



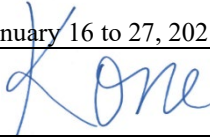
RADIO TEST REPORT

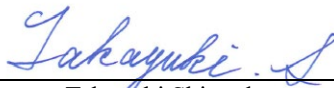
Test Report No. : 13674969H-C

Applicant : Murata Manufacturing Co., Ltd.
Type of EUT : W-LAN + Bluetooth Module
Model Number of EUT : 1PJ
FCC ID : VPYLBEE5ZZ1PJ
Test regulation : FCC Part 15 Subpart E: 2021
 *For Permissive Change
Test Result : Complied (Refer to SECTION 3)
 *26 dB Bandwidth, 99 % Occupied Bandwidth,
 6 dB Bandwidth, Maximum Conducted Output
 Power, Conducted Spurious Emission and Radiated
 Spurious Emission tests only

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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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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. Ise 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.

Date of test: January 16 to 27, 2021

Representative test engineer: 
 Nachi Konegawa
 Engineer
 Consumer Technology Division

Approved by: 
 Takayuki Shimada
 Leader
 Consumer Technology Division



CERTIFICATE 5107.02

- 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.: 13674969H-C

Revision	Test report No.	Date	Page revised	Contents
- (Original)	13674969H-C	March 29, 2021	-	-

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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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SECTION 1: Customer information

Company Name : Murata Manufacturing Co., Ltd.
Address : 1-10-1 Higashikotari, Nagaokakyo-shi, Kyoto 617-8555 Japan
Telephone Number : +81-75-955-6736
Facsimile Number : +81-75-955-6634
Contact Person : Motoo Hayashi

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 : W-LAN + Bluetooth Module
Model Number : 1PJ
Serial Number : Refer to SECTION 4.2
Rating : Typ. DC 3.3 V/ Min. DC 3.135 V/ Max. DC 3.465 V
Receipt Date : January 14, 2021
Country of Mass-production : China, Japan
Condition : Production model
Modification : No Modification by the test lab.

2.2 Product Description

Model: 1PJ (referred to as the EUT in this report) is a W-LAN + Bluetooth Module.

Radio Specification

Specification of Wireless LAN (IEEE802.11b/g/a/n-20/n-40/11ac-20/11ac-40/11ac-80)

Type of radio	IEEE802.11b	IEEE802.11g/n (20 M band)	IEEE802.11a/n/ac (20 M band) *1)	IEEE802.11n/ac (40 M band) *1)	IEEE802.11ac (80 M band) *1)
Frequency of operation	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	5210 MHz 5290 MHz 5530 MHz - 5690 MHz 5775 MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK, 256QAM(IEEE802.11ac only))		
Channel spacing	5 MHz		20 MHz	40 MHz	80 MHz
Antenna type	Monopole Antenna				
Antenna Gain	2.4 GHz: 1.8 dBi 5 GHz: 2.0 dBi				

Bluetooth

	Bluetooth
Frequency of operation	2402 MHz - 2480 MHz
Type of modulation	BT: FHSS (GFSK, $\pi/4$ DQPSK, 8DPSK) LE: GFSK
Channel spacing	BT: 1 MHz LE: 2 MHz
Antenna type	Monopole Antenna
Antenna Gain	1.8 dBi

*1) This test report applies to Wireless LAN (5GHz Band).

* WLAN and Bluetooth do not transmit simultaneously.

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

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
26 dB Emission Bandwidth	FCC: KDB Publication Number 789033 ISED: -	FCC: 15.407 (a) (1) (2) (3) ISED: -		Complied 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	See data	Complied b)	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 c)	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	6.5 dB 5470.000 MHz, PK, Hori.	Complied d) / e)	Conducted (< 30 MHz)/ Radiated (> 30 MHz) *1)
6 dB Emission Bandwidth	FCC: ANSI C63.10-2013 ISED: -	FCC: 15.407 (e) ISED: RSS-247 6.2.4.1	See data	Complied f)	Conducted
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 26 dB Emission Bandwidth and 99 % Occupied Bandwidth) b) Refer to APPENDIX 1 (data of Maximum Conducted Output Power) c) Refer to APPENDIX 1 (data of Maximum Power Spectral Density) d) Refer to APPENDIX 1 (data of Radiated Spurious Emission) e) Refer to APPENDIX 1 (data of Conducted Spurious Emission) f) 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)

The antenna is not removable from the EUT.
Therefore, the equipment complies with the antenna requirement of Section 15.203.

FCC Part 15.203 Antenna requirement

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

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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) 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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Radiated emission

Measurement distance	Frequency range	Uncertainty (+/-)
3 m	9 kHz to 30 MHz	3.3 dB
10 m		3.2 dB
3 m	30 MHz to 200 MHz (Horizontal)	4.8 dB
		(Vertical) 5.0 dB
	200 MHz to 1000 MHz (Horizontal)	5.2 dB
		(Vertical) 6.3 dB
10 m	30 MHz to 200 MHz (Horizontal)	4.8 dB
		(Vertical) 4.8 dB
	200 MHz to 1000 MHz (Horizontal)	5.0 dB
		(Vertical) 5.0 dB
3 m	1 GHz to 6 GHz	4.9 dB
	6 GHz to 18 GHz	5.2 dB
1 m	10 GHz to 26.5 GHz	5.5 dB
	26.5 GHz to 40 GHz	5.5 dB
0.5 m	26.5 GHz to 40 GHz	5.5 dB
10 m	1 GHz to 18 GHz	5.2 dB

Antenna Terminal test

Test Item	Uncertainty (+/-)
26 dB Emission Bandwidth / 6 dB Emission Bandwidth /	0.96 %
Maximum Conducted Output Power / Average Output Power	1.4 dB
Burst Rate	0.10 %
Maximum Power Spectral Density	2.6 dB
Spurious Emission (Conducted)	2.6 dB

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3.5 Test Location

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*A2LA Certificate Number: 5107.02 / FCC Test Firm Registration Number: 199967

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

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Test site	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms	Maximum measurement distance
No.1 semi-anechoic chamber	19.2 x 11.2 x 7.7	7.0 x 6.0	No.1 Power source room	10 m
No.2 semi-anechoic chamber	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.3 Preparation room	3 m
No.3 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.4 semi-anechoic chamber	12.0 x 8.5 x 5.9	6.8 x 5.75	No.4 Preparation room	3 m
No.4 shielded room	4.0 x 6.0 x 2.7	N/A	-	-
No.5 semi-anechoic chamber	6.0 x 6.0 x 3.9	6.0 x 6.0	-	-
No.5 measurement room	6.4 x 6.4 x 3.0	6.4 x 6.4	-	-
No.6 shielded room	4.0 x 4.5 x 2.7	4.0 x 4.5	-	-
No.6 measurement room	4.75 x 5.4 x 3.0	4.75 x 4.15	-	-
No.7 shielded room	4.7 x 7.5 x 2.7	4.7 x 7.5	-	-
No.8 measurement room	3.1 x 5.0 x 2.7	3.1 x 5.0	-	-
No.9 measurement room	8.8 x 4.6 x 2.8	2.4 x 2.4	-	-
No.11 measurement room	6.2 x 4.7 x 3.0	4.8 x 4.6	-	-

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

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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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 (11a)	6 Mbps, PN9					
IEEE 802.11n 20MHz BW (11n-20)	MCS 0, PN9					
IEEE 802.11n 40MHz BW (11n-40)	MCS 0, PN9					
IEEE 802.11ac 20MHz BW (11ac-20)	MCS 0, PN9					
IEEE 802.11ac 40MHz BW (11ac-40)	MCS 0, PN9					
IEEE 802.11ac 80MHz BW (11ac-80)	MCS 0, PN9					
*The worst condition was determined based on the test result of Maximum Conducted Output Power.						
*Power of the EUT was set by the software as follows;						
Power settings: Refer to following table						
	11a	11n-20	11n-40	11ac-20	11ac-40	11ac-80
U-NII-1	5.5	5.5	5.5	5.5	5.5	5.5
U-NII-2A	5.5	6.0	6.0	6.0	6.0	5.5
U-NII-2C	5.5	6.0	6.0	6.0	6.0	5.5
U-NII-3	6.5	6.5	6.5	6.5	6.5	6.5
Software: QRCT 3 version 3.0.276.0 (Date: 2020.12.23 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 Frequency			
		Low Band	Middle Band	Additional Band	Upper Band
Radiated Spurious Emission (Below 1GHz) Conducted Spurious Emission	11ac-20 Tx,*1)	-	-	5580 MHz	-
26dB Emission Bandwidth	11a Tx, 11n-20 Tx, 11ac-20 Tx	-	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz 5720 MHz	-
	11n-40 Tx, 11ac-40 Tx	-	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	-
	11ac-80 Tx	-	5290 MHz	5530 MHz 5610 MHz 5690 MHz	-
99% Occupied Bandwidth, Maximum Conducted Output Power,	11a Tx, 11n-20 Tx, 11ac-20 Tx	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	5190 MHz 5230 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz 5710 MHz	5755 MHz 5795 MHz
	11ac-80 Tx	5210 MHz	5290 MHz	5530 MHz 5610 MHz 5690 MHz	5775 MHz
Radiated Spurious Emission (Above 1GHz)	11ac-20 Tx *2)	5180 MHz	5260 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	11ac-40 Tx *2)	5190 MHz	5270 MHz 5310 MHz	5510 MHz 5550 MHz 5670 MHz	5755 MHz 5795 MHz
	11ac-80 Tx*2)	5210 MHz	5290 MHz	5530 MHz 5610 MHz	5775 MHz
6dB Bandwidth	11a Tx, 11n-20 Tx, 11ac-20 Tx	-	-	-	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx, 11ac-40 Tx	-	-	-	5755 MHz 5795 MHz
	11ac-80 Tx	-	-	-	5775 MHz
*1) The mode was tested as a representative, because it had the highest power at antenna terminal test.					
*2) Since 11a/ 11n-20/ 11ac-20 and 11n-40/ 11ac-40 have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest output power.					

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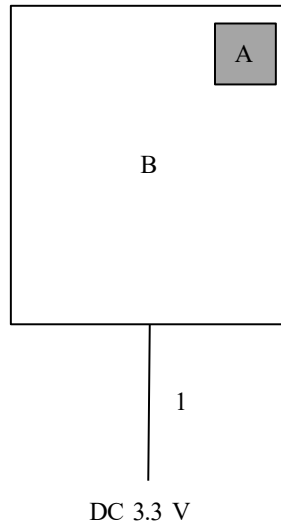
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4.2 Configuration and peripherals

Radiated Spurious Emission



Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	W-LAN + Bluetooth Module	1PJ	3#	Murata Manufacturing Co., Ltd.	EUT
B	Jig	JS0941	3#	Murata Manufacturing Co., Ltd.	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	2.5	Unshielded	Unshielded	-

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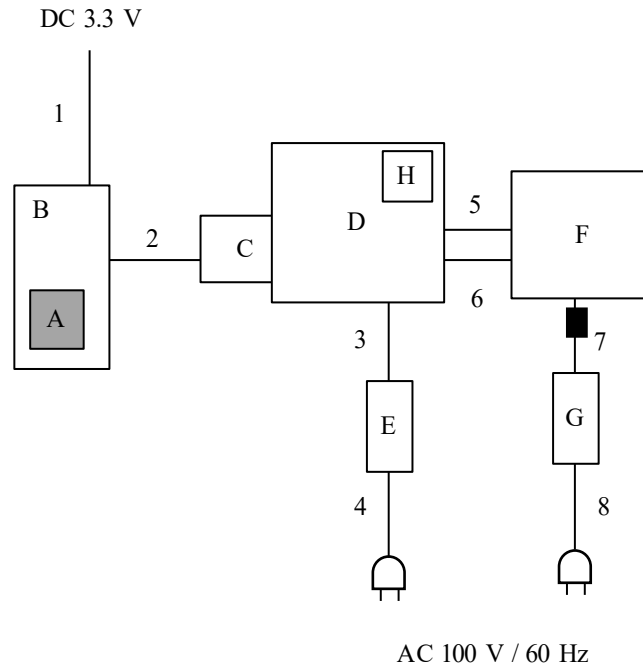
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Antenna Terminal Conducted Tests



* 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	W-LAN + Bluetooth Module	1PJ	3#	Murata Manufacturing Co., Ltd.	EUT
B	Jig	JS0941	3#	Murata Manufacturing Co., Ltd.	-
C	Jig	iMX6ull	TR18491580	NXP Semiconductors	-
D	Jig	TDA6834	TR18491562	Murata Manufacturing Co., Ltd.	-
E	AC Adapter	ATS024T-A050	400-76027	ADAPTER TECH.	-
F	Laptop PC	CF-MX4	5FKSA17992	PANASONIC	-
G	AC Adapter	CF-AA62J2C	62J2CM215225143 8SB	Panasonic	-
H	micro SD Card	110-78060B	CERT-PL059	SanDisk	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	0.9	Unshielded	Unshielded	-
2	Signal Cable	0.1	Unshielded	Unshielded	-
3	DC Cable	1.0	Unshielded	Unshielded	-
4	AC Cable	1.0	Unshielded	Unshielded	-
5	LAN Cable	1.0	Unshielded	Unshielded	-
6	USB Cable	1.0	Shielded	Shielded	-
7	DC Cable	1.6	Unshielded	Unshielded	-
8	AC Cable	0.8	Unshielded	Unshielded	-

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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, 0.5 m by 1.0 m, raised 0.8 m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

< Above 1GHz >

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

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

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

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

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

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

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

< Below 1GHz >

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

< Above 1GHz >

Inside of restricted bands (Section 15.205):

Apply to limit in the Section 15.209 (a).

Outside of the restricted bands:

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

For W58 Bandedge

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

Restricted band edge:

Apply to limit in the Section 15.209 (a).

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

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

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

Test Antennas are used as below;

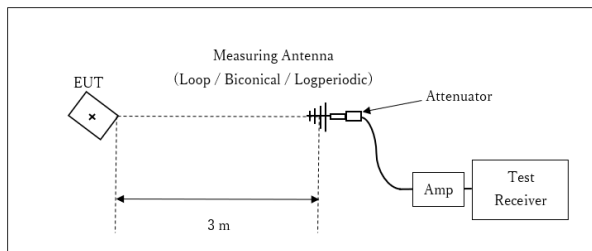
Frequency	30 MHz to 200 MHz	200 MHz to 1 GHz	Above 1 GHz
Antenna Type	Biconical	Logperiodic	Horn

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

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

Figure 2: Test Setup

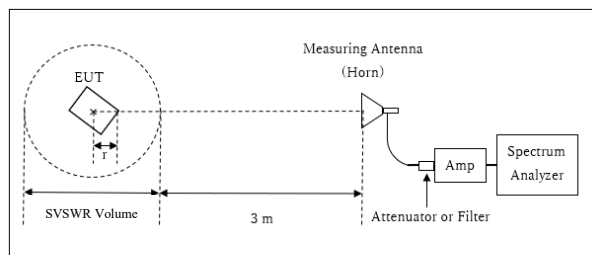
Below 1 GHz



× : 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: $20 \times \log(3.8 \text{ m} / 3.0 \text{ m}) = 2.06 \text{ dB}$

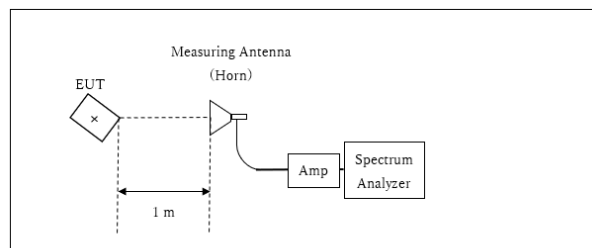
* Test Distance: $(3 + \text{SVSWR Volume} / 2) - r = 3.8 \text{ m}$

SVSWR Volume : 2.0 m

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

r = 0.2 m

10 GHz - 40 GHz



× : Center of turn table

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

*Test Distance: 1 m

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

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

Measurement range : 30 MHz - 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
26 dB Bandwidth	Enough to capture the emission	Close to 1 % of EBW	> RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 % to 5 % of OBW	≥ 3 RBW	Auto	Peak	Max Hold	Spectrum Analyzer
6 dB Bandwidth	Enough to capture the emission	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Conducted Output Power	-	-	-	Auto	Average	-	Power Meter (Sensor: 80 MHz BW) (Method PM-G)
Conducted Spurious Emission*2) *3)	9 kHz – 150 kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150 kHz – 30 MHz	9.1 kHz	27 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) 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 = 9.1 kHz)

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

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

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No. 13674969H
Test place Ise EMC Lab. No.4 Measurement Room
Date January 27, 2021
Temperature / Humidity 23 deg. C / 35 % RH
Engineer Takafumi Noguchi
Mode Tx

11a

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5180	-	16383.2
5220	-	16409.1
5240	-	16402.8
5260	19.100	16401.3
5300	18.941	16430.2
5320	19.071	16395.3
5500	19.207	16412.6
5580	18.670	16411.0
5700	19.136	16398.5
5720	18.568	16382.0
5745	-	16382.0
5785	-	16382.8
5825	-	16403.7

11n-20

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5180	-	17467.5
5220	-	17500.1
5240	-	17488.7
5260	19.510	17517.7
5300	19.521	17475.9
5320	19.587	17490.3
5500	19.429	17498.8
5580	19.514	17499.7
5700	19.401	17448.5
5720	19.306	17472.7
5745	-	17497.7
5785	-	17480.0
5825	-	17512.2

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No. 13674969H
Test place Ise EMC Lab. No.4 Measurement Room
Date January 27, 2021
Temperature / Humidity 23 deg. C / 35 % RH
Engineer Takafumi Noguchi
Mode Tx

11ac-20

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5180	-	17489.9
5220	-	17444.3
5240	-	17499.3
5260	19.368	17490.4
5300	19.378	17500.4
5320	19.196	17459.6
5500	20.287	17484.3
5580	19.613	17477.7
5700	19.568	17516.5
5720	20.038	17451.0
5745	-	17481.9
5785	-	17445.9
5825	-	17499.6

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Report No. 13674969H
Test place Ise EMC Lab. No.4 Measurement Room
Date January 27, 2021
Temperature / Humidity 23 deg. C / 35 % RH
Engineer Takafumi Noguchi
Mode Tx

11n-40

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5190	-	35924.7
5230	-	35852.3
5270	40.570	35890.3
5310	41.229	35874.0
5510	39.965	35815.4
5550	41.190	35825.1
5670	40.693	35849.4
5710	39.710	35861.6
5755	-	35879.0
5795	-	35873.9

11ac-40

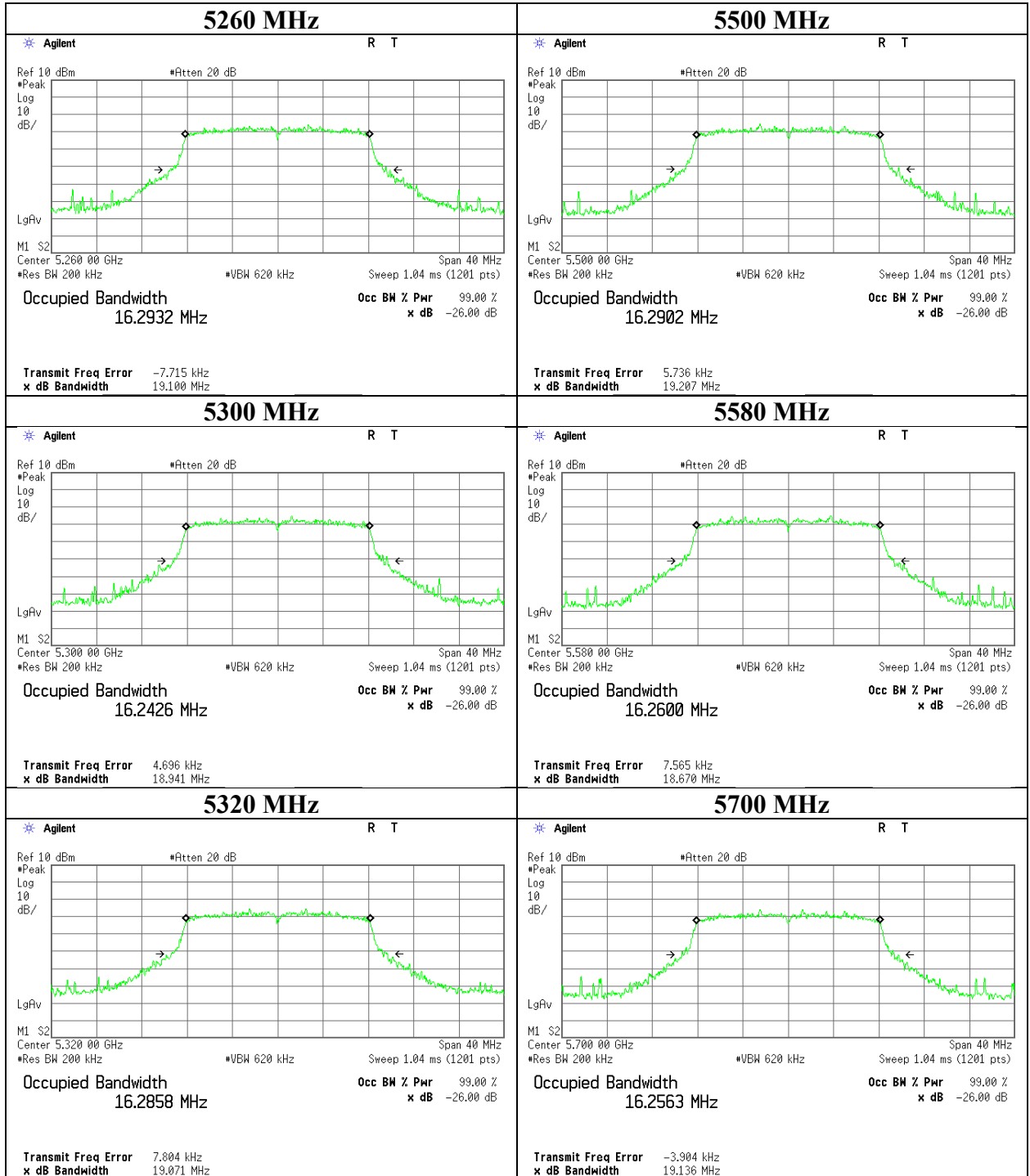
Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5190	-	35819.3
5230	-	35861.6
5270	39.887	35874.3
5310	40.158	35838.0
5510	40.266	35857.4
5550	39.725	35831.7
5670	39.639	35832.0
5710	39.756	35893.5
5755	-	35860.0
5795	-	35866.5

11ac-80

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]
5210	-	75138.7
5290	82.595	75108.2
5530	81.081	74968.7
5610	81.048	74908.9
5690	82.074	75052.7
5775	-	75044.0

26 dB Emission Bandwidth

11a



UL Japan, Inc.

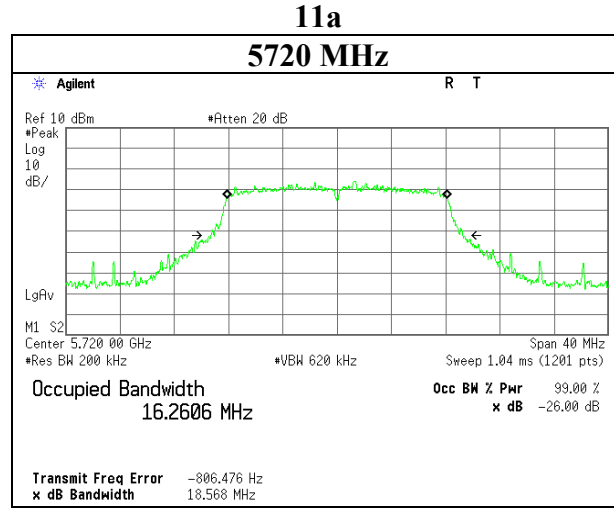
Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

26 dB Emission Bandwidth



UL Japan, Inc.

Ise EMC Lab.

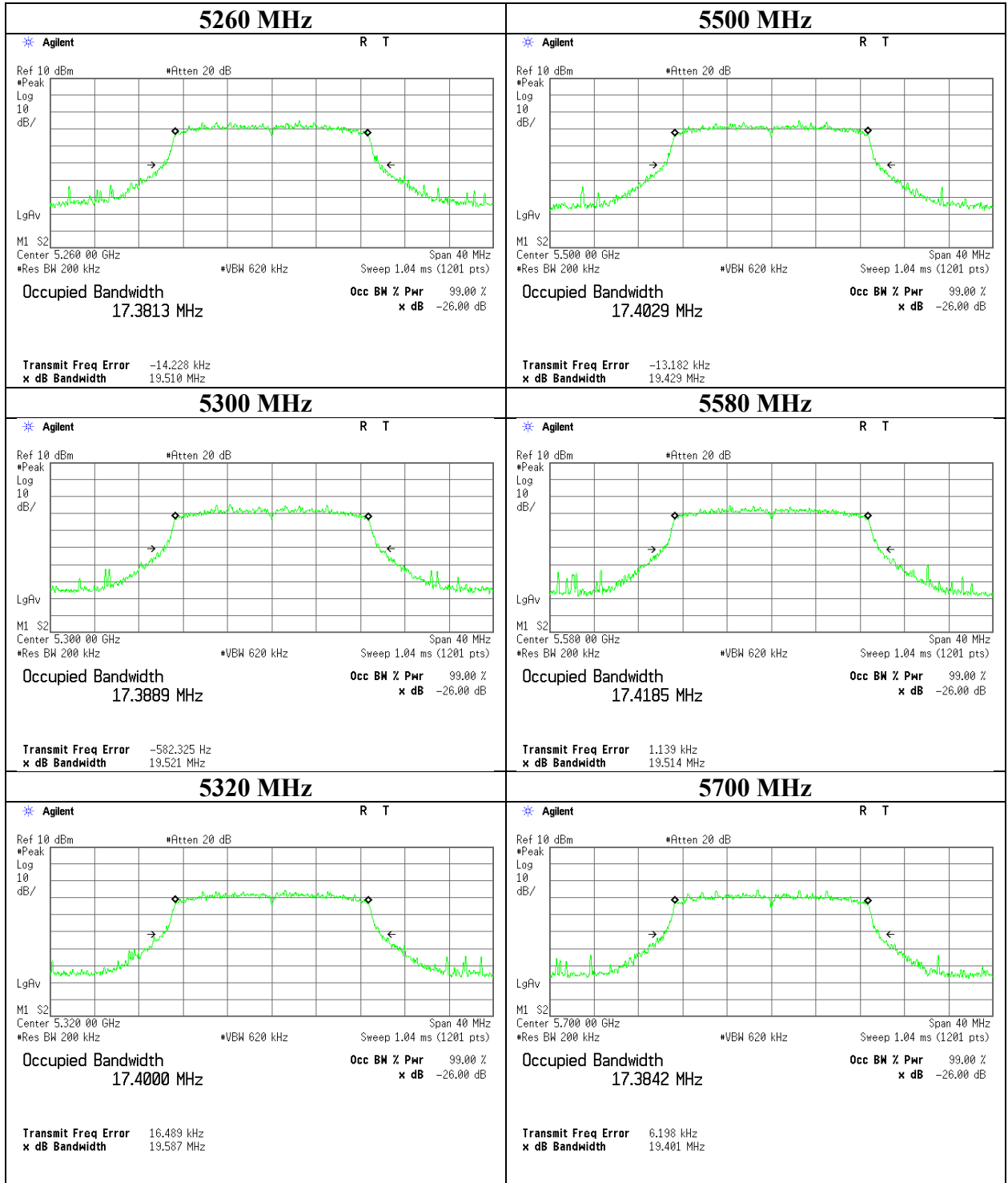
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

11n-20



UL Japan, Inc.

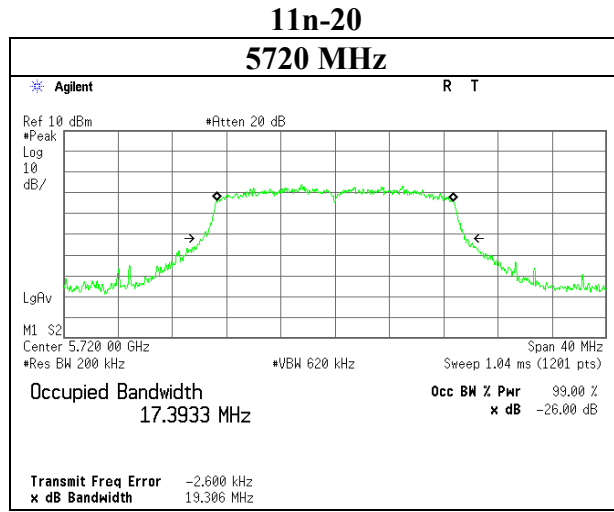
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26 dB Emission Bandwidth



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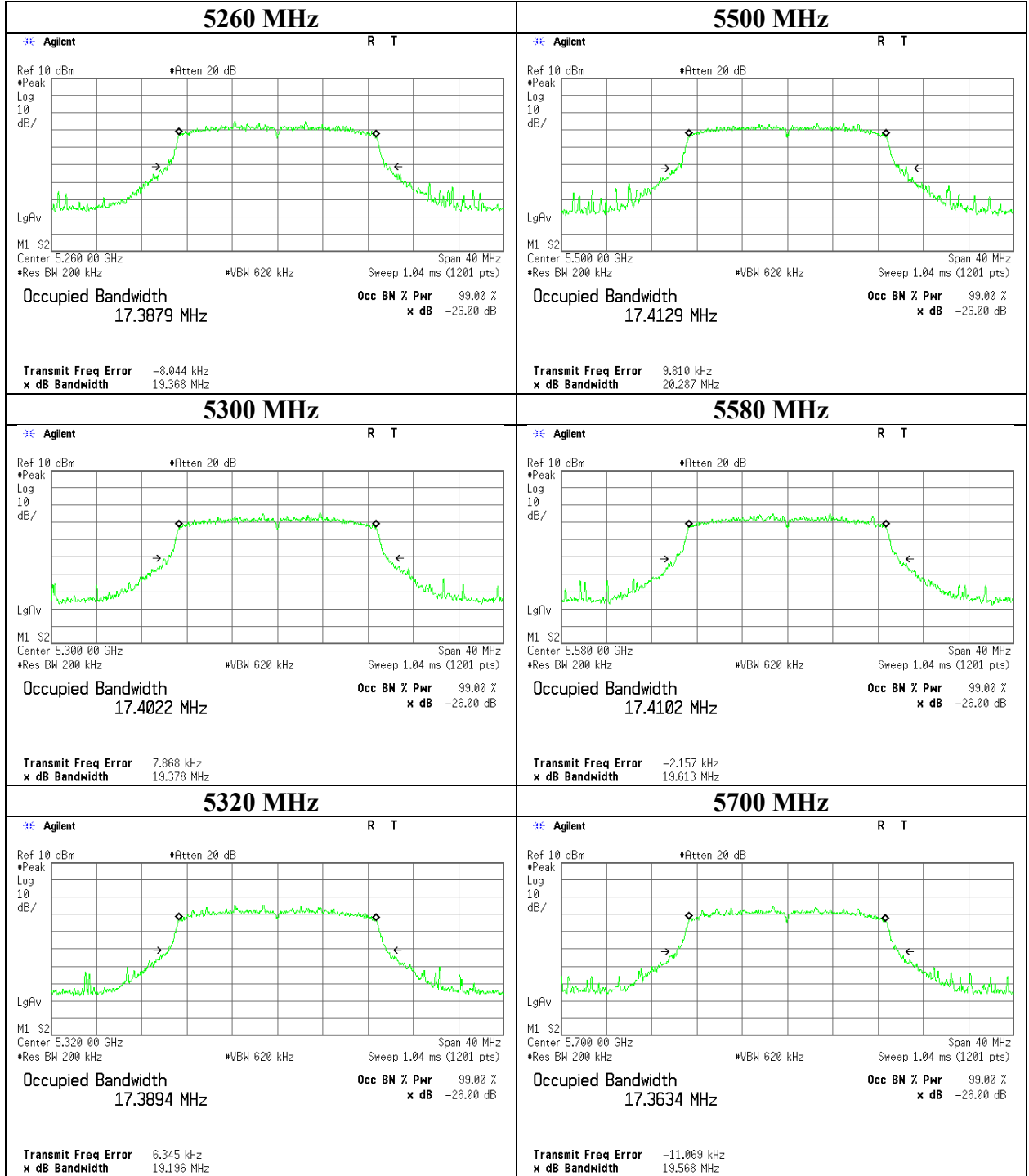
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26 dB Emission Bandwidth

11ac-20



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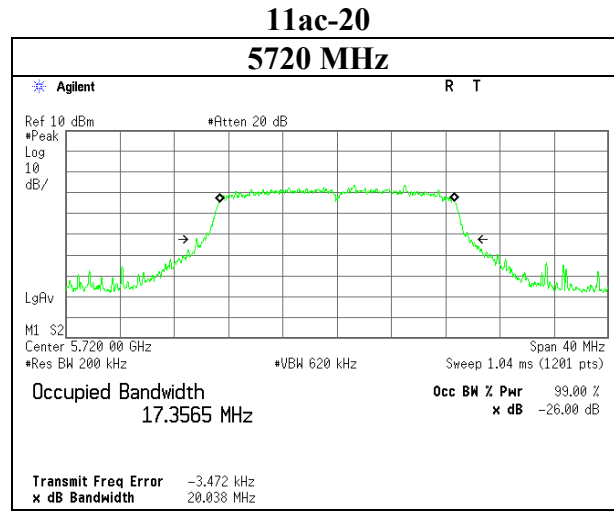
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26 dB Emission Bandwidth



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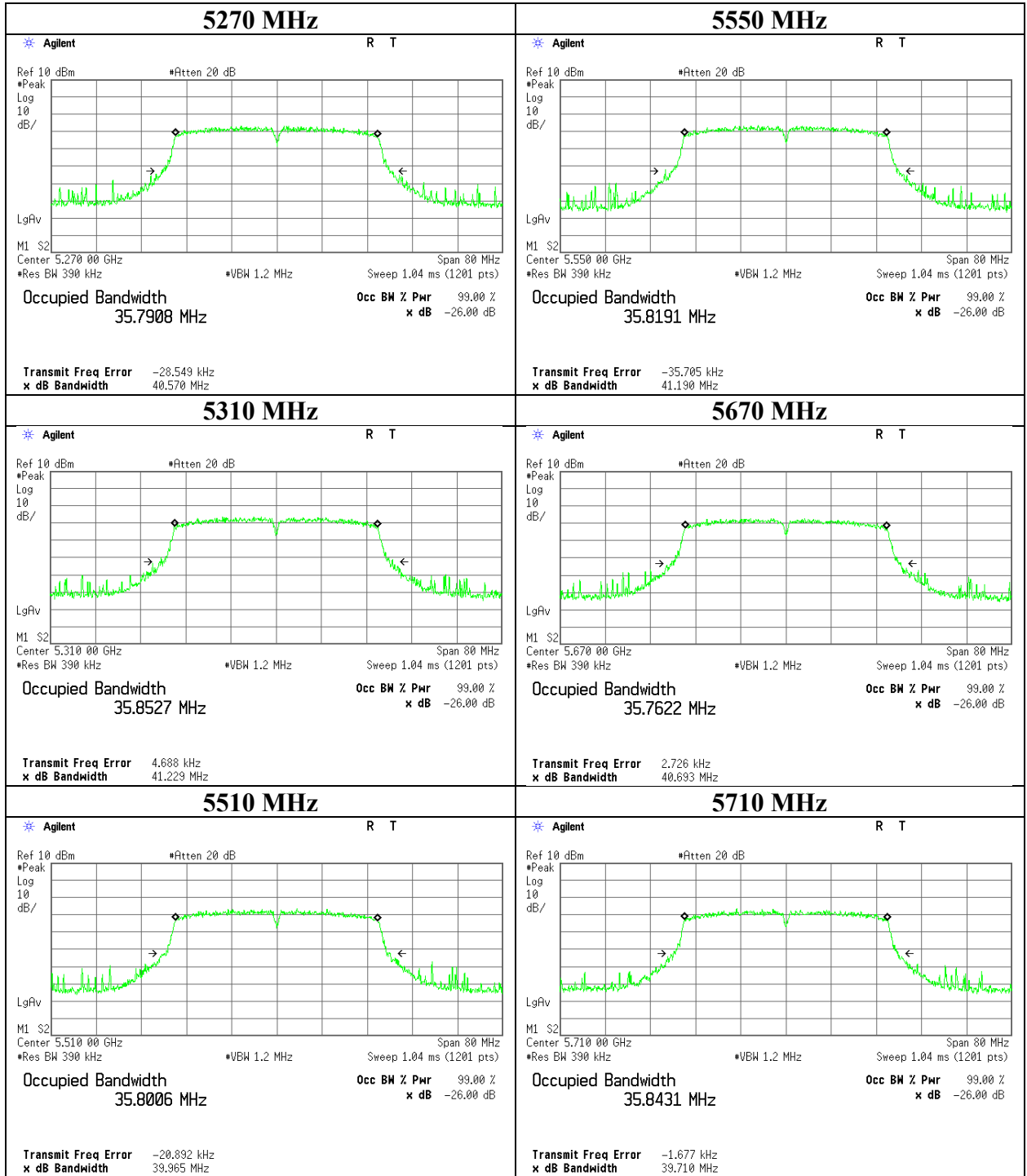
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26 dB Emission Bandwidth

11n-40



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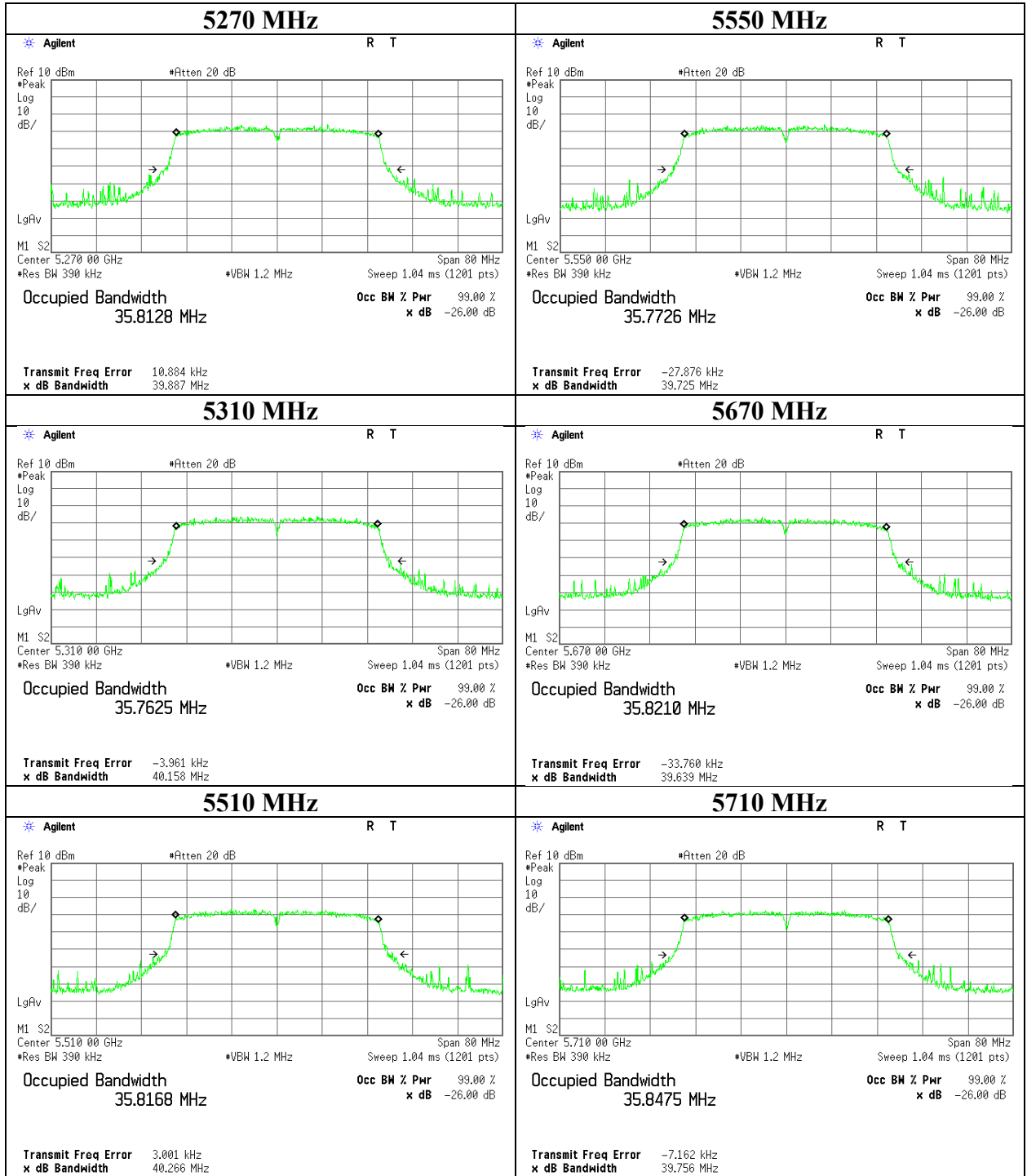
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

11ac-40



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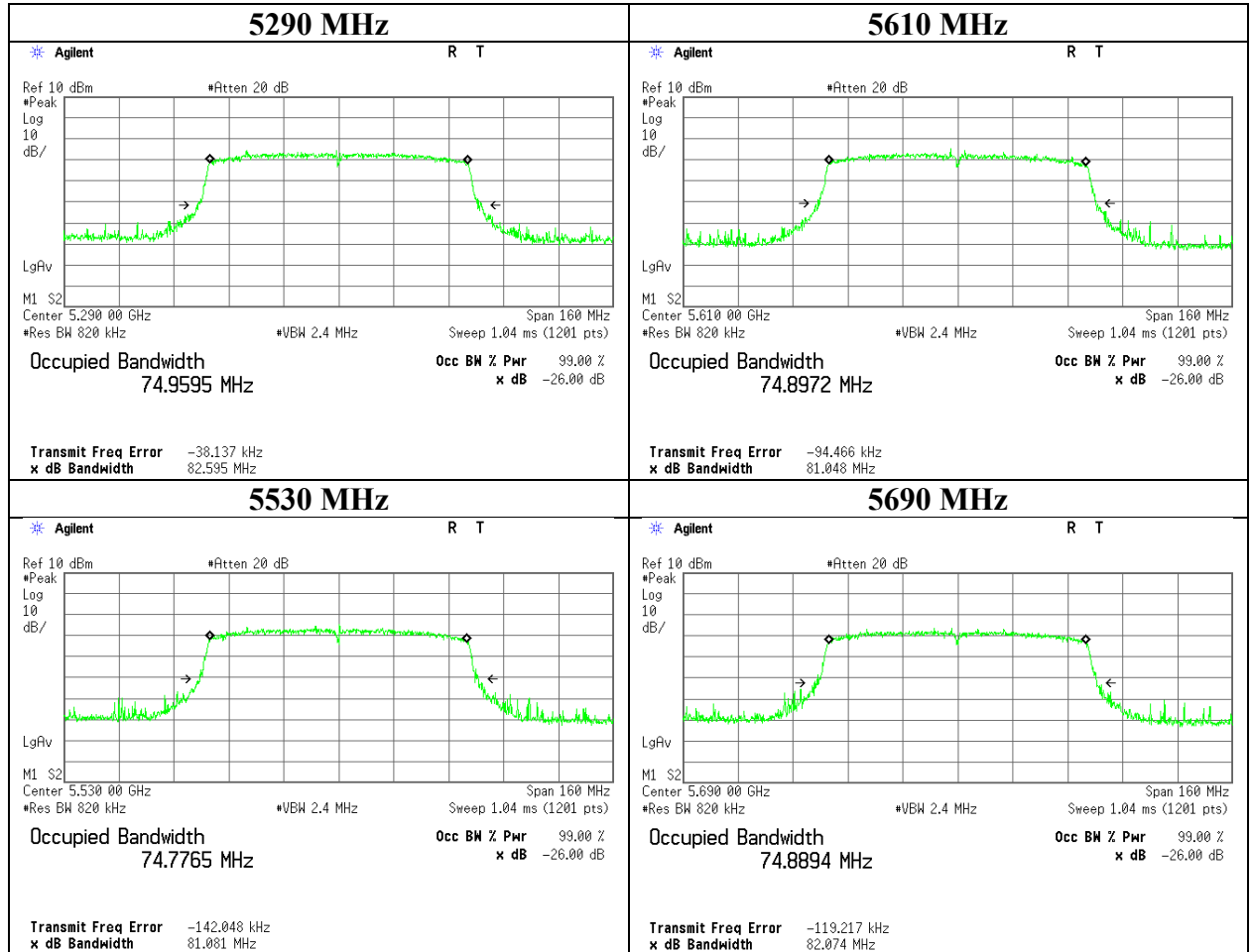
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

11ac-80



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Ise EMC Lab.

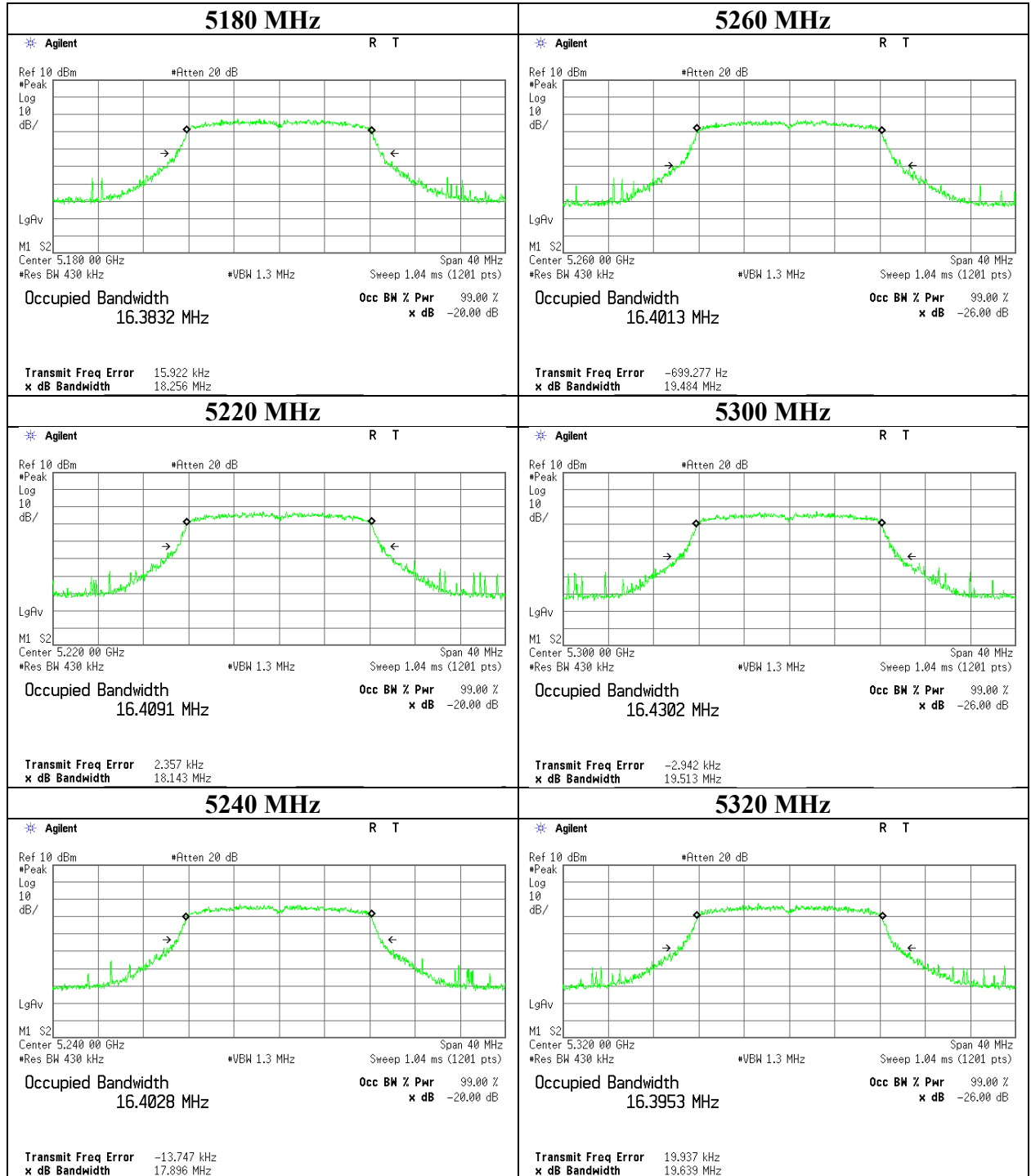
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

11a



UL Japan, Inc.

Ise EMC Lab.

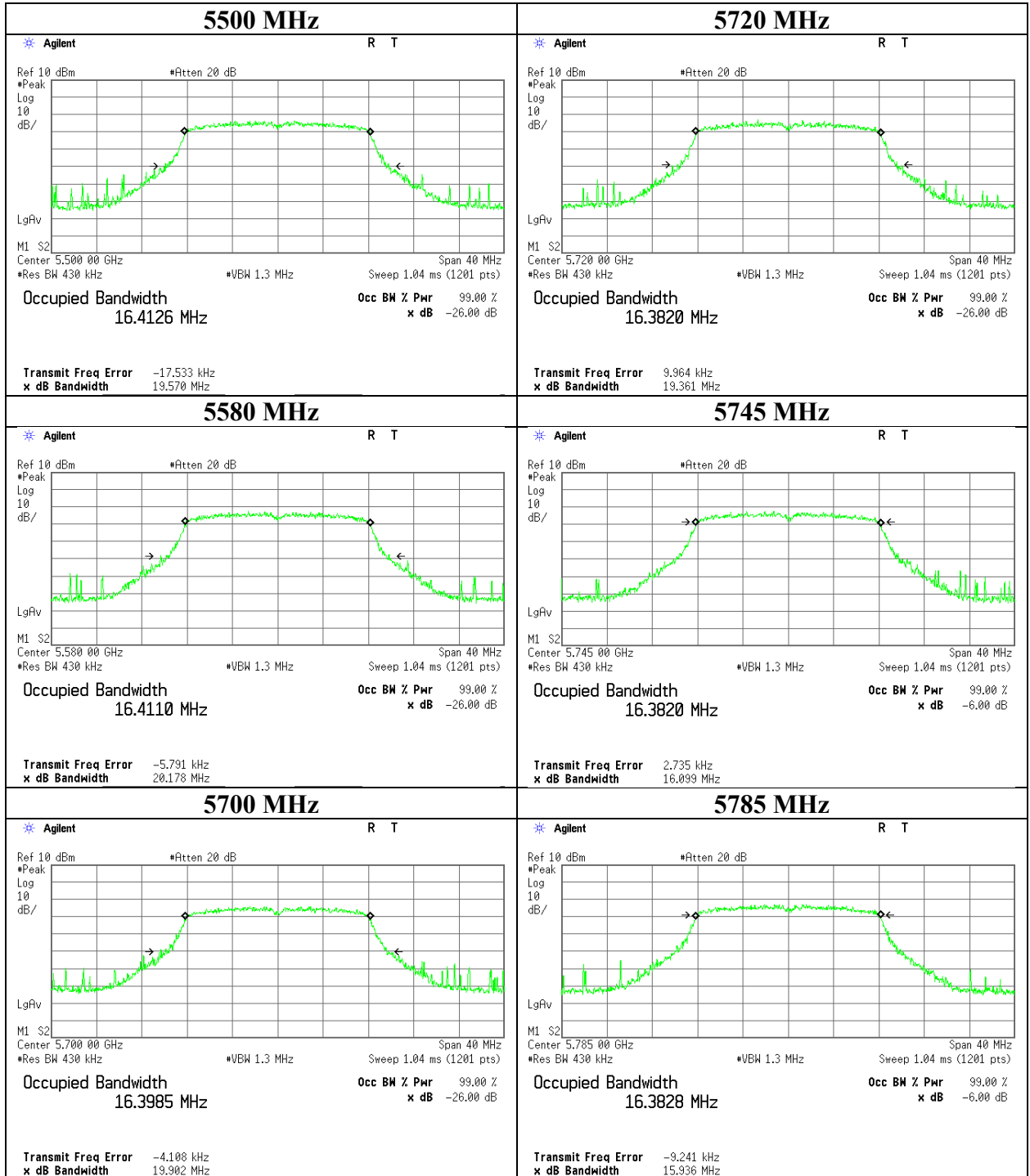
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

11a



UL Japan, Inc.

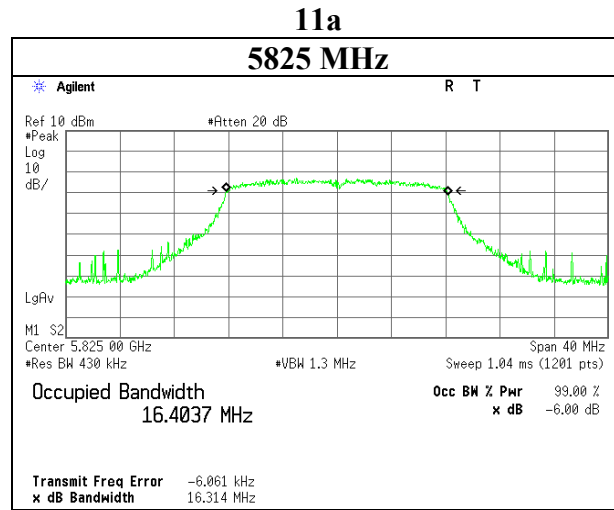
Ise EMC Lab.

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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99 % Occupied Bandwidth



UL Japan, Inc.

Ise EMC Lab.

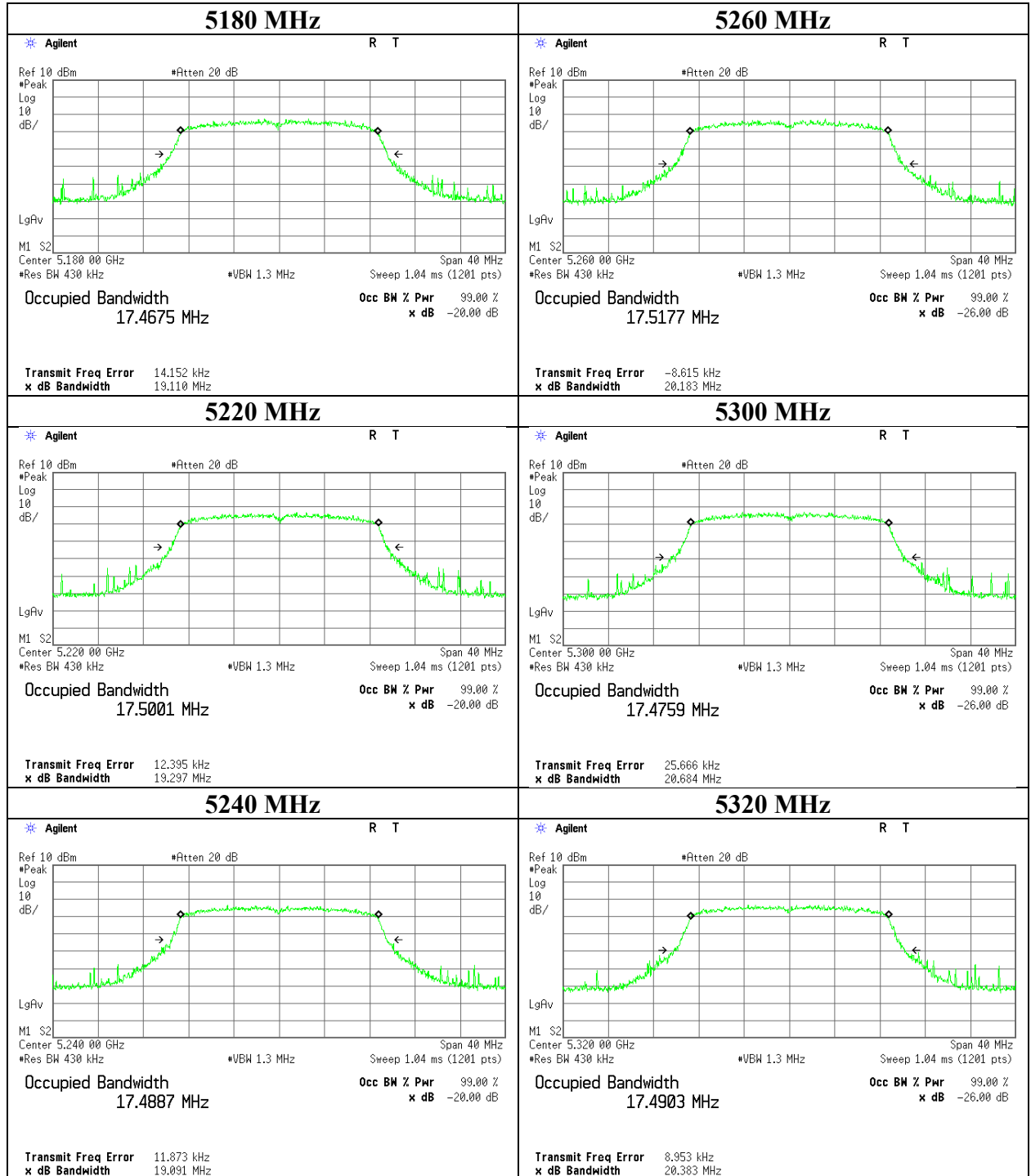
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

11n-20



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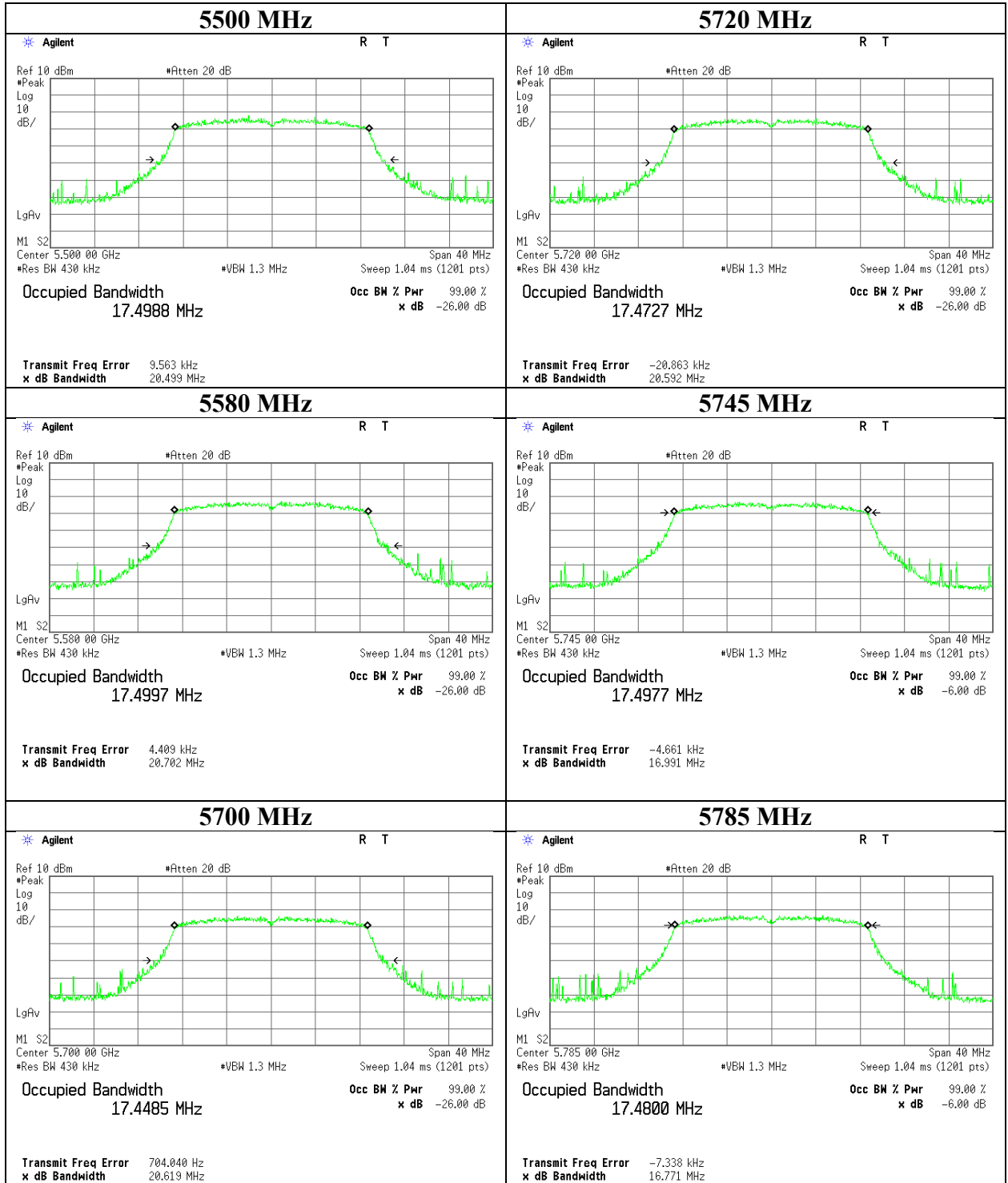
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

11n-20



UL Japan, Inc.

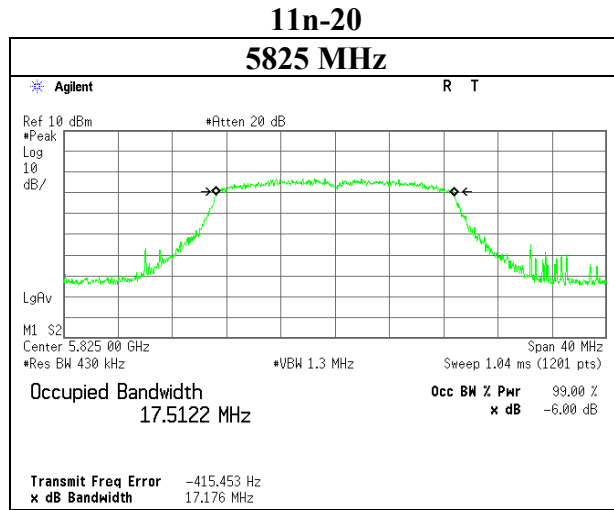
Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99 % Occupied Bandwidth



UL Japan, Inc.

Ise EMC Lab.

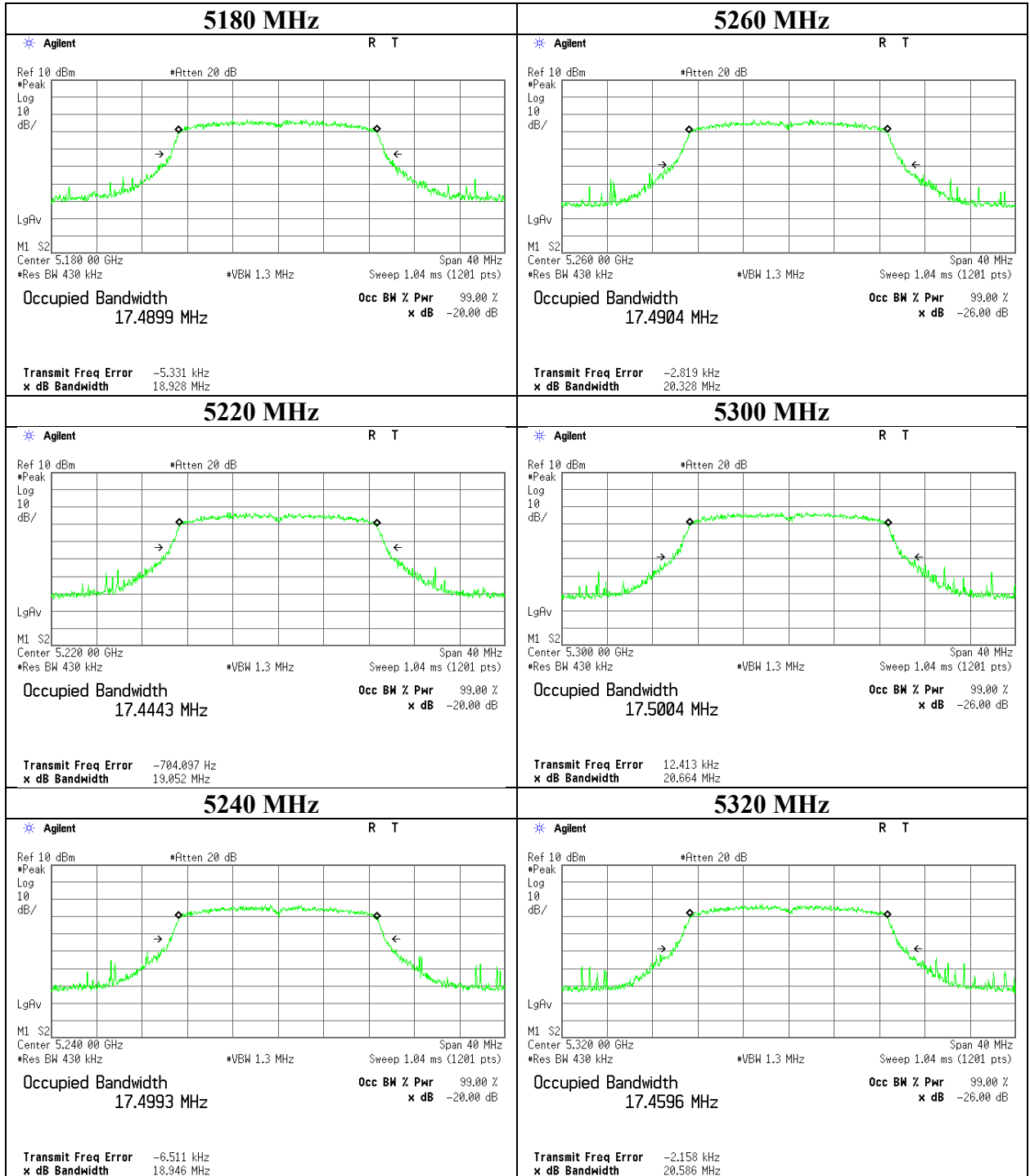
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

11ac-20



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Ise EMC Lab.

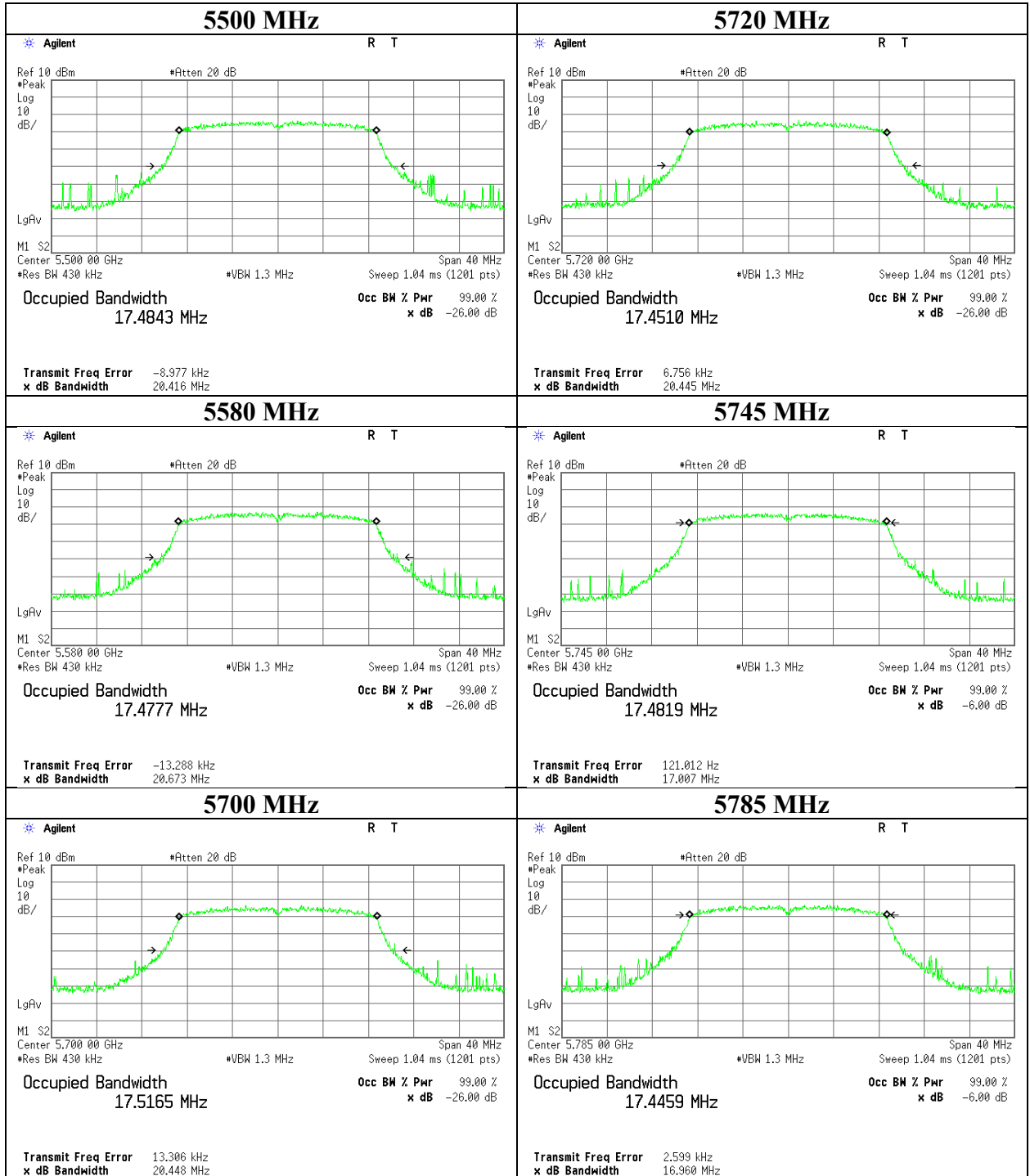
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

11ac-20



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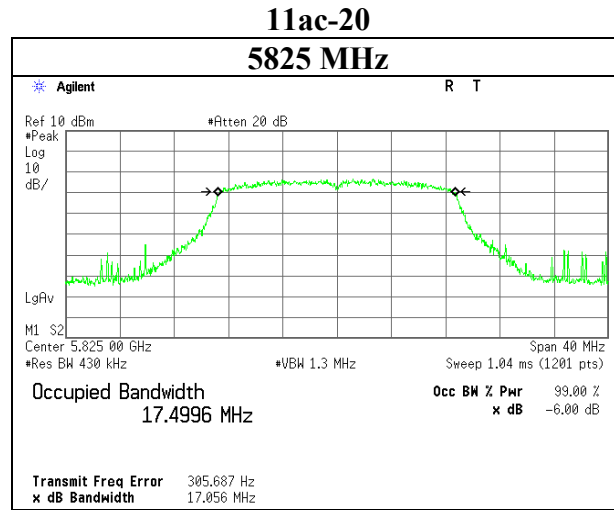
Ise EMC Lab.

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Telephone : +81 596 24 8999

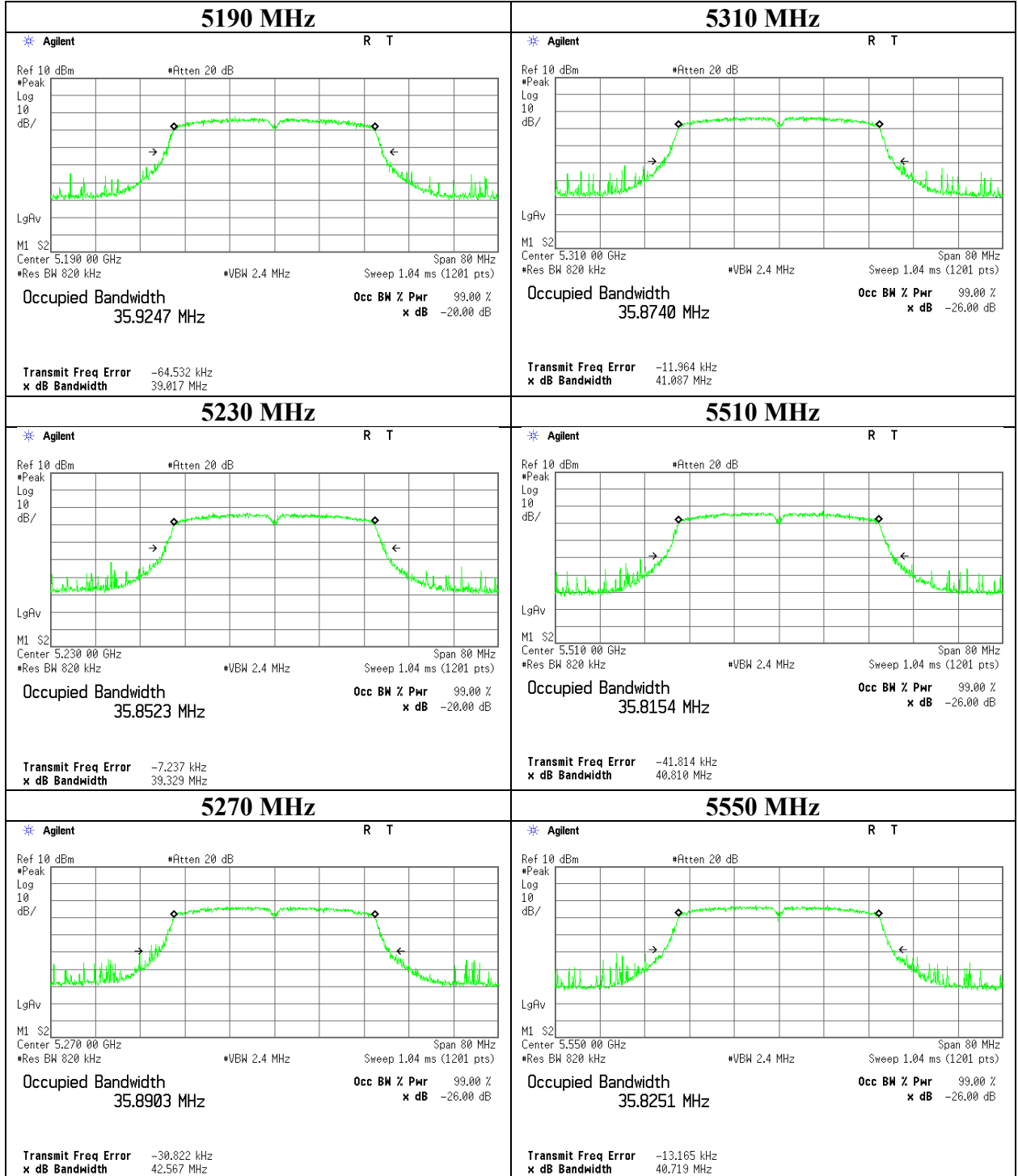
Facsimile : +81 596 24 8124

99 % Occupied Bandwidth



99 % Occupied Bandwidth

11n-40



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Ise EMC Lab.

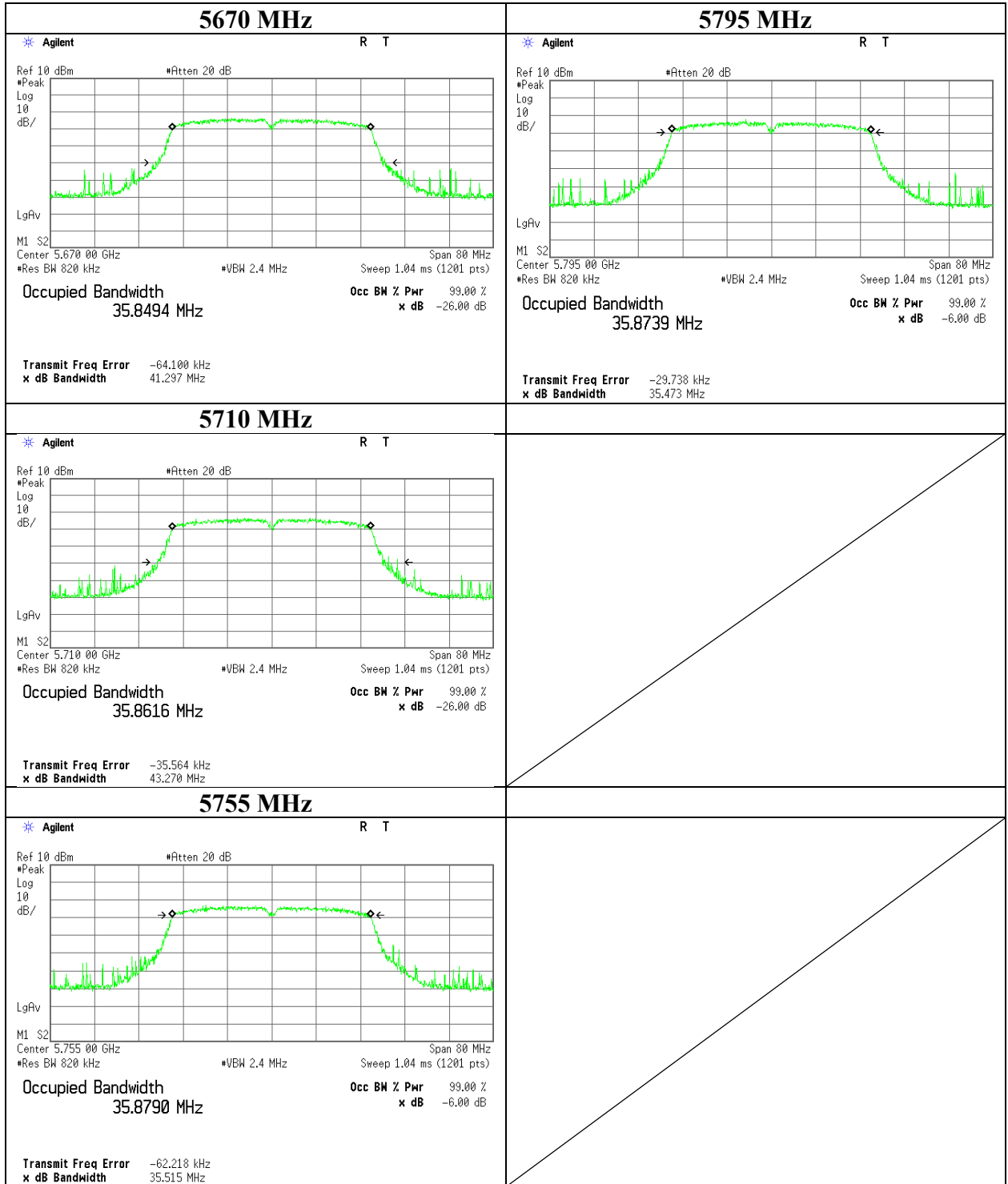
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

11n-40



UL Japan, Inc.

Ise EMC Lab.

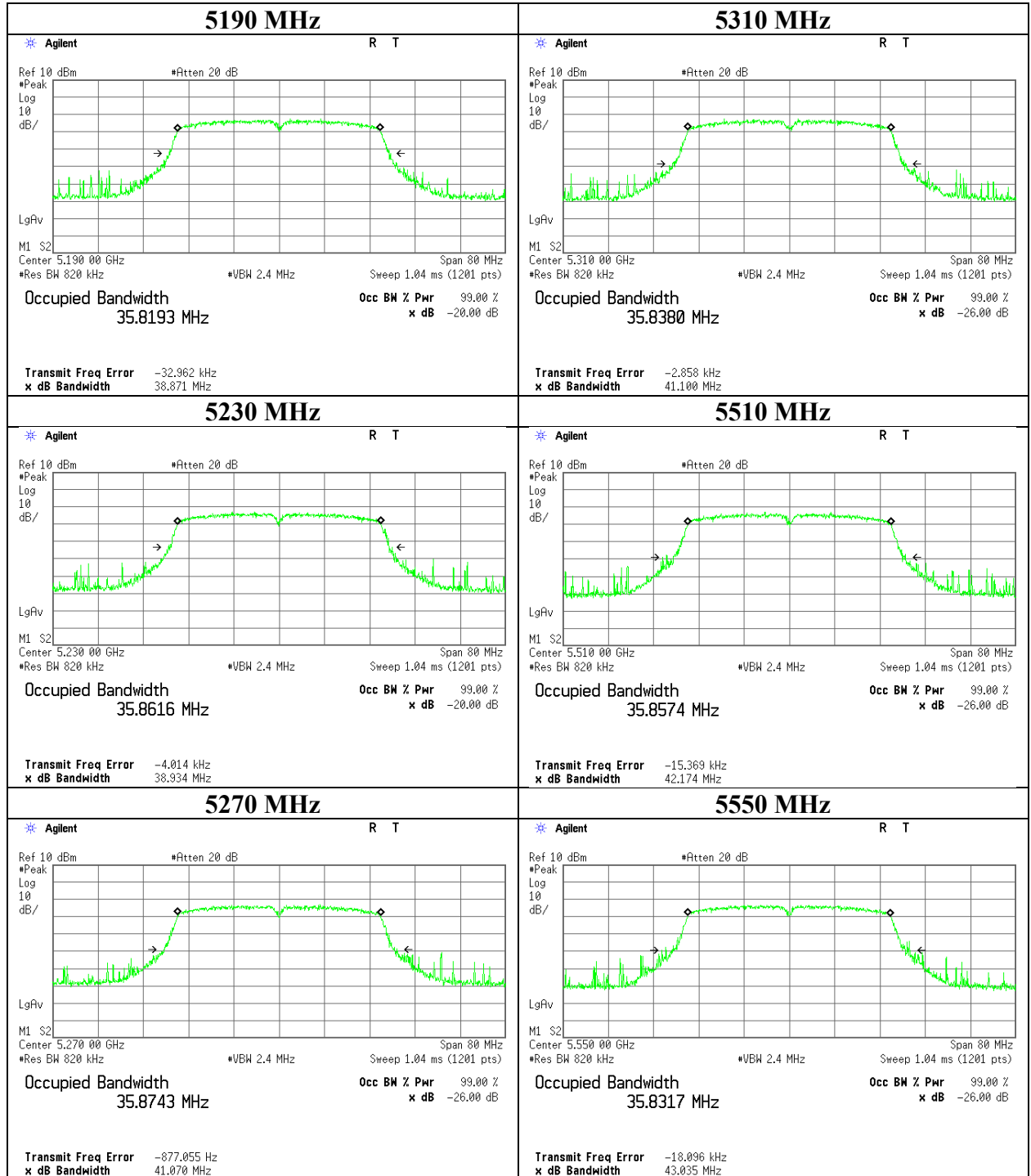
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

11ac-40



UL Japan, Inc.

Ise EMC Lab.

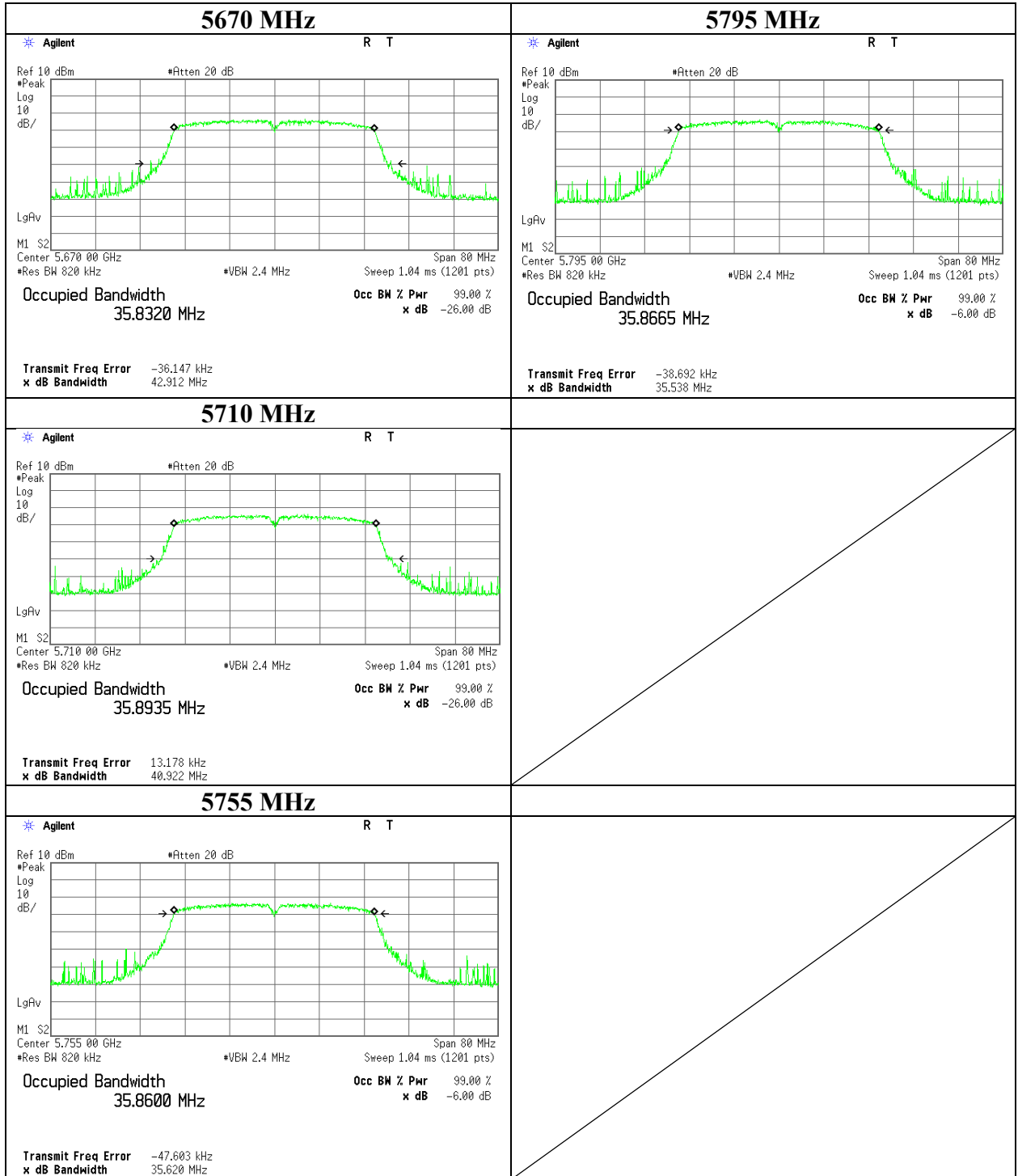
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

11ac-40



UL Japan, Inc.

Ise EMC Lab.

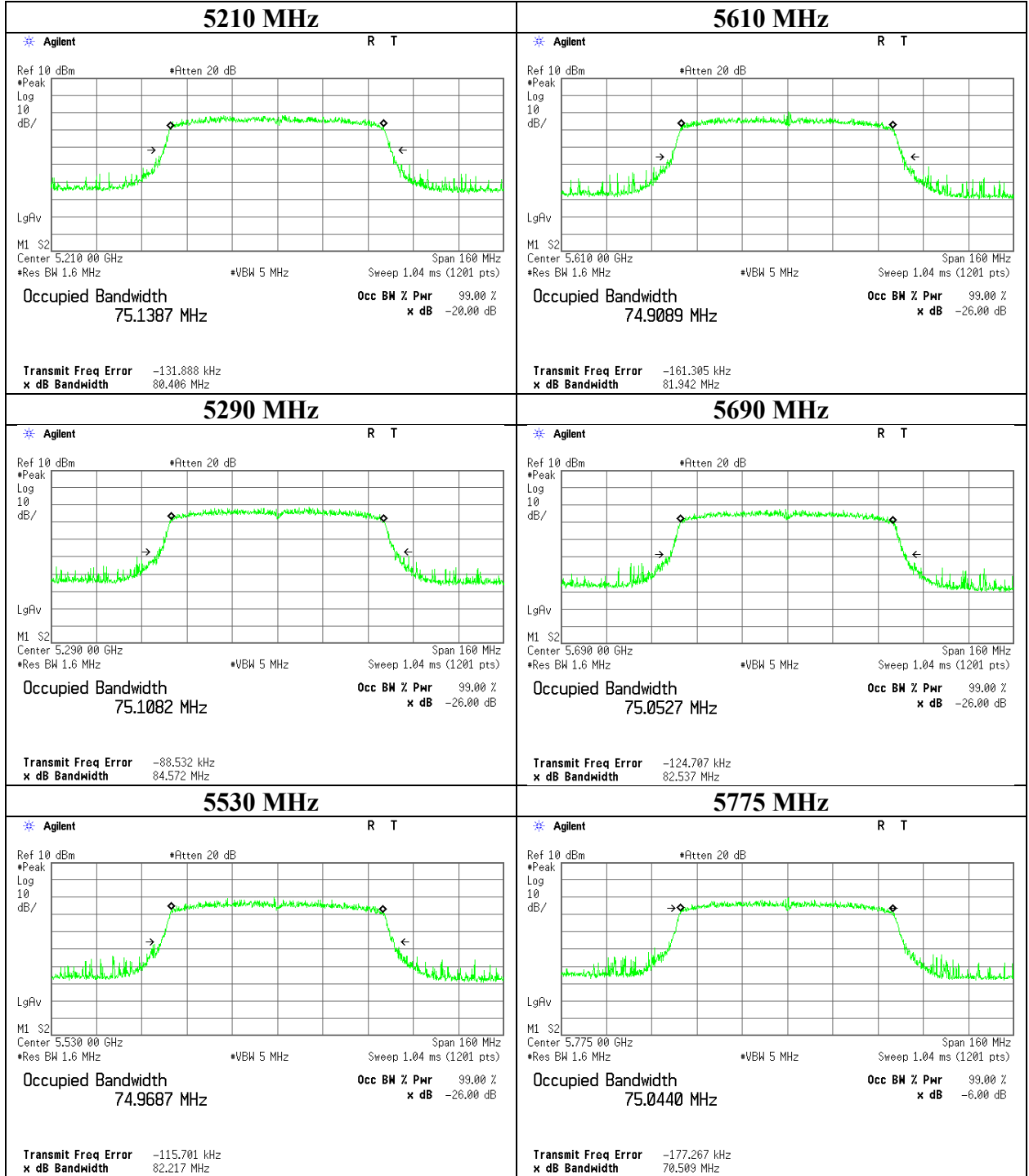
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

11ac-80



6 dB Bandwidth

Report No. 13674969H
Test place Ise EMC Lab. No.4 Measurement Room
Date January 27, 2021
Temperature / Humidity 23 deg. C / 35 % RH
Engineer Takafumi Noguchi
Mode Tx

11a

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 1	5745	14.355	> 0.500
	5785	14.442	> 0.500
	5825	14.477	> 0.500

11n-20

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 1	5745	15.143	> 0.500
	5785	15.013	> 0.500
	5825	15.021	> 0.500

11ac-20

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 1	5745	13.288	> 0.500
	5785	13.902	> 0.500
	5825	14.783	> 0.500

11n-40

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 1	5755	35.130	> 0.500
	5795	35.005	> 0.500

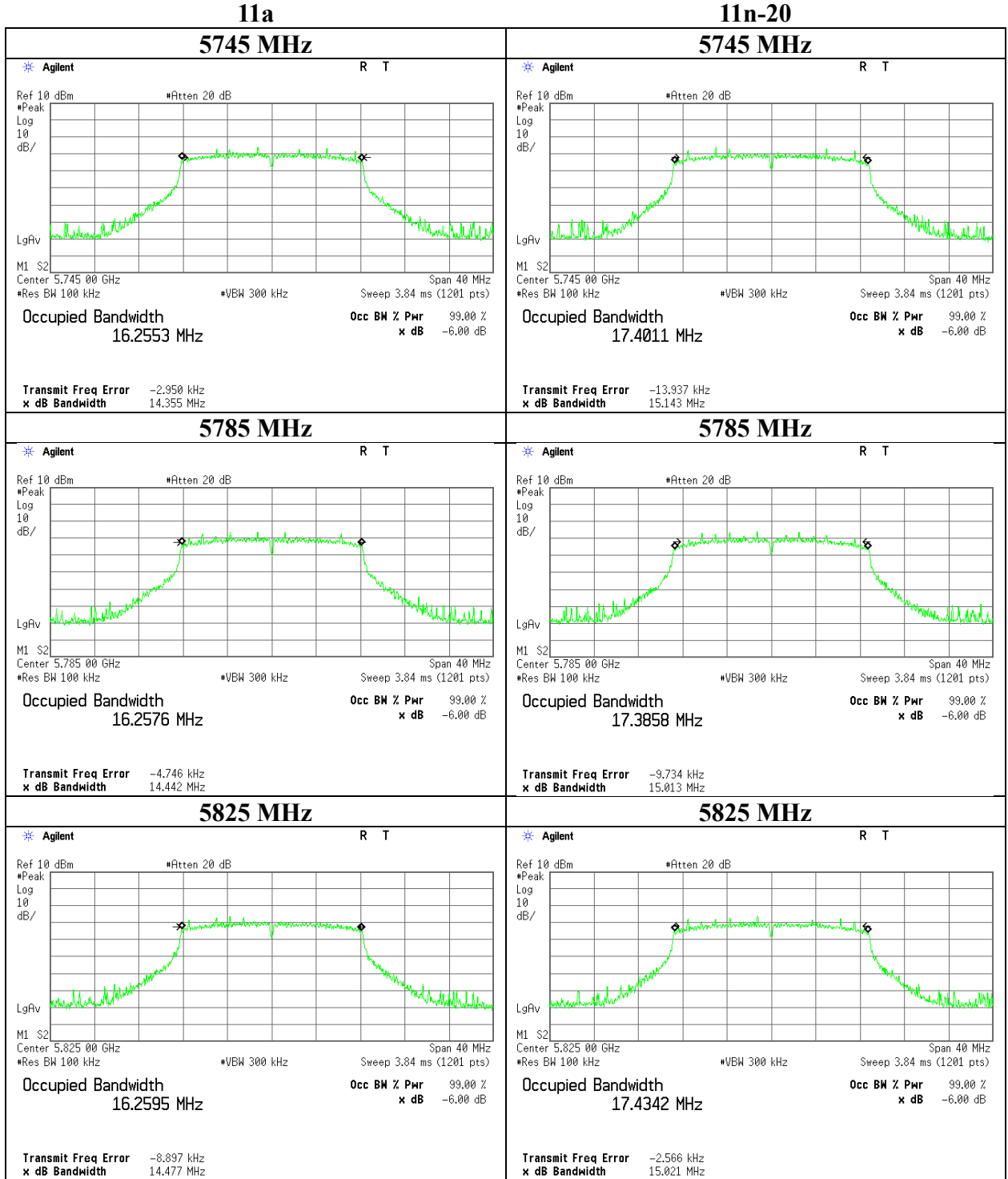
11ac-40

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 1	5755	35.017	> 0.500
	5795	34.995	> 0.500

11ac-80

Antenna	Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [MHz]
Antenna 1	5775	75.128	> 0.500

6 dB Bandwidth



UL Japan, Inc.

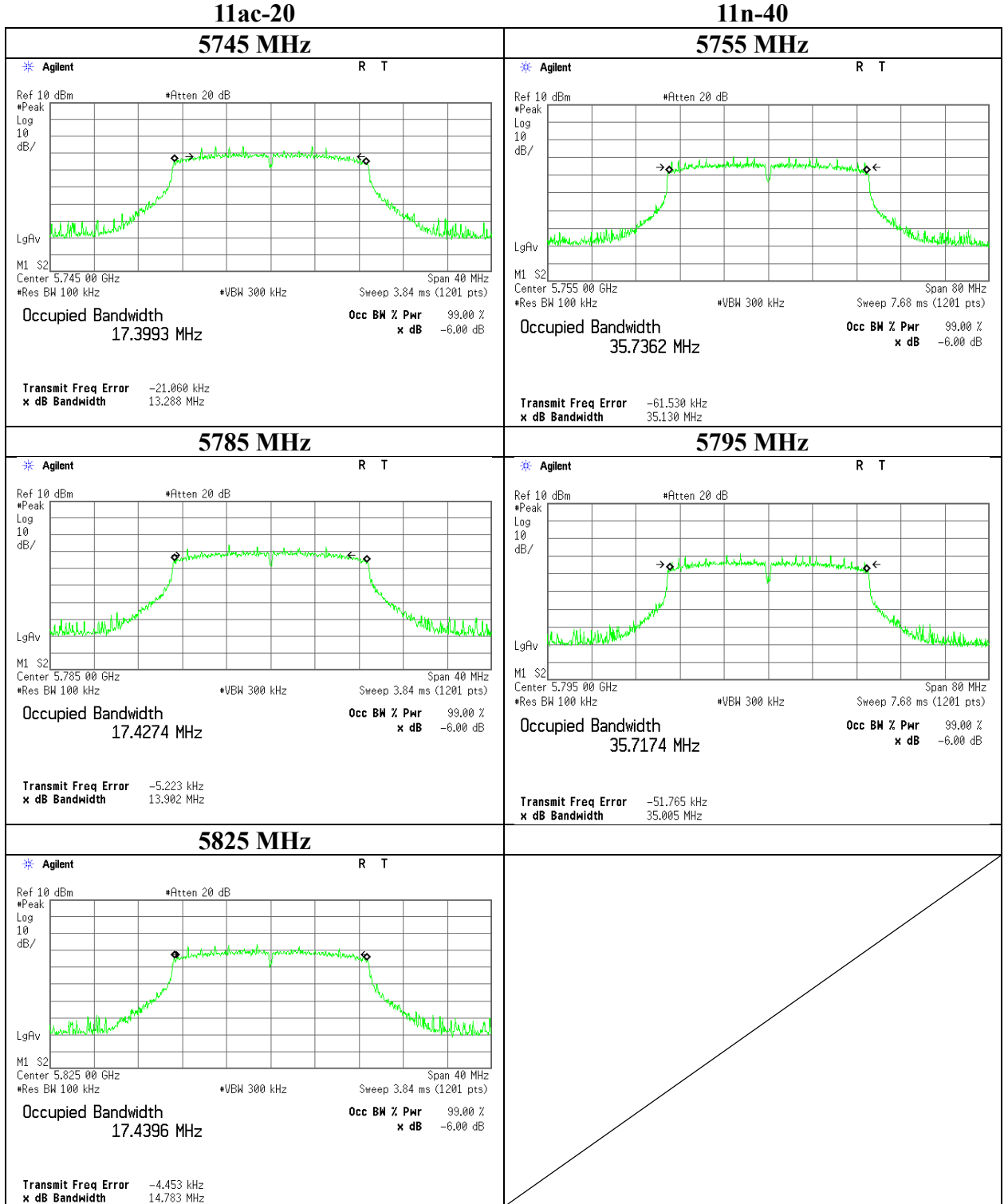
Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

6 dB Bandwidth



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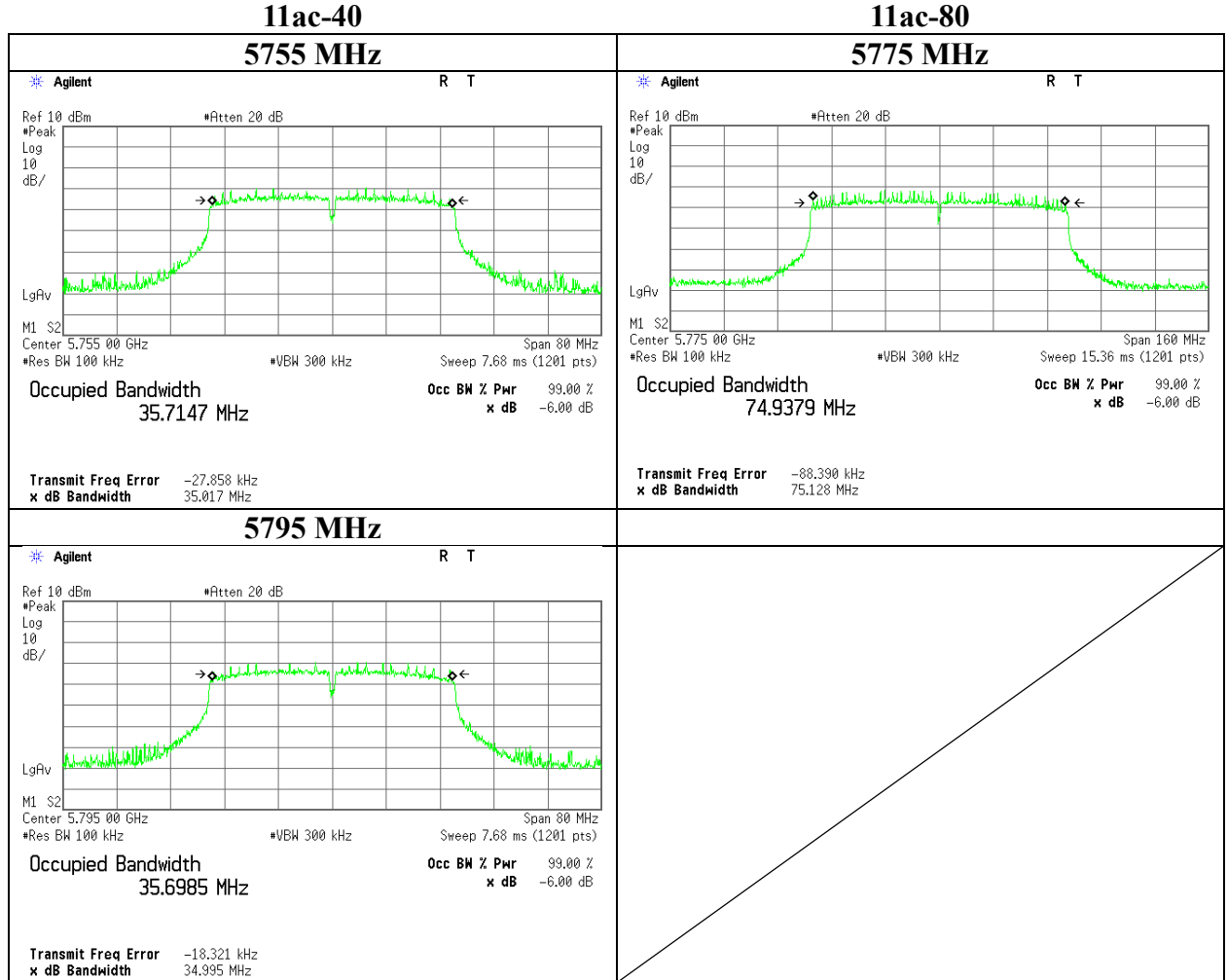
Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

6 dB Bandwidth



Maximum Conducted Output Power

Report No. 13674969H
Test place Ise EMC Lab. No.6 Measurement Room
Date January 16, 2021
Temperature / Humidity 24 deg. C / 32 % RH
Engineer Nachi Konegawa
Mode Tx

11a 6Mbps

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
								Result [dBm]	Limit [dBm]	Margin [dB]	Result [dBm]	Limit [dBm]	Margin [dB]		
5180	-5.82	2.50	10.09	0.00	2.0	-	16.383	6.77	4.75	23.97	17.20	8.77	7.53	29.97	21.20
5220	-5.96	2.50	10.09	0.00	2.0	-	16.409	6.63	4.60	23.97	17.34	8.63	7.29	29.97	21.34
5240	-5.99	2.50	10.09	0.00	2.0	-	16.403	6.60	4.57	23.97	17.37	8.60	7.24	29.97	21.37
5260	-6.21	2.50	10.09	0.00	2.0	19.100	16.401	6.38	4.35	23.81	17.43	8.38	6.89	29.97	21.59
5300	-5.94	2.50	10.09	0.00	2.0	18.941	16.430	6.65	4.62	23.77	17.12	8.65	7.33	29.97	21.32
5320	-6.26	2.50	10.09	0.00	2.0	19.071	16.395	6.33	4.30	23.80	17.47	8.33	6.81	29.97	21.64
5500	-6.47	2.50	10.10	0.00	2.0	19.207	16.413	6.13	4.10	23.83	17.70	8.13	6.50	29.97	21.84
5580	-5.76	2.50	10.10	0.00	2.0	18.670	16.411	6.84	4.83	23.71	16.87	8.84	7.66	29.97	21.13
5700	-6.80	2.50	10.09	0.00	2.0	19.136	16.399	5.79	3.79	23.81	18.02	7.79	6.01	29.97	22.18
5720	-6.93	2.50	10.09	0.00	2.0	18.568	16.382	5.66	3.68	23.68	18.02	7.66	5.83	29.97	22.31
5745	-5.75	2.50	10.09	0.00	2.0	-	16.382	6.84	4.83	30.00	23.16	8.84	7.66	36.00	27.16
5785	-5.84	2.50	10.09	0.00	2.0	-	16.383	6.75	4.73	30.00	23.25	8.75	7.50	36.00	27.25
5825	-5.77	2.50	10.09	0.00	2.0	-	16.404	6.82	4.81	30.00	23.18	8.82	7.62	36.00	27.18

Sample Calculation:

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

*The test was conducted by the use of Gate function.

Maximum Conducted Output Power

Report No. 13674969H
Test place Ise EMC Lab. No.6 Measurement Room
Date January 16, 2021
Temperature / Humidity 24 deg. C / 32 % RH
Engineer Nachi Konogawa
Mode Tx

11n-20 MCS0

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
								Result [dBm]	[mW]	Limit [dBm]	Margin [dB]	Result [dBm]	[mW]	Limit [dBm]	Margin [dB]
5180	-5.90	2.50	10.09	0.00	2.0	-	17.468	6.69	4.67	23.97	17.28	8.69	7.40	29.97	21.28
5220	-6.03	2.50	10.09	0.00	2.0	-	17.500	6.56	4.53	23.97	17.41	8.56	7.18	29.97	21.41
5240	-6.27	2.50	10.09	0.00	2.0	-	17.489	6.32	4.29	23.97	17.65	8.32	6.79	29.97	21.65
5260	-5.91	2.50	10.09	0.00	2.0	19.510	17.518	6.68	4.66	23.90	17.22	8.68	7.38	29.97	21.29
5300	-5.69	2.50	10.09	0.00	2.0	19.521	17.476	6.90	4.90	23.90	17.00	8.90	7.76	29.97	21.07
5320	-5.80	2.50	10.09	0.00	2.0	19.587	17.490	6.79	4.78	23.91	17.12	8.79	7.57	29.97	21.18
5500	-6.15	2.50	10.10	0.00	2.0	19.429	17.499	6.45	4.42	23.88	17.43	8.45	7.00	29.97	21.52
5580	-5.65	2.50	10.10	0.00	2.0	19.514	17.500	6.95	4.95	23.90	16.95	8.95	7.85	29.97	21.02
5700	-6.55	2.50	10.09	0.00	2.0	19.401	17.449	6.04	4.02	23.87	17.83	8.04	6.37	29.97	21.93
5720	-6.74	2.50	10.09	0.00	2.0	19.306	17.472	5.85	3.85	23.85	18.00	7.85	6.10	29.97	22.12
5745	-6.00	2.50	10.09	0.00	2.0	-	17.498	6.59	4.56	30.00	23.41	8.59	7.23	36.00	27.41
5785	-6.10	2.50	10.09	0.00	2.0	-	17.480	6.49	4.46	30.00	23.51	8.49	7.06	36.00	27.51
5825	-6.03	2.50	10.09	0.00	2.0	-	17.512	6.56	4.53	30.00	23.44	8.56	7.18	36.00	27.44

Sample Calculation:

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

*The test was conducted by the use of Gate function.

11n-40 MCS0

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
								Result [dBm]	[mW]	Limit [dBm]	Margin [dB]	Result [dBm]	[mW]	Limit [dBm]	Margin [dB]
5190	-5.81	2.50	10.09	0.00	2.0	-	35.925	6.78	4.76	23.97	17.19	8.78	7.55	29.97	21.19
5230	-5.86	2.50	10.09	0.00	2.0	-	35.852	6.73	4.71	23.97	17.24	8.73	7.46	29.97	21.24
5270	-5.91	2.50	10.09	0.00	2.0	40.570	35.890	6.68	4.66	23.97	17.29	8.68	7.38	29.97	21.29
5310	-5.72	2.50	10.09	0.00	2.0	41.229	35.874	6.87	4.86	23.97	17.10	8.87	7.71	29.97	21.10
5510	-6.13	2.50	10.10	0.00	2.0	39.965	35.815	6.47	4.44	23.97	17.50	8.47	7.03	29.97	21.50
5550	-5.71	2.50	10.10	0.00	2.0	41.190	35.825	6.89	4.89	23.97	17.08	8.89	7.74	29.97	21.08
5670	-6.25	2.50	10.09	0.00	2.0	40.693	35.849	6.34	4.31	23.97	17.63	8.34	6.82	29.97	21.63
5710	-6.70	2.50	10.09	0.00	2.0	39.710	35.862	5.89	3.88	23.97	18.08	7.89	6.15	29.97	22.08
5755	-6.00	2.50	10.09	0.00	2.0	-	35.879	6.59	4.56	30.00	23.41	8.59	7.23	36.00	27.41
5795	-5.96	2.50	10.09	0.00	2.0	-	35.874	6.63	4.60	30.00	23.37	8.63	7.29	36.00	27.37

Sample Calculation:

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

*The test was conducted by the use of Gate function.

Maximum Conducted Output Power

Report No. 13674969H
Test place Ise EMC Lab. No.6 Measurement Room
Date January 16, 2021
Temperature / Humidity 24 deg. C / 32 % RH
Engineer Nachi Konogawa
Mode Tx

11ac-20 MCS0

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power			e.i.r.p.				
								Result [dBm]	Limit [dBm]	Margin [dB]	Result [dBm]	Limit [dBm]	Margin [dB]	Result [mW]	Limit [dBm]
5180	-5.80	2.50	10.09	0.00	2.0	-	17.490	6.79	4.78	23.97	17.18	8.79	7.57	29.97	21.18
5220	-5.94	2.50	10.09	0.00	2.0	-	17.444	6.65	4.62	23.97	17.32	8.65	7.33	29.97	21.32
5240	-5.97	2.50	10.09	0.00	2.0	-	17.499	6.62	4.59	23.97	17.35	8.62	7.28	29.97	21.35
5260	-5.90	2.50	10.09	0.00	2.0	19.368	17.490	6.69	4.67	23.87	17.18	8.69	7.40	29.97	21.28
5300	-5.68	2.50	10.09	0.00	2.0	19.378	17.501	6.91	4.91	23.87	16.96	8.91	7.78	29.97	21.06
5320	-5.78	2.50	10.09	0.00	2.0	19.196	17.460	6.81	4.80	23.83	17.02	8.81	7.60	29.97	21.16
5500	-6.09	2.50	10.10	0.00	2.0	20.287	17.484	6.51	4.48	23.97	17.46	8.51	7.10	29.97	21.46
5580	-5.62	2.50	10.10	0.00	2.0	19.613	17.478	6.98	4.99	23.92	16.94	8.98	7.91	29.97	20.99
5700	-6.53	2.50	10.09	0.00	2.0	19.568	17.517	6.06	4.04	23.91	17.85	8.06	6.40	29.97	21.91
5720	-6.73	2.50	10.09	0.00	2.0	20.038	17.451	5.86	3.85	23.97	18.11	7.86	6.11	29.97	22.11
5745	-5.74	2.50	10.09	0.00	2.0	-	17.482	6.85	4.84	30.00	23.15	8.85	7.67	36.00	27.15
5785	-5.82	2.50	10.09	0.00	2.0	-	17.446	6.77	4.75	30.00	23.23	8.77	7.53	36.00	27.23
5825	-5.75	2.50	10.09	0.00	2.0	-	17.500	6.84	4.83	30.00	23.16	8.84	7.66	36.00	27.16

Sample Calculation:

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

*The test was conducted by the use of Gate function.

11ac-40 MCS0

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power			e.i.r.p.				
								Result [dBm]	Limit [dBm]	Margin [dB]	Result [dBm]	Limit [dBm]	Margin [dB]	Result [mW]	Limit [dBm]
5190	-5.79	2.50	10.09	0.00	2.0	-	35.819	6.80	4.79	23.97	17.17	8.80	7.59	29.97	21.17
5230	-5.84	2.50	10.09	0.00	2.0	-	35.862	6.75	4.73	23.97	17.22	8.75	7.50	29.97	21.22
5270	-5.90	2.50	10.09	0.00	2.0	39.887	35.874	6.69	4.67	23.97	17.28	8.69	7.40	29.97	21.28
5310	-5.70	2.50	10.09	0.00	2.0	40.158	35.838	6.89	4.89	23.97	17.08	8.89	7.74	29.97	21.08
5510	-6.08	2.50	10.10	0.00	2.0	40.266	35.857	6.52	4.49	23.97	17.45	8.52	7.11	29.97	21.45
5550	-5.67	2.50	10.10	0.00	2.0	39.725	35.832	6.93	4.93	23.97	17.04	8.93	7.82	29.97	21.04
5670	-6.24	2.50	10.09	0.00	2.0	39.639	35.832	6.35	4.32	23.97	17.62	8.35	6.84	29.97	21.62
5710	-6.61	2.50	10.09	0.00	2.0	39.756	35.894	5.98	3.96	23.97	17.99	7.98	6.28	29.97	21.99
5755	-5.99	2.50	10.09	0.00	2.0	-	35.860	6.60	4.57	30.00	23.40	8.60	7.24	36.00	27.40
5795	-5.94	2.50	10.09	0.00	2.0	-	35.867	6.65	4.62	30.00	23.35	8.65	7.33	36.00	27.35

Sample Calculation:

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

*The test was conducted by the use of Gate function.

Maximum Conducted Output Power

Report No. 13674969H
Test place Ise EMC Lab. No.6 Measurement Room
Date January 16, 2021
Temperature / Humidity 24 deg. C / 32 % RH
Engineer Nachi Konegawa
Mode Tx

11ac-80 MCS0

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	26 dB EBW (B for FCC) [MHz]	99% OBW (B for IC) [MHz]	Conducted Power				e.i.r.p.			
								Result [dBm]	Limit [dBm]	Margin [dB]	Result [dBm]	Limit [dBm]	Margin [dB]		
5210	-5.69	2.50	10.09	0.00	2.0	-	75.139	6.90	4.90	23.97	17.07	8.90	7.76	29.97	21.07
5290	-5.78	2.50	10.09	0.00	2.0	82.595	75.108	6.81	4.80	23.97	17.16	8.81	7.60	29.97	21.16
5530	-5.80	2.50	10.10	0.00	2.0	81.081	74.969	6.80	4.79	23.97	17.17	8.80	7.59	29.97	21.17
5610	-6.32	2.50	10.09	0.00	2.0	81.048	74.909	6.27	4.24	23.97	17.70	8.27	6.71	29.97	21.70
5690	-6.77	2.50	10.09	0.00	2.0	82.075	75.053	5.82	3.82	23.97	18.15	7.82	6.05	29.97	22.15
5775	-5.83	2.50	10.09	0.00	2.0	-	75.044	6.76	4.74	30.00	23.24	8.76	7.52	36.00	27.24

Sample Calculation:

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

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

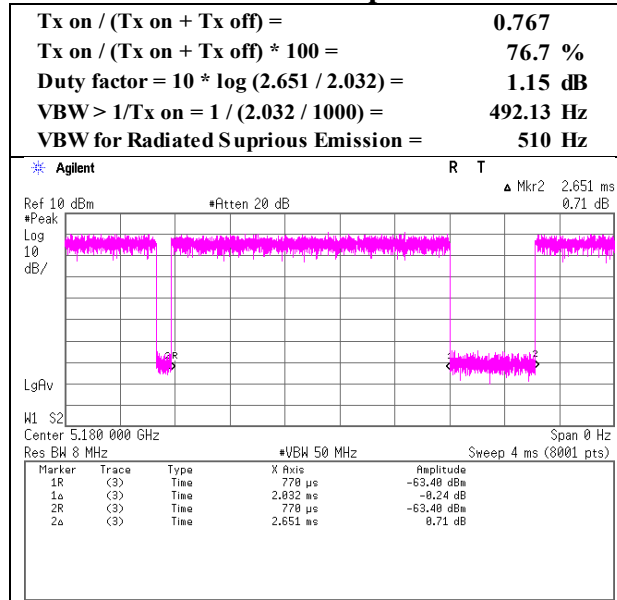
Conducted Power Limit (5250 MHz-5350 MHz, 5470 MHz-5725 MHz) = 250 mW or (11 + 10logB) dBm, whichever is lower

*The test was conducted by the use of Gate function.

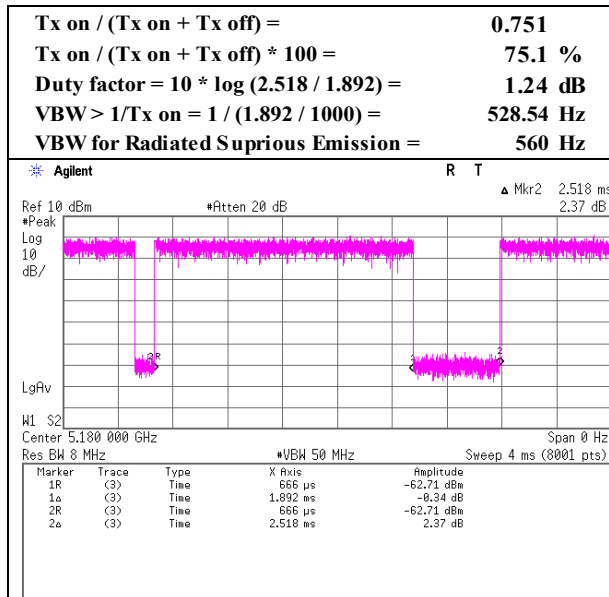
Burst rate confirmation

Report No. 13674969H
 Test place Ise EMC Lab. No.6 Measurement Room
 Date January 16, 2021
 Temperature / Humidity 24 deg. C / 32 % RH
 Engineer Nachi Konegawa
 Mode Tx

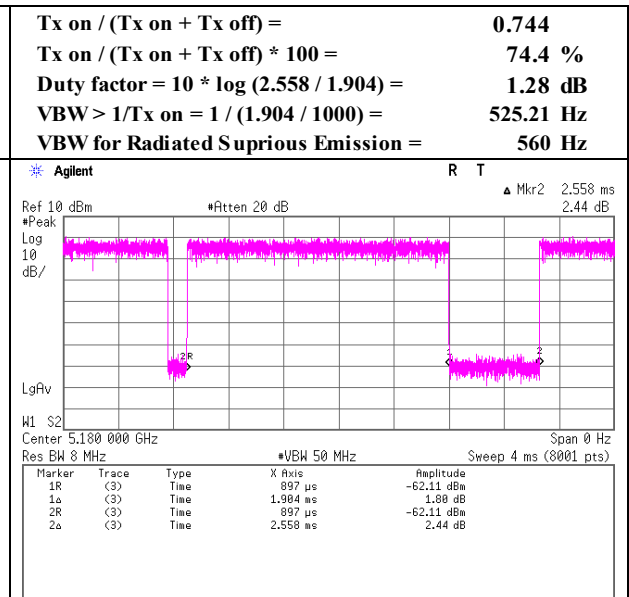
11a 6 Mbps



11n-20 MCS 0



11ac-20 MCS 0

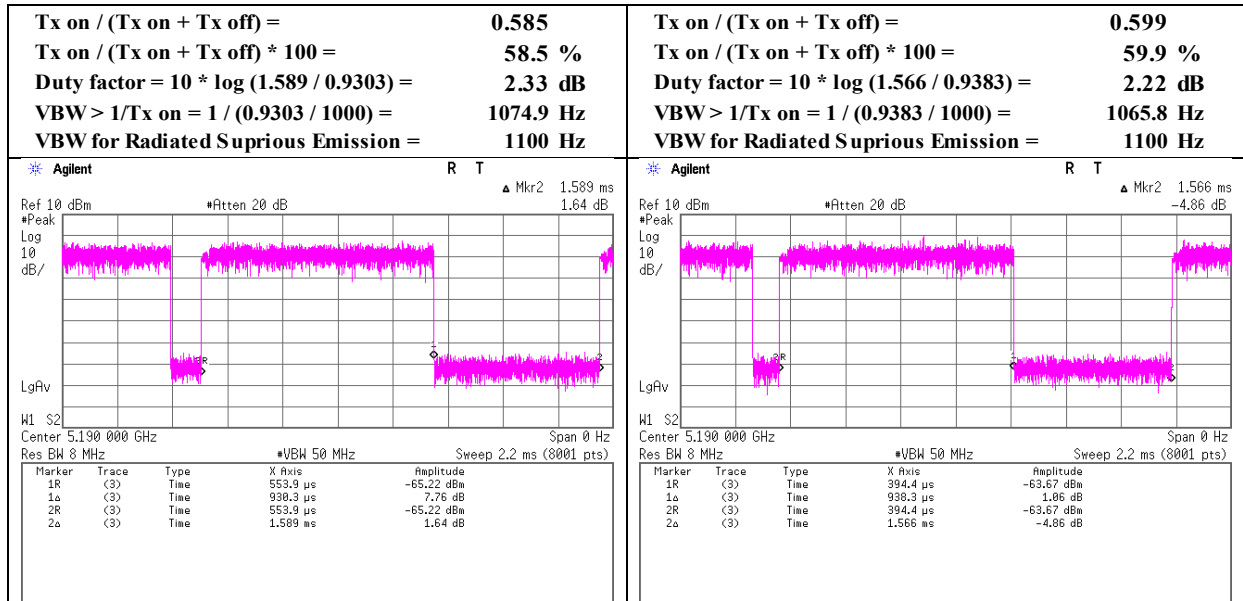


Burst rate confirmation

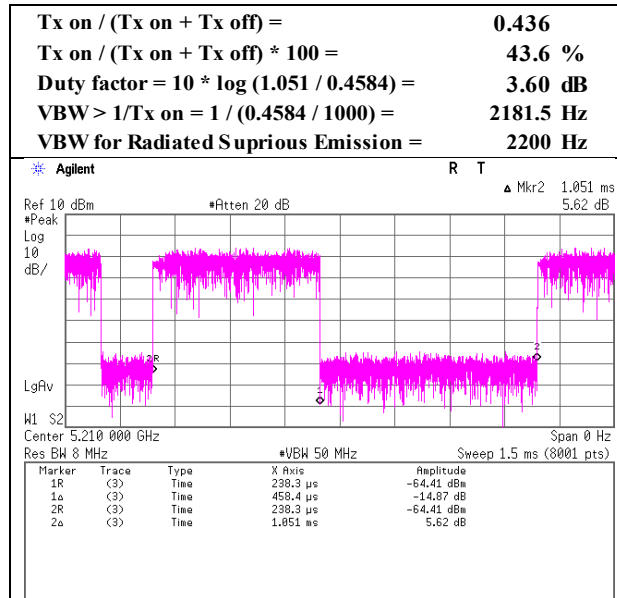
Report No. 13674969H
Test place Ise EMC Lab. No.6 Measurement Room
Date January 16, 2021
Temperature / Humidity 24 deg. C / 32 % RH
Engineer Nachi Konegawa
Mode Tx

11n-40 MCS 0

11ac-40 MCS 0



11ac-80 MCS 0



Radiated Spurious Emission

Report No.	13674969H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 16, 2021	January 17, 2021	January 18, 2021
Temperature / Humidity	21 deg. C / 33 % RH	23 deg. C / 38 % RH	24 deg. C / 34 % RH
Engineer	Akihiko Maeda	Akihiko Maeda	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11ac-20 5180 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5150.000	PK	49.3	32.0	5.8	31.6	-	55.4	73.9	18.5	
Hori.	10360.000	PK	42.2	40.1	-2.9	33.5	-	45.9	73.9	28.0	Floor noise
Hori.	15540.000	PK	43.3	37.4	-1.5	32.5	-	46.8	73.9	27.2	Floor noise
Hori.	20720.000	PK	42.9	37.9	-1.5	33.2	-	46.1	73.9	27.8	Floor noise
Hori.	25900.000	PK	45.9	39.2	-0.6	31.2	-	53.4	73.9	20.5	Floor noise
Hori.	5150.000	AV	31.7	32.0	5.8	31.6	-	37.8	53.9	16.1	
Hori.	10360.000	AV	30.8	40.1	-2.9	33.5	-	34.5	53.9	19.4	Floor noise
Hori.	15540.000	AV	32.3	37.4	-1.5	32.5	-	35.8	53.9	18.2	Floor noise
Hori.	20720.000	AV	37.7	37.9	-1.5	33.2	-	40.8	53.9	13.1	Floor noise
Hori.	25900.000	AV	36.6	39.2	-0.6	31.2	-	44.0	53.9	9.9	Floor noise
Vert.	5150.000	PK	50.9	32.0	5.8	31.6	-	57.0	73.9	16.9	
Vert.	10360.000	PK	42.2	40.1	-2.9	33.5	-	45.9	73.9	28.0	Floor noise
Vert.	15540.000	PK	43.3	37.4	-1.5	32.5	-	46.8	73.9	27.2	Floor noise
Vert.	20720.000	PK	41.0	37.9	-1.5	33.2	-	44.1	73.9	29.8	Floor noise
Vert.	25900.000	PK	43.0	39.2	-0.6	31.2	-	50.5	73.9	23.4	Floor noise
Vert.	5150.000	AV	32.1	32.0	5.8	31.6	-	38.2	53.9	15.7	
Vert.	10360.000	AV	30.8	40.1	-2.9	33.5	-	34.5	53.9	19.4	Floor noise
Vert.	15540.000	AV	32.3	37.4	-1.5	32.5	-	35.8	53.9	18.2	Floor noise
Vert.	20720.000	AV	35.7	37.9	-1.5	33.2	-	38.9	53.9	15.0	Floor noise
Vert.	25900.000	AV	36.0	39.2	-0.6	31.2	-	43.5	53.9	10.4	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log(3.8 m / 3.0 m) = 2.06 dB
 10 GHz - 40 GHz 20log(1.0 m / 3.0 m) = -9.5 dB

* See Burst rate confirmation for VBW calculation.

UL Japan, Inc.

Ise EMC Lab.

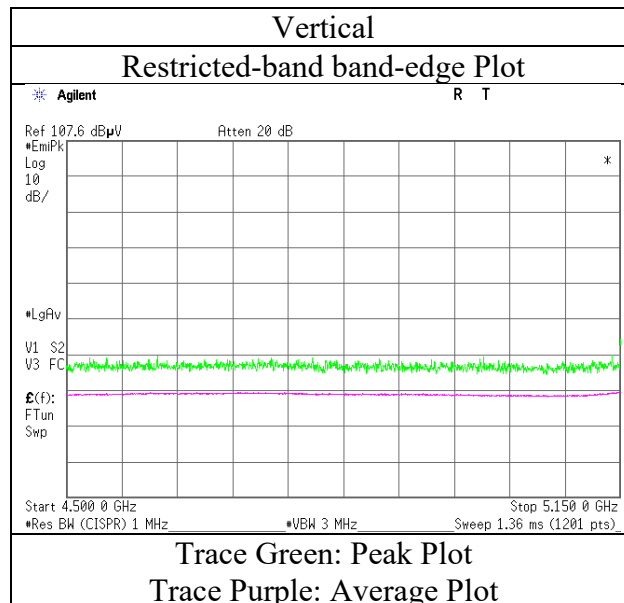
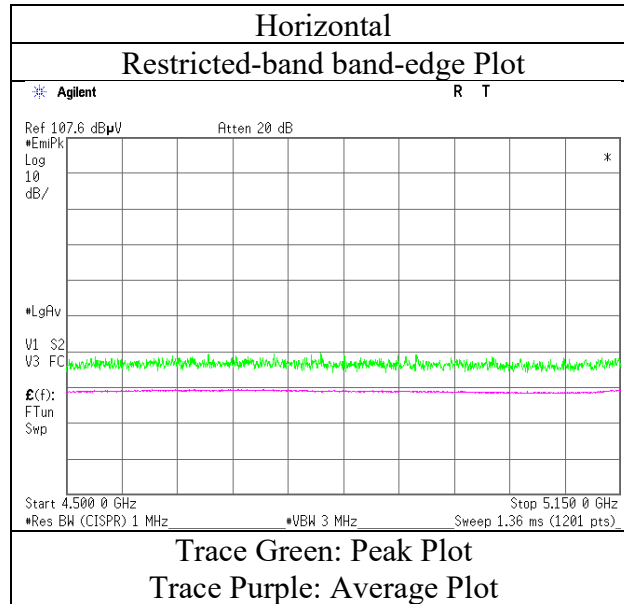
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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Radiated Spurious Emission

Report No. 13674969H
 Test place Ise EMC Lab.
 Semi Anechoic Chamber No.3
 Date January 16, 2021
 Temperature / Humidity 21 deg. C / 33 % RH
 Engineer Akihiko Maeda
 (1 GHz - 10 GHz)
 Mode Tx 11ac-20 5180 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
 Final result of restricted band edge was shown in tabular data.

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Report No.	13674969H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 16, 2021	January 17, 2021	January 18, 2021
Temperature / Humidity	21 deg. C / 33 % RH	23 deg. C / 38 % RH	24 deg. C / 34 % RH
Engineer	Akihiko Maeda (1 GHz - 10 GHz)	Akihiko Maeda (10 GHz - 18 GHz)	Hiroki Numata (18 GHz - 40 GHz)
Mode	Tx 11ac-20 5260 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	10520.000	PK	42.1	39.9	-2.8	33.6	-	45.7	73.9	28.2	Floor noise
Hori.	15780.000	PK	43.2	37.0	-1.4	32.6	-	46.1	73.9	27.8	Floor noise
Hori.	21040.000	PK	43.7	38.0	-1.4	33.3	-	47.0	73.9	26.9	Floor noise
Hori.	26300.000	PK	45.7	39.2	-0.4	30.8	-	53.7	73.9	20.3	Floor noise
Hori.	10520.000	AV	30.7	39.9	-2.8	33.6	-	34.3	53.9	19.6	Floor noise
Hori.	15780.000	AV	32.2	37.0	-1.4	32.6	-	35.1	53.9	18.8	Floor noise
Hori.	21040.000	AV	36.2	38.0	-1.4	33.3	-	39.6	53.9	14.3	Floor noise
Hori.	26300.000	AV	38.1	39.2	-0.4	30.8	-	46.0	53.9	7.9	Floor noise
Vert.	10520.000	PK	42.1	39.9	-2.8	33.6	-	45.7	73.9	28.2	Floor noise
Vert.	15780.000	PK	43.2	37.0	-1.4	32.6	-	46.1	73.9	27.8	Floor noise
Vert.	21040.000	PK	44.0	38.0	-1.4	33.3	-	47.3	73.9	26.6	Floor noise
Vert.	26300.000	PK	46.3	39.2	-0.4	30.8	-	54.3	73.9	19.6	Floor noise
Vert.	10520.000	AV	30.7	39.9	-2.8	33.6	-	34.3	53.9	19.6	Floor noise
Vert.	15780.000	AV	32.2	37.0	-1.4	32.6	-	35.1	53.9	18.8	Floor noise
Vert.	21040.000	AV	36.6	38.0	-1.4	33.3	-	39.9	53.9	14.0	Floor noise
Vert.	26300.000	AV	38.8	39.2	-0.4	30.8	-	46.7	53.9	7.2	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log(3.8 m / 3.0 m) = 2.06 dB
 10 GHz - 40 GHz 20log(1.0 m / 3.0 m) = -9.5 dB

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No.	13674969H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 16, 2021	January 17, 2021	January 18, 2021
Temperature / Humidity	21 deg. C / 33 % RH	23 deg. C / 38 % RH	24 deg. C / 34 % RH
Engineer	Akihiko Maeda (1 GHz - 10 GHz)	Akihiko Maeda (10 GHz - 18 GHz)	Hiroki Numata (18 GHz - 40 GHz)
Mode	Tx 11ac-20 5320 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5350.000	PK	51.5	31.5	5.8	31.7	-	57.2	73.9	16.7	
Hori.	10640.000	PK	42.0	39.9	-2.7	33.6	-	45.6	73.9	28.3	Floor noise
Hori.	15960.000	PK	43.3	37.6	-1.3	32.8	-	46.8	73.9	27.1	Floor noise
Hori.	21280.000	PK	43.2	38.1	-1.4	33.1	-	46.8	73.9	27.1	Floor noise
Hori.	5350.000	AV	32.9	31.5	5.8	31.7	-	38.6	53.9	15.3	
Hori.	10640.000	AV	30.5	39.9	-2.7	33.6	-	34.1	53.9	19.8	Floor noise
Hori.	15960.000	AV	32.0	37.6	-1.3	32.8	-	35.5	53.9	18.4	Floor noise
Hori.	21280.000	AV	36.0	38.1	-1.4	33.1	-	39.6	53.9	14.3	Floor noise
Vert.	5350.000	PK	52.1	31.5	5.8	31.7	-	57.8	73.9	16.1	
Vert.	10640.000	PK	42.0	39.9	-2.7	33.6	-	45.6	73.9	28.3	Floor noise
Vert.	15960.000	PK	43.3	37.6	-1.3	32.8	-	46.8	73.9	27.1	Floor noise
Vert.	21280.000	PK	42.8	38.1	-1.4	33.1	-	46.4	73.9	27.6	Floor noise
Vert.	5350.000	AV	33.7	31.5	5.8	31.7	-	39.4	53.9	14.5	
Vert.	10640.000	AV	30.5	39.9	-2.7	33.6	-	34.1	53.9	19.8	Floor noise
Vert.	15960.000	AV	32.0	37.6	-1.3	32.8	-	35.5	53.9	18.4	Floor noise
Vert.	21280.000	AV	35.8	38.1	-1.4	33.1	-	39.4	53.9	14.6	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

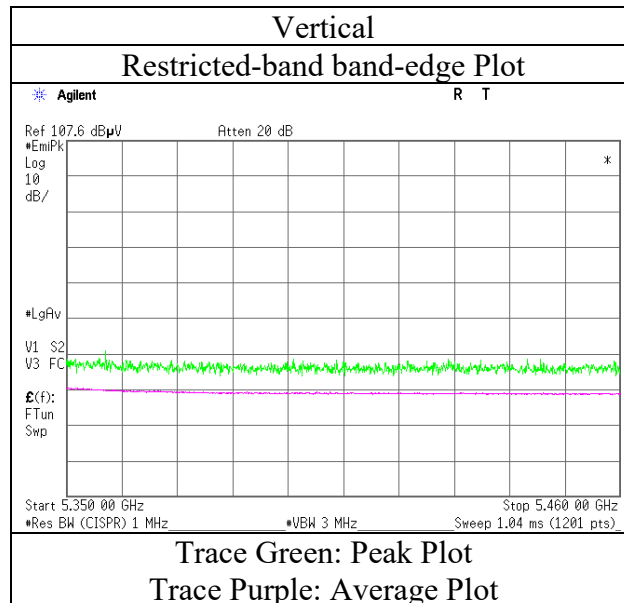
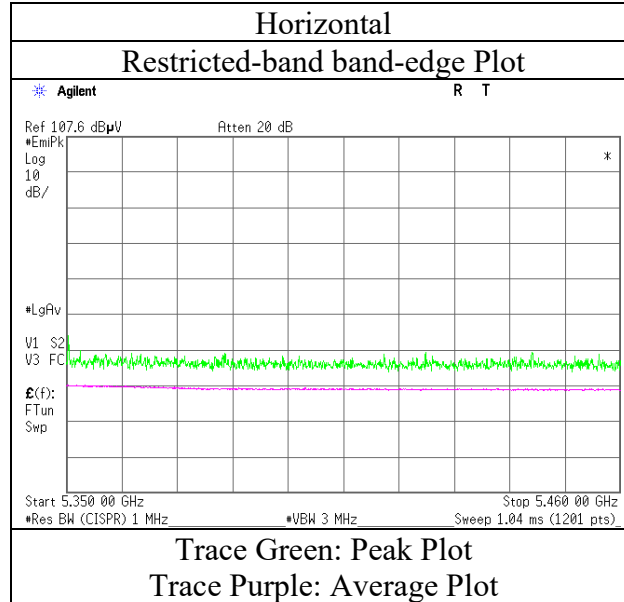
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.06\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No. 13674969H
 Test place Ise EMC Lab.
 Semi Anechoic Chamber No.3
 Date January 16, 2021
 Temperature / Humidity 21 deg. C / 33 % RH
 Engineer Akihiko Maeda
 Mode Tx 11ac-20 5320 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

Final result of restricted band edge was shown in tabular data.

UL Japan, Inc.

Ise EMC Lab.

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Radiated Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3 No.3 No.3
Date January 16, 2021 January 17, 2021 January 18, 2021
Temperature / Humidity 21 deg. C / 33 % RH 23 deg. C / 38 % RH 24 deg. C / 34 % RH
Engineer Akihiko Maeda Akihiko Maeda Hiroki Numata
(1 GHz - 10 GHz) (10 GHz - 18 GHz) (18 GHz - 40 GHz)
Mode Tx 11ac-20 5500 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5460.000	PK	48.4	31.7	5.9	31.7	-	54.2	68.2	14.0	
Hori.	5470.000	PK	51.6	31.7	5.9	31.7	-	57.5	68.2	10.7	
Hori.	11000.000	PK	42.7	40.0	-2.6	33.6	-	46.5	73.9	27.4	Floor noise
Hori.	16500.000	PK	43.5	39.5	-1.1	32.7	-	49.2	73.9	24.7	Floor noise
Hori.	22000.000	PK	45.5	38.0	-1.4	32.4	-	49.7	73.9	24.2	Floor noise
Hori.	5460.000	AV	32.5	31.7	5.9	31.7	-	38.3	53.9	15.6	
Hori.	11000.000	AV	31.5	40.0	-2.6	33.6	-	35.3	53.9	18.6	Floor noise
Hori.	16500.000	AV	32.1	39.5	-1.1	32.7	-	37.8	53.9	16.1	Floor noise
Hori.	22000.000	AV	37.0	38.0	-1.4	32.4	-	41.2	53.9	12.8	Floor noise
Vert.	5460.000	PK	47.7	31.7	5.9	31.7	-	53.5	68.2	14.7	
Vert.	5470.000	PK	51.5	31.7	5.9	31.7	-	57.4	68.2	10.8	
Vert.	11000.000	PK	42.7	40.0	-2.6	33.6	-	46.5	73.9	27.4	Floor noise
Vert.	16500.000	PK	43.5	39.5	-1.1	32.7	-	49.2	73.9	24.7	Floor noise
Vert.	22000.000	PK	45.5	38.0	-1.4	32.4	-	49.7	73.9	24.2	Floor noise
Vert.	5460.000	AV	31.9	31.7	5.9	31.7	-	37.7	53.9	16.2	
Vert.	11000.000	AV	31.5	40.0	-2.6	33.6	-	35.3	53.9	18.6	Floor noise
Vert.	16500.000	AV	32.1	39.5	-1.1	32.7	-	37.8	53.9	16.1	Floor noise
Vert.	22000.000	AV	36.6	38.0	-1.4	32.4	-	40.8	53.9	13.2	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

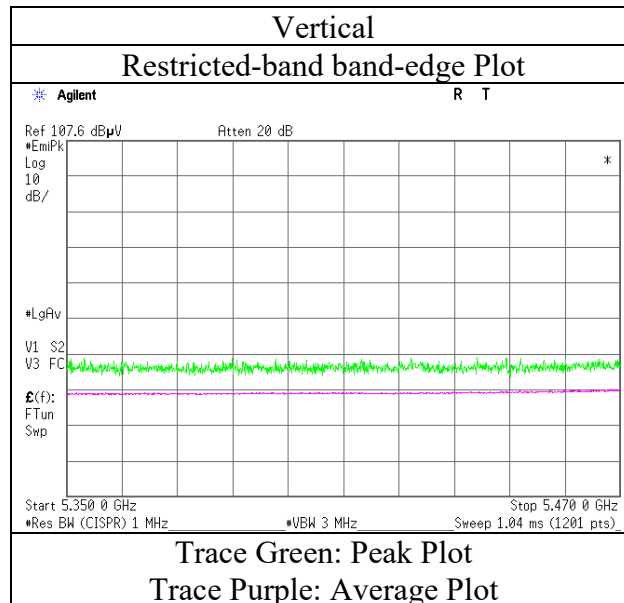
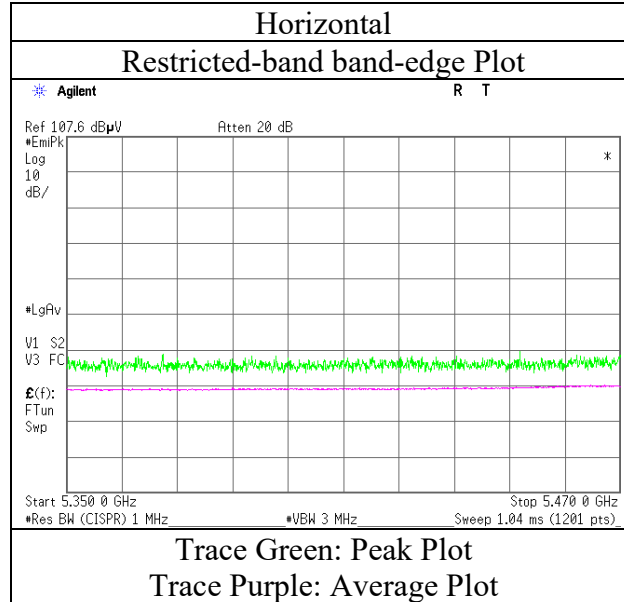
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date January 16, 2021
Temperature / Humidity 21 deg. C / 33 % RH
Engineer Akihiko Maeda
Mode Tx 11ac-20 5500 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13674969H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.2
Date	January 16, 2021	January 17, 2021	January 18, 2021	January 18, 2021
Temperature / Humidity	21 deg. C / 33 % RH	23 deg. C / 38 % RH	24 deg. C / 34 % RH	21 deg. C / 34 % RH
Engineer	Akihiko Maeda	Akihiko Maeda	Hiroki Numata	Ken Fujita
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)	(Below 1GHz)
Mode	Tx 11ac-20 5580 MHz			

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	35.657	QP	21.1	16.4	6.8	28.6	-	15.7	40.0	24.3	Floor noise
Hori.	73.227	QP	21.6	6.2	7.2	28.6	-	6.4	40.0	33.6	Floor noise
Hori.	124.897	QP	22.1	13.2	7.7	28.4	-	14.5	43.5	29.0	Floor noise
Hori.	279.175	QP	21.3	13.4	8.7	27.8	-	15.6	46.0	30.4	Floor noise
Hori.	503.879	QP	22.0	17.8	9.8	29.2	-	20.4	46.0	25.6	Floor noise
Hori.	854.000	QP	21.5	21.6	11.2	29.0	-	25.2	46.0	20.8	Floor noise
Hori.	11160.000	PK	42.8	39.6	-2.5	33.6	-	46.3	73.9	27.6	Floor noise
Hori.	16740.000	PK	43.9	40.9	-1.0	32.7	-	51.1	73.9	22.8	Floor noise
Hori.	22320.000	PK	45.3	38.1	-1.4	32.4	-	49.7	73.9	24.2	Floor noise
Hori.	11160.000	AV	31.2	39.6	-2.5	33.6	-	34.7	53.9	19.2	Floor noise
Hori.	16740.000	AV	32.1	40.9	-1.0	32.7	-	39.3	53.9	14.6	Floor noise
Hori.	22320.000	AV	37.0	38.1	-1.4	32.4	-	41.4	53.9	12.5	Floor noise
Vert.	35.657	QP	21.3	16.4	6.8	28.6	-	15.9	40.0	24.1	Floor noise
Vert.	73.227	QP	22.1	6.2	7.2	28.6	-	6.9	40.0	33.1	Floor noise
Vert.	124.897	QP	21.8	13.2	7.7	28.4	-	14.2	43.5	29.3	Floor noise
Vert.	279.175	QP	22.1	13.4	8.7	27.8	-	16.4	46.0	29.6	Floor noise
Vert.	503.879	QP	21.7	17.8	9.8	29.2	-	20.1	46.0	25.9	Floor noise
Vert.	854.000	QP	22.2	21.6	11.2	29.0	-	25.9	46.0	20.1	Floor noise
Vert.	11160.000	PK	42.8	39.6	-2.5	33.6	-	46.3	73.9	27.6	Floor noise
Vert.	16740.000	PK	43.9	40.9	-1.0	32.7	-	51.1	73.9	22.8	Floor noise
Vert.	22320.000	PK	45.0	38.1	-1.4	32.4	-	49.4	73.9	24.5	Floor noise
Vert.	11160.000	AV	31.2	39.6	-2.5	33.6	-	34.7	53.9	19.2	Floor noise
Vert.	16740.000	AV	32.1	40.9	-1.0	32.7	-	39.3	53.9	14.6	Floor noise
Vert.	22320.000	AV	37.3	38.1	-1.4	32.4	-	41.7	53.9	12.2	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No.	13674969H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 16, 2021	January 17, 2021	January 18, 2021
Temperature / Humidity	21 deg. C / 33 % RH	23 deg. C / 38 % RH	24 deg. C / 34 % RH
Engineer	Akihiko Maeda (1 GHz - 10 GHz)	Akihiko Maeda (10 GHz - 18 GHz)	Hiroki Numata (18 GHz - 40 GHz)
Mode	Tx 11ac-20 5700 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5725.000	PK	53.4	32.0	6.0	31.8	-	59.5	68.2	8.7	
Hori.	11400.000	PK	42.5	39.9	-2.5	33.5	-	46.4	73.9	27.5	Floor noise
Hori.	17100.000	PK	44.1	42.0	-0.9	32.6	-	52.6	73.9	21.3	Floor noise
Hori.	22800.000	PK	45.8	38.4	-1.3	32.3	-	50.6	73.9	23.3	Floor noise
Hori.	11400.000	AV	30.8	39.9	-2.5	33.5	-	34.7	53.9	19.2	Floor noise
Hori.	17100.000	AV	32.3	42.0	-0.9	32.6	-	40.8	53.9	13.1	Floor noise
Hori.	22800.000	AV	37.6	38.4	-1.3	32.3	-	42.4	53.9	11.6	Floor noise
Vert.	5725.000	PK	52.2	32.0	6.0	31.8	-	58.3	68.2	9.9	
Vert.	11400.000	PK	42.5	39.9	-2.5	33.5	-	46.4	73.9	27.5	Floor noise
Vert.	17100.000	PK	44.1	42.0	-0.9	32.6	-	52.6	73.9	21.3	Floor noise
Vert.	22800.000	PK	45.9	38.4	-1.3	32.3	-	50.7	73.9	23.2	Floor noise
Vert.	11400.000	AV	30.8	39.9	-2.5	33.5	-	34.7	53.9	19.2	Floor noise
Vert.	17100.000	AV	32.3	42.0	-0.9	32.6	-	40.8	53.9	13.1	Floor noise
Vert.	22800.000	AV	37.9	38.4	-1.3	32.3	-	42.7	53.9	11.2	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

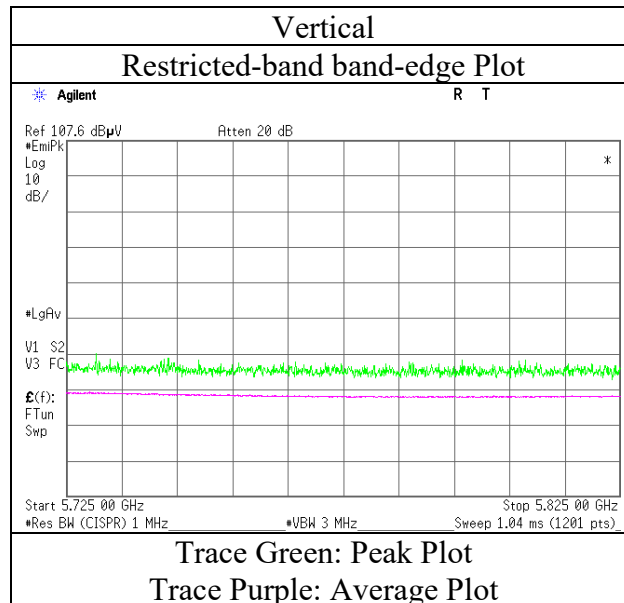
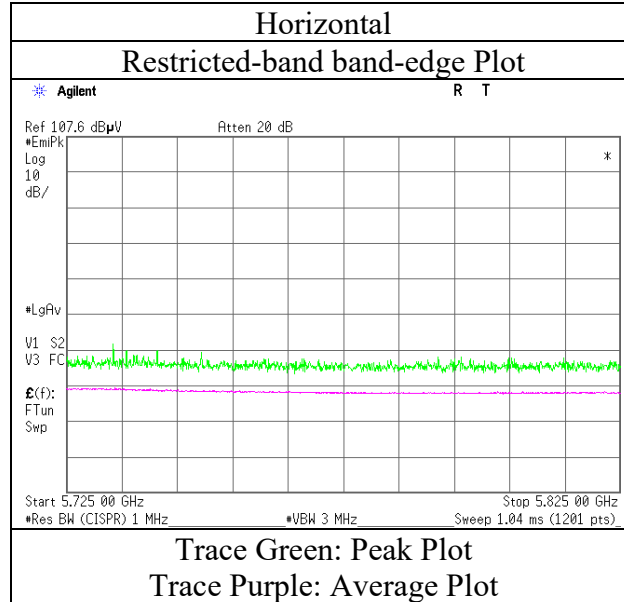
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.06\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date January 16, 2021
Temperature / Humidity 21 deg. C / 33 % RH
Engineer Akihiko Maeda
Mode Tx 11ac-20 5700 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13674969H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 16, 2021	January 17, 2021	January 18, 2021
Temperature / Humidity	21 deg. C / 33 % RH	23 deg. C / 38 % RH	24 deg. C / 34 % RH
Engineer	Akihiko Maeda (1 GHz - 10 GHz)	Akihiko Maeda (10 GHz - 18 GHz)	Hiroki Numata (18 GHz - 40 GHz)
Mode	Tx 11ac-20 5745 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5650.000	PK	41.4	31.7	5.9	31.8	-	47.2	68.2	21.0	
Hori.	5700.000	PK	45.8	31.8	6.0	31.8	-	51.8	105.2	53.4	
Hori.	5720.000	PK	53.4	31.9	6.0	31.8	-	59.5	110.8	51.3	
Hori.	5725.000	PK	56.1	32.0	6.0	31.8	-	62.2	122.2	60.0	
Hori.	11490.000	PK	41.9	39.7	-2.4	33.5	-	45.7	73.9	28.2	Floor noise
Hori.	17235.000	PK	43.8	42.6	-0.9	32.7	-	52.8	73.9	21.2	Floor noise
Hori.	22980.000	PK	45.5	38.5	-1.2	32.3	-	50.5	73.9	23.4	Floor noise
Hori.	11490.000	AV	30.4	39.7	-2.4	33.5	-	34.2	53.9	19.7	Floor noise
Hori.	17235.000	AV	32.4	42.6	-0.9	32.7	-	41.4	53.9	12.6	Floor noise
Hori.	22980.000	AV	36.8	38.5	-1.2	32.3	-	41.8	53.9	12.1	Floor noise
Vert.	5650.000	PK	42.0	31.7	5.9	31.8	-	47.8	68.2	20.4	
Vert.	5700.000	PK	44.5	31.8	6.0	31.8	-	50.5	105.2	54.7	
Vert.	5720.000	PK	53.9	31.9	6.0	31.8	-	60.0	110.8	50.8	
Vert.	5725.000	PK	55.7	32.0	6.0	31.8	-	61.8	122.2	60.4	
Vert.	11490.000	PK	41.9	39.7	-2.4	33.5	-	45.7	73.9	28.2	Floor noise
Vert.	17235.000	PK	43.8	42.6	-0.9	32.7	-	52.8	73.9	21.2	Floor noise
Vert.	22980.000	PK	45.0	38.5	-1.2	32.3	-	49.9	73.9	24.0	Floor noise
Vert.	11490.000	AV	30.4	39.7	-2.4	33.5	-	34.2	53.9	19.7	Floor noise
Vert.	17235.000	AV	32.4	42.6	-0.9	32.7	-	41.4	53.9	12.6	Floor noise
Vert.	22980.000	AV	37.1	38.5	-1.2	32.3	-	42.1	53.9	11.9	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

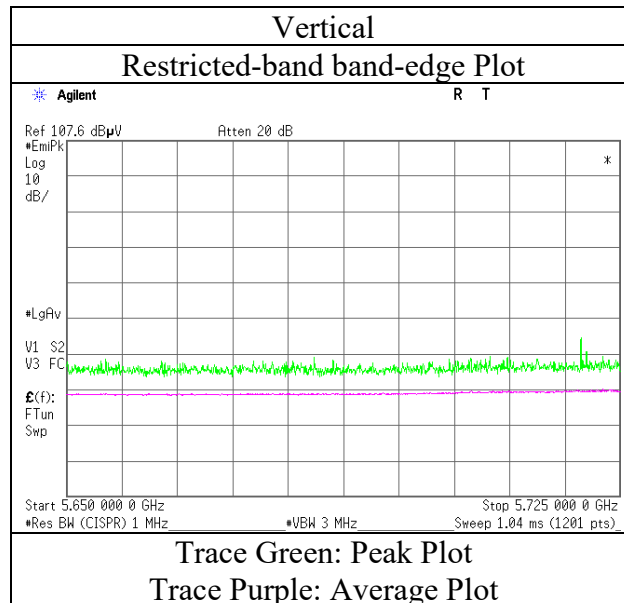
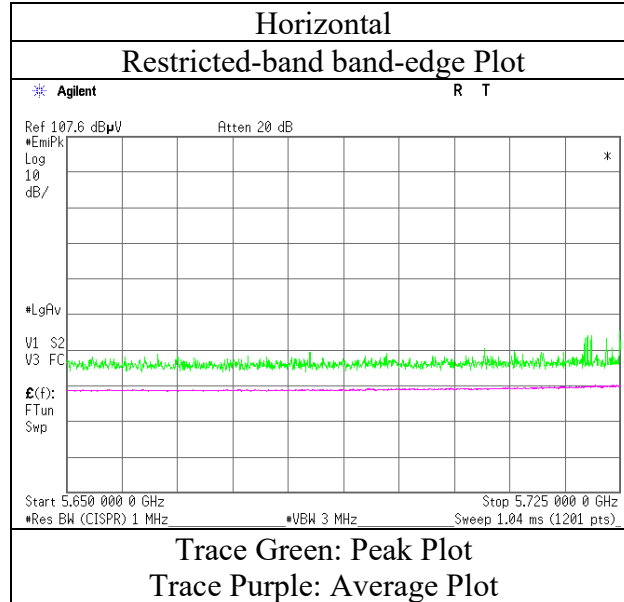
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.06\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date January 16, 2021
Temperature / Humidity 21 deg. C / 33 % RH
Engineer Akihiko Maeda
Mode Tx 11ac-20 5745 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

Final result of restricted band edge was shown in tabular data.

UL Japan, Inc.

Ise EMC Lab.

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Radiated Spurious Emission

Report No.	13674969H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 16, 2021	January 17, 2021	January 18, 2021
Temperature / Humidity	21 deg. C / 33 % RH	23 deg. C / 38 % RH	24 deg. C / 34 % RH
Engineer	Akihiko Maeda (1 GHz - 10 GHz)	Akihiko Maeda (10 GHz - 18 GHz)	Hiroki Numata (18 GHz - 40 GHz)
Mode	Tx 11ac-20 5785 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	11570.000	PK	42.1	39.5	-2.4	33.4	-	45.7	73.9	28.2	Floor noise
Hori.	17355.000	PK	43.8	43.7	-0.9	32.7	-	53.9	73.9	20.0	Floor noise
Hori.	23140.000	PK	43.1	38.5	-1.2	32.2	-	48.2	73.9	25.7	Floor noise
Hori.	11570.000	AV	30.5	39.5	-2.4	33.4	-	34.1	53.9	19.8	Floor noise
Hori.	17355.000	AV	32.1	43.7	-0.9	32.7	-	42.2	53.9	11.7	Floor noise
Hori.	23140.000	AV	37.5	38.5	-1.2	32.2	-	42.7	53.9	11.2	Floor noise
Vert.	11570.000	PK	42.1	39.5	-2.4	33.4	-	45.7	73.9	28.2	Floor noise
Vert.	17355.000	PK	43.8	43.7	-0.9	32.7	-	53.9	73.9	20.0	Floor noise
Vert.	23140.000	PK	43.8	38.5	-1.2	32.2	-	48.9	73.9	25.0	Floor noise
Vert.	11570.000	AV	30.5	39.5	-2.4	33.4	-	34.1	53.9	19.8	Floor noise
Vert.	17355.000	AV	32.1	43.7	-0.9	32.7	-	42.2	53.9	11.7	Floor noise
Vert.	23140.000	AV	37.1	38.5	-1.2	32.2	-	42.2	53.9	11.7	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3 No.3 No.3
Date January 16, 2021 January 17, 2021 January 18, 2021
Temperature / Humidity 21 deg. C / 33 % RH 23 deg. C / 38 % RH 24 deg. C / 34 % RH
Engineer Akihiko Maeda Akihiko Maeda Hiroki Numata
(1 GHz - 10 GHz) (10 GHz - 18 GHz) (18 GHz - 40 GHz)
Mode Tx 11ac-20 5825 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5850.000	PK	53.6	32.3	6.0	31.8	-	60.1	122.2	62.1	
Hori.	5855.000	PK	51.0	32.3	6.0	31.8	-	57.5	110.8	53.3	
Hori.	5875.000	PK	42.4	32.3	6.0	31.8	-	48.9	105.2	56.3	
Hori.	5925.000	PK	41.0	32.4	6.0	31.9	-	47.6	68.2	20.7	
Hori.	11650.000	PK	42.0	39.2	-2.4	33.4	-	45.4	73.9	28.5	Floor noise
Hori.	17475.000	PK	43.6	44.6	-0.9	32.7	-	54.6	73.9	19.3	Floor noise
Hori.	23300.000	PK	45.7	38.6	-1.1	32.2	-	51.0	73.9	22.9	Floor noise
Hori.	11650.000	AV	31.1	39.2	-2.4	33.4	-	34.5	53.9	19.4	Floor noise
Hori.	17475.000	AV	31.9	44.6	-0.9	32.7	-	42.9	53.9	11.0	Floor noise
Hori.	23300.000	AV	37.5	38.6	-1.1	32.2	-	42.8	53.9	11.1	Floor noise
Vert.	5850.000	PK	52.6	32.3	6.0	31.8	-	59.1	122.2	63.1	
Vert.	5855.000	PK	50.1	32.3	6.0	31.8	-	56.6	110.8	54.2	
Vert.	5875.000	PK	41.7	32.3	6.0	31.8	-	48.2	105.2	57.0	
Vert.	5925.000	PK	40.5	32.4	6.0	31.9	-	47.1	68.2	21.2	
Vert.	11650.000	PK	42.0	39.2	-2.4	33.4	-	45.4	73.9	28.5	Floor noise
Vert.	17475.000	PK	43.6	44.6	-0.9	32.7	-	54.6	73.9	19.3	Floor noise
Vert.	23300.000	PK	45.1	38.6	-1.1	32.2	-	50.4	73.9	23.5	Floor noise
Vert.	11650.000	AV	31.1	39.2	-2.4	33.4	-	34.5	53.9	19.4	Floor noise
Vert.	17475.000	AV	31.9	44.6	-0.9	32.7	-	42.9	53.9	11.0	Floor noise
Vert.	23300.000	AV	37.2	38.6	-1.1	32.2	-	42.6	53.9	11.4	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

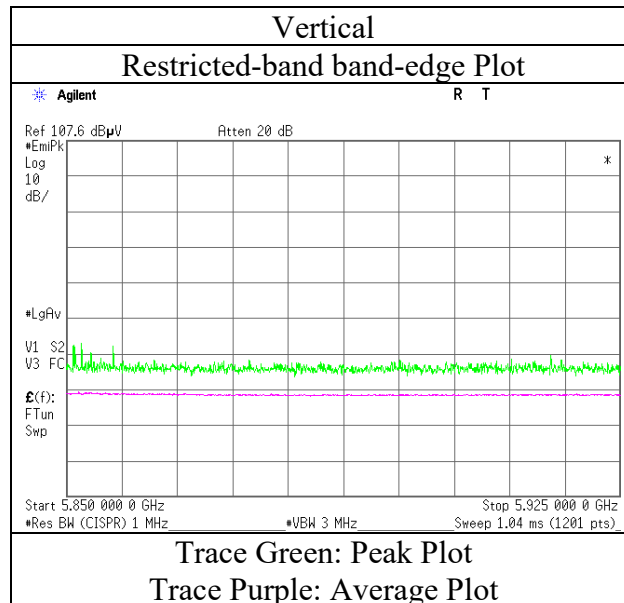
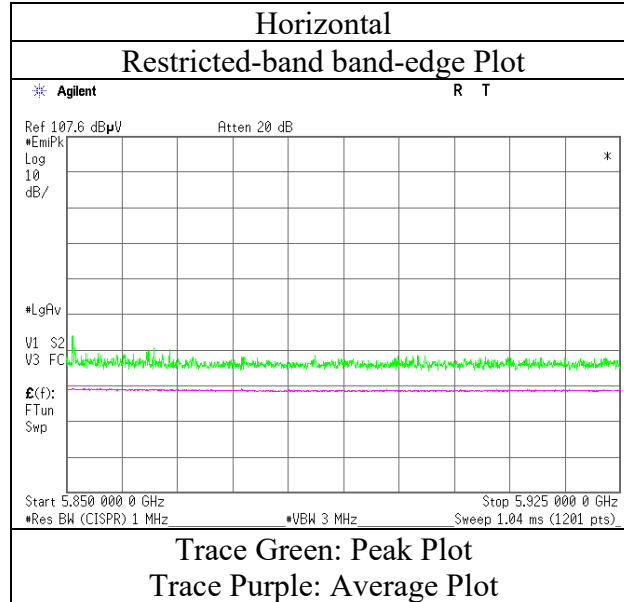
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date January 16, 2021
Temperature / Humidity 21 deg. C / 33 % RH
Engineer Akihiko Maeda
Mode Tx 11ac-20 5825 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13674969H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 16, 2021	January 17, 2021	January 18, 2021
Temperature / Humidity	21 deg. C / 33 % RH	23 deg. C / 38 % RH	24 deg. C / 34 % RH
Engineer	Akihiko Maeda	Akihiko Maeda	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11ac-40 5190 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5150.000	PK	52.8	32.0	5.8	31.6	-	58.9	73.9	15.0	
Hori.	10380.000	PK	42.1	40.0	-2.9	33.5	-	45.8	73.9	28.2	Floor noise
Hori.	15570.000	PK	43.5	37.2	-1.5	32.5	-	46.7	73.9	27.2	Floor noise
Hori.	20760.000	PK	45.7	37.9	-1.5	33.2	-	48.9	73.9	25.0	Floor noise
Hori.	25950.000	PK	46.3	39.2	-0.5	31.2	-	53.7	73.9	20.2	Floor noise
Hori.	5150.000	AV	33.1	32.0	5.8	31.6	-	39.2	53.9	14.7	
Hori.	10380.000	AV	31.6	40.0	-2.9	33.5	-	35.3	53.9	18.7	Floor noise
Hori.	15570.000	AV	32.5	37.2	-1.5	32.5	-	35.7	53.9	18.2	Floor noise
Hori.	20760.000	AV	37.9	37.9	-1.5	33.2	-	41.0	53.9	12.9	Floor noise
Hori.	25950.000	AV	37.8	39.2	-0.5	31.2	-	45.2	53.9	8.7	Floor noise
Vert.	5150.000	PK	54.8	32.0	5.8	31.6	-	60.9	73.9	13.0	
Vert.	10380.000	PK	42.1	40.0	-2.9	33.5	-	45.8	73.9	28.2	Floor noise
Vert.	15570.000	PK	43.5	37.2	-1.5	32.5	-	46.7	73.9	27.2	Floor noise
Vert.	20760.000	PK	45.2	37.9	-1.5	33.2	-	48.4	73.9	25.5	Floor noise
Vert.	25950.000	PK	46.5	39.2	-0.5	31.2	-	53.9	73.9	20.0	Floor noise
Vert.	5150.000	AV	33.8	32.0	5.8	31.6	-	39.9	53.9	14.0	
Vert.	10380.000	AV	31.6	40.0	-2.9	33.5	-	35.3	53.9	18.7	Floor noise
Vert.	15570.000	AV	32.5	37.2	-1.5	32.5	-	35.7	53.9	18.2	Floor noise
Vert.	20760.000	AV	37.3	37.9	-1.5	33.2	-	40.5	53.9	13.4	Floor noise
Vert.	25950.000	AV	38.8	39.2	-0.5	31.2	-	46.2	53.9	7.7	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

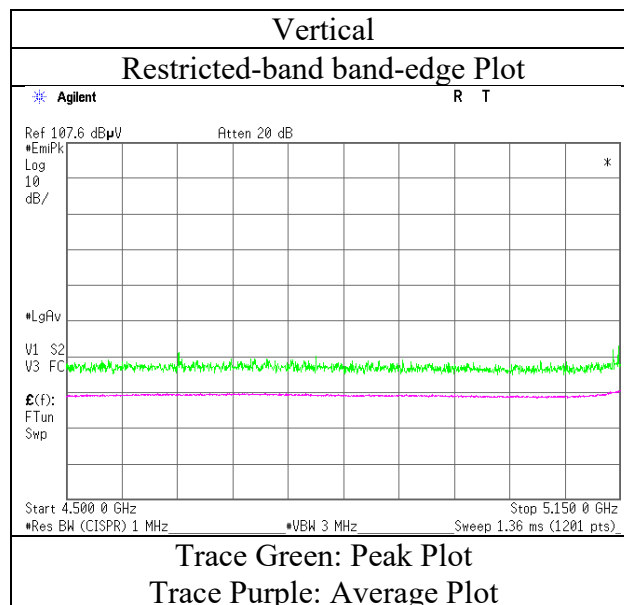
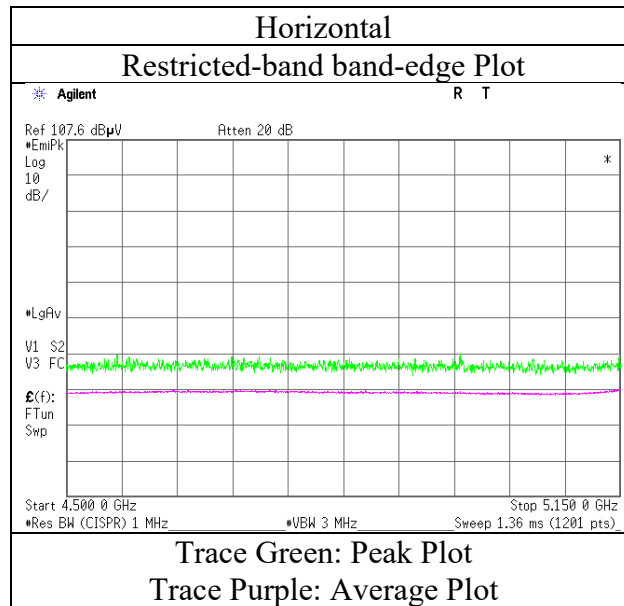
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No. 13674969H
 Test place Ise EMC Lab.
 Semi Anechoic Chamber No.3
 Date January 16, 2021
 Temperature / Humidity 21 deg. C / 33 % RH
 Engineer Akihiko Maeda
 (1 GHz - 10 GHz)
 Mode Tx 11ac-40 5190 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
 Final result of restricted band edge was shown in tabular data.

UL Japan, Inc.

Ise EMC Lab.

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Radiated Spurious Emission

Report No.	13674969H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 16, 2021	January 17, 2021	January 18, 2021
Temperature / Humidity	21 deg. C / 33 % RH	23 deg. C / 38 % RH	24 deg. C / 34 % RH
Engineer	Akihiko Maeda (1 GHz - 10 GHz)	Akihiko Maeda (10 GHz - 18 GHz)	Hiroki Numata (18 GHz - 40 GHz)
Mode	Tx 11ac-40 5270 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	10540.000	PK	42.0	39.9	-2.8	33.6	-	45.6	73.9	28.3	Floor noise
Hori.	15810.000	PK	43.6	36.8	-1.4	32.7	-	46.3	73.9	27.6	Floor noise
Hori.	21080.000	PK	42.7	38.0	-1.4	33.2	-	46.1	73.9	27.9	Floor noise
Hori.	26350.000	PK	45.3	39.2	-0.4	30.8	-	53.3	73.9	20.6	Floor noise
Hori.	10540.000	AV	31.3	39.9	-2.8	33.6	-	34.9	53.9	19.0	Floor noise
Hori.	15810.000	AV	32.7	36.8	-1.4	32.7	-	35.4	53.9	18.5	Floor noise
Hori.	21080.000	AV	35.6	38.0	-1.4	33.2	-	38.9	53.9	15.0	Floor noise
Hori.	26350.000	AV	38.3	39.2	-0.4	30.8	-	46.4	53.9	7.6	Floor noise
Vert.	10540.000	PK	42.0	39.9	-2.8	33.6	-	45.6	73.9	28.3	Floor noise
Vert.	15810.000	PK	43.6	36.8	-1.4	32.7	-	46.3	73.9	27.6	Floor noise
Vert.	21080.000	PK	42.1	38.0	-1.4	33.2	-	45.5	73.9	28.4	Floor noise
Vert.	26350.000	PK	45.2	39.2	-0.4	30.8	-	53.2	73.9	20.7	Floor noise
Vert.	10540.000	AV	31.3	39.9	-2.8	33.6	-	34.9	53.9	19.0	Floor noise
Vert.	15810.000	AV	32.7	36.8	-1.4	32.7	-	35.4	53.9	18.5	Floor noise
Vert.	21080.000	AV	35.8	38.0	-1.4	33.2	-	39.1	53.9	14.8	Floor noise
Vert.	26350.000	AV	38.7	39.2	-0.4	30.8	-	46.7	53.9	7.2	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No.	13674969H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 16, 2021	January 17, 2021	January 18, 2021
Temperature / Humidity	21 deg. C / 33 % RH	23 deg. C / 38 % RH	24 deg. C / 34 % RH
Engineer	Akihiko Maeda (1 GHz - 10 GHz)	Akihiko Maeda (10 GHz - 18 GHz)	Hiroki Numata (18 GHz - 40 GHz)
Mode	Tx 11ac-40 5310 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5350.000	PK	54.3	31.5	5.8	31.7	-	60.0	73.9	13.9	
Hori.	10620.000	PK	42.7	39.9	-2.7	33.6	-	46.3	73.9	27.6	Floor noise
Hori.	15930.000	PK	43.6	37.3	-1.3	32.7	-	46.9	73.9	27.0	Floor noise
Hori.	21240.000	PK	41.5	38.1	-1.4	33.1	-	45.0	73.9	28.9	Floor noise
Hori.	5350.000	AV	33.9	31.5	5.8	31.7	-	39.6	53.9	14.3	
Hori.	10620.000	AV	30.9	39.9	-2.7	33.6	-	34.5	53.9	19.4	Floor noise
Hori.	15930.000	AV	32.3	37.3	-1.3	32.7	-	35.6	53.9	18.3	Floor noise
Hori.	21240.000	AV	33.7	38.1	-1.4	33.1	-	37.2	53.9	16.7	Floor noise
Vert.	5350.000	PK	54.8	31.5	5.8	31.7	-	60.5	73.9	13.4	
Vert.	10620.000	PK	42.7	39.9	-2.7	33.6	-	46.3	73.9	27.6	Floor noise
Vert.	15930.000	PK	43.6	37.3	-1.3	32.7	-	46.9	73.9	27.0	Floor noise
Vert.	21240.000	PK	41.7	38.1	-1.4	33.1	-	45.3	73.9	28.6	Floor noise
Vert.	5350.000	AV	34.0	31.5	5.8	31.7	-	39.7	53.9	14.2	
Vert.	10620.000	AV	30.9	39.9	-2.7	33.6	-	34.5	53.9	19.4	Floor noise
Vert.	15930.000	AV	32.3	37.3	-1.3	32.7	-	35.6	53.9	18.3	Floor noise
Vert.	21240.000	AV	33.4	38.1	-1.4	33.1	-	36.9	53.9	17.0	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

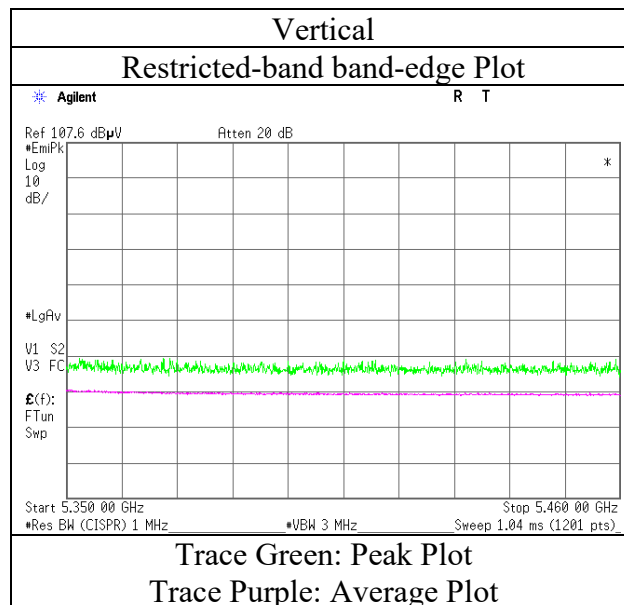
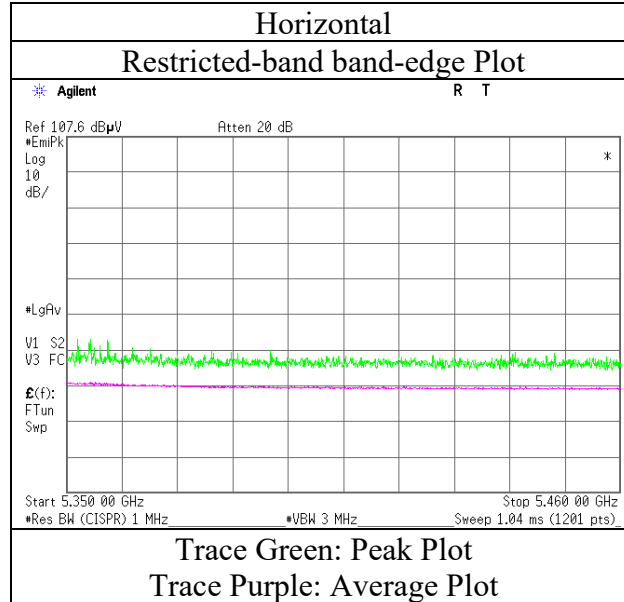
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.06\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No. 13674969H
 Test place Ise EMC Lab.
 Semi Anechoic Chamber No.3
 Date January 16, 2021
 Temperature / Humidity 21 deg. C / 33 % RH
 Engineer Akihiko Maeda
 Mode Tx 11ac-40 5310 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

Final result of restricted band edge was shown in tabular data.

UL Japan, Inc.

Ise EMC Lab.

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Radiated Spurious Emission

Report No.	13674969H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 16, 2021	January 17, 2021	January 18, 2021
Temperature / Humidity	21 deg. C / 33 % RH	23 deg. C / 38 % RH	24 deg. C / 34 % RH
Engineer	Akihiko Maeda	Akihiko Maeda	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11ac-40 5510 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5460.000	PK	51.5	31.7	5.9	31.7	-	57.3	68.2	10.9	
Hori.	5470.000	PK	55.8	31.7	5.9	31.7	-	61.7	68.2	6.5	
Hori.	11020.000	PK	42.9	40.0	-2.6	33.6	-	46.7	73.9	27.2	Floor noise
Hori.	16530.000	PK	43.8	39.6	-1.1	32.7	-	49.6	73.9	24.4	Floor noise
Hori.	22040.000	PK	44.6	38.1	-1.4	32.4	-	48.9	73.9	25.0	Floor noise
Hori.	5460.000	AV	33.3	31.7	5.9	31.7	-	39.1	53.9	14.8	
Hori.	11020.000	AV	31.8	40.0	-2.6	33.6	-	35.6	53.9	18.3	Floor noise
Hori.	16530.000	AV	32.5	39.6	-1.1	32.7	-	38.3	53.9	15.7	Floor noise
Hori.	22040.000	AV	37.1	38.1	-1.4	32.4	-	41.3	53.9	12.6	Floor noise
Vert.	5460.000	PK	48.9	31.7	5.9	31.7	-	54.7	68.2	13.5	
Vert.	5470.000	PK	54.1	31.7	5.9	31.7	-	60.0	68.2	8.2	
Vert.	11020.000	PK	42.9	40.0	-2.6	33.6	-	46.7	73.9	27.2	Floor noise
Vert.	16530.000	PK	43.8	39.6	-1.1	32.7	-	49.6	73.9	24.4	Floor noise
Vert.	22040.000	PK	44.5	38.1	-1.4	32.4	-	48.7	73.9	25.2	Floor noise
Vert.	5460.000	AV	32.2	31.7	5.9	31.7	-	38.0	53.9	15.9	
Vert.	11020.000	AV	31.8	40.0	-2.6	33.6	-	35.6	53.9	18.3	Floor noise
Vert.	16530.000	AV	32.5	39.6	-1.1	32.7	-	38.3	53.9	15.7	Floor noise
Vert.	22040.000	AV	37.1	38.1	-1.4	32.4	-	41.3	53.9	12.6	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

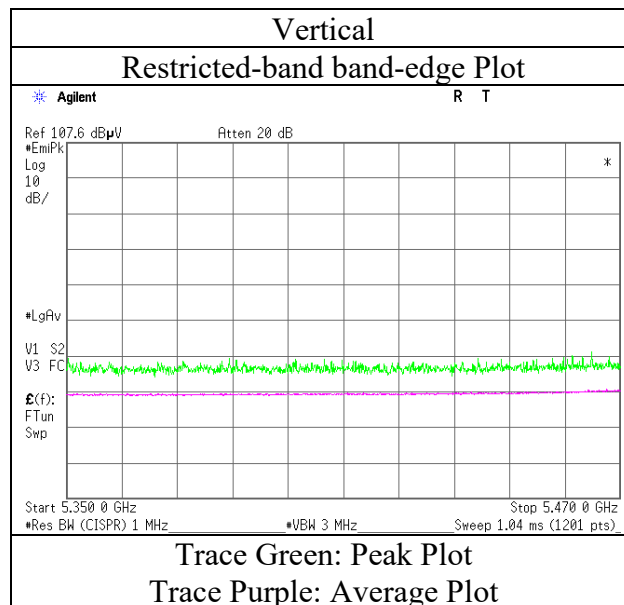
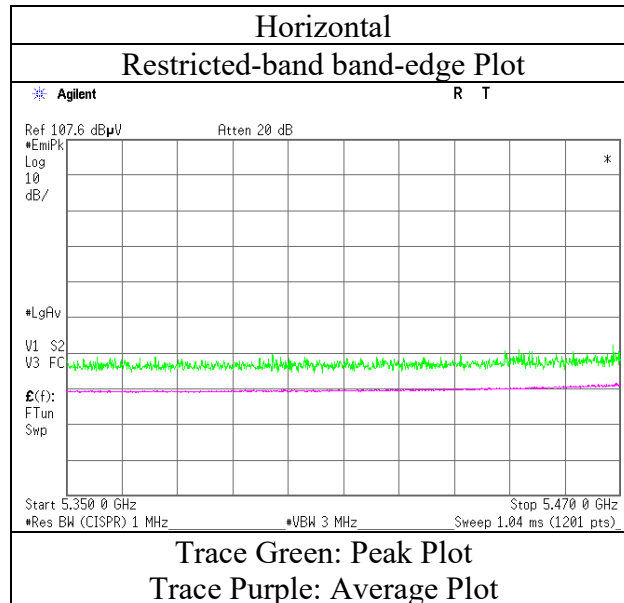
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.06\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date January 16, 2021
Temperature / Humidity 21 deg. C / 33 % RH
Engineer Akihiko Maeda
Mode Tx 11ac-40 5510 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No.	13674969H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 16, 2021	January 17, 2021	January 18, 2021
Temperature / Humidity	21 deg. C / 33 % RH	23 deg. C / 38 % RH	24 deg. C / 34 % RH
Engineer	Akihiko Maeda (1 GHz - 10 GHz)	Akihiko Maeda (10 GHz - 18 GHz)	Hiroki Numata (18 GHz - 40 GHz)
Mode	Tx 11ac-40 5550 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	11100.000	PK	42.7	39.6	-2.6	33.6	-	46.2	73.9	27.7	Floor noise
Hori.	16650.000	PK	43.4	40.2	-1.1	32.7	-	49.9	73.9	24.0	Floor noise
Hori.	22200.000	PK	45.7	38.1	-1.4	32.4	-	50.1	73.9	23.9	Floor noise
Hori.	11100.000	AV	31.4	39.6	-2.6	33.6	-	34.9	53.9	19.0	Floor noise
Hori.	16650.000	AV	32.2	40.2	-1.1	32.7	-	38.7	53.9	15.2	Floor noise
Hori.	22200.000	AV	36.9	38.1	-1.4	32.4	-	41.2	53.9	12.7	Floor noise
Vert.	11100.000	PK	42.7	39.6	-2.6	33.6	-	46.2	73.9	27.7	Floor noise
Vert.	16650.000	PK	43.4	40.2	-1.1	32.7	-	49.9	73.9	24.0	Floor noise
Vert.	22200.000	PK	45.4	38.1	-1.4	32.4	-	49.7	73.9	24.2	Floor noise
Vert.	11100.000	AV	31.4	39.6	-2.6	33.6	-	34.9	53.9	19.0	Floor noise
Vert.	16650.000	AV	32.2	40.2	-1.1	32.7	-	38.7	53.9	15.2	Floor noise
Vert.	22200.000	AV	36.9	38.1	-1.4	32.4	-	41.2	53.9	12.7	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.06\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No.	13674969H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 16, 2021	January 17, 2021	January 18, 2021
Temperature / Humidity	21 deg. C / 33 % RH	23 deg. C / 38 % RH	24 deg. C / 34 % RH
Engineer	Akihiko Maeda (1 GHz - 10 GHz)	Akihiko Maeda (10 GHz - 18 GHz)	Hiroki Numata (18 GHz - 40 GHz)
Mode	Tx 11ac-40 5670 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5725.000	PK	46.3	32.0	6.0	31.8	-	52.4	68.2	15.8	
Hori.	11340.000	PK	42.5	39.8	-2.5	33.5	-	46.3	73.9	27.6	Floor noise
Hori.	17010.000	PK	43.7	41.7	-0.9	32.6	-	51.9	73.9	22.1	Floor noise
Hori.	22680.000	PK	44.7	38.3	-1.3	32.3	-	49.4	73.9	24.5	Floor noise
Hori.	11340.000	AV	31.0	39.8	-2.5	33.5	-	34.8	53.9	19.1	Floor noise
Hori.	17010.000	AV	32.2	41.7	-0.9	32.6	-	40.4	53.9	13.6	Floor noise
Hori.	22680.000	AV	37.7	38.3	-1.3	32.3	-	42.3	53.9	11.6	Floor noise
Vert.	5725.000	PK	46.8	32.0	6.0	31.8	-	52.9	68.2	15.3	
Vert.	11340.000	PK	42.5	39.8	-2.5	33.5	-	46.3	73.9	27.6	Floor noise
Vert.	17010.000	PK	43.7	41.7	-0.9	32.6	-	51.9	73.9	22.1	Floor noise
Vert.	22680.000	PK	44.4	38.3	-1.3	32.3	-	49.1	73.9	24.8	Floor noise
Vert.	11340.000	AV	31.0	39.8	-2.5	33.5	-	34.8	53.9	19.1	Floor noise
Vert.	17010.000	AV	32.2	41.7	-0.9	32.6	-	40.4	53.9	13.6	Floor noise
Vert.	22680.000	AV	37.7	38.3	-1.3	32.3	-	42.4	53.9	11.5	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

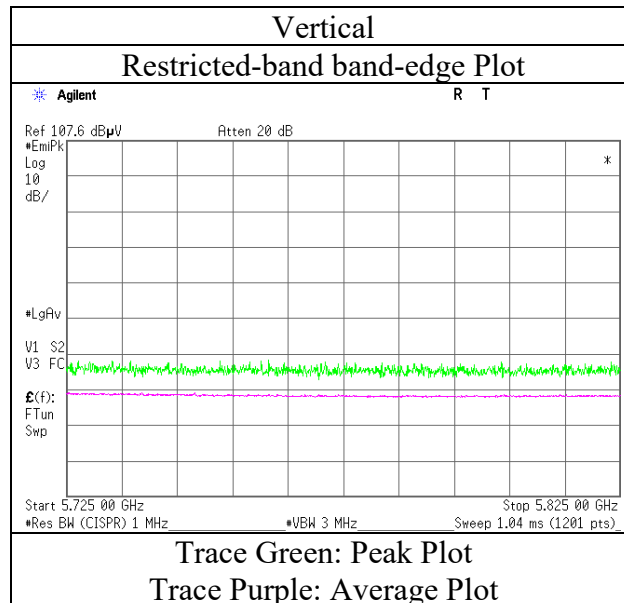
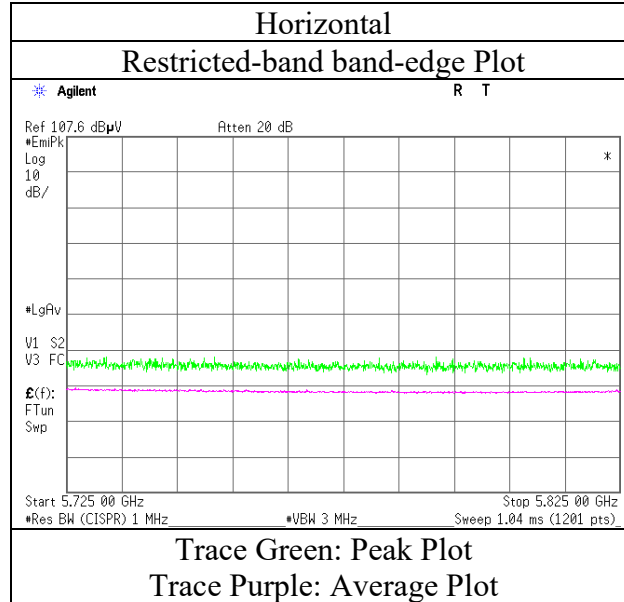
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.06\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No. 13674969H
 Test place Ise EMC Lab.
 Semi Anechoic Chamber No.3
 Date January 16, 2021
 Temperature / Humidity 21 deg. C / 33 % RH
 Engineer Akihiko Maeda
 Mode Tx 11ac-40 5670 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

Final result of restricted band edge was shown in tabular data.

UL Japan, Inc.

Ise EMC Lab.

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Radiated Spurious Emission

Report No.	13674969H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 16, 2021	January 17, 2021	January 18, 2021
Temperature / Humidity	21 deg. C / 33 % RH	23 deg. C / 38 % RH	24 deg. C / 34 % RH
Engineer	Akihiko Maeda (1 GHz - 10 GHz)	Akihiko Maeda (10 GHz - 18 GHz)	Hiroki Numata (18 GHz - 40 GHz)
Mode	Tx 11ac-40 5755 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5650.000	PK	43.6	31.7	5.9	31.8	-	49.4	68.2	18.8	
Hori.	5700.000	PK	45.5	31.8	6.0	31.8	-	51.5	105.2	53.7	
Hori.	5720.000	PK	55.0	31.9	6.0	31.8	-	61.1	110.8	49.7	
Hori.	5725.000	PK	57.8	32.0	6.0	31.8	-	63.9	122.2	58.3	
Hori.	11510.000	PK	42.2	39.6	-2.4	33.5	-	46.0	73.9	27.9	Floor noise
Hori.	17265.000	PK	43.8	42.8	-0.9	32.7	-	53.0	73.9	20.9	Floor noise
Hori.	23020.000	PK	45.3	38.5	-1.2	32.3	-	50.3	73.9	23.6	Floor noise
Hori.	11510.000	AV	30.5	39.6	-2.4	33.5	-	34.3	53.9	19.6	Floor noise
Hori.	17265.000	AV	32.7	42.8	-0.9	32.7	-	41.9	53.9	12.0	Floor noise
Hori.	23020.000	AV	37.2	38.5	-1.2	32.3	-	42.2	53.9	11.7	Floor noise
Vert.	5650.000	PK	42.2	31.7	5.9	31.8	-	48.0	68.2	20.2	
Vert.	5700.000	PK	46.7	31.8	6.0	31.8	-	52.7	105.2	52.5	
Vert.	5720.000	PK	56.2	31.9	6.0	31.8	-	62.3	110.8	48.5	
Vert.	5725.000	PK	57.6	32.0	6.0	31.8	-	63.7	122.2	58.5	
Vert.	11510.000	PK	42.2	39.6	-2.4	33.5	-	46.0	73.9	27.9	Floor noise
Vert.	17265.000	PK	43.8	42.8	-0.9	32.7	-	53.0	73.9	20.9	Floor noise
Vert.	23020.000	PK	45.3	38.5	-1.2	32.3	-	50.3	73.9	23.6	Floor noise
Vert.	11510.000	AV	30.5	39.6	-2.4	33.5	-	34.3	53.9	19.6	Floor noise
Vert.	17265.000	AV	32.7	42.8	-0.9	32.7	-	41.9	53.9	12.0	Floor noise
Vert.	23020.000	AV	37.3	38.5	-1.2	32.3	-	42.3	53.9	11.6	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

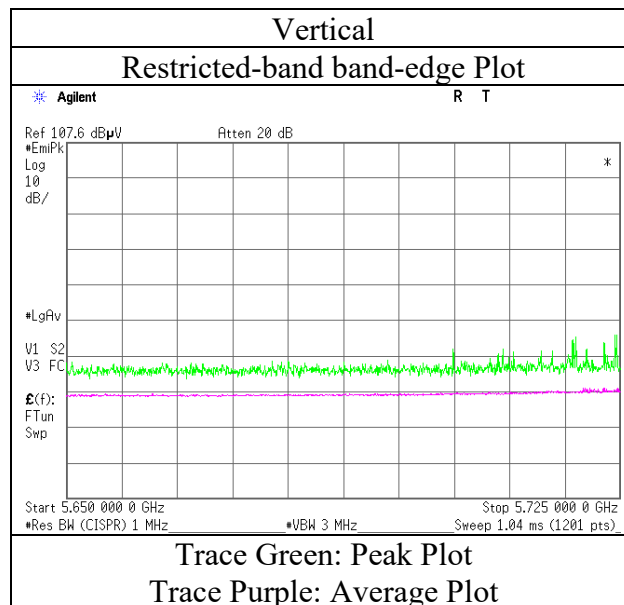
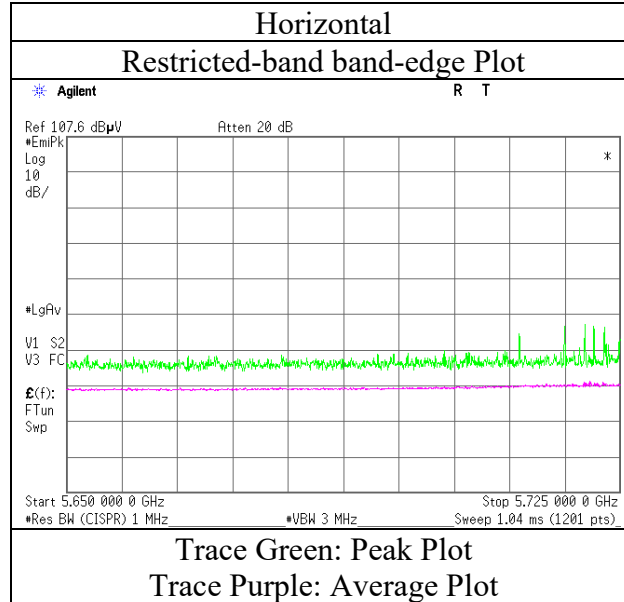
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No. 13674969H
 Test place Ise EMC Lab.
 Semi Anechoic Chamber No.3
 Date January 16, 2021
 Temperature / Humidity 21 deg. C / 33 % RH
 Engineer Akihiko Maeda
 Mode Tx 11ac-40 5755 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

Final result of restricted band edge was shown in tabular data.

UL Japan, Inc.

Ise EMC Lab.

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Radiated Spurious Emission

Report No.	13674969H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 16, 2021	January 17, 2021	January 18, 2021
Temperature / Humidity	21 deg. C / 33 % RH	23 deg. C / 38 % RH	24 deg. C / 34 % RH
Engineer	Akihiko Maeda	Akihiko Maeda	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11ac-40 5795 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5850.000	PK	48.4	32.3	6.0	31.8	-	54.9	122.2	67.3	
Hori.	5855.000	PK	46.4	32.3	6.0	31.8	-	52.9	110.8	57.9	
Hori.	5875.000	PK	44.3	32.3	6.0	31.8	-	50.8	105.2	54.4	
Hori.	5925.000	PK	41.5	32.4	6.0	31.9	-	48.1	68.2	20.2	
Hori.	11590.000	PK	42.3	39.2	-2.4	33.4	-	45.7	73.9	28.2	Floor noise
Hori.	17385.000	PK	43.9	44.2	-0.9	32.7	-	54.5	73.9	19.4	Floor noise
Hori.	23180.000	PK	44.4	38.6	-1.2	32.2	-	49.6	73.9	24.3	Floor noise
Hori.	11590.000	AV	31.0	39.2	-2.4	33.4	-	34.4	53.9	19.5	Floor noise
Hori.	17385.000	AV	32.3	44.2	-0.9	32.7	-	42.9	53.9	11.0	Floor noise
Hori.	23180.000	AV	37.4	38.6	-1.2	32.2	-	42.6	53.9	11.3	Floor noise
Vert.	5850.000	PK	46.7	32.3	6.0	31.8	-	53.2	122.2	69.0	
Vert.	5855.000	PK	45.5	32.3	6.0	31.8	-	52.0	110.8	58.8	
Vert.	5875.000	PK	43.4	32.3	6.0	31.8	-	49.9	105.2	55.3	
Vert.	5925.000	PK	41.2	32.4	6.0	31.9	-	47.8	68.2	20.5	
Vert.	11590.000	PK	42.3	39.2	-2.4	33.4	-	45.7	73.9	28.2	Floor noise
Vert.	17385.000	PK	43.9	44.2	-0.9	32.7	-	54.5	73.9	19.4	Floor noise
Vert.	23180.000	PK	44.9	38.6	-1.2	32.2	-	50.1	73.9	23.8	Floor noise
Vert.	11590.000	AV	31.0	39.2	-2.4	33.4	-	34.4	53.9	19.5	Floor noise
Vert.	17385.000	AV	32.3	44.2	-0.9	32.7	-	42.9	53.9	11.0	Floor noise
Vert.	23180.000	AV	37.0	38.6	-1.2	32.2	-	42.2	53.9	11.7	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

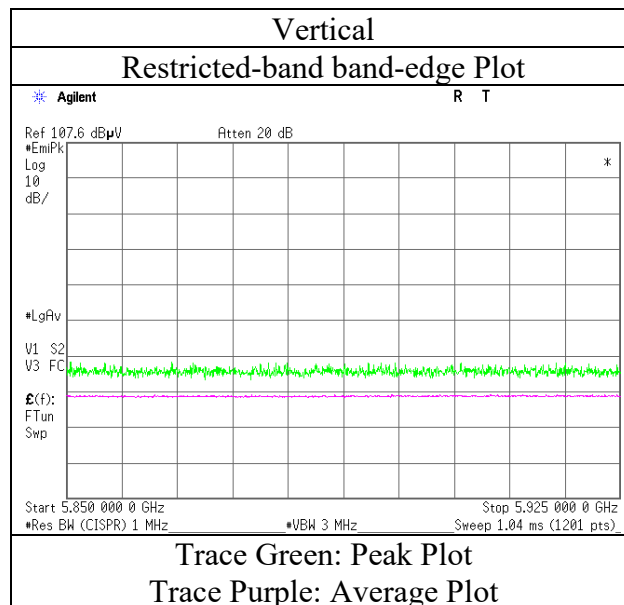
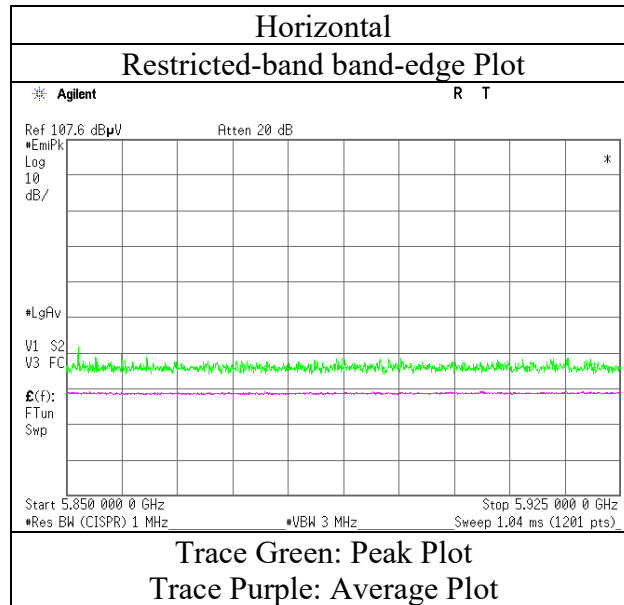
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date January 16, 2021
Temperature / Humidity 21 deg. C / 33 % RH
Engineer Akihiko Maeda
Mode Tx 11ac-40 5795 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

Final result of restricted band edge was shown in tabular data.

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Ise EMC Lab.

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Radiated Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3 No.3
Date January 17, 2021 January 18, 2021
Temperature / Humidity 23 deg. C / 38 % RH 24 deg. C / 34 % RH
Engineer Akihiko Maeda Hiroki Numata
(1 GHz - 18 GHz) (18 GHz - 40 GHz)
Mode Tx 11ac-80 5210 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5150.000	PK	48.7	32.0	5.8	31.6	-	54.8	73.9	19.1	
Hori.	10420.000	PK	42.5	40.1	-2.8	33.5	-	46.2	73.9	27.7	Floor noise
Hori.	15630.000	PK	43.7	37.2	-1.5	32.5	-	46.9	73.9	27.0	Floor noise
Hori.	20840.000	PK	42.7	37.9	-1.5	33.3	-	45.9	73.9	28.0	Floor noise
Hori.	26050.000	PK	48.3	39.2	-0.5	31.1	-	55.8	73.9	18.1	Floor noise
Hori.	5150.000	AV	34.2	32.0	5.8	31.6	-	40.3	53.9	13.6	
Hori.	10420.000	AV	31.8	40.1	-2.8	33.5	-	35.5	53.9	18.4	Floor noise
Hori.	15630.000	AV	33.1	37.2	-1.5	32.5	-	36.3	53.9	17.6	Floor noise
Hori.	20840.000	AV	34.7	37.9	-1.5	33.3	-	37.9	53.9	16.0	Floor noise
Hori.	26050.000	AV	39.7	39.2	-0.5	31.1	-	47.3	53.9	6.6	Floor noise
Vert.	5150.000	PK	49.2	32.0	5.8	31.6	-	55.3	73.9	18.6	
Vert.	10420.000	PK	42.5	40.1	-2.8	33.5	-	46.2	73.9	27.7	Floor noise
Vert.	15630.000	PK	43.7	37.2	-1.5	32.5	-	46.9	73.9	27.0	Floor noise
Vert.	20840.000	PK	42.2	37.9	-1.5	33.3	-	45.5	73.9	28.5	Floor noise
Vert.	26050.000	PK	48.3	39.2	-0.5	31.1	-	55.8	73.9	18.1	Floor noise
Vert.	5150.000	AV	34.5	32.0	5.8	31.6	-	40.6	53.9	13.3	
Vert.	10420.000	AV	31.8	40.1	-2.8	33.5	-	35.5	53.9	18.4	Floor noise
Vert.	15630.000	AV	33.1	37.2	-1.5	32.5	-	36.3	53.9	17.6	Floor noise
Vert.	20840.000	AV	34.9	37.9	-1.5	33.3	-	38.1	53.9	15.8	Floor noise
Vert.	26050.000	AV	39.2	39.2	-0.5	31.1	-	46.7	53.9	7.2	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

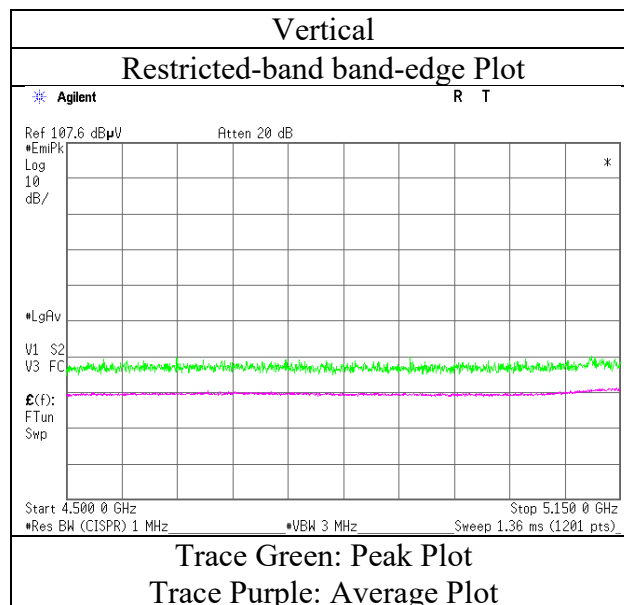
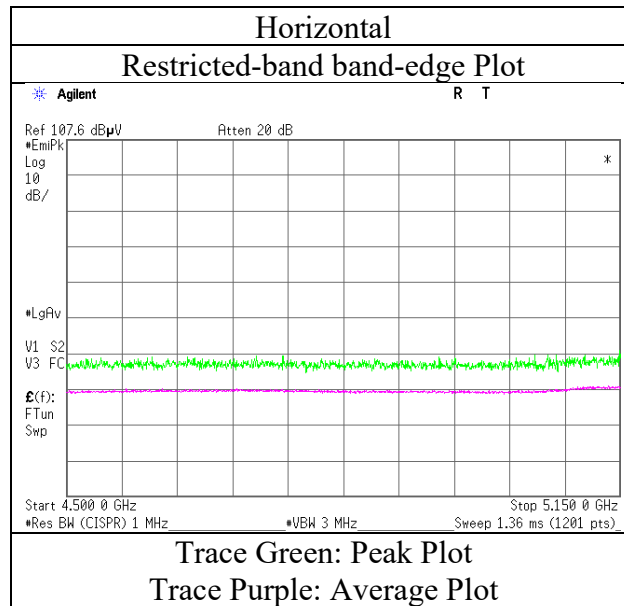
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date January 17, 2021
Temperature / Humidity 23 deg. C / 38 % RH
Engineer Akihiko Maeda
(1 GHz - 10 GHz)
Mode Tx 11ac-80 5210 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3 No.3
Date January 17, 2021 January 18, 2021
Temperature / Humidity 23 deg. C / 38 % RH 24 deg. C / 34 % RH
Engineer Akihiko Maeda Hiroki Numata
(1 GHz - 18 GHz) (18 GHz - 40 GHz)
Mode Tx 11ac-80 5290 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5350.000	PK	50.4	31.5	5.8	31.7	-	56.1	73.9	17.8	
Hori.	10580.000	PK	41.7	39.9	-2.8	33.6	-	45.3	73.9	28.6	Floor noise
Hori.	15870.000	PK	43.8	37.2	-1.4	32.7	-	46.9	73.9	27.0	Floor noise
Hori.	21160.000	PK	44.5	38.0	-1.4	33.2	-	48.0	73.9	25.9	Floor noise
Hori.	26450.000	PK	44.7	39.2	-0.4	30.6	-	52.9	73.9	21.0	Floor noise
Hori.	5350.000	AV	35.3	31.5	5.8	31.7	-	41.0	53.9	12.9	
Hori.	10580.000	AV	31.1	39.9	-2.8	33.6	-	34.7	53.9	19.2	Floor noise
Hori.	15870.000	AV	32.8	37.2	-1.4	32.7	-	35.9	53.9	18.0	Floor noise
Hori.	21160.000	AV	36.8	38.0	-1.4	33.2	-	40.2	53.9	13.7	Floor noise
Hori.	26450.000	AV	38.6	39.2	-0.4	30.6	-	46.9	53.9	7.0	Floor noise
Vert.	5350.000	PK	50.7	31.5	5.8	31.7	-	56.4	73.9	17.5	
Vert.	10580.000	PK	41.7	39.9	-2.8	33.6	-	45.3	73.9	28.6	Floor noise
Vert.	15870.000	PK	43.8	37.2	-1.4	32.7	-	46.9	73.9	27.0	Floor noise
Vert.	21160.000	PK	43.1	38.0	-1.4	33.2	-	46.6	73.9	27.3	Floor noise
Vert.	26450.000	PK	44.8	39.2	-0.4	30.6	-	53.0	73.9	20.9	Floor noise
Vert.	5350.000	AV	35.4	31.5	5.8	31.7	-	41.1	53.9	12.8	
Vert.	10580.000	AV	31.1	39.9	-2.8	33.6	-	34.7	53.9	19.2	Floor noise
Vert.	15870.000	AV	32.8	37.2	-1.4	32.7	-	35.9	53.9	18.0	Floor noise
Vert.	21160.000	AV	36.0	38.0	-1.4	33.2	-	39.5	53.9	14.4	Floor noise
Vert.	26450.000	AV	38.7	39.2	-0.4	30.6	-	46.9	53.9	7.0	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

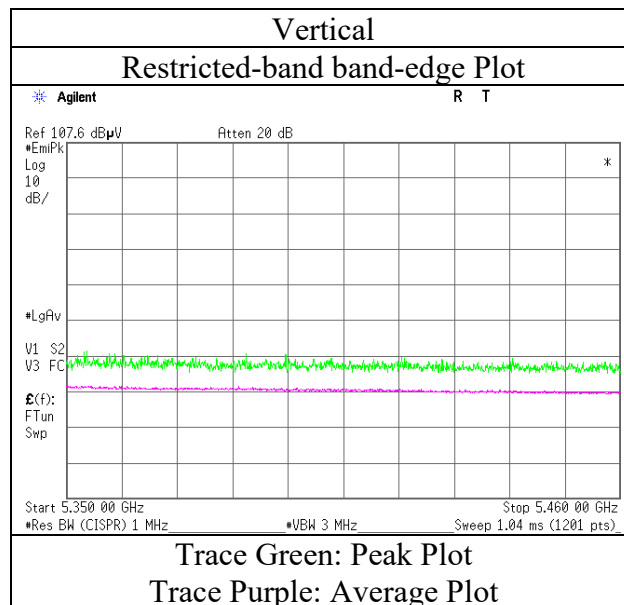
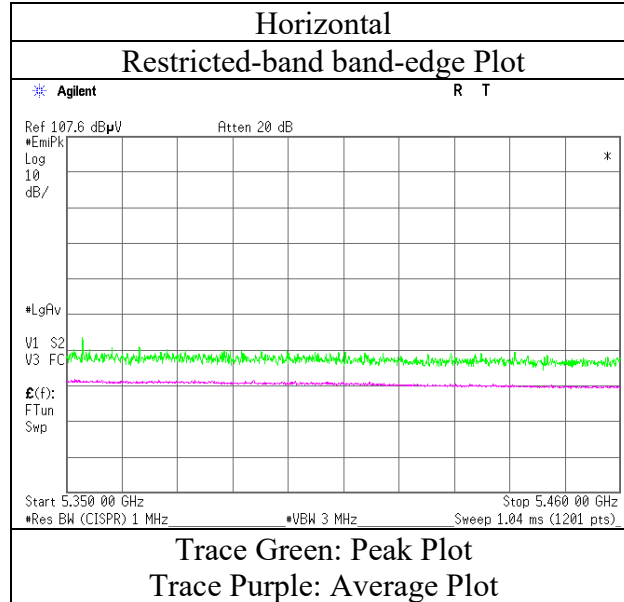
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (3.8 m / 3.0 m) = 2.06 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No. 13674969H
 Test place Ise EMC Lab.
 Semi Anechoic Chamber No.3
 Date January 17, 2021
 Temperature / Humidity 23 deg. C / 38 % RH
 Engineer Akihiko Maeda
 Mode Tx 11ac-80 5290 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.

Final result of restricted band edge was shown in tabular data.

UL Japan, Inc.

Ise EMC Lab.

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Radiated Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3 No.3
Date January 17, 2021 January 18, 2021
Temperature / Humidity 23 deg. C / 38 % RH 24 deg. C / 34 % RH
Engineer Akihiko Maeda Hiroki Numata
(1 GHz - 18 GHz) (18 GHz - 40 GHz)
Mode Tx 11ac-80 5530 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5460.000	PK	48.9	31.7	5.9	31.7	-	54.7	68.2	13.5	
Hori.	5470.000	PK	50.7	31.7	5.9	31.7	-	56.6	68.2	11.6	
Hori.	11060.000	PK	42.8	39.8	-2.6	33.6	-	46.5	73.9	27.4	Floor noise
Hori.	16590.000	PK	43.9	40.2	-1.1	32.7	-	50.3	73.9	23.6	Floor noise
Hori.	22120.000	PK	43.7	38.1	-1.4	32.4	-	48.0	73.9	25.9	Floor noise
Hori.	5460.000	AV	34.7	31.7	5.9	31.7	-	40.5	53.9	13.4	
Hori.	11060.000	AV	32.2	39.8	-2.6	33.6	-	35.9	53.9	18.0	Floor noise
Hori.	16590.000	AV	33.2	40.2	-1.1	32.7	-	39.6	53.9	14.3	Floor noise
Hori.	22120.000	AV	36.6	38.1	-1.4	32.4	-	40.8	53.9	13.1	Floor noise
Vert.	5460.000	PK	49.4	31.7	5.9	31.7	-	55.2	68.2	13.0	
Vert.	5470.000	PK	50.5	31.7	5.9	31.7	-	56.4	68.2	11.8	
Vert.	11060.000	PK	42.8	39.8	-2.6	33.6	-	46.5	73.9	27.4	Floor noise
Vert.	16590.000	PK	43.9	40.2	-1.1	32.7	-	50.3	73.9	23.6	Floor noise
Vert.	22120.000	PK	43.7	38.1	-1.4	32.4	-	48.0	73.9	25.9	Floor noise
Vert.	5460.000	AV	35.1	31.7	5.9	31.7	-	40.9	53.9	13.0	
Vert.	11060.000	AV	32.2	39.8	-2.6	33.6	-	35.9	53.9	18.0	Floor noise
Vert.	16590.000	AV	33.2	40.2	-1.1	32.7	-	39.6	53.9	14.3	Floor noise
Vert.	22120.000	AV	36.5	38.1	-1.4	32.4	-	40.8	53.9	13.1	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

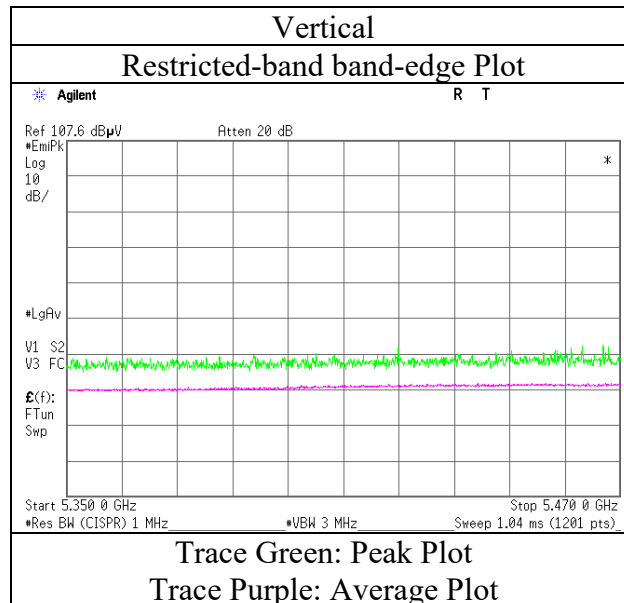
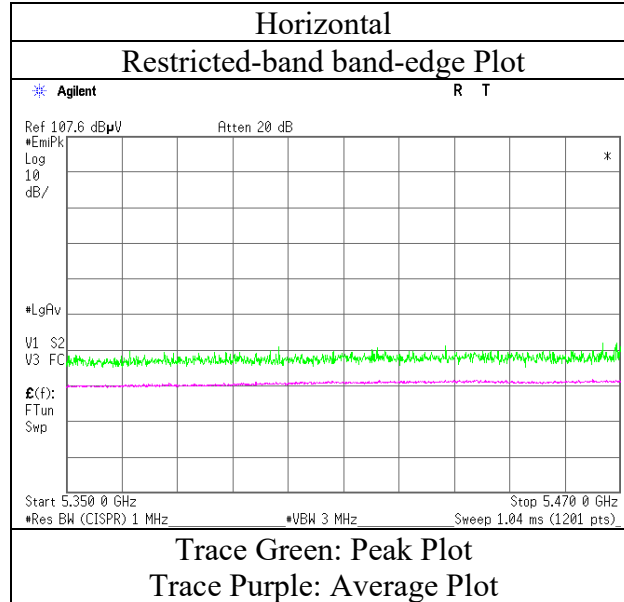
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log(3.8 m / 3.0 m) = 2.06 dB
10 GHz - 40 GHz 20log(1.0 m / 3.0 m) = -9.5 dB

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date January 17, 2021
Temperature / Humidity 23 deg. C / 38 % RH
Engineer Akihiko Maeda
Mode Tx 11ac-80 5530 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3 No.3
Date January 17, 2021 January 18, 2021
Temperature / Humidity 23 deg. C / 38 % RH 24 deg. C / 34 % RH
Engineer Akihiko Maeda Hiroki Numata
(1 GHz - 18 GHz) (18 GHz - 40 GHz)
Mode Tx 11ac-80 5610 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5725.000	PK	43.0	32.0	6.0	31.8	-	49.1	68.2	19.1	
Hori.	11220.000	PK	42.2	39.6	-2.5	33.6	-	45.7	73.9	28.2	Floor noise
Hori.	16830.000	PK	43.1	41.3	-1.0	32.7	-	50.7	73.9	23.2	Floor noise
Hori.	22440.000	PK	44.3	38.2	-1.3	32.4	-	48.8	73.9	25.1	Floor noise
Hori.	11220.000	AV	31.4	39.6	-2.5	33.6	-	34.9	53.9	19.0	Floor noise
Hori.	16830.000	AV	32.5	41.3	-1.0	32.7	-	40.1	53.9	13.8	Floor noise
Hori.	22440.000	AV	37.6	38.2	-1.3	32.4	-	42.1	53.9	11.8	Floor noise
Vert.	5725.000	PK	42.3	32.0	6.0	31.8	-	48.4	68.2	19.8	
Vert.	11220.000	PK	42.2	39.6	-2.5	33.6	-	45.7	73.9	28.2	Floor noise
Vert.	16830.000	PK	43.1	41.3	-1.0	32.7	-	50.7	73.9	23.2	Floor noise
Vert.	22440.000	PK	44.1	38.2	-1.3	32.4	-	48.6	73.9	25.3	Floor noise
Vert.	11220.000	AV	31.4	39.6	-2.5	33.6	-	34.9	53.9	19.0	Floor noise
Vert.	16830.000	AV	32.5	41.3	-1.0	32.7	-	40.1	53.9	13.8	Floor noise
Vert.	22440.000	AV	37.1	38.2	-1.3	32.4	-	41.6	53.9	12.4	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

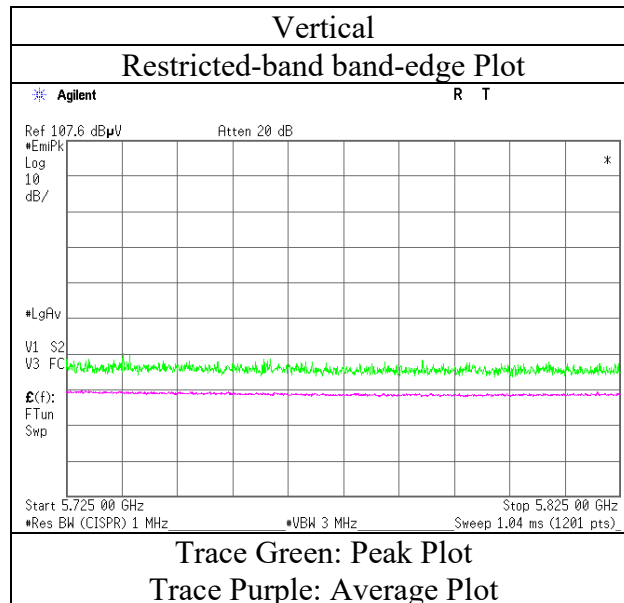
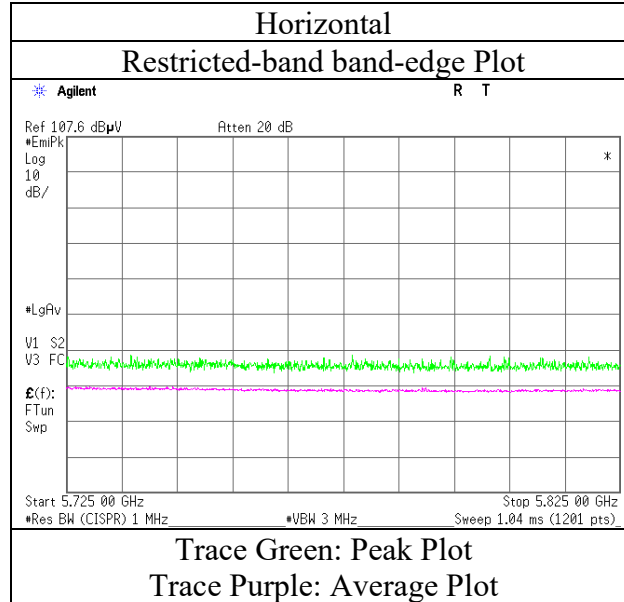
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz $20\log(3.8\text{ m} / 3.0\text{ m}) = 2.06\text{ dB}$
10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

* See Burst rate confirmation for VBW calculation.

Radiated Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date January 17, 2021
Temperature / Humidity 23 deg. C / 38 % RH
Engineer Akihiko Maeda
Mode Tx 11ac-80 5610 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3 No.3
Date January 17, 2021 January 18, 2021
Temperature / Humidity 23 deg. C / 38 % RH 24 deg. C / 34 % RH
Engineer Akihiko Maeda Hiroki Numata
(1 GHz - 18 GHz) (18 GHz - 40 GHz)
Mode Tx 11ac-80 5775 MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	5650.000	PK	44.5	31.7	5.9	31.8	-	50.3	68.2	17.9	
Hori.	5700.000	PK	48.2	31.8	6.0	31.8	-	54.2	105.2	51.0	
Hori.	5720.000	PK	52.1	31.9	6.0	31.8	-	58.2	110.8	52.6	
Hori.	5725.000	PK	54.3	32.0	6.0	31.8	-	60.4	122.2	61.8	
Hori.	5850.000	PK	47.4	32.3	6.0	31.8	-	53.9	122.2	68.3	
Hori.	5855.000	PK	44.7	32.3	6.0	31.8	-	51.2	110.8	59.6	
Hori.	5875.000	PK	43.4	32.3	6.0	31.8	-	49.9	105.2	55.3	
Hori.	5925.000	PK	41.5	32.4	6.0	31.9	-	48.1	68.2	20.2	
Hori.	11550.000	PK	41.8	39.7	-2.4	33.5	-	45.7	73.9	28.2	Floor noise
Hori.	17325.000	PK	43.6	43.7	-0.9	32.7	-	53.6	73.9	20.3	Floor noise
Hori.	23100.000	PK	44.6	38.5	-1.2	32.3	-	49.6	73.9	24.3	Floor noise
Hori.	11550.000	AV	31.2	39.7	-2.4	33.5	-	35.1	53.9	18.8	Floor noise
Hori.	17325.000	AV	32.8	43.7	-0.9	32.7	-	42.8	53.9	11.1	Floor noise
Hori.	23100.000	AV	36.8	38.5	-1.2	32.3	-	41.8	53.9	12.1	Floor noise
Vert.	5650.000	PK	44.4	31.7	5.9	31.8	-	50.2	68.2	18.0	
Vert.	5700.000	PK	47.7	31.8	6.0	31.8	-	53.7	105.2	51.5	
Vert.	5720.000	PK	51.5	31.9	6.0	31.8	-	57.6	110.8	53.2	
Vert.	5725.000	PK	53.2	32.0	6.0	31.8	-	59.3	122.2	62.9	
Vert.	5850.000	PK	45.3	32.3	6.0	31.8	-	51.8	122.2	70.4	
Vert.	5855.000	PK	44.7	32.3	6.0	31.8	-	51.2	110.8	59.6	
Vert.	5875.000	PK	42.8	32.3	6.0	31.8	-	49.3	105.2	55.9	
Vert.	5925.000	PK	41.3	32.4	6.0	31.9	-	47.9	68.2	20.4	
Vert.	11550.000	PK	41.8	39.7	-2.4	33.5	-	45.7	73.9	28.2	Floor noise
Vert.	17325.000	PK	43.6	43.7	-0.9	32.7	-	53.6	73.9	20.3	Floor noise
Vert.	23100.000	PK	44.6	38.5	-1.2	32.3	-	49.7	73.9	24.2	Floor noise
Vert.	11550.000	AV	31.2	39.7	-2.4	33.5	-	35.1	53.9	18.8	Floor noise
Vert.	17325.000	AV	32.8	43.7	-0.9	32.7	-	42.8	53.9	11.1	Floor noise
Vert.	23100.000	AV	37.0	38.5	-1.2	32.3	-	42.1	53.9	11.8	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log(3.8 m / 3.0 m) = 2.06 dB
10 GHz - 40 GHz 20log(1.0 m / 3.0 m) = -9.5 dB

* See Burst rate confirmation for VBW calculation.

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Ise EMC Lab.

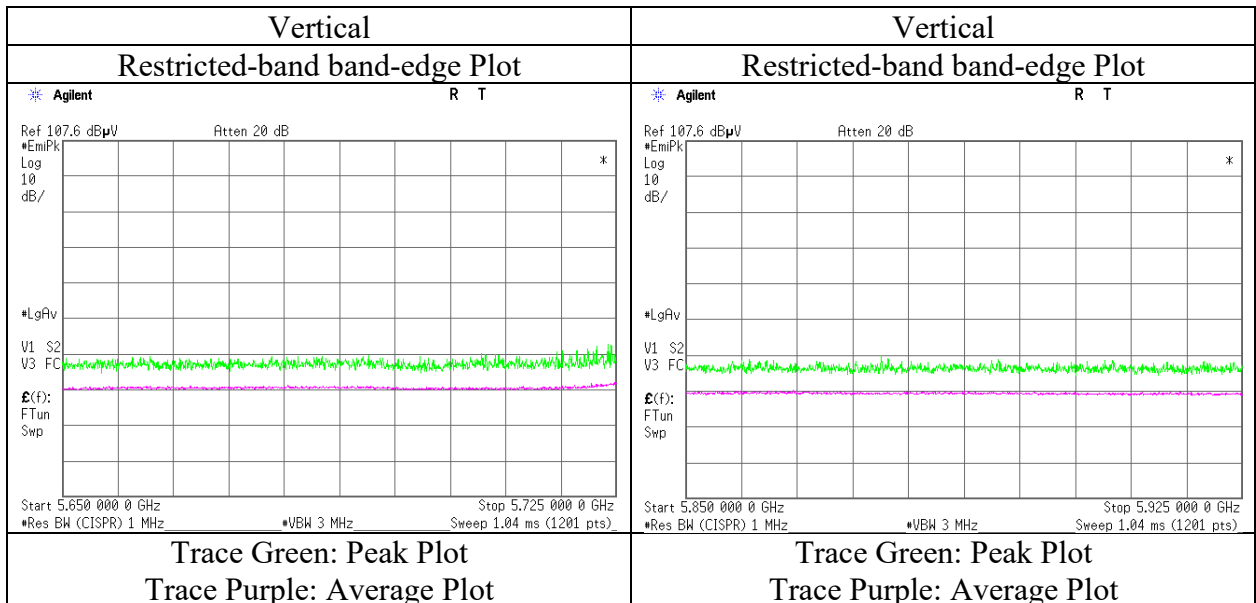
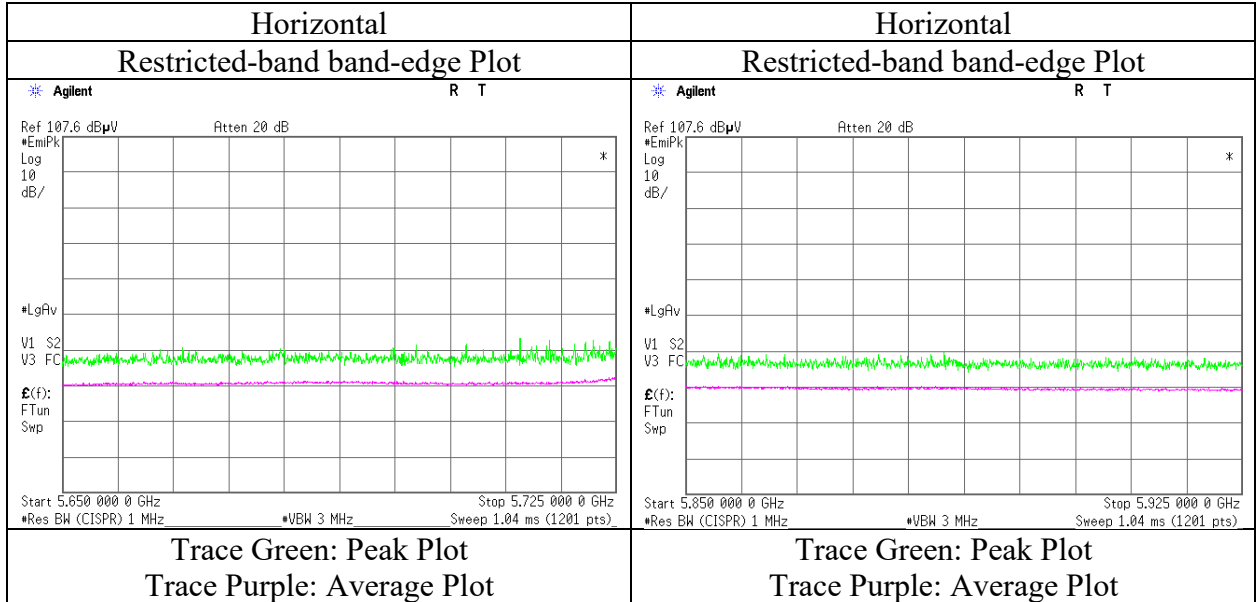
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Radiated Spurious Emission

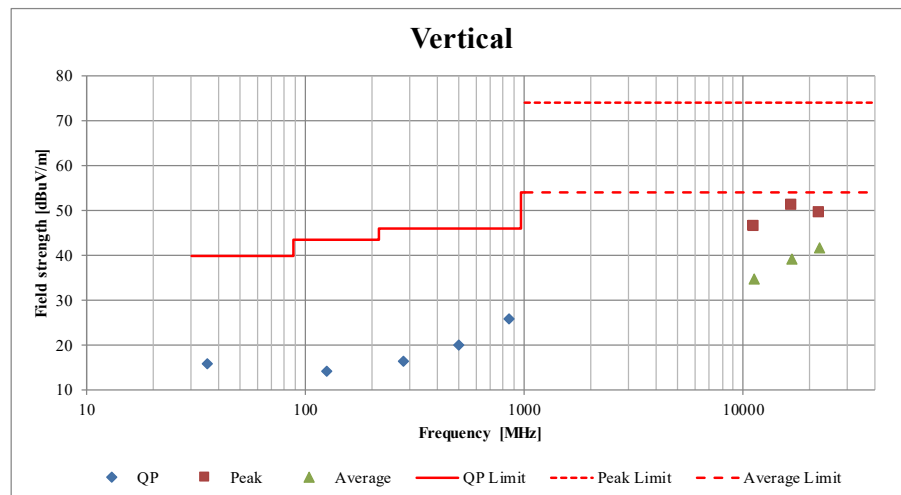
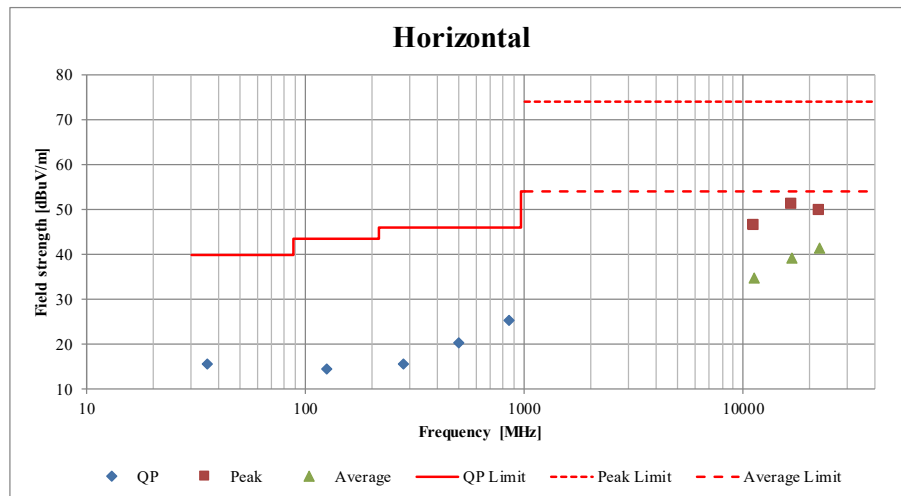
Report No.	13674969H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 17, 2021
Temperature / Humidity	23 deg. C / 38 % RH
Engineer	Akihiko Maeda
Mode	Tx 11ac-80 5775 MHz



* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Plot data, Worst case)

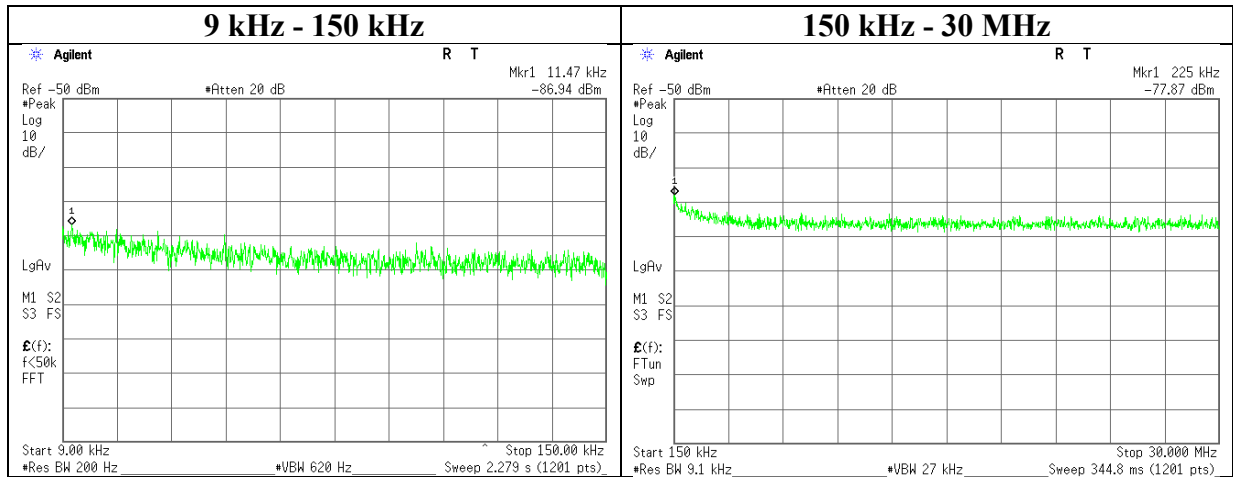
Report No.	13674969H			
Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.2
Date	January 16, 2021	January 17, 2021	January 18, 2021	January 18, 2021
Temperature / Humidity	21 deg. C / 33 % RH	23 deg. C / 38 % RH	24 deg. C / 34 % RH	21 deg. C / 34 % RH
Engineer	Akihiko Maeda (1 GHz - 10 GHz)	Akihiko Maeda (10 GHz - 18 GHz)	Hiroki Numata (18 GHz - 40 GHz)	Ken Fujita (Below 1GHz)
Mode	Tx 11ac-20 5580 MHz			



*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Conducted Spurious Emission

Report No. 13674969H
Test place Ise EMC Lab. No.6 Measurement Room
Date January 16, 2021
Temperature / Humidity 24 deg. C / 32 % RH
Engineer Nachi Konegawa
Mode Tx 11ac-20 5580 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain* [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
11.47	-86.94	2.5	10.09	2.0	1	-72.4	300	6.0	-11.1	46.4	57.5	
225.00	-77.87	2.5	10.09	2.0	1	-63.3	300	6.0	-2.0	20.5	22.5	

$$E \text{ [dBuV/m]} = \text{EIRP [dBm]} - 20 \log(\text{Distance [m]}) + \text{Ground bounce [dB]} + 104.8 \text{ [dBuV/m]}$$

$$\text{EIRP [dBm]} = \text{Reading [dBm]} + \text{Cable loss [dB]} + \text{Attenuator Loss [dB]} + \text{Antenna gain [dBi]} + 10 * \log(N)$$

N: Number of output

*2.0 dBi was applied to the test result based on ANSI C63.10 since antenna gain was less than 2.0 dBi.

APPENDIX 2: Test instruments

Test equipment (1/2)

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	MAEC-03	142008	AC3_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	05/22/2020	24
RE	MOS-13	141554	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	1301	01/15/2021	12
RE	MMM-08	141532	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	51201197	01/07/2021	12
RE	MJM-16	142183	Measure	KOMELON	KMC-36	-	-	-
RE	COTS-MEMI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	MAEC-03-SVSWR	142013	AC3_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-10005	04/08/2019	24
RE	MHA-20	141507	Horn Antenna 1-18GHz	Schwarzbeck Mess - Elektronik	BBHA9120D	258	10/01/2020	12
RE	MPA-11	141580	MicroWave System Amplifier	Keysight Technologies Inc	83017A	MY39500779	03/24/2020	12
RE	MCC-231	177964	Microwave Cable	Junkosha INC.	MMX221	1901S329(1m)/1902S579(5m)	03/02/2020	12
RE	MSA-04	141885	Spectrum Analyzer	Keysight Technologies Inc	E4448A	US44300523	11/09/2020	12
AT	MOS-24	90289	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	0005	01/15/2021	12
AT	MBM-10	141345	Barometer	Sunoh	SBR121	832	12/11/2019	36
AT	MMM-12	141547	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	60500120	02/03/2020	12
AT	MJM-24	142225	Measure	ASKUL	-	-	-	-
AT	MSA-14	141901	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY48250080	12/18/2020	12
AT	MAT-58	141334	Attenuator(10dB)	Suhner	6810.19.A	-	12/07/2020	12
AT	MPM-16	141812	Power Meter	Keysight Technologies Inc	8990B	MY51000271	08/20/2020	12
AT	MPSE-22	141842	Power sensor	Keysight Technologies Inc	N1923A	MY54070003	08/20/2020	12
RE	MHF-22	141293	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCB	602	01/14/2021	12

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Test equipment (2/2)

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
RE	MHA-16	141513	Horn Antenna 15-40GHz	Schwarzbeck Mess - Elektronik	BBHA9170	BBHA9170306	05/21/2020	12
RE	MHA-29	141517	Horn Antenna 26.5-40GHz	ETS LINDGREN	3160-10	152399	08/03/2020	12
RE	MPA-22	141588	Pre Amplifier	MITEQ, Inc	AMF-6F-2600400-33-8P / AMF-4F-2600400-33-8P	1871355 /1871328	09/07/2020	12
RE	MCC-224	160324	Coaxial Cable	Huber+Suhner	SUCOFLEX 102A	MY009/2A	11/17/2020	12
RE	MSA-03	141884	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY44020357	03/04/2020	12
RE	MTR-03	141942	Test Receiver	Rohde & Schwarz	ESCI	100300	08/18/2020	12
RE	MCC-12	141317	Coaxial Cable	UL Japan Inc.	-	-	09/25/2020	12
RE	MPA-24	141594	Pre Amplifier	Keysight Technologies Inc	8447D	2944A10150	02/10/2020	12
RE	MBA-08	141427	Biconical Antenna	Schwarzbeck Mess - Elektronik	VHA9103B+BBA9106	8031	07/29/2020	12
RE	MLA-21	141265	Logperiodic Antenna(200-1000MHz)	Schwarzbeck Mess - Elektronik	VUSLP9111B	9111B-190	07/29/2020	12
RE	MAT-07	141203	Attenuator(6dB)	Weinschel Corp	2	BK7970	11/13/2020	12
RE	MAEC-02	142004	AC2_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	05/26/2020	24
RE	MOS-41	192300	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	0013	12/06/2020	12
RE	MMM-01	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	08/18/2020	12
RE	MJM-27	142228	Measure	KOMELON	KMC-36	-	-	-
RE	MAEC-02-SVSWR	142006	AC2_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-06902	04/01/2019	24

*Hyphens for Last Calibration Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

The expiration date of the calibration is the end of the expired month.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

Test item:

RE: Radiated Emission

AT: Antenna Terminal Conducted test

UL Japan, Inc.

Ise EMC Lab.

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