

RADIO TEST REPORT

Test Report No. 14854382S-AI-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 (6 GHz band) part Low-power indoor client Except for Contention based protocol test

Representative Test Engineer



Kenichi 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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REVISION HISTORY

Original Test Report No. 14854382S-AI

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

Revision	Test Report No.	Date	Page Revised Contents																																																																																				
- (Original)	14854382S-AI	August 30, 2024	-																																																																																				
1	14854382S-AI-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>Transmit</td><td>-</td><td>-</td><td>Transmit *1)</td><td>-</td></tr><tr><td>5G_CH0</td><td>5 GHz / 6 GHz</td><td>Transmit</td><td>-</td><td>Transmit</td><td>-</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>-</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>Transmit</td><td>Transmit</td><td>-</td><td>Transmit</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> 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)	Port	Mode	Config 1	Config 2	Config 3	Config 5	Config 6	2G_CH0	Bluetooth	-	-	Transmit	Transmit *1)	Transmit	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	-	-	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	-	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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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 19, 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)

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 (*6505 MHz:straddle ch) 6665 MHz to 6825 MHz (*6825 MHz:straddle ch) 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	17.3 dB, 0.58955 MHz, N, AV Mode: Tx 11ax-160 (OFDMA) 6665 MHz, 996-tone RU 5GHz_CH0 & CH1 Slot	Complied	-
26 dB Emission Bandwidth	FCC: KDB Publication Number 987594 ISED: -	FCC: 15.407 (a) (10) ISED: -	See data	Complied	Conducted
Maximum Conducted Output Power	FCC: KDB Publication Number 987594 ISED: -	FCC: 15.407 (a) (8) ISED: RSS-248 4.5.3		Complied	Conducted
Maximum Power Spectral Density	FCC: KDB Publication Number 987594 ISED: -	FCC: 15.407 (a) (8) ISED: RSS-248 4.5.3		Complied	Conducted
Spurious Emission Restricted Band Edge	FCC: ANSI C63.10-2013 KDB Publication Number 987594 ISED: -	FCC: 15.407 (b), 15.205 and 15.209 ISED: RSS-248 4.6.2	13.9 dB 557.814 MHz, QP, Vert. Mode: Tx 11ax-160 (OFDMA) 996 -tone RU, 6665 MHz, 5G CH0: monopole 5G CH1: slot	Complied	Conducted (< 30 MHz) / Radiated (> 30 MHz) *1)
In band spurious emission	FCC: KDB Publication Number 987594 ISED: -	FCC: 15.407 (b) (7) ISED: RSS-248 4.6.2	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: RSS-248 4.4	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 MIMO 20 MHz BW (11a)	54 Mbps, PN9
IEEE 802.11ax MIMO 20 MHz BW (11ax-20)	MCS 11 (1SS), PN9 MCS 11 (2SS), PN9
IEEE 802.11ax MIMO 40 MHz BW (11ax-40)	MCS 11 (1SS), PN9 MCS 8 (2SS), PN9
IEEE 802.11ax MIMO 80 MHz BW (11ax-80)	MCS 9 (1SS), PN9 MCS 9 (2SS), PN9
IEEE 802.11ax MIMO 160 MHz BW (11ax-160)	MCS 9 (1SS), PN9 MCS 10 (2SS), PN9
*The worst rate and burst rate was determined based on the test result refer to the module test report No.14854382S-AE issued by UL Japan, Inc. *The worst condition was determined based on the test result of Maximum Peak Output Power. (* SS: Spatial Stream, For data sheet 1SS: CDD, 2SS: SDM) *Power of the EUT was set by the software as follows; Power Setting: See table (Power Setting value for OFDM and Power Setting for OFDMA) (Setting value) 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 for OFDM High power

	11a	11ax-20	11ax-40	11ax-80	11ax-160
(U-NII 5)	4.5 dBm	4.5 dBm (1SS) 4.5 dBm (2SS)	7.5 dBm (1SS) 7.5 dBm (2SS)	10.0 dBm (1SS) 10.0 dBm (2SS)	10.0 dBm (1SS) 10.0 dBm (2SS)
(U-NII 6)	3.5 dBm	3.5 dBm (1SS) 3.5 dBm (2SS)	6 dBm (1SS) 6.5 dBm (2SS)	10.0 dBm (1SS) 10.5 dBm (2SS)	9.5 dBm (1SS) 9.5 dBm (2SS)
(U-NII 7)	3.5 dBm	3.5 dBm (1SS) 3.5 dBm (2SS)	7.5 dBm (1SS) 7.5 dBm (2SS)	10.5 dBm (1SS) 10.5 dBm (2SS)	10.0 dBm (1SS) 10.0 dBm (2SS)
(U-NII 8)	4.5 dBm	4.5 dBm (1SS) 4.5 dBm (2SS)	8 dBm (1SS) 8 dBm (2SS)	10.0 dBm (1SS) 10.0 dBm (2SS)	10.5 dBm (1SS) 10.5 dBm (2SS)

Power Setting for OFDM Standard power

	11a	11ax-20	11ax-40	11ax-80	11ax-160
(U-NII 5)	4.5 dBm	4.5 dBm (1SS) 4.5 dBm (2SS)	7.5 dBm (1SS) 7.5 dBm (2SS)	7.5 dBm (1SS) 7.5 dBm (2SS)	7.5 dBm (1SS) 7.5 dBm (2SS)
(U-NII 6)	3.5 dBm	3.5 dBm (1SS) 3.5 dBm (2SS)	6 dBm (1SS) 6.5 dBm (2SS)	6.5 dBm (1SS) 6.5 dBm (2SS)	6.5 dBm (1SS) 6.5 dBm (2SS)
(U-NII 7)	3.5 dBm	3.5 dBm (1SS) 3.5 dBm (2SS)	7.5 dBm (1SS) 7.5 dBm (2SS)	7.5 dBm (1SS) 7.5 dBm (2SS)	7.5 dBm (1SS) 7.5 dBm (2SS)
(U-NII 8)	4.5 dBm	4.5 dBm (1SS) 4.5 dBm (2SS)	8 dBm (1SS) 8 dBm (2SS)	8.5 dBm (1SS) 8.5 dBm (2SS)	8.0 dBm (1SS) 8.0 dBm (2SS)

Power Setting for OFDMA (U-NII 5) High power

	11ax-20	11ax-40	11ax-80	11ax-160
26-tone RU	-5.0 dBm (1SS) -4.5 dBm (2SS)	-4.5 dBm (1SS) -5.0 dBm (2SS)	-6.0 dBm (1SS) -6.0 dBm (2SS)	-5.0 dBm (1SS) -5.0 dBm (2SS)
52-tone RU	-1.5 dBm (1SS) -1.5 dBm (2SS)	-1.5 dBm (1SS) -2.0 dBm (2SS)	-3.0 dBm (1SS) -2.5 dBm (2SS)	-1.5 dBm (1SS) -2.0 dBm (2SS)
106-tone RU	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) -0.5 dBm (2SS)	-1.0 dBm (1SS) -1.0 dBm (2SS)	0.0 dBm (1SS) -0.5 dBm (2SS)
242-tone RU	4.5 dBm (1SS) 4.5 dBm (2SS)	4.5 dBm (1SS) 4.5 dBm (2SS)	4.5 dBm (1SS) 4.5 dBm (2SS)	5.5 dBm (1SS) 5.5 dBm (2SS)
484-tone RU	-	7.0 dBm (1SS) 7.0 dBm (2SS)	7.0 dBm (1SS) 7.0 dBm (2SS)	7.5 dBm (1SS) 7.5 dBm (2SS)
996-tone RU	-	-	10.0 dBm (1SS) 10.0 dBm (2SS)	10.5 dBm (1SS) 10.5 dBm (2SS)
2*996-tone RU	-	-	-	10.0 dBm (1SS) 10.5 dBm (2SS)

Power Setting for OFDMA (U-NII 6) High power

	11ax-20	11ax-40	11ax-80	11ax-160
26-tone RU	-5.0 dBm (1SS) -4.5 dBm (2SS)	-4.5 dBm (1SS) -5.0 dBm (2SS)	-5.0 dBm (1SS) -5.0 dBm (2SS)	-4.5 dBm (1SS) -4.5 dBm (2SS)
52-tone RU	-1.5 dBm (1SS) -1.5 dBm (2SS)	-2.0 dBm (1SS) -2.0 dBm (2SS)	-2.0 dBm (1SS) -2.0 dBm (2SS)	-1.5 dBm (1SS) -1.5 dBm (2SS)
106-tone RU	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) -0.5 dBm (2SS)	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) 0.0 dBm (2SS)
242-tone RU	4.0 dBm (1SS) 4.0 dBm (2SS)	3.5 dBm (1SS) 3.5 dBm (2SS)	4.0 dBm (1SS) 4.0 dBm (2SS)	4.5 dBm (1SS) 4.5 dBm (2SS)
484-tone RU	-	6.5 dBm (1SS) 6.5 dBm (2SS)	6.5 dBm (1SS) 6.5 dBm (2SS)	6.5 dBm (1SS) 6.5 dBm (2SS)
996-tone RU	-	-	10.0 dBm (1SS) 9.5 dBm (2SS)	10.0 dBm (1SS) 10.5 dBm (2SS)
2*996-tone RU	-	-	-	9.5 dBm (1SS) 10.0 dBm (2SS)

Power Setting for OFDMA (U-NII 7) High power

	11ax-20	11ax-40	11ax-80	11ax-160
26-tone RU	-4.5 dBm (1SS) -4.5 dBm (2SS)	-4.5 dBm (1SS) -4.0 dBm (2SS)	-4.5 dBm (1SS) -4.5 dBm (2SS)	-4.5 dBm (1SS) -4.5 dBm (2SS)
52-tone RU	-1.0 dBm (1SS) -1.0 dBm (2SS)	-1.5 dBm (1SS) -1.5 dBm (2SS)	-1.5 dBm (1SS) -1.5 dBm (2SS)	-1.5 dBm (1SS) -1.5 dBm (2SS)
106-tone RU	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) 0.0 dBm (2SS)
242-tone RU	4.0 dBm (1SS) 4.0 dBm (2SS)	4.5 dBm (1SS) 4.5 dBm (2SS)	4.5 dBm (1SS) 4.5 dBm (2SS)	5.0 dBm (1SS) 5.0 dBm (2SS)
484-tone RU	-	7.0 dBm (1SS) 7.0 dBm (2SS)	7.0 dBm (1SS) 6.5 dBm (2SS)	7.5 dBm (1SS) 7.5 dBm (2SS)
996-tone RU	-	-	10.5 dBm (1SS) 10.0 dBm (2SS)	11.0 dBm (1SS) 11.0 dBm (2SS)
2*996-tone RU	-	-	-	11.0 dBm (1SS) 11.0 dBm (2SS)

Power Setting for OFDMA (U-NII 8) High power

	11ax-20	11ax-40	11ax-80	11ax-160
26-tone RU	-4.0 dBm (1SS) -3.5 dBm (2SS)	-3.5 dBm (1SS) -4.0 dBm (2SS)	-4.0 dBm (1SS) -3.5 dBm (2SS)	-3.5 dBm (1SS) -3.5 dBm (2SS)
52-tone RU	-0.5 dBm (1SS) -0.5 dBm (2SS)	-1.0 dBm (1SS) -1.0 dBm (2SS)	-1.0 dBm (1SS) -0.5 dBm (2SS)	-0.5 dBm (1SS) -0.5 dBm (2SS)
106-tone RU	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) 0.0 dBm (2SS)
242-tone RU	5.0 dBm (1SS) 5.0 dBm (2SS)	5.0 dBm (1SS) 5.0 dBm (2SS)	5.0 dBm (1SS) 5.0 dBm (2SS)	5.0 dBm (1SS) 5.0 dBm (2SS)
484-tone RU	-	8.0 dBm (1SS) 8.0 dBm (2SS)	8.0 dBm (1SS) 8.0 dBm (2SS)	7.5 dBm (1SS) 8.0 dBm (2SS)
996-tone RU	-	-	11.0 dBm (1SS) 11.0 dBm (2SS)	11.0 dBm (1SS) 11.0 dBm (2SS)
2*996-tone RU	-	-	-	11.0 dBm (1SS) 11.0 dBm (2SS)

Power Setting for OFDMA (U-NII 5) Standard power

	11ax-20	11ax-40	11ax-80	11ax-160
26-tone RU	-5.0 dBm (1SS) -4.5 dBm (2SS)	-4.5 dBm (1SS) -5.0 dBm (2SS)	-6.0 dBm (1SS) -6.0 dBm (2SS)	-5.0 dBm (1SS) -5.0 dBm (2SS)
52-tone RU	-1.5 dBm (1SS) -1.5 dBm (2SS)	-1.5 dBm (1SS) -2.0 dBm (2SS)	-3.0 dBm (1SS) -2.5 dBm (2SS)	-1.5 dBm (1SS) -2.0 dBm (2SS)
106-tone RU	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) -0.5 dBm (2SS)	-1.0 dBm (1SS) -1.0 dBm (2SS)	0.0 dBm (1SS) -0.5 dBm (2SS)
242-tone RU	4.5 dBm (1SS) 4.5 dBm (2SS)	4.5 dBm (1SS) 4.5 dBm (2SS)	4.5 dBm (1SS) 4.5 dBm (2SS)	5.5 dBm (1SS) 5.5 dBm (2SS)
484-tone RU	-	7.0 dBm (1SS) 7.0 dBm (2SS)	7.0 dBm (1SS) 7.0 dBm (2SS)	7.5 dBm (1SS) 7.5 dBm (2SS)
996-tone RU	-	-	7.5 dBm (1SS) 7.5 dBm (2SS)	8.0 dBm (1SS) 8.0 dBm (2SS)
2*996-tone RU	-	-	-	7.5 dBm (1SS) 7.5 dBm (2SS)

Power Setting for OFDMA (U-NII 6) Standard power

	11ax-20	11ax-40	11ax-80	11ax-160
26-tone RU	-5.0 dBm (1SS) -4.5 dBm (2SS)	-4.5 dBm (1SS) -5.0 dBm (2SS)	-5.0 dBm (1SS) -5.0 dBm (2SS)	-4.5 dBm (1SS) -4.5 dBm (2SS)
52-tone RU	-1.5 dBm (1SS) -1.5 dBm (2SS)	-2.0 dBm (1SS) -2.0 dBm (2SS)	-2.0 dBm (1SS) -2.0 dBm (2SS)	-1.5 dBm (1SS) -1.5 dBm (2SS)
106-tone RU	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) -0.5 dBm (2SS)	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) 0.0 dBm (2SS)
242-tone RU	4.0 dBm (1SS) 4.0 dBm (2SS)	3.5 dBm (1SS) 3.5 dBm (2SS)	4.0 dBm (1SS) 4.0 dBm (2SS)	4.5 dBm (1SS) 4.5 dBm (2SS)
484-tone RU	-	6.5 dBm (1SS) 6.5 dBm (2SS)	6.5 dBm (1SS) 6.5 dBm (2SS)	6.5 dBm (1SS) 6.5 dBm (2SS)
996-tone RU	-	-	7.5 dBm (1SS) 7.5 dBm (2SS)	7.0 dBm (1SS) 7.0 dBm (2SS)
2*996-tone RU	-	-	-	7.0 dBm (1SS) 7.0 dBm (2SS)

Power Setting for OFDMA (U-NII 7) Standard power

	11ax-20	11ax-40	11ax-80	11ax-160
26-tone RU	-4.5 dBm (1SS) -4.5 dBm (2SS)	-4.5 dBm (1SS) -4.0 dBm (2SS)	-4.5 dBm (1SS) -4.5 dBm (2SS)	-4.5 dBm (1SS) -4.5 dBm (2SS)
52-tone RU	-1.0 dBm (1SS) -1.0 dBm (2SS)	-1.5 dBm (1SS) -1.5 dBm (2SS)	-1.5 dBm (1SS) -1.5 dBm (2SS)	-1.5 dBm (1SS) -1.5 dBm (2SS)
106-tone RU	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) 0.0 dBm (2SS)
242-tone RU	4.0 dBm (1SS) 4.0 dBm (2SS)	4.5 dBm (1SS) 4.5 dBm (2SS)	4.5 dBm (1SS) 4.5 dBm (2SS)	5.0 dBm (1SS) 5.0 dBm (2SS)
484-tone RU	-	7.0 dBm (1SS) 7.0 dBm (2SS)	7.0 dBm (1SS) 6.5 dBm (2SS)	7.5 dBm (1SS) 7.5 dBm (2SS)
996-tone RU	-	-	7.5 dBm (1SS) 7.5 dBm (2SS)	8.0 dBm (1SS) 8.5 dBm (2SS)
2*996-tone RU	-	-	-	8.5 dBm (1SS) 8.5 dBm (2SS)

Power Setting for OFDMA (U-NII 8) Standard power

	11ax-20	11ax-40	11ax-80	11ax-160
26-tone RU	-4.0 dBm (1SS) -3.5 dBm (2SS)	-3.5 dBm (1SS) -4.0 dBm (2SS)	-4.0 dBm (1SS) -3.5 dBm (2SS)	-3.5 dBm (1SS) -3.5 dBm (2SS)
52-tone RU	-0.5 dBm (1SS) -0.5 dBm (2SS)	-1.0 dBm (1SS) -1.0 dBm (2SS)	-1.0 dBm (1SS) -0.5 dBm (2SS)	-0.5 dBm (1SS) -0.5 dBm (2SS)
106-tone RU	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) 0.0 dBm (2SS)	0.0 dBm (1SS) 0.0 dBm (2SS)
242-tone RU	5.0 dBm (1SS) 5.0 dBm (2SS)	5.0 dBm (1SS) 5.0 dBm (2SS)	5.0 dBm (1SS) 5.0 dBm (2SS)	5.0 dBm (1SS) 5.0 dBm (2SS)
484-tone RU	-	8.0 dBm (1SS) 8.0 dBm (2SS)	8.0 dBm (1SS) 8.0 dBm (2SS)	7.5 dBm (1SS) 8.0 dBm (2SS)
996-tone RU	-	-	8.5 dBm (1SS) 8.5 dBm (2SS)	8.5 dBm (1SS) 8.5 dBm (2SS)
2*996-tone RU	-	-	-	8.5 dBm (1SS) 8.5 dBm (2SS)

* Details of Operation Mode(s)

Test Item	Operating Mode *1)	Tested Antenna	Tested Frequency			
			U-NII-5	U-NII-6	U-NII-7	U-NII-8
Conducted emission, Radiated Spurious Emission (Below 1 GHz)	Tx 11ax-160 (OFDMA) *1)	5G_CH 0 + 5G_CH 1	-	-	6665 MHz	-
26 dB Emission Bandwidth, 99 % Occupied Bandwidth, In-Band Emissions	Tx 11a Tx 11ax-20 (OFDM) Tx 11ax-20 (OFDMA)	5G_CH 1 *2)	5955 MHz 6195 MHz 6415 MHz	6435 MHz 6475 MHz 6515 MHz	6535 MHz 6695 MHz 6875 MHz*	6895 MHz 6995 MHz 7095 MHz
	Tx 11ax-40 (OFDM) Tx 11ax-40 (OFDMA)		5965 MHz 6205 MHz 6405 MHz	6445 MHz 6485 MHz 6525 MHz*	6565 MHz 6685 MHz 6845 MHz 6885 MHz*	6925 MHz 7005 MHz 7085 MHz
	Tx 11ax-80 (OFDM) Tx 11ax-80 (OFDMA)		5985 MHz 6225 MHz 6385 MHz	6465 MHz 6545 MHz*	6625 MHz 6705 MHz 6865 MHz*	6945 MHz 7025 MHz
	Tx 11ax-160 (OFDM) Tx 11ax-160 (OFDMA)		6025 MHz 6185 MHz 6345 MHz	6505 MHz	6665 MHz 6825 MHz	6985 MHz
Maximum Conducted Output Power, Maximum Power Spectral Density	Tx 11a Tx 11ax-20 (OFDM) Tx 11ax-20 (OFDMA)	5G_CH 0 + 5G_CH 1	5955 MHz 6195 MHz 6415 MHz	6435 MHz 6475 MHz 6515 MHz	6535 MHz 6695 MHz 6855 MHz 6875 MHz*	6895 MHz 6995 MHz 7095 MHz
	Tx 11ax-40 (OFDM) Tx 11ax-40 (OFDMA)		5965 MHz 6205 MHz 6405 MHz	6445 MHz 6485 MHz 6525 MHz*	6565 MHz 6685 MHz 6845 MHz 6885 MHz*	6925 MHz 7005 MHz 7085 MHz
	Tx 11ax-80 (OFDM) Tx 11ax-80 (OFDMA)		5985 MHz 6225 MHz 6385 MHz	6465 MHz 6545 MHz*	6625 MHz 6705 MHz 6865 MHz*	6945 MHz 7025 MHz
	Tx 11ax-160 (OFDM) Tx 11ax-160 (OFDMA)		6025 MHz 6185 MHz 6345 MHz	6505 MHz	6665 MHz 6825MHz	6985 MHz
Maximum Power Spectral Density *3)	Tx 11a Tx 11ax-20 (OFDM) Tx 11ax-20 (OFDMA)	5G_CH 0 + 5G_CH 1	5955 MHz 6195 MHz 6415 MHz	6435 MHz 6475 MHz 6515 MHz	6535 MHz 6695 MHz 6855 MHz 6875 MHz*	6895 MHz 6995 MHz 7095 MHz
	Tx 11ax-40 (OFDM) Tx 11ax-40 (OFDMA)		5965 MHz 6205 MHz 6405 MHz	6445 MHz 6485 MHz 6525 MHz*	6565 MHz 6685 MHz 6845 MHz 6885 MHz*	6925 MHz 7005 MHz 7085 MHz
	Tx 11ax-80 (OFDM) Tx 11ax-80 (OFDMA)		5985 MHz 6225 MHz 6385 MHz	6465 MHz 6545 MHz*	6625 MHz 6705 MHz 6865 MHz*	6945 MHz 7025 MHz
	Tx 11ax-160 (OFDM) Tx 11ax-160 (OFDMA)		6025 MHz 6185 MHz 6345 MHz	6505 MHz	6665 MHz 6825MHz	6985 MHz
Radiated Spurious Emission (Above 1 GHz) *4) *5) *6)	Tx 11a *7) Tx 11ax-20 (OFDM) *8) Tx 11ax-20 (OFDMA) *9)	5G_CH 0 + 5G_CH 1	5955 MHz 6195 MHz 6415 MHz	6435 MHz 6475 MHz 6515 MHz	6535 MHz 6695 MHz 6855 MHz 6875 MHz*	6895 MHz 6995 MHz 7095 MHz
	Tx 11ax-40 (OFDM) *8) Tx 11ax-40 (OFDMA) *9)		5965 MHz 6205 MHz 6405 MHz	6445 MHz 6485 MHz 6525 MHz*	6565 MHz 6685 MHz 6845 MHz 6885 MHz*	6925 MHz 7005 MHz 7085 MHz
	Tx 11ax-80 (OFDM) *8) Tx 11ax-80 (OFDMA) *9)		5985 MHz 6225 MHz 6385 MHz	6465 MHz 6545 MHz*	6625 MHz 6705 MHz 6865 MHz*	6945 MHz 7025 MHz
	Tx 11ax-160 (OFDM) *8) Tx 11ax-160 (OFDMA) *9)		6025 MHz 6185 MHz 6345 MHz	6505 MHz	6665 MHz 6825MHz	6985 MHz
Conducted Spurious Emission	Tx 11ax-160 (OFDM) *2)	5G_CH 1 *2)	-	-	6665 MHz	-

*Straddle channel

*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 5G_CH1 that had higher power as a representative, because preliminary testing indicated that no difference between 5G_CH0 and 5G_CH1.

*3) The worst combination of "1SS Directional gain" was applied to the test results.

*4) After the comparison between CDD and SDM, the test was performed with the CDD as a representative.

*5) Bandedge was tested at Lowest channel of UNII-5 and Highest channel of UNII-8.

*6) 6665 MHz of 11ax-160[OFDMA] 996-tone was tested 1 GHz to 40 GHz as representative, because it had the highest power at antenna terminal test.

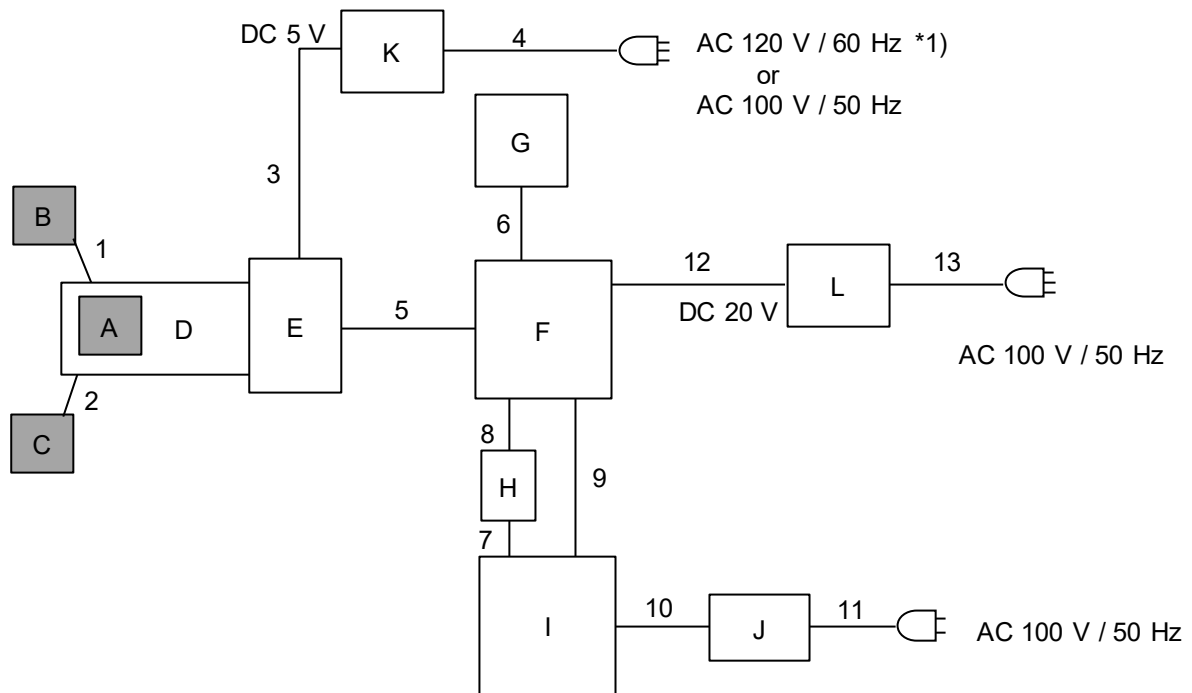
*7) 11a and 11ax-20 have the same modulation method and no differences in transmitting specification, so 11a was tested only Bandedge, because it had lower conducted power than 11ax-20.

*8) For OFDM, it was tested only 1 GHz to 18 GHz as a representative, because preliminary testing indicated that the above 18 GHz spurious emission was lower than worst conducted power and power spectral density modes.

*9) For OFDMA, worst conducted power and power spectral density modes were tested 1GHz to 18 GHz as a representative, and other modes were tested only Bandedge.

4.2 Configuration and Peripherals

<For Conducted Emission and Radiated 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-1 *1) A-2	Murata	EUT
B	Antenna (monopole)	chain0_monopole_6 GHz	#9	SONY	EUT
C	Antenna (monopole)	chain1_monopole_6 GHz	#5	SONY	EUT
	Antenna (Slot)	chain1_slot_6 GHz	#1	SONY	EUT
D	Jig Board	P2ML10932	A-2	Murata	-
E	LDO Board	P2ML8516	A-2	Murata	-
F	Mini PC	Brix	A-2	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.	-

*1) Used for Conducted Emission test.

List of Cables Used

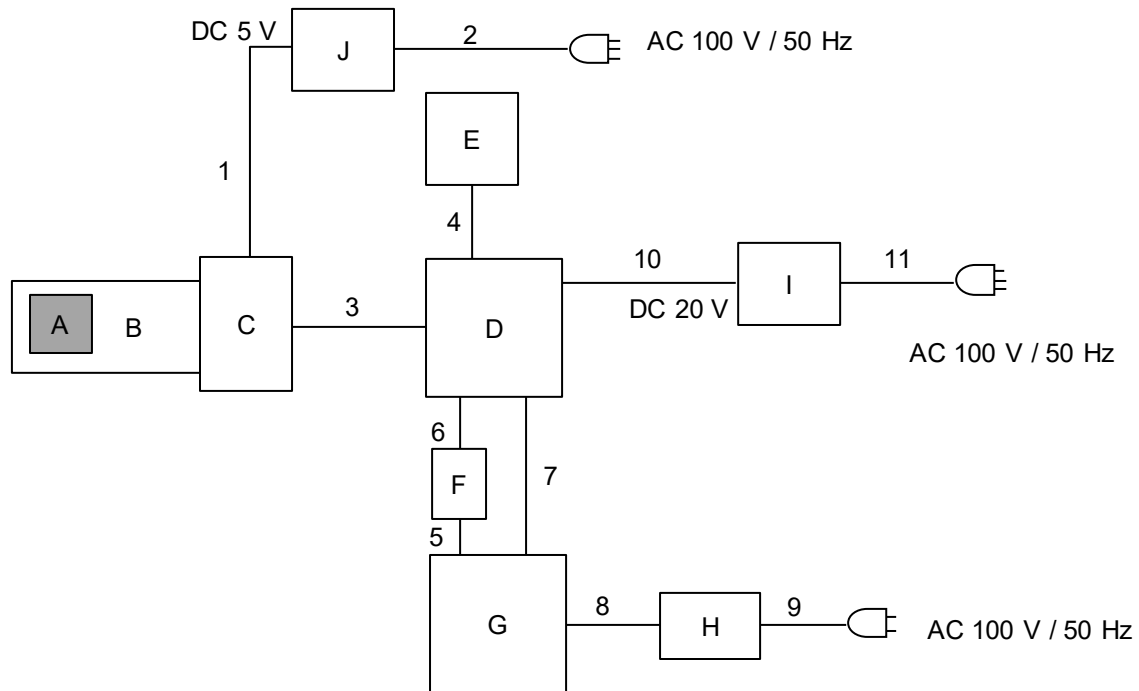
No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Antenna	0.1	Shielded	Shielded	-
2	Antenna	0.1	Shielded	Shielded	-
3	DC	1.7	Unshielded	Unshielded	-
4	AC	2.8	Unshielded	Unshielded	-
5	Signal	1.0 *1) *3) 0.15 *2)	Unshielded	Unshielded	-
6	Signal	0.1	Shielded	Shielded	-
7	USB	0.06	Shielded	Shielded	-
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-1	Murata	EUT
B	Jig Board	P2ML10932	A-1	Murata	-
C	LDO Board	P2ML8516	A-1	Murata	-
D	Mini PC	Brix	A-1	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 urethane platform 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 40 cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80 cm from any other grounded conducting surface. EUT was located 80 cm 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.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT via Auxiliary equipment in a Shielded rom.

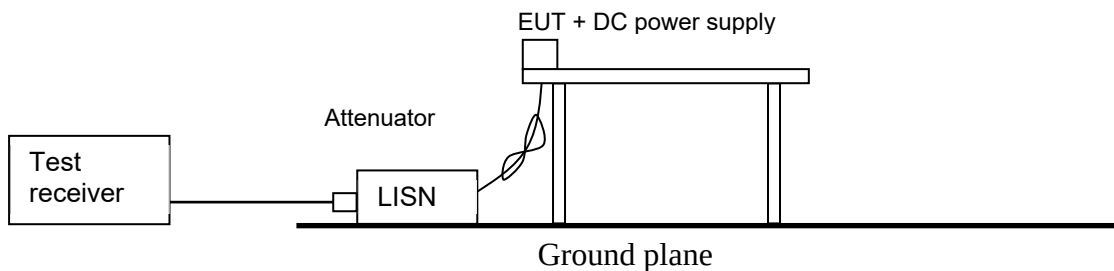
The EUT via Auxiliary equipment was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

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

Figure 1: Test Setup



SECTION 6: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

< Below 1 GHz >

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 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) (6).

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:

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

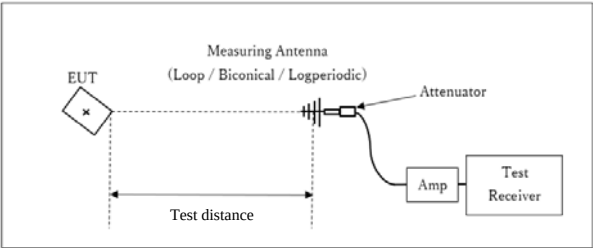
Test Antennas are used as below;

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

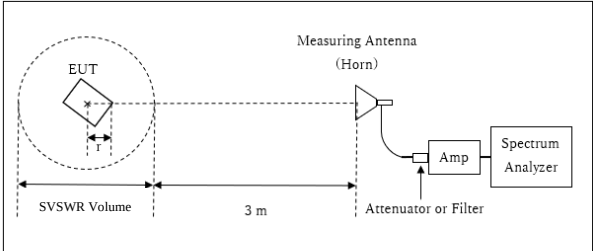
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz to 10 GHz

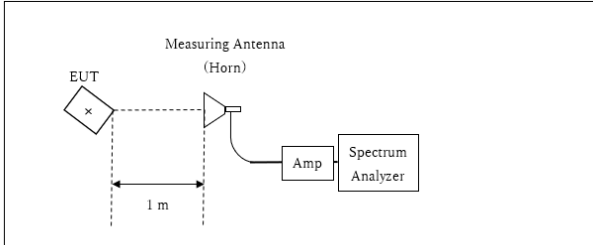


r : Radius of an outer periphery of EUT
× : Center of turn table

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.)
 $r = 0.18 \text{ m}$

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 to see the position of maximum noise, and the test was made at the position that has the maximum noise.

WLAN

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

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

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

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

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

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

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
26 dB Bandwidth	Enough to capture the emission	Close to 1 % of EBW	>RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 % to 5 % of OBW	≥3 RBW	Auto	Peak	Max Hold	Spectrum Analyzer
6 dB Bandwidth	Enough to capture the emission	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Conducted Output Power	-	-	-	Auto	Average	-	Power Meter (Sensor: 160 MHz BW) (Method PM-G)
Maximum Power Spectral Density	Encompass the entire EBW	1 MHz	≥3 RBW	Auto	RMS Power Averaging (>100 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*2) *3)	9 kHz to 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz to 30 MHz	10 kHz	30 kHz				
In-Band Emissions	Enough to capture the emission	same RBW used for 26 dB Bandwidth measurement	≥3 RBW	Auto	RMS Power Averaging (≥100 traces)	Clear Write	Spectrum Analyzer

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

*2) 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)

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

The test results and limit are rounded off to two decimals place, so some differences might be observed.
The equipment and cables were not used for factor 0 dB of the data sheets.

Test Data : APPENDIX
Test Result : Pass

APPENDIX 1: Test Data

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan,Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date : 2024/06/24

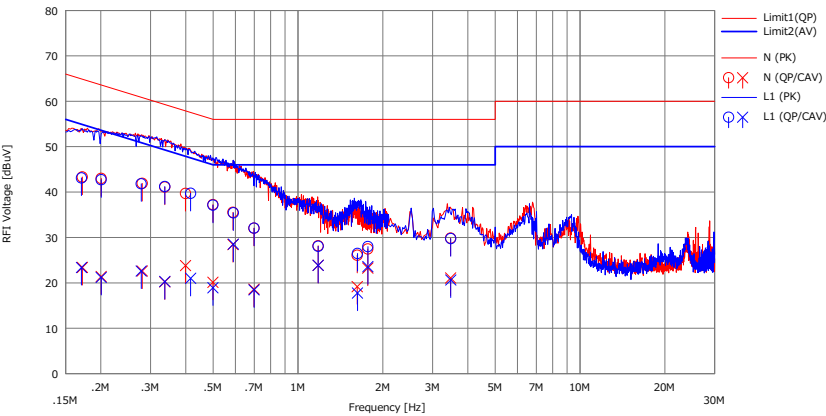
Mode : Tx 11ax-160(OFDMA) 6665 MHz

Power : DC 5 V
Temp./Humi. : 24 deg.C / 37 %RH

Remarks : CDD, 5G CH0: monopole , 5G CH 1: monopole, 996-tone RU01

Limit : FCC_Part 15 Subpart C(15.207)

Engineer : Yasumasa Owaki



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		(OP) [dBuV]	(CAV) [dBuV]		(OP) [dBuV]	(CAV) [dBuV]	(OP) [dBuV]	(AV) [dBuV]	(OP) [dB]	(AV) [dB]		
1	0.17197	27.90	8.00	15.40	43.30	23.40	64.86	54.86	21.5	31.4	N	
2	0.20056	27.60	6.00	15.39	42.99	21.39	63.59	53.59	20.6	32.2	N	
3	0.28046	26.50	7.20	15.41	41.91	22.61	60.80	50.80	18.8	28.1	N	
4	0.33704	25.70	4.80	15.40	41.10	20.20	59.28	49.28	18.1	29.0	N	
5	0.39907	24.30	8.40	15.40	39.70	23.80	57.87	47.87	18.1	24.0	N	
6	0.49938	21.80	4.70	15.43	37.23	20.13	56.01	46.01	18.7	25.8	N	
7	0.58799	20.10	13.00	15.43	35.53	28.43	56.00	46.00	20.4	17.5	N	
8	0.69790	16.60	3.20	15.43	32.03	18.63	56.00	46.00	23.9	27.3	N	
9	1.17913	12.70	8.40	15.46	28.16	23.86	56.00	46.00	27.8	22.1	N	
10	1.62226	10.60	3.70	15.47	26.07	19.17	56.00	46.00	29.9	26.8	N	
11	1.76826	12.00	7.80	15.47	27.47	23.27	56.00	46.00	28.5	22.7	N	
12	3.47622	14.30	5.50	15.55	29.85	21.05	56.00	46.00	26.1	24.9	N	
13	0.17069	27.70	8.00	15.39	43.09	23.39	64.93	54.93	21.8	31.5	L1	
14	0.20056	27.30	5.80	15.40	42.70	21.20	63.59	53.59	20.8	32.3	L1	
15	0.27807	26.40	7.20	15.41	41.81	22.61	60.87	50.87	19.0	28.2	L1	
16	0.33704	25.80	4.90	15.41	41.21	20.31	59.28	49.28	18.0	28.9	L1	
17	0.41638	24.30	5.60	15.41	39.71	21.01	57.52	47.52	17.8	26.5	L1	
18	0.49938	21.70	3.50	15.42	37.12	18.92	56.01	46.01	18.8	27.0	L1	
19	0.58982	20.00	13.10	15.42	35.42	28.52	56.00	46.00	20.5	17.4	L1	
20	0.69885	16.60	3.00	15.44	32.04	18.44	56.00	46.00	23.9	27.5	L1	
21	1.17913	12.60	8.40	15.45	28.05	23.85	56.00	46.00	27.9	22.1	L1	
22	1.62527	11.00	2.30	15.46	26.46	17.76	56.00	46.00	29.5	28.2	L1	
23	1.76978	12.50	8.10	15.48	27.98	23.58	56.00	46.00	28.0	22.4	L1	
24	3.47978	14.20	5.10	15.54	29.74	20.64	56.00	46.00	26.2	25.3	L1	

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

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date : 2024/06/24

Mode : Tx 11ax-160(OFDMA) 6665 MHz

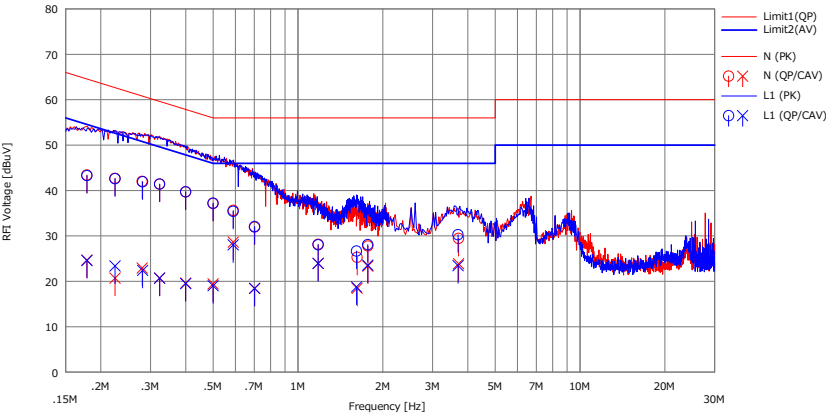
Power : DC 5 V

Temp./Humi. : 24 deg.C / 37 %RH

Remarks : CDD, 5G CH0: monopole , 5G CH 1: slot, 996-tone RU01

Limit : FCC_Part 15 Subpart C(15.207)

Engineer : Yasumasa Owaki



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	0.17841	28.00	9.30	15.40	43.40	24.70	64.56	54.56	21.1	29.8	N	
2	0.22454	27.30	5.30	15.39	42.69	20.69	62.65	52.65	19.9	31.9	N	
3	0.28024	26.60	7.50	15.41	42.01	22.91	60.81	50.81	18.8	27.9	N	
4	0.32331	26.00	5.30	15.41	41.41	20.71	59.62	49.62	18.2	28.9	N	
5	0.39982	24.30	4.20	15.40	39.70	19.60	57.86	47.86	18.1	28.2	N	
6	0.49996	21.70	4.00	15.43	37.13	19.43	56.00	46.00	18.8	26.5	N	
7	0.58955	20.20	13.20	15.43	35.63	28.63	56.00	46.00	20.3	17.3	N	
8	0.70159	16.50	3.00	15.43	31.93	18.43	56.00	46.00	24.0	27.5	N	
9	1.17949	12.70	8.50	15.46	28.16	23.96	56.00	46.00	27.8	22.0	N	
10	1.62125	9.80	3.00	15.47	25.27	18.47	56.00	46.00	30.7	27.5	N	
11	1.76919	12.30	7.90	15.47	27.77	23.37	56.00	46.00	28.2	22.6	N	
12	3.70789	13.90	8.30	15.56	29.46	23.86	56.00	46.00	26.5	22.1	N	
13	0.17853	27.90	9.20	15.39	43.29	24.59	64.55	54.55	21.2	29.9	L1	
14	0.22454	27.20	8.00	15.39	42.59	23.39	62.65	52.65	20.0	29.2	L1	
15	0.28132	26.50	7.00	15.41	41.91	22.41	60.78	50.78	18.8	28.3	L1	
16	0.32331	26.00	5.30	15.41	41.41	20.71	59.62	49.62	18.2	28.9	L1	
17	0.39982	24.30	4.10	15.41	39.71	19.51	57.86	47.86	18.1	28.3	L1	
18	0.49996	21.80	3.60	15.42	37.22	19.02	56.00	46.00	18.7	26.9	L1	
19	0.58922	20.00	12.60	15.42	35.42	28.02	56.00	46.00	20.5	17.9	L1	
20	0.70159	16.60	3.00	15.44	32.04	18.44	56.00	46.00	23.9	27.5	L1	
21	1.17916	12.60	8.50	15.45	28.05	23.95	56.00	46.00	27.9	22.0	L1	
22	1.61264	11.20	3.30	15.46	26.66	18.76	56.00	46.00	29.3	27.2	L1	
23	1.76764	12.60	8.10	15.48	28.08	23.58	56.00	46.00	27.9	22.4	L1	
24	3.69285	14.70	7.90	15.56	30.26	23.46	56.00	46.00	25.7	22.5	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 May 25, 2024
Temperature / Humidity 23 deg. C / 34 % RH
Engineer Hiromasa Sato
Mode Tx 11a

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5955	20.980	16596.8
6195	20.618	16597.0
6415	20.840	16591.6
6435	21.090	16565.4
6475	21.040	16562.8
6515	20.933	16602.2
6535	20.782	16593.2
6695	20.543	16597.5
6875	20.492	16593.4
6895	20.892	16589.3
6995	20.398	16585.7
7095	20.914	16582.6

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 25, 2024
Temperature / Humidity 23 deg. C / 34 % RH
Engineer Hiromasa Sato
Mode Tx 11ax-20 [OFDM]

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5955	21.805	19067.1
6195	21.547	19051.0
6415	21.639	19027.6
6435	21.882	19032.4
6475	21.199	19070.4
6515	21.727	19082.2
6535	21.433	19036.1
6695	21.587	19055.9
6875	21.770	19046.9
6895	21.787	19054.9
6995	21.658	19049.9
7095	21.566	19027.1

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 26, 2024
Temperature / Humidity 28 deg. C / 30 % RH
Engineer Kouki Yamada
Mode Tx 11ax-20 [26-tone RU]

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
26-tone RU	5955	0	20.751	18636.9
	6195	4	18.784	17350.9
	6415	8	20.310	18487.5
	6435	0	20.243	18453.6
	6475	4	18.778	17356.3
	6515	8	20.267	18459.6
	6535	0	20.197	18447.9
	6695	4	18.824	17335.8
	6875	8	20.075	18462.0
	6895	0	20.104	18377.2
	6995	4	18.861	17350.9
	7095	8	20.209	18509.4

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 26, 2024
Temperature / Humidity 28 deg. C / 30 % RH
Engineer Kouki Yamada
Mode Tx 11ax-20 [52-tone RU]

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
52-tone RU	5955	37	20.606	18303.4
	6195	38	19.411	17434.4
	6415	40	20.137	18246.3
	6435	37	20.264	18247.5
	6475	38	19.589	17440.8
	6515	40	20.664	18373.9
	6535	37	20.308	18253.2
	6695	38	19.515	17441.0
	6875	40	20.359	18296.7
	6895	37	20.906	18300.1
	6995	38	19.447	17427.8
	7095	40	20.617	18394.8

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 26, 2024
Temperature / Humidity 28 deg. C / 30 % RH
Engineer Kouki Yamada
Mode Tx 11ax-20 [106-tone RU]

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
106-tone RU	5955	53	20.976	18274.1
	6195	53	20.968	18288.0
	6415	54	20.399	18267.7
	6435	53	20.880	18276.7
	6475	53	21.036	18302.0
	6515	54	20.630	18271.6
	6535	53	20.895	18268.2
	6695	53	21.007	18285.6
	6875	54	20.689	18277.0
	6895	53	20.917	18284.1
	6995	53	21.989	18326.5
	7095	54	20.780	18299.3

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 25, 2024
Temperature / Humidity 23 deg. C / 34 % RH
Engineer Hiromasa Sato
Mode Tx 11ax-20 [242-tone RU]

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
242-tone RU	5955	61	21.720	19054.6
	6195	61	21.526	19110.0
	6415	61	21.502	19112.7
	6435	61	21.578	19124.4
	6475	61	21.818	19102.5
	6515	61	21.586	19131.6
	6535	61	21.496	19078.0
	6695	61	21.602	19090.0
	6875	61	21.618	19084.0
	6895	61	21.325	19079.5
	6995	61	21.486	19085.2
	7095	61	21.789	19063.9

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 25, 2024
Temperature / Humidity 23 deg. C / 34 % RH
Engineer Hiromasa Sato
Mode Tx 11ax-40 [OFDM]

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5965	43.852	38041.6
6205	43.461	37979.4
6405	43.826	38067.7
6445	43.678	37960.6
6485	43.456	37971.5
6525	43.365	38048.5
6565	44.219	37989.0
6685	43.343	37968.9
6885	43.888	37994.7
6925	43.437	37995.1
7005	43.919	37977.3
7085	43.648	37971.1

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 26, 2024
Temperature / Humidity 28 deg. C / 30 % RH
Engineer Kouki Yamada
Mode Tx 11ax-40 [26-tone RU]

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
26-tone RU	5965	0	40.242	38046.0
	6205	8	38.312	36519.5
	6405	17	40.774	38264.0
	6445	0	40.400	38082.2
	6485	8	38.407	36623.8
	6525	17	40.735	38310.4
	6565	0	40.127	37801.3
	6685	8	38.348	36585.2
	6885	17	40.783	38358.2
	6925	0	40.124	37936.0
	7005	8	38.364	36573.6
	7085	17	40.567	38199.8

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 26, 2024
Temperature / Humidity 28 deg. C / 30 % RH
Engineer Kouki Yamada
Mode Tx 11ax-40 [52-tone RU]

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
52-tone RU	5965	37	40.475	37698.5
	6205	40	38.603	36487.8
	6405	44	41.033	37946.1
	6445	37	40.718	37591.1
	6485	40	38.663	36578.8
	6525	44	41.765	38234.6
	6565	37	40.576	37647.6
	6685	40	38.709	36594.8
	6885	44	41.024	38110.8
	6925	37	41.007	37897.2
	7005	40	38.710	36605.8
	7085	44	41.559	38131.3

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 26, 2024
Temperature / Humidity 28 deg. C / 30 % RH
Engineer Kouki Yamada
Mode Tx 11ax-40 [106-tone RU]

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
106-tone RU	5965	53	40.967	37432.5
	6205	54	38.710	36450.1
	6405	56	40.792	37506.7
	6445	53	40.965	37384.3
	6485	54	38.752	36503.1
	6525	56	40.823	37564.4
	6565	53	41.012	37371.0
	6685	54	38.716	36468.5
	6885	56	40.763	37495.6
	6925	53	40.949	37404.2
	7005	54	38.726	36461.4
	7085	56	40.869	37554.6

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 26, 2024
Temperature / Humidity 28 deg. C / 30 % RH
Engineer Kouki Yamada
Mode Tx 11ax-40 [242-tone RU]

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
242-tone RU	5965	61	41.614	37416.6
	6205	61	41.773	37413.2
	6405	62	42.835	37571.0
	6445	61	41.697	37435.1
	6485	61	41.901	37437.4
	6525	62	42.748	37571.4
	6565	61	41.665	37388.2
	6685	61	41.878	37413.7
	6885	62	42.770	37556.1
	6925	61	42.003	37395.0
	7005	61	41.542	37375.5
	7085	62	42.862	37592.1

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 25, 2024
Temperature / Humidity 23 deg. C / 34 % RH
Engineer Hiromasa Sato
Mode Tx 11ax-40 [484-tone RU]

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
484-tone RU	5965	65	43.457	38051.4
	6205	65	43.379	38046.1
	6405	65	43.564	38034.7
	6445	65	43.587	38006.3
	6485	65	43.483	38051.1
	6525	65	43.650	38019.2
	6565	65	43.406	37999.1
	6685	65	43.334	38070.5
	6885	65	43.346	38065.4
	6925	65	43.045	38026.9
	7005	65	43.937	38051.8
	7085	65	43.748	38044.6

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 25, 2024
Temperature / Humidity 23 deg. C / 34 % RH
Engineer Hiromasa Sato
Mode Tx 11ax-80 [OFDM]

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5985	87.827	77599.0
6225	87.100	77593.4
6385	86.322	77724.2
6465	87.827	77631.4
6545	87.106	77657.2
6625	86.291	77609.2
6705	88.426	77621.6
6865	88.000	77616.4
6945	85.922	77550.3
7025	88.489	77648.8

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 28, 2024
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Makoto Hosaka
Mode Tx 11ax-80 [26-tone RU]

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
26-tone RU	5985	0	81.67	78212
	6225	18	78.33	74950
	6385	36	81.29	78446
	6465	0	81.02	78242
	6545	36	81.33	78375
	6625	0	80.97	77664
	6705	18	78.37	75357
	6865	36	82.00	78400
	6945	0	80.74	78003
	7025	36	82.00	78485

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 28, 2024
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Makoto Hosaka
Mode Tx 11ax-80 [52-tone RU]

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
52-tone RU	5985	37	82.54	78099
	6225	44	78.91	75351
	6385	52	83.32	78055
	6465	37	83.30	78213
	6545	52	81.73	77522
	6625	37	82.28	77919
	6705	44	78.99	75377
	6865	52	82.17	77715
	6945	37	82.64	77984
	7025	52	82.19	77836

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 28, 2024
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Makoto Hosaka
Mode Tx 11ax-80 [106-tone RU]

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
106-tone RU	5985	53	82.64	77566
	6225	56	79.21	75225
	6385	60	82.72	77388
	6465	53	82.93	77624
	6545	60	82.37	77315
	6625	53	82.43	77234
	6705	56	79.49	75316
	6865	60	82.17	77351
	6945	53	82.61	77461
	7025	60	82.79	77580

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 28, 2024
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Makoto Hosaka
Mode Tx 11ax-80 [242-tone RU]

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
242-tone RU	5985	61	85.31	77316
	6225	62	81.21	75293
	6385	64	84.17	77155
	6465	61	84.73	77154
	6545	64	83.35	76985
	6625	61	84.37	77183
	6705	62	81.45	75614
	6865	64	83.54	77157
	6945	61	84.21	77250
	7025	64	82.31	77273

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 28, 2024
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Makoto Hosaka
Mode Tx 11ax-80 [484-tone RU]

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
484-tone RU	5985	65	85.48	77142
	6225	65	85.84	77211
	6385	66	84.47	76977
	6465	65	86.42	77429
	6545	66	84.06	77016
	6625	65	86.71	77508
	6705	65	85.09	77268
	6865	66	84.90	77058
	6945	65	85.60	77457
	7025	66	83.52	76943

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 25, 2024
Temperature / Humidity 23 deg. C / 34 % RH
Engineer Hiromasa Sato
Mode Tx 11ax-80 [996-tone RU]

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
996-tone RU	5985	67	89.037	77864.5
	6225	67	88.584	77799.3
	6385	67	89.258	77824.8
	6465	67	88.117	77633.4
	6545	67	88.529	77787.9
	6625	67	89.013	77747.7
	6705	67	88.542	77606.6
	6865	67	89.037	77682.2
	6945	67	88.327	77713.9
	7025	67	88.648	77825.5

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 29, 2024
Temperature / Humidity 23 deg. C / 34 % RH
Engineer Hiromasa Sato
Mode Tx 11ax-160 [OFDM]

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
6025	170.267	156675.6
6185	172.881	156742.5
6345	170.759	156711.8
6505	170.551	156489.9
6665	171.053	156759.8
6825	171.778	156871.0
6985	173.205	156730.2

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 28, 2024
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Makoto Hosaka
Mode Tx 11ax-160 [26-tone RU]

RU Type	Tested Frequency [MHz]	Segment	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
26-tone RU	6025	0	0	163.200	158600.0
	6185	0	36	158.700	153720.0
	6345	1	36	162.500	158040.0
	6505	0	0	161.900	157730.0
	6665	0	0	162.300	157240.0
	6825	1	36	163.700	158380.0
	6985	1	36	163.300	158360.0

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 28, 2024
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Makoto Hosaka
Mode Tx 11ax-160 [52-tone RU]

RU Type	Tested Frequency [MHz]	Segment	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
52-tone RU	6025	0	37	162.900	157510.0
	6185	0	52	159.200	153250.0
	6345	1	52	162.400	157050.0
	6505	0	37	163.300	157450.0
	6665	0	37	163.200	157070.0
	6825	1	52	163.200	157770.0
	6985	1	52	163.200	157530.0

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 28, 2024
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Makoto Hosaka
Mode Tx 11ax-160 [106-tone RU]

RU Type	Tested Frequency [MHz]	Segment	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
106-tone-RU	6025	0	53	163.800	157320.0
	6185	0	60	159.700	152970.0
	6345	1	60	163.800	157000.0
	6505	0	53	163.000	156490.0
	6665	0	53	163.500	156460.0
	6825	1	60	162.900	157220.0
	6985	1	60	163.500	157250.0

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 28, 2024
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Makoto Hosaka
Mode Tx 11ax-160 [242-tone RU]

RU Type	Tested Frequency [MHz]	Segment	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
242-tone RU	6025	0	61	164.400	156990.0
	6185	0	64	160.700	153250.0
	6345	1	64	164.000	156710.0
	6505	0	61	164.600	156740.0
	6665	0	61	164.600	156060.0
	6825	1	64	163.600	156910.0
	6985	1	64	164.200	157050.0

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 28, 2024
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Makoto Hosaka
Mode Tx 11ax-160 [484-tone RU]

RU Type	Tested Frequency [MHz]	Segment	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
484-tone RU	6025	0	65	166.600	156580.0
	6185	0	66	161.700	153990.0
	6345	1	66	165.600	156370.0
	6505	0	65	165.500	156390.0
	6665	0	65	165.400	155910.0
	6825	1	66	165.000	156840.0
	6985	1	66	165.200	156800.0

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 28, 2024
Temperature / Humidity 25 deg. C / 46 % RH
Engineer Makoto Hosaka
Mode Tx 11ax-160 [996-tone RU]

RU Type	Tested Frequency [MHz]	Segment	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
996-tone RU	6025	0	67	168.300	156400.0
	6185	0	67	167.300	156340.0
	6345	1	67	166.000	156090.0
	6505	0	67	167.400	156130.0
	6665	0	67	166.300	155880.0
	6825	1	67	165.400	156340.0
	6985	1	67	165.500	156460.0

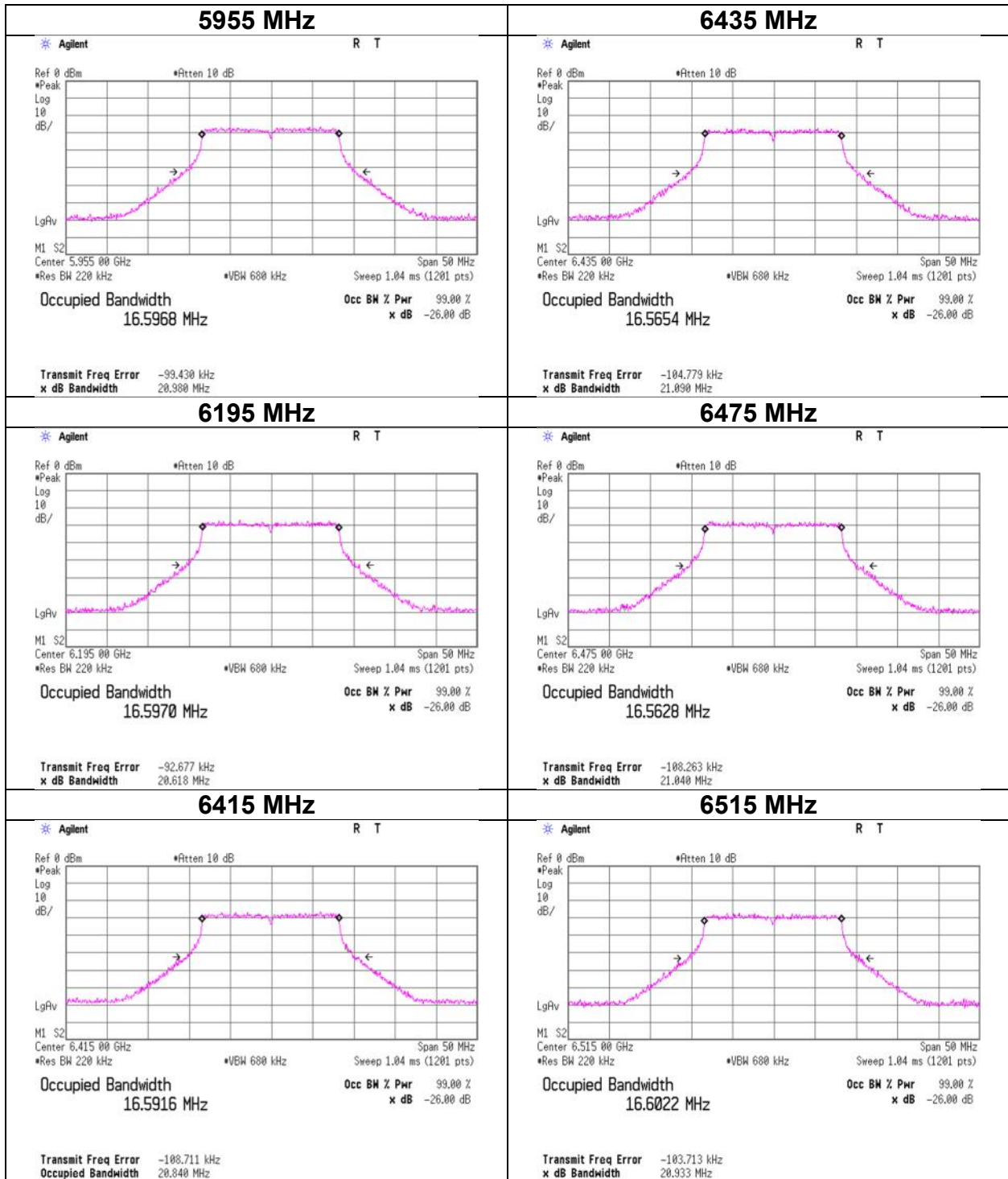
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Shonan EMC Lab. No.8 Shielded Room
Date May 25, 2024
Temperature / Humidity 23 deg. C / 34 % RH
Engineer Hiromasa Sato
Mode Tx 11ax-160 [2x996-tone RU]

RU Type	Tested Frequency [MHz]	RU Index	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
2x996-tone RU	6025	68	170.678	156717.7
	6185	68	170.067	156620.8
	6345	68	171.031	156816.5
	6505	68	170.693	156848.7
	6665	68	169.716	156762.1
	6825	68	170.773	156832.3
	6985	68	169.989	156819.1

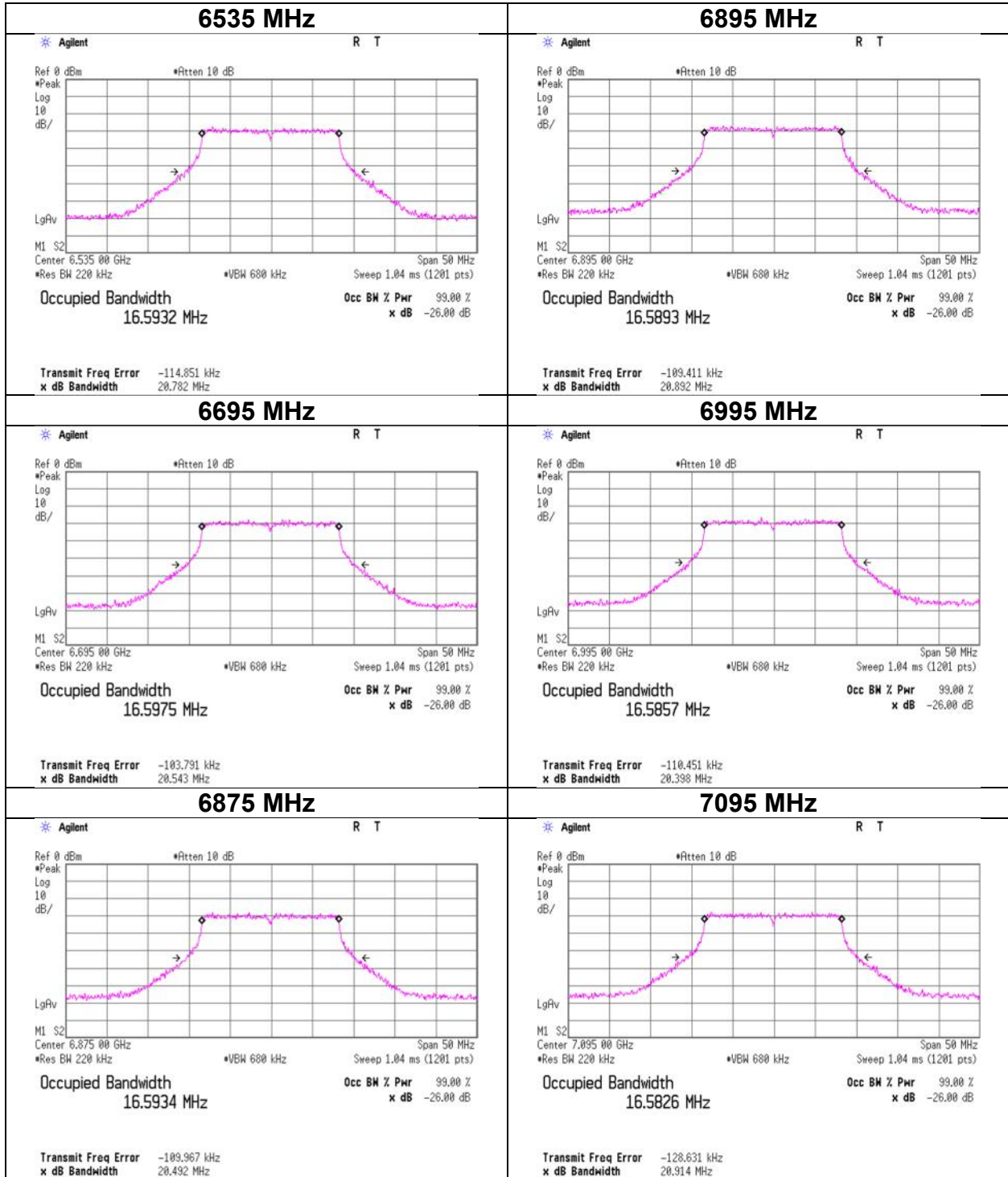
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11a



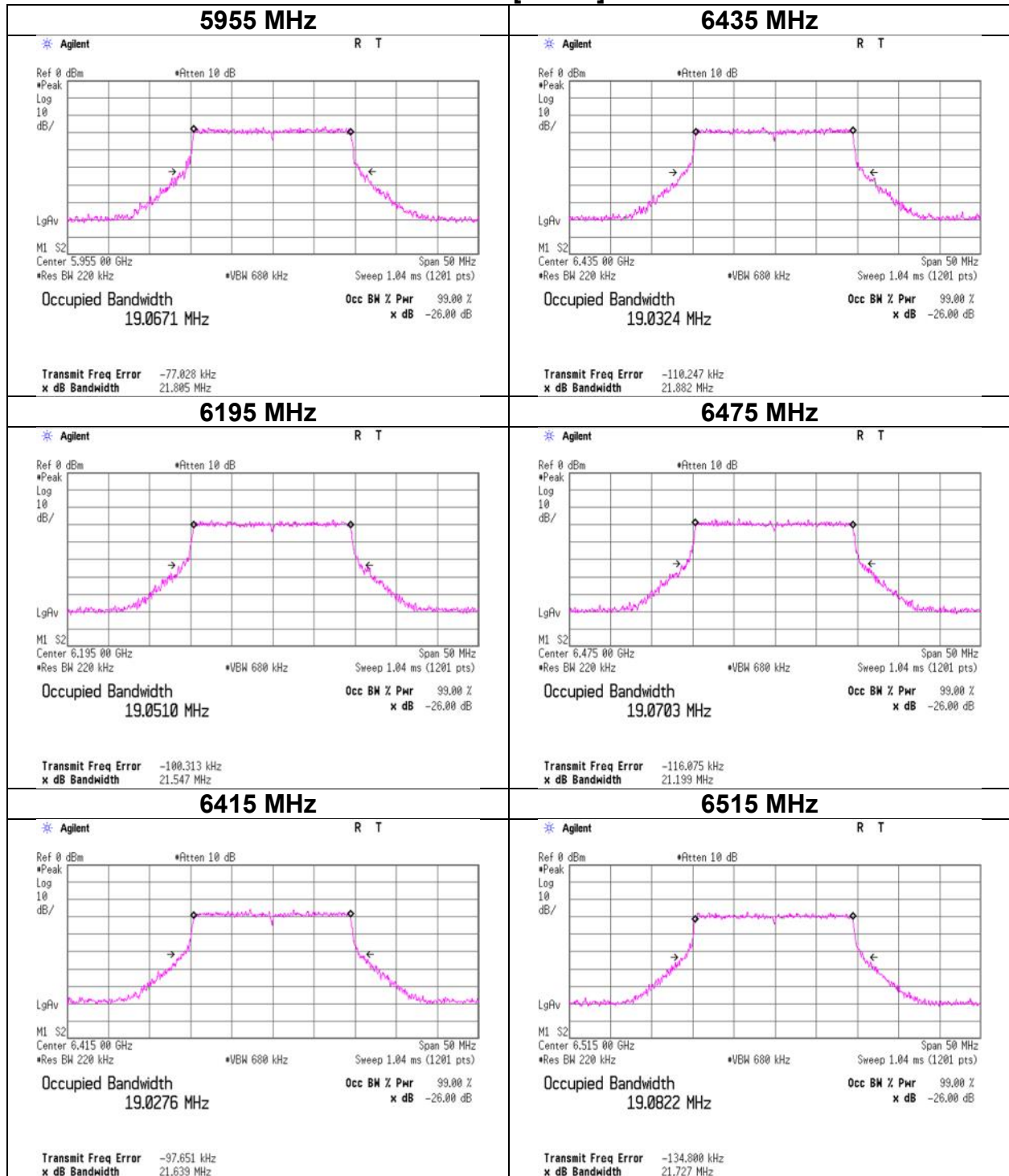
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11a



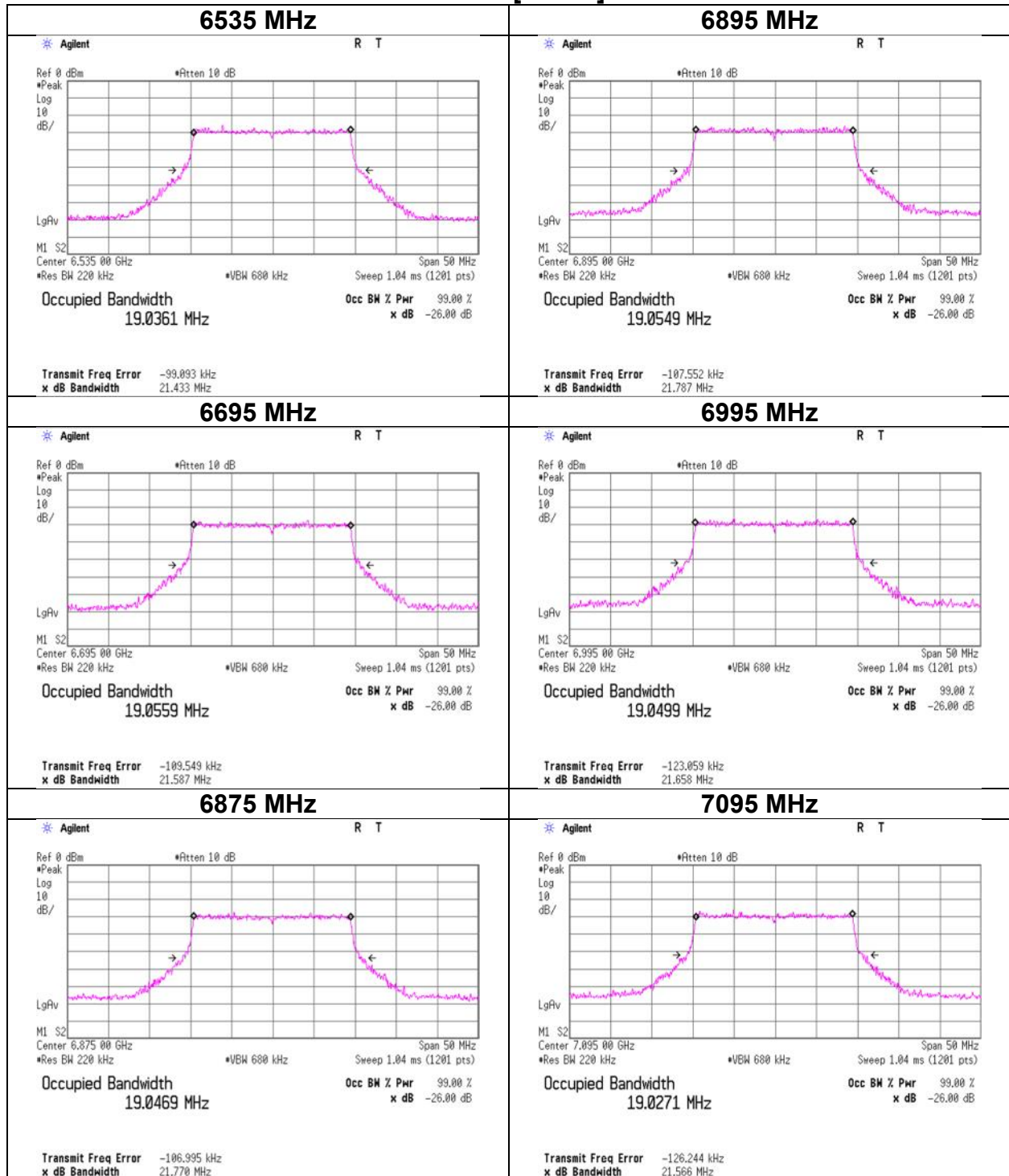
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [OFDM]



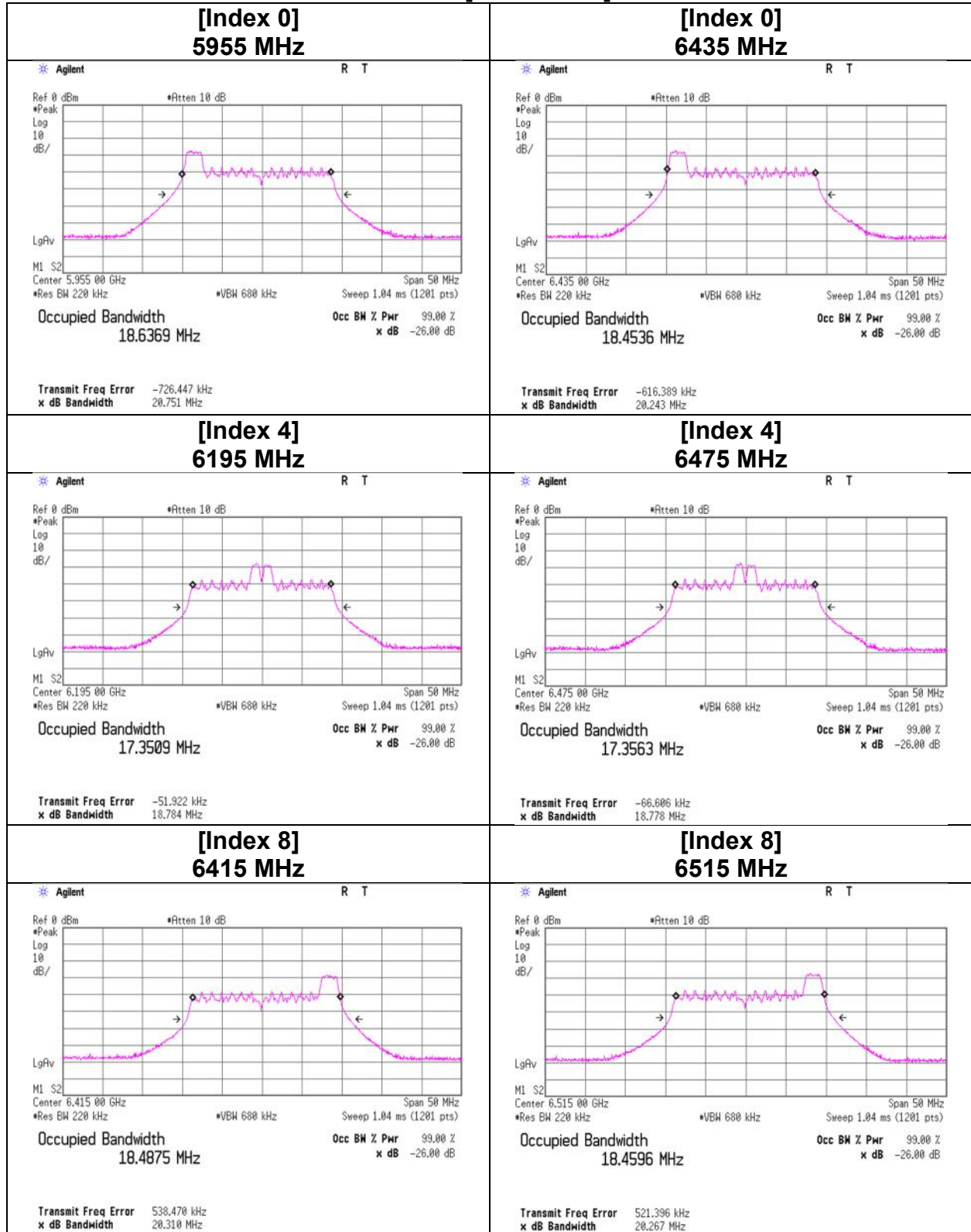
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [OFDM]



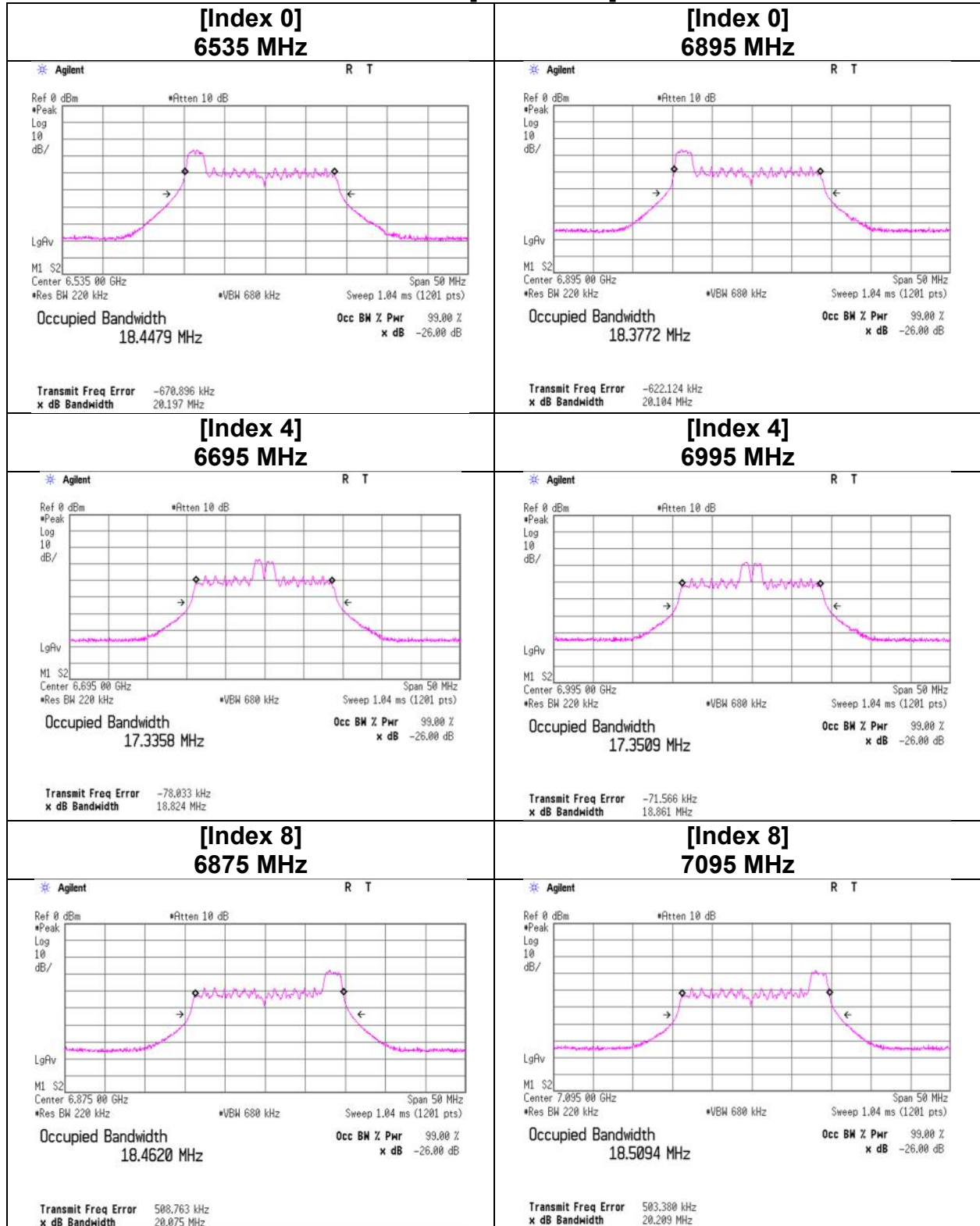
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [26-tone RU]



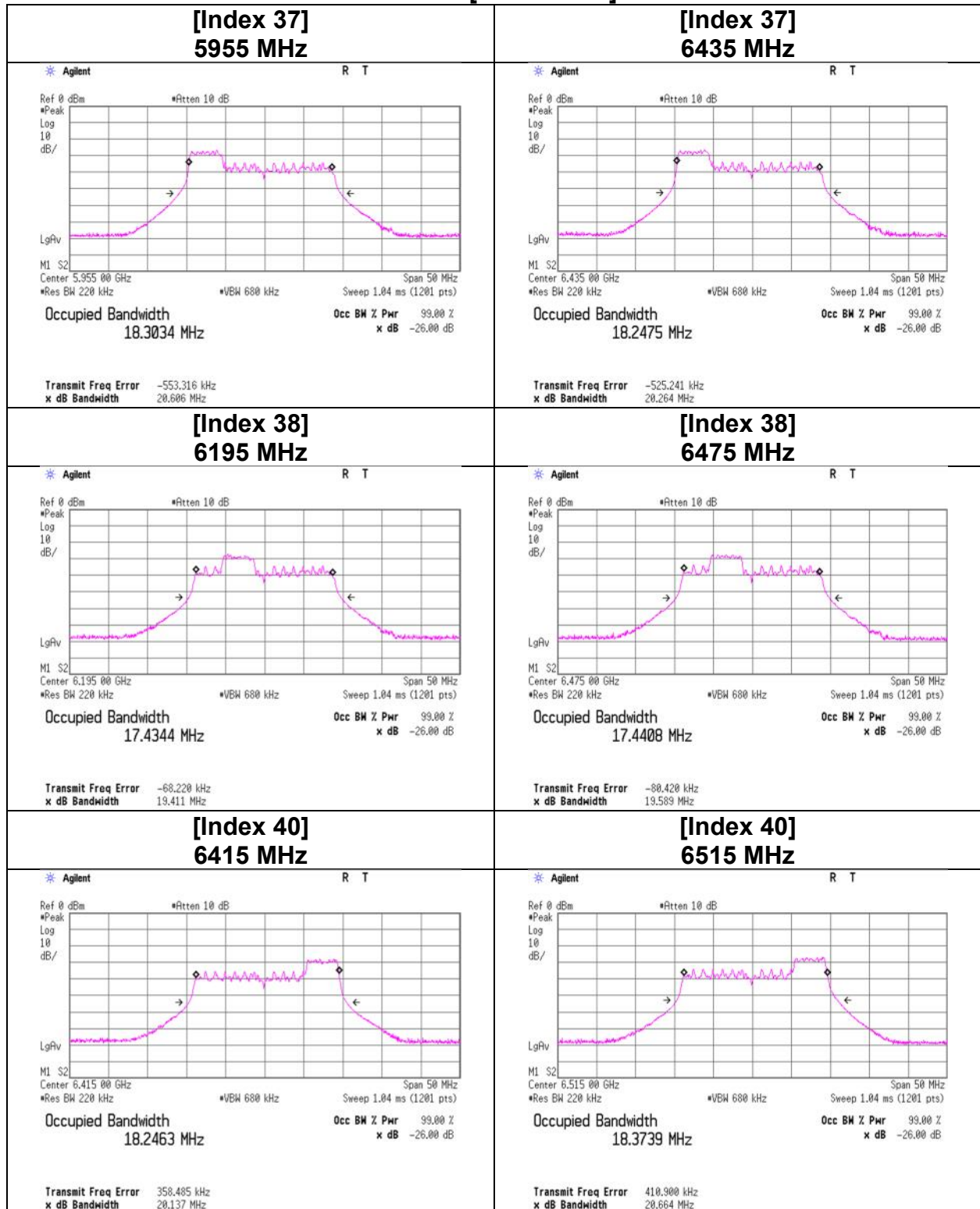
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [26-tone RU]



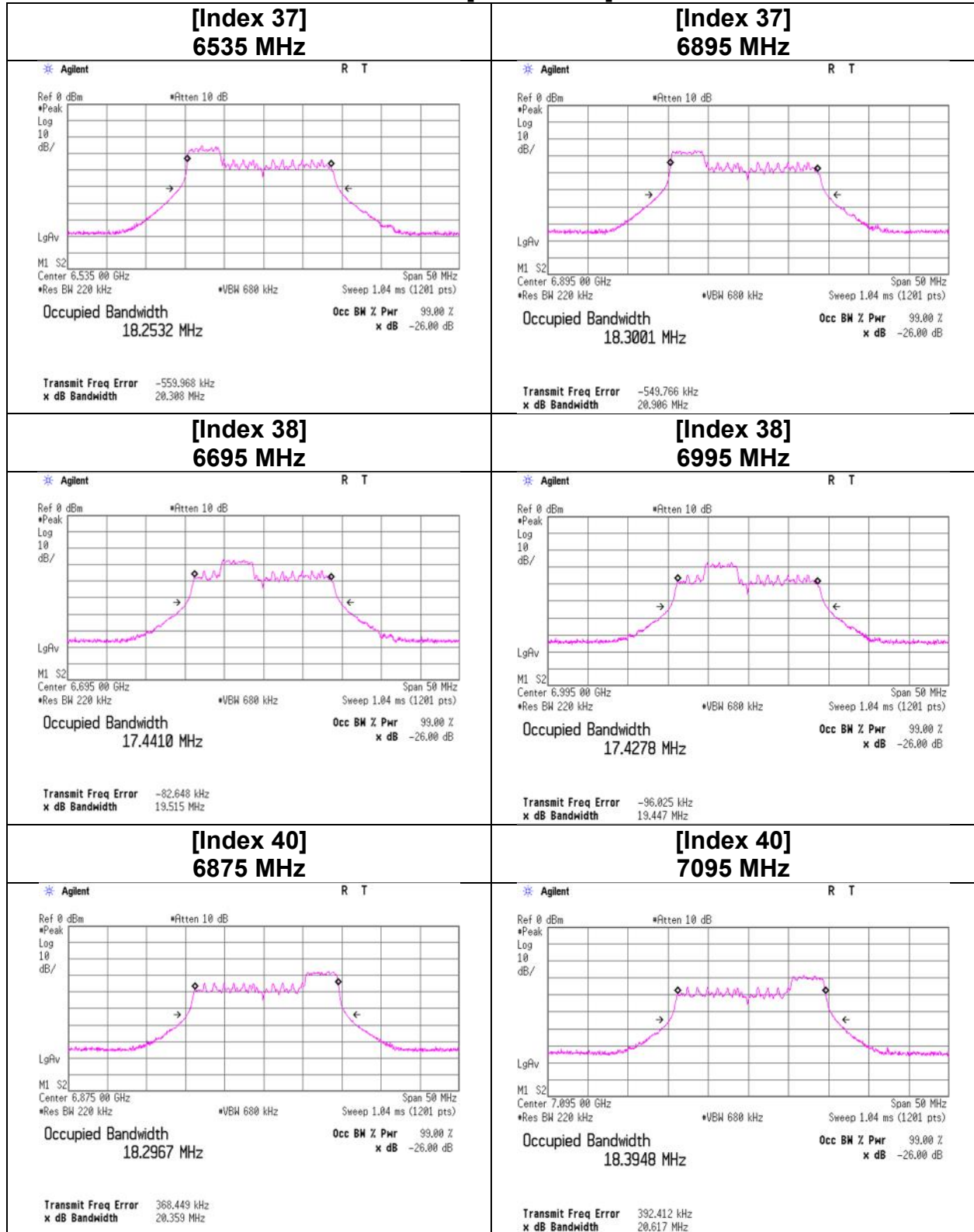
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [52-tone RU]



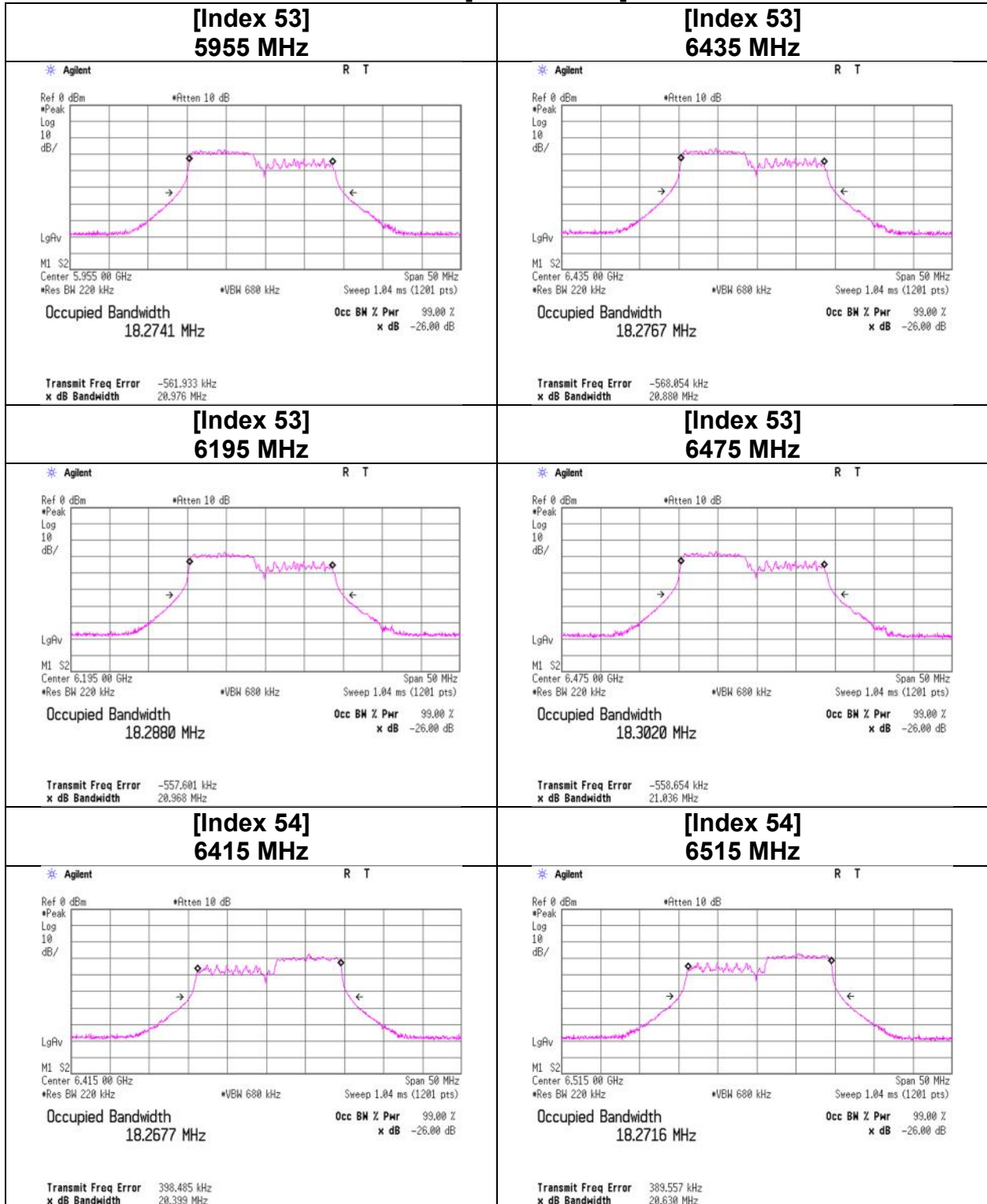
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [52-tone RU]



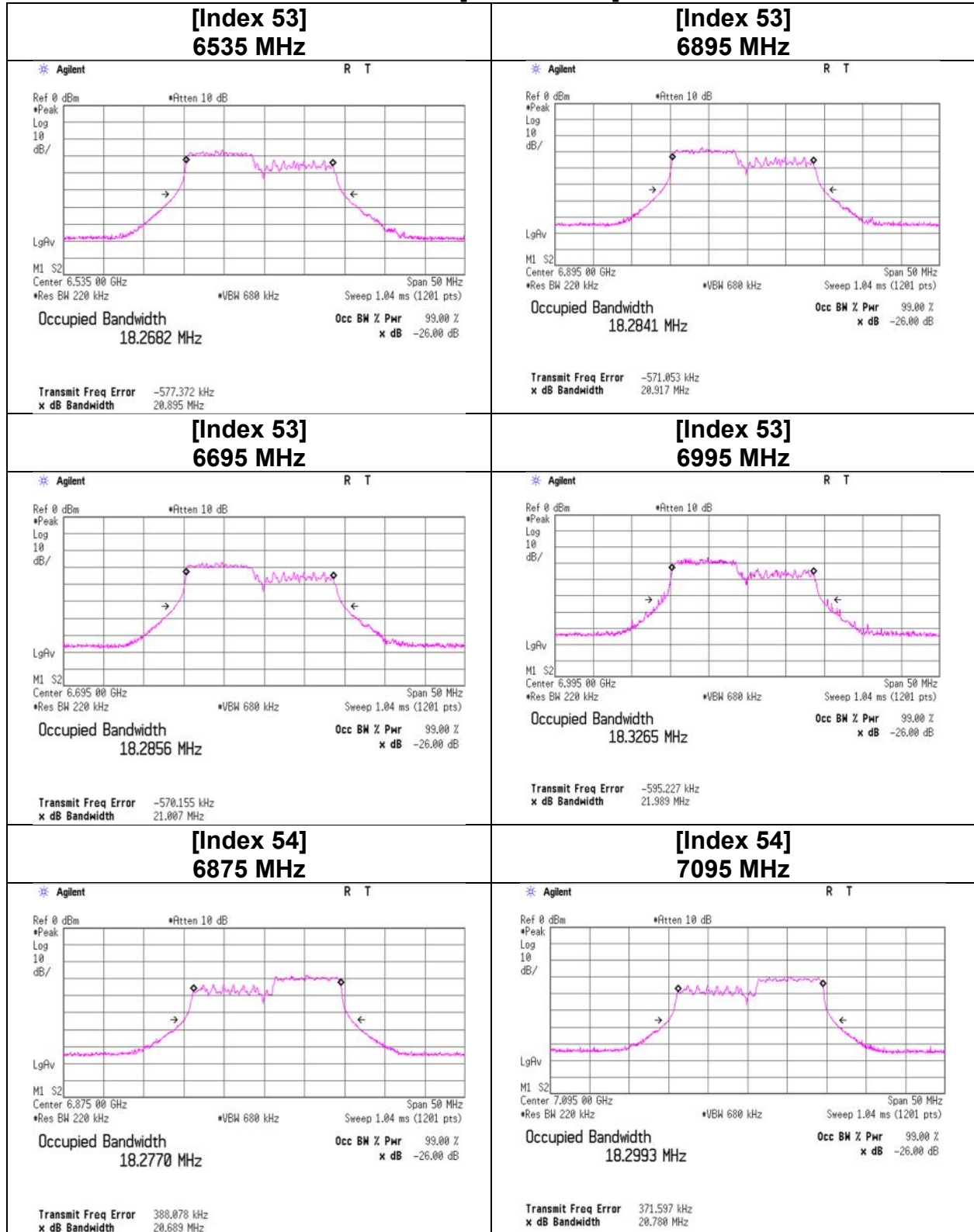
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [106-tone RU]



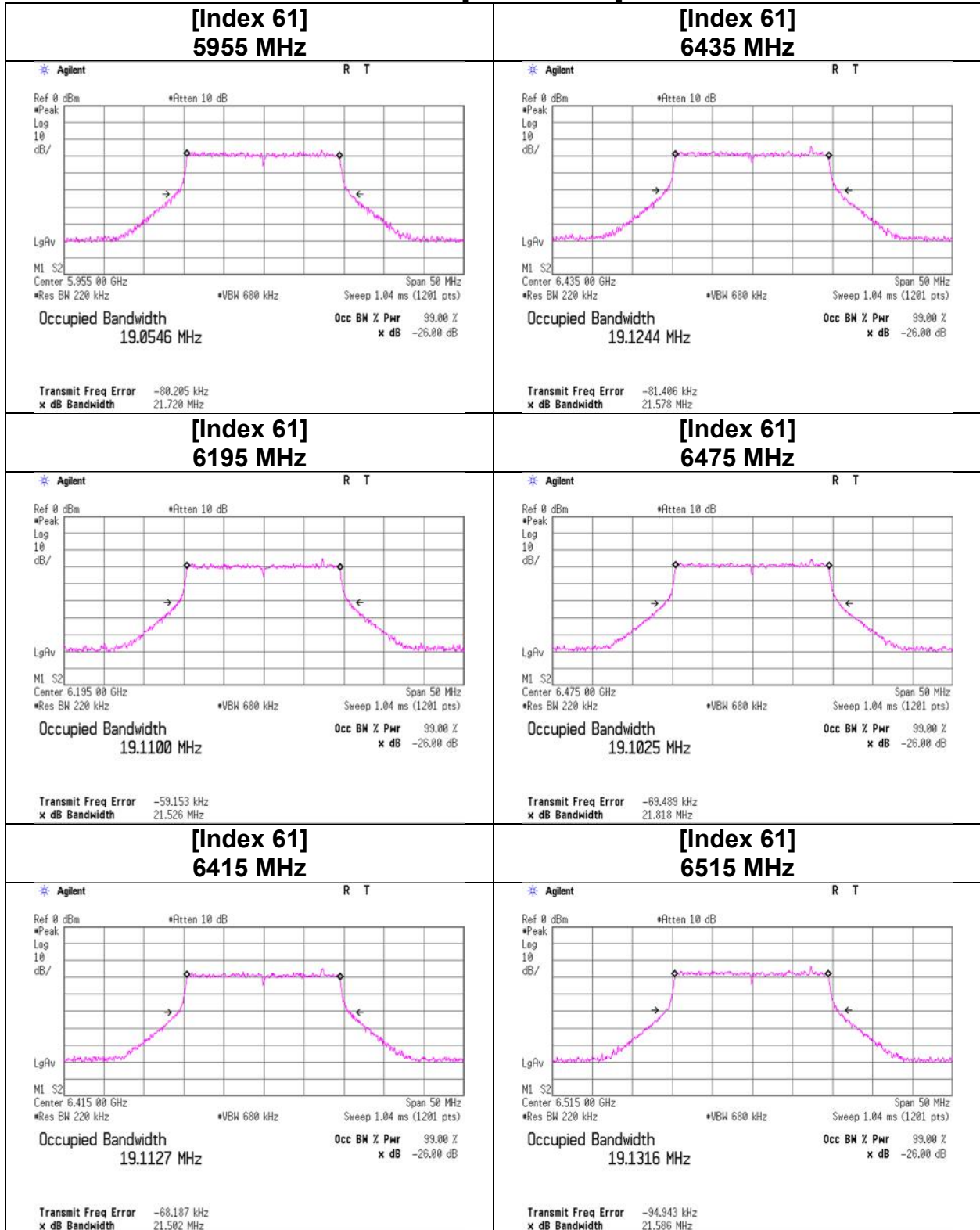
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [106-tone RU]



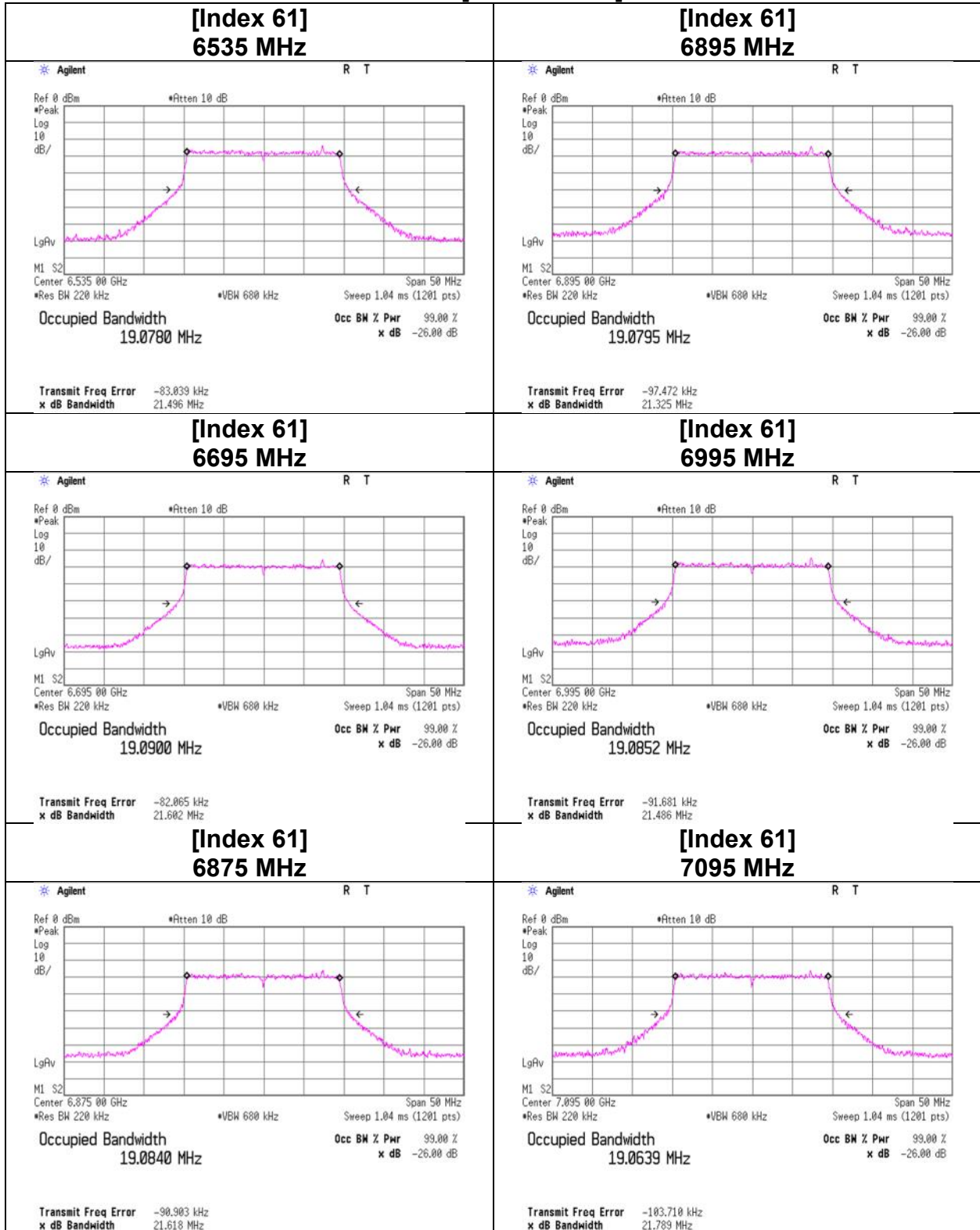
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [242-tone RU]



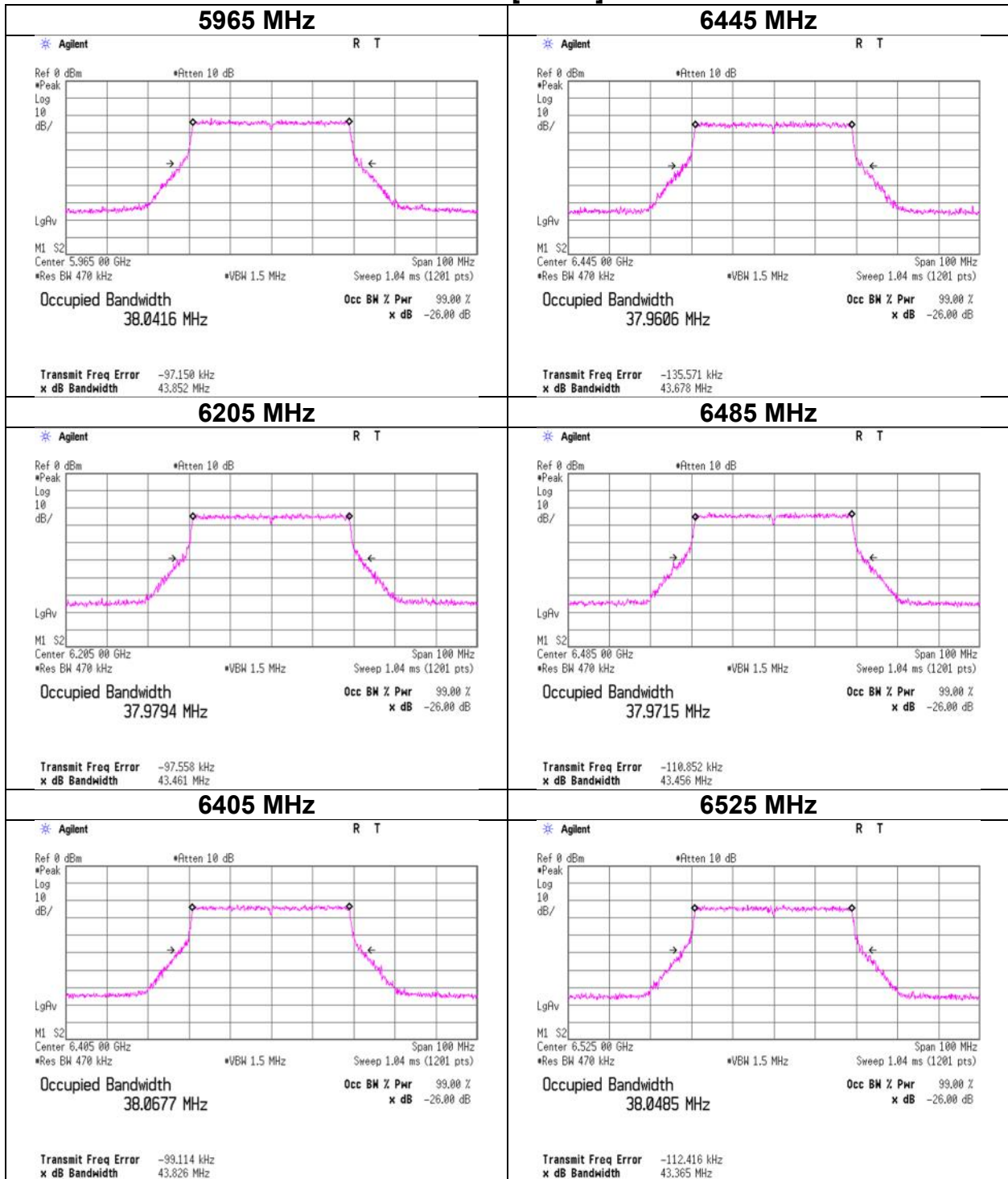
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-20 [242-tone RU]



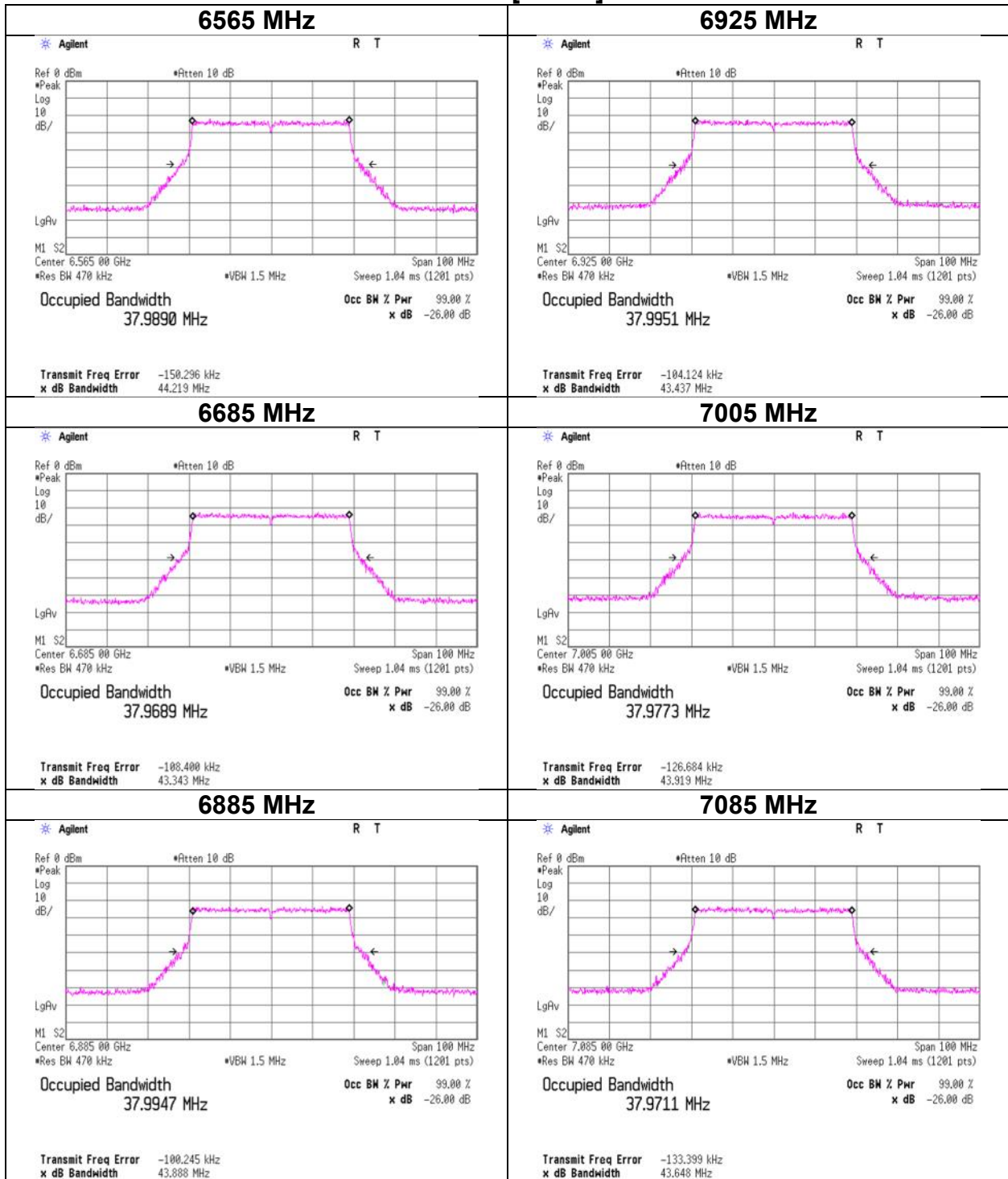
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [OFDM]



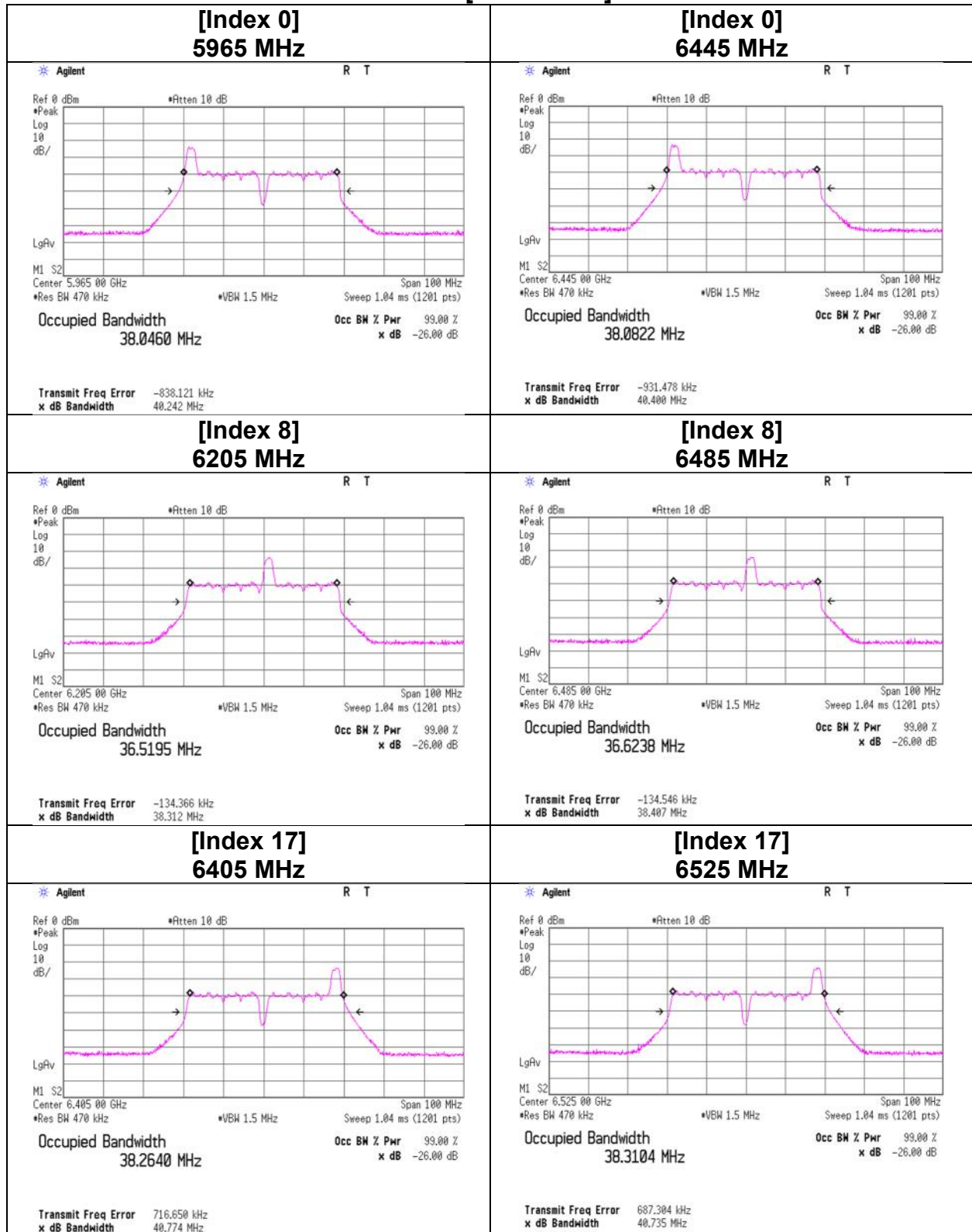
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [OFDM]



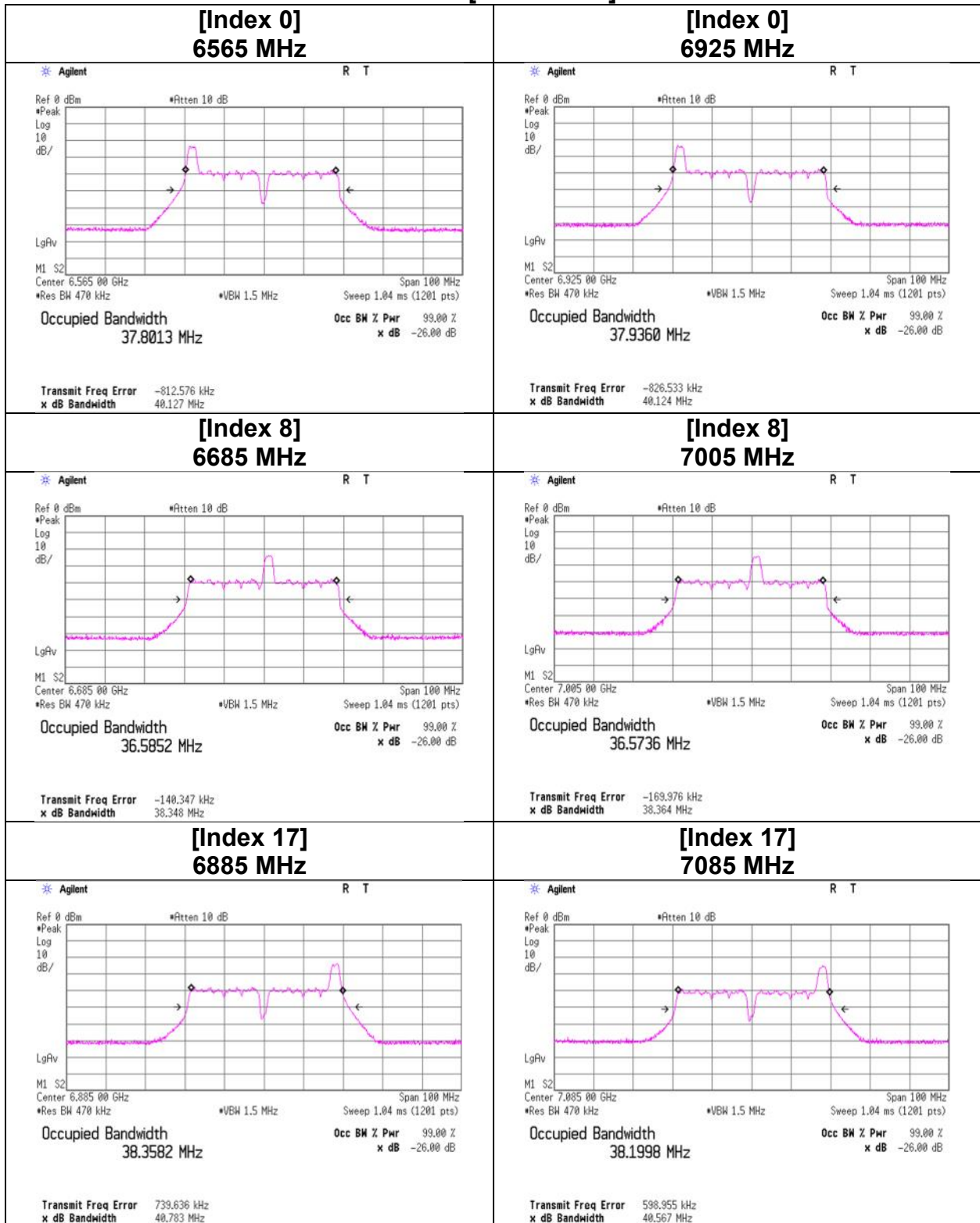
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [26-tone RU]



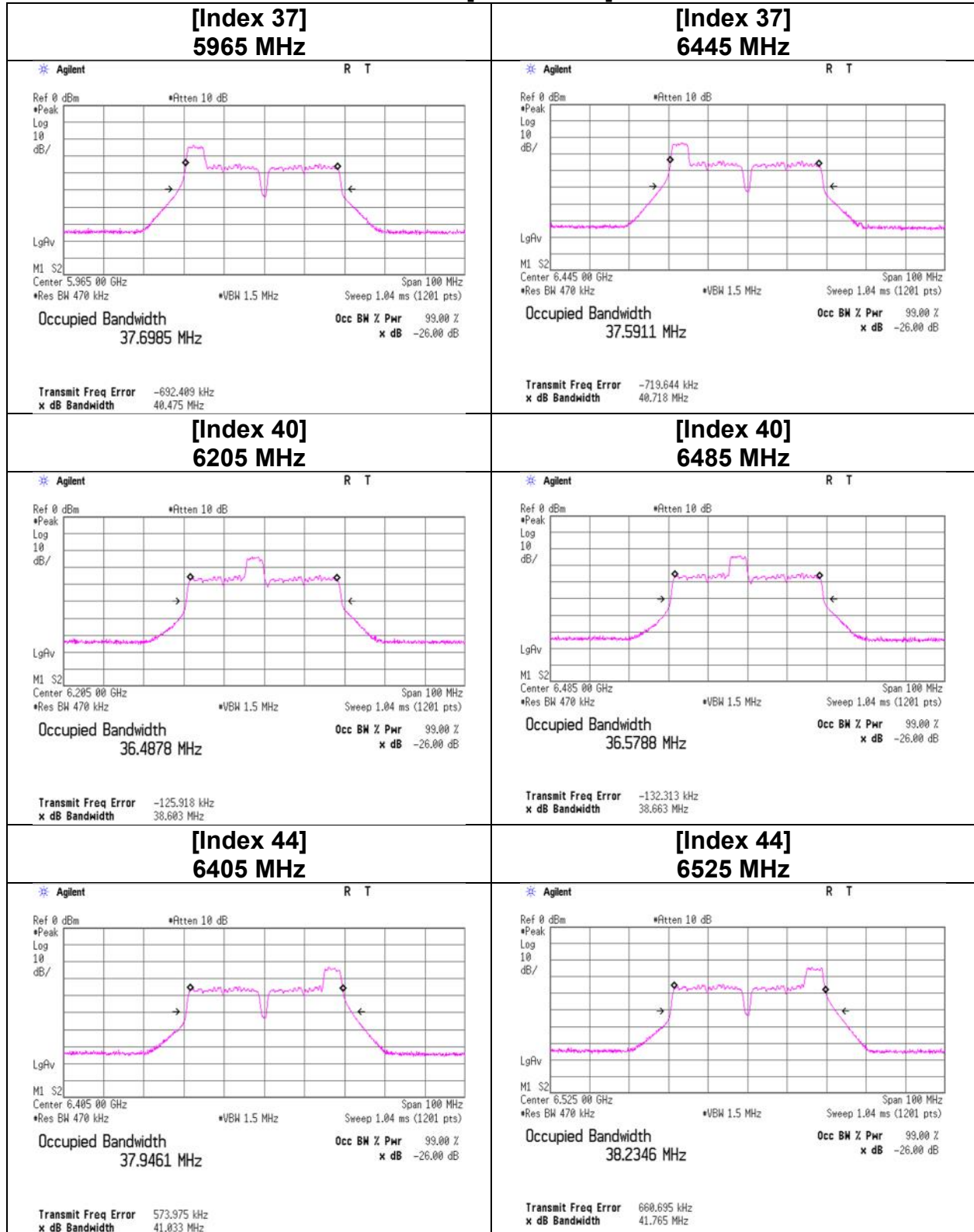
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [26-tone RU]

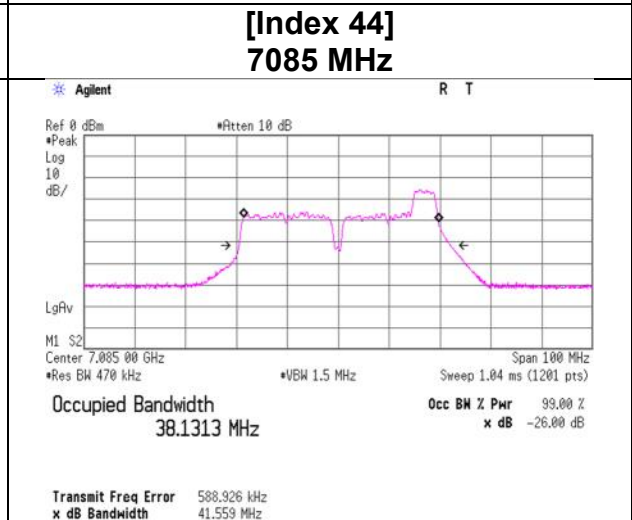
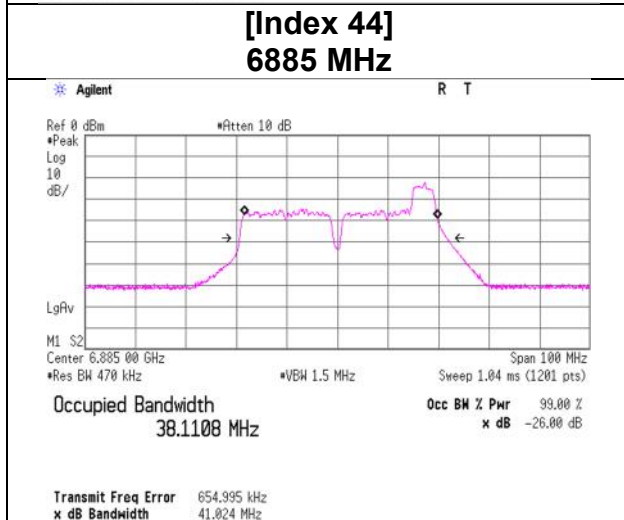
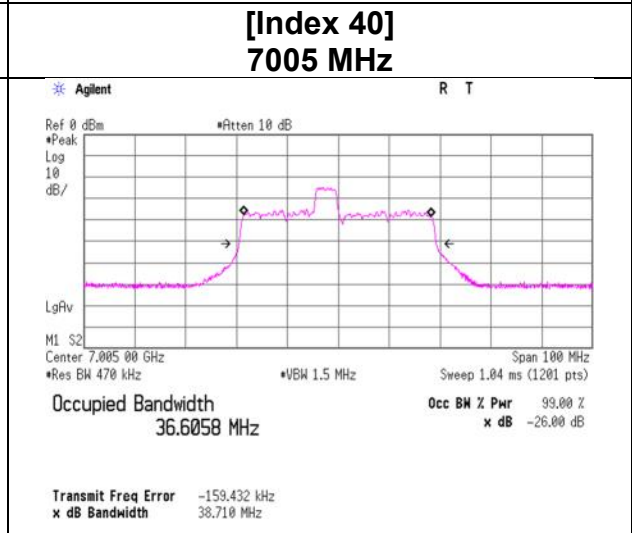
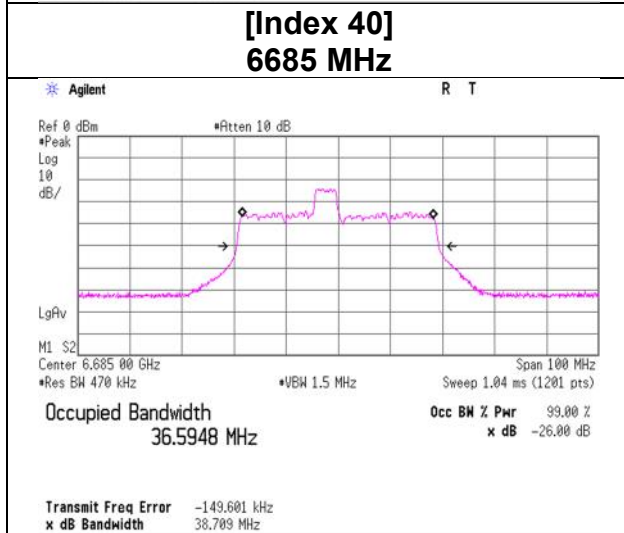
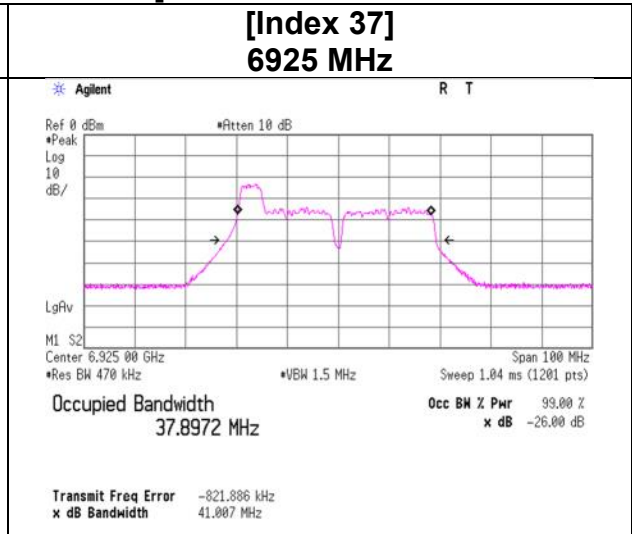
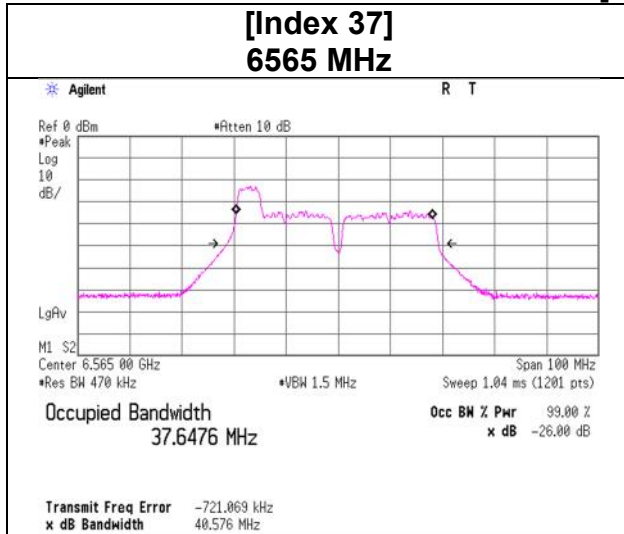


26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [52-tone RU]

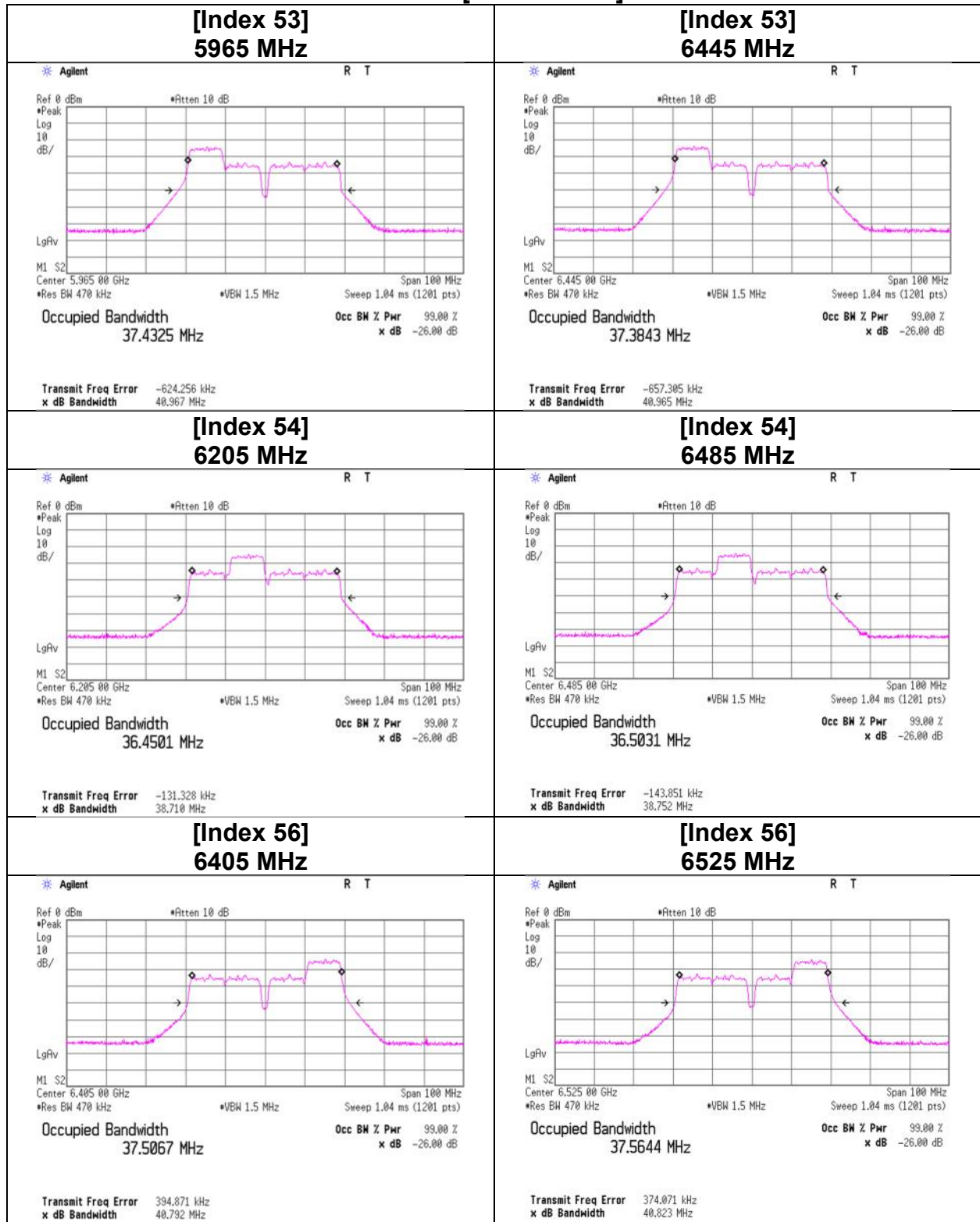


11ax-40 [52-tone RU]



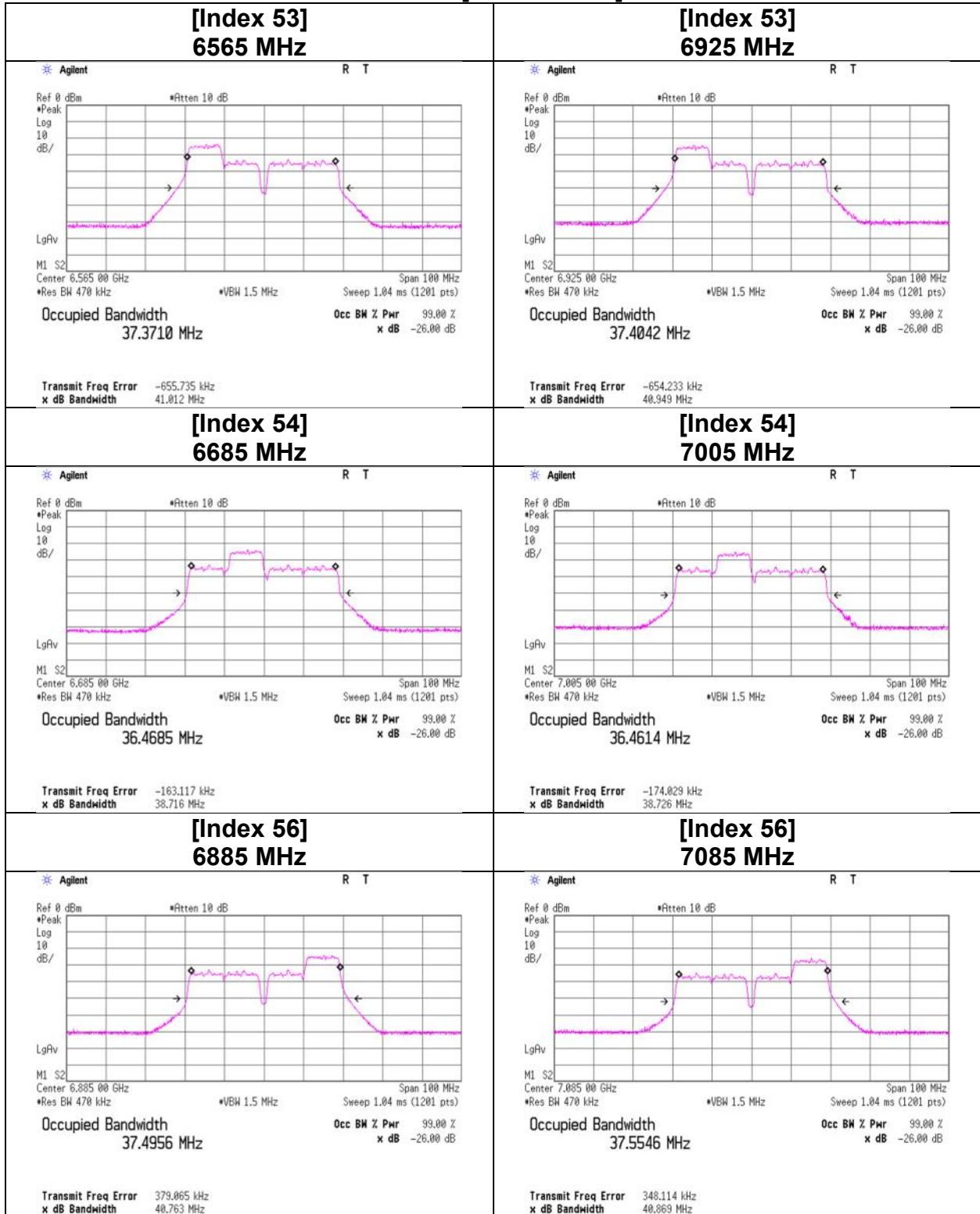
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [106-tone RU]



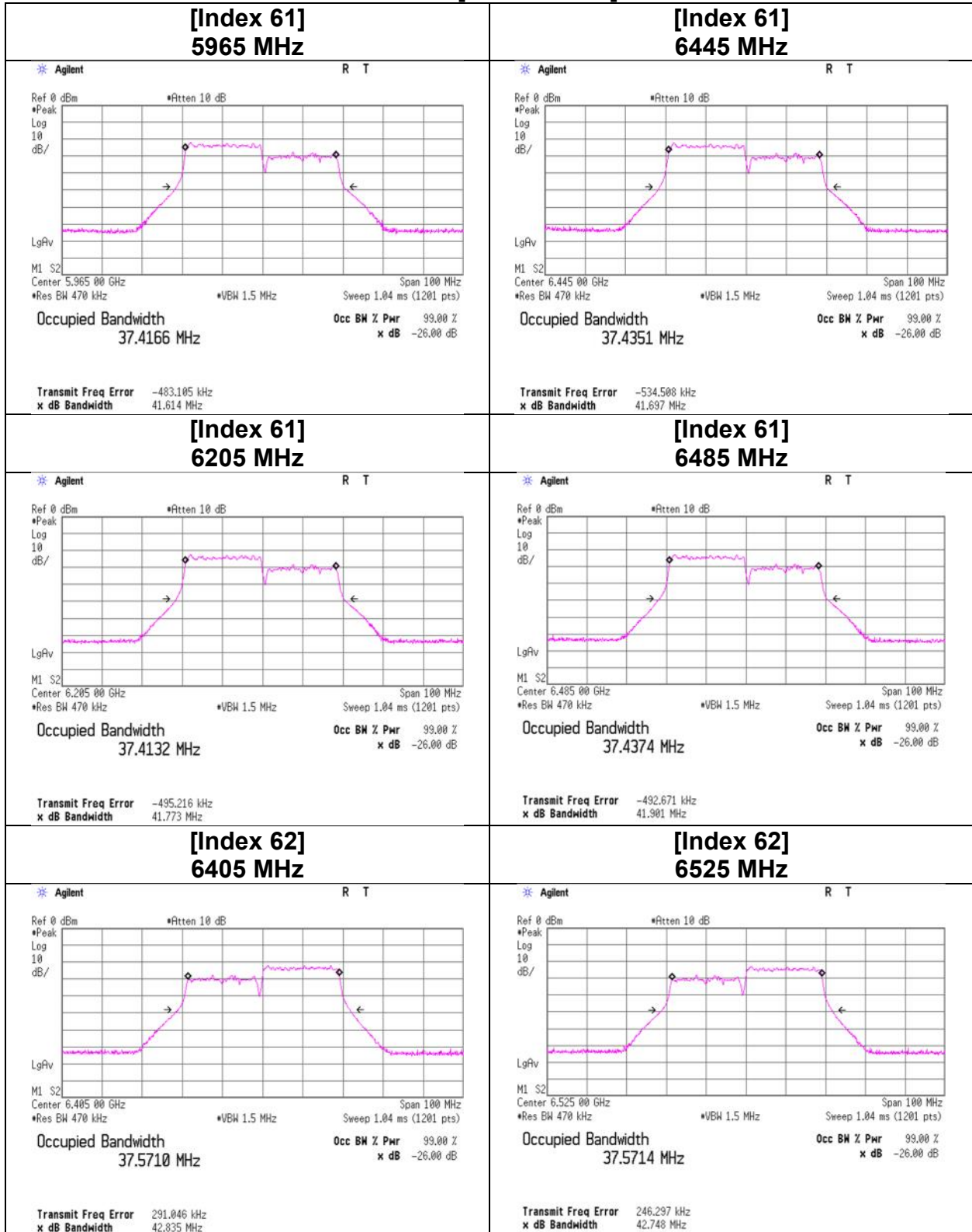
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [106-tone RU]



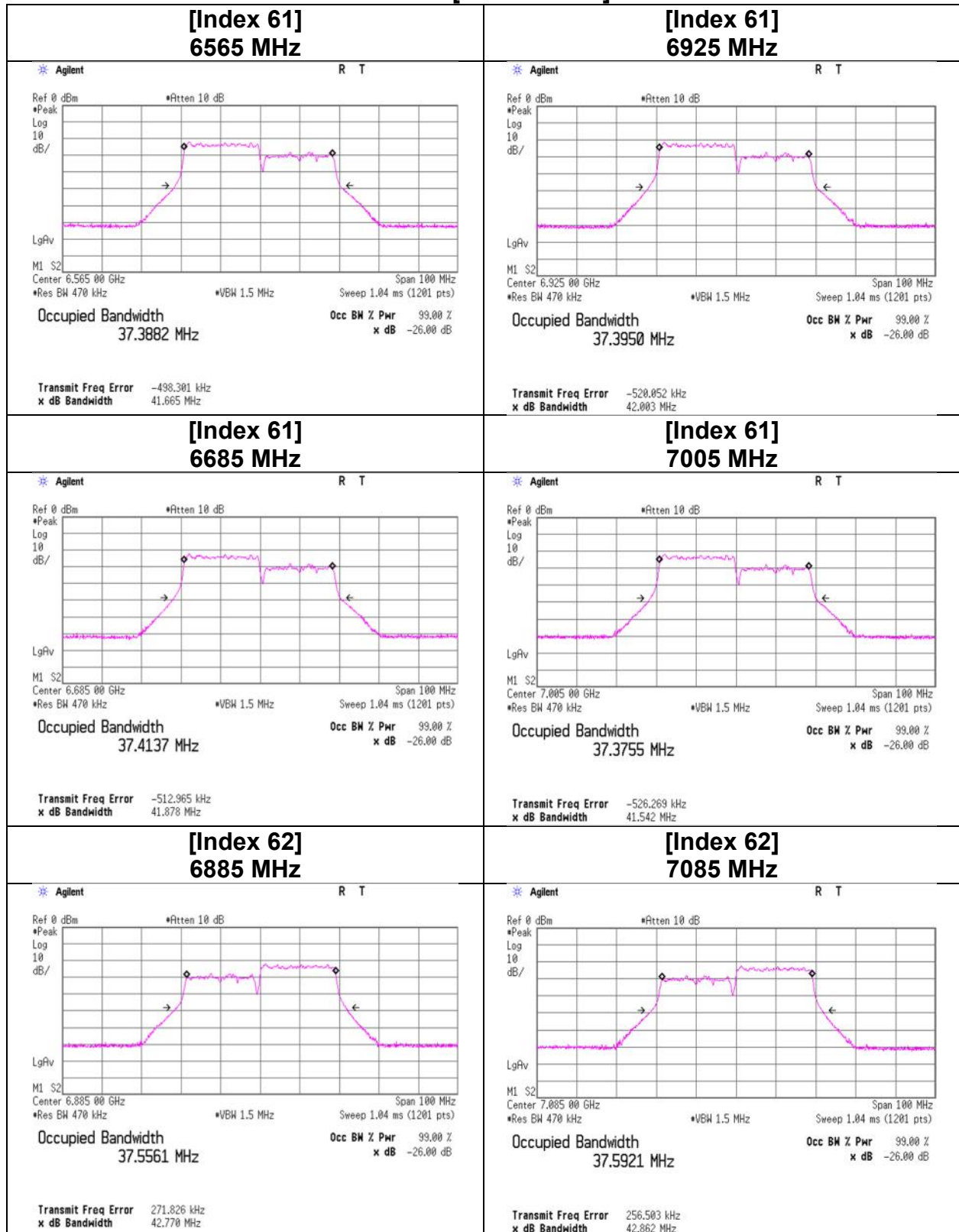
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [242-tone RU]



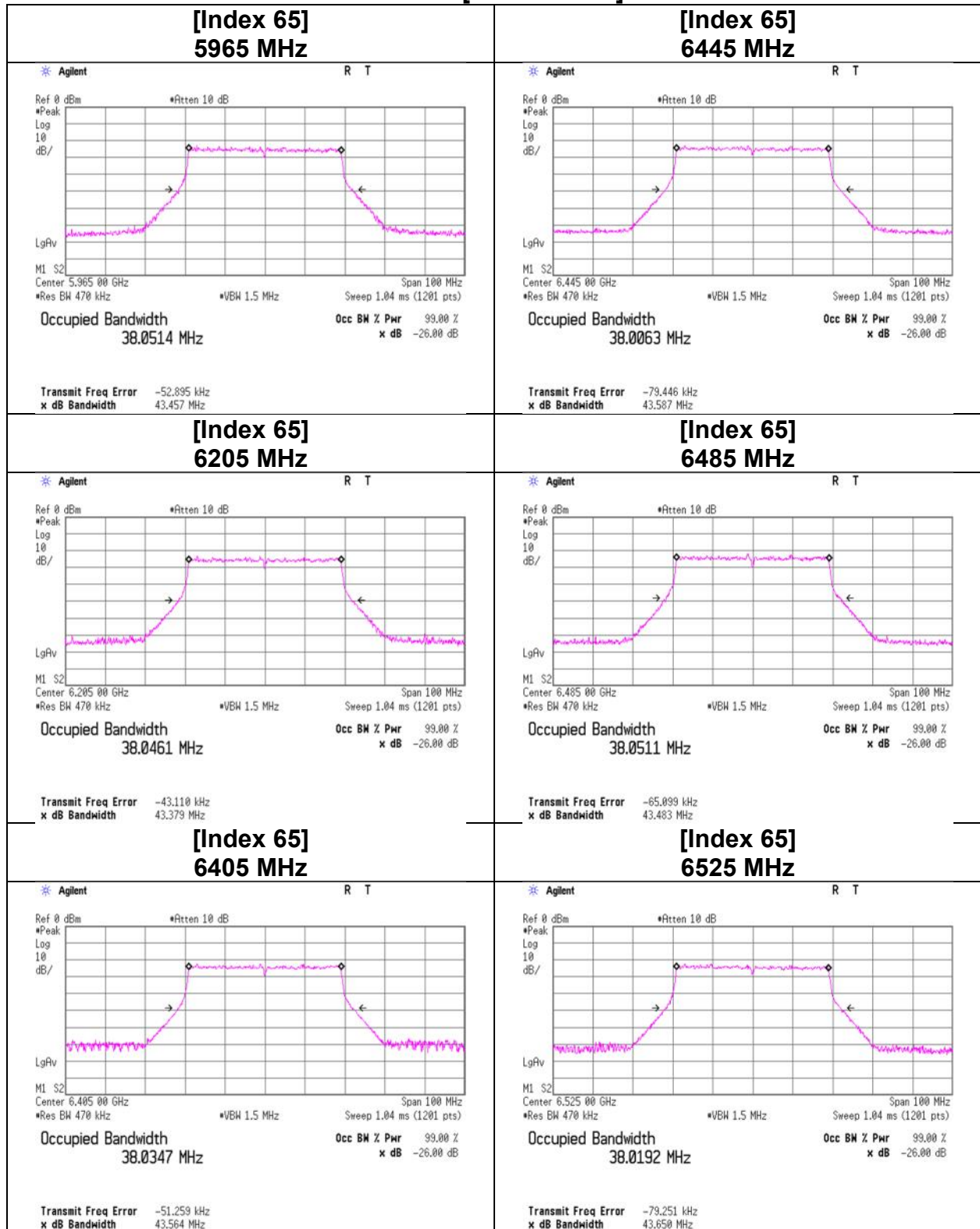
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [242-tone RU]



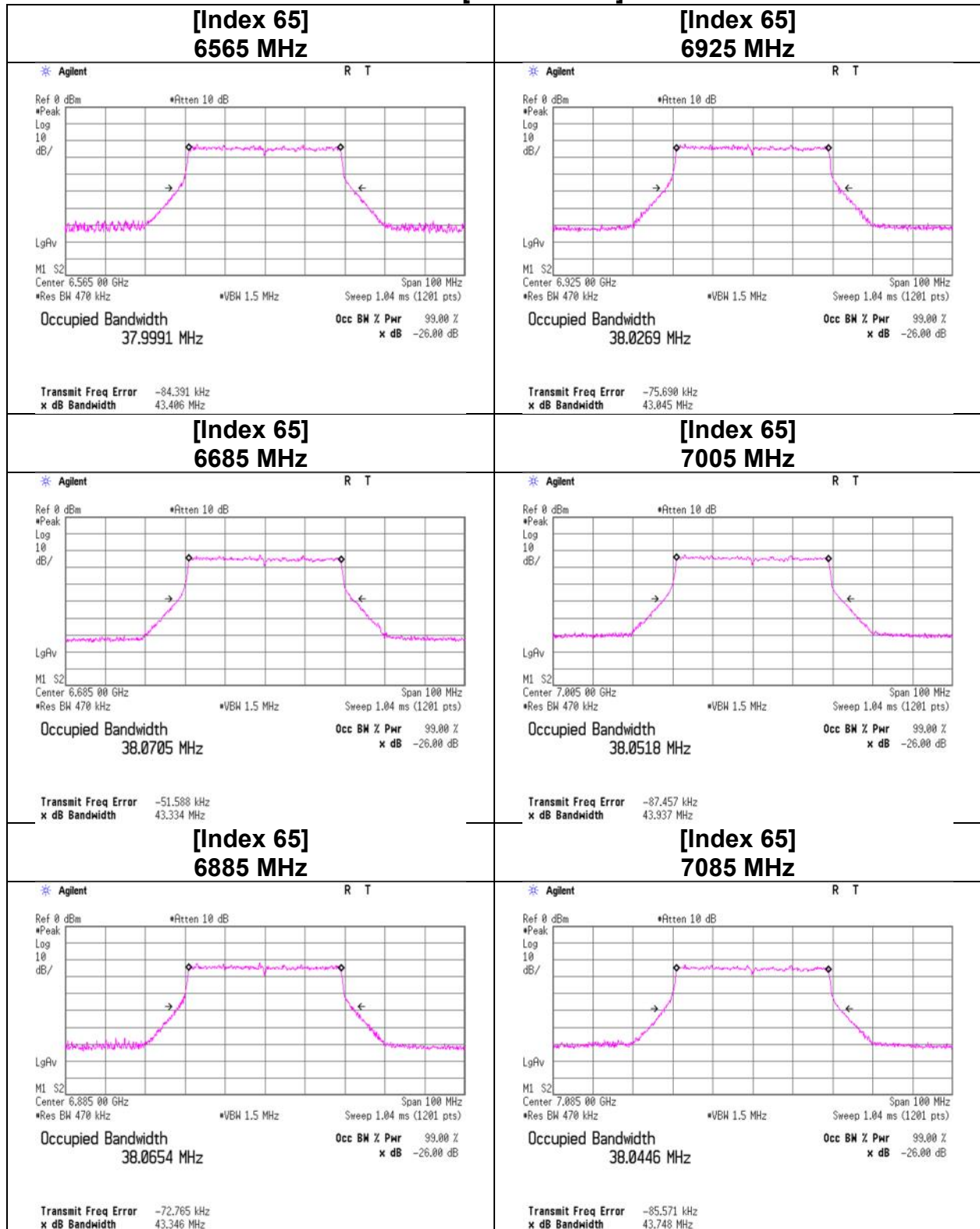
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [484-tone RU]



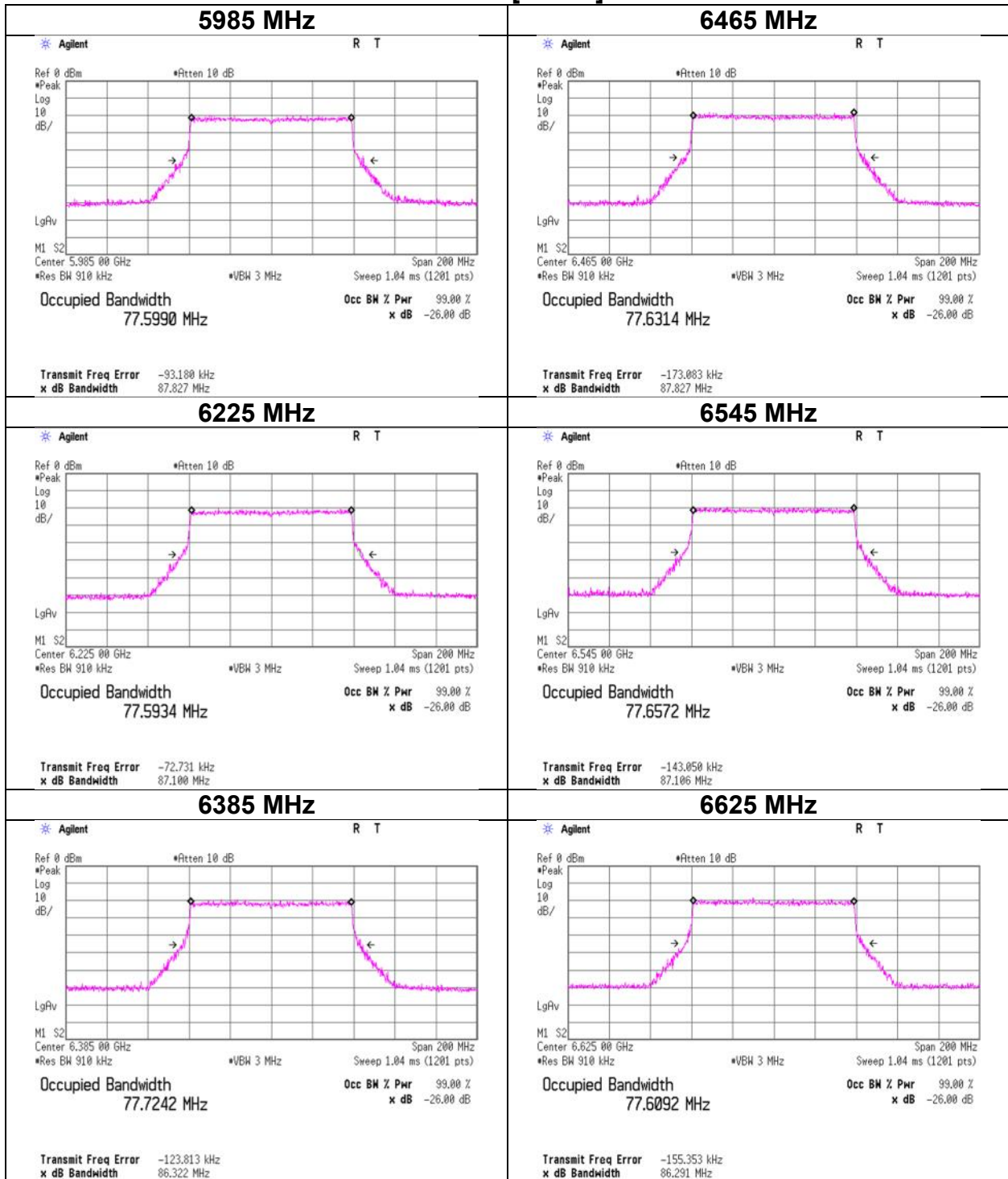
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-40 [484-tone RU]



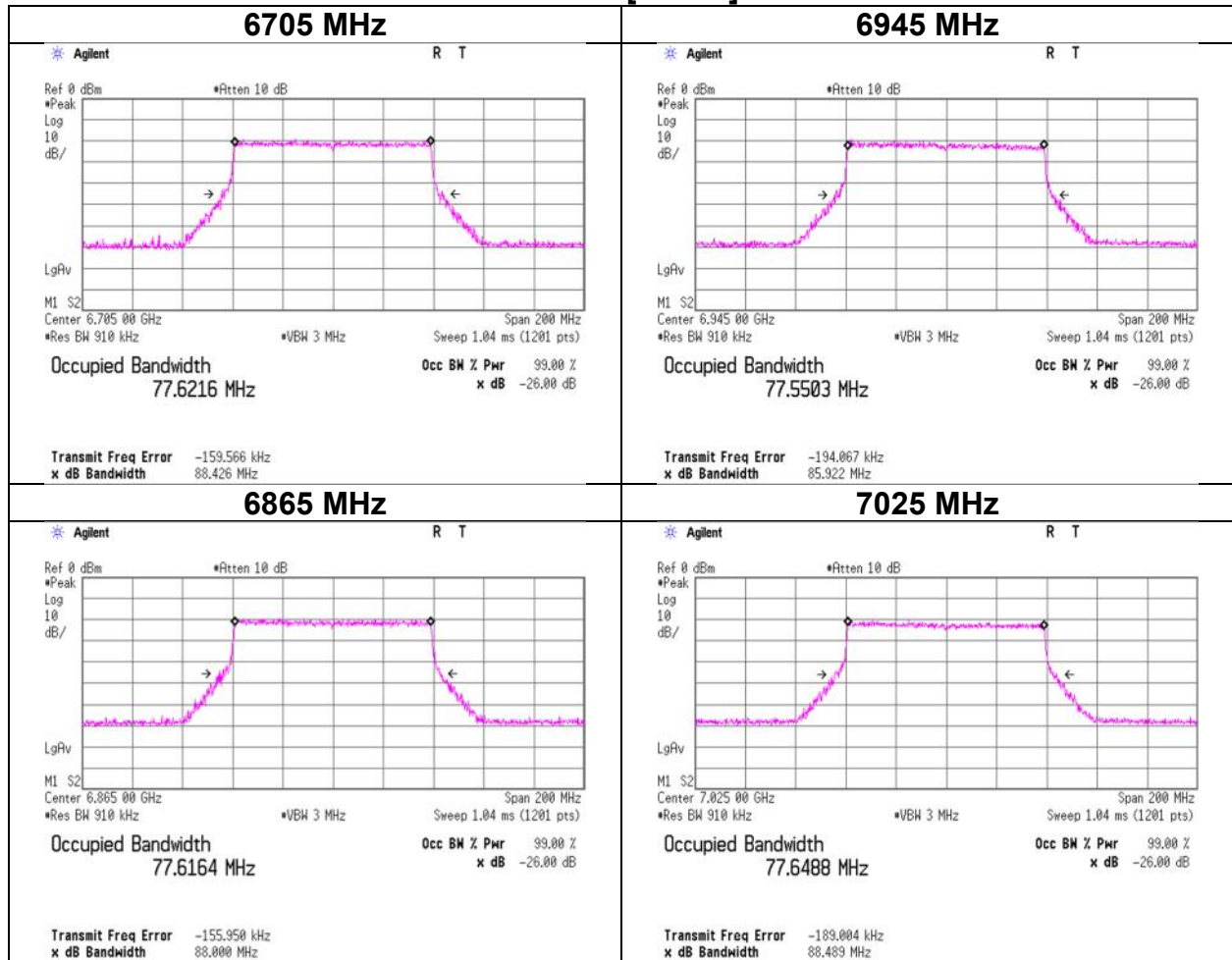
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-80 [OFDM]



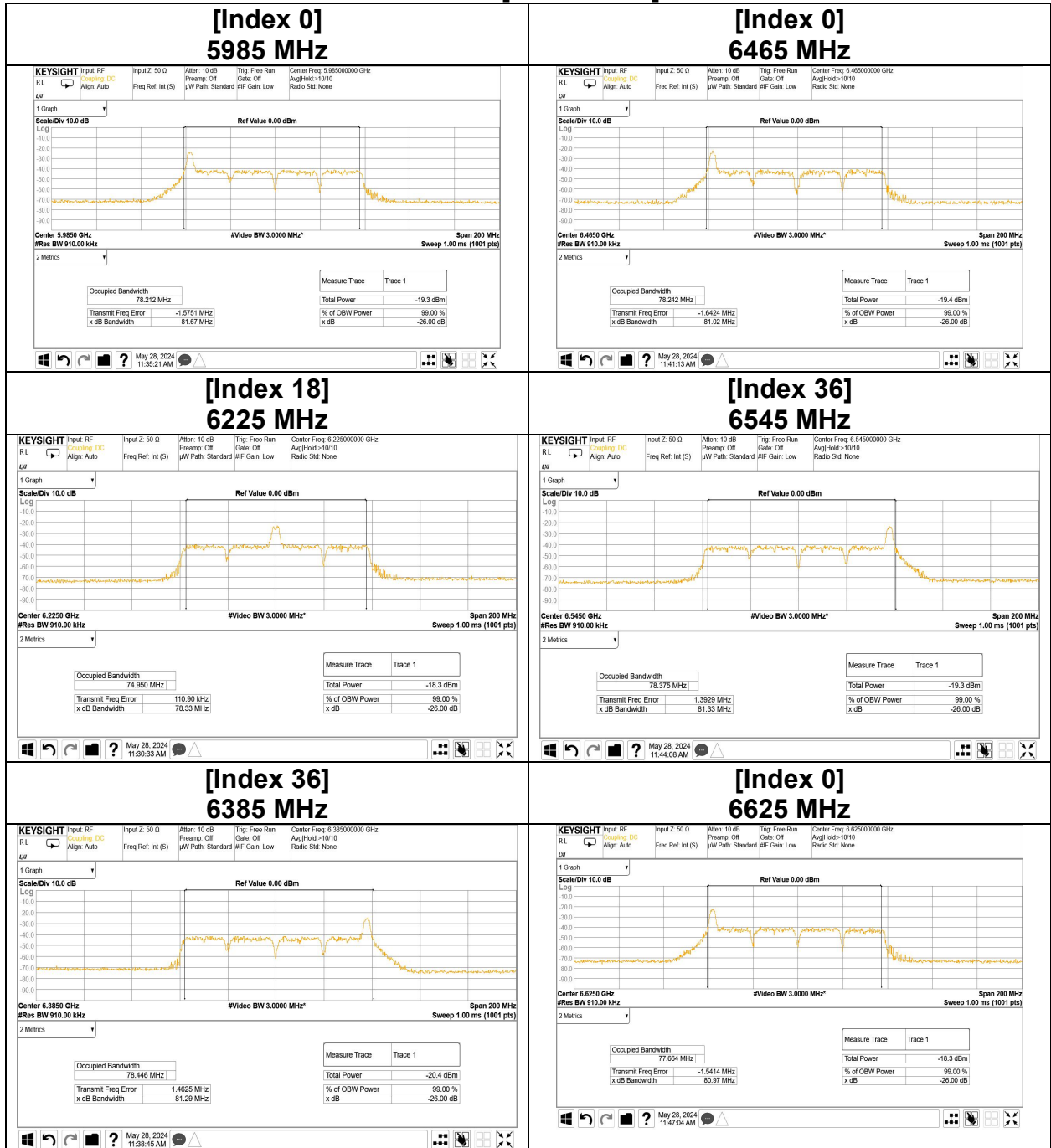
26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-80 [OFDM]



26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-80 [26-tone RU]



26 dB Emission Bandwidth and 99 % Occupied Bandwidth

11ax-80 [26-tone RU]

