

RADIO TEST REPORT

Test Report No. 15486544S-C-R1

Customer	ALPS ALPINE CO., LTD.
Description of EUT	Vehicle equipment
Model Number of EUT	AH00CDC
FCC ID	A269ZUA174
Test Regulation	FCC Part 15 Subpart E
Test Result	Complied
Issue Date	September 2, 2025
Remarks	WLAN (5 GHz band) part Except for DFS test

Representative Test EngineerShiro Kobayashi
Engineer**Approved By**Kazuya Noda
Leader

CERTIFICATE 1266.03

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

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- For test report(s) referred in this report, the latest version (including any revisions) is always referred.
- If the latest version is a revision, it replaces the previous version. See the table below for revisions and versions.

REVISION HISTORY

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	15486544S-C	August 6, 2025	-
1	15486544S-C-R1	September 2, 2025	Page 611:Correction of Duty Factor. From 2.60 To 0.26

Reference: Abbreviations (Including words undescribed in this report)

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

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SECTION 1: Customer Information

Company Name	ALPS ALPINE CO., LTD.
Address	20-1 Yoshima Industrial park, Iwaki, Fukushima, Japan 970-1192
Telephone Number	+81-246-36-4111
Contact Person	Kenji Nagase

The information provided by 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

SECTION 2: Equipment Under Test (EUT)

2.1 Identification of EUT

Description	Vehicle equipment
Model Number	AH00CDC
Serial Number	Refer to SECTION 4.2
Condition	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab
Receipt Date	December 17, 2024
Test Date	December 17, 2024 to April 17, 2025

2.2 Product Description

General Specification

Rating	DC 13.5 V
Operating temperature	-30 deg. C to +70 deg. C

Radio Specification

This report contains data provided by the customer which can impact the validity of results. UL Japan, Inc. is only responsible for the validity of results after the integration of the data provided by the customer. The data provided by the customer is marked "a)" in the table below.

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

Equipment Type	Transceiver	
Frequency of Operation	20 MHz Band: 2412 MHz to 2462 MHz	
Type of Modulation	DSSS, OFDM	
	OFDMA (IEEE802.11ax Only)	20 MHz: 26/52/106/242-tone RU
Antenna Type	Printed Inverted F Antenna	
Antenna Gain ^{a)}	ANT1: -1.70 dBi	
	ANT2: -1.70 dBi	

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, 8 DPSK) BT LE: GFSK	
Antenna Type	Printed Inverted F Antenna	
Antenna Gain ^{a)}	-1.70 dBi	

WLAN (IEEE802.11a/11n-20/11ac-20/11ax-20/11n-40/11ac-40/11ax-40/11ac-80/11ax-80/11ac-160/11ax-160)

Equipment Type	Transceiver	
Frequency of Operation	20 MHz Band	5180 MHz to 5240 MHz 5260 MHz to 5320 MHz 5500 MHz to 5720 MHz 5745 MHz to 5825 MHz 5955 MHz to 6415 MHz 6535 MHz to 6855 MHz
	40 MHz Band	5190 MHz to 5230 MHz 5270 MHz to 5310 MHz 5510 MHz to 5710 MHz 5755 MHz to 5795 MHz 5965 MHz to 6405 MHz 6565 MHz to 6845 MHz
	80 MHz Band	5210 MHz, 5290 MHz 5530 MHz to 5690 MHz 5775 MHz 5985 MHz to 6385 MHz 6625 MHz to 6785 MHz
	160 MHz Band	5250 MHz, 5570 MHz 6025 MHz to 6345 MHz 6665 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
		160 MHz: 26/52/106/242/484/996/2x996-tone RU
Antenna Type	Printed Inverted F Antenna	
Antenna Gain ^{a)}	U-NII-1, -2A, -2C, -3	ANT1: 2.73 dBi
		ANT2: 3.30 dBi
	U-NII-5, 7	ANT1: 4.67 dBi
		ANT2: 4.42 dBi

SECTION 3: Test Summary

3.1 Test Specification

Test Specification	FCC Part 15 Subpart E The latest version on the first day of the testing period
Title	FCC 47 CFR Part 15 Radio Frequency Device Subpart E Unlicensed National Information Infrastructure Devices Section 15.407 General technical requirements

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

3.2 Reference Standards

ANSI/USEMCSC C63.2-2023
ANSI C63.4-2014+C63.4a-2017
ANSI C63.10-2020
ANSI/USEMCSC C63.10/Cor 1-2023
ANSI/USEMCSC C63.10a-2024 for ISED
ANSI C63.5-2017
ANSI C63.25.1-2018
RSS-Gen Issue 5/Amendment 1/Amendment 2 for ISED
KDB 789033 D02 v02r01

3.3 Summary of Test Results

Item	Specification	Results	Remarks
Conducted Emission	FCC: 15.407 (b) (9) / 15.207 ISED: RSS-Gen 8.8	N/A	*1)
26 dB Emission Bandwidth	FCC: 15.407 (a) (1) (2) (3) ISED: -	Complied	Conducted
Maximum Conducted Output Power	FCC: 15.407 (a) (1) (2) (3) ISED: RSS-247 6.2	Complied	Conducted
Maximum Power Spectral Density	FCC : 15.407 (a) (1) (2) (3) ISED: RSS-247 6.2	Complied	Conducted
Spurious Emission Restricted Band Edge	FCC: 15.407 (b), 15.205 and 15.209 ISED: RSS-247 6.2	Complied	Conducted (below 30 MHz) / Radiated (above 30 MHz) *2)
6 dB Emission Bandwidth	FCC: 15.407 (e) ISED: RSS-247 6.2	Complied	Conducted
Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003593.			
*1) The test is not applicable since the EUT does not have AC Mains.			
*2) Radiated test was selected over 30 MHz based on FCC 15.407 (b) and KDB 789033 D02 G.3.b).			

FCC Part 15.31 (e)

The EUT provides stable voltage constantly to the RF Part regardless of input voltage. Instead of a new battery, DC power supply was used for the test. That does not affect the test result, therefore the EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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

3.4 Addition to Standard

Item	Specification	Results	Remarks
99% Occupied Bandwidth	ISED: -	-	Conducted

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

3.5 Uncertainty

Measurement uncertainty is not taken into account when stating conformity with a specified requirement.
Note: When margins obtained from test results are less than the measurement uncertainty, the test results may exceed the limit.

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

Item	Frequency range	Uncertainty (+/-)
Conducted Emission (AC Mains) LISN	150 kHz to 30 MHz	3.0 dB
Radiated Emission (Measurement distance: 3 m)	9 kHz to 30 MHz	3.3 dB
	30 MHz to 200 MHz	4.8 dB
	200 MHz to 1 GHz	6.1 dB
	1 GHz to 6 GHz	4.7 dB
	6 GHz to 18 GHz	5.3 dB
	18 GHz to 40 GHz	5.5 dB
Radiated Emission (Measurement distance: 1 m)	1 GHz to 18 GHz	5.6 dB
	18 GHz to 40 GHz	5.8 dB

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)	1.3 dB
Power Measurement above 1 GHz (Peak Detector)	1.5 dB
Spurious Emission (Conducted) below 1 GHz	0.93 dB
Conducted Emissions Power Density Measurement 1 GHz to 3 GHz	0.93 dB
Conducted Emissions Power Density Measurement 3 GHz to 18 GHz	3.0 dB
Spurious Emission (Conducted) 18 GHz to 26.5 GHz	2.8 dB
Spurious Emission (Conducted) 26.5 GHz to 40 GHz	2.3 dB
Bandwidth Measurement	0.012 %
Duty Cycle and Time Measurement	0.27 %
Temperature	2.2 deg.C.
Humidity	3.4 %
Voltage	0.92 %

3.6 Test Location

UL Japan, Inc. Shonan EMC Lab.

1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 Japan

Telephone: +81-463-50-6400

A2LA Certificate Number: 1266.03

(FCC test firm registration number: 626366, ISED lab company number: 2973D / CAB identifier: JP0001)

Test room	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Semi-anechoic chamber (SAC1)	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.2 Semi-anechoic chamber (SAC2)	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.3 Semi-anechoic chamber (SAC3)	12.7 x 7.7 x 5.35	12.7 x 7.7	5 m
No.4 Semi-anechoic chamber (SAC4)	8.1 x 5.1 x 3.55	8.1 x 5.1	-
Wireless anechoic chamber 1 (WAC1)	9.5 x 6.0 x 5.4	9.5 x 6.0	3 m
Wireless anechoic chamber 2 (WAC2)	9.5 x 6.0 x 5.4	9.5 x 6.0	3 m
No.1 Shielded room (SR1)	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.2 Shielded room (SR2)	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.3 Shielded room (SR3)	6.3 x 4.7 x 2.7	6.3 x 4.7	-
No.4 Shielded room (SR4)	4.4 x 4.7 x 2.7	4.4 x 4.7	-
No.5 Shielded room (SR5)	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.6 Shielded room (SR6)	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.8 Shielded room (SR8)	3.45 x 5.5 x 2.4	3.45 x 5.5	-
No.1 Measurement room (MR1)	2.55 x 4.1 x 2.5	-	-
No.2 Measurement room (MR2)	4.5 x 3.5 x 2.5	-	-
Wireless shielded room 1 (WSR1)	3.0 x 4.5 x 2.7	3.0 x 4.5	-
Wireless shielded room 2 (WSR2)	3.0 x 4.5 x 2.7	3.0 x 4.5	-

3.7 Test Data, Test Instruments, and Test Set Up

Refer to APPENDIX.

SECTION 4: Operation of EUT during testing

4.1 Operating Mode(s)

Mode	Remarks*
IEEE 802.11a SISO (11a SISO)	54 Mbps, PN9
IEEE 802.11a MIMO (11a MIMO)	54 Mbps, PN9
IEEE 802.11n SISO 20 MHz BW (11n-20 SISO)	MCS 7, PN9
IEEE 802.11n MIMO 20 MHz BW (11n-20 MIMO)	MCS 7 (1 Stream), PN9
IEEE 802.11ac SISO 20 MHz BW (11ac-20 SISO)	MCS 8, PN9
IEEE 802.11ac MIMO 20 MHz BW (11ac-20 MIMO)	MCS 8 (1 Stream), PN9
IEEE 802.11ax SISO 20 MHz BW (11ax-20 SISO)	MCS 11, PN9
IEEE 802.11ax MIMO 20 MHz BW (11ax-20 MIMO)	MCS 11 (1 Stream), PN9
IEEE 802.11n SISO 40 MHz BW (11n-40 SISO)	MCS 7, PN9
IEEE 802.11n MIMO 40 MHz BW (11n-40 MIMO)	MCS 7 (1 Stream), PN9
IEEE 802.11ac SISO 40 MHz BW (11ac-40 SISO)	MCS 9, PN9
IEEE 802.11ac MIMO 40 MHz BW (11ac-40 MIMO)	MCS 9 (1 Stream), PN9
IEEE 802.11ax SISO 40 MHz BW (11ax-40 SISO)	MCS 11, PN9
IEEE 802.11ax MIMO 40 MHz BW (11ax-40 MIMO)	MCS 11 (1 Stream), PN9
IEEE 802.11ac SISO 80 MHz BW (11ac-80 SISO)	MCS 9, PN9
IEEE 802.11ac MIMO 80 MHz BW (11ac-80 MIMO)	MCS 9 (1 Stream), PN9
IEEE 802.11ax SISO 80 MHz BW (11ax-80 SISO)	MCS 11, PN9
IEEE 802.11ax MIMO 80 MHz BW (11ax-80 MIMO)	MCS 11 (1 Stream), PN9
IEEE 802.11ac SISO 160 MHz BW (11ac-160 SISO)	MCS 9, PN9
IEEE 802.11ac MIMO 160 MHz BW (11ac-160 MIMO)	MCS 9 (1 Stream), PN9
IEEE 802.11ax SISO 160 MHz BW (11ax-160 SISO)	MCS 11, PN9
IEEE 802.11ax MIMO 160 MHz BW (11ax-160 MIMO)	MCS 11 (1 Stream), PN9
*The worst antenna (ANT2) and condition was determined based on the test result of Maximum Conducted Output Power.	
*Since 11n and 11ac have the same modulation method, after comparison between 11n and 11ac, the test was performed with 11ac, which has the highest power, as a representative.	
*Power of the EUT was set by the software as follows; Power Setting: See below table Software: QRCT Version: 4.0.125.1 (Date: 2024.12.17, 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.	
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/ax mode by the pre-test.	

Power Setting table

[OFDM]

Mode	U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
11a	3.5			
11n-20	3.5			
11ac-20	3.5			
11ax-20 (OFDM)	2.5			
11n-40	3.5			
11ac-40	3.5			
11ax-40 (OFDM)	2.5			
11ac-80	3.5			
11ax-80 (OFDM)	2.5			
11ac-160	3.5			-
11ax-160 (OFDM)	3.5			-

[OFDMA]

Mode	RU	U-NII-1	U-NII-2A	U-NII-2C	U-NII-3
11ax-20 (OFDMA)	26-tone RU	2.0			
	52-tone RU	2.5			2.0
	106-tone RU	2.5			2.0
	242-tone RU	2.5			2.0
11ax-40 (OFDMA)	26-tone RU	2.5			2.0
	52-tone RU	2.5			2.0
	106-tone RU	2.0	2.5		2.0
	242-tone RU	2.5			2.0
	484-tone RU	2.5			2.0
11ax-80 (OFDMA)	26-tone RU	2.5			
	52-tone RU	2.5			
	106-tone RU	2.5			
	242-tone RU	2.5			
	484-tone RU	2.5			
	996-tone RU	2.5			
11ax-160 (OFDMA)	26-tone RU	1.5		2.5	-
	52-tone RU	1.5		2.5	-
	106-tone RU	1.5		2.5	-
	242-tone RU	1.0		2.5	-
	484-tone RU	1.5		2.5	-
	996-tone RU	2.5		3.0	-
	2x996-tone RU	2.5		2.5	-

Note:

1. These above setting values are a unitless value (not dBm).
2. SISO and MIMO have the same setting value.

*The Details of Operation Mode(s) [1/2]

Test Item	Operating Mode	Tested Antenna	Tested Frequency			
			Lower Band	Middle Band	Additional Band	Upper Band
26 dB Emission Bandwidth *4)	Tx 11a MIMO, Tx 11ac-20 MIMO, Tx 11ax-20 (OFDM) MIMO, Tx 11ax-20 (OFDMA) MIMO	ANT2 *2)	-	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz 5720 MHz	-
	Tx 11ac-40 MIMO, Tx 11ax-40 (OFDM) MIMO, Tx 11ax-40 (OFDMA) MIMO		-	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	-
	Tx 11ac-80 MIMO, Tx 11ax-80 (OFDM) MIMO, Tx 11ax-80 (OFDMA) MIMO		-	5290 MHz	5530 MHz 5610 MHz 5690 MHz	-
	Tx 11ac-160 MIMO, Tx 11ax-160 (OFDM) MIMO, Tx 11ax-160 (OFDMA) MIMO		-	5250 MHz	5570 MHz	-
99 % Occupied Bandwidth *4)	Tx 11a MIMO, Tx 11ac-20 MIMO, Tx 11ax-20 (OFDM) MIMO, Tx 11ax-20 (OFDMA) MIMO	ANT2 *2)	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz 5720 MHz	5745 MHz 5785 MHz 5825 MHz
	Tx 11ac-40 MIMO, Tx 11ax-40 (OFDM) MIMO, Tx 11ax-40 (OFDMA) MIMO		5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	5755 MHz 5795 MHz
	Tx 11ac-80 MIMO, Tx 11ax-80 (OFDM) MIMO, Tx 11ax-80 (OFDMA) MIMO		5210 MHz	5290 MHz	5530 MHz 5610 MHz 5690 MHz	5775 MHz
	Tx 11ac-160 MIMO, Tx 11ax-160 (OFDM) MIMO, Tx 11ax-160 (OFDMA) MIMO		-	5250 MHz	5570 MHz	-
Maximum Power Spectral Density *4)	Tx 11a MIMO, Tx 11ac-20 MIMO, Tx 11ax-20 (OFDM) MIMO, Tx 11ax-20 (OFDMA) MIMO	ANT1 + ANT2	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz 5720 MHz	5745 MHz 5785 MHz 5825 MHz
	Tx 11ac-40 MIMO, Tx 11ax-40 (OFDM) MIMO, Tx 11ax-40 (OFDMA) MIMO		5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	5755 MHz 5795 MHz
	Tx 11ac-80 MIMO, Tx 11ax-80 (OFDM) MIMO, Tx 11ax-80 (OFDMA) MIMO		5210 MHz	5290 MHz	5530 MHz 5610 MHz 5690 MHz	5775 MHz
	Tx 11ac-160 MIMO, Tx 11ax-160 (OFDM) MIMO, Tx 11ax-160 (OFDMA) MIMO		-	5250 MHz	5570 MHz	-
Maximum Conducted Output Power	Tx 11a SISO / MIMO, Tx 11ac-20 SISO / MIMO, Tx 11ax-20 (OFDM) SISO / MIMO, Tx 11ax-20 (OFDMA) SISO / MIMO	SISO: ANT2 *2)	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz 5720 MHz	5745 MHz 5785 MHz 5825 MHz
	Tx 11ac-40 SISO / MIMO, Tx 11ax-40 (OFDM) SISO / MIMO, Tx 11ax-40 (OFDMA) SISO / MIMO	MIMO: ANT1 + ANT2	5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	5755 MHz 5795 MHz
	Tx 11ac-80 SISO / MIMO, Tx 11ax-80 (OFDM) SISO / MIMO, Tx 11ax-80 (OFDMA) SISO / MIMO		5210 MHz	5290 MHz	5530 MHz 5610 MHz 5690 MHz	5775 MHz
	Tx 11ac-160 SISO / MIMO, Tx 11ax-160 (OFDM) SISO / MIMO, Tx 11ax-160 (OFDMA) SISO / MIMO		-	5250 MHz	5570 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 *4)	Tx 11a MIMO, Tx 11ac-20 MIMO, Tx 11ax-20 (OFDM) MIMO	ANT2 *2)	-	-	-	5745 MHz 5785 MHz 5825 MHz
	Tx 11ac-40 MIMO, Tx 11ax-40 (OFDM) MIMO		-	-	-	5755 MHz 5795 MHz
	Tx 11ac-80 MIMO, Tx 11ax-80 (OFDM) MIMO		-	-	-	5775 MHz
Radiated Spurious Emission (Below 1 GHz)	Tx 11ac-20 MIMO *1)	ANT1 + ANT2	-	-	-	5825 MHz
Radiated Spurious Emission (Band edge) *3), *4)	Tx 11ax-20 (OFDMA) MIMO	ANT1 + ANT2	5180 MHz	5320 MHz	5500 MHz 5700 MHz	5745 MHz 5825 MHz
	Tx 11ax-40 (OFDMA) MIMO		5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5670 MHz	5755 MHz 5795 MHz
	Tx 11ax-80 (OFDMA) MIMO		5210 MHz	5290 MHz	5530 MHz 5610 MHz	5775 MHz
	Tx 11ax-160 (OFDMA) MIMO		-	5250 MHz	5570 MHz	-
Radiated Spurious Emission (Above 1 GHz) *4)	Tx 11ac-20 MIMO, Tx 11ax-20 (OFDM) MIMO	ANT1 + ANT2	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	Tx 11ac-40 MIMO, Tx 11ax-40 (OFDM) MIMO		5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz	5755 MHz 5795 MHz
	Tx 11ac-80 MIMO, Tx 11ax-80 (OFDM) MIMO		5210 MHz	5290 MHz	5530 MHz 5610 MHz	5775 MHz
	Tx 11ac-160 MIMO, Tx 11ax-160 (OFDM) MIMO		-	5250 MHz	5570 MHz	-
Conducted Spurious Emission	Tx 11ac-20 MIMO *1)	ANT2 *2)	-	-	-	5825 MHz
*1) The mode was tested as a representative, because it had the highest power at antenna terminal test. *2) The test was performed with the antenna that had higher power as a representative. *3) OFDMA mode was performed only at the band edge, since preliminary testing indicated that the other spurious emission was lower than OFDM mode. *4) The test was performed with MIMO mode as representative as it had higher power than SISO mode.						

Simultaneous transmission

Test Item	Operating Mode *1)	Tested Antenna
Radiated Spurious Emission	Tx 11ac-160, MIMO 5250 MHz with BT 3DH5 Hopping *2)	5 GHz WLAN: ANT1 + ANT2 BT: ANT1
	Tx 11ac-160, MIMO 5250 MHz with 11g 2462 MHz	5 GHz WLAN: ANT1 + ANT2 2.4 GHz WLAN: ANT1 + ANT2
*1) This test was conducted using a combination of the worst mode above 1 GHz in the WLAN 5 GHz spurious emissions test and the highest power mode in the antenna terminal conducted test as the representative mode. *2) *Since BT and BT LE have the same modulation method, the test was performed with BT, which has the highest power, as a representative.		

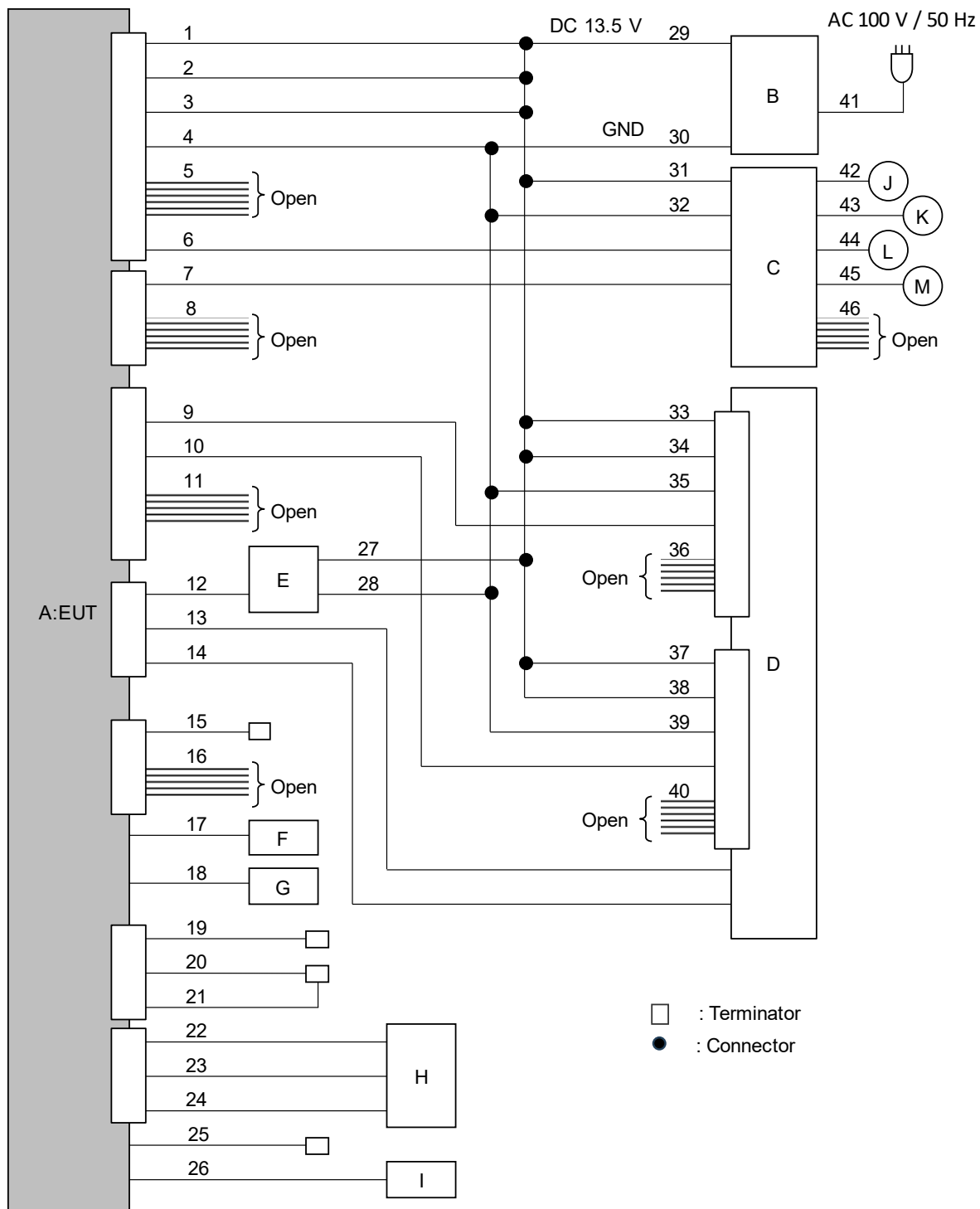
Description of EUT and Support Equipment

No.	Item	Model Number	Serial Number	Manufacturer	Remarks
A	Vehicle equipment	AH00CDC	No.022	ALPS ALPINE CO., LTD.	EUT
B	Display Unit	QH00287A	WK2 379 318	ALPS ALPINE CO., LTD.	-
C	Laptop Computer	ThinkPad E14 Gen2	PF397TQG	LENOVO	-
D	AC Adapter	ADLX65YCC2D	8SSA10R16922C 2TJ19M1368	LENOVO	-
E	Power Supply(DC)	PAN35-10A	ML002085	Kikusui Electronics Corp.	-

List of Cables Used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	IG	0.5+0.1	Unshielded	Unshielded	-
2	ACC	0.5+0.5	Unshielded	Unshielded	-
3	+B	0.5+0.5	Unshielded	Unshielded	-
4	GND	0.5+0.5	Unshielded	Unshielded	-
5	Signal	0.5	Unshielded	Unshielded	-
6	CENTER DISP CONT	0.5	Unshielded	Unshielded	-
7	METER DISP CONT	0.5	Unshielded	Unshielded	-
8	Signal	0.5	Unshielded	Unshielded	-
9	GVIF	0.5	Shielded	Shielded	-
10	GMLS	0.5	Shielded	Shielded	-
11	Signal	0.5	Shielded	Shielded	-
12	USB	0.45 + 2.0	Shielded	Shielded	-
13	DC(+)	1.5	Unshielded	Unshielded	-
14	GND	1.5	Unshielded	Unshielded	-
15	IG1 CID	0.9	Unshielded	Unshielded	-
16	+B CID	0.9	Unshielded	Unshielded	-
17	GND	0.9	Unshielded	Unshielded	-
18	CENTER DISP CONT	0.9	Unshielded	Unshielded	-
19	Signal	0.9	Unshielded	Unshielded	-
20	IG1 METER	0.9	Unshielded	Unshielded	-
21	+B METER	0.9	Unshielded	Unshielded	-
22	GND	0.9	Unshielded	Unshielded	-
23	METER DISP CONT	0.9	Unshielded	Unshielded	-
24	Signal	0.9	Unshielded	Unshielded	-
25	DC	1.8	Unshielded	Unshielded	-
26	AC	0.9	Unshielded	Unshielded	-
27	AC	2.0	Unshielded	Unshielded	-

[Radiated Emission test]



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

Description of EUT and Support Equipment

No.	Item	Model Number	Serial Number	Manufacturer	Remarks
A	Vehicle equipment	AH00CDC	No.030	ALPS ALPINE CO., LTD.	EUT
B	Power Supply(DC)	PAN35-10A	CY002948	KIKUSUI	-
C	Amplifier	AMP ASSY 17CH	No.03	HARMAN	-
D	Display Unit	QH00287A	E239Z1QH00 287A26000062	ALPS ALPINE CO., LTD.	-
E	Ether Jig	-	-	-	-
F	USB Memory	USM4GL-W	-	Sony Corporation	-
G	GPS Antenna	8B550-T20-A111- M1-03N10907	-	ALPS ALPINE CO., LTD.	-
H	HUD Jig	-	-	-	-
I	Tablet Computer	JDN2-L09	D89E61C92966	Huawei	-
J	Speaker	KFC-RS160	-	KENWOOD	-
K	Speaker	KFC-RS160	-	KENWOOD	-
L	Speaker	KFC-RS160	-	KENWOOD	-
M	Speaker	KFC-RS160	-	KENWOOD	-

List of Cables Used [1/2]

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	IG	0.5+0.2	Unshielded	Unshielded	-
2	ACC	0.5+0.1	Unshielded	Unshielded	-
3	+B	0.5+0.5	Unshielded	Unshielded	-
4	GND	0.5+0.2	Unshielded	Unshielded	-
5	Signal	0.5+1.0	Unshielded	Unshielded	-
6	SWD +B	0.5+1.0	Unshielded	Unshielded	-
7	A2B AUDIO B+/-	0.5+1.0	Unshielded	Unshielded	-
8	Signal	0.5+1.0	Unshielded	Unshielded	-
9	CTR DISP CONT	0.5+1.0	Unshielded	Unshielded	-
10	METER DISP CONT	0.5+1.0	Unshielded	Unshielded	-
11	Signal	0.5+1.0	Unshielded	Unshielded	-
12	Ether	2.2+0.6	Shielded	Shielded	-
13	GVIF	2.2	Shielded	Shielded	-
14	GMLS	2.2	Shielded	Shielded	-
15	Camera	1.1	Shielded	Shielded	-
16	Camera	1.1	Shielded	Shielded	-
17	USB	0.5+2.0	Shielded	Shielded	-
18	GPS	0.4+0.4	Shielded	Shielded	-
19	FM/AM	0.2+2.0	Shielded	Shielded	Main
20	FM/AM	0.3	Shielded	Shielded	Sub
21	AMT+B	0.2+1.0	Unshielded	Unshielded	-
22	Signal	0.8	Shielded	Shielded	-
23	DC(+)	0.8	Unshielded	Unshielded	-
24	GND	0.8	Unshielded	Unshielded	-
25	SiriusXM	0.5+2.0	Shielded	Shielded	-
26	HDMI	0.2+2.9	Shielded	Shielded	-
27	DC(+)	0.5+0.4	Unshielded	Unshielded	-
28	GND	0.5+0.2	Unshielded	Unshielded	-
29	DC(+)	1.5	Unshielded	Unshielded	-
30	GND	1.5	Unshielded	Unshielded	-
31	DC(+)	1.0+0.9	Unshielded	Unshielded	-
32	GND	1.0+0.5	Unshielded	Unshielded	-
33	IG1 CID	1.0+0.4	Unshielded	Unshielded	-
34	+B CID	1.0+0.6	Unshielded	Unshielded	-
35	GND	1.0+0.1	Unshielded	Unshielded	-
36	Signal	1.0	Unshielded	Unshielded	-

List of Cables Used [2/2]

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
37	IG1 METER	1.0+0.3	Unshielded	Unshielded	-
38	+B METER	1.0+0.7	Unshielded	Unshielded	-
39	GND	1.0+0.3	Unshielded	Unshielded	-
40	Signal	1.0	Unshielded	Unshielded	-
41	AC	2.9	Unshielded	Unshielded	-
42	Speaker	1.0+2.0	Unshielded	Unshielded	-
43	Speaker	1.0+2.0	Unshielded	Unshielded	-
44	Speaker	1.0+2.0	Unshielded	Unshielded	-
45	Speaker	1.0+2.0	Unshielded	Unshielded	-
46	Signal	1.0	Unshielded	Unshielded	-

SECTION 5: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

< Below 1 GHz >

EUT was placed on a urethane platform of nominal size, 1.0 m by 2.0 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 1 GHz >

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. 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 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.

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 1 GHz >

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

< Above 1 GHz >

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 U-NII-3 band 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 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.

Figure 2: Test Setup

Below 1 GHz	
Measuring Antenna (Loop / Biconical / Logperiodic) Test distance Attenuator Amp Test Receiver x : Center of turn table	Test Distance: 3 m
1 GHz to 10 GHz	
Measuring Antenna (Horn) Test distance Attenuator or Filter Amp Spectrum Analyzer SVSWR Volume r : Radius of an outer periphery of EUT x : Center of turn table	$\text{Distance Factor: } 20 \times \log(3.87 \text{ m}^* / 3.0 \text{ m}) = 2.22 \text{ dB}$ $\text{*}(\text{Test Distance} + \text{SVSWR Volume} / 2) - r = 3.87 \text{ m}$ Test Distance: 3 m SVSWR Volume: 2 m (SVSWR Volume has been calibrated based on CISPR 16-1-4.) r: 0.13 m
10 GHz to 40 GHz	
Measuring Antenna (Horn) Test distance 1 m Amp Spectrum Analyzer x : Center of turn table	$\text{Distance Factor: } 20 \times \log(1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$ *Test Distance: 1 m

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

Measurement Range : 30 MHz to 40 GHz
 Test Data : APPENDIX
 Test Result : Pass

SECTION 6: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
26 dB Bandwidth	Enough to capture the emission	Close to 1 % of EBW	> RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 % to 5 % of OBW	≥ 3 RBW	Auto	Peak	Max Hold	Spectrum Analyzer
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: 160 MHz BW) (Method PM-G)
Maximum Power Spectral Density	Encompass the entire EBW	1 MHz or 470 kHz *2)	≥ 3 RBW	Auto	RMS or Sample Power Averaging (300 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*3) *4)	9 kHz to 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz to 30 MHz	10 kHz	30 kHz				

*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 not detected as shown in the chart.

(9 kHz to 150 kHz: RBW = 200 Hz, 150 kHz to 30 MHz: RBW = 10 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.

Test results are rounded off and limit are rounded down, 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

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx			
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Date	Test Place	Temperature	Humidity	Engineer
January 14, 2025	SR5	20 deg.C	45 %RH	Shiro Kobayashi

11a, MIMO

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5180	-	16595.2
5220	-	16641.6
5240	-	16607.6
5260	20.619	16610.7
5300	21.493	16596.4
5320	21.188	16591.0
5500	20.787	16611.8
5580	20.668	16585.6
5700	21.419	16572.3
5720	20.771	16611.3
5745	-	16562.1
5785	-	16607.7
5825	-	16603.9

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
------	----

Date	Test Place	Temperature	Humidity	Engineer
January 14, 2025	SR5	20 deg.C	45 %RH	Shiro Kobayashi

11ac-20, MIMO

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5180	-	17817.4
5220	-	17813.4
5240	-	17819.8
5260	22.257	17825.1
5300	22.369	17832.9
5320	22.240	17839.6
5500	21.863	17821.0
5580	22.536	17820.5
5700	22.181	17824.0
5720	22.270	17828.5
5745	-	17828.0
5785	-	17815.3
5825	-	17825.0

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 14, 2025	SR5	20 deg.C	45 %RH	Shiro Kobayashi

11ax-20(OFDM), MIMO

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5180	-	19080.4
5220	-	19083.0
5240	-	19087.8
5260	23.039	19073.5
5300	22.789	19078.9
5320	22.960	19097.2
5500	22.719	19088.8
5580	22.755	19067.3
5700	22.797	19071.3
5720	23.102	19080.6
5745	-	19074.6
5785	-	19081.5
5825	-	19098.9

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 15, 2025	SR5	19 deg.C	53 %RH	Shiro Kobayashi

11ax-20(OFDMA), 26-tone RU, MIMO

Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5180	0	-	18597.6
5220	4	-	17178.5
5240	8	-	18325.6
5260	0	20.473	18601.7
5300	4	18.469	17183.3
5320	8	20.107	18381.2
5500	0	20.433	18602.6
5580	4	18.454	17164.0
5700	8	20.045	18321.4
5720	8	20.067	18320.3
5745	0	-	18607.4
5785	4	-	17175.1
5825	8	-	18342.8

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 15, 2025	SR5	19 deg.C	53 %RH	Shiro Kobayashi

11ax-20(OFDMA), 52-tone RU, MIMO

Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5180	37	-	18212.1
5220	38	-	17212.4
5240	40	-	18331.6
5260	37	20.263	18201.8
5300	38	18.901	17225.1
5320	40	20.630	18378.5
5500	37	20.247	18206.1
5580	38	18.790	17187.4
5700	40	20.530	18337.1
5720	40	20.545	18326.7
5745	37	-	18199.0
5785	38	-	17200.5
5825	40	-	18335.8

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 15, 2025	SR5	19 deg.C	53 %RH	Shiro Kobayashi

11ax-20(OFDMA), 106-tone RU, MIMO

Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5180	53	-	18213.8
5220	53	-	18201.6
5240	54	-	18273.8
5260	53	20.738	18194.1
5300	53	20.804	18197.1
5320	54	20.338	18309.6
5500	53	20.764	18210.5
5580	53	20.754	18206.3
5700	54	20.260	18274.2
5720	54	20.261	18272.0
5745	53	-	18196.7
5785	53	-	18202.5
5825	54	-	18267.8

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20(OFDMA), 242-tone RU, MIMO

Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5180	61	-	19051.5
5220	61	-	19054.6
5240	61	-	19043.2
5260	61	22.425	19045.9
5300	61	22.387	19053.1
5320	61	22.523	19074.7
5500	61	22.377	19063.5
5580	61	22.529	19061.9
5700	61	22.401	19051.7
5720	61	22.306	19038.0
5745	61	-	19050.8
5785	61	-	19043.2
5825	61	-	19058.3

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx			
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Date	Test Place	Temperature	Humidity	Engineer
January 14, 2025	SR5	20 deg.C	45 %RH	Shiro Kobayashi

11ac-40, MIMO

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5190	-	36651.4
5230	-	36645.1
5270	44.562	36638.9
5310	44.995	36647.5
5510	44.903	36657.1
5550	44.479	36641.0
5670	44.683	36627.6
5710	44.975	36671.5
5755	-	36635.0
5795	-	36661.3

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 14, 2025	SR5	20 deg.C	45 %RH	Shiro Kobayashi

11ax-40(OFDM), MIMO

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5190	-	38028.6
5230	-	38037.3
5270	44.818	38033.3
5310	44.697	38042.1
5510	45.198	38057.6
5550	44.707	38027.6
5670	44.528	38005.5
5710	44.841	38015.9
5755	-	38021.6
5795	-	38028.3

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 15, 2025	SR5	19 deg.C	53 %RH	Shiro Kobayashi

11ax-40(OFDMA), 26-tone RU, MIMO

Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5190	0	-	38202.3
5230	17	-	38530.3
5270	0	40.607	38145.4
5310	17	40.345	38060.8
5510	0	40.675	38136.3
5550	8	38.208	36385.4
5670	17	40.306	38060.3
5710	17	40.181	38011.8
5755	0	-	38166.4
5795	17	-	38101.4

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
------	----

Date	Test Place	Temperature	Humidity	Engineer
January 16, 2025	SR5	21 deg.C	25 %RH	Shiro Kobayashi

11ax-40(OFDMA), 52-tone RU, MIMO

Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5190	37	-	37688.6
5230	44	-	38030.1
5270	37	40.920	37647.7
5310	44	41.385	38096.5
5510	37	40.897	37699.6
5550	40	38.537	36502.2
5670	44	41.284	38040.8
5710	44	41.264	38035.3
5755	37	-	37686.8
5795	44	-	38049.3

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
------	----

Date	Test Place	Temperature	Humidity	Engineer
January 16, 2025	SR5	21 deg.C	25 %RH	Shiro Kobayashi

11ax-40(OFDMA), 106-tone RU, MIMO

Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5190	53	-	37483.6
5230	56	-	37487.6
5270	53	41.447	37470.8
5310	56	41.593	37555.5
5510	53	41.475	37502.3
5550	54	39.195	36524.6
5670	56	41.487	37531.1
5710	56	41.533	37514.9
5755	53	-	37485.9
5795	56	-	37504.0

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 16, 2025	SR5	21 deg.C	25 %RH	Shiro Kobayashi

11ax-40(OFDMA), 242-tone RU, MIMO

Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5190	61	-	37394.7
5230	62	-	37467.2
5270	61	41.830	37372.6
5310	62	42.843	37504.9
5510	61	41.852	37396.3
5550	61	41.630	37399.8
5670	62	42.781	37489.9
5710	62	42.729	37502.5
5755	61	-	37368.7
5795	62	-	37480.4

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 16, 2025	SR5	21 deg.C	25 %RH	Shiro Kobayashi

11ax-40(OFDMA), 484-tone RU, MIMO

Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5190	65	-	38054.0
5230	65	-	38044.5
5270	65	43.675	38040.3
5310	65	43.946	38062.4
5510	65	43.672	38073.0
5550	65	43.621	38054.9
5670	65	43.539	38048.4
5710	65	43.655	38051.0
5755	65	-	38051.2
5795	65	-	38044.8

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx			
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Date	Test Place	Temperature	Humidity	Engineer
January 14, 2025	SR5	20 deg.C	45 %RH	Shiro Kobayashi

11ac-80, MIMO

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5210	-	76354.8
5290	89.450	76247.1
5530	89.839	76283.1
5610	89.879	76349.4
5690	89.866	76275.9
5775	-	76281.7

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 14, 2025	SR5	20 deg.C	45 %RH	Shiro Kobayashi

11ax-80(OFDM), MIMO

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5210	-	77768.3
5290	90.505	77739.6
5530	90.191	77810.5
5610	90.149	77753.0
5690	90.060	77709.4
5775	-	77725.8

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 16, 2025	SR5	21 deg.C	25 %RH	Shiro Kobayashi

11ax-80(OFDMA), 26-tone RU, MIMO

Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5210	0	-	79003.2
5290	36	81.821	78264.0
5530	0	82.501	79010.1
5610	18	78.428	75148.4
5690	36	82.169	78505.5
5775	0	-	78985.9
	36	-	78511.7

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 16, 2025	SR5	21 deg.C	25 %RH	Shiro Kobayashi

11ax-80(OFDMA), 52-tone RU, MIMO

Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5210	37	-	77926.4
5290	52	83.632	78767.1
5530	37	82.519	77963.4
5610	44	78.649	75155.2
5690	52	83.605	78708.0
5775	37	-	77925.5
	52	-	78705.6

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 16, 2025	SR5	21 deg.C	25 %RH	Shiro Kobayashi

11ax-80(OFDMA), 106-tone RU, MIMO

Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5210	53	-	77986.3
5290	60	84.742	77730.9
5530	53	83.914	77822.8
5610	56	79.668	75586.2
5690	60	84.711	77793.9
5775	53	-	77905.3
	60	-	77792.4

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 16, 2025	SR5	21 deg.C	25 %RH	Shiro Kobayashi

11ax-80(OFDMA), 242-tone RU, MIMO

Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5210	61	-	77142.2
5290	64	84.659	76969.4
5530	61	84.499	77137.9
5610	62	79.823	75303.4
5690	64	85.138	76995.3
5775	61	-	77127.7
	64	-	77003.9

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 16, 2025	SR5	21 deg.C	25 %RH	Shiro Kobayashi

11ax-80(OFDMA), 484-tone RU, MIMO

Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5210	65	-	76752.1
5290	66	85.616	76715.4
5530	65	83.593	76746.8
5610	66	85.474	76751.3
5690	66	85.569	76725.4
5775	65	-	76737.1
	66	-	76729.5

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx			
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Date	Test Place	Temperature	Humidity	Engineer
January 16, 2025	SR5	21 deg.C	25 %RH	Shiro Kobayashi

11ax-80(OFDMA), 996-tone RU, MIMO

Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5210	67	-	77852.2
5290	67	89.789	77839.4
5530	67	89.858	77895.8
5610	67	89.977	77914.7
5690	67	89.687	77874.4
5775	67	-	77864.9

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx			
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Date	Test Place	Temperature	Humidity	Engineer
January 15, 2025	SR5	19 deg.C	53 %RH	Shiro Kobayashi

11ac-160, MIMO

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5250	174.461	155641.7
5570	174.262	155642.0

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 15, 2025	SR5	19 deg.C	53 %RH	Shiro Kobayashi

11ax-160(OFDM), MIMO

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5250	173.182	157087.2
5570	174.996	157249.0

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 17, 2025	SR5	21 deg.C	37 %RH	Shiro Kobayashi

11ax-160(OFDMA), 26-tone RU, MIMO

Tested Frequency [MHz]	Segment	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5250	0	0	164.886	170476.6
	1	36	164.052	165153.5
5570	0	0	164.677	163832.5
	1	36	164.039	162967.7

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 17, 2025	SR5	21 deg.C	37 %RH	Shiro Kobayashi

11ax-160(OFDMA), 52-tone RU, MIMO

Tested Frequency [MHz]	Segment	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5250	0	37	163.957	158231.1
	1	52	165.621	159304.5
5570	0	37	164.000	158243.7
	1	52	165.547	159240.5

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 17, 2025	SR5	21 deg.C	37 %RH	Shiro Kobayashi

11ax-160(OFDMA), 106-tone RU, MIMO

Tested Frequency [MHz]	Segment	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5250	0	53	166.730	159469.2
	1	60	166.573	159221.0
5570	0	53	167.001	158288.9
	1	60	166.406	158300.8

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 17, 2025	SR5	21 deg.C	37 %RH	Shiro Kobayashi

11ax-160(OFDMA), 242-tone RU, MIMO

Tested Frequency [MHz]	Segment	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5250	0	61	169.688	158810.1
	1	64	166.810	157768.0
5570	0	61	168.261	156993.8
	1	64	166.521	157036.5

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 17, 2025	SR5	21 deg.C	37 %RH	Shiro Kobayashi

11ax-160(OFDMA), 484-tone RU, MIMO

Tested Frequency [MHz]	Segment	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5250	0	65	169.082	157290.7
	1	66	170.490	157053.7
5570	0	65	170.271	156340.4
	1	66	168.950	156920.0

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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Date	Test Place	Temperature	Humidity	Engineer
January 17, 2025	SR5	21 deg.C	37 %RH	Shiro Kobayashi

11ax-160(OFDMA), 996-tone RU, MIMO

Tested Frequency [MHz]	Segment	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5250	0	67	172.546	156127.5
	1	67	168.107	156065.4
5570	0	67	172.335	156121.2
	1	67	168.451	156185.1

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Mode	Tx
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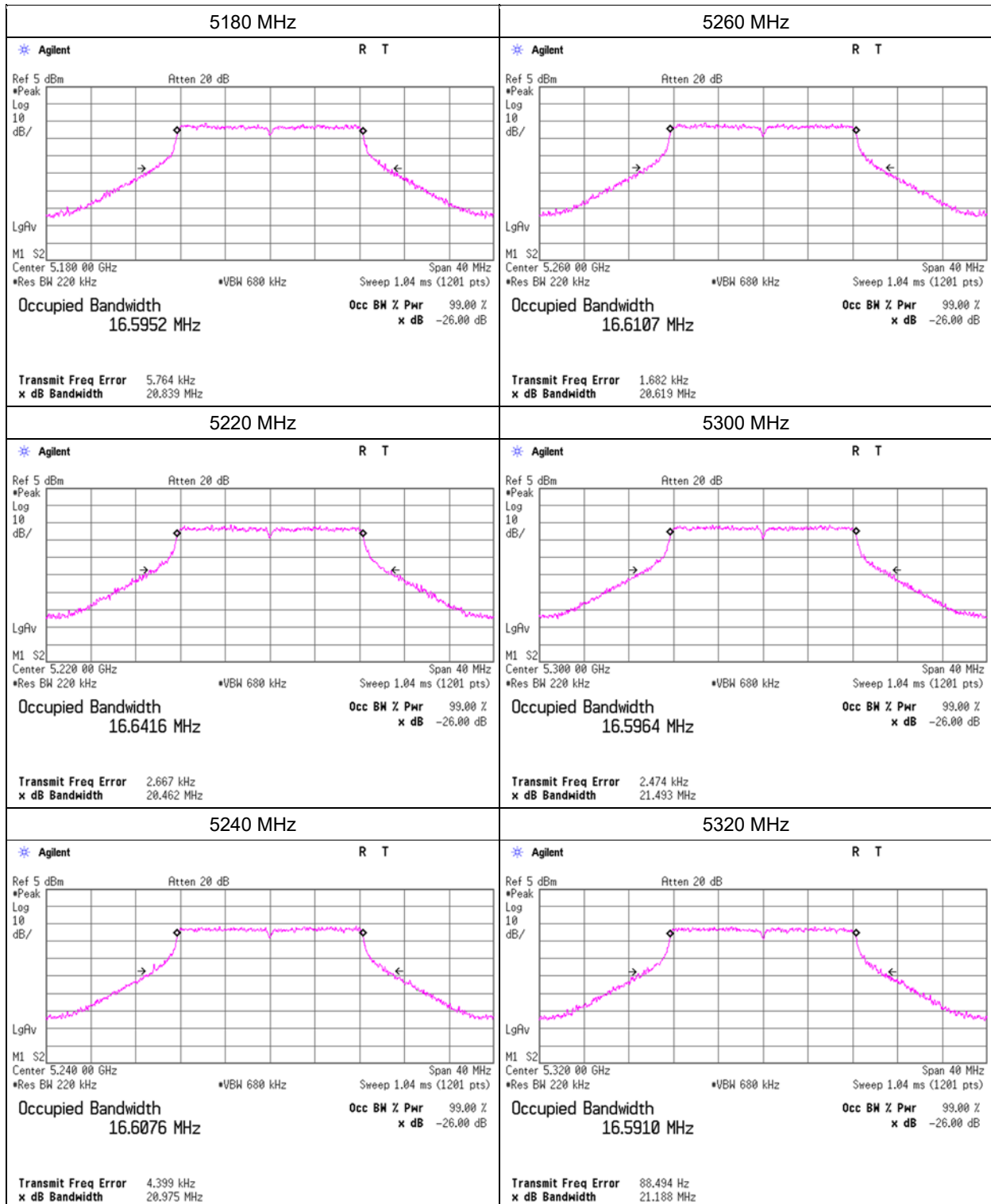
Date	Test Place	Temperature	Humidity	Engineer
January 17, 2025	SR5	21 deg.C	37 %RH	Shiro Kobayashi

11ax-160(OFDMA), 2x996-tone RU, MIMO

Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5250	68	172.705	156744.6
5570	68	172.768	156789.9

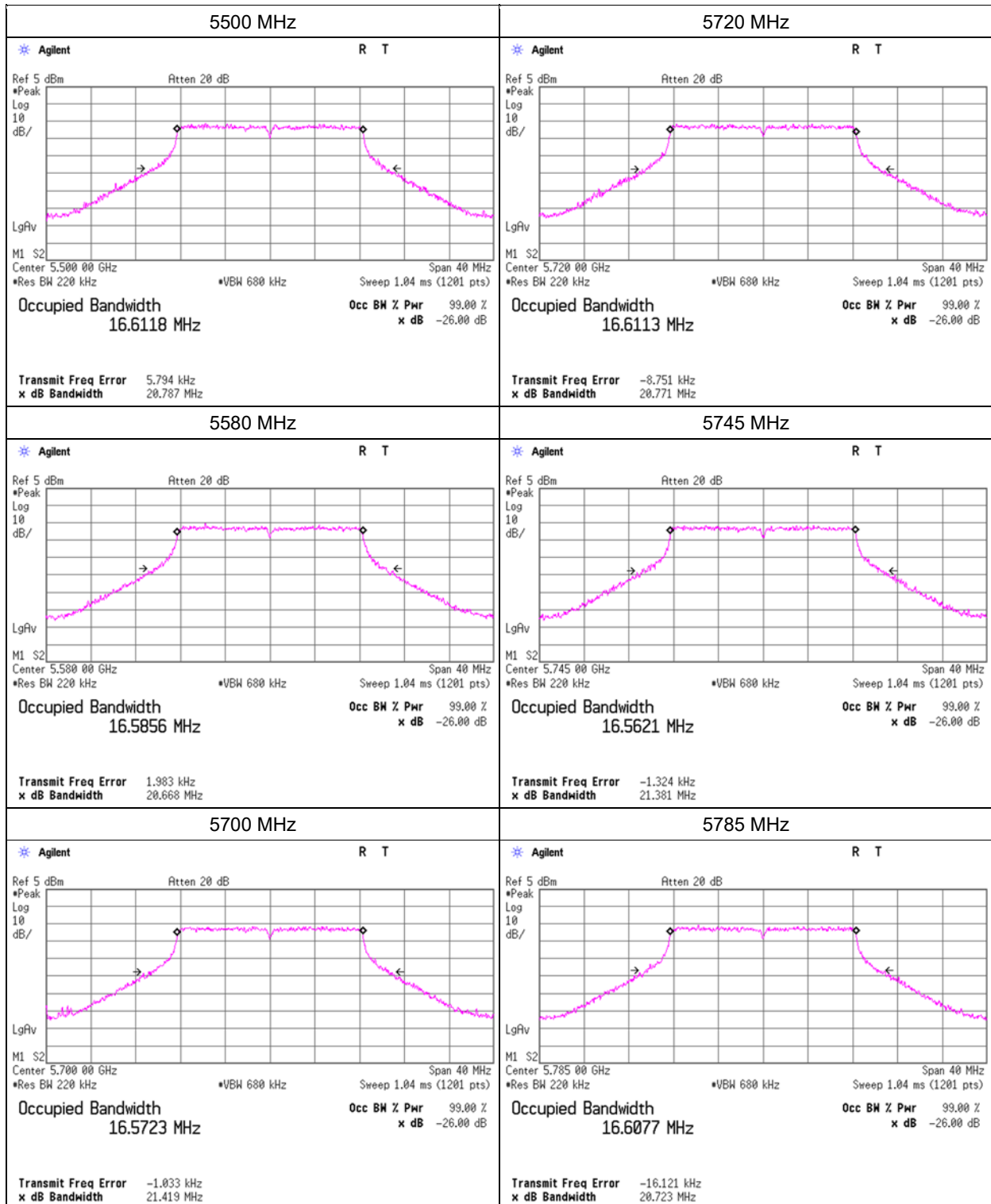
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11a, MIMO



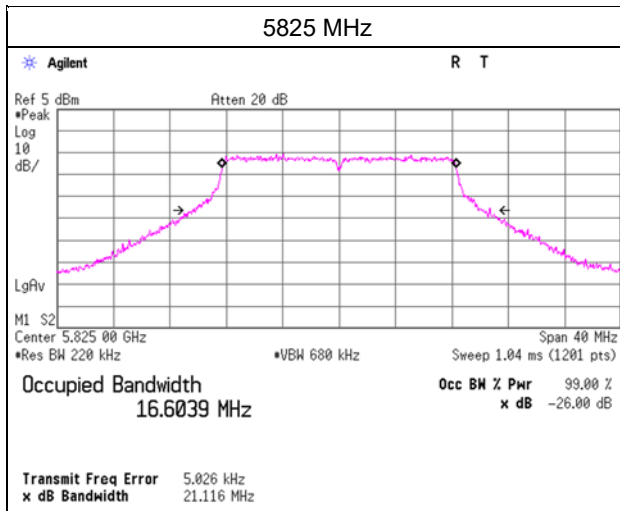
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11a, MIMO



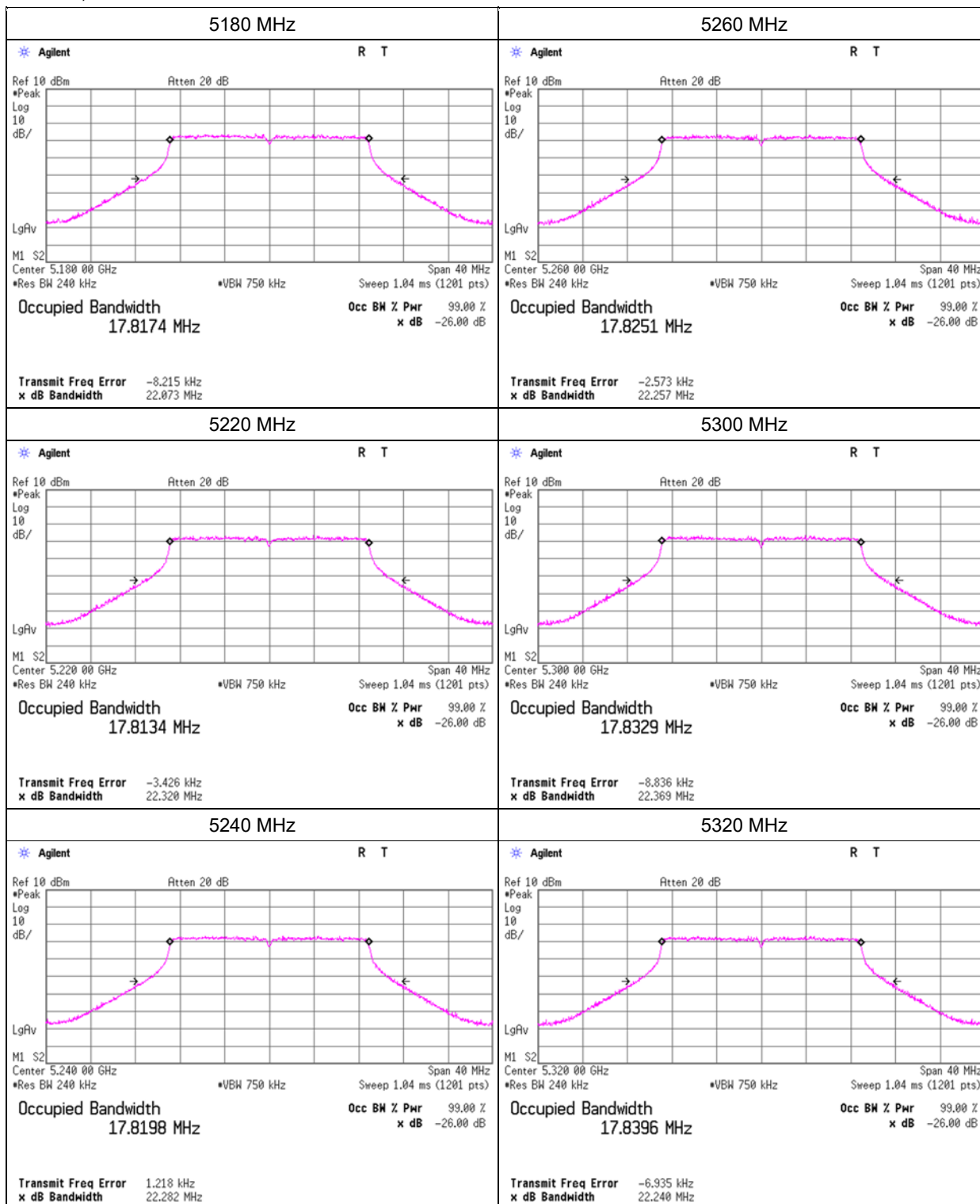
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11a, MIMO



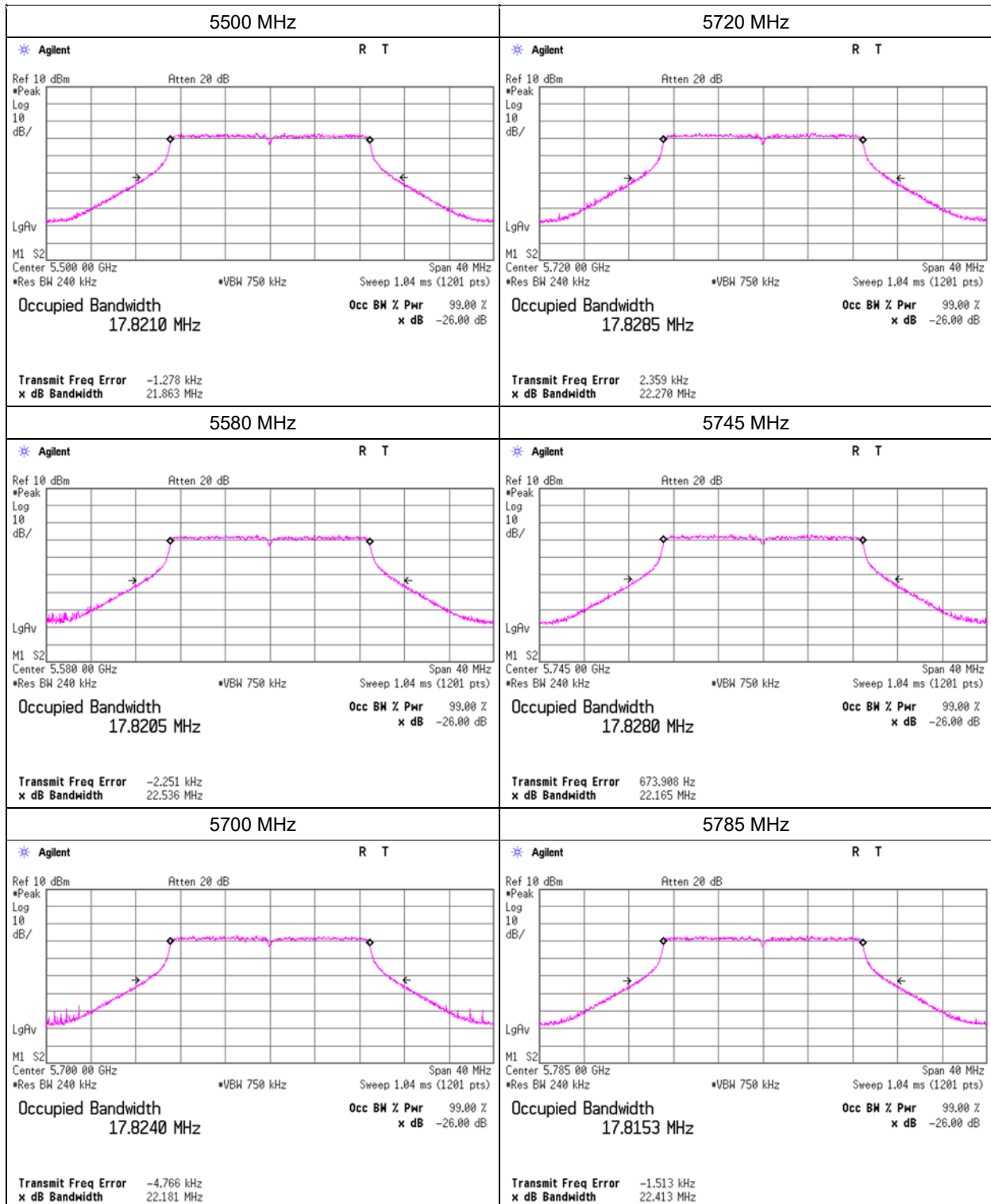
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ac-20, MIMO



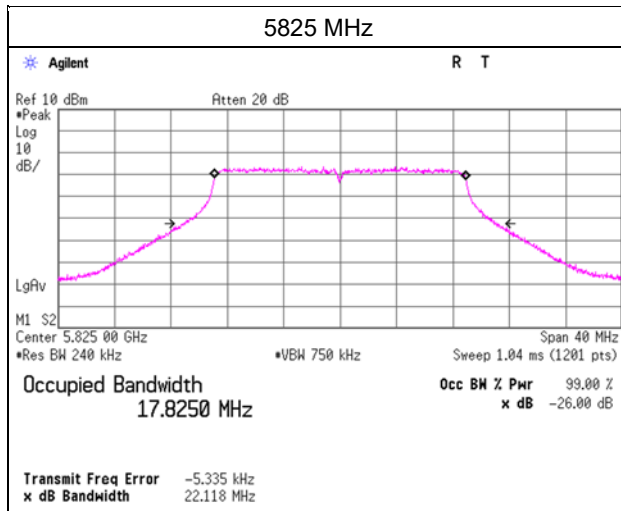
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ac-20, MIMO



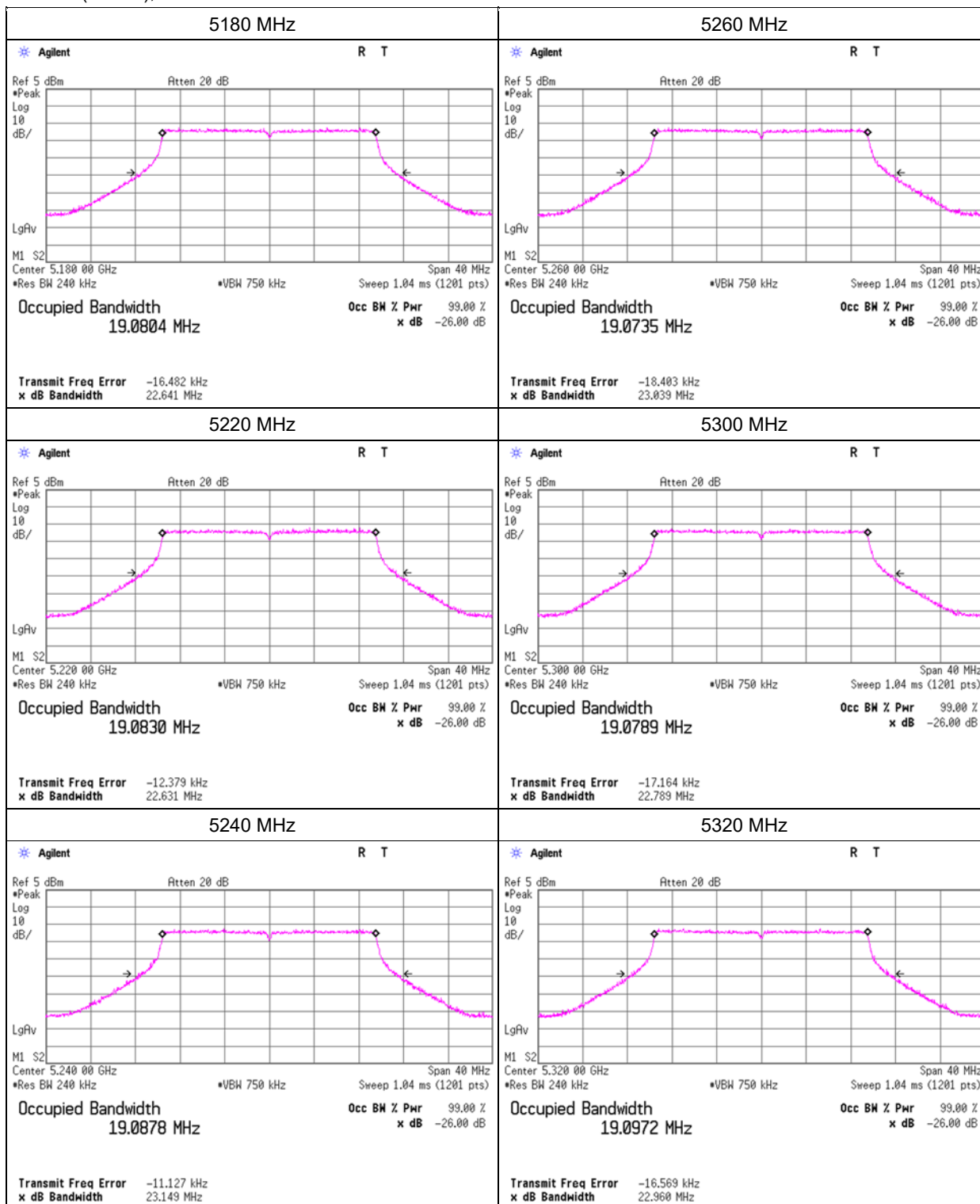
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ac-20, MIMO



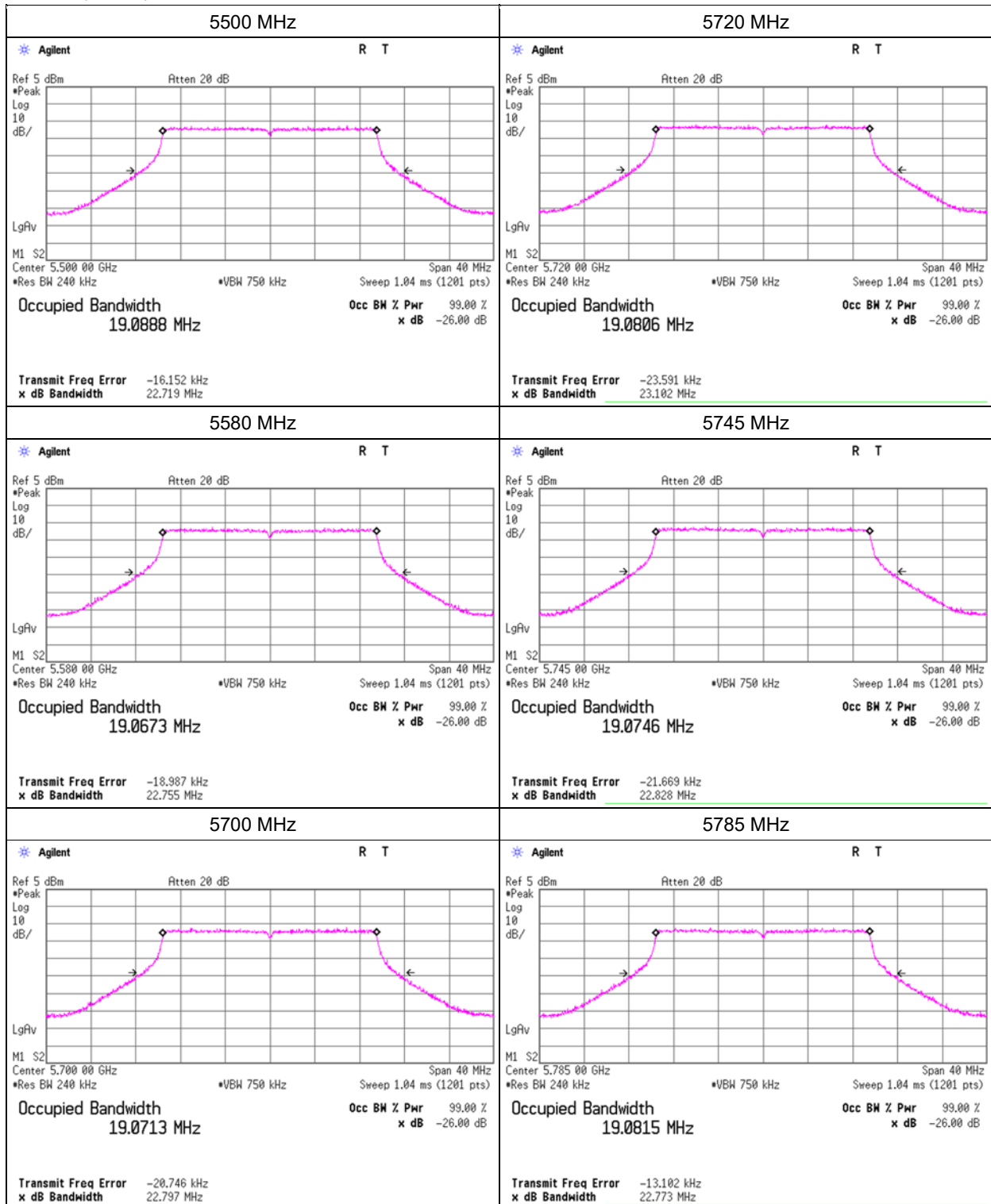
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20(OFDM), MIMO



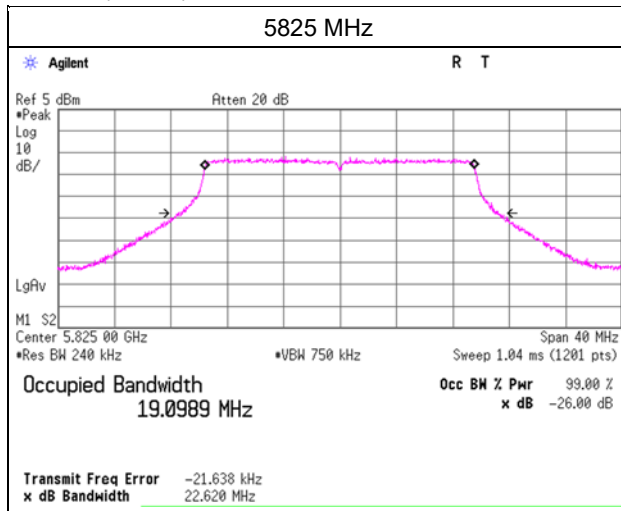
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20(OFDM), MIMO



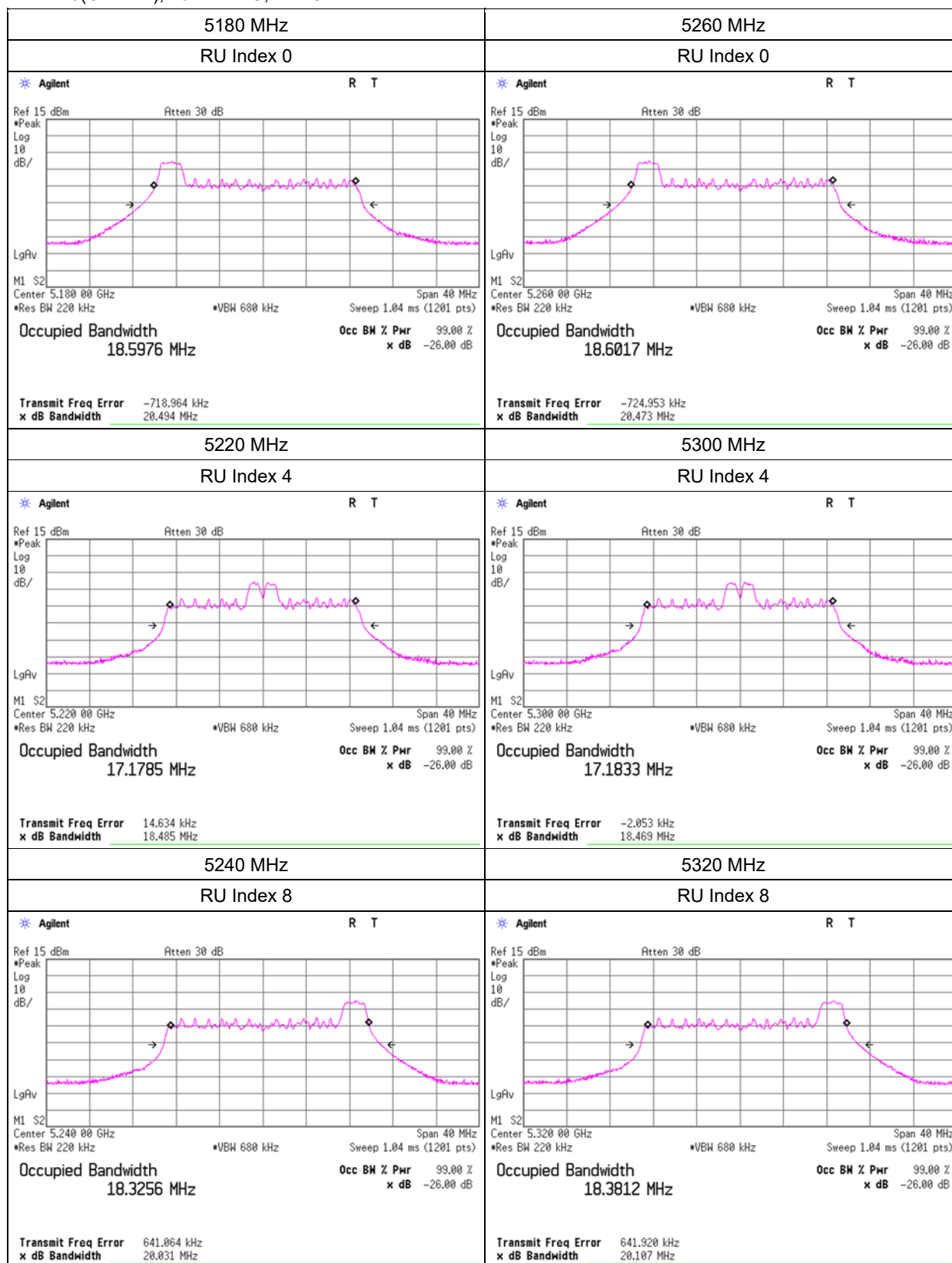
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20(OFDM), MIMO



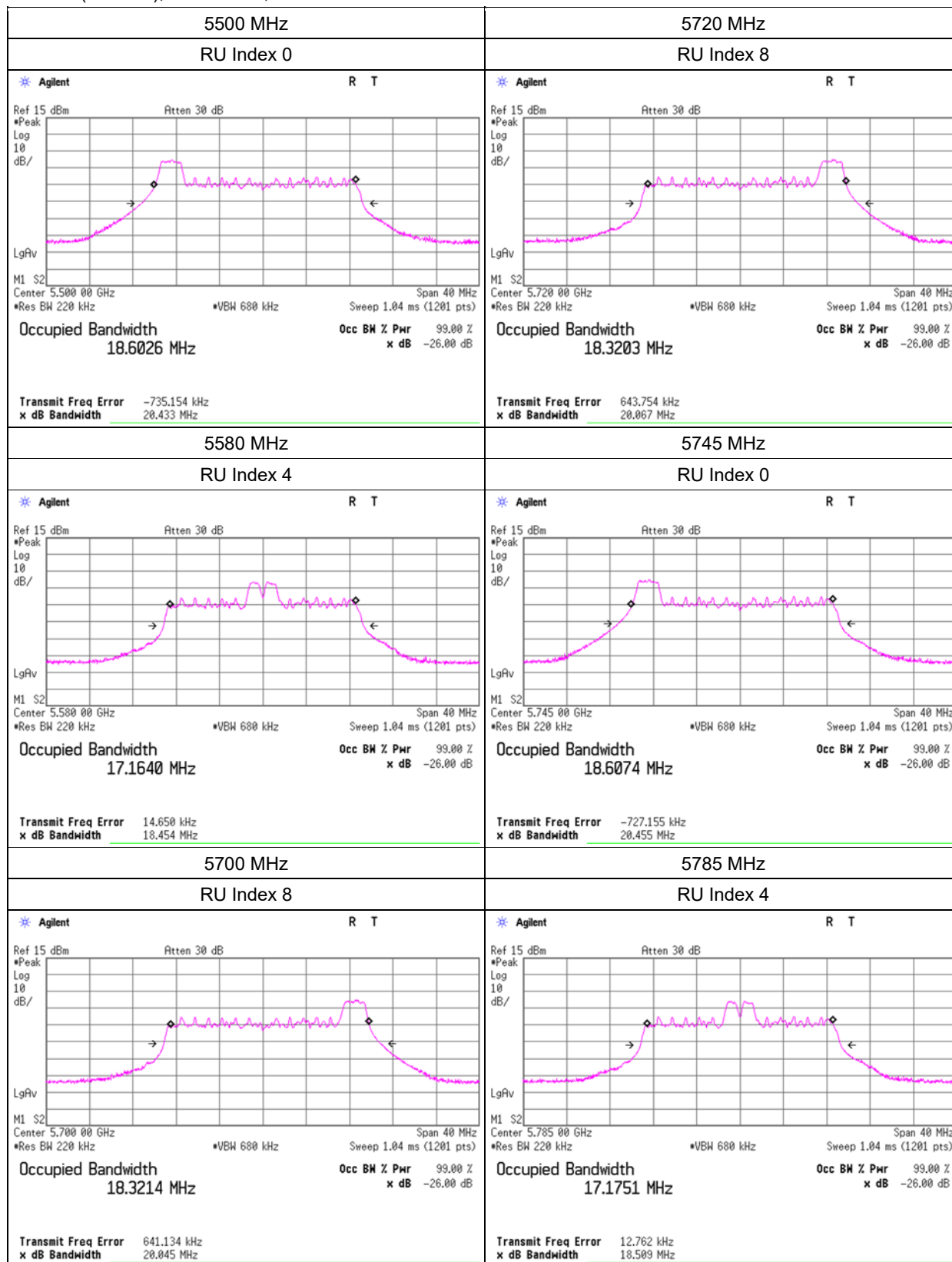
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20(OFDMA), 26-tone RU, MIMO



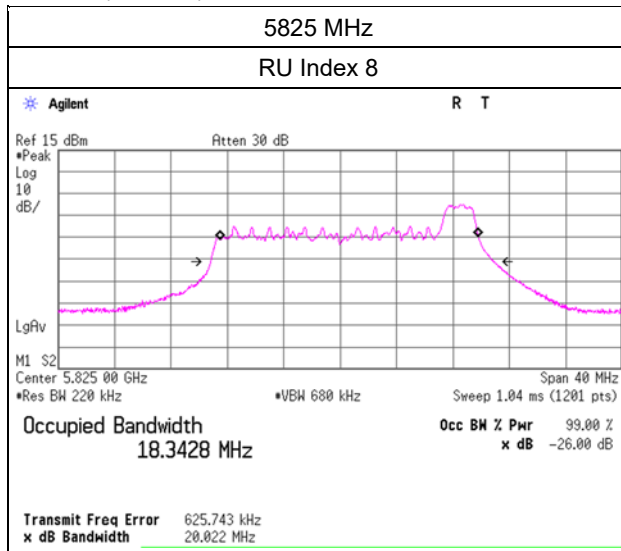
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20(OFDMA), 26-tone RU, MIMO



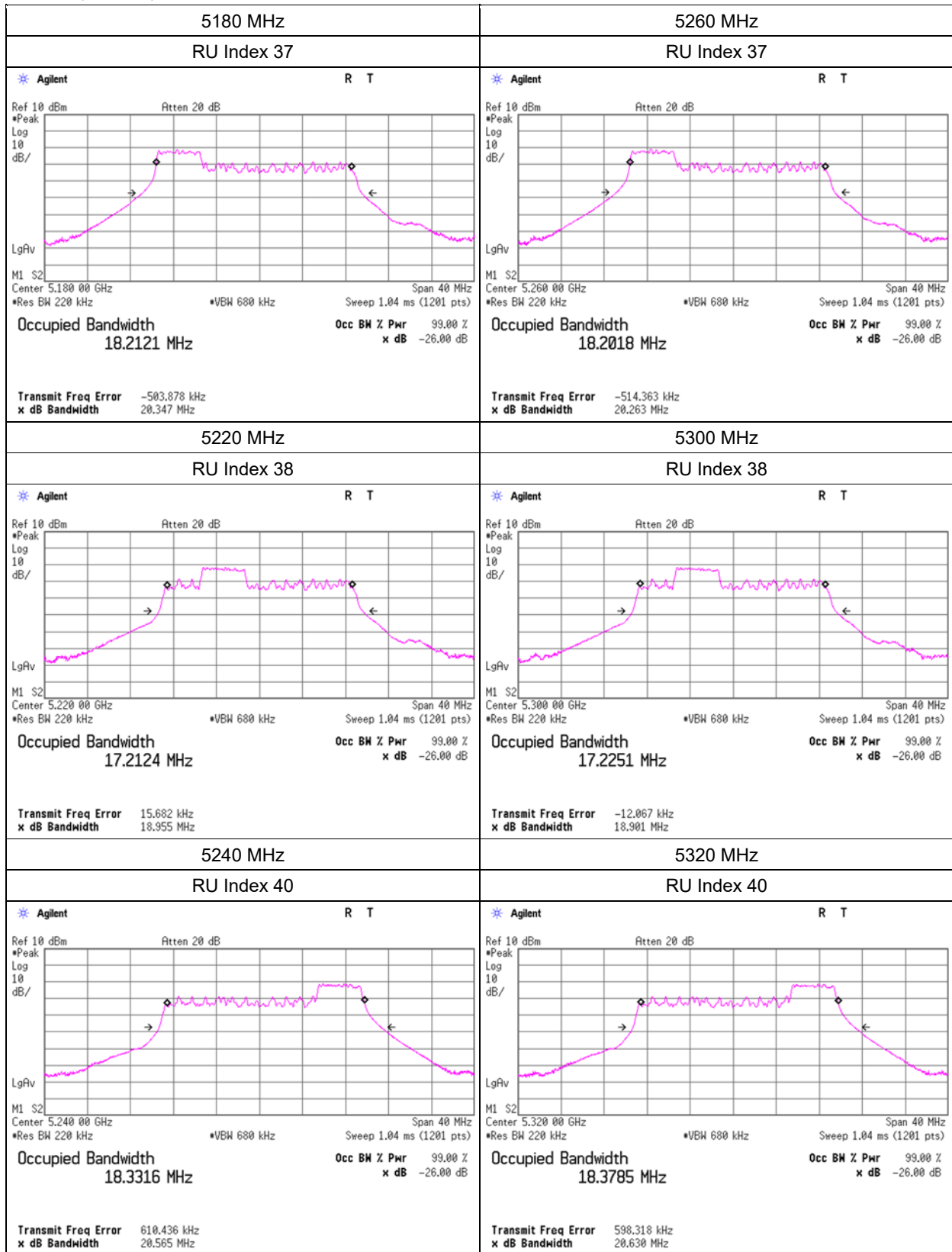
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20(OFDMA), 26-tone RU, MIMO



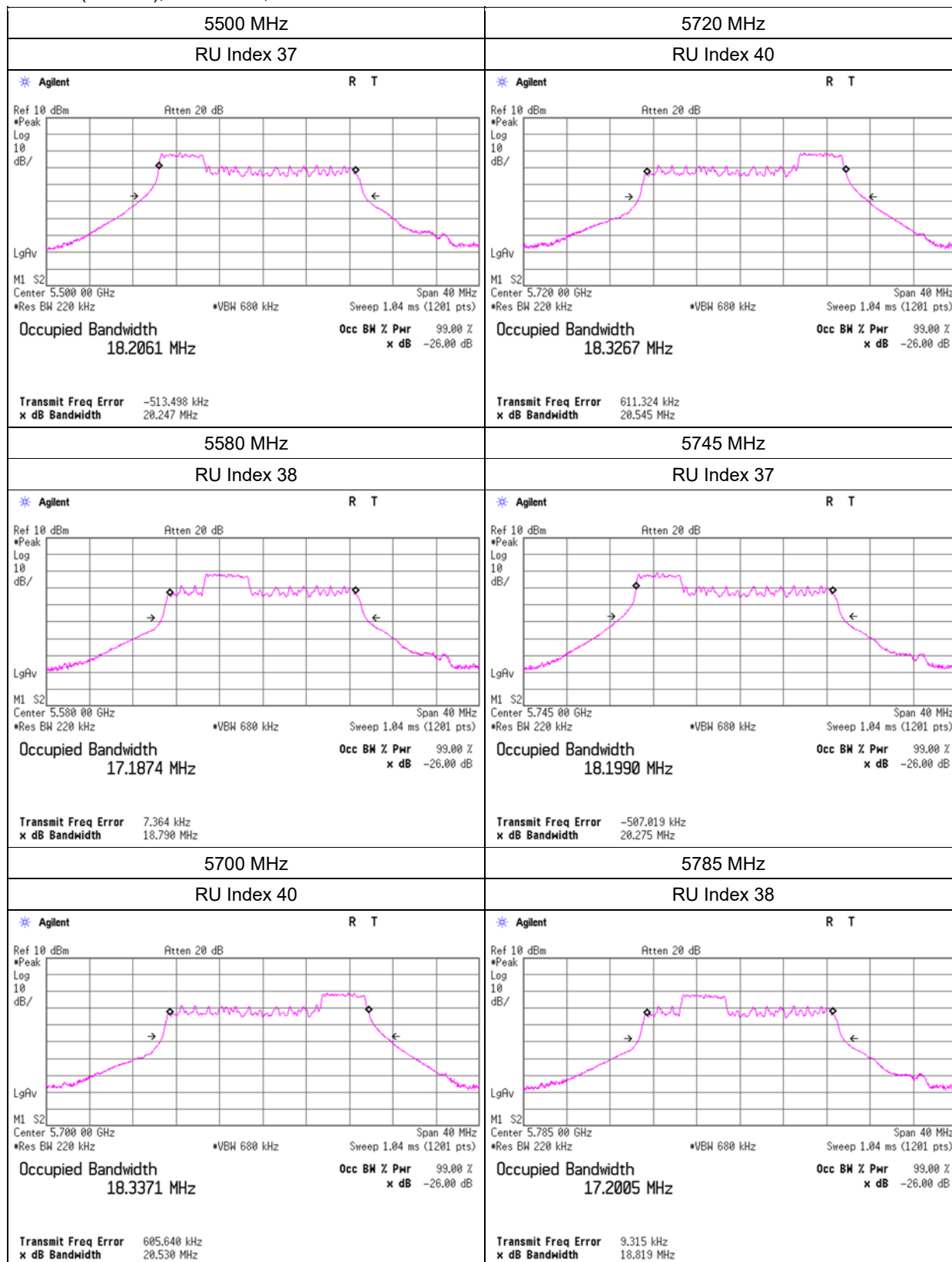
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20(OFDMA), 52-tone RU, MIMO



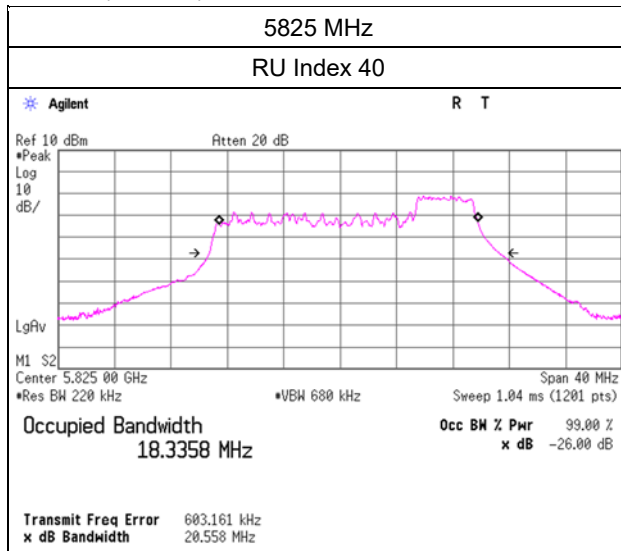
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20(OFDMA), 52-tone RU, MIMO



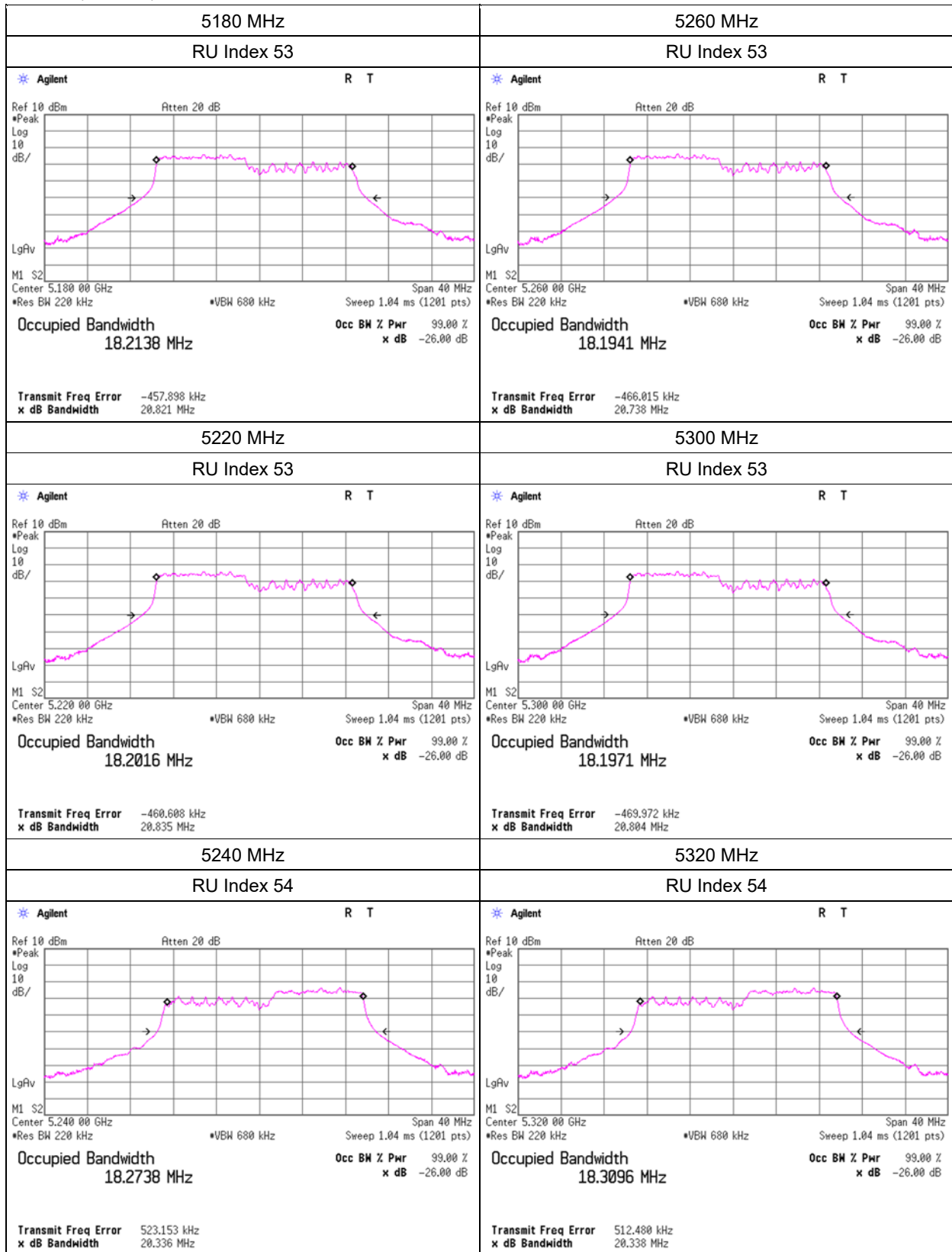
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20(OFDMA), 52-tone RU, MIMO



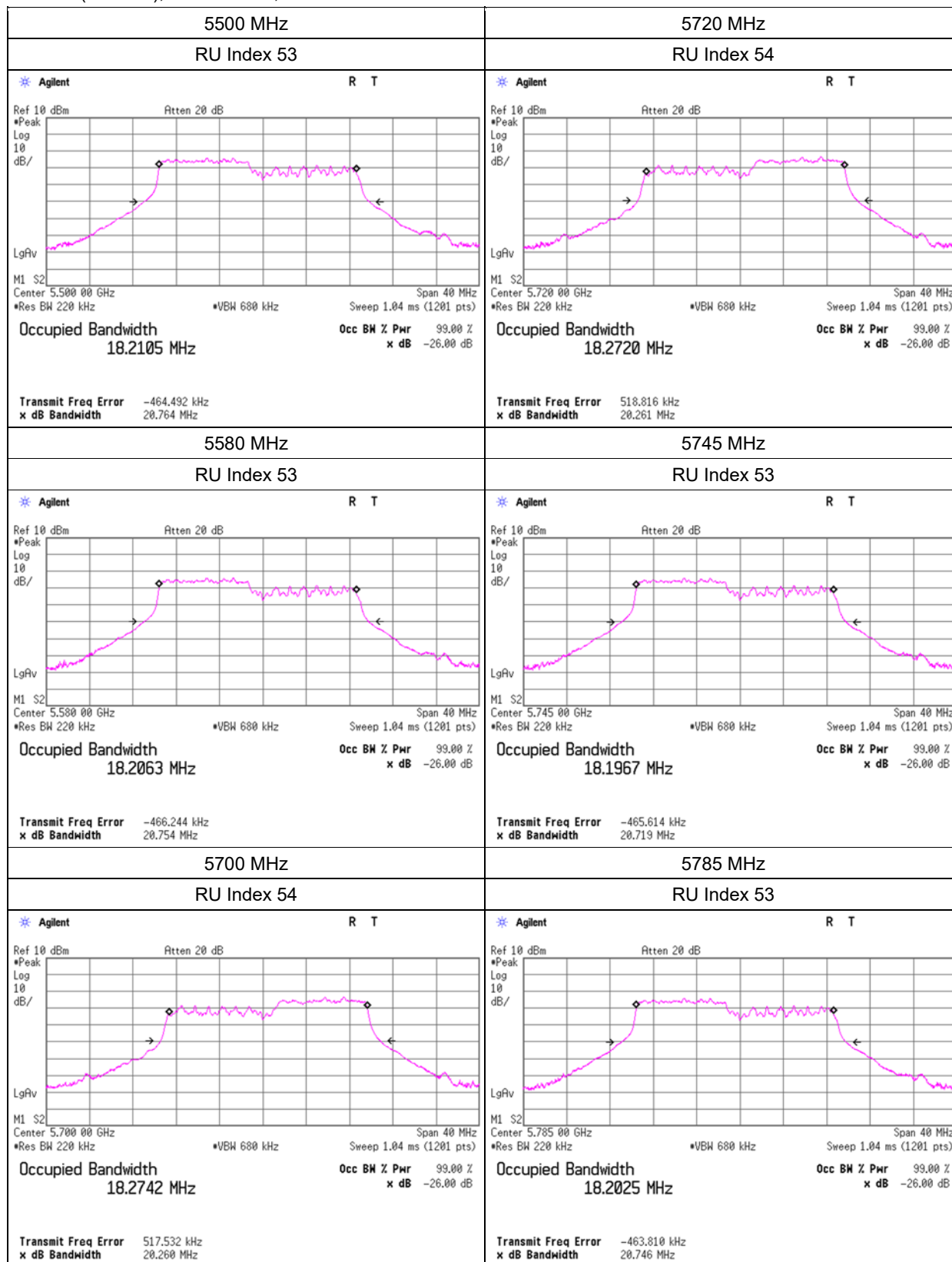
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20(OFDMA), 106-tone RU, MIMO



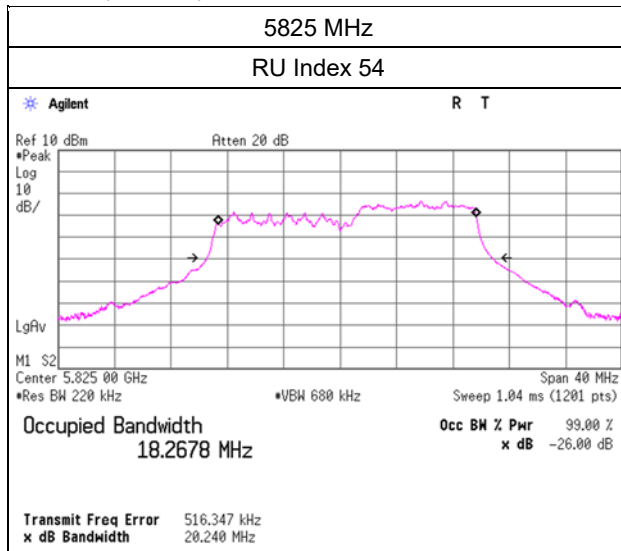
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20(OFDMA), 106-tone RU, MIMO



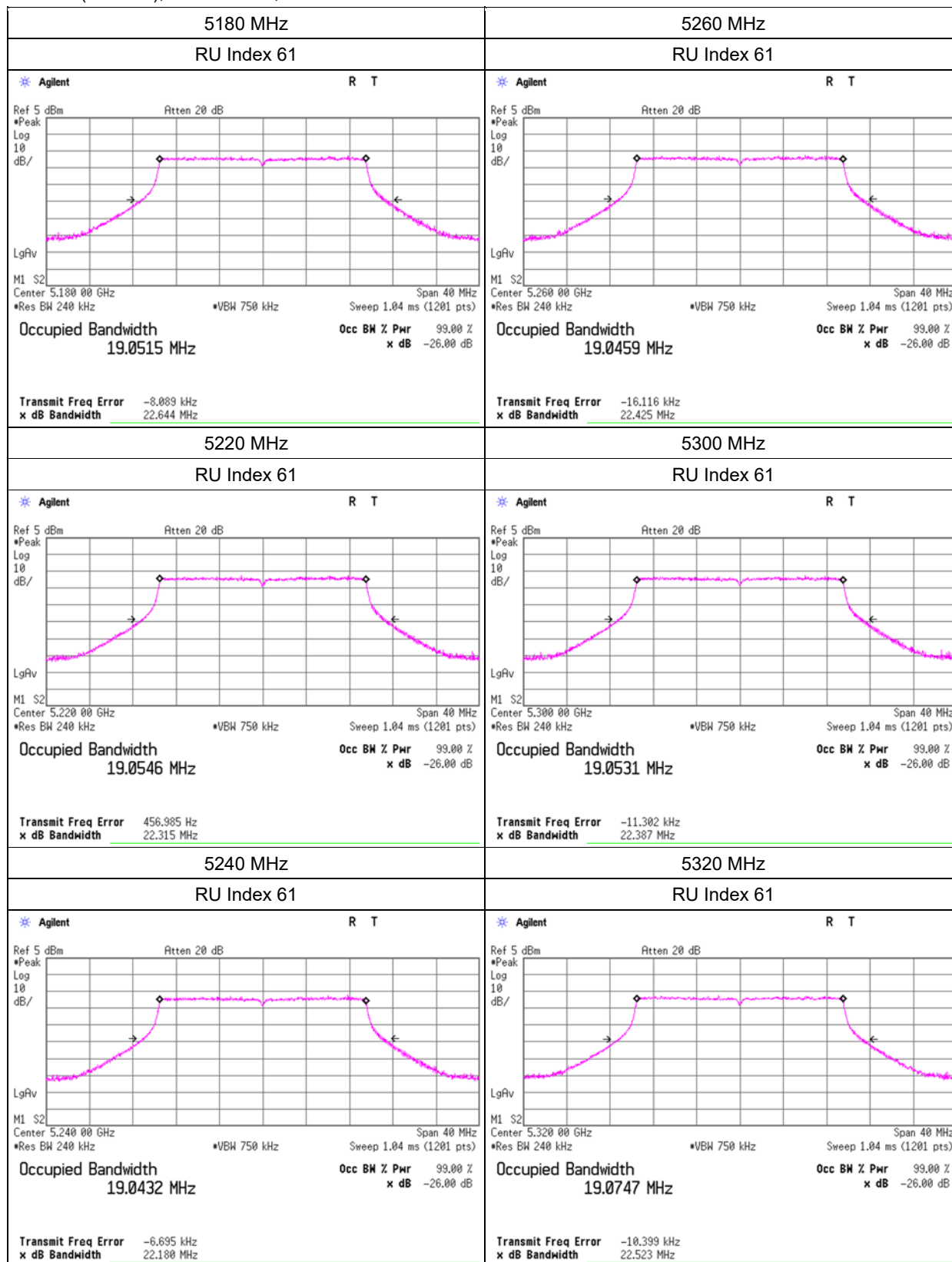
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20(OFDMA), 106-tone RU, MIMO



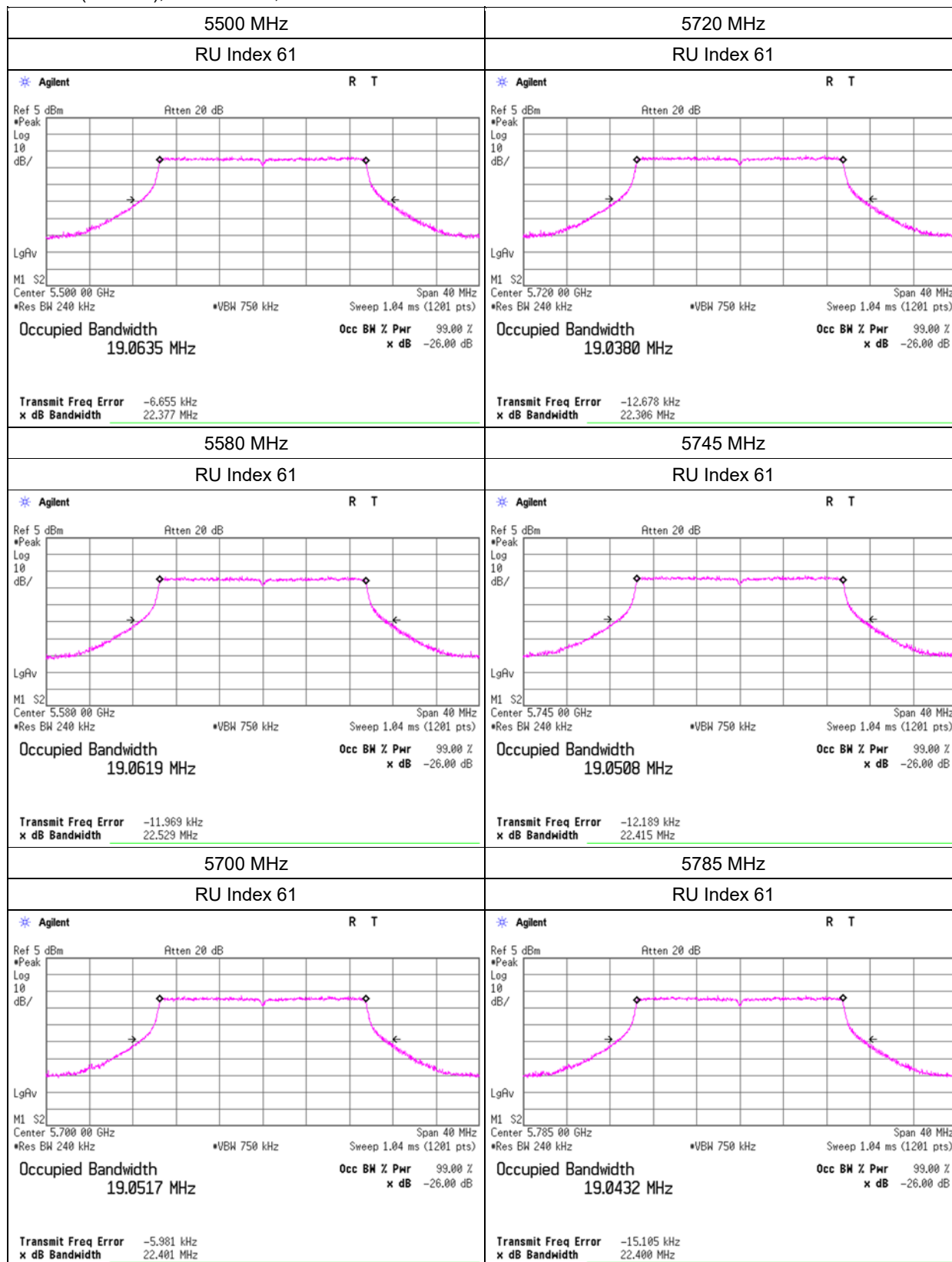
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20(OFDMA), 242-tone RU, MIMO



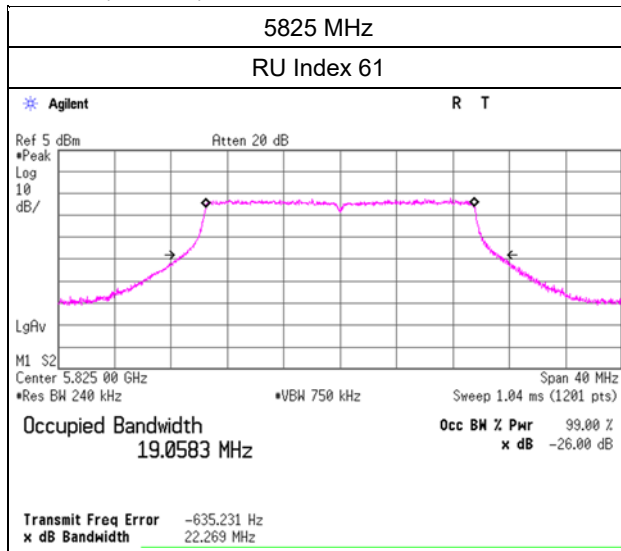
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20(OFDMA), 242-tone RU, MIMO



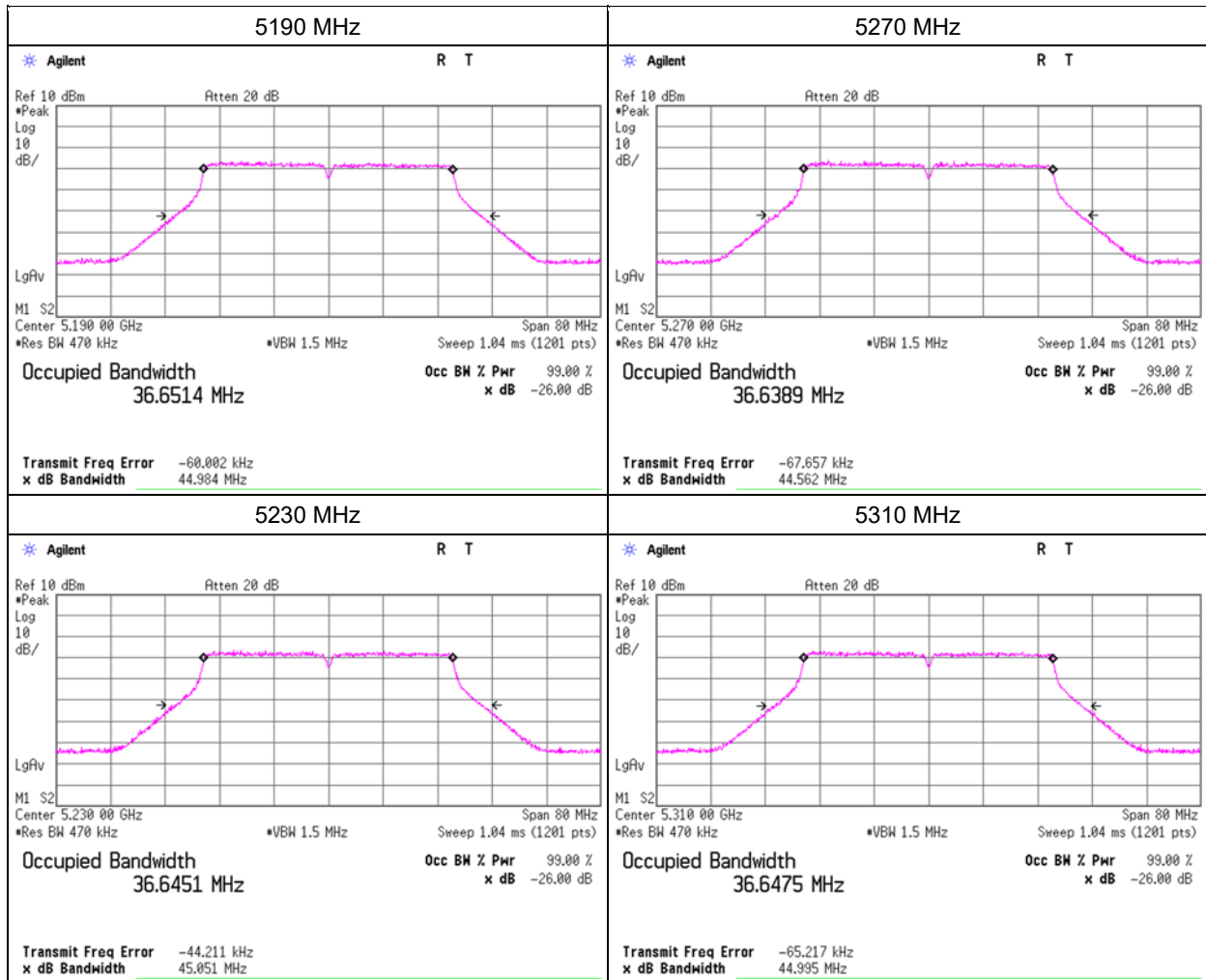
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20(OFDMA), 242-tone RU, MIMO



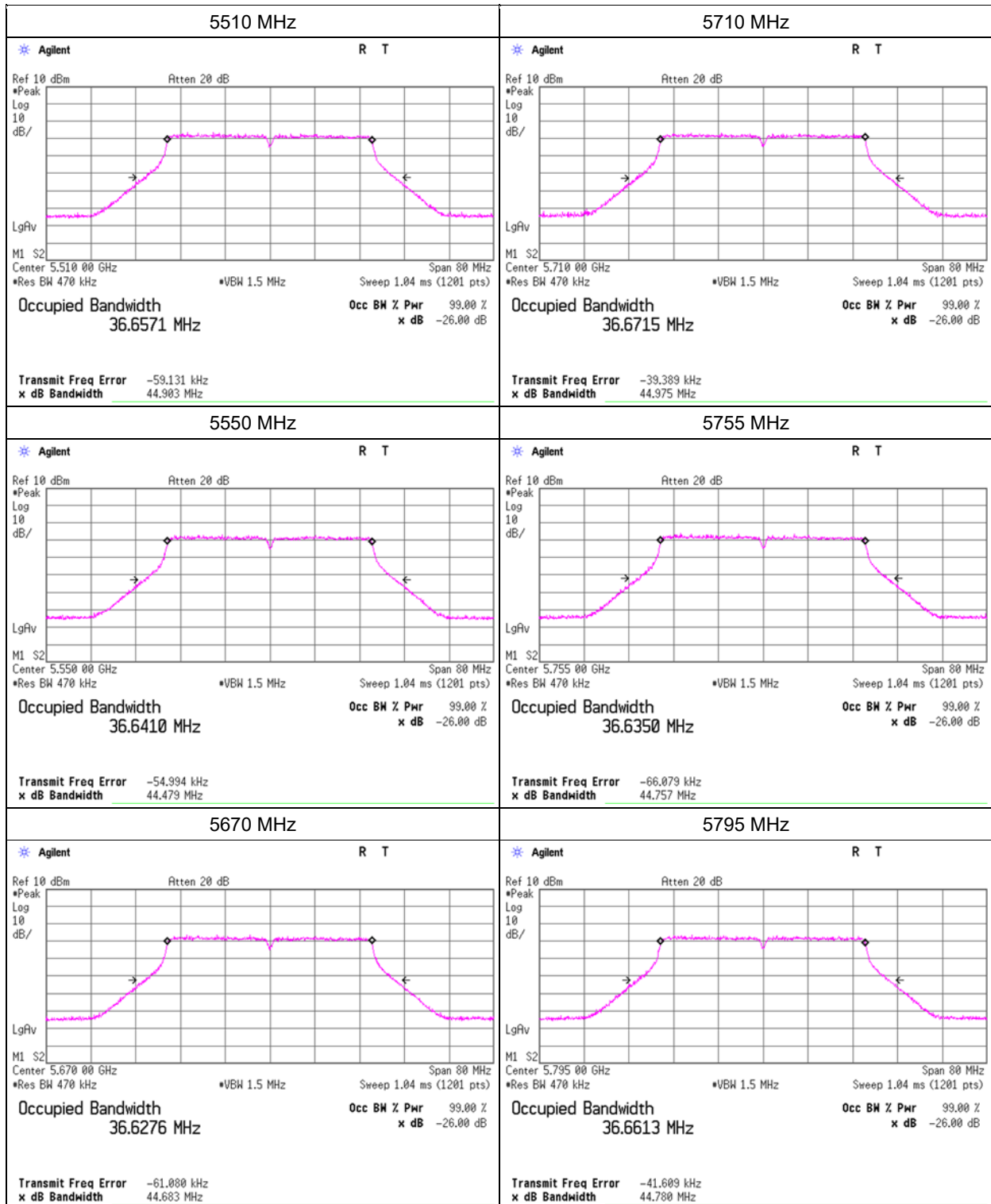
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ac-40, MIMO



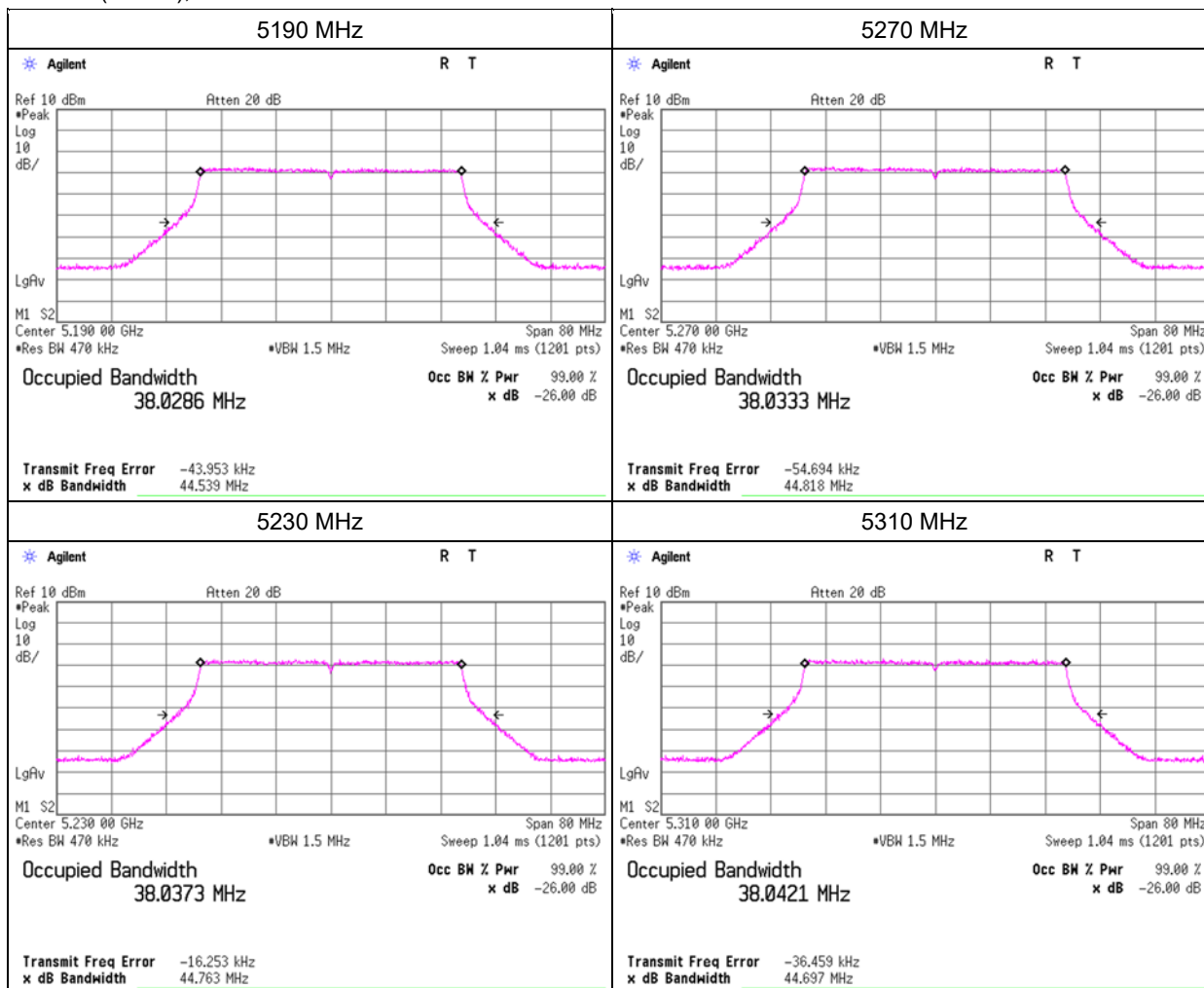
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ac-40, MIMO



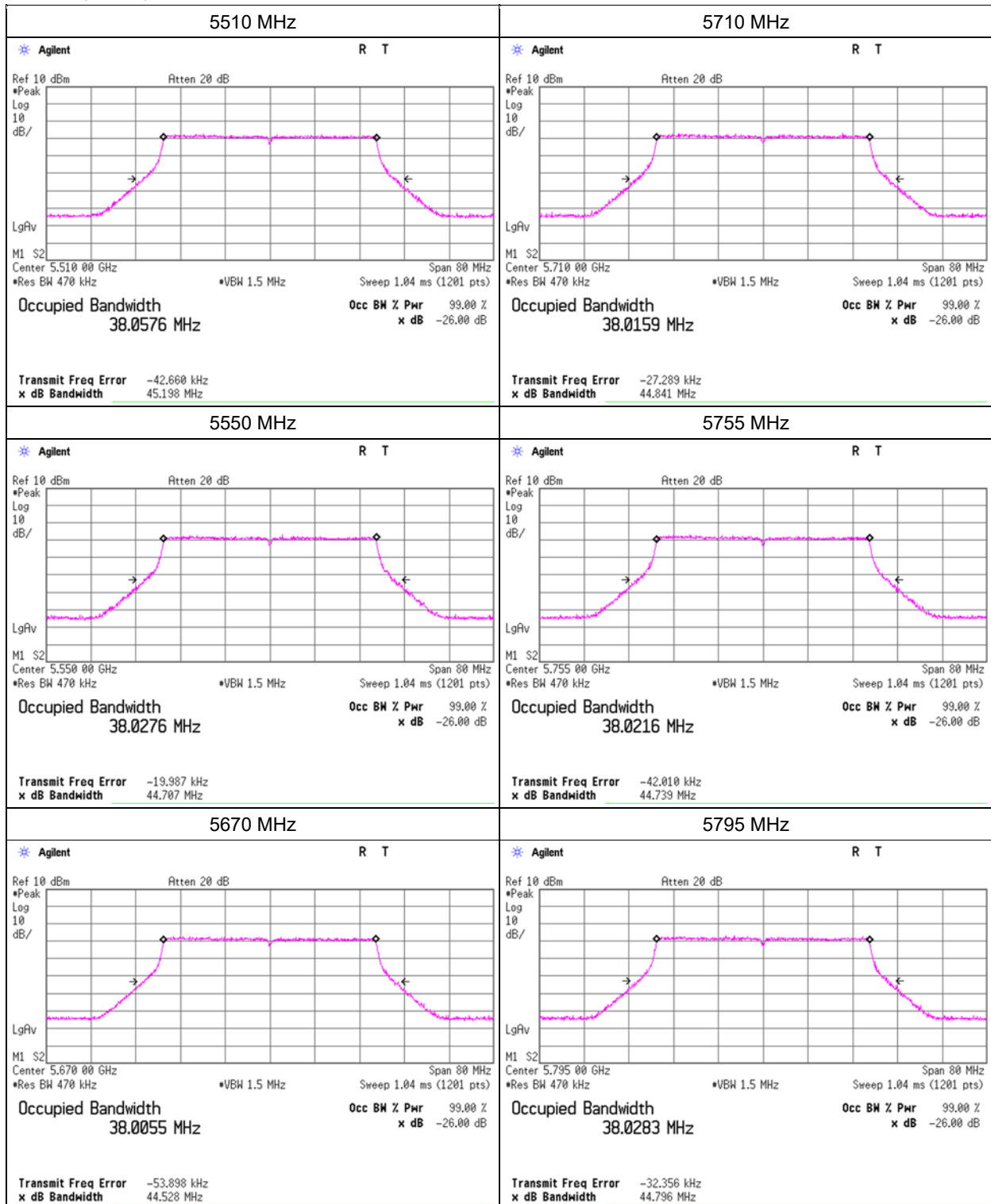
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40(OFDM), MIMO



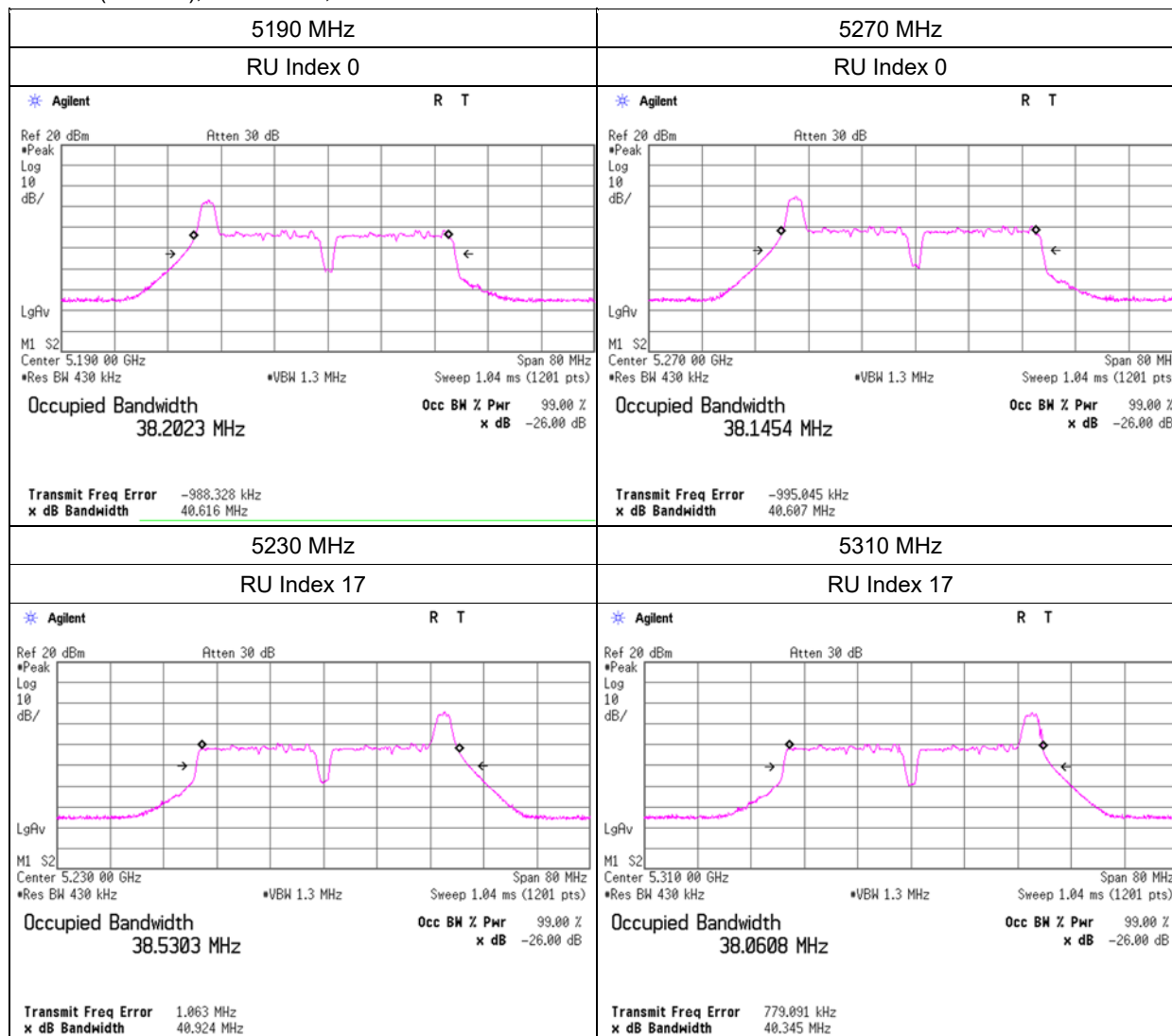
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40(OFDM), MIMO



26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40(OFDMA), 26-tone RU, MIMO



26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40(OFDMA), 26-tone RU, MIMO

