

RADIO TEST REPORT

Test Report No. 14854382S-AE-R1

Customer	Murata Manufacturing Co., Ltd.
Description of EUT	Communication module
Model Number of EUT	2CX
FCC ID	VPYLBEE5QG2CX
Test Regulation	FCC Part 15 Subpart E
Test Result	Complied
Issue Date	September 18, 2024
Remarks	WLAN (5 GHz band) part Except for DFS test

Representative Test EngineerKenichi Adachi
Engineer**Approved By**Kazutaka Takeyama
Leader

CERTIFICATE 1266.03

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

Report Cover Page - Form-ULID-003532 (DCS:13-EM-F0429) Issue# 23.0

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- The laboratory is not responsible for information provided by the customer which can impact the validity of the results.
- For test report(s) referred in this report, the latest version (including any revisions) is always referred.

REVISION HISTORY

Original Test Report No. 14854382S-AE

This report is a revised version of 14854382S-AE. 14854382S-AE is replaced with this report.

Revision	Test Report No.	Date	Page Revised Contents																																																																																				
- (Original)	14854382S-AE	August 27, 2024	-																																																																																				
1	14854382S-AE-R1	September 18, 2024	Clause 2.2 Corrected transmission patterns from; <table><tr><th>Port</th><th>Mode</th><th>Config 1</th><th>Config 2</th><th>Config 3</th><th>Config 5</th><th>Config 6</th></tr><tr><td>2G_CH0</td><td>Bluetooth</td><td>-</td><td>-</td><td>Transmit</td><td>Transmit *1)</td><td>Transmit</td></tr><tr><td>5G_CH0</td><td>2.4 GHz</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr><tr><td>5G_CH0</td><td>5 GHz / 6 GHz</td><td>Transmit</td><td>Transmit</td><td>Transmit</td><td>Transmit *1)</td><td>-</td></tr><tr><td>2G_CH1</td><td>2.4 GHz</td><td>-</td><td>Transmit</td><td>-</td><td>Transmit *1)</td><td>-</td></tr><tr><td>5G_CH1</td><td>5 GHz / 6 GHz</td><td>Transmit</td><td>Transmit</td><td>Transmit</td><td>-</td><td>-</td></tr></table> to; <table><tr><th>Port</th><th>Mode</th><th>Config 1</th><th>Config 2</th><th>Config 3</th><th>Config 4</th><th>Config 5</th></tr><tr><td>2G_CH0</td><td>Bluetooth</td><td>-</td><td>-</td><td>Transmit</td><td>Transmit</td><td>Transmit *1)</td></tr><tr><td>5G_CH0</td><td>2.4 GHz</td><td>-</td><td>Transmit</td><td>-</td><td>-</td><td>Transmit *1)</td></tr><tr><td>5G_CH0</td><td>5 GHz / 6 GHz</td><td>Transmit</td><td>-</td><td>-</td><td>Transmit</td><td>-</td></tr><tr><td>2G_CH1</td><td>2.4 GHz</td><td>-</td><td>Transmit</td><td>-</td><td>-</td><td>Transmit *1)</td></tr><tr><td>5G_CH1</td><td>5 GHz / 6 GHz</td><td>Transmit</td><td>-</td><td>-</td><td>Transmit</td><td>-</td></tr></table>	Port	Mode	Config 1	Config 2	Config 3	Config 5	Config 6	2G_CH0	Bluetooth	-	-	Transmit	Transmit *1)	Transmit	5G_CH0	2.4 GHz	-	-	-	-	-	5G_CH0	5 GHz / 6 GHz	Transmit	Transmit	Transmit	Transmit *1)	-	2G_CH1	2.4 GHz	-	Transmit	-	Transmit *1)	-	5G_CH1	5 GHz / 6 GHz	Transmit	Transmit	Transmit	-	-	Port	Mode	Config 1	Config 2	Config 3	Config 4	Config 5	2G_CH0	Bluetooth	-	-	Transmit	Transmit	Transmit *1)	5G_CH0	2.4 GHz	-	Transmit	-	-	Transmit *1)	5G_CH0	5 GHz / 6 GHz	Transmit	-	-	Transmit	-	2G_CH1	2.4 GHz	-	Transmit	-	-	Transmit *1)	5G_CH1	5 GHz / 6 GHz	Transmit	-	-	Transmit	-
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			Clause 3.2 FCC Part 15.31 (e) Deleted “regardless of input voltage” FCC Part 15.203 Antenna requirement Corrected from; “The EUT has a unique coupling/antenna connector (U.FL).” to; “The EUT has an external antenna connector, but it is installed inside the end product by the professionals.”																																																																																				
			Appendix 3 “Pre-check of Worst Case Position” Replaced antenna photos. (2 pages)																																																																																				

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
APD	Absorbed Power Density	LIMS	Laboratory Information Management System
ASK	Amplitude Shift Keying	MCS	Modulation and Coding Scheme
Atten., ATT	Attenuator	MRA	Mutual Recognition Arrangement
AV	Average	N/A	Not Applicable
BPSK	Binary Phase-Shift Keying	NIST	National Institute of Standards and Technology
BR	Bluetooth Basic Rate	NS	No signal detect.
BT	Bluetooth	NSA	Normalized Site Attenuation
BT LE	Bluetooth Low Energy	NVLAP	National Voluntary Laboratory Accreditation Program
BW	BandWidth	OBW	Occupied Band Width
Cal Int	Calibration Interval	OFDM	Orthogonal Frequency Division Multiplexing
CCK	Complementary Code Keying	OFDMA	Orthogonal Frequency Division Multiple Access
Ch., CH	Channel	P/M	Power meter
CISPR	Comite International Special des Perturbations Radioelectriques	PCB	Printed Circuit Board
CW	Continuous Wave	PER	Packet Error Rate
DBPSK	Differential BPSK	PHY	Physical Layer
DC	Direct Current	PK	Peak
D-factor	Distance factor	PN	Pseudo random Noise
DFS	Dynamic Frequency Selection	PP	Preamble Puncturing
DQPSK	Differential QPSK	PRBS	Pseudo-Random Bit Sequence
DSSS	Direct Sequence Spread Spectrum	PSD	Power Spectral Density
EDR	Enhanced Data Rate	QAM	Quadrature Amplitude Modulation
EIRP, e.i.r.p.	Equivalent Isotropically Radiated Power	QP	Quasi-Peak
EMC	ElectroMagnetic Compatibility	QPSK	Quadri-Phase Shift Keying
EMI	ElectroMagnetic Interference	RBW	Resolution Band Width
EN	European Norm	RDS	Radio Data System
ERP, e.r.p.	Effective Radiated Power	RE	Radio Equipment
EU	European Union	RF	Radio Frequency
EUT	Equipment Under Test	RMS	Root Mean Square
Fac.	Factor	RSS	Radio Standards Specifications
FCC	Federal Communications Commission	Rx	Receiving
FHSS	Frequency Hopping Spread Spectrum	SA, S/A	Spectrum Analyzer
FM	Frequency Modulation	SAR	Specific Absorption Rate
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
HPF	High-Pass Filter	WLAN	Wireless LAN
ICES	Interference-Causing Equipment Standard	WPT	Wireless Power Transmit

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SECTION 1: Customer Information

Company Name	Murata Manufacturing Co., Ltd.
Address	1-10-1 Higashikotari, Nagaokakyo-shi, Kyoto 617-8555 Japan
Telephone Number	+81-50-1737-2801
Contact Person	Kenji Hayashikoshi

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	Communication module
Model Number	2CX
Serial Number	Refer to SECTION 4.2
Condition	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	No Modification by the test lab
Receipt Date	June 16, 2023
Test Date	July 4, 2023 to June 24, 2024

2.2 Product Description

General Specification

Rating	VPH_PA_2G_CH0 : 3.85 V (typical) (3.00 V to 4.60 V)
	VPH_PA_2G_CH1 : 3.85 V (typical) (3.00 V to 4.60 V)
	VPH_PA_5G_CH0 : 3.85 V (typical) (3.00 V to 4.60 V)
	VPH_PA_5G_CH1 : 3.85 V (typical) (3.00 V to 4.60 V)
	VDD18_DIG_IO : 1.80 V (typical) (1.71 V to 2.10 V)
	AON_RFACMN_LDO_IN : 0.95 V (typical) (0.90 V to 2.10 V)
	WLCX_BT_LDO_IN / WLMX_LDO_IN : 0.95 V (typical) (0.90 V to 2.10 V)
	RFA0P8_LDO_IN : 0.95 V (typical) (0.90 V to 2.10 V)
	RFA12_LDO_IN : 1.35 V (typical) (1.30 V to 2.10 V)
	RFA17_LDO_IN : 1.90 V (typical) (1.85 V to 2.10 V)
	PCIE0P92_LDO_IN : 1.35 V (typical) (1.28 V to 2.10 V)
	PCIE18_LDO_IN : 1.90 V (typical) (1.85 V to 2.10 V)
Operating temperature	-30 deg. C to +85 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.

Bluetooth (BR/EDR/BTLE)

Equipment Type	Transceiver
Frequency of Operation	2402 MHz to 2480 MHz
Type of Modulation	FHSS, GFSK / $\pi/4$ -DQPSK, 8DPSK / GFSK
Antenna Type	Monopole Antenna
Antenna Gain ^{a)}	2G_CH0: -0.23 dBi

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

Equipment Type	Transceiver
Frequency of Operation	2412 MHz to 2462 MHz
Type of Modulation	CCK, DSSS, OFDM
	OFDMA: (20 MHz band): 26/52/106/242-tone RU
Antenna Type	Monopole Antenna, Slot antenna
Antenna Gain ^{a)}	2G_CH0: -0.23 dBi (monopole antenna) 2G_CH1: +1.60 dBi (monopole antenna) +1.65 dBi (slot antenna)

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

IEEE802.11a/11n-20/11ac-20/11ax-20/11n-40/11ac-40/11ac-60/11ax-60/11ax-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 6435 MHz to 6515 MHz 6535 MHz to 6875 MHz (*6875 MHz:straddle ch) 6895 MHz to 7095 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 6445 MHz to 6525 MHz (*6525 MHz:straddle ch) 6565 MHz to 6885 MHz (*6885 MHz:straddle ch) 6925 MHz to 7085 MHz
	80 MHz band	5210 MHz 5290 MHz 5530 MHz to 5690 MHz 5775 MHz 5985 MHz to 6385 MHz 6465 MHz to 6545 MHz (*6545 MHz:straddle ch) 6625 MHz to 6865 MHz (*6865 MHz:straddle ch) 6945 MHz to 7025 MHz
	160 MHz band	5250 MHz 5570 MHz 6025 MHz to 6345 MHz 6505 MHz 6665 MHz to 6825 MHz 6985 MHz
Type of Modulation	OFDM	
	OFDMA (IEEE802.11ax only)	(20 MHz band): 26/52/106/242-tone RU
		(40 MHz band): 26/52/106/242/484-tone RU
		(80 MHz band): 26/52/106/242/484/996-tone RU
	(160 MHz band): 26/52/106/242/484/996/2x996-tone RU	
Antenna Type	Monopole Antenna, Slot antenna	
Antenna Gain ^{a)}	U-NII-1, -2A, -2C, -3, 5180 MHz to 5825 MHz	5G_CH0: +0.51 dBi (monopole antenna) 5G_CH1: +0.57 dBi (monopole antenna) +1.13 dBi (slot antenna)
	U-NII-5, -6, -7, -8, 5955 MHz to 7095 MHz	5G_CH0: -1.36 dBi (monopole antenna) 5G_CH1: -1.25 dBi (monopole antenna) -1.14 dBi (slot antenna)
6 GHz Contention Based Protocol incumbent avoidance	Channel puncturing: Not supported	
	Bandwidth reduction: Supported	

Transmission patterns

Port	Mode	Config.1	Config.2	Config.3	Config.4	Config.5
2G_CH0	Bluetooth	-	-	Transmit	Transmit	Transmit *1)
	2.4 GHz	-	Transmit	-	-	Transmit *1)
5G_CH0	5 GHz / 6 GHz	Transmit	-	-	Transmit	-
2G_CH1	2.4 GHz	-	Transmit	-	-	Transmit *1)
5G_CH1	5 GHz / 6 GHz	Transmit	-	-	Transmit	-

*1) WLAN and Bluetooth do not transmit simultaneously.

SECTION 3: Test specification, Procedures & Results

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

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) (9) / 15.207 ISED: RSS-Gen 8.8	14.5 dB, 0.51854 MHz, L, AV Mode: Tx 11ac-80 5290 MHz, 5G_CH 0 &CH 1 monopole Antenna	Complied	-
26 dB Emission Bandwidth	FCC: KDB Publication Number 789033 ISED: -	FCC: 15.407 (a) (1) (2) (3) ISED: -	See data	Complied	Conducted
Maximum Conducted Output Power	FCC: KDB Publication Number 789033 ISED: -	FCC: 15.407 (a) (1) (2) (3) ISED: RSS-247 6.2		Complied	Conducted
Maximum Power Spectral Density	FCC: KDB Publication Number 789033 ISED: -	FCC: 15.407 (a) (1) (2) (3) ISED: RSS-247 6.2		Complied	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	5.6 dB 99.999 MHz, QP, Vert. Mode: Tx 11ac-80 5290 MHz, 5G_CH 0 &CH 1 monopole Antenna	Complied	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	See data	Complied	Conducted
Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003593. * In case any questions arise about test procedure, ANSI C63.10: 2013 is also referred.					
*1) Radiated test was selected over 30 MHz based on FCC 15.407 (b) and KDB 789033 D02 G.3.b).					

FCC Part 15.31 (e)

The module is constantly provided with the stable voltage from the host device. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

The EUT has an external antenna connector, but it is installed inside the end product by the professionals. Therefore the equipment complies with the requirement of 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	-	Conducted

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

3.4 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	3.2 dB
Radiated Emission (Measurement distance: 3 m)	9 kHz to 30 MHz	3.3 dB
	30 MHz to 200 MHz	4.9 dB
	200 MHz to 1 GHz	6.2 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)	1.8 dB
Spurious Emission (Conducted) below 1 GHz	0.91 dB
Conducted Emissions Power Density Measurement 1 GHz to 3 GHz	1.3 dB
Conducted Emissions Power Density Measurement 3 GHz to 18 GHz	2.5 dB
Spurious Emission (Conducted) 18 GHz to 26.5 GHz	2.8 dB
Spurious Emission (Conducted) 26.5 GHz to 40 GHz	2.6 dB
Bandwidth Measurement	0.012 %
Duty Cycle and Time Measurement	0.27 %
Temperature	2.2 deg.C.
Humidity	4.0 %
Voltage	0.74 %

3.5 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	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.2 Shielded room	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.3 Shielded room	6.3 x 4.7 x 2.7	6.3 x 4.7	-
No.4 Shielded room	4.4 x 4.7 x 2.7	4.4 x 4.7	-
No.5 Shielded room	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.6 Shielded room	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.8 Shielded room	3.45 x 5.5 x 2.4	3.45 x 5.5	-
No.1 Measurement room	2.55 x 4.1 x 2.5	-	-
No.2 Measurement room	4.5 x 3.5 x 2.5	-	-
Wireless shielded room 1	3.0 x 4.5 x 2.7	3.0 x 4.5	-
Wireless shielded room 2	3.0 x 4.5 x 2.7	3.0 x 4.5	-

3.6 Test Data, Test Instruments, and Test Set Up

Refer to APPENDIX.

SECTION 4: Operation of EUT during testing

4.1 Operating Mode(s)

Mode	Remarks*
IEEE 802.11a CDD (11a)	54 Mbps, PN9
IEEE 802.11n MIMO 20 MHz BW (11n-20 (CDD) / (SDM))	MCS 5, (1SS), PN9 MCS 15, (2SS), PN9
IEEE 802.11ac MIMO 20 MHz BW (11ac-20 (CDD) / (SDM))	MCS 8 (1SS), PN9 MCS 7 (2SS), PN9
IEEE 802.11ax MIMO 20 MHz BW (11ax-20 (CDD) / (SDM))	MCS 11 (1SS), PN9 MCS 11 (2SS), PN9
IEEE 802.11n MIMO 40 MHz BW (11n-40 (CDD) / (SDM))	MCS 7 (1SS), PN9 MCS 15 (2SS), PN9
IEEE 802.11ac MIMO 40 MHz BW (11ac-40 (CDD) / (SDM))	MCS 9 (1SS), PN9 MCS 5 (2SS), PN9
IEEE 802.11ax MIMO 40 MHz BW (11ax-40 (CDD) / (SDM))	MCS 11 (1SS), PN9 MCS 8 (2SS), PN9
IEEE 802.11ac MIMO 80 MHz BW (11ac-80 (CDD) / (SDM))	MCS 9 (1SS), PN9 MCS 9 (2SS), PN9
IEEE 802.11ax MIMO 80 MHz BW (11ax-80 (CDD) / (SDM))	MCS 9 (1SS), PN9 MCS 9 (2SS), PN9
IEEE 802.11ax MIMO 160 MHz BW (11ax-160 (CDD) / (SDM))	MCS 9 (1SS), PN9 MCS 10 (2SS), PN9
The worst antenna (Ant: 5G_CH0) and condition was determined based on the test result of Maximum Conducted Output Power, including 1SS/2SS. (SS: Spatial Stream)	
*Power of the EUT was set by the software as follows; Power Setting: See below table Software: QSPR (Qualcomm Sequence Profiling Resource) tool Version: 5.0-00202 (Date: 2023.06.16, 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 (High Power Mode)

[OFDM]

Mode	UNII-1	UNII-2A	UNII-2C	UNII-3
11a	10.5 dBm			11 dBm

Mode	UNII-1	UNII-2A	UNII-2C	UNII-3
11n-20 (CDD)	10.5 dBm			11 dBm
11n-20 (SDM)	10.5 dBm			
11n-40 (CDD)	10.5 dBm			11 dBm
11n-40 (SDM)	10.5 dBm			

Mode	UNII-1	UNII-2A	UNII-2C	UNII-3
11ac-20 (CDD)	10.5 dBm			
11ac-20 (SDM)	10.5 dBm			
11ac-40 (CDD)	10.5 dBm			
11ac-40 (SDM)	10.5 dBm			
11ac-80 (CDD)	11 dBm		10.5 dBm	
11ac-80 (SDM)	11 dBm		10.5 dBm	

Mode	UNII-1	UNII-2A	UNII-2C	UNII-3
11ax-20 (CDD)	10.5 dBm			
11ax-20 (SDM)	10.5 dBm			
11ax-40 (CDD)	10.5 dBm			
11ax-40 (SDM)	10.5 dBm			
11ax-80 (CDD)	10.5 dBm			
11ax-80 (SDM)	10.5 dBm			
11x-160 (CDD)	-	10.5 dBm	10 dBm	-
11x-160 (SDM)	-	10.5 dBm	10 dBm	-

[OFDMA, UNII-1]

BW	RU 26	RU 52	RU 106	RU 242	RU 484	RU 996	RU 2x996
20 MHz	4 dBm	7.5 dBm * 7 dBm **	10.5 dBm	10.5 dBm	-		
40 MHz	4 dBm	7.5 dBm * 7 dBm **	10.5 dBm	10.5 dBm	10.5 dBm	-	
80 MHz	4 dBm	7 dBm	10.5 dBm	10.5 dBm	10.5 dBm	10.5 dBm	-

* CDD, ** SDM

[OFDMA, UNII-2A]

BW	RU 26	RU 52	RU 106	RU 242	RU 484	RU 996	RU 2x996
20 MHz	9 dBm	10.5 dBm	10 dBm	10.5 dBm	-		
40 MHz	9 dBm	10.5 dBm * 10 dBm **	10 dBm	10.5 dBm * 10 dBm **	10 dBm	-	
80 MHz	9.5 dBm	10.5 dBm	10.5 dBm	10.5 dBm	10.5 dBm	10.5 dBm	-
160 MHz	4 dBm	7 dBm	10.5 dBm	10.5 dBm	10.5 dBm	10.5 dBm	10.5 dBm 10 dBm

* CDD, ** SDM

[OFDMA, UNII-2C]

BW	RU 26	RU 52	RU 106	RU 242	RU 484	RU 996	RU 2x996
20 MHz	9 dBm	10 dBm * 10.5 dBm **	10 dBm * 10.5 dBm **	10.5 dBm	-		
40 MHz	9.5 dBm	10.5 dBm * 10 dBm **	10.5 dBm	10.5 dBm	10.5 dBm	-	
80 MHz	9.5 dBm	10 dBm	10.5 dBm	10.5 dBm	10.5 dBm	10.5 dBm	-
160 MHz	9.5 dBm	10.5 dBm	10.5 dBm	10.5 dBm	10.5 dBm	10.5 dBm	10.5 dBm

* CDD, ** SDM

[OFDMA, UNII-3]

BW	RU 26	RU 52	RU 106	RU 242	RU 484	RU 996	RU 2x996
20 MHz	9.5 dBm	10.5 dBm	10.5 dBm	10.5 dBm	-		
40 MHz	9.5 dBm	10.5 dBm	10.5 dBm	11 dBm * 10.5 dBm **	10.5 dBm	-	
80 MHz	9.5 dBm	10.5 dBm	10.5 dBm	10.5 dBm	10.5 dBm	10.5 dBm	-

* CDD, ** SDM

Power Setting table (Standard Power Mode)

[OFDM]

Mode	UNII-1	UNII-2A	UNII-2C	UNII-3
11a	8 dBm			8.5 dBm

Mode	UNII-1	UNII-2A	UNII-2C	UNII-3
11n-20 (CDD)	8.5 dBm	8 dBm		8.5 dBm
11n-20 (SDM)	8 dBm			8.5 dBm
11n-40 (CDD)	8 dBm			8.5 dBm
11n-40 (SDM)	8 dBm			8.5 dBm

Mode	UNII-1	UNII-2A	UNII-2C	UNII-3
11ac-20 (CDD)	8 dBm			8.5 dBm
11ac-20 (SDM)	8 dBm			8.5 dBm
11ac-40 (CDD)	8 dBm			8.5 dBm
11ac-40 (SDM)	8 dBm			8.5 dBm
11ac-80 (CDD)	8 dBm			8.5 dBm
11ac-80 (SDM)	8 dBm			8.5 dBm

Mode	UNII-1	UNII-2A	UNII-2C	UNII-3
11ax-20 (CDD)	8 dBm			8.5 dBm
11ax-20 (SDM)	8 dBm			8.5 dBm
11ax-40 (CDD)	8 dBm			8.5 dBm
11ax-40 (SDM)	8 dBm			8.5 dBm
11ax-80 (CDD)	8 dBm			
11ax-80 (SDM)	8.5 dBm	8 dBm		8.5 dBm
11x-160 (CDD)	-	8 dBm		-
11x-160 (SDM)	-	8 dBm		-

[OFDMA, UNII-1]

BW	RU 26	RU 52	RU 106	RU 242	RU 484	RU 996	RU 2x996
20 MHz	*1)	*1)	8 dBm	8 dBm	-		
40 MHz	*1)	*1)	8.5 dBm *	8.5 dBm *	8.5 dBm	-	
80 MHz	*1)	*1)	8 dBm *	8.5 dBm	8.5 dBm	8 dBm *	-
			8.5 dBm **			8.5 dBm **	

* CDD, ** SDM

[OFDMA, UNII-2A]

BW	RU 26	RU 52	RU 106	RU 242	RU 484	RU 996	RU 2x996
20 MHz	7.5 dBm *	8 dBm	8 dBm	8 dBm	-		
	8 dBm **						
40 MHz	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	-	
80 MHz	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	-
160 MHz	*1)	*1)	8 dBm	8 dBm	8 dBm	8 dBm	7.5 dBm

* CDD, ** SDM

[OFDMA, UNII-2C]

BW	RU 26	RU 52	RU 106	RU 242	RU 484	RU 996	RU 2x996
20 MHz	7.5 dBm	8 dBm	8 dBm	8 dBm	-		
40 MHz	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	-	
80 MHz	8 dBm	7.5 dBm *	8 dBm	8 dBm	8 dBm	8 dBm	-
		8 dBm **					
160 MHz	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	7.5 dBm

* CDD, ** SDM

[OFDMA, UNII-3]

BW	RU 26	RU 52	RU 106	RU 242	RU 484	RU 996	RU 2x996
20 MHz	8 dBm	8 dBm *	8 dBm *	8 dBm *	-		
		8.5 dBm **	8.5 dBm **	8.5 dBm **			
40 MHz	8 dBm	8 dBm	8 dBm	8.5 dBm *	8.5 dBm	-	
				8 dBm **			
80 MHz	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8.5 dBm *	-
						8 dBm **	

* CDD, ** SDM

*1) High Power Mode and Standard Power Mode are same settings.

* Details of Operation Mode(s) (1/2)

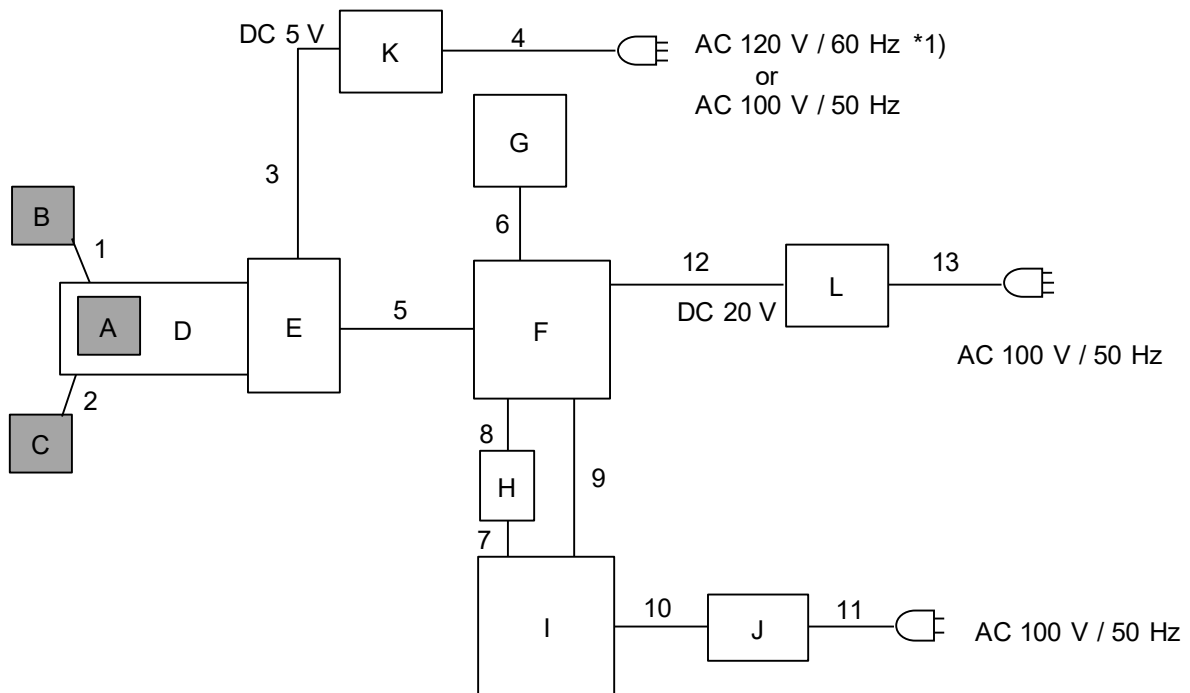
Test Item	Operating Mode	Tested Antenna	Tested Frequency			
			Lower Band	Middle Band	Additional Band	Upper Band
Conducted Emission, Radiated Spurious Emission (Below 1 GHz)	Tx 11ac-80 *1)	5G_CH 0 + 5G_CH 1	-	5290 MHz	-	-
26 dB Emission Bandwidth *5)	Tx 11a Tx 11ax-20 (OFDM) Tx 11ax-20 (OFDMA)	5G_CH 0 *2)	-	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz 5720 MHz	-
	Tx 11n-40 Tx 11ax-40 (OFDM) Tx 11ax-40 (OFDMA)		-	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	-
	Tx 11ac-80 Tx 11ax-80 (OFDM) Tx 11ax-80 (OFDMA)		-	5290 MHz	5530 MHz 5610 MHz 5690 MHz	-
	Tx 11ax-160 (OFDM) Tx 11ax-160 (OFDMA)		-	5250 MHz	5570 MHz	-
99 % Occupied Bandwidth *5)	Tx 11a Tx 11ax-20 (OFDM) Tx 11ax-20 (OFDMA)	5G_CH 0 *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 11n-40 Tx 11ax-40 (OFDM) Tx 11ax-40 (OFDMA)		5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	5755 MHz 5795 MHz
	Tx 11ac-80 Tx 11ax-80 (OFDM) Tx 11ax-80 (OFDMA)		5210 MHz	5290 MHz	5530 MHz 5610 MHz 5690 MHz	5775 MHz
	Tx 11ax-160 (OFDM) Tx 11ax-160 (OFDMA)		-	5250 MHz	5570 MHz	-
Maximum Conducted Output Power	Tx 11a Tx 11n-20 Tx 11ac-20 Tx 11ax-20 (OFDM) Tx 11ax-20 (OFDMA)	5G_CH 0 + 5G_CH 1	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 11n-40 Tx 11ac-40 Tx 11ax-40 (OFDM) Tx 11ax-40 (OFDMA)		5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	5755 MHz 5795 MHz
	Tx 11ac-80 Tx 11ax-80 (OFDM) Tx 11ax-80 (OFDMA)		5210 MHz	5290 MHz	5530 MHz 5610 MHz 5690 MHz	5775 MHz
	Tx 11ax-160 (OFDM) Tx 11ax-160 (OFDMA)		-	5250 MHz	5570 MHz	-
Maximum Power Spectral Density *4)	Tx 11a Tx 11n-20 Tx 11ac-20 Tx 11ax-20 (OFDM) , Tx 11ax-20 (OFDMA)	5G_CH 0 + 5G_CH 1	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 11n-40 Tx 11ac-40 Tx 11ax-40 (OFDM) , Tx 11ax-40 (OFDMA)		5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	5755 MHz 5795 MHz
	Tx 11ac-80 Tx 11ax-80 (OFDM) Tx 11ax-80 (OFDMA)		5210 MHz	5290 MHz	5530 MHz 5610 MHz 5690 MHz	5775 MHz
	Tx 11ax-160 (OFDM) Tx 11ax-160 (OFDMA)		-	5250 MHz	5570 MHz	-

* Details of Operation Mode(s) (2/2)

Test Item	Operating Mode	Tested Antenna	Tested Frequency			
			Lower Band	Middle Band	Additional Band	Upper Band
6 dB Bandwidth	Tx 11a Tx 11n-20 Tx 11ac-20 Tx 11ax-20 (OFDM) Tx 11ax-20 (OFDMA)	5G_CH 0 *2)	-	-	-	5745 MHz 5785 MHz 5825 MHz
	Tx 11n-40 Tx 11ac-40 Tx 11ax-40 (OFDM) Tx 11ax-40 (OFDMA)		-	-	-	5755 MHz 5795 MHz
	Tx 11ac-80 Tx 11ax-80 (OFDM) Tx 11ax-80 (OFDMA)		-	-	-	5775 MHz
Conducted Spurious Emission	Tx 11ac-80 *1)	5G_CH 0 *2)	-	5290 Hz	-	-
Radiated Spurious Emission (Band edge) *6)	Tx 11a Tx 11n-20 Tx 11ac-20 Tx 11ax-20 (OFDM) Tx 11ax-20 (OFDMA) *3)	5G_CH 0 + 5G_CH 1	5180 MHz	5320 MHz	5500 MHz 5700 MHz	5745 MHz 5825 MHz
	Tx 11n-40 Tx 11ac-40 Tx 11ax-40 (OFDM) Tx 11ax-40 (OFDMA) *3)		5190 MHz	5310 MHz	5510 MHz 5670 MHz	5755 MHz 5795 MHz
	Tx 11ac-80 Tx 11ax-80 (OFDM) Tx 11ax-80 (OFDMA) *3)		5210 MHz	5290 MHz	5530 MHz 5610 MHz	5775 MHz
	Tx 11ax-160 (OFDM) Tx 11ax-160 (OFDMA) *3)		-	5250 MHz	5570 MHz	-
Radiated Spurious Emission (Above 1 GHz) *6) *7)	Tx 11n-20	5G_CH 0 + 5G_CH 1	5180 MHz 5240 MHz	5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	Tx 11n-40		5190 MHz 5230 MHz	5310 MHz	5510 MHz 5550 MHz 5670 MHz	5755 MHz 5795 MHz
	Tx 11ac-80		5210 MHz	5290 MHz	5530 MHz 5610 MHz 5690 MHz	5775 MHz
	Tx 11ax-160 (OFDM)		-	5250 MHz	5570 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 configuration tests were conducted only at the band edge since preliminary testing indicated that the other spurious emission was lower than OFDM. *4) The worst combination of "1SS Directional gain" was applied to the test results. *5) After the comparison between each mode, the test was performed with the maximum and minimum BW value as a representative. The minimum value for each BW was used to calculate Limit for Maximum Conducted Output Power. (Except for 11ax.) *6) After the comparison between CDD and SDM, the test was performed with the CDD as a representative. *7) After the comparison between each mode, the test was performed with the highest power as a representative.						

4.2 Configuration and Peripherals

<For Radiated and Conducted Emission Tests>



*1) For Conducted 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	Communication module	2CX	A-2	Murata	EUT
B	Antenna (monopole)	Chain 0 monopole 5 GHz	#11	SONY	EUT
C	Antenna (monopole)	Chain 1 monopole 5 GHz	#7	SONY	EUT
	Antenna (Slot)	Chain 1 slot 5 GHz	#3	SONY	EUT
D	Jig Board	P2ML10932	A-2	Murata	-
E	LDO Board	P2ML8516	A-2	Murata	-
F	Mini PC	Brix	1449631682	GIGABYTE	-
G	SSD	SSD370S	C78637-2668	Transcend	-
H	Ethernet-USB Adaptor	ETG5-US3	BC500102349C	I/O DATA	-
I	Laptop PC	HQAMB407	2F4A7B36-42D1-4E7B-9A50-E92517A62729	Dynabook Inc.	-
J	AC Adaptor	PA5177U-1ACA	K80611667CGD	Dynabook Inc.	-
K	DC Power supply	PAN35-10A	CY003459	Kikusui Electronics Corp.	-
L	DC Power supply	PAN35-10A	CY002947	Kikusui Electronics Corp.	-

List of Cables Used

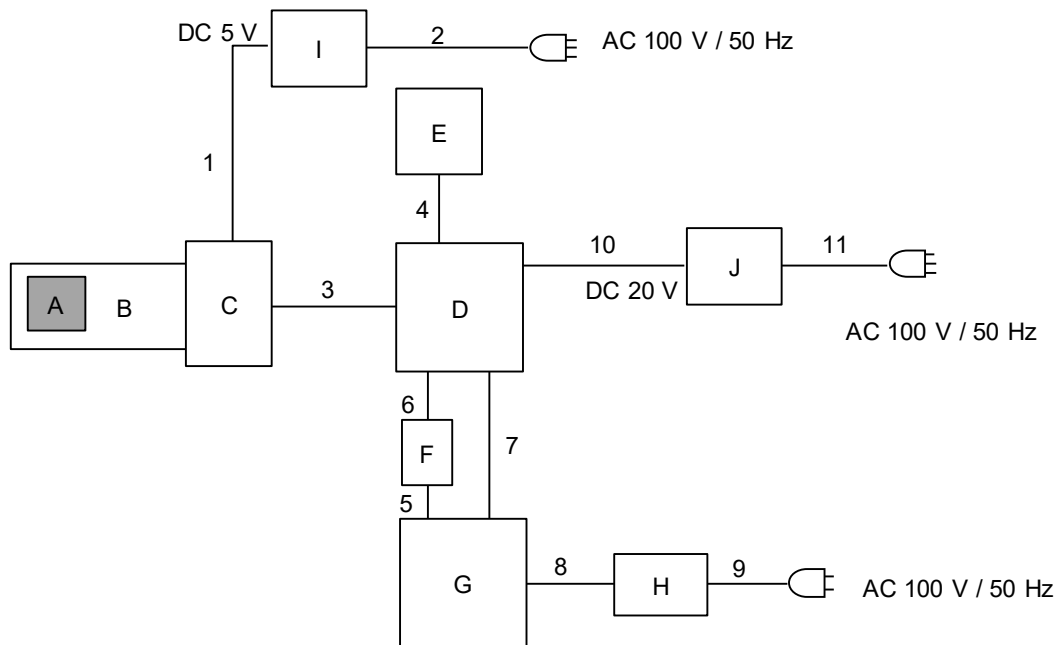
No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Antenna	0.1	Shielded	Shielded	-
2	Antenna	0.1	Shielded	Shielded	-
3	DC	1.7	Unshielded	Unshielded	-
4	AC	2.8	Unshielded	Unshielded	-
5	Signal	1.0 *1), *3) 0.15 *2)	Unshielded	Unshielded	-
6	Signal	0.1	Shielded	Shielded	-
7	USB	0.06	Shielded	Shielded	-
8	Ether	2.0	Unshielded	Unshielded	-
9	USB	0.5 *1) 2.5 *2), *3)	Shielded	Shielded	-
10	DC	0.4	Unshielded	Unshielded	-
11	AC	1.7	Unshielded	Unshielded	-
12	DC	1.0 *1), *3) 2.5 *2)	Unshielded	Unshielded	-
13	AC	2.8	Unshielded	Unshielded	-

*1) Used for Radiated Emission test for Above 1 GHz.

*2) Used for Radiated Emission test for Below 1 GHz.

*3) Used for Conducted Emission test.

<For Antenna Terminal Conducted Test>



Description of EUT and Support Equipment

No.	Item	Model Number	Serial Number	Manufacturer	Remarks
A	Communication module	2CX	A-2	Murata	EUT
B	Jig Board	P2ML10932	A-2	Murata	-
C	LDO Board	P2ML8516	A-2	Murata	-
D	Mini PC	Brix	1505631984	GIGABYTE	-
E	SSD	SSD370S	C78637-2668	Transcend	-
F	Ethernet-USB Adaptor	ETG5-US3	BC500102349C	I/O DATA	-
G	Laptop PC	HQAMB407	2F4A7B36-42D1-4E7B-9A50-E92517A62729	Dynabook Inc.	-
H	AC Adaptor	PA5177U-1ACA	K80611667CGD	Dynabook Inc.	-
I	DC Power supply	PWR800M	QJ003485	Kikusui Electronics Corp.	-
J	DC power supply	PW8-5ADPS	14086035	TEXIO	-

List of Cables Used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC	1.7	Unshielded	Unshielded	-
2	AC	2.8	Unshielded	Unshielded	-
3	Signal	0.15	Unshielded	Unshielded	-
4	Signal	0.1	Shielded	Shielded	-
5	USB	0.06	Shielded	Shielded	-
6	Ether	1.0	Unshielded	Unshielded	-
7	USB	0.5	Shielded	Shielded	-
8	DC	0.4	Unshielded	Unshielded	-
9	AC	1.7	Unshielded	Unshielded	-
10	DC	1.0	Unshielded	Unshielded	-
11	AC	2.8	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and Conditions

EUT was placed on a wooden table of nominal size, 1.0 m by 2.0 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 was 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 via Auxiliary equipment in Shielded room.

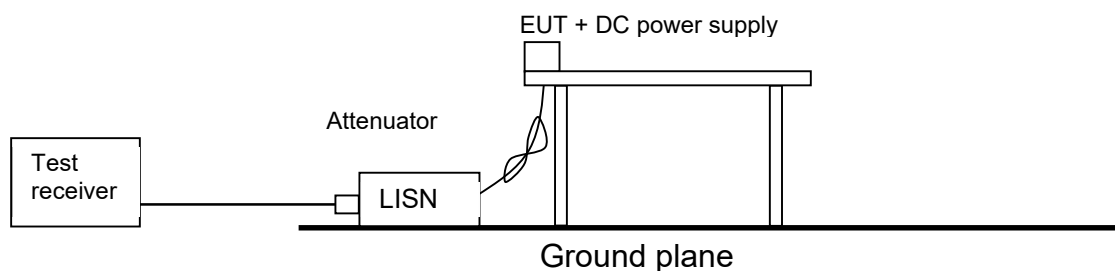
The EUT via Auxiliary equipment was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

Test results are rounded off and limit are rounded down, so some differences might be observed.

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

Figure 1: Test Setup



SECTION 6: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

< Below 1 GHz >

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

< Above 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 5.8 GHz 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:

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

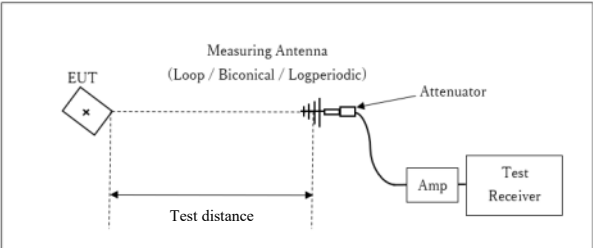
Test Antennas are used as below;

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	RBW: 1 MHz VBW: 1/T (T: burst length, refer to Burst rate confirmation sheet) Detector: Peak

Figure 2: Test Setup

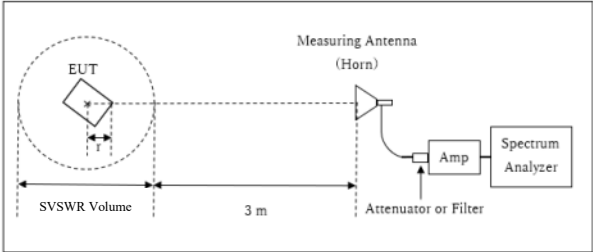
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz to 10 GHz

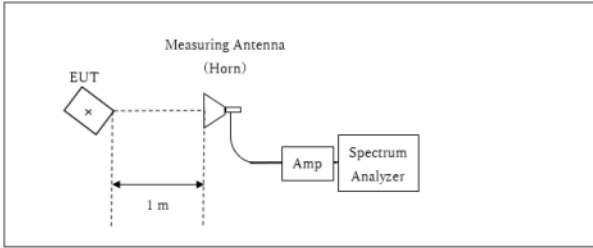


r : Radius of an outer periphery of EUT
× : Center of turn table

Distance Factor: $20 \times \log (3.82 \text{ m} / 3.0 \text{ m}) = 2.10 \text{ dB}$
* Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.82 \text{ m}$

SVSWR Volume : 2.0 m
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)
r = 0.18 m

10 GHz to 40 GHz



× : Center of turn table

Distance Factor: $20 \times \log (1.0 \text{ m} / 3.0 \text{ m}) = -9.54 \text{ dB}$
*Test Distance: 1 m

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

(5G_CH0: monopole antenna, 5G_CH1: monopole antenna)

	Antenna polarization	Carrier	Spurious (30 MHz to 1 GHz)	Spurious (1 GHz to 10 GHz)	Spurious (10 GHz to 18 GHz)	Spurious (18 GHz to 26.5 GHz)	Spurious (26.5 GHz to 40 GHz)
Module	Horizontal	X	Z	X	Y	X	Y
	Vertical	X	Z	X	Y	X	Z
Antenna (5G_CH0)	Horizontal	X	X	X	Y	X	X
	Vertical	Y	X	Y	Y	X	X
Antenna (5G_CH1)	Horizontal	X	X	X	Y	X	X
	Vertical	Y	X	Y	Y	X	X

(5G_CH0: monopole antenna, 5G_CH1: slot antenna)

	Antenna polarization	Carrier	Spurious (30 MHz to 1 GHz)	Spurious (1 GHz to 6.4 GHz)	Spurious (2.8 GHz to 10 GHz)	Spurious (10 GHz to 26.5 GHz)	Spurious (26.5 GHz to 40 GHz)
Module	Horizontal	X	Z	X	Y	X	Y
	Vertical	X	Z	X	Y	X	Z
Antenna (5G_CH0)	Horizontal	X	X	X	Y	X	X
	Vertical	Y	X	Y	Y	X	X
Antenna (5G_CH1)	Horizontal	Z	X	Z	X	X	X
	Vertical	Z	X	Z	X	X	X

Test results are rounded off and limit are rounded down, so some differences might be observed.

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

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
26 dB Bandwidth	Enough to capture the emission	Close to 1 % of EBW	> RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 % to 5 % of OBW	≥ 3 RBW	Auto	Peak	Max Hold	Spectrum Analyzer
6 dB Bandwidth	Enough to capture the emission	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Conducted Output Power	-	-	-	Auto	Average	-	Power Meter (Sensor: 160 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 (>100 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 kHz / 470 kHz)) was added to the test result.

*3) In the frequency range below 30 MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately, however the noise was low enough as shown in the chart.
(9 kHz to 150 kHz: RBW = 200 Hz, 150 kHz to 30 MHz: RBW = 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.

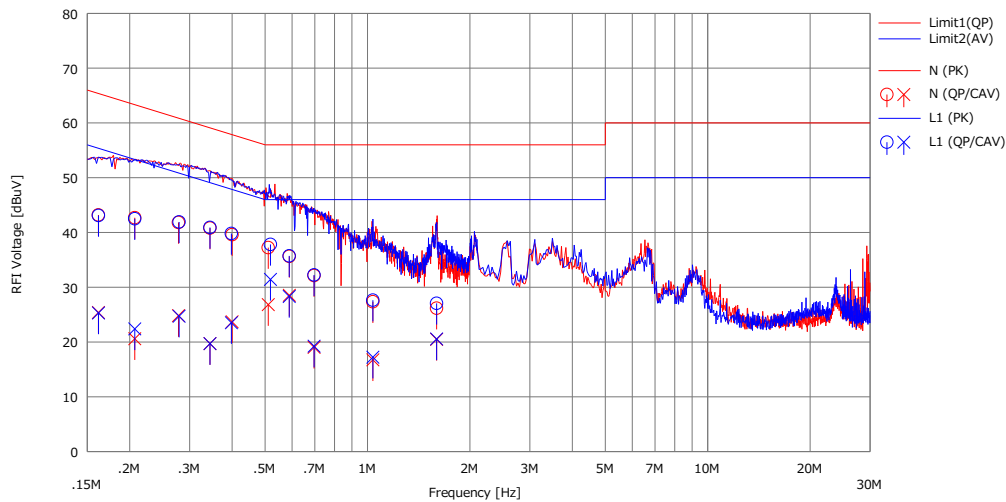
Test Data : APPENDIX
Test Result : Pass

APPENDIX 1: Test Data

Conducted Emission

Test placeShonan EMC Lab. No.2 Shielded Room
DateJune 24, 2024
Temperature / Humidity24 deg. C / 37 % RH
EngineerYasumasa Owaki
ModeTx 11ac-80 5290 MHz
Antenna type5G_CH 0: monopole Antenna, 5G_CH 1: monopole Antenna

Limit: FCC Part 15 Subpart C (15.207)



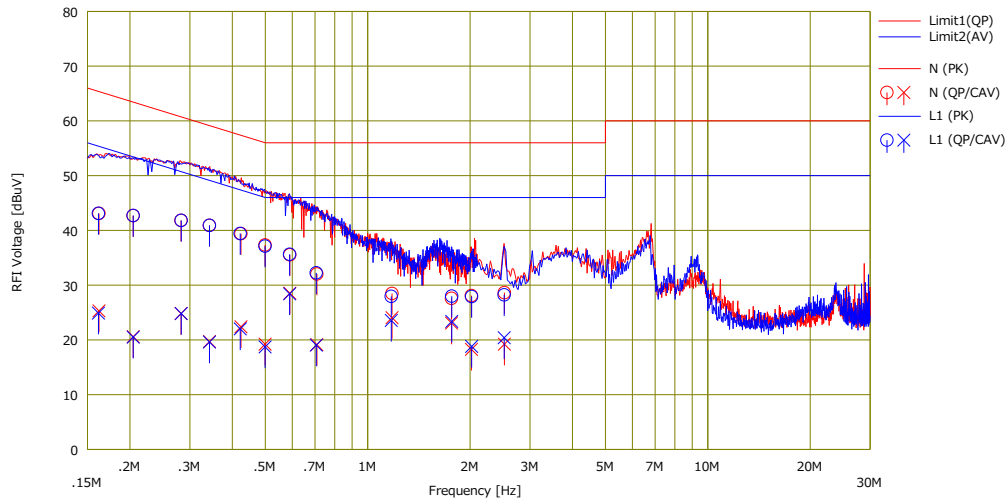
No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP>	<CAV>		<QP>	<CAV>	<QP>	<AV>	<QP>	<AV>		
		[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.16178	27.80	10.00	15.40	43.20	25.40	65.37	55.37	22.1	29.9	N	
2	0.20698	27.30	5.20	15.39	42.69	20.59	63.33	53.33	20.6	32.7	N	
3	0.27816	26.40	9.40	15.41	41.81	24.81	60.87	50.87	19.0	26.0	N	
4	0.34441	25.40	4.30	15.40	40.80	19.70	59.10	49.10	18.3	29.4	N	
5	0.39988	24.20	8.30	15.40	39.60	23.70	57.86	47.86	18.2	24.1	N	
6	0.51098	21.80	11.40	15.43	37.23	26.83	56.00	46.00	18.7	19.1	N	
7	0.58933	20.20	13.10	15.43	35.63	28.53	56.00	46.00	20.3	17.4	N	
8	0.69660	16.70	3.60	15.43	32.13	19.03	56.00	46.00	23.8	26.9	N	
9	1.03731	11.90	1.30	15.45	27.35	16.75	56.00	46.00	28.6	29.2	N	
10	1.59692	10.70	5.00	15.47	26.17	20.47	56.00	46.00	29.8	25.5	N	
11	0.16191	27.70	9.90	15.39	43.09	25.29	65.37	55.37	22.2	30.0	L1	
12	0.20698	27.10	7.00	15.40	42.50	22.40	63.33	53.33	20.8	30.9	L1	
13	0.27941	26.50	9.30	15.41	41.91	24.71	60.83	50.83	18.9	26.1	L1	
14	0.34441	25.50	4.30	15.40	40.90	19.70	59.10	49.10	18.2	29.4	L1	
15	0.39788	24.40	8.10	15.41	39.81	23.51	57.90	47.90	18.0	24.3	L1	
16	0.51854	22.40	16.00	15.42	37.82	31.42	56.00	46.00	18.1	14.5	L1	
17	0.58895	20.30	12.90	15.42	35.72	28.32	56.00	46.00	20.2	17.6	L1	
18	0.69660	16.80	3.80	15.44	32.24	19.24	56.00	46.00	23.7	26.7	L1	
19	1.03731	12.20	1.80	15.43	27.63	17.23	56.00	46.00	28.3	28.7	L1	
20	1.59692	11.60	5.10	15.46	27.06	20.56	56.00	46.00	28.9	25.4	L1	

Calculation: Result[dBuV]=Reading[dBuV]+C.Fac(LISN(AMN)+Cable+ATT)[dB]
LISN(AMN)=145542

Conducted Emission

Test place Shonan EMC Lab. No.2 Shielded Room
Date June 24, 2024
Temperature / Humidity 24 deg. C / 37 % RH
Engineer Yasumasa Owaki
Mode Tx 11ac-80 5290 MHz
Antenna type 5G_CH 0: monopole Antenna, 5G_CH 1: slot Antenna

Limit: FCC Part 15 Subpart C (15.207)



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP>	<CAV>		<QP>	<CAV>	<QP>	<AV>	<QP>	<AV>		
		[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.16222	27.70	9.90	15.40	43.10	25.30	65.35	55.35	22.2	30.0	N	
2	0.20441	27.30	5.20	15.39	42.69	20.59	63.43	53.43	20.7	32.8	N	
3	0.28273	26.40	9.40	15.41	41.81	24.81	60.74	50.74	18.9	25.9	N	
4	0.34259	25.50	4.30	15.40	40.90	19.70	59.14	49.14	18.2	29.4	N	
5	0.42412	24.00	7.00	15.40	39.40	22.40	57.37	47.37	17.9	24.9	N	
6	0.49937	21.90	3.80	15.43	37.33	19.23	56.01	46.01	18.6	26.7	N	
7	0.59034	20.10	13.10	15.43	35.53	28.53	56.00	46.00	20.4	17.4	N	
8	0.70911	16.60	3.70	15.43	32.03	19.13	56.00	46.00	23.9	26.8	N	
9	1.17957	13.00	8.60	15.46	28.46	24.06	56.00	46.00	27.5	21.9	N	
10	1.76375	12.10	7.60	15.47	27.57	23.07	56.00	46.00	28.4	22.9	N	
11	2.01878	12.60	2.80	15.48	28.08	18.28	56.00	46.00	27.9	27.7	N	
12	2.52360	13.10	3.70	15.52	28.62	19.22	56.00	46.00	27.3	26.7	N	
13	0.16163	27.70	9.50	15.39	43.09	24.89	65.38	55.38	22.2	30.4	L1	
14	0.20441	27.30	5.10	15.40	42.70	20.50	63.43	53.43	20.7	32.9	L1	
15	0.28311	26.40	9.40	15.41	41.81	24.81	60.72	50.72	18.9	25.9	L1	
16	0.34259	25.50	4.20	15.40	40.90	19.60	59.14	49.14	18.2	29.5	L1	
17	0.42193	24.00	6.60	15.41	39.41	22.01	57.41	47.41	18.0	25.4	L1	
18	0.49937	21.70	3.30	15.42	37.12	18.72	56.01	46.01	18.8	27.2	L1	
19	0.58958	20.20	13.00	15.42	35.62	28.42	56.00	46.00	20.3	17.5	L1	
20	0.70629	16.80	3.60	15.44	32.24	19.04	56.00	46.00	23.7	26.9	L1	
21	1.17359	12.50	8.10	15.45	27.95	23.55	56.00	46.00	28.0	22.4	L1	
22	1.76709	12.50	7.90	15.48	27.98	23.38	56.00	46.00	28.0	22.6	L1	
23	2.02210	12.40	3.30	15.51	27.91	18.81	56.00	46.00	28.0	27.1	L1	
24	2.51911	12.70	4.90	15.51	28.21	20.41	56.00	46.00	27.7	25.5	L1	

Calculation: Result[dBuV]=Reading[dBuV]+C.Fac(LISN(AMN)+Cable+ATT)[dB]
LISN(AMN)=145542

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date June 7, 2024 June 12, 2024
Temperature / Humidity 24 deg. C / 43 % RH 22 deg. C / 50 % RH
Engineer Hiromasa Sato Hiromasa Sato
Mode Tx

11a

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5180	-	16630.7
5220	-	16628.8
5240	-	16646.4
5260	20.763	16621.5
5300	21.168	16626.3
5320	21.438	16641.8
5500	21.239	16630.0
5580	21.023	16618.9
5700	21.180	16601.6
5720	21.329	16664.7
5745	-	16635.0
5785	-	16641.2
5825	-	16642.1

11ax-20(OFDM)

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5180	-	19045.2
5220	-	19130.7
5240	-	19064.1
5260	22.284	19037.4
5300	22.799	19053.7
5320	22.542	19061.3
5500	22.356	19096.8
5580	22.344	19022.2
5700	21.869	19045.8
5720	22.636	19053.1
5745	-	19091.1
5785	-	19081.4
5825	-	19058.7

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date June 8, 2024
Temperature / Humidity 24 deg. C / 36 % RH
Engineer Takayuki Kobayashi
Mode Tx

11ax-20(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
26-tone RU	5180	0	-	18481.6
	5220	4	-	17367.2
	5240	8	-	18475.5
	5260	0	20.087	18389.4
	5300	4	18.844	17335.7
	5320	8	20.152	18471.0
	5500	0	20.255	18403.9
	5580	4	18.896	17345.7
	5700	8	19.899	18452.8
	5720	8	20.017	18425.7
	5745	0	-	18396.3
	5785	4	-	17320.0
	5825	8	-	18575.5

11ax-20(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
52-tone RU	5180	37	-	18348.4
	5220	38	-	17446.3
	5240	40	-	18327.6
	5260	37	21.009	18330.4
	5300	38	19.500	17412.3
	5320	40	20.617	18386.4
	5500	37	20.885	18297.6
	5580	38	19.580	17455.1
	5700	40	20.366	18288.3
	5720	40	20.230	18281.7
	5745	37	-	18297.9
	5785	38	-	17428.5
	5825	40	-	18382.0

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date June 8, 2024
Temperature / Humidity 24 deg. C / 36 % RH
Engineer Takayuki Kobayashi
Mode Tx

11ax-20(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
106-tone RU	5180	53	-	18276.1
	5220	53	-	18276.2
	5240	54	-	18276.2
	5260	53	21.150	18295.2
	5300	53	21.214	18278.6
	5320	54	20.654	18280.2
	5500	53	21.276	18291.2
	5580	53	21.084	18269.7
	5700	54	20.734	18285.4
	5720	54	20.612	18270.3
	5745	53	-	18275.4
	5785	53	-	18288.0
	5825	54	-	18281.6

11ax-20(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
242-tone RU	5180	61	-	19091.5
	5220	61	-	19123.7
	5240	61	-	19088.6
	5260	61	21.580	19084.5
	5300	61	21.889	19123.1
	5320	61	21.963	19102.5
	5500	61	21.963	19101.2
	5580	61	22.018	19112.8
	5700	61	21.959	19136.7
	5720	61	21.634	19132.7
	5745	61	-	19134.7
	5785	61	-	19153.4
	5825	61	-	19112.9

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date June 7, 2024 June 12, 2024
Temperature / Humidity 24 deg. C / 43 % RH 22 deg. C / 50 % RH
Engineer Hiromasa Sato Hiromasa Sato
Mode Tx

11n-40

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5190	-	36851.2
5230	-	36635.9
5270	46.322	36928.6
5310	45.911	36912.7
5510	45.855	36918.9
5550	44.641	36606.7
5670	44.655	36594.9
5710	44.511	36577.9
5755	-	36638.2
5795	-	36617.0

11ax-40(OFDM)

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5190	-	38046.4
5230	-	38017.7
5270	44.653	38034.0
5310	44.176	37965.2
5510	43.901	37978.9
5550	44.313	38009.5
5670	43.281	38024.5
5710	44.286	38052.7
5755	-	38048.4
5795	-	37973.1

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date June 8, 2024 June 12, 2024
Temperature / Humidity 24 deg. C / 36 % RH 22 deg. C / 50 % RH
Engineer Takayuki Kobayashi Hiromasa Sato
Mode Tx

11ax-40(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
26-tone RU	5190	0	-	38264.4
	5230	17	-	38204.8
	5270	0	40.516	38212.9
	5310	17	40.956	38332.3
	5510	0	40.440	38001.8
	5550	8	38.103	36466.1
	5670	17	41.100	38471.0
	5710	17	40.798	38253.9
	5755	0	-	37956.5
	5795	17	-	38188.6

11ax-40(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
52-tone RU	5190	37	-	38073.3
	5230	44	-	37988.9
	5270	37	41.296	38034.8
	5310	44	41.400	38207.3
	5510	37	40.475	37599.5
	5550	40	38.564	36614.2
	5670	44	41.282	38168.7
	5710	44	40.787	37905.9
	5755	37	-	38014.3
	5795	44	-	38146.0

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date June 8, 2024 June 12, 2024
Temperature / Humidity 24 deg. C / 36 % RH 22 deg. C / 50 % RH
Engineer Takayuki Kobayashi Hiromasa Sato
Mode Tx

11ax-40(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
106-tone RU	5190	53	-	37422.3
	5230	56	-	37502.0
	5270	53	41.043	37393.4
	5310	56	40.593	37485.2
	5510	53	41.042	37480.0
	5550	54	38.757	36464.0
	5670	56	40.766	37548.0
	5710	56	40.761	37504.3
	5755	53	-	37474.8
	5795	56	-	37388.1

11ax-40(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
242-tone RU	5190	61	-	37455.9
	5230	62	-	37597.0
	5270	61	41.660	37426.7
	5310	62	42.825	37514.3
	5510	61	41.753	37465.8
	5550	61	41.746	37372.2
	5670	62	42.763	37536.2
	5710	62	42.684	37516.1
	5755	61	-	37426.1
	5795	62	-	37569.4

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date June 9, 2024
Temperature / Humidity 24 deg. C / 45 % RH
Engineer Yohsuke Matsuzawa
Mode Tx

11ax-40(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
484-tone RU	5190	65	-	38023.7
	5230	65	-	38023.2
	5270	65	43.677	38067.6
	5310	65	43.438	38049.7
	5510	65	43.571	38061.0
	5550	65	43.332	38031.1
	5670	65	43.511	38029.3
	5710	65	43.267	38045.6
	5755	65	-	38032.1
	5795	65	-	38042.7

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date June 7, 2024 June 12, 2024
Temperature / Humidity 24 deg. C / 43 % RH 22 deg. C / 50 % RH
Engineer Hiromasa Sato Hiromasa Sato
Mode Tx

11ac-80

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5210	-	76099.1
5290	88.351	76340.5
5530	89.146	76058.8
5610	89.398	76151.4
5690	88.767	76263.1
5775	-	76221.2

11ax-80(OFDM)

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5210	-	77529.4
5290	86.193	77564.6
5530	87.736	77477.8
5610	85.949	77445.2
5690	87.379	77549.0
5775	-	77518.9

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date June 9, 2024
Temperature / Humidity 24 deg. C / 45 % RH
Engineer Yohsuke Matsuzawa
Mode Tx

11ax-80(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
26-tone RU	5210	0	-	78728.3
	5290	36	82.441	78645.6
	5530	0	81.670	78632.8
	5610	18	78.398	75158.0
	5690	36	81.827	78232.9
	5775	0	-	78893.8

11ax-80(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
52-tone RU	5210	37	-	78182.9
	5290	52	83.218	78349.9
	5530	37	83.298	78021.6
	5610	44	79.379	75420.9
	5690	52	82.609	77488.2
	5775	37	-	78214.7

11ax-80(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
106-tone RU	5210	53	-	77484.2
	5290	60	83.412	77464.4
	5530	53	83.737	77580.1
	5610	56	80.329	75403.3
	5690	60	82.828	77071.8
	5775	53	-	77574.9

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date June 9, 2024
Temperature / Humidity 24 deg. C / 45 % RH
Engineer Yohsuke Matsuzawa
Mode Tx

11ax-80(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
242-tone RU	5210	61	-	77218.1
	5290	62	85.824	77178.5
	5530	61	86.032	77228.6
	5610	62	82.999	75635.8
	5690	64	85.301	77092.1
	5775	61	-	77435.6

11ax-80(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
484-tone RU	5210	65	-	77510.9
	5290	66	85.102	76831.1
	5530	65	87.931	77674.1
	5610	66	85.488	76780.9
	5690	66	85.198	76790.4
	5775	65	-	77521.8

11ax-80(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
996-tone RU	5210	67	-	77738.1
	5290	67	89.259	77799.1
	5530	67	89.092	77740.6
	5610	67	89.781	77867.8
	5690	67	88.344	77838.3
	5775	67	-	77752.7

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date June 7, 2024 June 9, 2024
Temperature / Humidity 24 deg. C / 43 % RH 24 deg. C / 45 % RH
Engineer Hiromasa Sato Yohsuke Matsuzawa
Mode Tx

11ax-160(OFDM)

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5250	173.285	156808.7
5570	168.672	156640.7

11ax-160(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
26-tone RU	5250	Segment 0 0	163.494	158474.1
	5570	Segment 0 0	163.230	158898.4
		Segment 1 36	163.653	158672.6

11ax-160(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
52-tone RU	5250	Segment 0 37	164.484	158049.3
	5570	Segment 0 37	163.324	157366.8
		Segment 1 52	164.044	158099.2

11ax-160(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
106-tone RU	5250	Segment 0 53	164.405	157367.0
	5570	Segment 0 53	165.281	157490.8
		Segment 1 60	165.458	157399.3

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date June 11, 2024
Temperature / Humidity 23 deg. C / 40 % RH
Engineer Hiromasa Sato
Mode Tx

11ax-160(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
242-tone RU	5250	Segment 0 61	166.816	156991.2
	5570	Segment 0 61	167.622	157334.6
		Segment 1 64	165.187	156675.4

11ax-160(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
484-tone RU	5250	Segment 0 65	168.005	156034.4
	5570	Segment 0 65	167.207	156076.4
		Segment 1 66	166.706	156320.5

11ax-160(OFDMA)

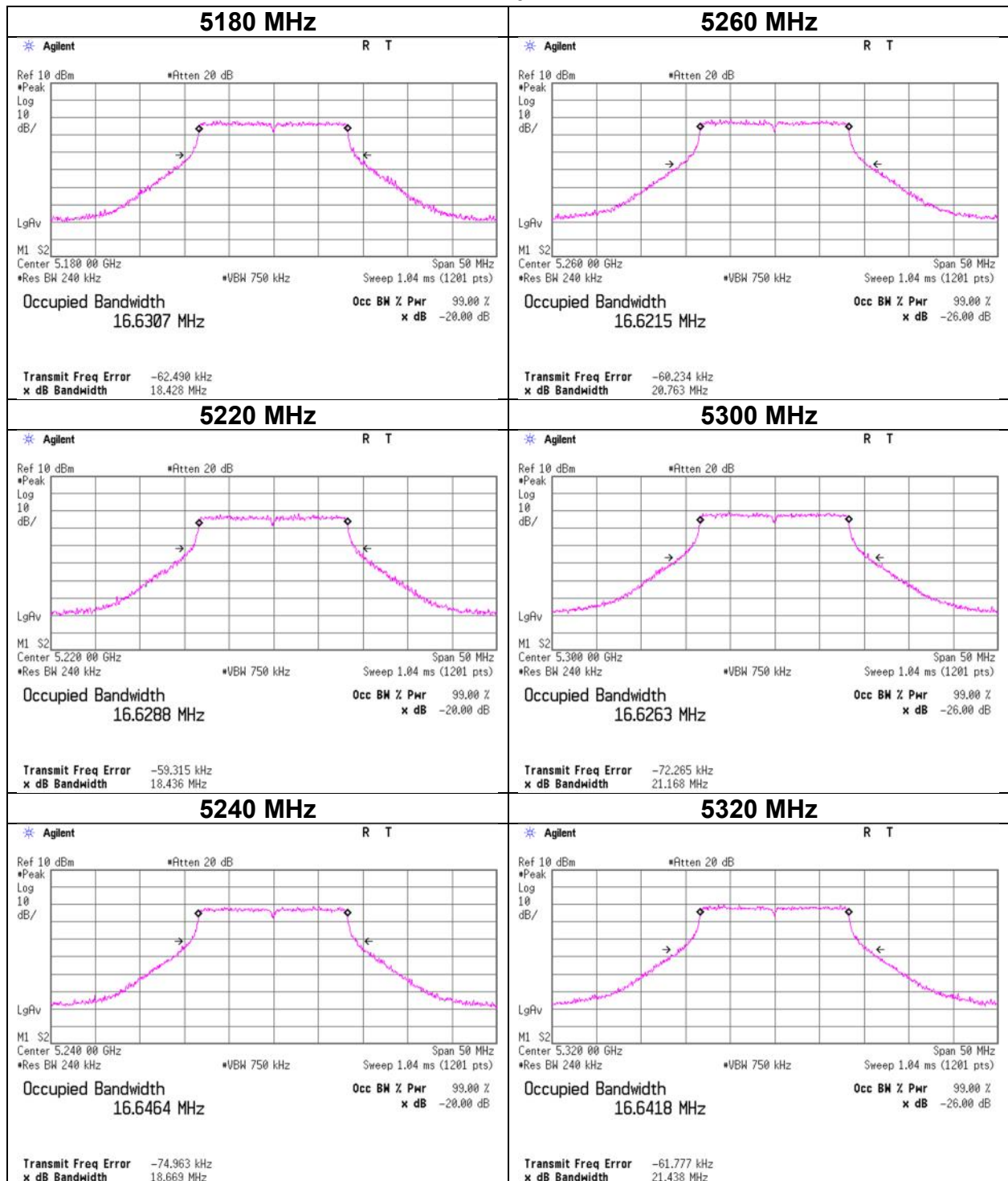
RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
996-tone RU	5250	Segment 0 67	170.778	155978.9
	5570	Segment 0 67	170.499	156067.9
		Segment 1 67	167.017	155851.0

11ax-160(OFDMA)

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
2x996-tone RU	5250	68	172.978	157094.8
	5570	68	172.356	157079.2

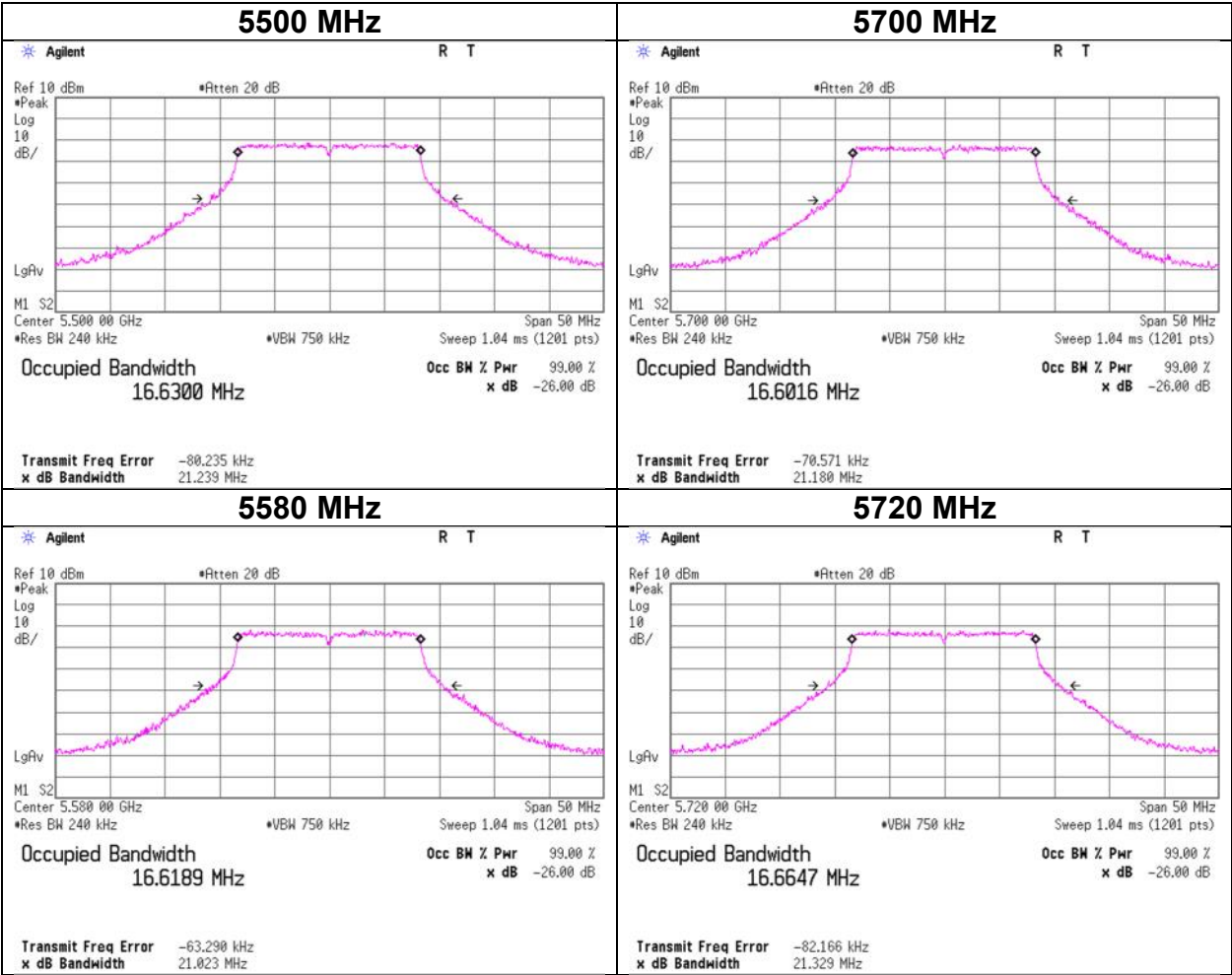
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11a

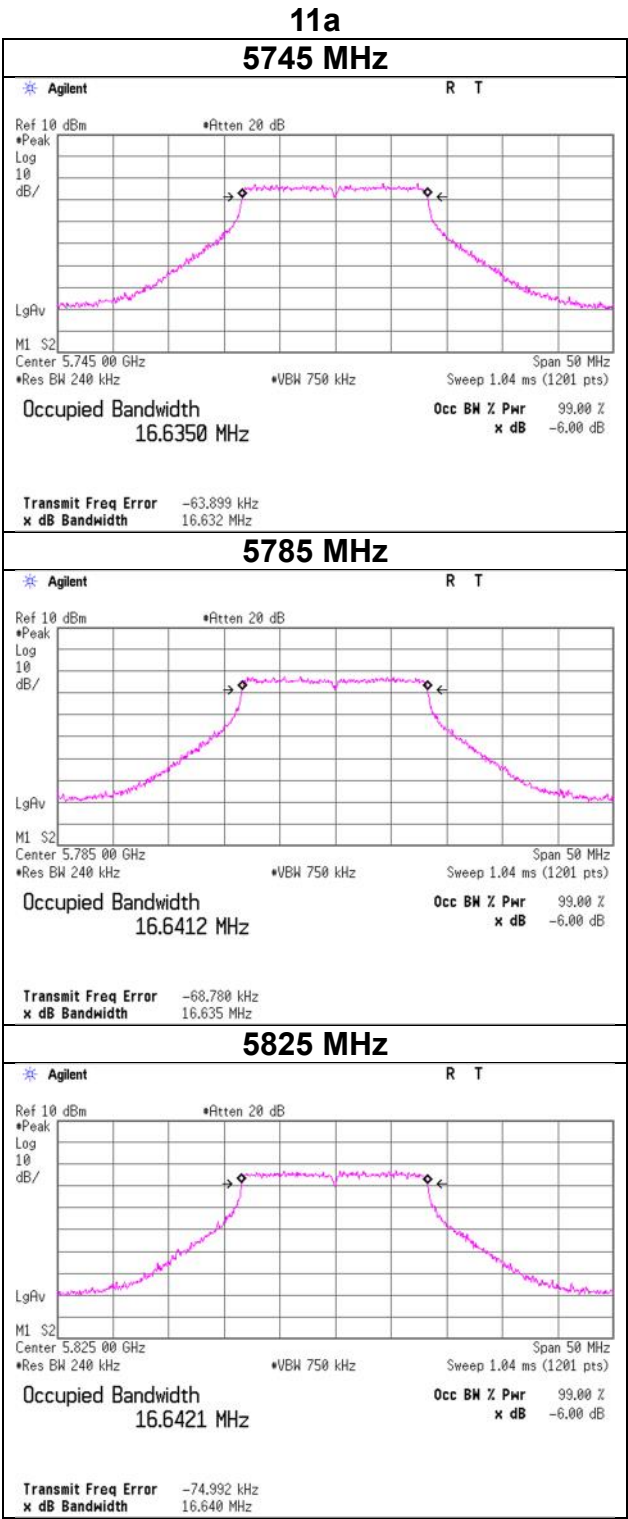


26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11a

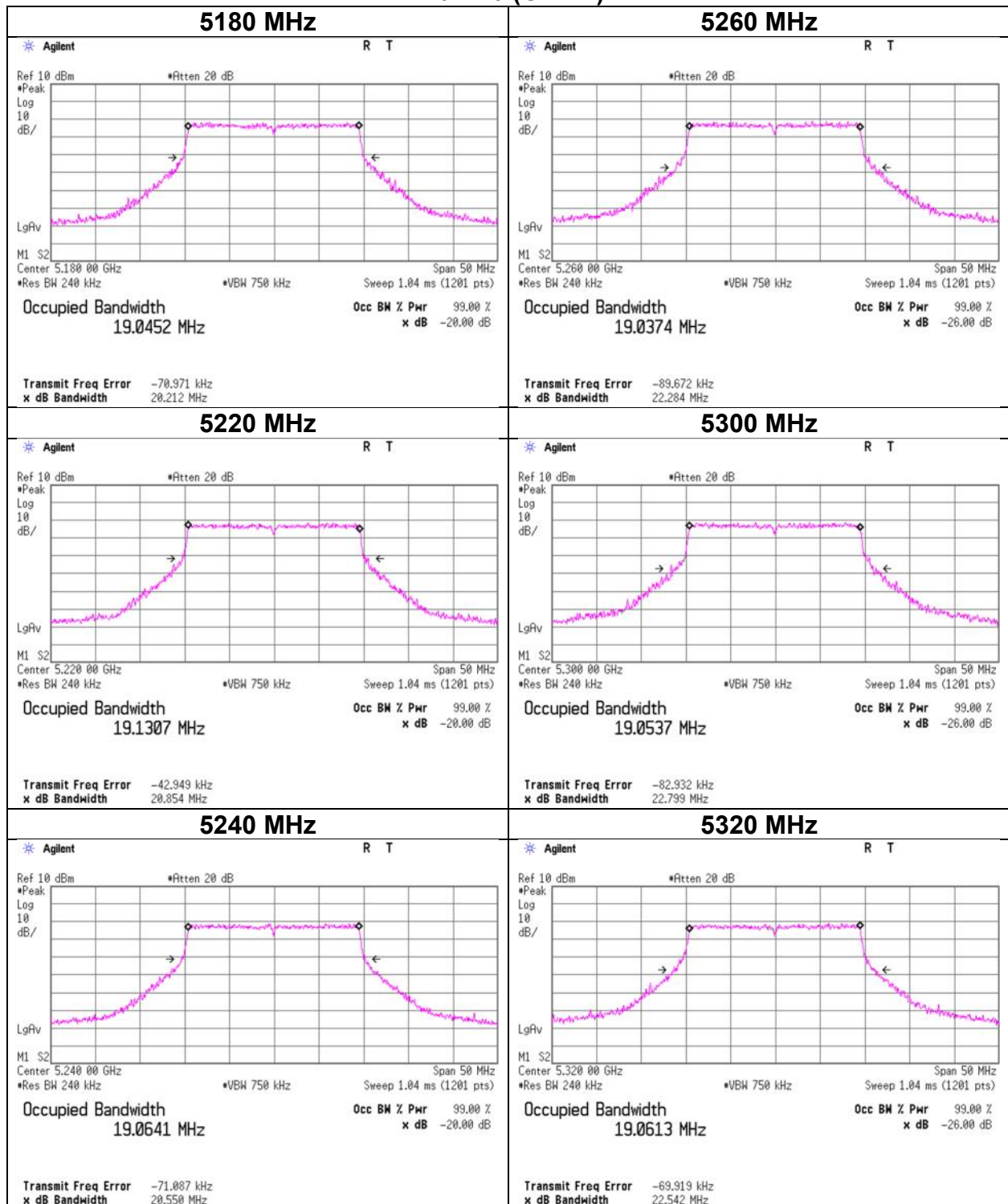


26 dB Emission Bandwidth and 99 % Occupied Bandwidth



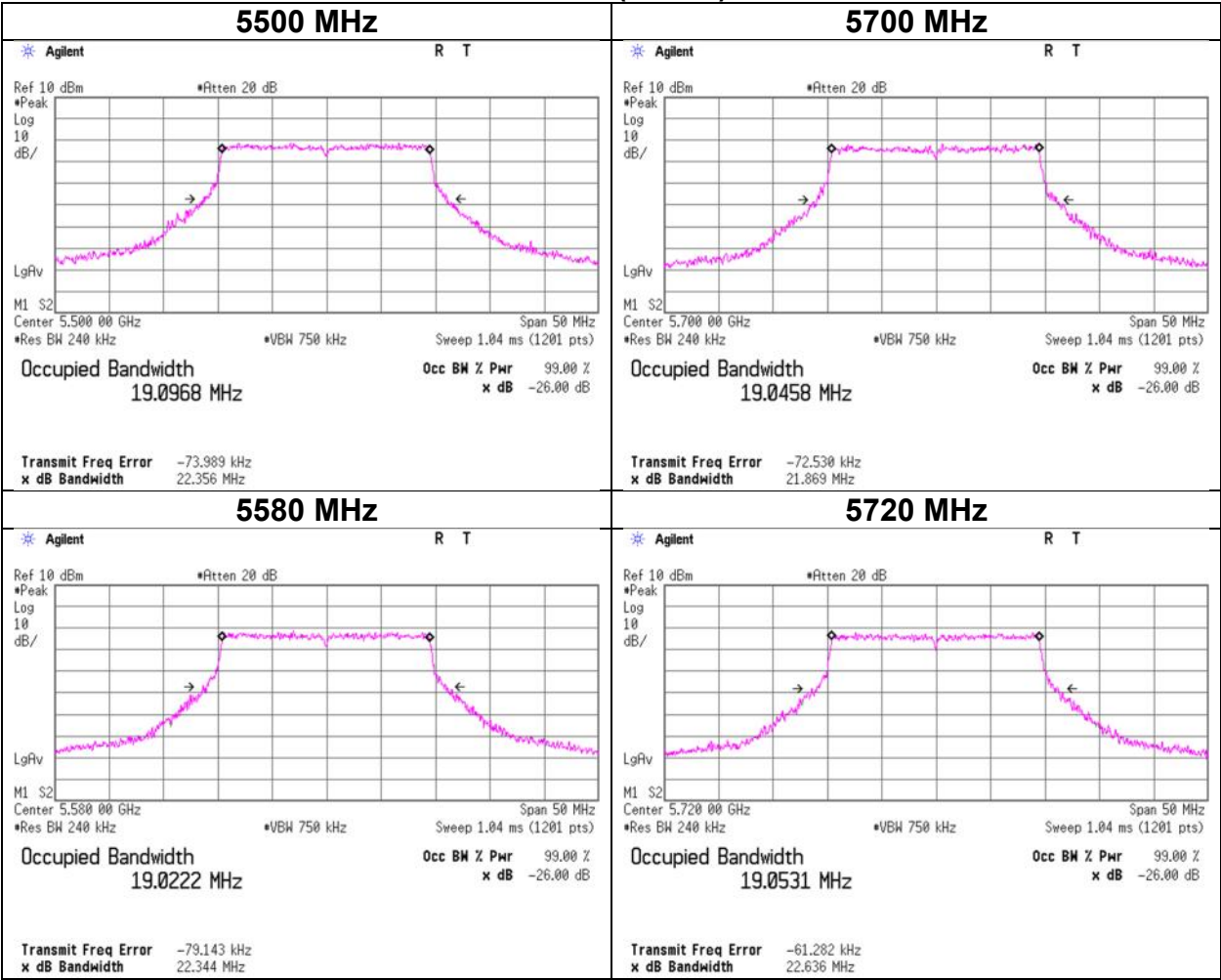
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 (OFDM)



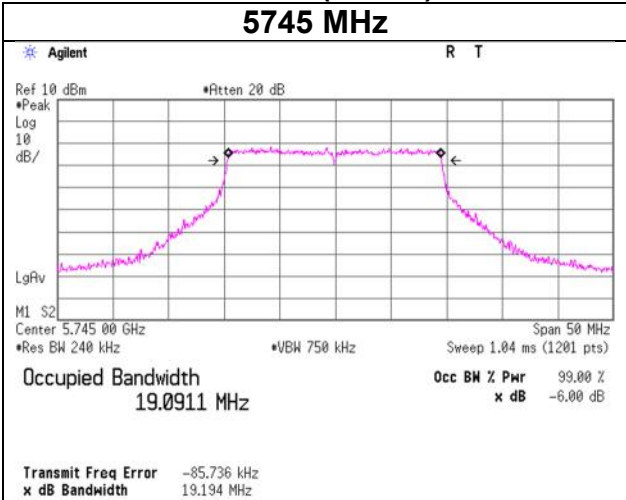
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 (OFDM)

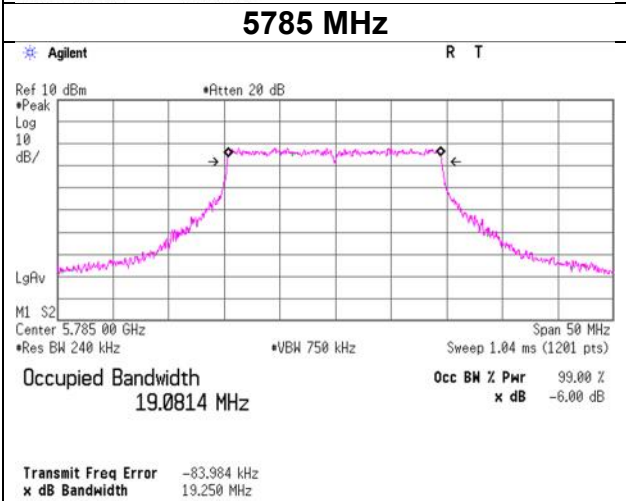


26 dB Emission Bandwidth and 99 % Occupied Bandwidth

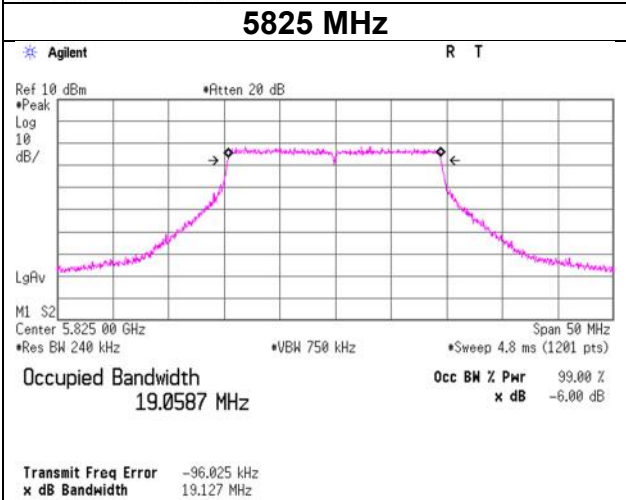
11ax-20 (OFDM)
5745 MHz



5785 MHz

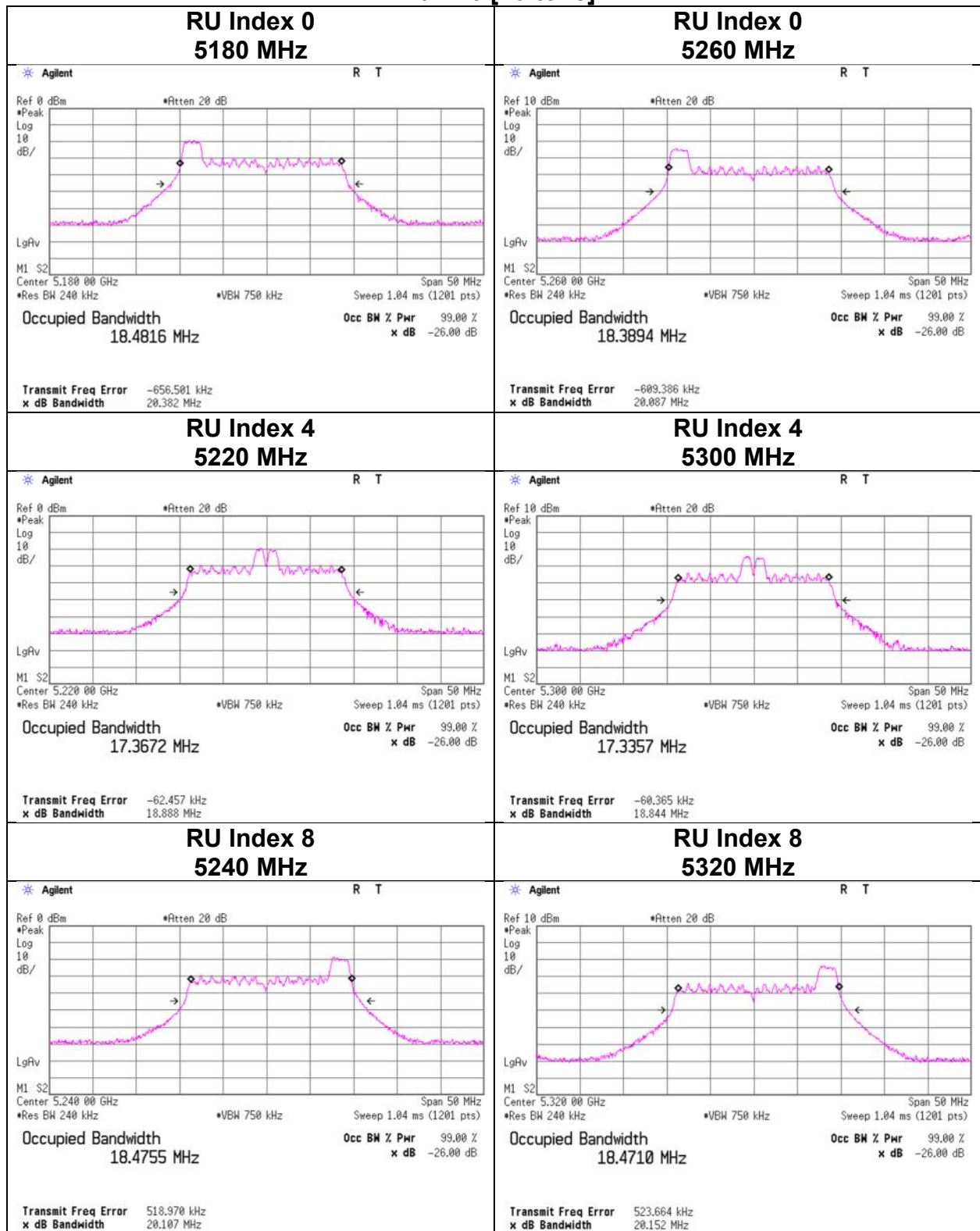


5825 MHz



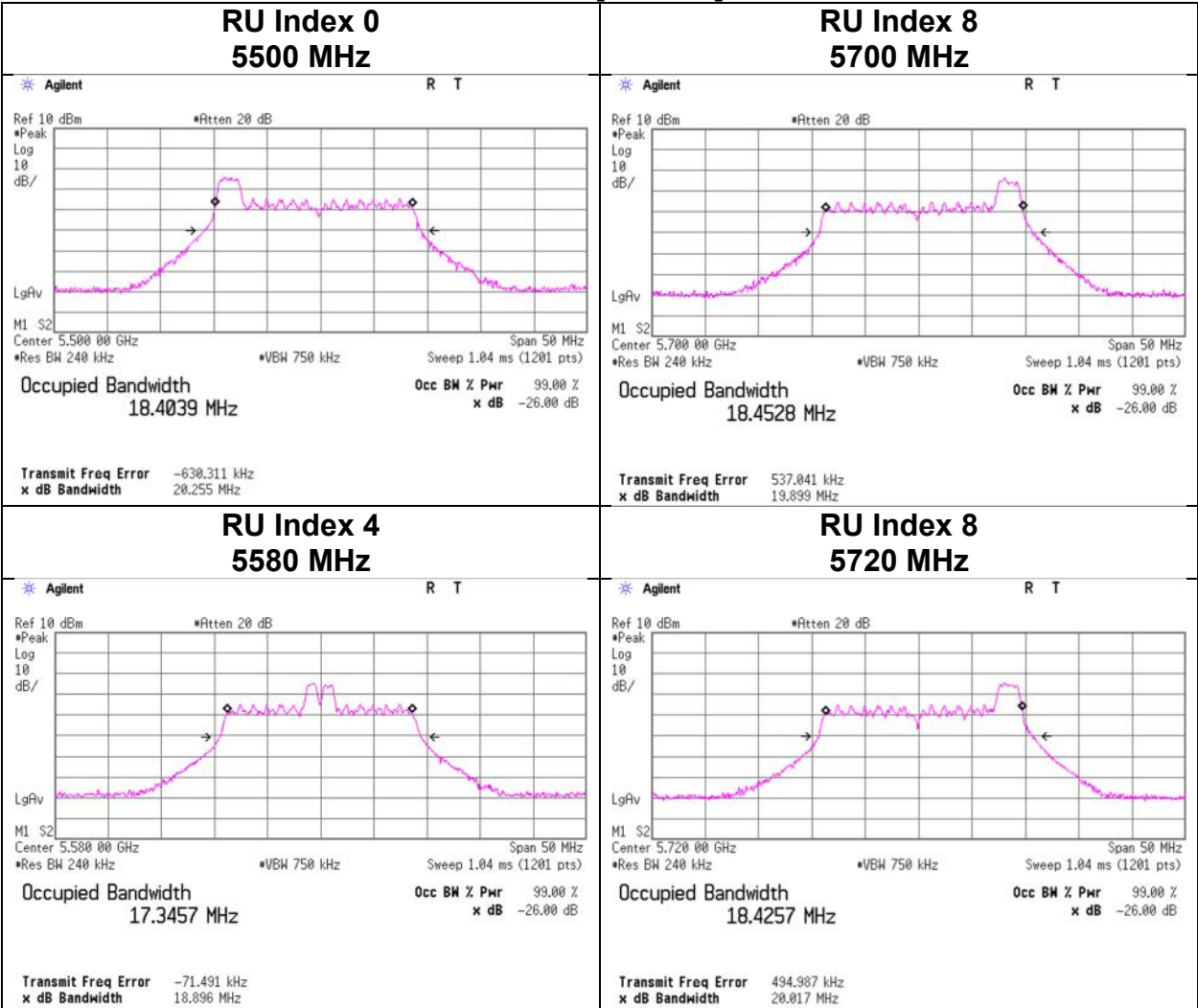
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [26-tone]



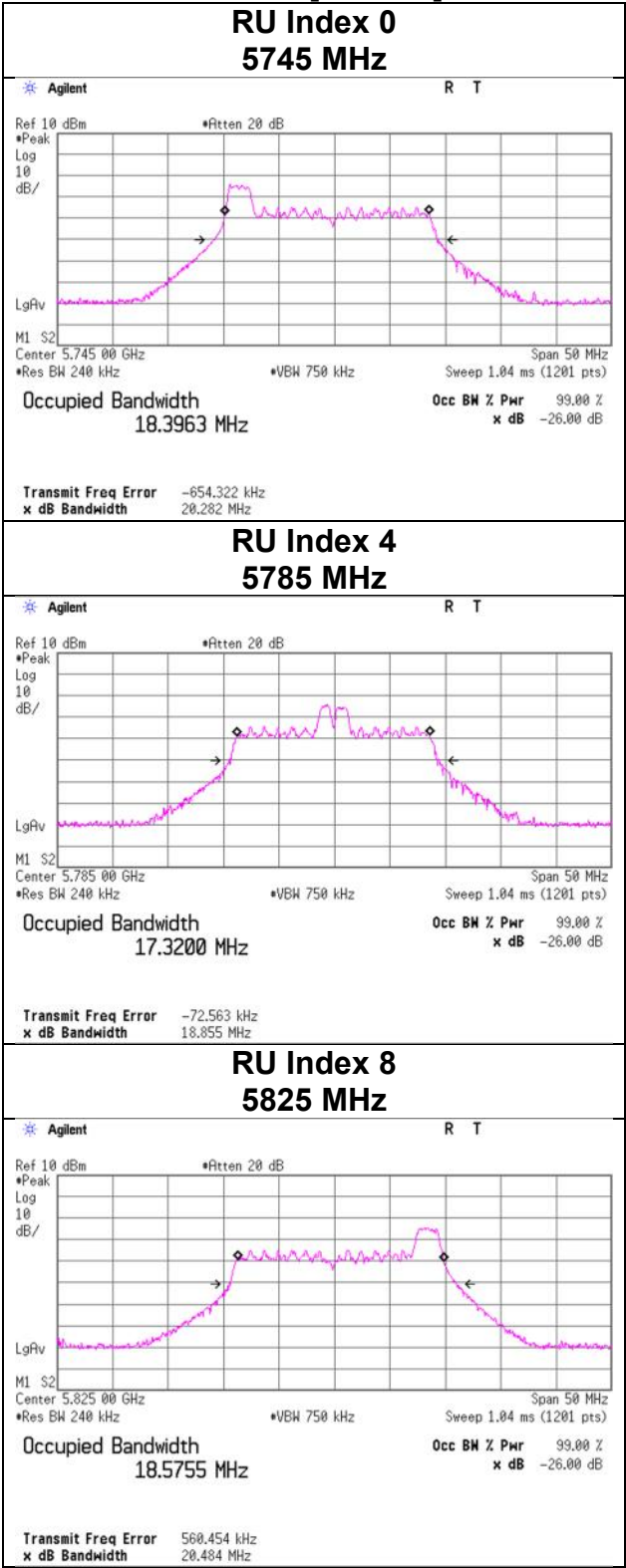
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [26-tone]



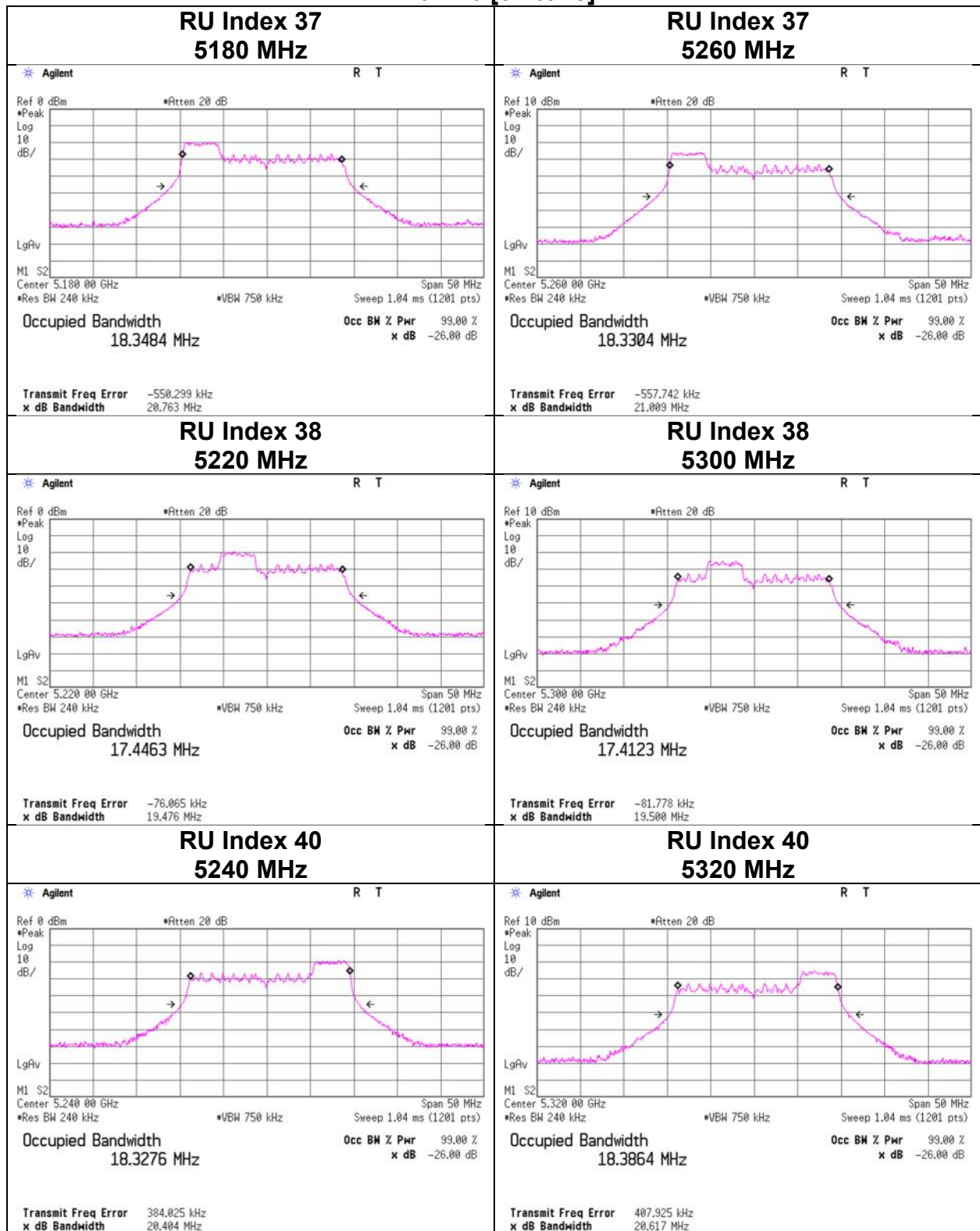
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [26-tone]



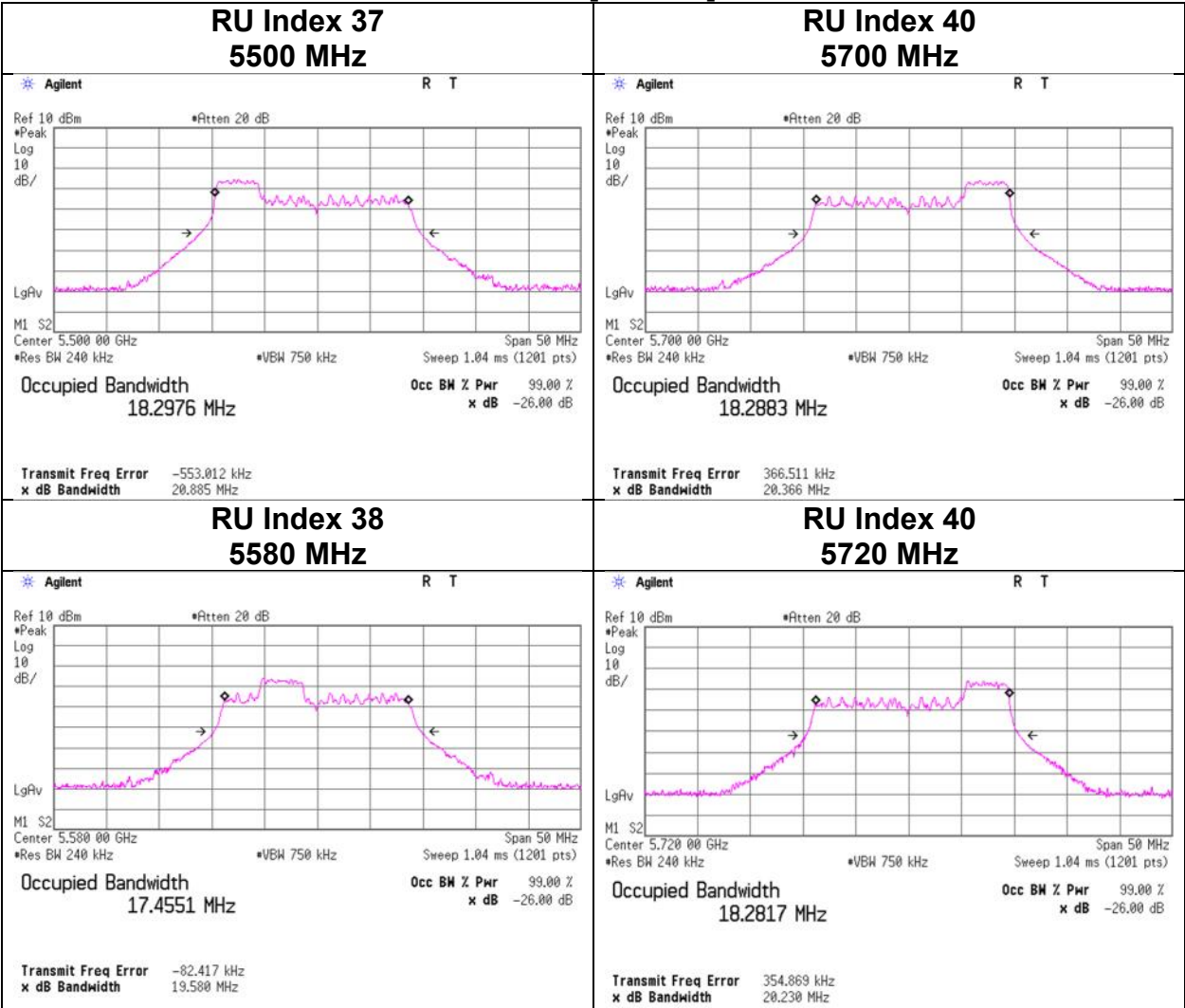
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [52-tone]



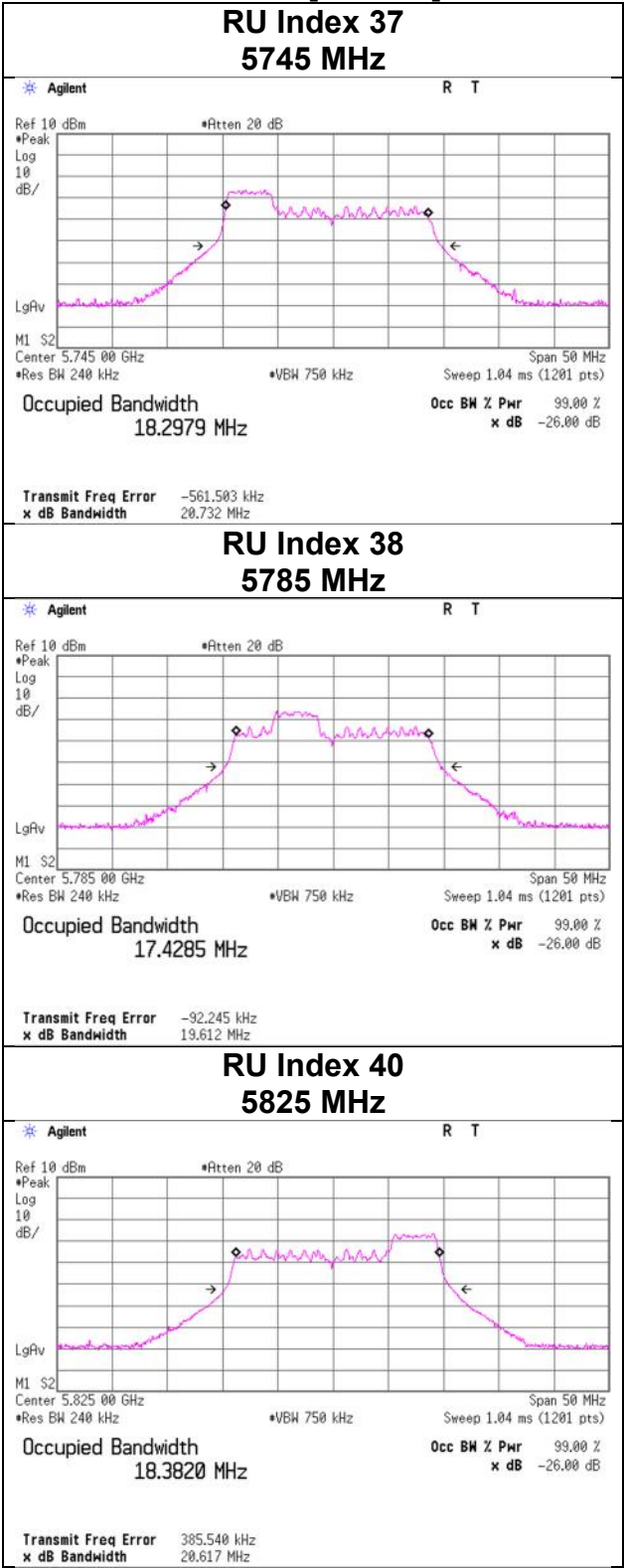
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [52-tone]



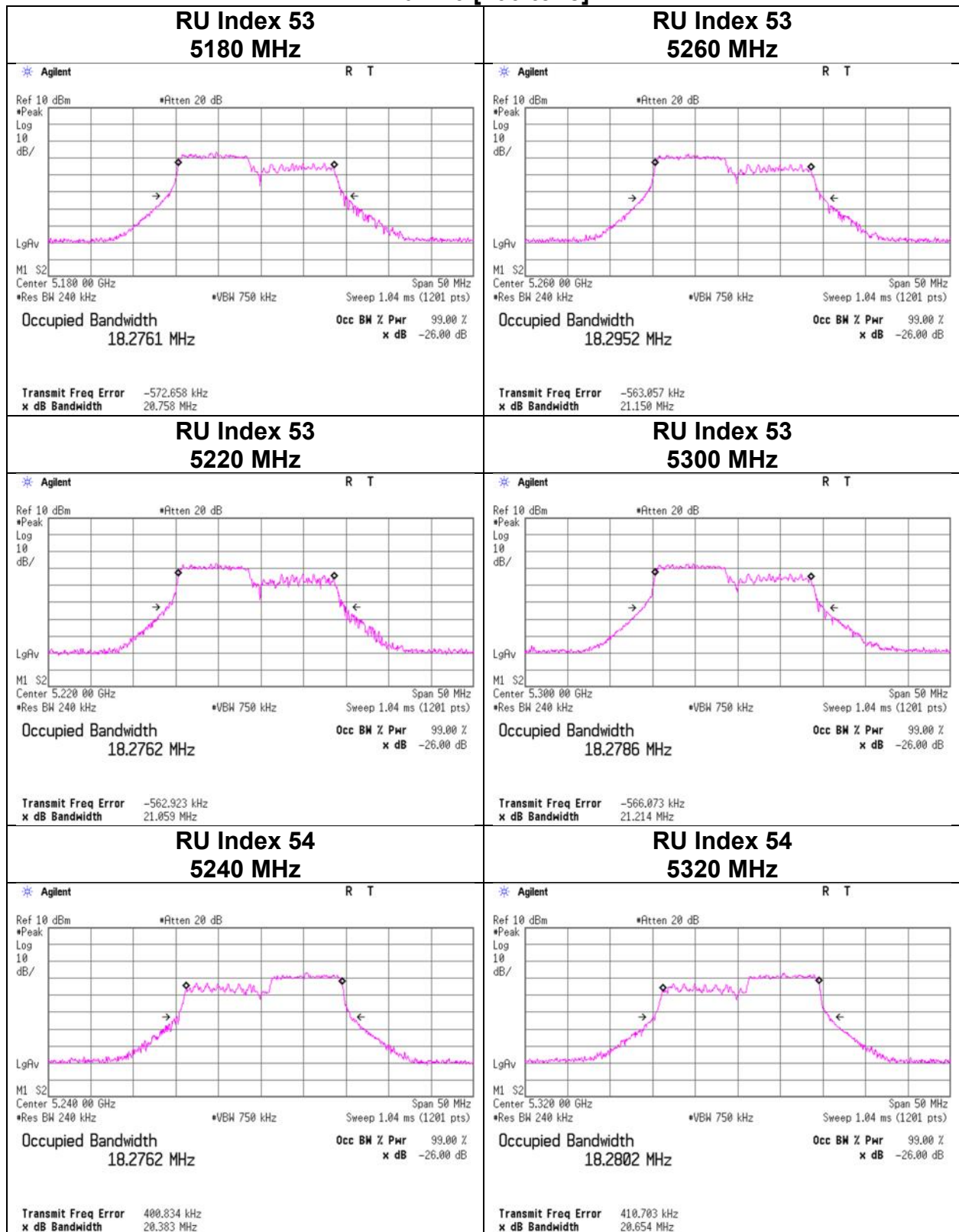
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [52-tone]



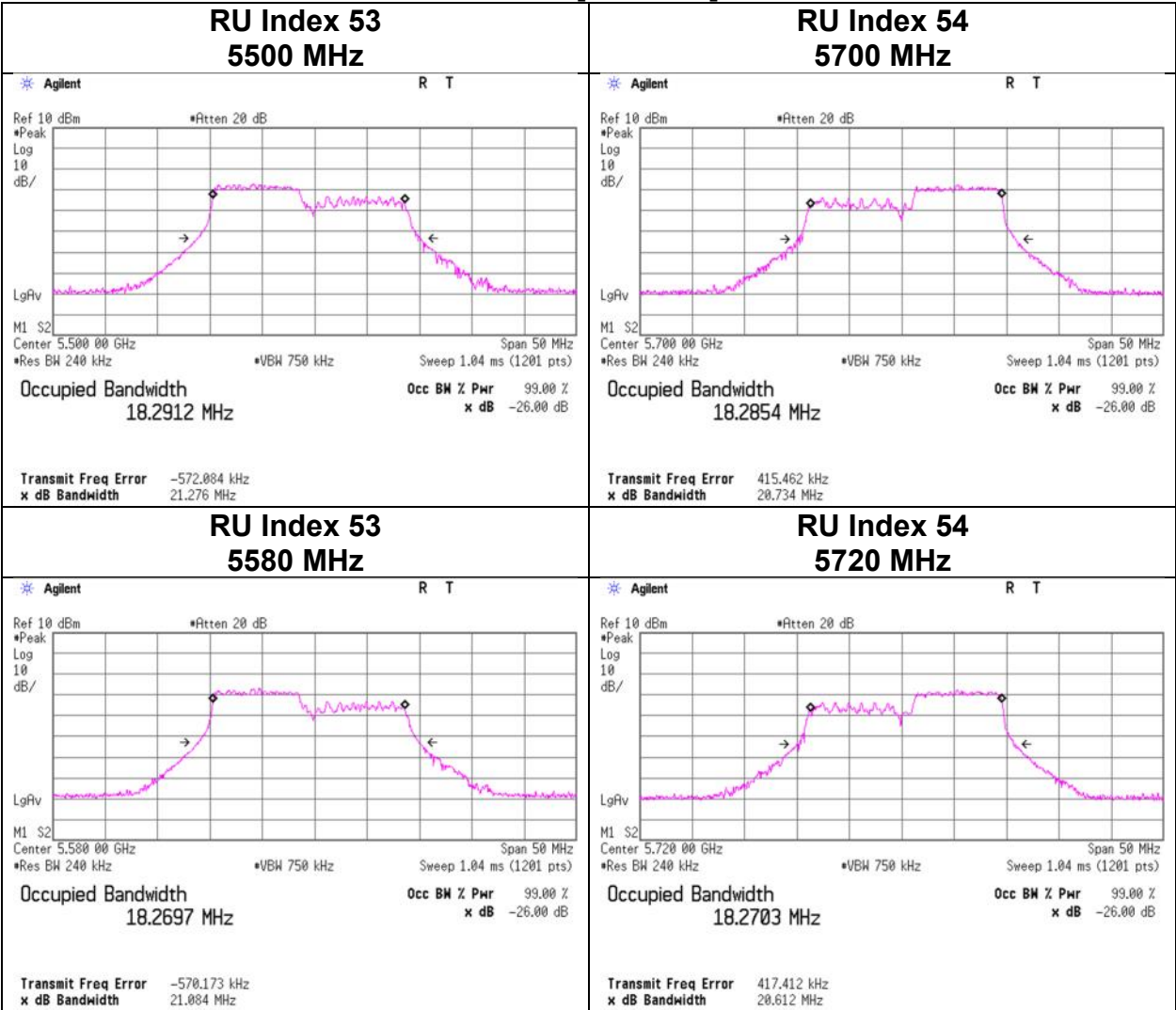
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [106-tone]



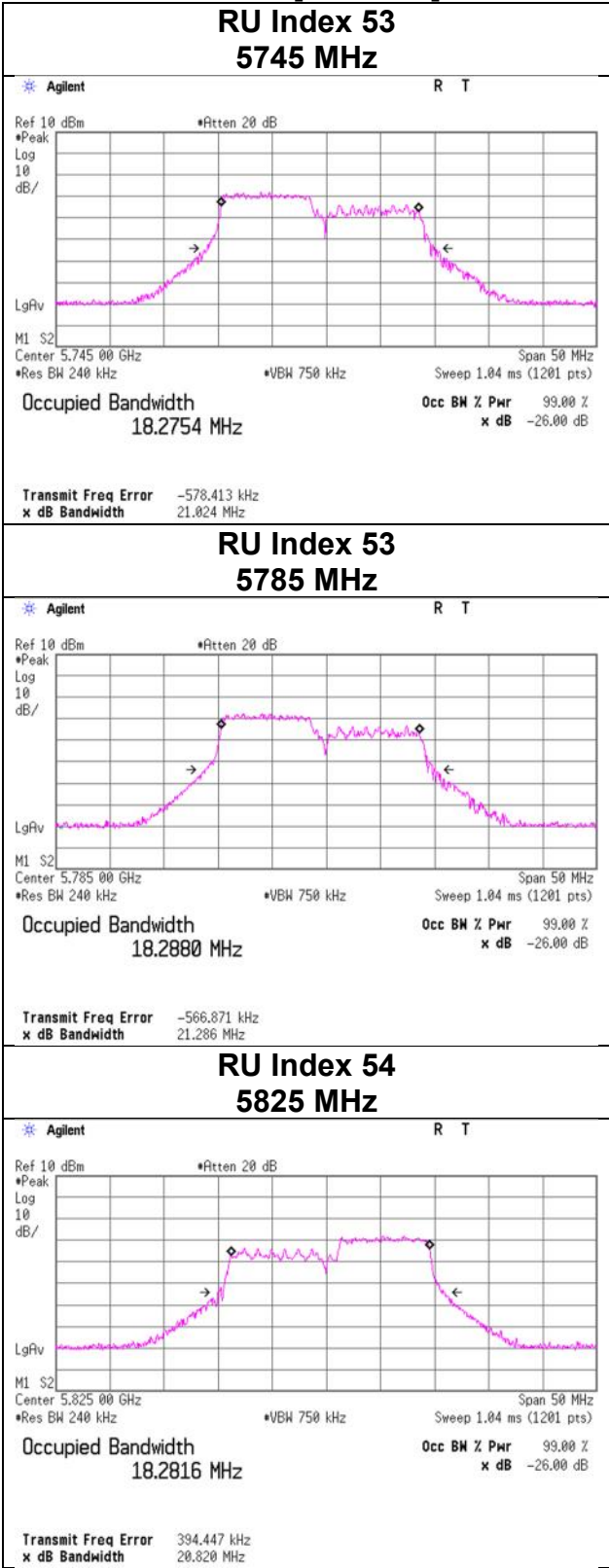
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [106-tone]



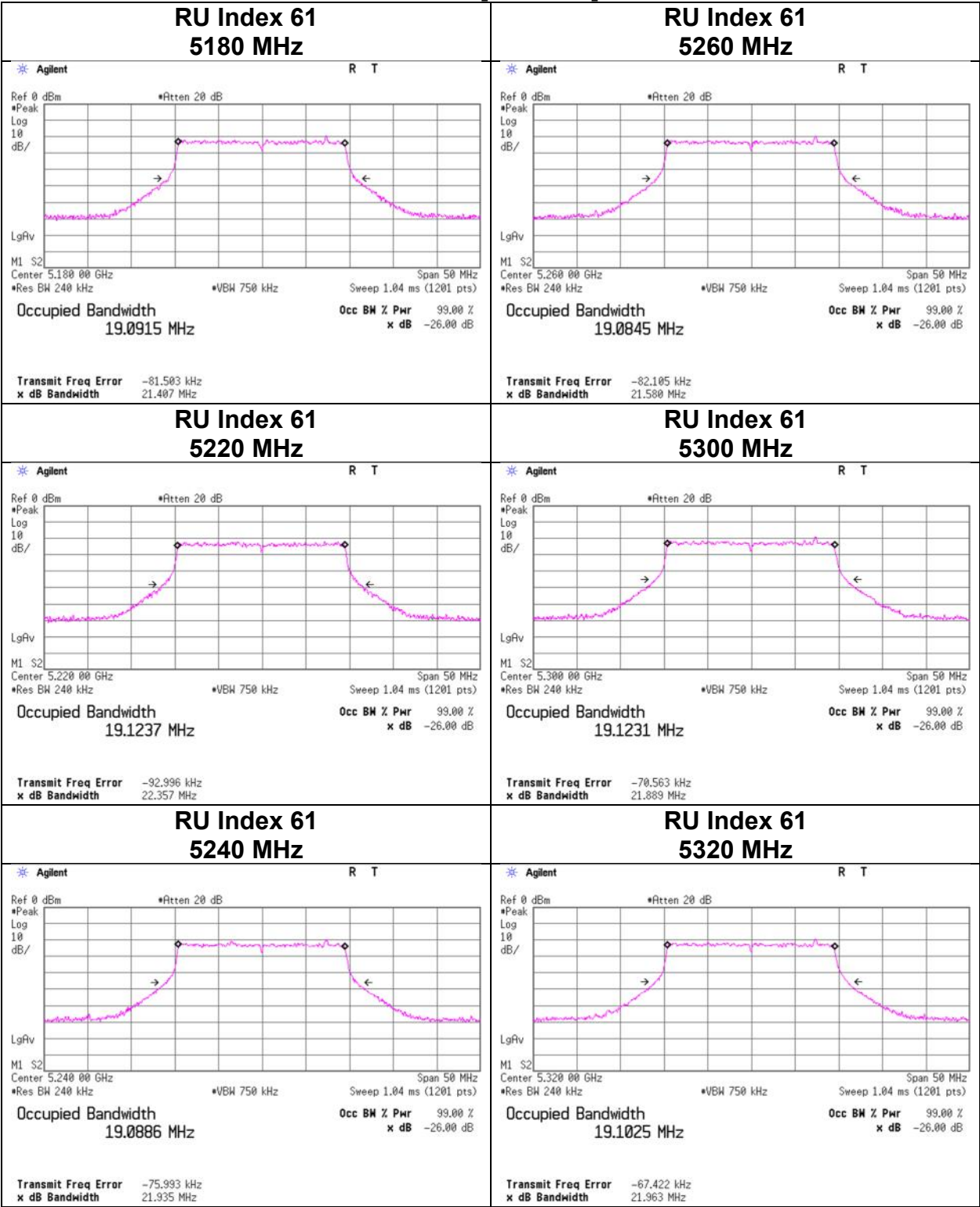
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [106-tone]



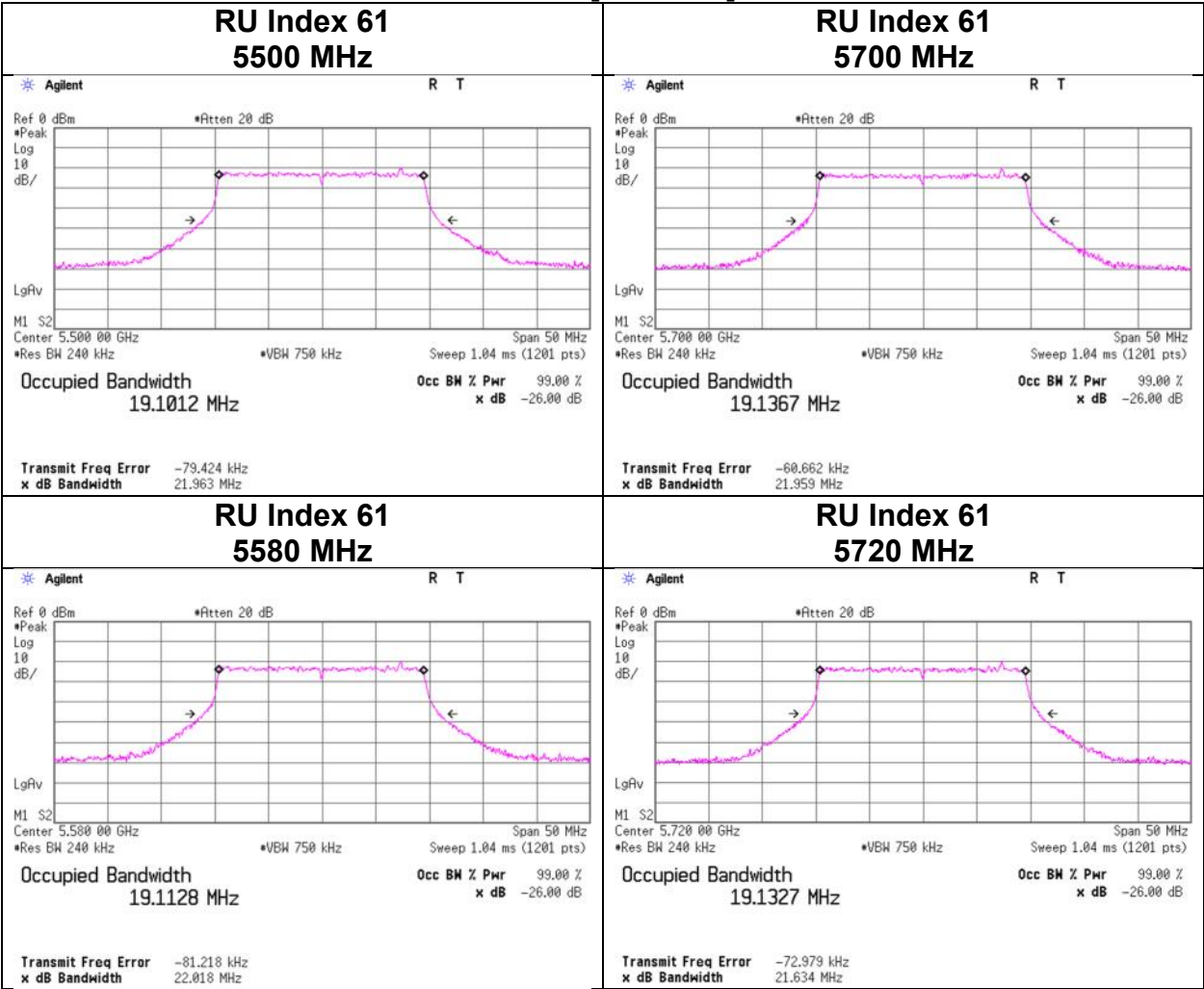
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [242-tone]



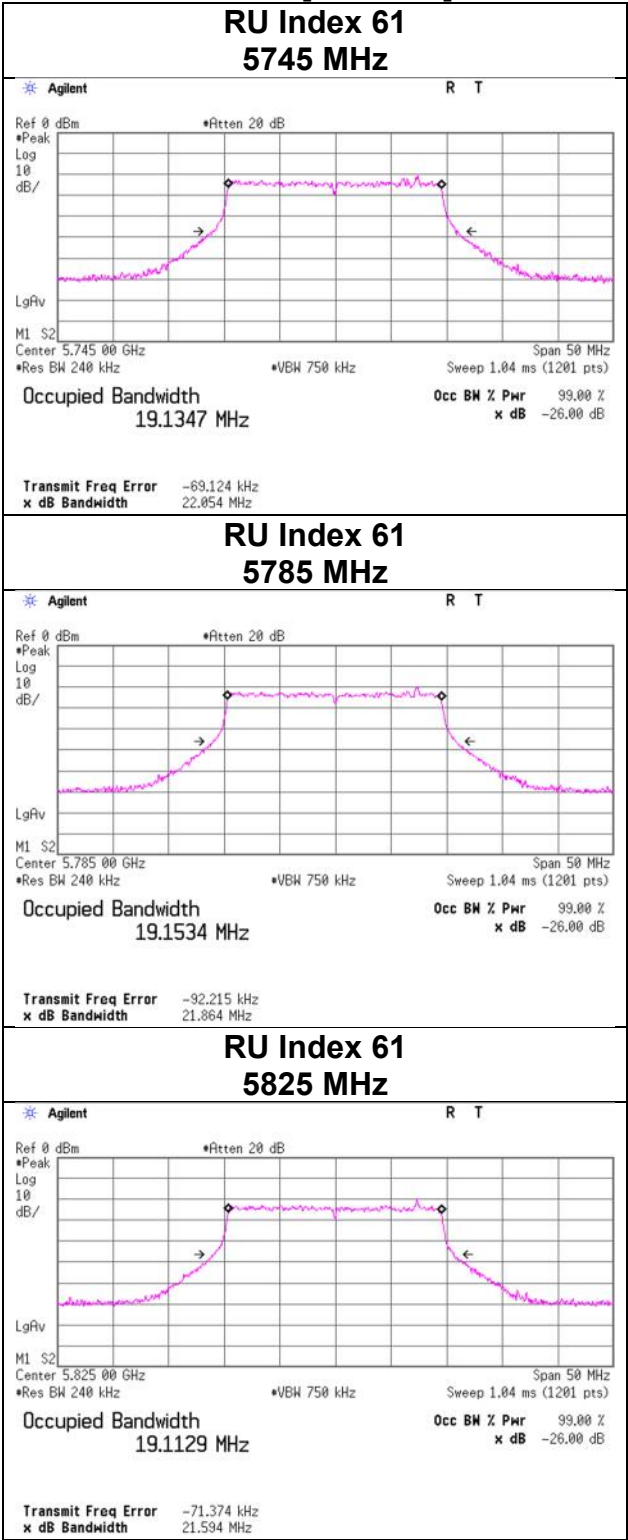
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [242-tone]



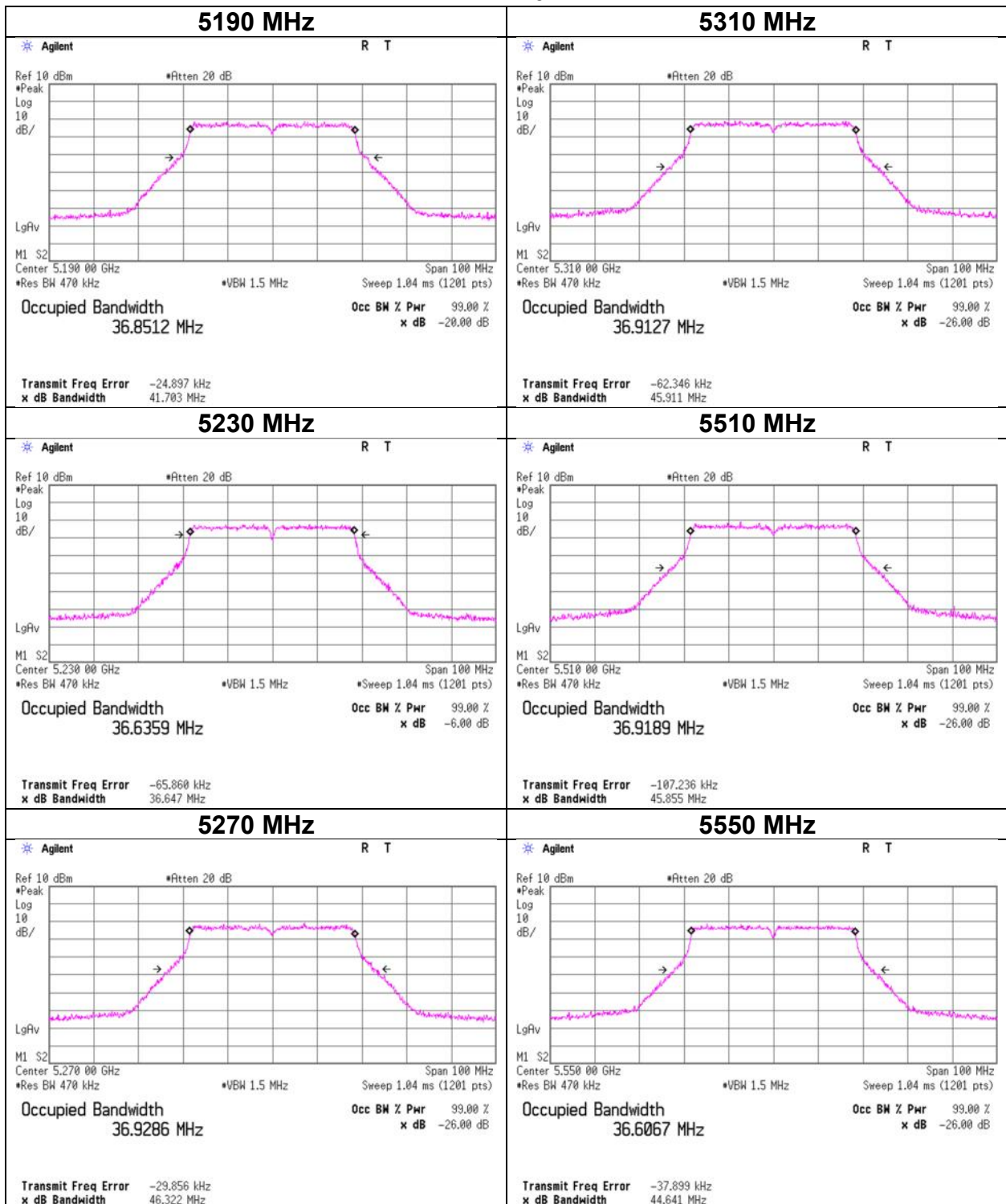
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [242-tone]



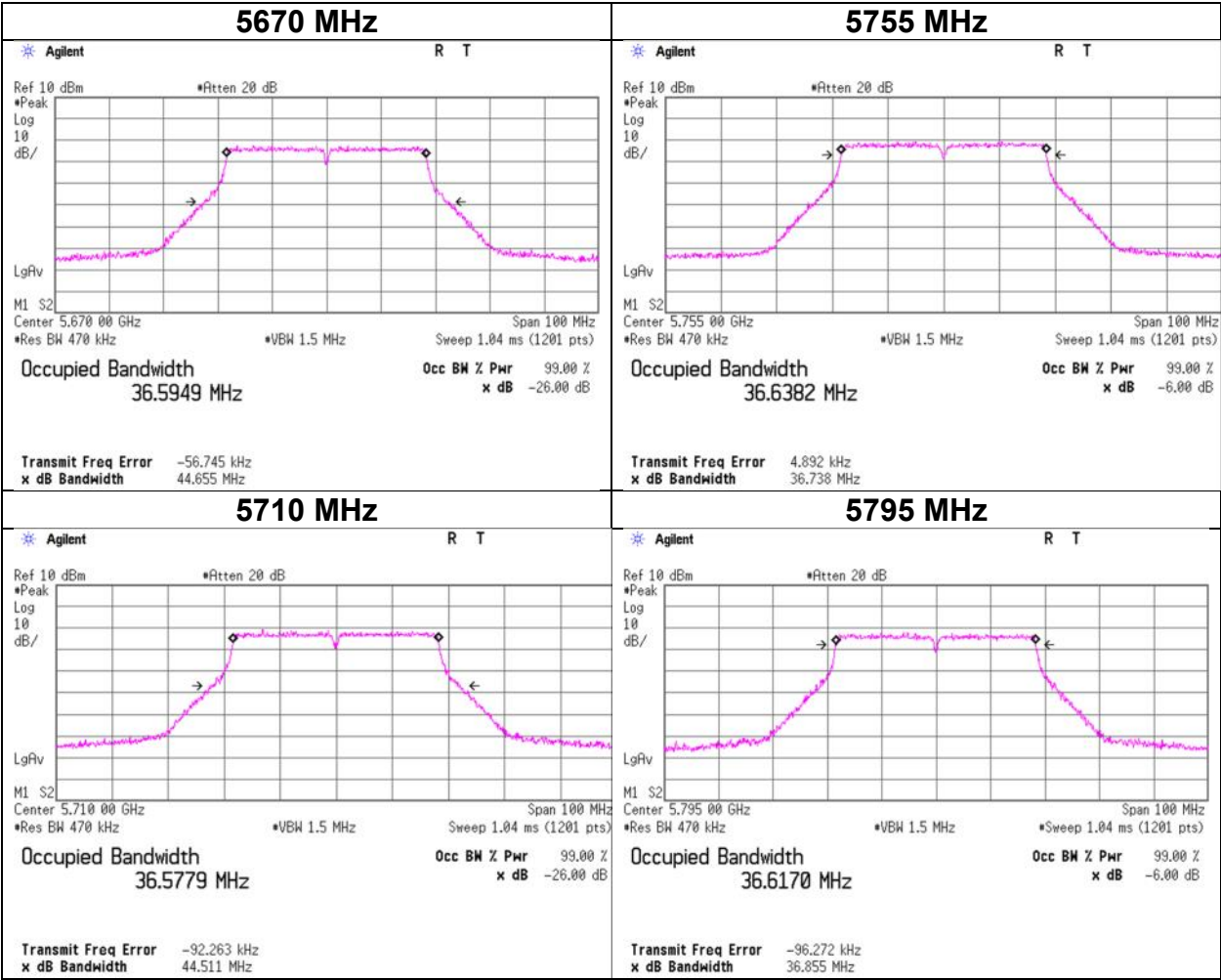
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11n-40



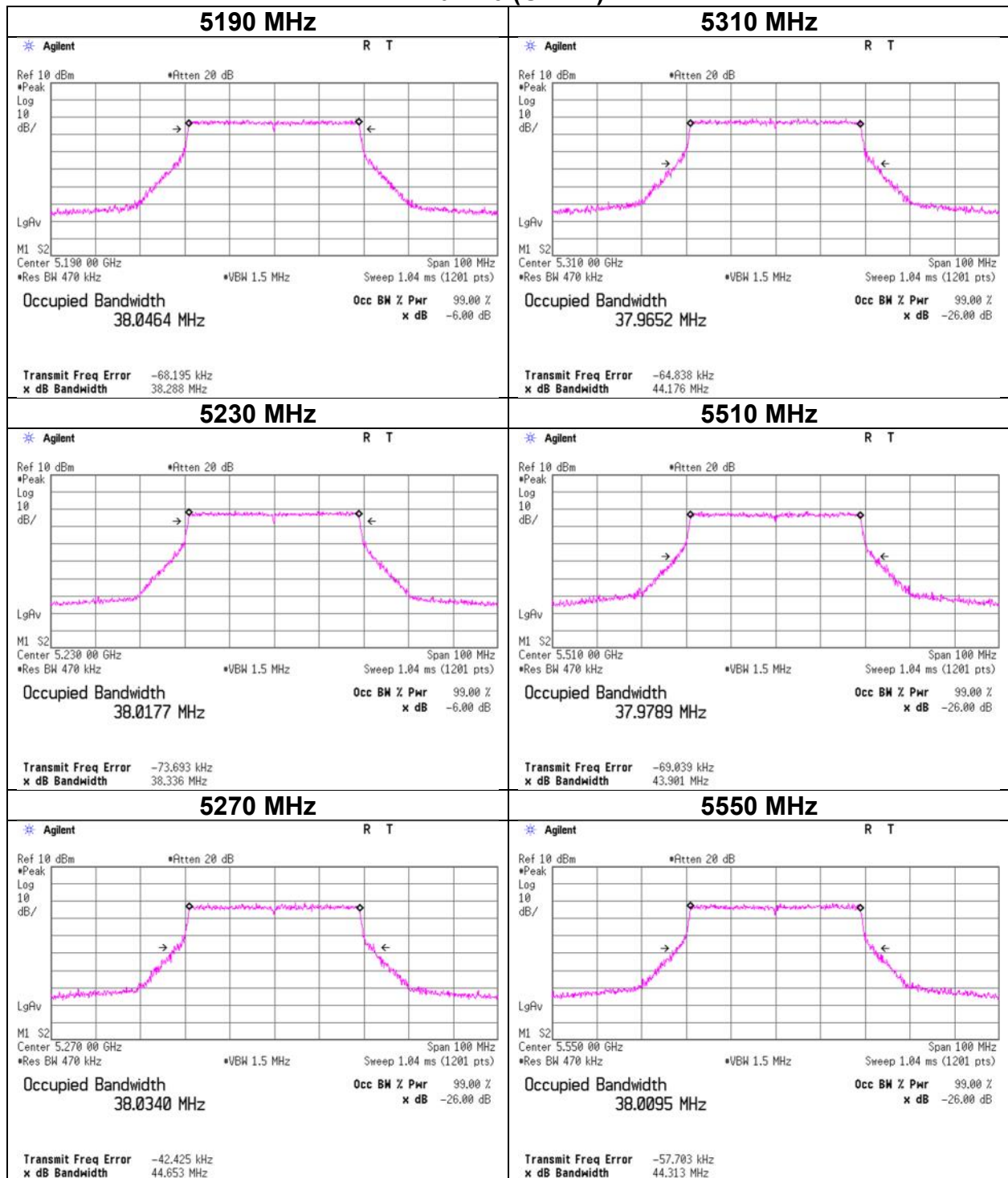
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11n-40



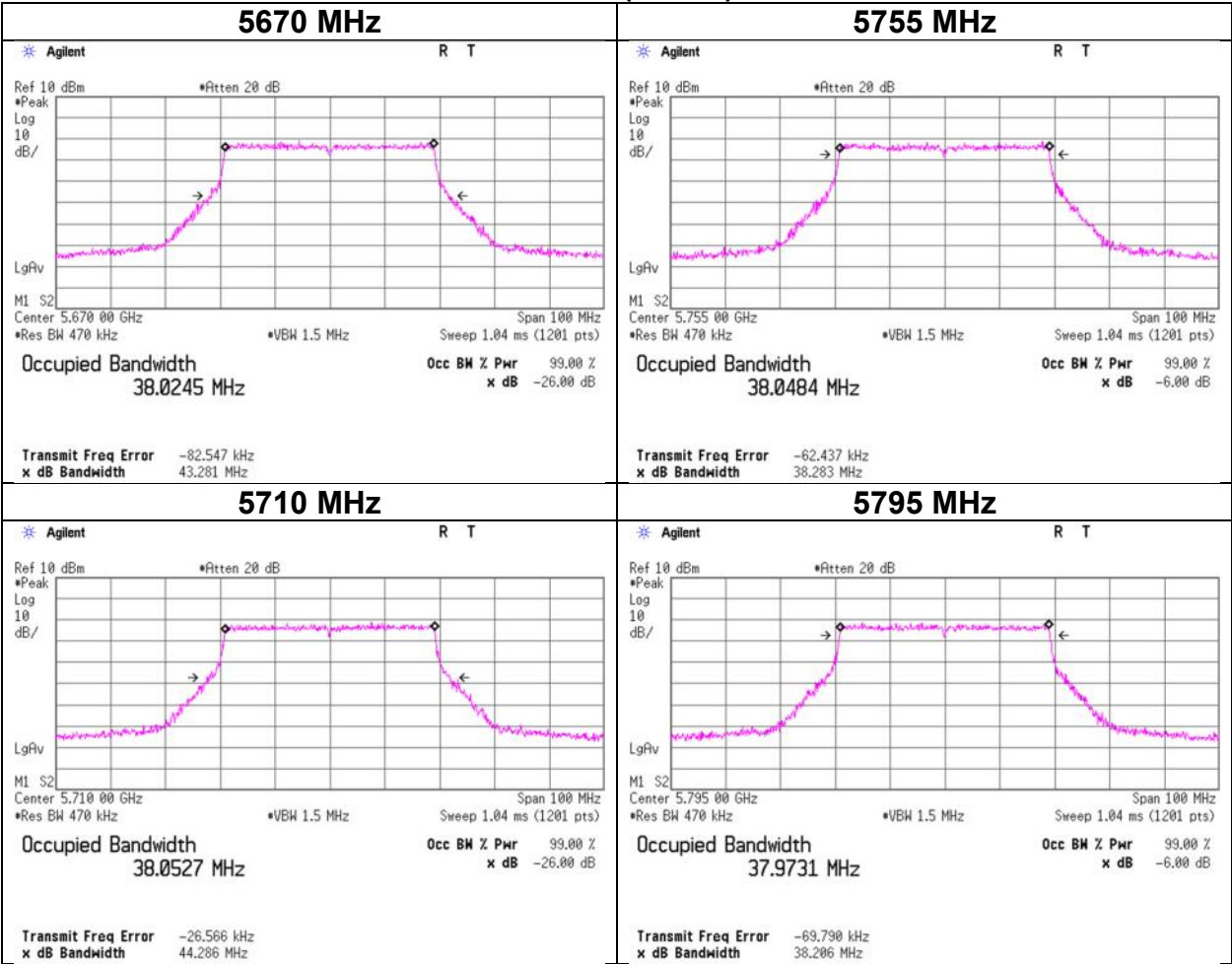
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 (OFDM)



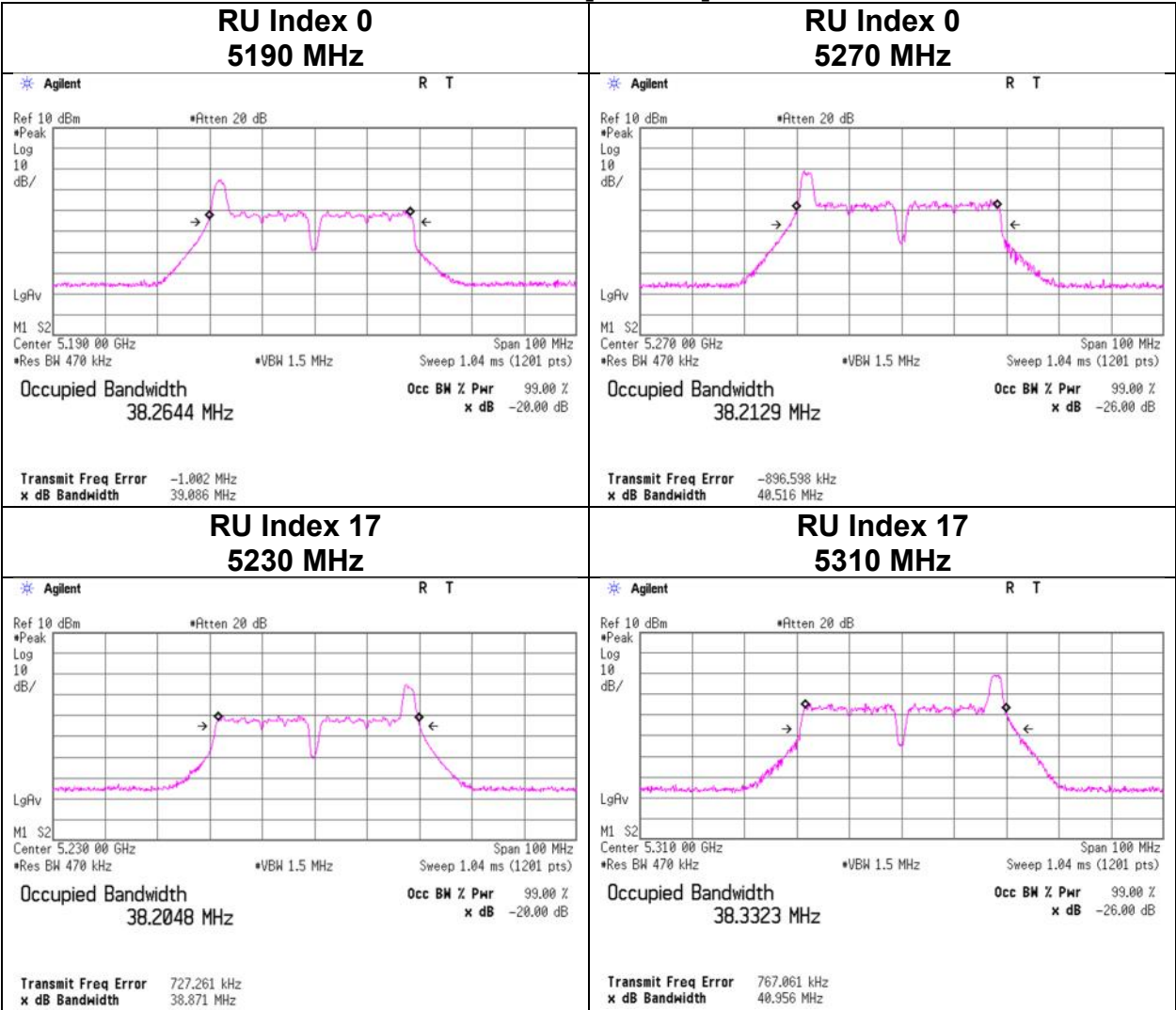
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11xa-40 (OFDM)



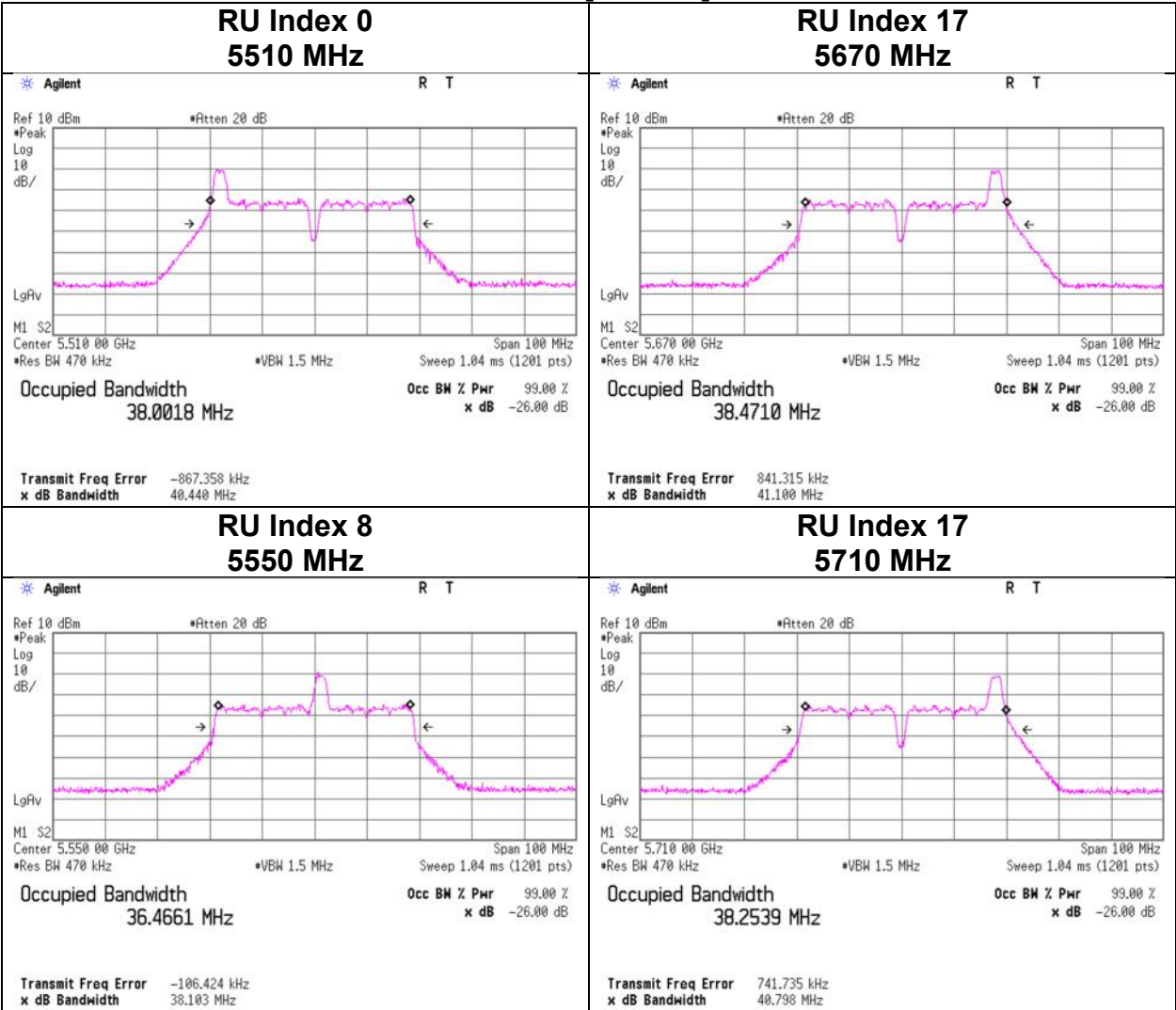
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [26-tone]



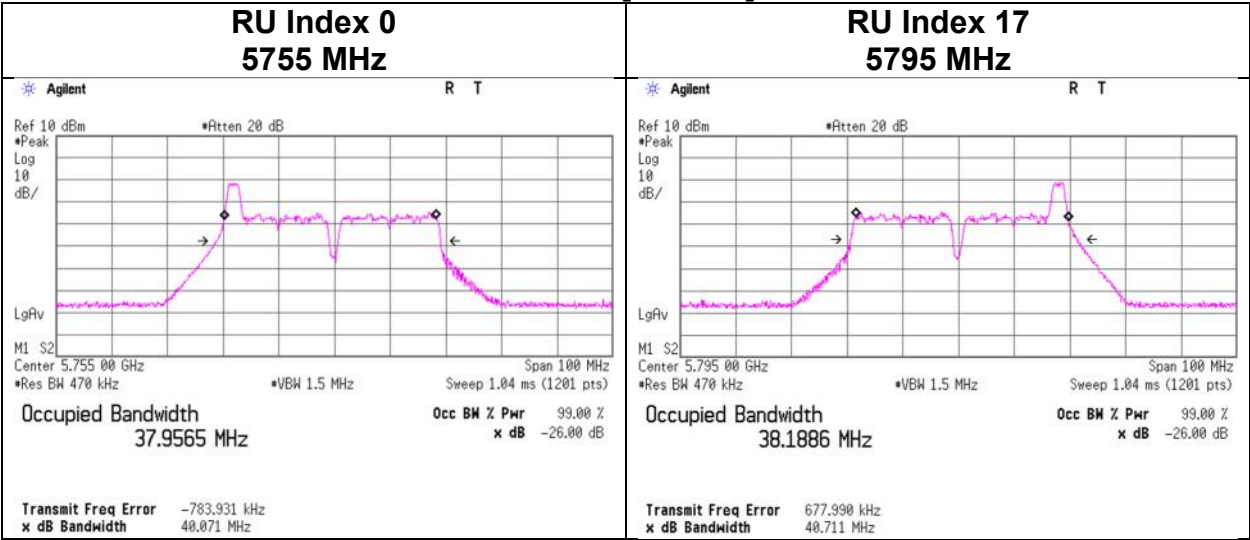
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [26-tone]



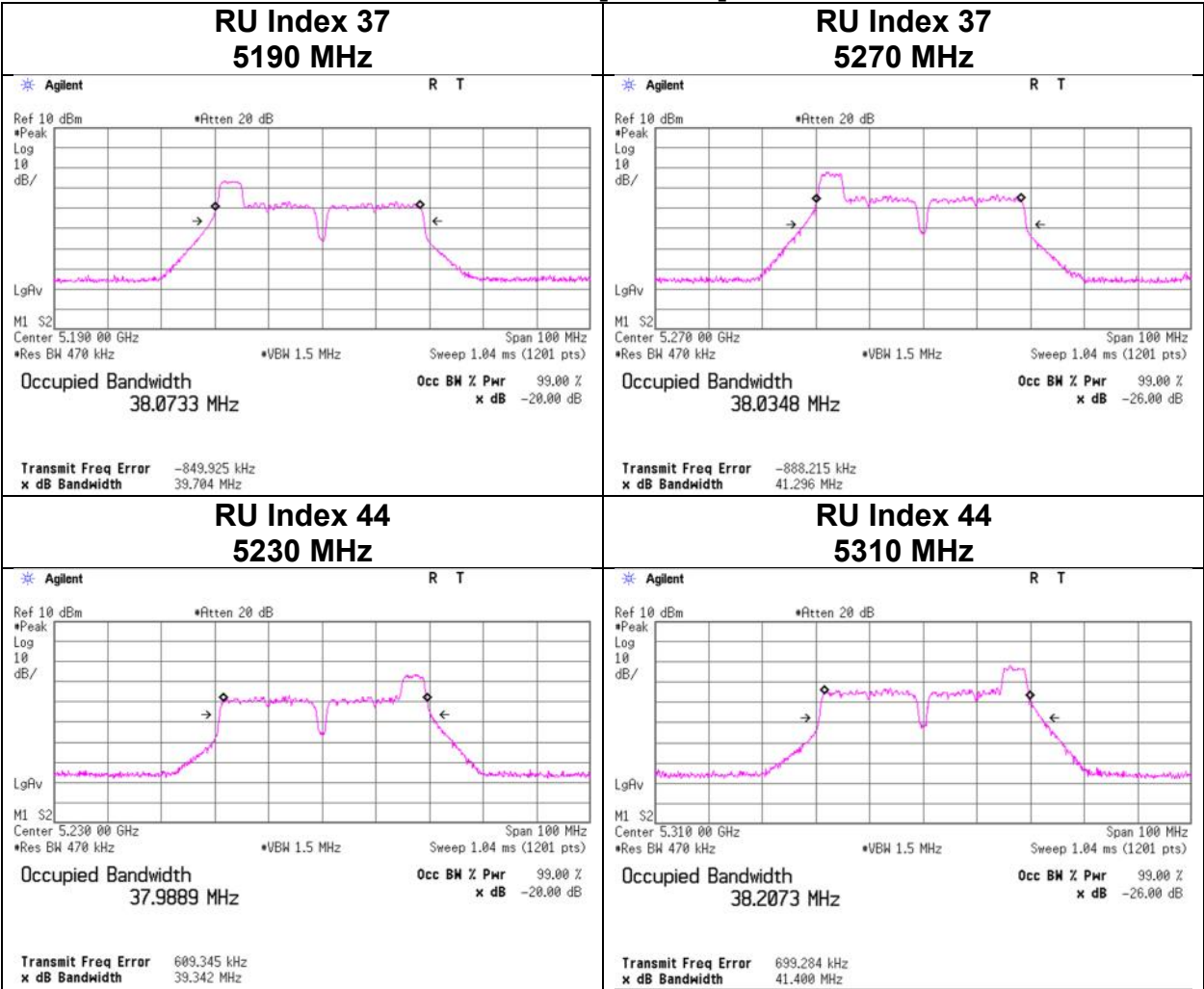
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [26-tone]



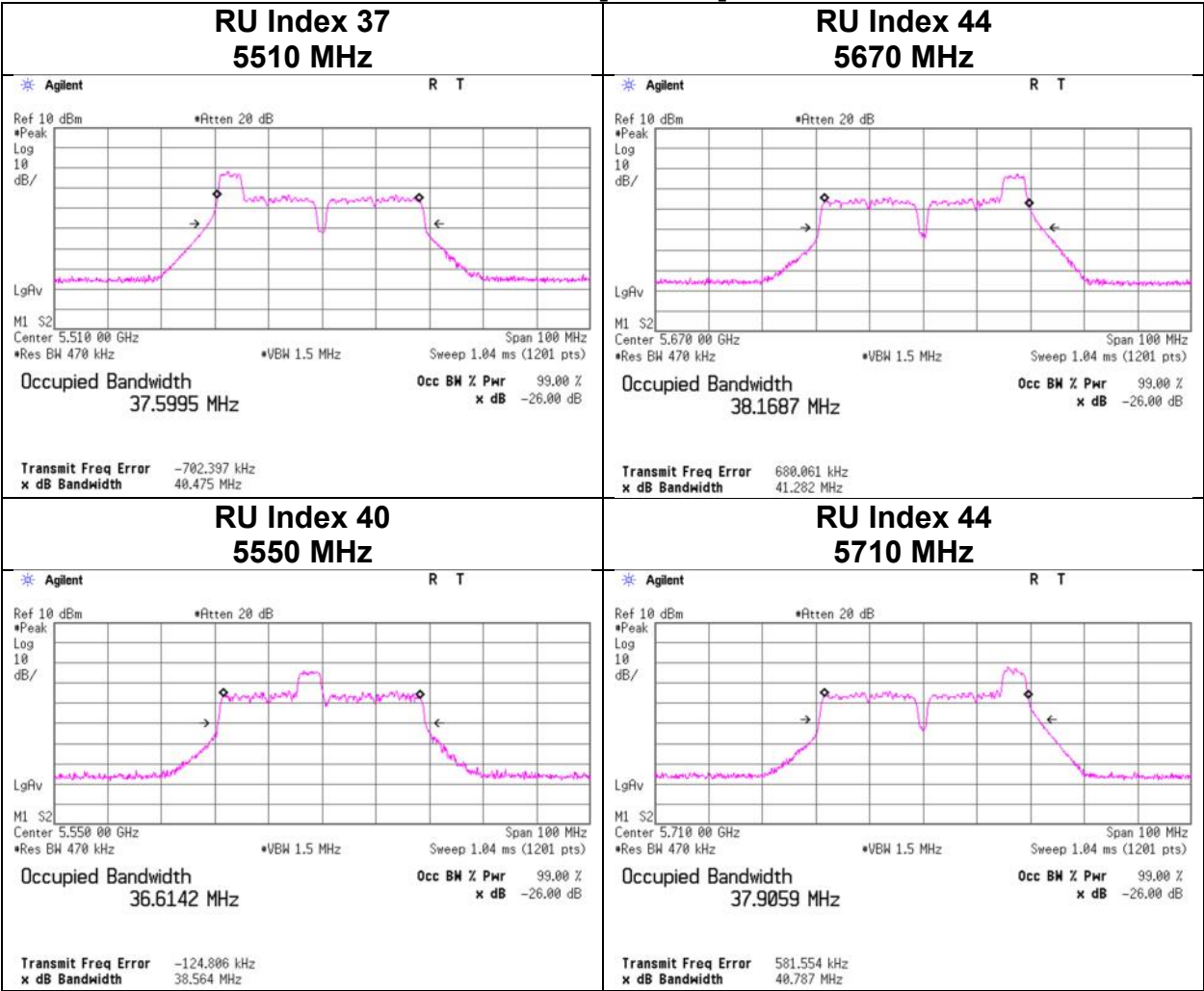
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [52-tone]



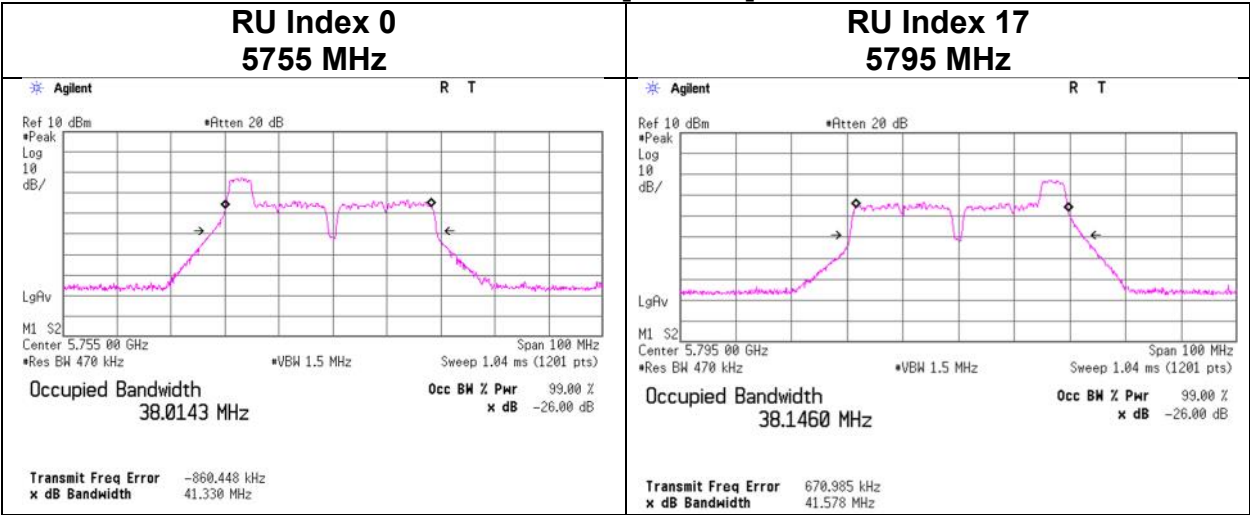
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [52-tone]



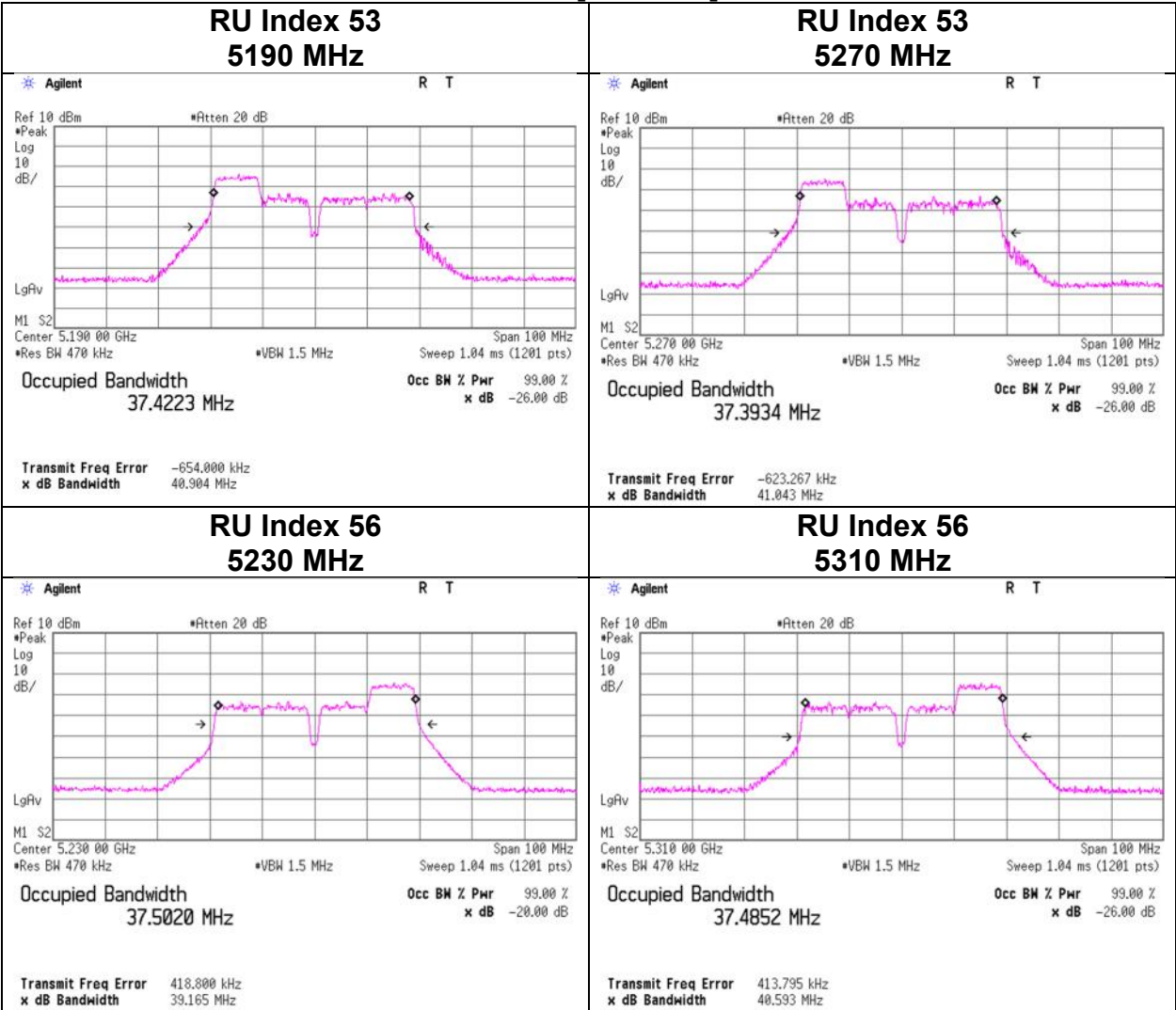
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [52-tone]



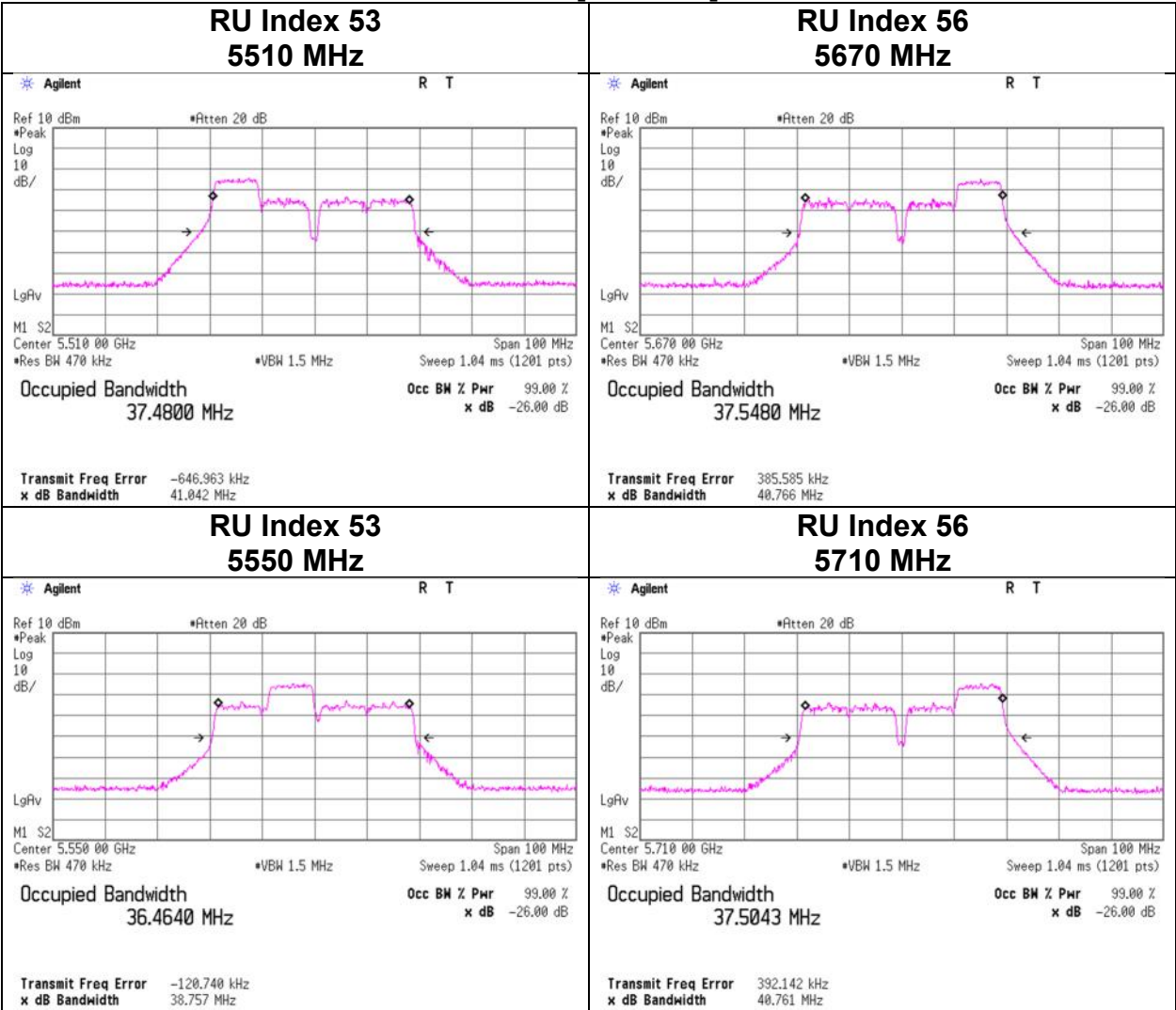
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [106-tone]



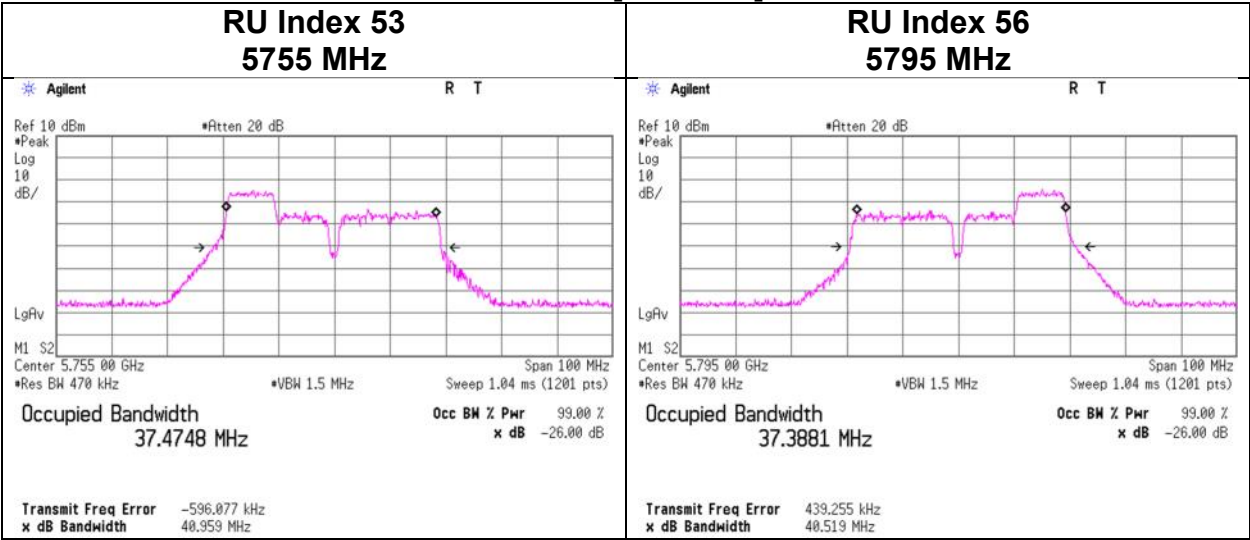
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [106-tone]



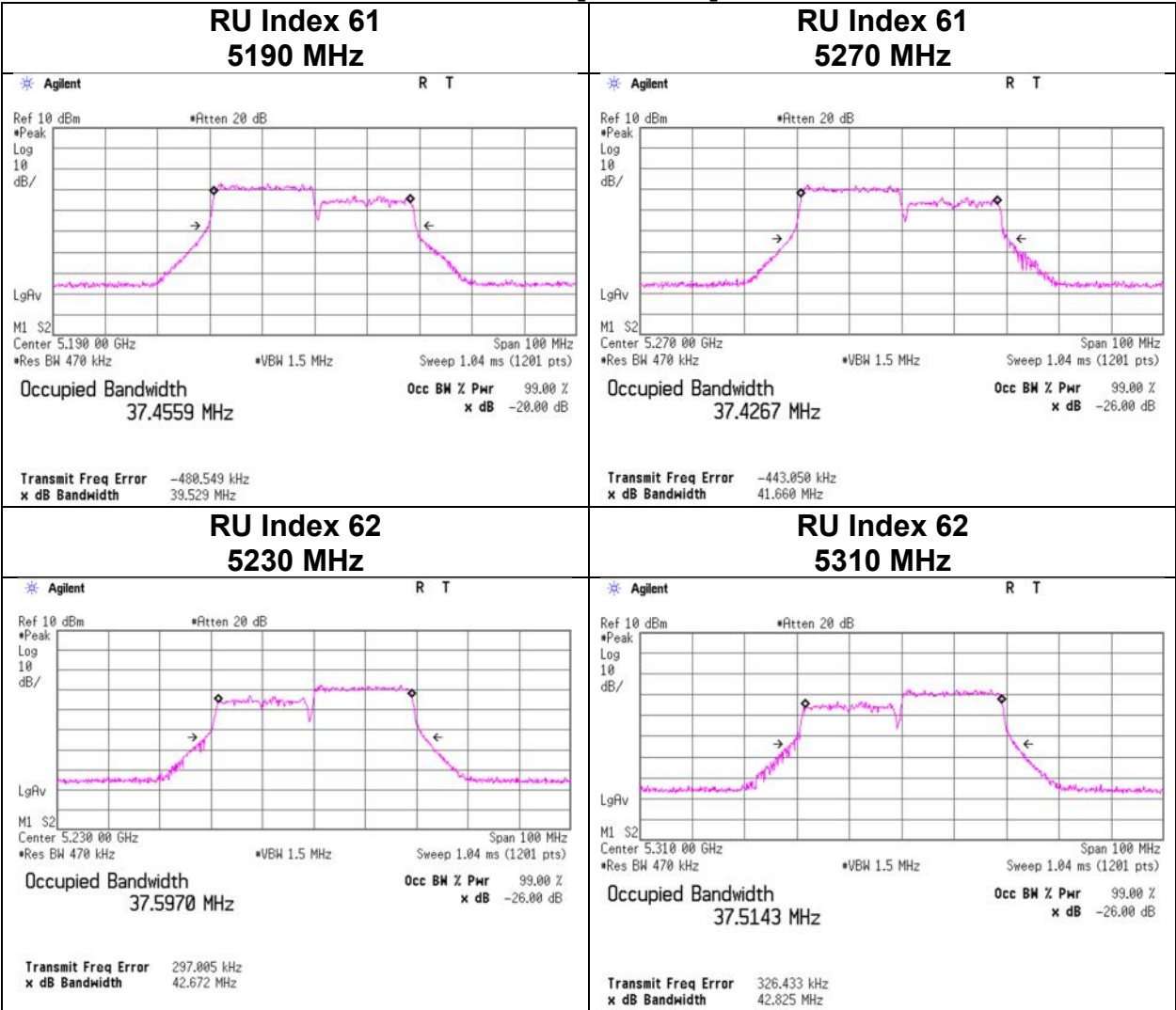
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [106-tone]



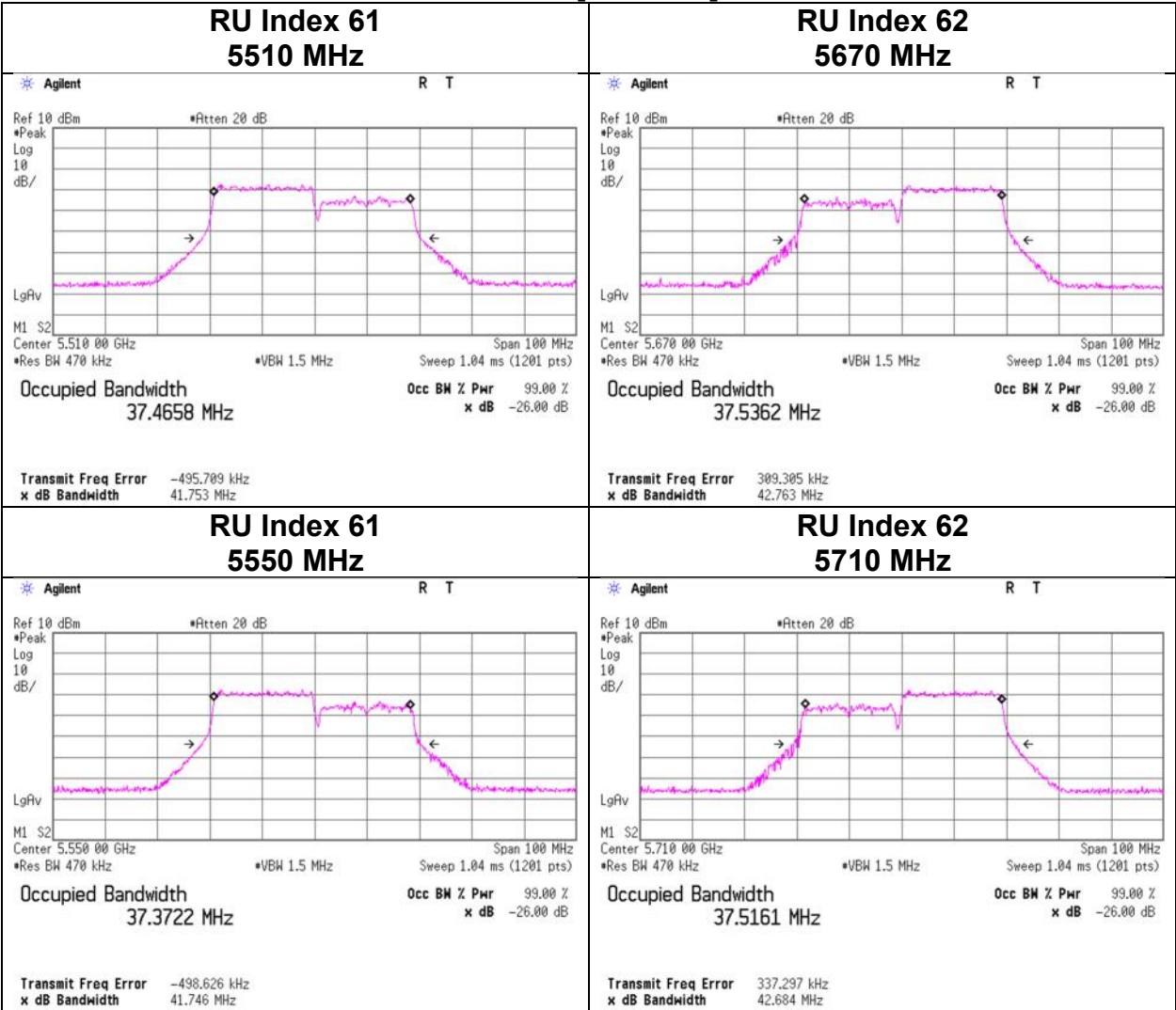
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [242-tone]



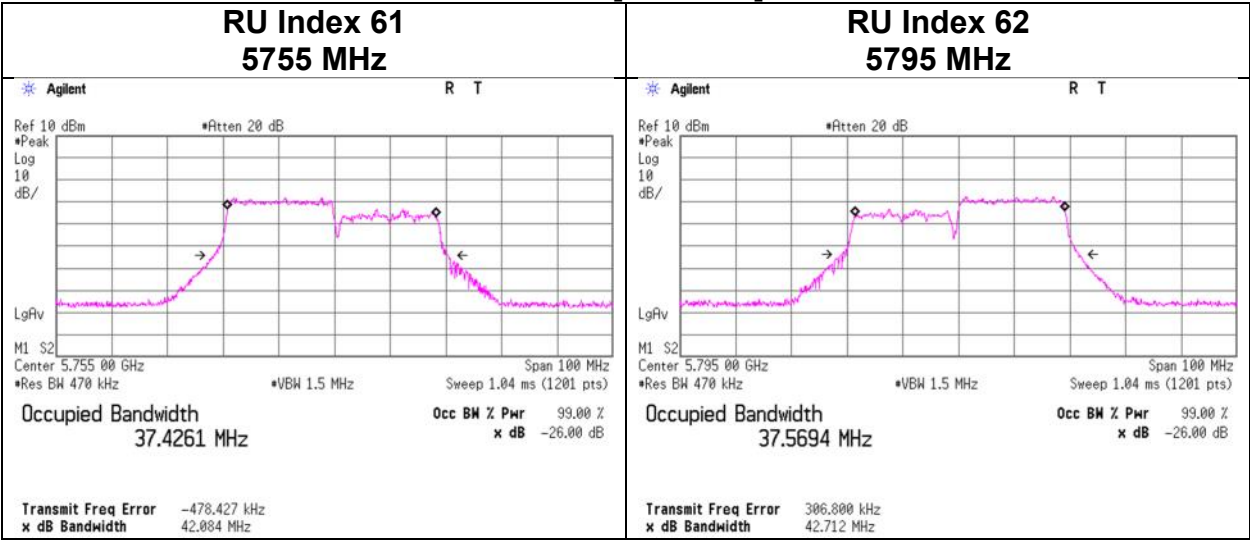
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [242-tone]



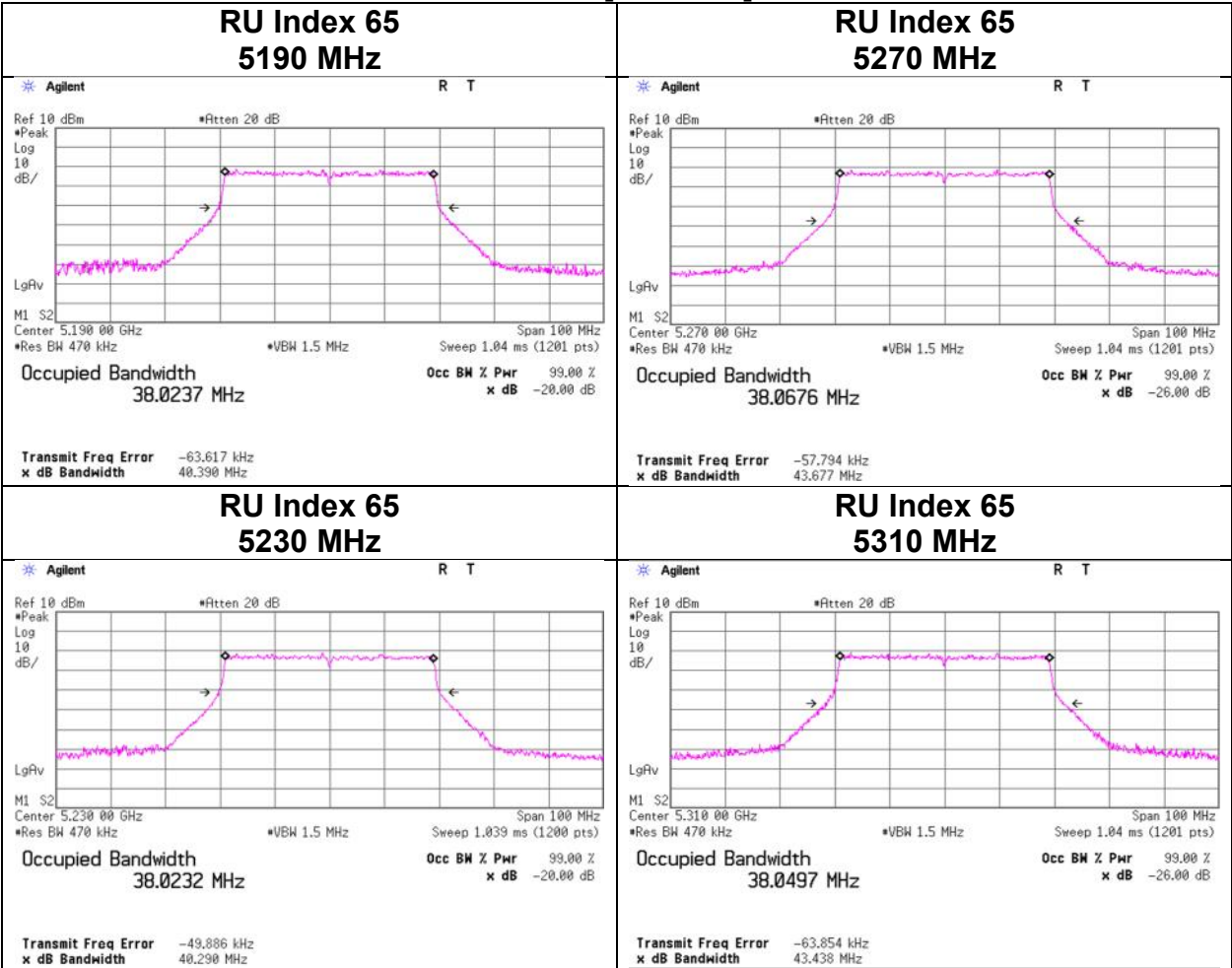
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [242-tone]



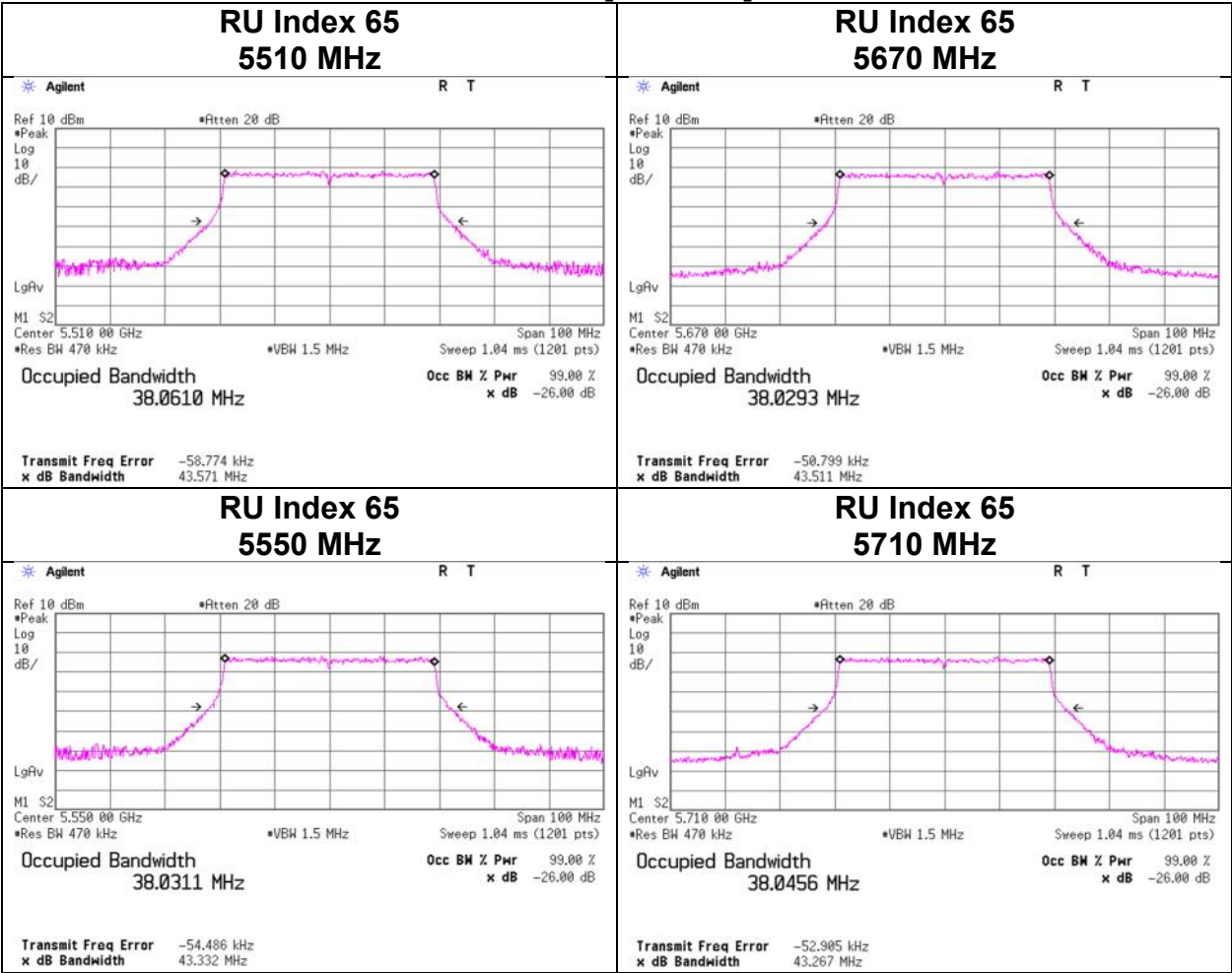
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [484-tone]



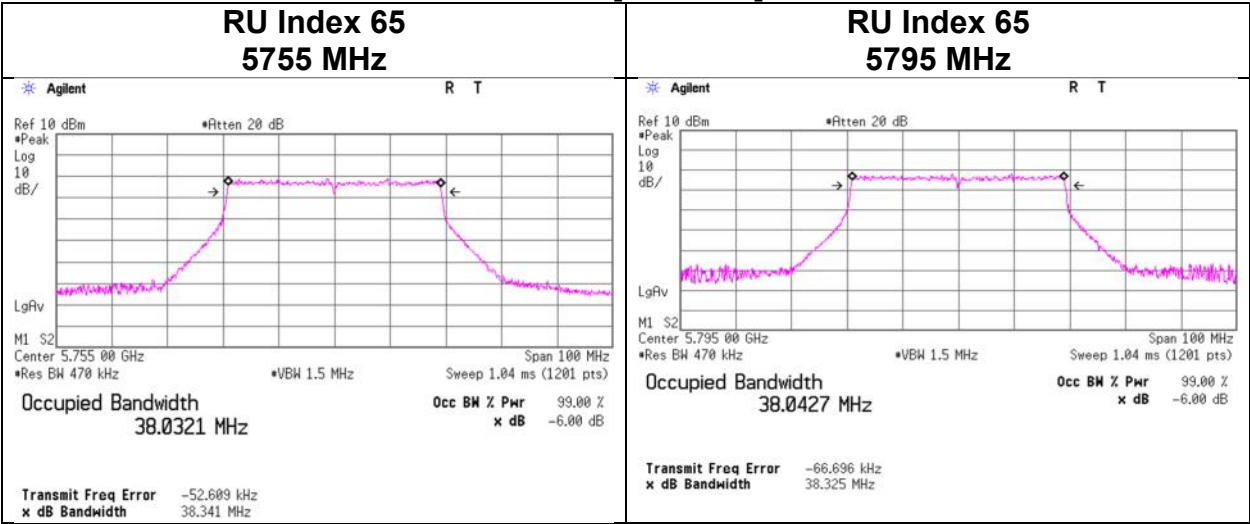
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [484-tone]



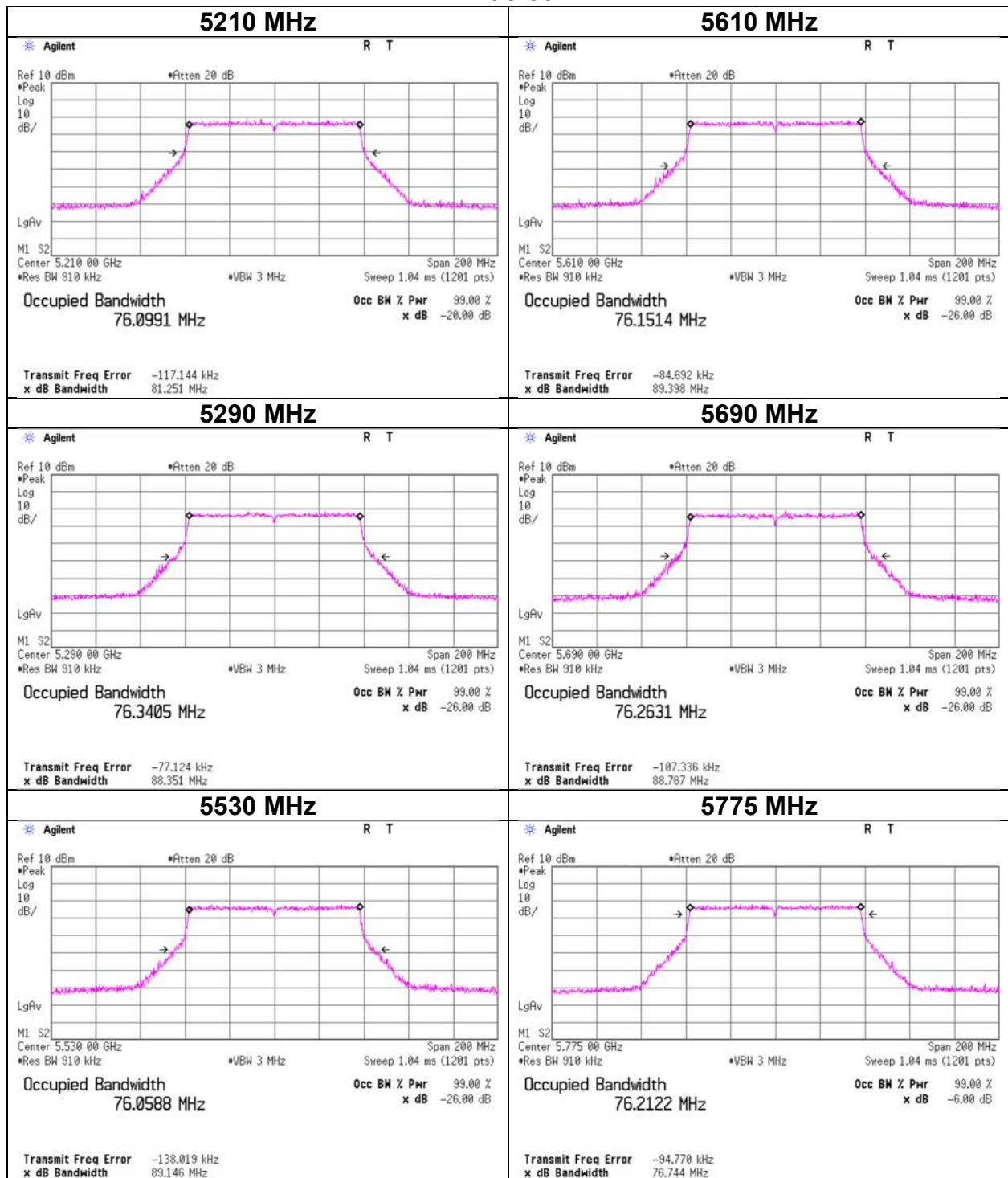
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [484-tone]



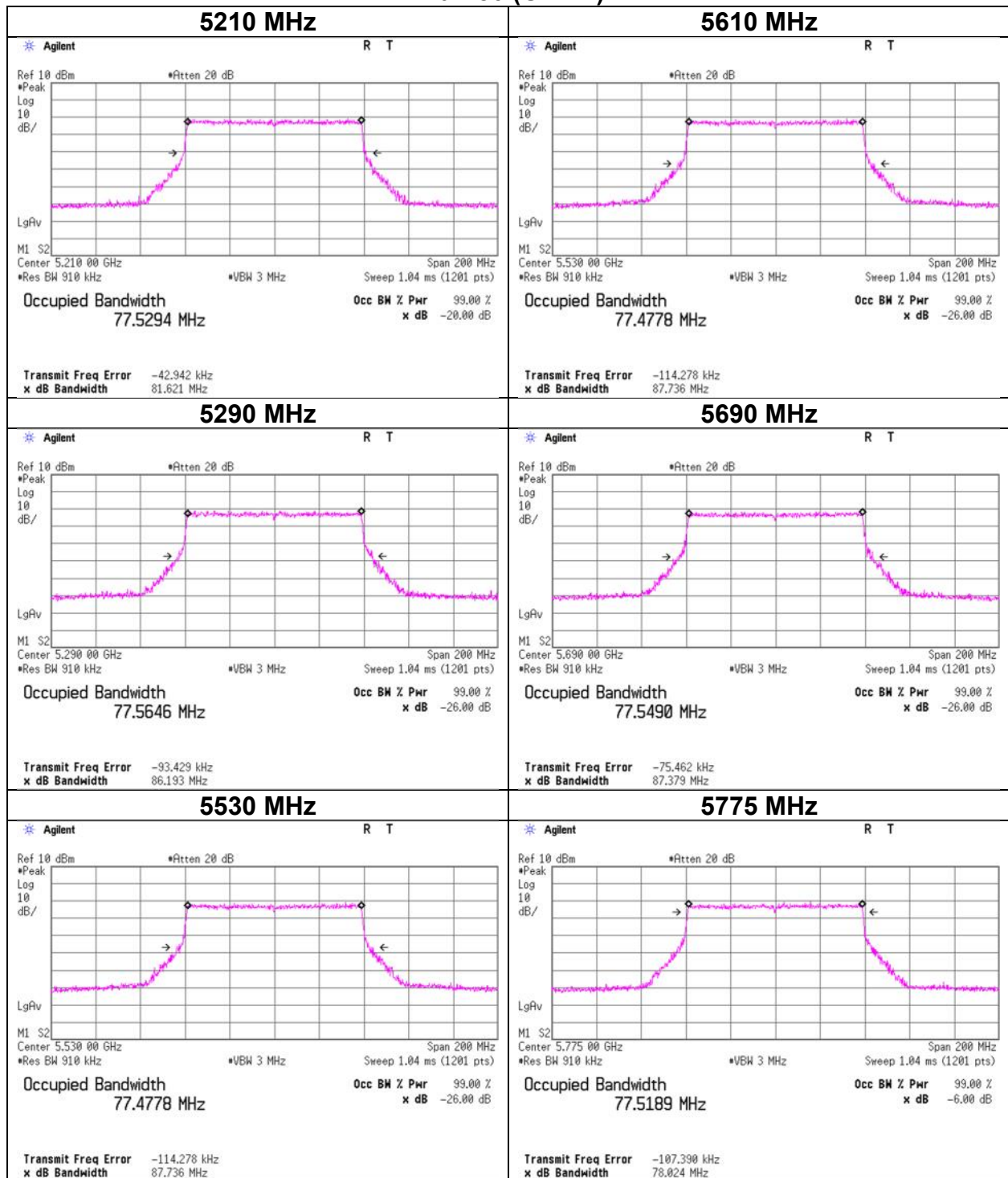
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ac-80



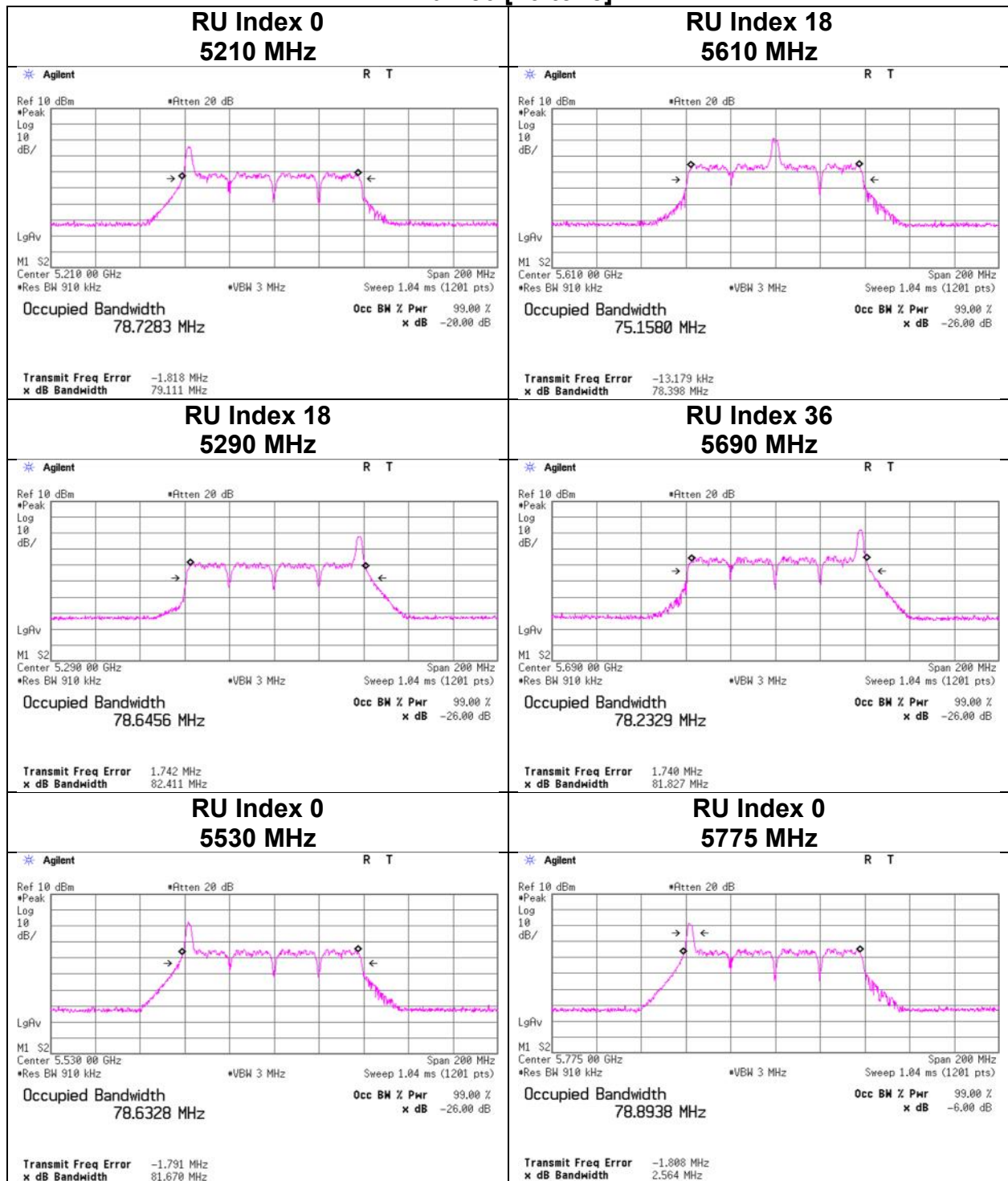
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-80 (OFDM)



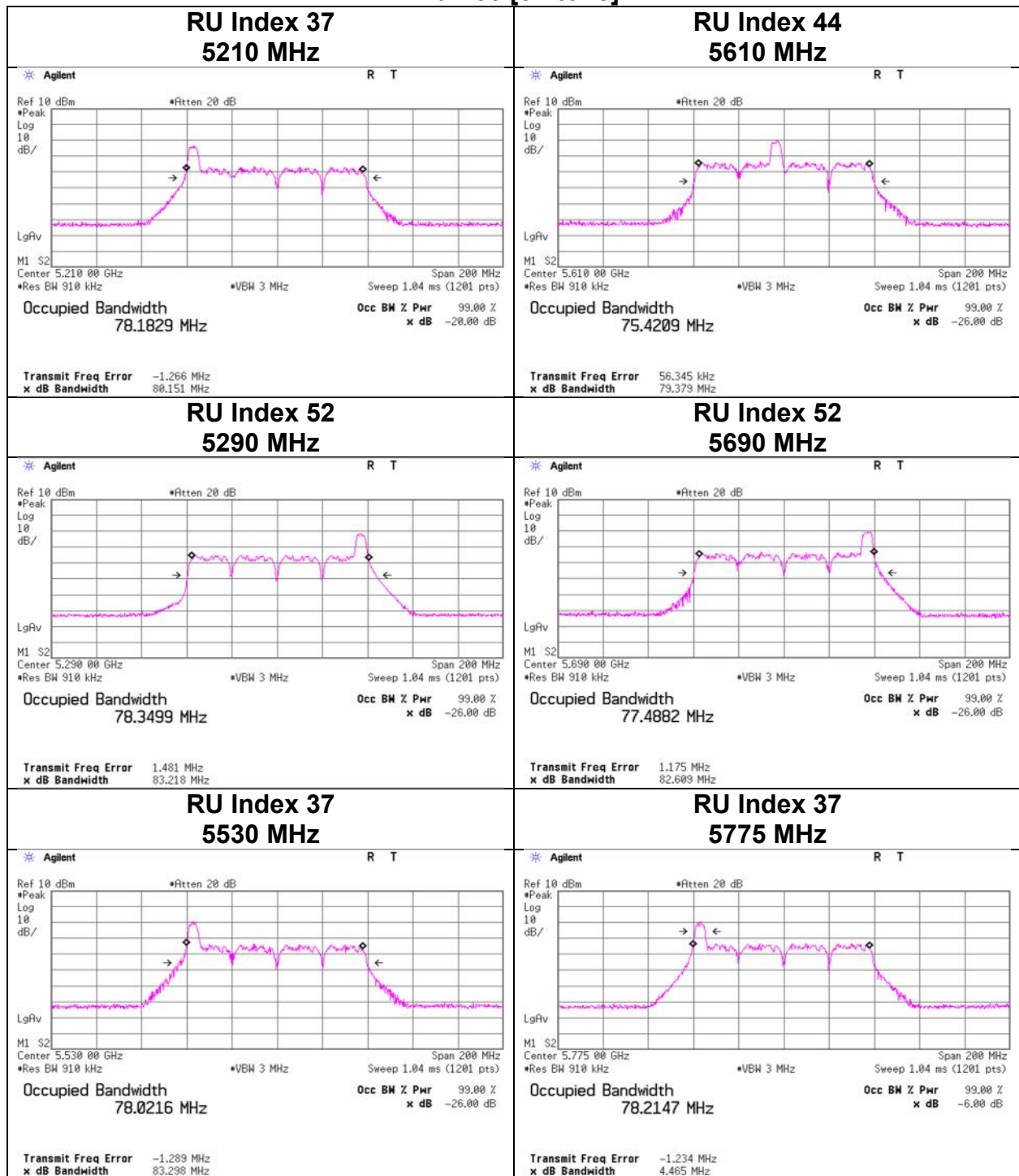
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-80 [26-tone]



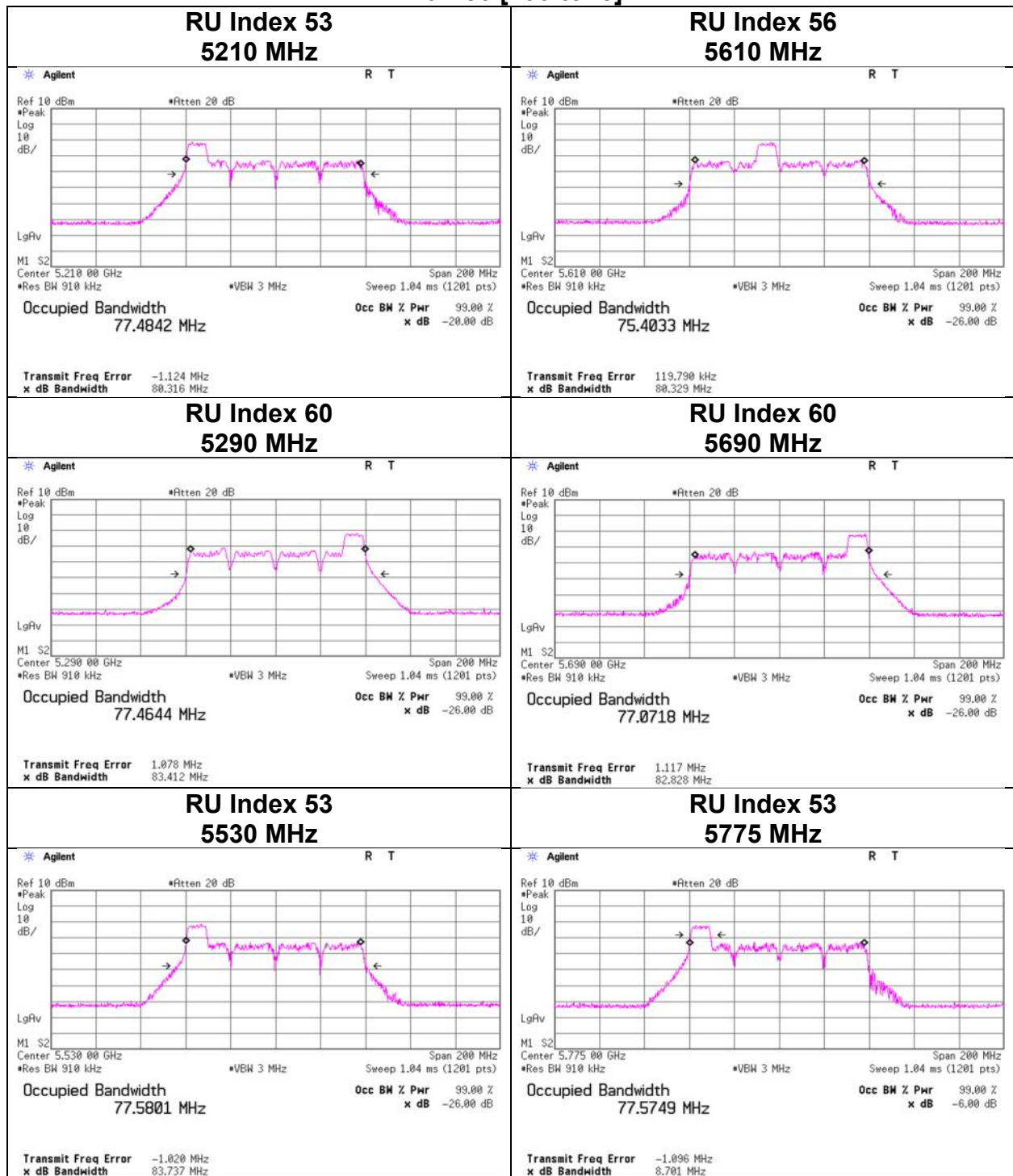
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-80 [52-tone]



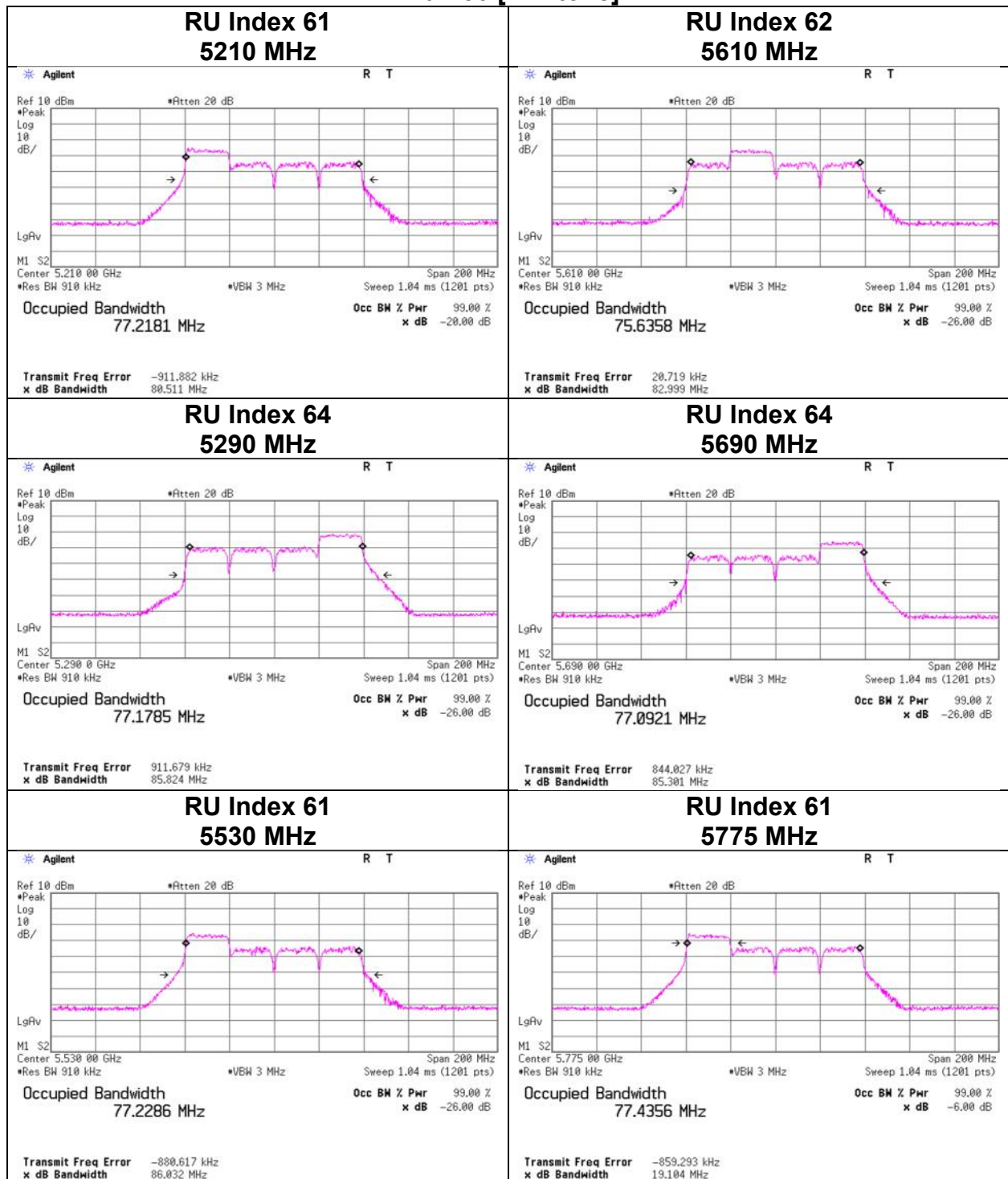
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-80 [106-tone]



26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-80 [242-tone]



26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-80 [484-tone]

