RADIO TEST REPORT

Test Report No. : 11624584H-D

Applicant	:	**VAIO Corporation**
Type of Equipment	:	**Digital Music Score**
Model No.	:	**DMS-W1**
FCC ID	:	**2AL4MDMS-W1**
Test regulation	:	**FCC Part 15 Subpart E: 2017 (Except for DFS test)**
Test Result	:	**Complied**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
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)

Date of test: April 17 to June 7, 2017

Representative test engineer:
Ken Fujita
Engineer
Consumer Technology Division

Approved by:
Takahiro Hatakeda
Leader
Consumer Technology Division

NVLAP TESTING
NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
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http://japan.ul.com/resources/emc_accredited/

REVISION HISTORY

Original Test Report No.: 11624584H-D

Revision	Test report No.	Date	Page revised	Contents
- (Original)	11624584H-D	July 6, 2017	-	-

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SECTION 1: Customer information

Company Name	:	VAIO Corporation
Address	:	5432 Toyoshina, Azumino-shi, Nagano, 399-8282 Japan
Telephone Number	:	+81-263-50-7391
Facsimile Number	:	+81-263-50-7015
Contact Person	:	Masami Ogawa

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

2.1 Identification of E.U.T.

Type of Equipment	:	Digital Music Score
Model No.	:	DMS-W1
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 5.0 V (USB), DC 3.7 V (Battery)
Receipt Date of Sample	:	April 17, 2017
Country of Mass-production	:	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: DMS-W1 (referred to as the EUT in this report) is a Digital Music Score.

General Specification

Clock frequency(ies) in the system	:	996 MHz, 630 MHz, 650 MHz, 528 MHz, 480 MHz, 26 MHz, 24 MHz, 32.768 kHz
Operating Temperature	:	+5 deg. C - +35 deg. C

Radio Specification

Radio Type	:	Transceiver
Power Supply (inner)	:	DC 1.8 V / DC 3.15 V

	IEEE802.11b	IEEE802.11g/n (20 M band)	IEEE802.11a/n (20 M band) *1)	IEEE802.11n (40 M band) *1)	Bluetooth Ver.3.0 with EDR function
Frequency of operation	2412 MHz -2462 MHz	2412 MHz -2462MHz	5180 MHz -5240MHz 5260 MHz -5320MHz 5500 MHz -5580MHz 5660 MHz-5700 MHz *2)	5190 MHz -5230MHz 5270 MHz -5310MHz 5510 MHz -5550 MHz 5670MHz *2)	2402 MHz -2480MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)		FHSS (GFSK, π/4-DQPSK, 8-DPSK)
Channel spacing	5MHz		20MHz	40MHz	1MHz
Antenna type	monopole pattern antenna				
Antenna Gain	0.3 dBi		2.6 dBi		0.3 dBi
Antenna Connector type	Surface mounted coaxial connector				Surface mounted coaxial connector

*1) This test report applies for WLAN (5 GHz band).
*2) 5600 MHz-5650 MHz is not used.
*Wireless LAN 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 June 14, 2017 and effective July 14, 2017
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart E Unlicensed National Information Infrastructure Devices Section 15.407 General technical requirements

* The revision on June 14, 2017, does not affect the test specification applied to the EUT.
* Also the EUT complies with FCC Part 15 Subpart B.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	**FCC:** ANSI C63.10-2013	**FCC:** 15.407 (b) (6) / 15.207	**QP** 15.2 dB 0.15000 MHz, L **AV** 17.5 dB, 0.51030 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)		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	0.4 dB 5470.000 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)			
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 11624584H-E 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)

This EUT provides stable voltage(DC 1.8 V/3.15 V) constantly to RF Part regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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

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.
Ise EMC Lab.

Frequency range	Conducted emission using AMN(LISN) (+/-)
0.009 MHz - 0.15 MHz	3.5 dB
0.15 MHz - 30 MHz	3.0 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	4.7 dB	5.9 dB	5.0 dB	5.1 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	5.4 dB	5.5 dB	5.5 dB	5.4 dB

*Measurement distance

Antenna terminal test	Uncertainty (+/-)
RF output power	1.2 dB
Conducted emission, Power spectral density and Unwanted emissions	3.1 dB
Channel power	2.6 dB

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.

3.5 Test Location

UL Japan, Inc. Ise EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone: +81 596 24 8999, Facsimile: +81 596 24 8124

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.

Mode	Remarks*
IEEE 802.11a (11a)	54 Mbps, PN9
IEEE 802.11n 20 MHz BW (11n-20)	MCS 3, PN9
IEEE 802.11n 40 MHz BW (11n-40)	MCS 3, PN9

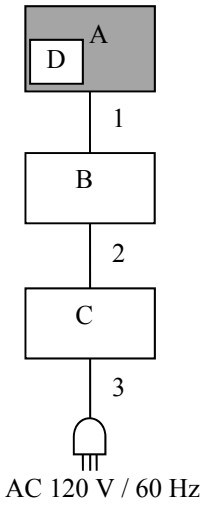
Power settings: WLAN W52/53 : 8 dBm
W56 : 9 dBm
Software: MAC F/W version : Rev. 8.9.0.0.48
PHY F/W version : Rev. 8.2.0.0.232 (FDSP: 1.162)
*This setting of software is the worst case.
Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

*The details of Operation mode(s)

Test Item	Operating Mode	Tested Frequency		
		Lower Band	Middle Band	Additional Band
Conducted emission	11n-20 Tx *1)	5240 MHz	-	-
26 dB Emission Bandwidth	11a Tx 11n-20 Tx 11n-40 Tx	-	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz
99 % Occupied Bandwidth, Maximum Conducted Output Power, Maximum Power Spectral Density	11a Tx 11n-20 Tx 11n-40 Tx	5180 MHz 5220 MHz 5240 MHz	5260 MHz 5300 MHz 5320 MHz	5500 MHz 5580 MHz 5700 MHz
Radiated Spurious Emission (Below 1 GHz)	11n-20 Tx *1)	5240 MHz	-	-
Radiated Spurious Emission (Above 1 GHz)	11n-20 Tx *2)	5180 MHz 5240 MHz	5320 MHz	5500 MHz 5580 MHz 5700 MHz
	11n-40 Tx	5190 MHz 5230 MHz	5310 MHz	5510 MHz 5550 MHz 5670 MHz
Conducted Spurious Emission	11n-20 Tx *1)	5240 MHz	-	-

*1) The mode was tested as a representative, because it had the highest power at antenna terminal test.
*2) Since 11a and 11n-20 have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest output power.

4.2 Configuration and peripherals



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Digital Music Score	DMS-W1	38 *1) 10 *2)	VAIO Corporation	EUT
B	Laptop PC	VJZ13AA11N	SKU013PVT1-S-06	VAIO Corporation	-
C	AC Adapter	VGP-AC19V74	1492510110002343	SONY	-
D	Micro SD Card	SDSDH-008G-J95	6356PKA053ES	SanDisk	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	USB Cable	1.0	Shielded	Shielded	-
2	DC Cable	1.8	Unshielded	Unshielded	-
3	AC Cable	2.0	Unshielded	Unshielded	-

*1) Used for Conducted emission and Radiated emission
*2) Used for Antenna terminal conducted test

SECTION 5: Conducted Emission

Test Procedure and conditions

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

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

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

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

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

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).

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:

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

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), 4.3 m*2) (1 GHz – 10GHz), 1 m*3) (10 GHz – 26.5 GHz),	

*1) The test method was also referred to KDB 789033 D02 General UNII Test Procedures New Rules v01r04 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".
*2) Distance Factor: 20 x log (4.3 m/3.0 m) = 3.13 dB
*3) Distance Factor: 20 x log (1.0 m/3.0 m) = -9.5 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 to 40 GHz
Test data : APPENDIX
Test result : Pass

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
26 dB Bandwidth	Enough to capture the emission	Close to 1 % of EBW	> RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth *1)	Enough width to display emission skirts	1 % to 5 % of OBW	≥ 3 RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Conducted Output Power	-	-	-	Auto	Average	-	Power Meter (Sensor: 80 MHz BW) (Method PM)
Maximum Power Spectral Density	Encompass the entire EBW	1 MHz	≥ 3 RBW	Auto	RMS Power Averaging (200 times)	Clear Write	Spectrum Analyzer
Conducted Spurious Emission*2)	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 v01r04 "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E".

*1) Peak hold was applied as Worst-case measurement.
*2) In the frequency range below 30 MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart. (9 kHz-150 kHz: RBW = 200 Hz, 150 kHz-30 MHz: RBW = 9.1 kHz)

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

DATA OF CONDUCTED EMISSION TEST

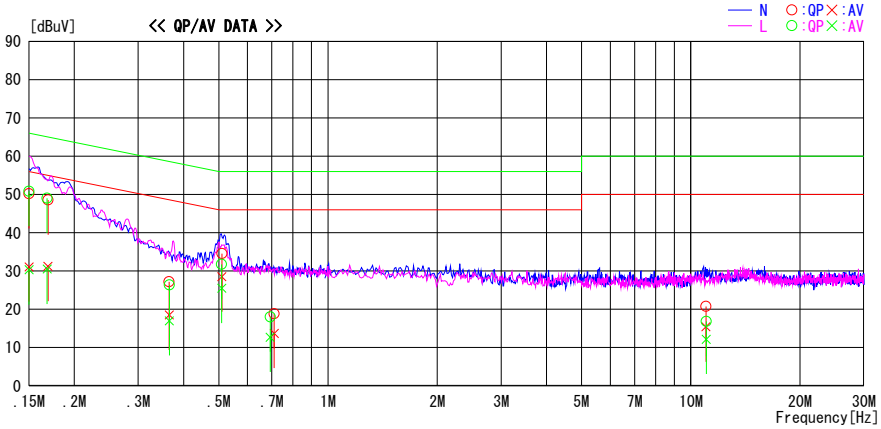
UL Japan, Inc. Ise EMC Lab. No.2 Semi Anechoic Chamber
Date : 2017/05/16

Report No. : 11624584H

Temp./Humi. : 24 deg. C / 42 % RH
Engineer : Hironobu Ohnishi

Mode / Remarks : Tx 11n20 5240 MHz

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.15000	37.0	17.9	13.2	50.2	31.1	66.0	56.0	15.8	24.9	N	
0.16920	35.4	18.0	13.2	48.6	31.2	65.0	55.0	16.4	23.8	N	
0.36500	14.0	5.3	13.2	27.2	18.5	58.6	48.6	31.4	30.1	N	
0.51030	21.3	15.2	13.3	34.6	28.5	56.0	46.0	21.4	17.5	N	
0.71090	5.5	0.4	13.3	18.8	13.7	56.0	46.0	37.2	32.3	N	
11.00210	6.4	1.1	14.3	20.7	15.4	60.0	50.0	39.3	34.6	N	
0.15000	37.6	17.1	13.2	50.8	30.3	66.0	56.0	15.2	25.7	L	
0.16820	35.8	17.3	13.2	49.0	30.5	65.0	55.0	16.0	24.5	L	
0.36570	13.2	3.8	13.2	26.4	17.0	58.6	48.6	32.2	31.6	L	
0.50950	18.4	12.2	13.3	31.7	25.5	56.0	46.0	24.3	20.5	L	
0.69290	4.7	-0.6	13.3	18.0	12.7	56.0	46.0	38.0	33.3	L	
11.02760	2.5	-2.1	14.3	16.8	12.2	60.0	50.0	43.2	37.8	L	

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

26 dB Emission Bandwidth and 99 % Occupied Bandwidth

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11624584H
Date	May 19, 2017
Temperature / Humidity	23deg. C / 42 % RH
Engineer	Ken Fujita
Mode	Tx

11a

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5180	-	16.715	-
5220	-	16.595	-
5240	-	16.642	-
5260	20.739	16.568	-
5300	20.784	16.616	-
5320	20.727	16.742	-
5500	22.238	16.633	-
5580	21.722	16.703	-
5700	21.386	16.631	-

11n-20

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5180	-	17.865	-
5220	-	17.789	-
5240	-	17.800	-
5260	22.183	17.731	-
5300	23.370	17.794	-
5320	22.156	17.796	-
5500	22.474	17.790	-
5580	23.575	17.763	-
5700	22.076	17.788	-

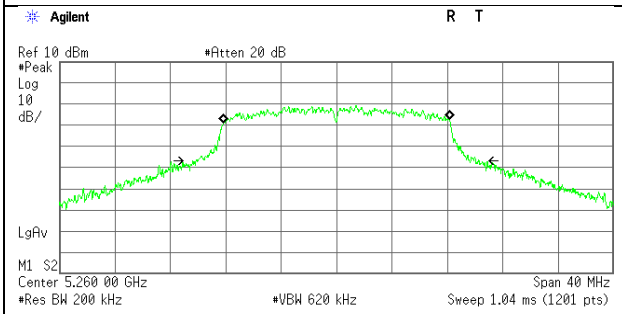
11n-40

Tested Frequency [MHz]	26 dB Emission Bandwidth [MHz]	99 % Occupied Bandwidth [MHz]	Limit [MHz]
5190	-	35.933	-
5230	-	35.888	-
5270	45.538	36.127	-
5310	42.788	36.038	-
5510	41.105	35.910	-
5550	41.363	35.995	-
5670	39.883	35.963	-

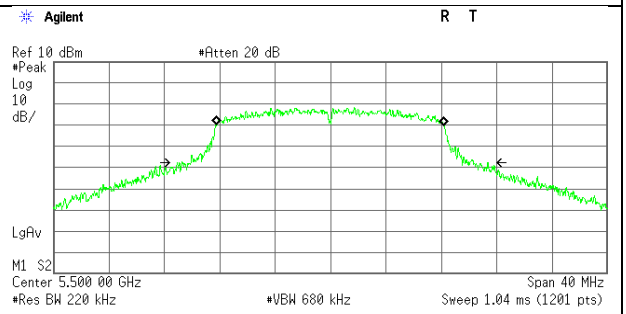
26 dB Emission Bandwidth

11a

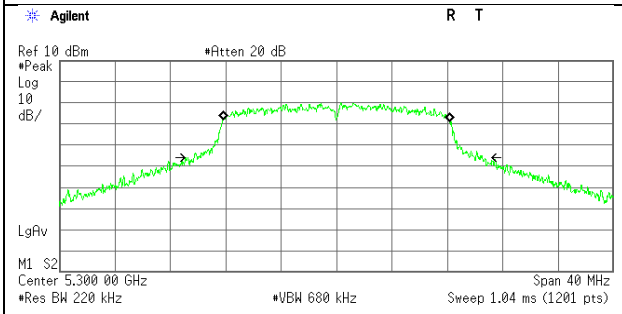
5260 MHz



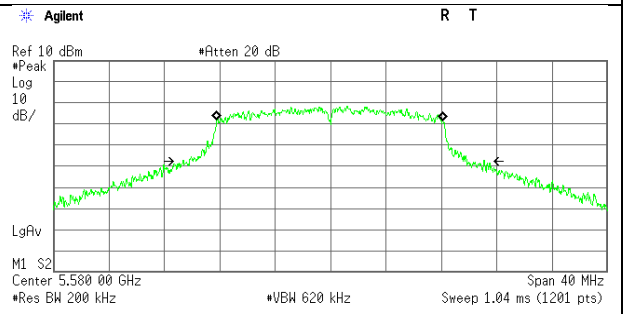
5500 MHz



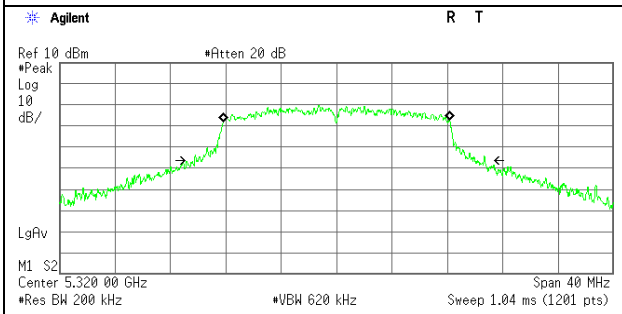
5300 MHz



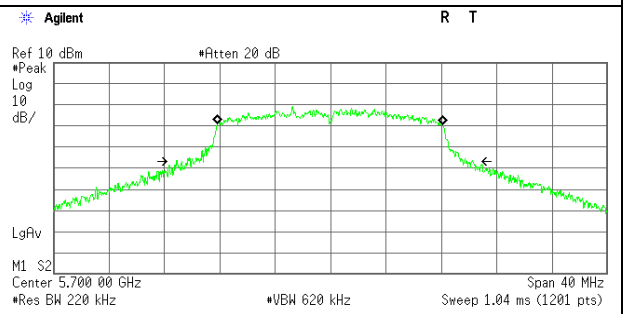
5580 MHz



5320 MHz

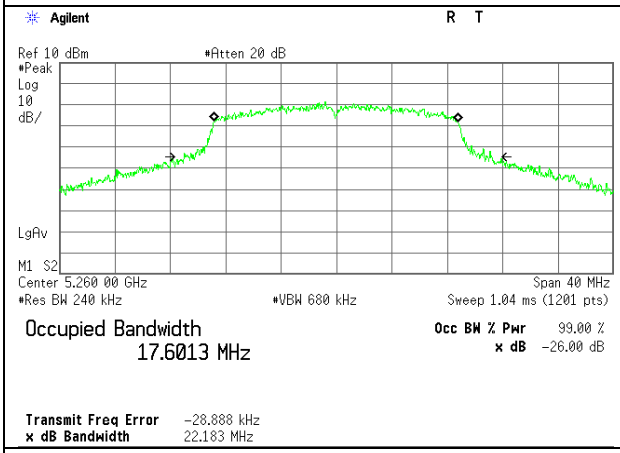


5700 MHz

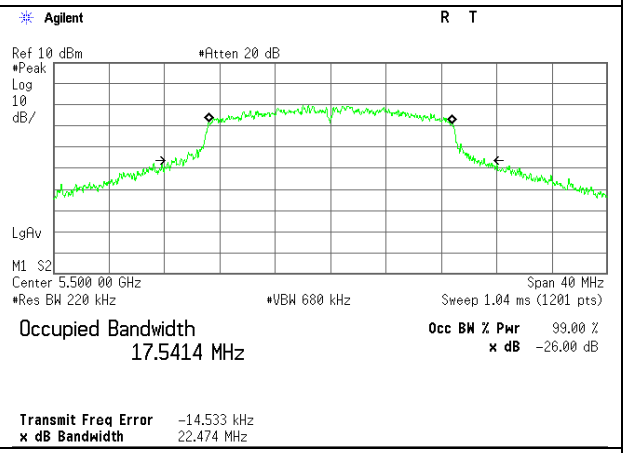


11n-20

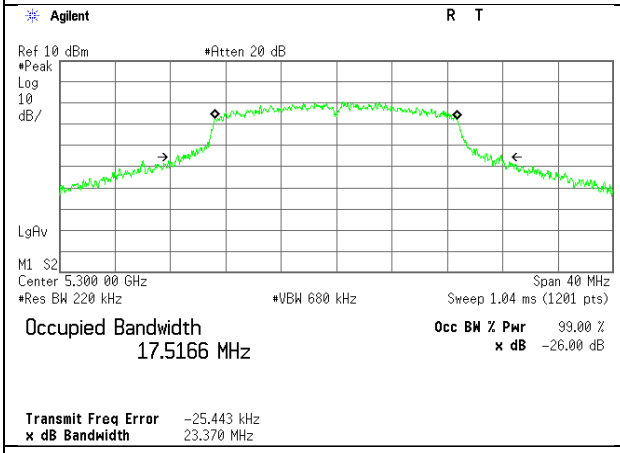
5260 MHz



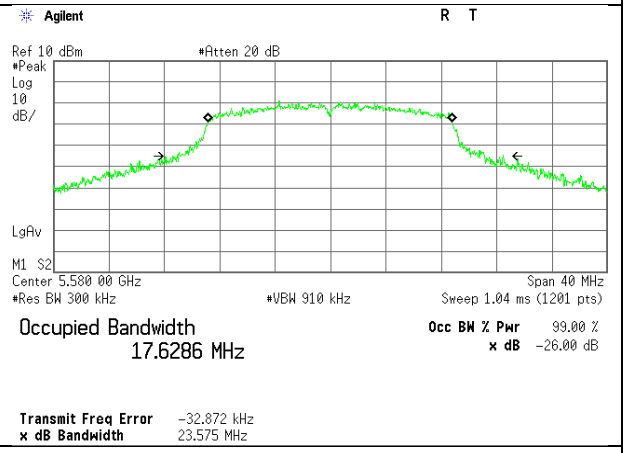
5500 MHz



5300 MHz



5580 MHz



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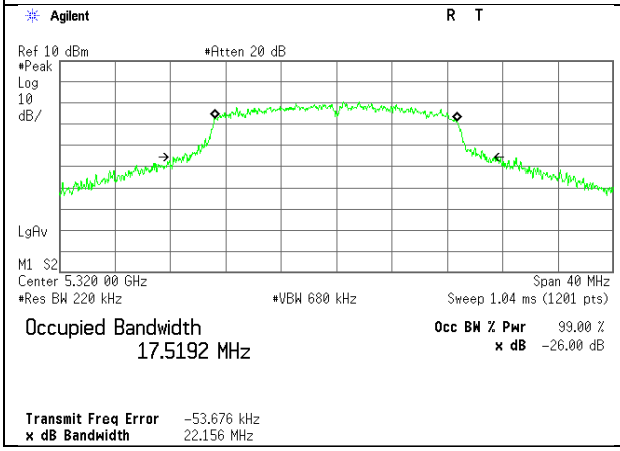
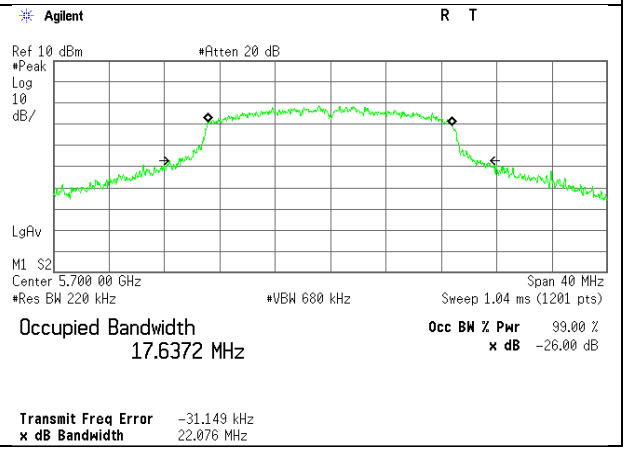
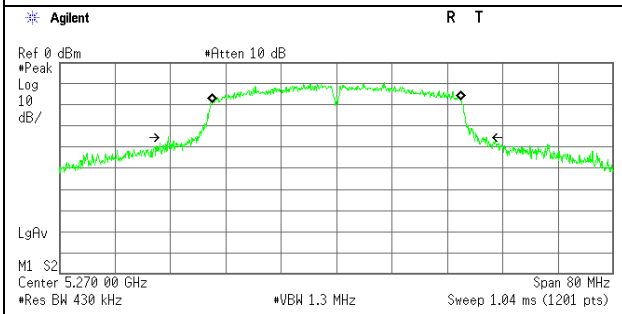


5700 MHz

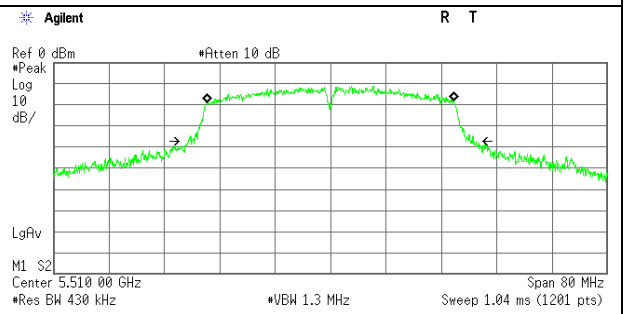


11n-40

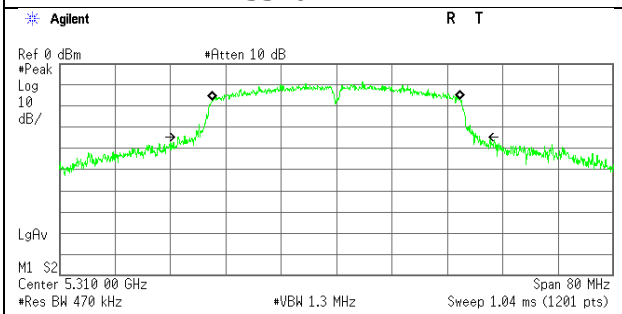
5270 MHz



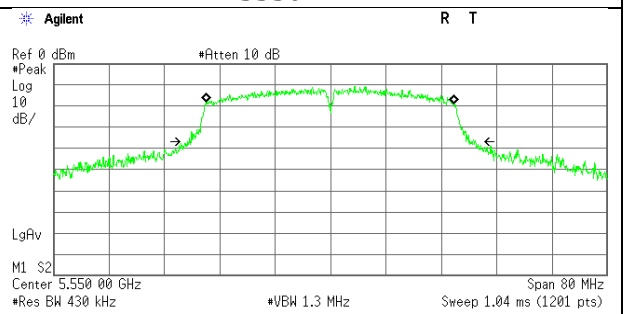
5510 MHz



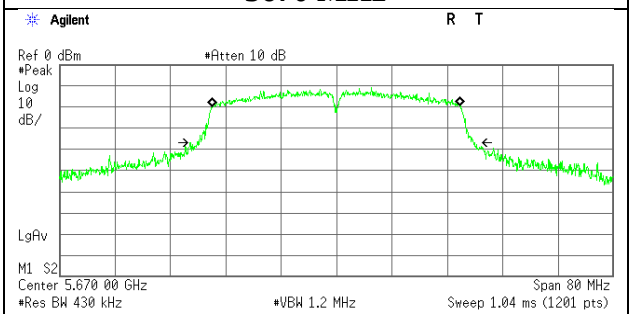
5310 MHz



5550 MHz



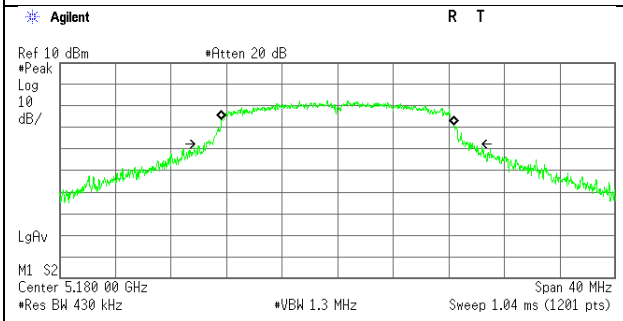
5670 MHz



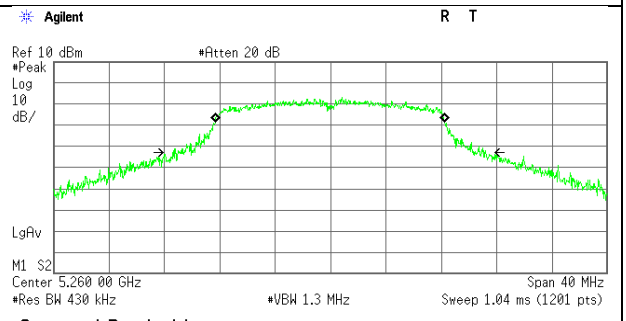
99 % Occupied Bandwidth

11a

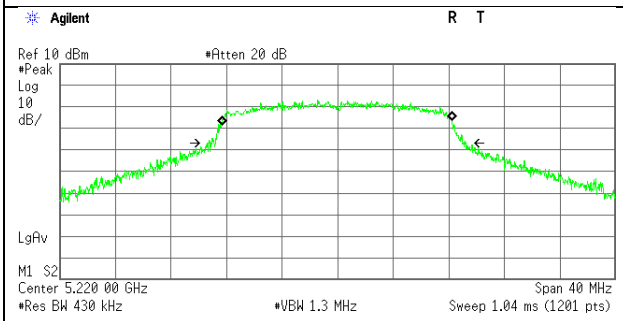
5180 MHz



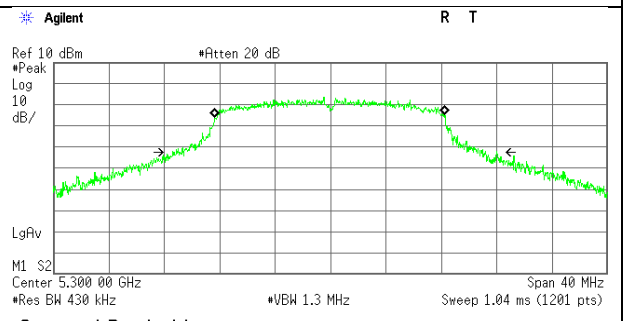
5260 MHz



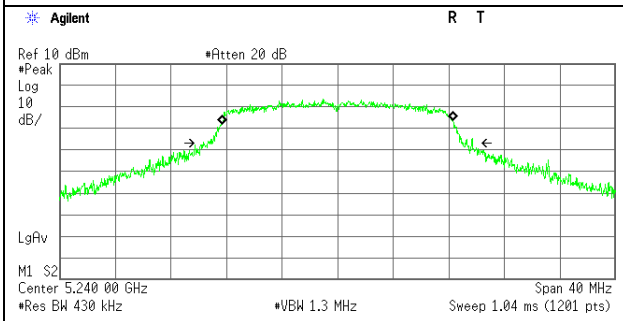
5220 MHz



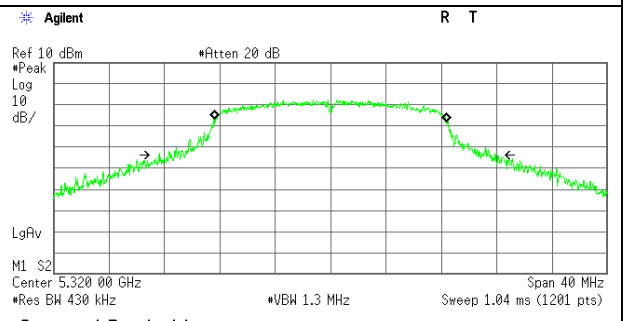
5300 MHz



5240 MHz



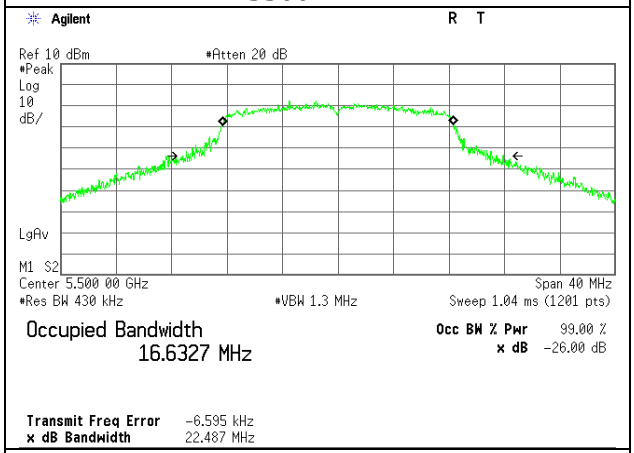
5320 MHz



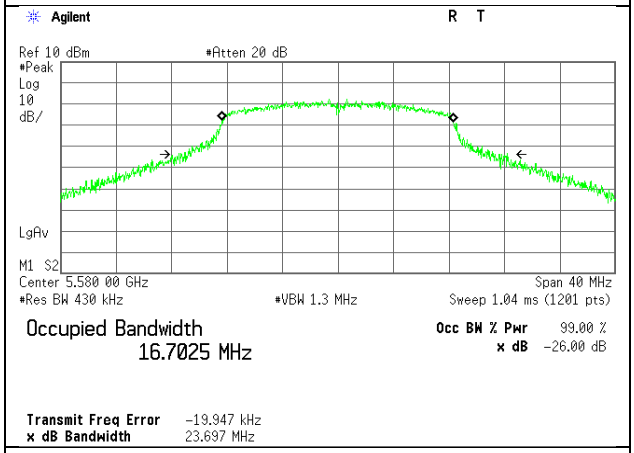
99 % Occupied Bandwidth

11a

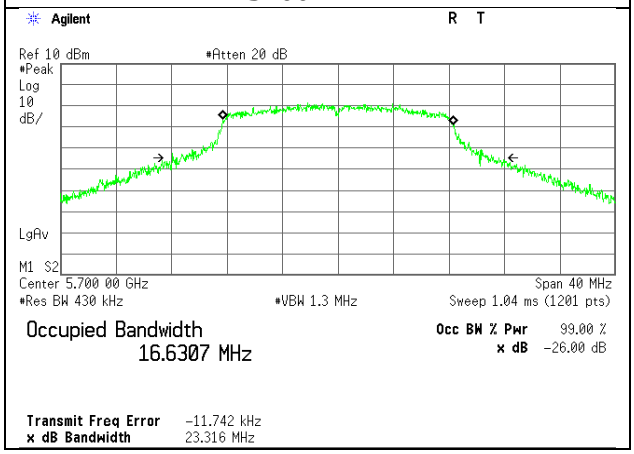
5500 MHz



5580 MHz



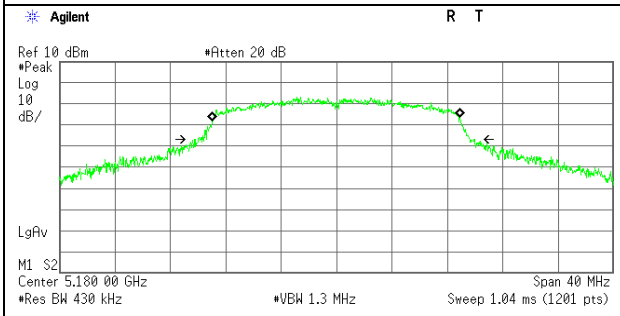
5700 MHz



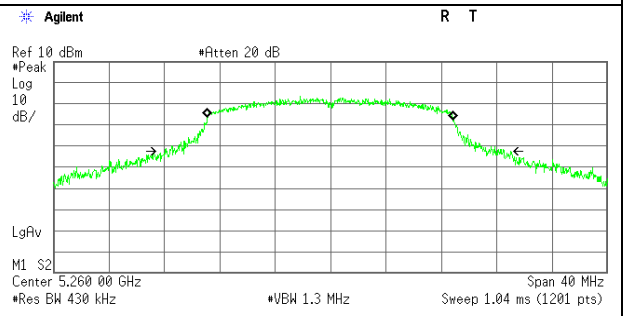
99 % Occupied Bandwidth

11n-20

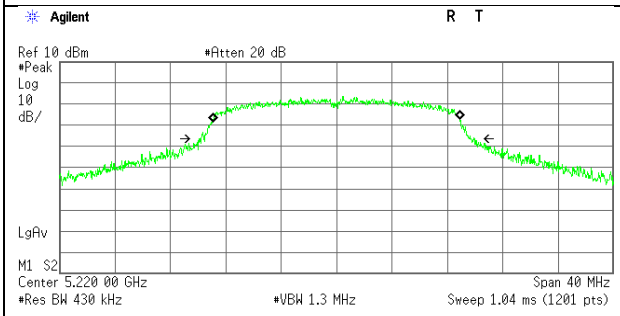
5180 MHz



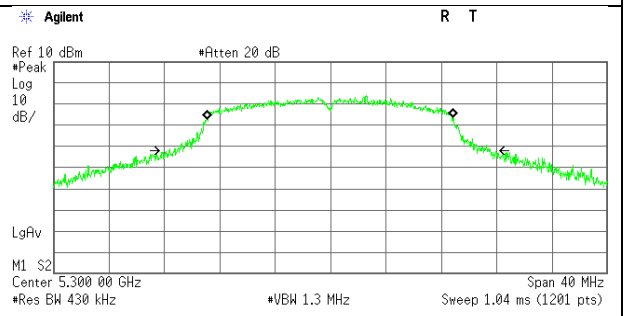
5260 MHz



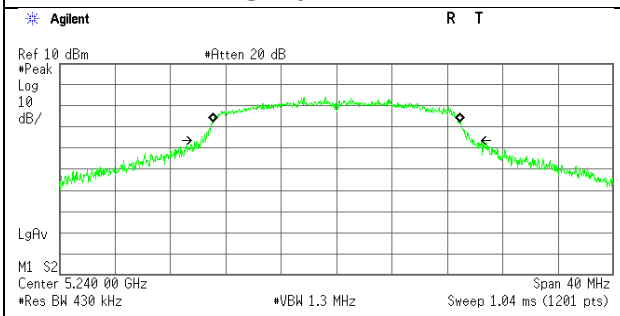
5220 MHz



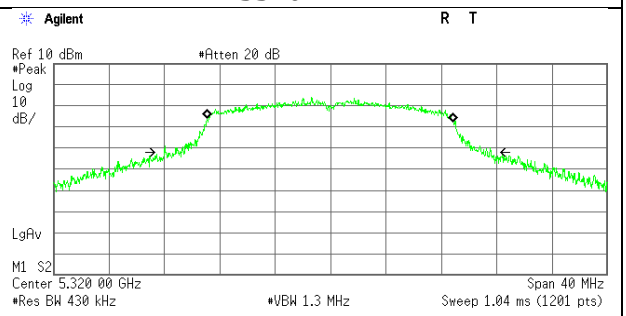
5300 MHz



5240 MHz



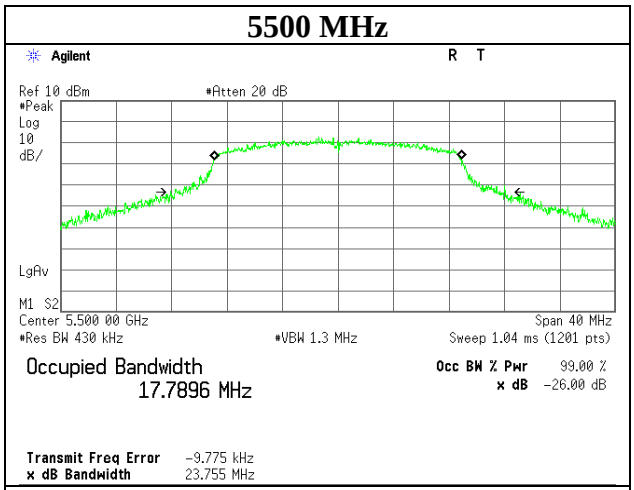
5320 MHz



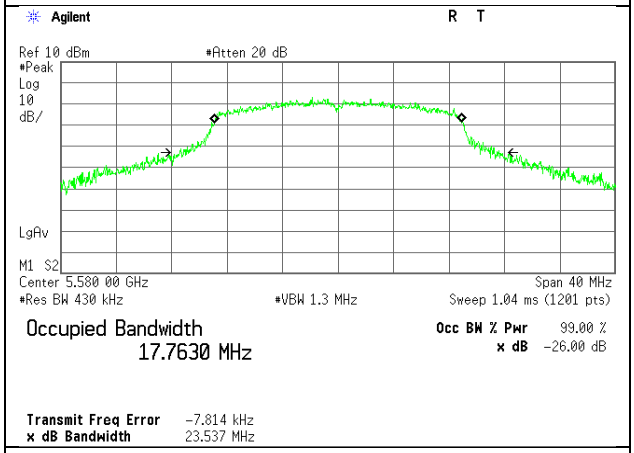
99 % Occupied Bandwidth

11n-20

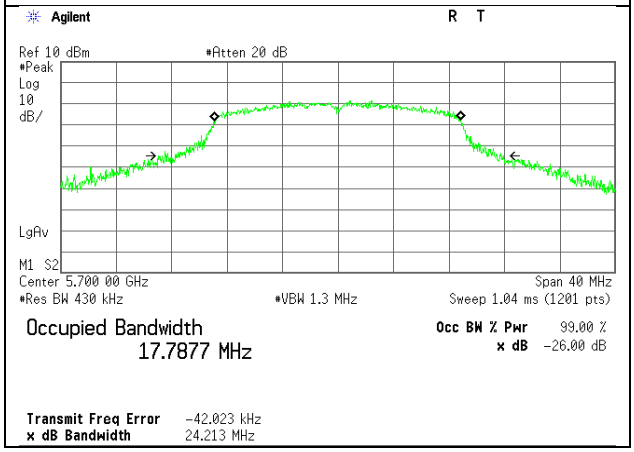
5500 MHz



5580 MHz



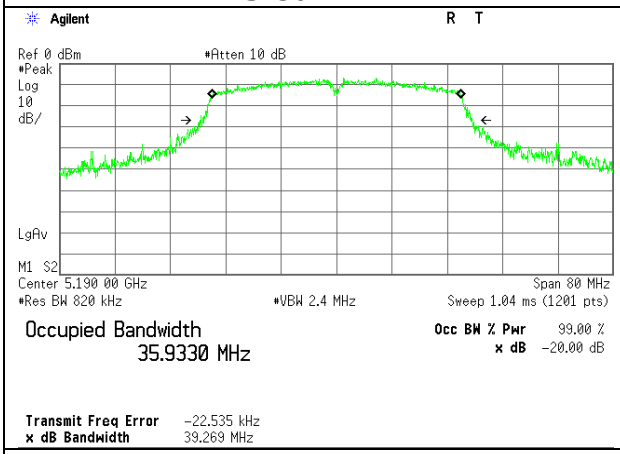
5700 MHz



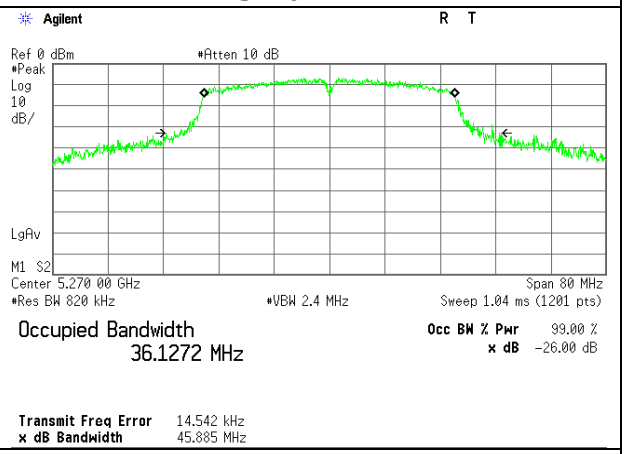
99 % Occupied Bandwidth

11n-40

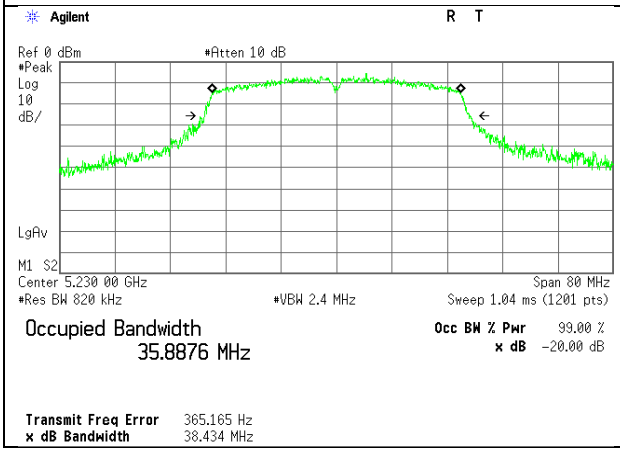
5190 MHz



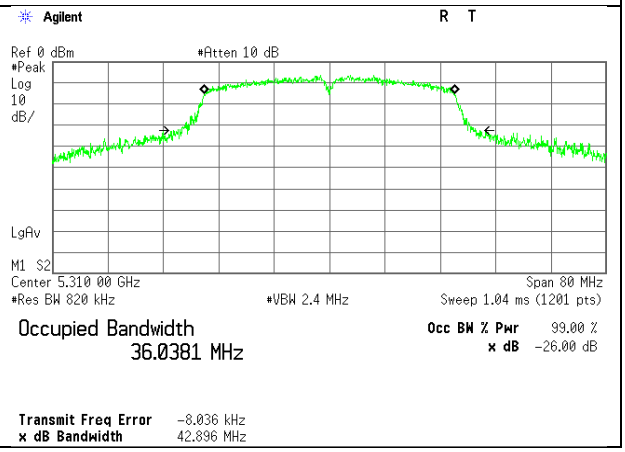
5270 MHz



5230 MHz



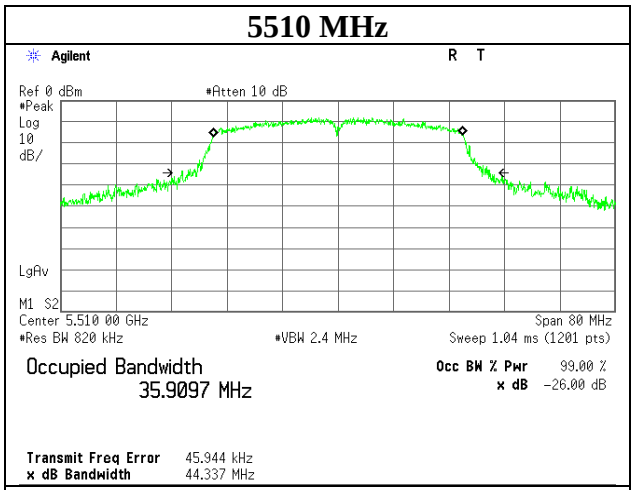
5310 MHz



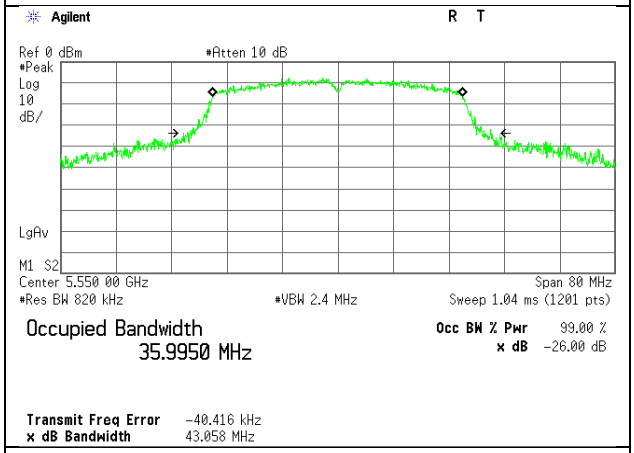
99 % Occupied Bandwidth

11n-40

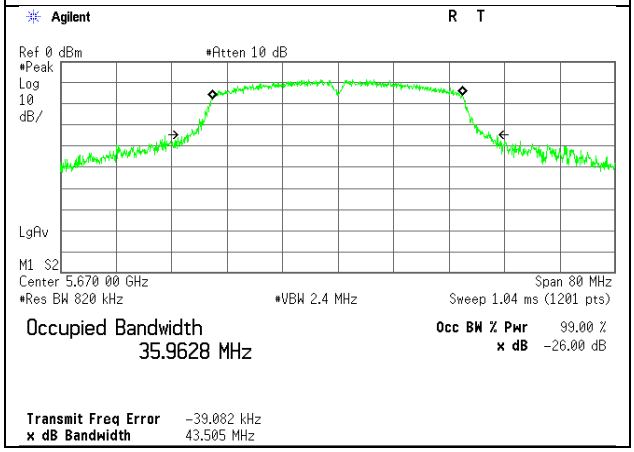
5510 MHz



5550 MHz



5670 MHz



Maximum Conducted Output Power

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11624584H
Date	June 7, 2017
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Yuta Moriya
Mode	Tx 11a

Applied limit: 15.407, mobile and portable client device

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Limit	Margin	e.i.r.p. Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	-4.63	2.32	10.05	1.22	2.6	-	16.715	8.96	7.87	23.97	15.01	11.56	14.32	29.97	18.41
5220	-4.28	2.32	10.05	1.22	2.6	-	16.595	9.31	8.53	23.97	14.66	11.91	15.52	29.97	18.06
5240	-4.16	2.33	10.05	1.22	2.6	-	16.642	9.44	8.79	23.97	14.53	12.04	16.00	29.97	17.93
5260	-4.45	2.33	10.05	1.22	2.6	20.739	16.568	9.15	8.22	23.97	14.82	11.75	14.96	29.97	18.22
5300	-4.21	2.34	10.05	1.22	2.6	20.784	16.616	9.40	8.71	23.97	14.57	12.00	15.85	29.97	17.97
5320	-4.33	2.34	10.05	1.22	2.6	20.727	16.742	9.28	8.47	23.97	14.69	11.88	15.42	29.97	18.09
5500	-4.40	2.37	10.05	1.22	2.6	22.238	16.633	9.24	8.39	23.97	14.73	11.84	15.28	29.97	18.13
5580	-4.44	2.38	10.05	1.22	2.6	21.722	16.703	9.21	8.34	23.97	14.76	11.81	15.17	29.97	18.16
5700	-4.83	2.40	10.05	1.22	2.6	21.386	16.631	8.84	7.66	23.97	15.13	11.44	13.93	29.97	18.53

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

Maximum Conducted Output Power

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11624584H
Date	June 7, 2017
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Yuta Moriya
Mode	Tx 11n-20

Applied limit: 15.407, mobile and portable client device

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Conducted Power Limit	Conducted Power Margin	e.i.r.p. Result		e.i.r.p. Limit	e.i.r.p. Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5180	-3.60	2.32	10.05	0.61	2.6	-	17.865	9.38	8.67	23.97	14.59	11.98	15.78	29.97	17.99
5220	-3.57	2.32	10.05	0.61	2.6	-	17.789	9.41	8.73	23.97	14.56	12.01	15.89	29.97	17.96
5240	-3.32	2.33	10.05	0.61	2.6	-	17.800	9.67	9.27	23.97	14.30	12.27	16.87	29.97	17.70
5260	-3.50	2.33	10.05	0.61	2.6	22.183	17.731	9.49	8.89	23.97	14.48	12.09	16.18	29.97	17.88
5300	-3.56	2.34	10.05	0.61	2.6	23.370	17.794	9.44	8.79	23.97	14.53	12.04	16.00	29.97	17.93
5320	-3.45	2.34	10.05	0.61	2.6	22.156	17.796	9.55	9.02	23.97	14.42	12.15	16.41	29.97	17.82
5500	-3.73	2.37	10.05	0.61	2.6	22.474	17.790	9.30	8.51	23.97	14.67	11.90	15.49	29.97	18.07
5580	-3.53	2.38	10.05	0.61	2.6	23.575	17.763	9.51	8.93	23.97	14.46	12.11	16.26	29.97	17.86
5700	-4.00	2.40	10.05	0.61	2.6	22.076	17.788	9.06	8.05	23.97	14.91	11.66	14.66	29.97	18.31

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.11 Measurement Room
Report No.	11624584H
Date	June 7, 2017
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Yuta Moriya
Mode	Tx 11n-40

Applied limit: 15.407, mobile and portable client device

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Duty Factor	Antenna Gain	26 dB EBW (B for FCC)	99% OBW (B for IC)	Conducted Power Result		Limit	Margin	e.i.r.p. Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[MHz]	[MHz]	[dBm]	[mW]	[dBm]	[dB]	[dBm]	[mW]	[dBm]	[dB]
5190	-4.30	2.32	10.05	1.18	2.6	-	35.933	9.25	8.41	23.97	14.72	11.85	15.31	29.97	18.12
5230	-3.89	2.32	10.05	1.18	2.6	-	35.888	9.66	9.25	23.97	14.31	12.26	16.83	29.97	17.71
5270	-3.94	2.32	10.05	1.18	2.6	45.538	36.127	9.61	9.14	23.97	14.36	12.21	16.63	29.97	17.76
5310	-3.95	2.34	10.05	1.18	2.6	42.788	36.038	9.62	9.16	23.97	14.35	12.22	16.67	29.97	17.75
5510	-4.28	2.37	10.05	1.18	2.6	41.105	35.910	9.32	8.55	23.97	14.65	11.92	15.56	29.97	18.05
5550	-4.21	2.38	10.05	1.18	2.6	41.363	35.995	9.40	8.71	23.97	14.57	12.00	15.85	29.97	17.97
5670	-4.45	2.40	10.05	1.18	2.6	39.883	35.963	9.18	8.28	23.97	14.79	11.78	15.07	29.97	18.19

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

(Worst Rate Check)

Test place	Ise EMC Lab. No.3 Measurement Room
Report No.	11624584H
Date	April 17, 2017
Temperature / Humidity	25 deg. C / 51 % RH
Engineer	Takumi Shimada
Mode	Tx

11a, 5180 MHz

Mode	Rate Mbps	Reading [dBm]	Remarks
11a	6	1.74	
	9	1.78	
	12	1.87	
	18	1.95	
	24	1.90	
	36	1.83	
	48	1.91	
	54	1.97	*

* Worst rate

11n-20, 5180 MHz

Mode	MCS	Reading [dBm]	Remarks
11n-20	0	1.78	
	1	1.98	
	2	2.10	
	3	2.14	*
	4	2.04	
	5	2.06	
	6	2.02	
	7	2.01	

* Worst rate

11n-40, 5190 MHz

Mode	MCS	Reading [dBm]	Remarks
11n-40	0	1.98	
	1	2.07	
	2	2.08	
	3	2.09	*
	4	2.00	
	5	2.08	
	6	2.14	
	7	1.50	

* Worst rate

The test was conducted by the use of Gate function.

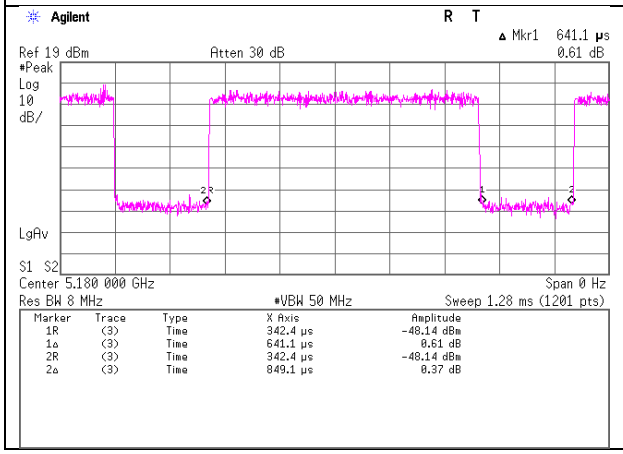
All comparison were carried out on same frequency and measurement factors.

Burst rate confirmation

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11624584H
Date	April 19, 2017
Temperature / Humidity	23deg. C / 40 % RH
Engineer	Ken Fujita
Mode	Tx

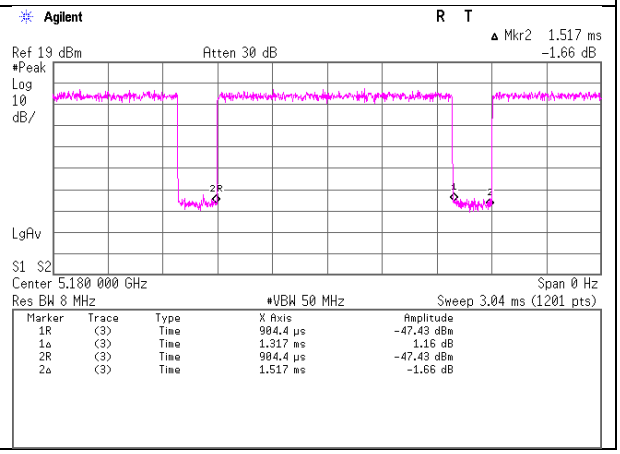
11a 54Mbps

Tx on / (Tx on + Tx off) =	**0.755**
Tx on / (Tx on + Tx off) * 100 =	**75.5 %**
Duty factor = 10 * log (0.8491 / 0.6411) =	**1.22 dB**



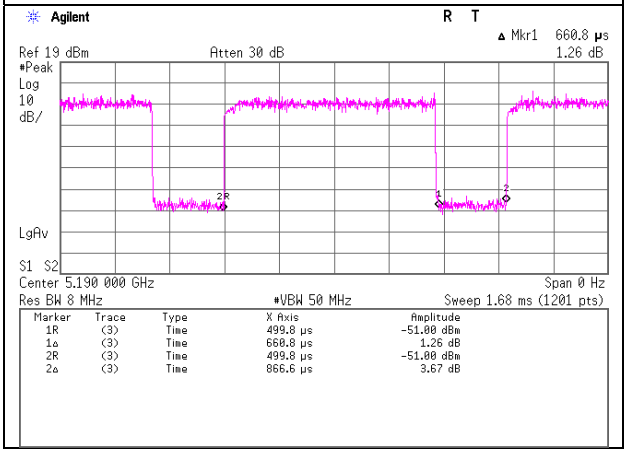
11n-20 MCS3

Tx on / (Tx on + Tx off) =	**0.868**
Tx on / (Tx on + Tx off) * 100 =	**86.8 %**
Duty factor = 10 * log (1.517 / 1.317) =	**0.61 dB**



11n-40 MCS3

Tx on / (Tx on + Tx off) =	**0.763**
Tx on / (Tx on + Tx off) * 100 =	**76.3 %**
Duty factor = 10 * log (0.8666 / 0.6608) =	**1.18 dB**



Average Output Power
(Reference data for RF Exposure)

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11624584H
Date	June 7, 2017
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Yuta Moriya
Mode	Tx

11a

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Result (Timed average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
5180	-3.59	2.32	10.05	8.78	7.55	0.17	8.95	7.85
5220	-3.24	2.32	10.05	9.13	8.18	0.17	9.30	8.51
5240	-3.19	2.33	10.05	9.19	8.30	0.17	9.36	8.63
5260	-3.41	2.33	10.05	8.97	7.89	0.17	9.14	8.20
5300	-3.29	2.34	10.05	9.10	8.13	0.17	9.27	8.45
5320	-3.38	2.34	10.05	9.01	7.96	0.17	9.18	8.28
5500	-3.38	2.37	10.05	9.04	8.02	0.17	9.21	8.34
5580	-3.40	2.38	10.05	9.03	8.00	0.17	9.20	8.32
5700	-3.82	2.40	10.05	8.63	7.29	0.17	8.80	7.59

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

11n-20

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Result (Timed average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
5180	-3.51	2.32	10.05	8.86	7.69	0.18	9.04	8.02
5220	-3.27	2.32	10.05	9.10	8.13	0.18	9.28	8.47
5240	-3.16	2.33	10.05	9.22	8.36	0.18	9.40	8.71
5260	-3.30	2.33	10.05	9.08	8.09	0.18	9.26	8.43
5300	-3.41	2.34	10.05	8.98	7.91	0.18	9.16	8.24
5320	-3.20	2.34	10.05	9.19	8.30	0.18	9.37	8.65
5500	-3.39	2.37	10.05	9.03	8.00	0.18	9.21	8.34
5580	-3.22	2.38	10.05	9.21	8.34	0.18	9.39	8.69
5700	-3.79	2.40	10.05	8.66	7.35	0.18	8.84	7.66

Sample Calculation:
Result (Timed average) = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss
*The equipment and cables were not used for factor 0 dB of the data sheets.

11n-40

Tested Frequency	Power Meter Reading	Cable Loss	Atten. Loss	Result (Timed average)		Duty factor	Result (Burst power average)	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dB]	[dBm]	[mW]
5190	-3.51	2.32	10.05	8.86	7.69	0.37	9.23	8.38
5230	-3.22	2.32	10.05	9.15	8.22	0.37	9.52	8.95
5270	-3.25	2.32	10.05	9.12	8.17	0.37	9.49	8.89
5310	-3.24	2.34	10.05	9.15	8.22	0.37	9.52	8.95
5510	-3.57	2.37	10.05	8.85	7.67	0.37	9.22	8.36
5550	-3.51	2.38	10.05	8.92	7.80	0.37	9.29	8.49
5670	-3.93	2.40	10.05	8.52	7.11	0.37	8.89	7.74

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

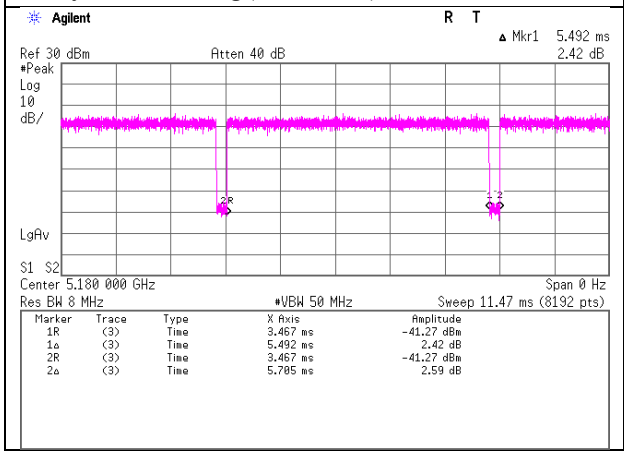
The average output power was measured with the lowest order modulation and lowest data rate configuration in each IEEE 802.11 mode based on KDB 248227 D01.

Burst rate confirmation

Test place	Ise EMC Lab. No.3 Measurement Room
Report No.	11624584H
Date	April 20, 2017
Temperature / Humidity	25 deg. C / 51 % RH
Engineer	Ken Fujita
Mode	Tx

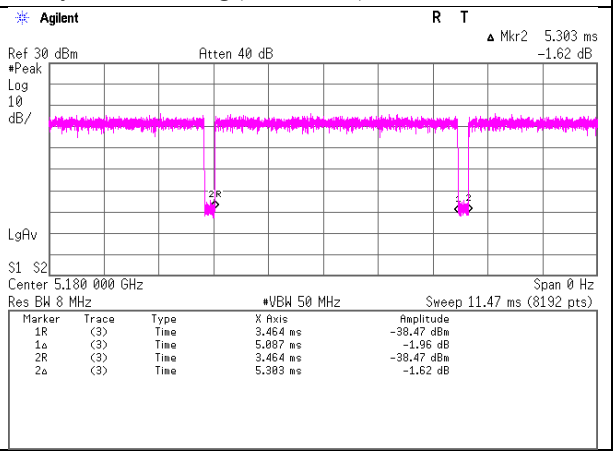
11a 6Mbps

Tx on / (Tx on + Tx off) =	**0.963**
Tx on / (Tx on + Tx off) * 100 =	**96.3 %**
Duty factor = 10 * log (5.705 / 5.492) =	**0.17 dB**



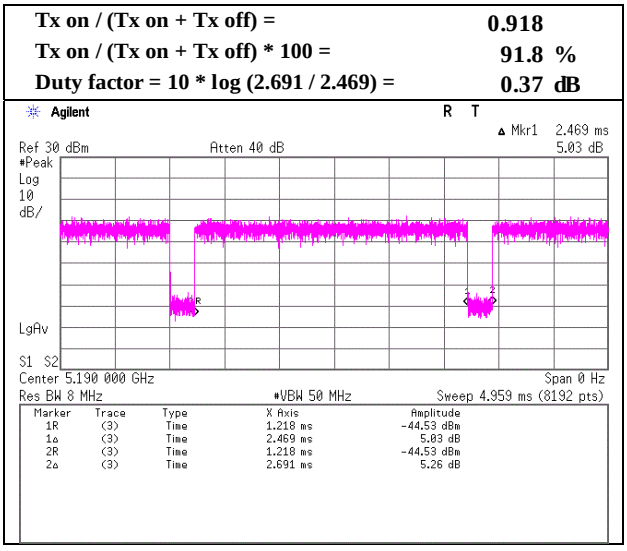
11n-20 MCS0

Tx on / (Tx on + Tx off) =	**0.959**
Tx on / (Tx on + Tx off) * 100 =	**95.9 %**
Duty factor = 10 * log (5.303 / 5.087) =	**0.18 dB**



11n-40 MCS0

Tx on / (Tx on + Tx off) =	**0.918**
Tx on / (Tx on + Tx off) * 100 =	**91.8 %**
Duty factor = 10 * log (2.691 / 2.469) =	**0.37 dB**



Maximum Power Spectral Density

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11624584H
Date	June 7, 2017
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Yuta Moriya
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) Result [dBm /MHz]	PSD (Conducted) Limit [dBm /MHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	PSD (e.i.r.p.) Limit [dBm /MHz]	PSD (e.i.r.p.) Margin [dB]
5180	-14.14	2.32	10.05	1.22	2.6	0.00	-0.55	11.00	11.55	2.05	17.00	14.95
5220	-14.07	2.32	10.05	1.22	2.6	0.00	-0.48	11.00	11.48	2.12	17.00	14.88
5240	-13.99	2.33	10.05	1.22	2.6	0.00	-0.39	11.00	11.39	2.21	17.00	14.79
5260	-13.73	2.33	10.05	1.22	2.6	0.00	-0.13	11.00	11.13	2.47	17.00	14.53
5300	-14.21	2.34	10.05	1.22	2.6	0.00	-0.60	11.00	11.60	2.00	17.00	15.00
5320	-13.92	2.34	10.05	1.22	2.6	0.00	-0.31	11.00	11.31	2.29	17.00	14.71
5500	-14.39	2.37	10.05	1.22	2.6	0.00	-0.75	11.00	11.75	1.85	17.00	15.15
5580	-14.12	2.38	10.05	1.22	2.6	0.00	-0.47	11.00	11.47	2.13	17.00	14.87
5700	-14.59	2.40	10.05	1.22	2.6	0.00	-0.92	11.00	11.92	1.69	17.00	15.32

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 (Specified bandwidth / Measured bandwidth)

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

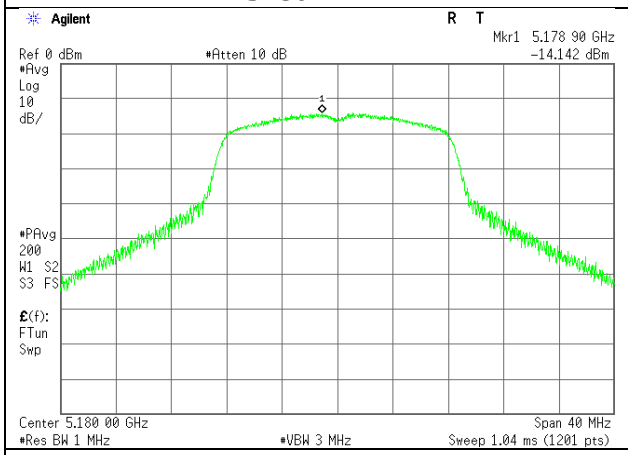
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

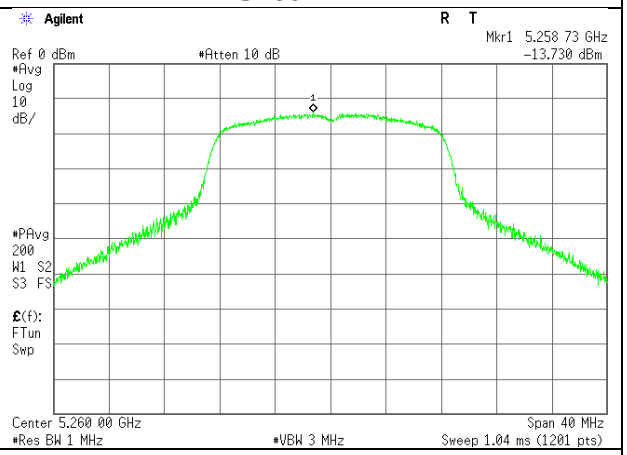
Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11624584H
Date	June 7, 2017
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Yuta Moriya
Mode	Tx 11a

11a

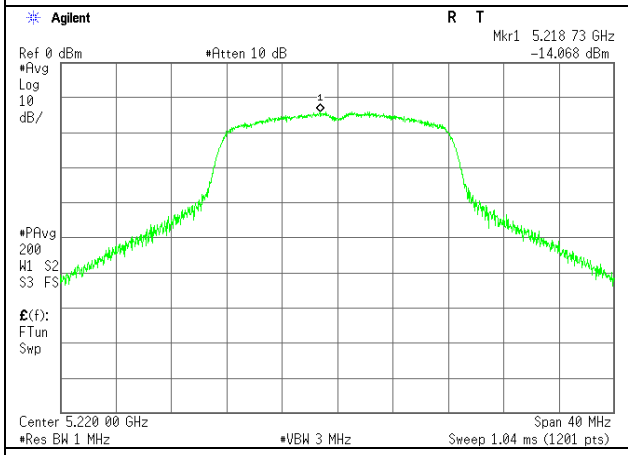
5180 MHz



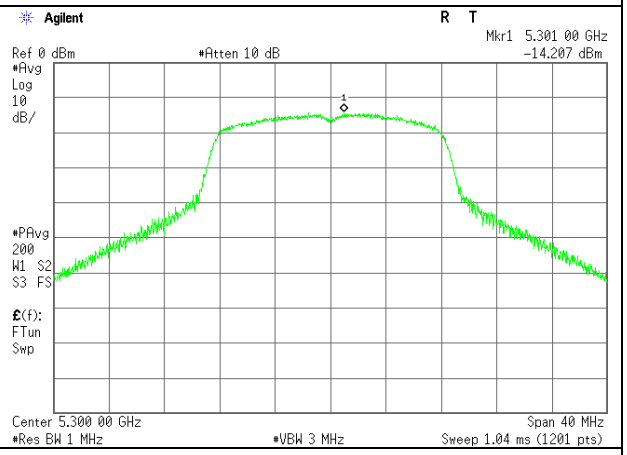
5260 MHz



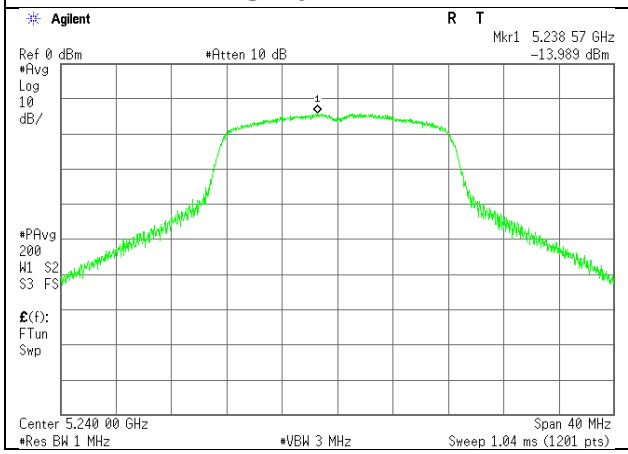
5220 MHz



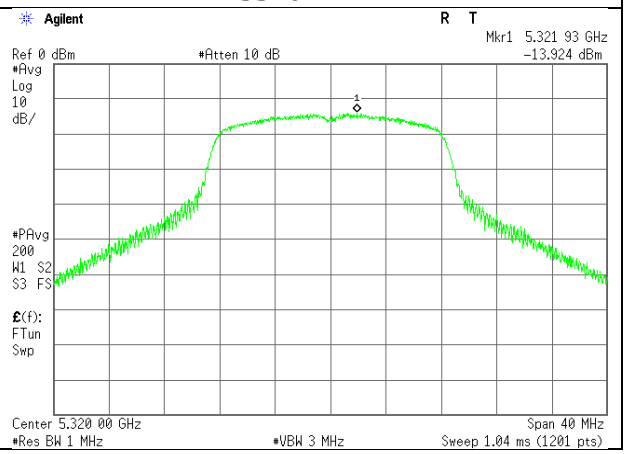
5300 MHz



5240 MHz



5320 MHz

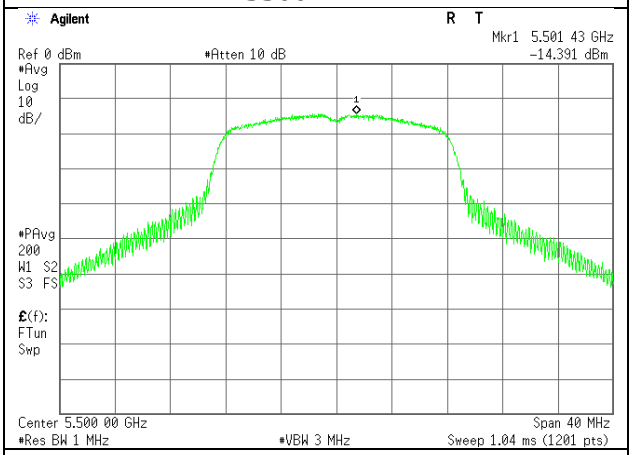


Maximum Power Spectral Density

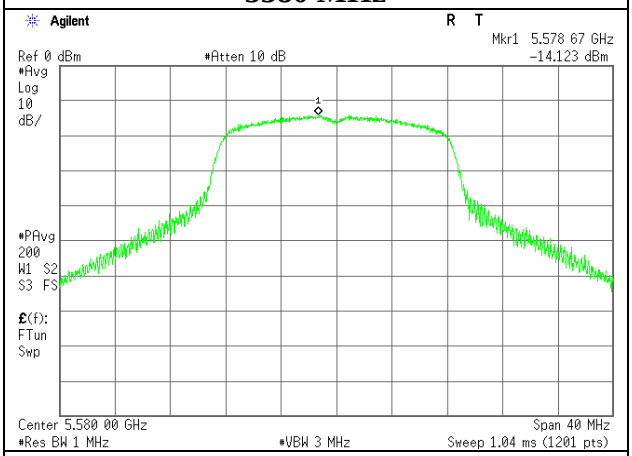
Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11624584H
Date	June 7, 2017
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Yuta Moriya
Mode	Tx 11a

11a

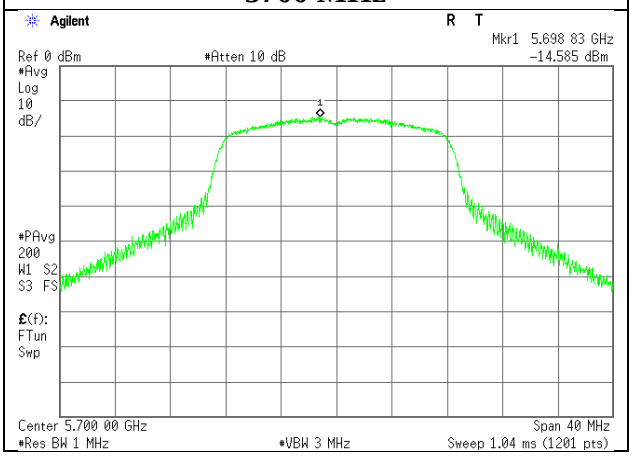
5500 MHz



5580 MHz



5700 MHz



Maximum Power Spectral Density

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11624584H
Date	June 7, 2017
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Yuta Moriya
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) Result [dBm /MHz]	PSD (Conducted) Limit [dBm /MHz]	PSD (Conducted) Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	PSD (e.i.r.p.) Limit [dBm /MHz]	PSD (e.i.r.p.) Margin [dB]
5180	-13.55	2.32	10.05	0.61	2.6	0.00	-0.57	11.00	11.57	2.03	17.00	14.97
5220	-13.56	2.32	10.05	0.61	2.6	0.00	-0.58	11.00	11.58	2.02	17.00	14.98
5240	-13.18	2.33	10.05	0.61	2.6	0.00	-0.19	11.00	11.19	2.41	17.00	14.59
5260	-13.66	2.33	10.05	0.61	2.6	0.00	-0.67	11.00	11.67	1.93	17.00	15.07
5300	-13.32	2.34	10.05	0.61	2.6	0.00	-0.32	11.00	11.32	2.28	17.00	14.72
5320	-13.38	2.34	10.05	0.61	2.6	0.00	-0.37	11.00	11.38	2.23	17.00	14.78
5500	-13.19	2.37	10.05	0.61	2.6	0.00	-0.16	11.00	11.16	2.44	17.00	14.56
5580	-13.40	2.38	10.05	0.61	2.6	0.00	-0.36	11.00	11.36	2.24	17.00	14.76
5700	-14.12	2.40	10.05	0.61	2.6	0.00	-1.06	11.00	12.06	1.55	17.00	15.46

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 (Specified bandwidth / Measured bandwidth)

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

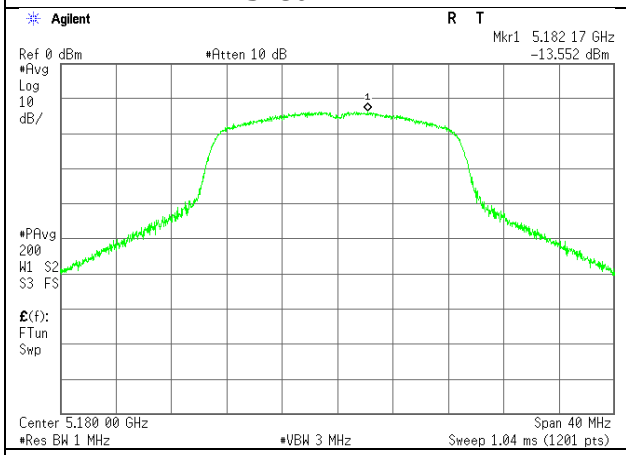
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

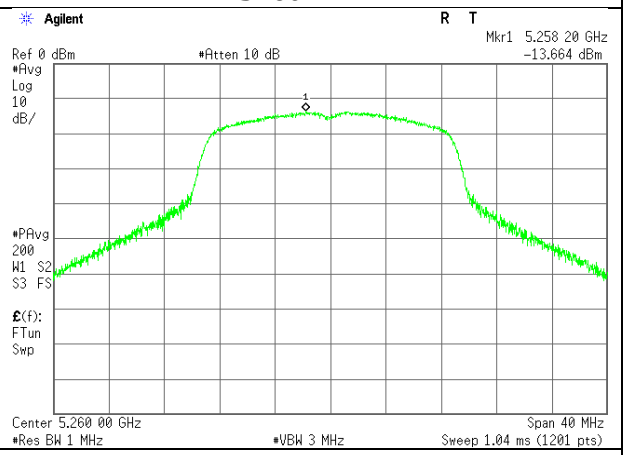
Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11624584H
Date	June 7, 2017
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Yuta Moriya
Mode	Tx 11n-20

11n-20

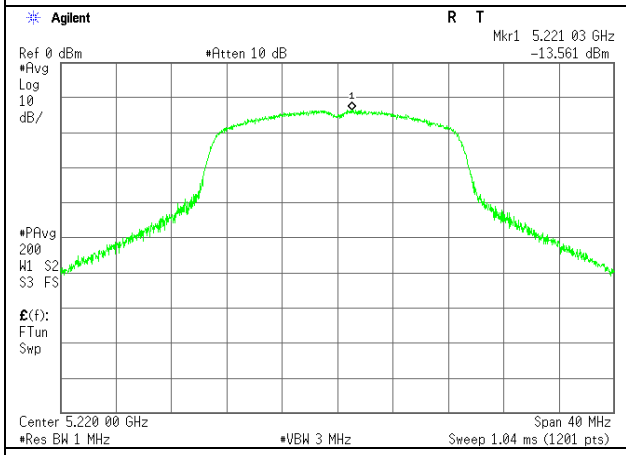
5180 MHz



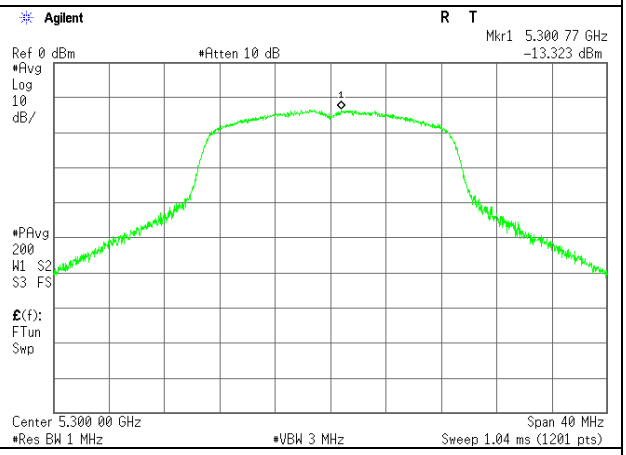
5260 MHz



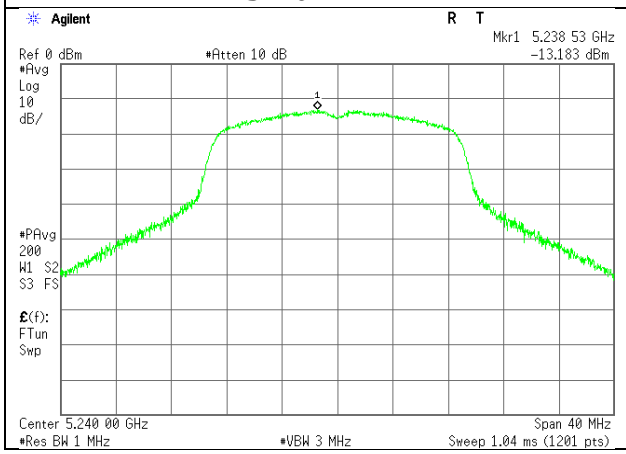
5220 MHz



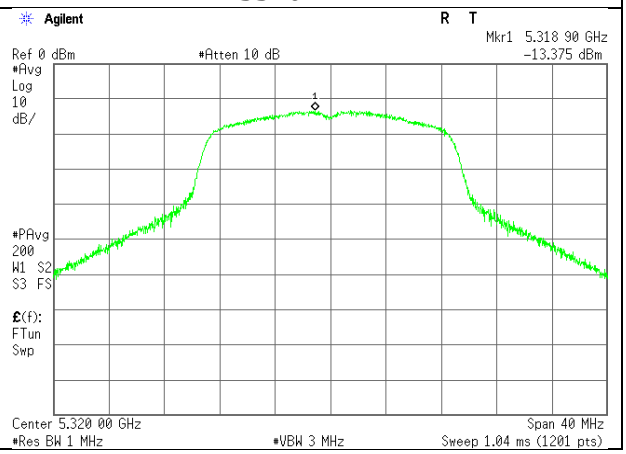
5300 MHz



5240 MHz



5320 MHz

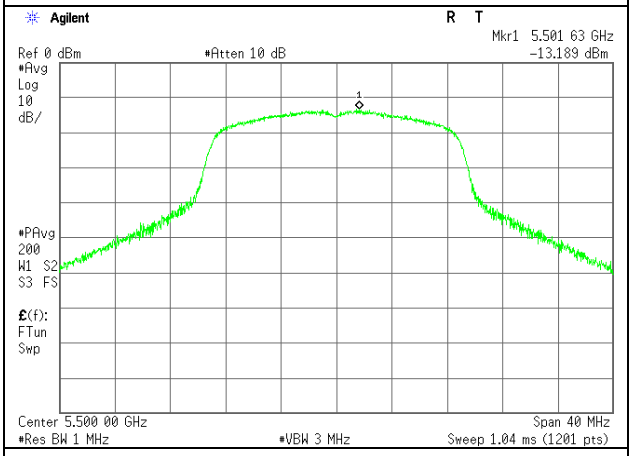


Maximum Power Spectral Density

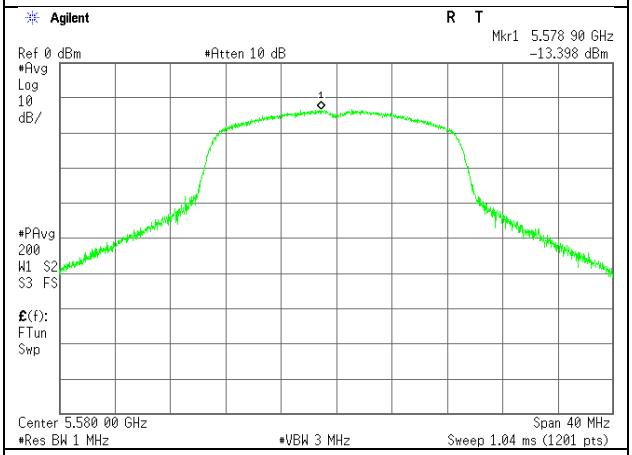
Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11624584H
Date	June 7, 2017
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Yuta Moriya
Mode	Tx 11n-20

11n-20

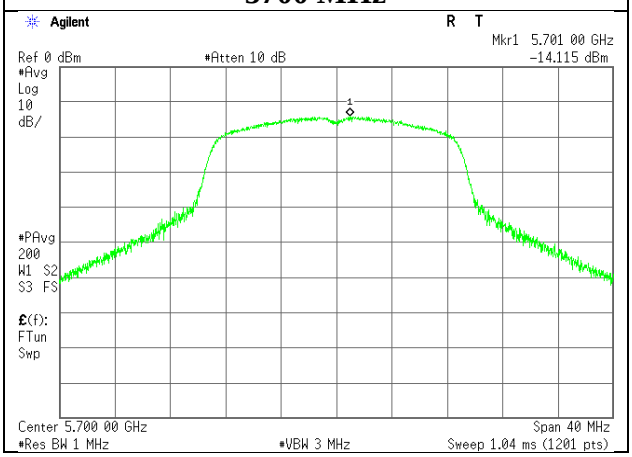
5500 MHz



5580 MHz



5700 MHz



Maximum Power Spectral Density

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11624584H
Date	June 7, 2017
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Yuta Moriya
Mode	Tx 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) Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]	PSD (e.i.r.p.) Result [dBm /MHz]	Limit [dBm /MHz]	Margin [dB]
5190	-17.04	2.32	10.05	1.18	2.6	0.00	-3.49	11.00	14.49	-0.89	17.00	17.89
5230	-16.52	2.32	10.05	1.18	2.6	0.00	-2.97	11.00	13.97	-0.37	17.00	17.37
5270	-16.91	2.32	10.05	1.18	2.6	0.00	-3.36	11.00	14.36	-0.76	17.00	17.76
5310	-16.64	2.34	10.05	1.18	2.6	0.00	-3.07	11.00	14.07	-0.47	17.00	17.47
5510	-17.07	2.37	10.05	1.18	2.6	0.00	-3.47	11.00	14.47	-0.87	17.00	17.87
5550	-16.79	2.38	10.05	1.18	2.6	0.00	-3.18	11.00	14.18	-0.58	17.00	17.58
5670	-16.96	2.40	10.05	1.18	2.6	0.00	-3.33	11.00	14.33	-0.73	17.00	17.73

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 (Specified bandwidth / Measured bandwidth)

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

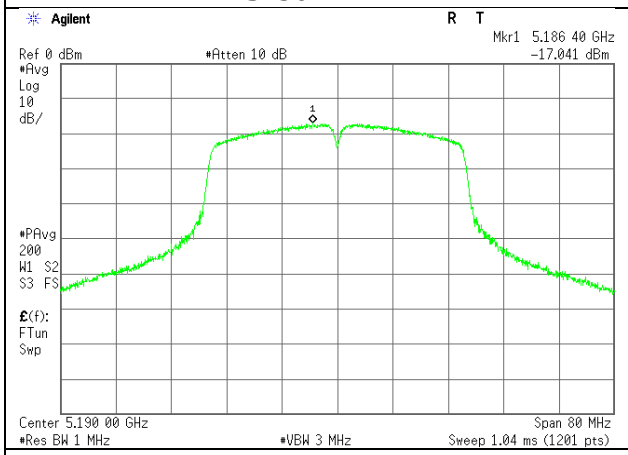
PSD Result (e.i.r.p.) = Conducted PSD Result + Antenna Gain

Maximum Power Spectral Density

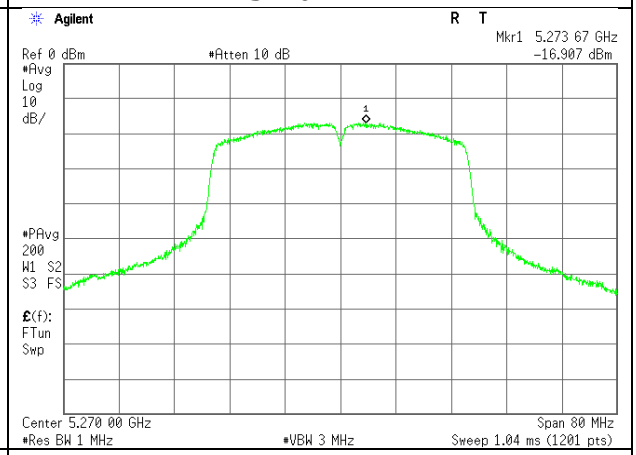
Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11624584H
Date	June 7, 2017
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Yuta Moriya
Mode	Tx 11n-40

11n-40

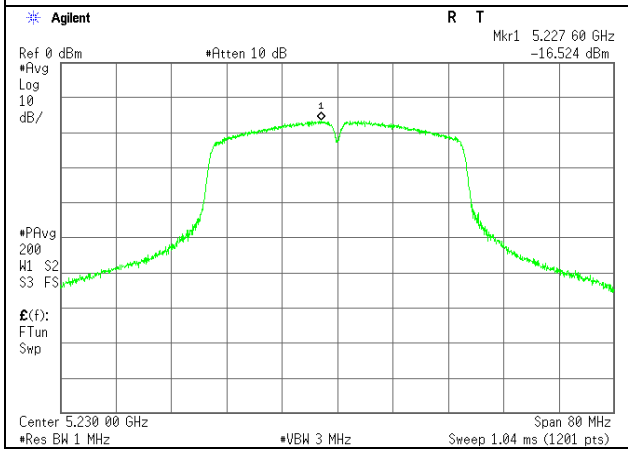
5190 MHz



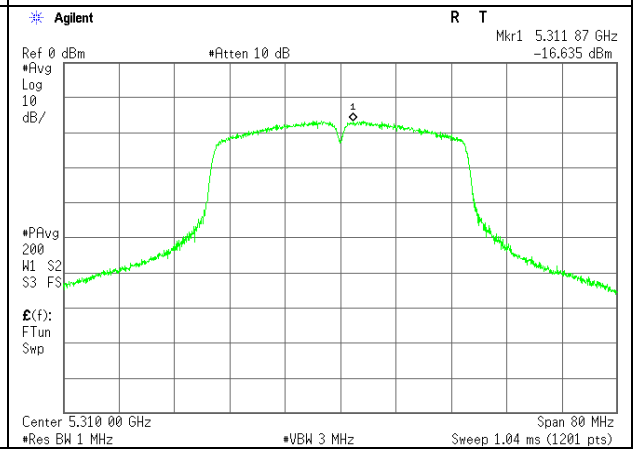
5270 MHz



5230 MHz



5310 MHz

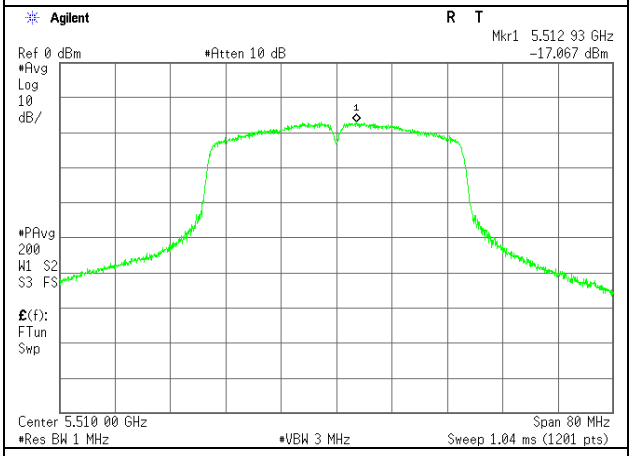


Maximum Power Spectral Density

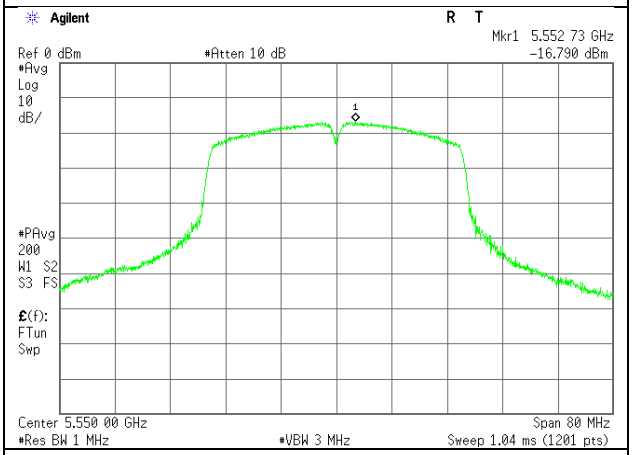
Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	11624584H
Date	June 7, 2017
Temperature / Humidity	25 deg. C / 42 % RH
Engineer	Yuta Moriya
Mode	Tx 11n-40

11n-40

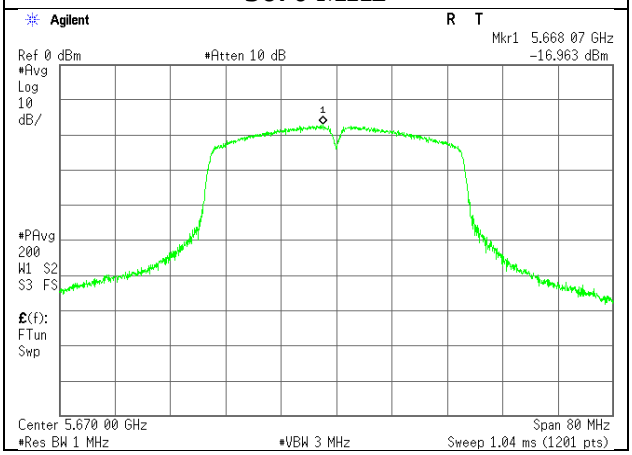
5510 MHz



5550 MHz



5670 MHz



Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11624584H	
Date	April 19, 2017	April 21, 2017
Temperature / Humidity	23deg. C / 50 % RH	23deg. C / 42 % RH
Engineer	Masafumi Niwa	Ken Fujita
	(1 GHz - 10 GHz)	(10 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	47.4	31.5	7.1	31.3	-	54.7	73.9	19.2	
Hori	10360.000	PK	48.2	39.5	-2.7	34.3	-	50.7	73.9	23.2	
Hori	15540.000	PK	45.2	40.2	-1.4	33.0	-	51.0	73.9	22.9	Floor noise
Hori	20720.000	PK	45.8	39.6	-0.3	32.7	-	52.4	73.9	21.5	Floor noise
Hori	5150.000	AV	35.7	31.5	7.1	31.3	0.6	43.6	53.9	10.3	*1)
Hori	10360.000	AV	41.4	39.5	-2.7	34.3	0.6	44.5	53.9	9.4	
Hori	15540.000	AV	37.0	40.2	-1.4	33.0	-	42.8	53.9	11.1	Floor noise
Hori	20720.000	AV	35.3	39.6	-0.3	32.7	-	41.9	53.9	12.0	Floor noise
Vert	5150.000	PK	47.0	31.5	7.1	31.3	-	54.3	73.9	19.6	
Vert	10360.000	PK	54.3	39.5	-2.7	34.3	-	56.8	73.9	17.1	
Vert	15540.000	PK	45.9	40.2	-1.4	33.0	-	51.7	73.9	22.2	Floor noise
Vert	20720.000	PK	45.8	39.6	-0.3	32.7	-	52.4	73.9	21.5	Floor noise
Vert	5150.000	AV	34.9	31.5	7.1	31.3	0.6	42.8	53.9	11.1	*1)
Vert	10360.000	AV	45.5	39.5	-2.7	34.3	0.6	48.6	53.9	5.3	
Vert	15540.000	AV	36.5	40.2	-1.4	33.0	-	42.3	53.9	11.6	Floor noise
Vert	20720.000	AV	35.6	39.6	-0.3	32.7	-	42.2	53.9	11.7	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 (4.3 m / 3.0 m) = 3.13 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

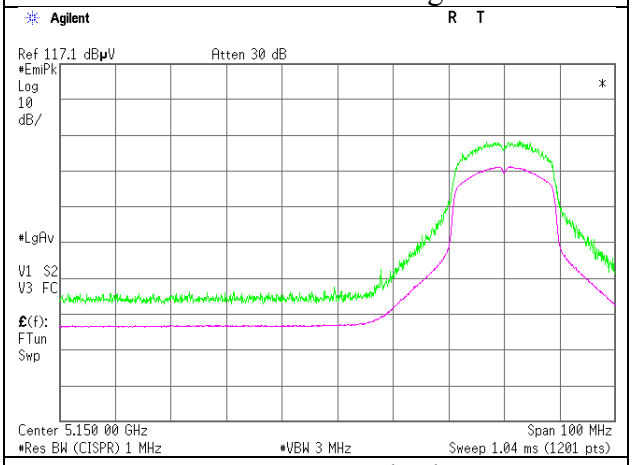
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11624584H
Date	April 19, 2017
Temperature / Humidity	23deg. C / 50 % RH
Engineer	Masafumi Niwa
Mode	Tx 11n-20 5180 MHz

Horizontal

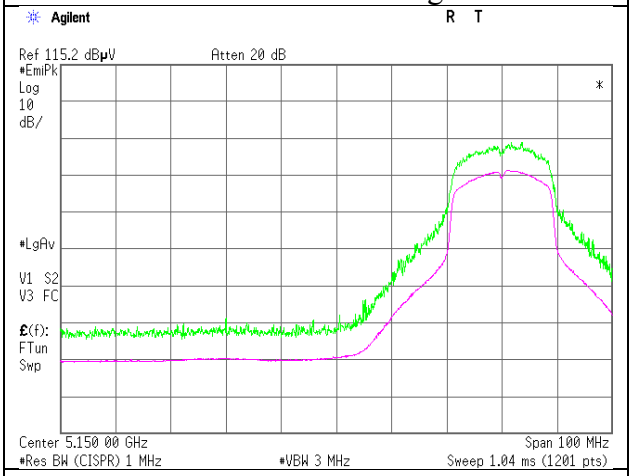
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

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

Radiated Spurious Emission

Report No.	11624584H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.4
Date	April 19, 2017	April 21, 2017	April 22, 2017
Temperature / Humidity	23deg. C / 50 % RH	23deg. C / 42 % RH	21 deg. C / 41 % RH
Engineer	Masafumi Niwa	Ken Fujita	Tomoki Matsui
	(1 GHz - 10 GHz)	(10 GHz - 40 GHz)	(Below 1GHz)
Mode	Tx 11n-20 5240 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	64.589	QP	35.6	6.8	7.8	32.1	-	18.1	40.0	21.9	
Hori	154.103	QP	38.1	15.2	8.7	32.0	-	30.0	43.5	13.5	
Hori	162.235	QP	36.7	15.6	8.8	32.0	-	29.1	43.5	14.4	
Hori	178.473	QP	31.1	16.2	9.0	32.0	-	24.3	43.5	19.2	
Hori	186.569	QP	31.0	16.3	9.0	32.0	-	24.3	43.5	19.2	
Hori	255.420	QP	41.0	11.9	9.6	31.9	-	30.6	46.0	15.4	
Hori	10480.000	PK	46.6	38.7	-1.9	34.2	-	49.2	73.9	24.7	
Hori	15720.000	PK	44.9	38.6	-0.4	33.1	-	50.0	73.9	23.9	Floor noise
Hori	10480.000	AV	39.6	38.7	-1.9	34.2	0.6	42.8	53.9	11.1	
Hori	15720.000	AV	36.4	38.6	-0.4	33.1	-	41.5	53.9	12.4	Floor noise
Vert	50.798	QP	41.1	10.5	7.6	32.1	-	27.1	40.0	12.9	
Vert	64.592	QP	33.5	6.8	7.8	32.1	-	16.0	40.0	24.0	
Vert	82.574	QP	31.5	7.2	8.1	32.1	-	14.7	40.0	25.3	
Vert	144.007	QP	34.8	14.6	8.7	32.0	-	26.1	43.5	17.4	
Vert	162.273	QP	33.5	15.6	8.8	32.0	-	25.9	43.5	17.6	
Vert	558.500	QP	26.0	18.5	11.4	32.1	-	23.8	46.0	22.2	
Vert	10480.000	PK	52.5	38.7	-1.9	34.2	-	55.1	73.9	18.8	
Vert	15720.000	PK	45.0	38.6	-0.4	33.1	-	50.1	73.9	23.8	Floor noise
Vert	10480.000	AV	45.6	38.7	-1.9	34.2	0.6	48.8	53.9	5.1	
Vert	15720.000	AV	36.7	38.6	-0.4	33.1	-	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 (4.3 m / 3.0 m) = 3.13 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11624584H	
Date	April 19, 2017	April 21, 2017
Temperature / Humidity	23deg. C / 50 % RH	23deg. C / 42 % RH
Engineer	Masafumi Niwa	Ken Fujita
	(1 GHz- 10 GHz)	(10 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	50.2	31.3	7.2	31.3	-	57.4	73.9	16.5	
Hori	10640.000	PK	48.1	40.2	-2.6	34.0	-	51.7	73.9	22.2	
Hori	15960.000	PK	45.7	39.0	-1.3	33.2	-	50.2	73.9	23.7	
Hori	21280.000	PK	45.2	39.6	-0.1	32.6	-	52.1	73.9	21.8	
Hori	5350.000	AV	33.4	31.3	7.2	31.3	0.6	41.2	53.9	12.7	*1)
Hori	10640.000	AV	41.3	40.2	-2.6	34.0	0.6	45.5	53.9	8.4	
Hori	15960.000	AV	37.4	39.0	-1.3	33.2	0.6	42.5	53.9	11.4	
Hori	21280.000	AV	35.6	39.6	-0.1	32.6	0.6	43.1	53.9	10.8	
Vert	5350.000	PK	48.7	31.3	7.2	31.3	-	55.9	73.9	18.0	
Vert	10640.000	PK	53.0	40.2	-2.6	34.0	-	56.6	73.9	17.3	
Vert	15960.000	PK	45.7	39.0	-1.3	33.2	-	50.2	73.9	23.7	
Vert	21280.000	PK	45.5	39.6	-0.1	32.6	-	52.4	73.9	21.5	
Vert	5350.000	AV	33.5	31.3	7.2	31.3	0.6	41.3	53.9	12.6	*1)
Vert	10640.000	AV	43.8	40.2	-2.6	34.0	0.6	48.0	53.9	5.9	
Vert	15960.000	AV	36.3	39.0	-1.3	33.2	0.6	41.4	53.9	12.5	
Vert	21280.000	AV	35.2	39.6	-0.1	32.6	0.6	42.7	53.9	11.2	

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 (4.3 m / 3.0 m) = 3.13 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

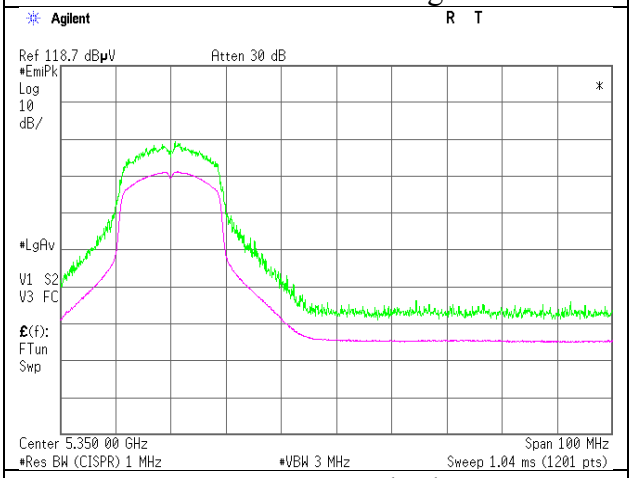
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11624584H
Date	April 19, 2017
Temperature / Humidity	23deg. C / 50 % RH
Engineer	Masafumi Niwa
Mode	Tx 11n-20 5320 MHz

Horizontal

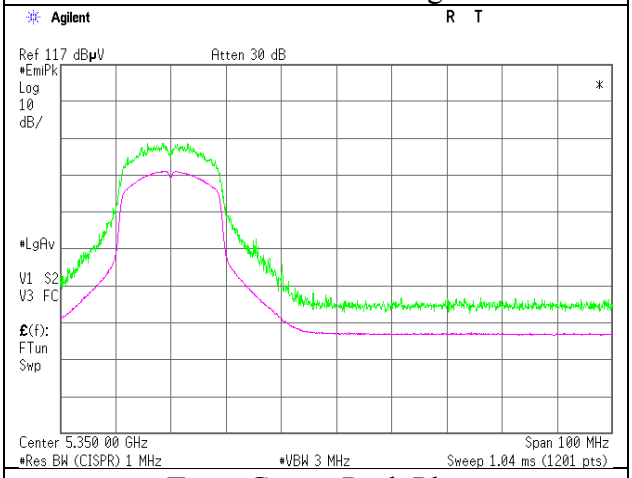
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

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

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11624584H	
Date	April 19, 2017	April 21, 2017
Temperature / Humidity	23deg. C / 50 % RH	23deg. C / 42 % RH
Engineer	Masafumi Niwa	Ken Fujita
	(1 GHz - 10 GHz)	(10 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	5470.000	PK	49.8	31.2	7.3	31.3	-	57.0	73.9	16.9	
Hori	11000.000	PK	44.4	40.9	-2.5	33.8	-	49.0	73.9	24.9	
Hori	16500.000	PK	45.4	40.3	-1.2	32.9	-	51.6	73.9	22.3	Floor noise
Hori	22000.000	PK	45.6	39.3	0.2	32.3	-	52.8	73.9	21.1	Floor noise
Hori	5470.000	AV	34.7	31.2	7.3	31.3	0.6	42.5	53.9	11.4	*1)
Hori	11000.000	AV	38.7	40.9	-2.5	33.8	0.6	43.9	53.9	10.0	
Hori	16500.000	AV	37.6	40.3	-1.2	32.9	-	43.8	53.9	10.1	Floor noise
Hori	22000.000	AV	35.7	39.3	0.2	32.3	-	42.9	53.9	11.0	Floor noise
Vert	5470.000	PK	48.3	31.2	7.3	31.3	-	55.5	73.9	18.4	
Vert	11000.000	PK	49.8	40.9	-2.5	33.8	-	54.4	73.9	19.5	
Vert	16500.000	PK	45.8	40.3	-1.2	32.9	-	52.0	73.9	21.9	
Vert	22000.000	PK	45.3	39.3	0.2	32.3	-	52.5	73.9	21.4	
Vert	5470.000	AV	34.2	31.2	7.3	31.3	0.6	42.0	53.9	11.9	*1)
Vert	11000.000	AV	42.3	40.9	-2.5	33.8	0.6	47.5	53.9	6.4	
Vert	16500.000	AV	36.5	40.3	-1.2	32.9	0.6	43.3	53.9	10.6	
Vert	22000.000	AV	35.5	39.3	0.2	32.3	0.6	43.3	53.9	10.6	

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).

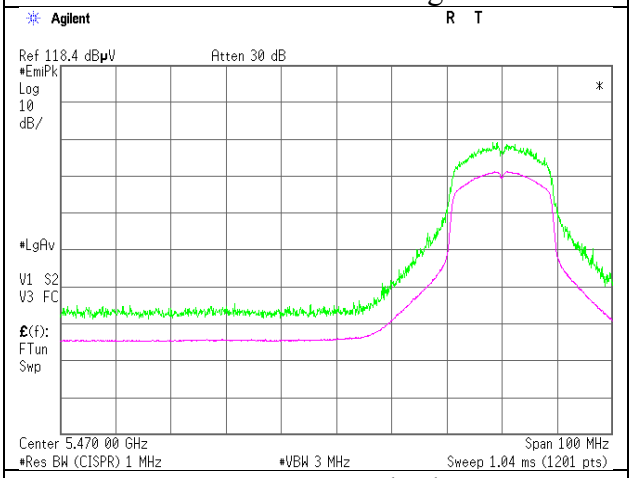
Distance factor: 1 GHz - 10 GHz 20log (4.3 m / 3.0 m) = 3.13 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11624584H
Date	April 19, 2017
Temperature / Humidity	23deg. C / 50 % RH
Engineer	Masafumi Niwa
Mode	Tx 11n-20 5500 MHz

Horizontal

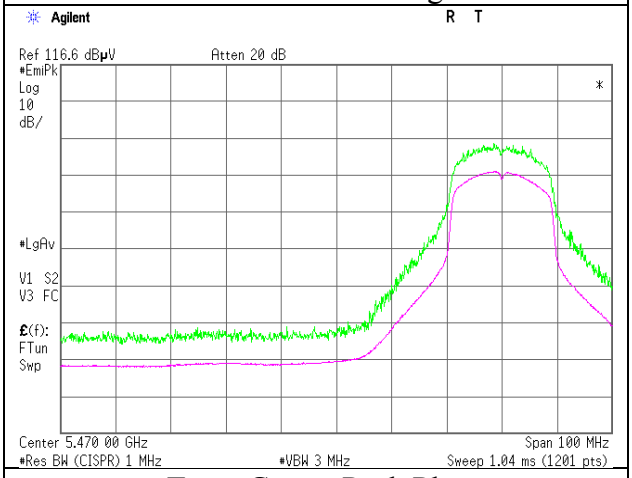
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

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

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11624584H	
Date	April 19, 2017	April 21, 2017
Temperature / Humidity	23deg. C / 50 % RH	23deg. C / 42 % RH
Engineer	Masafumi Niwa	Ken Fujita
	(1 GHz - 10 GHz)	(10 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	42.1	40.5	-2.5	33.7	-	46.4	73.9	27.5	Floor noise
Hori	16740.000	PK	45.1	40.9	-1.1	32.8	-	52.1	73.9	21.8	Floor noise
Hori	22320.000	PK	45.2	39.8	0.3	31.9	-	53.4	73.9	20.5	Floor noise
Hori	11160.000	AV	33.6	40.5	-2.5	33.7	-	37.9	53.9	16.0	Floor noise
Hori	16740.000	AV	37.1	40.9	-1.1	32.8	-	44.1	53.9	9.8	Floor noise
Hori	22320.000	AV	35.5	39.8	0.3	31.9	-	43.7	53.9	10.2	Floor noise
Vert	11160.000	PK	44.4	40.5	-2.5	33.7	-	48.7	73.9	25.2	
Vert	16740.000	PK	45.3	40.9	-1.1	32.8	-	52.3	73.9	21.6	
Vert	22320.000	PK	45.2	39.8	0.3	31.9	-	53.4	73.9	20.5	Floor noise
Vert	11160.000	AV	36.5	40.5	-2.5	33.7	-	40.8	53.9	13.1	Floor noise
Vert	16740.000	AV	36.2	40.9	-1.1	32.8	-	43.2	53.9	10.7	Floor noise
Vert	22320.000	AV	35.4	39.8	0.3	31.9	-	43.6	53.9	10.3	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.3 m / 3.0 m) = 3.13 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11624584H	
Date	April 19, 2017	April 21, 2017
Temperature / Humidity	23deg. C / 50 % RH	23deg. C / 42 % RH
Engineer	Masafumi Niwa	Ken Fujita
	(1 GHz - 10 GHz)	(10 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	3799.954	PK	48.3	28.9	6.6	31.8	-	52.0	73.9	21.9	
Hori	5725.000	PK	51.3	31.4	7.4	31.4	-	58.7	73.9	15.2	
Hori	11400.000	PK	43.3	40.5	-2.5	33.7	-	47.6	73.9	26.3	Floor noise
Hori	17100.000	PK	45.2	40.9	-1.1	32.8	-	52.2	73.9	21.7	Floor noise
Hori	22800.000	PK	45.4	40.4	0.3	31.5	-	54.6	73.9	19.3	Floor noise
Hori	3799.954	AV	44.3	28.9	6.6	31.8	0.6	48.6	53.9	5.3	
Hori	5725.000	AV	39.1	31.4	7.4	31.4	0.6	47.1	53.9	6.8	*1)
Hori	11400.000	AV	33.5	40.5	-2.5	33.7	-	37.8	53.9	16.1	Floor noise
Hori	17100.000	AV	37.4	40.9	-1.1	32.8	-	44.4	53.9	9.5	Floor noise
Hori	22800.000	AV	35.3	40.4	0.3	31.5	-	44.5	53.9	9.4	Floor noise
Vert	3799.954	PK	46.9	28.9	6.6	31.8	-	50.6	73.9	23.3	
Vert	5725.000	PK	53.0	31.4	7.4	31.4	-	60.4	73.9	13.5	
Vert	11400.000	PK	44.9	40.5	-2.5	33.7	-	49.2	73.9	24.7	
Vert	17100.000	PK	45.2	40.9	-1.1	32.8	-	52.2	73.9	21.7	Floor noise
Vert	22800.000	PK	45.7	40.4	0.3	31.5	-	54.9	73.9	19.0	Floor noise
Vert	3799.954	AV	42.7	28.9	6.6	31.8	0.6	47.0	53.9	6.9	
Vert	5725.000	AV	39.6	31.4	7.4	31.4	0.6	47.6	53.9	6.3	*1)
Vert	11400.000	AV	35.9	40.5	-2.5	33.7	0.6	40.8	53.9	13.1	
Vert	17100.000	AV	36.2	40.9	-1.1	32.8	-	43.2	53.9	10.7	Floor noise
Vert	22800.000	AV	35.4	40.4	0.3	31.5	-	44.6	53.9	9.3	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 (4.3 m / 3.0 m) = 3.13 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

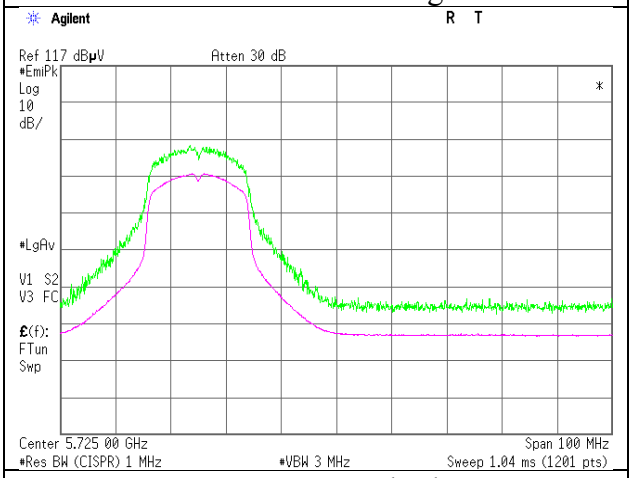
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11624584H
Date	April 19, 2017
Temperature / Humidity	23deg. C / 50 % RH
Engineer	Masafumi Niwa
Mode	Tx 11n-20 5700 MHz

Horizontal

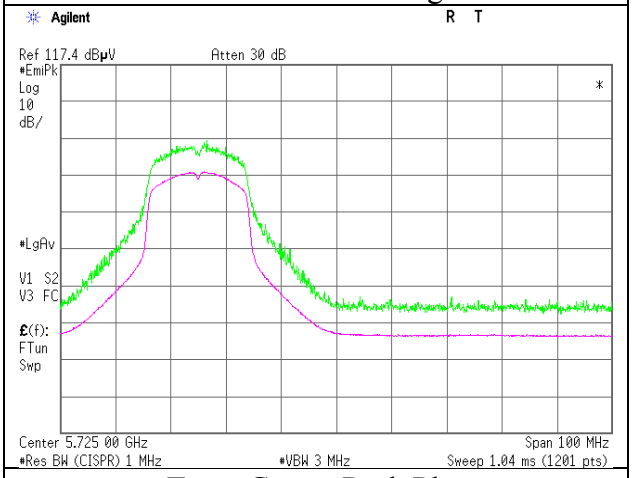
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

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

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11624584H	
Date	April 19, 2017	April 21, 2017
Temperature / Humidity	23deg. C / 50 % RH	23deg. C / 42 % RH
Engineer	Masafumi Niwa	Ken Fujita
	(1 GHz - 10 GHz)	(10 GHz - 40 GHz)
Mode	Tx 11n-40 5190 MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5150.000	PK	55.7	31.5	7.1	31.3	-	63.0	73.9	10.9	
Hori	10380.000	PK	47.3	39.5	-2.7	34.3	-	49.8	73.9	24.1	
Hori	15570.000	PK	45.2	40.2	-1.4	33.0	-	51.0	73.9	22.9	
Hori	20760.000	PK	45.1	39.6	-0.3	32.7	-	51.7	73.9	22.2	
Hori	5150.000	AV	41.9	31.5	7.1	31.3	1.2	50.4	53.9	3.5	*1),*2)
Hori	10380.000	AV	41.8	39.5	-2.7	34.3	1.2	45.5	53.9	8.4	
Hori	15570.000	AV	37.0	40.2	-1.4	33.0	1.2	44.0	53.9	9.9	
Hori	20760.000	AV	35.4	39.6	-0.3	32.7	1.2	43.2	53.9	10.7	
Vert	5150.000	PK	58.3	31.5	7.1	31.3	-	65.6	73.9	8.3	
Vert	10380.000	PK	49.8	39.5	-2.7	34.3	-	52.3	73.9	21.6	
Vert	15570.000	PK	45.8	40.2	-1.4	33.0	-	51.6	73.9	22.3	
Vert	20760.000	PK	45.2	39.6	-0.3	32.7	-	51.8	73.9	22.1	
Vert	5150.000	AV	43.4	31.5	7.1	31.3	1.2	51.9	53.9	2.0	*1),*2)
Vert	10380.000	AV	42.1	39.5	-2.7	34.3	1.2	45.8	53.9	8.1	
Vert	15570.000	AV	36.8	40.2	-1.4	33.0	1.2	43.8	53.9	10.1	
Vert	20760.000	AV	35.3	39.6	-0.3	32.7	1.2	43.1	53.9	10.8	

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 (4.3 m / 3.0 m) = 3.13 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

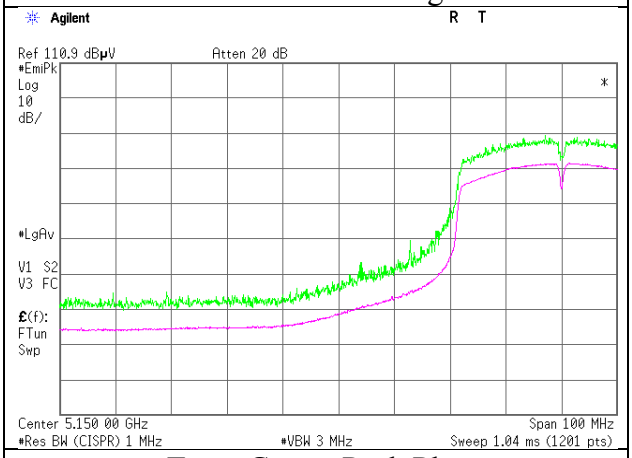
*2) Integration method

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11624584H
Date	April 19, 2017
Temperature / Humidity	23deg. C / 50 % RH
Engineer	Masafumi Niwa
Mode	Tx 11n-40 5190 MHz

Horizontal

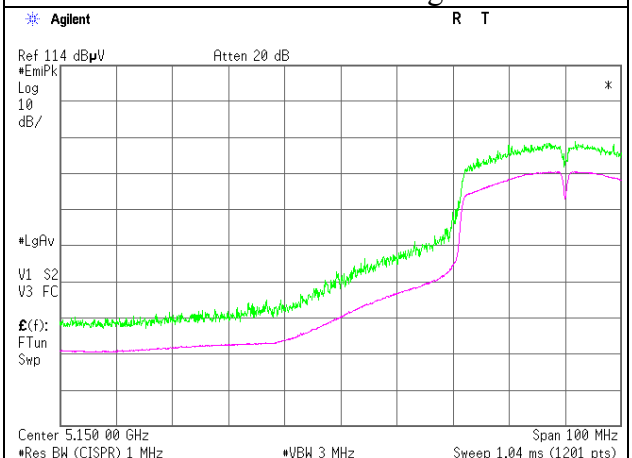
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

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

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11624584H	
Date	April 19, 2017	April 21, 2017
Temperature / Humidity	23deg. C / 50 % RH	23deg. C / 42 % RH
Engineer	Masafumi Niwa	Ken Fujita
	(1 GHz - 10 GHz)	(10 GHz - 40 GHz)
Mode	Tx 11n-40 5230 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	10460.000	PK	45.2	40.0	-2.7	34.1	-	48.4	73.9	25.5	
Hori	15690.000	PK	44.9	39.5	-1.4	33.1	-	49.9	73.9	24.0	Floor noise
Hori	20920.000	PK	45.5	39.6	-0.2	32.6	-	52.3	73.9	21.6	Floor noise
Hori	10460.000	AV	36.7	40.0	-2.7	34.1	1.2	41.1	53.9	12.8	
Hori	15690.000	AV	37.0	39.5	-1.4	33.1	-	42.0	53.9	11.9	Floor noise
Hori	20920.000	AV	35.3	39.6	-0.2	32.6	-	42.1	53.9	11.8	Floor noise
Vert	10460.000	PK	47.9	40.0	-2.7	34.1	-	51.1	73.9	22.8	
Vert	15690.000	PK	45.7	39.5	-1.4	33.1	-	50.7	73.9	23.2	Floor noise
Vert	20920.000	PK	45.5	39.6	-0.2	32.6	-	52.3	73.9	21.6	Floor noise
Vert	10460.000	AV	41.9	40.0	-2.7	34.1	1.2	46.3	53.9	7.6	
Vert	15690.000	AV	36.6	39.5	-1.4	33.1	-	41.6	53.9	12.3	Floor noise
Vert	20920.000	AV	35.1	39.6	-0.2	32.6	-	41.9	53.9	12.0	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 (4.3 m / 3.0 m) = 3.13 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11624584H	
Date	April 19, 2017	April 21, 2017
Temperature / Humidity	23deg. C / 50 % RH	23deg. C / 42 % RH
Engineer	Masafumi Niwa	Ken Fujita
	(1 GHz - 10 GHz)	(10 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	59.8	31.3	7.2	31.3	-	67.0	73.9	6.9	
Hori	10620.000	PK	45.4	40.2	-2.6	34.1	-	48.9	73.9	25.0	
Hori	15930.000	PK	45.4	39.1	-1.4	33.2	-	49.9	73.9	24.0	Floor noise
Hori	21240.000	PK	45.6	39.6	-0.1	32.6	-	52.5	73.9	21.4	Floor noise
Hori	5350.000	AV	43.9	31.3	7.2	31.3	1.2	52.3	53.9	1.6	*1),*2)
Hori	10620.000	AV	36.7	40.2	-2.6	34.1	1.2	41.4	53.9	12.5	
Hori	15930.000	AV	37.4	39.1	-1.4	33.2	-	41.9	53.9	12.0	Floor noise
Hori	21240.000	AV	35.5	39.6	-0.1	32.6	-	42.4	53.9	11.5	Floor noise
Vert	5350.000	PK	58.6	31.3	7.2	31.3	-	65.8	73.9	8.1	
Vert	10620.000	PK	48.8	40.2	-2.6	34.1	-	52.3	73.9	21.6	
Vert	15930.000	PK	45.5	39.1	-1.4	33.2	-	50.0	73.9	23.9	Floor noise
Vert	21240.000	PK	45.4	39.6	-0.1	32.6	-	52.3	73.9	21.6	Floor noise
Vert	5350.000	AV	43.2	31.3	7.2	31.3	1.2	51.6	53.9	2.3	*1),*2)
Vert	10620.000	AV	41.8	40.2	-2.6	34.1	1.2	46.5	53.9	7.4	
Vert	15930.000	AV	36.9	39.1	-1.4	33.2	-	41.4	53.9	12.5	Floor noise
Vert	21240.000	AV	35.5	39.6	-0.1	32.6	-	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 20log (4.3 m / 3.0 m) = 3.13 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

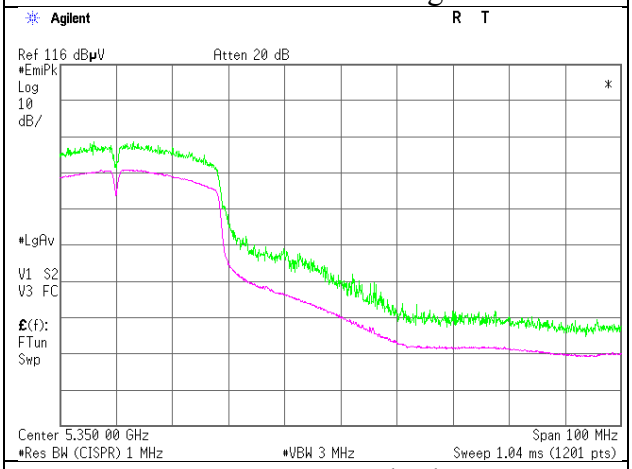
*2) Integration method

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11624584H
Date	April 19, 2017
Temperature / Humidity	23deg. C / 50 % RH
Engineer	Masafumi Niwa
Mode	Tx 11n-40 5310 MHz

Horizontal

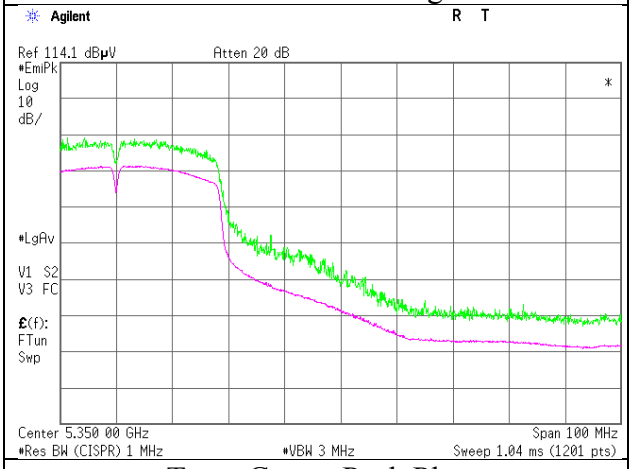
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

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

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11624584H	
Date	April 19, 2017	April 21, 2017
Temperature / Humidity	23deg. C / 50 % RH	23deg. C / 42 % RH
Engineer	Masafumi Niwa	Ken Fujita
	(1 GHz - 10 GHz)	(10 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	5470.000	PK	60.8	31.2	7.3	31.3	-	68.0	73.9	5.9	
Hori	11020.000	PK	45.7	40.8	-2.5	33.8	-	50.2	73.9	23.7	
Hori	16530.000	PK	45.4	40.3	-1.2	32.9	-	51.6	73.9	22.3	Floor noise
Hori	22040.000	PK	45.8	39.4	0.2	32.2	-	53.2	73.9	20.7	Floor noise
Hori	5470.000	AV	45.1	31.2	7.3	31.3	1.2	53.5	53.9	0.4	*1),*2)
Hori	11020.000	AV	36.9	40.8	-2.5	33.8	1.2	42.6	53.9	11.3	
Hori	16530.000	AV	37.4	40.3	-1.2	32.9	-	43.6	53.9	10.3	Floor noise
Hori	22040.000	AV	35.6	39.4	0.2	32.2	-	43.0	53.9	10.9	Floor noise
Vert	5470.000	PK	58.0	31.2	7.3	31.3	-	65.2	73.9	8.7	
Vert	11020.000	PK	47.2	40.8	-2.5	33.8	-	51.7	73.9	22.2	
Vert	16530.000	PK	45.1	40.3	-1.2	32.9	-	51.3	73.9	22.6	Floor noise
Vert	22040.000	PK	45.7	39.4	0.2	32.2	-	53.1	73.9	20.8	Floor noise
Vert	5470.000	AV	43.3	31.2	7.3	31.3	1.2	51.7	53.9	2.2	*1),*2)
Vert	11020.000	AV	41.2	40.8	-2.5	33.8	1.2	46.9	53.9	7.0	
Vert	16530.000	AV	37.3	40.3	-1.2	32.9	-	43.5	53.9	10.4	Floor noise
Vert	22040.000	AV	35.4	39.4	0.2	32.2	-	42.8	53.9	11.1	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 (4.3 m / 3.0 m) = 3.13 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

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

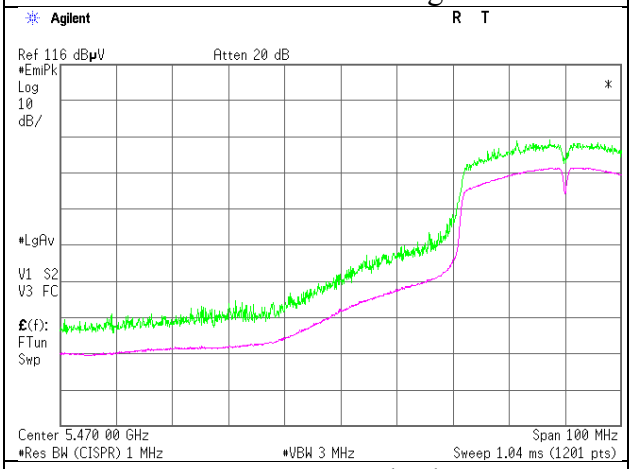
*2) Integration method

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11624584H
Date	April 19, 2017
Temperature / Humidity	23deg. C / 50 % RH
Engineer	Masafumi Niwa
Mode	Tx 11n-40 5510 MHz

Horizontal

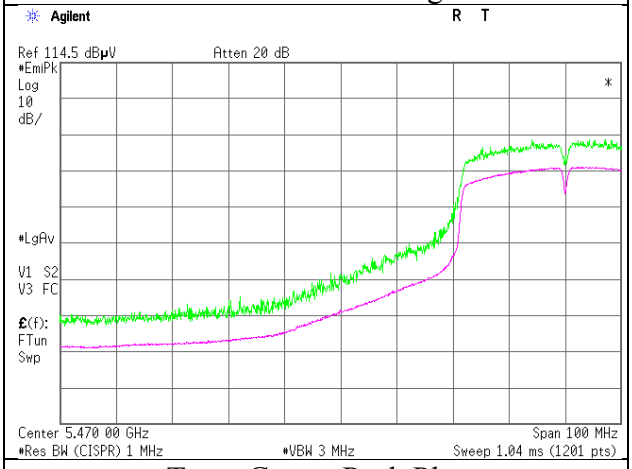
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

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

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11624584H	
Date	April 19, 2017	April 21, 2017
Temperature / Humidity	23deg. C / 50 % RH	23deg. C / 42 % RH
Engineer	Masafumi Niwa	Ken Fujita
	(1 GHz-10 GHz)	(1 GHz-10 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	45.3	40.7	-2.5	33.8	-	49.7	73.9	24.2	Floor noise
Hori	16650.000	PK	45.2	40.6	-1.1	32.8	-	51.9	73.9	22.0	Floor noise
Hori	22200.000	PK	45.7	39.6	0.2	32.1	-	53.4	73.9	20.5	Floor noise
Hori	11100.000	AV	37.0	40.7	-2.5	33.8	-	41.4	53.9	12.5	Floor noise
Hori	16650.000	AV	37.2	40.6	-1.1	32.8	-	43.9	53.9	10.0	Floor noise
Hori	22200.000	AV	35.5	39.6	0.2	32.1	-	43.2	53.9	10.7	Floor noise
Vert	11100.000	PK	45.4	40.7	-2.5	33.8	-	49.8	73.9	24.1	Floor noise
Vert	16650.000	PK	45.2	40.6	-1.1	32.8	-	51.9	73.9	22.0	Floor noise
Vert	22200.000	PK	45.5	39.6	0.2	32.1	-	53.2	73.9	20.7	Floor noise
Vert	11100.000	AV	37.3	40.7	-2.5	33.8	-	41.7	53.9	12.2	Floor noise
Vert	16650.000	AV	37.5	40.6	-1.1	32.8	-	44.2	53.9	9.7	Floor noise
Vert	22200.000	AV	35.3	39.6	0.2	32.1	-	43.0	53.9	10.9	Floor noise

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 1 GHz - 10 GHz 20log (4.3 m / 3.0 m) = 3.13 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	11624584H	
Date	April 19, 2017	April 21, 2017
Temperature / Humidity	23deg. C / 50 % RH	23deg. C / 42 % RH
Engineer	Masafumi Niwa	Ken Fujita
	(1 GHz - 10 GHz)	(10 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	3780.027	PK	47.5	28.9	6.6	31.8	-	51.2	73.9	22.7	
Hori	5725.000	PK	47.2	31.4	7.4	31.4	-	54.6	73.9	19.3	
Hori	11340.000	PK	45.0	40.4	-2.5	33.7	-	49.2	73.9	24.7	Floor noise
Hori	17010.000	PK	45.1	41.1	-1.1	32.7	-	52.4	73.9	21.5	Floor noise
Hori	22680.000	PK	45.9	39.9	0.3	31.8	-	54.3	73.9	19.6	Floor noise
Hori	3780.027	AV	42.1	28.9	6.6	31.8	1.2	47.0	53.9	6.9	
Hori	5725.000	AV	34.9	31.4	7.4	31.4	1.2	43.5	53.9	10.4	*1)
Hori	11340.000	AV	35.2	40.4	-2.5	33.7	-	39.4	53.9	14.5	Floor noise
Hori	17010.000	AV	37.1	41.1	-1.1	32.7	-	44.4	53.9	9.5	Floor noise
Hori	22680.000	AV	35.7	39.9	0.3	31.8	-	44.1	53.9	9.8	Floor noise
Vert	3780.027	PK	45.7	28.9	6.6	31.8	-	49.4	73.9	24.5	
Vert	5725.000	PK	47.7	31.4	7.4	31.4	-	55.1	73.9	18.8	
Vert	11340.000	PK	44.2	40.4	-2.5	33.7	-	48.4	73.9	25.5	Floor noise
Vert	17010.000	PK	45.4	41.1	-1.1	32.7	-	52.7	73.9	21.2	Floor noise
Vert	22680.000	PK	45.7	39.9	0.3	31.8	-	54.1	73.9	19.8	Floor noise
Vert	3780.027	AV	40.2	28.9	6.6	31.8	1.2	45.1	53.9	8.8	
Vert	5725.000	AV	35.8	31.4	7.4	31.4	1.2	44.4	53.9	9.5	*1)
Vert	11340.000	AV	36.8	40.4	-2.5	33.7	-	41.0	53.9	12.9	Floor noise
Vert	17010.000	AV	37.7	41.1	-1.1	32.7	-	45.0	53.9	8.9	Floor noise
Vert	22680.000	AV	35.4	39.9	0.3	31.8	-	43.8	53.9	10.1	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 (4.3 m / 3.0 m) = 3.13 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

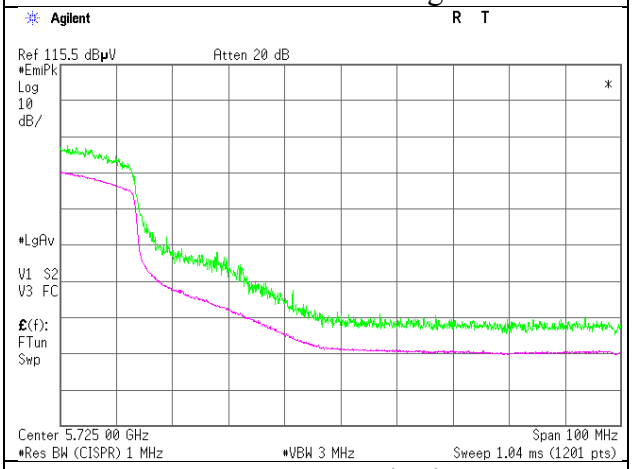
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	11624584H
Date	April 19, 2017
Temperature / Humidity	23deg. C / 50 % RH
Engineer	Masafumi Niwa
Mode	Tx 11n-40 5670 MHz

Horizontal

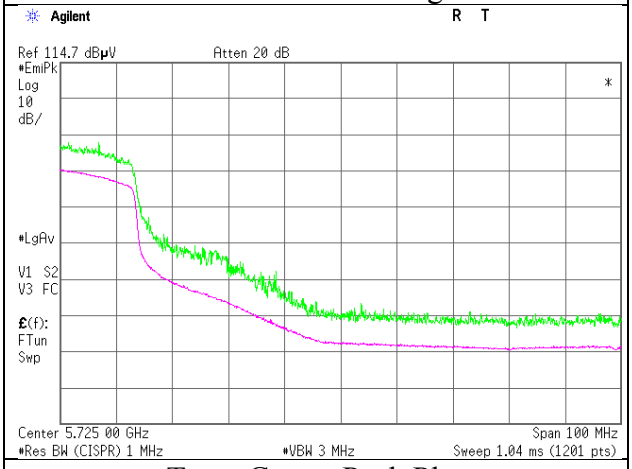
Restricted-band band-edge Plot



Trace Green: Peak Plot
Trace Purple: Average Plot

Vertical

Restricted-band band-edge Plot

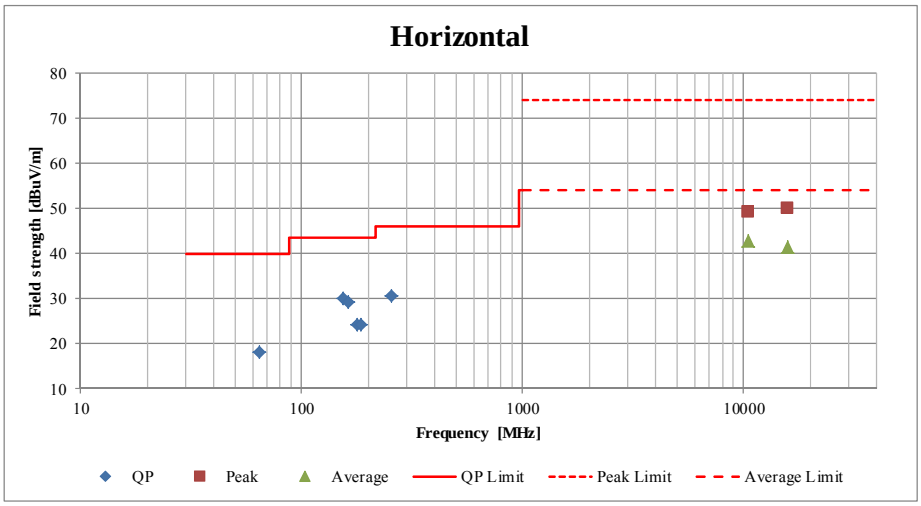


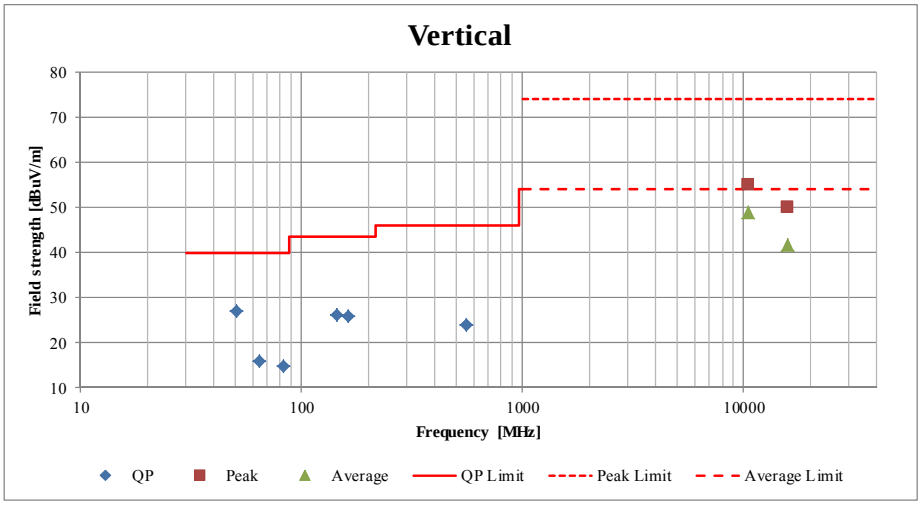
Trace Green: Peak Plot
Trace Purple: Average Plot

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

Radiated Spurious Emission
(Plot data, Worst case)

Report No.	11624584H		
Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.4
Date	April 19, 2017	April 21, 2017	April 22, 2017
Temperature / Humidity	23deg. C / 50 % RH	23deg. C / 42 % RH	21 deg. C / 41 % RH
Engineer	Masafumi Niwa	Ken Fujita	Tomoki Matsui
	(1 GHz - 10 GHz)	(10 GHz - 40 GHz)	(Below 1GHz)
Mode	Tx 11n-20 5240 MHz		



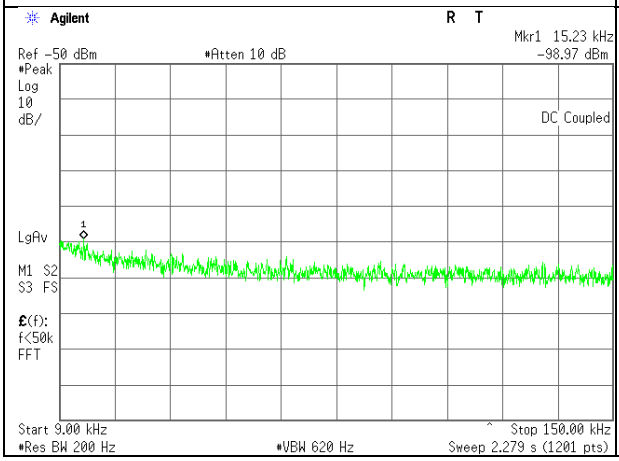


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

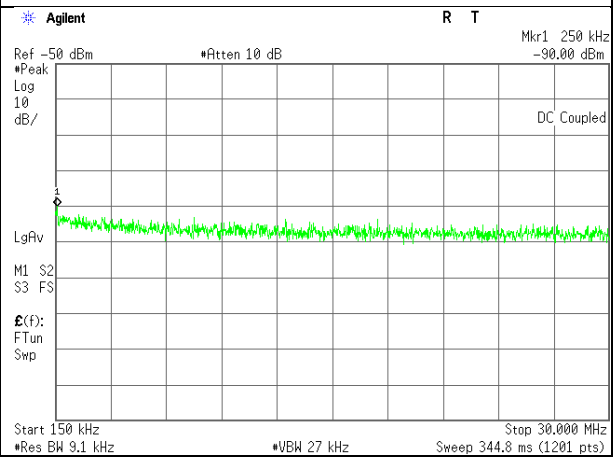
Conducted Spurious Emission

Test place	Ise EMC Lab. No.6 Measurement Room
Report No.	11624584H
Date	May 19, 2017
Temperature / Humidity	23deg. C / 42 % RH
Engineer	Ken Fujita
Mode	Tx 11n-20 5240 MHz

9 kHz-150 kHz



150 kHz-30 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
15.23	-99.0	0.81	10.0	2.6	1	-85.6	300	6.0	-24.3	43.9	68.2	
250.00	-90.0	0.81	10.0	2.6	1	-76.6	300	6.0	-15.3	19.6	34.9	

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

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

N: Number of output

APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MPM-16	Power Meter	Agilent	8990B	MY51000271	AT	2017/04/28 * 12
MPSE-23	Power sensor	Agilent	N1923A	MY54070004	AT	2017/04/28 * 12
MAT-90	Attenuator	Weinschel Associates	WA56-10	56100306	AT	2016/06/09 * 12
MOS-29	Thermo-Hygrometer	Custom	CTH-201	2901	AT	2017/01/20 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2016/10/20 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE	2017/01/20 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	
MSA-16	Spectrum Analyzer	Agilent	E4440A	MY46186390	RE	2017/02/21 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2016/05/29 * 12
MCC-167	Microwave Cable	Junkosha	MWX221	1404S374(1m) / 1405S074(5m)	RE	2016/05/20 * 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
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2016/10/19 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	1501	RE	2017/01/20 * 12
MJM-26	Measure	KOMELON	KMC-36	-	RE	-
MTR-10	EMI Test Receiver	Rohde & Schwarz	ESR26	101408	RE	2017/01/12 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2016/11/23 * 12
MLA-23	Logperiodic Antenna(200-1000MHz)	Schwarzbeck	VUSLP9111B	911B-192	RE	2017/01/26 * 12
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2016/06/20 * 12
MAT-97	Attenuator	KEYSIGHT	8491A	MY52462282	RE	2016/10/31 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2017/03/27 * 12
MMM-10	DIGITAL HiTESTER	Hioki	3805	051201148	RE	2017/01/19 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	CE	2016/08/02 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	CE	2016/12/13 * 12
MJM-14	Measure	KOMELON	KMC-36	-	CE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	CE	2016/11/10 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	CE	2016/10/21 * 12
MLS-23	LISN(AMN)	Schwarzbeck	NSLK8127	8127-729	CE	2016/07/07 * 12
MCC-13	Coaxial Cable	Fujikura	3D-2W(12m)/ 5D-2W(5m)/ 5D-2W(0.8m)/ 5D-2W(1m)	-	CE	2017/02/24 * 12
MAT-65	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2016/12/21 * 12
MMM-01	Digital Tester	Fluke	FLUKE 26-3	78030611	CE	2016/08/23 * 12
MJG-52	Extension Tap EU	UL Japan			CE	-
MSA-14	Spectrum Analyzer	Agilent	E4440A	MY48250080	RE	2016/10/14 * 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	2016/10/03 * 12
MHA-29	Horn Antenna 26.5-40GHz	ETS LINDGREN	Oct-60	152399	RE	2016/09/28 * 12
MPA-22	Pre Amplifier	MITEQ, Inc	AMF-6F-2600400-33-8P / AMF-4F-2600400-33-8P	1871355 /1871328	RE	2016/09/06 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE/AT	2016/08/17 * 12
MOS-19	Thermo-Hygrometer	Custom	CTH-201	1	AT	2016/12/13 * 12
MPSE-22	Power sensor	Agilent	N1923A	MY54070003	AT	2017/04/28 * 12
MCC-173	Microwave Cable	Junkosha	MWX221	1409S496	AT	2017/03/13 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2017/03/21 * 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