



RADIO TEST REPORT

Test Report No. : 13462774S-C-R2

Applicant : Panasonic Corporation
Type of EUT : Car Navigation
Model Number of EUT : AT2105
FCC ID : ACJ932AT2105
Test regulation : FCC Part 15 Subpart E: 2020
Test result : Complied (Refer to SECTION 3.2)

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
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It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in SECTION 1.
10. This report is a revised version of 13462774S-C-R1. 13462774S-C-R1 is replaced with this report.

Date of test: August 19 to November 11, 2020

Representative test engineer:


Shiro Kobayashi
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Approved by:


Shinichi Takano
Engineer
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CERTIFICATE 1266.03

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

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REVISION HISTORY

Original Test Report No.: 13462774S-C

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13462774S-C	October 22, 2020	-	-
1	13462774S-C-R1	November 20, 2020	P.1	Correction of "Date of test": from August 19 to September 9, 2020 to August 19 to November 11, 2020
			P.11	Correction of "Operating Mode" at Radiated Spurious Emission (Above 1 GHz): from 3DH5 Hopping to DH5 Hopping
			P.11	Correction of "Operating Mode" at Radiated Spurious Emission (Above 1 GHz): from 11g to 11n-20
			P.11	Addition "Operating Mode" at Radiated Spurious Emission (Above 1 GHz): 11ac-80 MIMO with 11n-20 2437 MHz and DH5 Hopping
			P.11	Addition Comment: *3)
			P.18	Correction of "Carrier (Band edge)": from Worst case: < Car Navigation > Antenna polarization Carrier (Band edge) Horizontal 30 deg. Vertical 30 deg. to Worst case < Car Navigation > Antenna polarization Carrier (Band edge) Horizontal 0 deg. Vertical 0 deg. < Antenna > Antenna polarization Carrier (Band edge) Horizontal 30 deg. Vertical 30 deg. to < Antenna > Antenna polarization Carrier (Band edge) Horizontal -90 deg. Vertical 90 deg.
			P.201 to 202	Addition Data of Radiated Spurious Emission.
			P.205	Addition Test equipment: KSA-08, SAEC-03(SVSWR), SCC-G40, SCC-G43, SCC-G58, SFL-02, SHA-03.
			P.208	Addition comment: *1)
2	13462774S-C-R2	December 22, 2020	P.6	Correction of Radio Specification: from IEEE802.11ac (80 MHz band) 5210 MHz, 5755 MHz to IEEE802.11ac (80 MHz band) 5210 MHz, 5775 MHz

Reference: Abbreviations (Including words undescribed in this report)

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

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SECTION 1: Customer information

Company Name	:	Panasonic Corporation
Address	:	4261 Ikonobe-cho, Tsuzuki-ku, Yokohama-shi, Kanagawa-ken, 224-8520, Japan
Telephone Number	:	+81-50-3689-7112
Contact Person	:	Takahisa Sakai

The information provided from the customer is as follows;

- Applicant, Type of EUT, Model Number of EUT, FCC ID on the cover and other relevant pages
- Operating/Test Mode(s) (Mode(s)) on all the relevant pages
- SECTION 1: Customer information
- SECTION 2: Equipment under test (EUT) other than the Receipt Date
- SECTION 4: Operation of EUT during testing

* The laboratory is exempted from liability of any test results affected from the above information in SECTION 2 and 4.

SECTION 2: Equipment under test (EUT)

2.1 Identification of EUT

Type	:	Car Navigation
Model Number	:	AT2105
Serial Number	:	Refer to SECTION 4.2
Rating	:	DC 13.2 V
Receipt Date	:	July 31, 2020
Country of Mass-production	:	Japan, Mexico, Czech Republic
Condition	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification	:	No Modification by the test lab.

2.2 Product Description

Model: AT2105 (referred to as the EUT in this report) is a Car Navigation.

Radio Specification

	IEEE802.11b	IEEE802.11g	IEEE802.11n (20 MHz band)	IEEE802.11n (40 MHz band)
Frequency of operation	2412 MHz - 2462 MHz	2412 MHz - 2462 MHz	2412 MHz – 2462 MHz, 5180 MHz – 5240 MHz, 5745 MHz – 5825 MHz	5190 MHz, 5230 MHz, 5755 MHz, 5795 MHz
Channel spacing	5 MHz		2.4 GHz band: 5 MHz 5 GHz band: 20 MHz	40 MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)	
	IEEE802.11a	IEEE802.11ac (20 MHz band)	IEEE802.11ac (40 MHz band)	IEEE802.11ac (80 MHz band)
Frequency of operation	5180 MHz – 5240 MHz, 5745 MHz – 5825 MHz	5180 MHz – 5240 MHz, 5745 MHz – 5825 MHz	5190 MHz, 5230 MHz, 5755 MHz, 5795 MHz	5210 MHz, 5775 MHz
Channel spacing	20 MHz		40 MHz	80 MHz
Modulation	OFDM (64QAM, 16QAM, QPSK, BPSK)	OFDM (256QAM,16QAM,QPSK,BPSK)		
	Bluetooth (BR/EDR)		Bluetooth Low Energy	
Frequency of operation	2402 MHz – 2480 MHz		2402 MHz – 2480 MHz	
Channel spacing	1 MHz		2 MHz	
Modulation	FHSS, GFSK, $\pi/4$ DQPSK, 8DPSK		FHSS, GFSK	
Antenna type	Inverted F type antenna			
Antenna Gain	RF0	2.4 GHz WLAN	-1.44 dBi	
		U-NII-1	-1.25 dBi	
		U-NII-3	0.24 dBi	
	RF1	BT, BT LE	0.05 dBi	
		U-NII-1	0.33 dBi	
		U-NII-3	0.01 dBi	
Antenna Connector type	HFC IV Coaxial connector			
Operating Temperature	-30 deg. C to + 65 deg. C			

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart E
 FCC Part 15 final revised on October 13, 2020
 * The revision does not affect the test result conducted before its effective date.

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

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

3.2 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	-	N/A *1)	-
26 dB Emission Bandwidth	FCC: KDB Publication Number 789033 ISED: -	FCC: 15.407 (a) (1) (2) (3) ISED: -	See data	N/A	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 a)	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 b)	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	5.7 dB 871.153 MHz, QP, Hori. Mode: Tx 11ac-20 CDD 5240 MHz	Complied c) / d)	Conducted (< 30 MHz) / Radiated (> 30 MHz) *2)
6 dB Emission Bandwidth	FCC: ANSI C63.10-2013 ISED: -	FCC: 15.407 (e) ISED: RSS-247 6.2.4.1	See data	Complied e)	Conducted

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.

*1) The test is not applicable since the EUT does not have AC Mains.

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

a) Refer to APPENDIX 1 (data of Maximum Conducted Output Power)

b) Refer to APPENDIX 1 (data of Maximum Power Spectral Density)

c) Refer to APPENDIX 1 (data of Radiated Spurious Emission)

d) Refer to APPENDIX 1 (data of Conducted Spurious Emission)

e) Refer to APPENDIX 1 (data of 6 dB Bandwidth)

Symbols:

Complied The data of this test item has enough margin, more than the measurement uncertainty.

Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.

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

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FCC Part 15.31 (e)

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

FCC Part 15.203 Antenna requirement

The EUT has a unique antenna connector (HFC IV Coaxial connector). 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	- f)	Conducted
f) Refer to APPENDIX 1 (data of 99 % Occupied Bandwidth)					

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

3.4 Uncertainty

There is no applicable rule of uncertainty in this applied standard. Therefore, the following results are derived depending on whether or not laboratory uncertainty is applied.

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

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Item	Frequency range	Uncertainty (+/-)			
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4,5,6,8 SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.6 dB	2.6 dB	2.5 dB	2.6 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	3.0 dB	3.0 dB	3.0 dB	-
	30 MHz-200 MHz	4.6 dB	4.6 dB	4.6 dB	-
	200 MHz-1 GHz	6.0 dB	6.0 dB	6.0 dB	-
	1 GHz-6 GHz	4.9 dB	4.9 dB	4.9 dB	-
	6 GHz-18 GHz	5.5 dB	5.5 dB	5.5 dB	-
	18 GHz-40 GHz	5.4 dB	5.4 dB	5.4 dB	-
Radiated emission (Measurement distance: 1 m)	1 GHz-18 GHz	5.8 dB	5.8 dB	5.8 dB	-
	18 GHz-40 GHz	5.7 dB	5.7 dB	5.7 dB	-

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Power Measurement above 1 GHz (Average Detector)_SPM-06	0.98 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-06	1.75 dB
Power Measurement above 1 GHz (Average Detector)_SPM-07	0.89 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-07	1.12 dB
Power Measurement above 1 GHz (Average Detector)_SPM-13	1.06 dB
Power Measurement above 1 GHz (Peak Detector)_SPM-13	1.24 dB
Spurious emission (Conducted) below 1GHz	0.9 dB
Spurious emission (Conducted) 1 GHz-3 GHz	0.9 dB
Spurious emission (Conducted) 3 GHz-18 GHz	2.9 dB
Spurious emission (Conducted) 18 GHz-26.5 GHz	2.6 dB
Spurious emission (Conducted) 26.5 GHz-40 GHz	2.0 dB
Bandwidth Measurement	0.07 %
Duty cycle and Time Measurement	0.262 %
Temperature	0.95 deg.C.
Voltage	0.83 %

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3.5 Test Location

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A2LA Certificate Number: 1266.03 (FCC Test Firm Registration Number: 626366, ISED Lab Company Number: 2973D)

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Semi-anechoic chamber	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5 m
No.4 Semi-anechoic chamber	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
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	-	-

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 and also was judged the necessity of 802.11ac mode by the pre-test.

Mode	Remarks*
IEEE 802.11a SISO (11a SISO)	12 Mbps (RF0, RF1), PN9
IEEE 802.11a CDD (11a CDD)	12 Mbps (RF0 + RF1), PN9
IEEE 802.11n SISO 20 MHz BW (11n-20 SISO)	MCS 0 (RF0, RF1), PN9
IEEE 802.11n CDD 20 MHz BW (11n-20 CDD)	MCS 0 (RF0 + RF1), PN9
IEEE 802.11n MIMO 20 MHz BW (11n-20 MIMO)	MCS 8 (RF0 + RF1), PN9
IEEE 802.11ac SISO 20 MHz BW (11ac-20 SISO)	MCS 0 (RF0, RF1), PN9
IEEE 802.11ac CDD 20 MHz BW (11ac-20 CDD)	MCS 0 (RF0 + RF1), PN9
IEEE 802.11ac MIMO 20 MHz BW (11ac-20 MIMO)	MCS 0 (RF0 + RF1), PN9
IEEE 802.11n SISO 40 MHz BW (11n-40 SISO)	MCS 0 (RF0, RF1), PN9
IEEE 802.11n CDD 40 MHz BW (11n-40 CDD)	MCS 0 (RF0 + RF1), PN9
IEEE 802.11n MIMO 40 MHz BW (11n-40 MIMO)	MCS 8 (RF0 + RF1), PN9
IEEE 802.11ac SISO 40 MHz BW (11ac-40 SISO)	MCS 0 (RF0, RF1), PN9
IEEE 802.11ac CDD 40 MHz BW (11ac-40 CDD)	MCS 0 (RF0 + RF1), PN9
IEEE 802.11ac MIMO 40 MHz BW (11ac-40 MIMO)	MCS 0 (RF0 + RF1), PN9
IEEE 802.11ac SISO 80 MHz BW (11ac-80 SISO)	MCS 0 (RF0, RF1), PN9
IEEE 802.11ac CDD 80 MHz BW (11ac-80 CDD)	MCS 0 (RF0 + RF1), PN9
IEEE 802.11ac MIMO 80 MHz BW (11ac-80 MIMO)	MCS 0 (RF0 + RF1), PN9
*The worst antenna (RF1) and condition was determined based on the test result of Maximum Conducted Output Power.	
*Power of the EUT was set by the software as follows; Power settings: 4 dBm Software: Labtool Version: 2.0.0.71 (Date: 2020.05.29, Storage location: EUT memory)	
*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.	

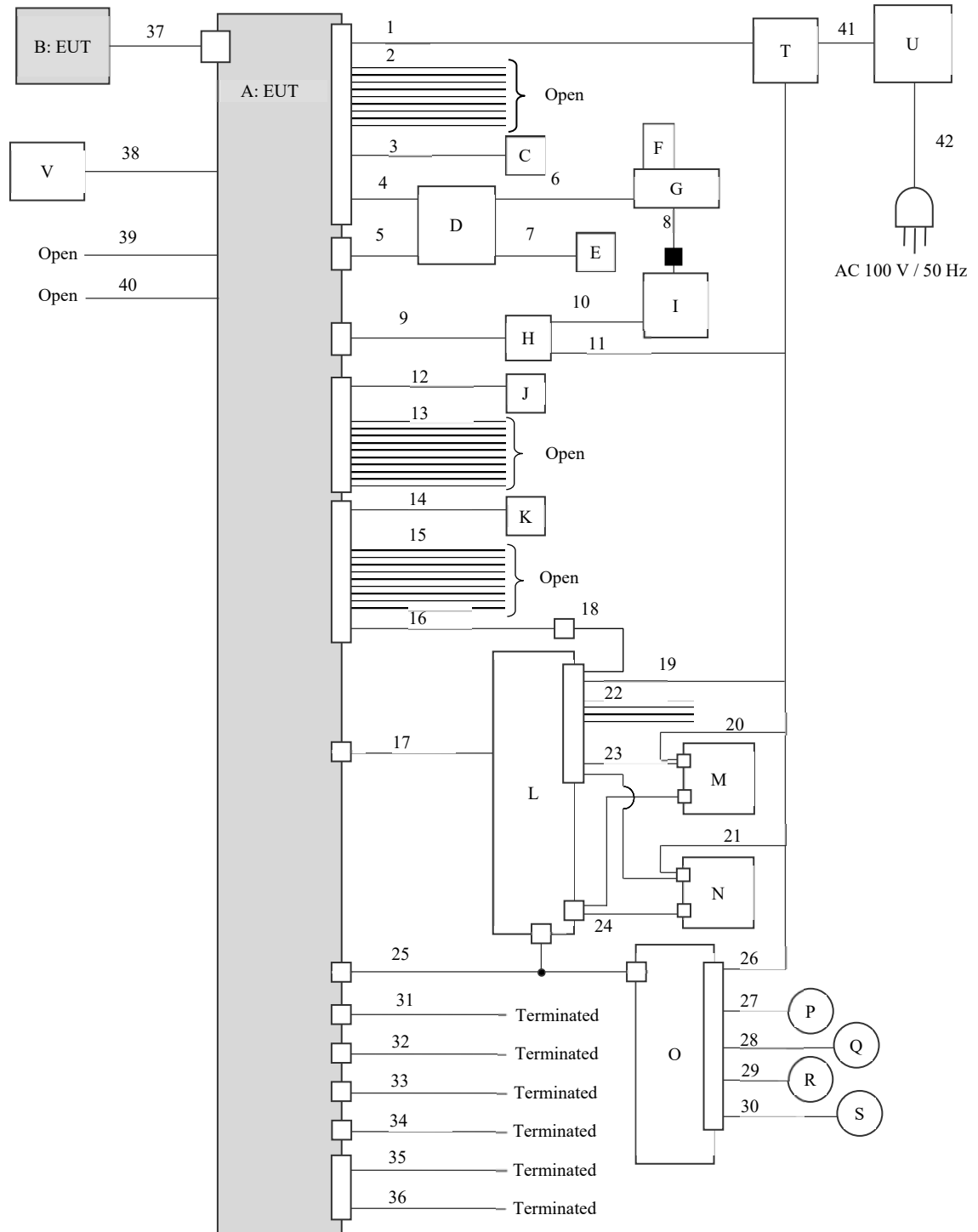
*The details of Operation mode(s)

Test Item	Operating Mode	Tested Antenna	Tested Frequency	
			U-NII-1 Band	U-NII-3 Band
99 % Occupied Bandwidth	11a SISO/CDD, 11n-20 SISO/CDD/MIMO, 11ac-20 SISO/CDD/MIMO	RF0	5180 MHz 5220 MHz 5240 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-40 SISO/CDD/MIMO, 11ac-40 SISO/CDD/MIMO	RF0	5190 MHz 5230 MHz	5755 MHz 5795 MHz
	11ac-80 SISO/CDD/MIMO	RF0	5210 MHz	5775 MHz
Maximum Conducted Output Power, Maximum Power Spectral Density	11a SISO, 11n-20 SISO, 11ac-20 SISO	RF0, RF1	5180 MHz 5220 MHz 5240 MHz	5745 MHz 5785 MHz 5825 MHz
	11a CDD, 11n-20 CDD, 11ac-20 CDD	RF0 + RF1	5180 MHz 5220 MHz 5240 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-20 MIMO, 11ac-20 MIMO	RF0 + RF1	5180 MHz 5220 MHz 5240 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-40 SISO, 11ac-40 SISO	RF0, RF1	5190 MHz 5230 MHz	5755 MHz 5795 MHz
	11n-40 CDD, 11ac-40 CDD	RF0 + RF1	5190 MHz 5230 MHz	5755 MHz 5795 MHz
	11n-40 MIMO, 11ac-40 MIMO	RF0 + RF1	5190 MHz 5230 MHz	5755 MHz 5795 MHz
	11ac-80 SISO	RF0, RF1	5210 MHz	5775 MHz
	11ac-80 CDD	RF0 + RF1	5210 MHz	5775 MHz
	11ac-80 MIMO	RF0 + RF1	5210 MHz	5775 MHz
6 dB Bandwidth	11a SISO/CDD, 11n-20 SISO/CDD/MIMO, 11ac-20 SISO/CDD/MIMO	RF0	-	5745 MHz 5785 MHz 5825 MHz
	11n-40 SISO/CDD/MIMO, 11ac-40 SISO/CDD/MIMO	RF0	-	5755 MHz 5795 MHz
	11ac-80 SISO/CDD/MIMO	RF0	-	5775 MHz
Radiated Spurious Emission (Below 1 GHz) *1)	11ac-20 CDD, 11ac-20 CDD with DH5 Hopping, 11ac-20 CDD with DH5 Hopping	RF0 + RF1	5240 MHz	-
Radiated Spurious Emission (Above 1 GHz)	11ac-20 CDD, 11ac-20 CDD with 11n-20 2437 MHz, 11ac-20 CDD with DH5 Hopping	RF0 + RF1	5180 MHz 5220 MHz 5240 MHz	5745 MHz 5785 MHz 5825 MHz
	11ac-40 CDD, 11ac-40 CDD with 11n-20 2437 MHz, 11ac-40 CDD with DH5 Hopping	RF0 + RF1	5190 MHz 5230 MHz	5755 MHz 5795 MHz
	11ac-80 CDD, 11ac-80 CDD with 11n-20 2437 MHz, 11ac-80 CDD with DH5 Hopping,	RF0 + RF1	5210 MHz	5775 MHz
	11ac-80 CDD with 11n-20 2437 MHz and DH5 Hopping *3)	RF0 + RF1	5210 MHz	-
Conducted Spurious Emission *2)	11ac-20 CDD	RF0	5240 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) The worst mode of two simultaneous transmission mode was measured as a representative, because the spurious characteristics of three simultaneous transmission was not deteriorated compared to two simultaneous transmission.				

4.2 Configuration and peripherals

< Radiated Emission test >

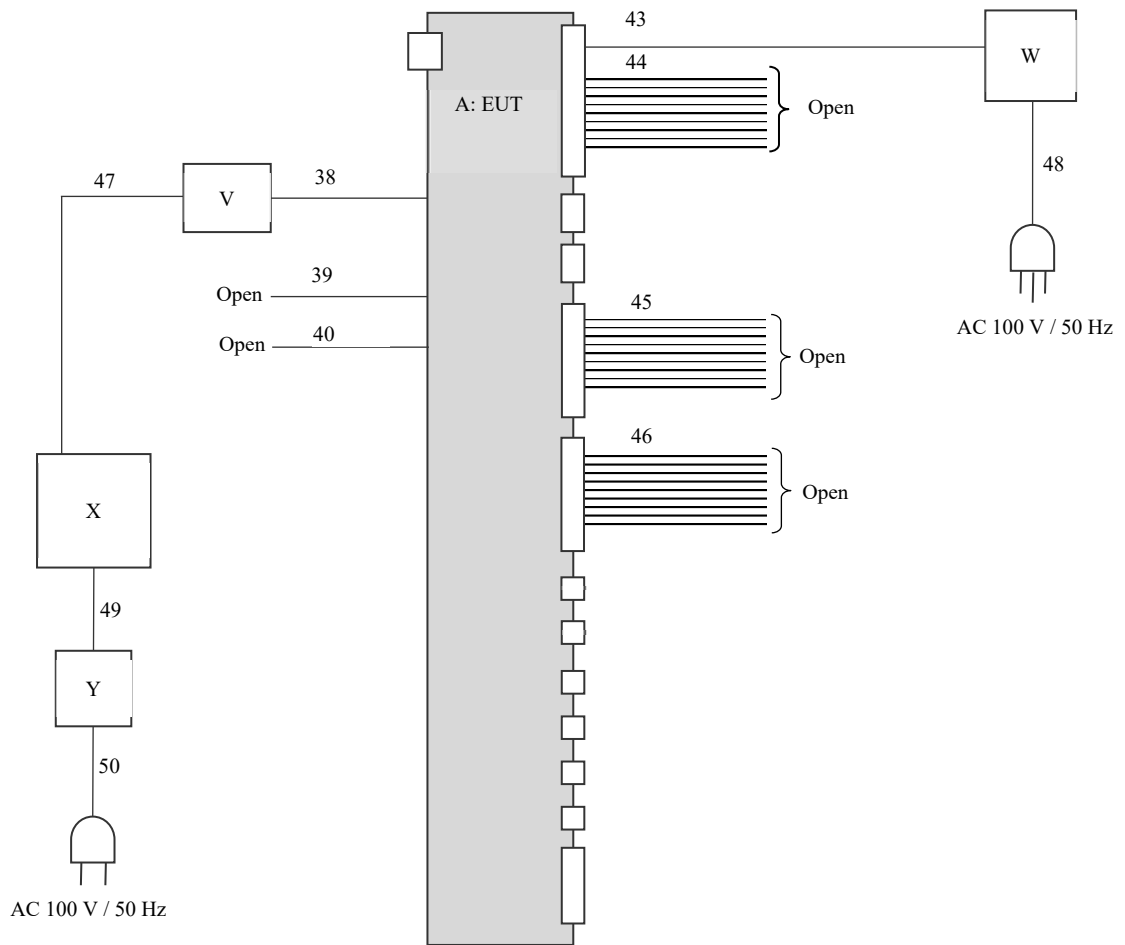
□ : Connector
■ : Ferrite core



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

*It was preliminary confirmed that there was no difference in emission level due to a standard ferrite core.

< Antenna Terminal Conducted test >



Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Navigation	AT2105	002 *1) 001 *2)	Panasonic Corporation	EUT
B	Antenna	CA-AL8BX0AJ	001	Panasonic Corporation	EUT
C	Steering Switch	-	1142	Panasonic Corporation	-
D	IF Box	DEP32-10078	033	Panasonic Corporation	-
E	Bluetooth Speaker	SRS-X11	2154715	Sony Corporation	-
F	USB memory	USM4GU	-	Sony Corporation	-
G	USB Hub	U3H-A422BX	0600341	ELECOM	-
H	JIG Bord	GVIF2HDJIG	16	Panasonic Corporation	-
I	Separate Display	On-Lap 1102I	11102100908028	TEKWIND	-
J	Mic	GP-SDA3510A	0DC062856	Panasonic Corporation	-
K	Mic	GP-SDA3510A	0DC062519	Panasonic Corporation	-
L	RSE ECU	CR-EL3BX0AJ	1S-188	Panasonic Corporation	-
M	RSE Display	CR-FL3BJ0AJ	107	Panasonic Corporation	-
N	RSE Display	CR-FL3BJ0AJ	108	Panasonic Corporation	-
O	MOST AMP	CL-DL47X2AJ	-	Panasonic Corporation	-
P	Speaker	KFC-RS160	-	KENWOOD	-
Q	Speaker	KFC-RS160	-	KENWOOD	-
R	Speaker	KFC-RS160	-	KENWOOD	-
S	Speaker	KFC-RS160	-	KENWOOD	-
T	Terminal Block	-	-	-	-
U	Power Supply (DC)	PAN35-10A	DE001677	KIKUSUI	-
V	Jig board	RCarDBG_JTAG2	WR19-4014 *1) WR12-3224 *2)	WESTEK	-
W	Power Supply (DC)	PAN35-10A	ML002085	KIKUSUI	-
X	Laptop Computer	7666-77J	LV-B8R1X 08/05	Lenovo	-
Y	AC Adapter	42T4422	11S92P1154Z1DXF 1DBFDN	Lenovo	-

*1) Used for Antenna Terminal conducted test

*2) Used for Radiated Emission test

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List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC	2.0	Unshielded	Unshielded	-
2	Signal	2.0	Unshielded	Unshielded	-
3	Signal	2.0 + 0.1	Unshielded	Unshielded	-
4	IF Box Power	2.0 + 0.3	Unshielded	Unshielded	-
5	Signal	2.0	Unshielded	Unshielded	-
6	USB	0.07	Shielded	Shielded	-
7	USB type C	0.9	Shielded	Shielded	-
8	USB	2.0	Shielded	Shielded	-
9	GVIF(Separate Display)	2.5	Shielded	Shielded	-
10	HDMI	1.2	Shielded	Shielded	-
11	DC	1.0	Unshielded	Unshielded	-
12	Mic	2.0 + 0.5	Unshielded	Unshielded	-
13	Signal	2.0	Unshielded	Unshielded	-
14	Mic	2.0 + 0.5	Unshielded	Unshielded	-
15	Signal	2.0	Unshielded	Unshielded	-
16	Signal	2.0	Unshielded	Unshielded	-
17	RSE	3.0	Shielded	Shielded	-
18	Signal	1.0	Unshielded	Unshielded	-
19	DC	1.0	Unshielded	Unshielded	-
20	DC	2.0	Unshielded	Unshielded	-
21	DC	2.0	Unshielded	Unshielded	-
22	Signal	1.0	Unshielded	Unshielded	-
23	RSE DISP-ECU	2.0	Shielded	Shielded	-
24	Main(RSE)	1.0	Unshielded	Unshielded	-
25	MOST AMP	2.5	Unshielded	Unshielded	-
26	DC	1.0	Unshielded	Unshielded	-
27	Speaker	1.0	Unshielded	Unshielded	-
28	Speaker	1.0	Unshielded	Unshielded	-
29	Speaker	1.0	Unshielded	Unshielded	-
30	Speaker	1.0	Unshielded	Unshielded	-
31	A2B	3.0	Unshielded	Unshielded	-
32	DCM	3.0	Shielded	Shielded	-
33	GPS	0.12 + 1.5	Shielded	Shielded	-
34	Sirius XM	2.5	Unshielded	Unshielded	-
35	FM	1.5	Shielded	Shielded	-
36	FM	1.5	Shielded	Shielded	-
37	BT/WLAN Antenna	0.3	Shielded	Shielded	-
38	Signal	0.1	Unshielded	Unshielded	*3)
39	Signal	0.2	Unshielded	Unshielded	*3)
40	UART	0.3	Unshielded	Unshielded	*3)
41	DC	1.0	Unshielded	Unshielded	-
42	AC	2.0	Unshielded	Unshielded	-
43	DC	1.0	Unshielded	Unshielded	-
44	Signal	0.2	Unshielded	Unshielded	-
45	Signal	0.2	Unshielded	Unshielded	-
46	Signal	0.2	Unshielded	Unshielded	-
47	USB	1.5	Shielded	Shielded	-
48	AC	2.0	Unshielded	Unshielded	-
49	DC	1.8	Unshielded	Unshielded	-
50	AC	0.9	Unshielded	Unshielded	-

*3) This cable is for testing and is not included with products.

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SECTION 5: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

< Below 1GHz >

EUT was placed on a urethane platform of nominal size, 1.0 m by 2.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

< Above 1GHz >

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.14 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 U-NII-3 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:

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

Test Antennas are used as below;

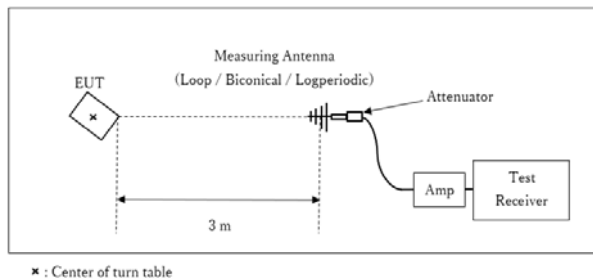
Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

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 MHz (T: Burst length, refer to Appendix) Detector: Peak Trace mode: 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".

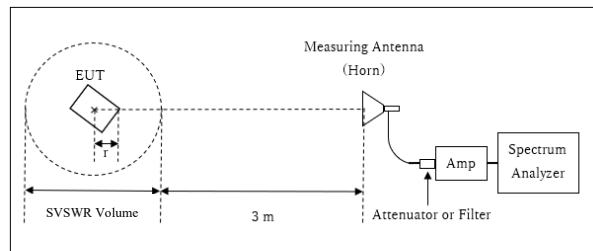
Figure 2: Test Setup

Below 1 GHz



Test Distance: 3 m

1 GHz - 10 GHz



Distance Factor: $20 \times \log (3.82 \text{ m} / 3.0 \text{ m}) = 2.10 \text{ dB}$

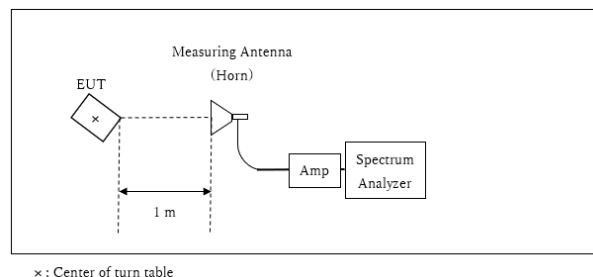
* Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.82 \text{ m}$

SVSWR Volume : 2.0 m

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

$r = 0.18 \text{ m}$

10 GHz - 40 GHz



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 0 deg. and 30 deg. of Car Navigation, and 0 deg. 90 deg. and -90 deg. of Antenna to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Worst case:

< Car Navigation >

Antenna polarization	Carrier (Band edge)	Spurious				
		Below 1 GHz	Above 1 GHz			
			1 GHz - 6.4 GHz	6.4 GHz - 10 GHz	10 GHz - 18 GHz	18 GHz - 40 GHz
Horizontal	0 deg.	0 deg.	0 deg.	0 deg.	0 deg.	0 deg.
Vertical	0 deg.	0 deg.	0 deg.	0 deg.	0 deg.	0 deg.

< Antenna >

Antenna polarization	Carrier (Band edge)	Spurious				
		Below 1 GHz	Above 1 GHz			
			1 GHz - 6.4 GHz	6.4 GHz - 10 GHz	10 GHz - 18 GHz	18 GHz - 40 GHz
Horizontal	-90 deg.	0 deg.	-90 deg.	-90 deg.	0 deg.	0 deg.
Vertical	90 deg.	0 deg.	90 deg.	90 deg.	0 deg.	0 deg.

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

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

SECTION 6: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
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	-	-	-	-	Average	-	Power Meter (Sensor: 160 MHz BW) (Method PM-G)
Maximum Power Spectral Density	Encompass the entire EBW	1 MHz or 100 kHz *2)	≥ 3 RBW	Auto	RMS Power Averaging (100 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*3) *4)	9 kHz – 150 kHz 150 kHz – 30 MHz	200 Hz 10 kHz	620 Hz 30 kHz	Auto	Peak	Max Hold	Spectrum Analyzer

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

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

*2) KDB 789033 D02 says that RBW is set to be 500 kHz for 5.725 GHz-5.850 GHz, but it is not possible with spectrum analyzer, so RBW Correction Factor ($10 \log(500 \text{ kHz} / 100 \text{ kHz})$) 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 low enough as shown in the chart. (9 kHz-150 kHz: RBW = 200 Hz, 150 kHz-30 MHz: RBW = 10 kHz).

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

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

99 % Occupied Bandwidth

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	September 5, 2020
Temperature / Humidity	24 deg. C / 49 % RH
Engineer	Toshinori Yamada
Mode	Tx

11a SISO

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5180	16723.5
	5220	16732.2
	5240	16730.1
	5745	16718.9
	5785	16734.1
	5825	16747.5

11n-20 SISO

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5180	17759.3
	5220	17780.7
	5240	17757.8
	5745	17745.2
	5785	17753.1
	5825	17784.6

11a CDD

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5180	16721.7
	5220	16738.1
	5240	16731.9
	5745	16722.9
	5785	16738.4
	5825	16740.2

11n-20 CDD

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5180	17789.7
	5220	17756.6
	5240	17747.5
	5745	17758.8
	5785	17759.9
	5825	17773.6

11n-20 MIMO

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5180	17767.6
	5220	17779.9
	5240	17778.3
	5745	17755.1
	5785	17750.1
	5825	17772.1

99 % Occupied Bandwidth

Report No. 13462774S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 5, 2020
Temperature / Humidity 24 deg. C / 49 % RH
Engineer Toshinori Yamada
Mode Tx

11ac-20 SISO

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5180	17793.4
	5220	17745.8
	5240	17759.0
	5745	17730.2
	5785	17784.1
	5825	17780.1

11n-40 SISO

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5190	36404.6
	5230	36418.6
	5755	36378.6
	5795	36417.0

11ac-20 CDD

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5180	17765.8
	5220	17758.4
	5240	17731.2
	5745	17749.7
	5785	17765.2
	5825	17740.6

11n-40 CDD

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5190	36343.1
	5230	36393.6
	5755	36393.5
	5795	36398.7

11ac-20 MIMO

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5180	17767.3
	5220	17776.5
	5240	17768.9
	5745	17769.4
	5785	17788.8
	5825	17789.9

11n-40 MIMO

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5190	36389.4
	5230	36435.4
	5755	36418.3
	5795	36426.9

99 % Occupied Bandwidth

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	September 5, 2020
Temperature / Humidity	24 deg. C / 49 % RH
Engineer	Toshinori Yamada
Mode	Tx

11ac-40 SISO

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5190	36424.6
	5230	36414.3
	5755	36394.0
	5795	36430.3

11ac-80 SISO

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5210	76426.1
	5775	76695.7

11ac-40 CDD

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5190	36435.2
	5230	36434.6
	5755	36401.5
	5795	36409.4

11ac-80 CDD

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5210	76332.1
	5775	76323.8

11ac-40 MIMO

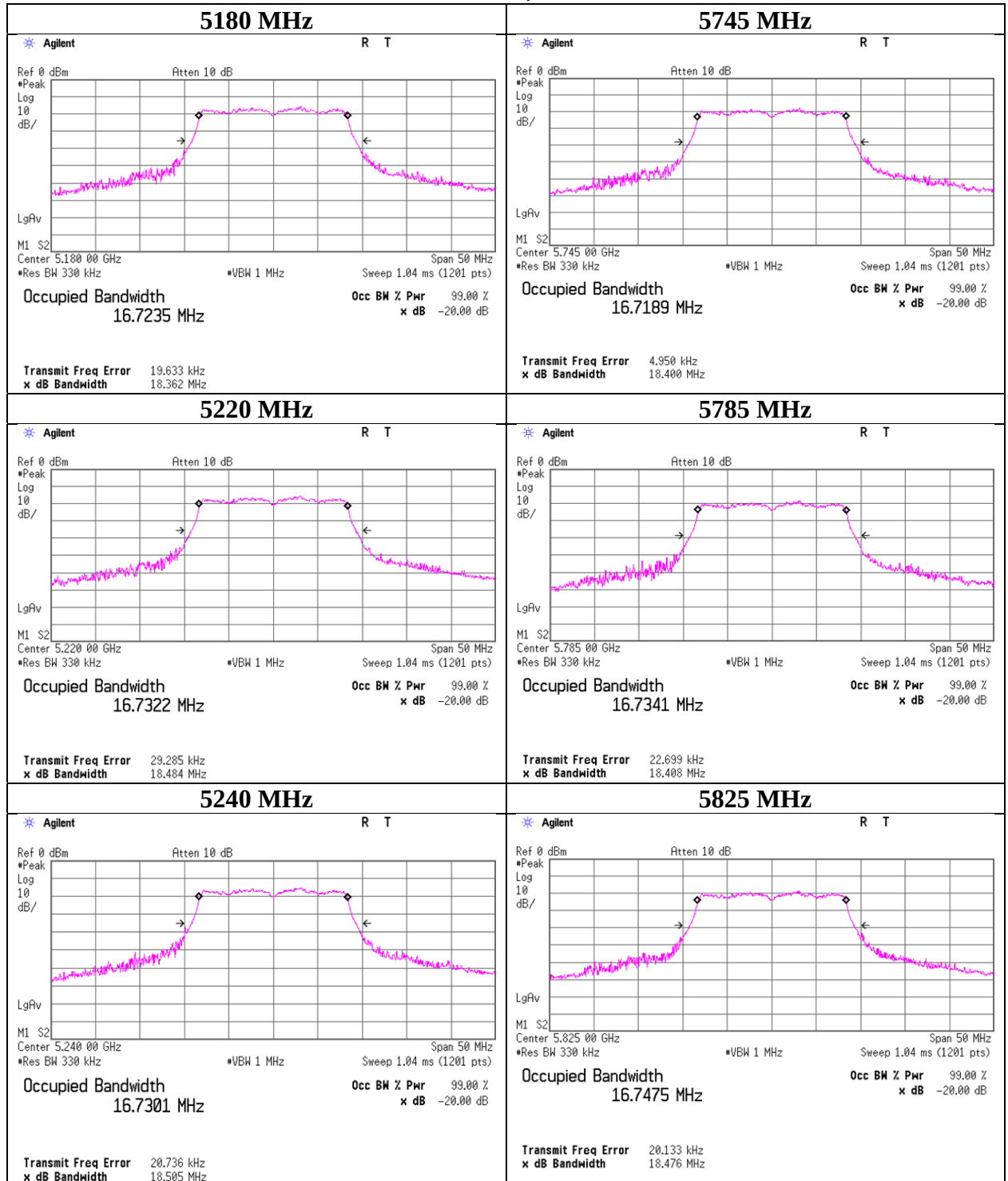
Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5190	36356.5
	5230	36425.4
	5755	36397.3
	5795	36404.1

11ac-80 MIMO

Antenna	Tested Frequency [MHz]	99 % Occupied Bandwidth [kHz]
RF0	5210	76369.7
	5775	76458.0

99 % Occupied Bandwidth

11a SISO, RF0



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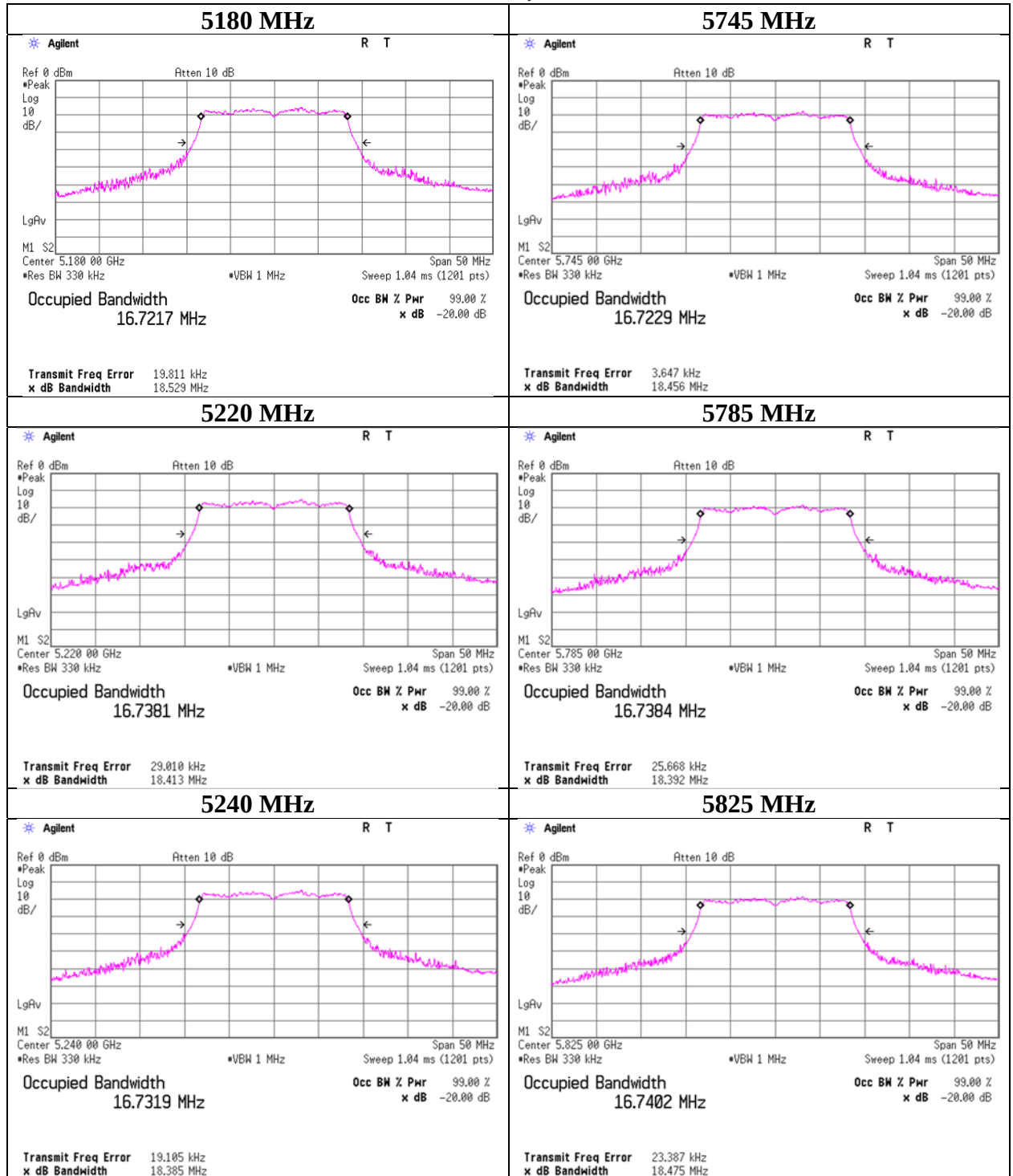
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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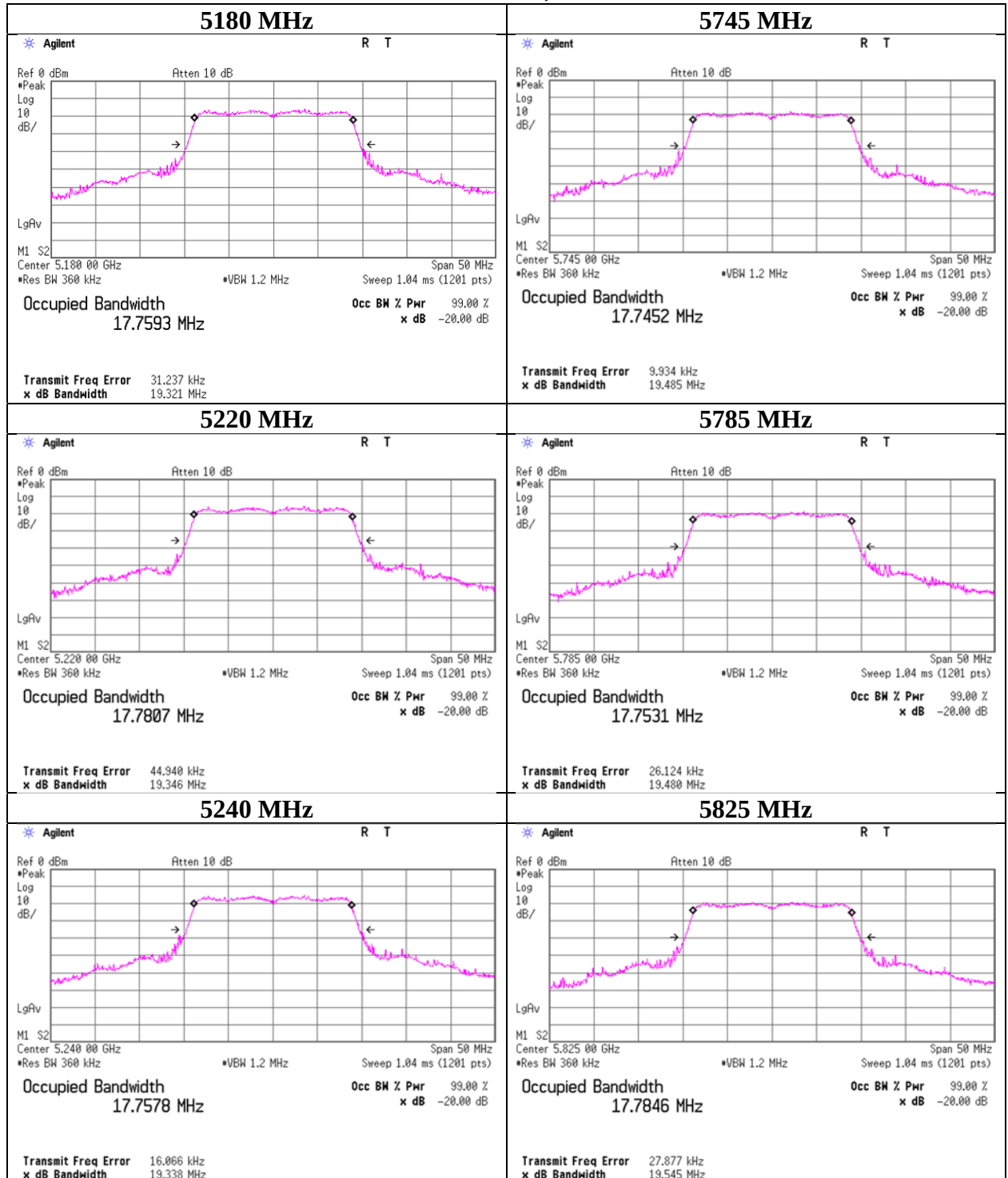
99 % Occupied Bandwidth

11a CDD, RF0



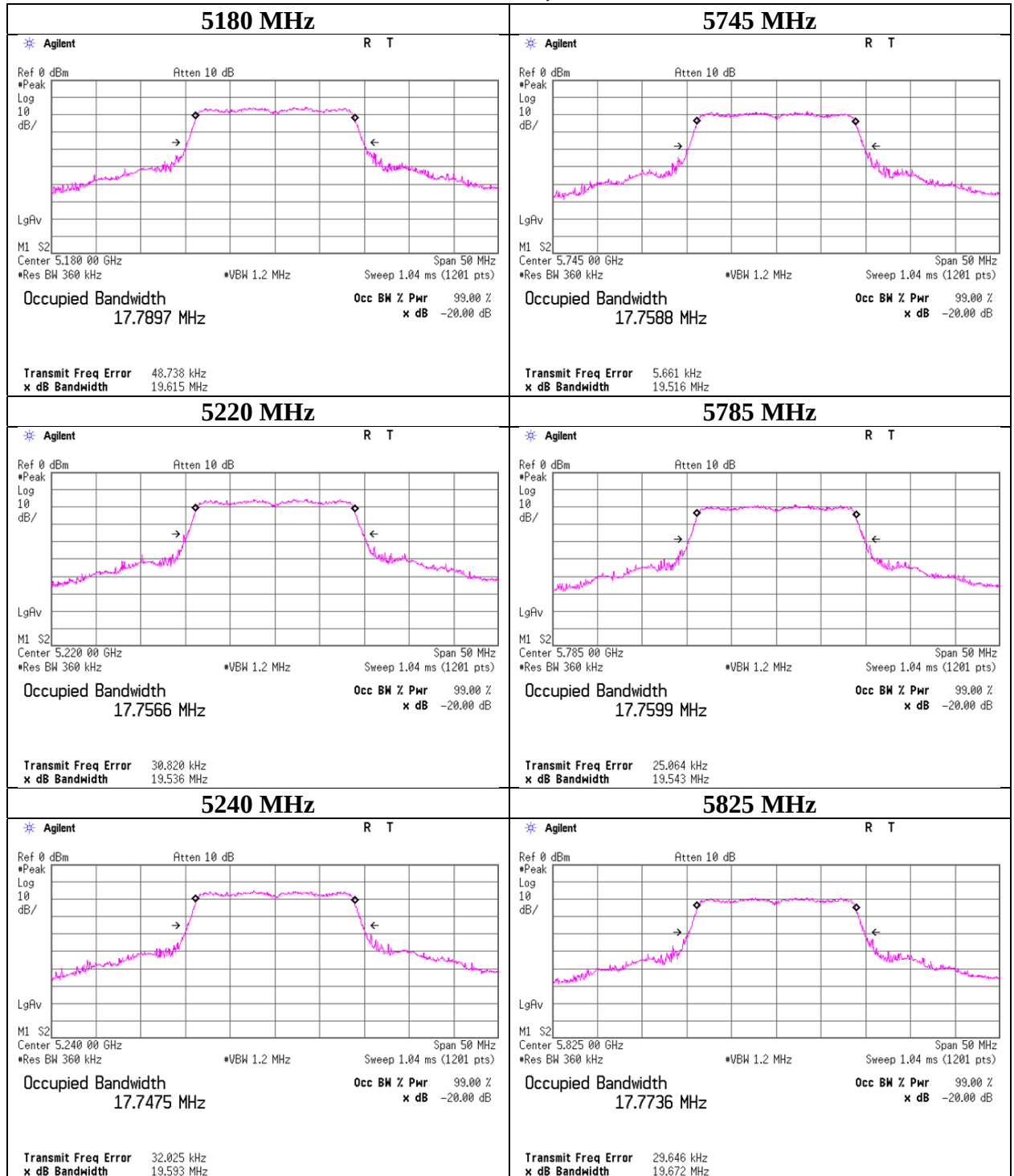
99 % Occupied Bandwidth

11n-20 SISO, RF0



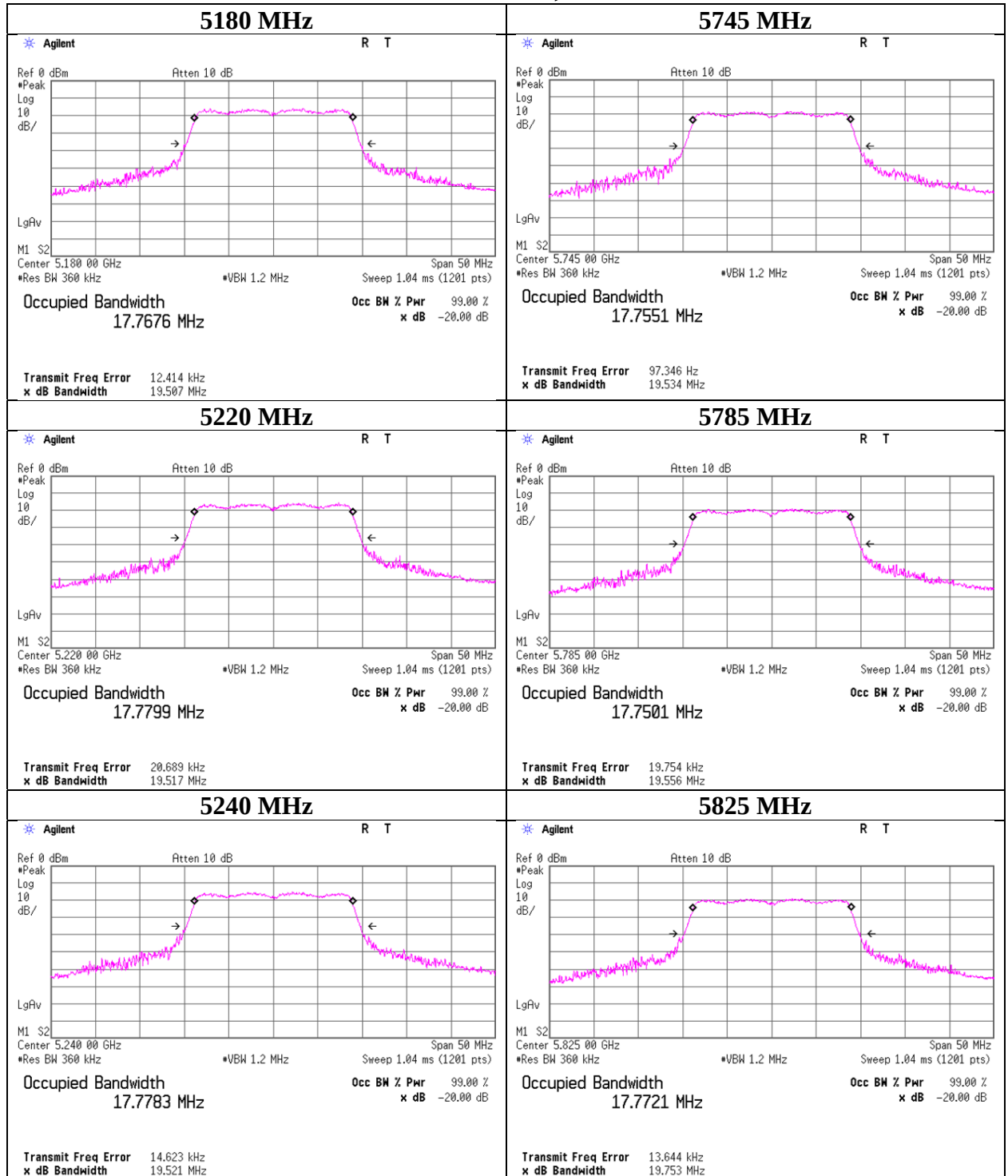
99 % Occupied Bandwidth

11n-20 CDD, RF0



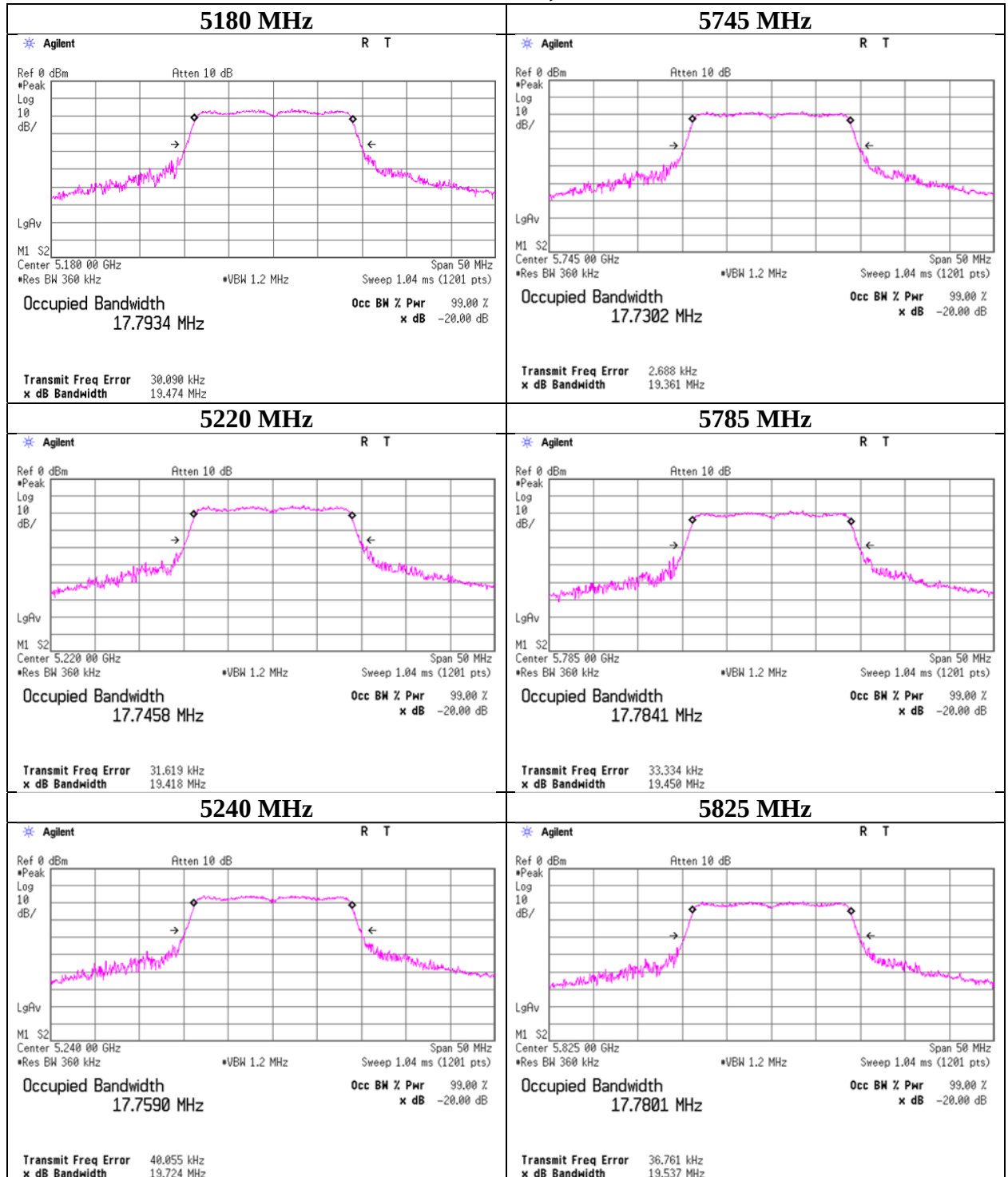
99 % Occupied Bandwidth

11n-20 MIMO, RF0



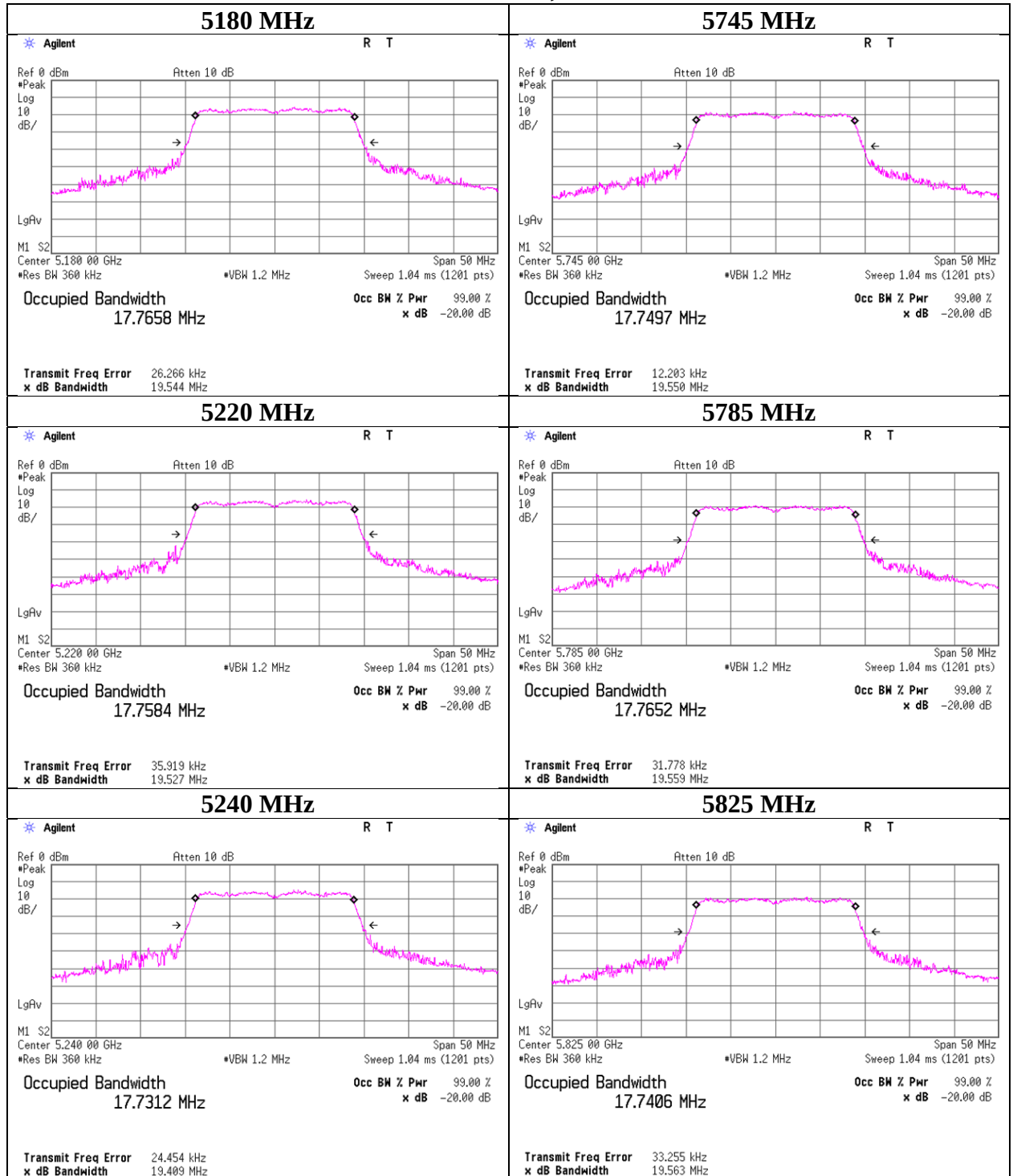
99 % Occupied Bandwidth

11ac-20 SISO, RF0



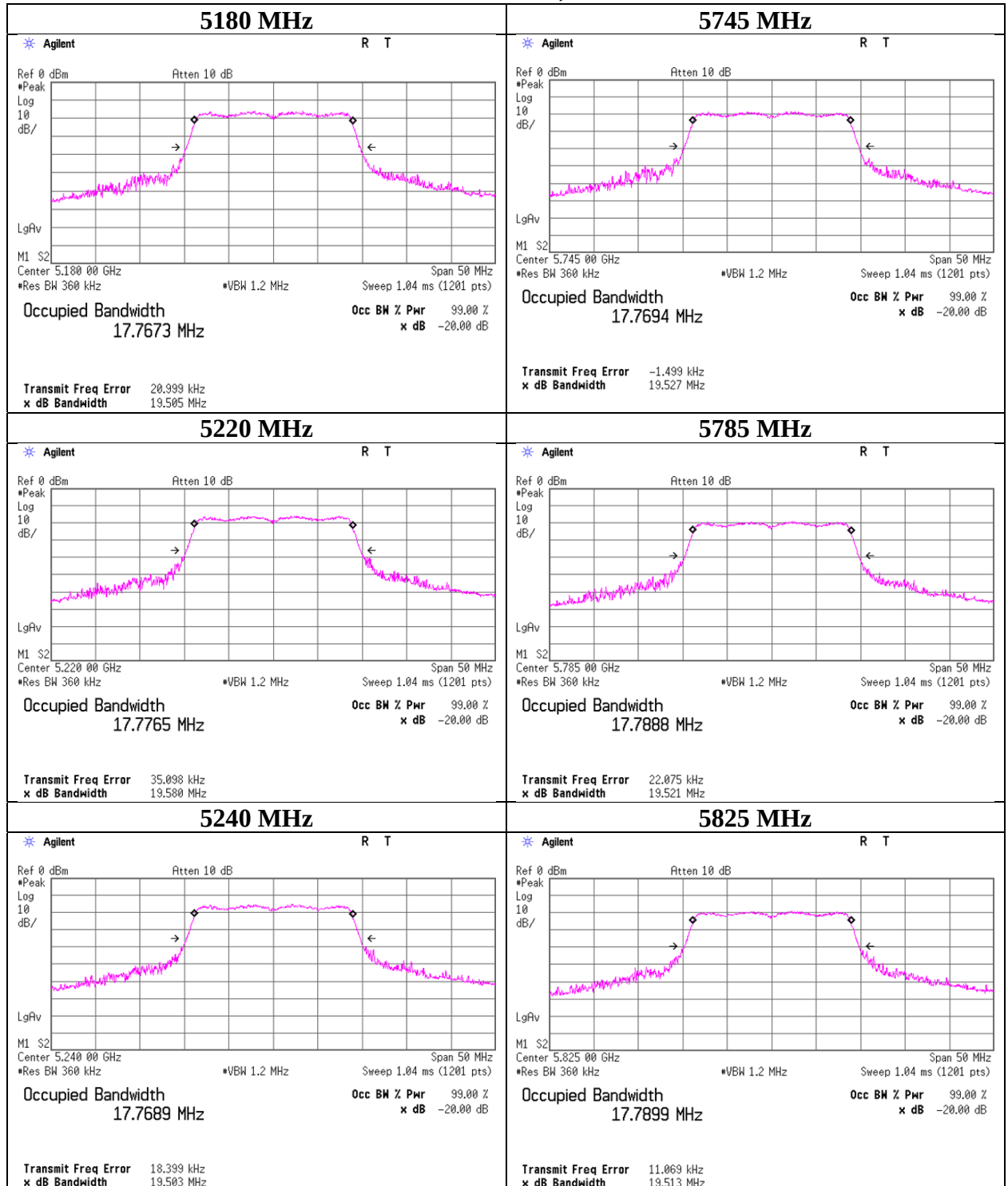
99 % Occupied Bandwidth

11ac-20 CDD, RF0



99 % Occupied Bandwidth

11ac-20 MIMO, RF0



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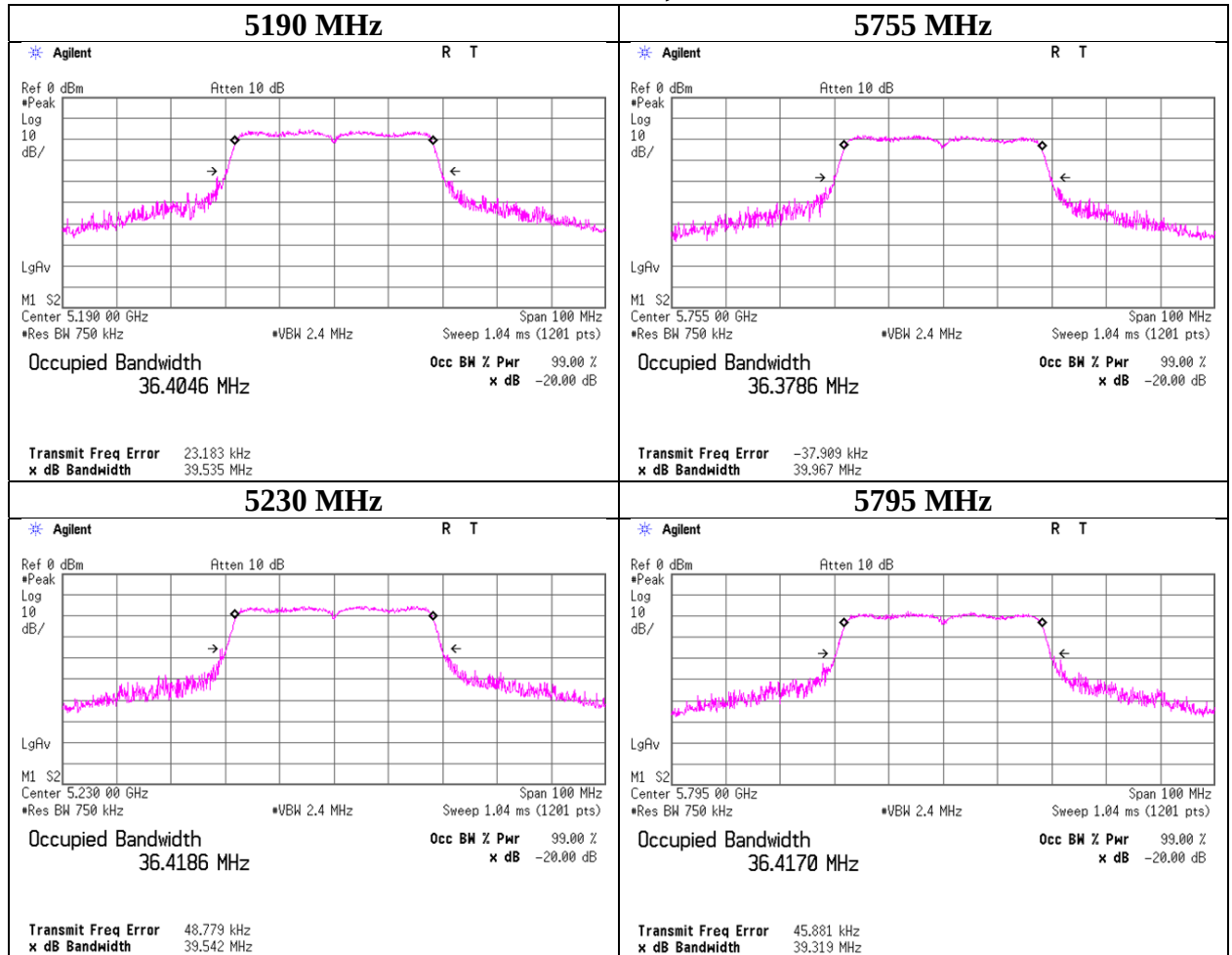
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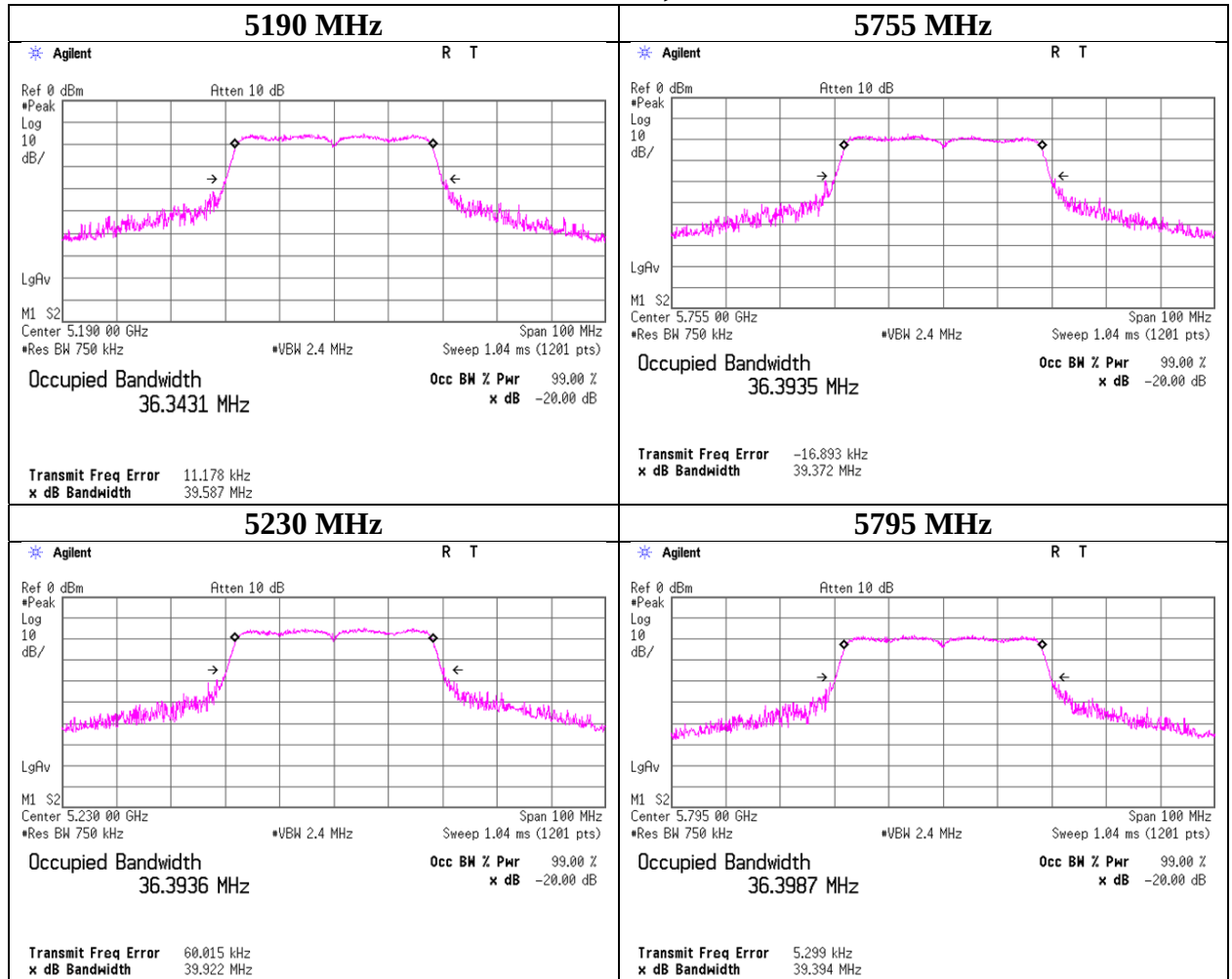
99 % Occupied Bandwidth

11n-40 SISO, RF0



99 % Occupied Bandwidth

11n-40 CDD, RF0



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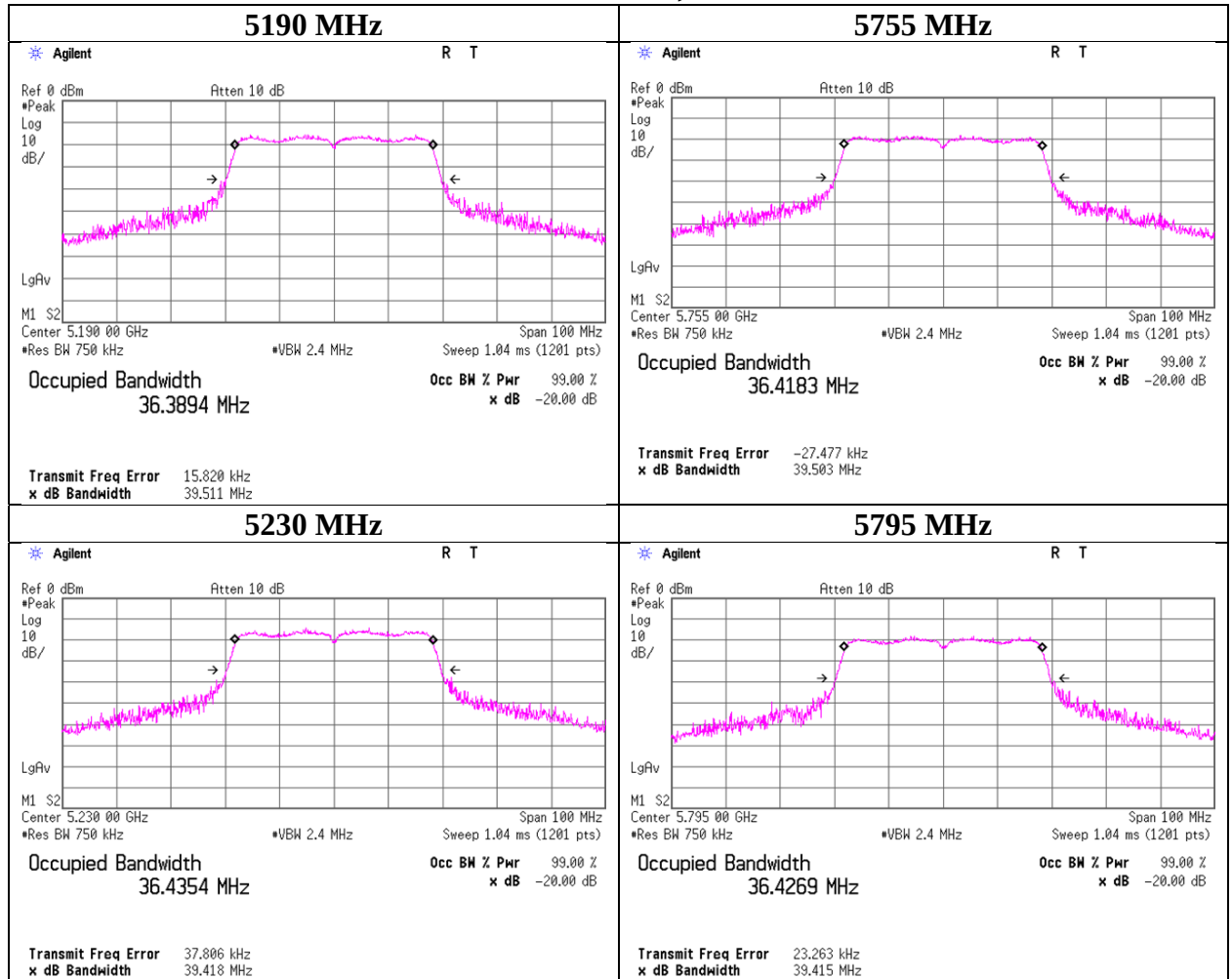
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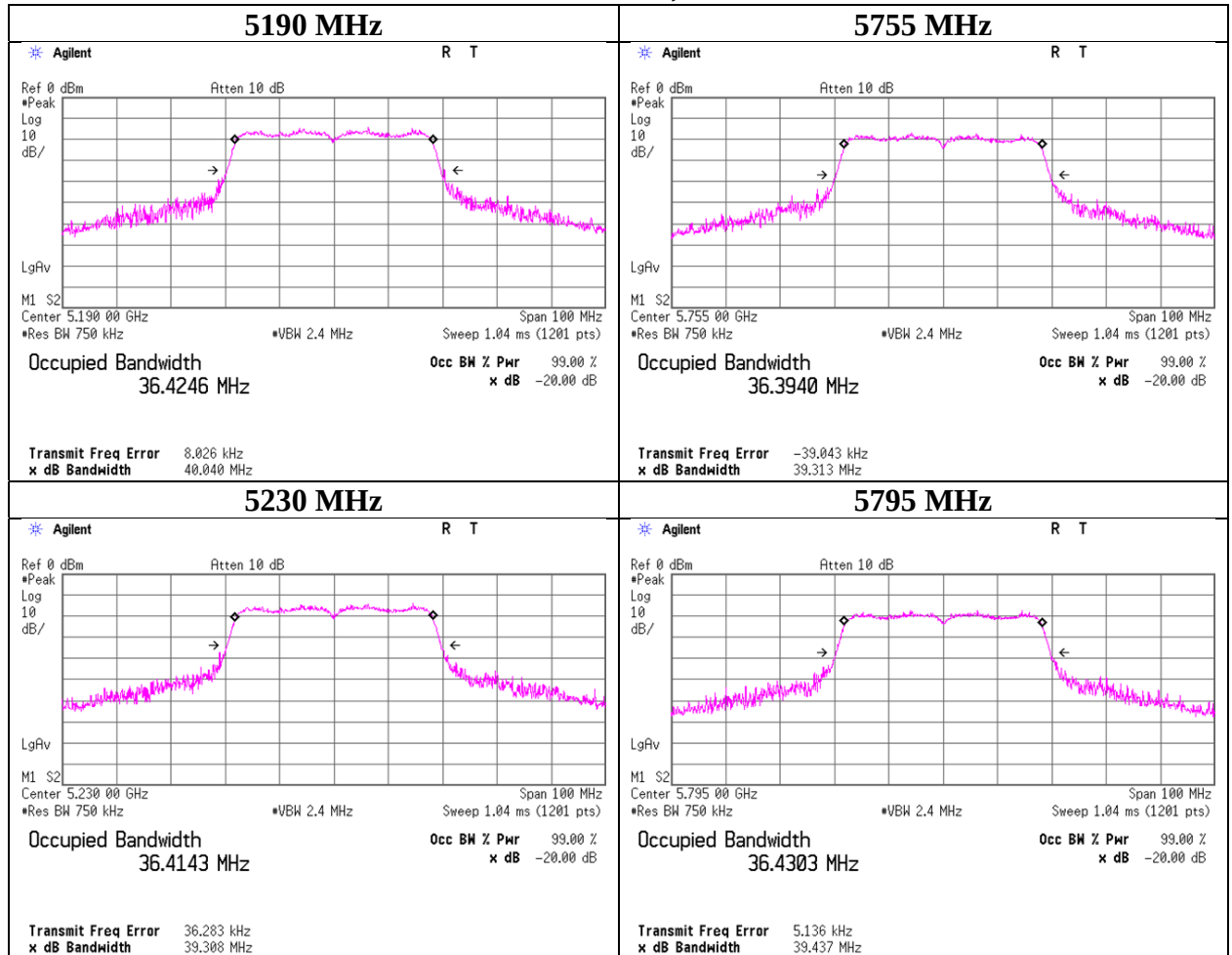
99 % Occupied Bandwidth

11n-40 MIMO, RF0



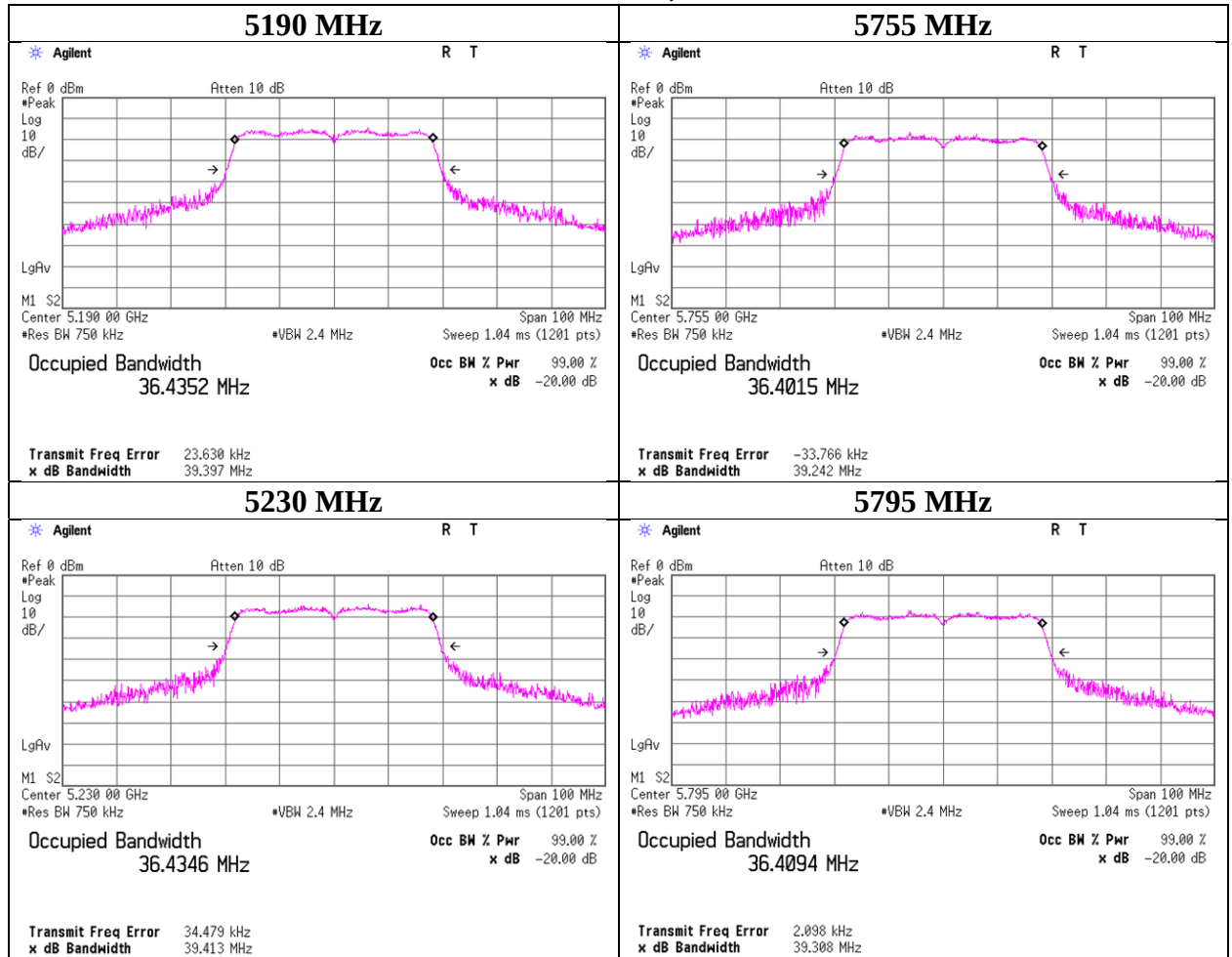
99 % Occupied Bandwidth

11ac-40 SISO, RF0



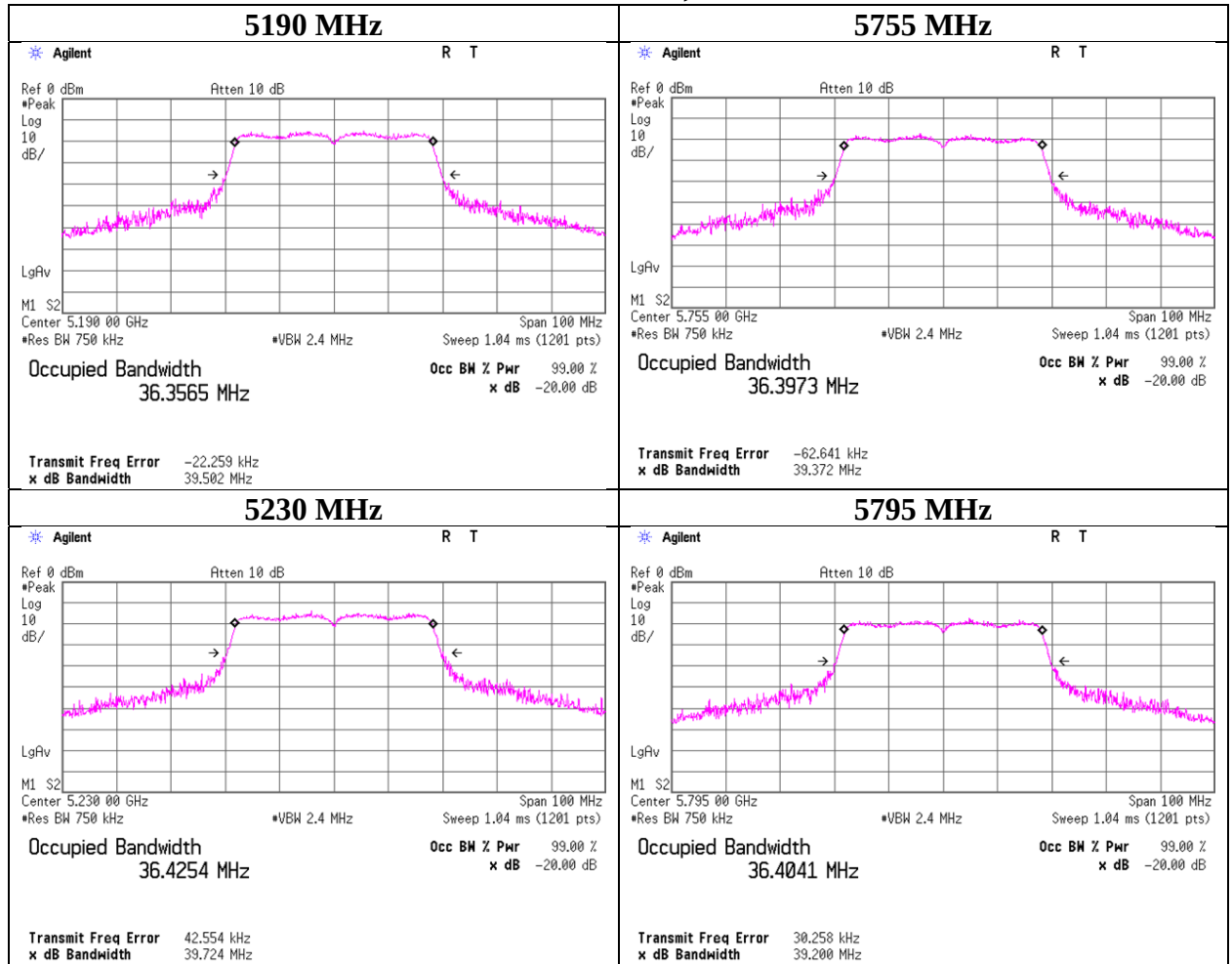
99 % Occupied Bandwidth

11ac-40 CDD, RF0

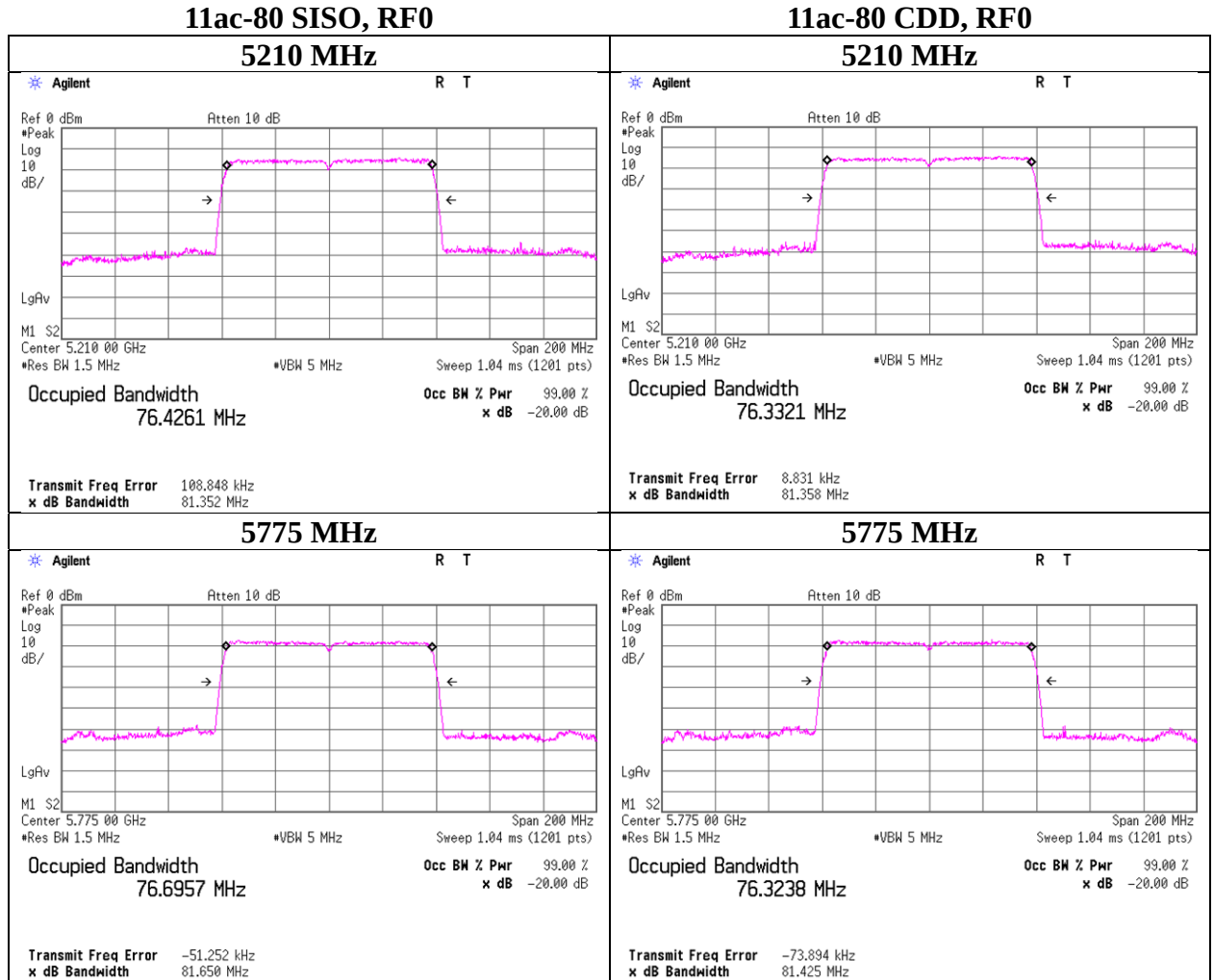


99 % Occupied Bandwidth

11ac-40 MIMO, RF0

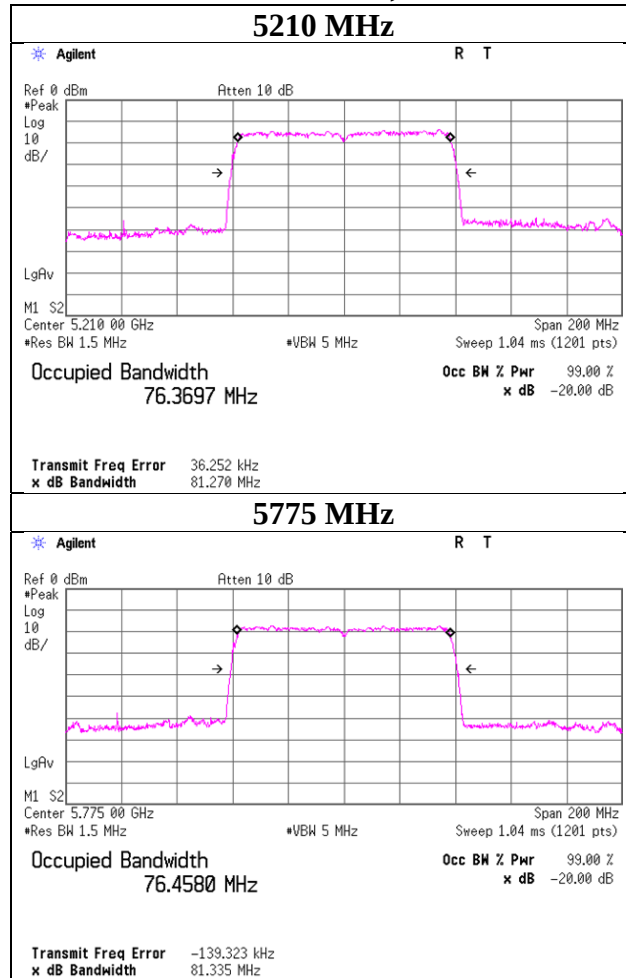


99 % Occupied Bandwidth



99 % Occupied Bandwidth

11ac-80 MIMO, RF0



6 dB Bandwidth

Report No.	13462774S-C-R2	
Test place	Shonan EMC Lab. No.5 Shielded Room	
Date	September 5, 2020	September 18, 2020
Temperature / Humidity	24 deg. C / 49 % RH	22 deg. C / 51 % RH
Engineer	Toshinori Yamada	Hiiromasa Sato
Mode	Tx	

11a SISO

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5745	16.461
	5785	16.467
	5825	16.464

11n-20 SISO

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5745	17.357
	5785	17.356
	5825	17.538

11a CDD

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5745	16.473
	5785	16.472
	5825	16.466

11n-20 CDD

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5745	17.524
	5785	17.549
	5825	17.552

11n-20 MIMO

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5745	17.338
	5785	17.309
	5825	17.563

11ac-20 SISO

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5745	17.355
	5785	17.368
	5825	17.542

11ac-20 CDD

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5745	17.547
	5785	17.388
	5825	17.368

11ac-20 MIMO

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5745	17.601
	5785	17.572
	5825	17.585

6 dB Bandwidth

Report No.	13462774S-C-R2	
Test place	Shonan EMC Lab. No.5 Shielded Room	
Date	September 5, 2020	September 18, 2020
Temperature / Humidity	24 deg. C / 49 % RH	22 deg. C / 51 % RH
Engineer	Toshinori Yamada	Hiiromasa Sato
Mode	Tx	

11n-40 SISO

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5755	35.598
	5795	35.813

11ac-40 SISO

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5755	35.556
	5795	35.836

11n-40 CDD

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5755	35.715
	5795	35.860

11ac-40 CDD

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5755	35.702
	5795	35.872

11n-40 MIMO

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5755	35.646
	5795	35.559

11ac-40 MIMO

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5755	35.322
	5795	35.547

11ac-80 SISO

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5775	76.430

11ac80 -CDD

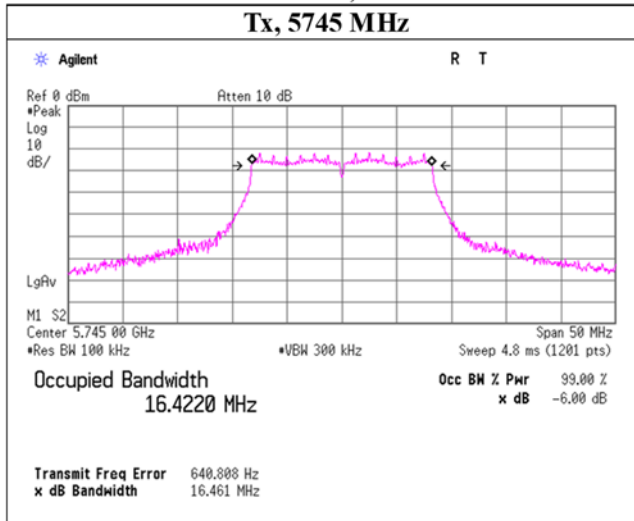
Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5775	76.456

11ac-80 MIMO

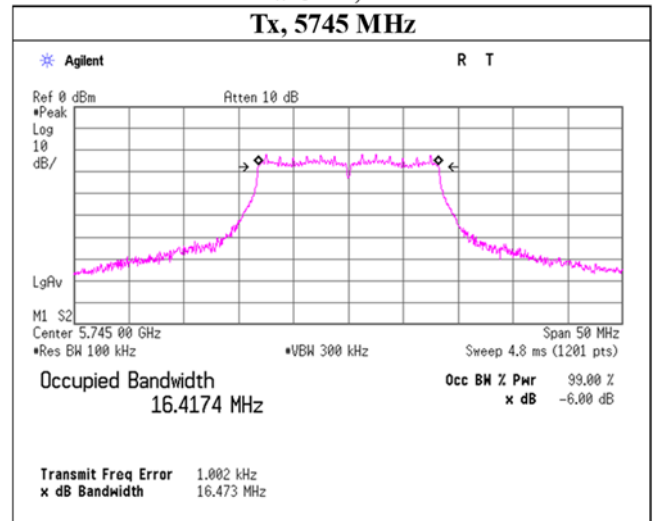
Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]
RF0	5775	76.431

6 dB Bandwidth

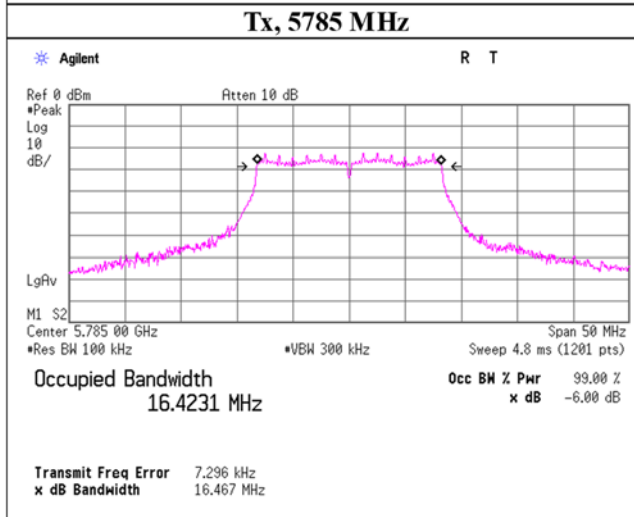
11a SISO, RF0
Tx, 5745 MHz



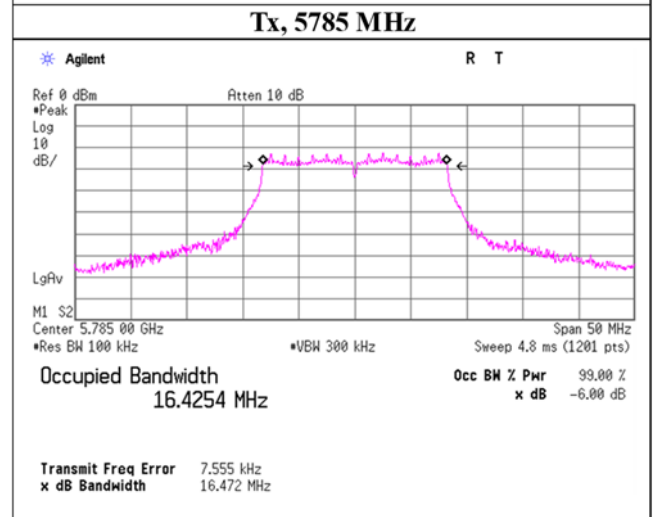
11a CDD, RF0
Tx, 5745 MHz



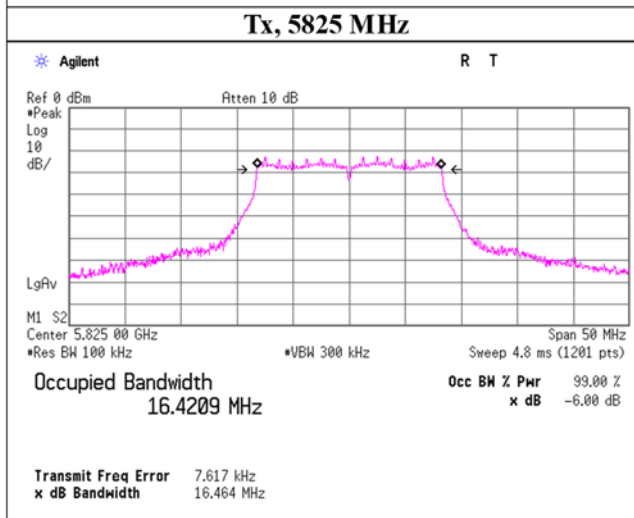
Tx, 5785 MHz



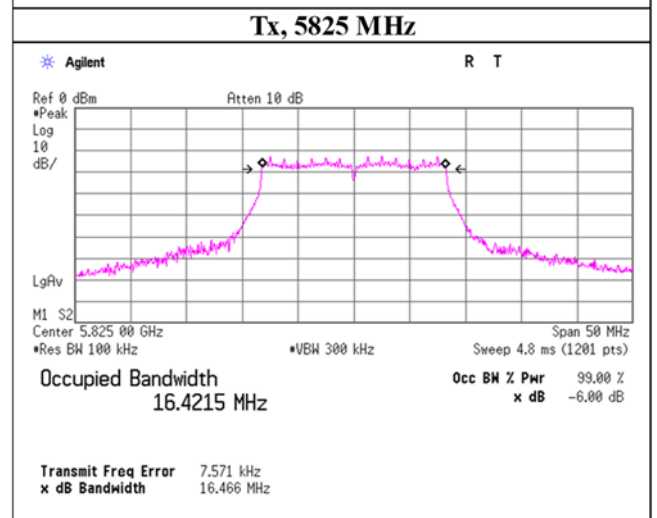
Tx, 5785 MHz



Tx, 5825 MHz



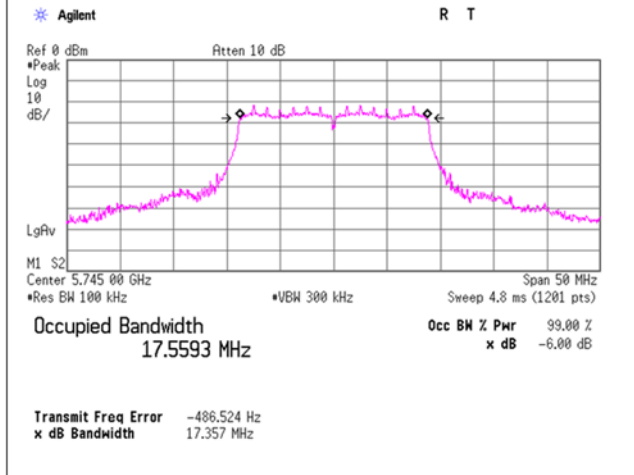
Tx, 5825 MHz



6 dB Bandwidth

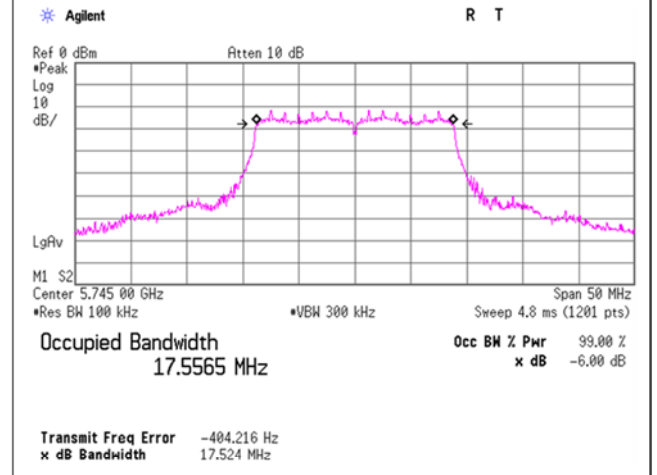
11n-20 SISO, RF0

Tx, 5745 MHz

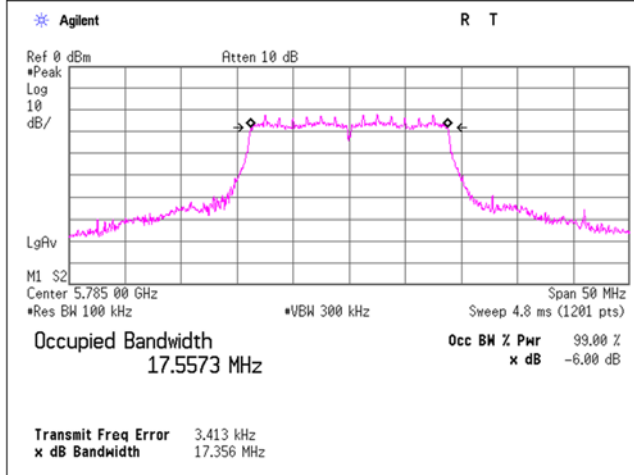


11n-20 CDD, RF0

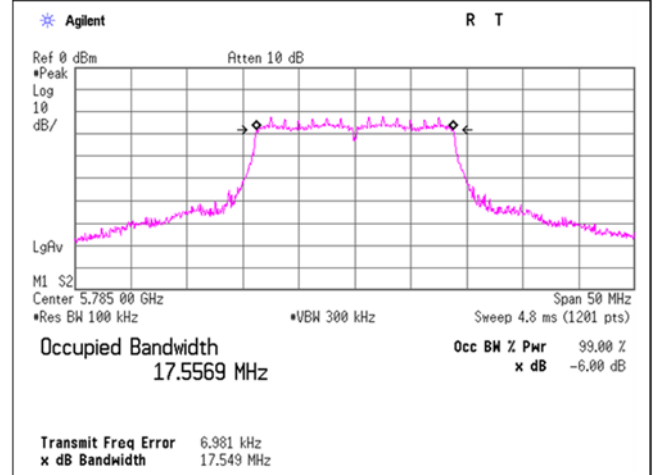
Tx, 5745 MHz



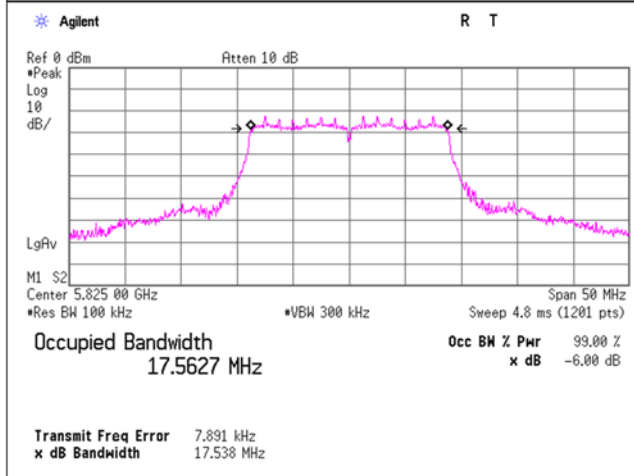
Tx, 5785 MHz



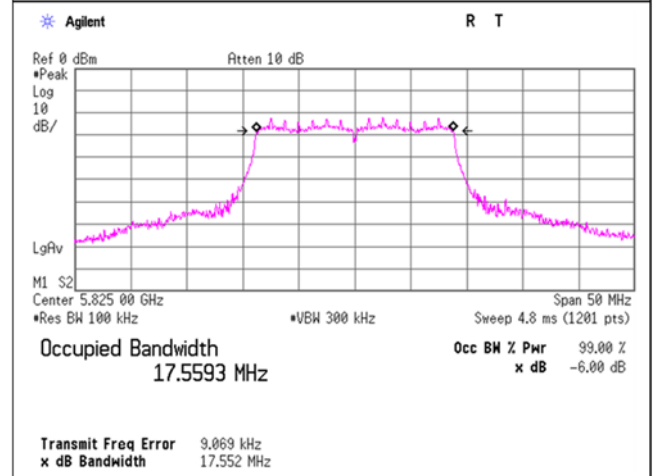
Tx, 5785 MHz



Tx, 5825 MHz

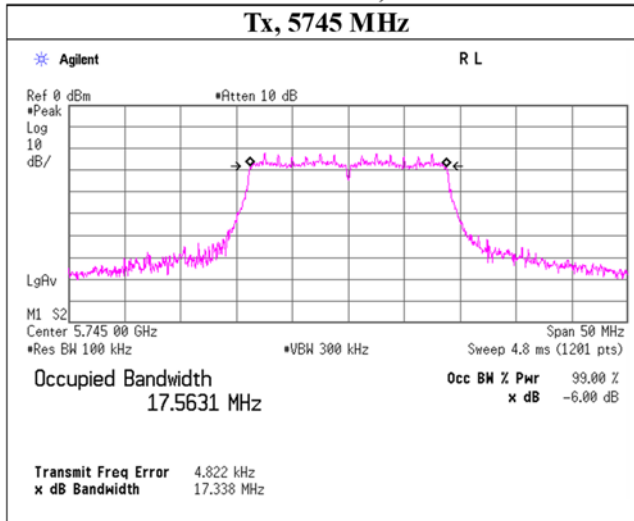


Tx, 5825 MHz

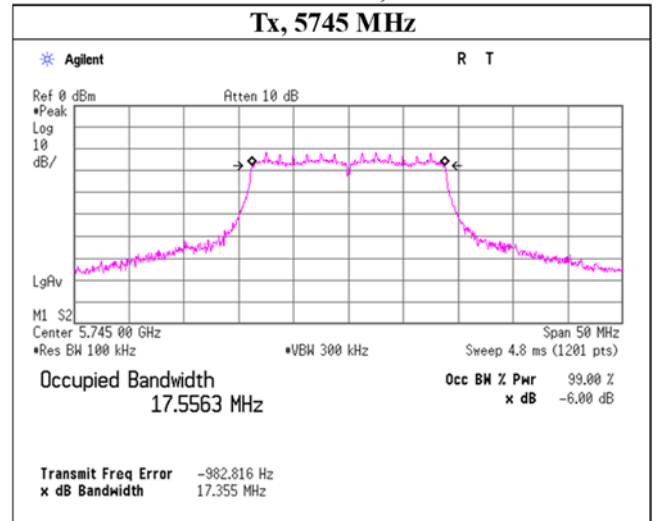


6 dB Bandwidth

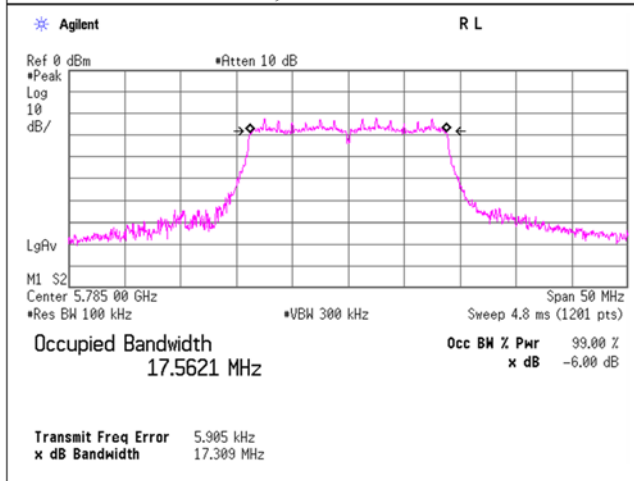
11n-20 MIMO, RF0
Tx, 5745 MHz



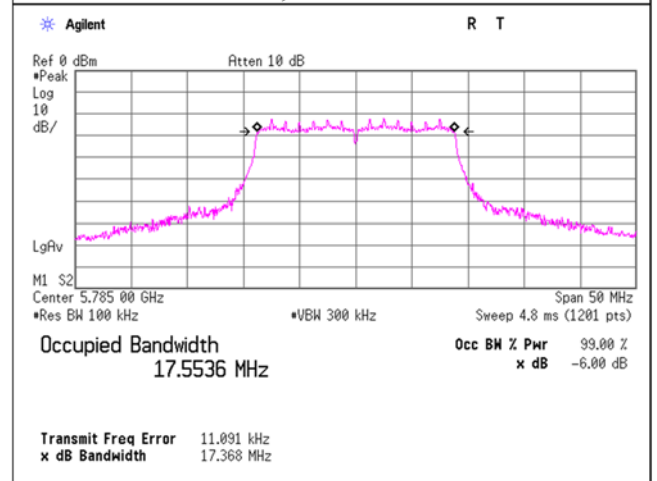
11ac-20 SISO, RF0
Tx, 5745 MHz



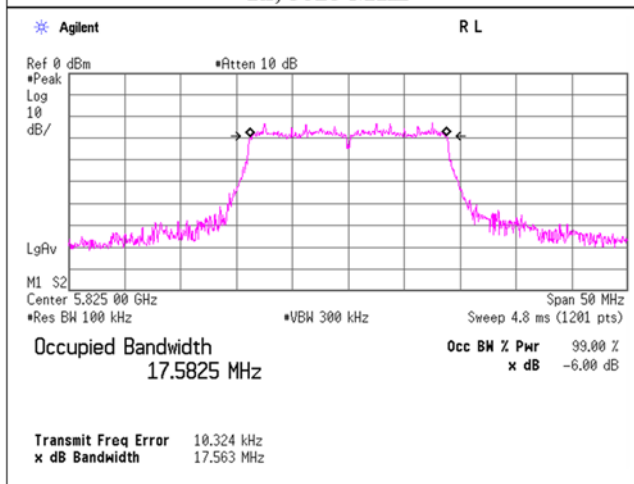
Tx, 5785 MHz



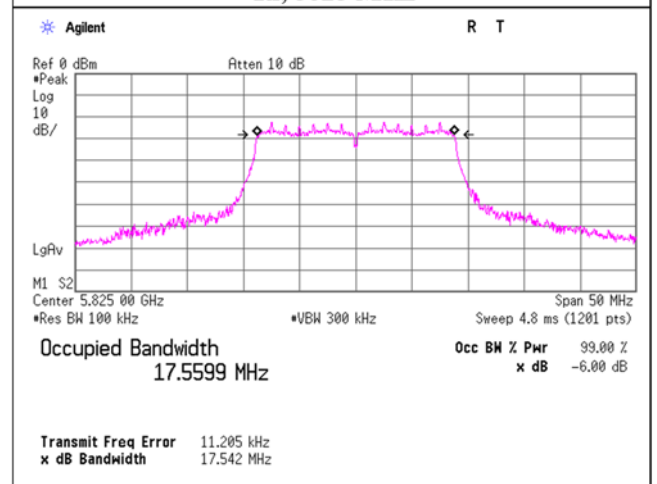
Tx, 5785 MHz



Tx, 5825 MHz



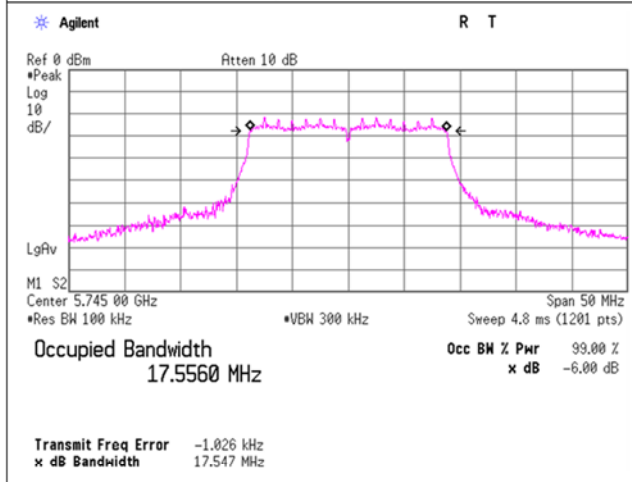
Tx, 5825 MHz



6 dB Bandwidth

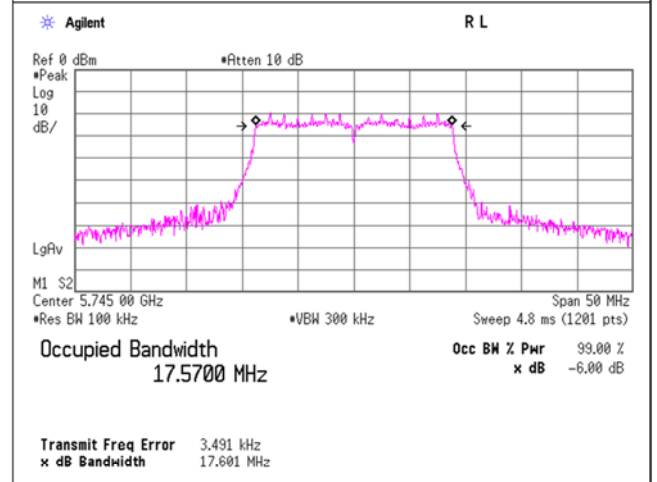
11ac-20 CDD, RF0

Tx, 5745 MHz

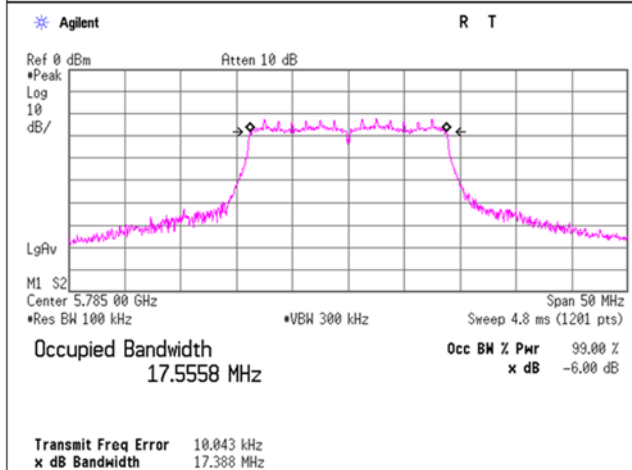


11ac-20 MIMO, RF0

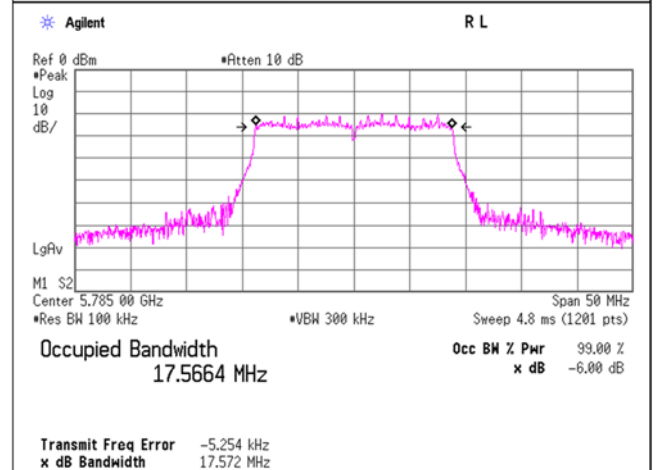
Tx, 5745 MHz



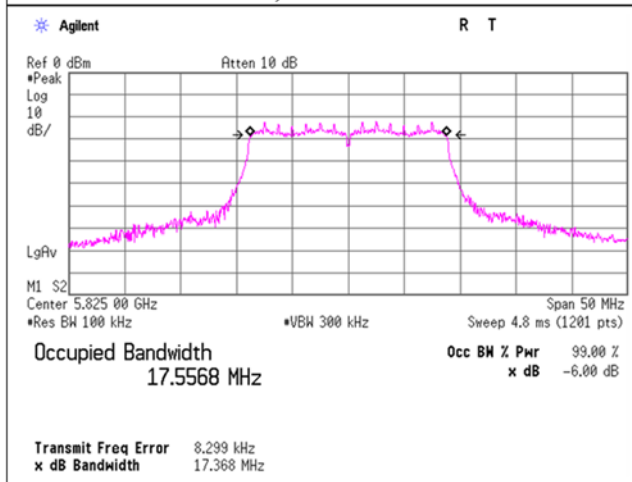
Tx, 5785 MHz



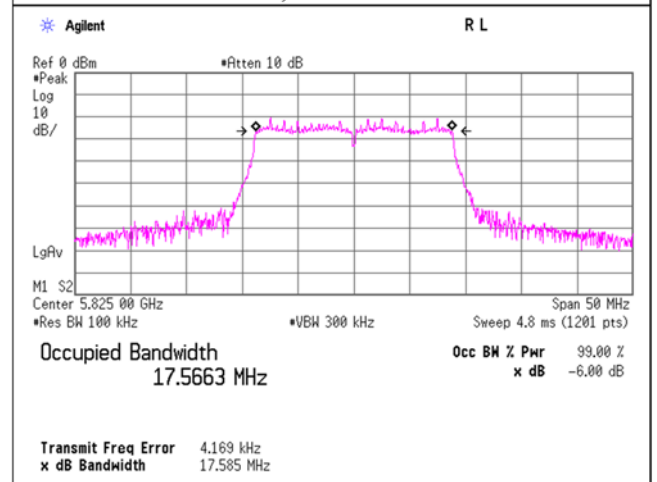
Tx, 5785 MHz



Tx, 5825 MHz

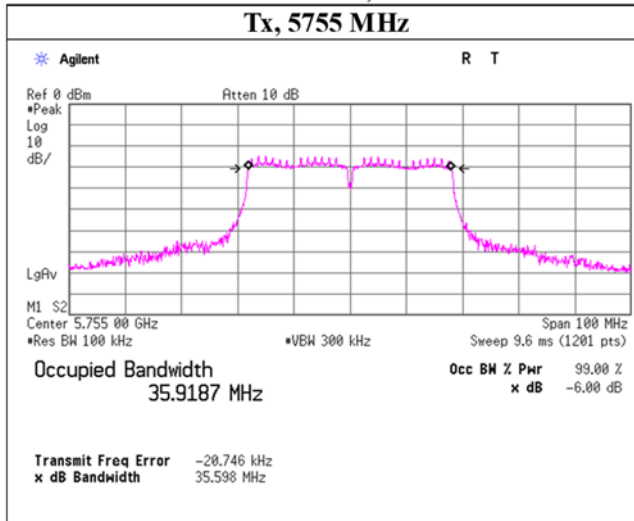


Tx, 5825 MHz

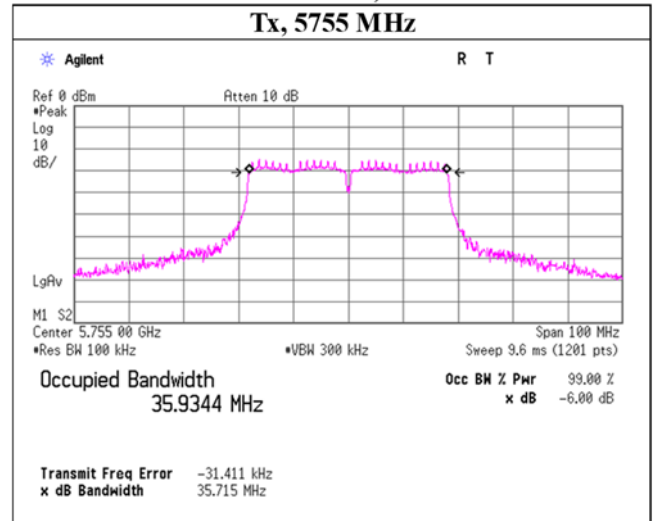


6 dB Bandwidth

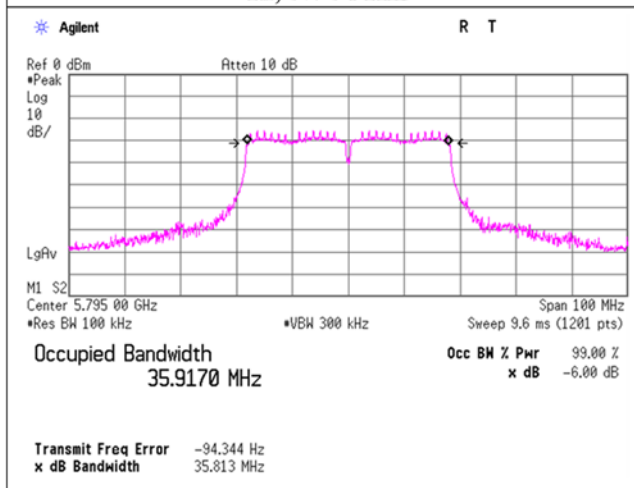
11n-40 SISO, RF0
Tx, 5755 MHz



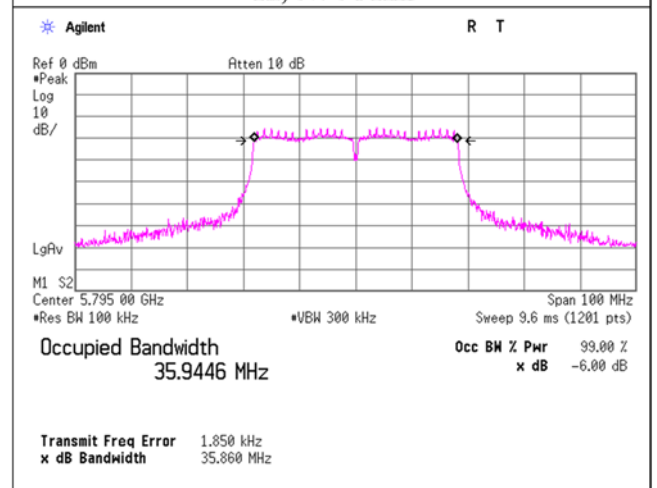
11n-40 CDD, RF0
Tx, 5755 MHz



Tx, 5795 MHz

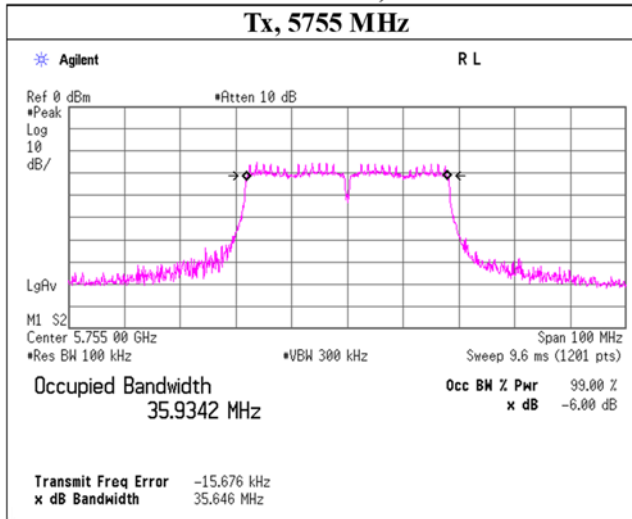


Tx, 5795 MHz

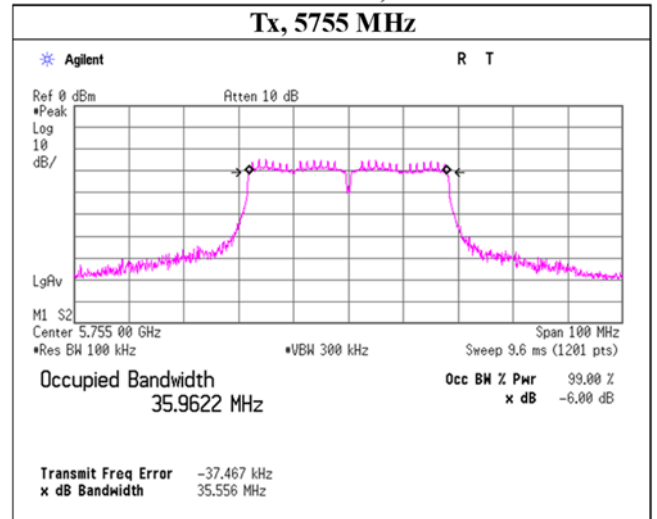


6 dB Bandwidth

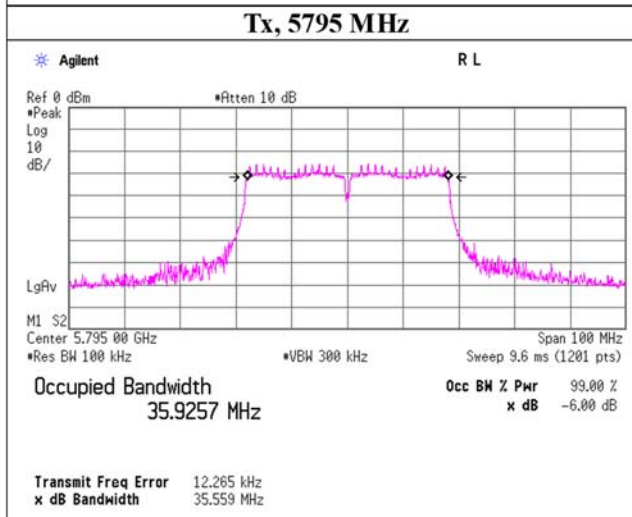
11n-40 MIMO, RF0
Tx, 5755 MHz



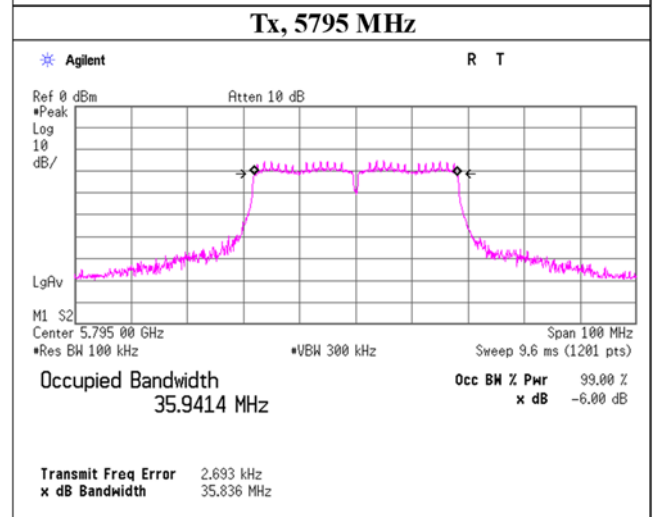
11ac-40 SISO, RF0
Tx, 5755 MHz



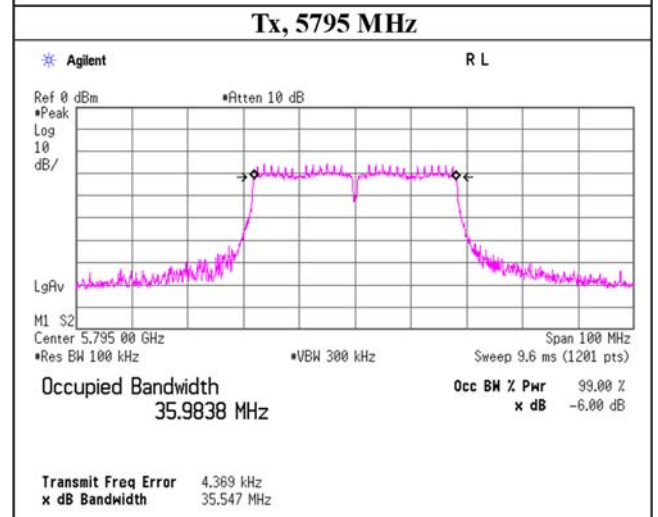
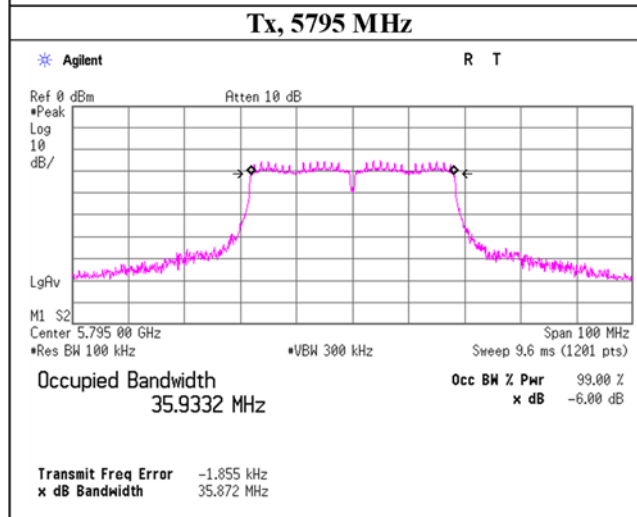
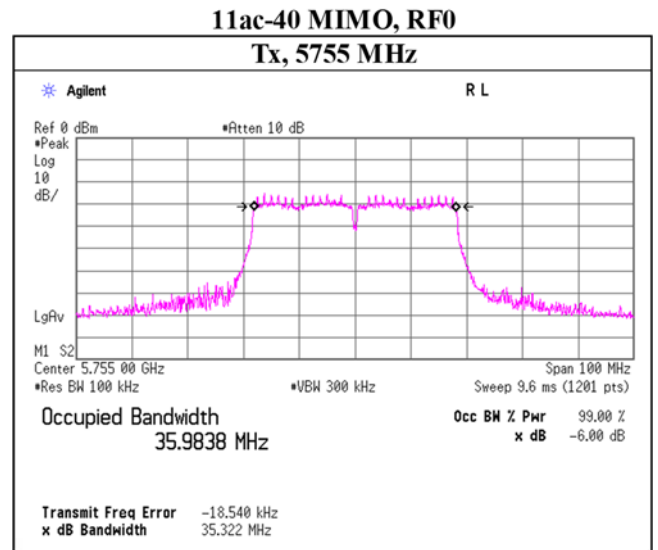
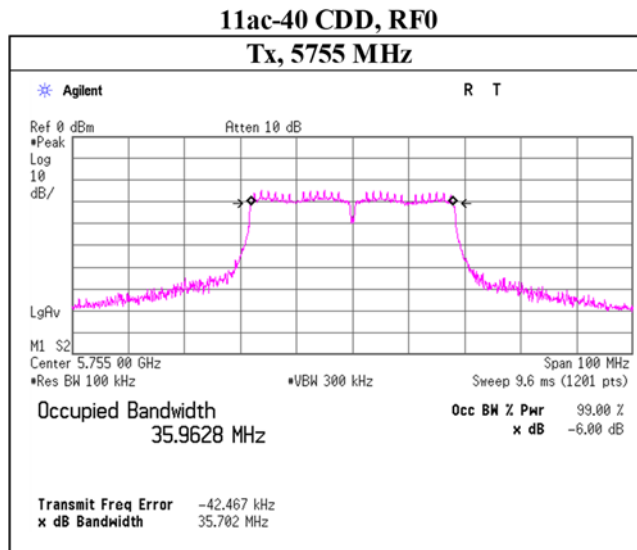
Tx, 5795 MHz



Tx, 5795 MHz

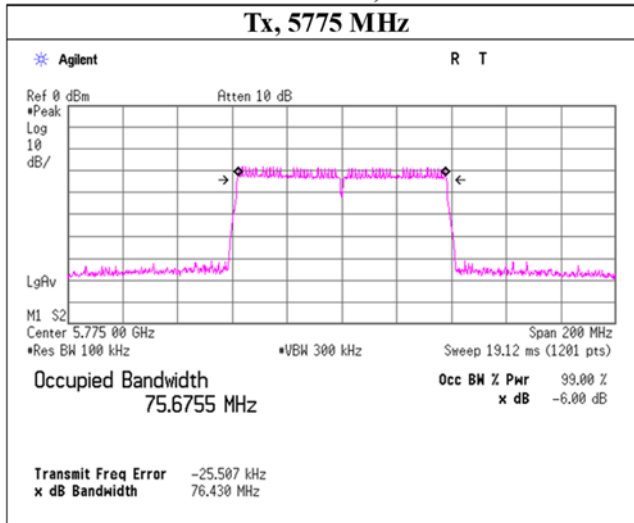


6 dB Bandwidth

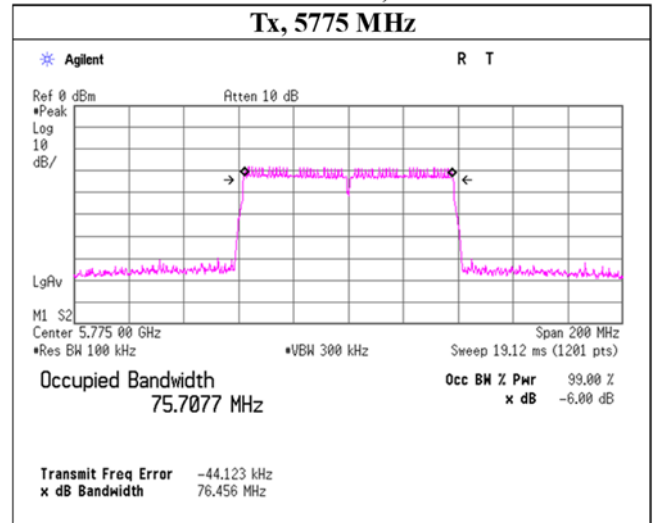


6 dB Bandwidth

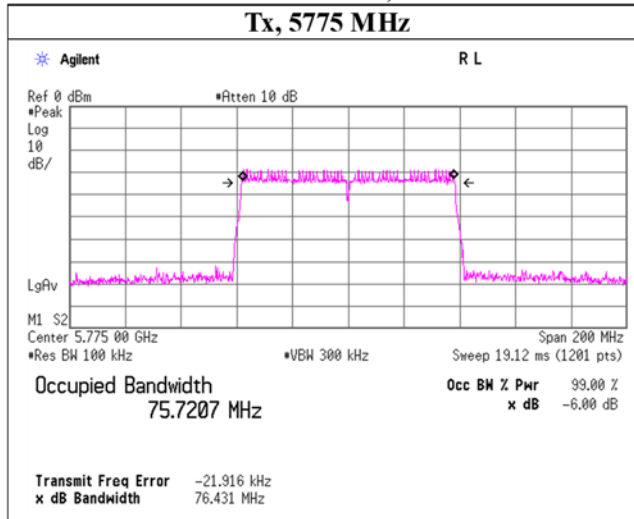
11ac-80 SISO, RF0
Tx, 5775 MHz



11ac80 -CDD , RF0
Tx, 5775 MHz



11ac-80 MIMO, RF0
Tx, 5775 MHz



Maximum Conducted Output Power

Report No. 13462774S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 2, 2020
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Toshinori Yamada
Mode Tx 11a SISO

11a SISO, RF0

Applied limit: 15.407, mobile and portable client device

Tested Frequency	Reading	Cable Loss	Atten. Loss	Duty Factor *1)	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power				e.i.r.p.			
								Result		Limit	Margin	Result		Limit	Margin
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	-9.12	3.35	9.87	-	-1.25	-	16.724	4.10	2.57	23.97	19.87	2.85	1.93	29.97	27.12
5220	-8.87	3.36	9.87	-	-1.25	-	16.732	4.36	2.73	23.97	19.61	3.11	2.05	29.97	26.86
5240	-8.45	3.36	9.88	-	-1.25	-	16.730	4.79	3.01	23.97	19.18	3.54	2.26	29.97	26.43
5745	-11.57	3.59	9.89	-	0.24	-	16.719	1.91	1.55	30.00	28.09	2.15	1.64	36.00	33.85
5785	-11.91	3.60	9.89	-	0.24	-	16.734	1.58	1.44	30.00	28.42	1.82	1.52	36.00	34.18
5825	-11.98	3.61	9.89	-	0.24	-	16.748	1.52	1.42	30.00	28.48	1.76	1.50	36.00	34.24

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

11a SISO, RF1

Applied limit: 15.407, mobile and portable client device

Tested Frequency	Reading	Cable Loss	Atten. Loss	Duty Factor *1)	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power				e.i.r.p.			
								Result		Limit	Margin	Result		Limit	Margin
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	-10.18	3.36	9.93	-	0.33	-	16.724	3.11	2.05	23.97	20.86	3.44	2.21	29.97	26.53
5220	-9.95	3.37	9.93	-	0.33	-	16.732	3.35	2.16	23.97	20.62	3.68	2.33	29.97	26.29
5240	-9.96	3.37	9.93	-	0.33	-	16.730	3.34	2.16	23.97	20.63	3.67	2.33	29.97	26.30
5745	-8.77	3.60	9.93	-	0.01	-	16.719	4.76	2.99	30.00	25.24	4.77	3.00	36.00	31.23
5785	-9.34	3.61	9.93	-	0.01	-	16.734	4.20	2.63	30.00	25.80	4.21	2.64	36.00	31.79
5825	-9.94	3.61	9.93	-	0.01	-	16.748	3.60	2.29	30.00	26.40	3.61	2.30	36.00	32.39

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

UL Japan, Inc.

Shonan EMC Lab.

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

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Maximum Conducted Output Power

Report No. 13462774S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date August 28, 2020
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Makoto Hosaka
Mode Tx 11a CDD

RF0 + RF1

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.					
			RF0	Antenna RF1	Sum	Result	Limit	Margin	RF0	Antenna RF1	Sum	Result	Limit	Margin
			[mW]	[mW]	[mW]	[dBm]	[dBm]	[dB]	[mW]	[mW]	[mW]	[dBm]	[dBm]	[dB]
5180	-	16.722	2.67	2.13	4.80	6.81	23.97	17.16	2.88	2.30	5.18	7.14	29.97	22.83
5220	-	16.738	2.81	2.29	5.10	7.07	23.97	16.90	3.03	2.47	5.50	7.40	29.97	22.57
5240	-	16.732	3.02	2.23	5.25	7.20	23.97	16.77	3.26	2.40	5.66	7.53	29.97	22.44
5745	-	16.723	1.60	2.96	4.56	6.59	30.00	23.41	1.69	3.13	4.82	6.83	36.00	29.17
5785	-	16.738	1.49	2.58	4.06	6.09	30.00	23.91	1.57	2.72	4.29	6.33	36.00	29.67
5825	-	16.740	1.45	2.28	3.73	5.71	30.00	24.29	1.53	2.40	3.94	5.95	36.00	30.05

		RF0						RF1					
Tested Frequency	Duty Factor *1)	Reading	Cable Loss	Atten. Loss	Directional Gain	Result		Reading	Cable Loss	Atten. Loss	Directional Gain	Result	
						Cond. Power	e.i.r.p.					Cond. Power	e.i.r.p.
		[MHz]	[dB]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]
5180	-	-8.96	3.35	9.87	0.33	4.26	4.59	-10.00	3.36	9.93	0.33	3.29	3.62
5220	-	-8.75	3.36	9.87	0.33	4.48	4.81	-9.70	3.37	9.93	0.33	3.60	3.93
5240	-	-8.44	3.36	9.88	0.33	4.80	5.13	-9.82	3.37	9.93	0.33	3.48	3.81
5745	-	-11.43	3.59	9.89	0.24	2.05	2.29	-8.82	3.60	9.93	0.24	4.71	4.95
5785	-	-11.77	3.60	9.89	0.24	1.72	1.96	-9.43	3.61	9.93	0.24	4.11	4.35
5825	-	-11.88	3.61	9.89	0.24	1.62	1.86	-9.97	3.61	9.93	0.24	3.57	3.81

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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

Directional Gain = G_{ANT} (Antenna Gain) + Array Gain

Array Gain = 0 dB(i.e.,no array gain) for $N_{ANT} < 4$

N_{ANT} = number of transmit antennas = 2

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

Maximum Conducted Output Power

Report No. 13462774S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 2, 2020
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Toshinori Yamada
Mode Tx 11n-20 SISO

11n-20 SISO, RF0

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor *1) [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
								Result	Limit	Margin		Result	Limit	Margin	
5180	-9.09	3.35	9.87	-	-1.25	-	17.759	4.13	2.59	23.97	19.84	2.88	1.94	29.97	27.09
5220	-8.81	3.36	9.87	-	-1.25	-	17.781	4.42	2.77	23.97	19.55	3.17	2.07	29.97	26.80
5240	-8.49	3.34	9.88	-	-1.25	-	17.758	4.73	2.97	23.97	19.24	3.48	2.23	29.97	26.49
5745	-11.58	3.59	9.89	-	0.24	-	17.745	1.90	1.55	30.00	28.10	2.14	1.64	36.00	33.86
5785	-11.90	3.60	9.89	-	0.24	-	17.753	1.59	1.44	30.00	28.41	1.83	1.52	36.00	34.17
5825	-11.96	3.61	9.89	-	0.24	-	17.785	1.54	1.43	30.00	28.46	1.78	1.51	36.00	34.22

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

11n-20 SISO, RF1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor *1) [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
								Result	Limit	Margin		Result	Limit	Margin	
5180	-10.15	3.36	9.93	-	0.33	-	17.759	3.14	2.06	23.97	20.83	3.47	2.22	29.97	26.50
5220	-9.89	3.37	9.93	-	0.33	-	17.781	3.41	2.19	23.97	20.56	3.74	2.37	29.97	26.23
5240	-9.89	3.37	9.93	-	0.33	-	17.758	3.41	2.19	23.97	20.56	3.74	2.37	29.97	26.23
5745	-8.78	3.60	9.93	-	0.01	-	17.745	4.75	2.99	30.00	25.25	4.76	2.99	36.00	31.24
5785	-9.36	3.61	9.93	-	0.01	-	17.753	4.18	2.62	30.00	25.82	4.19	2.62	36.00	31.81
5825	-9.95	3.61	9.93	-	0.01	-	17.785	3.59	2.29	30.00	26.41	3.60	2.29	36.00	32.40

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

UL Japan, Inc.

Shonan EMC Lab.

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Facsimile : +81 463 50 6401

Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	August 28, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Makoto Hosaka
Mode	Tx 11n-20 CDD

RF0 + RF1

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]
			RF0 [mW]	RF1 [mW]	Sum [mW]				RF0 [mW]	RF1 [mW]	Sum [mW]			
5180	-	17.790	2.69	2.10	4.78	6.80	23.97	17.17	2.90	2.26	5.16	7.13	29.97	22.84
5220	-	17.757	2.81	2.23	5.03	7.02	23.97	16.95	3.03	2.40	5.43	7.35	29.97	22.62
5240	-	17.748	3.02	2.19	5.21	7.17	23.97	16.80	3.26	2.37	5.62	7.50	29.97	22.47
5745	-	17.759	1.57	2.86	4.44	6.47	30.00	23.53	1.66	3.03	4.69	6.71	36.00	29.29
5785	-	17.760	1.46	2.55	4.01	6.03	30.00	23.97	1.55	2.69	4.24	6.27	36.00	29.73
5825	-	17.774	1.44	2.24	3.69	5.67	30.00	24.33	1.52	2.37	3.90	5.91	36.00	30.09

		RF0						RF1					
Tested Frequency	Duty Factor *1)	Reading	Cable Loss	Atten. Loss	Directional Gain	Result		Reading	Cable Loss	Atten. Loss	Directional Gain	Result	
						Cond. Power	e.i.r.p.					Cond. Power	e.i.r.p.
		[MHz]	[dB]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]
5180	-	-8.93	3.35	9.87	0.33	4.29	4.62	-10.07	3.36	9.93	0.33	3.22	3.55
5220	-	-8.75	3.36	9.87	0.33	4.48	4.81	-9.82	3.37	9.93	0.33	3.48	3.81
5240	-	-8.44	3.36	9.88	0.33	4.80	5.13	-9.89	3.37	9.93	0.33	3.41	3.74
5745	-	-11.51	3.59	9.89	0.24	1.97	2.21	-8.96	3.60	9.93	0.24	4.57	4.81
5785	-	-11.84	3.60	9.89	0.24	1.65	1.89	-9.48	3.61	9.93	0.24	4.06	4.30
5825	-	-11.91	3.61	9.89	0.24	1.59	1.83	-10.03	3.61	9.93	0.24	3.51	3.75

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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

Directional Gain = G_{ANT} (Antenna Gain) + Array Gain

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} < 4$

N_{ANT} = number of transmit antennas = 2

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

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Shonan EMC Lab.

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Maximum Conducted Output Power

Report No. 13462774S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date August 28, 2020
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Makoto Hosaka
Mode Tx 11n-20 MIMO

RF0 + RF1

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]
			RF0 [mW]	RF1 [mW]	Sum [mW]				RF0 [mW]	RF1 [mW]	Sum [mW]			
5180	-	17.768	2.65	2.07	4.72	6.74	23.97	17.23	1.99	2.24	4.22	6.26	29.97	23.71
5220	-	17.780	2.79	2.26	5.06	7.04	23.97	16.93	2.09	2.44	4.54	6.57	29.97	23.40
5240	-	17.778	3.01	2.23	5.24	7.19	23.97	16.78	2.26	2.40	4.66	6.69	29.97	23.28
5745	-	17.755	1.57	2.87	4.44	6.48	30.00	23.52	1.66	2.88	4.54	6.57	36.00	29.43
5785	-	17.750	1.47	2.53	4.00	6.02	30.00	23.98	1.56	2.54	4.09	6.12	36.00	29.88
5825	-	17.772	1.43	2.24	3.67	5.65	30.00	24.35	1.51	2.24	3.76	5.75	36.00	30.25

		RF0						RF1					
Tested Frequency	Duty Factor *1)	Reading	Cable Loss	Atten. Loss	Antenna Gain	Result		Reading	Cable Loss	Atten. Loss	Antenna Gain	Result	
						Cond. Power	e.i.r.p.					Cond. Power	e.i.r.p.
						[dBm]	[dBm]					[dBm]	[dBm]
[MHz]	[dB]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]
5180	-	-8.99	3.35	9.87	-1.25	4.23	2.98	-10.12	3.36	9.93	0.33	3.17	3.50
5220	-	-8.77	3.36	9.87	-1.25	4.46	3.21	-9.75	3.37	9.93	0.33	3.55	3.88
5240	-	-8.45	3.36	9.88	-1.25	4.79	3.54	-9.82	3.37	9.93	0.33	3.48	3.81
5745	-	-11.51	3.59	9.89	0.24	1.97	2.21	-8.95	3.60	9.93	0.01	4.58	4.59
5785	-	-11.81	3.60	9.89	0.24	1.68	1.92	-9.51	3.61	9.93	0.01	4.03	4.04
5825	-	-11.94	3.61	9.89	0.24	1.56	1.80	-10.04	3.61	9.93	0.01	3.50	3.51

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

Maximum Conducted Output Power

Report No. 13462774S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 2, 2020
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Toshinori Yamada
Mode Tx 11ac-20 SISO

11ac-20 SISO, RF0

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor *1) [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
								Result	Limit	Margin		Result	Limit	Margin	
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	-9.16	3.35	9.87	-	-1.25	-	17.793	4.06	2.55	23.97	19.91	2.81	1.91	29.97	27.16
5220	-8.81	3.36	9.87	-	-1.25	-	17.746	4.42	2.77	23.97	19.55	3.17	2.07	29.97	26.80
5240	-8.46	3.36	9.88	-	-1.25	-	17.759	4.78	3.01	23.97	19.19	3.53	2.25	29.97	26.44
5745	-11.62	3.59	9.89	-	0.24	-	17.730	1.86	1.53	30.00	28.14	2.10	1.62	36.00	33.90
5785	-11.94	3.60	9.89	-	0.24	-	17.784	1.55	1.43	30.00	28.45	1.79	1.51	36.00	34.21
5825	-12.02	3.61	9.89	-	0.24	-	17.780	1.48	1.41	30.00	28.52	1.72	1.49	36.00	34.28

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

11ac-20 SISO, RF1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor *1) [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
								Result	Limit	Margin		Result	Limit	Margin	
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	-10.17	3.36	9.93	-	0.33	-	17.793	3.12	2.05	23.97	20.85	3.45	2.21	29.97	26.52
5220	-9.89	3.37	9.93	-	0.33	-	17.746	3.41	2.19	23.97	20.56	3.74	2.37	29.97	26.23
5240	-9.90	3.37	9.93	-	0.33	-	17.759	3.40	2.19	23.97	20.57	3.73	2.36	29.97	26.24
5745	-8.79	3.60	9.93	-	0.01	-	17.730	4.74	2.98	30.00	25.26	4.75	2.99	36.00	31.25
5785	-9.34	3.61	9.93	-	0.01	-	17.784	4.20	2.63	30.00	25.80	4.21	2.64	36.00	31.79
5825	-9.93	3.61	9.93	-	0.01	-	17.780	3.61	2.30	30.00	26.39	3.62	2.30	36.00	32.38

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

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Maximum Conducted Output Power

Report No. 13462774S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date August 28, 2020
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Makoto Hosaka
Mode Tx 11ac-20 CDD

RF0 + RF1

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]
			RF0 [mW]	RF1 [mW]	Sum [mW]				RF0 [mW]	RF1 [mW]	Sum [mW]			
5180	-	17.766	2.69	2.09	4.78	6.80	23.97	17.17	2.90	2.25	5.16	7.13	29.97	22.84
5220	-	17.758	2.82	2.26	5.08	7.06	23.97	16.91	3.04	2.44	5.48	7.39	29.97	22.58
5240	-	17.731	3.04	2.22	5.26	7.21	23.97	16.76	3.28	2.39	5.67	7.54	29.97	22.43
5745	-	17.750	1.58	2.93	4.51	6.54	30.00	23.46	1.67	3.10	4.77	6.78	36.00	29.22
5785	-	17.765	1.46	2.57	4.03	6.05	30.00	23.95	1.54	2.72	4.26	6.29	36.00	29.71
5825	-	17.741	1.44	2.28	3.71	5.70	30.00	24.30	1.52	2.40	3.92	5.94	36.00	30.06

		RF0						RF1					
Tested Frequency	Duty Factor *1)	Reading	Cable Loss	Atten. Loss	Directional Gain	Result		Reading	Cable Loss	Atten. Loss	Directional Gain	Result	
						Cond. Power	e.i.r.p.					Cond. Power	e.i.r.p.
		[MHz]	[dB]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]
5180	-	-8.92	3.35	9.87	0.33	4.30	4.63	-10.09	3.36	9.93	0.33	3.20	3.53
5220	-	-8.73	3.36	9.87	0.33	4.50	4.83	-9.76	3.37	9.93	0.33	3.54	3.87
5240	-	-8.41	3.36	9.88	0.33	4.83	5.16	-9.84	3.37	9.93	0.33	3.46	3.79
5745	-	-11.49	3.59	9.89	0.24	1.99	2.23	-8.86	3.60	9.93	0.24	4.67	4.91
5785	-	-11.85	3.60	9.89	0.24	1.64	1.88	-9.44	3.61	9.93	0.24	4.10	4.34
5825	-	-11.92	3.61	9.89	0.24	1.58	1.82	-9.97	3.61	9.93	0.24	3.57	3.81

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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

Directional Gain = G_{ANT} (Antenna Gain) + Array Gain

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} < 4$

N_{ANT} = number of transmit antennas = 2

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

Maximum Conducted Output Power

Report No. 13462774S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date August 28, 2020
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Makoto Hosaka
Mode Tx 11ac-20 MIMO

RF0 + RF1

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.					
			RF0 [mW]	Antenna RF1 [mW]	Sum [mW]	Result [dBm]	Limit [dBm]	Margin [dB]	RF0 [mW]	Antenna RF1 [mW]	Sum [mW]	Result [dBm]	Limit [dBm]	Margin [dB]
5180	-	17.767	2.64	2.04	4.68	6.71	23.97	17.26	1.98	2.20	4.18	6.22	29.97	23.75
5220	-	17.777	2.75	2.25	5.00	6.99	23.97	16.98	2.06	2.43	4.49	6.53	29.97	23.44
5240	-	17.769	2.97	2.23	5.20	7.16	23.97	16.81	2.23	2.40	4.63	6.66	29.97	23.31
5745	-	17.769	1.57	2.87	4.44	6.47	30.00	23.53	1.66	2.88	4.53	6.56	36.00	29.44
5785	-	17.789	1.45	2.54	3.99	6.01	30.00	23.99	1.53	2.55	4.08	6.11	36.00	29.89
5825	-	17.790	1.43	2.25	3.68	5.66	30.00	24.34	1.51	2.26	3.77	5.76	36.00	30.24

RF0								RF1					
Tested Frequency	Duty Factor *1)	Reading	Cable Loss	Atten. Loss	Antenna Gain	Result		Reading	Cable Loss	Atten. Loss	Antenna Gain	Result	
[MHz]	[dB]	[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	-	-9.00	3.35	9.87	-1.25	4.22	2.97	-10.19	3.36	9.93	0.33	3.10	3.43
5220	-	-8.84	3.36	9.87	-1.25	4.39	3.14	-9.77	3.37	9.93	0.33	3.53	3.86
5240	-	-8.51	3.36	9.88	-1.25	4.73	3.48	-9.82	3.37	9.93	0.33	3.48	3.81
5745	-	-11.53	3.59	9.89	0.24	1.95	2.19	-8.95	3.60	9.93	0.01	4.58	4.59
5785	-	-11.87	3.60	9.89	0.24	1.62	1.86	-9.49	3.61	9.93	0.01	4.05	4.06
5825	-	-11.95	3.61	9.89	0.24	1.55	1.79	-10.01	3.61	9.93	0.01	3.53	3.54

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

Maximum Conducted Output Power

Report No. 13462774S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 2, 2020
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Toshinori Yamada
Mode Tx 11n-40 SISO

11n-40 SISO, RF0

Applied limit: 15.407, mobile and portable client device

Tested Frequency	Reading	Cable Loss	Atten. Loss	Duty Factor *1)	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power				e.i.r.p.			
								Result		Limit	Margin	Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5190	-9.09	3.35	9.87	-	-1.25	-	35.405	4.13	2.59	23.97	19.84	2.88	1.94	29.97	27.09
5230	-8.57	3.36	9.87	-	-1.25	-	36.419	4.66	2.92	20.06	15.40	3.41	2.19	29.97	26.56
5755	-11.74	3.60	9.89	-	0.24	-	36.379	1.75	1.50	30.00	28.25	1.99	1.58	36.00	34.01
5795	-11.84	3.60	9.89	-	0.24	-	36.417	1.65	1.46	30.00	28.35	1.89	1.55	36.00	34.11

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

11n-40 SISO, RF1

Applied limit: 15.407, mobile and portable client device

Tested Frequency	Reading	Cable Loss	Atten. Loss	Duty Factor *1)	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power				e.i.r.p.			
								Result		Limit	Margin	Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5190	-10.11	3.36	9.93	-	0.33	-	35.405	3.18	2.08	23.97	20.79	3.51	2.24	29.97	26.46
5230	-9.90	3.37	9.93	-	0.33	-	36.419	3.40	2.19	23.97	20.57	3.73	2.36	29.97	26.24
5755	-8.90	3.60	9.93	-	0.01	-	36.379	4.63	2.90	30.00	25.37	4.64	2.91	36.00	31.36
5795	-9.48	3.61	9.93	-	0.01	-	36.417	4.06	2.55	30.00	25.94	4.07	2.55	36.00	31.93

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

Maximum Conducted Output Power

Report No. 13462774S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date August 28, 2020
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Makoto Hosaka
Mode Tx 11n-40 CDD

RF0 + RF1

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]	
			RF0 [mW]	RF1 [mW]	Sum [mW]					RF0 [mW]	RF1 [mW]	Sum [mW]				
5190	-	36.343	2.67	2.13	4.80	6.81	23.97	17.16	2.88	2.30	5.18	7.14	29.97	22.83		
5230	-	36.394	2.86	2.21	5.07	7.05	23.97	16.92	3.09	2.38	5.47	7.38	29.97	22.59		
5755	-	36.394	1.53	2.81	4.33	6.37	30.00	23.63	1.61	2.96	4.58	6.61	36.00	29.39		
5795	-	36.399	1.47	2.44	3.91	5.92	30.00	24.08	1.55	2.58	4.13	6.16	36.00	29.84		

		RF0						RF1					
Tested Frequency	Duty Factor *1)	Reading	Cable Loss	Atten. Loss	Directional Gain	Result		Reading	Cable Loss	Atten. Loss	Directional Gain	Result	
						Cond. Power	e.i.r.p.					Cond. Power	e.i.r.p.
[MHz]	[dB]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]
5190	-	-8.96	3.35	9.87	0.33	4.26	4.59	-10.00	3.36	9.93	0.33	3.29	3.62
5230	-	-8.66	3.36	9.87	0.33	4.57	4.90	-9.86	3.37	9.93	0.33	3.44	3.77
5755	-	-11.65	3.60	9.89	0.24	1.84	2.08	-9.05	3.60	9.93	0.24	4.48	4.72
5795	-	-11.82	3.60	9.89	0.24	1.67	1.91	-9.66	3.61	9.93	0.24	3.88	4.12

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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

Directional Gain = G_{ANT} (Antenna Gain) + Array Gain

Array Gain = 0 dB(i.e.,no array gain) for $N_{ANT} < 4$

N_{ANT} = number of transmit antennas = 2

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

Maximum Conducted Output Power

Report No. 13462774S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date August 28, 2020
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Makoto Hosaka
Mode Tx 11n-40 MIMO

RF0 + RF1

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.					
			RF0 [mW]	Antenna RF1 [mW]	Sum [mW]	Result [dBm]	Limit [dBm]	Margin [dB]	RF0 [mW]	Antenna RF1 [mW]	Sum [mW]	Result [dBm]	Limit [dBm]	Margin [dB]
5190	-	36.389	2.62	2.05	4.66	6.69	23.97	17.28	1.96	2.21	4.17	6.20	29.97	23.77
5230	-	36.435	2.81	2.16	4.97	6.97	23.97	17.00	2.11	2.33	4.44	6.48	29.97	23.49
5755	-	36.418	1.52	2.74	4.26	6.29	30.00	23.71	1.60	2.75	4.35	6.39	36.00	29.61
5795	-	36.427	1.47	2.40	3.87	5.88	30.00	24.12	1.55	2.41	3.96	5.98	36.00	30.02

RF0								RF1						
Tested Frequency	Duty Factor *1)	Reading	Cable Loss	Atten. Loss	Antenna Gain	Result		Reading	Cable Loss	Atten. Loss	Antenna Gain	Result		
[MHz]	[dB]	[dBm]	[dB]	[dB]	[dBi]	Cond. Power [dBm]	e.i.r.p. [dBm]	[dBm]	[dB]	[dB]	[dBi]	Cond. Power [dBm]	e.i.r.p. [dBm]	
5190	-	-9.04	3.35	9.87	-1.25	4.18	2.93	-10.18	3.36	9.93	0.33	3.11	3.44	
5230	-	-8.74	3.36	9.87	-1.25	4.49	3.24	-9.95	3.37	9.93	0.33	3.35	3.68	
5755	-	-11.68	3.60	9.89	0.24	1.81	2.05	-9.15	3.60	9.93	0.01	4.38	4.39	
5795	-	-11.83	3.60	9.89	0.24	1.66	1.90	-9.73	3.61	9.93	0.01	3.81	3.82	

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	September 2, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Toshinori Yamada
Mode	Tx 11ac-40 SISO

11ac-40 SISO, RF0

Applied limit: 15.407, mobile and portable client device

Tested Frequency	Reading	Cable Loss	Atten. Loss	Duty Factor *1)	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power				e.i.r.p.			
								Result		Limit	Margin	Result		Limit	Margin
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5190	-9.07	3.35	9.87	-	-1.25	-	36.425	4.15	2.60	23.97	19.82	2.90	1.95	29.97	27.07
5230	-8.61	3.36	9.87	-	-1.25	-	36.414	4.62	2.90	23.97	19.35	3.37	2.17	29.97	26.60
5755	-11.72	3.60	9.89	-	0.24	-	36.394	1.77	1.50	30.00	28.23	2.01	1.59	36.00	33.99
5795	-11.85	3.60	9.89	-	0.24	-	36.430	1.64	1.46	30.00	28.36	1.88	1.54	36.00	34.12

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

11ac-40 SISO, RF1

Applied limit: 15.407, mobile and portable client device

Tested Frequency	Reading	Cable Loss	Atten. Loss	Duty Factor *1)	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power				e.i.r.p.			
								Result		Limit	Margin	Result		Limit	Margin
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5190	-10.11	3.36	9.93	-	0.33	-	36.425	3.18	2.08	23.97	20.79	3.51	2.24	29.97	26.46
5230	-9.89	3.37	9.93	-	0.33	-	36.414	3.41	2.19	23.97	20.56	3.74	2.37	29.97	26.23
5755	-8.92	3.60	9.93	-	0.01	-	36.394	4.61	2.89	30.00	25.39	4.62	2.90	36.00	31.38
5795	-9.53	3.61	9.93	-	0.01	-	36.430	4.01	2.52	30.00	25.99	4.02	2.52	36.00	31.98

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

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Maximum Conducted Output Power

Report No. 13462774S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date August 28, 2020
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Makoto Hosaka
Mode Tx 11ac-40 CDD

RF0 + RF1

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]
			RF0 [mW]	RF1 [mW]	Sum [mW]				RF0 [mW]	RF1 [mW]	Sum [mW]			
5190	-	36.435	2.65	2.14	4.79	6.80	23.97	17.17	2.86	2.31	5.16	7.13	29.97	22.84
5230	-	36.435	2.90	2.23	5.14	7.11	23.97	16.86	3.13	2.41	5.54	7.44	29.97	22.53
5755	-	36.402	1.51	2.76	4.27	6.31	30.00	23.69	1.60	2.92	4.52	6.55	36.00	29.45
5795	-	36.409	1.46	2.42	3.88	5.89	30.00	24.11	1.55	2.56	4.10	6.13	36.00	29.87

Tested Frequency [MHz]	Duty Factor *1) [dB]	RF0						RF1					
		Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Directional Gain [dBi]	Result		Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Directional Gain [dBi]	Result	
						Cond. Power [dBm]	e.i.r.p. [dBm]					Cond. Power [dBm]	e.i.r.p. [dBm]
5190	-	-8.99	3.35	9.87	0.33	4.23	4.56	-9.99	3.36	9.93	0.33	3.30	3.63
5230	-	-8.60	3.36	9.87	0.33	4.63	4.96	-9.81	3.37	9.93	0.33	3.49	3.82
5755	-	-11.69	3.60	9.89	0.24	1.80	2.04	-9.12	3.60	9.93	0.24	4.41	4.65
5795	-	-11.84	3.60	9.89	0.24	1.65	1.89	-9.70	3.61	9.93	0.24	3.84	4.08

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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

Directional Gain = G_{ANT} (Antenna Gain) + Array Gain

Array Gain = 0 dB(i.e.,no array gain) for $N_{ANT} < 4$

N_{ANT} = number of transmit antennas = 2

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

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Maximum Conducted Output Power

Report No. 13462774S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date August 28, 2020
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Makoto Hosaka
Mode Tx 11ac-40 MIMO

RF0 + RF1

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]
			RF0 [mW]	RF1 [mW]	Sum [mW]				RF0 [mW]	RF1 [mW]	Sum [mW]			
5190	-	36.357	2.58	2.07	4.66	6.68	23.97	17.29	1.94	2.24	4.18	6.21	29.97	23.76
5230	-	36.425	2.84	2.15	4.99	6.98	23.97	16.99	2.13	2.32	4.45	6.48	29.97	23.49
5755	-	36.397	1.50	2.76	4.26	6.29	30.00	23.71	1.58	2.77	4.35	6.38	36.00	29.62
5795	-	36.404	1.47	2.39	3.86	5.86	30.00	24.14	1.55	2.40	3.95	5.96	36.00	30.04

		RF0							RF1						
Tested Frequency	Duty Factor *1)	Reading	Cable Loss	Atten. Loss	Antenna Gain	Result		Reading	Cable Loss	Atten. Loss	Antenna Gain	Result			
						Cond.	e.i.r.p.					Cond.	e.i.r.p.		
						Power						Power			
[MHz]	[dB]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]		
5190	-	-9.10	3.35	9.87	-1.25	4.12	2.87	-10.12	3.36	9.93	0.33	3.17	3.50		
5230	-	-8.69	3.36	9.87	-1.25	4.54	3.29	-9.98	3.37	9.93	0.33	3.32	3.65		
5755	-	-11.74	3.60	9.89	0.24	1.75	1.99	-9.12	3.60	9.93	0.01	4.41	4.42		
5795	-	-11.83	3.60	9.89	0.24	1.66	1.90	-9.75	3.61	9.93	0.01	3.79	3.80		

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

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Maximum Conducted Output Power

Report No. 13462774S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date September 2, 2020
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Toshinori Yamada
Mode Tx 11ac-80 SISO

11ac-80 SISO, RF0

Applied limit: 15.407, mobile and portable client device

Tested Frequency	Reading	Cable Loss	Atten. Loss	Duty Factor *1)	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power				e.i.r.p.			
								Result		Limit	Margin	Result		Limit	Margin
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5210	-8.73	3.36	9.87	-	-1.25	-	76.426	4.50	2.82	23.97	19.47	3.25	2.11	29.97	26.72
5775	-11.64	3.60	9.89	-	0.24	-	76.696	1.85	1.53	30.00	28.15	2.09	1.62	36.00	33.91

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

11ac-80 SISO, RF1

Applied limit: 15.407, mobile and portable client device

Tested Frequency	Reading	Cable Loss	Atten. Loss	Duty Factor *1)	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power				e.i.r.p.			
								Result		Limit	Margin	Result		Limit	Margin
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5210	-9.85	3.37	9.93	-	0.33	-	76.426	3.45	2.21	23.97	20.52	3.78	2.39	29.97	26.19
5775	-9.08	3.61	9.93	-	0.01	-	76.696	4.46	2.79	30.00	25.54	4.47	2.80	36.00	31.53

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	August 28, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Makoto Hosaka
Mode	Tx 11ac-80 CDD

RF0 + RF1

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]
			RF0 [mW]	RF1 [mW]	Sum [mW]				RF0 [mW]	RF1 [mW]	Sum [mW]			
5210	-	76.332	2.85	2.20	5.05	7.03	23.97	16.94	3.08	2.37	5.45	7.36	29.97	22.61
5775	-	76.324	1.54	2.70	4.24	6.27	30.00	23.73	1.63	2.85	4.48	6.51	36.00	29.49

		RF0						RF1					
Tested Frequency	Duty Factor	Reading	Cable Loss	Atten. Loss	Directional Gain	Result		Reading	Cable Loss	Atten. Loss	Directional Gain	Result	
	*1)					Cond.	e.i.r.p.					Cond.	e.i.r.p.
	[dB]					Power [dBm]	[dBm]					Power [dBm]	[dBm]
[MHz]	[dB]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]
5210	-	-8.68	3.36	9.87	0.33	4.55	4.88	-9.88	3.37	9.93	0.33	3.42	3.75
5775	-	-11.62	3.60	9.89	0.24	1.87	2.11	-9.23	3.61	9.93	0.24	4.31	4.55

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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

Directional Gain = G_{ANT} (Antenna Gain) + Array Gain

Array Gain = 0 dB(i.e.,no array gain) for $N_{ANT} < 4$

N_{ANT} = number of transmit antennas = 2

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

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Maximum Conducted Output Power

Report No. 13462774S-C-R2
Test place Shonan EMC Lab. No.5 Shielded Room
Date August 28, 2020
Temperature / Humidity 23 deg. C / 52 % RH
Engineer Makoto Hosaka
Mode Tx 11ac-80 MIMO

RF0 + RF1

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]
			RF0 [mW]	RF1 [mW]	Sum [mW]				RF0 [mW]	RF1 [mW]	Sum [mW]			
5210	-	76.370	2.79	2.22	5.00	6.99	23.97	16.98	2.09	2.39	4.48	6.52	29.97	23.45
5775	-	76.458	1.51	2.67	4.19	6.22	30.00	23.78	1.60	2.68	4.28	6.31	36.00	29.69

		RF0						RF1					
Tested Frequency	Duty Factor *1)	Reading	Cable Loss	Atten. Loss	Antenna Gain	Result		Reading	Cable Loss	Atten. Loss	Antenna Gain	Result	
[MHz]	[dB]	[dBm]	[dB]	[dB]	[dBi]	Cond. Power [dBm]	e.i.r.p. [dBm]	[dBm]	[dB]	[dB]	[dBi]	Cond. Power [dBm]	e.i.r.p. [dBm]
5210	-	-8.78	3.36	9.87	-1.25	4.45	3.20	-9.84	3.37	9.93	0.33	3.46	3.79
5775	-	-11.69	3.60	9.89	0.24	1.80	2.04	-9.27	3.61	9.93	0.01	4.27	4.28

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

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

Conducted Power Limit (5150 MHz-5250 MHz) = 250 mW

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

Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.3 Shielded Room
Date	August 19, 2020
Temperature / Humidity	23 deg. C / 47 % RH
Engineer	Shiro Kobayashi
Mode	Tx 11a SISO

5180 MHz

Antenna	Rate [Mbps]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor *1) [dB]	Conducted Power Result [dBm]	Remarks
RF0	6	-9.15	3.35	9.87	-	4.07	-
	9	-9.14	3.35	9.87	-	4.08	-
	12	-9.12	3.35	9.87	-	4.10	*
	18	-9.14	3.35	9.87	-	4.08	-
	24	-9.23	3.35	9.87	-	3.99	-
	36	-9.22	3.35	9.87	-	4.00	-
	48	-9.27	3.35	9.87	-	3.95	-
	54	-9.23	3.35	9.87	-	3.99	-
RF1	6	-10.19	3.36	9.93	-	3.10	-
	9	-10.19	3.36	9.93	-	3.10	-
	12	-10.18	3.36	9.93	-	3.11	-
	18	-10.18	3.36	9.93	-	3.11	-
	24	-10.25	3.36	9.93	-	3.04	-
	36	-10.23	3.36	9.93	-	3.06	-
	48	-10.30	3.36	9.93	-	2.99	-
	54	-10.34	3.36	9.93	-	2.95	-

* Worst rate

Sample Calculation:

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

*1) Duty factor is not required because the measurement use a gated average power meter.

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Shonan EMC Lab.

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Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	August 28, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Makoto Hosaka
Mode	Tx 11a CDD

5180 MHz

Rate [Mbps]	Conducted power			Result [dBm]	Remarks
	Antenna RF0 [mW]	RF1 [mW]	Sum [mW]		
6	2.69	2.09	4.78	6.79	-
9	2.66	2.10	4.76	6.78	-
12	2.67	2.13	4.80	6.81	*
18	2.65	2.08	4.73	6.75	-
24	2.62	2.07	4.69	6.71	-
36	2.61	2.09	4.70	6.72	-
48	2.58	2.02	4.60	6.63	-
54	2.58	2.03	4.61	6.64	-

RF0						RF1			
Rate [Mbps]	Duty Factor *1) [dB]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]
6	-	-8.93	3.35	9.87	4.29	-10.08	3.36	9.93	3.21
9	-	-8.97	3.35	9.87	4.25	-10.06	3.36	9.93	3.23
12	-	-8.96	3.35	9.87	4.26	-10.00	3.36	9.93	3.29
18	-	-8.99	3.35	9.87	4.23	-10.11	3.36	9.93	3.18
24	-	-9.04	3.35	9.87	4.18	-10.12	3.36	9.93	3.17
36	-	-9.06	3.35	9.87	4.16	-10.09	3.36	9.93	3.20
48	-	-9.10	3.35	9.87	4.12	-10.24	3.36	9.93	3.05
54	-	-9.10	3.35	9.87	4.12	-10.21	3.36	9.93	3.08

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	September 2, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Toshinori Yamada
Mode	Tx 11n-20 SISO

5180 MHz

Antenna	Rate [MCS]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor *1) [dB]	Conducted Power Result [dBm]	Remarks
RF0	0	-9.09	3.35	9.87	-	4.13	*
	1	-9.16	3.35	9.87	-	4.06	-
	2	-9.12	3.35	9.87	-	4.10	-
	3	-9.13	3.35	9.87	-	4.09	-
	4	-9.12	3.35	9.87	-	4.10	-
	5	-9.18	3.35	9.87	-	4.04	-
	6	-9.17	3.35	9.87	-	4.05	-
RF1	7	-9.18	3.35	9.87	-	4.04	-
	0	-10.15	3.36	9.93	-	3.14	-
	1	-10.16	3.36	9.93	-	3.13	-
	2	-10.20	3.36	9.93	-	3.09	-
	3	-10.17	3.36	9.93	-	3.12	-
	4	-10.19	3.36	9.93	-	3.10	-
	5	-10.15	3.36	9.93	-	3.14	-
	6	-10.18	3.36	9.93	-	3.11	-
	7	-10.21	3.36	9.93	-	3.08	-

* Worst rate

Sample Calculation:

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

*1) Duty factor is not required because the measurement use a gated average power meter.

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Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	August 28, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Makoto Hosaka
Mode	Tx 11n-20 CDD

5180 MHz

Rate [MCS]	Conducted power Antenna			Result [dBm]	Remarks
	RF0 [mW]	RF1 [mW]	Sum [mW]		
0	2.69	2.10	4.78	6.80	*
1	2.65	2.09	4.74	6.76	-
2	2.64	2.06	4.69	6.71	-
3	2.62	2.09	4.71	6.73	-
4	2.62	2.04	4.67	6.69	-
5	2.57	2.06	4.63	6.66	-
6	2.58	2.02	4.60	6.63	-
7	2.55	2.04	4.59	6.62	-

RF0						RF1			
Rate [MCS]	Duty Factor *1) [dB]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]
0	-	-8.93	3.35	9.87	4.29	-10.07	3.36	9.93	3.22
1	-	-8.98	3.35	9.87	4.24	-10.09	3.36	9.93	3.20
2	-	-9.01	3.35	9.87	4.21	-10.16	3.36	9.93	3.13
3	-	-9.04	3.35	9.87	4.18	-10.08	3.36	9.93	3.21
4	-	-9.03	3.35	9.87	4.19	-10.19	3.36	9.93	3.10
5	-	-9.12	3.35	9.87	4.10	-10.15	3.36	9.93	3.14
6	-	-9.11	3.35	9.87	4.11	-10.23	3.36	9.93	3.06
7	-	-9.16	3.35	9.87	4.06	-10.19	3.36	9.93	3.10

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	August 28, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Makoto Hosaka
Mode	Tx 11n-20 MIMO

5180 MHz

Rate [MCS]	Conducted power Antenna			Result [dBm]	Remarks
	RF0 [mW]	RF1 [mW]	Sum [mW]		
8	2.65	2.07	4.72	6.74	*
9	2.62	2.05	4.68	6.70	-
10	2.63	2.03	4.66	6.69	-
11	2.59	2.01	4.60	6.63	-
12	2.58	2.05	4.63	6.65	-
13	2.58	2.00	4.58	6.61	-
14	2.54	2.06	4.60	6.63	-
15	2.51	2.01	4.53	6.56	-

RF0						RF1			
Rate [MCS]	Duty Factor *1) [dB]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]
8	-	-8.99	3.35	9.87	4.23	-10.12	3.36	9.93	3.17
9	-	-9.03	3.35	9.87	4.19	-10.17	3.36	9.93	3.12
10	-	-9.02	3.35	9.87	4.20	-10.21	3.36	9.93	3.08
11	-	-9.09	3.35	9.87	4.13	-10.25	3.36	9.93	3.04
12	-	-9.10	3.35	9.87	4.12	-10.18	3.36	9.93	3.11
13	-	-9.10	3.35	9.87	4.12	-10.28	3.36	9.93	3.01
14	-	-9.17	3.35	9.87	4.05	-10.15	3.36	9.93	3.14
15	-	-9.22	3.35	9.87	4.00	-10.25	3.36	9.93	3.04

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	September 2, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Toshinori Yamada
Mode	Tx 11ac-20 SISO

5180 MHz

Antenna	Rate [MCS]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor *1) [dB]	Conducted Power Result [dBm]	Remarks
RF0	0	-9.16	3.35	9.87	-	4.06	*
	1	-9.19	3.35	9.87	-	4.03	-
	2	-9.22	3.35	9.87	-	4.00	-
	3	-9.22	3.35	9.87	-	4.00	-
	4	-9.24	3.35	9.87	-	3.98	-
	5	-9.21	3.35	9.87	-	4.01	-
	6	-9.24	3.35	9.87	-	3.98	-
	7	-9.22	3.35	9.87	-	4.00	-
	8	-9.21	3.35	9.87	-	4.01	-
RF1	0	-10.14	3.36	9.93	-	3.15	-
	1	-10.15	3.36	9.93	-	3.14	-
	2	-10.24	3.36	9.93	-	3.05	-
	3	-10.22	3.36	9.93	-	3.07	-
	4	-10.25	3.36	9.93	-	3.04	-
	5	-10.21	3.36	9.93	-	3.08	-
	6	-10.20	3.36	9.93	-	3.09	-
	7	-10.20	3.36	9.93	-	3.09	-
	8	-10.27	3.36	9.93	-	3.02	-

* Worst rate

Sample Calculation:

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

*1) Duty factor is not required because the measurement use a gated average power meter.

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Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	August 28, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Makoto Hosaka
Mode	Tx 11ac-20 CDD

5180 MHz

Rate [MCS]	Conducted power Antenna			Result [dBm]	Remarks
	RF0 [mW]	RF1 [mW]	Sum [mW]		
0	2.69	2.09	4.78	6.80	*
1	2.65	2.09	4.75	6.77	-
2	2.65	2.06	4.71	6.73	-
3	2.62	2.07	4.69	6.72	-
4	2.63	2.02	4.65	6.68	-
5	2.62	2.04	4.66	6.68	-
6	2.61	2.03	4.64	6.67	-
7	2.61	2.02	4.62	6.65	-
8	2.59	2.01	4.60	6.63	-

RF0						RF1			
Rate [MCS]	Duty Factor *1) [dB]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]
0	-	-8.92	3.35	9.87	4.30	-10.09	3.36	9.93	3.20
1	-	-8.98	3.35	9.87	4.24	-10.08	3.36	9.93	3.21
2	-	-8.98	3.35	9.87	4.24	-10.16	3.36	9.93	3.13
3	-	-9.03	3.35	9.87	4.19	-10.13	3.36	9.93	3.16
4	-	-9.02	3.35	9.87	4.20	-10.23	3.36	9.93	3.06
5	-	-9.04	3.35	9.87	4.18	-10.19	3.36	9.93	3.10
6	-	-9.05	3.35	9.87	4.17	-10.22	3.36	9.93	3.07
7	-	-9.06	3.35	9.87	4.16	-10.24	3.36	9.93	3.05
8	-	-9.09	3.35	9.87	4.13	-10.25	3.36	9.93	3.04

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	August 28, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Makoto Hosaka
Mode	Tx 11ac-20 MIMO

5180 MHz

Rate [MCS]	Conducted power Antenna			Result [dBm]	Remarks
	RF0 [mW]	RF1 [mW]	Sum [mW]		
0	2.64	2.04	4.68	6.71	*
1	2.61	2.03	4.64	6.67	-
2	2.56	2.05	4.62	6.64	-
3	2.58	1.99	4.57	6.60	-
4	2.55	2.01	4.56	6.59	-
5	2.54	2.02	4.56	6.59	-
6	2.54	2.02	4.56	6.59	-
7	2.51	2.04	4.55	6.58	-
8	2.51	2.02	4.52	6.56	-

RF0						RF1			
Rate [MCS]	Duty Factor *1) [dB]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]
0	-	-9.00	3.35	9.87	4.22	-10.19	3.36	9.93	3.10
1	-	-9.05	3.35	9.87	4.17	-10.22	3.36	9.93	3.07
2	-	-9.13	3.35	9.87	4.09	-10.17	3.36	9.93	3.12
3	-	-9.11	3.35	9.87	4.11	-10.30	3.36	9.93	2.99
4	-	-9.16	3.35	9.87	4.06	-10.25	3.36	9.93	3.04
5	-	-9.17	3.35	9.87	4.05	-10.24	3.36	9.93	3.05
6	-	-9.18	3.35	9.87	4.04	-10.23	3.36	9.93	3.06
7	-	-9.22	3.35	9.87	4.00	-10.19	3.36	9.93	3.10
8	-	-9.23	3.35	9.87	3.99	-10.24	3.36	9.93	3.05

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	September 2, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Toshinori Yamada
Mode	Tx 11n-40 SISO

5190 MHz

Antenna	Rate [MCS]	Reading (timed average) [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor *1) [dB]	Conducted Power Result [dBm]	Remarks
RF0	0	-9.09	3.35	9.87	-	4.13	*
	1	-9.11	3.35	9.87	-	4.11	-
	2	-9.16	3.35	9.87	-	4.06	-
	3	-9.15	3.35	9.87	-	4.07	-
	4	-9.17	3.35	9.87	-	4.05	-
	5	-9.14	3.35	9.87	-	4.08	-
	6	-9.17	3.35	9.87	-	4.05	-
	7	-9.24	3.35	9.87	-	3.98	-
RF1	0	-10.11	3.36	9.93	-	3.18	-
	1	-10.13	3.36	9.93	-	3.16	-
	2	-10.17	3.36	9.93	-	3.12	-
	3	-10.13	3.36	9.93	-	3.16	-
	4	-10.19	3.36	9.93	-	3.10	-
	5	-10.21	3.36	9.93	-	3.08	-
	6	-10.22	3.36	9.93	-	3.07	-
	7	-10.23	3.36	9.93	-	3.06	-

* Worst rate

Sample Calculation:

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

*1) Duty factor is not required because the measurement use a gated average power meter.

Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	August 28, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Makoto Hosaka
Mode	Tx 11n-40 CDD

5190 MHz

Rate [MCS]	Conducted power Antenna			Result [dBm]	Remarks
	RF0 [mW]	RF1 [mW]	Sum [mW]		
0	2.67	2.13	4.80	6.81	*
1	2.61	2.10	4.72	6.74	-
2	2.62	2.05	4.67	6.69	-
3	2.61	2.07	4.68	6.70	-
4	2.56	2.07	4.63	6.66	-
5	2.57	2.07	4.64	6.67	-
6	2.54	2.07	4.61	6.63	-
7	2.54	2.06	4.59	6.62	-

RF0						RF1			
Rate [Mbps]	Duty Factor *1) [dB]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]
0	-	-8.96	3.35	9.87	4.26	-10.00	3.36	9.93	3.29
1	-	-9.05	3.35	9.87	4.17	-10.06	3.36	9.93	3.23
2	-	-9.04	3.35	9.87	4.18	-10.17	3.36	9.93	3.12
3	-	-9.05	3.35	9.87	4.17	-10.13	3.36	9.93	3.16
4	-	-9.14	3.35	9.87	4.08	-10.12	3.36	9.93	3.17
5	-	-9.12	3.35	9.87	4.10	-10.13	3.36	9.93	3.16
6	-	-9.18	3.35	9.87	4.04	-10.13	3.36	9.93	3.16
7	-	-9.18	3.35	9.87	4.04	-10.16	3.36	9.93	3.13

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	August 28, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Makoto Hosaka
Mode	Tx 11n-40 MIMO

5190 MHz

Rate [MCS]	Conducted power Antenna			Result [dBm]	Remarks
	RF0 [mW]	RF1 [mW]	Sum [mW]		
8	2.62	2.05	4.66	6.69	*
9	2.57	2.02	4.59	6.62	-
10	2.56	2.02	4.59	6.62	-
11	2.52	2.02	4.54	6.57	-
12	2.52	2.03	4.55	6.58	-
13	2.54	2.02	4.56	6.59	-
14	2.50	2.02	4.52	6.55	-
15	2.51	2.00	4.52	6.55	-

RF0						RF1			
Rate [MCS]	Duty Factor *1) [dB]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]
8	-	-9.04	3.35	9.87	4.18	-10.18	3.36	9.93	3.11
9	-	-9.12	3.35	9.87	4.10	-10.23	3.36	9.93	3.06
10	-	-9.13	3.35	9.87	4.09	-10.23	3.36	9.93	3.06
11	-	-9.21	3.35	9.87	4.01	-10.23	3.36	9.93	3.06
12	-	-9.21	3.35	9.87	4.01	-10.21	3.36	9.93	3.08
13	-	-9.17	3.35	9.87	4.05	-10.23	3.36	9.93	3.06
14	-	-9.24	3.35	9.87	3.98	-10.24	3.36	9.93	3.05
15	-	-9.22	3.35	9.87	4.00	-10.27	3.36	9.93	3.02

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	September 2, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Toshinori Yamada
Mode	Tx 11ac-40 SISO

5190 MHz

Antenna	Rate [MCS]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor *1) [dB]	Conducted Power Result [dBm]	Remarks
RF0	0	-9.07	3.35	9.87	-	4.15	*
	1	-9.16	3.35	9.87	-	4.06	-
	2	-9.13	3.35	9.87	-	4.09	-
	3	-9.17	3.35	9.87	-	4.05	-
	4	-9.21	3.35	9.87	-	4.01	-
	5	-9.16	3.35	9.87	-	4.06	-
	6	-9.16	3.35	9.87	-	4.06	-
	7	-9.17	3.35	9.87	-	4.05	-
	8	-9.21	3.35	9.87	-	4.01	-
	9	-9.15	3.35	9.87	-	4.07	-
RF1	0	-10.11	3.36	9.93	-	3.18	-
	1	-10.17	3.36	9.93	-	3.12	-
	2	-10.17	3.36	9.93	-	3.12	-
	3	-10.19	3.36	9.93	-	3.10	-
	4	-10.18	3.36	9.93	-	3.11	-
	5	-10.19	3.36	9.93	-	3.10	-
	6	-10.19	3.36	9.93	-	3.10	-
	7	-10.20	3.36	9.93	-	3.09	-
	8	-10.21	3.36	9.93	-	3.08	-
	9	-10.22	3.36	9.93	-	3.07	-

* Worst rate

Sample Calculation:

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

*1) Duty facotr is not required because the measurement use a gated average power meter.

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Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	August 28, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Makoto Hosaka
Mode	Tx 11ac-40 CDD

5190 MHz

Rate [MCS]	Conducted power Antenna			Result [dBm]	Remarks
	RF0 [mW]	RF1 [mW]	Sum [mW]		
0	2.65	2.14	4.79	6.80	*
1	2.62	2.11	4.74	6.76	-
2	2.59	2.07	4.66	6.68	-
3	2.62	2.07	4.69	6.71	-
4	2.52	2.05	4.56	6.59	-
5	2.51	2.04	4.55	6.58	-
6	2.52	2.03	4.56	6.59	-
7	2.55	2.04	4.59	6.62	-
8	2.51	2.07	4.58	6.61	-
9	2.53	2.07	4.60	6.63	-

		RF0				RF1			
Rate [MCS]	Duty Factor *1) [dB]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]
0	-	-8.99	3.35	9.87	4.23	-9.99	3.36	9.93	3.30
1	-	-9.03	3.35	9.87	4.19	-10.04	3.36	9.93	3.25
2	-	-9.08	3.35	9.87	4.14	-10.14	3.36	9.93	3.15
3	-	-9.04	3.35	9.87	4.18	-10.12	3.36	9.93	3.17
4	-	-9.21	3.35	9.87	4.01	-10.18	3.36	9.93	3.11
5	-	-9.23	3.35	9.87	3.99	-10.19	3.36	9.93	3.10
6	-	-9.20	3.35	9.87	4.02	-10.21	3.36	9.93	3.08
7	-	-9.16	3.35	9.87	4.06	-10.19	3.36	9.93	3.10
8	-	-9.23	3.35	9.87	3.99	-10.12	3.36	9.93	3.17
9	-	-9.19	3.35	9.87	4.03	-10.13	3.36	9.93	3.16

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	August 28, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Makoto Hosaka
Mode	Tx 11ac-40 MIMO

5190 MHz

Rate [MCS]	Conducted power Antenna			Result [dBm]	Remarks
	RF0 [mW]	RF1 [mW]	Sum [mW]		
0	2.58	2.07	4.66	6.68	*
1	2.58	2.06	4.63	6.66	-
2	2.51	2.06	4.57	6.60	-
3	2.53	2.08	4.61	6.64	-
4	2.49	2.06	4.54	6.58	-
5	2.50	2.06	4.56	6.59	-
6	2.51	2.04	4.55	6.58	-
7	2.45	2.02	4.48	6.51	-
8	2.51	2.05	4.55	6.58	-
9	2.48	2.04	4.52	6.56	-

RF0						RF1			
Rate [MCS]	Duty Factor *1) [dB]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]
0	-	-9.10	3.35	9.87	4.12	-10.12	3.36	9.93	3.17
1	-	-9.11	3.35	9.87	4.11	-10.16	3.36	9.93	3.13
2	-	-9.23	3.35	9.87	3.99	-10.15	3.36	9.93	3.14
3	-	-9.19	3.35	9.87	4.03	-10.11	3.36	9.93	3.18
4	-	-9.26	3.35	9.87	3.96	-10.16	3.36	9.93	3.13
5	-	-9.24	3.35	9.87	3.98	-10.15	3.36	9.93	3.14
6	-	-9.22	3.35	9.87	4.00	-10.20	3.36	9.93	3.09
7	-	-9.32	3.35	9.87	3.90	-10.23	3.36	9.93	3.06
8	-	-9.23	3.35	9.87	3.99	-10.18	3.36	9.93	3.11
9	-	-9.27	3.35	9.87	3.95	-10.19	3.36	9.93	3.10

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	September 2, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Toshinori Yamada
Mode	Tx 11ac-80 SISO

5210 MHz

Antenna	Rate [MCS]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor *1) [dB]	Conducted Power Result [dBm]	Remarks
RF0	0	-8.74	3.36	9.87	-	4.49	*
	1	-8.80	3.36	9.87	-	4.43	-
	2	-8.83	3.36	9.87	-	4.40	-
	3	-8.85	3.36	9.87	-	4.38	-
	4	-8.89	3.36	9.87	-	4.34	-
	5	-8.88	3.36	9.87	-	4.35	-
	6	-8.88	3.36	9.87	-	4.35	-
	7	-8.90	3.36	9.87	-	4.33	-
	8	-8.89	3.35	9.87	-	4.33	-
	9	-8.90	3.36	9.87	-	4.33	-
RF1	0	-9.85	3.37	9.93	-	3.45	-
	1	-9.91	3.37	9.93	-	3.39	-
	2	-9.97	3.37	9.93	-	3.33	-
	3	-9.91	3.37	9.93	-	3.39	-
	4	-9.99	3.37	9.93	-	3.31	-
	5	-9.96	3.37	9.93	-	3.34	-
	6	-10.00	3.37	9.93	-	3.30	-
	7	-10.02	3.37	9.93	-	3.28	-
	8	-10.01	3.36	9.93	-	3.28	-
	9	-10.01	3.37	9.93	-	3.29	-

* Worst rate

Sample Calculation:

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

*1) Duty facotr is not required because the measurement use a gated average power meter.

Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	August 28, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Makoto Hosaka
Mode	Tx 11ac-80 CDD

5210 MHz

Rate [MCS]	Conducted power Antenna			Result [dBm]	Remarks
	RF0 [mW]	RF1 [mW]	Sum [mW]		
0	2.85	2.20	5.05	7.03	*
1	2.79	2.14	4.93	6.93	-
2	2.73	2.13	4.86	6.87	-
3	2.76	2.12	4.88	6.89	-
4	2.70	2.12	4.83	6.84	-
5	2.72	2.12	4.84	6.85	-
6	2.70	2.13	4.83	6.84	-
7	2.72	2.13	4.85	6.86	-
8	2.67	2.14	4.80	6.82	-
9	2.72	2.12	4.84	6.85	-

		RF0				RF1			
Rate [MCS]	Duty Factor *1) [dB]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]
0	-	-8.68	3.36	9.87	4.55	-9.88	3.37	9.93	3.42
1	-	-8.78	3.36	9.87	4.45	-9.99	3.37	9.93	3.31
2	-	-8.87	3.36	9.87	4.36	-10.01	3.37	9.93	3.29
3	-	-8.82	3.36	9.87	4.41	-10.03	3.37	9.93	3.27
4	-	-8.91	3.36	9.87	4.32	-10.03	3.37	9.93	3.27
5	-	-8.89	3.36	9.87	4.34	-10.03	3.37	9.93	3.27
6	-	-8.91	3.36	9.87	4.32	-10.02	3.37	9.93	3.28
7	-	-8.89	3.36	9.87	4.34	-10.01	3.37	9.93	3.29
8	-	-8.97	3.36	9.87	4.26	-10.00	3.37	9.93	3.30
9	-	-8.88	3.36	9.87	4.35	-10.04	3.37	9.93	3.26

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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Maximum Conducted Output Power

Report No.	13462774S-C-R2
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	August 28, 2020
Temperature / Humidity	23 deg. C / 52 % RH
Engineer	Makoto Hosaka
Mode	Tx 11ac-80 MIMO

5210 MHz

Rate [MCS]	Conducted power Antenna			Result [dBm]	Remarks
	RF0 [mW]	RF1 [mW]	Sum [mW]		
0	2.79	2.22	5.00	6.99	*
1	2.72	2.12	4.83	6.84	-
2	2.69	2.15	4.84	6.85	-
3	2.68	2.14	4.82	6.83	-
4	2.67	2.10	4.77	6.79	-
5	2.69	2.12	4.81	6.83	-
6	2.69	2.13	4.82	6.83	-
7	2.69	2.14	4.83	6.84	-
8	2.62	2.09	4.71	6.73	-
9	2.64	2.08	4.72	6.74	-

Rate [MCS]	Duty Factor *1) [dB]	RF0				RF1			
		Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result Cond. Power [dBm]
0	-	-8.78	3.36	9.87	4.45	-9.84	3.37	9.93	3.46
1	-	-8.89	3.36	9.87	4.34	-10.04	3.37	9.93	3.26
2	-	-8.93	3.36	9.87	4.30	-9.98	3.37	9.93	3.32
3	-	-8.95	3.36	9.87	4.28	-9.99	3.37	9.93	3.31
4	-	-8.96	3.36	9.87	4.27	-10.08	3.37	9.93	3.22
5	-	-8.93	3.36	9.87	4.30	-10.03	3.37	9.93	3.27
6	-	-8.94	3.36	9.87	4.29	-10.01	3.37	9.93	3.29
7	-	-8.93	3.36	9.87	4.30	-9.99	3.37	9.93	3.31
8	-	-9.05	3.36	9.87	4.18	-10.09	3.37	9.93	3.21
9	-	-9.02	3.36	9.87	4.21	-10.12	3.37	9.93	3.18

*1) Duty Factor is not required because the measurement using a gated RF average power meter.

Sample Calculation:

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

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