



RADIO TEST REPORT

Test Report No. : 12608632H-C-R2

Applicant : MITSUBISHI ELECTRIC CORPORATION
SANDA WORKS

Type of Equipment : Display Audio

Model No. : R1 LOW

FCC ID : UJHR1LOW

Test regulation : FCC Part 15 Subpart E: 2018
(Except for DFS test)

Test Result : Complied (Refer to SECTION 3.2)

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
6. The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
7. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
8. The information provided from the customer for this report is identified in SECTION 1.
9. This report is a revised version of 12608632H-C-R1. 12608632H-C-R1 is replaced with this report.

Date of test: March 18 to May 17, 2019

Representative test engineer:

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REVISION HISTORY

Original Test Report No.: 12608632H-C

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CONTENTS	PAGE
SECTION 1: Customer information.....	4
SECTION 2: Equipment under test (E.U.T.).....	4
SECTION 3: Test specification, procedures & results.....	6
SECTION 4: Operation of E.U.T. during testing.....	9
SECTION 5: Radiated Spurious Emission and Band Edge Compliance.....	13
SECTION 6: Antenna Terminal Conducted Tests.....	16
APPENDIX 1: Test data	17
26 dB Emission Bandwidth and 99 % Occupied Bandwidth.....	17
20 dB Bandwidth	43
6 dB Bandwidth	45
Maximum Conducted Output Power	49
Average Output Power.....	60
Maximum Power Spectral Density	71
Radiated Spurious Emission	102
Conducted Spurious Emission	143
APPENDIX 2: Test instruments	144
APPENDIX 3: Photographs of test setup	146
Radiated Spurious Emission	146

SECTION 1: Customer information

Company Name	:	MITSUBISHI ELECTRIC CORPORATION SANDA WORKS
Address	:	2-3-33, Miwa, Sanda-city, Hyogo, 669-1513, Japan
Telephone Number	:	+81-79-559-3952
Facsimile Number	:	+81-79-559-3875
Contact Person	:	Hiroataka Minato

The information provided from the customer is as follows;

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

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

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

2.1 Identification of E.U.T.

Type of Equipment	:	Display Audio
Model No.	:	R1 LOW
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 12.0 V
Receipt Date of Sample (Information from test lab.)	:	February 4, 2018
Country of Mass-production	:	Mexico, China, Thailand, Japan
Condition of EUT	:	Production model
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model: R1 LOW (referred to as the EUT in this report) is a Display Audio.

Radio Specification

Wireless LAN (IEEE802.11b/g/a/n-20/n-40/11ac-20/11ac-40/11ac-80)

Type of radio	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 - 2462 MHz	2412 MHz - 2462 MHz	5180 MHz - 5240 MHz 5260 MHz - 5320 MHz 5500 MHz - 5700 MHz 5745 MHz - 5825 MHz	5190 MHz - 5230 MHz 5270 MHz - 5310 MHz 5510 MHz - 5670 MHz 5755 MHz - 5795 MHz	5210 MHz 5290 MHz 5530 MHz, 5610 MHz 5775 MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK, 256QAM(IEEE802.11ac only))		
Channel spacing	5 MHz		20 MHz	40 MHz	80 MHz
Antenna type	Sheet metal antenna				
Antenna Gain	Antenna 0: 2.4 GHz: 1.61 dBi / 5 GHz: 3.54 dBi Antenna 1: 2.4 GHz: 3.01 dBi / 5 GHz: 1.68 dBi				
Directional Antenna Gain *2)	2.4 GHz: 5.35 dBi 5 GHz: 5.67 dBi				

Bluetooth

Type of radio	Bluetooth
Frequency of operation	2402 MHz - 2480 MHz
Type of modulation	BT: FHSS (GFSK, $\pi/4$ DQPSK, 8DPSK) LE: GFSK
Channel spacing	BT: 1 MHz LE: 2 MHz
Antenna type	Sheet metal antenna
Antenna Gain	1.61 dBi

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

*2) Directional Antenna Gain = $10 \log \left(\left(10^{\frac{G_{Anto}}{20}} + 10^{\frac{G_{Antl}}{20}} \right)^2 / 2 \right)$

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart E
FCC Part 15 final revised on March 12, 2018 and effective April 11, 2018

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

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

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 IC: RSS-Gen 8.8	FCC: 15.407 (b) (6) / 15.207 IC: RSS-Gen 8.8	-	N/A	-
26 dB Emission Bandwidth	FCC: KDB Publication Number 789033 IC: -	FCC: 15.407 (a) (1) (2) (3) IC: -	See data	Complied a)	Conducted
Maximum Conducted Output Power	FCC: KDB Publication Number 789033 IC: -	FCC: 15.407 (a) (1) (2) (3) IC: RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1		Complied b)	Conducted
Maximum Power Spectral Density	FCC: KDB Publication Number 789033 IC: -	FCC : 15.407 (a) (1) (2) (3) IC: RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1		Complied c)	Conducted
Spurious Emission Restricted Band Edge	FCC: ANSI C63.10-2013 KDB Publication Number 789033 IC: -	FCC: 15.407 (b), 15.205 and 15.209 IC: RSS-247 6.2.1.2 6.2.2.2 6.2.3.2 6.2.4.2	7.3 dB 5150.000 MHz, AV, Hori.	Complied d) / e)	Conducted (< 30 MHz) / Radiated (> 30 MHz) *1)
6 dB Emission Bandwidth	FCC: ANSI C63.10-2013 IC: -	FCC: 15.407 (e) IC: RSS-247 6.2.4.1	See data	Complied f)	Conducted

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 12608632H-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).

a) Refer to APPENDIX 1 (data of 26 dB Emission Bandwidth and 99 % Occupied Bandwidth)

b) Refer to APPENDIX 1 (data of Maximum Conducted Output Power)

c) Refer to APPENDIX 1 (data of Maximum Power Spectral Density)

d) Refer to APPENDIX 1 (data of Radiated Spurious Emission)

e) Refer to APPENDIX 1 (data of Conducted Spurious Emission)

f) Refer to APPENDIX 1 (data of 6 dB Bandwidth)

Symbols:

Complied The data of this test item has enough margin, more than the measurement uncertainty.

Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.

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

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Supplied Voltage Information

This EUT provides stable voltage constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

Antenna Information

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

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99 % Occupied Band Width	RSS-Gen 6.7	IC: -	N/A	- a)	Conducted
a) Refer to APPENDIX 1 (data of 26 dB Emission Bandwidth and 99 % Occupied Bandwidth)					

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

3.4 Uncertainty

EMI

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

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k=2$.
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Radiated emission

Measurement distance	Frequency range	Uncertainty (+/-)
3 m	9 kHz to 30 MHz	3.3 dB
10 m		3.2 dB
3 m	30 MHz to 200 MHz (Horizontal)	4.8 dB
		5.0 dB
	200 MHz to 1000 MHz (Horizontal)	5.2 dB
		6.3 dB
10 m	30 MHz to 200 MHz (Horizontal)	4.8 dB
		4.9 dB
	200 MHz to 1000 MHz (Horizontal)	5.0 dB
		5.0 dB
3 m	1 GHz to 6 GHz	5.0 dB
	6 GHz to 18 GHz	5.3 dB
1 m	10 GHz to 26.5 GHz	5.8 dB
	26.5 GHz to 40 GHz	5.8 dB
10 m	1 GHz to 18 GHz	5.2 dB

Antenna Terminal test

Test Item	Uncertainty (+/-)
26 dB Emission Bandwidth / 6 dB Emission Bandwidth / 99 % Occupied Bandwidth	0.96 %
Maximum Conducted Output Power / Average Output Power	1.3 dB
Burst Rate	0.10 %
Maximum Power Spectral Density	2.7 dB
Spurious Emission (Conducted)	1.9 dB

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3.5 Test Location

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NVLAP Lab. code: 200572-0 / FCC Test Firm Registration Number: 199967

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	3.1 x 5.0	-	-
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.

Mode	Remarks*
IEEE 802.11a (11a)	54 Mbps, PN9
IEEE 802.11n 20 MHz BW (11n-20)	MCS 11, PN9
IEEE 802.11ac 20 MHz BW (11ac-20)	MCS 3 , PN9
IEEE 802.11n 40 MHz BW (11n-40)	MCS 12, PN9
IEEE 802.11ac 40 MHz BW (11ac-40)	MCS 1 , PN9
IEEE 802.11ac 80 MHz BW (11ac-80)	MCS 7 , PN9
*The worst antenna and 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: 11a: 7.5 dBm 11n-20: 6.5 dBm 11n-40: 5.5 dBm 11ac-20 (MCS 0 to 7): 6.5 dBm 11ac-20 (MCS 8): 5.5 dBm 11ac-40 (MCS 0 to 7): 5.5 dBm 11ac-40 (MCS 8 and 9): 3.5 dBm 11ac-80 (MCS 0 to 7): 4.5 dBm 11ac-80 (MCS 8 and 9): 2.5 dBm Software: BTFM.RM.2.4.1-00019-QCABTFMSWPZ-1 *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.	

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*The details of Operation mode(s)

Test Item	Operating Mode	Tested Antenna Port	Tested Frequency			
			Low Band	Middle Band	Additional Band	Upper Band
Conducted Spurious Emission, Radiated Spurious Emission (Below 1GHz)	11ac-20 Tx *1)	0+1	5180 MHz *3)	-	-	-
26dB Emission Bandwidth	11a Tx, 11n-20 Tx, 11ac-20 Tx	0	-	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	-
	11n-40 Tx, 11ac-40 Tx	0	-	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz	-
	11ac-80 Tx	0	-	5290 MHz	5530 MHz 5610 MHz	-
99% Occupied Bandwidth,	11a Tx, 11n-20 Tx, 11ac-20 Tx	0	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx, 11ac-40 Tx	0	5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz	5755 MHz 5795 MHz
	11ac-80 Tx	0	5210 MHz	5290 MHz	5530 MHz 5610 MHz	5775 MHz
Radiated Spurious Emission (Above 1 GHz)	11ac-20 Tx *2)	0+1	5180 MHz	5260 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	11ac-40 Tx *2)	0+1	5190 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz	5755 MHz 5795 MHz
	11ac-80 Tx	0+1	5210 MHz *3)	5290 MHz	5530 MHz 5610 MHz	5775 MHz
6dB Bandwidth	11a Tx, 11n-20 Tx, 11ac-20 Tx	0	-	-	-	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx, 11ac-40 Tx	0	-	-	-	5755 MHz 5795 MHz
	11ac-80 Tx	0	-	-	-	5775 MHz
20 dB Emission Bandwidth	11a Tx, 11n-20 Tx, 11ac-20 Tx	0	5240 MHz	-	-	-
	11n-40 Tx, 11ac-40 Tx	0	5230 MHz	-	-	-
	11ac-80 Tx	0	5210 MHz	-	-	-
Maximum Conducted Output Power, Maximum Power Spectral Density	11a Tx	0	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-20 Tx, 11ac-20 Tx	0, 1, 0+1				
	11n-40 Tx, 11ac-40 Tx	0, 1, 0+1	5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz	5755 MHz 5795 MHz
	11ac-80 Tx	0, 1, 0+1	5210 MHz	5290 MHz	5530 MHz 5610 MHz	5775 MHz
*1) The mode was tested as a representative, because it had the highest power at antenna terminal test. *2) Since 11n-20 and 11ac-20, 11n-40 and 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. *3) Transmit simultaneously with Bluetooth.						

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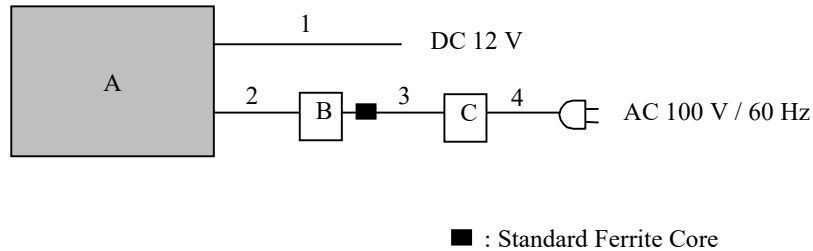
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4.2 Configuration and peripherals

For Antenna Terminal Conducted Tests



* 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	Display Audio	R1 LOW	PV1-UNIT-027	MITSUBISHI ELECTRIC CORPORATION SANDA WORKS	EUT
B	Laptop PC	CF-N8HWCDPS	OBKSA08704	Panasonic	-
C	AC Adaptor	CF-AA6372B	6372BM409907232B	Panasonic	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	0.9	Unshielded	Unshielded	-
2	USB Cable	1.0	Shielded	Shielded	-
3	DC Cable	0.8	Unshielded	Unshielded	-
4	AC Cable	1.0	Unshielded	Unshielded	-

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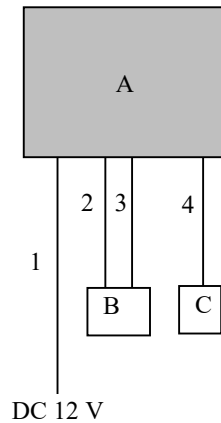
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For Radiated Spurious Emission



* 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	Display Audio	R1 LOW	PV1-UNIT-042	MITSUBISHI ELECTRIC CORPORATION SANDA WORKS	EUT
B	Jig	-	-	-	-
C	GNSS Antenna	BY-GPS-03	-	-	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	2.0	Unshielded	Unshielded	-
2	USB Cable	0.9	Shielded	Shielded	-
3	Signal Cable	2.0	Unshielded	Unshielded	-
4	GNSS Cable	5.0	Unshielded	Unshielded	-

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SECTION 5: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

< Below 1GHz >

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

< 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).

For W58 Bandedge

-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 section 15.407(b)(4)(i).

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;

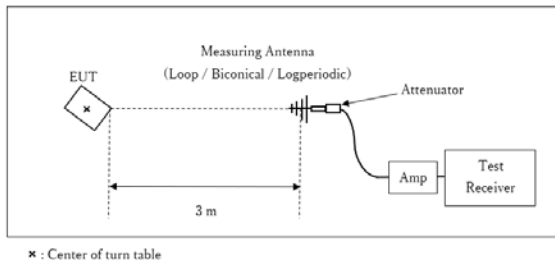
Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

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.

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

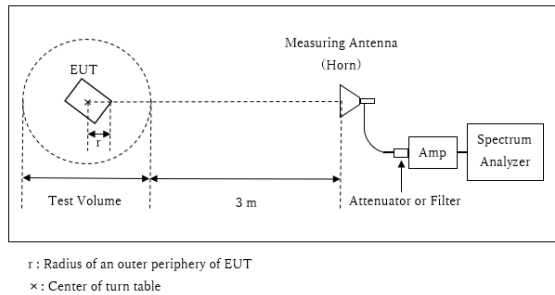
Figure 2: Test Setup

Below 1 GHz



Test Distance: 3 m

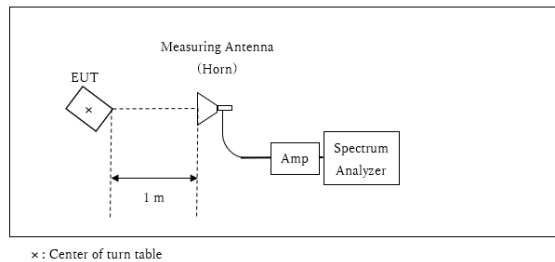
1 GHz - 10 GHz



Distance Factor: $20 \times \log (3.65 \text{ m} / 3.0 \text{ m}) = 1.71 \text{ dB}$
* Test Distance: $(3 + \text{Test Volume} / 2) - r = 3.65 \text{ m}$

Test Volume : 1.5 m
(Test Volume has been calibrated based on CISPR 16-1-4.)
r = 0.1 m

10 GHz - 40 GHz



Distance Factor: $20 \times \log (1.0 \text{ m} / 3.0 \text{ m}) = -9.5 \text{ dB}$
*Test Distance: 1 m

The test was made on EUT at the normal use position.

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 6: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
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	≥ 3 RBW	Auto	Peak	Max Hold	Spectrum Analyzer
20 dB Bandwidth	Enough to capture the emission	100 kHz	300 kHz	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 k.Hz *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 v02r01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".

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

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

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

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

Test data : APPENDIX

Test result : Pass

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APPENDIX 1: Test data

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No. 12608632H
Test place Ise EMC Lab. No.4 Measurement Room
Date March 22, 2019 March 25, 2019
Temperature / Humidity 24 deg. C / 41 % RH 23 deg. C / 40 % RH
Engineer Ryota Yamanaka Ryota Yamanaka
Mode Tx

11a

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 0	5180	-	16916.2
	5220	-	16906.6
	5240	-	16862.2
	5260	20.312	16893.9
	5300	20.459	16898.5
	5320	20.253	16947.1
	5500	20.436	16893.0
	5580	20.329	16931.9
	5700	20.379	16966.1
	5745	-	16899.5
	5785	-	16919.4
	5825	-	16941.7

11n-20

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 0	5180	-	18111.9
	5220	-	18090.7
	5240	-	18076.9
	5260	22.170	18107.0
	5300	21.877	18076.0
	5320	21.857	18084.4
	5500	21.493	18099.1
	5580	22.127	18101.8
	5700	21.931	18129.3
	5745	-	18151.0
	5785	-	18106.4
	5825	-	18096.8

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No. 12608632H
Test place Ise EMC Lab. No.4 Measurement Room
Date March 22, 2019 March 25, 2019
Temperature / Humidity 24 deg. C / 41 % RH 23 deg. C / 40 % RH
Engineer Ryota Yamanaka Ryota Yamanaka
Mode Tx

11ac-20

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 0	5180	-	18109.1
	5220	-	18044.5
	5240	-	18128.5
	5260	21.945	18126.8
	5300	21.783	18130.6
	5320	21.794	18093.6
	5500	22.061	18073.2
	5580	21.715	18063.1
	5700	21.561	18044.0
	5745	-	18111.8
	5785	-	18076.0
	5825	-	18056.5

11n-40

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 0	5190	-	36583.1
	5230	-	36655.5
	5270	42.738	36675.1
	5310	42.776	36629.0
	5510	44.043	36568.6
	5550	43.615	36714.4
	5670	43.653	36646.8
	5755	-	36559.6
	5795	-	36622.9

11ac-40

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 0	5190	-	36049.3
	5230	-	36039.1
	5270	40.556	35973.7
	5310	40.517	36064.9
	5510	40.884	36015.4
	5550	39.892	35970.8
	5670	40.226	35936.3
	5755	-	35978.3
	5795	-	35970.9

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

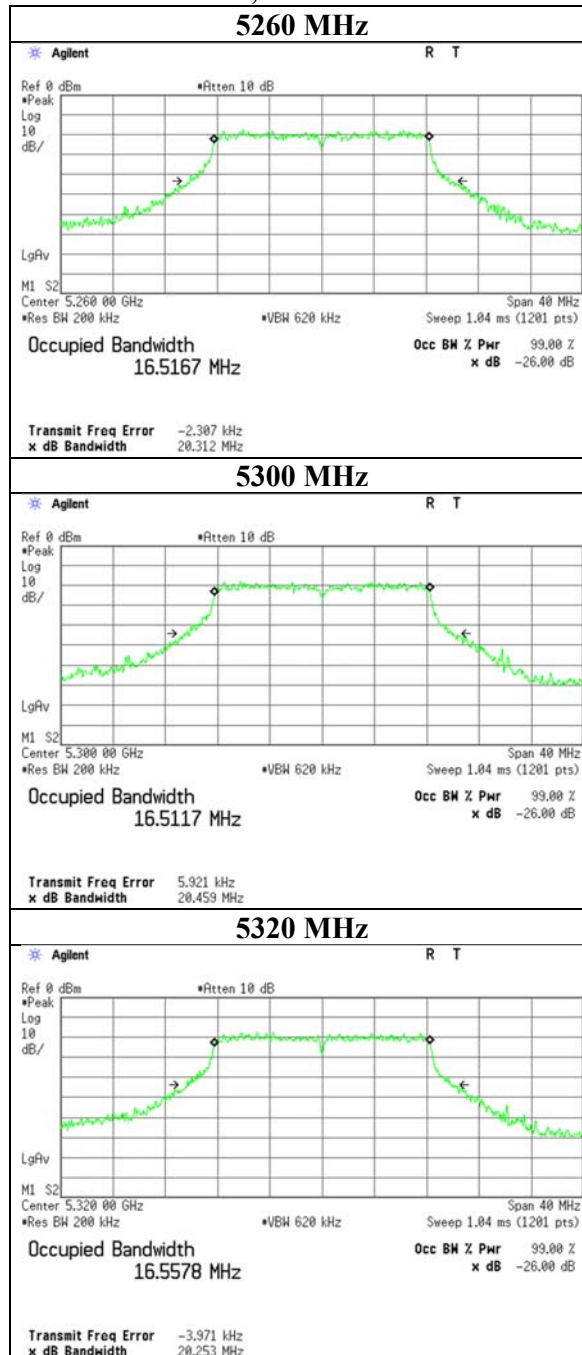
Report No. 12608632H
Test place Ise EMC Lab. No.4 Measurement Room
Date March 22, 2019 March 25, 2019
Temperature / Humidity 24 deg. C / 41 % RH 23 deg. C / 40 % RH
Engineer Ryota Yamanaka Ryota Yamanaka
Mode Tx

11ac-80

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 0	5210	-	76791.8
	5290	94.880	76755.1
	5530	94.414	76574.3
	5610	86.814	76643.6
	5775	-	76477.9

26 dB Emission Bandwidth

11a, Antenna 0



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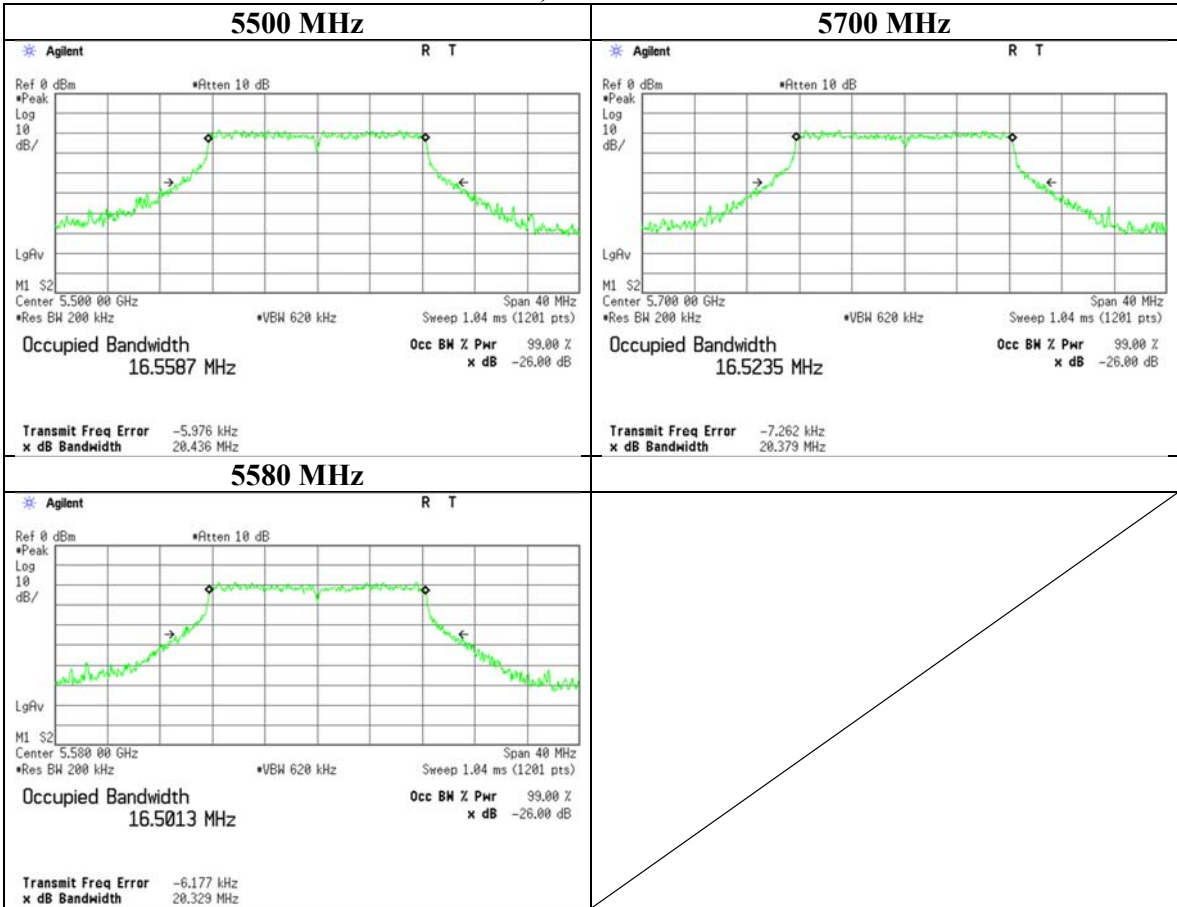
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26 dB Emission Bandwidth

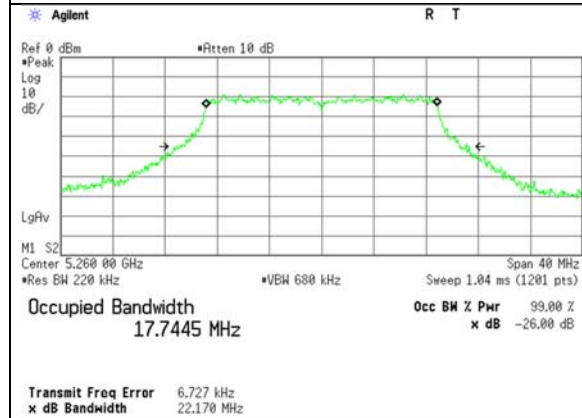
11a, Antenna 0



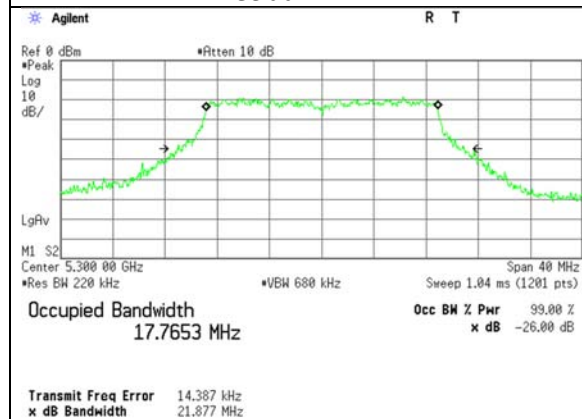
26 dB Emission Bandwidth

11n-20, Antenna 0

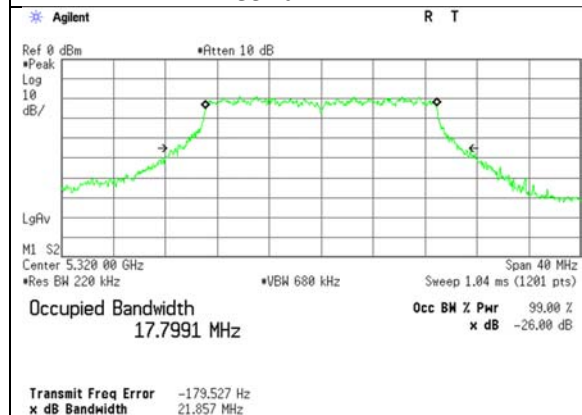
5260 MHz



5300 MHz



5320 MHz



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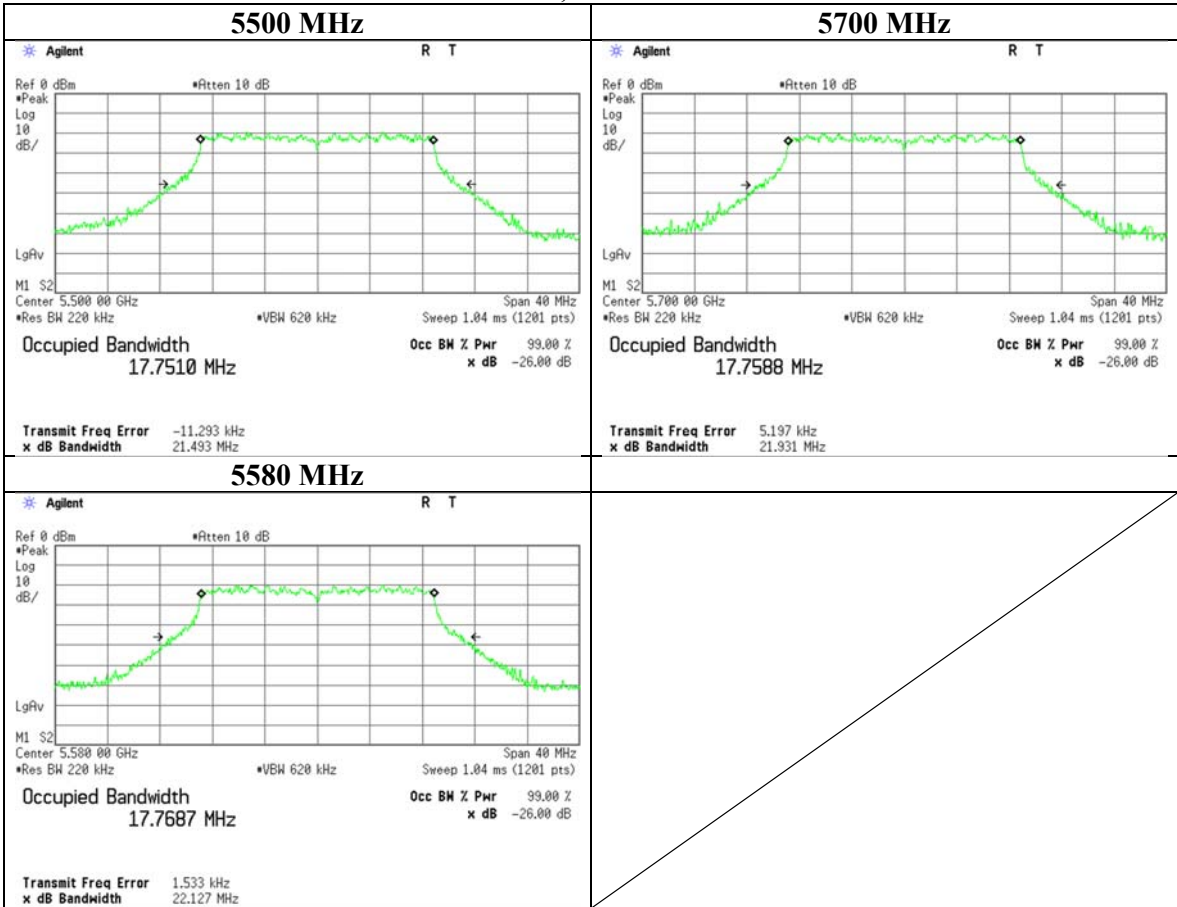
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26 dB Emission Bandwidth

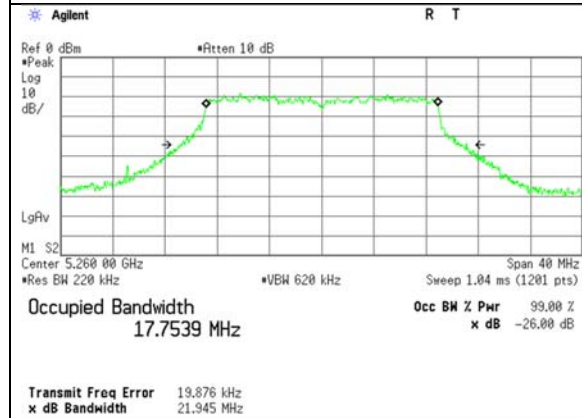
11n-20, Antenna 0



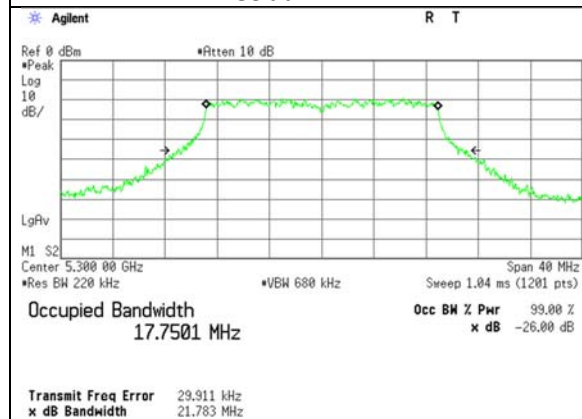
26 dB Emission Bandwidth

11ac-20, Antenna 0

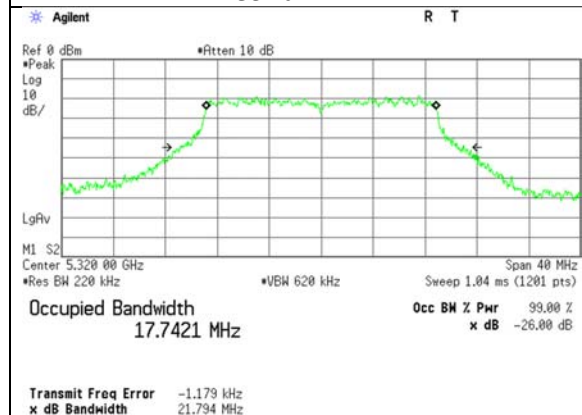
5260 MHz



5300 MHz

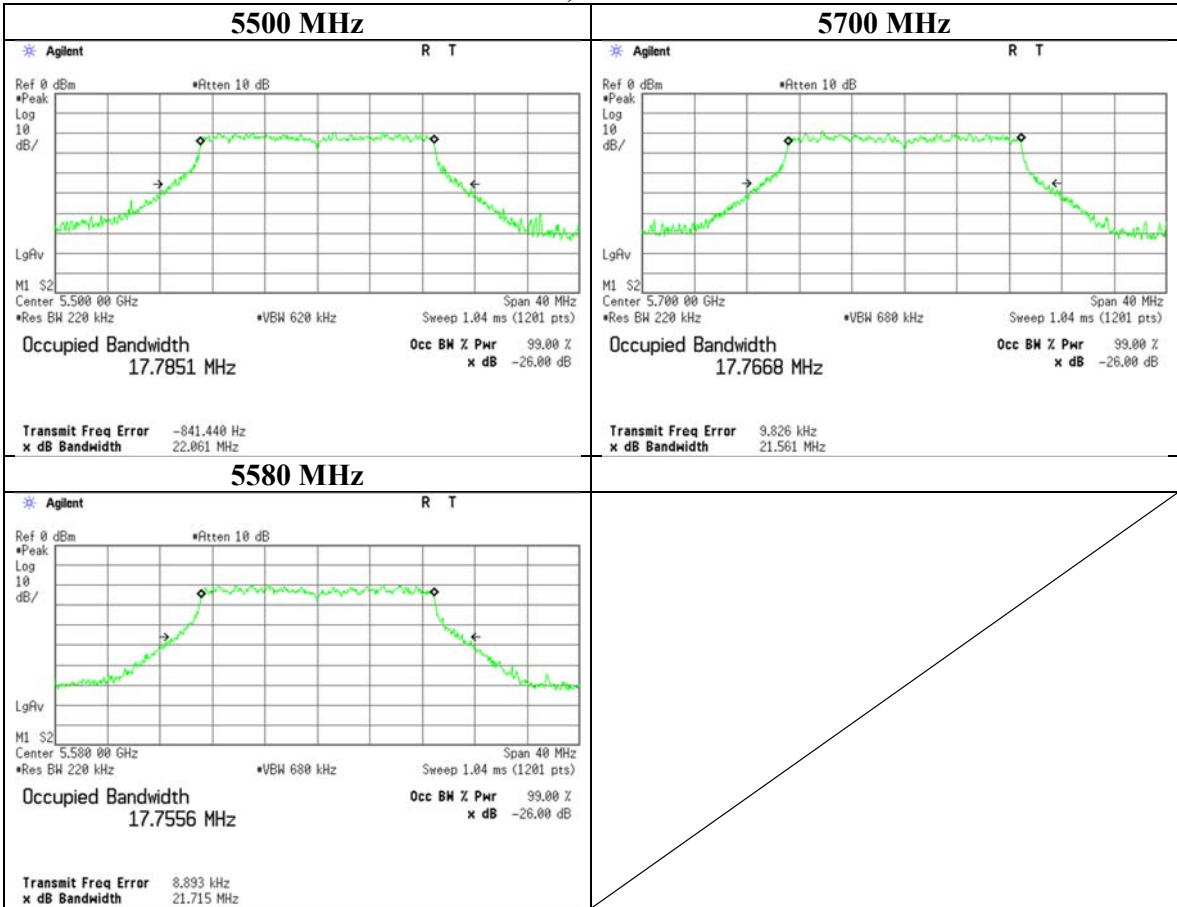


5320 MHz



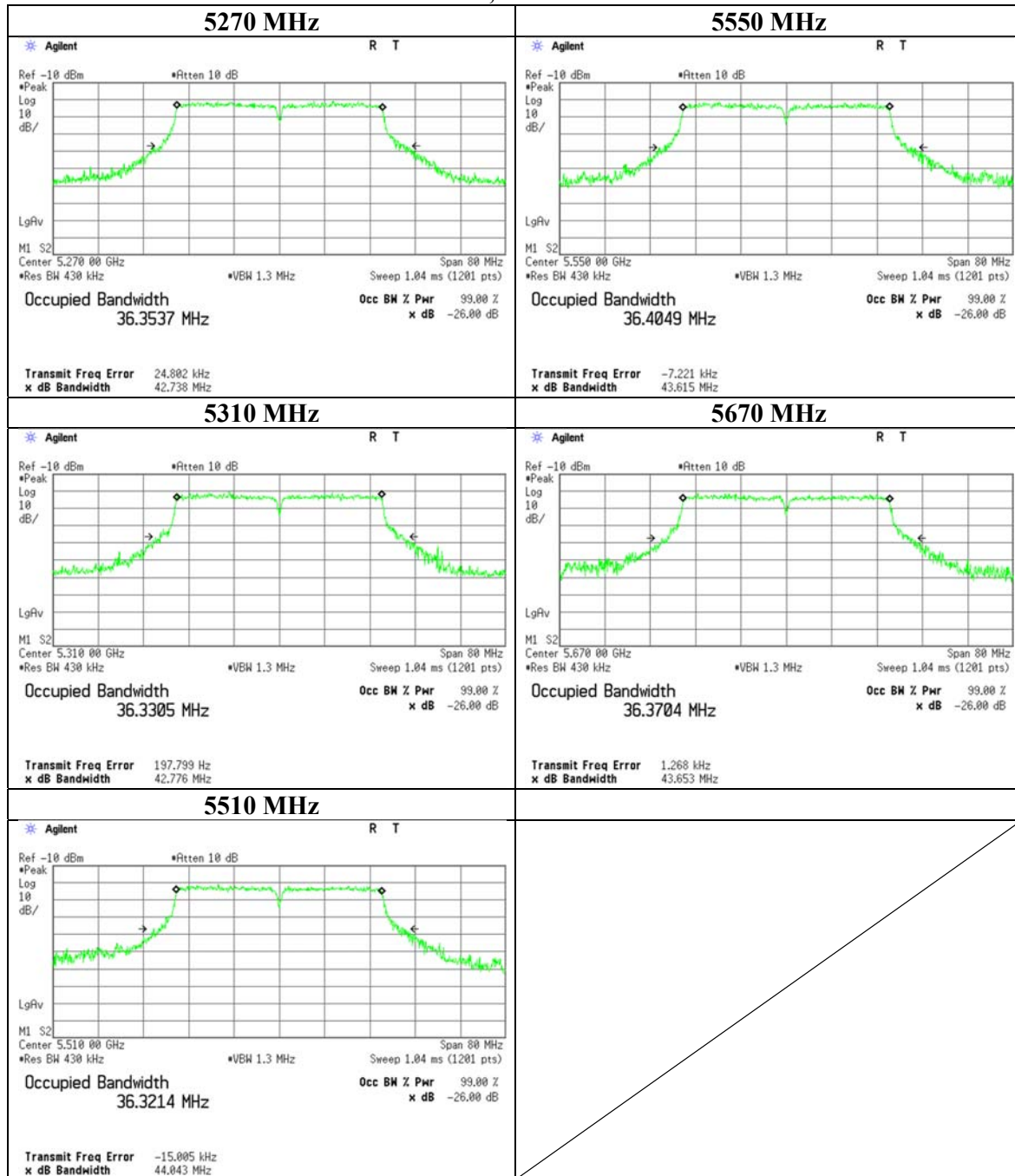
26 dB Emission Bandwidth

11ac-20, Antenna 0



26 dB Emission Bandwidth

11n-40, Antenna 0



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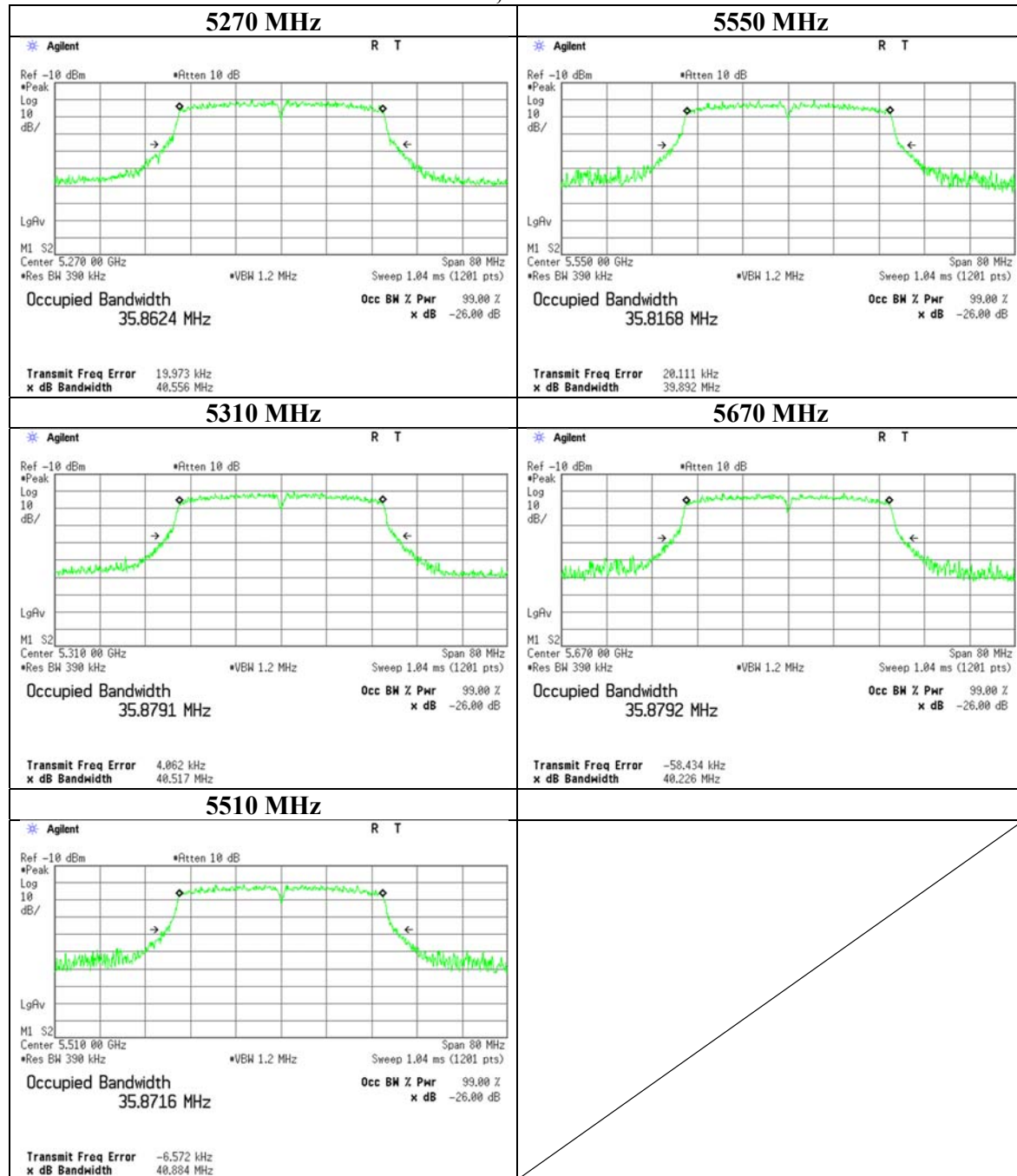
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26 dB Emission Bandwidth

11ac-40, Antenna 0



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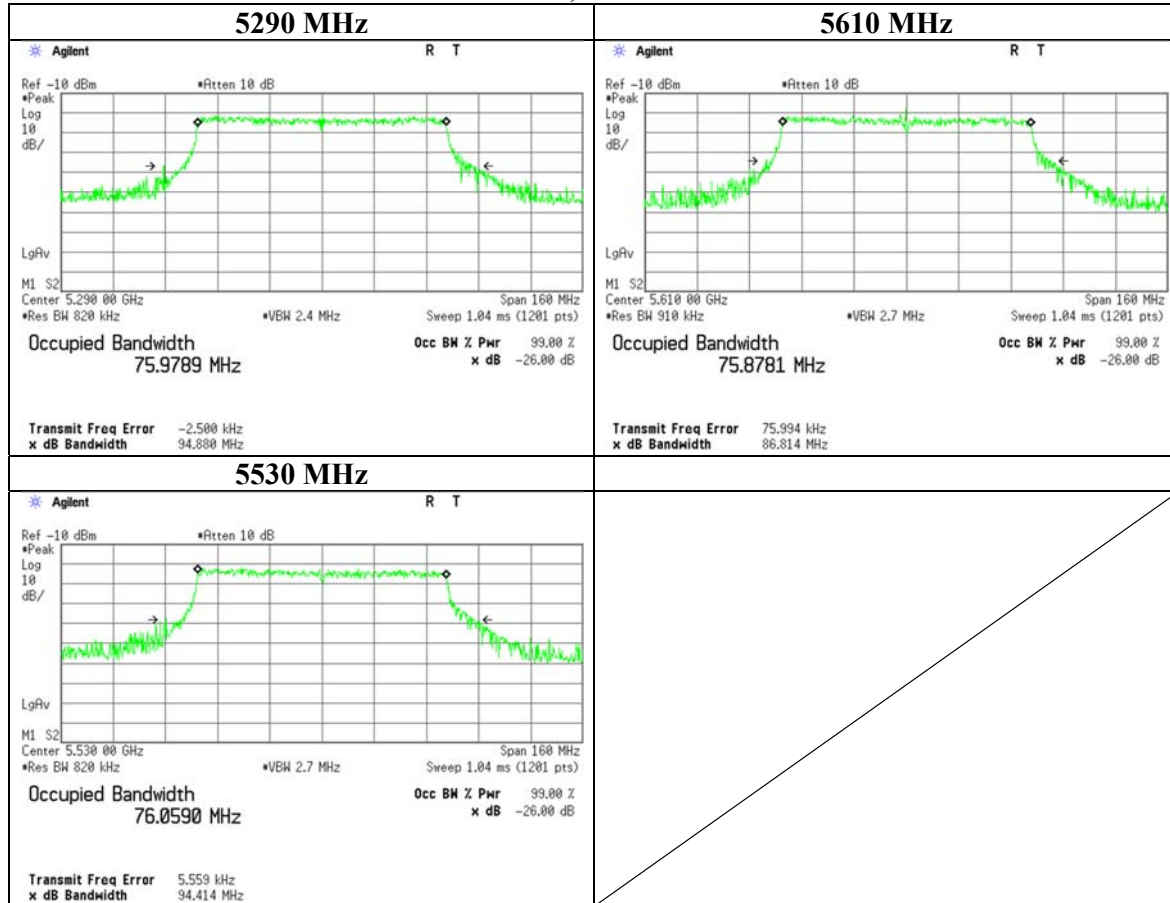
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26 dB Emission Bandwidth

11ac-80, Antenna 0



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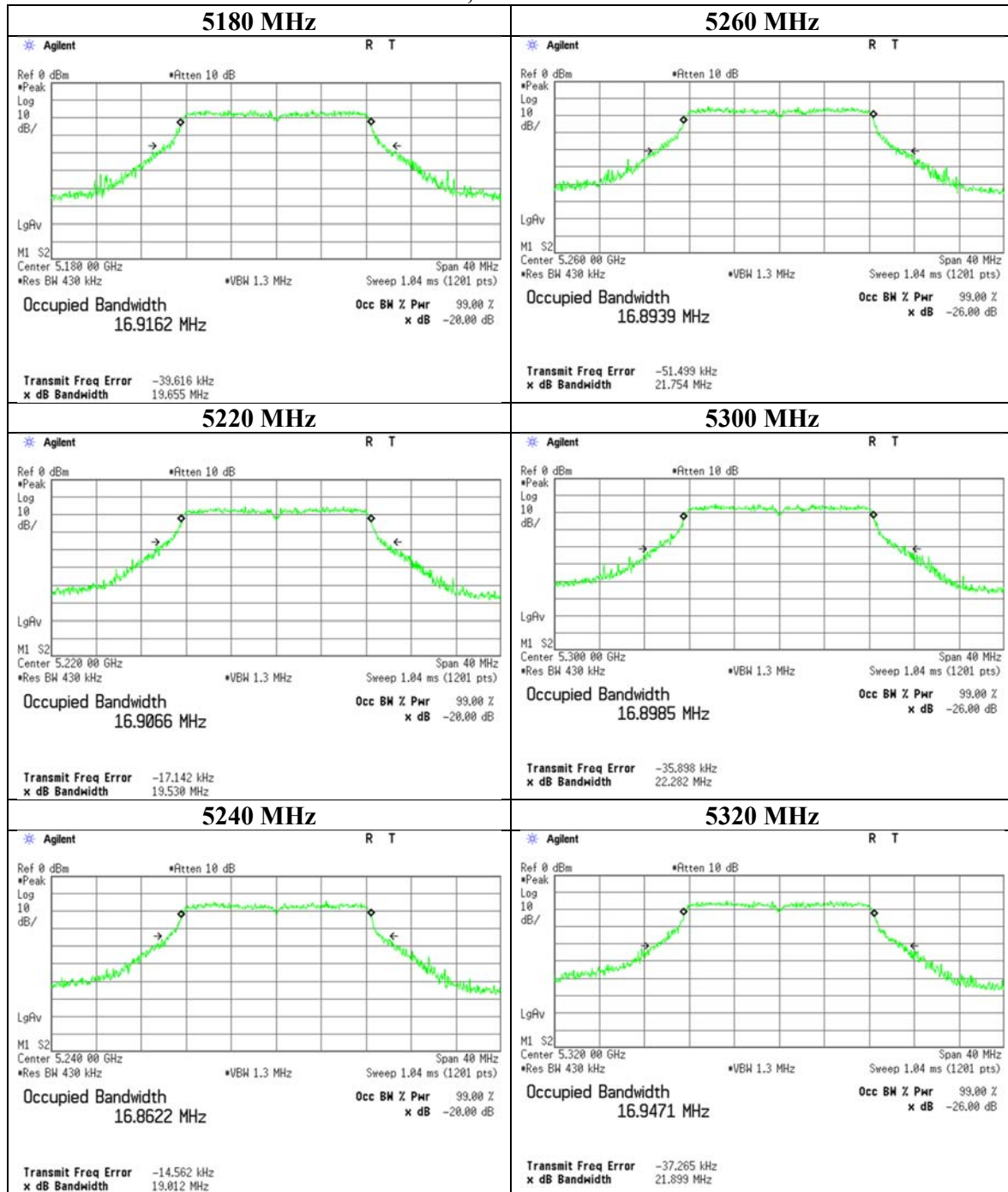
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

11a, Antenna 0



UL Japan, Inc.

Ise EMC Lab.

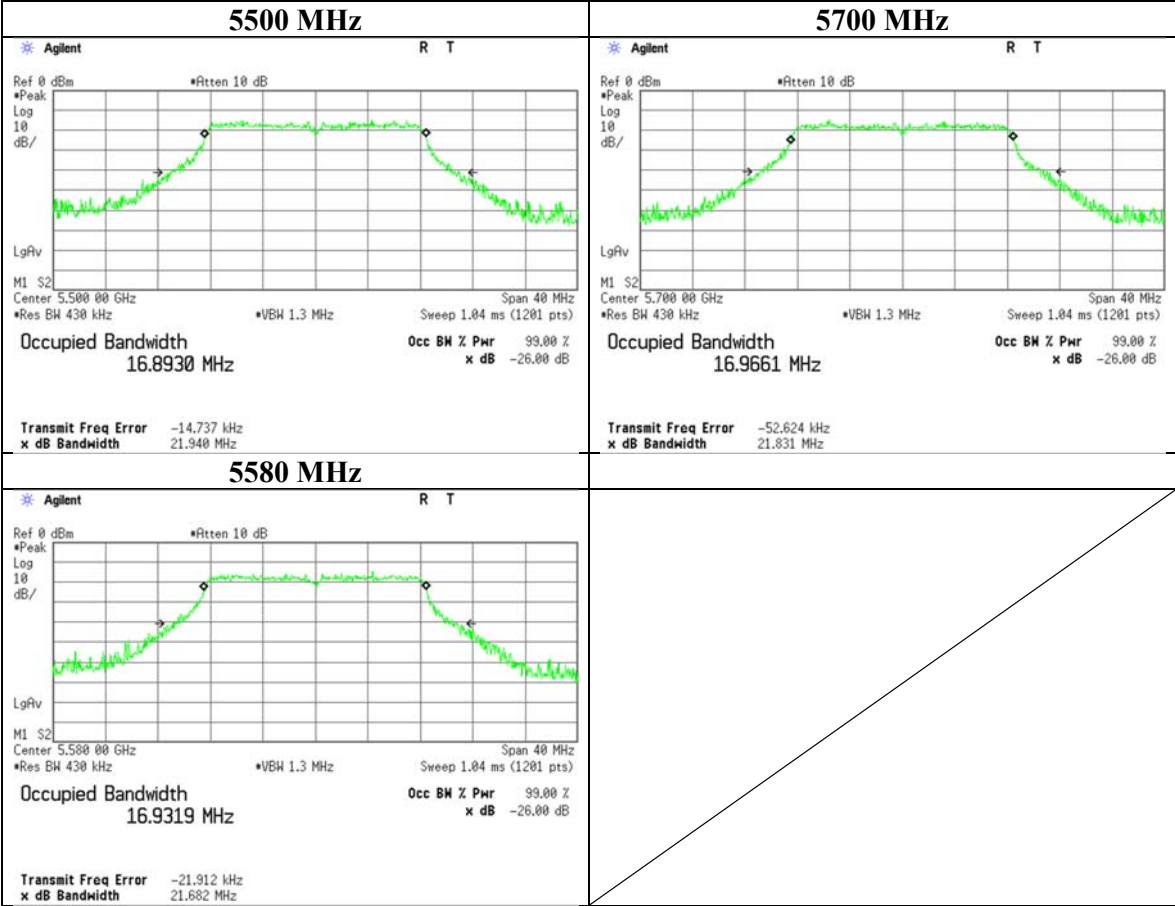
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

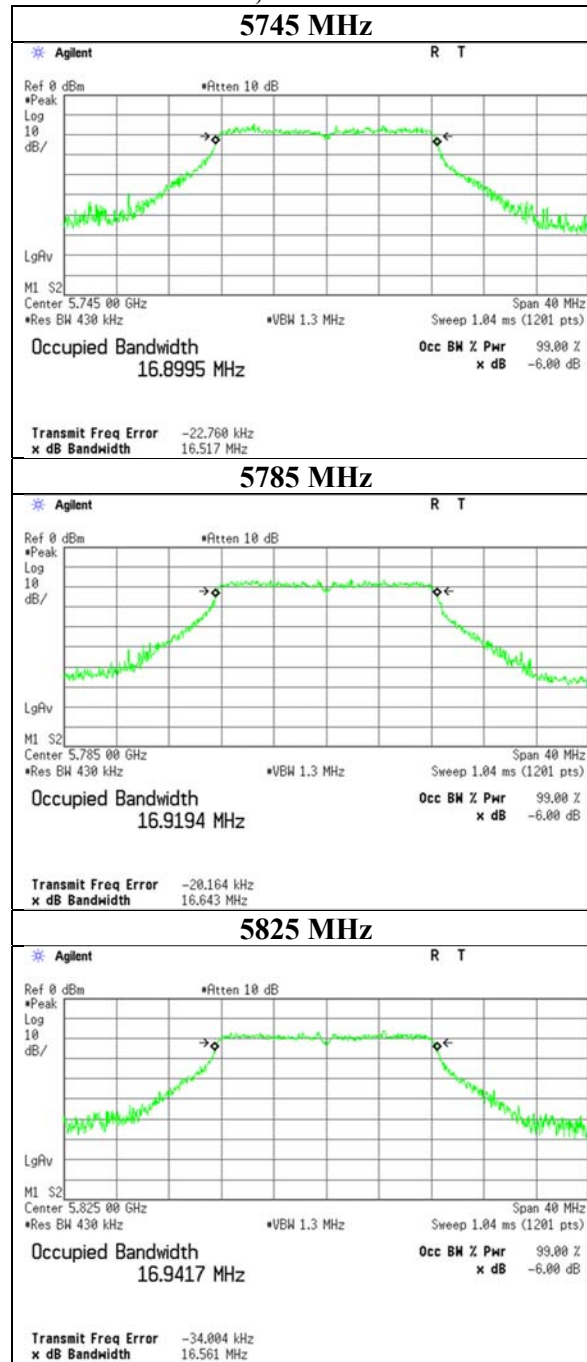
99 % Occupied Bandwidth

11a, Antenna 0



99 % Occupied Bandwidth

11a, Antenna 0



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Ise EMC Lab.

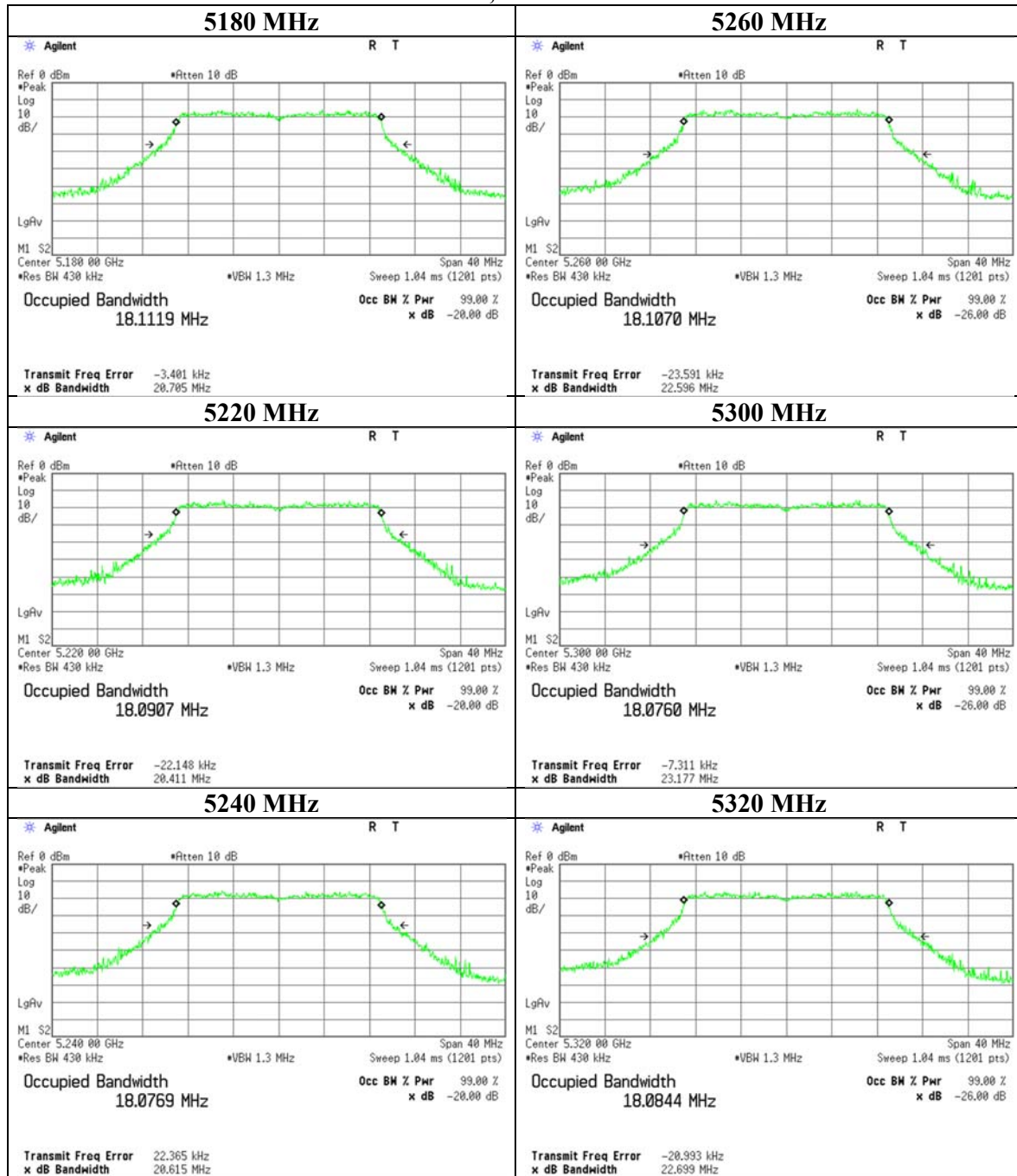
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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99 % Occupied Bandwidth

11n-20, Antenna 0



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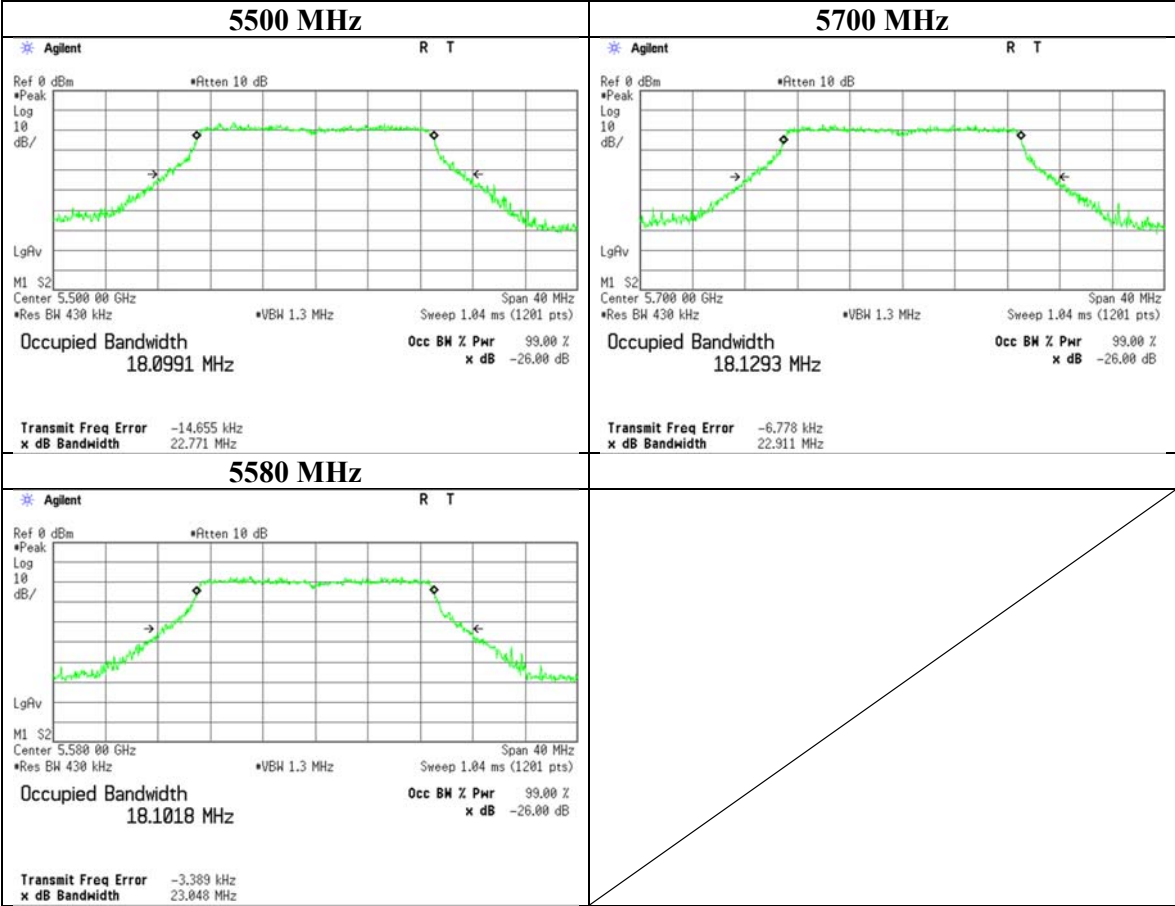
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Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

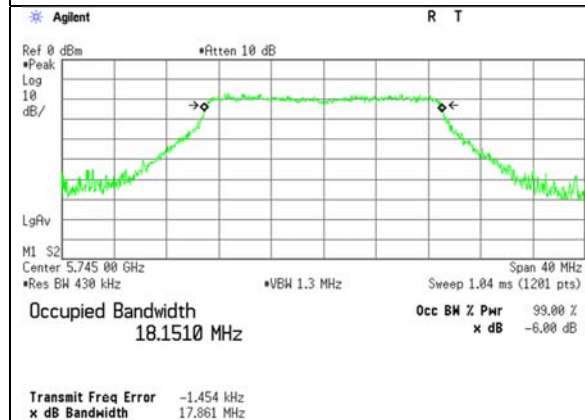
11n-20, Antenna 0



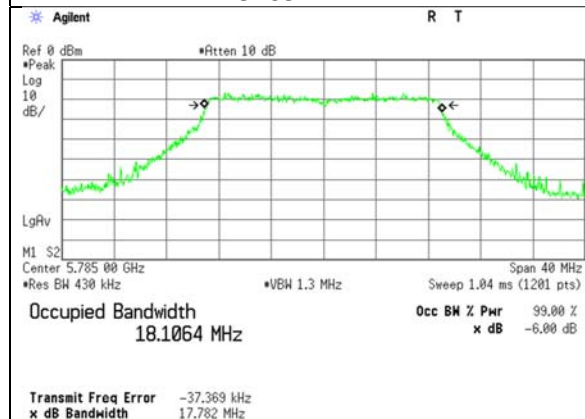
99 % Occupied Bandwidth

11n-20, Antenna 0

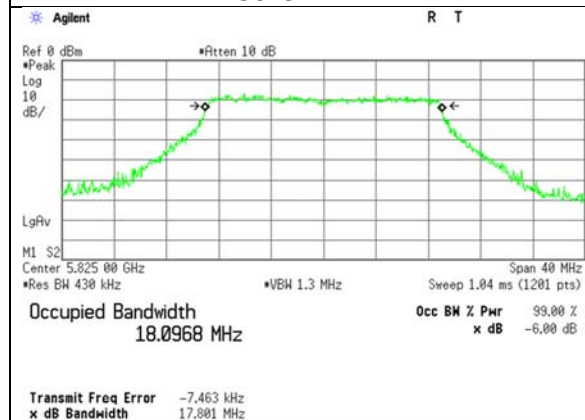
5745 MHz



5785 MHz

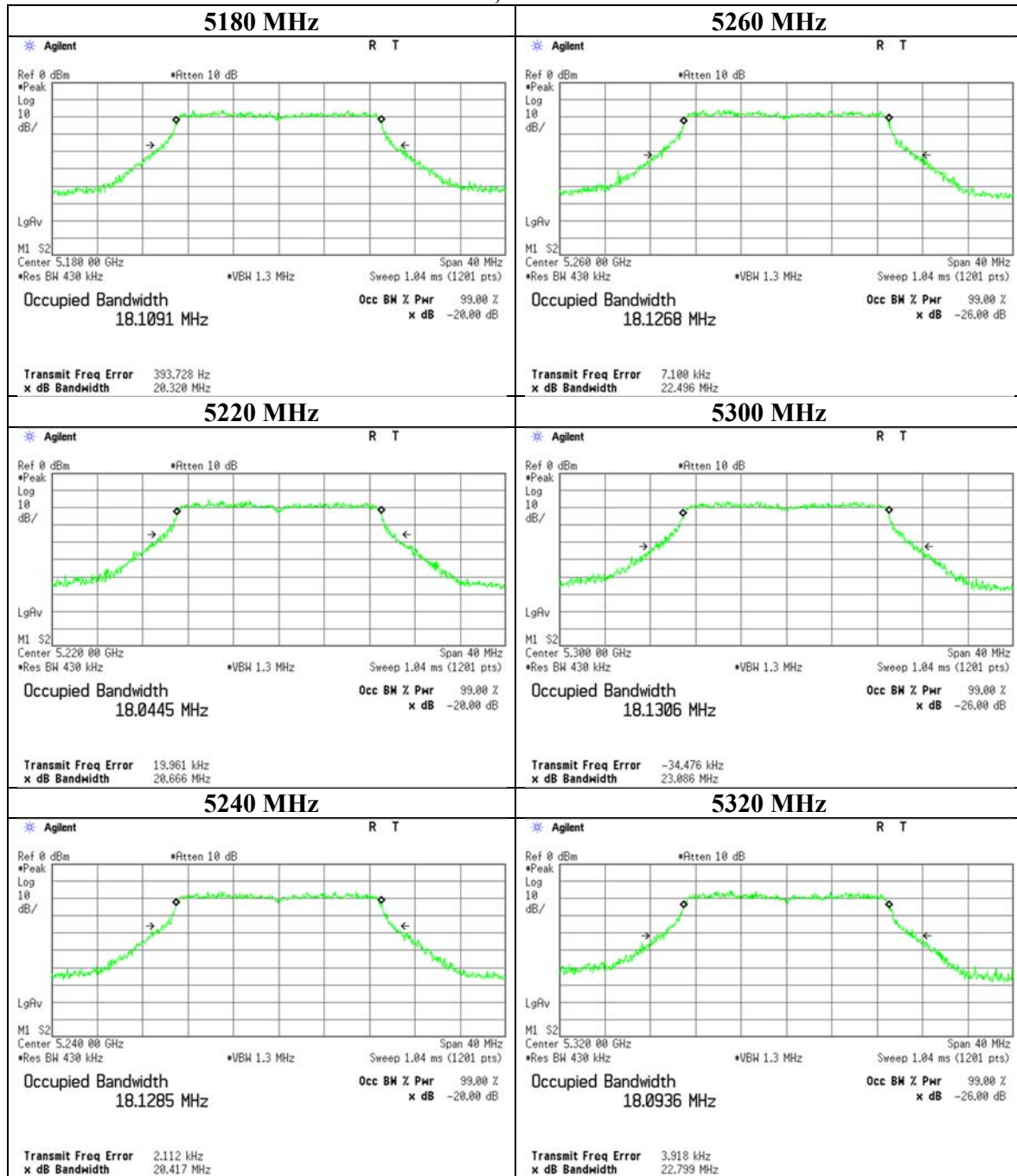


5825 MHz



99 % Occupied Bandwidth

11ac-20, Antenna 0



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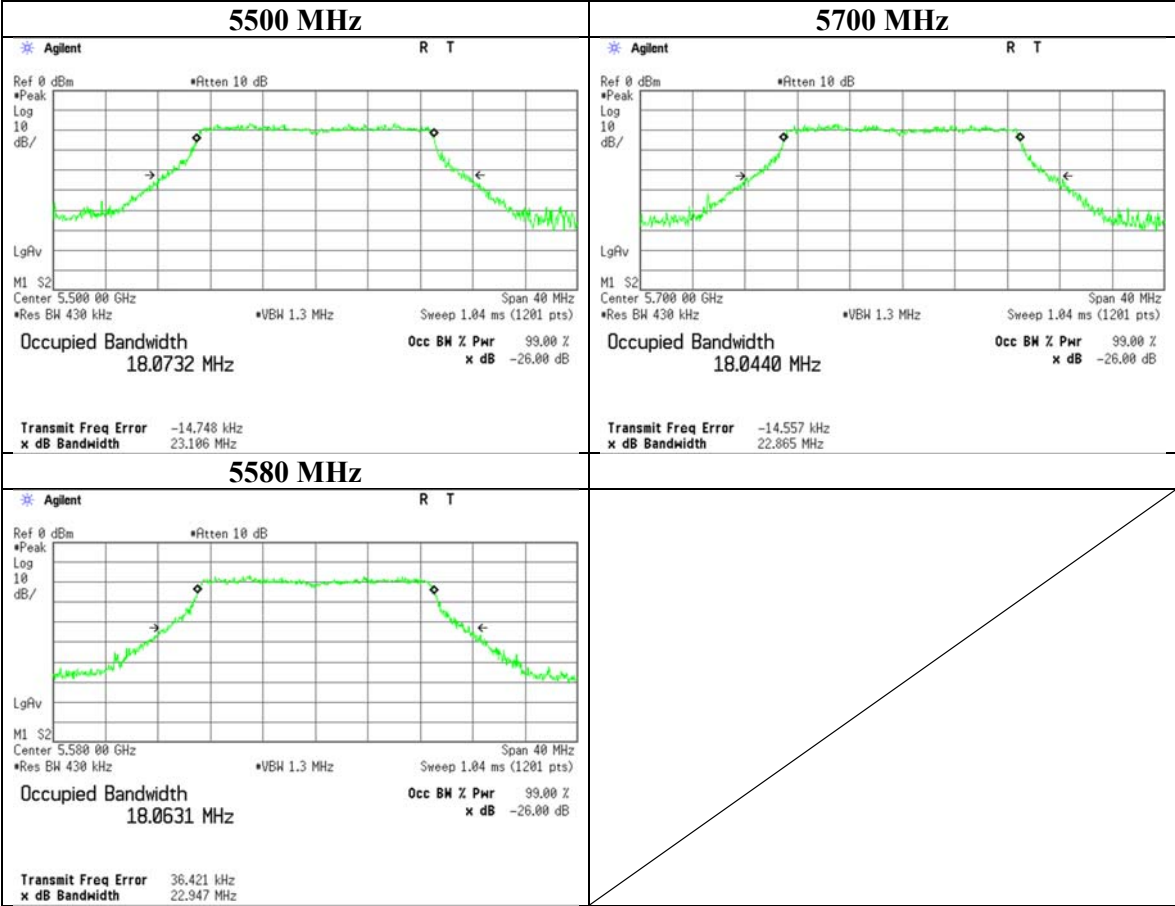
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99 % Occupied Bandwidth

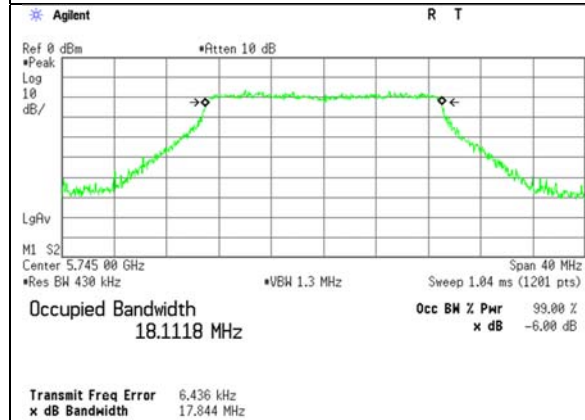
11ac-20, Antenna 0



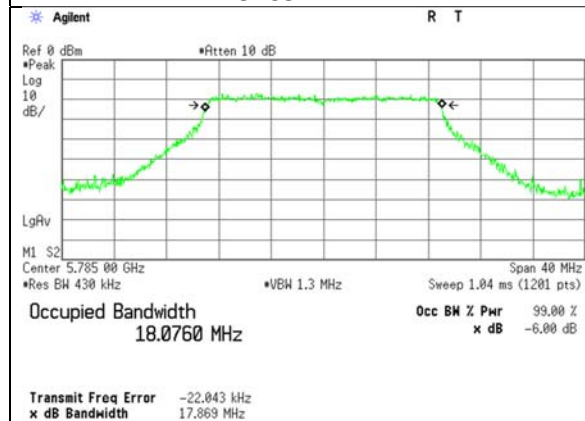
99 % Occupied Bandwidth

11ac-20, Antenna 0

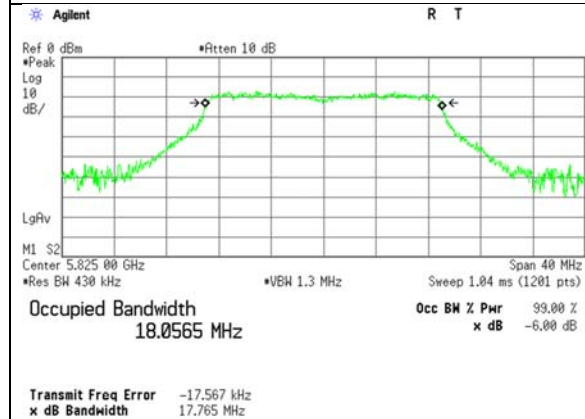
5745 MHz



5785 MHz

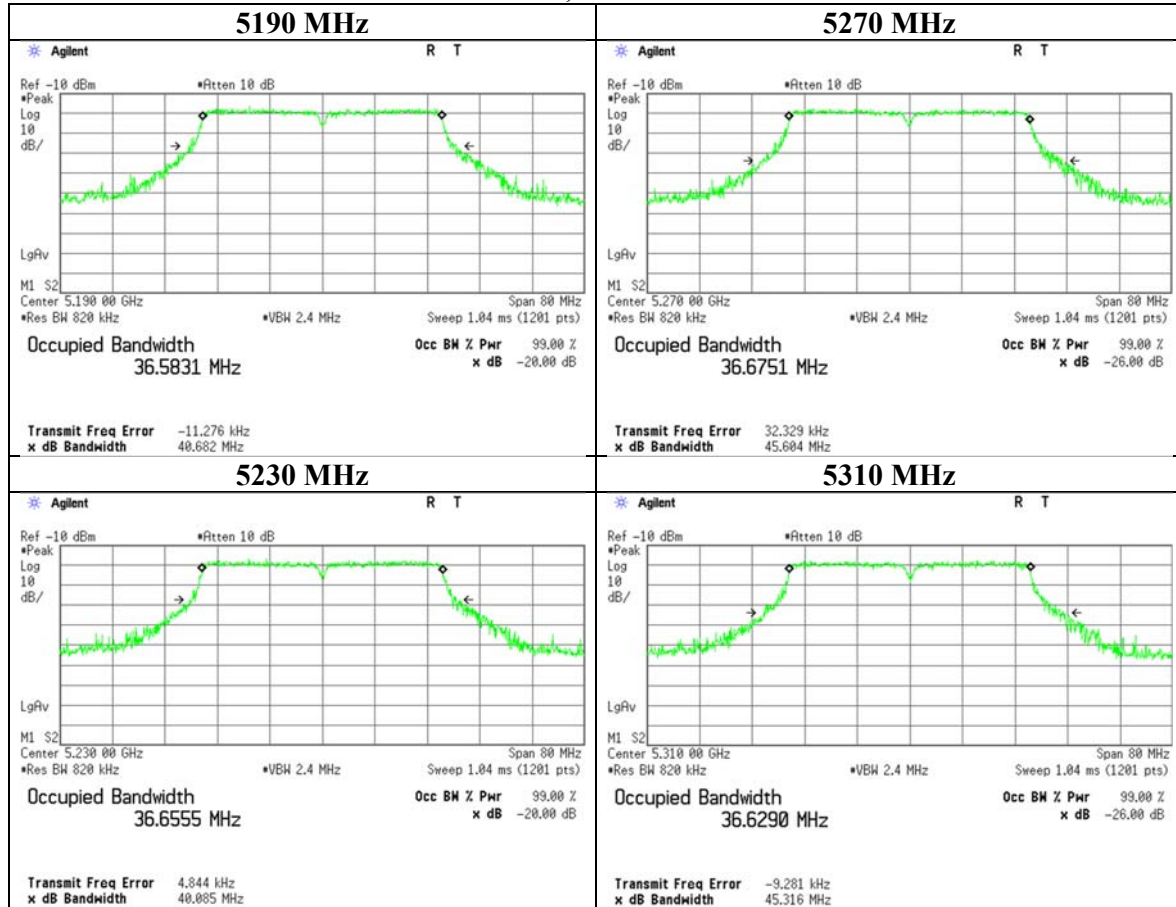


5825 MHz



99 % Occupied Bandwidth

11n-40, Antenna 0



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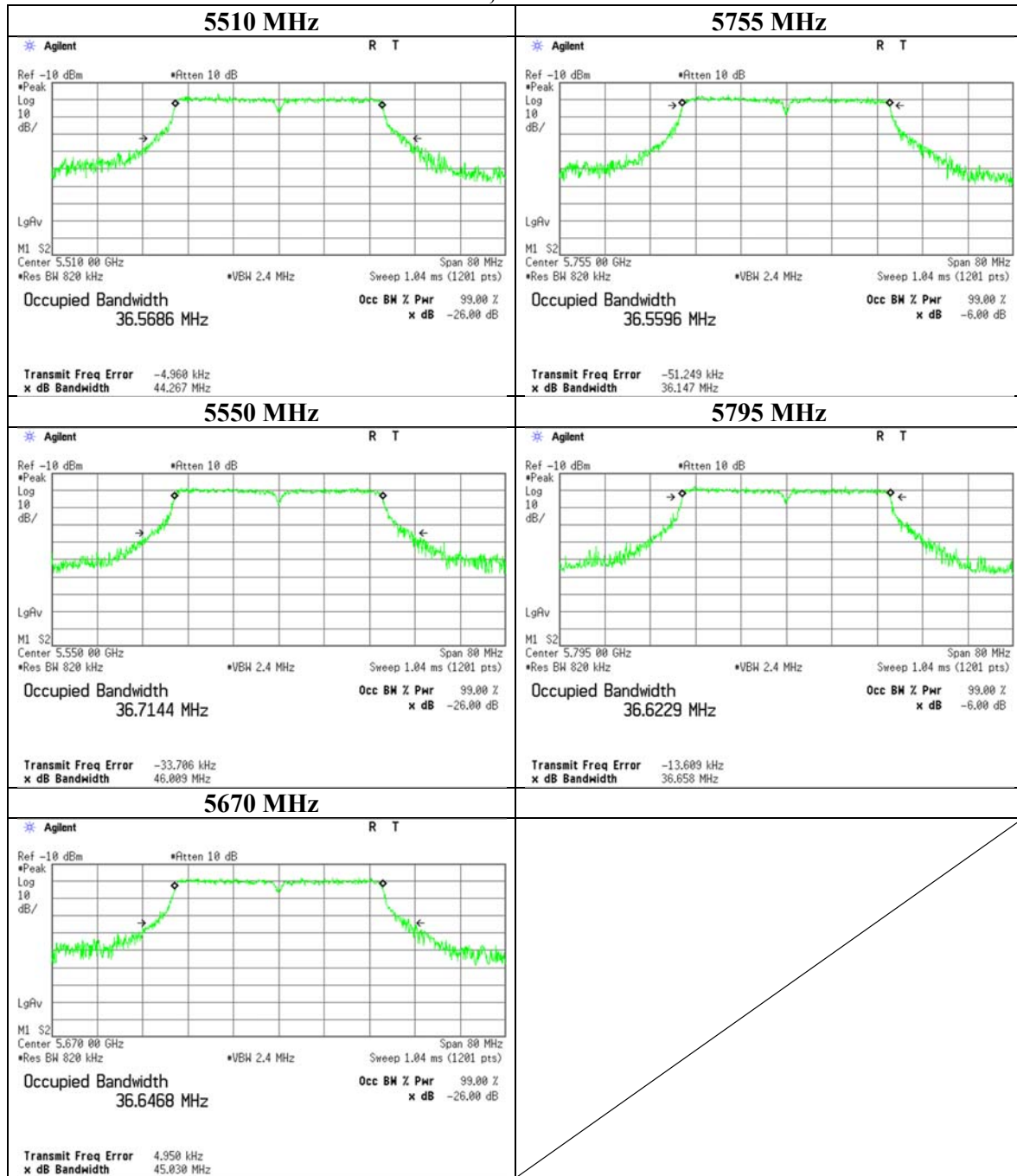
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99 % Occupied Bandwidth

11n-40, Antenna 0



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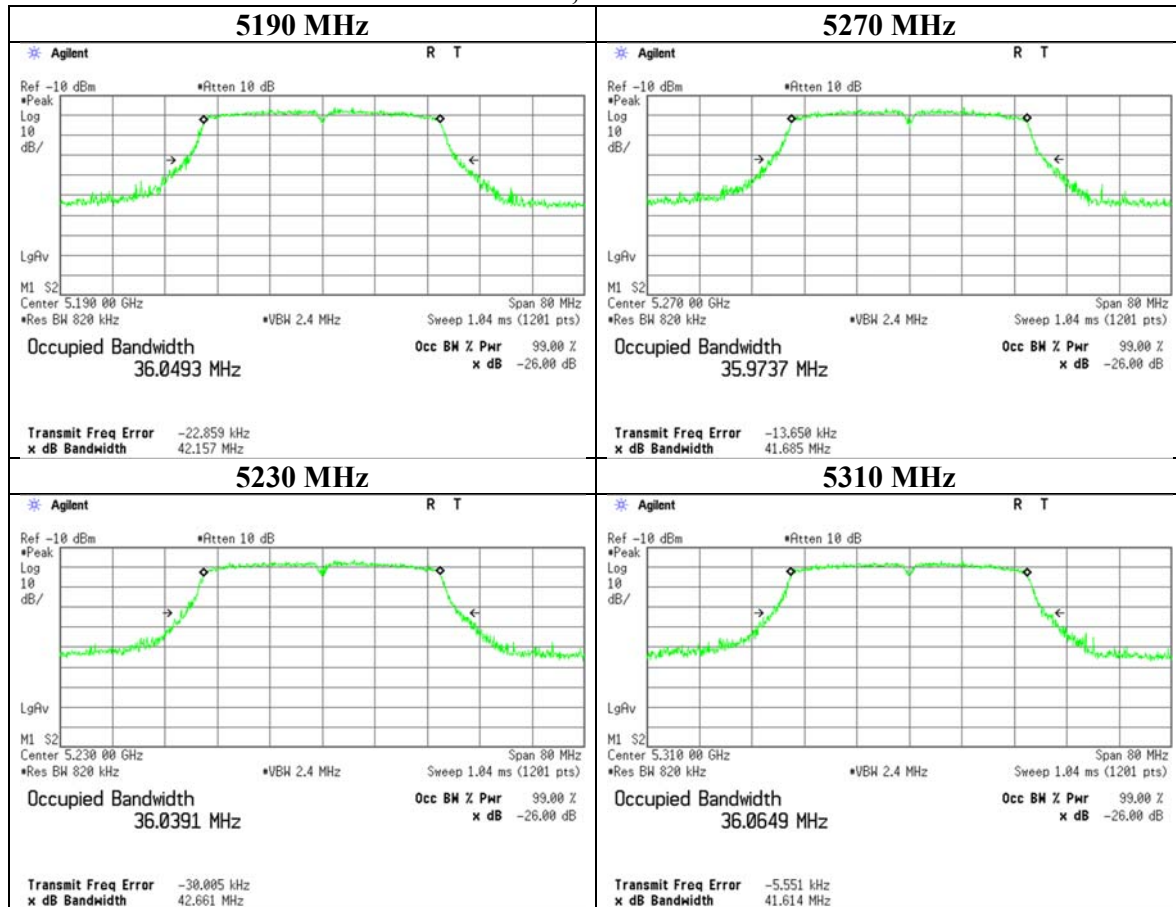
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Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

11ac-40, Antenna 0



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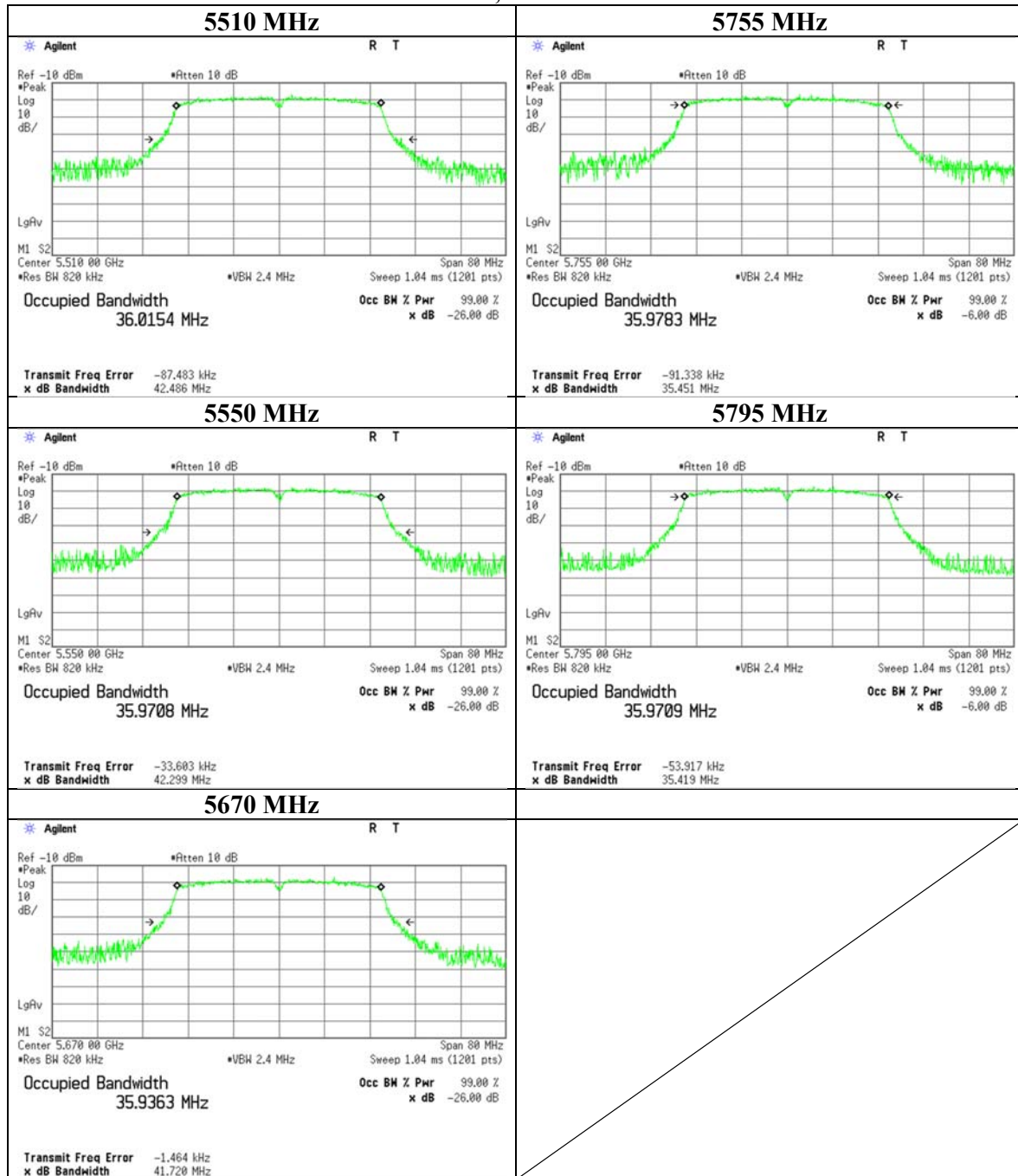
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99 % Occupied Bandwidth

11ac-40, Antenna 0



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Ise EMC Lab.

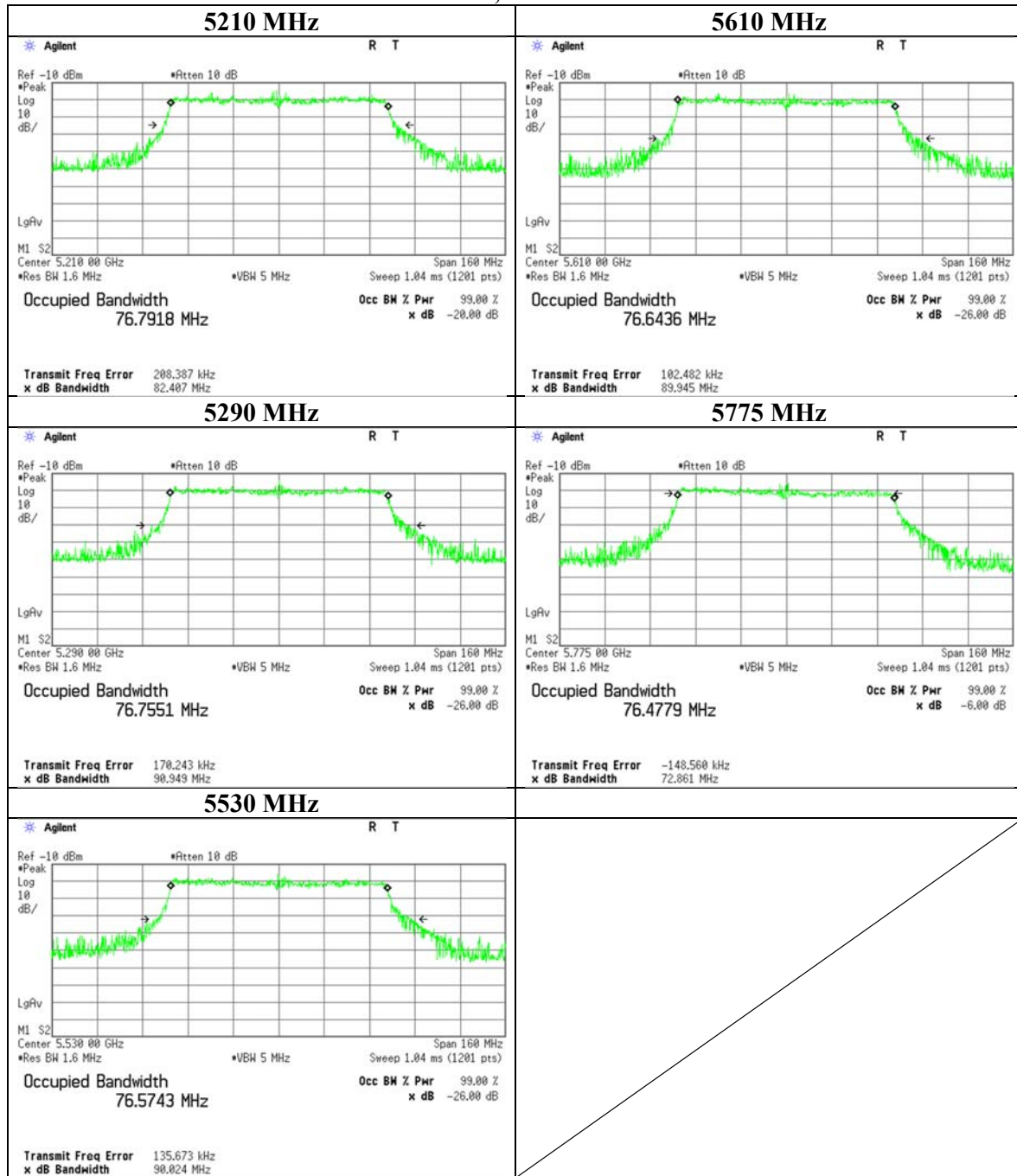
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99 % Occupied Bandwidth

11ac-80, Antenna 0



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20 dB Bandwidth

Report No. 12608632H
Test place Ise EMC Lab. No.4 Measurement Room
Date March 22, 2019 March 25, 2019
Temperature / Humidity 24 deg. C / 41 % RH 23 deg. C / 40 % RH
Engineer Ryota Yamanaka Ryota Yamanaka
Mode Tx

11a

Antenna	Tested Frequency [MHz]	20 dB Emission Bandwidth [MHz]
Antenna 0	5240	17.346

11n-20

Antenna	Tested Frequency [MHz]	20 dB Emission Bandwidth [MHz]
Antenna 0	5240	18.678

11ac-20

Antenna	Tested Frequency [MHz]	20 dB Emission Bandwidth [MHz]
Antenna 0	5240	18.586

11n-40

Antenna	Tested Frequency [MHz]	20 dB Emission Bandwidth [MHz]
Antenna 0	5230	37.149

11ac-40

Antenna	Tested Frequency [MHz]	20 dB Emission Bandwidth [MHz]
Antenna 0	5230	36.997

11ac-80

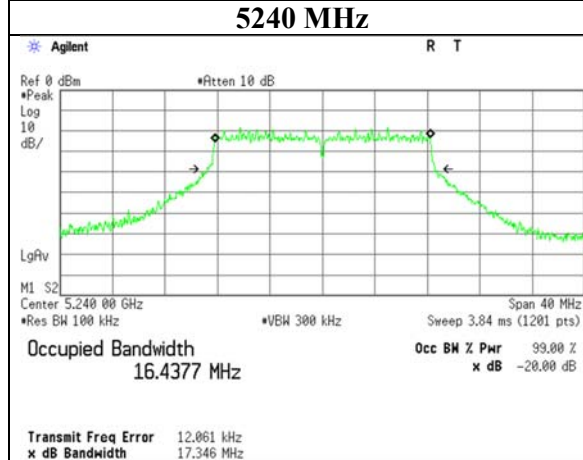
Antenna	Tested Frequency [MHz]	20 dB Emission Bandwidth [MHz]
Antenna 0	5210	77.252

20 dB Bandwidth

Report No.	12608632H	
Test place	Ise EMC Lab. No.4 Measurement Room	
Date	March 22, 2019	March 25, 2019
Temperature / Humidity	24 deg. C / 41 % RH	23 deg. C / 40 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka
Mode	Tx	

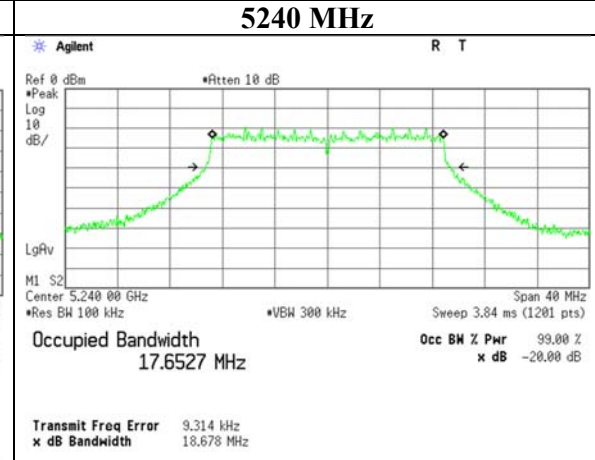
11a, Antenna 0

5240 MHz



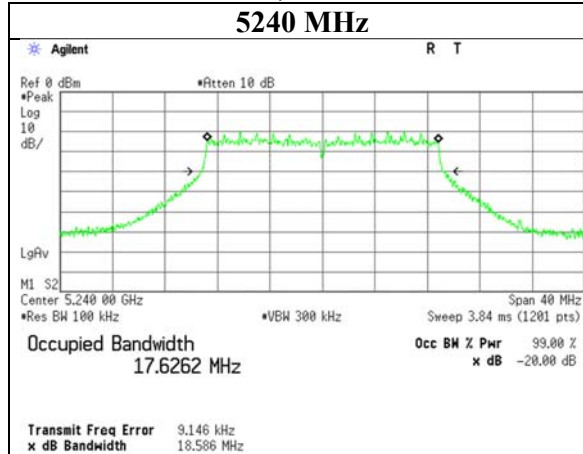
11n-20, Antenna 0

5240 MHz



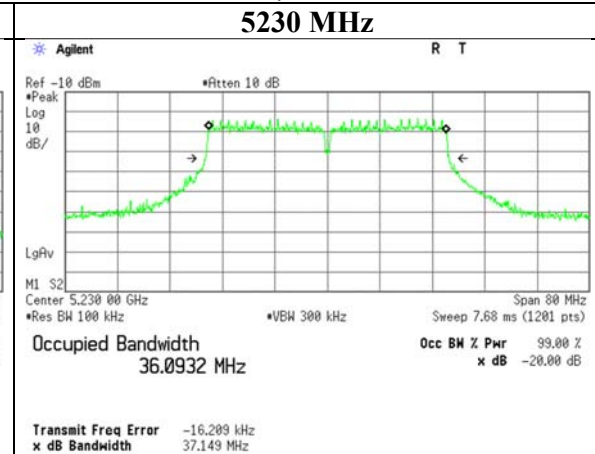
11ac-20, Antenna 0

5240 MHz



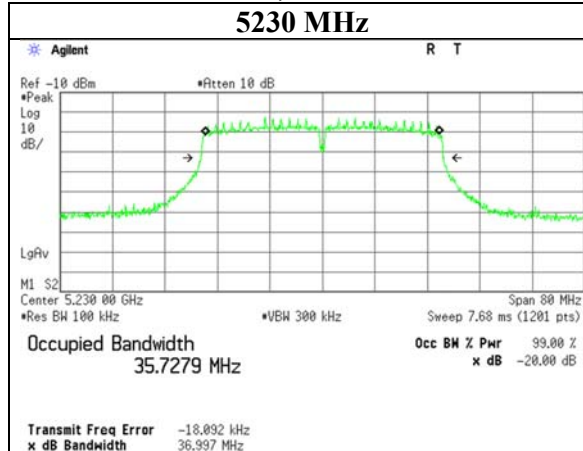
11n-40, Antenna 0

5230 MHz



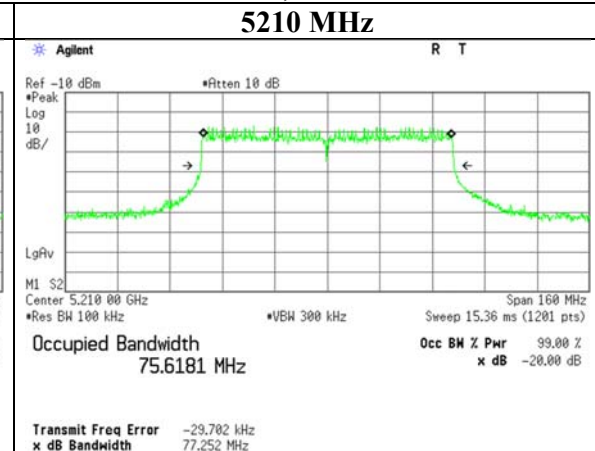
11ac-40, Antenna 0

5230 MHz



11ac-80, Antenna 0

5210 MHz



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6 dB Bandwidth

Report No.	12608632H	
Test place	Ise EMC Lab. No.4 Measurement Room	
Date	March 22, 2019	March 25, 2019
Temperature / Humidity	24 deg. C / 41 % RH	23 deg. C / 40 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka
Mode	Tx	

11a

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 0	5745	16.486	> 0.500
	5785	16.507	> 0.500
	5825	16.497	> 0.500

11n-20

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 0	5745	17.654	> 0.500
	5785	17.664	> 0.500
	5825	17.662	> 0.500

11ac-20

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 0	5745	17.619	> 0.500
	5785	17.676	> 0.500
	5825	17.667	> 0.500

11n-40

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 0	5755	35.806	> 0.500
	5795	36.139	> 0.500

11ac-40

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 0	5755	35.112	> 0.500
	5795	34.675	> 0.500

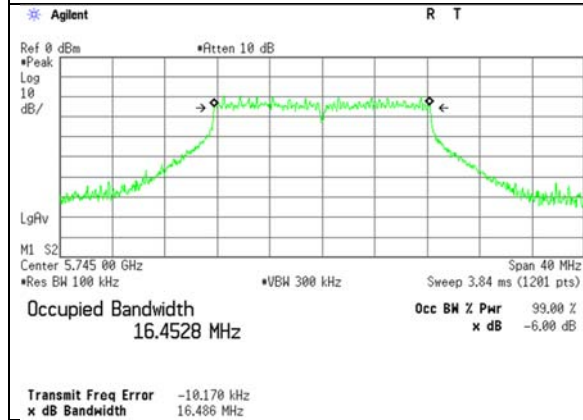
11ac-80

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 0	5775	75.364	> 0.500

6 dB Bandwidth

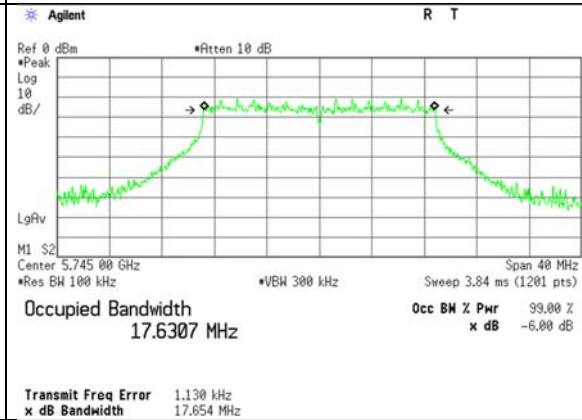
11a, Antenna 0

5745 MHz

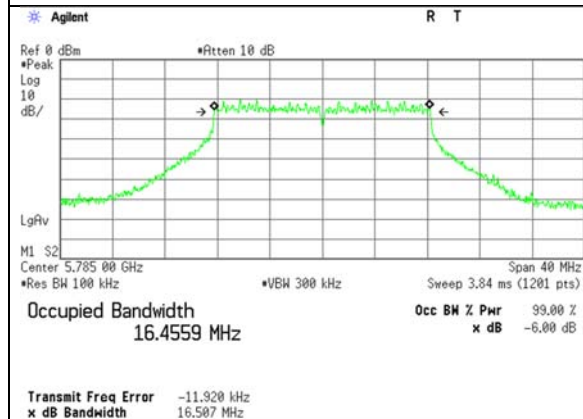


11n-20, Antenna 0

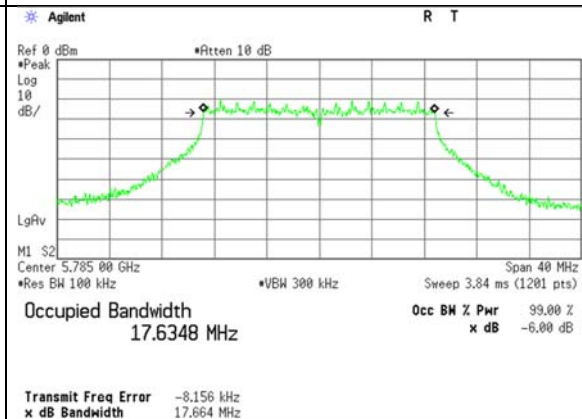
5745 MHz



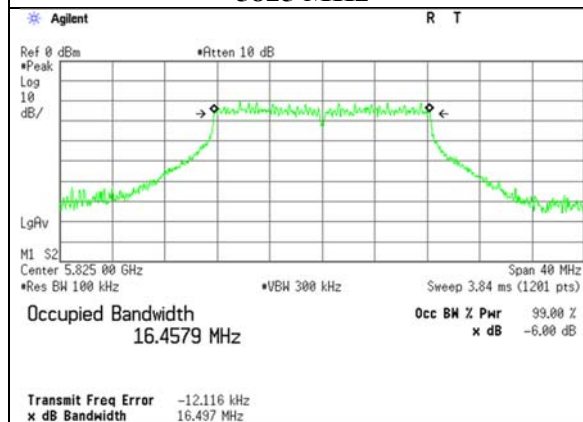
5785 MHz



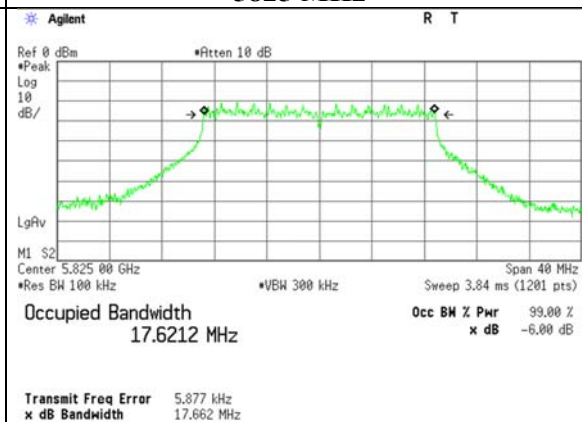
5785 MHz



5825 MHz



5825 MHz



UL Japan, Inc.

Ise EMC Lab.

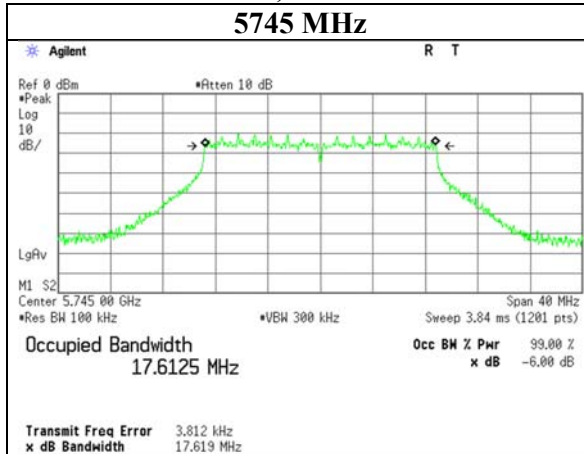
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Telephone : +81 596 24 8999

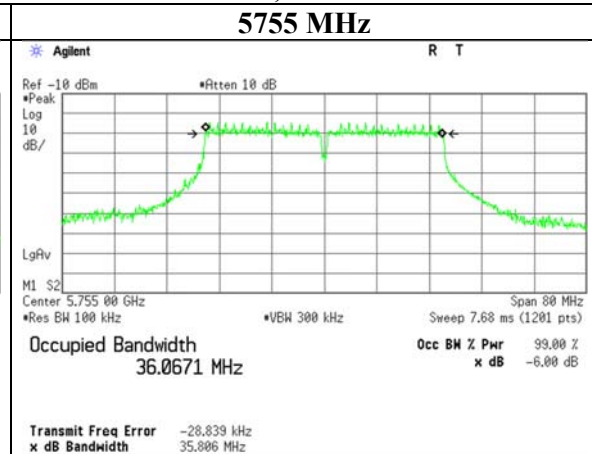
Facsimile : +81 596 24 8124

6 dB Bandwidth

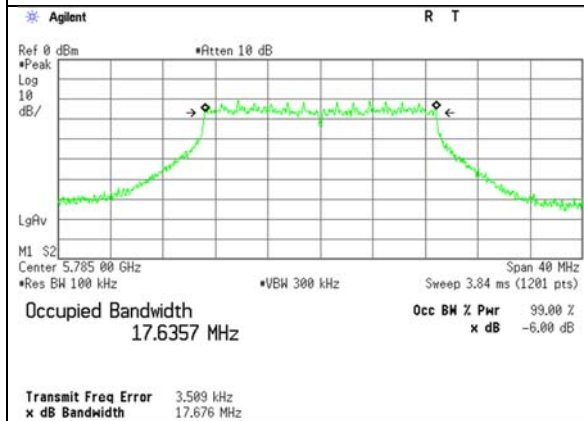
11ac-20, Antenna 0



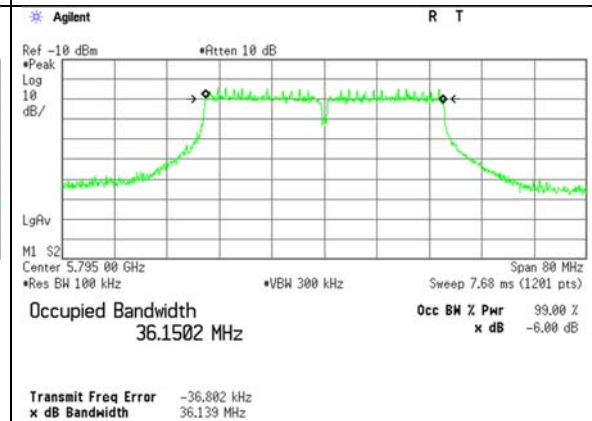
11n-40, Antenna 0



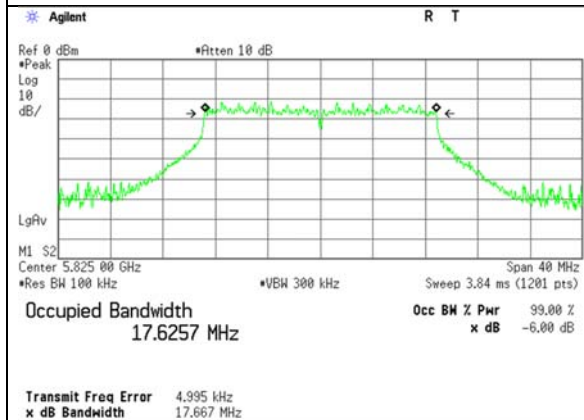
5785 MHz



5795 MHz



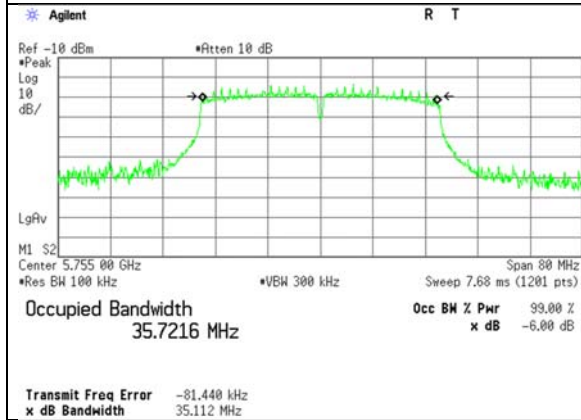
5825 MHz



6 dB Bandwidth

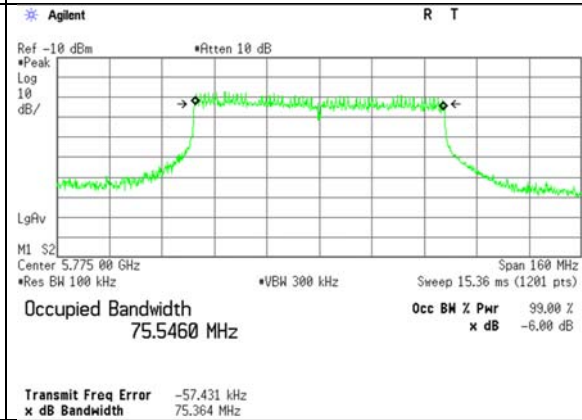
11ac-40, Antenna 0

5755 MHz

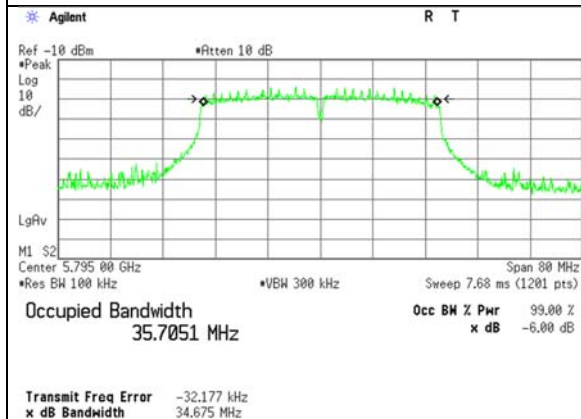


11ac-80, Antenna 0

5775 MHz



5795 MHz



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Maximum Conducted Output Power

Report No. 12608632H
Test place Ise EMC Lab. No.5 Measurement Room
Date March 18, 2019
Temperature / Humidity 21 deg. C / 35 % RH
Engineer Hiroyuki Furutaka
Mode Tx 11a

Antenna 0

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]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.				
							Result	Limit	Margin	Antenna Gain	Result	Limit	Margin	Result	Margin
							[dBm]	[mW]	[dBm]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[dB]
5180	-16.79	1.00	19.95	0.00	-	16.916	4.16	2.61	23.97	19.81	3.54	7.70	5.89	29.97	22.27
5220	-16.88	1.00	19.95	0.00	-	16.907	4.07	2.55	23.97	19.90	3.54	7.61	5.77	29.97	22.36
5240	-15.84	1.00	19.95	0.00	-	16.862	5.11	3.24	23.97	18.86	3.54	8.65	7.33	29.97	21.32
5260	-15.86	1.00	19.95	0.00	20.312	16.894	5.09	3.23	23.97	18.88	3.54	8.63	7.29	29.97	21.34
5300	-15.70	1.00	19.96	0.00	20.459	16.899	5.26	3.36	23.97	18.71	3.54	8.80	7.59	29.97	21.17
5320	-15.88	1.00	19.96	0.00	20.253	16.947	5.08	3.22	23.97	18.89	3.54	8.62	7.28	29.97	21.35
5500	-16.47	1.00	19.98	0.00	20.436	16.893	4.51	2.82	23.97	19.46	3.54	8.05	6.38	29.97	21.92
5580	-16.43	1.00	19.99	0.00	20.329	16.932	4.56	2.86	23.97	19.41	3.54	8.10	6.46	29.97	21.87
5700	-16.06	1.00	19.99	0.00	20.379	16.966	4.93	3.11	23.97	19.04	3.54	8.47	7.03	29.97	21.50
5745	-16.15	1.00	19.99	0.00	-	16.900	4.84	3.05	30.00	25.16	3.54	8.38	6.89	36.00	27.62
5785	-17.53	1.00	20.00	0.00	-	16.919	3.47	2.22	30.00	26.53	3.54	7.01	5.02	36.00	28.99
5825	-17.97	1.00	20.00	0.00	-	16.942	3.03	2.01	30.00	26.97	3.54	6.57	4.54	36.00	29.43

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

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

This test was performed using the Gate function.

UL Japan, Inc.

Ise EMC Lab.

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Maximum Conducted Output Power

Report No. 12608632H
Test place Ise EMC Lab. No.5 Measurement Room
Date March 18, 2019
Temperature / Humidity 22 deg. C / 34 % RH
Engineer Yuichiro Yamazaki
Mode Tx 11n-20

Antenna 0+1

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		Sum [mW]	Result [dBm]	Limit [dBm]	Margin [dB]	Antenna Gain [dBi]	Result		Limit [dBm]	Margin [dB]
			0 [mW]	1 [mW]						[dBm]	[mW]		
5180	-	18.112	2.59	2.04	4.64	6.66	23.97	17.31	5.67	12.33	17.11	29.97	17.64
5220	-	18.091	2.55	2.01	4.56	6.59	23.97	17.38	5.67	12.26	16.81	29.97	17.71
5240	-	18.077	2.52	2.06	4.58	6.61	23.97	17.36	5.67	12.28	16.90	29.97	17.69
5260	22.170	18.107	2.40	2.03	4.44	6.47	23.97	17.50	5.67	12.14	16.37	29.97	17.83
5300	21.877	18.076	2.36	1.86	4.22	6.25	23.97	17.72	5.67	11.92	15.56	29.97	18.05
5320	21.857	18.084	2.37	1.83	4.20	6.24	23.97	17.73	5.67	11.91	15.51	29.97	18.06
5500	21.493	18.099	2.16	1.60	3.76	5.75	23.97	18.22	5.67	11.42	13.87	29.97	18.55
5580	22.127	18.102	2.10	1.59	3.70	5.68	23.97	18.29	5.67	11.35	13.64	29.97	18.62
5700	21.931	18.129	2.19	1.82	4.01	6.03	23.97	17.94	5.67	11.70	14.81	29.97	18.27
5745	-	18.151	2.14	1.91	4.06	6.08	30.00	23.92	5.67	11.75	14.97	36.00	24.25
5785	-	18.106	2.40	2.00	4.41	6.44	30.00	23.56	5.67	12.11	16.27	36.00	23.89
5825	-	18.097	2.42	1.97	4.39	6.42	30.00	23.58	5.67	12.09	16.19	36.00	23.91

		Antenna 0 Main				Antenna 1 Sub			
Tested Frequency	Duty Factor	Power Meter Reading	Cable Loss	Atten. Loss	Result Cond. Power	Power Meter Reading	Cable Loss	Atten. Loss	Result Cond. Power
[MHz]	[dB]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]	[dB]	[dBm]
5180	0.00	-16.81	1.00	19.95	4.14	-17.81	1.00	19.91	3.10
5220	0.00	-16.89	1.00	19.95	4.06	-17.88	1.00	19.91	3.03
5240	0.00	-16.93	1.00	19.95	4.02	-17.78	1.00	19.91	3.13
5260	0.00	-17.14	1.00	19.95	3.81	-17.83	1.00	19.91	3.08
5300	0.00	-17.23	1.00	19.96	3.73	-18.22	1.00	19.91	2.69
5320	0.00	-17.21	1.00	19.96	3.75	-18.28	1.00	19.91	2.63
5500	0.00	-17.63	1.00	19.98	3.35	-18.88	1.00	19.91	2.03
5580	0.00	-17.76	1.00	19.99	3.23	-18.91	1.00	19.93	2.02
5700	0.00	-17.58	1.00	19.99	3.41	-18.33	1.00	19.93	2.60
5745	0.00	-17.68	1.00	19.99	3.31	-18.11	1.00	19.93	2.82
5785	0.00	-17.19	1.00	20.00	3.81	-17.91	1.00	19.93	3.02
5825	0.00	-17.16	1.00	20.00	3.84	-17.99	1.00	19.93	2.94

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

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

This test was performed using the Gate function.

UL Japan, Inc.

Ise EMC Lab.

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Maximum Conducted Output Power

Report No. 12608632H
Test place Ise EMC Lab. No.8 Measurement Room
Date March 18, 2019
Temperature / Humidity 21 deg. C / 35 % RH
Engineer Hiroyuki Furutaka
Mode Tx 11ac-20

Antenna 0+1

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		Sum [mW]	Result [dBm]	Limit [dBm]	Margin [dB]	Antenna Gain [dBi]	Result		Limit [dBm]	Margin [dB]
			0 [mW]	1 [mW]						[dBm]	[mW]		
5180	-	18.109	2.69	2.13	4.82	6.83	23.97	17.14	5.67	12.50	17.78	29.97	17.47
5220	-	18.045	2.68	2.13	4.81	6.82	23.97	17.15	5.67	12.49	17.76	29.97	17.48
5240	-	18.129	2.49	2.08	4.58	6.61	23.97	17.36	5.67	12.28	16.90	29.97	17.69
5260	21.945	18.127	2.48	2.02	4.50	6.53	23.97	17.44	5.67	12.20	16.61	29.97	17.77
5300	21.783	18.131	2.42	1.93	4.35	6.38	23.97	17.59	5.67	12.05	16.05	29.97	17.92
5320	21.794	18.094	2.43	1.81	4.24	6.28	23.97	17.69	5.67	11.95	15.66	29.97	18.02
5500	22.061	18.073	2.16	1.70	3.86	5.87	23.97	18.10	5.67	11.54	14.26	29.97	18.43
5580	21.715	18.063	2.06	1.91	3.96	5.98	23.97	17.99	5.67	11.65	14.62	29.97	18.32
5700	21.561	18.044	2.26	1.92	4.18	6.21	23.97	17.76	5.67	11.88	15.42	29.97	18.09
5745	-	18.044	2.26	1.98	4.24	6.27	30.00	23.73	5.67	11.94	15.65	36.00	24.06
5785	-	18.112	2.40	2.01	4.41	6.44	30.00	23.56	5.67	12.11	16.26	36.00	23.89
5825	-	18.076	2.23	2.15	4.38	6.42	30.00	23.58	5.67	12.09	16.17	36.00	23.91

Antenna 0						Antenna 1				
Tested Frequency [MHz]	Duty Factor [dB]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]	Result Cond. Power [dBm]
5180	0.00	-16.65	1.00	19.95	4.30	-17.63	1.00	19.91	3.28	
5220	0.00	-16.67	1.00	19.95	4.28	-17.62	1.00	19.91	3.29	
5240	0.00	-16.98	1.00	19.95	3.97	-17.72	1.00	19.91	3.19	
5260	0.00	-17.01	1.00	19.95	3.94	-17.85	1.00	19.91	3.06	
5300	0.00	-17.12	1.00	19.96	3.84	-18.06	1.00	19.91	2.85	
5320	0.00	-17.10	1.00	19.96	3.86	-18.33	1.00	19.91	2.58	
5500	0.00	-17.63	1.00	19.98	3.35	-18.60	1.00	19.91	2.31	
5580	0.00	-17.86	1.00	19.99	3.13	-18.13	1.00	19.93	2.80	
5700	0.00	-17.45	1.00	19.99	3.54	-18.10	1.00	19.93	2.83	
5745	0.00	-17.45	1.00	19.99	3.54	-17.96	1.00	19.93	2.97	
5785	0.00	-17.20	1.00	20.00	3.80	-17.90	1.00	19.93	3.03	
5825	0.00	-17.51	1.00	20.00	3.49	-17.61	1.00	19.93	3.32	

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

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

This test was performed using the Gate function.

UL Japan, Inc.

Ise EMC Lab.

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Maximum Conducted Output Power

Report No. 12608632H
Test place Ise EMC Lab. No.5 Measurement Room
Date March 18, 2019
Temperature / Humidity 22 deg. C / 34 % RH
Engineer Yuichiro Yamazaki
Mode Tx 11n-40

Antenna 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted power						e.i.r.p.					
			Antenna		Sum	Result	Limit	Margin	Antenna Gain	Result		Limit	Margin	
			0	1						[dBm]	[dBm]			[dB]
[MHz]	[MHz]	[MHz]	[mW]	[mW]	[mW]	[dBm]	[dBm]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[dB]	
5190	-	36.583	1.99	1.56	3.55	5.50	23.97	18.47	5.67	11.17	13.08	29.97	18.80	
5230	-	36.656	2.04	1.56	3.59	5.55	23.97	18.42	5.67	11.22	13.26	29.97	18.75	
5270	42.738	36.675	1.91	1.54	3.45	5.38	23.97	18.59	5.67	11.05	12.74	29.97	18.92	
5310	42.776	36.629	1.94	1.49	3.43	5.35	23.97	18.62	5.67	11.02	12.64	29.97	18.95	
5510	44.043	36.569	1.84	1.30	3.13	4.96	23.97	19.01	5.67	10.63	11.56	29.97	19.34	
5550	43.615	36.714	1.65	1.34	2.99	4.76	23.97	19.21	5.67	10.43	11.05	29.97	19.54	
5670	43.653	36.647	1.69	1.55	3.24	5.10	23.97	18.87	5.67	10.77	11.95	29.97	19.20	
5755	-	36.560	1.91	1.55	3.47	5.40	30.00	24.60	5.67	11.07	12.79	36.00	24.93	
5795	-	36.623	1.94	1.57	3.51	5.45	30.00	24.55	5.67	11.12	12.94	36.00	24.88	

Tested Frequency [MHz]	Duty Factor	Antenna 0 Main				Antenna 1 Sub			
		Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]
5190	0.00	-17.97	1.00	19.95	2.98	-18.98	1.00	19.91	1.93
5230	0.00	-17.86	1.00	19.95	3.09	-18.99	1.00	19.91	1.92
5270	0.00	-18.14	1.00	19.96	2.82	-19.04	1.00	19.91	1.87
5310	0.00	-18.09	1.00	19.96	2.87	-19.18	1.00	19.91	1.73
5510	0.00	-18.34	1.00	19.98	2.64	-19.78	1.00	19.91	1.13
5550	0.00	-18.80	1.00	19.98	2.18	-19.64	1.00	19.92	1.28
5670	0.00	-18.70	1.00	19.99	2.29	-19.04	1.00	19.93	1.89
5755	0.00	-18.18	1.00	20.00	2.82	-19.02	1.00	19.93	1.91
5795	0.00	-18.12	1.00	20.00	2.88	-18.98	1.00	19.93	1.95

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

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

This test was performed using the Gate function.

Maximum Conducted Output Power

Report No. 12608632H
Test place Ise EMC Lab. No.5 Measurement Room
Date March 18, 2019
Temperature / Humidity 21 deg. C / 35 % RH
Engineer Hiroyuki Furutaka
Mode Tx 11ac-40

Antenna 0+1

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 Gain [dBi]	Result		Limit [dBm]	Margin [dB]
			0 [mW]	1 [mW]	Sum [mW]					[dBm]	[mW]		
5190	-	36.049	2.13	1.64	3.76	5.76	23.97	18.21	5.67	11.43	13.89	29.97	18.54
5230	-	36.039	1.97	1.59	3.56	5.52	23.97	18.45	5.67	11.19	13.14	29.97	18.78
5270	40.556	35.974	1.92	1.53	3.45	5.38	23.97	18.59	5.67	11.05	12.73	29.97	18.92
5310	40.517	36.065	1.92	1.48	3.40	5.31	23.97	18.66	5.67	10.98	12.54	29.97	18.99
5510	40.884	36.015	1.79	1.29	3.08	4.89	23.97	19.08	5.67	10.56	11.38	29.97	19.41
5550	39.892	35.971	1.67	1.34	3.01	4.79	23.97	19.18	5.67	10.46	11.12	29.97	19.51
5670	40.226	35.936	1.69	1.53	3.23	5.09	23.97	18.88	5.67	10.76	11.91	29.97	19.21
5755	-	35.978	1.86	1.59	3.45	5.38	30.00	24.62	5.67	11.05	12.73	36.00	24.95
5795	-	35.971	1.80	1.56	3.36	5.27	30.00	24.73	5.67	10.94	12.41	36.00	25.06

		Antenna 0 Main				Antenna 1 Sub				
Tested Frequency [MHz]	Duty Factor [dB]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]	
5190	0.00	-17.67	1.00	19.95	3.28	-18.77	1.00	19.91	2.14	
5230	0.00	-18.00	1.00	19.95	2.95	-18.90	1.00	19.91	2.01	
5270	0.00	-18.13	1.00	19.96	2.83	-19.06	1.00	19.91	1.85	
5310	0.00	-18.12	1.00	19.96	2.84	-19.22	1.00	19.91	1.69	
5510	0.00	-18.45	1.00	19.98	2.53	-19.79	1.00	19.91	1.12	
5550	0.00	-18.74	1.00	19.98	2.24	-19.65	1.00	19.92	1.27	
5670	0.00	-18.70	1.00	19.99	2.29	-19.07	1.00	19.93	1.86	
5755	0.00	-18.30	1.00	20.00	2.70	-18.92	1.00	19.93	2.01	
5795	0.00	-18.44	1.00	20.00	2.56	-19.00	1.00	19.93	1.93	

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

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

This test was performed using the Gate function.

UL Japan, Inc.

Ise EMC Lab.

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Maximum Conducted Output Power

Report No. 12608632H
Test place Ise EMC Lab. No.5 Measurement Room
Date March 18, 2019
Temperature / Humidity 21 deg. C / 35 % RH
Engineer Hiroyuki Furutaka
Mode Tx 11ac-80

Antenna 0+1

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 Gain [dBi]	Result		Limit [dBm]	Margin [dB]
			0 [mW]	1 [mW]	Sum [mW]					[dBm]	[mW]		
5210	-	76.792	1.61	1.25	2.86	4.57	23.97	19.40	5.67	10.24	10.56	29.97	19.73
5290	94.880	76.755	1.52	1.19	2.71	4.33	23.97	19.64	5.67	10.00	10.00	29.97	19.97
5530	94.414	76.574	1.36	0.99	2.35	3.72	23.97	20.25	5.67	9.39	8.69	29.97	20.58
5610	86.814	76.644	1.42	1.03	2.45	3.89	23.97	20.08	5.67	9.56	9.04	29.97	20.41
5775	-	76.478	1.47	1.19	2.65	4.24	30.00	25.76	5.67	9.91	9.79	36.00	26.09

		Antenna 0				Antenna 1			
Tested Frequency	Duty Factor	Main				Sub			
		Power Meter Reading	Cable Loss	Atten. Loss	Result Cond. Power	Power Meter Reading	Cable Loss	Atten. Loss	Result Cond. Power
		[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]	[dB]	[dBm]
5210	0.00	-18.88	1.00	19.95	2.07	-19.94	1.00	19.91	0.97
5290	0.00	-19.15	1.00	19.96	1.81	-20.14	1.00	19.91	0.77
5530	0.00	-19.64	1.00	19.98	1.34	-20.95	1.00	19.92	-0.03
5610	0.00	-19.46	1.00	19.99	1.53	-20.81	1.00	19.93	0.12
5775	0.00	-19.34	1.00	20.00	1.66	-20.18	1.00	19.93	0.75

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

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

This test was performed using the Gate function.

UL Japan, Inc.

Ise EMC Lab.

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

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Maximum Conducted Output Power Worst Rate Check

Report No.	12608632H
Test place	Ise EMC Lab. No.5 Measurement Room
Date	March 18, 2019
Temperature / Humidity	22 deg. C / 34 % RH
Engineer	Yuichiro Yamazaki
Mode	Tx 11a, Tx 11n-20

5180 MHz

Mode	Rate Mbps	Results (Burst Power) [dBm]	Remarks
11a	6	3.70	
	9	3.72	
	12	3.76	
	18	2.03	
	24	3.83	
	36	3.02	
	48	3.77	
	54	4.04	*

* Worst rate

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

5180 MHz

Mode	MCS Number	Results (Burst power) Antenna			Remarks
		0 [dBm]	1 [dBm]	0+1 [dBm]	
11n-20	0	3.77	-	-	
	1	4.09	-	-	
	2	3.89	-	-	
	3	3.93	-	-	
	4	3.87	-	-	
	5	4.02	-	-	
	6	4.05	-	-	
	7	4.02	-	-	
	8	-	-	6.37	
	9	-	-	6.49	
	10	-	-	6.51	
	11	4.02	3.07	6.58	* Antenna 0
	12	-	-	6.57	
	13	-	-	6.57	
	14	-	-	6.57	
	15	-	-	6.57	

* Worst rate

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

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Maximum Conducted Output Power Worst Rate Check

Report No.	12608632H
Test place	Ise EMC Lab. No.5 Measurement Room
Date	March 18, 2019
Temperature / Humidity	22 deg. C / 34 % RH
Engineer	Yuichiro Yamazaki
Mode	Tx 11ac-20

SISO

5180 MHz SISO

Mode	MCS Number	Reading (Burst Power) Antenna		Remarks
		0	1	
		[dBm]	[dBm]	
11ac-20	0	4.01	2.62	
	1	4.21	2.99	
	2	3.87	2.45	
	3	4.10	2.62	
	4	4.09	2.56	
	5	4.02	2.67	
	6	4.00	2.70	
	7	3.95	2.64	
	8	2.90	1.76	

* Worst rate

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

MIMO

5180 MHz MIMO

Mode	MCS Number	Reading (Burst Power) Antenna			Remarks
		0	1	0+1	
		[dBm]	[dBm]	[dBm]	
11ac-20	0	3.81	2.62	6.27	
	1	3.77	2.72	6.29	
	2	3.94	2.70	6.37	
	3	4.08	3.01	6.59	* Antenna 0
	4	4.03	2.83	6.48	
	5	4.02	2.97	6.54	
	6	4.08	2.82	6.51	
	7	4.07	2.86	6.52	
	8	2.93	1.91	5.46	

* Worst rate

All comparison were carried out on same frequency and measurement factors

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Maximum Conducted Output Power
Worst Rate Check

Report No. 12608632H
Test place Ise EMC Lab. No.5 Measurement Room
Date March 18, 2019
Temperature / Humidity 22 deg. C / 34 % RH
Engineer Yuichiro Yamazaki
Mode Tx 11n-40

5190 MHz

Mode	MCS Number	Results (Burst power)			Remarks
		Antenna			
		0 [dBm]	1 [dBm]	0+1 [dBm]	
11n-40	0	2.85	-	-	
	1	2.94	-	-	
	2	3.02	-	-	
	3	2.12	-	-	
	4	3.08	-	-	
	5	3.11	-	-	
	6	3.17	-	-	
	7	3.06	-	-	
	8	-	-	5.46	
	9	-	-	5.44	
	10	-	-	5.53	
	11	-	-	5.51	
	12	3.20	1.81	5.57	* Antenna 0
	13	-	-	5.51	
	14	-	-	5.49	
15	-	-	5.54		

* Worst rate

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

Maximum Conducted Output Power Worst Rate Check

Report No.	12608632H
Test place	Ise EMC Lab. No.5 Measurement Room
Date	March 18, 2019
Temperature / Humidity	22 deg. C / 34 % RH
Engineer	Yuichiro Yamazaki
Mode	Tx 11ac-40

SISO

5190 MHz SISO

Mode	MCS Number	Reading (Burst Power) Antenna		Remarks
		0	1	
		[dBm]	[dBm]	
11ac-40	0	3.11	1.88	
	1	3.35	2.10	
	2	3.34	1.85	
	3	3.36	1.82	
	4	3.22	1.93	
	5	3.35	2.14	
	6	3.23	2.00	
	7	3.00	2.02	
	8	1.14	-0.08	
	9	1.31	0.00	

* Worst rate

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

MIMO

5190 MHz MIMO

Mode	MCS Number	Results (Burst Power) Antenna			Remarks
		0	1	0+1	
		[dBm]	[dBm]	[dBm]	
11ac-40	0	-	-	5.18	
	1	3.32	2.11	5.77	* Antenna 0
	2	-	-	5.75	
	3	-	-	5.58	
	4	-	-	5.63	
	5	-	-	5.64	
	6	-	-	5.58	
	7	-	-	5.59	
	8	-	-	3.73	
	9	-	-	3.68	

* Worst rate

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

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Maximum Conducted Output Power Worst Rate Check

Report No.	12608632H
Test place	Ise EMC Lab. No.5 Measurement Room
Date	March 18, 2019
Temperature / Humidity	22 deg. C / 34 % RH
Engineer	Yuichiro Yamazaki
Mode	Tx 11ac-80

SISO

5210 MHz SISO

Mode	MCS Number	Results (Burst Power) Antenna		Remarks
		0	1	
		[dBm]	[dBm]	
11ac-80	0	1.87	0.79	
	1	1.99	0.77	
	2	2.18	0.81	
	3	1.13	0.82	
	4	2.18	0.70	
	5	2.33	0.83	
	6	2.16	0.80	
	7	2.27	0.83	
	8	-0.04	-1.09	
	9	-0.16	-1.32	

* Worst rate

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

MIMO

5210 MHz MIMO

Mode	MCS Number	Results (Burst Power) Antenna			Remarks
		0	1	0+1	
		[dBm]	[dBm]	[dBm]	
11ac-80	0	1.88	0.84	4.40	
	1	1.97	0.94	4.50	
	2	1.96	0.83	4.44	
	3	1.08	0.93	4.02	
	4	2.04	0.91	4.52	
	5	2.03	0.97	4.54	
	6	1.95	0.93	4.48	
	7	2.16	0.95	4.61	* Antenna 0
	8	-0.10	-1.19	2.40	
	9	-0.19	-1.15	2.37	

* Worst rate

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

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Average Output Power
(Reference data for RF Exposure)

Report No. 12608632H
Test place Ise EMC Lab. No.5 Measurement Room
Date March 18, 2019
Temperature / Humidity 22 deg. C / 34 % RH
Engineer Yuichiro Yamazaki
Mode Tx 11a

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average)	
				[dBm]	[mW]
5180	-17.11	1.00	19.95	3.84	2.42
5220	-17.20	1.00	19.95	3.75	2.37
5240	-16.12	1.00	19.95	4.83	3.04
5260	-16.02	1.00	19.95	4.93	3.11
5300	-16.41	1.00	19.96	4.55	2.85
5320	-16.09	1.00	19.96	4.87	3.07
5500	-16.79	1.00	19.98	4.19	2.62
5580	-17.09	1.00	19.99	3.90	2.45
5700	-16.67	1.00	19.99	4.32	2.70
5745	-16.50	1.00	19.99	4.49	2.81
5785	-17.92	1.00	20.00	3.08	2.03
5825	-18.37	1.00	20.00	2.63	1.83

Sample Calculation:

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

This test was performed using the Gate function.

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.

Average Output Power (Reference data for RF Exposure)

Report No.	12608632H
Test place	Ise EMC Lab. No.5 Measurement Room
Date	March 18, 2019
Temperature / Humidity	22 deg. C / 34 % RH
Engineer	Yuichiro Yamazaki
Mode	Tx 11n-20

MCS0 SISO Antenna 0

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average)	
				[dBm]	[mW]
5180	-16.93	1.00	19.95	4.02	2.52
5220	-16.96	1.00	19.95	3.99	2.51
5240	-17.04	1.00	19.95	3.91	2.46
5260	-16.95	1.00	19.95	4.00	2.51
5300	-17.12	1.00	19.96	3.84	2.42
5320	-17.13	1.00	19.96	3.83	2.42
5500	-17.63	1.00	19.98	3.35	2.16
5580	-17.96	1.00	19.99	3.03	2.01
5700	-17.84	1.00	19.99	3.15	2.07
5745	-17.74	1.00	19.99	3.25	2.11
5785	-17.64	1.00	20.00	3.36	2.17
5825	-17.82	1.00	20.00	3.18	2.08

Sample Calculation:

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

MCS8 MIMO

Tested Frequency [MHz]	Antenna 0				Antenna 1				Antenna 0+1			
	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average) [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average) [dBm]	Result (Burst power average) Antenna		Sum	
									0 [mW]	1 [mW]	0+1 [mW]	[dBm]
5180	-17.29	1.00	19.95	3.66	-18.01	1.00	19.91	2.90	2.32	1.95	4.27	6.31
5220	-17.15	1.00	19.95	3.80	-17.98	1.00	19.91	2.93	2.40	1.96	4.36	6.40
5240	-17.42	1.00	19.95	3.53	-18.10	1.00	19.91	2.81	2.25	1.91	4.16	6.20
5260	-17.44	1.00	19.95	3.51	-18.05	1.00	19.91	2.86	2.24	1.93	4.18	6.21
5300	-17.42	1.00	19.96	3.54	-18.29	1.00	19.91	2.62	2.26	1.83	4.09	6.11
5320	-17.34	1.00	19.96	3.62	-18.54	1.00	19.91	2.37	2.30	1.73	4.03	6.05
5500	-17.84	1.00	19.98	3.14	-19.05	1.00	19.91	1.86	2.06	1.53	3.60	5.56
5580	-18.22	1.00	19.99	2.77	-18.94	1.00	19.93	1.99	1.89	1.58	3.47	5.41
5700	-17.92	1.00	19.99	3.07	-18.55	1.00	19.93	2.38	2.03	1.73	3.76	5.75
5745	-17.95	1.00	19.99	3.04	-18.45	1.00	19.93	2.48	2.01	1.77	3.78	5.78
5785	-17.72	1.00	20.00	3.28	-18.00	1.00	19.93	2.93	2.13	1.96	4.09	6.12
5825	-17.93	1.00	20.00	3.07	-18.12	1.00	19.93	2.81	2.03	1.91	3.94	5.95

Sample Calculation:

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

This test was performed using the Gate function.

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.

UL Japan, Inc.

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Average Output Power
(Reference data for RF Exposure)

Report No. 12608632H
Test place Ise EMC Lab. No.5 Measurement Room
Date March 18, 2019
Temperature / Humidity 22 deg. C / 34 % RH
Engineer Yuichiro Yamazaki
Mode Tx 11ac-20

MCS0 SISO Antenna 0

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average)	
				[dBm]	[mW]
5180	-16.91	1.00	19.95	4.04	2.54
5220	-16.87	1.00	19.95	4.08	2.56
5240	-17.06	1.00	19.95	3.89	2.45
5260	-17.16	1.00	19.95	3.79	2.39
5300	-17.34	1.00	19.96	3.62	2.30
5320	-17.29	1.00	19.96	3.67	2.33
5500	-17.67	1.00	19.98	3.31	2.14
5580	-17.92	1.00	19.99	3.07	2.03
5700	-17.78	1.00	19.99	3.21	2.09
5745	-17.60	1.00	19.99	3.39	2.18
5785	-17.50	1.00	20.00	3.50	2.24
5825	-17.87	1.00	20.00	3.13	2.06

Sample Calculation:

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

MCS0 MIMO

Antenna 0					Antenna 1				Antenna 0+1			
Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average) [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average) [dBm]	Result (Burst power average) Antenna			
									0	1	Sum 0+1	
									[mW]	[mW]	[mW]	[dBm]
5180	-17.10	1.00	19.95	3.85	-18.18	1.00	19.91	2.73	2.43	1.87	4.30	6.34
5220	-17.26	1.00	19.95	3.69	-18.06	1.00	19.91	2.85	2.34	1.93	4.27	6.30
5240	-17.33	1.00	19.95	3.62	-18.11	1.00	19.91	2.80	2.30	1.91	4.21	6.24
5260	-17.46	1.00	19.95	3.49	-18.11	1.00	19.91	2.80	2.23	1.91	4.14	6.17
5300	-17.42	1.00	19.96	3.54	-18.27	1.00	19.91	2.64	2.26	1.84	4.10	6.12
5320	-17.56	1.00	19.96	3.40	-18.47	1.00	19.91	2.44	2.19	1.75	3.94	5.96
5500	-18.03	1.00	19.98	2.95	-18.98	1.00	19.91	1.93	1.97	1.56	3.53	5.48
5580	-18.25	1.00	19.99	2.74	-18.78	1.00	19.93	2.15	1.88	1.64	3.52	5.47
5700	-17.93	1.00	19.99	3.06	-18.55	1.00	19.93	2.38	2.02	1.73	3.75	5.74
5745	-17.92	1.00	19.99	3.07	-18.59	1.00	19.93	2.34	2.03	1.71	3.74	5.73
5785	-17.83	1.00	20.00	3.17	-17.98	1.00	19.93	2.95	2.07	1.97	4.05	6.07
5825	-18.02	1.00	20.00	2.98	-18.30	1.00	19.93	2.63	1.99	1.83	3.82	5.82

Sample Calculation:

Result (Burst power 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.**

This test was performed using the Gate function.

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Average Output Power (Reference data for RF Exposure)

Report No.	12608632H
Test place	Ise EMC Lab. No.5 Measurement Room
Date	March 18, 2019
Temperature / Humidity	22 deg. C / 34 % RH
Engineer	Yuichiro Yamazaki
Mode	Tx 11n-40

MCS0 SISO Antenna 0

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average)	
				[dBm]	[mW]
5190	-18.03	1.00	19.95	2.92	1.96
5230	-17.96	1.00	19.95	2.99	1.99
5270	-18.18	1.00	19.96	2.78	1.90
5310	-18.15	1.00	19.96	2.81	1.91
5510	-18.65	1.00	19.98	2.33	1.71
5550	-18.88	1.00	19.98	2.10	1.62
5670	-18.90	1.00	19.99	2.09	1.62
5755	-18.55	1.00	20.00	2.45	1.76
5795	-18.22	1.00	20.00	2.78	1.90

Sample Calculation:

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

MCS8 MIMO

Tested Frequency [MHz]	Antenna 0				Antenna 1				Antenna 0+1			
	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average) [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average) [dBm]	Result (Burst power average) Antenna			
									0	1	Sum 0+1	
									[mW]	[mW]	[mW]	[dBm]
5190	-18.02	1.00	19.95	2.93	-19.07	1.00	19.91	1.84	1.96	1.53	3.49	5.43
5230	-18.21	1.00	19.95	2.74	-19.02	1.00	19.91	1.89	1.88	1.55	3.42	5.35
5270	-18.33	1.00	19.95	2.62	-19.07	1.00	19.91	1.84	1.83	1.53	3.36	5.26
5310	-18.47	1.00	19.96	2.49	-19.29	1.00	19.91	1.62	1.78	1.45	3.23	5.09
5510	-18.70	1.00	19.98	2.28	-19.82	1.00	19.91	1.09	1.69	1.29	2.98	4.74
5550	-18.98	1.00	19.99	2.01	-19.77	1.00	19.93	1.16	1.59	1.31	2.89	4.62
5670	-18.93	1.00	19.99	2.06	-19.18	1.00	19.93	1.75	1.61	1.50	3.10	4.92
5755	-18.81	1.00	20.00	2.19	-19.19	1.00	19.93	1.74	1.66	1.49	3.15	4.98
5795	-18.50	1.00	20.00	2.50	-19.03	1.00	19.93	1.90	1.78	1.55	3.33	5.22

Sample Calculation:

Result (Burst power 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.

This test was performed using the Gate function.

UL Japan, Inc.

Ise EMC Lab.

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Average Output Power (Reference data for RF Exposure)

Report No. 12608632H
Test place Ise EMC Lab. No.5 Measurement Room
Date March 18, 2019
Temperature / Humidity 22 deg. C / 34 % RH
Engineer Yuichiro Yamazaki
Mode Tx 11ac-40

MCS0 SISO Antenna 0

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average)	
				[dBm]	[mW]
5190	-17.91	1.00	19.95	3.04	2.01
5230	-18.13	1.00	19.95	2.82	1.91
5270	-18.19	1.00	19.96	2.77	1.89
5310	-18.18	1.00	19.96	2.78	1.90
5510	-18.57	1.00	19.98	2.41	1.74
5550	-18.77	1.00	19.98	2.21	1.66
5670	-18.88	1.00	19.99	2.11	1.63
5755	-18.85	1.00	20.00	2.15	1.64
5795	-18.55	1.00	20.00	2.45	1.76

Sample Calculation:

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

MCS0 MIMO

Tested Frequency [MHz]	Antenna 0				Antenna 1				Antenna 0+1			
	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average) [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average) [dBm]	Result (Burst power average) Antenna			
									0	1	Sum 0+1	
									[mW]	[mW]	[mW]	[dBm]
5190	-18.12	1.00	19.95	2.83	-19.07	1.00	19.91	1.84	1.92	1.53	3.45	5.37
5230	-18.17	1.00	19.95	2.78	-18.98	1.00	19.91	1.93	1.90	1.56	3.46	5.39
5270	-18.20	1.00	19.95	2.75	-19.10	1.00	19.91	1.81	1.88	1.52	3.40	5.32
5310	-18.58	1.00	19.96	2.38	-19.31	1.00	19.91	1.60	1.73	1.45	3.18	5.02
5510	-18.64	1.00	19.98	2.34	-19.94	1.00	19.91	0.97	1.71	1.25	2.96	4.72
5550	-18.94	1.00	19.99	2.05	-19.87	1.00	19.93	1.06	1.60	1.28	2.88	4.59
5670	-19.03	1.00	19.99	1.96	-19.19	1.00	19.93	1.74	1.57	1.49	3.06	4.86
5755	-18.67	1.00	20.00	2.33	-19.11	1.00	19.93	1.82	1.71	1.52	3.23	5.09
5795	-18.74	1.00	20.00	2.26	-19.16	1.00	19.93	1.77	1.68	1.50	3.19	5.03

Sample Calculation:

Result (Burst power 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.

This test was performed using the Gate function.

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Ise EMC Lab.

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Average Output Power
(Reference data for RF Exposure)

Report No.	12608632H
Test place	Ise EMC Lab. No.5 Measurement Room
Date	March 18, 2019
Temperature / Humidity	22 deg. C / 34 % RH
Engineer	Yuichiro Yamazaki
Mode	Tx 11ac-80

MCS0 SISO Antenna 0

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average)	
				[dBm]	[mW]
5210	-19.07	1.00	19.95	1.88	1.54
5290	-19.22	1.00	19.96	1.74	1.49
5530	-19.84	1.00	19.98	1.14	1.30
5610	-19.81	1.00	19.99	1.18	1.31
5775	-19.79	1.00	20.00	1.21	1.32

Sample Calculation:

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

MCS0 MIMO

Tested Frequency [MHz]	Antenna 0				Antenna 1				Antenna 0+1			
	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average) [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst power average) [dBm]	Result (Burst power average) Antenna		Sum	
									0	1	0+1	
5210	-19.00	1.00	19.95	1.95	-20.13	1.00	19.91	0.78	1.57	1.20	2.76	4.41
5290	-19.29	1.00	19.96	1.67	-20.18	1.00	19.91	0.73	1.47	1.18	2.65	4.24
5530	-19.98	1.00	19.98	1.00	-20.99	1.00	19.92	-0.07	1.26	0.98	2.24	3.51
5610	-20.14	1.00	19.99	0.85	-20.89	1.00	19.93	0.04	1.22	1.01	2.23	3.47
5775	-19.64	1.00	20.00	1.36	-20.21	1.00	19.93	0.72	1.37	1.18	2.55	4.06

Sample Calculation:

Result (Burst power 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.

This test was performed using the Gate function.

UL Japan, Inc.

Ise EMC Lab.

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

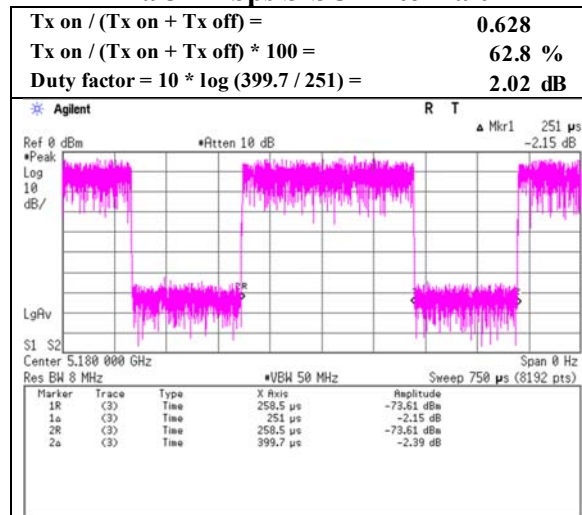
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

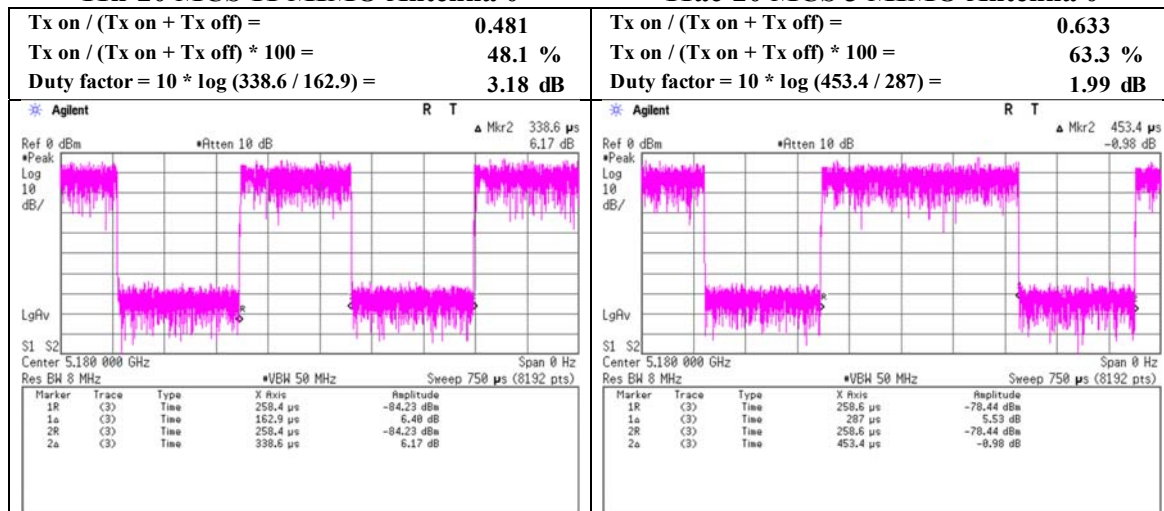
Burst rate confirmation

Report No.	12608632H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	March 19, 2019
Temperature / Humidity	25 deg. C / 32 % RH
Engineer	Yuichiro Yamazaki
Mode	Tx

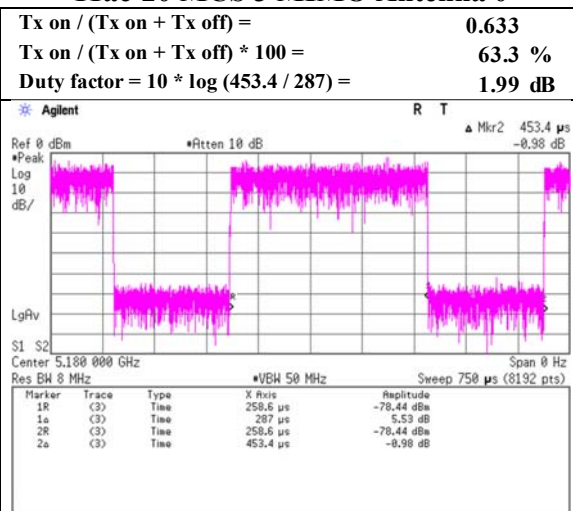
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11n-20 MCS 11 MIMO Antenna 0



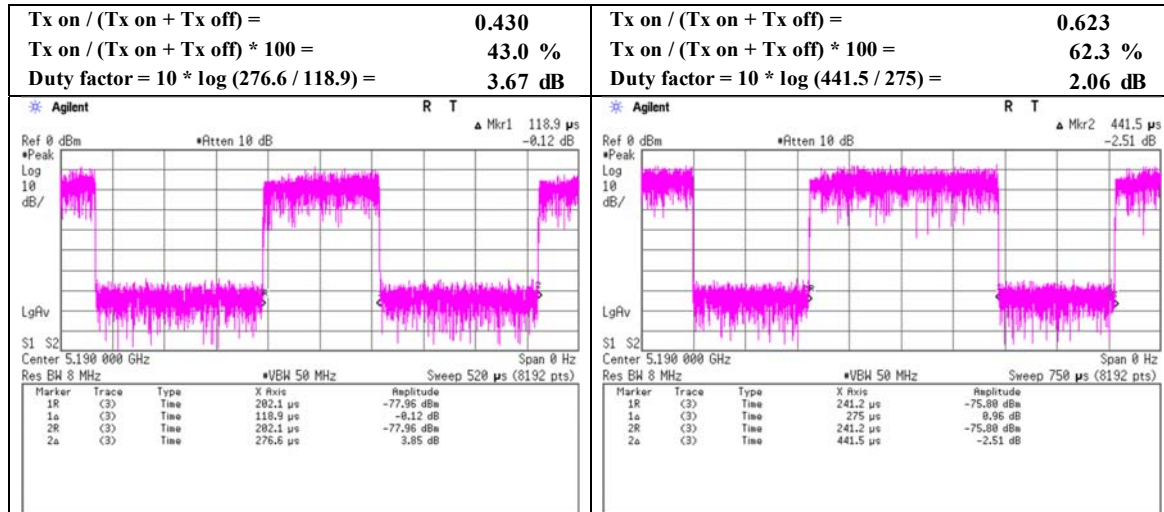
11ac-20 MCS 3 MIMO Antenna 0



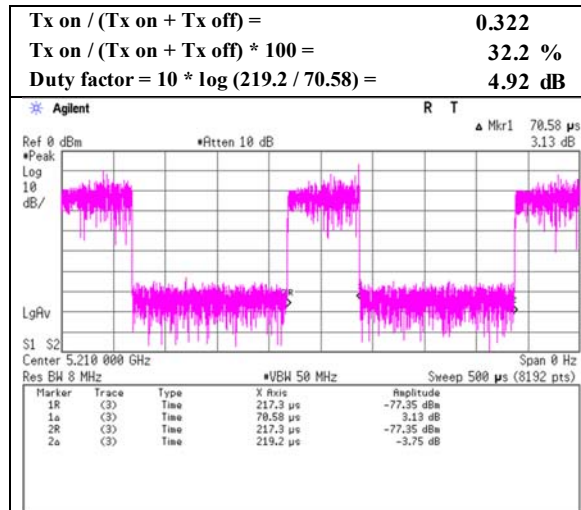
Burst rate confirmation

Report No. 12608632H
Test place Ise EMC Lab. No.8 Measurement Room
Date March 19, 2019
Temperature / Humidity 25 deg. C / 32 % RH
Engineer Yuichiro Yamazaki
Mode Tx

11n-40 MCS 12 MIMO Antenna 0



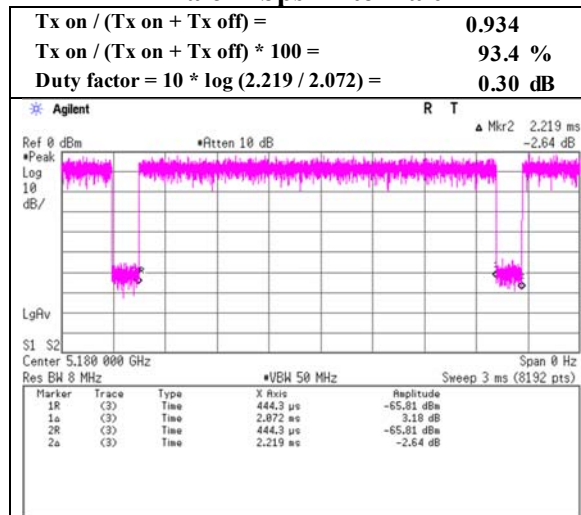
11ac-80 MCS 7 MIMO Antenna 0



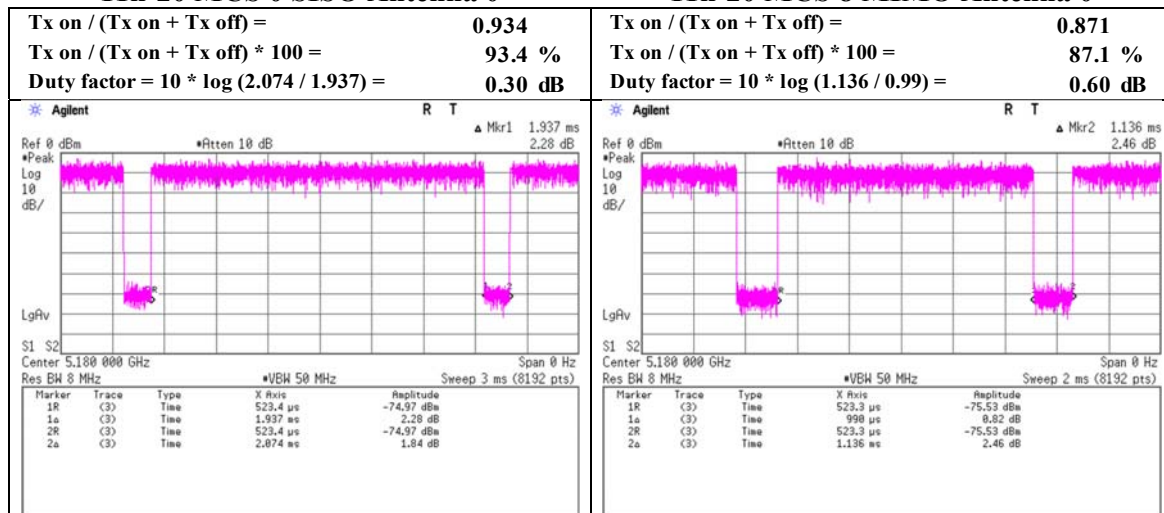
Burst rate confirmation

Report No. 12608632H
Test place Ise EMC Lab. No.8 Measurement Room
Date March 19, 2019
Temperature / Humidity 25 deg. C / 32 % RH
Engineer Yuichiro Yamazaki
Mode Tx

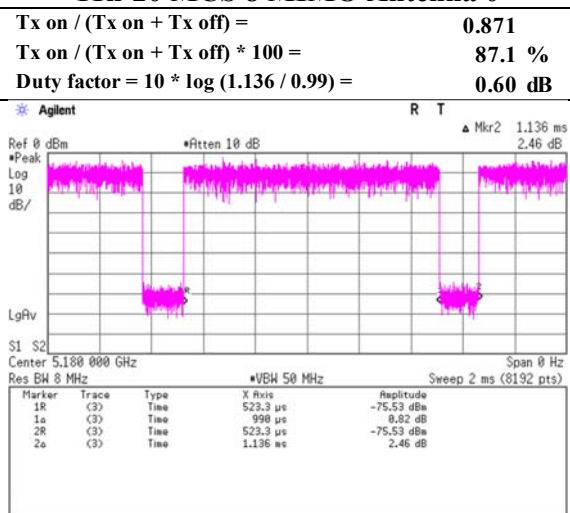
11a 6 Mbps Antenna 0



11n-20 MCS 0 SISO Antenna 0



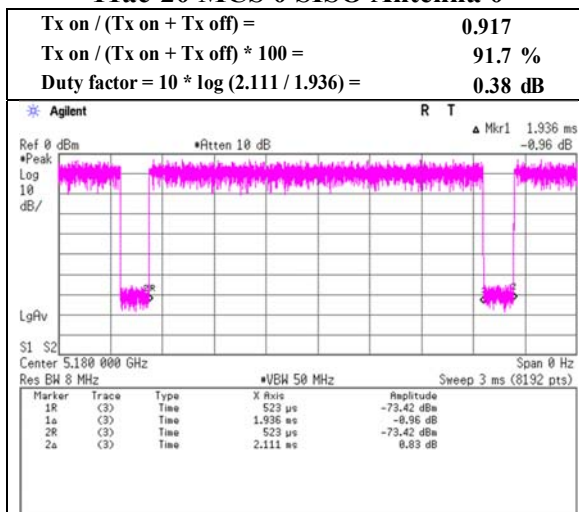
11n-20 MCS 8 MIMO Antenna 0



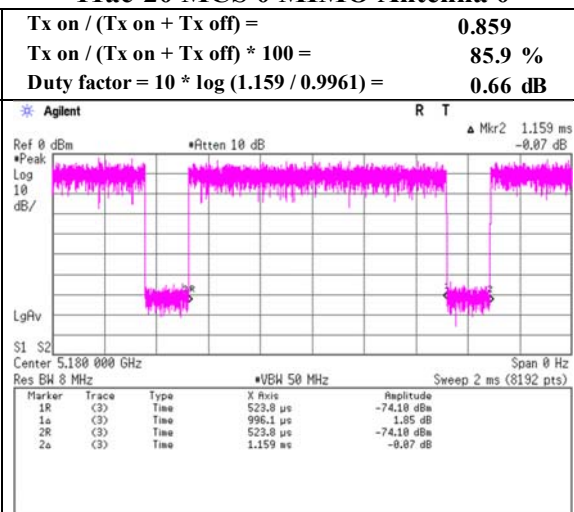
Burst rate confirmation

Report No. 12608632H
Test place Ise EMC Lab. No.8 Measurement Room
Date March 19, 2019
Temperature / Humidity 25 deg. C / 32 % RH
Engineer Yuichiro Yamazaki
Mode Tx

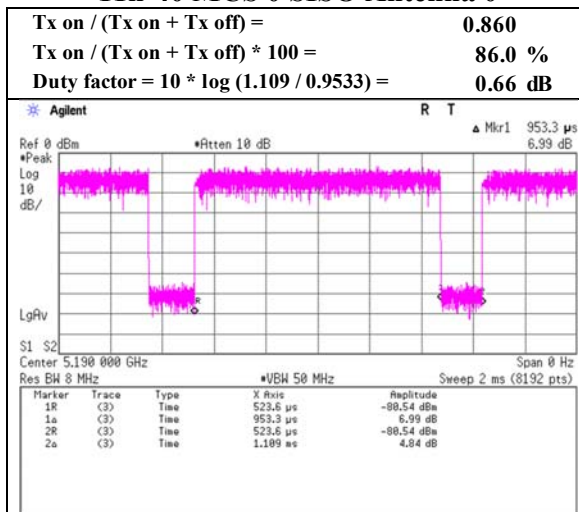
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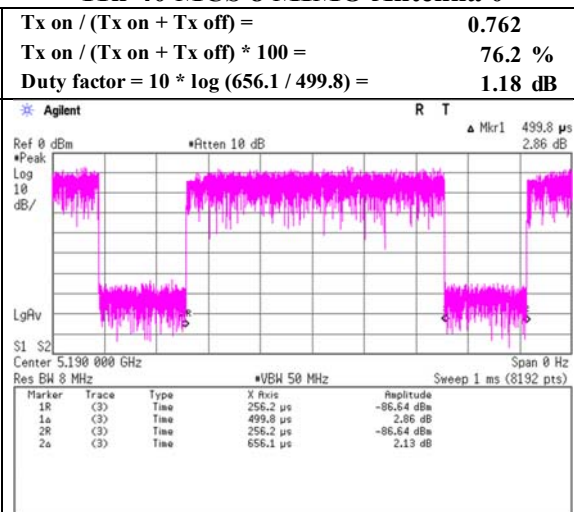
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11n-40 MCS 0 SISO Antenna 0



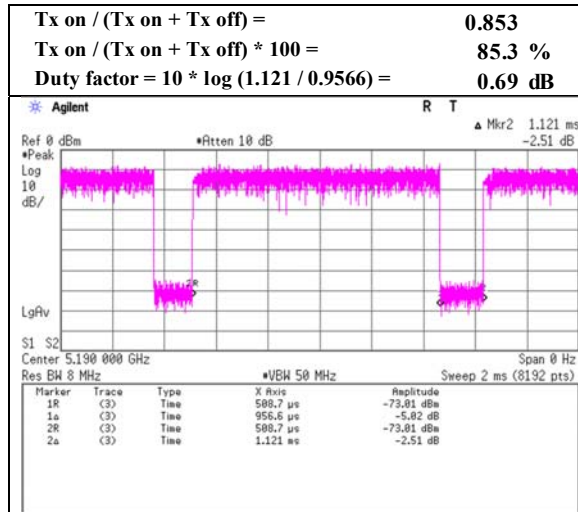
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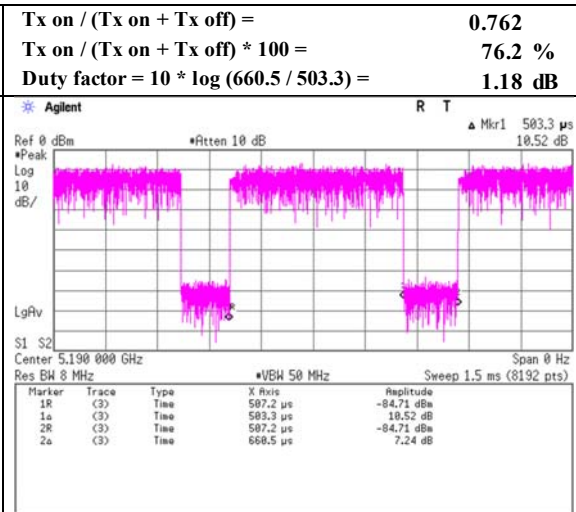
Burst rate confirmation

Report No. 12608632H
Test place Ise EMC Lab. No.8 Measurement Room
Date March 19, 2019
Temperature / Humidity 25 deg. C / 32 % RH
Engineer Yuichiro Yamazaki
Mode Tx

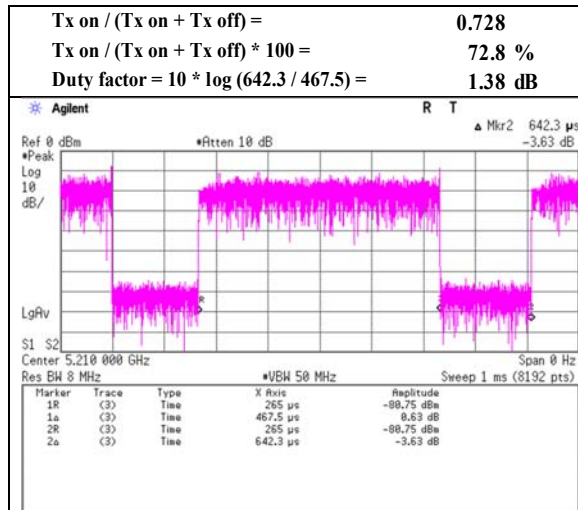
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11ac-40 MCS 0 MIMO Antenna 0



11ac-80 MCS 0 SISO Antenna 0



11ac-80 MCS 0 MIMO Antenna 0

