RADIO TEST REPORT

Test Report No. : 10812026H-A-R1

Applicant	:	**NIKON CORPORATION**
Type of Equipment	:	**Wireless Transmitter**
Model No.	:	**N1526**
FCC ID	:	**CGJ1152EA**
Test regulation	:	**FCC Part 15 Subpart C: 2015**
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)
7. This report is a revised version of 10812026H-A. 10812026H-A is replaced with this report.

Date of test: June 3 to July 1, 2015

Representative test engineer: T. matsui
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Consumer Technology Division

Approved by: T. Hatakeda
Takahiro Hatakeda
Leader
Consumer Technology Division

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.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address,
http://japan.ul.com/resources/emc_accredited/

REVISION HISTORY

Original Test Report No.: 10812026H-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10812026H-A	July 21, 2015	-	-
1	10812026H-A-R1	November 24, 2015	P.5	Update of FCC15 version
1	10812026H-A-R1	November 24, 2015	P.5	Correction of FCC Part 15.203 Antenna requirement sentence

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SECTION 1: Customer information

Company Name	:	NEC Platforms, Ltd.
Address	:	800, Shimomata, Kakegawa-shi, Shizuoka 436-8501,Japan
Telephone Number	:	+81-537-22-8276
Facsimile Number	:	+81-537-22-8236
Contact Person	:	Kouichi Sakurai

*Remarks:
NIKON CORPORATION designates NEC Platforms, Ltd. as manufacturer of the product (Wireless Transmitter).

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

2.1 Identification of E.U.T.

Type of Equipment	:	Wireless Transmitter
Model No.	:	N1526
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC 5.0 V
Receipt Date of Sample	:	June 1, 2015
Country of Mass-production	:	Japan
Condition of EUT	:	Engineering 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 No: N1526 (referred to as the EUT in this report) is the Wireless Transmitter.

General Specification

Clock frequency(ies) in the system	:	40 MHz (Crystal), 32.7 kHz (OSC)
Operating temperature	:	0 deg. C to +40 deg. C

Radio Specification

Radio Type	:	Transceiver
Power Supply (inner)	:	DC 3.3 V

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

Type of radio	IEEE802.11b	IEEE802.11g/n (20 M band)	IEEE802.11n (40 M band)	IEEE802.11a/n/ac (20 M band)	IEEE802.11n/ac (40 M band)	IEEE802.11ac (80 M band)
Frequency of operation (MHz)	2412 - 2462 *	2412 - 2462 *	2422 - 2452 *	5180 - 5240 5260 - 5320 5745 - 5825	5190 - 5230 5270 - 5310 5755 - 5795	5210 5290 5775
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)		OFDM (64QAM, 16QAM, QPSK, BPSK, 256QAM(IEEE802.11ac only))		
Channel spacing	5 MHz			20 MHz	40 MHz	80 MHz
Antenna type	Antenna 0: Pattern Antenna Inverted L Type Antenna 1: Pattern Antenna Inverted L Type					
Antenna Gain	2.4GHz: 1 dBi 5GHz: 1 dBi					
Directional Antenna Gain	2.4 GHz: 4.01 dBi 5 GHz: 4.01 dBi					

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

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2015, final revised on November 23, 2015
*Some parts are effective on and after December 17, 2015 or December 23, 2015. The revision does not affect the test specification applied to the EUT.

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
Conducted Emission	**FCC:** ANSI C63.4-2009 7. AC powerline Conducted Emission measurements **IC:** RSS-Gen 8.8	**FCC:** Section 15.207 **IC:** RSS-Gen 8.8	**QP** 17.9 dB, 0.47575 MHz, N 0.47694 MHz, L **AV** 7.8 dB, 0.47575 MHz, N 0.47694 MHz, L	Complied	-
6dB Bandwidth	**FCC:** KDB 558074 D01 DTS Meas Guidance v03r03 **IC:** -	**FCC:** Section 15.247(a)(2) **IC:** RSS-247 5.2(1)	See data.	Complied	Conducted
Maximum Peak Output Power	**FCC:** KDB 558074 D01 DTS Meas Guidance v03r03 **IC:** RSS-Gen 6.12	**FCC:** Section 15.247(b)(3) **IC:** RSS-247 5.4(4)		Complied	Conducted
Power Density	**FCC:** KDB 558074 D01 DTS Meas Guidance v03r03 **IC:** -	**FCC:** Section 15.247(e) **IC:** RSS-247 5.2(2)		Complied	Conducted
Spurious Emission Restricted Band Edges	**FCC:** KDB 558074 D01 DTS Meas Guidance v03r03 **IC:** RSS-Gen 6.13	**FCC:** Section15.247(d) **IC:** RSS-247 5.5 RSS-Gen 8.9 RSS-Gen 8.10	0.2 dB 2483.500 MHz / 2388.342 MHz Horizontal, AV	Complied	Conducted (below 30MHz)/ Radiated (above 30MHz) *1)

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.
*1) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 DTS Meas Guidance v03r03 12.2.7.

* In case any questions arise about test procedure, ANSI C63.4: 2009 is also referred.

FCC 15.31 (e)
This EUT provides stable voltage (DC 3.3 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 Bandwidth	**IC:** RSS-Gen 6.6	**IC:** -	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.

Test site (semi anechoic chamber)	Conducted emission Uncertainty (+/-)			
	No. 1	No. 2	No. 3	No. 4
150 kHz - 30 MHz	3.5 dB	3.5 dB	3.4 dB	3.5 dB

Test site (semi anechoic chamber)	Radiated emission Uncertainty (+/-)						
	Measurement distance: 3 m				1 m		0.5 m
	9 kHz - 30 MHz	30 MHz - 300 MHz	300 MHz - 1 GHz	1 GHz - 10 GHz	10 GHz - 18 GHz	18 GHz - 26.5 GHz	26.5 GHz - 40 GHz
No. 1	4.3 dB	5.5 dB	6.3 dB	5.5 dB	5.8 dB	5.8 dB	4.3 dB
No. 2	4.2 dB	5.4 dB	6.3 dB	5.4 dB	5.7 dB	5.9 dB	5.6 dB
No. 3	4.4 dB	5.4 dB	6.4 dB	5.2 dB	5.5 dB	5.8 dB	5.5 dB
No. 4	4.7 dB	5.6 dB	6.4 dB	5.3 dB	5.7 dB	5.9 dB	5.5 dB

Antenna terminal test Uncertainty (+/-)							
Power meter		Conducted emission and Power density			Conducted emission		Channel power
Below 1 GHz	Above 1 GHz	Below 1 GHz	1 GHz - 3 GHz	3 GHz - 18 GHz	18 GHz - 26.5 GHz	26.5 GHz - 40 GHz	
0.7 dB	1.5 dB	1.5 dB	1.7 dB	2.8 dB	2.8 dB	2.9 dB	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 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.

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)	1Mbps, PN9
IEEE 802.11g (11g)	9Mbps, PN9
IEEE 802.11n SISO 20MHz BW (11n-20)	MCS 1, PN9
IEEE 802.11n SISO 40MHz BW (11n-40)	MCS 1, PN9
*The worst condition was determined based on the test result of Maximum Peak Output Power.	
*The power value of the EUT was set for testing as follows (setting value might be different from product specification value); - Power Setting: Refer to the following table. - Software: LAB-tool Ver : 15.2.4.92 *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.	

[Power Settings]

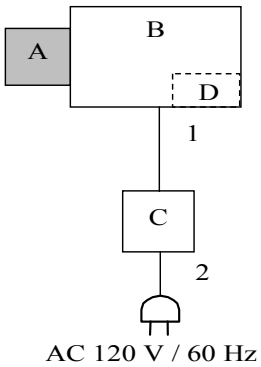
Mode	ch1	ch2	ch3	ch4	ch5	ch6	ch7	ch8	ch9	ch10	ch11
11b	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm
11g	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm
11n-20	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm
11n-40	-	-	6 dBm	8 dBm	8 dBm	8 dBm	8 dBm	8 dBm	5 dBm	-	-

*The details of Operating mode(s)

Test Item	Operating Mode	Tested Antenna port	Tested frequency
Conducted Emission	11n-20 Tx *1)	0+1	2437 MHz *1)
Radiated Spurious Emission (Below 1GHz)	11n-20 Tx *1)	0+1	2437 MHz *1)
Radiated Spurious Emission (Above 1GHz)	11b Tx 11n-20 Tx *2)	0+1	2412 MHz 2437 MHz 2462 MHz
	11n-40 Tx		2422 MHz 2437 MHz 2452 MHz
Band Edge confirmation	11b Tx 11g Tx 11n-20 Tx	0 *3)	2412 MHz 2462 MHz
	11n-40 Tx		2422 MHz 2452 MHz
Conducted Spurious Emission	11n-20 Tx *1)	0 *3)	2437 MHz *1)
6dB Bandwidth, 99% Occupied Bandwidth	11b Tx 11g Tx 11n-20 Tx	0 *3)	2412 MHz 2437 MHz 2462 MHz
	11n-40 Tx		2422 MHz 2437 MHz 2452 MHz
Maximum Peak Output Power, Maximum Average Output Power, Power Density	11b Tx 11g Tx 11n-20 Tx	0+1	2412 MHz 2437 MHz 2462 MHz
	11n-40 Tx		2422 MHz 2437 MHz 2452 MHz

*1) The operating mode and tested frequency were tested as a representative, because it had the highest power at antenna terminal test.
*2) Since 11g 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.
*3) After the comparison between Antenna port 0 and Antenna port 1, test was performed with the antenna that had higher power as a representative.

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

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless Transmitter	N1526	No.1	NEC Platforms, Ltd.	EUT
B	Camera	Q870	PT62024	Nikon	-
C	AC Adapter	YHA-67EA	3Y000410	YHT	-
D	Power Connector	-	-	Nikon	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	2.0	Unshielded	Unshielded	-
2	AC Cable	2.0	Unshielded	Unshielded	-

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0 m by 0.5 m, raised 0.8 m above the conducting ground plane.
The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80 cm from a Line Impedance Stabilization Network (LISN) / Artificial mains Network (AMN) and excess AC cable was bundled in center.

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 50ohm 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 AV
Measurement range : 0.15 MHz – 30 MHz
Test data : APPENDIX
Test result : Pass

SECTION 6: Radiated Spurious Emission

Test Procedure

It was measured based on "11.0 Emissions in non-restricted frequency bands" of "558074 D01 DTS Meas Guidance v03r03".
EUT was placed on a urethane platform of nominal size, 1.0 m by 0.5 m, raised 0.8 m above the conducting ground plane.
The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.
The height of the measuring antenna varied between 1 m and 4 m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
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 300 MHz	300 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	Average Power Method: 12.2.5.2 RBW: 1 MHz VBW: 3 MHz Detector: Power Averaging (RMS) Trace: 100 traces Duty factor was added to the results.	RBW: 100 kHz VBW: 300 kHz
Test Distance	3m	3 m (below 10 GHz), 1 m *2) (above 10 GHz)		3 m (below 10 GHz), 1 m *2) (above 10 GHz)

*1) Average Power Measurement was performed based on 6.0 & 12.2.5 of "KDB 558074 D01 DTS Meas Guidance v03r03"
*2) Distance Factor: 20 x log (3.0m/1.0m) = 9.5dB

- 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 M - 26.5 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
6dB Bandwidth	20MHz / 40 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth *1)	Enough width to display emission skirts	1 to 5 % of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/ Average *2)	-	Power Meter (Sensor: 80 MHz BW)
Peak Power Density	1.5 times the 6dB Bandwidth	3 kHz	10 kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4)	9kHz to 150kHz	200 Hz	620 Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	9.1 kHz	27 kHz				
Band Edge confirmation *2)	49.5 MHz	100 kHz	300 kHz	Auto	Peak	Max Hold	Spectrum Analyzer

*1) Peak hold was applied as Worst-case measurement.
*2) Reference data
*3) Section 10.2 Method PKPSD (peak PSD) of "KDB 558074 D01 DTS Meas Guidance v03r03".
*4) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately, however the noise was low enough 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

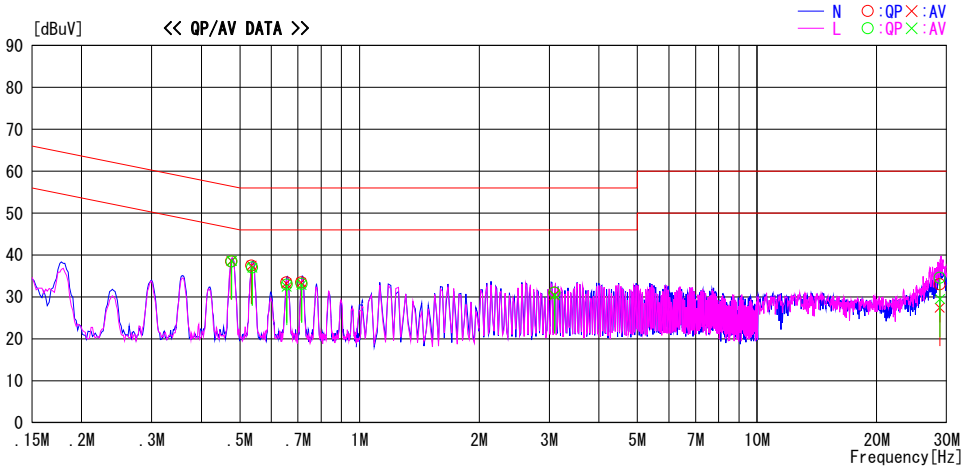
UL Japan, Inc. Ise EMC Lab. No.2 Semi Anechoic Chamber
Date: 2015/07/01

Report No. : 10812026H

Temp./Humi. : 18deg. C / 58% RH
Engineer : Takafumi Noguchi

Mode / Remarks : 11n-20 2437 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]		
0.47575	25.3	25.4	13.2	38.5	38.6	56.4	46.4	17.9	7.8	N	
0.53494	24.3	24.3	13.2	37.5	37.5	56.0	46.0	18.5	8.5	N	
0.65418	20.2	19.9	13.3	33.5	33.2	56.0	46.0	22.5	12.8	N	
0.71337	20.2	20.1	13.3	33.5	33.4	56.0	46.0	22.5	12.6	N	
3.08817	17.4	16.8	13.6	31.0	30.4	56.0	46.0	25.0	15.6	N	
28.80720	17.6	12.0	15.4	33.0	27.4	60.0	50.0	27.0	22.6	N	
0.47694	25.3	25.4	13.2	38.5	38.6	56.4	46.4	17.9	7.8	L	
0.53721	23.8	23.8	13.2	37.0	37.0	56.0	46.0	19.0	9.0	L	
0.65566	19.6	19.1	13.3	32.9	32.4	56.0	46.0	23.1	13.6	L	
0.71518	19.8	19.6	13.3	33.1	32.9	56.0	46.0	22.9	13.1	L	
3.09698	17.4	16.8	13.6	31.0	30.4	56.0	46.0	25.0	15.6	L	
28.82850	19.2	14.1	15.4	34.6	29.5	60.0	50.0	25.4	20.5	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.

6dB Bandwidth

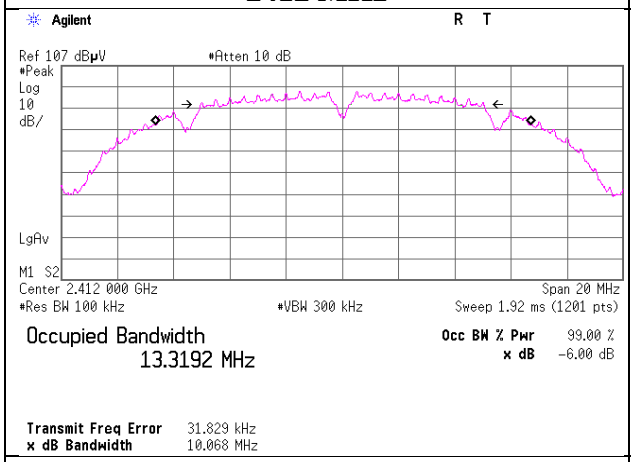
Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 8, 2015
Temperature / Humidity	23 deg. C / 57 % RH
Engineer	Tomoki Matsui
Mode	Tx

Mode	Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
11b	2412	10.068	> 500
	2437	10.088	> 500
	2462	10.088	> 500
11g	2412	16.338	> 500
	2437	16.353	> 500
	2462	16.387	> 500
11n-20	2412	17.453	> 500
	2437	17.500	> 500
	2462	17.535	> 500
11n-40	2422	35.743	> 500
	2437	35.757	> 500
	2452	35.666	> 500

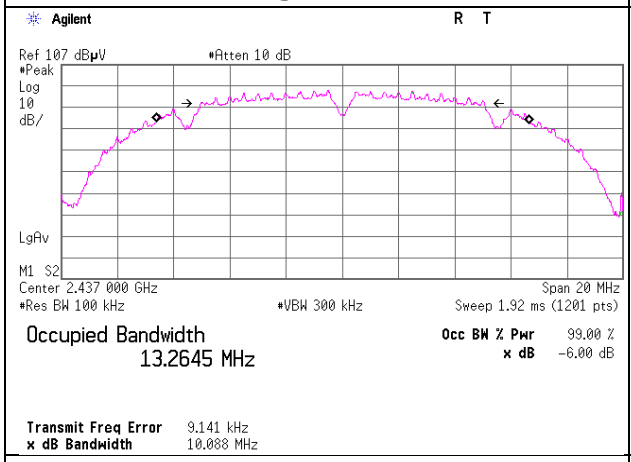
6dB Bandwidth

11b Antenna port 0

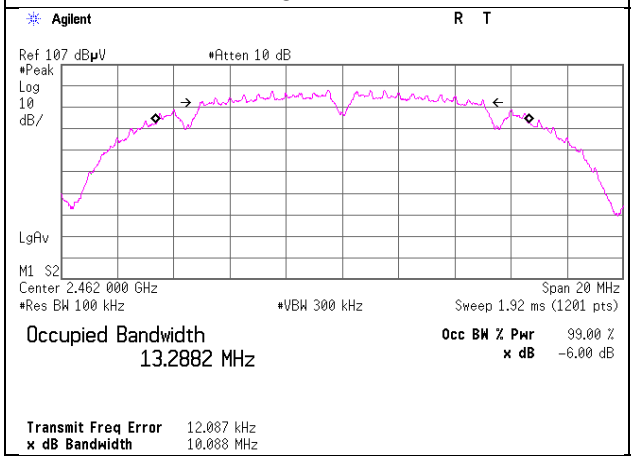
2412 MHz



2437 MHz

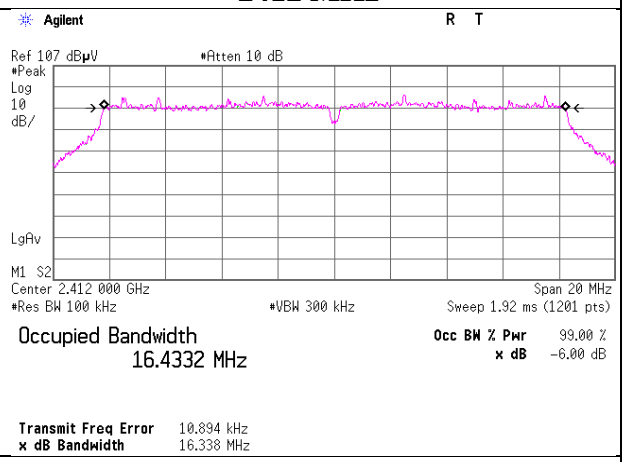


2462 MHz

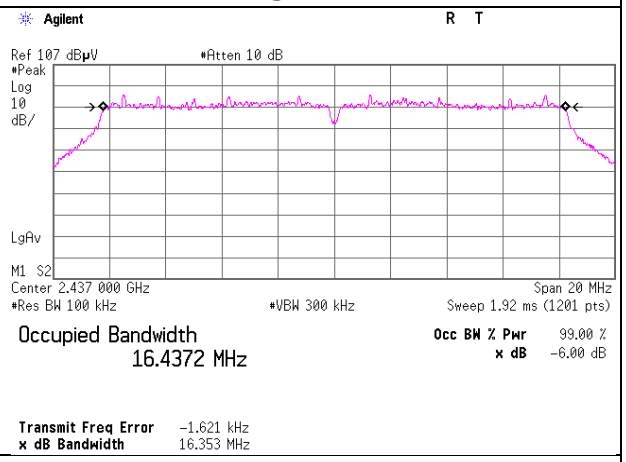


11g Antenna port 0

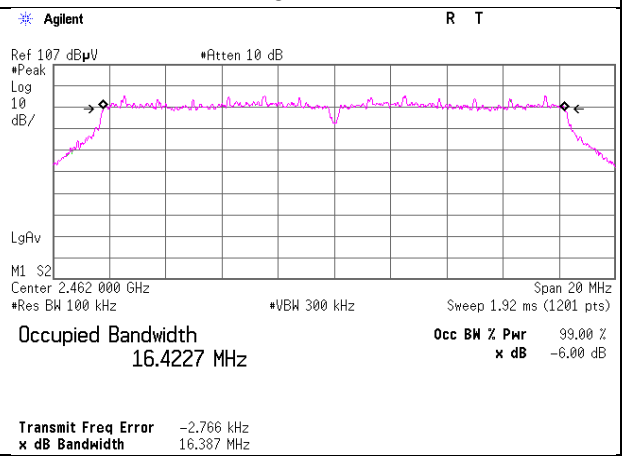
2412 MHz



2437 MHz



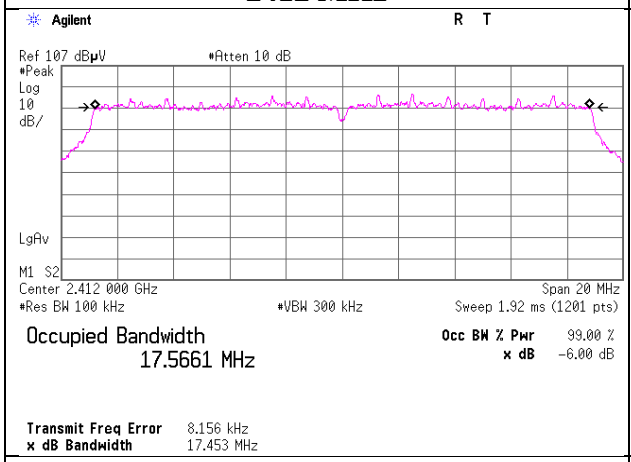
2462 MHz



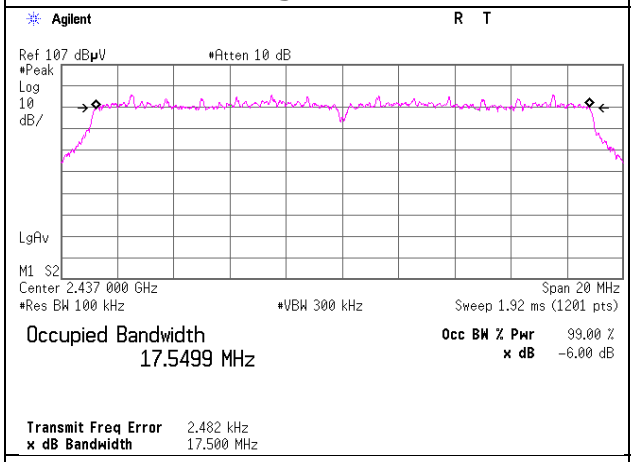
6dB Bandwidth

11n-20 Antenna port 0

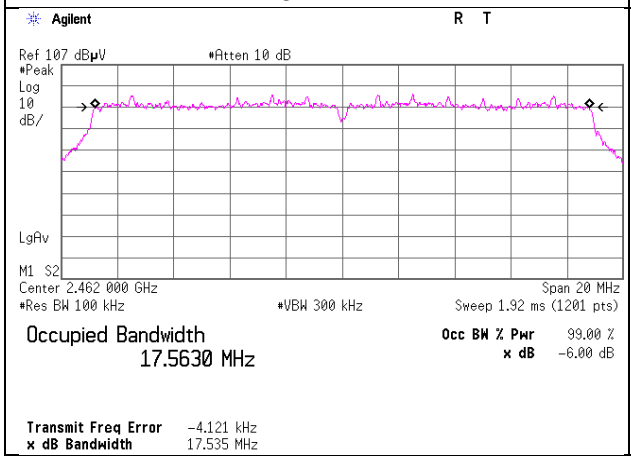
2412 MHz



2437 MHz

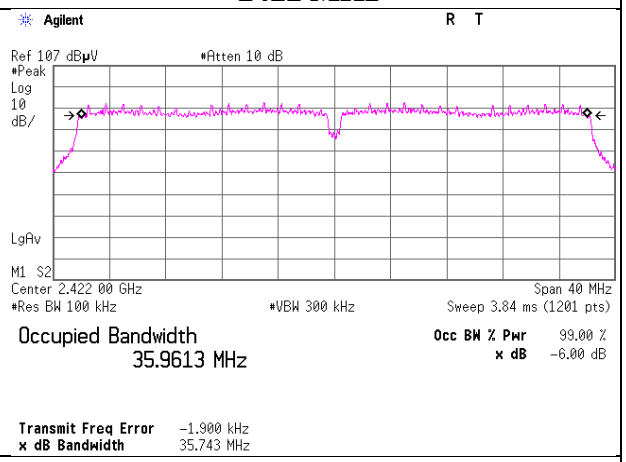


2462 MHz

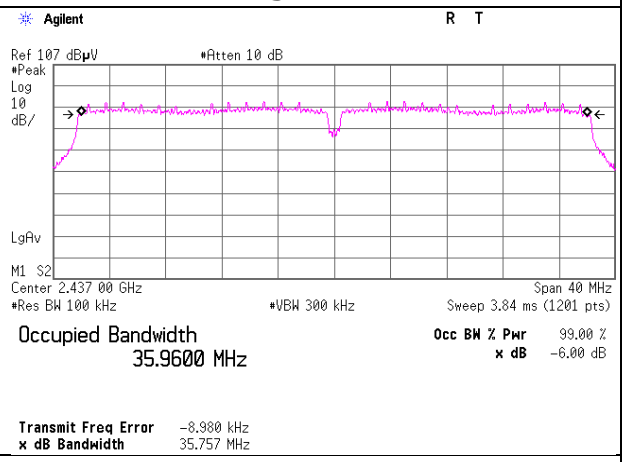


11n-40 Antenna port 0

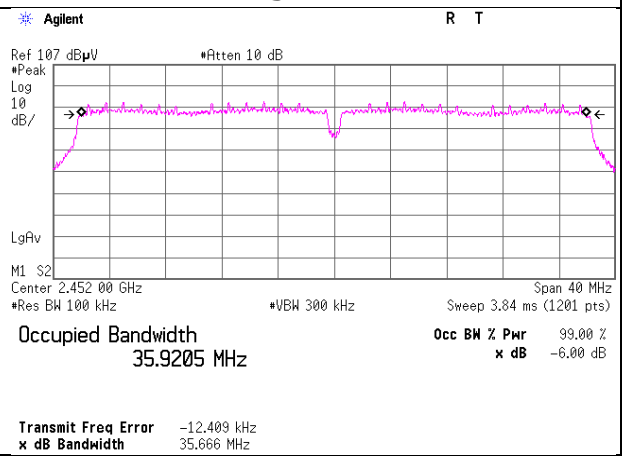
2422 MHz



2437 MHz



2452 MHz



Maximum Peak Output Power

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 4, 2015
Temperature/ Humidity	26deg. C / 32% RH
Engineer	Tomoki Matsui
Mode	Tx 11b

Antenna port 0 + 1

Freq.	Antenna port 0 Result	Antenna port 1 Result	Antenna port 0 + Antenna port 1 Result		Limit		Margin
[MHz]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	15.17	14.62	14.74	29.79	30.00	1000.00	15.26
2437	17.10	16.29	15.24	33.39	30.00	1000.00	14.76
2462	17.26	16.11	15.23	33.36	30.00	1000.00	14.77

Sample Calculation:
Result = Antenna port 0 + 1

Antenna port 0

Freq.	Reading	Cable Loss	Atten.	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	1.10	0.69	10.02	11.81	15.17
2437	1.61	0.70	10.02	12.33	17.10
2462	1.65	0.70	10.02	12.37	17.26

Antenna port 1

Freq.	Reading	Cable Loss	Atten.	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	0.90	0.69	10.06	11.65	14.62
2437	1.36	0.70	10.06	12.12	16.29
2462	1.31	0.70	10.06	12.07	16.11

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

Maximum Peak Output Power

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 4, 2015
Temperature/ Humidity	26deg. C / 32% RH
Engineer	Tomoki Matsui
Mode	Tx 11g

Antenna port 0 + 1

Freq.	Antenna port 0 Result	Antenna port 1 Result	Antenna port 0 + Antenna port 1 Result		Limit		Margin
[MHz]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	96.16	57.94	21.88	154.10	30.00	1000.00	8.12
2437	92.26	55.85	21.71	148.10	30.00	1000.00	8.29
2462	91.62	41.02	21.23	132.64	30.00	1000.00	8.77

Sample Calculation:
Result = Antenna port 0 + 1

Antenna port 0

Freq.	Reading	Cable Loss	Atten.	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	9.12	0.69	10.02	19.83	96.16
2437	8.93	0.70	10.02	19.65	92.26
2462	8.90	0.70	10.02	19.62	91.62

Antenna port 1

Freq.	Reading	Cable Loss	Atten.	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	6.88	0.69	10.06	17.63	57.94
2437	6.71	0.70	10.06	17.47	55.85
2462	5.37	0.70	10.06	16.13	41.02

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

Maximum Peak Output Power

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 4, 2015
Temperature/ Humidity	26deg. C / 32% RH
Engineer	Tomoki Matsui
Mode	Tx 11n-20

Antenna port 0 + 1

Freq.	Antenna port 0 Result	Antenna port 1 Result	Antenna 0 + Antenna 1 Result		Limit		Margin
[MHz]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2412	101.39	46.99	21.71	148.38	30.00	1000	8.29
2437	119.12	47.53	22.22	166.66	30.00	1000	7.78
2462	99.54	44.77	21.59	144.31	30.00	1000	8.41

Sample Calculation:
Result = Antenna port 0 + 1

Antenna port 0

Freq.	Reading	Cable Loss	Atten.	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	9.35	0.69	10.02	20.06	101.39
2437	10.04	0.70	10.02	20.76	119.12
2462	9.26	0.70	10.02	19.98	99.54

Antenna port 1

Freq.	Reading	Cable Loss	Atten.	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2412	5.97	0.69	10.06	16.72	46.99
2437	6.01	0.70	10.06	16.77	47.53
2462	5.75	0.70	10.06	16.51	44.77

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

Maximum Peak Output Power

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	10812026H	
Date	June 4, 2015	June 17, 2015
Temperature/ Humidity	26deg. C / 32% RH	24deg. C / 42% RH
Engineer	Tomoki Matsui	Tomoki Matsui
Mode	Tx 11n-40	

Antenna port 0 + 1

Freq.	Antenna port 0 Result	Antenna port 1 Result	Antenna port 0 + Antenna port 1 Result		Limit		Margin
[MHz]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2422	79.15	61.02	21.47	140.16	30.00	1000	8.53
2437	105.20	52.00	21.96	157.20	30.00	1000	8.04
2452	64.13	50.47	20.59	114.60	30.00	1000	9.41

Sample Calculation:
Result = Antenna port 0 + 1

Antenna port 0

Freq.	Reading	Cable Loss	Atten.	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2422	6.95	1.97	10.06	18.98	79.15
2437	9.50	0.70	10.02	20.22	105.20
2452	6.02	1.99	10.06	18.07	64.13

Antenna port 1

Freq.	Reading	Cable Loss	Atten.	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
2422	5.85	1.98	10.02	17.85	61.02
2437	6.40	0.70	10.06	17.16	52.00
2452	5.01	2.00	10.02	17.03	50.47

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator

Maximum Peak Output Power(Worst Rate Check)

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	10812026H	
Date	June 3, 2015	June 4, 2015
Temperature/ Humidity	23deg. C / 43% RH	26deg. C / 32% RH
Engineer	Shinya Watanabe	Tomoki Matsui
Mode	Tx 11b	

11b 2437 MHz

Rate	Antenna port 0 Result Peak		Antenna port 1 Result Peak		Remark
[Mbps]	[dBm]	[mW]	[dBm]	[mW]	
1	11.13	12.97	-	-	
2	11.18	13.12	11.16	13.06	*Single transmission
5.5	10.80	12.02	-	-	
11	10.68	11.69	-	-	

*: Worst Rate
All comparison were carried out on same frequency and measurement factors.

11b 2437 MHz

Rate	Antenna port 0 Result Peak		Antenna port 1 Result Peak		Total Result Power		Remark
[Mbps]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
1	11.63	14.55	11.42	13.87	14.54	28.42	*Simultaneous transmission
2	11.34	13.61	11.16	13.06	14.26	26.68	
5.5	10.68	11.69	10.41	10.99	13.56	22.69	
11	10.82	12.08	10.76	11.91	13.80	23.99	

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

Maximum Peak Output Power(Worst Rate Check)

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	10812026H	
Date	June 3, 2015	June 4, 2015
Temperature/ Humidity	23deg. C / 43% RH	26deg. C / 32% RH
Engineer	Shinya Watanabe	Tomoki Matsui
Mode	Tx 11g	

11g 2437 MHz

Rate	Antenna port 0 Result Peak		Antenna port 1 Result Peak		Remark
[Mbps]	[dBm]	[mW]	[dBm]	[mW]	
6	18.75	74.99	-	-	
9	18.98	79.07	16.17	41.40	*Single transmission
12	18.15	65.31	-	-	
18	18.05	63.83	-	-	
24	17.82	60.53	-	-	
36	17.69	58.75	-	-	
48	18.17	65.61	-	-	
54	18.22	66.37	-	-	

*: Worst Rate
All comparison were carried out on same frequency and measurement factors.

11g 2437 MHz

Rate	Antenna port 0 Result Peak		Antenna port 1 Result Peak		Total Result Power		Remark
[Mbps]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
6	18.92	77.98	16.76	47.42	20.98	125.41	
9	18.95	78.52	16.77	47.53	21.01	126.06	*Simultaneous transmission
12	18.21	66.22	16.66	46.34	20.51	112.57	
18	18.56	71.78	16.17	41.40	20.54	113.18	
24	18.05	63.83	16.16	41.30	20.22	105.13	
36	18.38	68.87	16.76	47.42	20.66	116.29	
48	18.02	63.39	16.26	42.27	20.24	105.65	
54	18.14	65.16	16.19	41.59	20.28	106.75	

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

Maximum Peak Output Power(Worst Rate Check)

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	10812026H	
Date	June 3, 2015	June 4, 2015
Temperature/ Humidity	23deg. C / 43% RH	26deg. C / 32% RH
Engineer	Shinya Watanabe	Tomoki Matsui
Mode	Tx 11n-20	

11n-20 2437 MHz

MCS Number	Antenna port 0 Result Peak		Antenna port 1 Result Peak		Remark
	[dBm]	[mW]	[dBm]	[mW]	
0	20.15	103.51	16.10	40.74	*Single transmission
1	19.28	84.72	-	-	
2	18.34	68.23	-	-	
3	18.11	64.71	-	-	
4	18.35	68.39	-	-	
5	18.57	71.94	-	-	
6	18.50	70.79	-	-	
7	18.50	70.79	-	-	

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

11n-20 2437 MHz

MCS Number	Antenna port 0 Result Peak		Antenna port 1 Result Peak		Total Result Power		Remark
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	19.06	80.54	15.79	37.93	20.74	118.47	
1	20.06	101.39	16.07	40.46	21.52	141.85	*Simultaneous transmission
2	19.41	87.30	16.04	40.18	21.05	127.48	
3	18.74	74.82	15.67	36.90	20.48	111.71	
4	18.72	74.47	15.95	39.36	20.56	113.83	
5	19.22	83.56	16.06	40.36	20.93	123.92	
6	18.48	70.47	15.72	37.33	20.33	107.79	
7	18.92	77.98	15.48	35.32	20.54	113.30	
8	18.54	71.45	17.01	50.23	20.85	121.68	
9	17.88	61.38	16.81	47.97	20.39	109.35	
10	18.43	69.66	15.78	37.84	20.31	107.51	
11	18.48	70.47	16.42	43.85	20.58	114.32	
12	18.82	76.21	16.44	44.06	20.80	120.26	
13	17.99	62.95	15.86	38.55	20.06	101.50	
14	17.93	62.09	16.07	40.46	20.11	102.54	
15	18.04	63.68	16.80	47.86	20.47	111.54	

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

Maximum Peak Output Power(Worst Rate Check)

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	10812026H	
Date	June 3, 2015	June 4, 2015
Temperature/ Humidity	23deg. C / 43% RH	26deg. C / 32% RH
Engineer	Shinya Watanabe	Tomoki Matsui
Mode	Tx 11n-40	

11n-40 2437 MHz

MCS Number	Antenna port 0 Result Peak		Antenna port 1 Result Peak		Remark
	[dBm]	[mW]	[dBm]	[mW]	
0	19.56	90.36	16.05	40.27	*Single transmission
1	19.45	88.10	-	-	
2	18.93	78.16	-	-	
3	18.80	75.86	-	-	
4	18.66	73.45	-	-	
5	17.88	61.38	-	-	
6	17.93	62.09	-	-	
7	17.58	57.28	-	-	

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

11n-40 2437 MHz

MCS Number	Antenna port 0 Result Peak		Antenna port 1 Result Peak		Total Result Power		Remark
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	18.94	78.34	15.25	33.50	20.49	111.84	
1	19.52	89.54	16.46	44.26	21.26	133.80	*Simultaneous transmission
2	18.74	74.82	16.36	43.25	20.72	118.07	
3	19.33	85.70	16.38	43.45	21.11	129.15	
4	18.22	66.37	15.12	32.51	19.95	98.88	
5	17.63	57.94	15.58	36.14	19.74	94.08	
6	18.34	68.23	15.50	35.48	20.16	103.72	
7	18.05	63.83	15.74	37.50	20.06	101.32	
8	18.56	71.78	17.10	51.29	20.90	123.07	
9	17.96	62.52	15.76	37.67	20.01	100.19	
10	18.04	63.68	15.86	38.55	20.10	102.23	
11	18.16	65.46	15.97	39.54	20.21	105.00	
12	18.26	66.99	16.16	41.30	20.35	108.29	
13	18.68	73.79	15.86	38.55	20.51	112.34	
14	18.43	69.66	16.36	43.25	20.53	112.91	
15	18.61	72.61	15.69	37.07	20.40	109.68	

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

Maximum Average Output Power (Reference data for RF EXposure)

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 4, 2015
Temperature/ Humidity	26 deg. C / 32 % RH
Engineer	Tomoki Matsui
Mode	Tx 11b

Antenna port 0+1

Freq.	Antenna Port 0 Result		Antenna Port 1 Result		Result Antenna Port 0+1 (Cond.)		Result Antenna Port 0+1 (e.i.r.p.)	
	(Cond.)	(e.r.i.p)	(Cond.)	(e.r.i.p)				
[MHz]	[mW]	[mW]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]
2412.0	7.40	18.62	7.28	18.32	11.67	14.67	15.68	36.94
2437.0	7.73	19.45	8.09	20.37	11.99	15.82	16.00	39.82
2462.0	8.13	20.46	8.13	20.46	12.11	16.26	16.12	40.93

Antenna port 0

Freq.	P/M Reading	Cable Loss	Atten. Loss	Antenna Gain	Result (Cond.)		Result (e.i.r.p.)	
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]
2412.0	-2.02	0.69	10.02	4.01	8.69	7.40	12.70	18.62
2437.0	-1.84	0.70	10.02	4.01	8.88	7.73	12.89	19.45
2462.0	-1.62	0.70	10.02	4.01	9.10	8.13	13.11	20.46

Antenna port 1

Freq.	P/M Reading	Cable Loss	Atten. Loss	Antenna Gain	Result (Cond.)		Result (e.i.r.p.)	
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]
2412.0	-2.13	0.69	10.06	4.01	8.62	7.28	12.63	18.32
2437.0	-1.68	0.70	10.06	4.01	9.08	8.09	13.09	20.37
2462.0	-1.66	0.70	10.06	4.01	9.10	8.13	13.11	20.46

Result(Cond.) = Reading + Cable Loss + Atten.Loss
Result(e.i.r.p.) = Reading + Cable Loss + Atten.Loss + Antenna Gain

Maximum Average Output Power (Reference data for RF EXposure)

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 4, 2015
Temperature/ Humidity	26d eg. C / 32 % RH
Engineer	Tomoki Matsui
Mode	Tx 11g

Antenna port 0+1

Freq.	Antenna Port 0 Result		Antenna Port 1 Result		Result Antenna Port 0+1 (Cond.)		Result Antenna Port 0+1 (e.i.r.p.)	
	(Cond.)	(e.r.i.p)	(Cond.)	(e.r.i.p)				
[MHz]	[mW]	[mW]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]
2412.0	6.78	17.06	8.15	20.51	11.74	14.92	15.75	37.57
2437.0	6.73	16.94	7.78	19.59	11.62	14.51	15.63	36.53
2462.0	6.38	16.07	6.70	16.87	11.17	13.08	15.18	32.93

Antenna port 0

Freq.	P/M Reading	Cable Loss	Atten. Loss	Antenna Gain	Result (Cond.)		Result (e.i.r.p.)	
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]
2412.0	-2.40	0.69	10.02	4.01	8.31	6.78	12.32	17.06
2437.0	-2.44	0.70	10.02	4.01	8.28	6.73	12.29	16.94
2462.0	-2.67	0.70	10.02	4.01	8.05	6.38	12.06	16.07

Antenna port 1

Freq.	P/M Reading	Cable Loss	Atten. Loss	Antenna Gain	Result (Cond.)		Result (e.i.r.p.)	
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]
2412.0	-1.64	0.69	10.06	4.01	9.11	8.15	13.12	20.51
2437.0	-1.85	0.70	10.06	4.01	8.91	7.78	12.92	19.59
2462.0	-2.50	0.70	10.06	4.01	8.26	6.70	12.27	16.87

Result(Cond.) = Reading + Cable Loss + Atten.Loss
Result(e.i.r.p.) = Reading + Cable Loss + Atten.Loss + Antenna Gain

Maximum Average Output Power (Reference data for RF EXposure)

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 4, 2015
Temperature/ Humidity	26deg. C / 32% RH
Engineer	Tomoki Matsui
Mode	Tx 11n-20

Antenna port 0+1

Freq.	Antenna Port 0 Result		Antenna Port 1 Result		Result Antenna Port 0+1 (Cond.)		Result Antenna Port 0+1 (e.i.r.p.)	
	(Cond.)	(e.r.i.p)	(Cond.)	(e.r.i.p)				
[MHz]	[mW]	[mW]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]
2412.0	6.44	16.22	7.76	19.54	11.52	14.20	15.53	35.76
2437.0	6.53	16.44	7.14	17.99	11.36	13.68	15.37	34.43
2462.0	6.34	15.96	7.23	18.20	11.32	13.57	15.33	34.16

Antenna port 0

Freq.	P/M Reading	Cable Loss	Atten. Loss	Antenna Gain	Result (Cond.)		Result (e.i.r.p.)	
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]
2412.0	-2.62	0.69	10.02	4.01	8.09	6.44	12.10	16.22
2437.0	-2.57	0.70	10.02	4.01	8.15	6.53	12.16	16.44
2462.0	-2.70	0.70	10.02	4.01	8.02	6.34	12.03	15.96

Antenna port 1

Freq.	P/M Reading	Cable Loss	Atten. Loss	Antenna Gain	Result (Cond.)		Result (e.i.r.p.)	
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]
2412.0	-1.85	0.69	10.06	4.01	8.90	7.76	12.91	19.54
2437.0	-2.21	0.69	10.06	4.01	8.54	7.14	12.55	17.99
2462.0	-2.17	0.70	10.06	4.01	8.59	7.23	12.60	18.20

Result(Cond.) = Reading + Cable Loss + Atten.Loss
Result(e.i.r.p.) = Reading + Cable Loss + Atten.Loss + Antenna Gain

Maximum Average Output Power (Reference data for RF EXposure)

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	10812026H	
Date	June 4, 2015	June 17, 2015
Temperature/ Humidity	26 deg. C / 32 % RH	24 deg. C / 47 % RH
Engineer	Tomoki Matsui	Tomoki Matsui
Mode	Tx 11n-40	

Antenna port 0+1

Freq.	Antenna Port 0 Result		Antenna Port 1 Result		Result Antenna Port 0+1 (Cond.)		Result Antenna Port 0+1 (e.i.r.p.)	
	(Cond.)	(e.r.i.p)	(Cond.)	(e.r.i.p)				
[MHz]	[mW]	[mW]	[mW]	[mW]	[dBm]	[mW]	[dBm]	[mW]
2422.0	4.84	12.17	3.99	10.06	9.46	8.83	13.47	22.23
2437.0	6.07	15.28	6.30	15.85	10.92	12.36	14.93	31.12
2452.0	3.70	9.31	3.29	8.28	8.44	6.99	12.45	17.59

Antenna port 0

Freq.	P/M Reading	Cable Loss	Atten. Loss	Antenna Gain	Result (Cond.)		Result (e.i.r.p.)	
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]
2422.0	-5.19	1.97	10.06	4.01	6.84	4.84	10.85	12.17
2437.0	-2.89	0.70	10.02	4.01	7.83	6.07	11.84	15.28
2452.0	-6.37	1.99	10.06	4.01	5.68	3.70	9.69	9.31

Antenna port 1

Freq.	P/M Reading	Cable Loss	Atten. Loss	Antenna Gain	Result (Cond.)		Result (e.i.r.p.)	
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]
2422.0	-5.99	1.98	10.02	4.01	6.01	3.99	10.02	10.06
2437.0	-2.77	0.70	10.06	4.01	7.99	6.30	12.00	15.85
2452.0	-6.85	2.00	10.02	4.01	5.17	3.29	9.18	8.28

Result(Cond.) = Reading + Cable Loss + Atten.Loss
Result(e.i.r.p.) = Reading + Cable Loss + Atten.Loss + Antenna Gain

Maximum Average Output Power(Worst Rate Check)

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 4, 2015
Temperature/ Humidity	26 deg. C / 32 % RH
Engineer	Tomoki Matsui
Mode	Tx 11b

11b 2437 MHz

Rate	Antenna port 0 Result Average		Antenna port 1 Result Average		Remark
[Mbps]	[dBm]	[mW]	[dBm]	[mW]	
1	8.04	6.37	-	-	
2	8.06	6.40	8.29	6.75	*Single transmission
5.5	7.47	5.58	-	-	
11	7.44	5.55	-	-	

*: Worst Rate
All comparison were carried out on same frequency and measurement factors.

11b 2437 MHz

Rate	Antenna port 0 Result Average		Antenna port 1 Result Average		Total Result Power		Remark
[Mbps]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
1	8.18	6.58	8.38	6.89	11.29	13.46	*Simultaneous transmission
2	8.10	6.46	8.37	6.87	11.25	13.33	
5.5	7.41	5.51	7.70	5.89	10.57	11.40	
11	7.19	5.24	7.38	5.47	10.30	10.71	

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

Maximum Average Output Power(Worst Rate Check)

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 4, 2015
Temperature/ Humidity	26 deg. C / 32 % RH
Engineer	Tomoki Matsui
Mode	Tx 11g

11g 2437 MHz

Rate	Antenna port 0 Result Average		Antenna port 1 Result Average		Remark
[Mbps]	[dBm]	[mW]	[dBm]	[mW]	
6	7.61	5.77	8.01	6.32	*Single transmission
9	7.17	5.21	-	-	
12	7.44	5.55	-	-	
18	7.06	5.08	-	-	
24	6.93	4.93	-	-	
36	6.69	4.67	-	-	
48	6.27	4.24	-	-	
54	6.35	4.32	-	-	

*: Worst Rate
All comparison were carried out on same frequency and measurement factors.

11g 2437 MHz

Rate	Antenna port 0 Result Average		Antenna port 1 Result Average		Total Result Power		Remark
[Mbps]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
6	7.58	5.73	8.21	6.62	10.92	12.35	*Simultaneous transmission
9	7.56	5.70	8.15	6.53	10.88	12.23	
12	7.32	5.40	8.08	6.43	10.73	11.82	
18	7.30	5.37	7.61	5.77	10.47	11.14	
24	6.93	4.93	7.32	5.40	10.14	10.33	
36	6.79	4.78	7.36	5.45	10.09	10.22	
48	6.48	4.45	7.21	5.26	9.87	9.71	
54	6.28	4.25	6.66	4.63	9.48	8.88	

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

Maximum Average Output Power(Worst Rate Check)

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 4, 2015
Temperature/ Humidity	26 deg. C / 32 % RH
Engineer	Tomoki Matsui
Mode	Tx 11n-20

11n-20 2437 MHz

MCS Number	Antenna port 0 Result Average		Antenna port 1 Result Average		Remark
	[dBm]	[mW]	[dBm]	[mW]	
0	7.50	5.62	7.67	5.85	*Single transmission
1	7.01	5.02	-	-	
2	6.90	4.90	-	-	
3	6.88	4.88	-	-	
4	6.69	4.67	-	-	
5	6.36	4.33	-	-	
6	6.33	4.30	-	-	
7	6.32	4.29	-	-	

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

11n-20 2437 MHz

MCS Number	Antenna port 0 Result Average		Antenna port 1 Result Average		Total Result Power		Remark
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	7.45	5.56	7.85	6.10	10.66	11.65	*Simultaneous transmission
1	7.28	5.35	7.76	5.97	10.54	11.32	
2	7.22	5.27	7.72	5.92	10.49	11.19	
3	7.09	5.12	7.35	5.43	10.23	10.55	
4	6.86	4.85	7.35	5.43	10.12	10.29	
5	6.76	4.74	7.35	5.43	10.08	10.17	
6	6.32	4.29	7.25	5.31	9.82	9.59	
7	6.46	4.43	7.31	5.38	9.92	9.81	
8	7.25	5.31	7.01	5.02	10.14	10.33	
9	7.06	5.08	6.93	4.93	10.01	10.01	
10	6.59	4.56	6.48	4.45	9.55	9.01	
11	6.70	4.68	6.59	4.56	9.66	9.24	
12	6.62	4.59	6.10	4.07	9.38	8.67	
13	5.51	3.56	5.56	3.60	8.55	7.15	
14	5.44	3.50	5.74	3.75	8.60	7.25	
15	5.66	3.68	5.73	3.74	8.71	7.42	

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

Maximum Average Output Power(Worst Rate Check)

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 4, 2015
Temperature/ Humidity	26 deg. C / 32 % RH
Engineer	Tomoki Matsui
Mode	Tx 11n-40

11n-40 2437 MHz

MCS Number	Antenna port 0 Result Average		Antenna port 1 Result Average		Remark
	[dBm]	[mW]	[dBm]	[mW]	
0	7.13	5.16	7.29	5.36	*Single transmission
1	7.00	5.01	-	-	
2	6.55	4.52	-	-	
3	6.26	4.23	-	-	
4	6.03	4.01	-	-	
5	5.84	3.84	-	-	
6	5.54	3.58	-	-	
7	5.42	3.48	-	-	

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

11n-40 2437 MHz

MCS Number	Antenna port 0 Result Average		Antenna port 1 Result Average		Total Result Power		Remark
	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	
0	6.87	4.86	7.50	5.62	10.21	10.49	*Simultaneous transmission
1	6.40	4.37	7.41	5.51	9.94	9.87	
2	6.43	4.40	7.43	5.53	9.97	9.93	
3	6.37	4.34	7.11	5.14	9.77	9.48	
4	5.55	3.59	6.70	4.68	9.17	8.27	
5	5.67	3.69	6.46	4.43	9.09	8.12	
6	5.17	3.29	5.84	3.84	8.53	7.13	
7	5.39	3.46	6.34	4.31	8.90	7.76	
8	6.31	4.28	6.52	4.49	9.43	8.76	
9	6.37	4.34	6.38	4.35	9.39	8.68	
10	5.94	3.93	5.47	3.52	8.72	7.45	
11	5.85	3.85	5.59	3.62	8.73	7.47	
12	5.31	3.40	5.03	3.18	8.18	6.58	
13	4.94	3.12	4.87	3.07	7.92	6.19	
14	4.69	2.94	4.44	2.78	7.58	5.72	
15	4.68	2.94	4.69	2.94	7.70	5.88	

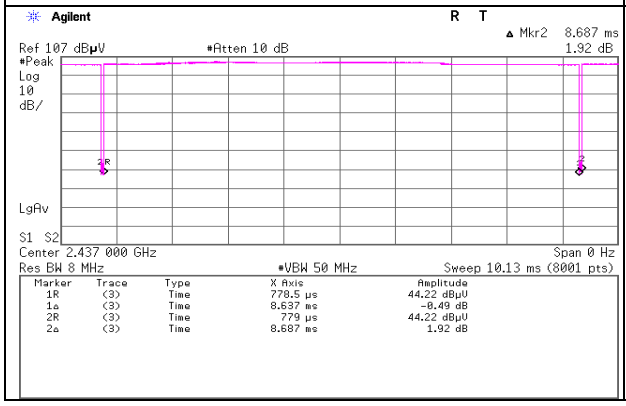
*Worst MCS
All comparison were carried out on same frequency and measurement factors.

Burst rate confirmation

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	10812026H
Date	June 5, 2015
Temperature / Humidity	23 deg. C / 40 % RH
Engineer	Keisuke Kawamura
Mode	Tx

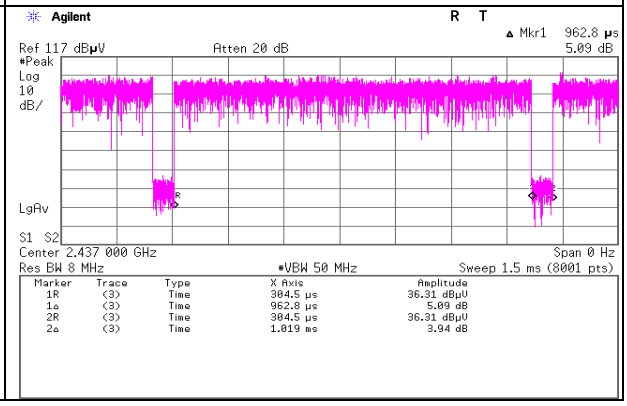
11b 1 Mbps

Tx on / (Tx on + Tx off) =	**0.994**
Tx on / (Tx on + Tx off) * 100 =	**99.4 %**
Duty factor = 10 * log (8.687 / 8.637) =	**0.03 dB**



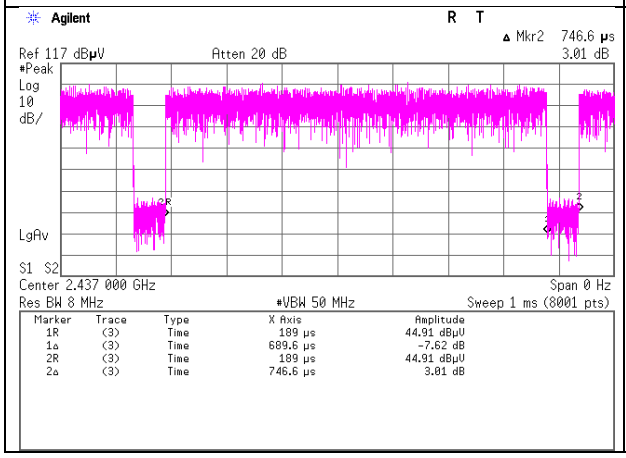
11g 9 Mbps

Tx on / (Tx on + Tx off) =	**0.945**
Tx on / (Tx on + Tx off) * 100 =	**94.5 %**
Duty factor = 10 * log (1.019 / 0.9628) =	**0.25 dB**



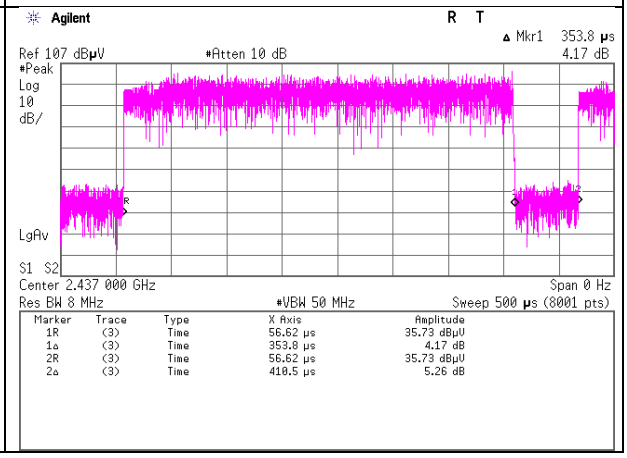
11n-20 MCS 1

Tx on / (Tx on + Tx off) =	**0.924**
Tx on / (Tx on + Tx off) * 100 =	**92.4 %**
Duty factor = 10 * log (746.6 / 689.6) =	**0.34 dB**



11n-40 MCS 1

Tx on / (Tx on + Tx off) =	**0.862**
Tx on / (Tx on + Tx off) * 100 =	**86.2 %**
Duty factor = 10 * log (410.5 / 353.8) =	**0.65 dB**



Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	10812026H	
Date	June 10, 2015	June 17, 2015
Temperature / Humidity	22 deg. C / 55 % RH	24 deg. C / 60 % RH
Engineer	Tomohisa Nakagawa (1-10GHz)	Keisuke Kawamura (Above 10GHz)
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	45.8	26.9	3.4	32.0	-	44.1	73.9	29.8	*1)
Hori	3215.938	PK	49.5	28.7	3.9	31.5	-	50.6	73.9	23.3	
Hori	4824.000	PK	48.9	31.8	5.5	31.3	-	54.9	73.9	19.0	
Hori	7236.000	PK	42.4	36.0	6.8	32.0	-	53.2	73.9	20.7	
Hori	9648.000	PK	41.9	38.2	7.3	32.4	-	55.0	73.9	18.9	
Hori	2390.000	AV	38.7	26.9	3.4	32.0	-	37.0	53.9	16.9	*1)
Hori	3215.938	AV	45.8	28.7	3.9	31.5	-	46.9	53.9	7.0	
Hori	4824.000	AV	45.2	31.8	5.5	31.3	-	51.2	53.9	2.7	
Hori	7236.000	AV	33.8	36.0	6.8	32.0	-	44.6	53.9	9.3	
Hori	9648.000	AV	34.5	38.2	7.3	32.4	-	47.6	53.9	6.3	
Vert	2390.000	PK	46.8	26.9	3.4	32.0	-	45.1	73.9	28.8	*1)
Vert	3215.938	PK	49.2	28.7	3.9	31.5	-	50.3	73.9	23.6	
Vert	4824.000	PK	48.0	31.8	5.5	31.3	-	54.0	73.9	19.9	
Vert	7236.000	PK	43.6	36.0	6.8	32.0	-	54.4	73.9	19.5	
Vert	9648.000	PK	43.9	38.2	7.3	32.4	-	57.0	73.9	16.9	
Vert	2390.000	AV	38.3	26.9	3.4	32.0	-	36.6	53.9	17.3	*1)
Vert	3215.938	AV	43.4	28.7	3.9	31.5	-	44.5	53.9	9.4	
Vert	4824.000	AV	43.9	31.8	5.5	31.3	-	49.9	53.9	4.0	
Vert	7236.000	AV	34.8	36.0	6.8	32.0	-	45.6	53.9	8.3	
Vert	9648.000	AV	34.4	38.2	7.3	32.4	-	47.5	53.9	6.4	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10 GHz)) - Gain(Amplifier)
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

Distance factor: 10 GHz - 26.5 GHz 20log (3.0 m / 1.0 m) = 9.5 dB
26.5 GHz - 40 GHz 20log (3.0 m / 0.5 m) = 15.6 dB
*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

Polarity	Frequency	Detector	Reading	Ant.Fac.	Loss	Gain	Result	Limit	Margin	Remark
Hori	2412.000	PK	102.3	26.9	3.4	32.0	100.6	-	-	Carrier
Hori	2397.025	PK	59.2	26.9	3.4	32.0	57.5	80.6	23.1	
Hori	2400.000	PK	51.8	26.9	3.4	32.0	50.1	80.6	30.5	
Vert	2412.000	PK	101.7	26.9	3.4	32.0	100.0	-	-	Carrier
Vert	2397.025	PK	60.0	26.9	3.4	32.0	58.3	80.0	21.7	
Vert	2400.000	PK	52.3	26.9	3.4	32.0	50.6	80.0	29.4	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amprifier)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	10812026H	
Date	June 10, 2015	June 17, 2015
Temperature / Humidity	22 deg. C / 55 % RH	24 deg. C / 60 % RH
Engineer	Tomohisa Nakagawa (1-10GHz)	Keisuke Kawamura (Above 10GHz)
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	3249.274	PK	49.6	28.8	3.9	31.5	-	50.8	73.9	23.1	
Hori	4874.000	PK	45.1	31.9	5.5	31.3	-	51.2	73.9	22.7	
Hori	7311.000	PK	41.9	36.0	6.8	32.0	-	52.7	73.9	21.2	
Hori	9748.000	PK	41.9	38.2	7.3	32.4	-	55.0	73.9	18.9	
Hori	3249.274	AV	46.4	28.8	3.9	31.5	-	47.6	53.9	6.3	
Hori	4874.000	AV	38.1	31.9	5.5	31.3	-	44.2	53.9	9.7	
Hori	7311.000	AV	33.9	36.0	6.8	32.0	-	44.7	53.9	9.2	
Hori	9748.000	AV	33.7	38.2	7.3	32.4	-	46.8	53.9	7.1	
Vert	3249.274	PK	48.0	28.8	3.9	31.5	-	49.2	73.9	24.7	
Vert	4874.000	PK	45.1	31.9	5.5	31.3	-	51.2	73.9	22.7	
Vert	7311.000	PK	42.0	36.0	6.8	32.0	-	52.8	73.9	21.1	
Vert	9748.000	PK	41.8	38.2	7.3	32.4	-	54.9	73.9	19.0	
Vert	3249.274	AV	45.1	28.8	3.9	31.5	-	46.3	53.9	7.6	
Vert	4874.000	AV	39.1	31.9	5.5	31.3	-	45.2	53.9	8.7	
Vert	7311.000	AV	34.5	36.0	6.8	32.0	-	45.3	53.9	8.6	
Vert	9748.000	AV	34.3	38.2	7.3	32.4	-	47.4	53.9	6.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10 GHz)) - Gain(Amplifier)

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

Distance factor: 10 GHz - 26.5 GHz 20log (3.0 m / 1.0 m) = 9.5 dB
26.5 GHz - 40 GHz 20log (3.0 m / 0.5 m) = 15.6 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	10812026H	
Date	June 10, 2015	June 17, 2015
Temperature / Humidity	22 deg. C / 55 % RH	24 deg. C / 60 % RH
Engineer	Tomohisa Nakagawa (1-10GHz)	Keisuke Kawamura (Above 10GHz)
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	48.5	26.9	3.4	32.0	-	46.8	73.9	27.1	*1)
Hori	3282.718	PK	49.3	28.8	3.9	31.5	-	50.5	73.9	23.4	
Hori	4924.000	PK	46.9	32.0	4.6	31.3	-	52.2	73.9	21.7	
Hori	7386.000	PK	42.4	36.0	5.9	32.1	-	52.2	73.9	21.7	
Hori	9848.000	PK	42.5	38.2	6.8	32.5	-	55.0	73.9	18.9	
Hori	2483.500	AV	39.3	26.9	3.4	32.0	-	37.6	53.9	16.3	*1)
Hori	3282.718	AV	46.2	28.8	3.9	31.5	-	47.4	53.9	6.5	
Hori	4924.000	AV	41.6	32.0	4.6	31.3	-	46.9	53.9	7.0	
Hori	7386.000	AV	32.9	36.0	5.9	32.1	-	42.7	53.9	11.2	
Hori	9848.000	AV	33.1	38.2	6.8	32.5	-	45.6	53.9	8.3	
Vert	2483.500	PK	40.0	26.9	3.4	32.0	-	38.3	73.9	35.6	*1)
Vert	3282.718	PK	48.5	28.8	3.9	31.5	-	49.7	73.9	24.2	
Vert	4924.000	PK	47.8	32.0	4.6	31.3	-	53.1	73.9	20.8	
Vert	7386.000	PK	42.2	36.0	5.9	32.1	-	52.0	73.9	21.9	
Vert	9848.000	PK	42.2	38.2	6.8	32.5	-	54.7	73.9	19.2	
Vert	2483.500	AV	39.1	26.9	3.4	32.0	-	37.4	53.9	16.5	*1)
Vert	3282.718	AV	43.6	28.8	3.9	31.5	-	44.8	53.9	9.1	
Vert	4924.000	AV	43.3	32.0	4.6	31.3	-	48.6	53.9	5.3	
Vert	7386.000	AV	32.8	36.0	5.9	32.1	-	42.6	53.9	11.3	
Vert	9848.000	AV	33.1	38.2	6.8	32.5	-	45.6	53.9	8.3	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10 GHz)) - Gain(Amplifier)

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

Distance factor: 10 GHz - 26.5 GHz 20log (3.0 m / 1.0 m) = 9.5 dB
26.5 GHz - 40 GHz 20log (3.0 m / 0.5 m) = 15.6 dB

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

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	10812026H	
Date	June 10, 2015	June 17, 2015
Temperature / Humidity	22 deg. C / 55 % RH	24 deg. C / 60 % RH
Engineer	Tomohisa Nakagawa (1-10GHz)	Keisuke Kawamura (Above 10GHz)
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	64.3	26.9	3.4	32.0	-	62.6	73.9	11.3	*1)
Hori	3215.938	PK	47.8	28.7	3.9	31.5	-	48.9	73.9	25.0	
Hori	4824.000	PK	40.5	31.8	5.5	31.3	-	46.5	73.9	27.4	
Hori	7236.000	PK	42.6	36.0	6.8	32.0	-	53.4	73.9	20.5	
Hori	9648.000	PK	41.8	38.2	7.3	32.4	-	54.9	73.9	19.0	
Hori	2390.000	AV	48.8	26.9	3.4	32.0	0.3	47.4	53.9	6.5	*1)
Hori	3215.938	AV	46.7	28.7	3.9	31.5	0.3	48.1	53.9	5.8	
Hori	4824.000	AV	33.3	31.8	5.5	31.3	0.3	39.6	53.9	14.3	
Hori	7236.000	AV	34.2	36.0	6.8	32.0	0.3	45.3	53.9	8.6	
Hori	9648.000	AV	34.4	38.2	7.3	32.4	0.3	47.8	53.9	6.1	
Vert	2390.000	PK	64.0	26.9	3.4	32.0	-	62.3	73.9	11.6	*1)
Vert	3215.938	PK	48.1	28.7	3.9	31.5	-	49.2	73.9	24.7	
Vert	4824.000	PK	41.9	31.8	5.5	31.3	-	47.9	73.9	26.0	
Vert	7236.000	PK	42.6	36.0	6.8	32.0	-	53.4	73.9	20.5	
Vert	9648.000	PK	42.3	38.2	7.3	32.4	-	55.4	73.9	18.5	
Vert	2390.000	AV	48.9	26.9	3.4	32.0	0.3	47.5	53.9	6.4	*1)
Vert	3215.938	AV	42.7	28.7	3.9	31.5	0.3	44.1	53.9	9.8	
Vert	4824.000	AV	32.4	31.8	5.5	31.3	0.3	38.7	53.9	15.2	
Vert	7236.000	AV	34.0	36.0	6.8	32.0	0.3	45.1	53.9	8.8	
Vert	9648.000	AV	33.4	38.2	7.3	32.4	0.3	46.8	53.9	7.1	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10 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: 10 GHz - 26.5 GHz 20log (3.0 m / 1.0 m) = 9.5 dB
26.5 GHz - 40 GHz 20log (3.0 m / 0.5 m) = 15.6 dB
*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

Polarity	Frequency	Detector	Reading	Ant.Fac.	Loss	Gain	Result	Limit	Margin	Remark
Hori	2412.000	PK	103.6	26.9	3.4	32.0	101.9	-	-	Carrier
Hori	2400.000	PK	57.6	26.9	3.4	32.0	55.9	81.9	26.0	
Vert	2412.000	PK	103.5	26.9	3.4	32.0	101.8	-	-	Carrier
Vert	2400.000	PK	57.0	26.9	3.4	32.0	55.3	81.8	26.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amprifier)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	10812026H	
Date	June 10, 2015	June 17, 2015
Temperature / Humidity	22 deg. C / 55 % RH	24 deg. C / 60 % RH
Engineer	Tomohisa Nakagawa (1-10GHz)	Keisuke Kawamura (Above 10GHz &Below 1GHz)
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	34.051	QP	22.7	16.1	7.1	32.3	-	13.6	40.0	26.4	
Hori	70.691	QP	26.2	6.2	7.7	32.1	-	8.0	40.0	32.0	
Hori	111.718	QP	26.5	11.7	8.2	32.2	-	14.2	43.5	29.3	
Hori	119.711	QP	22.9	12.7	8.3	32.2	-	11.7	43.5	31.8	
Hori	127.681	QP	25.0	13.4	8.4	32.2	-	14.6	43.5	28.9	
Hori	533.326	QP	25.6	18.6	11.4	32.1	-	23.5	46.0	22.5	
Hori	3249.274	PK	49.7	28.8	3.9	31.5	-	50.9	73.9	23.0	
Hori	4874.000	PK	42.3	31.9	5.5	31.3	-	48.4	73.9	25.5	
Hori	7311.000	PK	42.8	36.0	6.8	32.0	-	53.6	73.9	20.3	
Hori	9748.000	PK	42.7	38.2	7.3	32.4	-	55.8	73.9	18.1	
Hori	3249.274	AV	46.2	28.8	3.9	31.5	0.3	47.7	53.9	6.2	
Hori	4874.000	AV	31.3	31.9	5.5	31.3	0.3	37.7	53.9	16.2	
Hori	7311.000	AV	32.6	36.0	6.8	32.0	0.3	43.7	53.9	10.2	
Hori	9748.000	AV	33.2	38.2	7.3	32.4	0.3	46.6	53.9	7.3	
Vert	34.051	QP	26.8	16.1	7.1	32.3	-	17.7	40.0	22.3	
Vert	70.691	QP	36.4	6.2	7.7	32.1	-	18.2	40.0	21.8	
Vert	111.718	QP	31.1	11.7	8.2	32.2	-	18.8	43.5	24.7	
Vert	119.711	QP	28.6	12.7	8.3	32.2	-	17.4	43.5	26.1	
Vert	127.681	QP	33.0	13.4	8.4	32.2	-	22.6	43.5	20.9	
Vert	533.326	QP	30.9	18.6	11.4	32.1	-	28.8	46.0	17.2	
Vert	3249.274	PK	48.7	28.8	3.9	31.5	-	49.9	73.9	24.0	
Vert	4874.000	PK	42.6	31.9	5.5	31.3	-	48.7	73.9	25.2	
Vert	7311.000	PK	42.1	36.0	6.8	32.0	-	52.9	73.9	21.0	
Vert	9748.000	PK	42.7	38.2	7.3	32.4	-	55.8	73.9	18.1	
Vert	3249.274	AV	43.8	28.8	3.9	31.5	0.3	45.3	53.9	8.6	
Vert	4874.000	AV	32.0	31.9	5.5	31.3	0.3	38.4	53.9	15.5	
Vert	7311.000	AV	32.7	36.0	6.8	32.0	0.3	43.8	53.9	10.1	
Vert	9748.000	AV	33.2	38.2	7.3	32.4	0.3	46.6	53.9	7.3	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10 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: 10 GHz - 26.5 GHz 20log (3.0 m / 1.0 m) = 9.5 dB
26.5 GHz - 40 GHz 20log (3.0 m / 0.5 m) = 15.6 dB

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	10812026H	
Date	June 10, 2015	June 17, 2015
Temperature / Humidity	22 deg. C / 55 % RH	24 deg. C / 60 % RH
Engineer	Tomohisa Nakagawa (1-10GHz)	Keisuke Kawamura (Above 10GHz)
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	70.5	26.9	3.4	32.0	-	68.8	73.9	5.1	*1)
Hori	3282.718	PK	49.5	28.8	3.9	31.5	-	50.7	73.9	23.2	
Hori	4924.000	PK	40.0	32.0	5.5	31.3	-	46.2	73.9	27.7	
Hori	7386.000	PK	40.9	36.0	6.8	32.1	-	51.6	73.9	22.3	
Hori	9848.000	PK	42.5	38.2	7.4	32.5	-	55.6	73.9	18.3	
Hori	2483.500	AV	55.1	26.9	3.4	32.0	0.3	53.7	53.9	0.2	*1)
Hori	3282.718	AV	46.7	28.8	3.9	31.5	0.3	48.2	53.9	5.7	
Hori	4924.000	AV	33.7	32.0	5.5	31.3	0.3	40.2	53.9	13.7	
Hori	7386.000	AV	33.4	36.0	6.8	32.1	0.3	44.4	53.9	9.5	
Hori	9848.000	AV	34.6	38.2	7.4	32.5	0.3	48.0	53.9	5.9	
Vert	2483.500	PK	68.2	26.9	3.4	32.0	-	66.5	73.9	7.4	*1)
Vert	3282.718	PK	50.2	28.8	3.9	31.5	-	51.4	73.9	22.5	
Vert	4924.000	PK	40.3	32.0	5.5	31.3	-	46.5	73.9	27.4	
Vert	7386.000	PK	41.6	36.0	6.8	32.1	-	52.3	73.9	21.6	
Vert	9848.000	PK	41.9	38.2	7.4	32.5	-	55.0	73.9	18.9	
Vert	2483.500	AV	51.7	26.9	3.4	32.0	0.3	50.3	53.9	3.6	*1)
Vert	3282.718	AV	47.1	28.8	3.9	31.5	0.3	48.6	53.9	5.3	
Vert	4924.000	AV	32.3	32.0	5.5	31.3	0.3	38.8	53.9	15.1	
Vert	7386.000	AV	33.3	36.0	6.8	32.1	0.3	44.3	53.9	9.6	
Vert	9848.000	AV	34.6	38.2	7.4	32.5	0.3	48.0	53.9	5.9	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10 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: 10 GHz - 26.5 GHz 20log (3.0 m / 1.0 m) = 9.5 dB
26.5 GHz - 40 GHz 20log (3.0 m / 0.5 m) = 15.6 dB
*1) Not Out of Band emission(Leakage Power)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	10812026H	
Date	June 11, 2015	June 17, 2015
Temperature / Humidity	23 deg. C / 40 % RH	24 deg. C / 60 % RH
Engineer	Tomohisa Nakagawa (1-10GHz)	Keisuke Kawamura (Above 10GHz)
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	2388.342	PK	70.7	26.9	3.4	32.0	-	69.0	73.9	4.9	*1)
Hori	2390.000	PK	61.0	26.9	3.4	32.0	-	59.3	73.9	14.6	*1)
Hori	3229.380	PK	49.4	28.7	3.9	31.5	-	50.5	73.9	23.4	
Hori	4844.000	PK	41.0	31.9	5.5	31.3	-	47.1	73.9	26.8	
Hori	7266.000	PK	42.0	36.0	6.8	32.0	-	52.8	73.9	21.1	
Hori	9688.000	PK	42.4	38.2	7.3	32.4	-	55.5	73.9	18.4	
Hori	2388.342	AV	54.8	26.9	3.4	32.0	0.65	53.8	53.9	0.2	*1)
Hori	2390.000	AV	50.6	26.9	3.4	32.0	0.65	49.6	53.9	4.3	*1)
Hori	3229.380	AV	45.6	28.7	3.9	31.5	0.65	47.4	53.9	6.6	
Hori	4844.000	AV	32.1	31.9	5.5	31.3	0.65	38.9	53.9	15.1	
Hori	7266.000	AV	33.6	36.0	6.8	32.0	0.65	45.1	53.9	8.9	
Hori	9688.000	AV	33.9	38.2	7.3	32.4	0.65	47.7	53.9	6.3	
Vert	2388.342	PK	65.8	26.9	3.4	32.0	-	64.1	73.9	9.8	*1)
Vert	2390.000	PK	59.3	26.9	3.4	32.0	-	57.6	73.9	16.3	*1)
Vert	3229.380	PK	48.0	28.7	3.9	31.5	-	49.1	73.9	24.8	
Vert	4844.000	PK	41.1	31.9	5.5	31.3	-	47.2	73.9	26.7	
Vert	7266.000	PK	42.5	36.0	6.8	32.0	-	53.3	73.9	20.6	
Vert	9688.000	PK	42.2	38.2	7.3	32.4	-	55.3	73.9	18.6	
Vert	2388.342	AV	53.9	26.9	3.4	32.0	0.65	52.9	53.9	1.1	*1)
Vert	2390.000	AV	49.6	26.9	3.4	32.0	0.65	48.6	53.9	5.3	*1)
Vert	3229.380	AV	43.0	28.7	3.9	31.5	0.65	44.8	53.9	9.1	
Vert	4844.000	AV	32.2	31.9	5.5	31.3	0.65	39.0	53.9	15.0	
Vert	7266.000	AV	33.5	36.0	6.8	32.0	0.65	45.0	53.9	9.0	
Vert	9688.000	AV	33.5	38.2	7.3	32.4	0.65	47.3	53.9	6.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10 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: 10 GHz - 26.5 GHz 20log (3.0 m / 1.0 m) = 9.5 dB
26.5 GHz - 40 GHz 20log (3.0 m / 0.5 m) = 15.6 dB
*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

Polarity	Frequency	Detector	Reading	Ant.Fac.	Loss	Gain	Result	Limit	Margin	Remark
Hori	2422.000	PK	100.0	26.9	3.4	32.0	98.3	-	-	Carrier
Hori	2397.617	PK	59.4	26.9	3.4	32.0	57.7	78.3	20.6	
Hori	2400.000	PK	55.4	26.9	3.4	32.0	53.7	78.3	24.6	
Vert	2422.000	PK	98.8	26.9	3.4	32.0	97.1	-	-	Carrier
Vert	2397.617	PK	57.4	26.9	3.4	32.0	55.7	77.1	21.4	
Vert	2400.000	PK	53.3	26.9	3.4	32.0	51.6	77.1	25.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amprifier)

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	10812026H	
Date	June 11, 2015	June 17, 2015
Temperature / Humidity	23 deg. C / 58 % RH	24 deg. C / 60 % RH
Engineer	Tomohisa Nakagawa (1-10GHz)	Keisuke Kawamura (Above 10GHz)
Mode	Tx 11n-40 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	3249.294	PK	51.3	28.8	3.9	31.5	-	52.5	73.9	21.4	
Hori	4874.000	PK	42.2	31.9	5.5	31.3	-	48.3	73.9	25.6	
Hori	7311.000	PK	42.5	36.0	6.8	32.0	-	53.3	73.9	20.6	
Hori	9748.000	PK	42.5	38.2	7.3	32.4	-	55.6	73.9	18.3	
Hori	3249.294	AV	48.0	28.8	3.9	31.5	0.65	49.9	53.9	4.1	
Hori	4874.000	AV	31.2	31.9	5.5	31.3	0.65	38.0	53.9	16.0	
Hori	7311.000	AV	32.6	36.0	6.8	32.0	0.65	44.1	53.9	9.9	
Hori	9748.000	AV	32.8	38.2	7.3	32.4	0.65	46.6	53.9	7.4	
Vert	3249.294	PK	50.1	28.8	3.9	31.5	-	51.3	73.9	22.6	
Vert	4874.000	PK	41.9	31.9	5.5	31.3	-	48.0	73.9	25.9	
Vert	7311.000	PK	41.7	36.0	6.8	32.0	-	52.5	73.9	21.4	
Vert	9748.000	PK	41.7	38.2	7.3	32.4	-	54.8	73.9	19.1	
Vert	3249.294	AV	46.5	28.8	3.9	31.5	0.65	48.4	53.9	5.6	
Vert	4874.000	AV	31.5	31.9	5.5	31.3	0.65	38.3	53.9	15.7	
Vert	7311.000	AV	32.6	36.0	6.8	32.0	0.65	44.1	53.9	9.9	
Vert	9748.000	AV	33.6	38.2	7.3	32.4	0.65	47.4	53.9	6.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10 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: 10 GHz - 26.5 GHz 20log (3.0 m / 1.0 m) = 9.5 dB
26.5 GHz - 40 GHz 20log (3.0 m / 0.5 m) = 15.6 dB

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

Radiated Spurious Emission

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	10812026H	
Date	June 11, 2015	June 17, 2015
Temperature / Humidity	23 deg. C / 58 % RH	24 deg. C / 60 % RH
Engineer	Tomohisa Nakagawa (1-10GHz)	Keisuke Kawamura (Above 10GHz)
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	65.0	26.9	3.4	32.0	-	63.3	73.9	10.6	*1)
Hori	2488.160	PK	64.0	26.9	3.4	32.0	-	62.3	73.9	11.6	*1)
Hori	3269.442	PK	51.0	28.8	3.9	31.5	-	52.2	73.9	21.7	
Hori	4904.000	PK	40.9	32.0	4.6	31.3	-	46.2	73.9	27.7	
Hori	7356.000	PK	42.1	36.0	5.9	32.1	-	51.9	73.9	22.0	
Hori	9808.000	PK	42.5	38.2	6.8	32.5	-	55.0	73.9	18.9	
Hori	2483.500	AV	53.5	26.9	3.4	32.0	0.65	52.5	53.9	1.4	*1)
Hori	2488.160	AV	52.2	26.9	3.4	32.0	0.65	51.2	53.9	2.8	*1)
Hori	3269.442	AV	48.0	28.8	3.9	31.5	0.65	49.9	53.9	4.1	
Hori	4904.000	AV	31.4	32.0	4.6	31.3	0.65	37.4	53.9	16.6	
Hori	7356.000	AV	32.7	36.0	5.9	32.1	0.65	43.2	53.9	10.8	
Hori	9808.000	AV	32.6	38.2	6.8	32.5	0.65	45.8	53.9	8.1	
Vert	2483.500	PK	65.8	26.9	3.4	32.0	-	64.1	73.9	9.8	*1)
Vert	2488.160	PK	64.3	26.9	3.4	32.0	-	62.6	73.9	11.3	*1)
Vert	3269.442	PK	50.6	28.8	3.9	31.5	-	51.8	73.9	22.1	
Vert	4904.000	PK	41.4	32.0	4.6	31.3	-	46.7	73.9	27.2	
Vert	7356.000	PK	42.8	36.0	5.9	32.1	-	52.6	73.9	21.3	
Vert	9808.000	PK	43.5	38.2	6.8	32.5	-	56.0	73.9	17.9	
Vert	2483.500	AV	54.1	26.9	3.4	32.0	0.65	53.1	53.9	0.8	*1)
Vert	2488.160	AV	52.8	26.9	3.4	32.0	0.65	51.8	53.9	2.2	*1)
Vert	3269.442	AV	47.2	28.8	3.9	31.5	0.65	49.1	53.9	4.8	
Vert	4904.000	AV	31.4	32.0	4.6	31.3	0.65	37.4	53.9	16.6	
Vert	7356.000	AV	32.7	36.0	5.9	32.1	0.65	43.2	53.9	10.8	
Vert	9808.000	AV	34.1	38.2	6.8	32.5	0.65	47.3	53.9	6.6	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10 GHz)) - Gain(Amplifier) + Duty Factor

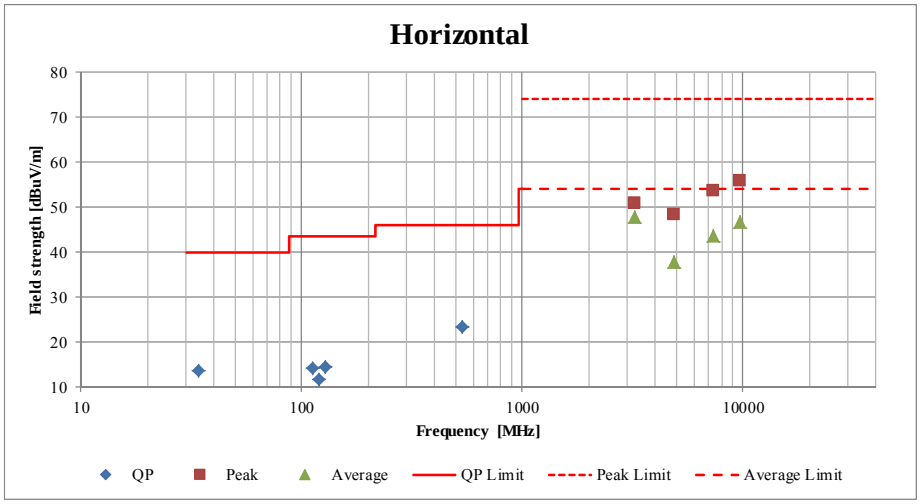
*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

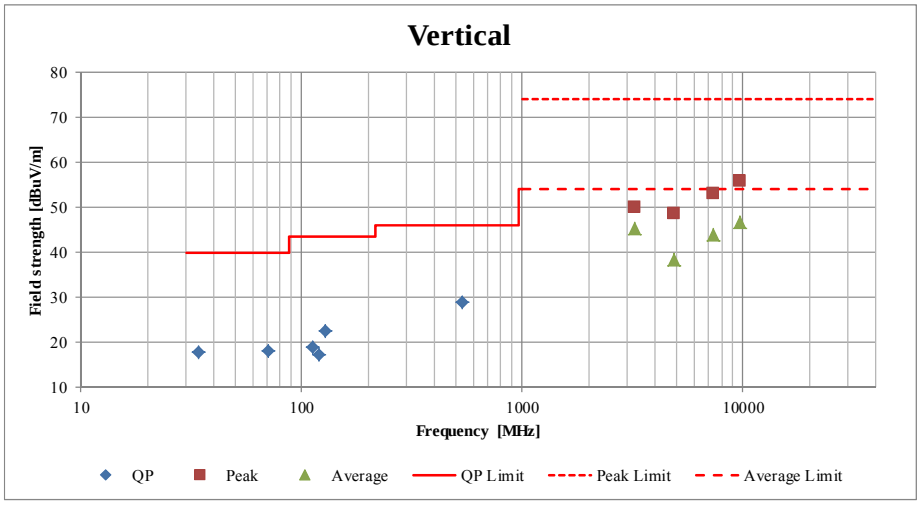
Distance factor: 10 GHz - 26.5 GHz 20log (3.0 m / 1.0 m) = 9.5 dB
26.5 GHz - 40 GHz 20log (3.0 m / 0.5 m) = 15.6 dB

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

Radiated Spurious Emission
(Plot data, Worst case)

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber	
Report No.	10812026H	
Date	June 10, 2015	June 17, 2015
Temperature / Humidity	22 deg. C / 55 % RH	24 deg. C / 60 % RH
Engineer	Tomohisa Nakagawa (1-10GHz)	Keisuke Kawamura (Above 10GHz &Below 1GHz)
Mode	Tx 11n-20 2437 MHz	





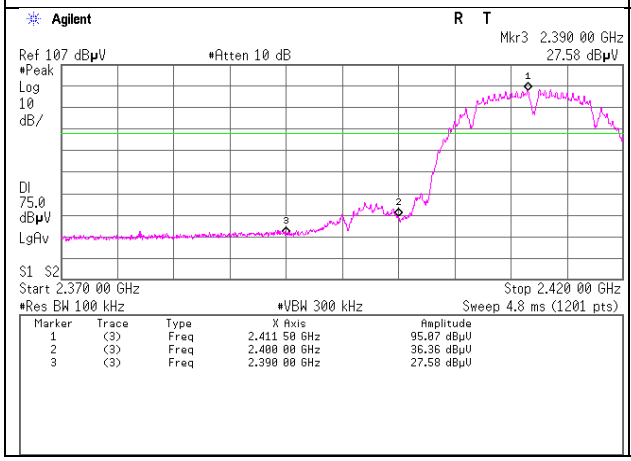
*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Band Edge confirmation

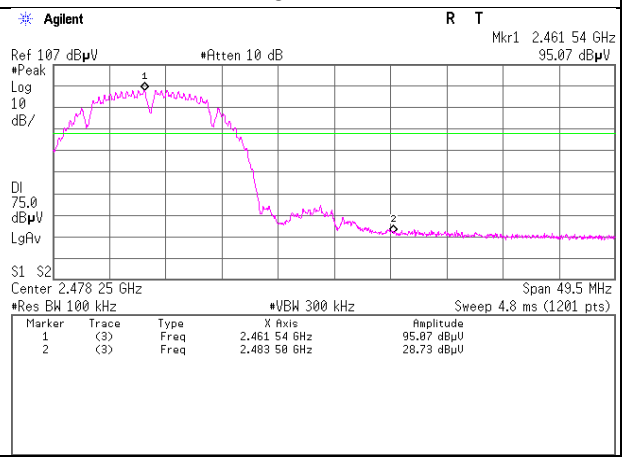
Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 8, 2015
Temperature/ Humidity	23 deg. C / 57 % RH
Engineer	Tomoki Matsui
Mode	Tx

11b Antenna port 0

2412 MHz

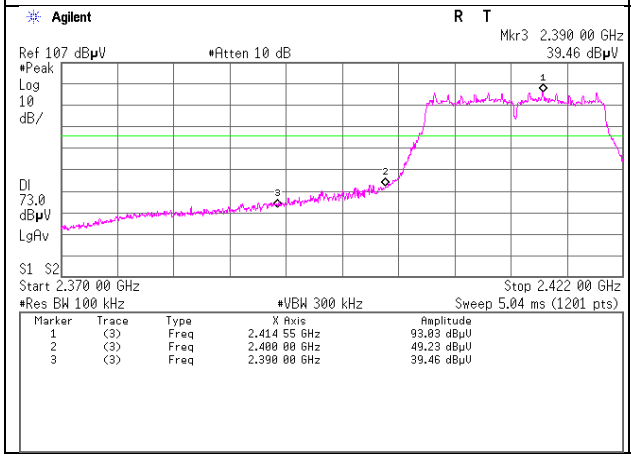


2462 MHz

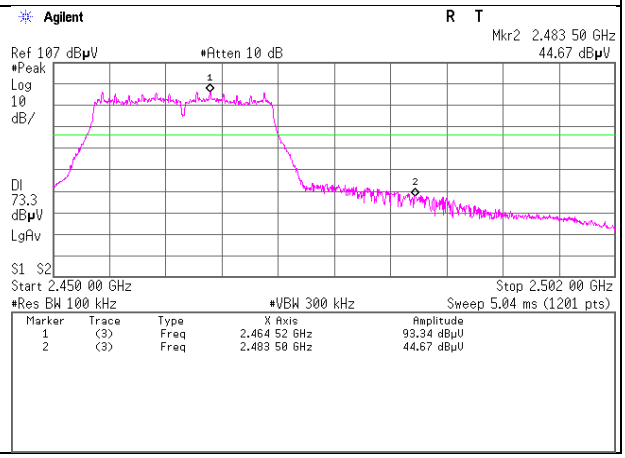


11g Antenna port 0

2412 MHz



2462 MHz



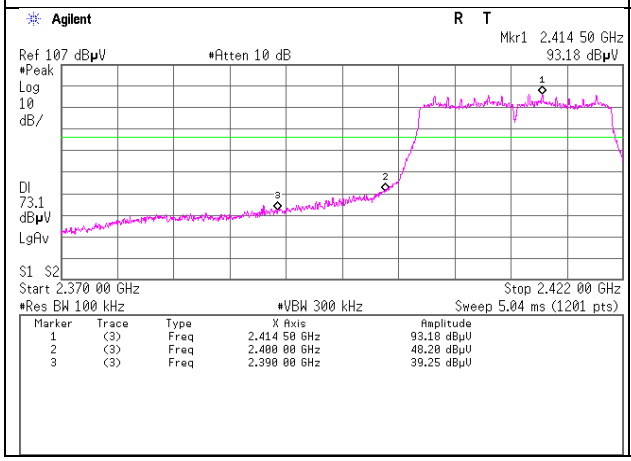
*Final result of band edge was measured as radiated spurious emission. Refer to Radiated Spurious Emission's pages.

Band Edge confirmation

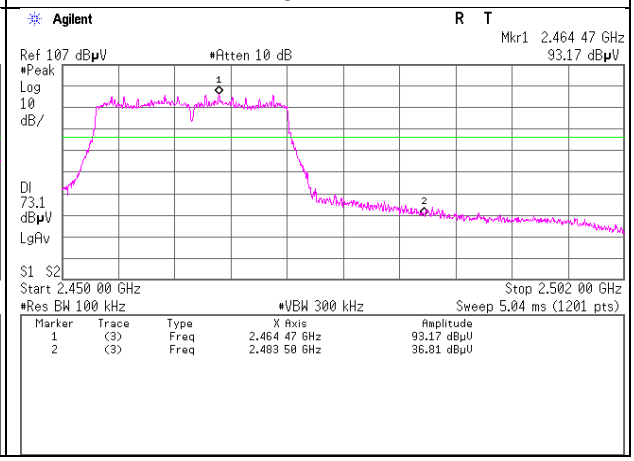
Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 8, 2015
Temperature/ Humidity	23 deg. C / 57 % RH
Engineer	Tomoki Matsui
Mode	Tx

11n-20 Antenna port 0

2412 MHz

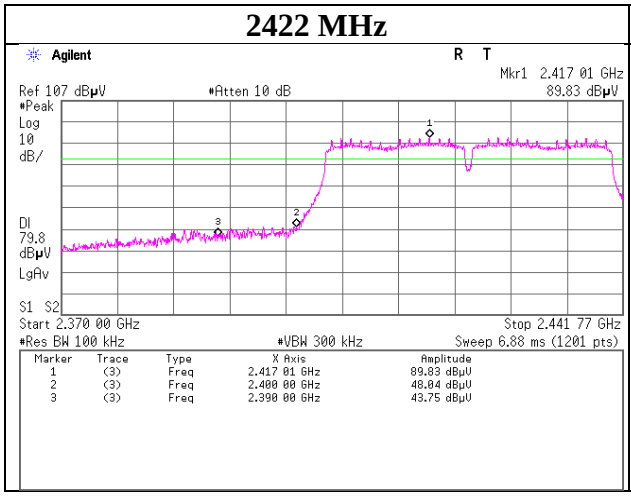


2462 MHz

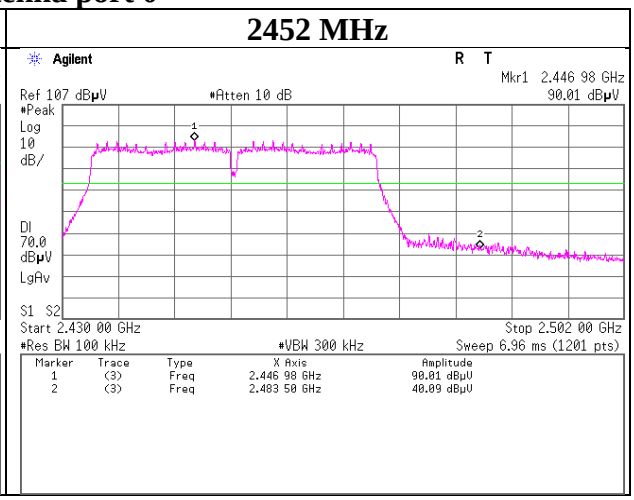


11n-40 Antenna port 0

2422 MHz



2452 MHz

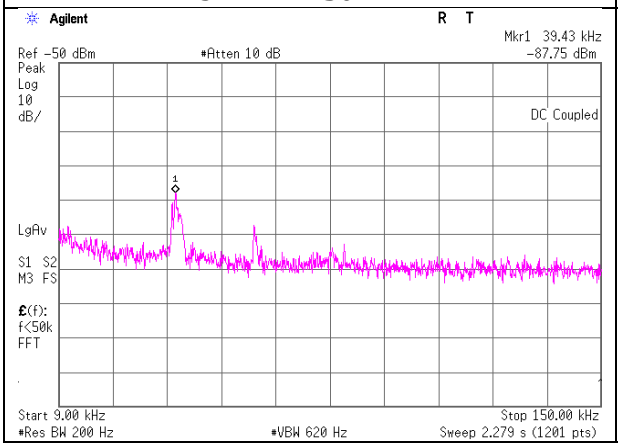


* Final result of band edge was measured as radiated spurious emission. Refer to Radiated Spurious Emission's pages.

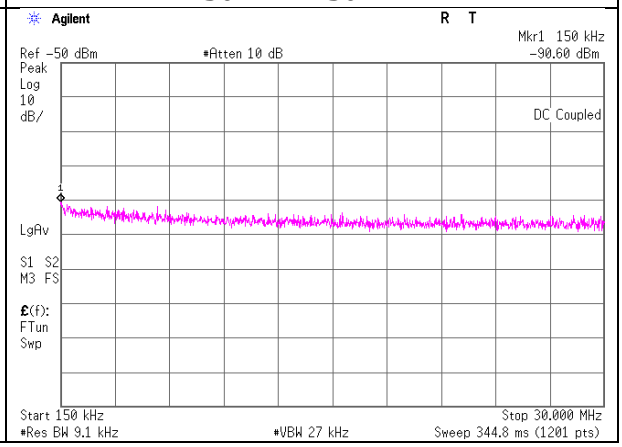
Conducted Spurious Emission

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 8, 2015
Temperature / Humidity	23 deg. C / 57 % RH
Engineer	Tomoki Matsui
Mode	Tx 11n-20 2437 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenator Loss [dB]	Antenna Gain [dBi]	N (Number of Output	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
39.43	-87.8	0.01	10.0	2.0	2	-72.7	300	6.0	-11.5	35.6	47.1	
150.00	-90.6	0.01	10.0	2.0	2	-75.6	300	6.0	-14.3	24.0	38.3	

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

EIRP = Reading + Cable Loss + Attenator Loss + Antenna Gain + 10 * log (N)

Power Density

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 8, 2015
Temperature / Humidity	23 deg. C / 57 % RH
Engineer	Tomoki Matsui
Mode	Tx 11b

Antenna port 0 + 1

Freq. [MHz]	Antenna port 0 Result [mW]	Antenna port 1 Result [mW]	Result [dBm]	Result [mW]	Limit [dBm]	Margin [dB]
2412.00	0.036	0.039	-11.21	0.076	8.00	19.21
2437.00	0.041	0.043	-10.77	0.084	8.00	18.77
2462.00	0.037	0.040	-11.11	0.077	8.00	19.11

Sample Calculation:
Result = Antenna port 0 + 1

Antenna port 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]	Limit [dBm]	Margin [dB]
2412.00	-26.38	1.97	10.02	-14.39	0.036	8.00	22.39
2437.00	-25.89	1.98	10.02	-13.89	0.041	8.00	21.89
2462.00	-26.30	1.99	10.02	-14.29	0.037	8.00	22.29

Antenna port 1

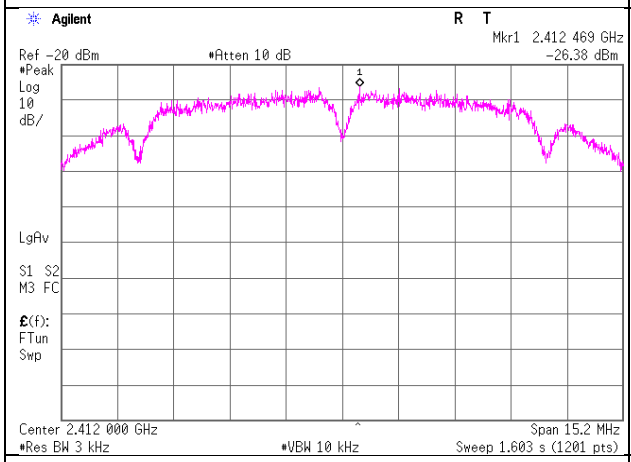
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]	Limit [dBm]	Margin [dB]
2412.00	-26.09	1.97	10.06	-14.06	0.039	8.00	22.06
2437.00	-25.72	1.98	10.06	-13.68	0.043	8.00	21.68
2462.00	-26.01	1.99	10.06	-13.96	0.040	8.00	21.96

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

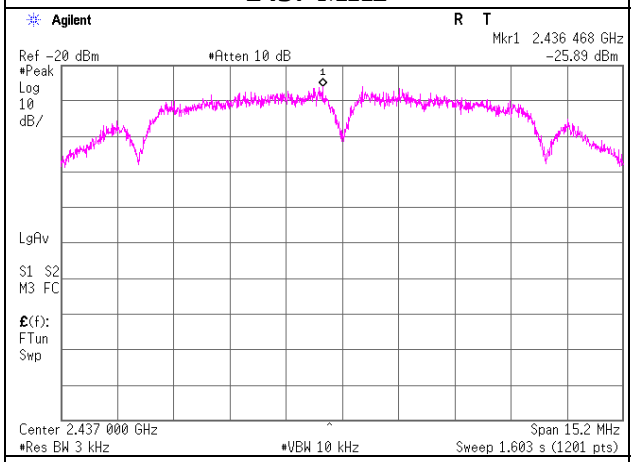
Power Density

11b Antenna port 0

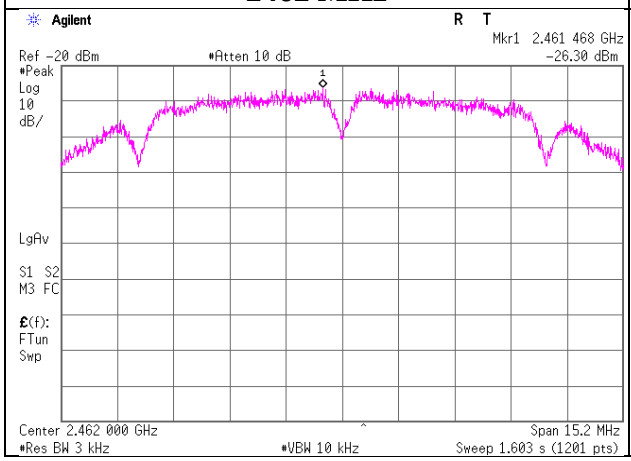
2412 MHz



2437 MHz

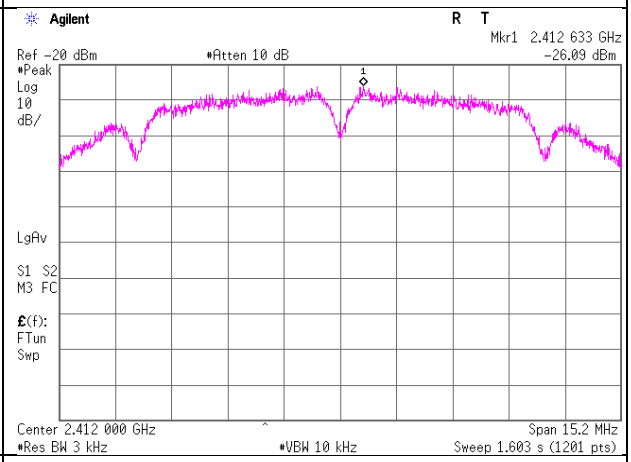


2462 MHz

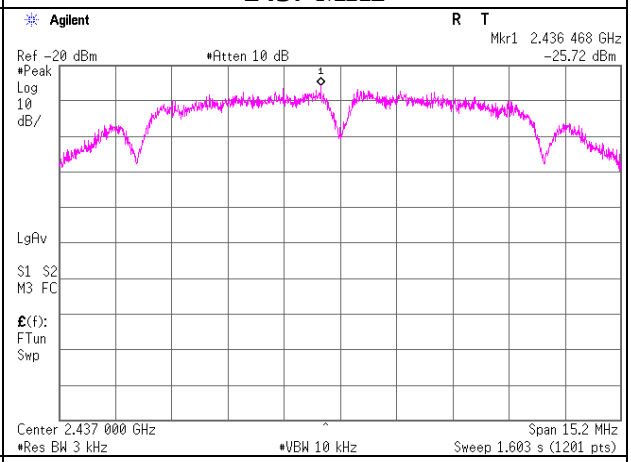


11b Antenna port 1

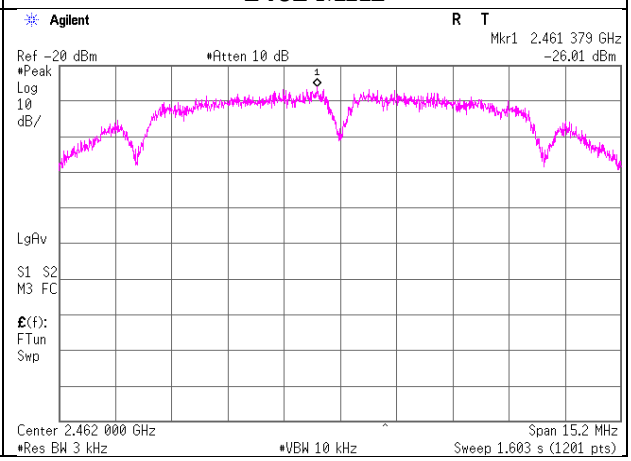
2412 MHz



2437 MHz



2462 MHz



Power Density

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 8, 2015
Temperature / Humidity	23 deg. C / 57 % RH
Engineer	Tomoki Matsui
Mode	Tx 11g

Antenna port 0 + 1

Freq. [MHz]	Antenna port 0 Result [mW]	Antenna port 1 Result [mW]	Result [dBm]	Result [mW]	Limit [dBm]	Margin [dB]
2412.00	0.019	0.021	-13.92	0.041	8.00	21.92
2437.00	0.019	0.018	-14.32	0.037	8.00	22.32
2462.00	0.019	0.019	-14.18	0.038	8.00	22.18

Sample Calculation:
Result = Antenna port 0 + 1

Antenna port 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]	Limit [dBm]	Margin [dB]
2412.00	-29.14	1.97	10.02	-17.15	0.019	8.00	25.15
2437.00	-29.30	1.98	10.02	-17.30	0.019	8.00	25.30
2462.00	-29.19	1.99	10.02	-17.18	0.019	8.00	25.18

Antenna port 1

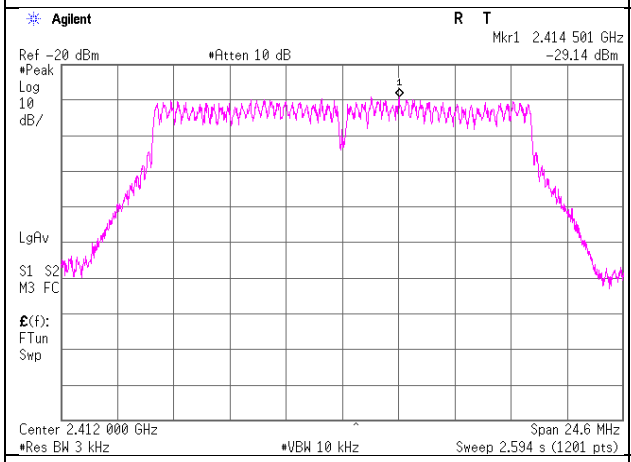
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]	Limit [dBm]	Margin [dB]
2412.00	-28.76	1.97	10.06	-16.73	0.021	8.00	24.73
2437.00	-29.41	1.98	10.06	-17.37	0.018	8.00	25.37
2462.00	-29.25	1.99	10.06	-17.20	0.019	8.00	25.20

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

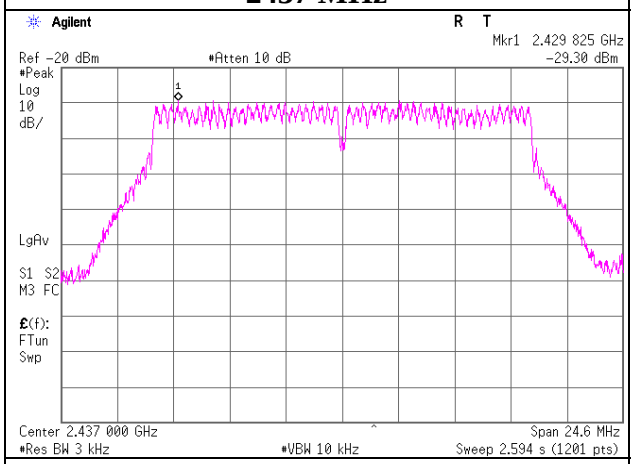
Power Density

11g Antenna port 0

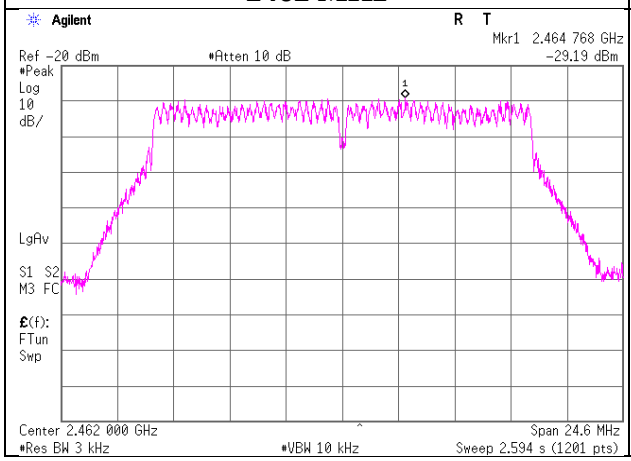
2412 MHz



2437 MHz

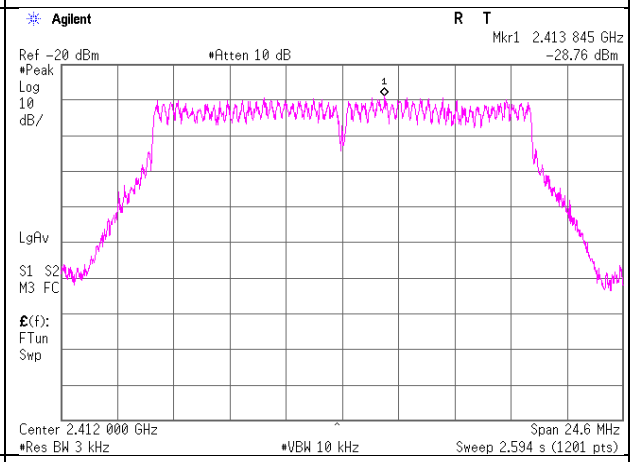


2462 MHz

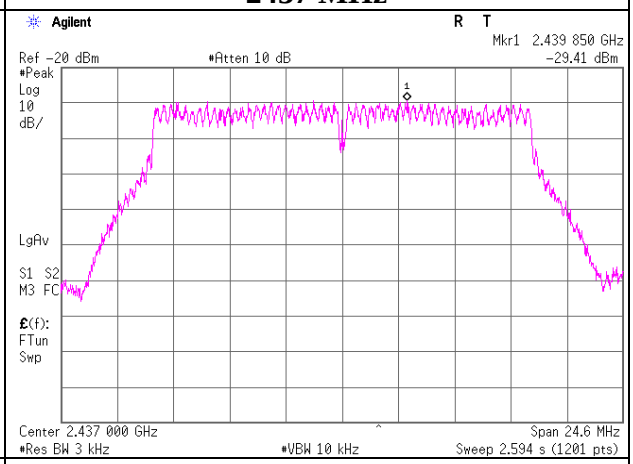


11g Antenna port 1

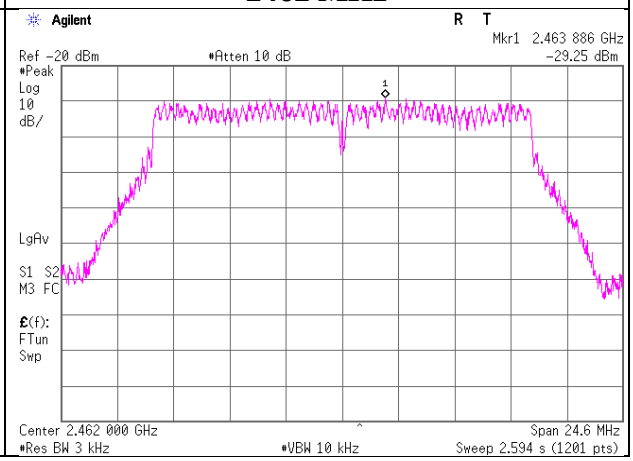
2412 MHz



2437 MHz



2462 MHz



Power Density

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 8, 2015
Temperature / Humidity	23 deg. C / 57 % RH
Engineer	Tomoki Matsui
Mode	Tx 11n-20

Antenna port 0 + 1

Freq. [MHz]	Antenna port 0 Result [mW]	Antenna port 1 Result [mW]	Result [dBm]	Result [mW]	Limit [dBm]	Margin [dB]
2412.00	0.022	0.021	-13.72	0.042	8.00	21.72
2437.00	0.019	0.024	-13.65	0.043	8.00	21.65
2462.00	0.020	0.023	-13.72	0.042	8.00	21.72

Sample Calculation:
Result = Antenna port 0 + 1

Antenna port 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]	Limit [dBm]	Margin [dB]
2412.00	-28.66	1.97	10.02	-16.67	0.022	8.00	24.67
2437.00	-29.14	1.98	10.02	-17.14	0.019	8.00	25.14
2462.00	-29.02	1.99	10.02	-17.01	0.020	8.00	25.01

Antenna port 1

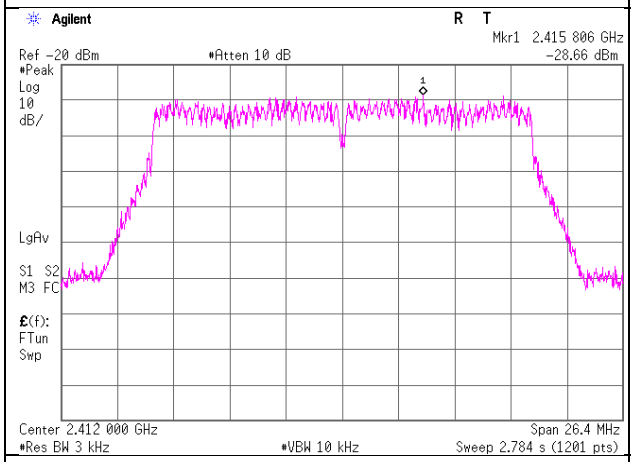
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]	Limit [dBm]	Margin [dB]
2412.00	-28.82	1.97	10.06	-16.79	0.021	8.00	24.79
2437.00	-28.27	1.98	10.06	-16.23	0.024	8.00	24.23
2462.00	-28.52	1.99	10.06	-16.47	0.023	8.00	24.47

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

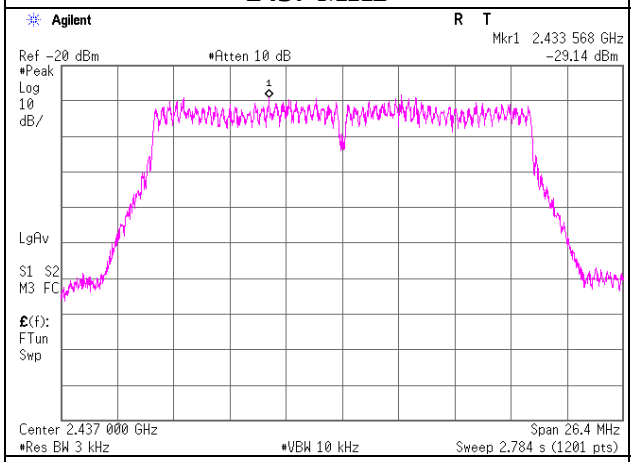
Power Density

11n-20 Antenna port 0

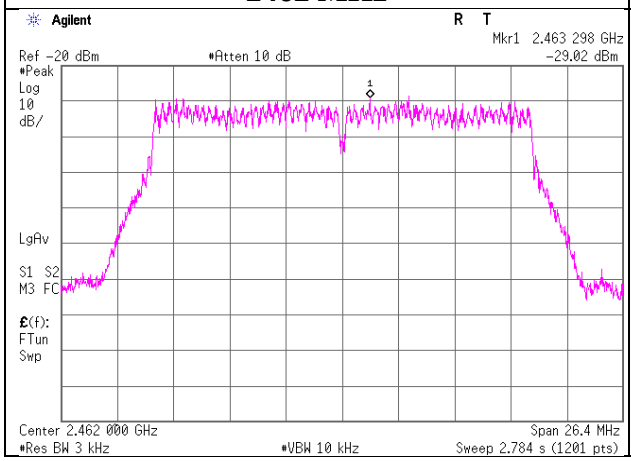
2412 MHz



2437 MHz

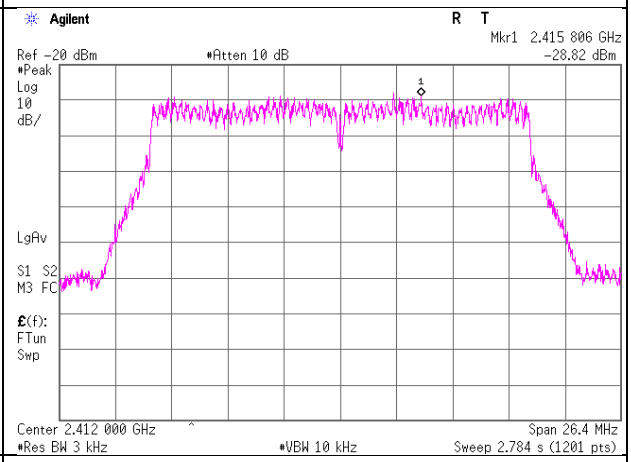


2462 MHz

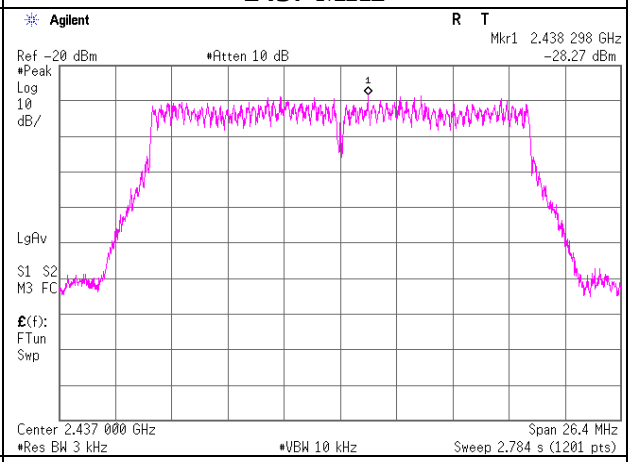


11n-20 Antenna port 1

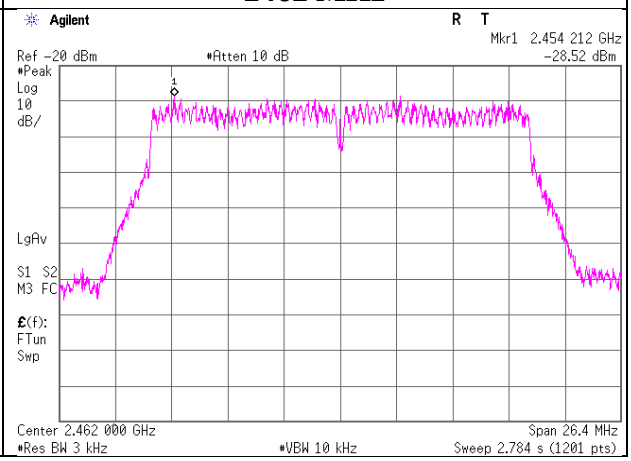
2412 MHz



2437 MHz



2462 MHz



Power Density

Test place	Ise EMC Lab. No.11 Measurement Room	
Report No.	10812026H	
Date	June 8, 2015	June 17, 2015
Temperature / Humidity	23 deg. C / 57 % RH	24 deg. C / 47% RH
Engineer	Tomoki Matsui	Tomoki Matsui
Mode	Tx 11n-40	

Antenna port 0 + 1

Freq. [MHz]	Antenna port 0 Result [mW]	Antenna port 1 Result [mW]	Result [dBm]	Result [mW]	Limit [dBm]	Margin [dB]
2422.00	0.010	0.008	-17.45	0.018	8.00	25.45
2437.00	0.010	0.013	-16.40	0.023	8.00	24.40
2452.00	0.005	0.005	-20.00	0.010	8.00	28.00

Sample Calculation:
Result = Antenna port 0 + 1

Antenna port 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]	Limit [dBm]	Margin [dB]
2422.00	-32.22	1.97	10.06	-20.19	0.010	8.00	28.19
2437.00	-31.92	1.98	10.02	-19.92	0.010	8.00	27.92
2452.00	-35.06	1.99	10.06	-23.01	0.005	8.00	31.01

Antenna port 1

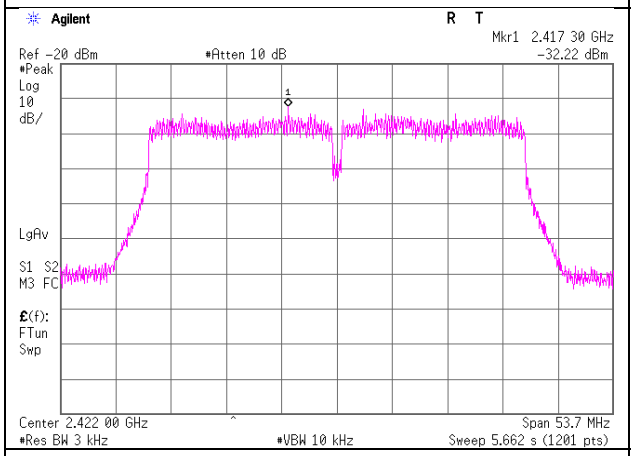
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Result [mW]	Limit [dBm]	Margin [dB]
2422.00	-32.76	1.98	10.02	-20.76	0.008	8.00	28.76
2437.00	-30.99	1.98	10.06	-18.95	0.013	8.00	26.95
2452.00	-35.03	2.00	10.02	-23.01	0.005	8.00	31.01

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

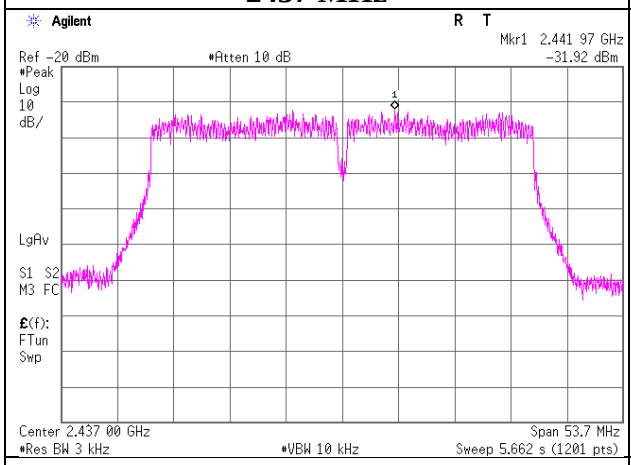
Power Density

11n-40 Antenna port 0

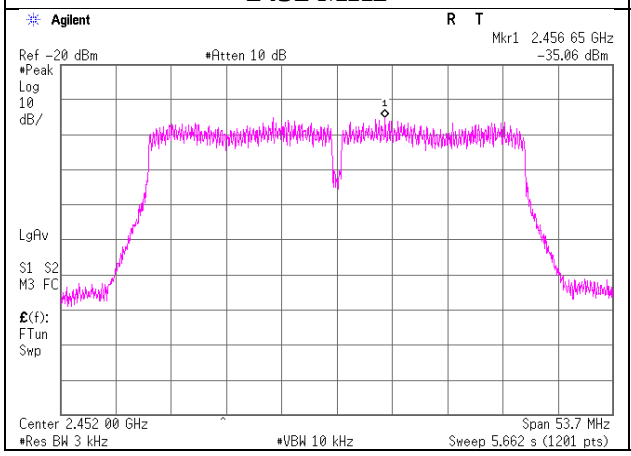
2422 MHz



2437 MHz

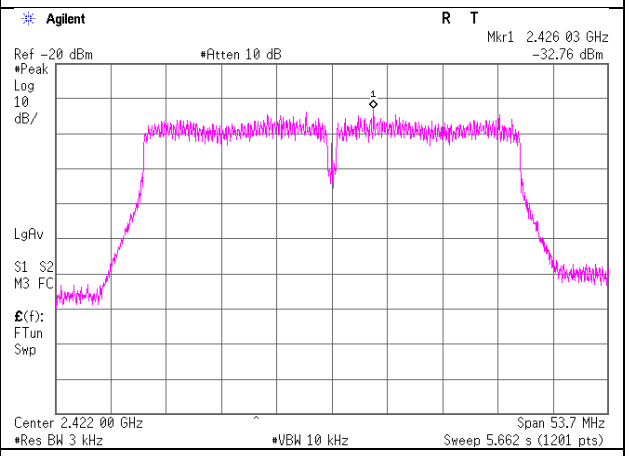


2452 MHz

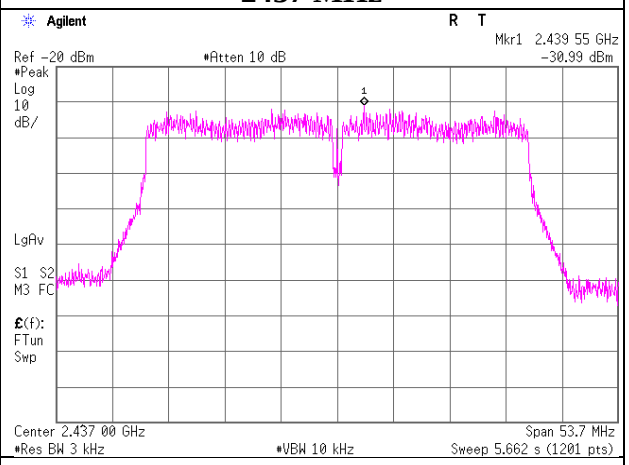


11n-40 Antenna port 1

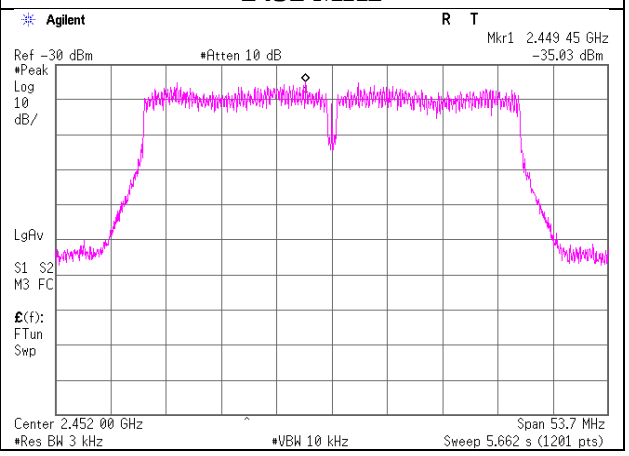
2422 MHz



2437 MHz



2452 MHz

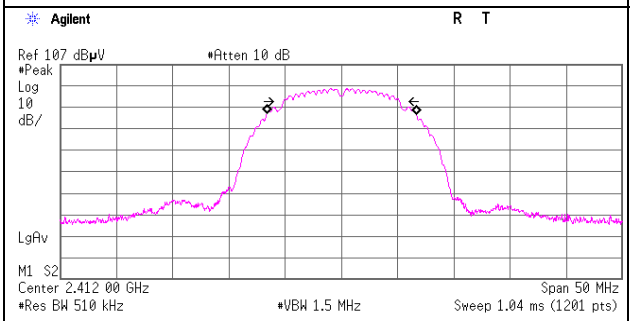


99%Occupied Bandwidth

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 8, 2015
Temperature / Humidity	23 deg. C / 57 % RH
Engineer	Tomoki Matsui
Mode	Tx

11b Antenna port 0

2412 MHz

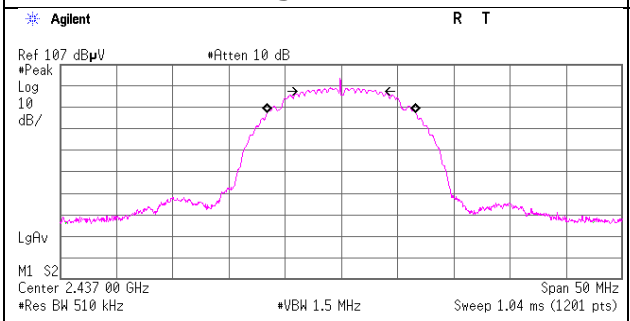


Occupied Bandwidth
13.3104 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 23.007 kHz
x dB Bandwidth 10.390 MHz

2437 MHz

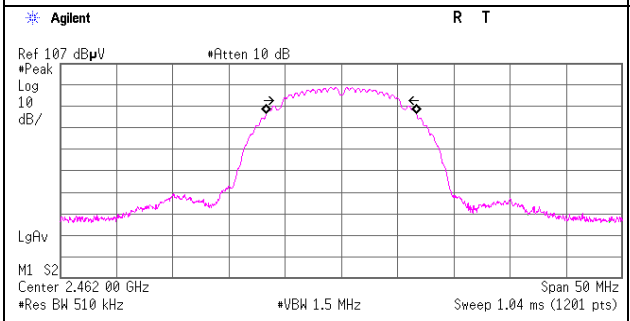


Occupied Bandwidth
13.2653 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 13.580 kHz
x dB Bandwidth 6.134 MHz

2462 MHz



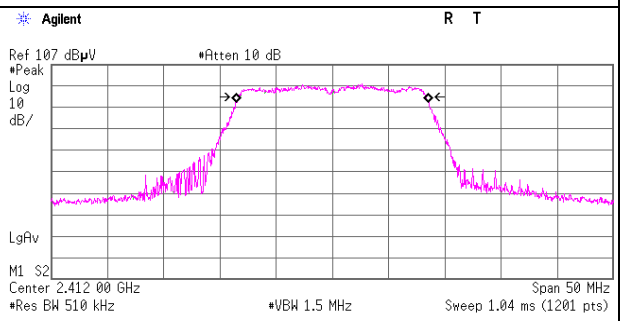
Occupied Bandwidth
13.3224 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 5.409 kHz
x dB Bandwidth 10.384 MHz

11g Antenna port 0

2412 MHz

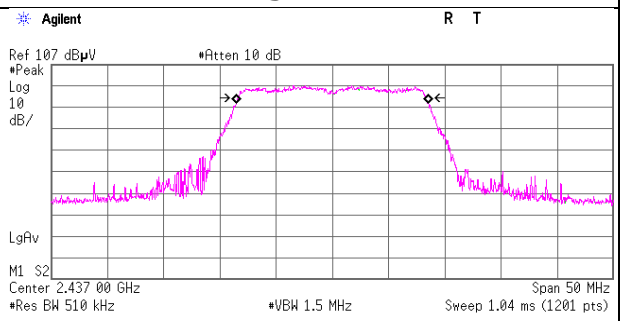


Occupied Bandwidth
17.0400 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 9.466 kHz
x dB Bandwidth 16.576 MHz

2437 MHz

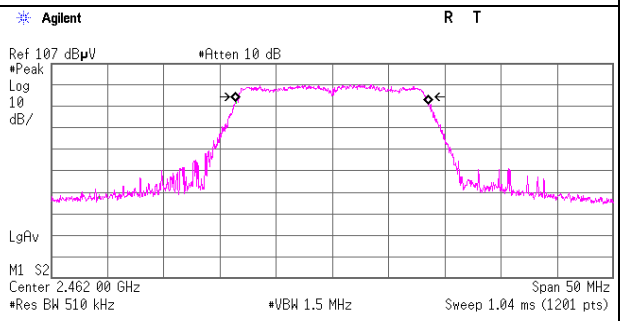


Occupied Bandwidth
17.0393 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -14.188 kHz
x dB Bandwidth 16.565 MHz

2462 MHz



Occupied Bandwidth
17.0936 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

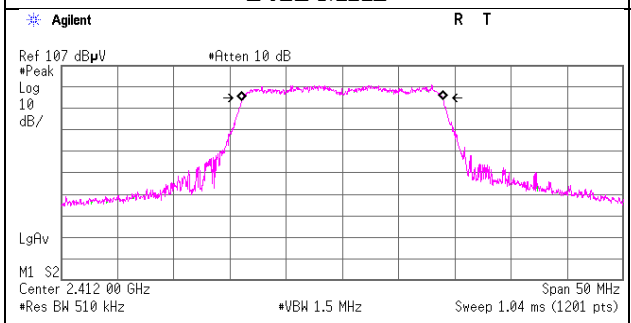
Transmit Freq Error -26.140 kHz
x dB Bandwidth 16.534 MHz

99% Occupied Bandwidth

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10812026H
Date	June 8, 2015
Temperature / Humidity	23 deg. C / 57 % RH
Engineer	Tomoki Matsui
Mode	Tx

11n-20 Antenna port 0

2412 MHz



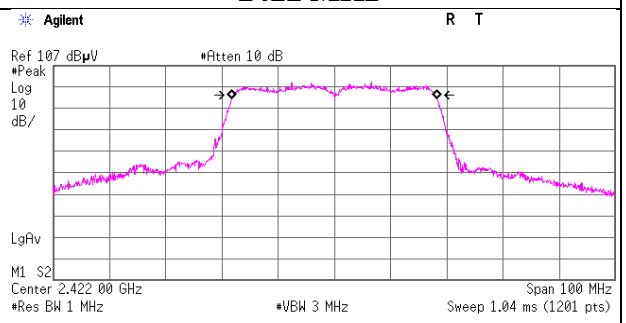
Occupied Bandwidth
17.8554 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 12.758 kHz
x dB Bandwidth 17.772 MHz

11n-40 Antenna port 0

2422 MHz

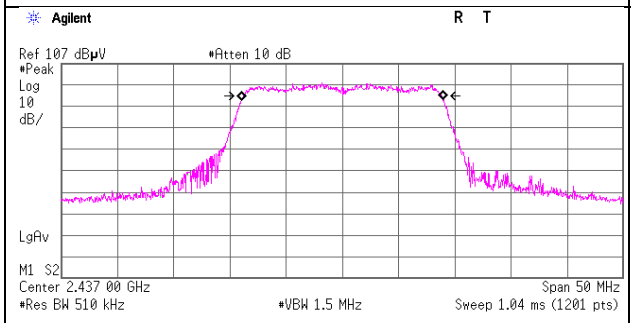


Occupied Bandwidth
36.4422 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 22.386 kHz
x dB Bandwidth 35.751 MHz

2437 MHz

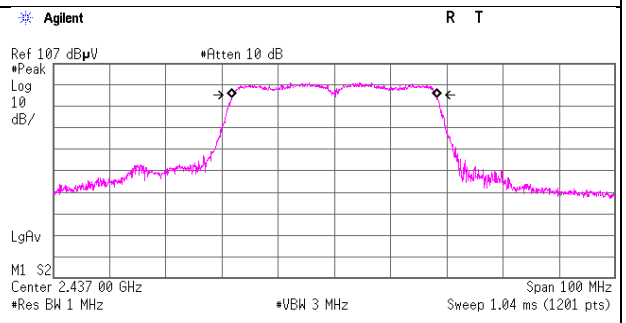


Occupied Bandwidth
17.8968 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 9.182 kHz
x dB Bandwidth 17.589 MHz

2437 MHz

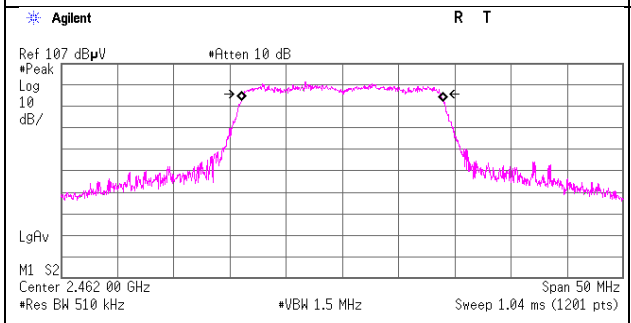


Occupied Bandwidth
36.3805 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -4.380 kHz
x dB Bandwidth 36.045 MHz

2462 MHz

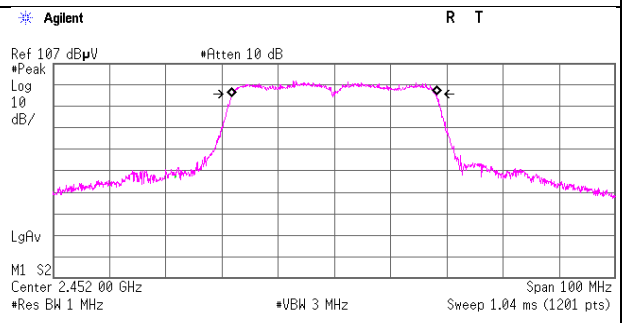


Occupied Bandwidth
17.8752 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -8.090 kHz
x dB Bandwidth 17.422 MHz

2452 MHz



Occupied Bandwidth
36.4156 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -43.698 kHz
x dB Bandwidth 35.896 MHz

APPENDIX 2: Test instruments

Test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2015/02/19 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE	2015/01/13 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2015/05/18 * 12
MCC-167	Microwave Cable	Junkosha	MWX221	1404S374(1m) / 1405S074(5m)	RE	2015/05/21 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2015/03/19 * 12
MHF-25	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	001	RE	2014/09/22 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2015/05/19 * 12
MTW-03	Torque wrench	HUBER+SUHNER	74 Z-0-0-21	98142	RE	2015/01/16 * 36
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2015/05/18 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2014/08/19 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2014/10/18 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2014/10/18 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2014/07/14 * 12
MAT-70	Attenuator(6dB)	Agilent	8491A-006	MY52460153	RE	2015/04/08 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2015/03/10 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE/CE	2014/06/25 * 12 *1)
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE/CE	2015/01/13 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE/CE	-
MSA-16	Spectrum Analyzer	Agilent	E4440A	MY46186390	RE	2015/02/16 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2015/02/05 * 12
MCC-166	Microwave Cable	Junkosha	MWX221	1303S120(1m) / 1311S167(5m)	RE	2014/09/24 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2015/01/28 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2015/05/15 * 12
MTW-02	Torque wrench	HUBER+SUHNER	74 Z-0-0-21	98190	RE	2015/01/16 * 36
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2014/12/22 * 12
MPM-13	Power Meter	Anritsu	ML2495A	0824014	AT	2014/11/11 * 12
MPSE-18	Power sensor	Anritsu	MA2411B	0738174	AT	2014/11/11 * 12
MPM-09	Power Meter	Anritsu	ML2495A	6K00003348	AT	2014/10/06 * 12
MPSE-12	Power sensor	Anritsu	MA2411B	011598	AT	2014/10/06 * 12
MAT-20	Attenuator(10dB)(above 1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	AT	2015/01/08 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2015/03/18 * 12
MTW-09	Torque wrench	HUBER+SUHNER	74 Z-0-0-21	72676	AT	2015/03/05 * 36
MSA-13	Spectrum Analyzer	Agilent	E4440A	MY46185823	AT	2015/06/02 * 12
MPM-16	Power Meter	Agilent	8990B	MY51000271	AT	2015/04/01 * 12
MPSE-22	Power sensor	Agilent	N1923A	MY54070003	AT	2015/04/01 * 12
MPSE-23	Power sensor	Agilent	N1923A	MY54070004	AT	2015/04/01 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	CE	2014/11/12 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	CE	2015/06/08 * 12
MLS-24	LISN(AMN)	Schwarzbeck	NSLK8127	8127-730	CE(EUT)	2014/07/10 * 12
MCC-13	Coaxial Cable	Fujikura	3D-2W(12m)/5D-2W(5m)/5D-2W(0.8m)/5D-2W(1m)	-	CE	2015/02/06 * 12
MAT-65	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2015/01/29 * 12
MCC-138	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37953/2	AT	2014/10/02 * 12

***1) This test equipment was used for the tests before the expiration date of the calibration.**

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 test**
RE: Radiated Emission test
AT: Antenna Terminal Conducted test