



RADIO TEST REPORT

Test Report No. : 12486805H-A-R2

Applicant : Panasonic Corporation of North America
Type of Equipment : Wireless LAN Module
Model No. : WJ-VR3004
FCC ID : ACJ9TAWJ-VR3004
Test regulation : FCC Part 15 Subpart C: 2018
For Permissive change
(Radiated Spurious Emission tests only)
Test Result : Complied

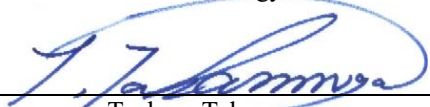
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3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
6. The all test items in this test report are conducted by UL Japan, Inc. Ise EMC Lab.
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8. This report is a revised version of 12486805H-A-R1. 12486805H-A-R1 is replaced with this report.

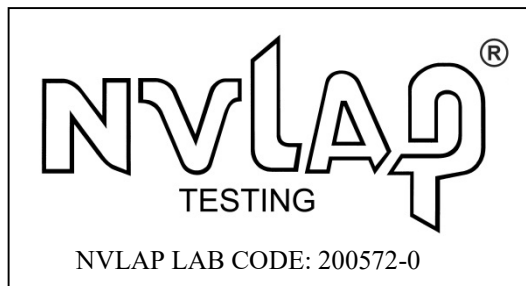
Date of test: September 18 to 27, 2018

Representative test engineer:


Takafumi Noguchi
Engineer
Consumer Technology Division

Approved by:


Tsubasa Takayama
Leader
Consumer Technology Division



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☒ There is no testing item of "Non-accreditation".

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 12486805H-A

[illegible]

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SECTION 1: Customer information

Company Name : Panasonic Corporation*
Address : 1-62, 4-chome, Minoshima, Hakata-ku, Fukuoka 812-853 Japan
Telephone Number : +81-50-3380-1993
Facsimile Number : +81-50-3380-2002
Contact Person : Koji Yamasaki

* Panasonic Corporation is on behalf of the applicant: Panasonic Corporation of North America.

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

2.1 Identification of E.U.T.

Type of Equipment : Wireless LAN Module
Model No. : WJ-VR3004
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC10.5 V
Receipt Date of Sample : September 14, 2018
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: WJ-VR3004 (referred to as the EUT in this report) is a Wireless LAN Module.

General Specification

Clock frequency(ies) in the system : 32.768 kHz, 38.4 MHz

Radio Specification

[WLAN (IEEE802.11a/b/g/n-20)]

Equipment Type	Transceiver	
Frequency of Operation	2412 MHz - 2462 MHz *1)	W53: 5280 MHz – 5320 MHz W58: 5745 MHz – 5825 MHz
Type of Modulation	DSSS, OFDM	OFDM
Antenna Type	Dual (Pattern)	
Antenna connector type	Module side: Rectangular Coaxial Connector (SMT) Antenna side: RP-SMA	
Antenna Gain with cable loss	3.9145 dBi (2.4 GHz)	0.24 dBi (5 GHz)

[WLAN (IEEE802.11n-40)]

Equipment Type	Transceiver	
Frequency of Operation	2422 MHz – 2452 MHz *1)	W53: 5310 MHz W58: 5755 MHz – 5795 MHz
Type of Modulation	OFDM	OFDM
Antenna Type	Dual (Pattern)	
Antenna connector type	Module side: Rectangular Coaxial Connector (SMT) Antenna side: RP-SMA	
Antenna Gain with cable loss	3.9145 dBi (2.4 GHz)	0.24 dBi (5 GHz)

*1) This test report applies to Wireless LAN (2.4 GHz Band).

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on March 12, 2018 and effective April 11, 2018

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.247 Operation within the bands 902-928MHz,
2400-2483.5MHz, and 5725-5850MHz

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Spurious Emission Restricted Band Edges	FCC: KDB 558074 D01 15.247 Meas Guidance v05	FCC: Section15.247(d)	14.3 dB 45.977 MHz, , OP, Vert.	Complied	Conducted (below 30 MHz)/ Radiated (above 30 MHz) *1)
	IC: RSS-Gen 6.13	IC: RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10			
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422. *1) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 15.247 Meas Guidance v05 8.5 and 8.6.					
Symbols: Complied The data of this test item has enough margin, more than the measurement uncertainty. Complied# The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.					

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

FCC 15.31 (e)

The RF Module has its own regulator.

The RF Module is constantly provided voltage through the regulator regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

The EUT has a unique coupling/antenna connector (Module side: Rectangular Coaxial Connector (SMT), Antenna side: RP-SMA). Therefore the equipment complies with the requirement of 15.203/212.

3.3 Addition to standard

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 $k=2$.

Radiated emission

Measurement distance	Frequency range	Uncertainty (+/-)
3 m	9 kHz to 30 MHz	3.3 dB
10 m		3.2 dB
3 m	30 MHz to 200 MHz (Horizontal) (Vertical)	4.8 dB
		5.0 dB
	200 MHz to 1000 MHz (Horizontal) (Vertical)	5.2 dB
		6.3 dB
10 m	30 MHz to 200 MHz (Horizontal) (Vertical)	4.8 dB
		4.9 dB
	200 MHz to 1000 MHz (Horizontal) (Vertical)	5.0 dB
		5.0 dB
3 m	1 GHz to 6 GHz	5.0 dB
	6 GHz to 18 GHz	5.3 dB
1 m	10 GHz to 26.5 GHz	5.8 dB
	26.5 GHz to 40 GHz	5.8 dB
10 m	1 GHz to 18 GHz	5.2 dB

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 m x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

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SECTION 4: Operation of 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 802.11b (11b)	11 Mbps, PN9
IEEE 802.11g (11g)	6 Mbps, PN9
IEEE 802.11n MIMO 20MHz BW (11n-20)	MCS 13, PN9
IEEE 802.11n MIMO 40MHz BW (11n-40)	MCS 11, PN9
*The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel)	
*Power of the EUT was set by the software as follows; - Power settings: 12 dBm - Software: Dut Wlan BT Labtool Version 1.0.8.1.6 *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.	

*Details of Operating mode(s):

Test Item	Operating Mode	Antenna	Tested frequency
Spurious Emission below 1GHz (Radiated)	11n-40 *1)	A+B	2437MHz
Spurious Emission above 1GHz (Radiated)	11b Tx	B	2412MHz
	11n-20 Tx *2)	A+B	2437MHz
			2462MHz
	11n-40 Tx	A+B	2422MHz
			2437MHz
			2452MHz
*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 peak output power.			

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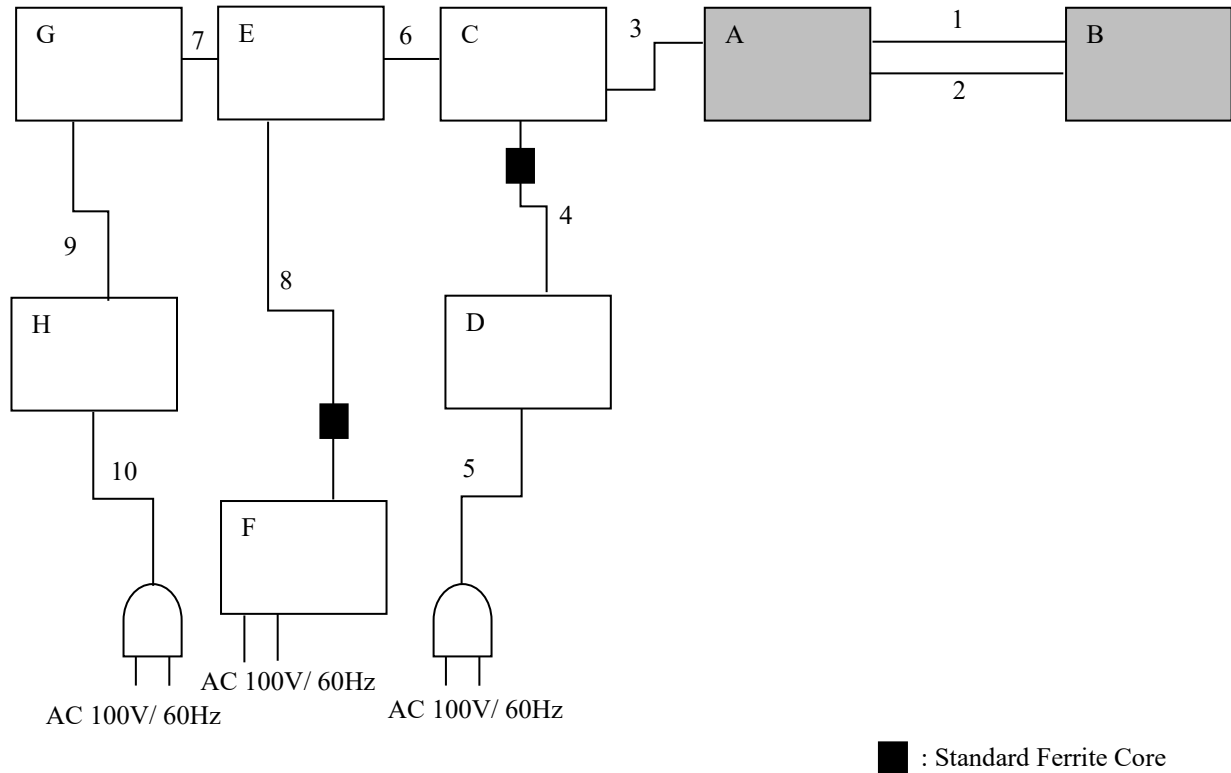
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4.2 Configuration and peripherals



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless LAN Module	WJ-VR3004	PJA00186	Panasonic	EUT
B	Double Wi-Fi Antenna	AP-PAN-WW-Q-S22-RP-BL-18 (ARB-APWWQS22-RP-BL)	-	Airgain, Inc. (Panasonic)	EUT
C	Laptop PC	CF-31	OJSA31800	Panasonic	-
D	AC Adaptor	CF-AA1653A	04209776B	Panasonic	-
E	Switching Hub	CG-SW05GTPLW	1077580071100385	Corega	-
F	AC Adaptor	MU10-4033200A-1	-	Corega	-
G	Laptop PC	ProBook 6560b	-	HP	-
H	AC Adaptor	PPP009L-E	WBGST0A4LZTT08	HP	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Antenna Cable	5.5	Shielded	Shielded	-
2	Antenna Cable	5.5	Shielded	Shielded	-
3	USB Cable	3.0	Shielded	Shielded	-
4	DC Cable	2.0	Unshielded	Unshielded	-
5	AC Cable	2.0	Unshielded	Unshielded	-
6	LAN Cable	1.0	Unshielded	Unshielded	-
7	LAN Cable	2.0	Unshielded	Unshielded	-
8	DC Cable	2.0	Unshielded	Unshielded	-
9	DC Cable	2.0	Unshielded	Unshielded	-
10	AC Cable	2.0	Unshielded	Unshielded	-

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SECTION 5: Radiated Spurious Emission

Test Procedure

It was measured based on "8.5 and 8.6 of KDB 558074 D01 15.247 Meas Guidance v05".

[For below 1 GHz]

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.

[For above 1 GHz]

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.

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

In any 100 kHz bandwidth outside the restricted band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

20 dBc was applied to the frequency over the limit of FCC 15.209 / Table 4 of RSS-Gen 8.9(IC) and outside the restricted band of FCC15.205 / Table 6 of RSS-Gen 8.10 (IC).

Frequency	Below 1 GHz	Above 1 GHz		20 dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV *1)	PK
IF Bandwidth	BW 120 kHz	RBW: 1 MHz VBW: 3 MHz	11.12.2.5.1 RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: 100 traces 11.12.2.5.2 The duty cycle was less than 98% for detected noise, a duty factor was added to the 11.12.2.5.1 results.	RBW: 100 kHz VBW: 300kHz

*1) Average Power Measurement was performed based on ANSI C63.10-2013.

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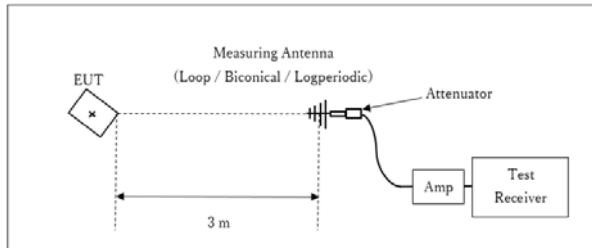
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Figure 1: Test Setup

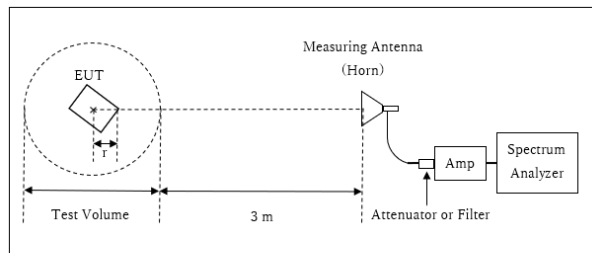
Below 1 GHz



x : Center of turn table

Test Distance: 3 m

1 GHz - 10 GHz



r : Radius of an outer periphery of EUT

x : Center of turn table

Distance Factor: $20 \times \log (4 \text{ m} / 3.0 \text{ m}) = 2.5 \text{ dB}$

* Test Distance: $(3 + \text{Test Volume} / 2) - r = 4.0 \text{ m}$

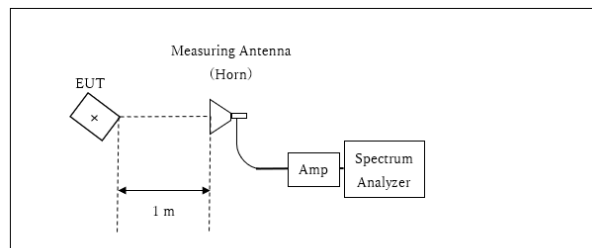
Test Volume : 2.0 m

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

$r = 0.0 \text{ m}$

* The test was performed with $r = 0.0 \text{ m}$ since EUT is small and it was the rather conservative condition.

10 GHz - 26.5 GHz



x : Center of turn table

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

*Test Distance: 1 m

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT and Antenna 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 - 26.5 GHz

Test data : APPENDIX

Test result : Pass

APPENDIX 1: Test data

Radiated Spurious Emission

Report No. 12486805H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.4 No.1
Date September 18, 2018 September 26, 2018
Temperature / Humidity 20 deg. C / 65 % RH 20 deg. C / 65 % RH
Engineer Takafumi Noguchi Takafumi Noguchi
(1 GHz - 10 GHz) (10 GHz - 26.5 GHz)
Mode Tx 11b 2412 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	2390.000	PK	41.3	27.6	5.9	32.1	-	42.7	73.9	31.2	
Hori	4824.000	PK	41.8	31.4	7.3	31.3	-	49.2	73.9	24.7	Floor noise
Hori	7236.000	PK	40.7	36.2	9.4	32.4	-	53.9	73.9	20.0	Floor noise
Hori	9648.000	PK	40.9	38.0	10.3	32.6	-	56.6	73.9	17.3	Floor noise
Hori	2390.000	AV	32.8	27.6	5.9	32.1	-	34.2	53.9	19.7	
Hori	4824.000	AV	32.2	31.4	7.3	31.3	-	39.6	53.9	14.3	Floor noise
Hori	7236.000	AV	32.7	36.2	9.4	32.4	-	45.9	53.9	8.0	Floor noise
Hori	9648.000	AV	33.0	38.0	10.3	32.6	-	48.7	53.9	5.2	Floor noise
Vert	2390.000	PK	41.1	27.6	5.9	32.1	-	42.5	73.9	31.4	
Vert	4824.000	PK	42.5	31.4	7.3	31.3	-	49.9	73.9	24.0	Floor noise
Vert	7236.000	PK	41.3	36.2	9.4	32.4	-	54.5	73.9	19.4	Floor noise
Vert	9648.000	PK	41.4	38.0	10.3	32.6	-	57.1	73.9	16.8	Floor noise
Vert	2390.000	AV	31.6	27.6	5.9	32.1	-	33.0	53.9	20.9	
Vert	4824.000	AV	33.4	31.4	7.3	31.3	-	40.8	53.9	13.1	Floor noise
Vert	7236.000	AV	32.1	36.2	9.4	32.4	-	45.3	53.9	8.6	Floor noise
Vert	9648.000	AV	32.6	38.0	10.3	32.6	-	48.3	53.9	5.6	Floor noise

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

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

20dBc Data Sheet

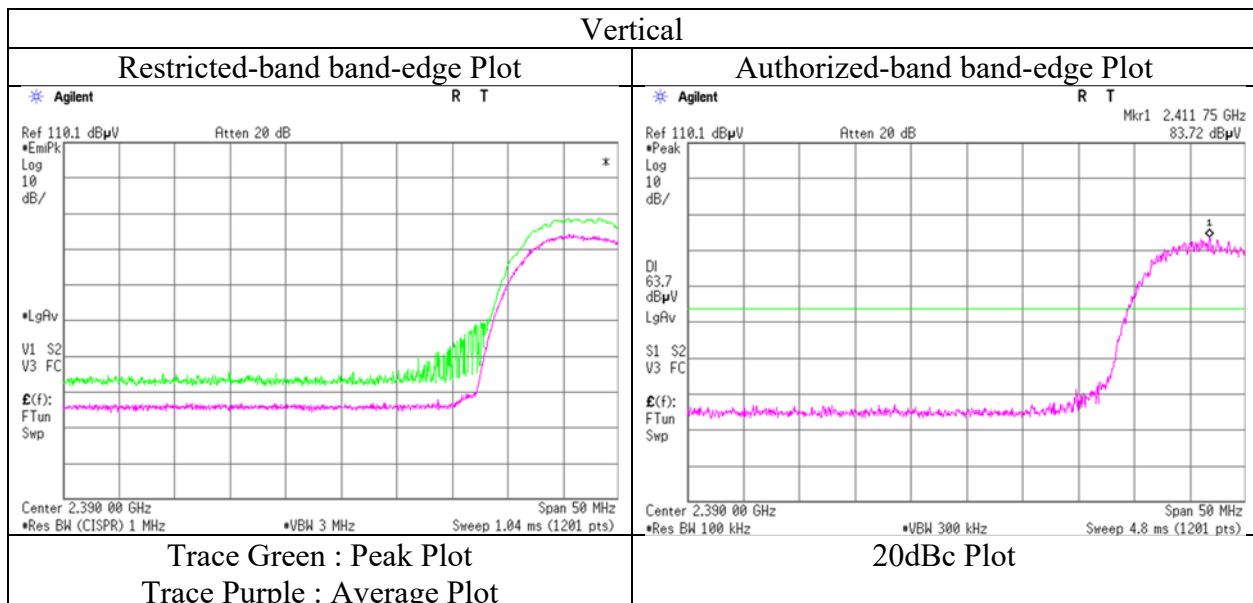
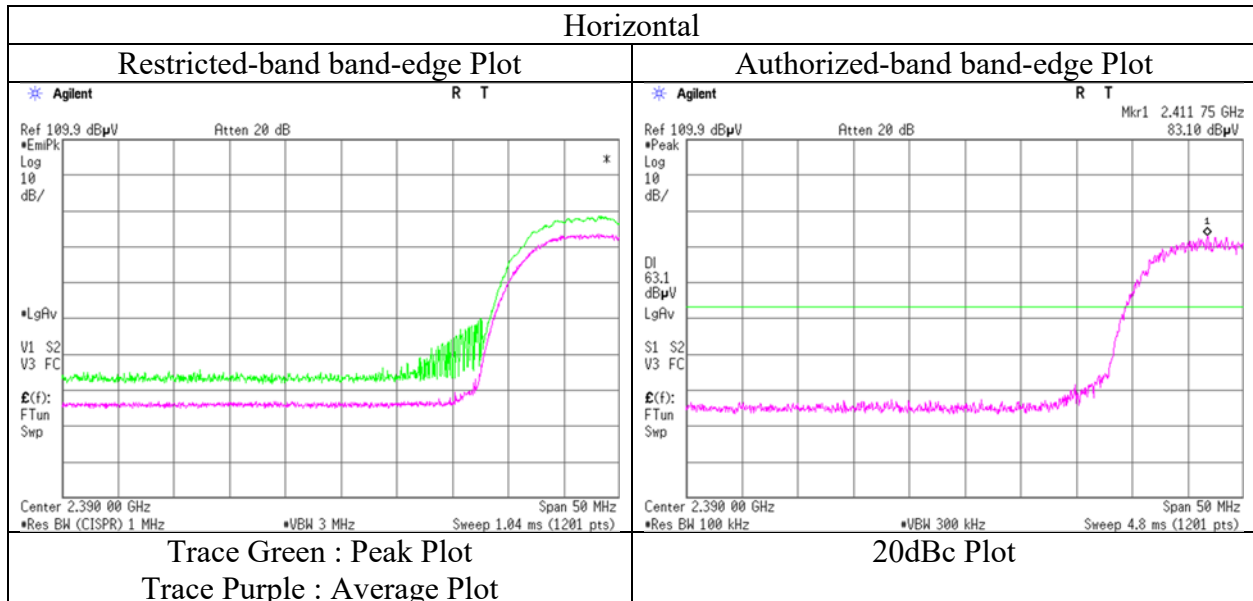
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	83.1	27.5	5.9	32.1	84.4	-	-	Carrier
Hori	2400.000	PK	38.6	27.6	5.9	32.1	40.0	64.4	24.4	
Vert	2412.000	PK	83.7	27.5	5.9	32.1	85.0	-	-	Carrier
Vert	2400.000	PK	39.7	27.6	5.9	32.1	41.1	65.0	23.9	

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

Distance factor:
1 GHz - 10 GHz $20\log(4\text{ m} / 3.0\text{ m}) = 2.5\text{ dB}$
10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	12486805H	No.1
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.4	
Date	September 18, 2018	September 26, 2018
Temperature / Humidity	20 deg. C / 65 % RH	20 deg. C / 65 % RH
Engineer	Takafumi Noguchi	Takafumi Noguchi
	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)
Mode	Tx 11b 2412 MHz	



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

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Radiated Spurious Emission

Report No.	12486805H	No.1
Test place	No.4	No.1
Semi Anechoic Chamber	September 18, 2018	September 26, 2018
Date	22 deg. C / 53 % RH	20 deg. C / 65 % RH
Temperature / Humidity	Takafumi Noguchi	Takafumi Noguchi
Engineer	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)
Mode	Tx 11b 2437 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	4874.000	PK	41.8	31.5	7.3	31.3	-	49.3	73.9	24.6	Floor noise
Hori	7311.000	PK	41.2	36.3	8.5	32.4	-	53.6	73.9	20.3	Floor noise
Hori	9748.000	PK	40.9	38.3	9.6	32.7	-	56.1	73.9	17.8	Floor noise
Hori	4874.000	AV	31.6	31.5	7.3	31.3	-	39.1	53.9	14.8	Floor noise
Hori	7311.000	AV	31.9	36.3	8.5	32.4	-	44.3	53.9	9.6	Floor noise
Hori	9748.000	AV	31.2	38.3	9.6	32.7	-	46.4	53.9	7.5	Floor noise
Vert	4874.000	PK	41.6	31.5	7.3	31.3	-	49.1	73.9	24.8	Floor noise
Vert	7311.000	PK	40.7	36.3	8.5	32.4	-	53.1	73.9	20.8	Floor noise
Vert	9748.000	PK	40.8	38.3	9.6	32.7	-	56.0	73.9	17.9	Floor noise
Vert	4874.000	AV	32.3	31.5	7.3	31.3	-	39.8	53.9	14.1	Floor noise
Vert	7311.000	AV	32.6	36.3	8.5	32.4	-	45.0	53.9	8.9	Floor noise
Vert	9748.000	AV	31.4	38.3	9.6	32.7	-	46.6	53.9	7.3	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 $20\log(4\text{ m} / 3.0\text{ m}) = 2.5\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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Radiated Spurious Emission

Report No.	12486805H	
Test place	No.4	No.1
Semi Anechoic Chamber	September 18, 2018	September 26, 2018
Date	22 deg. C / 53 % RH	20 deg. C / 65 % RH
Temperature / Humidity	Takafumi Noguchi	Takafumi Noguchi
Engineer	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)
Mode	Tx 11b 2462 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	2483.500	PK	41.6	27.5	5.9	32.0	-	43.0	73.9	30.9	
Hori	4924.000	PK	42.1	31.6	7.3	31.2	-	49.8	73.9	24.1	Floor noise
Hori	7386.000	PK	41.6	36.3	9.3	32.5	-	54.7	73.9	19.2	Floor noise
Hori	9848.000	PK	41.2	38.4	10.3	32.7	-	57.2	73.9	16.7	Floor noise
Hori	2483.500	AV	31.9	27.5	5.9	32.0	-	33.3	53.9	20.6	
Hori	4924.000	AV	31.6	31.6	7.3	31.2	-	39.3	53.9	14.6	Floor noise
Hori	7386.000	AV	31.5	36.3	9.3	32.5	-	44.6	53.9	9.3	Floor noise
Hori	9848.000	AV	32.6	38.4	10.3	32.7	-	48.6	53.9	5.3	Floor noise
Vert	2483.500	PK	41.2	27.5	5.9	32.0	-	42.6	73.9	31.3	
Vert	4924.000	PK	42.2	31.6	7.3	31.2	-	49.9	73.9	24.0	Floor noise
Vert	7386.000	PK	41.4	36.3	9.3	32.5	-	54.5	73.9	19.4	Floor noise
Vert	9848.000	PK	41.5	38.4	10.3	32.7	-	57.5	73.9	16.4	Floor noise
Vert	2483.500	AV	31.1	27.5	5.9	32.0	-	32.5	53.9	21.4	
Vert	4924.000	AV	30.6	31.6	7.3	31.2	-	38.3	53.9	15.6	Floor noise
Vert	7386.000	AV	31.4	36.3	9.3	32.5	-	44.5	53.9	9.4	Floor noise
Vert	9848.000	AV	32.7	38.4	10.3	32.7	-	48.7	53.9	5.2	Floor noise

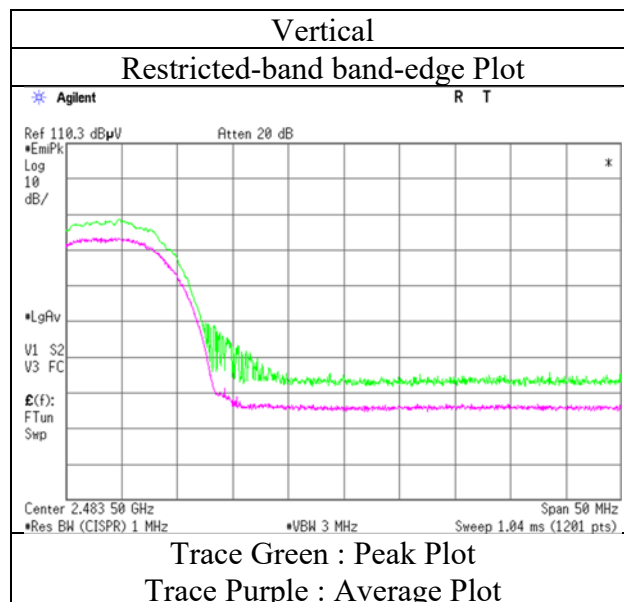
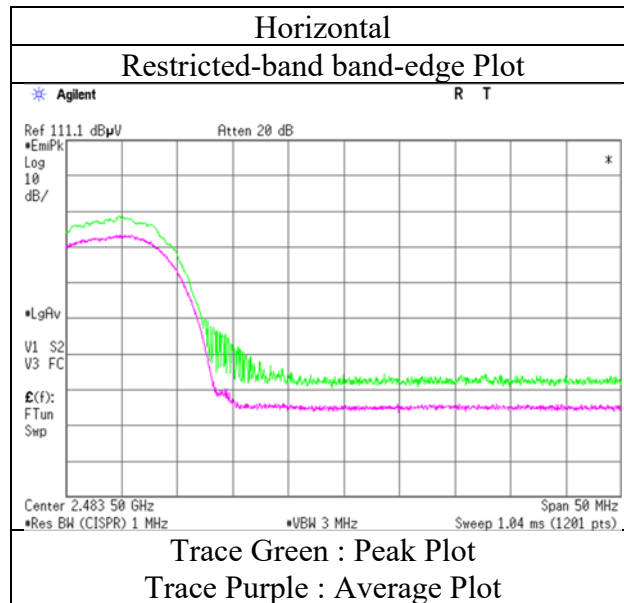
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

Distance factor: 1 GHz - 10 GHz 20log (4 m / 3.0 m) = 2.5 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	12486805H	No.1
Test place	No.4	September 26, 2018
Semi Anechoic Chamber	September 18, 2018	20 deg. C / 65 % RH
Date	22 deg. C / 53 % RH	Takafumi Noguchi
Temperature / Humidity	Takafumi Noguchi	(10 GHz - 26.5 GHz)
Engineer	(1 GHz - 10 GHz)	
Mode	Tx 11b 2462 MHz	



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

Radiated Spurious Emission

Report No. 12486805H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.4 No.1
Date September 18, 2018 September 26, 2018
Temperature / Humidity 20 deg. C / 65 % RH 20 deg. C / 65 % RH
Engineer Takafumi Noguchi Takafumi Noguchi
(1 GHz - 10 GHz) (10 GHz - 26.5 GHz)
Mode Tx 11n-20 2412 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	2390.000	PK	41.4	27.6	5.9	32.1	-	42.8	73.9	31.1	
Hori	4824.000	PK	42.3	31.4	7.3	31.3	-	49.7	73.9	24.2	Floor noise
Hori	7236.000	PK	40.8	36.2	9.4	32.4	-	54.0	73.9	19.9	Floor noise
Hori	9648.000	PK	41.1	38.0	10.3	32.6	-	56.8	73.9	17.1	Floor noise
Hori	2390.000	AV	31.6	27.6	5.9	32.1	-	33.0	53.9	20.9	
Hori	4824.000	AV	30.6	31.4	7.3	31.3	-	38.0	53.9	15.9	Floor noise
Hori	7236.000	AV	31.7	36.2	9.4	32.4	-	44.9	53.9	9.0	Floor noise
Hori	9648.000	AV	32.2	38.0	10.3	32.6	-	47.9	53.9	6.0	Floor noise
Vert	2390.000	PK	40.9	27.6	5.9	32.1	-	42.3	73.9	31.6	
Vert	4824.000	PK	41.1	31.4	7.3	31.3	-	48.5	73.9	25.4	Floor noise
Vert	7236.000	PK	41.0	36.2	9.4	32.4	-	54.2	73.9	19.7	Floor noise
Vert	9648.000	PK	41.3	38.0	10.3	32.6	-	57.0	73.9	16.9	Floor noise
Vert	2390.000	AV	31.8	27.6	5.9	32.1	-	33.2	53.9	20.7	
Vert	4824.000	AV	30.9	31.4	7.3	31.3	-	38.3	53.9	15.6	Floor noise
Vert	7236.000	AV	30.9	36.2	9.4	32.4	-	44.1	53.9	9.8	Floor noise
Vert	9648.000	AV	31.6	38.0	10.3	32.6	-	47.3	53.9	6.6	Floor noise

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

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

20dBc Data Sheet

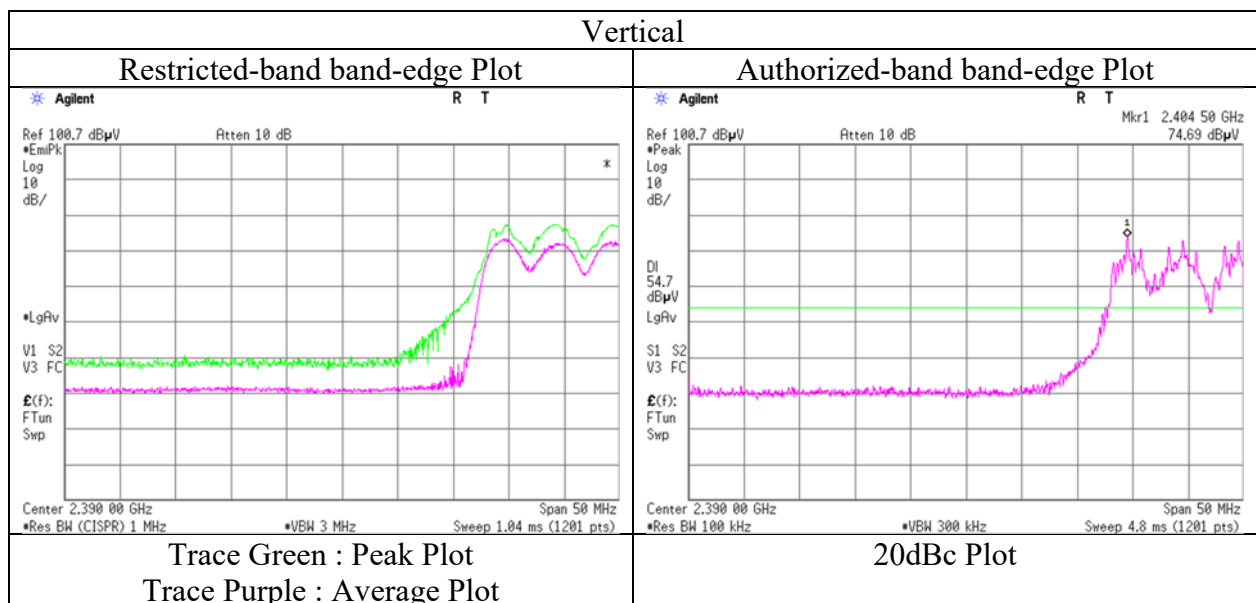
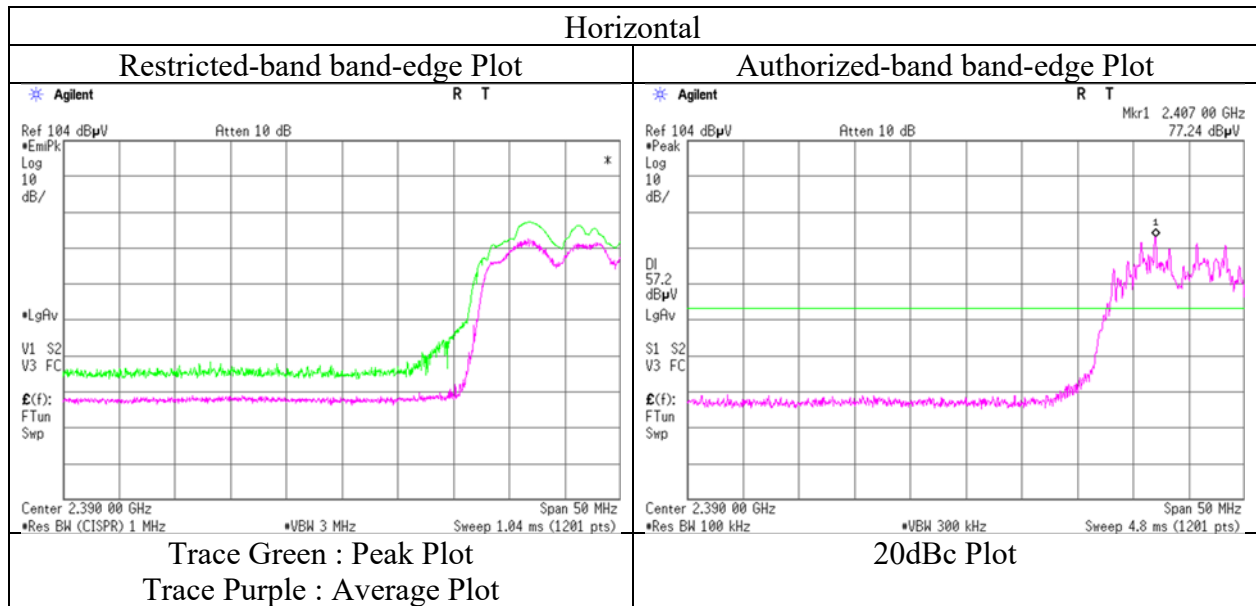
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	77.2	27.5	5.9	32.1	78.5	-	-	Carrier
Hori	2400.000	PK	37.0	27.6	5.9	32.1	38.4	58.5	20.1	
Vert	2412.000	PK	74.7	27.5	5.9	32.1	74.8	-	-	Carrier
Vert	2400.000	PK	38.4	27.6	5.9	32.1	39.8	54.8	15.0	

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

Distance factor: 1 GHz - 10 GHz 20log (4 m / 3.0 m) = 2.5 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5dB

Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	12486805H	No.1
Test place	No.4	September 26, 2018
Semi Anechoic Chamber	September 18, 2018	20 deg. C / 65 % RH
Date	22 deg. C / 53 % RH	Takafumi Noguchi
Temperature / Humidity	Takafumi Noguchi	(10 GHz - 26.5 GHz)
Engineer	(1 GHz - 10 GHz)	
Mode	Tx 11n-20 2412 MHz	



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

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Radiated Spurious Emission

Report No.	12486805H	No.1
Test place	No.4	
Semi Anechoic Chamber	September 18, 2018	September 26, 2018
Date	22 deg. C / 53 % RH	20 deg. C / 65 % RH
Temperature / Humidity	Takafumi Noguchi	Takafumi Noguchi
Engineer	(1 GHz - 10 GHz)	(10 GHz - 26.5 GHz)
Mode	Tx 11n-20 2437 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	4874.000	PK	40.2	31.5	7.3	31.3	-	47.7	73.9	26.2	Floor noise
Hori	7311.000	PK	41.0	36.3	9.4	32.4	-	54.3	73.9	19.6	Floor noise
Hori	9748.000	PK	41.6	38.3	10.2	32.7	-	57.4	73.9	16.5	Floor noise
Hori	4874.000	AV	30.9	31.5	7.3	31.3	-	38.4	53.9	15.5	Floor noise
Hori	7311.000	AV	31.4	36.3	9.4	32.4	-	44.7	53.9	9.2	Floor noise
Hori	9748.000	AV	31.8	38.3	10.2	32.7	-	47.6	53.9	6.3	Floor noise
Vert	4874.000	PK	40.9	31.5	7.3	31.3	-	48.4	73.9	25.5	Floor noise
Vert	7311.000	PK	41.3	36.3	9.4	32.4	-	54.6	73.9	19.3	Floor noise
Vert	9748.000	PK	41.3	38.3	10.2	32.7	-	57.1	73.9	16.8	Floor noise
Vert	4874.000	AV	30.7	31.5	7.3	31.3	-	38.2	53.9	15.7	Floor noise
Vert	7311.000	AV	32.5	36.3	9.4	32.4	-	45.8	53.9	8.1	Floor noise
Vert	9748.000	AV	31.2	38.3	10.2	32.7	-	47.0	53.9	6.9	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz $20\log(4\text{ m} / 3.0\text{ m}) = 2.5\text{ dB}$
 10 GHz - 40 GHz $20\log(1.0\text{ m} / 3.0\text{ m}) = -9.5\text{ dB}$

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Radiated Spurious Emission

Report No.	12486805H	
Test place	No.4	No.1
Semi Anechoic Chamber	September 18, 2018	September 26, 2018
Date	22 deg. C / 53 % RH	20 deg. C / 65 % RH
Temperature / Humidity	Takafumi Noguchi	Takafumi Noguchi
Engineer	(1 GHz - 26.5 GHz)	(10 GHz - 26.5 GHz)
Mode	Tx 11n-20 2462 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	2483.500	PK	41.5	27.5	5.9	32.0	-	42.9	73.9	31.0	
Hori	4924.000	PK	39.6	31.6	7.3	31.2	-	47.3	73.9	26.6	Floor noise
Hori	7386.000	PK	41.3	36.3	9.3	32.5	-	54.4	73.9	19.5	Floor noise
Hori	9848.000	PK	41.8	38.4	10.3	32.7	-	57.8	73.9	16.1	Floor noise
Hori	2483.500	AV	30.7	27.5	5.9	32.0	-	32.1	53.9	21.8	
Hori	4924.000	AV	30.4	31.6	7.3	31.2	-	38.1	53.9	15.8	Floor noise
Hori	7386.000	AV	31.4	36.3	9.3	32.5	-	44.5	53.9	9.4	Floor noise
Hori	9848.000	AV	32.2	38.4	10.3	32.7	-	48.2	53.9	5.7	Floor noise
Vert	2483.500	PK	40.5	27.5	5.9	32.0	-	41.9	73.9	32.0	
Vert	4924.000	PK	41.2	31.6	7.3	31.2	-	48.9	73.9	25.0	Floor noise
Vert	7386.000	PK	41.9	36.3	9.3	32.5	-	55.0	73.9	18.9	Floor noise
Vert	9848.000	PK	39.6	38.4	10.3	32.7	-	55.6	73.9	18.3	Floor noise
Vert	2483.500	AV	31.9	27.5	5.9	32.0	-	33.3	53.9	20.6	
Vert	4924.000	AV	29.9	31.6	7.3	31.2	-	37.6	53.9	16.3	Floor noise
Vert	7386.000	AV	31.1	36.3	9.3	32.5	-	44.2	53.9	9.7	Floor noise
Vert	9848.000	AV	31.8	38.4	10.3	32.7	-	47.8	53.9	6.1	Floor noise

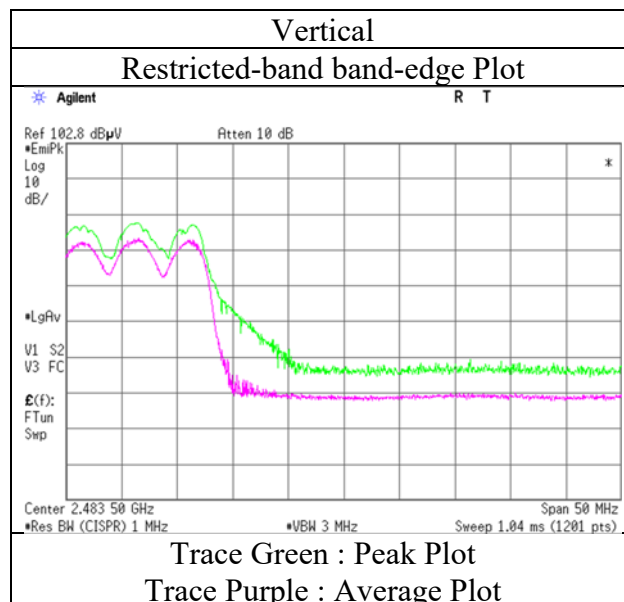
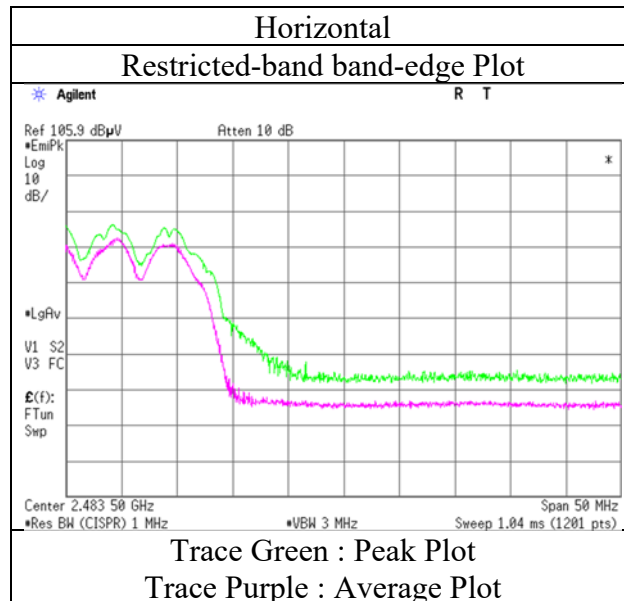
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

Distance factor: 1 GHz - 10 GHz 20log (4 m / 3.0 m) = 2.5 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	12486805H	No.1
Test place	No.4	September 26, 2018
Semi Anechoic Chamber	September 18, 2018	20 deg. C / 65 % RH
Date	22 deg. C / 53 % RH	Takafumi Noguchi
Temperature / Humidity	Takafumi Noguchi	(10 GHz - 26.5 GHz)
Engineer	(1 GHz - 26.5 GHz)	
Mode	Tx 11n-20 2462 MHz	



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

Radiated Spurious Emission

Report No. 12486805H
Test place Ise EMC Lab.
Semi Anechoic Chamber No.4
Date September 18, 2018 No.1
Temperature / Humidity 20 deg. C / 65 % RH September 26, 2018
Engineer Takafumi Noguchi 20 deg. C / 65 % RH
(1 GHz - 10 GHz) Takafumi Noguchi
(10 GHz - 26.5 GHz)
Mode Tx 11n-40 2422 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	2390.000	PK	41.2	27.6	5.9	32.1	-	42.6	73.9	31.3	
Hori	4844.000	PK	39.8	31.5	7.3	31.3	-	47.3	73.9	26.6	Floor noise
Hori	7266.000	PK	41.9	36.2	9.4	32.4	-	55.1	73.9	18.8	Floor noise
Hori	9688.000	PK	40.6	38.1	10.2	32.7	-	56.2	73.9	17.7	Floor noise
Hori	2390.000	AV	32.2	27.6	5.9	32.1	-	33.6	53.9	20.3	
Hori	4844.000	AV	30.9	31.5	7.3	31.3	-	38.4	53.9	15.5	Floor noise
Hori	7266.000	AV	32.8	36.2	9.4	32.4	-	46.0	53.9	7.9	Floor noise
Hori	9688.000	AV	30.9	38.1	10.2	32.7	-	46.5	53.9	7.4	Floor noise
Vert	2390.000	PK	41.5	27.6	5.9	32.1	-	42.9	73.9	31.0	
Vert	4844.000	PK	40.2	31.5	7.3	31.3	-	47.7	73.9	26.2	Floor noise
Vert	7266.000	PK	41.5	36.2	9.4	32.4	-	54.7	73.9	19.2	Floor noise
Vert	9688.000	PK	40.7	38.1	10.2	32.7	-	56.3	73.9	17.6	Floor noise
Vert	2390.000	AV	32.3	27.6	5.9	32.1	-	33.7	53.9	20.2	
Vert	4844.000	AV	30.3	31.5	7.3	31.3	-	37.8	53.9	16.1	Floor noise
Vert	7266.000	AV	32.5	36.2	9.4	32.4	-	45.7	53.9	8.2	Floor noise
Vert	9688.000	AV	32.3	38.1	10.2	32.7	-	47.9	53.9	6.0	Floor noise

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

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

20dBc Data Sheet

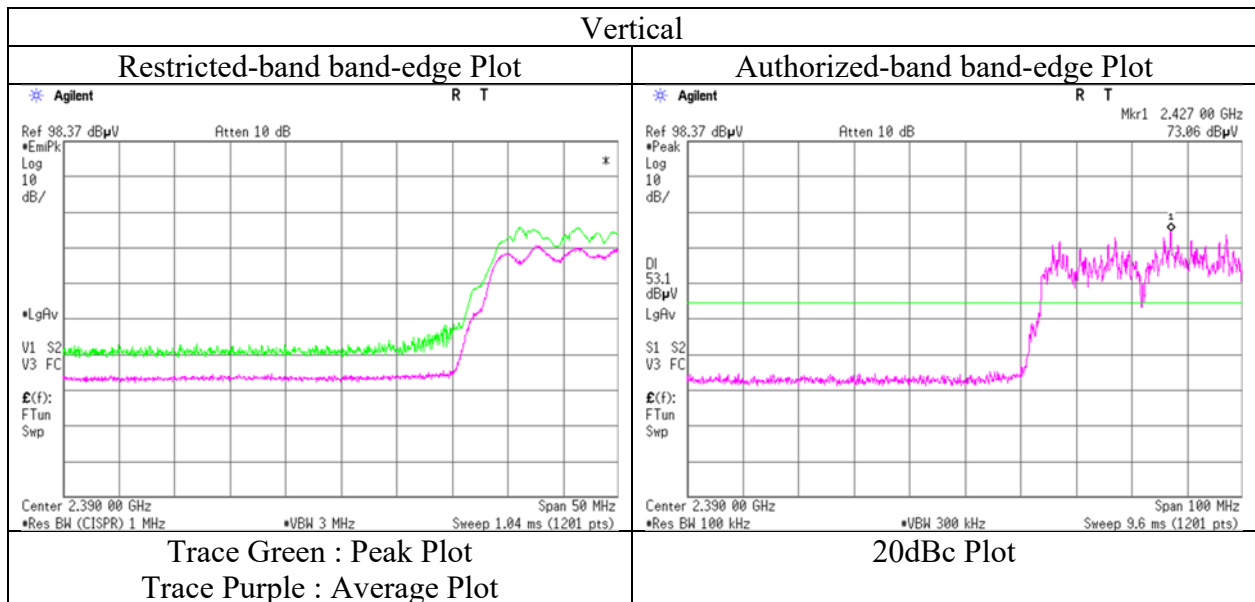
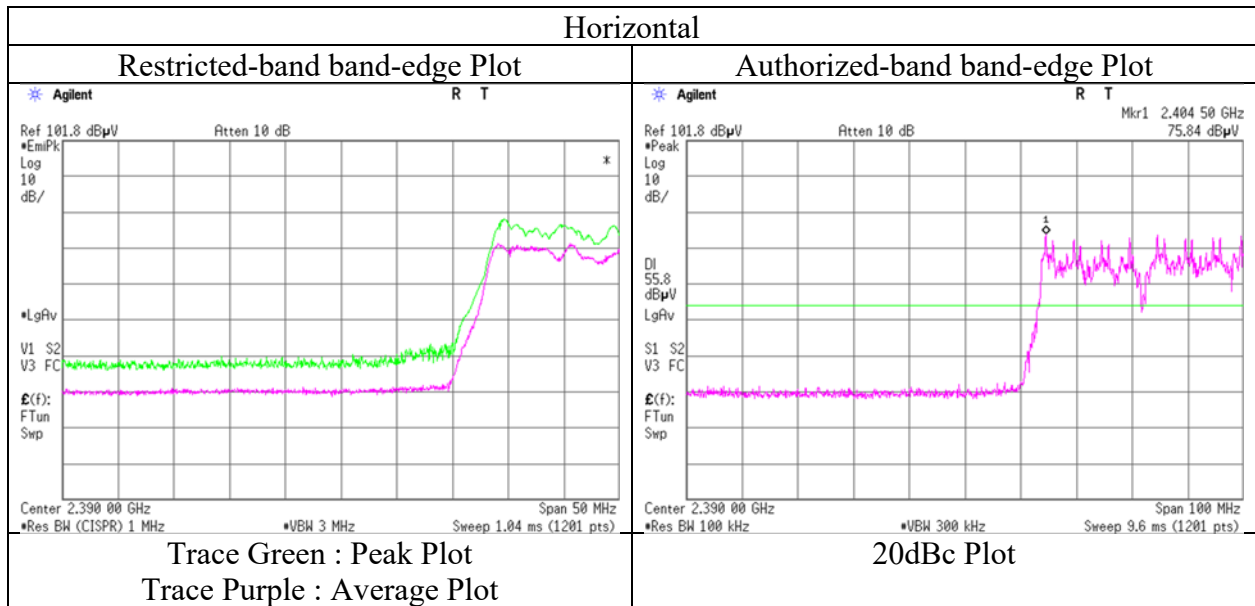
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2422.000	PK	75.8	27.5	5.9	32.1	77.1	-	-	Carrier
Hori	2400.000	PK	34.1	27.6	5.9	32.1	35.5	57.1	21.6	
Vert	2422.000	PK	73.1	27.5	5.9	32.1	74.8	-	-	Carrier
Vert	2400.000	PK	34.3	27.6	5.9	32.1	35.7	54.8	19.1	

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

Distance factor: 1 GHz - 10 GHz 20log (4 m / 3.0 m) = 2.5 dB
10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5dB

Radiated Spurious Emission (Reference Plot for band-edge)

Report No.	12486805H	No.1
Test place	No.4	September 26, 2018
Semi Anechoic Chamber	September 18, 2018	20 deg. C / 65 % RH
Date	22 deg. C / 53 % RH	Takafumi Noguchi
Temperature / Humidity	Takafumi Noguchi	(10 GHz - 26.5 GHz)
Engineer	(1 GHz - 26.5 GHz)	
Mode	Tx 11n-40 2422 MHz	



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

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Radiated Spurious Emission

Report No.	12486805H		
Test place	No.4	No.1	No.1
Semi Anechoic Chamber	September 18, 2018	September 26, 2018	September 27, 2018
Date	22 deg. C / 53 % RH	20 deg. C / 65 % RH	23 deg. C / 67 % RH
Temperature / Humidity	Takafumi Noguchi	Takafumi Noguchi	Takafumi Noguchi
Engineer	(1 GHz - 26.5 GHz)	(10 GHz - 26.5 GHz)	(30MHz - 1000MHz)
Mode	Tx 11n-40 2437 MHz		

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dBm]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	45.979	QP	35.7	12.5	7.7	38.9	-	17.0	40.0	23.0	
Hori	54.584	QP	40.1	9.4	7.8	38.9	-	18.4	40.0	21.6	
Hori	88.688	QP	39.7	7.8	8.4	38.9	-	17.0	43.5	26.5	
Hori	248.101	QP	38.0	11.6	10.2	38.9	-	20.9	46.0	25.1	
Hori	480.000	QP	38.4	17.5	12.0	38.5	-	29.4	46.0	16.6	
Hori	617.407	QP	28.6	19.6	12.9	38.3	-	22.8	46.0	23.2	
Hori	722.559	QP	34.2	20.1	13.7	38.3	-	29.7	46.0	16.3	
Hori	4874.000	PK	40.9	31.5	7.3	31.3	-	48.4	73.9	25.5	Floor noise
Hori	7311.000	PK	41.6	36.3	9.4	32.4	-	54.9	73.9	19.0	Floor noise
Hori	9748.000	PK	41.3	38.3	10.2	32.7	-	57.1	73.9	16.8	Floor noise
Hori	4874.000	AV	30.9	31.5	7.3	31.3	-	38.4	53.9	15.5	Floor noise
Hori	7311.000	AV	31.7	36.3	9.4	32.4	-	45.0	53.9	8.9	Floor noise
Hori	9748.000	AV	31.6	38.3	10.2	32.7	-	47.4	53.9	6.5	Floor noise
Vert	45.977	QP	44.4	12.5	7.7	38.9	-	25.7	40.0	14.3	
Vert	88.640	QP	45.9	7.8	8.4	38.9	-	23.2	43.5	20.3	
Vert	104.860	QP	44.5	10.8	8.6	39.0	-	24.9	43.5	18.6	
Vert	241.826	QP	46.4	11.5	10.1	38.9	-	29.1	46.0	16.9	
Vert	336.837	QP	42.4	14.7	11.0	38.7	-	29.4	46.0	16.6	
Vert	617.312	QP	32.9	19.6	12.9	38.3	-	27.1	46.0	18.9	
Vert	4874.000	PK	41.3	31.5	7.3	31.3	-	48.8	73.9	25.1	Floor noise
Vert	7311.000	PK	41.1	36.3	9.4	32.4	-	54.4	73.9	19.5	Floor noise
Vert	9748.000	PK	40.9	38.3	10.2	32.7	-	56.7	73.9	17.2	Floor noise
Vert	4874.000	AV	31.1	31.5	7.3	31.3	-	38.6	53.9	15.3	Floor noise
Vert	7311.000	AV	31.6	36.3	9.4	32.4	-	44.9	53.9	9.0	Floor noise
Vert	9748.000	AV	32.0	38.3	10.2	32.7	-	47.8	53.9	6.1	Floor noise

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

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

Distance factor: 1 GHz - 10 GHz 20log (4 m / 3.0 m) = 2.5 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission

Report No.	12486805H	
Test place	No.4	No.1
Semi Anechoic Chamber	September 18, 2018	September 26, 2018
Date	22 deg. C / 53 % RH	20 deg. C / 65 % RH
Temperature / Humidity	Takafumi Noguchi	Takafumi Noguchi
Engineer	(1 GHz – 10 GHz)	(10 GHz - 26.5 GHz)
Mode	Tx 11n-40 2452 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	2483.500	PK	42.4	27.5	5.9	32.0	-	43.8	73.9	30.1	
Hori	4904.000	PK	40.0	31.6	7.3	31.2	-	47.7	73.9	26.2	Floor noise
Hori	7356.000	PK	41.7	36.3	9.4	32.4	-	55.0	73.9	18.9	Floor noise
Hori	9808.000	PK	41.1	38.4	10.3	32.7	-	57.1	73.9	16.8	Floor noise
Hori	2483.500	AV	31.3	27.5	5.9	32.0	-	32.7	53.9	21.2	
Hori	4904.000	AV	30.0	31.6	7.3	31.2	-	37.7	53.9	16.2	Floor noise
Hori	7356.000	AV	31.0	36.3	9.4	32.4	-	44.3	53.9	9.6	Floor noise
Hori	9808.000	AV	30.4	38.4	10.3	32.7	-	46.4	53.9	7.5	Floor noise
Vert	2483.500	PK	41.2	27.5	5.9	32.0	-	42.6	73.9	31.3	
Vert	4904.000	PK	39.5	31.6	7.3	31.2	-	47.2	73.9	26.7	Floor noise
Vert	7356.000	PK	41.1	36.3	9.4	32.4	-	54.4	73.9	19.5	Floor noise
Vert	9808.000	PK	40.9	38.4	10.3	32.7	-	56.9	73.9	17.0	Floor noise
Vert	2483.500	AV	31.7	27.5	5.9	32.0	-	33.1	53.9	20.8	
Vert	4904.000	AV	31.6	31.6	7.3	31.2	-	39.3	53.9	14.6	Floor noise
Vert	7356.000	AV	32.0	36.3	9.4	32.4	-	45.3	53.9	8.6	Floor noise
Vert	9808.000	AV	32.5	38.4	10.3	32.7	-	48.5	53.9	5.4	Floor noise

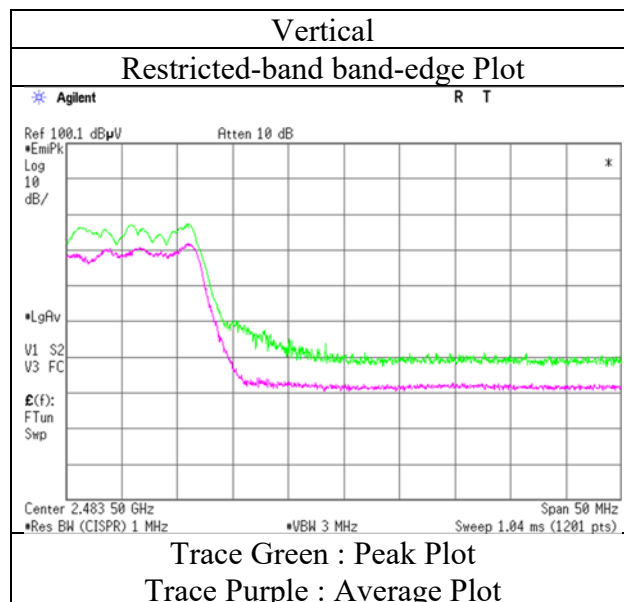
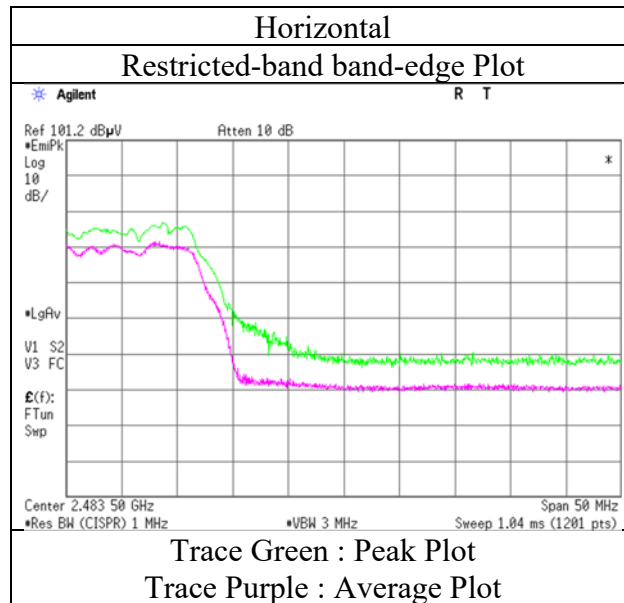
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

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

Distance factor: 1 GHz - 10 GHz 20log (4 m / 3.0 m) = 2.5 dB
 10 GHz - 40 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission (Reference Plot for band-edge)

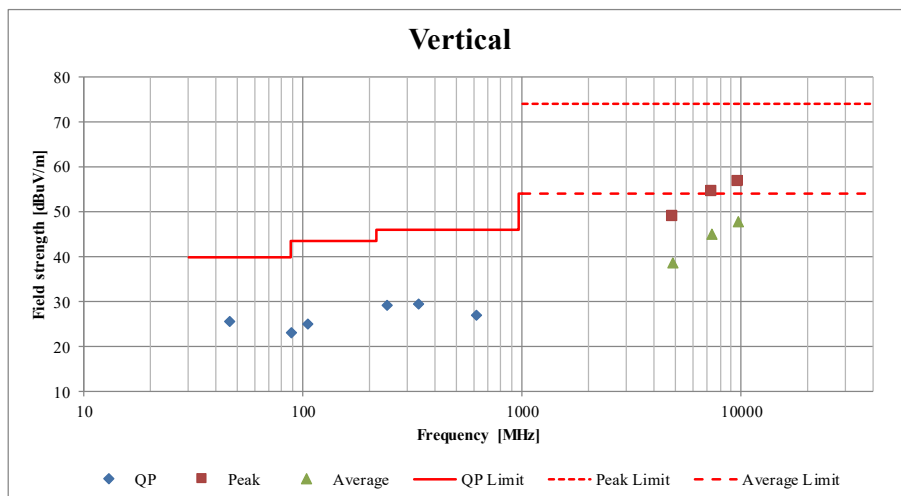
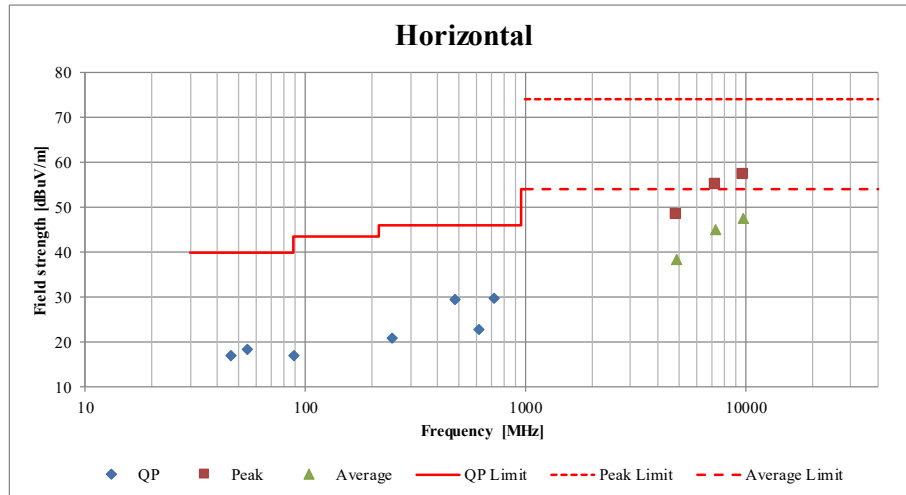
Report No.	12486805H	No.1
Test place	No.4	September 26, 2018
Semi Anechoic Chamber	September 18, 2018	20 deg. C / 65 % RH
Date	22 deg. C / 53 % RH	Takafumi Noguchi
Temperature / Humidity	Takafumi Noguchi	(10 GHz - 26.5 GHz)
Engineer	(1 GHz – 10 GHz)	
Mode	Tx 11n-40 2452 MHz	



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

Radiated Spurious Emission
(Plot data, Worst case)

Report No.	12486805H		
Test place	No.4	No.1	No.1
Semi Anechoic Chamber	September 18, 2018	September 26, 2018	September 27, 2018
Date	22 deg. C / 53 % RH	20 deg. C / 65 % RH	23 deg. C / 67 % RH
Temperature / Humidity	Takafumi Noguchi	Takafumi Noguchi	Takafumi Noguchi
Engineer	(1 GHz – 26.5 GHz)	(10 GHz - 26.5 GHz)	(30 MHz - 1000 MHz)
Mode	Tx 11n-40 2437 MHz		



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

APPENDIX 2: Test instruments

Test Instruments

Test Item	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Cal Int
RE	141542	Digital Tester	Fluke Corporation	FLUKE 26-3	78030611	08/21/2018	08/31/2019	12
RE	142228	Measure	KOMELON	KMC-36	-	-	-	-
RE	141318	Coaxial Cable	UL Japan	-	-	07/03/2018	07/31/2019	12
RE	141512	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	06/06/2018	06/30/2019	12
RE	141232	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	001	09/19/2018	09/30/2019	12
RE	141579	Pre Amplifier	AGILENT	8449B	3008A02142	01/23/2018	01/31/2019	12
RE	141900	Spectrum Analyzer	AGILENT	E4440A	MY46185823	11/16/2017	11/30/2018	12
RE	141556	Thermo-Hygrometer	CUSTOM	CTH-201	0003	12/21/2017	12/31/2018	12
RE	141412	Microwave Cable	Junkosha	MWX221	1305S002R(1m) 1405S146(5m)	06/14/2018	06/30/2019	12
RE	141506	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170307	06/08/2018	06/30/2019	12
RE	141508	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	06/08/2018	06/30/2019	12
RE	141581	MicroWave System Amplifier	AGILENT	83017A	650	10/04/2018	10/31/2019	12
RE	141296	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	002	09/19/2018	09/30/2019	12
RE	141545	DIGITAL HiTESTER	HIOKI	3805	51201148	01/09/2018	01/31/2019	12
RE	142227	Measure	KOMELON	KMC-36	-	-	-	-
RE	141562	Thermo-Hygrometer	CUSTOM	CTH-180	1501	01/24/2018	01/31/2019	12
RE	141902	Spectrum Analyzer	AGILENT	E4440A	MY46187105	10/04/2018	10/31/2019	12

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

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

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: RE: Radiated Emission test

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