



RADIO TEST REPORT

Test Report No.: 14524536H-B-R1

Customer	Murata Manufacturing Co., Ltd.
Description of EUT	Communication Module
Model Number of EUT	Type1VY-934
FCC ID	VPYLB1VY934
Test Regulation	FCC Part 15 Subpart E
Test Result	Complied (Refer to SECTION 3)
Issue Date	February 9, 2023
Remarks	WLAN (5 GHz band) part Except for DFS test

Representative Test Engineer

Tetsuro Yoshida
Engineer

Approved By

Takumi Shimada
Engineer



CERTIFICATE 5107.02

- ☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan, Inc.
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- The information provided from the customer for this report is identified in Section 1.
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REVISION HISTORY

Original Test Report No.: 14524536H-B

This report is a revised version of 14524536H-B. 14524536H-B is replaced with this report.

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	14524536H-B	November 30, 2022	-
1	14524536H-B-R1	February 9, 2023	2.1: Identification of EUT Correction of Test Date October 13 to November 18, 2022 →October 13, 2022 to February 8, 2023
1	14524536H-B-R1	February 9, 2023	Section 2.2: Radio Specification for WLAN (IEEE802.11b/11g/11n-20) and Bluetooth (Low Energy) -Correction of item name Antenna Gain→Antenna Type
1	14524536H-B-R1	February 9, 2023	Section 2.2: Radio Specification for Bluetooth (Low Energy) -Deletion of information for PCB Antenna
1	14524536H-B-R1	February 9, 2023	Section 4.1: Operating Mode(s) -Addition of power setting for Maximum Conducted Output Power test and Average Output Power test
1	14524536H-B-R1	February 9, 2023	Section 7: Antenna Terminal Conducted Tests Correction of font color of *1) 1. Correction of font color of *1) 2. Addition of 470 kHz for Maximum Power Spectral Density test 3. Changed the spacing between explanatory note *4)
1	14524536H-B-R1	February 9, 2023	APPENDIX 1: Test Data: Maximum Conducted Output Power for 11a -Correction of 26 dB EBW for 5720 MHz of Chain 0 + Chain 1 21.073 MHz→21.072 MHz
1	14524536H-B-R1	February 9, 2023	APPENDIX 1: Test Data: Maximum Conducted Output Power for 11ac-80 -Correction of 26 dB EBW for 5290 MHz of Chain 0 + Chain 1 37.748 MHz→87.089 MHz
1	14524536H-B-R1	February 9, 2023	APPENDIX 1: Test Data: Maximum Conducted Output Power test (P 51 to P 56) and Average Output Power test -Replacement test data
1	14524536H-B-R1	February 9, 2023	APPENDIX 2: Test Instruments -Replacement Test Instruments list for Antenna Terminal Conducted test

Reference: Abbreviations (Including words undescribed in this report)

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

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SECTION 1: Customer Information

Company Name	Murata Manufacturing Co., Ltd.
Address	1-10-1 Higashikotari, Nagaokakyo-shi, Kyoto 617-8555 Japan
Telephone Number	+81-75-955-6736
Contact Person	Motoo Hayashi

The information provided from the customer is as follows;

- Customer, Description of EUT, Model Number of EUT, FCC ID on the cover and other relevant pages
 - Operating/Test Mode(s) (Mode(s)) on all the relevant pages
 - SECTION 1: Customer Information
 - SECTION 2: Equipment Under Test (EUT) other than the Receipt Date and Test Date
 - SECTION 4: Operation of EUT during testing
- * The laboratory is exempted from liability of any test results affected from the above information in SECTION 2 and 4.

SECTION 2: Equipment Under Test (EUT)

2.1 Identification of EUT

Description	Communication Module
Model Number	Type1 VY-934
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	October 11, 2022
Test Date	October 13, 2022 to February 8, 2023

2.2 Product Description

General Specification

Rating	VDD_3P3, SWREG_IN, VDD_FEM: Typ.: DC 3.3 V, Min.: DC 3.135 V, Max: DC 3.465 V VDDIO_GPIO, VDDIO_AO: Typ.: DC 3.3 V, Min.: DC 3.14 V, Max: DC 3.46 V
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Radio Specification

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

Equipment Type	Transceiver
Frequency of Operation	2412 MHz to 2462 MHz
Type of Modulation	DSSS, OFDM
Antenna Type	Pattern Antenna: Chain 0 PCB Antenna: Chain 1
Antenna Gain	Pattern Antenna: 2.0 dBi PCB Antenna: 2.0 dBi to 1.4 dBi [RF Cable length: 30 mm to 315 mm]

Bluetooth (Low Energy)

Equipment Type	Transceiver
Frequency of Operation	2402 MHz to 2480 MHz
Type of Modulation	BT LE: GFSK
Antenna Type	Pattern Antenna: Chain 0
Antenna Gain	Pattern Antenna: 2.0 dBi

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

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
	40 MHz Band:	5190 MHz to 5230 MHz 5270 MHz to 5310 MHz 5510 MHz to 5710 MHz 5755 MHz to 5795 MHz
	80 MHz Band:	5210 MHz 5290 MHz 5530 MHz to 5690 MHz 5775 MHz
Type of Modulation	OFDM	
Antenna Type	Pattern Antenna: Chain 0 PCB Antenna: Chain 1	
Antenna Gain	Pattern Antenna: 1.9 dBi PCB Antenna: 1.3 dBi to -1.3 dBi [RF Cable length: 30 mm to 315 mm]	

SECTION 3: Test specification, Procedures & Results

3.1 Test Specification

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

3.2 Procedures and Results

Item	Test Procedure	Specification	Worst Margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013 ISED: RSS-Gen 8.8	FCC: 15.407 (b) (6) / 15.207 ISED: RSS-Gen 8.8	18.25 dB, 9.54400 MHz, N, AV	Complied a)	-
26 dB Emission Bandwidth	FCC: KDB Publication Number 789033 ISED: -	FCC: 15.407 (a) (1) (2) (3) ISED: -	See data	N/A b)	Conducted
Maximum Conducted Output Power	FCC: KDB Publication Number 789033 ISED: -	FCC: 15.407 (a) (1) (2) (3) ISED: RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1		Complied c)	Conducted
Maximum Power Spectral Density	FCC: KDB Publication Number 789033 ISED: -	FCC : 15.407 (a) (1) (2) (3) ISED: RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1		N/A d)	Conducted
Spurious Emission Restricted Band Edge	FCC: ANSI C63.10-2013 KDB Publication Number 789033 ISED: -	FCC: 15.407 (b), 15.205 and 15.209 ISED: RSS-247 6.2.1.2 6.2.2.2 6.2.3.2 6.2.4.2	4.8 dB 5150.0 MHz, PK, Vert.	Complied e) / f)	Conducted (< 30 MHz) / Radiated (> 30 MHz) *1)
6 dB Emission Bandwidth	FCC: ANSI C63.10-2013 ISED: -	FCC: 15.407 (e) ISED: RSS-247 6.2.4.1	See data	Complied g)	Conducted

Note: UL Japan, Inc.'s EMI Work Procedures: Work Instructions-ULID-003591 and Work Instructions-ULID-003593.

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

*1) Radiated test was selected over 30 MHz based on FCC 15.407 (b) and KDB 789033 D02 G.3.b).

- a) Refer to APPENDIX 1 (data of Conducted Emission)
- b) Refer to APPENDIX 1 (data of 26 dB Emission Bandwidth and 99 % Occupied Bandwidth)
- c) Refer to APPENDIX 1 (data of Maximum Conducted Output Power)
- d) Refer to APPENDIX 1 (data of Maximum Power Spectral Density)
- e) Refer to APPENDIX 1 (data of Radiated Spurious Emission)
- f) Refer to APPENDIX 1 (data of Conducted Spurious Emission)
- g) Refer to APPENDIX 1 (data of 6 dB Bandwidth)

FCC Part 15.31 (e)

The EUT has the power supply regulator.

However one of the input voltages to RF part doesn't go through the regulator. The stable voltage will be supplied by the end product, which will be required to have a power supply regulator.

Therefore, the EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

Chain 0: Pattern Antenna

The antenna is not removable from the EUT.

Therefore, the equipment complies with the antenna requirement of Section 15.203.

Chain 1: PCB Antenna

The EUT has a unique coupling/antenna connector (U.FL).

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	- a)	Conducted
a) Refer to APPENDIX 1 (data of 26 dB Emission Bandwidth and 99 % Occupied Bandwidth)					

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

3.4 Uncertainty

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 $k=2$.

Conducted emission

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

Radiated emission

Measurement distance	Frequency range	Uncertainty (+/-)
3 m	9 kHz to 30 MHz	3.2 dB
10 m		3.0 dB
3 m	30 MHz to 200 MHz	(Horizontal) 4.8 dB
		(Vertical) 5.0 dB
	200 MHz to 1000 MHz	(Horizontal) 5.1 dB
		(Vertical) 6.2 dB
10 m	30 MHz to 200 MHz	(Horizontal) 4.8 dB
		(Vertical) 4.8 dB
	200 MHz to 1000 MHz	(Horizontal) 5.0 dB
		(Vertical) 5.0 dB
3 m	1 GHz to 6 GHz	4.9 dB
	6 GHz to 18 GHz	5.2 dB
1 m	10 GHz to 26.5 GHz	5.4 dB
	26.5 GHz to 40 GHz	5.4 dB
0.5 m	26.5 GHz to 40 GHz	5.4 dB
10 m	1 GHz to 18 GHz	5.4 dB

Antenna Terminal test

Test Item	Uncertainty (+/-)
26 dB Emission Bandwidth / 6 dB Emission Bandwidth / 99 % Occupied Bandwidth	0.96 %
Maximum Conducted Output Power / Average Output Power	1.5 dB
Burst Rate	0.10 %
Maximum Power Spectral Density	2.7 dB
Conducted Spurious Emission	2.7 dB

3.5 Test Location

UL Japan, Inc. Ise EMC Lab.

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

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

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

Telephone: +81-596-24-8999

Test site	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.5 measurement room	6.4 x 6.4 x 3.0	6.4 x 6.4	-	-
No.6 shielded room	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	3.1 x 5.0 x 2.7	3.1 x 5.0	-	-
No.9 measurement room	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.10 shielded room	3.8 x 2.8 x 2.8	3.8 x 2.8	-	-
No.11 measurement room	4.0 x 3.4 x 2.5	N/A	-	-
No.12 measurement room	2.6 x 3.4 x 2.5	N/A	-	-
Large Chamber	16.9 x 22.1 x 10.17	16.9 x 22.1	-	10 m
Small Chamber	5.3 x 6.69 x 3.59	5.3 x 6.69	-	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 3.0 m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test Data, Test Instruments, and Test Set Up

Refer to APPENDIX.

SECTION 4: Operation of EUT during testing

4.1 Operating Mode(s)

Test operating mode was determined as follows according to “Section 1 of 6 802.11 a/b/g/n testing - Managing Complex Regulatory Approvals -” of TCB Council Workshop October 2009.

Mode	Remarks*
IEEE 802.11a CDD (11a)	54 Mbps, PN9
IEEE 802.11n MIMO 20 MHz BW (11n-20)	MCS 14 (Long GI), PN9
IEEE 802.11n MIMO 20 MHz BW (11ac-20)	MCS 15 (Long GI), PN9
IEEE 802.11n MIMO 40 MHz BW (11n-40)	MCS 11 (Long GI), PN9
IEEE 802.11n MIMO 40 MHz BW (11ac-40)	MCS 16 (Long GI), PN9
IEEE 802.11n MIMO 80 MHz BW (11ac-80)	MCS 16 (Long GI), PN9
*The worst condition was determined based on the test result of Maximum Conducted Output Power.	
*Power of the EUT was set by the software as follows;	
Power Setting:	<u>[All tests for except for Maximum Conducted Output Power test and Average Output Power test]</u> 11a: 10.5 dBm 11n-20: 10 dBm 11ac-20:10 dBm 11n-40: 10 dBm 11ac-40: 10 dBm 11ac-80: 10 dBm <u>[Maximum Conducted Output Power test and Average Output Power test]</u> 11a: 10 dBm 11n-20: 9.5 dBm 11ac-20:9.5 dBm 11n-40: 9.5 dBm 11ac-40: 9.5 dBm 11ac-80: 9.5 dBm
Software:	QRCT Ver. 3.0.276.0 (Date: October 11, 2022, Storage location: Driven by connected PC)
*This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.	

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

Test Item	Operating Mode	Tested Antenna	Tested Frequency			
			Lower Band	Middle Band	Additional Band	Upper Band
Conducted emission	Tx 11ac-40 (MIMO) *1)	Chain 0 + Chain 1	-		-	5795 MHz
26 dB Emission Bandwidth	Tx 11a (CDD) Tx 11n-20 (MIMO) Tx 11ac-20 (MIMO)	Chain 1 *2)	-	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz 5720 MHz	-
	Tx 11n-40 (MIMO) Tx 11ac-40 (MIMO)		-	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	-
	Tx 11ac-80 (MIMO)		-	5290 MHz	5530 MHz 5610 MHz 5690 MHz	-
99 % Occupied Bandwidth	Tx 11a (CDD) Tx 11n-20 (MIMO) Tx 11ac-20 (MIMO)	Chain 1 *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 (MIMO) Tx 11ac-40 (MIMO)		5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	5755 MHz 5795 MHz
	Tx 11ac-80 (MIMO)		5210 MHz	5290 MHz	5530 MHz 5610 MHz 5690 MHz	5775 MHz

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

Test Item	Operating Mode	Tested Antenna	Tested Frequency			
			Lower Band	Middle Band	Additional Band	Upper Band
6 dB Bandwidth	Tx 11a (CDD) Tx 11n-20 (MIMO) Tx 11ac-20 (MIMO)	Chain 1 *2)	-	-	-	5745 MHz 5785 MHz 5825 MHz
	Tx 11n-40 (MIMO) Tx 11ac-40 (MIMO)	Chain 1 *2)	-	-	-	5755 MHz 5795 MHz
	Tx 11ac-80 (MIMO)	Chain 1 *2)	-	-	-	5775 MHz
Maximum Conducted Output Power, Maximum Power Spectral Density	Tx 11a (CDD) Tx 11n-20 (MIMO) Tx 11ac-20 (MIMO)	Chain 0 Chain 1 Chain 0 + Chain 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 (MIMO) Tx 11ac-40 (MIMO)	Chain 0 Chain 1 Chain 0 + Chain 1	5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	5755 MHz 5795 MHz
	Tx 11ac-80 (MIMO)	Chain 0 Chain 1 Chain 0 + Chain 1	5210 MHz	5290 MHz	5530 MHz 5610 MHz 5690 MHz	5775 MHz
Radiated Spurious Emission (Below 1 GHz)	Tx 11ac-40 (MIMO)*1)	Chain 0 + Chain 1	-	-	-	5795 MHz
Radiated Spurious Emission (Above 1 GHz)	Tx 11ac-20 (MIMO) *3)	Chain 0 + Chain 1	5180 MHz	5260 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	Tx 11ac-40 (MIMO) *3), *4)	Chain 0 + Chain 1	5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz	5755 MHz 5795 MHz
	Tx 11ac-80 (MIMO)	Chain 0 + Chain 1	5210 MHz	5290 MHz	5530 MHz 5610 MHz	5775 MHz
Conducted Spurious Emission	Tx 11ac-40 (MIMO)*1)	Chain 1 *2)	-	-	-	5795 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) Since each of 20 MHz BW (11a / 11n-20 / 11ac-20) and 40 MHz BW (11n-40 / 11ac-40) have the same modulation method and no differences in transmitting specification, the test was performed on the representative mode that had the highest output power.
 *4) After the comparison between MIMO and CDD, test was performed with the representative mode that had worst case.

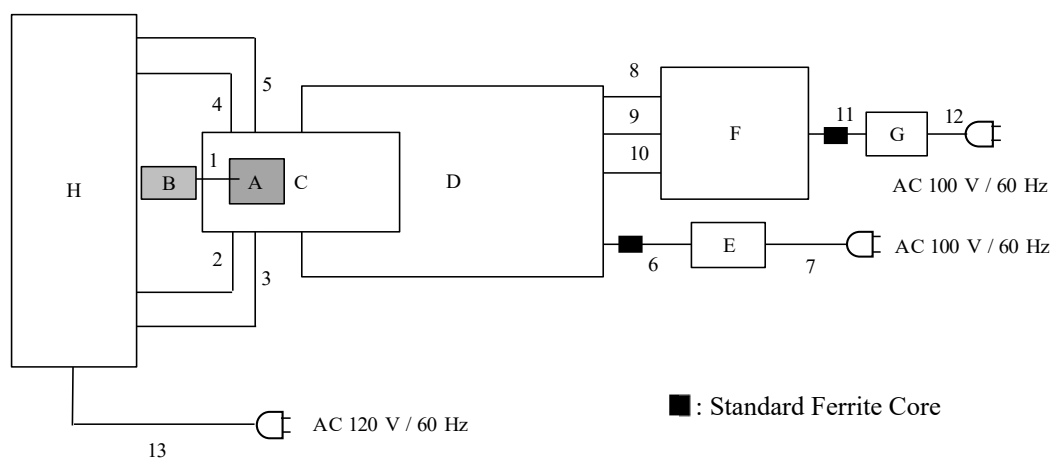
Simultaneous transmission (simultaneously transmits BT and WLAN 5 GHz band on a single antenna.)

Test Item	Mode *1)	Tested Antenna
Radiated Spurious Emission	Tx 11ac-80 5210 MHz + BT LE 1M-PHY 2480 MHz	Chain 0 + Chain 1

*1) The test was conducted on representative mode, the worst mode at Spurious emission test for BT and the mode had the highest power at Antenna terminal conducted test for WLAN 5 GHz band.

4.2 Configuration and Peripherals

<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	Type1VY-934	No.2 *1) No.3 *2)	Murata Manufacturing Co., Ltd.	EUT
B	PCB Antenna	1VY DC1231	No.2 *1) No.3 *2)	Murata Manufacturing Co., Ltd.	EUT
C	Jig board	P2ML10415	No.2 *1) No.3 *2)	Murata Manufacturing Co., Ltd.	-
D	Jig board	TDA6305	TR17472217	-	-
E	AC adapter	EA108683N-120	400-76062	EDACPOWER ELEC,	-
F	Laptop PC	CF-LX4EDHCS	5GKSA17377	Panasonic	-
G	AC adapter	CF-AA62J2C	64B2CM114703755B	Panasonic	-
H	DC Power Supply	PMC35-2A	2871	KIKUSUI	-

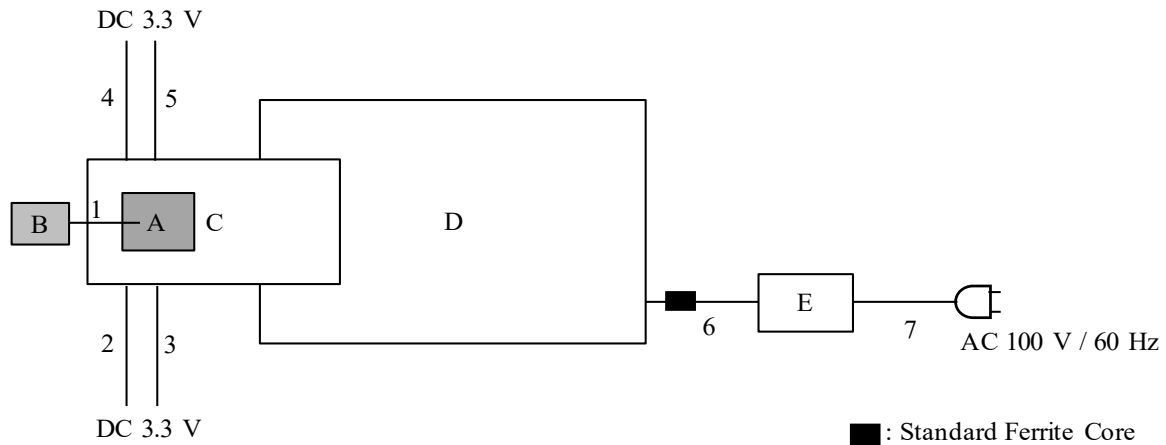
*1) Antenna cable length: 30 mm

*2) Antenna cable length: 315 mm

List of Cables Used

No.	Name	Length (m)	Shield Cable	Connector	Remarks
1	Antenna Cable	0.03 0.315	Unshielded	Unshielded	-
2	DC Cable	0.8	Unshielded	Unshielded	-
3	DC Cable	0.8	Unshielded	Unshielded	-
4	DC Cable	0.8	Unshielded	Unshielded	-
5	DC Cable	0.8	Unshielded	Unshielded	-
6	DC Cable	1.0	Unshielded	Unshielded	-
7	AC Cable	1.0	Unshielded	Unshielded	-
8	LAN Cable	2.0	Unshielded	Unshielded	-
9	USB Cable	1.0	Shielded	Shielded	-
10	USB Cable	2.0	Shielded	Shielded	-
11	DC Cable	1.0	Unshielded	Unshielded	-
12	AC Cable	1.0	Unshielded	Unshielded	-
13	AC Cable	1.8	Unshielded	Unshielded	-

<Radiated Emission test>



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

Description of EUT and Support Equipment

No.	Item	Model number	Serial Number	Manufacturer	Remarks
A	Communication Module	Type1VY-934	No.2 *1) No.3 *2)	Murata Manufacturing Co., Ltd.	EUT
B	PCB Antenna	1VY DC1231	No.2 *1) No.3 *2)	Murata Manufacturing Co., Ltd.	EUT
C	Jig board	P2ML10415	No.2 *1) No.3 *2)	Murata Manufacturing Co., Ltd.	-
D	Jig board	TDA6305	TR17472217	-	-
E	AC adapter	EA108683N-120	400-76062	EDACPOWER ELEC,	-

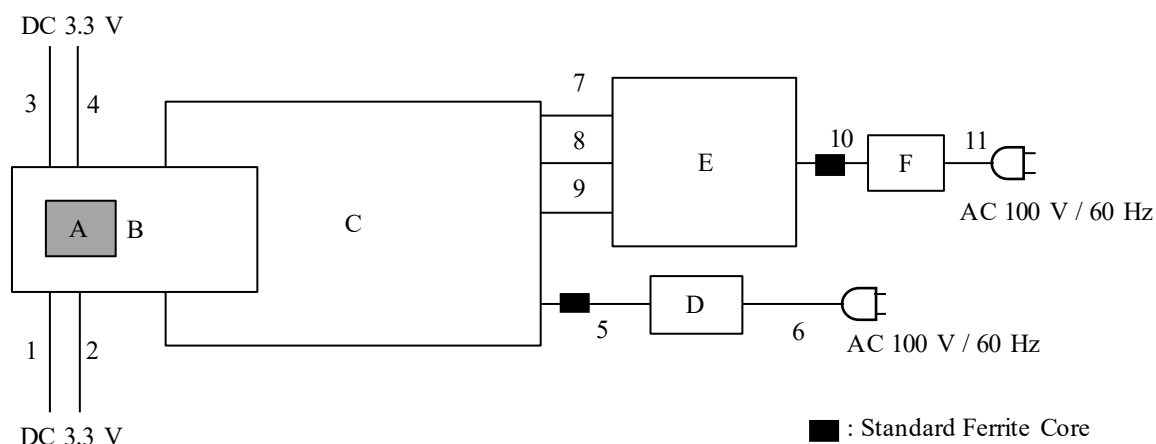
*1) Antenna cable length: 30 mm

*2) Antenna cable length: 315 mm

List of Cables Used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Antenna Cable	0.03 0.315	Unshielded	Unshielded	-
2	DC Cable	0.8	Unshielded	Unshielded	-
3	DC Cable	0.8	Unshielded	Unshielded	-
4	DC Cable	0.8	Unshielded	Unshielded	-
5	DC Cable	0.8	Unshielded	Unshielded	-
6	DC Cable	1.0	Unshielded	Unshielded	-
7	AC Cable	1.0	Unshielded	Unshielded	-

<Antenna Terminal Conducted 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	Type1VY-934	No.1	Murata Manufacturing Co., Ltd.	EUT
B	Jig board	P2ML10415	No.1	Murata Manufacturing Co., Ltd.	-
C	Jig board	TDA6305	TR17472217	-	-
D	AC adapter	EA108683N-120	400-76062	EDACPOWER ELEC,	-
E	Laptop PC	CF-LX4EDHCS	5GKSA17377	Panasonic	-
F	AC adapter	CF-AA62J2C	64B2CM114703755B	Panasonic	-

List of Cables Used

List of Cables Used					
No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	0.8	Unshielded	Unshielded	-
2	DC Cable	0.8	Unshielded	Unshielded	-
3	DC Cable	0.8	Unshielded	Unshielded	-
4	DC Cable	0.8	Unshielded	Unshielded	-
5	DC Cable	1.0	Unshielded	Unshielded	-
6	AC Cable	1.0	Unshielded	Unshielded	-
7	LAN Cable	2.0	Unshielded	Unshielded	-
8	USB Cable	1.0	Shielded	Shielded	-
9	USB Cable	2.0	Shielded	Shielded	-
10	DC Cable	1.0	Unshielded	Unshielded	-
11	AC Cable	1.0	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and Conditions

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

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

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

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

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

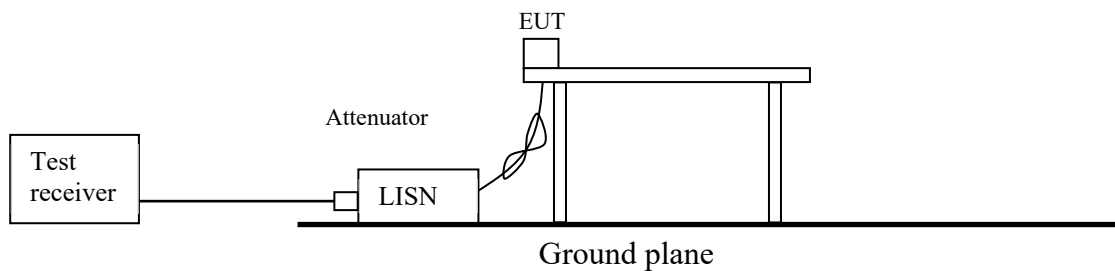
The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

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

Figure 1: Test Setup



SECTION 6: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

< Below 1GHz >

EUT was placed on a urethane platform of nominal size, 0.5 m by 1.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

< Above 1GHz >

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane.

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

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

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

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

< Below 1GHz >

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

< Above 1GHz >

Inside of restricted bands (Section 15.205):

Apply to limit in the Section 15.209 (a).

Outside of the restricted bands:

Apply to limit 68.2 dBuV/m, 3 m (-27 dBm e.i.r.p. *) in the Section 15.407 (b) (1) (2) (3).

For W58 Bandedge

-27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge in the section 15.407(b)(4)(i).

Restricted band edge:

Apply to limit in the Section 15.209 (a).

Since this limit is severer than the limit of the inside of restricted bands.

*Electric field strength to e.i.r.p. conversion:

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

Test Antennas are used as below;

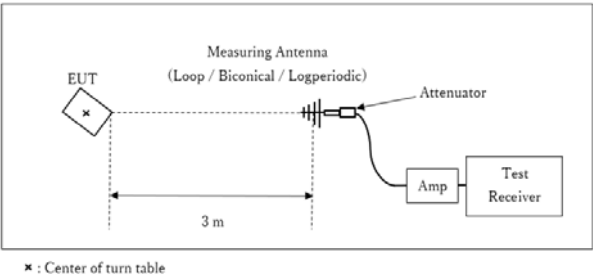
Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

Frequency	Below 1 GHz	Above 1 GHz	
Instrument Used	Test Receiver	Spectrum Analyzer	
Detector	QP	Peak	Average
IF Bandwidth	BW: 120 kHz	RBW: 1 MHz VBW: 3 MHz	Method VB *1) RBW: 1 MHz VBW: 1 / T (T: burst length, refer to Burst confirmation sheet) Detector: Peak Trace: Max Hold

*1) The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".

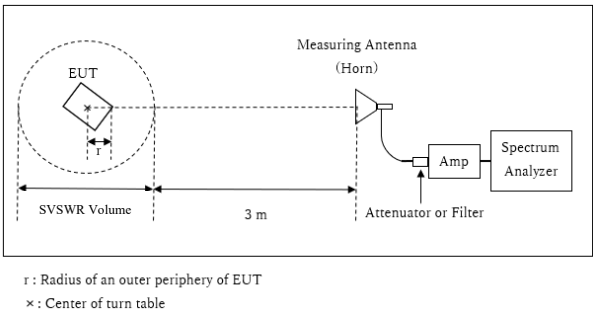
Figure 2: Test Setup

Below 1 GHz



Test Distance: 3 m

1 GHz to 10 GHz



No.2 semi anechoic chamber

Distance Factor: $20 \times \log (3.75 \text{ m} / 3.0 \text{ m}) = 1.94 \text{ dB}$

* Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.75 \text{ m}$

SVSWR Volume : 1.5 m

(SVSWR Volume has been calibrated based on CISPR 16-1-4.)

No.3 semi anechoic chamber

Distance Factor: $20 \times \log (4.0 \text{ m} / 3.0 \text{ m}) = 2.50 \text{ dB}$

* Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 4.0 \text{ m}$

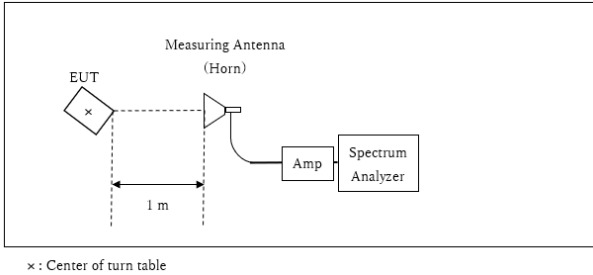
SVSWR Volume : 2.0 m

(SVSWR Volume has been calibrated based on CISPR 16-1-4.)

$r = 0.0 \text{ m}$

* The test was performed with $r = 0.0 \text{ m}$ since EUT is small and it was the rather conservative condition.

10 GHz to 40 GHz



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

*Test Distance: 1 m

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

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

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

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
26 dB Bandwidth	Enough to capture the emission	Close to 1 % of EBW	> RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 % to 5 % of OBW	≥ 3 RBW	Auto	Peak	Max Hold	Spectrum Analyzer
6 dB Bandwidth	Enough to capture the emission	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Conducted Output Power	-	-	-	Auto	Average	-	Power Meter (Sensor: 80 MHz BW) (Method PM-G)
Maximum Power Spectral Density	Encompass the entire EBW	1 MHz, 470 kHz *2)	≥ 3 RBW	Auto	RMS Power Averaging (200 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*3) *4)	9 kHz to 150 kHz 150 kHz to 30 MHz	200 Hz 9.1 kHz	620 Hz 27 kHz	Auto	Peak	Max Hold	Spectrum Analyzer

* The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".

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

*2) KDB 789033 D02 says that RBW is set to be 500 kHz for 5.725 GHz to 5.850 GHz, but it is not possible with spectrum analyzer, so RBW Correction Factor ($10 \log(500 \text{ kHz} / 470 \text{ kHz})$) was added to the test result.

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

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

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

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

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

Test Data : APPENDIX

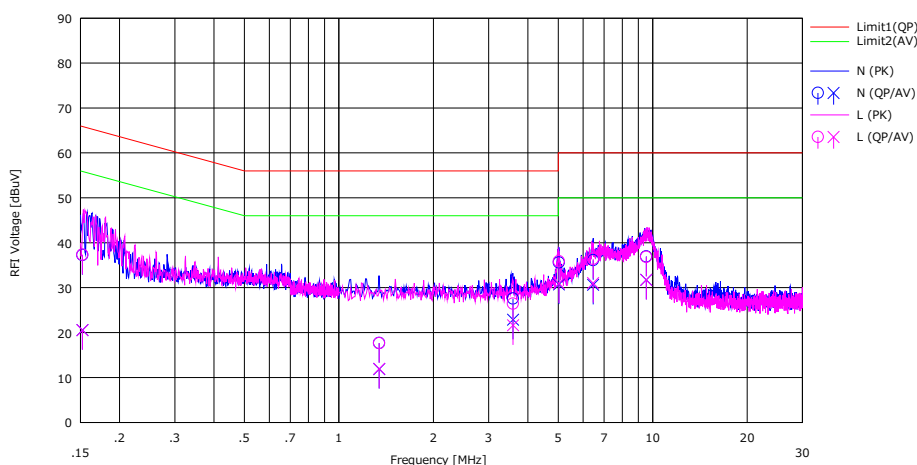
Test Result : Pass

APPENDIX 1: Test Data

Conducted Emission

Test place Ise EMC Lab. No.1 Shielded Room
Date November 13, 2022
Temperature / Humidity 23 deg. C / 58 % RH
Engineer Tetsuro Yoshida
Mode Tx 11ac-40 5795 MHz

Limit : FCC_Part 15 Subpart C(15.207)



No.	Freq. [MHz]	Reading		LISN	LOSS	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]			<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15233	24.10	7.40	0.09	13.06	37.25	20.55	65.87	55.87	28.62	35.32	N	
2	1.34430	4.30	-1.50	0.10	13.27	17.67	11.87	56.00	46.00	38.33	34.13	N	
3	3.58910	13.90	9.20	0.14	13.52	27.56	22.86	56.00	46.00	28.44	23.14	N	
4	5.02540	21.80	16.90	0.16	13.63	35.59	30.69	60.00	50.00	24.41	19.31	N	
5	6.45857	22.20	16.70	0.19	13.74	36.13	30.63	60.00	50.00	23.87	19.37	N	
6	9.54400	22.80	17.60	0.24	13.91	36.95	31.75	60.00	50.00	23.05	18.25	N	
7	0.15233	24.20	7.40	0.07	13.06	37.33	20.53	65.87	55.87	28.54	35.34	L	
8	1.34430	4.30	-1.40	0.07	13.27	17.64	11.94	56.00	46.00	38.36	34.06	L	
9	3.58910	12.80	8.00	0.11	13.52	26.43	21.63	56.00	46.00	29.57	24.37	L	
10	5.02540	22.10	17.20	0.14	13.63	35.87	30.97	60.00	50.00	24.13	19.03	L	
11	6.45857	22.50	17.10	0.16	13.74	36.40	31.00	60.00	50.00	23.60	19.00	L	
12	9.54400	22.70	17.60	0.22	13.91	36.83	31.73	60.00	50.00	23.17	18.27	L	

CHART: WITH FACTOR Peak hold data. CALCULATION : RESULT = READING + C.F (LISN + CABLE + ATT)
Except for the above table: adequate margin data below the limits.

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place Ise EMC Lab. No.8 Measurement Room
Date October 28, 2022 November 18, 2022
Temperature / Humidity 23 deg. C / 45 % RH 21 deg. C / 44 % RH
Engineer Sayaka Hara Takafumi Noguchi
Mode Tx

11a

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Chain 1	5180	-	16932.2
	5220	-	16906.1
	5240	-	16940.2
	5260	20.728	16906.1
	5300	20.564	16901.4
	5320	20.726	16960.5
	5500	20.583	16837.3
	5580	20.570	16929.9
	5700	20.400	16861.8
	5720	21.072	16881.1
	5745	-	16836.9
	5785	-	16899.2
	5825	-	16969.5

11n-20

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Chain 1	5180	-	18000.6
	5220	-	18041.5
	5240	-	17964.6
	5260	21.376	17983.3
	5300	21.678	17983.7
	5320	21.375	17992.6
	5500	21.387	17982.3
	5580	21.636	17946.6
	5700	21.220	18016.9
	5720	21.160	18068.6
	5745	-	18051.4
	5785	-	18042.2
	5825	-	18024.1

11ac-20

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Chain 1	5180	-	18000.9
	5220	-	18083.2
	5240	-	18039.7
	5260	21.555	18083.5
	5300	21.117	18028.1
	5320	21.402	18023.6
	5500	21.548	18072.5
	5580	21.332	18019.6
	5700	21.220	18043.7
	5720	21.017	18041.2
	5745	-	17977.5
	5785	-	18008.8
	5825	-	18013.5

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room
Date	October 31, 2022
Temperature / Humidity	20 deg. C / 41 % RH
Engineer	Hiroki Numata
Mode	Tx

11n-40

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Chain 1	5190	-	36714.8
	5230	-	36714.0
	5270	42.169	36758.8
	5310	41.964	36641.2
	5510	42.916	36707.4
	5550	42.608	36727.7
	5670	42.967	36573.8
	5710	43.363	36789.4
	5755	-	36792.3
	5795	-	36680.6

11ac-40

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Chain 1	5190	-	36794.0
	5230	-	36721.5
	5270	42.329	36618.4
	5310	41.584	36625.3
	5510	42.572	36749.6
	5550	42.890	36744.7
	5670	43.096	36605.9
	5710	42.527	36625.2
	5755	-	36728.8
	5795	-	36705.7

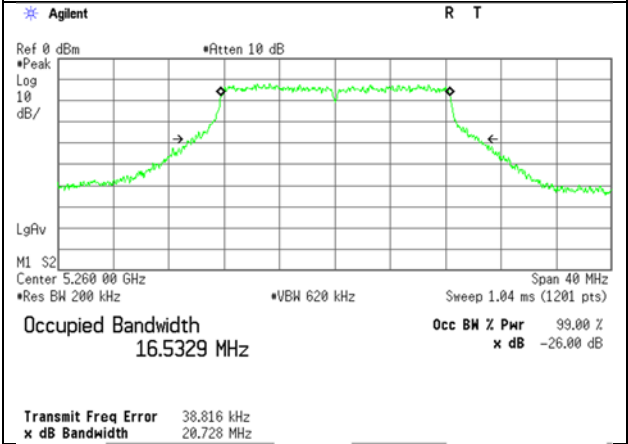
11ac-80

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
Chain 1	5210	-	76318.6
	5290	87.089	76253.1
	5530	85.725	76291.3
	5610	85.714	76407.3
	5690	87.014	76405.4
	5775	-	76260.7

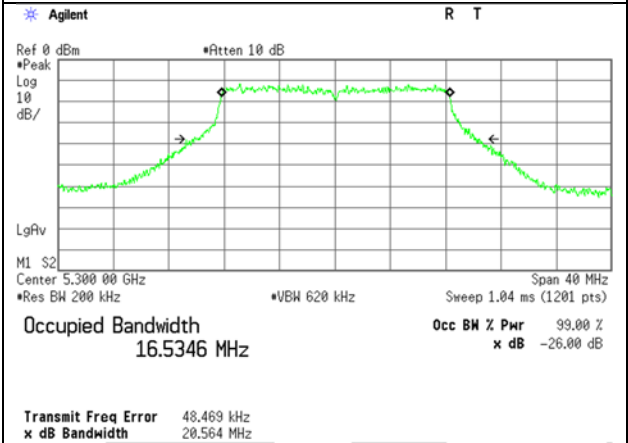
26 dB Emission Bandwidth

11a, Chain 1

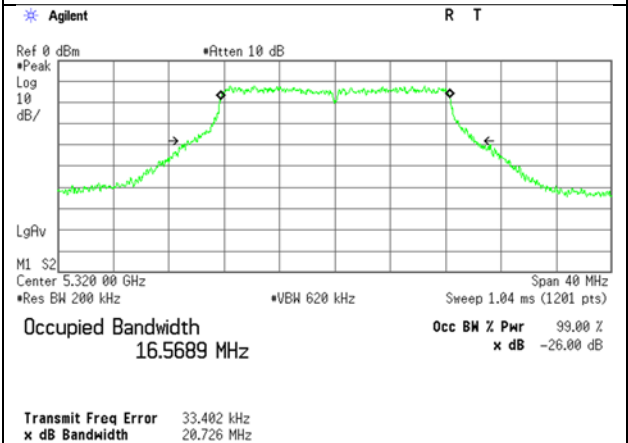
5260 MHz



5300 MHz

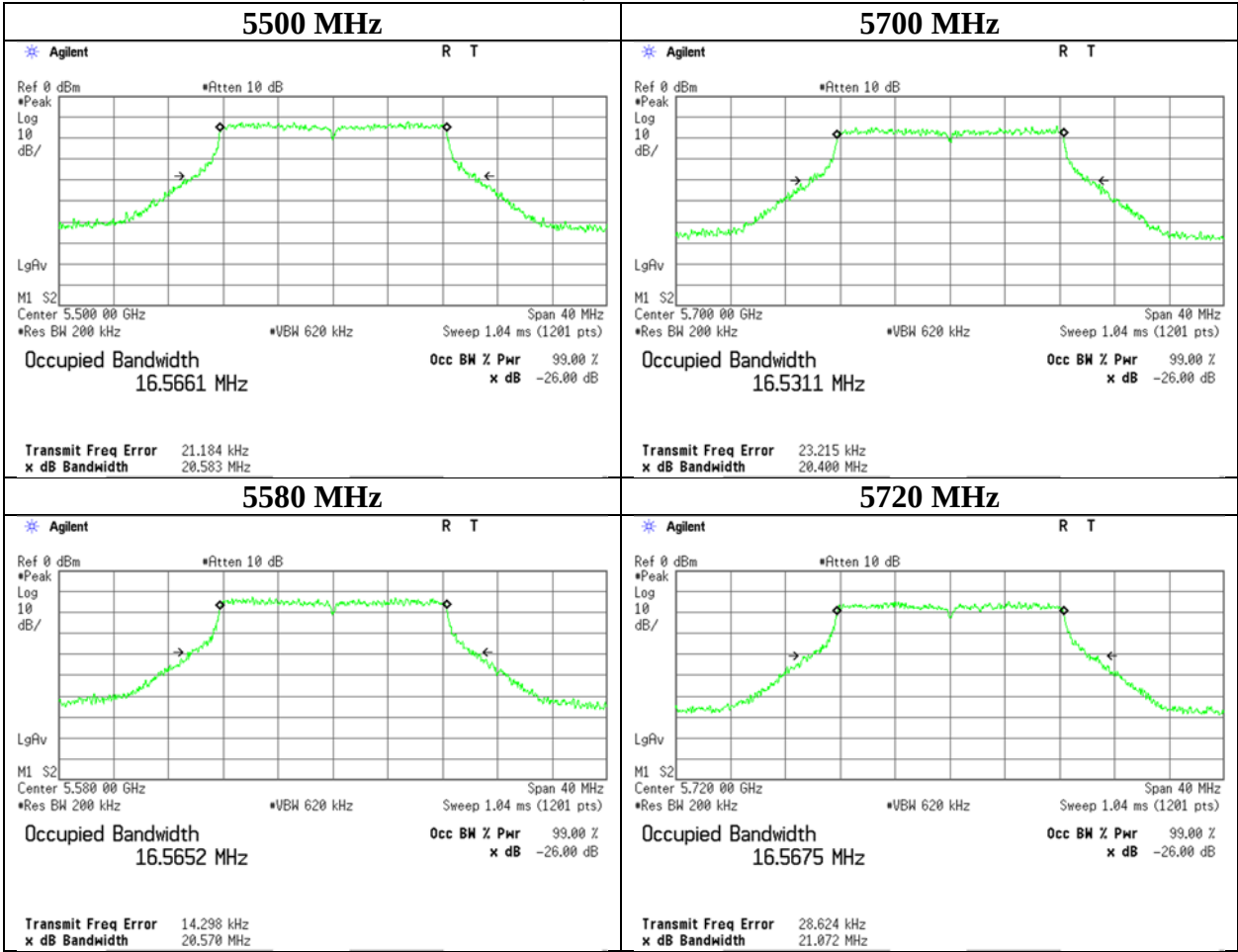


5320 MHz



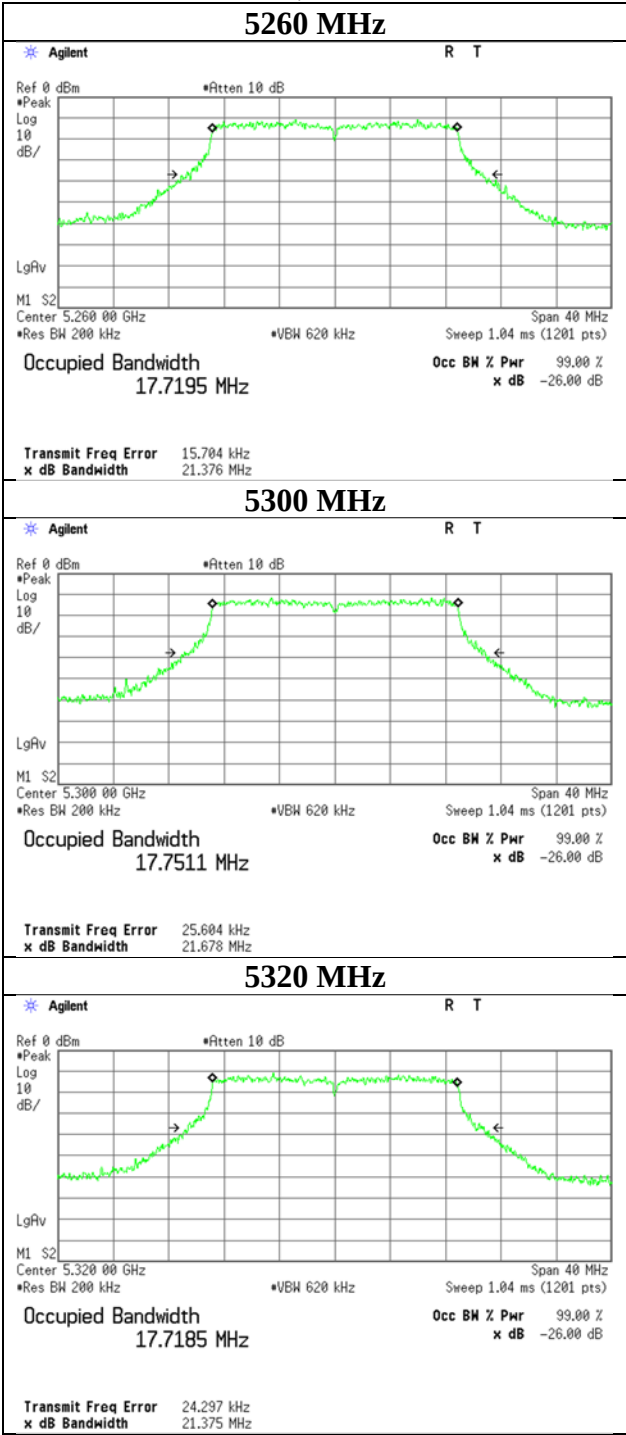
26 dB Emission Bandwidth

11a, Chain 1



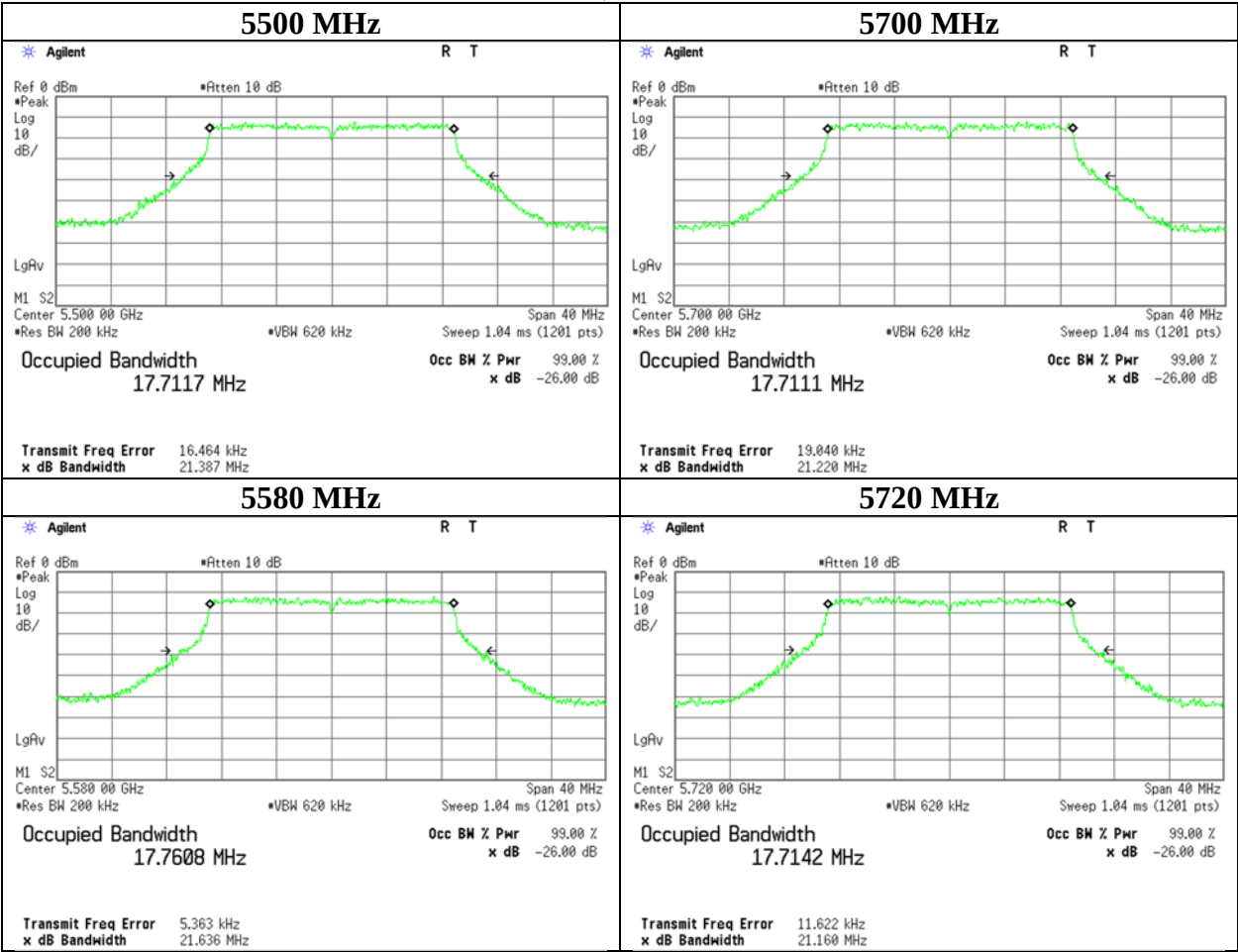
26 dB Emission Bandwidth

11n-20, Chain 1



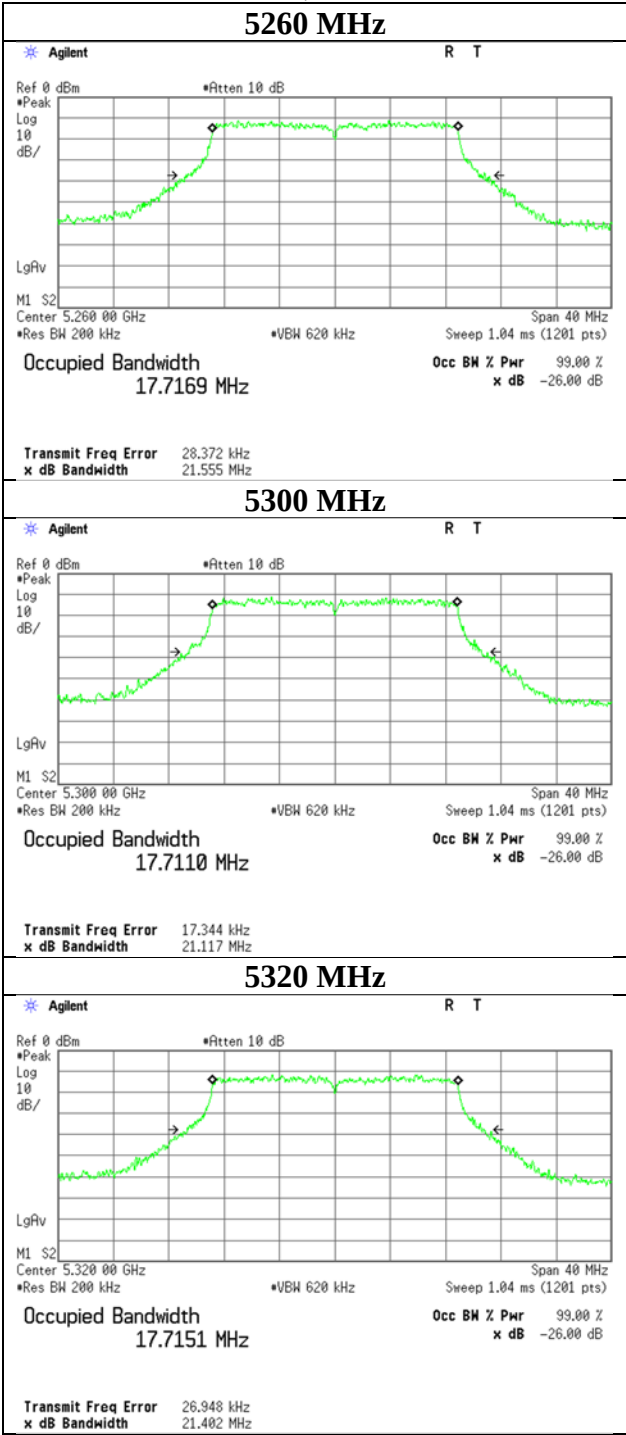
26 dB Emission Bandwidth

11n-20, Chain 1



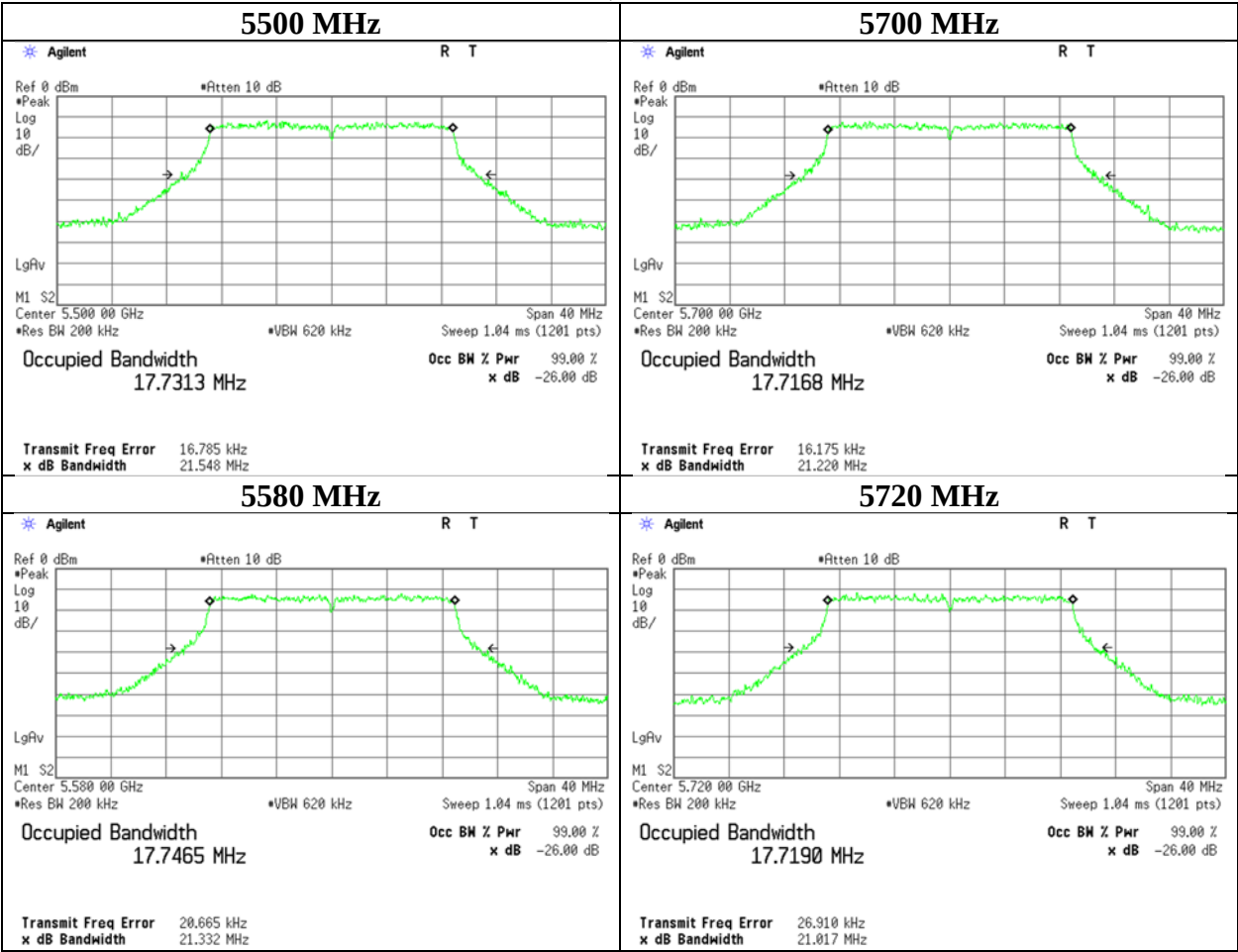
26 dB Emission Bandwidth

11ac-20, Chain 1



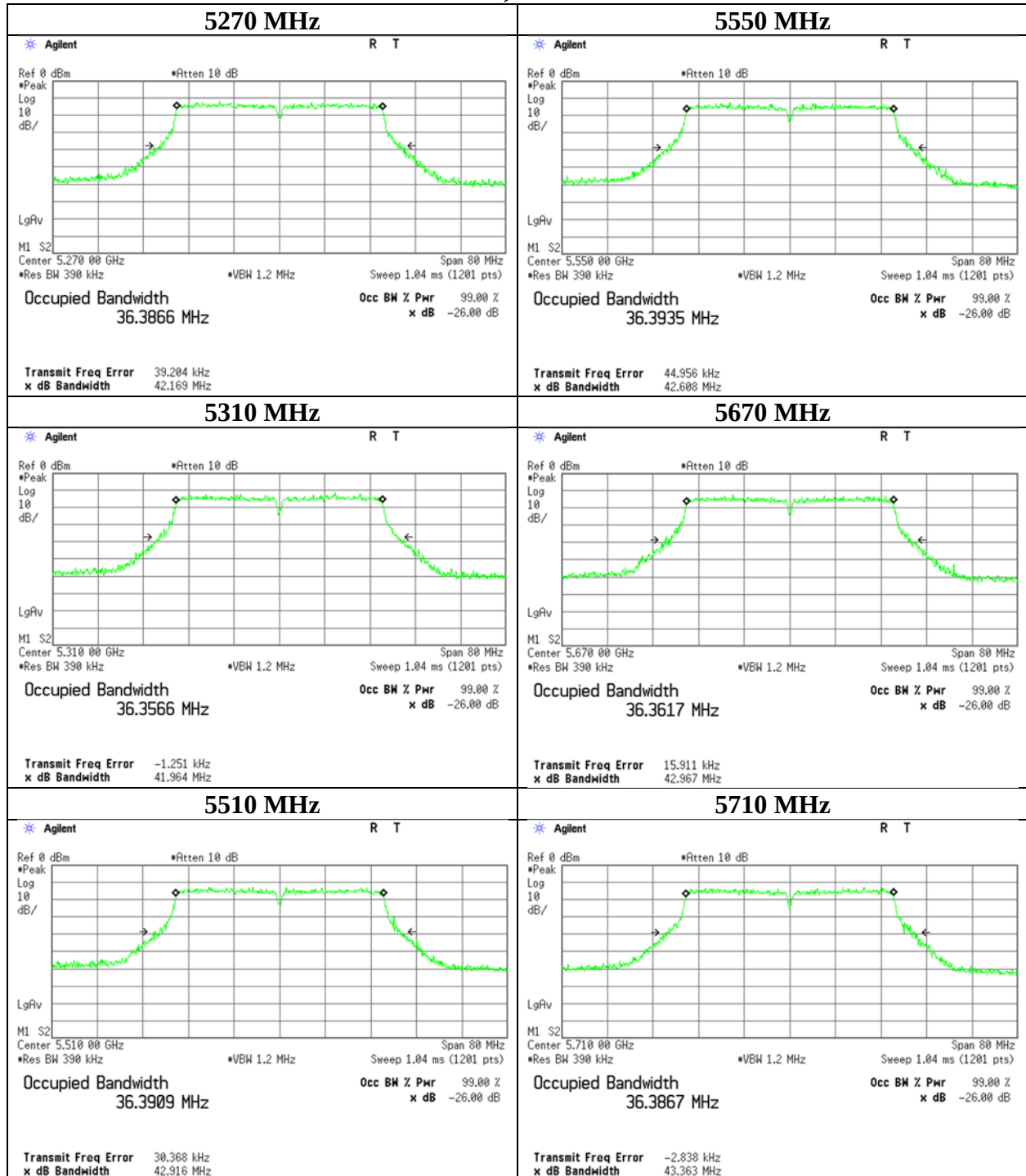
26 dB Emission Bandwidth

11ac-20, Chain 1



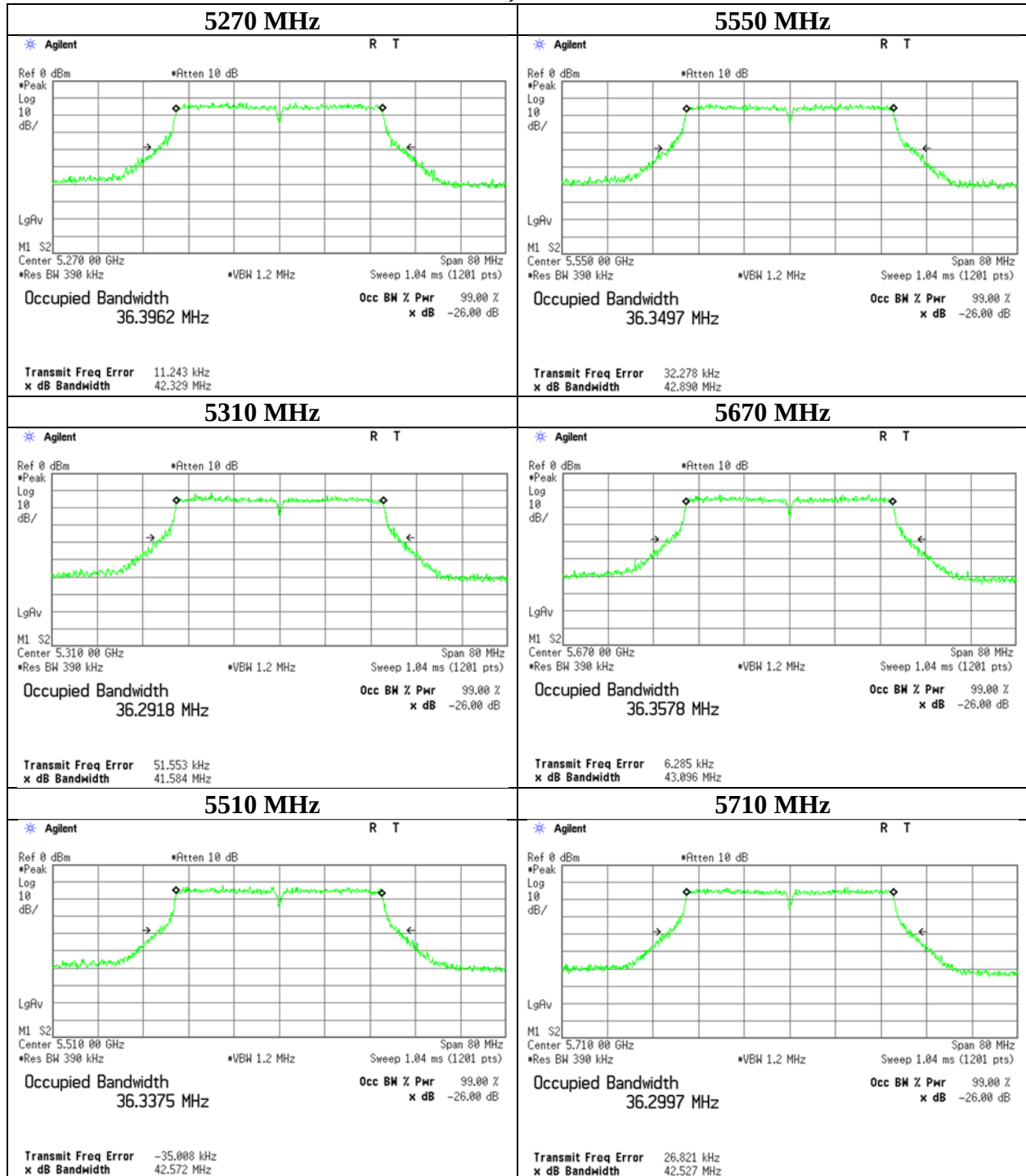
26 dB Emission Bandwidth

11n-40, Chain 1



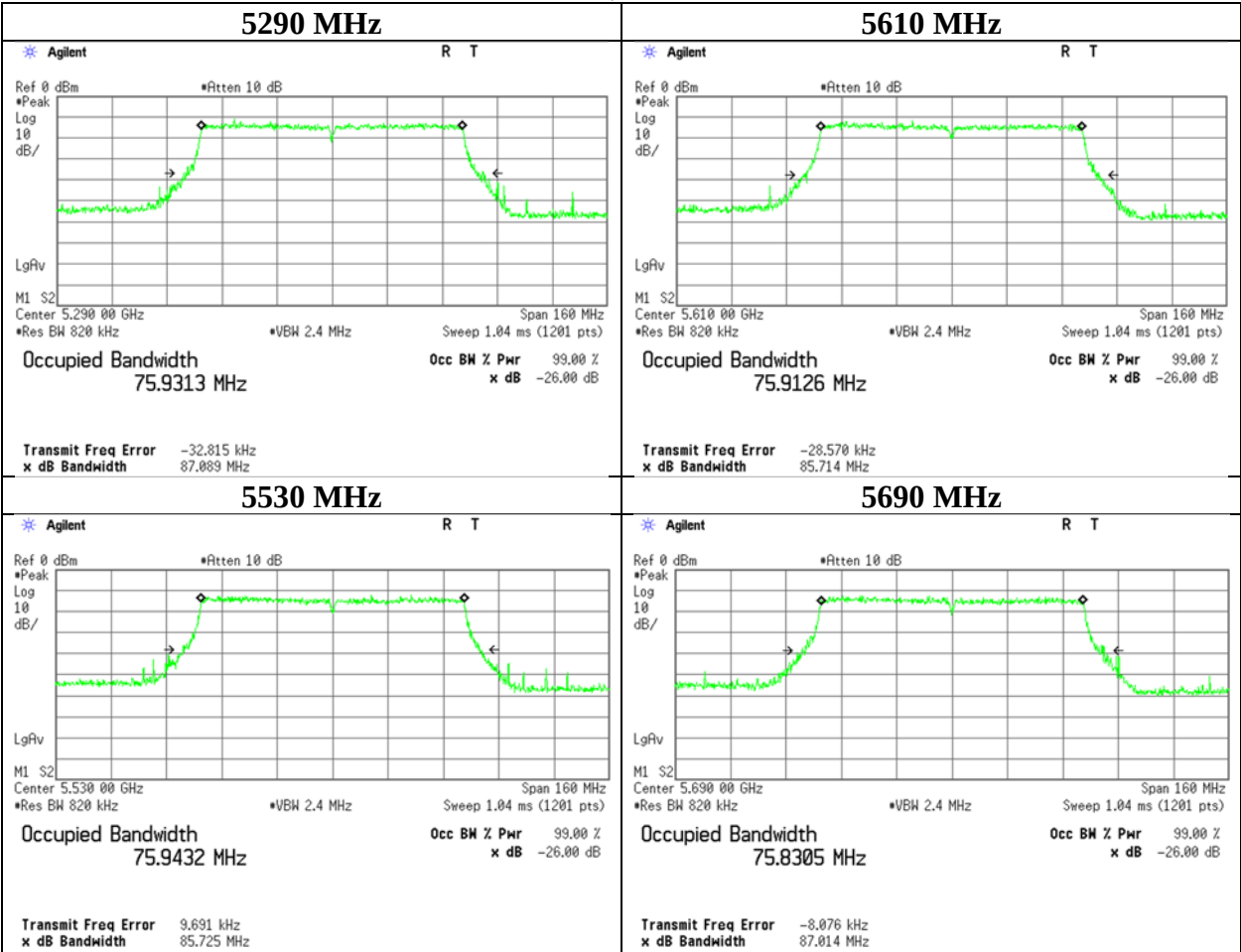
26 dB Emission Bandwidth

11ac-40, Chain 1



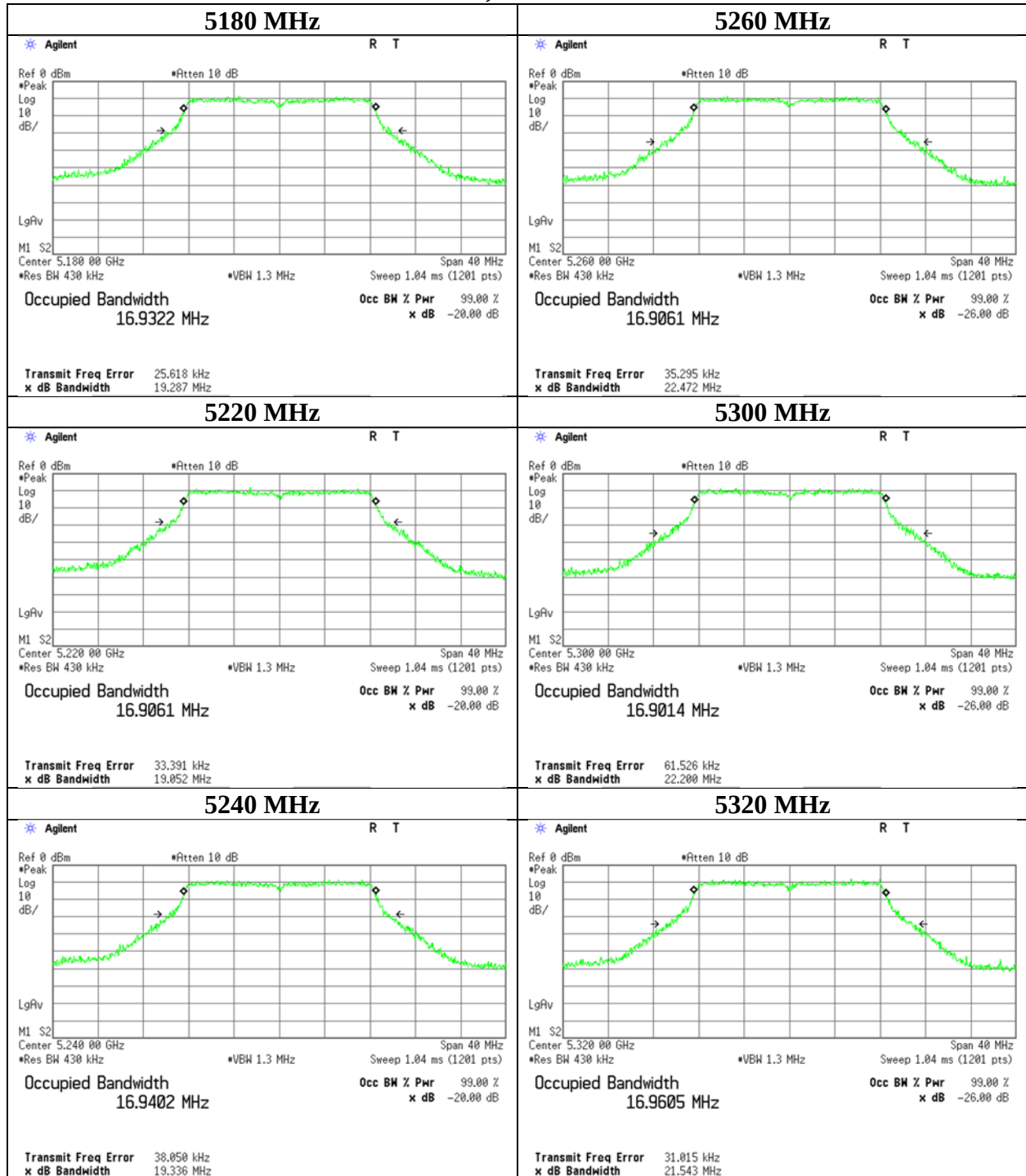
26 dB Emission Bandwidth

11ac-80, Chain 1



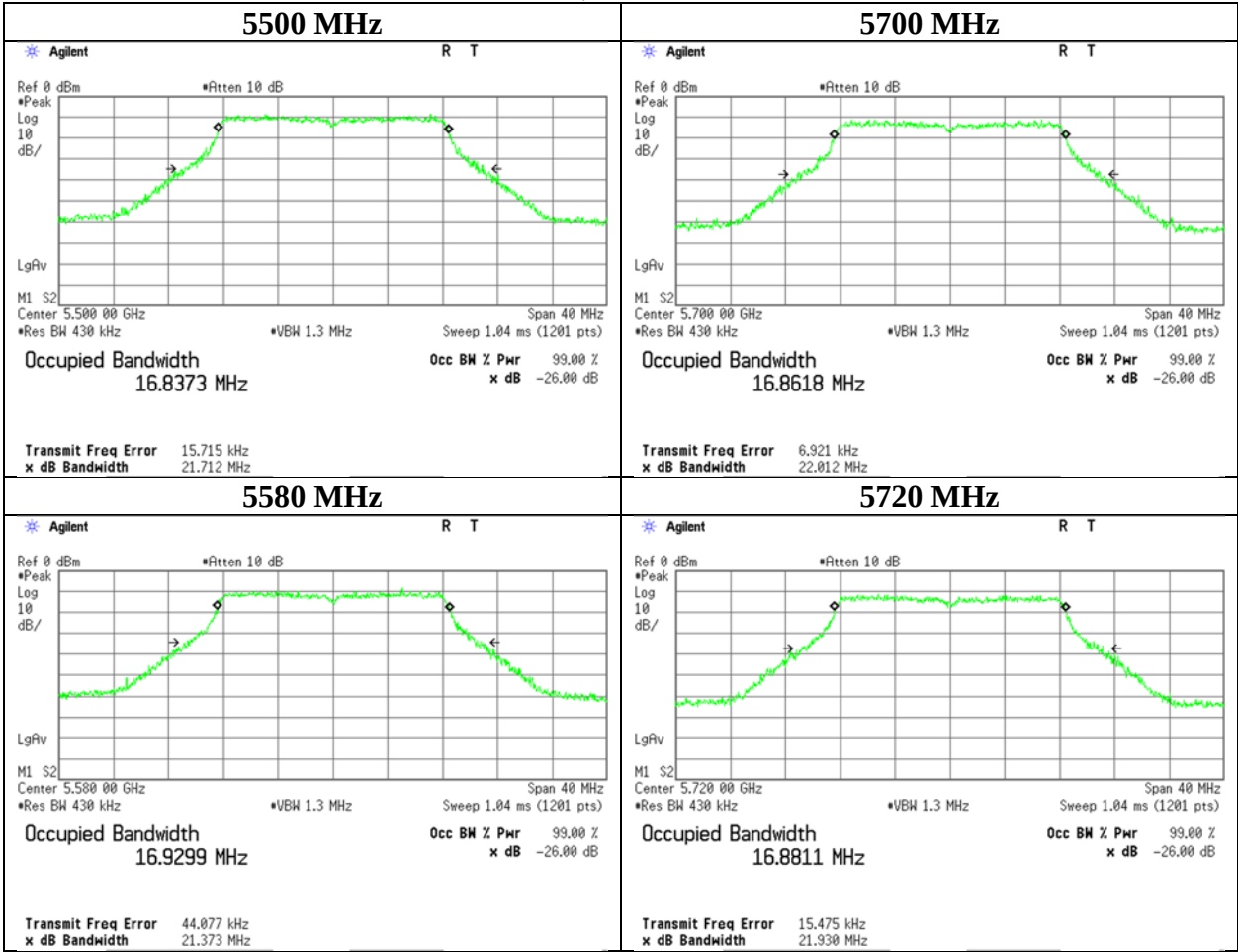
99 % Occupied Bandwidth

11a, Chain 1



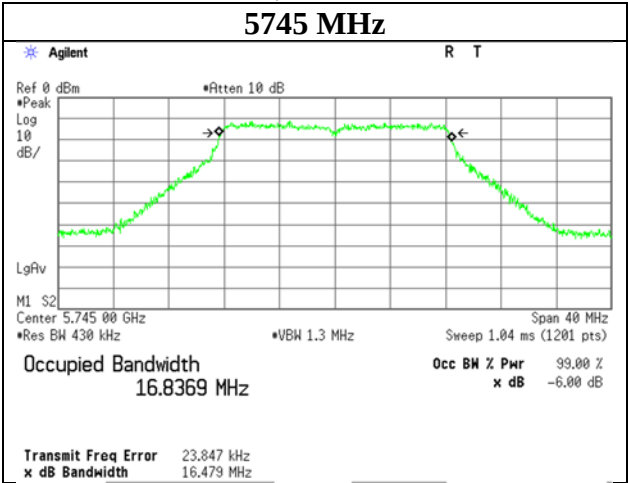
99 % Occupied Bandwidth

11a, Chain 1

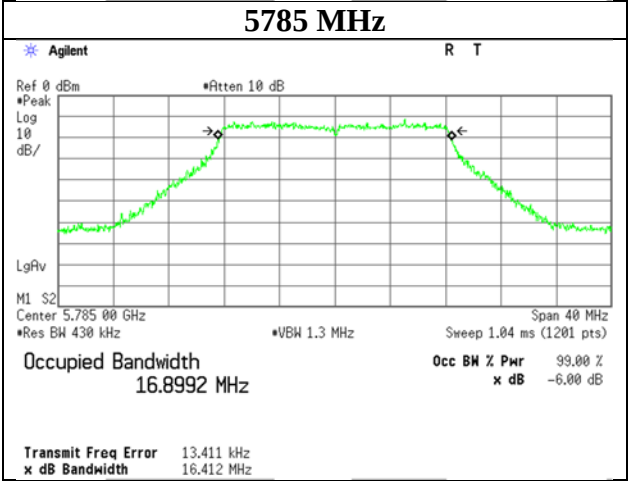


99 % Occupied Bandwidth

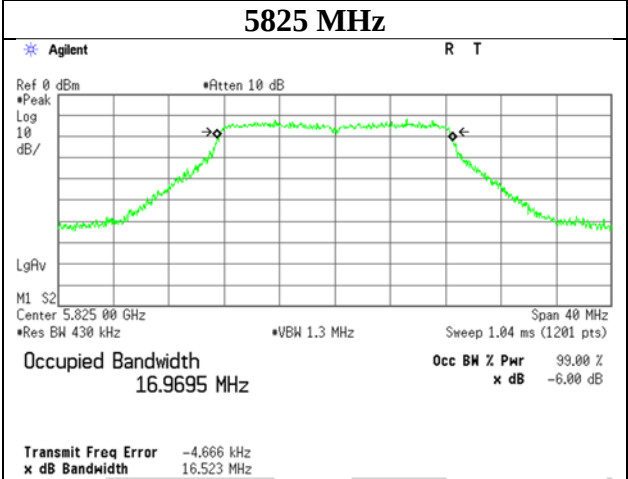
11a, Chain 1
5745 MHz



5785 MHz

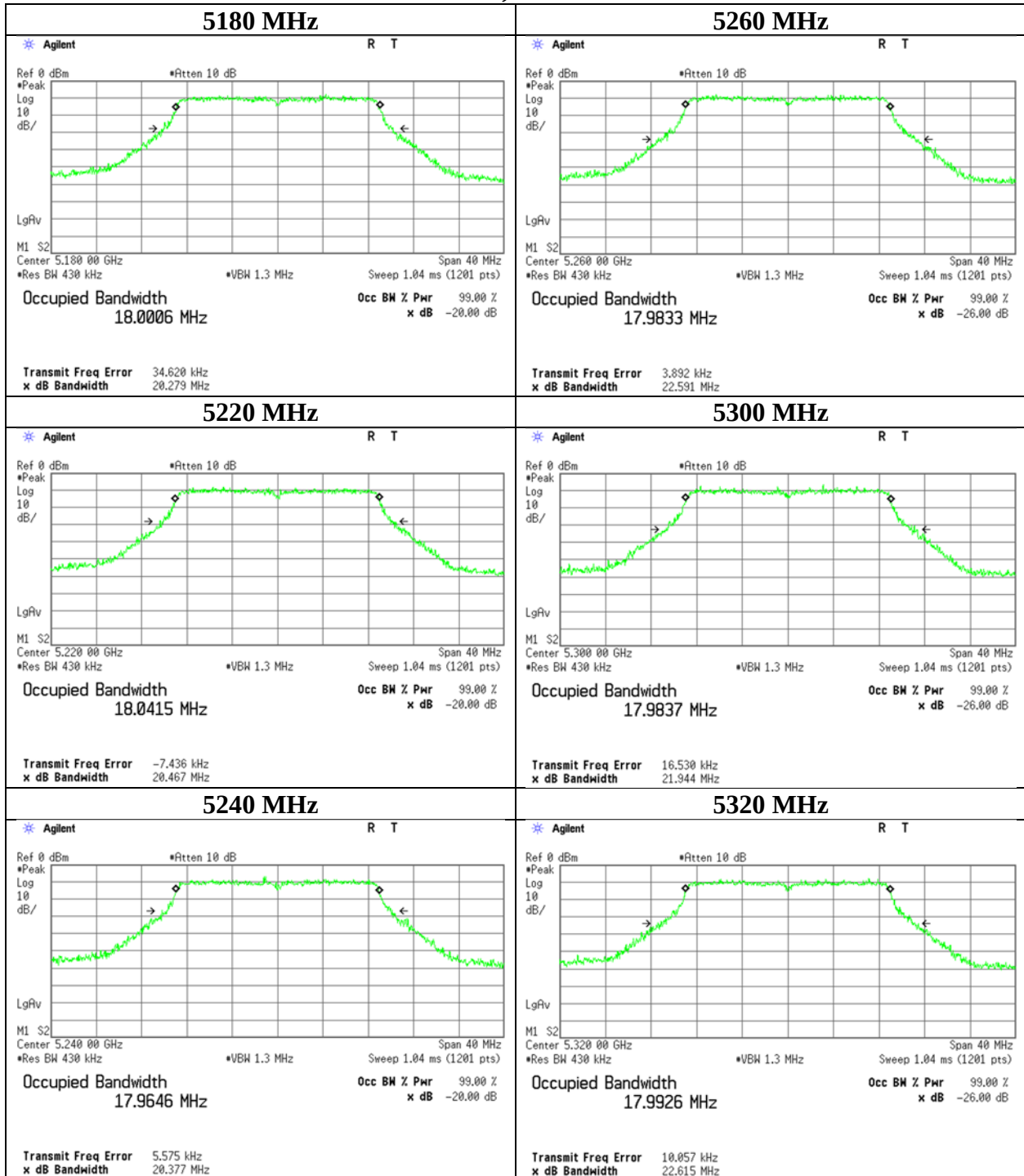


5825 MHz



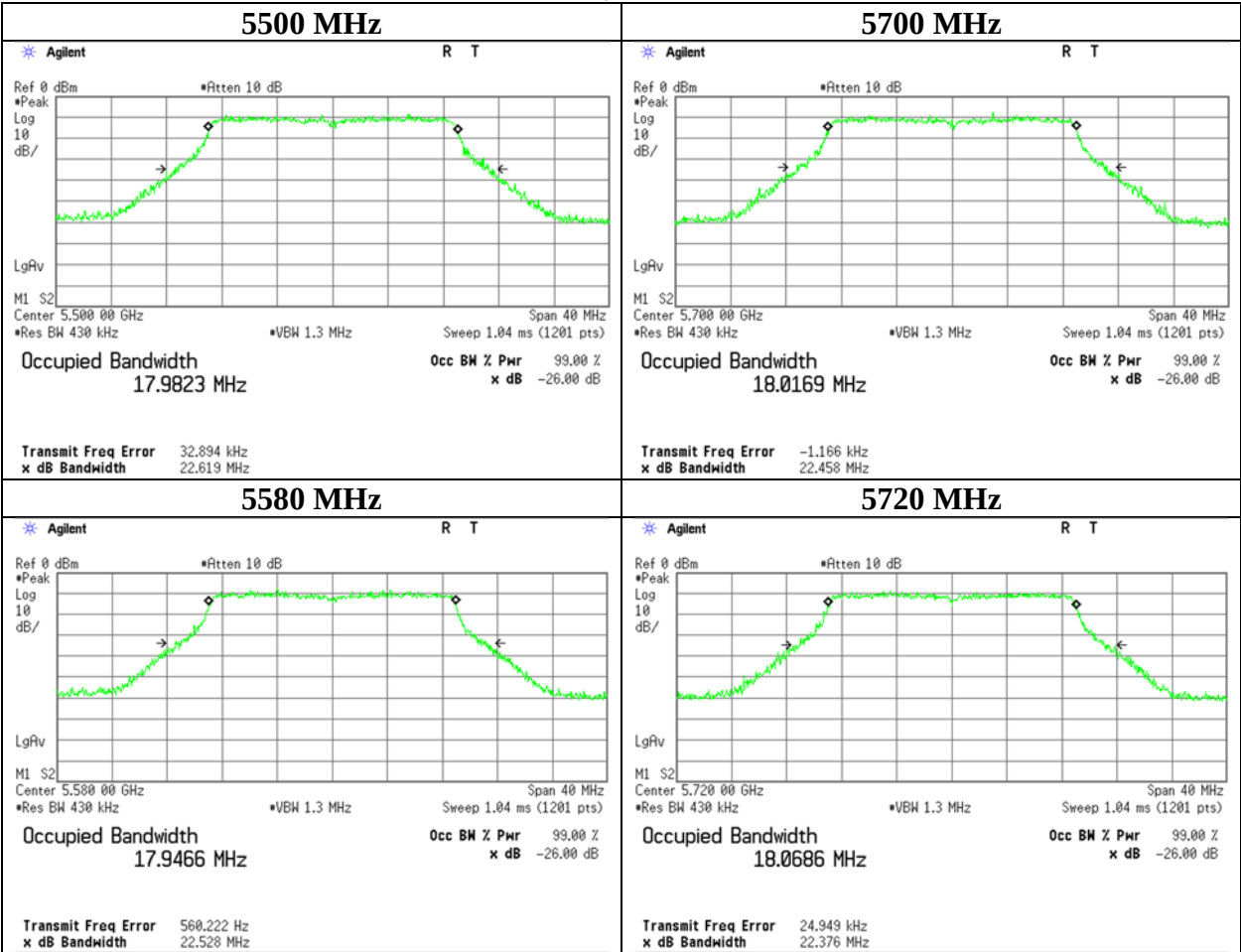
99 % Occupied Bandwidth

11n-20, Chain 1



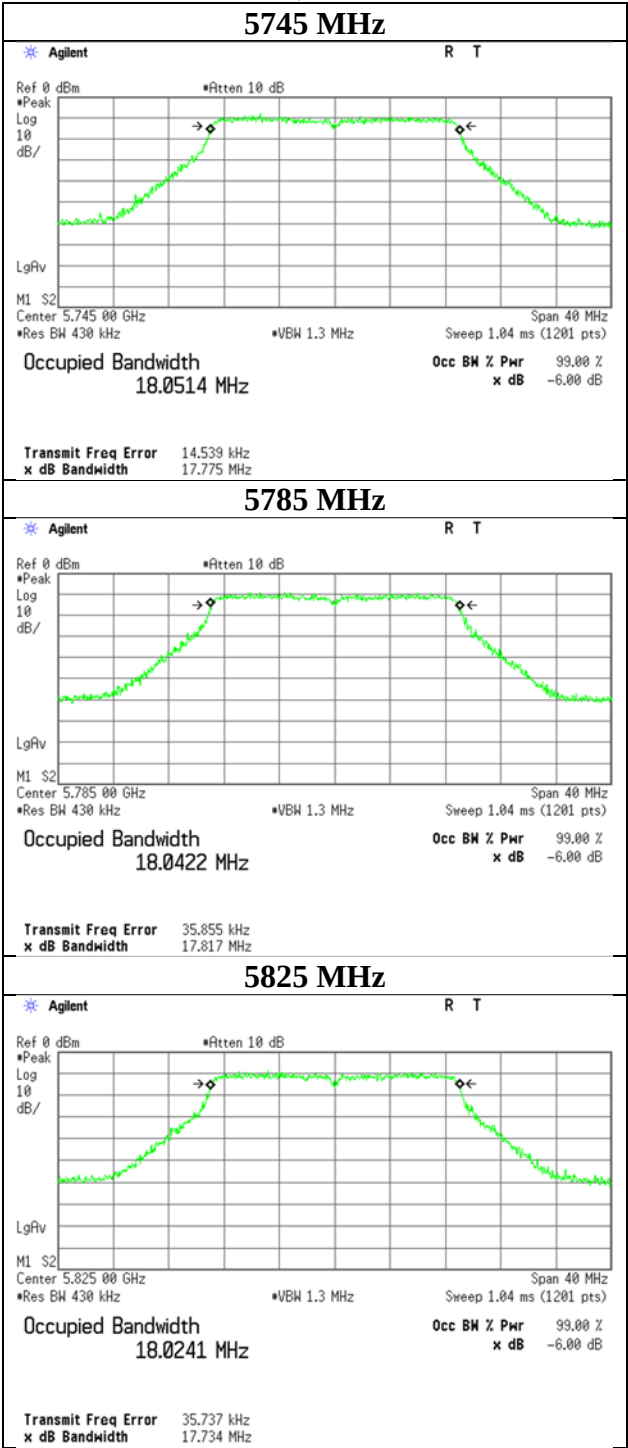
99 % Occupied Bandwidth

11n-20, Chain 1



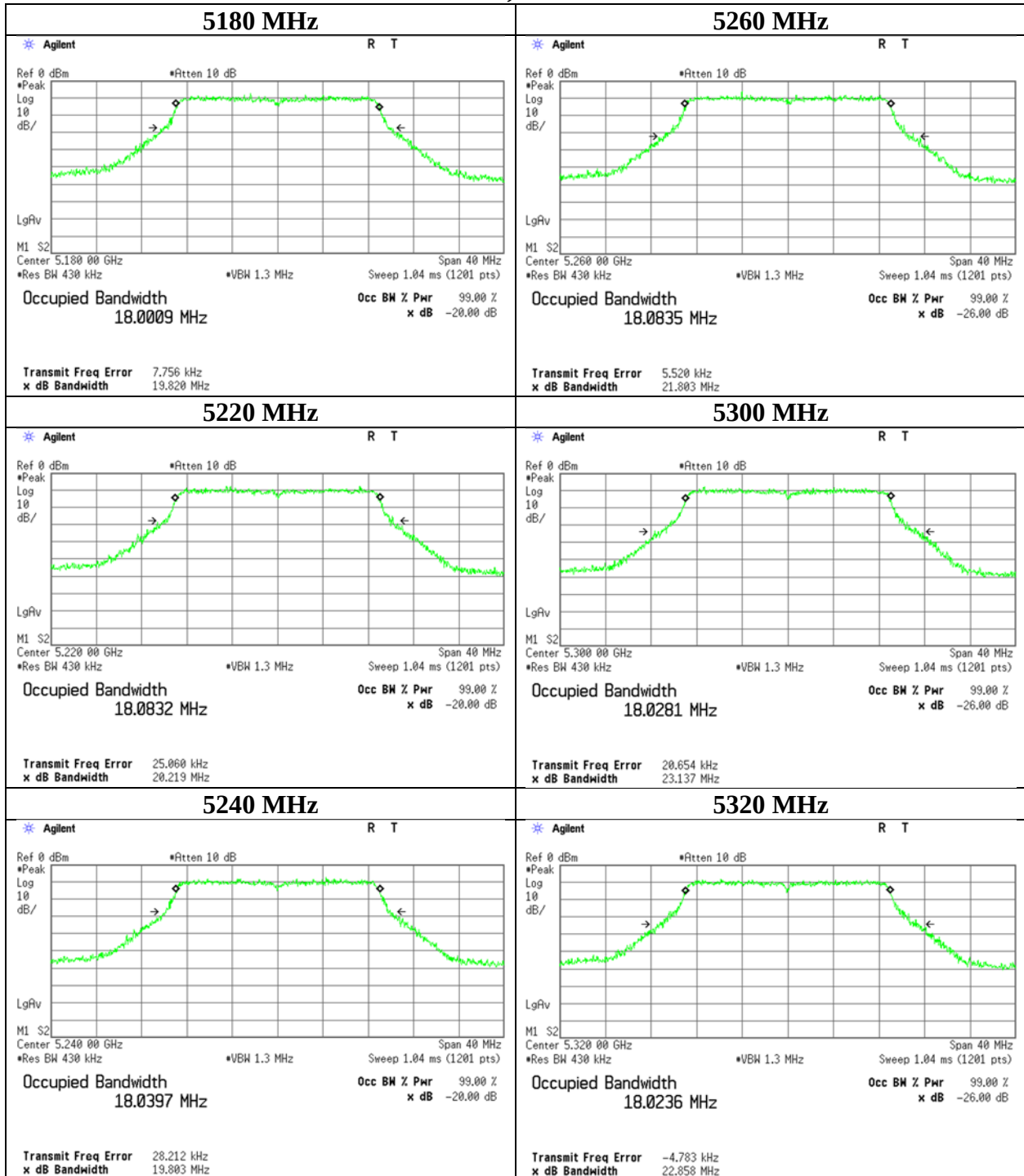
99 % Occupied Bandwidth

11n-20, Chain 1



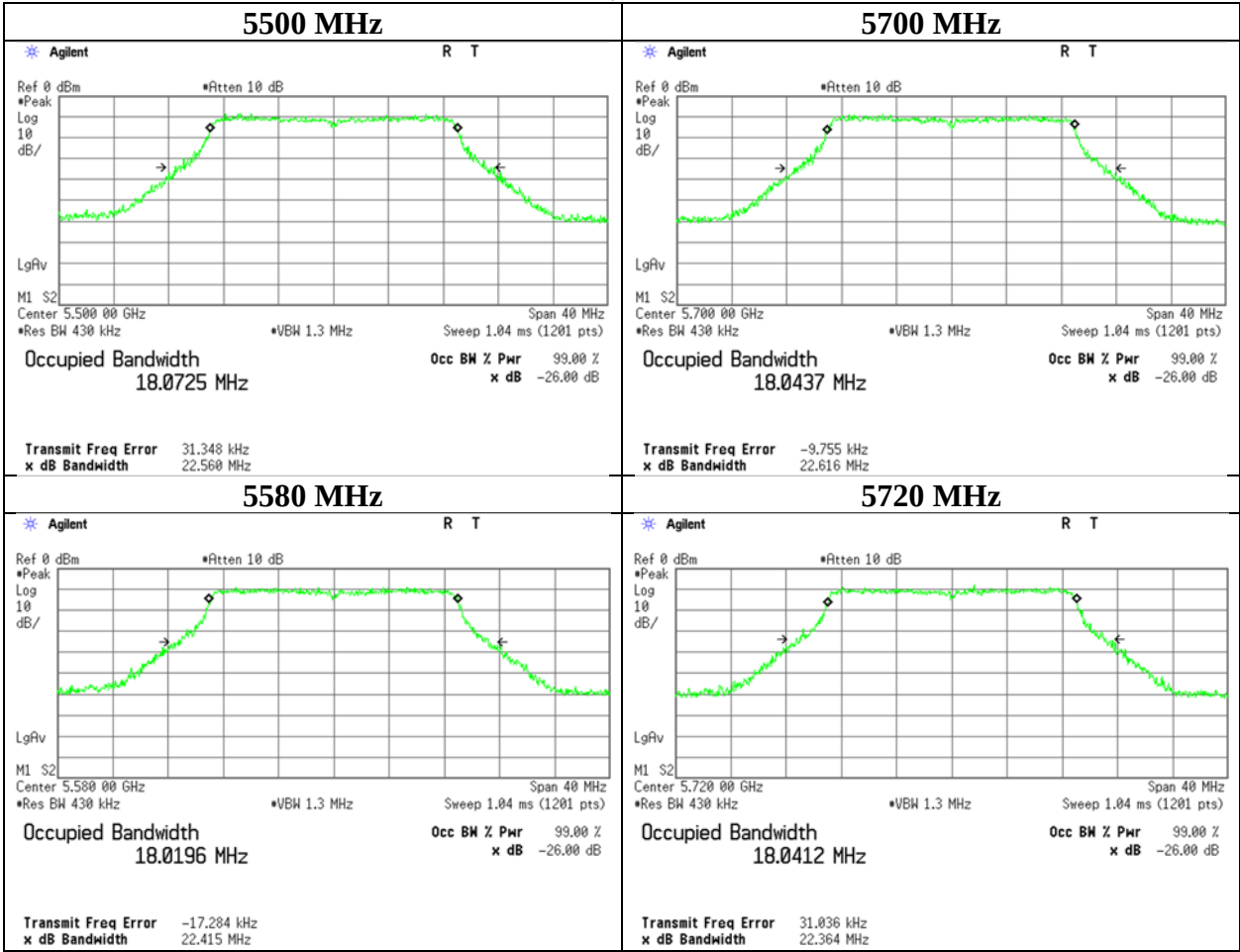
99 % Occupied Bandwidth

11ac-20, Chain 1



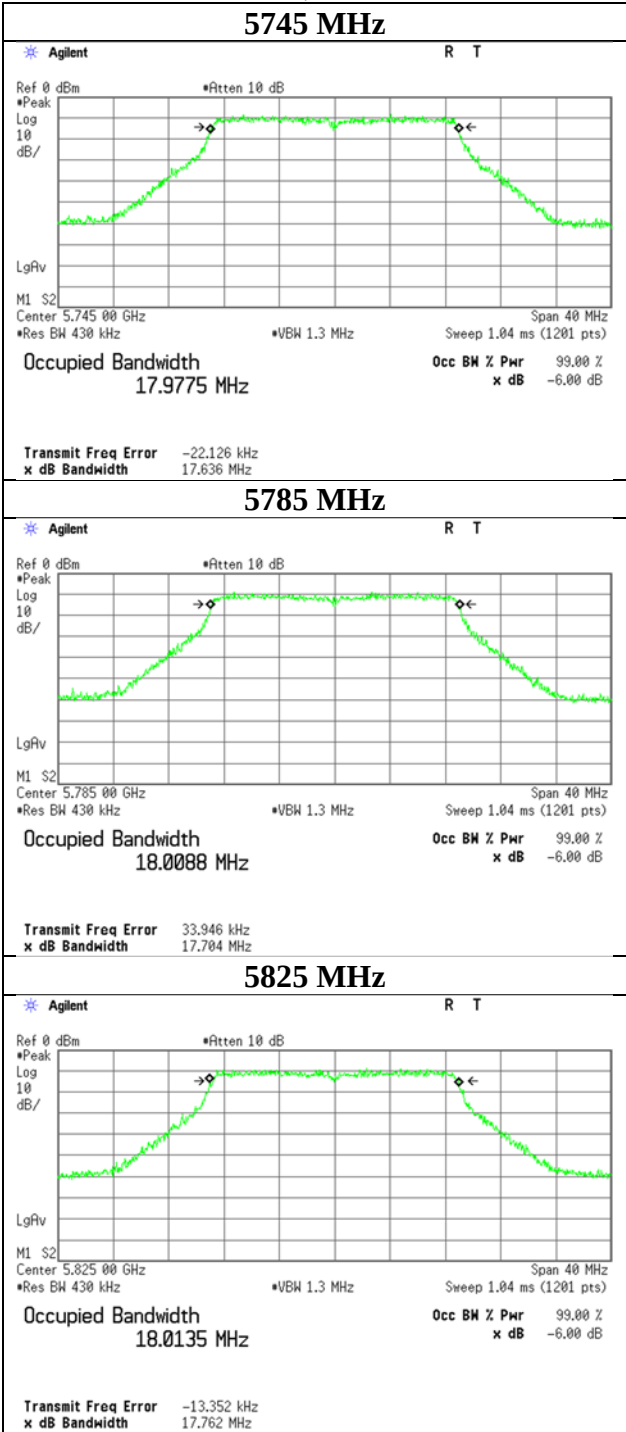
99 % Occupied Bandwidth

11ac-20, Chain 1



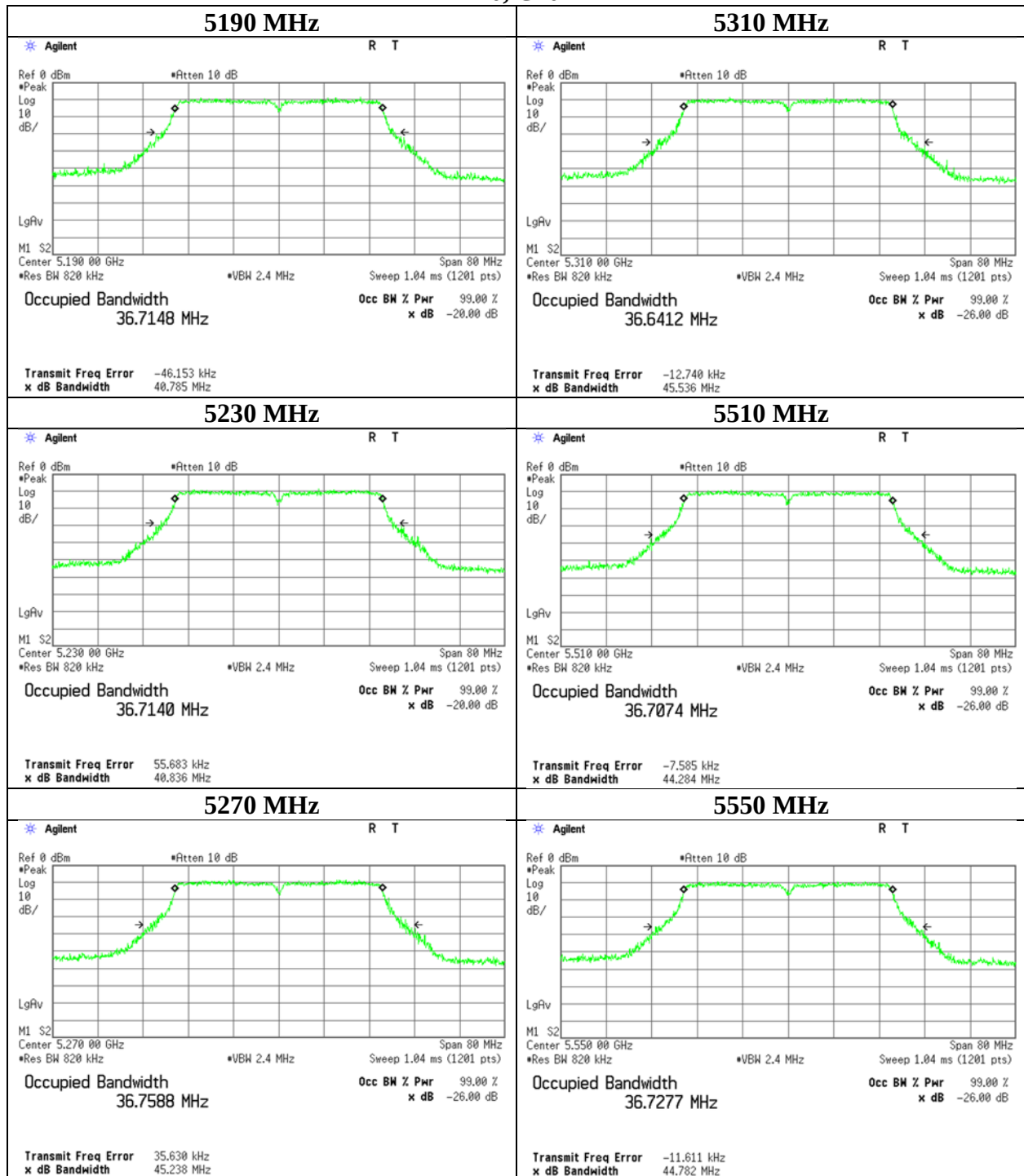
99 % Occupied Bandwidth

11ac-20, Chain 1



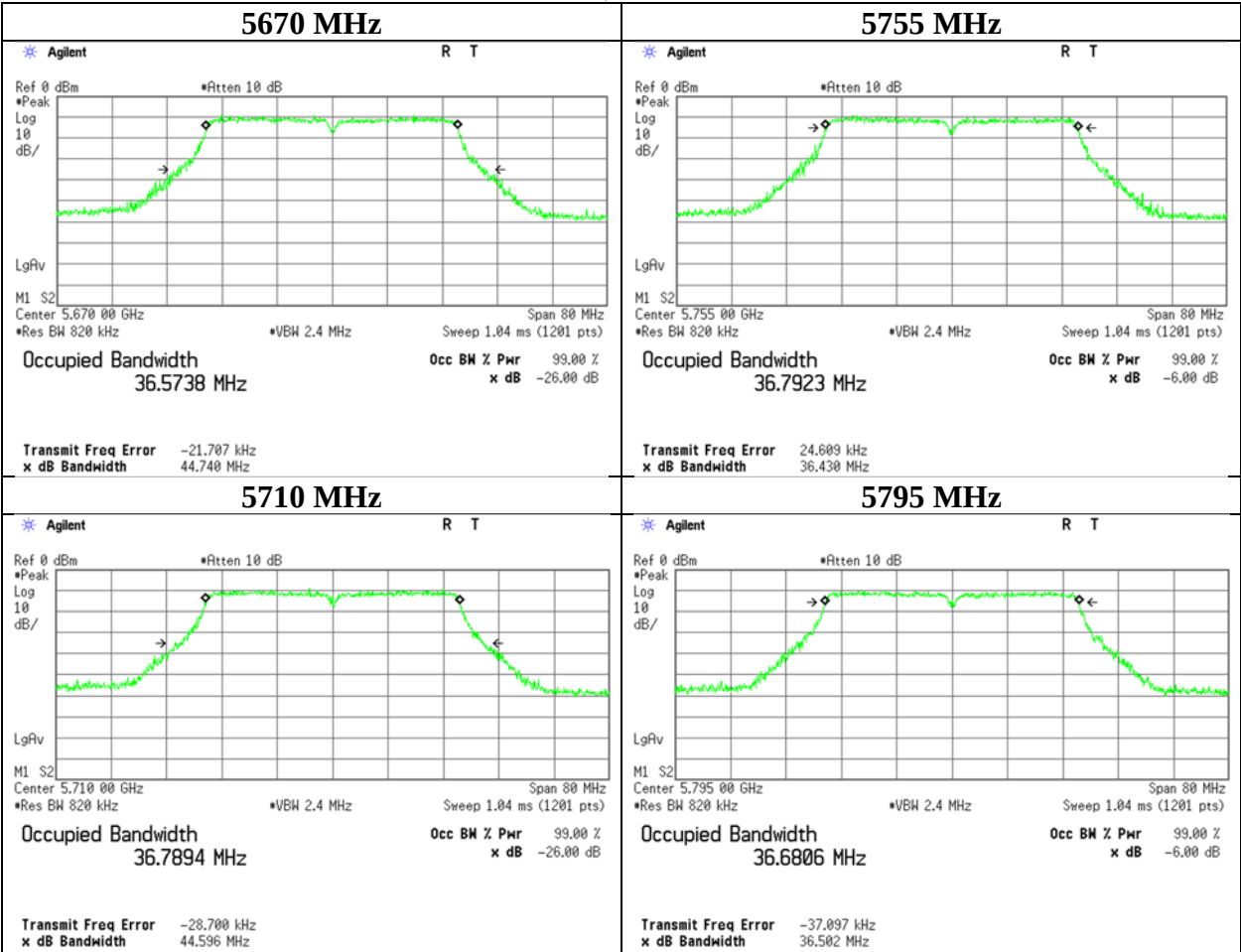
99 % Occupied Bandwidth

11n-40, Chain 1



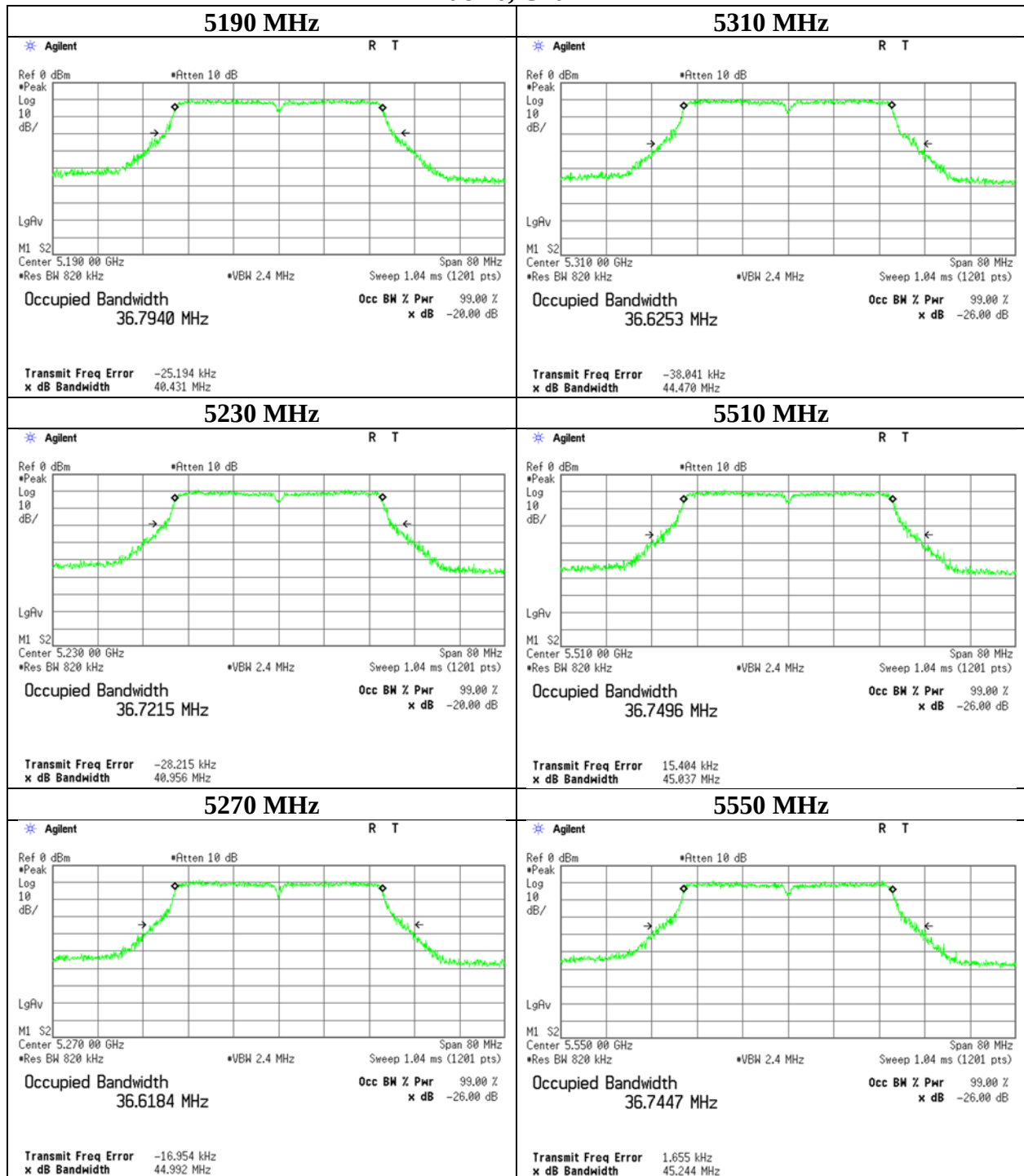
99 % Occupied Bandwidth

11n-40, Chain 1



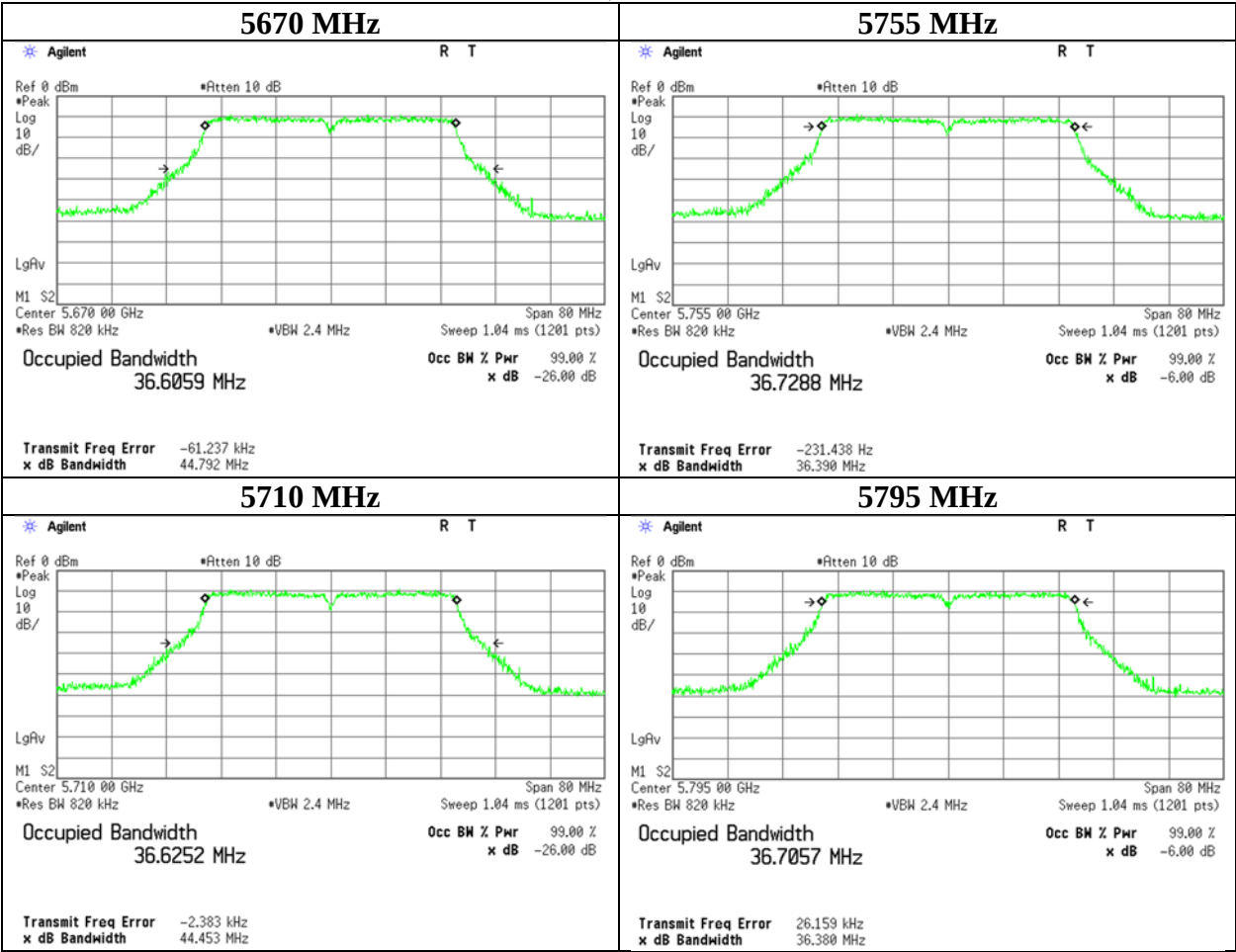
99 % Occupied Bandwidth

11ac-40, Chain 1



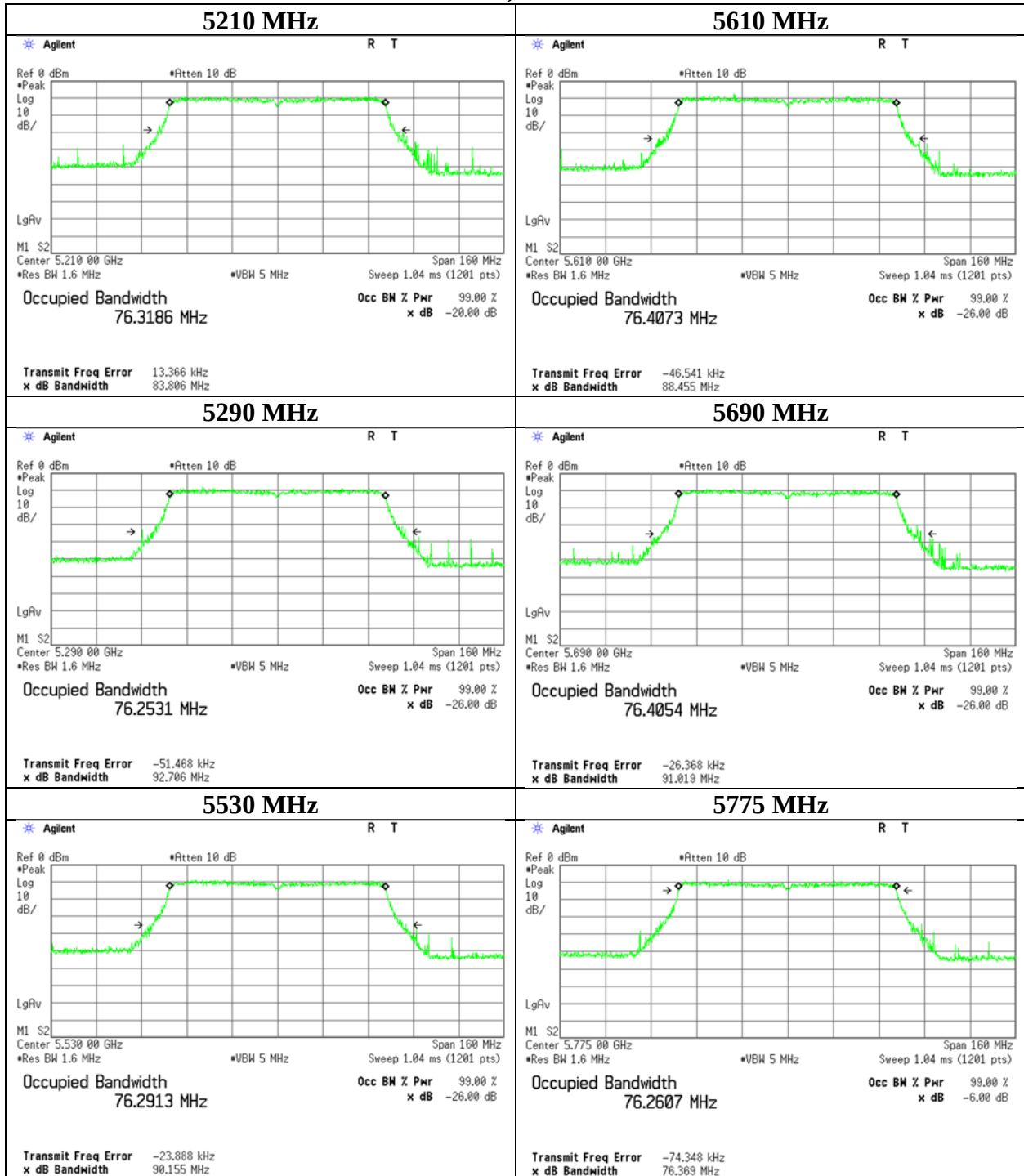
99 % Occupied Bandwidth

11ac-40, Chain 1



99 % Occupied Bandwidth

11ac-80, Chain 1



6 dB Bandwidth

Test place	Ise EMC Lab. No.8 Measurement Room		
Date	October 28, 2022	October 31, 2022	November 18, 2022
Temperature / Humidity	23 deg. C / 45 % RH	20 deg. C / 41 % RH	21 deg. C / 44 % RH
Engineer	Sayaka Hara	Hiroki Numata	Takafumi Noguchi
Mode	Tx		

11a

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Chain 1	5745	16.511	> 0.500
	5785	16.514	> 0.500
	5825	16.539	> 0.500

11n-20

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Chain 1	5745	17.768	> 0.500
	5785	17.725	> 0.500
	5825	17.738	> 0.500

11ac-20

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Chain 1	5745	17.745	> 0.500
	5785	17.762	> 0.500
	5825	17.752	> 0.500

11n-40

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Chain 1	5755	36.535	> 0.500
	5795	36.570	> 0.500

11ac-40

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Chain 1	5755	36.538	> 0.500
	5795	36.522	> 0.500

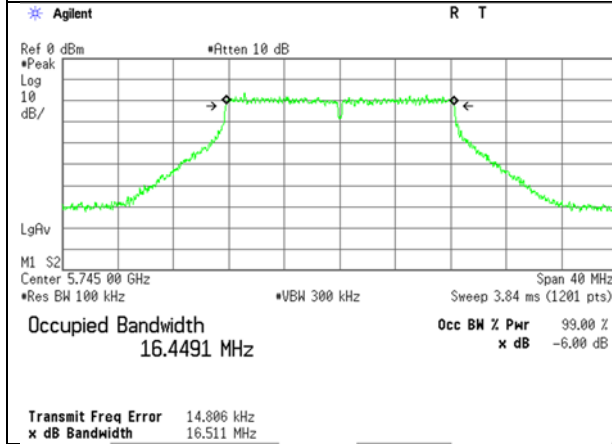
11ac-80

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Chain 1	5775	76.561	> 0.500

6 dB Bandwidth

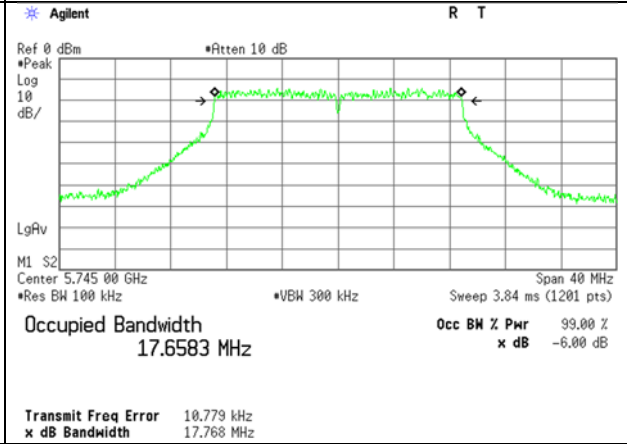
11a, Chain 1

5745 MHz

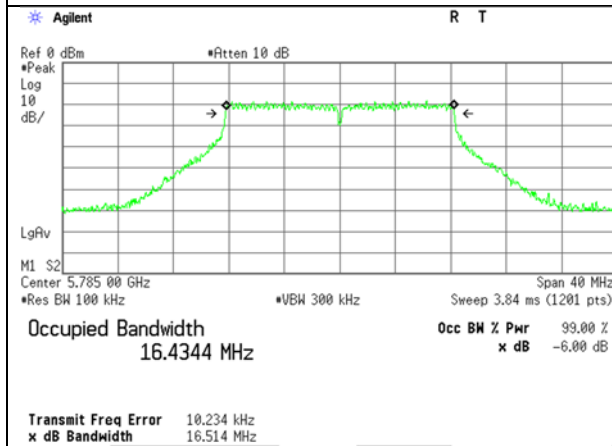


11n-20, Chain 1

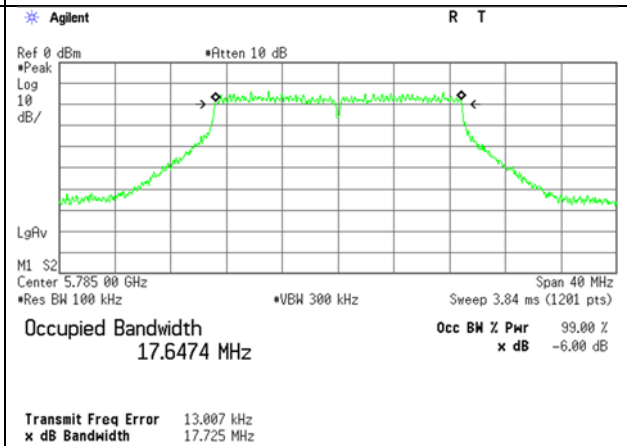
5745 MHz



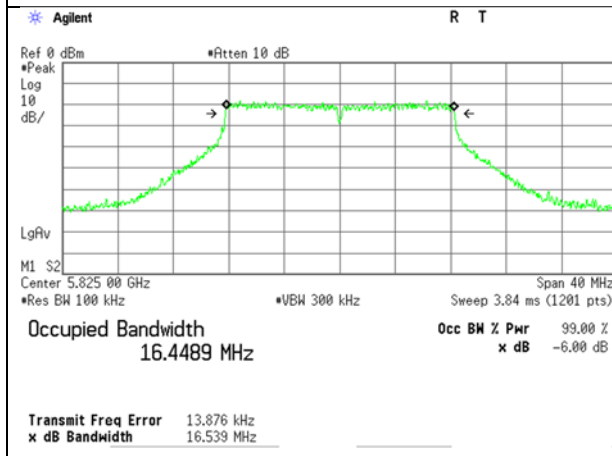
5785 MHz



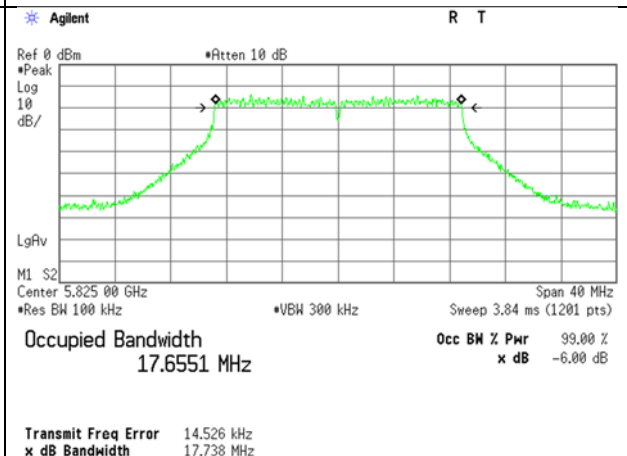
5785 MHz



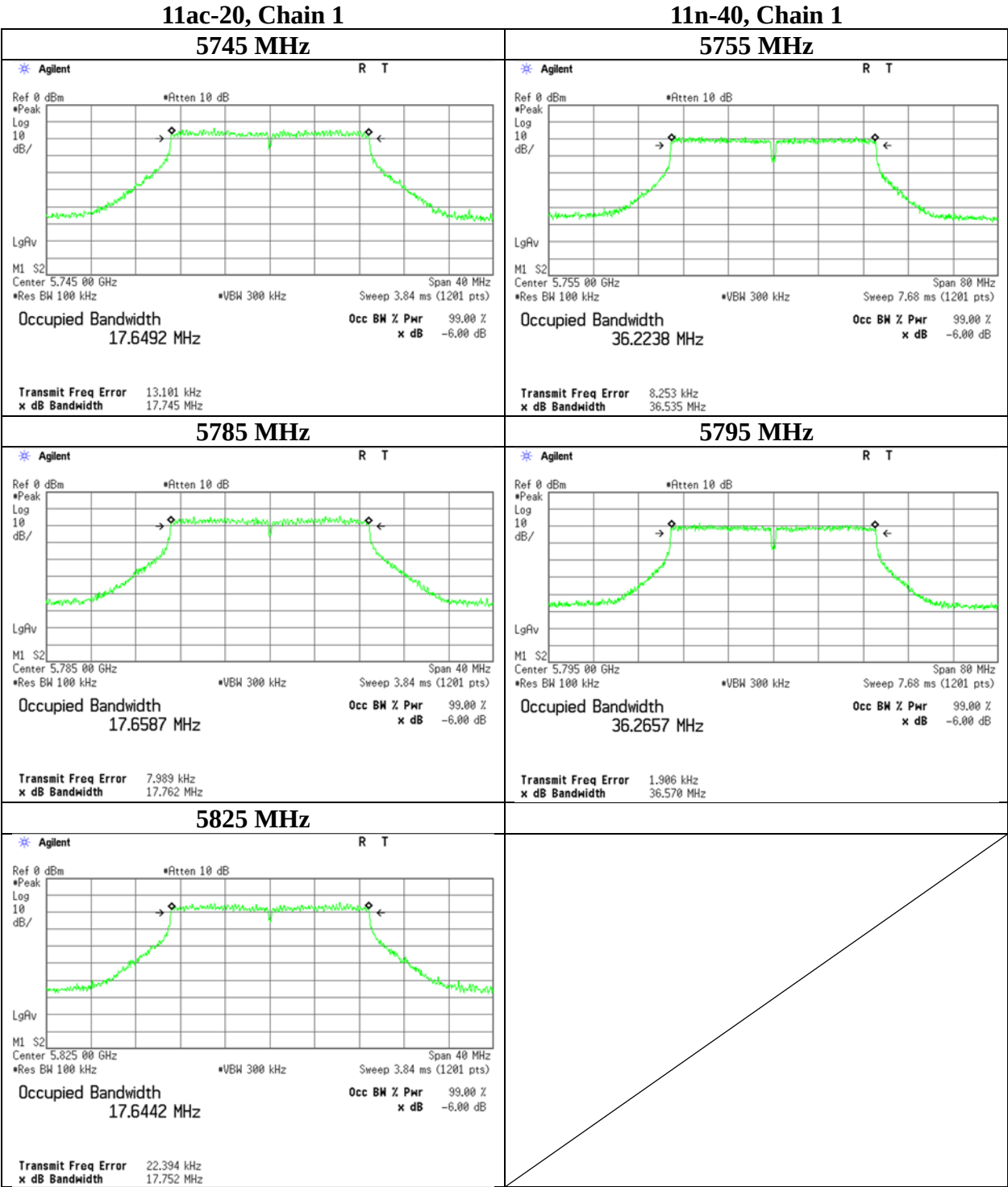
5825 MHz



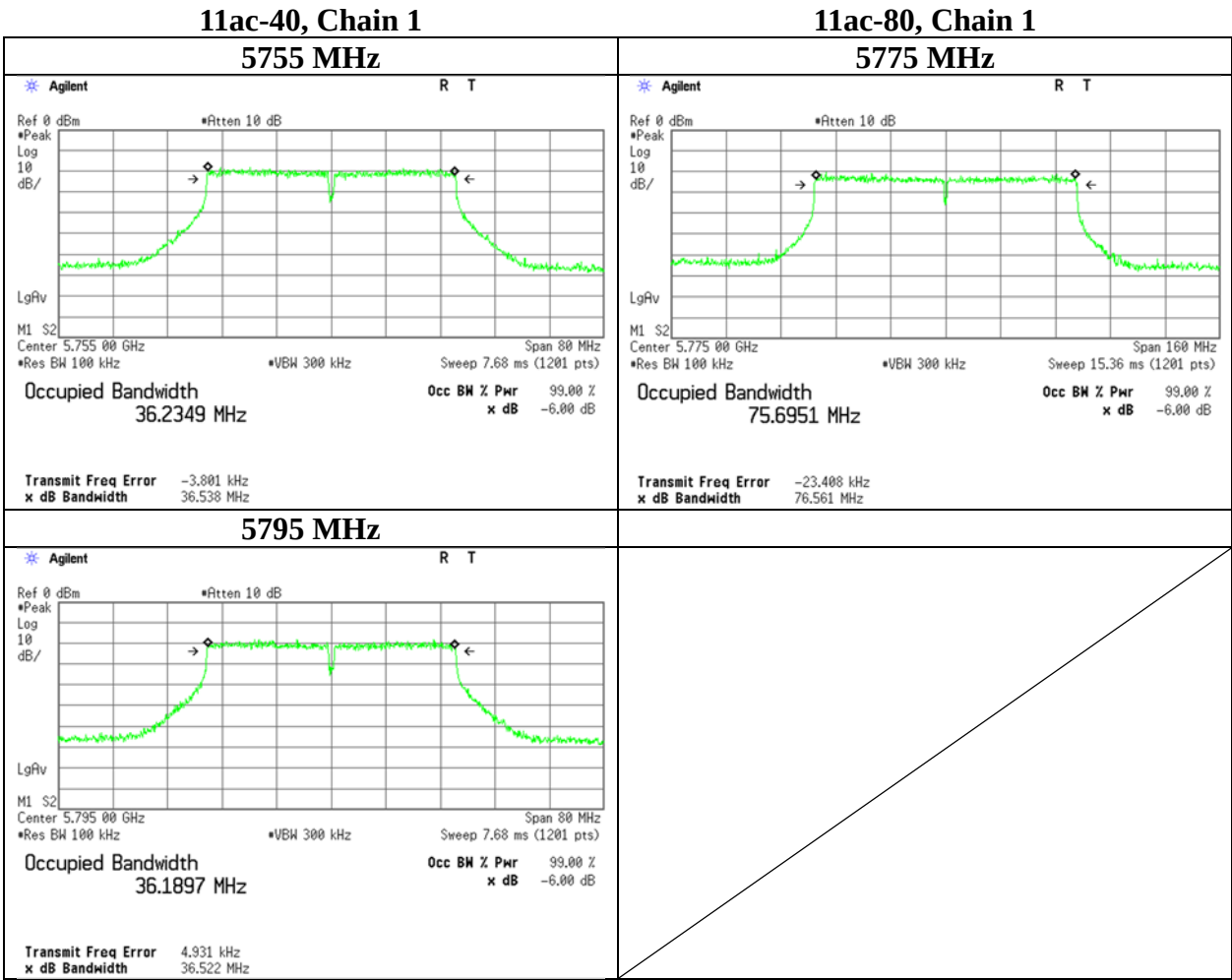
5825 MHz



6 dB Bandwidth



6 dB Bandwidth



Maximum Conducted Output Power

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 7, 2023
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Kiyoshiro Okazaki
Mode	Tx 11a

Chain 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
			1 [mW]	2 [mW]	Sum [mW]				1 [mW]	2 [mW]	Sum [mW]			
5180	-	16.932	7.98	6.87	14.85	11.72	23.97	12.25	12.36	10.64	23.00	13.62	29.97	16.35
5220	-	16.906	8.38	6.49	14.86	11.72	23.97	12.25	12.97	10.05	23.02	13.62	29.97	16.35
5240	-	16.940	8.26	6.50	14.76	11.69	23.97	12.28	12.79	10.07	22.86	13.59	29.97	16.38
5260	20.728	16.906	8.51	6.30	14.81	11.70	23.97	12.27	13.18	9.75	22.93	13.60	29.97	16.37
5300	20.564	16.901	8.30	6.58	14.88	11.72	23.97	12.25	12.85	10.19	23.04	13.62	29.97	16.35
5320	20.726	16.961	8.32	6.59	14.91	11.73	23.97	12.24	12.88	10.21	23.09	13.63	29.97	16.34
5500	20.583	16.837	7.80	6.93	14.73	11.68	23.97	12.29	12.08	10.74	22.82	13.58	29.97	16.39
5580	20.570	16.930	7.78	6.98	14.76	11.69	23.97	12.28	12.05	10.81	22.86	13.59	29.97	16.38
5700	20.400	16.862	7.38	7.41	14.79	11.70	23.97	12.27	11.43	11.48	22.91	13.60	29.97	16.37
5720	21.072	16.881	7.55	7.60	15.15	11.81	23.97	12.16	11.69	11.78	23.47	13.71	29.97	16.26
5745	-	16.837	7.28	7.91	15.18	11.81	30.00	18.19	11.27	12.25	23.52	13.71	36.00	22.29
5785	-	16.899	6.90	8.28	15.18	11.81	30.00	18.19	10.69	12.82	23.51	13.71	36.00	22.29
5825	-	16.970	6.92	8.28	15.20	11.82	30.00	18.18	10.72	12.82	23.54	13.72	36.00	22.28

Chain 0							Chain 1					
Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Directional Gain	Result		Power Meter Reading	Cable Loss	Atten. Loss	Directional Gain	Result	
					Cond. Power	e.i.r.p.					Cond. Power	e.i.r.p.
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]
5180	-0.98	0.40	9.60	1.90	9.02	10.92	-2.02	0.37	10.02	1.90	8.37	10.27
5220	-0.77	0.40	9.60	1.90	9.23	11.13	-2.27	0.37	10.02	1.90	8.12	10.02
5240	-0.83	0.40	9.60	1.90	9.17	11.07	-2.26	0.37	10.02	1.90	8.13	10.03
5260	-0.70	0.40	9.60	1.90	9.30	11.20	-2.40	0.37	10.02	1.90	7.99	9.89
5300	-0.81	0.40	9.60	1.90	9.19	11.09	-2.21	0.37	10.02	1.90	8.18	10.08
5320	-0.80	0.40	9.60	1.90	9.20	11.10	-2.20	0.37	10.02	1.90	8.19	10.09
5500	-1.10	0.40	9.62	1.90	8.92	10.82	-2.02	0.37	10.06	1.90	8.41	10.31
5580	-1.11	0.40	9.62	1.90	8.91	10.81	-1.99	0.37	10.06	1.90	8.44	10.34
5700	-1.34	0.40	9.62	1.90	8.68	10.58	-1.73	0.37	10.06	1.90	8.70	10.60
5720	-1.24	0.40	9.62	1.90	8.78	10.68	-1.62	0.37	10.06	1.90	8.81	10.71
5745	-1.40	0.40	9.62	1.90	8.62	10.52	-1.45	0.37	10.06	1.90	8.98	10.88
5785	-1.63	0.40	9.62	1.90	8.39	10.29	-1.25	0.37	10.06	1.90	9.18	11.08
5825	-1.62	0.40	9.62	1.90	8.40	10.30	-1.25	0.37	10.06	1.90	9.18	11.08

Sample Calculation:

Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Directional Gain = G ANT + Array Gain

G ANT = Set equal to the gain of the antenna having the highest gain

Array Gain = 0 dB(i.e.,no array gain) for N ANT < 4

N ANT = number of transmit antennas = 2

Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

Maximum Conducted Output Power

Test place

Ise EMC Lab. No.8 Measurement Room

Date

February 7, 2023

Temperature / Humidity

22 deg. C / 41 % RH

Engineer

Kiyoshiro Okazaki

Mode

Tx 11n-20

Chain 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
			1 [mW]	2 [mW]	Sum [mW]				1 [mW]	2 [mW]	Sum [mW]			
5180	-	18.001	8.36	6.19	14.55	11.63	23.97	12.34	12.94	9.59	22.54	13.53	29.97	16.44
5220	-	18.042	8.63	5.97	14.60	11.64	23.97	12.33	13.37	9.25	22.61	13.54	29.97	16.43
5240	-	17.965	8.69	5.94	14.63	11.65	23.97	12.32	13.46	9.20	22.66	13.55	29.97	16.42
5260	21.376	17.983	8.69	6.01	14.70	11.67	23.97	12.30	13.46	9.31	22.77	13.57	29.97	16.40
5300	21.678	17.984	7.98	6.21	14.19	11.52	23.97	12.45	12.36	9.62	21.98	13.42	29.97	16.55
5320	21.375	17.993	8.49	6.28	14.77	11.69	23.97	12.28	13.15	9.73	22.88	13.59	29.97	16.38
5500	21.387	17.982	7.89	6.15	14.04	11.47	23.97	12.50	12.22	9.53	21.75	13.37	29.97	16.60
5580	21.636	17.947	7.48	6.19	13.68	11.36	23.97	12.61	11.59	9.59	21.18	13.26	29.97	16.71
5700	21.220	18.017	7.23	6.40	13.63	11.34	23.97	12.63	11.19	9.91	21.10	13.24	29.97	16.73
5720	21.160	18.069	7.91	6.87	14.78	11.70	23.97	12.27	12.25	10.64	22.89	13.60	29.97	16.37
5745	-	18.051	8.07	6.79	14.86	11.72	30.00	18.28	12.50	10.52	23.02	13.62	36.00	22.38
5785	-	18.042	7.59	7.28	14.86	11.72	30.00	18.28	11.75	11.27	23.02	13.62	36.00	22.38
5825	-	18.024	7.35	7.38	14.72	11.68	30.00	18.32	11.38	11.43	22.81	13.58	36.00	22.42

Chain 0							Chain 1						
Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Directional Gain	Result		Power Meter Reading	Cable Loss	Atten. Loss	Directional Gain	Result		
					Cond. Power	e.i.r.p.					Cond. Power	e.i.r.p.	
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[dBm]	[dBm]
5180	-0.78	0.40	9.60	1.90	9.22	11.12	-2.05	0.37	9.60	1.90	7.92	9.82	11.72
5220	-0.64	0.40	9.60	1.90	9.36	11.26	-2.21	0.37	9.60	1.90	7.76	9.66	11.56
5240	-0.61	0.40	9.60	1.90	9.39	11.29	-2.23	0.37	9.60	1.90	7.74	9.64	11.54
5260	-0.61	0.40	9.60	1.90	9.39	11.29	-2.18	0.37	9.60	1.90	7.79	9.69	11.59
5300	-0.98	0.40	9.60	1.90	9.02	10.92	-2.04	0.37	9.60	1.90	7.93	9.83	11.73
5320	-0.71	0.40	9.60	1.90	9.29	11.19	-1.99	0.37	9.60	1.90	7.98	9.88	11.78
5500	-1.05	0.40	9.62	1.90	8.97	10.87	-2.10	0.37	9.62	1.90	7.89	9.79	11.69
5580	-1.28	0.40	9.62	1.90	8.74	10.64	-2.07	0.37	9.62	1.90	7.92	9.82	11.72
5700	-1.43	0.40	9.62	1.90	8.59	10.49	-1.93	0.37	9.62	1.90	8.06	9.96	11.86
5720	-1.04	0.40	9.62	1.90	8.98	10.88	-1.62	0.37	9.62	1.90	8.37	10.27	12.17
5745	-0.95	0.40	9.62	1.90	9.07	10.97	-1.67	0.37	9.62	1.90	8.32	10.22	12.12
5785	-1.22	0.40	9.62	1.90	8.80	10.70	-1.37	0.37	9.62	1.90	8.62	10.52	12.42
5825	-1.36	0.40	9.62	1.90	8.66	10.56	-1.31	0.37	9.62	1.90	8.68	10.58	12.48

Sample Calculation:

Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Directional Gain = G ANT + Array Gain

G ANT = Set equal to the gain of the antenna having the highest gain

Array Gain = 0 dB(i.e.,no array gain) for N ANT < 4

N ANT = number of transmit antennas = 2

Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 7, 2023
Temperature / Humidity	22 deg. C / 41 % RH
Engineer	Kiyoshiro Okazaki
Mode	Tx 11ac-20

Chain 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
			1 [mW]	2 [mW]	Sum [mW]				1 [mW]	2 [mW]	Sum [mW]			
5180	-	18.001	7.87	6.58	14.45	11.60	23.97	12.37	12.19	10.19	22.38	13.50	29.97	16.47
5220	-	18.083	8.69	6.64	15.33	11.85	23.97	12.12	13.46	10.28	23.74	13.75	29.97	16.22
5240	-	18.040	8.36	6.25	14.61	11.65	23.97	12.32	12.94	9.68	22.62	13.55	29.97	16.42
5260	21.555	18.084	8.41	5.87	14.29	11.55	23.97	12.42	13.03	9.10	22.13	13.45	29.97	16.52
5300	21.117	18.028	7.87	6.10	13.97	11.45	23.97	12.52	12.19	9.44	21.63	13.35	29.97	16.62
5320	21.402	18.024	7.94	6.01	13.96	11.45	23.97	12.52	12.30	9.31	21.61	13.35	29.97	16.62
5500	21.548	18.073	7.40	6.37	13.76	11.39	23.97	12.58	11.46	9.86	21.32	13.29	29.97	16.68
5580	21.332	18.020	6.98	6.61	13.59	11.33	23.97	12.64	10.81	10.23	21.05	13.23	29.97	16.74
5700	21.220	18.044	6.50	6.93	13.44	11.28	23.97	12.69	10.07	10.74	20.81	13.18	29.97	16.79
5720	21.017	18.041	6.71	7.24	13.96	11.45	23.97	12.52	10.40	11.22	21.62	13.35	29.97	16.62
5745	-	17.978	6.68	7.08	13.76	11.39	30.00	18.61	10.35	10.96	21.32	13.29	36.00	22.71
5785	-	18.009	6.46	7.83	14.29	11.55	30.00	18.45	10.00	12.13	22.13	13.45	36.00	22.55
5825	-	18.014	6.25	7.67	13.93	11.44	30.00	18.56	9.68	11.89	21.57	13.34	36.00	22.66

	Chain 0						Chain 1					
Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Directional Gain	Result		Power Meter Reading	Cable Loss	Atten. Loss	Directional Gain	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBi]	Cond. Power [dBm]	e.i.r.p. [dBm]	[dBm]	[dB]	[dB]	[dBi]	Cond. Power [dBm]	e.i.r.p. [dBm]
5180	-1.04	0.40	9.60	1.90	8.96	10.86	-1.79	0.37	9.60	1.90	8.18	10.08
5220	-0.61	0.40	9.60	1.90	9.39	11.29	-1.75	0.37	9.60	1.90	8.22	10.12
5240	-0.78	0.40	9.60	1.90	9.22	11.12	-2.01	0.37	9.60	1.90	7.96	9.86
5260	-0.75	0.40	9.60	1.90	9.25	11.15	-2.28	0.37	9.60	1.90	7.69	9.59
5300	-1.04	0.40	9.60	1.90	8.96	10.86	-2.12	0.37	9.60	1.90	7.85	9.75
5320	-1.00	0.40	9.60	1.90	9.00	10.90	-2.18	0.37	9.60	1.90	7.79	9.69
5500	-1.33	0.40	9.62	1.90	8.69	10.59	-1.95	0.37	9.62	1.90	8.04	9.94
5580	-1.58	0.40	9.62	1.90	8.44	10.34	-1.79	0.37	9.62	1.90	8.20	10.10
5700	-1.89	0.40	9.62	1.90	8.13	10.03	-1.58	0.37	9.62	1.90	8.41	10.31
5720	-1.75	0.40	9.62	1.90	8.27	10.17	-1.39	0.37	9.62	1.90	8.60	10.50
5745	-1.77	0.40	9.62	1.90	8.25	10.15	-1.49	0.37	9.62	1.90	8.50	10.40
5785	-1.92	0.40	9.62	1.90	8.10	10.00	-1.05	0.37	9.62	1.90	8.94	10.84
5825	-2.06	0.40	9.62	1.90	7.96	9.86	-1.14	0.37	9.62	1.90	8.85	10.75

Sample Calculation:

Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Directional Gain = G ANT + Array Gain

G ANT = Set equal to the gain of the antenna having the highest gain

Array Gain = 0 dB(i.e.,no array gain) for N ANT < 4

N ANT = number of transmit antennas = 2

Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

Maximum Conducted Output Power

Test place Ise EMC Lab. No.8 Measurement Room
Date February 7, 2023
Temperature / Humidity 22 deg. C / 41 % RH
Engineer Kiyoshiro Okazaki
Mode Tx 11n-40

Chain 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
			1 [mW]	2 [mW]	Sum [mW]				1 [mW]	2 [mW]	Sum [mW]			
5190	-	36.715	8.20	6.87	15.07	11.78	23.97	12.19	12.71	10.64	23.35	13.68	29.97	16.29
5230	-	36.714	8.53	6.59	15.12	11.80	23.97	12.17	13.21	10.21	23.42	13.70	29.97	16.27
5270	42.169	36.759	8.43	6.65	15.09	11.79	23.97	12.18	13.06	10.30	23.37	13.69	29.97	16.28
5310	41.964	36.641	7.93	7.05	14.97	11.75	23.97	12.22	12.27	10.91	23.19	13.65	29.97	16.32
5510	42.916	36.707	7.48	7.31	14.79	11.70	23.97	12.27	11.59	11.32	22.91	13.60	29.97	16.37
5550	42.608	36.728	7.36	7.52	14.88	11.73	23.97	12.24	11.40	11.64	23.04	13.63	29.97	16.34
5670	42.967	36.574	6.90	7.98	14.88	11.73	23.97	12.24	10.69	12.36	23.05	13.63	29.97	16.34
5710	43.363	36.789	7.01	8.34	15.35	11.86	23.97	12.11	10.86	12.91	23.78	13.76	29.97	16.21
5755	-	36.792	6.95	8.17	15.12	11.79	30.00	18.21	10.76	12.65	23.41	13.69	36.00	22.31
5795	-	36.681	6.58	8.61	15.19	11.81	30.00	18.19	10.19	13.34	23.52	13.71	36.00	22.29

Chain 0							Chain 1						
Tested Frequency	Power	Cable	Atten.	Directional	Result		Power	Cable	Atten.	Directional	Result		
	Meter	Loss	Loss	Gain	Cond.	e.i.r.p.	Meter	Loss	Loss	Gain	Cond.	e.i.r.p.	
	Reading				Power		Reading				Power		
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	
5190	-0.86	0.40	9.60	1.90	9.14	11.04	-2.02	0.37	10.02	1.90	8.37	10.27	
5230	-0.69	0.40	9.60	1.90	9.31	11.21	-2.20	0.37	10.02	1.90	8.19	10.09	
5270	-0.74	0.40	9.60	1.90	9.26	11.16	-2.16	0.37	10.02	1.90	8.23	10.13	
5310	-1.01	0.40	9.60	1.90	8.99	10.89	-1.91	0.37	10.02	1.90	8.48	10.38	
5510	-1.28	0.40	9.62	1.90	8.74	10.64	-1.79	0.37	10.06	1.90	8.64	10.54	
5550	-1.35	0.40	9.62	1.90	8.67	10.57	-1.67	0.37	10.06	1.90	8.76	10.66	
5670	-1.63	0.40	9.62	1.90	8.39	10.29	-1.41	0.37	10.06	1.90	9.02	10.92	
5710	-1.56	0.40	9.62	1.90	8.46	10.36	-1.22	0.37	10.06	1.90	9.21	11.11	
5755	-1.60	0.40	9.62	1.90	8.42	10.32	-1.31	0.37	10.06	1.90	9.12	11.02	
5795	-1.84	0.40	9.62	1.90	8.18	10.08	-1.08	0.37	10.06	1.90	9.35	11.25	

Sample Calculation:

Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Directional Gain = G ANT + Array Gain

G ANT = Set equal to the gain of the antenna having the highest gain

Array Gain = 0 dB(i.e.,no array gain) for N ANT < 4

N ANT = number of transmit antennas = 2

Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

Maximum Conducted Output Power

Test place

Ise EMC Lab. No.8 Measurement Room

Date

February 7, 2023

Temperature / Humidity

22 deg. C / 41 % RH

Engineer

Kiyoshiro Okazaki

Mode

Tx 11ac-40

Chain 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
			1 [mW]	2 [mW]	Sum [mW]				1 [mW]	2 [mW]	Sum [mW]			
5190	-	36.794	8.24	7.06	15.30	11.85	23.97	12.12	12.76	10.94	23.70	13.75	29.97	16.22
5230	-	36.722	8.51	7.01	15.53	11.91	23.97	12.06	13.18	10.86	24.05	13.81	29.97	16.16
5270	42.329	36.618	8.65	6.79	15.44	11.89	23.97	12.08	13.40	10.52	23.92	13.79	29.97	16.18
5310	41.584	36.625	8.26	7.06	15.32	11.85	23.97	12.12	12.79	10.94	23.73	13.75	29.97	16.22
5510	42.572	36.750	7.62	7.45	15.07	11.78	23.97	12.19	11.80	11.53	23.34	13.68	29.97	16.29
5550	42.890	36.745	7.48	7.53	15.02	11.77	23.97	12.20	11.59	11.67	23.26	13.67	29.97	16.30
5670	43.096	36.606	6.89	7.87	14.76	11.69	23.97	12.28	10.67	12.19	22.86	13.59	29.97	16.38
5710	42.527	36.625	7.06	8.20	15.27	11.84	23.97	12.13	10.94	12.71	23.65	13.74	29.97	16.23
5755	-	36.729	7.11	8.43	15.55	11.92	30.00	18.08	11.02	13.06	24.08	13.82	36.00	22.18
5795	-	36.706	7.00	8.71	15.71	11.96	30.00	18.04	10.84	13.49	24.33	13.86	36.00	22.14

Chain 0							Chain 1						
Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Directional Gain	Result		Power Meter Reading	Cable Loss	Atten. Loss	Directional Gain	Result		
					Cond. Power	e.i.r.p.					Cond. Power	e.i.r.p.	
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	
5190	-0.84	0.40	9.60	1.90	9.16	11.06	-1.90	0.37	10.02	1.90	8.49	10.39	
5230	-0.70	0.40	9.60	1.90	9.30	11.20	-1.93	0.37	10.02	1.90	8.46	10.36	
5270	-0.63	0.40	9.60	1.90	9.37	11.27	-2.07	0.37	10.02	1.90	8.32	10.22	
5310	-0.83	0.40	9.60	1.90	9.17	11.07	-1.90	0.37	10.02	1.90	8.49	10.39	
5510	-1.20	0.40	9.62	1.90	8.82	10.72	-1.71	0.37	10.06	1.90	8.72	10.62	
5550	-1.28	0.40	9.62	1.90	8.74	10.64	-1.66	0.37	10.06	1.90	8.77	10.67	
5670	-1.64	0.40	9.62	1.90	8.38	10.28	-1.47	0.37	10.06	1.90	8.96	10.86	
5710	-1.53	0.40	9.62	1.90	8.49	10.39	-1.29	0.37	10.06	1.90	9.14	11.04	
5755	-1.50	0.40	9.62	1.90	8.52	10.42	-1.17	0.37	10.06	1.90	9.26	11.16	
5795	-1.57	0.40	9.62	1.90	8.45	10.35	-1.03	0.37	10.06	1.90	9.40	11.30	

Sample Calculation:

Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Directional Gain = G ANT + Array Gain

G ANT = Set equal to the gain of the antenna having the highest gain

Array Gain = 0 dB(i.e.,no array gain) for N ANT < 4

N ANT = number of transmit antennas = 2

Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

Maximum Conducted Output Power

Test place Ise EMC Lab. No.8 Measurement Room
Date February 7, 2023
Temperature / Humidity 22 deg. C / 41 % RH
Engineer Kiyoshiro Okazaki
Mode Tx 11ac-80

Chain 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
			1 [mW]	2 [mW]	Sum [mW]				1 [mW]	2 [mW]	Sum [mW]			
5210	-	76.319	8.32	6.98	15.30	11.85	23.97	12.12	12.88	10.81	23.70	13.75	29.97	16.22
5290	87.089	76.253	8.02	7.08	15.10	11.79	23.97	12.18	12.42	10.96	23.38	13.69	29.97	16.28
5530	85.725	76.291	7.50	7.33	14.83	11.71	23.97	12.26	11.61	11.35	22.96	13.61	29.97	16.36
5610	85.714	76.407	7.14	7.48	14.63	11.65	23.97	12.32	11.07	11.59	22.65	13.55	29.97	16.42
5690	87.014	76.405	6.78	7.80	14.57	11.64	23.97	12.33	10.50	12.08	22.57	13.54	29.97	16.43
5775	-	76.261	7.00	8.18	15.18	11.81	30.00	18.19	10.84	12.68	23.52	13.71	36.00	22.29

	Chain 0						Chain 1					
Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Directional Gain	Result		Power Meter Reading	Cable Loss	Atten. Loss	Directional Gain	Result	
					Cond. Power	e.i.r.p.					Cond. Power	e.i.r.p.
					[dBm]	[dBm]					[dBm]	[dBm]
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]
5210	-0.80	0.40	9.60	1.90	9.20	11.10	-1.95	0.37	10.02	1.90	8.44	10.34
5290	-0.96	0.40	9.60	1.90	9.04	10.94	-1.89	0.37	10.02	1.90	8.50	10.40
5530	-1.27	0.40	9.62	1.90	8.75	10.65	-1.78	0.37	10.06	1.90	8.65	10.55
5610	-1.48	0.40	9.62	1.90	8.54	10.44	-1.69	0.37	10.06	1.90	8.74	10.64
5690	-1.71	0.40	9.62	1.90	8.31	10.21	-1.51	0.37	10.06	1.90	8.92	10.82
5775	-1.57	0.40	9.62	1.90	8.45	10.35	-1.30	0.37	10.06	1.90	9.13	11.03

Sample Calculation:

Conducted Power Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

e.i.r.p. Result = Conducted Power Result + Antenna Gain

Directional Gain = G ANT + Array Gain

G ANT = Set equal to the gain of the antenna having the highest gain

Array Gain = 0 dB(i.e.,no array gain) for N ANT < 4

N ANT = number of transmit antennas = 2

Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

Conducted Power Limit (5725 MHz-5850 MHz) = 1W

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.6 Measurement Room		
Date	October 21, 2022	October 24, 2022	November 17, 2022
Temperature / Humidity	22 deg. C / 40 % RH	22 deg. C / 43 % RH	23 deg. C / 46 % RH
Engineer	Takafumi Noguchi	Sayaka Hara	Takafumi Noguchi
Mode	Tx 11a		

5180 MHz

Mode	Rate	Reading (Burst average)						Remarks
		Chain		Chain		Sum		
		0	1	0	1	0+1	0+1	
11a	Mbps	[dBm]	[dBm]	[mW]	[mW]	[mW]	[dBm]	
SISO	6	-1.50		-	-	-	-	
	9	-1.56		-	-	-	-	
	12	-1.43		-	-	-	-	
	18	-1.41		-	-	-	-	
	24	-1.23		-	-	-	-	
	36	-1.18		-	-	-	-	
	48	-1.16		-	-	-	-	
	54	-1.14	-2.28	-	-	-	-	
CDD	6	-1.40	-2.49	0.65	0.50	1.15	0.60	
	9	-1.36	-2.60	0.65	0.49	1.14	0.57	
	12	-1.25	-2.48	0.67	0.50	1.17	0.69	
	18	-1.32	-2.44	0.66	0.51	1.17	0.67	
	24	-1.11	-2.19	0.69	0.54	1.23	0.89	
	36	-1.09	-2.25	0.69	0.53	1.22	0.88	
	48	-1.05	-2.17	0.70	0.54	1.24	0.94	
	54	-0.99	-2.17	0.71	0.54	1.25	0.97	*

* Worst rate

Sample Calculation:

All comparison were carried out on same frequency and measurement factors.

*The power setting values are different for rate check and final testing.

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.6 Measurement Room		
Date	October 13, 2022	October 24, 2022	November 7, 2022
Temperature / Humidity	22 deg. C / 60 % RH	22 deg. C / 43 % RH	22 deg. C / 45 % RH
Engineer	Hiroki Numata	Sayaka Hara	Keiya Ido
Mode	Tx 11n-20		

5180 MHz

Mode	MCS Number	Reading (Burst average)						Remarks
		Chain		Chain		Sum		
		0 [dBm]	1 [dBm]	0 [mW]	1 [mW]	0+1 [mW]	0+1 [dBm]	
11n-20 SISO	0	-2.09		-	-	-	-	
	1	-1.95		-	-	-	-	
	2	-2.00		-	-	-	-	
	3	-1.54		-	-	-	-	
	4	-1.46	-2.84	-	-	-	-	
	5	-1.62		-	-	-	-	
	6	-1.52		-	-	-	-	
	7	-1.49		-	-	-	-	
MIMO	8	-2.00	-3.20	0.63	0.48	1.11	0.45	
	9	-1.98	-3.22	0.63	0.48	1.11	0.45	
	10	-1.95	-3.23	0.64	0.48	1.11	0.47	
	11	-1.39	-2.68	0.73	0.54	1.27	1.02	
	12	-1.51	-2.64	0.71	0.54	1.25	0.97	
	13	-1.41	-2.69	0.72	0.54	1.26	1.01	
	14	-1.40	-2.60	0.72	0.55	1.27	1.05	*
	15	-1.49	-2.93	0.71	0.51	1.22	0.86	
CDD	0	-2.10	-3.55	0.62	0.44	1.06	0.25	
	1	-2.04	-3.51	0.63	0.45	1.07	0.30	
	2	-2.07	-3.49	0.62	0.45	1.07	0.29	
	3	-1.65	-3.07	0.68	0.49	1.18	0.71	
	4	-1.59	-3.05	0.69	0.50	1.19	0.75	
	5	-1.61	-3.02	0.69	0.50	1.19	0.75	
	6	-1.60	-3.06	0.69	0.49	1.19	0.74	
	7	-1.60	-3.03	0.69	0.50	1.19	0.75	

* Worst rate

Sample Calculation:

All comparison were carried out on same frequency and measurement factors.

*The power setting values are different for rate check and final testing.

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.6 Measurement Room		
Date	October 13, 2022	October 24, 2022	November 7, 2022
Temperature / Humidity	22 deg. C / 60 % RH	22 deg. C / 43 % RH	22 deg. C / 45 % RH
Engineer	Hiroki Numata	Sayaka Hara	Keiya Ido
Mode	Tx 11ac-20		

5180 MHz

Mode	MCS Number	Reading (Burst average)						Remarks
		Chain		Chain		Sum		
		0 [dBm]	1 [dBm]	0 [mW]	1 [mW]	0+1 [mW]	0+1 [dBm]	
11ac-20								
SISO	0	-2.05		-	-	-	-	
	1	-2.02		-	-	-	-	
	2	-2.00		-	-	-	-	
	3	-1.49		-	-	-	-	
	4	-1.56		-	-	-	-	
	5	-1.47		-	-	-	-	
	6	-1.45	-2.82	-	-	-	-	
	7	-1.50		-	-	-	-	
	8	-1.51		-	-	-	-	
MIMO	9	-1.94	-3.07	0.64	0.49	1.13	0.54	
	10	-1.93	-3.16	0.64	0.48	1.12	0.51	
	11	-1.95	-3.16	0.64	0.48	1.12	0.50	
	12	-1.67	-2.74	0.68	0.53	1.21	0.84	
	13	-1.48	-2.71	0.71	0.54	1.25	0.96	
	14	-1.53	-2.73	0.70	0.53	1.24	0.92	
	15	-1.40	-2.56	0.72	0.55	1.28	1.07	*
	16	-1.83	-2.69	0.66	0.54	1.19	0.77	
	17	-1.64	-2.68	0.69	0.54	1.22	0.88	
CDD	0	-2.13	-3.56	0.61	0.44	1.05	0.22	
	1	-2.08	-3.58	0.62	0.44	1.06	0.24	
	2	-2.06	-3.49	0.62	0.45	1.07	0.29	
	3	-1.50	-3.05	0.71	0.50	1.20	0.80	
	4	-1.53	-3.04	0.70	0.50	1.20	0.79	
	5	-1.54	-3.07	0.70	0.49	1.19	0.77	
	6	-1.58	-3.11	0.70	0.49	1.18	0.73	
	7	-1.49	-3.09	0.71	0.49	1.20	0.79	
	8	-1.53	-3.07	0.70	0.49	1.20	0.78	

* Worst rate

Sample Calculation:

All comparison were carried out on same frequency and measurement factors.

*The power setting values are different for rate check and final testing.

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.6 Measurement Room		
Date	October 13, 2022	October 25, 2022	November 7, 2022
Temperature / Humidity	22 deg. C / 60 % RH	23 deg. C / 40 % RH	22 deg. C / 45 % RH
Engineer	Hiroki Numata	Sayaka Hara	Keiya Ido
Mode	Tx 11n-40		

5190 MHz

Mode	MCS Number	Reading (Burst average)						Remarks
		Chain						
		0 [dBm]	1 [dBm]	0 [mW]	1 [mW]	0+1 [mW]	0+1 [dBm]	
11n-40								
SISO	0	-1.43		-	-	-	-	
	1	-1.44		-	-	-	-	
	2	-1.47		-	-	-	-	
	3	-1.40		-	-	-	-	
	4	-1.37	-2.87	-	-	-	-	
	5	-1.42		-	-	-	-	
	6	-1.41		-	-	-	-	
	7	-1.43		-	-	-	-	
MIMO	8	-1.40	-2.62	0.72	0.55	1.27	1.04	
	9	-1.45	-2.67	0.72	0.54	1.26	0.99	
	10	-1.41	-2.67	0.72	0.54	1.26	1.02	
	11	-1.32	-2.60	0.74	0.55	1.29	1.10	*
	12	-1.35	-2.57	0.73	0.55	1.29	1.09	
	13	-1.38	-2.58	0.73	0.55	1.28	1.07	
	14	-1.40	-2.55	0.72	0.56	1.28	1.07	
	15	-1.38	-2.55	0.73	0.56	1.28	1.08	
CDD	0	-1.45	-2.98	0.72	0.50	1.22	0.86	
	1	-1.54	-3.06	0.70	0.49	1.20	0.78	
	2	-1.50	-3.11	0.71	0.49	1.20	0.78	
	3	-1.44	-3.08	0.72	0.49	1.21	0.83	
	4	-1.37	-2.97	0.73	0.50	1.23	0.91	
	5	-1.40	-3.10	0.72	0.49	1.21	0.84	
	6	-1.39	-3.07	0.73	0.49	1.22	0.86	
	7	-1.43	-3.00	0.72	0.50	1.22	0.87	

* Worst rate

Sample Calculation:

All comparison were carried out on same frequency and measurement factors.

*The power setting values are different for rate check and final testing.

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.6 Measurement Room		
Date	October 13, 2022	October 25, 2022	November 7, 2022
Temperature / Humidity	22 deg. C / 60 % RH	23 deg. C / 40 % RH	22 deg. C / 45 % RH
Engineer	Hiroki Numata	Sayaka Hara	Keiya Ido
Mode	Tx 11ac-40		

5190 MHz

Mode	MCS Number	Reading (Burst average)						Remarks
		Chain		Chain		Sum		
		0 [dBm]	1 [dBm]	0 [mW]	1 [mW]	0+1 [mW]	0+1 [dBm]	
11ac-40								
SISO	0	-1.49		-	-	-	-	
	1	-1.49		-	-	-	-	
	2	-1.45		-	-	-	-	
	3	-1.46		-	-	-	-	
	4	-1.45		-	-	-	-	
	5	-1.49		-	-	-	-	
	6	-1.42	-2.73	-	-	-	-	
	7	-1.50		-	-	-	-	
	8	-1.49		-	-	-	-	
	9	-1.47		-	-	-	-	
MIMO	10	-1.54	-2.62	0.70	0.55	1.25	0.96	
	11	-1.44	-2.67	0.72	0.54	1.26	1.00	
	12	-1.41	-2.63	0.72	0.55	1.27	1.03	
	13	-1.42	-2.63	0.72	0.55	1.27	1.03	
	14	-1.50	-2.60	0.71	0.55	1.26	1.00	
	15	-1.45	-2.60	0.72	0.55	1.27	1.02	
	16	-1.35	-2.50	0.73	0.56	1.30	1.12	*
	17	-1.41	-2.58	0.72	0.55	1.27	1.05	
	18	-1.49	-2.61	0.71	0.55	1.26	1.00	
	19	-1.53	-2.59	0.70	0.55	1.25	0.98	
CDD	0	-1.39	-3.02	0.73	0.50	1.22	0.88	
	1	-1.35	-2.97	0.73	0.50	1.24	0.93	
	2	-1.36	-3.12	0.73	0.49	1.22	0.86	
	3	-1.30	-2.99	0.74	0.50	1.24	0.95	
	4	-1.30	-2.95	0.74	0.51	1.25	0.96	
	5	-1.35	-3.02	0.73	0.50	1.23	0.91	
	6	-1.30	-3.04	0.74	0.50	1.24	0.93	
	7	-1.38	-2.99	0.73	0.50	1.23	0.90	
	8	-1.36	-3.00	0.73	0.50	1.23	0.91	
	9	-1.35	-2.98	0.73	0.50	1.24	0.92	

* Worst rate

Sample Calculation:

All comparison were carried out on same frequency and measurement factors.

*The power setting values are different for rate check and final testing.

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.6 Measurement Room		
Date	October 13, 2022	October 25, 2022	November 7, 2022
Temperature / Humidity	22 deg. C / 60 % RH	23 deg. C / 40 % RH	22 deg. C / 45 % RH
Engineer	Hiroki Numata	Sayaka Hara	Keiya Ido
Mode	Tx 11ac-80		

5210 MHz

Mode	MCS Number	Reading (Burst average)						Remarks
		Chain		Chain		Sum		
		0 [dBm]	1 [dBm]	0 [mW]	1 [mW]	0+1 [mW]	0+1 [dBm]	
11ac-80								
SISO	0	-1.73		-	-	-	-	
	1	-1.67		-	-	-	-	
	2	-1.66		-	-	-	-	
	3	-1.47		-	-	-	-	
	4	-1.49		-	-	-	-	
	5	-1.48		-	-	-	-	
	6	-1.43	-2.76	-	-	-	-	
	7	-1.44		-	-	-	-	
	8	-1.48		-	-	-	-	
	9	-1.52		-	-	-	-	
MIMO	10	-1.60	-2.93	0.69	0.51	1.20	0.80	
	11	-1.62	-2.93	0.69	0.51	1.20	0.78	
	12	-1.60	-2.87	0.69	0.52	1.21	0.82	
	13	-1.46	-2.64	0.71	0.54	1.26	1.00	
	14	-1.48	-2.63	0.71	0.55	1.26	0.99	
	15	-1.45	-2.58	0.72	0.55	1.27	1.03	
	16	-1.42	-2.61	0.72	0.55	1.27	1.04	*
	17	-1.50	-2.62	0.71	0.55	1.25	0.99	
	18	-1.50	-2.60	0.71	0.55	1.26	1.00	
	19	-1.51	-2.61	0.71	0.55	1.25	0.99	
CDD	0	-1.48	-3.21	0.71	0.48	1.19	0.75	
	1	-1.50	-3.28	0.71	0.47	1.18	0.71	
	2	-1.41	-3.17	0.72	0.48	1.20	0.81	
	3	-1.30	-3.08	0.74	0.49	1.23	0.91	
	4	-1.26	-2.99	0.75	0.50	1.25	0.97	
	5	-1.31	-3.01	0.74	0.50	1.24	0.93	
	6	-1.31	-2.97	0.74	0.50	1.24	0.95	
	7	-1.29	-2.95	0.74	0.51	1.25	0.97	
	8	-1.28	-2.93	0.74	0.51	1.25	0.98	
	9	-1.30	-3.03	0.74	0.50	1.24	0.93	

* Worst rate

Sample Calculation:

All comparison were carried out on same frequency and measurement factors.

*The power setting values are different for rate check and final testing.

Average Output Power
(Reference data for RF Exposure)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 8, 2023
Temperature / Humidity	20 deg. C / 39 % RH
Engineer	Kiyoshiro Okazaki
Mode	Tx 11a

Tested Frequency [MHz]	Chain 0				Chain 1				Chain 0+1			
	Power Meter Reading	Cable Loss	Atten. Loss	Result (Burst average)	Power Meter Reading	Cable Loss	Atten. Loss	Result (Burst average)	Result (Burst average)		Sum	
	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]	[dB]	[dBm]	Antenna 1	Antenna 2	1+2 [mW]	[dBm]
5180	-1.10	0.40	9.60	8.90	-2.34	0.37	10.02	8.05	7.76	6.38	14.15	11.51
5220	-0.98	0.40	9.60	9.02	-2.49	0.37	10.02	7.90	7.98	6.17	14.15	11.51
5240	-1.04	0.40	9.60	8.96	-2.66	0.37	10.02	7.73	7.87	5.93	13.80	11.40
5260	-0.98	0.40	9.60	9.02	-2.57	0.37	10.02	7.82	7.98	6.05	14.03	11.47
5300	-1.19	0.40	9.60	8.81	-2.44	0.37	10.02	7.95	7.60	6.24	13.84	11.41
5320	-1.11	0.40	9.60	8.89	-2.49	0.37	10.02	7.90	7.74	6.17	13.91	11.43
5500	-1.30	0.40	9.62	8.72	-2.41	0.37	10.06	8.02	7.45	6.34	13.79	11.39
5580	-1.20	0.40	9.62	8.82	-2.29	0.37	10.06	8.14	7.62	6.52	14.14	11.50
5700	-1.70	0.40	9.62	8.32	-2.17	0.37	10.06	8.26	6.79	6.70	13.49	11.30
5720	-1.67	0.40	9.62	8.35	-1.95	0.37	10.06	8.48	6.84	7.05	13.89	11.43
5745	-1.70	0.40	9.62	8.32	-1.81	0.37	10.06	8.62	6.79	7.28	14.07	11.48
5785	-1.97	0.40	9.62	8.05	-1.62	0.37	10.06	8.81	6.38	7.60	13.99	11.46
5825	-2.09	0.40	9.62	7.93	-1.69	0.37	10.06	8.74	6.21	7.48	13.69	11.36

Sample Calculation:

Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power (Reference data for RF Exposure)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 8, 2023
Temperature / Humidity	20 deg. C / 39 % RH
Engineer	Kiyoshiro Okazaki
Mode	Tx 11n-20

Tested Frequency [MHz]	Chain 0				Chain 1				Chain 0+1			
	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst average) [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst average) [dBm]	Result (Burst average)			
									Antenna		Sum 1+2	
									1 [mW]	2 [mW]	[mW]	[dBm]
5180	-2.58	0.40	10.02	7.84	-2.45	0.37	9.60	7.52	6.08	5.65	11.73	10.69
5220	-2.23	0.40	10.02	8.19	-2.64	0.37	9.60	7.33	6.59	5.41	12.00	10.79
5240	-2.09	0.40	10.02	8.33	-2.68	0.37	9.60	7.29	6.81	5.36	12.17	10.85
5260	-2.06	0.40	10.02	8.36	-2.87	0.37	9.60	7.10	6.85	5.13	11.98	10.79
5300	-2.14	0.40	10.02	8.28	-2.66	0.37	9.60	7.31	6.73	5.38	12.11	10.83
5320	-1.98	0.40	10.02	8.44	-2.61	0.37	9.60	7.36	6.98	5.45	12.43	10.94
5500	-2.40	0.40	10.06	8.06	-2.41	0.37	9.62	7.58	6.40	5.73	12.13	10.84
5580	-2.48	0.40	10.06	7.98	-2.41	0.37	9.62	7.58	6.28	5.73	12.01	10.79
5700	-2.99	0.40	10.06	7.47	-2.25	0.37	9.62	7.74	5.58	5.94	11.53	10.62
5720	-2.95	0.40	10.06	7.51	-1.99	0.37	9.62	8.00	5.64	6.31	11.95	10.77
5745	-2.97	0.40	10.06	7.49	-1.99	0.37	9.62	8.00	5.61	6.31	11.92	10.76
5785	-3.24	0.40	10.06	7.22	-1.70	0.37	9.62	8.29	5.27	6.75	12.02	10.80
5825	-3.30	0.40	10.06	7.16	-1.66	0.37	9.62	8.33	5.20	6.81	12.01	10.79

Sample Calculation:

Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power (Reference data for RF Exposure)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 8, 2023
Temperature / Humidity	20 deg. C / 39 % RH
Engineer	Kiyoshiro Okazaki
Mode	Tx 11ac-20

Tested Frequency [MHz]	Chain 0				Chain 1				Chain 0+1			
	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst average) [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst average) [dBm]	Result (Burst average) Antenna		Sum 1+2	
									1 [mW]	2 [mW]	[mW]	[dBm]
5180	-2.18	0.40	10.02	8.24	-2.00	0.37	9.60	7.97	6.67	6.27	12.93	11.12
5220	-1.66	0.40	10.02	8.76	-2.09	0.37	9.60	7.88	7.52	6.14	13.65	11.35
5240	-1.44	0.40	10.02	8.98	-2.05	0.37	9.60	7.92	7.91	6.19	14.10	11.49
5260	-1.37	0.40	10.02	9.05	-2.22	0.37	9.60	7.75	8.04	5.96	13.99	11.46
5300	-1.55	0.40	10.02	8.87	-2.04	0.37	9.60	7.93	7.71	6.21	13.92	11.44
5320	-1.60	0.40	10.02	8.82	-1.96	0.37	9.60	8.01	7.62	6.32	13.94	11.44
5500	-1.78	0.40	10.06	8.68	-2.08	0.37	9.62	7.91	7.38	6.18	13.56	11.32
5580	-2.05	0.40	10.06	8.41	-1.79	0.37	9.62	8.20	6.93	6.61	13.54	11.32
5700	-2.30	0.40	10.06	8.16	-1.63	0.37	9.62	8.36	6.55	6.85	13.40	11.27
5720	-2.31	0.40	10.06	8.15	-1.30	0.37	9.62	8.69	6.53	7.40	13.93	11.44
5745	-2.39	0.40	10.06	8.07	-1.35	0.37	9.62	8.64	6.41	7.31	13.72	11.37
5785	-2.50	0.40	10.06	7.96	-1.15	0.37	9.62	8.84	6.25	7.66	13.91	11.43
5825	-2.70	0.40	10.06	7.76	-1.13	0.37	9.62	8.86	5.97	7.69	13.66	11.36

Sample Calculation:

Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power (Reference data for RF Exposure)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 8, 2023
Temperature / Humidity	20 deg. C / 39 % RH
Engineer	Kiyoshiro Okazaki
Mode	Tx 11n-40

Tested Frequency [MHz]	Chain 0				Chain 1				Chain 0+1			
	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst average) [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst average) [dBm]	Result (Burst average)			
									Antenna		Sum 1+2	
									1 [mW]	2 [mW]	[mW]	[dBm]
5190	-1.99	0.40	10.02	8.43	-1.96	0.37	9.60	8.01	6.97	6.32	13.29	11.24
5230	-1.47	0.40	10.02	8.95	-2.07	0.37	9.60	7.90	7.85	6.17	14.02	11.47
5270	-1.29	0.40	10.02	9.13	-2.23	0.37	9.60	7.74	8.18	5.94	14.13	11.50
5310	-1.41	0.40	10.02	9.01	-2.02	0.37	9.60	7.95	7.96	6.24	14.20	11.52
5510	-1.52	0.40	10.06	8.94	-1.86	0.37	9.62	8.13	7.83	6.50	14.34	11.56
5550	-1.71	0.40	10.06	8.75	-1.87	0.37	9.62	8.12	7.50	6.49	13.99	11.46
5670	-2.30	0.40	10.06	8.16	-1.57	0.37	9.62	8.42	6.55	6.95	13.50	11.30
5710	-2.25	0.40	10.06	8.21	-1.35	0.37	9.62	8.64	6.62	7.31	13.93	11.44
5755	-2.21	0.40	10.06	8.25	-1.27	0.37	9.62	8.72	6.68	7.45	14.13	11.50
5795	-2.65	0.40	10.06	7.81	-1.13	0.37	9.62	8.86	6.04	7.69	13.73	11.38

Sample Calculation:

Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Average Output Power (Reference data for RF Exposure)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 8, 2023
Temperature / Humidity	20 deg. C / 39 % RH
Engineer	Kiyoshiro Okazaki
Mode	Tx 11ac-40

Tested Frequency [MHz]	Chain 0				Chain 1				Chain 0+1			
	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst average) [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst average) [dBm]	Result (Burst average)			
									Antenna		Sum 1+2	
									1 [mW]	2 [mW]	[mW]	[dBm]
5190	-1.95	0.40	10.02	8.47	-2.00	0.37	9.60	7.97	7.03	6.27	13.30	11.24
5230	-1.51	0.40	10.02	8.91	-2.09	0.37	9.60	7.88	7.78	6.14	13.92	11.44
5270	-1.31	0.40	10.02	9.11	-2.15	0.37	9.60	7.82	8.15	6.05	14.20	11.52
5310	-1.32	0.40	10.02	9.10	-2.03	0.37	9.60	7.94	8.13	6.22	14.35	11.57
5510	-1.48	0.40	10.06	8.98	-1.76	0.37	9.62	8.23	7.91	6.65	14.56	11.63
5550	-1.64	0.40	10.06	8.82	-1.73	0.37	9.62	8.26	7.62	6.70	14.32	11.56
5670	-2.21	0.40	10.06	8.25	-1.50	0.37	9.62	8.49	6.68	7.06	13.75	11.38
5710	-2.25	0.40	10.06	8.21	-1.28	0.37	9.62	8.71	6.62	7.43	14.05	11.48
5755	-2.24	0.40	10.06	8.22	-1.24	0.37	9.62	8.75	6.64	7.50	14.14	11.50
5795	-2.45	0.40	10.06	8.01	-0.95	0.37	9.62	9.04	6.32	8.02	14.34	11.57

Sample Calculation:

Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

**The average output power was measured with the lowest order modulation and
lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.**

Average Output Power (Reference data for RF Exposure)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 8, 2023
Temperature / Humidity	20 deg. C / 39 % RH
Engineer	Kiyoshiro Okazaki
Mode	Tx 11ac-80

Tested Frequency [MHz]	Chain 0				Chain 1				Chain 0+1			
	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst average) [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Burst average) [dBm]	Result (Burst average)			
									Antenna		Sum 1+2	
									1 [mW]	2 [mW]	[mW]	[dBm]
5210	-1.98	0.40	10.02	8.44	-2.30	0.37	9.60	7.67	6.98	5.85	12.83	11.08
5290	-1.80	0.40	10.02	8.62	-2.20	0.37	9.60	7.77	7.28	5.98	13.26	11.23
5530	-1.83	0.40	10.06	8.63	-2.10	0.37	9.62	7.89	7.29	6.15	13.45	11.29
5610	-2.08	0.40	10.06	8.38	-2.01	0.37	9.62	7.98	6.89	6.28	13.17	11.19
5690	-2.55	0.40	10.06	7.91	-1.75	0.37	9.62	8.24	6.18	6.67	12.85	11.09
5775	-2.52	0.40	10.06	7.94	-1.58	0.37	9.62	8.41	6.22	6.93	13.16	11.19

Sample Calculation:

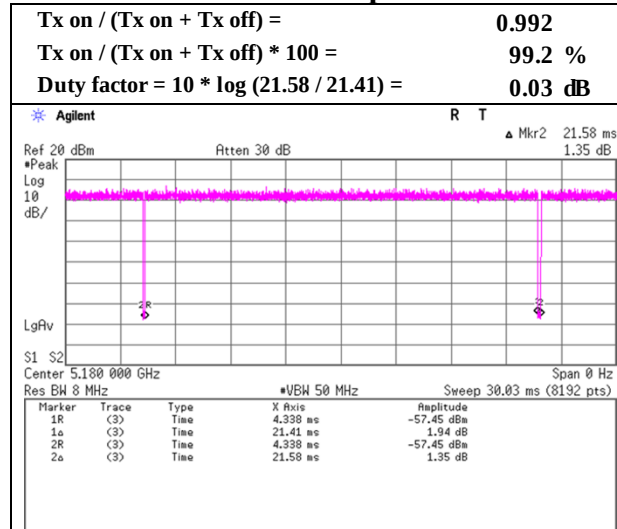
Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

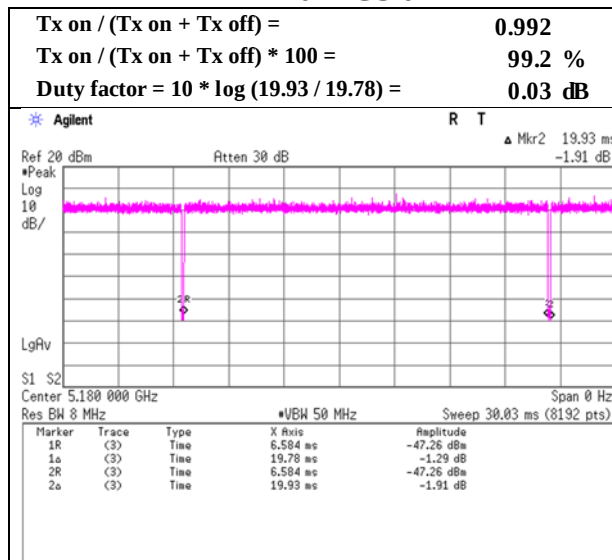
Burst rate confirmation

Test place	Ise EMC Lab. No.8 Measurement Room	
Date	October 25, 2022	November 18, 2022
Temperature / Humidity	23 deg. C / 40 % RH	21 deg. C / 44 % RH
Engineer	Sayaka Hara	Takafumi Noguchi
Mode	Tx	

11a 6 Mbps



11n-20 MCS 0



11ac-20 MCS 0

