



RADIO TEST REPORT

Test Report No. : 10014382H-A-R1

Applicant : Sony Computer Entertainment Inc.
Type of Equipment : Computer Entertainment System
Model No. : CECH-4201x
FCC ID : AK8CBEH19S1
Test regulation : FCC Part 15 Subpart C: 2013
*WLAN Part
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 report is a revised version of 10014382H-A. 10014382H-A is replaced with this report.

Date of test: June 11 to June 28, 2013

Representative test engineer:

T. Shimada

Takumi Shimada
Engineer of WiSE Japan,
UL Verification Service

Approved by:

M. Nishiyama

Masanori Nishiyama
Manager of WiSE Japan,
UL Verification Service



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://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap>

UL Japan, Inc.

Head Office EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

13-EM-F0429

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SECTION 1: Customer information

Company Name	Sony Computer Entertainment Inc.
Brand Name	SONY
Address	1-7-1 Konan, Minato-ku, Tokyo, 108-0075 Japan
Telephone Number	+81-3-6748-6333
Facsimile Number	+81-3-6748-6383
Contact Person	Kiyoto Sasaki

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

2.1 Identification of E.U.T.

Type of Equipment	Computer Entertainment System
Model No	CECH-4201x
Serial No	4000009 for Conducted Emission and Radiated Emission tests 4000010 for Antenna Conducted Terminal test
Country of Manufacture	China/Japan
Receipt Date of Sample	June 10, 2013
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: CECH-4201x, referred to as the EUT in this report, is a Computer Entertainment System. The EUT contains a Bluetooth and IEEE802.11b/g WLAN module. WLAN antennas do not transmit simultaneously. Bluetooth antenna also does not transmit simultaneously with WLAN antennas.

Details of model name CECH-4201x:

“x” will be replaced by an alphabet denoting the different capacity of storage. The difference of the capacity of storage does not influence on radio specification.

Product Specification

Maximum clock frequency in the system	3.2GHz
Operating Temperature	5-35 deg. C
Power Supply	AC100-240V, 50Hz/60Hz (made by Chicony)
Size	290 x 60 x 230 mm
Weight	Approx. 2.1kg

Radio Specification

WLAN (IEEE802.11b/g)

Equipment Type	Transceiver	
Frequency of Operation	2412-2462MHz	
Type of Modulation	DSSS, OFDM	
Bandwidth & Channel spacing	20MHz & 5MHz	
Method of frequency generation	Synthesizer	
Power Supply (inner)	DC3.3V/1.8V	
Antenna Type	Antenna 0: IFA	Antenna 1: PIFA
Antenna Gain	Antenna 0: 1.5 dBi (max)	Antenna 1: 3.0 dBi (max)

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Bluetooth (BDR/EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS (GFSK, $\pi/4$ DQPSK, 8DPSK)
Bandwidth & Channel spacing	1MHz & 1MHz
Method of frequency generation	Synthesizer
Power Supply (inner)	DC3.3V/1.8V
Antenna Type	PIFA
Antenna Gain	3.0dBi (peak)

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Head Office EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2013, final revised on June 11, 2013 and effective July 11, 2013

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

* The revision on June 11, 2013 does not affect the test specification applied to the EUT.

* The EUT complies with FCC Part 15 Subpart B: 2013, final revised on June 11, 2013 and effective July 11, 2013.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.4:2003 7. AC powerline Conducted Emission measurements ----- IC: RSS-Gen 7.2.4	FCC: Section 15.207 ----- IC: RSS-Gen 7.2.4	QP 22.6dB, 0.15000MHz, L/N AV 16.1dB, 0.20292MHz, L 0.20512MHz, L 0.20428MHz, L	Complied	-
6dB Bandwidth	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on April 9, 2013)" ----- IC: RSS-Gen 4.6.2	FCC: Section 15.247(a)(2) ----- IC: RSS-210 A8.2(a)		Complied	Conducted
Maximum Peak Output Power	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on April 9, 2013)" ----- IC: RSS-Gen 4.8	FCC: Section 15.247(b)(3) ----- IC: RSS-210 A8.4(4)	See data.	Complied	Conducted
Power Density	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on April 9, 2013)" ----- IC: -	FCC: Section 15.247 (e) ----- IC: RSS-210 A8.2(b)		Complied	Conducted
Spurious Emission Restricted Band Edges	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on April 9, 2013)" ----- IC: RSS-Gen 4.9	FCC: Section15.247(d) ----- IC: RSS-210 A8.5 RSS-Gen 7.2.3	6.1dB 2390.000MHz, AV, Vertical	Complied	Conducted/ Radiated

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422.

* In case any questions arise about test procedure, ANSI C63.4: 2003 is also referred.

FCC 15.31 (e)

This EUT provides stable voltage (DC3.3/1.8V) 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.

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Head Office EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	IC: RSS-Gen 4.6.1	IC: RSS-Gen 4.6.1	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.

Test room (semi-anechoic chamber)	Conducted emission (+dB)
	150kHz-30MHz
No.1	3.5dB
No.2	3.6dB
No.3	3.6dB
No.4	3.6dB

Test room (semi-anechoic chamber)	Radiated emission						
	(3m*)(+dB)				(1m*)(+dB)		(0.5m*)(+dB)
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.3dB	5.0dB	5.1dB	4.9dB	5.8dB	4.4dB	4.3dB
No.2	4.3dB	5.2dB	5.1dB	5.0dB	5.7dB	4.3dB	4.2dB
No.3	4.6dB	5.0dB	5.1dB	5.0dB	5.7dB	4.5dB	4.2dB
No.4	4.8dB	5.2dB	5.0dB	5.0dB	5.7dB	5.2dB	4.2dB

*3m/1m/0.5m = Measurement distance

Power meter (+dB)	
Below 1GHz	Above 1GHz
0.7dB	1.5dB

Antenna terminal conducted emission and Power density (+dB)			Antenna terminal conducted emission (+dB)		Channel power (+dB)
Below 1GHz	1GHz-3GHz	3GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz	
1.5dB	1.7dB	2.8dB	2.8dB	2.9dB	2.6dB

Conducted Emission test

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

Radiated emission test(3m)

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

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Head Office EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

3.5 Test Location

UL Japan, Inc. Head Office 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

	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.8 x 4.6 x 2.8m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 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 Data of EMI, Test instruments, and Test set up

Refer to APPENDIX.

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Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

SECTION 4: Operation of E.U.T. during testing

4.1 Operating Mode(s)

Mode	Remarks*
IEEE 802.11b (11b)	2Mbps, PN9
IEEE 802.11g (11g)	24Mbps, PN9
*Transmitting duty was 100% on all tests. *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: Same as production model Software: LABTOOL_LV2DIAG_20111206 *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product.	

*The details of Operating mode(s)

Test Item	Operating Mode	Tested Antenna	Tested frequency
Conducted Emission	11b Tx	Antenna 0	2412MHz
Spurious Emission (Radiated)	11g Tx	Antenna 1	2437MHz
Maximum Peak Output Power			2462MHz
6dB Bandwidth	11b Tx	Antenna 0 *1)	2412MHz
Power Density	11g Tx		2437MHz
99% Occupied Bandwidth			2462MHz
Spurious Emission (Conducted)			
*1) Test was performed with Antenna 0 as representative as it had higher peak output power than Antenna 1.			

*Antenna 1 has two kinds of manufacturer's antennas (TE Connectivity and LuxShare-ICT) and the test was performed only with TE Connectivity antenna according to the customer's request, because they have identical antenna characteristics.

*The transmitting data shall be scrambled with the following scramblers and it was transmitted continuously.

[11b]

2Mbps: IEEE Std 802.11b(1999) Section 15.2.4

[11g]

24Mbps: IEEE Std 802.11a(1999) Section 17.3.5.4

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

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4.2 Configuration and peripherals

This page has been submitted for a separate exhibit.

SECTION 5: Conducted Emission

Test Procedure and conditions

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

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

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

I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. All unused 50ohm connectors of the LISN(AMN) were resistivity terminated in 50ohm 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 : 0.15-30MHz
Test data : APPENDIX
Test result : Pass

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Head Office EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

SECTION 6: Radiated Spurious Emission

Test Procedure

It was measured based on "11.0 Emissions in non-restricted frequency bands" of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 (Issued on April 9, 2013)".

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m 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 and 4m 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	Below 30MHz	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Loop	Biconical	Logperiodic	Horn

In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

20dBc was applied to the frequency over the limit of FCC 15.209 / Table 5 of RSS-Gen 7.2.5(IC) and outside the restricted band of FCC15.205 / Table 3 of RSS-Gen 7.2.2 (IC).

Frequency	Below 1GHz	Above 1GHz		20dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV *1)	PK
IF Bandwidth	BW 120kHz(T/R)	RBW: 1MHz VBW: 3MHz	Average Power Method: <u>WLAN: 12.2.5.1</u> RBW: 1MHz VBW: 3MHz Trace: Free Run Detector: Power Averaging (RMS)	RBW: 100kHz VBW: 300kHz (S/A)
Test Distance	3m	3m (below 10GHz), 1m *2) (above 10GHz)		3m (below 10GHz), 1m *2) (above 10GHz)

*1) Average Power Measurement was performed based on 6.0 & 12.2.5 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 (Issued on April 9, 2013)"

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

- The carrier level and noise levels were confirmed at each position of X and Y 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 : 30M-26.5GHz
Test data : APPENDIX
Test result : Pass

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

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	100kHz	300kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	50MHz	1 to 3% of Span	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak	-	Power Meter (Sensor: 50MHz BW)
Peak Power Density	14.9MHz, 24.8MHz,	3kHz	10kHz	Auto	Peak	Max Hold	Spectrum Analyzer *1)
Conducted Spurious Emission *2)	9kHz to 150kHz	200Hz	620Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	9.1kHz	27kHz				

*1) Section 10.2 Method PKPSD (peak PSD) of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 (Issued on April 9, 2013)".
*2) 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 not detected as shown in the chart.(9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=9.1kHz)

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

Test data : **APPENDIX**
Test result : **Pass**

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

APPENDIX 1: Data of EMI test

Conducted Emission

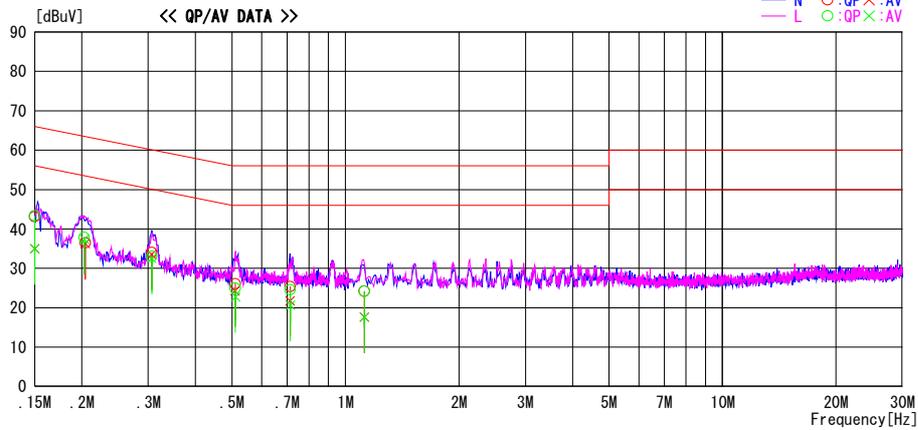
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 3 Semi Anechoic Chamber
 Date : 2013/06/28

Report No. : 10014383H
 Power : AC 120V / 60Hz
 Temp./Humi. : 24deg. C / 66% RH
 Engineer : Katsunori Okai

Mode / Remarks : WLAN 11b 2412MHz Antenna 0

LIMIT : FCC15.207 QP
 FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15000	29.9	21.8	13.2	43.1	35.0	66.0	56.0	22.9	21.0	N	
0.20405	23.3	23.0	13.2	36.5	36.2	63.4	53.4	26.9	17.2	N	
0.30653	20.7	20.2	13.3	34.0	33.5	60.1	50.1	26.1	16.6	N	
0.51018	12.8	10.9	13.3	26.1	24.2	56.0	46.0	29.9	21.8	N	
0.71361	12.0	8.4	13.4	25.4	21.8	56.0	46.0	30.6	24.2	N	
1.12207	10.8	4.2	13.4	24.2	17.6	56.0	46.0	31.8	28.4	N	
0.15000	30.2	21.8	13.2	43.4	35.0	66.0	56.0	22.6	21.0	L	
0.20292	24.6	24.2	13.2	37.8	37.4	63.5	53.5	25.7	16.1	L	
0.30647	19.7	19.2	13.3	33.0	32.5	60.1	50.1	27.1	17.6	L	
0.51081	11.6	9.4	13.3	24.9	22.7	56.0	46.0	31.1	23.3	L	
0.71441	11.2	7.2	13.4	24.6	20.6	56.0	46.0	31.4	25.4	L	
1.12216	10.8	4.2	13.4	24.2	17.6	56.0	46.0	31.8	28.4	L	

CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT[dBuV]=READING[dBuV]+C.F[dB] (LISN LOSS+CABLE LOSS+ATE TN. LOSS)
 Except for the above table : adequate margin data below the limits.

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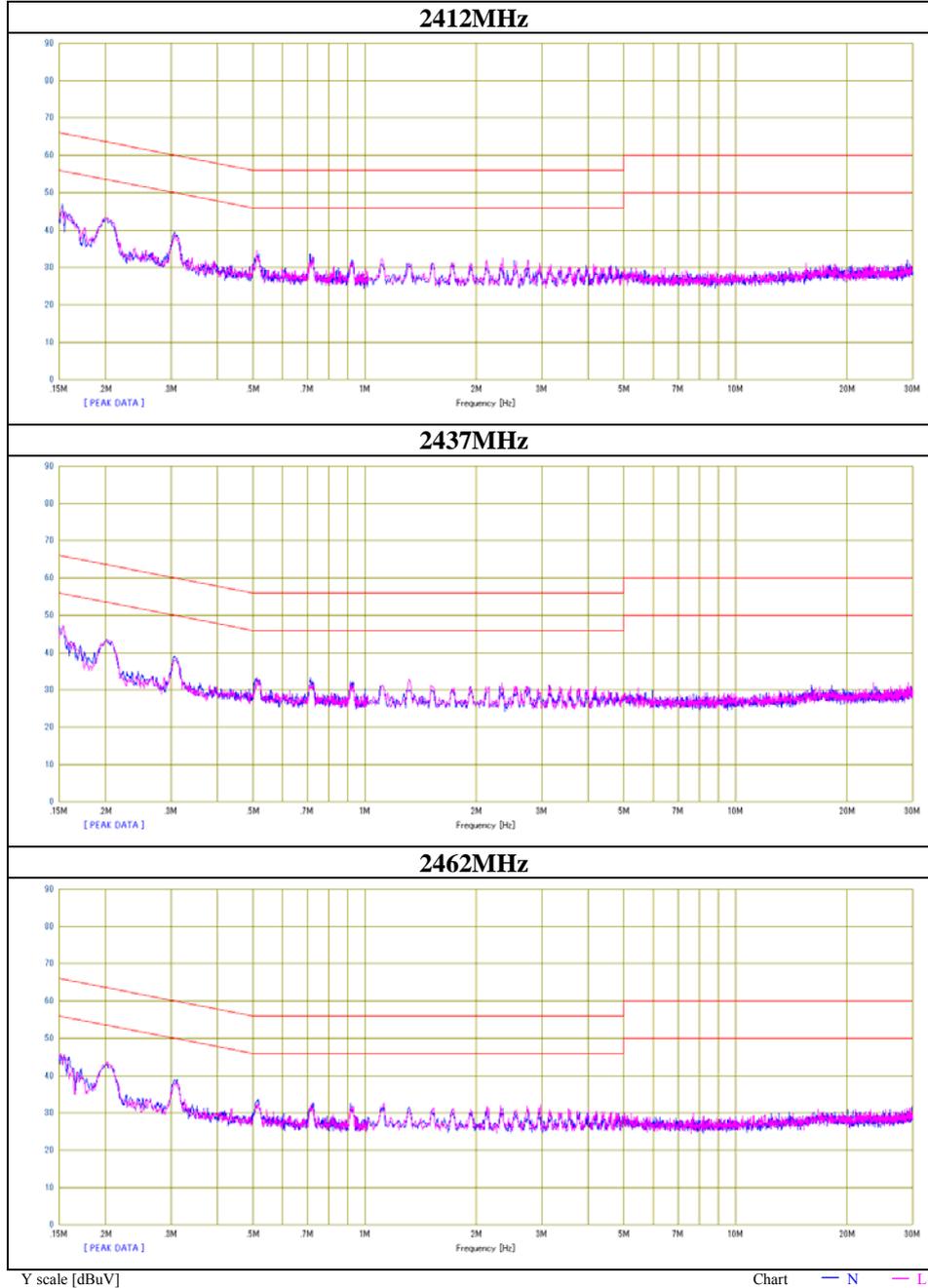
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Emission

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10014382H
Date	06/27/2013
Temperature/ Humidity	24 deg. C / 66% RH
Engineer	Katsunori Okai
Mode	11b Tx Antenna 0



Conducted Emission

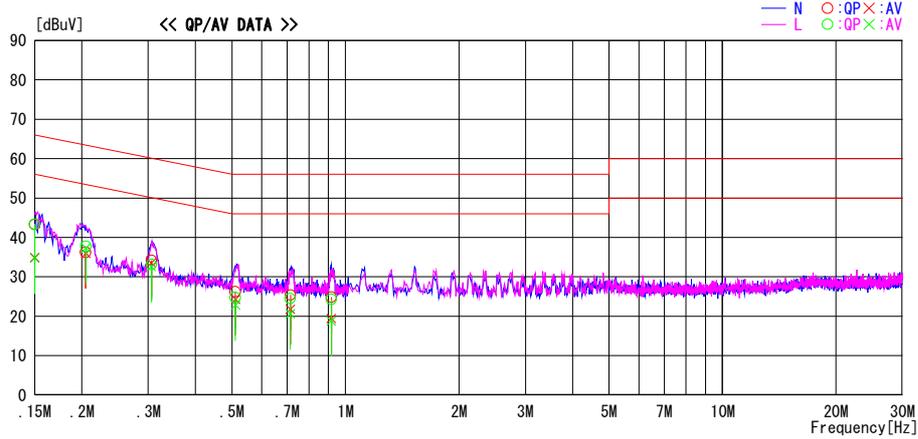
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
 Date : 2013/06/28

Report No. : 10014383H
 Power : AC 120V / 60Hz
 Temp./Humi. : 24deg. C / 66% RH
 Engineer : Katsunori Okai

Mode / Remarks : WLAN 11g 2412MHz Antenna 0

LIMIT : FCC15.207 QP
 FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15000	30.1	21.7	13.2	43.3	34.9	66.0	56.0	22.7	21.1	N	
0.20472	23.0	22.8	13.2	36.2	36.0	63.4	53.4	27.2	17.4	N	
0.30567	20.9	20.2	13.3	34.2	33.5	60.1	50.1	25.9	16.6	N	
0.51045	12.9	10.9	13.3	26.2	24.2	56.0	46.0	29.8	21.8	N	
0.71456	12.0	8.4	13.4	25.4	21.8	56.0	46.0	30.6	24.2	N	
0.91763	11.4	6.0	13.4	24.8	19.4	56.0	46.0	31.2	26.6	N	
0.15000	30.2	21.5	13.2	43.4	34.7	66.0	56.0	22.6	21.3	L	
0.20512	24.5	24.1	13.2	37.7	37.3	63.4	53.4	25.7	16.1	L	
0.30577	19.8	19.3	13.3	33.1	32.6	60.1	50.1	27.0	17.5	L	
0.51041	11.4	9.5	13.3	24.7	22.8	56.0	46.0	31.3	23.2	L	
0.71429	11.1	7.2	13.4	24.5	20.6	56.0	46.0	31.5	25.4	L	
0.91733	10.9	5.4	13.4	24.3	18.8	56.0	46.0	31.7	27.2	L	

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

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Head Office EMC Lab.

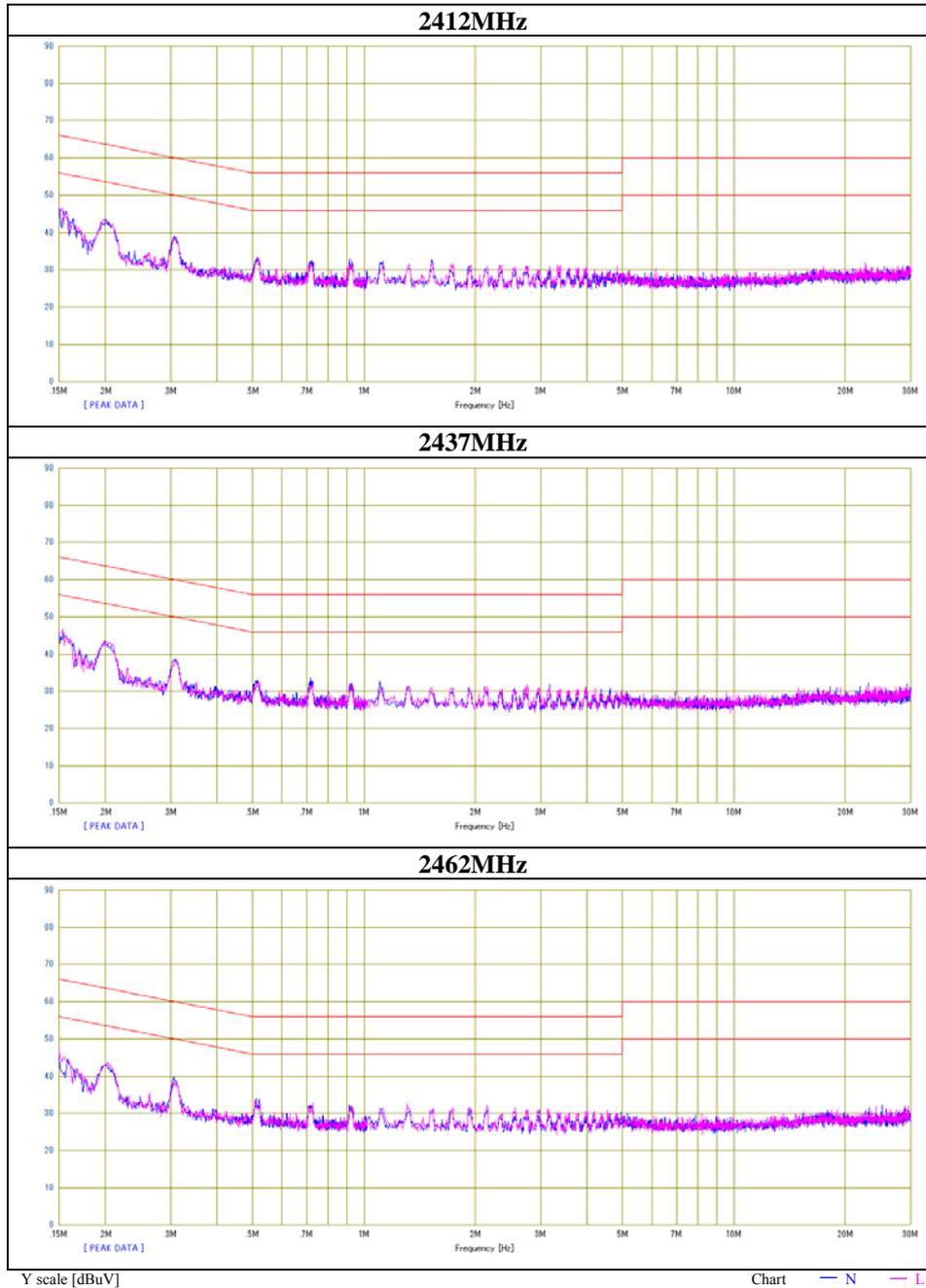
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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Emission

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10014382H
Date	06/27/2013
Temperature/ Humidity	24 deg. C / 66% RH
Engineer	Katsunori Okai
Mode	11g Tx Antenna 0



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Head Office EMC Lab.

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Telephone : +81 596 24 8999

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Conducted Emission

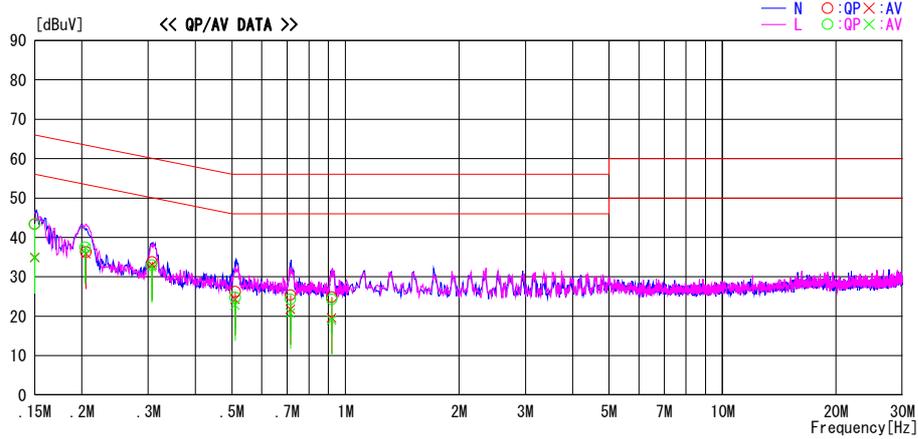
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
 Date : 2013/06/28

Report No. : 10014383H
 Power : AC 120V / 60Hz
 Temp./Humi. : 24deg. C / 66% RH
 Engineer : Katsunori Okai

Mode / Remarks : WLAN 11b 2412MHz Antenna 1

LIMIT : FCC15.207 QP
 FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15000	30.2	21.8	13.2	43.4	35.0	66.0	56.0	22.6	21.0	N	
0.20511	23.1	22.7	13.2	36.3	35.9	63.4	53.4	27.1	17.5	N	
0.30718	20.4	19.8	13.3	33.7	33.1	60.0	50.0	26.3	16.9	N	
0.50982	12.9	10.9	13.3	26.2	24.2	56.0	46.0	29.8	21.8	N	
0.71472	12.0	8.4	13.4	25.4	21.8	56.0	46.0	30.6	24.2	N	
0.91907	11.4	6.2	13.4	24.8	19.6	56.0	46.0	31.2	26.4	N	
0.15000	30.2	21.6	13.2	43.4	34.8	66.0	56.0	22.6	21.2	L	
0.20428	24.3	24.1	13.2	37.5	37.3	63.4	53.4	25.9	16.1	L	
0.30622	19.6	19.2	13.3	32.9	32.5	60.1	50.1	27.2	17.6	L	
0.51011	11.4	9.5	13.3	24.7	22.8	56.0	46.0	31.3	23.2	L	
0.71521	10.9	7.4	13.4	24.3	20.8	56.0	46.0	31.7	25.2	L	
0.91913	10.9	5.6	13.4	24.3	19.0	56.0	46.0	31.7	27.0	L	

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

UL Japan, Inc.

Head Office EMC Lab.

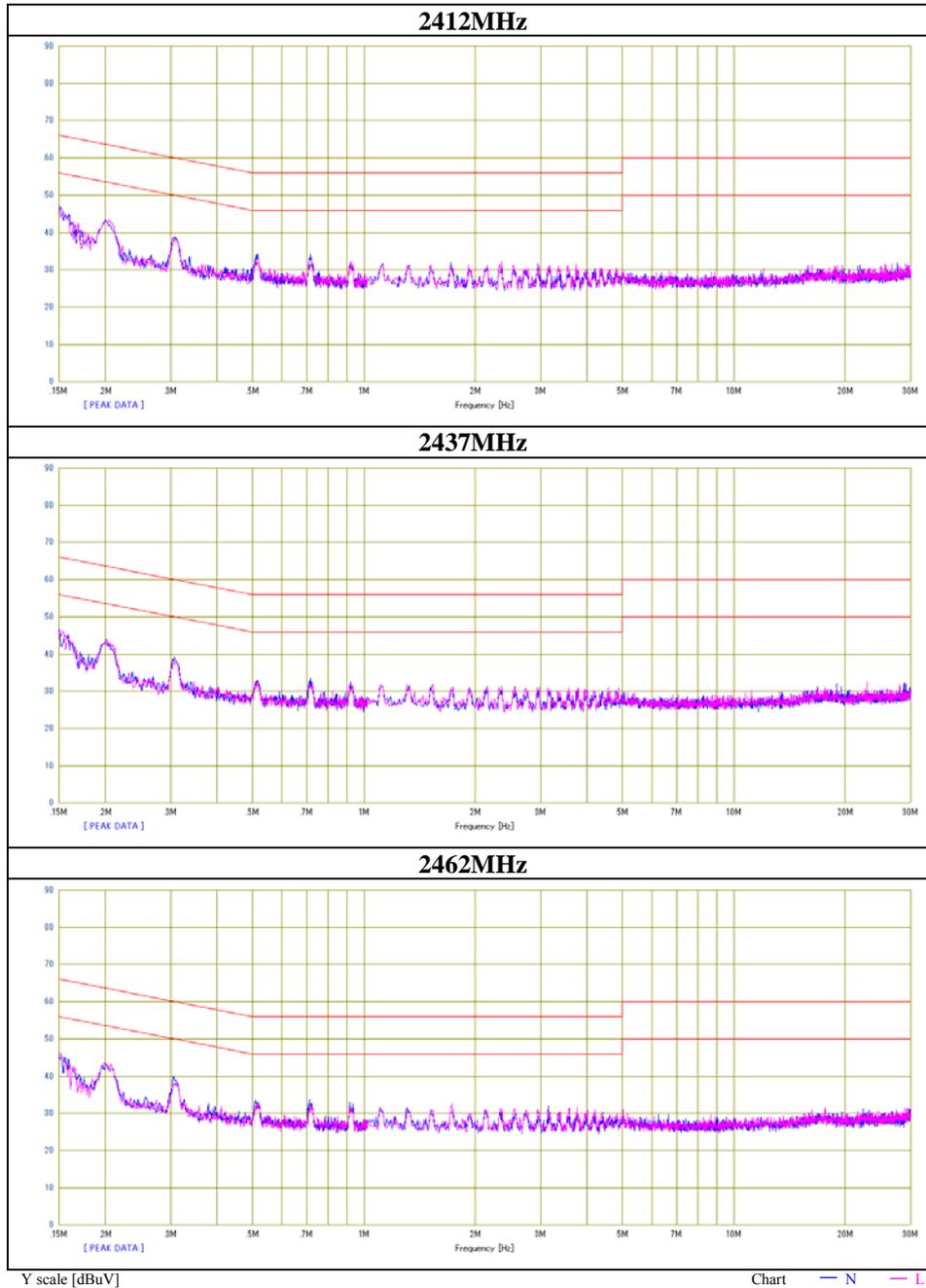
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Emission

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10014382H
Date	06/27/2013
Temperature/ Humidity	24 deg. C / 66% RH
Engineer	Katsunori Okai
Mode	11b Tx Antenna 1



Conducted Emission

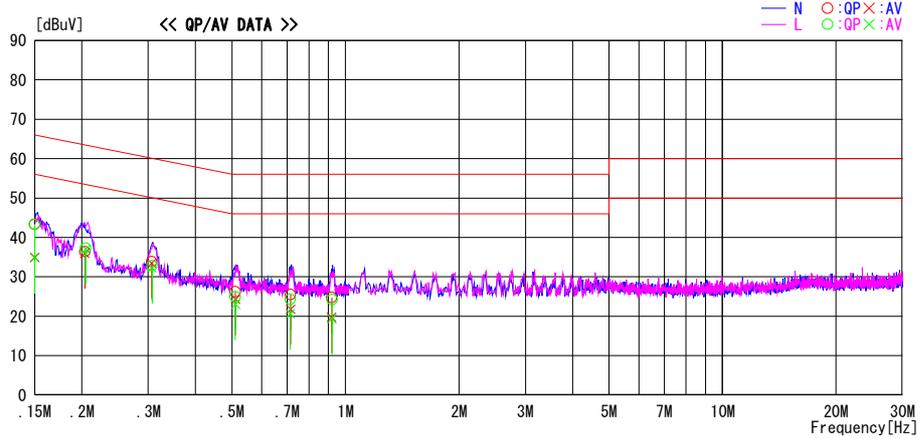
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
 Date : 2013/06/28

Report No. : 10014383H
 Power : AC 120V / 60Hz
 Temp./Humi. : 24deg. C / 66% RH
 Engineer : Katsunori Okai

Mode / Remarks : WLAN 11g 2412MHz Antenna 1

LIMIT : FCC15.207 QP
 FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15000	30.2	21.8	13.2	43.4	35.0	66.0	56.0	22.6	21.0	N	
0.20362	23.2	22.8	13.2	36.4	36.0	63.5	53.5	27.1	17.5	N	
0.30629	20.5	20.1	13.3	33.8	33.4	60.1	50.1	26.3	16.7	N	
0.51037	12.9	10.9	13.3	26.2	24.2	56.0	46.0	29.8	21.8	N	
0.71590	12.1	8.4	13.4	25.5	21.8	56.0	46.0	30.5	24.2	N	
0.91924	11.3	6.3	13.4	24.7	19.7	56.0	46.0	31.3	26.3	N	
0.15000	30.1	21.6	13.2	43.3	34.8	66.0	56.0	22.7	21.2	L	
0.20483	24.1	23.9	13.2	37.3	37.1	63.4	53.4	26.1	16.3	L	
0.30692	19.5	19.0	13.3	32.8	32.3	60.1	50.1	27.3	17.8	L	
0.51052	11.6	9.7	13.3	24.9	23.0	56.0	46.0	31.1	23.0	L	
0.71424	10.9	7.2	13.4	24.3	20.6	56.0	46.0	31.7	25.4	L	
0.92168	10.8	5.9	13.4	24.2	19.3	56.0	46.0	31.8	26.7	L	

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

UL Japan, Inc. Head Office EMC Lab.

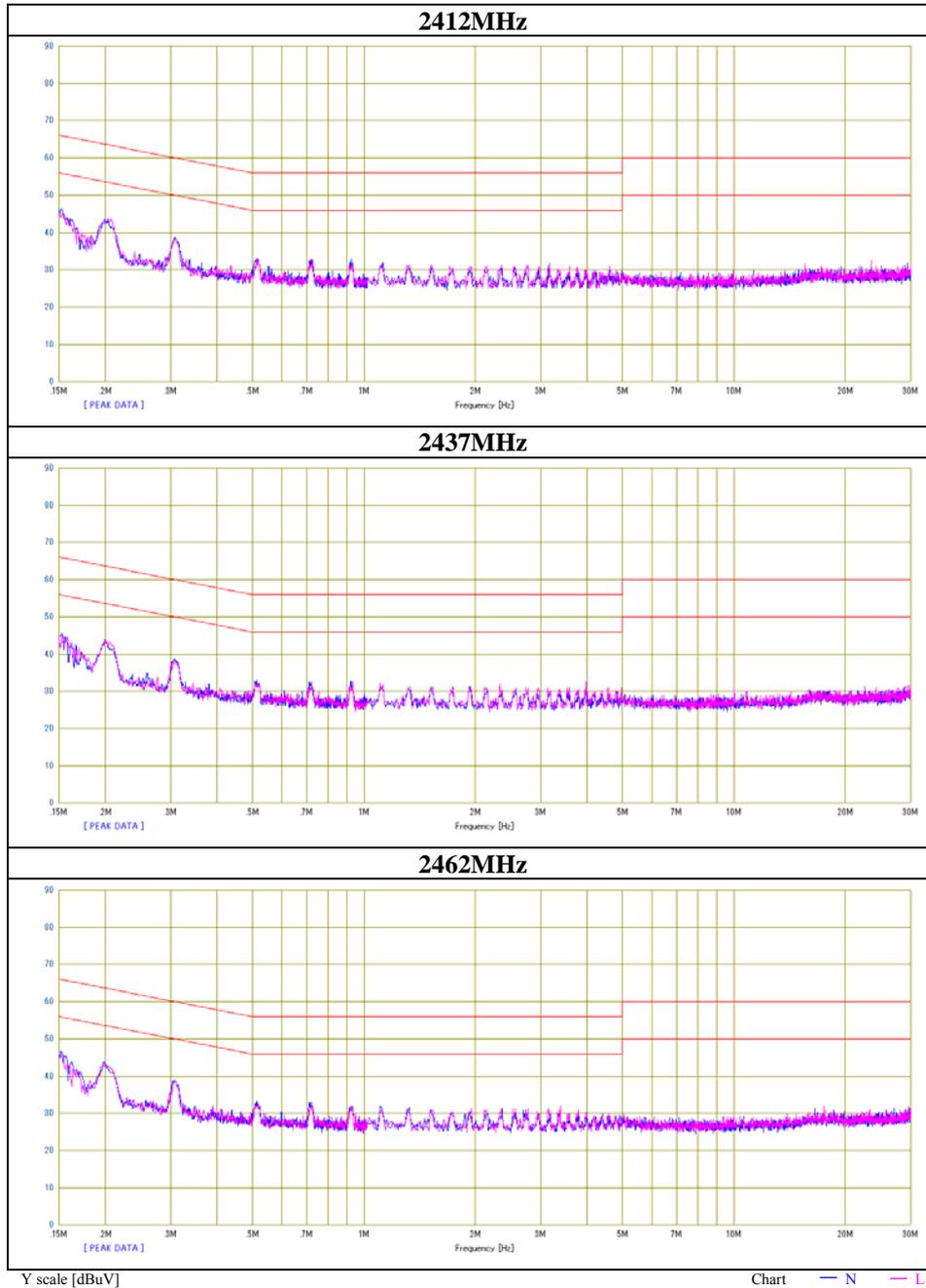
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted Emission

Test place	Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10014382H
Date	06/27/2013
Temperature/ Humidity	24 deg. C / 66% RH
Engineer	Katsunori Okai
Mode	11g Tx Antenna 1



6dB Bandwidth

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 10014382H
Date 06/11/2013
Temperature/ Humidity 23 deg. C / 52% RH
Engineer Takayuki Shimada
Mode Tx

11b

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2412	9.912	>500
2437	9.917	>500
2462	9.923	>500

11g

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2412	16.513	>500
2437	16.528	>500
2462	16.507	>500

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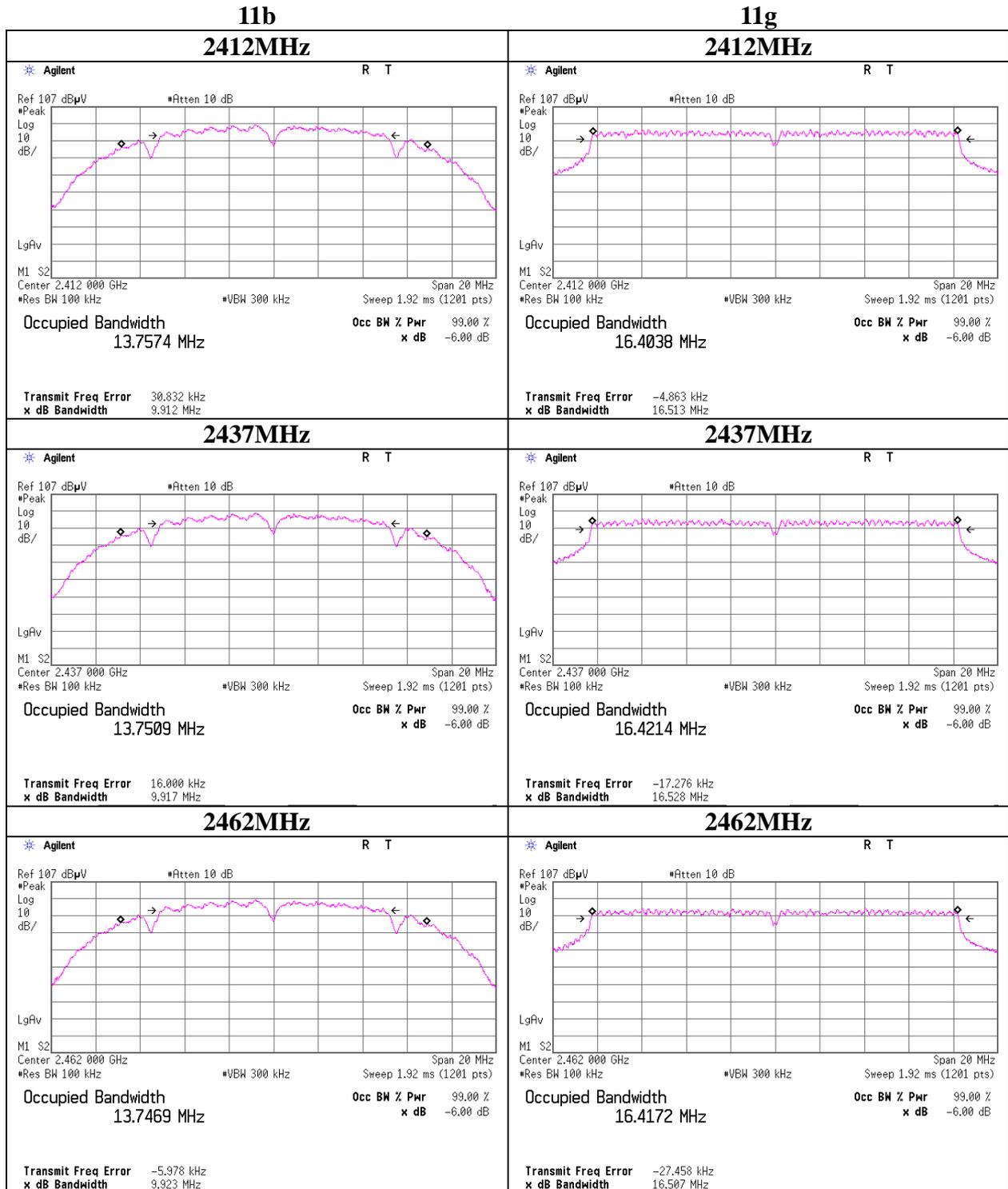
Head Office EMC Lab.

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Telephone : +81 596 24 8999

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6dB Bandwidth



Maximum Peak Output Power

Test place : Head Office EMC Lab. No.11 Measurement Room
Report No. : 10014382H
Date : 06/11/2013
Temperature/ Humidity : 23 deg. C / 52% RH
Engineer : Takayuki Shimada
Mode : 11b Tx

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	1.52	2.06	10.07	13.65	23.17	30.00	1000	16.35
2437	1.62	2.07	10.07	13.76	23.77	30.00	1000	16.24
2462	1.44	2.07	10.07	13.58	22.80	30.00	1000	16.42

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	1.06	2.06	10.07	13.19	20.84	30.00	1000	16.81
2437	1.22	2.07	10.07	13.36	21.68	30.00	1000	16.64
2462	1.05	2.07	10.07	13.19	20.84	30.00	1000	16.81

Sample Calculation:

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

Antenna 0, 2437MHz

Rate [Mbps]	Reading [dBm]	Remark
1	1.16	
2	1.62	*
5.5	0.10	
11	1.07	

Antenna 1, 2437MHz

Rate [Mbps]	Reading [dBm]	Remark
1	0.70	
2	1.22	*
5.5	-0.35	
11	0.64	

*: Worst Rate

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

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Head Office EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Maximum Peak Output Power

Test place : Head Office EMC Lab. No.11 Measurement Room
Report No. : 10014382H
Date : 06/11/2013
Temperature/ Humidity : 23 deg. C / 52% RH
Engineer : Takayuki Shimada
Mode : 11g Tx

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	9.57	2.06	10.07	21.70	147.91	30.00	1000	8.30
2437	8.57	2.07	10.07	20.71	117.76	30.00	1000	9.29
2462	8.15	2.07	10.07	20.29	106.91	30.00	1000	9.71

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	9.24	2.06	10.07	21.37	137.09	30.00	1000	8.63
2437	8.22	2.07	10.07	20.36	108.64	30.00	1000	9.64
2462	7.83	2.07	10.07	19.97	99.31	30.00	1000	10.03

Sample Calculation:

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

Antenna 0, 2437MHz

Rate [Mbps]	Reading [dBm]	Remark
6	7.85	
9	7.52	
12	7.62	
18	6.76	
24	8.57	*
36	8.31	
48	7.35	
54	8.24	

Antenna 1, 2437MHz

Rate [Mbps]	Reading [dBm]	Remark
6	8.16	
9	6.72	
12	7.36	
18	6.84	
24	8.22	*
36	6.95	
48	6.93	
54	7.16	

*: Worst Rate

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

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Head Office EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10014382H
Date 06/13/2013 06/15/2013 06/23/2013
Temperature/ Humidity 22 deg. C / 61% RH 24 deg. C / 60% RH 24 deg. C / 63% RH
Engineer Takumi Shimada Takayuki Shimada Takumi Shimada
(1-10GHz) (Above 1GHz) (Below 1GHz)
Mode 11b Tx 2437MHz Antenna 0

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	115.534	QP	36.5	12.4	8.2	32.1	25.0	43.5	18.5	
Hori	405.002	QP	35.9	17.4	10.6	32.0	31.9	46.0	14.1	
Hori	432.006	QP	39.1	17.6	10.8	32.0	35.5	46.0	10.5	
Hori	540.609	QP	31.7	18.6	11.5	32.1	29.7	46.0	16.3	
Hori	576.003	QP	37.5	19.0	11.7	32.1	36.1	46.0	9.9	
Hori	810.922	QP	32.5	21.9	12.9	31.5	35.8	46.0	10.2	
Hori	4874.000	PK	41.6	30.6	4.7	31.4	45.5	73.9	28.4	
Hori	7311.000	PK	42.0	35.9	5.6	32.4	51.1	73.9	22.8	
Hori	9748.000	PK	42.8	39.4	6.4	33.0	55.6	73.9	18.3	
Hori	4874.000	AV	33.2	30.6	4.7	31.4	37.1	53.9	16.8	
Hori	7311.000	AV	33.7	35.9	5.6	32.4	42.8	53.9	11.1	
Hori	9748.000	AV	33.7	39.4	6.4	33.0	46.5	53.9	7.4	
Vert	115.643	QP	41.2	12.4	8.2	32.1	29.7	43.5	13.8	
Vert	405.008	QP	41.0	17.4	10.6	32.0	37.0	46.0	9.0	
Vert	432.020	QP	41.4	17.6	10.8	32.0	37.8	46.0	8.2	
Vert	540.610	QP	36.5	18.6	11.5	32.1	34.5	46.0	11.5	
Vert	576.004	QP	34.2	19.0	11.7	32.1	32.8	46.0	13.2	
Vert	810.915	QP	29.5	21.9	12.9	31.5	32.8	46.0	13.2	
Vert	4874.000	PK	40.9	30.6	4.7	31.4	44.8	73.9	29.1	
Vert	7311.000	PK	41.9	35.9	5.6	32.4	51.0	73.9	22.9	
Vert	9748.000	PK	42.1	39.4	6.4	33.0	54.9	73.9	19.0	
Vert	4874.000	AV	33.1	30.6	4.7	31.4	37.0	53.9	16.9	
Vert	7311.000	AV	33.4	35.9	5.6	32.4	42.5	53.9	11.4	
Vert	9748.000	AV	33.8	39.4	6.4	33.0	46.6	53.9	7.3	

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

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

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

UL Japan, Inc.

Head Office EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10014382H
Date 06/13/2013 06/15/2013 06/23/2013
Temperature/ Humidity 22 deg. C / 61% RH 24 deg. C / 60% RH 24 deg. C / 63% RH
Engineer Takumi Shimada Takayuki Shimada Takumi Shimada
(1-10GHz) (Above 1GHz) (Below 1GHz)
Mode 11b Tx 2462MHz Antenna 0

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	115.532	QP	36.8	12.4	8.2	32.1	25.3	43.5	18.2	
Hori	405.003	QP	36.0	17.4	10.6	32.0	32.0	46.0	14.0	
Hori	432.002	QP	39.3	17.6	10.8	32.0	35.7	46.0	10.3	
Hori	540.610	QP	31.8	18.6	11.5	32.1	29.8	46.0	16.2	
Hori	576.005	QP	37.1	19.0	11.7	32.1	35.7	46.0	10.3	
Hori	810.921	QP	32.3	21.9	12.9	31.5	35.6	46.0	10.4	
Hori	2483.500	PK	51.5	28.4	2.3	32.3	49.9	73.9	24.0	
Hori	4924.000	PK	41.4	30.7	4.7	31.4	45.4	73.9	28.6	
Hori	7386.000	PK	42.3	36.1	5.6	32.4	51.6	73.9	22.3	
Hori	9848.000	PK	42.4	39.6	6.4	33.1	55.3	73.9	18.6	
Hori	2483.500	AV	43.7	28.4	2.3	32.3	42.1	53.9	11.8	
Hori	4924.000	AV	33.4	30.7	4.7	31.4	37.4	53.9	16.5	
Hori	7386.000	AV	33.8	36.1	5.6	32.4	43.1	53.9	10.8	
Hori	9848.000	AV	33.8	39.6	6.4	33.1	46.7	53.9	7.2	
Vert	115.617	QP	41.4	12.4	8.2	32.1	29.9	43.5	13.6	
Vert	405.006	QP	41.0	17.4	10.6	32.0	37.0	46.0	9.0	
Vert	432.012	QP	41.4	17.6	10.8	32.0	37.8	46.0	8.2	
Vert	540.611	QP	36.3	18.6	11.5	32.1	34.3	46.0	11.7	
Vert	576.004	QP	34.4	19.0	11.7	32.1	33.0	46.0	13.0	
Vert	810.921	QP	29.7	21.9	12.9	31.5	33.0	46.0	13.0	
Vert	2483.500	PK	52.0	28.4	2.3	32.3	50.4	73.9	23.5	
Vert	4924.000	PK	41.1	30.7	4.7	31.4	45.1	73.9	28.8	
Vert	7386.000	PK	41.9	36.1	5.6	32.4	51.2	73.9	22.7	
Vert	9848.000	PK	42.3	39.6	6.4	33.1	55.2	73.9	18.7	
Vert	2483.500	AV	44.6	28.4	2.3	32.3	43.0	53.9	10.9	
Vert	4924.000	AV	33.2	30.7	4.7	31.4	37.2	53.9	16.7	
Vert	7386.000	AV	33.7	36.1	5.6	32.4	43.0	53.9	10.9	
Vert	9848.000	AV	33.8	39.6	6.4	33.1	46.7	53.9	7.2	

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

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

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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10014382H
Date 06/13/2013 06/15/2013 06/23/2013
Temperature/ Humidity 22 deg. C / 61% RH 24 deg. C / 60% RH 24 deg. C / 63% RH
Engineer Takumi Shimada Takayuki Shimada Takumi Shimada
(1-10GHz) (Above 1GHz) (Below 1GHz)
Mode 11g Tx 2437MHz Antenna 0

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	115.548	QP	36.7	12.4	8.2	32.1	25.2	43.5	18.3	
Hori	405.003	QP	36.1	17.4	10.6	32.0	32.1	46.0	13.9	
Hori	432.004	QP	39.6	17.6	10.8	32.0	36.0	46.0	10.0	
Hori	540.608	QP	31.3	18.6	11.5	32.1	29.3	46.0	16.7	
Hori	576.001	QP	37.1	19.0	11.7	32.1	35.7	46.0	10.3	
Hori	810.921	QP	32.4	21.9	12.9	31.5	35.7	46.0	10.3	
Hori	4874.000	PK	41.5	30.6	4.7	31.4	45.4	73.9	28.5	
Hori	7311.000	PK	41.7	35.9	5.6	32.4	50.8	73.9	23.1	
Hori	9748.000	PK	42.4	39.4	6.4	33.0	55.2	73.9	18.7	
Hori	4874.000	AV	33.2	30.6	4.7	31.4	37.1	53.9	16.8	
Hori	7311.000	AV	33.9	35.9	5.6	32.4	43.0	53.9	10.9	
Hori	9748.000	AV	33.7	39.4	6.4	33.0	46.5	53.9	7.4	
Vert	106.772	QP	45.2	11.1	8.1	32.1	32.3	43.5	11.2	
Vert	405.004	QP	40.5	17.4	10.6	32.0	36.5	46.0	9.5	
Vert	432.002	QP	41.3	17.6	10.8	32.0	37.7	46.0	8.3	
Vert	540.606	QP	36.6	18.6	11.5	32.1	34.6	46.0	11.4	
Vert	576.002	QP	34.5	19.0	11.7	32.1	33.1	46.0	12.9	
Vert	810.921	QP	29.4	21.9	12.9	31.5	32.7	46.0	13.3	
Vert	4874.000	PK	41.1	30.6	4.7	31.4	45.0	73.9	28.9	
Vert	7311.000	PK	42.1	35.9	5.6	32.4	51.2	73.9	22.7	
Vert	9748.000	PK	41.9	39.4	6.4	33.0	54.7	73.9	19.2	
Vert	4874.000	AV	33.3	30.6	4.7	31.4	37.2	53.9	16.7	
Vert	7311.000	AV	33.8	35.9	5.6	32.4	42.9	53.9	11.0	
Vert	9748.000	AV	33.9	39.4	6.4	33.0	46.7	53.9	7.2	

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

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

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

UL Japan, Inc.

Head Office EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10014382H
Date 06/13/2013 06/15/2013 06/23/2013
Temperature/ Humidity 22 deg. C / 61% RH 24 deg. C / 60% RH 24 deg. C / 63% RH
Engineer Takumi Shimada Takayuki Shimada Takumi Shimada
(1-10GHz) (Above 1GHz) (Below 1GHz)
Mode 11g Tx 2462MHz Antenna 0

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	115.521	QP	36.4	12.4	8.2	32.1	24.9	43.5	18.6	
Hori	405.001	QP	36.2	17.4	10.6	32.0	32.2	46.0	13.8	
Hori	432.001	QP	39.3	17.6	10.8	32.0	35.7	46.0	10.3	
Hori	540.607	QP	31.1	18.6	11.5	32.1	29.1	46.0	16.9	
Hori	576.002	QP	37.3	19.0	11.7	32.1	35.9	46.0	10.1	
Hori	810.922	QP	32.1	21.9	12.9	31.5	35.4	46.0	10.6	
Hori	2483.500	PK	58.1	28.4	2.3	32.3	56.5	73.9	17.4	
Hori	4924.000	PK	41.6	30.7	4.7	31.4	45.6	73.9	28.3	
Hori	7386.000	PK	42.6	36.1	5.6	32.4	51.9	73.9	22.0	
Hori	9848.000	PK	42.0	39.6	6.4	33.1	54.9	73.9	19.0	
Hori	2483.500	AV	48.5	28.4	2.3	32.3	46.9	53.9	7.0	
Hori	4924.000	AV	33.2	30.7	4.7	31.4	37.2	53.9	16.7	
Hori	7386.000	AV	33.9	36.1	5.6	32.4	43.2	53.9	10.7	
Hori	9848.000	AV	33.7	39.6	6.4	33.1	46.6	53.9	7.3	
Vert	106.768	QP	45.0	11.1	8.1	32.1	32.1	43.5	11.4	
Vert	405.002	QP	40.0	17.4	10.6	32.0	36.0	46.0	10.0	
Vert	432.001	QP	41.4	17.6	10.8	32.0	37.8	46.0	8.2	
Vert	540.606	QP	36.7	18.6	11.5	32.1	34.7	46.0	11.3	
Vert	576.002	QP	34.7	19.0	11.7	32.1	33.3	46.0	12.7	
Vert	810.921	QP	29.6	21.9	12.9	31.5	32.9	46.0	13.1	
Vert	2483.500	PK	58.3	28.4	2.3	32.3	56.7	73.9	17.2	
Vert	4924.000	PK	41.3	30.7	4.7	31.4	45.3	73.9	28.6	
Vert	7386.000	PK	42.1	36.1	5.6	32.4	51.4	73.9	22.5	
Vert	9848.000	PK	42.1	39.6	6.4	33.1	55.0	73.9	18.9	
Vert	2483.500	AV	48.9	28.4	2.3	32.3	47.3	53.9	6.6	
Vert	4924.000	AV	33.6	30.7	4.7	31.4	37.6	53.9	16.3	
Vert	7386.000	AV	33.6	36.1	5.6	32.4	42.9	53.9	11.0	
Vert	9848.000	AV	33.7	39.6	6.4	33.1	46.6	53.9	7.3	

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

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

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

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Head Office EMC Lab.

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

Telephone : +81 596 24 8999

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10014382H
Date 06/14/2013 06/15/2013 06/23/2013
Temperature/ Humidity 23 deg. C / 63% RH 24 deg. C / 60% RH 24 deg. C / 63% RH
Engineer Takayuki Shimada Takayuki Shimada Takumi Shimada
(1-10GHz) (Above 1GHz) (Below 1GHz)
Mode 11b Tx 2437MHz Antenna 1

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	107.988	QP	38.1	11.3	8.1	32.1	25.4	43.5	18.1	
Hori	405.003	QP	36.1	17.4	10.6	32.0	32.1	46.0	13.9	
Hori	432.001	QP	40.1	17.6	10.8	32.0	36.5	46.0	9.5	
Hori	540.605	QP	31.6	18.6	11.5	32.1	29.6	46.0	16.4	
Hori	576.002	QP	36.9	19.0	11.7	32.1	35.5	46.0	10.5	
Hori	810.921	QP	32.1	21.9	12.9	31.5	35.4	46.0	10.6	
Hori	4874.000	PK	42.7	30.6	4.7	31.4	46.6	73.9	27.3	
Hori	7311.000	PK	43.0	35.9	5.6	32.4	52.1	73.9	21.8	
Hori	9748.000	PK	43.2	39.4	6.4	33.0	56.0	73.9	17.9	
Hori	4874.000	AV	36.4	30.6	4.7	31.4	40.3	53.9	13.6	
Hori	7311.000	AV	33.6	35.9	5.6	32.4	42.7	53.9	11.2	
Hori	9748.000	AV	33.7	39.4	6.4	33.0	46.5	53.9	7.4	
Vert	106.612	QP	45.8	11.1	8.1	32.1	32.9	43.5	10.6	
Vert	405.002	QP	40.0	17.4	10.6	32.0	36.0	46.0	10.0	
Vert	432.002	QP	41.2	17.6	10.8	32.0	37.6	46.0	8.4	
Vert	540.607	QP	36.7	18.6	11.5	32.1	34.7	46.0	11.3	
Vert	576.002	QP	33.8	19.0	11.7	32.1	32.4	46.0	13.6	
Vert	810.922	QP	29.5	21.9	12.9	31.5	32.8	46.0	13.2	
Vert	4874.000	PK	45.2	30.6	4.7	31.4	49.1	73.9	24.8	
Vert	7311.000	PK	43.0	35.9	5.6	32.4	52.1	73.9	21.8	
Vert	9748.000	PK	43.3	39.4	6.4	33.0	56.1	73.9	17.8	
Vert	4874.000	AV	39.3	30.6	4.7	31.4	43.2	53.9	10.7	
Vert	7311.000	AV	33.6	35.9	5.6	32.4	42.7	53.9	11.2	
Vert	9748.000	AV	33.8	39.4	6.4	33.0	46.6	53.9	7.3	

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

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

Distance factor: 10GHz-26.5GHz $20\log(3.0m/1.0m) = 9.5dB$

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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10014382H
Date 06/14/2013 06/15/2013 06/23/2013
Temperature/ Humidity 23 deg. C / 63% RH 24 deg. C / 60% RH 24 deg. C / 63% RH
Engineer Takayuki Shimada Takayuki Shimada Takumi Shimada
(1-10GHz) (Above 1GHz) (Below 1GHz)
Mode 11b Tx 2462MHz Antenna 1

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	107.989	QP	37.8	11.3	8.1	32.1	25.1	43.5	18.4	
Hori	405.002	QP	35.9	17.4	10.6	32.0	31.9	46.0	14.1	
Hori	432.001	QP	40.2	17.6	10.8	32.0	36.6	46.0	9.4	
Hori	540.605	QP	31.3	18.6	11.5	32.1	29.3	46.0	16.7	
Hori	576.010	QP	37.2	19.0	11.7	32.1	35.8	46.0	10.2	
Hori	810.901	QP	32.1	21.9	12.9	31.5	35.4	46.0	10.6	
Hori	2483.500	PK	49.9	28.4	2.3	32.3	48.3	73.9	25.6	
Hori	4924.000	PK	43.6	30.7	4.7	31.4	47.6	73.9	26.3	
Hori	7386.000	PK	43.1	36.1	5.6	32.4	52.4	73.9	21.5	
Hori	9848.000	PK	42.5	39.6	6.4	33.1	55.4	73.9	18.5	
Hori	2483.500	AV	40.4	28.4	2.3	32.3	38.8	53.9	15.1	
Hori	4924.000	AV	36.3	30.7	4.7	31.4	40.3	53.9	13.6	
Hori	7386.000	AV	33.9	36.1	5.6	32.4	43.2	53.9	10.7	
Hori	9848.000	AV	33.8	39.6	6.4	33.1	46.7	53.9	7.2	
Vert	106.616	QP	45.6	11.1	8.1	32.1	32.7	43.5	10.8	
Vert	405.002	QP	40.1	17.4	10.6	32.0	36.1	46.0	9.9	
Vert	432.001	QP	41.5	17.6	10.8	32.0	37.9	46.0	8.1	
Vert	540.602	QP	36.8	18.6	11.5	32.1	34.8	46.0	11.2	
Vert	576.005	QP	34.1	19.0	11.7	32.1	32.7	46.0	13.3	
Vert	810.907	QP	29.5	21.9	12.9	31.5	32.8	46.0	13.2	
Vert	2483.500	PK	53.0	28.4	2.3	32.3	51.4	73.9	22.5	
Vert	4924.000	PK	43.7	30.7	4.7	31.4	47.7	73.9	26.2	
Vert	7386.000	PK	43.0	36.1	5.6	32.4	52.3	73.9	21.6	
Vert	9848.000	PK	42.7	39.6	6.4	33.1	55.6	73.9	18.3	
Vert	2483.500	AV	43.4	28.4	2.3	32.3	41.8	53.9	12.1	
Vert	4924.000	AV	37.6	30.7	4.7	31.4	41.6	53.9	12.3	
Vert	7386.000	AV	33.9	36.1	5.6	32.4	43.2	53.9	10.7	
Vert	9848.000	AV	33.8	39.6	6.4	33.1	46.7	53.9	7.2	

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

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

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

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Head Office EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10014382H
Date 06/14/2013 06/15/2013 06/23/2013
Temperature/ Humidity 23 deg. C / 63% RH 24 deg. C / 60% RH 24 deg. C / 63% RH
Engineer Takayuki Shimada Takayuki Shimada Takumi Shimada
(1-10GHz) (Above 1GHz) (Below 1GHz)
Mode 1g Tx 2412MHz Antenna 1

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	107.986	QP	37.5	11.3	8.1	32.1	24.8	43.5	18.7	
Hori	405.001	QP	36.1	17.4	10.6	32.0	32.1	46.0	13.9	
Hori	432.002	QP	40.1	17.6	10.8	32.0	36.5	46.0	9.5	
Hori	540.601	QP	31.4	18.6	11.5	32.1	29.4	46.0	16.6	
Hori	576.010	QP	37.6	19.0	11.7	32.1	36.2	46.0	9.8	
Hori	810.901	QP	32.5	21.9	12.9	31.5	35.8	46.0	10.2	
Hori	2390.000	PK	56.8	28.2	2.3	32.4	54.9	73.9	19.0	
Hori	4824.000	PK	42.2	30.5	4.8	31.4	46.1	73.9	27.8	
Hori	7236.000	PK	42.8	35.8	5.6	32.3	51.9	73.9	22.0	
Hori	9648.000	PK	42.7	39.1	6.4	33.0	55.2	73.9	18.7	
Hori	2390.000	AV	45.8	28.2	2.3	32.4	43.9	53.9	10.0	
Hori	4824.000	AV	33.0	30.5	4.8	31.4	36.9	53.9	17.0	
Hori	7236.000	AV	33.6	35.8	5.6	32.3	42.7	53.9	11.2	
Hori	9648.000	AV	33.8	39.1	6.4	33.0	46.3	53.9	7.6	
Vert	106.621	QP	45.4	11.1	8.1	32.1	32.5	43.5	11.0	
Vert	405.002	QP	40.2	17.4	10.6	32.0	36.2	46.0	9.8	
Vert	432.003	QP	41.5	17.6	10.8	32.0	37.9	46.0	8.1	
Vert	540.602	QP	36.6	18.6	11.5	32.1	34.6	46.0	11.4	
Vert	576.091	QP	34.2	19.0	11.7	32.1	32.8	46.0	13.2	
Vert	810.911	QP	29.5	21.9	12.9	31.5	32.8	46.0	13.2	
Vert	2390.000	PK	60.2	28.2	2.3	32.4	58.3	73.9	15.6	
Vert	4824.000	PK	43.5	30.5	4.8	31.4	47.4	73.9	26.5	
Vert	7236.000	PK	42.7	35.8	5.6	32.3	51.8	73.9	22.1	
Vert	9648.000	PK	42.8	39.1	6.4	33.0	55.3	73.9	18.6	
Vert	2390.000	AV	49.7	28.2	2.3	32.4	47.8	53.9	6.1	
Vert	4824.000	AV	34.9	30.5	4.8	31.4	38.8	53.9	15.1	
Vert	7236.000	AV	33.6	35.8	5.6	32.3	42.7	53.9	11.2	
Vert	9648.000	AV	33.9	39.1	6.4	33.0	46.4	53.9	7.5	

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

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

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

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	95.7	28.2	2.3	32.4	93.8	-	-	Carrier
Hori	2400.000	PK	62.2	28.2	2.3	32.4	60.3	73.8	13.5	
Vert	2412.000	PK	99.4	28.2	2.3	32.4	97.5	-	-	Carrier
Vert	2400.000	PK	65.3	28.2	2.3	32.4	63.4	77.5	14.1	

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

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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10014382H
Date 06/14/2013 06/15/2013 06/23/2013
Temperature/ Humidity 23 deg. C / 63% RH 24 deg. C / 60% RH 24 deg. C / 63% RH
Engineer Takayuki Shimada Takayuki Shimada Takumi Shimada
(1-10GHz) (Above 1GHz) (Below 1GHz)
Mode 11g Tx 2437MHz Antenna 1

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	107.988	QP	37.1	11.3	8.1	32.1	24.4	43.5	19.1	
Hori	405.002	QP	35.9	17.4	10.6	32.0	31.9	46.0	14.1	
Hori	432.001	QP	39.9	17.6	10.8	32.0	36.3	46.0	9.7	
Hori	540.601	QP	31.2	18.6	11.5	32.1	29.2	46.0	16.8	
Hori	576.009	QP	37.5	19.0	11.7	32.1	36.1	46.0	9.9	
Hori	810.901	QP	32.7	21.9	12.9	31.5	36.0	46.0	10.0	
Hori	4874.000	PK	41.8	30.6	4.7	31.4	45.7	73.9	28.2	
Hori	7311.000	PK	43.1	35.9	5.6	32.4	52.2	73.9	21.7	
Hori	9748.000	PK	43.1	39.4	6.4	33.0	55.9	73.9	18.0	
Hori	4874.000	AV	33.5	30.6	4.7	31.4	37.4	53.9	16.5	
Hori	7311.000	AV	33.6	35.9	5.6	32.4	42.7	53.9	11.2	
Hori	9748.000	AV	33.8	39.4	6.4	33.0	46.6	53.9	7.3	
Vert	106.635	QP	45.2	11.1	8.1	32.1	32.3	43.5	11.2	
Vert	405.001	QP	39.8	17.4	10.6	32.0	35.8	46.0	10.2	
Vert	432.003	QP	41.6	17.6	10.8	32.0	38.0	46.0	8.0	
Vert	540.601	QP	36.4	18.6	11.5	32.1	34.4	46.0	11.6	
Vert	576.009	QP	34.2	19.0	11.7	32.1	32.8	46.0	13.2	
Vert	810.902	QP	29.4	21.9	12.9	31.5	32.7	46.0	13.3	
Vert	4874.000	PK	41.8	30.6	4.7	31.4	45.7	73.9	28.2	
Vert	7311.000	PK	42.9	35.9	5.6	32.4	52.0	73.9	21.9	
Vert	9748.000	PK	43.4	39.4	6.4	33.0	56.2	73.9	17.7	
Vert	4874.000	AV	33.8	30.6	4.7	31.4	37.7	53.9	16.2	
Vert	7311.000	AV	33.6	35.9	5.6	32.4	42.7	53.9	11.2	
Vert	9748.000	AV	33.8	39.4	6.4	33.0	46.6	53.9	7.3	

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

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

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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 10014382H
Date 06/14/2013 06/15/2013 06/23/2013
Temperature/ Humidity 23 deg. C / 63% RH 24 deg. C / 60% RH 24 deg. C / 63% RH
Engineer Takayuki Shimada Takayuki Shimada Takumi Shimada
(1-10GHz) (Above 1GHz) (Below 1GHz)
Mode 11g Tx 2462MHz Antenna 1

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	107.997	QP	38.0	11.3	8.1	32.1	25.3	43.5	18.2	
Hori	405.000	QP	36.3	17.4	10.6	32.0	32.3	46.0	13.7	
Hori	432.001	QP	39.9	17.6	10.8	32.0	36.3	46.0	9.7	
Hori	540.601	QP	31.7	18.6	11.5	32.1	29.7	46.0	16.3	
Hori	576.034	QP	37.3	19.0	11.7	32.1	35.9	46.0	10.1	
Hori	810.910	QP	32.3	21.9	12.9	31.5	35.6	46.0	10.4	
Hori	2483.500	PK	54.0	28.4	2.3	32.3	52.4	73.9	21.5	
Hori	4924.000	PK	41.2	30.7	4.7	31.4	45.2	73.9	28.7	
Hori	7386.000	PK	43.1	36.1	5.6	32.4	52.4	73.9	21.5	
Hori	9848.000	PK	42.5	39.6	6.4	33.1	55.4	73.9	18.5	
Hori	2483.500	AV	44.2	28.4	2.3	32.3	42.6	53.9	11.3	
Hori	4924.000	AV	33.3	30.7	4.7	31.4	37.3	53.9	16.6	
Hori	7386.000	AV	33.9	36.1	5.6	32.4	43.2	53.9	10.7	
Hori	9848.000	AV	33.8	39.6	6.4	33.1	46.7	53.9	7.2	
Vert	106.655	QP	45.7	11.1	8.1	32.1	32.8	43.5	10.7	
Vert	405.001	QP	40.3	17.4	10.6	32.0	36.3	46.0	9.7	
Vert	432.003	QP	41.7	17.6	10.8	32.0	38.1	46.0	7.9	
Vert	540.600	QP	36.5	18.6	11.5	32.1	34.5	46.0	11.5	
Vert	576.009	QP	34.5	19.0	11.7	32.1	33.1	46.0	12.9	
Vert	810.903	QP	29.7	21.9	12.9	31.5	33.0	46.0	13.0	
Vert	2483.500	PK	57.6	28.4	2.3	32.3	56.0	73.9	17.9	
Vert	4924.000	PK	41.8	30.7	4.7	31.4	45.8	73.9	28.1	
Vert	7386.000	PK	43.1	36.1	5.6	32.4	52.4	73.9	21.5	
Vert	9848.000	PK	42.6	39.6	6.4	33.1	55.5	73.9	18.4	
Vert	2483.500	AV	47.4	28.4	2.3	32.3	45.8	53.9	8.1	
Vert	4924.000	AV	34.0	30.7	4.7	31.4	38.0	53.9	15.9	
Vert	7386.000	AV	33.9	36.1	5.6	32.4	43.2	53.9	10.7	
Vert	9848.000	AV	33.8	39.6	6.4	33.1	46.7	53.9	7.2	

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

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

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

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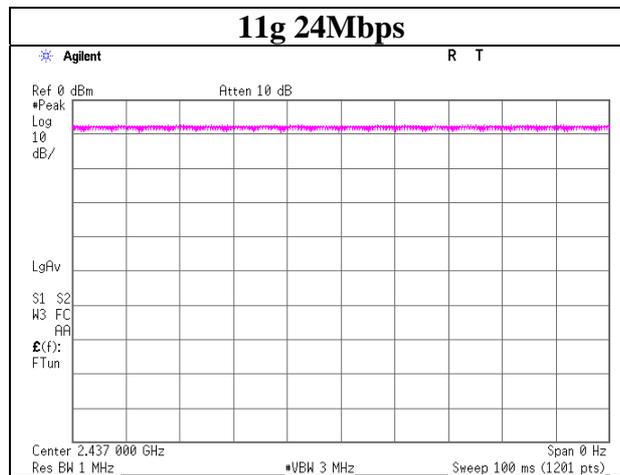
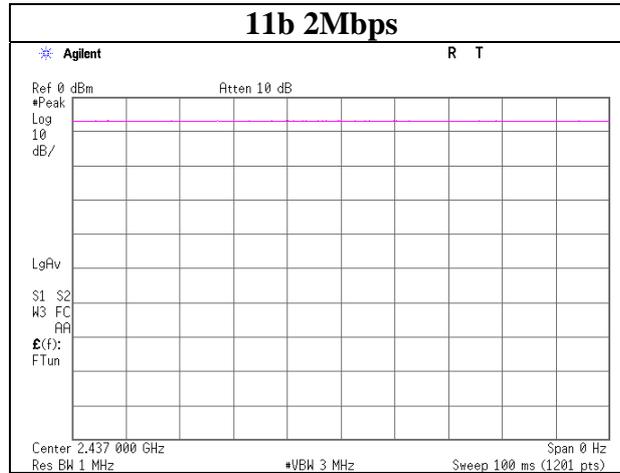
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Telephone : +81 596 24 8999

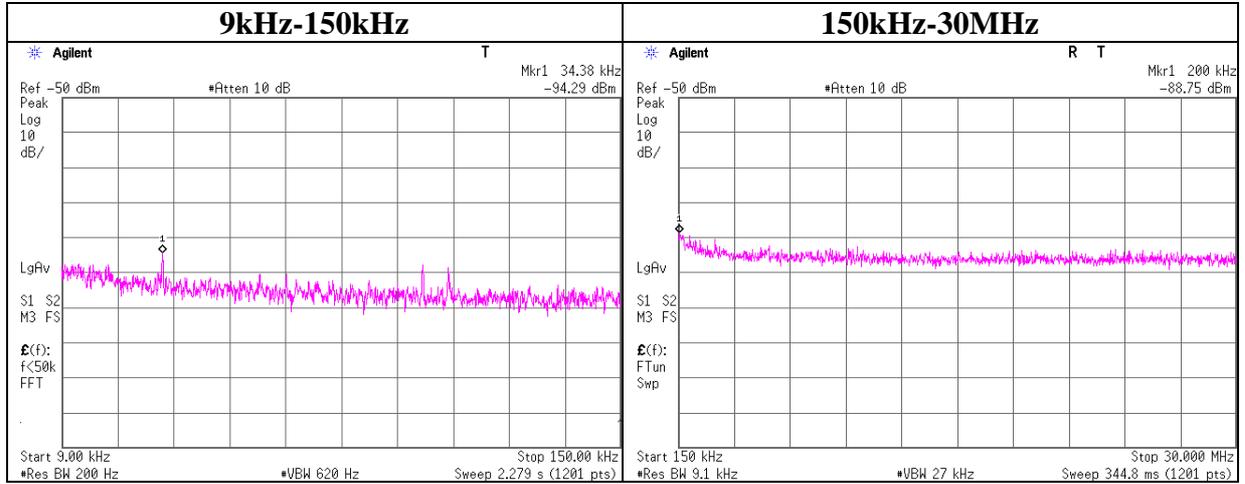
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Burst rate confirmation



Conducted Spurious Emission

11b Tx 2412MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]
34.38	-94.3	0.80	9.87	1.5	-82.1	300.0	6.0	-20.9	36.9
200	-88.8	0.81	9.83	1.5	-76.6	300.0	6.0	-15.4	21.6

$E = \text{EIRP} - 20 \log(D) + \text{Ground bounce} + 104.8 [\text{dBuV/m}]$
 $\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain}$

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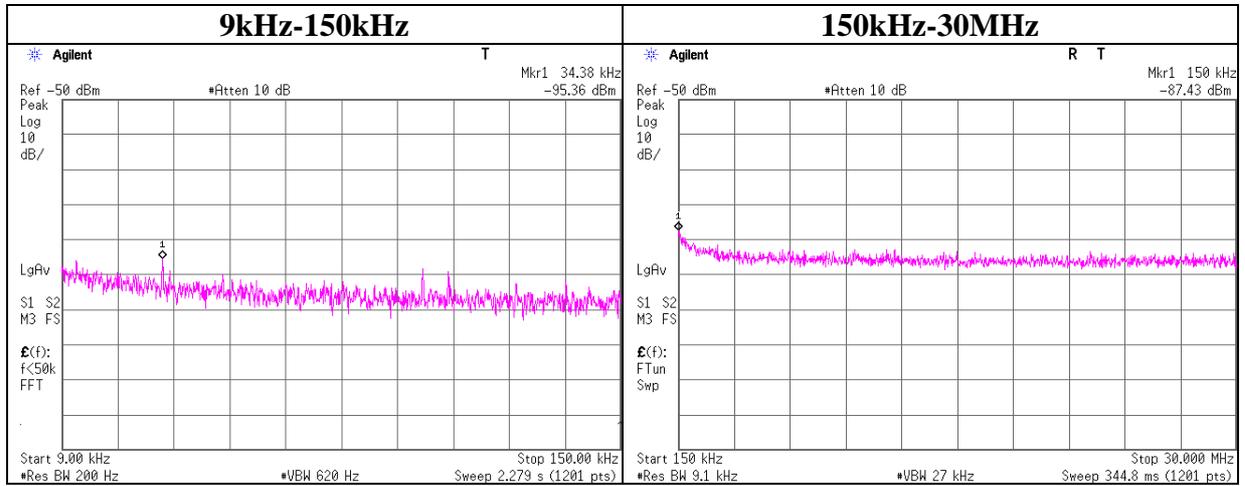
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Facsimile : +81 596 24 8124

Conducted Spurious Emission

11b Tx 2437MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]
34.38	-95.4	0.80	9.87	1.5	-83.2	300.0	6.0	-21.9	36.9
150	-87.4	0.81	9.83	1.5	-75.3	300.0	6.0	-14.0	24.1

$E = \text{EIRP} - 20 \log(D) + \text{Ground bounce} + 104.8$ [dBuV/m]
 $\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain}$

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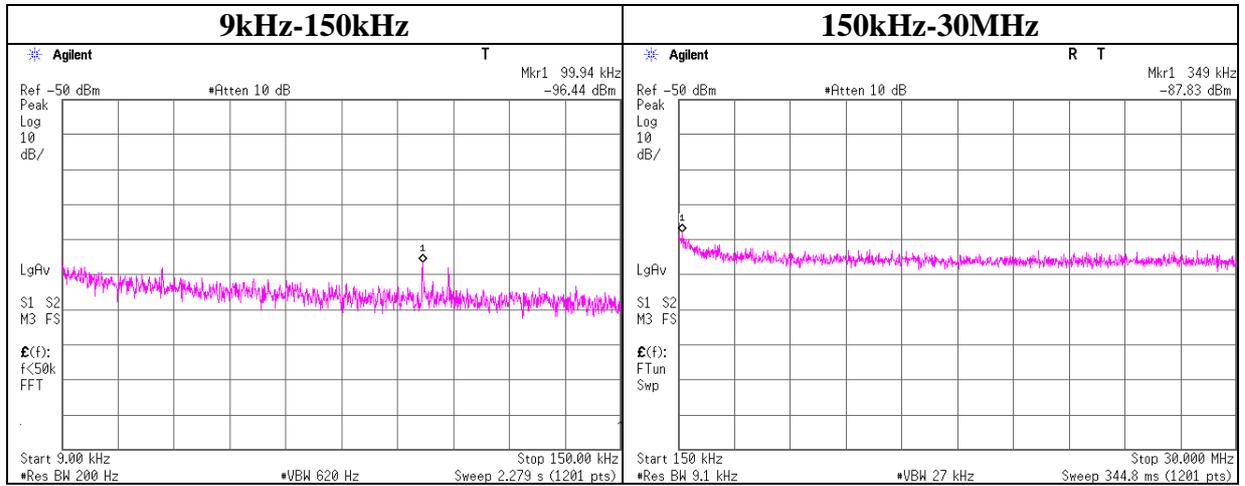
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Conducted Spurious Emission

11b Tx 2462MHz

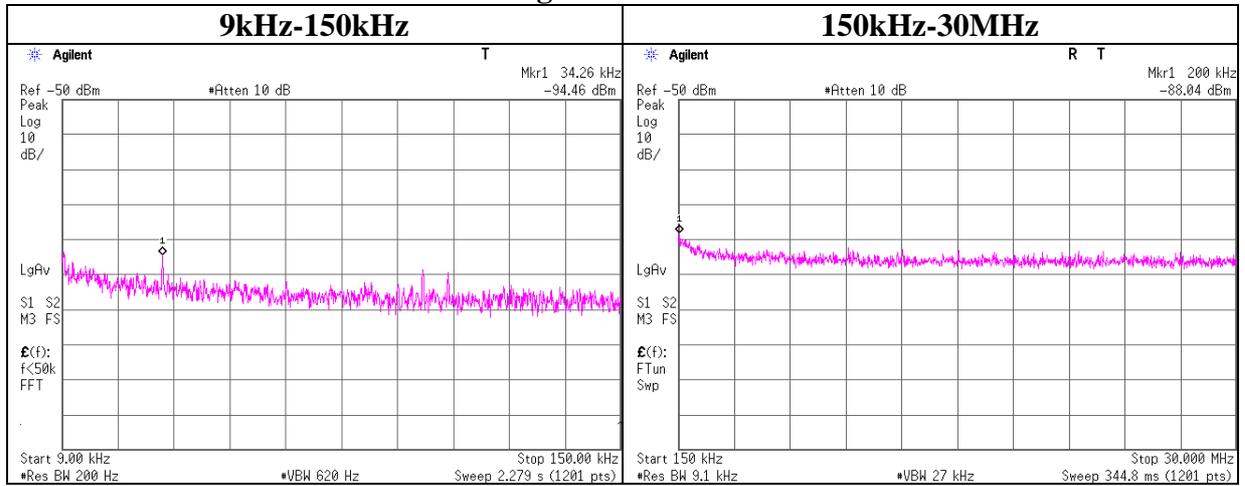


Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]
99.94	-96.4	0.80	9.87	1.5	-84.3	300.0	6.0	-23.0	27.6
349	-87.8	0.81	9.83	1.5	-75.7	300.0	6.0	-14.4	16.7

$E = \text{EIRP} - 20 \log(D) + \text{Ground bounce} + 104.8 [\text{dBuV/m}]$
 $\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain}$

Conducted Spurious Emission

11g Tx 2412MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]
34.26	-94.5	0.80	9.87	1.5	-82.3	300.0	6.0	-21.0	36.9
200	-88.0	0.81	9.83	1.5	-75.9	300.0	6.0	-14.6	21.6

$E = \text{EIRP} - 20 \log(D) + \text{Ground bounce} + 104.8 [\text{dBuV/m}]$
 $\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain}$

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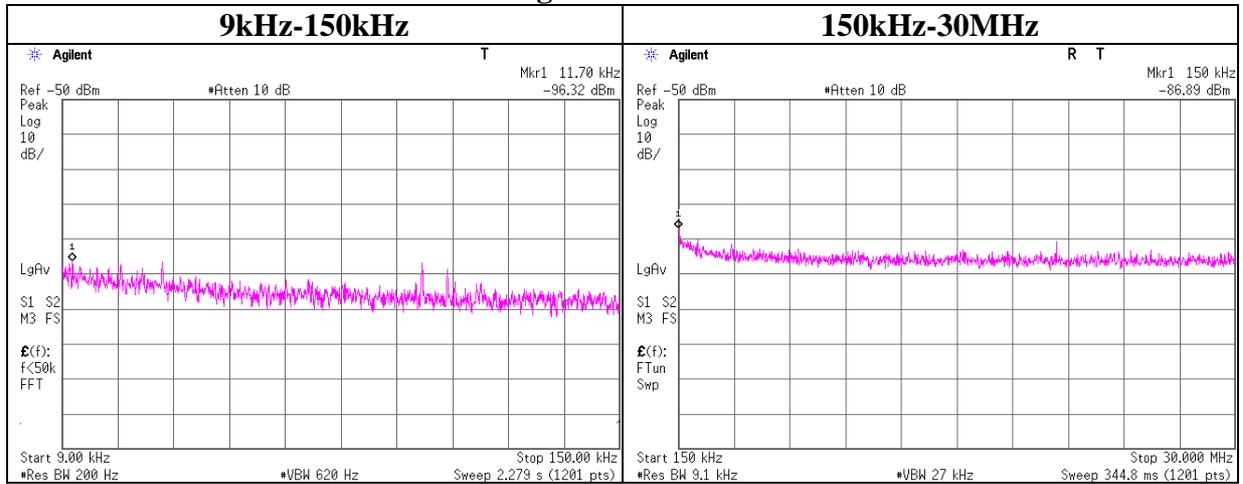
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Conducted Spurious Emission

11g Tx 2437MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]
11.70	-96.3	0.80	9.87	1.5	-84.2	300.0	6.0	-22.9	46.2
150	-86.9	0.81	9.83	1.5	-74.8	300.0	6.0	-13.5	24.1

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

$\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain}$

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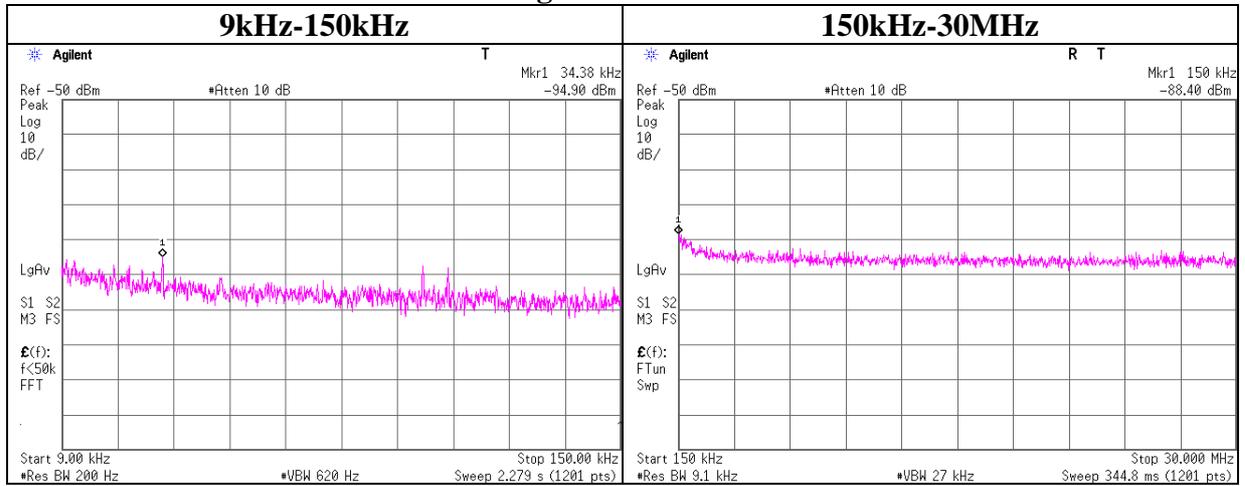
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Conducted Spurious Emission

11g Tx 2462MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dBi]	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]
34.38	-94.9	0.80	9.87	1.5	-82.7	300.0	6.0	-21.5	36.9
150	-88.4	0.81	9.83	1.5	-76.3	300.0	6.0	-15.0	24.1

$E = \text{EIRP} - 20 \log(D) + \text{Ground bounce} + 104.8$ [dBuV/m]
 $\text{EIRP} = \text{Reading} + \text{Cable Loss} + \text{Attenuator} + \text{Antenna Gain}$

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Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Power Density

Test place Head Office EMC Lab. No.11 Measurement Room
Report No. 10014382H
Date 06/11/2013
Temperature/ Humidity 23 deg. C / 52% RH
Engineer Takayuki Shimada
Mode Tx

11b Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.00	-23.46	2.06	10.07	-11.33	8.00	19.33
2437.00	-22.83	2.07	10.07	-10.69	8.00	18.69
2462.00	-22.96	2.07	10.07	-10.82	8.00	18.82

11g Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.00	-25.97	2.06	10.07	-13.84	8.00	21.84
2437.00	-27.13	2.07	10.07	-14.99	8.00	22.99
2462.00	-27.71	2.07	10.07	-15.57	8.00	23.57

Sample Calculation:

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

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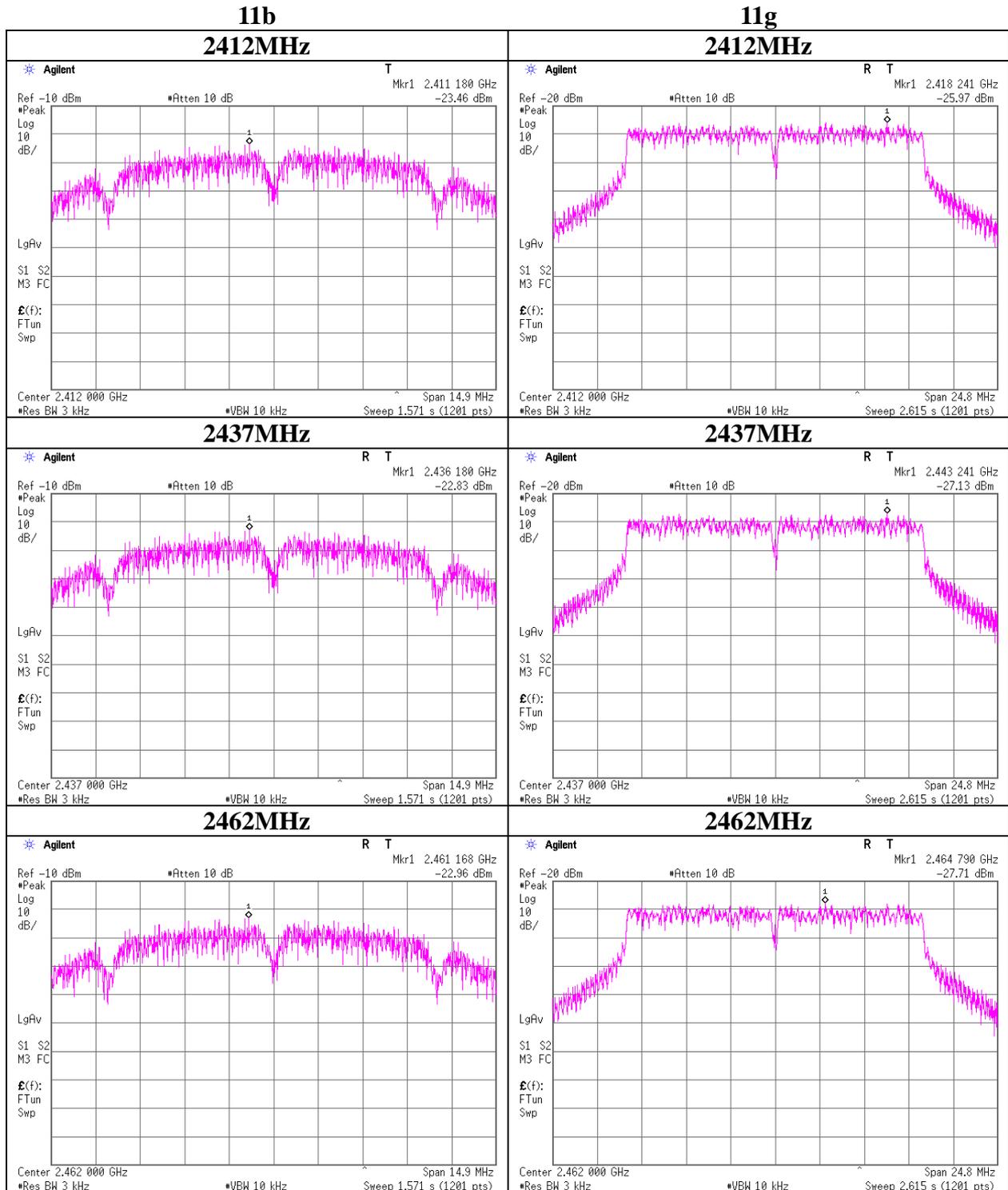
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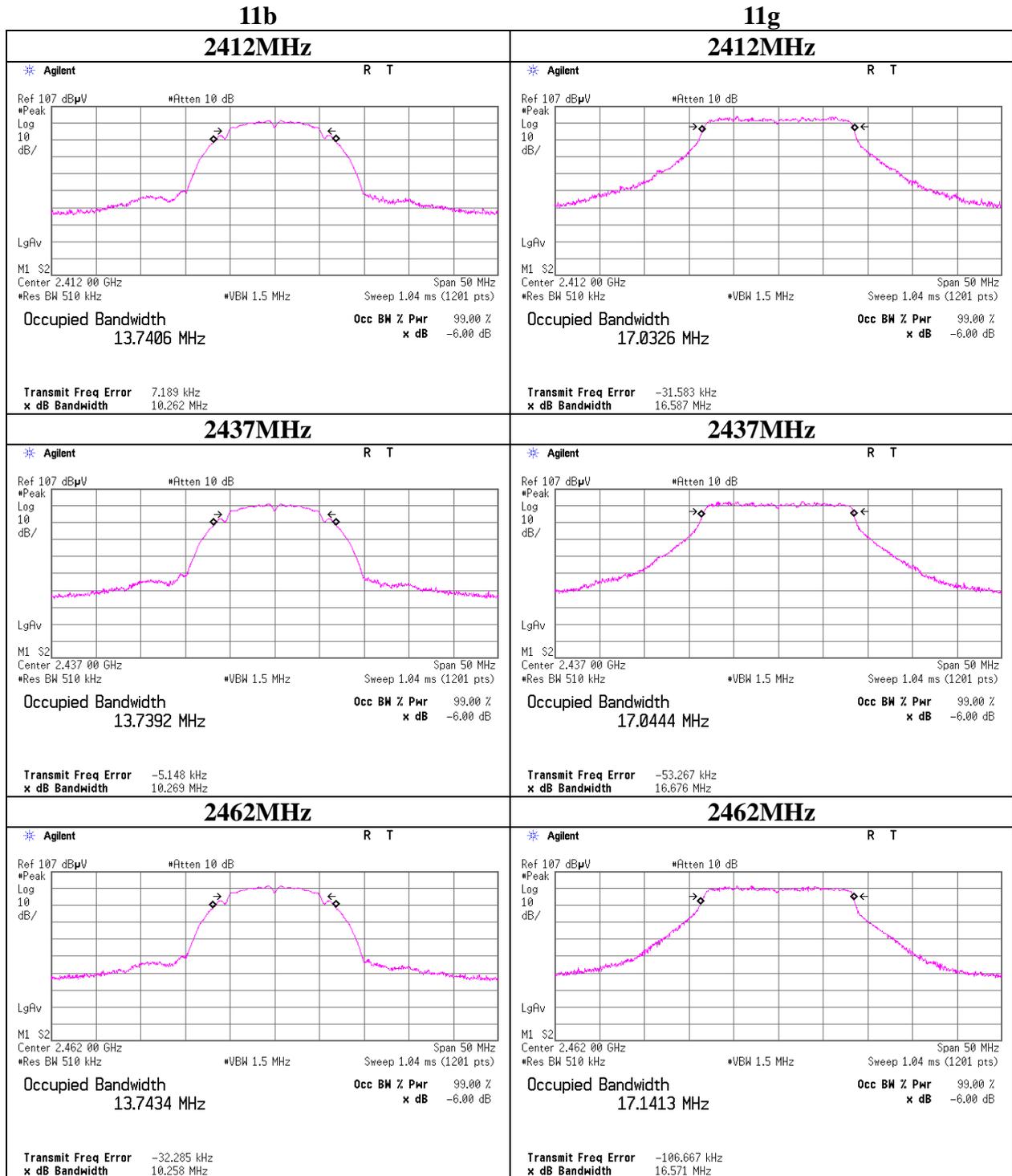
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Power Density



99% Occupied Bandwidth



APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2012/12/25 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	AT	2013/04/03 * 12
MPM-09	Power Meter	Anritsu	ML2495A	6K00003348	AT	2012/10/08 * 12
MPSE-12	Power sensor	Anritsu	MA2411B	011598	AT	2012/10/08 * 12
MFC-01	Microwave Counter	Advantest	R5373	120100309	AT	2012/08/16 * 12
MCC-138	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37953/2	AT	2012/10/17 * 12
MAT-20	Attenuator(10dB)(above 1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	AT	2013/01/09 * 12
MCC-64	Coaxial Cable	UL Japan	-	-	AT	2013/03/22 * 12
MAT-10	Attenuator(10dB)	Weinschel Corp	2	BL1173	AT	2012/11/06 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE/CE	2013/02/28 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE/CE	2013/02/26 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE/CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2012/11/20 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2013/05/17 * 12
MCC-133	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336164/4(1m) / 340640(5m)	RE	2012/09/05 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2013/03/12 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170306	RE	2013/05/17 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE/CE	2012/08/23 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2012/10/08 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2012/10/08 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2012/07/12 * 12
MAT-70	Attenuator(6dB)	Agilent	8491A-006	MY52460153	RE	2013/04/05 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2013/03/12 * 12
MSA-05	Spectrum Analyzer	Advantest	R3273	160400285	CE	2012/11/21 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE (EUT)	2013/01/07 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	8127364	CE (AE)	2013/01/07 * 12
MTA-31	Terminator	TME	CT-01	-	CE	2013/01/21 * 12
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/SFM141(3m)/sucoform141-PE(1m)/421-010(1.5m)/RFM-E321(Switcher)	-/00640	CE	2012/07/12 * 12
MAT-66	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2013/01/22 * 12

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The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

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

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