RADIO TEST REPORT

Test Report No.: 10055965S-A

Applicant	:	**Ricoh Company, Ltd.**
Type of Equipment	:	**Wireless LAN Module**
Model No.	:	**R-WL6**
FCC ID	:	**BBP-WLKIB01**
Test regulation	:	**FCC Part15 Subpart C: 2013**
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: August 26 to 30, 2013

Tested by:

Tatsuya Arai
Engineer of WiSE Japan,
UL Verification Service

Approved by :

Toyokazu Imamura
Leader of WiSE Japan,
UL Verification Service

☐ 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

UL Japan, Inc.
Shonan EMC Lab.
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REVISION HISTORY

Original Test Report No.: 10055965S-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10055965S-A	November 22, 2013	-	-
1	10055965S-A	December 4, 2013	4, 24-29	P4: Correction of Antenna connector type P24-29: Addition of Remarks to data

Contents

SECTION 1: Customer information

Company Name	:	Ricoh Company, Ltd.
Address	:	810 Shimoimaizumi, Ebina-shi, Kanagawa-ken, 243-0460 Japan
Telephone Number	:	+81- 46- 292- 2564
Facsimile Number	:	+81- 3- 6673- 4430
Contact Person	:	Seiji Nakamura

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

2.1 Identification of E.U.T.

Type of Equipment	:	Wireless LAN Module
Model Number	:	R-WL6
Serial Number	:	Refer to Section 4.2
Rating	:	DC 3.6V (VBAT), DC 3.0V (PAVDD)
Country of Mass-production	:	China
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample	:	August 26, 2013
Modification of EUT	:	No modification by the test lab.

2.2 Product description

Model: R-WL6 (referred to as the EUT in this report) is a Wireless LAN Module.

Clock frequency(ies) in the system : 26MHz, 32.768kHz

<Radio part>

Equipment type	:	Transceiver
Frequency of operation	:	2412-2462MHz
Bandwidth	:	20MHz
Channel spacing	:	5MHz
Type of modulation	:	DSSS, OFDM
ITU code	:	D1D, G1D
Operation temperature range	:	0 to +70 deg.C
Antenna type	:	Print Pattern Antenna
Antenna gain	:	-1.2dBi peak
Antenna connector type	:	None

FCC 15.31 (e) / 212
This host device provides stable voltage (DC3.6V (VBAT) and DC3.0V (PAVDD)) constantly to RF Module regardless of input voltage. Therefore, the equipment complies with the requirement.

FCC 15.203 / 212
The antenna is not removable from the EUT.
Therefore, the equipment complies with the antenna requirement.

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2013,
final revised on September 30, 2013 and effective October 30, 2013
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 September 30, 2013 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	15.1dB Freq.: 0.17413MHz Detector: Average Phase: L1 Mode: Tx 2437MHz, IEEE 802.11g	Complied
6dB bandwidth	ANSI C63.10:2009	FCC 15.247 (a)(2)	Conducted	N/A	* See data	Complied
Maximum peak conducted output power	ANSI C63.10:2009	FCC 15.247 (b)(3)	Conducted	N/A	7.74dB (result: 22.26dBm) Mode: Tx 2437MHz, IEEE 802.11g	Complied
Out of band emission & Restricted band edges	ANSI C63.10:2009	FCC 15.109, 15.247 (d) & 15.209	Conducted / Radiated	N/A	4.2dB Freq.: 2390.000MHz Polarization: Horizontal Detection: Peak Mode: Tx 2412MHz, IEEE 802.11n HT20	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 r01 (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 C63.4:2009 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	3.6 dB	3.5 dB
Radiated emission (Measurement distance: 3m)	9kHz-30MHz	3.7 dB	3.7 dB	3.6 dB
	30MHz-300MHz	4.8 dB	5.0 dB	4.8 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	5.6 dB	5.6 dB
	18GHz-40GHz	5.2 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 test report meets the limits unless the uncertainty is taken into consideration.

Antenna port conducted test

Power measurement uncertainty above 1GHz for this test was: (±) 1.5dB
Spurious emission (Conducted) measurement (below 1GHz) uncertainty for this test was: (±) 1.6dB
Spurious emission (Conducted) measurement (1G-3GHz) uncertainty for this test was: (±) 1.4dB
Spurious emission (Conducted) measurement (3G-18GHz) uncertainty for this test was: (±) 2.8dB
Spurious emission (Conducted) measurement (18G-26.5GHz) uncertainty for this test was: (±) 2.5dB
Bandwidth measurement uncertainty for this test was: (±) 5.4%

3.5 Test location

UL Japan, Inc. Shonan EMC Lab.
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Telephone number : +81 463 50 6400
Facsimile number : +81 463 50 6401
JAB Accreditation No. : RTL02610

	FCC Registration No.	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	697847	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☐ No.2 semi-anechoic chamber	697847	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☒ No.3 semi-anechoic chamber	697847	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	-

3.6 Test setup, Data of test & Test instruments

Refer to APPENDIX 1 to 3.

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

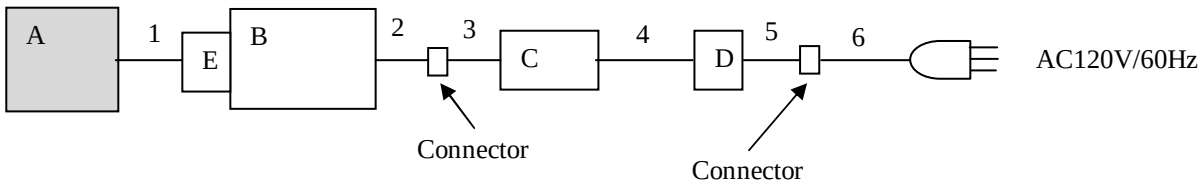
4.1 Operating mode

Test item	Mode	Tested frequency	Power setting *1)	Worst data rate *2)
Conducted emission Radiated emission (below 1GHz) *3)	Transmitting IEEE 802.11g	2437MHz	10dBm	6Mbps, PN9
Other items	Transmitting IEEE 802.11b	2412MHz, 2437MHz, 2462MHz	10dBm	1Mbps, PN9
	Transmitting IEEE 802.11g	2412MHz, 2437MHz, 2462MHz	10dBm	6Mbps, PN9
	Transmitting IEEE 802.11n (HT20)	2412MHz, 2437MHz, 2462MHz	10dBm	MCS0, PN9

*1) Software used for the test: wDbgmon2.2 V1.0.0.0. This power setting is average value and maximum except tolerance, and any user cannot set over this value.
*2) The worst condition was determined based on the test result of Maximum Peak Conducted Output Power.
*3) 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.

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

4.2 Configuration and peripherals



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

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless LAN Module	R-WL6	*4)	Ricoh	EUT
B	Jig board (RICOH printer controller board)	Ves-MF1	008	Ricoh	-
C	Power Supply board	ZSRC924G	BGZ2300581106001574	Ricoh	-
D	Switch unit	-	-	Ricoh	-
E	Interface board	WLAN-SDIF	-	Ricoh	-

*4) Antenna terminal conducted tests: 80, Radiated emission test: 76

List of cables used

No.	Cable Name	Length (m)	Shield		Remark
			Cable	Connector	
1	IF	0.13	Unshielded	Unshielded	-
2	IF	0.17	Unshielded	Unshielded	-
3	IF	0.43	Unshielded	Unshielded	-
4	IF	0.12	Unshielded	Unshielded	-
5	AC	0.5	Unshielded	Unshielded	-
6	AC	1.6	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 1.5m, 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 EUT, including peripherals 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.
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 within a Shielded room.
The EUT 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 conducted output power

Test procedure
The Maximum Peak Output Power was measured with a power meter connected to the antenna port.
The test was measured based on Method 9.1.3 PKPM1 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 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.
In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.
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 urethane platform of nominal size, 0.5m by 0.5m, raised 0.8m (below 15GHz) / 1m (above 15GHz) 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: RMS	RBW: 100kHz VBW: 300kHz

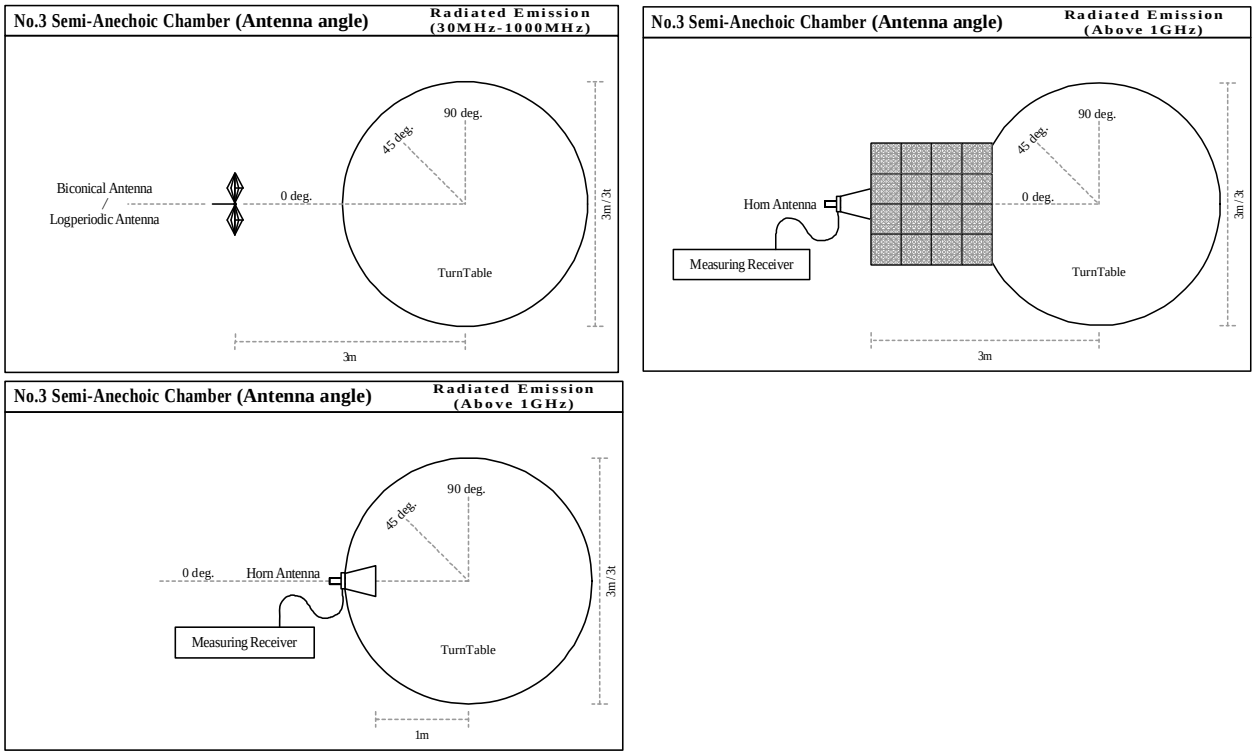
*1) Average Power Measurement was measured based on 12.2.5 of KDB 558074 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

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

Worst case:

Antenna polarization	Carrier (Band edge)	Spurious			
		Below 1GHz	Above 1GHz		
			1-2.8GHz	2.8-15GHz	15-25GHz
Horizontal	X	X	X	Y	Y
Vertical	Z	X	Z	Y	Y

Figure 1. Antenna angle



10.5 Band edge

Band edge level at 2390MHz and 2483.5MHz is 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.

Contents of APPENDIXES

APPENDIX 1: Data of Radio tests

Conducted emission
6dB bandwidth
Maximum peak output power
Radiated emission
Spurious emission (Antenna port conducted)
Peak power density
Occupied bandwidth

APPENDIX 2: Test instruments

Test instruments

APPENDIX 3: Photographs of test setup

Conducted emission
Radiated emission
Pre-check of the worst position

DATA OF CONDUCTED EMISSION TEST

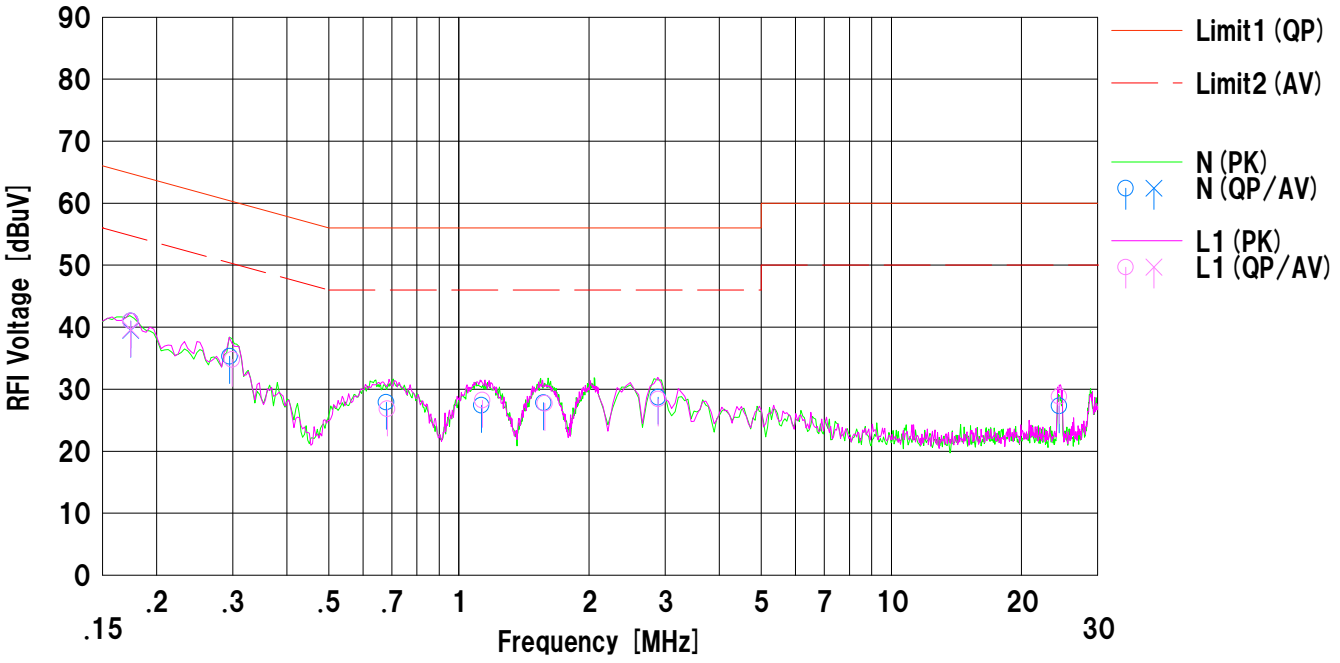
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/08/30

Company : RICOH COMPANY,LTD.
Kind of EUT : Wireless Module
Model No. : R-WL6
Serial No. : 76
Remarks : -

Mode : Tx 11g 2437MHz
Report No. : 10055965S
Power : DC3V
Temp./Humi. : 27deg.C. / 45%RH

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

Engineer : Tatsuya Arai



No.	Freq.	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP>	<AV>		<QP>	<AV>	<QP>	<AV>	<QP>	<AV>		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.17425	28.4	26.9	12.6	41.0	39.5	64.7	54.7	23.7	15.2	N	
2	0.29531	22.7	---	12.6	35.3	---	60.3	50.3	25.0	---	N	
3	0.67950	15.3	---	12.6	27.9	---	56.0	46.0	28.1	---	N	
4	1.12800	14.8	---	12.6	27.4	---	56.0	46.0	28.6	---	N	
5	1.57050	15.2	---	12.6	27.8	---	56.0	46.0	28.2	---	N	
6	2.88850	16.0	---	12.7	28.7	---	56.0	46.0	27.3	---	N	
7	24.44820	13.8	---	13.5	27.3	---	60.0	50.0	32.7	---	N	
8	0.17413	28.4	27.0	12.6	41.0	39.6	64.7	54.7	23.7	15.1	L1	
9	0.29900	22.2	---	12.6	34.8	---	60.2	50.2	25.4	---	L1	
10	0.68300	14.2	---	12.6	26.8	---	56.0	46.0	29.2	---	L1	
11	1.13400	15.6	---	12.6	28.2	---	56.0	46.0	27.8	---	L1	
12	1.58100	15.1	---	12.6	27.7	---	56.0	46.0	28.3	---	L1	
13	2.89200	15.7	---	12.7	28.4	---	56.0	46.0	27.6	---	L1	
14	24.44856	15.3	---	13.5	28.8	---	60.0	50.0	31.2	---	L1	

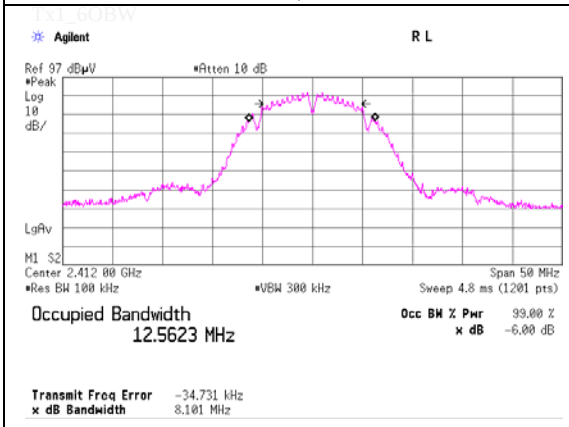
Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-04

-6dB Bandwidth

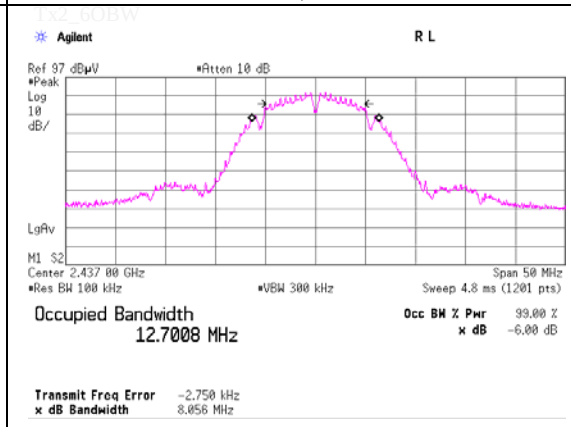
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 26, 2013	
Temperature / Humidity	27deg.C , 58%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11b, PN9, worst data mode 1Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	8.101	> 0.500
2437.0000	8.056	> 0.500
2462.0000	8.097	> 0.500

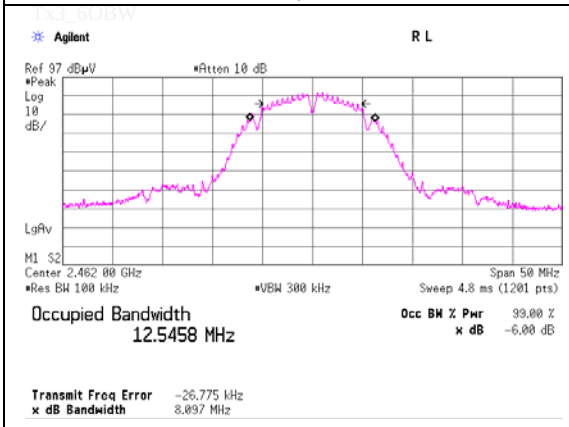
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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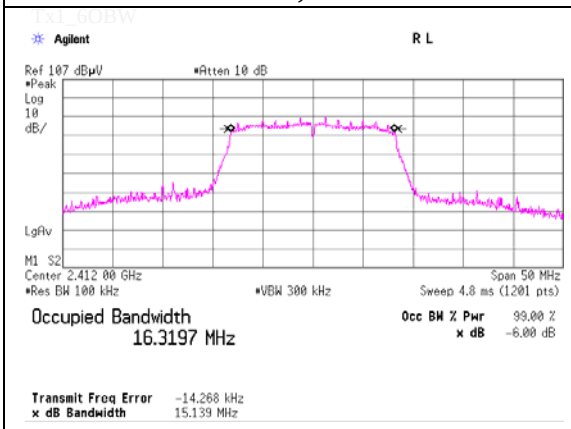
-6dB Bandwidth

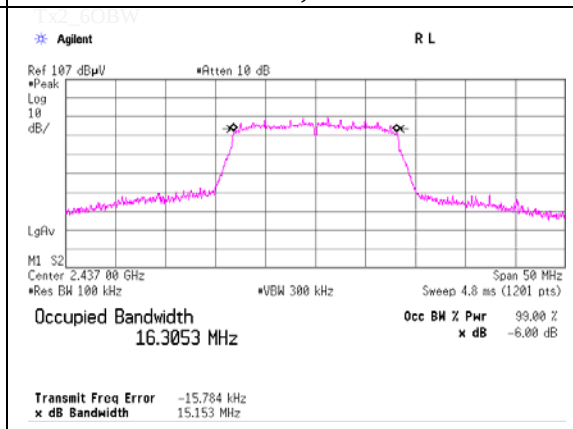
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 26, 2013	
Temperature / Humidity	27deg.C , 58%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	15.139	> 0.500
2437.0000	15.153	> 0.500
2462.0000	14.855	> 0.500

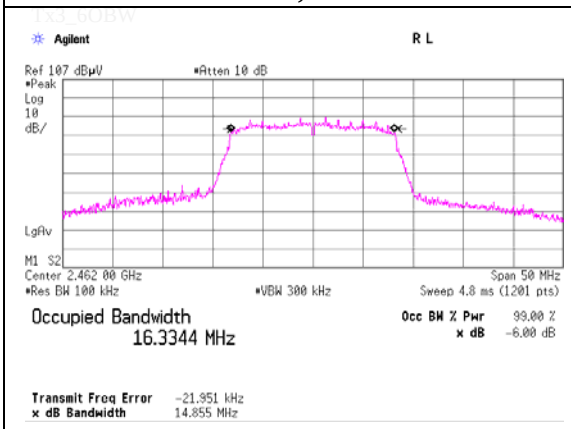
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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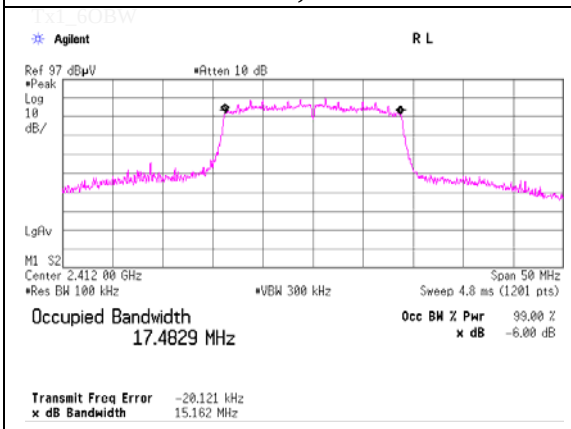
-6dB Bandwidth

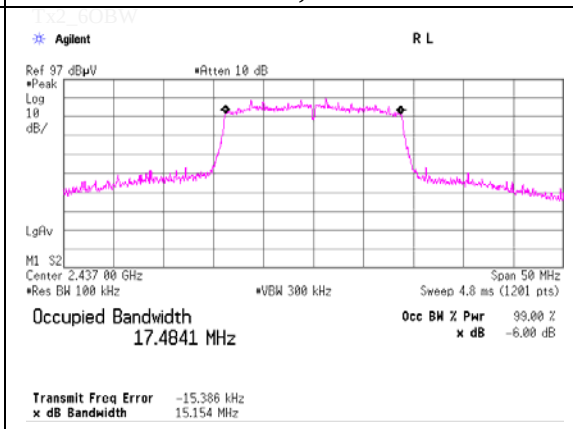
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 26, 2013	
Temperature / Humidity	27deg.C , 58%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	15.162	> 0.500
2437.0000	15.154	> 0.500
2462.0000	15.102	> 0.500

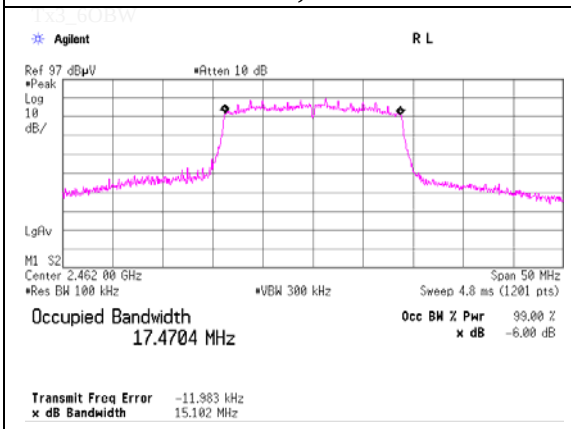
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



Maximum Peak Conducted Output Power

(PKPM1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room	
Date	August 26, 2013		
Temperature / Humidity	27deg.C , 58%RH		
Engineer	Akio Hayashi		
Mode	Tx, IEEE802.11b, PN9,	worst data mode :	1 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	-7.02	0.76	20.21	13.95	24.83	30.00	1000	16.05
Mid	2437.0	-7.05	0.77	20.21	13.93	24.72	30.00	1000	16.07
High	2462.0	-7.14	0.77	20.21	13.84	24.21	30.00	1000	16.16

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	2437.0	-7.05	0.77	20.21	**13.93**	24.72	30.00	1000	**16.07**	**Worst**
	2	2437.0	-7.12	0.77	20.21	13.86	24.32	30.00	1000	16.14	
	5.5	2437.0	-7.17	0.77	20.21	13.81	24.04	30.00	1000	16.19	
	11	2437.0	-7.13	0.77	20.21	13.85	24.27	30.00	1000	16.15	

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

Maximum Peak Conducted Output Power

(PKPM1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room	
Date	August 26, 2013		
Temperature / Humidity	27deg.C , 58%RH		
Engineer	Akio Hayashi		
Mode	Tx, IEEE802.11g, PN9,	worst data mode :	6 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	1.13	0.76	20.21	22.10	162.18	30.00	1000	7.90
Mid	2437.0	1.28	0.77	20.21	22.26	168.27	30.00	1000	7.74
High	2462.0	0.98	0.77	20.21	21.96	157.04	30.00	1000	8.04

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	2437.0	1.28	0.77	20.21	**22.26**	168.27	30.00	1000	**7.74**	**Worst**
	9	2437.0	1.16	0.77	20.21	22.14	163.68	30.00	1000	7.86	
	12	2437.0	0.82	0.77	20.21	21.80	151.36	30.00	1000	8.20	
	18	2437.0	0.65	0.77	20.21	21.63	145.55	30.00	1000	8.37	
	24	2437.0	0.66	0.77	20.21	21.64	145.88	30.00	1000	8.36	
	36	2437.0	1.15	0.77	20.21	22.13	163.31	30.00	1000	7.87	
	48	2437.0	0.59	0.77	20.21	21.57	143.55	30.00	1000	8.43	
	54	2437.0	0.77	0.77	20.21	21.75	149.62	30.00	1000	8.25	

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

Maximum Peak Conducted Output Power

(PKPM1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room	
Date	August 26, 2013		
Temperature / Humidity	27deg.C , 58%RH		
Engineer	Akio Hayashi		
Mode	Tx, IEEE802.11n (HT20), PN9,	worst data mode :	0 (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	1.26	0.76	20.21	22.23	167.11	30.00	1000	7.77
Mid	2437.0	1.02	0.77	20.21	22.00	158.49	30.00	1000	8.00
High	2462.0	0.50	0.77	20.21	21.48	140.60	30.00	1000	8.52

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	2437.0	1.02	0.77	20.21	**22.00**	158.49	30.00	1000	**8.00**	**Worst**
	1	2437.0	0.78	0.77	20.21	21.76	149.97	30.00	1000	8.24	
	2	2437.0	0.33	0.77	20.21	21.31	135.21	30.00	1000	8.69	
	3	2437.0	0.45	0.77	20.21	21.43	139.00	30.00	1000	8.57	
	4	2437.0	0.28	0.77	20.21	21.26	133.66	30.00	1000	8.74	
	5	2437.0	0.11	0.77	20.21	21.09	128.53	30.00	1000	8.91	
	6	2437.0	0.63	0.77	20.21	21.61	144.88	30.00	1000	8.39	
	7	2437.0	0.39	0.77	20.21	21.37	137.09	30.00	1000	8.63	

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

Radiated Emission

Test place	No.3 Semi Anechoic Chamber		
Date	August 26, 2013	August 27, 2013	August 28, 2013
Temperature / Humidity	20 deg.C, 57 %RH	21 deg.C, 66 %RH	25 deg.C, 55 %RH
Engineer	Tatsuya Arai		
Mode	Tx, 2412 MHz		
	Tx, IEEE802.11b, 1Mbps		

(* 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	47.8	26.8	14.7	41.1	48.2	73.9	25.7	100	84	
Hori.	2397.775	PK	52.2	26.8	14.7	41.1	52.6	73.9	21.3	100	84	
Hori.	2400.000	PK	53.3	26.8	14.7	41.1	53.7	73.9	20.2	100	84	
Hori.	3617.050	PK	49.5	28.9	6.7	41.7	43.4	73.9	30.5	119	285	
Hori.	4824.000	PK	49.6	32.3	7.5	41.2	48.2	73.9	25.7	100	17	
Hori.	7236.000	PK	48.4	37.2	9.0	41.0	53.6	73.9	20.3	100	0	
Hori.	9648.000	PK	45.0	39.1	10.2	38.9	55.4	73.9	18.5	100	0	
Hori.	2390.000	AV	39.1	26.8	14.7	41.1	39.5	53.9	14.4	100	84	
Hori.	2397.775	AV	43.7	26.8	14.7	41.1	44.1	53.9	9.8	100	84	
Hori.	2400.000	AV	43.5	26.8	14.7	41.1	43.9	53.9	10.0	100	84	
Hori.	3617.050	AV	43.4	28.9	6.7	41.7	37.3	53.9	16.6	119	285	
Hori.	4824.000	AV	42.7	32.3	7.5	41.2	41.3	53.9	12.6	100	17	
Hori.	7236.000	AV	38.2	37.2	9.0	41.0	43.4	53.9	10.5	100	0	
Hori.	9648.000	AV	35.3	39.1	10.2	38.9	45.7	53.9	**8.2**	100	0	
Vert.	2390.000	PK	47.5	26.8	14.7	41.1	47.9	73.9	26.0	100	267	
Vert.	2397.775	PK	50.8	26.8	14.7	41.1	51.2	73.9	22.7	100	267	
Vert.	2400.000	PK	51.9	26.8	14.7	41.1	52.3	73.9	21.6	100	267	
Vert.	3617.050	PK	49.8	28.9	6.7	41.7	43.7	73.9	30.2	118	332	
Vert.	4824.000	PK	49.6	32.3	7.5	41.2	48.2	73.9	25.7	100	221	
Vert.	7236.000	PK	47.3	37.2	9.0	41.0	52.5	73.9	21.4	100	0	
Vert.	9648.000	PK	44.8	39.1	10.2	38.9	55.2	73.9	18.7	100	0	
Vert.	2390.000	AV	38.4	26.8	14.7	41.1	38.8	53.9	15.1	100	267	
Vert.	2397.775	AV	42.1	26.8	14.7	41.1	42.5	53.9	11.4	100	267	
Vert.	2400.000	AV	41.9	26.8	14.7	41.1	42.3	53.9	11.6	100	267	
Vert.	3617.050	AV	42.9	28.9	6.7	41.7	36.8	53.9	17.1	118	332	
Vert.	4824.000	AV	43.6	32.3	7.5	41.2	42.2	53.9	11.7	100	221	
Vert.	7236.000	AV	38.1	37.2	9.0	41.0	43.3	53.9	10.6	100	0	
Vert.	9648.000	AV	35.3	39.1	10.2	38.9	45.7	53.9	**8.2**	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-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.3 Semi Anechoic Chamber		
Date	August 26, 2013	August 27, 2013	August 28, 2013
Temperature / Humidity	20 deg.C, 57 %RH	21 deg.C, 66 %RH	25 deg.C, 55 %RH
Engineer	Tatsuya Arai		
Mode	Tx, 2437 MHz		
	Tx, IEEE802.11b, 1Mbps		

(* 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.	3655.516	PK	50.9	29.1	6.7	41.7	45.0	73.9	28.9	119	286	
Hori.	4874.000	PK	49.1	32.5	7.5	41.2	47.9	73.9	26.0	100	231	
Hori.	7311.000	PK	46.8	37.2	9.0	41.1	51.9	73.9	22.0	100	0	
Hori.	9748.000	PK	44.9	39.1	10.1	38.8	55.3	73.9	18.6	100	0	
Hori.	3655.516	AV	45.2	29.1	6.7	41.7	39.3	53.9	14.6	119	286	
Hori.	4874.000	AV	43.1	32.5	7.5	41.2	41.9	53.9	12.0	100	231	
Hori.	7311.000	AV	37.1	37.2	9.0	41.1	42.2	53.9	11.7	100	0	
Hori.	9748.000	AV	35.1	39.1	10.1	38.8	45.5	53.9	8.4	100	0	
Vert.	3655.516	PK	49.4	29.1	6.7	41.7	43.5	73.9	30.4	100	331	
Vert.	4874.000	PK	48.0	32.5	7.5	41.2	46.8	73.9	27.1	100	220	
Vert.	7311.000	PK	46.3	37.2	9.0	41.1	51.4	73.9	22.5	100	0	
Vert.	9748.000	PK	44.8	39.1	10.1	38.8	55.2	73.9	18.7	100	0	
Vert.	3655.516	AV	43.7	29.1	6.7	41.7	37.8	53.9	16.1	100	331	
Vert.	4874.000	AV	41.4	32.5	7.5	41.2	40.2	53.9	13.7	100	220	
Vert.	7311.000	AV	37.2	37.2	9.0	41.1	42.3	53.9	11.6	100	0	
Vert.	9748.000	AV	35.2	39.1	10.1	38.8	45.6	53.9	**8.3**	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-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.3 Semi Anechoic Chamber		
Date	August 26, 2013	August 27, 2013	August 28, 2013
Temperature / Humidity	20 deg.C, 57 %RH	21 deg.C, 66 %RH	25 deg.C, 55 %RH
Engineer	Tatsuya Arai		
Mode	Tx, 2462 MHz		
	Tx, IEEE802.11b, 1Mbps		

(* 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	48.2	26.9	14.8	41.0	48.9	73.9	25.0	100	88	
Hori.	3693.050	PK	50.3	29.2	6.8	41.7	44.6	73.9	29.3	119	284	
Hori.	4924.000	PK	48.3	32.8	7.5	41.1	47.5	73.9	26.4	100	25	
Hori.	7386.000	PK	46.8	37.3	9.0	41.1	52.0	73.9	21.9	100	0	
Hori.	9848.000	PK	44.2	39.0	10.0	38.8	54.4	73.9	19.5	100	0	
Hori.	2483.500	AV	38.6	26.9	14.8	41.0	39.3	53.9	14.6	100	88	
Hori.	3693.050	AV	44.3	29.2	6.8	41.7	38.6	53.9	15.3	119	284	
Hori.	4924.000	AV	41.6	32.8	7.5	41.1	40.8	53.9	13.1	100	25	
Hori.	7386.000	AV	37.1	37.3	9.0	41.1	42.3	53.9	11.6	100	0	
Hori.	9848.000	AV	34.3	39.0	10.0	38.8	44.5	53.9	**9.4**	100	0	
Vert.	2483.500	PK	49.1	26.9	14.8	41.0	49.8	73.9	24.1	100	267	
Vert.	3693.050	PK	50.1	29.2	6.8	41.7	44.4	73.9	29.5	100	328	
Vert.	4924.000	PK	47.5	32.8	7.5	41.1	46.7	73.9	27.2	100	18	
Vert.	7386.000	PK	46.5	37.3	9.0	41.1	51.7	73.9	22.2	100	0	
Vert.	9848.000	PK	44.1	39.0	10.0	38.8	54.3	73.9	19.6	100	0	
Vert.	2483.500	AV	38.2	26.9	14.8	41.0	38.9	53.9	15.0	100	267	
Vert.	3693.050	AV	43.5	29.2	6.8	41.7	37.8	53.9	16.1	100	328	
Vert.	4924.000	AV	39.5	32.8	7.5	41.1	38.7	53.9	15.2	100	18	
Vert.	7386.000	AV	37.0	37.3	9.0	41.1	42.2	53.9	11.7	100	0	
Vert.	9848.000	AV	34.2	39.0	10.0	38.8	44.4	53.9	9.5	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-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.3 Semi Anechoic Chamber		
Date	August 26, 2013	August 27, 2013	August 28, 2013
Temperature / Humidity	20 deg.C, 57 %RH	21 deg.C, 66 %RH	25 deg.C, 55 %RH
Engineer	Tatsuya Arai		
Mode	Tx, 2412 MHz		
	Tx, IEEE802.11g, 6Mbps		

(* 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	68.9	26.8	14.7	41.1	69.3	73.9	**4.6**	100	84	
Hori.	3618.031	PK	49.8	28.9	6.7	41.7	43.7	73.9	30.2	100	99	
Hori.	4824.000	PK	50.4	32.3	7.5	41.2	49.0	73.9	24.9	100	227	
Hori.	7236.000	PK	47.7	37.2	9.0	41.0	52.9	73.9	21.0	100	0	
Hori.	9648.000	PK	45.2	39.1	10.2	38.9	55.6	73.9	18.3	100	0	
Hori.	2390.000	AV	46.7	26.8	14.7	41.1	47.1	53.9	6.8	100	84	*1
Hori.	3618.031	AV	44.0	28.9	6.7	41.7	37.9	53.9	16.0	100	99	*2
Vert.	2390.000	PK	67.5	26.8	14.7	41.1	67.9	73.9	6.0	100	0	
Vert.	3618.031	PK	49.6	28.9	6.7	41.7	43.5	73.9	30.4	108	332	
Vert.	4824.000	PK	47.9	32.3	7.5	41.2	46.5	73.9	27.4	100	221	
Vert.	7236.000	PK	48.0	37.2	9.0	41.0	53.2	73.9	20.7	100	0	
Vert.	9648.000	PK	45.9	39.1	10.2	38.9	56.3	73.9	17.6	100	0	
Vert.	2390.000	AV	45.9	26.8	14.7	41.1	46.3	53.9	7.6	100	0	*1
Vert.	3618.031	AV	43.3	28.9	6.7	41.7	37.2	53.9	16.7	108	332	*2

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB
*1) Out of Band emission (Leakage Power)
*2) Continuous wave (no pulse emission)

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.	4824.000	AV	38.9	32.3	7.5	41.2	0.6	38.1	53.9	15.8	
Hori.	7236.000	AV	38.2	37.2	9.0	41.0	0.6	44.0	53.9	9.9	
Hori.	9648.000	AV	35.1	39.1	10.2	38.9	0.6	46.1	53.9	7.8	
Vert.	4824.000	AV	38.3	32.3	7.5	41.2	0.6	37.5	53.9	16.4	
Vert.	7236.000	AV	38.2	37.2	9.0	41.0	0.6	44.0	53.9	9.9	
Vert.	9648.000	AV	35.2	39.1	10.2	38.9	0.6	46.2	53.9	**7.7**	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-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.	2412.000	PK	91.5	26.8	14.7	41.1	91.9	-	-	100k/300k
Hori.	2400.000	PK	63.3	26.8	14.7	41.1	63.7	71.9	8.2	100k/300k
Vert.	2412.000	PK	90.9	26.8	14.7	41.1	91.3	-	-	100k/300k
Vert.	2400.000	PK	60.9	26.8	14.7	41.1	61.3	71.3	10.0	100k/300k

Result = Reading + Ant.Fac. + Loss(Cable+Attenuator+Filter) - Gain(Amplifier)

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Radiated Emission

Test place	No.3 Semi Anechoic Chamber			
Date	August 26, 2013	August 27, 2013	August 28, 2013	August 30, 2013
Temperature / Humidity	20 deg.C, 57 %RH	21 deg.C, 66 %RH	25 deg.C, 55 %RH	27 deg.C, 45 %RH
Engineer	Tatsuya Arai			
Mode	Tx, 2437 MHz			
	Tx, IEEE802.11g, 6Mbps			

(* 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.	100.910	QP	45.0	10.3	7.2	32.1	30.4	43.5	13.1	163	114	
Hori.	273.033	QP	43.9	18.2	8.4	32.0	38.5	46.0	**7.5**	125	191	
Hori.	314.131	QP	44.4	14.3	8.6	31.9	35.4	46.0	10.6	100	179	
Hori.	701.467	QP	35.2	20.3	10.2	31.8	33.9	46.0	12.1	144	65	
Hori.	3655.558	PK	50.4	29.1	6.7	41.7	44.5	73.9	29.4	100	99	
Hori.	4874.000	PK	48.0	32.5	7.5	41.2	46.8	73.9	27.1	100	226	
Hori.	7311.000	PK	47.3	37.2	9.0	41.1	52.4	73.9	21.5	100	0	
Hori.	9748.000	PK	44.7	39.1	10.1	38.8	55.1	73.9	18.8	100	0	
Hori.	3655.558	AV	44.6	29.1	6.7	41.7	38.7	53.9	15.2	100	99	*1
Vert.	104.378	QP	42.6	10.8	7.3	32.1	28.6	43.5	14.9	100	0	
Vert.	3655.558	PK	49.8	29.1	6.7	41.7	43.9	73.9	30.0	100	331	
Vert.	4874.000	PK	47.1	32.5	7.5	41.2	45.9	73.9	28.0	100	220	
Vert.	7311.000	PK	46.7	37.2	9.0	41.1	51.8	73.9	22.1	100	0	
Vert.	9748.000	PK	45.0	39.1	10.1	38.8	55.4	73.9	18.5	100	0	
Vert.	3655.558	AV	43.9	29.1	6.7	41.7	38.0	53.9	15.9	100	331	*1

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB
*1) Continuous wave (no pulse emission)

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.	4874.000	AV	38.0	32.5	7.5	41.2	0.6	37.4	53.9	16.5	
Hori.	7311.000	AV	37.7	37.2	9.0	41.1	0.6	43.4	53.9	10.5	
Hori.	9748.000	AV	35.1	39.1	10.1	38.8	0.6	46.1	53.9	**7.8**	
Vert.	4874.000	AV	37.6	32.5	7.5	41.2	0.6	37.0	53.9	16.9	
Vert.	7311.000	AV	37.6	37.2	9.0	41.1	0.6	43.3	53.9	10.6	
Vert.	9748.000	AV	34.9	39.1	10.1	38.8	0.6	45.9	53.9	8.0	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-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.3 Semi Anechoic Chamber		
Date	August 26, 2013	August 27, 2013	August 28, 2013
Temperature / Humidity	20 deg.C, 57 %RH	21 deg.C, 66 %RH	25 deg.C, 55 %RH
Engineer	Tatsuya Arai		
Mode	Tx, 2462 MHz		
	Tx, IEEE802.11g, 6Mbps		

(* 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	66.8	26.9	14.8	41.0	67.5	73.9	6.4	100	84	
Hori.	3693.007	PK	49.6	29.2	6.8	41.7	43.9	73.9	30.0	100	93	
Hori.	4924.000	PK	46.7	32.8	7.5	41.1	45.9	73.9	28.0	100	333	
Hori.	7386.000	PK	46.7	37.3	9.0	41.1	51.9	73.9	22.0	100	0	
Hori.	9848.000	PK	43.6	39.0	10.0	38.8	53.8	73.9	20.1	100	0	
Hori.	2483.500	AV	43.6	26.9	14.8	41.0	44.3	53.9	9.6	100	84	*1
Hori.	3693.007	AV	44.1	29.2	6.8	41.7	38.4	53.9	15.5	100	93	*2
Vert.	2483.500	PK	67.0	26.9	14.8	41.0	67.7	73.9	**6.2**	100	246	
Vert.	3693.007	PK	49.6	29.2	6.8	41.7	43.9	73.9	30.0	100	334	
Vert.	4924.000	PK	46.7	32.8	7.5	41.1	45.9	73.9	28.0	100	220	
Vert.	7386.000	PK	46.9	37.3	9.0	41.1	52.1	73.9	21.8	100	0	
Vert.	9848.000	PK	44.4	39.0	10.0	38.8	54.6	73.9	19.3	100	0	
Vert.	2483.500	AV	42.2	26.9	14.8	41.0	42.9	53.9	11.0	100	246	*1
Vert.	3693.007	AV	43.9	29.2	6.8	41.7	38.2	53.9	15.7	100	334	*2

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB
*1) Out of Band emission (Leakage Power)
*2) Continuous wave (no pulse emission)

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.	4924.000	AV	37.0	32.8	7.5	41.1	0.6	36.8	53.9	17.1	
Hori.	7386.000	AV	37.4	37.3	9.0	41.1	0.6	43.2	53.9	10.7	
Hori.	9848.000	AV	34.3	39.0	10.0	38.8	0.6	45.1	53.9	8.8	
Vert.	4924.000	AV	37.0	32.8	7.5	41.1	0.6	36.8	53.9	17.1	
Vert.	7386.000	AV	37.4	37.3	9.0	41.1	0.6	43.2	53.9	10.7	
Vert.	9848.000	AV	34.4	39.0	10.0	38.8	0.6	45.2	53.9	**8.7**	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-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.3 Semi Anechoic Chamber		
Date	August 26, 2013	August 27, 2013	August 28, 2013
Temperature / Humidity	20 deg.C, 57 %RH	21 deg.C, 66 %RH	25 deg.C, 55 %RH
Engineer	Tatsuya Arai		
Mode	Tx, 2412 MHz		
	Tx, IEEE802.11n HT20, MCS0		

(* 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	69.3	26.8	14.7	41.1	69.7	73.9	**4.2**	100	83	
Hori.	3618.041	PK	50.4	28.9	6.7	41.7	44.3	73.9	29.6	119	283	
Hori.	4824.000	PK	48.6	32.3	7.5	41.2	47.2	73.9	26.7	100	230	
Hori.	7236.000	PK	48.3	37.2	9.0	41.0	53.5	73.9	20.4	100	0	
Hori.	9648.000	PK	45.4	39.1	10.2	38.9	55.8	73.9	18.1	100	0	
Hori.	2390.000	AV	46.9	26.8	14.7	41.1	47.3	53.9	6.6	100	83	*1
Hori.	3618.041	AV	44.0	28.9	6.7	41.7	37.9	53.9	16.0	119	283	*2
Vert.	2390.000	PK	66.3	26.8	14.7	41.1	66.7	73.9	7.2	100	0	
Vert.	3618.041	PK	50.4	28.9	6.7	41.7	44.3	73.9	29.6	100	331	
Vert.	4824.000	PK	47.8	32.3	7.5	41.2	46.4	73.9	27.5	100	220	
Vert.	7236.000	PK	48.4	37.2	9.0	41.0	53.6	73.9	20.3	100	0	
Vert.	9648.000	PK	45.3	39.1	10.2	38.9	55.7	73.9	18.2	100	0	
Vert.	2390.000	AV	43.4	26.8	14.7	41.1	43.8	53.9	10.1	100	0	*1
Vert.	3618.041	AV	42.8	28.9	6.7	41.7	36.7	53.9	17.2	100	331	*2

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB
*1) Out of Band emission (Leakage Power)
*2) Continuous wave (no pulse emission)

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.	4824.000	AV	38.6	32.3	7.5	41.2	0.6	37.8	53.9	16.1	
Hori.	7236.000	AV	38.0	37.2	9.0	41.0	0.6	43.8	53.9	10.1	
Hori.	9648.000	AV	34.9	39.1	10.2	38.9	0.6	45.9	53.9	**8.0**	
Vert.	4824.000	AV	37.9	32.3	7.5	41.2	0.6	37.1	53.9	16.8	
Vert.	7236.000	AV	38.8	37.2	9.0	41.0	0.6	44.6	53.9	9.3	
Vert.	9648.000	AV	34.9	39.1	10.2	38.9	0.6	45.9	53.9	**8.0**	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-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.	2412.000	PK	91.5	26.8	14.7	41.1	91.9	-	-	100k/300k
Hori.	2400.000	PK	62.5	26.8	14.7	41.1	62.9	71.9	9.0	100k/300k
Vert.	2412.000	PK	90.1	26.8	14.7	41.1	90.5	-	-	100k/300k
Vert.	2400.000	PK	61.0	26.8	14.7	41.1	61.4	70.5	9.1	100k/300k

Result = Reading + Ant.Fac. + Loss(Cable+Attenuator+Filter) - Gain(Amplifier)

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Radiated Emission

Test place	No.3 Semi Anechoic Chamber		
Date	August 26, 2013	August 27, 2013	August 28, 2013
Temperature / Humidity	20 deg.C, 57 %RH	21 deg.C, 66 %RH	25 deg.C, 55 %RH
Engineer	Tatsuya Arai		
Mode	Tx, 2437 MHz		
	Tx, IEEE802.11n HT20, MCS0		

(* 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.	3655.472	PK	50.6	29.1	6.7	41.7	44.7	73.9	29.2	100	290	
Hori.	4874.000	PK	45.2	32.5	7.5	41.2	44.0	73.9	29.9	100	0	
Hori.	7311.000	PK	46.9	37.2	9.0	41.1	52.0	73.9	21.9	100	0	
Hori.	9748.000	PK	45.5	39.1	10.1	38.8	55.9	73.9	18.0	100	0	
Hori.	3655.472	AV	44.9	29.1	6.7	41.7	39.0	53.9	**14.9**	100	290	*1
Vert.	3655.472	PK	50.7	29.1	6.7	41.7	44.8	73.9	29.1	100	330	
Vert.	4874.000	PK	45.7	32.5	7.5	41.2	44.5	73.9	29.4	100	0	
Vert.	7311.000	PK	47.0	37.2	9.0	41.1	52.1	73.9	21.8	100	0	
Vert.	9748.000	PK	44.4	39.1	10.1	38.8	54.8	73.9	19.1	100	0	
Vert.	3655.472	AV	44.1	29.1	6.7	41.7	38.2	53.9	15.7	100	330	*1

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB
*1) Continuous wave (no pulse emission)

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.	4874.000	AV	35.9	32.5	7.5	41.2	0.6	35.3	53.9	18.6	
Hori.	7311.000	AV	37.5	37.2	9.0	41.1	0.6	43.2	53.9	10.7	
Hori.	9748.000	AV	34.9	39.1	10.1	38.8	0.6	45.9	53.9	**8.0**	
Vert.	4874.000	AV	35.8	32.5	7.5	41.2	0.6	35.2	53.9	18.7	
Vert.	7311.000	AV	37.4	37.2	9.0	41.1	0.6	43.1	53.9	10.8	
Vert.	9748.000	AV	34.8	39.1	10.1	38.8	0.6	45.8	53.9	8.1	

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-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.3 Semi Anechoic Chamber		
Date	August 26, 2013	August 27, 2013	August 28, 2013
Temperature / Humidity	20 deg.C, 57 %RH	21 deg.C, 66 %RH	25 deg.C, 55 %RH
Engineer	Tatsuya Arai		
Mode	Tx, 2462 MHz		
	Tx, IEEE802.11n HT20, MCS0		

(* 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	67.7	26.9	14.8	41.0	68.4	73.9	**5.5**	100	185	
Hori.	3693.000	PK	50.3	29.2	6.8	41.7	44.6	73.9	29.3	122	286	
Hori.	4924.000	PK	46.7	32.8	7.5	41.1	45.9	73.9	28.0	100	17	
Hori.	7386.000	PK	46.9	37.3	9.0	41.1	52.1	73.9	21.8	100	0	
Hori.	9848.000	PK	43.7	39.0	10.0	38.8	53.9	73.9	20.0	100	0	
Hori.	2483.500	AV	44.6	26.9	14.8	41.0	45.3	53.9	8.6	100	185	*1
Hori.	3693.000	AV	45.1	29.2	6.8	41.7	39.4	53.9	14.5	122	286	*2
Vert.	2483.500	PK	66.2	26.9	14.8	41.0	66.9	73.9	7.0	100	0	
Vert.	3693.000	PK	50.6	29.2	6.8	41.7	44.9	73.9	29.0	100	332	
Vert.	4924.000	PK	46.6	32.8	7.5	41.1	45.8	73.9	28.1	100	219	
Vert.	7386.000	PK	47.6	37.3	9.0	41.1	52.8	73.9	21.1	100	0	
Vert.	9848.000	PK	43.7	39.0	10.0	38.8	53.9	73.9	20.0	100	0	
Vert.	2483.500	AV	43.3	26.9	14.8	41.0	44.0	53.9	9.9	100	0	*1
Vert.	3693.000	AV	44.3	29.2	6.8	41.7	38.6	53.9	15.3	100	332	*2

Result = Reading + Ant.Fac. + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB
*1) Out of Band emission (Leakage Power)
*2) Continuous wave (no pulse emission)

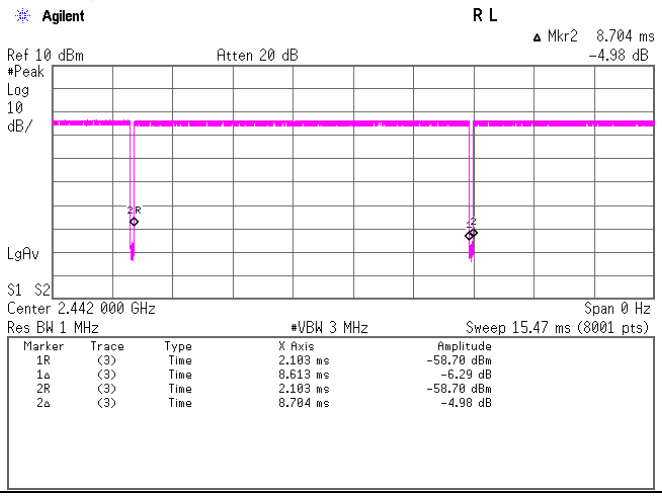
Average measurement value with duty factor

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.	4924.000	AV	37.0	32.8	7.5	41.1	0.6	36.8	53.9	17.1	
Hori.	7386.000	AV	37.6	37.3	9.0	41.1	0.6	43.4	53.9	10.5	
Hori.	9848.000	AV	34.3	39.0	10.0	38.8	0.6	45.1	53.9	**8.8**	
Vert.	4924.000	AV	36.7	32.8	7.5	41.1	0.6	36.5	53.9	17.4	
Vert.	7386.000	AV	37.4	37.3	9.0	41.1	0.6	43.2	53.9	10.7	
Vert.	9848.000	AV	34.0	39.0	10.0	38.8	0.6	44.8	53.9	9.1	

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

Burst rate confirmation

Tx, IEEE802.11b, PN9, worst data mode 1Mbps

duty cycle = 8.613 / 8.704 = 0.99 (99%)	
Tx2_duty1 	Tx2_duty2

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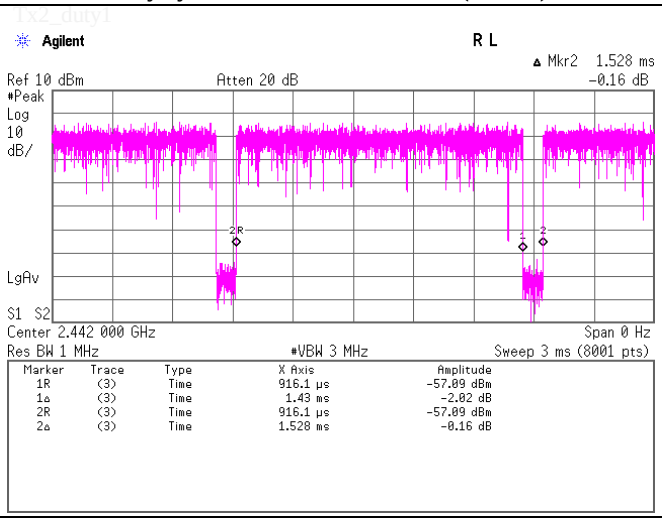
Duty Factor Calculation chart

Tx, IEEE802.11g, PN9, worst data mode 6Mbps

Duty Factor Calculation	
Duty Factor: 20log (1/duty cycle) = 0.6dB	
duty cycle = 1.43 / 1.528 = 0.936 (93.6%)	
	

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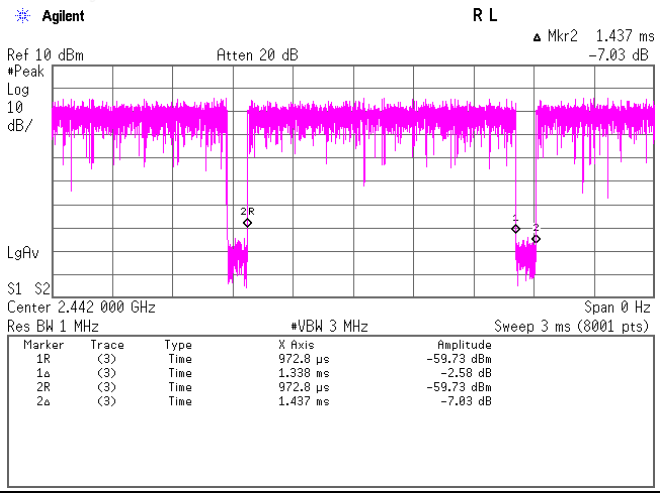
Duty Factor Calculation chart

Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)

Duty Factor Calculation	
Duty Factor: 20log (1/duty cycle) = 0.6dB	
duty cycle = 1.338 / 1.437 = 0.931 (93.1%)	



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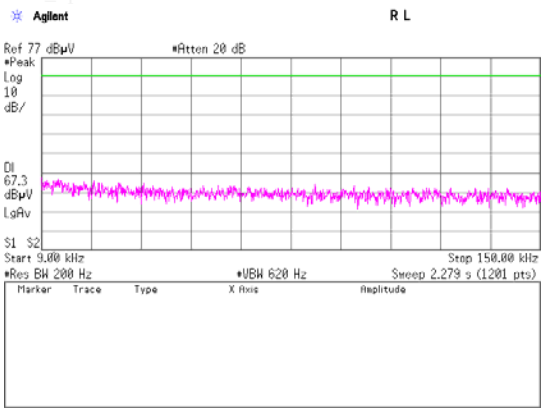
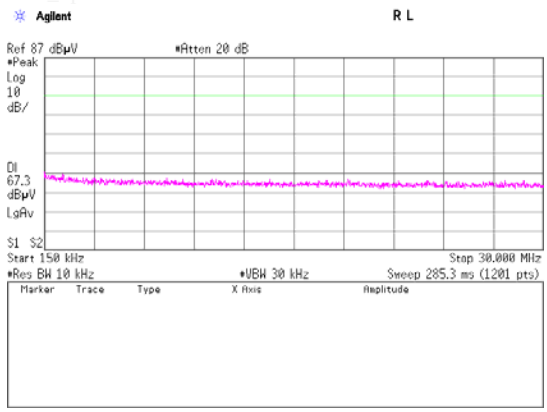
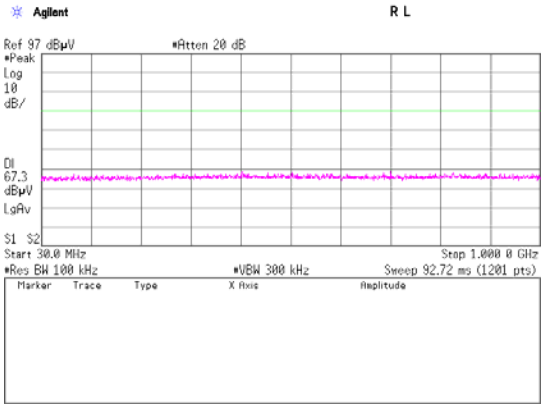
(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11b, PN9, worst data mode 1Mbps

Tx, 2412MHz (below 1GHz)	
9kHz - 150kHz	**150kHz - 30MHz**
	
30MHz - 1GHz	
	

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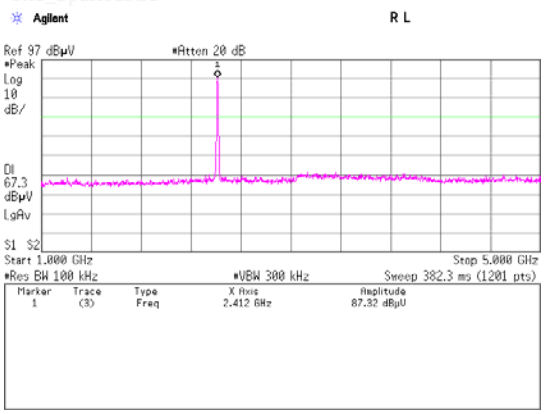
(Reference chart) Spurious emission (Conducted)

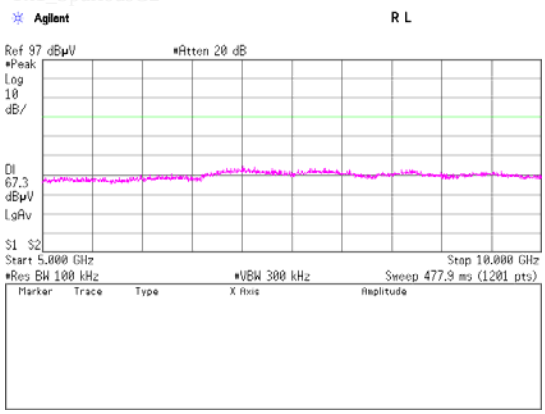
Tx, IEEE802.11b, PN9, worst data mode 1Mbps

Tx, 2412MHz (above 1GHz)

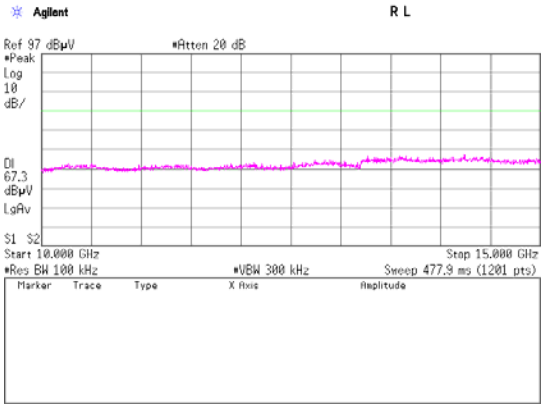
1GHz - 5GHz



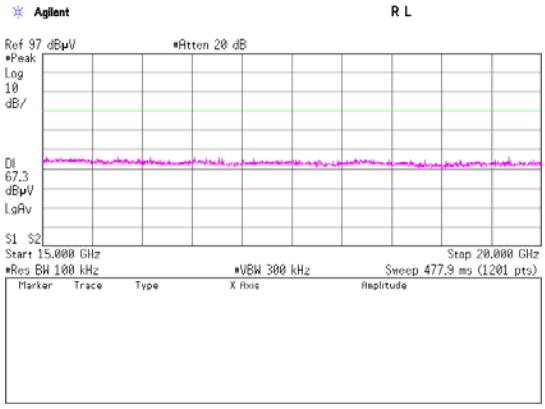
5GHz - 10GHz



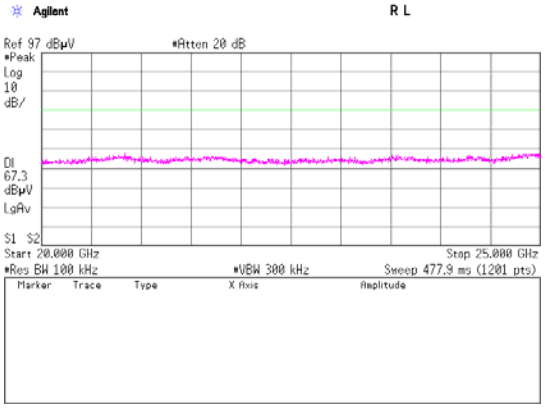
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



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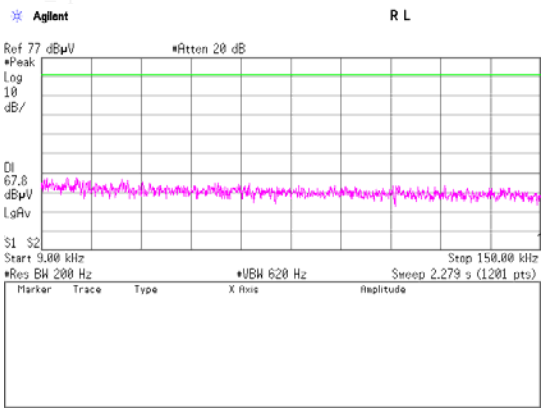
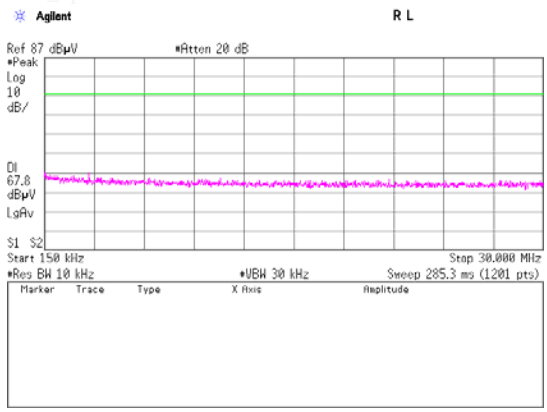
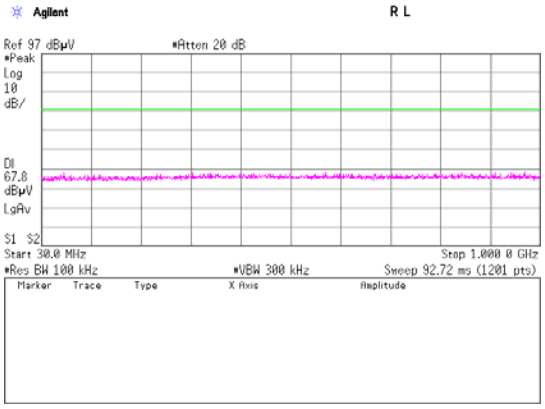
(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11b, PN9, worst data mode 1Mbps

Tx, 2437MHz (below 1GHz)	
9kHz - 150kHz	**150kHz - 30MHz**
	
30MHz - 1GHz	
	

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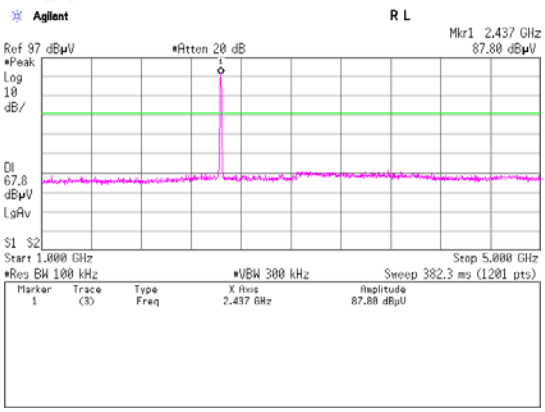
(Reference chart) Spurious emission (Conducted)

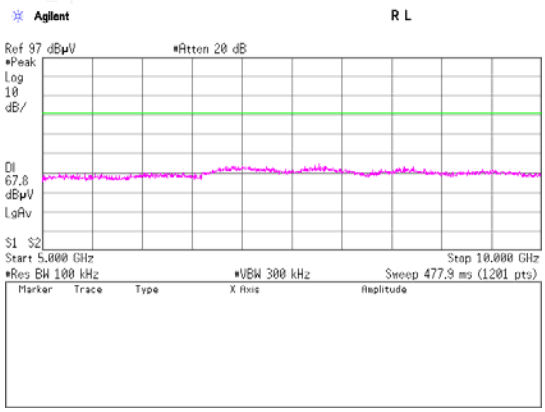
Tx, IEEE802.11b, PN9, worst data mode 1Mbps

Tx, 2437MHz (above 1GHz)

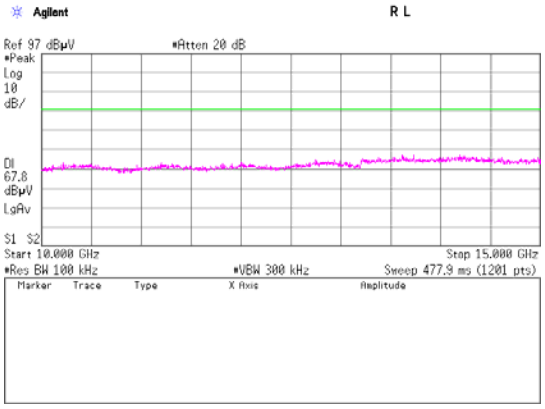
1GHz - 5GHz



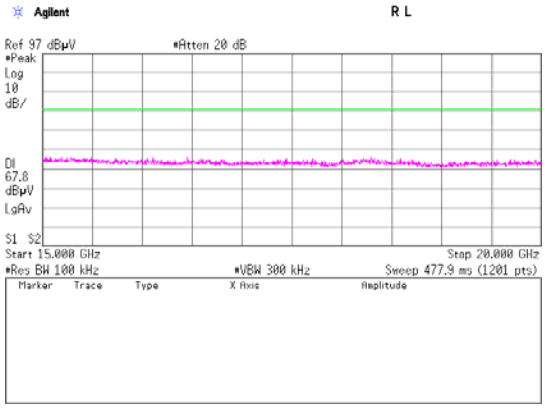
5GHz - 10GHz



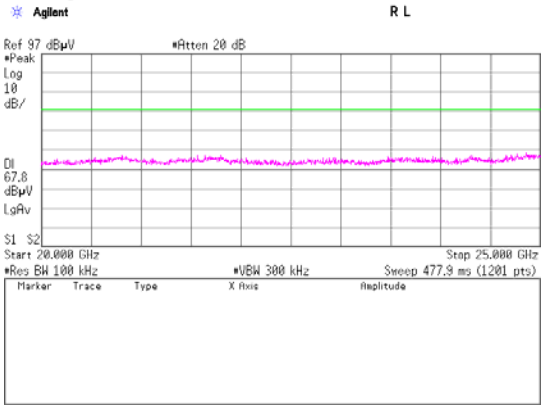
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



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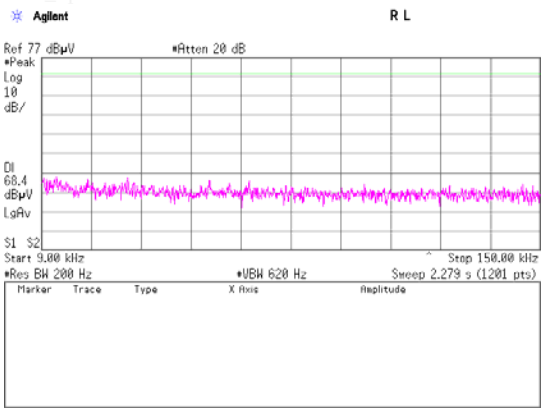
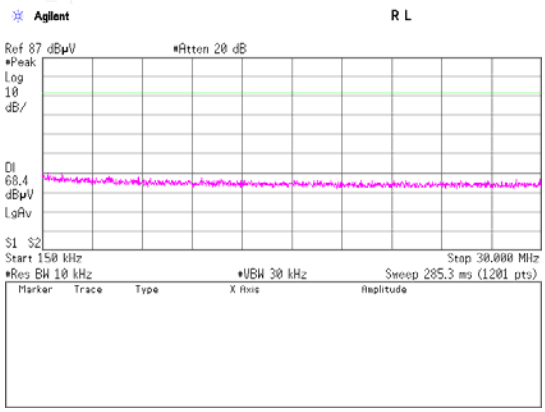
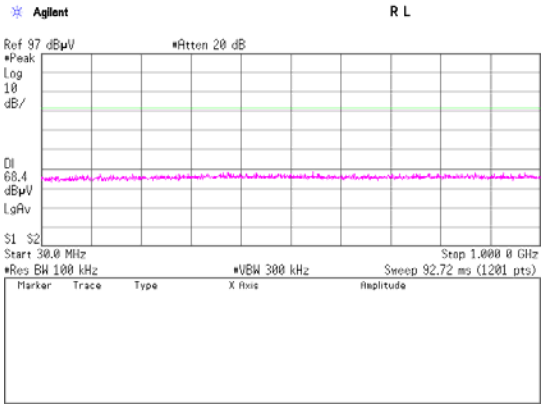
(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11b, PN9, worst data mode 1Mbps

Tx, 2462MHz (below 1GHz)	
9kHz - 150kHz	**150kHz - 30MHz**
	
30MHz - 1GHz	
	

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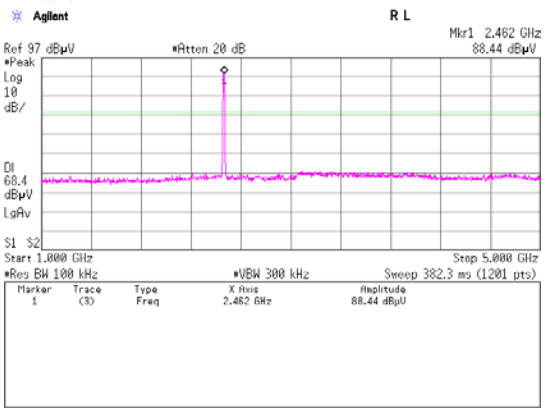
(Reference chart) Spurious emission (Conducted)

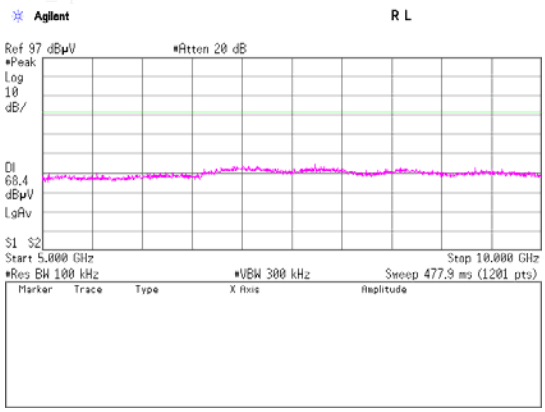
Tx, IEEE802.11b, PN9, worst data mode 1Mbps

Tx, 2462MHz (above 1GHz)

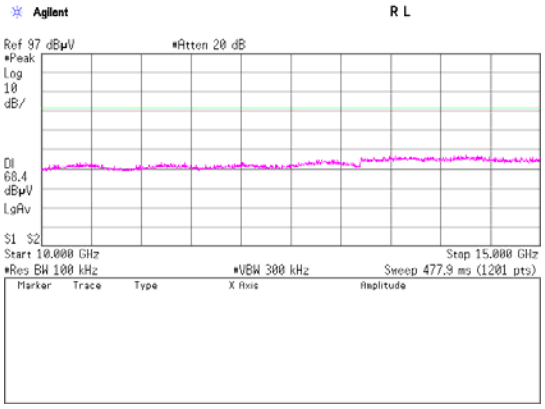
1GHz - 5GHz



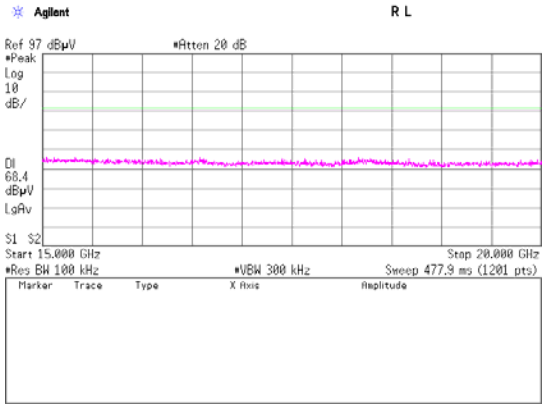
5GHz - 10GHz



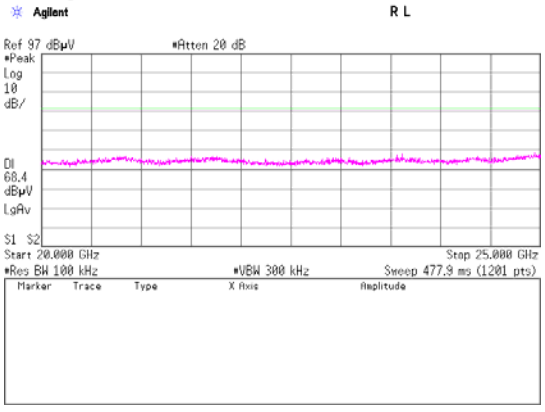
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



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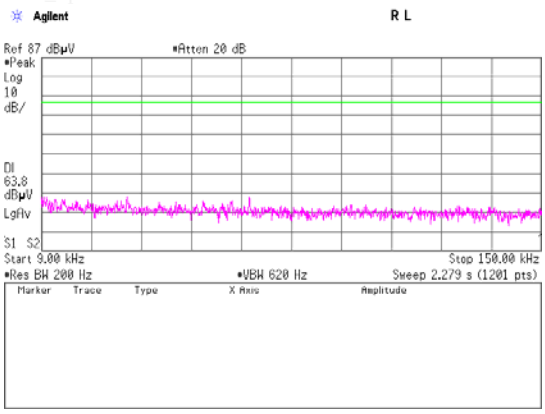
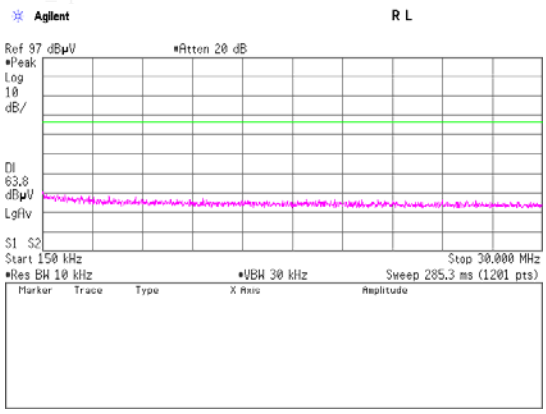
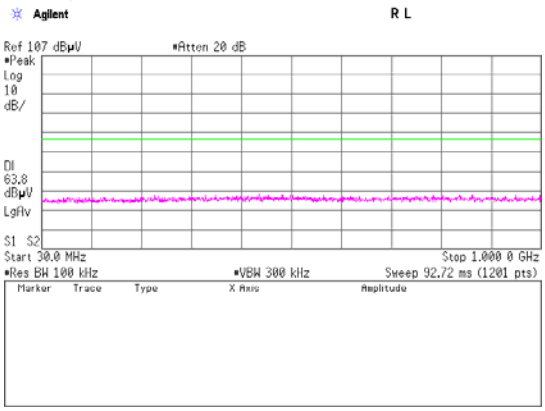
(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps

Tx, 2412MHz (below 1GHz)	
9kHz - 150kHz	**150kHz - 30MHz**
	
30MHz - 1GHz	
	

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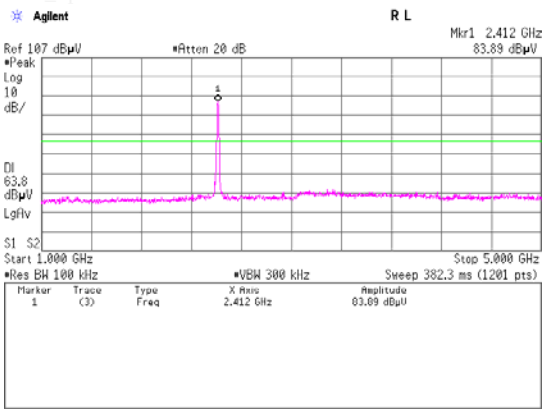
(Reference chart) Spurious emission (Conducted)

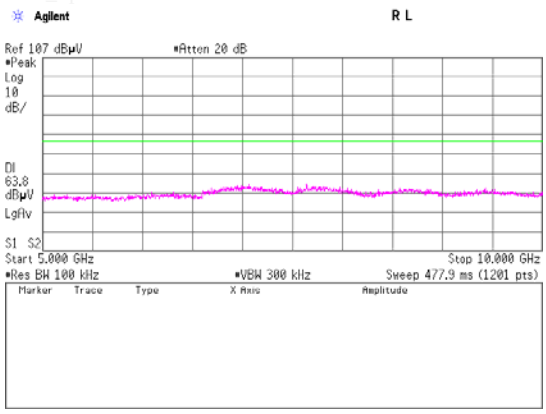
Tx, IEEE802.11g, PN9, worst data mode 6Mbps

Tx, 2412MHz (above 1GHz)

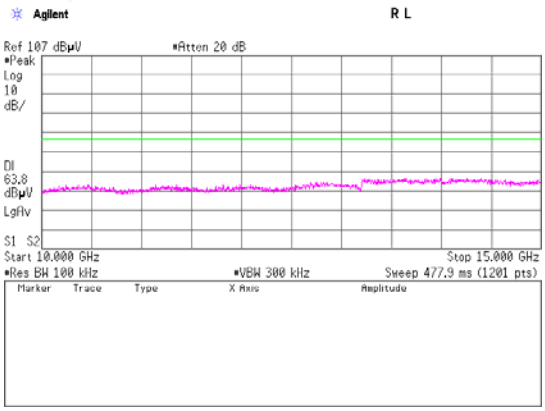
1GHz - 5GHz



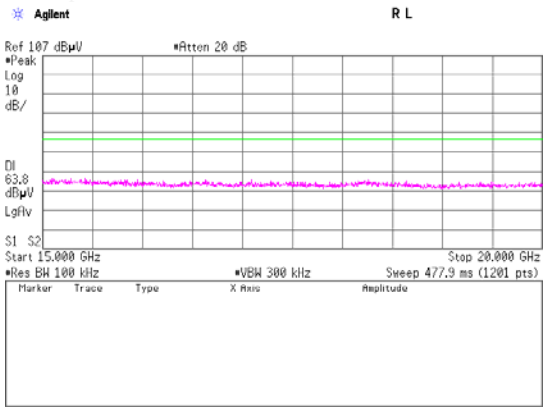
5GHz - 10GHz



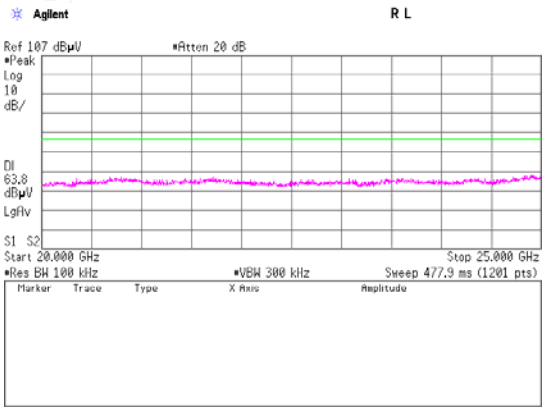
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



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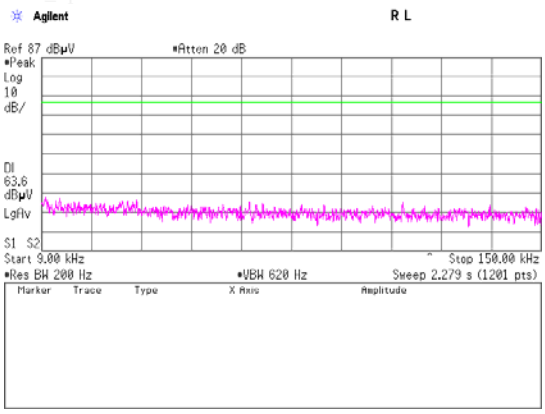
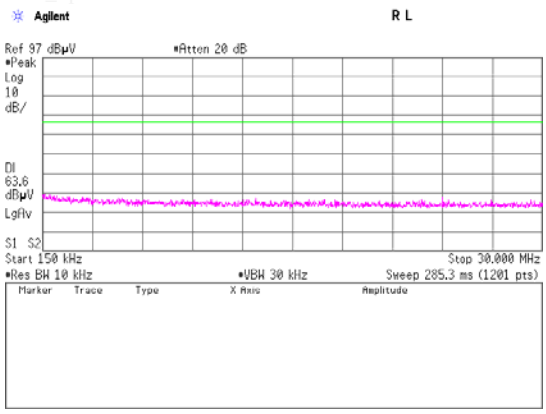
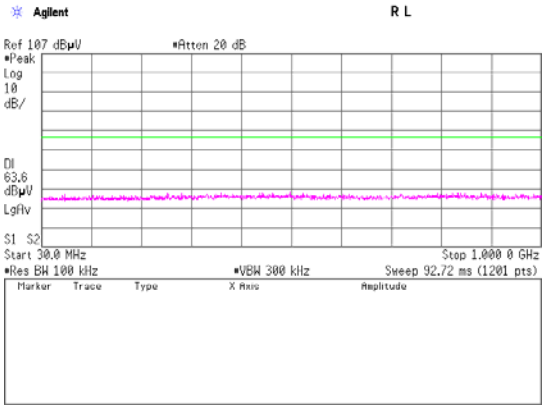
(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps

Tx, 2437MHz (below 1GHz)	
9kHz - 150kHz	**150kHz - 30MHz**
	
30MHz - 1GHz	
	

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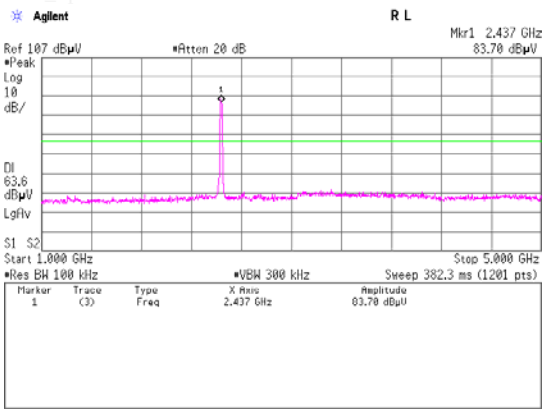
(Reference chart) Spurious emission (Conducted)

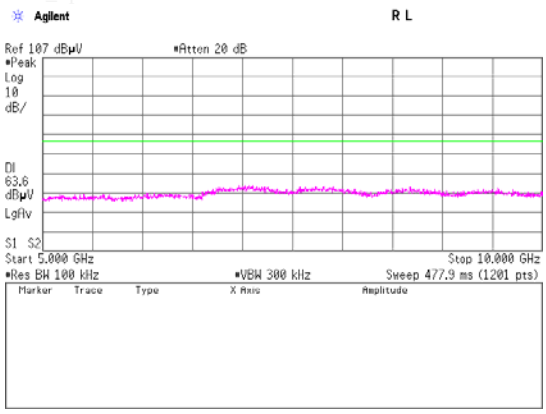
Tx, IEEE802.11g, PN9, worst data mode 6Mbps

Tx, 2437MHz (above 1GHz)

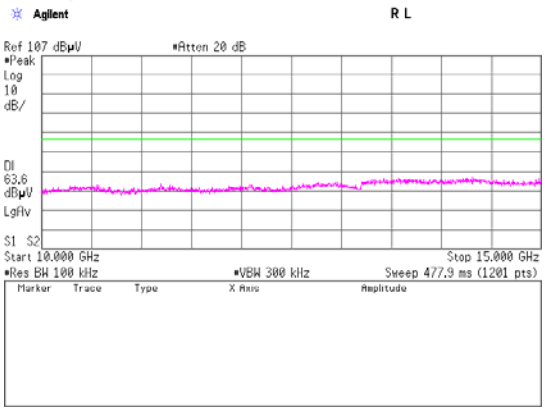
1GHz - 5GHz



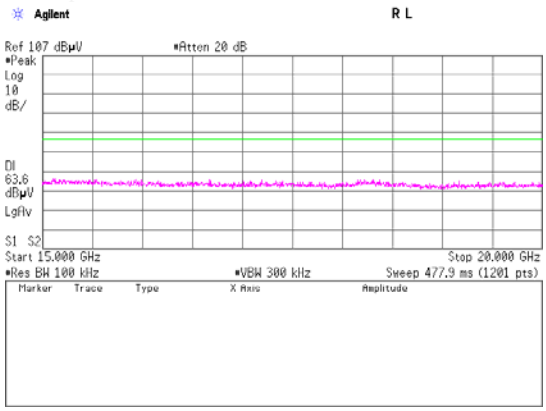
5GHz - 10GHz



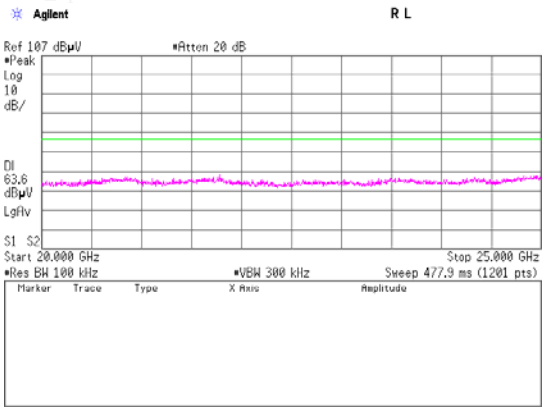
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



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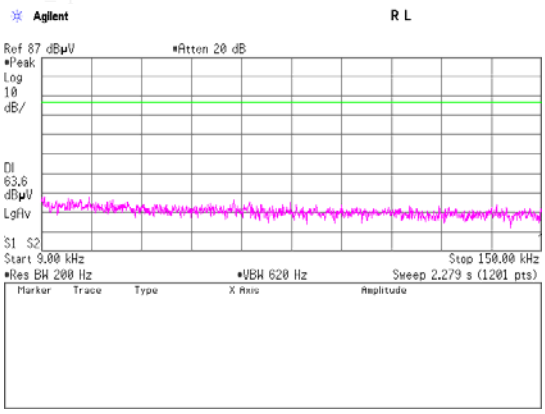
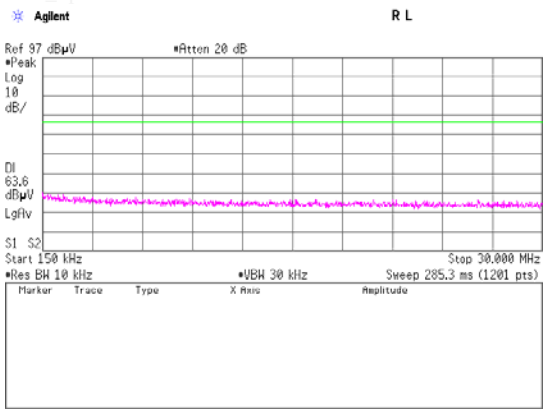
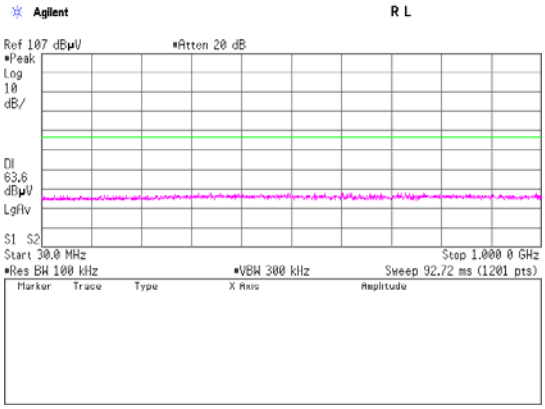
(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps

Tx, 2462MHz (below 1GHz)	
9kHz - 150kHz	**150kHz - 30MHz**
	
30MHz - 1GHz	
	

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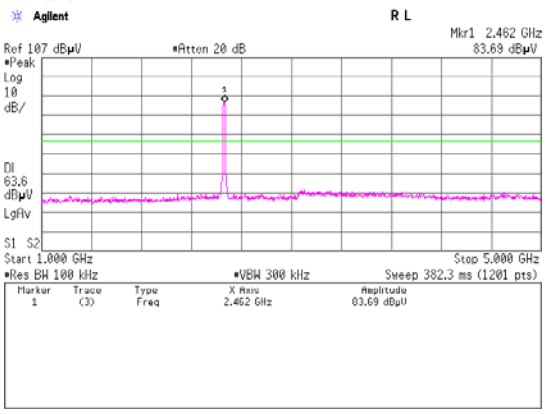
(Reference chart) Spurious emission (Conducted)

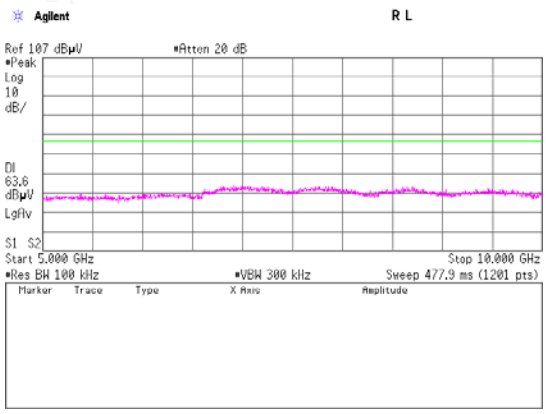
Tx, IEEE802.11g, PN9, worst data mode 6Mbps

Tx, 2462MHz (above 1GHz)

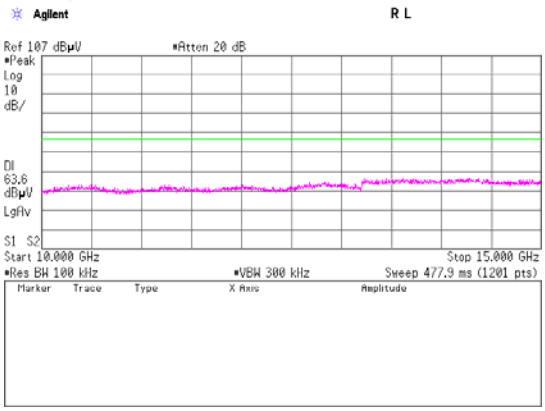
1GHz - 5GHz



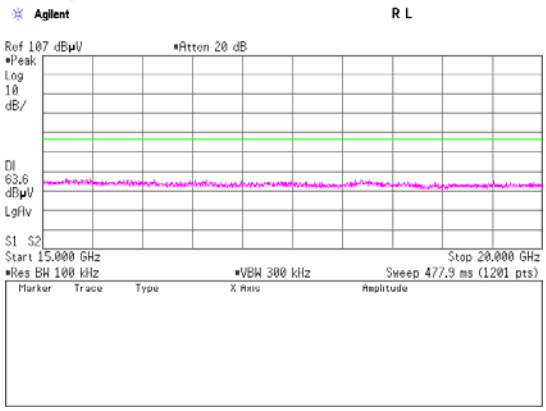
5GHz - 10GHz



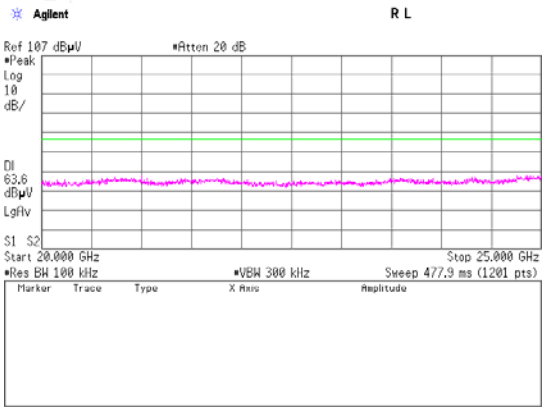
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



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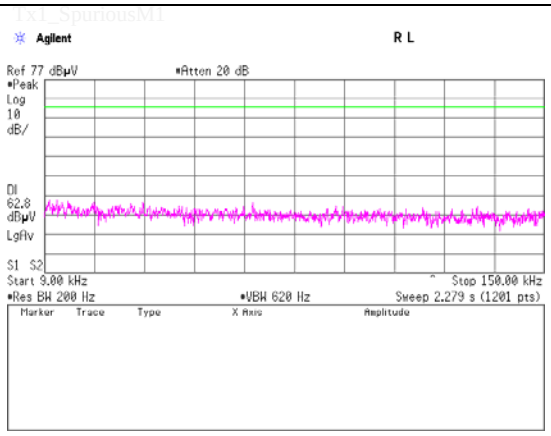
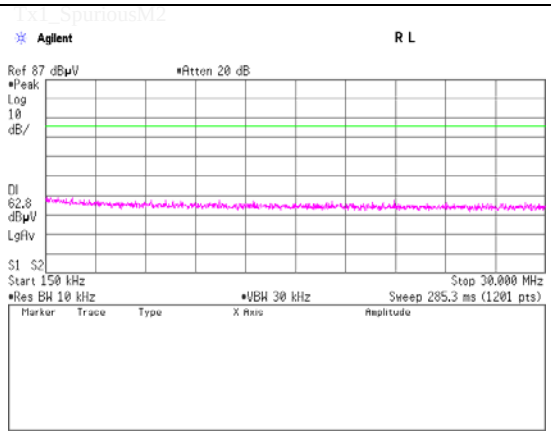
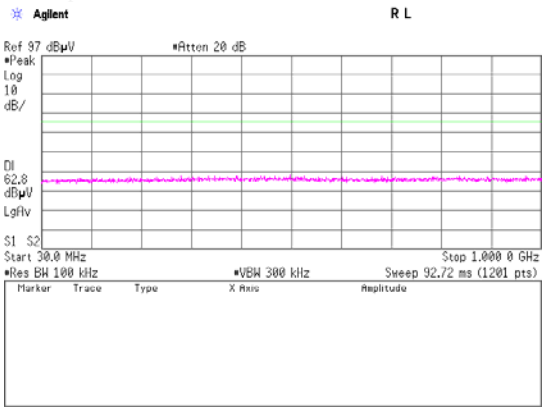
(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)

Tx, 2412MHz (below 1GHz)	
9kHz - 150kHz	**150kHz - 30MHz**
	
30MHz - 1GHz	
	

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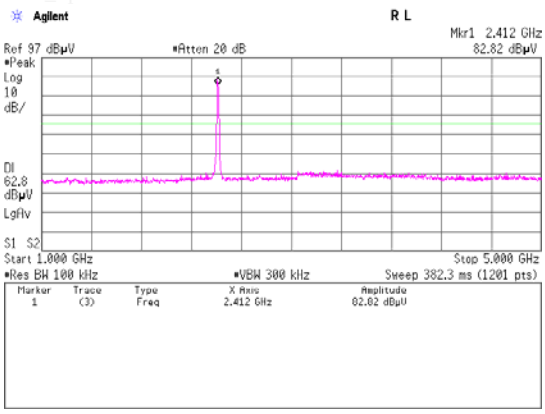
(Reference chart) Spurious emission (Conducted)

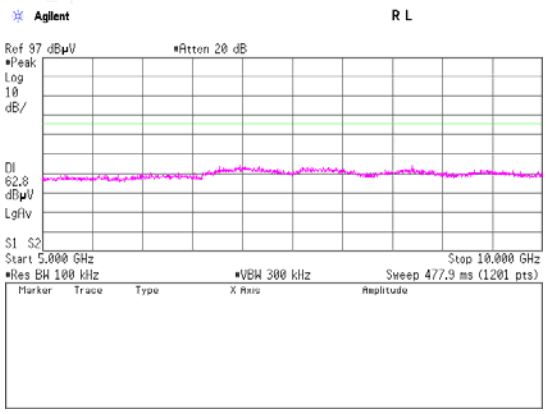
Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)

Tx, 2412MHz (above 1GHz)

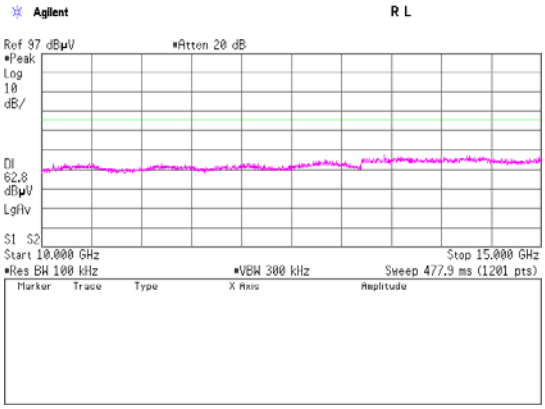
1GHz - 5GHz



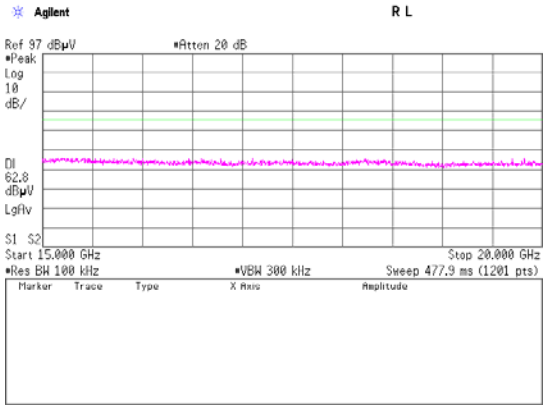
5GHz - 10GHz



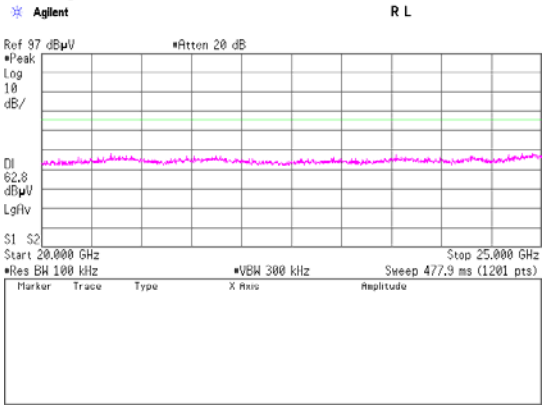
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



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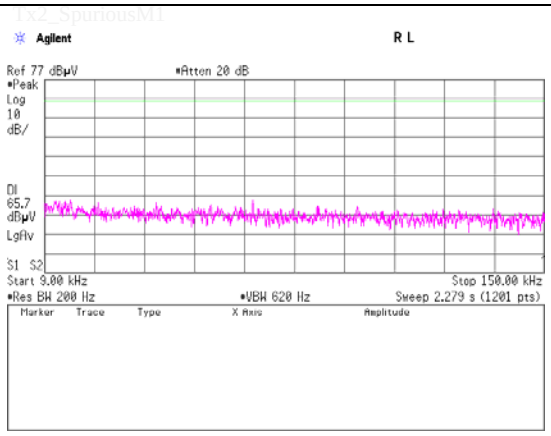
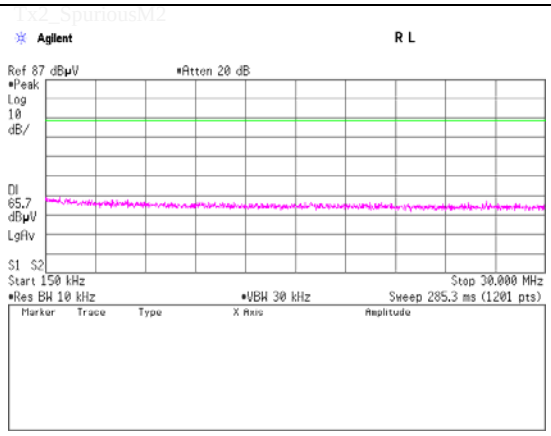
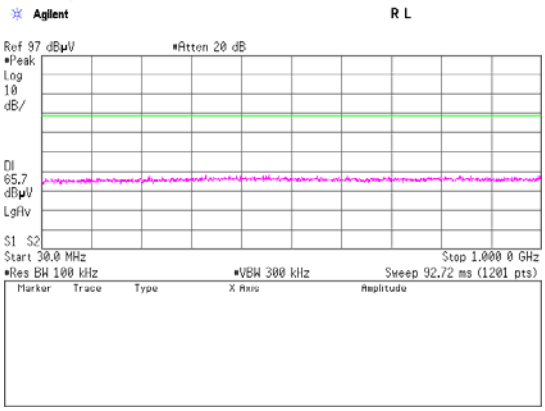
(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)

Tx, 2437MHz (below 1GHz)	
9kHz - 150kHz	**150kHz - 30MHz**
	
30MHz - 1GHz	
	

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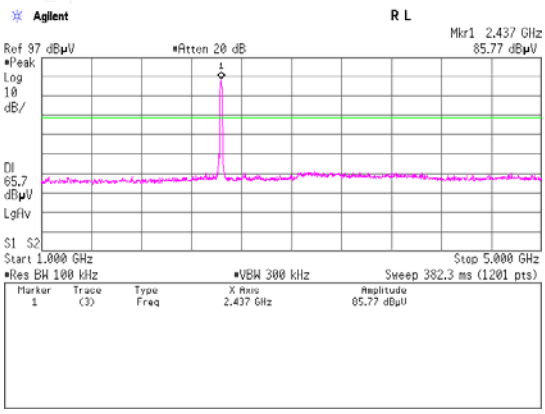
(Reference chart) Spurious emission (Conducted)

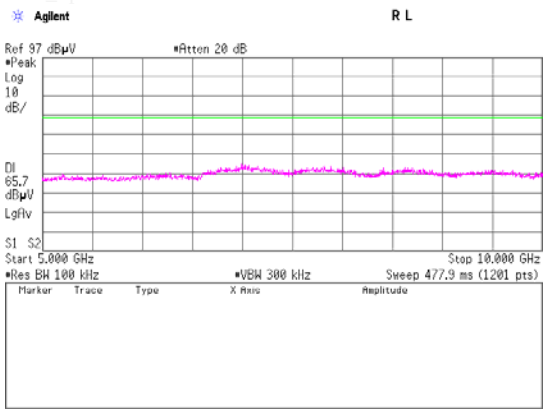
Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)

Tx, 2437MHz (above 1GHz)

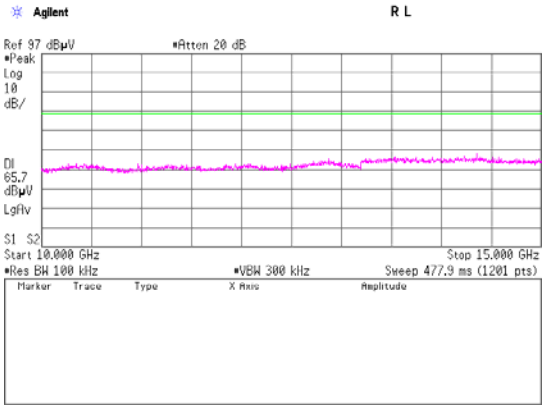
1GHz - 5GHz



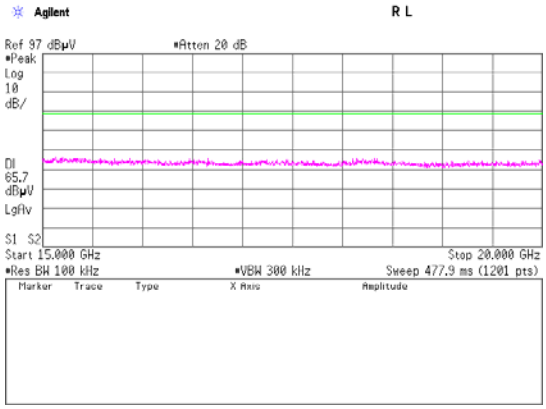
5GHz - 10GHz



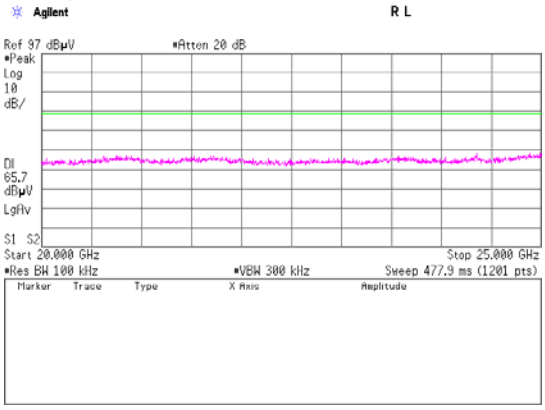
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



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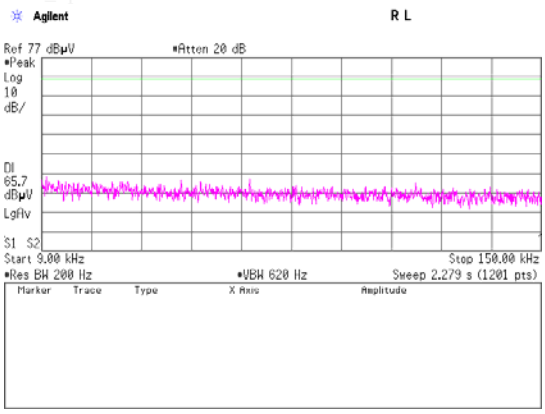
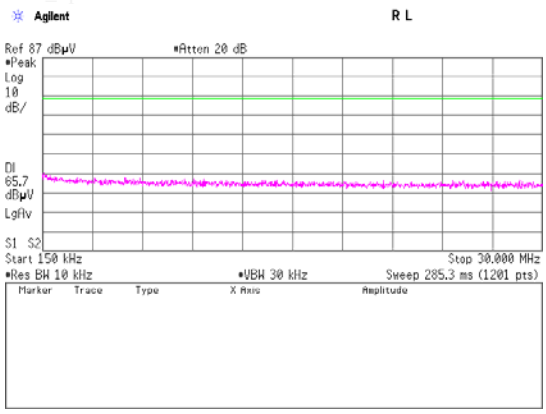
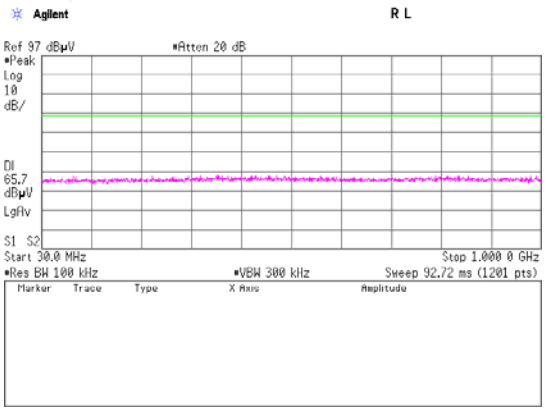
(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)

Tx, 2462MHz (below 1GHz)	
9kHz - 150kHz	**150kHz - 30MHz**
	
30MHz - 1GHz	
	

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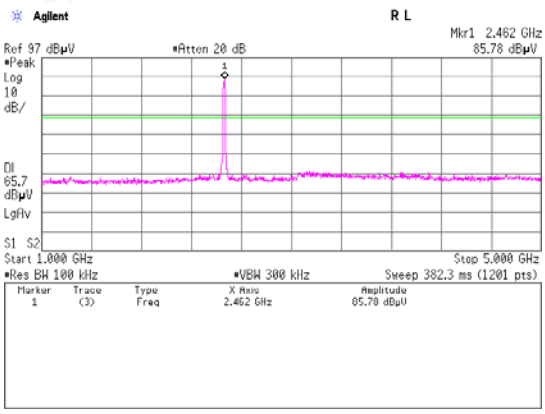
(Reference chart) Spurious emission (Conducted)

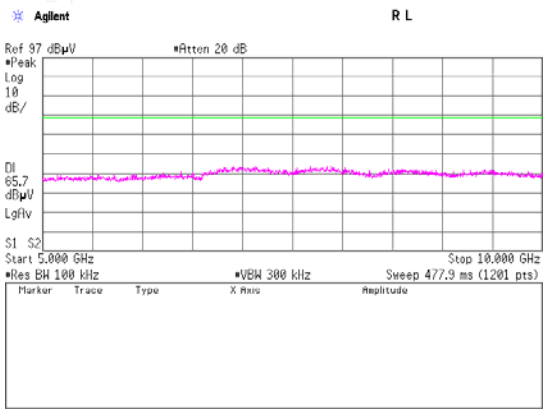
Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)

Tx, 2462MHz (above 1GHz)

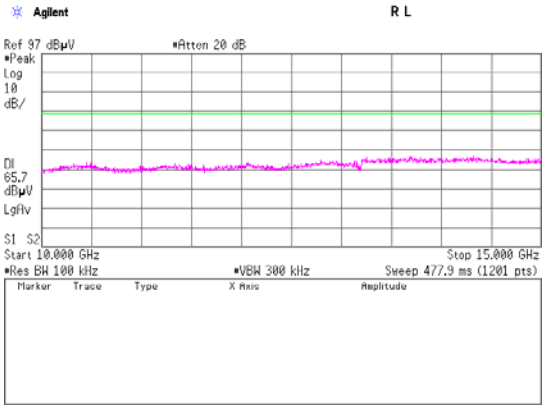
1GHz - 5GHz



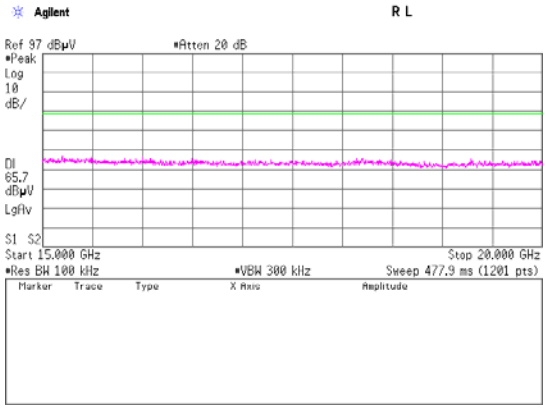
5GHz - 10GHz



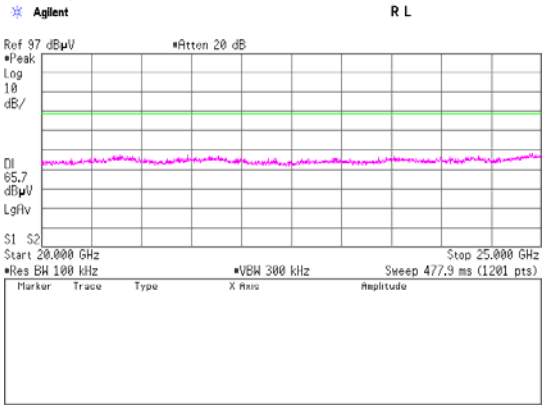
10GHz - 15GHz



15GHz - 20GHz



20GHz - 25GHz



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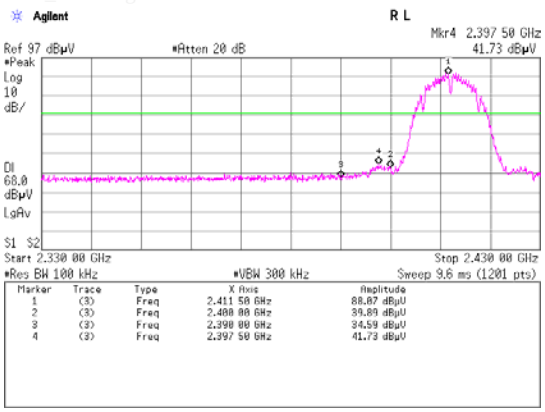
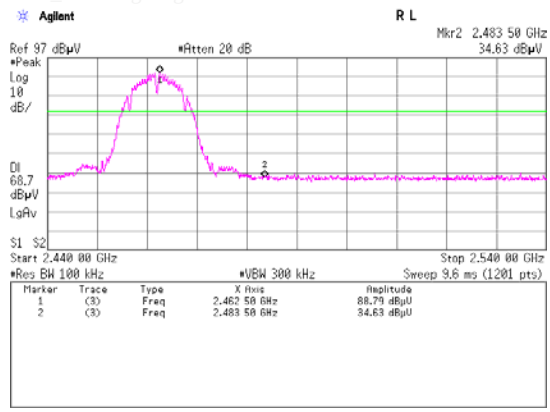
(Reference chart) Spurious emission (Conducted)

Band Edge compliance

Tx, IEEE802.11b, PN9, worst data mode 1Mbps	
Tx, 2412MHz	**Tx, 2462MHz**
TX1_BandEdgeLow	TX3_BandEdgeHigh





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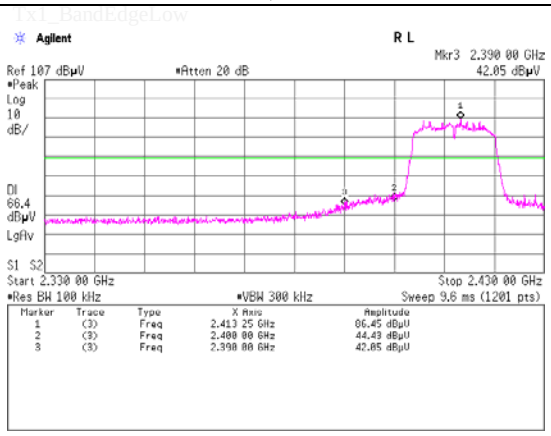
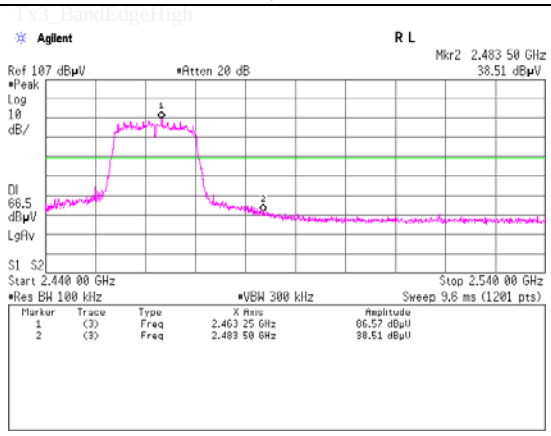
(Reference chart) Spurious emission (Conducted)

Band Edge compliance

Tx, IEEE802.11g, PN9, worst data mode 6Mbps	
Tx, 2412MHz	**Tx, 2462MHz**
	

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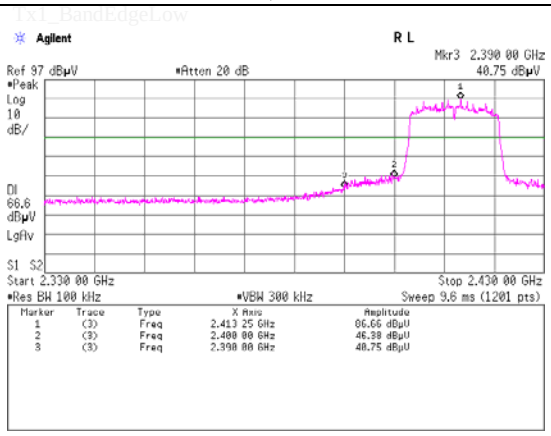
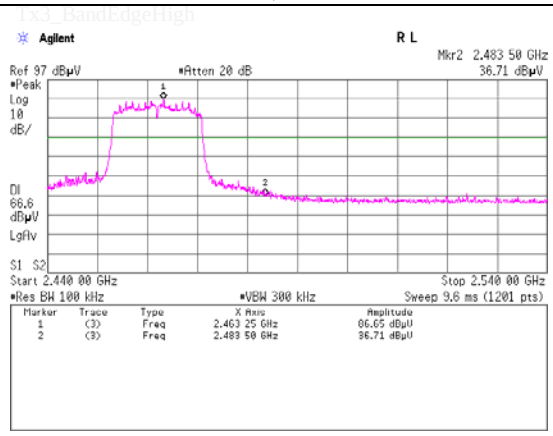
(Reference chart) Spurious emission (Conducted)

Band Edge compliance

Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)	
Tx, 2412MHz	**Tx, 2462MHz**
	

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Maximum Power Spectral Density

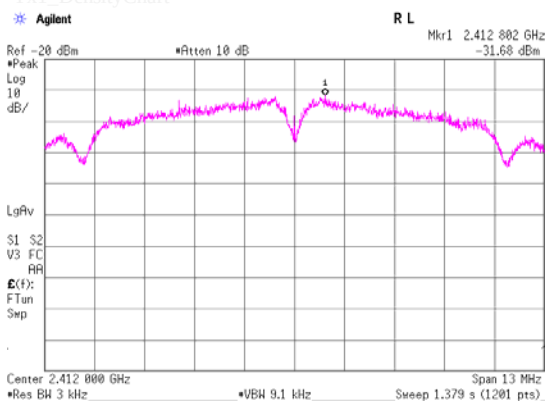
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 26, 2013	
Temperature / Humidity	27deg.C , 58%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11b, PN9, worst data mode 1Mbps	

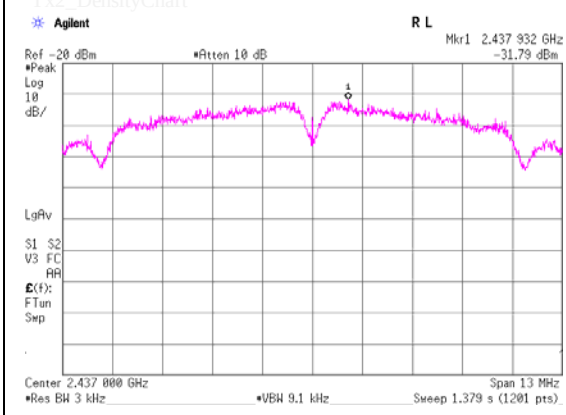
Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2412.80	-31.68	0.76	20.21	-10.71	8.00	18.71
2437.0000	2437.93	-31.79	0.77	20.21	-10.81	8.00	18.81
2462.0000	2462.75	-31.62	0.77	20.21	-10.64	8.00	18.64

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

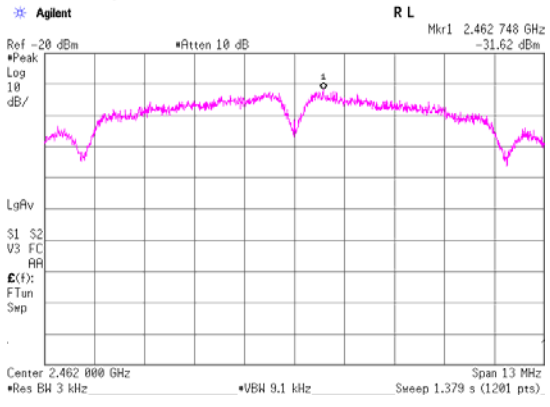
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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Maximum Power Spectral Density

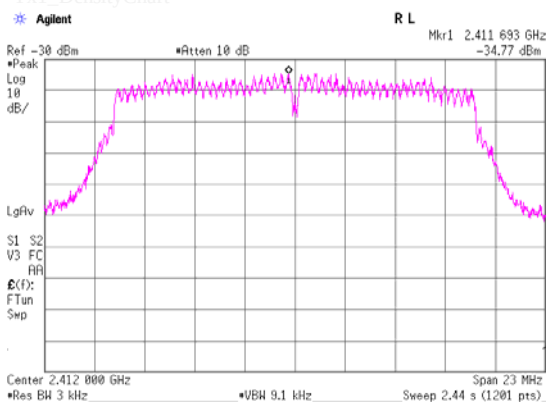
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 26, 2013	
Temperature / Humidity	27deg.C , 58%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	

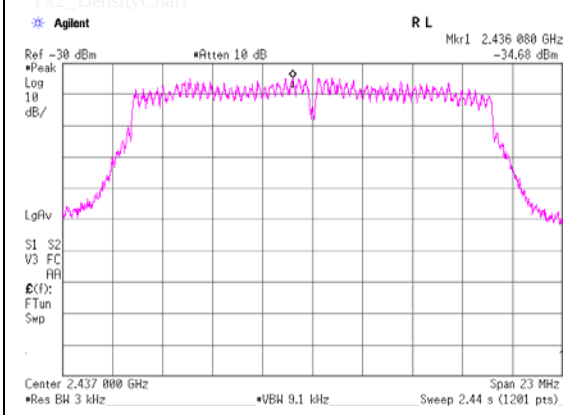
Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2411.69	-34.77	0.76	20.21	-13.80	8.00	21.80
2437.0000	2436.08	-34.68	0.77	20.21	-13.70	8.00	21.70
2462.0000	2460.72	-33.41	0.77	20.21	-12.43	8.00	20.43

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

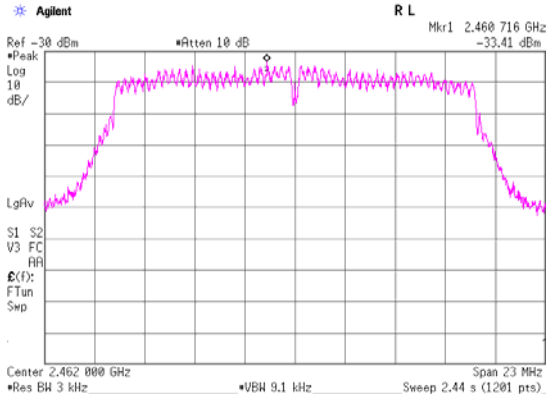
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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Maximum Power Spectral Density

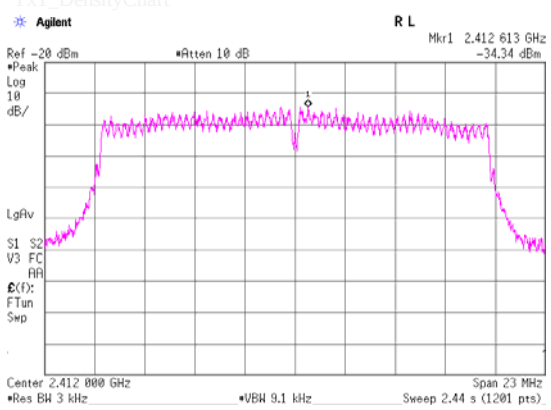
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 26, 2013	
Temperature / Humidity	27deg.C , 58%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)	

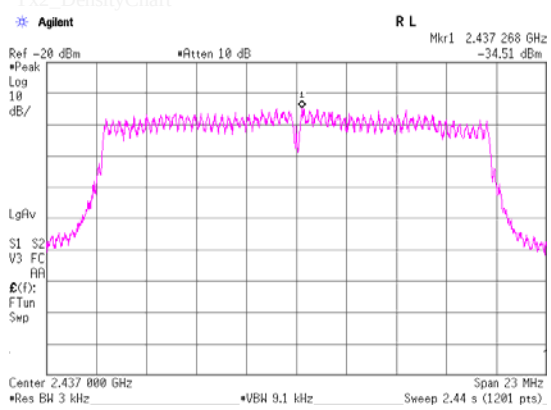
Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2412.61	-34.34	0.76	20.21	-13.37	8.00	21.37
2437.0000	2437.27	-34.51	0.77	20.21	-13.53	8.00	21.53
2462.0000	2458.90	-34.46	0.77	20.21	-13.48	8.00	21.48

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

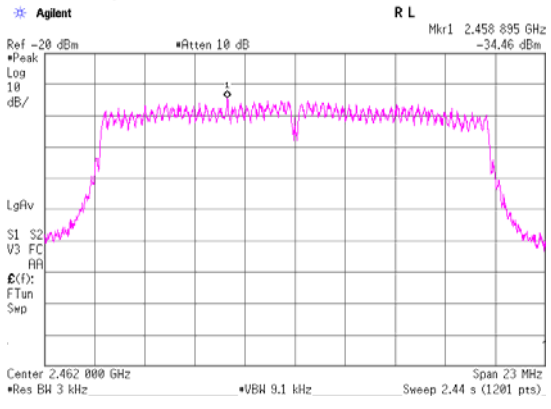
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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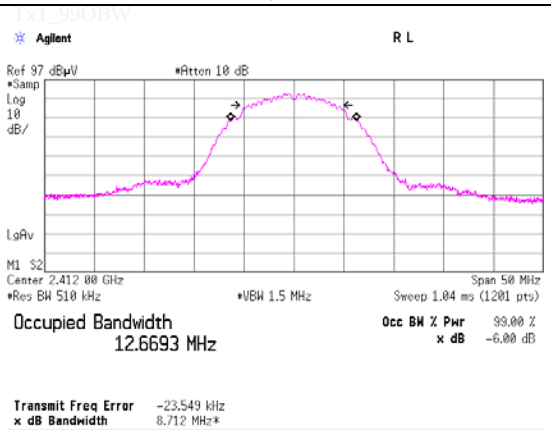
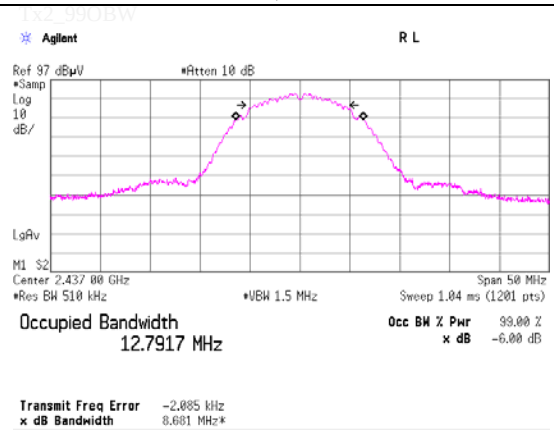
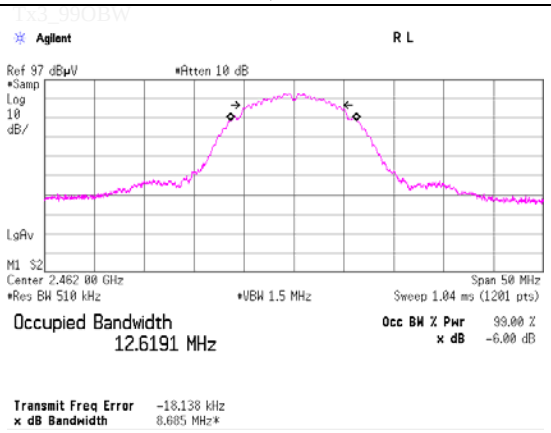
99% Occupied Bandwidth

Tx, IEEE802.11b, PN9, worst data mode 1Mbps	
Tx, 2412MHz	**Tx, 2437MHz**
	
Tx, 2462MHz	
	

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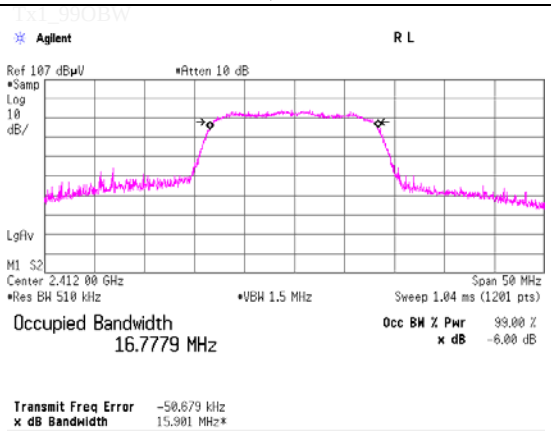
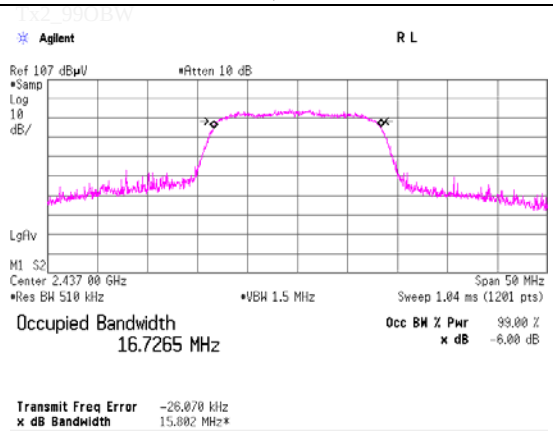
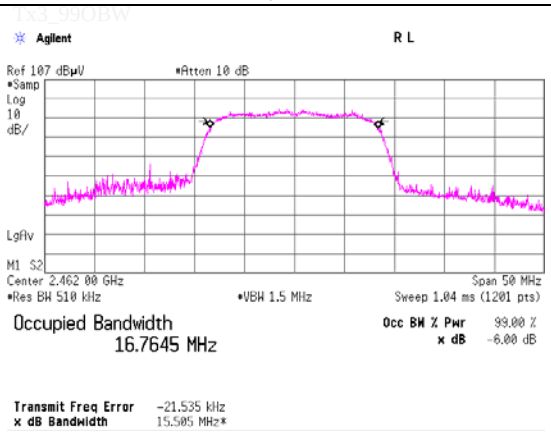
99% Occupied Bandwidth

Tx, IEEE802.11g, PN9, worst data mode 6Mbps	
Tx, 2412MHz	**Tx, 2437MHz**
	
Tx, 2462MHz	
	

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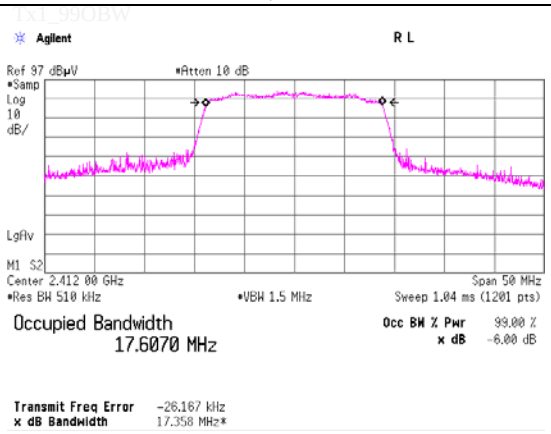
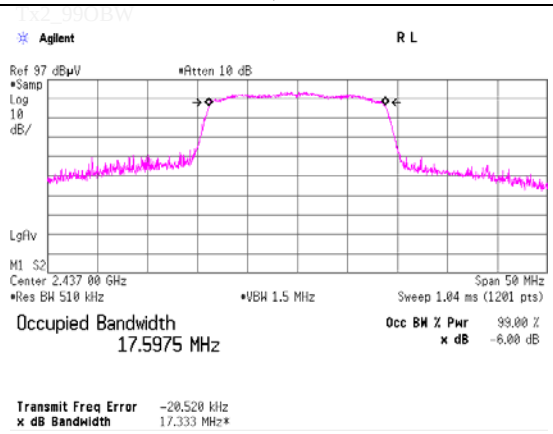
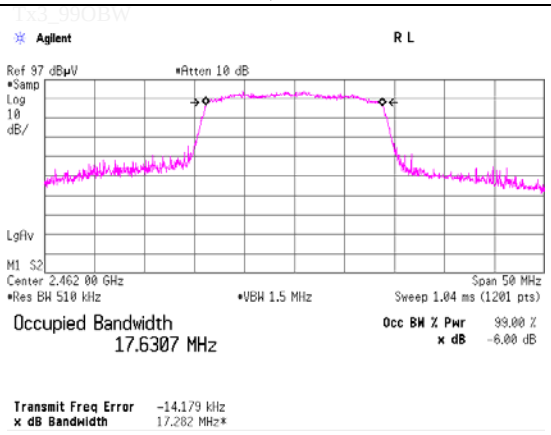
99% Occupied Bandwidth

Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)	
Tx, 2412MHz	**Tx, 2437MHz**
	
Tx, 2462MHz	
	

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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)
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2013/03/07 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2013/04/09 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2013/04/09 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	AT	2013/03/28 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2013/03/16 * 12
SAT20-05	Attenuator	Weinschel Corp.	54A-20	Y5649	AT	2012/11/15 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2013/07/09 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2013/07/22 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	2013/04/11 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2013/05/22 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2013/08/19 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2013/02/27 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2013/03/28 * 12
SJM-11	Measure	PROMART	SEN1935	-	RE/CE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFI,MF)	-	RE/CE	-
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2012/12/18 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2012/12/18 * 12
SHA-05	Horn Antenna	ETS LINDGREN	3160-09	LM4210	RE	2013/03/14 * 12
SCC-G18	Coaxial Cable	Suhner	SUCOFLEX 104A	46292/4A	RE	2013/03/16 * 12
SAF-09	Pre Amplifier	TOYO Corporation	HAP18-26W	00000018	RE	2013/03/19 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2013/02/12 * 12
SAT6-06	Attenuator	JFW	50HF-006N	-	RE	2013/02/12 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2012/10/08 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2013/04/03 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2012/10/08 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE	2013/02/27 * 12
SCC-C9/C10/SRSE-03	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-271(RF Selector)	CE	2013/04/03 * 12
SLS-04	LISN	Rohde & Schwarz	ENV216	100514	CE	2013/02/25 * 12
SAT3-06	Attenuator	JFW	50HF-003N	-	CE	2013/02/12 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2013/03/07 * 12
STR-03	Test Receiver	Rohde & Schwarz	ESI40	100054/040	CE	2013/07/09 * 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 disturbance voltage