



RADIO TEST REPORT

Test Report No. : 11932168H-C-R1

Applicant : Murata Manufacturing Co., Ltd.
Type of Equipment : Communication Module
Model No. : Type1NX
FCC ID : VPYLB1NX
Test regulation : FCC Part 15 Subpart E: 2018
(Except for DFS test)
Test Result : Complied

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2. The results in this report apply only to the sample tested.
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4. The test results in this 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. This report is a revised version of 11932168H-C. 11932168H-C is replaced with this report.

Date of test: September 25 to November 17, 2017

Representative test engineer:

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 11932168H-C

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CONTENTS	PAGE
SECTION 1: Customer information.....	4
SECTION 2: Equipment under test (E.U.T.).....	4
SECTION 3: Test specification, procedures & results.....	6
SECTION 4: Operation of E.U.T. during testing.....	10
SECTION 5: Conducted Emission.....	16
SECTION 6: Radiated Spurious Emission and Band Edge Compliance	17
SECTION 7: Antenna Terminal Conducted Tests.....	19
APPENDIX 1: Test data	20
Conducted Emission	20
26 dB Emission Bandwidth and 99 % Occupied Bandwidth.....	21
6 dB Bandwidth	46
Maximum Conducted Output Power	50
Average Output Power	55
Maximum Power Spectral Density	62
Radiated Spurious Emission	80
Conducted Spurious Emission	135
APPENDIX 2: Test instruments	136
APPENDIX 3: Photographs of test setup	137
Conducted Emission	137
Radiated Spurious Emission	138
Worst Case Position	139

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

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	Communication Module
Model No.	:	Type1NX
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	VBAT: Min. 3.35 V / Typ. 3.6 V / Max. 4.8 V *VIO: Min. 1.71 V / Typ. 1.8 V / Max. 1.89 V * VIO don't influence the RF characteristic.
Receipt Date of Sample	:	September 15, 2017
Country of Mass-production	:	China and Japan
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model: Type1NX (referred to as the EUT in this report) is a Communication Module.

General Specification

Clock frequency(ies) in the system	:	37.4 MHz (X'tal)
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Radio Specification

Radio Type : Transceiver
Power Supply (inner) : DC 1.35 V, 1.2 V, 3.3 V, 2.5 V

Specification of Wireless LAN (IEEE802.11b/g/a/n-20/11ac-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	Dipole antenna				
Antenna Gain	2.4 GHz: 0.2 dBi 5 GHz: 1.4dBi				

Bluetooth (Ver. 4.2 with EDR function)

	Bluetooth Ver.4.2 with EDR function
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	Dipole antenna
Antenna Gain	2.4 GHz: 0.2 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 February 2, 2018 and effective March 5, 2018

Title : FCC 47CFR Part15 Radio Frequency Device Subpart E
Unlicensed National Information Infrastructure Devices
Section 15.407 General technical requirements

* The revisions made after testing date do not affect the test specification applied to the EUT.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.10-2013	FCC: 15.407 (b) (6) / 15.207	QP 23.6 dB, 0.15000 MHz, N AV 24.8 dB, 29.02984 MHz, N	Complied	-
	IC: RSS-Gen 8.8	IC: RSS-Gen 8.8			
26 dB Emission Bandwidth	FCC: KDB Publication Number 789033	FCC: 15.407 (a) (1) (2) (3)	See data	N/A	Conducted
	IC: -	IC: -			
Maximum Conducted Output Power	FCC: KDB Publication Number 789033	FCC: 15.407 (a) (1) (2) (3)		Complied	Conducted
	IC: -	IC: RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1			
Maximum Power Spectral Density	FCC: KDB Publication Number 789033	FCC : 15.407 (a) (1) (2) (3)	See data	Complied	Conducted
	IC: -	IC: RSS-247 6.2.1.1 6.2.2.1 6.2.3.1 6.2.4.1			
Spurious Emission Restricted Band Edge	FCC: ANSI C63.10-2013 KDB Publication Number 789033	FCC: 15.407 (b), 15.205 and 15.209	0.2 dB 11650.000 MHz AV, Hori	Complied	Conducted (< 30 MHz) / Radiated (> 30 MHz) *1)
	IC: -	IC: RSS-247 6.2.1.2 6.2.2.2 6.2.3.2 6.2.4.2			
6 dB Emission Bandwidth	FCC: ANSI C63.10-2013	FCC: 15.407 (e)	See data	Complied	Conducted
	IC: -	IC: RSS-247 6.2.4.1			

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.
* For DFS tests, please see the test report number 11932168H-D issued by UL Japan, Inc.
*1) Radiated test was selected over 30 MHz based on section FCC 15.407 (b) and KDB 789033 D02 G.3.b).

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

FCC Part 15.31 (e)

The RF Module has its own regulator.

The RF Module is constantly provided voltage (DC 1.35 V, 1.2 V, 3.3 V, 2.5 V) through the regulator regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

The antenna is not removable from the EUT.

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

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3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99 % Occupied Band Width	RSS-Gen 6.6	IC: -	N/A	N/A	Conducted

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

3.4 Uncertainty

EMI

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

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Antenna terminal test		Uncertainty (+/-)
RF output power		1.2 dB
Antenna terminal conducted emission / Power density / Burst power		3.1 dB
Adjacent channel power / Channel power		
Below 3 GHz		1.8 dB
3 GHz to 6 GHz		2.7 dB

Frequency range	Conducted emission using AMN(LISN) (+/-)
0.009 MHz - 0.15 MHz	3.1 dB
0.15 MHz - 30 MHz	2.5 dB

Test distance	Radiated emission (+/-) 9 kHz - 30 MHz
3 m	3.8 dB
10 m	3.6 dB

Polarity	Radiated emission (Below 1 GHz)			
	(3 m*) (+/-)		(10 m*) (+/-)	
	30 MHz - 200 MHz	200 MHz - 1000 MHz	30 MHz - 200 MHz	200 MHz - 1000 MHz
Horizontal	5.0 dB	5.3 dB	5.0 dB	5.0 dB
Vertical	5.2 dB	6.3 dB	5.0 dB	5.0 dB

Radiated emission (Above 1 GHz)				
(3 m*) (+/-)		(1 m*) (+/-)		(10 m*) (+/-)
1 GHz - 6 GHz	6 GHz - 18 GHz	10 GHz - 26.5 GHz	26.5 GHz - 40 GHz	1 GHz - 18 GHz
5.2 dB	5.5 dB	5.5 dB	5.4 dB	5.5 dB

*Measurement distance

Conducted Emission test

The data listed in this test report has enough margin, more than the site margin.

Radiated emission test

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

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3.5 Test Location

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NVLAP Lab. code: 200572-0 / FCC Test Firm Registration Number: 199967

Test site	IC Registration Number	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	2973C-1	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	2973C-2	7.5 x 5.8 x 5.2	4.0 x 4.0	-	3 m
No.3 semi-anechoic chamber	2973C-3	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	2973C-4	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.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	N/A	-	-
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.

SECTION 4: Operation of E.U.T. 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)	48 Mbps, PN9
IEEE 802.11n 20MHz BW (11n-20)	MCS 4, PN9
IEEE 802.11ac 20MHz BW (11ac-20)	MCS 5, PN9
IEEE 802.11n 40MHz BW (11n-40)	MCS 2, PN9
IEEE 802.11ac 40MHz BW (11ac-40)	MCS 4, 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 the following table Software: WLAN: Tera term- 4.8.7 *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.	

[Power setting]

11a								
Data Rate	6	9	12	18	24	36	48	54
Frequency	5180 to 5240 MHz (20MHz)							
Power Setting	10.5							
Frequency	5260 to 5320 MHz (20MHz)							
Power Setting	9.5							
Frequency	5500 to 5720 MHz (20MHz)							
Power Setting	14							13
Frequency	5745 to 5825 MHz (20MHz)							
Power Setting	13							12

11n/11ac 20MHz									
Data Rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7✖	MCS8✖
Frequency	5180 to 5240 MHz (20MHz)								
Power Setting	10								
Frequency	5260 to 5320 MHz (20MHz)								
Power Setting	9								
Frequency	5500 to 5720 MHz (20MHz)								
Power Setting	12								11
Frequency	5745 to 5825 MHz (20MHz)								
Power Setting	12							11	10

※11n : MCS0 to 7, 11ac : MCS0 to 8

11n/11ac 40MHz										
Data Rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7※	MCS8※	MCS9※
Frequency	5190 to 5230 MHz (40MHz)									
Power Setting	9.5									
Frequency	5270 to 5310 MHz (40MHz)									
Power Setting	9									
Frequency	5510 to 5710 MHz (40MHz)									
Power Setting	8.5									
Frequency	5755 to 5795 MHz (40MHz)									
Power Setting	12							11	10	

※11n : MCS0 to 7, 11ac : MCS0 to 9

11ac 80MHz										
Data Rate	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7	MCS8	MCS9
Frequency	5210 MHz (80MHz)									
Power Setting	9.5									
Frequency	5290 MHz (80MHz)									
Power Setting	9									
Frequency	5530 to 5690 MHz (80MHz)									
Power Setting	7.5									
Frequency	5775 MHz (80MHz)									
Power Setting	11							10		

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*The details of Operation mode(s)

Test Item	Operating Mode	Tested Frequency			
		Low Band	Middle Band	Additional Band	Upper Band
Conducted emission, Conducted Spurious Emission, Radiated Spurious Emission (Below 1GHz)	11n-40 Tx, *1)	-	5755 MHz	-	-
26dB Emission Bandwidth	11a Tx, 11n-20 Tx, 11ac-20 Tx	-	5260 MHz 5280 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, Maximum Power Spectral Density	11a Tx, 11n-20 Tx, 11ac-20 Tx	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5280 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)	11a Tx 11n-20 Tx *2)	5180 MHz	5280 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz	5745 MHz 5785 MHz 5825 MHz
	11n-40 Tx *2)	5190 MHz	5270 MHz 5310 MHz	5510 MHz 5670 MHz	5755 MHz 5795 MHz
	11ac-80 Tx	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 11n-20 and 11ac-20, 11n-40 and 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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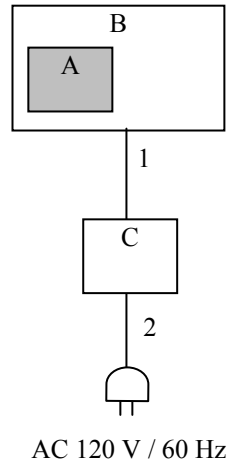
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4.2 Configuration and peripherals

For Conducted Emission



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

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Communication Module	Type1NX	17	Murata Manufacturing Co., Ltd.	EUT
B	Jig Board	-	-	Murata Manufacturing Co., Ltd.	*1)
C	Regulated DC Power Supply	PW16-5ADP	171116437	TEXIO	-

*1) The test was performed with the module that as normal assumed implementation conditions.
The use of a jig does not influence on the test result.

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	2.5	Unshielded	Unshielded	-
2	AC Cable	1.0	Unshielded	Unshielded	-

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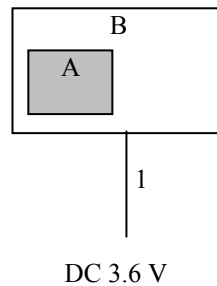
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For Radiated Emission test



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

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Communication Module	Type1NX	17	Murata Manufacturing Co., Ltd.	EUT
B	Jig Board	-	-	Murata Manufacturing Co., Ltd.	*1)

*1) The test was performed with the module that as normal assumed implementation conditions.
The use of a jig does not influence on the test result.

List of cables used

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

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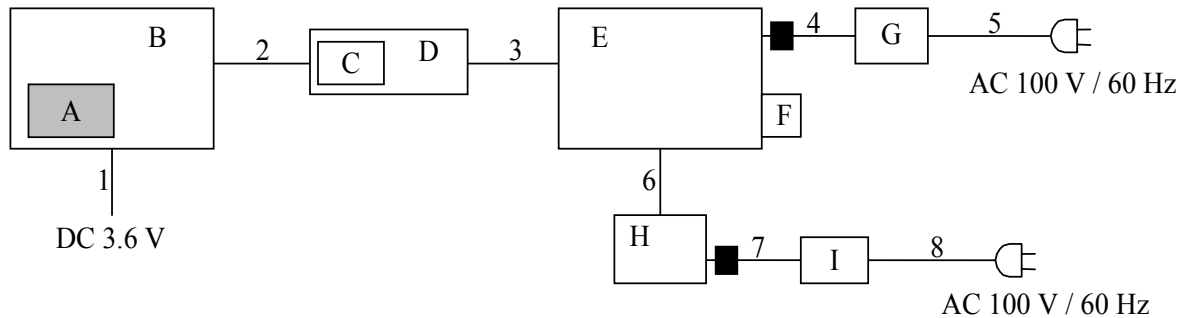
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For Antenna Terminal Conducted test



■ : Standard Ferrite Core

* 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	Module	Type1NX	9	Murata Manufacturing	EUT
B	Jig board 1	-	-	-	*1)
C	Jig board 2	-	-	-	-
D	Jig board 3	-	-	-	-
E	BRIX	GB-BKi3HA-7100	SN1717630455	GIGABYTE	-
F	USB Memory	SDCZ33	BM170525475D	Sandisk	-
G	AC Adaptor	9NA0654719	H6141013436	FSP GROUP INC.	-
H	Laptop PC	CF-N8HWCDPS	OBKSA07449	Panasonic	-
I	AC Adaptor	CF-AA6372B	637BM610701051E	Panasonic	-

*1) The test was performed with the module that as normal assumed implementation conditions.
The use of a jig does not influence on the test result.

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	0.55	Unshielded	Unshielded	-
2	Signal Cable	0.10	Unshielded	Unshielded	-
3	Signal Cable	0.30	Unshielded	Unshielded	-
4	DC Cable	1.50	Unshielded	Unshielded	-
5	AC Cable	0.60	Unshielded	Unshielded	-
6	LAN Cable	3.00	Unshielded	Unshielded	-
7	DC Cable	1.10	Unshielded	Unshielded	-
8	AC Cable	0.90	Unshielded	Unshielded	-

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SECTION 5: Conducted Emission

Test Procedure and conditions

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

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

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

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

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

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

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

SECTION 6: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

< Below 1GHz >

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

< Above 1GHz >

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

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

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

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

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

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

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

< Below 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 AD *1) RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: ≥ 100 traces If duty cycle was less than 98%, a duty factor was added to the results.
Test Distance	3 m	3 m (below 1 GHz), 4.5 m*2) (1 GHz – 10GHz), 1 m*3) (10 GHz – 40 GHz)	

*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".

*2) Distance Factor: $20 \times \log (4.5 \text{ m}/3.0 \text{ m}) = 3.5 \text{ dB}$

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

- 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 7: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
26 dB Bandwidth	Enough to capture the emission	Close to 1 % of EBW	> RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 % to 5 % of OBW	≥ 3 RBW	Auto	Peak	Max Hold	Spectrum Analyzer
6 dB Bandwidth	Enough to capture the emission	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Conducted Output Power	-	-	-	Auto	Average	-	Power Meter (Sensor: 80 MHz BW) (Method PM)
Maximum Power Spectral Density	Encompass the entire EBW	1 MHz *2)	≥ 3 RBW	Auto	RMS Power Averaging (200 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*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) KDB 789033 D02 says that RBW is set to be 500 kHz for 5.725 GHz-5.850 GHz, but it is not possible with spectrum analyzer, so RBW Correction Factor ($10 \log(500 \text{ kHz} / 470 \text{ kHz})$) was added to the test result.

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

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

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

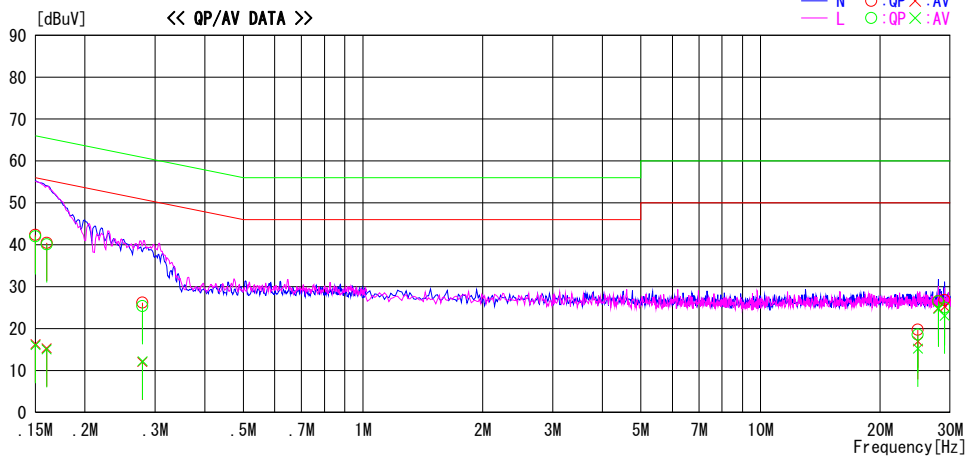
Test data	: APPENDIX
Test result	: Pass

APPENDIX 1: Test data

Conducted Emission

Test place : Ise EMC Lab. No.3 Measurement Room
Report No. : 11932168H
Date : October 29, 2017
Temperature / Humidity : 21 deg. C / 59 % RH
Engineer : Takafumi Noguchi
Mode : Tx 11n-40 5755 MHz

LIMIT : FCC15. 207 QP
FCC15. 207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15000	29.2	3.1	13.2	42.4	16.3	66.0	56.0	23.6	39.7	N	
0.16008	27.3	2.1	13.2	40.5	15.3	65.5	55.5	25.0	40.2	N	
0.27852	13.0	-1.1	13.2	26.2	12.1	60.9	50.9	34.7	38.8	N	
24.88285	5.2	2.5	14.5	19.7	17.0	60.0	50.0	40.3	33.0	N	
27.99312	12.0	10.3	14.6	26.6	24.9	60.0	50.0	33.4	25.1	N	
29.02984	12.2	10.6	14.6	26.8	25.2	60.0	50.0	33.2	24.8	N	
0.15000	28.8	2.9	13.2	42.0	16.1	66.0	56.0	24.0	39.9	L	
0.16016	26.9	1.9	13.2	40.1	15.1	65.5	55.5	25.4	40.4	L	
0.27890	12.2	-1.0	13.2	25.4	12.2	60.8	50.8	35.4	38.6	L	
24.88283	4.1	0.7	14.5	18.6	15.2	60.0	50.0	41.4	34.8	L	
27.99294	11.9	10.1	14.6	26.5	24.7	60.0	50.0	33.5	25.3	L	
29.02968	10.4	8.5	14.6	25.0	23.1	60.0	50.0	35.0	26.9	L	

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

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26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room		
Report No.	11932168H		
Date	October 17, 2017	October 19, 2017	October 23, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH	23deg. C / 61 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka	Takumi Shimada
Mode	Tx		

11a

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]	Limit [MHz]
5180	-	17122.0	-
5220	-	17021.2	-
5240	-	17113.3	-
5260	20.799	17112.1	-
5280	20.727	17093.2	-
5300	20.883	17034.0	-
5320	20.925	17051.4	-
5500	21.790	17095.7	-
5580	21.312	17108.0	-
5700	21.009	17075.1	-
5720	21.214	17071.1	-
5745	-	17067.0	-
5785	-	17147.5	-
5825	-	17105.6	-

11n-20

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]	Limit [MHz]
5180	-	18172.1	-
5220	-	18168.8	-
5240	-	18167.3	-
5260	21.267	18051.6	-
5280	21.255	18091.6	-
5300	21.218	18107.7	-
5320	21.322	18142.6	-
5500	20.966	18149.2	-
5580	21.611	18187.8	-
5700	21.071	18188.3	-
5720	21.253	18143.8	-
5745	-	18240.0	-
5785	-	18269.9	-
5825	-	18258.4	-

11n-40

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]	Limit [MHz]
5190	-	36409.8	-
5230	-	36475.0	-
5270	39.654	36380.1	-
5310	39.214	36320.8	-
5510	39.552	36433.0	-
5550	39.580	36443.8	-
5670	39.597	36443.1	-
5710	39.280	36388.3	-
5755	-	36871.9	-
5795	-	36786.5	-

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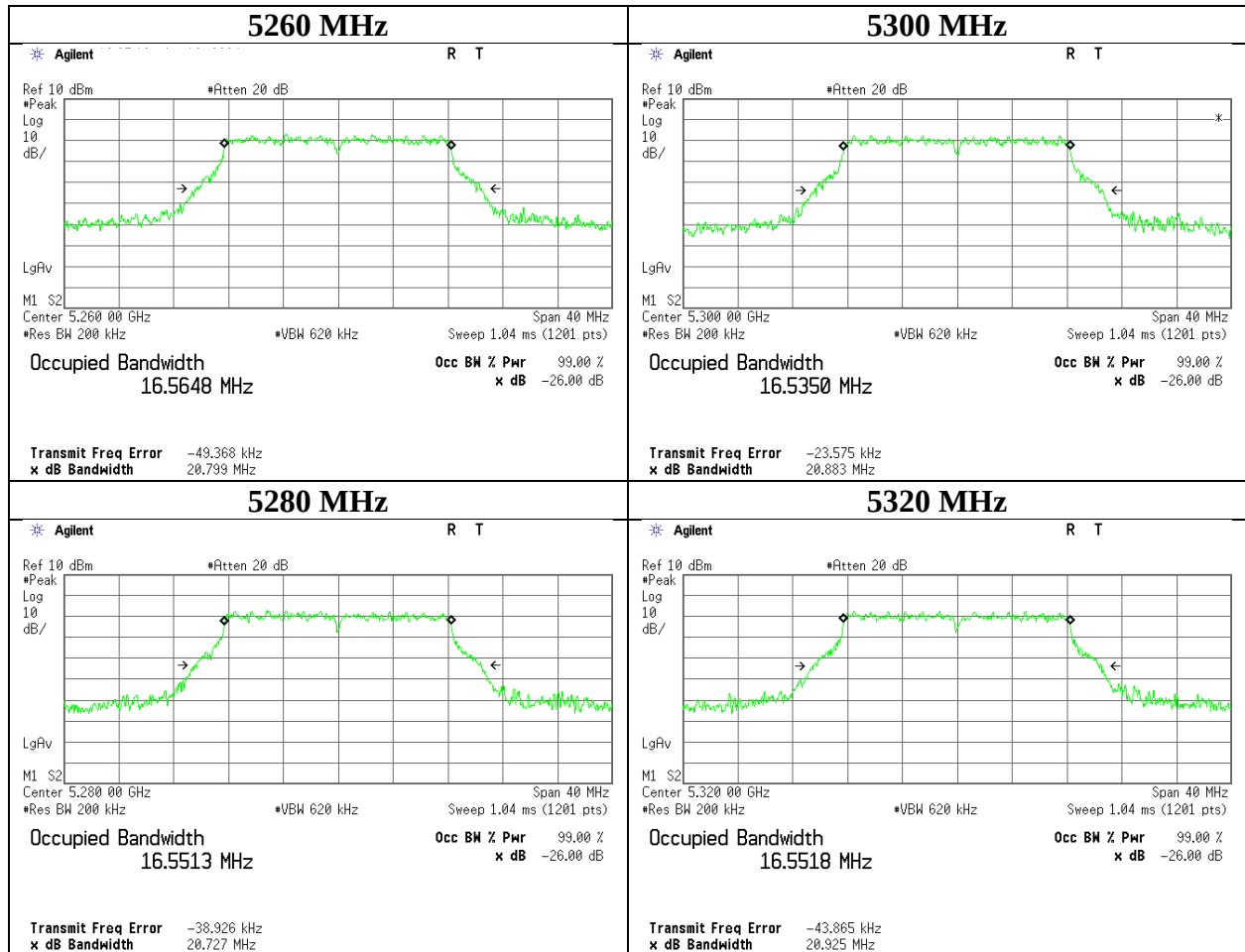
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room	
Report No.	11932168H	
Date	October 17, 2017	October 19, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka
Mode	Tx 11a	



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Ise EMC Lab.

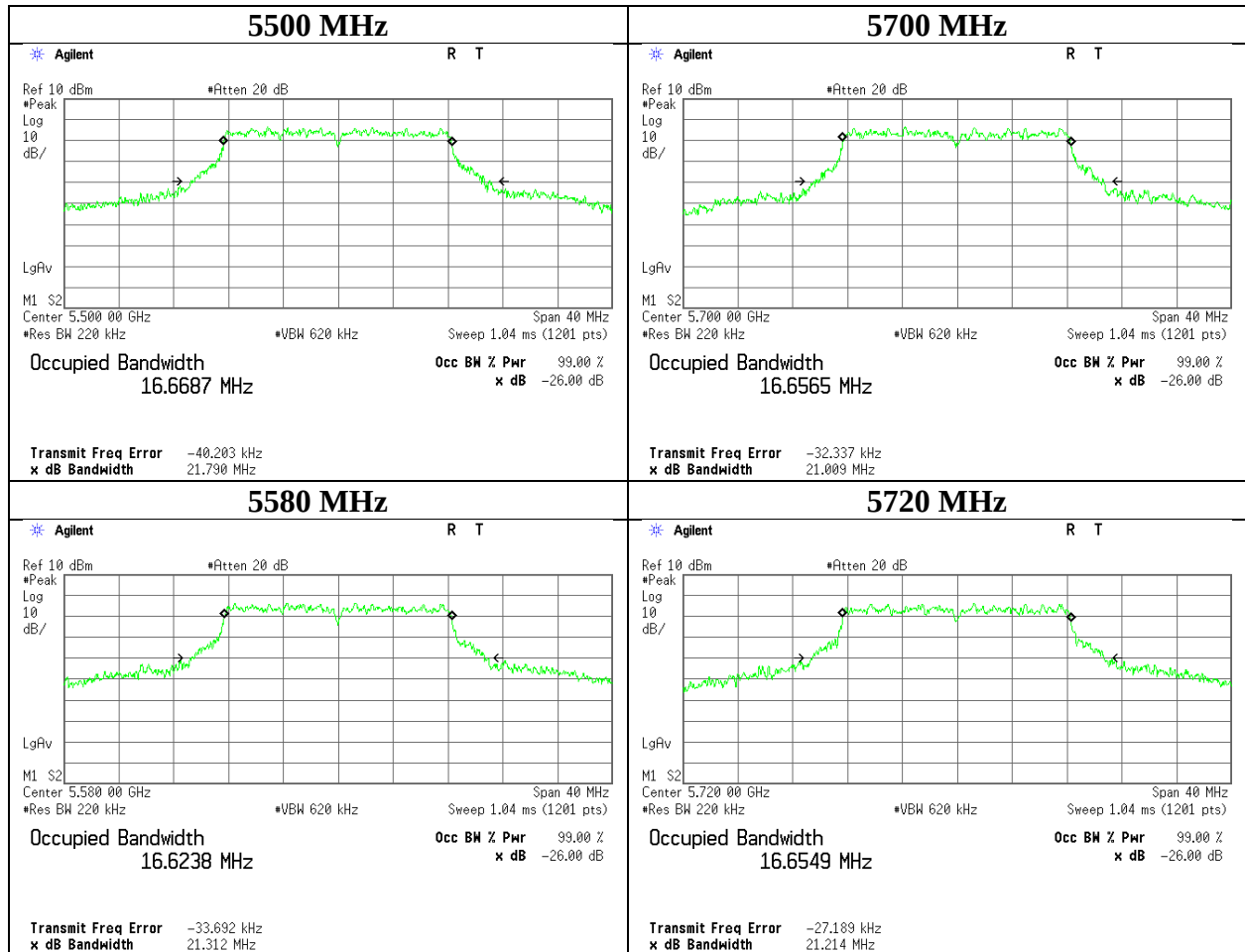
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room	
Report No.	11932168H	
Date	October 17, 2017	October 19, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka
Mode	Tx 11a	



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99 % Occupied Bandwidth

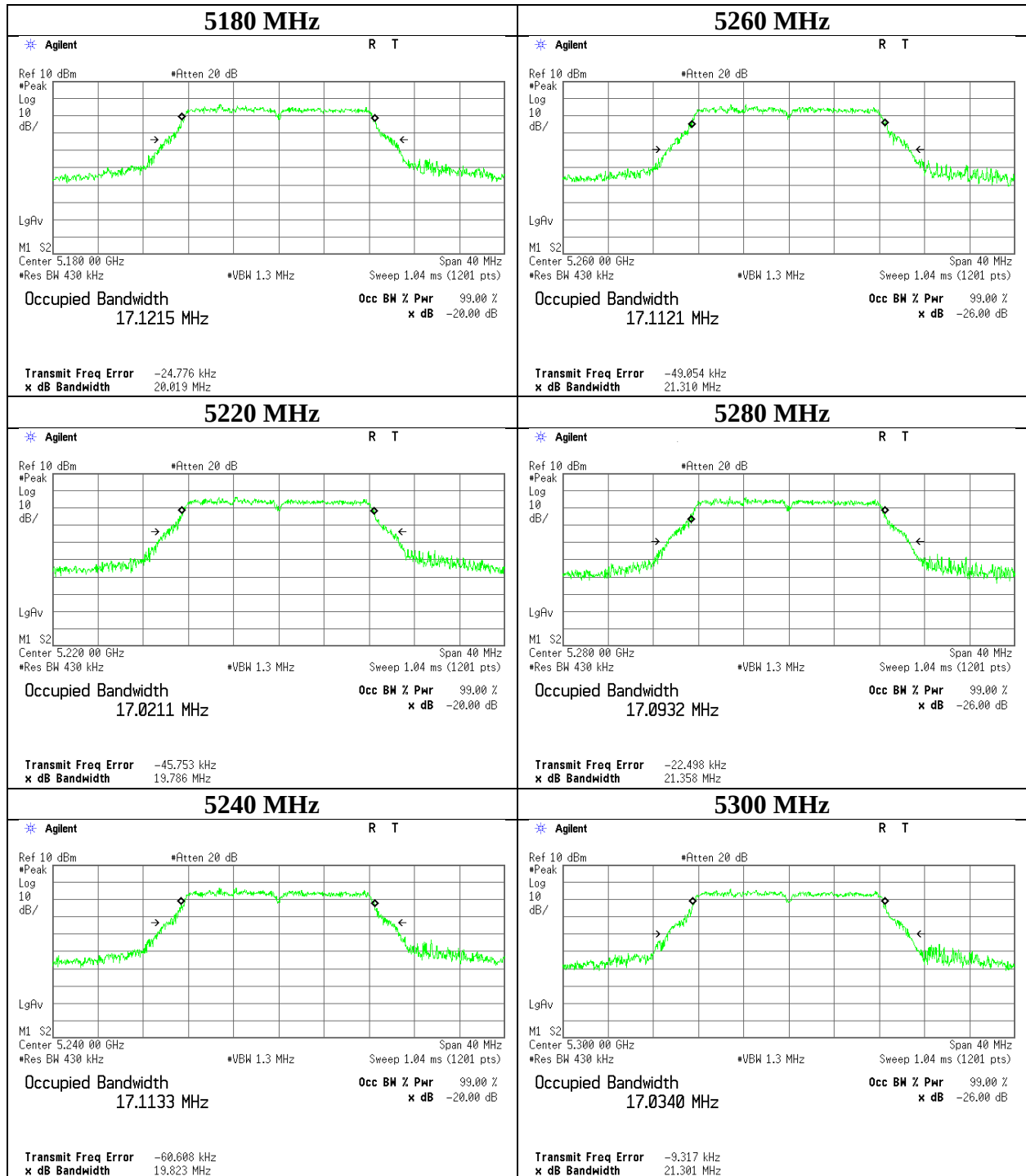
Test place
Report No.

Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.6 Measurement Room
11932168H

October 17, 2017
21deg. C / 69 % RH
Ryota Yamanaka
Tx 11a

October 19, 2017
24 deg. C / 53 % RH
Ryota Yamanaka



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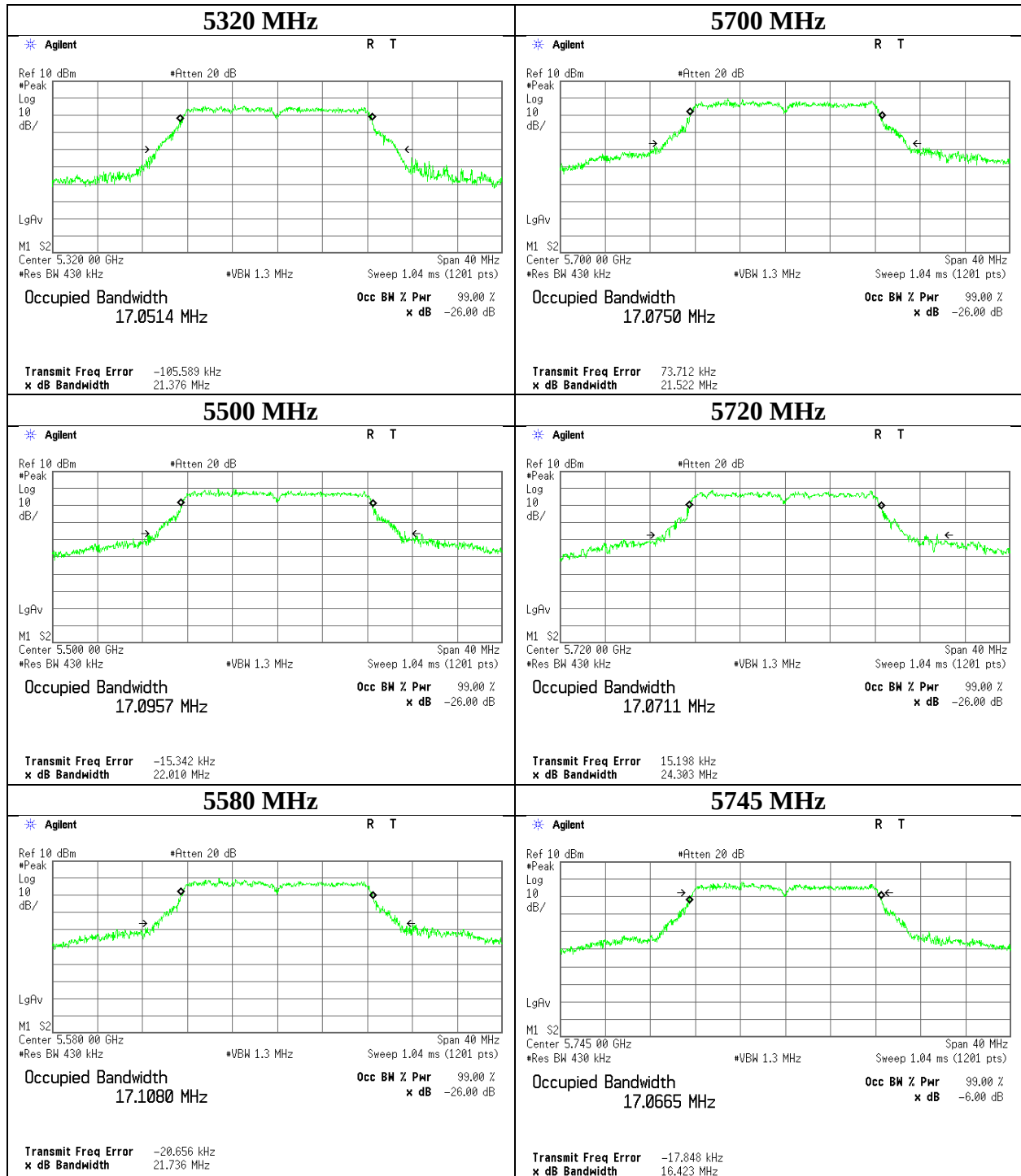
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room		
Report No.	11932168H		
Date	October 17, 2017	October 19, 2017	October 23, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH	23deg. C / 61 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka	Takumi Shimada
Mode	Tx 11a		



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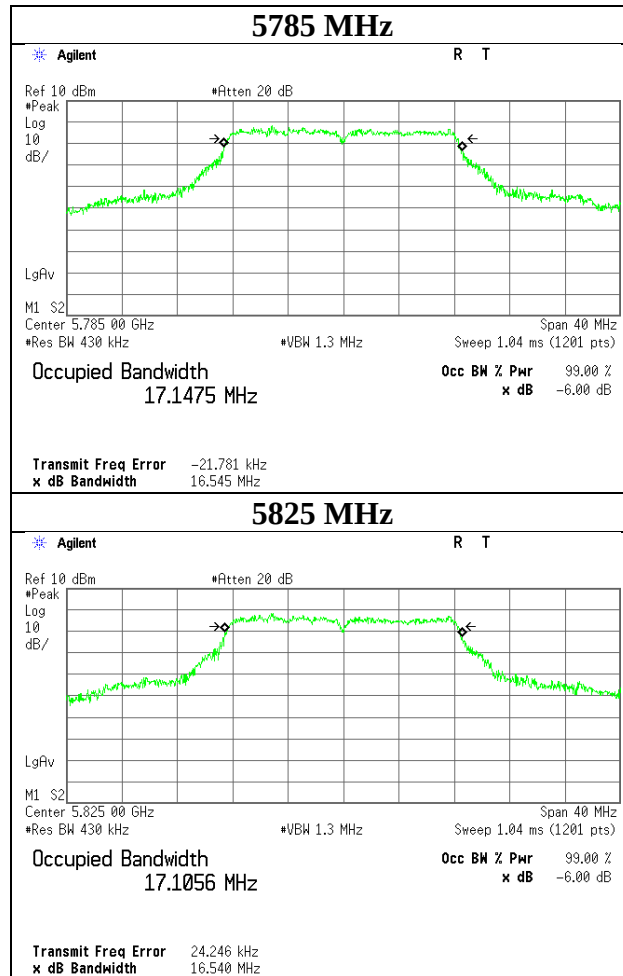
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Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

Test place Ise EMC Lab. No.6 Measurement Room
Report No. 11932168H
Date October 23, 2017
Temperature / Humidity 23deg. C / 61 % RH
Engineer Takumi Shimada
Mode Tx 11a



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Ise EMC Lab.

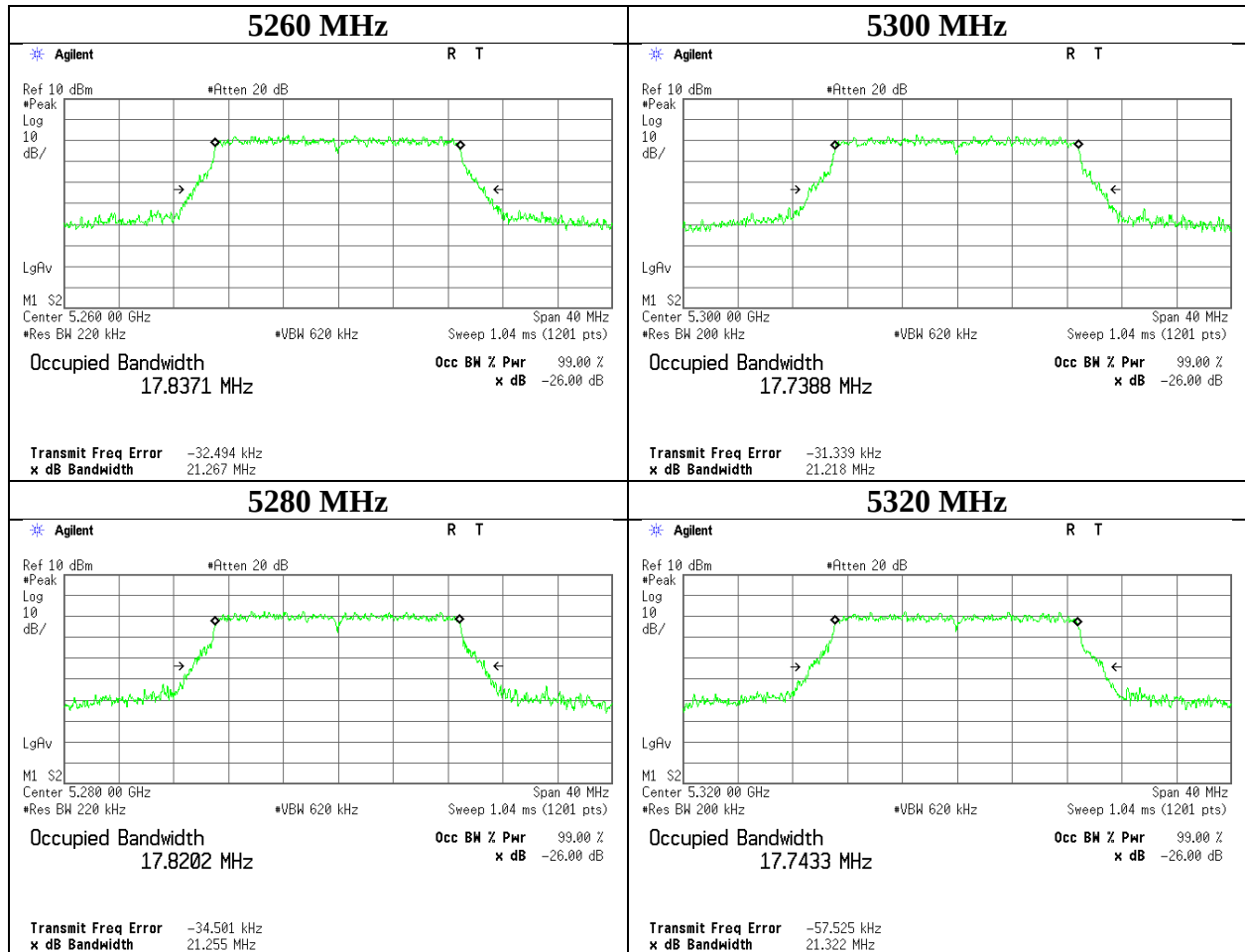
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room	
Report No.	11932168H	
Date	October 17, 2017	October 19, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka
Mode	Tx 11n-20	



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Ise EMC Lab.

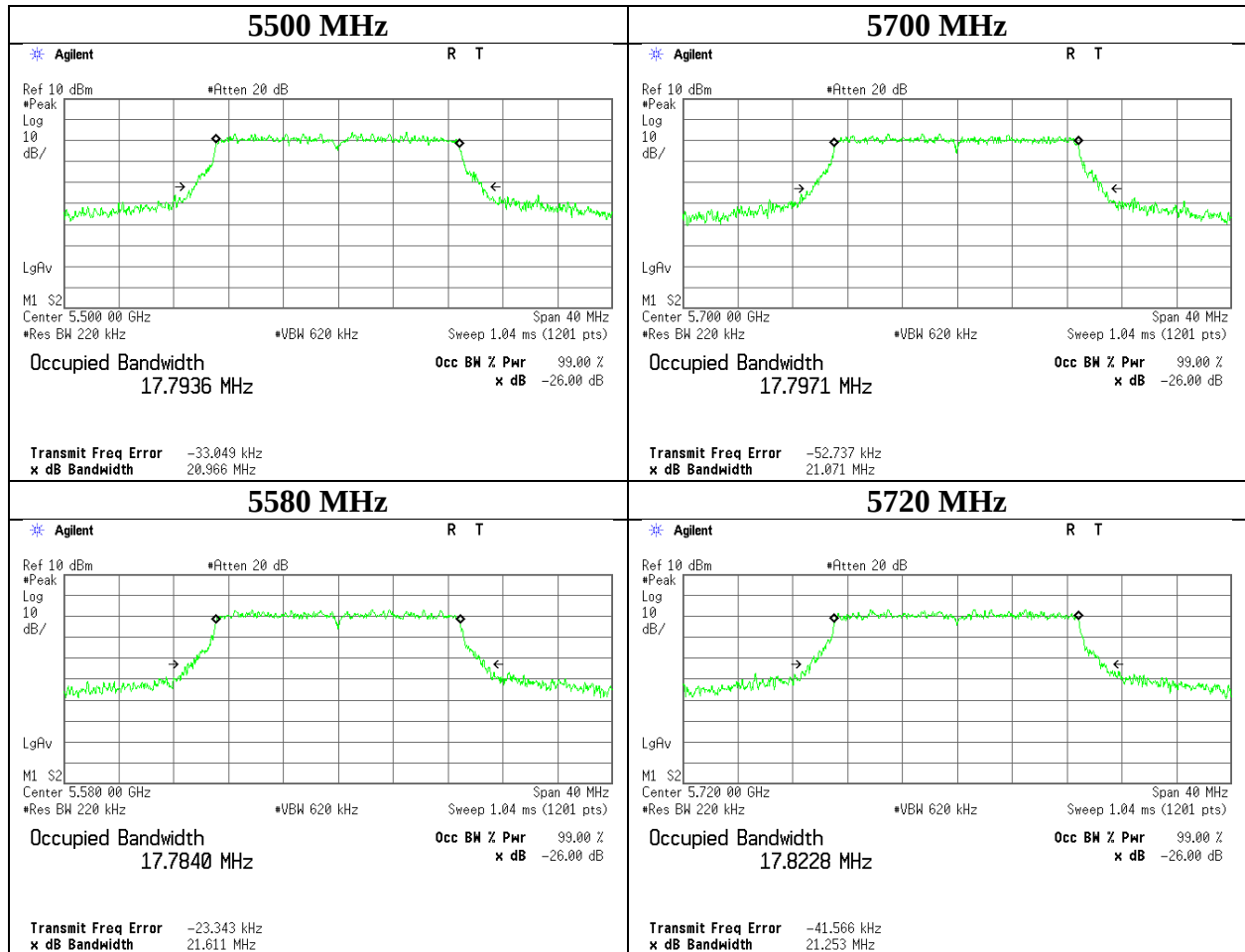
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26 dB Emission Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room	
Report No.	11932168H	
Date	October 17, 2017	October 19, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka
Mode	Tx 11n-20	



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99 % Occupied Bandwidth

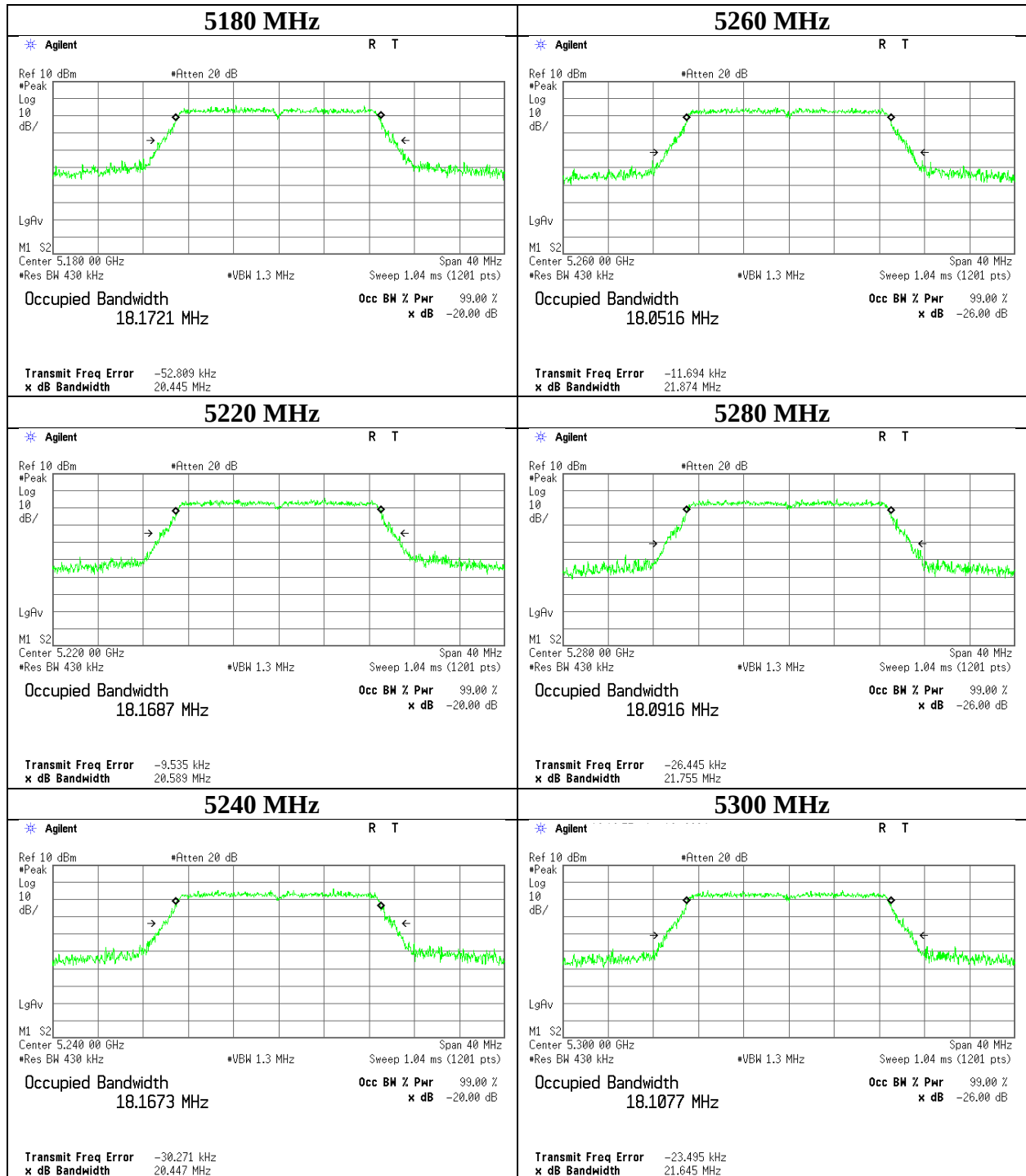
Test place
Report No.

Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.6 Measurement Room
11932168H

October 17, 2017
21deg. C / 69 % RH
Ryota Yamanaka
Tx 11n-20

October 19, 2017
24 deg. C / 53 % RH
Ryota Yamanaka



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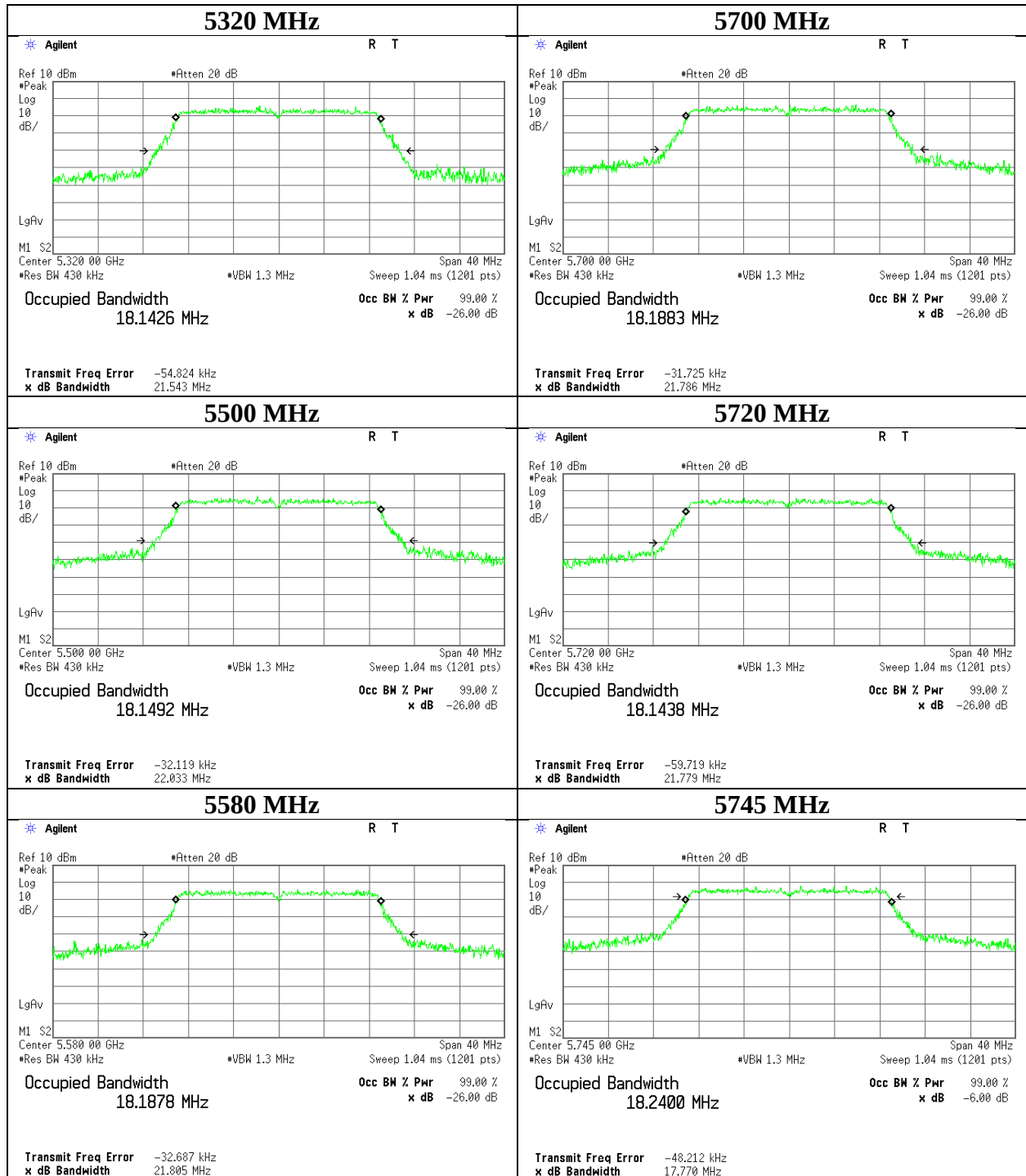
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Telephone : +81 596 24 8999

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99 % Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room		
Report No.	11932168H		
Date	October 17, 2017	October 19, 2017	October 23, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH	23deg. C / 61 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka	Takumi Shimada
Mode	Tx 11n-20		



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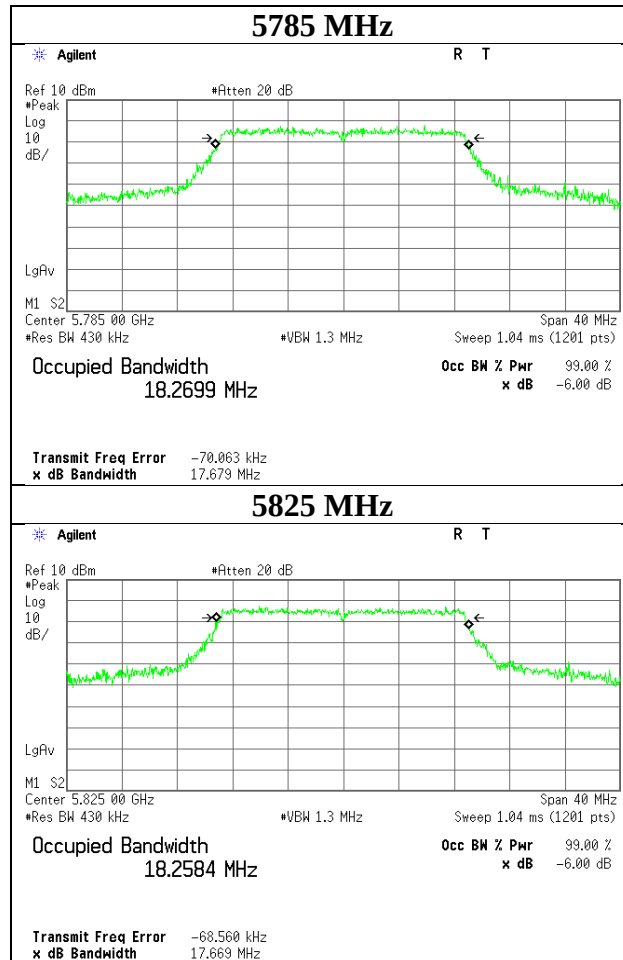
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Telephone : +81 596 24 8999

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99 % Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room		
Report No.	11932168H		
Date	October 17, 2017	October 19, 2017	October 23, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH	23deg. C / 61 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka	Takumi Shimada
Mode	Tx 11n-20		



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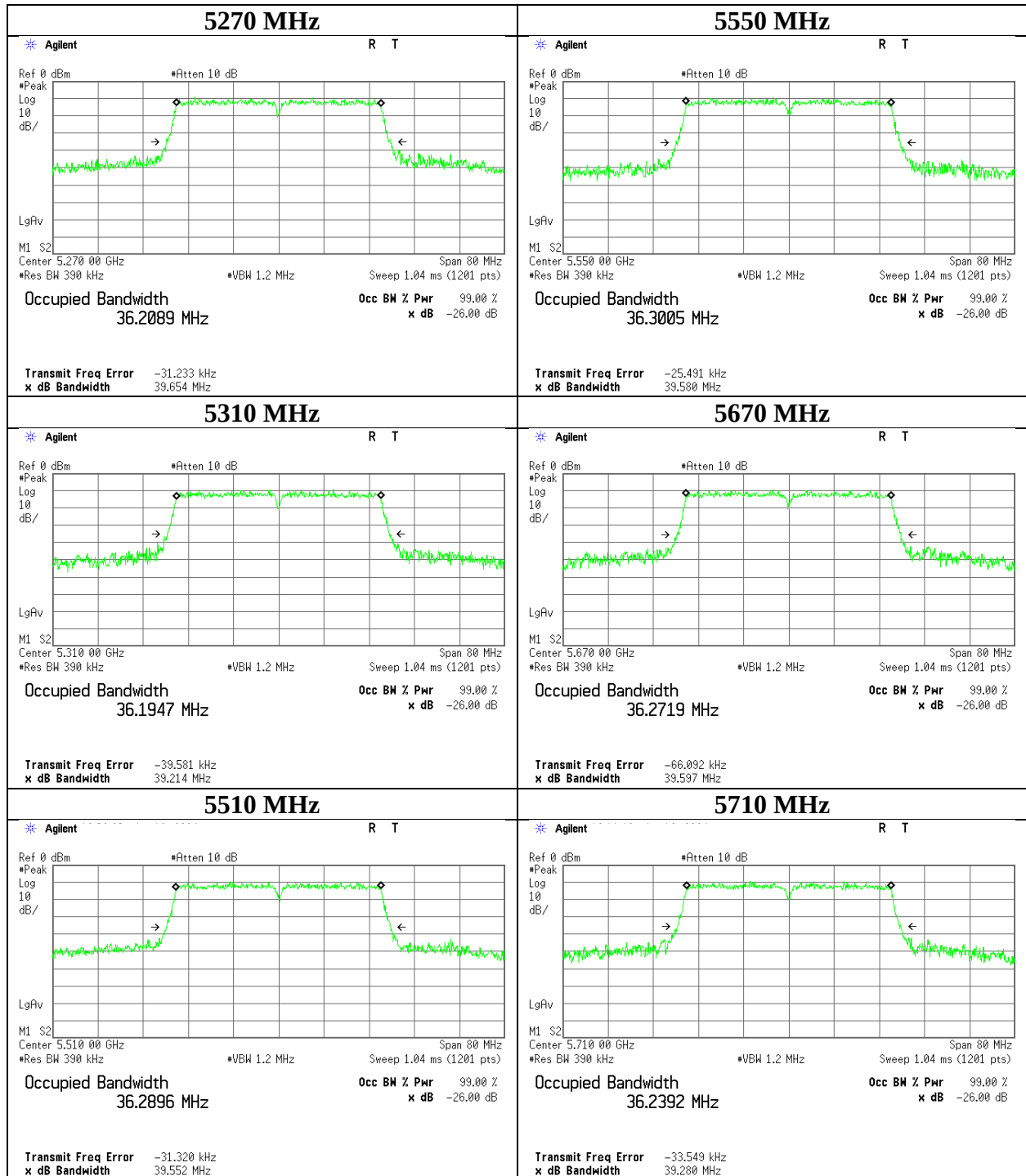
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26 dB Emission Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11932168H
Date	October 17, 2017
Temperature / Humidity	21deg. C / 69 % RH
Engineer	Ryota Yamanaka
Mode	Tx 11n-40
	October 19, 2017
	24 deg. C / 53 % RH
	Ryota Yamanaka



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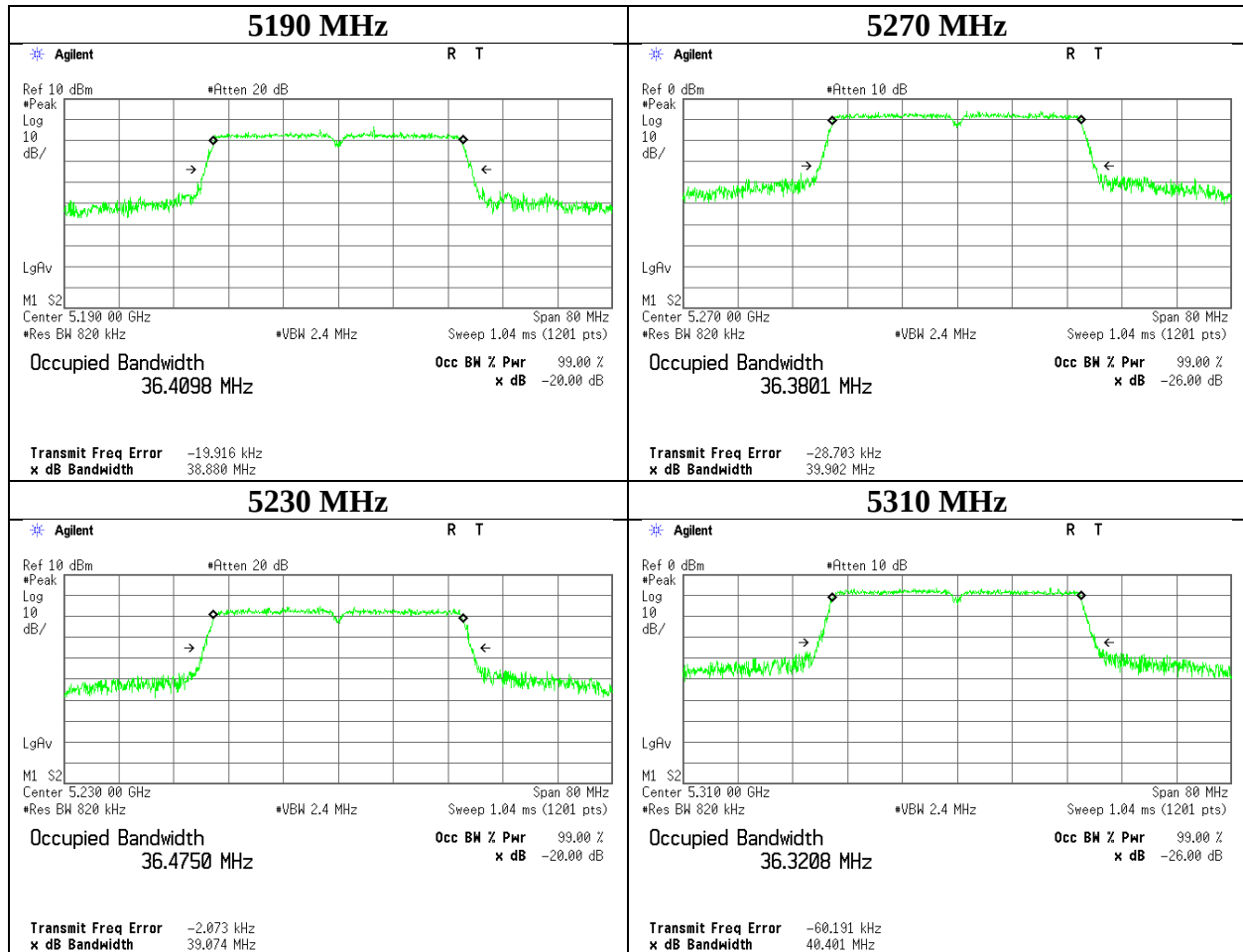
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Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room	
Report No.	11932168H	
Date	October 17, 2017	October 19, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka
Mode	Tx 11n-40	



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99 % Occupied Bandwidth

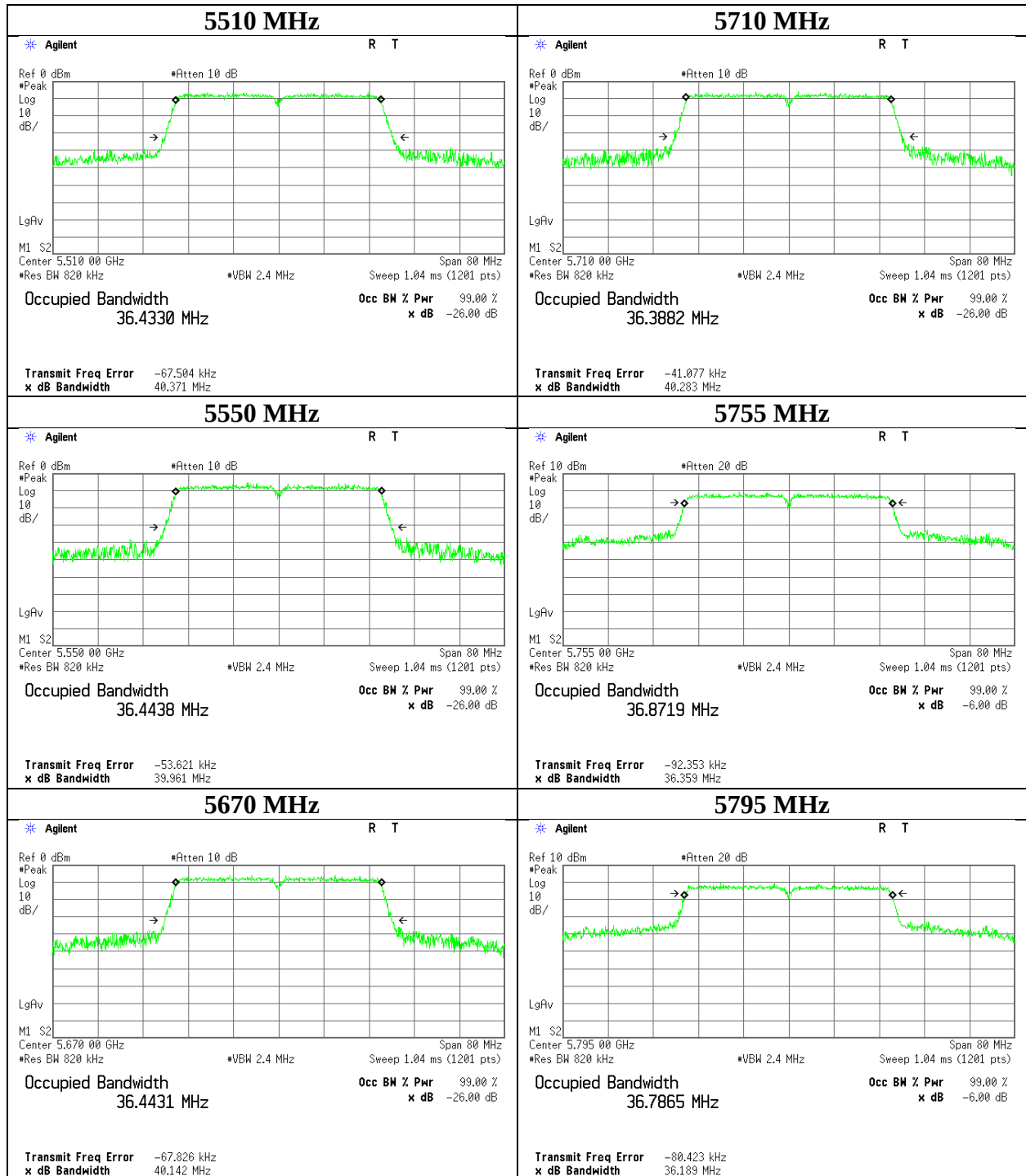
Test place
Report No.

Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.6 Measurement Room
11932168H

October 17, 2017
21deg. C / 69 % RH
Ryota Yamanaka
Tx 11n-40

October 19, 2017
24 deg. C / 53 % RH
Ryota Yamanaka



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26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room		
Report No.	11932168H		
Date	October 17, 2017	October 19, 2017	October 23, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH	23deg. C / 61 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka	Takumi Shimada
Mode	Tx		

11ac-20

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]	Limit [MHz]
5180	-	18086.7	-
5220	-	18126.9	-
5240	-	18130.7	-
5260	21.105	18089.2	-
5280	21.177	18106.7	-
5300	21.103	18059.9	-
5320	21.154	18116.7	-
5500	21.349	18101.5	-
5580	21.310	18048.8	-
5700	21.430	18142.0	-
5720	21.399	18144.5	-
5745	-	18301.4	-
5785	-	18281.4	-
5825	-	18180.2	-

11ac-40

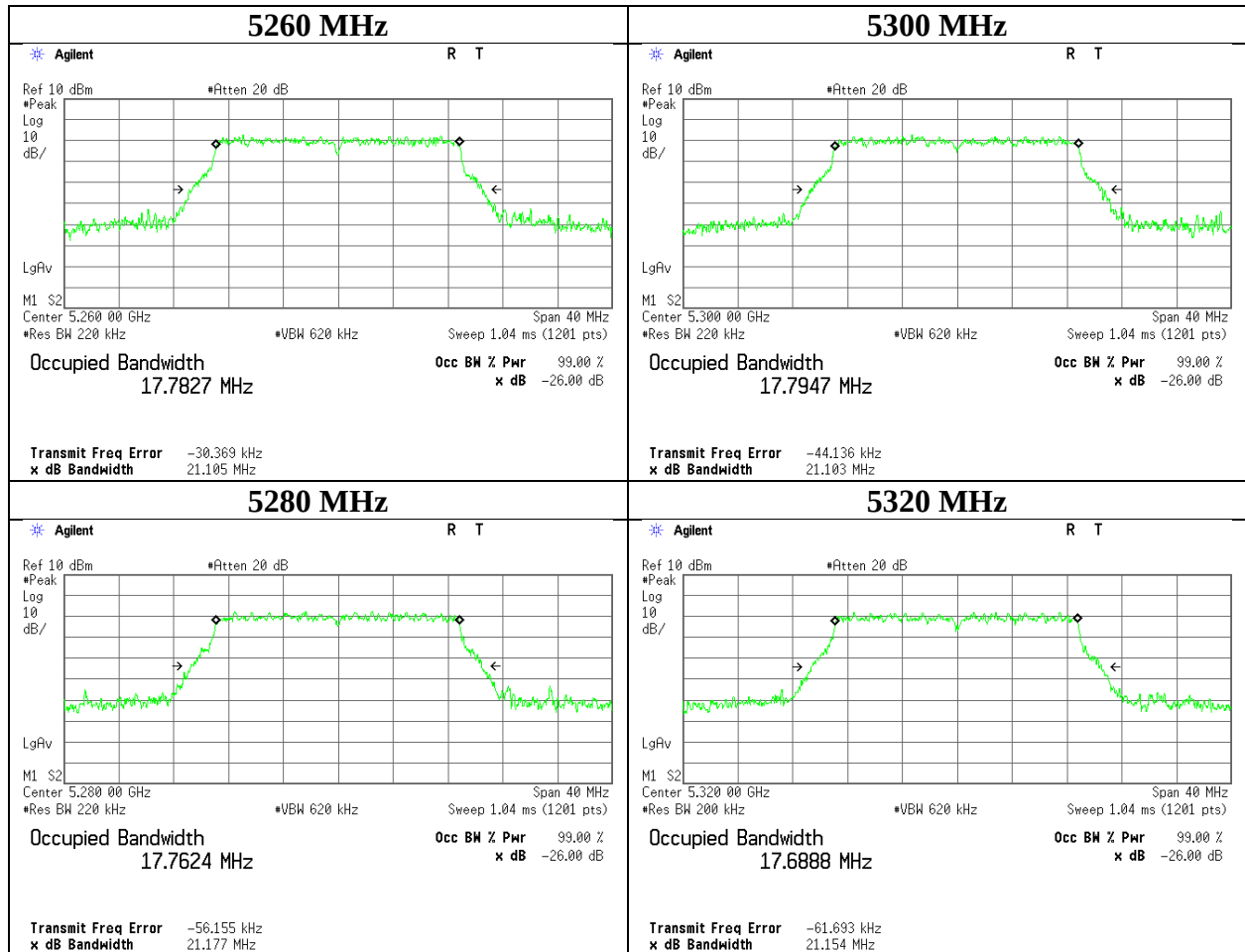
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5190	-	36522.5	-
5230	-	36564.3	-
5270	39.580	36491.1	-
5310	39.792	36484.3	-
5510	39.417	36445.2	-
5550	39.620	36505.1	-
5670	39.822	36464.5	-
5710	39.408	36470.5	-
5755	-	36932.9	-
5795	-	36803.7	-

11ac-80

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [kHz]	Limit [MHz]
5210	-	76161.5	-
5290	81.419	75795.9	-
5530	81.488	75854.2	-
5610	81.355	75947.7	-
5690	81.621	75790.6	-
5775	-	75973.6	-

26 dB Emission Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room	
Report No.	11932168H	
Date	October 17, 2017	October 19, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka
Mode	Tx 11ac-20	



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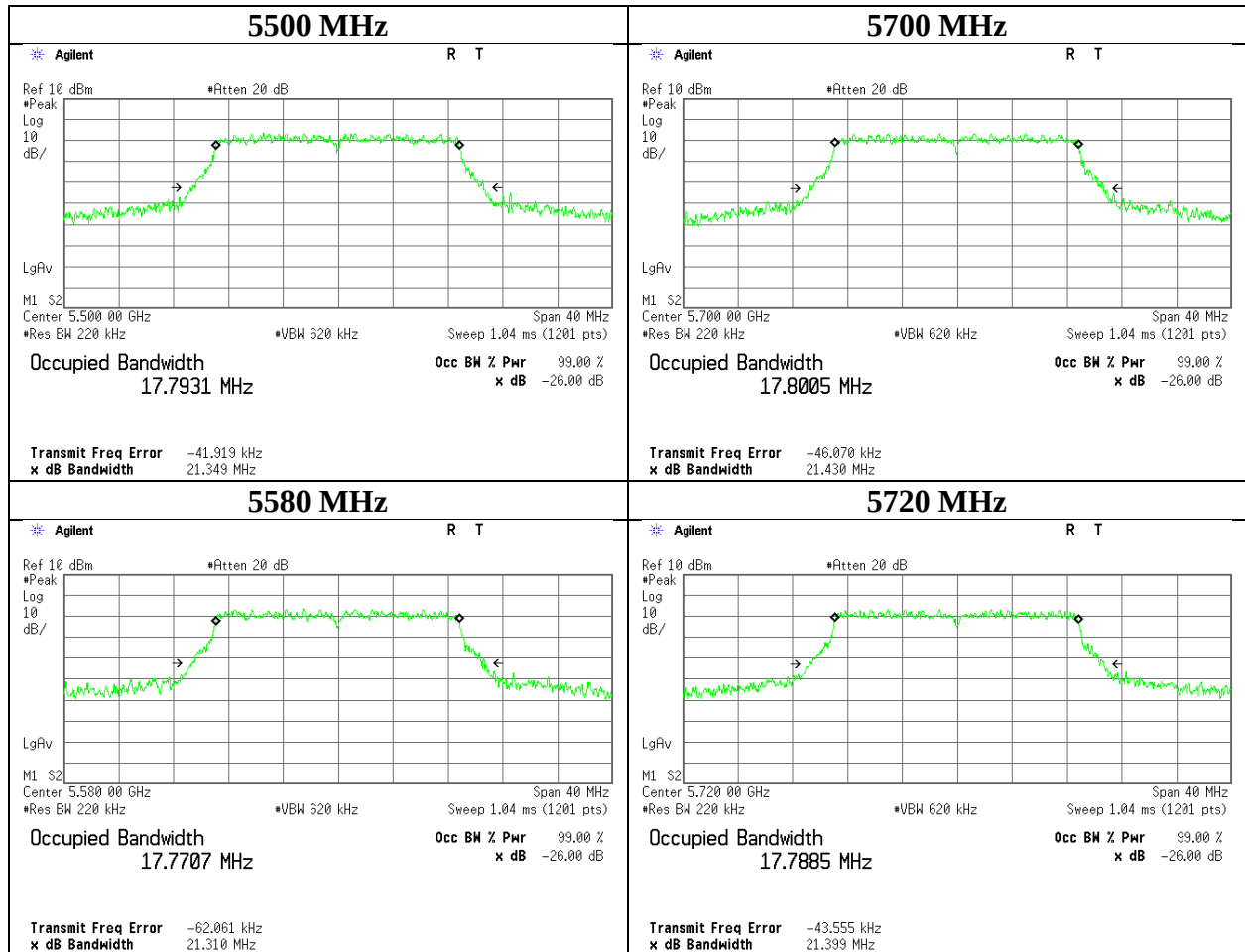
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26 dB Emission Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room	
Report No.	11932168H	
Date	October 17, 2017	October 19, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka
Mode	Tx 11ac-20	



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99 % Occupied Bandwidth

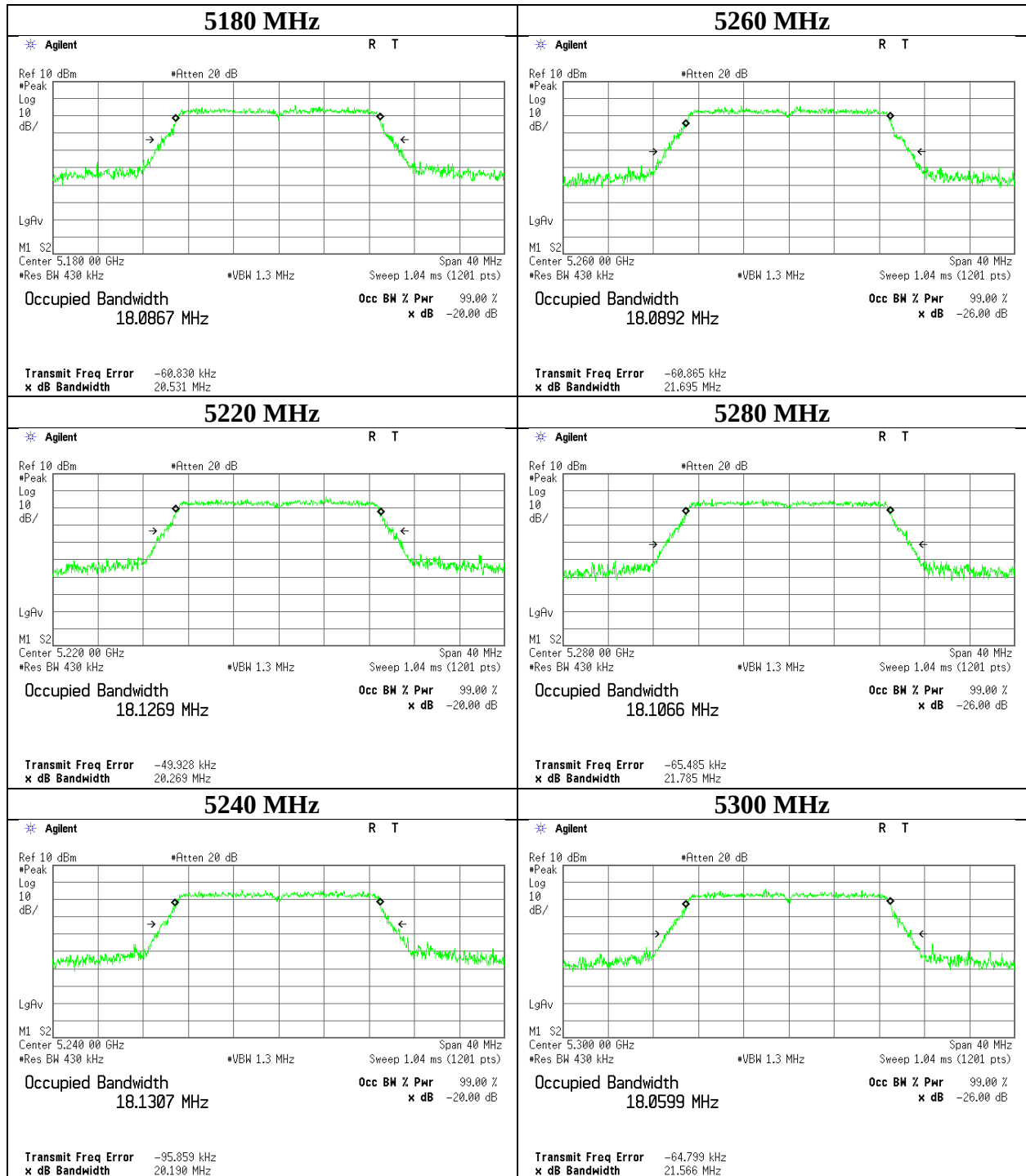
Test place
Report No.

Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.6 Measurement Room
11932168H

October 17, 2017
21deg. C / 69 % RH
Ryota Yamanaka
Tx 11ac-20

October 19, 2017
24 deg. C / 53 % RH
Ryota Yamanaka



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Ise EMC Lab.

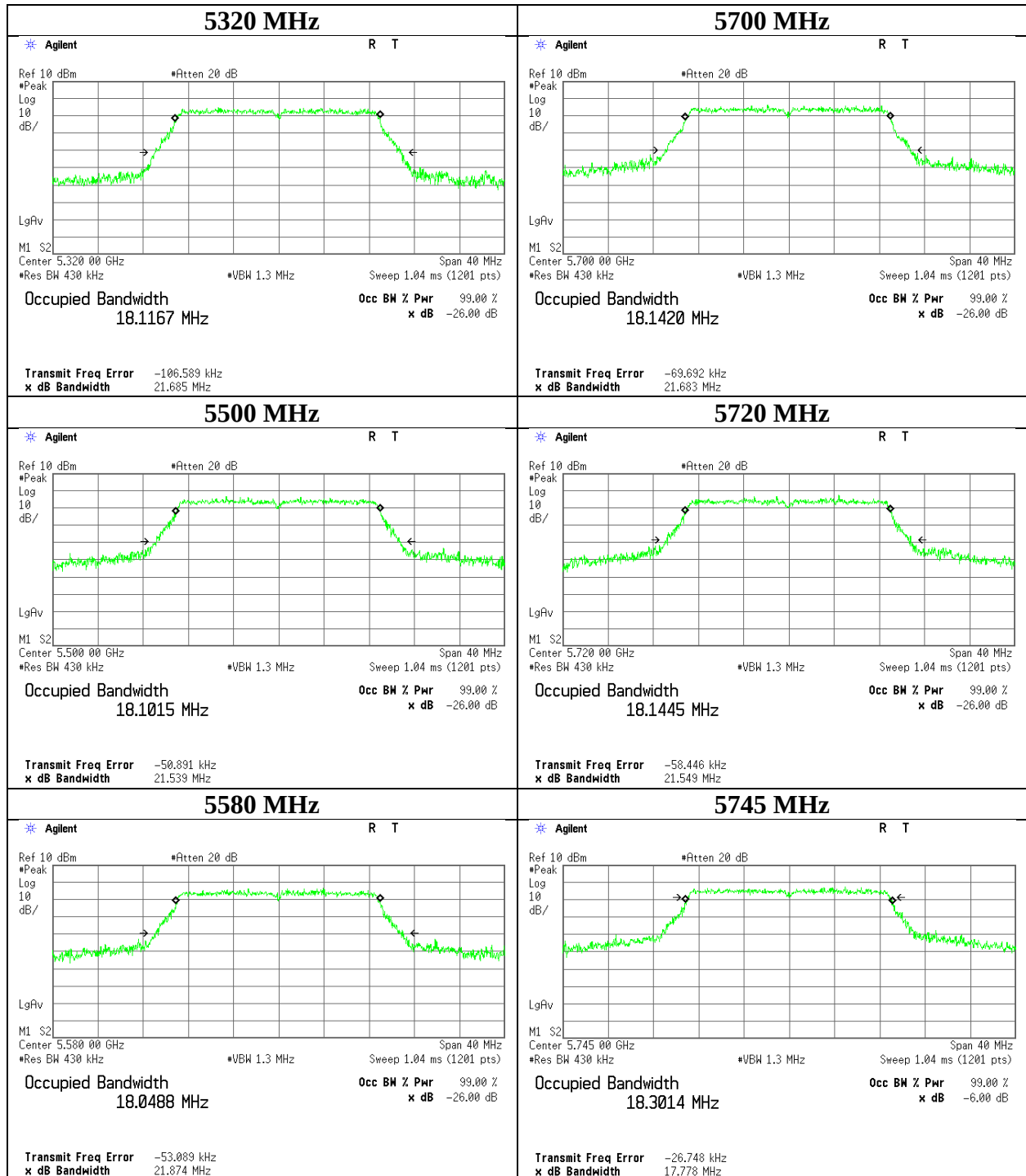
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Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room		
Report No.	11932168H		
Date	October 17, 2017	October 19, 2017	October 23, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH	23deg. C / 61 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka	Takumi Shimada
Mode	Tx 11ac-20		



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Ise EMC Lab.

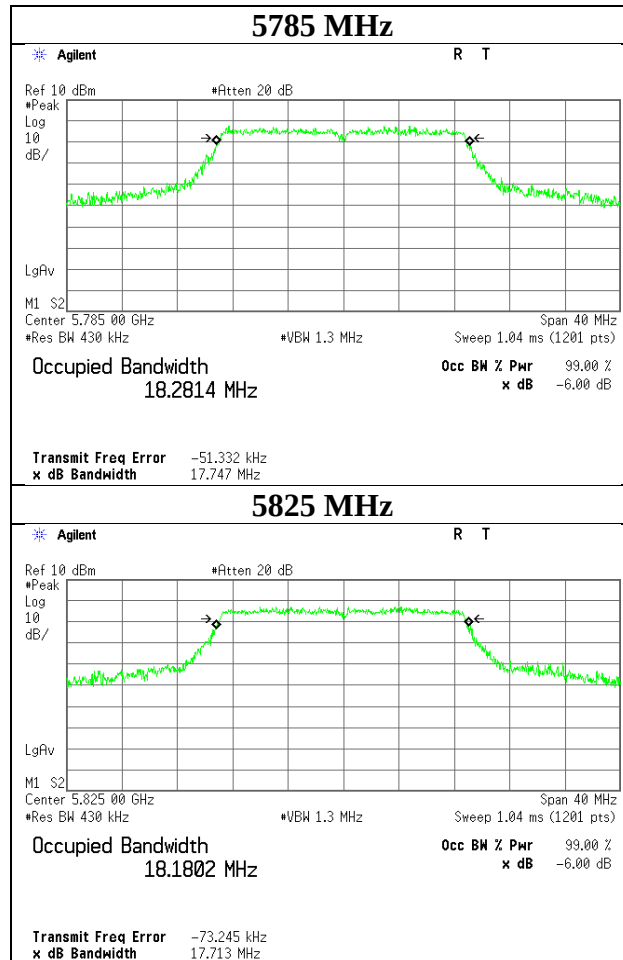
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room		
Report No.	11932168H		
Date	October 17, 2017	October 19, 2017	October 23, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH	23deg. C / 61 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka	Takumi Shimada
Mode	Tx 11ac-20		



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Telephone : +81 596 24 8999

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26 dB Emission Bandwidth

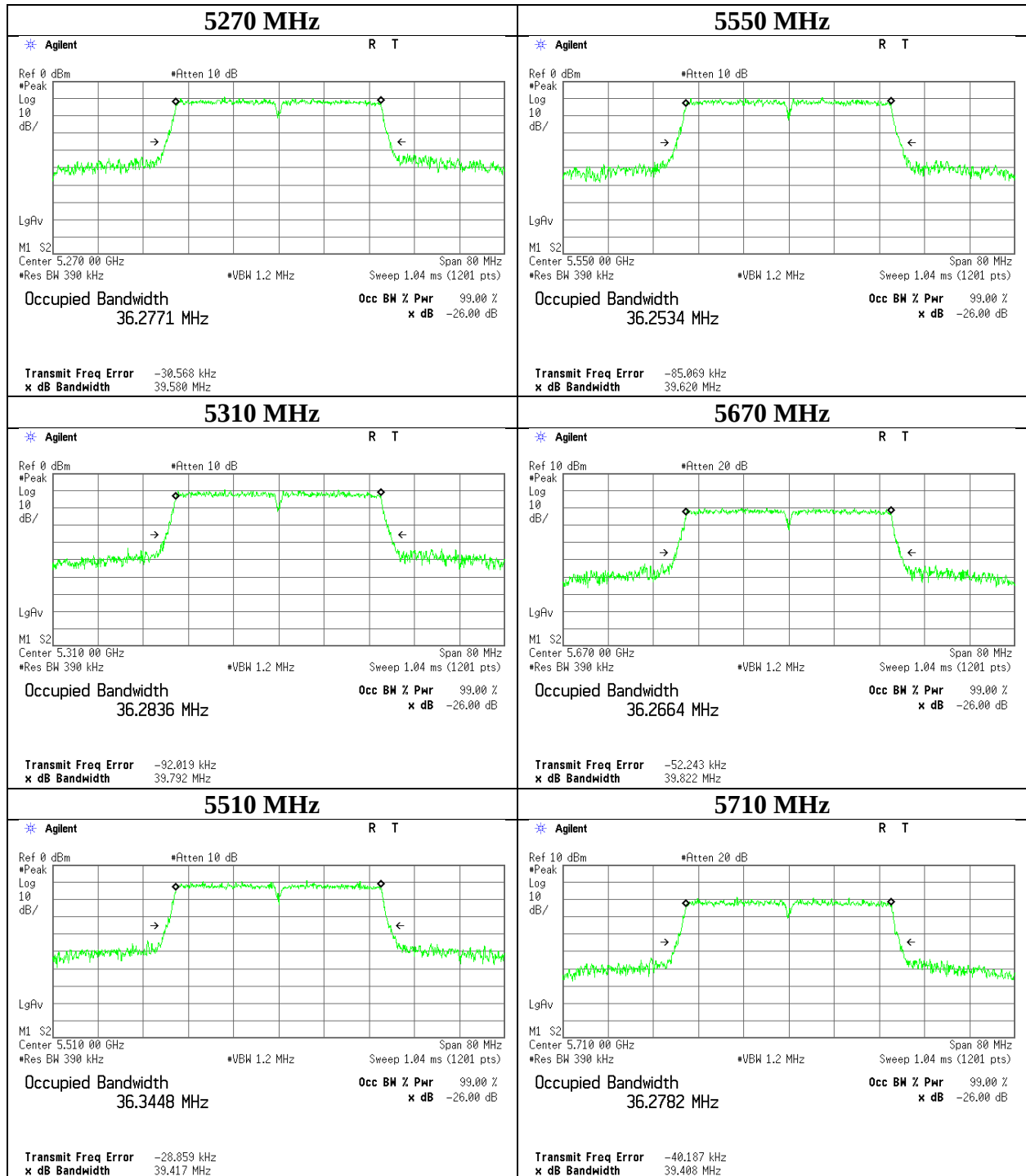
Test place
Report No.

Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.6 Measurement Room
11932168H

October 17, 2017
21deg. C / 69 % RH
Ryota Yamanaka
Tx 11ac-40

October 19, 2017
24 deg. C / 53 % RH
Ryota Yamanaka



UL Japan, Inc.

Ise EMC Lab.

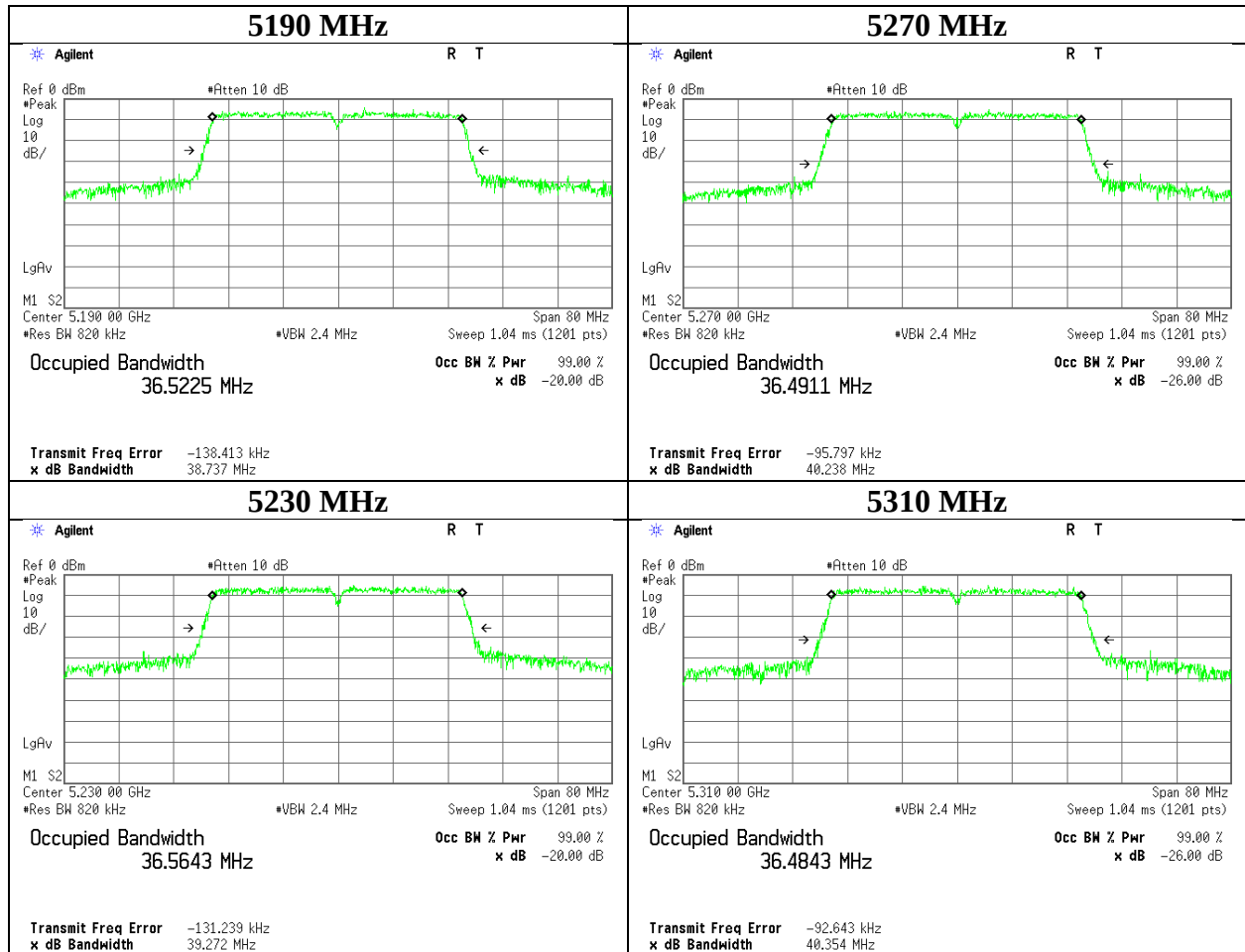
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

99 % Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room	
Report No.	11932168H	
Date	October 17, 2017	October 19, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka
Mode	Tx 11ac-40	



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99 % Occupied Bandwidth

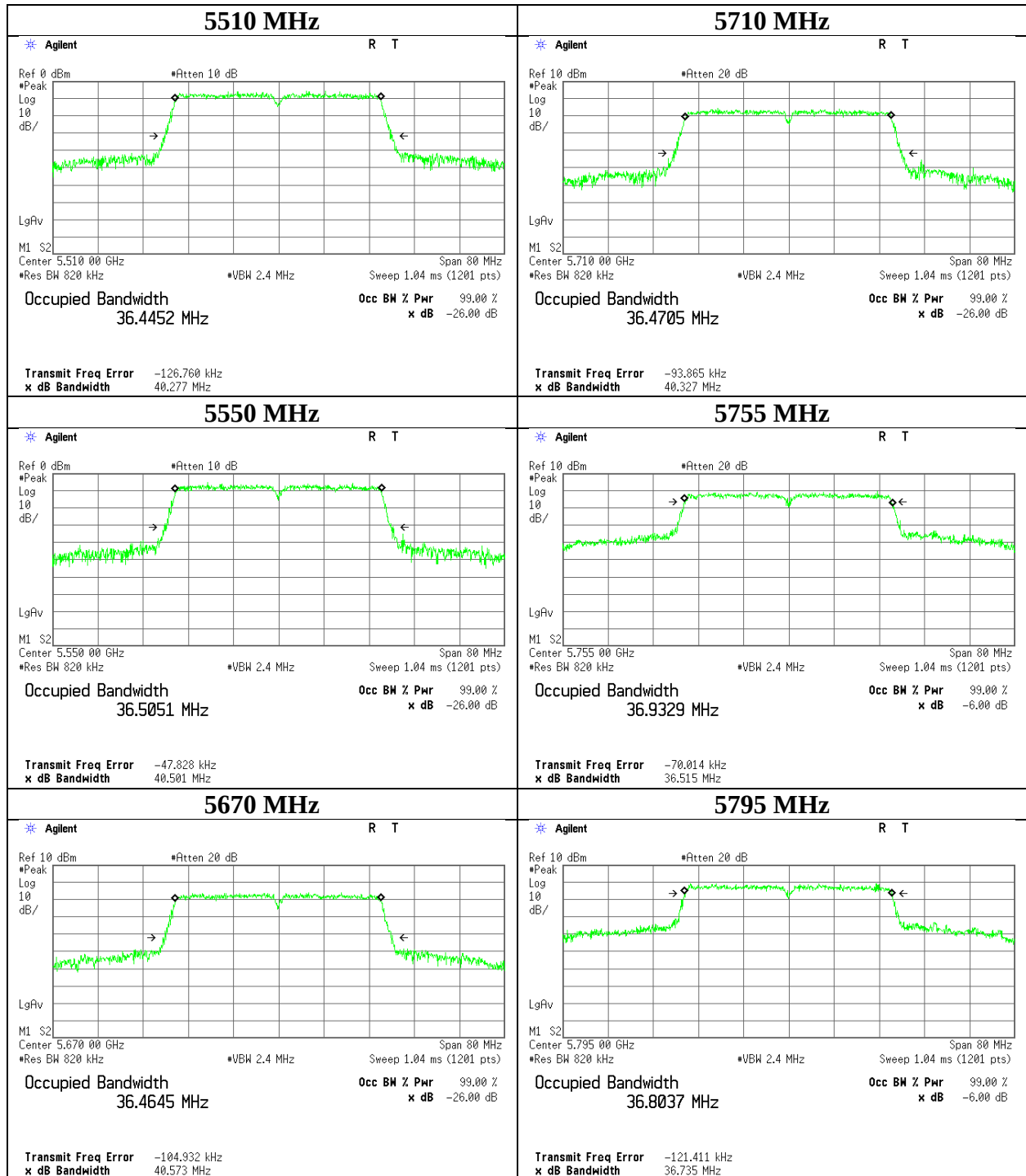
Test place
Report No.

Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.6 Measurement Room
11932168H

October 17, 2017
21deg. C / 69 % RH
Ryota Yamanaka
Tx 11ac-40

October 19, 2017
24 deg. C / 53 % RH
Ryota Yamanaka



UL Japan, Inc.

Ise EMC Lab.

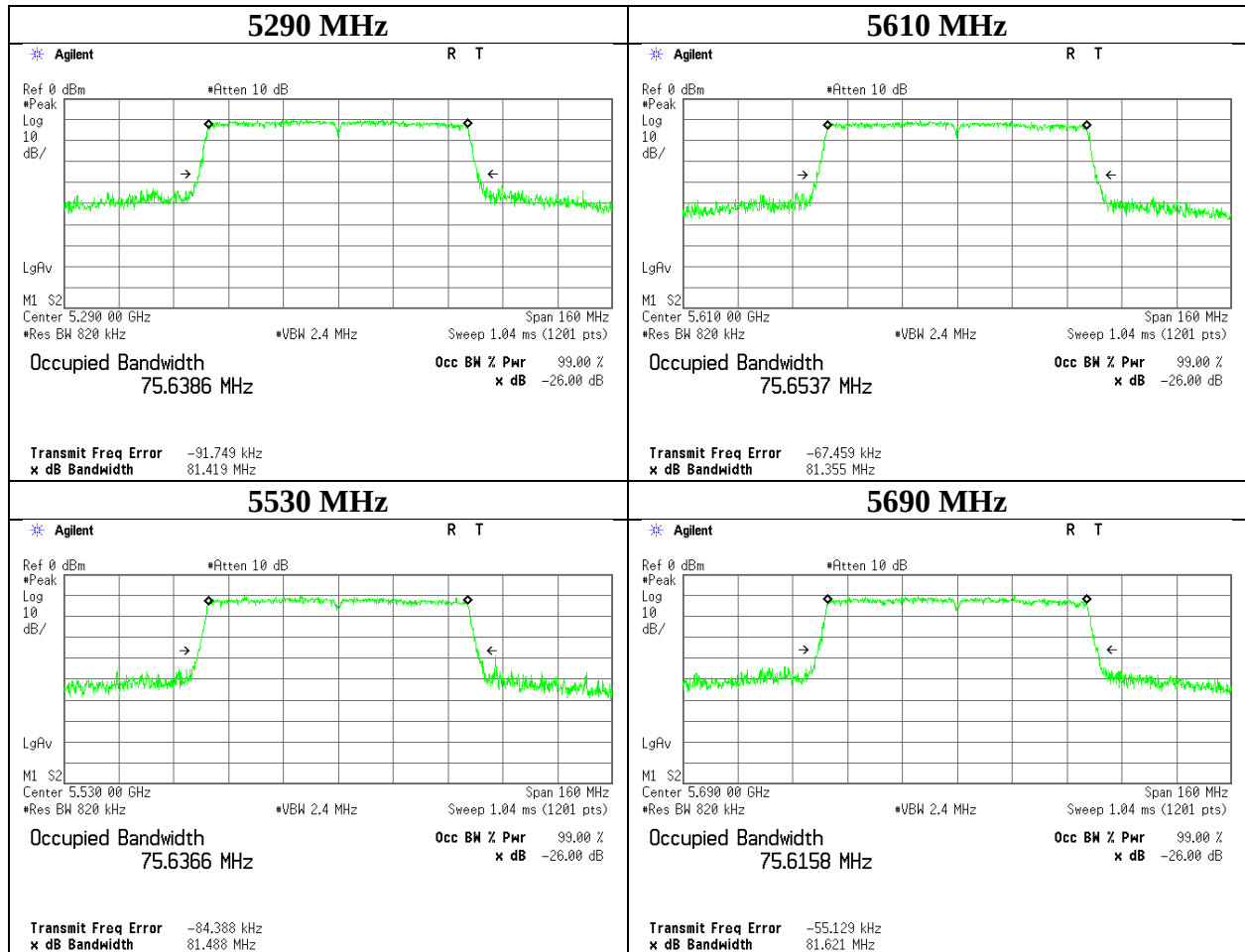
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Facsimile : +81 596 24 8124

26 dB Emission Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room	
Report No.	11932168H	
Date	October 17, 2017	October 19, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka
Mode	Tx 11ac-80	



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99 % Occupied Bandwidth

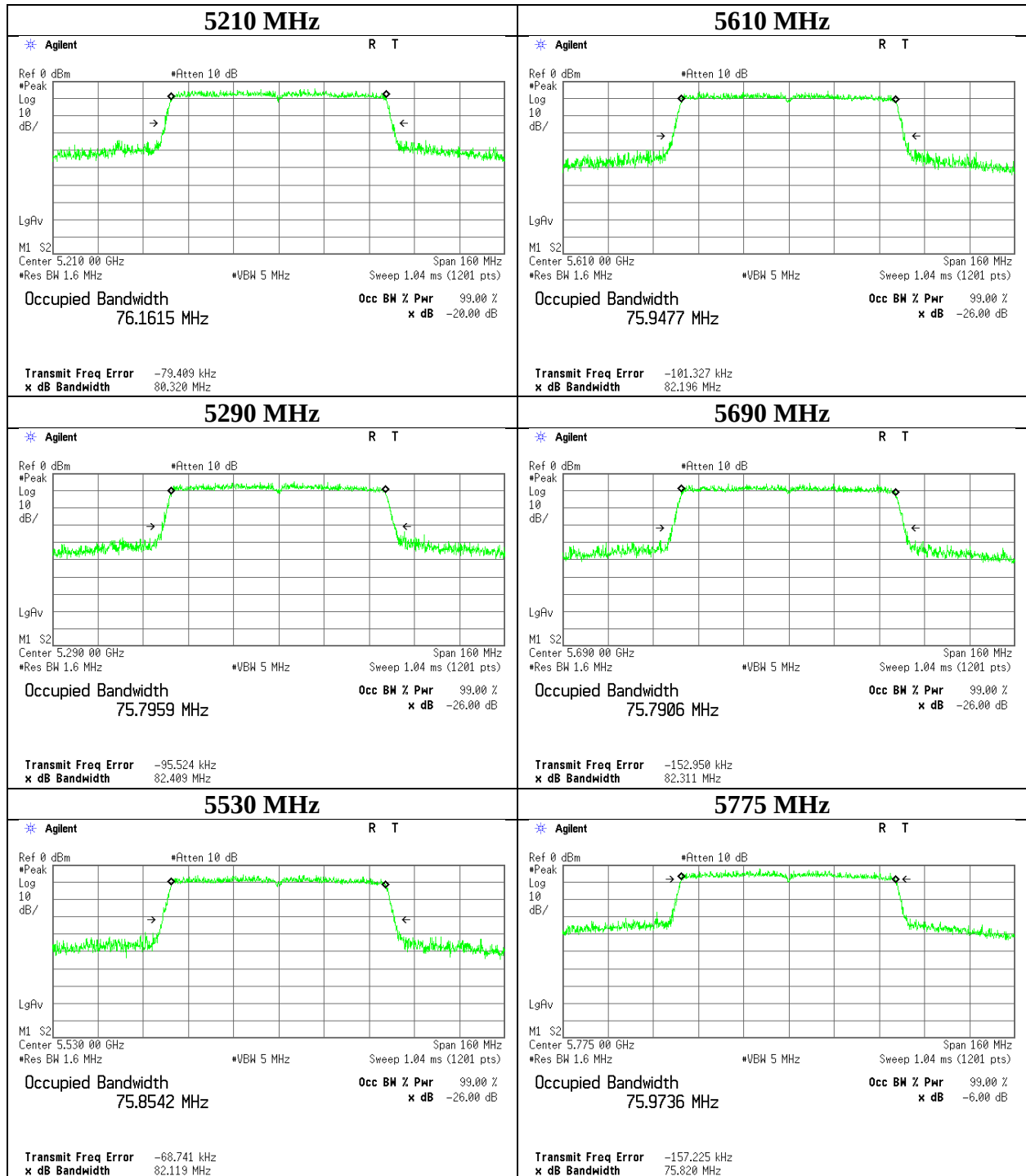
Test place
Report No.

Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.6 Measurement Room
11932168H

October 17, 2017
21deg. C / 69 % RH
Ryota Yamanaka
Tx 11ac-80

October 19, 2017
24 deg. C / 53 % RH
Ryota Yamanaka



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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

6 dB Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room		
Report No.	11932168H		
Date	October 17, 2017	October 19, 2017	October 23, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH	23deg. C / 61 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka	Takumi Shimada
Mode	Tx		

11a

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5745	16.433	> 500
5785	16.412	> 500
5825	16.382	> 500

11n-20

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5745	17.621	> 500
5785	17.657	> 500
5825	17.655	> 500

11n-40

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5755	36.110	> 500
5795	36.357	> 500

11ac-20

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5745	17.679	> 500
5785	17.579	> 500
5825	17.666	> 500

11ac-40

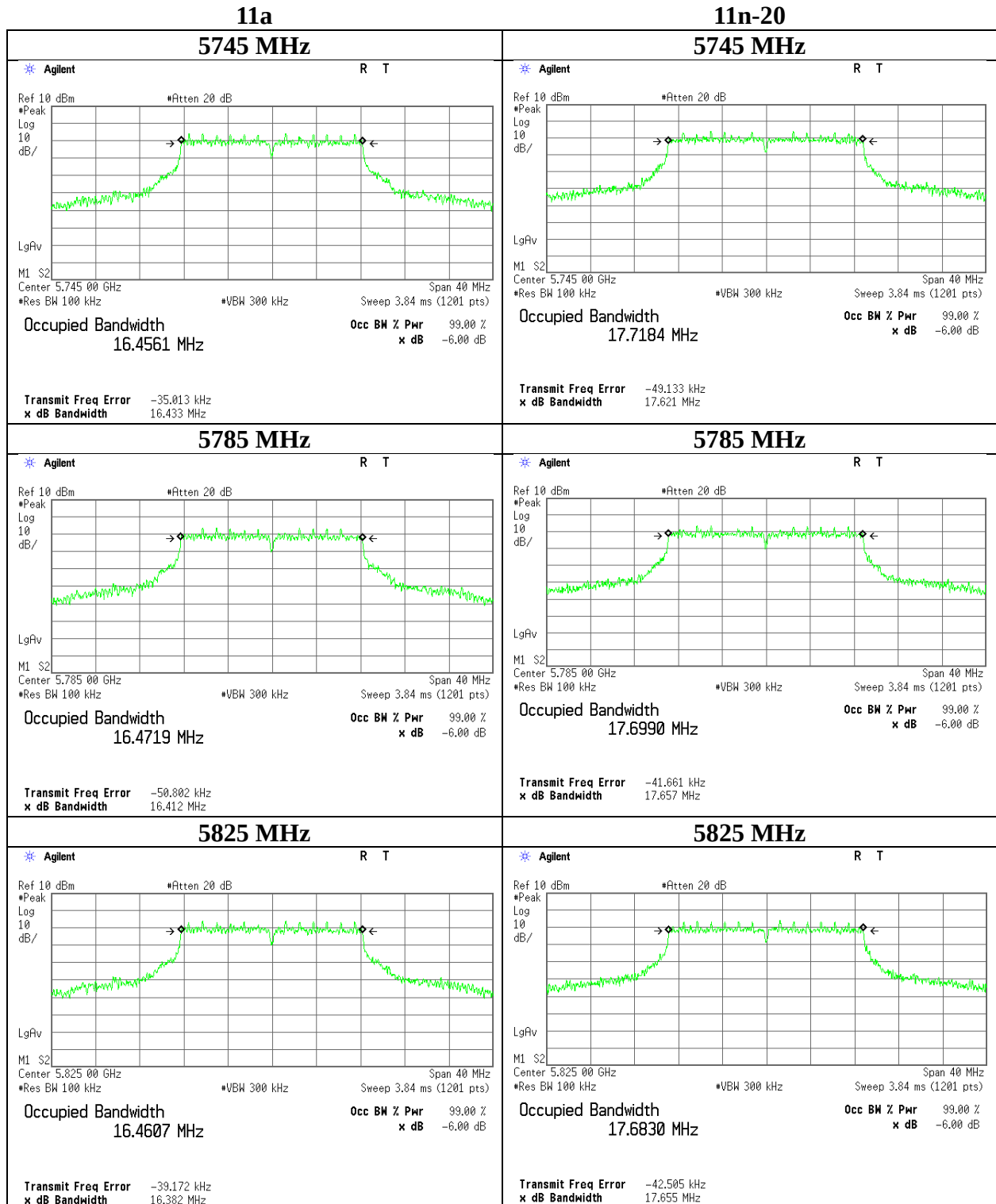
Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5755	36.191	> 500
5795	36.504	> 500

11ac-80

Tested Frequency [MHz]	6 dB Bandwidth [MHz]	Limit [kHz]
5775	75.475	> 500

6 dB Bandwidth

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 11932168H
Date : October 23, 2017
Temperature / Humidity : 23deg. C / 61 % RH
Engineer : Takumi Shimada
Mode : Tx



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Ise EMC Lab.

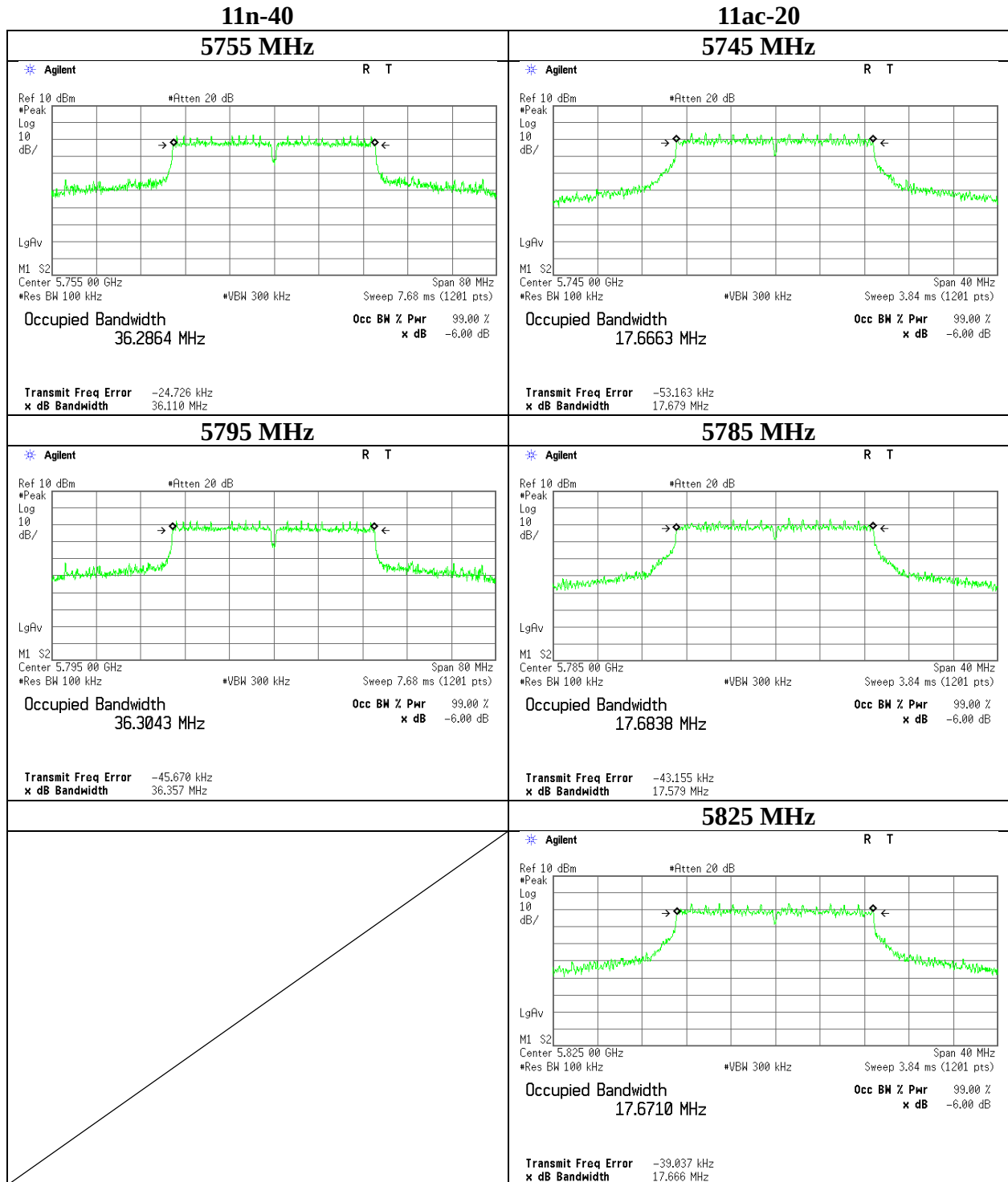
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

6 dB Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room		
Report No.	11932168H		
Date	October 17, 2017	October 19, 2017	October 23, 2017
Temperature / Humidity	21deg. C / 69 % RH	24 deg. C / 53 % RH	23deg. C / 61 % RH
Engineer	Ryota Yamanaka	Ryota Yamanaka	Takumi Shimada
Mode	Tx		



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Facsimile : +81 596 24 8124

6 dB Bandwidth

Test place
Report No.

Date
Temperature / Humidity
Engineer
Mode

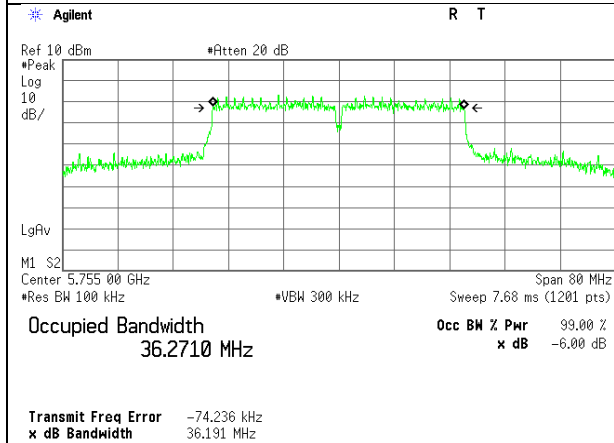
Ise EMC Lab. No.6 Measurement Room
11932168H

October 17, 2017
21deg. C / 69 % RH
Ryota Yamanaka
Tx

October 19, 2017
24 deg. C / 53 % RH
Ryota Yamanaka

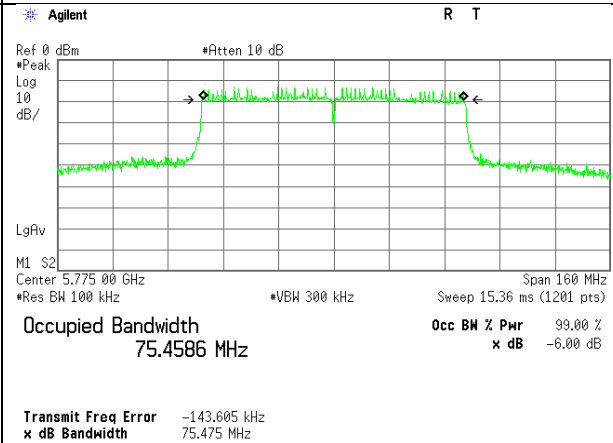
11ac-40

5755 MHz

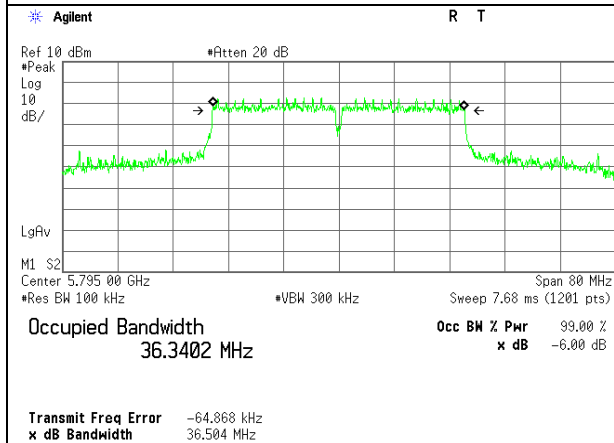


11ac-80

5775 MHz



5795 MHz



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Maximum Conducted Output Power

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 11932168H
Date : November 7, 2017 November 16, 2017
Temperature / Humidity : 24 deg. C / 40 % RH 22 deg. C / 41 % RH
Engineer : Takafumi Noguchi Tomoki Matsui
Mode : Tx

11a 48Mbps

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	Limit	Margin		Result	Limit	Margin	
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	0.08	0.80	10.08	1.71	1.4	-	17.122	12.67	18.49	23.97	11.30	14.07	25.53	29.97	15.90
5220	0.14	0.80	10.08	1.71	1.4	-	17.021	12.73	18.75	23.97	11.24	14.13	25.88	29.97	15.84
5240	0.08	0.80	10.08	1.71	1.4	-	17.113	12.67	18.49	23.97	11.30	14.07	25.53	29.97	15.90
5260	-0.75	0.80	10.08	1.71	1.4	20.799	17.112	11.84	15.28	23.97	12.13	13.24	21.09	29.97	16.73
5280	-0.76	0.80	10.08	1.71	1.4	20.727	17.093	11.83	15.24	23.97	12.14	13.23	21.04	29.97	16.74
5300	-0.76	0.80	10.08	1.71	1.4	20.883	17.034	11.83	15.24	23.97	12.14	13.23	21.04	29.97	16.74
5320	-0.80	0.80	10.08	1.71	1.4	20.925	17.051	11.79	15.10	23.97	12.18	13.19	20.84	29.97	16.78
5500	2.34	0.80	10.07	1.71	1.4	21.790	17.096	14.92	31.05	23.97	9.05	16.32	42.85	29.97	13.65
5580	2.32	0.80	10.08	1.71	1.4	21.312	17.108	14.91	30.97	23.97	9.06	16.31	42.76	29.97	13.66
5700	2.13	0.80	10.10	1.71	1.4	21.009	17.075	14.74	29.79	23.97	9.23	16.14	41.11	29.97	13.83
5720	2.01	0.80	10.10	1.71	1.4	21.214	17.071	14.62	28.97	23.97	9.35	16.02	39.99	29.97	13.95
5745	1.57	0.80	10.11	1.71	1.4	-	-	14.19	26.24	30.00	15.81	15.59	36.22	36.00	20.41
5785	1.45	0.80	10.11	1.71	1.4	-	-	14.07	25.53	30.00	15.93	15.47	35.24	36.00	20.53
5825	1.32	0.80	10.12	1.71	1.4	-	-	13.95	24.83	30.00	16.05	15.35	34.28	36.00	20.65

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

11n-20 MCS4

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	Limit	Margin		Result	Limit	Margin	
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	0.02	0.80	10.08	1.37	1.4	-	18.172	12.27	16.87	23.97	11.70	13.67	23.28	29.97	16.30
5220	0.03	0.80	10.08	1.37	1.4	-	18.169	12.28	16.90	23.97	11.69	13.68	23.33	29.97	16.29
5240	0.07	0.80	10.08	1.37	1.4	-	18.167	12.32	17.06	23.97	11.65	13.72	23.55	29.97	16.25
5260	-0.95	0.80	10.08	1.37	1.4	21.267	18.052	11.30	13.49	23.97	12.67	12.70	18.62	29.97	17.27
5280	-0.94	0.80	10.08	1.37	1.4	21.255	18.092	11.31	13.52	23.97	12.66	12.71	18.66	29.97	17.26
5300	-0.98	0.80	10.08	1.37	1.4	21.218	18.108	11.27	13.40	23.97	12.70	12.67	18.49	29.97	17.30
5320	-1.02	0.80	10.08	1.37	1.4	21.322	18.143	11.23	13.27	23.97	12.74	12.63	18.32	29.97	17.34
5500	1.10	0.80	10.07	1.37	1.4	20.966	18.149	13.34	21.58	23.97	10.63	14.74	29.79	29.97	15.23
5580	1.11	0.80	10.08	1.37	1.4	21.611	18.188	13.36	21.68	23.97	10.61	14.76	29.92	29.97	15.21
5700	1.01	0.80	10.10	1.37	1.4	21.071	18.188	13.28	21.28	23.97	10.69	14.68	29.38	29.97	15.29
5720	0.90	0.80	10.10	1.37	1.4	21.253	18.144	13.17	20.75	23.97	10.80	14.57	28.64	29.97	15.40
5745	0.87	0.80	10.11	1.37	1.4	-	-	13.15	20.65	30.00	16.85	14.55	28.51	36.00	21.45
5785	0.72	0.80	10.11	1.37	1.4	-	-	13.00	19.95	30.00	17.00	14.40	27.54	36.00	21.60
5825	0.59	0.80	10.12	1.37	1.4	-	-	12.88	19.41	30.00	17.12	14.28	26.79	36.00	21.72

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

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.6 Measurement Room		
Report No.	11932168H		
Date	November 7, 2017	November 16, 2017	
Temperature / Humidity	24 deg. C / 40 % RH	22 deg. C / 41 % RH	
Engineer	Takafumi Noguchi	Tomoki Matsui	
Mode	Tx		

11n-40 MCS2

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	Limit	Margin		Result	Limit	Margin	
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5190	-0.61	0.80	10.08	1.41	1.4	-	36.410	11.68	14.72	23.97	12.29	13.08	20.32	29.97	16.89
5230	-0.56	0.80	10.08	1.41	1.4	-	36.475	11.73	14.89	23.97	12.24	13.13	20.56	29.97	16.84
5270	-1.12	0.80	10.08	1.41	1.4	39.654	36.380	11.17	13.09	23.97	12.80	12.57	18.07	29.97	17.40
5310	-1.15	0.80	10.08	1.41	1.4	39.214	36.321	11.14	13.00	23.97	12.83	12.54	17.95	29.97	17.43
5510	-1.80	0.80	10.07	1.41	1.4	39.552	36.433	10.48	11.17	23.97	13.49	11.88	15.42	29.97	18.09
5550	-1.79	0.80	10.08	1.41	1.4	39.580	36.444	10.50	11.22	23.97	13.47	11.90	15.49	29.97	18.07
5670	-1.88	0.80	10.10	1.41	1.4	39.597	36.443	10.43	11.04	23.97	13.54	11.83	15.24	29.97	18.14
5710	-1.92	0.80	10.10	1.41	1.4	39.280	36.388	10.39	10.94	23.97	13.58	11.79	15.10	29.97	18.18
5755	0.88	0.80	10.11	1.41	1.4	-	-	13.20	20.89	30.00	16.80	14.60	28.84	36.00	21.40
5795	0.81	0.80	10.11	1.41	1.4	-	-	13.13	20.56	30.00	16.87	14.53	28.38	36.00	21.47

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

11ac-20 MCS5

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	Limit	Margin		Result	Limit	Margin	
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	-0.37	0.80	10.08	1.66	1.4	-	18.087	12.17	16.48	23.97	11.80	13.57	22.75	29.97	16.40
5220	-0.33	0.80	10.08	1.66	1.4	-	18.127	12.21	16.63	23.97	11.76	13.61	22.96	29.97	16.36
5240	-0.34	0.80	10.08	1.66	1.4	-	18.131	12.20	16.60	23.97	11.77	13.60	22.91	29.97	16.37
5260	-1.34	0.80	10.08	1.66	1.4	21.105	18.089	11.20	13.18	23.97	12.77	12.60	18.20	29.97	17.37
5280	-1.43	0.80	10.08	1.66	1.4	21.177	18.107	11.11	12.91	23.97	12.86	12.51	17.82	29.97	17.46
5300	-1.42	0.80	10.08	1.66	1.4	21.103	18.060	11.12	12.94	23.97	12.85	12.52	17.86	29.97	17.45
5320	-1.46	0.80	10.08	1.66	1.4	21.154	18.117	11.08	12.82	23.97	12.89	12.48	17.70	29.97	17.49
5500	0.70	0.80	10.07	1.66	1.4	21.349	18.102	13.23	21.04	23.97	10.74	14.63	29.04	29.97	15.34
5580	0.71	0.80	10.08	1.66	1.4	21.310	18.049	13.25	21.13	23.97	10.72	14.65	29.17	29.97	15.32
5700	0.51	0.80	10.10	1.66	1.4	21.430	18.142	13.07	20.28	23.97	10.90	14.47	27.99	29.97	15.50
5720	0.54	0.80	10.10	1.66	1.4	21.399	18.145	13.10	20.42	23.97	10.87	14.50	28.18	29.97	15.47
5745	0.57	0.80	10.11	1.66	1.4	-	-	13.14	20.61	30.00	16.86	14.54	28.44	36.00	21.46
5785	0.42	0.80	10.11	1.66	1.4	-	-	12.99	19.91	30.00	17.01	14.39	27.48	36.00	21.61
5825	0.24	0.80	10.12	1.66	1.4	-	-	12.82	19.14	30.00	17.18	14.22	26.42	36.00	21.78

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

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.6 Measurement Room	
Report No.	11932168H	
Date	November 7, 2017	November 16, 2017
Temperature / Humidity	24 deg. C / 40 % RH	22 deg. C / 41 % RH
Engineer	Takafumi Noguchi	Tomoki Matsui
Mode	Tx	

11ac-40 MCS4

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	Limit	Margin		Result	Limit	Margin	
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5190	-1.35	0.80	10.08	2.14	1.4	-	36.523	11.67	14.69	23.97	12.30	13.07	20.28	29.97	16.90
5230	-1.30	0.80	10.08	2.14	1.4	-	36.564	11.72	14.86	23.97	12.25	13.12	20.51	29.97	16.85
5270	-1.88	0.80	10.08	2.14	1.4	39.580	36.491	11.14	13.00	23.97	12.83	12.54	17.95	29.97	17.43
5310	-1.90	0.80	10.08	2.14	1.4	39.792	36.484	11.12	12.94	23.97	12.85	12.52	17.86	29.97	17.45
5510	-2.53	0.80	10.07	2.14	1.4	39.417	36.445	10.48	11.17	23.97	13.49	11.88	15.42	29.97	18.09
5550	-2.52	0.80	10.08	2.14	1.4	39.620	36.505	10.50	11.22	23.97	13.47	11.90	15.49	29.97	18.07
5670	-2.61	0.80	10.10	2.14	1.4	39.822	36.465	10.43	11.04	23.97	13.54	11.83	15.24	29.97	18.14
5710	-2.65	0.80	10.10	2.14	1.4	39.408	36.471	10.39	10.94	23.97	13.58	11.79	15.10	29.97	18.18
5755	0.11	0.80	10.11	2.14	1.4	-	-	13.16	20.70	30.00	16.84	14.56	28.58	36.00	21.44
5795	0.02	0.80	10.11	2.14	1.4	-	-	13.07	20.28	30.00	16.93	14.47	27.99	36.00	21.53

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

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	Limit	Margin		Result	Limit	Margin	
								[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5210	-0.71	0.80	10.08	1.09	1.4	-	76.162	11.26	13.37	23.97	12.71	12.66	18.45	29.97	17.31
5290	-1.22	0.80	10.08	1.09	1.4	81.419	75.796	10.75	11.89	23.97	13.22	12.15	16.41	29.97	17.82
5530	-2.65	0.80	10.08	1.09	1.4	81.488	75.854	9.32	8.55	23.97	14.65	10.72	11.80	29.97	19.25
5610	-2.64	0.80	10.09	1.09	1.4	81.355	75.948	9.34	8.59	23.97	14.63	10.74	11.86	29.97	19.23
5690	-2.72	0.80	10.10	1.09	1.4	81.621	75.791	9.27	8.45	23.97	14.70	10.67	11.67	29.97	19.30
5775	-0.14	0.80	10.11	1.09	1.4	-	-	11.86	15.35	30.00	18.14	13.26	21.18	36.00	22.74

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

Maximum Conducted Output Power

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 11932168H
Date : November 7, 2017
Temperature / Humidity : 24 deg. C / 40 % RH
Engineer : Takafumi Noguchi
Mode : Tx

5180 MHz

Mode	Rate	Reading	Remarks
	Mbps	[dBm]	
11a	6	1.77	
	9	1.72	
	12	1.75	
	18	1.77	
	24	1.62	
	36	1.60	
	48	1.78	*
	54	1.63	

* Worst rate

Difference between worst rate check data and formal test result is due to the different test condition.

5180 MHz

Mode	MCS Number	Reading	Remarks
		[dBm]	
11n-20	0	1.21	
	1	1.21	
	2	1.22	
	3	1.22	
	4	1.41	*
	5	1.35	
	6	1.17	
	7	1.21	

* Worst rate

Difference between worst rate check data and formal test result is due to the different test condition.

5190 MHz

Mode	MCS Number	Reading	Remarks
		[dBm]	
11n-40	0	0.79	
	1	0.78	
	2	0.87	*
	3	0.75	
	4	0.76	
	5	0.76	
	6	0.79	
	7	0.70	

* Worst rate

Difference between worst rate check data and formal test result is due to the different test condition.

Maximum Conducted Output Power

Test place Ise EMC Lab. No.6 Measurement Room
Report No. 11932168H
Date November 7, 2017
Temperature / Humidity 24 deg. C / 40 % RH
Engineer Takafumi Noguchi
Mode Tx

5745 MHz

Mode	MCS Number	Reading [dBm]	Remarks
11ac-20	0	1.29	
	1	1.23	
	2	1.21	
	3	1.27	
	4	1.18	
	5	1.30	*
	6	1.24	
	7	1.19	
	8	1.21	

* Worst rate

Difference between worst rate check data and formal test result is due to the different test condition.

5190 MHz

Mode	MCS Number	Reading [dBm]	Remarks
11ac-40	0	0.71	
	1	0.58	
	2	0.57	
	3	0.51	
	4	0.79	*
	5	0.70	
	6	0.68	
	7	0.65	
	8	0.49	
	9	0.59	

* Worst rate

Difference between worst rate check data and formal test result is due to the different test condition.

5210 MHz

Mode	MCS Number	Reading [dBm]	Remarks
11ac-80	0	0.37	*
	1	0.33	
	2	0.25	
	3	0.09	
	4	0.12	
	5	0.14	
	6	0.13	
	7	0.31	
	8	0.29	
	9	0.23	

* Worst rate

Difference between worst rate check data and formal test result is due to the different test condition.

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Average Output Power **(Reference data for RF Exposure)**

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 11932168H
Date : November 7, 2017 November 16, 2017
Temperature / Humidity : 24 deg. C / 40 % RH 22 deg. C / 41 % RH
Engineer : Takafumi Noguchi Tomoki Matsui
Mode : Tx

11a 6Mbps

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
5180	1.50	0.80	10.08	12.38	17.30	0.28	12.66	18.45
5220	1.54	0.80	10.08	12.42	17.46	0.28	12.70	18.62
5240	1.50	0.80	10.08	12.38	17.30	0.28	12.66	18.45
5260	0.64	0.80	10.08	11.52	14.19	0.28	11.80	15.14
5280	0.66	0.80	10.08	11.54	14.26	0.28	11.82	15.21
5300	0.67	0.80	10.08	11.55	14.29	0.28	11.83	15.24
5320	0.62	0.80	10.08	11.50	14.13	0.28	11.78	15.07
5500	3.72	0.80	10.07	14.59	28.77	0.28	14.87	30.69
5580	3.66	0.80	10.08	14.54	28.44	0.28	14.82	30.34
5700	3.54	0.80	10.10	14.44	27.80	0.28	14.72	29.65
5720	3.41	0.80	10.10	14.31	26.98	0.28	14.59	28.77
5745	2.95	0.80	10.11	13.86	24.32	0.28	14.14	25.94
5785	2.87	0.80	10.11	13.78	23.88	0.28	14.06	25.47
5825	2.75	0.80	10.12	13.67	23.28	0.28	13.95	24.83

Sample Calculation:

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

Result (Burst power average) = Time average + Duty factor

11n-20 MCS0

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
5180	1.08	0.80	10.08	11.96	15.70	0.30	12.26	16.83
5220	1.06	0.80	10.08	11.94	15.63	0.30	12.24	16.75
5240	1.10	0.80	10.08	11.98	15.78	0.30	12.28	16.90
5260	0.01	0.80	10.08	10.89	12.27	0.30	11.19	13.15
5280	0.03	0.80	10.08	10.91	12.33	0.30	11.21	13.21
5300	0.00	0.80	10.08	10.88	12.25	0.30	11.18	13.12
5320	0.02	0.80	10.08	10.90	12.30	0.30	11.20	13.18
5500	2.04	0.80	10.07	12.91	19.54	0.30	13.21	20.94
5580	2.05	0.80	10.08	12.93	19.63	0.30	13.23	21.04
5700	1.98	0.80	10.10	12.88	19.41	0.30	13.18	20.80
5720	1.93	0.80	10.10	12.83	19.19	0.30	13.13	20.56
5745	1.90	0.80	10.11	12.81	19.10	0.30	13.11	20.46
5785	1.76	0.80	10.11	12.67	18.49	0.30	12.97	19.82
5825	1.57	0.80	10.12	12.49	17.74	0.30	12.79	19.01

Sample Calculation:

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

Result (Burst power average) = Time average + Duty factor

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

UL Japan, Inc.

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Average Output Power (Reference data for RF Exposure)

Test place	Ise EMC Lab. No.6 Measurement Room	
Report No.	11932168H	
Date	November 7, 2017	November 16, 2017
Temperature / Humidity	24 deg. C / 40 % RH	22 deg. C / 41 % RH
Engineer	Takafumi Noguchi	Tomoki Matsui
Mode	Tx	

11n-40 MCS0

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
5190	0.20	0.80	10.08	11.08	12.82	0.59	11.67	14.69
5230	0.22	0.80	10.08	11.10	12.88	0.59	11.69	14.76
5270	-0.40	0.80	10.08	10.48	11.17	0.59	11.07	12.79
5310	-0.40	0.80	10.08	10.48	11.17	0.59	11.07	12.79
5510	-1.03	0.80	10.07	9.84	9.64	0.59	10.43	11.04
5550	-1.00	0.80	10.08	9.88	9.73	0.59	10.47	11.14
5670	-1.09	0.80	10.10	9.81	9.57	0.59	10.40	10.96
5710	-1.17	0.80	10.10	9.73	9.40	0.59	10.32	10.76
5755	1.66	0.80	10.11	12.57	18.07	0.59	13.16	20.70
5795	1.52	0.80	10.11	12.43	17.50	0.59	13.02	20.04

Sample Calculation:

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

Result (Burst power average) = Time average + Duty factor

11ac-20 MCS0

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
5180	0.99	0.80	10.08	11.87	15.38	0.30	12.17	16.48
5220	1.03	0.80	10.08	11.91	15.52	0.30	12.21	16.63
5240	1.01	0.80	10.08	11.89	15.45	0.30	12.19	16.56
5260	-0.03	0.80	10.08	10.85	12.16	0.30	11.15	13.03
5280	-0.07	0.80	10.08	10.81	12.05	0.30	11.11	12.91
5300	-0.07	0.80	10.08	10.81	12.05	0.30	11.11	12.91
5320	-0.10	0.80	10.08	10.78	11.97	0.30	11.08	12.82
5500	2.03	0.80	10.07	12.90	19.50	0.30	13.20	20.89
5580	2.05	0.80	10.08	12.93	19.63	0.30	13.23	21.04
5700	1.87	0.80	10.10	12.77	18.92	0.30	13.07	20.28
5720	1.88	0.80	10.10	12.78	18.97	0.30	13.08	20.32
5745	1.85	0.80	10.11	12.76	18.88	0.30	13.06	20.23
5785	1.74	0.80	10.11	12.65	18.41	0.30	12.95	19.72
5825	1.56	0.80	10.12	12.48	17.70	0.30	12.78	18.97

Sample Calculation:

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

Result (Burst power average) = Time average + Duty factor

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

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Average Output Power (Reference data for RF Exposure)

Test place	Ise EMC Lab. No.6 Measurement Room	
Report No.	11932168H	
Date	November 7, 2017	November 16, 2017
Temperature / Humidity	24 deg. C / 40 % RH	22 deg. C / 41 % RH
Engineer	Takafumi Noguchi	Tomoki Matsui
Mode	Tx	

11ac-40 MCS0

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
5190	0.20	0.80	10.08	11.08	12.82	0.58	11.66	14.66
5230	0.22	0.80	10.08	11.10	12.88	0.58	11.68	14.72
5270	-0.39	0.80	10.08	10.49	11.19	0.58	11.07	12.79
5310	-0.39	0.80	10.08	10.49	11.19	0.58	11.07	12.79
5510	-1.03	0.80	10.07	9.84	9.64	0.58	10.42	11.02
5550	-0.99	0.80	10.08	9.89	9.75	0.58	10.47	11.14
5670	-1.08	0.80	10.10	9.82	9.59	0.58	10.40	10.96
5710	-1.16	0.80	10.10	9.74	9.42	0.58	10.32	10.76
5755	1.63	0.80	10.11	12.54	17.95	0.58	13.12	20.51
5795	1.56	0.80	10.11	12.47	17.66	0.58	13.05	20.18

Sample Calculation:

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

Result (Burst power average) = Time average + Duty factor

11ac-80 MCS0

Tested Frequency [MHz]	Power Meter Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result (Timed average)		Duty factor [dB]	Result (Burst power average)	
				[dBm]	[mW]		[dBm]	[mW]
5210	-0.71	0.80	10.08	10.17	10.40	1.09	11.26	13.37
5290	-1.22	0.80	10.08	9.66	9.25	1.09	10.75	11.89
5530	-2.65	0.80	10.08	8.23	6.65	1.09	9.32	8.55
5610	-2.64	0.80	10.09	8.25	6.68	1.09	9.34	8.59
5690	-2.72	0.80	10.10	8.18	6.58	1.09	9.27	8.45
5775	-0.14	0.80	10.11	10.77	11.94	1.09	11.86	15.35

Sample Calculation:

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

Result (Burst power average) = Time average + Duty factor

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

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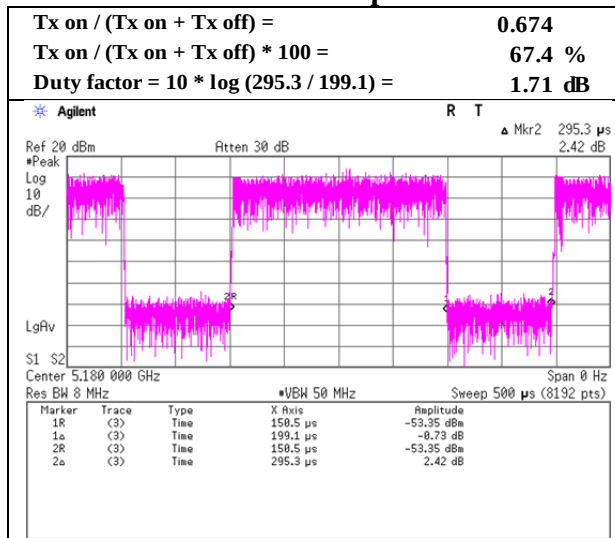
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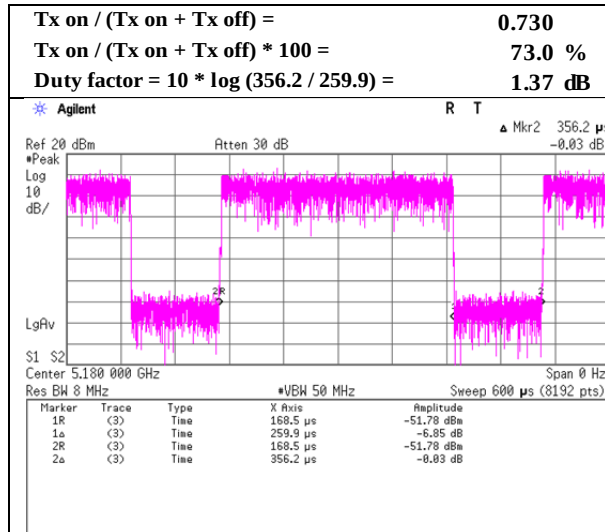
Burst rate confirmation

Test place Ise EMC Lab. No.7 Measurement Room
Report No. 11932168H
Date September 25, 2017
Temperature / Humidity 26 deg. C / 60 % RH
Engineer Takumi Shimada
Mode Tx

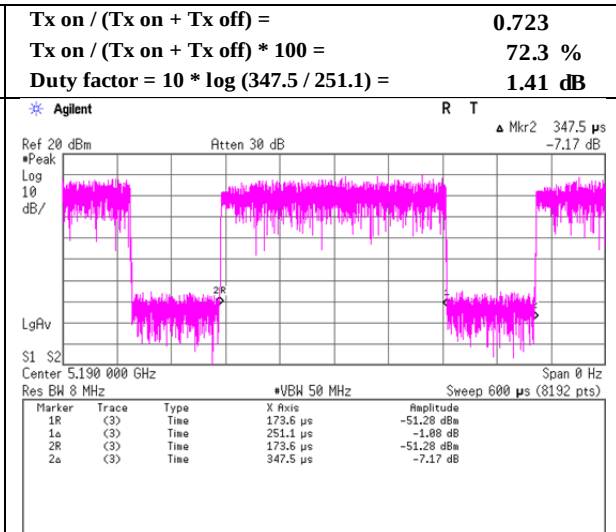
11a 48Mbps



11n-20 MCS4



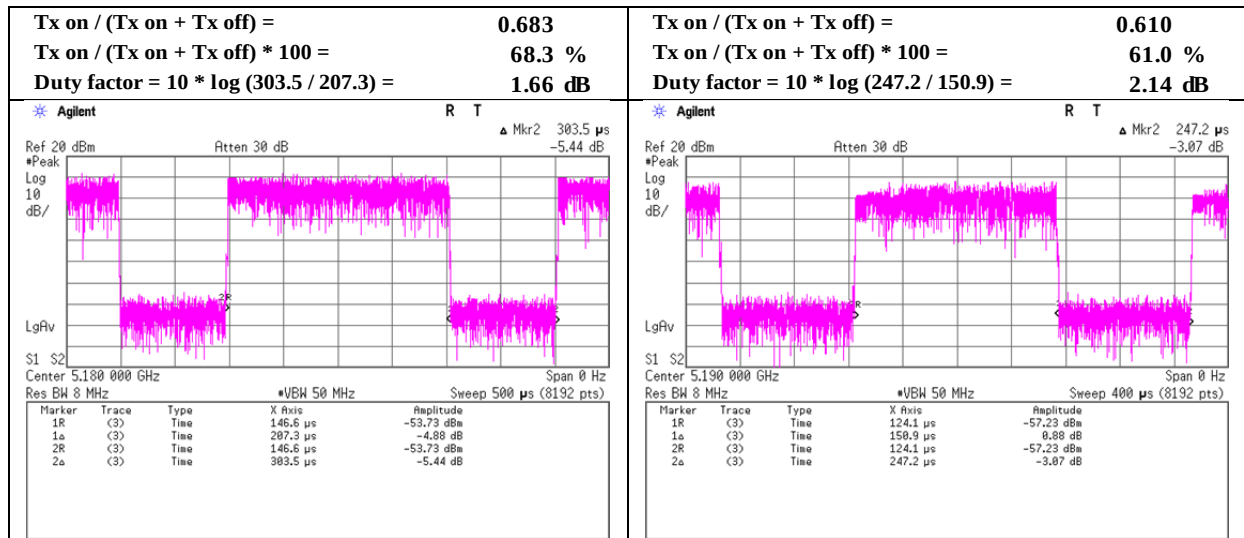
11n-40 MCS2



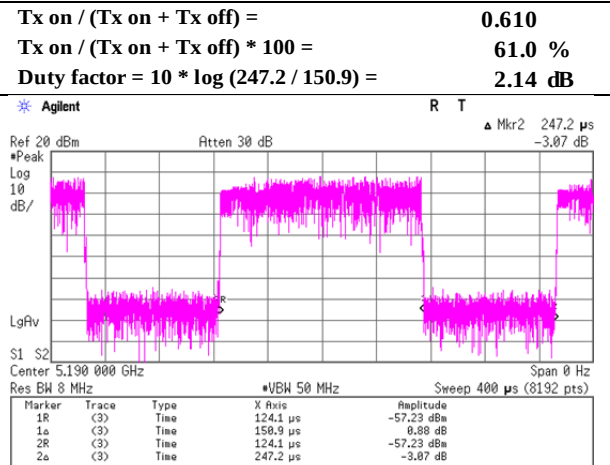
Burst rate confirmation

Test place : Ise EMC Lab. No.7 Measurement Room
Report No. : 11932168H
Date : September 25, 2017
Temperature / Humidity : 26 deg. C / 60 % RH
Engineer : Takumi Shimada
Mode : Tx

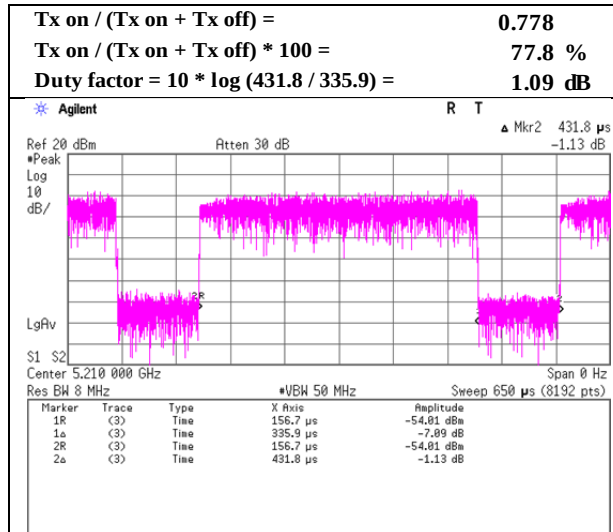
11ac-20 MCS5



11ac-40 MCS4



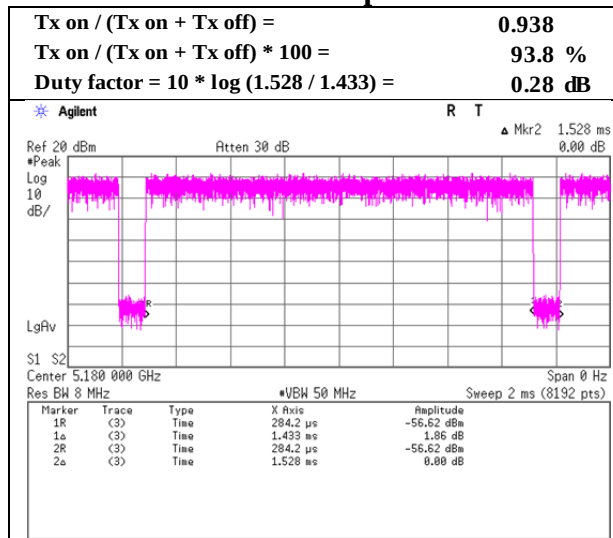
11ac-80 MCS0



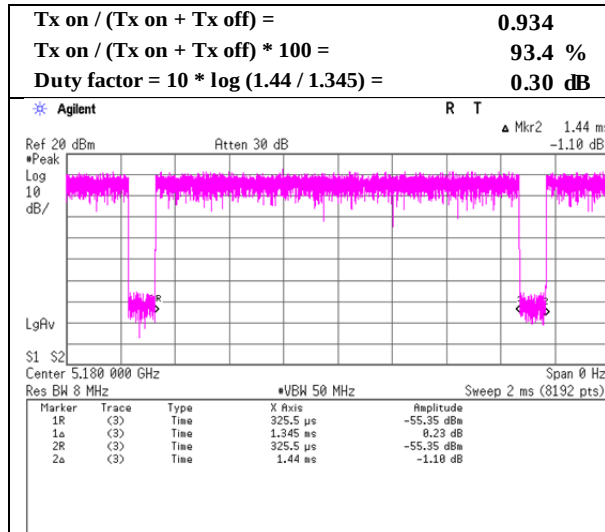
Burst rate confirmation

Test place : Ise EMC Lab. No.7 Measurement Room
Report No. : 11932168H
Date : September 25, 2017
Temperature / Humidity : 26 deg. C / 60 % RH
Engineer : Takumi Shimada
Mode : Tx

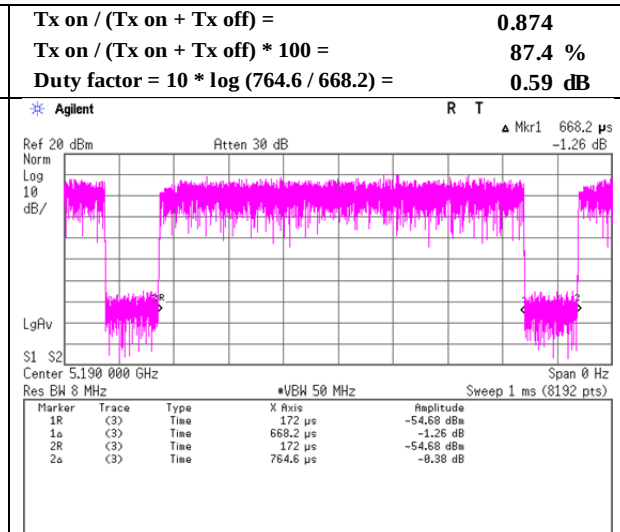
11a 6Mbps



11n-20 MCS0



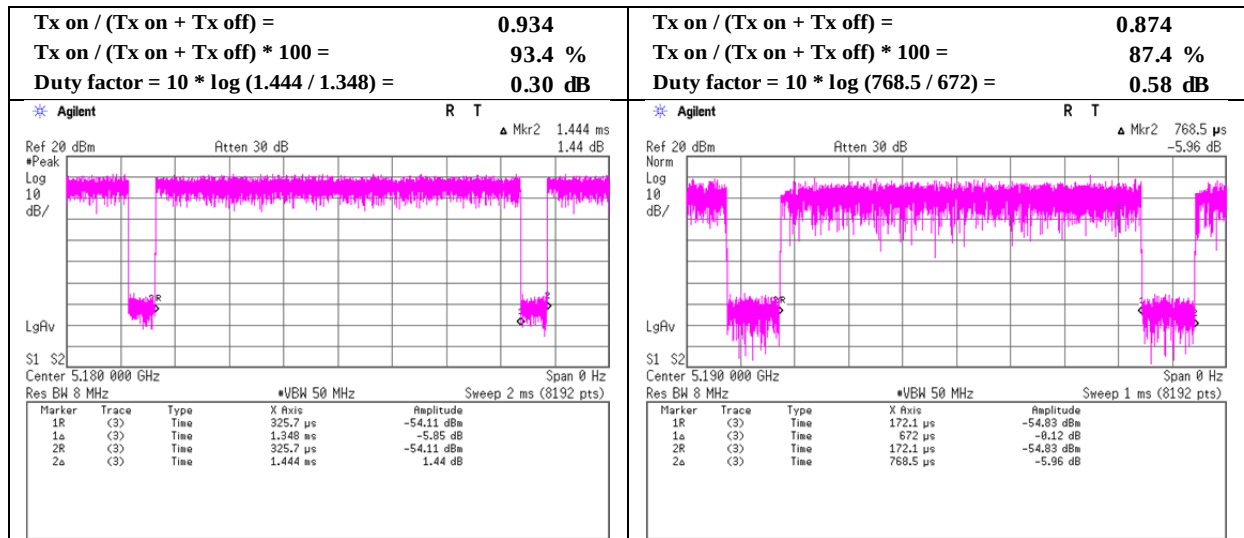
11n-40 MCS0



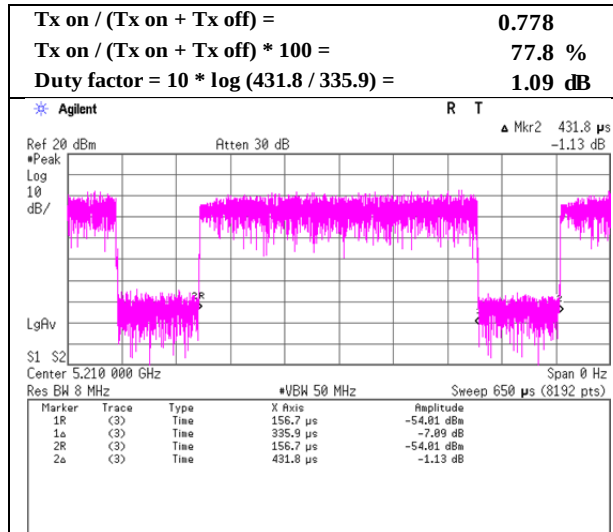
Burst rate confirmation

Test place Ise EMC Lab. No.7 Measurement Room
Report No. 11932168H
Date September 25, 2017
Temperature / Humidity 26 deg. C / 60 % RH
Engineer Takumi Shimada
Mode Tx

11ac-20 MCS0



11ac-80 MCS0



Maximum Power Spectral Density

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	11932168H	
Date	November 8, 2017	November 17, 2017
Temperature / Humidity	25deg. C / 47 % RH	20deg. C / 49 % RH
Engineer	Ken Fujita	Takafumi Noguchi
Mode	Tx	

11a

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted)			PSD (e.i.r.p.)		
							Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]	Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]
5180	-9.93	0.80	9.84	1.71	1.4	0.00	2.42	11.00	8.58	3.82	17.00	13.18
5220	-9.67	0.80	9.84	1.71	1.4	0.00	2.68	11.00	8.32	4.08	17.00	12.92
5240	-9.76	0.80	9.84	1.71	1.4	0.00	2.59	11.00	8.41	3.99	17.00	13.01
5260	-10.94	0.80	9.84	1.71	1.4	0.00	1.41	11.00	9.59	2.81	17.00	14.19
5280	-10.93	0.80	9.85	1.71	1.4	0.00	1.43	11.00	9.57	2.83	17.00	14.17
5300	-10.87	0.80	9.85	1.71	1.4	0.00	1.49	11.00	9.51	2.89	17.00	14.11
5320	-10.92	0.80	9.85	1.71	1.4	0.00	1.44	11.00	9.56	2.84	17.00	14.16
5500	-8.46	0.80	10.07	1.71	1.4	0.00	4.12	11.00	6.88	5.52	17.00	11.48
5580	-8.61	0.80	10.08	1.71	1.4	0.00	3.98	11.00	7.02	5.38	17.00	11.62
5700	-8.65	0.80	10.10	1.71	1.4	0.00	3.96	11.00	7.04	5.36	17.00	11.64
5720	-8.62	0.80	10.10	1.71	1.4	0.00	3.99	11.00	7.01	5.39	17.00	11.61
5745	-11.52	0.80	9.86	1.71	1.4	0.27	1.12	30.00	28.88	2.52	36.00	33.48
5785	-11.80	0.80	9.86	1.71	1.4	0.27	0.84	30.00	29.16	2.24	36.00	33.76
5825	-11.69	0.80	9.86	1.71	1.4	0.27	0.95	30.00	29.05	2.35	36.00	33.65

Sample Calculation:

PSD: Power Spectral Density

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

RBW Correction Factor = $10 * \log(\text{Specified bandwidth} / \text{Measured bandwidth})$

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

+ Duty Factor + RBW Correction Factor

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

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Maximum Power Spectral Density

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	11932168H	
Date	November 8, 2017	November 17, 2017
Temperature / Humidity	25deg. C / 47 % RH	20deg. C / 49 % RH
Engineer	Ken Fujita	Takafumi Noguchi
Mode	Tx	

11n-20

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted)			PSD (e.i.r.p.)		
							Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]	Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]
5180	-10.33	0.80	9.84	1.37	1.4	0.00	1.68	11.00	9.32	3.08	17.00	13.92
5220	-9.92	0.80	9.84	1.37	1.4	0.00	2.10	11.00	8.91	3.50	17.00	13.51
5240	-10.22	0.80	9.84	1.37	1.4	0.00	1.79	11.00	9.21	3.19	17.00	13.81
5260	-11.39	0.80	9.84	1.37	1.4	0.00	0.62	11.00	10.38	2.02	17.00	14.98
5280	-11.38	0.80	9.85	1.37	1.4	0.00	0.64	11.00	10.36	2.04	17.00	14.96
5300	-11.36	0.80	9.85	1.37	1.4	0.00	0.66	11.00	10.34	2.06	17.00	14.94
5320	-11.34	0.80	9.85	1.37	1.4	0.00	0.68	11.00	10.32	2.08	17.00	14.92
5500	-9.63	0.80	9.86	1.37	1.4	0.00	2.40	11.00	8.60	3.80	17.00	13.20
5580	-9.74	0.80	9.86	1.37	1.4	0.00	2.29	11.00	8.71	3.69	17.00	13.31
5700	-9.47	0.80	9.86	1.37	1.4	0.00	2.56	11.00	8.44	3.96	17.00	13.04
5720	-9.87	0.80	9.86	1.37	1.4	0.00	2.16	11.00	8.84	3.56	17.00	13.44
5745	-13.59	0.80	10.11	1.37	1.4	0.27	-1.04	30.00	31.04	0.36	36.00	35.64
5785	-13.88	0.80	10.11	1.37	1.4	0.27	-1.33	30.00	31.33	0.07	36.00	35.93
5825	-13.50	0.80	10.12	1.37	1.4	0.27	-0.94	30.00	30.94	0.46	36.00	35.54

Sample Calculation:

PSD: Power Spectral Density

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

RBW Correction Factor = $10 * \log(\text{Specified bandwidth} / \text{Measured bandwidth})$

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

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

11n-40

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted)			PSD (e.i.r.p.)		
							Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]	Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]
5190	-14.37	0.80	9.84	1.41	1.4	0.00	-2.32	11.00	13.32	-0.92	17.00	17.92
5230	-14.07	0.80	9.84	1.41	1.4	0.00	-2.02	11.00	13.02	-0.62	17.00	17.62
5270	-14.55	0.80	9.85	1.41	1.4	0.00	-2.49	11.00	13.49	-1.09	17.00	18.09
5310	-14.56	0.80	9.85	1.41	1.4	0.00	-2.50	11.00	13.50	-1.10	17.00	18.10
5510	-15.91	0.80	9.86	1.41	1.4	0.00	-3.84	11.00	14.84	-2.44	17.00	19.44
5550	-15.45	0.80	9.86	1.41	1.4	0.00	-3.38	11.00	14.38	-1.98	17.00	18.98
5670	-15.32	0.80	9.86	1.41	1.4	0.00	-3.25	11.00	14.25	-1.85	17.00	18.85
5710	-15.83	0.80	9.86	1.41	1.4	0.00	-3.76	11.00	14.76	-2.36	17.00	19.36
5755	-16.57	0.80	10.11	1.41	1.4	0.27	-3.98	30.00	33.98	-2.58	17.00	19.58
5795	-16.32	0.80	10.11	1.41	1.4	0.27	-3.73	30.00	33.73	-2.33	17.00	19.33

Sample Calculation:

PSD: Power Spectral Density

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

RBW Correction Factor = $10 * \log(\text{Specified bandwidth} / \text{Measured bandwidth})$

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

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

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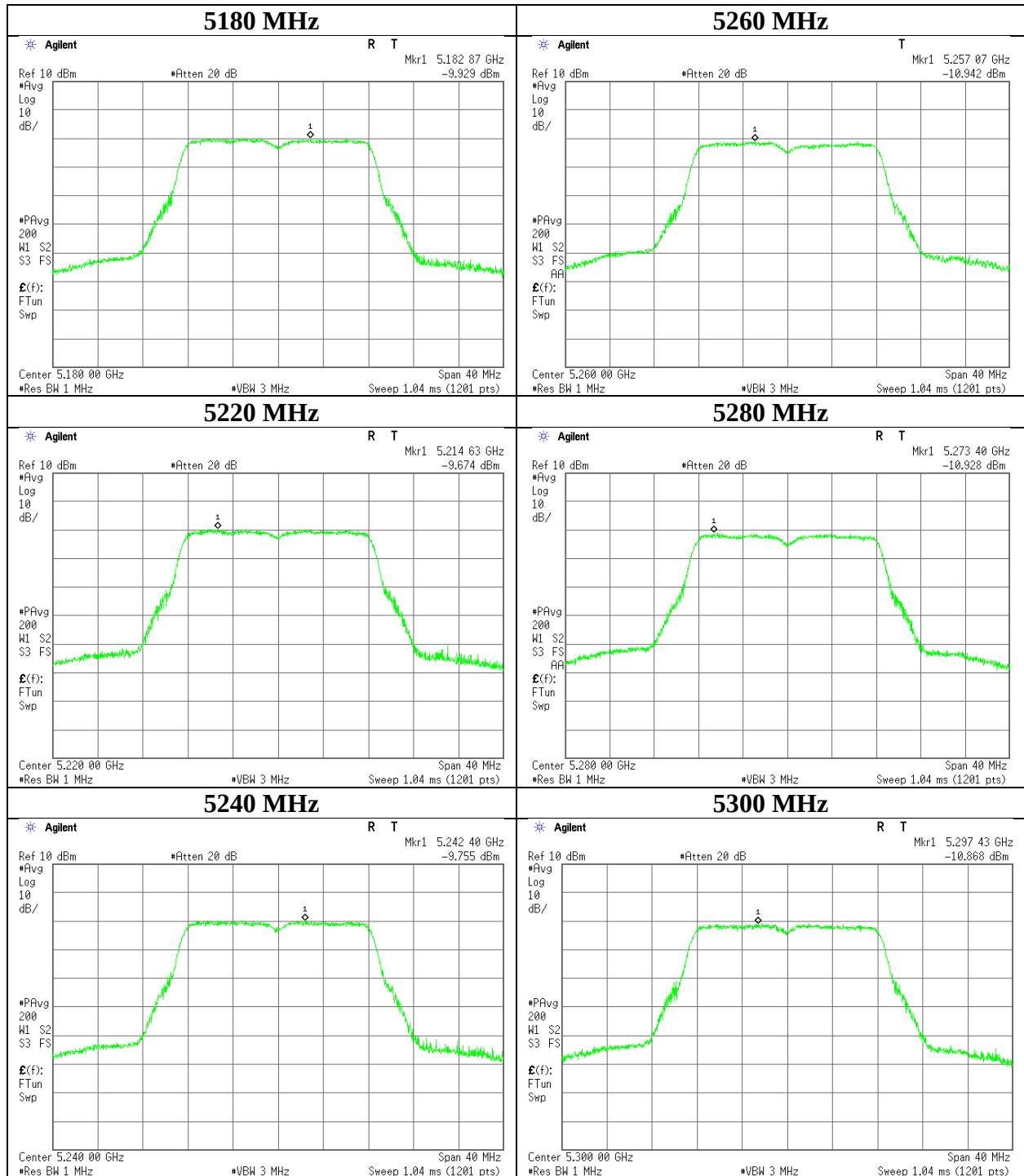
Facsimile : +81 596 24 8124

Maximum Power Spectral Density

Test place
Report No.

Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.11 Measurement Room
11932168H
November 8, 2017
25deg. C / 47 % RH
Ken Fujita
Tx 11a



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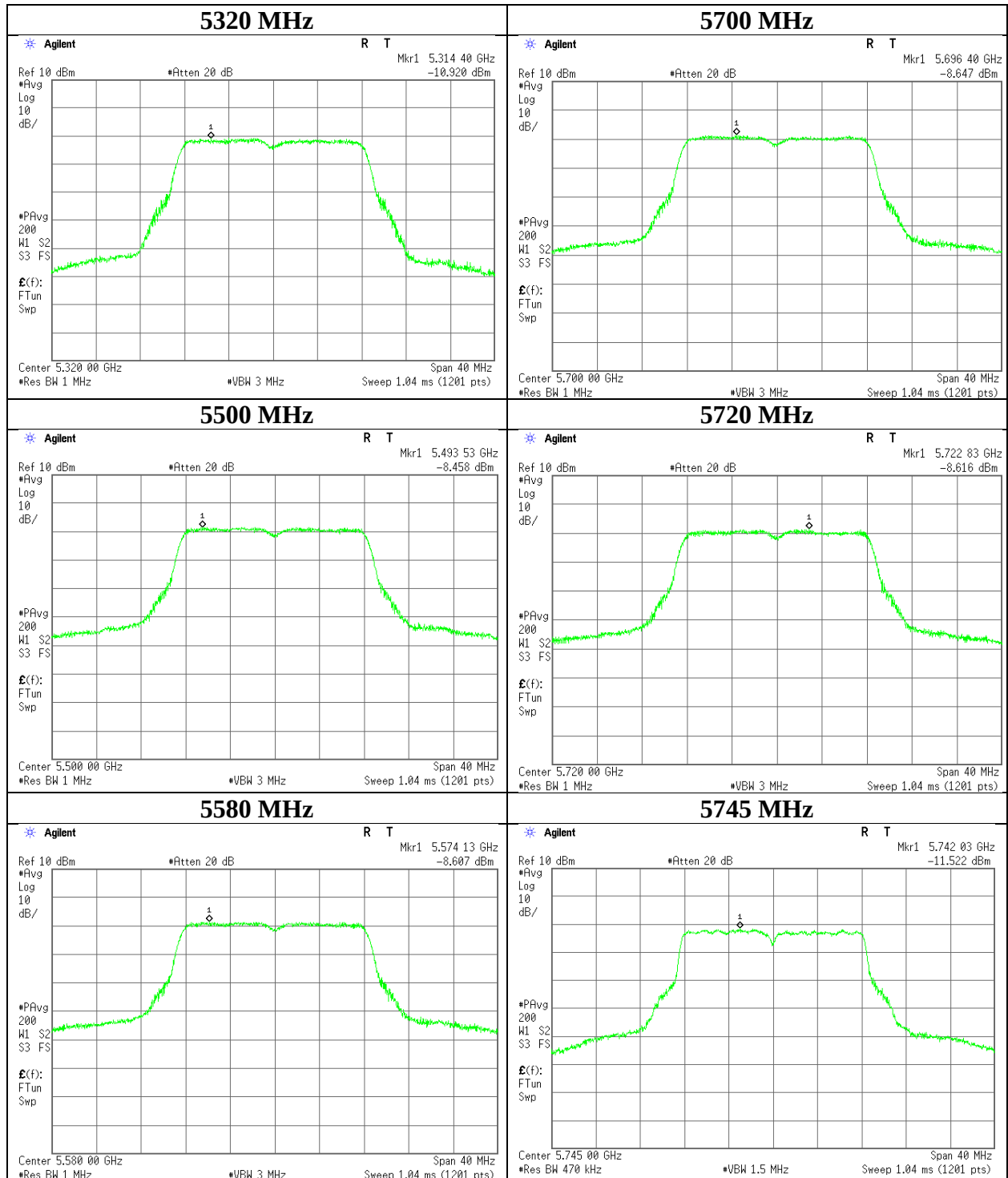
Maximum Power Spectral Density

Test place
Report No.

Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.11 Measurement Room
11932168H
November 8, 2017
25deg. C / 47 % RH
Ken Fujita
Tx 11a

November 17, 2017
20deg. C / 49 % RH
Takafumi Noguchi



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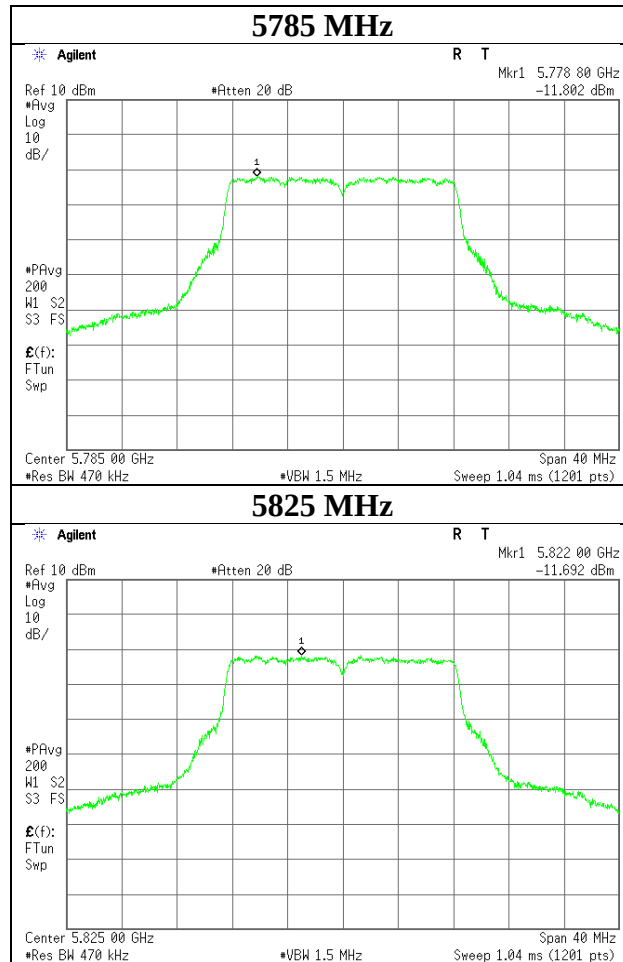
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Maximum Power Spectral Density

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	11932168H	
Date	November 8, 2017	November 17, 2017
Temperature / Humidity	25deg. C / 47 % RH	20deg. C / 49 % RH
Engineer	Ken Fujita	Takafumi Noguchi
Mode	Tx 11a	



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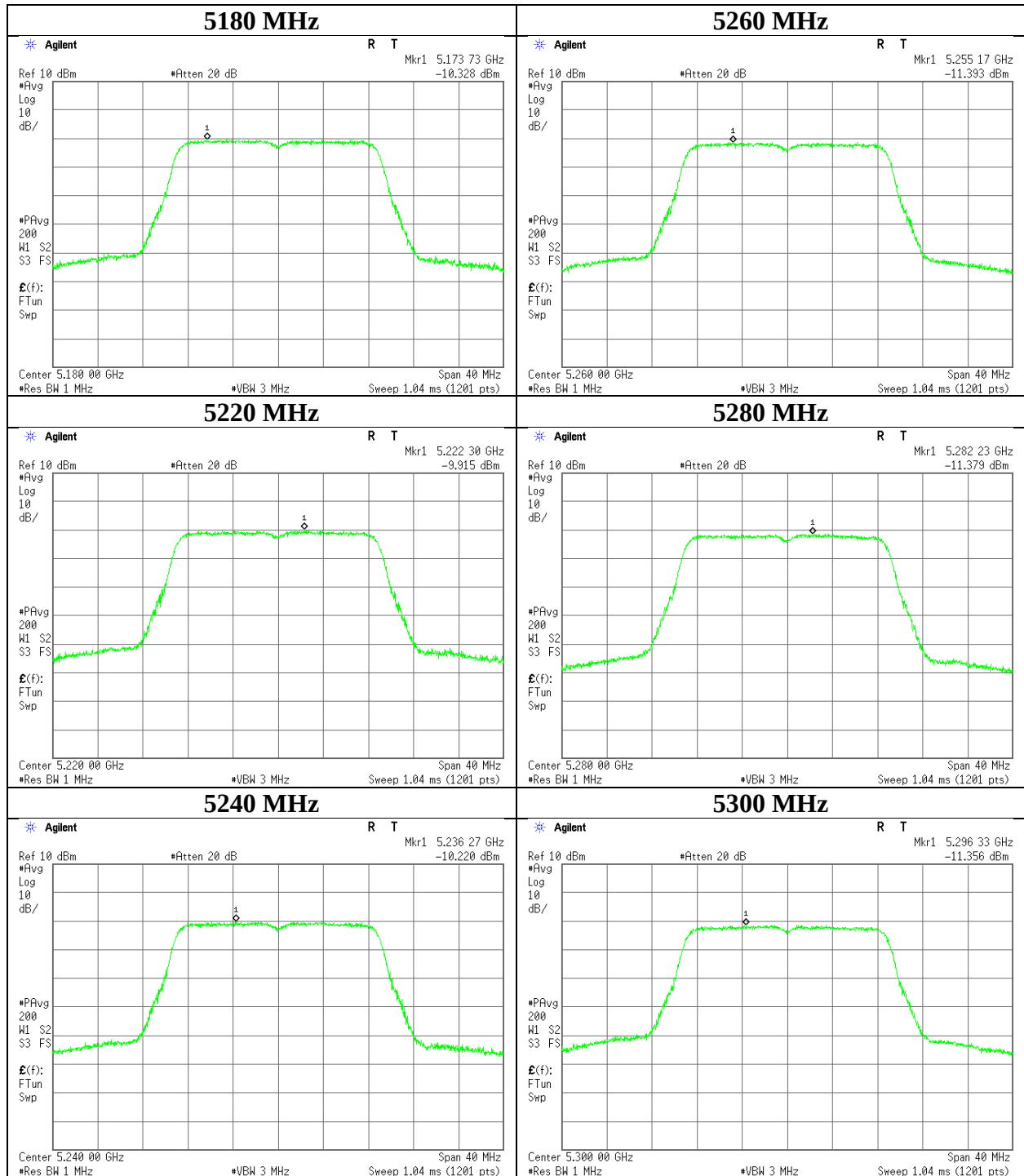
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Maximum Power Spectral Density

Test place Report No. Date Temperature / Humidity Engineer Mode	Ise EMC Lab. No.11 Measurement Room 11932168H November 8, 2017 25deg. C / 47 % RH Ken Fujita Tx 11n-20
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Maximum Power Spectral Density

Test place
Report No.

Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.11 Measurement Room

11932168H

November 8, 2017

25deg. C / 47 % RH

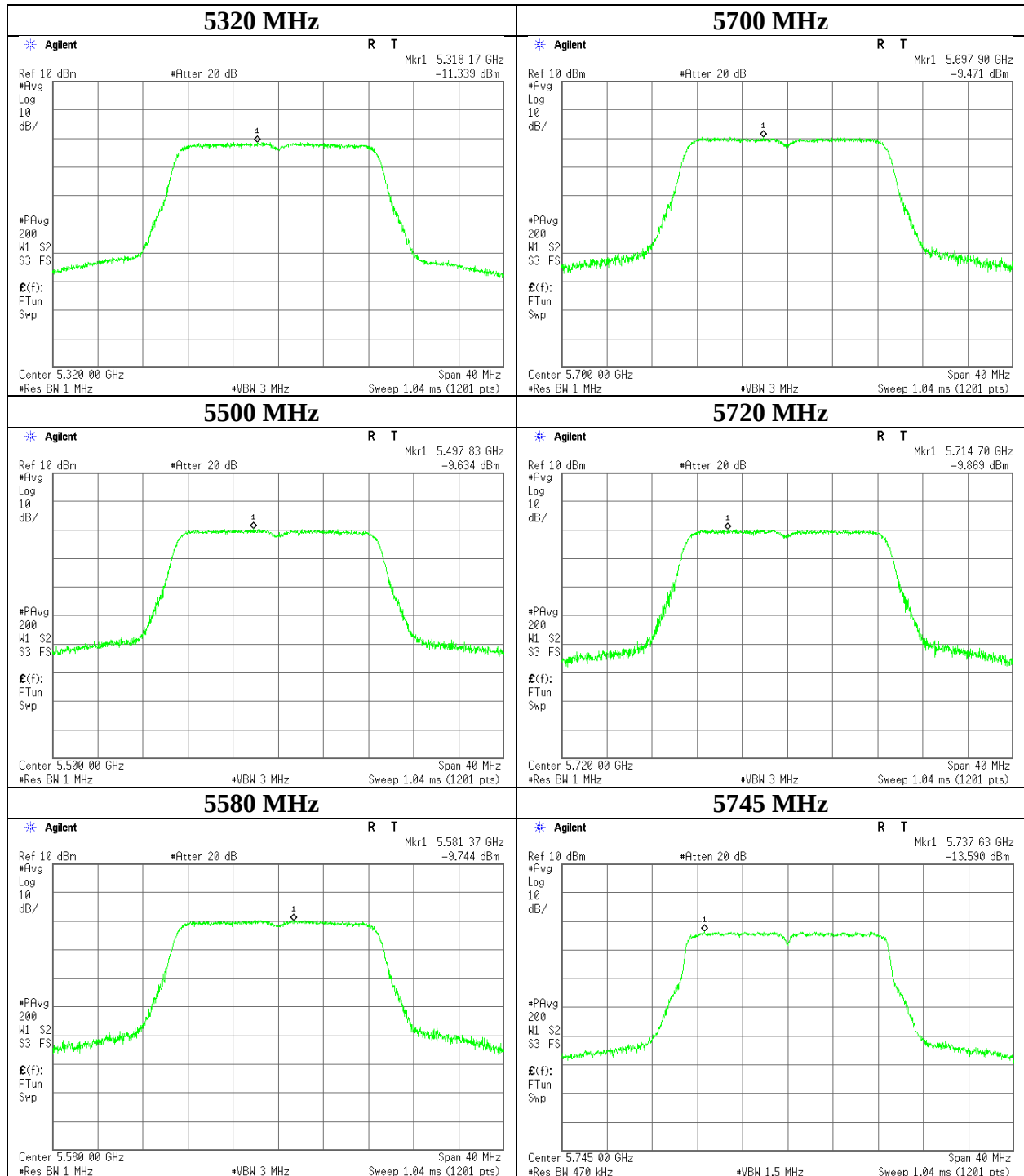
Ken Fujita

Tx 11n-20

November 17, 2017

20deg. C / 49 % RH

Takafumi Noguchi



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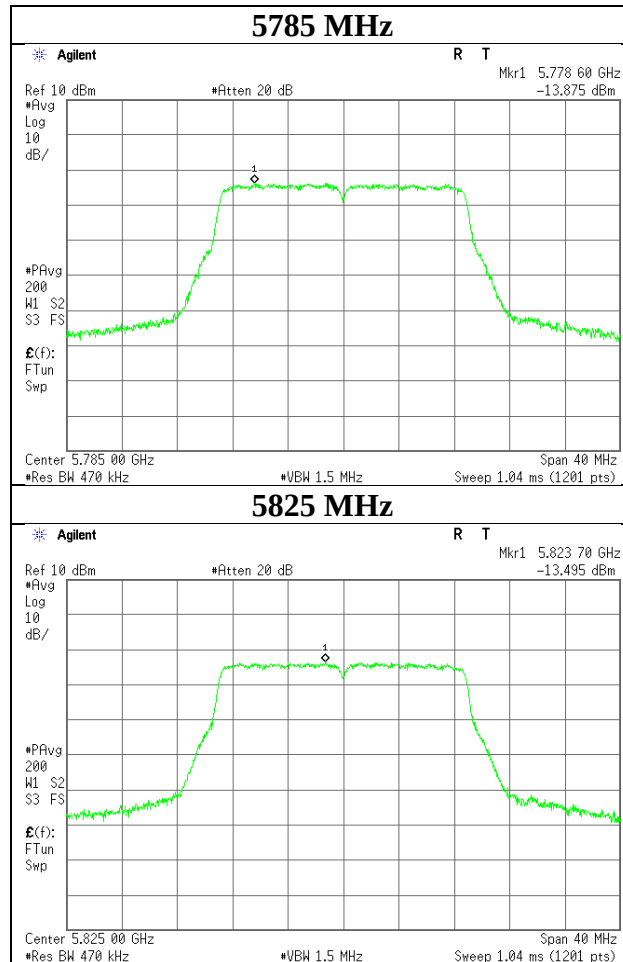
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Maximum Power Spectral Density

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	11932168H	
Date	November 8, 2017	November 17, 2017
Temperature / Humidity	25deg. C / 47 % RH	20deg. C / 49 % RH
Engineer	Ken Fujita	Takafumi Noguchi
Mode	Tx 11n-20	



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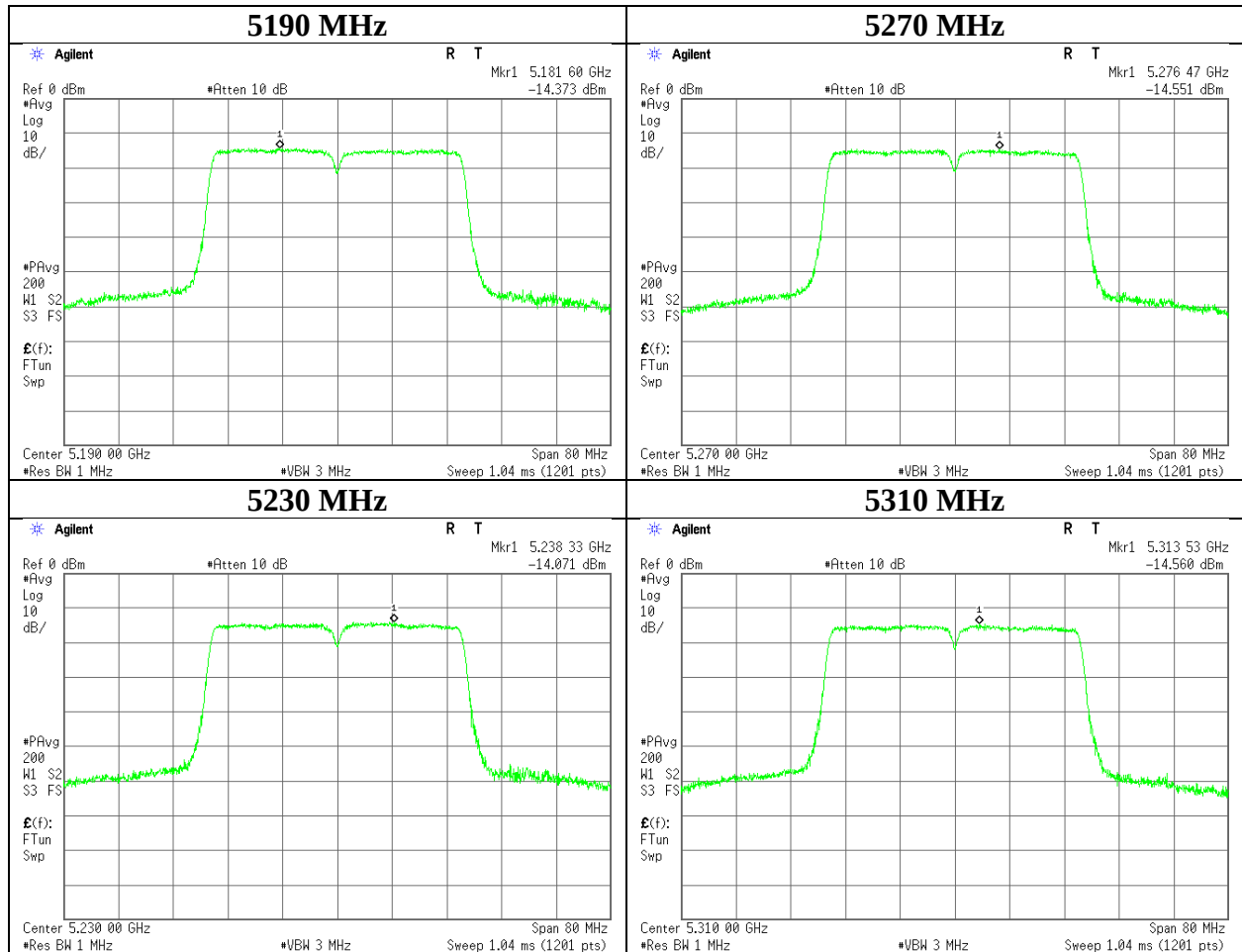
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Maximum Power Spectral Density

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11932168H
Date : November 8, 2017
Temperature / Humidity : 25deg. C / 47 % RH
Engineer : Ken Fujita
Mode : Tx 11n-40



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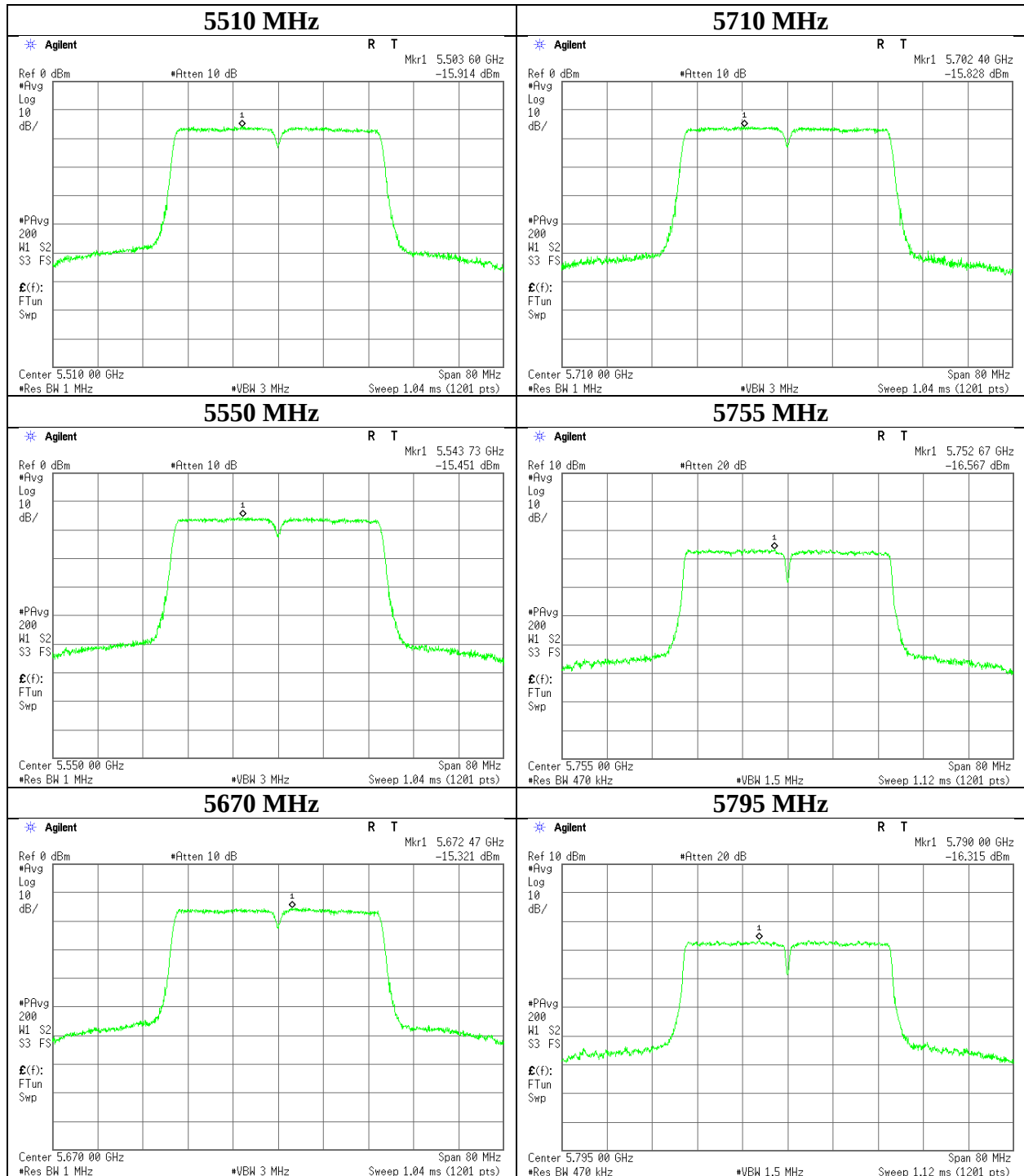
Maximum Power Spectral Density

Test place
Report No.

Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.11 Measurement Room
11932168H
November 8, 2017
25deg. C / 47 % RH
Ken Fujita
Tx 11n-40

November 17, 2017
20deg. C / 49 % RH
Takafumi Noguchi



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Maximum Power Spectral Density

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	11932168H	
Date	November 8, 2017	November 17, 2017
Temperature / Humidity	25deg. C / 47 % RH	20deg. C / 49 % RH
Engineer	Ken Fujita	Takafumi Noguchi
Mode	Tx	

11ac-20

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted)			PSD (e.i.r.p.)		
							Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]	Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]
5180	-10.44	0.80	9.84	1.66	1.4	0.00	1.86	11.00	9.14	3.26	17.00	13.74
5220	-10.63	0.80	9.84	1.66	1.4	0.00	1.67	11.00	9.33	3.07	17.00	13.93
5240	-10.48	0.80	9.84	1.66	1.4	0.00	1.82	11.00	9.18	3.22	17.00	13.78
5260	-11.53	0.80	9.84	1.66	1.4	0.00	0.77	11.00	10.23	2.17	17.00	14.83
5280	-11.77	0.80	9.85	1.66	1.4	0.00	0.54	11.00	10.46	1.94	17.00	15.06
5300	-11.55	0.80	9.85	1.66	1.4	0.00	0.76	11.00	10.24	2.16	17.00	14.84
5320	-11.64	0.80	9.85	1.66	1.4	0.00	0.67	11.00	10.33	2.07	17.00	14.93
5500	-9.98	0.80	9.86	1.66	1.4	0.00	2.34	11.00	8.66	3.74	17.00	13.26
5580	-9.66	0.80	9.86	1.66	1.4	0.00	2.66	11.00	8.34	4.06	17.00	12.94
5700	-9.46	0.80	9.86	1.66	1.4	0.00	2.86	11.00	8.14	4.26	17.00	12.74
5720	-9.60	0.80	9.86	1.66	1.4	0.00	2.72	11.00	8.28	4.12	17.00	12.88
5745	-13.18	0.80	10.11	1.66	1.4	0.27	-0.34	30.00	30.34	1.06	36.00	34.94
5785	-13.75	0.80	10.11	1.66	1.4	0.27	-0.91	30.00	30.91	0.49	36.00	35.51
5825	-13.79	0.80	10.12	1.66	1.4	0.27	-0.94	30.00	30.94	0.46	36.00	35.54

Sample Calculation:

PSD: Power Spectral Density

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

RBW Correction Factor = $10 * \log (\text{Specified bandwidth} / \text{Measured bandwidth})$

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

+ Duty Factor + RBW Correction Factor

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

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Maximum Power Spectral Density

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	11932168H	
Date	November 8, 2017	November 17, 2017
Temperature / Humidity	25deg. C / 47 % RH	20deg. C / 49 % RH
Engineer	Ken Fujita	Takafumi Noguchi
Mode	Tx	

11ac-40

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted)			PSD (e.i.r.p.)		
							Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]	Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]
5190	-14.58	0.80	9.84	2.14	1.4	0.00	-1.80	11.00	12.80	-0.40	17.00	17.40
5230	-14.28	0.80	9.84	2.14	1.4	0.00	-1.50	11.00	12.50	-0.10	17.00	17.10
5270	-15.26	0.80	9.85	2.14	1.4	0.00	-2.47	11.00	13.47	-1.07	17.00	18.07
5310	-15.21	0.80	9.85	2.14	1.4	0.00	-2.42	11.00	13.42	-1.02	17.00	18.02
5510	-16.24	0.80	9.86	2.14	1.4	0.00	-3.44	11.00	14.44	-2.04	17.00	19.04
5550	-16.13	0.80	9.86	2.14	1.4	0.00	-3.33	11.00	14.33	-1.93	17.00	18.93
5670	-16.28	0.80	9.86	2.14	1.4	0.00	-3.48	11.00	14.48	-2.08	17.00	19.08
5710	-16.33	0.80	9.86	2.14	1.4	0.00	-3.53	11.00	14.53	-2.13	17.00	19.13
5755	-16.89	0.80	10.11	2.14	1.4	0.27	-3.57	30.00	33.57	-2.17	17.00	19.17
5795	-17.10	0.80	10.11	2.14	1.4	0.27	-3.78	30.00	33.78	-2.38	17.00	19.38

Sample Calculation:

PSD: Power Spectral Density

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

RBW Correction Factor = $10 * \log(\text{Specified bandwidth} / \text{Measured bandwidth})$

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

+ Duty Factor + RBW Correction Factor

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

11ac-80

Applied limit: 15.407, mobile and portable client device

Tested Frequency [MHz]	PSD Reading [dBm /MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Antenna Gain [dBi]	RBW Correction Factor [dB]	PSD (Conducted)			PSD (e.i.r.p.)		
							Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]	Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]
5210	-17.23	0.80	9.84	1.09	1.4	0.00	-5.50	11.00	16.50	-4.10	17.00	21.10
5290	-17.53	0.80	9.85	1.09	1.4	0.00	-5.79	11.00	16.79	-4.39	17.00	21.39
5530	-19.36	0.80	9.86	1.09	1.4	0.00	-7.61	11.00	18.61	-6.21	17.00	23.21
5610	-19.46	0.80	9.86	1.09	1.4	0.00	-7.71	11.00	18.71	-6.31	17.00	23.31
5690	-19.33	0.80	9.86	1.09	1.4	0.00	-7.58	11.00	18.58	-6.18	17.00	23.18
5775	-20.26	0.80	10.11	1.09	1.4	0.27	-7.99	30.00	37.99	-6.59	17.00	23.59

Sample Calculation:

PSD: Power Spectral Density

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

RBW Correction Factor = $10 * \log(\text{Specified bandwidth} / \text{Measured bandwidth})$

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

+ Duty Factor + RBW Correction Factor

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

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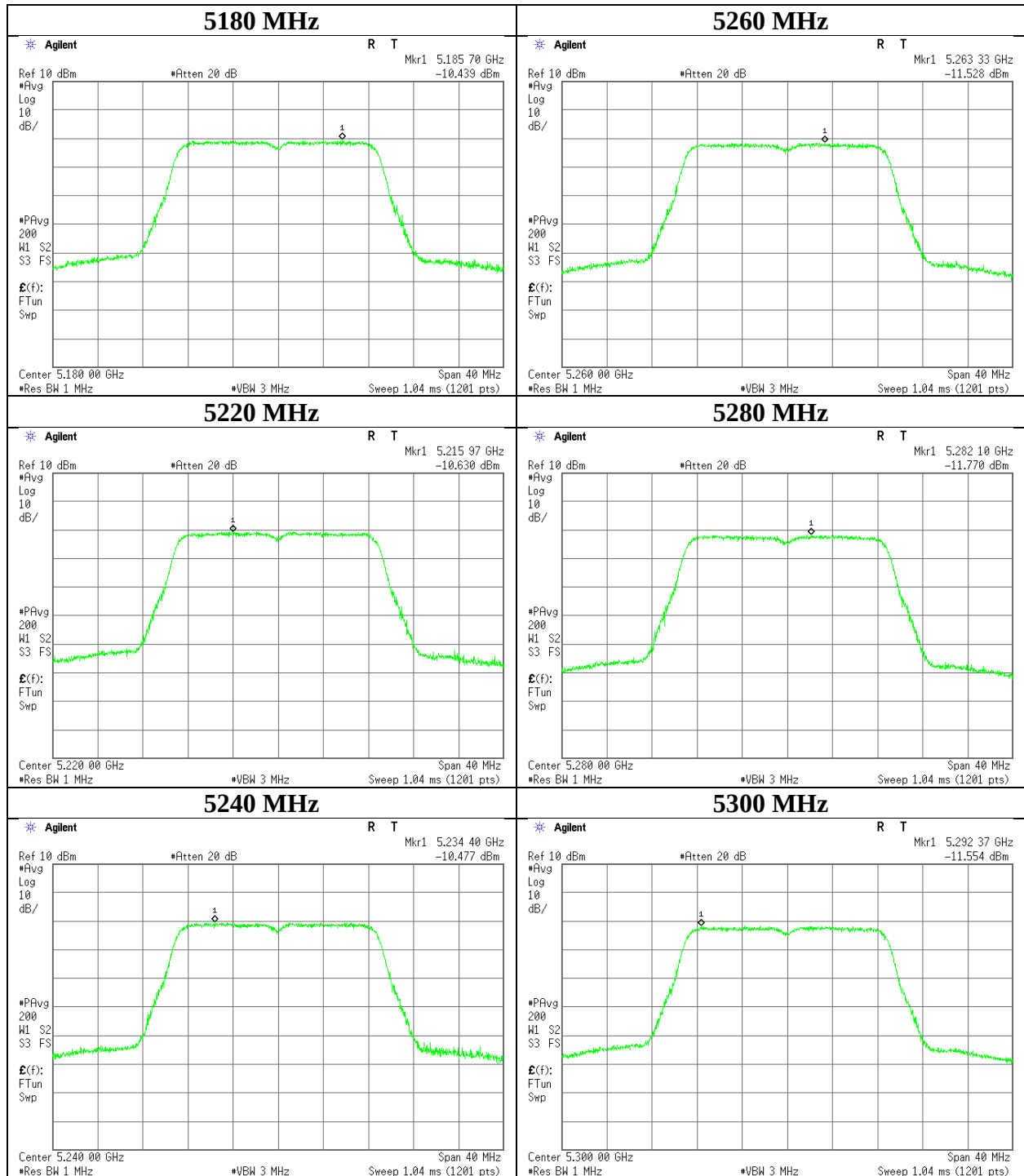
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Facsimile : +81 596 24 8124

Maximum Power Spectral Density

Test place : Ise EMC Lab. No.11 Measurement Room
Report No. : 11932168H
Date : November 8, 2017
Temperature / Humidity : 25deg. C / 47 % RH
Engineer : Ken Fujita
Mode : Tx 11ac-20



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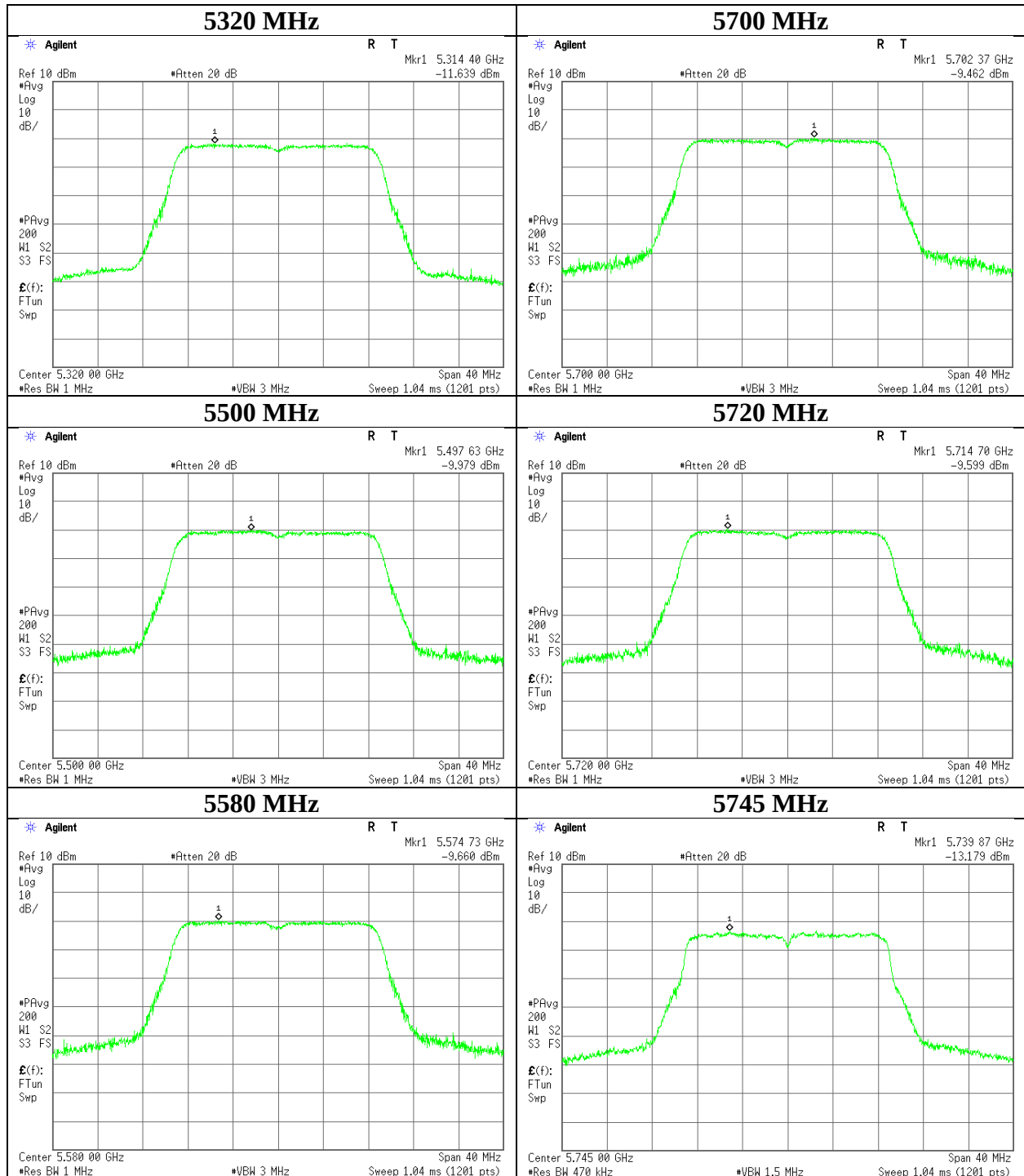
Maximum Power Spectral Density

Test place
Report No.

Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.11 Measurement Room
11932168H
November 8, 2017
25deg. C / 47 % RH
Ken Fujita
Tx 11ac-20

November 17, 2017
20deg. C / 49 % RH
Takafumi Noguchi



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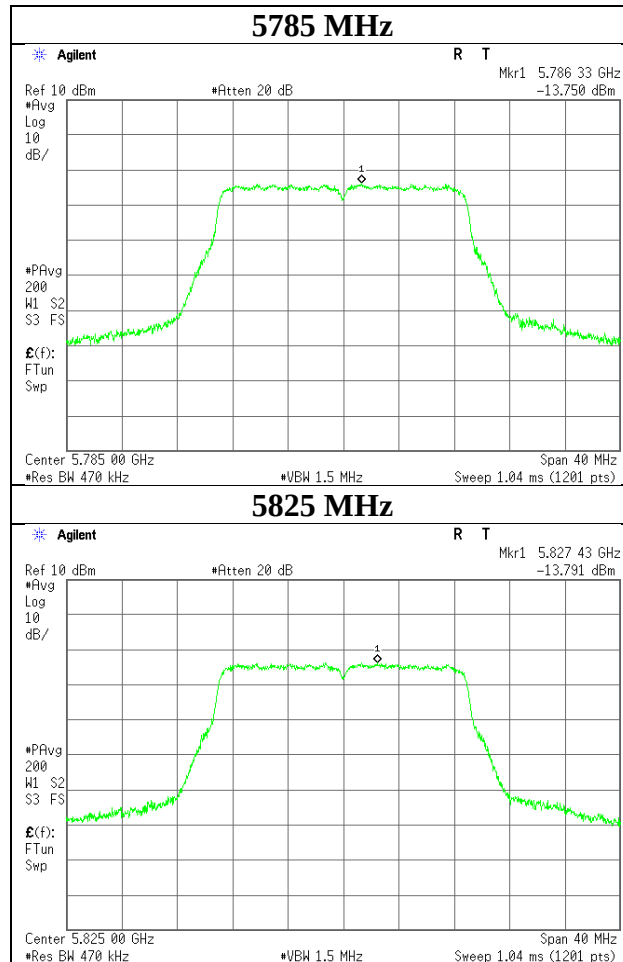
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Maximum Power Spectral Density

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	11932168H	
Date	November 8, 2017	November 17, 2017
Temperature / Humidity	25deg. C / 47 % RH	20deg. C / 49 % RH
Engineer	Ken Fujita	Takafumi Noguchi
Mode	Tx 11ac-20	



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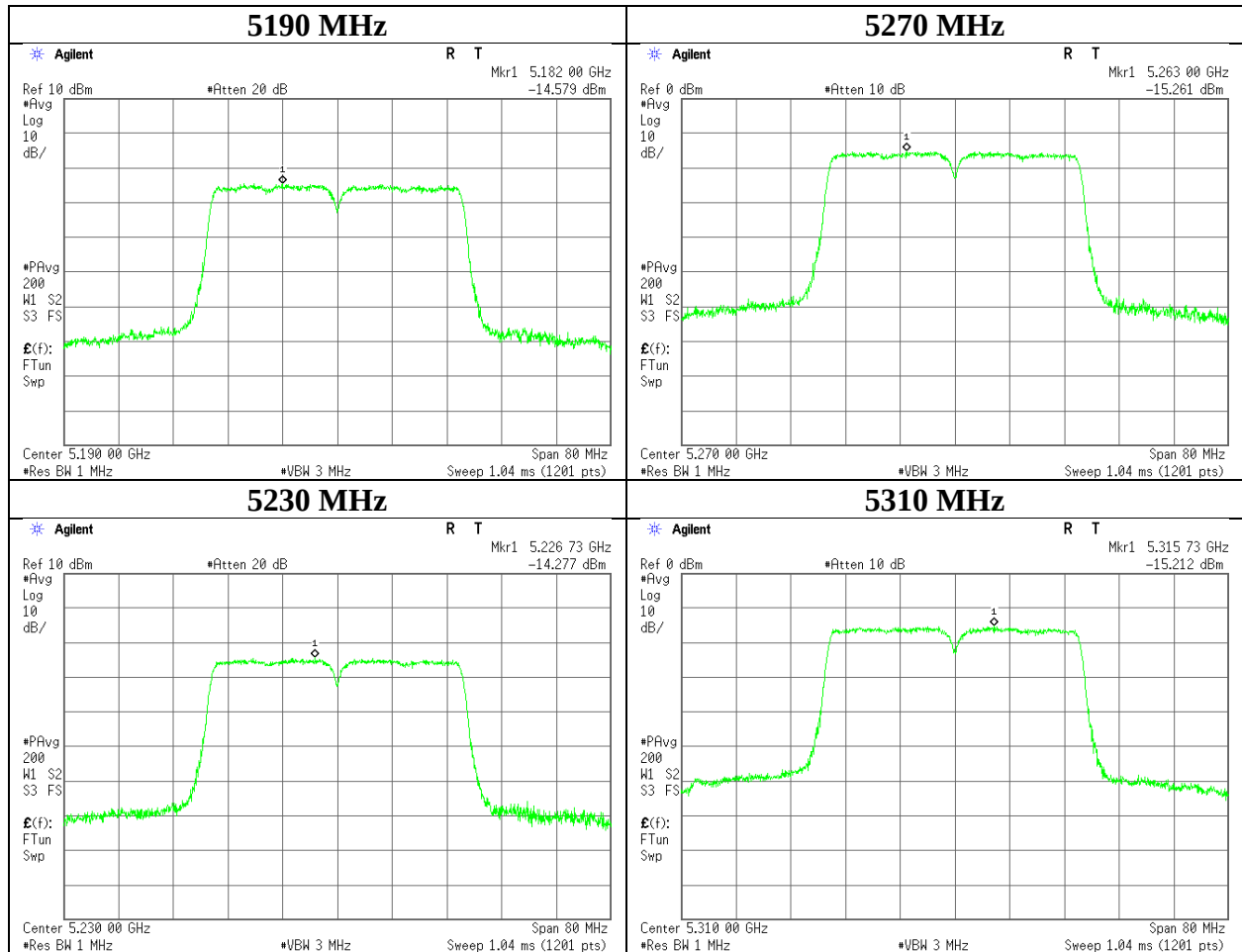
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Maximum Power Spectral Density

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11932168H
Date	November 8, 2017
Temperature / Humidity	25deg. C / 47 % RH
Engineer	Ken Fujita
Mode	Tx 11ac-40



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Maximum Power Spectral Density

Test place
Report No.

Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.11 Measurement Room

11932168H

November 8, 2017

25deg. C / 47 % RH

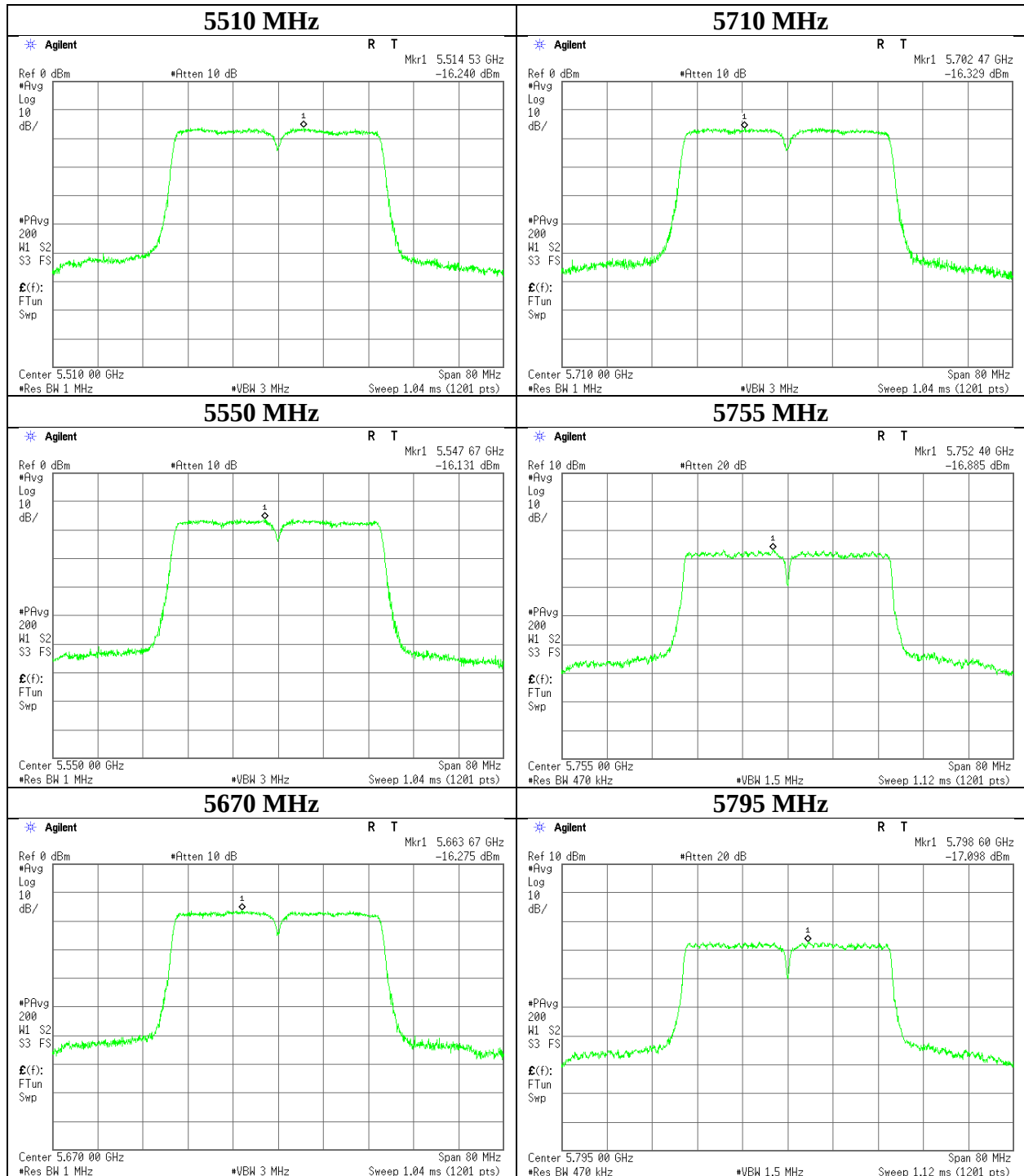
Ken Fujita

Tx 11ac-40

November 17, 2017

20deg. C / 49 % RH

Takafumi Noguchi



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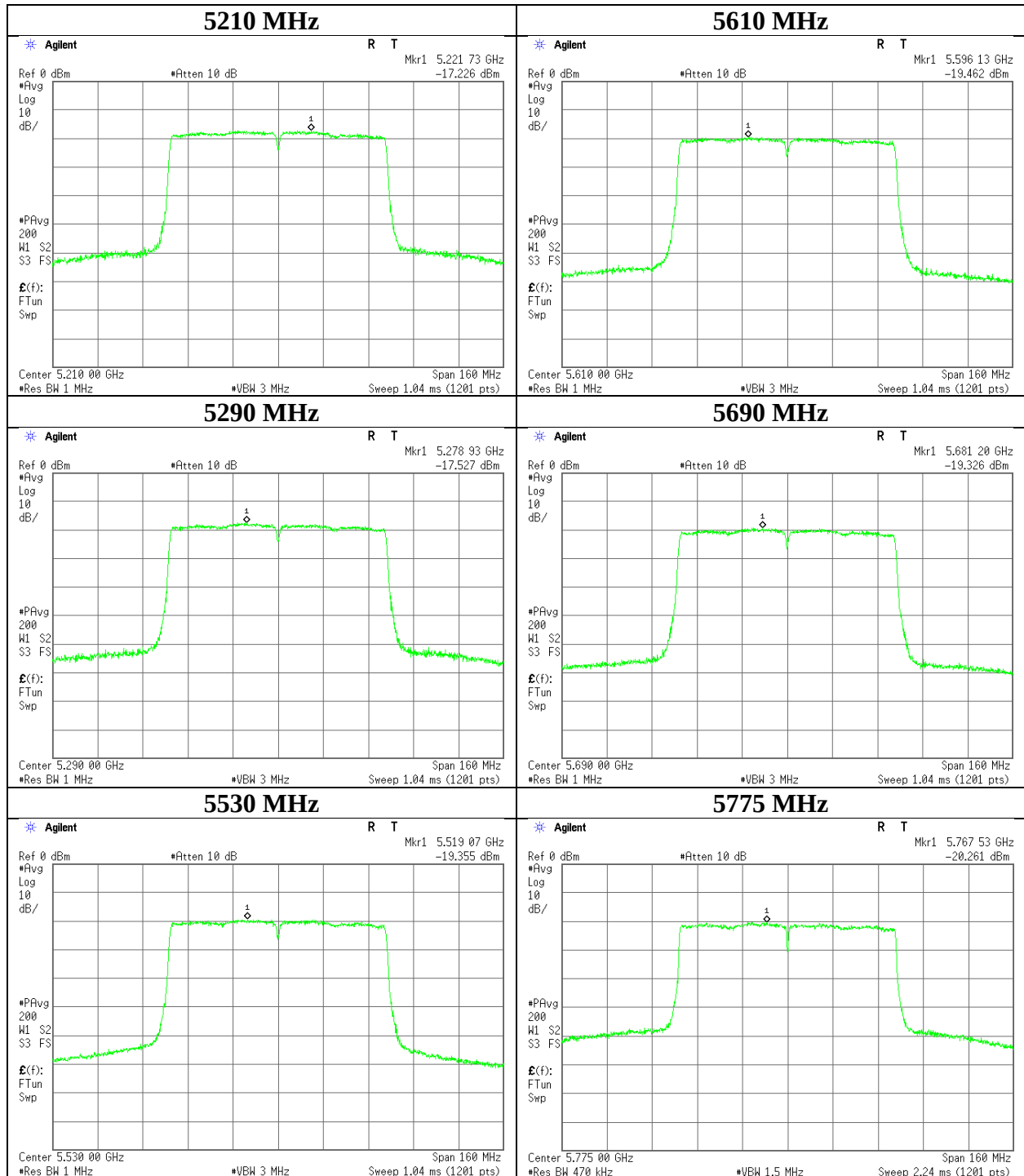
Maximum Power Spectral Density

Test place
Report No.

Date
Temperature / Humidity
Engineer
Mode

Ise EMC Lab. No.11 Measurement Room
11932168H
November 8, 2017
25deg. C / 47 % RH
Ken Fujita
Tx 11ac-80

November 17, 2017
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Mode

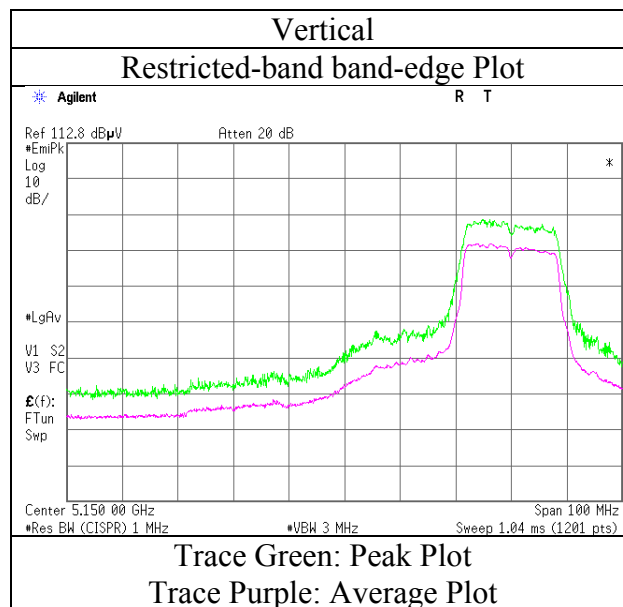
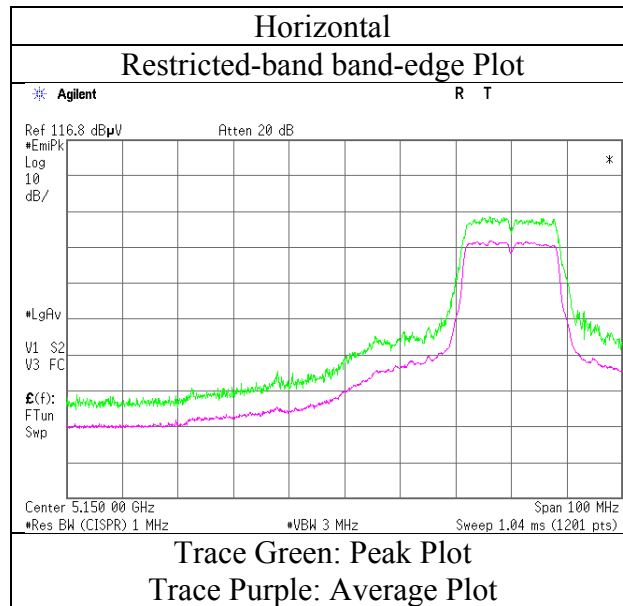
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*1) Not Out of Band emission(Leakage Power)

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Radiated Spurious Emission

Report No.	11932168H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	October 16, 2017
Temperature / Humidity	23 deg. C / 65 % RH
Engineer	Takafumi Noguchi
	(1 GHz - 10 GHz)
Mode	Tx 11a 5180 MHz



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

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Mode

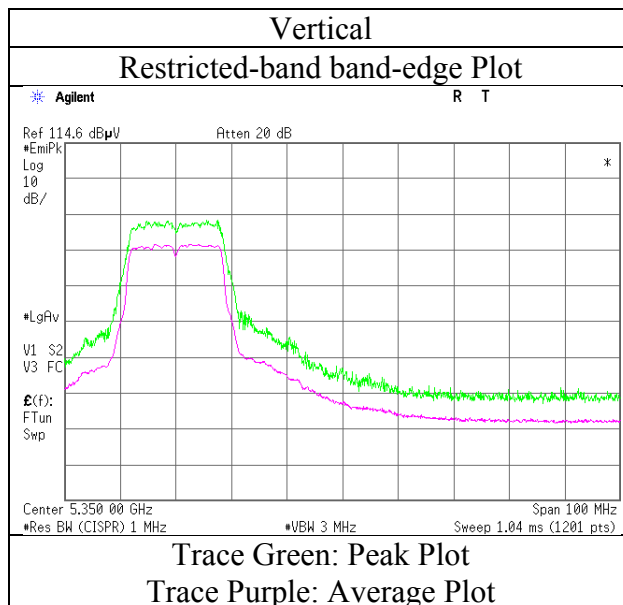
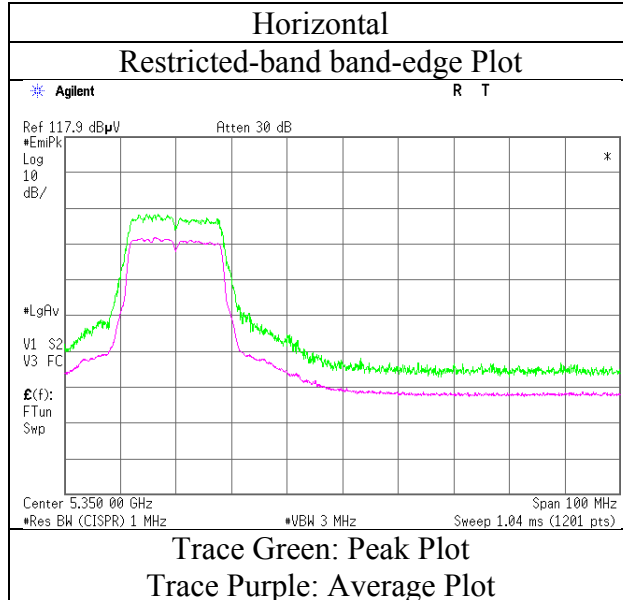
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*1) Not Out of Band emission(Leakage Power)

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Radiated Spurious Emission

Report No.	11932168H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	October 18, 2017
Temperature / Humidity	23 deg. C / 54 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11a 5320 MHz



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

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Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya (1 GHz - 10 GHz)	Takafumi Noguchi (10 GHz - 18 GHz)	Takafumi Noguchi (18 GHz - 40 GHz)
Mode	Tx 11a 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	35.000	QP	22.7	15.8	7.2	32.2	-	13.5	40.0	26.5	
Hori	50.000	QP	22.9	10.8	7.5	32.2	-	9.0	40.0	31.0	
Hori	100.000	QP	22.7	10.0	8.2	32.2	-	8.7	43.5	34.8	
Hori	240.000	QP	22.2	11.7	9.5	32.0	-	11.4	46.0	34.6	
Hori	610.000	QP	22.0	19.1	12.0	32.0	-	21.1	46.0	24.9	
Hori	960.000	QP	21.0	22.3	13.8	30.7	-	26.4	46.0	19.6	
Hori	5460.000	PK	50.5	32.0	7.6	31.3	-	58.8	73.9	15.1	
Hori	5470.000	PK	55.4	32.0	7.6	31.3	-	63.7	68.2	4.5	
Hori	11000.000	PK	55.4	40.5	-1.4	33.3	-	61.2	73.9	12.7	
Hori	16500.000	PK	54.9	39.3	0.3	32.6	-	61.9	73.9	12.0	
Hori	22000.000	PK	44.3	37.3	-0.9	32.5	-	48.2	73.9	25.7	Floor noise
Hori	5460.000	AV	41.0	32.0	7.6	31.3	1.7	51.0	53.9	2.9	*1)
Hori	11000.000	AV	46.1	40.5	-1.4	33.3	1.7	53.6	53.9	0.3	
Hori	16500.000	AV	44.6	39.3	0.3	32.6	1.7	53.3	53.9	0.6	
Hori	22000.000	AV	36.0	37.3	-0.9	32.5	-	39.9	53.9	14.0	Floor noise
Vert	35.000	QP	22.7	15.8	7.2	32.2	-	13.5	40.0	26.5	
Vert	50.000	QP	22.9	10.8	7.5	32.2	-	9.0	40.0	31.0	
Vert	100.000	QP	22.7	10.0	8.2	32.2	-	8.7	43.5	34.8	
Vert	240.000	QP	22.2	11.7	9.5	32.0	-	11.4	46.0	34.6	
Vert	610.000	QP	22.0	19.1	12.0	32.0	-	21.1	46.0	24.9	
Vert	960.000	QP	21.0	22.3	13.8	30.7	-	26.4	46.0	19.6	
Vert	5460.000	PK	46.6	32.0	7.6	31.3	-	54.9	73.9	19.0	
Vert	5470.000	PK	49.2	32.0	7.6	31.3	-	57.5	68.2	10.7	
Vert	11000.000	PK	54.1	40.5	-1.4	33.3	-	59.9	73.9	14.0	
Vert	16500.000	PK	51.5	39.3	0.3	32.6	-	58.5	73.9	15.4	
Vert	22000.000	PK	44.1	37.3	-0.9	32.5	-	48.0	73.9	25.9	Floor noise
Vert	5460.000	AV	36.5	32.0	7.6	31.3	1.7	46.5	53.9	7.4	*1)
Vert	11000.000	AV	44.8	40.5	-1.4	33.3	1.7	52.3	53.9	1.6	
Vert	16500.000	AV	41.2	39.3	0.3	32.6	1.7	49.9	53.9	4.0	
Vert	22000.000	AV	36.0	37.3	-0.9	32.5	-	39.9	53.9	14.0	Floor noise

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

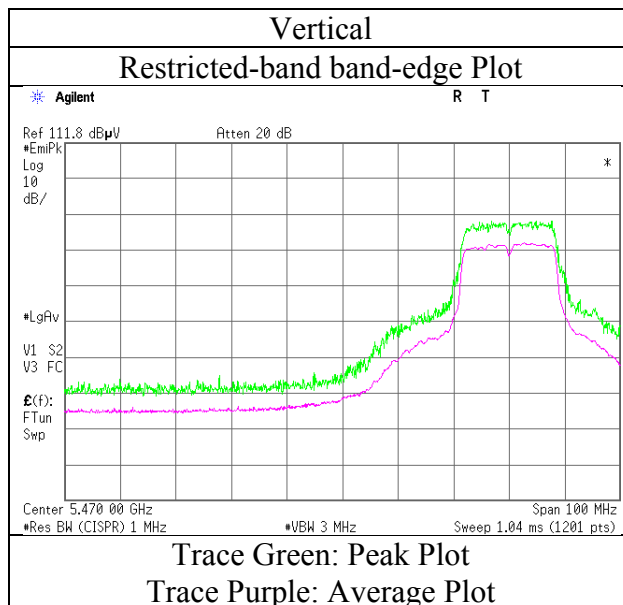
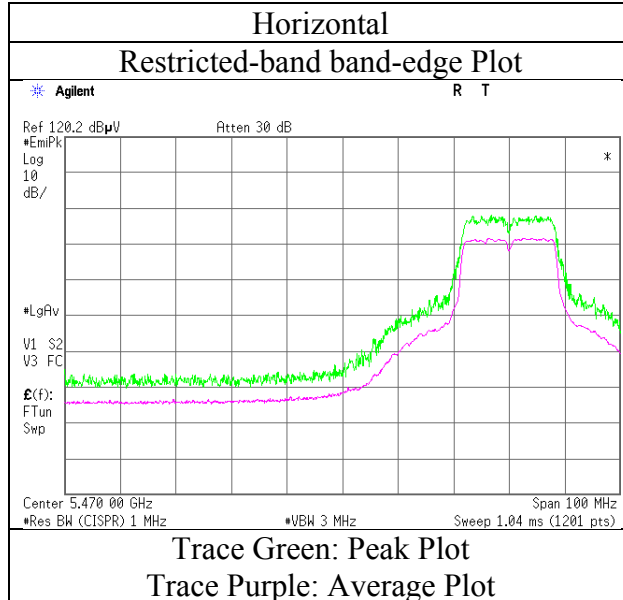
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No.	11932168H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	October 18, 2017
Temperature / Humidity	22deg. C / 64 % RH
Engineer	Yuta Moriya
Mode	Tx 11a 5500 MHz



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

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Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11a 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	11160.000	PK	54.2	40.4	-1.4	33.3	-	59.9	73.9	14.0	
Hori	16740.000	PK	53.4	40.0	0.3	32.6	-	61.1	73.9	12.8	
Hori	22320.000	PK	44.4	37.6	-0.8	32.3	-	48.9	73.9	25.0	Floor noise
Hori	11160.000	AV	44.7	40.4	-1.4	33.3	1.7	52.1	53.9	1.8	
Hori	16740.000	AV	43.8	40.0	0.3	32.6	1.7	53.2	53.9	0.7	
Hori	22320.000	AV	35.9	37.6	-0.8	32.3	-	40.4	53.9	13.5	Floor noise
Vert	11160.000	PK	52.9	40.4	-1.4	33.3	-	58.6	73.9	15.3	
Vert	16740.000	PK	48.3	40.0	0.3	32.6	-	56.0	73.9	17.9	
Vert	22320.000	PK	44.3	37.6	-0.8	32.3	-	48.8	73.9	25.1	Floor noise
Vert	11160.000	AV	43.0	40.4	-1.4	33.3	1.7	50.4	53.9	3.5	
Vert	16740.000	AV	39.3	40.0	0.3	32.6	1.7	48.7	53.9	5.2	
Vert	22320.000	AV	35.8	37.6	-0.8	32.3	-	40.3	53.9	13.6	Floor noise

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

*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 (4.5 m / 3.0 m) = 3.53 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11a 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	59.1	32.3	7.7	31.4	-	67.7	68.2	0.5	
Hori	11400.000	PK	54.7	40.1	-1.3	33.3	-	60.2	73.9	13.7	
Hori	17100.000	PK	51.2	41.4	0.3	32.5	-	60.4	73.9	13.5	
Hori	22800.000	PK	44.5	37.9	-0.7	32.1	-	49.6	73.9	24.3	Floor noise
Hori	11400.000	AV	45.0	40.1	-1.3	33.3	1.7	52.2	53.9	1.7	
Hori	17100.000	AV	40.7	41.4	0.3	32.5	1.7	51.6	53.9	2.3	
Hori	22800.000	AV	36.0	37.9	-0.7	32.1	-	41.1	53.9	12.8	Floor noise
Vert	5725.000	PK	51.2	32.3	7.7	31.4	-	59.8	68.2	8.4	
Vert	11400.000	PK	53.1	40.1	-1.3	33.3	-	58.6	73.9	15.3	
Vert	17100.000	PK	45.9	41.4	0.3	32.5	-	55.1	73.9	18.8	
Vert	22800.000	PK	44.5	37.9	-0.7	32.1	-	49.6	73.9	24.3	Floor noise
Vert	11400.000	AV	43.3	40.1	-1.3	33.3	1.7	50.5	53.9	3.4	
Vert	17100.000	AV	37.8	41.4	0.3	32.5	1.7	48.7	53.9	5.2	
Vert	22800.000	AV	36.0	37.9	-0.7	32.1	-	41.1	53.9	12.8	Floor noise

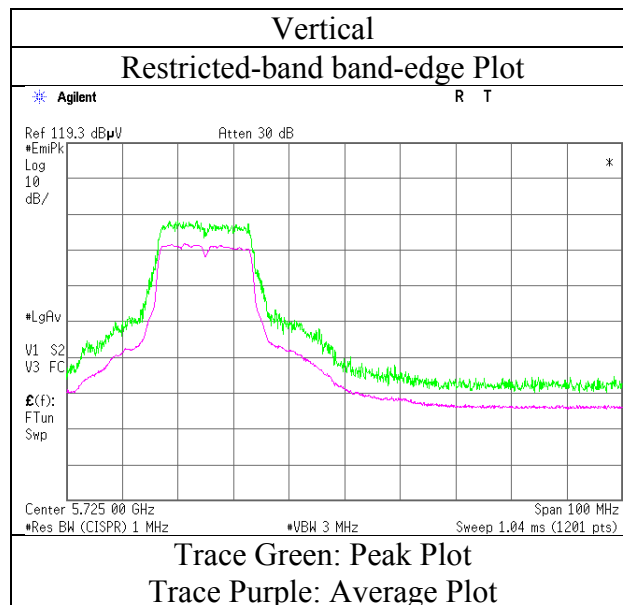
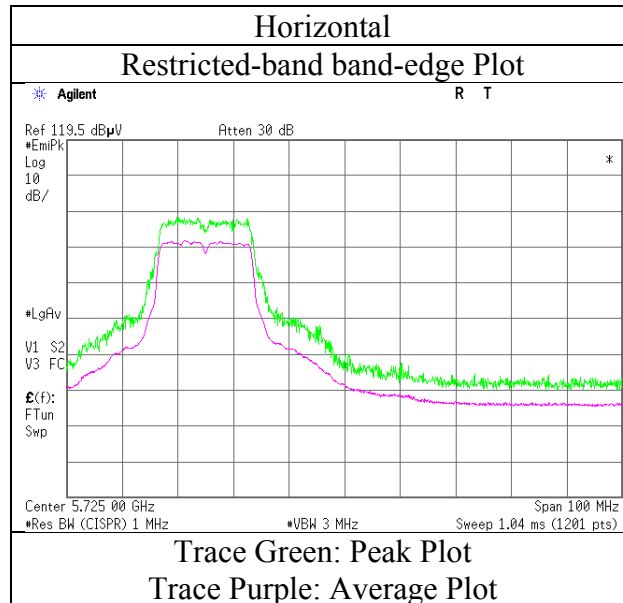
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Report No.	11932168H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	October 18, 2017
Temperature / Humidity	22deg. C / 64 % RH
Engineer	Yuta Moriya
Mode	Tx 11a 5700 MHz



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

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Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11a 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	41.7	32.2	7.7	31.4	-	50.2	68.2	18.0	
Hori	5700.000	PK	49.1	32.3	7.7	31.4	-	57.7	105.2	47.5	
Hori	5715.000	PK	58.3	32.3	7.7	31.4	-	66.9	109.4	42.5	
Hori	5720.000	PK	61.3	32.3	7.7	31.4	-	69.9	110.8	40.9	
Hori	5725.000	PK	64.4	32.3	7.7	31.4	-	73.0	122.2	49.2	
Hori	11490.000	PK	55.0	40.1	-1.2	33.3	-	60.6	73.9	13.3	
Hori	17235.000	PK	47.6	42.2	0.2	32.5	-	57.5	73.9	16.4	
Hori	22980.000	PK	44.4	38.1	-0.7	32.0	-	49.8	73.9	24.1	Floor noise
Hori	11490.000	AV	45.0	40.1	-1.2	33.3	1.7	52.3	53.9	1.6	
Hori	17235.000	AV	37.9	42.2	0.2	32.5	1.7	49.5	53.9	4.4	
Hori	22980.000	AV	36.4	38.1	-0.7	32.0	-	41.8	53.9	12.1	Floor noise
Vert	5650.000	PK	41.4	32.2	7.7	31.4	-	49.9	68.2	18.3	
Vert	5700.000	PK	44.2	32.3	7.7	31.4	-	52.8	105.2	52.4	
Vert	5715.000	PK	52.5	32.3	7.7	31.4	-	61.1	109.4	48.3	
Vert	5720.000	PK	54.7	32.3	7.7	31.4	-	63.3	110.8	47.5	
Vert	5725.000	PK	57.7	32.3	7.7	31.4	-	66.3	122.2	55.9	
Vert	11490.000	PK	53.4	40.1	-1.2	33.3	-	59.0	73.9	14.9	
Vert	17235.000	PK	44.5	42.2	0.2	32.5	-	54.4	73.9	19.5	
Vert	22980.000	PK	44.4	38.1	-0.7	32.0	-	49.8	73.9	24.1	Floor noise
Vert	11490.000	AV	43.1	40.1	-1.2	33.3	1.7	50.4	53.9	3.5	
Vert	17235.000	AV	36.2	42.2	0.2	32.5	1.7	47.8	53.9	6.1	
Vert	22980.000	AV	36.4	38.1	-0.7	32.0	-	41.8	53.9	12.1	Floor noise

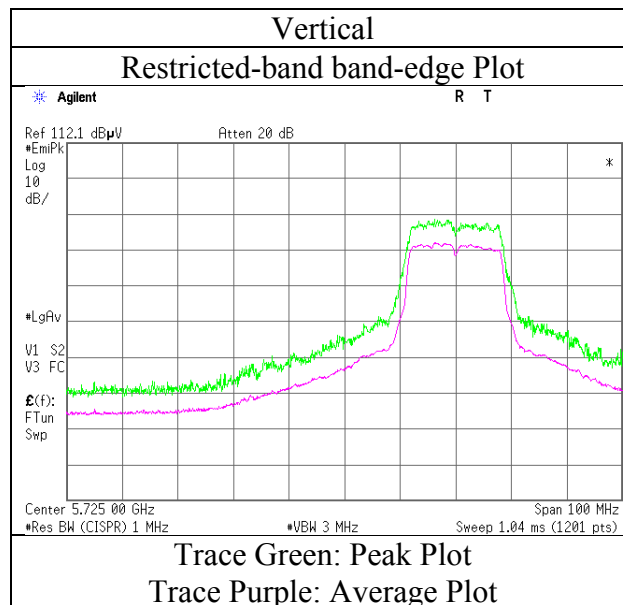
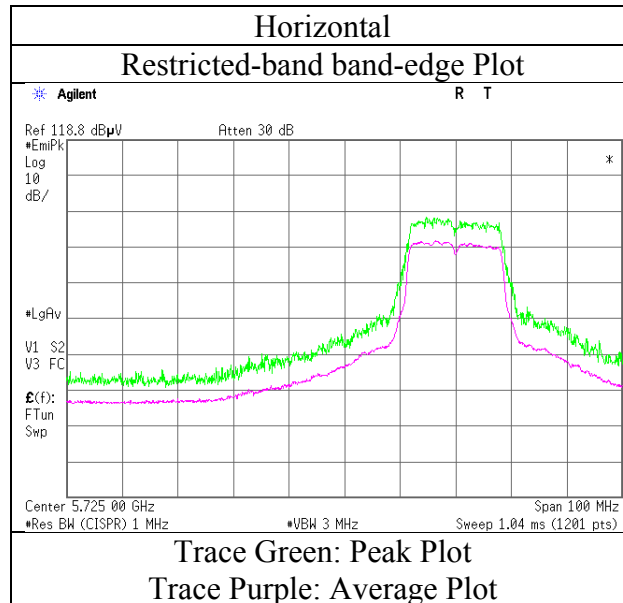
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*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 (4.5 m / 3.0 m) = 3.53 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No. 11932168H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date October 18, 2017
Temperature / Humidity 22deg. C / 64 % RH
Engineer Yuta Moriya
Mode Tx 11a 5745 MHz



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

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Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya (1 GHz - 10 GHz)	Takafumi Noguchi (10 GHz - 18 GHz)	Takafumi Noguchi (18 GHz - 40 GHz)
Mode	Tx 11a 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	55.9	40.0	-1.1	33.3	-	61.5	73.9	12.4	
Hori	17355.000	PK	46.9	42.9	0.3	32.5	-	57.6	73.9	16.3	
Hori	23140.000	PK	44.8	38.1	-0.6	32.0	-	50.3	73.9	23.6	Floor noise
Hori	11570.000	AV	45.8	40.0	-1.1	33.3	1.7	53.1	53.9	0.8	
Hori	17355.000	AV	37.7	42.9	0.3	32.5	1.7	50.1	53.9	3.8	
Hori	23140.000	AV	37.0	38.1	-0.6	32.0	-	42.5	53.9	11.4	Floor noise
Vert	11570.000	PK	54.4	40.0	-1.1	33.3	-	60.0	73.9	13.9	
Vert	17355.000	PK	44.9	42.9	0.3	32.5	-	55.6	73.9	18.3	
Vert	23140.000	PK	44.9	38.1	-0.6	32.0	-	50.4	73.9	23.5	Floor noise
Vert	11570.000	AV	44.4	40.0	-1.1	33.3	1.7	51.7	53.9	2.2	
Vert	17355.000	AV	36.1	42.9	0.3	32.5	1.7	48.5	53.9	5.4	
Vert	23140.000	AV	37.0	38.1	-0.6	32.0	-	42.5	53.9	11.4	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11a 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	59.0	32.5	7.7	31.4	-	67.8	122.2	54.4	
Hori	5855.000	PK	57.6	32.5	7.7	31.4	-	66.4	110.8	44.4	
Hori	5860.000	PK	54.4	32.5	7.7	31.4	-	63.2	109.4	46.2	
Hori	5875.000	PK	45.1	32.5	7.7	31.4	-	53.9	105.2	51.3	
Hori	5925.000	PK	40.9	32.6	7.8	31.4	-	49.9	68.2	18.3	
Hori	11650.000	PK	57.9	39.9	-1.1	33.3	-	63.4	73.9	10.5	
Hori	17475.000	PK	44.8	43.6	0.3	32.5	-	56.2	73.9	17.7	
Hori	23300.000	PK	44.4	38.2	-0.6	31.9	-	50.1	73.9	23.8	Floor noise
Hori	11650.000	AV	46.5	39.9	-1.1	33.3	1.7	53.7	53.9	0.2	
Hori	17475.000	AV	36.2	43.6	0.3	32.5	1.7	49.3	53.9	4.6	
Hori	23300.000	AV	36.4	38.2	-0.6	31.9	-	42.1	53.9	11.8	Floor noise
Vert	5850.000	PK	58.5	32.5	7.7	31.4	-	67.3	122.2	54.9	
Vert	5855.000	PK	57.0	32.5	7.7	31.4	-	65.8	110.8	45.0	
Vert	5860.000	PK	53.4	32.5	7.7	31.4	-	62.2	109.4	47.2	
Vert	5875.000	PK	45.4	32.5	7.7	31.4	-	54.2	105.2	51.0	
Vert	5925.000	PK	40.7	32.6	7.8	31.4	-	49.7	68.2	18.5	
Vert	11650.000	PK	55.9	39.9	-1.1	33.3	-	61.4	73.9	12.5	
Vert	17475.000	PK	44.7	43.6	0.3	32.5	-	56.1	73.9	17.8	
Vert	23300.000	PK	44.4	38.2	-0.6	31.9	-	50.1	73.9	23.8	Floor noise
Vert	11650.000	AV	44.5	39.9	-1.1	33.3	1.7	51.7	53.9	2.2	
Vert	17475.000	AV	36.1	43.6	0.3	32.5	1.7	49.2	53.9	4.7	
Vert	23300.000	AV	36.4	38.2	-0.6	31.9	-	42.1	53.9	11.8	Floor noise

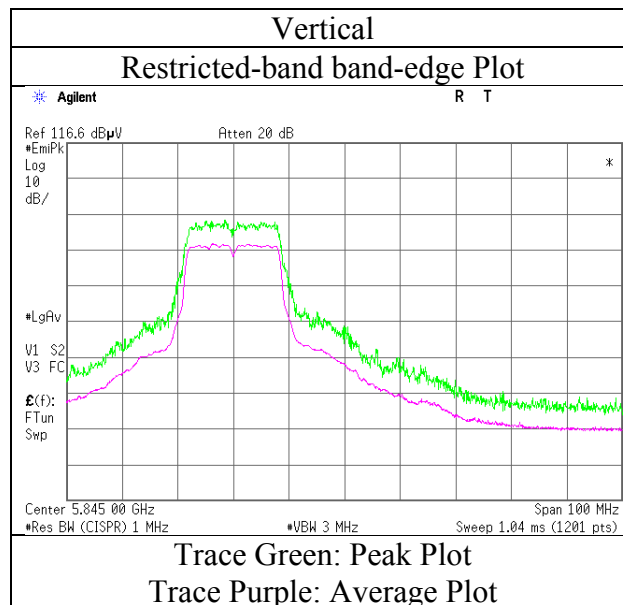
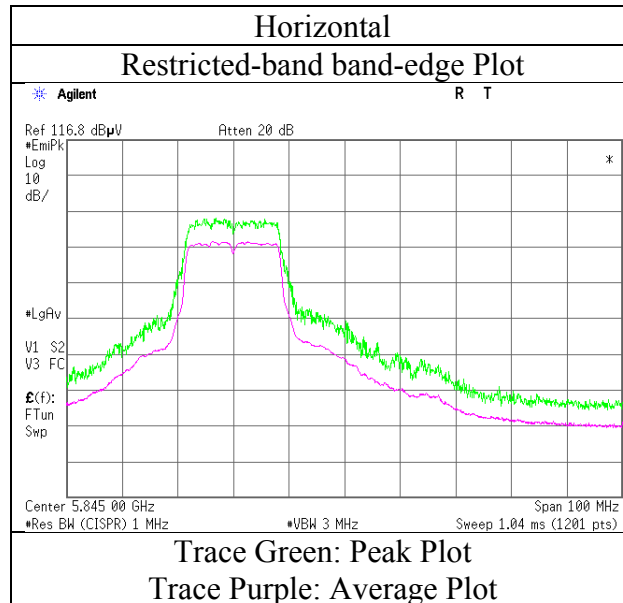
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*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 (4.5 m / 3.0 m) = 3.53 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No. 11932168H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date October 18, 2017
Temperature / Humidity 22deg. C / 64 % RH
Engineer Yuta Moriya
Mode Tx 11a 5825 MHz



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

UL Japan, Inc.

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Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 16, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	23 deg. C / 65 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Takafumi Noguchi (1 GHz - 10 GHz)	Takafumi Noguchi (10 GHz - 18 GHz)	Takafumi Noguchi (18 GHz - 40 GHz)
Mode	Tx 11n-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	60.0	32.2	7.4	31.3	-	68.3	73.9	5.6	
Hori	10360.000	PK	53.0	39.5	-1.5	33.2	-	57.8	73.9	16.1	
Hori	15540.000	PK	46.5	39.0	0.1	32.6	-	53.0	73.9	20.9	
Hori	20720.000	PK	44.1	36.4	-1.2	32.6	-	46.7	73.9	27.2	Floor noise
Hori	5150.000	AV	43.4	32.2	7.4	31.3	1.4	53.1	53.9	0.8	*1),*2)
Hori	10360.000	AV	42.8	39.5	-1.5	33.2	1.4	49.0	53.9	4.9	
Hori	15540.000	AV	37.8	39.0	0.1	32.6	1.4	45.7	53.9	8.2	
Hori	20720.000	AV	35.5	36.4	-1.2	32.6	-	38.1	53.9	15.8	Floor noise
Vert	5150.000	PK	58.1	32.2	7.4	31.3	-	66.4	73.9	7.5	
Vert	10360.000	PK	51.9	39.5	-1.5	33.2	-	56.7	73.9	17.2	
Vert	15540.000	PK	46.0	39.0	0.1	32.6	-	52.5	73.9	21.4	
Vert	20720.000	PK	44.0	36.4	-1.2	32.6	-	46.6	73.9	27.3	Floor noise
Vert	5150.000	AV	41.7	32.2	7.4	31.3	1.4	51.4	53.9	2.5	*1),*2)
Vert	10360.000	AV	41.6	39.5	-1.5	33.2	1.4	47.8	53.9	6.1	
Vert	15540.000	AV	37.0	39.0	0.1	32.6	1.4	44.9	53.9	9.0	
Vert	20720.000	AV	35.5	36.4	-1.2	32.6	-	38.1	53.9	15.8	Floor noise

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

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

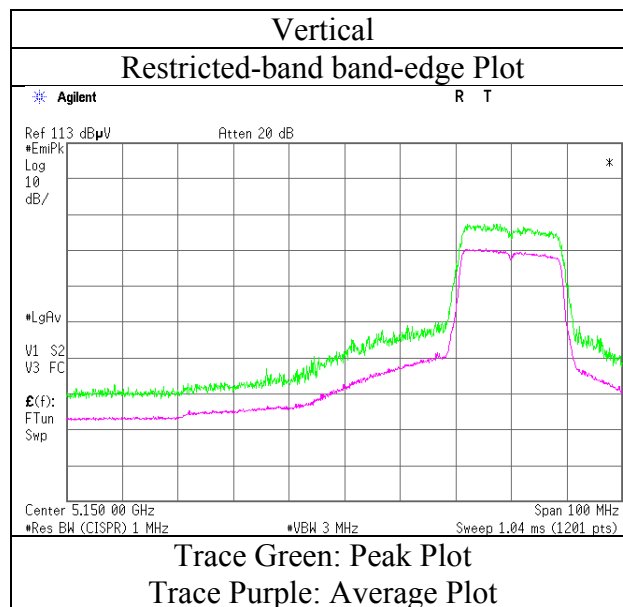
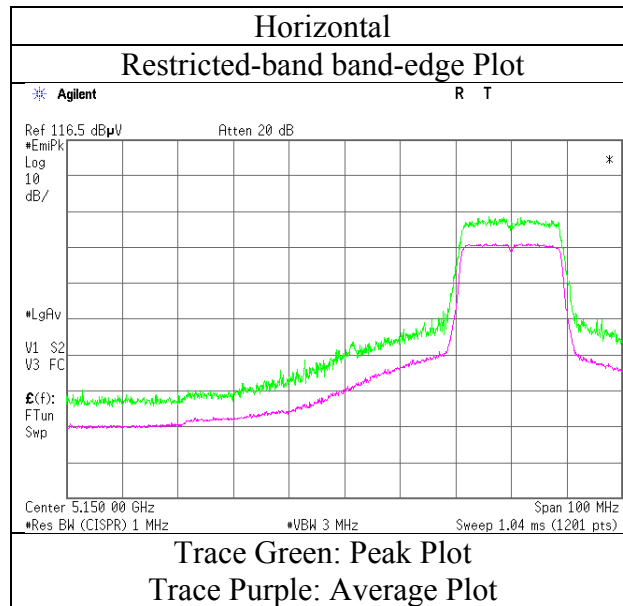
Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

*1) Not Out of Band emission(Leakage Power)

*2) Integration method

Radiated Spurious Emission

Report No.	11932168H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	October 16, 2017
Temperature / Humidity	23 deg. C / 65 % RH
Engineer	Takafumi Noguchi
	(1 GHz - 10 GHz)
Mode	Tx 11n-20 5180 MHz



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

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Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	23 deg. C / 54 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Takafumi Noguchi	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11n-20 5280 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	10560.000	PK	48.2	39.8	-1.5	33.2	-	53.3	73.9	20.6	
Hori	15840.000	PK	48.6	38.2	0.3	32.6	-	54.5	73.9	19.4	
Hori	21120.000	PK	44.0	36.7	-1.1	32.6	-	47.0	73.9	26.9	Floor noise
Hori	10560.000	AV	38.9	39.8	-1.5	33.2	1.4	45.4	53.9	8.5	
Hori	15840.000	AV	37.9	38.2	0.3	32.6	1.4	45.2	53.9	8.7	
Hori	21120.000	AV	35.8	36.7	-1.1	32.6	-	38.8	53.9	15.1	Floor noise
Vert	10560.000	PK	47.2	39.8	-1.5	33.2	-	52.3	73.9	21.6	
Vert	15840.000	PK	46.9	38.2	0.3	32.6	-	52.8	73.9	21.1	
Vert	21120.000	PK	44.0	36.7	-1.1	32.6	-	47.0	73.9	26.9	Floor noise
Vert	10560.000	AV	37.7	39.8	-1.5	33.2	1.4	44.2	53.9	9.7	
Vert	15840.000	AV	37.5	38.2	0.3	32.6	1.4	44.8	53.9	9.1	
Vert	21120.000	AV	35.8	36.7	-1.1	32.6	-	38.8	53.9	15.1	Floor noise

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

*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 (4.5 m / 3.0 m) = 3.53 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Not Out of Band emission(Leakage Power)

*2) Integration method

Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	23 deg. C / 54 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Takafumi Noguchi (1 GHz - 10 GHz)	Takafumi Noguchi (10 GHz - 18 GHz)	Takafumi Noguchi (18 GHz - 40 GHz)
Mode	Tx 11n-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	55.4	32.1	7.5	31.3	-	63.7	73.9	10.2	
Hori	10640.000	PK	49.3	39.9	-1.5	33.2	-	54.5	73.9	19.4	
Hori	15960.000	PK	46.5	37.8	0.3	32.6	-	52.0	73.9	21.9	
Hori	21280.000	PK	44.5	36.8	-1.1	32.6	-	47.6	73.9	26.3	Floor noise
Hori	5350.000	AV	40.7	32.1	7.5	31.3	1.4	50.4	53.9	3.5	*1),*2)
Hori	10640.000	AV	39.5	39.9	-1.5	33.2	1.4	46.1	53.9	7.8	
Hori	15960.000	AV	37.6	37.8	0.3	32.6	1.4	44.5	53.9	9.4	
Hori	21280.000	AV	35.9	36.8	-1.1	32.6	-	39.0	53.9	14.9	Floor noise
Vert	5350.000	PK	53.5	32.1	7.5	31.3	-	61.8	73.9	12.1	
Vert	10640.000	PK	47.9	39.9	-1.5	33.2	-	53.1	73.9	20.8	
Vert	15960.000	PK	45.8	37.8	0.3	32.6	-	51.3	73.9	22.6	
Vert	21280.000	PK	44.5	36.8	-1.1	32.6	-	47.6	73.9	26.3	Floor noise
Vert	5350.000	AV	38.8	32.1	7.5	31.3	1.4	48.5	53.9	5.4	*1),*2)
Vert	10640.000	AV	38.2	39.9	-1.5	33.2	1.4	44.8	53.9	9.1	
Vert	15960.000	AV	36.7	37.8	0.3	32.6	1.4	43.6	53.9	10.3	
Vert	21280.000	AV	35.9	36.8	-1.1	32.6	-	39.0	53.9	14.9	Floor noise

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

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

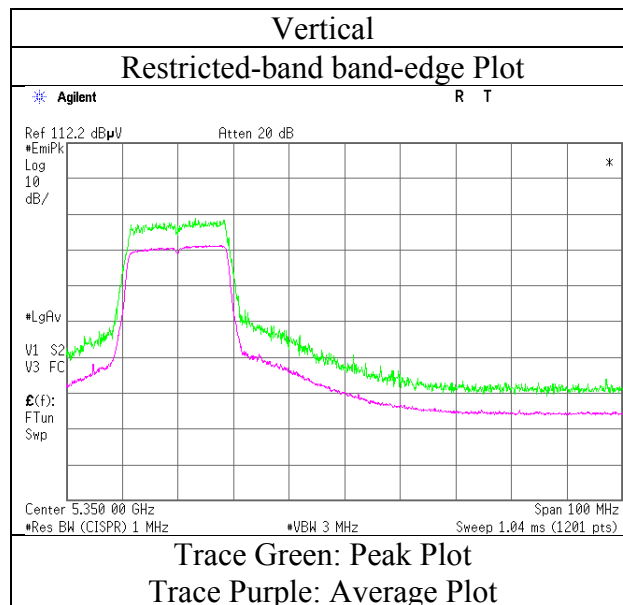
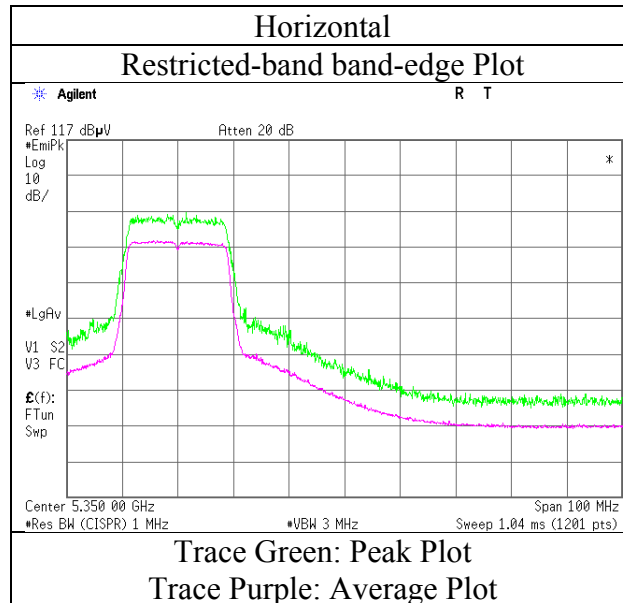
Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

*1) Not Out of Band emission(Leakage Power)

*2) Integration method

Radiated Spurious Emission

Report No.	11932168H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	October 18, 2017
Temperature / Humidity	23 deg. C / 54 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11n-20 5320 MHz



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

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Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11n-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	47.7	32.0	7.6	31.3	-	56.0	73.9	17.9	
Hori	5470.000	PK	53.1	32.0	7.6	31.3	-	61.4	68.2	6.8	
Hori	11000.000	PK	51.2	40.5	-1.4	33.3	-	57.0	73.9	16.9	
Hori	16500.000	PK	48.5	39.3	0.3	32.6	-	55.5	73.9	18.4	
Hori	22000.000	PK	44.4	37.3	-0.9	32.5	-	48.3	73.9	25.6	Floor noise
Hori	5460.000	AV	34.4	32.0	7.6	31.3	1.4	44.1	53.9	9.8	*1)
Hori	11000.000	AV	41.9	40.5	-1.4	33.3	1.4	49.1	53.9	4.8	
Hori	16500.000	AV	39.3	39.3	0.3	32.6	1.4	47.7	53.9	6.2	
Hori	22000.000	AV	36.1	37.3	-0.9	32.5	-	40.0	53.9	13.9	Floor noise
Vert	5460.000	PK	43.3	32.0	7.6	31.3	-	51.6	73.9	22.3	
Vert	5470.000	PK	47.8	32.0	7.6	31.3	-	56.1	68.2	12.1	
Vert	11000.000	PK	49.5	40.5	-1.4	33.3	-	55.3	73.9	18.6	
Vert	16500.000	PK	47.9	39.3	0.3	32.6	-	54.9	73.9	19.0	
Vert	22000.000	PK	44.3	37.3	-0.9	32.5	-	48.2	73.9	25.7	Floor noise
Vert	5460.000	AV	34.5	32.0	7.6	31.3	1.4	44.2	53.9	9.7	*1)
Vert	11000.000	AV	40.1	40.5	-1.4	33.3	1.4	47.3	53.9	6.6	
Vert	16500.000	AV	38.5	39.3	0.3	32.6	1.4	46.9	53.9	7.0	
Vert	22000.000	AV	36.1	37.3	-0.9	32.5	-	40.0	53.9	13.9	Floor noise

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

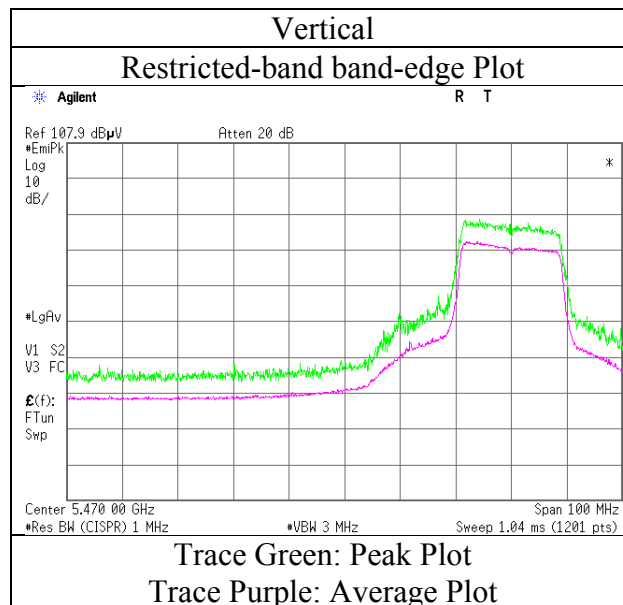
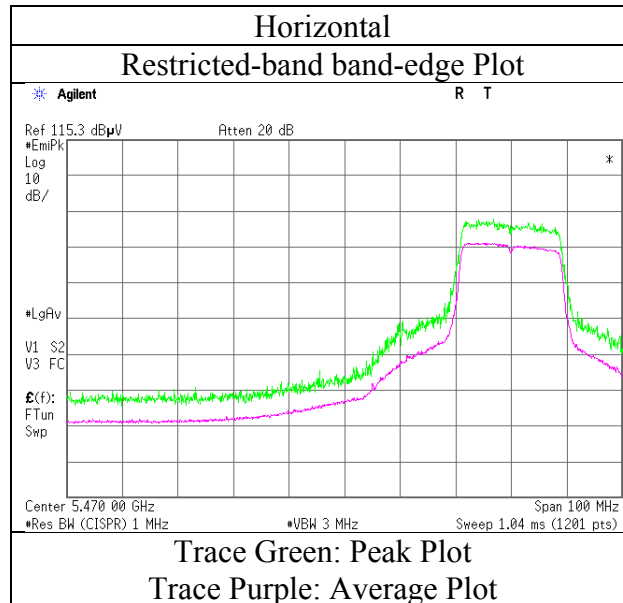
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No. 11932168H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date October 18, 2017
Temperature / Humidity 22deg. C / 64 % RH
Engineer Yuta Moriya
Mode Tx 11n-20 5500 MHz



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

UL Japan, Inc.

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Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya (1 GHz - 10 GHz)	Takafumi Noguchi (10 GHz - 18 GHz)	Takafumi Noguchi (18 GHz - 40 GHz)
Mode	Tx 11n-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	11160.000	PK	50.3	40.4	-1.4	33.3	-	56.0	73.9	17.9	
Hori	16740.000	PK	49.3	40.0	0.3	32.6	-	57.0	73.9	16.9	
Hori	22320.000	PK	44.4	37.6	-0.8	32.3	-	48.9	73.9	25.0	Floor noise
Hori	11160.000	AV	40.9	40.4	-1.4	33.3	1.4	48.0	53.9	5.9	
Hori	16740.000	AV	39.2	40.0	0.3	32.6	1.4	48.3	53.9	5.6	
Hori	22320.000	AV	35.9	37.6	-0.8	32.3	-	40.4	53.9	13.5	Floor noise
Vert	11160.000	PK	48.5	40.4	-1.4	33.3	-	54.2	73.9	19.7	
Vert	16740.000	PK	44.0	40.0	0.3	32.6	-	51.7	73.9	22.2	
Vert	22320.000	PK	44.4	37.6	-0.8	32.3	-	48.9	73.9	25.0	Floor noise
Vert	11160.000	AV	39.2	40.4	-1.4	33.3	1.4	46.3	53.9	7.6	
Vert	16740.000	AV	35.9	40.0	0.3	32.6	1.4	45.0	53.9	8.9	
Vert	22320.000	AV	35.9	37.6	-0.8	32.3	-	40.4	53.9	13.5	Floor noise

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

*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 (4.5 m / 3.0 m) = 3.53 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11n-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	55.8	32.3	7.7	31.4	-	64.4	68.2	3.8	
Hori	11400.000	PK	52.6	40.1	-1.3	33.3	-	58.1	73.9	15.8	
Hori	17100.000	PK	46.3	41.4	0.3	32.5	-	55.5	73.9	18.4	
Hori	22800.000	PK	44.5	37.9	-0.7	32.1	-	49.6	73.9	24.3	Floor noise
Hori	11400.000	AV	43.0	40.1	-1.3	33.3	1.4	49.9	53.9	4.0	
Hori	17100.000	AV	37.5	41.4	0.3	32.5	1.4	48.1	53.9	5.8	
Hori	22800.000	AV	36.1	37.9	-0.7	32.1	-	41.2	53.9	12.7	Floor noise
Vert	5725.000	PK	56.1	32.3	7.7	31.4	-	64.7	68.2	3.5	
Vert	11400.000	PK	51.1	40.1	-1.3	33.3	-	56.6	73.9	17.3	
Vert	17100.000	PK	45.4	41.4	0.3	32.5	-	54.6	73.9	19.3	
Vert	22800.000	PK	44.5	37.9	-0.7	32.1	-	49.6	73.9	24.3	Floor noise
Vert	11400.000	AV	42.0	40.1	-1.3	33.3	1.4	48.9	53.9	5.0	
Vert	17100.000	AV	36.5	41.4	0.3	32.5	1.4	47.1	53.9	6.8	
Vert	22800.000	AV	36.0	37.9	-0.7	32.1	-	41.1	53.9	12.8	Floor noise

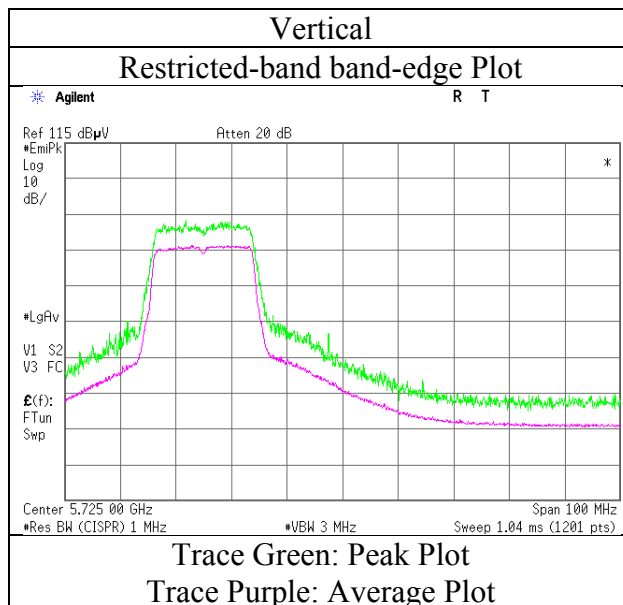
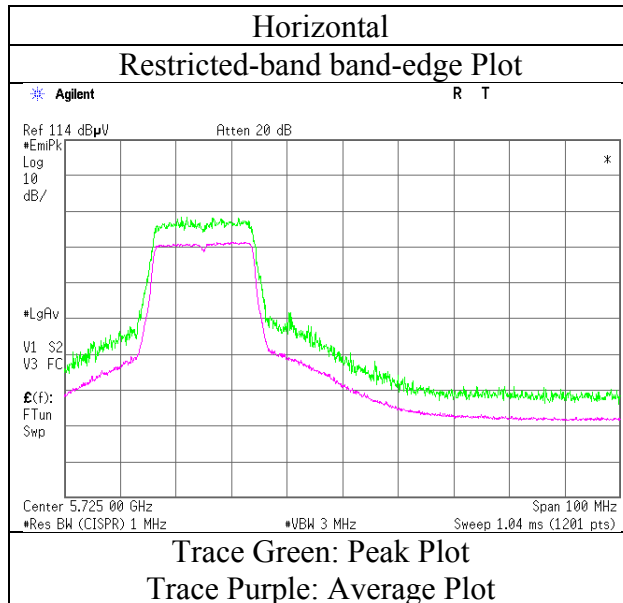
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Report No. 11932168H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date October 18, 2017
Temperature / Humidity 22deg. C / 64 % RH
Engineer Yuta Moriya
Mode Tx 11n-20 5700 MHz



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

UL Japan, Inc.

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Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11n-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	40.1	32.2	7.7	31.4	-	48.6	68.2	19.6	
Hori	5700.000	PK	50.2	32.3	7.7	31.4	-	58.8	105.2	46.4	
Hori	5715.000	PK	59.9	32.3	7.7	31.4	-	68.5	109.4	40.9	
Hori	5720.000	PK	62.8	32.3	7.7	31.4	-	71.4	110.8	39.4	
Hori	5725.000	PK	69.9	32.3	7.7	31.4	-	78.5	122.2	43.7	
Hori	11490.000	PK	54.6	40.1	-1.2	33.3	-	60.2	73.9	13.7	
Hori	17235.000	PK	48.0	42.2	0.2	32.5	-	57.9	73.9	16.0	
Hori	22980.000	PK	44.2	38.1	-0.7	32.0	-	49.6	73.9	24.3	Floor noise
Hori	11490.000	AV	44.6	40.1	-1.2	33.3	1.4	51.6	53.9	2.3	
Hori	17235.000	AV	38.7	42.2	0.2	32.5	1.4	50.0	53.9	3.9	
Hori	22980.000	AV	36.3	38.1	-0.7	32.0	-	41.7	53.9	12.2	Floor noise
Vert	5650.000	PK	40.8	32.2	7.7	31.4	-	49.3	68.2	18.9	
Vert	5700.000	PK	49.3	32.3	7.7	31.4	-	57.9	105.2	47.3	
Vert	5715.000	PK	57.3	32.3	7.7	31.4	-	65.9	109.4	43.5	
Vert	5720.000	PK	60.8	32.3	7.7	31.4	-	69.4	110.8	41.4	
Vert	5725.000	PK	68.2	32.3	7.7	31.4	-	76.8	122.2	45.4	
Vert	11490.000	PK	53.4	40.1	-1.2	33.3	-	59.0	73.9	14.9	
Vert	17235.000	PK	45.4	42.2	0.2	32.5	-	55.3	73.9	18.6	
Vert	22980.000	PK	44.3	38.1	-0.7	32.0	-	49.7	73.9	24.2	Floor noise
Vert	11490.000	AV	43.2	40.1	-1.2	33.3	1.4	50.2	53.9	3.7	
Vert	17235.000	AV	36.2	42.2	0.2	32.5	1.4	47.5	53.9	6.4	
Vert	22980.000	AV	36.4	38.1	-0.7	32.0	-	41.8	53.9	12.1	Floor noise

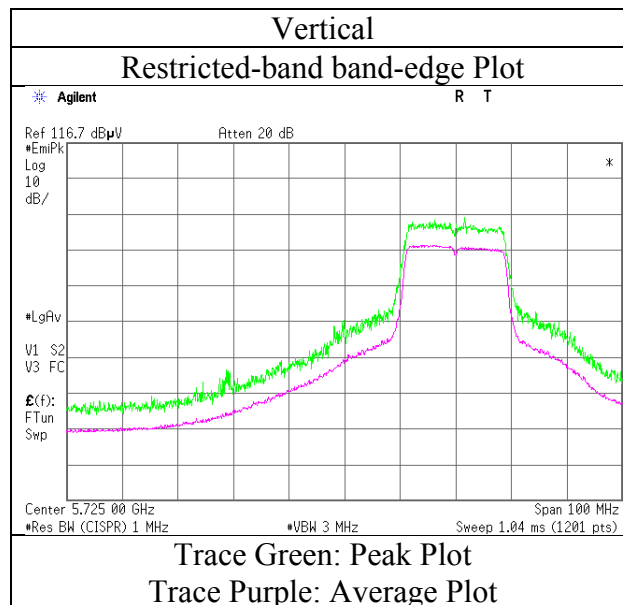
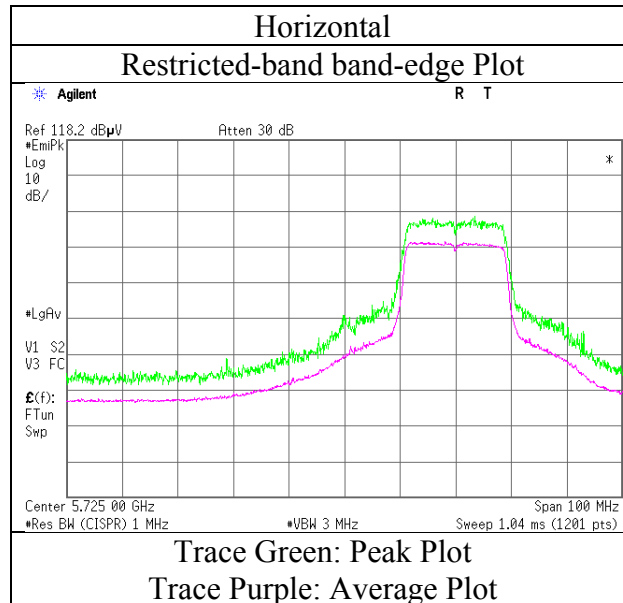
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*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 (4.5 m / 3.0 m) = 3.53 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No.	11932168H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	October 18, 2017
Temperature / Humidity	22deg. C / 64 % RH
Engineer	Yuta Moriya
Mode	Tx 11n-20 5745 MHz



* 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.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya (1 GHz - 10 GHz)	Takafumi Noguchi (10 GHz - 18 GHz)	Takafumi Noguchi (18 GHz - 40 GHz)
Mode	Tx 11n-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	55.7	40.0	-1.1	33.3	-	61.3	73.9	12.6	
Hori	17355.000	PK	45.2	42.9	0.3	32.5	-	55.9	73.9	18.0	
Hori	23140.000	PK	44.9	38.1	-0.6	32.0	-	50.4	73.9	23.5	Floor noise
Hori	11570.000	AV	45.3	40.0	-1.1	33.3	1.4	52.3	53.9	1.6	
Hori	17355.000	AV	36.5	42.9	0.3	32.5	1.4	48.6	53.9	5.3	
Hori	23140.000	AV	36.8	38.1	-0.6	32.0	-	42.3	53.9	11.6	Floor noise
Vert	11570.000	PK	53.9	40.0	-1.1	33.3	-	59.5	73.9	14.4	
Vert	17355.000	PK	44.6	42.9	0.3	32.5	-	55.3	73.9	18.6	
Vert	23140.000	PK	44.9	38.1	-0.6	32.0	-	50.4	73.9	23.5	Floor noise
Vert	11570.000	AV	43.6	40.0	-1.1	33.3	1.4	50.6	53.9	3.3	
Vert	17355.000	AV	36.2	42.9	0.3	32.5	1.4	48.3	53.9	5.6	
Vert	23140.000	AV	36.8	38.1	-0.6	32.0	-	42.3	53.9	11.6	Floor noise

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

*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 (4.5 m / 3.0 m) = 3.53 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11n-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	61.5	32.5	7.7	31.4	-	70.3	122.2	51.9	
Hori	5855.000	PK	57.2	32.5	7.7	31.4	-	66.0	110.8	44.8	
Hori	5860.000	PK	54.7	32.5	7.7	31.4	-	63.5	109.4	45.9	
Hori	5875.000	PK	46.2	32.5	7.7	31.4	-	55.0	105.2	50.2	
Hori	5925.000	PK	40.7	32.6	7.8	31.4	-	49.7	68.2	18.5	
Hori	11650.000	PK	57.6	39.9	-1.1	33.3	-	63.1	73.9	10.8	
Hori	17475.000	PK	46.6	43.6	0.3	32.5	-	58.0	73.9	15.9	
Hori	23300.000	PK	44.4	38.2	-0.6	31.9	-	50.1	73.9	23.8	Floor noise
Hori	11650.000	AV	46.7	39.9	-1.1	33.3	1.4	53.6	53.9	0.3	
Hori	17475.000	AV	37.0	43.6	0.3	32.5	1.4	49.8	53.9	4.1	
Hori	23300.000	AV	36.3	38.2	-0.6	31.9	-	42.0	53.9	11.9	Floor noise
Vert	5850.000	PK	61.1	32.5	7.7	31.4	-	69.9	122.2	52.3	
Vert	5855.000	PK	57.4	32.5	7.7	31.4	-	66.2	110.8	44.6	
Vert	5860.000	PK	54.9	32.5	7.7	31.4	-	63.7	109.4	45.7	
Vert	5875.000	PK	47.3	32.5	7.7	31.4	-	56.1	105.2	49.1	
Vert	5925.000	PK	41.4	32.6	7.8	31.4	-	50.4	68.2	17.8	
Vert	11650.000	PK	55.3	39.9	-1.1	33.3	-	60.8	73.9	13.1	
Vert	17475.000	PK	44.8	43.6	0.3	32.5	-	56.2	73.9	17.7	
Vert	23300.000	PK	44.4	38.2	-0.6	31.9	-	50.1	73.9	23.8	Floor noise
Vert	11650.000	AV	44.8	39.9	-1.1	33.3	1.4	51.7	53.9	2.2	
Vert	17475.000	AV	35.5	43.6	0.3	32.5	1.4	48.3	53.9	5.6	
Vert	23300.000	AV	36.3	38.2	-0.6	31.9	-	42.0	53.9	11.9	Floor noise

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

*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 (4.5 m / 3.0 m) = 3.53 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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Ise EMC Lab.

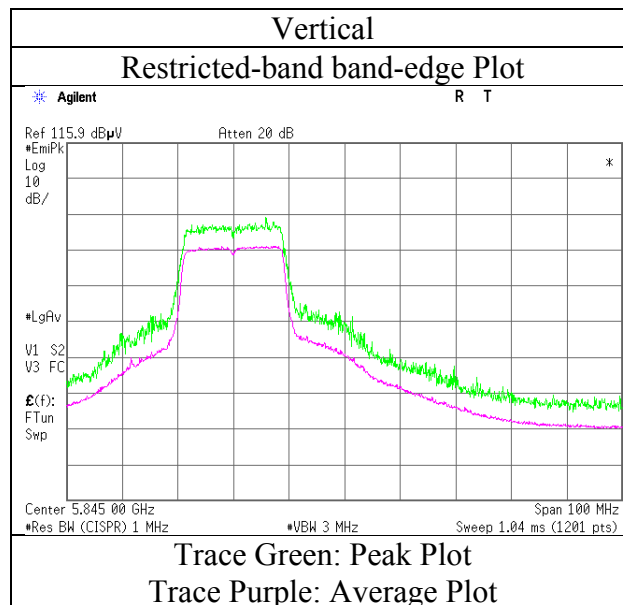
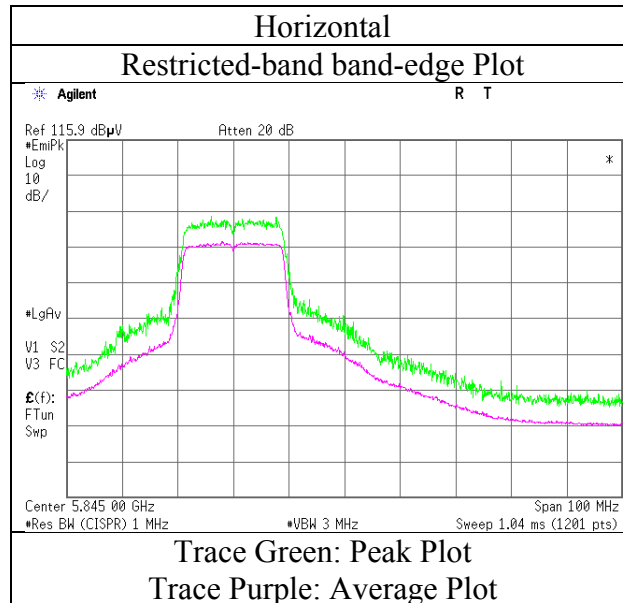
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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Radiated Spurious Emission

Report No. 11932168H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date October 18, 2017
Temperature / Humidity 22deg. C / 64 % RH
Engineer Yuta Moriya
Mode Tx 11n-20 5825 MHz



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

Mode Tx 11n-40 5190 MHz

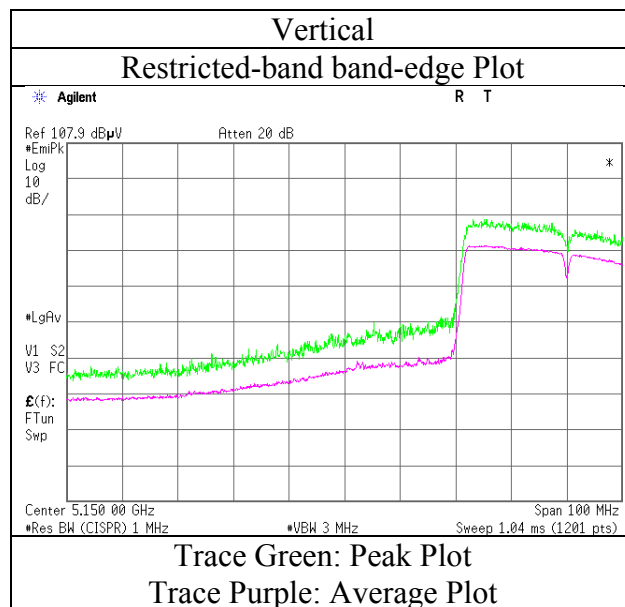
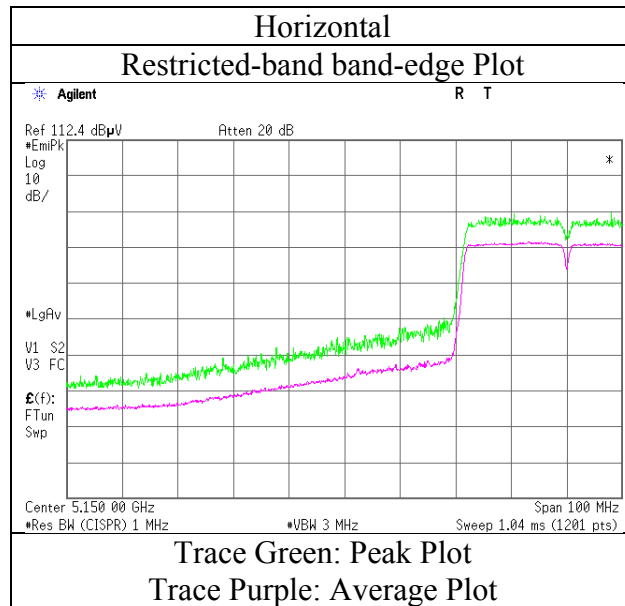
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*1) Not Out of Band emission(Leakage Power)

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Radiated Spurious Emission

Report No. 11932168H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date October 16, 2017
Temperature / Humidity 23 deg. C / 65 % RH
Engineer Takafumi Noguchi
(1 GHz - 10 GHz)
Mode Tx 11n-40 5190 MHz



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

UL Japan, Inc.

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Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 16, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	23 deg. C / 65 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Takafumi Noguchi	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11n-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	45.4	39.8	-1.5	33.2	-	50.5	73.9	23.4	
Hori	15810.000	PK	42.0	38.3	0.3	32.6	-	48.0	73.9	25.9	Floor noise
Hori	21080.000	PK	44.2	36.7	-1.1	32.6	-	47.2	73.9	26.7	Floor noise
Hori	10540.000	AV	36.6	39.8	-1.5	33.2	1.4	43.1	53.9	10.8	
Hori	15810.000	AV	34.2	38.3	0.3	32.6	-	40.2	53.9	13.7	Floor noise
Hori	21080.000	AV	35.9	36.7	-1.1	32.6	-	38.9	53.9	15.0	Floor noise
Vert	10540.000	PK	45.2	39.8	-1.5	33.2	-	50.3	73.9	23.6	
Vert	15810.000	PK	42.0	38.3	0.3	32.6	-	48.0	73.9	25.9	Floor noise
Vert	21080.000	PK	44.1	36.7	-1.1	32.6	-	47.1	73.9	26.8	Floor noise
Vert	10540.000	AV	36.2	39.8	-1.5	33.2	1.4	42.7	53.9	11.2	
Vert	15810.000	AV	34.2	38.3	0.3	32.6	-	40.2	53.9	13.7	Floor noise
Vert	21080.000	AV	35.9	36.7	-1.1	32.6	-	38.9	53.9	15.0	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 16, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	23 deg. C / 65 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Takafumi Noguchi (1 GHz - 10 GHz)	Takafumi Noguchi (10 GHz - 18 GHz)	Takafumi Noguchi (18 GHz - 40 GHz)
Mode	Tx 11n-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	59.6	32.1	7.5	31.3	-	67.9	73.9	6.0	
Hori	10620.000	PK	47.3	39.9	-1.5	33.2	-	52.5	73.9	21.4	
Hori	15930.000	PK	45.4	37.9	0.3	32.6	-	51.0	73.9	22.9	
Hori	21240.000	PK	44.5	36.8	-1.1	32.6	-	47.6	73.9	26.3	Floor noise
Hori	5350.000	AV	43.6	32.1	7.5	31.3	1.4	53.3	53.9	0.6	*1),*2)
Hori	10620.000	AV	37.3	39.9	-1.5	33.2	1.4	43.9	53.9	10.0	
Hori	15930.000	AV	36.3	37.9	0.3	32.6	1.4	43.3	53.9	10.6	
Hori	21240.000	AV	36.0	36.8	-1.1	32.6	-	39.1	53.9	14.8	Floor noise
Vert	5350.000	PK	57.7	32.1	7.5	31.3	-	66.0	73.9	7.9	
Vert	10620.000	PK	45.4	39.9	-1.5	33.2	-	50.6	73.9	23.3	
Vert	15930.000	PK	44.2	37.9	0.3	32.6	-	49.8	73.9	24.1	
Vert	21240.000	PK	44.4	36.8	-1.1	32.6	-	47.5	73.9	26.4	Floor noise
Vert	5350.000	AV	41.9	32.1	7.5	31.3	1.4	51.6	53.9	2.3	*1),*2)
Vert	10620.000	AV	36.7	39.9	-1.5	33.2	1.4	43.3	53.9	10.6	
Vert	15930.000	AV	35.5	37.9	0.3	32.6	1.4	42.5	53.9	11.4	
Vert	21240.000	AV	36.0	36.8	-1.1	32.6	-	39.1	53.9	14.8	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

*1) Not Out of Band emission(Leakage Power)

*2) Integration method

UL Japan, Inc.

Ise EMC Lab.

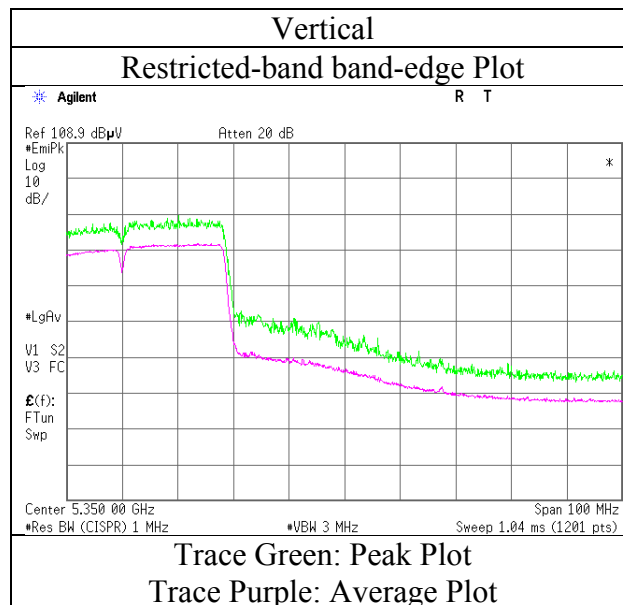
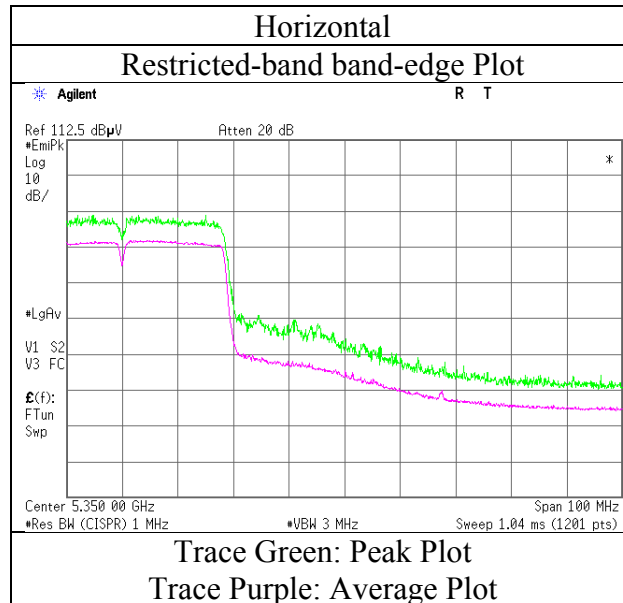
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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Facsimile : +81 596 24 8124

Radiated Spurious Emission

Report No. 11932168H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date October 16, 2017
Temperature / Humidity 23 deg. C / 65 % RH
Engineer Takafumi Noguchi
Mode Tx 11n-40 5310 MHz



* 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.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11n-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	50.4	32.0	7.6	31.3	-	58.7	73.9	15.2	
Hori	5470.000	PK	57.4	32.0	7.6	31.3	-	65.7	68.2	2.5	
Hori	11020.000	PK	45.4	40.5	-1.5	33.3	-	51.1	73.9	22.8	
Hori	16530.000	PK	44.6	39.4	0.3	32.6	-	51.7	73.9	22.2	
Hori	22040.000	PK	43.5	37.3	-0.9	32.5	-	47.4	73.9	26.5	Floor noise
Hori	5460.000	AV	40.0	32.0	7.6	31.3	1.4	49.7	53.9	4.2	*1)
Hori	11020.000	AV	36.8	40.5	-1.5	33.3	1.4	43.9	53.9	10.0	
Hori	16530.000	AV	36.3	39.4	0.3	32.6	1.4	44.8	53.9	9.1	
Hori	22040.000	AV	35.4	37.3	-0.9	32.5	-	39.3	53.9	14.6	Floor noise
Vert	5460.000	PK	51.6	32.0	7.6	31.3	-	59.9	73.9	14.0	
Vert	5470.000	PK	56.4	32.0	7.6	31.3	-	64.7	68.2	3.5	
Vert	11020.000	PK	44.8	40.5	-1.5	33.3	-	50.5	73.9	23.4	
Vert	16530.000	PK	44.4	39.4	0.3	32.6	-	51.5	73.9	22.4	
Vert	22040.000	PK	43.5	37.3	-0.9	32.5	-	47.4	73.9	26.5	Floor noise
Vert	5460.000	AV	36.1	32.0	7.6	31.3	1.4	45.8	53.9	8.1	*1)
Vert	11020.000	AV	35.7	40.5	-1.5	33.3	1.4	42.8	53.9	11.1	
Vert	16530.000	AV	36.5	39.4	0.3	32.6	1.4	45.0	53.9	8.9	
Vert	22040.000	AV	35.4	37.3	-0.9	32.5	-	39.3	53.9	14.6	Floor noise

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

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

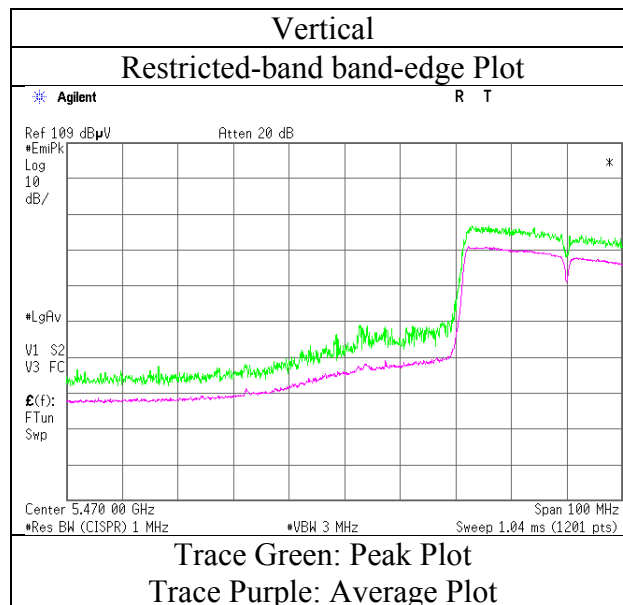
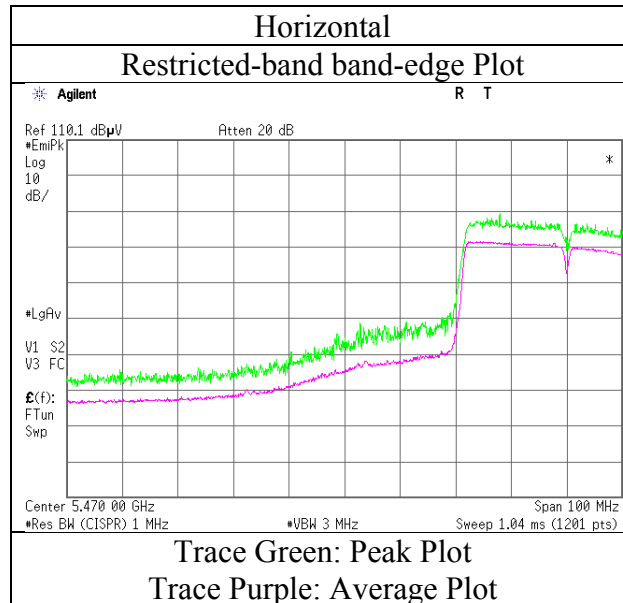
Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB

10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No. 11932168H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date October 18, 2017
Temperature / Humidity 22deg. C / 64 % RH
Engineer Yuta Moriya
Mode Tx 11n-40 5510 MHz



* 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.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11n-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	45.8	40.4	-1.4	33.3	-	51.5	73.9	22.4	
Hori	16650.000	PK	42.4	39.8	0.3	32.6	-	49.9	73.9	24.0	Floor noise
Hori	22200.000	PK	44.0	37.5	-0.8	32.4	-	48.3	73.9	25.6	Floor noise
Hori	11100.000	AV	36.4	40.4	-1.4	33.3	1.4	43.5	53.9	10.4	
Hori	16650.000	AV	34.6	39.8	0.3	32.6	-	42.1	53.9	11.8	Floor noise
Hori	22200.000	AV	35.3	37.5	-0.8	32.4	-	39.6	53.9	14.3	Floor noise
Vert	11100.000	PK	44.1	40.4	-1.4	33.3	-	49.8	73.9	24.1	
Vert	16650.000	PK	42.3	39.8	0.3	32.6	-	49.8	73.9	24.1	Floor noise
Vert	22200.000	PK	44.0	37.5	-0.8	32.4	-	48.3	73.9	25.6	Floor noise
Vert	11100.000	AV	35.8	40.4	-1.4	33.3	1.4	42.9	53.9	11.0	
Vert	16650.000	AV	34.5	39.8	0.3	32.6	-	42.0	53.9	11.9	Floor noise
Vert	22200.000	AV	35.4	37.5	-0.8	32.4	-	39.7	53.9	14.2	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11n-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	45.8	32.3	7.7	31.4	-	54.4	68.2	13.8	
Hori	11340.000	PK	45.2	40.2	-1.3	33.3	-	50.8	73.9	23.1	
Hori	17010.000	PK	42.3	40.9	0.3	32.6	-	50.9	73.9	23.0	Floor noise
Hori	22680.000	PK	44.1	37.8	-0.7	32.2	-	49.0	73.9	24.9	Floor noise
Hori	11340.000	AV	36.2	40.2	-1.3	33.3	1.4	43.2	53.9	10.7	
Hori	17010.000	AV	34.1	40.9	0.3	32.6	-	42.7	53.9	11.2	Floor noise
Hori	22680.000	AV	35.5	37.8	-0.7	32.2	-	40.4	53.9	13.5	Floor noise
Vert	5725.000	PK	45.9	32.3	7.7	31.4	-	54.5	68.2	13.7	
Vert	11340.000	PK	44.2	40.2	-1.3	33.3	-	49.8	73.9	24.1	
Vert	17010.000	PK	42.3	40.9	0.3	32.6	-	50.9	73.9	23.0	Floor noise
Vert	22680.000	PK	44.2	37.8	-0.7	32.2	-	49.1	73.9	24.8	Floor noise
Vert	11340.000	AV	35.6	40.2	-1.3	33.3	1.4	42.6	53.9	11.3	
Vert	17010.000	AV	34.1	40.9	0.3	32.6	-	42.7	53.9	11.2	Floor noise
Vert	22680.000	AV	35.5	37.8	-0.7	32.2	-	40.4	53.9	13.5	Floor noise

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

*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 (4.5 m / 3.0 m) = 3.53 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

UL Japan, Inc.

Ise EMC Lab.

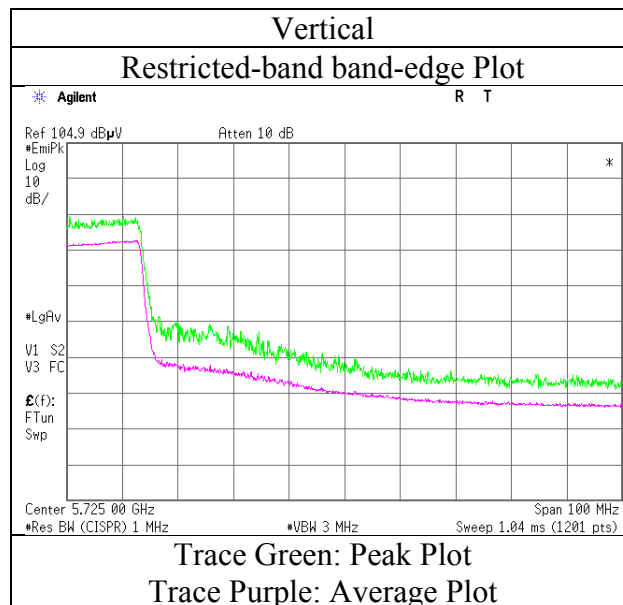
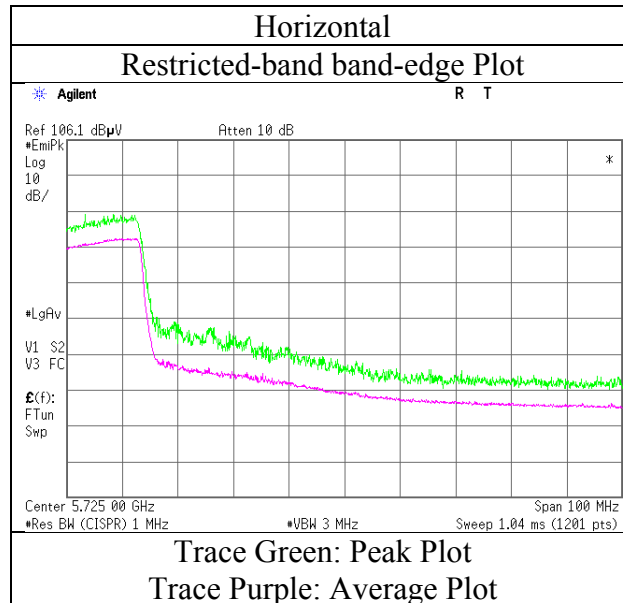
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Radiated Spurious Emission

Report No.	11932168H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	October 18, 2017
Temperature / Humidity	22deg. C / 64 % RH
Engineer	Yuta Moriya
Mode	Tx 11n-40 5670 MHz



* 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.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya (1 GHz - 10 GHz)	Takafumi Noguchi (10 GHz - 18 GHz)	Takafumi Noguchi (18 GHz - 40 GHz) (30 MHz - 1 GHz)
Mode	Tx 11n-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	41.1	32.2	7.7	31.4	-	49.6	68.2	18.6	
Hori	5700.000	PK	52.8	32.3	7.7	31.4	-	61.4	105.2	43.8	
Hori	5715.000	PK	62.6	32.3	7.7	31.4	-	71.2	109.4	38.2	
Hori	5720.000	PK	66.6	32.3	7.7	31.4	-	75.2	110.8	35.6	
Hori	5725.000	PK	67.1	32.3	7.7	31.4	-	75.7	122.2	46.5	
Hori	11510.000	PK	54.0	40.0	-1.1	33.3	-	59.6	73.9	14.3	
Hori	17265.000	PK	47.0	42.4	0.2	32.5	-	57.1	73.9	16.8	
Hori	23020.000	PK	44.4	38.1	-0.7	32.0	-	49.8	73.9	24.1	Floor noise
Hori	11510.000	AV	45.1	40.0	-1.1	33.3	1.4	52.1	53.9	1.8	
Hori	17265.000	AV	38.1	42.4	0.2	32.5	1.4	49.6	53.9	4.3	
Hori	23020.000	AV	36.4	38.1	-0.7	32.0	-	41.8	53.9	12.1	Floor noise
Vert	5650.000	PK	41.2	32.2	7.7	31.4	-	49.7	68.2	18.5	
Vert	5700.000	PK	53.3	32.3	7.7	31.4	-	61.9	105.2	43.3	
Vert	5715.000	PK	64.0	32.3	7.7	31.4	-	72.6	109.4	36.8	
Vert	5720.000	PK	66.8	32.3	7.7	31.4	-	75.4	110.8	35.4	
Vert	5725.000	PK	67.0	32.3	7.7	31.4	-	75.6	122.2	46.6	
Vert	11510.000	PK	52.1	40.0	-1.1	33.3	-	57.7	73.9	16.2	
Vert	17265.000	PK	44.8	42.4	0.2	32.5	-	54.9	73.9	19.0	
Vert	23020.000	PK	44.3	38.1	-0.7	32.0	-	49.7	73.9	24.2	Floor noise
Vert	11510.000	AV	42.8	40.0	-1.1	33.3	1.4	49.8	53.9	4.1	
Vert	17265.000	AV	36.3	42.4	0.2	32.5	1.4	47.8	53.9	6.1	
Vert	23020.000	AV	36.3	38.1	-0.7	32.0	-	41.7	53.9	12.2	Floor noise

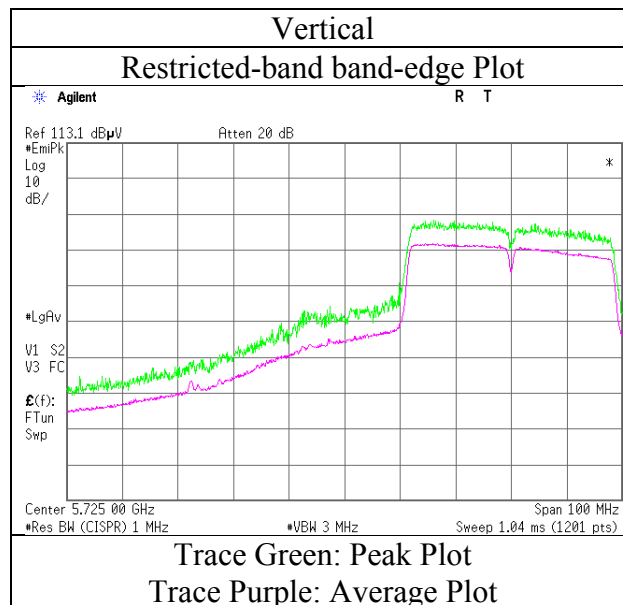
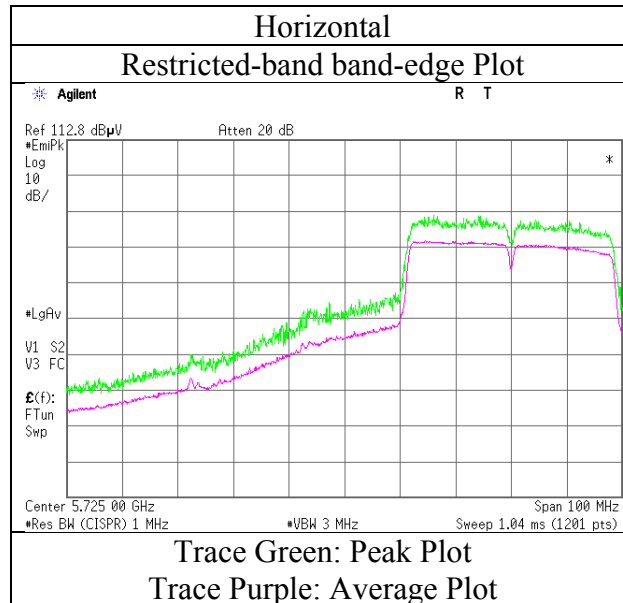
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*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 (4.5 m / 3.0 m) = 3.53 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No. 11932168H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date October 18, 2017
Temperature / Humidity 22deg. C / 64 % RH
Engineer Yuta Moriya
Mode Tx 11n-40 5755 MHz



* 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

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Facsimile : +81 596 24 8124

Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya (1 GHz - 10 GHz)	Takafumi Noguchi (10 GHz - 18 GHz)	Takafumi Noguchi (18 GHz - 40 GHz)
Mode	Tx 11n-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	55.9	32.5	7.7	31.4	-	64.7	122.2	57.5	
Hori	5855.000	PK	51.2	32.5	7.7	31.4	-	60.0	110.8	50.8	
Hori	5860.000	PK	51.0	32.5	7.7	31.4	-	59.8	109.4	49.6	
Hori	5875.000	PK	45.3	32.5	7.7	31.4	-	54.1	105.2	51.1	
Hori	5925.000	PK	41.0	32.6	7.8	31.4	-	50.0	68.2	18.2	
Hori	11590.000	PK	55.4	40.0	-1.1	33.3	-	61.0	73.9	12.9	
Hori	17385.000	PK	46.0	43.1	0.2	32.5	-	56.8	73.9	17.1	
Hori	23140.000	PK	44.7	38.1	-0.6	32.0	-	50.2	73.9	23.7	Floor noise
Hori	11590.000	AV	46.5	40.0	-1.1	33.3	1.4	53.5	53.9	0.4	
Hori	17385.000	AV	37.0	43.1	0.2	32.5	1.4	49.2	53.9	4.7	
Hori	23140.000	AV	36.8	38.1	-0.6	32.0	-	42.3	53.9	11.6	Floor noise
Vert	5850.000	PK	55.5	32.5	7.7	31.4	-	64.3	122.2	57.9	
Vert	5855.000	PK	54.1	32.5	7.7	31.4	-	62.9	110.8	47.9	
Vert	5860.000	PK	50.4	32.5	7.7	31.4	-	59.2	109.4	50.2	
Vert	5875.000	PK	46.4	32.5	7.7	31.4	-	55.2	105.2	50.0	
Vert	5925.000	PK	40.6	32.6	7.8	31.4	-	49.6	68.2	18.6	
Vert	11590.000	PK	54.0	40.0	-1.1	33.3	-	59.6	73.9	14.3	
Vert	17385.000	PK	45.0	43.1	0.2	32.5	-	55.8	73.9	18.1	
Vert	23140.000	PK	44.7	38.1	-0.6	32.0	-	50.2	73.9	23.7	Floor noise
Vert	11590.000	AV	44.5	40.0	-1.1	33.3	1.4	51.5	53.9	2.4	
Vert	17385.000	AV	36.0	43.1	0.2	32.5	1.4	48.2	53.9	5.7	
Vert	23140.000	AV	36.8	38.1	-0.6	32.0	-	42.3	53.9	11.6	Floor noise

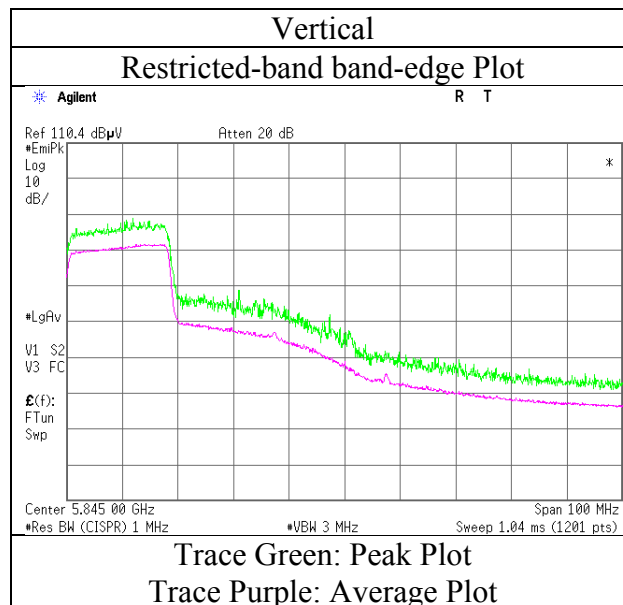
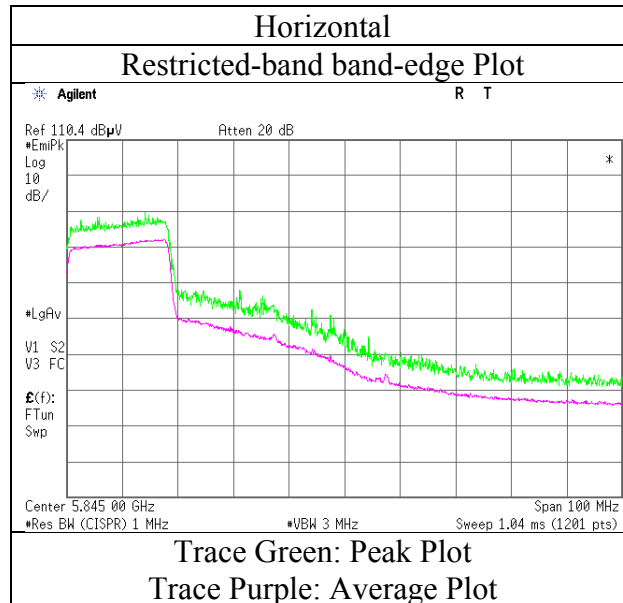
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*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 (4.5 m / 3.0 m) = 3.53 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No. 11932168H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date October 18, 2017
Temperature / Humidity 22deg. C / 64 % RH
Engineer Yuta Moriya
Mode Tx 11n-40 5795 MHz



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

UL Japan, Inc.

Ise EMC Lab.

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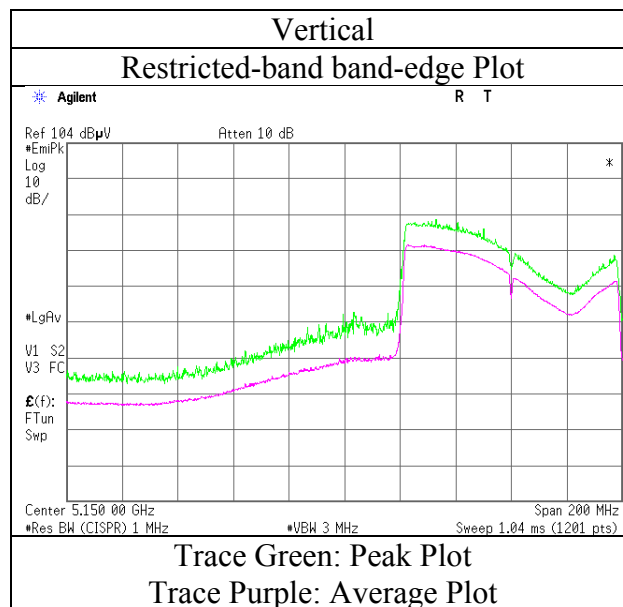
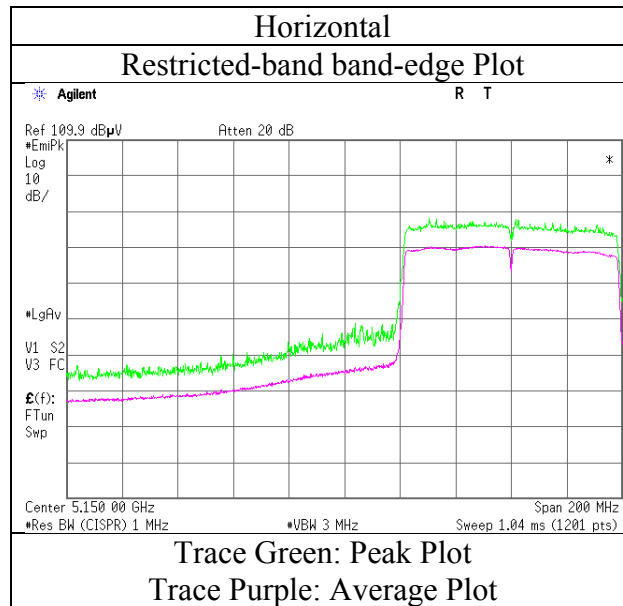
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Radiated Spurious Emission

Report No. 11932168H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date October 16, 2017
Temperature / Humidity 23 deg. C / 65 % RH
Engineer Takafumi Noguchi
(1 GHz - 10 GHz)
Mode Tx 11ac-80 5210 MHz



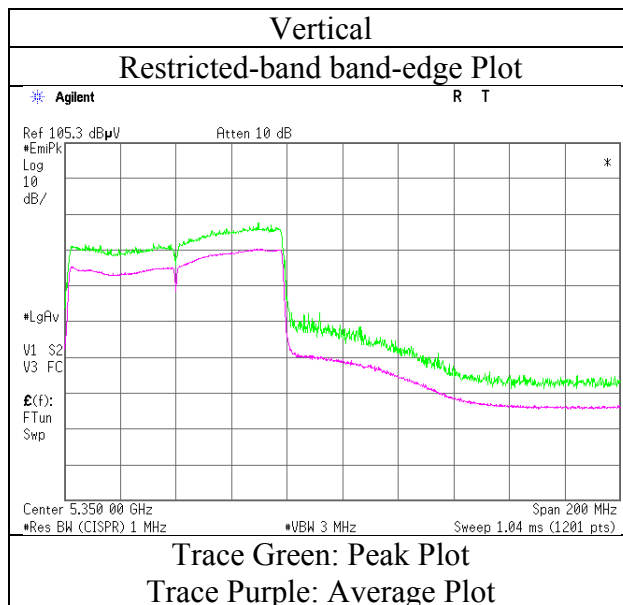
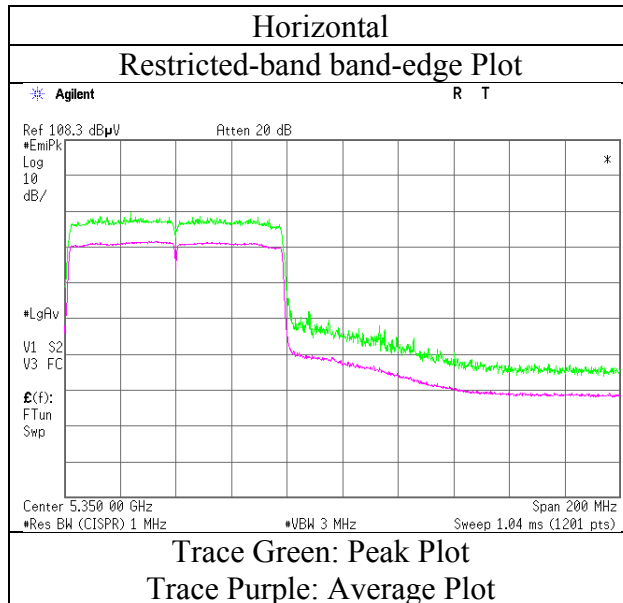
* Final result of restricted band edge was shown in tabular data.

olarity	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
ori	5350.000	PK	57.9	32.1	7.5	31.3	-	66.2	73.9	7.7	
ori	10580.000	PK	44.2	39.8	-1.5	33.2	-	49.3	73.9	24.6	
ori	15870.000	PK	41.7	38.1	0.3	32.6	-	47.5	73.9	26.4	Floor noise
ori	21160.000	PK	44.2	36.8	-1.1	32.6	-	47.3	73.9	26.6	Floor noise
ori	5350.000	AV	43.3	32.1	7.5	31.3	1.1	52.7	53.9	1.2	*1),*2)
ori	10580.000	AV	35.4	39.8	-1.5	33.2	1.1	41.6	53.9	12.3	
ori	15870.000	AV	33.7	38.1	0.3	32.6	-	39.5	53.9	14.4	Floor noise
ori	21160.000	AV	35.8	36.8	-1.1	32.6	-	38.9	53.9	15.0	Floor noise
ert	5350.000	PK	56.7	32.1	7.5	31.3	-	65.0	73.9	8.9	
ert	10580.000	PK	43.6	39.8	-1.5	33.2	-	48.7	73.9	25.2	
ert	15870.000	PK	41.8	38.1	0.3	32.6	-	47.6	73.9	26.3	Floor noise
ert	21160.000	PK	44.2	36.8	-1.1	32.6	-	47.3	73.9	26.6	Floor noise
ert	5350.000	AV	41.8	32.1	7.5	31.3	1.1	51.2	53.9	2.7	*1),*2)
ert	10580.000	AV	35.1	39.8	-1.5	33.2	1.1	41.3	53.9	12.6	
ert	15870.000	AV	33.8	38.1	0.3	32.6	-	39.6	53.9	14.3	Floor noise
ert	21160.000	AV	35.8	36.8	-1.1	32.6	-	38.9	53.9	15.0	Floor noise

*2) Integration method

Radiated Spurious Emission

Report No. 11932168H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date October 16, 2017
Temperature / Humidity 23 deg. C / 65 % RH
Engineer Takafumi Noguchi
Mode Tx 11ac-80 5290 MHz



* 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

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Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 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	57.5	32.0	7.6	31.3	-	65.8	73.9	8.1	
Hori	5470.000	PK	56.1	32.0	7.6	31.3	-	64.4	68.2	3.8	
Hori	11060.000	PK	44.3	40.5	-1.5	33.3	-	50.0	73.9	23.9	
Hori	16590.000	PK	41.4	39.6	0.3	32.6	-	48.7	73.9	25.2	Floor noise
Hori	22120.000	PK	44.3	37.4	-0.9	32.4	-	48.4	73.9	25.5	Floor noise
Hori	5460.000	AV	43.5	32.0	7.6	31.3	1.1	52.9	53.9	1.0	*1)
Hori	11060.000	AV	35.1	40.5	-1.5	33.3	1.1	41.9	53.9	12.0	
Hori	16590.000	AV	34.4	39.6	0.3	32.6	-	41.7	53.9	12.2	Floor noise
Hori	22120.000	AV	36.0	37.4	-0.9	32.4	-	40.1	53.9	13.8	Floor noise
Vert	5460.000	PK	54.4	32.0	7.6	31.3	-	62.7	73.9	11.2	
Vert	5470.000	PK	53.9	32.0	7.6	31.3	-	62.2	68.2	6.0	
Vert	11060.000	PK	44.0	40.5	-1.5	33.3	-	49.7	73.9	24.2	
Vert	16590.000	PK	41.5	39.6	0.3	32.6	-	48.8	73.9	25.1	Floor noise
Vert	22120.000	PK	44.3	37.4	-0.9	32.4	-	48.4	73.9	25.5	Floor noise
Vert	5460.000	AV	37.0	32.0	7.6	31.3	1.1	46.4	53.9	7.5	*1)
Vert	11060.000	AV	34.9	40.5	-1.5	33.3	1.1	41.7	53.9	12.2	
Vert	16590.000	AV	34.4	39.6	0.3	32.6	-	41.7	53.9	12.2	Floor noise
Vert	22120.000	AV	36.0	37.4	-0.9	32.4	-	40.1	53.9	13.8	Floor noise

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

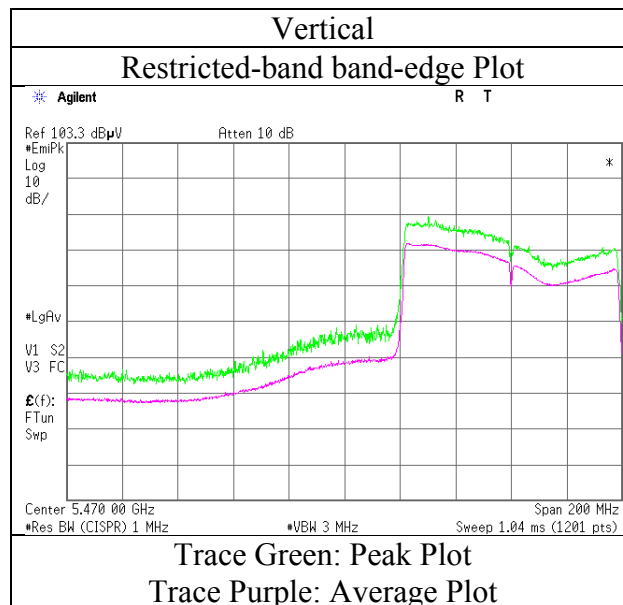
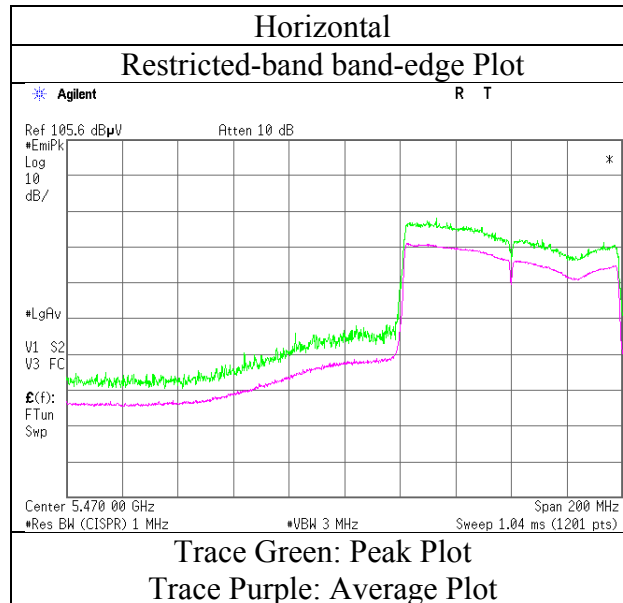
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.5 m / 3.0 m) = 3.53 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Report No. 11932168H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date October 18, 2017
Temperature / Humidity 22deg. C / 64 % RH
Engineer Yuta Moriya
Mode Tx 11ac-80 5530 MHz



* 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.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 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	43.1	32.3	7.7	31.4	-	51.7	68.2	16.5	
Hori	11220.000	PK	43.8	40.3	-1.4	33.3	-	49.4	73.9	24.5	
Hori	16830.000	PK	42.2	40.3	0.4	32.6	-	50.3	73.9	23.6	Floor noise
Hori	22440.000	PK	43.7	37.7	-0.8	32.3	-	48.3	73.9	25.6	Floor noise
Hori	11220.000	AV	35.4	40.3	-1.4	33.3	1.1	42.1	53.9	11.8	
Hori	16830.000	AV	34.2	40.3	0.4	32.6	-	42.3	53.9	11.6	Floor noise
Hori	22440.000	AV	35.5	37.7	-0.8	32.3	-	40.1	53.9	13.8	Floor noise
Vert	5725.000	PK	42.9	32.3	7.7	31.4	-	51.5	68.2	16.7	
Vert	11220.000	PK	43.6	40.3	-1.4	33.3	-	49.2	73.9	24.7	
Vert	16830.000	PK	42.2	40.3	0.4	32.6	-	50.3	73.9	23.6	Floor noise
Vert	22440.000	PK	43.9	37.7	-0.8	32.3	-	48.5	73.9	25.4	Floor noise
Vert	11220.000	AV	35.2	40.3	-1.4	33.3	1.1	41.9	53.9	12.0	
Vert	16830.000	AV	34.2	40.3	0.4	32.6	-	42.3	53.9	11.6	Floor noise
Vert	22440.000	AV	35.5	37.7	-0.8	32.3	-	40.1	53.9	13.8	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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Ise EMC Lab.

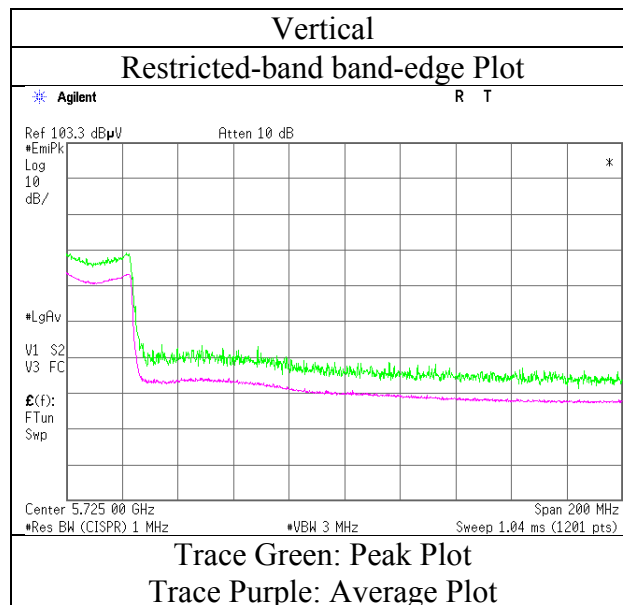
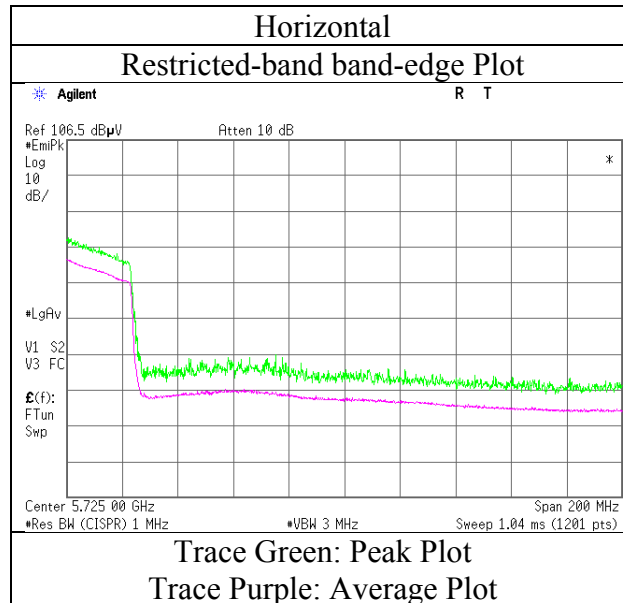
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Radiated Spurious Emission

Report No. 11932168H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.3
Date October 18, 2017
Temperature / Humidity 22deg. C / 64 % RH
Engineer Yuta Moriya
Mode Tx 11ac-80 5610 MHz



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

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Radiated Spurious Emission

Report No.	11932168H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 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	42.1	32.2	7.7	31.4	-	50.6	68.2	17.6	
Hori	5700.000	PK	52.2	32.3	7.7	31.4	-	60.8	105.2	44.4	
Hori	5715.000	PK	55.6	32.3	7.7	31.4	-	64.2	109.4	45.2	
Hori	5720.000	PK	56.6	32.3	7.7	31.4	-	65.2	110.8	45.6	
Hori	5725.000	PK	59.4	32.3	7.7	31.4	-	68.0	122.2	54.2	
Hori	5850.000	PK	55.5	32.5	7.7	31.4	-	64.3	122.2	57.9	
Hori	5855.000	PK	53.1	32.5	7.7	31.4	-	61.9	110.8	48.9	
Hori	5860.000	PK	52.3	32.5	7.7	31.4	-	61.1	109.4	48.3	
Hori	5875.000	PK	49.1	32.5	7.7	31.4	-	57.9	105.2	47.3	
Hori	5925.000	PK	40.6	32.6	7.8	31.4	-	49.6	68.2	18.6	
Hori	11550.000	PK	47.2	40.0	-1.1	33.3	-	52.8	73.9	21.1	
Hori	17325.000	PK	42.2	42.7	0.3	32.5	-	52.7	73.9	21.2	Floor noise
Hori	23100.000	PK	44.9	38.1	-0.6	32.0	-	50.4	73.9	23.5	Floor noise
Hori	11550.000	AV	38.0	40.0	-1.1	33.3	1.1	44.7	53.9	9.2	
Hori	17325.000	AV	34.3	42.7	0.3	32.5	-	44.8	53.9	9.1	Floor noise
Hori	23100.000	AV	36.8	38.1	-0.6	32.0	-	42.3	53.9	11.6	Floor noise
Vert	5650.000	PK	42.2	32.2	7.7	31.4	-	50.7	68.2	17.5	
Vert	5700.000	PK	52.3	32.3	7.7	31.4	-	60.9	105.2	44.3	
Vert	5715.000	PK	56.9	32.3	7.7	31.4	-	65.5	109.4	43.9	
Vert	5720.000	PK	57.0	32.3	7.7	31.4	-	65.6	110.8	45.2	
Vert	5725.000	PK	59.4	32.3	7.7	31.4	-	68.0	122.2	54.2	
Vert	5850.000	PK	56.4	32.5	7.7	31.4	-	65.2	122.2	57.0	
Vert	5855.000	PK	52.9	32.5	7.7	31.4	-	61.7	110.8	49.1	
Vert	5860.000	PK	51.6	32.5	7.7	31.4	-	60.4	109.4	49.0	
Vert	5875.000	PK	47.1	32.5	7.7	31.4	-	55.9	105.2	49.3	
Vert	5925.000	PK	40.1	32.6	7.8	31.4	-	49.1	68.2	19.1	
Vert	11550.000	PK	46.7	40.0	-1.1	33.3	-	52.3	73.9	21.6	
Vert	17325.000	PK	42.3	42.7	0.3	32.5	-	52.8	73.9	21.1	Floor noise
Vert	23100.000	PK	44.9	38.1	-0.6	32.0	-	50.4	73.9	23.5	Floor noise
Vert	11550.000	AV	37.5	40.0	-1.1	33.3	1.1	44.2	53.9	9.7	
Vert	17325.000	AV	34.3	42.7	0.3	32.5	-	44.8	53.9	9.1	Floor noise
Vert	23100.000	AV	36.9	38.1	-0.6	32.0	-	42.4	53.9	11.5	Floor noise

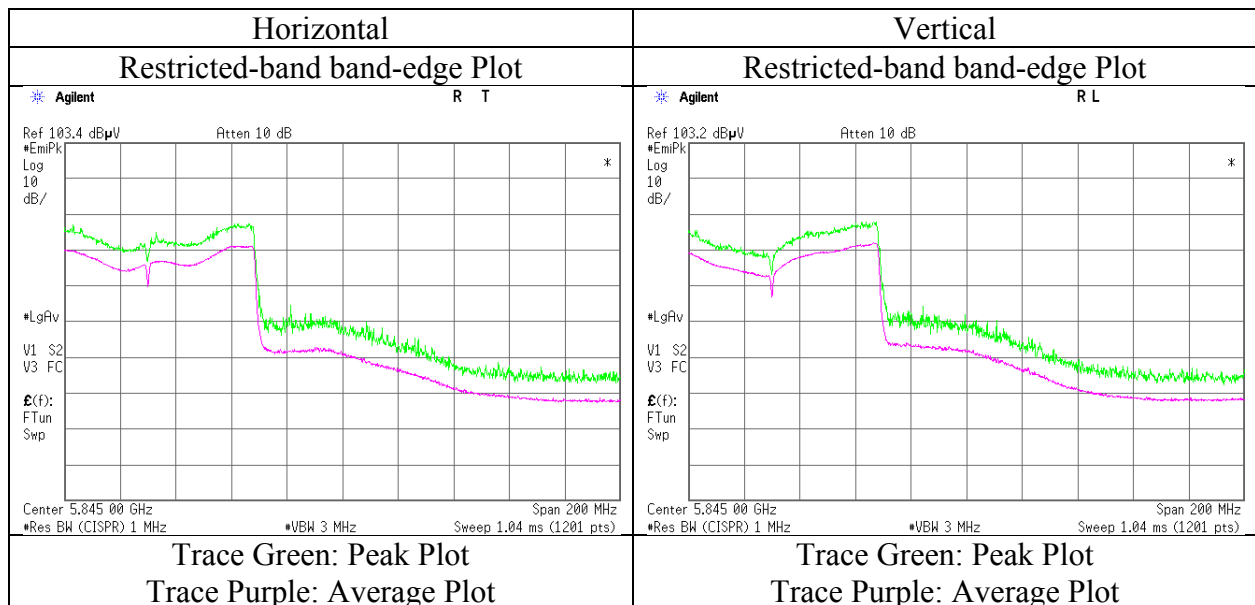
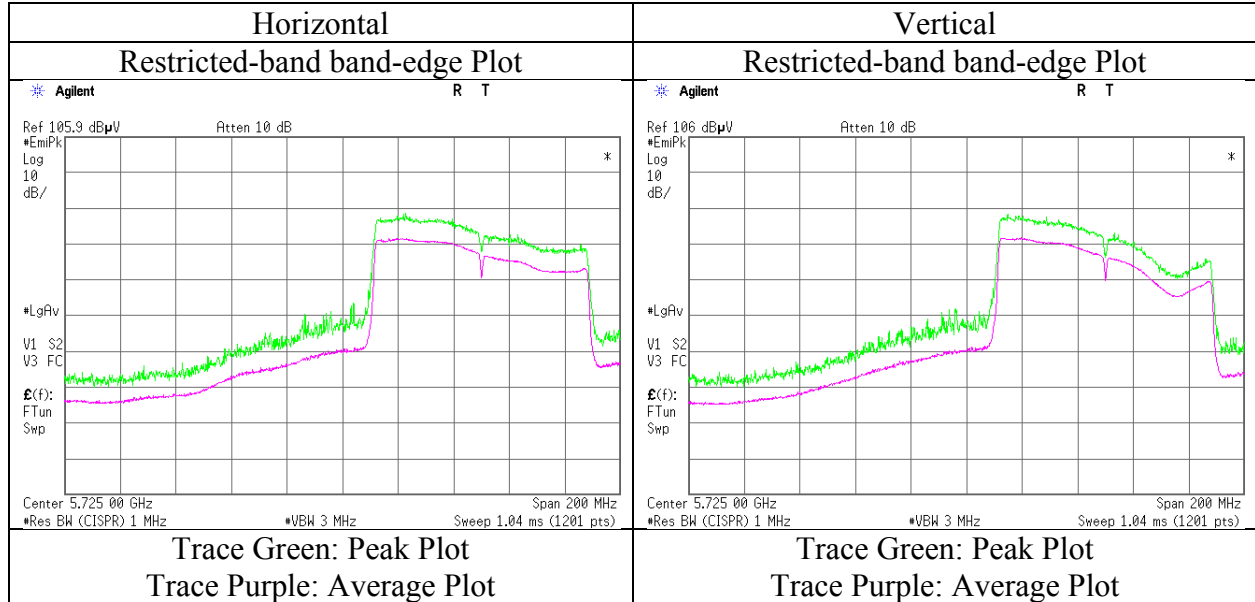
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

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

Distance factor: 1 GHz - 10 GHz $20\log(4.5\text{ m} / 3.0\text{ m}) = 3.53\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission

Report No.	11932168H
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	October 18, 2017
Temperature / Humidity	22deg. C / 64 % RH
Engineer	Yuta Moriya
Mode	Tx 11ac-80 5775 MHz



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

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Ise EMC Lab.

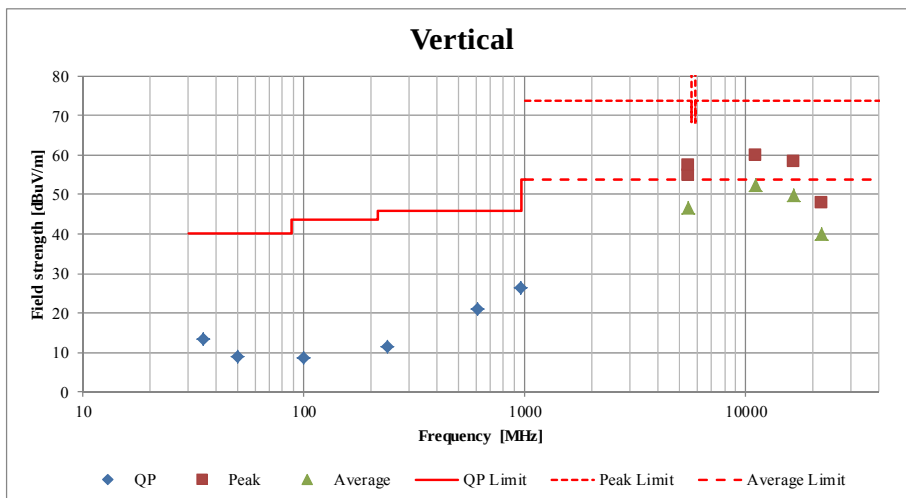
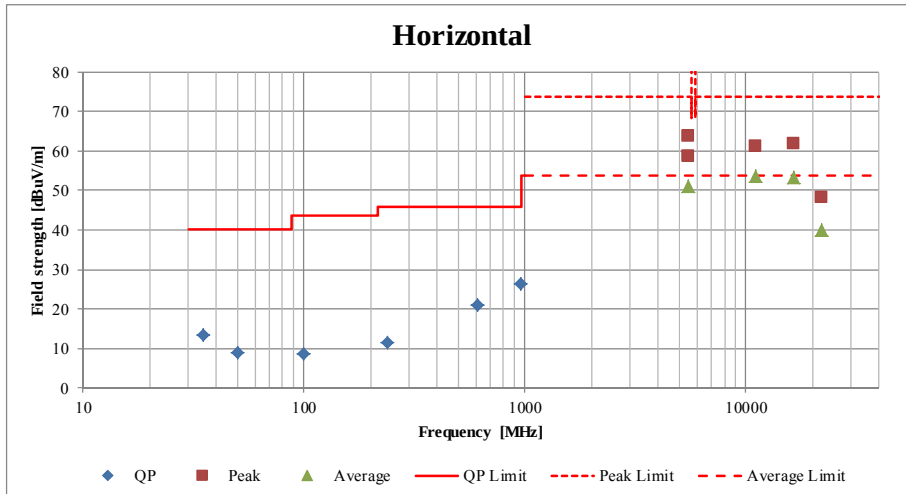
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Radiated Spurious Emission (Plot data, Worst case)

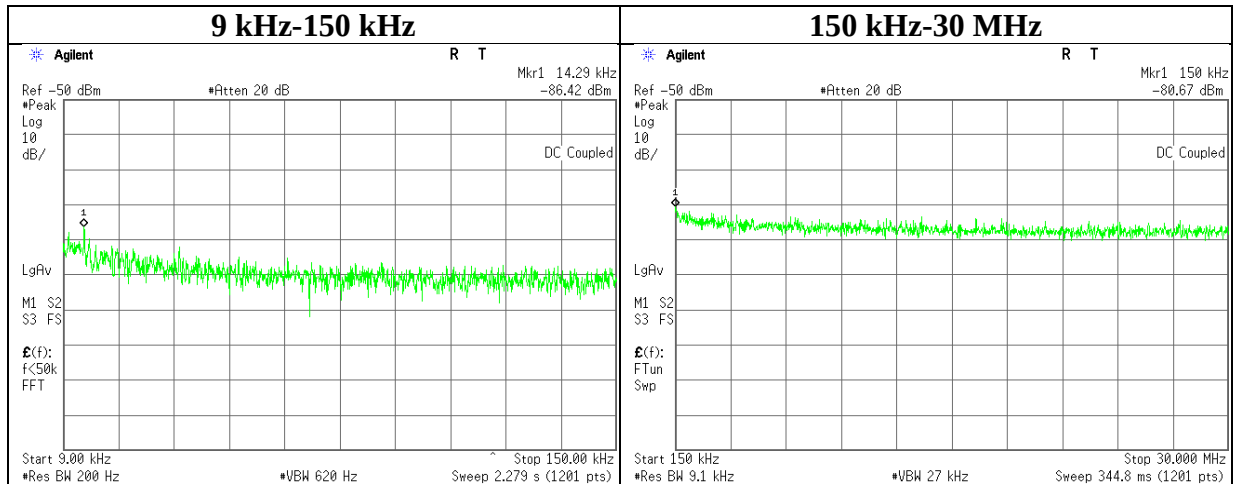
Report No.	11932168H	No.3	No.3
Test place	Ise EMC Lab.	October 18, 2017	October 20, 2017
Semi Anechoic Chamber	No.3	October 20, 2017	October 28, 2017
Date	October 18, 2017	October 20, 2017	October 28, 2017
Temperature / Humidity	22deg. C / 64 % RH	23 deg. C / 58 % RH	21 deg. C / 59 % RH
Engineer	Yuta Moriya	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 40 GHz)
Mode	Tx 11a 5500 MHz		



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

Conducted Spurious Emission

Test place : Ise EMC Lab. No.6 Measurement Room
Report No. : 11932168H
Date : October 19, 2017
Temperature / Humidity : 24 deg. C / 53 % RH
Engineer : Ryota Yamanaka
Mode : Tx 11a 5500 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [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
14.29	-86.4	0.80	9.8	2.0	1	-73.8	300	6.0	-12.5	44.5	57.0	
150.00	-80.7	0.80	9.8	2.0	1	-68.0	300	6.0	-6.8	24.0	30.8	

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

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

N: Number of output

*2.0 dBi was applied to the test result based on KDB 789033 since antenna gain was less than 2.0 dBi.

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APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAT-57	Attenuator(10dB)	Suhner	6810.19.A	-	AT	2016/12/15 * 12
MPSE-18	Power sensor	Anritsu	MA2411B	0738174	AT	2016/11/02 * 12
MPM-13	Power Meter	Anritsu	ML2495A	0824014	AT	2016/11/02 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	1401	AT	2017/01/20 * 12
MPM-16	Power Meter	Agilent	8990B	MY51000271	AT	2017/04/28 * 12
MPSE-22	Power sensor	Agilent	N1923A	MY54070003	AT	2017/04/28 * 12
MOS-34	Thermo-Hygrometer	Custom	CTH-201	3401	AT	2017/01/20 * 12
MAT-10	Attenuator(10dB)	Weinschel Corp	2	BL1173	AT	2016/11/28 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE / CE	2017/10/31 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE / CE	2017/01/20 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE / CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE / CE	-
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE	2017/08/22 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2017/05/22 * 12
MCC-167	Microwave Cable	Junkosha	MWX221	1404S374(1m) / 1405S074(5m)	RE	2017/05/29 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2017/03/21 * 12
MMM-08	DIGITAL HiTESTER	Hioki	3805	051201197	RE	2017/01/19 * 12
MHF-22	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCB	602	RE	2017/01/13 * 12
MCC-177	Microwave Cable	Junkosha	MMX221-00500 DMSDMS	1502S304	RE	2017/03/13 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2017/05/14 * 12
MCC-54	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	RE	2017/03/02 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	MY39500610	RE	2017/10/12 * 12
MHA-29	Horn Antenna 26.5-40GHz	ETS LINDGREN	3160-10	00152399	RE	2017/09/15 * 12
MPA-22	Pre Amplifier	MITEQ, Inc	AMF-6F-260040 0-33-8P / AMF-4F-260040 0-33-8P	1871355 /1871328	RE	2017/09/07 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE/CE	2017/08/22 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2016/11/23 * 12
MLA-22	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-191	RE	2017/01/26 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2017/07/12 * 12
MAT-98	Attenuator	KEYSIGHT	8491A	MY52462349	RE	2016/12/05 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2017/03/27 * 12
MLS-23	LISN(AMN)	Schwarzbeck	NSLK8127	8127-729	CE(EUT)	2017/07/24 * 12
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/SF M141(3m)/sucof orm141-PE(1m)/ 421-010(1.5m)/ RFM-E321(Swit cher)	-/00640	CE	2017/07/12 * 12
MAT-66	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2016/12/24 * 12
MAT-88	Attenuator	Weinschel Associates	WA56-10	56100304	AT	2017/06/12 * 12

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

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

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

Test Item: CE: Conducted Emission
RE: Radiated Emission
AT: Antenna Terminal Conducted test

UL Japan, Inc.

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