



RADIO TEST REPORT

Test Report No. : 13671144H-C

Applicant : Sony Interactive Entertainment Inc.
Type of EUT : Wireless communication module
Model Number of EUT : AW-XM501
FCC ID : AK8M20DAL1
Test regulation : FCC Part 15 Subpart E: 2021
*WLAN (5 GHz band) part (Except for DFS test)
Test Result : Complied (Refer to SECTION 3)

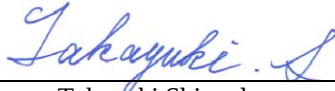
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8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in Section 1.

Date of test: January 14 to March 9, 2021

Representative test engineer:


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Takayuki Shimada
Leader
Consumer Technology Division



CERTIFICATE 5107.02

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☒ There is no testing item of "Non-accreditation".

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REVISION HISTORY

Original Test Report No.: 13671144H-C

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13671144H-C	March 23, 2021	-	-

Reference: Abbreviations (Including words undescribed in this report)

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

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SECTION 1: Customer information

Company Name	Sony Interactive Entertainment Inc.
Brand Name	SONY
Address	1-7-1 Konan, Minato-ku, Tokyo, 108-0075 Japan
Telephone Number	+81-50-3807-5639
Facsimile Number	+81-50-3807-9594
Contact Person	Miho Nakamura

***Remarks:**

Sony Interactive Entertainment Inc. designates AzureWave Technologies, Inc. as manufacturer of the product (Wireless communication module).

The information provided from the customer is as follows;

- Applicant, Type 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
- 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

Type	Wireless communication module
Model Number	AW-XM501
Serial Number	Refer to SECTION 4.2
Country of Manufacture	China
Receipt Date	January 12, 2021
Condition	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No modification by the test lab.

2.2 Product Description

Model: AW-XM501 (referred to as the EUT in this report) is a Wireless communication module.

Product Specification

Operating Temperature	-5 deg. C to 85 deg. C
Power Supply	DC 3.3 V, DC 1.8 V

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	IFA	
Antenna Gain: G_{ANT}	Antenna 1: 4.0 dBi Antenna 2: 3.5 dBi	
Directional Gain *1)	6.76 dBi	
Maximum clock frequency	320 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	IFA	PIFA
Antenna Gain: G_{ANT}	Antenna 1: 6.0 dBi	Antenna 3: 4.5 dBi
Directional Gain *1)	8.29 dBi	
Maximum clock frequency	512 MHz	

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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	128 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	128 MHz

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

*This test report applies to WLAN (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 January 12, 2021 and effective February 11, 2021

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

* The revision does not affect the test result conducted before its effective date.

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	14.39 dB 22.04420 MHz, Phase: L, AV	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	3.9 dB 617.243 MHz, Vertical, QP	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 No. 13-EM-W0420 and 13-EM-W0422.

*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.

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

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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

[Antenna 1 and 2] The antenna is not removable from the EUT.

[Antenna 3 and 4] 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 $k=2$.

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Conducted emission

using Item	Frequency range	Uncertainty (+/-)
AMN (LISN)	0.009 MHz to 0.15 MHz	3.4 dB
	0.15 MHz to 30 MHz	2.9 dB

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
		4.8 dB
	200 MHz to 1000 MHz (Horizontal)	5.0 dB
		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	5.5 dB
	26.5 GHz to 40 GHz	5.5 dB
0.5 m	26.5 GHz to 40 GHz	5.5 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 /	0.96 %
Maximum Conducted Output Power / Average Output Power	1.4 dB
Burst Rate	0.10 %
Maximum Power Spectral Density	2.6 dB
Spurious Emission (Conducted)	2.6 dB

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3.5 Test Location

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*A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 199967

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

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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.11 measurement room	6.2 x 4.7 x 3.0	4.8 x 4.6	-	-

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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SECTION 4: Operation of 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 settings: See the table below - Software: Dut labtool - Version: 1.0.0.110 (Date: January 13, 2021, 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.	

		5.2 GHz band			5.3 GHz band / 5.6 GHz band / 5.8 GHz band		
		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	-3.5	-6.5	-10	-2.0	-5.0	-8.0
	52-tone RU	-0.5	-3.5	-7	1.0	-2.0	-5.0
	106-tone RU	3	0	-4	4.5	1.0	-2.0
	242-tone RU	6.5	4	0	8.0	5.0	2.0
	484-tone RU	-	6.5	3.0	-	8.0	5.0
	996-tone RU	-	-	6.5	-	-	8.0

(dBm)

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*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)	11ax-20 OFDM Tx *1)	Antenna 1 + 3	-	-	5700 MHz	-
26 dB Emission Bandwidth	11a Tx 11n-20 Tx 11ac-20 Tx 11ax-20 OFDMA Tx 11ax-20 OFDM Tx	Antenna 3 *4)	-	5260 MHz 5300 MHz 5320 MHz	5500 MHz *5) 5520 MHz *6) 5580 MHz 5700 MHz 5720 MHz	-
	11n-40 Tx 11ac-40 Tx 11ax-40 OFDMA Tx 11ax-40 OFDM Tx		-	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	-
	11ac-80 Tx 11ax-80 OFDMA Tx 11ax-80 OFDM Tx		-	5290 MHz	5530 MHz 5610 MHz 5690 MHz	-
99 % Occupied Bandwidth	11a Tx 11n-20 Tx 11ac-20 Tx 11ax-20 OFDMA Tx 11ax-20 OFDM Tx	Antenna 3 *4)	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5300 MHz 5320 MHz	5500 MHz *5) 5520 MHz *6) 5580 MHz 5700 MHz 5720 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx 11ac-40 Tx 11ax-40 OFDMA Tx 11ax-40 OFDM Tx		5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	5755 MHz 5795 MHz
	11ac-80 Tx 11ax-80 OFDMA Tx 11ax-80 OFDM Tx		5210 MHz	5290 MHz	5530 MHz 5610 MHz 5690 MHz	5775 MHz
Maximum Conducted Output Power, Maximum Power Spectral Density	11a Tx 11n-20 Tx 11ac-20 Tx 11ax-20 OFDMA Tx 11ax-20 OFDM Tx	Antenna 1 Antenna 3 Antenna 1 + 3	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5300 MHz 5320 MHz	5500 MHz *5) 5520 MHz *6) 5580 MHz 5700 MHz 5720 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx 11ac-40 Tx 11ax-40 OFDMA Tx 11ax-40 OFDM Tx		5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	5755 MHz 5795 MHz
	11ac-80 Tx 11ax-80 OFDMA Tx 11ax-80 OFDM Tx		5210 MHz	5290 MHz	5530 MHz 5610 MHz 5690 MHz	5775 MHz

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*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	11a Tx	Antenna 3 *4)	-	-	-	5745 MHz
	11n-20 Tx		-	-	-	5785 MHz
	11ac-20 Tx		-	-	-	5825 MHz
	11ax-20 OFDMA Tx		-	-	-	-
	11ax-20 OFDM Tx		-	-	-	-
	11n-40 Tx		-	-	-	5755 MHz
	11ac-40 Tx		-	-	-	5795 MHz
	11ax-40 OFDMA Tx		-	-	-	-
	11ax-40 OFDM Tx		-	-	-	-
Radiated Spurious Emission (Above 1 GHz)	11ax-20 OFDMA Tx *2)	Antenna 1 + 3	5180 MHz	5260 MHz	5500 MHz	5745 MHz
	11ax-20 OFDM Tx *3)		-	5320 MHz	5580 MHz	5785 MHz
	-		-	-	5700 MHz	5825 MHz
	11ax-40 OFDMA Tx *2)		5190 MHz	5270 MHz	5510 MHz	5755 MHz
	11ax-40 OFDM Tx *3)		-	5310 MHz	5550 MHz	5795 MHz
	-		-	-	5670 MHz	-
	11ax-80 OFDMA Tx *2)		5210 MHz	5290 MHz	5530 MHz	5775 MHz
	11ax-80 OFDM Tx *3)		-	-	5610 MHz	-
	-		-	-	5700 MHz	-
Conducted Spurious Emission	11ax-20 OFDM Tx *1)	Antenna 1 + 3	-	-	-	-

*1) The mode was tested as a representative, because it had the highest power at antenna terminal test.
*2) OFDMA configuration tests were conducted only at the band edge since they had lower power and density than OFDM.
*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) After the comparison between Antenna 1 and Antenna 3, the test was performed with the antenna that had higher power as a representative.
*5) Only 11ax-20 OFDMA (26-tone RU), the test at 5500 MHz was excluded since the EUT didn't support the feature.
*6) Only 11ax-20 OFDMA (26-tone RU), the test at 5520 MHz was performed instead of 5500 MHz.

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 5530 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.

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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.

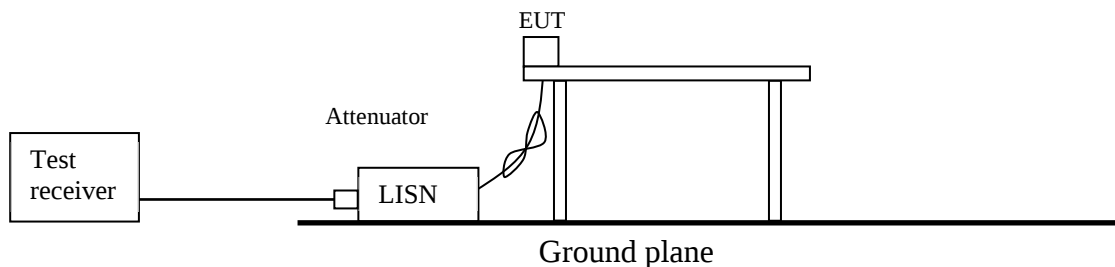
The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber. The EUT was connected to a LISN (AMN).

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 - 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 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 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:

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

Test Antennas are used as below;

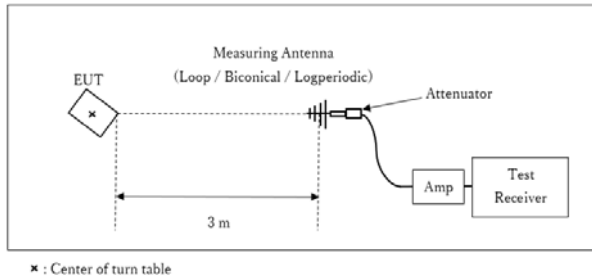
Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

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".

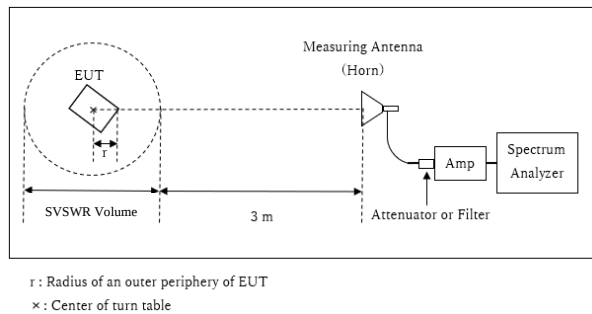
Figure 2: Test Setup

Below 1 GHz



Test Distance: 3 m

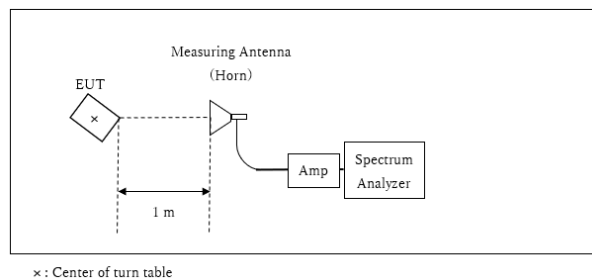
1 GHz - 10 GHz



Distance Factor: $20 \times \log (3.95 \text{ m} / 3.0 \text{ m}) = 2.39 \text{ dB}$
* Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.95 \text{ m}$

SVSWR Volume : 2.0 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
 $r = 0.05 \text{ m}$

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

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

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

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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 - 150 kHz 150 kHz - 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-5.850 GHz, but it is not possible with spectrum analyzer, so RBW Correction Factor ($10 \log(500 \text{ kHz} / 470 \text{ kHz})$) was added to the test result.

*3) In the frequency range below 30 MHz, RBW was narrowed to separate the noise contents.

Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart. (9 kHz-150 kHz: RBW = 200 Hz, 150 kHz-30 MHz: RBW = 9.1 kHz)

*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

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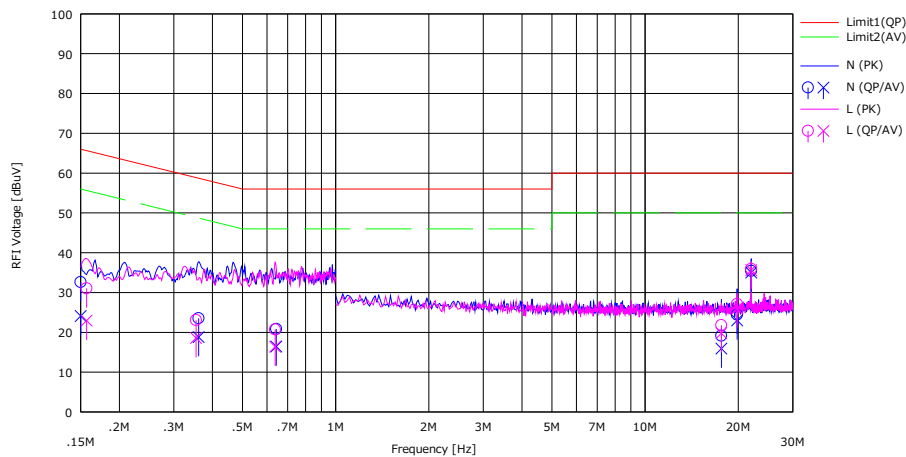
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APPENDIX 1: Test data

Conducted Emission

Report No. 13671144H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date February 5, 2021
Temperature / Humidity 24 deg. C / 32 % RH
Engineer Hiroki Numata
Mode Tx 11ax-20 5700MHz (OFDM)

Limit : FCC_Part 15 Subpart C(15.207)



No.	Freq. [MHz]	Reading		USN	LOSS	Results		Limit		Margin		Phase	Comment
		(QP) [dBuV]	(AV) [dBuV]			(QP) [dBuV]	(AV) [dBuV]	(QP) [dBuV]	(AV) [dBuV]	(QP) [dB]	(AV) [dB]		
1	0.15010	19.30	10.80	0.07	13.23	32.60	24.10	65.99	55.99	33.39	31.89	N	
2	0.36080	10.20	5.50	0.06	13.26	23.52	18.82	58.71	48.71	35.19	29.89	N	
3	0.64300	7.50	3.10	0.06	13.28	20.84	16.44	56.00	46.00	35.16	29.56	N	
4	17.64000	4.90	1.70	0.36	13.87	19.13	15.93	60.00	50.00	40.87	34.07	N	
5	19.84000	10.10	8.70	0.40	13.92	24.42	23.02	60.00	50.00	35.58	26.98	N	
6	22.04540	21.00	20.60	0.44	13.97	35.41	35.01	60.00	50.00	24.59	14.99	N	
7	0.15680	17.70	9.60	0.10	13.23	31.03	22.93	65.63	55.63	34.60	32.70	L	
8	0.35400	9.70	5.20	0.10	13.26	23.06	18.56	58.87	48.87	35.81	30.31	L	
9	0.63790	7.30	3.00	0.11	13.28	20.69	16.39	56.00	46.00	35.31	29.61	L	
10	17.63860	7.50	5.50	0.43	13.87	21.80	19.80	60.00	50.00	38.20	30.20	L	
11	19.84240	12.70	11.60	0.48	13.92	27.10	26.00	60.00	50.00	32.90	24.00	L	
12	22.04420	21.40	21.10	0.54	13.97	35.91	35.61	60.00	50.00	24.09	14.39	L	

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.

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26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No. 13671144H
Test place Ise EMC Lab. No.8 Measurement Room
Date January 22, 2021
Temperature / Humidity 23 deg. C / 45 % RH
Engineer Junya Okuno
Mode Tx

11a

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5180	-	16875.5
	5220	-	16874.9
	5240	-	16902.4
	5260	19.705	16892.4
	5300	19.820	16930.8
	5320	19.771	16897.7
	5500	19.787	16919.6
	5580	19.672	16918.1
	5700	19.732	16879.4
	5720	19.738	16887.4
	5745	-	16921.2
	5785	-	16875.0
	5825	-	16898.3

11n-20

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5180	-	17859.8
	5220	-	17833.6
	5240	-	17830.4
	5260	20.030	17838.3
	5300	20.078	17837.6
	5320	20.119	17802.2
	5500	20.006	17848.8
	5580	20.126	17851.9
	5700	20.028	17838.7
	5720	20.247	17855.0
	5745	-	17813.4
	5785	-	17876.0
	5825	-	17829.1

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No.	13671144H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	January 22, 2021
Temperature / Humidity	23 deg. C / 45 % RH
Engineer	Junya Okuno
Mode	Tx

11ac-20

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5180	-	17866.8
	5220	-	17824.3
	5240	-	17856.7
	5260	20.161	17833.9
	5300	20.065	17845.8
	5320	20.164	17845.6
	5500	20.258	17822.5
	5580	20.034	17835.7
	5700	20.090	17829.2
	5720	20.067	17863.0
	5745	-	17821.4
	5785	-	17847.5
	5825	-	17865.2

11ax-20 (OFDM)

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5180	-	18840.5
	5220	-	18849.0
	5240	-	18856.9
	5260	20.314	18802.5
	5300	20.165	18811.3
	5320	20.529	18851.4
	5500	20.350	18825.8
	5580	20.513	18859.4
	5700	20.401	18850.8
	5720	20.425	18839.0
	5745	-	18841.8
	5785	-	18850.2
	5825	-	18850.9

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No. 13671144H
Test place Ise EMC Lab. No.8 Measurement Room
Date February 1, 2021
Temperature / Humidity 21 deg. C / 40 % RH
Engineer Hiroyuki Furutaka
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	-	18214.4
			4	-	16919.0
			8	-	18314.2
		5220	0	-	18203.3
			4	-	16940.9
			8	-	18309.4
		5240	0	-	18198.9
			4	-	16938.9
			8	-	18362.1
		5260	0	19.169	18204.0
			4	18.151	16942.2
			8	19.374	18332.1
		5300	0	19.188	18195.6
			4	18.158	16945.5
			8	19.373	18302.1
		5320	0	19.212	18188.0
			4	18.157	16936.6
			8	19.326	18335.3
		5520	0	19.225	18204.2
			4	18.122	16932.3
			8	19.327	18304.2
		5580	0	19.224	18199.4
			4	18.128	16938.2
			8	19.396	18321.9
		5700	0	19.207	18184.0
			4	18.146	16943.3
			8	19.408	18344.5
		5720	0	19.280	18206.6
			4	18.118	16928.8
			8	19.381	18349.2
		5745	0	-	18192.0
			4	-	16927.9
			8	-	18331.4
		5785	0	-	18178.7
			4	-	16945.6
			8	-	18324.4
		5825	0	-	18178.4
			4	-	16930.0
			8	-	18358.3

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No. 13671144H
Test place Ise EMC Lab. No.8 Measurement Room
Date February 1, 2021
Temperature / Humidity 21 deg. C / 40 % RH
Engineer Hiroyuki Furutaka
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	-	18095.2
			38	-	16895.3
			40	-	18169.7
		5220	37	-	18094.5
			38	-	16914.1
			40	-	18170.4
		5240	37	-	18135.6
			38	-	16903.6
			40	-	18169.0
		5260	37	19.353	18091.8
			38	18.273	16886.3
			40	19.422	18163.2
		5300	37	19.344	18084.4
			38	18.241	16896.9
			40	19.500	18175.8
		5320	37	19.316	18086.6
			38	18.281	16883.4
			40	19.510	18184.2
		5500	37	19.319	18085.8
			38	18.249	16886.6
			40	19.520	18161.4
		5580	37	19.252	18097.1
			38	18.278	16878.4
			40	19.407	18160.0
		5700	37	19.298	18100.6
			38	18.225	16886.6
			40	19.503	18174.0
		5720	37	19.338	18079.6
			38	18.303	16897.4
			40	19.437	18185.9
		5745	37	-	18086.4
			38	-	16911.0
			40	-	18256.3
		5785	37	-	18085.6
			38	-	16902.5
			40	-	18195.9
		5825	37	-	18065.7
			38	-	16900.8
			40	-	18208.5

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26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No. 13671144H
Test place Ise EMC Lab. No.8 Measurement Room
Date February 2, 2021
Temperature / Humidity 22 deg. C / 38 % RH
Engineer Hiroyuki Furutaka
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	-	18022.5
			54	-	18092.7
		5220	53	-	18024.8
			54	-	18098.3
		5240	53	-	18016.2
			54	-	18103.7
		5260	53	19.421	18013.2
			54	19.705	18097.3
		5300	53	19.398	18010.7
			54	19.699	18106.9
		5320	53	19.469	18024.2
			54	19.675	18110.6
		5500	53	19.363	18020.8
			54	19.651	18093.9
		5580	53	19.419	18017.5
			54	19.682	18097.9
		5700	53	19.430	18012.8
			54	19.685	18103.3
		5720	53	19.375	18011.4
			54	19.703	18112.8
		5745	53	-	18011.3
			54	-	18094.4
		5785	53	-	18019.9
			54	-	18103.8
		5825	53	-	17994.4
			54	-	18120.0

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No. 13671144H
Test place Ise EMC Lab. No.8 Measurement Room
Date February 3, 2021
Temperature / Humidity 22 deg. C / 38 % RH
Engineer Hiroyuki Furutaka
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	-	18856.1
		5220	-	18825.1
		5240	-	18808.6
		5260	20.232	18860.3
		5300	20.420	18830.4
		5320	20.216	18836.9
		5500	20.456	18881.0
		5580	20.543	18842.9
		5700	20.175	18825.5
		5720	20.283	18851.7
		5745	-	18853.4
		5785	-	18843.8
		5825	-	18822.9

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No. 13671144H
Test place Ise EMC Lab. No.8 Measurement Room
Date January 23, 2021
Temperature / Humidity 23 deg. C / 47 % RH
Engineer Junya Okuno
Mode Tx

11n-40

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5190	-	36480.7
	5230	-	36400.2
	5270	40.267	36357.9
	5310	40.185	36419.2
	5510	40.450	36379.6
	5550	40.435	36434.0
	5670	40.400	36359.2
	5710	40.082	36417.6
	5755	-	36393.3
	5795	-	36379.6

11ac-40

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5190	-	36304.7
	5230	-	36379.6
	5270	40.317	36318.9
	5310	40.621	36432.3
	5510	40.101	36371.4
	5550	40.439	36288.1
	5670	40.573	36423.2
	5710	40.085	36426.4
	5755	-	36398.9
	5795	-	36415.4

11ax-40 (OFDM)

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5190	-	37583.3
	5230	-	37595.1
	5270	40.290	37549.4
	5310	40.377	37522.4
	5510	40.144	37605.8
	5550	39.991	37636.4
	5670	40.091	37531.8
	5710	40.415	37563.3
	5755	-	37572.0
	5795	-	37572.8

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No. 13671144H
Test place Ise EMC Lab. No.8 Measurement Room
Date February 3, 2021
Temperature / Humidity 22 deg. C / 38 % RH
Engineer Hiroyuki Furutaka
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	-	18621.3
			8	-	23757.5
			17	-	18741.5
		5230	0	-	18588.1
			8	-	23849.5
			17	-	18715.2
		5270	0	19.886	18609.0
			8	24.049	23699.8
			17	19.826	18749.3
		5310	0	19.821	18548.3
			8	23.884	23691.8
			17	19.821	18760.5
		5510	0	19.895	18621.3
			8	24.267	23827.3
			17	19.869	18733.4
		5550	0	19.820	18586.6
			8	24.391	23835.0
			17	19.742	18770.9
		5670	0	19.811	18557.5
			8	24.189	23701.1
			17	19.831	18840.5
		5710	0	19.871	18543.1
			8	23.867	23719.5
			17	19.834	18865.4
		5755	0	-	18605.0
			8	-	23675.1
			17	-	18774.5
		5795	0	-	18561.2
			8	-	23496.6
			17	-	18812.2

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26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No. 13671144H
Test place Ise EMC Lab. No.8 Measurement Room
Date February 3, 2021
Temperature / Humidity 22 deg. C / 38 % RH
Engineer Hiroyuki Furutaka
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	-	18262.3
			40	-	22438.0
			44	-	18322.2
		5230	37	-	18274.0
			40	-	22344.5
			44	-	18322.5
		5270	37	19.910	18251.6
			40	24.708	22478.5
			44	19.857	18335.6
		5310	37	19.911	18230.5
			40	24.808	22175.5
			44	19.885	18367.8
		5510	37	19.918	18242.6
			40	25.002	22548.0
			44	19.796	18317.0
		5550	37	19.814	18260.9
			40	25.106	22409.6
			44	19.825	18331.3
		5670	37	19.948	18227.3
			40	24.354	22296.2
			44	19.842	18388.5
		5710	37	19.992	18222.1
			40	24.691	22375.6
			44	19.841	18372.6
		5755	37	-	18229.2
			40	-	22428.8
			44	-	18375.4
		5795	37	-	18230.8
			40	-	22166.5
			44	-	18391.2

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26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No.	13671144H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 4, 2021
Temperature / Humidity	21 deg. C / 40 % RH
Engineer	Hiroyuki Furutaka
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	-	18154.0
			54	-	22048.9
			56	-	18183.9
		5230	53	-	18156.9
			54	-	21734.0
			56	-	18244.4
		5270	53	20.300	18103.5
			54	26.363	21935.6
			56	20.599	18272.2
		5310	53	20.272	18116.7
			54	26.279	21775.8
			56	20.367	18234.9
		5510	53	20.284	18181.2
			54	27.097	22012.3
			56	20.668	18207.3
		5550	53	20.351	18159.4
			54	26.377	22034.2
			56	20.662	18243.0
		5670	53	20.213	18083.9
			54	26.505	21883.4
			56	20.591	18265.7
		5710	53	20.188	18114.9
			54	25.433	21849.9
			56	20.808	18280.9
		5755	53	-	18112.7
			54	-	21817.4
			56	-	18233.1
		5795	53	-	18104.4
			54	-	21808.9
			56	-	18276.8

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26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No.	13671144H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 4, 2021
Temperature / Humidity	21 deg. C / 40 % RH
Engineer	Hiroyuki Furutaka
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	-	20916.9
			62	-	20666.4
		5230	61	-	21187.3
			62	-	20754.4
		5270	61	29.249	20950.8
			62	27.590	20766.3
		5310	61	28.052	20966.0
			62	27.340	20883.2
		5510	61	30.001	21198.3
			62	28.960	20696.8
		5550	61	29.539	21177.6
			62	27.409	20713.3
		5670	61	28.708	21094.2
			62	28.259	20825.6
		5710	61	27.924	20679.4
			62	27.368	20895.4
		5755	61	-	20717.9
			62	-	20853.6
		5795	61	-	20941.6
			62	-	21176.8

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No. 13671144H
Test place Ise EMC Lab. No.8 Measurement Room
Date February 5, 2021
Temperature / Humidity 20 deg. C / 41 % RH
Engineer Hiroyuki Furutaka
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	-	37591.0
		5230	-	37571.5
		5270	40.084	37645.8
		5310	40.604	37655.9
		5510	40.641	37543.4
		5550	40.294	37587.5
		5670	40.450	37558.0
		5710	40.834	37621.5
		5755	-	37621.9
		5795	-	37563.4

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No. 13671144H
Test place Ise EMC Lab. No.8 Measurement Room
Date January 23, 2021
Temperature / Humidity 23 deg. C / 47 % RH
Engineer Junya Okuno
Mode Tx

11ac-80

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5210	-	76135.2
	5290	81.291	76089.2
	5530	81.278	76157.9
	5610	81.296	76217.8
	5690	81.593	76340.2
	5775	-	76188.1

11ax-80 (OFDM)

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	5210	-	77619.0
	5290	80.499	77701.7
	5530	80.400	77646.8
	5610	80.604	77761.9
	5690	80.481	77806.9
	5775	-	77676.6

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No.	13671144H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 5, 2021
Temperature / Humidity	20 deg. C / 41 % RH
Engineer	Hiroyuki Furutaka
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	-	79077.8
			18	-	39889.5
			36	-	78913.8
		5290	0	80.155	78994.7
			18	39.618	39924.2
			36	80.217	79113.3
		5530	0	80.280	79138.5
			18	39.568	40083.4
			36	80.186	79019.2
		5610	0	80.250	79146.2
			18	39.585	39974.1
			36	80.218	79136.1
		5690	0	79.947	78924.6
			18	39.607	40131.0
			36	80.224	79275.5
		5775	0	-	78886.0
			18	-	40178.1
			36	-	79214.3

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26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No.	13671144H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 5, 2021
Temperature / Humidity	20 deg. C / 41 % RH
Engineer	Hiroyuki Furutaka
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	-	78525.8
			44	-	33203.6
			52	-	77966.4
		5290	37	80.208	78312.4
			44	26.939	32192.4
			52	80.301	78313.5
		5530	37	80.359	78590.8
			44	26.874	33337.9
			52	80.231	78073.0
		5610	37	80.333	78462.7
			44	26.580	33164.0
			52	80.274	78170.1
		5690	37	80.280	78246.4
			44	26.936	25881.9
			52	80.293	78441.8
		5775	37	-	78120.7
			44	-	25579.4
			52	-	78460.4

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No.	13671144H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 5, 2021
Temperature / Humidity	20 deg. C / 41 % RH
Engineer	Hiroyuki Furutaka
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	-	77763.7
			56	-	32343.7
			60	-	76987.0
		5290	53	80.250	77518.8
			56	31.628	25158.8
			60	80.222	77538.8
		5530	53	80.438	77791.8
			56	31.656	32875.2
			60	80.284	77050.4
		5610	53	80.370	77632.8
			56	29.693	32497.4
			60	80.234	77338.9
		5690	53	80.267	77300.9
			56	31.492	31058.5
			60	80.317	77623.2
		5775	53	-	77027.2
			56	-	24439.7
			60	-	77764.8

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No.	13671144H
Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 5, 2021
Temperature / Humidity	20 deg. C / 41 % RH
Engineer	Hiroyuki Furutaka
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	-	75776.0
			62	-	49050.3
			64	-	73611.0
		5290	61	80.367	74392.0
			62	78.936	45928.1
			64	80.302	75065.7
		5530	61	80.348	75755.5
			62	79.273	49502.7
			64	80.259	73207.5
		5610	61	80.330	75128.8
			62	79.082	48784.2
			64	80.242	73986.7
		5690	61	80.164	74196.5
			62	78.980	47308.8
			64	80.181	75487.2
		5775	61	-	73076.6
			62	-	46388.2
			64	-	75324.4

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26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No. 13671144H
Test place Ise EMC Lab. No.8 Measurement Room
Date February 5, 2021
Temperature / Humidity 20 deg. C / 41 % RH
Engineer Hiroyuki Furutaka
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	-	72168.6
			66	-	69081.4
		5290	65	80.204	69679.3
			66	80.355	71546.9
		5530	65	80.351	72211.1
			66	80.394	68746.2
		5610	65	80.361	71712.3
			66	80.369	69522.8
		5690	65	80.203	69717.3
			66	80.398	71645.0
		5775	65	-	68698.0
			66	-	73121.8

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

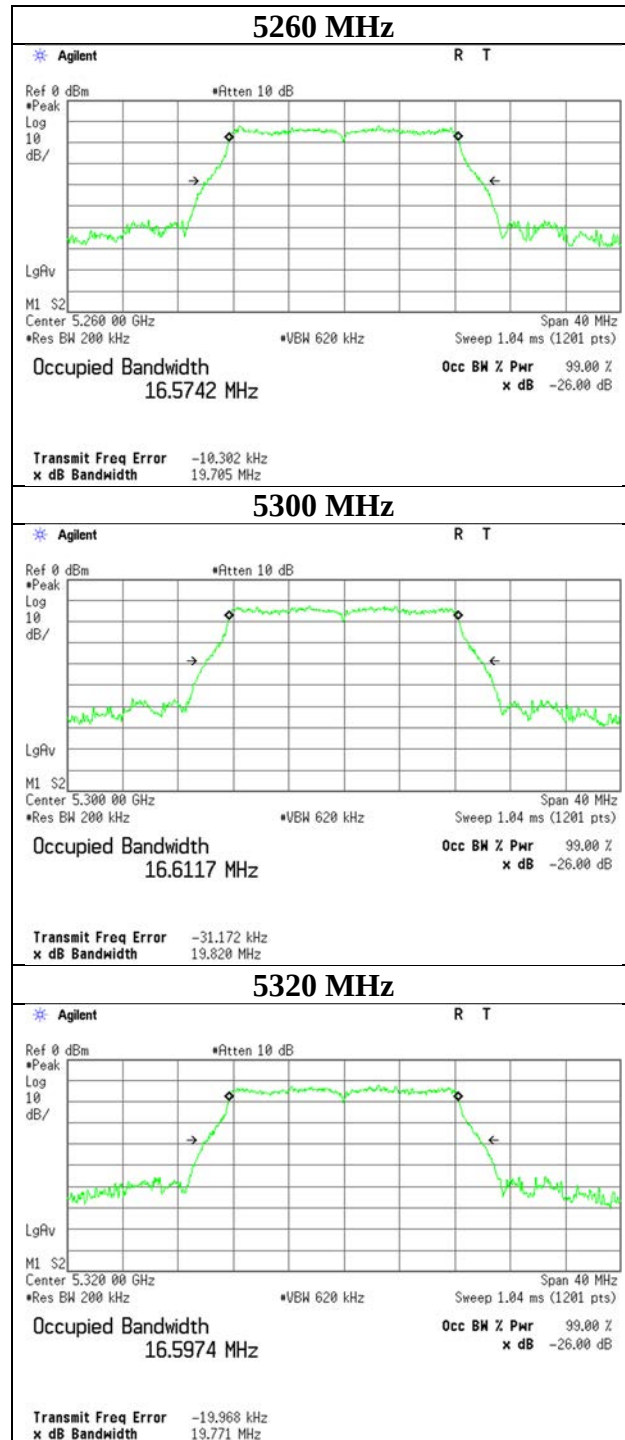
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Test place Ise EMC Lab. No.8 Measurement Room
Date February 5, 2021
Temperature / Humidity 20 deg. C / 41 % RH
Engineer Hiroyuki Furutaka
Mode Tx

11ax-80 (OFDMA)

Antenna	RU Type	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Antenna 3	996-tone RU	5210	-	77750.6
		5290	80.632	77761.7
		5530	80.735	77785.3
		5610	80.698	77798.7
		5690	80.732	77775.4
		5775	-	77692.7

26 dB Emission Bandwidth

11a



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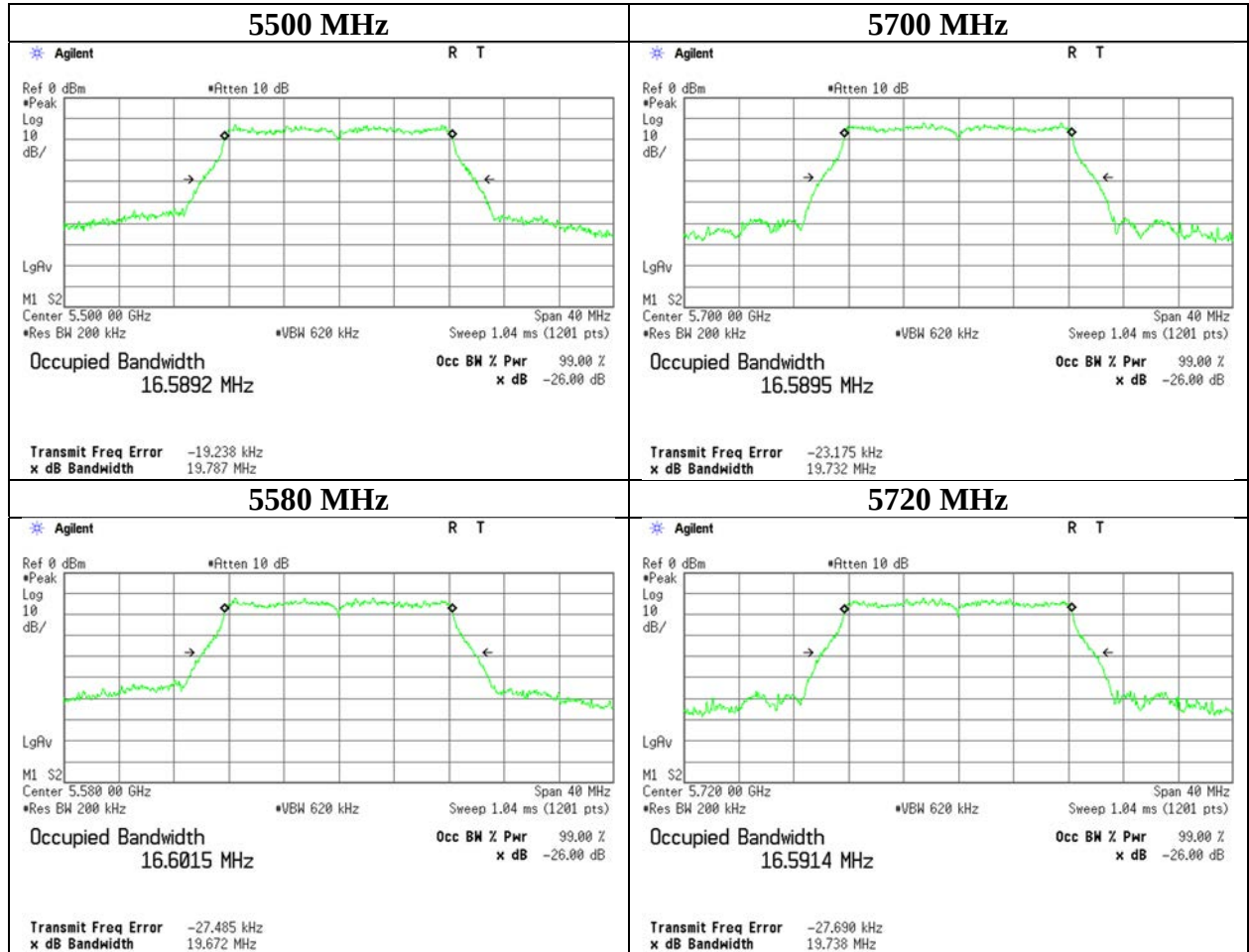
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26 dB Emission Bandwidth

11a



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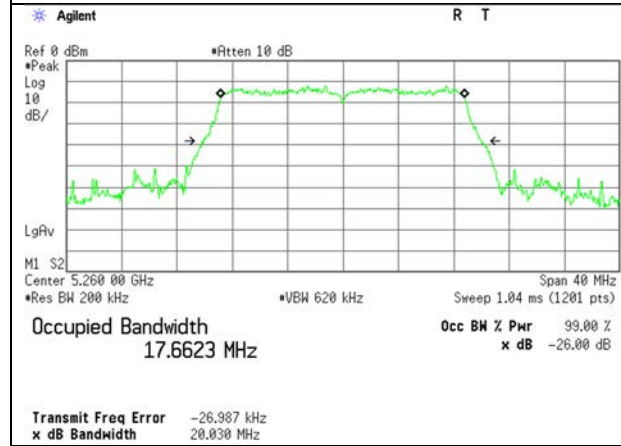
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Facsimile : +81 596 24 8124

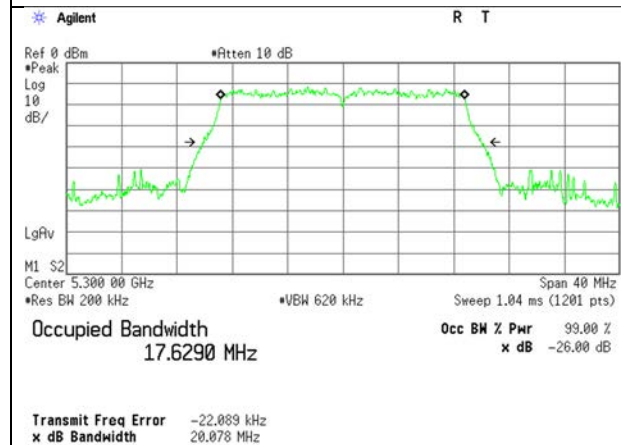
26 dB Emission Bandwidth

11n-20

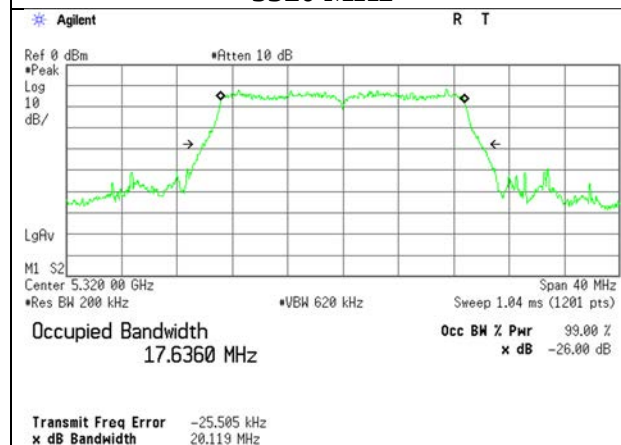
5260 MHz



5300 MHz



5320 MHz



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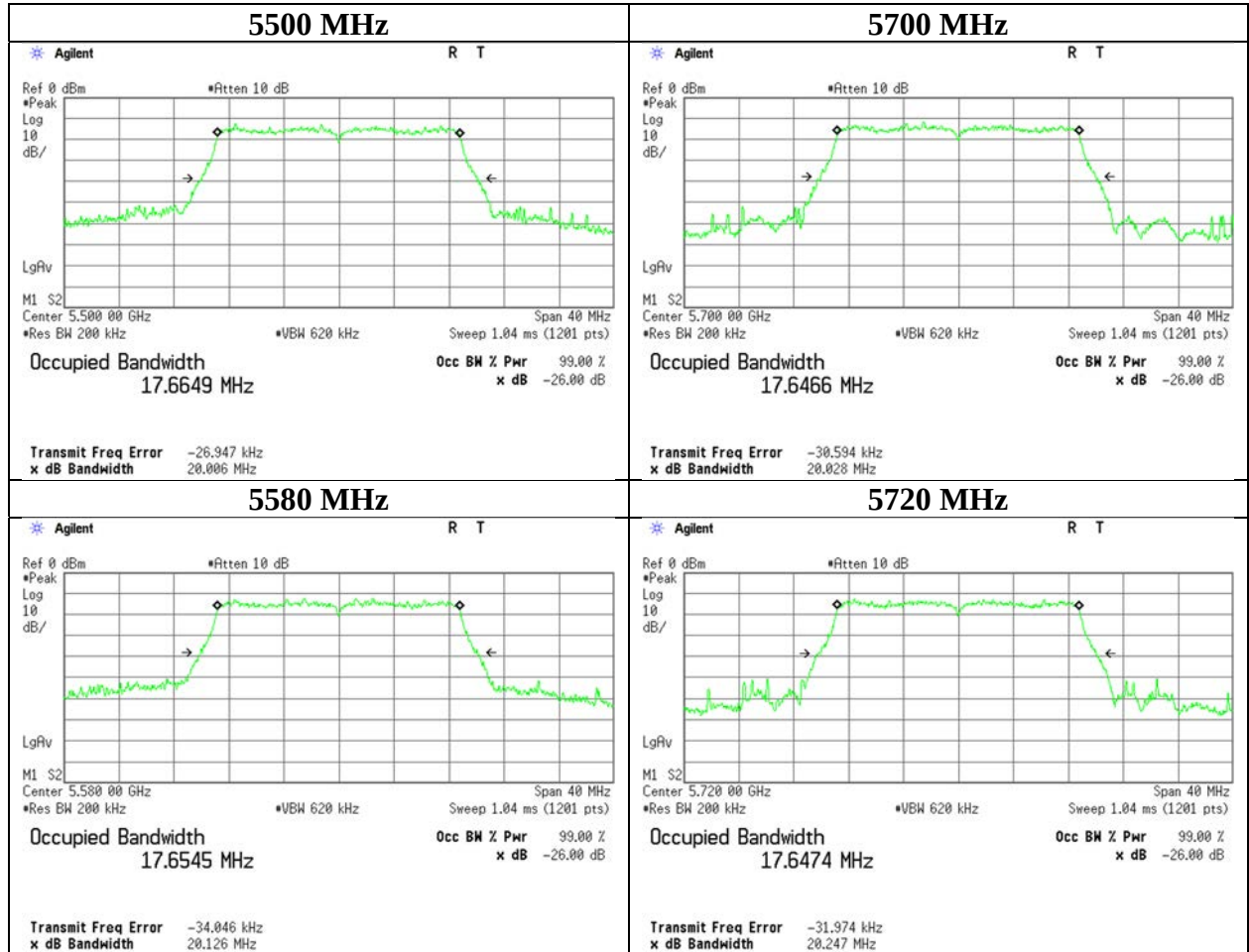
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26 dB Emission Bandwidth

11n-20



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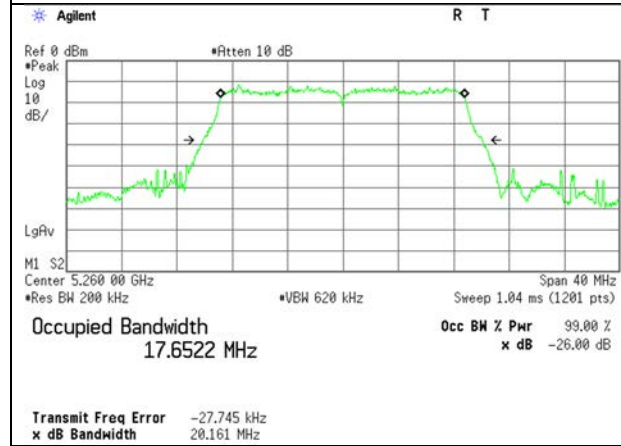
Telephone : +81 596 24 8999

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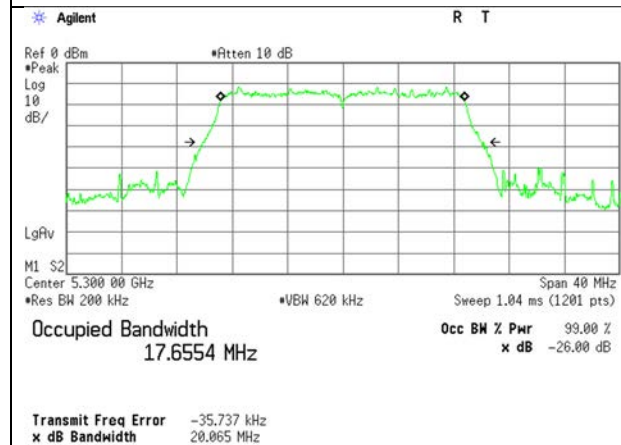
26 dB Emission Bandwidth

11ac-20

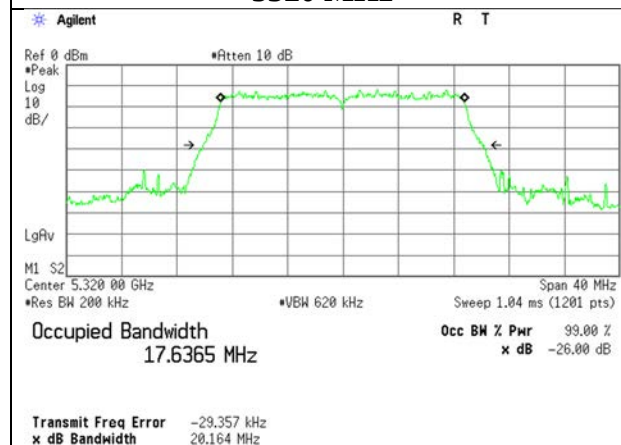
5260 MHz



5300 MHz



5320 MHz



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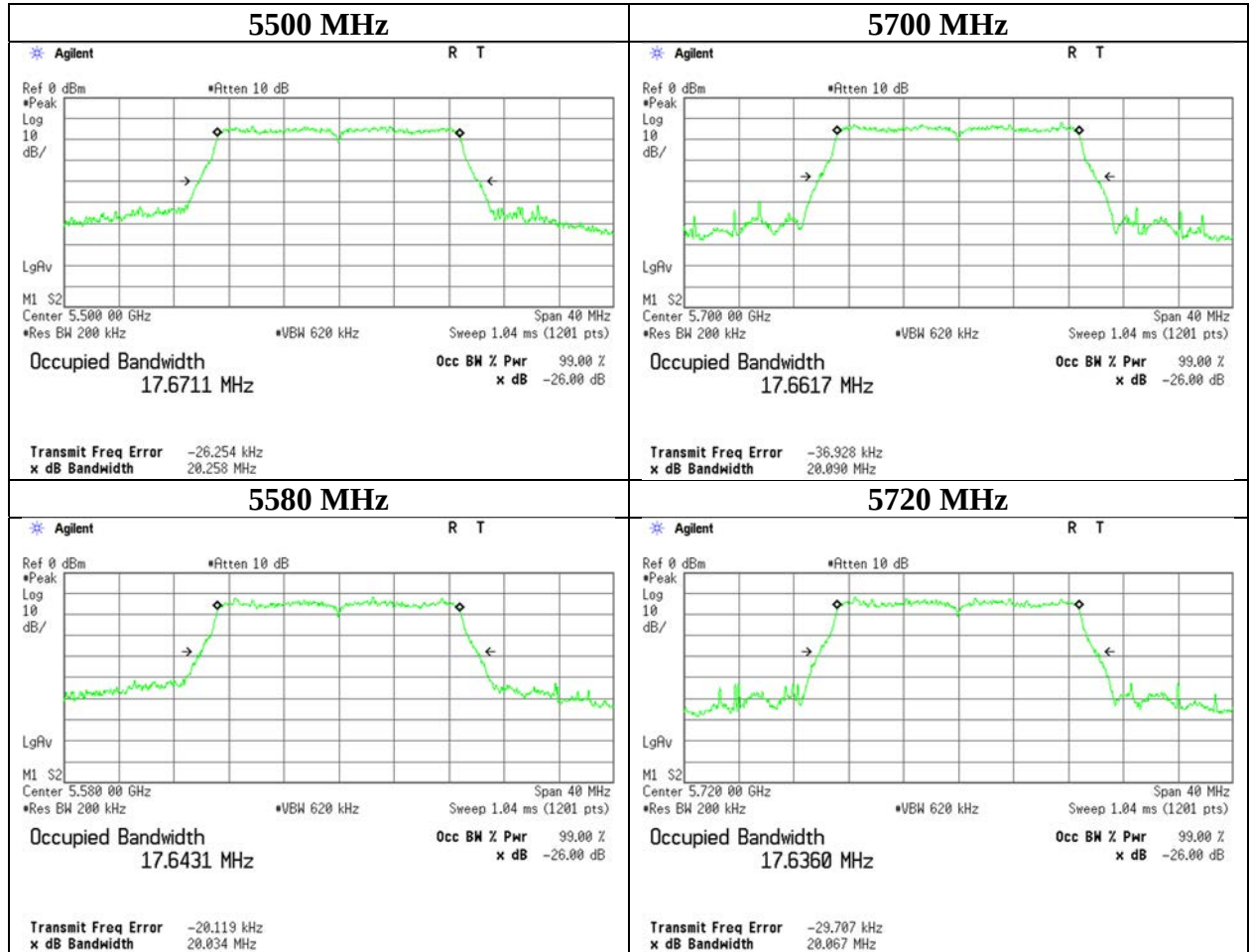
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26 dB Emission Bandwidth

11ac-20



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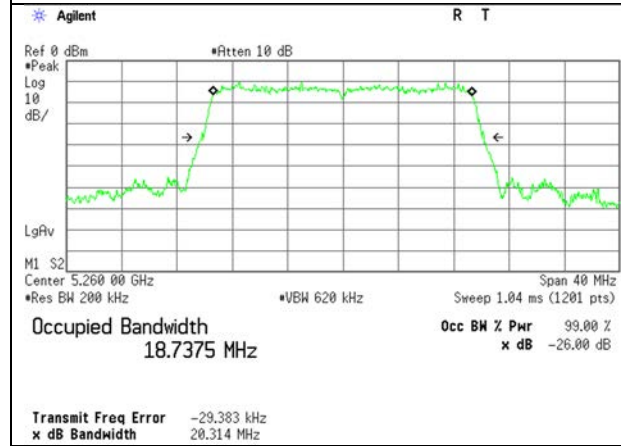
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

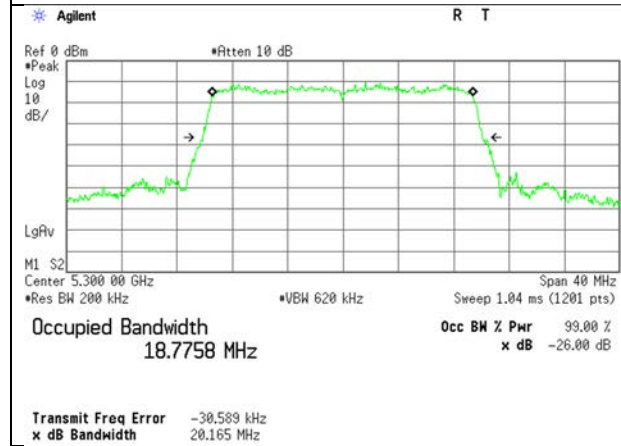
26 dB Emission Bandwidth

11ax-20 (OFDM)

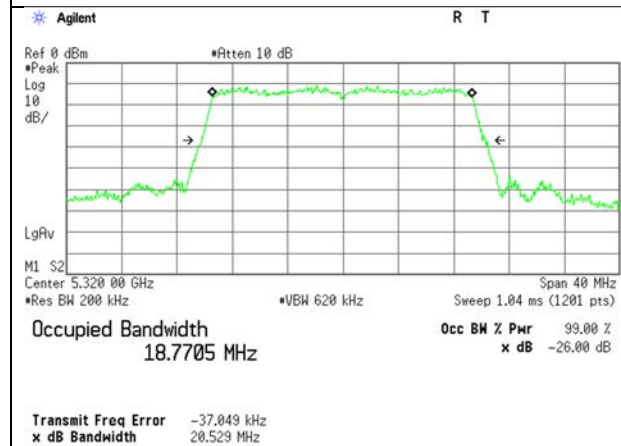
5260 MHz



5300 MHz



5320 MHz



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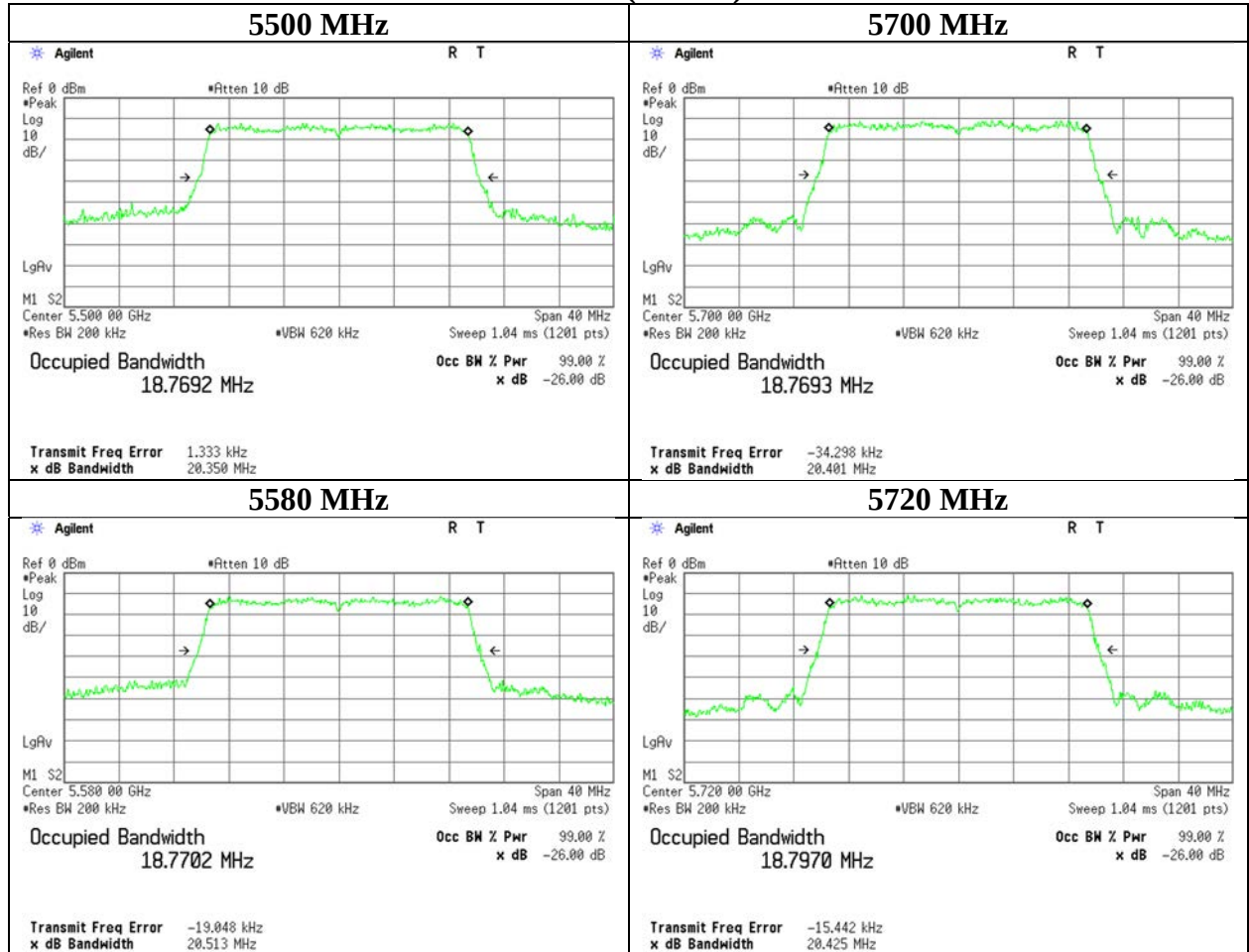
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26 dB Emission Bandwidth

11ax-20 (OFDM)



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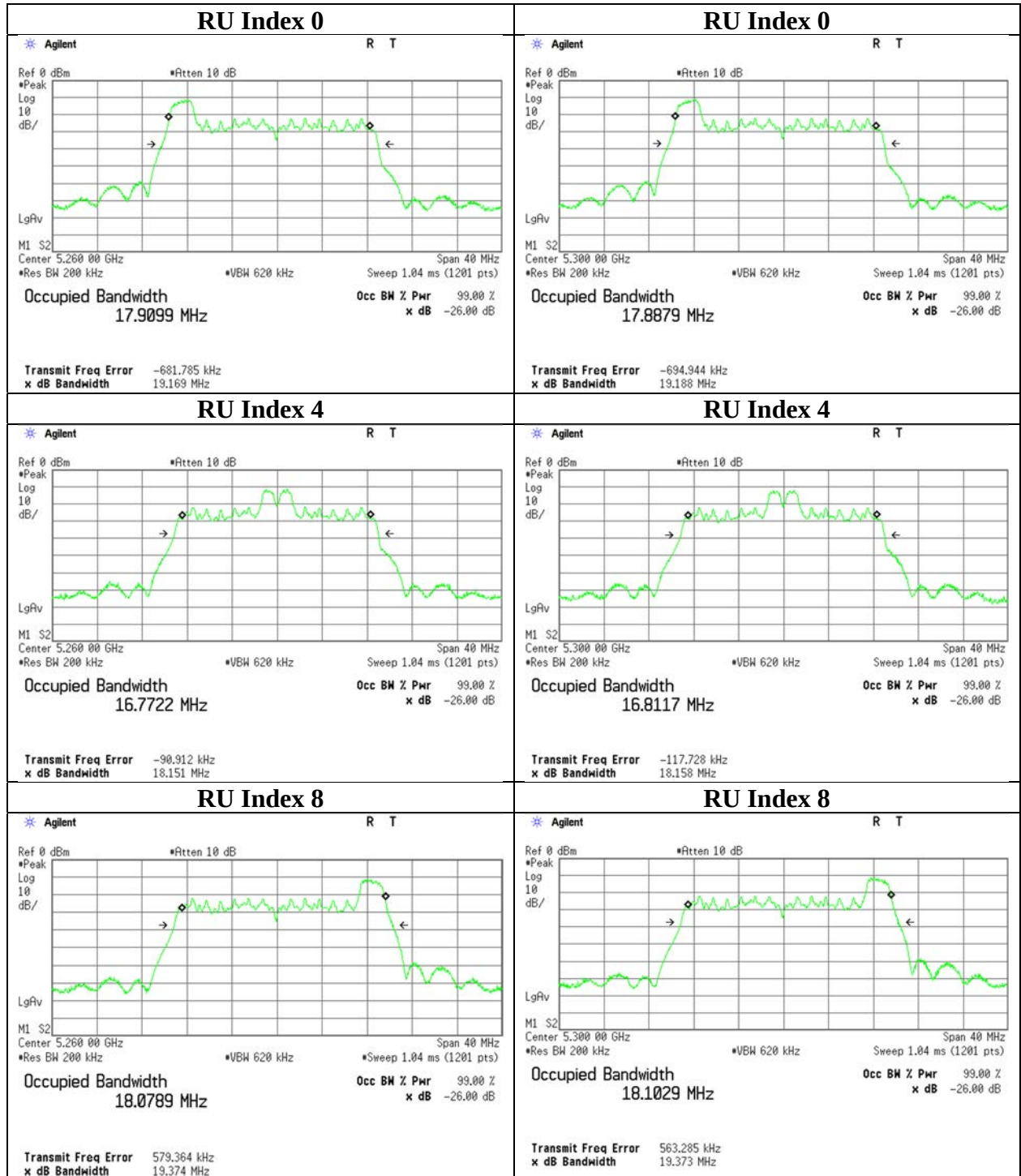
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26 dB Emission Bandwidth

11ax-20 (OFDMA)

26-tone RU 5260 MHz

26-tone RU 5300 MHz



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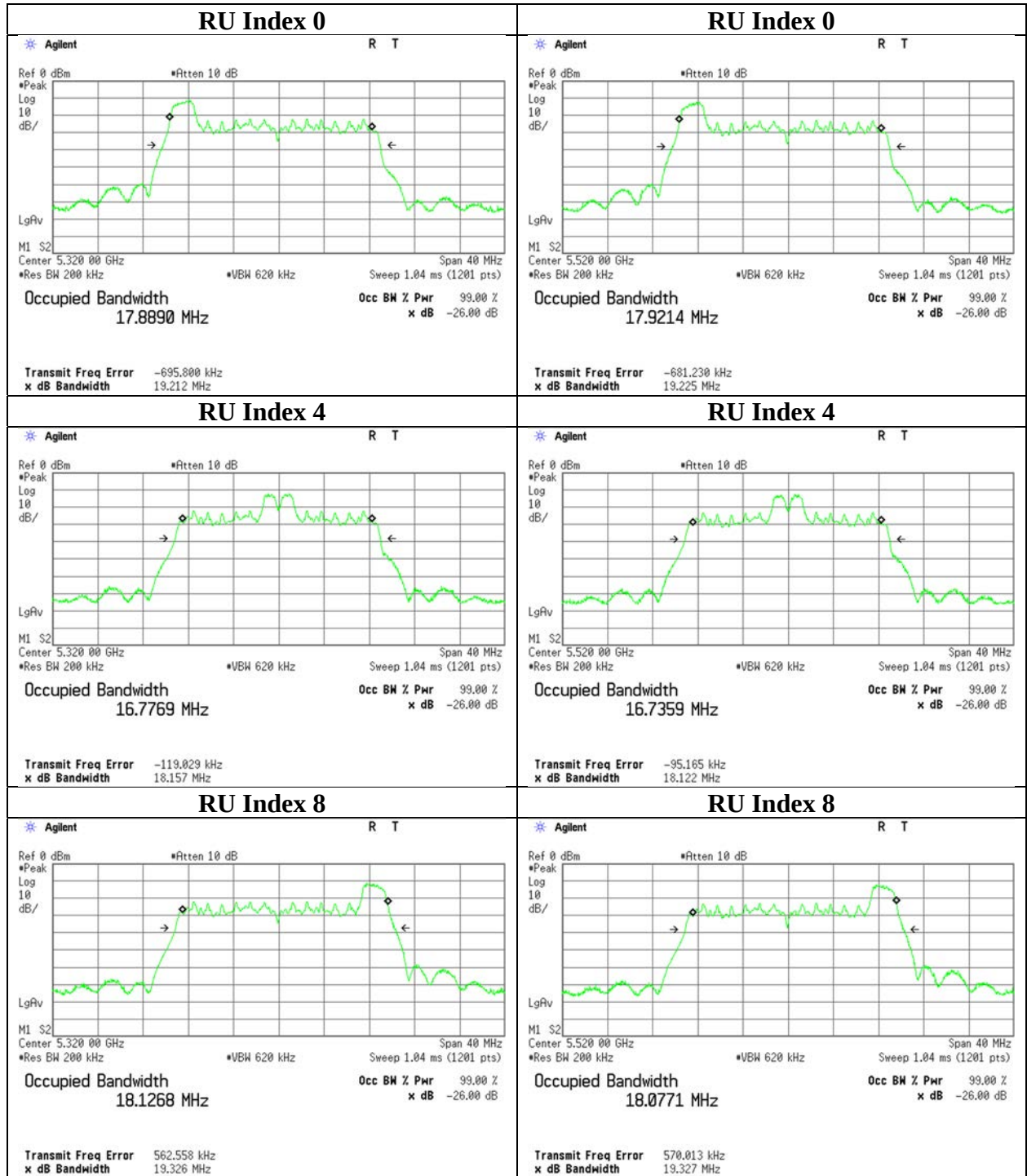
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26 dB Emission Bandwidth

11ax-20 (OFDMA)

26-tone RU 5320 MHz

26-tone RU 5520 MHz

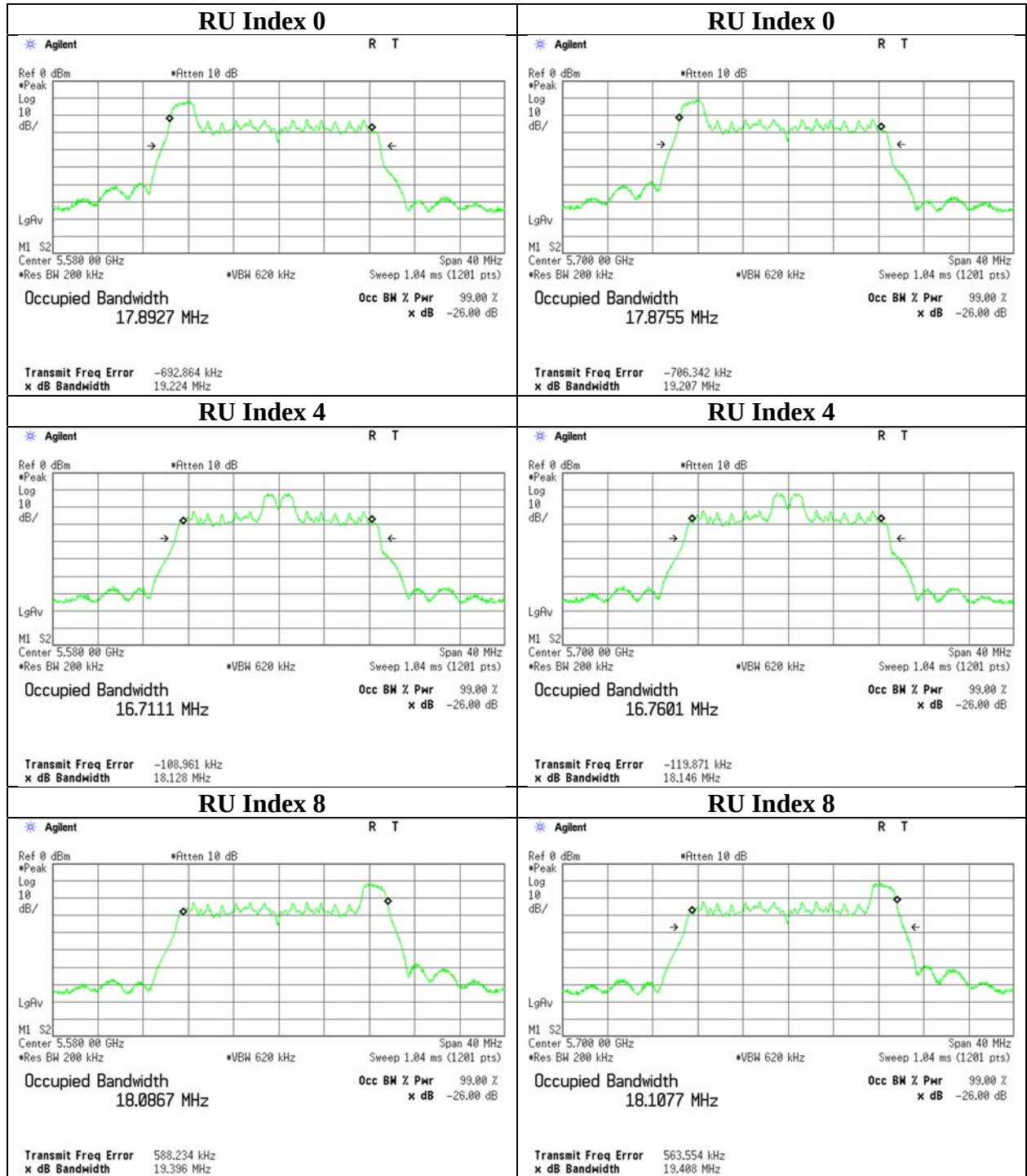


26 dB Emission Bandwidth

11ax-20 (OFDMA)

26-tone RU 5580 MHz

26-tone RU 5700 MHz



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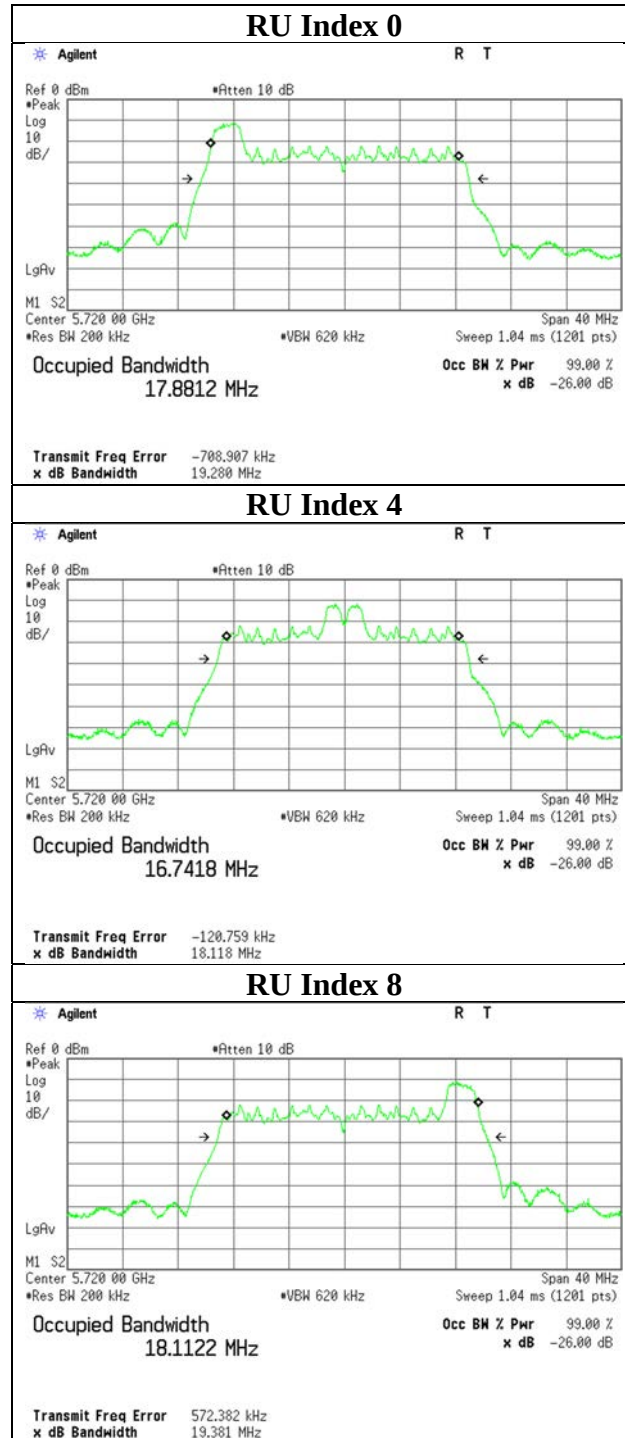
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26 dB Emission Bandwidth

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



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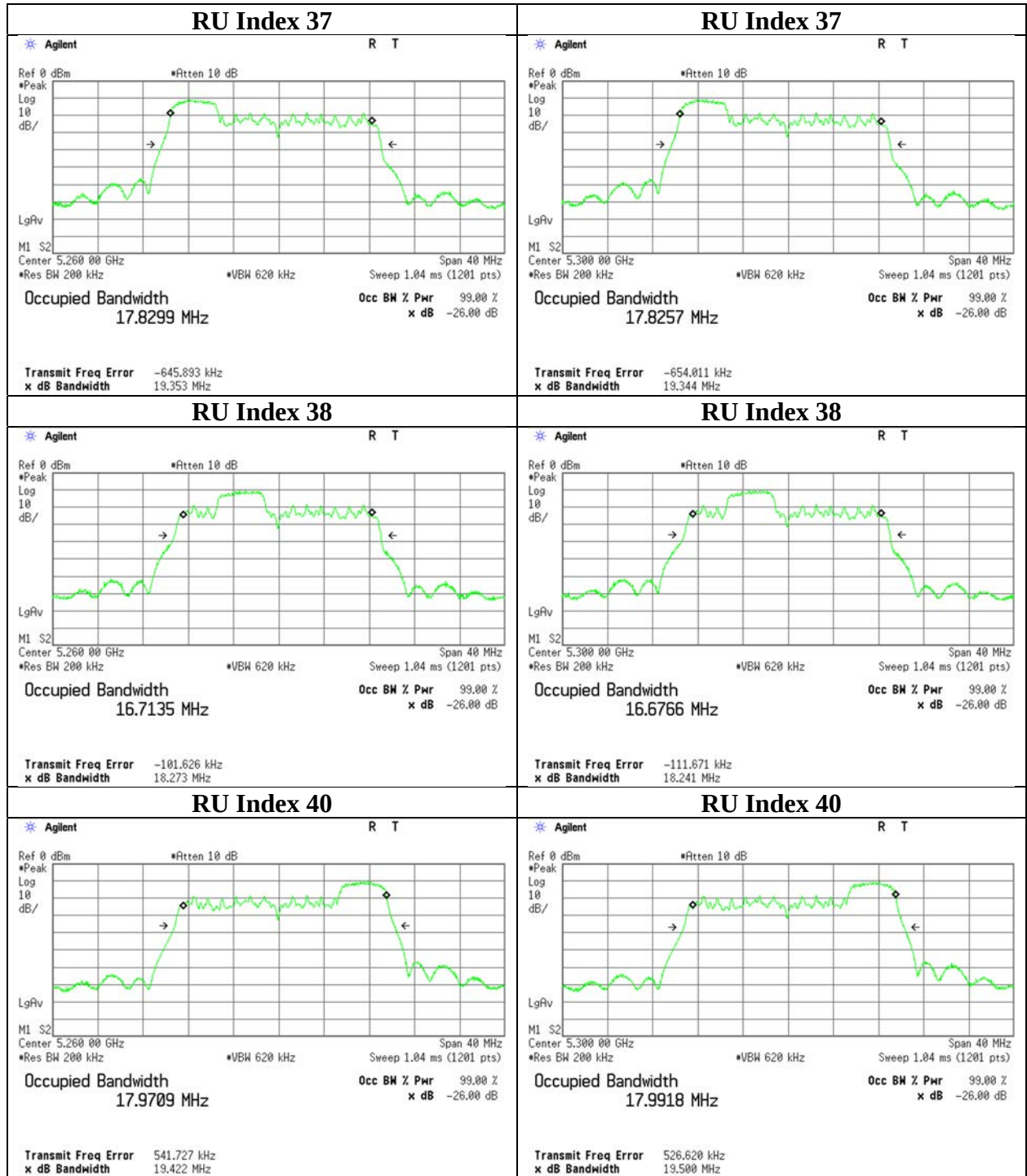
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26 dB Emission Bandwidth

11ax-20 (OFDMA)

52-tone RU 5260 MHz

52-tone RU 5300 MHz



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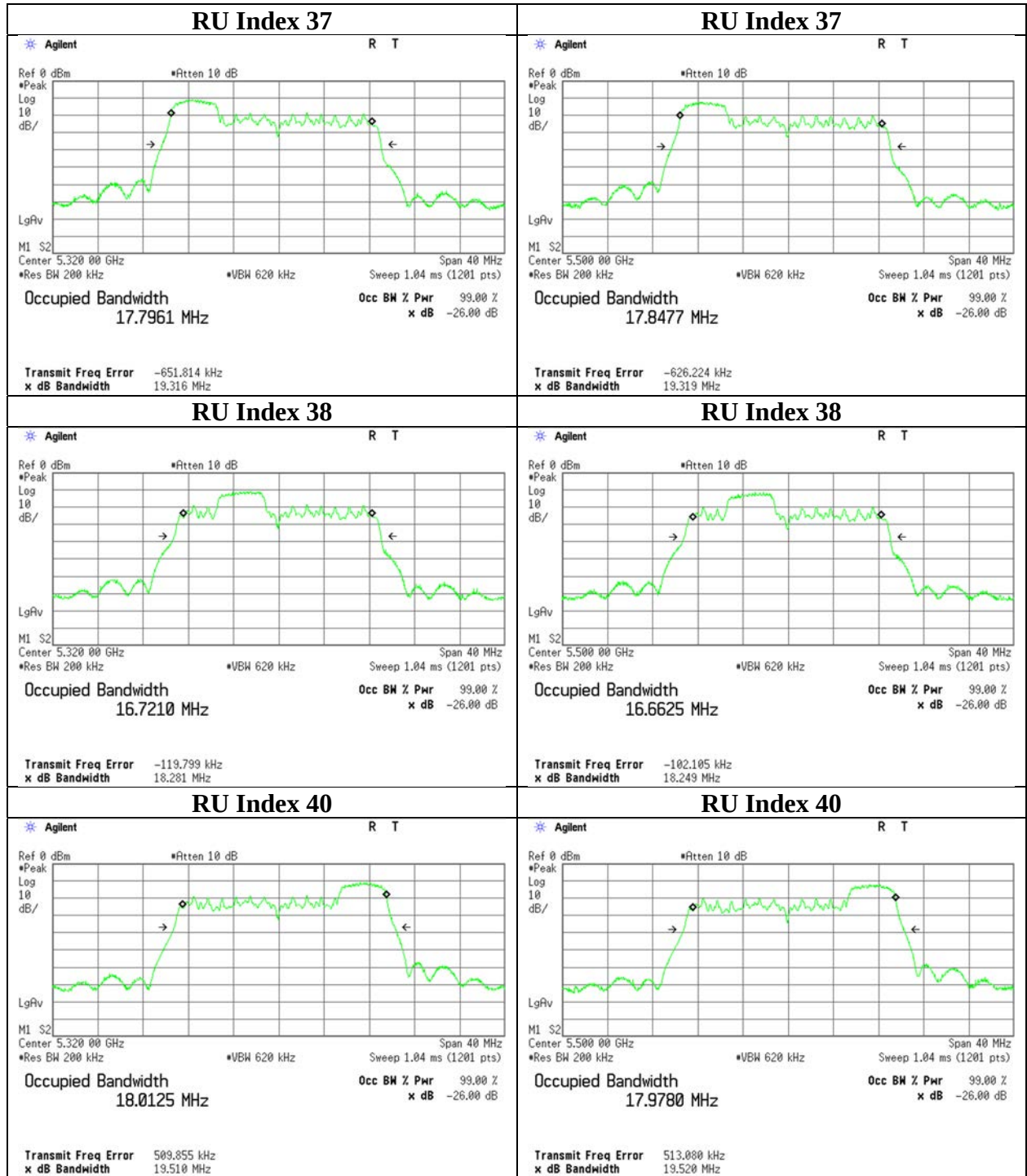
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26 dB Emission Bandwidth

11ax-20 (OFDMA)

52-tone RU 5320 MHz

52-tone RU 5500 MHz



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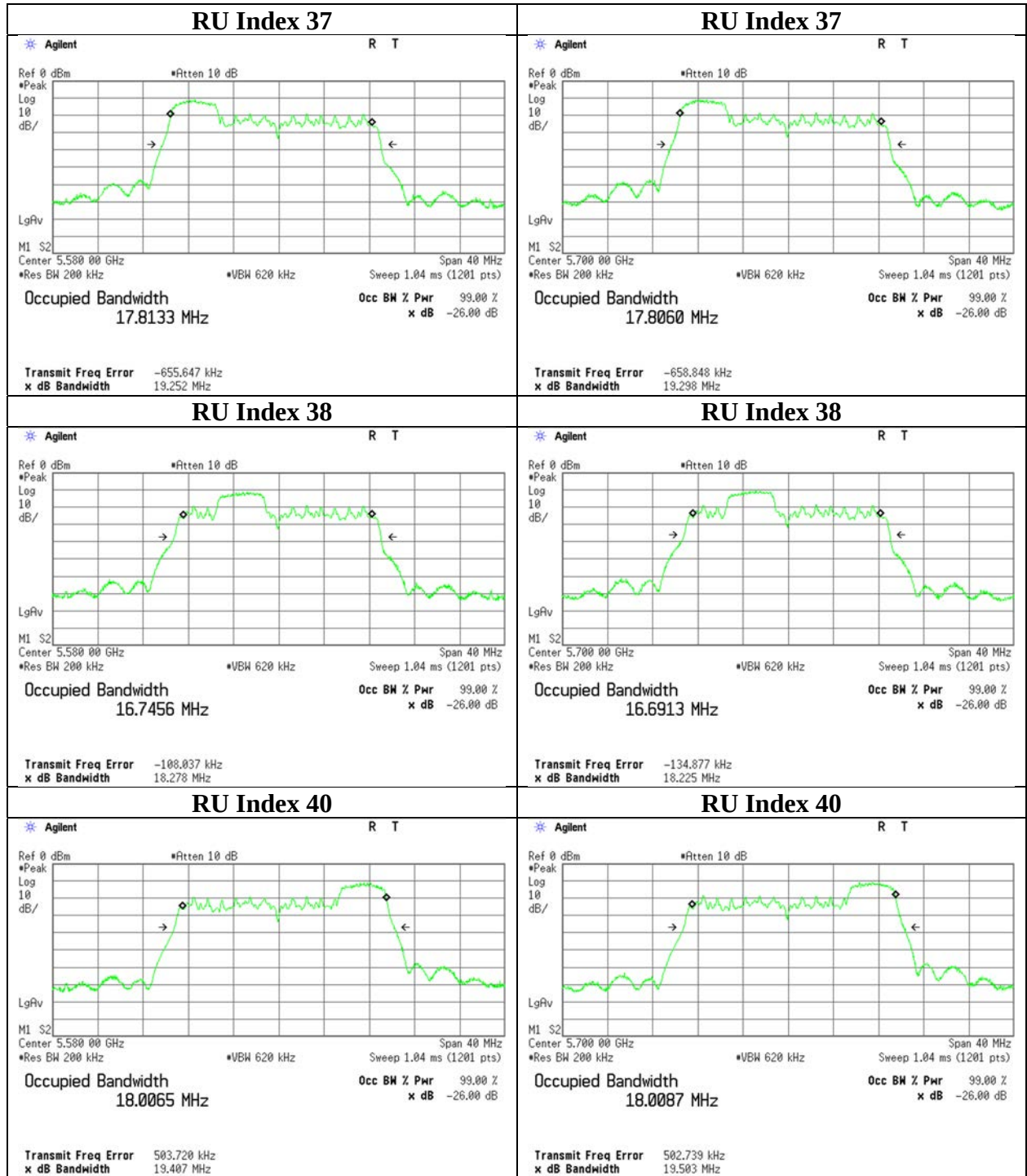
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26 dB Emission Bandwidth

11ax-20 (OFDMA)

52-tone RU 5580 MHz

52-tone RU 5700 MHz



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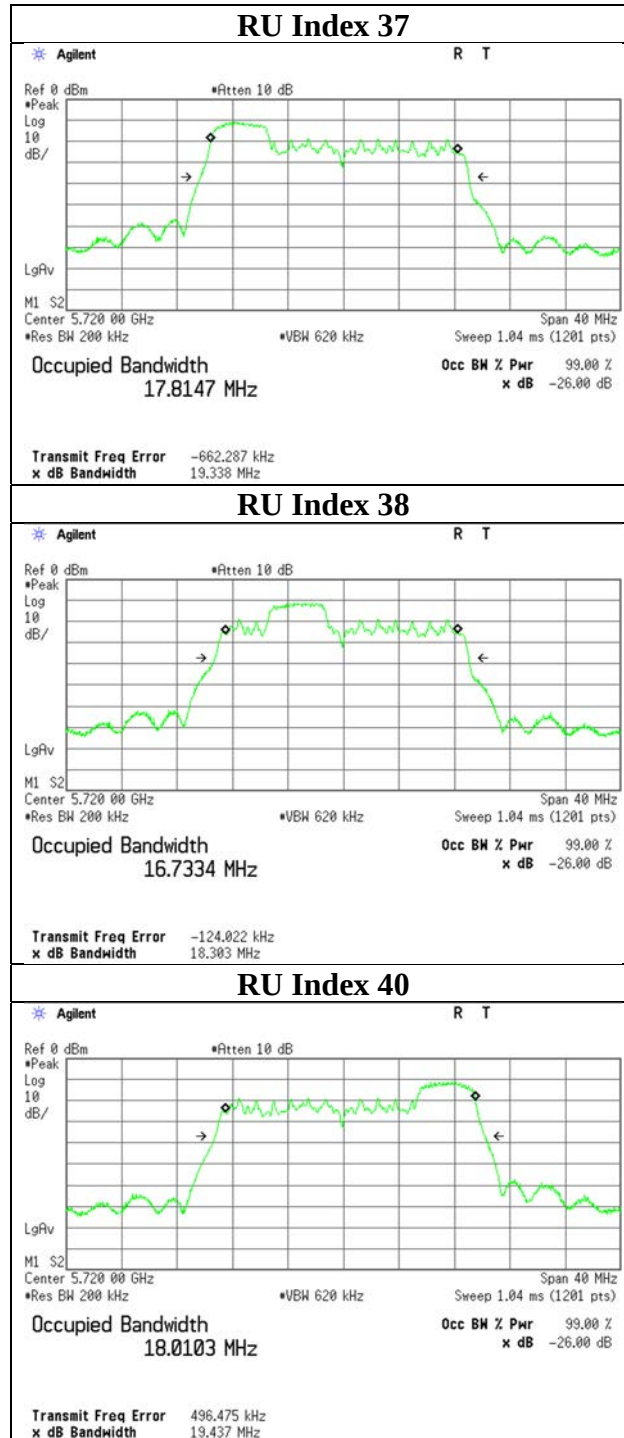
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26 dB Emission Bandwidth

11ax-20 (OFDMA) 52-tone RU 5720 MHz

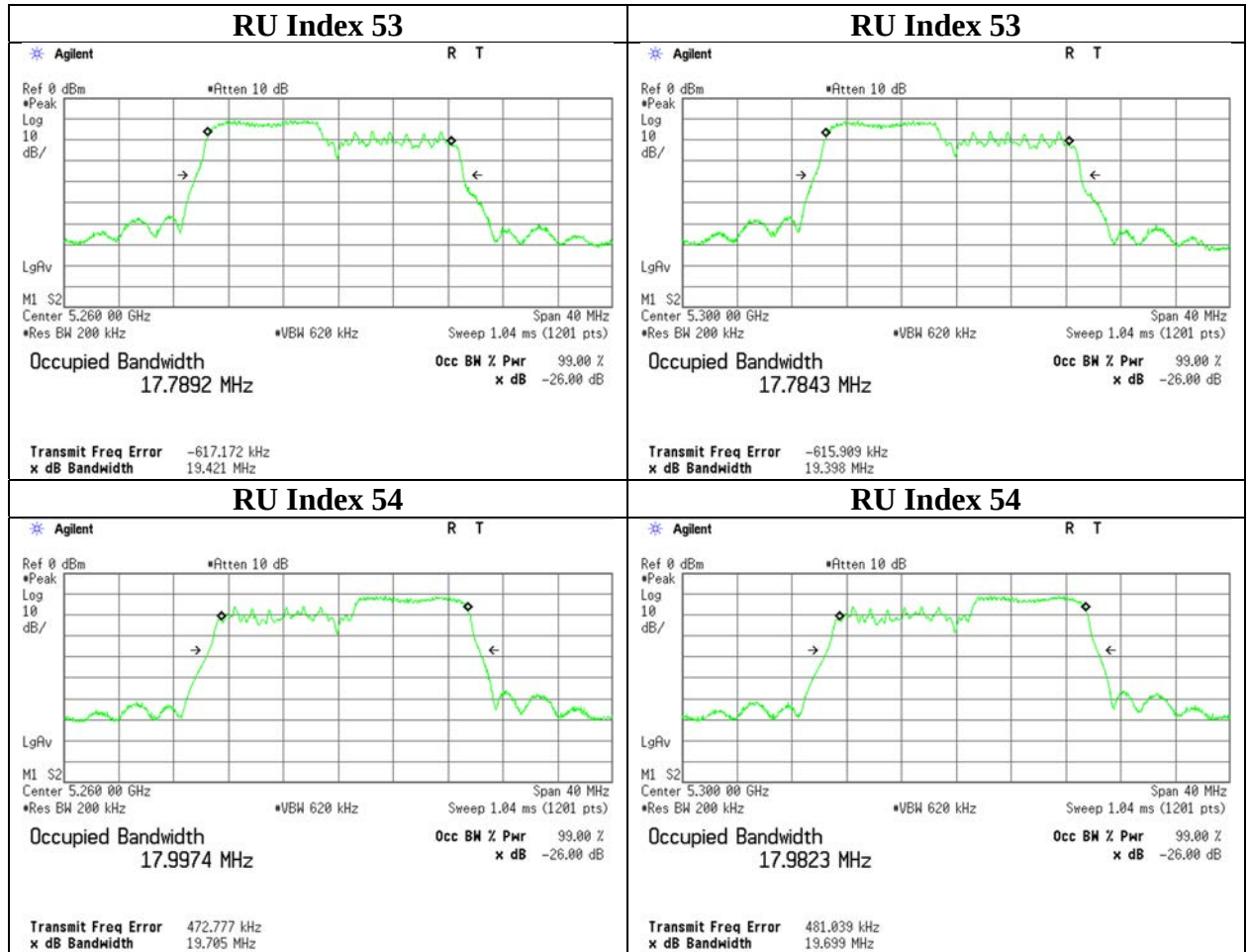


26 dB Emission Bandwidth

11ax-20 (OFDMA)

106-tone RU 5260 MHz

106-tone RU 5300 MHz



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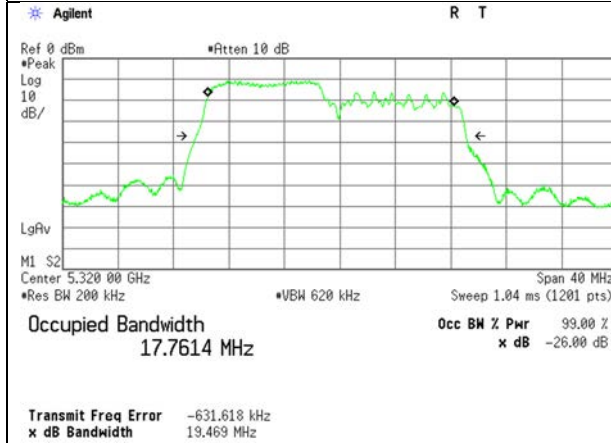
Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

11ax-20 (OFDMA)

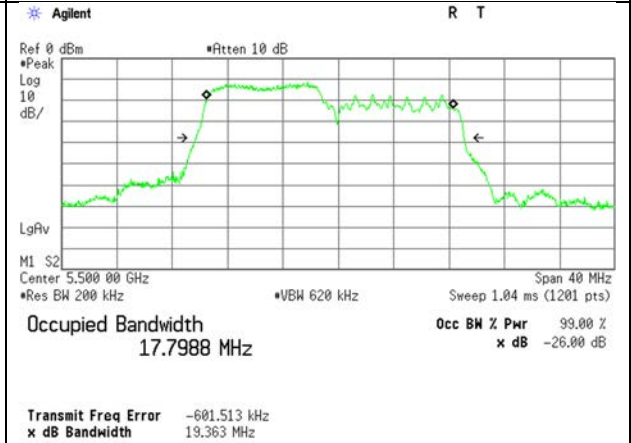
106-tone RU 5320 MHz

RU Index 53

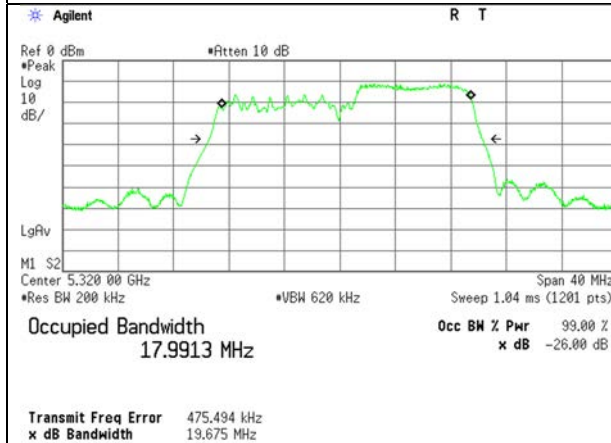


106-tone RU 5500 MHz

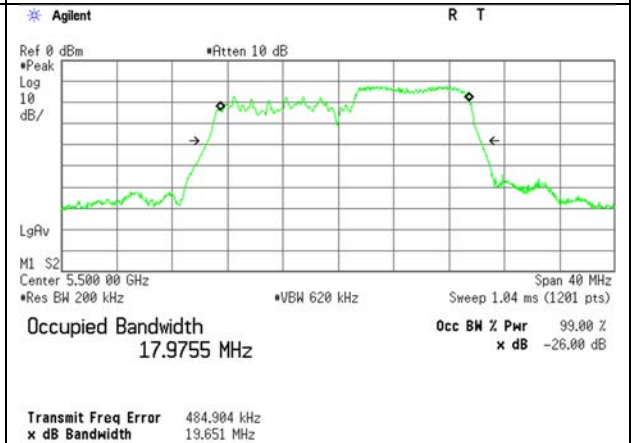
RU Index 53



RU Index 54



RU Index 54

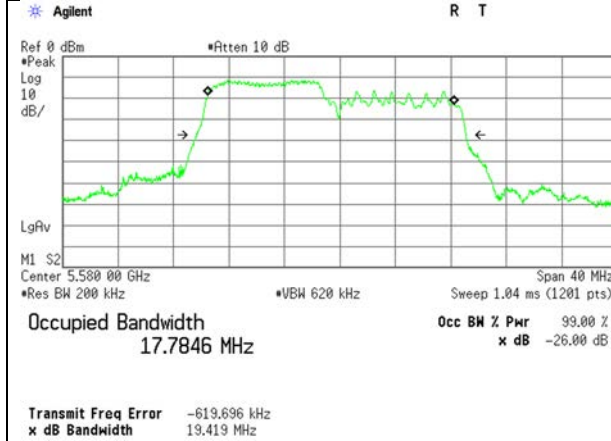


26 dB Emission Bandwidth

11ax-20 (OFDMA)

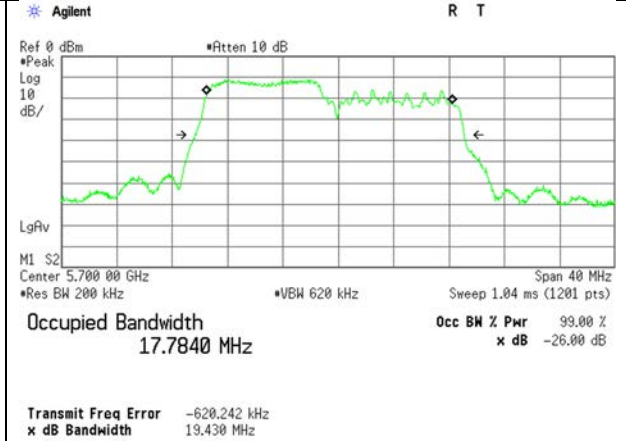
106-tone RU 5580 MHz

RU Index 53

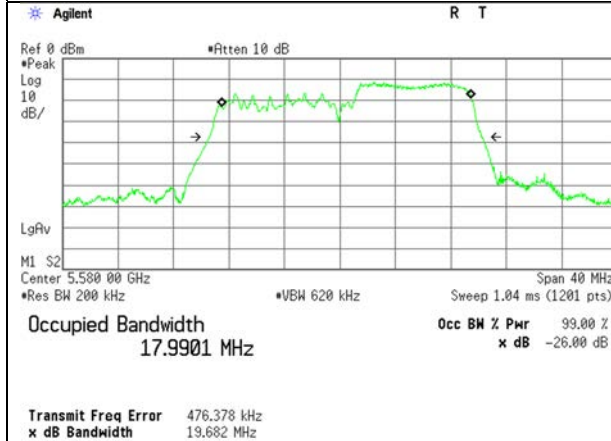


106-tone RU 5700 MHz

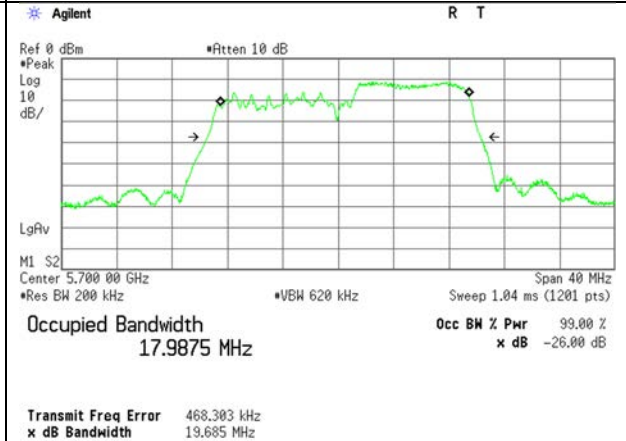
RU Index 53



RU Index 54

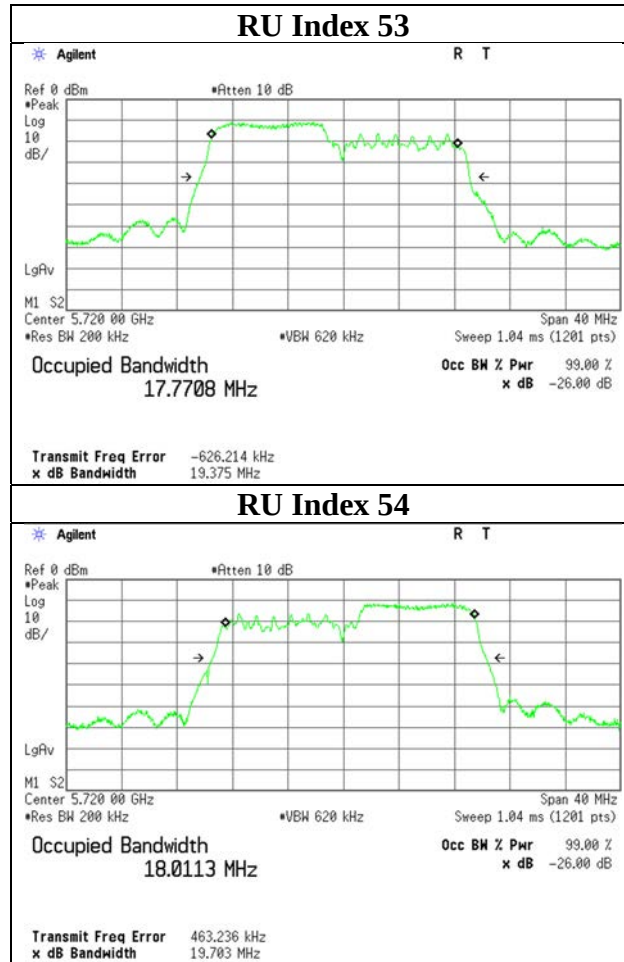


RU Index 54



26 dB Emission Bandwidth

11ax-20 (OFDMA) 106-tone RU 5720 MHz



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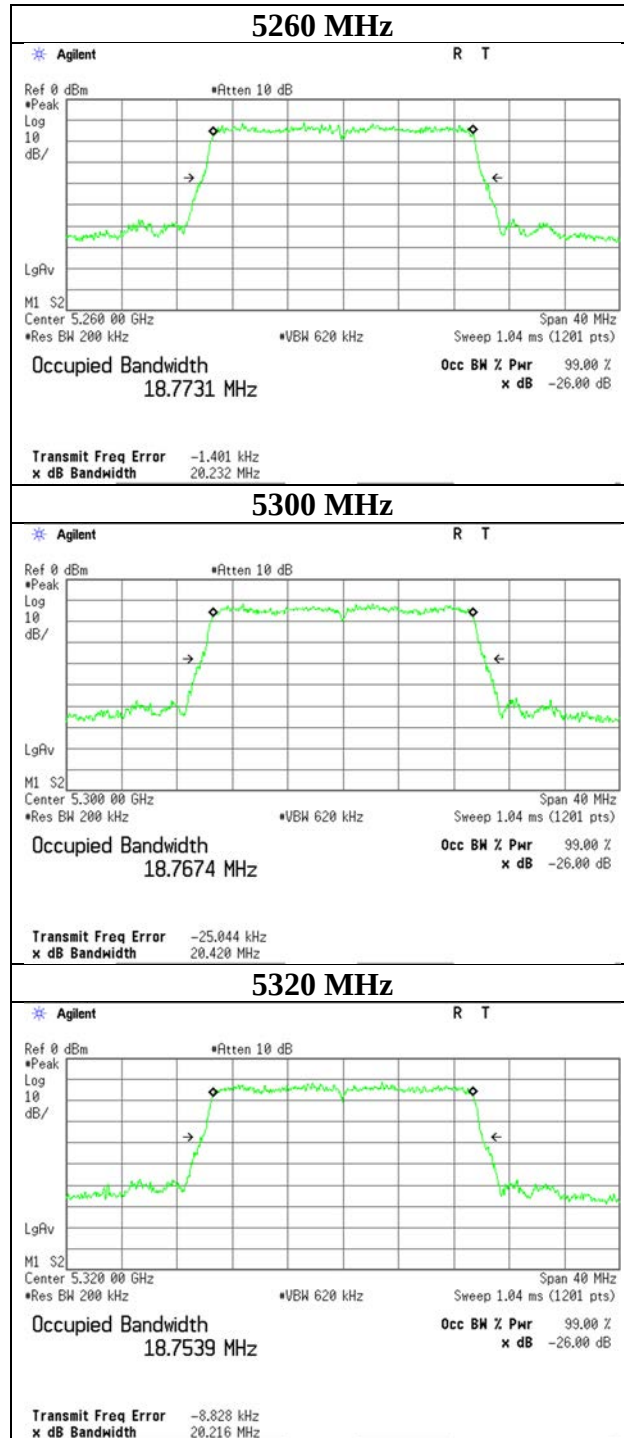
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Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

11ax-20 (OFDMA) 242-tone RU



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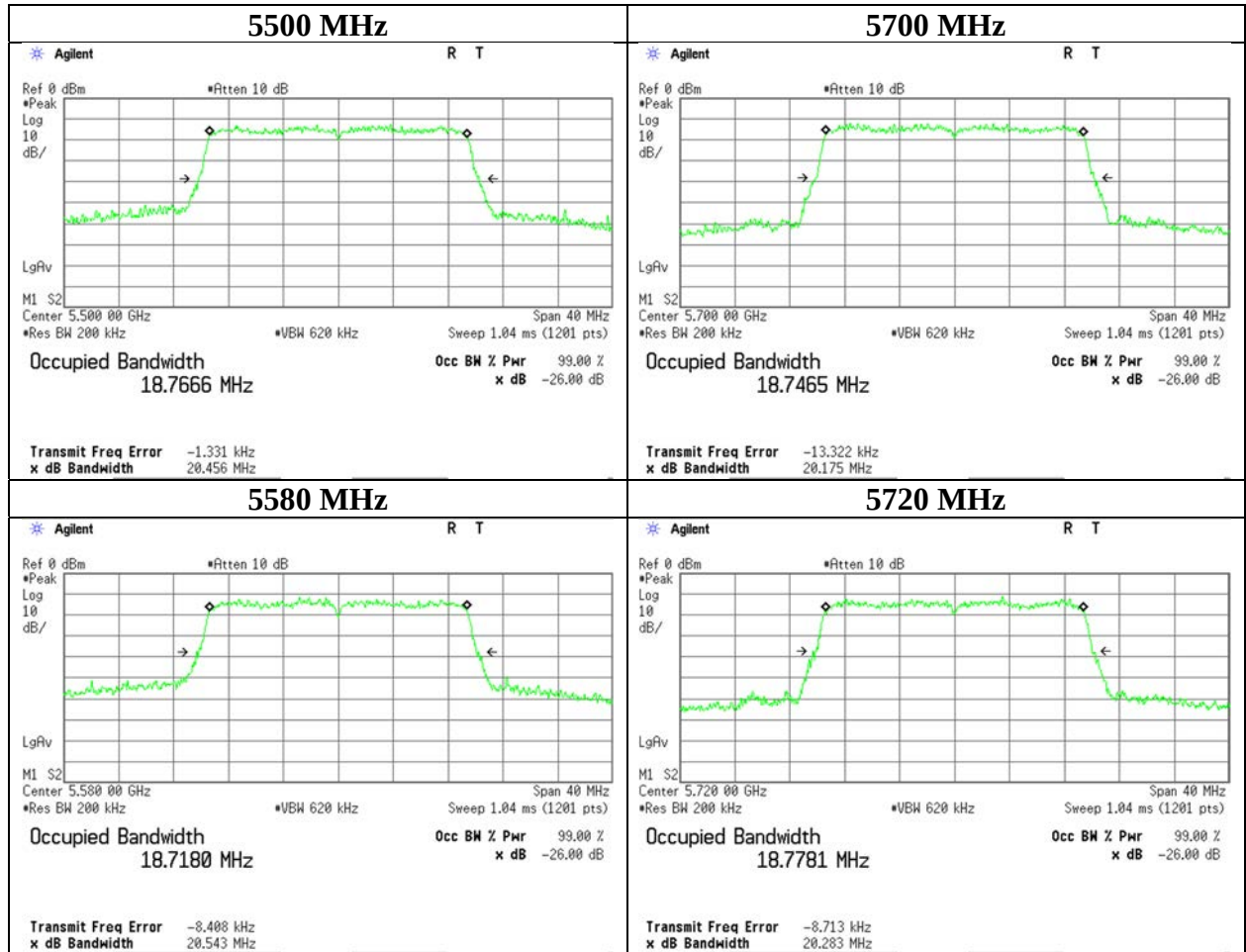
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Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

11ax-20 (OFDMA) 242-tone RU



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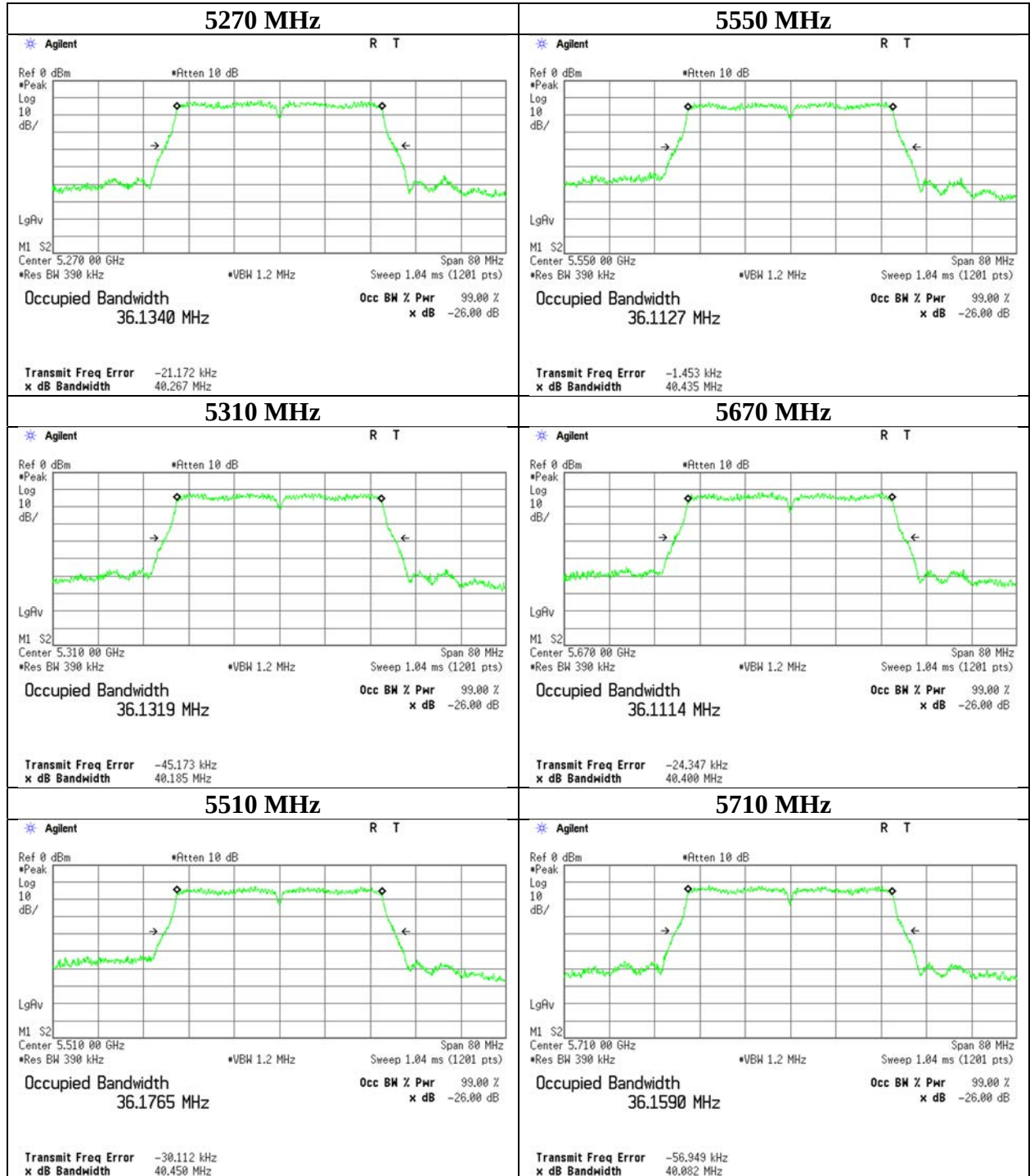
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Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

11n-40



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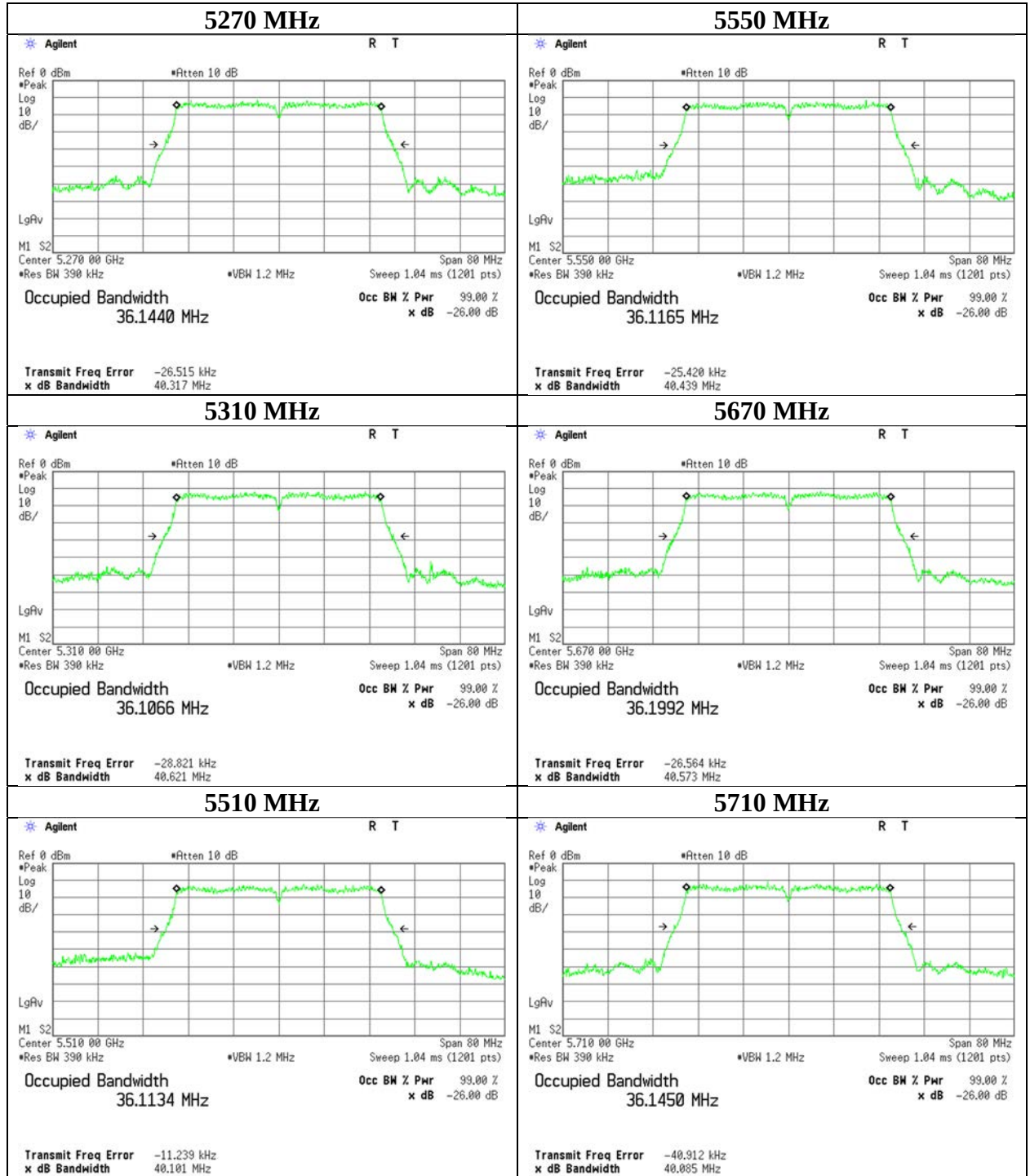
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26 dB Emission Bandwidth

11ac-40



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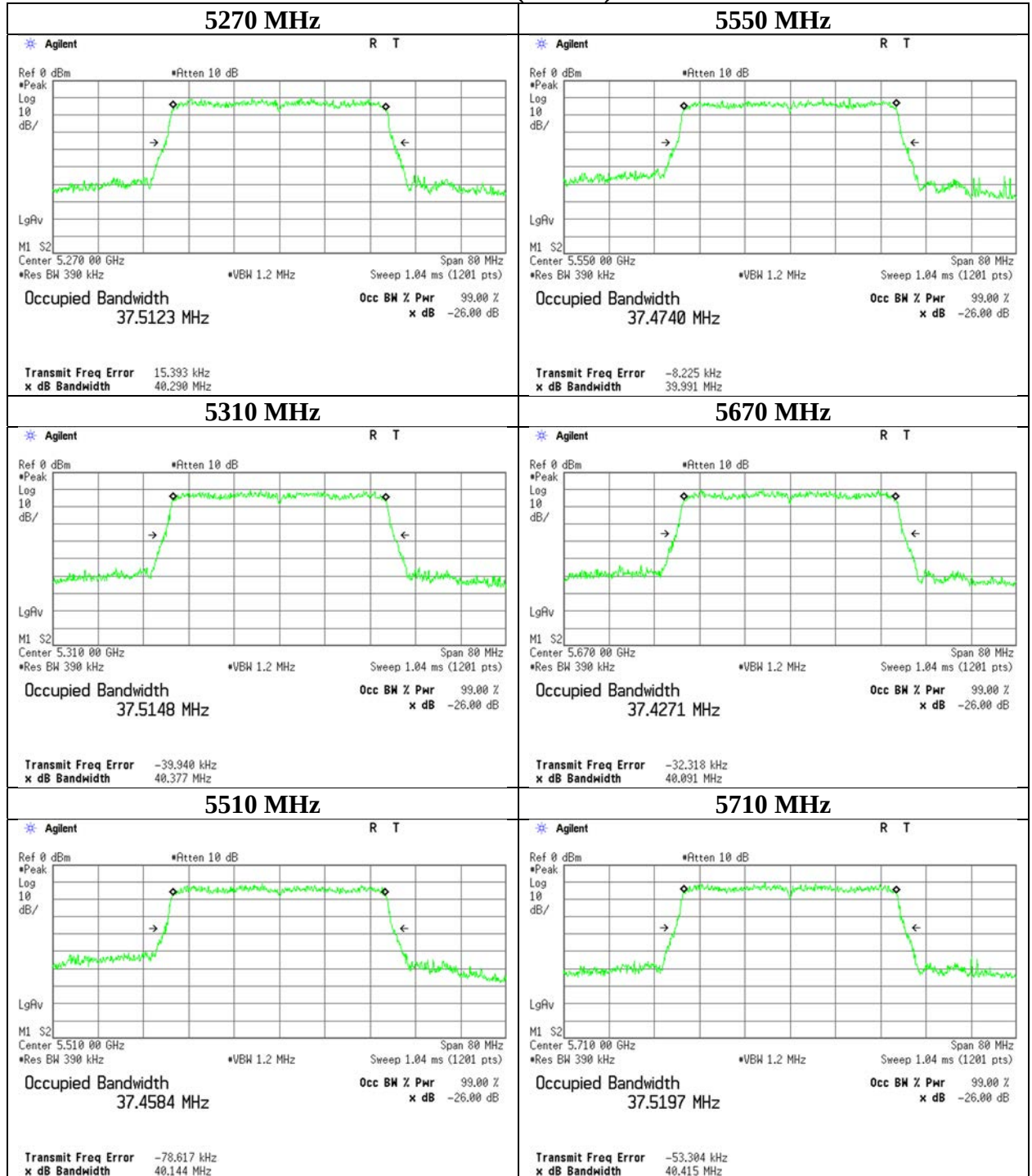
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Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

11ax-40 (OFDM)

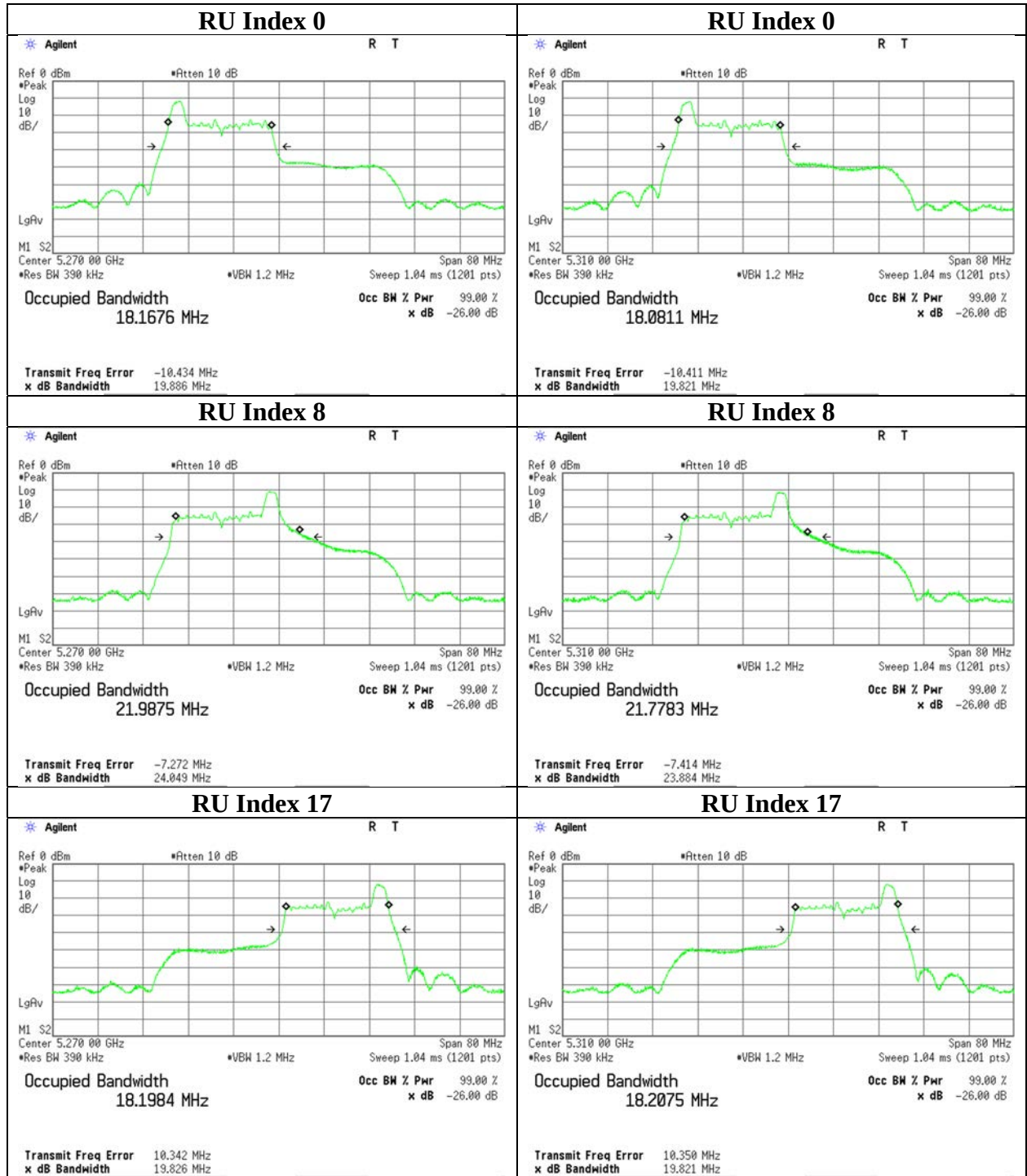


26 dB Emission Bandwidth

11ax-40 (OFDMA)

26-tone RU 5270 MHz

26-tone RU 5310 MHz



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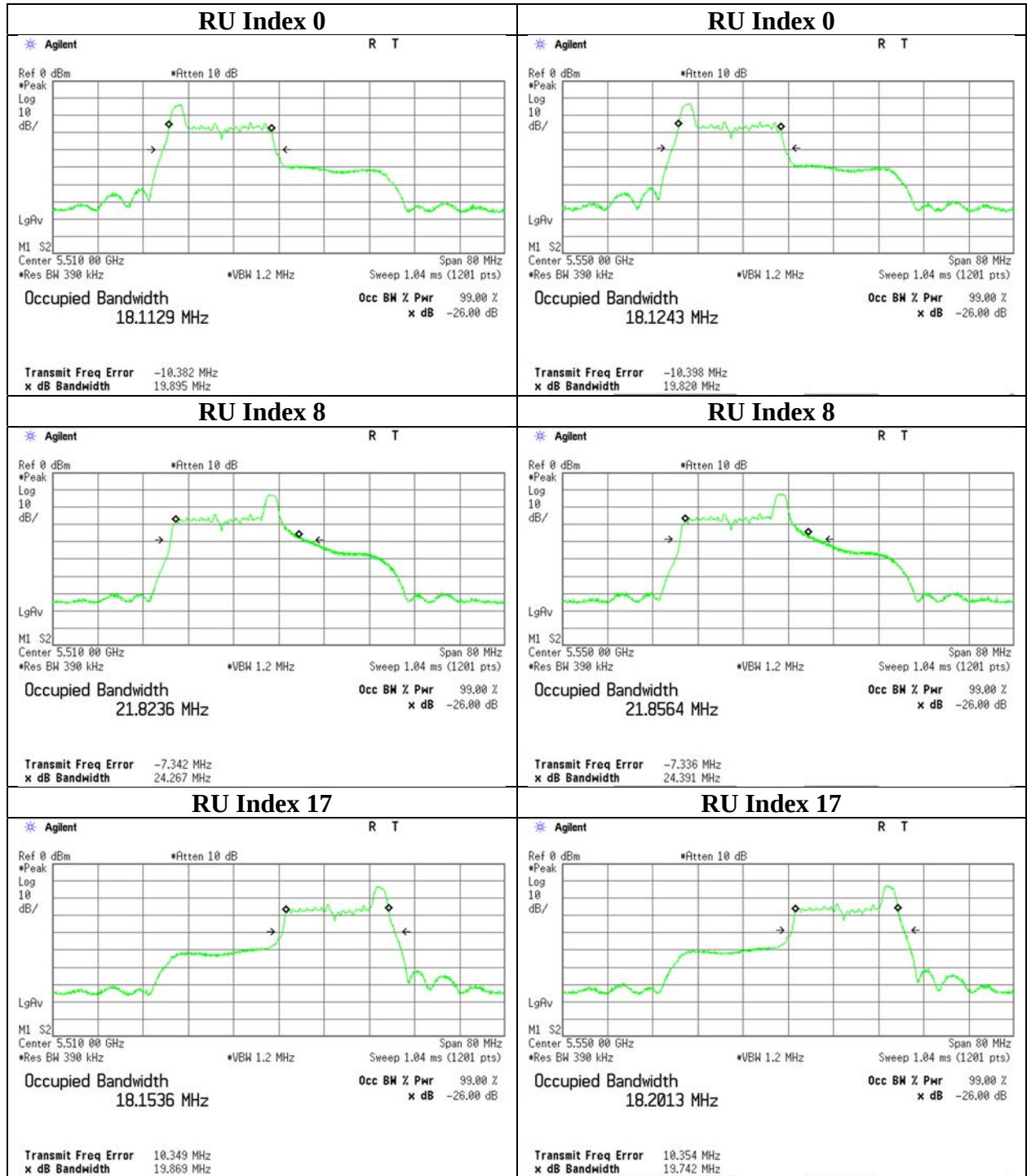
Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

11ax-40 (OFDMA)

26-tone RU 5510 MHz

26-tone RU 5550 MHz

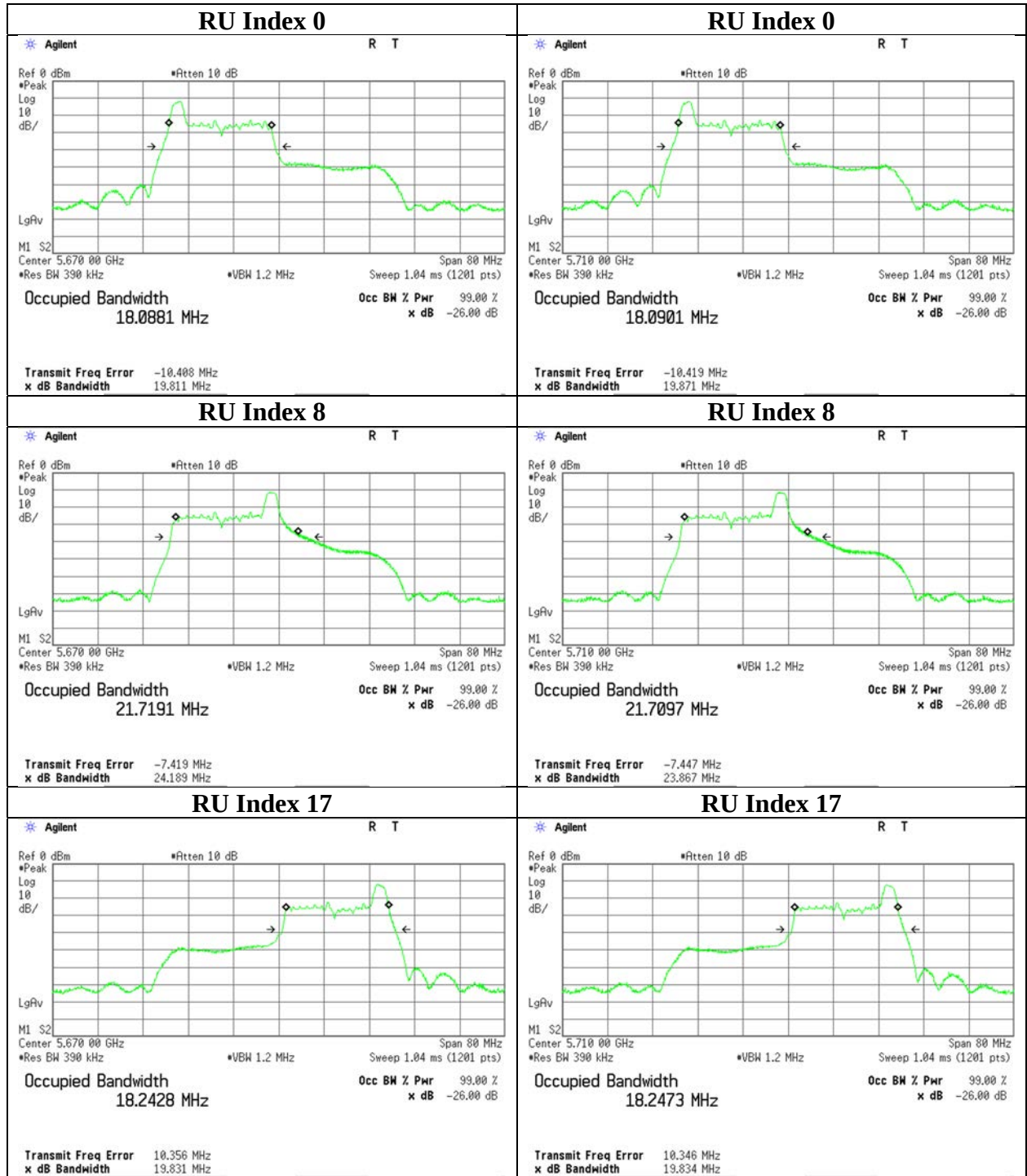


26 dB Emission Bandwidth

11ax-40 (OFDMA)

26-tone RU 5670 MHz

26-tone RU 5710 MHz



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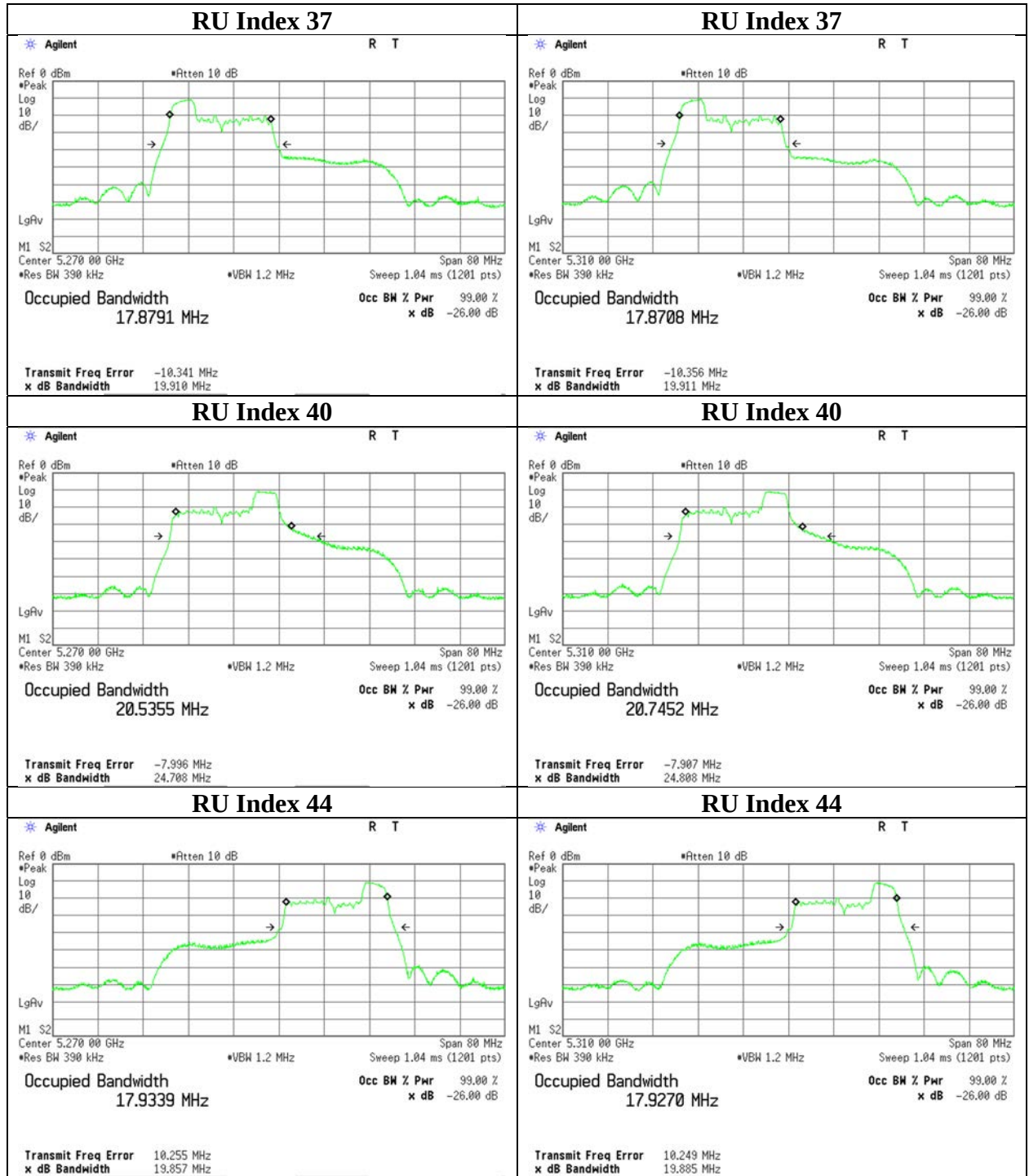
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26 dB Emission Bandwidth

11ax-40 (OFDMA)

52-tone RU 5270 MHz

52-tone RU 5310 MHz



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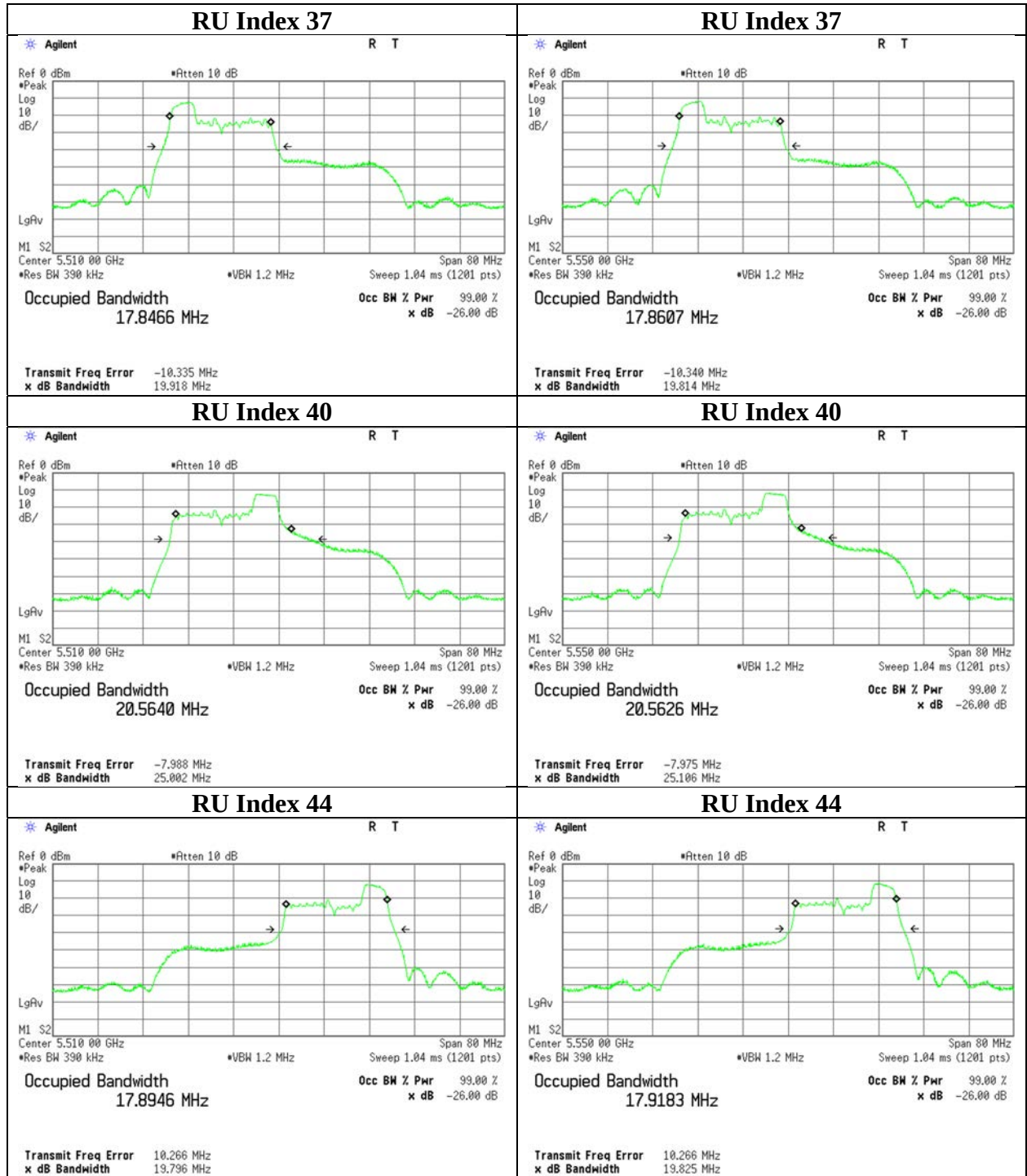
Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

11ax-40 (OFDMA)

52-tone RU 5510 MHz

52-tone RU 5550 MHz



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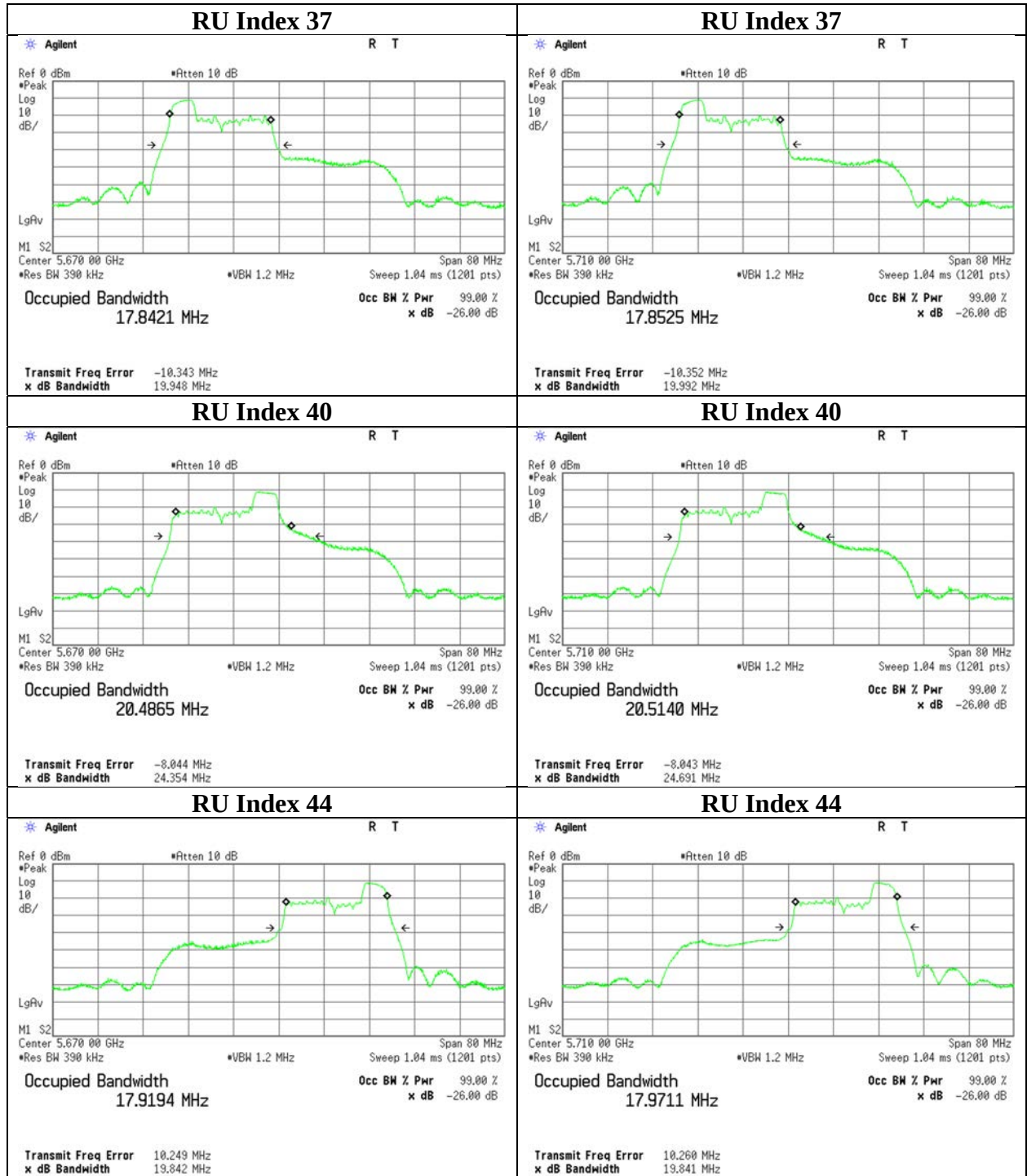
Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

11ax-40 (OFDMA)

52-tone RU 5670 MHz

52-tone RU 5710 MHz



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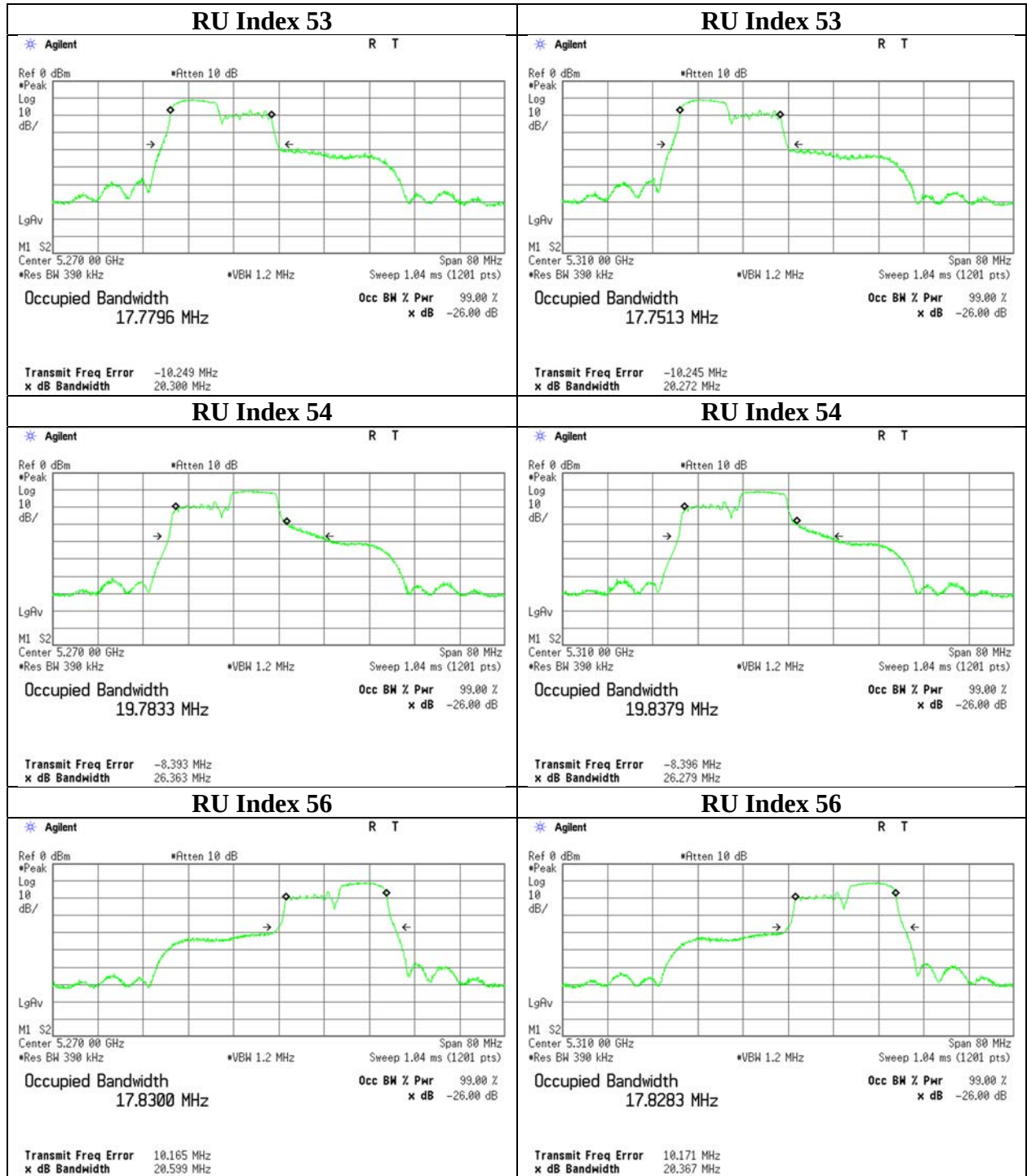
Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

11ax-40 (OFDMA)

106-tone RU 5270 MHz

106-tone RU 5310 MHz

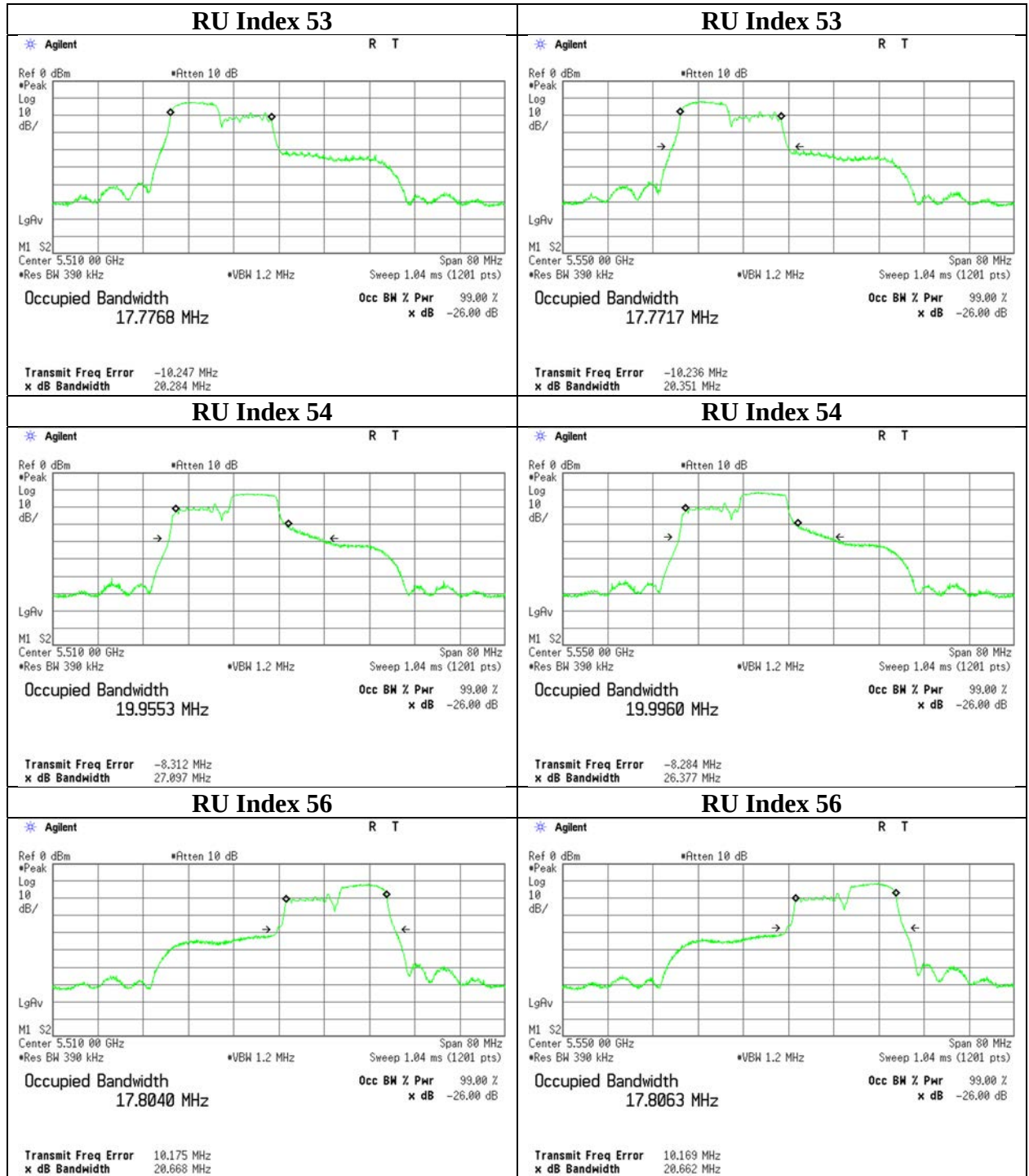


26 dB Emission Bandwidth

11ax-40 (OFDMA)

106-tone RU 5510 MHz

106-tone RU 5550 MHz

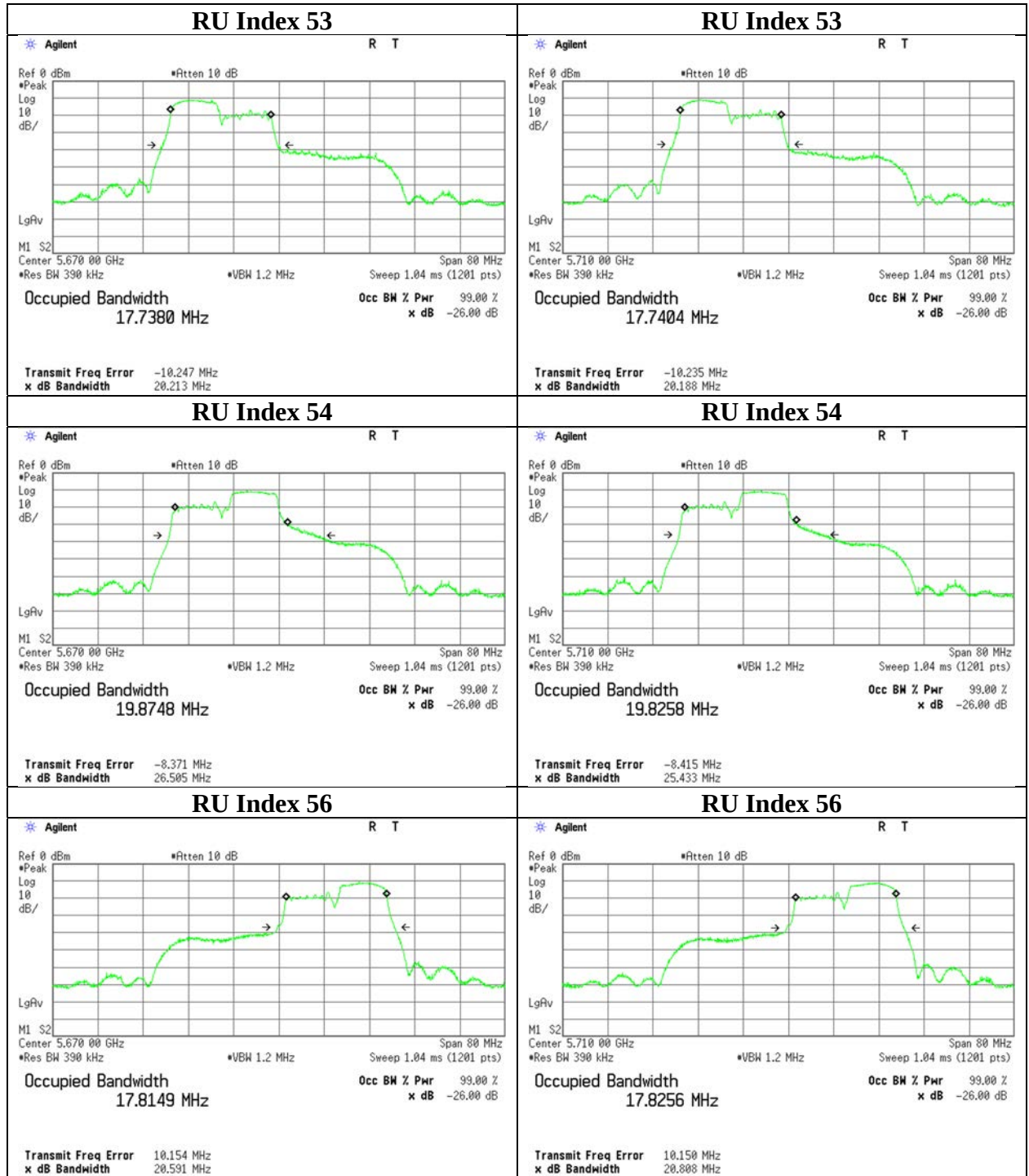


26 dB Emission Bandwidth

11ax-40 (OFDMA)

106-tone RU 5670 MHz

106-tone RU 5710 MHz



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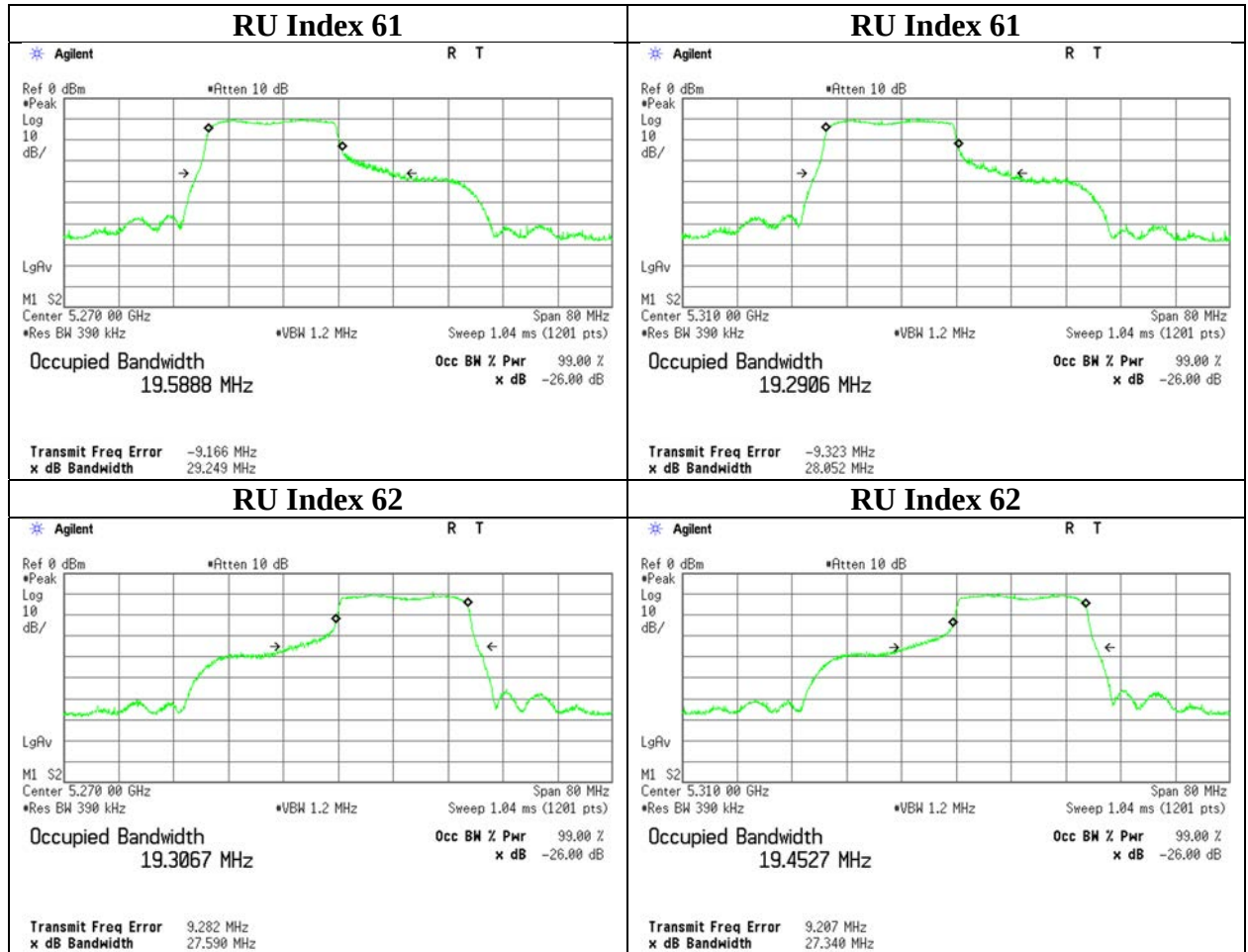
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26 dB Emission Bandwidth

11ax-40 (OFDMA)

242-tone RU 5270 MHz

242-tone RU 5310 MHz



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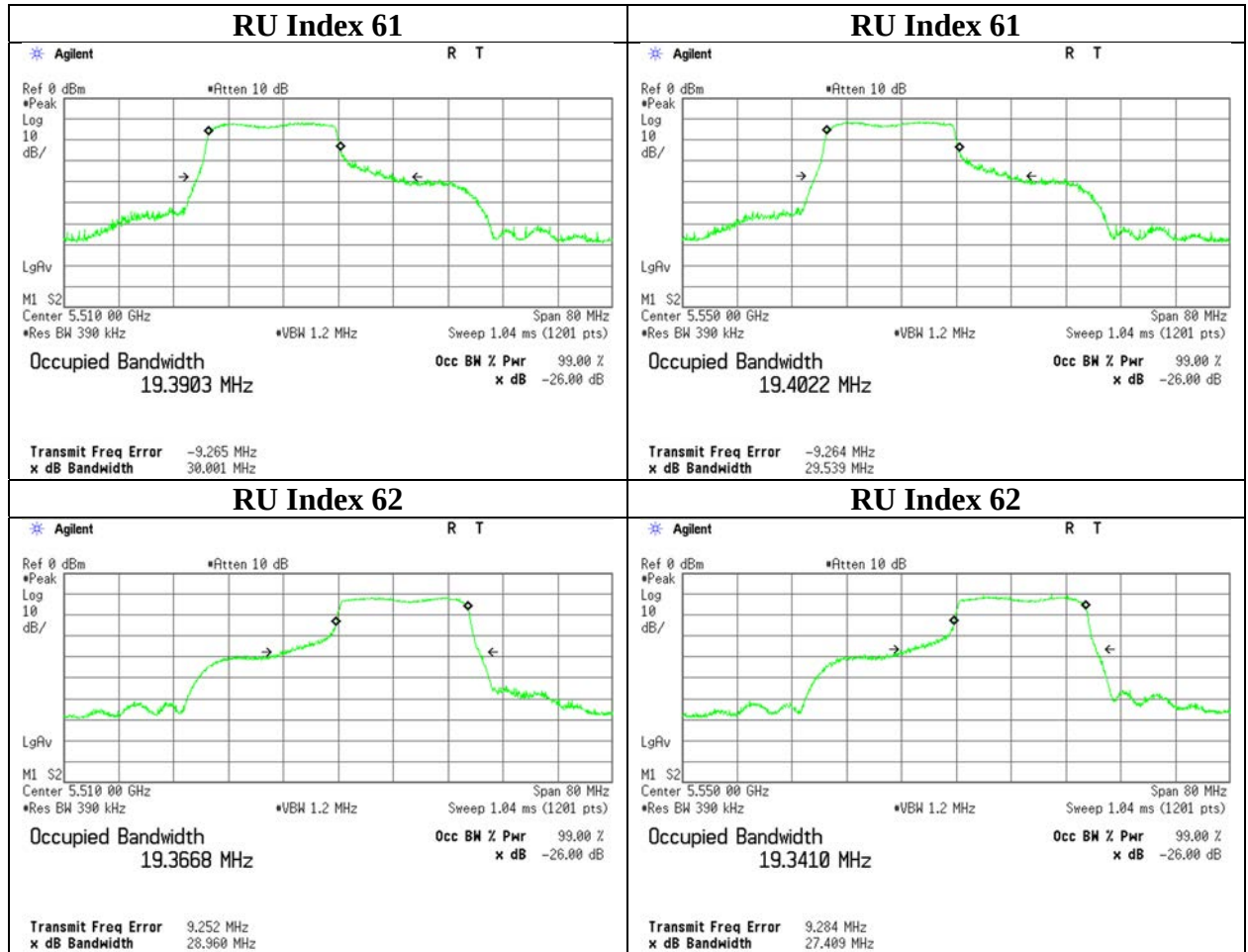
Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

11ax-40 (OFDMA)

242-tone RU 5510 MHz

242-tone RU 5550 MHz

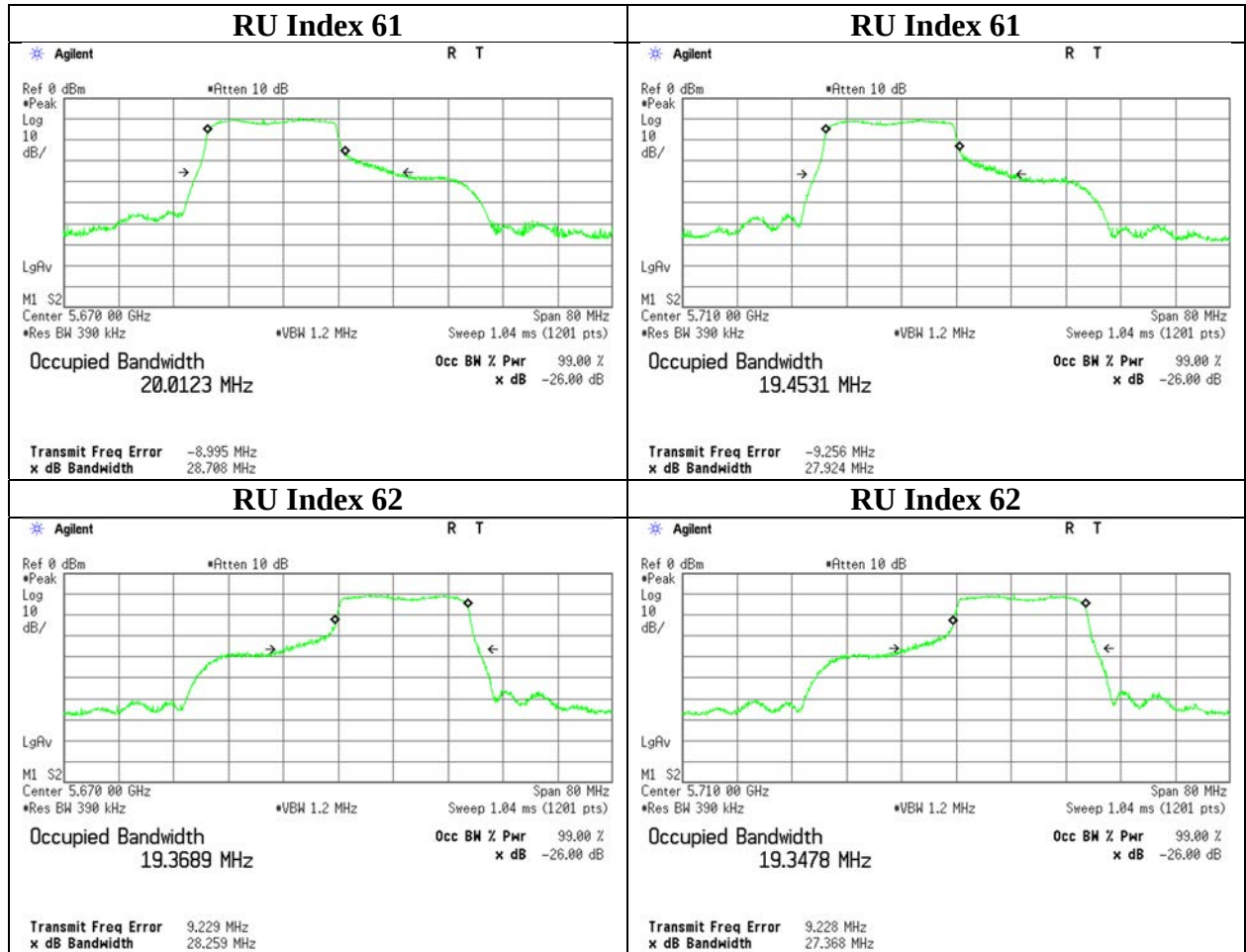


26 dB Emission Bandwidth

11ax-40 (OFDMA)

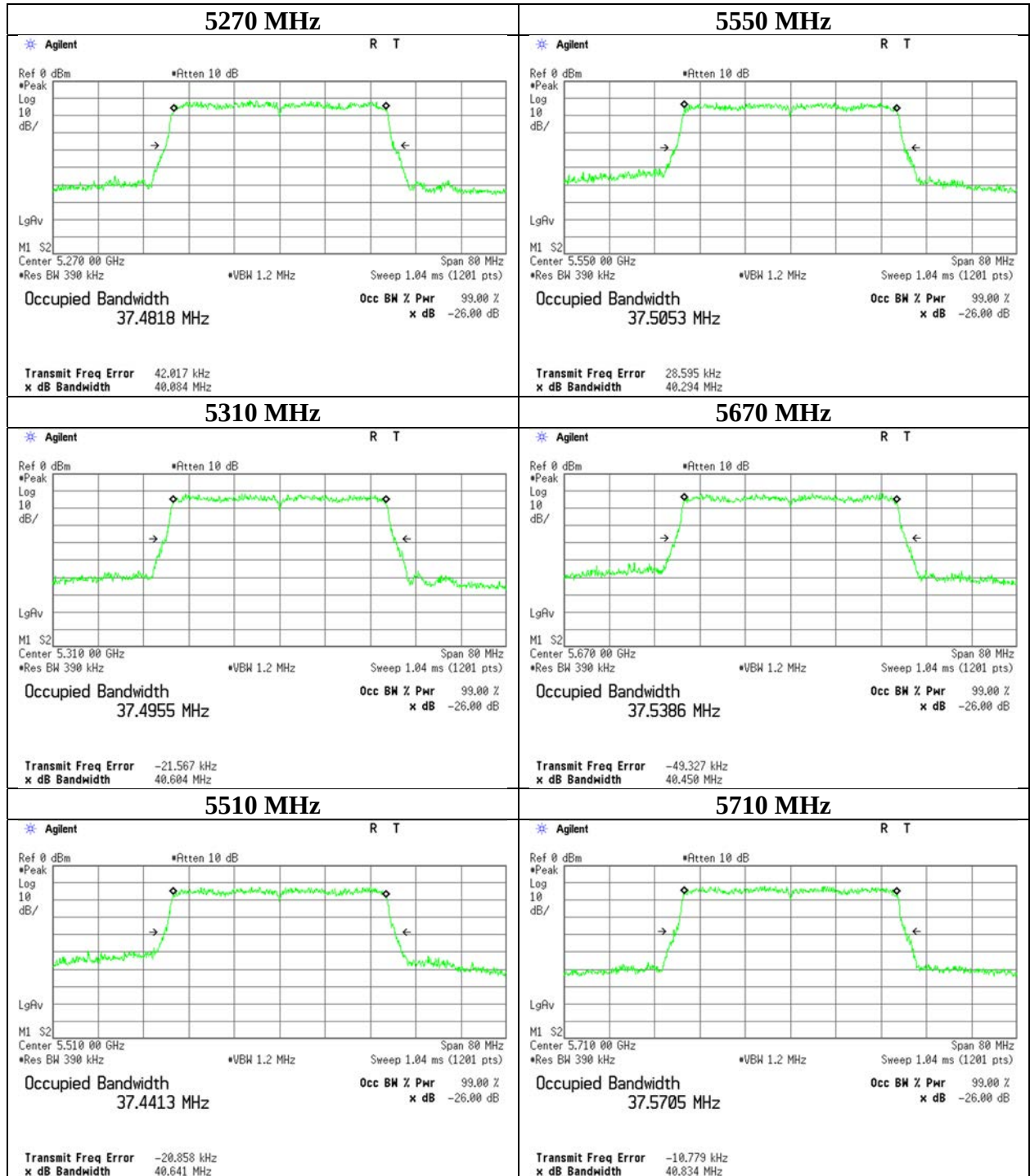
242-tone RU 5670 MHz

242-tone RU 5710 MHz



26 dB Emission Bandwidth

11ax-40 (OFDMA) 484-tone RU



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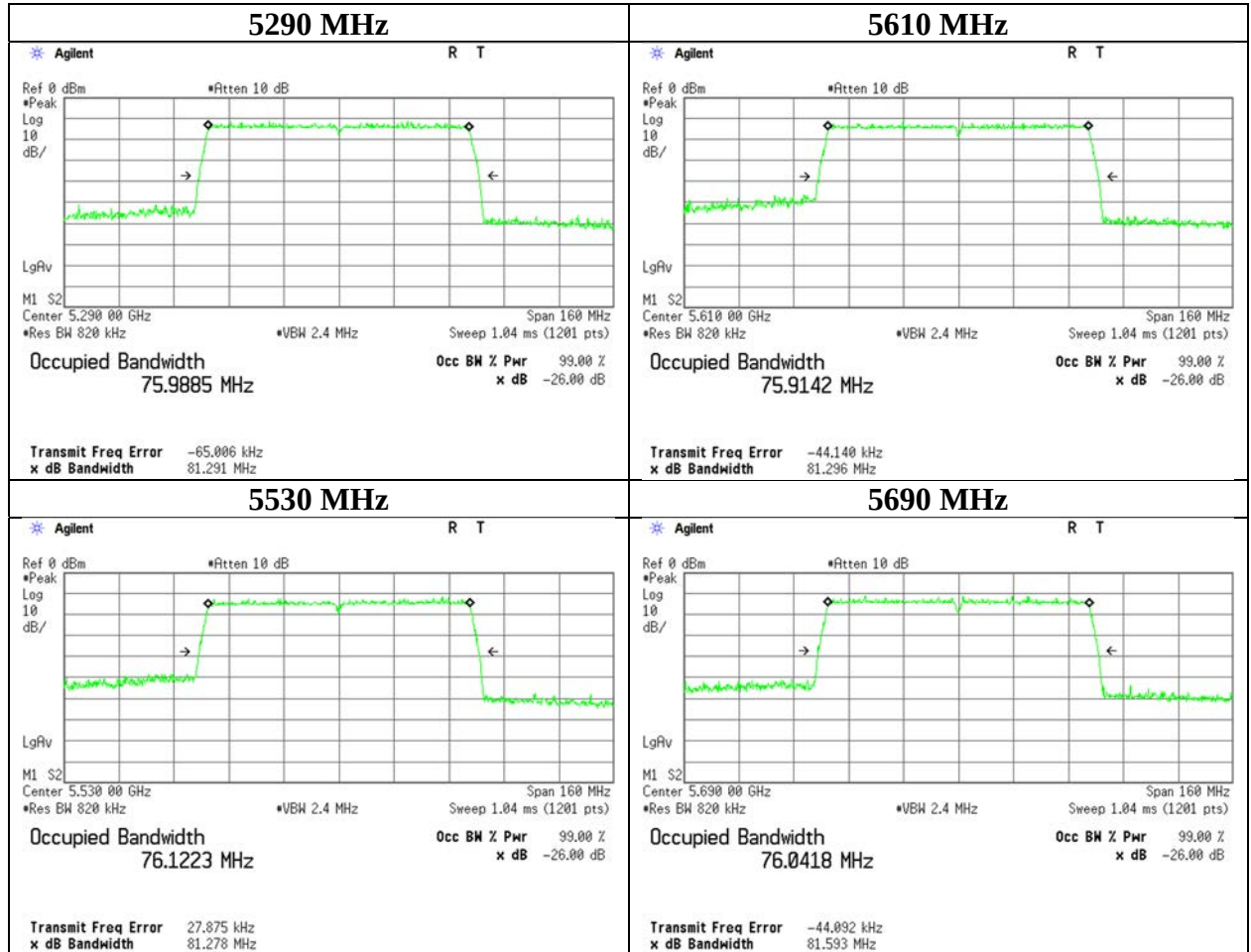
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26 dB Emission Bandwidth

11ac-80



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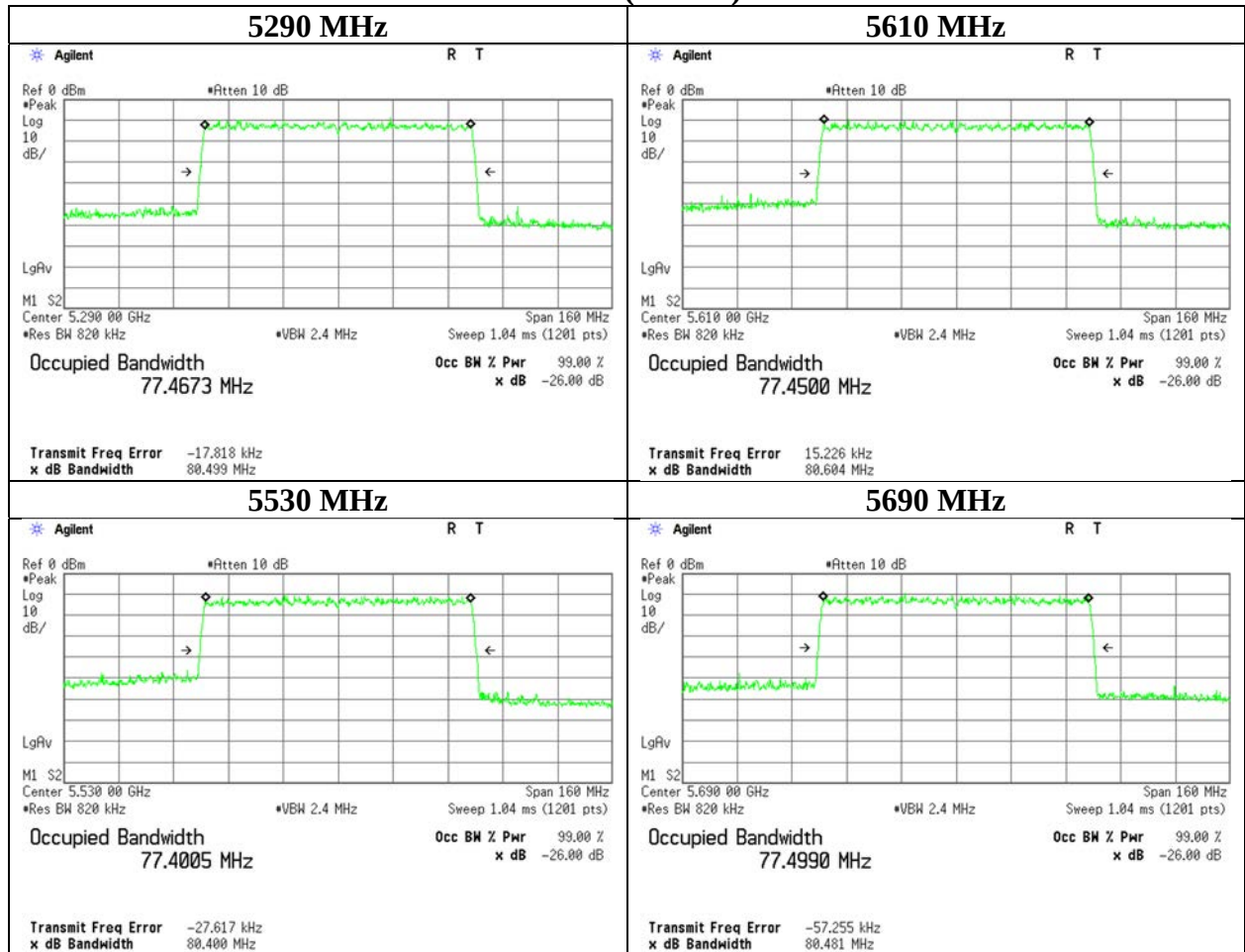
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26 dB Emission Bandwidth

11ax-80 (OFDM)



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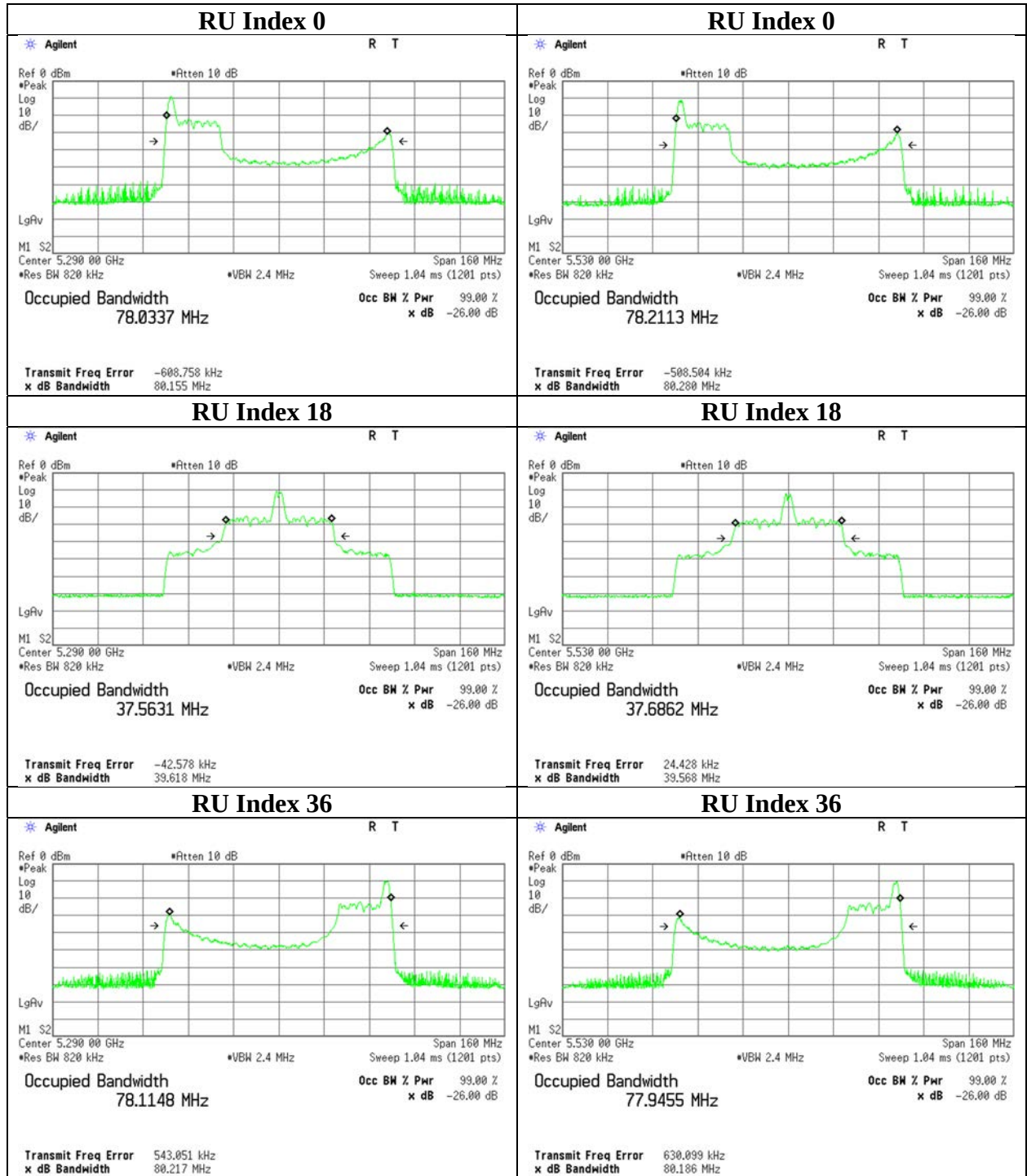
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26 dB Emission Bandwidth

11ax-80 (OFDMA)

26-tone RU 5290 MHz

26-tone RU 5530 MHz



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26 dB Emission Bandwidth

11ax-80 (OFDMA)

26-tone RU 5610 MHz

26-tone RU 5690 MHz

