RADIO TEST REPORT

Test Report No.: 10499187S-G

Applicant	:	**MITSUMI ELECTRIC CO., LTD.**
Type of Equipment	:	**Wireless LAN + BT/BLE Module**
Model No.	:	**DWM-W314**
FCC ID	:	**EW4DWMW314**
Test regulation	:	**FCC Part15 Subpart C: 2014**
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 limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
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6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.

Date of test: October 13 to 30, 2014

Representative test engineer:

S. Takano

Shinichi Takano
Engineer
Consumer Technology Division

Approved by :

T. Imamura

Toyokazu Imamura
Leader
Consumer Technology Division

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☒ There is no testing item of "Non-accreditation".

RTL02610

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REVISION HISTORY

Original Test Report No.: 10499187S-G

Revision	Test report No.	Date	Page revised	Contents
-(Original)	10499187S-G	November 19, 2014	-	-
1	10499187S-G	November 21, 2014	4 8	Correction of Equipment type description Correction of Power setting description
2	10499187S-G	November 26, 2014	8 27,29,31,33, 35,37,39	Correction of Power setting description Correction of duty factor description

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SECTION 1: Customer information

Company Name	:	MITSUMI ELECTRIC CO., LTD.
Address	:	2-11-2, Tsurumaki, Tama-shi, Tokyo, 206-8567 JAPAN
Telephone Number	:	+81-42-310-5801
Facsimile Number	:	+81-42-310-5598
Contact Person	:	Yuki Takakura

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

2.1 Identification of E.U.T.

Type of equipment	:	Wireless LAN + BT/BLE Module
Model No.	:	DWM-W314
Serial No.	:	Refer to 4.2 in this report.
Rating	:	DC3.3V
Country of Mass-production	:	Philippines
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.
Receipt Date of Sample	:	September 26, 2014

2.2 Product description

Model: DWM-W314 (referred to as the EUT in this report) is Wireless LAN + BT/BLE Module.

Clock frequency(ies) in the system	:	32.768kHz, 26MHz
Antenna type	:	Monopole type chip antenna
Antenna gain	:	-9.2dBi
Antenna connector type	:	None (It exist the connector for only the tests of shipment.)
Operation temperature range	:	-20 to +70 deg.C

<Bluetooth part>

Equipment type	:	Transceiver
Frequency of operation	:	2402-2480MHz
Bandwidth / channel spacing	:	79MHz / 1MHz (BDR/EDR) & 2MHz (Low Energy)
Type of modulation	:	FHSS (GFSK, π/4-DQPSK, 8DPSK), DSSS (GFSK)
ITU code	:	F1D, G1D

<Wireless LAN part>

Equipment type	:	Transceiver
Frequency of operation	:	2412-2462MHz
Bandwidth / channel spacing	:	20MHz / 5MHz
Type of modulation	:	DSSS, OFDM
ITU code	:	D1D, G1D

* For Bluetooth BDR/EDR part, refer to the test report: 10499187S-H.

FCC 15.31 (e) / 212
The Wireless LAN + BT/BLE Module has its own regulator.
The module is constantly provided voltage (DC1.8V) through the regulator regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC 15.203 / 212
It is impossible for end users to replace the antenna, because it is soldered on the circuit board.
Therefore the equipment complies with the requirement of 15.203/212.

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2014, final revised on August 15, 2014 and effective October 14, 2014
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.209 Radiated emission limits, general requirements
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz

* The revision on August 15, 2014 does not affect the test specification applied to the EUT.

3.2 Procedures & Results

Item	Test Procedure *1)	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.10:2009	FCC 15.207	-	N/A	20.6dB Freq.: 0.43708MHz Detection: Quasi-Peak Phase: L1 Mode: Tx 11g 2412MHz	Complied
6dB bandwidth	ANSI C63.10:2009	FCC 15.247 (a)(2)	Conducted	N/A	* See data	Complied
Maximum peak output power	ANSI C63.10:2009	FCC 15.247 (b)(3)	Conducted	N/A		Complied
Out of band emission & Restricted band edges	ANSI C63.10:2009	FCC 15.109, 15.247 (d) & 15.209	Conducted / Radiated	N/A	0.5 dB Freq.: 7320.000 MHz Polarization: Vertical Detection: Average Mode: Tx, Bluetooth Low Energy 2440 MHz	Complied
Power density	ANSI C63.10:2009	FCC 15.247 (e)	Conducted	N/A	* See data	Complied
Note: UL Japan's EMI Work Procedures No.13-EM-W0420 and 13-EM-W0422. *1) These tests were also referred to KDB 558074 v03 r02 (FCC), "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".						

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied Bandwidth (99%)	ANSI C63.10:2009, RSS-Gen 4.6.1	-	Conducted	-	-
Note: UL Japan's Work Procedures No. 13-EM-W0420 and 13-EM-W0422					

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

3.4 Uncertainty

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

Item	Frequency range	No.1 SAC*1/SR*2 (±)	No.2 SAC/SR (±)	No.3 SAC/SR (±)
Conducted emission (AC Mains) LISN	150kHz-30MHz	3.6 dB	3.4 dB	3.4 dB
Radiated emission (Measurement distance: 3m)	9kHz-30MHz	3.7 dB	3.5 dB	3.5 dB
	30MHz-300MHz	4.9 dB	4.9 dB	4.7 dB
	300MHz-1GHz	5.0 dB	5.0 dB	4.8 dB
	1GHz-15GHz	4.9 dB	4.9 dB	4.9 dB
Radiated emission (Measurement distance: 1m)	15GHz-18GHz	5.7 dB	5.7 dB	5.7 dB
	18GHz-40GHz	4.5 dB	4.3 dB	4.3 dB

*1: SAC=Semi-Anechoic Chamber
*2: SR= Shielded Room is applied besides radiated emission

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.

Antenna port conducted test

Power measurement uncertainty above 1GHz for this test was: (±) 0.68dB
Spurious emission (Conducted) measurement (below 1GHz) uncertainty for this test was: (±) 1.5dB
Spurious emission (Conducted) measurement (1G-3GHz) uncertainty for this test was: (±) 1.7dB
Spurious emission (Conducted) measurement (3G-18GHz) uncertainty for this test was: (±) 2.4dB
Spurious emission (Conducted) measurement (18G-26.5GHz) uncertainty for this test was: (±) 2.5dB
Bandwidth Measurement uncertainty for this test was: (±) 0.66%

3.5 Test location

UL Japan, Inc. Shonan EMC Lab.
1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN
Telephone number : +81 463 50 6400
Facsimile number : +81 463 50 6401
JAB Accreditation No. : RTL02610

	IC Registration No.	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
☐ No.1 Semi-anechoic chamber	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☒ No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☒ No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
☐ No.4 Semi-anechoic chamber	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
☒ No.1 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
☐ No.2 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
☐ No.3 Shielded room	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
☐ No.4 Shielded room	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
☐ No.5 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
☒ No.6 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
☐ No.7 Shielded room	-	2.76 x 3.76 x 2.4	2.76 x 3.76	-
☐ No.8 Shielded room	-	3.45 x 5.5 x 2.4	3.45 x 5.5	-
☒ No.1 Measurement room	-	2.55 x 4.1 x 2.5	2.55 x 4.1	-

3.6 Test setup, Test data & Test instruments

Refer to APPENDIX 1 to 3.

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

4.1 Operating mode

Test item	Mode	Tested frequency	Worst data mode *1)	Power setting [dBm] *3)
Conducted emission Radiated emission (below 1GHz)	Transmitting(Tx) IEEE 802.11g *2)	2412MHz *2)	PN9, 2Mbps	12
	Transmitting(Tx) Hopping OFF Low Energy(LE), Payload: PRBS9	2402MHz, 2440MHz, 2480MHz	-	Fixed
Radaited emission (Spurious emission) (Above 1GHz)	Transmitting(Tx) IEEE 802.11b	2412MHz, 2437MHz, 2462MHz	PN9, 2Mbps	12
	Transmitting(Tx) IEEE 802.11g	2412MHz, 2437MHz, 2462MHz	PN9, 48Mbps	12
	Transmitting(Tx) IEEE 802.11n HT20	2412MHz, 2437MHz, 2462MHz	PN9, MCS5	12
	Transmitting(Tx) Hopping OFF Low Energy(LE), Payload: PRBS9	2402MHz, 2440MHz, 2480MHz	-	Fixed
Other items	Transmitting(Tx) IEEE 802.11b	2412MHz, 2437MHz, 2462MHz	PN9, 2Mbps	4, 12
	Transmitting(Tx) IEEE 802.11g	2412MHz, 2437MHz, 2462MHz	PN9, 48Mbps	4, 12
	Transmitting(Tx) IEEE 802.11n HT20	2412MHz, 2437MHz, 2462MHz	PN9, MCS5	4, 12
	Transmitting(Tx) Hopping OFF Low Energy(LE), Payload: PRBS9	2402MHz, 2440MHz, 2480MHz	-	Fixed

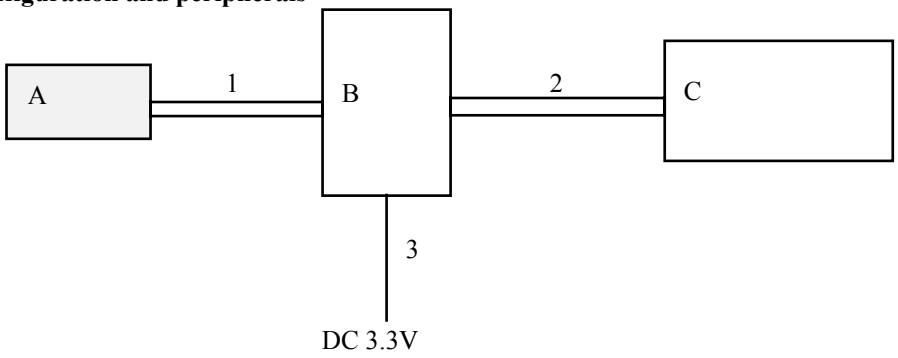
*1) The worst condition was determined based on the test result of Maximum Peak Output Power.
*2) Test operating mode was determined as follows according to "Section 1 of 6 802.11 a/b/g/n testing- Managing Complex Regulatory Approvals - "of TCB Council Workshop October 2009.
*3) Lowest power setting mode was performed only worst mode (maximum peak conducted output power mode).

(Wireless LAN mode)
Software : driver1 (for Linux PC): sd87xx (for Wireless LAN) ver.14.66.33.p71
: bridge tool (for Linux PC):: mfgbridge ver.0.1.0.26
: DutApiBRIDGEETH8777.exe ver.14.2.33.p37 (for Windows PC):

(Bluetooth Low energy mode)
Software : driver1 (for Linux PC):: sd87xx (for Wireless LAN) ver.14.66.33.p71
: driver2 (for Linux PC):: bt87xx (for Bluetooth) ver.14.66.33.p71
: bridge tool (for Linux PC):: mfgbridge ver.0.1.0.26
: DutApiBRIDGEETH8777.exe ver.14.2.33.p37 (for Windows PC):

Justification: The system was configured in typical fashion (as customer would normally use it) for testing.

4.2 Configuration and peripherals



* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Wireless LAN + BT/BLE Module	DWM-W314	2	MITSUMI	EUT
B	Jig	-	-	MITSUMI	-
C	Jig (SD card I/F board)	-	-	MITSUMI	-

List of cable used

No.	Cable name	Length (m)	Shield		Remark
			Cable	Connector	
1	Signal	0.1	Unshielded	Unshielded	-
2	Signal	0.15	Unshielded	Unshielded	-
3	DC cable	1.3	Unshielded	Unshielded	-

SECTION 5: Conducted emission

5.1 Operating environment

Test place : See test data (APPENDIX 1)
Temperature : See test data (APPENDIX 1)
Humidity : See test data (APPENDIX 1)

5.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 2.0m, raised 0.8m above the conducting ground plane.
The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity.
The rear of tabletop was located 40cm to the vertical conducting plane. The rear of peripheral was aligned and was 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 LISN.
Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source. All unused 50ohm connectors of the LISN were resistively terminated in 50ohm when not connected to the measuring equipment.
Photographs of the set up are shown in APPENDIX 3.

5.3 Test conditions

Frequency range : 0.15 - 30MHz
EUT position : Table top

5.4 Test procedure

The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT via DC power supply within a Shielded room. The EUT via DC power supply was connected to a Line Impedance Stabilization Network (LISN).
An overview sweep with peak detection has been performed.
The measurements had been performed with a quasi-peak detector and if required, a CISPR average detector.
The conducted emission measurements were made with the following detection of the test receiver.

Detection Type : Quasi-Peak/ CISPR Average
IF Bandwidth : 9kHz

5.5 Results

Summary of the test results : Pass
Refer to APPENDIX 1

SECTION 6: 6dB bandwidth & Occupied bandwidth (99%)

Test procedure
The bandwidth was measured with a spectrum analyzer connected to the antenna port.
The test was measured based on Method 8.1 Option 1 and 8.2 Option 2 of KDB 558074 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

Summary of the test results: Pass
Refer to APPENDIX 1

SECTION 7: Maximum peak output power

Test procedure
The Maximum Output Power was measured with a power meter connected to the antenna port.
The test was measured based on Method 9.1.2 PKPM1 of KDB 558074 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247" .

Detection type: Peak / Average *1)

Summary of the test results: Pass
Refer to APPENDIX 1

*1) Average detector was used only for Reference data.

SECTION 8: Out of band emissions (Antenna port conducted)

Test procedure
The Out of Band Emissions was measured with a spectrum analyzer connected to the antenna port.
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.
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=10kHz)

Summary of the test results: Pass
Refer to APPENDIX 1

SECTION 9: Peak power density

Test procedure
The peak power density was measured with a spectrum analyzer connected to the antenna port.
Instrument used : Spectrum Analyzer
RBW / VBW : 3kHz / 9.1kHz

The test was measured based on Method 10.2 PKPSD of KDB 558074 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

Summary of the test results: Pass
Refer to APPENDIX 1

SECTION 10: Radiated emission

10.1 Operating environment

Test place : See test data (APPENDIX 1)
Temperature : See test data (APPENDIX 1)
Humidity : See test data (APPENDIX 1)

10.2 Test configuration

EUT was placed on a polystyrene platform of nominal size, 0.5m by 0.5m, raised 0.8m above the conducting ground plane. Photographs of the set up are shown in APPENDIX 3.

10.3 Test conditions

Frequency range : 30MHz to 25GHz
EUT position : Table top

10.4 Test procedure

The Radiated Electric Field Strength intensity has been measured on a semi-anechoic chamber with a ground plane and at a distance of 3m (below 15GHz) / 1m (above 15GHz) (Refer to Figure 1). Measurements were performed with quasi-peak, peak and average detector. The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity. The measurements were performed for both vertical and horizontal antenna polarization.
The radiated emission measurements were made with the following detection.

Frequency	30-1000MHz	1-25GHz		20dBc
Detection type	Quasi-Peak	Peak	Average *1)	Peak
IF Bandwidth	120kHz	RBW: 1MHz VBW: 3MHz	RBW: 1MHz VBW: 3MHz Detector: Linear Voltage Averaging	RBW: 100kHz VBW: 300kHz

*1) Average Power Measurement was measured based on 12.2.5 of KDB 558074 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

The carrier levels and noise levels were confirmed at each position of X, Y and Z axes to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Wireless LAN mode

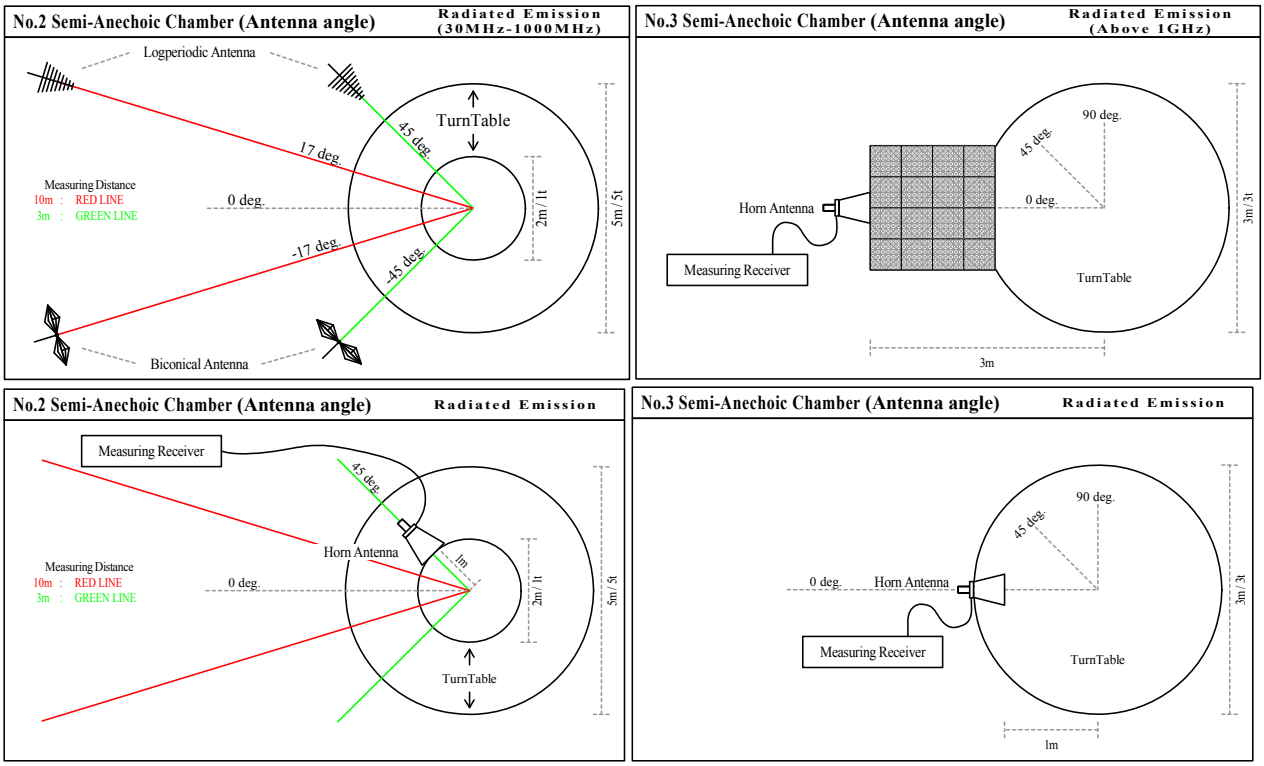
Antenna polarization	Carrier	Spurious (Below 1GHz)	Spurious (1-15GHz)	Spurious (15-18GHz)	Spurious (18-25GHz)
Horizontal	X	Z	Y	X	X
Vertical	Z	Z	Z	X	X

Bluetooth Low energy mode

Antenna polarization	Carrier	Spurious (Below 1GHz)	Spurious (1-15GHz)	Spurious (15-18GHz)	Spurious (18-25GHz)
Horizontal	X	Y	Y	Y	Y
Vertical	Z	Y	Y	Y	Y

* The definition of each position is shown in a 'Pre-check of the worst position' in APPENDIX 3.

Figure 1. Antenna angle



10.5 Band edge

Band edge level at 2390MHz and 2483.5MHzis below the limits of FCC 15.209 and band edge level at 2400MHz is below the 20dBc. Refer to the data.

10.6 Results

Summary of the test results : Pass
* No noise was detected above the 5th order harmonics.

Refer to APPENDIX 1

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Test instruments

APPENDIX 3: Photographs of test setup

Conducted emission
Radiated emission
Pre-check of the worst position

APPENDIX 1:Data of Radio tests

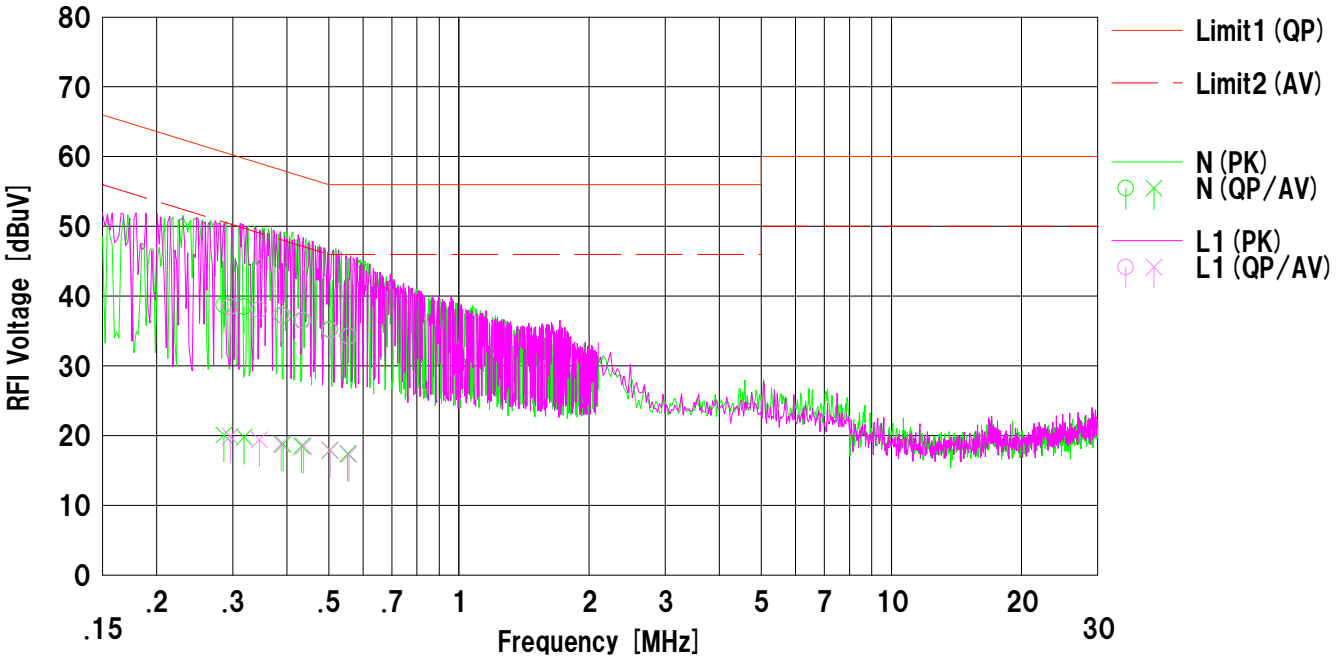
DATA OF CONDUCTED EMISSION TEST

UL Japan,Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2014/10/30

Company	: MITSUMI ELECTRIC CO., LTD.	Mode	: Tx 11g 2412MHz
Kind of EUT	: Wireless LAN + BT/BLE Module	Order No.	: 10499187S
Model No.	: DWM-W314	Power	: DC 3.3V
Serial No.	: 2	Temp./Humi.	: 25deg.C / 43%RH
Remarks	: -		

Limit1 : FCC 15C(15.207) QP
Limit2 : FCC 15C(15.207) AV

Engineer : Shinichi Takano



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	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.28590	26.1	7.5	12.6	38.7	20.1	60.6	50.6	21.9	30.5	N	
2	0.31874	26.0	7.3	12.5	38.5	19.8	59.7	49.7	21.2	29.9	N	
3	0.39222	24.7	6.3	12.5	37.2	18.8	58.0	48.0	20.8	29.2	N	
4	0.43272	24.0	6.0	12.5	36.5	18.5	57.2	47.2	20.7	28.7	N	
5	0.50278	22.7	5.4	12.5	35.2	17.9	56.0	46.0	20.8	28.1	N	
6	0.55328	21.8	4.9	12.5	34.3	17.4	56.0	46.0	21.7	28.6	N	
7	0.29594	26.0	7.4	12.5	38.5	19.9	60.3	50.3	21.8	30.4	L1	
8	0.34557	25.5	6.9	12.5	38.0	19.4	59.0	49.0	21.0	29.6	L1	
9	0.38780	24.8	6.3	12.5	37.3	18.8	58.1	48.1	20.8	29.3	L1	
10	0.43708	24.0	6.0	12.5	36.5	18.5	57.1	47.1	20.6	28.6	L1	
11	0.50356	22.6	5.4	12.5	35.1	17.9	56.0	46.0	20.9	28.1	L1	
12	0.55728	21.7	4.8	12.5	34.2	17.3	56.0	46.0	21.8	28.7	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN:SLS-01

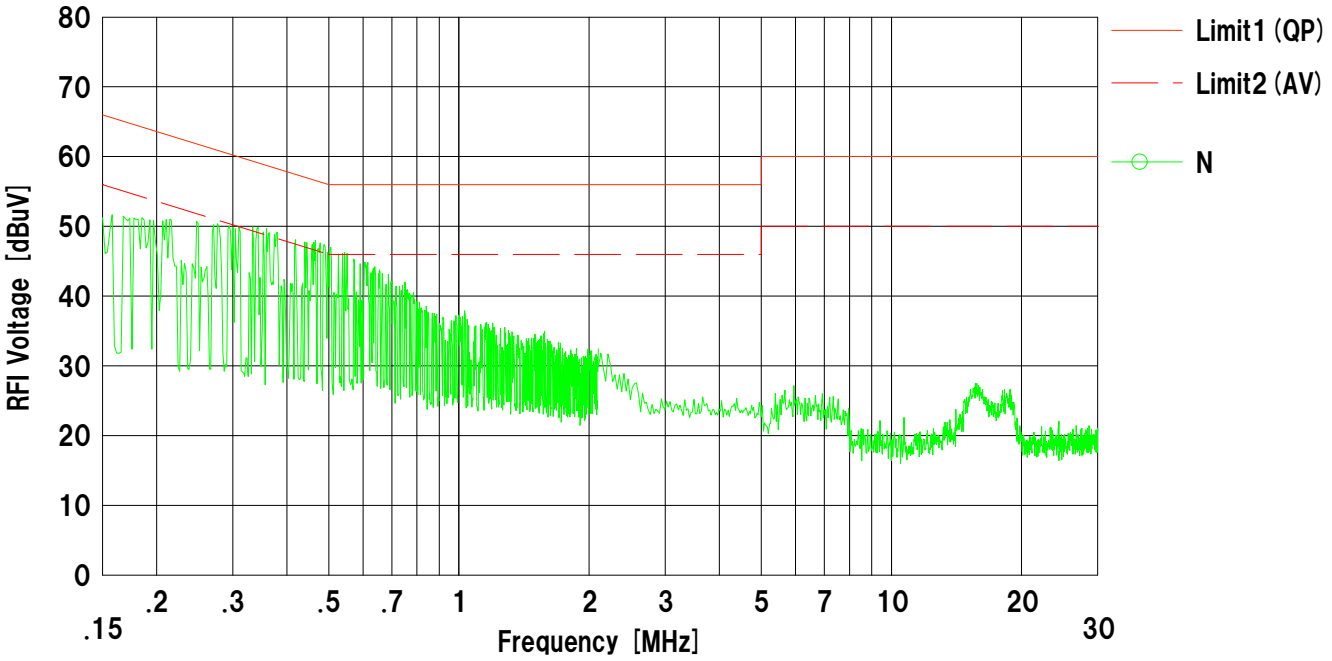
DATA OF CONDUCTED EMISSION TEST

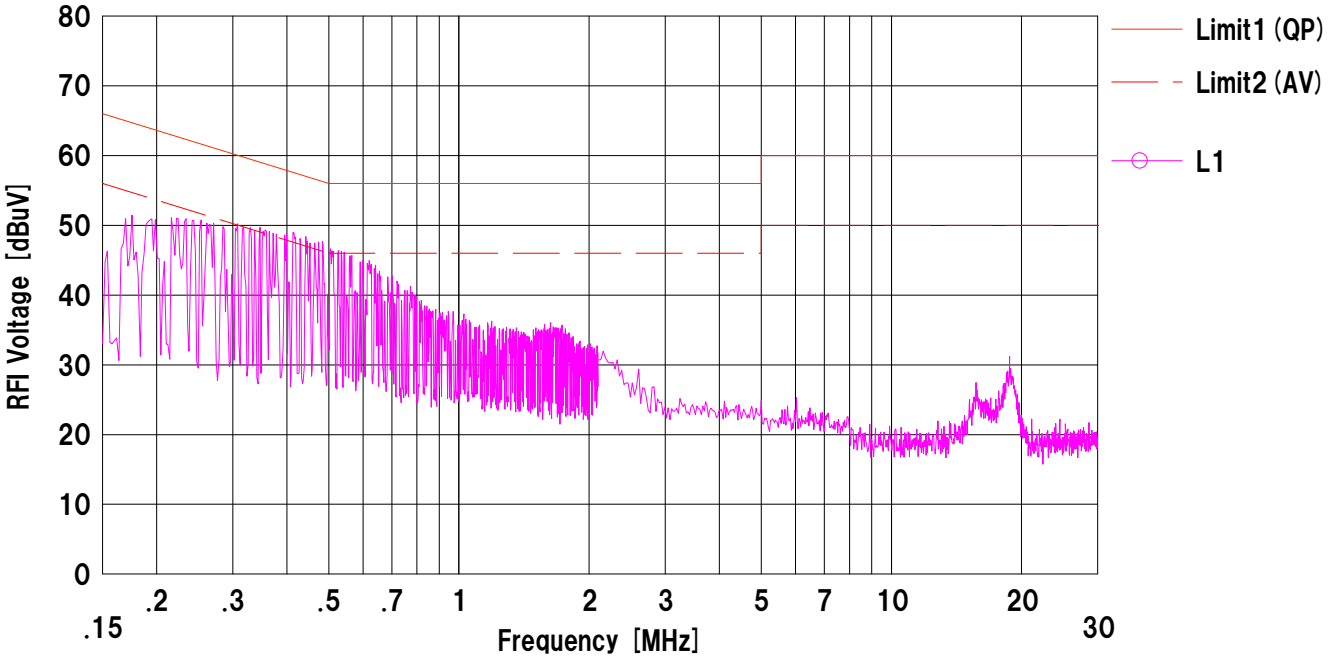
UL Japan,Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2014/10/30

Company	: MITSUMI ELECTRIC CO., LTD.	Mode	: Tx LE 2402MHz
Kind of EUT	: Wireless LAN + BT/BLE Module	Order No.	: 10499187S
Model No.	: DWM-W314	Power	: DC 3.3V
Serial No.	: 2	Temp./Humi.	: 25deg.C / 43%RH
Remarks	: -		

Limit1 : FCC 15C(15.207) QP
Limit2 : FCC 15C(15.207) AV

Engineer : Shinichi Takano





Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN:SLS-01

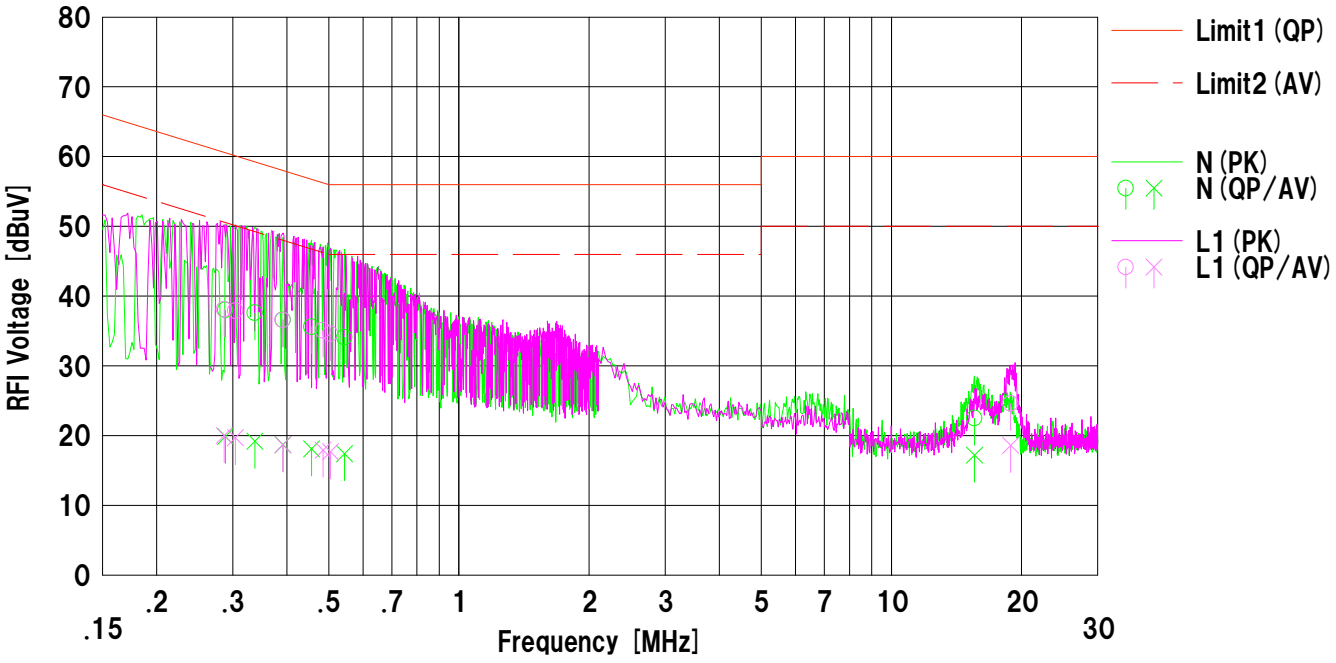
DATA OF CONDUCTED EMISSION TEST

UL Japan,Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2014/10/30

Company	: MITSUMI ELECTRIC CO., LTD.	Mode	: Tx LE 2440MHz
Kind of EUT	: Wireless LAN + BT/BLE Module	Order No.	: 10499187S
Model No.	: DWM-W314	Power	: DC 3.3V
Serial No.	: 2	Temp./Humi.	: 25deg.C / 43%RH
Remarks	: -		

Limit1 : FCC 15C(15.207) QP
Limit2 : FCC 15C(15.207) AV

Engineer : Shinichi Takano



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	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.28856	25.4	7.3	12.6	38.0	19.9	60.5	50.5	22.5	30.6	N	
2	0.33752	25.1	6.7	12.5	37.6	19.2	59.2	49.2	21.6	30.0	N	
3	0.39178	24.1	6.2	12.5	36.6	18.7	58.0	48.0	21.4	29.3	N	
4	0.45605	23.1	5.6	12.5	35.6	18.1	56.7	46.7	21.1	28.6	N	
5	0.54398	21.6	4.9	12.5	34.1	17.4	56.0	46.0	21.9	28.6	N	
6	15.57405	9.2	3.9	13.3	22.5	17.2	60.0	50.0	37.5	32.8	N	
7	0.28647	25.5	7.4	12.6	38.1	20.0	60.6	50.6	22.5	30.6	L1	
8	0.30421	25.4	7.2	12.5	37.9	19.7	60.1	50.1	22.2	30.4	L1	
9	0.39139	24.1	6.2	12.5	36.6	18.7	58.0	48.0	21.4	29.3	L1	
10	0.48535	22.6	5.4	12.5	35.1	17.9	56.2	46.2	21.1	28.3	L1	
11	0.50475	22.1	5.2	12.5	34.6	17.7	56.0	46.0	21.4	28.3	L1	
12	18.88198	11.1	5.1	13.5	24.6	18.6	60.0	50.0	35.4	31.4	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN:SLS-01

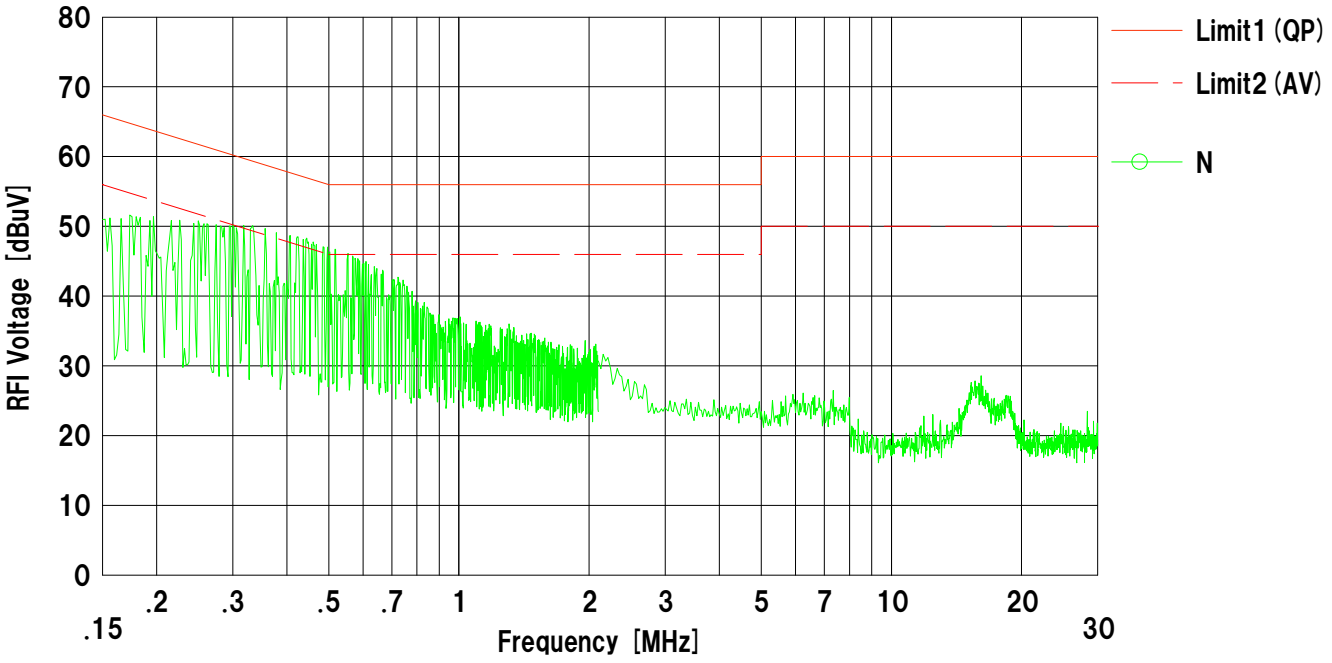
DATA OF CONDUCTED EMISSION TEST

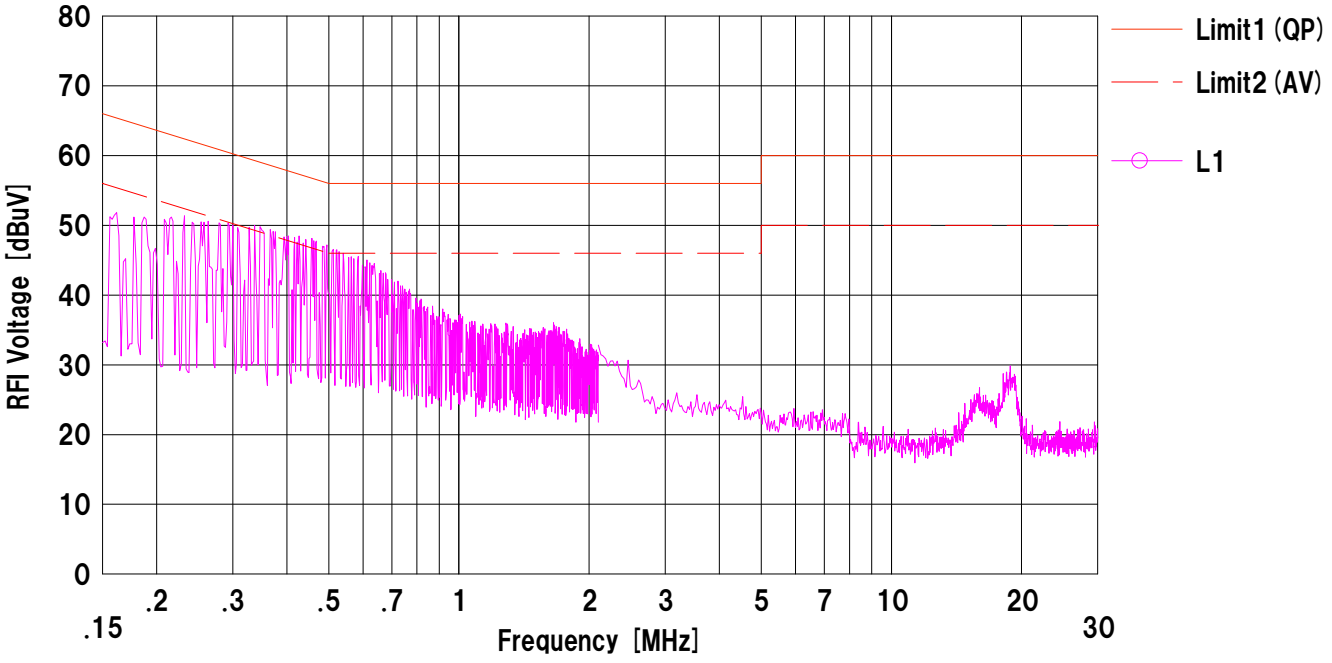
UL Japan,Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2014/10/30

Company	: MITSUMI ELECTRIC CO., LTD.	Mode	: Tx LE 2480MHz
Kind of EUT	: Wireless LAN + BT/BLE Module	Order No.	: 10499187S
Model No.	: DWM-W314	Power	: DC 3.3V
Serial No.	: 2	Temp./Humi.	: 25deg.C / 43%RH
Remarks	: -		

Limit1 : FCC 15C(15.207) QP
Limit2 : FCC 15C(15.207) AV

Engineer : Shinichi Takano





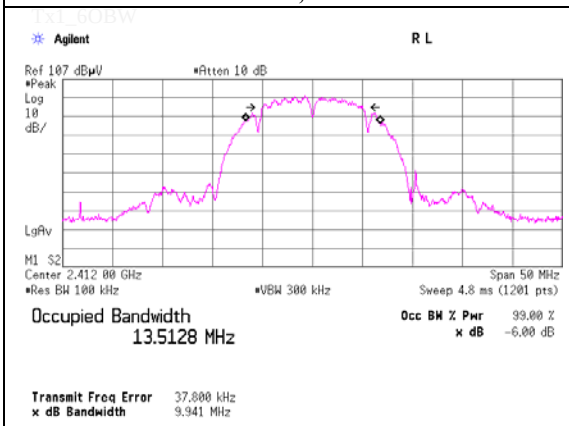
Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN:SLS-01

-6dB Bandwidth

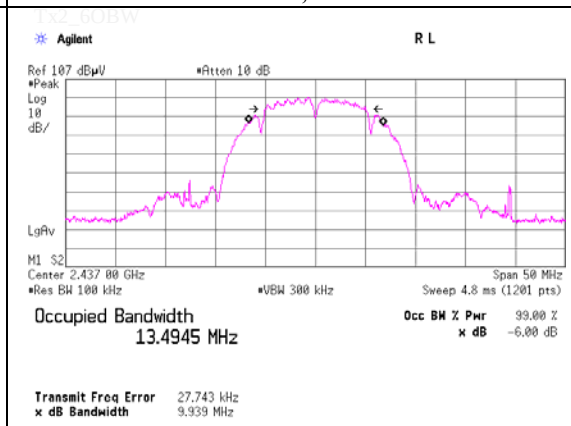
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11b, power setting 12dBm, PN9, worst data mode 2Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	9.941	> 0.500
2437.0000	9.939	> 0.500
2462.0000	9.926	> 0.500

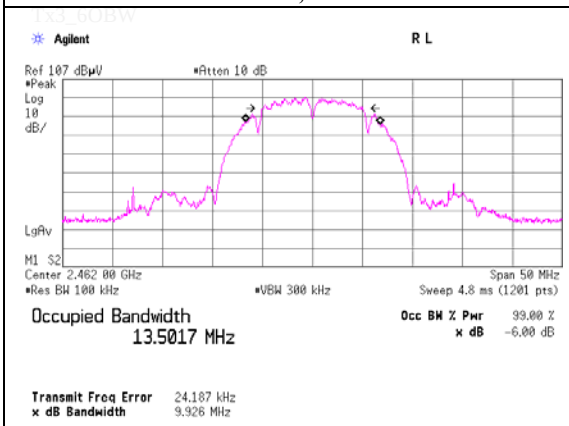
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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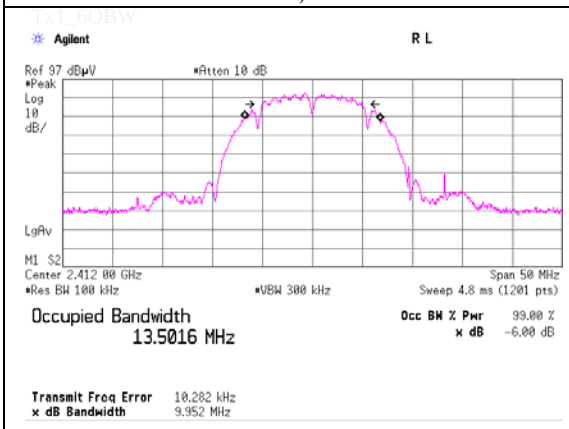
-6dB Bandwidth

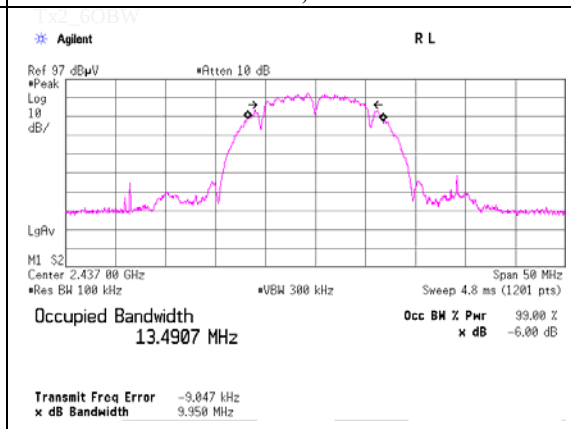
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11b, power setting 4dBm, PN9, worst data mode 2Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	9.952	> 0.500
2437.0000	9.950	> 0.500
2462.0000	9.938	> 0.500

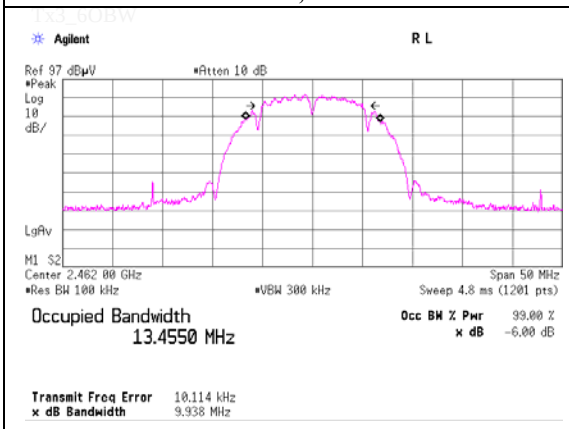
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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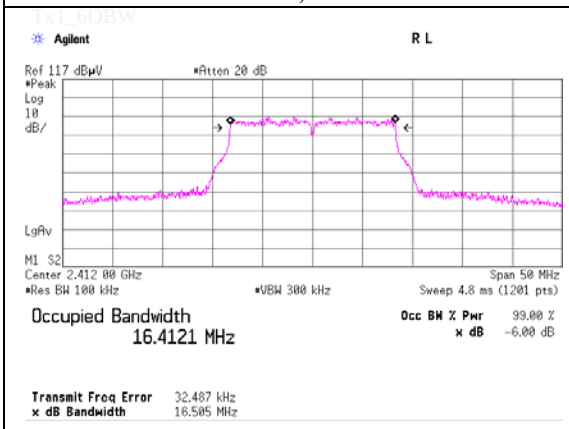
-6dB Bandwidth

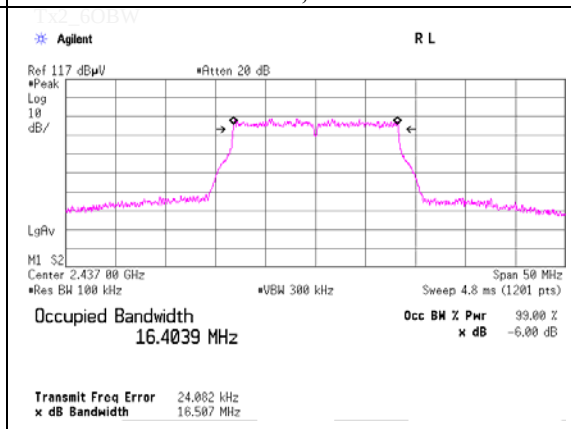
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11g, power setting 12dBm, PN9, worst data mode 48Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.505	> 0.500
2437.0000	16.507	> 0.500
2462.0000	16.503	> 0.500

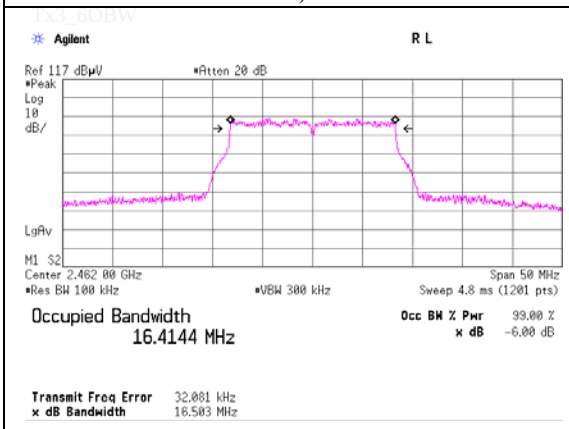
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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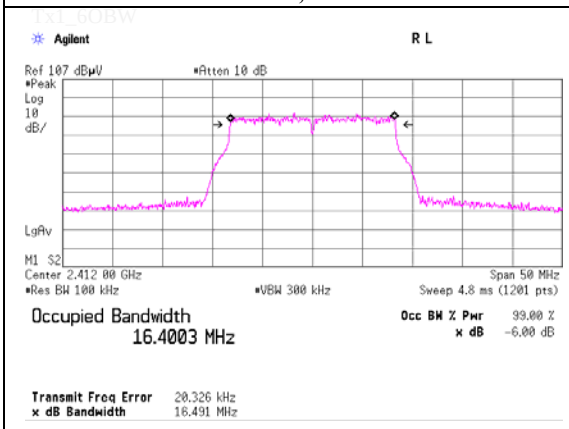
-6dB Bandwidth

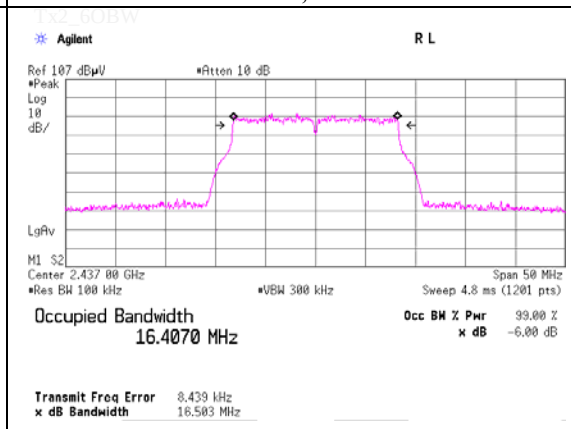
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11g, power setting 4dBm, PN9, worst data mode 48Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.491	> 0.500
2437.0000	16.503	> 0.500
2462.0000	16.511	> 0.500

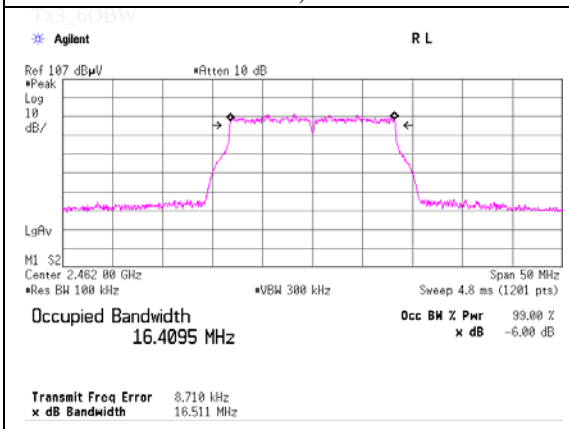
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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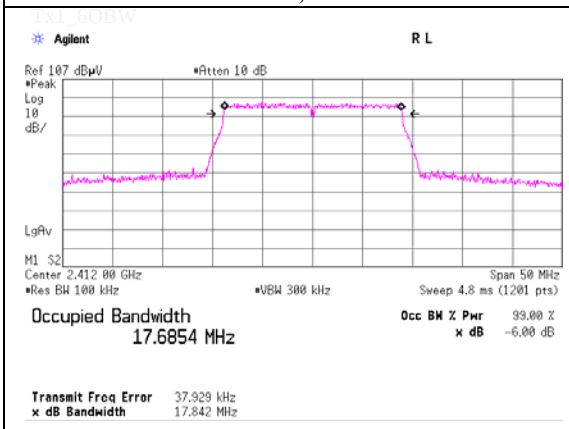
-6dB Bandwidth

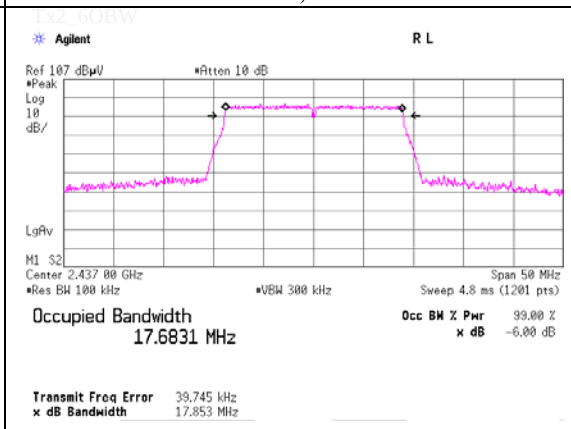
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11n HT20, power setting 12dBm, PN9, worst data mode 5(MCS)	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	17.842	> 0.500
2437.0000	17.853	> 0.500
2462.0000	17.840	> 0.500

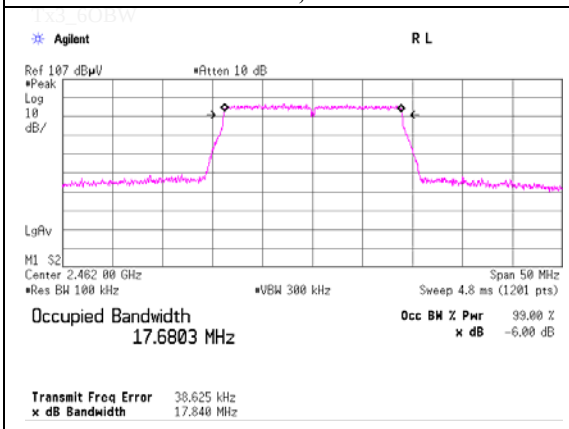
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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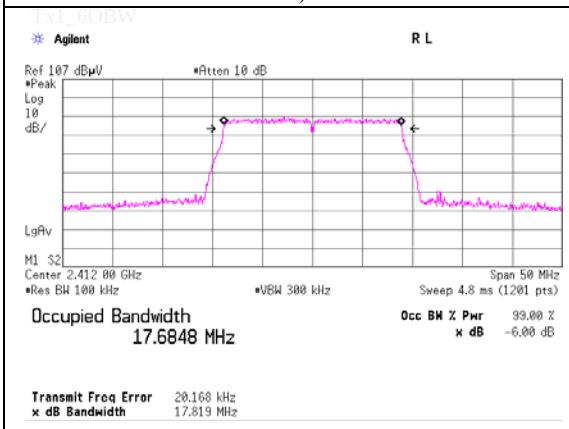
-6dB Bandwidth

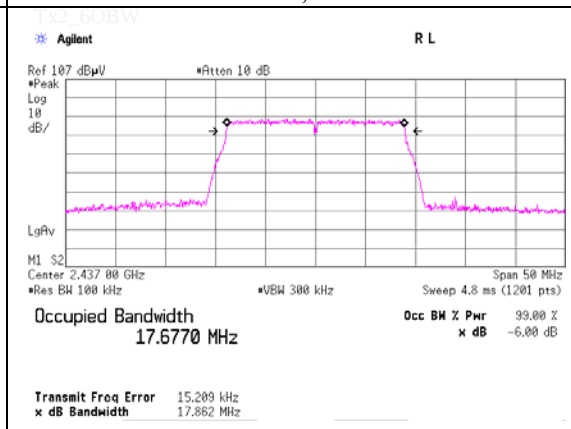
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11n HT20, power setting 4dBm, PN9, worst data mode 5(MCS)	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	17.819	> 0.500
2437.0000	17.862	> 0.500
2462.0000	17.836	> 0.500

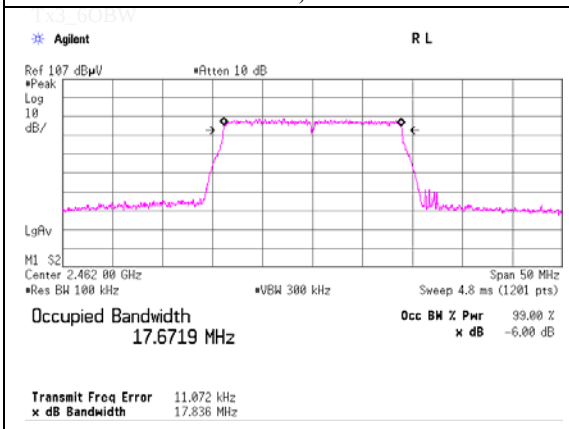
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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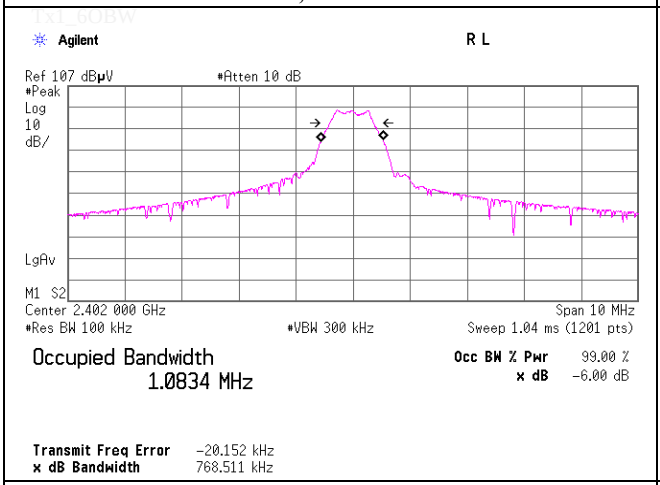
-6dB Bandwidth

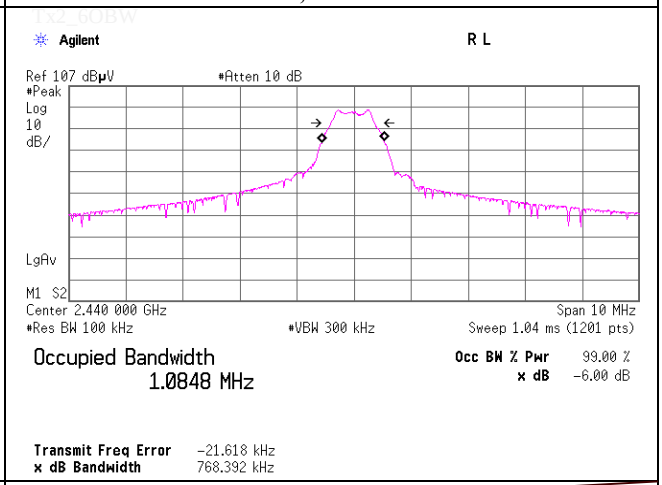
Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	October 24, 2014	
Temperature / Humidity	24deg.C , 55%RH	
Engineer	Tatsuya Arai	
Mode	Tx, Bluetooth, Low Energy, PN9	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2402.0000	0.769	> 0.500
2440.0000	0.768	> 0.500
2480.0000	0.769	> 0.500

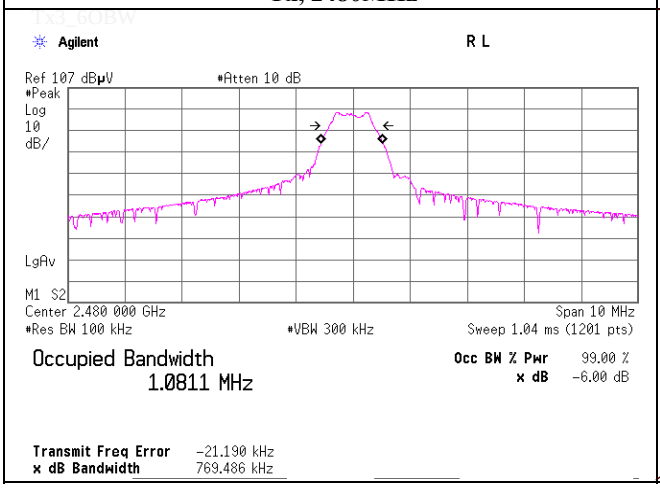
Tx, 2402MHz



Tx, 2440MHz



Tx, 2480MHz



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Maximum Peak Conducted Output Power

(PKPM1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room	
Date	October 16, 2014		
Temperature / Humidity	25deg.C , 49%RH		
Engineer	Akio Hayashi		
Mode	Tx, IEEE802.11b, power setting 12dBm, PN9,	worst data mode :	2 Mbps

(* P/M: Power Meter with power sensor)

Ch	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	14.09	2.16	0.00	16.25	42.17	30.00	1000	13.75
Mid	2437.0	13.17	2.17	0.00	15.34	34.20	30.00	1000	14.66
High	2462.0	12.99	2.18	0.00	15.17	32.89	30.00	1000	14.83

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

[Pre check]

	Data rate	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin	
	[Mbps]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	
	1	2412.0	13.96	2.16	0.00	16.12	40.93	30.00	1000	13.88	
	2	2412.0	14.09	2.16	0.00	**16.25**	42.17	30.00	1000	**13.75**	**Worst**
	5.5	2412.0	14.06	2.16	0.00	16.22	41.88	30.00	1000	13.78	
	11	2412.0	13.77	2.16	0.00	15.93	39.17	30.00	1000	14.07	

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

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Maximum Conducted Output Power(Reference Data)

(AVGPM)

Test place	UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
Date	October 16, 2014
Temperature / Humidity	25deg.C , 49%RH
Engineer	Akio Hayashi
Mode	Tx, IEEE802.11b, power setting 12dBm, PN9, worst data mode : 1 Mbps

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result [dBm]	Result [mW]
Low	2412.0	11.18	2.16	0.00	0.00	13.34	21.58
Mid	2437.0	10.48	2.17	0.00	0.00	12.65	18.41
High	2462.0	10.35	2.18	0.00	0.00	12.53	17.91

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

[Pre check]

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result [dBm]	Result [mW]
	1	2412.0	11.18	2.16	0.00	0.00	**13.34**	21.58
	2	2412.0	11.17	2.16	0.00	0.00	13.33	21.53
	5.5	2412.0	11.03	2.16	0.00	0.00	13.19	20.84
	11	2412.0	10.83	2.16	0.00	0.00	12.99	19.91

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

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Maximum Peak Conducted Output Power

(PKPM1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room	
Date	October 16, 2014		
Temperature / Humidity	25deg.C , 49%RH		
Engineer	Akio Hayashi		
Mode	Tx, IEEE802.11b, power setting 4dBm, PN9,	worst data mode :	2 Mbps

(* P/M: Power Meter with power sensor)

Ch	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	6.01	2.16	0.00	8.17	6.56	30.00	1000	21.83
Mid	2437.0	5.24	2.17	0.00	7.41	5.51	30.00	1000	22.59
High	2462.0	5.08	2.18	0.00	7.26	5.32	30.00	1000	22.74

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss
The worst rate is based on power setting 12dBm data

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Maximum Conducted Output Power(Reference data)

(AVGPM)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room	
Date	October 16, 2014		
Temperature / Humidity	25deg.C , 49%RH		
Engineer	Akio Hayashi		
Mode	Tx, IEEE802.11b, power setting 4dBm, PN9,	worst data mode :	1 Mbps

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty Factor	Result	
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]
Low	2412.0	3.01	2.16	0.00	0.00	5.17	3.29
Mid	2437.0	2.56	2.17	0.00	0.00	4.73	2.97
High	2462.0	2.36	2.18	0.00	0.00	4.54	2.84

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor
The worst rate is based on power setting 12dBm data

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Maximum Peak Conducted Output Power

(PKPM1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room	
Date	October 16, 2014		
Temperature / Humidity	25deg.C , 49%RH		
Engineer	Akio Hayashi		
Mode	Tx, IEEE802.11g, power setting 12dBm, PN9,	worst data mode :	48 Mbps

(* P/M: Power Meter with power sensor)

Ch	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	20.92	2.16	0.00	23.08	203.24	30.00	1000	6.92
Mid	2437.0	20.61	2.17	0.00	22.78	189.67	30.00	1000	7.22
High	2462.0	20.22	2.18	0.00	22.40	173.78	30.00	1000	7.60

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

[Pre check]

	Data rate	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin	
	[Mbps]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	
	6	2412.0	19.43	2.16	0.00	21.59	144.21	30.00	1000	8.41	
	9	2412.0	18.56	2.16	0.00	20.72	118.03	30.00	1000	9.28	
	12	2412.0	19.07	2.16	0.00	21.23	132.74	30.00	1000	8.77	
	18	2412.0	18.46	2.16	0.00	20.62	115.35	30.00	1000	9.38	
	24	2412.0	19.42	2.16	0.00	21.58	143.88	30.00	1000	8.42	
	36	2412.0	19.26	2.16	0.00	21.42	138.68	30.00	1000	8.58	
	48	2412.0	20.92	2.16	0.00	**23.08**	203.24	30.00	1000	**6.92**	**Worst**
	54	2412.0	20.76	2.16	0.00	22.92	195.88	30.00	1000	7.08	

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

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Maximum Conducted Output Power(Reference data)

(AVGPM)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room	
Date	October 16, 2014		
Temperature / Humidity	25deg.C , 49%RH		
Engineer	Akio Hayashi		
Mode	Tx, IEEE802.11g, power setting 12dBm, PN9,	worst data mode :	54 Mbps

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result [dBm]	Result [mW]
Low	2412.0	11.82	2.16	0.00	0.00	13.98	25.00
Mid	2437.0	11.13	2.17	0.00	0.00	13.30	21.38
High	2462.0	11.01	2.18	0.00	0.00	13.19	20.84

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

[Pre check]

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result [dBm]	Result [mW]
	6	2412.0	11.47	2.16	0.00	0.00	13.63	23.07
	9	2412.0	11.55	2.16	0.00	0.00	13.71	23.50
	12	2412.0	11.54	2.16	0.00	0.00	13.70	23.44
	18	2412.0	11.45	2.16	0.00	0.00	13.61	22.96
	24	2412.0	11.56	2.16	0.00	0.00	13.72	23.55
	36	2412.0	11.49	2.16	0.00	0.00	13.65	23.17
	48	2412.0	11.77	2.16	0.00	0.00	13.93	24.72
	54	2412.0	11.82	2.16	0.00	0.00	**13.98**	25.00

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

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Maximum Peak Conducted Output Power

(PKPM1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room	
Date	October 16, 2014		
Temperature / Humidity	25deg.C , 49%RH		
Engineer	Akio Hayashi		
Mode	Tx, IEEE802.11g, power setting 4dBm, PN9,	worst data mode :	48 Mbps

(* P/M: Power Meter with power sensor)

Ch	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	13.48	2.16	0.00	15.64	36.64	30.00	1000	14.36
Mid	2437.0	13.19	2.17	0.00	15.36	34.36	30.00	1000	14.64
High	2462.0	12.86	2.18	0.00	15.04	31.92	30.00	1000	14.96

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss
The worst rate is based on power setting 12dBm data

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Maximum Conducted Output Power(Reference data)

(AVGPM)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room	
Date	October 16, 2014		
Temperature / Humidity	25deg.C , 49%RH		
Engineer	Akio Hayashi		
Mode	Tx, IEEE802.11g, power setting 4dBm, PN9,	worst data mode :	54 Mbps

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty Factor	Result	
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]
Low	2412.0	3.78	2.16	0.00	0.00	5.94	3.93
Mid	2437.0	3.21	2.17	0.00	0.00	5.38	3.45
High	2462.0	3.00	2.18	0.00	0.00	5.18	3.30

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor
The worst rate is based on power setting 12dBm data

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Maximum Peak Conducted Output Power

(PKPM1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room	
Date	October 16, 2014		
Temperature / Humidity	25deg.C , 49%RH		
Engineer	Akio Hayashi		
Mode	Tx, IEEE802.11n HT20, power setting 12dBm, PN9,	worst data mode :	5 (MCS)

(* P/M: Power Meter with power sensor)

Ch	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	20.16	2.16	0.00	22.32	170.61	30.00	1000	7.68
Mid	2437.0	20.04	2.17	0.00	22.21	166.34	30.00	1000	7.79
High	2462.0	19.80	2.18	0.00	21.98	157.76	30.00	1000	8.02

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

[Pre check]

	Mode	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin	
	(MCS)	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	
	0	2412.0	18.68	2.16	0.00	20.84	121.34	30.00	1000	9.16	
	1	2412.0	18.13	2.16	0.00	20.29	106.91	30.00	1000	9.71	
	2	2412.0	18.37	2.16	0.00	20.53	112.98	30.00	1000	9.47	
	3	2412.0	18.21	2.16	0.00	20.37	108.89	30.00	1000	9.63	
	4	2412.0	18.11	2.16	0.00	20.27	106.41	30.00	1000	9.73	
	5	2412.0	20.16	2.16	0.00	**22.32**	170.61	30.00	1000	**7.68**	**Worst**
	6	2412.0	20.12	2.16	0.00	22.28	169.04	30.00	1000	7.72	
	7	2412.0	20.11	2.16	0.00	22.27	168.66	30.00	1000	7.73	

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

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Maximum Conducted Output Power(Reference data)

(AVGPM)

Test place	UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room		
Date	October 16, 2014		
Temperature / Humidity	25deg.C , 49%RH		
Engineer	Akio Hayashi		
Mode	Tx, IEEE802.11n HT20, power setting 12dBm, PI	worst data mode :	5 (MCS)

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result [dBm]	Result [mW]
Low	2412.0	11.86	2.16	0.00	0.00	14.02	25.23
Mid	2437.0	10.96	2.17	0.00	0.00	13.13	20.56
High	2462.0	10.68	2.18	0.00	0.00	12.86	19.32

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

[Pre check]

	Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result [dBm]	Result [mW]
	0	2412.0	11.55	2.16	0.00	0.00	13.71	23.50
	1	2412.0	11.52	2.16	0.00	0.00	13.68	23.33
	2	2412.0	11.51	2.16	0.00	0.00	13.67	23.28
	3	2412.0	11.51	2.16	0.00	0.00	13.67	23.28
	4	2412.0	11.51	2.16	0.00	0.00	13.67	23.28
	5	2412.0	11.86	2.16	0.00	0.00	**14.02**	25.23
	6	2412.0	11.81	2.16	0.00	0.00	13.97	24.95
	7	2412.0	11.81	2.16	0.00	0.00	13.97	24.95

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

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Maximum Peak Conducted Output Power

(PKPM1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room	
Date	October 16, 2014		
Temperature / Humidity	25deg.C , 49%RH		
Engineer	Akio Hayashi		
Mode	Tx, IEEE802.11n HT20, power setting 4dBm, PN9,	worst data mode :	5 (MCS)

(* P/M: Power Meter with power sensor)

Ch	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	13.03	2.16	0.00	15.19	33.04	30.00	1000	14.81
Mid	2437.0	12.20	2.17	0.00	14.37	27.35	30.00	1000	15.63
High	2462.0	11.77	2.18	0.00	13.95	24.83	30.00	1000	16.05

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss
The worst rate is based on power setting 12dBm data

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Maximum Conducted Output Power(Reference data)

(AVGPM)

Test place	UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room		
Date	October 16, 2014		
Temperature / Humidity	25deg.C , 49%RH		
Engineer	Akio Hayashi		
Mode	Tx, IEEE802.11n HT20, power setting 4dBm, PN9	worst data mode :	5 (MCS)

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty Factor	Result	
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]
Low	2412.0	3.73	2.16	0.00	0.00	5.89	3.88
Mid	2437.0	3.14	2.17	0.00	0.00	5.31	3.40
High	2462.0	2.96	2.18	0.00	0.00	5.14	3.27

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor
The worst rate is based on power setting 12dBm data

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Maximum Peak Conducted Output Power

(PKPM1)

Test place	UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date	October 23, 2014
Temperature / Humidity	25deg.C , 47%RH
Engineer	Akio Hayashi
Mode	Tx, Bluetooth, Low Energy, PN9,

(* P/M: Power Meter with power sensor)

Ch	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2402.0	-0.28	2.19	0.00	1.91	1.55	30.00	1000	28.09
Mid	2440.0	-0.33	2.20	0.00	1.87	1.54	30.00	1000	28.13
High	2480.0	-0.51	2.21	0.00	1.70	1.48	30.00	1000	28.30

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

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Maximum Conducted Output Power(Reference)

(AVGPM)

Test place	UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date	October 23, 2014
Temperature / Humidity	25deg.C , 47%RH
Engineer	Akio Hayashi
Mode	Tx, Bluetooth, Low Energy, PN9,

(* P/M: Power Meter with power sensor, AV: Average)

Ch	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty Factor	Result	
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]
Low	2402.0	-0.41	2.19	0.00	0.00	1.78	1.51
Mid	2440.0	-0.46	2.20	0.00	0.00	1.74	1.49
High	2480.0	-0.63	2.21	0.00	0.00	1.58	1.44

Sample Calculation:

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

E.I.R.P = Result + Antenna Gain

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Radiated Emission

Test place	No.2 & No.3 Semi Anechoic Chamber	
Date	October 24, 2014	October 26, 2014
Temperature / Humidity	24 deg.C, 44 %RH	25 deg.C, 50 %RH
Engineer	Makoto Hosaka	Tatsuya Arai
Mode	Tx, 2412 MHz	
	Tx, IEEE802.11b	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	47.3	26.4	13.6	41.1	46.2	73.9	27.7	100	204	
Hori.	4824.000	PK	54.1	30.7	6.0	39.8	51.0	73.9	22.9	100	252	
Hori.	7236.000	PK	47.5	36.7	7.1	40.2	51.1	73.9	22.8	122	206	
Hori.	9648.000	PK	47.8	38.5	8.3	40.1	54.5	73.9	19.4	100	265	
Hori.	12060.000	PK	47.5	39.5	9.3	39.6	56.7	73.9	17.2	100	0	
Hori.	2390.000	AV	38.8	26.4	13.6	41.1	37.7	53.9	16.2	100	204	
Hori.	4824.000	AV	49.8	30.7	6.0	39.8	46.7	53.9	7.2	100	252	
Hori.	7236.000	AV	37.7	36.7	7.1	40.2	41.3	53.9	12.6	122	206	
Hori.	9648.000	AV	38.3	38.5	8.3	40.1	45.0	53.9	8.9	100	265	
Hori.	12060.000	AV	37.7	39.5	9.3	39.6	46.9	53.9	**7.0**	100	0	
Vert.	2390.000	PK	46.9	26.4	13.6	41.1	45.8	73.9	28.1	123	226	
Vert.	4824.000	PK	52.6	30.7	6.0	39.8	49.5	73.9	24.4	100	292	
Vert.	7236.000	PK	46.2	36.7	7.1	40.2	49.8	73.9	24.1	100	124	
Vert.	9648.000	PK	48.3	38.5	8.3	40.1	55.0	73.9	18.9	143	201	
Vert.	12060.000	PK	47.1	39.5	9.3	39.6	56.3	73.9	17.6	100	0	
Vert.	2390.000	AV	36.9	26.4	13.6	41.1	35.8	53.9	18.1	123	226	
Vert.	4824.000	AV	47.4	30.7	6.0	39.8	44.3	53.9	9.6	100	292	
Vert.	7236.000	AV	37.4	36.7	7.1	40.2	41.0	53.9	12.9	100	124	
Vert.	9648.000	AV	38.4	38.5	8.3	40.1	45.1	53.9	8.8	143	201	
Vert.	12060.000	AV	37.6	39.5	9.3	39.6	46.8	53.9	7.1	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

20dBc Data Sheet **(RBW 100kHz, VBW 300kHz)**

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	98.4	26.4	13.6	41.1	97.3	-	-	Carrier
Hori.	2397.264	PK	50.4	26.4	13.6	41.1	49.3	77.3	28.0	
Hori.	2400.000	PK	45.7	26.4	13.6	41.1	44.6	77.3	32.7	
Vert.	2412.000	PK	94.2	26.4	13.6	41.1	93.1	-	-	Carrier
Vert.	2397.264	PK	49.6	26.4	13.6	41.1	48.5	73.1	24.6	
Vert.	2400.000	PK	42.6	26.4	13.6	41.1	41.5	73.1	31.6	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	No.2 & No.3 Semi Anechoic Chamber	
Date	October 24, 2014	October 26, 2014
Temperature / Humidity	24 deg.C, 44 %RH	25 deg.C, 50 %RH
Engineer	Makoto Hosaka	Tatsuya Arai
Mode	Tx, 2437 MHz	
	Tx, IEEE802.11b	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	52.1	30.9	6.0	39.7	49.3	73.9	24.6	100	298	
Hori.	7311.000	PK	46.1	36.8	7.1	40.3	49.7	73.9	24.2	100	0	
Hori.	9748.000	PK	47.7	38.6	8.1	40.0	54.4	73.9	19.5	149	265	
Hori.	12185.000	PK	46.4	39.4	9.4	39.8	55.4	73.9	18.5	100	0	
Hori.	4874.000	AV	47.1	30.9	6.0	39.7	44.3	53.9	9.6	100	298	
Hori.	7311.000	AV	36.8	36.8	7.1	40.3	40.4	53.9	13.5	100	0	
Hori.	9748.000	AV	37.8	38.6	8.1	40.0	44.5	53.9	9.4	149	265	
Hori.	12185.000	AV	37.0	39.4	9.4	39.8	46.0	53.9	**7.9**	100	0	
Vert.	4874.000	PK	51.4	30.9	6.0	39.7	48.6	73.9	25.3	100	256	
Vert.	7311.000	PK	46.5	36.8	7.1	40.3	50.1	73.9	23.8	100	136	
Vert.	9748.000	PK	46.8	38.6	8.1	40.0	53.5	73.9	20.4	123	206	
Vert.	12185.000	PK	46.5	39.4	9.4	39.8	55.5	73.9	18.4	100	0	
Vert.	4874.000	AV	46.5	30.9	6.0	39.7	43.7	53.9	10.2	100	256	
Vert.	7311.000	AV	36.9	36.8	7.1	40.3	40.5	53.9	13.4	100	136	
Vert.	9748.000	AV	37.8	38.6	8.1	40.0	44.5	53.9	9.4	123	206	
Vert.	12185.000	AV	36.8	39.4	9.4	39.8	45.8	53.9	8.1	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	No.2 & No.3 Semi Anechoic Chamber	
Date	October 24, 2014	October 26, 2014
Temperature / Humidity	24 deg.C, 44 %RH	25 deg.C, 50 %RH
Engineer	Makoto Hosaka	Tatsuya Arai
Mode	Tx, 2462 MHz	
	Tx, IEEE802.11b	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	46.7	26.6	13.6	41.1	45.8	73.9	28.1	100	212	
Hori.	4924.000	PK	50.8	31.1	5.9	39.6	48.2	73.9	25.7	100	311	
Hori.	7386.000	PK	46.0	36.9	7.2	40.4	49.7	73.9	24.2	100	0	
Hori.	9848.000	PK	46.9	38.6	8.1	39.9	53.7	73.9	20.2	155	288	
Hori.	12310.000	PK	46.1	39.3	9.4	39.9	54.9	73.9	19.0	100	0	
Hori.	2483.500	AV	38.3	26.6	13.6	41.1	37.4	53.9	16.5	100	212	
Hori.	4924.000	AV	45.2	31.1	5.9	39.6	42.6	53.9	11.3	100	311	
Hori.	7386.000	AV	36.5	36.9	7.2	40.4	40.2	53.9	13.7	100	0	
Hori.	9848.000	AV	37.6	38.6	8.1	39.9	44.4	53.9	9.5	155	288	
Hori.	12310.000	AV	36.1	39.3	9.4	39.9	44.9	53.9	9.0	100	0	
Vert.	2483.500	PK	47.0	26.6	13.6	41.1	46.1	73.9	27.8	100	224	
Vert.	4924.000	PK	51.1	31.1	5.9	39.6	48.5	73.9	25.4	108	252	
Vert.	7386.000	PK	45.2	36.9	7.2	40.4	48.9	73.9	25.0	100	82	
Vert.	9848.000	PK	47.8	38.6	8.1	39.9	54.6	73.9	19.3	162	226	
Vert.	12310.000	PK	45.7	39.3	9.4	39.9	54.5	73.9	19.4	100	0	
Vert.	2483.500	AV	37.8	26.6	13.6	41.1	36.9	53.9	17.0	100	224	
Vert.	4924.000	AV	45.2	31.1	5.9	39.6	42.6	53.9	11.3	108	252	
Vert.	7386.000	AV	36.2	36.9	7.2	40.4	39.9	53.9	14.0	100	82	
Vert.	9848.000	AV	39.1	38.6	8.1	39.9	45.9	53.9	**8.0**	162	226	
Vert.	12310.000	AV	35.8	39.3	9.4	39.9	44.6	53.9	9.3	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	No.2 & No.3 Semi Anechoic Chamber		
Date	October 23, 2014	October 24, 2014	October 26, 2014
Temperature / Humidity	24 deg.C, 47 %RH	24 deg.C, 44 %RH	25 deg.C, 50 %RH
Engineer	Kenichi Adachi	Makoto Hosaka	Tatsuya Arai
Mode	Tx, 2412 MHz		
	Tx, IEEE802.11g		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	280.001	QP	24.3	18.6	9.5	31.7	20.7	46.0	25.3	122	46	
Hori.	320.001	QP	29.2	14.3	6.6	31.7	18.4	46.0	27.6	100	148	
Hori.	360.001	QP	33.8	15.2	6.9	31.7	24.2	46.0	21.8	100	293	
Hori.	400.001	QP	34.8	16.2	7.1	31.7	26.4	46.0	19.6	100	151	
Hori.	960.001	QP	27.5	22.7	9.7	30.4	29.5	53.9	24.4	100	202	
Hori.	2339.809	PK	57.1	26.3	13.5	41.1	55.8	73.9	18.1	100	207	
Hori.	2390.000	PK	63.0	26.4	13.6	41.1	61.9	73.9	12.0	100	207	
Hori.	2484.270	PK	56.3	26.6	13.6	41.1	55.4	73.9	18.5	100	207	
Hori.	4824.000	PK	54.7	30.7	6.0	39.8	51.6	73.9	22.3	100	174	
Hori.	7236.000	PK	47.9	36.7	7.1	40.2	51.5	73.9	22.4	100	218	
Hori.	9648.000	PK	46.7	38.5	8.3	40.1	53.4	73.9	20.5	100	271	
Hori.	12060.000	PK	46.8	39.5	9.3	39.6	56.0	73.9	17.9	100	0	
Hori.	2339.809	AV	49.0	26.3	13.5	41.1	47.7	53.9	6.2	100	207	
Hori.	2390.000	AV	51.6	26.4	13.6	41.1	50.5	53.9	**3.4**	100	207	
Hori.	2484.270	AV	48.6	26.6	13.6	41.1	47.7	53.9	6.2	100	207	
Hori.	4824.000	AV	45.2	30.7	6.0	39.8	42.1	53.9	11.8	100	174	
Hori.	7236.000	AV	37.8	36.7	7.1	40.2	41.4	53.9	12.5	100	218	
Hori.	9648.000	AV	37.8	38.5	8.3	40.1	44.5	53.9	9.4	100	271	
Hori.	12060.000	AV	37.7	39.5	9.3	39.6	46.9	53.9	7.0	100	0	
Vert.	160.001	QP	23.1	15.2	8.6	31.8	15.1	43.5	28.4	100	152	
Vert.	280.001	QP	23.9	18.6	9.5	31.7	20.3	46.0	25.7	100	43	
Vert.	400.001	QP	34.3	16.2	7.1	31.7	25.9	46.0	20.1	100	222	
Vert.	960.001	QP	26.4	22.7	9.7	30.4	28.4	53.9	25.5	112	222	
Vert.	2339.809	PK	50.6	26.3	13.5	41.1	49.3	73.9	24.6	126	228	
Vert.	2390.000	PK	57.8	26.4	13.6	41.1	56.7	73.9	17.2	126	228	
Vert.	2484.270	PK	53.9	26.6	13.6	41.1	53.0	73.9	20.9	126	228	
Vert.	4824.000	PK	52.7	30.7	6.0	39.8	49.6	73.9	24.3	100	296	
Vert.	7236.000	PK	47.3	36.7	7.1	40.2	50.9	73.9	23.0	100	138	
Vert.	9648.000	PK	47.9	38.5	8.3	40.1	54.6	73.9	19.3	159	152	
Vert.	12060.000	PK	47.7	39.5	9.3	39.6	56.9	73.9	17.0	100	0	
Vert.	2339.809	AV	43.0	26.3	13.5	41.1	41.7	53.9	12.2	126	228	
Vert.	2390.000	AV	46.5	26.4	13.6	41.1	45.4	53.9	8.5	126	228	
Vert.	2484.270	AV	45.2	26.6	13.6	41.1	44.3	53.9	9.6	126	228	
Vert.	4824.000	AV	42.7	30.7	6.0	39.8	39.6	53.9	14.3	100	296	
Vert.	7236.000	AV	37.5	36.7	7.1	40.2	41.1	53.9	12.8	100	138	
Vert.	9648.000	AV	39.2	38.5	8.3	40.1	45.9	53.9	8.0	159	152	
Vert.	12060.000	AV	37.8	39.5	9.3	39.6	47.0	53.9	6.9	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

20dBc Data Sheet **(RBW 100kHz, VBW 300kHz)**

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	99.2	26.4	13.6	41.1	98.1	-	-	Carrier
Hori.	2400.000	PK	57.0	26.4	13.6	41.1	55.9	78.1	22.2	
Vert.	2412.000	PK	93.7	26.4	13.6	41.1	92.6	-	-	Carrier
Vert.	2400.000	PK	51.1	26.4	13.6	41.1	50.0	72.6	22.6	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	No.2 & No.3 Semi Anechoic Chamber	
Date	October 24, 2014	October 26, 2014
Temperature / Humidity	24 deg.C, 44 %RH	25 deg.C, 50 %RH
Engineer	Makoto Hosaka	Tatsuya Arai
Mode	Tx, 2437 MHz	
	Tx, IEEE802.11g	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2364.727	PK	56.0	26.3	13.5	41.1	54.7	73.9	19.2	100	214	
Hori.	2509.253	PK	52.4	26.6	13.6	41.0	51.6	73.9	22.3	100	214	
Hori.	4874.000	PK	52.3	30.9	6.0	39.7	49.5	73.9	24.4	100	171	
Hori.	7311.000	PK	45.8	36.8	7.1	40.3	49.4	73.9	24.5	100	0	
Hori.	9748.000	PK	47.0	38.6	8.1	40.0	53.7	73.9	20.2	100	274	
Hori.	12185.000	PK	46.8	39.4	9.4	39.8	55.8	73.9	18.1	100	0	
Hori.	2364.727	AV	47.7	26.3	13.5	41.1	46.4	53.9	**7.5**	100	214	
Hori.	2509.253	AV	44.8	26.6	13.6	41.0	44.0	53.9	9.9	100	214	
Hori.	4874.000	AV	41.3	30.9	6.0	39.7	38.5	53.9	15.4	100	171	
Hori.	7311.000	AV	36.5	36.8	7.1	40.3	40.1	53.9	13.8	100	0	
Hori.	9748.000	AV	38.0	38.6	8.1	40.0	44.7	53.9	9.2	100	274	
Hori.	12185.000	AV	36.9	39.4	9.4	39.8	45.9	53.9	8.0	100	0	
Vert.	2364.727	PK	53.1	26.3	13.5	41.1	51.8	73.9	22.1	100	227	
Vert.	2509.253	PK	53.3	26.6	13.6	41.0	52.5	73.9	21.4	100	227	
Vert.	4874.000	PK	50.7	30.9	6.0	39.7	47.9	73.9	26.0	100	206	
Vert.	7311.000	PK	47.4	36.8	7.1	40.3	51.0	73.9	22.9	100	154	
Vert.	9748.000	PK	46.9	38.6	8.1	40.0	53.6	73.9	20.3	127	201	
Vert.	12185.000	PK	45.8	39.4	9.4	39.8	54.8	73.9	19.1	100	0	
Vert.	2364.727	AV	44.1	26.3	13.5	41.1	42.8	53.9	11.1	100	227	
Vert.	2509.253	AV	46.1	26.6	13.6	41.0	45.3	53.9	8.6	100	227	
Vert.	4874.000	AV	41.4	30.9	6.0	39.7	38.6	53.9	15.3	100	206	
Vert.	7311.000	AV	36.4	36.8	7.1	40.3	40.0	53.9	13.9	100	154	
Vert.	9748.000	AV	38.4	38.6	8.1	40.0	45.1	53.9	8.8	127	201	
Vert.	12185.000	AV	36.9	39.4	9.4	39.8	45.9	53.9	8.0	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	No.2 & No.3 Semi Anechoic Chamber	
Date	October 24, 2014	October 26, 2014
Temperature / Humidity	24 deg.C, 44 %RH	25 deg.C, 50 %RH
Engineer	Makoto Hosaka	Tatsuya Arai
Mode	Tx, 2462 MHz	
	Tx, IEEE802.11g	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2389.970	PK	55.5	26.4	13.6	41.1	54.4	73.9	19.5	100	208	
Hori.	2483.500	PK	57.7	26.6	13.6	41.1	56.8	73.9	17.1	100	208	
Hori.	2533.956	PK	49.9	26.7	13.7	41.0	49.3	73.9	24.6	100	208	
Hori.	4924.000	PK	51.3	31.1	5.9	39.6	48.7	73.9	25.2	100	305	
Hori.	7386.000	PK	46.0	36.9	7.2	40.4	49.7	73.9	24.2	100	0	
Hori.	9848.000	PK	47.0	38.6	8.1	39.9	53.8	73.9	20.1	100	267	
Hori.	12310.000	PK	45.5	39.3	9.4	39.9	54.3	73.9	19.6	100	0	
Hori.	2389.970	AV	48.3	26.4	13.6	41.1	47.2	53.9	**6.7**	100	208	
Hori.	2483.500	AV	47.8	26.6	13.6	41.1	46.9	53.9	7.0	100	208	
Hori.	2533.956	AV	42.1	26.7	13.7	41.0	41.5	53.9	12.4	100	208	
Hori.	4924.000	AV	40.8	31.1	5.9	39.6	38.2	53.9	15.7	100	305	
Hori.	7386.000	AV	36.2	36.9	7.2	40.4	39.9	53.9	14.0	100	0	
Hori.	9848.000	AV	37.7	38.6	8.1	39.9	44.5	53.9	9.4	100	267	
Hori.	12310.000	AV	35.9	39.3	9.4	39.9	44.7	53.9	9.2	100	0	
Vert.	2389.970	PK	52.0	26.4	13.6	41.1	50.9	73.9	23.0	100	224	
Vert.	2483.500	PK	57.7	26.6	13.6	41.1	56.8	73.9	17.1	100	224	
Vert.	2533.956	PK	51.8	26.7	13.7	41.0	51.2	73.9	22.7	100	224	
Vert.	4924.000	PK	51.4	31.1	5.9	39.6	48.8	73.9	25.1	110	208	
Vert.	7386.000	PK	46.3	36.9	7.2	40.4	50.0	73.9	23.9	100	108	
Vert.	9848.000	PK	46.6	38.6	8.1	39.9	53.4	73.9	20.5	145	234	
Vert.	12310.000	PK	45.5	39.3	9.4	39.9	54.3	73.9	19.6	100	0	
Vert.	2389.970	AV	44.2	26.4	13.6	41.1	43.1	53.9	10.8	100	224	
Vert.	2483.500	AV	44.6	26.6	13.6	41.1	43.7	53.9	10.2	100	224	
Vert.	2533.956	AV	43.0	26.7	13.7	41.0	42.4	53.9	11.5	100	224	
Vert.	4924.000	AV	41.3	31.1	5.9	39.6	38.7	53.9	15.2	110	208	
Vert.	7386.000	AV	36.4	36.9	7.2	40.4	40.1	53.9	13.8	100	108	
Vert.	9848.000	AV	38.0	38.6	8.1	39.9	44.8	53.9	9.1	145	234	
Vert.	12310.000	AV	36.2	39.3	9.4	39.9	45.0	53.9	8.9	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	No.2 & No.3 Semi Anechoic Chamber	
Date	October 24, 2014	October 26, 2014
Temperature / Humidity	24 deg.C, 44 %RH	25 deg.C, 50 %RH
Engineer	Makoto Hosaka	Tatsuya Arai
Mode	Tx, 2412 MHz	
	Tx, IEEE802.11n HT20	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2340.436	PK	56.4	26.3	13.5	41.1	55.1	73.9	18.8	100	207	
Hori.	2390.000	PK	66.3	26.4	13.6	41.1	65.2	73.9	8.7	100	207	
Hori.	2483.713	PK	56.5	26.6	13.6	41.1	55.6	73.9	18.3	100	207	
Hori.	4824.000	PK	54.0	30.7	6.0	39.8	50.9	73.9	23.0	100	129	
Hori.	7236.000	PK	48.3	36.7	7.1	40.2	51.9	73.9	22.0	100	211	
Hori.	9648.000	PK	47.9	38.5	8.3	40.1	54.6	73.9	19.3	100	268	
Hori.	12060.000	PK	47.4	39.5	9.3	39.6	56.6	73.9	17.3	100	0	
Hori.	2340.436	AV	50.0	26.3	13.5	41.1	48.7	53.9	5.2	100	207	
Hori.	2390.000	AV	54.4	26.4	13.6	41.1	53.3	53.9	**0.6**	100	207	
Hori.	2483.713	AV	49.9	26.6	13.6	41.1	49.0	53.9	4.9	100	207	
Hori.	4824.000	AV	43.3	30.7	6.0	39.8	40.2	53.9	13.7	100	129	
Hori.	7236.000	AV	37.9	36.7	7.1	40.2	41.5	53.9	12.4	100	211	
Hori.	9648.000	AV	38.0	38.5	8.3	40.1	44.7	53.9	9.2	100	268	
Hori.	12060.000	AV	38.0	39.5	9.3	39.6	47.2	53.9	6.7	100	0	
Vert.	2340.436	PK	50.3	26.3	13.5	41.1	49.0	73.9	24.9	100	328	
Vert.	2390.000	PK	57.9	26.4	13.6	41.1	56.8	73.9	17.1	100	328	
Vert.	2483.713	PK	54.0	26.6	13.6	41.1	53.1	73.9	20.8	100	328	
Vert.	4824.000	PK	53.1	30.7	6.0	39.8	50.0	73.9	23.9	100	298	
Vert.	7236.000	PK	47.9	36.7	7.1	40.2	51.5	73.9	22.4	100	137	
Vert.	9648.000	PK	47.5	38.5	8.3	40.1	54.2	73.9	19.7	171	222	
Vert.	12060.000	PK	47.1	39.5	9.3	39.6	56.3	73.9	17.6	100	0	
Vert.	2340.436	AV	42.3	26.3	13.5	41.1	41.0	53.9	12.9	100	328	
Vert.	2390.000	AV	46.4	26.4	13.6	41.1	45.3	53.9	8.6	100	328	
Vert.	2483.713	AV	46.2	26.6	13.6	41.1	45.3	53.9	8.6	100	328	
Vert.	4824.000	AV	42.8	30.7	6.0	39.8	39.7	53.9	14.2	100	298	
Vert.	7236.000	AV	37.4	36.7	7.1	40.2	41.0	53.9	12.9	100	137	
Vert.	9648.000	AV	38.2	38.5	8.3	40.1	44.9	53.9	9.0	171	222	
Vert.	12060.000	AV	37.5	39.5	9.3	39.6	46.7	53.9	7.2	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

20dBc Data Sheet **(RBW 100kHz, VBW 300kHz)**

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	97.2	26.4	13.6	41.1	96.1	-	-	Carrier
Hori.	2400.000	PK	58.1	26.4	13.6	41.1	57.0	76.1	19.1	
Vert.	2412.000	PK	90.3	26.4	13.6	41.1	89.2	-	-	Carrier
Vert.	2400.000	PK	50.8	26.4	13.6	41.1	49.7	69.2	19.5	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	No.2 & No.3 Semi Anechoic Chamber	
Date	October 24, 2014	October 26, 2014
Temperature / Humidity	24 deg.C, 44 %RH	25 deg.C, 50 %RH
Engineer	Makoto Hosaka	Tatsuya Arai
Mode	Tx, 2437 MHz	
	Tx, IEEE802.11n HT20	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2365.339	PK	55.7	26.3	13.5	41.1	54.4	73.9	19.5	100	211	
Hori.	2508.771	PK	52.1	26.6	13.6	41.0	51.3	73.9	22.6	100	211	
Hori.	4874.000	PK	53.5	30.9	6.0	39.7	50.7	73.9	23.2	100	171	
Hori.	7311.000	PK	46.1	36.8	7.1	40.3	49.7	73.9	24.2	100	0	
Hori.	9748.000	PK	47.1	38.6	8.1	40.0	53.8	73.9	20.1	100	193	
Hori.	12185.000	PK	46.6	39.4	9.4	39.8	55.6	73.9	18.3	100	0	
Hori.	2365.339	AV	48.6	26.3	13.5	41.1	47.3	53.9	**6.6**	100	211	
Hori.	2508.771	AV	45.2	26.6	13.6	41.0	44.4	53.9	9.5	100	211	
Hori.	4874.000	AV	41.3	30.9	6.0	39.7	38.5	53.9	15.4	100	171	
Hori.	7311.000	AV	36.6	36.8	7.1	40.3	40.2	53.9	13.7	100	0	
Hori.	9748.000	AV	37.9	38.6	8.1	40.0	44.6	53.9	9.3	100	193	
Hori.	12185.000	AV	36.9	39.4	9.4	39.8	45.9	53.9	8.0	100	0	
Vert.	2365.339	PK	51.8	26.3	13.5	41.1	50.5	73.9	23.4	100	227	
Vert.	2508.771	PK	53.4	26.6	13.6	41.0	52.6	73.9	21.3	100	227	
Vert.	4874.000	PK	52.0	30.9	6.0	39.7	49.2	73.9	24.7	100	205	
Vert.	7311.000	PK	46.0	36.8	7.1	40.3	49.6	73.9	24.3	100	80	
Vert.	9748.000	PK	47.0	38.6	8.1	40.0	53.7	73.9	20.2	137	225	
Vert.	12185.000	PK	46.5	39.4	9.4	39.8	55.5	73.9	18.4	100	0	
Vert.	2365.339	AV	44.2	26.3	13.5	41.1	42.9	53.9	11.0	100	227	
Vert.	2508.771	AV	45.9	26.6	13.6	41.0	45.1	53.9	8.8	100	227	
Vert.	4874.000	AV	40.9	30.9	6.0	39.7	38.1	53.9	15.8	100	205	
Vert.	7311.000	AV	36.5	36.8	7.1	40.3	40.1	53.9	13.8	100	80	
Vert.	9748.000	AV	38.2	38.6	8.1	40.0	44.9	53.9	9.0	137	225	
Vert.	12185.000	AV	37.4	39.4	9.4	39.8	46.4	53.9	7.5	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	No.2 & No.3 Semi Anechoic Chamber	
Date	October 24, 2014	October 26, 2014
Temperature / Humidity	24 deg.C, 44 %RH	25 deg.C, 50 %RH
Engineer	Makoto Hosaka	Tatsuya Arai
Mode	Tx, 2462 MHz	
	Tx, IEEE802.11n HT20	

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.405	PK	55.3	26.4	13.6	41.1	54.2	73.9	19.7	100	209	
Hori.	2483.500	PK	58.7	26.6	13.6	41.1	57.8	73.9	16.1	100	209	
Hori.	2533.671	PK	50.7	26.6	13.7	41.0	50.0	73.9	23.9	100	209	
Hori.	4924.000	PK	50.2	31.1	5.9	39.6	47.6	73.9	26.3	100	305	
Hori.	7386.000	PK	45.4	36.9	7.2	40.4	49.1	73.9	24.8	100	0	
Hori.	9848.000	PK	46.6	38.6	8.1	39.9	53.4	73.9	20.5	100	268	
Hori.	12310.000	PK	45.7	39.3	9.4	39.9	54.5	73.9	19.4	100	0	
Hori.	2390.405	AV	49.0	26.4	13.6	41.1	47.9	53.9	**6.0**	100	209	
Hori.	2483.500	AV	47.3	26.6	13.6	41.1	46.4	53.9	7.5	100	209	
Hori.	2533.671	AV	42.9	26.6	13.7	41.0	42.2	53.9	11.7	100	209	
Hori.	4924.000	AV	39.9	31.1	5.9	39.6	37.3	53.9	16.6	100	305	
Hori.	7386.000	AV	36.4	36.9	7.2	40.4	40.1	53.9	13.8	100	0	
Hori.	9848.000	AV	37.4	38.6	8.1	39.9	44.2	53.9	9.7	100	268	
Hori.	12310.000	AV	35.8	39.3	9.4	39.9	44.6	53.9	9.3	100	0	
Vert.	2390.405	PK	52.0	26.4	13.6	41.1	50.9	73.9	23.0	100	226	
Vert.	2483.500	PK	58.2	26.6	13.6	41.1	57.3	73.9	16.6	100	226	
Vert.	2533.671	PK	51.5	26.6	13.7	41.0	50.8	73.9	23.1	100	226	
Vert.	4924.000	PK	50.0	31.1	5.9	39.6	47.4	73.9	26.5	100	254	
Vert.	7386.000	PK	45.6	36.9	7.2	40.4	49.3	73.9	24.6	100	121	
Vert.	9848.000	PK	46.3	38.6	8.1	39.9	53.1	73.9	20.8	149	230	
Vert.	12310.000	PK	45.8	39.3	9.4	39.9	54.6	73.9	19.3	100	0	
Vert.	2390.405	AV	44.6	26.4	13.6	41.1	43.5	53.9	10.4	100	226	
Vert.	2483.500	AV	46.2	26.6	13.6	41.1	45.3	53.9	8.6	100	226	
Vert.	2533.671	AV	44.3	26.6	13.7	41.0	43.6	53.9	10.3	100	226	
Vert.	4924.000	AV	40.3	31.1	5.9	39.6	37.7	53.9	16.2	100	254	
Vert.	7386.000	AV	35.7	36.9	7.2	40.4	39.4	53.9	14.5	100	121	
Vert.	9848.000	AV	38.0	38.6	8.1	39.9	44.8	53.9	9.1	149	230	
Vert.	12310.000	AV	35.8	39.3	9.4	39.9	44.6	53.9	9.3	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	No.2 & No.3 Semi Anechoic Chamber		
Date	October 21, 2014	October 22, 2014	October 29, 2014
Temperature / Humidity	26 deg.C, 50 %RH	24 deg.C, 54 %RH	24 deg.C, 38 %RH
Engineer	Hikaru Shirasawa	Kenichi Adachi	Shinichi Takano
Mode	Tx, 2402 MHz		
	Tx, Bluetooth Low Energy		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	240.001	QP	27.4	17.0	9.2	31.7	21.9	46.0	24.1	137	60	
Hori.	320.001	QP	32.8	14.3	6.6	31.7	22.0	46.0	24.0	100	145	
Hori.	360.001	QP	31.9	15.2	6.9	31.7	22.3	46.0	23.7	100	132	
Hori.	400.001	QP	35.2	16.2	7.1	31.7	26.8	46.0	19.2	100	171	
Hori.	640.001	QP	25.9	19.5	8.3	31.7	22.0	46.0	24.0	149	282	
Hori.	960.002	QP	32.7	22.7	9.7	30.4	34.7	53.9	19.2	100	200	
Hori.	2390.000	PK	53.5	26.4	13.6	41.1	52.4	73.9	21.5	100	331	
Hori.	4804.000	PK	44.7	30.6	6.0	39.8	41.5	73.9	32.4	100	113	
Hori.	7206.000	PK	52.1	36.6	7.1	40.2	55.6	73.9	18.3	103	249	
Hori.	9608.000	PK	48.4	38.5	8.2	40.1	55.0	73.9	18.9	147	51	
Hori.	12010.000	PK	46.5	39.5	9.3	39.6	55.7	73.9	18.2	100	109	
Hori.	2390.000	AV	37.2	26.4	13.6	41.1	36.1	53.9	17.8	100	331	*1
Vert.	160.001	QP	24.6	15.2	8.6	31.8	16.6	43.5	26.9	100	0	
Vert.	240.001	QP	25.5	17.0	9.2	31.7	20.0	46.0	26.0	100	74	
Vert.	400.001	QP	33.4	16.2	7.1	31.7	25.0	46.0	21.0	100	228	
Vert.	960.002	QP	29.0	22.7	9.7	30.4	31.0	53.9	22.9	100	222	
Vert.	2390.000	PK	47.4	26.4	13.6	41.1	46.3	73.9	27.6	100	62	
Vert.	4804.000	PK	45.4	30.6	6.0	39.8	42.2	73.9	31.7	100	211	
Vert.	7206.000	PK	56.4	36.6	7.1	40.2	59.9	73.9	**14.0**	158	101	
Vert.	9608.000	PK	47.5	38.5	8.2	40.1	54.1	73.9	19.8	100	209	
Vert.	12010.000	PK	45.6	39.5	9.3	39.6	54.8	73.9	19.1	100	132	
Vert.	2390.000	AV	36.8	26.4	13.6	41.1	35.7	53.9	18.2	100	62	*1

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB
*1) Out of Band emission (Leakage Power)

Average measurement value with duty factor

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.	4804.000	AV	33.1	30.6	6.0	39.8	4.8	34.7	53.9	19.2	
Hori.	7206.000	AV	39.5	36.6	7.1	40.2	4.8	47.8	53.9	6.1	
Hori.	9608.000	AV	36.5	38.5	8.2	40.1	4.8	47.9	53.9	6.0	
Hori.	12010.000	AV	34.9	39.5	9.3	39.6	4.8	48.9	53.9	5.0	
Vert.	4804.000	AV	32.9	30.6	6.0	39.8	4.8	34.5	53.9	19.4	
Vert.	7206.000	AV	41.1	36.6	7.1	40.2	4.8	49.4	53.9	**4.5**	
Vert.	9608.000	AV	34.6	38.5	8.2	40.1	4.8	46.0	53.9	7.9	
Vert.	12010.000	AV	34.1	39.5	9.3	39.6	4.8	48.1	53.9	5.8	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier) + Duty factor
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

20dBc Data Sheet **(RBW 100kHz, VBW 300kHz)**

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.000	PK	92.7	26.4	13.6	41.1	91.6	-	-	Carrier
Hori.	2400.000	PK	54.0	26.4	13.6	41.1	52.9	71.6	18.7	
Vert.	2402.000	PK	80.0	26.4	13.6	41.1	78.9	-	-	Carrier
Vert.	2400.000	PK	43.3	26.4	13.6	41.1	42.2	58.9	16.7	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	No.2 & No.3 Semi Anechoic Chamber		
Date	October 21, 2014	October 22, 2014	October 27, 2014
Temperature / Humidity	26 deg.C, 50 %RH	24 deg.C, 54 %RH	23 deg.C, 61 %RH
Engineer	Hikaru Shirasawa	Kenichi Adachi	Shinichi Takano
Mode	Tx, 2440 MHz		
	Tx, Bluetooth Low Energy		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	240.001	QP	27.5	17.0	9.2	31.7	22.0	46.0	24.0	141	56	
Hori.	320.001	QP	32.4	14.3	6.6	31.7	21.6	46.0	24.4	100	149	
Hori.	400.001	QP	35.0	16.2	7.1	31.7	26.6	46.0	19.4	100	166	
Hori.	960.001	QP	32.4	22.7	9.7	30.4	34.4	53.9	19.5	100	199	
Hori.	4880.000	PK	44.3	30.9	6.0	39.7	41.5	73.9	32.4	190	156	
Hori.	7320.000	PK	51.4	36.8	7.1	40.3	55.0	73.9	18.9	100	285	
Hori.	9760.000	PK	47.6	38.6	8.1	40.0	54.3	73.9	19.6	121	358	
Hori.	12200.000	PK	45.6	39.4	9.4	39.8	54.6	73.9	19.3	100	140	
Vert.	160.001	QP	24.5	15.2	8.6	31.8	16.5	43.5	27.0	100	0	
Vert.	240.001	QP	25.4	17.0	9.2	31.7	19.9	46.0	26.1	100	79	
Vert.	400.001	QP	33.2	16.2	7.1	31.7	24.8	46.0	21.2	100	218	
Vert.	960.001	QP	29.1	22.7	9.7	30.4	31.1	53.9	22.8	100	224	
Vert.	4880.000	PK	44.9	30.9	6.0	39.7	42.1	73.9	31.8	142	246	
Vert.	7320.000	PK	55.5	36.8	7.1	40.3	59.1	73.9	**14.8**	170	123	
Vert.	9760.000	PK	48.9	38.6	8.1	40.0	55.6	73.9	18.3	181	135	
Vert.	12200.000	PK	45.6	39.4	9.4	39.8	54.6	73.9	19.3	100	149	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

Average measurement value with duty factor

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.	4880.000	AV	33.5	30.9	6.0	39.7	4.8	35.5	53.9	18.4	
Hori.	7320.000	AV	40.1	36.8	7.1	40.3	4.8	48.5	53.9	5.4	
Hori.	9760.000	AV	36.5	38.6	8.1	40.0	4.8	48.0	53.9	5.9	
Hori.	12200.000	AV	33.6	39.4	9.4	39.8	4.8	47.4	53.9	6.5	
Vert.	4880.000	AV	32.7	30.9	6.0	39.7	4.8	34.7	53.9	19.2	
Vert.	7320.000	AV	45.0	36.8	7.1	40.3	4.8	53.4	53.9	**0.5**	
Vert.	9760.000	AV	37.5	38.6	8.1	40.0	4.8	49.0	53.9	4.9	
Vert.	12200.000	AV	34.5	39.4	9.4	39.8	4.8	48.3	53.9	5.6	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier) + Duty factor
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	No.2 & No.3 Semi Anechoic Chamber		
Date	October 21, 2014	October 22, 2014	October 27, 2014
Temperature / Humidity	26 deg.C, 50 %RH	24 deg.C, 54 %RH	23 deg.C, 61 %RH
Engineer	Hikaru Shirasawa	Kenichi Adachi	Shinichi Takano
Mode	Tx, 2480 MHz		
	Tx, Bluetooth Low Energy		

(* PK: Peak, AV: Average, QP: Quasi-Peak)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	240.001	QP	27.8	17.0	9.2	31.7	22.3	46.0	23.7	139	68	
Hori.	320.001	QP	31.8	14.3	6.6	31.7	21.0	46.0	25.0	100	152	
Hori.	360.001	QP	31.7	15.2	6.9	31.7	22.1	46.0	23.9	100	135	
Hori.	400.001	QP	35.5	16.2	7.1	31.7	27.1	46.0	18.9	100	153	
Hori.	960.002	QP	31.4	22.7	9.7	30.4	33.4	53.9	20.5	100	203	
Hori.	2483.500	PK	51.9	26.6	13.6	41.1	51.0	73.9	22.9	100	38	
Hori.	4960.000	PK	46.2	31.2	6.0	39.6	43.8	73.9	30.1	100	133	
Hori.	7440.000	PK	52.3	37.0	7.2	40.4	56.1	73.9	17.8	129	76	
Hori.	9920.000	PK	47.8	38.6	8.1	39.9	54.6	73.9	19.3	116	18	
Hori.	12400.000	PK	46.6	39.3	9.4	40.0	55.3	73.9	18.6	100	94	
Hori.	2483.500	AV	37.1	26.6	13.6	41.1	36.2	53.9	17.7	100	38	*1
Vert.	160.001	QP	24.4	15.2	8.6	31.8	16.4	43.5	27.1	100	0	
Vert.	240.001	QP	25.6	17.0	9.2	31.7	20.1	46.0	25.9	100	89	
Vert.	400.001	QP	33.3	16.2	7.1	31.7	24.9	46.0	21.1	100	211	
Vert.	960.002	QP	28.9	22.7	9.7	30.4	30.9	53.9	23.0	100	226	
Vert.	2483.500	PK	47.9	26.6	13.6	41.1	47.0	73.9	26.9	100	256	
Vert.	4960.000	PK	46.6	31.2	6.0	39.6	44.2	73.9	29.7	152	85	
Vert.	7440.000	PK	54.3	37.0	7.2	40.4	58.1	73.9	**15.8**	100	34	
Vert.	9920.000	PK	49.7	38.6	8.1	39.9	56.5	73.9	17.4	100	184	
Vert.	12400.000	PK	45.6	39.3	9.4	40.0	54.3	73.9	19.6	100	63	
Vert.	2483.500	AV	35.7	26.6	13.6	41.1	34.8	53.9	19.1	100	256	*1

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB
*1) Out of Band emission (Leakage Power)

Average measurement value with duty factor

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.	4960.000	AV	33.0	31.2	6.0	39.6	4.8	35.4	53.9	18.5	
Hori.	7440.000	AV	37.6	37.0	7.2	40.4	4.8	46.2	53.9	7.7	
Hori.	9920.000	AV	34.2	38.6	8.1	39.9	4.8	45.8	53.9	8.1	
Hori.	12400.000	AV	32.4	39.3	9.4	40.0	4.8	45.9	53.9	8.0	
Vert.	4960.000	AV	32.8	31.2	6.0	39.6	4.8	35.2	53.9	18.7	
Vert.	7440.000	AV	41.3	37.0	7.2	40.4	4.8	49.9	53.9	4.0	
Vert.	9920.000	AV	38.6	38.6	8.1	39.9	4.8	50.2	53.9	**3.7**	
Vert.	12400.000	AV	32.4	39.3	9.4	40.0	4.8	45.9	53.9	8.0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier) + Duty factor
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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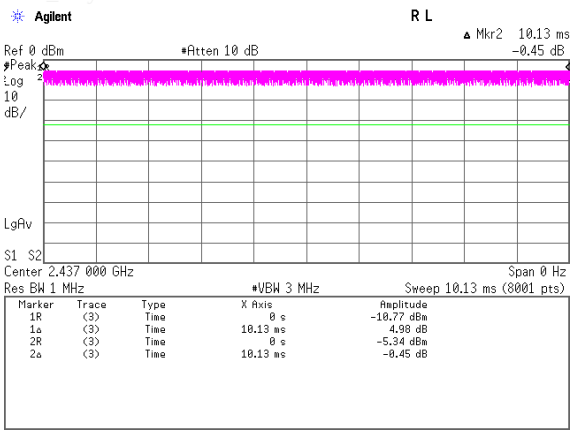
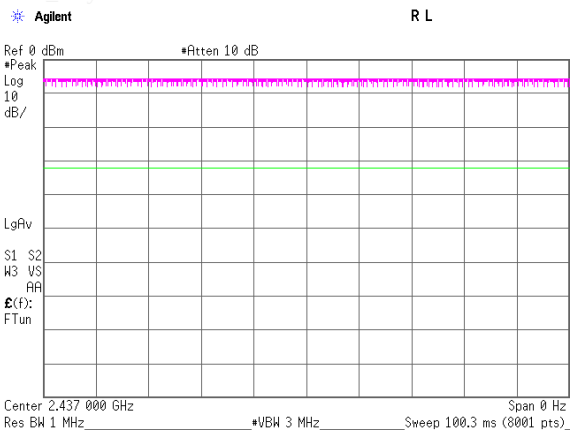
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	

Burst rate confirmation

Tx, IEEE802.11b, power setting 12dBm, PN9, worst data mode 2Mbps

duty cycle = 0.0101333 / 0.0101333 = 1 (100%)	
Tx2_duty1	Tx2_duty2





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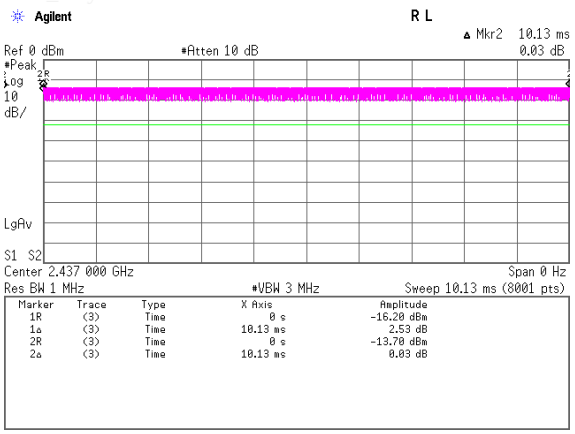
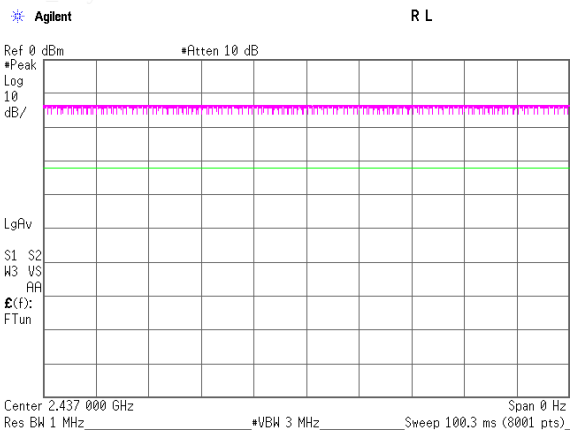
Engineer	Akio Hayashi	

Burst rate confirmation

Tx, IEEE802.11b, power setting 4dBm, PN9, worst data mode 2Mbps

duty cycle = 0.0101333 / 0.0101333 = 1 (100%)	
	

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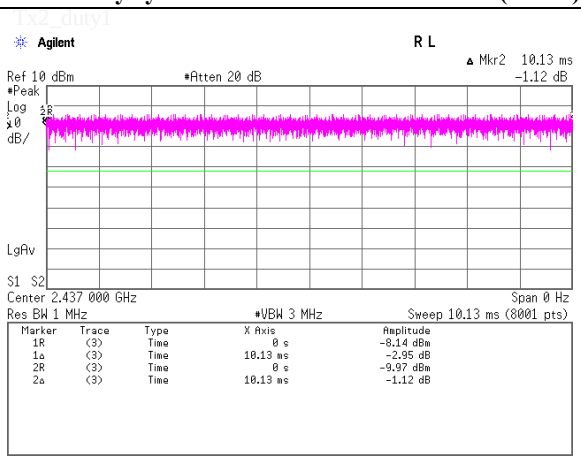
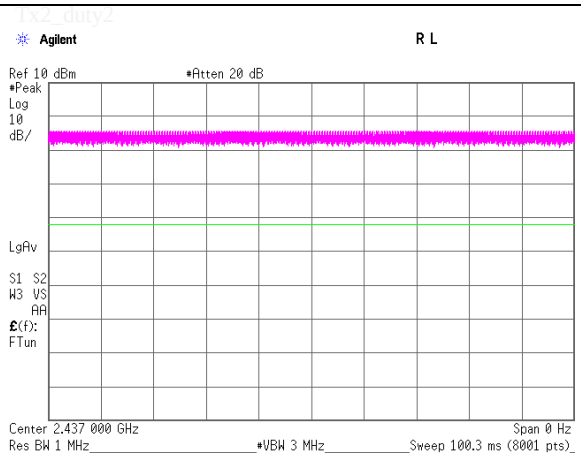
Test place	UL Japan, Inc. Shonan EMC Lab. No.1 Measurement Room
Date	October 16, 2014
Temperature / Humidity	25deg.C , 49%RH
Engineer	Akio Hayashi

Burst rate confirmation

Tx, IEEE802.11g, power setting 12dBm, PN9, worst data mode 48Mbps

duty cycle = 0.0101333 / 0.0101333 = 1 (100%)	
	

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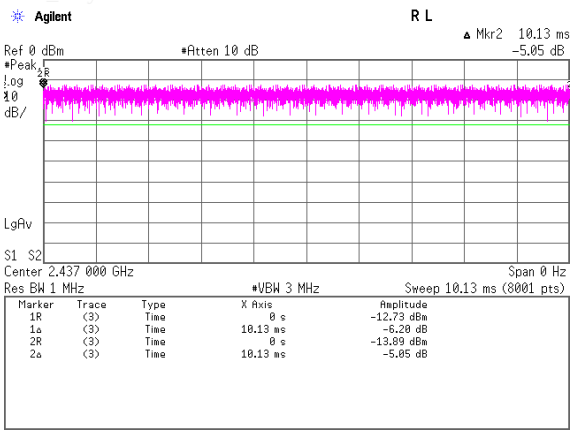
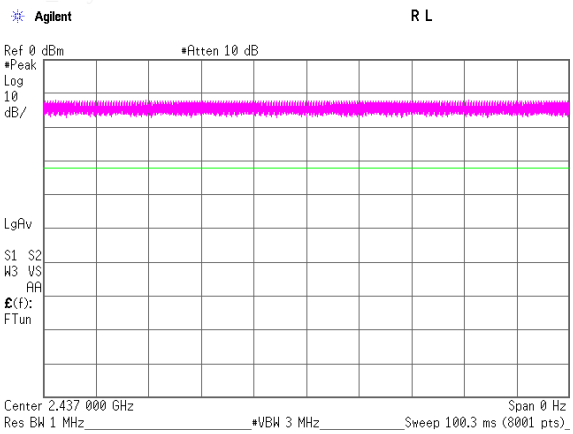
Engineer	Akio Hayashi	

Burst rate confirmation

Tx, IEEE802.11g, power setting 4dBm, PN9, worst data mode 48Mbps

duty cycle = 0.0101333 / 0.0101333 = 1 (100%)	
	

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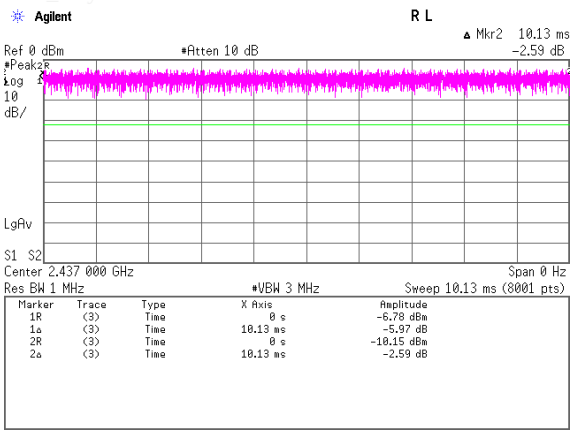
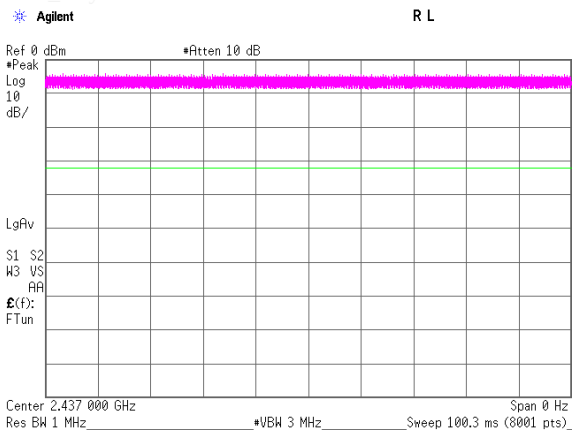
Engineer	Akio Hayashi	

Burst rate confirmation

Tx, IEEE802.11n HT20, power setting 12dBm, PN9, worst data mode 5(MCS)

duty cycle = 0.0101333 / 0.0101333 = 1 (100%)	
Tx2_duty1  	Tx2_duty2 

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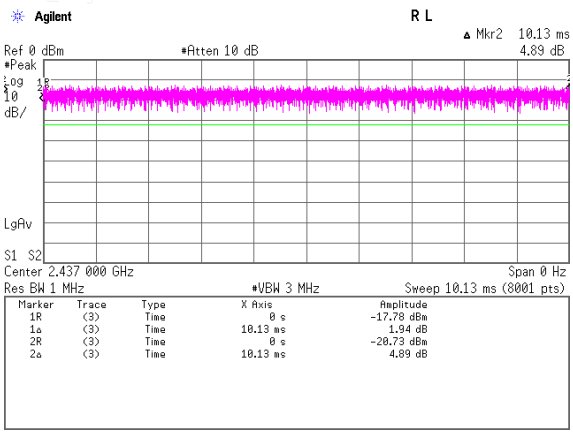
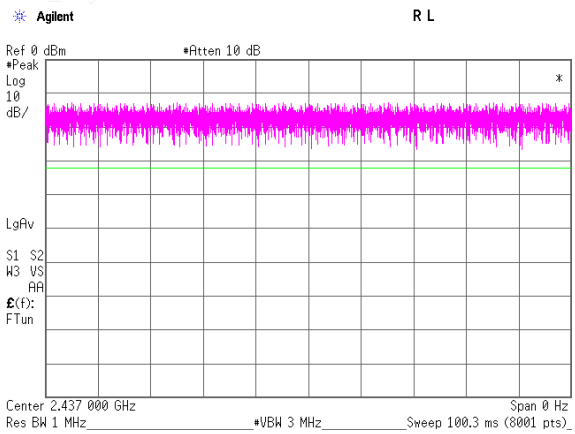
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	

Burst rate confirmation

Tx, IEEE802.11n HT20, power setting 4dBm, PN9, worst data mode 5(MCS)

duty cycle = 0.0101333 / 0.0101333 = 1 (100%)	
	

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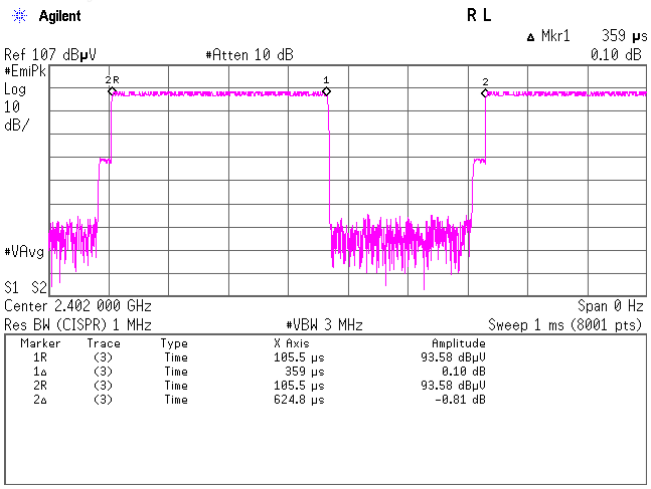
Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	October 24, 2014	
Temperature / Humidity	24deg.C , 55%RH	
Engineer	Tatsuya Arai	

Duty Factor Calculation chart

Tx, Bluetooth, Low Energy, PN9

Duty Factor Calculation	
Duty Factor: 20log (1/duty cycle) = 4.8dB	
duty cycle = 0.000359 / 0.0006248 = 0.575 (58%)	
	

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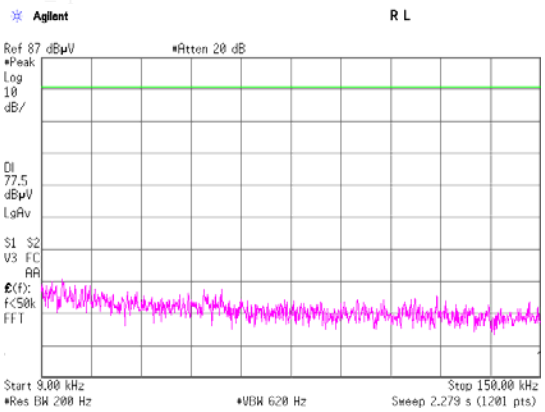
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	

Spurious emission (Conducted)

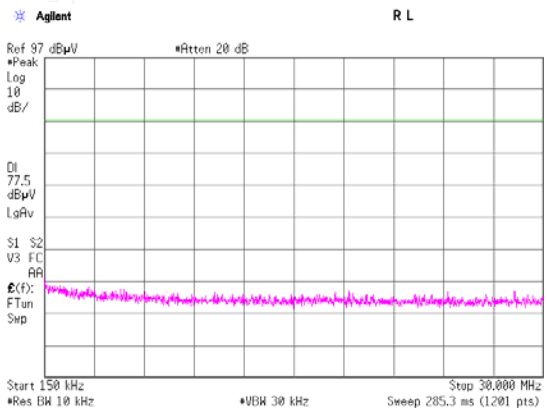
Tx, IEEE802.11b, power setting 12dBm, PN9, worst data mode 2Mbps

Tx, 2412MHz (below 30MHz)

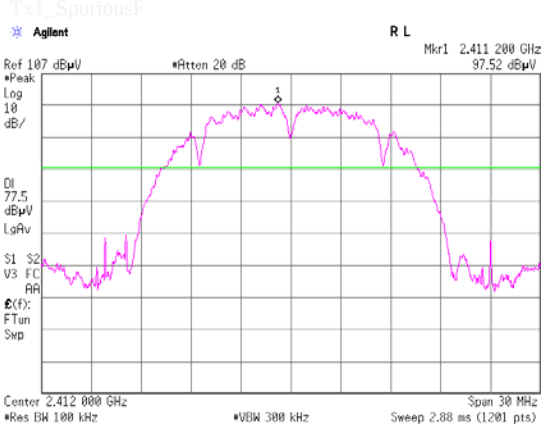
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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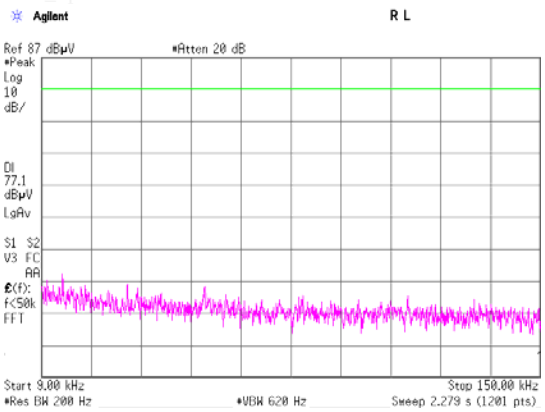
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	

Spurious emission (Conducted)

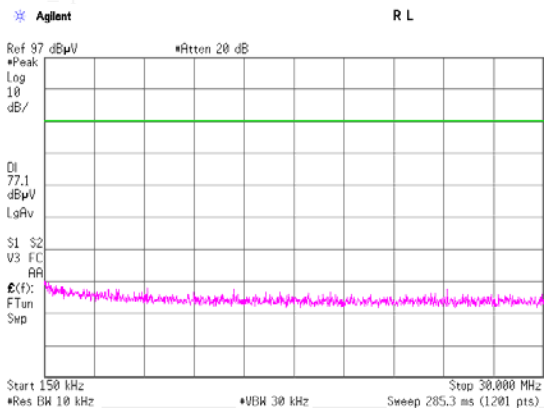
Tx, IEEE802.11b, power setting 12dBm, PN9, worst data mode 2Mbps

Tx, 2437MHz (below 30MHz)

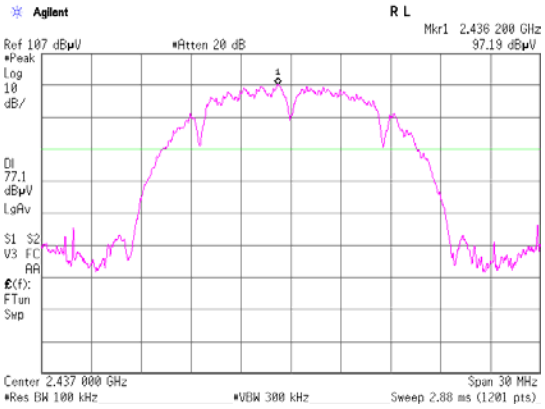
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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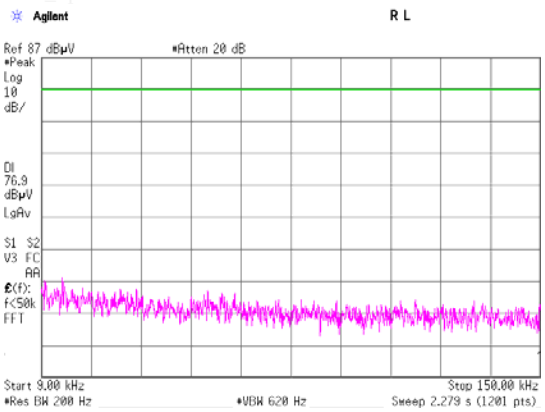
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	

Spurious emission (Conducted)

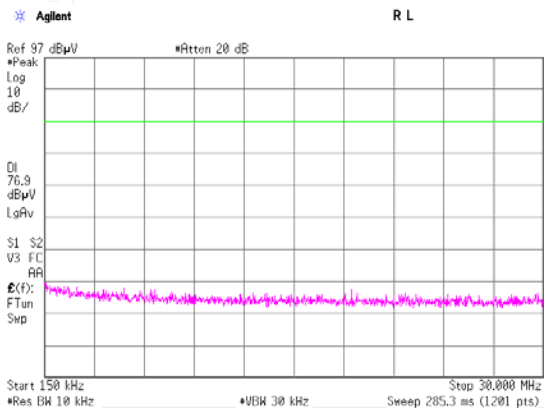
Tx, IEEE802.11b, power setting 12dBm, PN9, worst data mode 2Mbps

Tx, 2462MHz (below 30MHz)

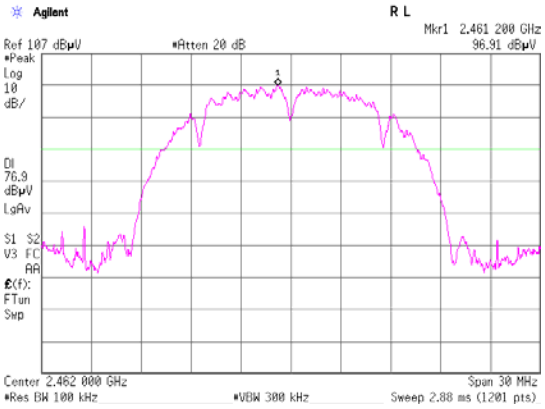
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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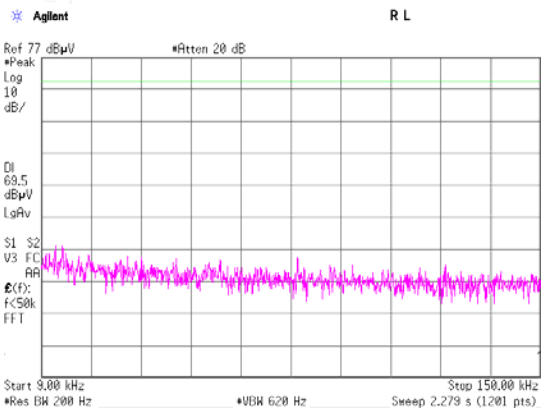
Engineer	Akio Hayashi	

Spurious emission (Conducted)

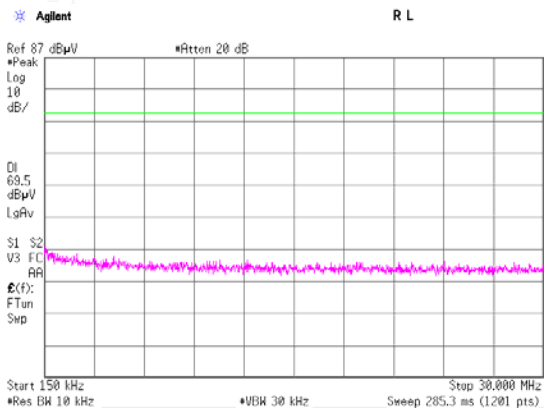
Tx, IEEE802.11b, power setting 4dBm, PN9, worst data mode 2Mbps

Tx, 2412MHz (below 30MHz)

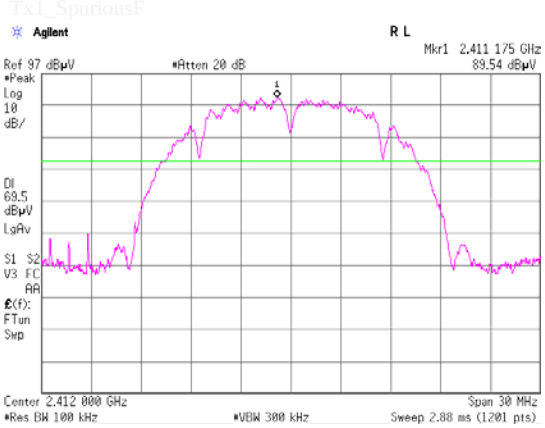
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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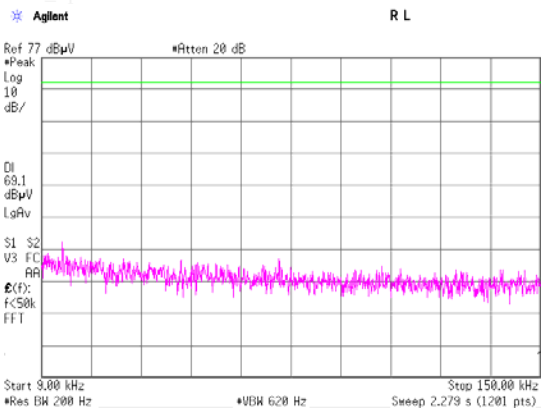
Engineer	Akio Hayashi	

Spurious emission (Conducted)

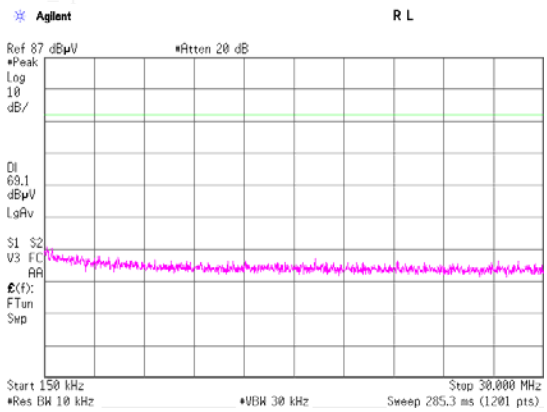
Tx, IEEE802.11b, power setting 4dBm, PN9, worst data mode 2Mbps

Tx, 2437MHz (below 30MHz)

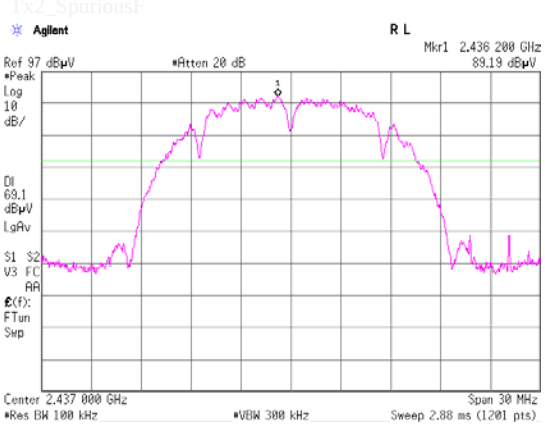
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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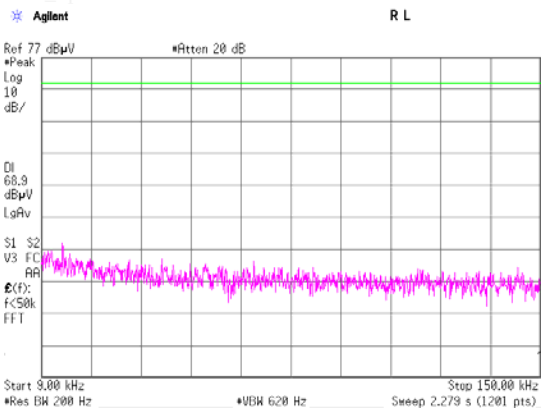
Spurious emission (Conducted)

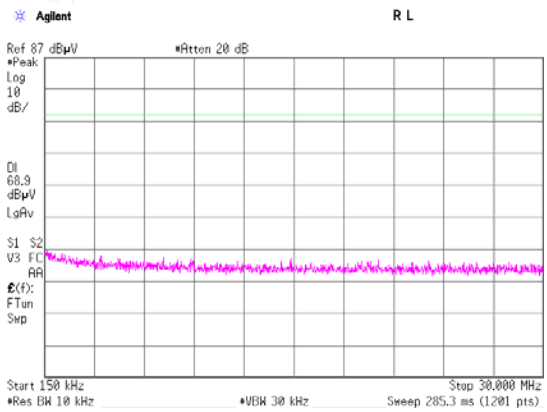
Tx, IEEE802.11b, power setting 4dBm, PN9, worst data mode 2Mbps

Tx, 2462MHz (below 30MHz)

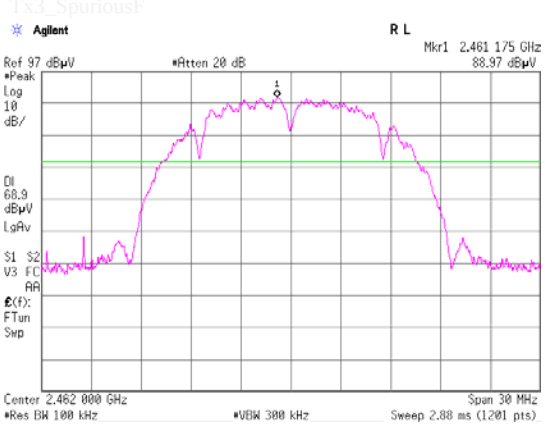
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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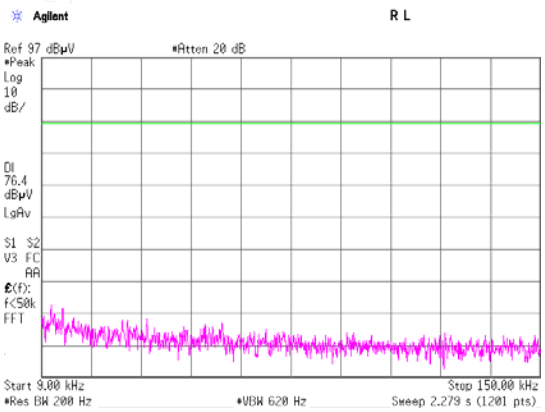
Engineer	Akio Hayashi	

Spurious emission (Conducted)

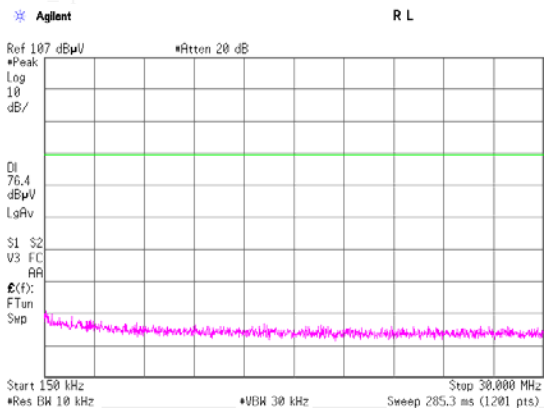
Tx, IEEE802.11g, power setting 12dBm, PN9, worst data mode 48Mbps

Tx, 2412MHz (below 30MHz)

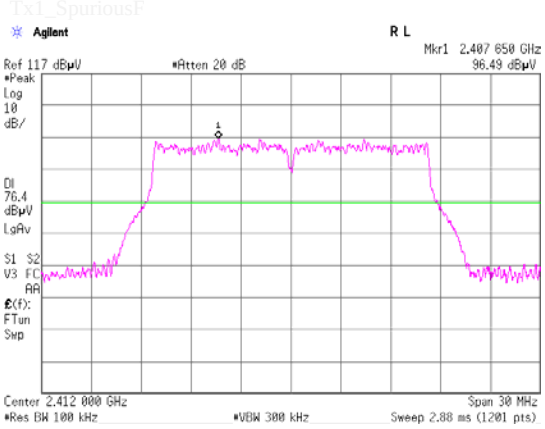
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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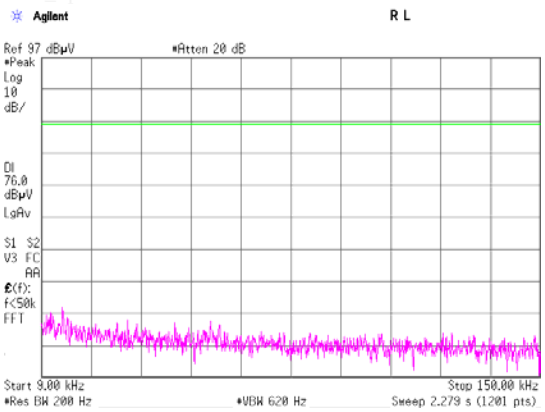
Spurious emission (Conducted)

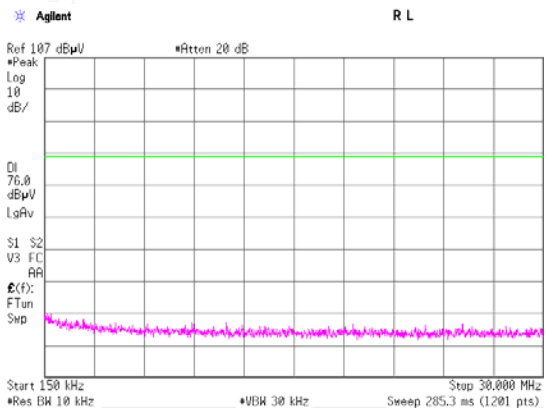
Tx, IEEE802.11g, power setting 12dBm, PN9, worst data mode 48Mbps

Tx, 2437MHz (below 30MHz)

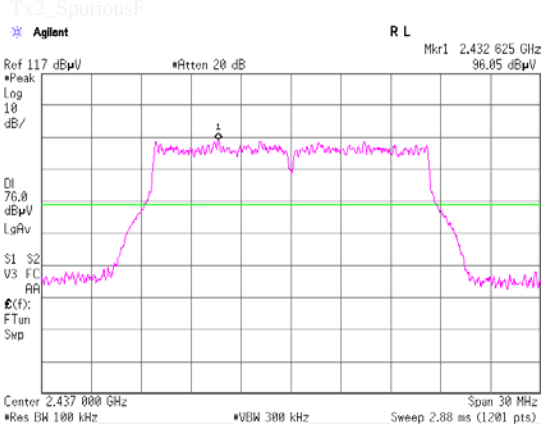
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN
Telephone : +81 463 50 6400
Facsimile : +81 463 50 6401

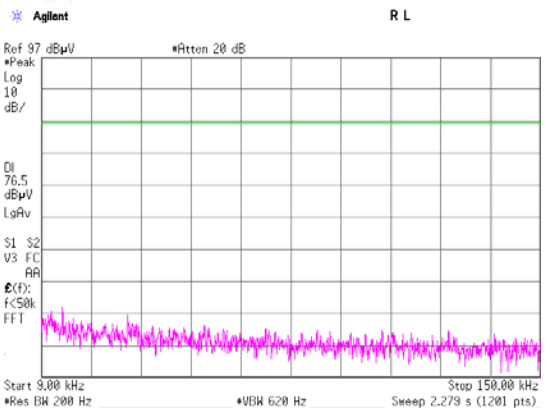
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	

Spurious emission (Conducted)

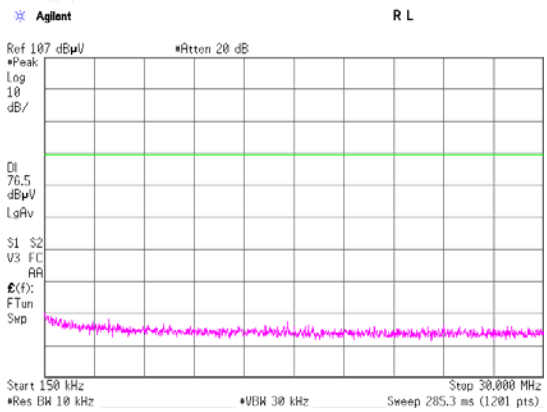
Tx, IEEE802.11g, power setting 12dBm, PN9, worst data mode 48Mbps

Tx, 2462MHz (below 30MHz)

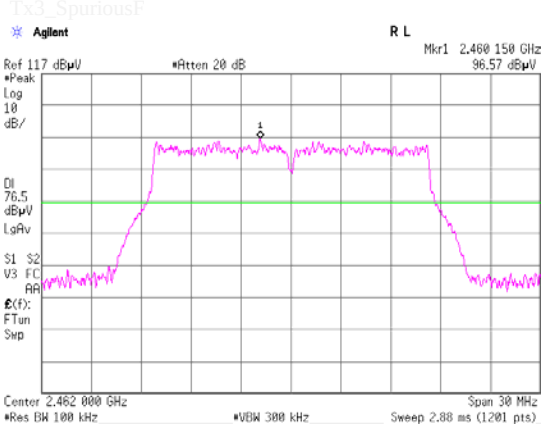
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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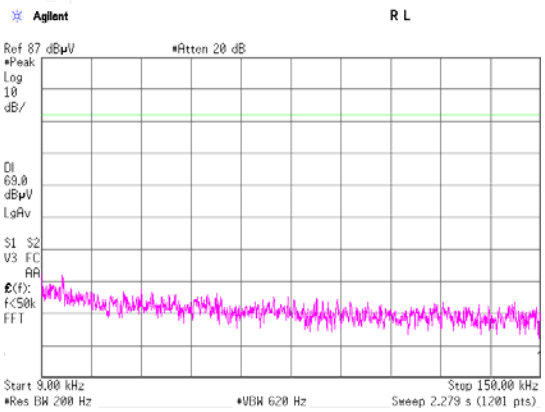
Engineer	Akio Hayashi	

Spurious emission (Conducted)

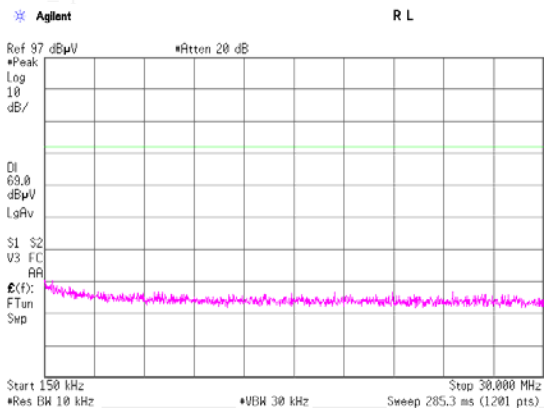
Tx, IEEE802.11g, power setting 4dBm, PN9, worst data mode 48Mbps

Tx, 2412MHz (below 30MHz)

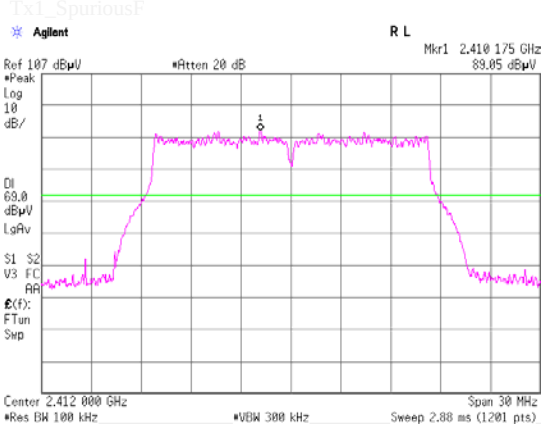
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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Date	October 16, 2014	
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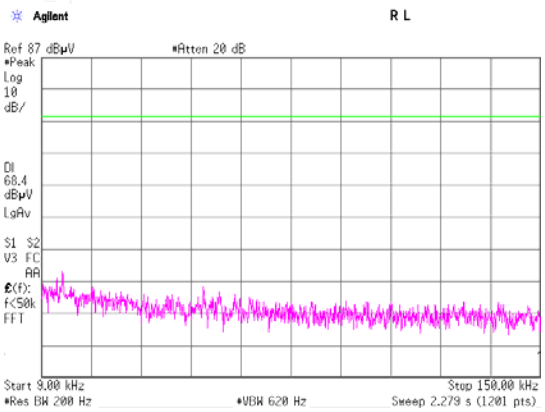
Engineer	Akio Hayashi	

Spurious emission (Conducted)

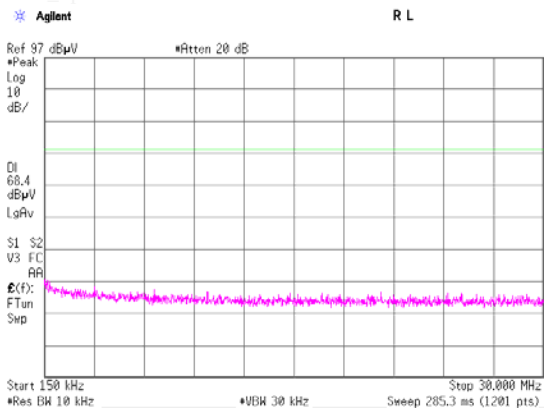
Tx, IEEE802.11g, power setting 4dBm, PN9, worst data mode 48Mbps

Tx, 2437MHz (below 30MHz)

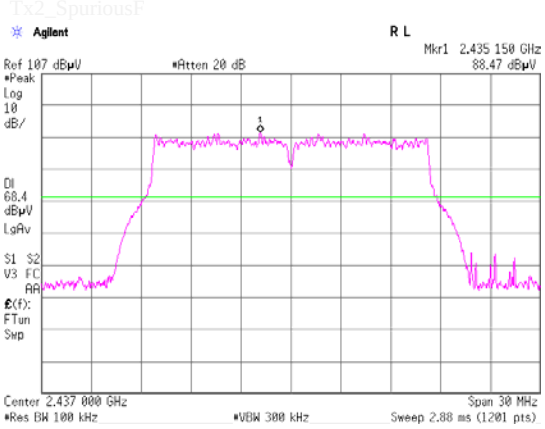
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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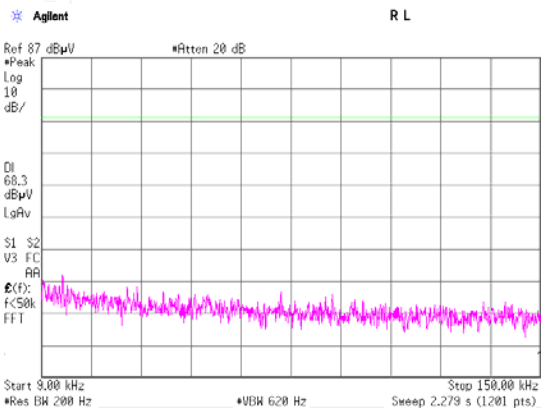
Engineer	Akio Hayashi	

Spurious emission (Conducted)

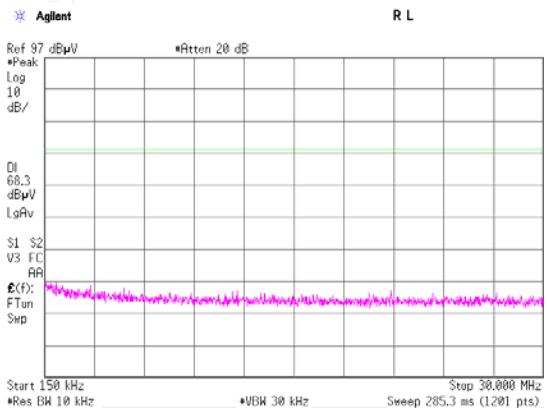
Tx, IEEE802.11g, power setting 4dBm, PN9, worst data mode 48Mbps

Tx, 2462MHz (below 30MHz)

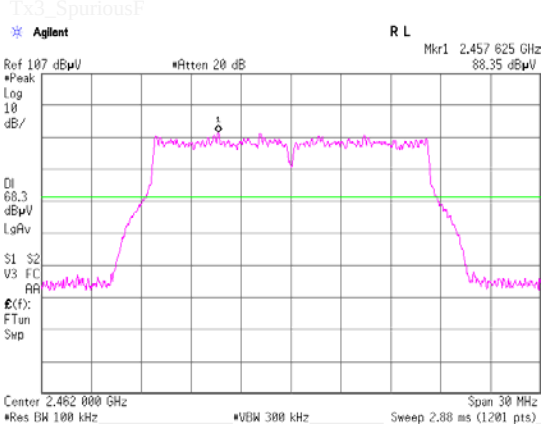
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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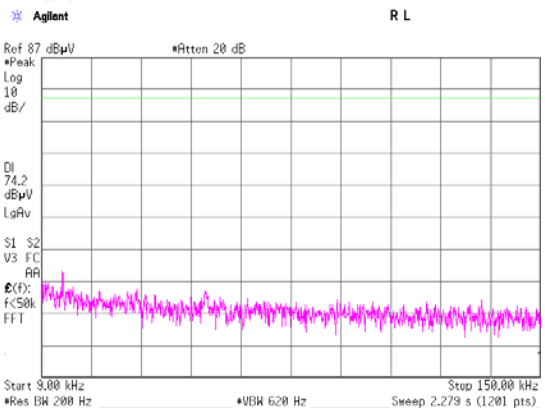
Engineer	Akio Hayashi	

Spurious emission (Conducted)

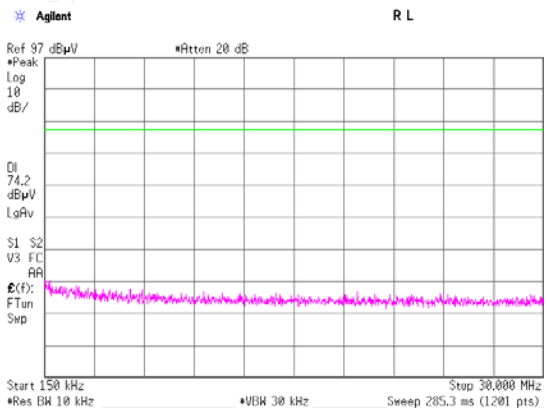
Tx, IEEE802.11n HT20, power setting 12dBm, PN9, worst data mode 5(MCS)

Tx, 2412MHz (below 30MHz)

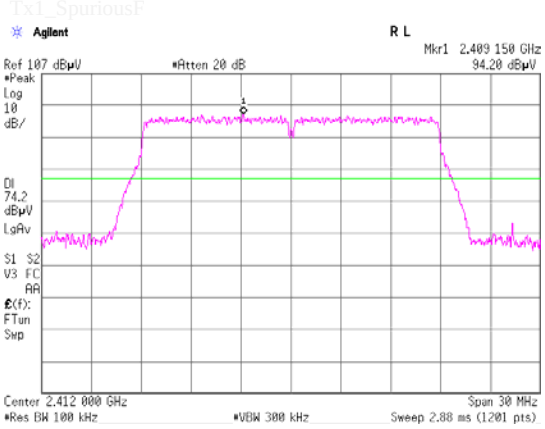
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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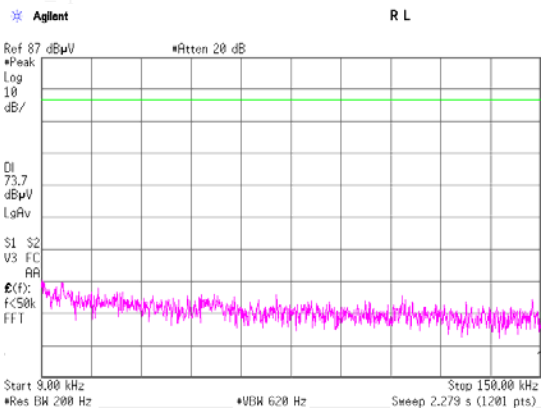
Engineer	Akio Hayashi	

Spurious emission (Conducted)

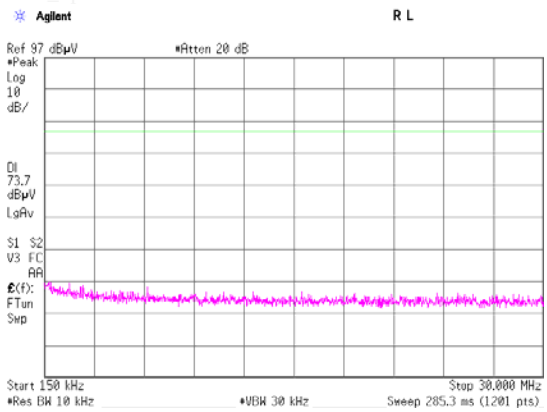
Tx, IEEE802.11n HT20, power setting 12dBm, PN9, worst data mode 5(MCS)

Tx, 2437MHz (below 30MHz)

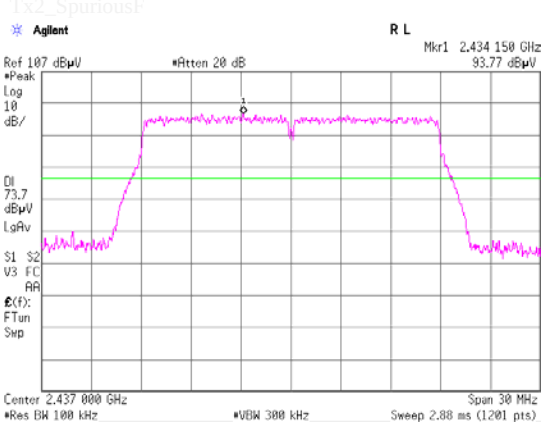
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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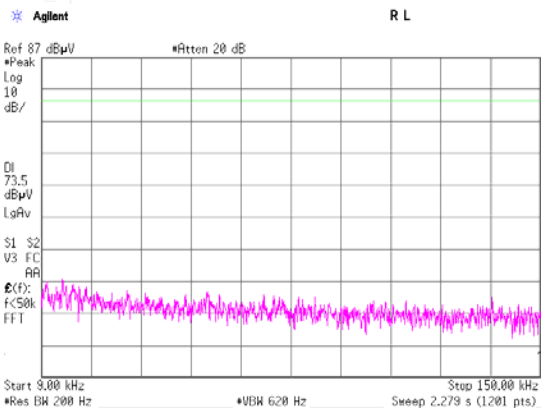
Engineer	Akio Hayashi	

Spurious emission (Conducted)

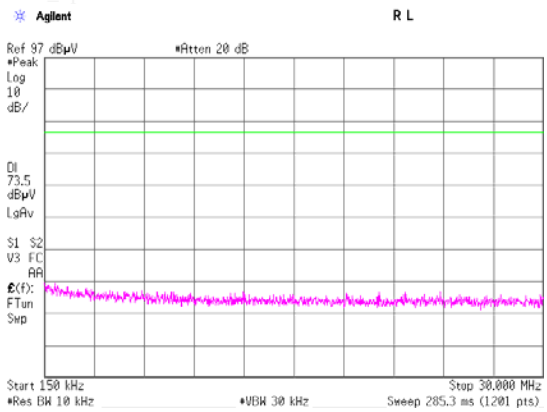
Tx, IEEE802.11n HT20, power setting 12dBm, PN9, worst data mode 5(MCS)

Tx, 2462MHz (below 30MHz)

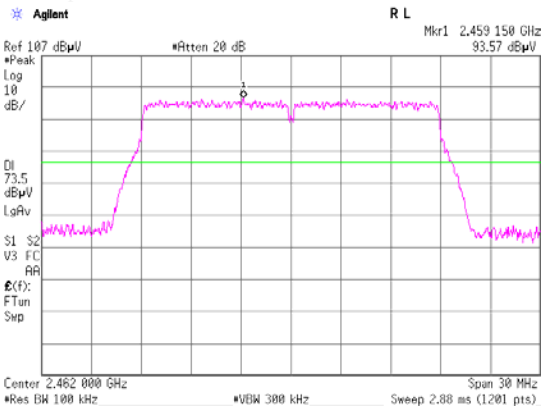
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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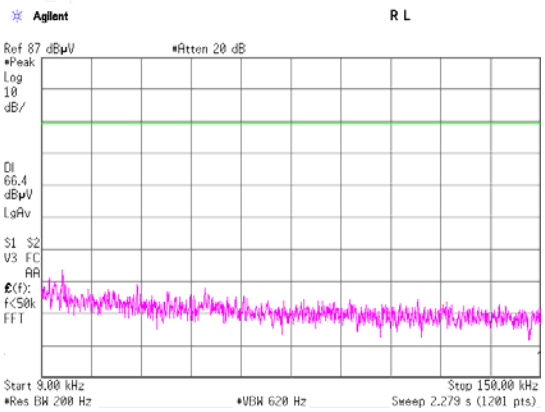
Engineer	Akio Hayashi	

Spurious emission (Conducted)

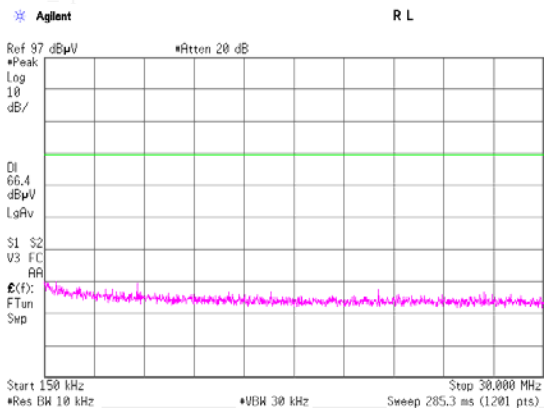
Tx, IEEE802.11n HT20, power setting 4dBm, PN9, worst data mode 5(MCS)

Tx, 2412MHz (below 30MHz)

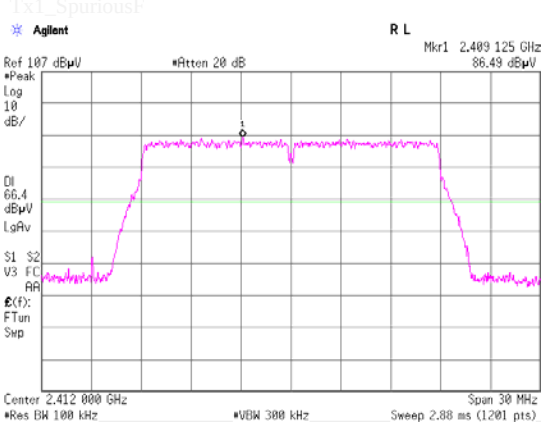
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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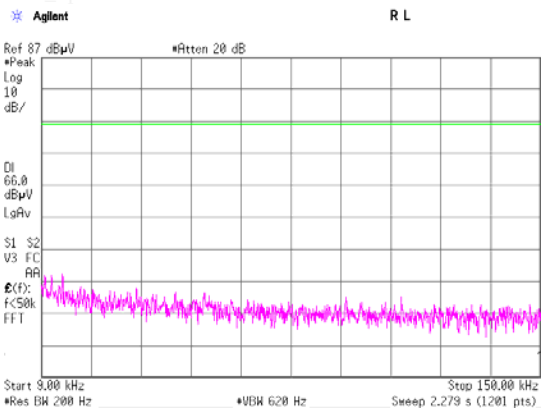
Spurious emission (Conducted)

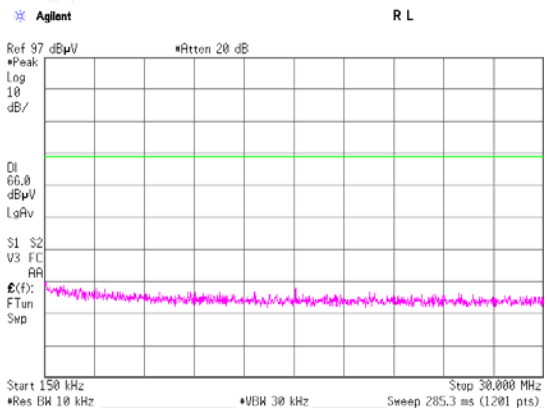
Tx, IEEE802.11n HT20, power setting 4dBm, PN9, worst data mode 5(MCS)

Tx, 2437MHz (below 30MHz)

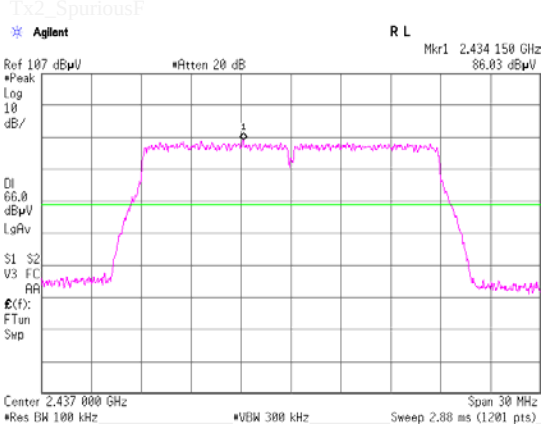
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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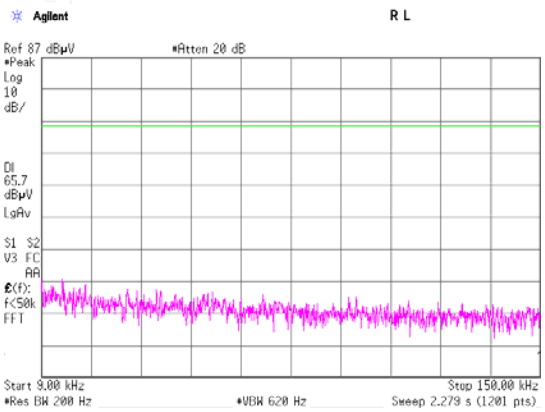
Spurious emission (Conducted)

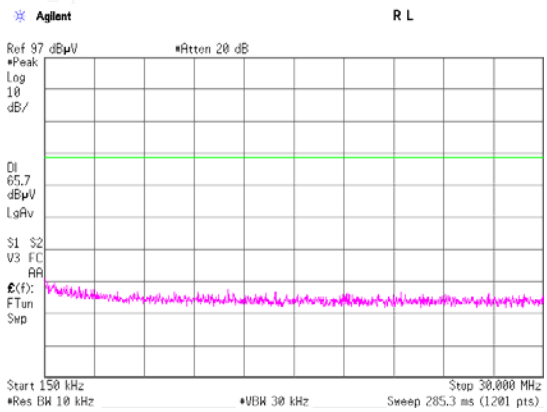
Tx, IEEE802.11n HT20, power setting 4dBm, PN9, worst data mode 5(MCS)

Tx, 2462MHz (below 30MHz)

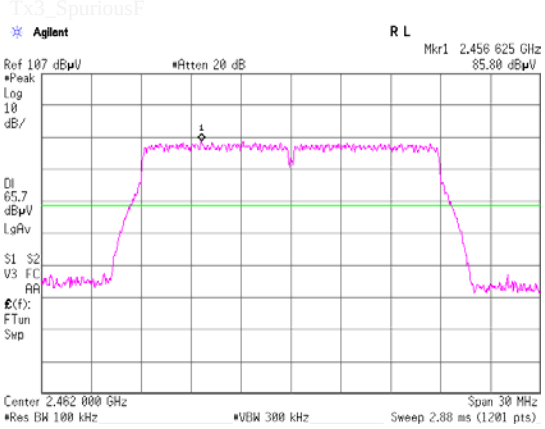
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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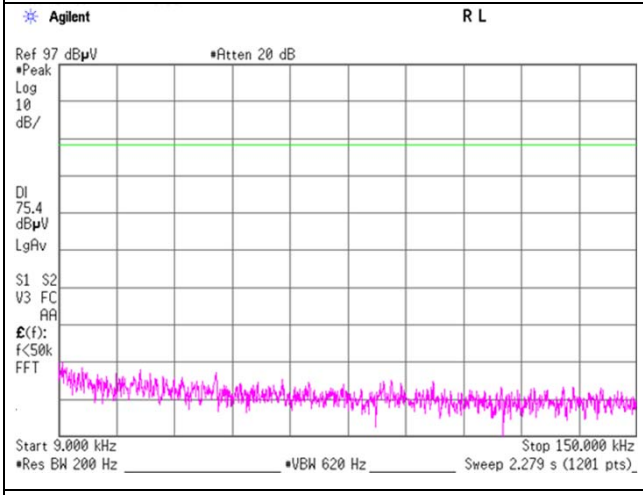
Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	'October 24, 2014	
Temperature / Humidity	24deg.C , 55%RH	
Engineer	Tatsuya Arai	

Spurious emission (Conducted)

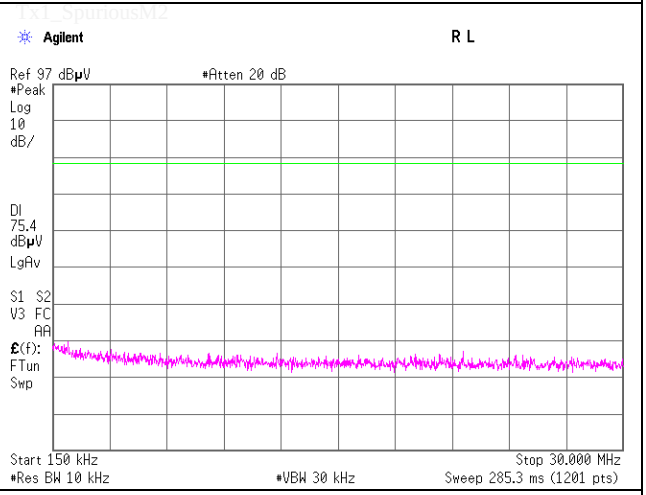
Tx, Bluetooth, Low Energy, PN9

Tx, 2402MHz (below 30MHz)

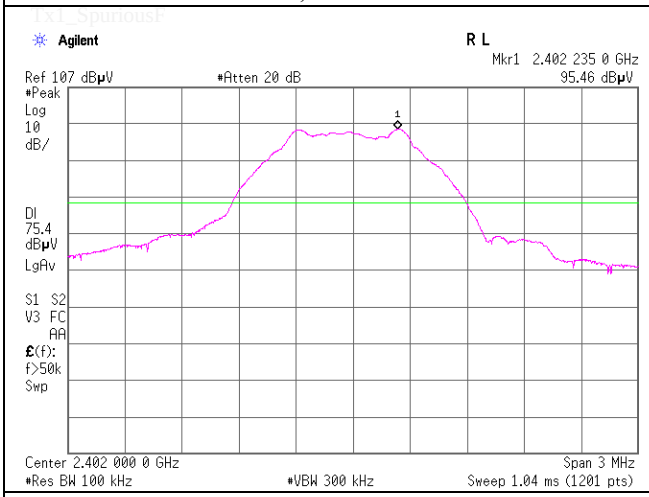
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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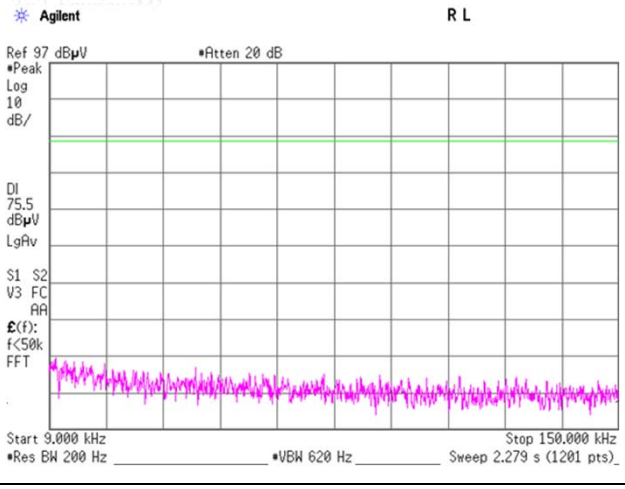
Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	'October 24, 2014	
Temperature / Humidity	24deg.C , 55%RH	
Engineer	Tatsuya Arai	

Spurious emission (Conducted)

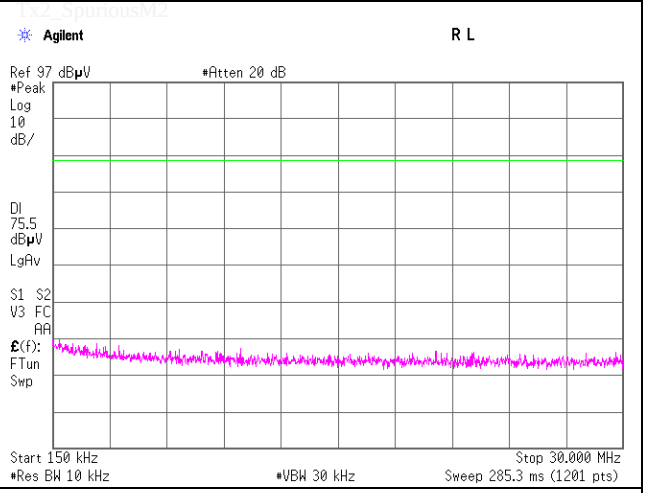
Tx, Bluetooth, Low Energy, PN9

Tx, 2440MHz (below 30MHz)

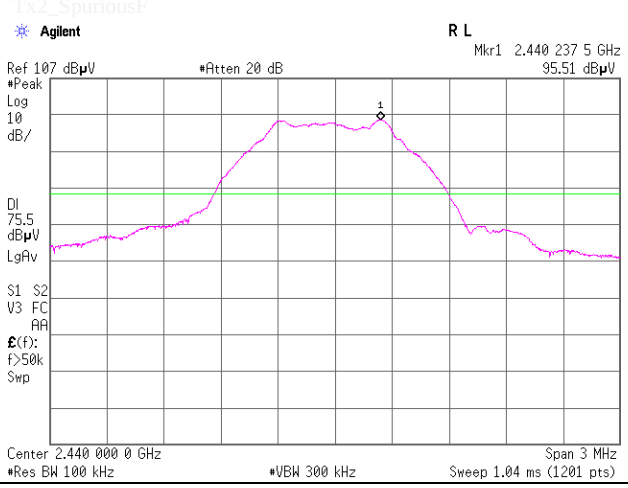
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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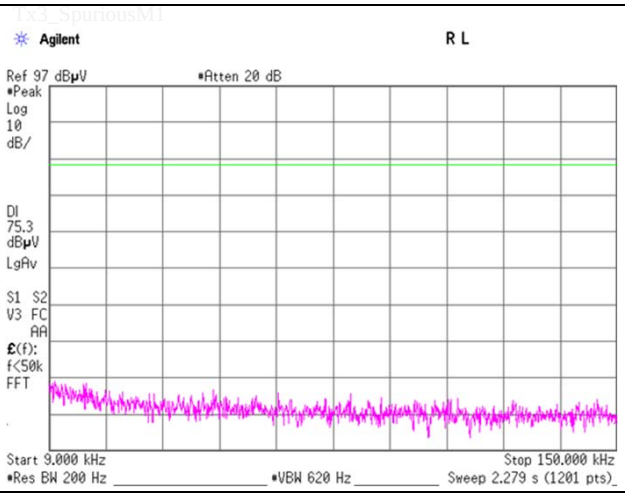
Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	'October 24, 2014	
Temperature / Humidity	24deg.C , 55%RH	
Engineer	Tatsuya Arai	

Spurious emission (Conducted)

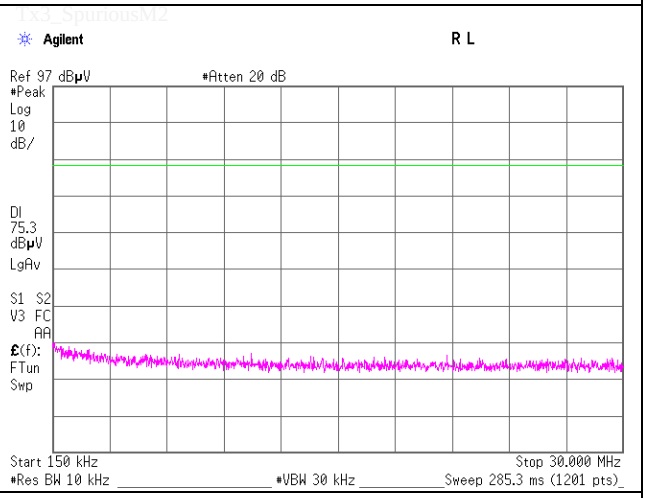
Tx, Bluetooth, Low Energy, PN9

Tx, 2480MHz (below 30MHz)

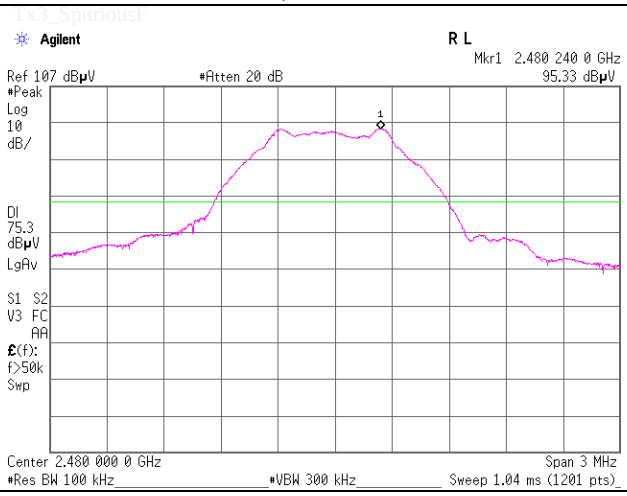
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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Maximum Power Spectral Density

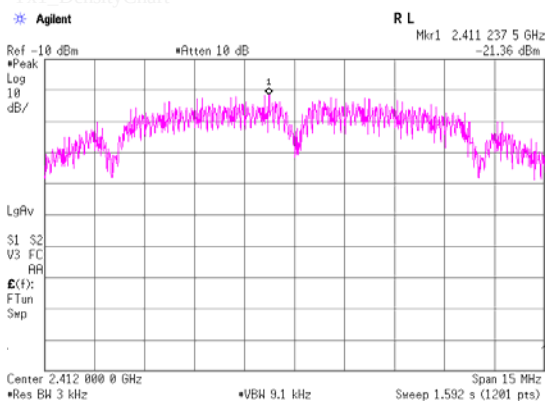
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11b, power setting 12dBm, PN9, worst data mode 2Mbps	

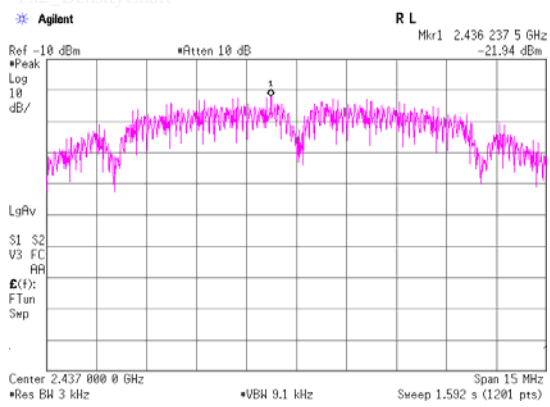
Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2411.24	-21.36	2.16	9.90	-9.30	8.00	17.30
2437.0000	2436.24	-21.94	2.17	9.90	-9.87	8.00	17.87
2462.0000	2461.25	-22.13	2.18	9.90	-10.05	8.00	18.05

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

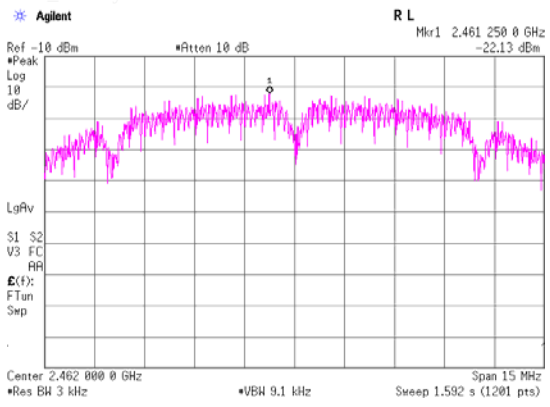
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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Maximum Power Spectral Density

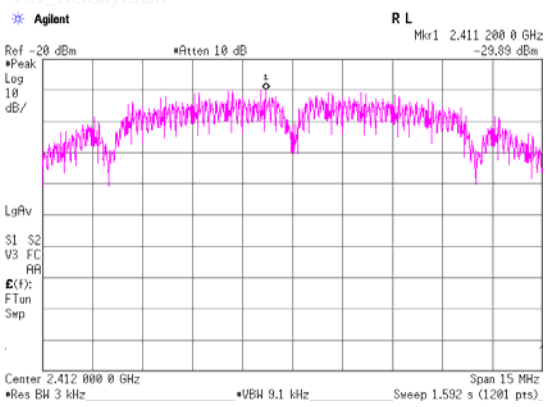
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11b, power setting 4dBm, PN9, worst data mode 2Mbps	

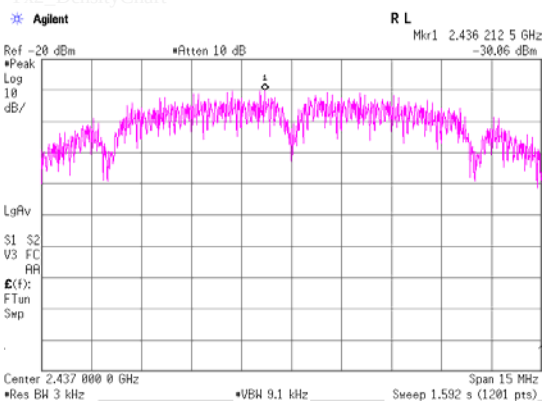
Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2411.20	-29.89	2.16	9.90	-17.83	8.00	25.83
2437.0000	2436.21	-30.06	2.17	9.90	-17.99	8.00	25.99
2462.0000	2461.23	-30.47	2.18	9.90	-18.39	8.00	26.39

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

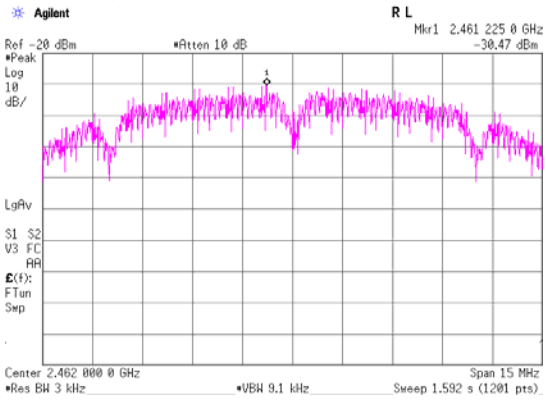
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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Maximum Power Spectral Density

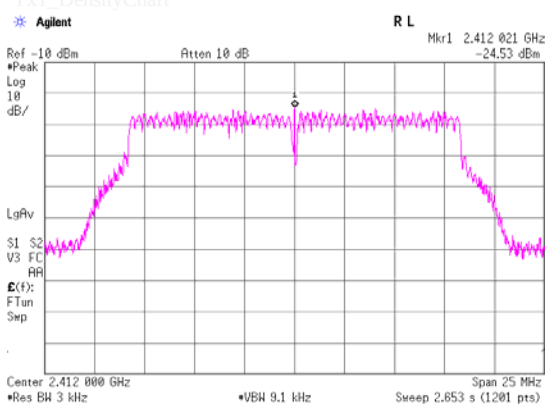
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11g, power setting 12dBm, PN9, worst data mode 48Mbps	

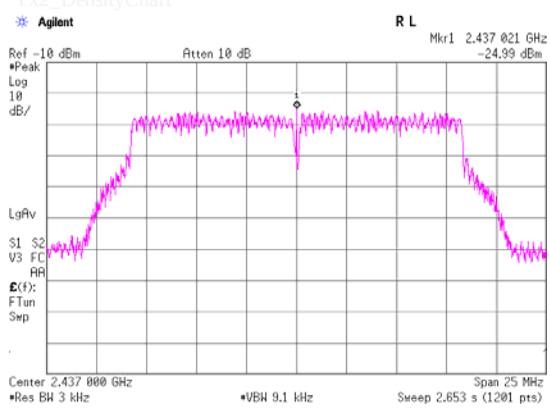
Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2412.02	-24.53	2.16	9.90	-12.47	8.00	20.47
2437.0000	2437.02	-24.99	2.17	9.90	-12.92	8.00	20.92
2462.0000	2462.04	-24.55	2.18	9.90	-12.47	8.00	20.47

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

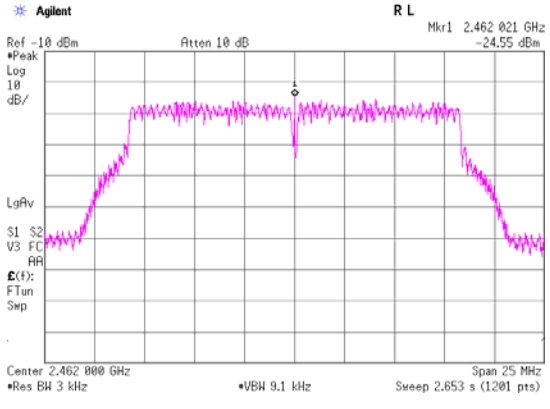
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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Maximum Power Spectral Density

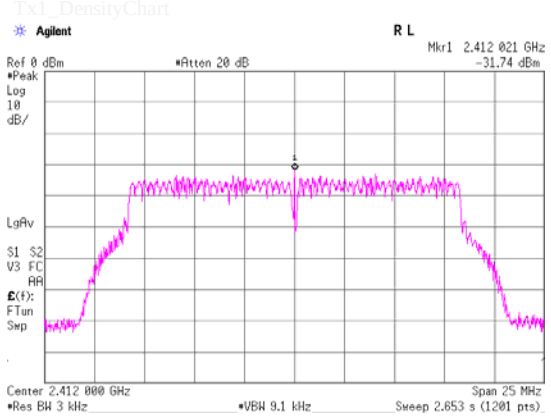
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11g, power setting 4dBm, PN9, worst data mode 48Mbps	

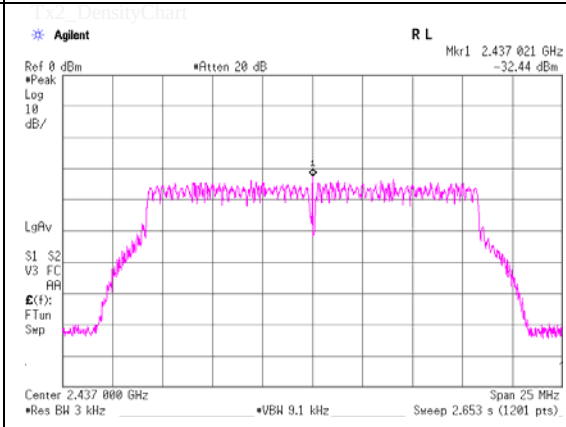
Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2412.02	-31.74	2.16	9.90	-19.68	8.00	27.68
2437.0000	2437.02	-32.44	2.17	9.90	-20.37	8.00	28.37
2462.0000	2462.00	-31.77	2.18	9.90	-19.69	8.00	27.69

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

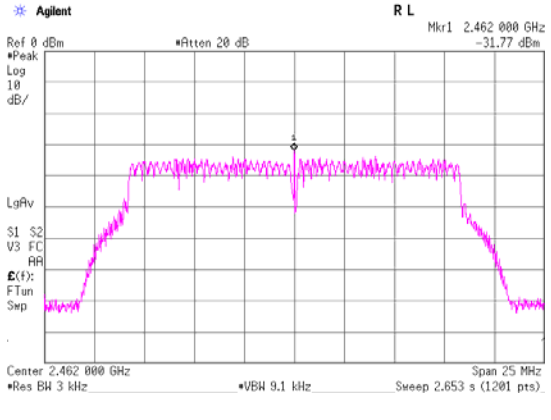
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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Maximum Power Spectral Density

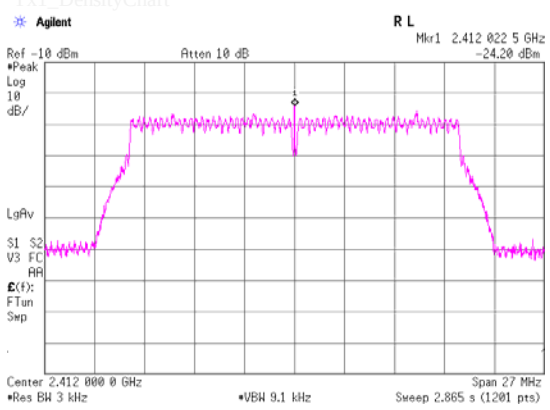
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11n HT20, power setting 12dBm, PN9, worst data mode 5(MCS)	

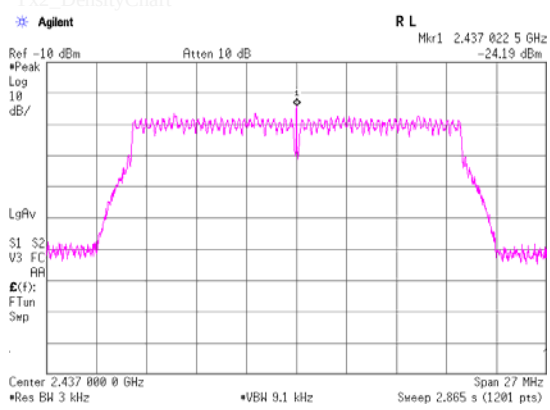
Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2412.02	-24.20	2.16	9.90	-12.14	8.00	20.14
2437.0000	2437.02	-24.19	2.17	9.90	-12.12	8.00	20.12
2462.0000	2462.05	-24.67	2.18	9.90	-12.59	8.00	20.59

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

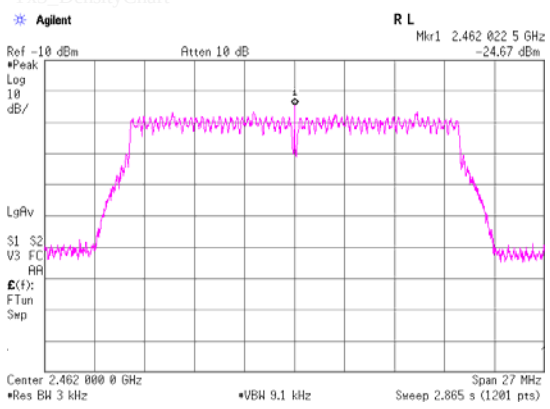
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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Maximum Power Spectral Density

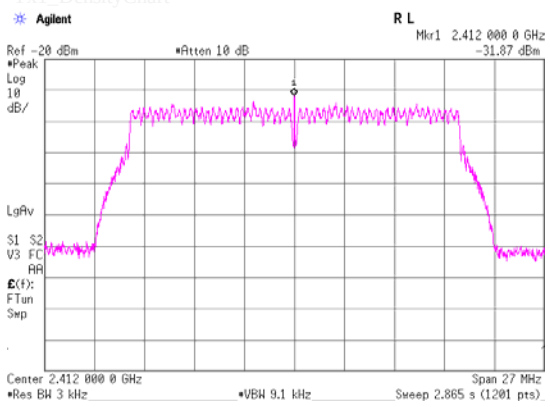
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11n HT20, power setting 4dBm, PN9, worst data mode 5(MCS)	

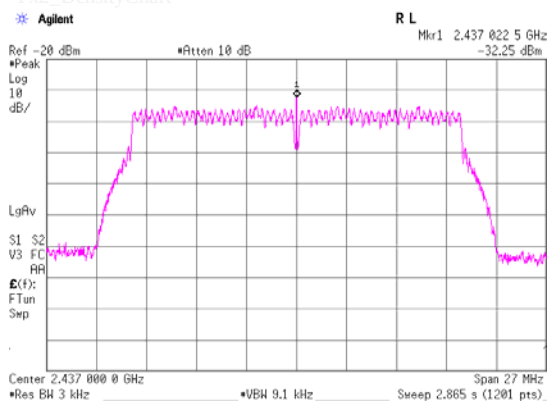
Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2412.00	-31.87	2.16	9.90	-19.81	8.00	27.81
2437.0000	2437.02	-32.25	2.17	9.90	-20.18	8.00	28.18
2462.0000	2462.00	-31.86	2.18	9.90	-19.78	8.00	27.78

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

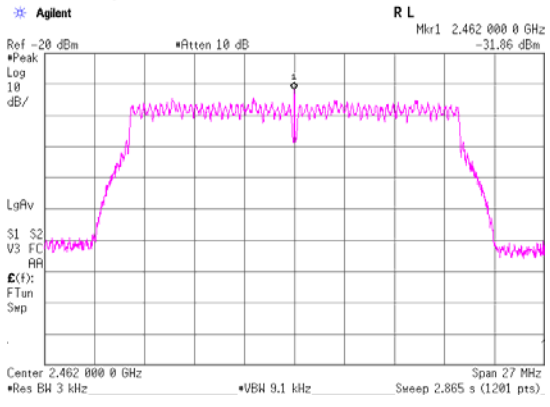
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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Maximum Power Spectral Density

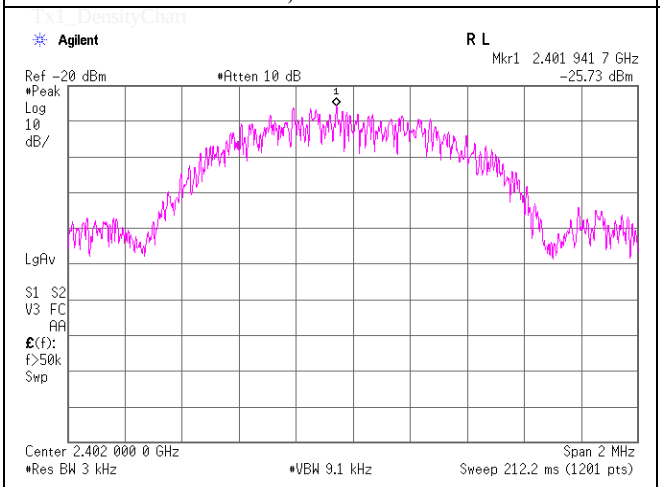
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	'October 24, 2014	
Temperature / Humidity	24deg.C , 55%RH	
Engineer	Tatsuya Arai	
Mode	Tx, Bluetooth, Low Energy, PN9	

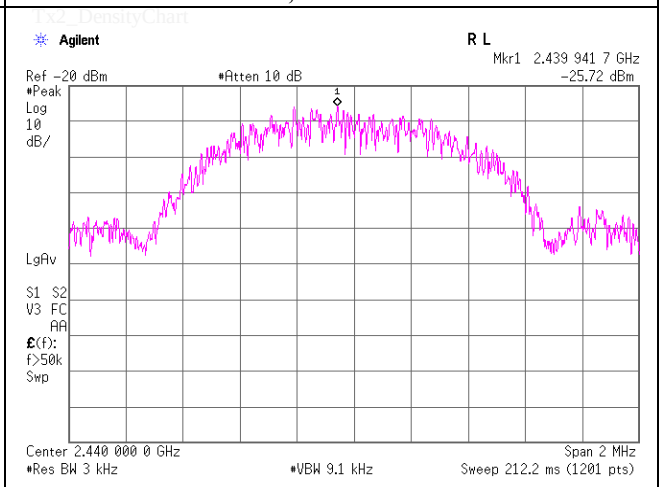
Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2402.0000	2401.94	-25.73	2.19	9.90	-13.64	8.00	21.64
2440.0000	2439.94	-25.72	2.20	9.90	-13.62	8.00	21.62
2480.0000	2479.94	-25.87	2.21	9.90	-13.76	8.00	21.76

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

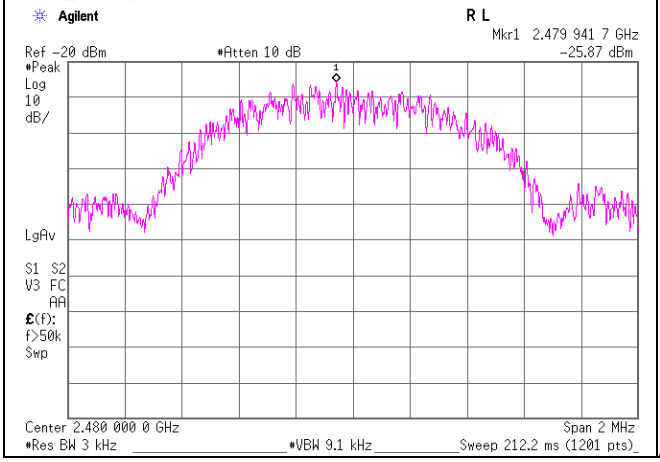
Tx, 2402MHz

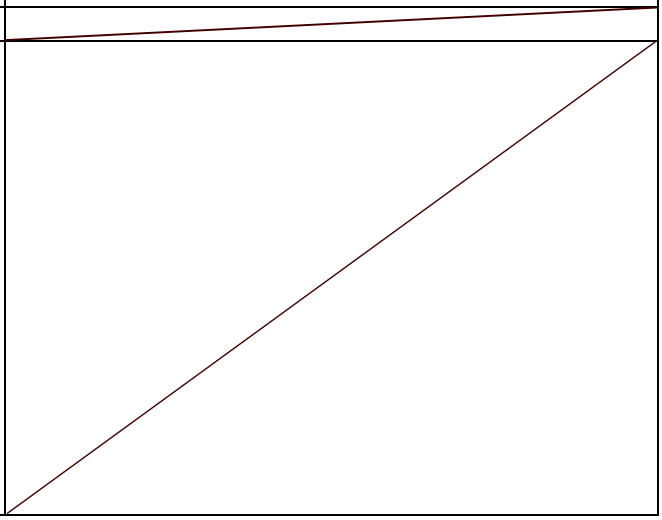


Tx, 2440MHz



Tx, 2480MHz





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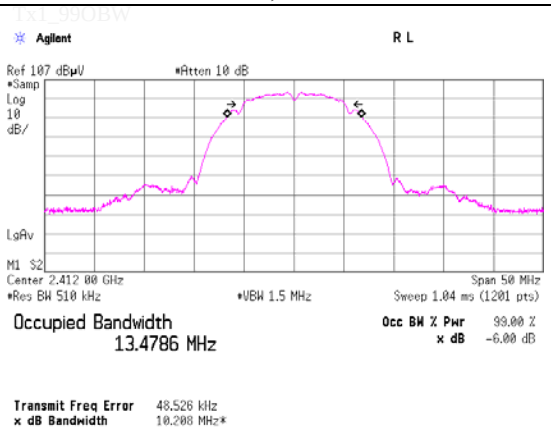
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	

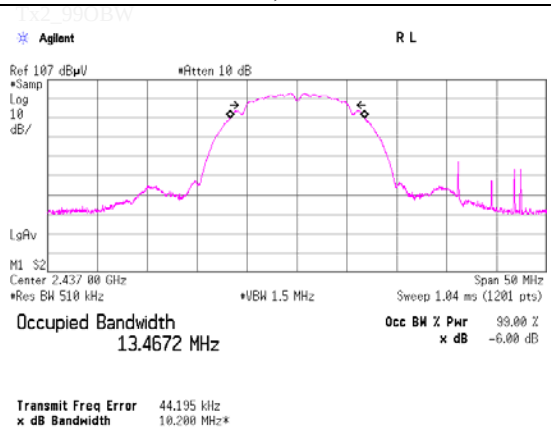
99% Occupied Bandwidth

Tx, IEEE802.11b, power setting 12dBm, PN9, worst data mode 2Mbps

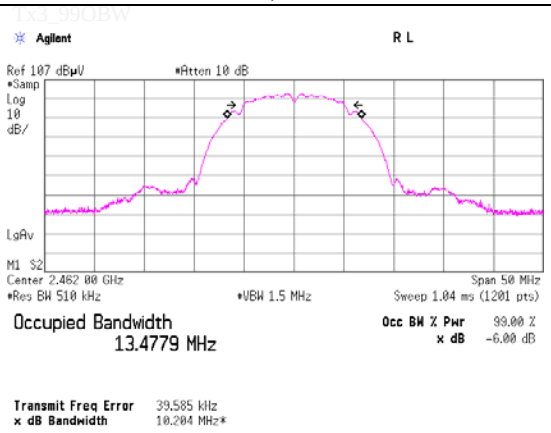
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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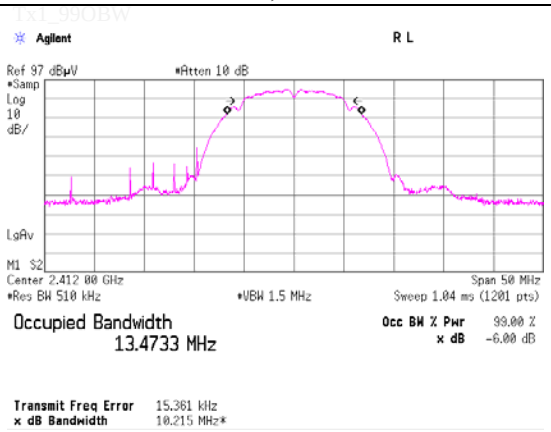
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	

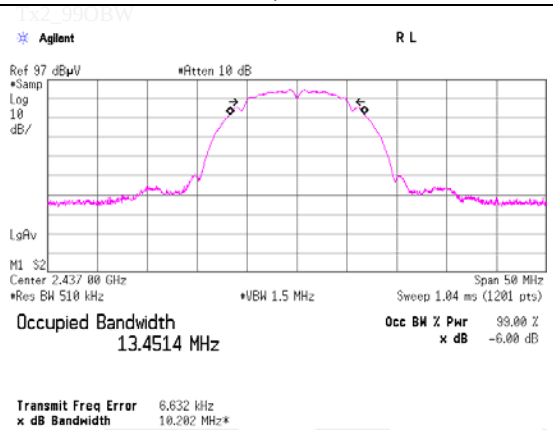
99% Occupied Bandwidth

Tx, IEEE802.11b, power setting 4dBm, PN9, worst data mode 2Mbps

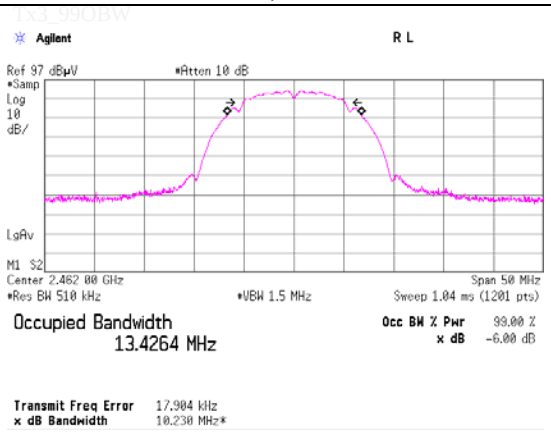
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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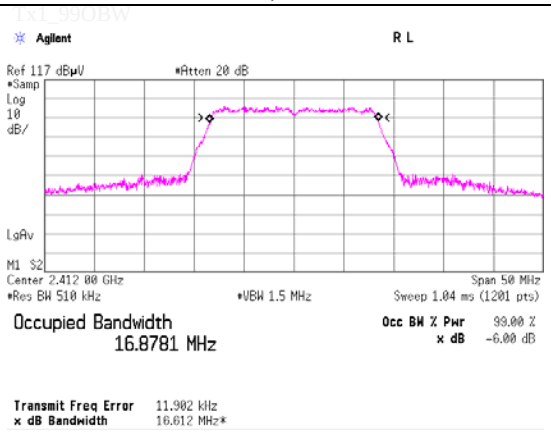
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	

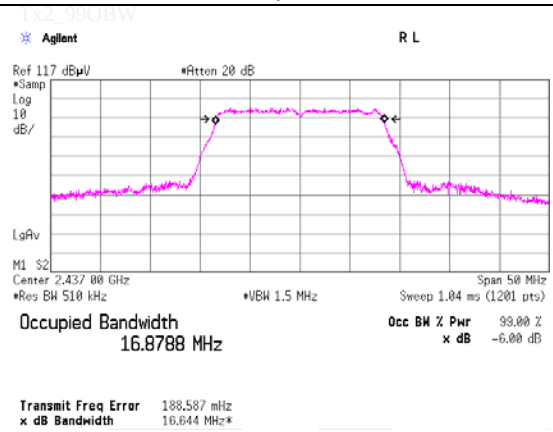
99% Occupied Bandwidth

Tx, IEEE802.11g, power setting 12dBm, PN9, worst data mode 48Mbps

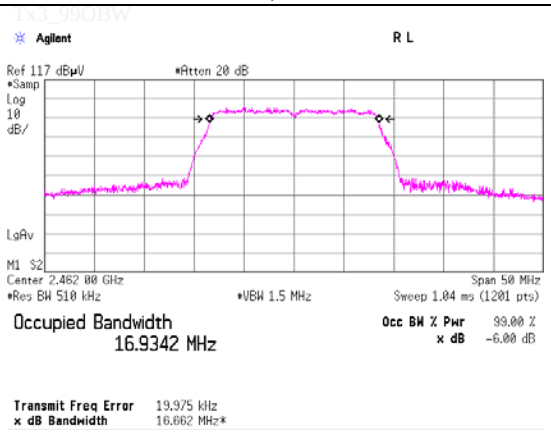
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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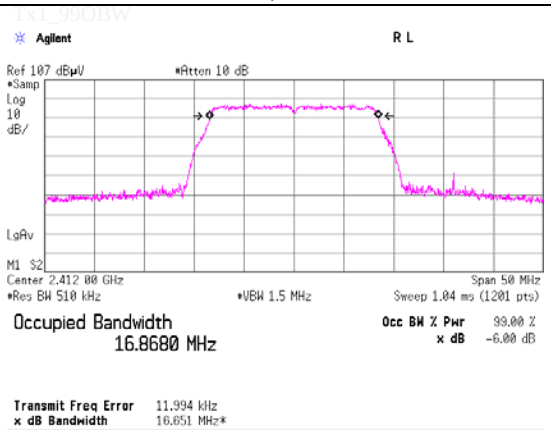
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	

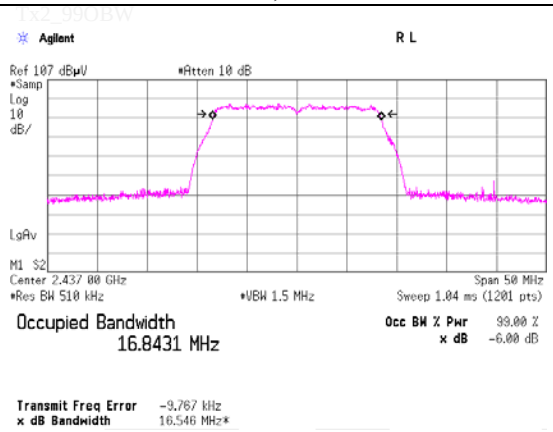
99% Occupied Bandwidth

Tx, IEEE802.11g, power setting 4dBm, PN9, worst data mode 48Mbps

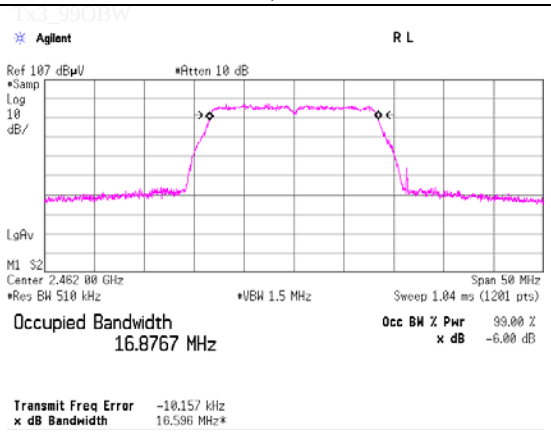
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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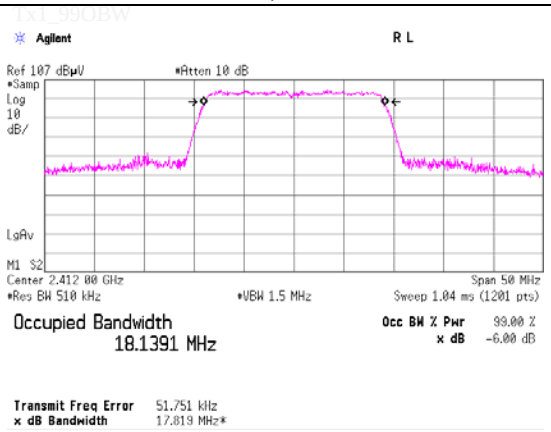
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	

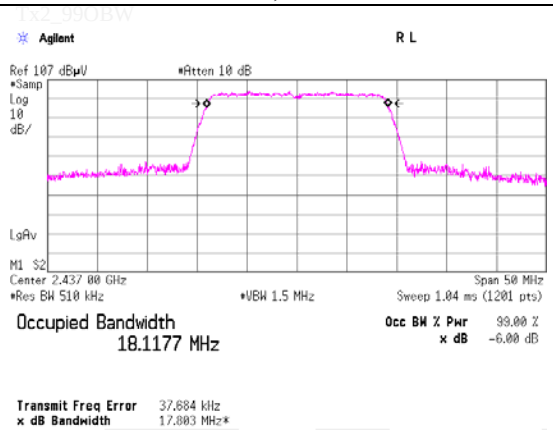
99% Occupied Bandwidth

Tx, IEEE802.11n HT20, power setting 12dBm, PN9, worst data mode 5(MCS)

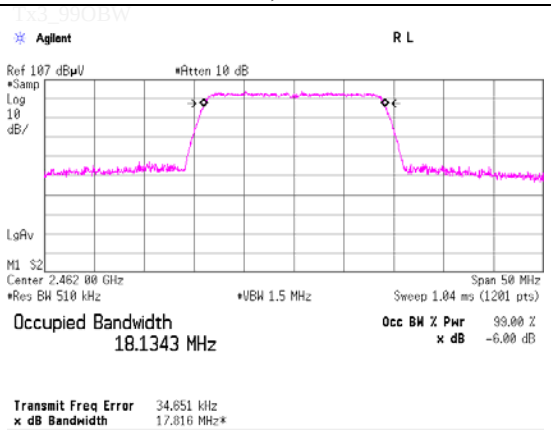
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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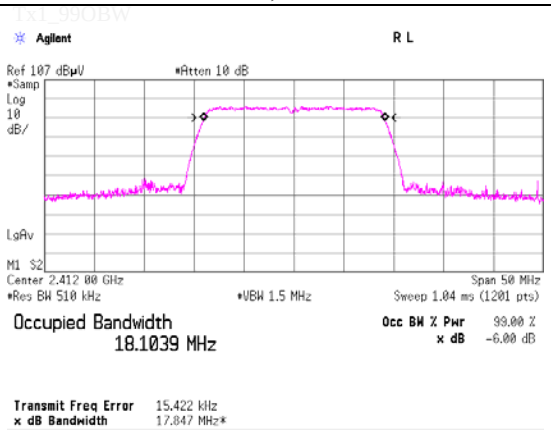
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 16, 2014	
Temperature / Humidity	25deg.C , 49%RH	
Engineer	Akio Hayashi	

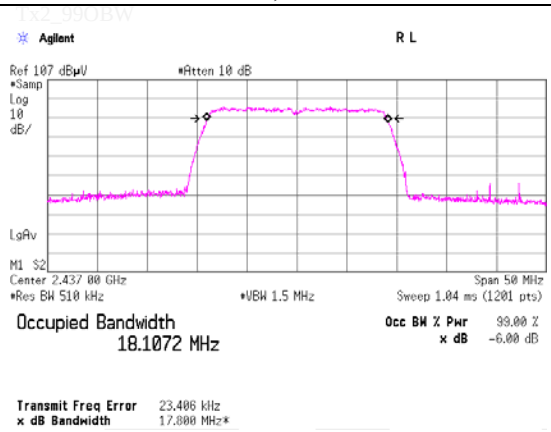
99% Occupied Bandwidth

Tx, IEEE802.11n HT20, power setting 4dBm, PN9, worst data mode 5(MCS)

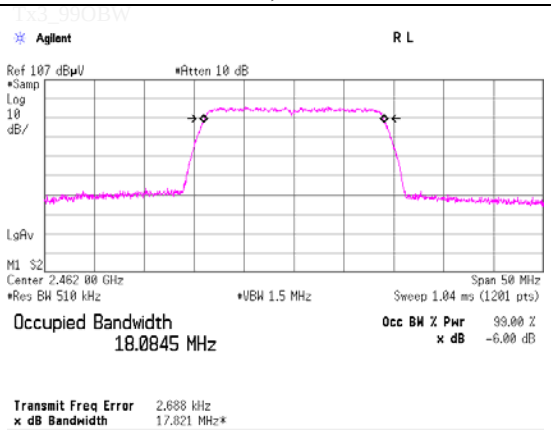
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



UL Japan, Inc.
Shonan EMC Lab.
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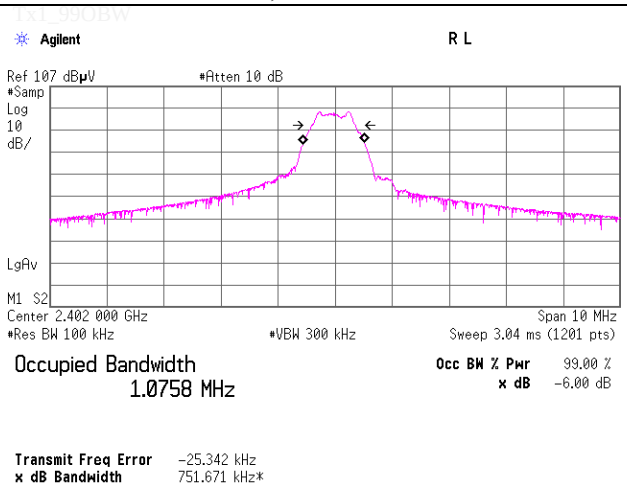
Facsimile : +81 463 50 6401

Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	'October 24, 2014	
Temperature / Humidity	24deg.C , 55%RH	
Engineer	Tatsuya Arai	

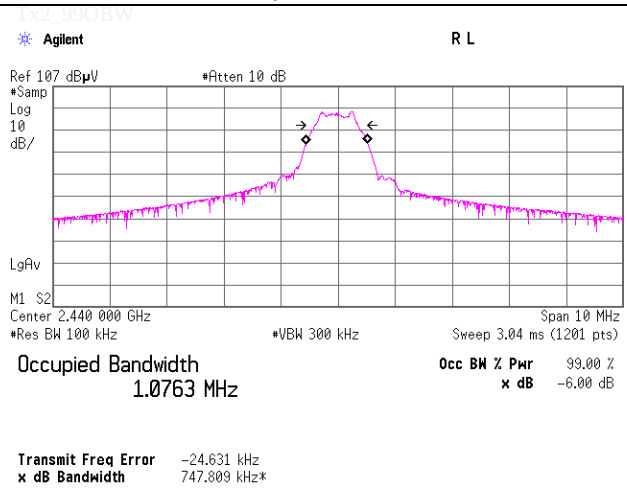
99% Occupied Bandwidth

Tx, Bluetooth, Low Energy, PN9

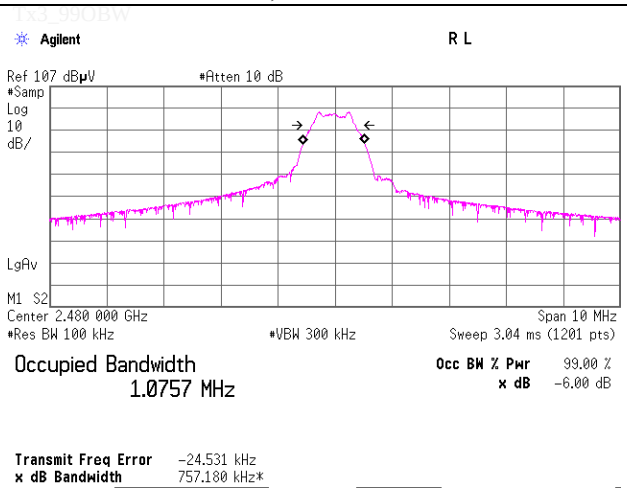
Tx, 2402MHz



Tx, 2440MHz



Tx, 2480MHz



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APPENDIX 2
Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2014/02/03 * 12
SPM-07	Power Meter	Agilent	8990B	MY5100272	AT	2014/04/04 * 12
SPSS-04	Power sensor	Agilent	N1923A	MY5326009	AT	2014/04/04 * 12
SAT10-10	Attenuator	Weinschel Corp.	54A-10	37584	AT	2014/04/22 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	AT	2014/03/13 * 12
SOS-13	Humidity Indicator	Custom	CTH-202	Q.C.17	AT	2014/04/22 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2014/07/14 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2014/05/23 * 12
SCC-G04	Coaxial Cable	Junkosha	J12J102207-00	JUN-12-14-01 8	RE	2014/06/24 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2014/05/15 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2014/08/12 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2014/02/21 * 12
SSA-01	Spectrum Analyzer	Agilent	N9010A-526	MY48031482	RE	2014/04/07 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2014/03/17 * 12
SJM-15	Measure	ASKUL	-	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFI,MF)	-	RE,CE	-
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2013/11/22 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2013/11/22 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2014/03/15 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2014/03/14 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2014/03/13 * 12
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2014/07/08 * 12
SBA-02	Biconical Antenna	Schwarzbeck	BBA9106	91032665	RE	2013/11/24 * 12
SAT6-02	Attenuator	JFW	50HF-006N	-	RE	2014/02/17 * 12
SCC-B1/B3/B 5/B7/B8/B13/ SRSE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/14 1PE/141PE/141P E/141PE/NS4906	-/0901-270(RF Selector)	RE	2014/04/25 * 12
SLA-02	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0893	RE	2013/11/24 * 12
KAT3-11	Attenuator	JFW IND. INC.	50HF-003N	-	RE	2014/08/27 * 12
SCC-B2/B4/B 6/B7/B8/B13/ SRSE-02	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/14 1PE/141PE/141P E/141PE/NS4906	-/0901-270(RF Selector)	RE	2014/04/25 * 12
SAF-02	Pre Amplifier	SONOMA	310N	290212	RE	2014/02/17 * 12
STR-07	Test Receiver	Rohde & Schwarz	ESU26	100484	RE	2014/09/03 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2014/02/21 * 12
SJM-14	Measure	ASKUL	-	-	RE	-
SHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	RE	2014/08/12 * 12
SCC-G02	Coaxial Cable	Suhner	SUCOFLEX 104A	46498/4A	RE	2014/04/22 * 12
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2013/11/22 * 12
SFL-18	Highpass Filter	MICRO-TRONICS	HPM50111	119	RE	2014/04/22 * 12
SAF-05	Pre Amplifier	TOYO Corporation	TPA0118-36	1440490	RE	2013/11/22 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2014/05/15 * 12

The expiration date of the calibration is the end of the expired month .
As for some calibrations performed after the tested dates , those test equipment have been controlled by means of an unbroken chains of calibrations .

All equipment is calibrated with valid calibrations . Each measurement data is traceable to the national or international standards .
Test Item :
CE: Conducted emission ,
RE: Radiated emission ,
AT: Antenna terminal condcuted tests

APPENDIX 2
Test Instruments

EMS test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SCC-A12/A13 /SRSE-01	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/N S4906	-/0901-269(RF Selector)	CE	2014/04/25 * 12
SLS-01	LISN	Rohde & Schwarz	ENV216	100511	CE	2014/02/14 * 12
SAT3-06	Attenuator	JFW	50HF-003N	-	CE	2014/02/17 * 12
SOS-02	Humidity Indicator	A&D	AD-5681	4063343	CE	2014/03/07 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	CE	2013/11/20 * 12
SJM-13	Measure	ASKUL	-	-	CE	-

The expiration date of the calibration is the end of the expired month .
As for some calibrations performed after the tested dates , those test equipment have been controlled by means of an unbroken chains of calibrations .
All equipment is calibrated with valid calibrations . Each measurement data is traceable to the national or international standards .
Test Item :

CE: Conducted emission