



# RADIO TEST REPORT

**Test Report No. : 13554183S-E-R1**

**Applicant** : Sony Corporation, Japan and Sony Group Companies  
**Type of EUT** : CONTROL BOX  
**Model Number of EUT** : TMR-A9WT (Module: WM-BAC-AT-49)  
**FCC ID** : AK8TMRA9WT  
**Test regulation** : FCC Part 15 Subpart E: 2021  
(Except for DFS test)  
**Test Result** : Complied (Refer to SECTION 3.2)

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
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.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by the A2LA accreditation body.
6. This test report covers Radio technical requirements.  
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 13554183S-E. 13554183S-E is replaced with this report.

**Date of test:** October 5 to November 28, 2020

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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.: 13554183S-E**

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13554183S-E	February 26, 2021	-	-
1	13554183S-E-R1	March 2, 2021	48	Correction of Antenna gain: ANT 1 From '4.13' to '6.64'
			61, 67, 73, 79, 84, 89	Addition of remarks: *1) PSD was measured with using the gate function of Spectrum analyzer.

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## 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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## Radio Specification

<Module A: model No. WM-BAC-AT-49> (\* The module covered by this report.)

	Bluetooth (BR/EDR) *1)	Bluetooth (Low Energy) *1)
Frequency of operation	2402 MHz - 2480 MHz	2402 MHz - 2480 MHz
Channel spacing	1 MHz	2 MHz
Modulation	FHSS: GFSK (* EDR: GFSK+ /4-DQPSK, GFSK+ 8DPSK)	
Antenna type	Dipole antenna	
Antenna Gain	3.54 dBi	
Antenna Connector type	U.FL connector	

\*1) The Bluetooth part antenna and the Module B antenna are common antenna.

	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 5260 MHz - 5320 MHz 5500 MHz - 5720 MHz 5745 MHz - 5825 MHz	5190 MHz - 5230 MHz 5270 MHz - 5310 MHz 5510 MHz - 5710 MHz 5755 MHz - 5795 MHz
Channel spacing	5 MHz		2.4 GHz band 5 MHz 5 GHz band 20 MHz	5 GHz band 40 MHz
Modulation	DSSS: DBPSK, DQPSK, CCK	OFDM: BPSK, QPSK, 16QAM, 64QAM		
	IEEE802.11a	IEEE802.11ac (20 MHz band)	IEEE802.11ac (40 MHz band)	IEEE802.11ac (80 MHz band)
Frequency of operation	5180 MHz - 5240 MHz 5260 MHz - 5320 MHz 5500 MHz - 5720 MHz 5745 MHz - 5825 MHz	5180 MHz - 5240 MHz 5260 MHz - 5320 MHz 5500 MHz - 5720 MHz 5745 MHz - 5825 MHz	5190 MHz - 5230 MHz 5270 MHz - 5310 MHz 5510 MHz - 5710 MHz 5755 MHz - 5795 MHz	5210 MHz 5290 MHz 5530 MHz - 5610 MHz 5690 MHz 5775 MHz
Channel spacing	20 MHz		40 MHz	80 MHz
Modulation	OFDM BPSK, QPSK, 16QAM, 64QAM, 256QAM (*256QAM is only for IEEE802.11ac 80 MHz band)			
Antenna type	Dipole antenna			
Antenna Gain	ANT0 : 1.36 dBi (2.4 GHz), 3.71 dBi (U-NII-1), 2.60 dBi (U-NII-2A), 2.48 dBi (U-NII-2C), 3.09 dBi (U-NII-3) ANT1 : 1.90 dBi (2.4 GHz), 5.79 dBi (U-NII-1), 5.79 dBi (U-NII-2A), 5.12 dBi (U-NII-2C), 4.13 dBi (U-NII-3)			
Antenna Connector type	U.FL connector			

<Module B: Model No. 1PJ>

	IEEE802.11a	IEEE802.11n (20 MHz band)	IEEE802.11n (40 MHz band)
Frequency of operation	5180 MHz - 5240 MHz 5260 MHz - 5320 MHz 5500 MHz - 5700 MHz 5745 MHz - 5825 MHz	5180 MHz - 5240 MHz 5260 MHz - 5320 MHz 5500 MHz - 5700 MHz 5745 MHz - 5825 MHz	5190 MHz - 5230 MHz 5270 MHz - 5310 MHz 5510 MHz - 5670 MHz 5755 MHz - 5795 MHz
Channel spacing	20 MHz	20 MHz	40 MHz
Modulation	DSSS: DBPSK, DQPSK, CCK	OFDM: BPSK, QPSK, 16QAM, 64QAM	
Antenna type	Dipole antenna		
Antenna Gain	ANT : 4.64 dBi (U-NII-1), 4.48 dBi (U-NII-2A), 4.76 dBi (U-NII-2C), 4.76 dBi (U-NII-3)		
Antenna Connector type	U.FL connector		

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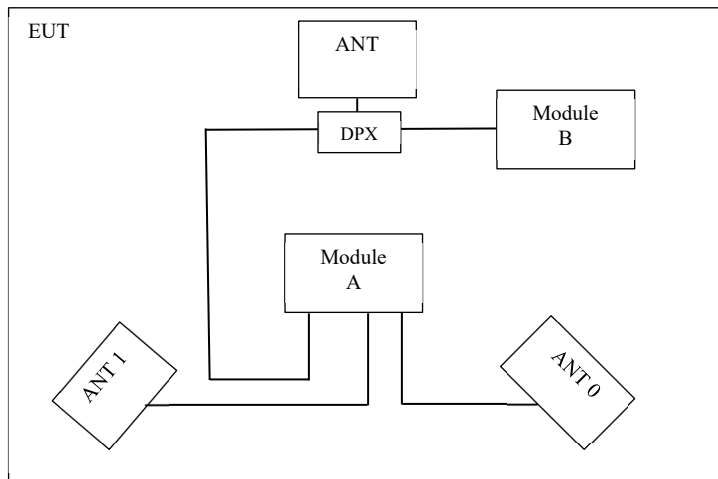
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Additional information for specification:



The EUT has Module A and Module B.

\* DPX: Diplexer.

Combination of antennas used

	BT	BT LE	WLAN 2.4 GHz	WLAN 5 GHz
ANT	Module A	Module A	-	Module B
ANT 0	-	-	Module A	Module A
ANT 1	-	-	Module A	Module A

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## **SECTION 3: Test specification, procedures & results**

### **3.1 Test Specification**

Test Specification : FCC Part 15 Subpart E  
FCC Part 15 final revised on January 12, 2021 and effective February 11, 2021  
\* 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



### 3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013	FCC: 15.407 (b) (6) / 15.207	15.0 dB 11.58686 MHz, N, AV Tx 11n-20 5320 MHz	Complied a)	-
	ISED: RSS-Gen 8.8	ISED: RSS-Gen 8.8			
26 dB Emission Bandwidth	FCC: KDB Publication Number 789033	FCC: 15.407 (a) (1) (2) (3)	See data	Complied b)	Conducted
	ISED: -	ISED: -			
Maximum Conducted Output Power	FCC: KDB Publication Number 789033	FCC: 15.407 (a) (1) (2) (3)		Complied c)	Conducted
	ISED: -	ISED: RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1			
Maximum Power Spectral Density	FCC: KDB Publication Number 789033	FCC : 15.407 (a) (1) (2) (3)		Complied d)	Conducted
	ISED: -	ISED: RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1			
Spurious Emission Restricted Band Edge	FCC: ANSI C63.10-2013 KDB Publication Number 789033	FCC: 15.407 (b), 15.205 and 15.209	1.1 dB 5150.000 MHz AV Tx 11ac-40 5190 MHz	Complied# e) / f)	Conducted (< 30 MHz) / Radiated (> 30 MHz) *1)
	ISED: -	ISED: RSS-247 6.2.1.2 6.2.2.2 6.2.3.2 6.2.4.2			
6 dB Emission Bandwidth	FCC: ANSI C63.10-2013	FCC: 15.407 (e)	See data	Complied g)	Conducted
	ISED: -	ISED: RSS-247 6.2.4.1			
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422. *1) Radiated test was selected over 30 MHz based on FCC 15.407 (b) and KDB 789033 D02 G.3.b).  a) Refer to APPENDIX 1 (data of Conducted Emission) b) Refer to APPENDIX 1 (data of 26 dB Emission Bandwidth and 99 % Occupied Bandwidth) c) Refer to APPENDIX 1 (data of Maximum Conducted Output Power) d) Refer to APPENDIX 1 (data of Maximum Power Spectral Density) e) Refer to APPENDIX 1 (data of Radiated Spurious Emission) f) Refer to APPENDIX 1 (data of Conducted Spurious Emission) g) Refer to APPENDIX 1 (data of 6 dB Bandwidth)  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.

#### **FCC Part 15.31 (e)**

This EUT provides the stable voltage constantly to RF part regardless of input voltage. Therefore, this EUT complies with the requirement.

#### **FCC Part 15.203 Antenna requirement**

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

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### 3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99 % Occupied Band Width	ISED: RSS-Gen 6.7	ISED: -	N/A	- a)	Conducted
a) Refer to APPENDIX 1 (data of 26 dB Emission Bandwidth and 99 % Occupied Bandwidth)					

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

### 3.4 Uncertainty

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
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.6 dB	2.6 dB	2.5 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 / CAB identifier: JP0001)

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.

<b>Mode</b>	<b>Remarks*</b>
IEEE 802.11a (11a)	18 Mbps, PN9
IEEE 802.11n 20 MHz BW (11n-20)	MCS 2, PN9
IEEE 802.11n 40 MHz BW (11n-40)	MCS 6, PN9
IEEE 802.11ac 20 MHz BW (11ac-20)	MCS 3, PN9
IEEE 802.11ac 40 MHz BW (11ac-40)	MCS 5, PN9
IEEE 802.11ac 80 MHz BW (11ac-80)	MCS 0, PN9
*The worst antenna (Ant: x) 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:    11a: 11 dBm (5180 MHz -5320 MHz), 9 dBm (5500 MHz -5825 MHz) 11n-20: 11 dBm (5180 MHz -5320 MHz), 9 dBm (5500 MHz -5825 MHz) 11ac-20: 11 dBm (5180 MHz -5320 MHz), 9 dBm (5500 MHz -5825 MHz) 11n-40: 11 dBm (5190 MHz -5310 MHz), 9 dBm (5510 MHz -5795 MHz) 11ac40: 11 dBm (5190 MHz -5310 MHz), 9 dBm (5510 MHz -5795 MHz) 11ac80: 11 dBm (5210 MHz -5290 MHz), 9 dBm (5530 MHz -5775 MHz)  Software:            AT-49 RF Test Ver 1.2 (Date: 2020.10.22, Storage location: Driven by connected PC)	
*This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.	

\*The details of Operation mode(s)

Test Item	Operating Mode	Tested Antenna	Tested Frequency			
			Lower Band	Middle Band	Additional Band	Upper Band
Conducted emission	11n-20 Tx *1)	0	-	5320 MHz	-	-
26 dB Emission Bandwidth	11a Tx 11n-20 Tx 11ac-20 Tx	0	-	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz 5720 MHz	-
	11n-40 Tx 11ac-40 Tx	0	-	5260 MHz 5300 MHz 5320 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	-
	11ac-80 Tx	0	-	5290 MHz	5530 MHz 5610 MHz 5690 MHz	-
99 % Occupied Bandwidth,	11a Tx 11n-20 Tx 11ac-20 Tx	0	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz 5720 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx 11ac-40 Tx	0	5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	5755 MHz 5795 MHz
	11ac-80 Tx	0	5210 MHz	5290 MHz	5530 MHz 5610 MHz 5690 MHz	5775 MHz
Maximum Conducted Output Power, Maximum Power Spectral Density	11a Tx 11n-20 Tx 11ac-20 Tx	0-1 (Simultaneously)	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz 5720 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx 11ac-40 Tx	0-1 (Simultaneously)	5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	5755 MHz 5795 MHz
	11ac-80 Tx	0-1 (Simultaneously)	5210 MHz	5290 MHz	5530 MHz 5610 MHz 5690 MHz	5775 MHz
6 dB Bandwidth	11a Tx 11n-20 Tx 11ac-20 Tx	0	-	-	-	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx 11ac-40 Tx	0	-	-	-	5755 MHz 5795 MHz
	11ac-80 Tx	0	-	-	-	5775 MHz
Radiated Spurious Emission (Below 1 GHz)	11n-20 Tx *1)	0-1 (Simultaneously)	-	5320 MHz	-	-
Radiated Spurious Emission (Above 1 GHz)	11a Tx 11ac-20 Tx	0-1 (Simultaneously)	5180 MHz	5320 MHz	5500 MHz 5700 MHz	5745 MHz 5825 MHz
	11n-20 Tx	0-1 (Simultaneously)	5180 MHz 5240 MHz	5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx	0-1 (Simultaneously)	5190 MHz 5230 MHz	5310 MHz	5510 MHz 5550 MHz 5670 MHz	5755 MHz 5795 MHz
	11ac-40 Tx	0-1 (Simultaneously)	5190 MHz	5310 MHz	5510 MHz 5670 MHz	5755 MHz 5795 MHz
	11ac-80 Tx	0-1 (Simultaneously)	5210 MHz	5290 MHz	5530 MHz 5610 MHz	5690 MHz 5775 MHz
Conducted Spurious Emission	11n-20 Tx *1)	0	-	5320 MHz	-	-

\*1) The mode was tested as a representative, because it had the highest power at antenna terminal test.

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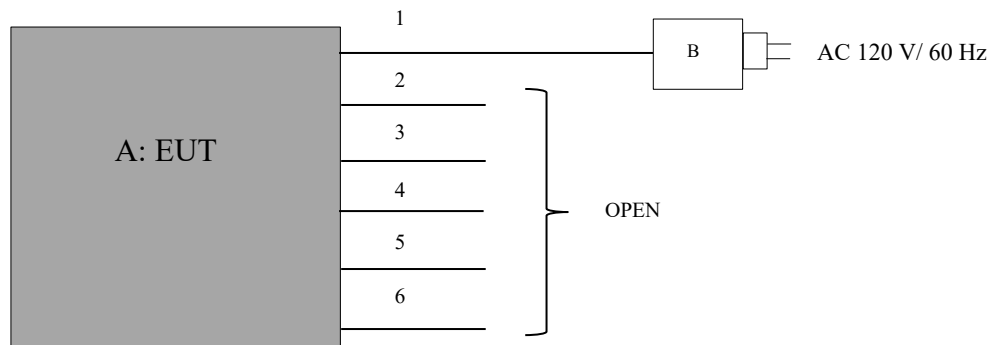
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## 4.2 Configuration and peripherals



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

### Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	CONTROL BOX	TMR-A9WT	005 *1) 1000002 *2) 1000015 *3)	SONY	EUT *4)
B	AC Adaptor	AC-M1215UC	M2090660255	SONY	-

\*1) Used for Antenna Terminal conducted test

\*2) Used for Radiated Emission test

\*3) Used for Conducted Emission test

\*4) The EUT is mounted Module A(WM-BAC-AT-49) and Module B(1PJ) on its inside.

### List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC	1.5	Unshielded	Unshielded	-
2	USB	1.7	Shielded	Shielded	-
3	Audio	2.0	Shielded	Shielded	-
4	LAN	1.0	Unshielded	Unshielded	Cat.5e
5	HDMI	1.5	Shielded	Shielded	HDMI OUT
6	HDMI	1.8	Shielded	Shielded	HDMI IN

## **SECTION 5: Conducted Emission**

### **Test Procedure and conditions**

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane. The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80 cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN) and excess AC cable was bundled in center.

I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane.

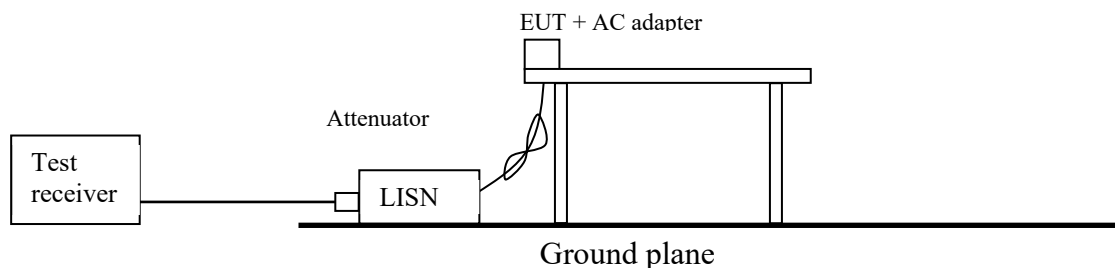
The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber. The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

**Detector** : QP and CISPR Average  
**Measurement range** : 0.15 MHz - 30 MHz  
**Test data** : APPENDIX  
**Test result** : Pass

**Figure 1: Test Setup**



## **SECTION 6: Radiated Spurious Emission and Band Edge Compliance**

### **Test Procedure**

< Below 1GHz >

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

< Above 1GHz >

EUT was placed on a urethane platform of nominal size, 0.5 m by 0.5 m, raised 1.5 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with absorbent materials lined on a ground plane.

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

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

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

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

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

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

< Below 1GHz >

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

< Above 1GHz >

Inside of restricted bands (Section 15.205):

Apply to limit in the Section 15.209 (a).

Outside of the restricted bands:

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

For W58 Bandedge

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

Restricted band edge:

Apply to limit in the Section 15.209 (a).

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

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

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



**Test Antennas are used as below;**

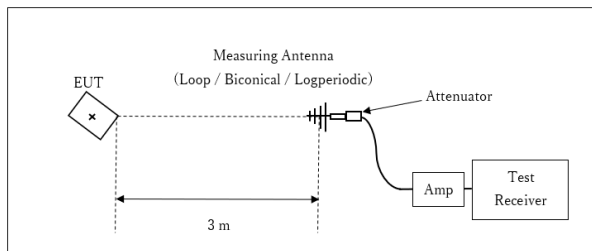
Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

Frequency	Below 1 GHz	Above 1 GHz	
Instrument used	Test Receiver	Spectrum Analyzer	
Detector	QP	Peak	Average
IF Bandwidth	BW: 120 kHz	RBW: 1 MHz VBW: 3 MHz	Method VB *1) RBW: 1 MHz VBW: 1/T 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**

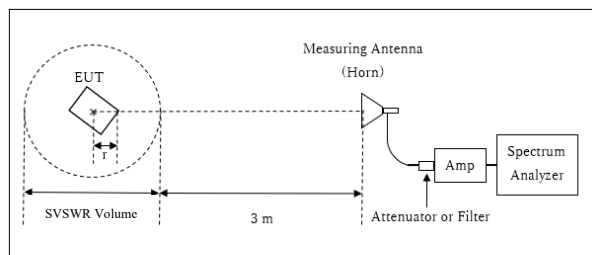
Below 1 GHz



× : Center of turn table

Test Distance: 3 m

1 GHz - 10 GHz

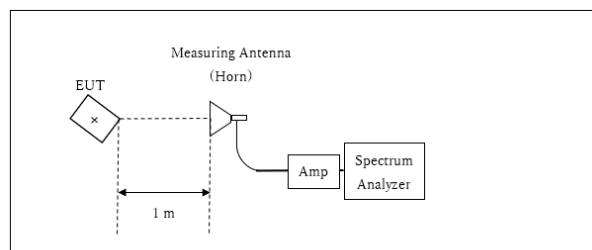


r : Radius of an outer periphery of EUT  
× : Center of turn table

Distance Factor:  $20 \times \log(3.9 \text{ m} / 3.0 \text{ m}) = 2.28 \text{ dB}$   
\* Test Distance:  $(3 + \text{SVSWR Volume} / 2) - r = 3.9 \text{ m}$

SVSWR Volume : 2.0 m  
(SVSWR Volume has been calibrated based on CISPR 16-1-4.)  
r = 0.1 m

10 GHz - 40 GHz



× : Center of turn table

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

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

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 7: Antenna Terminal Conducted Tests**

### **Test Procedure**

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
26 dB Bandwidth	Enough to capture the emission	Close to 1 % of EBW	> RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 % to 5 % of OBW	$\geq 3$ RBW	Auto	Peak	Max Hold	Spectrum Analyzer
6 dB Bandwidth	Enough to capture the emission	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Conducted Output Power	-	-	-	Auto	Average	-	Power Meter (Sensor: 160 MHz BW) (Method PM-G)
Maximum Power Spectral Density	Encompass the entire EBW	1 MHz or 100 kHz *2)	$\geq 3$ RBW	Auto	RMS Power Averaging (100 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*3) *4)	9 kHz – 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz – 30 MHz	10 kHz	30 kHz				

\* 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 ( $10 \log(500 \text{ kHz} / 470 \text{ kHz})$ ) was added to the test result.

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

Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart. (9 kHz-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

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**Shonan EMC Lab.**

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**APPENDIX 1: Test data**

**Conducted Emission**

**DATA OF CONDUCTED EMISSION TEST**

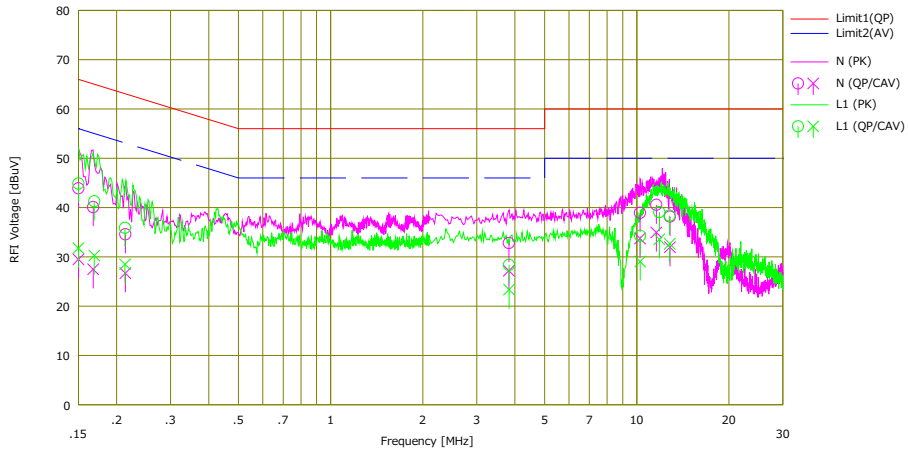
UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room  
Date : 2020/11/28

Mode : Tx 11n-20 5320 MHz  
Power : AC 120 V / 60 Hz  
Temp./Humi. : 22 deg.C / 45 %RH

Remarks : -

Limit : FCC\_Part 15 Subpart C(15.207)

Engineer : Kazuya Noda



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<CAV> [dBuV]		<QP> [dBuV]	<CAV> [dBuV]	<QP> [dB]	<AV> [dB]	<QP> [dB]	<AV> [dB]		
1	0.15000	31.30	16.90	12.60	43.90	29.50	66.00	56.00	22.1	26.5	N	
2	0.16768	27.50	14.90	12.59	40.09	27.49	65.07	55.07	24.9	27.5	N	
3	0.21359	22.00	14.10	12.59	34.59	26.69	63.06	53.06	28.4	26.3	N	
4	3.82250	19.80	14.20	13.00	32.80	27.20	56.00	46.00	23.2	18.8	N	
5	10.24670	25.30	20.10	13.64	38.94	33.74	60.00	50.00	21.0	16.2	N	
6	11.58686	26.80	21.20	13.76	40.56	34.96	60.00	50.00	19.4	15.0	N	
7	12.83180	24.30	18.10	13.87	38.17	31.97	60.00	50.00	21.8	18.0	N	
8	0.15000	32.30	19.20	12.58	44.88	31.78	66.00	56.00	21.1	24.2	L1	
9	0.16908	28.70	17.70	12.58	41.28	30.28	65.01	55.01	23.7	24.7	L1	
10	0.21292	23.30	15.90	12.59	35.89	28.49	63.09	53.09	27.2	24.6	L1	
11	3.82700	15.40	10.40	12.97	28.37	23.37	56.00	46.00	27.6	22.6	L1	
12	10.25880	20.80	15.60	13.47	34.27	29.07	60.00	50.00	25.7	20.9	L1	
13	11.84850	25.50	20.00	13.58	39.08	33.58	60.00	50.00	20.9	16.4	L1	
14	12.80930	24.70	19.00	13.66	38.36	32.66	60.00	50.00	21.6	17.3	L1	

Calculation: Result[dBuV]=Reading[dBuV]+C.Fac(LISN(AMN)+Cable+ATT)[dB]  
LISN(AMN): SLS-02

**26 dB Emission Bandwidth and 99 % Occupied Bandwidth**

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab.  
No.5 Shielded Room  
Date October 22, 2020 November 24, 2020  
Temperature / Humidity 25 deg. C / 53 % RH 22 deg. C / 44 % RH  
Engineer Makoto Hosaka Yohsuke Matsuzawa  
Mode Tx

11a

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
ANT 0	5180	-	16691.5
	5220	-	16706.4
	5240	-	16676.8
	5260	19.050	16729.3
	5300	19.658	16659.6
	5320	19.179	16670.5
	5500	19.443	16696.1
	5580	19.533	16736.2
	5700	19.294	16702.0
	5720	19.735	16685.9
	5745	-	16673.6
	5785	-	16732.9
	5825	-	16702.1

11n-20

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
ANT 0	5180	-	17885.3
	5220	-	17877.6
	5240	-	17818.5
	5260	19.796	17821.9
	5300	19.957	17796.4
	5320	19.659	17806.9
	5500	20.101	17790.7
	5580	20.305	17842.2
	5700	20.060	17834.6
	5720	20.031	17921.5
	5745	-	17978.6
	5785	-	17923.7
	5825	-	17882.1

11ac-20

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
ANT 0	5180	-	17883.8
	5220	-	17878.4
	5240	-	17862.5
	5260	20.130	17926.1
	5300	20.271	17869.0
	5320	20.444	17880.5
	5500	19.905	17875.8
	5580	20.198	17878.1
	5700	20.260	17896.6
	5720	19.906	17827.0
	5745	-	17913.4
	5785	-	17877.6
	5825	-	17953.0

**26 dB Emission Bandwidth and 99 % Occupied Bandwidth**

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab.  
No.3 Shielded Room  
Date October 22, 2020 November 24, 2020  
Temperature / Humidity 25 deg. C / 53 % RH 22 deg. C / 44 % RH  
Engineer Makoto Hosaka Yohsuke Matsuzawa  
Mode Tx

11n-40

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
ANT 0	5190	-	37048.5
	5230	-	37037.1
	5270	43.222	37047.6
	5310	42.842	37111.5
	5510	42.224	37034.5
	5550	42.865	37094.4
	5670	42.876	37102.8
	5710	42.925	37228.3
	5755	-	36994.4
	5795	-	37220.9

11ac-40

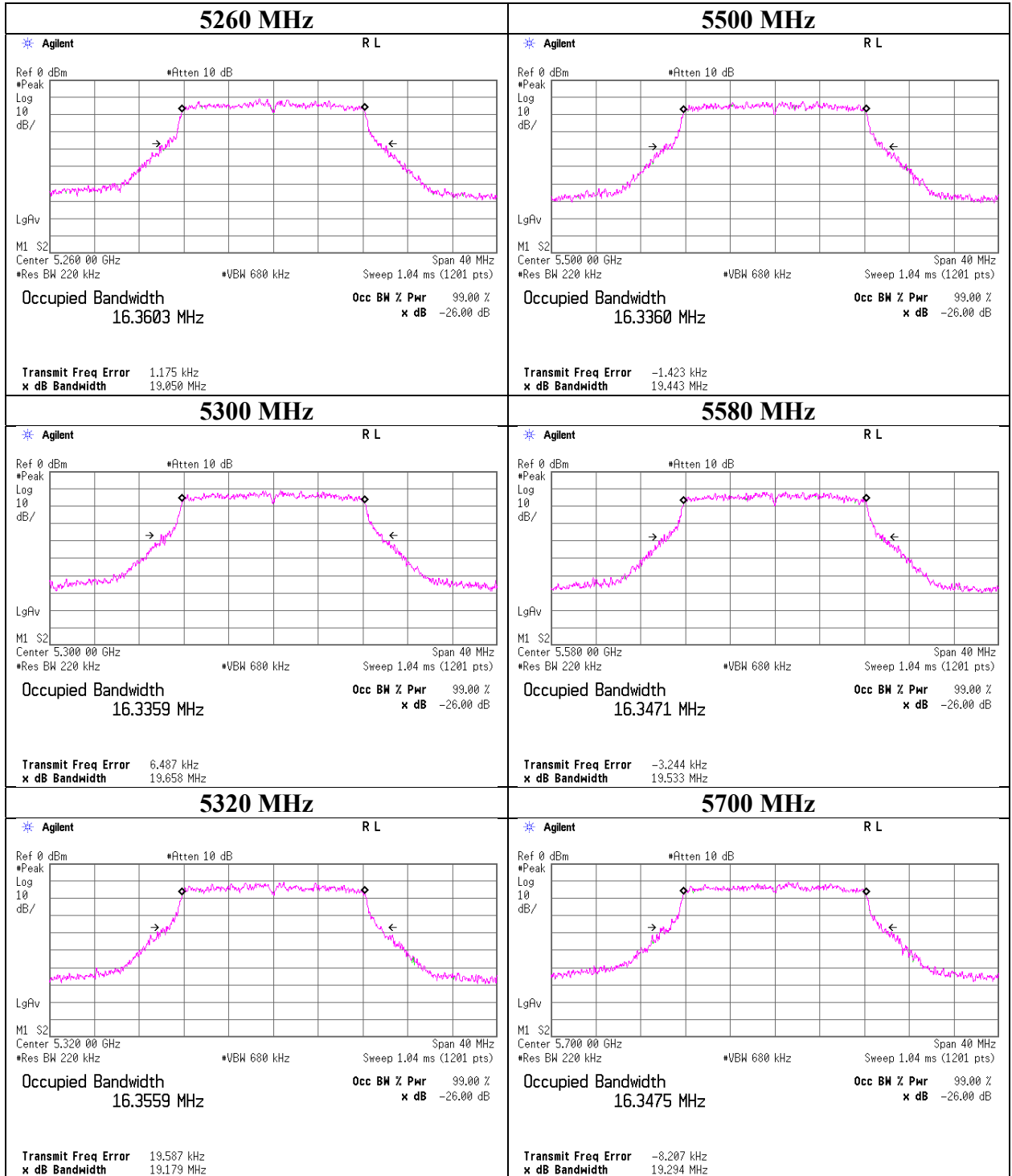
Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
ANT 0	5190	-	36912.6
	5230	-	36882.9
	5270	43.808	36838.6
	5310	42.471	36684.7
	5510	43.333	36792.9
	5550	42.293	36832.9
	5670	43.201	36940.4
	5710	43.248	36925.3
	5755	-	36878.1
	5795	-	36804.3

11ac-80

Antenna	Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
ANT 0	5210	-	75361.5
	5290	79.729	75529.6
	5530	80.510	75370.0
	5610	81.396	75342.0
	5690	80.174	75441.3
	5775	-	75624.2

**26 dB Emission Bandwidth**

**11a**



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**Shonan EMC Lab.**

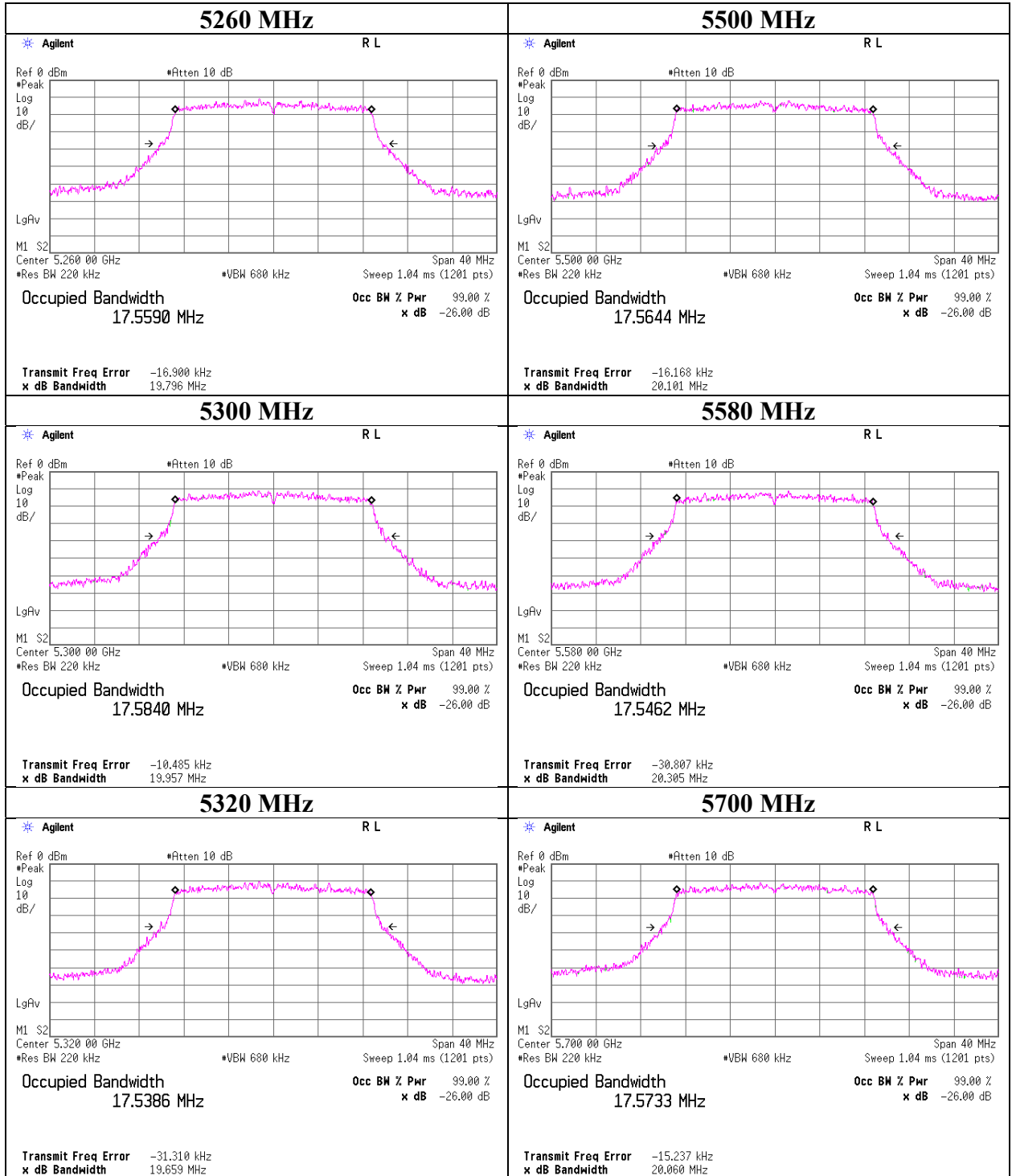
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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**26 dB Emission Bandwidth**

11n-20



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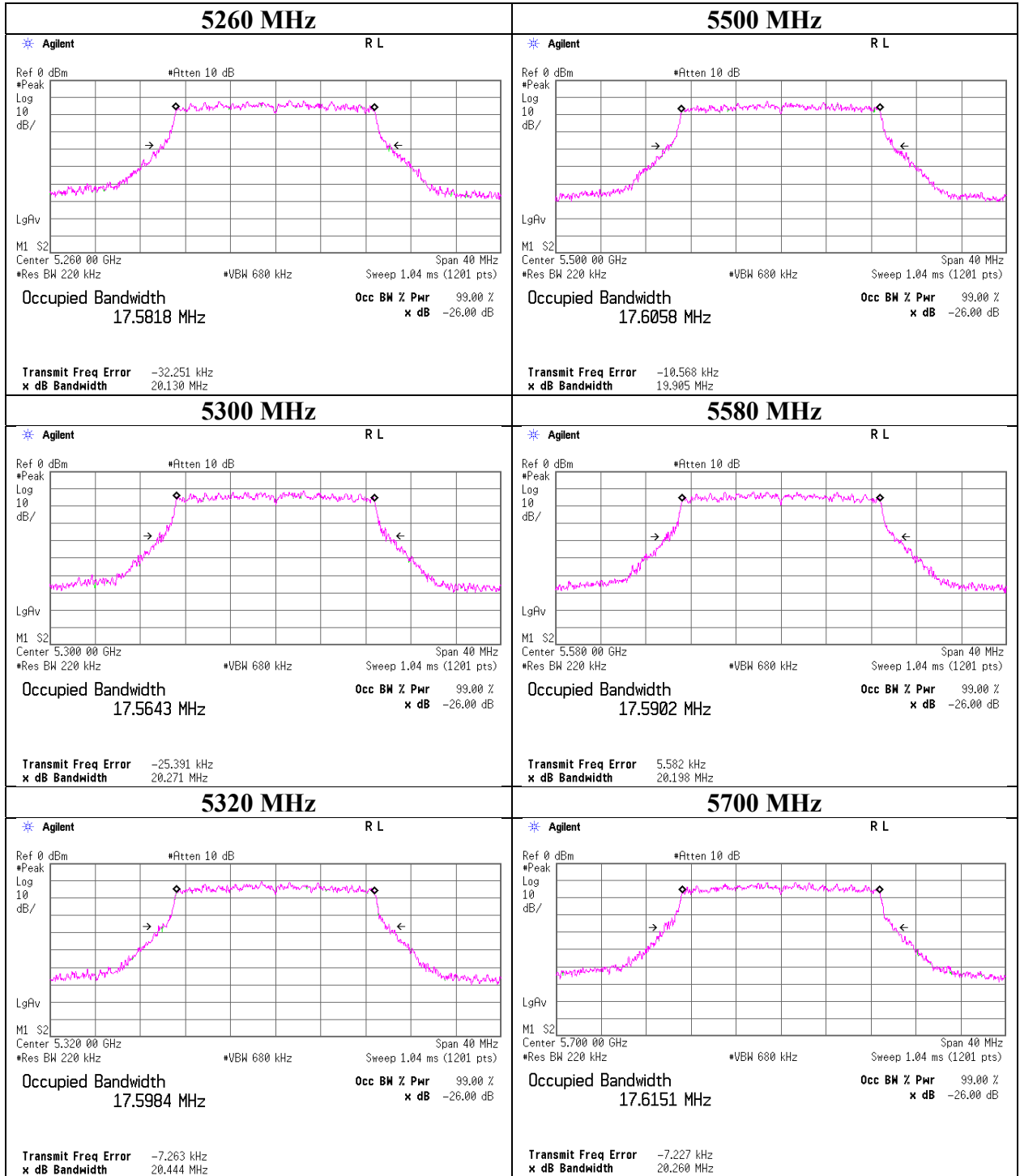
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## 26 dB Emission Bandwidth

### 11ac-20



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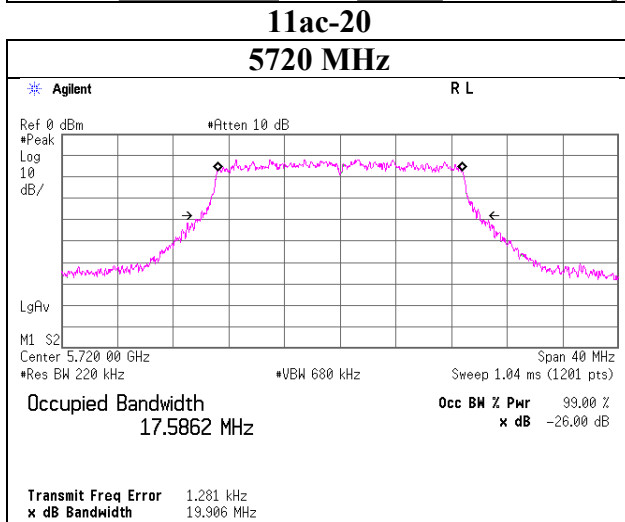
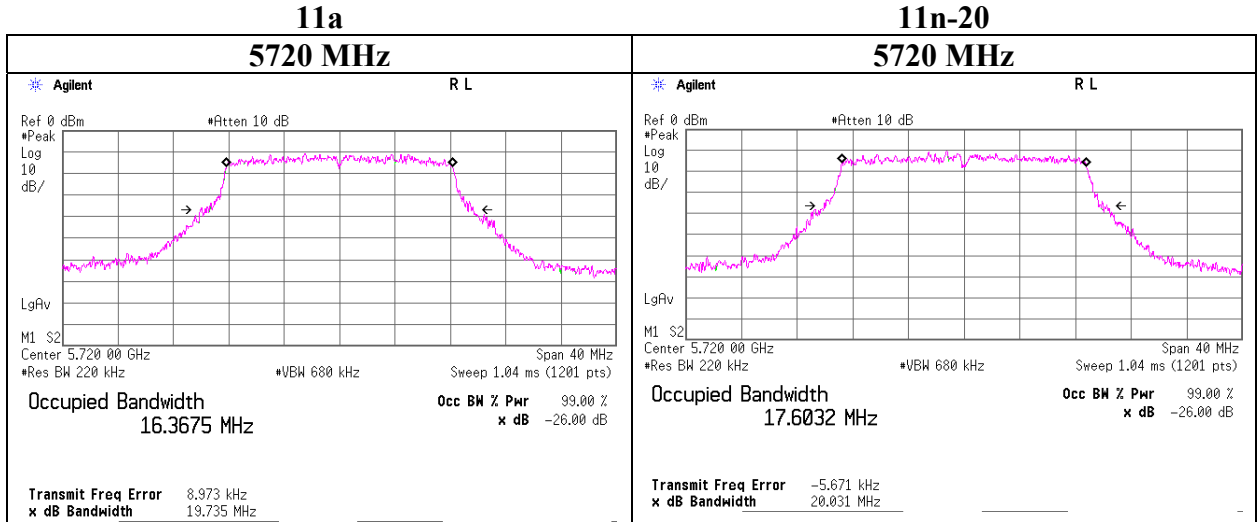
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Telephone : +81 463 50 6400

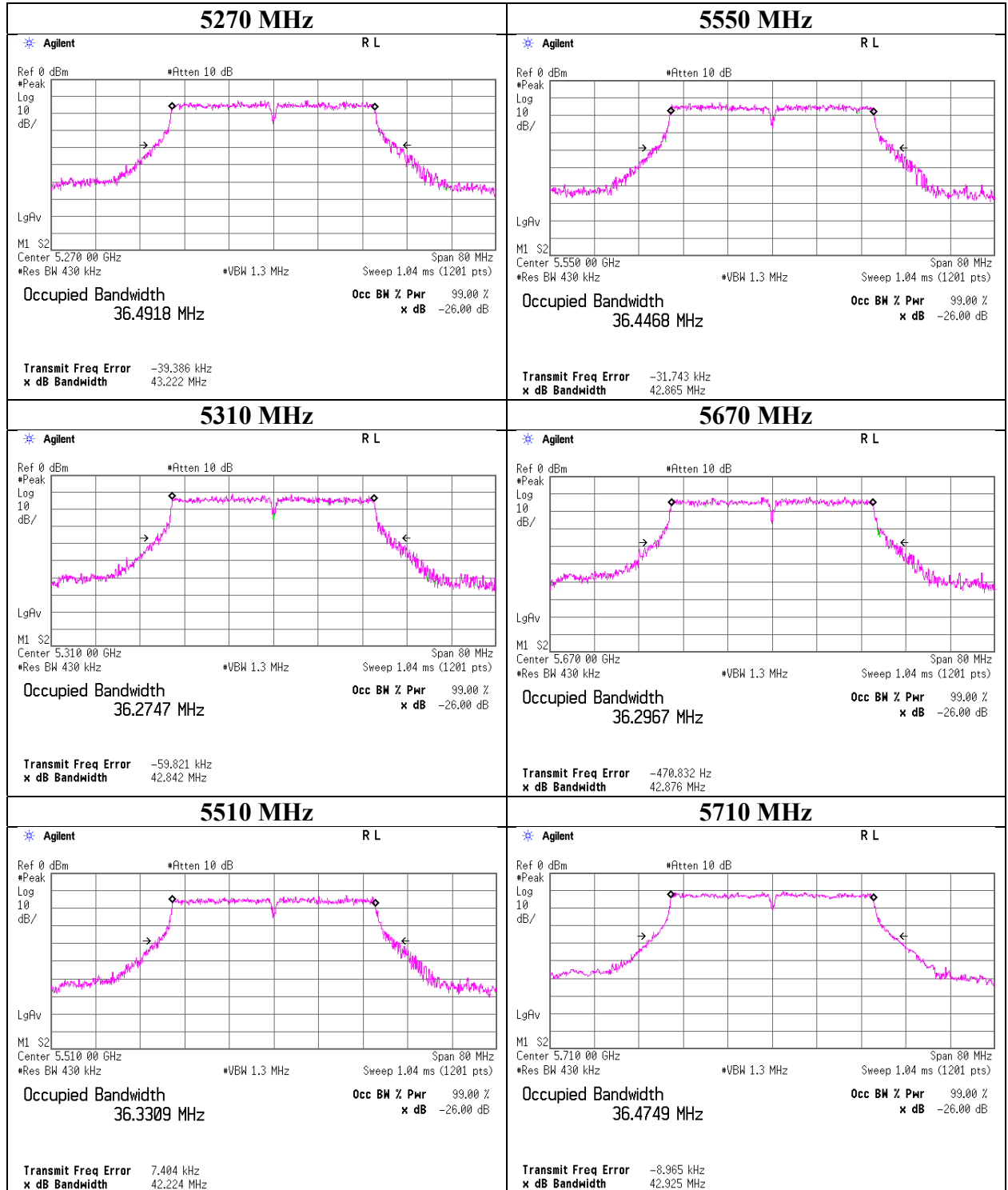
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**26 dB Emission Bandwidth**



**26 dB Emission Bandwidth**

**11n-40**



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**Shonan EMC Lab.**

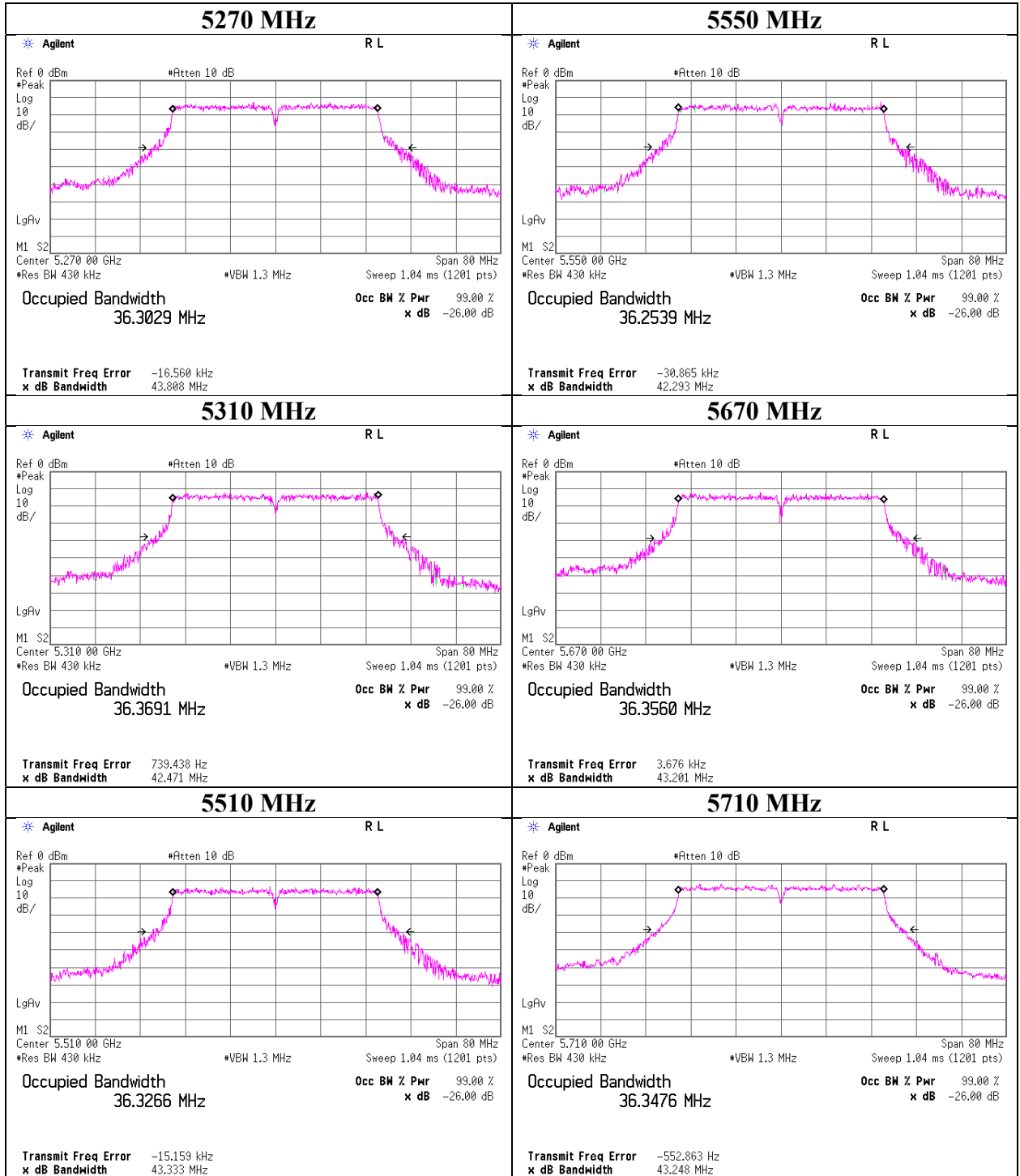
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Facsimile : +81 463 50 6401

## 26 dB Emission Bandwidth

### 11ac-40



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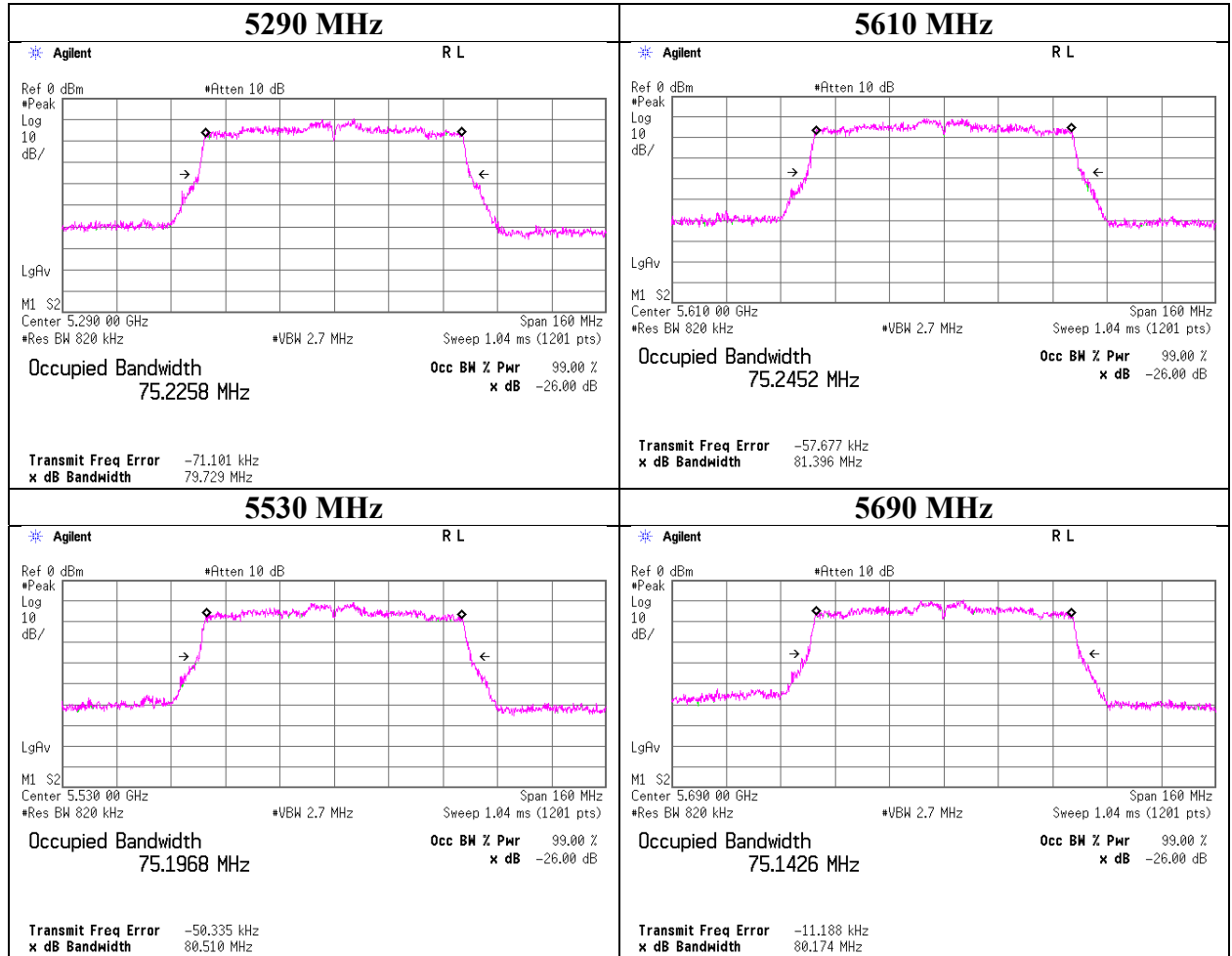
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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

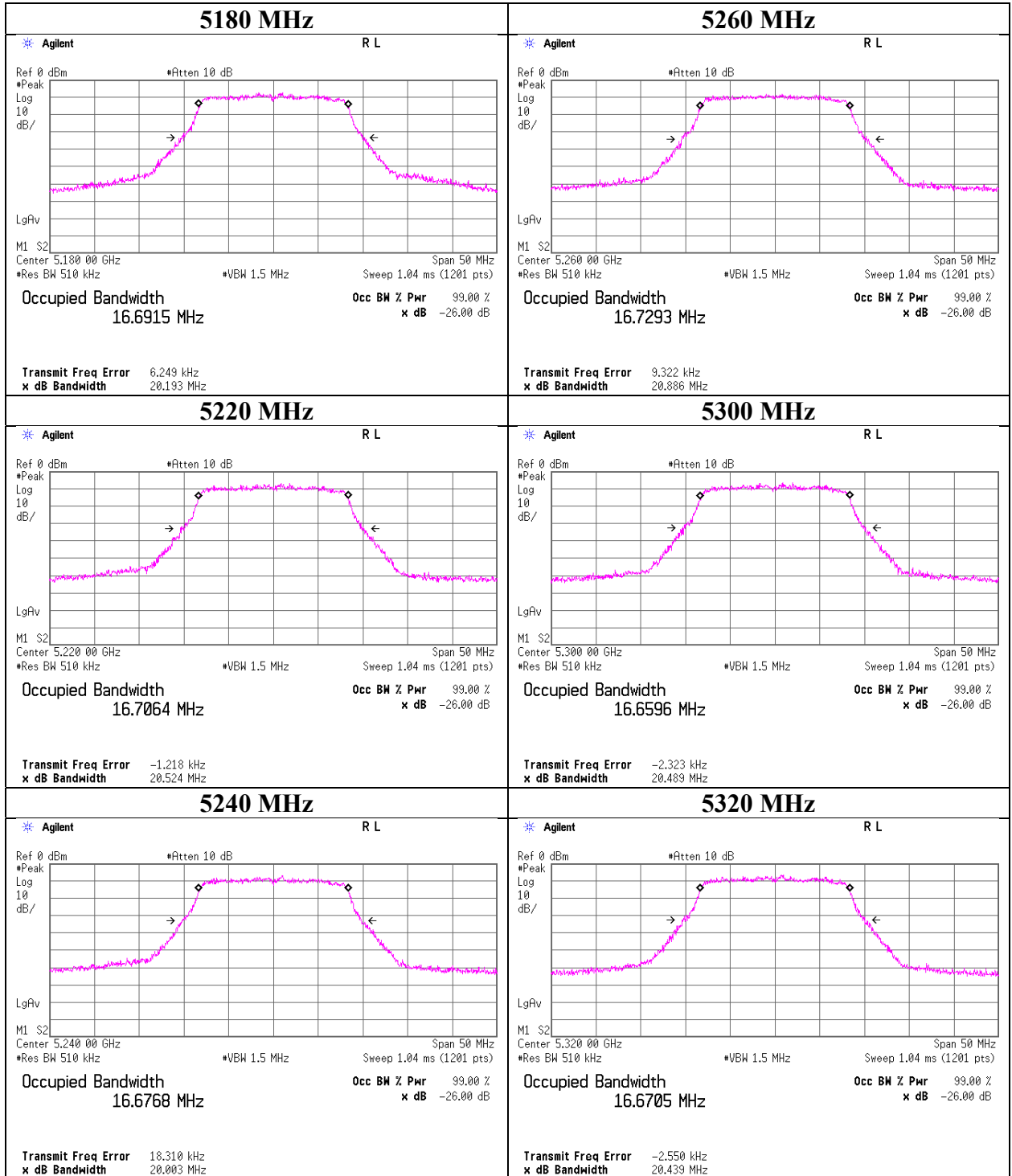
**26 dB Emission Bandwidth**

**11ac-80**



**99 % Occupied Bandwidth**

11a



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**Shonan EMC Lab.**

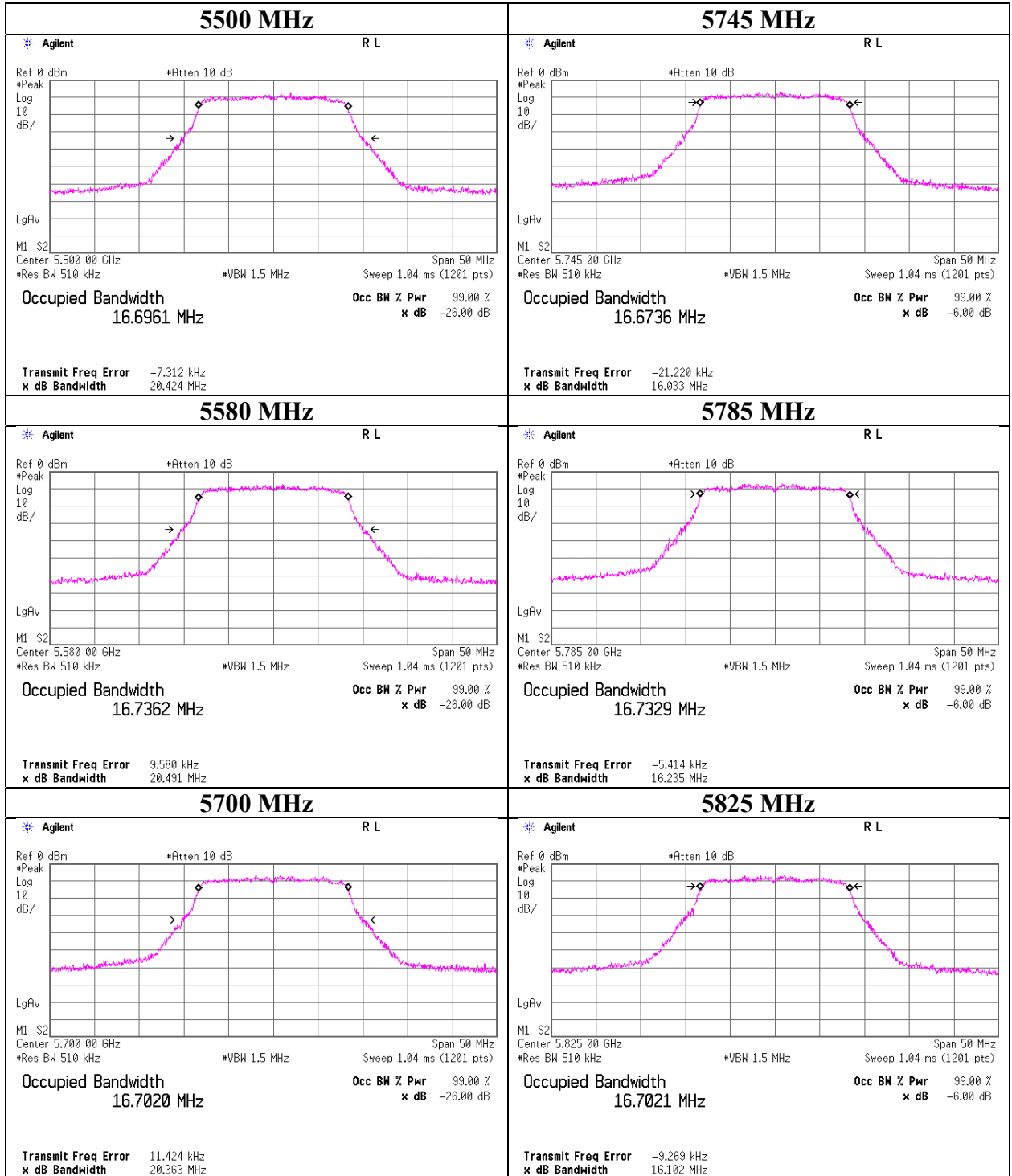
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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**99 % Occupied Bandwidth**

11a



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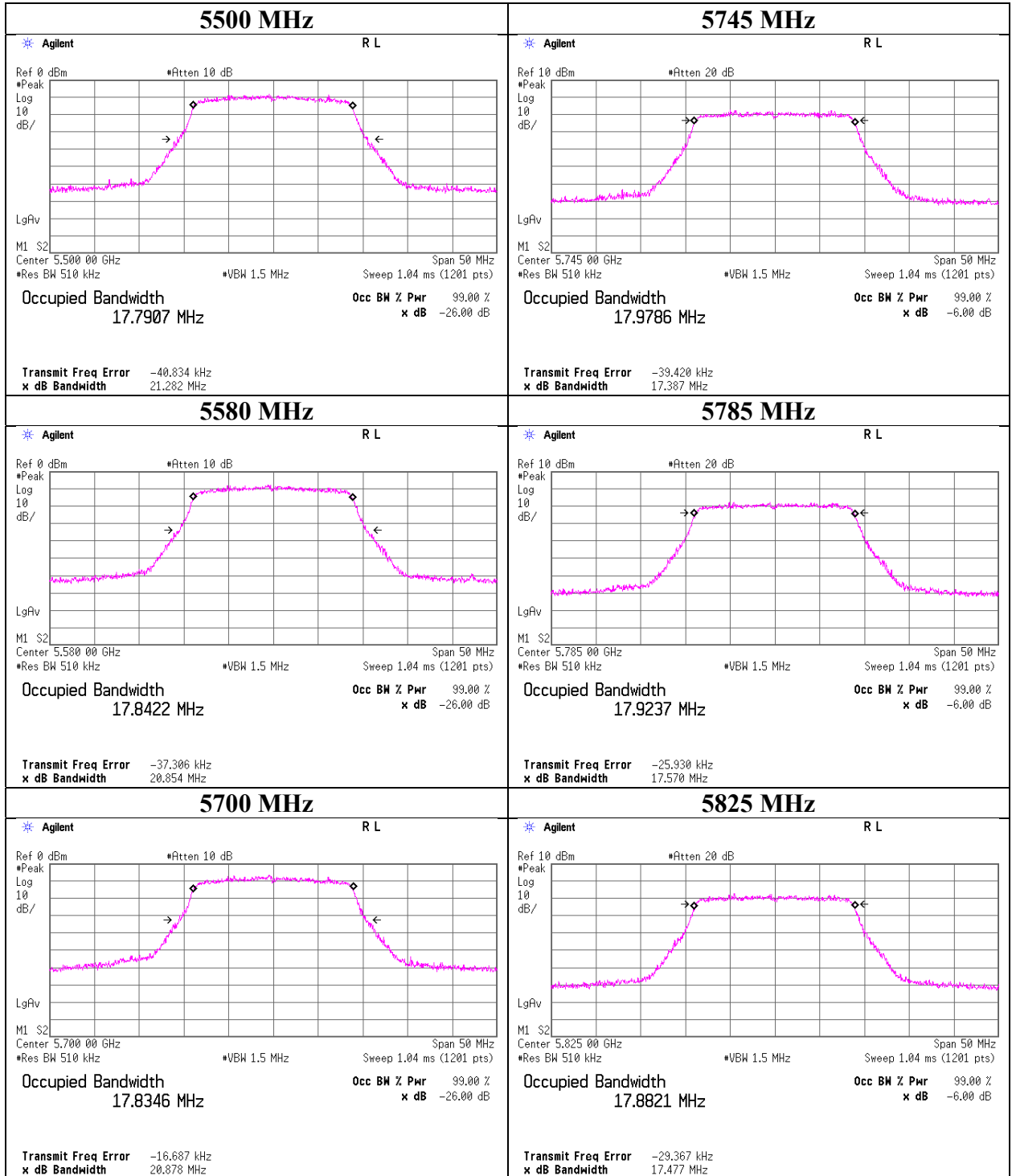
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**99 % Occupied Bandwidth**

**11n-20**



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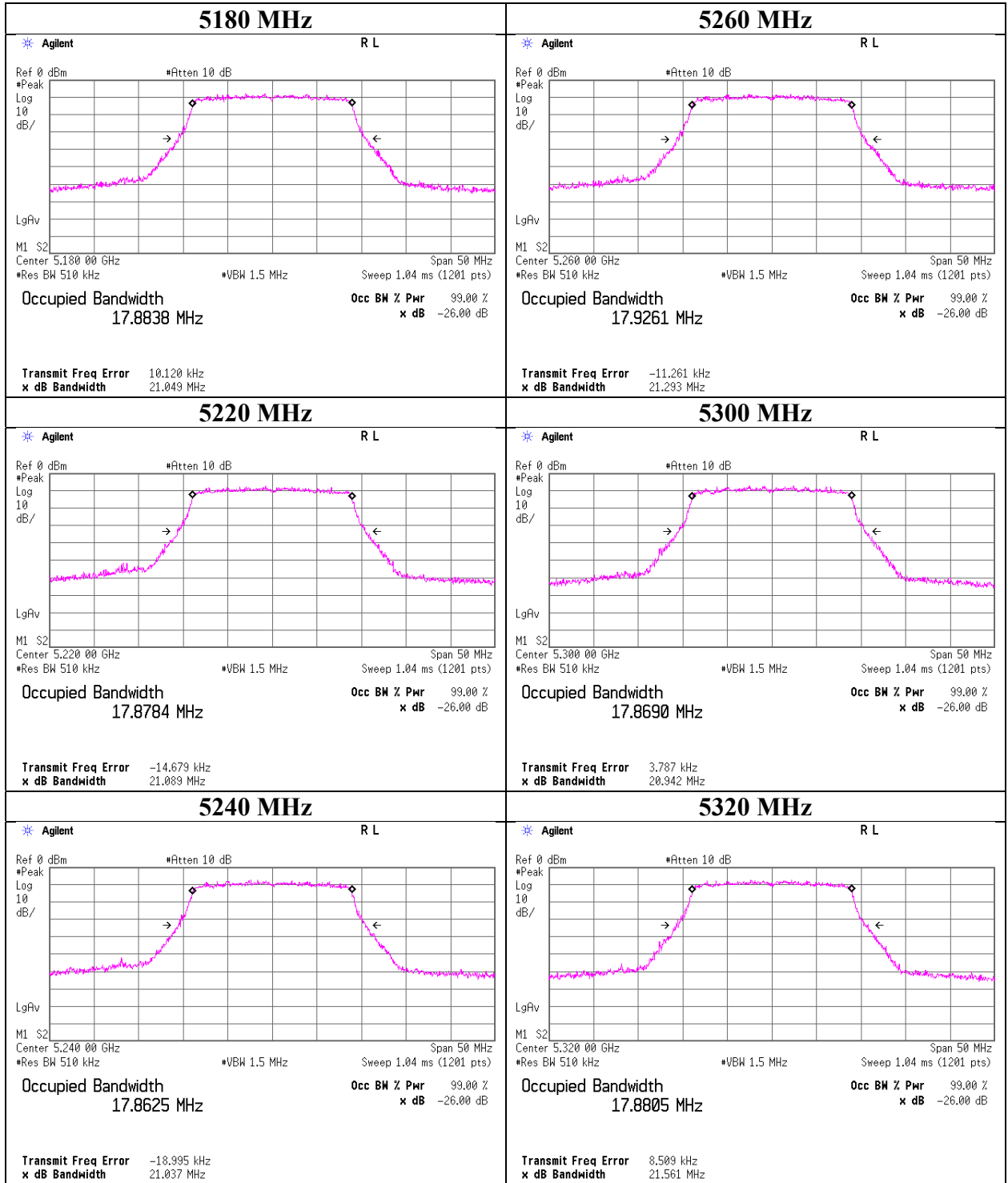
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Facsimile : +81 463 50 6401

**99 % Occupied Bandwidth**

**11ac-20**



**UL Japan, Inc.**

**Shonan EMC Lab.**

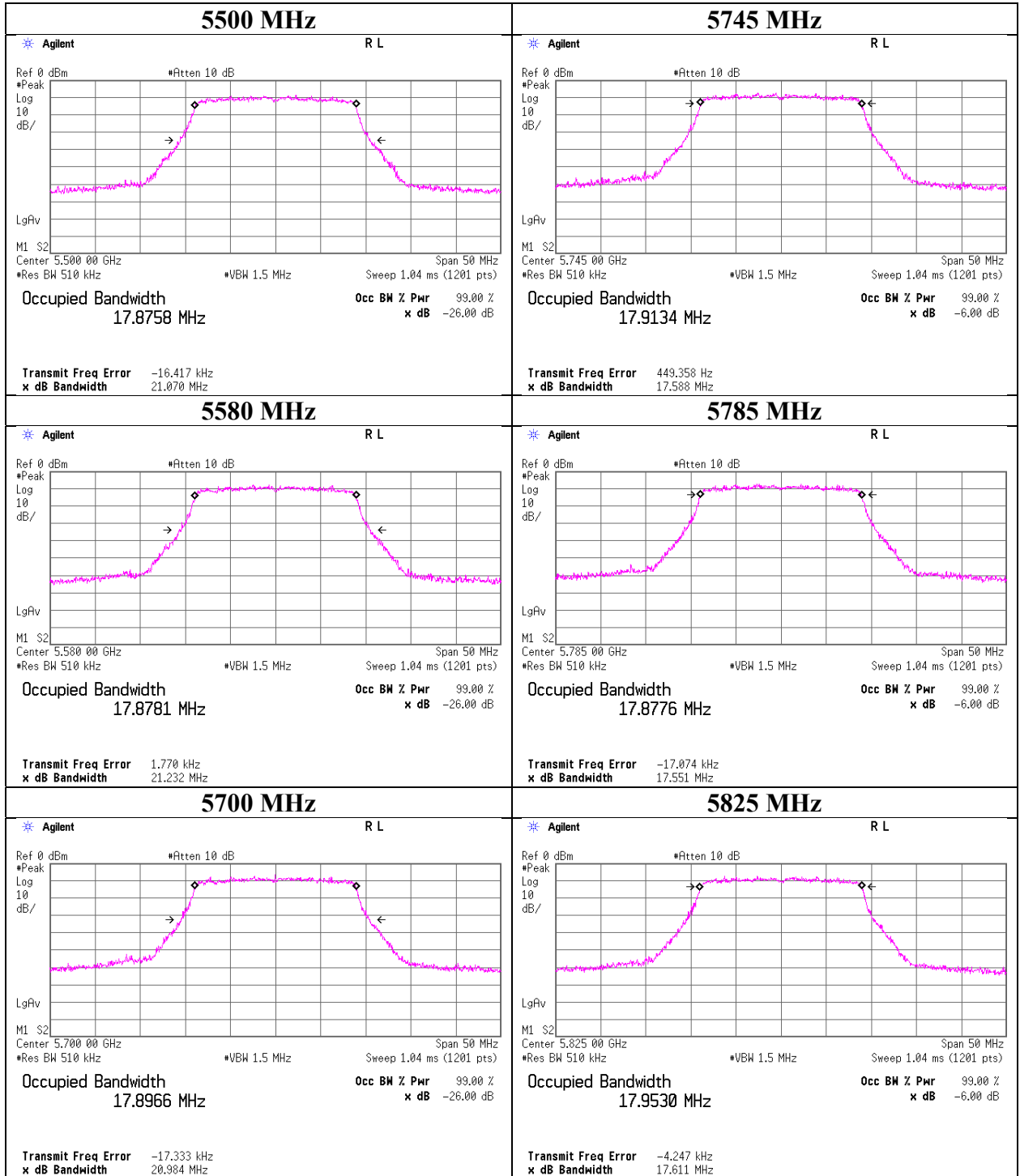
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

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Facsimile : +81 463 50 6401

**99 % Occupied Bandwidth**

**11ac-20**



**UL Japan, Inc.**

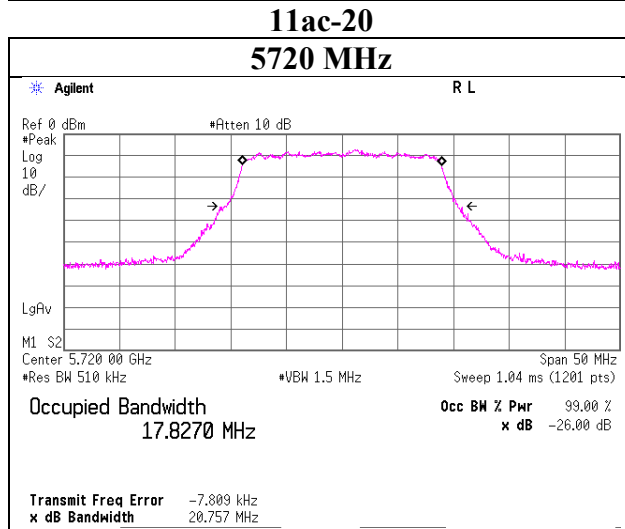
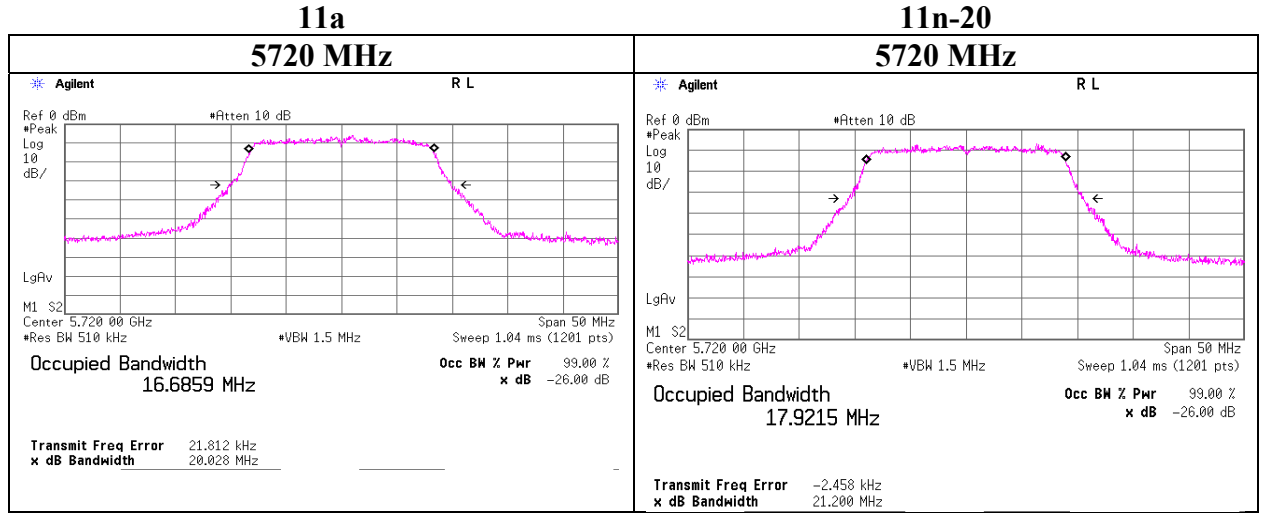
**Shonan EMC Lab.**

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

Telephone : +81 463 50 6400

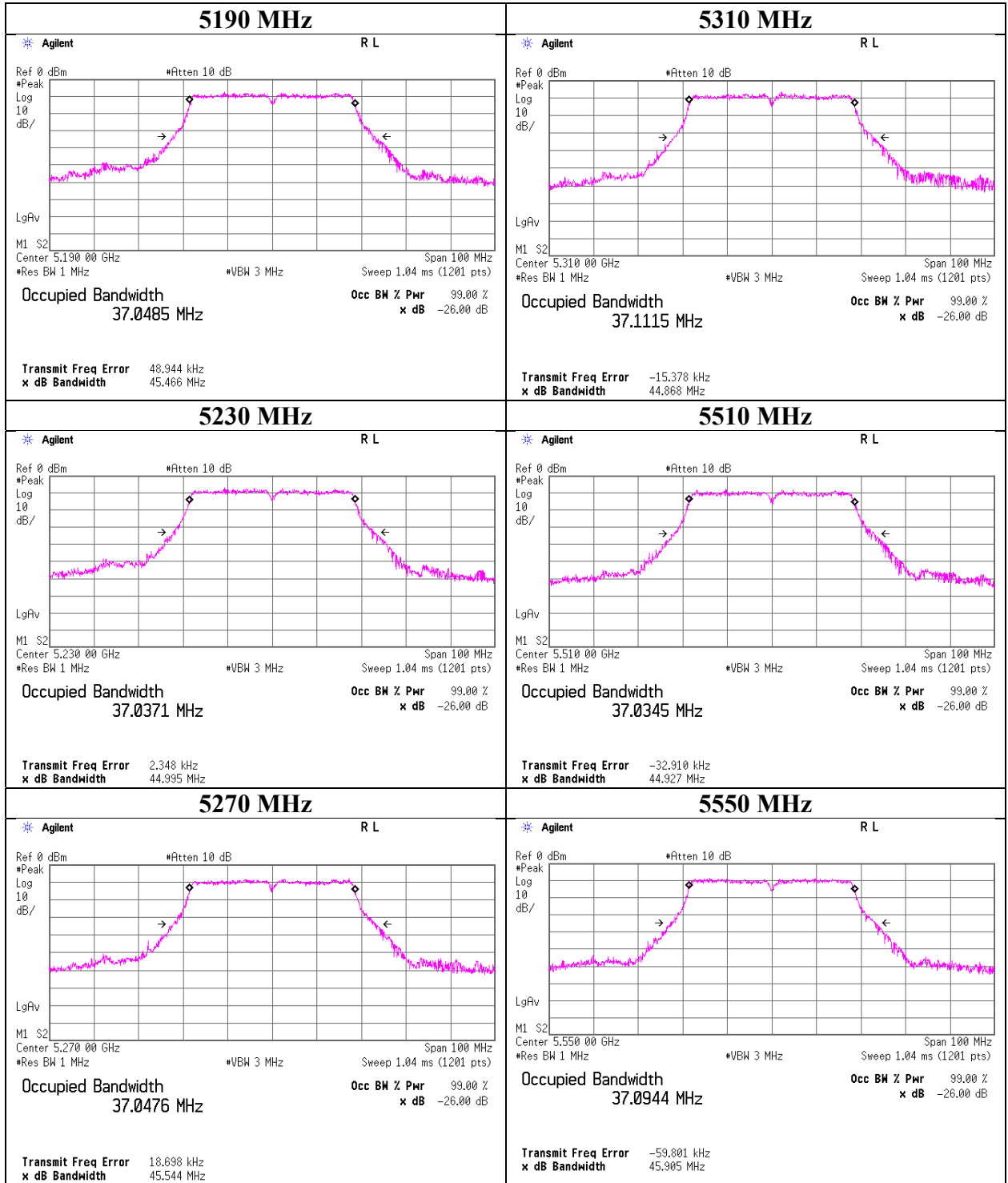
Facsimile : +81 463 50 6401

**99 % Occupied Bandwidth**



**99 % Occupied Bandwidth**

**11n-40**



**UL Japan, Inc.**

**Shonan EMC Lab.**

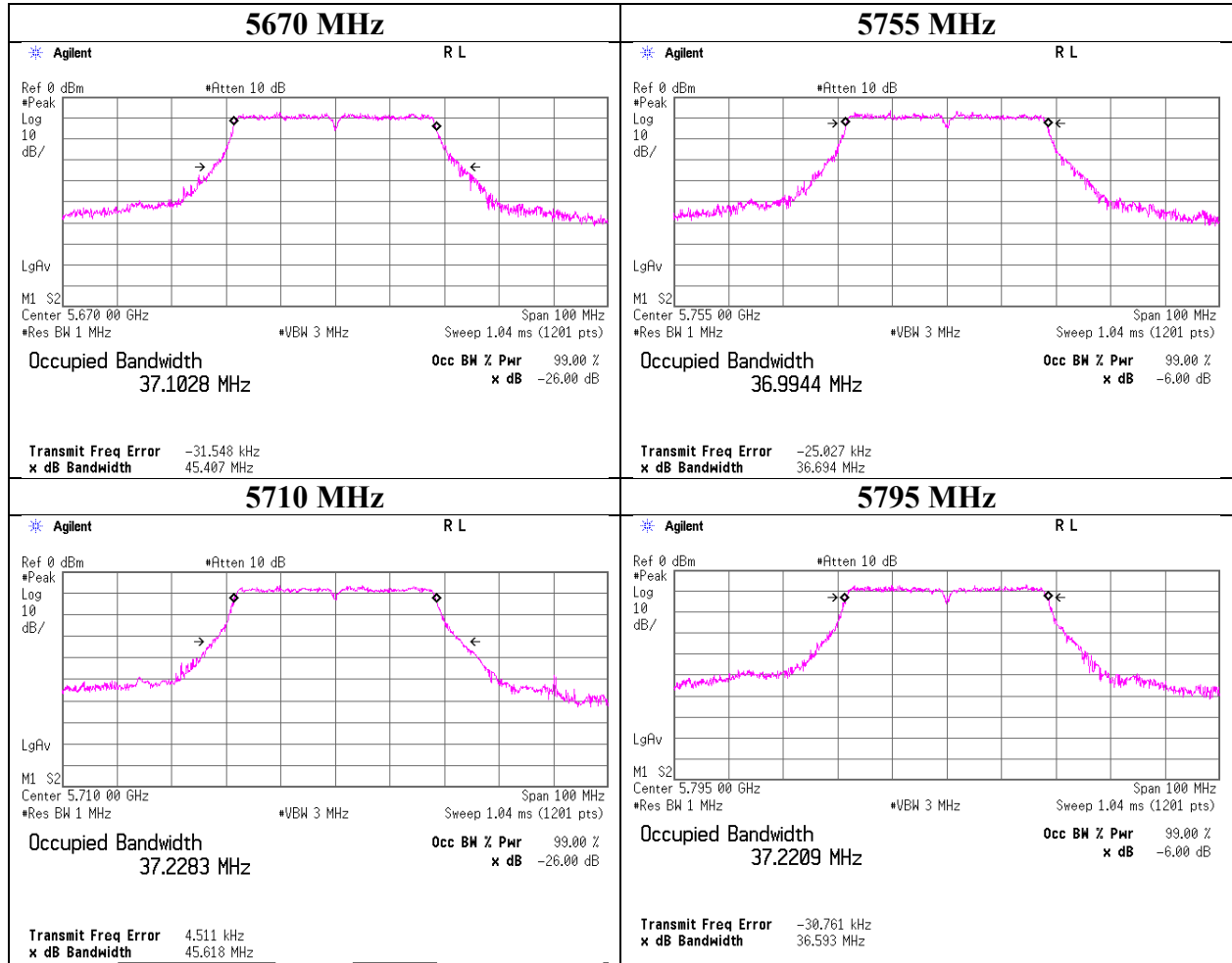
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**99 % Occupied Bandwidth**

**11n-40**



**UL Japan, Inc.**

**Shonan EMC Lab.**

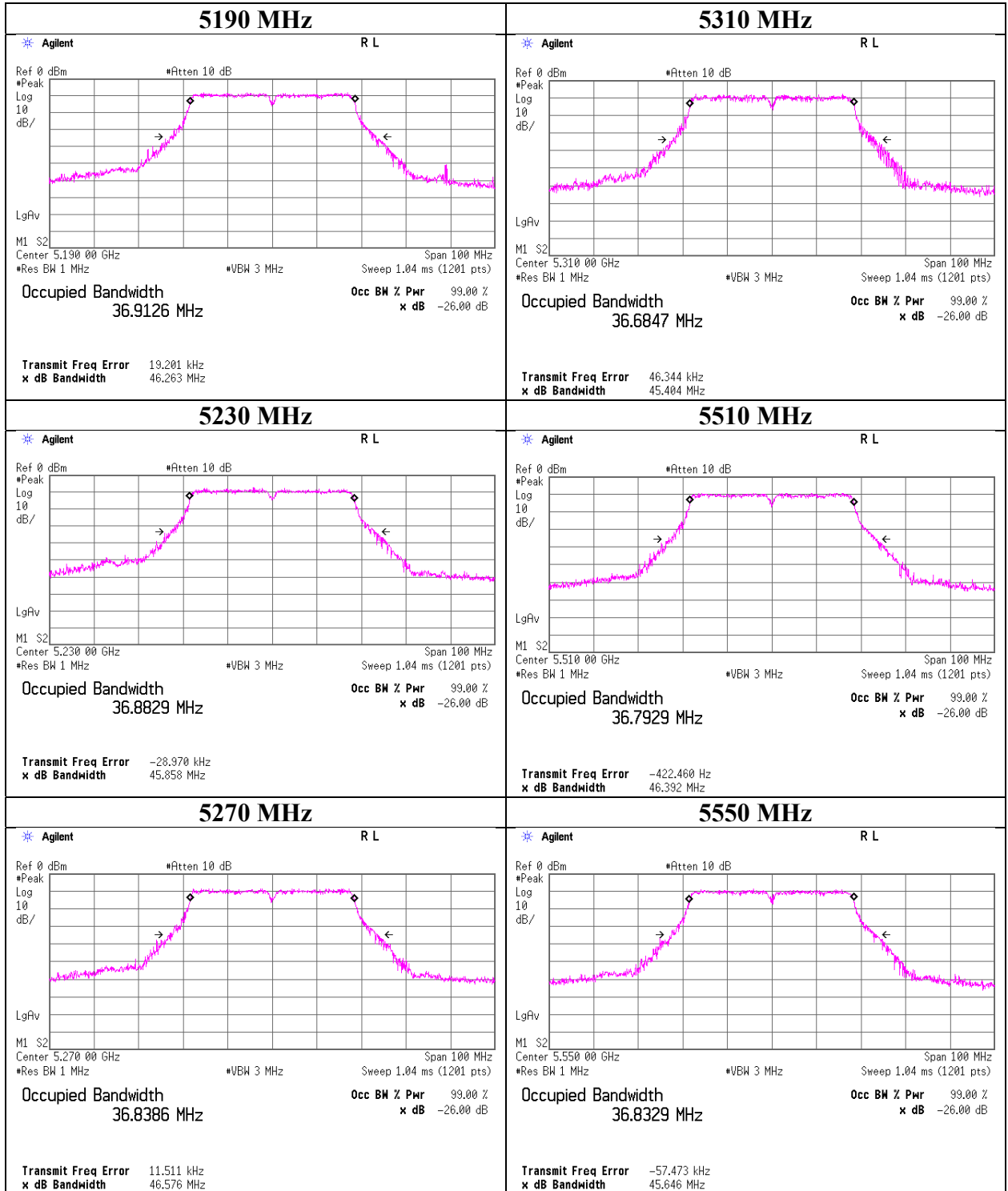
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**99 % Occupied Bandwidth**

**11ac-40**



**UL Japan, Inc.**

**Shonan EMC Lab.**

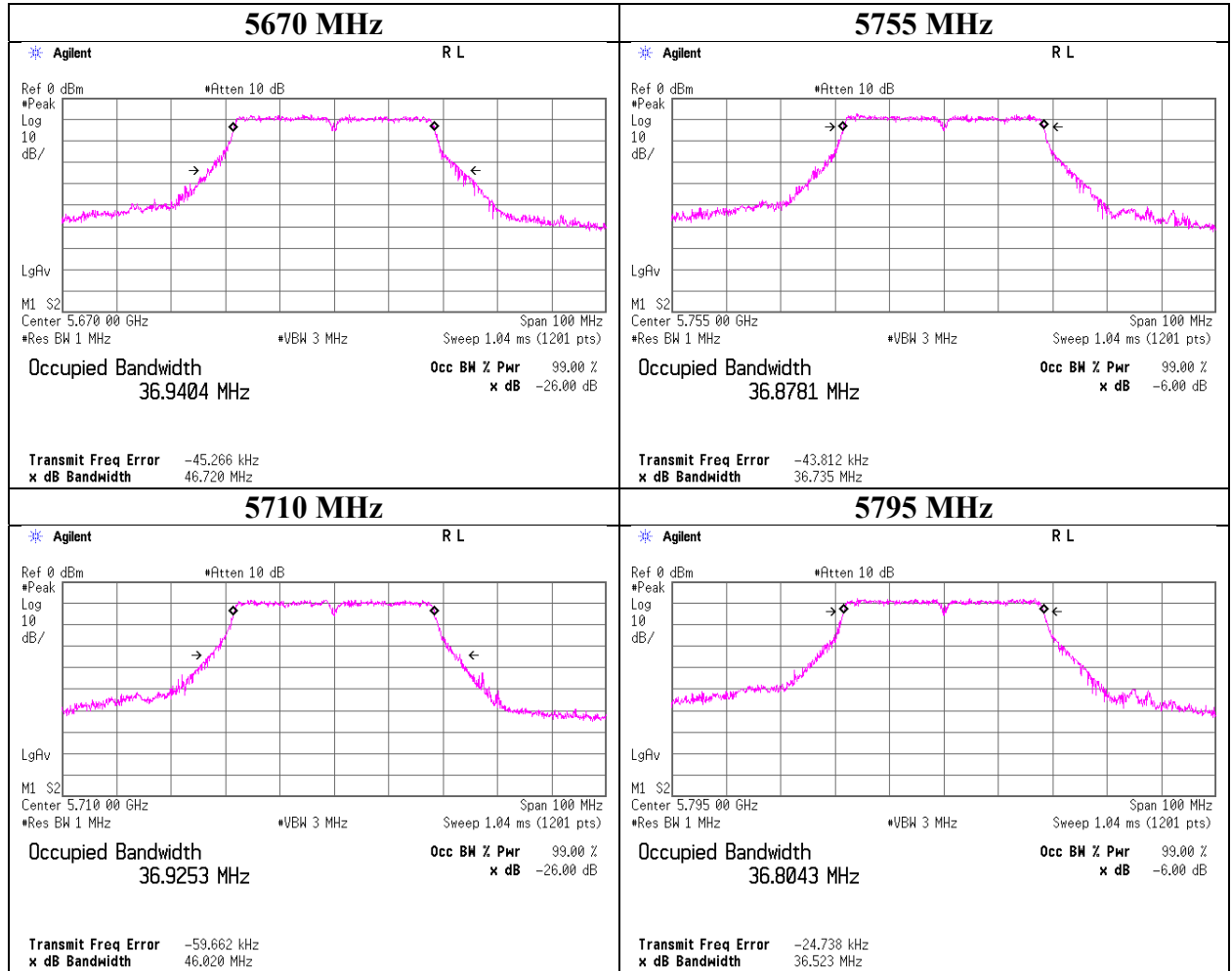
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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**99 % Occupied Bandwidth**

**11ac-40**



**UL Japan, Inc.**

**Shonan EMC Lab.**

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

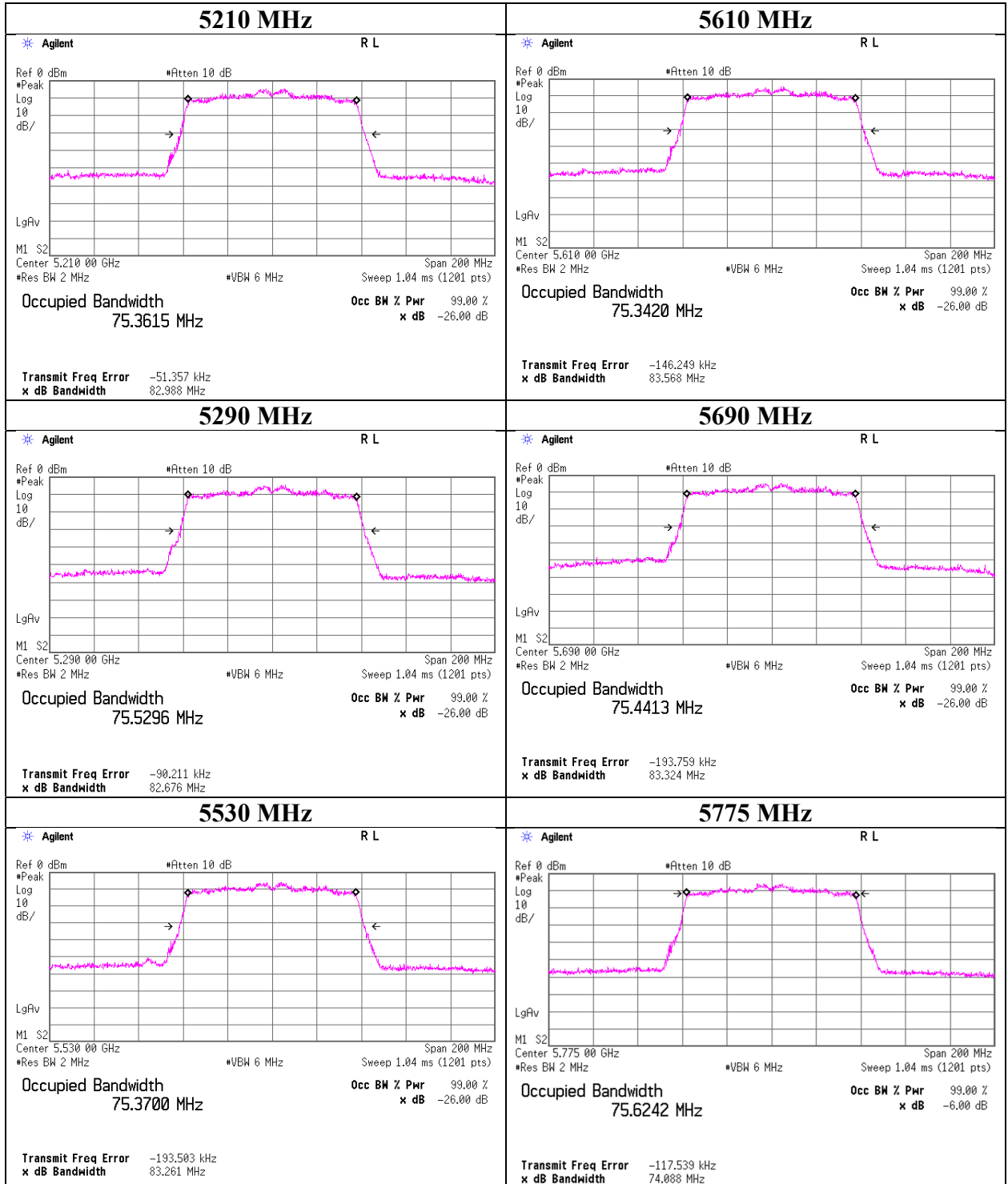
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401



**99 % Occupied Bandwidth**

**11ac-80**



**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

### 6 dB Bandwidth

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab.  
No.3 Shielded Room  
Date October 22, 2020  
Temperature / Humidity 25 deg. C / 53 % RH  
Engineer Makoto Hosaka  
Mode Tx

#### 11a

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
ANT 0	5745	16.079	> 0.500
	5785	15.820	> 0.500
	5825	15.439	> 0.500

#### 11n-20

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
ANT 0	5745	16.641	> 0.500
	5785	16.066	> 0.500
	5825	15.996	> 0.500

#### 11ac-20

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
ANT 0	5745	17.168	> 0.500
	5785	17.608	> 0.500
	5825	16.351	> 0.500

### 6 dB Bandwidth

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab.  
No.3 Shielded Room  
Date October 22, 2020  
Temperature / Humidity 25 deg. C / 53 % RH  
Engineer Makoto Hosaka  
Mode Tx

#### 11n-40

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
ANT 0	5755	36.513	> 0.500
	5795	36.494	> 0.500

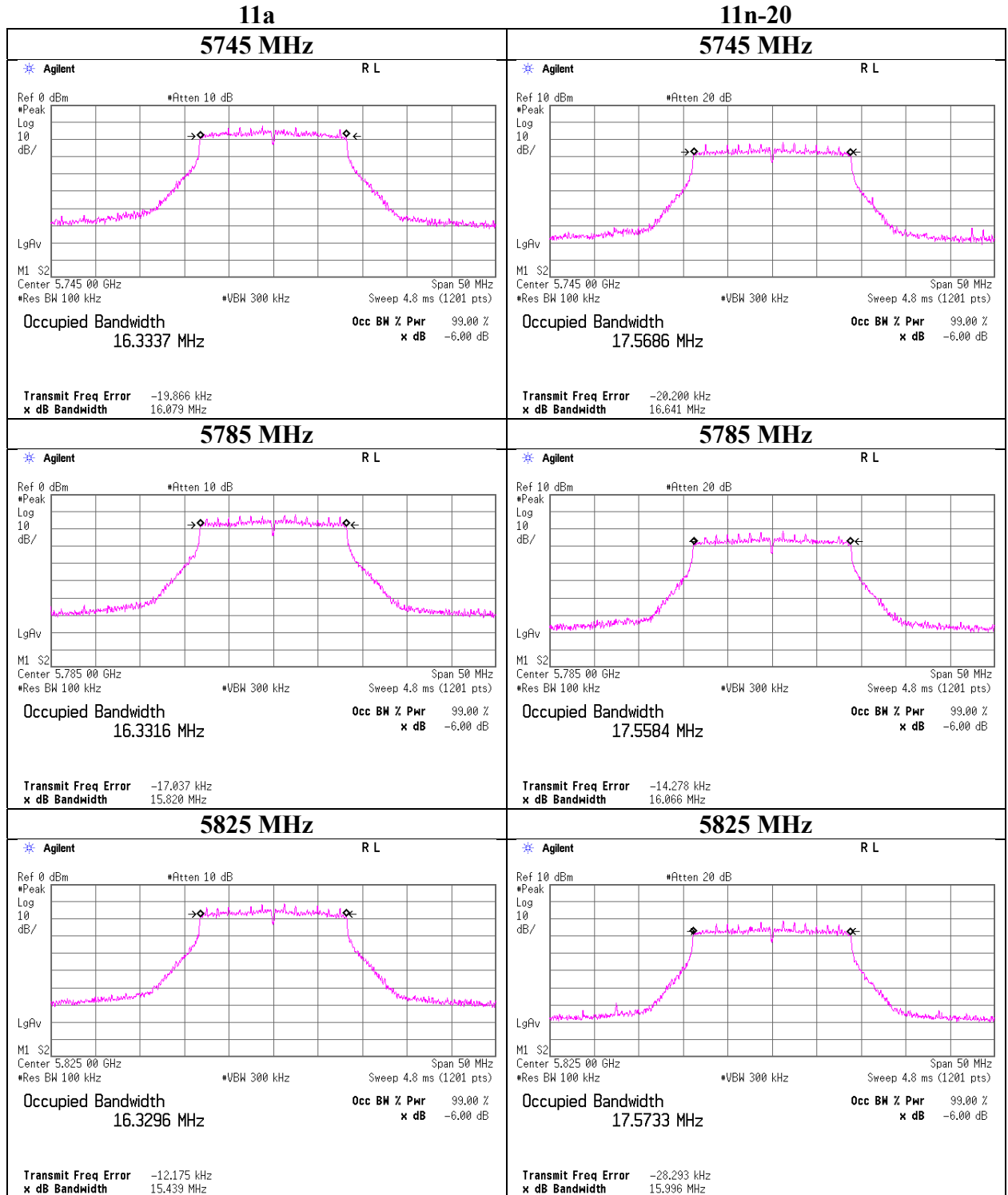
#### 11ac-40

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
ANT 0	5755	36.452	> 0.500
	5795	36.487	> 0.500

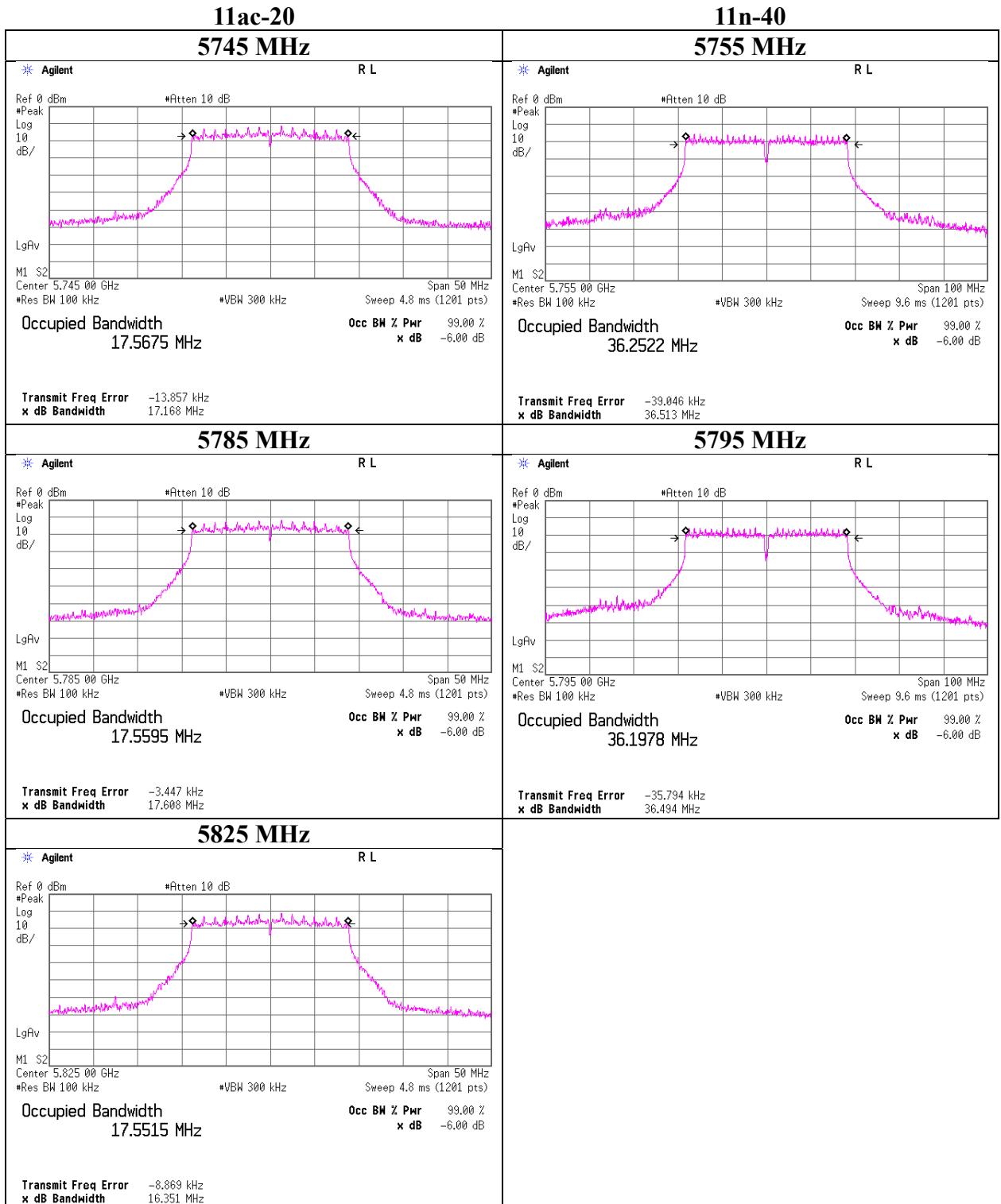
#### 11ac-80

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
ANT 0	5775	70.064	> 0.500

**6 dB Bandwidth**



### 6 dB Bandwidth



**UL Japan, Inc.**

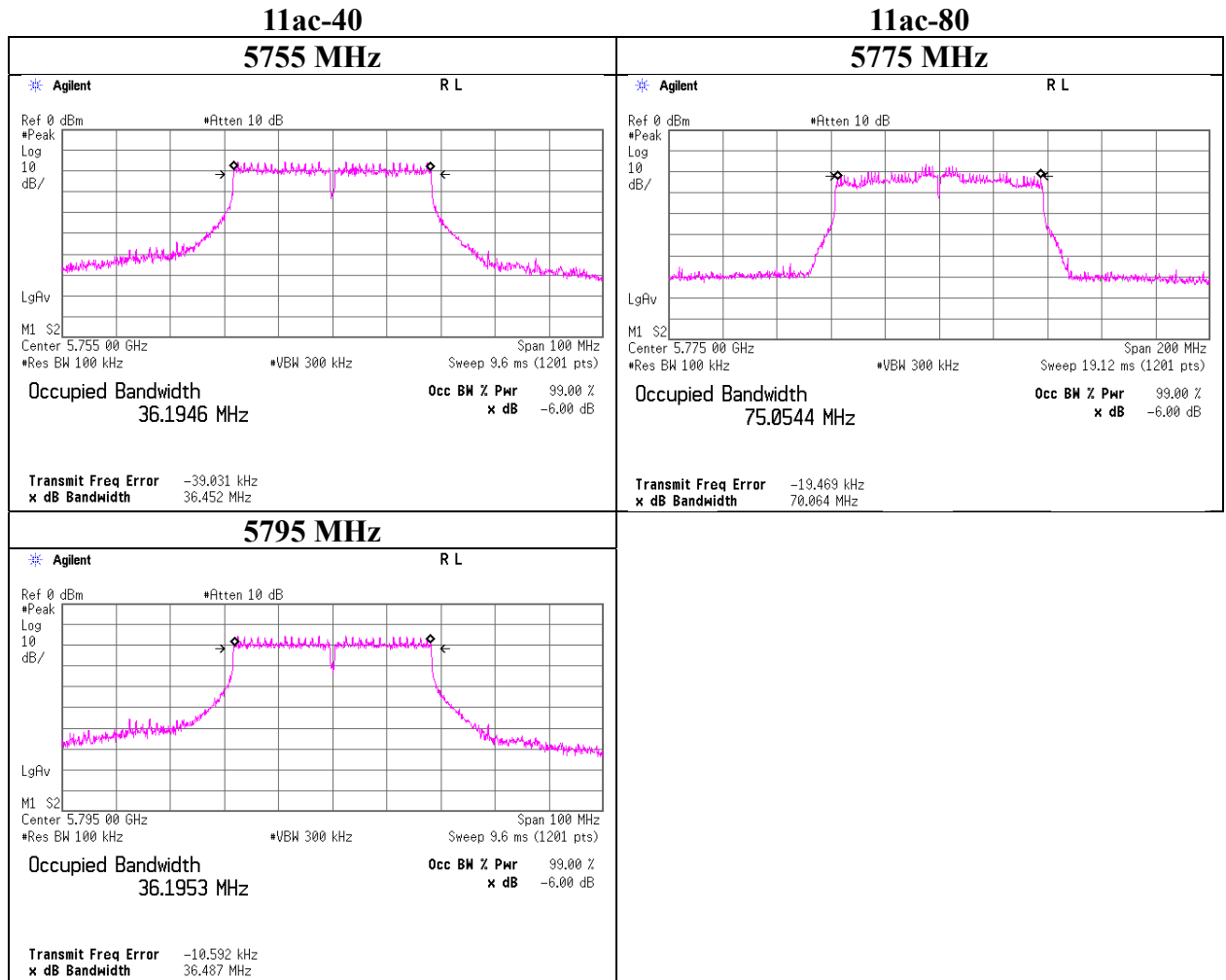
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**6 dB Bandwidth**



## Maximum Conducted Output Power

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date October 20, 2020 October 22, 2020 November 24, 2020  
Temperature / Humidity 24 deg. C / 43 % RH 25 deg. C / 53 % RH 22 deg. C / 44 % RH  
Engineer Yosuke Murakami Makoto Hosaka Yohsuke Matsuzawa  
Mode Tx, 11a

**Antenna: ANT 0 + ANT 1**

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna		Sum [mW]	Result [dBm]	Limit [dBm]	Margin [dB]	Antenna		Sum [mW]	Result [dBm]	Limit [dBm]	Margin [dB]
ANT 0 [mW]	ANT 1 [mW]	ANT 0 [mW]	ANT 1 [mW]											
5180	-	16.692	8.73	8.97	17.70	12.48	22.15	9.67	52.87	54.36	107.23	20.30	29.97	9.67
5220	-	16.706	8.99	9.12	18.12	12.58	22.15	9.57	54.48	55.24	109.72	20.40	29.97	9.57
5240	-	16.677	9.08	8.85	17.93	12.54	22.15	9.61	54.98	53.61	108.59	20.36	29.97	9.61
5260	19.050	16.729	7.98	9.86	17.84	12.51	22.44	9.93	43.36	53.59	96.95	19.87	29.97	10.10
5300	19.658	16.660	8.39	10.26	18.65	12.71	22.58	9.87	45.61	55.73	101.34	20.06	29.97	9.91
5320	19.179	16.671	8.39	10.94	19.33	12.86	22.47	9.61	45.61	59.44	105.06	20.21	29.97	9.76
5500	19.443	16.696	7.48	7.74	15.23	11.83	22.97	11.14	36.73	38.02	74.75	18.74	29.97	11.23
5580	19.533	16.736	8.83	7.96	16.79	12.25	22.99	10.74	43.35	39.09	82.44	19.16	29.97	10.81
5700	19.294	16.702	10.47	8.32	18.79	12.74	22.94	10.20	51.41	40.83	92.24	19.65	29.97	10.32
5720	19.735	16.686	8.67	8.87	17.54	12.44	23.04	10.60	42.56	43.55	86.12	19.35	29.97	10.62
5745	-	16.674	10.35	7.78	18.13	12.58	29.36	16.78	47.71	35.86	83.57	19.22	36.00	16.78
5785	-	16.733	10.07	7.98	18.05	12.56	29.36	16.80	46.41	36.78	83.19	19.20	36.00	16.80
5825	-	16.702	10.64	7.98	18.62	12.70	29.36	16.66	49.04	36.81	85.86	19.34	36.00	16.66

**Antenna: ANT 0**

**Antenna: ANT 1**

Tested Frequency [MHz]	Duty Factor *1) [dB]	Antenna: ANT 0						Antenna: ANT 1					
		Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Directional Gain [dBi]	Result Cond. Power [dBm]	e.i.r.p. [dBm]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Directional Gain [dBi]	Result Cond. Power [dBm]	e.i.r.p. [dBm]
5180	0.00	-1.79	1.48	9.72	7.82	9.41	17.23	-1.81	1.47	9.87	7.82	9.53	17.35
5220	0.00	-1.67	1.49	9.72	7.82	9.54	17.36	-1.74	1.47	9.87	7.82	9.60	17.42
5240	0.00	-1.55	1.41	9.72	7.82	9.58	17.40	-1.83	1.42	9.88	7.82	9.47	17.29
5260	0.00	-2.14	1.44	9.72	7.35	9.02	16.37	-1.40	1.46	9.88	7.35	9.94	17.29
5300	0.00	-1.92	1.44	9.72	7.35	9.24	16.59	-1.23	1.46	9.88	7.35	10.11	17.46
5320	0.00	-2.04	1.56	9.72	7.35	9.24	16.59	-1.06	1.57	9.88	7.35	10.39	17.74
5500	0.00	-2.58	1.59	9.73	6.91	8.74	15.65	-2.59	1.60	9.88	6.91	8.89	15.80
5580	0.00	-1.87	1.60	9.73	6.91	9.46	16.37	-2.47	1.60	9.88	6.91	9.01	15.92
5700	0.00	-1.05	1.51	9.74	6.91	10.20	17.11	-2.21	1.52	9.89	6.91	9.20	16.11
5720	0.00	-1.88	1.52	9.74	6.91	9.38	16.29	-1.93	1.52	9.89	6.91	9.48	16.39
5745	0.00	-1.06	1.47	9.74	6.64	10.15	16.79	-2.30	1.47	9.74	6.64	8.91	15.55
5785	0.00	-1.19	1.48	9.74	6.64	10.03	16.67	-2.20	1.48	9.74	6.64	9.02	15.66
5825	0.00	-0.99	1.52	9.74	6.64	10.27	16.91	-2.24	1.52	9.74	6.64	9.02	15.66

Sample Calculation: ( \*1) Power was measured with using the gate function of power meter.)

Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor

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

$$\text{Directional Gain} = 10 \log \frac{\sum_{j=1}^{N_{SS}} (\sum_{k=1}^{N_{ANT}} g_{j,k})^2}{N_{ANT}}$$

N<sub>SS</sub> = the number of independent spatial streams of data = 1

N<sub>ANT</sub> = the total number of antennas = 2

$$g_{j,k} = 10^{G_k/20}$$

G<sub>k</sub> is the gain in dBi of the k th antenna.

Refer to SECTION 2 for Antenna gain.

## Maximum Conducted Output Power

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date October 20, 2020 October 22, 2020 November 24, 2020  
Temperature / Humidity 24 deg. C / 43 % RH 25 deg. C / 53 % RH 22 deg. C / 44 % RH  
Engineer Yosuke Murakami Makoto Hosaka Yohsuke Matsuzawa  
Mode Tx, 11n-20

**Antenna: ANT0 + ANT 1**

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			ANT 0 [mW]	ANT 1 [mW]	Sum [mW]	Result [dBm]	Limit [dBm]	Margin [dB]	ANT 0 [mW]	ANT 1 [mW]	Sum [mW]	Result [dBm]	Limit [dBm]	Margin [dB]
5180	-	17.885	8.91	8.65	17.56	12.45	23.97	11.52	20.94	32.81	53.75	17.30	29.97	12.67
5220	-	17.878	9.04	8.77	17.81	12.51	23.97	11.46	21.23	33.27	54.50	17.36	29.97	12.61
5240	-	17.819	8.49	9.02	17.51	12.43	23.97	11.54	19.95	34.20	54.15	17.34	29.97	12.63
5260	19.796	17.822	8.11	9.71	17.81	12.51	23.96	11.45	14.76	36.81	51.57	17.12	29.97	12.85
5300	19.957	17.796	8.83	9.71	18.54	12.68	23.97	11.29	16.07	36.81	52.88	17.23	29.97	12.74
5320	19.659	17.807	9.12	10.54	19.66	12.94	23.93	10.99	16.60	39.99	56.59	17.53	29.97	12.44
5500	20.101	17.791	7.33	7.57	14.90	11.73	23.97	12.24	12.97	24.60	37.58	15.75	29.97	14.22
5580	20.305	17.842	8.69	7.62	16.31	12.12	23.97	11.85	15.38	24.77	40.16	16.04	29.97	13.93
5700	20.060	17.835	10.33	7.96	18.29	12.62	23.97	11.35	18.28	25.88	44.16	16.45	29.97	13.52
5720	20.031	17.922	10.07	8.41	18.48	12.67	23.97	11.30	17.82	27.35	45.18	16.55	29.97	13.42
5745	-	17.979	10.21	7.48	17.69	12.48	30.00	17.52	20.80	19.36	40.16	16.04	36.00	19.96
5785	-	17.924	10.05	7.67	17.72	12.48	30.00	17.52	20.46	19.86	40.33	16.06	36.00	19.94
5825	-	17.882	9.93	7.73	17.66	12.47	30.00	17.53	20.23	20.00	40.23	16.05	36.00	19.95

Antenna: ANT 0							Antenna: ANT 1							
Tested Frequency [MHz]	Duty Factor *1) [dB]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result		Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result		
						Cond. Power [dBm]	e.i.r.p. [dBm]					Cond. Power [dBm]	e.i.r.p. [dBm]	
5180	0.00	-1.70	1.48	9.72	3.71	9.50	13.21	-1.97	1.47	9.87	5.79	9.37	15.16	
5220	0.00	-1.65	1.49	9.72	3.71	9.56	13.27	-1.91	1.47	9.87	5.79	9.43	15.22	
5240	0.00	-1.84	1.41	9.72	3.71	9.29	13.00	-1.75	1.42	9.88	5.79	9.55	15.34	
5260	0.00	-2.07	1.44	9.72	2.60	9.09	11.69	-1.47	1.46	9.88	5.79	9.87	15.66	
5300	0.00	-1.70	1.44	9.72	2.60	9.46	12.06	-1.47	1.46	9.88	5.79	9.87	15.66	
5320	0.00	-1.68	1.56	9.72	2.60	9.60	12.20	-1.22	1.57	9.88	5.79	10.23	16.02	
5500	0.00	-2.67	1.59	9.73	2.48	8.65	11.13	-2.69	1.60	9.88	5.12	8.79	13.91	
5580	0.00	-1.94	1.60	9.73	2.48	9.39	11.87	-2.66	1.60	9.88	5.12	8.82	13.94	
5700	0.00	-1.11	1.51	9.74	2.48	10.14	12.62	-2.40	1.52	9.89	5.12	9.01	14.13	
5720	0.00	-1.23	1.52	9.74	2.48	10.03	12.51	-2.16	1.52	9.89	5.12	9.25	14.37	
5745	0.00	-1.12	1.47	9.74	3.09	10.09	13.18	-2.47	1.47	9.74	4.13	8.74	12.87	
5785	0.00	-1.20	1.48	9.74	3.09	10.02	13.11	-2.37	1.48	9.74	4.13	8.85	12.98	
5825	0.00	-1.29	1.52	9.74	3.09	9.97	13.06	-2.38	1.52	9.74	4.13	8.88	13.01	

Sample Calculation: (\*1) Power was measured with using the gate function of power meter.)  
Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor  
e.i.r.p. Result = Conducted Power Result + Antenna Gain  
Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower  
Conducted Power Limit (5725 MHz-5850 MHz) = 1 W



## Maximum Conducted Output Power

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date October 20, 2020 October 22, 2020 November 24, 2020  
Temperature / Humidity 25 deg. C / 41 % RH 25 deg. C / 53 % RH 22 deg. C / 44 % RH  
Engineer Makoto Hosaka Makoto Hosaka Yohsuke Matsuzawa  
Mode Tx 11ac-20

Antenna: ANT 0 + ANT 1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW [MHz] (B for FCC)	99% OBW [MHz] (B for IC)	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
			ANT 0 [mW]	ANT 1 [mW]	Sum [mW]				ANT 0 [mW]	ANT 1 [mW]	Sum [mW]			
5180	-	17.884	8.65	8.81	17.46	12.42	23.97	11.55	20.32	33.42	53.74	17.30	29.97	12.67
5220	-	17.878	8.75	9.02	17.77	12.50	23.97	11.47	20.56	34.20	54.76	17.38	29.97	12.59
5240	-	17.863	8.38	9.29	17.66	12.47	23.97	11.50	19.68	35.24	54.92	17.40	29.97	12.57
5260	20.130	17.926	7.76	9.71	17.47	12.42	23.97	11.55	14.13	36.81	50.94	17.07	29.97	12.90
5300	20.271	17.869	8.39	10.40	18.79	12.74	23.97	11.23	15.28	39.45	54.72	17.38	29.97	12.59
5320	20.444	17.881	8.69	10.76	19.45	12.89	23.97	11.08	15.81	40.83	56.64	17.53	29.97	12.44
5500	19.905	17.876	7.50	7.94	15.44	11.89	23.97	12.08	13.27	25.82	39.10	15.92	29.97	14.05
5580	20.198	17.878	8.73	8.05	16.78	12.25	23.97	11.72	15.45	26.18	41.63	16.19	29.97	13.78
5700	20.260	17.897	10.23	8.36	18.59	12.69	23.97	11.28	18.11	27.16	45.28	16.56	29.97	13.41
5720	19.906	17.827	10.09	8.67	18.76	12.73	23.97	11.24	17.86	28.18	46.05	16.63	29.97	13.34
5745	-	17.913	10.30	7.91	18.21	12.60	30.00	17.40	20.99	20.46	41.45	16.18	36.00	19.82
5785	-	17.878	9.82	7.96	17.78	12.50	30.00	17.50	20.00	20.61	40.60	16.09	36.00	19.91
5825	-	17.953	10.28	8.09	18.37	12.64	30.00	17.36	20.94	20.94	41.88	16.22	36.00	19.78

Tested Frequency [MHz]	Duty Factor *1) [dB]	Antenna: ANT 0						Antenna: ANT 1					
		Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result		Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result	
						Cond. Power [dBm]	e.i.r.p. [dBm]					Cond. Power [dBm]	e.i.r.p. [dBm]
5180	0.00	-1.83	1.48	9.72	3.71	9.37	13.08	-1.89	1.47	9.87	5.79	9.45	15.24
5220	0.00	-1.79	1.49	9.72	3.71	9.42	13.13	-1.79	1.47	9.87	5.79	9.55	15.34
5240	0.00	-1.90	1.41	9.72	3.71	9.23	12.94	-1.62	1.42	9.88	5.79	9.68	15.47
5260	0.00	-2.26	1.44	9.72	2.60	8.90	11.50	-1.47	1.46	9.88	5.79	9.87	15.66
5300	0.00	-1.92	1.44	9.72	2.60	9.24	11.84	-1.17	1.46	9.88	5.79	10.17	15.96
5320	0.00	-1.89	1.56	9.72	2.60	9.39	11.99	-1.13	1.57	9.88	5.79	10.32	16.11
5500	0.00	-2.57	1.59	9.73	2.48	8.75	11.23	-2.48	1.60	9.88	5.12	9.00	14.12
5580	0.00	-1.92	1.60	9.73	2.48	9.41	11.89	-2.42	1.60	9.88	5.12	9.06	14.18
5700	0.00	-1.15	1.51	9.74	2.48	10.10	12.58	-2.19	1.52	9.89	5.12	9.22	14.34
5720	0.00	-1.22	1.52	9.74	2.48	10.04	12.52	-2.03	1.52	9.89	5.12	9.38	14.50
5745	0.00	-1.08	1.47	9.74	3.09	10.13	13.22	-2.23	1.47	9.74	4.13	8.98	13.11
5785	0.00	-1.30	1.48	9.74	3.09	9.92	13.01	-2.21	1.48	9.74	4.13	9.01	13.14
5825	0.00	-1.14	1.52	9.74	3.09	10.12	13.21	-2.18	1.52	9.74	4.13	9.08	13.21

Sample Calculation: ( \*1) Power was measured with using the gate function of power meter.)  
Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor  
e.i.r.p. Result = Conducted Power Result + Antenna Gain  
Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower  
Conducted Power Limit (5725 MHz-5850 MHz) = 1 W

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## Maximum Conducted Output Power

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date October 20, 2020 October 22, 2020 November 24, 2020  
Temperature / Humidity 24 deg. C / 43 % RH 25 deg. C / 53 % RH 22 deg. C / 44 % RH  
Engineer Yosuke Murakami Makoto Hosaka Yohsuke Matsuzawa  
Mode Tx 11n-40

**Antenna: ANT 0 + ANT 1**

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW [MHz] (B for FCC)	99% OBW [MHz] (B for IC)	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
			ANT 0 [mW]	ANT 1 [mW]	Sum [mW]				ANT 0 [mW]	ANT 1 [mW]	Sum [mW]			
5190	-	37.049	8.73	8.17	16.90	12.28	23.97	11.69	20.51	30.97	51.49	17.12	29.97	12.85
5230	-	37.037	8.73	8.43	17.16	12.35	23.97	11.62	20.51	31.99	52.50	17.20	29.97	12.77
5270	43.222	37.048	7.83	8.87	16.71	12.23	23.97	11.74	14.26	33.65	47.91	16.80	29.97	13.17
5310	42.842	37.116	8.59	9.35	17.94	12.54	23.97	11.43	15.63	35.48	51.11	17.09	29.97	12.88
5510	42.224	37.035	7.19	7.31	14.51	11.62	23.97	12.35	12.74	23.77	36.50	15.62	29.97	14.35
5550	42.865	37.094	7.16	7.38	14.54	11.63	23.97	12.34	12.68	23.99	36.66	15.64	29.97	14.33
5670	42.876	37.103	9.14	7.78	16.92	12.28	23.97	11.69	16.18	25.29	41.47	16.18	29.97	13.79
5710	42.925	37.228	9.55	8.02	17.57	12.45	23.97	11.52	16.90	26.06	42.97	16.33	36.00	19.67
5755	-	36.994	9.82	7.62	17.44	12.42	30.00	17.58	20.00	19.72	39.72	15.99	36.00	20.01
5795	-	37.221	9.68	7.98	17.66	12.47	30.00	17.53	19.72	20.65	40.38	16.06	36.00	19.94

Antenna: ANT 0								Antenna: ANT 1							
Tested Frequency [MHz]	Duty Factor *1) [dB]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result		Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result			
						Cond. Power [dBm]	e.i.r.p. [dBm]					Cond. Power [dBm]	e.i.r.p. [dBm]		
5190	0.00	-1.79	1.48	9.72	3.71	9.41	13.12	-2.22	1.47	9.87	5.79	9.12	14.91		
5230	0.00	-1.79	1.48	9.72	3.71	9.41	13.12	-2.09	1.48	9.87	5.79	9.26	15.05		
5270	0.00	-2.22	1.44	9.72	2.60	8.94	11.54	-1.86	1.46	9.88	5.79	9.48	15.27		
5310	0.00	-1.82	1.44	9.72	2.60	9.34	11.94	-1.63	1.46	9.88	5.79	9.71	15.50		
5510	0.00	-2.75	1.59	9.73	2.48	8.57	11.05	-2.84	1.60	9.88	5.12	8.64	13.76		
5550	0.00	-2.78	1.60	9.73	2.48	8.55	11.03	-2.80	1.60	9.88	5.12	8.68	13.80		
5670	0.00	-1.60	1.47	9.74	2.48	9.61	12.09	-2.45	1.47	9.89	5.12	8.91	14.03		
5710	0.00	-1.45	1.51	9.74	2.48	9.80	12.28	-2.32	1.47	9.89	5.12	9.04	14.16		
5755	0.00	-1.30	1.48	9.74	3.09	9.92	13.01	-2.56	1.49	9.89	4.13	8.82	12.95		
5795	0.00	-1.36	1.48	9.74	3.09	9.86	12.95	-2.36	1.49	9.89	4.13	9.02	13.15		

Sample Calculation: ( \*1) Power was measured with using the gate function of power meter.)

Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor

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

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

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

## Maximum Conducted Output Power

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date October 20, 2020 October 22, 2020 November 24, 2020  
Temperature / Humidity 25 deg. C / 41 % RH 25 deg. C / 53 % RH 22 deg. C / 44 % RH  
Engineer Makoto Hosaka Makoto Hosaka Yohsuke Matsuzawa  
Mode Tx 11ac-40

Antenna: ANT 0 + ANT 1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
			ANT 0 [mW]	ANT 1 [mW]	Sum [mW]				ANT 0 [mW]	ANT 1 [mW]	Sum [mW]			
5190	-	36.913	8.51	8.05	16.57	12.19	23.97	11.78	20.00	30.55	50.55	17.04	29.97	12.93
5230	-	36.883	8.67	8.39	17.06	12.32	23.97	11.65	20.37	31.84	52.21	17.18	29.97	12.79
5270	43.808	36.839	7.67	8.36	16.03	12.05	23.97	11.92	13.96	31.70	45.66	16.60	29.97	13.37
5310	42.471	36.685	8.85	9.33	18.18	12.60	23.97	11.37	16.11	35.40	51.51	17.12	29.97	12.85
5510	43.333	36.793	6.53	6.73	13.26	11.23	23.97	12.74	11.56	21.88	33.44	15.24	29.97	14.73
5550	42.293	36.833	6.62	6.75	13.37	11.26	23.97	12.71	11.72	21.93	33.65	15.27	29.97	14.70
5670	43.201	36.940	8.22	7.19	15.42	11.88	23.97	12.09	14.55	23.39	37.94	15.79	29.97	14.18
5710	43.248	36.925	7.76	7.36	15.12	11.80	23.97	12.17	13.74	23.93	37.67	15.76	36.00	20.24
5755	-	36.878	9.27	7.01	16.28	12.12	30.00	17.88	23.99	18.16	42.14	16.25	36.00	19.75
5795	-	36.804	8.97	7.24	16.22	12.10	30.00	17.90	23.23	18.75	41.98	16.23	36.00	19.77

Tested Frequency [MHz]	Antenna: ANT 0						Antenna: ANT 1							
	Duty Factor *1) [dB]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result		Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result		
						Cond. Power [dBm]	e.i.r.p. [dBm]					Cond. Power [dBm]	e.i.r.p. [dBm]	
5190	0.00	-1.90	1.48	9.72	3.71	9.30	13.01	-2.28	1.47	9.87	5.79	9.06	14.85	
5230	0.00	-1.83	1.49	9.72	3.71	9.38	13.09	-2.11	1.48	9.87	5.79	9.24	15.03	
5270	0.00	-2.31	1.44	9.72	2.60	8.85	11.45	-1.94	1.44	9.72	5.79	9.22	15.01	
5310	0.00	-1.87	1.46	9.88	2.60	9.47	12.07	-1.64	1.46	9.88	5.79	9.70	15.49	
5510	0.00	-3.17	1.59	9.73	2.48	8.15	10.63	-3.20	1.60	9.88	5.12	8.28	13.40	
5550	0.00	-3.12	1.60	9.73	2.48	8.21	10.69	-3.19	1.60	9.88	5.12	8.29	13.41	
5670	0.00	-2.06	1.47	9.74	2.48	9.15	11.63	-2.79	1.47	9.89	5.12	8.57	13.69	
5710	0.00	-2.35	1.51	9.74	2.48	8.90	11.38	-2.69	1.47	9.89	5.12	8.67	13.79	
5755	0.00	-1.55	1.48	9.74	4.13	9.67	13.80	-2.92	1.49	9.89	4.13	8.46	12.59	
5795	0.00	-1.69	1.48	9.74	4.13	9.53	13.66	-2.78	1.49	9.89	4.13	8.60	12.73	

Sample Calculation:

(\*1) Power was measured with using the gate function of power meter.)

Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor

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

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

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

**UL Japan, Inc.**

**Shonan EMC Lab.**

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## Maximum Conducted Output Power

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date October 22, 2020 October 22, 2020  
Temperature / Humidity 23 deg. C / 57 % RH 25 deg. C / 53 % RH  
Engineer Yosuke Murakami Makoto Hosaka  
Mode Tx 11ac-80

**Antenna: ANT 0 + ANT 1**

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	26 dB EBW [MHz]	99% OBW [MHz]	Conducted power						e.i.r.p.					
			Antenna			Result [dBm]	Limit [dBm]	Margin [dB]	Antenna			Result [dBm]	Limit [dBm]	Margin [dB]
			ANT 0 [mW]	ANT 1 [mW]	Sum [mW]				ANT 0 [mW]	ANT 1 [mW]	Sum [mW]			
5210	-	75.362	8.41	8.17	16.58	12.20	23.97	11.77	19.77	30.97	50.74	17.05	29.97	12.92
5290	79.729	75.530	8.15	9.27	17.42	12.41	23.97	11.56	14.83	35.16	49.98	16.99	29.97	12.98
5530	80.510	75.370	7.35	7.06	14.41	11.59	23.97	12.38	13.00	22.86	35.86	15.55	29.97	14.42
5610	81.396	75.342	8.24	7.19	15.44	11.89	23.97	12.08	14.59	23.28	37.87	15.78	29.97	14.19
5690	80.174	75.441	9.33	7.31	16.64	12.21	30.00	17.79	16.52	23.66	40.18	16.04	36.00	19.96
5775	-	75.624	9.31	7.31	16.62	12.21	30.00	17.79	18.97	18.92	37.89	15.79	36.00	20.21

Tested Frequency [MHz]	Duty Factor [*1] [dB]	Antenna: ANT 0						Antenna: ANT 1					
		Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result		Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result	
						Cond. Power [dBm]	e.i.r.p. [dBm]					Cond. Power [dBm]	e.i.r.p. [dBm]
5210	0.00	-1.96	1.49	9.72	3.71	9.25	12.96	-2.22	1.47	9.87	5.79	9.12	14.91
5290	0.00	-2.05	1.44	9.72	2.60	9.11	11.71	-1.67	1.46	9.88	5.79	9.67	15.46
5530	0.00	-2.66	1.59	9.73	2.48	8.66	11.14	-2.99	1.60	9.88	5.10	8.49	13.59
5610	0.00	-2.03	1.46	9.73	2.48	9.16	11.64	-2.77	1.46	9.88	5.10	8.57	13.67
5690	0.00	-1.51	1.47	9.74	2.48	9.70	12.18	-2.72	1.47	9.89	5.10	8.64	13.74
5775	0.00	-1.53	1.48	9.74	3.09	9.69	12.78	-2.74	1.49	9.89	4.13	8.64	12.77

Sample Calculation: ( \*1) Power was measured with using the gate function of power meter.)  
Conducted Power Result = Reading + Cable Loss + Atten. Loss + Duty Factor  
e.i.r.p. Result = Conducted Power Result + Antenna Gain  
Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower  
Conducted Power Limit (5725 MHz-5850 MHz) = 1 W

**Maximum Conducted Output Power**  
**(Confirmation of worst rate)**

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date October 20, 2020  
Temperature / Humidity 24 deg. C / 43 % RH  
Engineer Yosuke Murakami  
Mode Tx, 11a

**5180 MHz**

Mode	Rate	Duty factor *1) [dB]	Reading				Result		Remarks
			ANT				0+1 [mW]	0+1 [dBm]	
			0 [dBm]	1 [dBm]	0 [mW]	1 [mW]			
11a	6	0.00	-3.05	-3.02	0.50	0.50	0.99	-0.02	*
	9	0.00	-3.16	-3.06	0.48	0.49	0.98	-0.10	
	12	0.00	-2.67	-2.63	0.54	0.55	1.09	0.36	
	18	0.00	-1.79	-1.81	0.66	0.66	1.32	1.21	
	24	0.00	-1.99	-2.01	0.63	0.63	1.26	1.01	
	36	0.00	-2.78	-2.54	0.53	0.56	1.08	0.35	
	48	0.00	-2.60	-2.61	0.55	0.55	1.10	0.41	
	54	0.00	-2.69	-2.62	0.54	0.55	1.09	0.36	

\* Worst rate

Sample Calculation: ( \*1) Power was measured with using the gate function of power meter.)

Result = Reading ANT 0 + Reading ANT 1 + Duty factor

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

**Maximum Conducted Output Power**  
**(Confirmation of worst rate)**

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date October 20, 2020  
Temperature / Humidity 24 deg. C / 43 % RH  
Engineer Yosuke Murakami  
Mode Tx, 11n-20

**5180 MHz**

Mode	Rate	Duty factor *1) [dB]	Reading				Result		Remarks
			ANT						
			0 [dBm]	1 [dBm]	0 [mW]	1 [mW]	0+1 [mW]	0+1 [dBm]	
11n-20	0	0.00	-3.09	-3.11	0.49	0.49	0.98	-0.09	*
	1	0.00	-2.97	-2.95	0.50	0.51	1.01	0.05	
	2	0.00	-1.70	-1.97	0.68	0.64	1.31	1.18	
	3	0.00	-1.86	-2.04	0.65	0.63	1.28	1.06	
	4	0.00	-2.60	-2.71	0.55	0.54	1.09	0.36	
	5	0.00	-2.68	-2.67	0.54	0.54	1.08	0.34	
	6	0.00	-2.50	-2.69	0.56	0.54	1.10	0.42	
7	0.00	-2.59	-2.73	0.55	0.53	1.08	0.35		

\* Worst rate

Sample Calculation: ( \*1) Power was measured with using the gate function of power meter.)

$$\text{Result} = \text{Reading ANT 0} + \text{Reading ANT 1} + \text{Duty factor}$$

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

**Maximum Conducted Output Power**  
**(Confirmation of worst rate)**

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date October 22, 2020  
Temperature / Humidity 25 deg. C / 53 % RH  
Engineer Makoto Hosaka  
Mode Tx 11ac-20

**5180 MHz**

Mode	Rate	Duty factor *1) [dB]	Reading				Result		Remarks
			ANT				0+1 [mW]	0+1 [dBm]	
			0 [dBm]	1 [dBm]	0 [mW]	1 [mW]			
11ac-20	0	0.00	-3.07	-3.18	0.49	0.48	0.97	-0.11	*
	1	0.00	-2.65	-2.81	0.54	0.52	1.07	0.28	
	2	0.00	-1.93	-1.93	0.64	0.64	1.28	1.08	
	3	0.00	-1.83	-1.89	0.66	0.65	1.30	1.15	
	4	0.00	-2.70	-2.76	0.54	0.53	1.07	0.28	
	5	0.00	-2.57	-2.67	0.55	0.54	1.09	0.39	
	6	0.00	-2.60	-2.76	0.55	0.53	1.08	0.33	
	7	0.00	-2.57	-2.68	0.55	0.54	1.09	0.39	
8	0.00	-2.60	-2.60	0.55	0.55	1.10	0.41		

\* Worst rate

Sample Calculation: ( \*1) Power was measured with using the gate function of power meter.)

Result = Reading ANT 0 + Reading ANT 1 + Duty factor

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

**Maximum Conducted Output Power**  
**(Confirmation of worst rate)**

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date October 20, 2020  
Temperature / Humidity 24 deg. C / 43 % RH  
Engineer Yosuke Murakami  
Mode Tx 11n-40

**5190 MHz**

Mode	Rate	Duty factor *1) [dB]	Reading				Result		Remarks
			ANT				0+1 [mW]	0+1 [dBm]	
			0 [dBm]	1 [dBm]	0 [mW]	1 [mW]			
11n-40	0	0.00	-2.28	-2.59	0.59	0.55	1.14	0.58	*
	1	0.00	-2.27	-2.57	0.59	0.55	1.15	0.59	
	2	0.00	-2.19	-2.56	0.60	0.55	1.16	0.64	
	3	0.00	-2.28	-2.74	0.59	0.53	1.12	0.51	
	4	0.00	-1.85	-2.23	0.65	0.60	1.25	0.97	
	5	0.00	-1.86	-2.31	0.65	0.59	1.24	0.93	
	6	0.00	-1.79	-2.22	0.66	0.60	1.26	1.01	
7	0.00	-1.97	-2.33	0.64	0.58	1.22	0.86		

\* Worst rate

Sample Calculation: ( \*1) Power was measured with using the gate function of power meter.)

Result = Reading ANT 0 + Reading ANT 1 + Duty factor

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



**Maximum Conducted Output Power**  
**(Confirmation of worst rate)**

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date October 22, 2020  
Temperature / Humidity 25 deg. C / 53 % RH  
Engineer Makoto Hosaka  
Mode Tx 11ac-40

**5190 MHz**

Mode	Rate	Duty factor *1) [dB]	Reading				Result		Remarks
			ANT						
			0 [dBm]	1 [dBm]	0 [mW]	1 [mW]	0+1 [mW]	0+1 [dBm]	
11ac-40	0	0.00	-2.32	-2.59	0.59	0.55	1.14	0.56	*
	1	0.00	-2.24	-2.64	0.60	0.54	1.14	0.57	
	2	0.00	-2.27	-2.63	0.59	0.55	1.14	0.56	
	3	0.00	-2.35	-2.63	0.58	0.55	1.13	0.52	
	4	0.00	-1.90	-2.34	0.65	0.58	1.23	0.90	
	5	0.00	-1.90	-2.28	0.65	0.59	1.24	0.92	
	6	0.00	-1.99	-2.27	0.63	0.59	1.23	0.88	
	7	0.00	-1.92	-2.27	0.64	0.59	1.24	0.92	
	8	0.00	-1.96	-2.36	0.64	0.58	1.22	0.85	
9	0.00	-1.96	-2.32	0.64	0.59	1.22	0.87		

\* Worst rate

Sample Calculation: ( \*1) Power was measured with using the gate function of power meter.)

Result = Reading ANT 0 + Reading ANT 1 + Duty factor

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

**Maximum Conducted Output Power**  
**(Confirmation of worst rate)**

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date October 22, 2020  
Temperature / Humidity 23 deg. C / 57 % RH  
Engineer Yosuke Murakami  
Mode Tx 11ac-80

**5210 MHz**

Mode	Rate	Duty factor *1) [dB]	Reading				Result		Remarks
			ANT						
			0 [dBm]	1 [dBm]	0 [mW]	1 [mW]	0+1 [mW]	0+1 [dBm]	
11ac-80	0	0.00	-1.96	-2.22	0.64	0.60	1.24	0.92	*
	1	0.00	-3.20	-2.91	0.48	0.51	0.99	-0.04	
	2	0.00	-3.00	-2.78	0.50	0.53	1.03	0.12	
	3	0.00	-2.88	-2.83	0.52	0.52	1.04	0.16	
	4	0.00	-2.90	-2.66	0.51	0.54	1.05	0.23	
	5	0.00	-2.81	-2.53	0.52	0.56	1.08	0.34	
	6	0.00	-2.76	-2.54	0.53	0.56	1.09	0.36	
	7	0.00	-2.75	-2.36	0.53	0.58	1.11	0.46	
	8	0.00	-2.61	-2.50	0.55	0.56	1.11	0.46	
9	0.00	-2.69	-2.41	0.54	0.57	1.11	0.46		

\* Worst rate

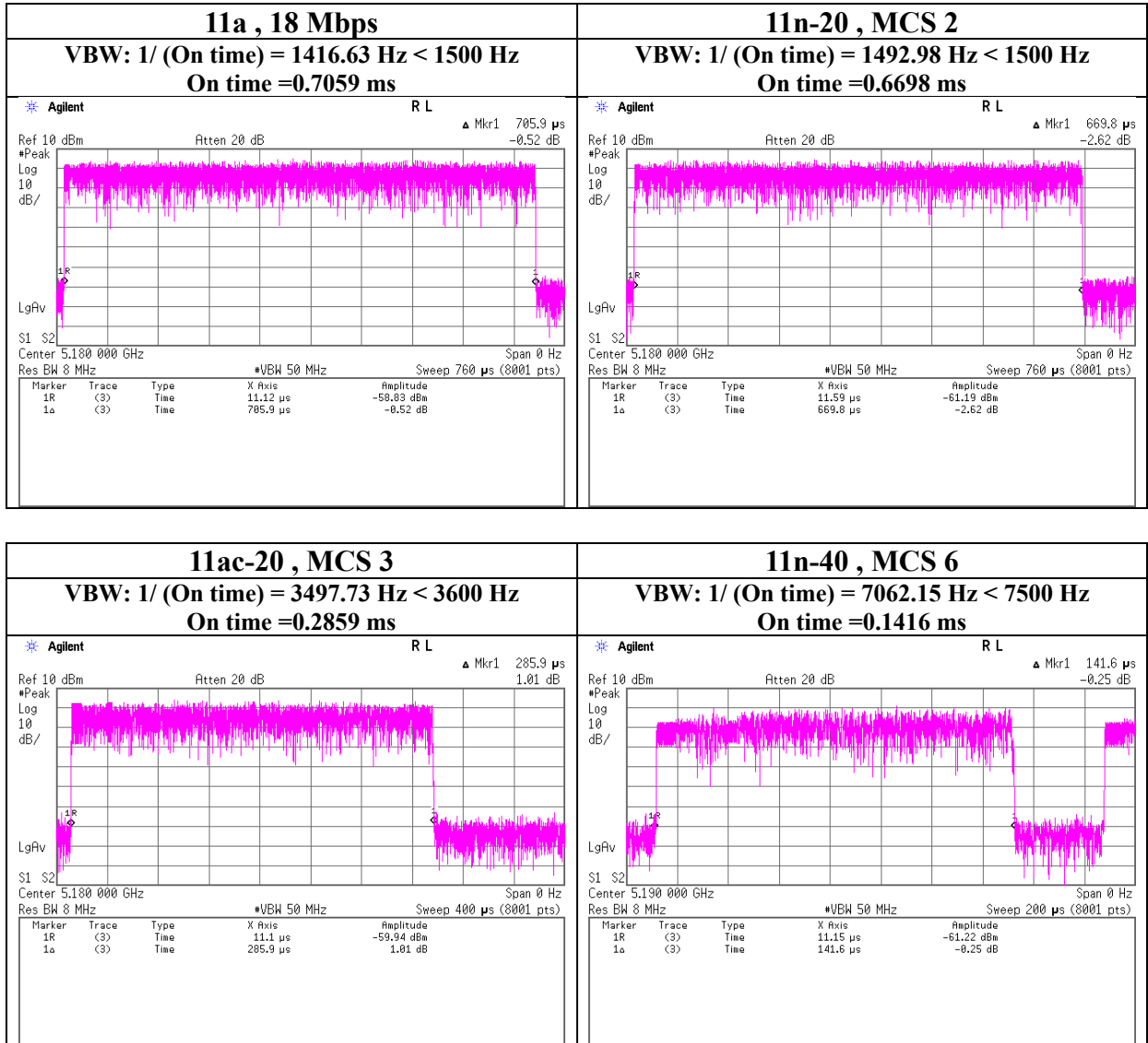
Sample Calculation: ( \*1) Power was measured with using the gate function of power meter.)

Result = Reading ANT 0 + Reading ANT 1 + Duty factor

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

### Burst rate confirmation

Report No. 13554183S-E-R1  
 Test place Shonan EMC Lab. No.5 Shielded Room  
 Date October 20, 2020  
 Temperature / Humidity 25 deg. C / 41 % RH  
 Engineer Makoto Hosaka  
 Mode Tx



**UL Japan, Inc.**

**Shonan EMC Lab.**

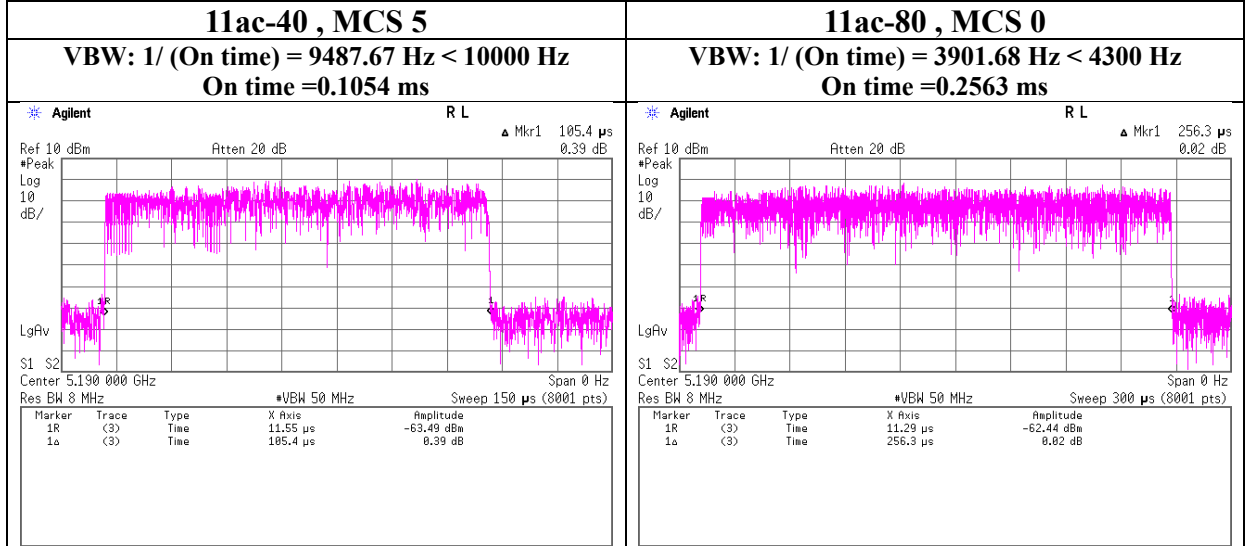
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**Burst rate confirmation**

Report No. 13554183S-E-R1  
 Test place Shonan EMC Lab. No.5 Shielded Room  
 Date October 5, 2020  
 Temperature / Humidity 25 deg. C / 41 % RH  
 Engineer Makoto Hosaka  
 Mode Tx



## Maximum Power Spectral Density

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.3, 5 Shielded Room  
Date October 30, 2020 November 24, 2020  
Temperature / Humidity 26 deg. C / 37 % RH 22 deg. C / 44 % RH  
Engineer Kazuya Noda Shiro Kobayashi  
Mode Tx, 11a,

**ANT 0+1**

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD (Conducted)						PSD (e.i.r.p.)					
	Antenna			Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]	Antenna			Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]
	ANT 0 [mW/MHz]	ANT 1 [mW/MHz]	Sum [mW/MHz]				ANT 0 [mW/MHz]	ANT 1 [mW/MHz]	Sum [mW/MHz]			
5180	0.65	0.64	1.30	1.13	9.18	8.05	3.95	3.90	7.85	8.95	17.00	8.05
5220	0.67	0.64	1.31	1.17	9.18	8.01	4.08	3.86	7.93	8.99	17.00	8.01
5240	0.65	0.66	1.31	1.17	9.18	8.01	3.91	4.02	7.93	8.99	17.00	8.01
5260	0.67	0.74	1.41	1.48	9.65	8.17	3.62	4.02	7.64	8.83	17.00	8.17
5300	0.73	0.82	1.54	1.89	9.65	7.76	3.95	4.45	8.39	9.24	17.00	7.76
5320	0.80	0.83	1.63	2.13	9.65	7.52	4.36	4.52	8.88	9.48	17.00	7.52
5500	0.58	0.58	1.16	0.65	10.09	9.44	2.84	2.86	5.70	7.56	17.00	9.44
5580	0.69	0.57	1.25	0.98	10.09	9.11	3.37	2.79	6.15	7.89	17.00	9.11
5700	0.83	0.61	1.44	1.59	10.09	8.50	4.07	3.01	7.09	8.50	17.00	8.50
5720	0.87	0.67	1.55	1.89	10.09	8.20	4.30	3.30	7.59	8.80	17.00	8.20
5745	0.51	0.39	0.90	-0.46	29.36	29.83	2.34	1.80	4.14	6.17	36.00	29.83
5785	0.54	0.40	0.93	-0.29	29.36	29.66	2.48	1.83	4.31	6.34	36.00	29.66
5825	0.55	0.37	0.92	-0.37	29.36	29.73	2.54	1.70	4.23	6.27	36.00	29.73

Tested Frequency [MHz]	Duty Factor *1 [dB]	RBW Correction Factor [dB]	ANT 0				ANT 1				PSD Result			
			PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Directional Gain [dBi]	PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Directional Gain [dBi]	Cond. [dBm/MHz]	e.i.r.p. [dBm/MHz]	Cond. [dBm/MHz]	e.i.r.p. [dBm/MHz]
			5180	0.00	0.00	-13.06	1.48	9.72	7.82	-1.86	5.96	-13.25	1.47	9.87
5220	0.00	0.00	-12.93	1.49	9.72	7.82	-1.72	6.10	-13.30	1.47	9.87	7.82	-1.96	5.86
5240	0.00	0.00	-13.03	1.41	9.72	7.82	-1.90	5.92	-13.08	1.42	9.88	7.82	-1.78	6.04
5260	0.00	0.00	-12.92	1.44	9.72	7.35	-1.76	5.59	-12.65	1.46	9.88	7.35	-1.31	6.04
5300	0.00	0.00	-12.55	1.44	9.72	7.35	-1.39	5.96	-12.21	1.46	9.88	7.35	-0.87	6.48
5320	0.00	0.00	-12.24	1.56	9.72	7.35	-0.96	6.39	-12.25	1.57	9.88	7.35	-0.80	6.55
5500	0.00	0.00	-13.70	1.59	9.73	6.91	-2.38	4.53	-13.83	1.60	9.88	6.91	-2.35	4.56
5580	0.00	0.00	-12.97	1.60	9.73	6.91	-1.64	5.27	-13.94	1.60	9.88	6.91	-2.46	4.45
5700	0.00	0.00	-12.06	1.51	9.74	6.91	-0.81	6.10	-13.53	1.52	9.89	6.91	-2.12	4.79
5720	0.00	0.00	-11.83	1.51	9.74	6.91	-0.58	6.33	-13.14	1.52	9.89	6.91	-1.73	5.18
5745	0.00	6.99	-21.14	1.47	9.74	6.64	-2.94	3.70	-22.28	1.47	9.74	6.64	-4.08	2.56
5785	0.00	6.99	-20.90	1.48	9.74	6.64	-2.69	3.95	-22.23	1.48	9.74	6.64	-4.02	2.62
5825	0.00	6.99	-20.84	1.52	9.74	6.64	-2.59	4.05	-22.59	1.52	9.74	6.64	-4.34	2.30

Sample Calculation:

(\*1) PSD was measured with using the gate function of Spectrum analyzer.)

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = 10 \* log (Specified bandwidth / Measured bandwidth)

PSD Result (Conducted) = Reading + Cable Loss + Atten. Loss + Duty Factor + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Directional Gain

$$\text{Directional Gain} = 10 \log \frac{\sum_{j=1}^{N_{SS}} (\sum_{k=1}^{N_{ANT}} g_{j,k})^2}{N_{ANT}}$$

N<sub>SS</sub> = the number of independent spatial streams of data = 1

N<sub>ANT</sub> = the total number of antennas = 2

$$g_{j,k} = 10^{G_k/20}$$

G<sub>k</sub> is the gain in dBi of the k<sup>th</sup> antenna.

Refer to SECTION 2 for Antenna gain.

The conducted PSD limit was reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. (All frequencies for FCC, 5725 MHz-5850 MHz for IC)

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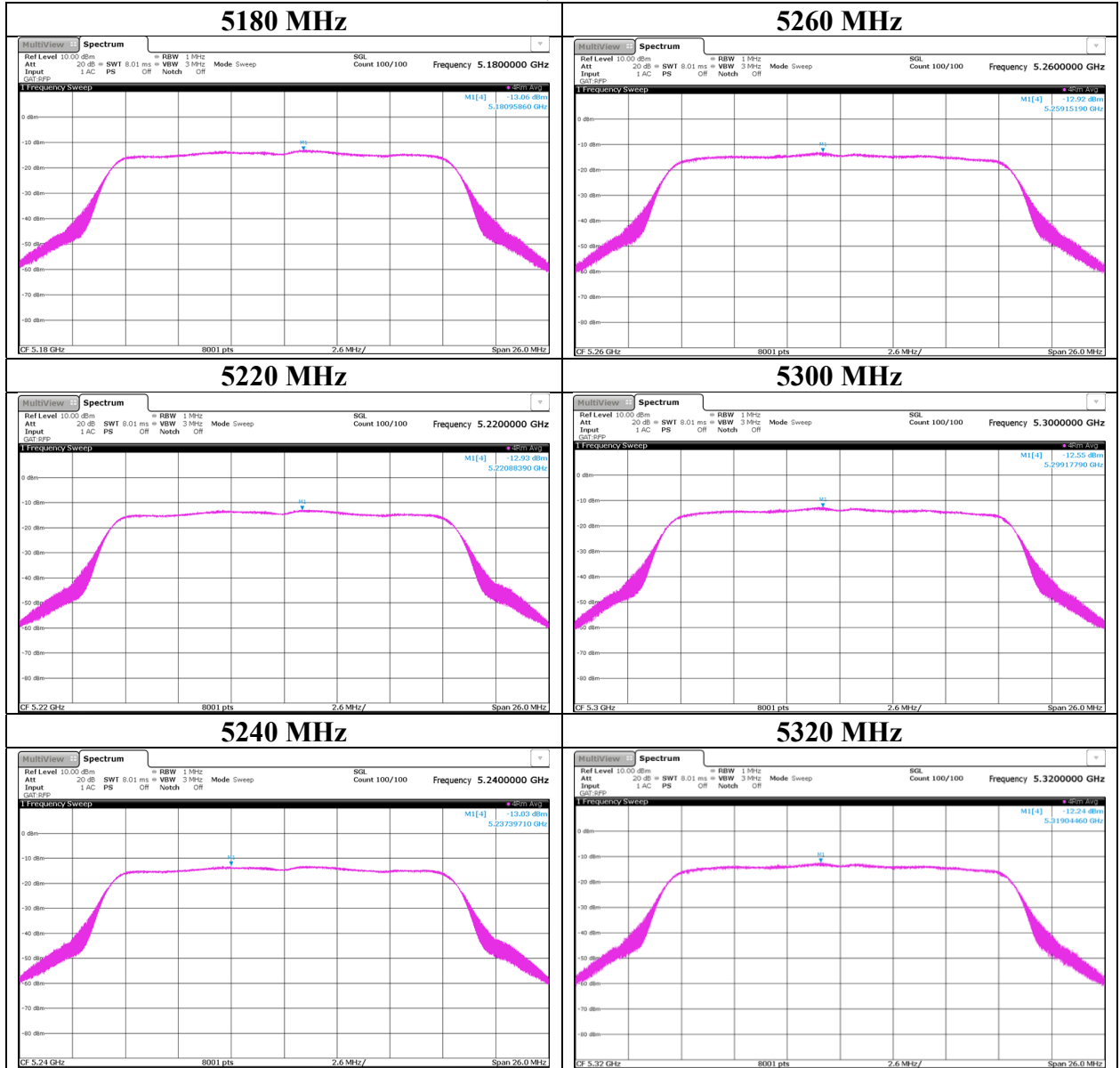
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Maximum Power Spectral Density

Report No.	13554183S-E-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 30, 2020
Temperature / Humidity	26 deg. C / 37 % RH
Engineer	Kazuya Noda
Mode	Tx, 11a

### 11a, Ant 0



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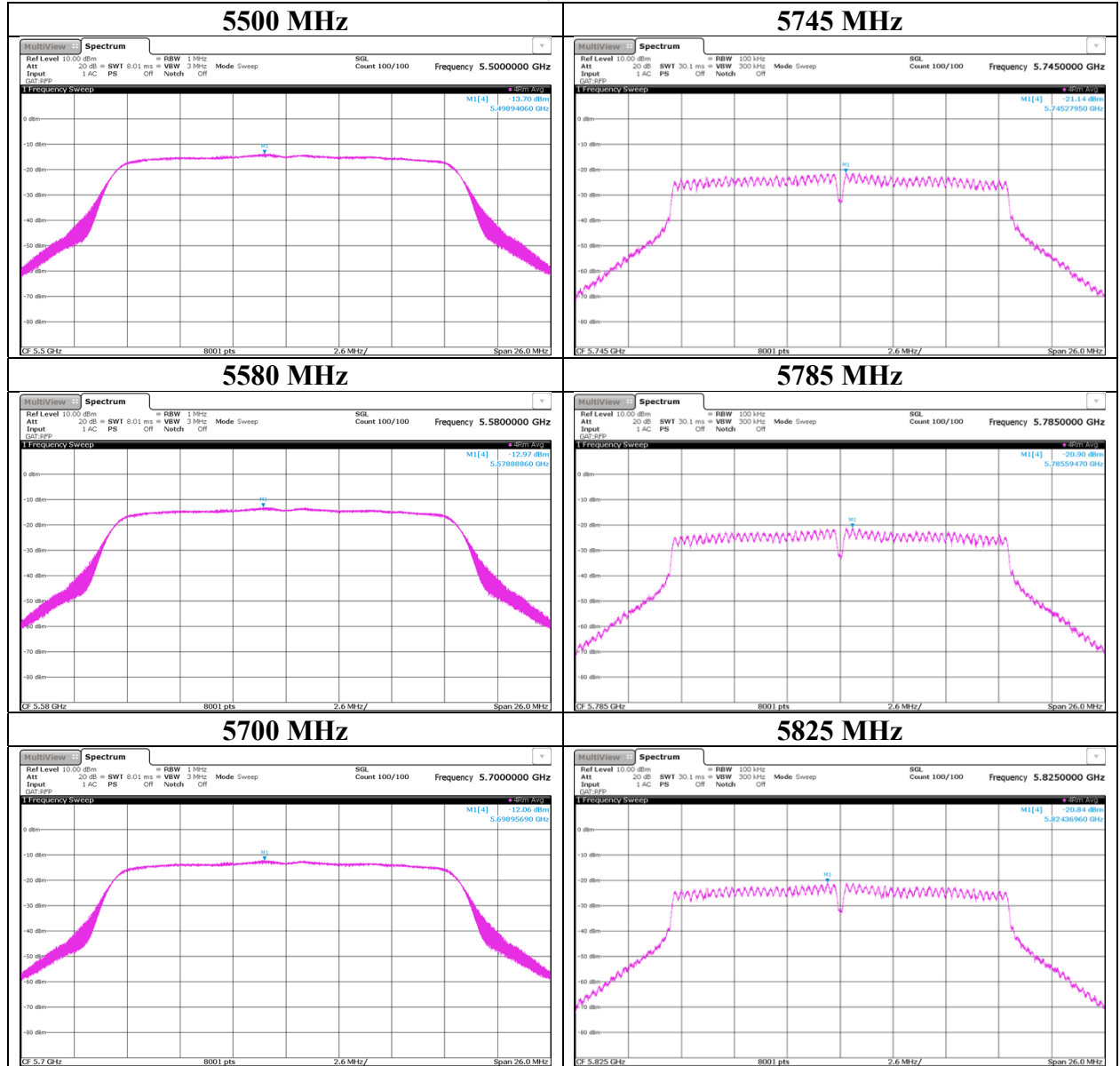
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Maximum Power Spectral Density

Report No.	13554183S-E-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 30, 2020
Temperature / Humidity	26 deg. C / 37 % RH
Engineer	Kazuya Noda
Mode	Tx, 11a

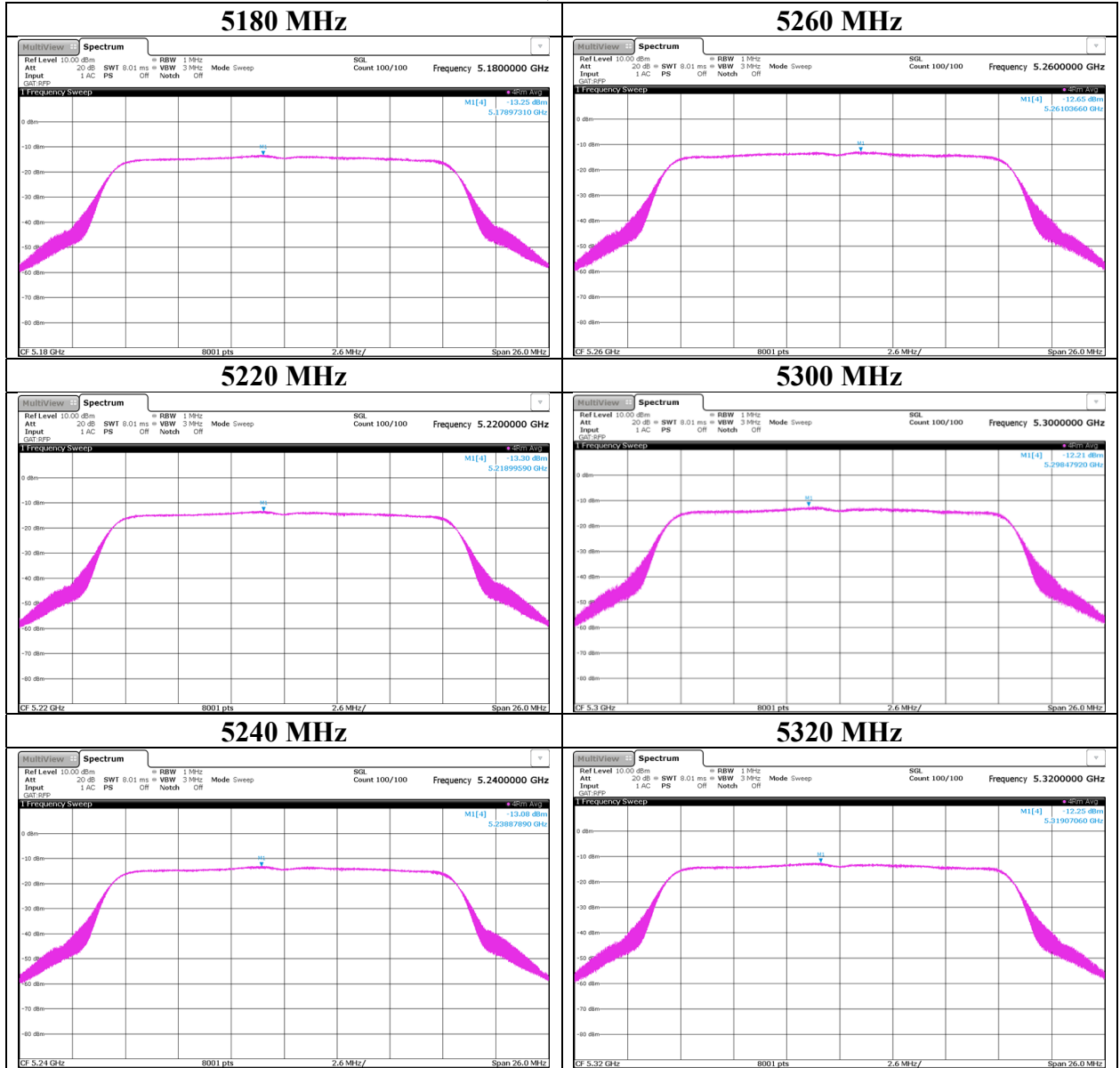
### 11a , Ant 0



## Maximum Power Spectral Density

Report No.	13554183S-E-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 30, 2020
Temperature / Humidity	26 deg. C / 37 % RH
Engineer	Kazuya Noda
Mode	Tx, 11a

### 11a , Ant 1



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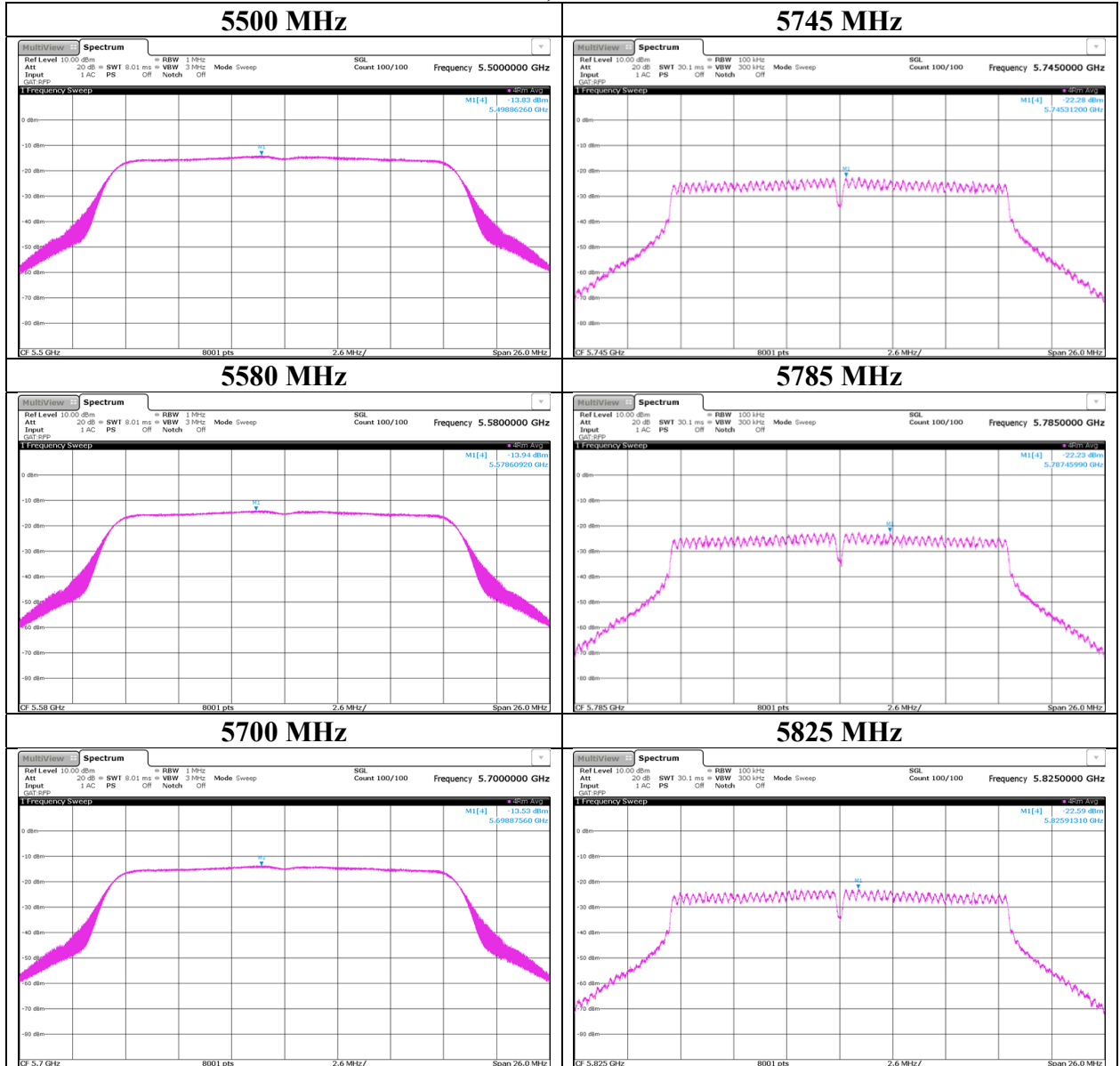
Facsimile : +81 463 50 6401



## Maximum Power Spectral Density

Report No.	13554183S-E-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 30, 2020
Temperature / Humidity	26 deg. C / 37 % RH
Engineer	Kazuya Noda
Mode	Tx, 11a

### 11a, Ant 1



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**Shonan EMC Lab.**

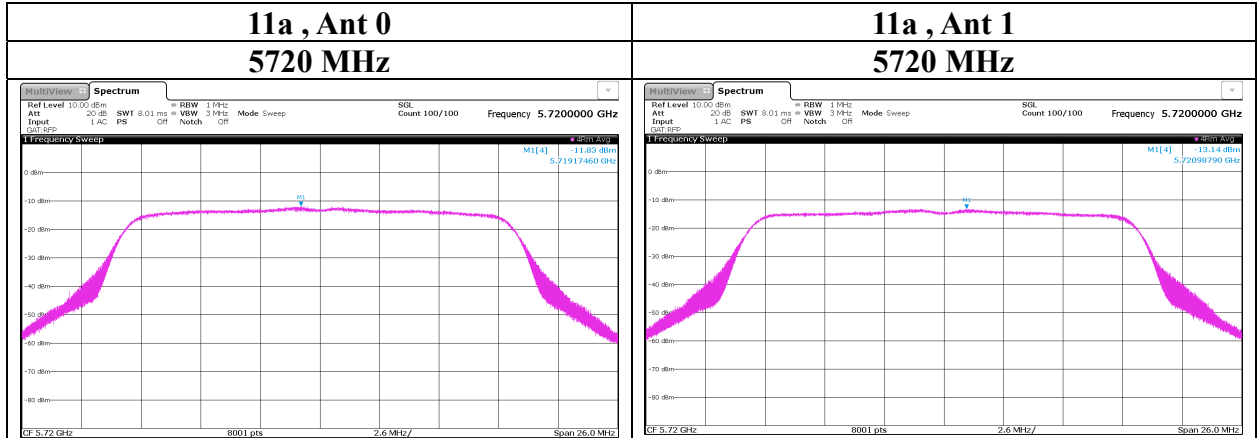
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

### Maximum Power Spectral Density

Report No.	13554183S-E-R1
Test place	Shonan EMC Lab. No.3 Shielded Room
Date	November 24, 2020
Temperature / Humidity	22 deg. C / 44 % RH
Engineer	Shiro Kobayashi
Mode	Tx, 11a



## Maximum Power Spectral Density

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.3, 5 Shielded Room  
Date October 30, 2020 November 24, 2020  
Temperature / Humidity 26 deg. C / 37 % RH 22 deg. C / 44 % RH  
Engineer Kazuya Noda Shiro Kobayashi  
Mode Tx 11n-20

ANT 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD (Conducted)						PSD (e.i.r.p.)					
	Antenna			Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]	Antenna			Result [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]
ANT 0 [mW/MHz]	ANT 1 [mW/MHz]	Sum [mW/MHz]	ANT 0 [mW/MHz]				ANT 1 [mW/MHz]	Sum [mW/MHz]				
5180	0.65	0.66	1.30	1.15	11.00	9.85	1.52	2.49	4.01	6.03	17.00	10.97
5220	0.71	0.62	1.33	1.23	11.00	9.77	1.66	2.36	4.02	6.04	17.00	10.96
5240	0.59	0.66	1.25	0.98	11.00	10.02	1.38	2.52	3.90	5.91	17.00	11.09
5260	0.63	0.71	1.33	1.24	11.00	9.76	1.14	2.68	3.82	5.82	17.00	11.18
5300	0.72	0.71	1.44	1.58	11.00	9.42	1.32	2.70	4.02	6.04	17.00	10.96
5320	0.76	0.79	1.55	1.91	11.00	9.09	1.39	2.99	4.38	6.41	17.00	10.59
5500	0.59	0.58	1.17	0.68	11.00	10.32	1.04	1.89	2.93	4.67	17.00	12.33
5580	0.70	0.56	1.26	1.01	11.00	9.99	1.25	1.81	3.06	4.86	17.00	12.14
5700	0.83	0.59	1.42	1.53	11.00	9.47	1.48	1.91	3.39	5.30	17.00	11.70
5720	0.82	0.60	1.42	1.51	11.00	9.49	1.45	1.95	3.39	5.31	17.00	11.69
5745	0.49	0.34	0.83	-0.79	30.00	30.79	1.00	0.89	1.88	2.75	36.00	33.25
5785	0.40	0.34	0.74	-1.30	30.00	31.30	0.81	0.89	1.70	2.30	36.00	33.70
5825	0.37	0.35	0.72	-1.42	30.00	31.42	0.76	0.91	1.66	2.21	36.00	33.79

Tested Frequency [MHz]	ANT 0							ANT 1						
	Duty Factor *1) [dB]	RBW Correction Factor [dB]	PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	PSD Result Cond. [dBm/MHz]	PSD Result e.i.r.p. [dBm/MHz]	PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	PSD Result Cond. [dBm/MHz]	PSD Result e.i.r.p. [dBm/MHz]
5180	0.00	0.00	-13.10	1.48	9.72	3.71	-1.90	1.81	-13.17	1.47	9.87	5.79	-1.83	3.96
5220	0.00	0.00	-12.71	1.49	9.72	3.71	-1.50	2.21	-13.41	1.47	9.87	5.79	-2.07	3.72
5240	0.00	0.00	-13.43	1.41	9.72	3.71	-2.30	1.41	-13.08	1.42	9.88	5.79	-1.78	4.01
5260	0.00	0.00	-13.20	1.44	9.72	2.60	-2.04	0.56	-12.85	1.46	9.88	5.79	-1.51	4.28
5300	0.00	0.00	-12.56	1.44	9.72	2.60	-1.40	1.20	-12.81	1.46	9.88	5.79	-1.47	4.32
5320	0.00	0.00	-12.45	1.56	9.72	2.60	-1.17	1.43	-12.49	1.57	9.88	5.79	-1.04	4.75
5500	0.00	0.00	-13.63	1.59	9.73	2.48	-2.31	0.17	-13.83	1.60	9.88	5.12	-2.35	2.77
5580	0.00	0.00	-12.85	1.60	9.73	2.48	-1.52	0.96	-14.02	1.60	9.88	5.12	-2.54	2.58
5700	0.00	0.00	-12.04	1.51	9.74	2.48	-0.79	1.69	-13.72	1.52	9.89	5.12	-2.31	2.81
5720	0.00	0.00	-12.12	1.51	9.74	2.48	-0.87	1.61	-13.64	1.52	9.89	5.12	-2.23	2.89
5745	0.00	6.99	-21.29	1.47	9.74	3.09	-3.09	0.00	-22.86	1.47	9.74	4.13	-4.66	-0.53
5785	0.00	6.99	-22.20	1.48	9.74	3.09	-3.99	-0.90	-22.86	1.48	9.74	4.13	-4.65	-0.52
5825	0.00	6.99	-22.55	1.52	9.74	3.09	-4.30	-1.21	-22.81	1.52	9.74	4.13	-4.56	-0.43

Sample Calculation:

(\*1) PSD was measured with using the gate function of Spectrum analyzer.)

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = 10 \* log (Specified bandwidth / Measured bandwidth)

PSD Result (Conducted) = Reading + Cable Loss + Atten. Loss + Duty Factor + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

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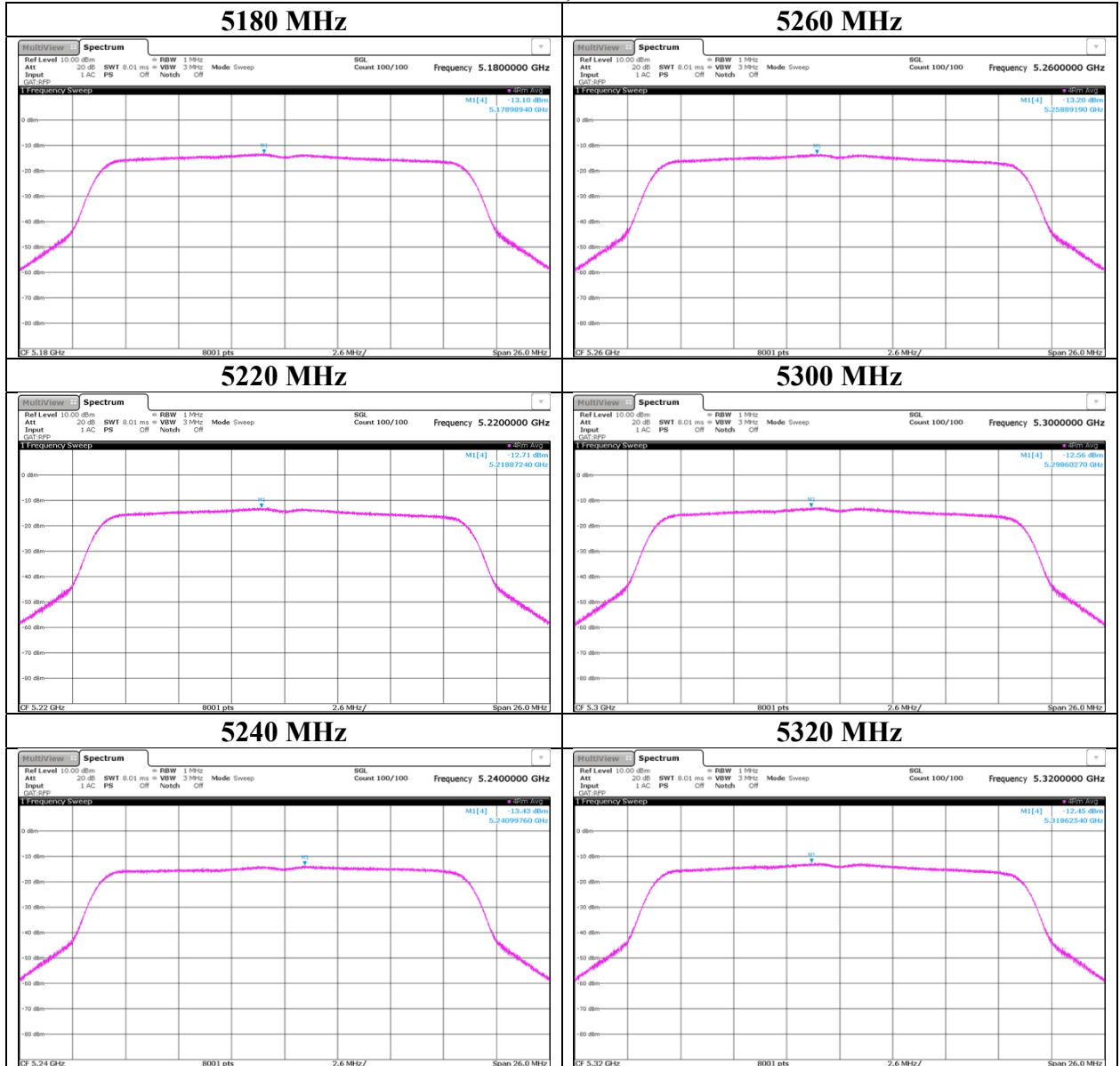
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Maximum Power Spectral Density

Report No.	13554183S-E-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 30, 2020
Temperature / Humidity	26 deg. C / 37 % RH
Engineer	Kazuya Noda
Mode	Tx 11n-20

### 11n-20, Ant 0



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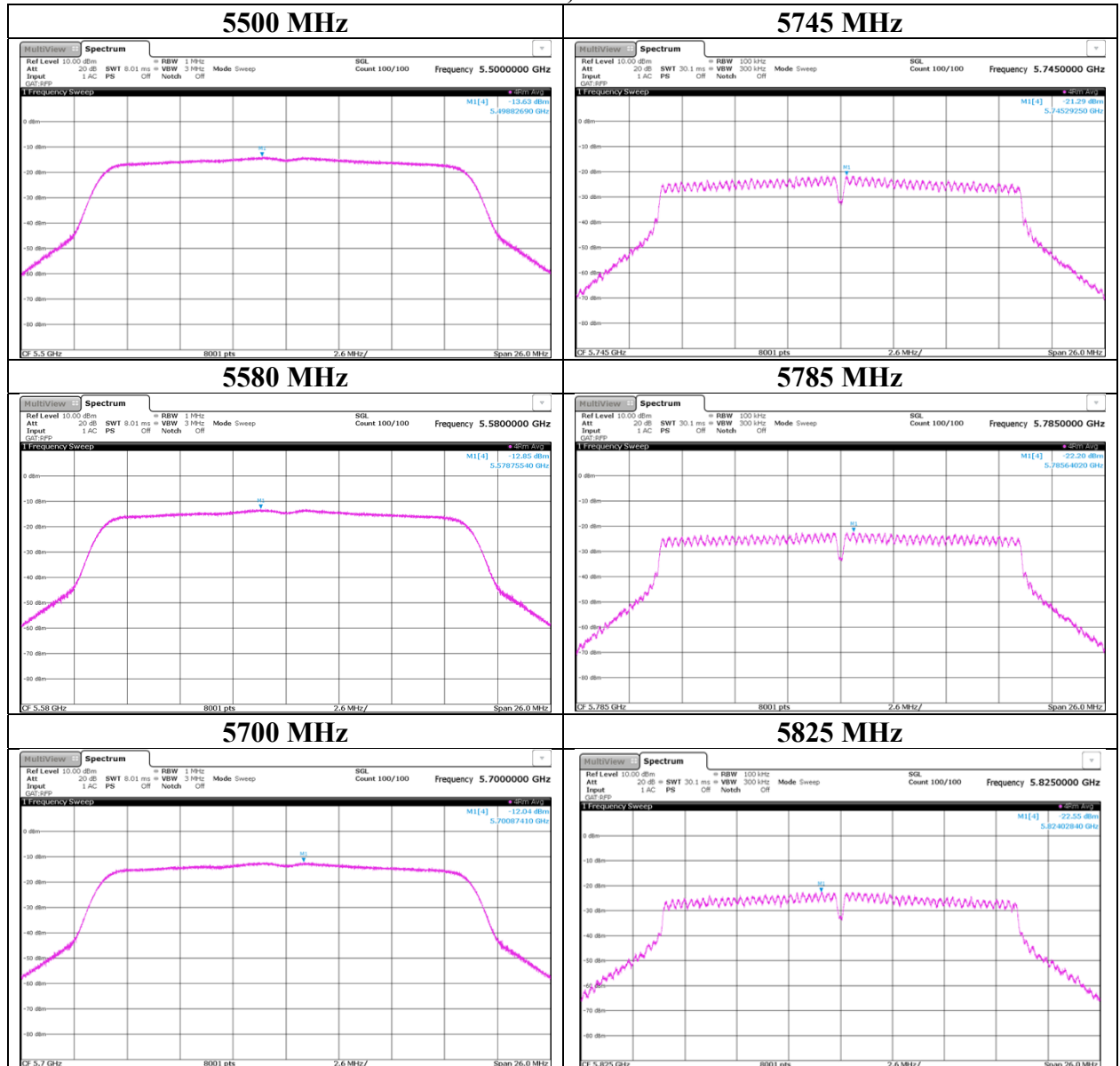
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Maximum Power Spectral Density

Report No.	13554183S-E-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 30, 2020
Temperature / Humidity	26 deg. C / 37 % RH
Engineer	Kazuya Noda
Mode	Tx 11n-20

### 11n-20, Ant 0



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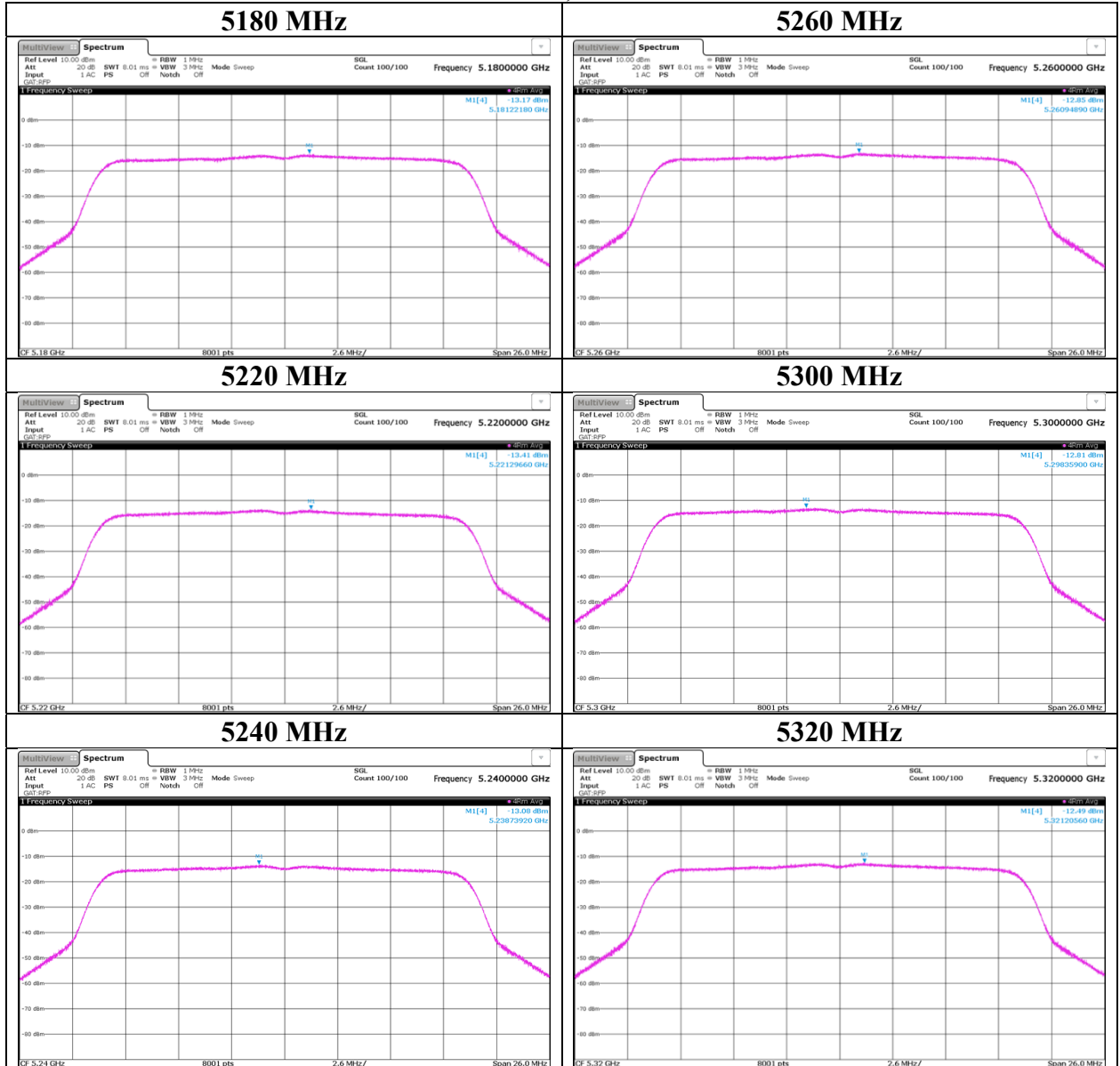
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Facsimile : +81 463 50 6401

## Maximum Power Spectral Density

Report No.	13554183S-E-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 30, 2020
Temperature / Humidity	26 deg. C / 37 % RH
Engineer	Kazuya Noda
Mode	Tx 11n-20

### 11n-20, Ant 1



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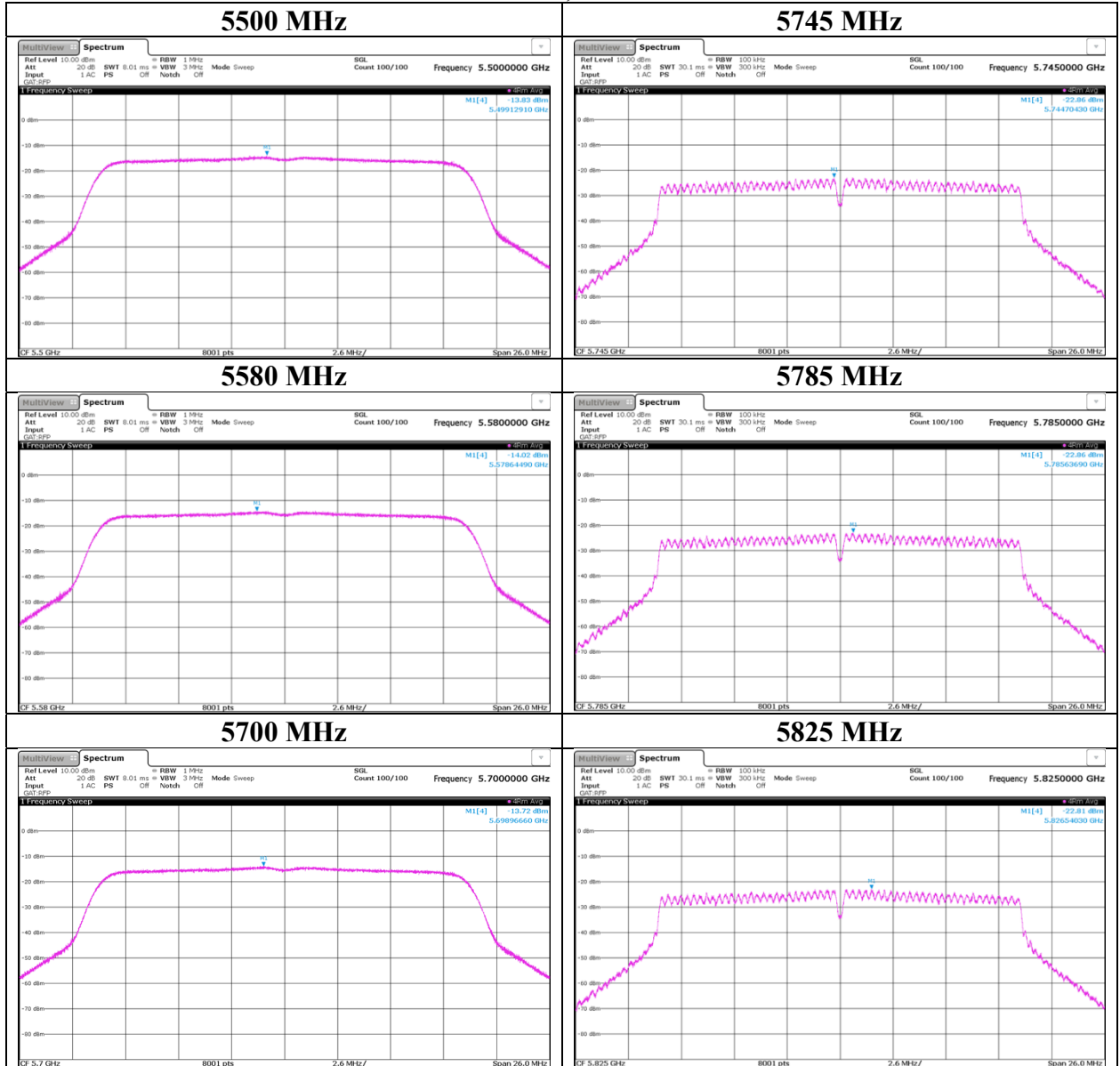
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Facsimile : +81 463 50 6401

## Maximum Power Spectral Density

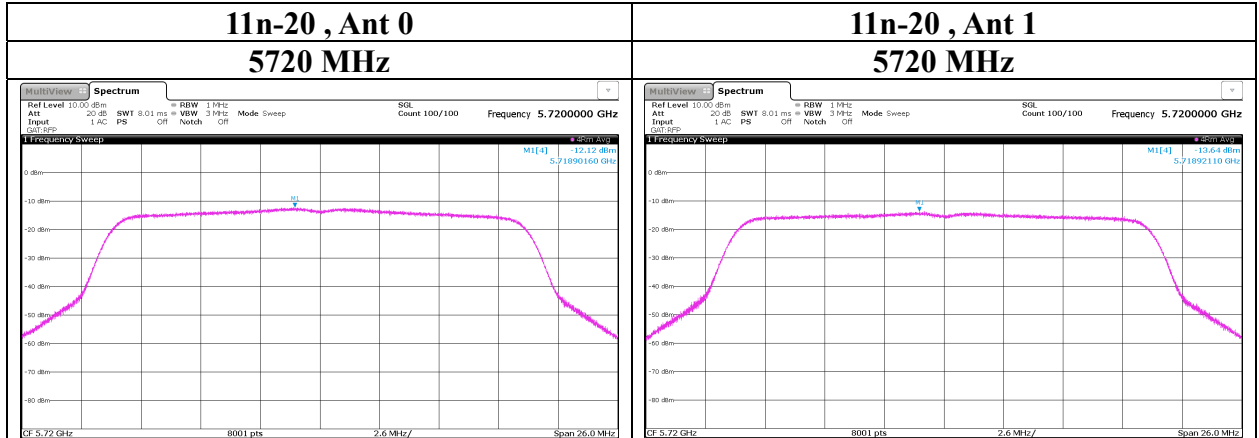
Report No.	13554183S-E-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 30, 2020
Temperature / Humidity	26 deg. C / 37 % RH
Engineer	Kazuya Noda
Mode	Tx 11n-20

### 11n-20, Ant 1



### Maximum Power Spectral Density

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.3 Shielded Room  
Date November 24, 2020  
Temperature / Humidity 22 deg. C / 44 % RH  
Engineer Shiro Kobayashi  
Mode Tx 11n-20



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## Maximum Power Spectral Density

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.3, 5 Shielded Room  
Date October 30, 2020 November 24, 2020  
Temperature / Humidity 26 deg. C / 37 % RH 22 deg. C / 44 % RH  
Engineer Kazuya Noda Shiro Kobayashi  
Mode Tx 11ac-20

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD (Conducted)						PSD (e.i.r.p.)					
	Antenna		Sum	Result	Limit	Margin	Antenna		Sum	Result	Limit	Margin
	ANT 0 [mW/MHz]	ANT 1 [mW/MHz]					ANT 0 [mW/MHz]	ANT 1 [mW/MHz]				
5180	0.63	0.66	1.28	1.08	11.00	9.92	1.47	2.49	3.96	5.97	17.00	11.03
5220	0.65	0.70	1.35	1.30	11.00	9.70	1.52	2.65	4.18	6.21	17.00	10.79
5240	0.64	0.70	1.33	1.24	11.00	9.76	1.49	2.64	4.13	6.16	17.00	10.84
5260	0.58	0.71	1.29	1.10	11.00	9.90	1.05	2.70	3.75	5.74	17.00	11.26
5300	0.66	0.80	1.46	1.64	11.00	9.36	1.20	3.03	4.23	6.26	17.00	10.74
5320	0.71	0.82	1.52	1.83	11.00	9.17	1.29	3.10	4.38	6.42	17.00	10.58
5500	0.53	0.60	1.13	0.54	11.00	10.46	0.93	1.96	2.90	4.62	17.00	12.38
5580	0.66	0.63	1.28	1.08	11.00	9.92	1.16	2.03	3.19	5.04	17.00	11.96
5700	0.75	0.66	1.41	1.49	11.00	9.51	1.33	2.14	3.47	5.41	17.00	11.59
5720	0.82	0.66	1.48	1.69	11.00	9.31	1.45	2.14	3.59	5.55	17.00	11.45
5745	0.54	0.54	1.08	0.32	30.00	29.68	1.10	1.39	2.49	3.96	36.00	32.04
5785	0.55	0.50	1.05	0.20	30.00	29.80	1.11	1.30	2.41	3.82	36.00	32.18
5825	0.50	0.57	1.07	0.29	30.00	29.71	1.02	1.47	2.49	3.97	36.00	32.03

Tested Frequency [MHz]	ANT 0							ANT 1						
	Duty Factor *1 [dB]	RBW Correction Factor [dB]	PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	PSD Result		PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	PSD Result	
							Cond. [dBm/MHz]	e.i.r.p. [dBm/MHz]					Cond. [dBm/MHz]	e.i.r.p. [dBm/MHz]
5180	0.00	0.00	-13.24	1.48	9.72	3.71	-2.04	1.67	-13.17	1.47	9.87	5.79	-1.83	3.96
5220	0.00	0.00	-13.09	1.49	9.72	3.71	-1.88	1.83	-12.89	1.47	9.87	5.79	-1.55	4.24
5240	0.00	0.00	-13.10	1.41	9.72	3.71	-1.97	1.74	-12.88	1.42	9.88	5.79	-1.58	4.21
5260	0.00	0.00	-13.55	1.44	9.72	2.60	-2.39	0.21	-12.81	1.46	9.88	5.79	-1.47	4.32
5300	0.00	0.00	-12.98	1.44	9.72	2.60	-1.82	0.78	-12.31	1.46	9.88	5.79	-0.97	4.82
5320	0.00	0.00	-12.79	1.56	9.72	2.60	-1.51	1.09	-12.33	1.57	9.88	5.79	-0.88	4.91
5500	0.00	0.00	-14.10	1.59	9.73	2.48	-2.78	-0.30	-13.67	1.60	9.88	5.12	-2.19	2.93
5580	0.00	0.00	-13.16	1.60	9.73	2.48	-1.83	0.65	-13.52	1.60	9.88	5.12	-2.04	3.08
5700	0.00	0.00	-12.49	1.51	9.74	2.48	-1.24	1.24	-13.22	1.52	9.89	5.12	-1.81	3.31
5720	0.00	0.00	-12.12	1.51	9.74	2.48	-0.87	1.61	-13.23	1.52	9.89	5.12	-1.82	3.30
5745	0.00	6.99	-20.88	1.47	9.74	3.09	-2.68	0.41	-20.90	1.47	9.74	4.13	-2.70	1.43
5785	0.00	6.99	-20.84	1.48	9.74	3.09	-2.63	0.46	-21.21	1.48	9.74	4.13	-3.00	1.13
5825	0.00	6.99	-21.25	1.52	9.74	3.09	-3.00	0.09	-20.70	1.52	9.74	4.13	-2.45	1.68

Sample Calculation: ( \*1) PSD was measured with using the gate function of Spectrum analyzer.)

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = 10 \* log (Specified bandwidth / Measured bandwidth)

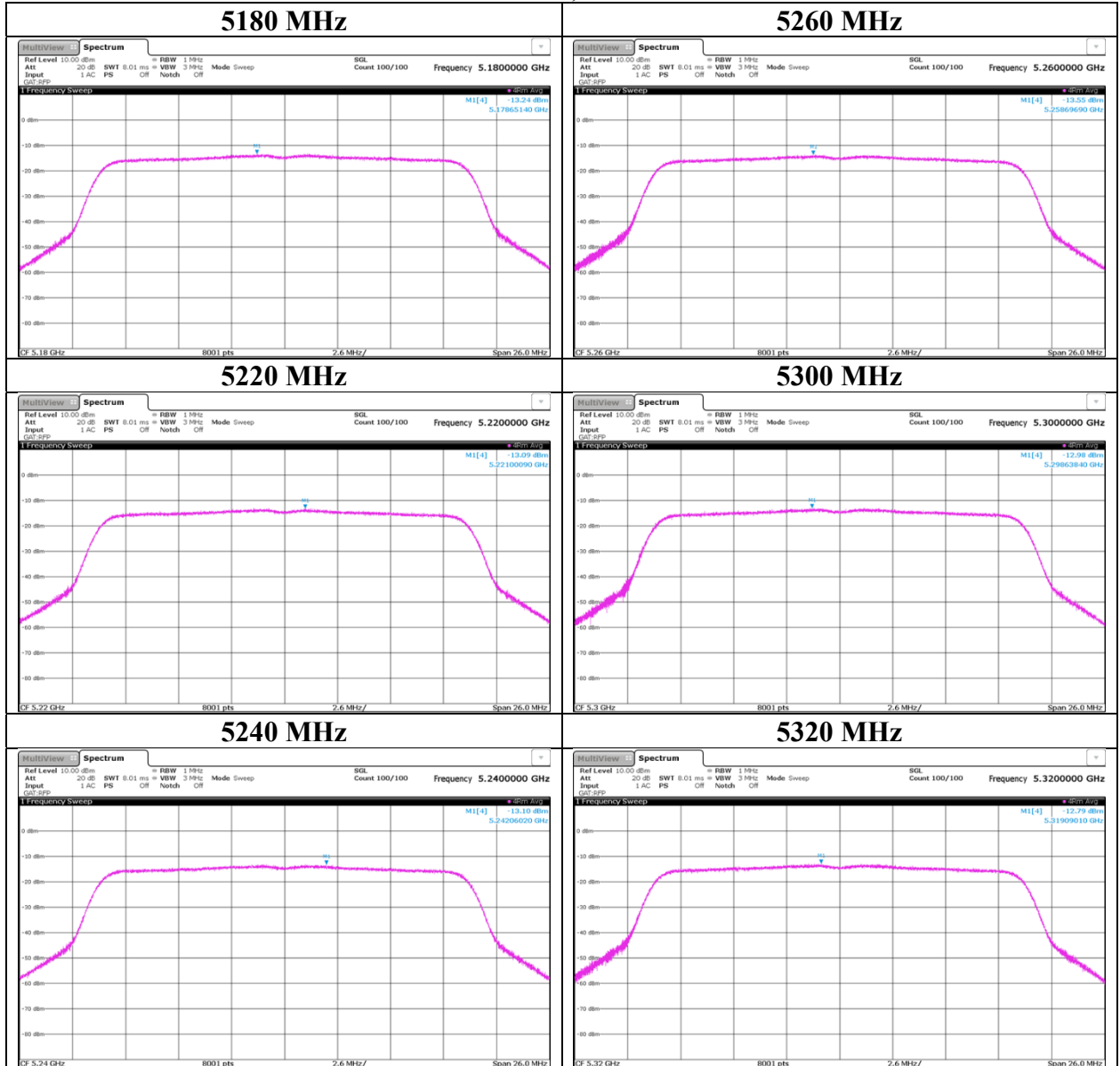
PSD Result (Conducted) = Reading + Cable Loss + Atten. Loss + Duty Factor + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

## Maximum Power Spectral Density

Report No.	13554183S-E-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 30, 2020
Temperature / Humidity	26 deg. C / 37 % RH
Engineer	Kazuya Noda
Mode	Tx 11ac-20

### 11ac-20 , Ant 0



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**Shonan EMC Lab.**

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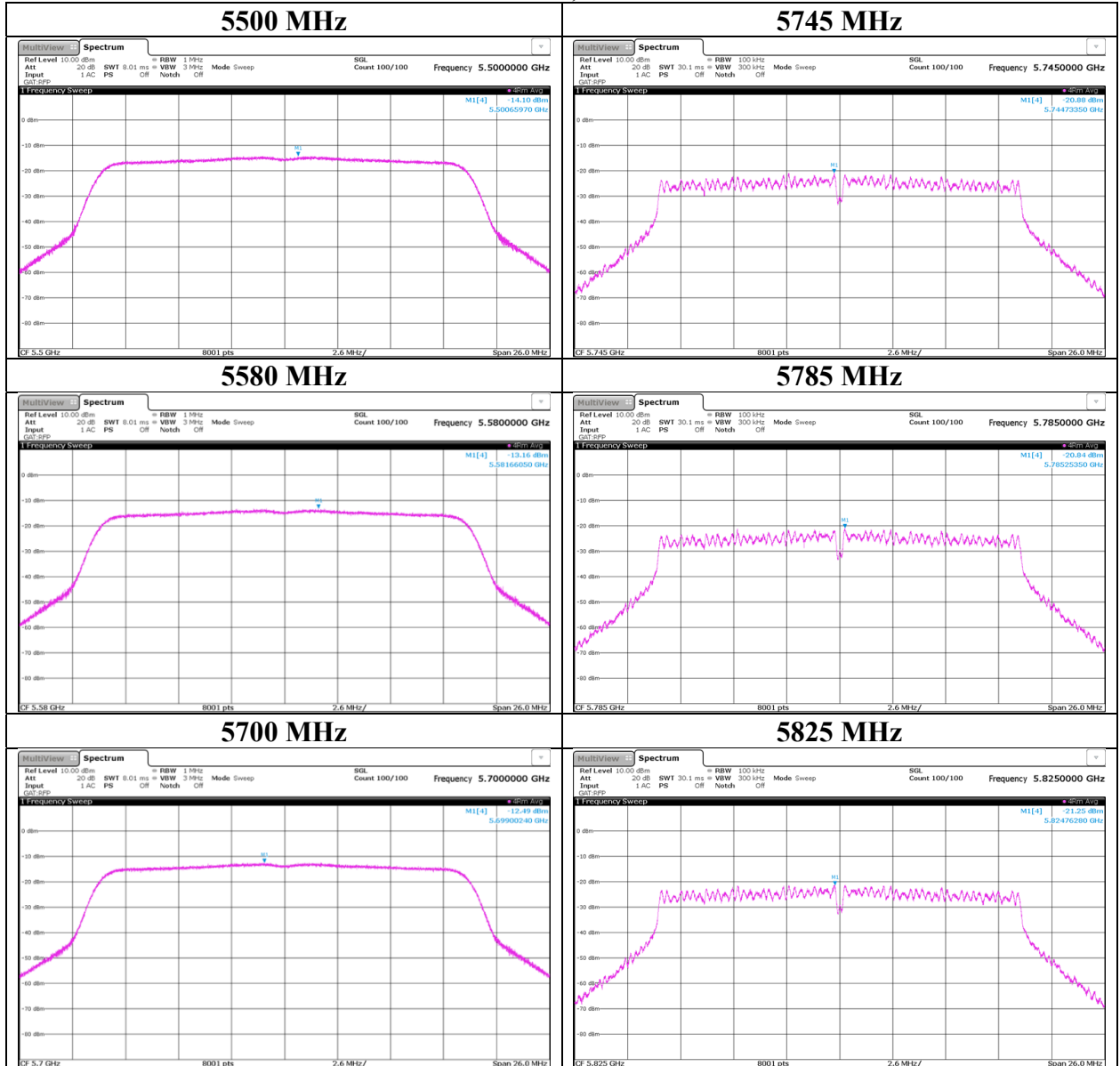
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Maximum Power Spectral Density

Report No.	13554183S-E-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 30, 2020
Temperature / Humidity	26 deg. C / 37 % RH
Engineer	Kazuya Noda
Mode	Tx 11ac-20

### 11ac-20 , Ant 0



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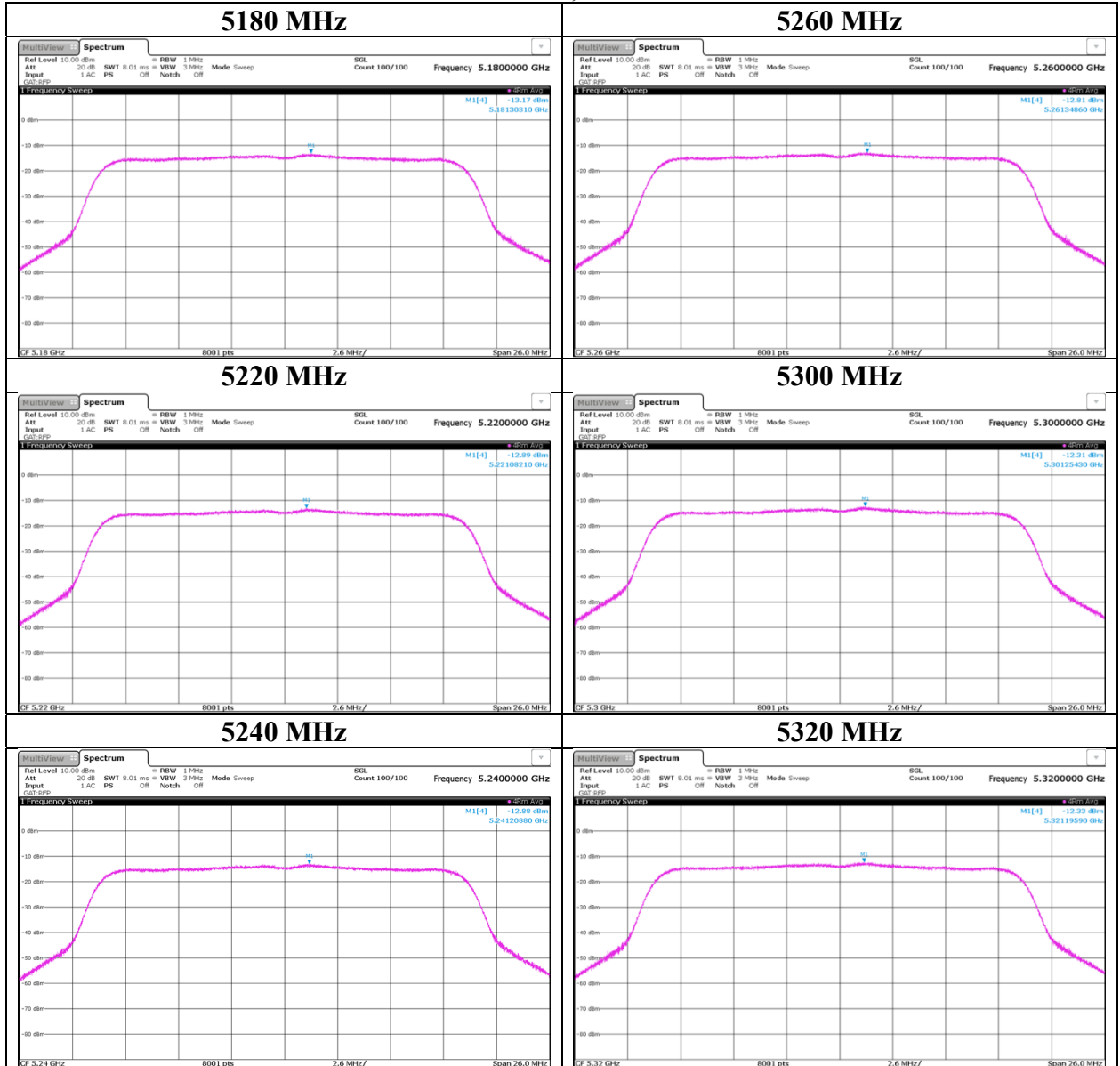
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Maximum Power Spectral Density

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date October 30, 2020  
Temperature / Humidity 26 deg. C / 37 % RH  
Engineer Kazuya Noda  
Mode Tx 11ac-20

### 11ac-20, Ant 1



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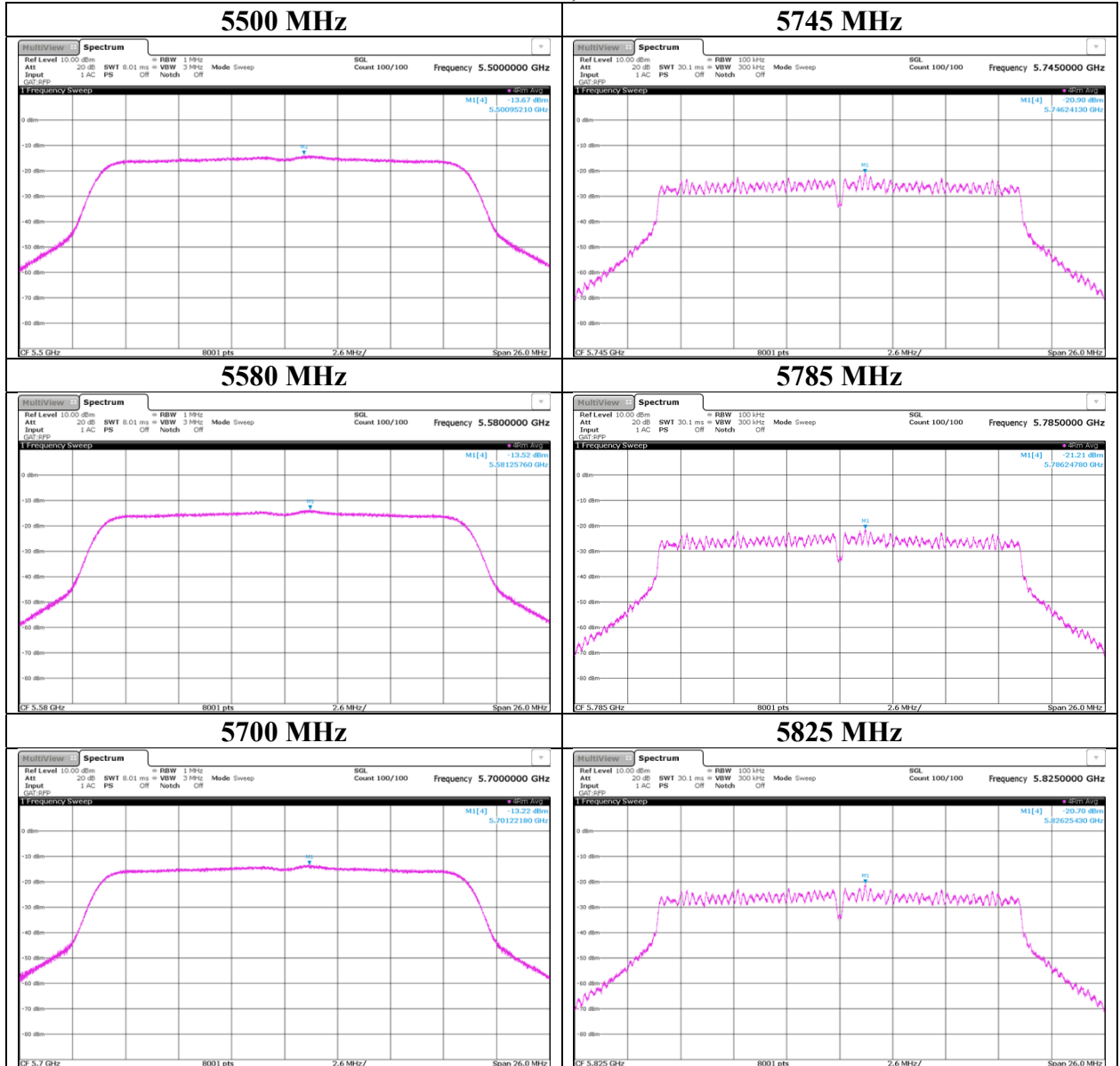
Telephone : +81 463 50 6400

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## Maximum Power Spectral Density

Report No.	13554183S-E-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	October 30, 2020
Temperature / Humidity	26 deg. C / 37 % RH
Engineer	Kazuya Noda
Mode	Tx 11ac-20

### 11ac-20, Ant 1



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**Shonan EMC Lab.**

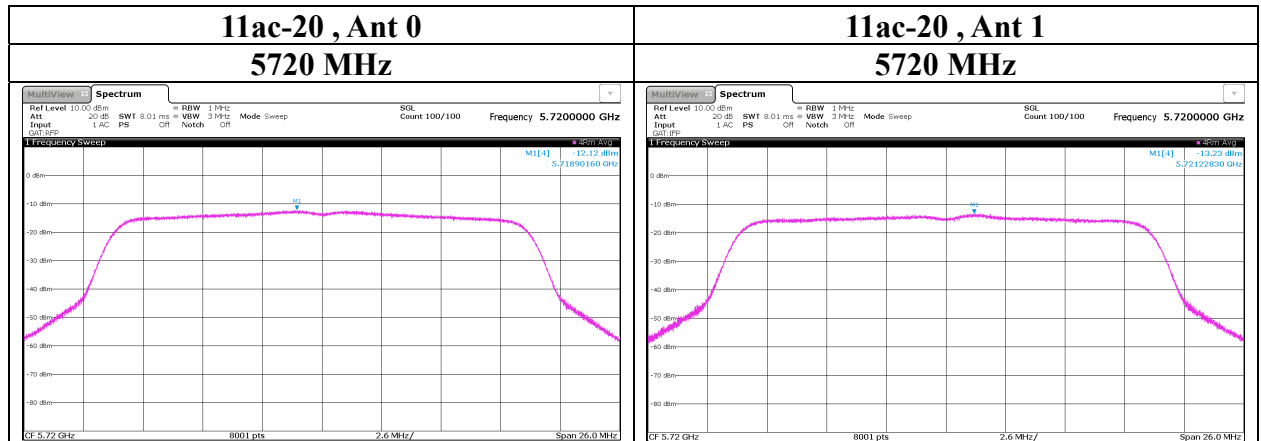
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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

### Maximum Power Spectral Density

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.3 Shielded Room  
Date November 24, 2020  
Temperature / Humidity 22 deg. C / 44 % RH  
Engineer Shiro Kobayashi  
Mode Tx 11ac-20



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Shonan EMC Lab.

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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

## Maximum Power Spectral Density

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.3, 5 Shielded Room  
Date October 30, 2020 November 24, 2020  
Temperature / Humidity 26 deg. C / 37 % RH 22 deg. C / 44 % RH  
Engineer Kazuya Noda Shiro Kobayashi  
Mode Tx 11n-40

ANT 0+1

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD (Conducted)						PSD (e.i.r.p.)					
	Antenna			Result	Limit	Margin	Antenna			Result	Limit	Margin
	ANT 0 [mW/MHz]	ANT 1 [mW/MHz]	Sum [mW/MHz]				ANT 0 [mW/MHz]	ANT 1 [mW/MHz]	Sum [mW/MHz]			
5190	0.28	0.28	0.56	-2.52	11.00	13.52	0.66	1.06	1.72	2.35	17.00	14.65
5230	0.29	0.25	0.54	-2.68	11.00	13.68	0.69	0.94	1.62	2.11	17.00	14.89
5270	0.24	0.26	0.50	-3.03	11.00	14.03	0.44	0.98	1.42	1.51	17.00	15.49
5310	0.28	0.27	0.55	-2.60	11.00	13.60	0.51	1.03	1.54	1.86	17.00	15.14
5510	0.22	0.20	0.43	-3.71	11.00	14.71	0.39	0.66	1.06	0.24	17.00	16.76
5550	0.23	0.22	0.45	-3.46	11.00	14.46	0.40	0.73	1.13	0.52	17.00	16.48
5670	0.28	0.23	0.51	-2.90	11.00	13.90	0.50	0.75	1.25	0.96	17.00	16.04
5710	0.32	0.23	0.56	-2.55	11.00	13.55	0.57	0.76	1.33	1.23	17.00	15.77
5755	0.24	0.17	0.41	-3.85	30.00	33.85	0.49	0.44	0.93	-0.30	36.00	36.30
5795	0.23	0.19	0.42	-3.79	30.00	33.79	0.47	0.49	0.96	-0.19	36.00	36.19

Tested Frequency [MHz]	ANT 0							ANT 1						
	Duty Factor *1) [dB]	RBW Correction Factor [dB]	PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	PSD Result		PSD Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	PSD Result	
							Cond.	e.i.r.p.					Cond.	e.i.r.p.
5190	0.00	0.00	-16.73	1.48	9.72	3.71	-5.53	-1.82	-16.74	1.48	9.72	5.79	-5.54	0.25
5230	0.00	0.00	-16.53	1.48	9.72	3.71	-5.33	-1.62	-17.28	1.48	9.72	5.79	-6.08	-0.29
5270	0.00	0.00	-17.36	1.44	9.72	2.60	-6.20	-3.60	-17.04	1.44	9.72	5.79	-5.88	-0.09
5310	0.00	0.00	-16.72	1.44	9.72	2.60	-5.56	-2.96	-16.82	1.44	9.72	5.79	-5.66	0.13
5510	0.00	0.00	-17.86	1.59	9.73	2.48	-6.54	-4.06	-18.22	1.59	9.73	5.12	-6.90	-1.78
5550	0.00	0.00	-17.77	1.60	9.73	2.48	-6.44	-3.96	-17.84	1.60	9.73	5.12	-6.51	-1.39
5670	0.00	0.00	-16.71	1.47	9.74	2.48	-5.50	-3.02	-17.58	1.47	9.74	5.12	-6.37	-1.25
5710	0.00	0.00	-16.11	1.47	9.74	2.48	-4.90	-2.42	-17.55	1.47	9.74	5.12	-6.34	-1.22
5755	0.00	6.99	-24.39	1.48	9.74	3.09	-6.18	-3.09	-25.88	1.48	9.74	4.13	-7.67	-3.54
5795	0.00	6.99	-24.61	1.48	9.74	3.09	-6.40	-3.31	-25.44	1.48	9.74	4.13	-7.23	-3.10

Sample Calculation:

(\*1) PSD was measured with using the gate function of Spectrum analyzer.)

PSD: Power Spectral Density

The PSD within 5725 MHz to 5825 MHz are based on any 500 kHz band.

RBW Correction Factor = 10 \* log (Specified bandwidth / Measured bandwidth)

PSD Result (Conducted) = Reading + Cable Loss + Atten. Loss + Duty Factor + RBW Correction Factor

PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

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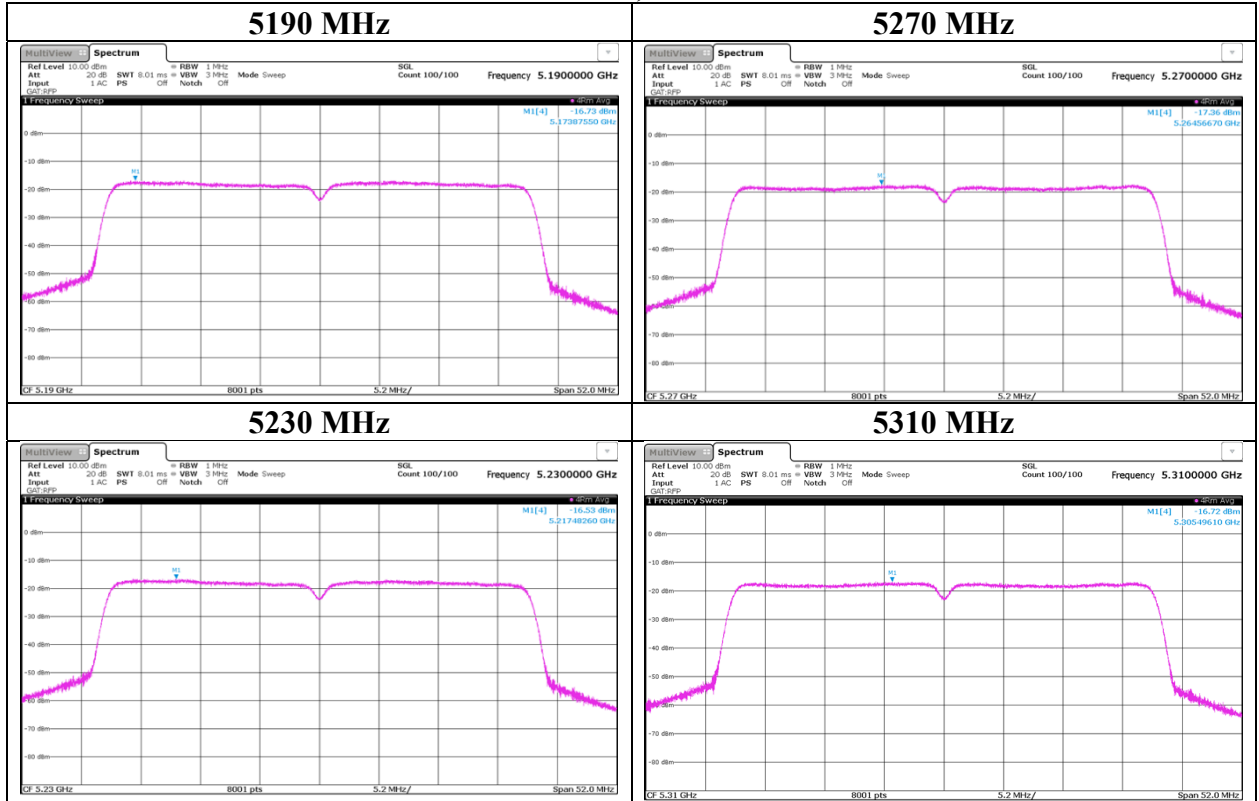
Telephone : +81 463 50 6400

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## Maximum Power Spectral Density

Report No. 13554183S-E-R1  
Test place Shonan EMC Lab. No.5 Shielded Room  
Date October 30, 2020  
Temperature / Humidity 26 deg. C / 37 % RH  
Engineer Kazuya Noda  
Mode Tx 11n-40

### 11n-40, Ant 0



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