RADIO TEST REPORT

Test Report No. : 32IE0119-SH-01-A

Applicant	:	**Murata Manufacturing Co., Ltd.**
Type of Equipment	:	**Communication Module**
Model No.	:	**TypeWN**
FCC ID	:	**VPYLBWN572**
Test regulation	:	**FCC Part15 Subpart C: 2012**
Test result	:	**Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
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.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by any agency of the Federal Government.
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: April 17 to 24, 2012

Representative test engineer:

Akio Hayashi
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".

JAB Testing RTL02610

UL Japan, Inc.
Shonan EMC Lab.
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REVISION HISTORY

Original Test Report No.: 32IE0119-SH-01-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	32IE0119-SH-01-A	May 21, 2012	-	-
1	32IE0119-SH-01-A	June 1, 2012	P1-2, 4, 7-8, 82	P4: Update of comment for antenna requirements P4,8: Correction of antenna type P7: Addition of table about antenna used P82: Correction of data

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Contents

Page

SECTION 1: Customer information

Company Name	:	Murata Manufacturing Co., Ltd.
Address	:	10-1, Higashikotari 1-chome, Nagaokakyo-shi, Kyoto 617-8555 Japan
Telephone Number	:	+81-75-955-6735
Facsimile Number	:	+81-75-955-6634
Contact Person	:	Takaharu Kawakatsu

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

2.1 Identification of E.U.T.

Type of Equipment	:	Communication Module
Model No.	:	TypeWN
Serial No.	:	Refer to 4.2 in this report.
Rating	:	DC1.8V, DC3.3V
Receipt Date of Sample	:	April 17, 2012
Country of Mass-production	:	China, Japan
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No modification by the test lab.

2.2 Product description

Model: TypeWN (referred to as the EUT in this report) is a Communication Module.

Clock frequency(ies) in the system : 26MHz

Radio specification

Equipment type	:	Transceiver
Frequency of operation	:	2412-2462MHz
Bandwidth & channel spacing	:	20MHz & 5MHz
Type of modulation	:	DSSS: CCK,DQPSK, DBPSK OFDM: 64QAM, 16QAM, QPSK, BPSK
Antenna type	:	3-type: Dipole, Monopole, Inversed F
Antenna connector type	:	Pin
Antenna gain with cable loss	:	Dipole: 3.18dBi, Monopole: 2.97dBi, Inversed F: 2.94dBi
ITU code	:	D1D, G1D
Operation temperature range	:	-20 to +55 deg.C.

FCC 15.31 (e)
The stable voltage (DC1.8V and DC3.3V) is constantly provided with the EUT through the regulator installed in the end product. Therefore, this EUT complies with the requirement.

FCC 15.203
Antenna is permanently attached to the modular transmitter based on the requirements of KDB996369.

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2012
final revised on March 30, 2012 and effective April 30, 2012

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 March 30, 2012 does not affect the test specification applied to the EUT.

The EUT will be tested for the compliance with FCC Part 15 Subpart B by the customer.

3.2 Procedures & Results

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.4:2009 7. AC powerline conducted emission measurements	FCC 15.207	-	N/A	19.5dB Freq.: 0.42830MHz Detector: Quasi-Peak Phase: N Mode: Tx 2462MHz, IEEE 802.11n (HT20) Antenna: Dipole	Complied
6dB bandwidth	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (a)(2) & 15.209	Conducted	N/A	* See data	Complied
Maximum peak output power	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (b)(3) & 15.209	Conducted	N/A		Complied
Spurious emission & Restricted band edges	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.109, 15.247 (d) & 15.209	Conducted / Radiated	N/A	0.1dB Freq.: 4824.000MHz Detector: Average Polarization: Horizontal Mode: Tx 2412MHz, IEEE 802.11b Antenna: Monopole	Complied
Power density	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (e) & 15.209	Conducted	N/A	* See data	Complied
Note: UL Japan's Work Procedures No.13-EM-W0420 and 13-EM-W0422 These tests were also referred to "Guidance on Measurement for Digital Transmission Systems Section15.247".						

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied bandwidth (99%)	ANSI C63.4:2009 13. Measurement of intentional radiators, 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) AMN/LISN	150kHz-30MHz	3.6 dB	3.6 dB	3.6 dB
Radiated emission (Measurement distance: 3m)	9kHz-30MHz	3.7 dB	3.7 dB	3.6 dB
	30MHz-300MHz	4.9 dB	5.1 dB	5.0 dB
	300MHz-1GHz	5.0 dB	5.2 dB	5.0 dB
	1GHz-15GHz	4.8 dB	4.8 dB	4.9 dB
Radiated emission (Measurement distance: 1m)	15GHz-18GHz	5.6 dB	5.6 dB	5.6 dB
	18GHz-40GHz	4.8 dB	4.3 dB	4.4 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 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: (±) 1.5dB
Spurious emission (Conducted) measurement (below 1GHz) uncertainty for this test was: (±) 1.7dB
Spurious emission (Conducted) measurement (1G-3GHz) uncertainty for this test was: (±) 2.3dB
Spurious emission (Conducted) measurement (3G-18GHz) uncertainty for this test was: (±) 3.0dB
Spurious emission (Conducted) measurement (18G-26.5GHz) uncertainty for this test was: (±) 2.9dB
Bandwidth measurement uncertainty for this test was: (±) 5.4%

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

	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 Full-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

The EUT exercise program used during testing was designed to exercise the various system components in a manner similar to typical use.

Test mode:

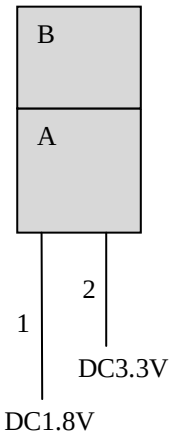
Test item	Mode	Tested frequency	Power setting *1)	Worst data rate *2)
Conducted emission & Radiated emission (below 1GHz) *3)	Transmitting IEEE 802.11n-20	2462MHz	7dBm	MCS5, PN9
Other items	Transmitting IEEE 802.11b	2412MHz, 2437MHz, 2462MHz	7dBm	1Mbps, PN9
	Transmitting IEEE 802.11g	2412MHz, 2437MHz, 2462MHz	7dBm	18Mbps, PN9
	Transmitting IEEE 802.11n-20	2412MHz, 2437MHz, 2462MHz	7dBm	MCS5, PN9
*1) Software: ART6003CTRL.exe, Ver.1.0.4.4 (Murata MFG Co., Ltd.) *2) The worst condition was determined based on the test result of Maximum Peak 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.				

Antenna used:

Test item	Antenna
Conducted emission & Radiated emission	Dipole Monopole Inversed F
Other items	-

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.

The test was performed with the board which simulated the actual use.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Communication Module	TypeWN	21	MURATA	EUT
B1	Dipole	ANT-D-1	1	SONY	EUT
B2	Monopole	ANT-M-1	1	SONY	EUT
B3	Inversed F	ANT-RF-1	1	SONY	EUT

List of cables used

No.	Cable	Length (m)	Shield-Cable	Shield-Connector	Remarks
1	DC (+, -)	1.2	Unshielded	Unshielded	-
2	DC (+, -)	1.0	Unshielded	Unshielded	-

***** All cables used for the measurement are exclusive use or marketed.

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 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 and excess AC cable was bundled in center.
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 via DC power supply within a shielded room. The EUT was connected to a Line Impedance Stabilization Network (LISN) via DC power supply.
An overview sweep with peak detection has been performed.
The measurements had been performed with a quasi-peak detector and if required, an average detector.
The conducted emission measurements were made with the following detector of the test receiver.

Detector Type : Quasi-Peak/ 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.

Summary of the test results: Pass
Refer to APPENDIX 1

SECTION 7: Maximum peak output power

Test procedure
The Maximum Peak Output Power was measured with a power meter connected to the antenna port.
Detection type: Peak / Average *1)

Summary of the test results: Pass
Refer to APPENDIX 1

*1) Testing using an average detector was performed in order to confirm that the output power of the EUT met the exclusion limits stated in FCC Part 2 Section 2.1093 and FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET 65 and the EUT was exempt from RF exposure SAR evaluation.

SECTION 8: Spurious emission (Antenna port conducted)

Test procedure
The spurious emission 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: Radiated emission

9.1 Operating environment

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

9.2 Test configuration

EUT was placed on a platform of nominal size, 0.5m by 0.5m, raised 0.8m above the conducting ground plane.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.
Photographs of the set up are shown in APPENDIX 3.

9.3 Test conditions

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

9.4 Test procedure

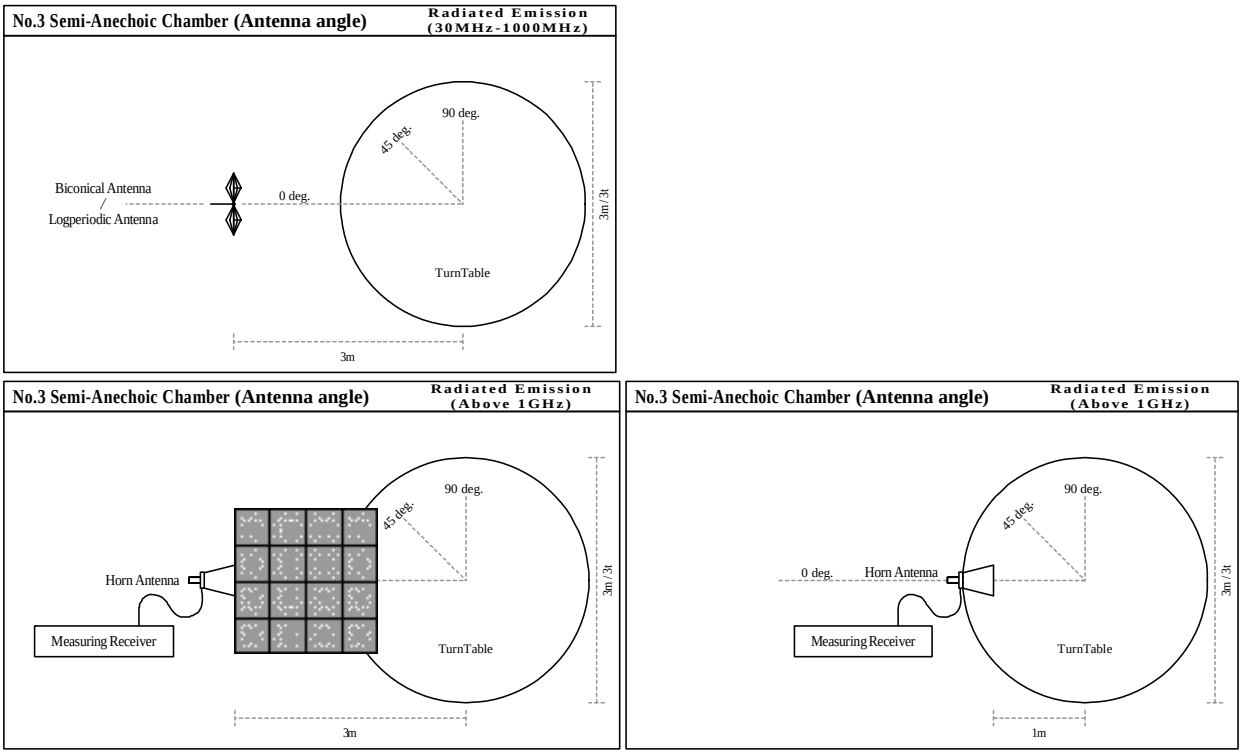
The Radiated Electric Field Strength intensity has been measured on a semi-anechoic chamber with a ground plane and at a distance of 3m (below 15GHz) / 1m (above 15GHz). Measurements were performed with quasi-peak, peak and average detector. The measuring antenna height was varied between 1 and 4m and 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 of the test receiver and spectrum analyzer.

Frequency	30-1000MHz	1-25GHz	
Detection type	Quasi-Peak	Peak	* Average
IF Bandwidth	120kHz	RBW: 1MHz VBW: 3MHz	RBW: 1MHz VBW: 10Hz

* When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.
The test was performed with VBW 10Hz since the EUT had no intervals during which the transmitter was off (see Appendix).

The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT with antenna to see the position of maximum noise, and the test was made at the position that has the maximum noise.
Worst position: Refer to test data (APPENDIX 1).

Figure 1. Antenna angle



9.5 Band edge

Band edge level is below the limits of FCC 15.209. Refer to the data.

9.6 Results

Summary of the test results : Pass *No noise was detected above the 6th order harmonics.
Refer to APPENDIX 1

SECTION 10: Peak Power density

Test procedure
The peak power density was measured with a spectrum analyzer connected to the antenna port.

Instrument used : Spectrum Analyzer *1)
RBW / VBW : 30kHz / 100kHz *2)

*1) PSD Option 1 of " Measurement of Digital Transmission Systems Operating under Section 15.247".
*2) The test was not performed at RBW: 3kHz that was stated in the Regulation. However, the measurement value with RBW: 3kHz is less than the value of RBW: 30kHz and the test data met the limit with RBW: 30kHz.

Summary of the test results: Pass
Refer to APPENDIX 1

Contents of APPENDIXES

APPENDIX 1: Test data

Conducted emission
6dB bandwidth
Maximum peak output power
Radiated emission
Spurious emission (Antenna port conducted)
Peak power density
99% Occupied bandwidth

APPENDIX 2: Test instruments

Test instruments

APPENDIX 3: Photographs of test setup

Conducted emission
Radiated emission
Pre-check of the worst position

APPENDIX 1: Test data

DATA OF CONDUCTED EMISSION TEST

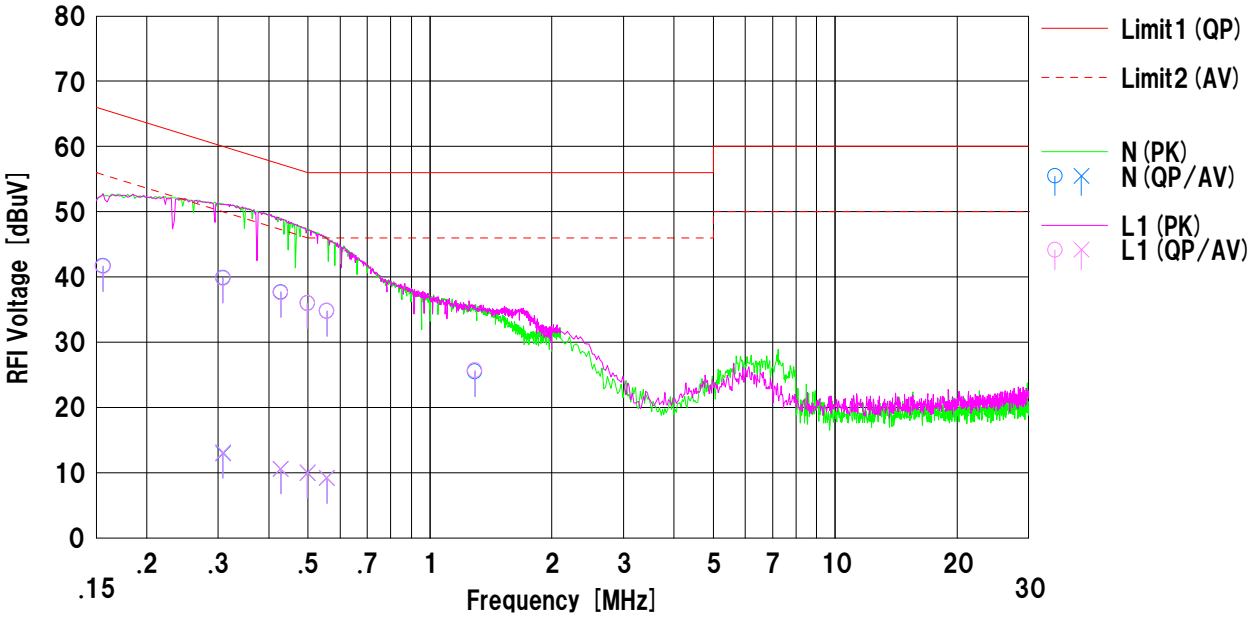
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2012/04/24

Company	: Murata Manufacturing Co., Ltd.	Mode	: Tx, 11n (HT20), MCS5, 2462MHz
Kind of EUT	: Communication Module	Report No.	: 32IE0119-SH-01-A
Model No.	: TypeWN	Power	: DC1.8V, DC 3.3V
Serial No.	: 21	Temp./Humi.	: 24deg.C / 52%RH

Remarks : with Dipole Antenna (S/N: 1), AC120V/60Hz (DC1.8V side)

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

Engineer : Makoto Hosaka



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1	0.15606	29.0	---	12.7	41.7	---	65.6	55.6	23.9	---	N	
2	0.30863	27.2	0.3	12.7	39.9	13.0	60.0	50.0	20.1	37.0	N	
3	0.42830	25.0	-2.1	12.7	37.7	10.6	57.2	47.2	19.5	36.6	N	
4	0.49846	23.3	-2.7	12.7	36.0	10.0	56.0	46.0	20.0	36.0	N	
5	0.55701	22.1	-3.5	12.7	34.8	9.2	56.0	46.0	21.2	36.8	N	
6	1.29016	12.7	---	12.8	25.5	---	56.0	46.0	30.5	---	N	
7	0.15606	28.9	---	12.7	41.6	---	65.6	55.6	24.0	---	L1	
8	0.30863	27.1	0.4	12.7	39.8	13.1	60.0	50.0	20.2	36.9	L1	
9	0.42830	24.9	-2.1	12.7	37.6	10.6	57.2	47.2	19.6	36.6	L1	
10	0.49846	23.3	-2.7	12.7	36.0	10.0	56.0	46.0	20.0	36.0	L1	
11	0.55701	22.1	-3.5	12.7	34.8	9.2	56.0	46.0	21.2	36.8	L1	
12	1.29016	12.9	---	12.8	25.7	---	56.0	46.0	30.3	---	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN:SLS-03

DATA OF CONDUCTED EMISSION TEST

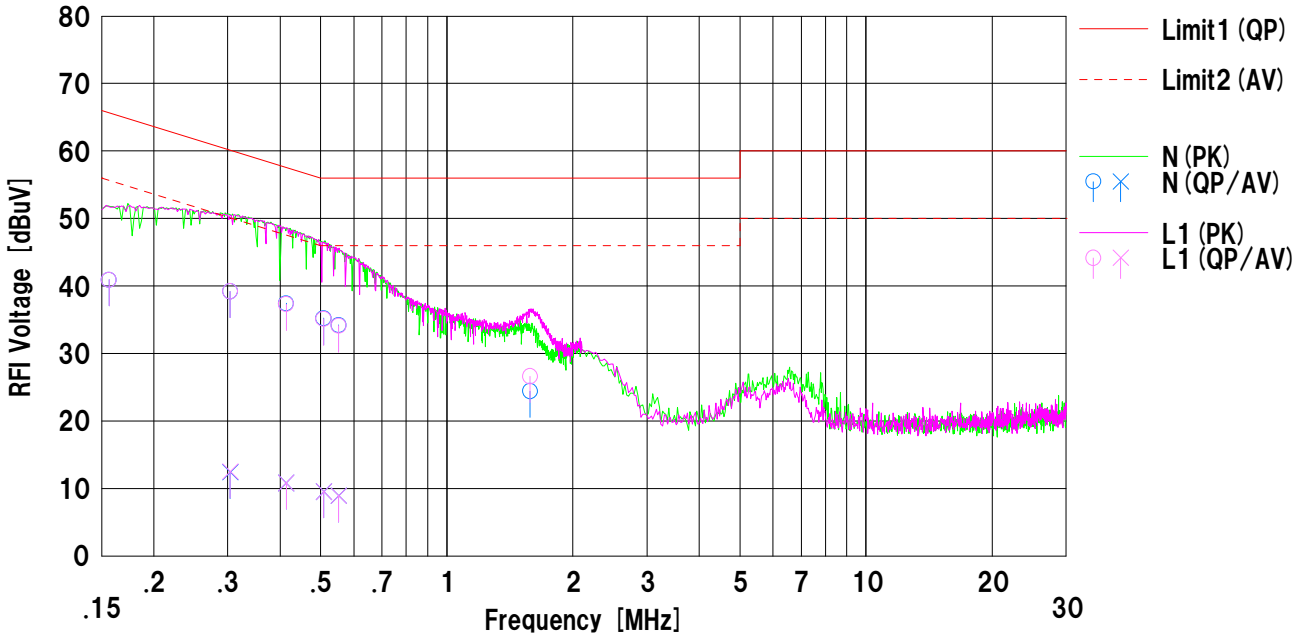
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2012/04/24

Company	: Murata Manufacturing Co., Ltd.	Mode	: Tx, 11n(HT20), MCS5, 2462MHz
Kind of EUT	: Communication Module	Report No.	: 32IE0119-SH-01-A
Model No.	: TypeWN	Power	: DC1.8V, DC 3.3V
Serial No.	: 21	Temp./Humi.	: 24deg.C / 52%RH

Remarks : with Dipole Antenna (S/N: 1), AC120V/60Hz (DC3.3V side)

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

Engineer : Makoto Hosaka



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	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15650	28.2	---	12.7	40.9	---	65.6	55.6	24.7	---	N	
2	0.30412	26.5	-0.3	12.7	39.2	12.4	60.1	50.1	20.9	37.7	N	
3	0.41382	24.7	-1.9	12.7	37.4	10.8	57.5	47.5	20.1	36.7	N	
4	0.50852	22.5	-3.2	12.7	35.2	9.5	56.0	46.0	20.8	36.5	N	
5	0.55265	21.5	-3.8	12.7	34.2	8.9	56.0	46.0	21.8	37.1	N	
6	1.58129	11.6	---	12.8	24.4	---	56.0	46.0	31.6	---	N	
7	0.15650	28.2	---	12.7	40.9	---	65.6	55.6	24.7	---	L1	
8	0.30412	26.5	-0.2	12.7	39.2	12.5	60.1	50.1	20.9	37.6	L1	
9	0.41382	24.6	-1.9	12.7	37.3	10.8	57.5	47.5	20.2	36.7	L1	
10	0.50852	22.4	-3.2	12.7	35.1	9.5	56.0	46.0	20.9	36.5	L1	
11	0.55265	21.4	-3.8	12.7	34.1	8.9	56.0	46.0	21.9	37.1	L1	
12	1.58129	13.8	---	12.8	26.6	---	56.0	46.0	29.4	---	L1	

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

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2012/04/24

Company	: Murata Manufacturing Co., Ltd.	Mode	: Tx, 11n(HT20), MCS5, 2462MHz
Kind of EUT	: Communication Module	Report No.	: 32IE0119-SH-01-A
Model No.	: TypeWN	Power	: DC1.8V, DC 3.3V
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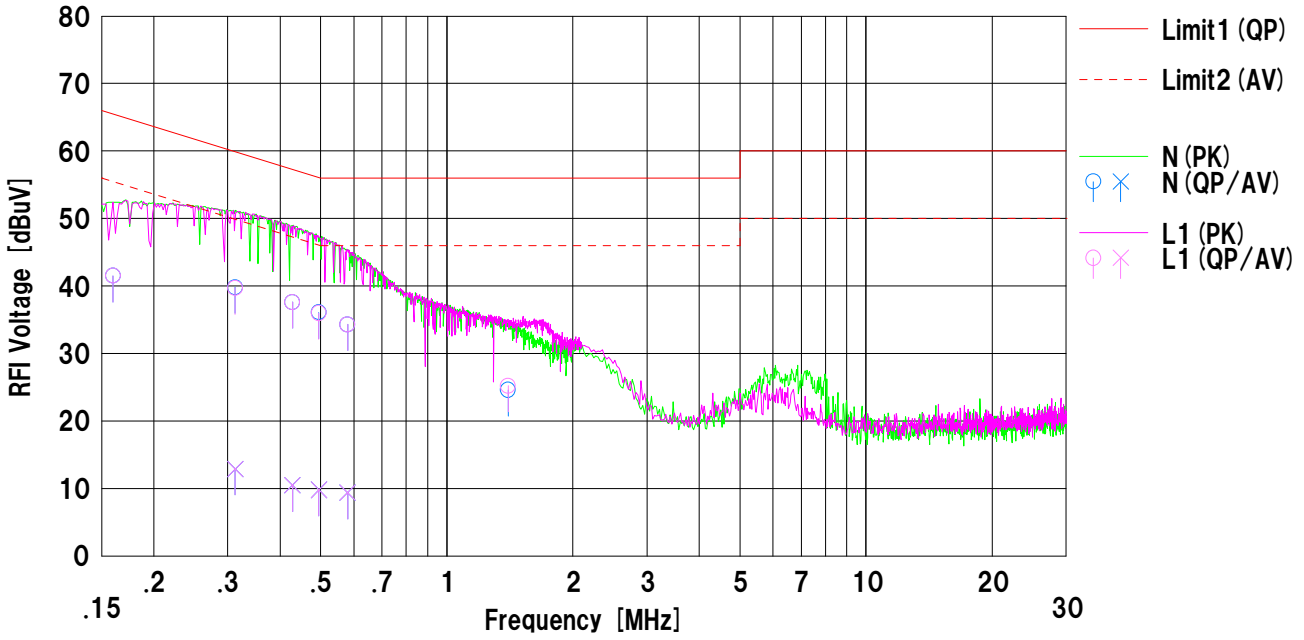
Engineer : Makoto Hosaka



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		<QP>	<AV>		<QP>	<AV>	<QP>	<AV>	<QP>	<AV>		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15986	28.8	---	12.7	41.5	---	65.4	55.4	23.9	---	N	
2	0.31269	27.1	0.2	12.7	39.8	12.9	59.8	49.8	20.0	36.9	N	
3	0.42881	24.9	-2.2	12.7	37.6	10.5	57.2	47.2	19.6	36.7	N	
4	0.49517	23.4	-2.9	12.7	36.1	9.8	56.0	46.0	19.9	36.2	N	
5	0.58019	21.6	-3.3	12.7	34.3	9.4	56.0	46.0	21.7	36.6	N	
6	1.40110	11.8	---	12.8	24.6	---	56.0	46.0	31.4	---	N	
7	0.15986	28.8	---	12.7	41.5	---	65.4	55.4	23.9	---	L1	
8	0.31269	27.0	0.2	12.7	39.7	12.9	59.8	49.8	20.1	36.9	L1	
9	0.42881	24.9	-2.2	12.7	37.6	10.5	57.2	47.2	19.6	36.7	L1	
10	0.49517	23.3	-2.9	12.7	36.0	9.8	56.0	46.0	20.0	36.2	L1	
11	0.58019	21.6	-3.3	12.7	34.3	9.4	56.0	46.0	21.7	36.6	L1	
12	1.40110	12.4	---	12.8	25.2	---	56.0	46.0	30.8	---	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN:SLS-03

DATA OF CONDUCTED EMISSION TEST

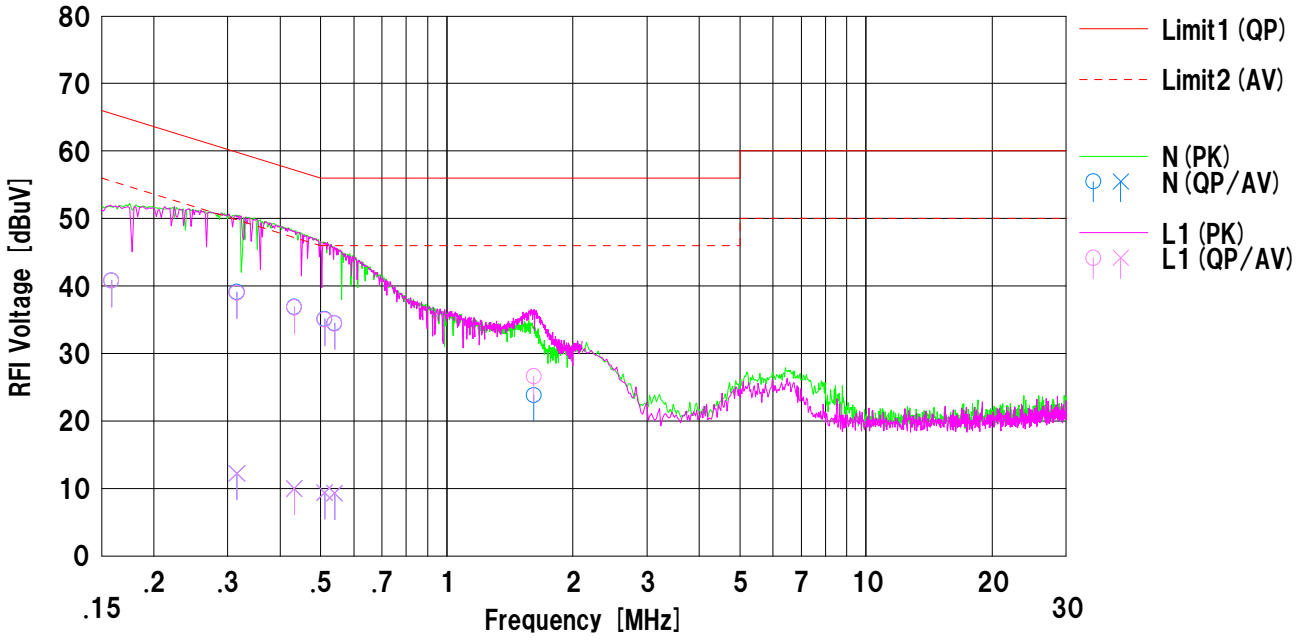
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2012/04/24

Company	: Murata Manufacturing Co., Ltd.	Mode	: Tx, 11n(HT20), MCS5, 2462MHz
Kind of EUT	: Communication Module	Report No.	: 32IE0119-SH-01-A
Model No.	: TypeWN	Power	: DC1.8V, DC 3.3V
Serial No.	: 21	Temp./Humi.	: 24deg.C / 52%RH

Remarks : with Monopole Antenna (S/N: 1), AC120V/60Hz (DC3.3V side)

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

Engineer : Makoto Hosaka



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	0.15856	28.1	---	12.7	40.8	---	65.5	55.5	24.7	---	N	
2	0.31562	26.4	-0.5	12.7	39.1	12.2	59.8	49.8	20.7	37.6	N	
3	0.43304	24.2	-2.7	12.7	36.9	10.0	57.1	47.1	20.2	37.1	N	
4	0.51159	22.4	-3.3	12.7	35.1	9.4	56.0	46.0	20.9	36.6	N	
5	0.53953	21.8	-3.4	12.7	34.5	9.3	56.0	46.0	21.5	36.7	N	
6	1.61369	11.0	---	12.8	23.8	---	56.0	46.0	32.2	---	N	
7	0.15856	28.1	---	12.7	40.8	---	65.5	55.5	24.7	---	L1	
8	0.31562	26.3	-0.5	12.7	39.0	12.2	59.8	49.8	20.8	37.6	L1	
9	0.43304	24.1	-2.7	12.7	36.8	10.0	57.1	47.1	20.3	37.1	L1	
10	0.51159	22.3	-3.3	12.7	35.0	9.4	56.0	46.0	21.0	36.6	L1	
11	0.53953	21.7	-3.4	12.7	34.4	9.3	56.0	46.0	21.6	36.7	L1	
12	1.61369	13.8	---	12.8	26.6	---	56.0	46.0	29.4	---	L1	

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

DATA OF CONDUCTED EMISSION TEST

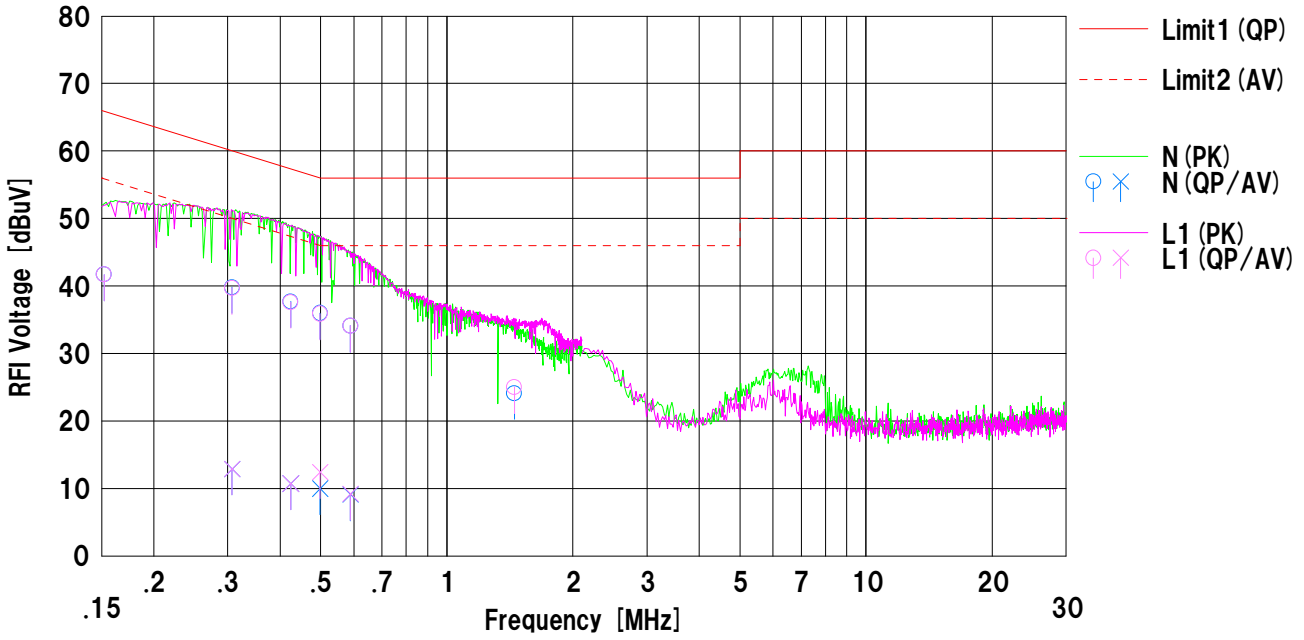
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2012/04/24

Company	: Murata Manufacturing Co., Ltd.	Mode	: Tx, 11n (HT20), MCS5, 2462MHz
Kind of EUT	: Communication Module	Report No.	: 32IE0119-SH-01-A
Model No.	: TypeWN	Power	: DC1.8V, DC 3.3V
Serial No.	: 21	Temp./Humi.	: 24deg.C / 52%RH

Remarks : with Inversed F Antenna (S/N: 1), AC120V/60Hz (DC1.8V side)

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

Engineer : Makoto Hosaka



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	0.15222	29.0	---	12.7	41.7	---	65.8	55.8	24.1	---	N	
2	0.30740	27.1	0.2	12.7	39.8	12.9	60.0	50.0	20.2	37.1	N	
3	0.42442	25.0	-2.0	12.7	37.7	10.7	57.3	47.3	19.6	36.6	N	
4	0.49858	23.3	-2.7	12.7	36.0	10.0	56.0	46.0	20.0	36.0	N	
5	0.58912	21.4	-3.6	12.7	34.1	9.1	56.0	46.0	21.9	36.9	N	
6	1.44993	11.3	---	12.8	24.1	---	56.0	46.0	31.9	---	N	
7	0.15222	29.0	---	12.7	41.7	---	65.8	55.8	24.1	---	L1	
8	0.30740	27.0	0.2	12.7	39.7	12.9	60.0	50.0	20.3	37.1	L1	
9	0.42442	24.9	-2.0	12.7	37.6	10.7	57.3	47.3	19.7	36.6	L1	
10	0.49858	23.2	-0.3	12.7	35.9	12.4	56.0	46.0	20.1	33.6	L1	
11	0.58912	21.4	-3.5	12.7	34.1	9.2	56.0	46.0	21.9	36.8	L1	
12	1.44993	12.2	---	12.8	25.0	---	56.0	46.0	31.0	---	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN:SLS-03

DATA OF CONDUCTED EMISSION TEST

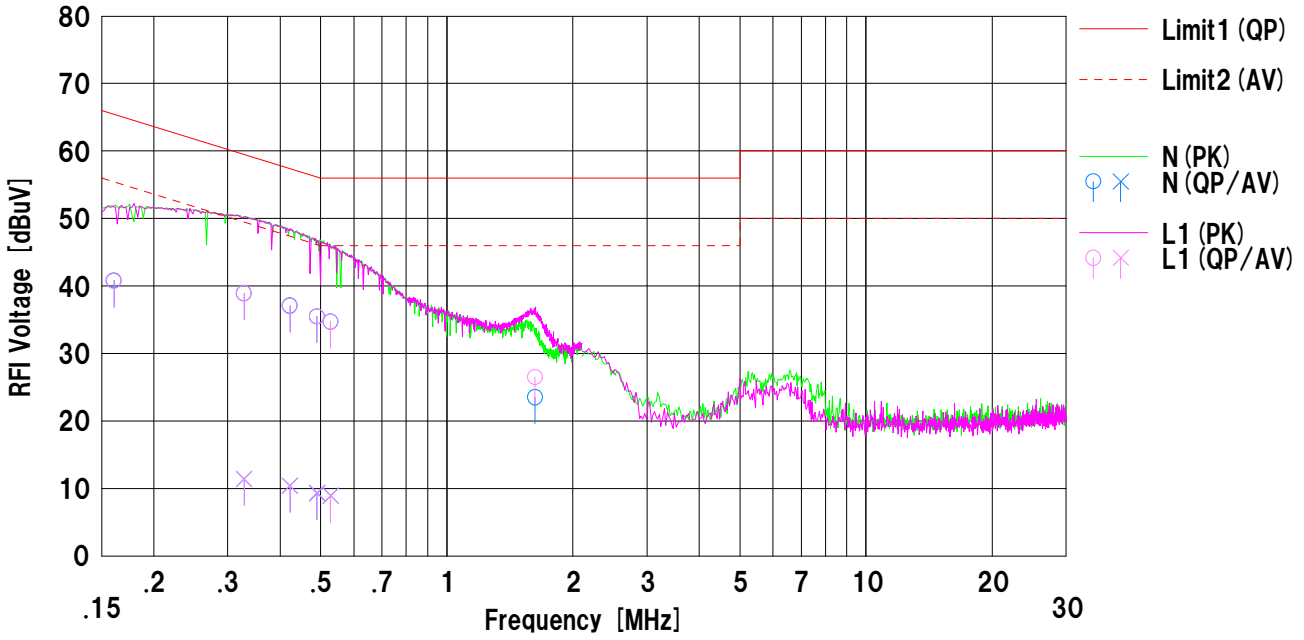
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2012/04/24

Company	: Murata Manufacturing Co., Ltd.	Mode	: Tx, 11n(HT20), MCS5, 2462MHz
Kind of EUT	: Communication Module	Report No.	: 32IE0119-SH-01-A
Model No.	: TypeWN	Power	: DC1.8V, DC 3.3V
Serial No.	: 21	Temp./Humi.	: 24deg.C / 52%RH

Remarks : with Inversed F Antenna (S/N: 1), AC120V/60Hz (DC3.3V side)

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

Engineer : Makoto Hosaka



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	0.16075	28.1	---	12.7	40.8	---	65.4	55.4	24.6	---	N	
2	0.32839	26.2	-1.3	12.7	38.9	11.4	59.4	49.4	20.5	38.0	N	
3	0.42265	24.4	-2.3	12.7	37.1	10.4	57.3	47.3	20.2	36.9	N	
4	0.48973	22.8	-3.4	12.7	35.5	9.3	56.1	46.1	20.6	36.8	N	
5	0.52794	22.0	-3.8	12.7	34.7	8.9	56.0	46.0	21.3	37.1	N	
6	1.62546	10.7	---	12.8	23.5	---	56.0	46.0	32.5	---	N	
7	0.16075	28.0	---	12.7	40.7	---	65.4	55.4	24.7	---	L1	
8	0.32839	26.2	-1.3	12.7	38.9	11.4	59.4	49.4	20.5	38.0	L1	
9	0.42265	24.3	-2.3	12.7	37.0	10.4	57.3	47.3	20.3	36.9	L1	
10	0.48973	22.8	-3.3	12.7	35.5	9.4	56.1	46.1	20.6	36.7	L1	
11	0.52794	22.0	-3.8	12.7	34.7	8.9	56.0	46.0	21.3	37.1	L1	
12	1.62546	13.7	---	12.8	26.5	---	56.0	46.0	29.5	---	L1	

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

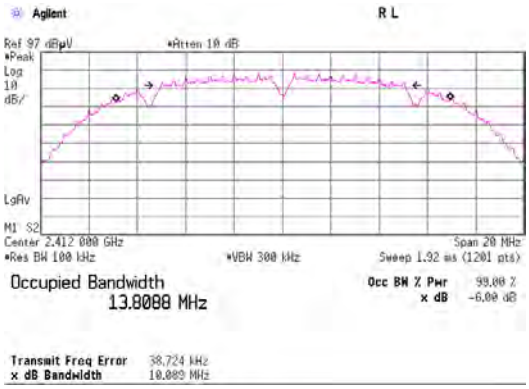
-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	4/18/2012	
Temperature / Humidity	24deg.C , 42%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11b, PN9, worst data mode 1Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	10.089	> 0.500
2437.0000	10.091	> 0.500
2462.0000	10.094	> 0.500

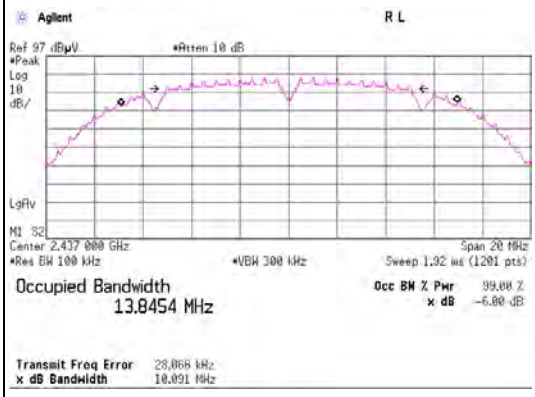
Tx, 2412MHz

Tx1_6OBW



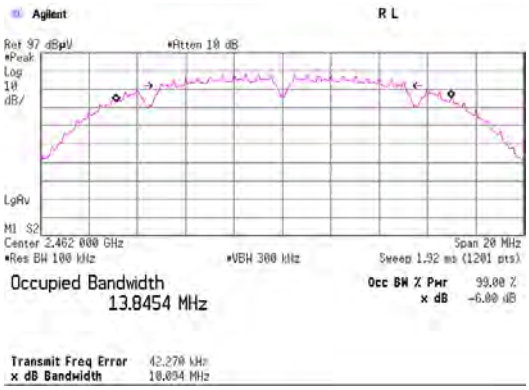
Tx, 2437MHz

Tx2_6OBW



Tx, 2462MHz

Tx3_6OBW



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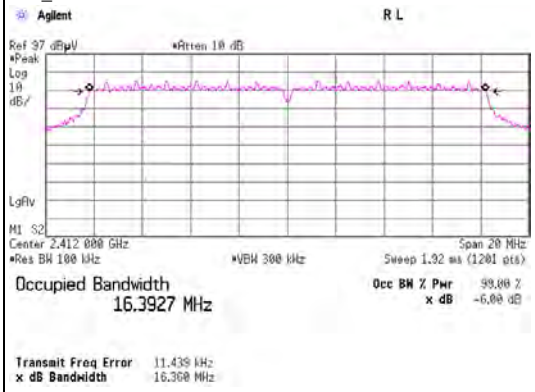
-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	4/18/2012	
Temperature / Humidity	24deg.C , 42%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11g, PN9, worst data mode 18Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.360	> 0.500
2437.0000	16.425	> 0.500
2462.0000	16.430	> 0.500

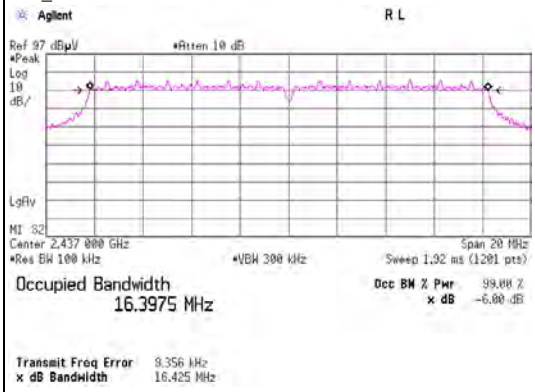
Tx, 2412MHz

Tx1_6OBW



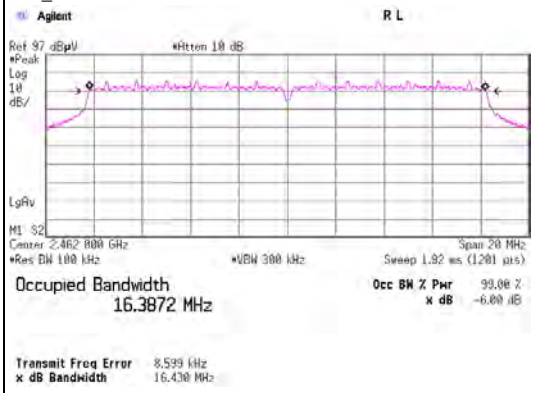
Tx, 2437MHz

Tx2_6OBW



Tx, 2462MHz

Tx3_6OBW



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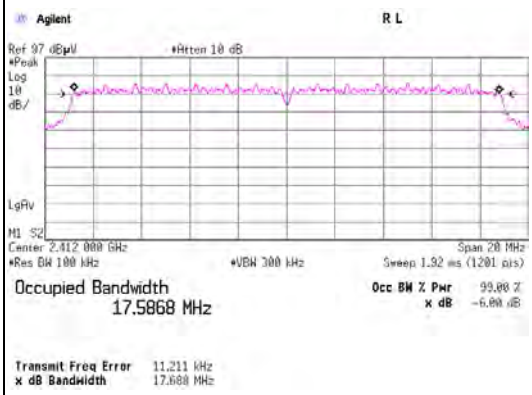
-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	4/18/2012	
Temperature / Humidity	24deg.C , 42%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	17.688	> 0.500
2437.0000	17.670	> 0.500
2462.0000	17.656	> 0.500

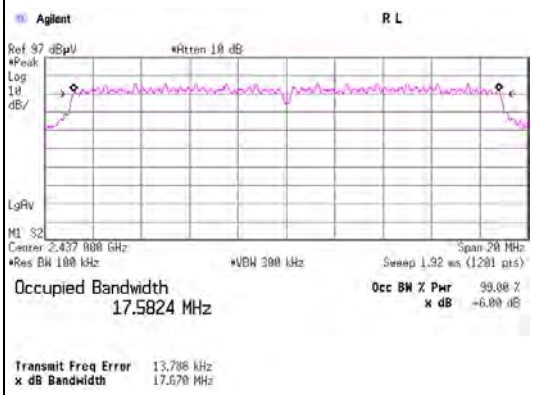
Tx, 2412MHz

Tx1_6OBW



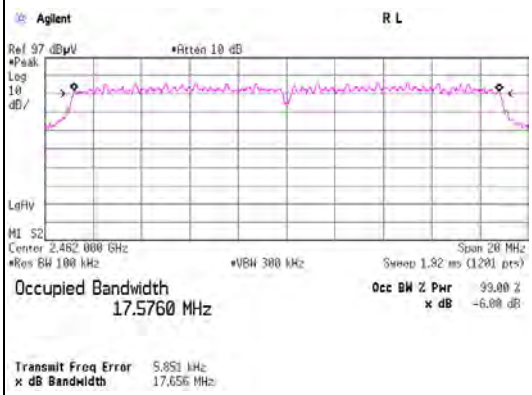
Tx, 2437MHz

Tx2_6OBW



Tx, 2462MHz

Tx3_6OBW



Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date 4/17/2012
Temperature / Humidity 23deg.C , 53%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	-9.89	1.66	20.01	11.78	15.07	30.00	1000	18.22
Mid	2437.0	-9.93	1.66	20.01	11.74	14.93	30.00	1000	18.26
High	2462.0	-9.81	1.67	20.01	11.87	15.38	30.00	1000	18.13

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	-9.93	1.66	20.01	**11.74**	14.93	30.00	1000	**18.26**	**Worst**
2	2437.0	-9.97	1.66	20.01	11.70	14.79	30.00	1000	18.30	
6	2437.0	-9.96	1.66	20.01	11.71	14.83	30.00	1000	18.29	
11	2437.0	-9.95	1.66	20.01	11.72	14.86	30.00	1000	18.28	

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

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Average Output Power (Conducted)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room	
Date	4/17/2012		
Temperature / Humidity	23deg.C , 53%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 (Average) Reading	Cable Loss	Atten. Loss	Result	
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
Low	2412.0	-12.68	1.66	20.01	8.99	7.93
Mid	2437.0	-12.65	1.66	20.01	9.02	7.98
High	2462.0	-12.59	1.67	20.01	9.09	8.11

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

[Pre check]

Data rate	Freq.	P/M (Average) Reading	Cable Loss	Atten. Loss	Result		
[Mbps]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	
1	2437.0	-12.65	1.66	20.01	**9.02**	7.98	**Worst**
2	2437.0	-12.70	1.66	20.01	8.97	7.89	
6	2437.0	-12.68	1.66	20.01	8.99	7.93	
11	2437.0	-12.73	1.66	20.01	8.94	7.83	

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

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date 4/17/2012
Temperature / Humidity 23deg.C , 53%RH
Engineer Akio Hayashi
Mode Tx, IEEE802.11g, PN9, worst data mode : 18 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	-3.30	1.66	20.01	18.37	68.71	30.00	1000	11.63
Mid	2437.0	-3.23	1.66	20.01	18.44	69.82	30.00	1000	11.56
High	2462.0	-3.10	1.67	20.01	18.58	72.11	30.00	1000	11.42

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	-3.93	1.66	20.01	17.74	59.43	30.00	1000	12.26	
9	2437.0	-3.64	1.66	20.01	18.03	63.53	30.00	1000	11.97	
12	2437.0	-3.32	1.66	20.01	18.35	68.39	30.00	1000	11.65	
18	2437.0	-3.23	1.66	20.01	**18.44**	69.82	30.00	1000	**11.56**	**Worst**
24	2437.0	-3.33	1.66	20.01	18.34	68.23	30.00	1000	11.66	
36	2437.0	-3.71	1.66	20.01	17.96	62.52	30.00	1000	12.04	
48	2437.0	-3.51	1.66	20.01	18.16	65.46	30.00	1000	11.84	
54	2437.0	-3.32	1.66	20.01	18.35	68.39	30.00	1000	11.65	

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

UL Japan, Inc.
Shonan EMC Lab.

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Average Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date 4/17/2012
Temperature / Humidity 23deg.C , 53%RH
Engineer Akio Hayashi
Mode Tx, IEEE802.11g, PN9, worst data mode : 6 Mbps

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

Ch	Freq. [MHz]	P/M (Average) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	[dBm]	[mW]
Low	2412.0	-12.96	1.66	20.01	8.71	7.43
Mid	2437.0	-12.97	1.66	20.01	8.70	7.41
High	2462.0	-12.79	1.67	20.01	8.89	7.74

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

[Pre check]

Data rate [Mbps]	Freq. [MHz]	P/M (Average) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	[mW]	
6	2437.0	-12.97	1.66	20.01	**8.70**	7.41	**Worst**
9	2437.0	-12.99	1.66	20.01	8.68	7.38	
12	2437.0	-13.00	1.66	20.01	8.67	7.36	
18	2437.0	-13.06	1.66	20.01	8.61	7.26	
24	2437.0	-13.12	1.66	20.01	8.55	7.16	
36	2437.0	-13.20	1.66	20.01	8.47	7.03	
48	2437.0	-13.30	1.66	20.01	8.37	6.87	
54	2437.0	-13.33	1.66	20.01	8.34	6.82	

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

UL Japan, Inc.
Shonan EMC Lab.

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Telephone : +81 463 50 6400
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Peak Output Power (Conducted)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room	
Date	4/17/2012		
Temperature / Humidity	23deg.C , 53%RH		
Engineer	Akio Hayashi		
Mode	Tx, IEEE802.11n(HT20), 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	-3.38	1.66	20.01	18.29	67.45	30.00	1000	11.71
Mid	2437.0	-3.14	1.66	20.01	18.53	71.29	30.00	1000	11.47
High	2462.0	-3.09	1.67	20.01	18.59	72.28	30.00	1000	11.41

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	-3.55	1.66	20.01	18.12	64.86	30.00	1000	11.88	
1	2437.0	-3.32	1.66	20.01	18.35	68.39	30.00	1000	11.65	
2	2437.0	-3.34	1.66	20.01	18.33	68.08	30.00	1000	11.67	
3	2437.0	-3.42	1.66	20.01	18.25	66.83	30.00	1000	11.75	
4	2437.0	-3.25	1.66	20.01	18.42	69.50	30.00	1000	11.58	
5	2437.0	-3.14	1.66	20.01	**18.53**	71.29	30.00	1000	**11.47**	**Worst**
6	2437.0	-3.48	1.66	20.01	18.19	65.92	30.00	1000	11.81	
7	2437.0	-3.42	1.66	20.01	18.25	66.83	30.00	1000	11.75	

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

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Average Output Power (Conducted)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room	
Date	4/17/2012		
Temperature / Humidity	23deg.C , 53%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 (Average) Reading	Cable Loss	Atten. Loss	Result	
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
Low	2412.0	-13.06	1.66	20.01	8.61	7.26
Mid	2437.0	-12.88	1.66	20.01	8.79	7.57
High	2462.0	-12.90	1.67	20.01	8.78	7.55

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

[Pre check]

Mode	Freq.	P/M (Average) Reading	Cable Loss	Atten. Loss	Result		
(MCS)	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	
0	2437.0	-12.88	1.66	20.01	**8.79**	7.57	**Worst**
1	2437.0	-13.00	1.66	20.01	8.67	7.36	
2	2437.0	-13.11	1.66	20.01	8.56	7.18	
3	2437.0	-13.15	1.66	20.01	8.52	7.11	
4	2437.0	-13.15	1.66	20.01	8.52	7.11	
5	2437.0	-13.28	1.66	20.01	8.39	6.90	
6	2437.0	-13.34	1.66	20.01	8.33	6.81	
7	2437.0	-13.40	1.66	20.01	8.27	6.71	

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

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.		No.3 Semi Anechoic Chamber	
Date	April 18, 2012	April 19, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 35%RH	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2412 MHz	with dipole antenna		

Tx, IEEE802.11b, PN9, worst data mode 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	45.6	27.2	24.4	41.1	56.1	73.9	17.8	100	15	X, noise floor level
Hori.	2397.500	PK	50.8	27.3	24.4	41.1	61.4	73.9	-	100	15	X, Refer to 20dBc Data Sheet
Hori.	2400.000	PK	46.2	27.3	24.4	41.1	56.8	73.9	-	100	15	X, Refer to 20dBc Data Sheet
Hori.	3216.000	PK	49.9	29.0	5.7	41.5	43.1	73.9	30.8	100	119	Z,
Hori.	4824.000	PK	58.3	31.1	6.6	41.0	55.0	73.9	18.9	153	96	Z,
Hori.	7236.000	PK	47.3	36.6	8.3	41.3	50.9	73.9	23.0	100	0	Z, noise floor level
Hori.	2390.000	AV	34.7	27.2	24.4	41.1	45.2	53.9	8.7	100	15	X, noise floor level
Hori.	2397.500	AV	43.1	27.3	24.4	41.1	53.7	53.9	-	100	15	X, Refer to 20dBc Data Sheet
Hori.	2400.000	AV	36.9	27.3	24.4	41.1	47.5	53.9	-	100	15	X, Refer to 20dBc Data Sheet
Hori.	3216.000	AV	42.7	29.0	5.7	41.5	35.9	53.9	18.0	100	119	Z,
Hori.	4824.000	AV	56.4	31.1	6.6	41.0	53.1	53.9	0.8	153	96	Z,
Hori.	7236.000	AV	36.1	36.6	8.3	41.3	39.7	53.9	14.2	100	0	Z, noise floor level
Vert.	2390.000	PK	45.7	27.2	24.4	41.1	56.2	73.9	17.7	100	50	Y, noise floor level
Vert.	2397.550	PK	50.1	27.3	24.4	41.1	60.7	73.9	-	100	50	Y, Refer to 20dBc Data Sheet
Vert.	2400.000	PK	46.1	27.3	24.4	41.1	56.7	73.9	-	100	50	Y, Refer to 20dBc Data Sheet
Vert.	3216.000	PK	51.2	29.0	5.7	41.5	44.4	73.9	29.5	100	121	X
Vert.	4824.000	PK	58.7	31.1	6.6	41.0	55.4	73.9	18.5	104	243	X
Vert.	7236.000	PK	47.3	36.6	8.3	41.3	50.9	73.9	23.0	100	0	X, noise floor level
Vert.	2390.000	AV	34.7	27.2	24.4	41.1	45.2	53.9	8.7	100	50	Y, noise floor level
Vert.	2397.550	AV	42.3	27.3	24.4	41.1	52.9	53.9	-	100	50	Y, Refer to 20dBc Data Sheet
Vert.	2400.000	AV	36.4	27.3	24.4	41.1	47.0	53.9	-	100	50	Y, Refer to 20dBc Data Sheet
Vert.	3216.000	AV	43.7	29.0	5.7	41.5	36.9	53.9	17.0	100	121	X,
Vert.	4824.000	AV	56.7	31.1	6.6	41.0	53.4	53.9	0.5	104	243	X,
Vert.	7236.000	AV	36.0	36.6	8.3	41.3	39.6	53.9	14.3	100	0	X, noise floor level

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	87.8	27.3	24.4	41.1	98.4	-	-	X, carrier
Hori.	2397.500	PK	45.0	27.3	24.4	41.1	55.6	78.4	22.8	X
Hori.	2400.000	PK	37.8	27.3	24.4	41.1	48.4	78.4	30.0	X
Vert.	2412.000	PK	87.1	27.3	24.4	41.1	97.7	-	-	Y, carrier
Vert.	2397.550	PK	43.9	27.3	24.4	41.1	54.5	77.7	23.2	Y
Vert.	2400.000	PK	37.7	27.3	24.4	41.1	48.3	77.7	29.4	Y

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.		No.3 Semi Anechoic Chamber	
Date	April 18, 2012	April 19, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 35%RH	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2437 MHz	with dipole antenna		

Tx, IEEE802.11b, PN9, worst data mode 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.	3249.350	PK	49.5	29.0	5.7	41.6	42.6	73.9	31.3	100	122	Z,
Hori.	4874.000	PK	56.9	31.2	6.7	41.0	53.8	73.9	20.1	151	94	Z,
Hori.	7311.000	PK	46.6	36.7	8.4	41.4	50.3	73.9	23.6	100	0	Z, noise floor level,
Hori.	3249.350	AV	40.0	29.0	5.7	41.6	33.1	53.9	20.8	100	122	Z,
Hori.	4874.000	AV	55.4	31.2	6.7	41.0	52.3	53.9	1.6	151	94	Z,
Hori.	7311.000	AV	35.6	36.7	8.4	41.4	39.3	53.9	14.6	100	0	Z, noise floor level,
Vert.	3249.350	PK	49.3	29.0	5.7	41.6	42.4	73.9	31.5	100	123	X
Vert.	4874.000	PK	57.4	31.2	6.7	41.0	54.3	73.9	19.6	103	248	X
Vert.	7311.000	PK	46.7	36.7	8.4	41.4	50.4	73.9	23.5	100	0	X, noise floor level,
Vert.	3249.350	AV	39.9	29.0	5.7	41.6	33.0	53.9	20.9	100	123	X,
Vert.	4874.000	AV	55.7	31.2	6.7	41.0	52.6	53.9	1.3	103	248	X,
Vert.	7311.000	AV	35.6	36.7	8.4	41.4	39.3	53.9	14.6	100	0	X, noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber		
Date	April 18, 2012	April 19, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 35%RH	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2462 MHz	with dipole antenna		
	Tx, IEEE802.11b, PN9, worst data mode 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	46.5	27.5	24.5	41.1	57.4	73.9	16.5	100	13	X, noise floor level
Hori.	2487.000	PK	46.4	27.5	24.5	41.1	57.3	73.9	16.6	100	13	X, noise floor level
Hori.	3282.700	PK	49.4	29.1	5.7	41.6	42.6	73.9	31.3	100	189	Z
Hori.	4924.000	PK	56.4	31.3	6.7	40.9	53.5	73.9	20.4	149	105	Z
Hori.	7386.000	PK	46.1	36.9	8.5	41.4	50.1	73.9	23.8	100	0	Z, noise floor level
Hori.	2483.500	AV	35.1	27.5	24.5	41.1	46.0	53.9	7.9	100	13	X, noise floor level
Hori.	2487.000	AV	35.1	27.5	24.5	41.1	46.0	53.9	7.9	100	13	X, noise floor level
Hori.	3282.700	AV	40.2	29.1	5.7	41.6	33.4	53.9	20.5	100	189	Z
Hori.	4924.000	AV	54.5	31.3	6.7	40.9	51.6	53.9	2.3	149	105	Z
Hori.	7386.000	AV	35.4	36.9	8.5	41.4	39.4	53.9	14.5	100	0	Z, noise floor level
Vert.	2483.500	PK	46.4	27.5	24.5	41.1	57.3	73.9	16.6	100	48	Y, noise floor level
Vert.	2487.000	PK	46.3	27.5	24.5	41.1	57.2	73.9	16.7	100	48	Y, noise floor level
Vert.	3282.700	PK	49.3	29.1	5.7	41.6	42.5	73.9	31.4	100	130	X
Vert.	4924.000	PK	57.0	31.3	6.7	40.9	54.1	73.9	19.8	103	237	X
Vert.	7386.000	PK	46.2	36.9	8.5	41.4	50.2	73.9	23.7	100	0	X, noise floor level
Vert.	2483.500	AV	35.1	27.5	24.5	41.1	46.0	53.9	7.9	100	48	Y, noise floor level
Vert.	2487.000	AV	35.0	27.5	24.5	41.1	45.9	53.9	8.0	100	48	Y, noise floor level
Vert.	3282.700	AV	40.1	29.1	5.7	41.6	33.3	53.9	20.6	100	130	X
Vert.	4924.000	AV	55.2	31.3	6.7	40.9	52.3	53.9	1.6	103	237	X
Vert.	7386.000	AV	35.5	36.9	8.5	41.4	39.5	53.9	14.4	100	0	X, noise floor level

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber		
Date	April 18, 2012	April 19, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 35%RH	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2412 MHz	with monopole antenna		

Tx, IEEE802.11b, PN9, worst data mode 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	47.0	27.2	24.4	41.1	57.5	73.9	16.4	145	213	X,noise floor level,
Hori.	2397.500	PK	50.3	27.3	24.4	41.1	60.9	73.9	-	145	213	X, Refer to 20dBc Data Sheet
Hori.	2400.000	PK	46.9	27.3	24.4	41.1	57.5	73.9	-	145	213	X, Refer to 20dBc Data Sheet
Hori.	3216.000	PK	47.9	29.0	5.7	41.5	41.1	73.9	32.8	149	188	Z,
Hori.	4824.000	PK	59.4	31.1	6.6	41.0	56.1	73.9	17.8	121	242	Z,
Hori.	7236.000	PK	47.1	36.6	8.3	41.3	50.7	73.9	23.2	100	0	Z,noise floor level
Hori.	2390.000	AV	35.0	27.2	24.4	41.1	45.5	53.9	8.4	145	213	X,noise floor level,
Hori.	2397.500	AV	42.6	27.3	24.4	41.1	53.2	53.9	-	145	213	X, Refer to 20dBc Data Sheet
Hori.	2400.000	AV	36.6	27.3	24.4	41.1	47.2	53.9	-	145	213	X, Refer to 20dBc Data Sheet
Hori.	3216.000	AV	39.2	29.0	5.7	41.5	32.4	53.9	21.5	149	188	Z,
Hori.	4824.000	AV	57.1	31.1	6.6	41.0	53.8	53.9	0.1	121	242	Z,
Hori.	7236.000	AV	36.0	36.6	8.3	41.3	39.6	53.9	14.3	100	0	Z,noise floor level
Vert.	2390.000	PK	46.9	27.2	24.4	41.1	57.4	73.9	16.5	110	180	Z,noise floor level
Vert.	2397.500	PK	49.9	27.3	24.4	41.1	60.5	73.9	-	110	180	Z, Refer to 20dBc Data Sheet
Vert.	2400.000	PK	46.2	27.3	24.4	41.1	56.8	73.9	-	110	180	Z, Refer to 20dBc Data Sheet
Vert.	3216.000	PK	48.0	29.0	5.7	41.5	41.2	73.9	32.7	100	290	Z,
Vert.	4824.000	PK	58.6	31.1	6.6	41.0	55.3	73.9	18.6	122	16	Z,
Vert.	7236.000	PK	47.0	36.6	8.3	41.3	50.6	73.9	23.3	100	0	Z,noise floor level
Vert.	2390.000	AV	35.0	27.2	24.4	41.1	45.5	53.9	8.4	110	180	Z,noise floor level
Vert.	2397.500	AV	42.1	27.3	24.4	41.1	52.7	53.9	-	110	180	Z, Refer to 20dBc Data Sheet
Vert.	2400.000	AV	36.4	27.3	24.4	41.1	47.0	53.9	-	110	180	Z, Refer to 20dBc Data Sheet
Vert.	3216.000	AV	40.0	29.0	5.7	41.5	33.2	53.9	20.7	100	290	Z,
Vert.	4824.000	AV	56.8	31.1	6.6	41.0	53.5	53.9	0.4	122	16	Z,
Vert.	7236.000	AV	36.0	36.6	8.3	41.3	39.6	53.9	14.3	100	0	Z,noise floor level

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	87.2	27.3	24.4	41.1	97.8	-	-	X, carrier,
Hori.	2397.500	PK	45.1	27.3	24.4	41.1	55.7	77.8	22.1	X,
Hori.	2400.000	PK	37.2	27.3	24.4	41.1	47.8	77.8	30.0	X,
Vert.	2412.000	PK	86.7	27.3	24.4	41.1	97.3	-	-	Z, carrier,
Vert.	2397.500	PK	44.9	27.3	24.4	41.1	55.5	77.3	21.8	Z,
Vert.	2400.000	PK	37.2	27.3	24.4	41.1	47.8	77.3	29.5	Z,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.		No.3 Semi Anechoic Chamber	
Date	April 18, 2012	April 19, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 35%RH	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2437 MHz	with monopole antenna		
	Tx, IEEE802.11b, PN9, worst data mode 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.	3249.350	PK	47.3	29.0	5.7	41.6	40.4	73.9	33.5	148	191	Z,
Hori.	4874.000	PK	58.0	31.2	6.7	41.0	54.9	73.9	19.0	122	248	Z,
Hori.	7311.000	PK	46.7	36.7	8.4	41.4	50.4	73.9	23.5	100	0	Z,noise floor level,
Hori.	3249.350	AV	39.5	29.0	5.7	41.6	32.6	53.9	21.3	148	191	Z,
Hori.	4874.000	AV	56.2	31.2	6.7	41.0	53.1	53.9	0.8	122	248	Z,
Hori.	7311.000	AV	35.5	36.7	8.4	41.4	39.2	53.9	14.7	100	0	Z,noise floor level,
Vert.	3249.350	PK	47.6	29.0	5.7	41.6	40.7	73.9	33.2	100	288	Z,
Vert.	4874.000	PK	56.5	31.2	6.7	41.0	53.4	73.9	20.5	110	98	Z,
Vert.	7311.000	PK	46.8	36.7	8.4	41.4	50.5	73.9	23.4	100	0	Z,noise floor level,
Vert.	3249.350	AV	39.7	29.0	5.7	41.6	32.8	53.9	21.1	100	288	Z,
Vert.	4874.000	AV	54.8	31.2	6.7	41.0	51.7	53.9	2.2	110	98	Z,
Vert.	7311.000	AV	35.5	36.7	8.4	41.4	39.2	53.9	14.7	100	0	Z,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber		
Date	April 18, 2012	April 19, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 35%RH	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2462 MHz	with monopole antenna		

Tx, IEEE802.11b, PN9, worst data mode 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	46.4	27.5	24.5	41.1	57.3	73.9	16.6	149	211	X,noise floor level,
Hori.	2487.000	PK	46.5	27.5	24.5	41.1	57.4	73.9	16.5	149	211	X,noise floor level,
Hori.	3282.700	PK	47.0	29.1	5.7	41.6	40.2	73.9	33.7	146	186	Z,
Hori.	4924.000	PK	57.7	31.3	6.7	40.9	54.8	73.9	19.1	123	251	Z,
Hori.	7386.000	PK	46.3	36.9	8.5	41.4	50.3	73.9	23.6	100	0	Z,noise floor level,
Hori.	2483.500	AV	35.0	27.5	24.5	41.1	45.9	53.9	8.0	149	211	X,noise floor level,
Hori.	2487.000	AV	35.0	27.5	24.5	41.1	45.9	53.9	8.0	149	211	X,noise floor level,
Hori.	3282.700	AV	39.3	29.1	5.7	41.6	32.5	53.9	21.4	146	186	Z,
Hori.	4924.000	AV	55.9	31.3	6.7	40.9	53.0	53.9	0.9	123	251	Z,
Hori.	7386.000	AV	35.5	36.9	8.5	41.4	39.5	53.9	14.4	100	0	Z,noise floor level,
Vert.	2483.500	PK	46.5	27.5	24.5	41.1	57.4	73.9	16.5	100	178	Z,noise floor level,
Vert.	2487.000	PK	46.4	27.5	24.5	41.1	57.3	73.9	16.6	100	178	Z,noise floor level,
Vert.	3282.700	PK	47.3	29.1	5.7	41.6	40.5	73.9	33.4	100	284	Z,
Vert.	4924.000	PK	56.4	31.3	6.7	40.9	53.5	73.9	20.4	104	96	Z,
Vert.	7386.000	PK	46.4	36.9	8.5	41.4	50.4	73.9	23.5	100	0	Z,noise floor level,
Vert.	2483.500	AV	35.1	27.5	24.5	41.1	46.0	53.9	7.9	100	178	Z,noise floor level,
Vert.	2487.000	AV	35.0	27.5	24.5	41.1	45.9	53.9	8.0	100	178	Z,noise floor level,
Vert.	3282.700	AV	39.5	29.1	5.7	41.6	32.7	53.9	21.2	100	284	Z,
Vert.	4924.000	AV	54.6	31.3	6.7	40.9	51.7	53.9	2.2	104	96	Z,
Vert.	7386.000	AV	35.6	36.9	8.5	41.4	39.6	53.9	14.3	100	0	Z,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.		No.3 Semi Anechoic Chamber	
Date	April 18, 2012	April 19, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 35%RH	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2412 MHz	with inversed F antenna		
	Tx, IEEE802.11b, PN9, worst data mode 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	46.9	27.2	24.4	41.1	57.4	73.9	16.5	109	204	X,noise floor level,
Hori.	2397.500	PK	49.9	27.3	24.4	41.1	60.5	73.9	-	109	204	X, Refer to 20dBc Data Sheet
Hori.	2400.000	PK	46.3	27.3	24.4	41.1	56.9	73.9	-	109	204	X, Refer to 20dBc Data Sheet
Hori.	3216.000	PK	46.8	29.0	5.7	41.5	40.0	73.9	33.9	147	192	Z
Hori.	4824.000	PK	57.2	31.1	6.6	41.0	53.9	73.9	20.0	153	116	Z,
Hori.	7236.000	PK	47.2	36.6	8.3	41.3	50.8	73.9	23.1	100	0	Z,noise floor level,
Hori.	2390.000	AV	35.0	27.2	24.4	41.1	45.5	53.9	8.4	109	204	X,noise floor level,
Hori.	2397.500	AV	41.6	27.3	24.4	41.1	52.2	53.9	-	109	204	X, Refer to 20dBc Data Sheet
Hori.	2400.000	AV	37.0	27.3	24.4	41.1	47.6	53.9	-	109	204	X, Refer to 20dBc Data Sheet
Hori.	3216.000	AV	34.9	29.0	5.7	41.5	28.1	53.9	25.8	147	192	Z,
Hori.	4824.000	AV	55.5	31.1	6.6	41.0	52.2	53.9	1.7	153	116	Z,
Hori.	7236.000	AV	36.1	36.6	8.3	41.3	39.7	53.9	14.2	100	0	Z,noise floor level,
Vert.	2390.000	PK	47.1	27.2	24.4	41.1	57.6	73.9	16.3	152	164	Z,noise floor level,
Vert.	2397.500	PK	49.5	27.3	24.4	41.1	60.1	73.9	-	152	164	Z, Refer to 20dBc Data Sheet
Vert.	2400.000	PK	46.0	27.3	24.4	41.1	56.6	73.9	-	152	164	Z, Refer to 20dBc Data Sheet
Vert.	3216.000	PK	48.0	29.0	5.7	41.5	41.2	73.9	32.7	100	280	X,
Vert.	4824.000	PK	56.9	31.1	6.6	41.0	53.6	73.9	20.3	100	247	X,
Vert.	7236.000	PK	47.0	36.6	8.3	41.3	50.6	73.9	23.3	100	0	X,noise floor level,
Vert.	2390.000	AV	35.0	27.2	24.4	41.1	45.5	53.9	8.4	152	164	Z,noise floor level,
Vert.	2397.500	AV	41.4	27.3	24.4	41.1	52.0	53.9	-	152	164	Z, Refer to 20dBc Data Sheet
Vert.	2400.000	AV	36.7	27.3	24.4	41.1	47.3	53.9	-	152	164	Z, Refer to 20dBc Data Sheet
Vert.	3216.000	AV	39.9	29.0	5.7	41.5	33.1	53.9	20.8	100	280	X,
Vert.	4824.000	AV	54.9	31.1	6.6	41.0	51.6	53.9	2.3	100	247	X,
Vert.	7236.000	AV	35.0	36.6	8.3	41.3	38.6	53.9	15.3	100	0	X,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	86.4	27.3	24.4	41.1	97.0	-	-	X, carrier,
Hori.	2397.500	PK	43.7	27.3	24.4	41.1	54.3	77.0	22.7	X,
Hori.	2400.000	PK	38.4	27.3	24.4	41.1	49.0	77.0	28.0	X,
Vert.	2412.000	PK	86.3	27.3	24.4	41.1	96.9	-	-	Z, carrier,
Vert.	2397.500	PK	43.4	27.3	24.4	41.1	54.0	76.9	22.9	Z,
Vert.	2400.000	PK	38.1	27.3	24.4	41.1	48.7	76.9	28.2	Z,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber		
Date	April 18, 2012	April 19, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 35%RH	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2437 MHz	with inversed F antenna		

Tx, IEEE802.11b, PN9, worst data mode 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.	3249.350	PK	47.4	29.0	5.7	41.6	40.5	73.9	33.4	145	194	Z,
Hori.	4874.000	PK	56.6	31.2	6.7	41.0	53.5	73.9	20.4	151	113	Z,
Hori.	7311.000	PK	46.9	36.7	8.4	41.4	50.6	73.9	23.3	100	0	Z,noise floor level,
Hori.	3249.350	AV	39.6	29.0	5.7	41.6	32.7	53.9	21.2	145	194	Z,
Hori.	4874.000	AV	55.0	31.2	6.7	41.0	51.9	53.9	2.0	151	113	Z,
Hori.	7311.000	AV	35.6	36.7	8.4	41.4	39.3	53.9	14.6	100	0	Z,noise floor level,
Vert.	3249.350	PK	47.8	29.0	5.7	41.6	40.9	73.9	33.0	100	288	X,
Vert.	4874.000	PK	56.2	31.2	6.7	41.0	53.1	73.9	20.8	100	251	X,
Vert.	7311.000	PK	46.8	36.7	8.4	41.4	50.5	73.9	23.4	100	0	X,noise floor level,
Vert.	3249.350	AV	39.8	29.0	5.7	41.6	32.9	53.9	21.0	100	288	X,
Vert.	4874.000	AV	54.5	31.2	6.7	41.0	51.4	53.9	2.5	100	251	X,
Vert.	7311.000	AV	35.5	36.7	8.4	41.4	39.2	53.9	14.7	100	0	X,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber		
Date	April 18, 2012	April 19, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 35%RH	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2462 MHz	with inversed F antenna		

Tx, IEEE802.11b, PN9, worst data mode 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	46.6	27.5	24.5	41.1	57.5	73.9	16.4	110	201	X,noise floor level,
Hori.	2487.000	PK	46.5	27.5	24.5	41.1	57.4	73.9	16.5	110	201	X,noise floor level,
Hori.	3282.700	PK	47.6	29.1	5.7	41.6	40.8	73.9	33.1	144	191	Z,
Hori.	4924.000	PK	56.4	31.3	6.7	40.9	53.5	73.9	20.4	149	114	Z,
Hori.	7386.000	PK	46.6	36.9	8.5	41.4	50.6	73.9	23.3	100	0	Z,noise floor level,
Hori.	2483.500	AV	35.1	27.5	24.5	41.1	46.0	53.9	7.9	110	201	X,noise floor level,
Hori.	2487.000	AV	35.1	27.5	24.5	41.1	46.0	53.9	7.9	110	201	X,noise floor level,
Hori.	3282.700	AV	39.5	29.1	5.7	41.6	32.7	53.9	21.2	144	191	Z,
Hori.	4924.000	AV	54.7	31.3	6.7	40.9	51.8	53.9	2.1	149	114	Z,
Hori.	7386.000	AV	35.2	36.9	8.5	41.4	39.2	53.9	14.7	100	0	Z,noise floor level,
Vert.	2483.500	PK	46.5	27.5	24.5	41.1	57.4	73.9	16.5	145	166	Z,noise floor level,
Vert.	2487.000	PK	46.5	27.5	24.5	41.1	57.4	73.9	16.5	145	166	Z,noise floor level,
Vert.	3282.700	PK	47.6	29.1	5.7	41.6	40.8	73.9	33.1	100	293	X,
Vert.	4924.000	PK	56.0	31.3	6.7	40.9	53.1	73.9	20.8	100	248	X,
Vert.	7386.000	PK	46.6	36.9	8.5	41.4	50.6	73.9	23.3	100	0	X,noise floor level,
Vert.	2483.500	AV	35.0	27.5	24.5	41.1	45.9	53.9	8.0	145	166	Z,noise floor level,
Vert.	2487.000	AV	35.1	27.5	24.5	41.1	46.0	53.9	7.9	145	166	Z,noise floor level,
Vert.	3282.700	AV	39.6	29.1	5.7	41.6	32.8	53.9	21.1	100	293	X,
Vert.	4924.000	AV	54.3	31.3	6.7	40.9	51.4	53.9	2.5	100	248	X,
Vert.	7386.000	AV	35.1	36.9	8.5	41.4	39.1	53.9	14.8	100	0	X,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber	
Date	April 19, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2412 MHz	with dipole antenna	

Tx, IEEE802.11g, PN9, worst data mode 18Mbps

(* 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	49.7	27.2	24.4	41.1	60.2	73.9	13.7	100	12	X,
Hori.	2400.000	PK	65.6	27.3	24.4	41.1	76.2	73.9	-	100	12	X, Refer to 20dBc Data Sheet
Hori.	3216.000	PK	49.7	29.0	5.7	41.5	42.9	73.9	31.0	102	119	Z,
Hori.	4824.000	PK	53.6	31.1	6.6	41.0	50.3	73.9	23.6	153	121	Z,
Hori.	7236.000	PK	46.4	36.6	8.3	41.3	50.0	73.9	23.9	100	0	Z,noise floor level,
Hori.	2390.000	AV	37.2	27.2	24.4	41.1	47.7	53.9	6.2	100	12	X,
Hori.	2400.000	AV	49.4	27.3	24.4	41.1	60.0	53.9	-	100	12	X, Refer to 20dBc Data Sheet
Hori.	3216.000	AV	42.4	29.0	5.7	41.5	35.6	53.9	18.3	102	119	Z,
Hori.	4824.000	AV	44.8	31.1	6.6	41.0	41.5	53.9	12.4	153	121	Z,
Hori.	7236.000	AV	35.4	36.6	8.3	41.3	39.0	53.9	14.9	100	0	Z,noise floor level,
Vert.	2390.000	PK	49.4	27.2	24.4	41.1	59.9	73.9	14.0	100	42	Y,
Vert.	2400.000	PK	65.1	27.3	24.4	41.1	75.7	73.9	-	100	42	Y, Refer to 20dBc Data Sheet
Vert.	3216.000	PK	49.4	29.0	5.7	41.5	42.6	73.9	31.3	100	135	X,
Vert.	4824.000	PK	53.5	31.1	6.6	41.0	50.2	73.9	23.7	104	248	X,
Vert.	7236.000	PK	46.5	36.6	8.3	41.3	50.1	73.9	23.8	100	0	X,noise floor level,
Vert.	2390.000	AV	37.0	27.2	24.4	41.1	47.5	53.9	6.4	100	42	Y,
Vert.	2400.000	AV	49.2	27.3	24.4	41.1	59.8	53.9	-	100	42	Y, Refer to 20dBc Data Sheet
Vert.	3216.000	AV	40.3	29.0	5.7	41.5	33.5	53.9	20.4	100	135	X,
Vert.	4824.000	AV	44.7	31.1	6.6	41.0	41.4	53.9	12.5	104	248	X,
Vert.	7236.000	AV	35.5	36.6	8.3	41.3	39.1	53.9	14.8	100	0	X,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	84.7	27.3	24.4	41.1	95.3	-	-	X, carrier
Hori.	2400.000	PK	51.2	27.3	24.4	41.1	61.8	75.3	13.5	X,
Vert.	2412.000	PK	84.5	27.3	24.4	41.1	95.1	-	-	Y, carrier
Vert.	2400.000	PK	50.9	27.3	24.4	41.1	61.5	75.1	13.6	Y,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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Facsimile : +81 463 50 6401

Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber	
Date	April 19, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2437 MHz	with dipole antenna	

Tx, IEEE802.11g, PN9, worst data mode 18Mbps

(* 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.	3249.350	PK	49.4	29.0	5.7	41.6	42.5	73.9	31.4	100	124	Z,
Hori.	4874.000	PK	53.0	31.2	6.7	41.0	49.9	73.9	24.0	154	118	Z,
Hori.	7311.000	PK	46.9	36.7	8.4	41.4	50.6	73.9	23.3	100	0	Z,noise floor level,
Hori.	3249.350	AV	40.0	29.0	5.7	41.6	33.1	53.9	20.8	100	124	Z,
Hori.	4874.000	AV	44.5	31.2	6.7	41.0	41.4	53.9	12.5	154	118	Z,
Hori.	7311.000	AV	35.7	36.7	8.4	41.4	39.4	53.9	14.5	100	0	Z,noise floor level,
Vert.	3249.350	PK	49.1	29.0	5.7	41.6	42.2	73.9	31.7	100	133	X,
Vert.	4874.000	PK	52.8	31.2	6.7	41.0	49.7	73.9	24.2	103	250	X,
Vert.	7311.000	PK	46.8	36.7	8.4	41.4	50.5	73.9	23.4	100	0	X,noise floor level,
Vert.	3249.350	AV	39.9	29.0	5.7	41.6	33.0	53.9	20.9	100	133	X,
Vert.	4874.000	AV	44.2	31.2	6.7	41.0	41.1	53.9	12.8	103	250	X,
Vert.	7311.000	AV	35.7	36.7	8.4	41.4	39.4	53.9	14.5	100	0	X,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber	
Date	April 19, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2462 MHz	with dipole antenna	

Tx, IEEE802.11g, PN9, worst data mode 18Mbps

(* 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	52.4	27.5	24.5	41.1	63.3	73.9	10.6	100	13	X,
Hori.	3282.700	PK	48.6	29.1	5.7	41.6	41.8	73.9	32.1	100	122	Z,
Hori.	4924.000	PK	52.7	31.3	6.7	40.9	49.8	73.9	24.1	151	117	Z,
Hori.	7386.000	PK	46.7	36.9	8.5	41.4	50.7	73.9	23.2	100	0	Z,noise floor level,
Hori.	2483.500	AV	37.6	27.5	24.5	41.1	48.5	53.9	5.4	100	13	X,
Hori.	3282.700	AV	38.9	29.1	5.7	41.6	32.1	53.9	21.8	100	122	Z,
Hori.	4924.000	AV	44.1	31.3	6.7	40.9	41.2	53.9	12.7	151	117	Z,
Hori.	7386.000	AV	35.3	36.9	8.5	41.4	39.3	53.9	14.6	100	0	Z,noise floor level,
Vert.	2483.500	PK	52.3	27.5	24.5	41.1	63.2	73.9	10.7	100	46	Y,
Vert.	3282.700	PK	48.2	29.1	5.7	41.6	41.4	73.9	32.5	100	137	X,
Vert.	4924.000	PK	52.5	31.3	6.7	40.9	49.6	73.9	24.3	105	246	X,
Vert.	7386.000	PK	46.6	36.9	8.5	41.4	50.6	73.9	23.3	100	0	X,noise floor level,
Vert.	2483.500	AV	37.5	27.5	24.5	41.1	48.4	53.9	5.5	100	46	Y,
Vert.	3282.700	AV	38.7	29.1	5.7	41.6	31.9	53.9	22.0	100	137	X,
Vert.	4924.000	AV	44.0	31.3	6.7	40.9	41.1	53.9	12.8	105	246	X,
Vert.	7386.000	AV	35.2	36.9	8.5	41.4	39.2	53.9	14.7	100	0	X,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber	
Date	April 20, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2412 MHz	with monopole antenna	

Tx, IEEE802.11g, PN9, worst data mode 18Mbps

(* 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	52.6	27.2	24.4	41.1	63.1	73.9	10.8	100	272	X,
Hori.	2400.000	PK	67.8	27.3	24.4	41.1	78.4	73.9	-	100	272	X, Refer to 20dBc Data Sheet
Hori.	3216.000	PK	48.4	29.0	5.7	41.5	41.6	73.9	32.3	100	129	Z,
Hori.	4824.000	PK	56.6	31.1	6.6	41.0	53.3	73.9	20.6	100	139	Z,
Hori.	7236.000	PK	47.2	36.6	8.3	41.3	50.8	73.9	23.1	100	0	Z,noise floor level,
Hori.	2390.000	AV	38.0	27.2	24.4	41.1	48.5	53.9	5.4	100	272	X,
Hori.	2400.000	AV	50.6	27.3	24.4	41.1	61.2	53.9	-	100	272	X, Refer to 20dBc Data Sheet
Hori.	3216.000	AV	39.6	29.0	5.7	41.5	32.8	53.9	21.1	100	129	Z,
Hori.	4824.000	AV	45.2	31.1	6.6	41.0	41.9	53.9	12.0	100	139	Z,
Hori.	7236.000	AV	36.2	36.6	8.3	41.3	39.8	53.9	14.1	100	0	Z,noise floor level,
Vert.	2390.000	PK	48.8	27.2	24.4	41.1	59.3	73.9	14.6	100	199	Z,
Vert.	2400.000	PK	67.0	27.3	24.4	41.1	77.6	73.9	-	100	199	Z, Refer to 20dBc Data Sheet
Vert.	3216.000	PK	47.8	29.0	5.7	41.5	41.0	73.9	32.9	100	92	Z,
Vert.	4824.000	PK	54.5	31.1	6.6	41.0	51.2	73.9	22.7	102	174	Z,
Vert.	7236.000	PK	47.3	36.6	8.3	41.3	50.9	73.9	23.0	100	0	Z,noise floor level,
Vert.	2390.000	AV	37.0	27.2	24.4	41.1	47.5	53.9	6.4	100	199	Z,
Vert.	2400.000	AV	49.2	27.3	24.4	41.1	59.8	53.9	-	100	199	Z, Refer to 20dBc Data Sheet
Vert.	3216.000	AV	39.5	29.0	5.7	41.5	32.7	53.9	21.2	100	92	Z,
Vert.	4824.000	AV	42.8	31.1	6.6	41.0	39.5	53.9	14.4	102	174	Z,
Vert.	7236.000	AV	36.3	36.6	8.3	41.3	39.9	53.9	14.0	100	0	Z,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	86.2	27.3	24.4	41.1	96.8	-	-	X, carrier,
Hori.	2400.000	PK	54.1	27.3	24.4	41.1	64.7	76.8	12.1	X,
Vert.	2412.000	PK	85.2	27.3	24.4	41.1	95.8	-	-	Z, carrier,
Vert.	2400.000	PK	53.4	27.3	24.4	41.1	64.0	75.8	11.8	Z,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber	
Date	April 20, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2437 MHz	with monopole antenna	

Tx, IEEE802.11g, PN9, worst data mode 18Mbps

(* 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.	3249.350	PK	48.7	29.0	5.7	41.6	41.8	73.9	32.1	100	125	Z,
Hori.	4874.000	PK	54.0	31.2	6.7	41.0	50.9	73.9	23.0	100	134	Z,
Hori.	7311.000	PK	47.7	36.7	8.4	41.4	51.4	73.9	22.5	100	0	Z,noise floor level,
Hori.	3249.350	AV	40.4	29.0	5.7	41.6	33.5	53.9	20.4	100	125	Z,
Hori.	4874.000	AV	45.0	31.2	6.7	41.0	41.9	53.9	12.0	100	134	Z,
Hori.	7311.000	AV	36.6	36.7	8.4	41.4	40.3	53.9	13.6	100	0	Z,noise floor level,
Vert.	3249.350	PK	47.9	29.0	5.7	41.6	41.0	73.9	32.9	100	88	Z,
Vert.	4874.000	PK	53.7	31.2	6.7	41.0	50.6	73.9	23.3	109	163	Z,
Vert.	7311.000	PK	47.8	36.7	8.4	41.4	51.5	73.9	22.4	100	0	Z,noise floor level,
Vert.	3249.350	AV	38.9	29.0	5.7	41.6	32.0	53.9	21.9	100	88	Z,
Vert.	4874.000	AV	43.7	31.2	6.7	41.0	40.6	53.9	13.3	109	163	Z,
Vert.	7311.000	AV	35.6	36.7	8.4	41.4	39.3	53.9	14.6	100	0	Z,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber	
Date	April 20, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2462 MHz	with monopole antenna	

Tx, IEEE802.11g, PN9, worst data mode 18Mbps

(* 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	54.8	27.5	24.5	41.1	65.7	73.9	8.2	100	268	X,
Hori.	3282.700	PK	48.4	29.1	5.7	41.6	41.6	73.9	32.3	100	137	Z,
Hori.	4924.000	PK	53.6	31.3	6.7	40.9	50.7	73.9	23.2	100	128	Z,
Hori.	7386.000	PK	47.5	36.9	8.5	41.4	51.5	73.9	22.4	100	0	Z,noise floor level,
Hori.	2483.500	AV	38.9	27.5	24.5	41.1	49.8	53.9	4.1	100	268	X,
Hori.	3282.700	AV	39.3	29.1	5.7	41.6	32.5	53.9	21.4	100	137	Z,
Hori.	4924.000	AV	44.1	31.3	6.7	40.9	41.2	53.9	12.7	100	128	Z,
Hori.	7386.000	AV	35.6	36.9	8.5	41.4	39.6	53.9	14.3	100	0	Z,noise floor level,
Vert.	2483.500	PK	54.3	27.5	24.5	41.1	65.2	73.9	8.7	100	204	Z,
Vert.	3282.700	PK	47.9	29.1	5.7	41.6	41.1	73.9	32.8	100	89	Z,
Vert.	4924.000	PK	52.3	31.3	6.7	40.9	49.4	73.9	24.5	111	136	Z,
Vert.	7386.000	PK	47.4	36.9	8.5	41.4	51.4	73.9	22.5	100	0	Z,noise floor level,
Vert.	2483.500	AV	38.6	27.5	24.5	41.1	49.5	53.9	4.4	100	204	Z,
Vert.	3282.700	AV	39.1	29.1	5.7	41.6	32.3	53.9	21.6	100	89	Z,
Vert.	4924.000	AV	43.1	31.3	6.7	40.9	40.2	53.9	13.7	111	136	Z,
Vert.	7386.000	AV	35.6	36.9	8.5	41.4	39.6	53.9	14.3	100	0	Z,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber	
Date	April 20, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2412 MHz	with inversed F antenna	

Tx, IEEE802.11g, PN9, worst data mode 18Mbps

(* 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	50.2	27.2	24.4	41.1	60.7	73.9	13.2	100	270	X,
Hori.	2400.000	PK	67.0	27.3	24.4	41.1	77.6	73.9	-	100	270	X, Refer to 20dBc Data Sheet
Hori.	3216.000	PK	47.5	29.0	5.7	41.5	40.7	73.9	33.2	100	268	Z,
Hori.	4824.000	PK	52.5	31.1	6.6	41.0	49.2	73.9	24.7	100	241	Z,
Hori.	7236.000	PK	47.6	36.6	8.3	41.3	51.2	73.9	22.7	100	0	Z,noise floor level,
Hori.	2390.000	AV	37.0	27.2	24.4	41.1	47.5	53.9	6.4	100	270	X,
Hori.	2400.000	AV	49.5	27.3	24.4	41.1	60.1	53.9	-	100	270	X, Refer to 20dBc Data Sheet
Hori.	3216.000	AV	38.4	29.0	5.7	41.5	31.6	53.9	22.3	100	268	Z,
Hori.	4824.000	AV	42.4	31.1	6.6	41.0	39.1	53.9	14.8	100	241	Z,
Hori.	7236.000	AV	36.2	36.6	8.3	41.3	39.8	53.9	14.1	100	0	Z,noise floor level,
Vert.	2390.000	PK	50.1	27.2	24.4	41.1	60.6	73.9	13.3	113	8	Z,
Vert.	2400.000	PK	65.5	27.3	24.4	41.1	76.1	73.9	-	113	8	Z, Refer to 20dBc Data Sheet
Vert.	3216.000	PK	47.7	29.0	5.7	41.5	40.9	73.9	33.0	100	266	X,
Vert.	4824.000	PK	52.7	31.1	6.6	41.0	49.4	73.9	24.5	104	253	X,
Vert.	7236.000	PK	47.5	36.6	8.3	41.3	51.1	73.9	22.8	100	0	X,noise floor level,
Vert.	2390.000	AV	36.9	27.2	24.4	41.1	47.4	53.9	6.5	113	8	Z,
Vert.	2400.000	AV	47.4	27.3	24.4	41.1	58.0	53.9	-	113	8	Z, Refer to 20dBc Data Sheet
Vert.	3216.000	AV	38.6	29.0	5.7	41.5	31.8	53.9	22.1	100	266	X,
Vert.	4824.000	AV	42.9	31.1	6.6	41.0	39.6	53.9	14.3	104	253	X,
Vert.	7236.000	AV	36.2	36.6	8.3	41.3	39.8	53.9	14.1	100	0	X,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	85.0	27.3	24.4	41.1	95.6	-	-	X, carrier,
Hori.	2400.000	PK	52.6	27.3	24.4	41.1	63.2	75.6	12.4	X,
Vert.	2412.000	PK	84.1	27.3	24.4	41.1	94.7	-	-	Z, carrier,
Vert.	2400.000	PK	51.6	27.3	24.4	41.1	62.2	74.7	12.5	Z,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber	
Date	April 20, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2437 MHz	with inversed F antenna	

Tx, IEEE802.11g, PN9, worst data mode 18Mbps

(* 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.	3249.350	PK	47.0	29.0	5.7	41.6	40.1	73.9	33.8	100	202	Z,
Hori.	4874.000	PK	51.6	31.2	6.7	41.0	48.5	73.9	25.4	100	239	Z,
Hori.	7311.000	PK	47.6	36.7	8.4	41.4	51.3	73.9	22.6	100	0	Z,noise floor level,
Hori.	3249.350	AV	37.4	29.0	5.7	41.6	30.5	53.9	23.4	100	202	Z,
Hori.	4874.000	AV	41.6	31.2	6.7	41.0	38.5	53.9	15.4	100	239	Z,
Hori.	7311.000	AV	35.6	36.7	8.4	41.4	39.3	53.9	14.6	100	0	Z,noise floor level,
Vert.	3249.350	PK	47.4	29.0	5.7	41.6	40.5	73.9	33.4	100	263	X,
Vert.	4874.000	PK	52.1	31.2	6.7	41.0	49.0	73.9	24.9	102	251	X,
Vert.	7311.000	PK	47.5	36.7	8.4	41.4	51.2	73.9	22.7	100	0	X,noise floor level,
Vert.	3249.350	AV	37.7	29.0	5.7	41.6	30.8	53.9	23.1	100	263	X,
Vert.	4874.000	AV	42.0	31.2	6.7	41.0	38.9	53.9	15.0	102	251	X,
Vert.	7311.000	AV	35.6	36.7	8.4	41.4	39.3	53.9	14.6	100	0	X,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber	
Date	April 20, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2462 MHz	with inversed F antenna	
	Tx, IEEE802.11g, PN9, worst data mode 18Mbps		

(* 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	53.7	27.5	24.5	41.1	64.6	73.9	9.3	100	263	X,
Hori.	3282.700	PK	47.3	29.1	5.7	41.6	40.5	73.9	33.4	100	202	Z,
Hori.	4924.000	PK	52.0	31.3	6.7	40.9	49.1	73.9	24.8	100	241	Z,
Hori.	7386.000	PK	47.7	36.9	8.5	41.4	51.7	73.9	22.2	100	0	Z,noise floor level,
Hori.	2483.500	AV	38.4	27.5	24.5	41.1	49.3	53.9	4.6	100	263	X,
Hori.	3282.700	AV	37.7	29.1	5.7	41.6	30.9	53.9	23.0	100	202	Z,
Hori.	4924.000	AV	40.1	31.3	6.7	40.9	37.2	53.9	16.7	100	241	Z,
Hori.	7386.000	AV	35.7	36.9	8.5	41.4	39.7	53.9	14.2	100	0	Z,noise floor level,
Vert.	2483.500	PK	53.3	27.5	24.5	41.1	64.2	73.9	9.7	109	9	Z,
Vert.	3282.700	PK	47.9	29.1	5.7	41.6	41.1	73.9	32.8	100	267	X,
Vert.	4924.000	PK	52.9	31.3	6.7	40.9	50.0	73.9	23.9	100	253	X,
Vert.	7386.000	PK	47.6	36.9	8.5	41.4	51.6	73.9	22.3	100	0	X,noise floor level,
Vert.	2483.500	AV	38.1	27.5	24.5	41.1	49.0	53.9	4.9	109	9	Z,
Vert.	3282.700	AV	38.0	29.1	5.7	41.6	31.2	53.9	22.7	100	267	X,
Vert.	4924.000	AV	42.6	31.3	6.7	40.9	39.7	53.9	14.2	100	253	X,
Vert.	7386.000	AV	35.7	36.9	8.5	41.4	39.7	53.9	14.2	100	0	X,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber	
Date	April 18, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 35%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2412 MHz	with dipole antenna	
	Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)		

(* 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	59.4	27.2	24.4	41.1	69.9	73.9	4.0	100	11	X,
Hori.	2391.878	PK	60.9	27.2	24.4	41.1	71.4	73.9	-	100	11	X, Refer to 20dBc Data Sheet
Hori.	2400.000	PK	69.0	27.3	24.4	41.1	79.6	73.9	-	100	11	X, Refer to 20dBc Data Sheet
Hori.	3216.000	PK	49.8	29.0	5.7	41.5	43.0	73.9	30.9	100	117	Z,
Hori.	4824.000	PK	53.8	31.1	6.6	41.0	50.5	73.9	23.4	155	122	Z,
Hori.	7236.000	PK	46.2	36.6	8.3	41.3	49.8	73.9	24.1	100	0	Z,noise floor level
Hori.	2390.000	AV	39.2	27.2	24.4	41.1	49.7	53.9	4.2	100	11	X,
Hori.	2391.878	AV	41.1	27.2	24.4	41.1	51.6	53.9	-	100	11	X, Refer to 20dBc Data Sheet
Hori.	2400.000	AV	50.0	27.3	24.4	41.1	60.6	53.9	-	100	11	X, Refer to 20dBc Data Sheet
Hori.	3216.000	AV	42.6	29.0	5.7	41.5	35.8	53.9	18.1	100	117	Z,
Hori.	4824.000	AV	45.0	31.1	6.6	41.0	41.7	53.9	12.2	155	122	Z,
Hori.	7236.000	AV	35.5	36.6	8.3	41.3	39.1	53.9	14.8	100	0	Z,noise floor level
Vert.	2390.000	PK	58.0	27.2	24.4	41.1	68.5	73.9	5.4	100	44	Y,
Vert.	2391.878	PK	60.1	27.2	24.4	41.1	70.6	73.9	-	100	44	Y, Refer to 20dBc Data Sheet
Vert.	2400.000	PK	68.4	27.3	24.4	41.1	79.0	73.9	-	100	44	Y, Refer to 20dBc Data Sheet
Vert.	3216.000	PK	49.3	29.0	5.7	41.5	42.5	73.9	31.4	100	132	X,
Vert.	4824.000	PK	53.4	31.1	6.6	41.0	50.1	73.9	23.8	102	240	X,
Vert.	7236.000	PK	46.1	36.6	8.3	41.3	49.7	73.9	24.2	100	0	X,noise floor level
Vert.	2390.000	AV	38.1	27.2	24.4	41.1	48.6	53.9	5.3	100	44	Y,
Vert.	2391.878	AV	40.1	27.2	24.4	41.1	50.6	53.9	-	100	44	Y, Refer to 20dBc Data Sheet
Vert.	2400.000	AV	49.3	27.3	24.4	41.1	59.9	53.9	-	100	44	Y, Refer to 20dBc Data Sheet
Vert.	3216.000	AV	40.0	29.0	5.7	41.5	33.2	53.9	20.7	100	132	X,
Vert.	4824.000	AV	44.6	31.1	6.6	41.0	41.3	53.9	12.6	102	240	X,
Vert.	7236.000	AV	35.4	36.6	8.3	41.3	39.0	53.9	14.9	100	0	X,noise floor level

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	85.5	27.3	24.4	41.1	96.1	-	-	X, carrier,
Hori.	2391.878	PK	49.8	27.2	24.4	41.1	60.3	76.1	15.8	X,
Hori.	2400.000	PK	55.0	27.3	24.4	41.1	65.6	76.1	10.5	X,
Vert.	2412.000	PK	85.4	27.3	24.4	41.1	96.0	-	-	Y, carrier,
Vert.	2391.878	PK	48.5	27.2	24.4	41.1	59.0	76.0	17.0	Y,
Vert.	2400.000	PK	54.6	27.3	24.4	41.1	65.2	76.0	10.8	Y,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber	
Date	April 18, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 35%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2437 MHz	with dipole antenna	
	Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)		

(* 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.	3249.350	PK	49.5	29.0	5.7	41.6	42.6	73.9	31.3	100	125	Z,
Hori.	4874.000	PK	53.5	31.2	6.7	41.0	50.4	73.9	23.5	151	92	Z,
Hori.	7311.000	PK	46.8	36.7	8.4	41.4	50.5	73.9	23.4	100	0	Z,noise floor level,
Hori.	3249.350	AV	42.0	29.0	5.7	41.6	35.1	53.9	18.8	100	125	Z,
Hori.	4874.000	AV	45.0	31.2	6.7	41.0	41.9	53.9	12.0	151	92	Z,
Hori.	7311.000	AV	35.7	36.7	8.4	41.4	39.4	53.9	14.5	100	0	Z,noise floor level,
Vert.	3249.350	PK	49.2	29.0	5.7	41.6	42.3	73.9	31.6	100	128	X,
Vert.	4874.000	PK	53.2	31.2	6.7	41.0	50.1	73.9	23.8	103	251	X,
Vert.	7311.000	PK	46.7	36.7	8.4	41.4	50.4	73.9	23.5	100	0	X,noise floor level,
Vert.	3249.350	AV	40.0	29.0	5.7	41.6	33.1	53.9	20.8	100	128	X,
Vert.	4874.000	AV	44.8	31.2	6.7	41.0	41.7	53.9	12.2	103	251	X,
Vert.	7311.000	AV	35.6	36.7	8.4	41.4	39.3	53.9	14.6	100	0	X,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber			
Date	April 18, 2012	April 21, 2012	April 22, 2012	April 23, 2012
Temperature / Humidity	26 deg.C , 35%RH	25 deg.C , 36%RH	23 deg.C , 34%RH	24 deg.C , 44%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi	Makoto Hosaka
Mode	Tx, 2462 MHz with dipole antenna			
	Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)			

(* 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.	103.994	QP	25.1	10.3	7.3	32.1	10.6	43.5	32.9	292	171	Z,
Hori.	130.003	QP	39.1	13.6	7.4	32.1	28.0	43.5	15.5	145	171	Z,
Hori.	132.004	QP	34.0	13.7	7.4	32.1	23.0	43.5	20.5	136	182	Z,
Hori.	2483.500	PK	58.5	27.5	24.5	41.1	69.4	73.9	4.5	100	16	X,
Hori.	3282.700	PK	49.3	29.1	5.7	41.6	42.5	73.9	31.4	100	192	Z,
Hori.	4924.000	PK	52.8	31.3	6.7	40.9	49.9	73.9	24.0	141	110	Z,
Hori.	7386.000	PK	46.2	36.9	8.5	41.4	50.2	73.9	23.7	100	0	Z,noise floor level,
Hori.	2483.500	AV	39.9	27.5	24.5	41.1	50.8	53.9	3.1	100	16	X,
Hori.	3282.700	AV	42.2	29.1	5.7	41.6	35.4	53.9	18.5	100	192	Z,
Hori.	4924.000	AV	44.5	31.3	6.7	40.9	41.6	53.9	12.3	141	110	Z,
Hori.	7386.000	AV	35.5	36.9	8.5	41.4	39.5	53.9	14.4	100	0	Z,noise floor level,
Vert.	104.004	QP	29.8	10.3	7.3	32.1	15.3	43.5	28.2	100	107	Z,
Vert.	130.002	QP	37.7	13.6	7.4	32.1	26.6	43.5	16.9	100	76	Z,
Vert.	132.004	QP	31.8	13.7	7.4	32.1	20.8	43.5	22.7	100	214	Z,
Vert.	2483.500	PK	58.3	27.5	24.5	41.1	69.2	73.9	4.7	100	46	Y,
Vert.	3282.700	PK	49.0	29.1	5.7	41.6	42.2	73.9	31.7	100	127	X,
Vert.	4924.000	PK	52.4	31.3	6.7	40.9	49.5	73.9	24.4	103	238	X,
Vert.	7386.000	PK	46.3	36.9	8.5	41.4	50.3	73.9	23.6	100	0	X,noise floor level,
Vert.	2483.500	AV	39.8	27.5	24.5	41.1	50.7	53.9	3.2	100	46	Y,
Vert.	3282.700	AV	39.9	29.1	5.7	41.6	33.1	53.9	20.8	100	127	X,
Vert.	4924.000	AV	44.0	31.3	6.7	40.9	41.1	53.9	12.8	103	238	X,
Vert.	7386.000	AV	35.5	36.9	8.5	41.4	39.5	53.9	14.4	100	0	X,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2412 MHz	with monopole antenna	
	Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)		

(* 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	57.9	27.2	24.4	41.1	68.4	73.9	5.5	100	267	X,
Hori.	2390.745	PK	59.2	27.2	24.4	41.1	69.7	73.9	-	100	267	X, Refer to 20dBc Data Sheet
Hori.	2400.000	PK	69.4	27.3	24.4	41.1	80.0	73.9	-	100	267	X, Refer to 20dBc Data Sheet
Hori.	3216.000	PK	48.1	29.0	5.7	41.5	41.3	73.9	32.6	100	143	Z,
Hori.	4824.000	PK	56.4	31.1	6.6	41.0	53.1	73.9	20.8	100	124	Z,
Hori.	7236.000	PK	47.3	36.6	8.3	41.3	50.9	73.9	23.0	100	0	Z,noise floor level,
Hori.	2390.000	AV	38.5	27.2	24.4	41.1	49.0	53.9	4.9	100	267	X,
Hori.	2390.745	AV	39.9	27.2	24.4	41.1	50.4	53.9	-	100	267	X, Refer to 20dBc Data Sheet
Hori.	2400.000	AV	50.8	27.3	24.4	41.1	61.4	53.9	-	100	267	X, Refer to 20dBc Data Sheet
Hori.	3216.000	AV	40.0	29.0	5.7	41.5	33.2	53.9	20.7	100	143	Z,
Hori.	4824.000	AV	45.4	31.1	6.6	41.0	42.1	53.9	11.8	100	124	Z,
Hori.	7236.000	AV	36.3	36.6	8.3	41.3	39.9	53.9	14.0	100	0	Z,noise floor level,
Vert.	2390.000	PK	56.8	27.2	24.4	41.1	67.3	73.9	6.6	102	201	Z,
Vert.	2390.745	PK	58.3	27.2	24.4	41.1	68.8	73.9	-	102	201	Z, Refer to 20dBc Data Sheet
Vert.	2400.000	PK	68.3	27.3	24.4	41.1	78.9	73.9	-	102	201	Z, Refer to 20dBc Data Sheet
Vert.	3216.000	PK	49.1	29.0	5.7	41.5	42.3	73.9	31.6	132	83	Z,
Vert.	4824.000	PK	55.6	31.1	6.6	41.0	52.3	73.9	21.6	125	169	Z,
Vert.	7236.000	PK	47.2	36.6	8.3	41.3	50.8	73.9	23.1	100	0	Z,noise floor level,
Vert.	2390.000	AV	38.4	27.2	24.4	41.1	48.9	53.9	5.0	102	201	Z,
Vert.	2390.745	AV	40.5	27.2	24.4	41.1	51.0	53.9	-	102	201	Z, Refer to 20dBc Data Sheet
Vert.	2400.000	AV	49.6	27.3	24.4	41.1	60.2	53.9	-	102	201	Z, Refer to 20dBc Data Sheet
Vert.	3216.000	AV	39.4	29.0	5.7	41.5	32.6	53.9	21.3	132	83	Z,
Vert.	4824.000	AV	43.1	31.1	6.6	41.0	39.8	53.9	14.1	125	169	Z,
Vert.	7236.000	AV	36.2	36.6	8.3	41.3	39.8	53.9	14.1	100	0	Z,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	86.7	27.3	24.4	41.1	97.3	-	-	X, carrier,
Hori.	2390.745	PK	48.7	27.2	24.4	41.1	59.2	77.3	18.1	X,
Hori.	2400.000	PK	54.7	27.3	24.4	41.1	65.3	77.3	12.0	X,
Vert.	2412.000	PK	85.6	27.3	24.4	41.1	96.2	-	-	Z, carrier,
Vert.	2390.745	PK	46.4	27.2	24.4	41.1	56.9	76.2	19.3	Z,
Vert.	2400.000	PK	54.2	27.3	24.4	41.1	64.8	76.2	11.4	Z,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber	
Date	April 20, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2437 MHz	with monopole antenna	
	Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)		

(* 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.	3249.350	PK	49.0	29.0	5.7	41.6	42.1	73.9	31.8	100	132	Z,
Hori.	4874.000	PK	54.9	31.2	6.7	41.0	51.8	73.9	22.1	100	128	Z,
Hori.	7311.000	PK	47.7	36.7	8.4	41.4	51.4	73.9	22.5	100	0	Z,noise floor level,
Hori.	3249.350	AV	40.5	29.0	5.7	41.6	33.6	53.9	20.3	100	132	Z,
Hori.	4874.000	AV	45.5	31.2	6.7	41.0	42.4	53.9	11.5	100	128	Z,
Hori.	7311.000	AV	35.5	36.7	8.4	41.4	39.2	53.9	14.7	100	0	Z,noise floor level,
Vert.	3249.350	PK	48.7	29.0	5.7	41.6	41.8	73.9	32.1	138	85	Z,
Vert.	4874.000	PK	53.0	31.2	6.7	41.0	49.9	73.9	24.0	114	165	Z,
Vert.	7311.000	PK	47.6	36.7	8.4	41.4	51.3	73.9	22.6	100	0	Z,noise floor level,
Vert.	3249.350	AV	38.1	29.0	5.7	41.6	31.2	53.9	22.7	138	85	Z,
Vert.	4874.000	AV	41.8	31.2	6.7	41.0	38.7	53.9	15.2	114	165	Z,
Vert.	7311.000	AV	35.5	36.7	8.4	41.4	39.2	53.9	14.7	100	0	Z,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber			
Date	April 20, 2012	April 21, 2012	April 22, 2012	April 23, 2012
Temperature / Humidity	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH	24 deg.C , 44%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi	Makoto Hosaka
Mode	Tx, 2462 MHz with monopole antenna			
	Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)			

(* 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.	103.995	QP	25.0	10.3	7.3	32.1	10.5	43.5	33.0	300	2	Z,
Hori.	130.003	QP	39.3	13.6	7.4	32.1	28.2	43.5	15.3	146	178	Z,
Hori.	132.002	QP	34.2	13.7	7.4	32.1	23.2	43.5	20.3	234	180	Z,
Hori.	2483.500	PK	58.3	27.5	24.5	41.1	69.2	73.9	4.7	100	265	X,
Hori.	3282.700	PK	48.7	29.1	5.7	41.6	41.9	73.9	32.0	100	136	Z,
Hori.	4924.000	PK	54.2	31.3	6.7	40.9	51.3	73.9	22.6	100	131	Z,
Hori.	7386.000	PK	47.3	36.9	8.5	41.4	51.3	73.9	22.6	100	0	Z,noise floor level,
Hori.	2483.500	AV	40.0	27.5	24.5	41.1	50.9	53.9	3.0	100	265	X,
Hori.	3282.700	AV	39.4	29.1	5.7	41.6	32.6	53.9	21.3	100	136	Z,
Hori.	4924.000	AV	45.4	31.3	6.7	40.9	42.5	53.9	11.4	100	131	Z,
Hori.	7386.000	AV	35.7	36.9	8.5	41.4	39.7	53.9	14.2	100	0	Z,noise floor level,
Vert.	104.001	QP	30.0	10.3	7.3	32.1	15.5	43.5	28.0	100	79	Z,
Vert.	130.003	QP	37.7	13.6	7.4	32.1	26.6	43.5	16.9	100	86	Z,
Vert.	132.002	QP	31.7	13.7	7.4	32.1	20.7	43.5	22.8	100	80	Z,
Vert.	2483.500	PK	57.7	27.5	24.5	41.1	68.6	73.9	5.3	100	200	Z,
Vert.	3282.700	PK	48.0	29.1	5.7	41.6	41.2	73.9	32.7	100	86	Z,
Vert.	4924.000	PK	50.5	31.3	6.7	40.9	47.6	73.9	26.3	123	143	Z,
Vert.	7386.000	PK	47.2	36.9	8.5	41.4	51.2	73.9	22.7	100	0	Z,noise floor level,
Vert.	2483.500	AV	39.9	27.5	24.5	41.1	50.8	53.9	3.1	100	200	Z,
Vert.	3282.700	AV	39.2	29.1	5.7	41.6	32.4	53.9	21.5	100	86	Z,
Vert.	4924.000	AV	41.3	31.3	6.7	40.9	38.4	53.9	15.5	123	143	Z,
Vert.	7386.000	AV	35.6	36.9	8.5	41.4	39.6	53.9	14.3	100	0	Z,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber	
Date	April 20, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2412 MHz	with inversed F antenna	
	Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)		

(* 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	55.8	27.2	24.4	41.1	66.3	73.9	7.6	100	266	X,
Hori.	2390.850	PK	57.8	27.2	24.4	41.1	68.3	73.9	-	100	266	X, Refer to 20dBc Data Sheet
Hori.	2400.000	PK	68.3	27.3	24.4	41.1	78.9	73.9	-	100	266	X, Refer to 20dBc Data Sheet
Hori.	3216.000	PK	47.6	29.0	5.7	41.5	40.8	73.9	33.1	100	204	Z,
Hori.	4824.000	PK	53.7	31.1	6.6	41.0	50.4	73.9	23.5	102	238	Z,
Hori.	7236.000	PK	47.5	36.6	8.3	41.3	51.1	73.9	22.8	100	0	Z,noise floor level,
Hori.	2390.000	AV	37.6	27.2	24.4	41.1	48.1	53.9	5.8	100	266	X,
Hori.	2390.850	AV	39.4	27.2	24.4	41.1	49.9	53.9	-	100	266	X, Refer to 20dBc Data Sheet
Hori.	2400.000	AV	49.2	27.3	24.4	41.1	59.8	53.9	-	100	266	X, Refer to 20dBc Data Sheet
Hori.	3216.000	AV	38.6	29.0	5.7	41.5	31.8	53.9	22.1	100	204	Z,
Hori.	4824.000	AV	42.2	31.1	6.6	41.0	38.9	53.9	15.0	102	238	Z,
Hori.	7236.000	AV	36.2	36.6	8.3	41.3	39.8	53.9	14.1	100	0	Z,noise floor level,
Vert.	2390.000	PK	55.7	27.2	24.4	41.1	66.2	73.9	7.7	118	9	Z,
Vert.	2390.850	PK	56.2	27.2	24.4	41.1	66.7	73.9	-	118	9	Z, Refer to 20dBc Data Sheet
Vert.	2400.000	PK	65.7	27.3	24.4	41.1	76.3	73.9	-	118	9	Z, Refer to 20dBc Data Sheet
Vert.	3216.000	PK	48.0	29.0	5.7	41.5	41.2	73.9	32.7	100	264	X,
Vert.	4824.000	PK	53.8	31.1	6.6	41.0	50.5	73.9	23.4	107	256	X,
Vert.	7236.000	PK	47.4	36.6	8.3	41.3	51.0	73.9	22.9	100	0	X,noise floor level,
Vert.	2390.000	AV	37.3	27.2	24.4	41.1	47.8	53.9	6.1	118	9	Z,
Vert.	2390.850	AV	38.3	27.2	24.4	41.1	48.8	53.9	-	118	9	Z, Refer to 20dBc Data Sheet
Vert.	2400.000	AV	47.6	27.3	24.4	41.1	58.2	53.9	-	118	9	Z, Refer to 20dBc Data Sheet
Vert.	3216.000	AV	38.9	29.0	5.7	41.5	32.1	53.9	21.8	100	264	X,
Vert.	4824.000	AV	42.9	31.1	6.6	41.0	39.6	53.9	14.3	107	256	X,
Vert.	7236.000	AV	36.1	36.6	8.3	41.3	39.7	53.9	14.2	100	0	X,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	85.0	27.3	24.4	41.1	95.6	-	-	X, carrier,
Hori.	2390.850	PK	47.2	27.2	24.4	41.1	57.7	75.6	17.9	X,
Hori.	2400.000	PK	53.1	27.3	24.4	41.1	63.7	75.6	11.9	X,
Vert.	2412.000	PK	84.2	27.3	24.4	41.1	94.8	-	-	Z, carrier,
Vert.	2390.850	PK	45.9	27.2	24.4	41.1	56.4	74.8	18.4	Z,
Vert.	2400.000	PK	51.8	27.3	24.4	41.1	62.4	74.8	12.4	Z,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber	
Date	April 20, 2012	April 21, 2012	April 22, 2012
Temperature / Humidity	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi
Mode	Tx, 2437 MHz	with inversed F antenna	
	Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)		

(* 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.	3249.350	PK	47.1	29.0	5.7	41.6	40.2	73.9	33.7	100	198	Z,
Hori.	4874.000	PK	51.8	31.2	6.7	41.0	48.7	73.9	25.2	100	241	Z,
Hori.	7311.000	PK	47.5	36.7	8.4	41.4	51.2	73.9	22.7	100	0	Z,noise floor level,
Hori.	3249.350	AV	37.5	29.0	5.7	41.6	30.6	53.9	23.3	100	198	Z,
Hori.	4874.000	AV	41.8	31.2	6.7	41.0	38.7	53.9	15.2	100	241	Z,
Hori.	7311.000	AV	35.5	36.7	8.4	41.4	39.2	53.9	14.7	100	0	Z,noise floor level,
Vert.	3249.350	PK	47.3	29.0	5.7	41.6	40.4	73.9	33.5	100	261	X,
Vert.	4874.000	PK	52.2	31.2	6.7	41.0	49.1	73.9	24.8	100	253	X,
Vert.	7311.000	PK	47.6	36.7	8.4	41.4	51.3	73.9	22.6	100	0	X,noise floor level,
Vert.	3249.350	AV	37.7	29.0	5.7	41.6	30.8	53.9	23.1	100	261	X,
Vert.	4874.000	AV	42.1	31.2	6.7	41.0	39.0	53.9	14.9	100	253	X,
Vert.	7311.000	AV	35.6	36.7	8.4	41.4	39.3	53.9	14.6	100	0	X,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber			
Date	April 20, 2012	April 21, 2012	April 22, 2012	April 23, 2012
Temperature / Humidity	26 deg.C , 34%RH	25 deg.C , 36%RH	23 deg.C , 34%RH	24 deg.C , 44%RH
Engineer	Kenichi Adachi	Shinichi Takano	Akio Hayashi	Makoto Hosaka
Mode	Tx, 2462 MHz with inversed F antenna			
	Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)			

(* 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.	101.885	QP	25.8	10.0	7.2	32.1	10.9	43.5	32.6	300	271	Z,
Hori.	130.001	QP	39.2	13.6	7.4	32.1	28.1	43.5	15.4	143	175	Z,
Hori.	132.006	QP	33.8	13.7	7.4	32.1	22.8	43.5	20.7	237	179	Z,
Hori.	2483.500	PK	57.2	27.5	24.5	41.1	68.1	73.9	5.8	100	263	X,
Hori.	3282.700	PK	47.4	29.1	5.7	41.6	40.6	73.9	33.3	100	199	Z,
Hori.	4924.000	PK	51.8	31.3	6.7	40.9	48.9	73.9	25.0	100	239	Z,
Hori.	7386.000	PK	47.6	36.9	8.5	41.4	51.6	73.9	22.3	100	0	Z,noise floor level,
Hori.	2483.500	AV	39.2	27.5	24.5	41.1	50.1	53.9	3.8	100	263	X,
Hori.	3282.700	AV	37.9	29.1	5.7	41.6	31.1	53.9	22.8	100	199	Z,
Hori.	4924.000	AV	39.4	31.3	6.7	40.9	36.5	53.9	17.4	100	239	Z,
Hori.	7386.000	AV	35.5	36.9	8.5	41.4	39.5	53.9	14.4	100	0	Z,noise floor level,
Vert.	101.886	QP	28.2	10.0	7.2	32.1	13.3	43.5	30.2	100	337	Z,
Vert.	130.000	QP	37.6	13.6	7.4	32.1	26.5	43.5	17.0	100	81	Z,
Vert.	132.006	QP	31.4	13.7	7.4	32.1	20.4	43.5	23.1	100	82	Z,
Vert.	2483.500	PK	54.6	27.5	24.5	41.1	65.5	73.9	8.4	107	7	Z,
Vert.	3282.700	PK	47.8	29.1	5.7	41.6	41.0	73.9	32.9	100	258	X,
Vert.	4924.000	PK	52.6	31.3	6.7	40.9	49.7	73.9	24.2	100	235	X,
Vert.	7386.000	PK	47.7	36.9	8.5	41.4	51.7	73.9	22.2	100	0	X,noise floor level,
Vert.	2483.500	AV	38.9	27.5	24.5	41.1	49.8	53.9	4.1	107	7	Z,
Vert.	3282.700	AV	38.0	29.1	5.7	41.6	31.2	53.9	22.7	100	258	X,
Vert.	4924.000	AV	42.4	31.3	6.7	40.9	39.5	53.9	14.4	100	235	X,
Vert.	7386.000	AV	35.6	36.9	8.5	41.4	39.6	53.9	14.3	100	0	X,noise floor level,

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 15GHz)) - Gain(Amplifier)

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

*In the frequency over the 3rd harmonic, the noise from the EUT was not seen.The data above is its base noise.

Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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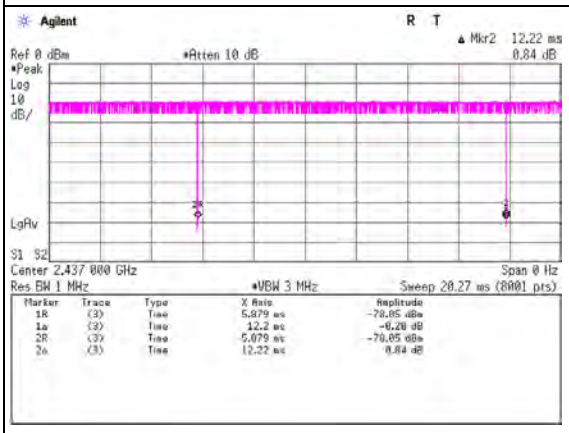
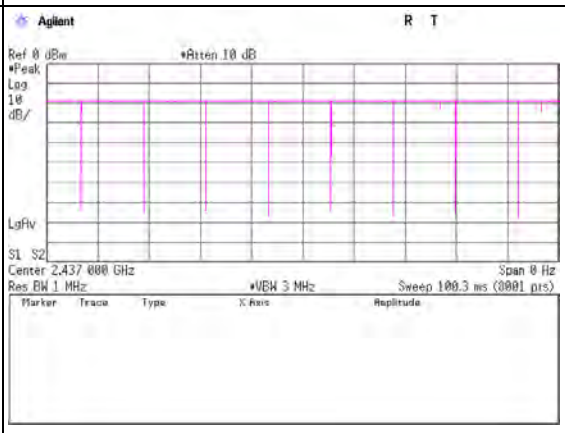
Burst Rate Confirmation

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

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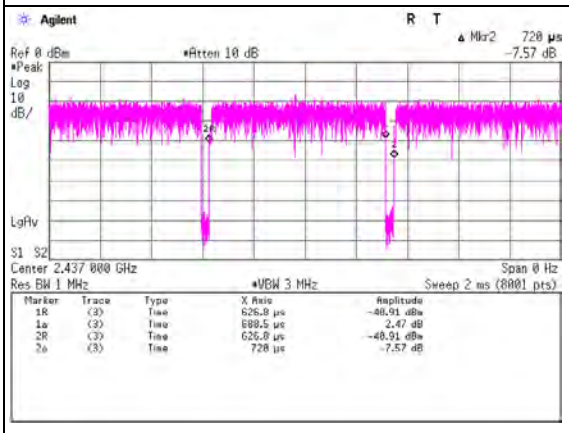
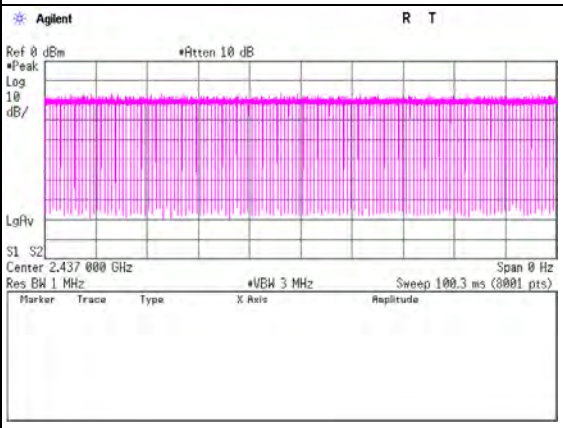
Burst Rate Confirmation

Tx, IEEE802.11g, PN9, worst data mode 18Mbps	
	

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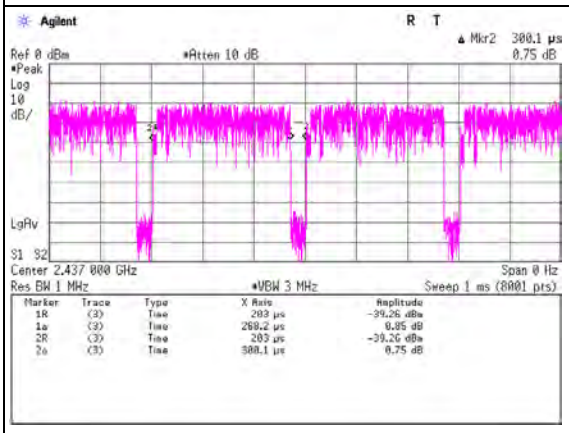
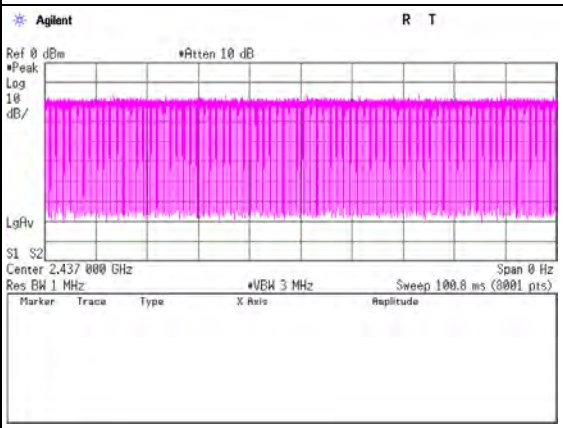
Burst Rate Confirmation

Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)	
	

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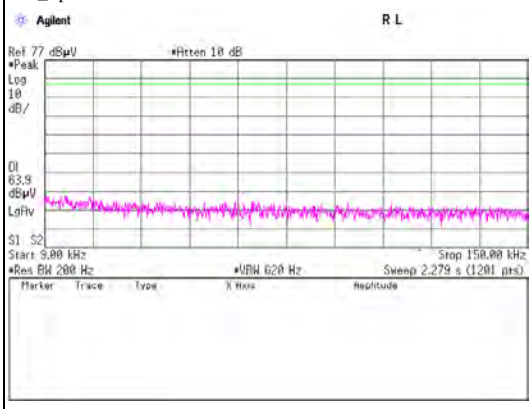
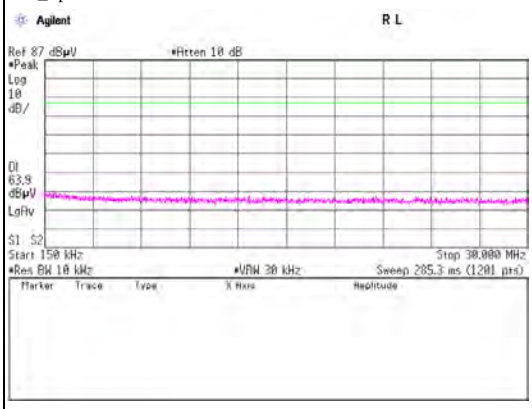
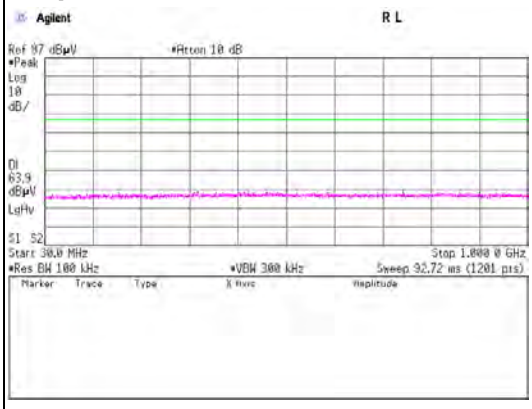
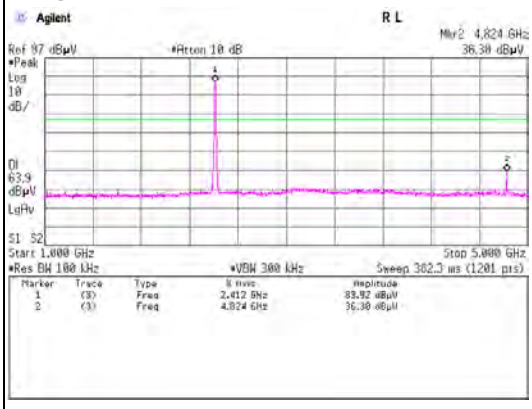
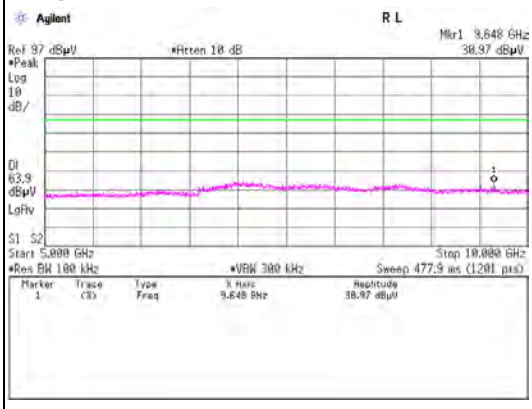
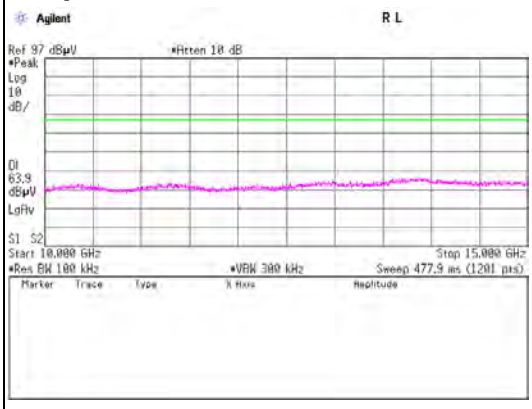
Spurious emission (Conducted)

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

Tx, 2412MHz (1/2)	
9kHz - 150kHz	**150kHz - 30MHz**
Tx1_SpuriousM1 	Tx1_SpuriousM2 
30MHz - 1GHz	**1GHz - 5GHz**
Tx1_SpuriousM3 	Tx1_SpuriousG1 
5GHz - 10GHz	**10GHz - 15GHz**
Tx1_SpuriousG2 	Tx1_SpuriousG3 

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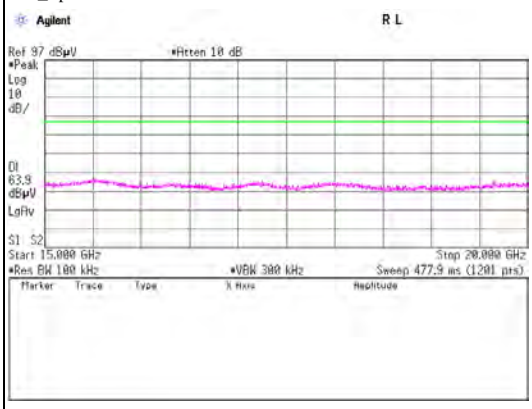
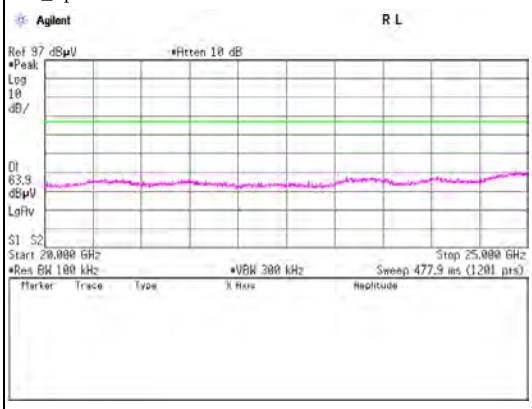
Spurious emission (Conducted)

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

Tx, 2412MHz (2/2)	
15GHz - 20GHz	**20GHz - 25GHz**
Tx1_SpuriousG4 	Tx1_SpuriousG5 
Tx1_SpuriousG6	Tx1_SpuriousG7
Tx1_SpuriousG8	

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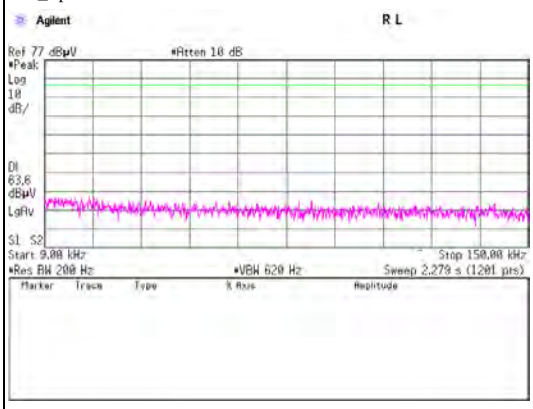
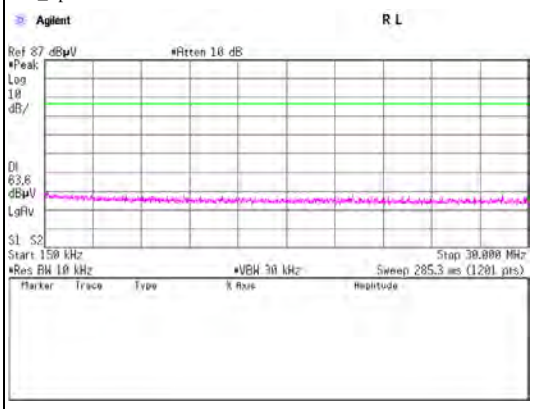
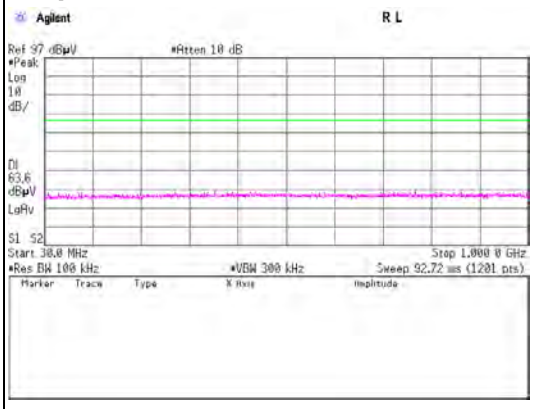
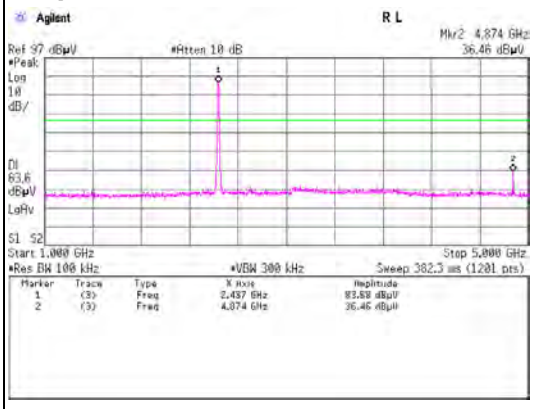
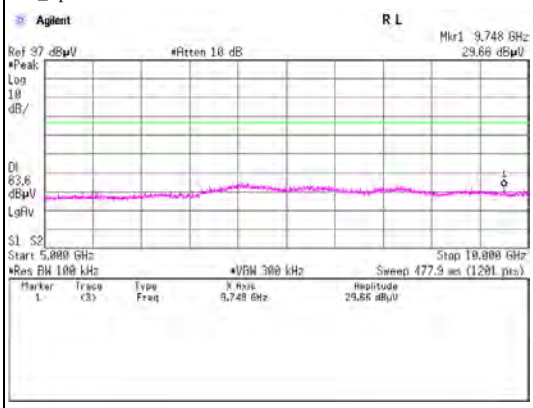
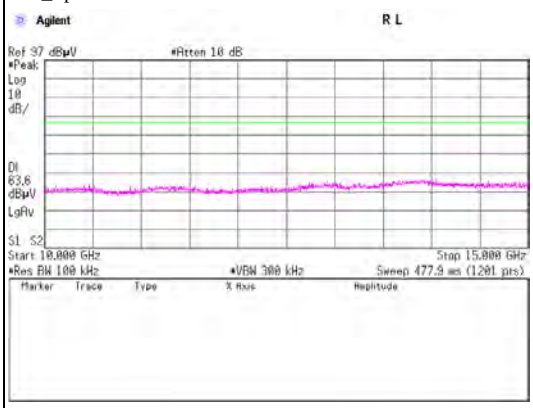
Spurious emission (Conducted)

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

Tx, 2437MHz (1/2)	
9kHz - 150kHz	**150kHz - 30MHz**
Tx2_SpuriousM1 	Tx2_SpuriousM2 
30MHz - 1GHz	**1GHz - 5GHz**
Tx2_SpuriousM3 	Tx2_SpuriousG1 
5GHz - 10GHz	**10GHz - 15GHz**
Tx2_SpuriousG2 	Tx2_SpuriousG3 

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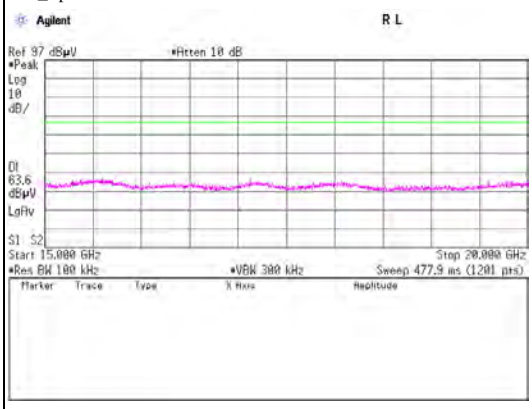
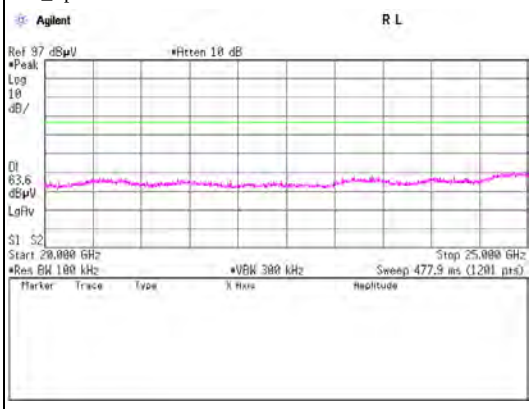
Spurious emission (Conducted)

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

Tx, 2437MHz (2/2)	
15GHz - 20GHz	**20GHz - 25GHz**
Tx2_SpuriousG4 	Tx2_SpuriousG5 
Tx2_SpuriousG6	Tx2_SpuriousG7
Tx2_SpuriousG8	

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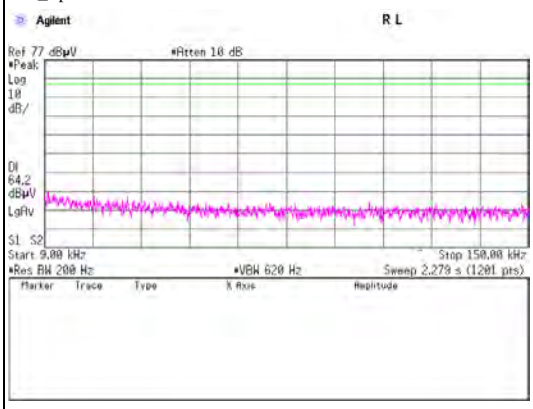
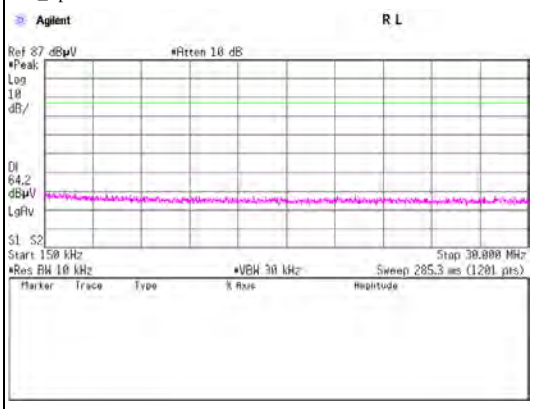
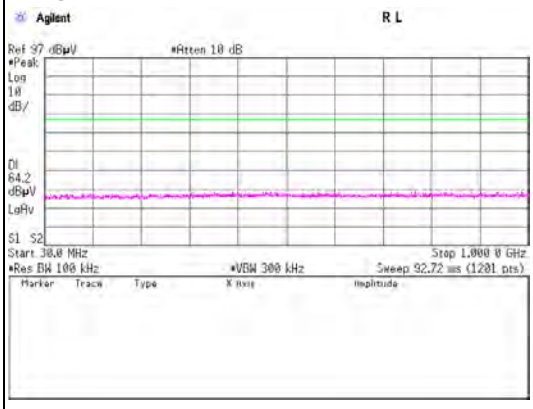
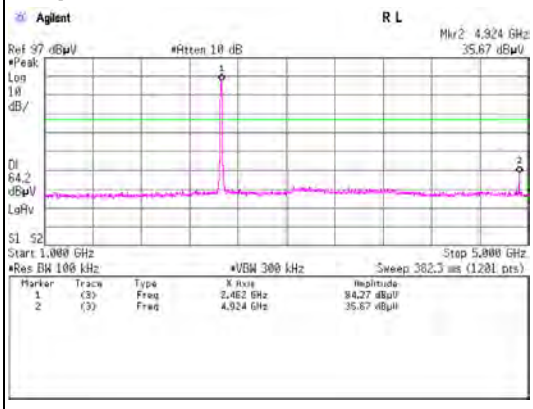
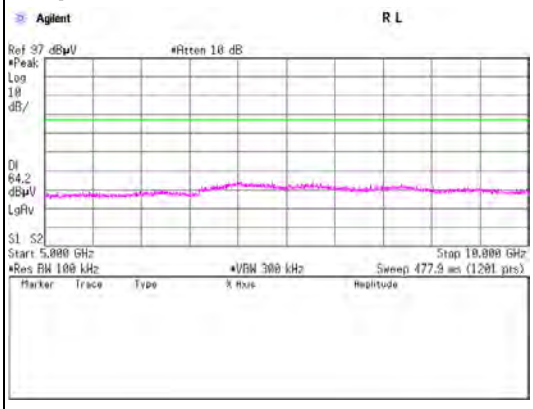
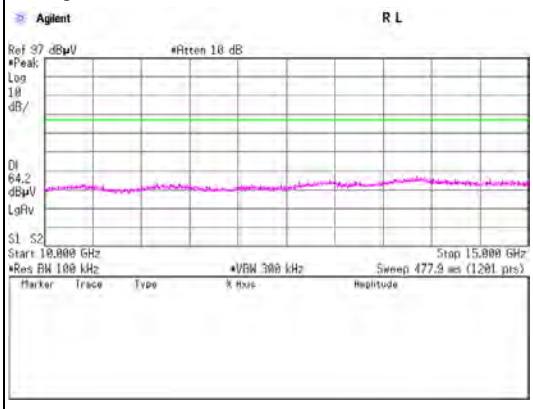
Spurious emission (Conducted)

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

Tx, 2462MHz (1/2)	
9kHz - 150kHz	**150kHz - 30MHz**
Tx3_SpuriousM1 	Tx3_SpuriousM2 
30MHz - 1GHz	**1GHz - 5GHz**
Tx3_SpuriousM3 	Tx3_SpuriousG1 
5GHz - 10GHz	**10GHz - 15GHz**
Tx3_SpuriousG2 	Tx3_SpuriousG3 

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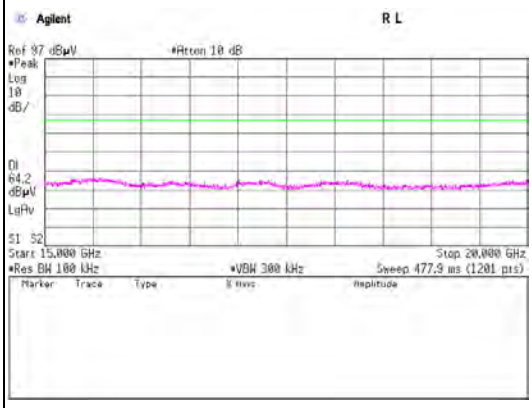
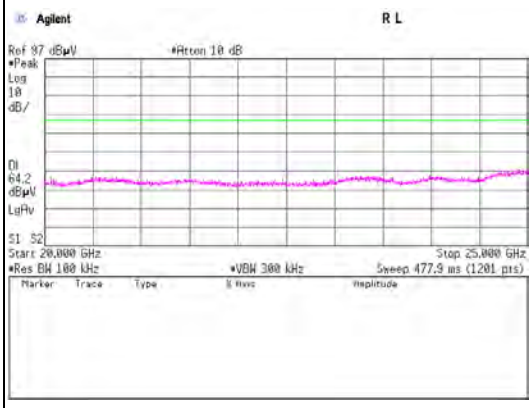
Spurious emission (Conducted)

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

Tx, 2462MHz (2/2)	
15GHz - 20GHz	**20GHz - 25GHz**
Tx3_SpuriousG4 	Tx3_SpuriousG5 
Tx3_SpuriousG6	Tx3_SpuriousG7
Tx3_SpuriousG8	

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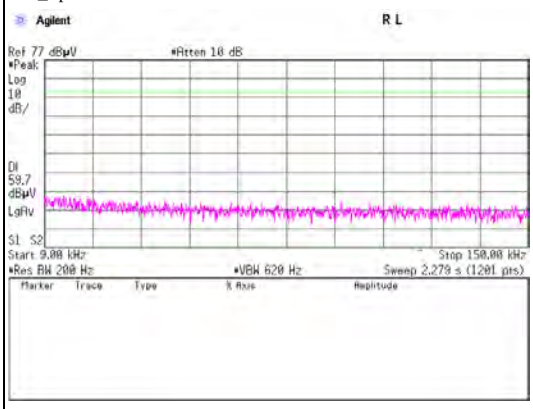
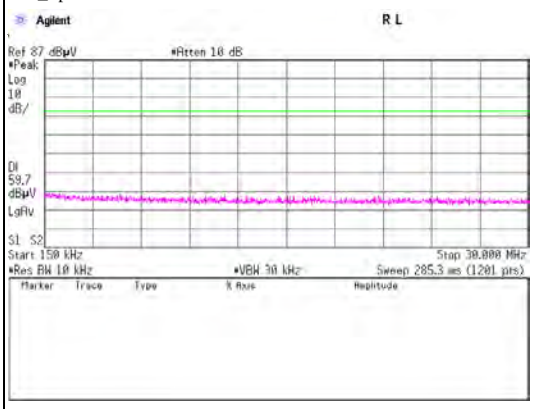
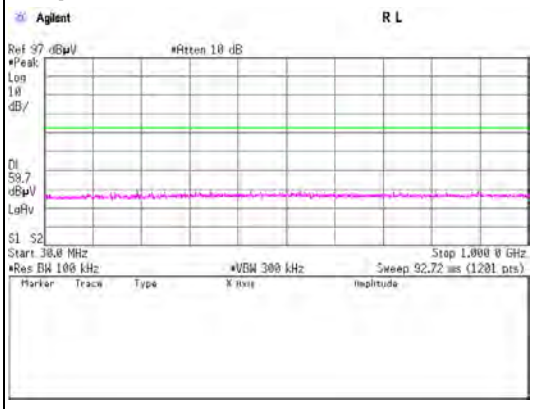
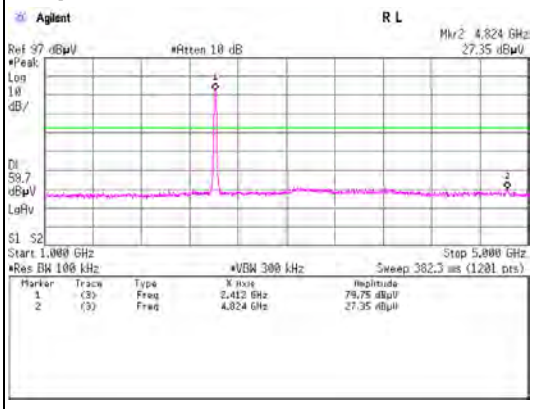
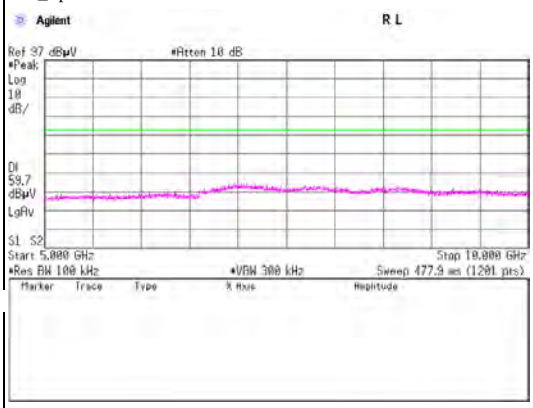
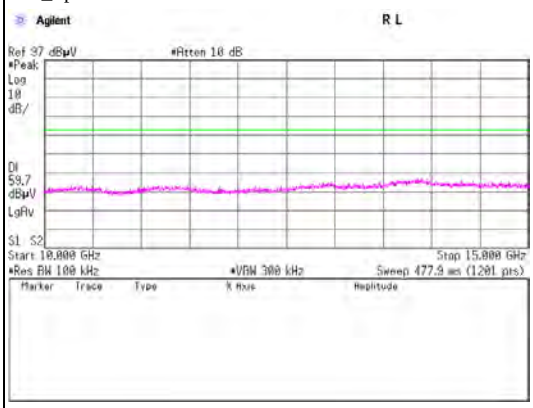
Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 18Mbps

Tx, 2412MHz (1/2)	
9kHz - 150kHz	**150kHz - 30MHz**
Tx1_SpuriousM1 	Tx1_SpuriousM2 
30MHz - 1GHz	**1GHz - 5GHz**
Tx1_SpuriousM3 	Tx1_SpuriousG1 
5GHz - 10GHz	**10GHz - 15GHz**
Tx1_SpuriousG2 	Tx1_SpuriousG3 

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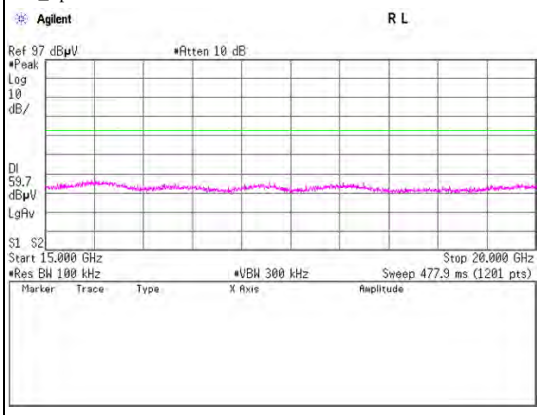
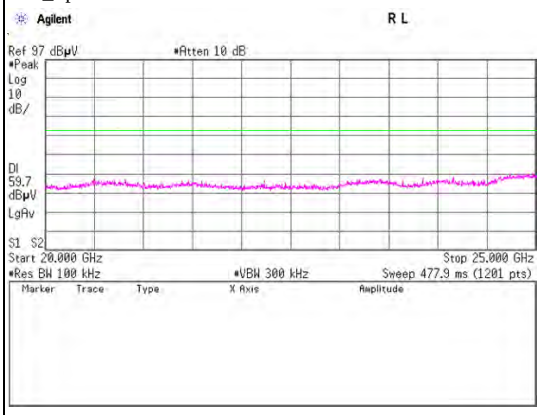
Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 18Mbps

Tx, 2412MHz (2/2)	
15GHz - 20GHz	**20GHz - 25GHz**
Tx1_SpuriousG4 	Tx1_SpuriousG5 
Tx1_SpuriousG6	Tx1_SpuriousG7
Tx1_SpuriousG8	

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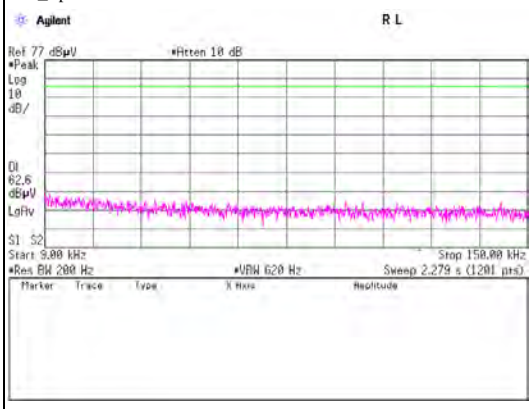
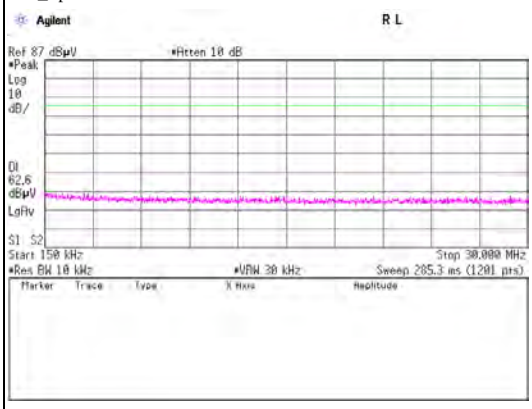
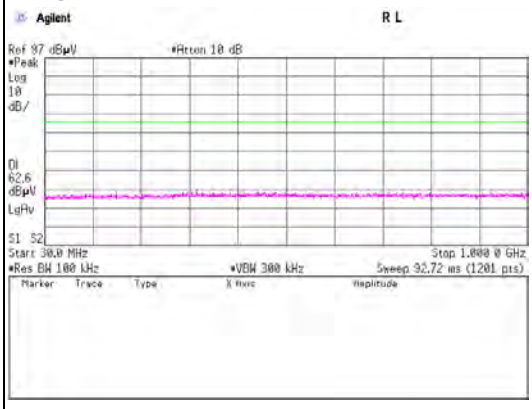
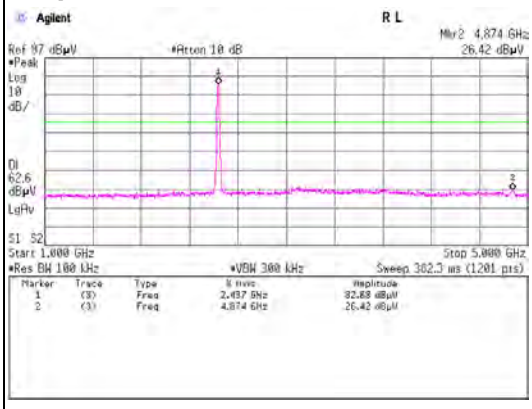
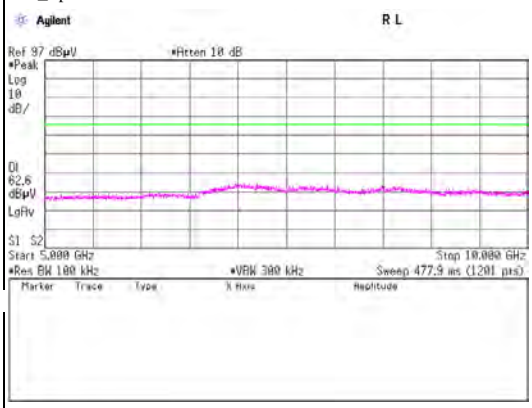
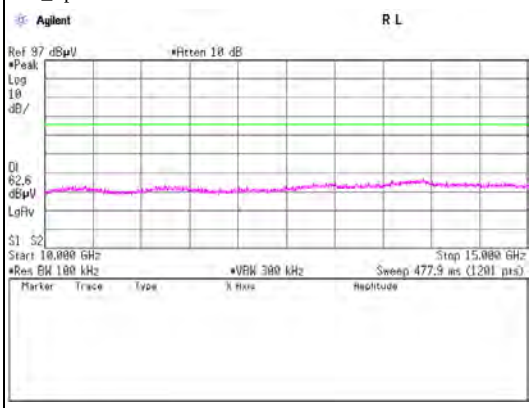
Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 18Mbps

Tx, 2437MHz (1/2)	
9kHz - 150kHz	**150kHz - 30MHz**
Tx2_SpuriousM1 	Tx2_SpuriousM2 
30MHz - 1GHz	**1GHz - 5GHz**
Tx2_SpuriousM3 	Tx2_SpuriousG1 
5GHz - 10GHz	**10GHz - 15GHz**
Tx2_SpuriousG2 	Tx2_SpuriousG3 

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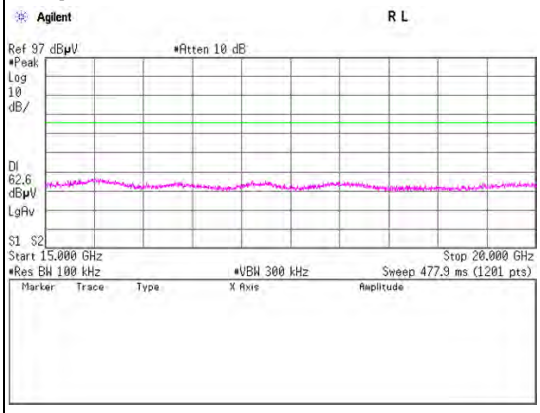
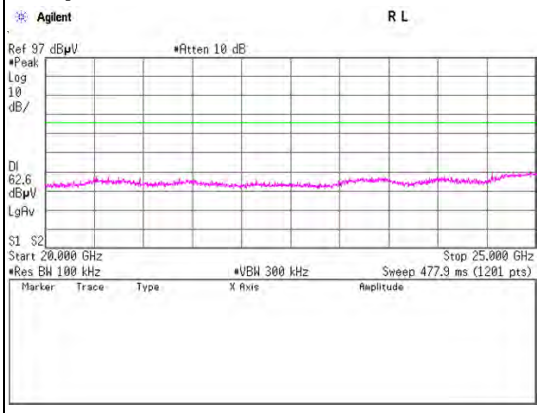
Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 18Mbps

Tx, 2437MHz (2/2)	
15GHz - 20GHz	**20GHz - 25GHz**
Tx2_SpuriousG4 	Tx2_SpuriousG5 
Tx2_SpuriousG6	Tx2_SpuriousG7
Tx2_SpuriousG8	

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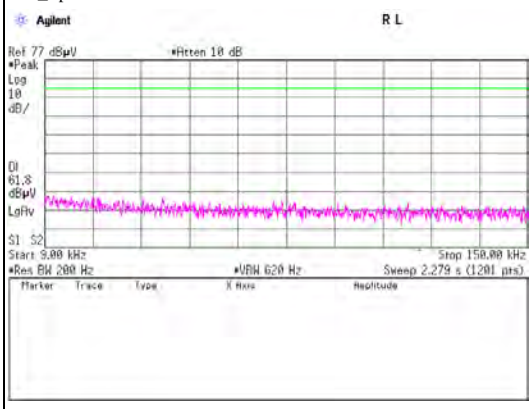
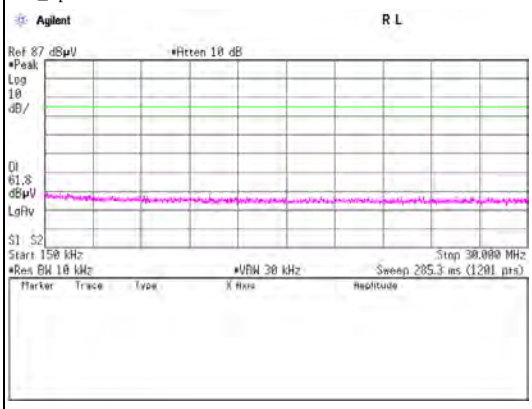
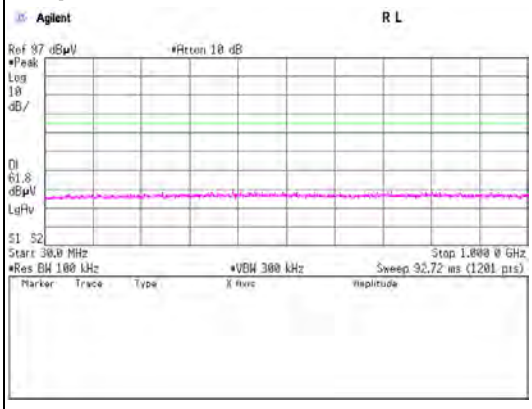
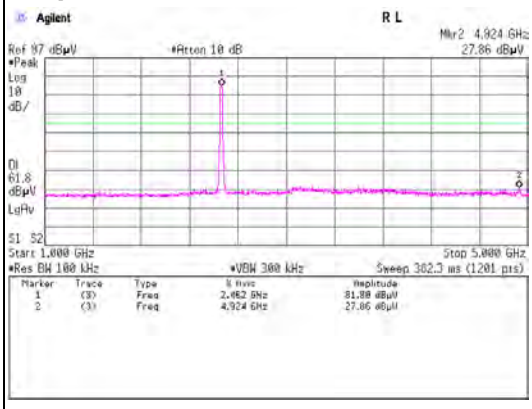
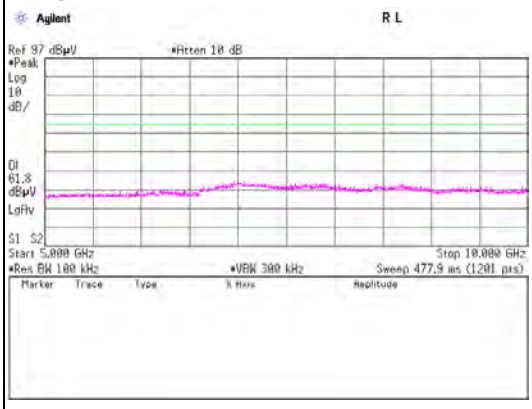
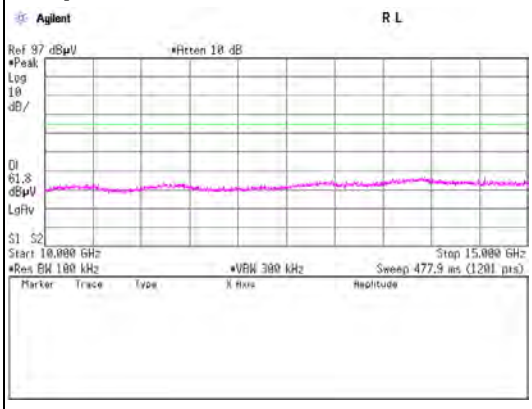
Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 18Mbps

Tx, 2462MHz (1/2)	
9kHz - 150kHz	**150kHz - 30MHz**
Tx3_SpuriousM1 	Tx3_SpuriousM2 
30MHz - 1GHz	**1GHz - 5GHz**
Tx3_SpuriousM3 	Tx3_SpuriousG1 
5GHz - 10GHz	**10GHz - 15GHz**
Tx3_SpuriousG2 	Tx3_SpuriousG3 

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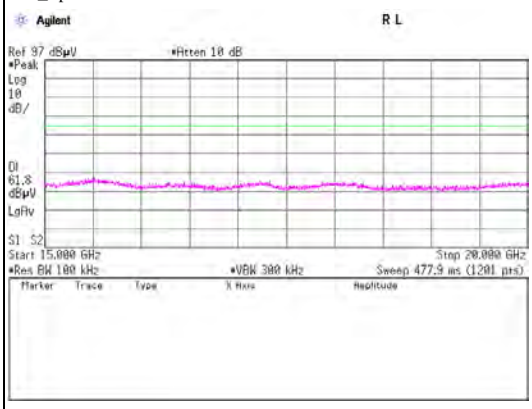
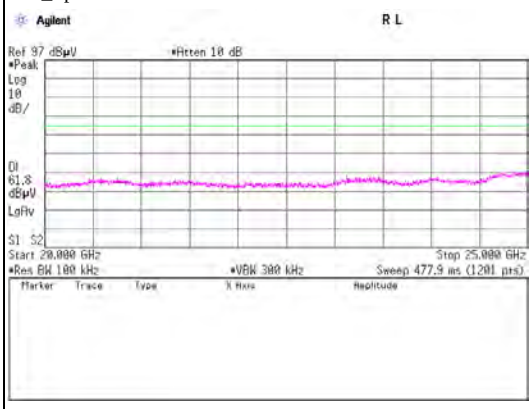
Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 18Mbps

Tx, 2462MHz (2/2)	
15GHz - 20GHz	**20GHz - 25GHz**
Tx3_SpuriousG4 	Tx3_SpuriousG5 
Tx3_SpuriousG6	Tx3_SpuriousG7
Tx3_SpuriousG8	

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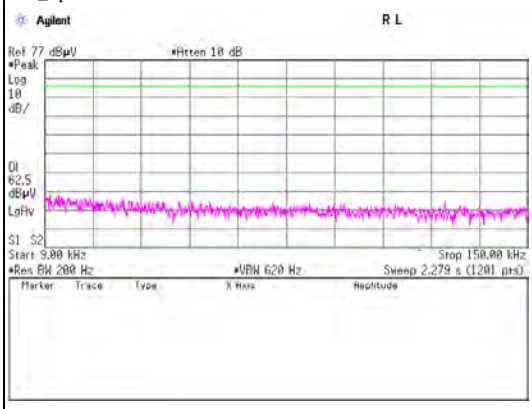
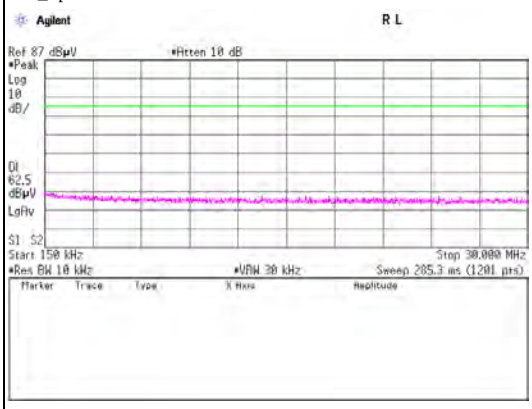
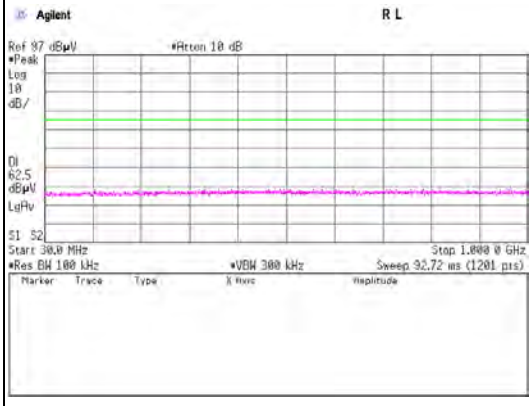
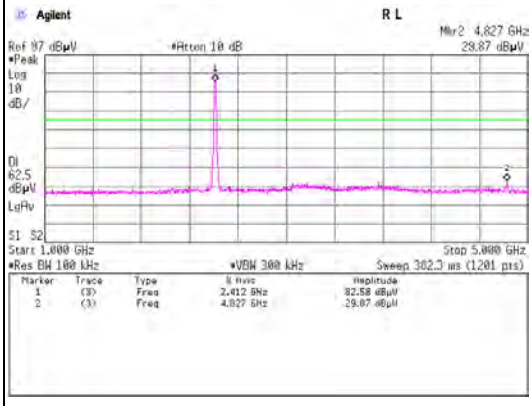
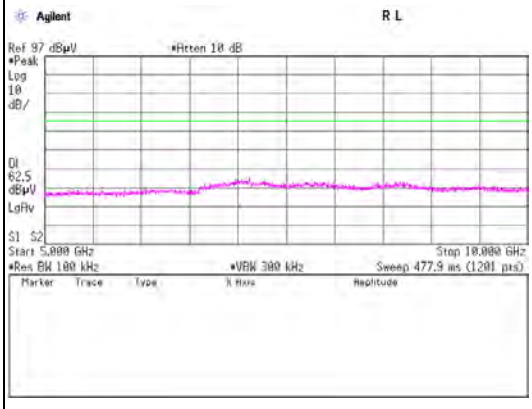
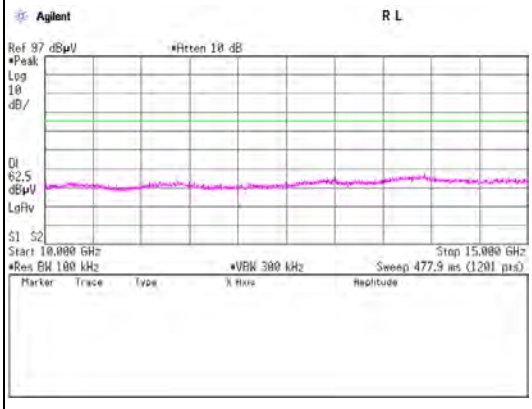
Spurious emission (Conducted)

Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)

Tx, 2412MHz (1/2)	
9kHz - 150kHz	**150kHz - 30MHz**
Tx1_SpuriousM1 	Tx1_SpuriousM2 
30MHz - 1GHz	**1GHz - 5GHz**
Tx1_SpuriousM3 	Tx1_SpuriousG1 
5GHz - 10GHz	**10GHz - 15GHz**
Tx1_SpuriousG2 	Tx1_SpuriousG3 

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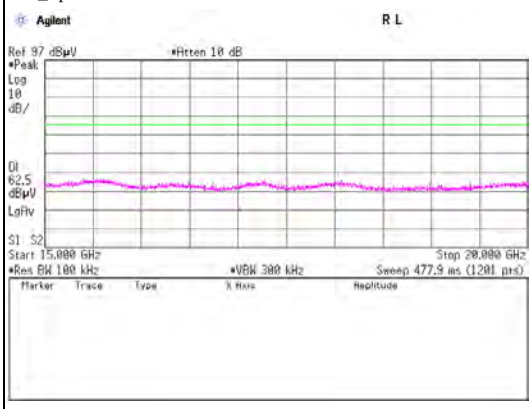
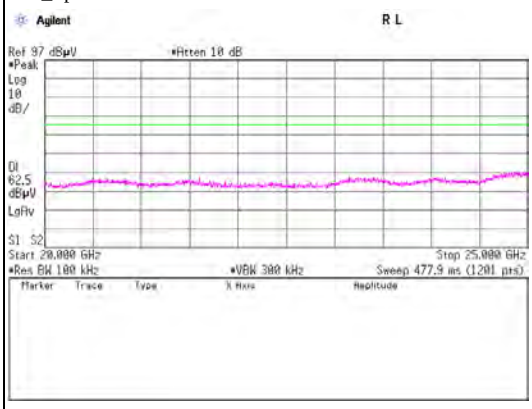
Spurious emission (Conducted)

Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)

Tx, 2412MHz (2/2)	
15GHz - 20GHz	**20GHz - 25GHz**
Tx1_SpuriousG4 	Tx1_SpuriousG5 
Tx1_SpuriousG6	Tx1_SpuriousG7
Tx1_SpuriousG8	

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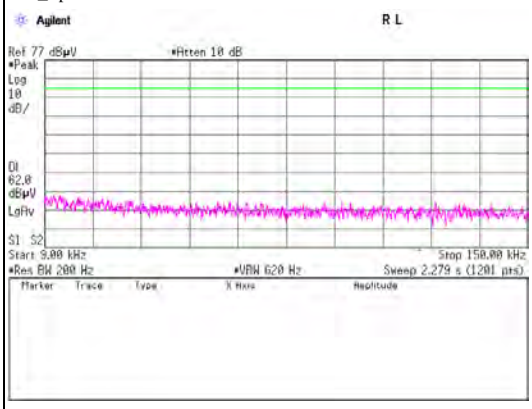
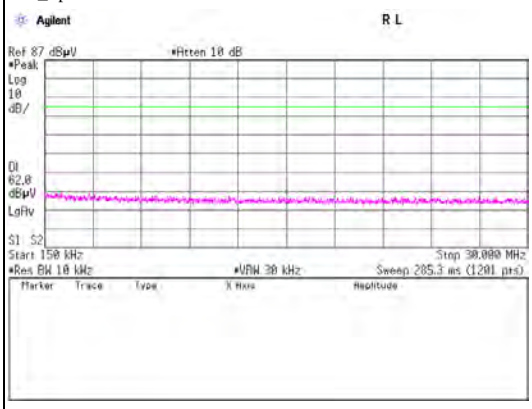
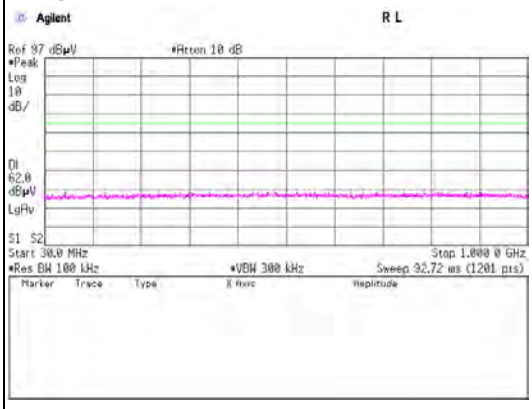
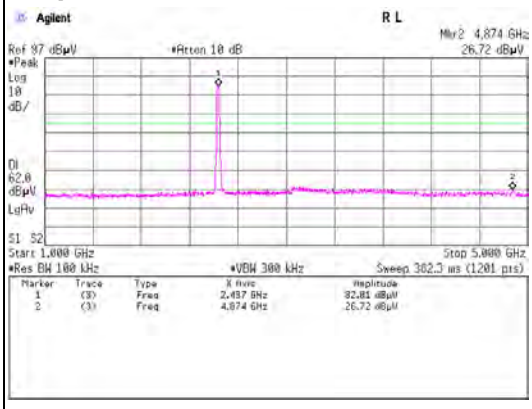
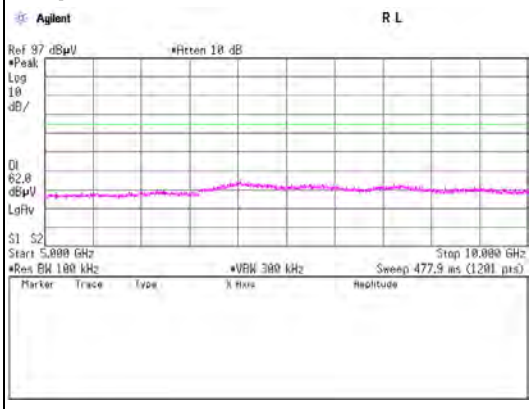
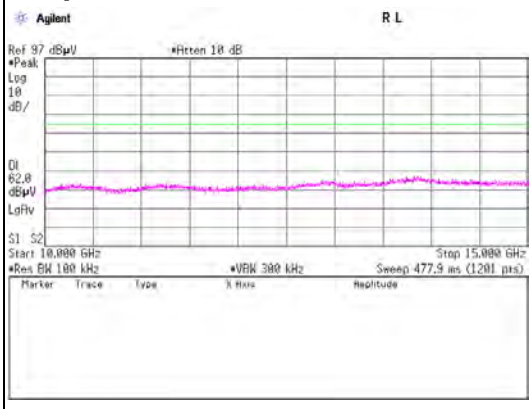
Spurious emission (Conducted)

Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)

Tx, 2437MHz (1/2)	
9kHz - 150kHz	**150kHz - 30MHz**
Tx2_SpuriousM1 	Tx2_SpuriousM2 
30MHz - 1GHz	**1GHz - 5GHz**
Tx2_SpuriousM3 	Tx2_SpuriousG1 
5GHz - 10GHz	**10GHz - 15GHz**
Tx2_SpuriousG2 	Tx2_SpuriousG3 

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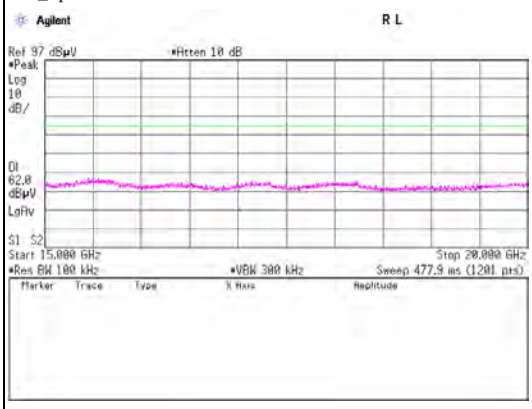
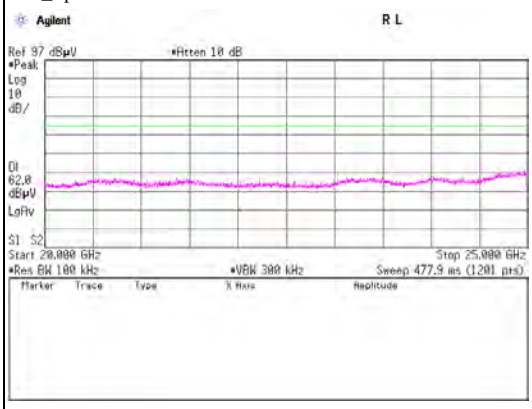
Spurious emission (Conducted)

Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)

Tx, 2437MHz (2/2)	
15GHz - 20GHz	**20GHz - 25GHz**
Tx2_SpuriousG4 	Tx2_SpuriousG5 
Tx2_SpuriousG6	Tx2_SpuriousG7
Tx2_SpuriousG8	

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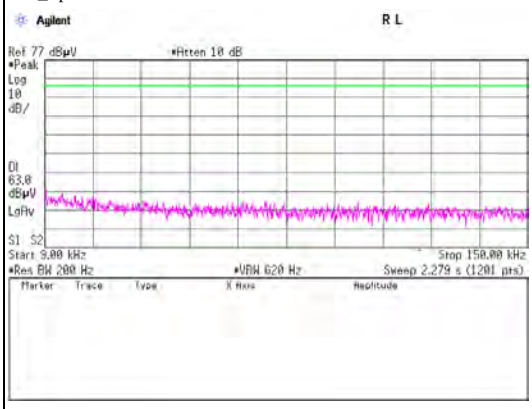
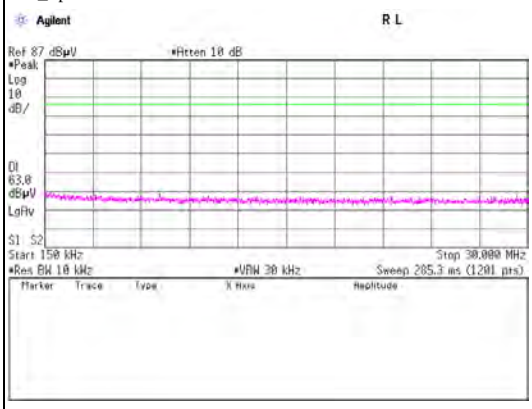
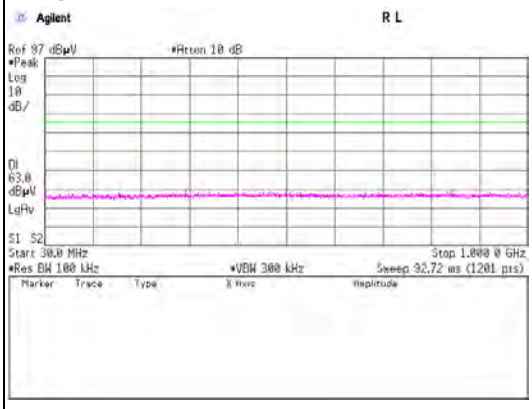
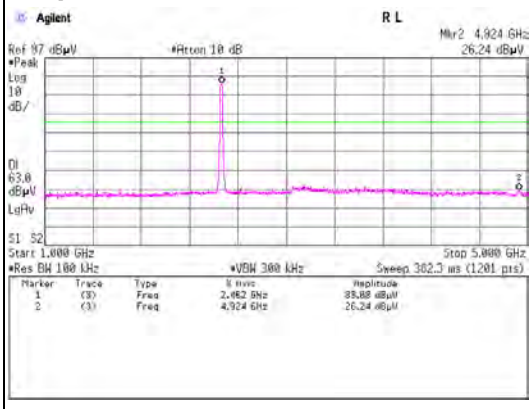
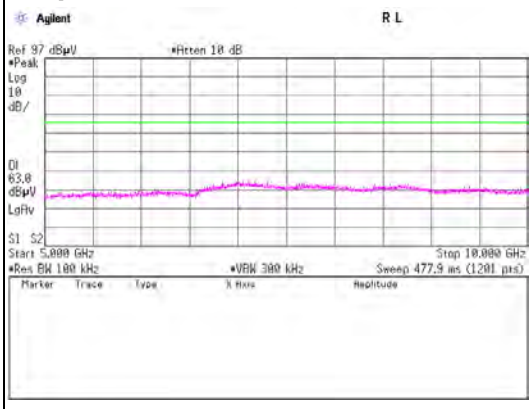
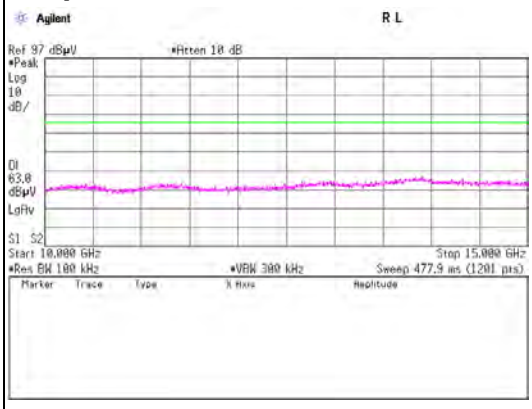
Spurious emission (Conducted)

Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)

Tx, 2462MHz (1/2)	
9kHz - 150kHz	**150kHz - 30MHz**
Tx3_SpuriousM1 	Tx3_SpuriousM2 
30MHz - 1GHz	**1GHz - 5GHz**
Tx3_SpuriousM3 	Tx3_SpuriousG1 
5GHz - 10GHz	**10GHz - 15GHz**
Tx3_SpuriousG2 	Tx3_SpuriousG3 

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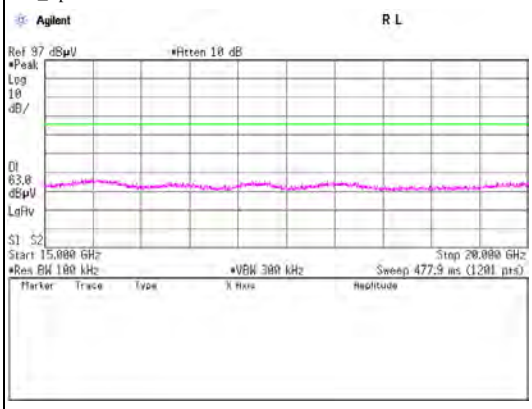
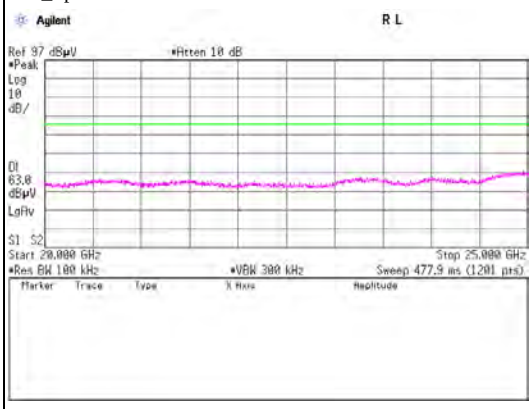
Spurious emission (Conducted)

Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)

Tx, 2462MHz (2/2)	
15GHz - 20GHz	**20GHz - 25GHz**
Tx3_SpuriousG4 	Tx3_SpuriousG5 
Tx3_SpuriousG6	Tx3_SpuriousG7
Tx3_SpuriousG8	

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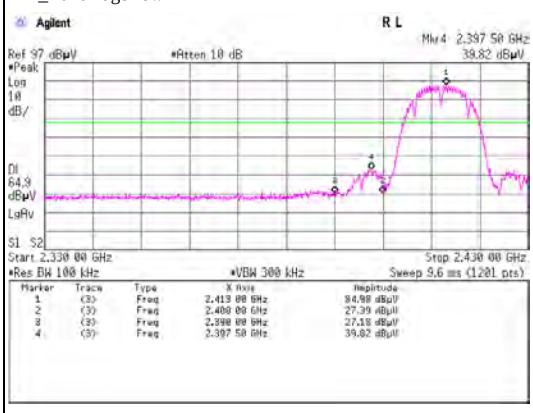
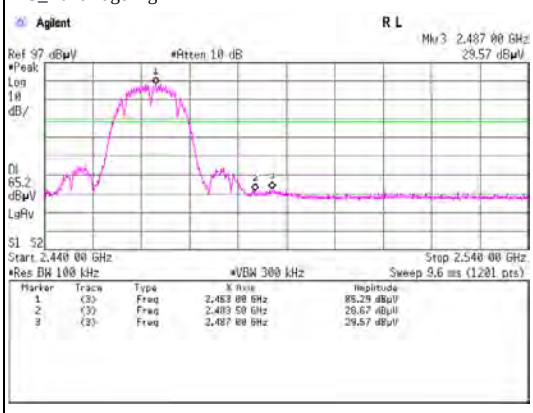
Spurious emission (Conducted)

Band Edge compliance

Tx, IEEE802.11b, PN9, worst data mode 1Mbps	
Tx, 2412MHz	**Tx, 2462MHz**
Tx1_BandEdgeLow	Tx3_BandEdgeHigh
	

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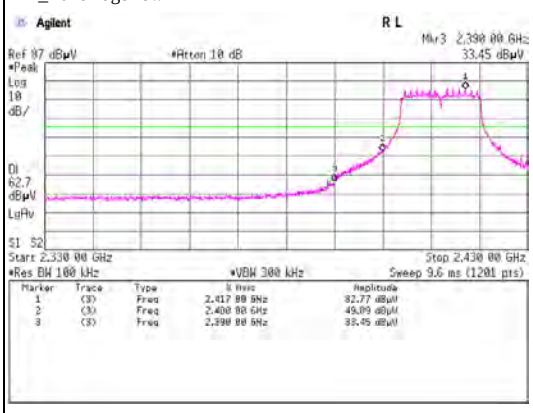
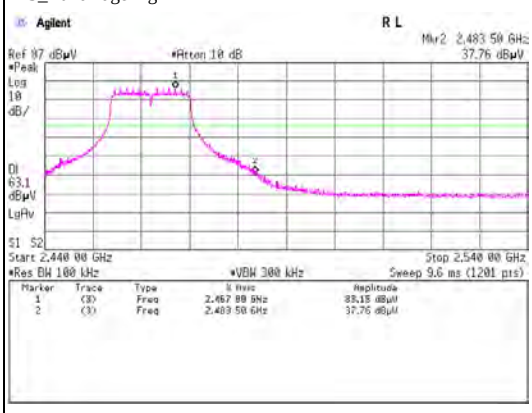
Spurious emission (Conducted)

Band Edge compliance

Tx, IEEE802.11g, PN9, worst data mode 18Mbps	
Tx, 2412MHz	**Tx, 2462MHz**
Tx1_BandEdgeLow	Tx3_BandEdgeHigh
	

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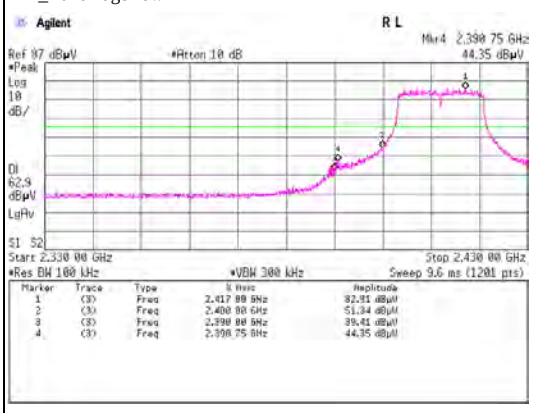
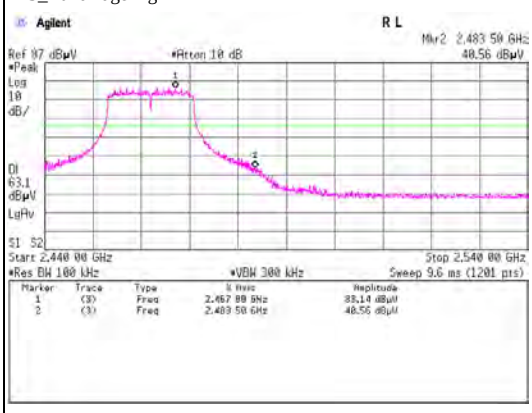
Spurious emission (Conducted)

Band Edge compliance

Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)	
Tx, 2412MHz	**Tx, 2462MHz**
Tx1_BandEdgeLow	Tx3_BandEdgeHigh
	

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Power Density

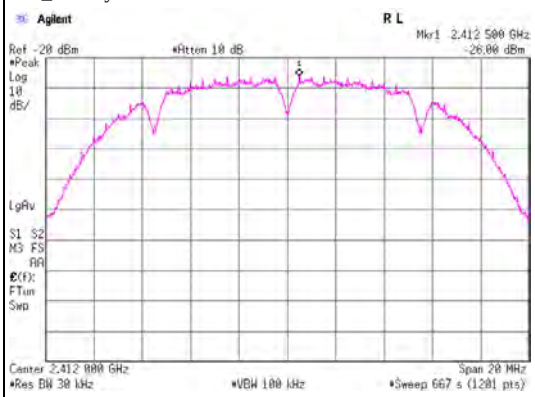
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	4/18/2012	
Temperature / Humidity	24deg.C , 42%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11b, PN9, worst data mode 1Mbps	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2412.50	-26.00	1.66	20.01	-4.33	8.00	12.33
2437.0000	2435.50	-25.95	1.66	20.01	-4.28	8.00	12.28
2462.0000	2462.50	-25.91	1.67	20.01	-4.23	8.00	12.23

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

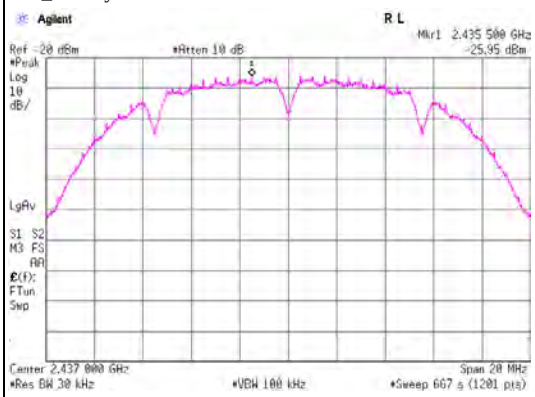
Tx, 2412MHz

Tx1_DensityChart



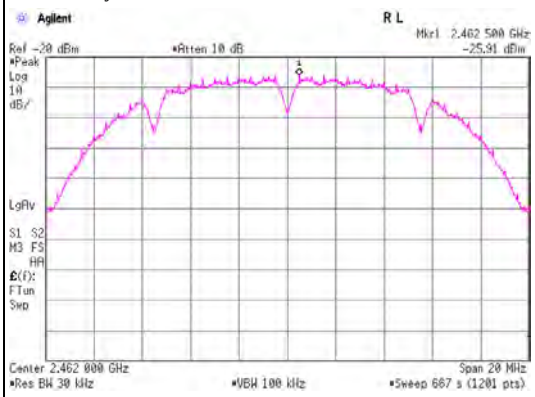
Tx, 2437MHz

Tx2_DensityChart



Tx, 2462MHz

Tx3_DensityChart



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Power Density

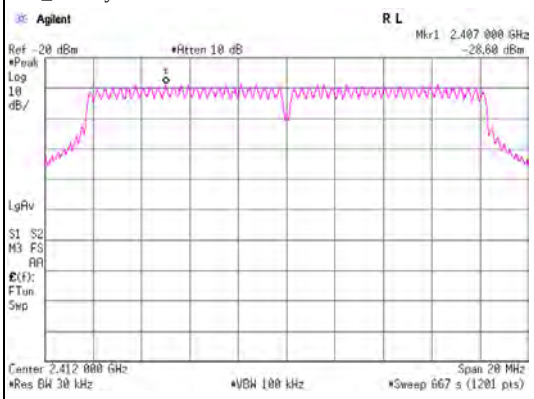
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	4/18/2012	
Temperature / Humidity	24deg.C , 42%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11g, PN9, worst data mode 18Mbps	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2407.00	-28.60	1.66	20.01	-6.93	8.00	14.93
2437.0000	2432.00	-28.53	1.66	20.01	-6.86	8.00	14.86
2462.0000	2457.00	-28.41	1.67	20.01	-6.73	8.00	14.73

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

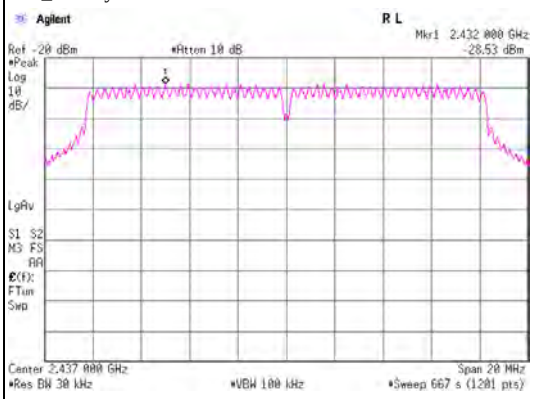
Tx, 2412MHz

Tx1_DensityChart



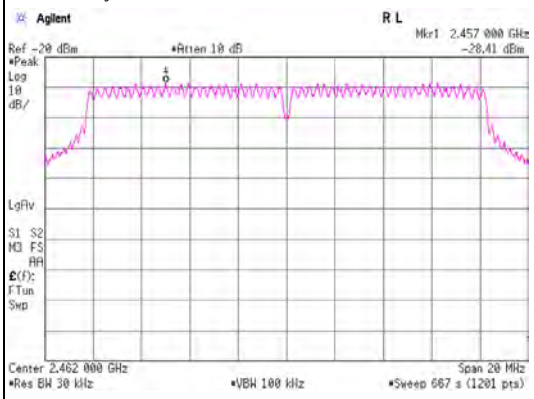
Tx, 2437MHz

Tx2_DensityChart



Tx, 2462MHz

Tx3_DensityChart



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Power Density

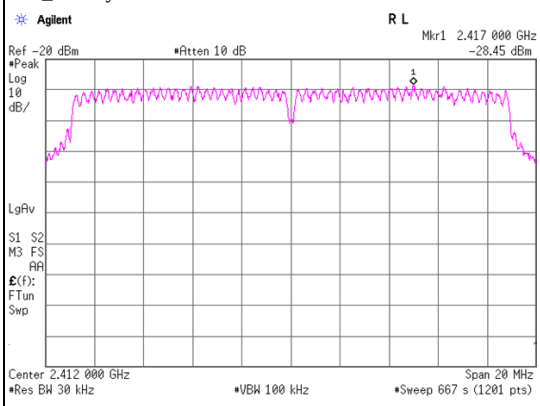
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	4/18/2012	
Temperature / Humidity	24deg.C , 42%RH	
Engineer	Akio Hayashi	
Mode	Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2417.00	-28.45	1.66	20.01	-6.78	8.00	14.78
2437.0000	2442.00	-28.33	1.66	20.01	-6.66	8.00	14.66
2462.0000	2467.00	-28.17	1.67	20.01	-6.49	8.00	14.49

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

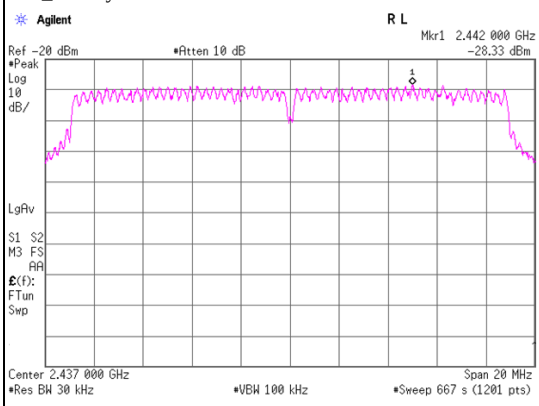
Tx, 2412MHz

Tx1_DensityChart



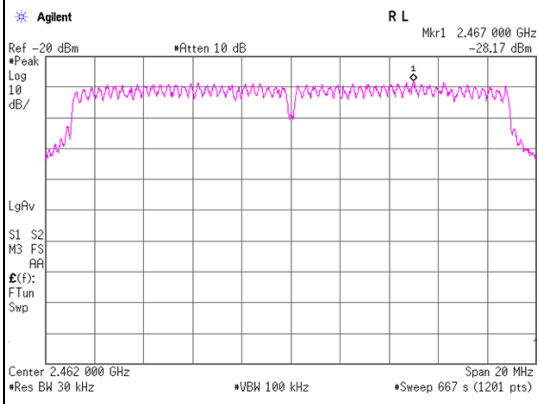
Tx, 2437MHz

Tx2_DensityChart



Tx, 2462MHz

Tx3_DensityChart



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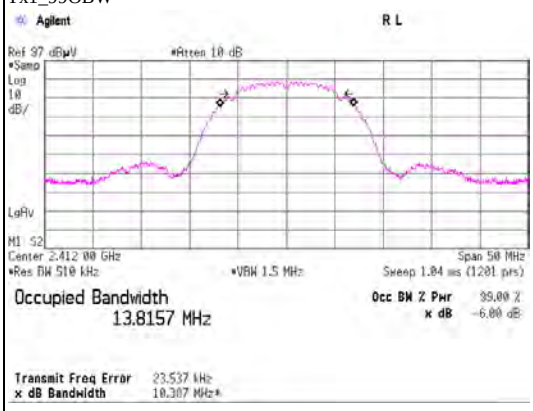
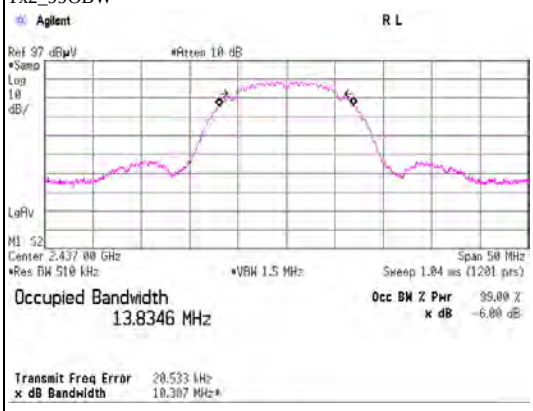
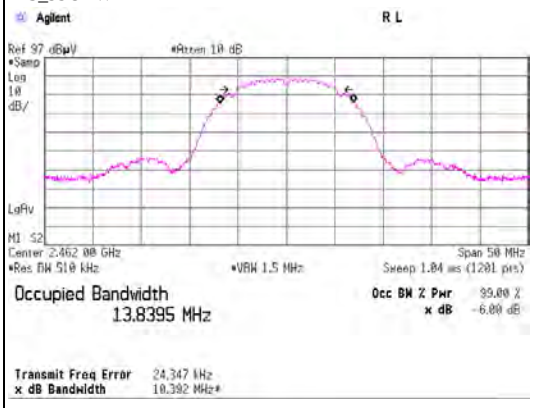
99% Occupied Bandwidth

Tx, IEEE802.11b, PN9, worst data mode 1Mbps	
Tx, 2412MHz	**Tx, 2437MHz**
Tx1_99OBW 	Tx2_99OBW 
Tx, 2462MHz	
Tx3_99OBW 	

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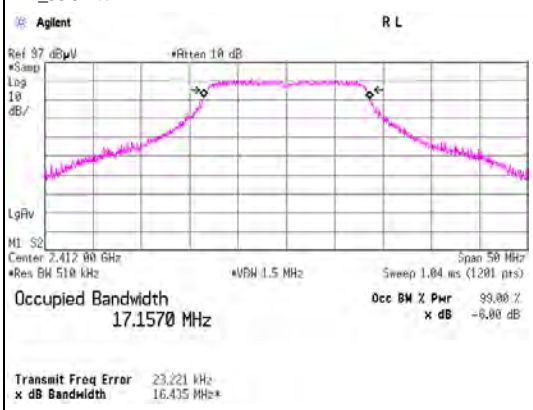
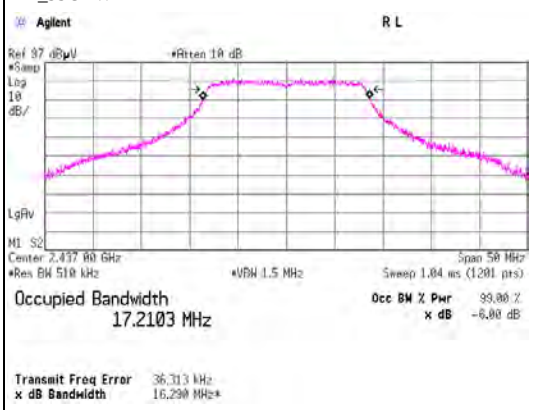
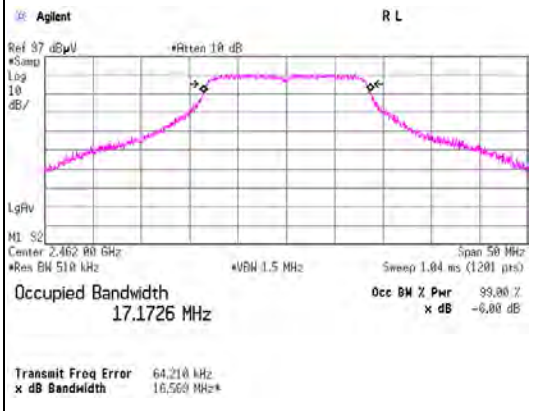
99% Occupied Bandwidth

Tx, IEEE802.11g, PN9, worst data mode 18Mbps	
Tx, 2412MHz	**Tx, 2437MHz**
Tx1_99OBW 	Tx2_99OBW 
Tx, 2462MHz	
Tx3_99OBW 	

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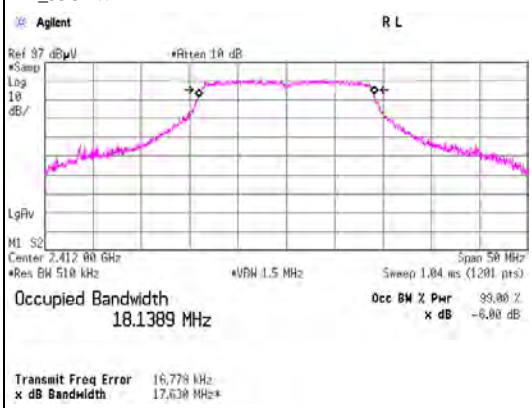
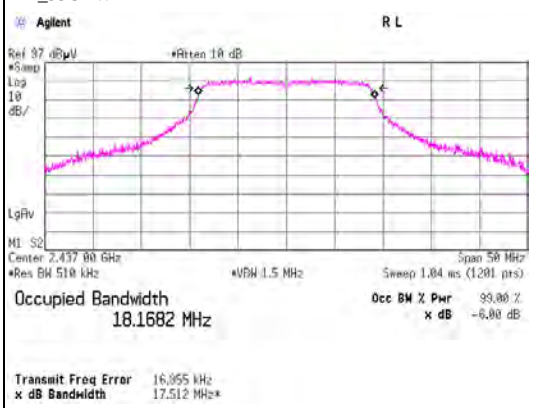
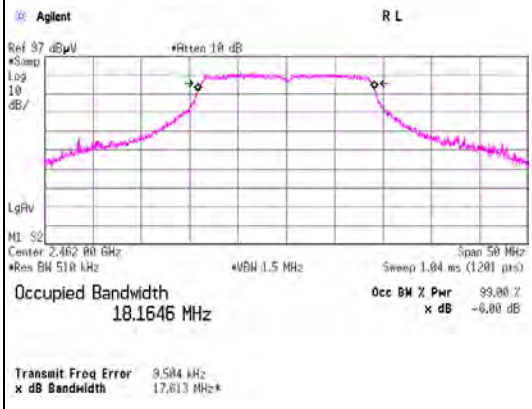
99% Occupied Bandwidth

Tx, IEEE802.11n(HT20), PN9, worst data mode 5(MCS)	
Tx, 2412MHz	**Tx, 2437MHz**
Tx1_99OBW 	Tx2_99OBW 
Tx, 2462MHz	
Tx3_99OBW 	

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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	2012/03/26 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2012/04/19 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2012/04/19 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	AT	2012/03/12 * 12
SAT20-02	Attenuator	Agilent	8493C-020	74890	AT	2012/03/12 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT	2012/02/16 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2011/08/28 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	2012/04/10 * 12
SAT20-01	Attenuator(above1GHz)	Agilent	8493C-020	74889	RE	2011/12/27 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2011/12/27 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2011/07/19 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2011/05/27 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2012/03/16 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2012/02/06 * 12
SJM-10	Measure	PROMART	SEN1935	-	RE/CE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFI,MF)	-	RE/CE	-
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2012/03/30 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2012/03/12 * 12
SCC-G17	Coaxial Cable	Suhner	SUCOFLEX 104A	46291/4A	RE	2012/03/12 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2012/02/10 * 12
SAT6-03	Attenuator	JFW	50HF-006N	-	RE	2012/02/10 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2011/10/23 * 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	2012/04/10 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2011/10/23 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE/CE	2012/02/07 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2011/09/23 * 12
SCC-C9/C10/SRSE-03	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-271(RF Selector)	CE	2012/04/10 * 12
SLS-03	LISN	Rohde & Schwarz	ENV216	100513	CE	2012/02/23 * 12
SAT3-05	Attenuator	JFW	50HF-003N	-	CE	2012/02/17 * 12
SLS-04	LISN	Rohde & Schwarz	ENV216	100514	CE	2012/02/20 * 12
SAT3-03	Attenuator	JFW	50HF-003N	-	CE	2012/02/17 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2012/03/26 * 12
STM-05	Terminator	TME	CT-01 BP	-	CE	2012/01/05 * 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