



# RADIO TEST REPORT


Test Report No. : 11500824H-C-R1

**Applicant** : Panasonic Corporation of North America  
**Type of Equipment** : Body Worn Camera  
**Model No.** : WV-TW370  
**FCC ID** : ACJ9TAWV-TW370  
**Test regulation** : FCC Part 15 Subpart E: 2016  
(Except for DFS test)  
**Test Result** : Complied

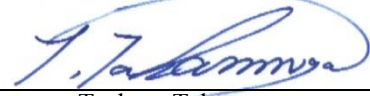
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6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 11500824H-C. 11500824H-C is replaced with this report.

**Date of test:** November 8 to 25, 2016

**Representative test engineer:**

  
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**Approved by:**

  
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<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>6</b>
<b>SECTION 4: Operation of E.U.T. during testing.....</b>	<b>9</b>
<b>SECTION 5: Conducted Emission.....</b>	<b>12</b>
<b>SECTION 6: Radiated Spurious Emission and Band Edge Compliance.....</b>	<b>13</b>
<b>SECTION 7: Antenna Terminal Conducted Tests.....</b>	<b>15</b>
<b>APPENDIX 1: Test data .....</b>	<b>16</b>
Conducted Emission .....	16
26 dB Emission Bandwidth and 99 % Occupied Bandwidth.....	17
6 dB Bandwidth .....	43
Maximum Conducted Output Power .....	47
Average Output Power.....	59
Maximum Power Spectral Density .....	68
Radiated Spurious Emission .....	85
Conducted Spurious Emission .....	118
<b>APPENDIX 2: Test instruments .....</b>	<b>119</b>
<b>APPENDIX 3: Photographs of test setup .....</b>	<b>121</b>
Conducted Emission .....	121
Radiated Spurious Emission .....	122
Worst Case Position.....	123

## **SECTION 1: Customer information**

### **Applicant**

Company Name : Panasonic Corporation of North America  
Address : Two Riverfront Plaza, Newark, NJ 07102-5490  
Telephone Number : +1-201-348-7724  
Facsimile Number : +1-201-392-4564  
Contact Person : Vir Angelo Lontoc

### **Manufacturer**

Company Name : Panasonic System Networks Co., Ltd.  
Address : 4-1-62, Minoshima, Hakata-ku, Fukuoka 812-8531, Japan  
Telephone Number : +81-50-3380-1993  
Facsimile Number : +81-50-3380-2002  
Contact Person : Yukio Kaneko

#### **\*Remarks:**

Panasonic Corporation of North America designates Panasonic System Networks Co., Ltd. as manufacturer of the product (Body Worn Camera).

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

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

Type of Equipment : Body Worn Camera  
Model No. : WV-TW370  
Serial No. : Refer to Section 4, Clause 4.2  
Rating : DC 3.7 V  
Receipt Date of Sample : November 19, 2016  
Country of Mass-production : Japan  
Condition of EUT : Engineering prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)  
Modification of EUT : No Modification by the test lab

## 2.2 Product Description

Model: WV-TW370 (referred to as the EUT in this report) is a Body Worn Camera.

### Radio Specification

Radio Type : Transceiver  
Power Supply (inner) : DC3.7V (POWER), DC1.8V (IO)  
Clock frequency (crystal) : 37.4 MHz

	IEEE802.11b	IEEE802.11g/n (20 M band)	IEEE802.11a/n/ac (20 M band) *1)	IEEE802.11n/ac (40 M band) *1)	IEEE802.11ac (80 M band) *1)
Frequency of operation	2412 MHz to 2462 MHz *2)	2412 MHz to 2462 MHz *2)	5280 MHz to 5320 MHz 5500 MHz to 5580 MHz 5660 MHz to 5720 MHz *2) 5745 MHz to 5825 MHz *2)	5310 MHz 5510 MHz 5550 MHz 5670 MHz 5710 MHz 5755 MHz *2) 5795 MHz *2)	5530 MHz 5690 MHz 5775 MHz *2)
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK, 256QAM(IEEE802.11ac only))		
Channel spacing	5MHz		20MHz	40MHz	80MHz
Antenna type	Chip Antenna				
Antenna Connector type	-				
Antenna Gain	-1.85 dBi (2.4 GHz Band) 0.3 dBi (5 GHz Band)				

	Bluetooth Ver.4.1 with EDR function / Bluetooth Low Energy
Frequency of operation	2402 MHz - 2480 MHz
Type of modulation	BT: FHSS (GFSK, $\pi/4$ -DQPSK, 8-DPSK) LE: GFSK
Channel spacing	BT: 1 MHz LE: 2 MHz
Antenna type	Chip Antenna
Antenna Connector type	-
Antenna Gain	-1.85 dBi

\*1) This test report applies to WLAN (5 GHz band).

\*2) AP mode has only these frequencies.

\*Wireless LAN and Bluetooth do not transmit simultaneously.

## **SECTION 3: Test specification, procedures & results**

### **3.1 Test Specification**

Test Specification : FCC Part 15 Subpart E  
FCC Part 15 final revised on November 14, 2016 and effective December 14, 2016

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

\* The revision on November 14, 2016, does not affect the test specification applied to the EUT.

### **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 11.5 dB 0.50700 MHz, N AV 6.9 dB 0.50700 MHz, N	Complied	-
	IC: RSS-Gen 8.8	IC: RSS-Gen 8.8			
26 dB Emission Bandwidth	FCC: KDB Publication Number 789033	FCC: 15.407 (a) (1) (2) (3)	See data	N/A	Conducted
	IC: -	IC: -			
Maximum Conducted Output Power	FCC: KDB Publication Number 789033	FCC: 15.407 (a) (1) (2) (3)		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	FCC : 15.407 (a) (1) (2) (3)		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: ANSI C63.10-2013 KDB Publication Number 789033	FCC: 15.407 (b), 15.205 and 15.209	1.8 dB 5350.000 MHz, AV, Vertical	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.

\* For DFS tests, please see the test report number 11500824H-D issued by UL Japan, Inc.

\*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.

#### **FCC Part 15.31 (e)**

The EUT is a battery-operated device and test was performed with the full-charged battery. Therefore, this EUT complies with the requirement.

#### **FCC Part 15.203 Antenna requirement**

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

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### 3.3 Addition to standard

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

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

### 3.4 Uncertainty

#### EMI

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor  $k=2$ .  
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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) (+/-)
0.009 – 0.15MHz	3.5 dB
0.15 – 30MHz	3.0 dB

Test distance	Radiated emission (+/-) 9 kHz - 30 MHz
3m	3.8 dB
10m	3.7 dB

Polarity	Radiated emission (Below 1GHz)			
	(3 m*) (+/-)		(10 m*) (+/-)	
	30 – 200 MHz	200 – 1000MHz	30 – 200 MHz	200 – 1000MHz
Horizontal	5.0 dB	5.3 dB	5.0 dB	5.0 dB
Vertical	4.7 dB	5.9 dB	5.0 dB	5.1 dB

Radiated emission (Above 1GHz)				
(3 m*) (+/-)		(1 m*) (+/-)		(10 m*) (+/-)
1 – 6GHz	6 – 18GHz	10 – 26.5 GHz	26.5 – 40GHz	1 -18 GHz
5.2 dB	5.4 dB	5.5 dB	5.5 dB	5.4 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.

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### 3.5 Test Location

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

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

### 3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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

### **4.1 Operating Mode(s)**

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)	6 Mbps, PN9
IEEE 802.11n 20 MHz BW (11n-20)	MCS 4 (Long GI), PN9
IEEE 802.11ac 20 MHz BW (11ac-20)	MCS 4 (Short GI), PN9
IEEE 802.11n 40 MHz BW (11n-40)	MCS 2 (Long GI), PN9
IEEE 802.11ac 40 MHz BW (11ac-40)	MCS 2 (Long GI), PN9
IEEE 802.11ac 80 MHz BW (11ac-80)	MCS 4 (Long GI), PN9
*The worst condition was determined based on the test result of Maximum Conducted Output Power.	
*The power value of the EUT was set for testing as follows (setting value might be different from product specification value); Power settings: Same as production model Software: bcm43455c0 *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.	

\*The details of Operation mode(s)

Test Item	Operating Mode	Tested Frequency			
		Lower Band	Middle Band	Additional Band	Upper Band
Conducted emission	11ac-20 Tx *1)	-	5300 MHz	-	-
26 dB Emission Bandwidth	11a Tx 11n-20 Tx 11ac-20 Tx	-	5280 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz 5720 MHz	-
	11n-40 Tx 11ac-40 Tx	-	5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	-
	11ac-80 Tx	-	-	5530 MHz 5690 MHz	-
99 % Occupied Bandwidth, Maximum Conducted Output Power, Maximum Power Spectral Density	11a Tx 11n-20 Tx 11ac-20 Tx	-	5280 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz 5720 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx 11ac-40 Tx	-	5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	5755 MHz 5795 MHz
	11ac-80 Tx	-	-	5530 MHz 5690 MHz	5775 MHz
6 dB Bandwidth	11a Tx 11n-20 Tx 11ac-20 Tx	-	-	-	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx 11ac-40 Tx	-	-	-	5755 MHz 5795 MHz
	11ac-80 Tx	-	-	-	5775 MHz
Radiated Spurious Emission (Below 1 GHz)	11ac-20 Tx *1)	-	5300 MHz	-	-
Radiated Spurious Emission (Above 1 GHz)	11ac-20 Tx *2)	-	5280 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz 5720 MHz	5745 MHz 5785 MHz 5825 MHz
	11ac-40 Tx *2)	-	5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	5755 MHz 5795 MHz
	11ac-80 Tx	-	-	5530 MHz 5690 MHz	5775 MHz
Conducted Spurious Emission	11ac-20 Tx *1)	-	5300 MHz	-	-

\*1) The mode was tested as a representative, because it had the highest power at antenna terminal test.  
\*2) Since 11a / 11n-20 / 11ac-20, 11n-40 / 11ac-40, have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest output power.

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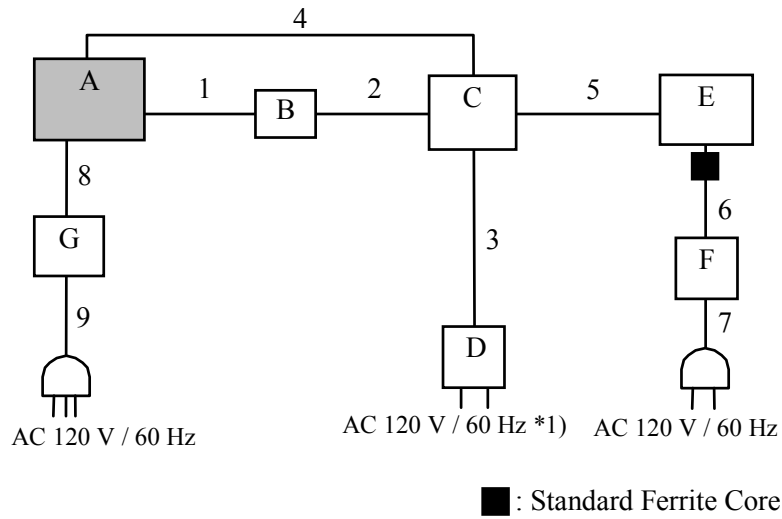
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## 4.2 Configuration and peripherals



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

\*1) Conducted Emission test was performed on this port.

### Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Body Worn Camera	WV-TW370	14	Panasonic System Networks Co., Ltd.	EUT
B	Jig	-	-	-	-
C	USB Hub	U2H-AN4S	6604382	ELECOM	-
D	AC Adapter	CS12F050200FJ	6607085	ELECOM	-
E	Laptop PC	T440	0814PB030VNE	Lenovo	-
F	AC Adapter	ADLX65NCC2A	11S36200284ZZ1004654HF	Lenovo	-
G	Monitor	ET-0037-N	ETN2B00760026	BenQ	-

### List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Flat Cable	0.12	Unshielded	Unshielded	-
2	USB Cable	1.50	Shielded	Shielded	-
3	DC Cable	1.50	Unshielded	Unshielded	-
4	USB Cable	1.00 for CE* 2.40 for RE*	Shielded	Shielded	-
5	USB Cable	1.50	Shielded	Shielded	-
6	DC Cable	1.80	Unshielded	Unshielded	-
7	AC Cable	1.00	Unshielded	Unshielded	-
8	HDMI Cable	2.00	Shielded	Shielded	-
9	AC Cable	2.10	Unshielded	Unshielded	-

\*CE: Conducted emission test, RE: Radiated Emission test

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## **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.

<b>Detector</b>	<b>: QP and CISPR Average</b>
<b>Measurement range</b>	<b>: 0.15 MHz-30 MHz</b>
<b>Test data</b>	<b>: APPENDIX</b>
<b>Test result</b>	<b>: Pass</b>

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

### **Test Procedure**

< 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 in the Section 15.407 (b) (1) (2) (3) (4).

or

Apply to limit in the Section 15.209 (a).

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 If duty cycle was less than 98%, a duty factor was added to the results.
Test Distance	3 m	3 m (below 1 GHz), 4.5 m*2) (1 GHz – 10GHz), 1 m*3) (10 GHz – 40 GHz)	

\*1) The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v01r03 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".

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

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

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

The EUT has some clips and chargers as accessories (wearing tools).

The pre-check was conducted with each accessory (wearing tool), and the test was performed under the worst condition.

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

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

### **Test Procedure**

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

<b>Test</b>	<b>Span</b>	<b>RBW</b>	<b>VBW</b>	<b>Sweep time</b>	<b>Detector</b>	<b>Trace</b>	<b>Instrument used and Test method</b>
26 dB Bandwidth	Enough to capture the emission	Close to 1 % of EBW	> RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 % to 5 % of OBW	$\geq 3$ 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	1 MHz or 470 kHz *2)	$\geq 3$ RBW	Auto	RMS or Sample 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 v01r03 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".

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

\*2) KDB 789033 D02 says that RBW is set to be 500 kHz for 5.725 GHz-5.850 GHz, but it is not possible with spectrum analyzer, so RBW Correction Factor ( $10 \log(500 \text{ kHz} / 470 \text{ kHz})$ ) 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 not detected 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**

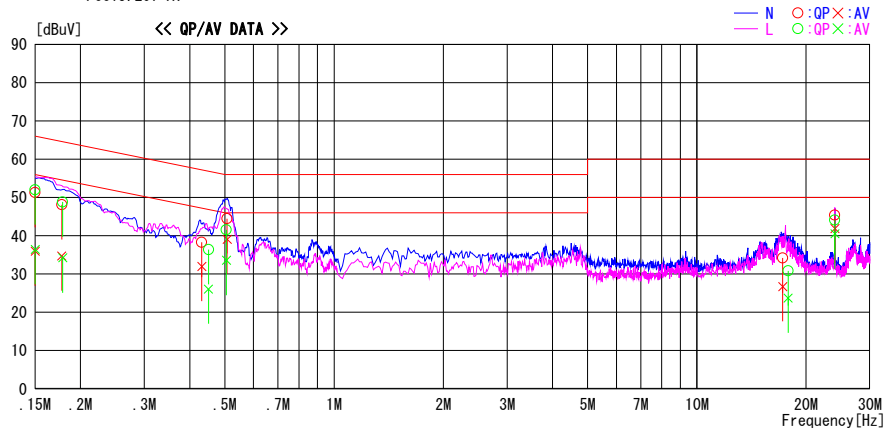
**DATA OF CONDUCTED EMISSION TEST**

UL Japan, Inc. Ise EMC Lab. No.3 Semi Anechoic Chamber  
Date : 2016/11/24

Report No. : 11500824H  
Temp./Humi. : 25deg. C / 32% RH  
Engineer : Tomoki Matsui

Mode / Remarks : Tx 11ac-20 5300MHz

LIMIT : FCC15.207 QP  
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15000	38.0	22.7	13.3	51.3	36.0	66.0	56.0	14.7	20.0	N	
0.17770	34.8	21.4	13.3	48.1	34.7	64.6	54.6	16.5	19.9	N	
0.43200	24.9	18.6	13.4	38.3	32.0	57.2	47.2	18.9	15.2	N	
0.50700	31.1	25.7	13.4	44.5	39.1	56.0	46.0	11.5	6.9	N	
17.24877	18.3	10.8	15.9	34.2	26.7	60.0	50.0	25.8	23.3	N	
24.00090	28.2	24.7	17.2	45.4	41.9	60.0	50.0	14.6	8.1	N	
0.15000	38.7	23.1	13.3	52.0	36.4	66.0	56.0	14.0	19.6	L	
0.17852	35.5	20.9	13.3	48.8	34.2	64.6	54.6	15.8	20.4	L	
0.45090	23.0	12.7	13.4	36.4	26.1	56.9	46.9	20.5	20.8	L	
0.50500	28.2	20.2	13.4	41.6	33.6	56.0	46.0	14.4	12.4	L	
17.84218	14.7	7.6	16.1	30.8	23.7	60.0	50.0	29.2	26.3	L	
24.00090	26.9	23.3	17.2	44.1	40.5	60.0	50.0	15.9	9.5	L	

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

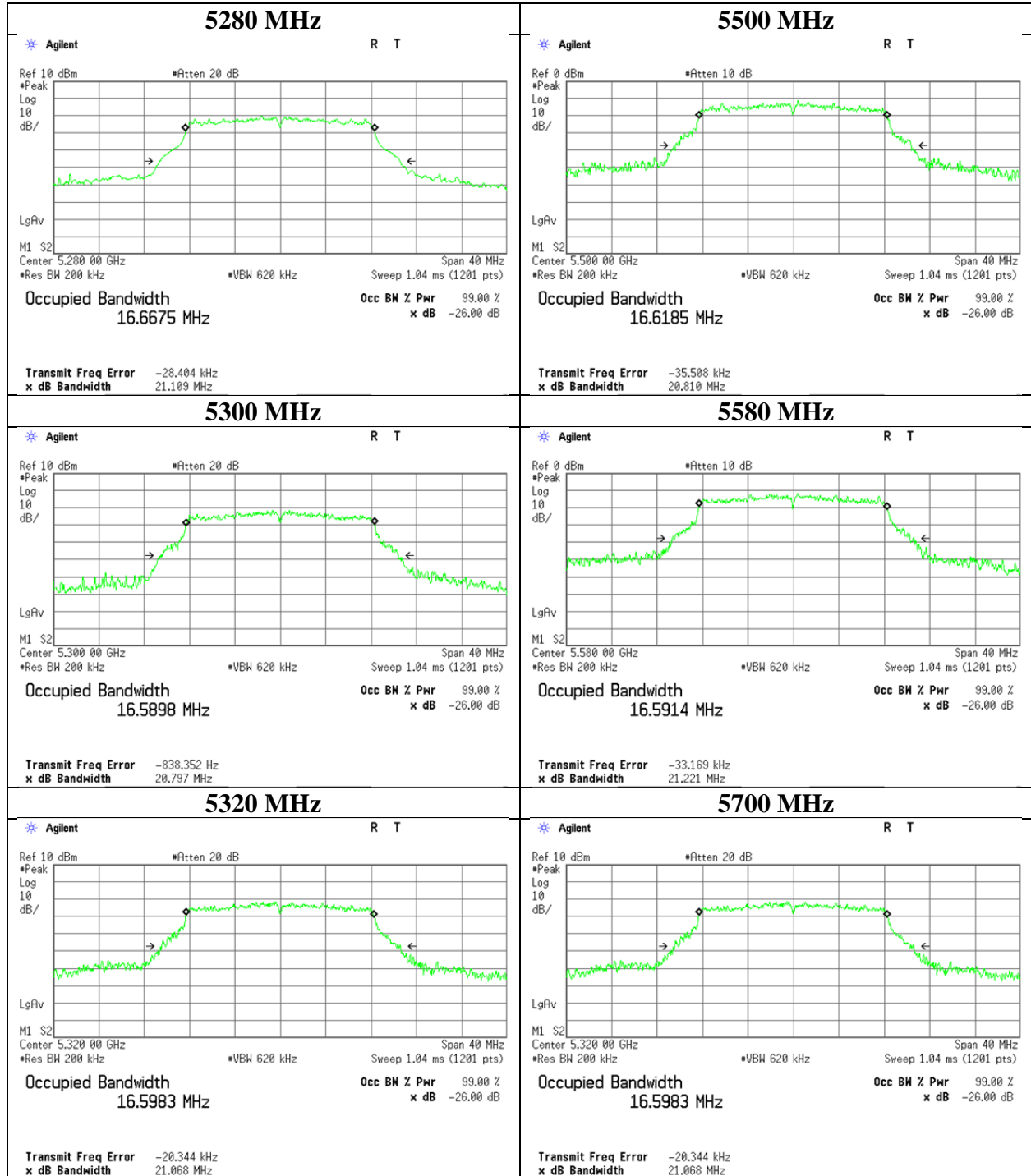
## 26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.3 Measurement Room  
Report No. 11500824H  
Date November 25, 2016  
Temperature / Humidity 24deg. C / 45 % RH  
Engineer Ryota Yamanaka  
Mode Tx 11a

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5280	21.109	17.094	-
5300	20.797	17.116	-
5320	21.068	17.128	-
5500	20.810	17.186	-
5580	21.221	17.171	-
5700	21.068	17.167	-
5720	21.172	17.161	-
5745	-	17.782	-
5785	-	17.979	-
5825	-	17.807	-

## 26 dB Emission Bandwidth

11a



**UL Japan, Inc.**

**Ise EMC Lab.**

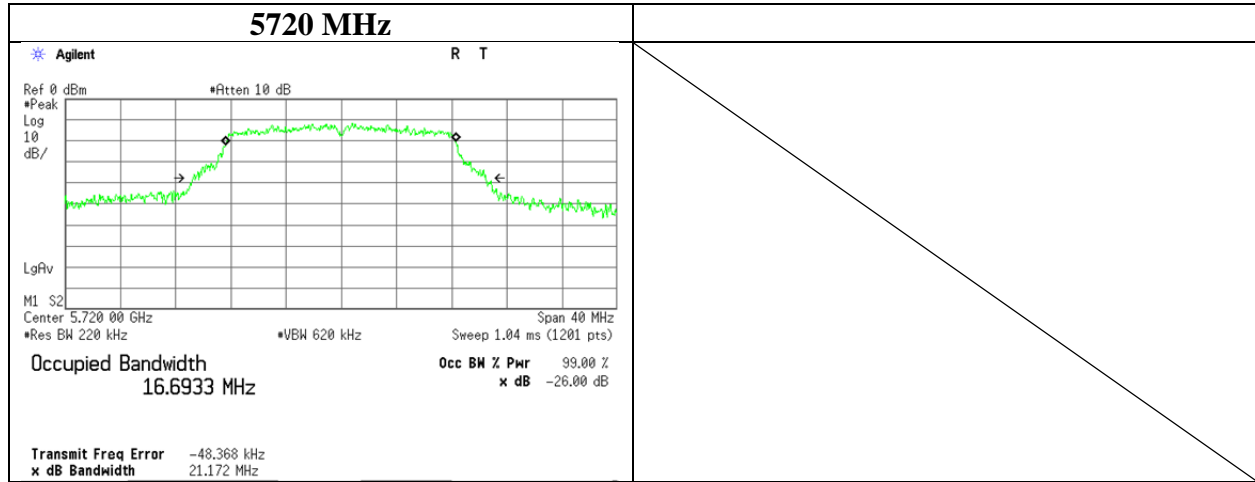
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

**26 dB Emission Bandwidth**

11a



**UL Japan, Inc.**

**Ise EMC Lab.**

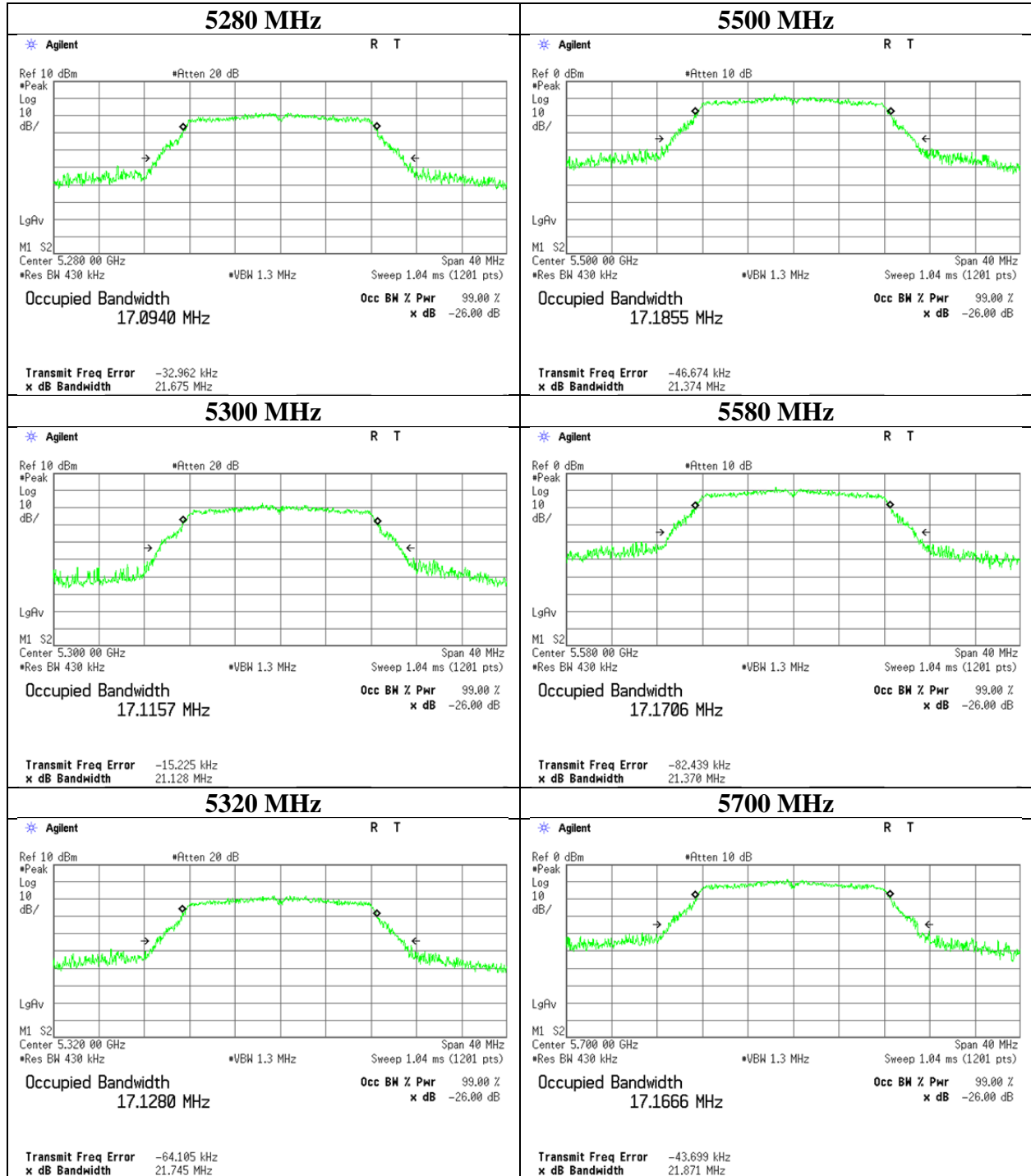
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## 99 % Occupied Bandwidth

11a



**UL Japan, Inc.**

**Ise EMC Lab.**

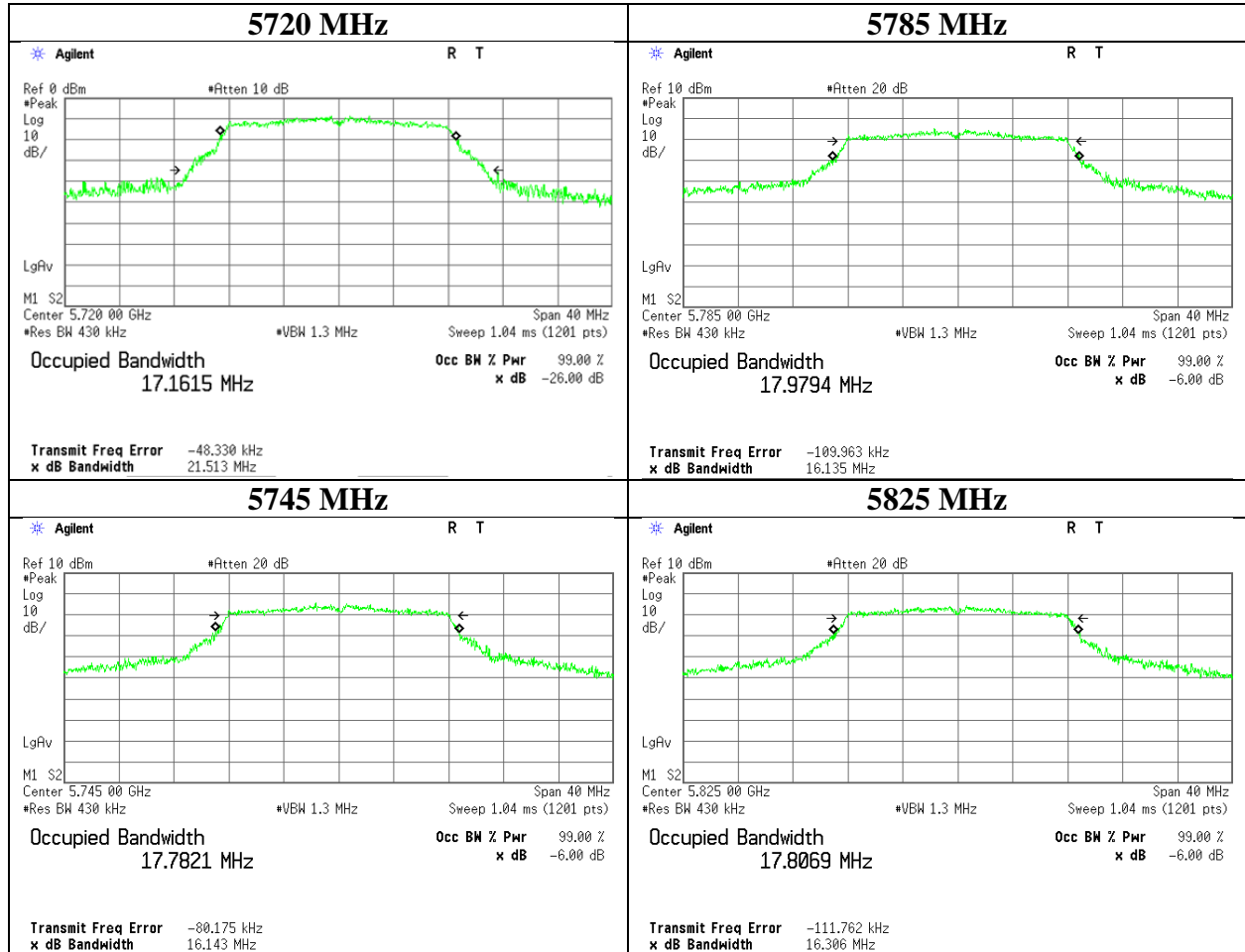
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

**99 % Occupied Bandwidth**

**11a**



**UL Japan, Inc.**

**Ise EMC Lab.**

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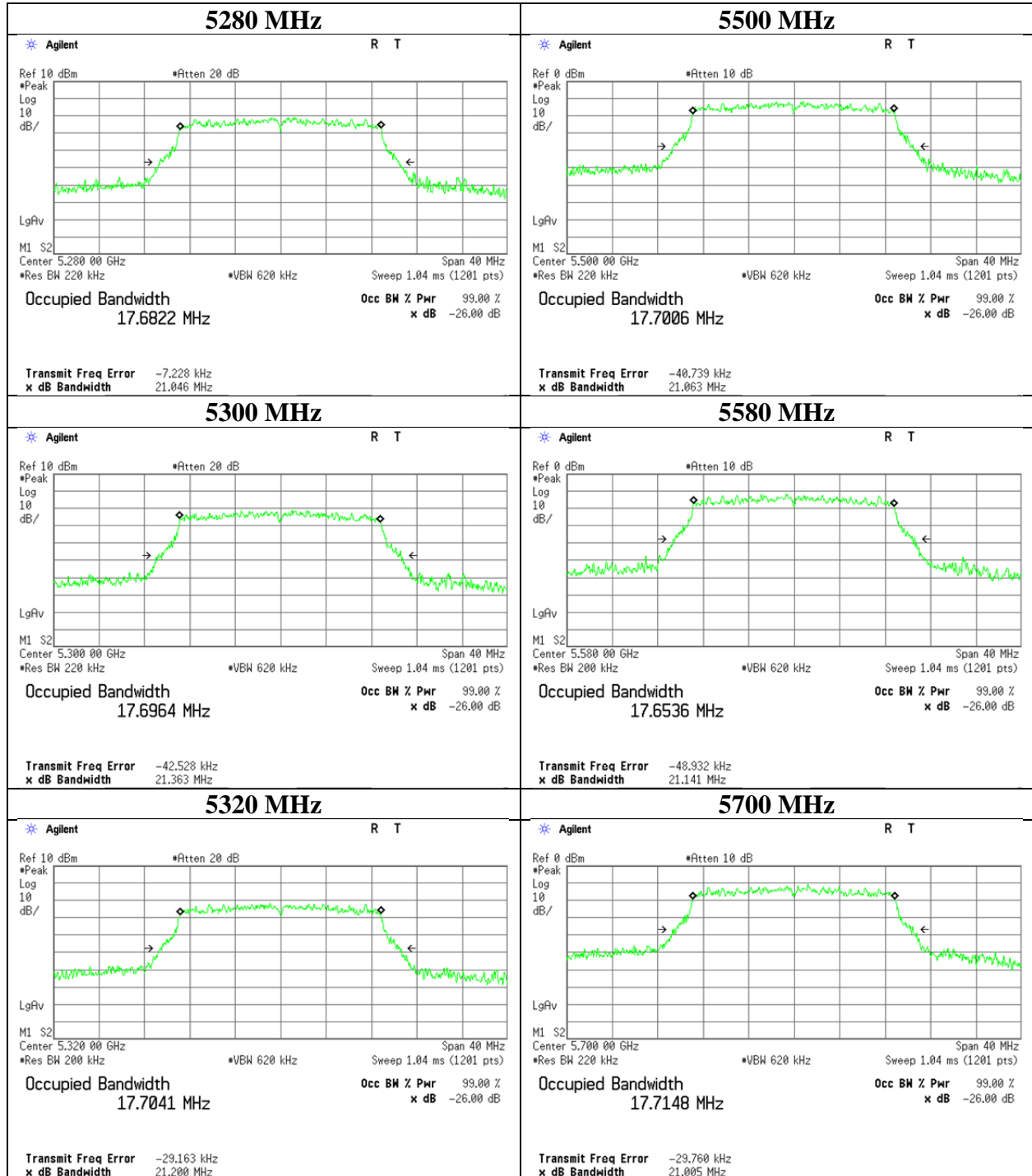
## 26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.3 Measurement Room  
Report No. 11500824H  
Date November 25, 2016  
Temperature / Humidity 24deg. C / 45 % RH  
Engineer Ryota Yamanaka  
Mode Tx 11n-20

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5280	21.046	17.967	-
5300	21.363	17.988	-
5320	21.200	18.034	-
5500	21.063	18.016	-
5580	21.141	17.943	-
5700	21.005	17.953	-
5720	21.124	17.887	-
5745	-	18.172	-
5785	-	18.273	-
5825	-	18.363	-

## 26 dB Emission Bandwidth

11n-20



**UL Japan, Inc.**

**Ise EMC Lab.**

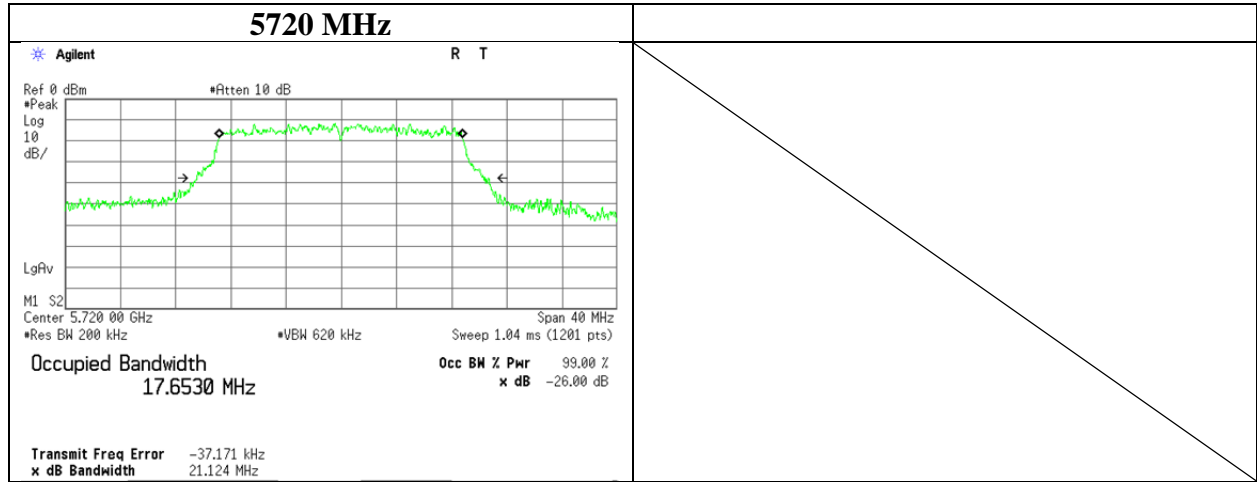
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

**26 dB Emission Bandwidth**

11n-20



**UL Japan, Inc.**

**Ise EMC Lab.**

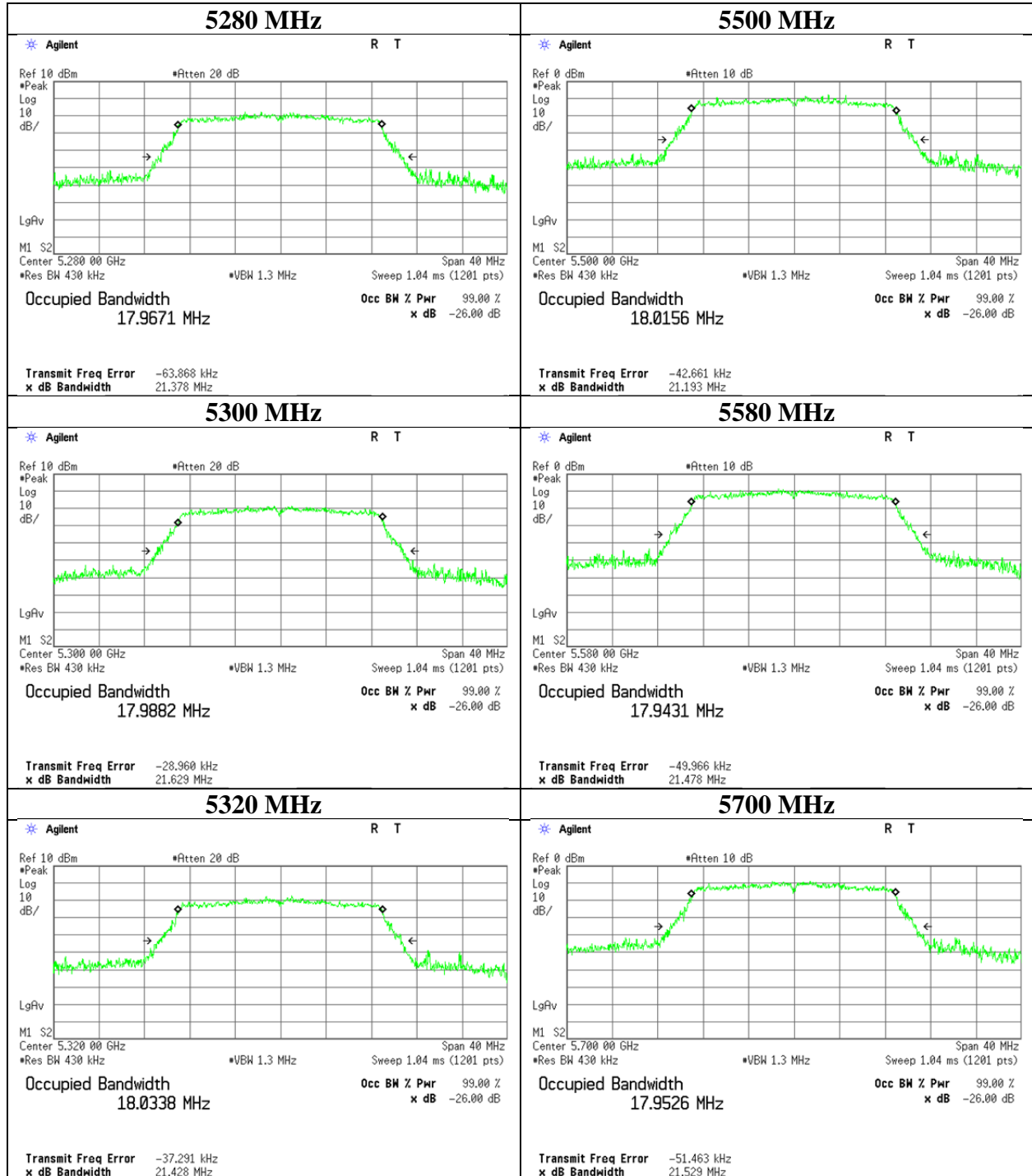
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## 99 % Occupied Bandwidth

11n-20



**UL Japan, Inc.**

**Ise EMC Lab.**

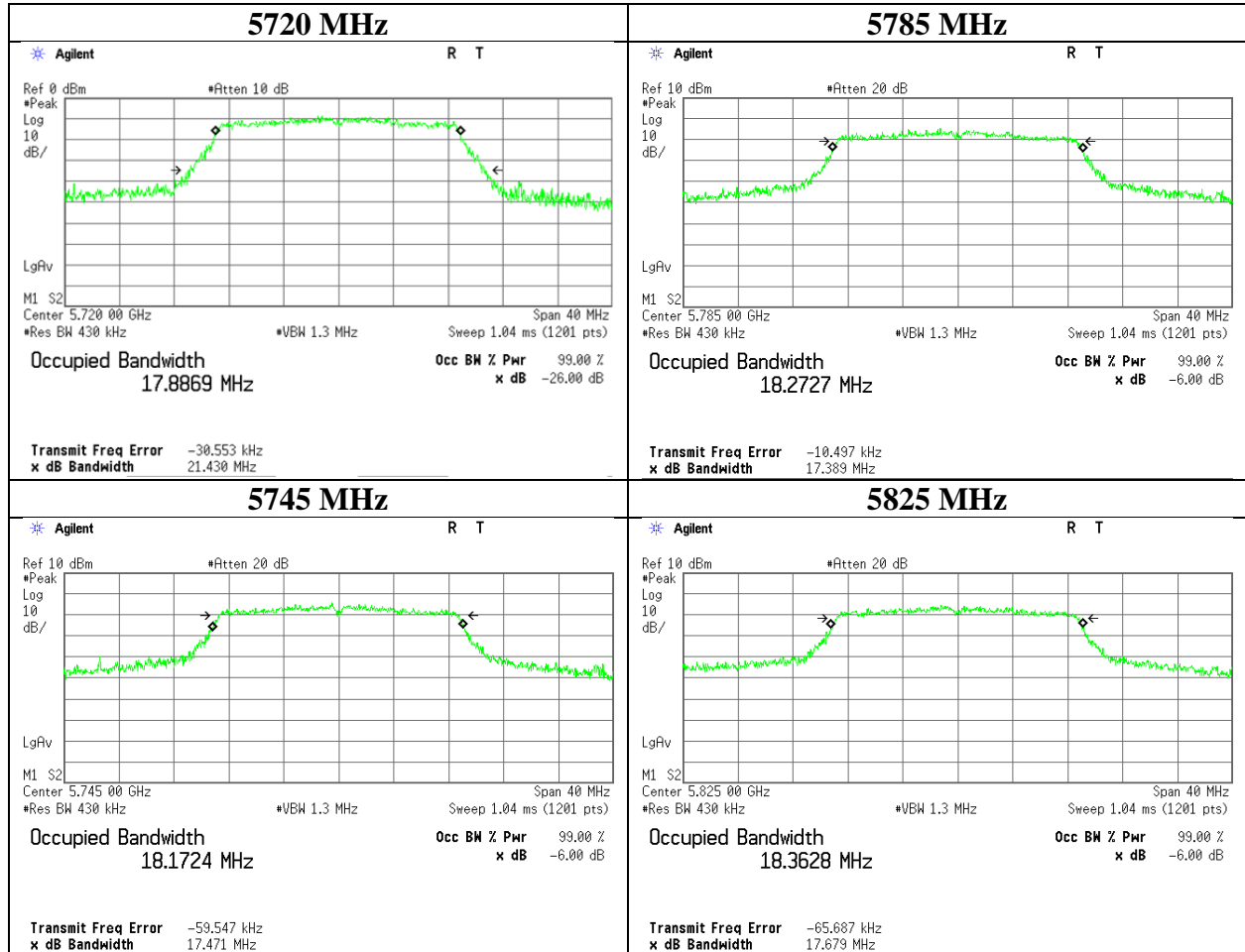
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

**99 % Occupied Bandwidth**

**11n-20**



**UL Japan, Inc.**

**Ise EMC Lab.**

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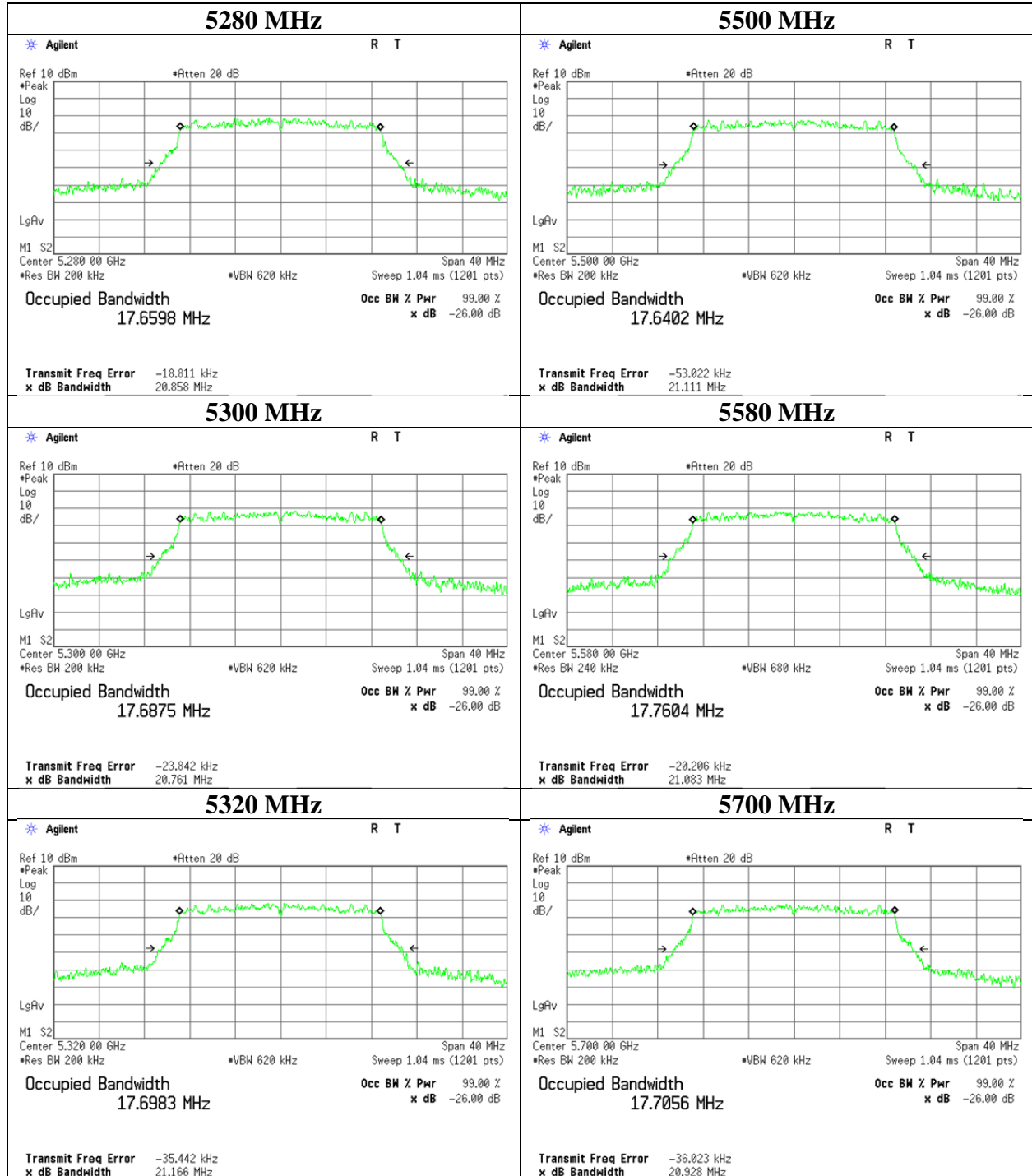
## 26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.3 Measurement Room  
Report No. 11500824H  
Date November 25, 2016  
Temperature / Humidity 24deg. C / 45 % RH  
Engineer Ryota Yamanaka  
Mode Tx 11ac-20

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5280	20.858	17.995	-
5300	20.761	17.983	-
5320	21.166	17.947	-
5500	21.111	18.084	-
5580	21.083	18.030	-
5700	20.928	17.951	-
5720	21.208	18.034	-
5745	-	18.210	-
5785	-	18.328	-
5825	-	18.374	-

## 26 dB Emission Bandwidth

### 11ac-20



**UL Japan, Inc.**

**Ise EMC Lab.**

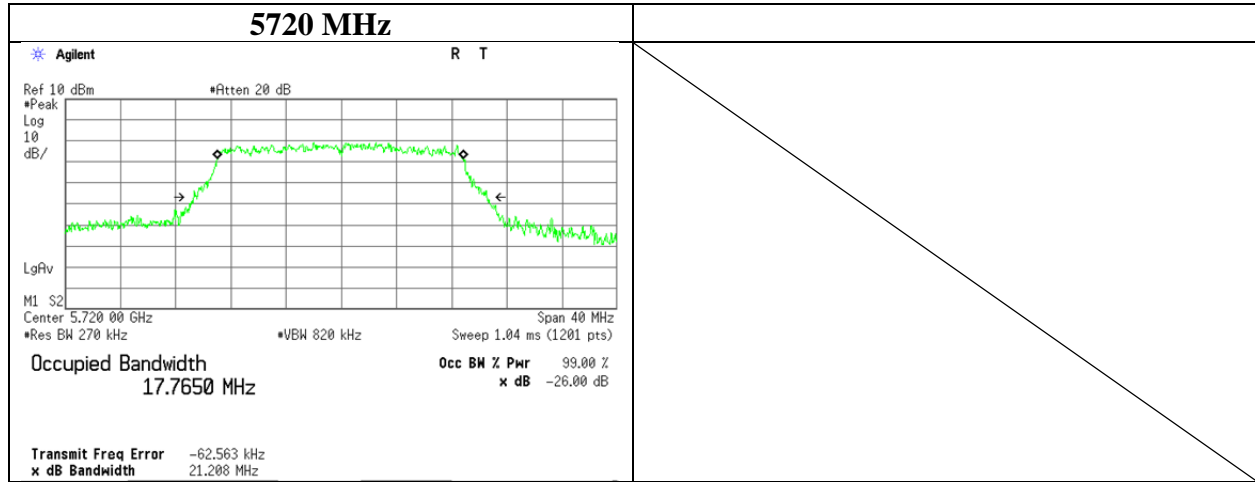
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## 26 dB Emission Bandwidth

11ac-20



**UL Japan, Inc.**

**Ise EMC Lab.**

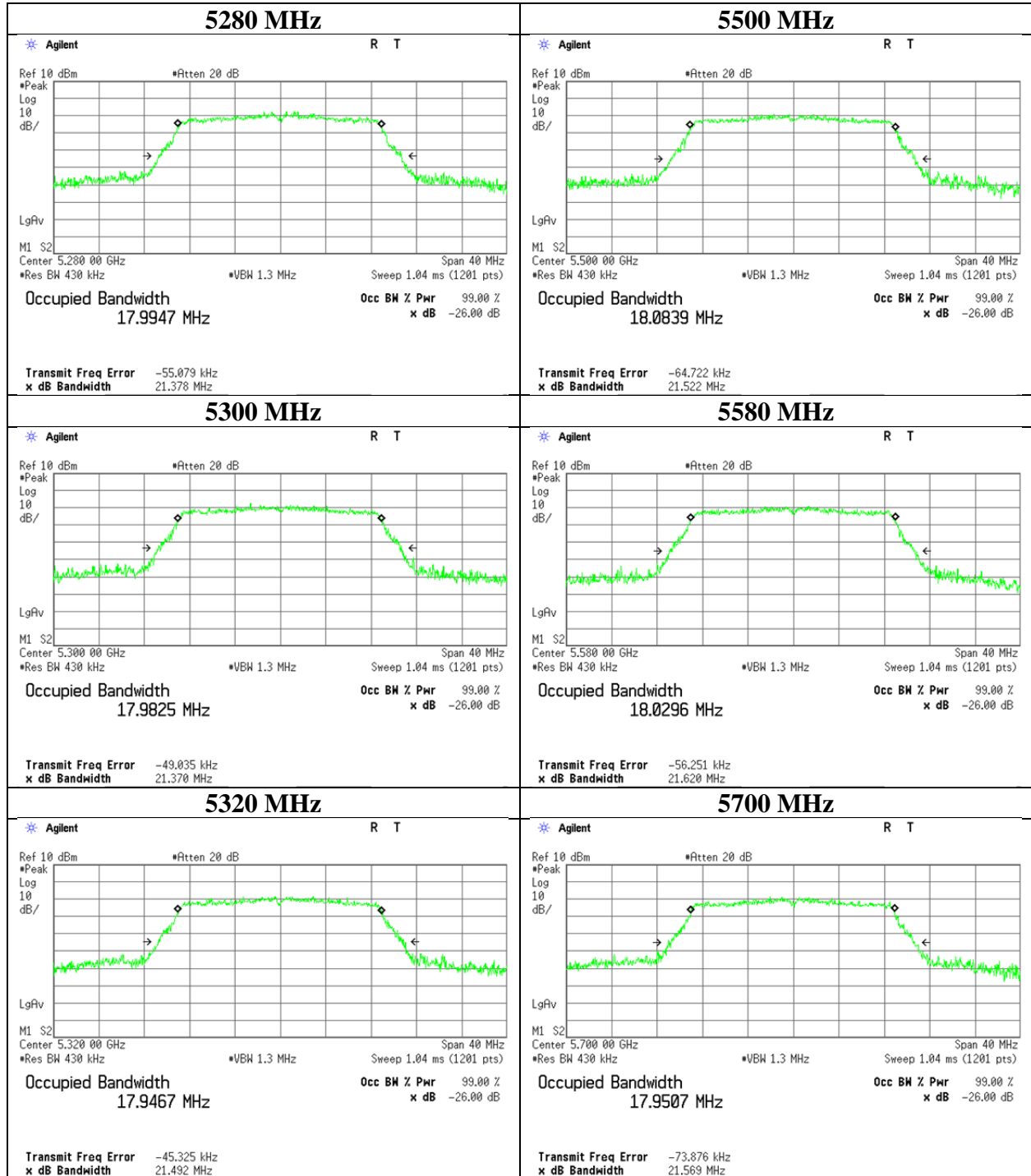
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## 99 % Occupied Bandwidth

### 11ac-20



**UL Japan, Inc.**

**Ise EMC Lab.**

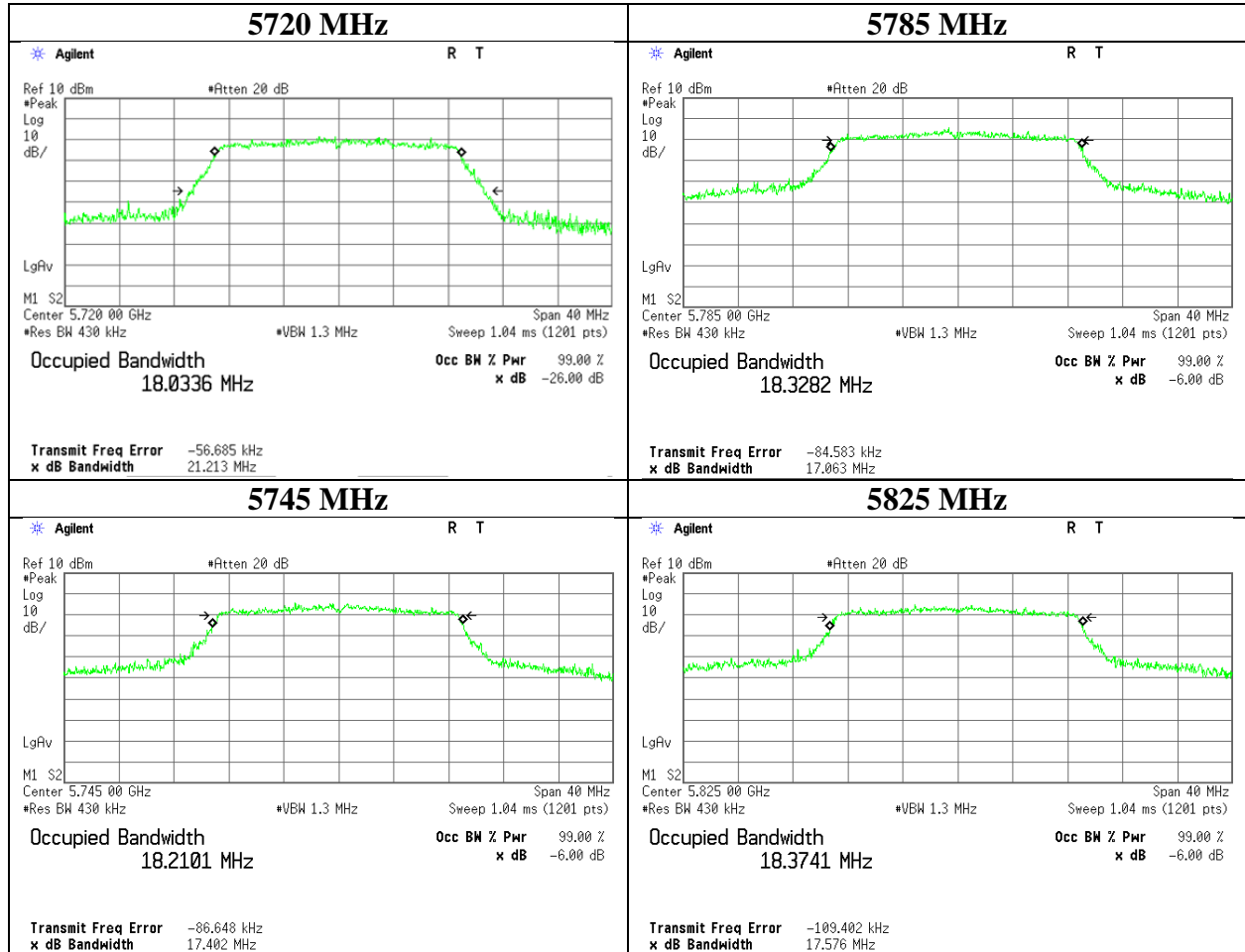
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

**99 % Occupied Bandwidth**

**11ac-20**



**UL Japan, Inc.**

**Ise EMC Lab.**

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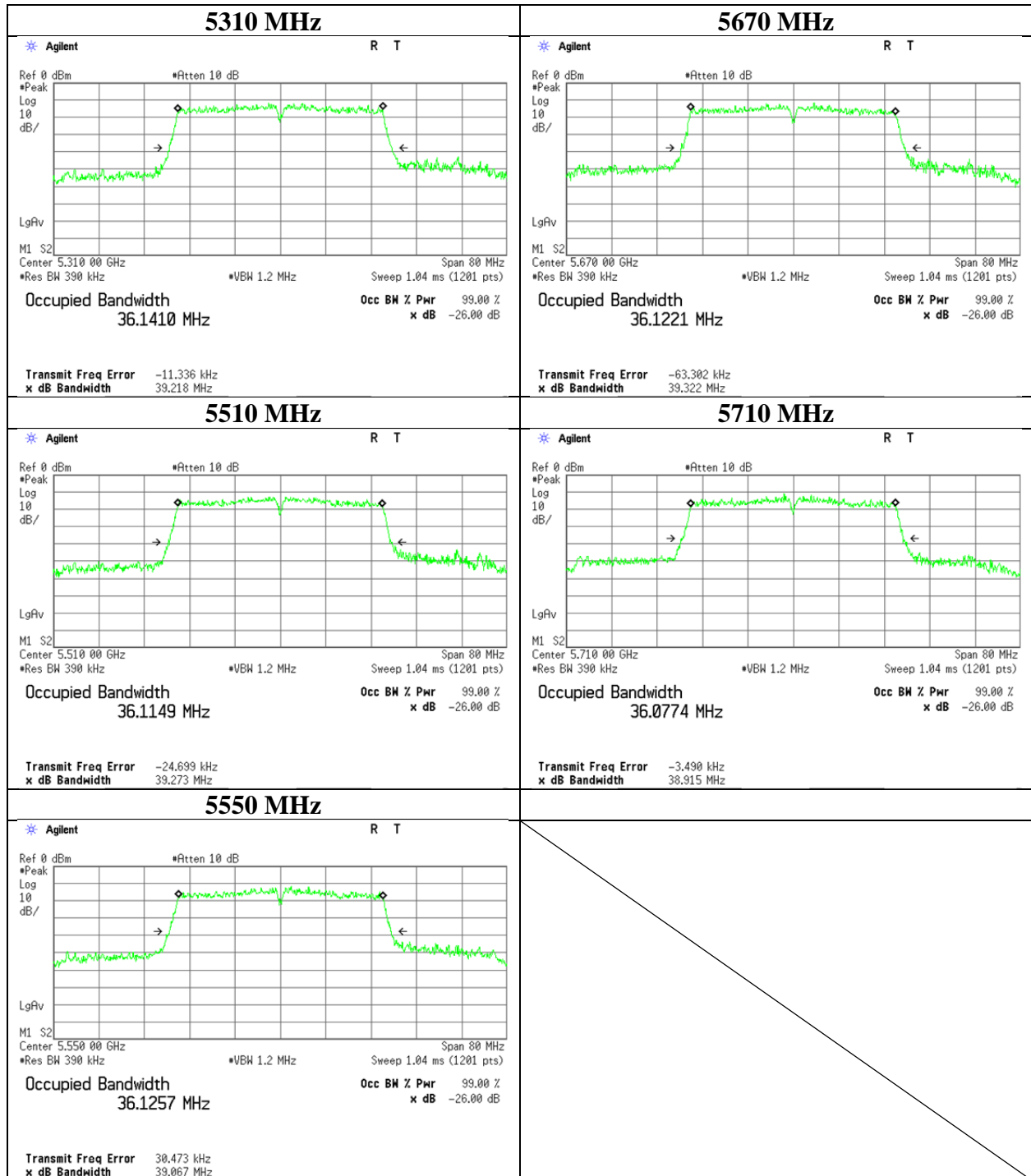
## 26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.3 Measurement Room  
Report No. 11500824H  
Date November 11, 2016  
Temperature / Humidity 24deg. C / 39 % RH  
Engineer Ryota Yamanaka  
Mode Tx 11n-40

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5310	39.218	36.258	-
5510	39.273	36.277	-
5550	39.067	36.312	-
5670	39.322	36.324	-
5710	38.915	36.221	-
5755	-	36.595	-
5795	-	36.710	-

## 26 dB Emission Bandwidth

11n-40



**UL Japan, Inc.**

**Ise EMC Lab.**

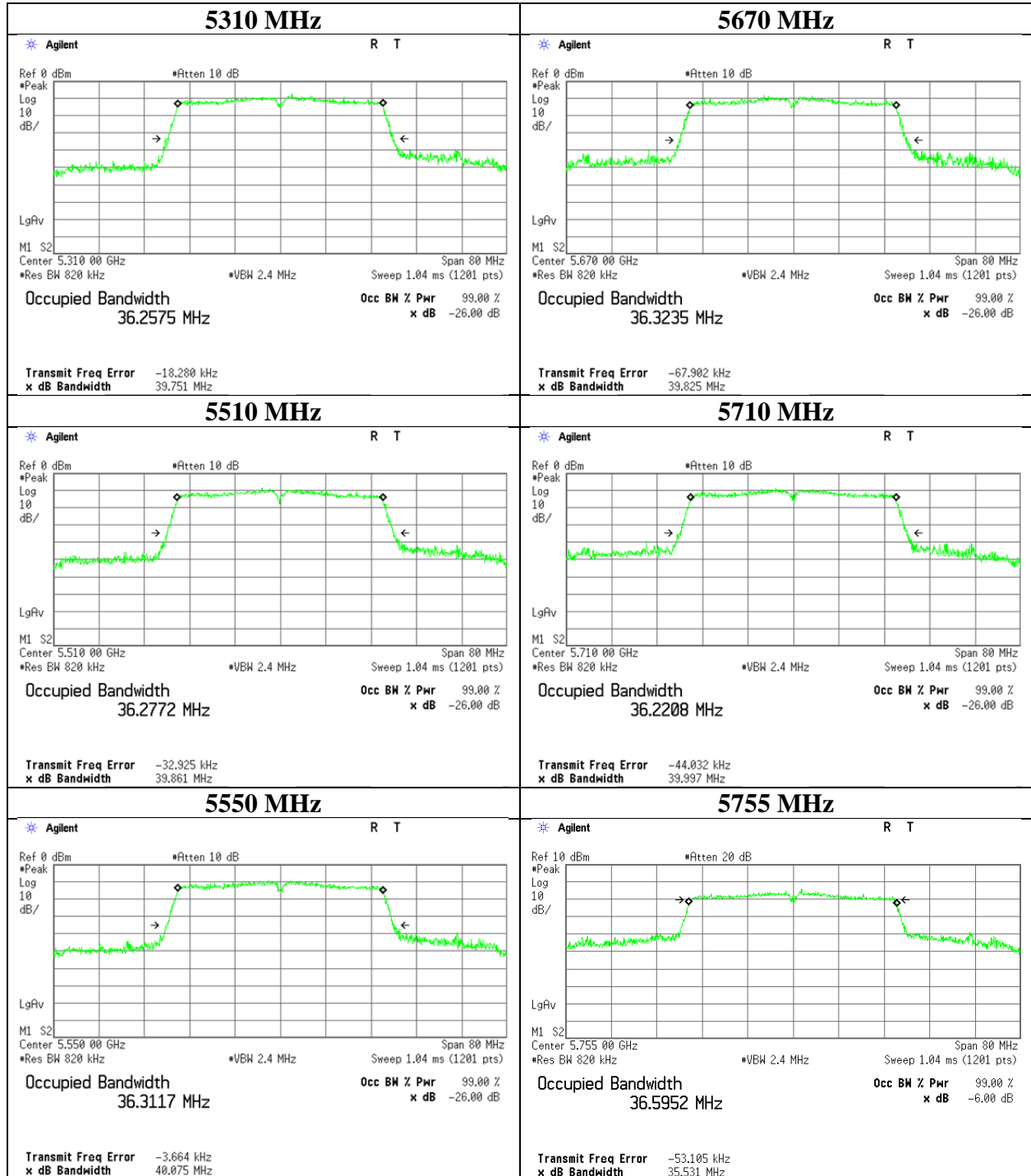
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

## 99 % Occupied Bandwidth

11n-40



**UL Japan, Inc.**

**Ise EMC Lab.**

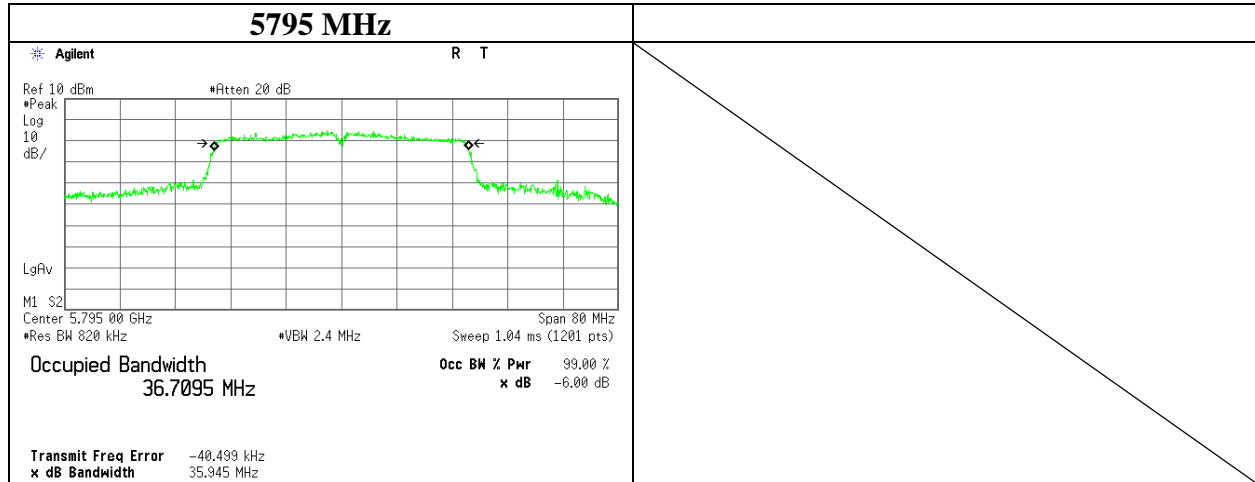
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

**99 % Occupied Bandwidth**

**11n-40**



**UL Japan, Inc.**

**Ise EMC Lab.**

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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

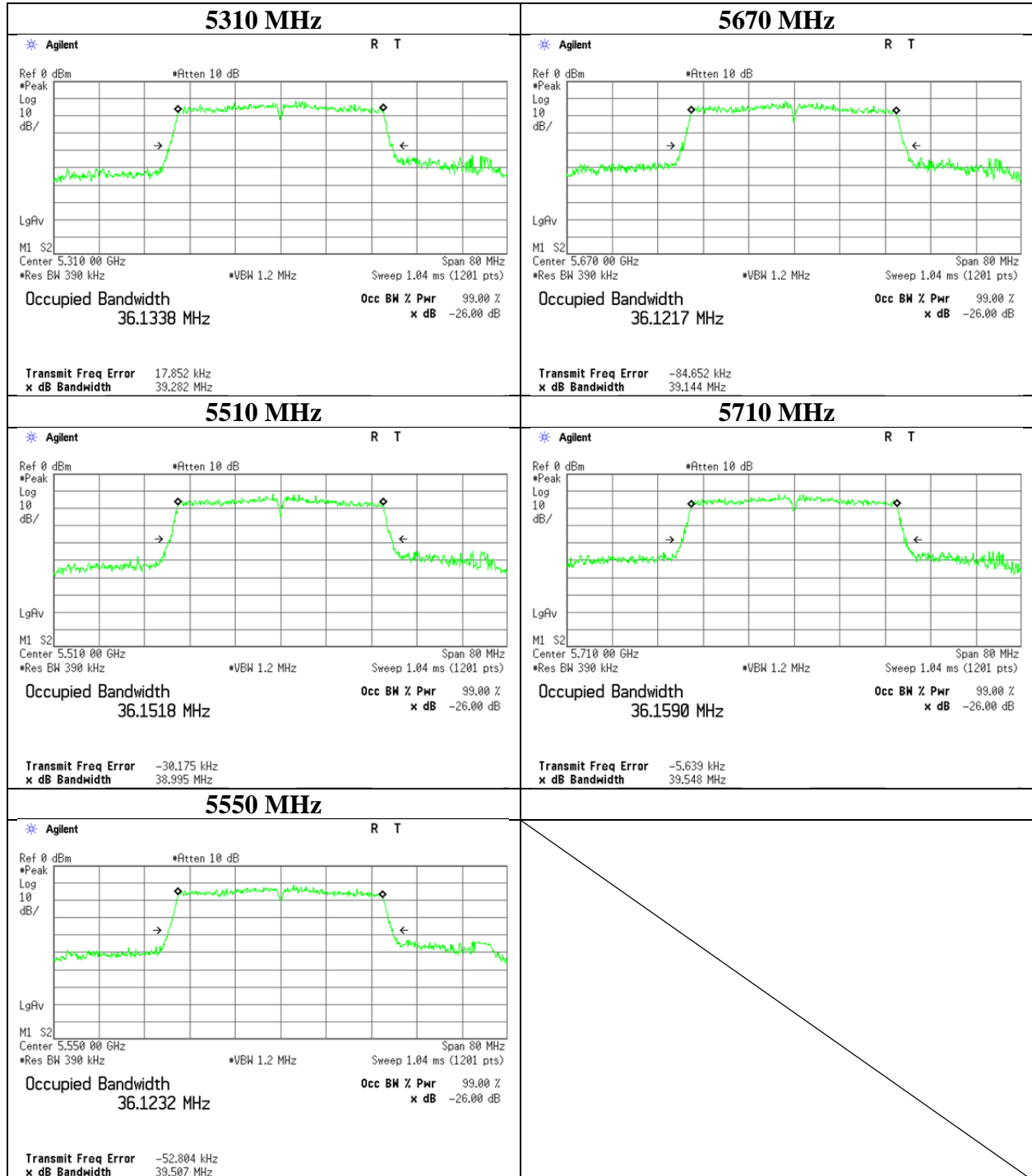
## 26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.3 Measurement Room  
Report No. 11500824H  
Date November 11, 2016  
Temperature / Humidity 24deg. C / 39 % RH  
Engineer Ryota Yamanaka  
Mode Tx 11ac-40

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5310	39.282	36.274	-
5510	38.995	36.290	-
5550	39.507	36.328	-
5670	39.144	36.254	-
5710	39.548	36.304	-
5755	-	36.507	-
5795	-	36.750	-

## 26 dB Emission Bandwidth

### 11ac-40



**UL Japan, Inc.**

**Ise EMC Lab.**

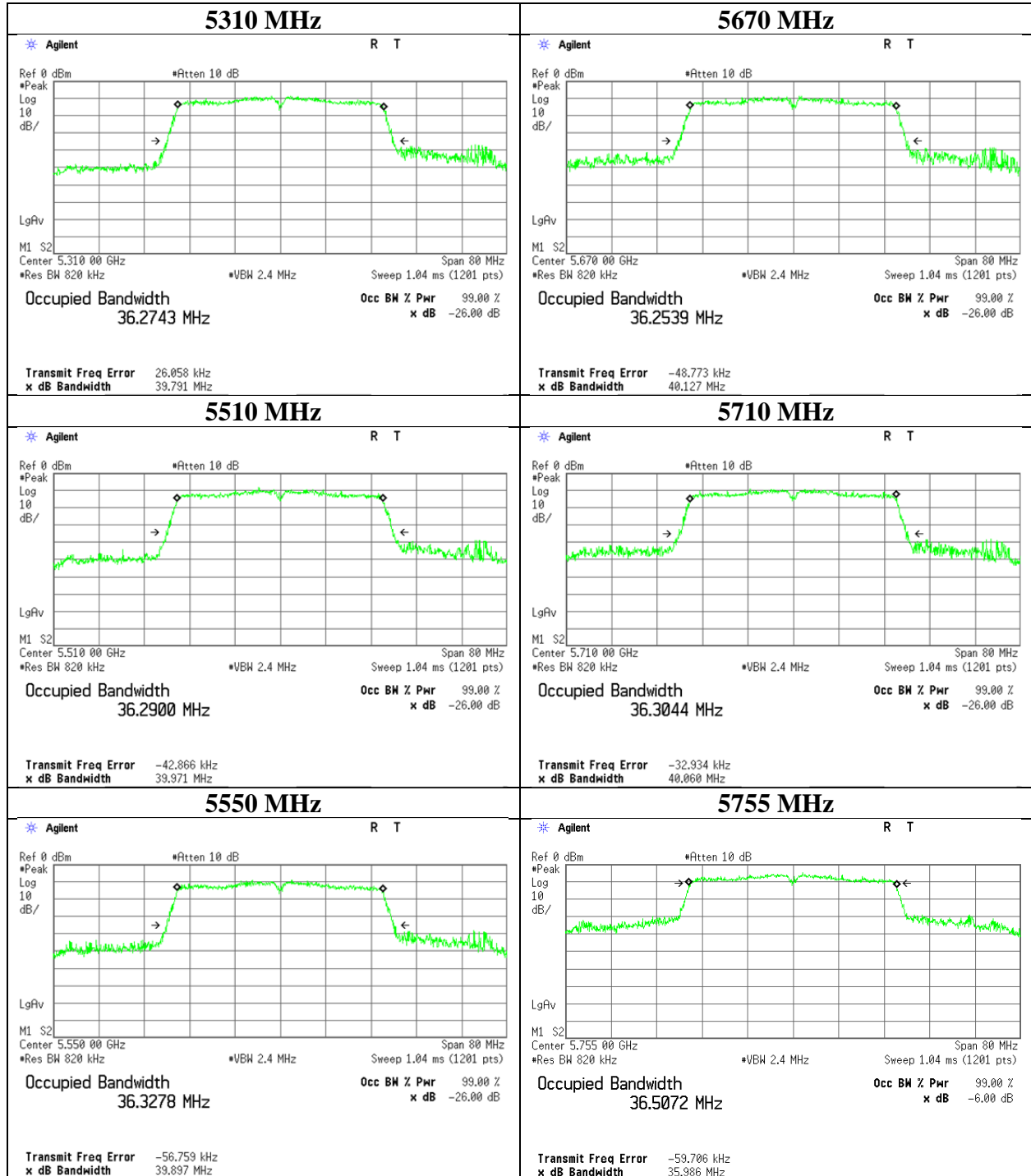
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

**99 % Occupied Bandwidth**

**11ac-40**



**UL Japan, Inc.**

**Ise EMC Lab.**

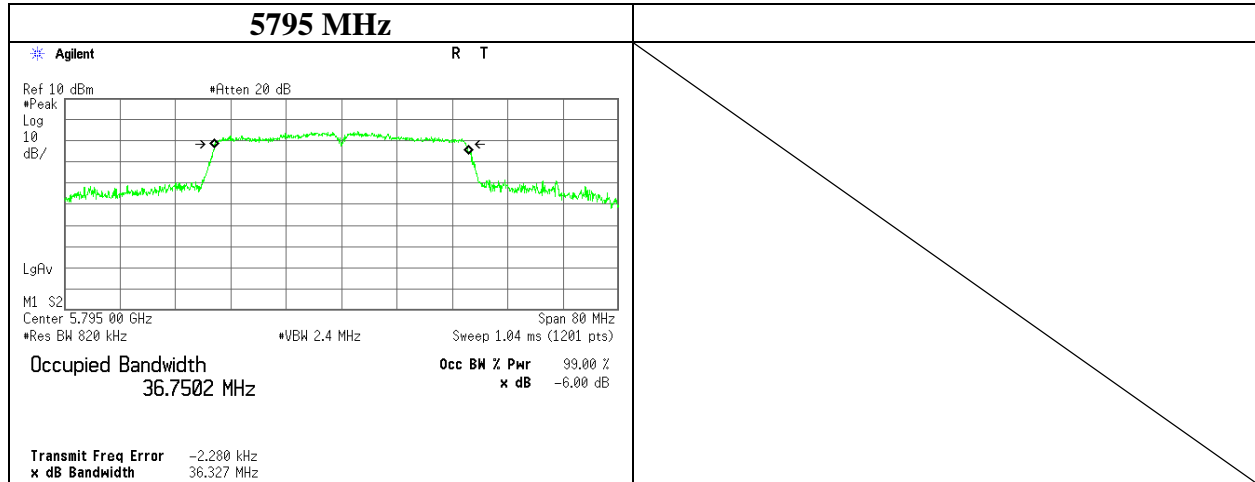
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

**99 % Occupied Bandwidth**

**11ac-40**



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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

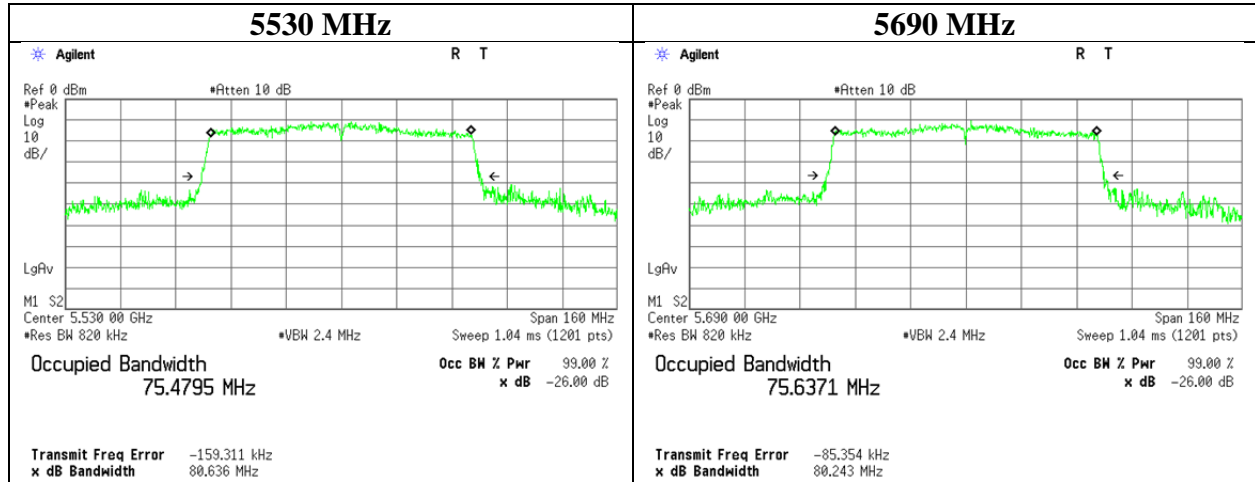
## 26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.3 Measurement Room  
Report No. 11500824H  
Date November 25, 2016  
Temperature / Humidity 24deg. C / 45 % RH  
Engineer Ryota Yamanaka  
Mode Tx 11ac-80

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5530	80.636	75.778	-
5690	80.244	75.763	-
5775	-	76.257	-

## 26 dB Emission Bandwidth

### 11ac-80



**UL Japan, Inc.**

**Ise EMC Lab.**

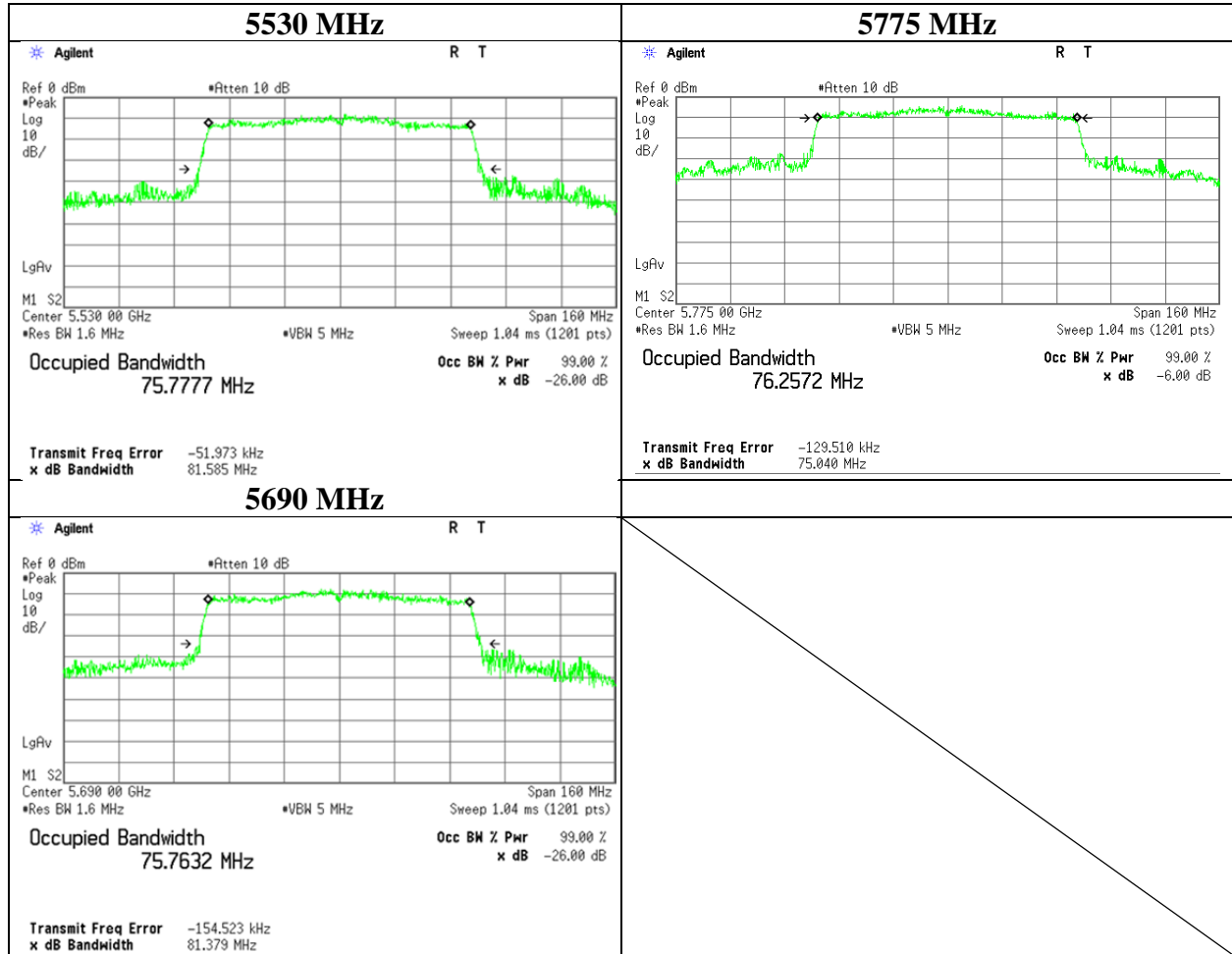
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

**99 % Occupied Bandwidth**

**11ac-80**



## 6 dB Bandwidth

Test place	Ise EMC Lab. No.3 Measurement Room
Report No.	11500824H
Date	November 10, 2016
Temperature / Humidity	23deg. C / 35 % RH
Engineer	Koji Yamamoto
Mode	Tx

11a

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5745	16.321	> 500
5785	16.324	> 500
5825	16.078	> 500

11n-20

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5745	17.628	> 500
5785	17.638	> 500
5825	17.322	> 500

11ac-20

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5745	17.556	> 500
5785	17.528	> 500
5825	17.523	> 500

11n-40

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5755	35.545	> 500
5795	35.282	> 500

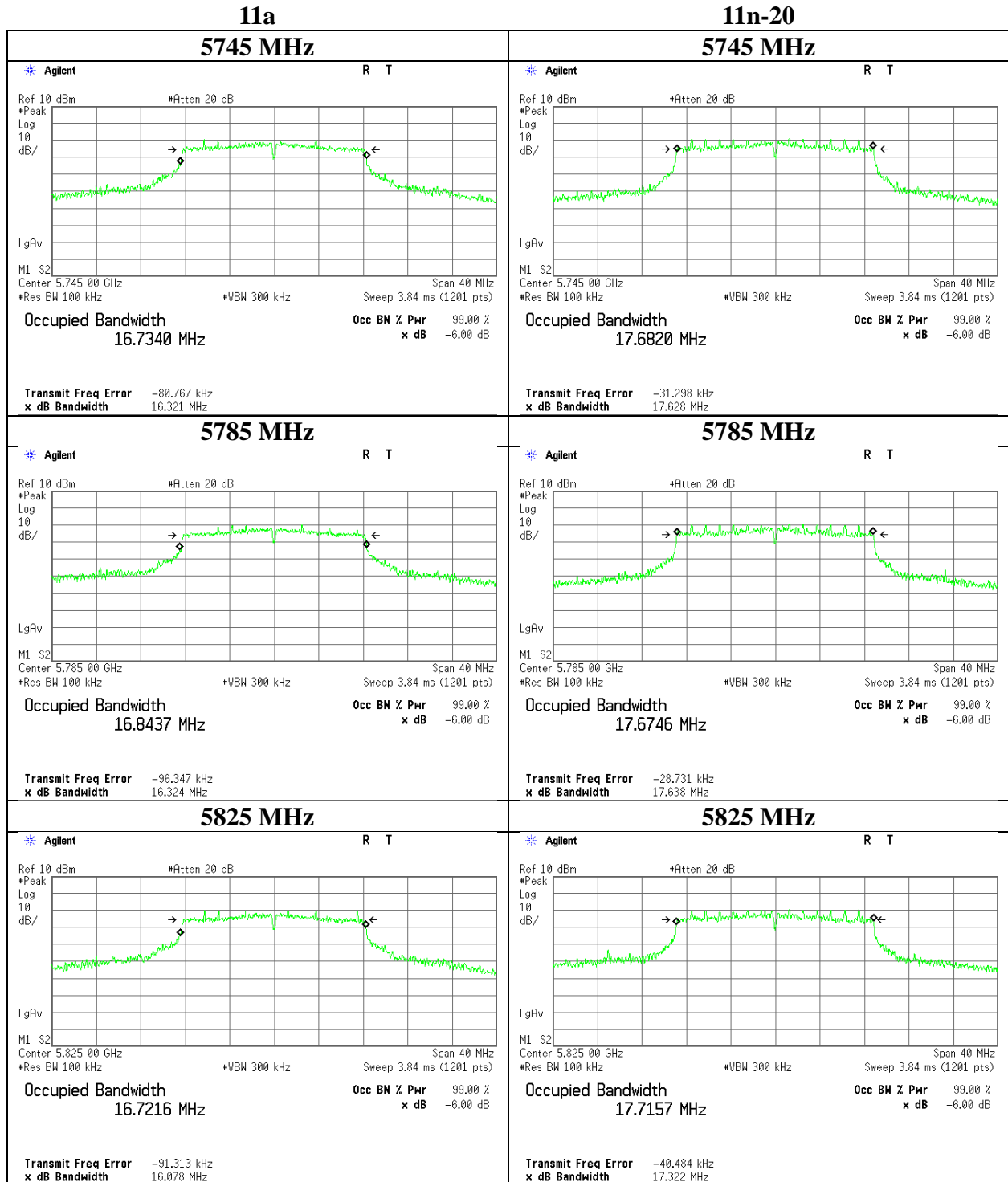
11ac-40

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5755	35.249	> 500
5795	35.544	> 500

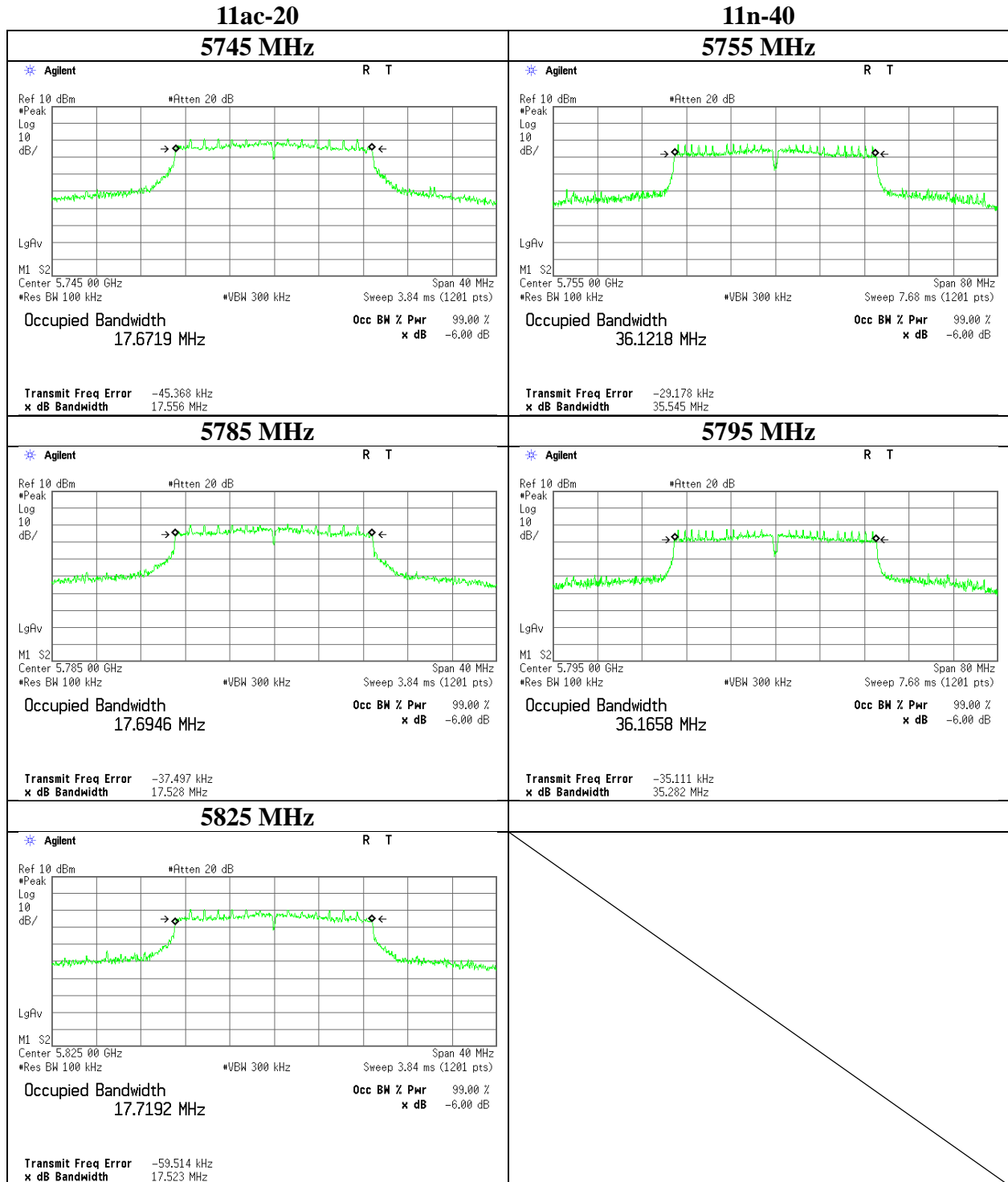
11ac-80

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5775	75.326	> 500

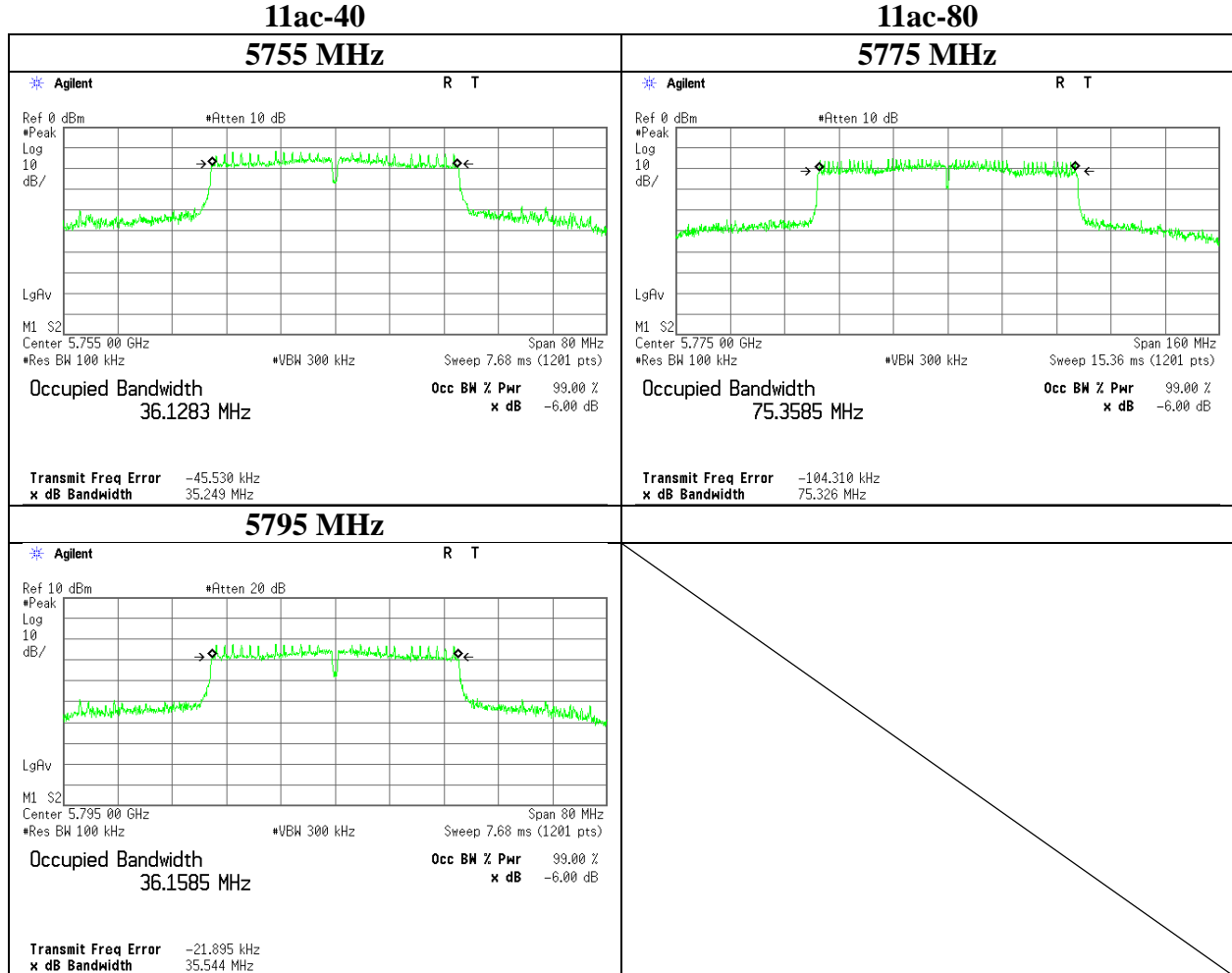
### 6 dB Bandwidth



**6 dB Bandwidth**



**6 dB Bandwidth**



**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.3 Measurement Room	
Report No.	11500824H	
Date	November 9, 2016	November 25, 2016
Temperature / Humidity	20 deg. C / 37 % RH	24deg. C / 45 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka
Mode	Tx 11a	

**6Mbps**

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [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]	Result [mW]	Limit [mW]
5280	0.62	0.05	10.13	0.29	0.3	21.109	17.094	11.09	12.85	23.97	12.88	11.39	13.77	29.97	18.58
5300	0.43	0.05	10.13	0.29	0.3	20.797	17.116	10.90	12.30	23.97	13.07	11.20	13.18	29.97	18.77
5320	0.62	0.05	10.13	0.29	0.3	21.068	17.128	11.09	12.85	23.97	12.88	11.39	13.77	29.97	18.58
5500	0.22	0.05	10.14	0.29	0.3	20.810	17.186	10.70	11.75	23.97	13.27	11.00	12.59	29.97	18.97
5580	0.30	0.05	10.13	0.29	0.3	21.221	17.171	10.77	11.94	23.97	13.20	11.07	12.79	29.97	18.90
5700	0.45	0.05	10.12	0.29	0.3	21.242	17.167	10.91	12.33	23.97	13.06	11.21	13.21	29.97	18.76
5720	0.50	0.05	10.12	0.29	0.3	21.172	17.161	10.96	12.47	23.97	13.01	11.26	13.37	29.97	18.71
5745	0.61	0.05	10.12	0.29	0.3	-	-	11.07	12.79	30.00	18.93	11.37	13.71	36.00	24.63
5785	0.44	0.05	10.12	0.29	0.3	-	-	10.90	12.30	30.00	19.10	11.20	13.18	36.00	24.80
5825	0.20	0.05	10.11	0.29	0.3	-	-	10.65	11.61	30.00	19.35	10.95	12.45	36.00	25.05

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 (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

\*Although the EUT has AP mode, client device limit which is more severe was applied to the 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

## Maximum Conducted Output Power

Test place	Ise EMC Lab. No.3 Measurement Room	
Report No.	11500824H	
Date	November 9, 2016	November 25, 2016
Temperature / Humidity	20 deg. C / 37 % RH	24deg. C / 45 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka
Mode	Tx 11n-20	

**MCS4**

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power					e.i.r.p.			
								Result		Limit [dBm]	Margin [dB]	Result		Limit [dBm]	Margin [dB]	
								[dBm]	[mW]			[dBm]	[mW]			
5280	0.53	0.05	10.13	1.42	0.3	21.046	17.967	12.13	16.33	23.97	11.84	12.43	17.50	29.97	17.54	
5300	0.67	0.05	10.13	1.42	0.3	21.363	17.988	12.27	16.87	23.97	11.70	12.57	18.07	29.97	17.40	
5320	0.69	0.05	10.13	1.42	0.3	21.200	18.034	12.29	16.94	23.97	11.68	12.59	18.16	29.97	17.38	
5500	0.29	0.05	10.14	1.42	0.3	21.063	18.016	11.90	15.49	23.97	12.07	12.20	16.60	29.97	17.77	
5580	0.31	0.05	10.13	1.42	0.3	21.141	17.943	11.91	15.52	23.97	12.06	12.21	16.63	29.97	17.76	
5700	0.32	0.05	10.12	1.42	0.3	21.005	17.953	11.91	15.52	23.97	12.06	12.21	16.63	29.97	17.76	
5720	0.17	0.05	10.12	1.42	0.3	21.124	17.887	11.76	15.00	23.97	12.21	12.06	16.07	29.97	17.91	
5745	0.24	0.05	10.12	1.42	0.3	-	-	11.83	15.24	30.00	18.17	12.13	16.33	36.00	23.87	
5785	-0.16	0.05	10.12	1.42	0.3	-	-	11.43	13.90	30.00	18.57	11.73	14.89	36.00	24.27	
5825	-0.12	0.05	10.11	1.42	0.3	-	-	11.46	14.00	30.00	18.54	11.76	15.00	36.00	24.24	

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 (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

\*Although the EUT has AP mode, client device limit which is more severe was applied to the test.

## Maximum Conducted Output Power

Test place	Ise EMC Lab. No.3 Measurement Room	
Report No.	11500824H	
Date	November 9, 2016	November 25, 2016
Temperature / Humidity	20 deg. C / 37 % RH	24deg. C / 45 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka
Mode	Tx 11ac-20	

**MCS4**

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [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]		
5280	0.56	0.05	10.13	1.54	0.3	20.858	17.995	12.28	16.90	23.97	11.69	12.58	18.11	29.97	17.39
5300	0.78	0.05	10.13	1.54	0.3	20.761	17.983	12.50	17.78	23.97	11.47	12.80	19.05	29.97	17.17
5320	0.70	0.05	10.13	1.54	0.3	21.166	17.947	12.42	17.46	23.97	11.55	12.72	18.71	29.97	17.25
5500	0.30	0.05	10.14	1.54	0.3	21.111	18.084	12.03	15.96	23.97	11.94	12.33	17.10	29.97	17.64
5580	0.35	0.05	10.13	1.54	0.3	21.083	18.030	12.07	16.11	23.97	11.90	12.37	17.26	29.97	17.60
5700	0.50	0.05	10.12	1.54	0.3	20.928	17.951	12.21	16.63	23.97	11.76	12.51	17.82	29.97	17.46
5720	0.52	0.05	10.12	1.54	0.3	21.208	18.034	12.23	16.71	23.97	11.74	12.53	17.91	29.97	17.44
5745	0.66	0.05	10.12	1.54	0.3	-	-	12.37	17.26	30.00	17.63	12.67	18.49	36.00	23.33
5785	0.50	0.05	10.12	1.54	0.3	-	-	12.21	16.63	30.00	17.79	12.51	17.82	36.00	23.49
5825	0.02	0.05	10.11	1.54	0.3	-	-	11.72	14.86	30.00	18.28	12.02	15.92	36.00	23.98

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 (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

\*Although the EUT has AP mode, client device limit which is more severe was applied to the test.

## Maximum Conducted Output Power

Test place	Ise EMC Lab. No.3 Measurement Room	
Report No.	11500824H	
Date	November 9, 2016	November 25, 2016
Temperature / Humidity	20 deg. C / 37 % RH	24deg. C / 45 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka
Mode	Tx 11n-40	

**MCS2**

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [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]		
5310	0.10	0.05	10.13	1.45	0.3	39.218	36.258	11.73	14.89	23.97	12.24	12.03	15.96	29.97	17.94
5510	-0.38	0.05	10.14	1.45	0.3	39.273	36.277	11.26	13.37	23.97	12.71	11.56	14.32	29.97	18.41
5550	-0.39	0.05	10.13	1.45	0.3	39.067	36.312	11.24	13.30	23.97	12.73	11.54	14.26	29.97	18.43
5670	0.18	0.05	10.13	1.45	0.3	39.322	36.324	11.81	15.17	23.97	12.16	12.11	16.26	29.97	17.86
5710	0.14	0.05	10.12	1.45	0.3	38.915	36.221	11.76	15.00	23.97	12.21	12.06	16.07	29.97	17.91
5755	0.10	0.05	10.12	1.45	0.3	-	-	11.72	14.86	30.00	18.28	12.02	15.92	36.00	23.98
5795	0.07	0.05	10.12	1.45	0.3	-	-	11.69	14.76	30.00	18.31	11.99	15.81	36.00	24.01

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 (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

\*Although the EUT has AP mode, client device limit which is more severe was applied to the test.

## Maximum Conducted Output Power

Test place	Ise EMC Lab. No.3 Measurement Room	
Report No.	11500824H	
Date	November 9, 2016	November 25, 2016
Temperature / Humidity	20 deg. C / 37 % RH	24deg. C / 45 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka
Mode	Tx 11ac-40	

**MCS2**

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [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]		
5310	0.11	0.05	10.13	1.42	0.3	39.282	36.396	11.71	14.83	23.97	12.26	12.01	15.89	29.97	17.96
5510	-0.29	0.05	10.14	1.42	0.3	38.995	36.290	11.32	13.55	23.97	12.65	11.62	14.52	29.97	18.35
5550	-0.35	0.05	10.13	1.42	0.3	39.507	36.328	11.25	13.34	23.97	12.72	11.55	14.29	29.97	18.42
5670	0.19	0.05	10.13	1.42	0.3	39.144	36.254	11.79	15.10	23.97	12.18	12.09	16.18	29.97	17.88
5710	0.16	0.05	10.12	1.42	0.3	39.548	36.304	11.75	14.96	23.97	12.22	12.05	16.03	29.97	17.92
5755	0.14	0.05	10.12	1.42	0.3	-	-	11.73	14.89	30.00	18.27	12.03	15.96	36.00	23.97
5795	0.10	0.05	10.12	1.42	0.3	-	-	11.69	14.76	30.00	18.31	11.99	15.81	36.00	24.01

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 (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

\*Although the EUT has AP mode, client device limit which is more severe was applied to the test.

## Maximum Conducted Output Power

Test place	Ise EMC Lab. No.3 Measurement Room		
Report No.	11500824H		
Date	November 9, 2016	November 25, 2016	
Temperature / Humidity	20 deg. C / 37 % RH	24deg. C / 45 % RH	
Engineer	Ryota Yamanaka	Ryota Yamanaka	
Mode	Tx 11ac-80		

**MCS4**

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [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]		
5530	-1.77	0.05	10.13	3.09	0.3	80.636	75.778	11.50	14.13	23.97	12.47	11.80	15.14	29.97	18.17
5690	-1.73	0.05	10.12	3.09	0.3	80.244	75.763	11.53	14.22	23.97	12.44	11.83	15.24	29.97	18.14
5775	-1.63	0.05	10.12	3.09	0.3	-	-	11.63	14.55	30.00	18.37	11.93	15.60	36.00	24.07

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 (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

\*Although the EUT has AP mode, client device limit which is more severe was applied to the test.

### Maximum Conducted Output Power

Test place : Ise EMC Lab. No.3 Measurement Room  
Report No. : 11500824H  
Date : November 8, 2016  
Temperature / Humidity : 22deg. C / 58 % RH  
Engineer : Ryota Yamanaka  
Mode : Tx 11a

#### **5280MHz**

Mode	Rate Mbps	Reading (timed average) [dBm]	Remarks
11a	6	3.12	*
	9	3.05	
	12	3.01	
	18	2.97	
	24	2.94	
	36	3.04	
	48	0.94	
	54	1.00	

\* Worst rate

Used gate function

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

\*Difference between worst rate check data and formal test result is due to the different test condition.

## Maximum Conducted Output Power

Test place : Ise EMC Lab. No.3 Measurement Room  
Report No. : 11500824H  
Date : November 8, 2016  
Temperature / Humidity : 22deg. C / 58 % RH  
Engineer : Ryota Yamanaka  
Mode : Tx 11n-20

### 5280 MHz

#### Short GI

Mode	MCS Number	Reading (timed average) [dBm]	Remarks
11n20	0	2.77	
	1	2.60	
	2	2.67	
	3	2.74	
	4	2.82	
	5	0.75	
	6	0.71	
	7	-3.96	

\* Worst rate

Used Gate function

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

\*Difference between worst rate check data and formal test result is due to the different test condition.

### 5280 MHz

#### Long GI

Mode	MCS Number	Reading (timed average) [dBm]	Remarks
11n20	0	2.70	
	1	2.73	
	2	2.68	
	3	2.77	
	4	3.23	*
	5	0.69	
	6	0.78	
	7	-4.17	

\* Worst rate

Used gate function

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

\*Difference between worst rate check data and formal test result is due to the different test condition.

## Maximum Conducted Output Power

Test place : Ise EMC Lab. No.3 Measurement Room  
Report No. : 11500824H  
Date : November 8, 2016  
Temperature / Humidity : 22deg. C / 58 % RH  
Engineer : Ryota Yamanaka  
Mode : Tx 11ac-20

### 5280 MHz

#### Short GI

Mode	MCS Number	Reading (timed average) [dBm]	Remarks
11ac20	0	2.68	
	1	2.59	
	2	2.27	
	3	2.78	
	4	3.15	*
	5	0.70	
	6	0.69	
	7	-4.28	
	8	-3.18	

\* Worst rate

Used gate function

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

\*Difference between worst rate check data and formal test result is due to the different test condition.

### 5280 MHz

#### Long GI

Mode	MCS Number	Reading (timed average) [dBm]	Remarks
11ac20	0	2.68	
	1	2.67	
	2	2.76	
	3	2.81	
	4	2.93	
	5	0.65	
	6	0.83	
	7	-3.99	
	8	-2.92	

\* Worst rate

Used gate function

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

\*Difference between worst rate check data and formal test result is due to the different test condition.

## Maximum Conducted Output Power

Test place : Ise EMC Lab. No.3 Measurement Room  
Report No. : 11500824H  
Date : November 8, 2016  
Temperature / Humidity : 22deg. C / 58 % RH  
Engineer : Ryota Yamanaka  
Mode : Tx 11n-40

### 5310 MHz

#### Short GI

Mode	MCS Number	Reading (timed average) [dBm]	Remarks
11n40	0	-0.62	
	1	-0.55	
	2	-0.92	
	3	-0.84	
	4	-0.76	
	5	-0.72	
	6	-0.67	
	7	-0.88	

\* Worst rate

Used gate function

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

\*Difference between worst rate check data and formal test result is due to the different test condition.

### 5310 MHz

#### Long GI

Mode	MCS Number	Reading (timed average) [dBm]	Remarks
11n40	0	-0.66	
	1	-0.51	
	2	-0.45	*
	3	-0.82	
	4	-0.81	
	5	-0.69	
	6	-0.69	
	7	-0.85	

\* Worst rate

Used gate function

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

\*Difference between worst rate check data and formal test result is due to the different test condition.

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## Maximum Conducted Output Power

Test place : Ise EMC Lab. No.3 Measurement Room  
Report No. : 11500824H  
Date : November 8, 2016  
Temperature / Humidity : 22deg. C / 58 % RH  
Engineer : Ryota Yamanaka  
Mode : Tx 11ac-40

### 5310 MHz

#### Short GI

Mode	MCS Number	Reading	Remarks
		(timed average) [dBm]	
11ac40	0	-0.51	
	1	-0.58	
	2	-0.50	
	3	-0.87	
	4	-0.81	
	5	-0.73	
	6	-0.75	
	7	-0.95	
	8	-3.06	
	9	-3.55	

\* Worst rate

Used gate function

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

\*Difference between worst rate check data and formal test result is due to the different test condition.

### 5310 MHz

#### Long GI

Mode	MCS Number	Reading	Remarks
		(timed average) [dBm]	
11ac40	0	-0.72	
	1	-0.53	
	2	-0.48	*
	3	-0.88	
	4	-0.78	
	5	-0.76	
	6	-0.71	
	7	-0.93	
	8	-2.97	
	9	-3.43	

\* Worst rate

Used gate function

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

\*Difference between worst rate check data and formal test result is due to the different test condition.

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## Maximum Conducted Output Power

Test place : Ise EMC Lab. No.3 Measurement Room  
Report No. : 11500824H  
Date : November 8, 2016  
Temperature / Humidity : 22deg. C / 58 % RH  
Engineer : Ryota Yamanaka  
Mode : Tx 11ac-80

### 5530 MHz

#### Short GI

Mode	MCS Number	Reading	Remarks
		(timed average) [dBm]	
11ac80	0	0.07	
	1	0.10	
	2	0.03	
	3	0.17	
	4	0.33	
	5	-1.85	
	6	-2.00	
	7	-3.04	
	8	-3.83	
9	-5.84		

\* Worst rate

Used gate function

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

\*Difference between worst rate check data and formal test result is due to the different test condition.

### 5530 MHz

#### Long GI

Mode	MCS Number	Reading	Remarks
		(timed average) [dBm]	
11ac80	0	0.03	
	1	0.05	
	2	0.06	
	3	0.18	
	4	0.34	*
	5	-2.08	
	6	-2.07	
	7	-3.03	
	8	-3.90	
9	-5.91		

\* Worst rate

Used gate function

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

\*Difference between worst rate check data and formal test result is due to the different test condition.

**Average Output Power**  
**(Reference data for RF Exposure)**

Test place : Ise EMC Lab. No.6 Measurement Room  
Report No. : 11500824H  
Date : November 24, 2016  
Temperature / Humidity : 23deg. C / 42 % RH  
Engineer : Keisuke Kawamura  
Mode : Tx 11a

**6Mbps**

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
5280	-0.19	0.05	10.14	10.00	10.00	0.29	10.29	10.69
5300	-0.12	0.05	10.14	10.07	10.16	0.29	10.36	10.86
5320	-0.17	0.05	10.14	10.02	10.05	0.29	10.31	10.74
5500	0.13	0.05	10.15	10.33	10.79	0.29	10.62	11.53
5580	0.25	0.05	10.14	10.44	11.07	0.29	10.73	11.83
5700	0.43	0.05	10.13	10.61	11.51	0.29	10.90	12.30
5720	0.45	0.05	10.13	10.63	11.56	0.29	10.92	12.36
5745	0.59	0.05	10.12	10.76	11.91	0.29	11.05	12.74
5785	0.42	0.05	10.12	10.59	11.46	0.29	10.88	12.25
5825	0.13	0.05	10.12	10.30	10.72	0.29	10.59	11.46

Sample Calculation:

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

**The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01 v02r02.**

**Average Output Power**  
**(Reference data for RF Exposure)**

Test place : Ise EMC Lab. No.6 Measurement Room  
Report No. : 11500824H  
Date : November 24, 2016  
Temperature / Humidity : 23deg. C / 42 % RH  
Engineer : Keisuke Kawamura  
Mode : Tx 11n-20

**MCS0(Long GI)**

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
5280	-0.62	0.05	10.14	9.57	9.06	0.30	9.87	9.71
5300	-0.66	0.05	10.14	9.53	8.97	0.30	9.83	9.62
5320	-0.66	0.05	10.14	9.53	8.97	0.30	9.83	9.62
5500	-0.31	0.05	10.15	9.89	9.75	0.30	10.19	10.45
5580	-0.27	0.05	10.14	9.92	9.82	0.30	10.22	10.52
5700	0.14	0.05	10.13	10.32	10.76	0.30	10.62	11.53
5720	0.18	0.05	10.13	10.36	10.86	0.30	10.66	11.64
5745	0.15	0.05	10.12	10.32	10.76	0.30	10.62	11.53
5785	-0.05	0.05	10.12	10.12	10.28	0.30	10.42	11.02
5825	-0.30	0.05	10.12	9.87	9.71	0.30	10.17	10.40

Sample Calculation:

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

**The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01 v02r02.**

**Average Output Power**  
**(Reference data for RF Exposure)**

Test place : Ise EMC Lab. No.6 Measurement Room  
Report No. : 11500824H  
Date : November 24, 2016  
Temperature / Humidity : 23deg. C / 42 % RH  
Engineer : Keisuke Kawamura  
Mode : Tx 11n-40

**MCS0 (Long GI)**

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
5310	-0.87	0.05	10.14	9.32	8.55	0.57	9.89	9.75
5510	-0.68	0.05	10.15	9.52	8.95	0.57	10.09	10.21
5550	-0.58	0.05	10.14	9.61	9.14	0.57	10.18	10.42
5670	-0.15	0.05	10.13	10.03	10.07	0.57	10.60	11.48
5710	-0.11	0.05	10.13	10.07	10.16	0.57	10.64	11.59
5755	-0.04	0.05	10.12	10.13	10.30	0.57	10.70	11.75
5795	-0.33	0.05	10.12	9.84	9.64	0.57	10.41	10.99

Sample Calculation:

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

**The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01 v02r02.**

**Average Output Power**  
**(Reference data for RF Exposure)**

Test place : Ise EMC Lab. No.6 Measurement Room  
Report No. : 11500824H  
Date : November 24, 2016  
Temperature / Humidity : 23deg. C / 42 % RH  
Engineer : Keisuke Kawamura  
Mode : Tx 11ac-20

**MCS0(Long GI)**

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
5280	-0.60	0.05	10.14	9.59	9.10	0.30	9.89	9.75
5300	-0.55	0.05	10.14	9.64	9.20	0.30	9.94	9.86
5320	-0.61	0.05	10.14	9.58	9.08	0.30	9.88	9.73
5500	-0.36	0.05	10.15	9.84	9.64	0.30	10.14	10.33
5580	-0.22	0.05	10.14	9.97	9.93	0.30	10.27	10.64
5700	0.18	0.05	10.13	10.36	10.86	0.30	10.66	11.64
5720	0.04	0.05	10.13	10.22	10.52	0.30	10.52	11.27
5745	0.16	0.05	10.12	10.33	10.79	0.30	10.63	11.56
5785	-0.05	0.05	10.12	10.12	10.28	0.30	10.42	11.02
5825	-0.35	0.05	10.12	9.82	9.59	0.30	10.12	10.28

Sample Calculation:

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

**The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01 v02r02.**

**Average Output Power**  
**(Reference data for RF Exposure)**

Test place : Ise EMC Lab. No.6 Measurement Room  
Report No. : 11500824H  
Date : November 24, 2016  
Temperature / Humidity : 23deg. C / 42 % RH  
Engineer : Keisuke Kawamura  
Mode : Tx 11ac-40

**MCS0(Long GI)**

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
5310	-0.96	0.05	10.14	9.23	8.38	0.58	9.81	9.57
5510	-0.67	0.05	10.15	9.53	8.97	0.58	10.11	10.26
5550	-0.47	0.05	10.14	9.72	9.38	0.58	10.30	10.72
5670	-0.23	0.05	10.13	9.95	9.89	0.58	10.53	11.30
5710	-0.15	0.05	10.13	10.03	10.07	0.58	10.61	11.51
5755	-0.14	0.05	10.12	10.03	10.07	0.58	10.61	11.51
5795	-0.23	0.05	10.12	9.94	9.86	0.58	10.52	11.27

Sample Calculation:

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

**The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01 v02r02.**

**Average Output Power**  
**(Reference data for RF Exposure)**

Test place : Ise EMC Lab. No.6 Measurement Room  
Report No. : 11500824H  
Date : November 24, 2016  
Temperature / Humidity : 23deg. C / 42 % RH  
Engineer : Keisuke Kawamura  
Mode : Tx 11ac-80

**MCS0(Long GI)**

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
5530	-2.03	0.05	10.15	8.17	6.56	1.10	9.27	8.45
5690	-1.67	0.05	10.13	8.51	7.10	1.10	9.61	9.14
5775	-1.57	0.05	10.12	8.60	7.24	1.10	9.70	9.33

Sample Calculation:

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

**The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01 v02r02.**