



RADIO TEST REPORT

Test Report No. 14173126H-C

Customer	Sony Interactive Entertainment Inc.
Description of EUT	Wireless communication module
Model Number of EUT	J20H104
FCC ID	AK8M21DFD1
Test Regulation	FCC Part 15 Subpart E: 2021
Test Result	Complied (Refer to SECTION 3)
Issue Date	March 11, 2022
Remarks	WLAN (5 GHz band) part Except for DFS test

Representative Test Engineer

Hiroki Numata
Engineer

Approved By

Takayuki Shimada
Leader



CERTIFICATE 5107.02

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

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- The information provided from the applicant for this report is identified in Section 1.
- For test report(s) referred in this report, the latest version (including any revisions) is always referred.

REVISION HISTORY

Original Test Report No.: 14173126H-C

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	14173126H-C	March 11, 2022	-

Reference: Abbreviations (Including words undescribed in this report)

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

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SECTION 1: Customer Information

Company Name	Sony Interactive Entertainment Inc.
Brand Name	SONY
Address	1-7-1 Konan, Minato-ku, Tokyo, 108-0075 Japan
Telephone Number	+81-50-3807-5639
Contact Person	Miho Nakamura

The information provided from the customer is as follows;

- Customer, Description of EUT, Model Number of EUT, FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer Information
- SECTION 2: Equipment Under Test (EUT) other than the Receipt Date and Test Date
- SECTION 4: Operation of EUT 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 (EUT)

2.1 Identification of EUT

Description	Wireless communication module
Model Number	J20H104
Serial Number	Refer to SECTION 4.2
Condition	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab
Receipt Date	January 17, 2022
Test Date	January 21 to February 15, 2022

2.2 Product Description

General Specification

Rating	DC 3.3 V
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Radio Specification

WLAN (IEEE802.11b/11g/11n-20/11ax-20)

Equipment Type	Transceiver	
Frequency of Operation	2412 MHz to 2462 MHz	
Type of Modulation	DSSS, OFDM	
	OFDMA (IEEE802.11ax only)	20 MHz: 26/52/106/242-tone RU
Bandwidth & Channel spacing	Less than 20 MHz & 5 MHz	
Method of frequency generation	Synthesizer	
Antenna Type	PIFA	
Antenna Gain: G_{ANT}	Antenna 1: 5.0 dBi Antenna 2: 5.0 dBi	
Directional Gain *1)	8.01 dBi	
Maximum clock frequency	640 MHz	

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

Equipment Type	Transceiver	
Frequency of Operation	20 M Band: 5180 MHz to 5240 MHz 5260 MHz to 5320 MHz 5500 MHz to 5720 MHz 5745 MHz to 5825 MHz	
	40 M Band: 5190 MHz to 5230 MHz 5270 MHz to 5310 MHz 5510 MHz to 5710 MHz 5755 MHz to 5795 MHz	
	80 M Band: 5210 MHz 5290 MHz 5530 MHz to 5690 MHz 5775 MHz	
Type of Modulation	OFDM	
	OFDMA (IEEE802.11ax only)	20 MHz: 26/52/106/242-tone RU 40 MHz: 26/52/106/242/484-tone RU 80 MHz: 26/52/106/242/484/996-tone RU
Bandwidth & Channel spacing	Less than 20 MHz / 40 MHz / 80 MHz & 20 MHz / 40 MHz / 80 MHz	
Method of frequency generation	Synthesizer	
Antenna Type	PIFA	
Antenna Gain: G_{ANT}	Antenna 1: 6.4 dBi Antenna 3: 5.0 dBi	
Directional Gain *1)	8.74 dBi	
Maximum clock frequency	640 MHz	

BT1: Bluetooth (BR / EDR / Low Energy)

Equipment Type	Transceiver
Frequency of Operation	2402 MHz to 2480 MHz
Type of Modulation	BT: FHSS (GFSK, $\pi/4$ DQPSK, 8DPSK) BT LE: GFSK
Bandwidth / Channel spacing	BT: 79 MHz / 1 MHz BT LE: 1 MHz & 2 MHz / 2 MHz
Method of frequency generation	Synthesizer
Antenna Type	PIFA
Antenna Gain	Antenna 3: 5.8 dBi
Maximum clock frequency	640 MHz

BT2: Bluetooth (BR / EDR / Low Energy)

Equipment Type	Transceiver
Frequency of Operation	2402 MHz to 2480 MHz
Type of Modulation	BT: FHSS (GFSK, $\pi/4$ DQPSK, 8DPSK) BT LE: GFSK
Bandwidth / Channel spacing	BT: 79 MHz / 1 MHz BT LE: 1 MHz & 2 MHz / 2 MHz
Method of frequency generation	Synthesizer
Antenna Type	PIFA
Antenna Gain	Antenna 4: 5.8 dBi
Maximum clock frequency	640 MHz

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

*This test report applies to Wireless LAN (5 GHz Band) part.

SECTION 3: Test specification, Procedures & Results

3.1 Test Specification

Test Specification	FCC Part 15 Subpart E FCC Part 15 final revised on May 3, 2021 and effective July 2, 2021
Title	FCC 47 CFR Part 15 Radio Frequency Device Subpart E Unlicensed National Information Infrastructure Devices Section 15.407 General technical requirements

3.2 Procedures and Results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 ISED: RSS-Gen 8.8	FCC: 15.407 (b) (6) / 15.207 ISED: RSS-Gen 8.8	20.13 dB 22.99664 MHz AV, N	Complied a)	-
26 dB Emission Bandwidth	FCC: KDB Publication Number 789033 ISED: -	FCC: 15.407 (a) (1) (2) (3) ISED: -	See data	Complied b)	Conducted
Maximum Conducted Output Power	FCC: KDB Publication Number 789033 ISED: -	FCC: 15.407 (a) (1) (2) (3) ISED: RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1		Complied c)	Conducted
Maximum Power Spectral Density	FCC: KDB Publication Number 789033 ISED: -	FCC : 15.407 (a) (1) (2) (3) ISED: RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1		Complied d)	Conducted
Spurious Emission Restricted Band Edge	FCC: ANSI C63.10-2013 KDB Publication Number 789033 ISED: -	FCC: 15.407 (b), 15.205 and 15.209 ISED: RSS-247 6.2.1.2 6.2.2.2 6.2.3.2 6.2.4.2	4.7 dB 5350.0 MHz / 5460.0 MHz, AV, Horizontal	Complied# e) / f)	Conducted (< 30 MHz) / Radiated (> 30 MHz) *1)
6 dB Emission Bandwidth	FCC: ANSI C63.10-2013 ISED: -	FCC: 15.407 (e) ISED: RSS-247 6.2.4.1	See data	Complied g)	Conducted
Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003593. * In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred.					
*1) Radiated test was selected over 30 MHz based on FCC 15.407 (b) and KDB 789033 D02 G.3.b).					
a) Refer to APPENDIX 1 (data of Conducted Emission) b) Refer to APPENDIX 1 (data of 26 dB Emission Bandwidth and 99 % Occupied Bandwidth) c) Refer to APPENDIX 1 (data of Maximum Conducted Output Power) d) Refer to APPENDIX 1 (data of Maximum Power Spectral Density) e) Refer to APPENDIX 1 (data of Radiated Spurious Emission) f) Refer to APPENDIX 1 (data of Conducted Spurious Emission) g) 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					

FCC Part 15.31 (e)

The stable voltage will be supplied by the end product, which will be required to have a power supply regulator. Therefore, the EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

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

3.3 Addition to Standard

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
99 % Occupied Band Width	ISED: RSS-Gen 6.7	ISED: -	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

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 $k=2$.

Conducted emission

Using Item	Frequency range	Uncertainty (+/-)
AMN (LISN)	0.009 MHz to 0.15 MHz	3.7 dB
	0.15 MHz to 30 MHz	3.3 dB

Radiated emission

Measurement distance	Frequency range		Uncertainty (+/-)
3 m	9 kHz to 30 MHz		3.2 dB
10 m			3.0 dB
3 m	30 MHz to 200 MHz	(Horizontal)	4.8 dB
		(Vertical)	5.0 dB
	200 MHz to 1000 MHz	(Horizontal)	5.1 dB
		(Vertical)	6.2 dB
10 m	30 MHz to 200 MHz	(Horizontal)	4.8 dB
		(Vertical)	4.8 dB
	200 MHz to 1000 MHz	(Horizontal)	5.0 dB
		(Vertical)	5.0 dB
3 m	1 GHz to 6 GHz		4.9 dB
	6 GHz to 18 GHz		5.2 dB
1 m	10 GHz to 26.5 GHz		5.4 dB
	26.5 GHz to 40 GHz		5.4 dB
0.5 m	26.5 GHz to 40 GHz		5.4 dB
10 m	1 GHz to 18 GHz		5.4 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	1.5 dB
Burst Rate	0.10 %
Maximum Power Spectral Density	2.7 dB
Conducted Spurious Emission	2.7 dB

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.

*A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 884919

ISED Lab Company Number: 2973C / CAB identifier: JP0002

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

Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124

Test site	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	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	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	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	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.5 measurement room	6.4 x 6.4 x 3.0	6.4 x 6.4	-	-
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.10 shielded room	3.8 x 2.8 x 2.8	3.8 x 2.8	-	-
No.11 measurement room	4.0 x 3.4 x 2.5	N/A	-	-
No.12 measurement room	2.6 x 3.4 x 2.5	N/A	-	-
Large Chamber	16.9 x 22.1 x 10.17	16.9 x 22.1	-	10 m
Small Chamber	5.3 x 6.69 x 3.59	5.3 x 6.69	-	-

* 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 EUT 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)	6 Mbps, PN9
IEEE 802.11n MIMO 20 MHz BW (11n-20)	MCS 0, PN9
IEEE 802.11ac MIMO 20 MHz BW (11ac-20)	MCS 0 (1TX), PN9
IEEE 802.11ax MIMO 20 MHz BW (11ax-20)	MCS 0 (1TX), PN9
IEEE 802.11n MIMO 40 MHz BW (11n-40)	MCS 0, PN9
IEEE 802.11ac MIMO 40 MHz BW (11ac-40)	MCS 0 (1TX), PN9
IEEE 802.11ax MIMO 40 MHz BW (11ax-40)	MCS 0 (1TX), PN9
IEEE 802.11ac MIMO 80 MHz BW (11ac-80)	MCS 0 (1TX), PN9
IEEE 802.11ax MIMO 80 MHz BW (11ax-80)	MCS 0 (1TX), PN9
*The worst antenna and condition was determined based on the test result of Maximum Conducted Output Power.	
*Power of the EUT was set by the software as follows; Power Setting: See the table below Software: autotest_for-ULJ.sh (Date: January 19, 2022, Storage location: Driven by connected PC)	
*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.	

Power Setting

		W52			W53/W56/W58		
		20 MHz BW	40 MHz BW	80 MHz BW	20 MHz BW	40 MHz BW	80 MHz BW
OFDM		6.5			8.0		
OFDMA	26-tone RU	-2.0			-0.5		
	52-tone RU	1.0			2.5		
	106-tone RU	4.0			5.5		
	242-tone RU	6.5			8.0		
	484-tone RU	-	6.5		-	8.0	
	996-tone RU	-	-	6.5	-	-	8.0

(dBm)

*The details of Operation mode(s) (1/2)

Test Item	Operating Mode	Tested Antenna	Tested Frequency			
			Lower Band	Middle Band	Additional Band	Upper Band
Conducted emission, Radiated Spurious Emission (Below 1 GHz)	Tx 11ax-20 OFDM *1)	Antenna 3	-	-	5500 MHz	-
26 dB Emission Bandwidth	Tx 11a	Antenna 3 *2)	-	5260 MHz	5500 MHz	-
	Tx 11n-20		-	5300 MHz	5580 MHz	-
	Tx 11ac-20		-	5320 MHz	5700 MHz	-
	Tx 11ax-20 OFDM		-	-	5720 MHz	-
	Tx 11ax-20 OFDMA		-	-	-	-
	Tx 11n-40		-	5270 MHz	5510 MHz	-
	Tx 11ac-40		-	5310 MHz	5550 MHz	-
	Tx 11ax-40 OFDM		-	-	5670 MHz	-
	Tx 11ax-40 OFDMA		-	-	5710 MHz	-
99 % Occupied Bandwidth	Tx 11a	Antenna 3 *2)	5180 MHz	5260 MHz	5500 MHz	5745 MHz
	Tx 11n-20		5220 MHz	5300 MHz	5580 MHz	5785 MHz
	Tx 11ac-20		5240 MHz	5320 MHz	5700 MHz	5825 MHz
	Tx 11ax-20 OFDM		-	-	5720 MHz	-
	Tx 11ax-20 OFDMA		-	-	-	-
	Tx 11n-40		5190 MHz	5270 MHz	5510 MHz	5755 MHz
	Tx 11ac-40		5230 MHz	5310 MHz	5550 MHz	5795 MHz
	Tx 11ax-40 OFDM		-	-	5670 MHz	-
	Tx 11ax-40 OFDMA		-	-	5710 MHz	-
Maximum Conducted Output Power, Maximum Power Spectral Density	Tx 11a	Antenna 1 Antenna 3 Antenna 1 + 3	5180 MHz	5260 MHz	5500 MHz	5745 MHz
	Tx 11n-20		5220 MHz	5300 MHz	5580 MHz	5785 MHz
	Tx 11ac-20		5240 MHz	5320 MHz	5700 MHz	5825 MHz
	Tx 11ax-20 OFDM		-	-	5720 MHz	-
	Tx 11ax-20 OFDMA		-	-	-	-
	Tx 11n-40		5190 MHz	5270 MHz	5510 MHz	5755 MHz
	Tx 11ac-40		5230 MHz	5310 MHz	5550 MHz	5795 MHz
	Tx 11ax-40 OFDM		-	-	5670 MHz	-
	Tx 11ax-40 OFDMA		-	-	5710 MHz	-
	Tx 11ac-80		5210 MHz	5290 MHz	5530 MHz	5775 MHz
	Tx 11ax-80 OFDM		-	-	5610 MHz	-
	Tx 11ax-80 OFDMA		-	-	5690 MHz	-
			-	-	-	-

*The details of Operation mode(s) (2/2)

Test Item	Operating Mode	Tested Antenna	Tested Frequency			
			Lower Band	Middle Band	Additional Band	Upper Band
6 dB Bandwidth	Tx 11a Tx 11n-20 Tx 11ac-20 Tx 11ax-20 OFDM Tx 11ax-20 OFDMA	Antenna 3 *2)	-	-	-	5745 MHz 5785 MHz 5825 MHz
	Tx 11n-40 Tx 11ac-40 Tx 11ax-40 OFDM Tx 11ax-40 OFDMA		-	-	-	5755 MHz 5795 MHz
	Tx 11ac-80 Tx 11ax-80 OFDM Tx 11ax-80 OFDMA		-	-	-	5775 MHz
Radiated Spurious Emission (Above 1 GHz)	Tx 11ax-20 OFDM *3) Tx 11ax-20 OFDMA *4)	Antenna 1 + 3	5180 MHz	5260 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	Tx 11ax-40 OFDM *3) Tx 11ax-40 OFDMA *4)		5190 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz	5755 MHz 5795 MHz
	Tx 11ax-80 OFDM *3) Tx 11ax-80 OFDMA *4)		5210 MHz	5290 MHz	5530 MHz 5610 MHz 5690 MHz	5775 MHz
Conducted Spurious Emission	Tx 11ax-20 OFDM *1)	Antenna 3	-	-	5500 MHz	-
*1) The mode was tested as a representative, because it had the highest power at antenna terminal test. *2) After the comparison between Antenna 1 and Antenna 3, the test was performed with the antenna that had higher power as a representative. *3) Since each of 20 MHz BW (11n-20 / 11ac-20 / 11ax-20), 40 MHz BW (11n-40 / 11ac-40 / 11ax-40) and 80 MHz BW (11ac-80 / 11ax-80) have the same modulation method and no differences in transmitting specification, the test was performed on the representative mode that had the highest output power. *4) OFDMA configuration tests were conducted only at the band edge since preliminary testing indicated that the other spurious emission was lower than OFDM.						

Simultaneous transmission (Only Antenna 3 simultaneously transmits BT1 and WLAN 5 GHz on a single antenna.)

Test Item	Mode *1)	Tested Antenna
Radiated Spurious Emission	Tx 11ax-80 5290 MHz (OFDM) + BT1 3DH5 Hopping	Antenna 3
*1) The test was performed on the mode as a representative, because it had the highest power of BT1 at antenna terminal test.		

4.2 Configuration and Peripherals

This page has been submitted for a separate exhibit.

SECTION 5: Conducted Emission

Test Procedure and Conditions

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

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

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

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

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

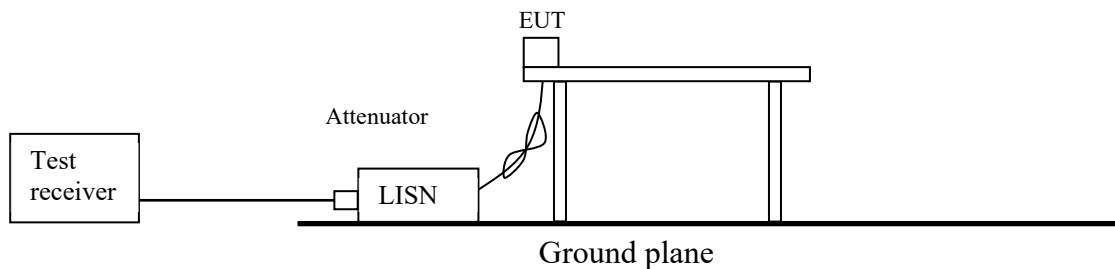
The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

Detector	: QP and CISPR Average
Measurement Range	: 0.15 MHz to 30 MHz
Test Data	: APPENDIX
Test Result	: Pass

Figure 1: Test Setup



SECTION 6: 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 1.0 m, raised 1.5 m above the conducting ground plane.

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

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

Test antenna was aimed at the EUT for receiving the maximum signal and always kept within the illumination area of the 3 dB beamwidth of the antenna.

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:

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

Test Antennas are used as below;

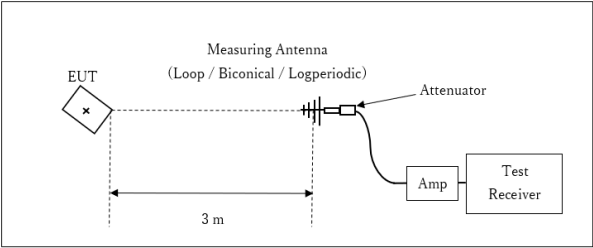
Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

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".

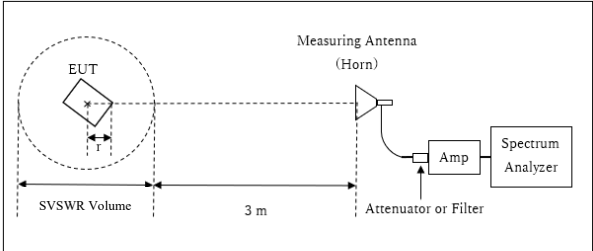
Figure 2: Test Setup

Below 1 GHz



Test Distance: 3 m

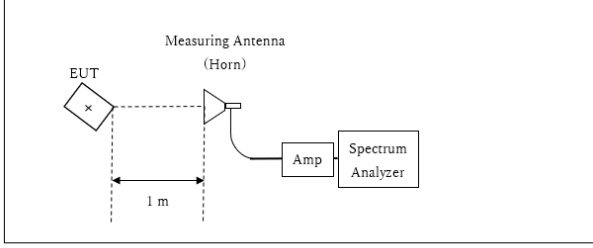
1 GHz to 10 GHz



Distance Factor: $20 \times \log (3.9 \text{ m} / 3.0 \text{ m}) = 2.28 \text{ dB}$
* Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.9 \text{ m}$

SVSWR Volume : 2.0 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
 $r = 0.1 \text{ m}$

10 GHz to 40 GHz



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

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

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

Measurement Range : 30 MHz to 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.

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
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)	≥ 3 RBW	Auto	RMS Power Averaging (200 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*3) *4)	9 kHz to 150 kHz 150 kHz to 30 MHz	200 Hz 9.1 kHz	620 Hz 27 kHz	Auto	Peak	Max Hold	Spectrum Analyzer

* 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 to 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. (9 kHz to 150 kHz: RBW = 200 Hz, 150 kHz to 30 MHz: RBW = 9.1 kHz).

*4) The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377 Ohms. For example, the measurement at frequency 9 kHz resulted in a level of 45.5 dBuV/m, which is equivalent to $45.5 - 51.5 = -6.0$ dBuA/m, which has the same margin, 3 dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.

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

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

Test Data : APPENDIX

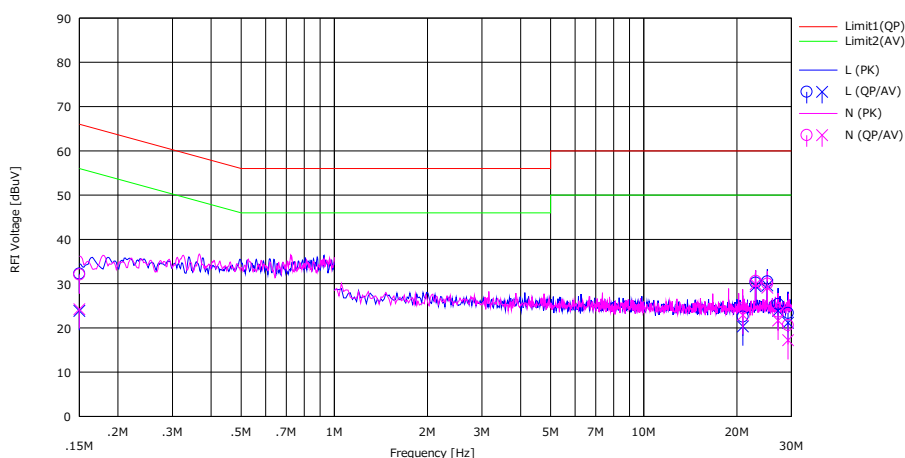
Test Result : Pass

APPENDIX 1: Test data

Conducted Emission

Test place Ise EMC Lab. No.3 Semi Anechoic Chamber
Date February 15, 2022
Temperature / Humidity 20 deg. C / 40 % RH
Engineer Junya Okuno
Mode Tx 11ax-20 5500 MHz (OFDM)

Limit : FCC_Part 15 Subpart E(15.207)



No.	Freq. [MHz]	Reading		LISN [dB]	LOSS [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]			<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	19.00	10.60	0.06	13.18	32.24	23.84	66.00	56.00	33.76	32.16	L	
2	20.90520	8.20	6.00	0.43	13.90	22.53	20.33	60.00	50.00	37.47	29.67	L	
3	22.99510	15.80	15.00	0.47	13.94	30.21	29.41	60.00	50.00	29.79	20.59	L	
4	25.08598	16.00	15.10	0.51	13.98	30.49	29.59	60.00	50.00	29.51	20.41	L	
5	27.17780	10.80	9.30	0.55	14.02	25.37	23.87	60.00	50.00	34.63	26.13	L	
6	29.26652	8.70	6.50	0.60	14.06	23.36	21.16	60.00	50.00	36.64	28.84	L	
7	0.15000	18.80	11.00	0.06	13.18	32.04	24.24	66.00	56.00	33.96	31.76	N	
8	20.90660	10.20	8.60	0.39	13.90	24.49	22.89	60.00	50.00	35.51	27.11	N	
9	22.99664	16.20	15.50	0.43	13.94	30.57	29.87	60.00	50.00	29.43	20.13	N	
10	25.08824	15.50	14.60	0.48	13.98	29.96	29.06	60.00	50.00	30.04	20.94	N	
11	27.17920	9.10	7.10	0.52	14.02	23.64	21.64	60.00	50.00	36.36	28.36	N	
12	29.26690	6.00	2.60	0.56	14.06	20.62	17.22	60.00	50.00	39.38	32.78	N	

CHART: WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + C.F (LISN + CABLE + ATT)
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.8 Measurement Room
Date February 2, 2022
Temperature / Humidity 25 deg. C / 40 % RH
Engineer Kiyoshiro Okazaki
Mode Tx

11a

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5180	-	17277.5
	5220	-	17301.0
	5240	-	16573.2
	5260	23.710	17287.1
	5300	23.794	17374.9
	5320	25.772	17416.5
	5500	24.547	17372.8
	5580	23.337	17269.6
	5700	24.129	17385.0
	5720	23.040	17307.7
	5745	-	17298.0
	5785	-	17305.2
	5825	-	17300.8

11n-20

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5180	-	17978.3
	5220	-	18041.7
	5240	-	17547.0
	5260	23.018	18023.3
	5300	23.244	18032.4
	5320	23.953	18041.1
	5500	23.635	18040.9
	5580	23.609	17965.8
	5700	23.210	18064.3
	5720	23.660	17958.3
	5745	-	17951.3
	5785	-	17992.6
	5825	-	17999.9

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date February 2, 2022
Temperature / Humidity 25 deg. C / 40 % RH
Engineer Kiyoshiro Okazaki
Mode Tx

11ac-20

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5180	-	17994.1
	5220	-	17999.9
	5240	-	17610.4
	5260	23.603	18044.8
	5300	23.321	18019.2
	5320	23.668	17999.4
	5500	23.392	18014.7
	5580	23.750	17986.5
	5700	23.698	18047.2
	5720	23.171	17920.8
	5745	-	17989.5
	5785	-	17962.4
	5825	-	17972.7

11ax-20(OFDM)

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5180	-	19203.7
	5220	-	19180.5
	5240	-	18826.3
	5260	23.794	19173.6
	5300	23.888	19218.9
	5320	24.850	19266.4
	5500	23.187	19226.9
	5580	24.341	19207.0
	5700	23.795	19247.8
	5720	22.513	19198.1
	5745	-	19188.5
	5785	-	19215.3
	5825	-	19200.6

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date February 3, 2022
Temperature / Humidity 24 deg. C / 41 % RH
Engineer Kiyoshiro Okazaki
Mode Tx

11ax-20 (OFDMA)

Antenna	RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	26-tone RU	5180	0	-	19111.4
			4	-	16996.2
			8	-	19231.2
		5220	0	-	19044.2
			4	-	17059.6
			8	-	19141.0
		5240	0	-	18169.1
			4	-	16853.7
			8	-	18153.5
		5260	0	20.415	19167.8
			4	18.038	17025.8
			8	20.595	19122.0
		5300	0	20.634	19181.8
			4	18.017	17033.3
			8	20.284	19158.7
		5320	0	20.427	19078.4
			4	18.046	17040.3
			8	20.467	19145.8
		5500	0	20.888	19131.2
			4	18.015	17048.0
			8	20.634	19097.7
		5580	0	20.995	19223.8
			4	18.079	17017.5
			8	20.818	19118.3
		5700	0	20.208	19152.7
			4	18.037	17057.7
			8	20.938	19097.2
		5720	0	20.492	19139.9
			4	18.068	17061.0
			8	21.415	19178.4
		5745	0	-	19079.0
			4	-	17036.5
			8	-	19111.1
		5785	0	-	19006.2
			4	-	17034.3
			8	-	19179.0
		5825	0	-	19040.3
			4	-	17048.1
			8	-	19096.8

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date February 3, 2022
Temperature / Humidity 24 deg. C / 41 % RH
Engineer Kiyoshiro Okazaki
Mode Tx

11ax-20 (OFDMA)

Antenna	RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	52-tone RU	5180	37	-	18635.2
			38	-	17088.2
			40	-	18655.2
		5220	37	-	18717.1
			38	-	17093.2
			40	-	18669.0
		5240	37	-	18066.8
			38	-	16872.8
			40	-	18057.0
		5260	37	20.759	18732.1
			38	18.208	17090.6
			40	20.464	18651.1
		5300	37	21.074	18662.6
			38	18.189	17096.9
			40	20.196	18726.4
		5320	37	20.773	18730.9
			38	18.188	17084.8
			40	21.215	18667.1
		5500	37	20.706	18715.7
			38	18.178	17102.6
			40	21.115	18702.7
		5580	37	20.561	18646.2
			38	18.215	17071.2
			40	20.873	18681.3
		5700	37	20.716	18651.7
			38	18.165	17063.2
			40	21.951	18654.2
		5720	37	20.706	18715.4
			38	18.206	17091.3
			40	21.116	18718.6
		5745	37	-	18666.7
			38	-	17072.0
			40	-	18740.1
		5785	37	-	18640.3
			38	-	17083.9
			40	-	18699.4
		5825	37	-	18927.5
			38	-	17082.8
			40	-	18711.4

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date February 4, 2022
Temperature / Humidity 20 deg. C / 38 % RH
Engineer Ken Fujita
Mode Tx

11ax-20 (OFDMA)

Antenna	RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	106-tone RU	5180	53	-	18498.2
			54	-	18424.5
		5220	53	-	18446.1
			54	-	18415.0
		5240	53	-	18087.7
			54	-	18039.4
		5260	53	22.294	18484.7
			54	21.409	18469.8
		5300	53	21.948	18494.1
			54	21.289	18462.2
		5320	53	22.185	18484.5
			54	21.325	18449.8
		5500	53	21.022	18432.9
			54	23.131	18462.0
		5580	53	22.688	18483.8
			54	20.906	18443.4
		5700	53	22.114	18478.8
			54	21.414	18471.6
		5720	53	21.321	18458.6
			54	21.377	18523.0
		5745	53	-	18456.4
			54	-	18481.3
		5785	53	-	18515.0
			54	-	18463.8
		5825	53	-	18486.6
			54	-	18400.2

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 4, 2022
Temperature / Humidity	20 deg. C / 38 % RH
Engineer	Ken Fujita
Mode	Tx

11ax-20 (OFDMA)

Antenna	RU Type	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	242-tone RU	5180	-	19189.0
		5220	-	19264.8
		5240	-	18842.1
		5260	24.575	19228.3
		5300	24.053	19324.3
		5320	23.187	19206.9
		5500	22.288	19199.7
		5580	26.339	19242.8
		5700	22.837	19210.4
		5720	25.450	19236.3
		5745	-	19255.5
		5785	-	19184.5
		5825	-	19230.7

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date February 2, 2022
Temperature / Humidity 25 deg. C / 40 % RH
Engineer Kiyoshiro Okazaki
Mode Tx

11n-40

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5190	-	35996.9
	5230	-	35795.3
	5270	39.234	35964.4
	5310	39.020	35981.9
	5510	39.197	35941.1
	5550	39.138	35852.2
	5670	39.191	35963.3
	5710	39.015	36032.7
	5755	-	35945.6
	5795	-	35844.9

11ac-40

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5190	-	35800.0
	5230	-	35873.7
	5270	39.328	35960.5
	5310	38.858	35955.7
	5510	38.976	35996.4
	5550	39.177	35900.6
	5670	38.950	35988.8
	5710	39.002	35926.6
	5755	-	35895.3
	5795	-	36019.1

11ax-40 (OFDM)

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5190	-	37497.0
	5230	-	37475.5
	5270	39.559	37500.5
	5310	39.518	37479.0
	5510	39.495	37545.5
	5550	39.492	37468.1
	5670	39.543	37458.1
	5710	39.519	37506.7
	5755	-	37467.0
	5795	-	37515.1

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date February 4, 2022
Temperature / Humidity 20 deg. C / 38 % RH
Engineer Ken Fujita
Mode Tx

11ax-40 (OFDMA)

Antenna	RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	26-tone RU	5190	0	-	18099.9
			8	-	21848.1
			17	-	18010.4
		5230	0	-	18047.8
			8	-	21679.4
			17	-	18007.7
		5270	0	19.083	18082.9
			8	22.257	21674.1
			17	19.057	18080.9
		5310	0	19.153	18083.7
			8	21.818	21256.3
			17	19.065	18091.7
		5510	0	19.071	18098.3
			8	21.924	21510.0
			17	19.029	18097.3
		5550	0	19.112	18099.8
			8	22.162	21321.5
			17	19.058	18075.8
		5670	0	19.120	18035.3
			8	21.697	21181.4
			17	19.102	18114.8
		5710	0	19.109	18056.6
			8	22.008	21273.3
			17	19.072	18034.5
		5755	0	-	18045.3
			8	-	21524.9
			17	-	18119.0
		5795	0	-	18068.9
			8	-	21426.2
			17	-	18135.6

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date February 13, 2022
Temperature / Humidity 23 deg. C / 39 % RH
Engineer Hiroki Numata
Mode Tx

11ax-40 (OFDMA)

Antenna	RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	52-tone RU	5190	37	-	18028.7
			40	-	22102.0
			44	-	17940.1
		5230	37	-	18030.4
			40	-	22571.6
			44	-	17972.7
		5270	37	19.195	17995.2
			40	25.381	22072.2
			44	19.327	17938.6
		5310	37	19.250	17976.4
			40	23.483	23477.2
			44	19.327	18003.7
		5510	37	19.262	17938.5
			40	23.993	22657.8
			44	19.381	17899.4
		5550	37	19.189	17987.0
			40	24.273	22938.8
			44	19.343	17959.6
		5670	37	19.224	17951.2
			40	23.381	22143.7
			44	19.311	17915.7
		5710	37	19.223	17956.5
			40	24.165	22139.8
			44	19.368	17991.8
		5755	37	-	17909.1
			40	-	22125.8
			44	-	17960.8
		5795	37	-	17937.4
			40	-	21054.5
			44	-	17960.0

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date February 14, 2022
Temperature / Humidity 23 deg. C / 38 % RH
Engineer Hiroki Numata
Mode Tx

11ax-40 (OFDMA)

Antenna	RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	106-tone RU	5190	53	-	17757.3
			54	-	20558.0
			56	-	17728.4
		5230	53	-	17751.2
			54	-	21630.7
			56	-	17653.9
		5270	53	19.496	17684.0
			54	23.322	20534.4
			56	19.341	17688.3
		5310	53	19.495	17742.5
			54	24.292	20670.7
			56	19.409	17676.7
		5510	53	19.411	17767.3
			54	26.386	20742.8
			56	19.331	17672.0
		5550	53	19.468	17815.2
			54	23.945	20672.2
			56	19.369	17673.1
		5670	53	19.374	17723.9
			54	24.698	20466.5
			56	19.352	17655.1
		5710	53	19.364	17737.2
			54	25.113	20781.4
			56	19.278	17738.2
		5755	53	-	17758.6
			54	-	21340.0
			56	-	17673.6
		5795	53	-	17748.7
			54	-	20632.7
			56	-	17729.2

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date February 6, 2022
Temperature / Humidity 21 deg. C / 36 % RH
Engineer Hiroki Numata
Mode Tx

11ax-40 (OFDMA)

Antenna	RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	242-tone RU	5190	61	-	23431.1
			62	-	23017.6
		5230	61	-	23671.9
			62	-	23711.2
		5270	61	39.304	24005.3
			62	39.294	23501.5
		5310	61	39.431	27711.8
			62	39.414	22785.6
		5510	61	39.441	25901.8
			62	39.272	23890.8
		5550	61	39.419	27961.6
			62	39.374	23076.9
		5670	61	39.225	26670.9
			62	39.209	27779.7
		5710	61	39.329	25594.5
			62	39.068	23296.3
		5755	61	-	25922.2
			62	-	25514.7
		5795	61	-	25469.0
			62	-	22612.4

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date February 6, 2022
Temperature / Humidity 21 deg. C / 36 % RH
Engineer Hiroki Numata
Mode Tx

11ax-40 (OFDMA)

Antenna	RU Type	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	484-tone RU	5190	-	37389.4
		5230	-	37373.8
		5270	39.546	37406.5
		5310	39.509	37379.1
		5510	39.400	37501.1
		5550	39.307	37384.1
		5670	39.541	37376.7
		5710	39.580	37474.4
		5755	-	37434.5
		5795	-	37416.4

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date February 2, 2022
Temperature / Humidity 25 deg. C / 40 % RH
Engineer Kiyoshiro Okazaki
Mode Tx

11ac-80

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5210	-	74976.6
	5290	79.012	75037.5
	5530	78.751	75065.8
	5610	79.069	75056.9
	5690	78.997	75042.2
	5775	-	75056.2

11ax-80 (OFDM)

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5210	-	76818.1
	5290	80.163	76793.7
	5530	80.184	76799.4
	5610	80.177	76825.0
	5690	80.183	76766.9
	5775	-	76849.6

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date February 15, 2022
Temperature / Humidity 21 deg. C / 38 % RH
Engineer Hiroki Numata
Mode Tx

11ax-80 (OFDMA)

Antenna	RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	26-tone RU	5210	0	-	19569.9
			18	-	37085.8
			36	-	19470.4
		5290	0	19.739	19476.9
			18	38.748	37023.2
			36	19.866	19500.6
		5530	0	19.805	19483.7
			18	38.828	37121.5
			36	19.760	19391.6
		5610	0	19.772	19380.1
			18	38.651	37057.4
			36	19.747	19354.7
		5690	0	19.778	19354.7
			18	38.565	37141.2
			36	19.863	19459.6
		5775	0	-	19439.9
			18	-	37035.7
			36	-	19346.5

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date February 15, 2022
Temperature / Humidity 21 deg. C / 38 % RH
Engineer Hiroki Numata
Mode Tx

11ax-80 (OFDMA)

Antenna	RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	52-tone RU	5210	37	-	20150.7
			44	-	26629.2
			52	-	19286.1
		5290	37	20.382	20128.6
			44	24.112	26096.3
			52	20.243	19360.3
		5530	37	21.181	19983.4
			44	25.667	27175.7
			52	20.168	19253.4
		5610	37	20.914	19979.9
			44	25.354	27430.8
			52	20.139	19190.2
		5690	37	20.826	19965.8
			44	25.621	26403.4
			52	20.154	19221.8
		5775	37	-	20032.3
			44	-	27286.0
			52	-	19236.1

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date February 6, 2022
Temperature / Humidity 20 deg. C / 37 % RH
Engineer Ken Fujita
Mode Tx

11ax-80 (OFDMA)

Antenna	RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	106-tone RU	5210	53	-	19977.9
			56	-	23688.0
			60	-	19244.2
		5290	53	21.183	20008.1
			56	26.366	24555.5
			60	20.701	19166.7
		5530	53	22.233	19904.9
			56	26.278	24031.7
			60	21.318	19170.1
		5610	53	21.712	19634.5
			56	25.661	24106.5
			60	20.718	19082.1
		5690	53	22.203	19980.7
			56	27.417	23734.2
			60	20.482	19124.0
		5775	53	-	19572.2
			56	-	24291.3
			60	-	19129.0

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date February 6, 2022
Temperature / Humidity 20 deg. C / 37 % RH
Engineer Ken Fujita
Mode Tx

11ax-80 (OFDMA)

Antenna	RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	242-tone RU	5210	61	-	23096.2
			62	-	40993.8
			64	-	22319.5
		5290	61	28.165	22396.1
			62	48.077	41256.2
			64	26.645	22362.1
		5530	61	30.249	22518.8
			62	51.193	41903.7
			64	28.646	22563.8
		5610	61	28.146	22398.8
			62	43.721	40435.4
			64	28.675	22242.4
		5690	61	29.877	22639.8
			62	45.068	41281.7
			64	29.347	22256.1
		5775	61	-	22363.2
			62	-	40567.8
			64	-	22525.9

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date February 7, 2022
Temperature / Humidity 23 deg. C / 32 % RH
Engineer Junki Nagatomi
Mode Tx

11ax-80 (OFDMA)

Antenna	RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	484-tone RU	5210	65	-	67604.6
			66	-	60258.8
		5290	65	79.638	62445.0
			66	79.852	60520.9
		5530	65	79.696	67637.3
			66	79.653	61589.6
		5610	65	80.012	63735.0
			66	79.840	60566.7
		5690	65	79.742	65022.8
			66	79.943	67731.0
		5775	65	-	66157.6
			66	-	66212.5

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

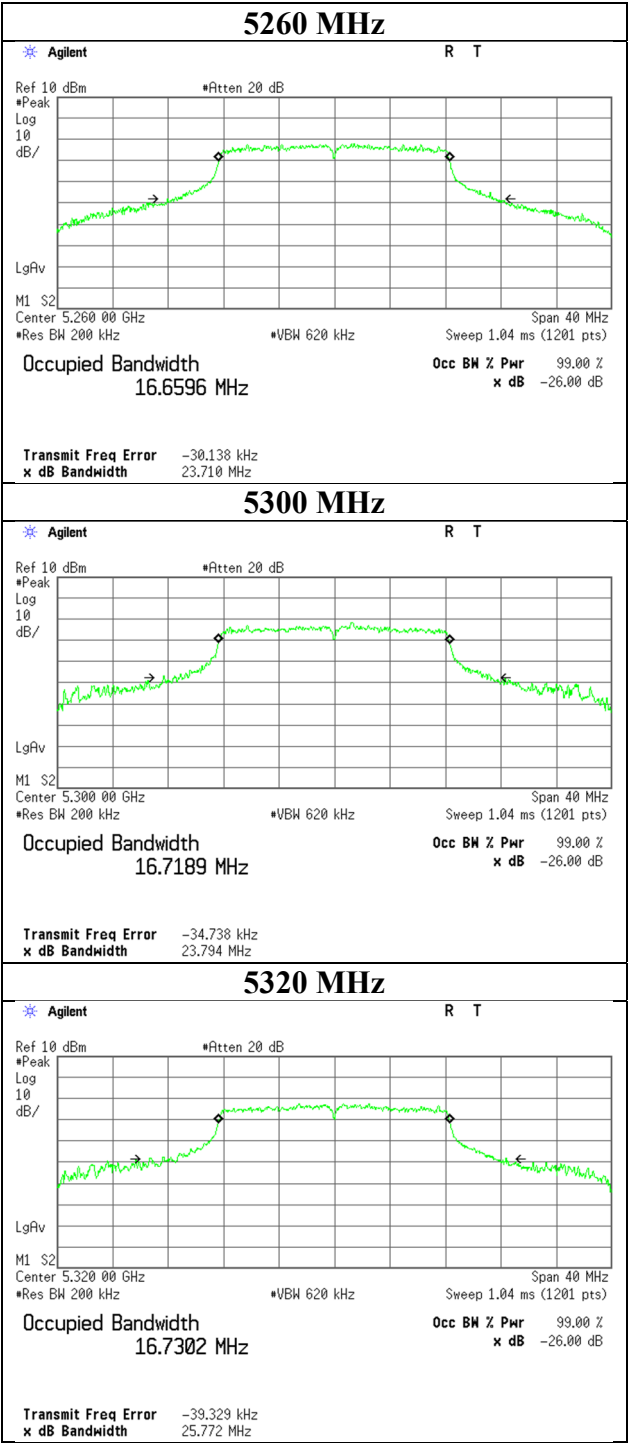
Test place Ise EMC Lab. No.8 Measurement Room
Date February 7, 2022
Temperature / Humidity 23 deg. C / 32 % RH
Engineer Junki Nagatomi
Mode Tx

11ax-80 (OFDMA)

Antenna	RU Type	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	996-tone RU	5210	-	76801.9
		5290	79.745	76547.5
		5530	80.130	76768.0
		5610	80.084	76801.6
		5690	79.820	76758.2
		5775	-	76970.9

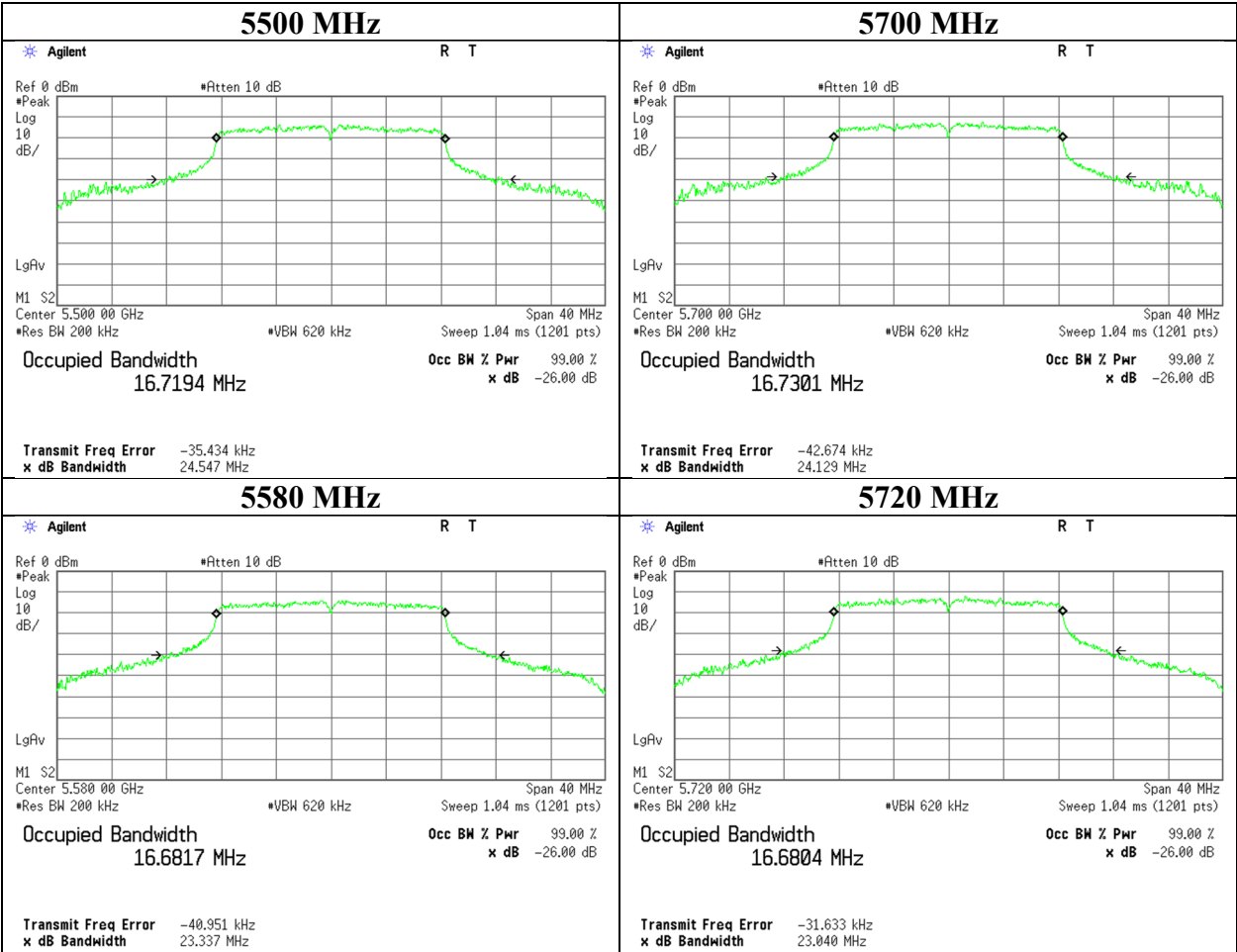
26 dB Emission Bandwidth

11a



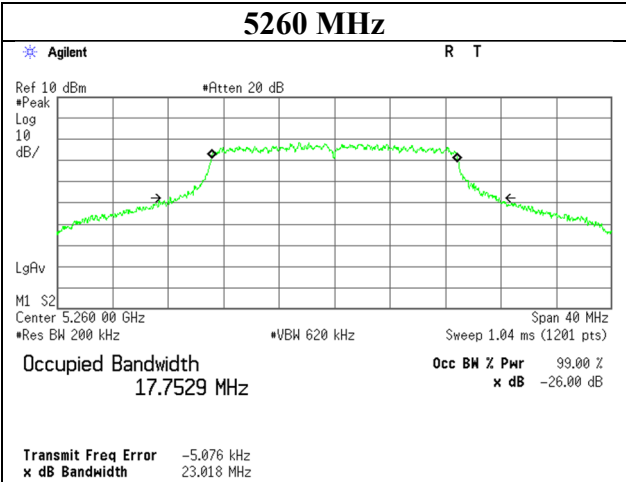
26 dB Emission Bandwidth

11a

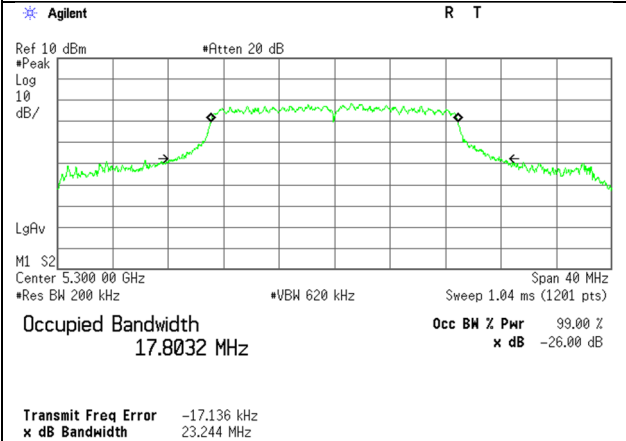


26 dB Emission Bandwidth

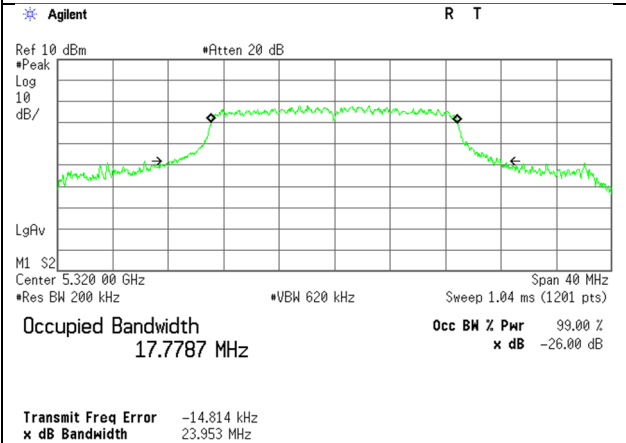
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5260 MHz



5300 MHz

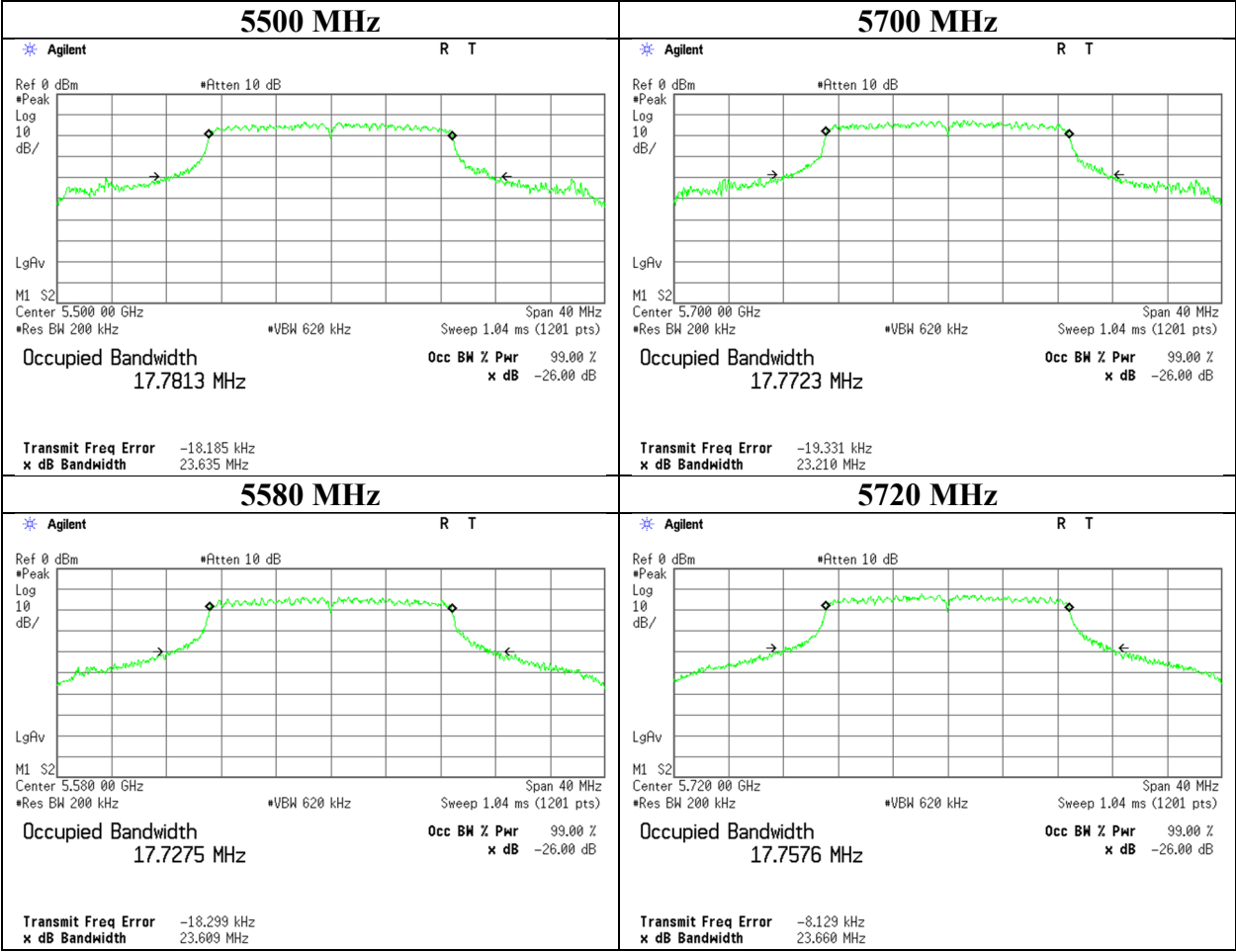


5320 MHz



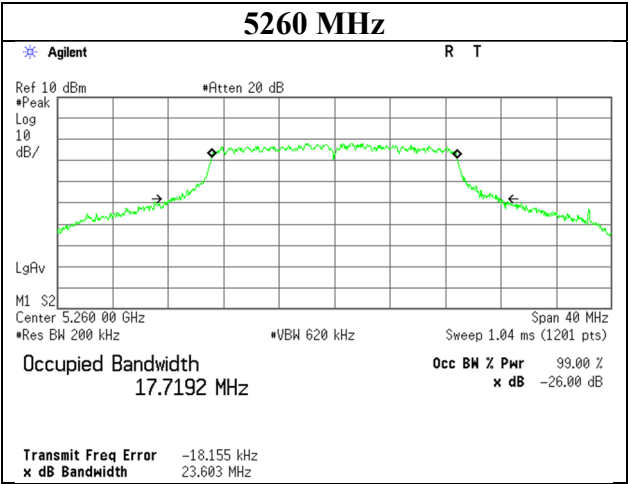
26 dB Emission Bandwidth

11n-20

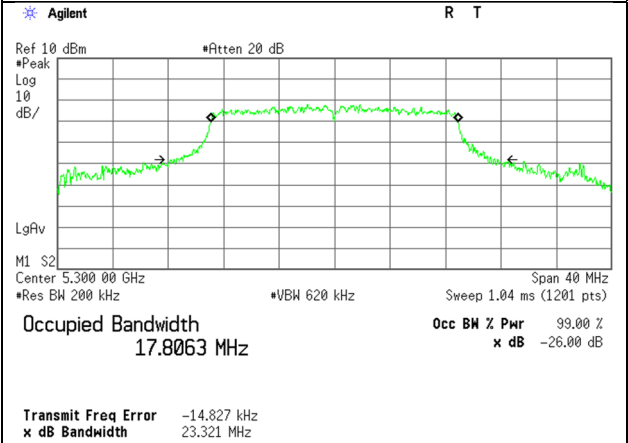


26 dB Emission Bandwidth

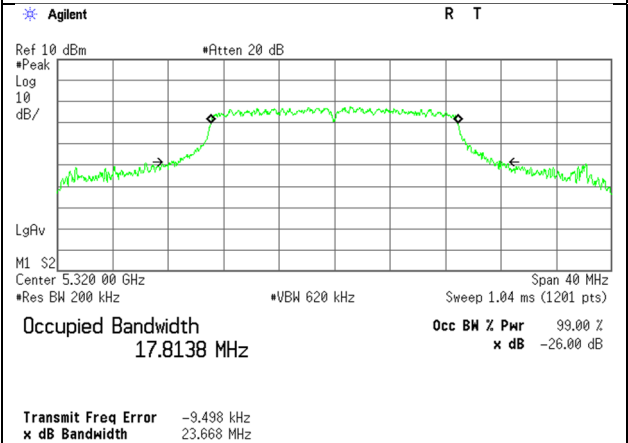
11ac-20
5260 MHz



5300 MHz

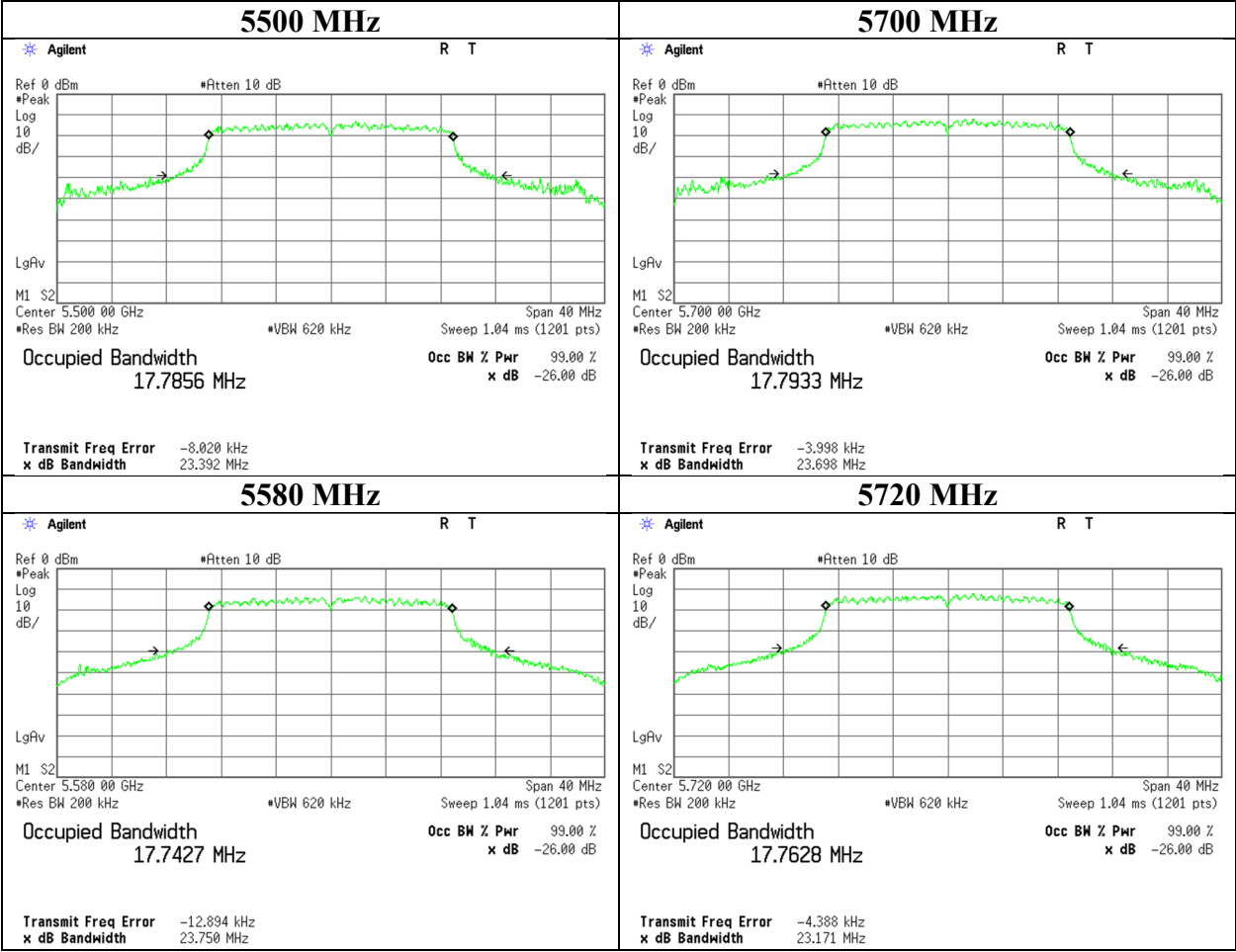


5320 MHz



26 dB Emission Bandwidth

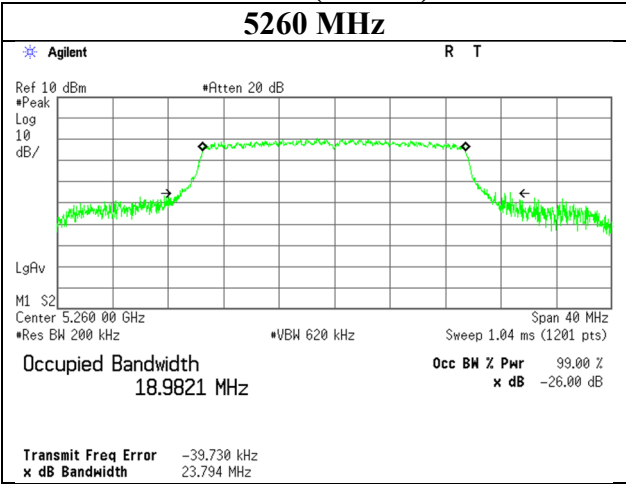
11ac-20



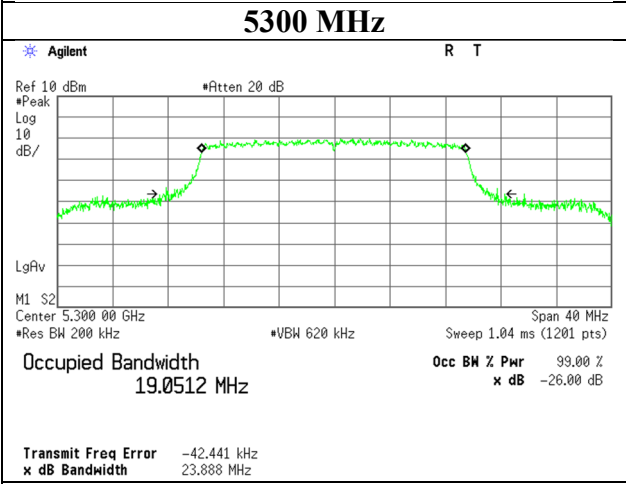
26 dB Emission Bandwidth

11ax-20 (OFDM)

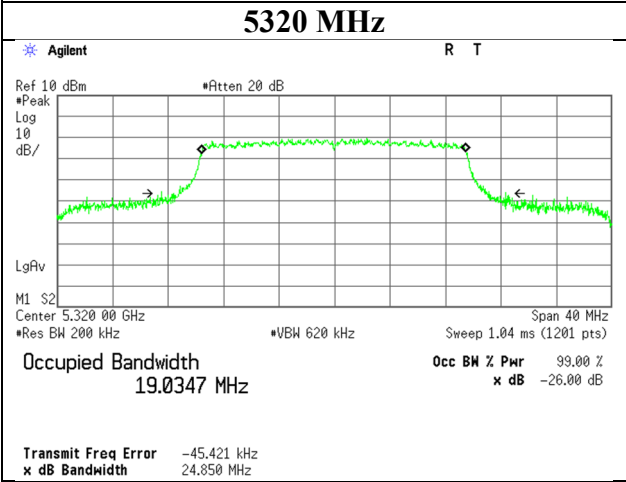
5260 MHz



5300 MHz

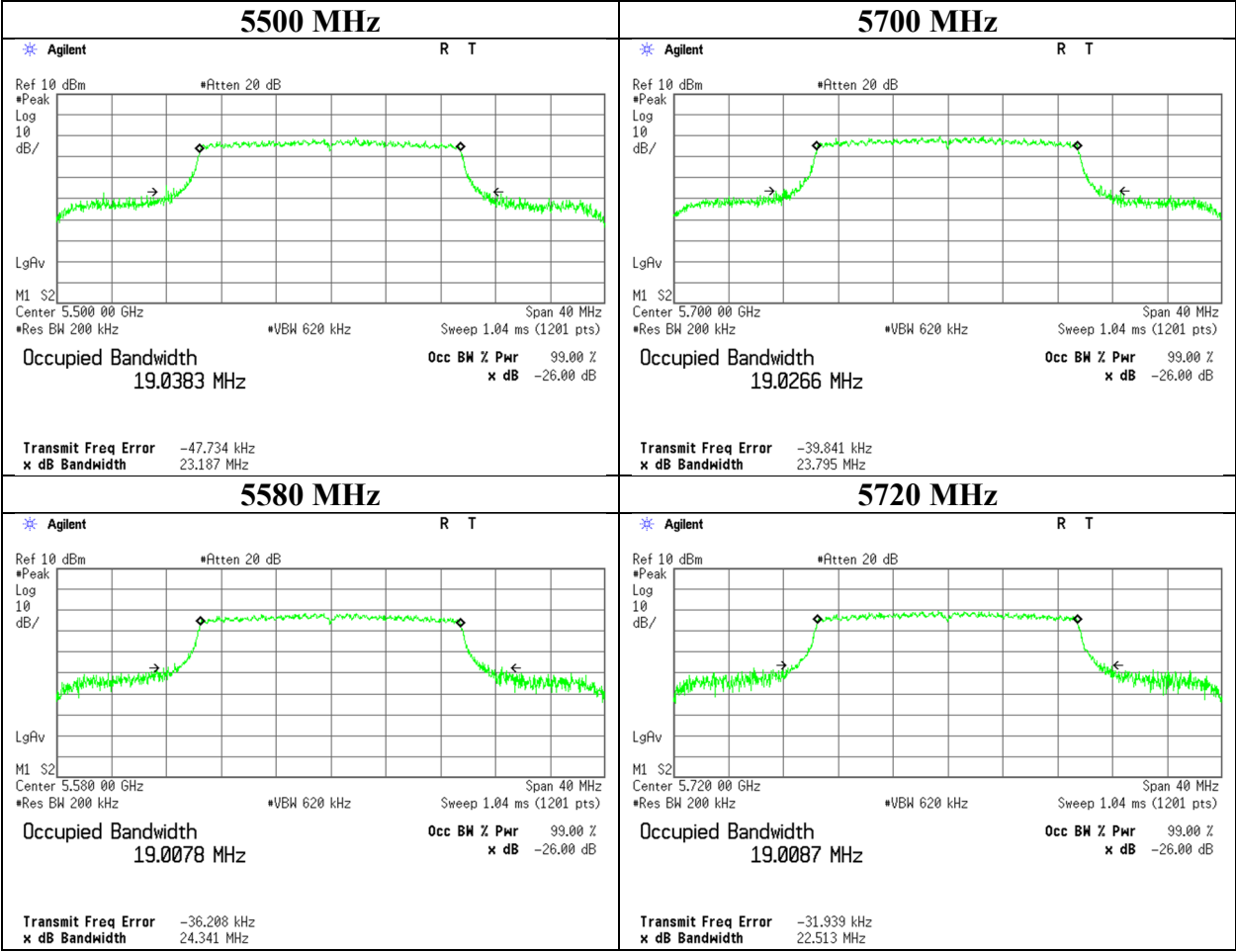


5320 MHz



26 dB Emission Bandwidth

11ax-20 (OFDM)

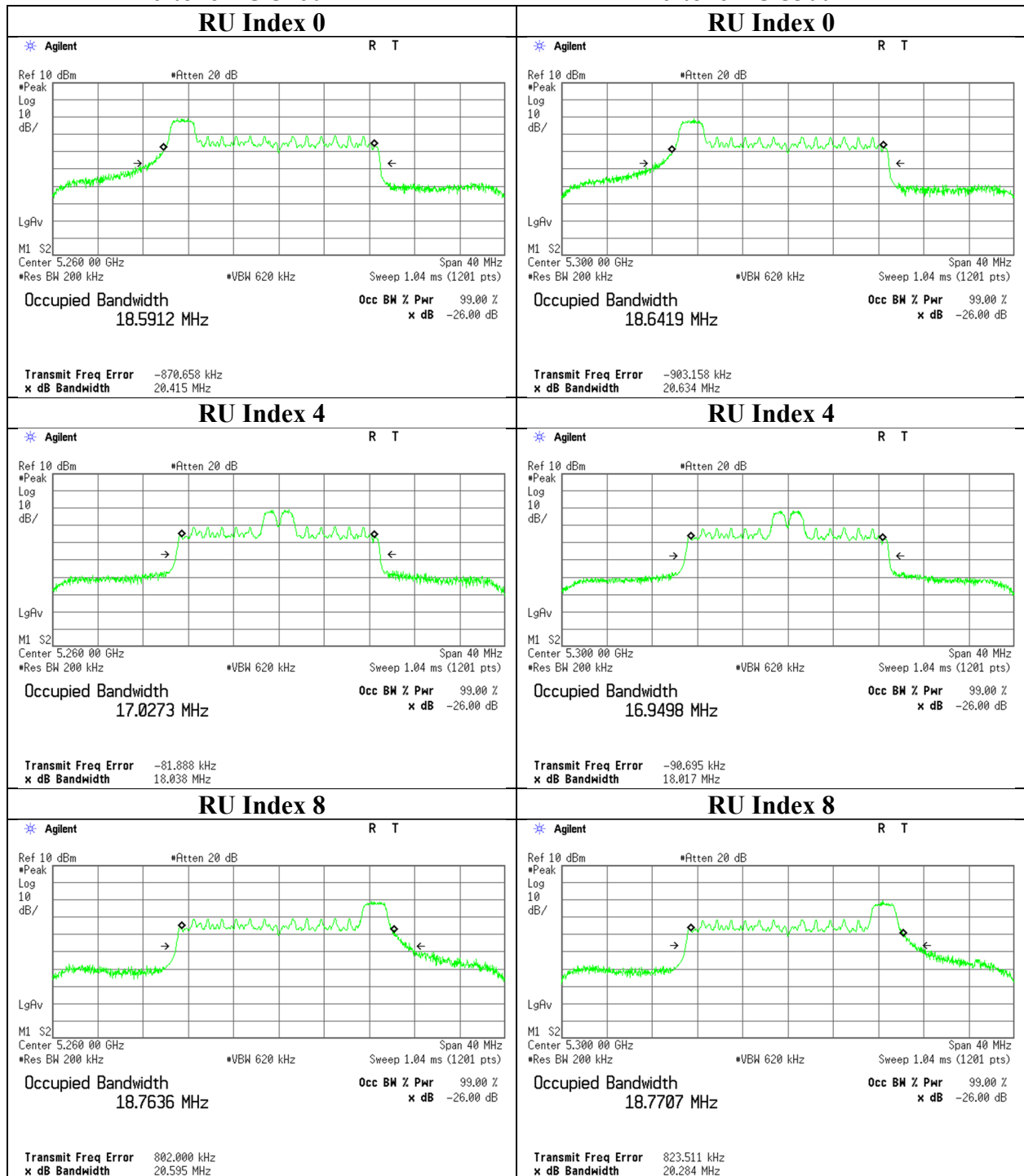


26 dB Emission Bandwidth

11ax-20 (OFDMA)

26-tone RU 5260 MHz

26-tone RU 5300 MHz

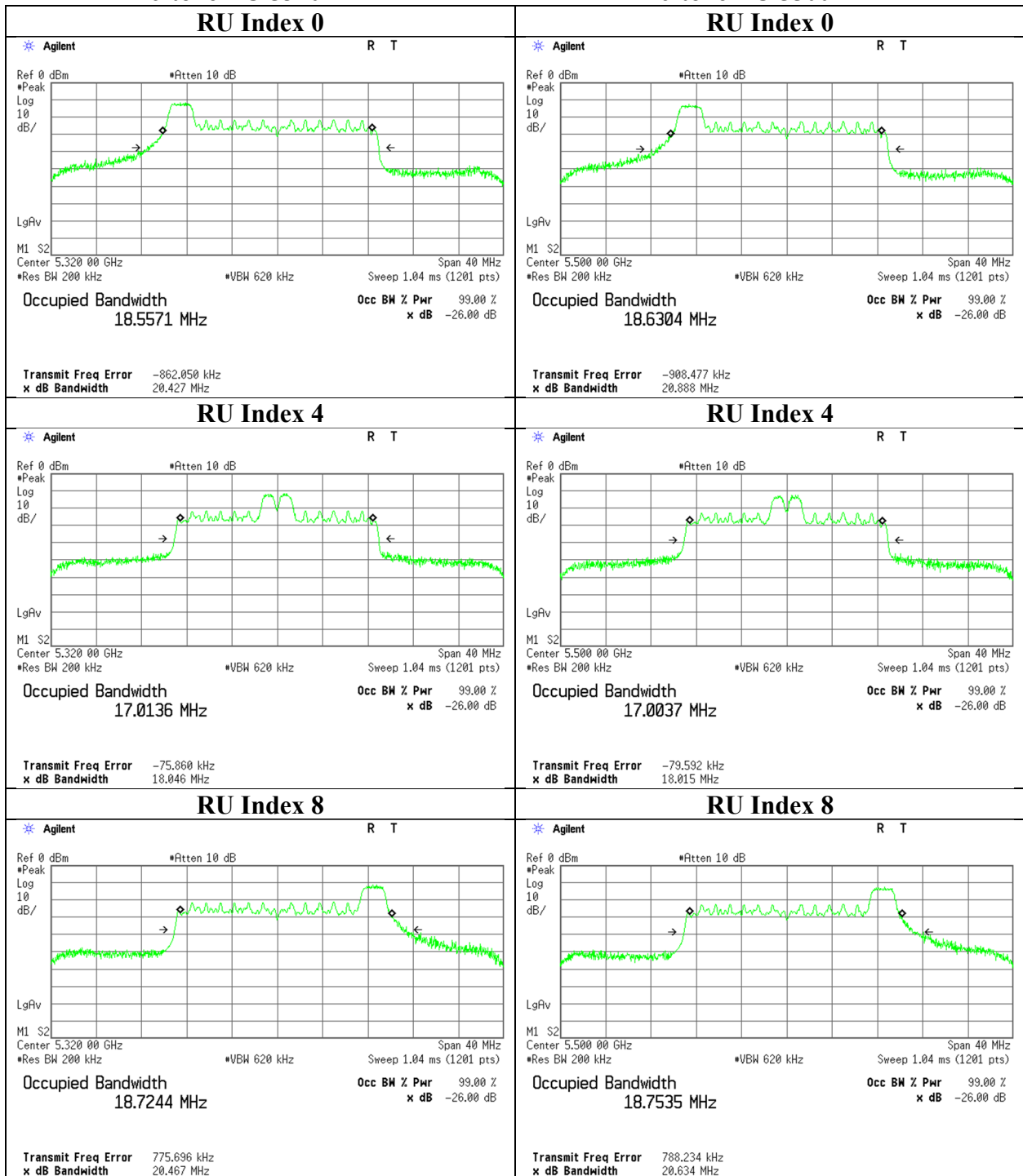


26 dB Emission Bandwidth

11ax-20 (OFDMA)

26-tone RU 5320 MHz

26-tone RU 5500 MHz

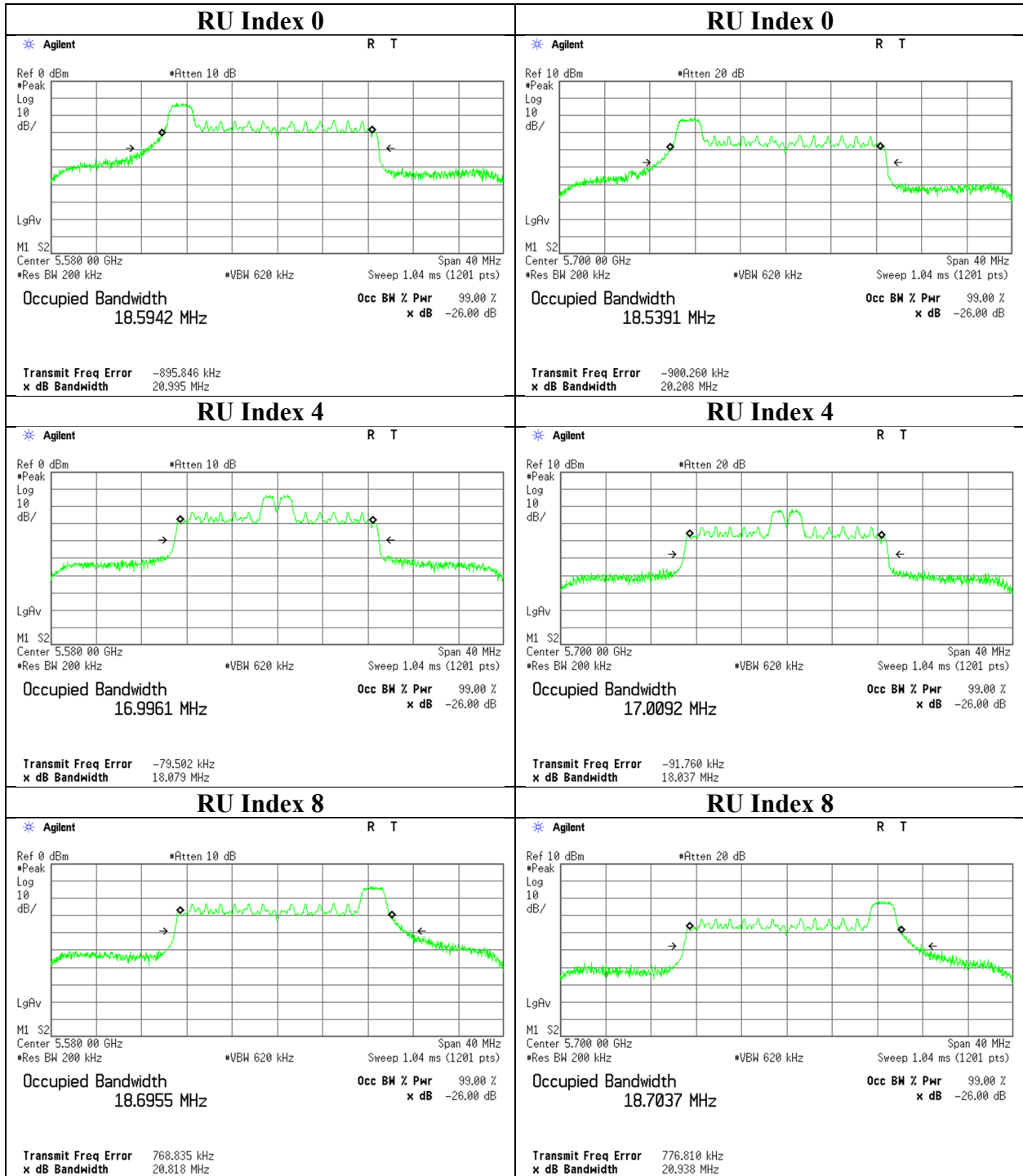


26 dB Emission Bandwidth

11ax-20 (OFDMA)

26-tone RU 5580 MHz

26-tone RU 5700 MHz



26 dB Emission Bandwidth

11ax-20 (OFDMA)
26-tone RU 5720 MHz

