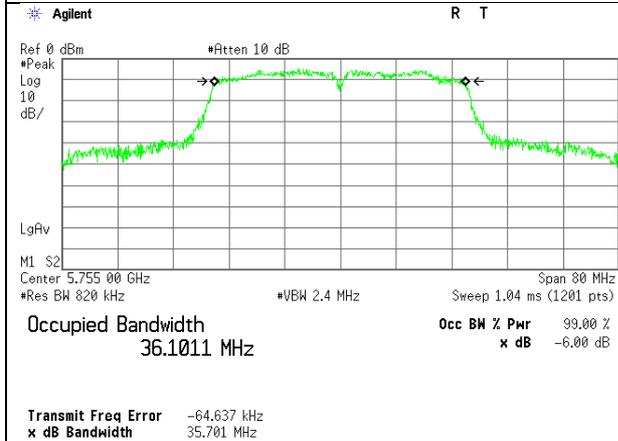
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

**99 % Occupied Bandwidth**

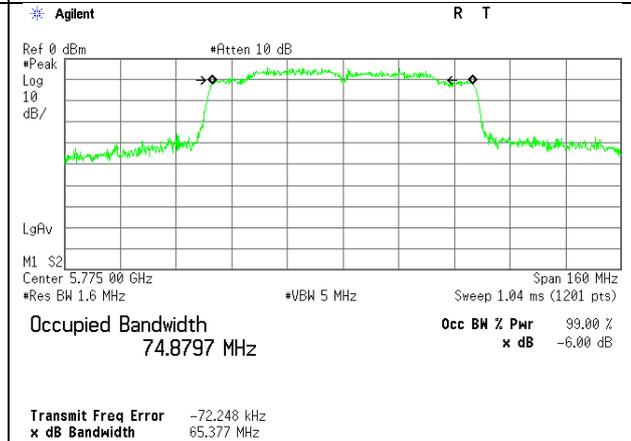
**11ac-40, Antenna B**

**5755 MHz**

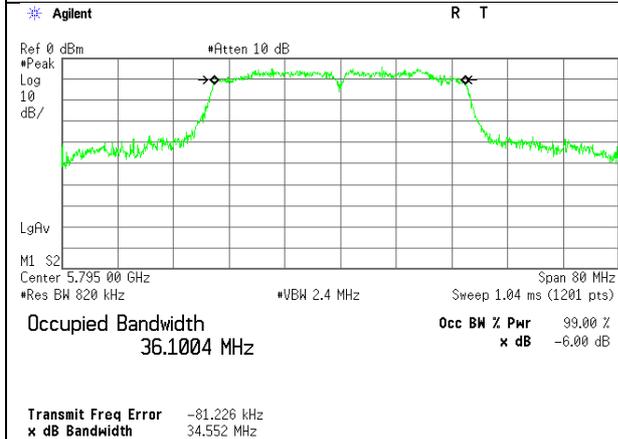


**11ac-80, Antenna B**

**5775 MHz**



**5795 MHz**



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## 6 dB Bandwidth

Test place Ise EMC Lab. No.6 Measurement Room  
Report No. 11228681H  
Date April 14, 2016  
Temperature / Humidity 23deg. C / 45 % RH  
Engineer Tomohisa Nakagawa  
Mode Tx

### 11a

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
Antenna B	5745	16.186	> 500
	5785	14.990	> 500
	5825	15.504	> 500

### 11ac-20

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
Antenna B	5745	16.674	> 500
	5785	17.610	> 500
	5825	15.718	> 500

### 11ac -40

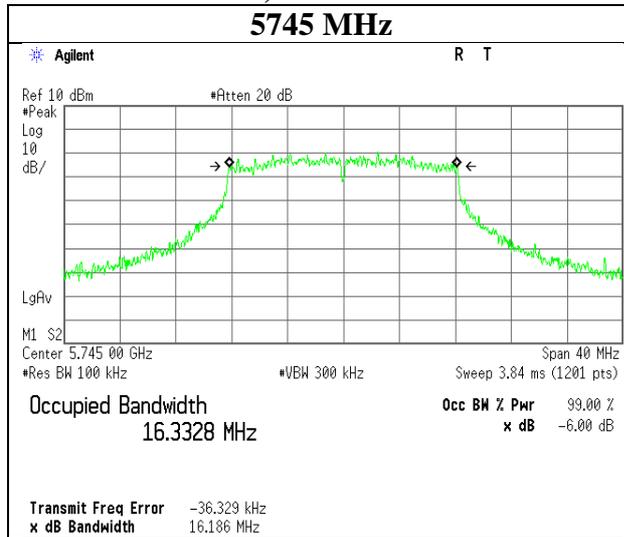
Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
Antenna B	5755	35.151	> 500
	5795	35.205	> 500

### 11ac-80

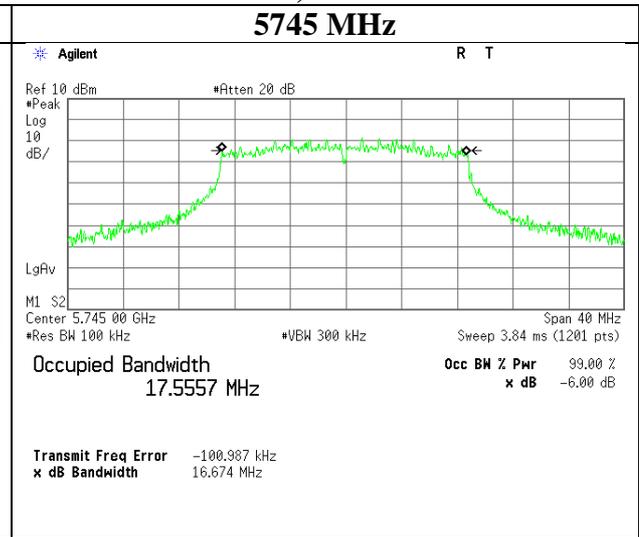
Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
Antenna B	5775	75.171	> 500

**6 dB Bandwidth**

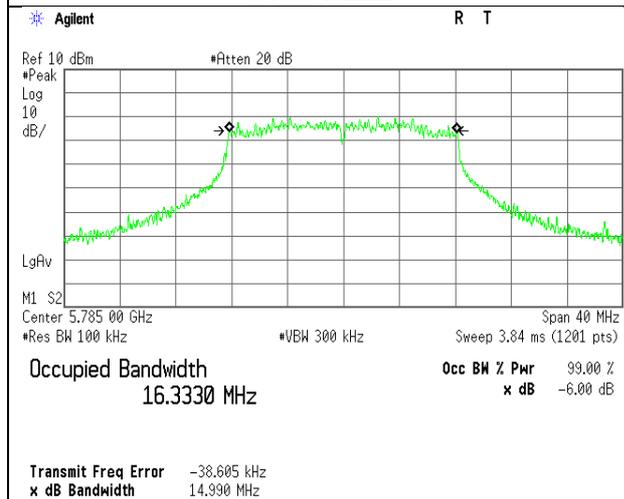
**11a, Antenna B**



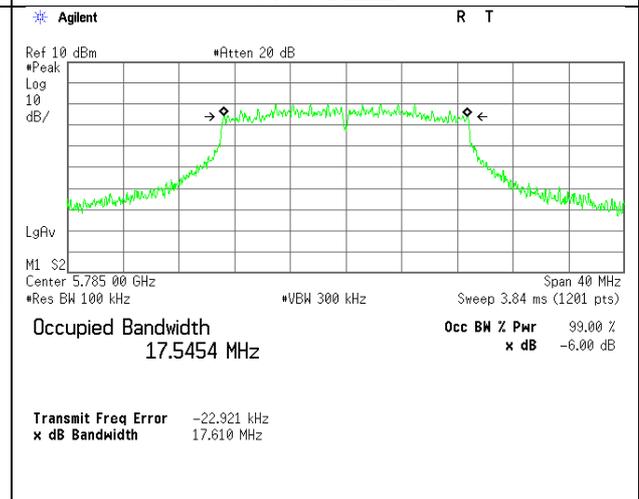
**11ac-20, Antenna B**



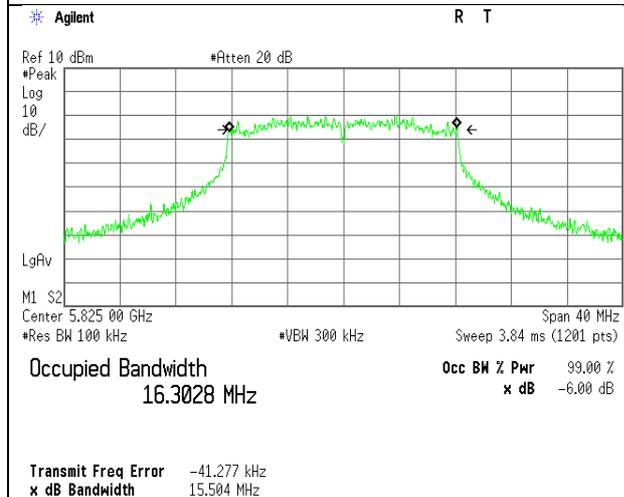
**5785 MHz**



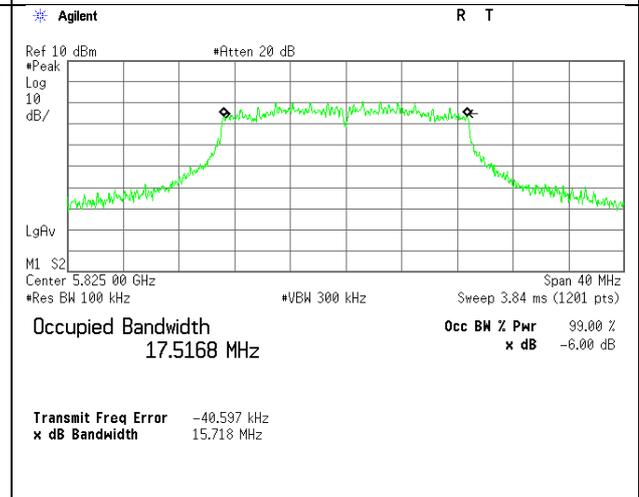
**5785 MHz**



**5825 MHz**



**5825 MHz**



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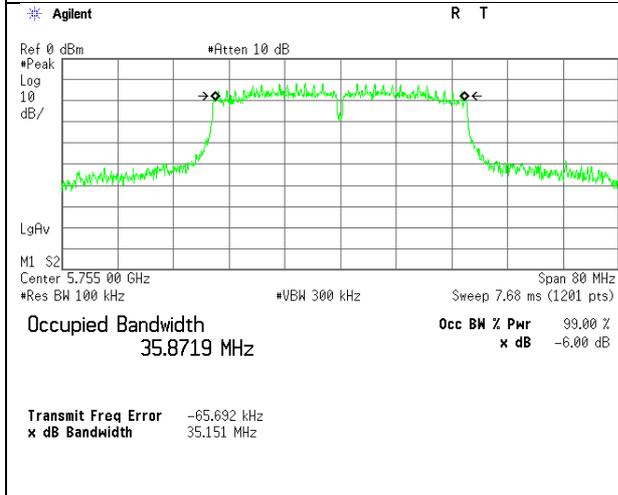
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

**6 dB Bandwidth**

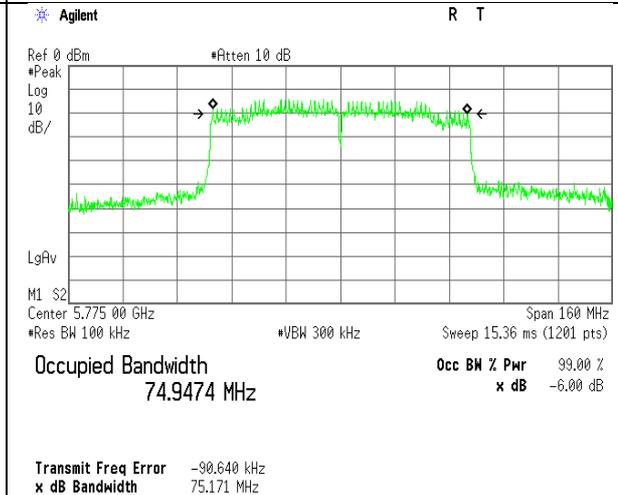
**11ac-40, Antenna B**

**5745 MHz**

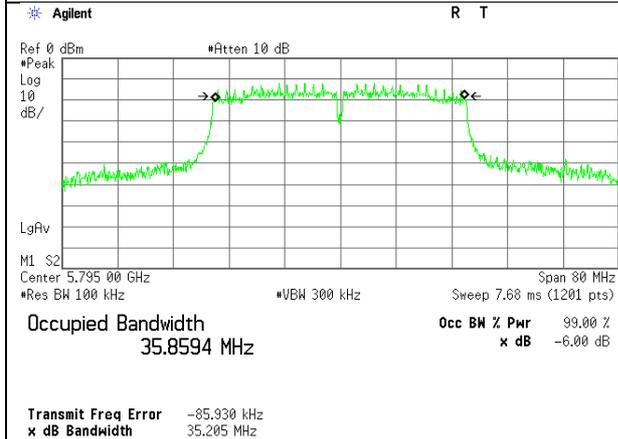


**11ac-80, Antenna B**

**5775 MHz**



**5795 MHz**



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## Maximum Conducted Output Power

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 14, 2016  
 Temperature / Humidity : 23deg. C / 45 % RH  
 Engineer : Tomohisa Nakagawa  
 Mode : Tx 11a 54Mbps

### Antenna A

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
							Result [dBm]	[mW]	Limit [dBm]	Margin [dB]	Result [dBm]	[mW]	Limit [dBm]	Margin [dB]
5745	14.38	-	-	2.30	-	-	14.38	27.42	30.00	15.62	16.68	46.56	36.00	19.32
5785	13.91	-	-	2.30	-	-	13.91	24.60	30.00	16.09	16.21	41.78	36.00	19.79
5825	13.53	-	-	2.30	-	-	13.53	22.54	30.00	16.47	15.83	38.28	36.00	20.17

Sample Calculation:

Conducted Power Result = Reading

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

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

### Antenna B

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
							Result [dBm]	[mW]	Limit [dBm]	Margin [dB]	Result [dBm]	[mW]	Limit [dBm]	Margin [dB]
5745	14.19	-	-	1.87	-	-	14.19	26.24	30.00	15.81	16.06	40.36	36.00	19.94
5785	13.88	-	-	1.87	-	-	13.88	24.43	30.00	16.12	15.75	37.58	36.00	20.25
5825	13.73	-	-	1.87	-	-	13.73	23.60	30.00	16.27	15.60	36.31	36.00	20.40

Sample Calculation:

Conducted Power Result = Reading

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

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

Method PM-G(Measurement using a Gated RF average power meter) is used.

## Maximum Conducted Output Power

Test place : Ise EMC Lab. No.6 Measurement Room  
Report No. : 11228681H  
Date : April 14, 2016  
Temperature / Humidity : 23deg. C / 45 % RH  
Engineer : Tomohisa Nakagawa  
Mode : Tx 11n-20 MCS7

### Antenna A

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
							Result [dBm]	[mW]	Limit [dBm]	Margin [dB]	Result [dBm]	[mW]	Limit [dBm]	Margin [dB]
5745	13.66	-	-	2.30	-	-	13.66	23.23	30.00	16.34	15.96	39.45	36.00	20.04
5785	14.02	-	-	2.30	-	-	14.02	25.23	30.00	15.98	16.32	42.85	36.00	19.68
5825	13.60	-	-	2.30	-	-	13.60	22.91	30.00	16.40	15.90	38.90	36.00	20.10

Sample Calculation:

Conducted Power Result = Reading

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

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

### Antenna B

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
							Result [dBm]	[mW]	Limit [dBm]	Margin [dB]	Result [dBm]	[mW]	Limit [dBm]	Margin [dB]
5745	13.71	-	-	1.87	-	-	13.71	23.50	30.00	16.29	15.58	36.14	36.00	20.42
5785	13.83	-	-	1.87	-	-	13.83	24.15	30.00	16.17	15.70	37.15	36.00	20.30
5825	13.71	-	-	1.87	-	-	13.71	23.50	30.00	16.29	15.58	36.14	36.00	20.42

Sample Calculation:

Conducted Power Result = Reading

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

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

Method PM-G(Measurement using a Gated RF average power meter) is used.

## Maximum Conducted Output Power

Test place : Ise EMC Lab. No.6 Measurement Room  
Report No. : 11228681H  
Date : April 14, 2016  
Temperature / Humidity : 23deg. C / 45 % RH  
Engineer : Tomohisa Nakagawa  
Mode : Tx 11n-20 MCS15

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
1 [mW]	2 [mW]	Sum [mW]	1 [mW]	2 [mW]	Sum [mW]									
5745	-	-	21.04	22.59	43.63	16.40	30.00	13.60	35.73	38.37	74.10	18.70	36.00	17.30
5785	-	-	21.04	22.44	43.48	16.38	30.00	13.62	35.73	38.11	73.83	18.68	36.00	17.32
5825	-	-	20.70	21.73	42.43	16.28	30.00	13.72	35.16	36.90	72.05	18.58	36.00	17.42

Tested Frequency [MHz]	Antenna A					Antenna B						
	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result Cond. Power [dBm]	Result e.i.r.p. [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result Cond. Power [dBm]	Result e.i.r.p. [dBm]
5745	13.23	-	-	2.30	13.23	15.53	13.54	-	-	2.30	13.54	15.84
5785	13.23	-	-	2.30	13.23	15.53	13.51	-	-	2.30	13.51	15.81
5825	13.16	-	-	2.30	13.16	15.46	13.37	-	-	2.30	13.37	15.67

Sample Calculation:

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

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

Antenna directional Gain =  $G_{ANTMAX} + 10 \log(N_{ANT} / N_{SS})$

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

The conducted power 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)

Method PM-G(Measurement using a Gated RF average power meter) is used.

## Maximum Conducted Output Power

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 14, 2016  
 Temperature / Humidity : 23deg. C / 45 % RH  
 Engineer : Tomohisa Nakagawa  
 Mode : Tx 11ac-20 VHT8

### Antenna A

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
							Result [dBm]	[mW]	Limit [dBm]	Margin [dB]	Result [dBm]	[mW]	Limit [dBm]	Margin [dB]
5745	14.03	-	-	2.30	-	-	14.03	25.29	30.00	15.97	16.33	42.95	36.00	19.67
5785	14.36	-	-	2.30	-	-	14.36	27.29	30.00	15.64	16.66	46.34	36.00	19.34
5825	13.78	-	-	2.30	-	-	13.78	23.88	30.00	16.22	16.08	40.55	36.00	19.92

Sample Calculation:

Conducted Power Result = Reading

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

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

### Antenna B

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
							Result [dBm]	[mW]	Limit [dBm]	Margin [dB]	Result [dBm]	[mW]	Limit [dBm]	Margin [dB]
5745	14.13	-	-	1.87	-	-	14.13	25.88	30.00	15.87	16.00	39.81	36.00	20.00
5785	13.83	-	-	1.87	-	-	13.83	24.15	30.00	16.17	15.70	37.15	36.00	20.30
5825	13.76	-	-	1.87	-	-	13.76	23.77	30.00	16.24	15.63	36.56	36.00	20.37

Sample Calculation:

Conducted Power Result = Reading

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

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

Method PM-G(Measurement using a Gated RF average power meter) is used.

## Maximum Conducted Output Power

Test place : Ise EMC Lab. No.6 Measurement Room  
Report No. : 11228681H  
Date : April 14, 2016  
Temperature / Humidity : 23deg. C / 45 % RH  
Engineer : Tomohisa Nakagawa  
Mode : Tx 11ac-20 VHT8

### Antenna A+B

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
1 [mW]	2 [mW]	Sum [mW]	1 [mW]	2 [mW]	Sum [mW]									
5745	-	-	21.38	22.59	43.97	16.43	30.00	13.57	36.31	38.37	74.68	18.73	36.00	17.27
5785	-	-	20.32	20.99	41.31	16.16	30.00	13.84	34.51	35.65	70.16	18.46	36.00	17.54
5825	-	-	20.84	20.61	41.45	16.18	30.00	13.82	35.40	34.99	70.39	18.48	36.00	17.52

Tested Frequency [MHz]	Antenna A					Antenna B						
	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result Cond. Power [dBm]	Result e.i.r.p. [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result Cond. Power [dBm]	Result e.i.r.p. [dBm]
5745	13.30	-	-	2.30	13.30	15.60	13.54	-	-	2.30	13.54	15.84
5785	13.08	-	-	2.30	13.08	15.38	13.22	-	-	2.30	13.22	15.52
5825	13.19	-	-	2.30	13.19	15.49	13.14	-	-	2.30	13.14	15.44

Sample Calculation:

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

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

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

Antenna directional Gain =  $G_{ANT\ MAX} + 10 \log(N_{ANT} / N_{SS})$

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

Method PM-G(Measurement using a Gated RF average power meter) is used.

## Maximum Conducted Output Power

Test place : Ise EMC Lab. No.6 Measurement Room  
Report No. : 11228681H  
Date : April 14, 2016  
Temperature / Humidity : 23deg. C / 45 % RH  
Engineer : Tomohisa Nakagawa  
Mode : Tx 11n-40 MCS7

### Antenna A

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
							Result [dBm]	Limit [dBm]	Margin [dB]	Result [dBm]	Limit [dBm]	Margin [dB]		
5755	13.96	-	-	2.30	-	-	13.96	24.89	30.00	16.04	16.26	42.27	36.00	19.74
5795	14.07	-	-	2.30	-	-	14.07	25.53	30.00	15.93	16.37	43.35	36.00	19.63

Sample Calculation:

Conducted Power Result = Reading

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

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

### Antenna B

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
							Result [dBm]	Limit [dBm]	Margin [dB]	Result [dBm]	Limit [dBm]	Margin [dB]		
5755	14.10	-	-	1.87	-	-	14.10	25.70	30.00	15.90	15.97	39.54	36.00	20.03
5795	13.87	-	-	1.87	-	-	13.87	24.38	30.00	16.13	15.74	37.50	36.00	20.26

Sample Calculation:

Conducted Power Result = Reading

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

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

Method PM-G(Measurement using a Gated RF average power meter) is used.

## Maximum Conducted Output Power

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 14, 2016  
 Temperature / Humidity : 23deg. C / 45 % RH  
 Engineer : Tomohisa Nakagawa  
 Mode : Tx 11n-40 MCS15

### Antenna A+B

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power							e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	
1 [mW]	2 [mW]	Sum [mW]	1 [mW]	2 [mW]	Sum [mW]				1 [dBm]	2 [dBm]	Sum [dBm]				
5755	-	-	23.66	26.73	50.39	17.02	30.00	12.98	40.18	45.39	85.57	19.32	36.00	16.68	
5795	-	-	23.93	25.35	49.28	16.93	30.00	13.07	40.64	43.05	83.70	19.23	36.00	16.77	

Tested Frequency [MHz]	Antenna A					Antenna B						
	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result Cond. Power [dBm]	Result e.i.r.p. [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result Cond. Power [dBm]	Result e.i.r.p. [dBm]
5755	13.74	-	-	2.30	13.74	16.04	14.27	-	-	2.30	14.27	16.57
5795	13.79	-	-	2.30	13.79	16.09	14.04	-	-	2.30	14.04	16.34

Sample Calculation:

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

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

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

Antenna directional Gain =  $G_{ANTMAX} + 10 \log(N_{ANT} / N_{SS})$

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

Method PM-G(Measurement using a Gated RF average power meter) is used.

**UL Japan, Inc.**

**Ise EMC Lab.**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## Maximum Conducted Output Power

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 14, 2016  
 Temperature / Humidity : 23deg. C / 45 % RH  
 Engineer : Tomohisa Nakagawa  
 Mode : Tx 11ac-40 VHT9

### Antenna A

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
							Result [dBm]	[mW]	Limit [dBm]	Margin [dB]	Result [dBm]	[mW]	Limit [dBm]	Margin [dB]
5755	13.88	-	-	2.30	-	-	13.88	24.43	30.00	16.12	16.18	41.50	36.00	19.82
5795	14.10	-	-	2.30	-	-	14.10	25.70	30.00	15.90	16.40	43.65	36.00	19.60

Sample Calculation:

Conducted Power Result = Reading

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

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

### Antenna B

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
							Result [dBm]	[mW]	Limit [dBm]	Margin [dB]	Result [dBm]	[mW]	Limit [dBm]	Margin [dB]
5755	13.55	-	-	1.87	-	-	13.55	22.65	30.00	16.45	15.42	34.83	36.00	20.58
5795	13.95	-	-	1.87	-	-	13.95	24.83	30.00	16.05	15.82	38.19	36.00	20.18

Sample Calculation:

Conducted Power Result = Reading

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

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

Method PM-G(Measurement using a Gated RF average power meter) is used.

## Maximum Conducted Output Power

Test place : Ise EMC Lab. No.6 Measurement Room  
Report No. : 11228681H  
Date : April 14, 2016  
Temperature / Humidity : 23deg. C / 45 % RH  
Engineer : Tomohisa Nakagawa  
Mode : Tx 11ac-40 VHT9

### Antenna A+B

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
1 [mW]	2 [mW]	Sum [mW]	1 [mW]	2 [mW]	Sum [mW]									
5755	-	-	23.82	26.61	50.43	17.03	30.00	12.97	40.46	45.19	85.64	19.33	36.00	16.67
5795	-	-	23.88	25.82	49.70	16.96	30.00	13.04	40.55	43.85	84.40	19.26	36.00	16.74

Tested Frequency [MHz]	Antenna A					Antenna B						
	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result Cond. Power [dBm]	Result e.i.r.p. [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result Cond. Power [dBm]	Result e.i.r.p. [dBm]
5755	13.77	-	-	2.30	13.77	16.07	14.25	-	-	2.30	14.25	16.55
5795	13.78	-	-	2.30	13.78	16.08	14.12	-	-	2.30	14.12	16.42

Sample Calculation:

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

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

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

Antenna directional Gain =  $G_{ANT\_MAX} + 10 \log(N_{ANT} / N_{SS})$

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

Method PM-G(Measurement using a Gated RF average power meter) is used.

## Maximum Conducted Output Power

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 14, 2016  
 Temperature / Humidity : 23deg. C / 45 % RH  
 Engineer : Tomohisa Nakagawa  
 Mode : Tx 11ac-80 VHT9

### Antenna A

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power			e.i.r.p.				
							Result [dBm]	Limit [dBm]	Margin [dB]	Result [dBm]	Limit [dBm]	Margin [dB]		
5775	14.27	-	-	2.30	-	-	14.27	26.73	30.00	15.73	16.57	45.39	36.00	19.43

Sample Calculation:

Conducted Power Result = Reading

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

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

### Antenna B

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power			e.i.r.p.				
							Result [dBm]	Limit [dBm]	Margin [dB]	Result [dBm]	Limit [dBm]	Margin [dB]		
5775	14.28	-	-	1.87	-	-	14.28	26.79	30.00	15.72	16.15	41.21	36.00	19.85

Sample Calculation:

Conducted Power Result = Reading

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

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

Method PM-G(Measurement using a Gated RF average power meter) is used.

## Maximum Conducted Output Power

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 14, 2016  
 Temperature / Humidity : 23deg. C / 45 % RH  
 Engineer : Tomohisa Nakagawa  
 Mode : Tx 11ac-80 VHT9

### Antenna A+B

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
			1 [mW]	2 [mW]	Sum [mW]				1 [mW]	2 [mW]	Sum [mW]			
5775	-	-	26.00	28.97	54.98	17.40	30.00	12.60	44.16	49.20	93.36	19.70	36.00	16.30

Tested Frequency [MHz]	Antenna A						Antenna B					
	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result		Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result	
					Cond. Power [dBm]	e.i.r.p. [dBm]					Cond. Power [dBm]	e.i.r.p. [dBm]
5775	14.15	-	-	2.30	14.15	16.45	14.62	-	-	2.30	14.62	16.92

Sample Calculation:

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

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

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

Antenna directional Gain =  $G_{ANT\ MAX} + 10 \log(N_{ANT} / N_{SS})$

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

Method PM-G(Measurement using a Gated RF average power meter) is used.

**Maximum Conducted Output Power rate check**  
**(Reference data)**

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 14, 2016  
 Temperature / Humidity : 23deg. C / 45 % RH  
 Engineer : Tomohisa Nakagawa  
 Mode : 11a Tx

5745MHz

Data Rate [Mbps]	Reading		Reading		Remark
	Antenna A		Antenna B		
	[dBm]	[mW]	[dBm]	[mW]	
6	14.19	26.24	13.69	23.39	
9	14.08	25.59	13.77	23.82	
12	14.08	25.59	13.86	24.32	
18	14.10	25.70	13.87	24.38	
24	14.25	26.61	13.92	24.66	
36	14.27	26.73	13.93	24.72	
48	14.33	27.10	14.35	27.23	
54	14.38	27.42	14.40	27.54	*

\* Worst Rate

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

Method PM-G(Measurement using a Gated RF average power meter) is used.

**Maximum Conducted Output Power rate check  
(Reference data)**

Test place Ise EMC Lab. No.6 Measurement Room  
Report No. 11228681H  
Date April 14, 2016  
Temperature / Humidity 23deg. C / 45 % RH  
Engineer Tomohisa Nakagawa  
Mode 11n-20 Tx

5745MHz

MCS Number	Reading		Reading		Result		Remark
	Antenna A		Antenna B		Antenna A + B		
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	13.42	21.98	13.47	22.23	-	-	
1	13.35	21.63	13.53	22.54	-	-	
2	13.35	21.63	13.52	22.49	-	-	
3	13.58	22.80	13.64	23.12	-	-	
4	13.62	23.01	13.62	23.01	-	-	
5	13.50	22.39	13.60	22.91	-	-	
6	13.48	22.28	13.70	23.44	-	-	
7	13.66	23.23	13.71	23.50	-	-	*SISO
8	13.20	20.89	13.54	22.57	16.38	43.47	
9	12.92	19.59	13.25	21.13	16.10	40.72	
10	12.93	19.63	12.69	18.58	15.82	38.21	
11	13.07	20.28	13.42	21.98	16.26	42.26	
12	13.06	20.23	13.41	21.93	16.25	42.16	
13	13.03	20.09	13.42	21.98	16.24	42.07	
14	13.09	20.37	13.40	21.88	16.26	42.25	
15	13.23	21.04	13.54	22.59	16.40	43.63	*MIMO

\* Worst MCS

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

5745MH

MCS Number	Reading Antenna A [dBm]	Reading Antenna B [dBm]	Result Antenna A+B [dBm]	GI	Remark
7	14.01	14.09	-	Long	*
7	13.99	14.08	-	Short	
15	13.19	13.62	16.42	Long	*
15	13.04	13.50	16.29	Short	

\* Worst GI

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

Method PM-G(Measurement using a Gated RF average power meter) is used.

**Maximum Conducted Output Power rate check**  
**(Reference data)**

Test place Ise EMC Lab. No.6 Measurement Room  
Report No. 11228681H  
Date April 14, 2016  
Temperature / Humidity 23deg. C / 45 % RH  
Engineer Tomohisa Nakagawa  
Mode 11ac-20 Tx

5745MHz

VHT Number	Reading		Reading		Result		Remark
	Antenna A		Antenna B		Antenna A + B		
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	13.76	23.77	13.87	24.38	-	-	
1	13.72	23.55	13.85	24.27	-	-	
2	13.74	23.66	13.76	23.77	-	-	
3	13.78	23.88	13.88	24.43	-	-	
4	13.83	24.15	13.99	25.06	-	-	
5	13.91	24.60	14.00	25.12	-	-	
6	13.97	24.95	13.99	25.06	-	-	
7	14.00	25.12	14.10	25.70	-	-	
8	14.03	25.29	14.13	25.88	-	-	*SISO
0	13.34	21.58	13.43	22.03	16.40	43.61	
1	13.00	19.95	13.41	21.93	16.22	41.88	
2	12.79	19.01	13.23	21.04	16.03	40.05	
3	12.93	19.63	13.48	22.28	16.22	41.92	
4	12.87	19.36	13.40	21.88	16.15	41.24	
5	12.95	19.72	13.52	22.49	16.25	42.21	
6	13.07	20.28	13.55	22.65	16.33	42.92	
7	13.11	20.46	13.55	22.65	16.35	43.11	
8	13.30	21.38	13.54	22.59	16.43	43.97	*MIMO

\* Worst VHT

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

5745MH

VHT Number	Reading Antenna A [dBm]	Reading Antenna B [dBm]	Result Antenna A+B [dBm]	GI	Remark
8	14.03	14.13	-	Long	*
8	14.00	14.02	-	Short	
8	13.30	13.54	16.43	Long	*
8	13.20	13.52	16.37	Short	

Method PM-G(Measurement using a Gated RF average power meter) is used.

**Maximum Conducted Output Power rate check**  
**(Reference data)**

Test place : Ise EMC Lab. No.6 Measurement Room  
Report No. : 11228681H  
Date : April 14, 2016  
Temperature / Humidity : 23deg. C / 45 % RH  
Engineer : Tomohisa Nakagawa  
Mode : 11n-40 Tx

5755MHz

MCS Number	Reading		Reading		Result		Remark
	Antenna A		Antenna B		Antenna A + B		
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	13.49	22.34	13.66	23.23	-	-	
1	13.50	22.39	13.69	23.39	-	-	
2	13.60	22.91	13.88	24.43	-	-	
3	13.65	23.17	13.89	24.49	-	-	
4	13.76	23.77	13.98	25.00	-	-	
5	13.77	23.82	13.93	24.72	-	-	
6	13.87	24.38	14.08	25.59	-	-	
7	13.96	24.89	14.10	25.70	-	-	*SISO
8	13.23	21.04	13.92	24.66	16.60	45.70	
9	13.44	22.08	14.00	25.12	16.74	47.20	
10	13.57	22.75	14.14	25.94	16.87	48.69	
11	13.55	22.65	14.12	25.82	16.85	48.47	
12	13.68	23.33	14.13	25.88	16.92	49.22	
13	13.68	23.33	14.12	25.82	16.92	49.16	
14	13.69	23.39	14.27	26.73	17.00	50.12	
15	13.74	23.66	14.27	26.73	17.02	50.39	*MIMO

\* Worst MCS

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

5755MHz

MCS Number	Reading Antenna A [dBm]	Reading Antenna B [dBm]	Result Antenna A+B [dBm]	GI	Remark
7	13.96	14.10	-	Long	*
7	13.90	13.95	-	Short	
15	13.74	14.27	17.02	Long	*
15	13.73	14.15	16.96	Short	

\* Worst GI

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

Method PM-G(Measurement using a Gated RF average power meter) is used.

**Maximum Conducted Output Power rate check  
(Reference data)**

Test place Ise EMC Lab. No.6 Measurement Room  
Report No. 11228681H  
Date April 14, 2016  
Temperature / Humidity 23deg. C / 45 % RH  
Engineer Tomohisa Nakagawa  
Mode 11ac-40 Tx

5755MHz

VHT Number	Reading		Reading		Result		Remark
	Antenna A		Antenna B		Antenna A + B		
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	13.42	21.98	13.09	20.37	-	-	
1	13.42	21.98	13.10	20.42	-	-	
2	13.51	22.44	13.21	20.94	-	-	
3	13.62	23.01	13.24	21.09	-	-	
4	13.75	23.71	13.37	21.73	-	-	
5	13.80	23.99	13.36	21.68	-	-	
6	13.81	24.04	13.48	22.28	-	-	
7	13.81	24.04	13.52	22.49	-	-	
8	13.86	24.32	13.53	22.54	-	-	
9	13.88	24.43	13.55	22.65	-	-	*SISO
0	13.37	21.73	13.92	24.66	16.66	46.39	
1	13.37	21.73	13.87	24.38	16.64	46.11	
2	13.57	22.75	13.97	24.95	16.78	47.70	
3	13.62	23.01	14.01	25.18	16.83	48.19	
4	13.66	23.23	14.06	25.47	16.87	48.70	
5	13.70	23.44	14.11	25.76	16.92	49.21	
6	13.62	23.01	14.23	26.49	16.95	49.50	
7	13.70	23.44	14.23	26.49	16.98	49.93	
8	13.70	23.44	14.20	26.40	16.98	49.84	
9	13.77	23.82	14.25	26.61	17.03	50.43	*MIMO

\* Worst VHT

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

5755MH

VHT Number	Reading Antenna A [dBm]	Reading Antenna B [dBm]	Result Antenna A+B [dBm]	GI	Remark
9	13.88	13.55	-	Long	*
9	13.80	13.52	-	Short	
9	13.77	14.25	17.03	Long	*
9	13.66	14.11	16.90	Short	

\* Worst GI

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

Method PM-G(Measurement using a Gated RF average power meter) is used.

**Maximum Conducted Output Power rate check  
(Reference data)**

Test place Ise EMC Lab. No.6 Measurement Room  
Report No. 11228681H  
Date April 14, 2016  
Temperature / Humidity 23deg. C / 45 % RH  
Engineer Tomohisa Nakagawa  
Mode 11ac-80 Tx

5775MHz

VHT Number	Reading		Reading		Result		Remark
	Antenna A		Antenna B		Antenna A + B		
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	13.70	23.44	13.64	23.12	-	-	
1	13.68	23.33	13.99	25.06	-	-	
2	13.79	23.93	14.05	25.41	-	-	
3	13.84	24.21	14.09	25.64	-	-	
4	14.08	25.59	14.16	26.06	-	-	
5	14.18	26.18	14.13	25.88	-	-	
6	14.17	26.12	14.15	26.00	-	-	
7	14.13	25.88	14.19	26.24	-	-	
8	14.09	25.64	14.22	26.42	-	-	
9	14.27	26.73	14.28	26.79	-	-	*SISO
0	13.45	22.13	14.19	26.24	16.85	48.37	
1	13.54	22.59	14.21	26.36	16.90	48.96	
2	13.79	23.93	14.39	27.48	17.11	51.41	
3	13.87	24.38	14.29	26.85	17.10	51.23	
4	13.85	24.27	14.40	27.54	17.14	51.81	
5	13.97	24.95	14.46	27.93	17.23	52.87	
6	13.90	24.55	14.45	27.86	17.19	52.41	
7	14.02	25.23	14.47	27.99	17.26	53.22	
8	14.14	25.94	14.57	28.64	17.37	54.58	
9	14.15	26.00	14.62	28.97	17.40	54.98	*MIMO

\* Worst VHT

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

5775MH

VHT Number	Reading Antenna A [dBm]	Reading Antenna B [dBm]	Result Antenna A+B [dBm]	GI	Remark
9	14.27	14.28	-	Long	*
9	14.19	14.23	-	Short	
9	14.15	14.62	17.40	Long	*
9	14.11	14.46	17.30	Short	

\* Worst GI

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

Method PM-G(Measurement using a Gated RF average power meter) is used.

**Maximum Conducted Output Power**  
 (Reference date timed average power)

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 06, 2016  
 Temperature / Humidity : 25deg. C / 27 % RH  
 Engineer : Satofumi Matsuyama  
 Mode : Tx 11a 6Mbps

**Antenna A**

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result		Limit [dBm]	Margin [dB]
					[dBm]	[mW]		
5745	13.50	-	-	-	13.50	22.39	30.00	16.50
5785	13.50	-	-	-	13.50	22.39	30.00	16.50
5825	13.40	-	-	-	13.40	21.88	30.00	16.60

Sample Calculation:

Power Result = Reading + Duty Factor

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

**Antenna B**

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result		Limit [dBm]	Margin [dB]
					[dBm]	[mW]		
5745	13.40	-	-	-	13.40	21.88	30.00	16.60
5785	13.40	-	-	-	13.40	21.88	30.00	16.60
5825	13.50	-	-	-	13.50	22.39	30.00	16.50

Sample Calculation:

Power Result = Reading + Duty Factor

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

**The test was performed with condition that obtained the maximum timed-average power for comparing power of Tune-up upper limit.**

**Maximum Conducted Output Power**  
 (Reference date timed average power)

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 06, 2016  
 Temperature / Humidity : 25deg. C / 27 % RH  
 Engineer : Satofumi Matsuyama  
 Mode : Tx 11n-20 MCS0

**Antenna A**

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result		Limit [dBm]	Margin [dB]
					[dBm]	[mW]		
5745	13.10	-	-	-	13.10	20.42	30.00	16.90
5785	13.39	-	-	-	13.39	21.83	30.00	16.61
5825	13.20	-	-	-	13.20	20.89	30.00	16.80

Sample Calculation:

Power Result = Reading

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

**Antenna B**

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result		Limit [dBm]	Margin [dB]
					[dBm]	[mW]		
5745	13.15	-	-	-	13.15	20.65	30.00	16.85
5785	13.29	-	-	-	13.29	21.35	30.00	16.71
5825	13.29	-	-	-	13.29	21.33	30.00	16.71

Sample Calculation:

Power Result = Reading

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

**The test was performed with condition that obtained the maximum timed-average power for comparing power of Tune-up upper limit.**

**Maximum Conducted Output Power**  
 (Reference date timed average power)

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 06, 2016  
 Temperature / Humidity : 25deg. C / 27 % RH  
 Engineer : Satofumi Matsuyama  
 Mode : Tx 11n-20 MCS8

**Antenna A+B**

Tested Frequency [MHz]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
	1 [mW]	2 [mW]	Sum [mW]			
5745	20.89	22.39	43.28	16.36	30.00	13.64
5785	20.89	22.39	43.28	16.36	30.00	13.64
5825	20.89	21.88	42.77	16.31	30.00	13.69

Tested Frequency [MHz]	Antenna A					Antenna B				
	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result Power [dBm]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result Power [dBm]
5745	13.20	-	-	-	13.20	13.50	-	-	-	13.50
5785	13.20	-	-	-	13.20	13.50	-	-	-	13.50
5825	13.20	-	-	-	13.20	13.40	-	-	-	13.40

Sample Calculation:

Power Result = Reading

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

**The test was performed with condition that obtained the maximum timed-average power for comparing power of Tune-up upper limit.**

**Maximum Conducted Output Power**  
 (Reference date timed average power)

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 06, 2016  
 Temperature / Humidity : 25deg. C / 27 % RH  
 Engineer : Satofumi Matsuyama  
 Mode : Tx 11ac-20 VHT0

**Antenna A**

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result		Limit [dBm]	Margin [dB]
					[dBm]	[mW]		
5745	13.40	-	-	-	13.40	21.88	30.00	16.60
5785	13.50	-	-	-	13.50	22.39	30.00	16.50
5825	13.40	-	-	-	13.40	21.88	30.00	16.60

Sample Calculation:

Power Result = Reading

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

**Antenna B**

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result		Limit [dBm]	Margin [dB]
					[dBm]	[mW]		
5745	13.50	-	-	-	13.50	22.39	30.00	16.50
5785	13.50	-	-	-	13.50	22.39	30.00	16.50
5825	13.50	-	-	-	13.50	22.39	30.00	16.50

Sample Calculation:

Power Result = Reading

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

**The test was performed with condition that obtained the maximum timed-average power for comparing power of Tune-up upper limit.**

**Maximum Conducted Output Power**  
 (Reference date timed average power)

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 06, 2016  
 Temperature / Humidity : 25deg. C / 27 % RH  
 Engineer : Satofumi Matsuyama  
 Mode : Tx 11ac-20 VHT0

**Antenna A+B**

Tested Frequency [MHz]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
	1 [mW]	2 [mW]	Sum [mW]			
5745	20.89	23.44	44.34	16.47	30.00	13.53
5785	20.89	23.44	44.34	16.47	30.00	13.53
5825	22.39	22.91	45.30	16.56	30.00	13.44

Tested Frequency [MHz]	Antenna A					Antenna B				
	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result Power [dBm]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result Power [dBm]
5745	13.20	-	-	-	13.20	13.70	-	-	-	13.70
5785	13.20	-	-	-	13.20	13.70	-	-	-	13.70
5825	13.50	-	-	-	13.50	13.60	-	-	-	13.60

Sample Calculation:

Power Result = Reading + Duty Factor

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

**The test was performed with condition that obtained the maximum timed-average power for comparing power of Tune-up upper limit.**

**Maximum Conducted Output Power**  
 (Reference date timed average power)

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 14, 2016  
 Temperature / Humidity : 23deg. C / 45 % RH  
 Engineer : Tomohisa Nakagawa  
 Mode : Tx 11n-40 MCS0

**Antenna A**

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result		Limit [dBm]	Margin [dB]
					[dBm]	[mW]		
5755	13.31	-	-	-	13.31	21.43	30.00	16.69
5795	13.48	-	-	-	13.48	22.27	30.00	16.52

Sample Calculation:

Power Result = Reading

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

**Antenna B**

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result		Limit [dBm]	Margin [dB]
					[dBm]	[mW]		
5755	13.48	-	-	-	13.48	22.28	30.00	16.52
5795	13.46	-	-	-	13.46	22.16	30.00	16.55

Sample Calculation:

Power Result = Reading

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

**The test was performed with condition that obtained the maximum timed-average power for comparing power of Tune-up upper limit.**

**Maximum Conducted Output Power**  
 (Reference date timed average power)

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 14, 2016  
 Temperature / Humidity : 23deg. C / 45 % RH  
 Engineer : Tomohisa Nakagawa  
 Mode : Tx 11n-40 MCS8

**Antenna A+B**

Tested Frequency [MHz]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
	1 [mW]	2 [mW]	Sum [mW]			
5755	19.53	22.30	41.83	16.21	30.00	13.79
5795	19.39	22.15	41.54	16.18	30.00	13.82

Tested Frequency [MHz]	Antenna A					Antenna B				
	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result Power [dBm]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result Power [dBm]
5755	12.91	-	-	-	12.91	13.48	-	-	-	13.48
5795	12.88	-	-	-	12.88	13.45	-	-	-	13.45

Sample Calculation:

Power Result = Reading + Duty Factor

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

**The test was performed with condition that obtained the maximum timed-average power for comparing power of Tune-up upper limit.**

**Maximum Conducted Output Power**  
 (Reference date timed average power)

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 14, 2016  
 Temperature / Humidity : 23deg. C / 45 % RH  
 Engineer : Tomohisa Nakagawa  
 Mode : Tx 11ac-40 VHT0

**Antenna A**

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result		Limit [dBm]	Margin [dB]
					[dBm]	[mW]		
5755	13.40	-	-	-	13.40	21.88	30.00	16.60
5795	13.35	-	-	-	13.35	21.63	30.00	16.65

Sample Calculation:

Power Result = Reading

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

**Antenna B**

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result		Limit [dBm]	Margin [dB]
					[dBm]	[mW]		
5755	13.20	-	-	-	13.20	20.89	30.00	16.80
5795	13.30	-	-	-	13.30	21.38	30.00	16.70

Sample Calculation:

Power Result = Reading

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

**The test was performed with condition that obtained the maximum timed-average power for comparing power of Tune-up upper limit.**

**Maximum Conducted Output Power**  
 (Reference date timed average power)

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 14, 2016  
 Temperature / Humidity : 23deg. C / 45 % RH  
 Engineer : Tomohisa Nakagawa  
 Mode : Tx 11ac-40 VHT0

**Antenna A+B**

Tested Frequency [MHz]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
	1 [mW]	2 [mW]	Sum [mW]			
5755	19.59	21.88	41.47	16.18	30.00	13.82
5795	18.97	20.99	39.96	16.02	30.00	13.98

Tested Frequency [MHz]	Antenna A					Antenna B				
	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result Power [dBm]	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result Power [dBm]
5755	12.92	-	-	-	12.92	13.40	-	-	-	13.40
5795	12.78	-	-	-	12.78	13.22	-	-	-	13.22

Sample Calculation:

Power Result = Reading + Duty Factor

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

**The test was performed with condition that obtained the maximum timed-average power for comparing power of Tune-up upper limit.**

**Maximum Conducted Output Power**  
 (Reference date timed average power)

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 14, 2016  
 Temperature / Humidity : 23deg. C / 45 % RH  
 Engineer : Tomohisa Nakagawa  
 Mode : Tx 11ac-80 VHT0

**Antenna A+B**

Tested Frequency [MHz]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
	1 [mW]	2 [mW]	Sum [mW]			
5775	18.95	21.86	40.81	16.11	30.00	13.89

Tested Frequency [MHz]	Antenna A					Result Power [dBm]	Antenna B				
	Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]			Power Meter Reading [dBm]	Cable Loss *1 [dB]	Atten. Loss *1 [dB]	Antenna Gain [dBi]	Result Power [dBm]
5775	12.78	-	-	-		12.78	13.40	-	-	-	13.40

Sample Calculation:

Power Result = Reading

Conducted Power Limit (5750 MHz-5825 MHz) = 1W (30dBm)

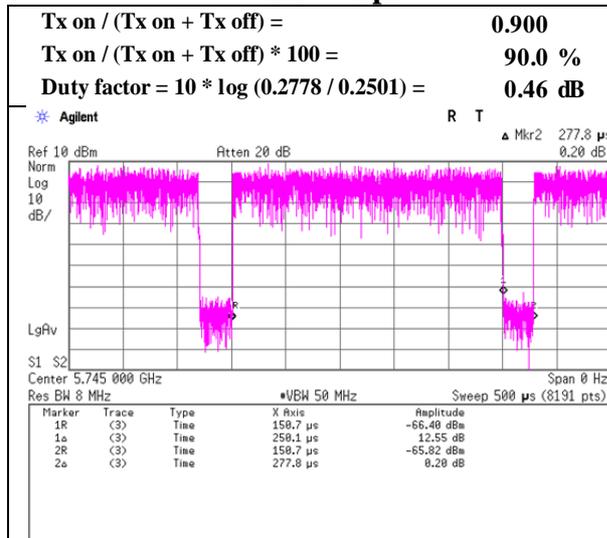
\*1) Cable Loss and Atten. Loss are included in Power Meter Reading value.

**The test was performed with condition that obtained the maximum timed-average power for comparing power of Tune-up upper limit.**

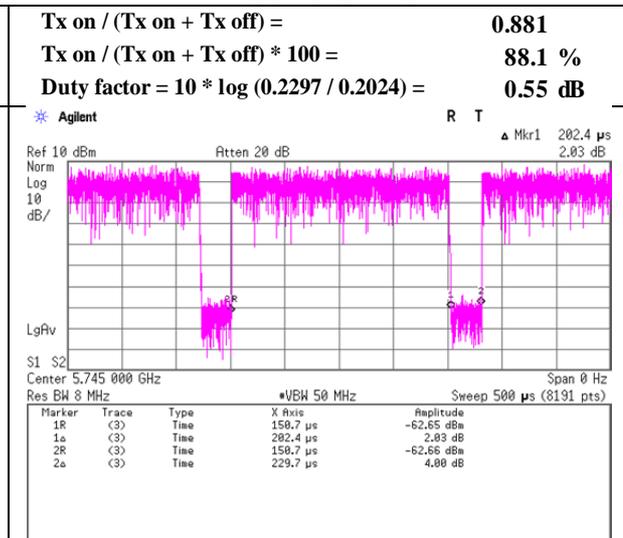
### Burst rate confirmation

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 14, 2016  
 Temperature / Humidity : 23deg. C / 45 % RH  
 Engineer : Tomohisa Nakagawa

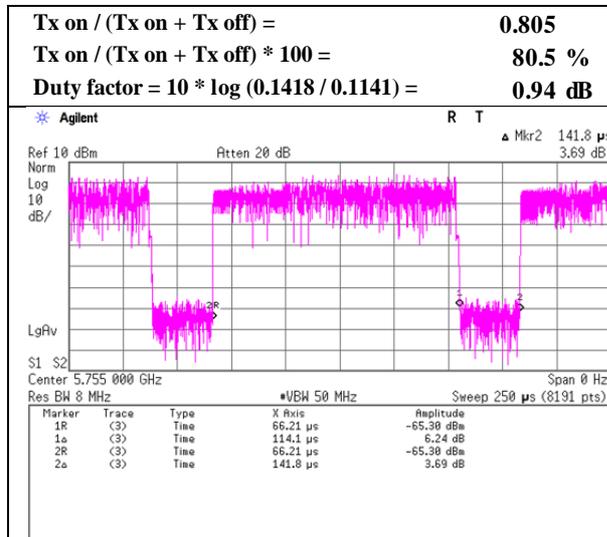
#### 11a 54Mbps



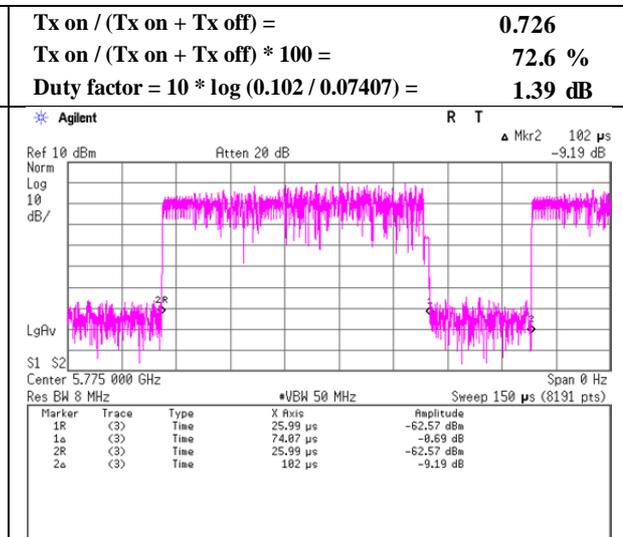
#### 11ac-20 VHT8



#### 11ac-40 VHT9



#### 11ac-80 VHT9



## Maximum Power Spectral Density

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 14, 2016  
 Temperature / Humidity : 23deg. C / 45 % RH  
 Engineer : Tomohisa Nakagawa  
 Mode : Tx 11a

### Antenna A

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	-12.96	3.03	9.95	0.46	2.30	0.27	0.75	30.00	29.25	3.05	36.00	32.95
5785	-13.28	3.04	9.95	0.46	2.30	0.27	0.44	30.00	29.56	2.74	36.00	33.26
5825	-12.63	3.05	9.95	0.46	2.30	0.27	1.09	30.00	28.91	3.39	36.00	32.61

### Antenna B

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	-13.02	3.03	9.95	0.46	1.87	0.27	0.69	30.00	29.31	2.56	36.00	33.44
5785	-13.32	3.04	9.95	0.46	1.87	0.27	0.40	30.00	29.60	2.27	36.00	33.73
5825	-12.87	3.05	9.95	0.46	1.87	0.27	0.86	30.00	29.14	2.73	36.00	33.27

#### Sample Calculation:

PSD: Power Spectral Density

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

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

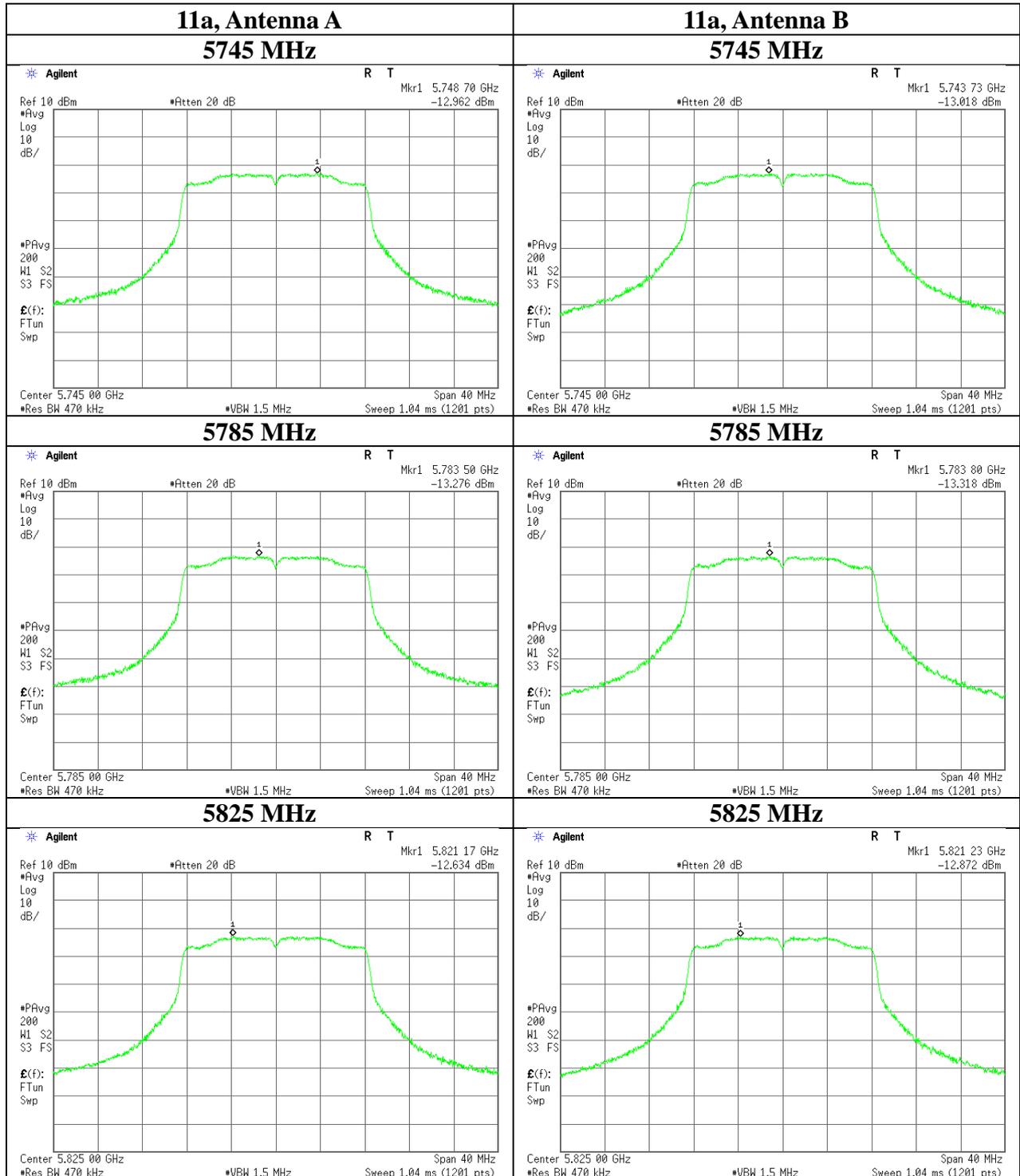
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor

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)

### Maximum Power Spectral Density

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11228681H
Date	April 14, 2016
Temperature / Humidity	23deg. C / 45 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx 11a



## Maximum Power Spectral Density

Test place : Ise EMC Lab. No.6 Measurement Room  
 Report No. : 11228681H  
 Date : April 14, 2016  
 Temperature / Humidity : 23deg. C / 45 % RH  
 Engineer : Tomohisa Nakagawa  
 Mode : Tx 11ac-20

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD (Conducted)						PSD (e.i.r.p.)					
	Antenna			Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]	Antenna			Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]
	1 [mW/MHz]	2 [mW/MHz]	Sum [mW/MHz]				1 [mW/MHz]	2 [mW/MHz]	Sum [mW/MHz]			
5745	1.00	0.95	1.95	2.90	30.00	27.10	1.71	1.61	3.31	5.20	36.00	30.80
5785	0.88	0.87	1.74	2.41	30.00	27.59	1.49	1.47	2.96	4.71	36.00	31.29
5825	1.03	1.05	2.08	3.18	30.00	26.82	1.75	1.78	3.53	5.48	36.00	30.52

Tested Frequency [MHz]	Duty Factor [dB]	RBW Correction Factor [dB]	Antenna A					Antenna B					PSD Result	
			PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	PSD Cond. [dBm/MHz]	PSD e.i.r.p. [dBm/MHz]	PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	PSD Cond. [dBm/MHz]	PSD e.i.r.p. [dBm/MHz]
5745	0.55	0.27	-13.78	3.03	9.95	2.30	0.02	2.32	-14.03	3.03	9.95	2.30	-0.23	2.07
5785	0.55	0.27	-14.38	3.04	9.95	2.30	-0.58	1.72	-14.43	3.04	9.95	2.30	-0.62	1.68
5825	0.55	0.27	-13.68	3.05	9.95	2.30	0.14	2.44	-13.62	3.05	9.95	2.30	0.20	2.50

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

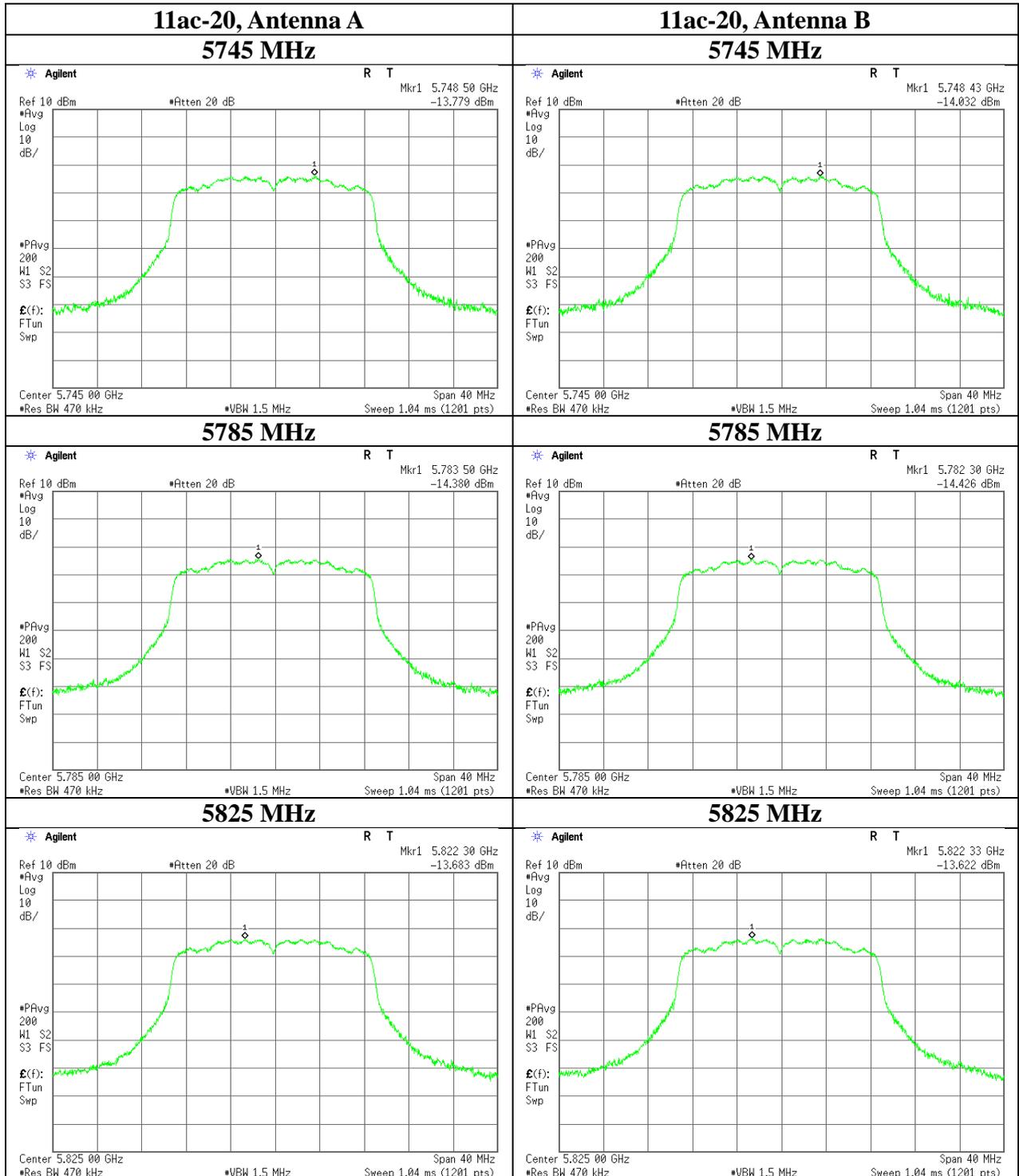
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Antenna directional Gain =  $G_{\text{ANT MAX}} + 10 \log(N_{\text{ANT}} / N_{\text{SS}})$

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)

### Maximum Power Spectral Density

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11228681H
Date	April 14, 2016
Temperature / Humidity	23deg. C / 45 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx 11ac-20



## Maximum Power Spectral Density

Test place : Ise EMC Lab. No.6 Measurement Room  
Report No. : 11228681H  
Date : April 14, 2016  
Temperature / Humidity : 23deg. C / 45 % RH  
Engineer : Tomohisa Nakagawa  
Mode : Tx 11ac-40

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD (Conducted)						PSD (e.i.r.p.)					
	Antenna			Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]	Antenna			Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]
	1 [mW/MHz]	2 [mW/MHz]	Sum [mW/MHz]				1 [mW/MHz]	2 [mW/MHz]	Sum [mW/MHz]			
5755	0.53	0.74	1.27	1.03	30.00	28.97	0.89	1.26	2.15	3.33	36.00	32.67
5795	0.53	0.59	1.12	0.49	30.00	29.51	0.89	1.01	1.90	2.79	36.00	33.21

Tested Frequency [MHz]	Duty Factor [dB]	RBW Correction Factor [dB]	Antenna A					Antenna B						
			PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	PSD Result Cond. [dBm/MHz]	PSD Result e.i.r.p. [dBm/MHz]	PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	PSD Result Cond. [dBm/MHz]	PSD Result e.i.r.p. [dBm/MHz]
			5755	0.94	0.27	-16.98	3.04	9.95	2.30	-2.79	-0.49	-15.49	3.04	9.95
5795	0.94	0.27	-16.98	3.04	9.95	2.30	-2.79	-0.49	-16.46	3.04	9.95	2.30	-2.27	0.03

Sample Calculation:

PSD: Power Spectral Density

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

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

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

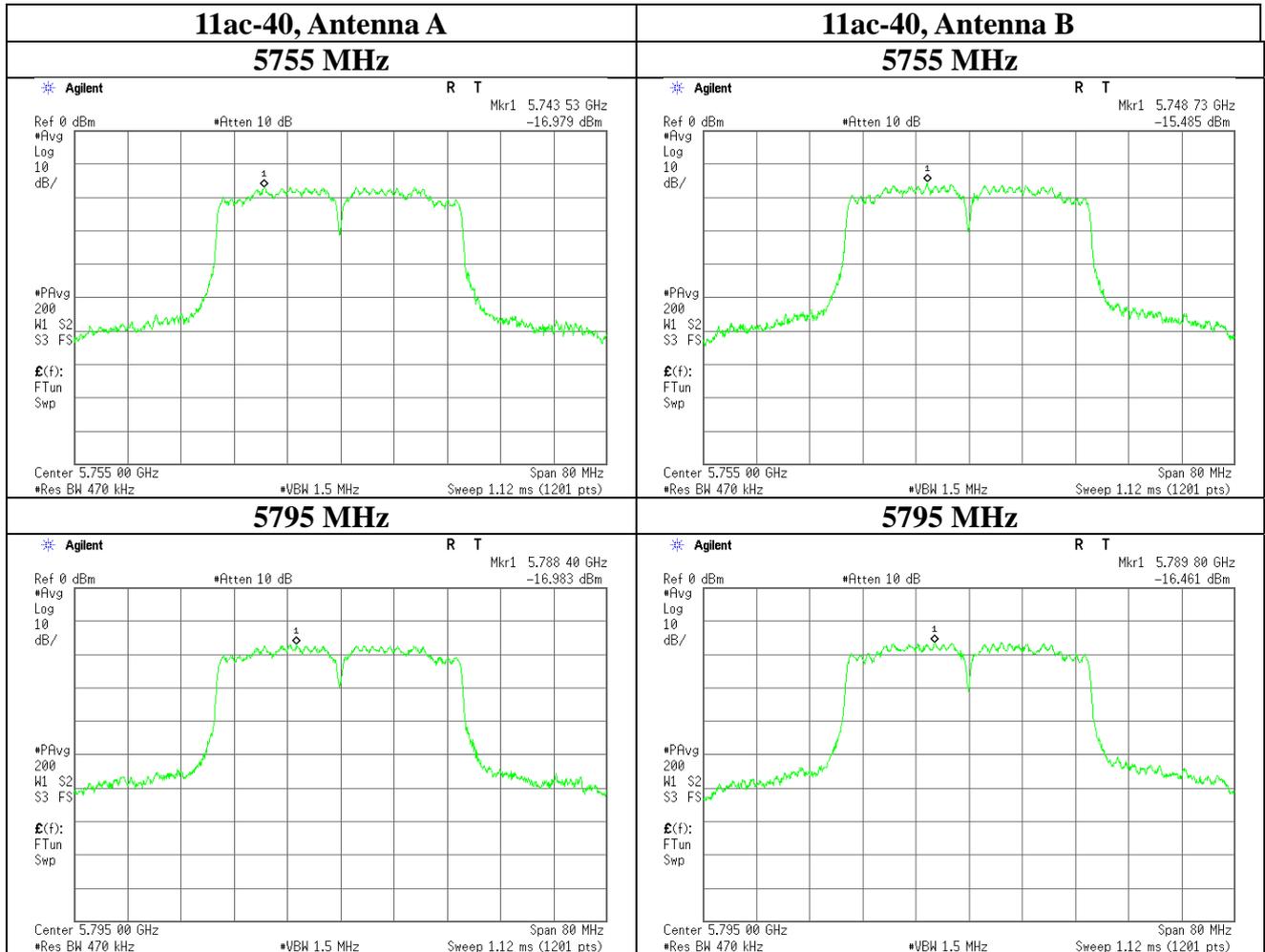
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Antenna directional Gain =  $G_{ANT\ MAX} + 10 \log(N_{ANT} / N_{SS})$

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)

### Maximum Power Spectral Density

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11228681H
Date	April 14, 2016
Temperature / Humidity	23deg. C / 45 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx 11ac-40



**UL Japan, Inc.**

**Ise EMC Lab.**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## Maximum Power Spectral Density

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11228681H
Date	April 7, 2016
Temperature / Humidity	25deg. C / 41 % RH
Engineer	Satofumi Matsuyama
Mode	Tx 11ac-80

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD (Conducted)						PSD (e.i.r.p.)					
	Antenna		Sum	Result	Limit	Margin	Antenna		Sum	Result	Limit	Margin
	1	2					1	2				
[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[mW/MHz]	[mW/MHz]	[mW/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	
5775	0.37	0.40	0.78	-1.10	30.00	31.10	0.63	0.69	1.32	1.20	36.00	34.80

Tested Frequency [MHz]	Antenna A						Antenna B							
	Duty Factor	RBW Correction Factor	PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result Cond.	e.i.r.p.	PSD Reading	Cable Loss	Atten. Loss	Antenna Gain	PSD Result Cond.	e.i.r.p.
	[dB]	[dB]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]	[dBm/MHz]	[dB]	[dB]	[dBi]	[dBm/MHz]	[dBm/MHz]
5775	1.39	0.27	-18.94	3.04	9.95	2.30	-4.29	-1.99	-18.57	3.04	9.95	2.30	-3.93	-1.63

Sample Calculation:

PSD: Power Spectral Density

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

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

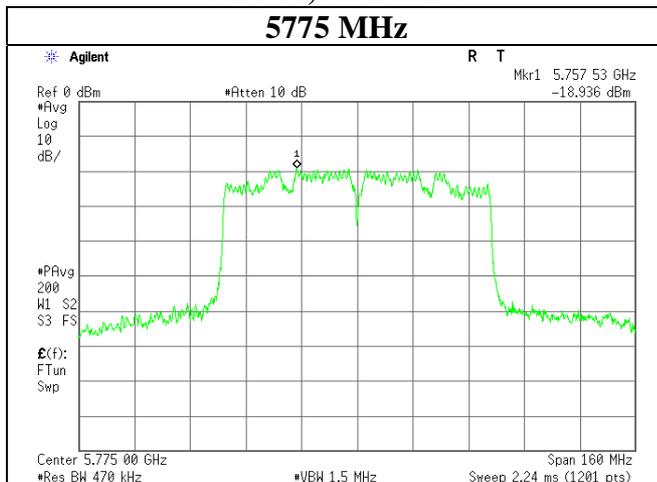
PSD Result (Conducted) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + RBW Correction Factor

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

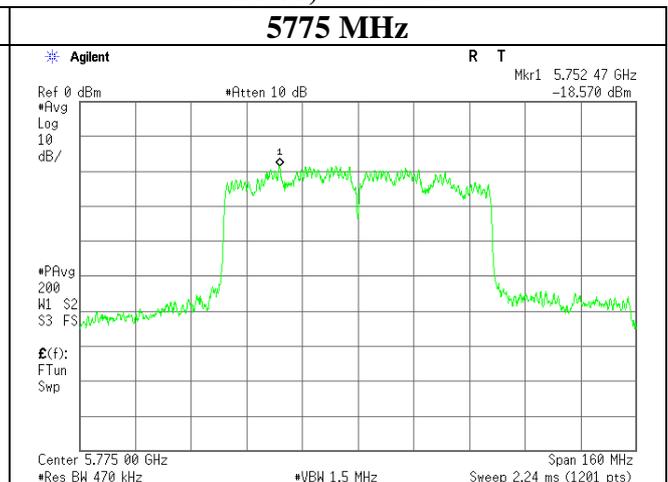
Antenna directional Gain =  $G_{ANT\ MAX} + 10 \log(N_{ANT} / N_{SS})$

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)

**11ac-80, Antenna A**



**11ac-80, Antenna B**



## Radiated Spurious Emission

Test place	Ise EMC Lab.	
Report No.	11228681H	
Semi Anechoic Chamber	No.1	No.1
Date	April 16, 2016	April 17, 2016
Temperature / Humidity	21deg. C / 27 % RH	22deg. C / 49 % RH
Engineer	Takafumi Noguchi	Tomoki Matsui
	(1-10GHz)	(Above 10GHz)
Mode	Tx 11ac-20 5745 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4924.232	PK	52.4	32.0	6.2	35.5	-	55.1	73.9	18.8	
Hori	5650.000	PK	50.6	32.8	6.5	35.4	-	54.5	68.2	13.7	
Hori	5700.000	PK	50.9	32.8	6.5	35.5	-	54.7	105.2	50.5	
Hori	5720.000	PK	58.1	32.9	6.5	35.5	-	62.0	110.8	48.8	
Hori	5725.000	PK	63.1	32.9	6.5	35.5	-	67.0	122.2	55.2	
Hori	11490.000	PK	46.6	40.5	-1.4	35.2	-	50.5	73.9	23.4	
Hori	17235.000	PK	45.6	42.9	0.1	35.0	-	53.6	73.9	20.3	Floor Noise
Hori	22980.000	PK	46.9	41.2	-0.6	34.7	-	52.8	73.9	21.1	
Hori	4924.232	AV	47.2	32.0	6.2	35.5	0.6	50.5	53.9	3.4	
Hori	11490.000	AV	41.5	40.5	-1.4	35.2	0.6	46.0	53.9	7.9	
Hori	17235.000	AV	36.4	42.9	0.1	35.0	-	44.4	53.9	9.5	Floor Noise
Hori	22980.000	AV	39.0	41.2	-0.6	34.7	0.6	45.5	53.9	8.4	
Vert	4924.232	PK	53.5	32.0	6.2	35.5	-	56.2	73.9	17.7	
Vert	5650.000	PK	48.2	32.8	6.5	35.4	-	52.1	68.2	16.1	
Vert	5700.000	PK	50.9	32.8	6.5	35.5	-	54.7	105.2	50.5	
Vert	5720.000	PK	59.7	32.9	6.5	35.5	-	63.6	110.8	47.2	
Vert	5725.000	PK	64.8	32.9	6.5	35.5	-	68.7	122.2	53.5	
Vert	11490.000	PK	50.0	40.5	-1.4	35.2	-	53.9	73.9	20.0	
Vert	17235.000	PK	45.2	42.9	0.1	35.0	-	53.2	73.9	20.7	Floor Noise
Vert	22980.000	PK	48.3	41.2	-0.6	34.7	-	54.2	73.9	19.7	
Vert	4924.232	AV	48.3	32.0	6.2	35.5	0.6	51.6	53.9	2.3	
Vert	11490.000	AV	45.5	40.5	-1.4	35.2	0.6	50.0	53.9	3.9	
Vert	17235.000	AV	36.8	42.9	0.1	35.0	-	44.8	53.9	9.1	Floor Noise
Vert	22980.000	AV	41.2	41.2	-0.6	34.7	0.6	47.7	53.9	6.2	

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

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

Distance factor:	1GHz-10GHz	20log(3.9m/3.0m)= 2.28dB
	10GHz-26.5GHz	20log(1.0m/3.0m)= -9.5dB
	26.5GHz-40GHz	20log(0.5m/3.0m)= -15.6dB

**UL Japan, Inc.**

**Ise EMC Lab.**

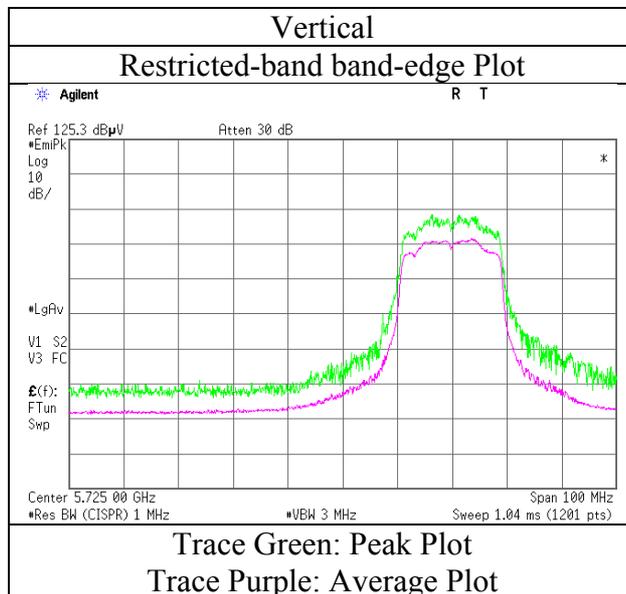
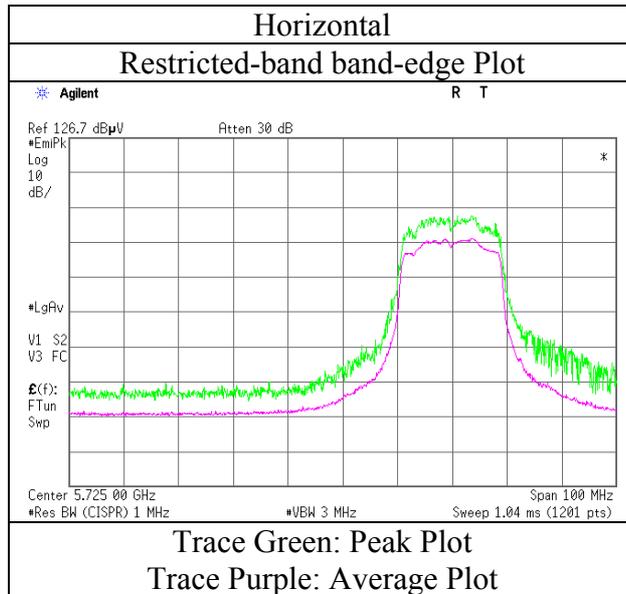
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## Radiated Spurious Emission

Test place	Ise EMC Lab.
Report No.	11228681H
Semi Anechoic Chamber	No.1
Date	April 16, 2016
Temperature / Humidity	21deg. C / 27 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11ac-20 5745 MHz



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

**UL Japan, Inc.**

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

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## Radiated Spurious Emission

Test place	Ise EMC Lab.	
Report No.	11228681H	
Semi Anechoic Chamber	No.1	No.1
Date	April 16, 2016	April 17, 2016
Temperature / Humidity	21deg. C / 27 % RH	22deg. C / 49 % RH
Engineer	Takafumi Noguchi	Tomoki Matsui
	(1-10GHz)	(Above 10GHz)
Mode	Tx 11ac-20 5785 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4958.507	PK	52.4	32.1	6.2	35.5	-	55.2	73.9	18.7	
Hori	11570.000	PK	48.4	40.5	-1.4	35.2	-	52.3	73.9	21.6	
Hori	17355.000	PK	43.6	43.5	0.3	35.0	-	52.4	73.9	21.5	Floor Noise
Hori	23140.000	PK	46.6	41.2	-0.6	34.6	-	52.6	73.9	21.3	
Hori	4958.507	AV	47.4	32.1	6.2	35.5	0.6	50.8	53.9	3.1	
Hori	11570.000	AV	43.4	40.5	-1.4	35.2	0.6	47.9	53.9	6.0	
Hori	17355.000	AV	35.4	43.5	0.3	35.0	-	44.2	53.9	9.7	Floor Noise
Hori	23140.000	AV	39.1	41.2	-0.6	34.6	0.6	45.7	53.9	8.2	
Vert	4958.507	PK	54.4	32.1	6.2	35.5	-	57.2	73.9	16.7	
Vert	11570.000	PK	50.6	40.5	-1.4	35.2	-	54.5	73.9	19.4	
Vert	17355.000	PK	43.8	43.5	0.3	35.0	-	52.6	73.9	21.3	Floor Noise
Vert	23140.000	PK	48.1	41.2	-0.6	34.6	-	54.1	73.9	19.8	
Vert	4958.507	AV	49.9	32.1	6.2	35.5	0.6	53.3	53.9	0.6	
Vert	11570.000	AV	46.2	40.5	-1.4	35.2	0.6	50.7	53.9	3.2	
Vert	17355.000	AV	35.4	43.5	0.3	35.0	-	44.2	53.9	9.7	Floor Noise
Vert	23140.000	AV	41.7	41.2	-0.6	34.6	0.6	48.3	53.9	5.6	

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

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

Distance factor:    1GHz-10GHz    20log(3.9m/3.0m)= 2.28dB  
                          10GHz-26.5GHz    20log(1.0m/3.0m)= -9.5dB  
                          26.5GHz-40GHz    20log(0.5m/3.0m)= -15.6dB

## Radiated Spurious Emission

Test place	Ise EMC Lab.	
Report No.	11228681H	
Semi Anechoic Chamber	No.1	No.1
Date	April 16, 2016	April 17, 2016
Temperature / Humidity	21deg. C / 27 % RH	22deg. C / 49 % RH
Engineer	Takafumi Noguchi	Tomoki Matsui
	(1-10GHz)	(Above 10GHz)
Mode	Tx 11ac-20 5825 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4992.712	PK	52.8	32.1	6.2	35.5	-	55.6	73.9	18.3	
Hori	5850.000	PK	58.7	33.0	6.6	35.5	-	62.8	122.2	59.4	
Hori	5855.000	PK	55.4	33.0	6.6	35.5	-	59.5	110.8	51.3	
Hori	5875.000	PK	48.1	33.0	6.6	35.5	-	52.2	105.2	53.0	
Hori	5925.000	PK	46.0	33.0	6.6	35.5	-	50.1	68.2	18.1	
Hori	11650.000	PK	50.4	40.5	-1.3	35.2	-	54.4	73.9	19.5	
Hori	17475.000	PK	44.2	44.0	0.4	35.0	-	53.6	73.9	20.3	Floor Noise
Hori	23300.000	PK	46.6	41.1	-0.5	34.5	-	52.7	73.9	21.2	
Hori	4992.712	AV	47.5	32.1	6.2	35.5	0.6	50.9	53.9	3.0	
Hori	11650.000	AV	45.9	40.5	-1.3	35.2	0.6	50.5	53.9	3.4	
Hori	17475.000	AV	35.8	44.0	0.4	35.0	-	45.2	53.9	8.7	Floor Noise
Hori	23300.000	AV	38.2	41.1	-0.5	34.5	0.6	44.9	53.9	9.0	
Vert	4992.712	PK	53.9	32.1	6.2	35.5	-	56.7	73.9	17.2	
Vert	5850.000	PK	60.5	33.0	6.6	35.5	-	64.6	122.2	57.6	
Vert	5855.000	PK	56.8	33.0	6.6	35.5	-	60.9	110.8	49.9	
Vert	5875.000	PK	47.0	33.0	6.6	35.5	-	51.1	105.2	54.1	
Vert	5925.000	PK	45.2	33.0	6.6	35.5	-	49.3	68.2	18.9	
Vert	11650.000	PK	49.8	40.5	-1.3	35.2	-	53.8	73.9	20.1	
Vert	17475.000	PK	44.4	44.0	0.4	35.0	-	53.8	73.9	20.1	Floor Noise
Vert	23300.000	PK	48.8	41.1	-0.5	34.5	-	54.9	73.9	19.0	
Vert	4992.712	AV	49.3	32.1	6.2	35.5	0.6	52.7	53.9	1.2	
Vert	11650.000	AV	44.7	40.5	-1.3	35.2	0.6	49.3	53.9	4.6	
Vert	17475.000	AV	35.8	44.0	0.4	35.0	-	45.2	53.9	8.7	Floor Noise
Vert	23300.000	AV	41.3	41.1	-0.5	34.5	0.6	48.0	53.9	5.9	

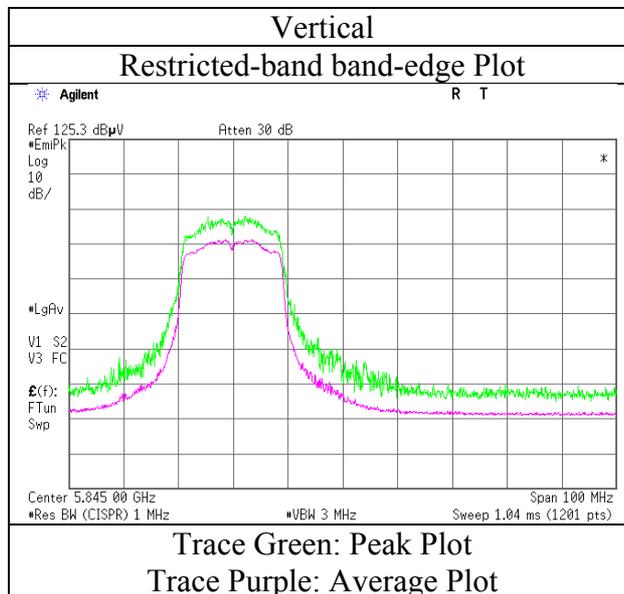
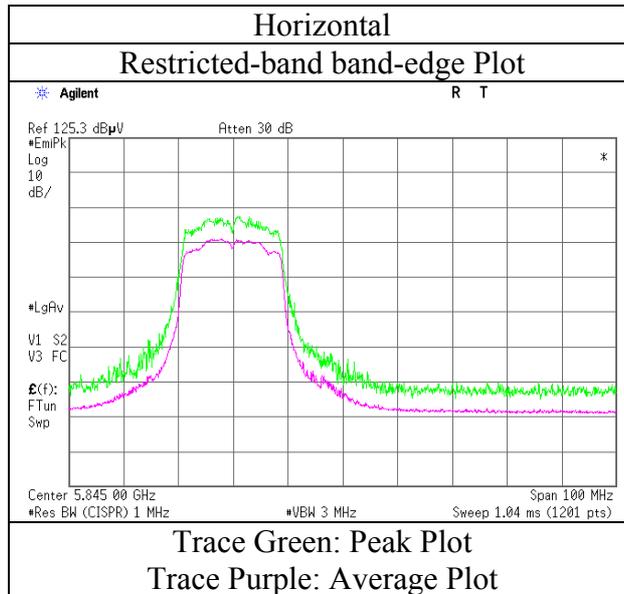
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor:	1GHz-10GHz	20log(3.9m/3.0m)= 2.28dB
	10GHz-26.5GHz	20log(1.0m/3.0m)= -9.5dB
	26.5GHz-40GHz	20log(0.5m/3.0m)= -15.6dB

## Radiated Spurious Emission

Test place	Ise EMC Lab.
Report No.	11228681H
Semi Anechoic Chamber	No.1
Date	April 16, 2016
Temperature / Humidity	21deg. C / 27 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11ac-20 5825 MHz



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

**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

Test place	Ise EMC Lab.	
Report No.	11228681H	
Semi Anechoic Chamber	No.1	No.1
Date	April 16, 2016	April 17, 2016
Temperature / Humidity	21deg. C / 27 % RH	22deg. C / 49 % RH
Engineer	Takafumi Noguchi	Tomoki Matsui
	(1-10GHz)	(Above 10GHz)
Mode	Tx 11ac-40 5755 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4932.752	PK	53.3	32.0	6.2	35.5	-	56.0	73.9	17.9	
Hori	5650.000	PK	50.8	32.8	6.5	35.4	-	54.7	68.2	13.5	
Hori	5700.000	PK	55.7	32.8	6.5	35.5	-	59.5	105.2	45.7	
Hori	5720.000	PK	63.7	32.9	6.5	35.5	-	67.6	110.8	43.2	
Hori	5725.000	PK	66.6	32.9	6.5	35.5	-	70.5	122.2	51.7	
Hori	11510.000	PK	47.5	40.5	-1.4	35.2	-	51.4	73.9	22.5	
Hori	17265.000	PK	43.9	43.1	0.2	35.0	-	52.2	73.9	21.7	Floor Noise
Hori	23020.000	PK	47.1	41.2	-0.6	34.7	-	53.0	73.9	20.9	
Hori	4932.752	AV	48.5	32.0	6.2	35.5	0.9	52.1	53.9	1.8	
Hori	11510.000	AV	42.2	40.5	-1.4	35.2	0.9	47.0	53.9	6.9	
Hori	17265.000	AV	35.6	43.1	0.2	35.0	-	43.9	53.9	10.0	Floor Noise
Hori	23020.000	AV	39.5	41.2	-0.6	34.7	0.9	46.3	53.9	7.6	
Vert	4932.752	PK	53.0	32.0	6.2	35.5	-	55.7	73.9	18.2	
Vert	5650.000	PK	50.9	32.8	6.5	35.4	-	54.8	68.2	13.4	
Vert	5700.000	PK	57.9	32.8	6.5	35.5	-	61.7	105.2	43.5	
Vert	5720.000	PK	65.8	32.9	6.5	35.5	-	69.7	110.8	41.1	
Vert	5725.000	PK	69.2	32.9	6.5	35.5	-	73.1	122.2	49.1	
Vert	11510.000	PK	49.8	40.5	-1.4	35.2	-	53.7	73.9	20.2	
Vert	17265.000	PK	44.0	43.1	0.2	35.0	-	52.3	73.9	21.6	Floor Noise
Vert	23020.000	PK	48.8	41.2	-0.6	34.7	-	54.7	73.9	19.2	
Vert	4932.752	AV	47.8	32.0	6.2	35.5	0.9	51.4	53.9	2.5	
Vert	11510.000	AV	45.1	40.5	-1.4	35.2	0.9	49.9	53.9	4.0	
Vert	17265.000	AV	35.4	43.1	0.2	35.0	-	43.7	53.9	10.2	Floor Noise
Vert	23020.000	AV	41.4	41.2	-0.6	34.7	0.9	48.2	53.9	5.7	

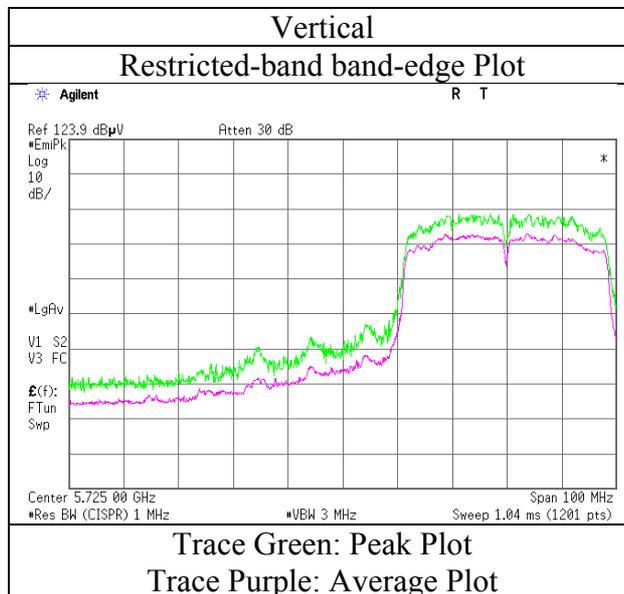
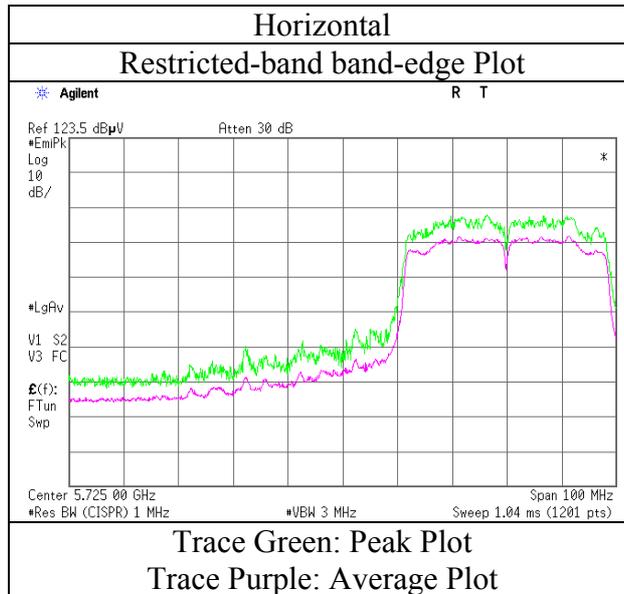
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor:    1GHz-10GHz    20log(3.9m/3.0m)= 2.28dB  
                          10GHz-26.5GHz    20log(1.0m/3.0m)= -9.5dB  
                          26.5GHz-40GHz    20log(0.5m/3.0m)= -15.6dB

## Radiated Spurious Emission

Test place	Ise EMC Lab.
Report No.	11228681H
Semi Anechoic Chamber	No.1
Date	April 16, 2016
Temperature / Humidity	21deg. C / 27 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11ac-40 5755 MHz



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

## Radiated Spurious Emission

Test place	Ise EMC Lab.	
Report No.	11228681H	
Semi Anechoic Chamber	No.1	No.1
Date	April 16, 2016	April 17, 2016
Temperature / Humidity	21deg. C / 27 % RH	22deg. C / 49 % RH
Engineer	Takafumi Noguchi	Tomoki Matsui
	(1-10GHz)	(Above 10GHz)
Mode	Tx 11ac-40 5795 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4967.023	PK	53.2	32.1	6.2	35.5	-	56.0	73.9	17.9	
Hori	5850.000	PK	53.6	33.0	6.6	35.5	-	57.7	122.2	64.5	
Hori	5855.000	PK	51.9	33.0	6.6	35.5	-	56.0	110.8	54.8	
Hori	5875.000	PK	48.7	33.0	6.6	35.5	-	52.8	105.2	52.4	
Hori	5925.000	PK	45.7	33.0	6.6	35.5	-	49.8	68.2	18.4	
Hori	11590.000	PK	50.7	40.5	-1.4	35.2	-	54.6	73.9	19.3	
Hori	17385.000	PK	44.5	43.6	0.3	35.0	-	53.4	73.9	20.5	Floor Noise
Hori	23180.000	PK	46.6	41.1	-0.6	34.6	-	52.5	73.9	21.4	
Hori	4967.023	AV	48.0	32.1	6.2	35.5	0.9	51.7	53.9	2.2	
Hori	11590.000	AV	45.4	40.5	-1.4	35.2	0.9	50.2	53.9	3.7	
Hori	17385.000	AV	35.9	43.6	0.3	35.0	-	44.8	53.9	9.1	Floor Noise
Hori	23180.000	AV	38.5	41.1	-0.6	34.6	0.9	45.3	53.9	8.6	
Vert	4967.023	PK	53.0	32.1	6.2	35.5	-	55.8	73.9	18.1	
Vert	5850.000	PK	54.4	33.0	6.6	35.5	-	58.5	122.2	63.7	
Vert	5855.000	PK	51.3	33.0	6.6	35.5	-	55.4	110.8	55.4	
Vert	5875.000	PK	51.9	33.0	6.6	35.5	-	56.0	105.2	49.2	
Vert	5925.000	PK	49.2	33.0	6.6	35.5	-	53.3	68.2	14.9	
Vert	11590.000	PK	50.2	40.5	-1.4	35.2	-	54.1	73.9	19.8	
Vert	17385.000	PK	44.8	43.6	0.3	35.0	-	53.7	73.9	20.2	Floor Noise
Vert	23180.000	PK	48.2	41.1	-0.6	34.6	-	54.1	73.9	19.8	
Vert	4967.023	AV	47.6	32.1	6.2	35.5	0.9	51.3	53.9	2.6	
Vert	11590.000	AV	45.4	40.5	-1.4	35.2	0.9	50.2	53.9	3.7	
Vert	17385.000	AV	35.7	43.6	0.3	35.0	-	44.6	53.9	9.3	Floor Noise
Vert	23180.000	AV	40.6	41.1	-0.6	34.6	0.9	47.4	53.9	6.5	

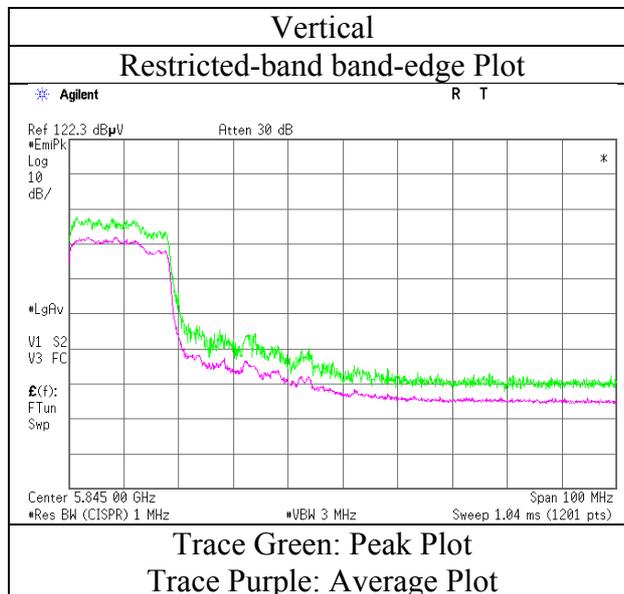
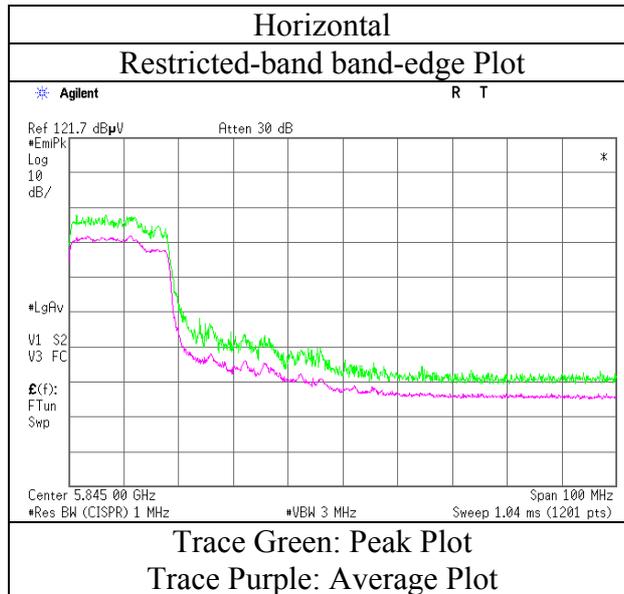
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor:    1GHz-10GHz    20log(3.9m/3.0m)= 2.28dB  
                          10GHz-26.5GHz    20log(1.0m/3.0m)= -9.5dB  
                          26.5GHz-40GHz    20log(0.5m/3.0m)= -15.6dB

## Radiated Spurious Emission

Test place	Ise EMC Lab.
Report No.	11228681H
Semi Anechoic Chamber	No.1
Date	April 16, 2016
Temperature / Humidity	21deg. C / 27 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11ac-40 5795 MHz



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

**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

Test place	Ise EMC Lab.	
Report No.	11228681H	
Semi Anechoic Chamber	No.1	No.1
Date	April 16, 2016	April 17, 2016
Temperature / Humidity	21deg. C / 27 % RH	22deg. C / 49 % RH
Engineer	Takafumi Noguchi	Tomoki Matsui
	(1-10GHz)	(Above 10GHz and Below 1GHz)
Mode	Tx 11ac-80 5775 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	72.003	QP	54.7	6.2	8.0	39.2	-	29.7	40.0	10.3	
Hori	84.029	QP	53.2	7.4	8.2	39.3	-	29.5	40.0	10.5	
Hori	99.612	QP	60.1	9.9	8.4	39.2	-	39.2	43.5	4.3	
Hori	139.403	QP	50.2	14.3	8.9	39.2	-	34.2	43.5	9.3	
Hori	298.742	QP	59.6	13.4	10.5	38.8	-	44.7	46.0	1.3	
Hori	399.631	QP	46.2	15.6	11.3	38.5	-	34.6	46.0	11.4	
Hori	4949.907	PK	51.7	32.1	6.2	35.5	-	54.5	73.9	19.4	
Hori	5650.000	PK	53.1	32.8	6.5	35.4	-	57.0	68.2	11.2	
Hori	5700.000	PK	60.2	32.8	6.5	35.5	-	64.0	105.2	41.2	
Hori	5720.000	PK	63.6	32.9	6.5	35.5	-	67.5	110.8	43.3	
Hori	5725.000	PK	65.4	32.9	6.5	35.5	-	69.3	122.2	52.9	
Hori	5850.000	PK	61.9	33.0	6.6	35.5	-	66.0	122.2	56.2	
Hori	5855.000	PK	61.0	33.0	6.6	35.5	-	65.1	110.8	45.7	
Hori	5875.000	PK	53.3	33.0	6.6	35.5	-	57.4	105.2	47.8	
Hori	5925.000	PK	47.9	33.0	6.6	35.5	-	52.0	68.2	16.2	
Hori	11550.000	PK	47.6	40.5	-1.4	35.2	-	51.5	73.9	22.4	
Hori	17325.000	PK	43.2	43.3	0.3	35.0	-	51.8	73.9	22.1	Floor Noise
Hori	23100.000	PK	47.1	41.2	-0.6	34.6	-	53.1	73.9	20.8	
Hori	4949.907	AV	45.5	32.1	6.2	35.5	1.4	49.7	53.9	4.2	
Hori	11550.000	AV	42.2	40.5	-1.4	35.2	1.4	47.5	53.9	6.4	
Hori	17325.000	AV	35.1	43.3	0.3	35.0	-	43.7	53.9	10.2	Floor Noise
Hori	23100.000	AV	38.6	41.2	-0.6	34.6	1.4	46.0	53.9	7.9	
Vert	72.004	QP	51.5	6.2	8.0	39.2	-	26.5	40.0	13.5	
Vert	99.614	QP	55.6	9.9	8.4	39.2	-	34.7	43.5	8.8	
Vert	137.558	QP	45.8	14.2	8.9	39.2	-	29.7	43.5	13.8	
Vert	264.002	QP	44.6	12.8	10.2	38.9	-	28.7	46.0	17.3	
Vert	298.731	QP	56.0	13.4	10.5	38.8	-	41.1	46.0	4.9	
Vert	312.000	QP	45.0	13.7	10.6	38.8	-	30.5	46.0	15.5	
Vert	4949.907	PK	52.7	32.1	6.2	35.5	-	55.5	73.9	18.4	
Vert	5650.000	PK	52.2	32.8	6.5	35.4	-	56.1	68.2	12.1	
Vert	5700.000	PK	60.5	32.8	6.5	35.5	-	64.3	105.2	40.9	
Vert	5720.000	PK	64.9	32.9	6.5	35.5	-	68.8	110.8	42.0	
Vert	5725.000	PK	67.3	32.9	6.5	35.5	-	71.2	122.2	51.0	
Vert	5850.000	PK	62.8	33.0	6.6	35.5	-	66.9	122.2	55.3	
Vert	5855.000	PK	64.0	33.0	6.6	35.5	-	68.1	110.8	42.7	
Vert	5875.000	PK	53.7	33.0	6.6	35.5	-	57.8	105.2	47.4	
Vert	5925.000	PK	48.6	33.0	6.6	35.5	-	52.7	68.2	15.5	
Vert	11550.000	PK	49.6	40.5	-1.4	35.2	-	53.5	73.9	20.4	
Vert	17325.000	PK	43.1	43.3	0.3	35.0	-	51.7	73.9	22.2	Floor Noise
Vert	23100.000	PK	48.0	41.2	-0.6	34.6	-	54.0	73.9	19.9	
Vert	4949.907	AV	46.6	32.1	6.2	35.5	1.4	50.8	53.9	3.1	
Vert	11550.000	AV	45.8	40.5	-1.4	35.2	1.4	51.1	53.9	2.8	
Vert	17325.000	AV	34.9	43.3	0.3	35.0	-	43.5	53.9	10.4	Floor Noise
Vert	23100.000	AV	40.5	41.2	-0.6	34.6	1.4	47.9	53.9	6.0	

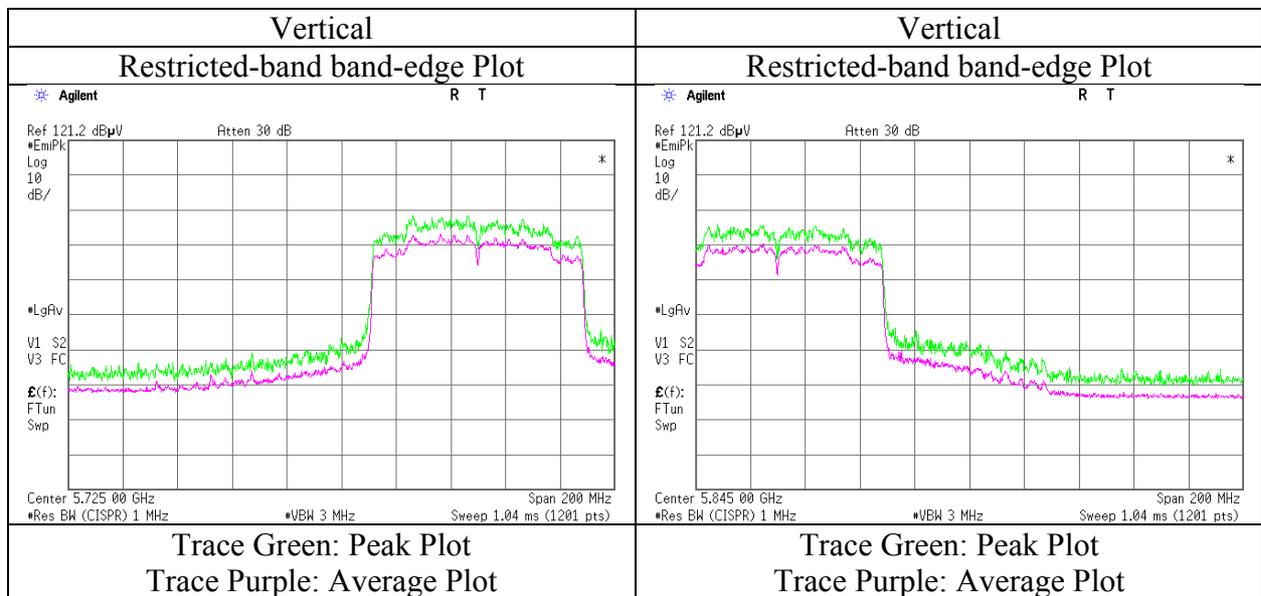
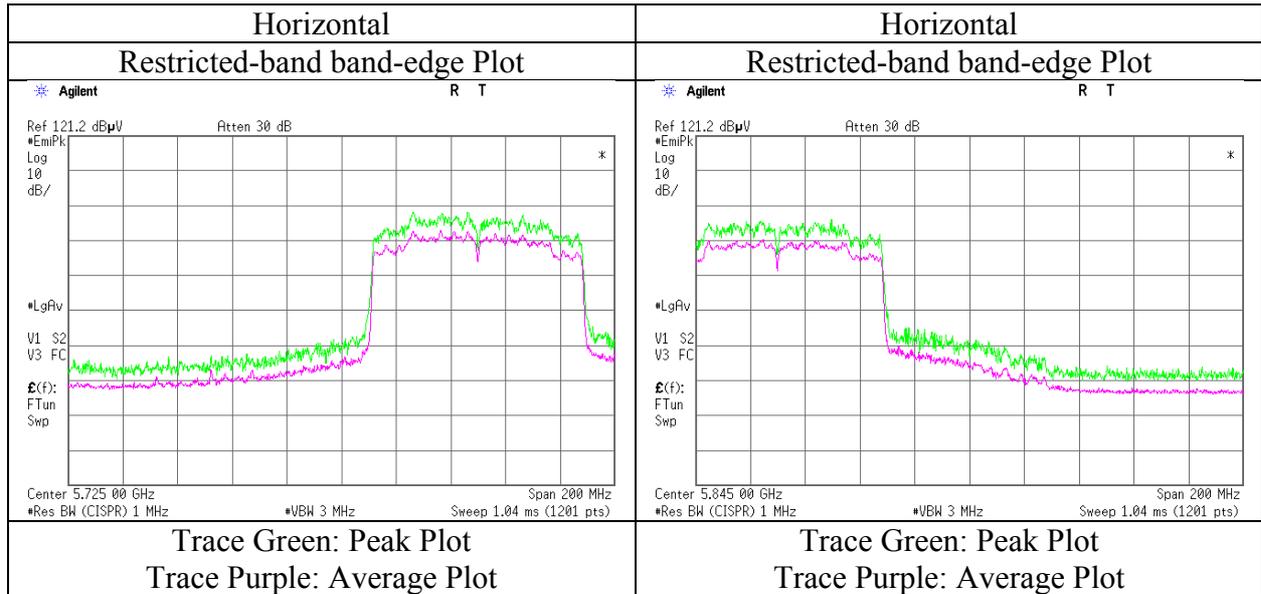
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor:      1GHz-10GHz      20log(3.9m/3.0m)= 2.28dB  
                             10GHz-26.5GHz      20log(1.0m/3.0m)= -9.5dB  
                             26.5GHz-40GHz      20log(0.5m/3.0m)= -15.6dB

## Radiated Spurious Emission

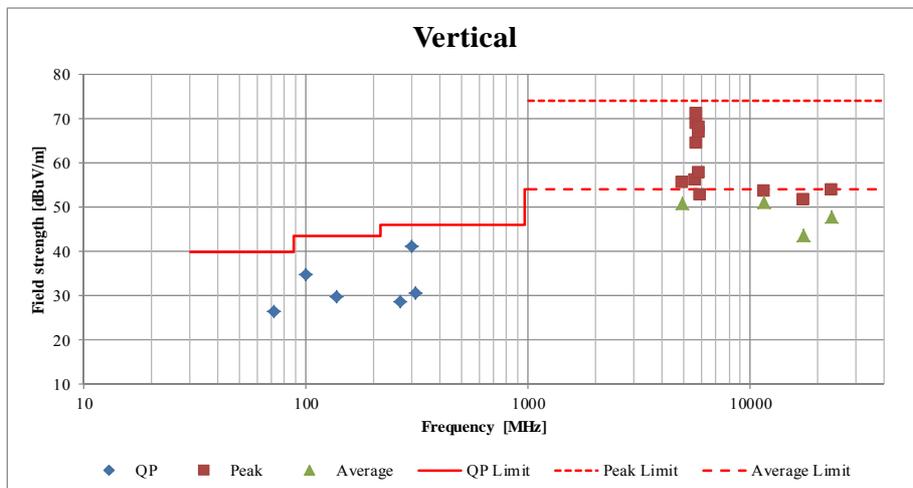
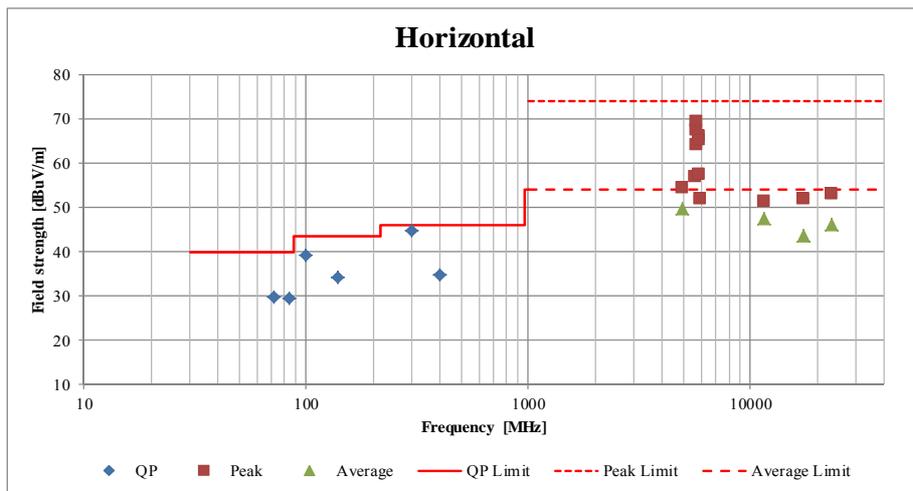
Test place	Ise EMC Lab.
Report No.	11228681H
Semi Anechoic Chamber	No.1
Date	April 16, 2016
Temperature / Humidity	21deg. C / 27 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11ac-80 5775 MHz



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

## Radiated Spurious Emission (Plot data, Worst case)

Test place	Ise EMC Lab.	
Report No.	11228681H	
Semi Anechoic Chamber	No.1	No.1
Date	April 16, 2016	April 17, 2016
Temperature / Humidity	21deg. C / 27 % RH	22deg. C / 49 % RH
Engineer	Takafumi Noguchi (1-10GHz)	Tomoki Matsui (Above 10GHz and Below 1GHz)
Mode	Tx 11ac-80 5775 MHz	



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

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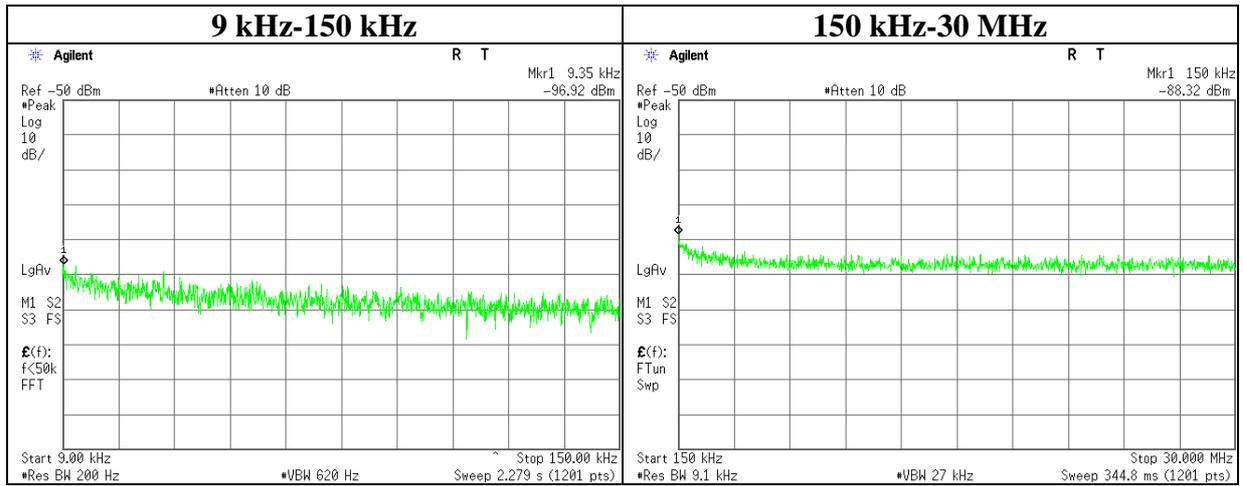
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11228681H
Date	April 14, 2016
Temperature / Humidity	23deg. C / 45 % RH
Engineer	Tomohisa Nakagawa
Mode	Tx 11ac-80 5775MHz



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
9.35	-96.9	3.04	9.9	2.3	2	-78.6	300	6.0	-17.4	48.1	65.5	
150.00	-88.3	3.04	9.9	2.3	2	-70.0	300	6.0	-8.8	24.0	32.8	

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

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

## APPENDIX 2: Test instruments

### Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MPM-17	Power Meter	DARE!! Instruments	RPR3006W	14100048SNO081	AT	2015/11/09 * 12
COTS-MPM	RPR3006W measurement software	DARE!! Instruments	RadiMation 2014.2.1	-	AT	-
MAT-57	Attenuator(10dB)	Suhner	6810.19.A	-	AT	2016/01/18 * 12
MOS-14	Thermo-Hyrometer	Custom	CTH-201	1401	AT	2016/01/21 * 12
MPM-18	Power Meter	DARE!! Instruments	RPR3006W	14100048SNO082	AT	2015/11/09 * 12
MAT-82	Attenuator	Weinschel Associates	WA1-20-33	100132	AT	2015/05/04 * 12
MAT-82	Attenuator	Weinschel Associates	WA1-20-33	100132	AT	2015/05/04 * 12
MCC-144	Microwave Cable	Junkosha	MWX221	1207S407	AT	2015/08/06 * 12
MAT-92	Attenuator	Weinschel Associates	WA56-10	56100308	AT	2015/06/01 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	AT	2015/05/18 * 12
MAEC-01	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 10m	DA-06881	RE/CE	2015/09/19 * 12
MOS-27	Thermo-Hyrometer	CUSTOM	CTH-201	A08Q26	RE/CE	2016/01/21 * 12
MJM-25	Measure	KOMELON	KMC-36	-	RE/CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MHA-05	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	253	RE	2015/05/18 * 12
MHA-01	Horn Antenna 18-26.5GHz	EMCO	3160-09	1266	RE	2015/06/06 * 12
MPA-01	Pre Amplifier	Agilent	8449B	3008A01671	RE	2016/02/26 * 12
MCC-165	Microwave Cable	Junkosha	MWX221	1203S213(1m) / 1311S166(5m)	RE	2015/11/10 * 12
MMM-03	Digital Tester	Fluke	FLUKE 26-3	78030621	RE	2015/08/19 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2015/05/18 * 12
MHA-29	Horn Antenna 26.5-40GHz	ETS LINDGREN	3160-10	00152399	RE	2015/09/04 * 12
MCC-54	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	RE	2016/03/18 * 12
MPA-22	Pre Amplifier	MITEQ, Inc	AMF-6F-2600400-3 3-8P / AMF-4F-2600400-3 3-8P	1871355 / 1871328	RE	2015/09/03 * 12
MTR-09	EMI Test Receiver	Rohde & Schwarz	ESU26	100412	CE	2015/06/08 * 12
MLS-26	LISN(AMN)	Schwarzbeck	NSLK8127	8127-732	CE(EUT)	2015/07/17 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/TSJ	5D-2W(20m)/3D-2W(7.5m)/RG400u(1.5m)/RFM-E421(Switcher)	-/01068(Switcher)	CE	2015/09/29 * 12
MAT-64	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2016/01/14 * 12

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

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

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

**Test Item:**  
**CE: Conducted Emission**  
**RE: Radiated Emission**  
**AT: Antenna Terminal Conducted test**

**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