



# RADIO TEST REPORT

**Test Report No.: 32JE0016-SH-01-C-R1**

**Applicant** : Sony Corporation  
**Type of Equipment** : Interchangeable Lens Digital Camera  
**Model No.** : NEX-5R  
**FCC ID** : AK8NEX5R  
**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.
7. This report is a revised version of 32JE0016-SH-01-C. 32JE0016-SH-01-C is replaced with this report.

**Date of test:** June 18 to July 9, 2012

**Tested by:**   
Kenichi Adachi  
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".



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**Shonan EMC Lab.**

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13-EM-F0429



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## **SECTION 1: Customer information**

Company Name : Sony Corporation  
Address : Shinagawa INTERCITY C Tower 2-15-3, Konan Minato-ku, Tokyo, Japan  
Telephone Number : +81-3-5769-5605  
Facsimile Number : +81-3-5769-5996  
Contact Person : Keizo Tsuneki

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

### **2.1 Identification of E.U.T.**

Type of Equipment : Interchangeable Lens Digital Camera  
Model Number : NEX-5R  
Serial Number : Refer to clause 4.2  
Rating : DC7.6V  
Country of Mass-production : Thailand  
Condition of EUT : Engineering prototype  
(Not for Sale: This sample is equivalent to mass-produced items.)  
Receipt Date of Sample : June 2, 2012  
Modification of EUT : No modification by the test lab.

### **2.2 Product description**

Model: NEX-5R (referred to as the EUT in this report) is an Interchangeable Lens Digital Camera.

Clock frequency(ies) in the system : 32.768kHz, 10MHz, 12MHz, 33MHz

### **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  
ITU code : D1D, G1D  
Antenna type : Inverted F  
Antenna connector type : None  
Antenna gain : -6.36 dBi  
Operation temperature range : 0 to 40 deg.C.

### **FCC 15.31 (e)**

The RF transmitter is constantly provided voltage (DC1.8V and DC3.3V) through the regulator regardless of input voltage. Therefore, this EUT complies with the requirement.

### **FCC 15.203**

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the requirement.

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## **SECTION 3: Test specification, procedures & results**

### **3.1 Test specification**

Test specification : FCC Part 15 Subpart C: 2012, final revised on May 17, 2012 and effective June 18, 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 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	27.1dB Freq.: 0.15036MHz Phase: N Detector: Quasi-Peak Mode: Tx 2437MHz, IEEE 802.11g	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	4.8dB Freq.: 2400.00MHz Detector: Average Polarization: Vertical Mode: Tx 2412MHz, IEEE 802.11n (HT20)	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.

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### 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 <sup>*1</sup> /SR <sup>*2</sup> (±)	No.2 SAC/SR (±)	No.3 SAC/SR (±)
Conducted emission (AC Mains) AMN/LISN	9kHz-150kHz	4.0 dB	4.0 dB	3.9 dB
	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 test report has enough margin, more than site margin.

#### 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

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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
<input type="checkbox"/> No.1 Semi-anechoic chamber	697847	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
<input checked="" type="checkbox"/> No.2 Semi-anechoic chamber	697847	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
<input checked="" type="checkbox"/> No.3 Semi-anechoic chamber	697847	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
<input type="checkbox"/> No.4 Full-anechoic chamber	-	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
<input type="checkbox"/> No.1 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
<input checked="" type="checkbox"/> No.2 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
<input type="checkbox"/> No.3 shielded room	-	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
<input type="checkbox"/> No.4 shielded room	-	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
<input checked="" type="checkbox"/> No.5 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
<input type="checkbox"/> 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.

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

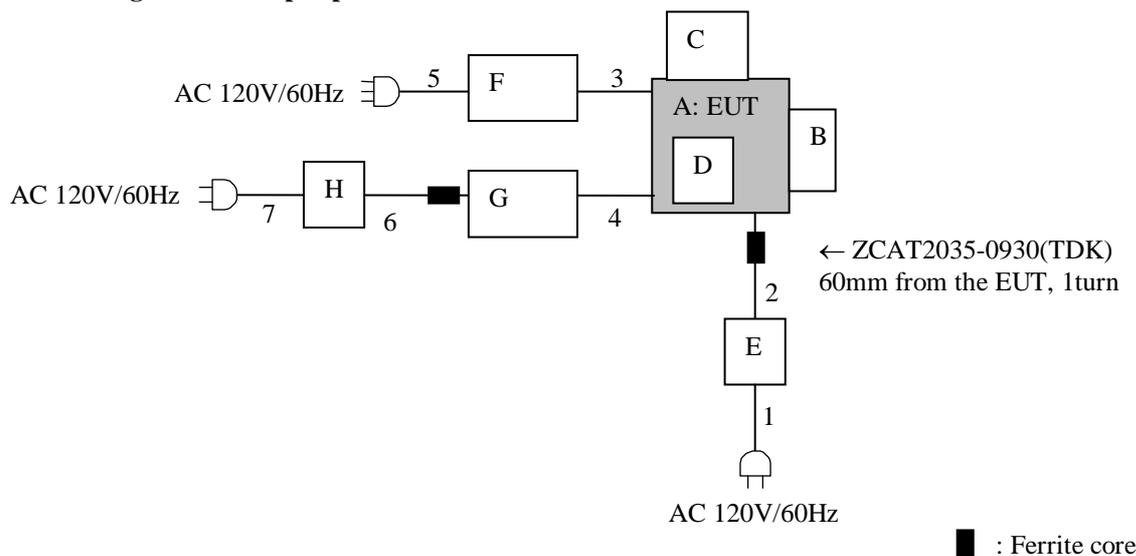
### 4.1 Operating mode

Test item	Mode	Tested frequency	Power setting *1)	Worst data rate *2)
Conducted emission & Radiated emission (below 1GHz) *3)	Transmitting IEEE 802.11g	2437MHz	7	24Mbps, PN9
Other items	Transmitting IEEE 802.11b	2412MHz, 2437MHz, 2462MHz	7	5.5Mbps, PN9
	Transmitting IEEE 802.11g	2412MHz, 2437MHz, 2462MHz	7	24Mbps, PN9
	Transmitting IEEE 802.11n (HT20)	2412MHz, 2437MHz, 2462MHz	7	MCS0, PN9

\*1) Test software: 20120528  
 \*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.

**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.

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**Description of EUT and support equipment**

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Interchangeable Lens Digital Camera	NEX-5R	*1)	SONY	EUT
B	Interchangeable Lens	SEL1855	7308468	SONY	-
C	Flash	HVL-F7S	-	SONY	-
D	Memory Stick	MS-HX8B	-	SONY	-
E	AC Adaptor	AC-PW20	12033004300	SONY	-
F	LCD Monitor	E2200HD	ETH2901919026	BenQ	-
G	Laptop PC	Latitude E5500	0DW634	DELL	-
H	AC Adaptor	HA90PE0-00	0W529F	DELL	-

\*1) Conducted/Radiated emission: 132, Antenna terminal conducted test: 87

**List of cables used**

No.	Cable	Length (m)	Shield-Cable	Shield-Connector	Remarks
1	AC	2.0	Unshielded	Unshielded	-
2	DC	1.6	Unshielded	Unshielded	-
3	HDMI	1.5	Shielded	Shielded	-
4	USB	1.0	Shielded	Shielded	-
5	AC	1.8	Unshielded	Unshielded	-
6	DC	1.8	Unshielded	Unshielded	-
7	AC	0.9	Unshielded	Unshielded	-

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

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## **SECTION 5: Conducted emission**

### **5.1 Operating environment**

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

### **5.2 Test configuration**

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 0.8m above the conducting ground plane. The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals was aligned and was flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from LISN and excess AC cable was bundled in center. I/O cables that were connected to the peripherals were bundled in center. They were folded back and for the forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source. All unused 50ohm connectors of the LISN were resistively terminated in 50ohm when not connected to the measuring equipment. Photographs of the set up are shown in APPENDIX 3.

### **5.3 Test conditions**

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

### **5.4 Test procedure**

The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT via AC adaptor within a Shielded room. The EUT was connected to a Line Impedance Stabilization Network (LISN) via AC adaptor. 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 detection of the test receiver.

Detection 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

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## **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: Radiated emission**

### **8.1 Operating environment**

Test place : See test data (APPENDIX 1)

Temperature : See test data (APPENDIX 1)

Humidity : See test data (APPENDIX 1)

### **8.2 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 EUT, including peripherals was aligned and was flushed with rear of tabletop. I/O cables that were connected to the peripherals were bundled in center. They were folded back and for the forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.

Photographs of the set up are shown in APPENDIX 3.

### **8.3 Test conditions**

Frequency range : 30MHz - 25GHz

EUT position : Table top

### **8.4 Test procedure**

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

The radiated emission measurements were made with the following detection of the test receiver.

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

\* When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

\*1) Refer to the VBW (Average) calculation sheet in APPENDIX 1.

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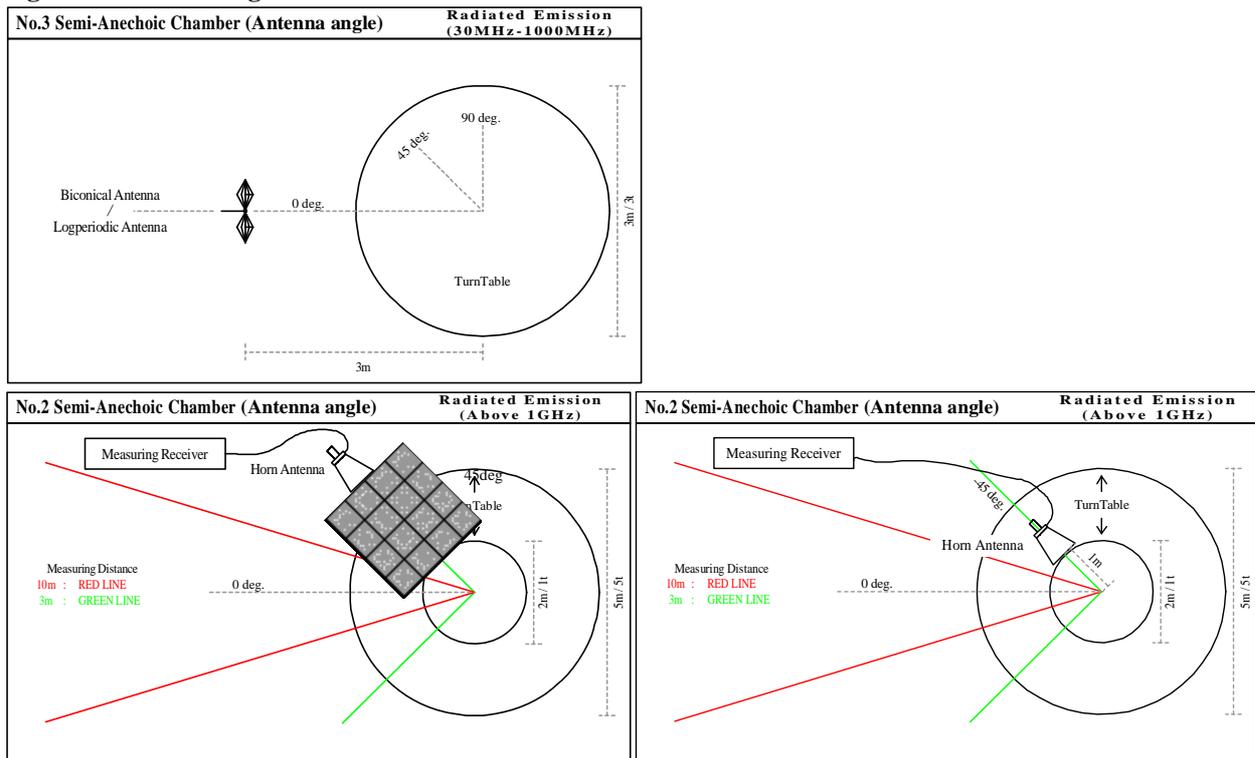
The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT and to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Worst position:

Antenna polarization \ Frequency	Carrier	Spurious			
		Below 1GHz	1-15GHz	15-18GHz	18-25GHz
Horizontal	X	Y	X	X	X
Vertical	Y	X	Y	Y	Y

The display angle can be changed in 0 to 90 deg. based on the product specification. Therefore, the carrier level and noise levels were compared at each angle, and the test was made at the position (90 deg.) that has the maximum noise.

Figure 1. Antenna angle



## 8.5 Band edge

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

## 8.6 Results

Summary of the test results : Pass \*No noise was detected above the 5<sup>th</sup> order harmonics.  
Refer to APPENDIX 1

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## **SECTION 9: Spurious emissions (Antenna port conducted)**

### **Test procedure**

The Out of Band Emissions was measured with a spectrum analyzer connected to the antenna port. In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement. In the frequency range below 30MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart. (9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=10kHz)

Summary of the test results: Pass  
Refer to APPENDIX 1

## **SECTION 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

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## **Contents of APPENDIXES**

### **APPENDIX 1: Data of Radio tests**

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

### **APPENDIX 2: Test instruments**

Test instruments

### **APPENDIX 3: Photographs of test setup**

Conducted emission  
Radiated emission  
Pre-check of worst position

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# DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.2 Shielded Room  
Date : 2012/07/07

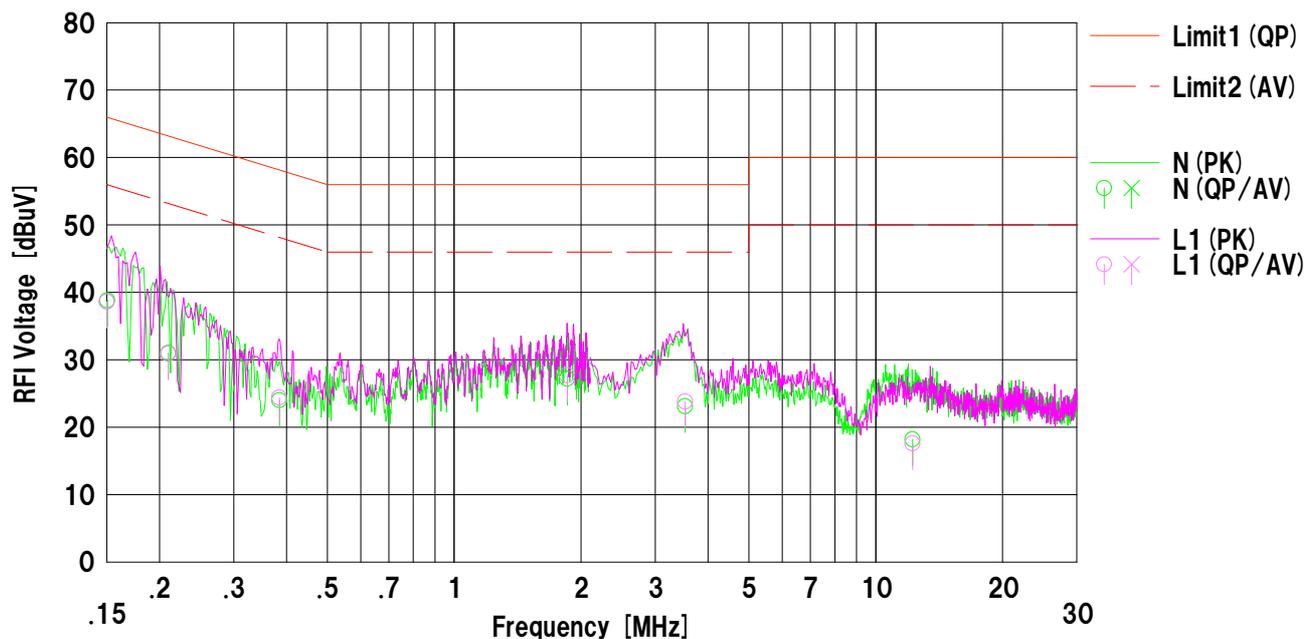
Company : Sony Corporation  
Kind of EUT : Interchangeable Lens Digital Camera  
Model No. : NEX-5R  
Serial No. : 132

Mode : IEEE802.11g 2437MHz  
Report No. : 32JE0016-SH-01-C-R1  
Power : AC120V/60Hz  
Temp./Humi. : 26deg.C /56%RH

Remarks : -

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

Engineer : Tatsuya Arai



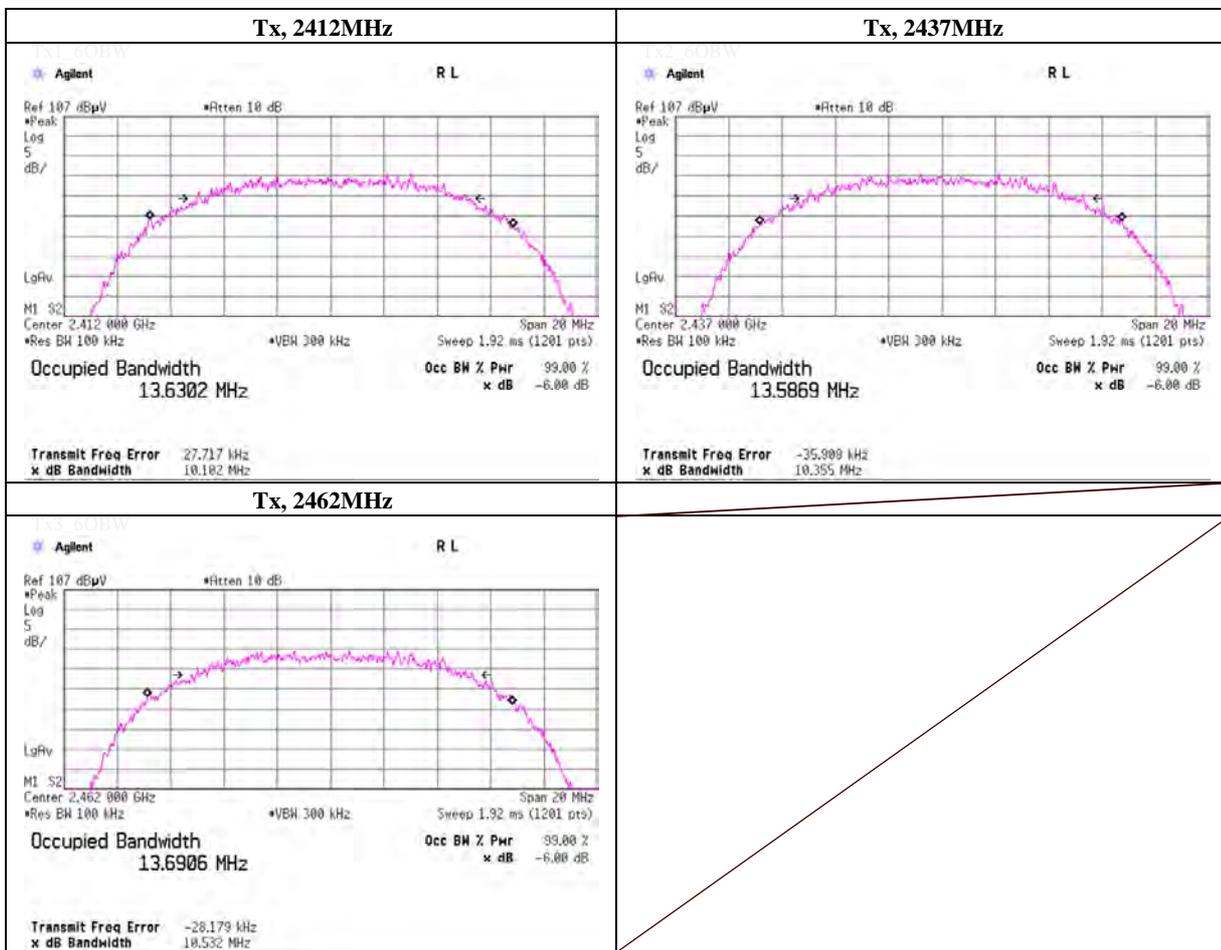
No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15036	26.1	---	12.7	38.8	---	65.9	55.9	27.1	---	N	
2	0.20980	18.3	---	12.7	31.0	---	63.2	53.2	32.2	---	N	
3	0.38519	11.3	---	12.7	24.0	---	58.1	48.1	34.1	---	N	
4	1.85500	14.4	---	12.8	27.2	---	56.0	46.0	28.8	---	N	
5	3.53100	10.2	---	12.9	23.1	---	56.0	46.0	32.9	---	N	
6	12.23838	4.8	---	13.4	18.2	---	60.0	50.0	41.8	---	N	
7	0.15000	25.9	---	12.7	38.6	---	65.9	55.9	27.3	---	L1	
8	0.21000	18.2	---	12.7	30.9	---	63.2	53.2	32.3	---	L1	
9	0.38500	11.7	---	12.7	24.4	---	58.1	48.1	33.7	---	L1	
10	1.85500	14.9	---	12.8	27.7	---	56.0	46.0	28.3	---	L1	
11	3.53100	10.9	---	12.9	23.8	---	56.0	46.0	32.2	---	L1	
12	12.23838	4.2	---	13.4	17.6	---	60.0	50.0	42.4	---	L1	

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

### -6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	June 18, 2012	
Temperature / Humidity	26deg.C , 69%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11b, PN9, worst data mode 5.5Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	10.102	> 0.500
2437.0000	10.355	> 0.500
2462.0000	10.532	> 0.500



**UL Japan, Inc.**

**Shonan EMC Lab.**

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

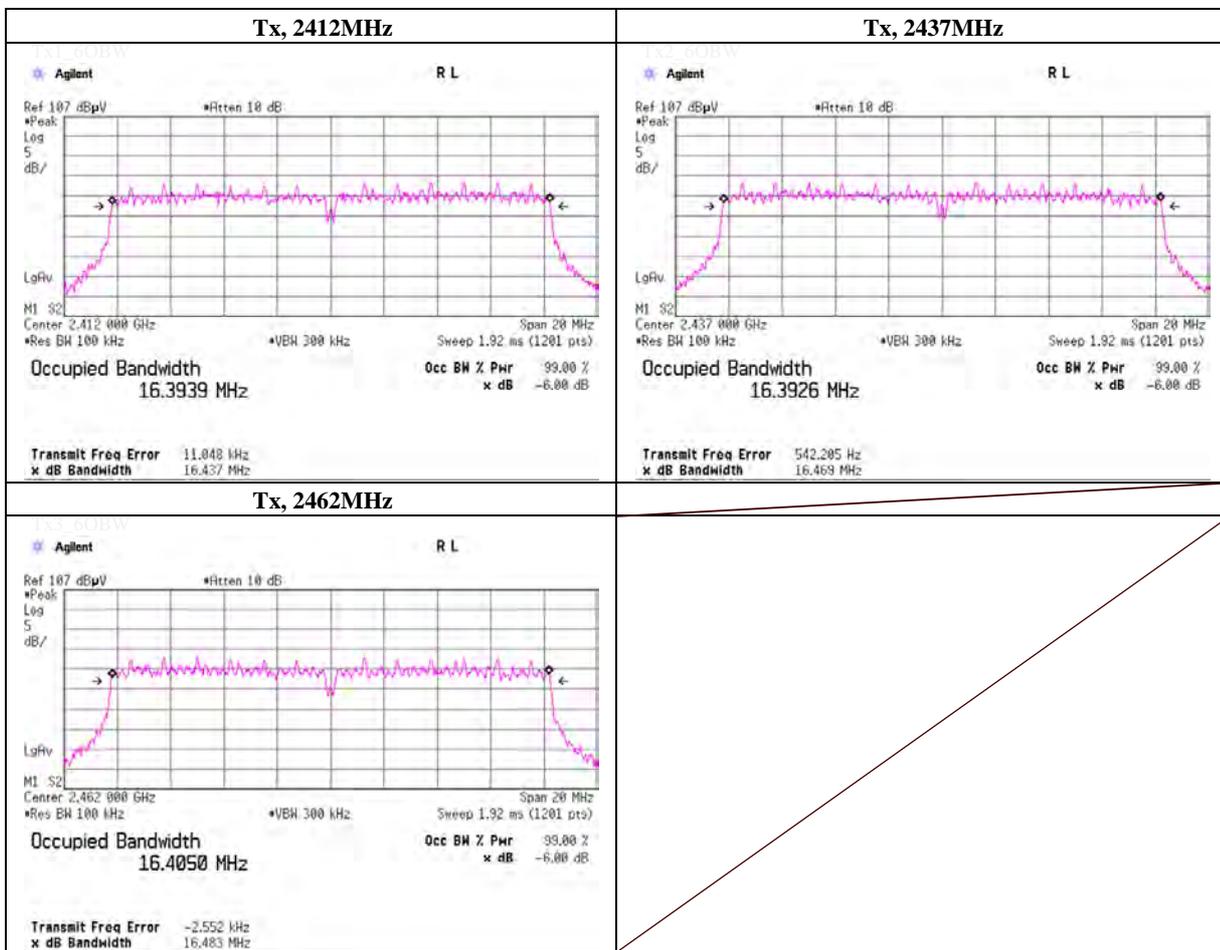
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

### -6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	June 18, 2012	
Temperature / Humidity	26deg.C , 69%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11g, PN9, worst data mode 24Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.437	> 0.500
2437.0000	16.469	> 0.500
2462.0000	16.483	> 0.500



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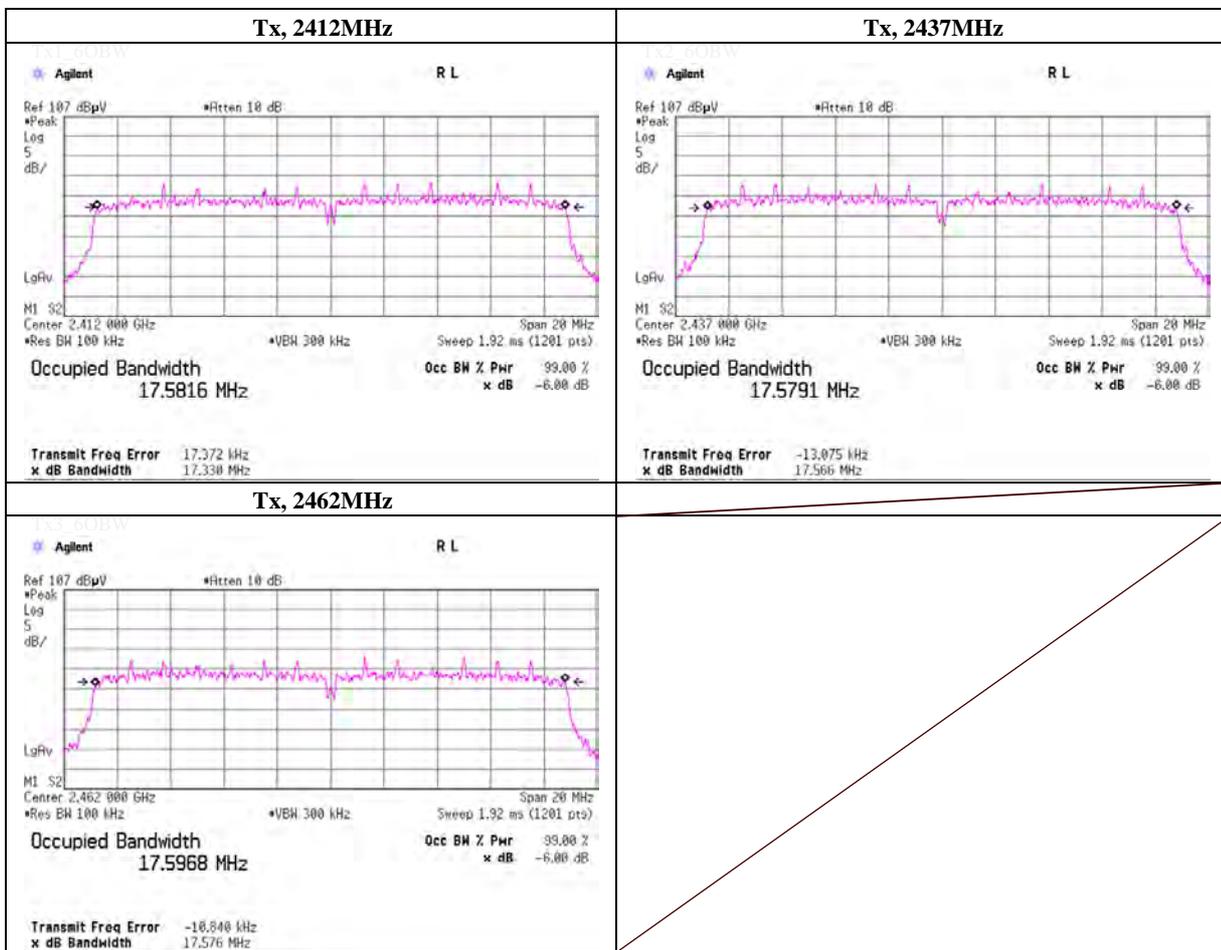
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

### -6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	June 18, 2012	
Temperature / Humidity	26deg.C , 69%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	17.330	> 0.500
2437.0000	17.566	> 0.500
2462.0000	17.576	> 0.500



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## Average Output Power (Conducted)

Test place                      UL Japan, Inc. Shonan EMC Lab.      No.5 Shielded Room  
 Date                                June 18, 2012  
 Temperature / Humidity        26deg.C      , 69%RH  
 Engineer                         Kenichi Adachi  
 Mode                                Tx, IEEE802.11b, PN9,                      worst data mode :      5.5 Mbps

(\* P/M: Power Meter with power sensor, AV: Average with gate trigger mode)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result	
					[dBm]	[mW]
Low	2412.0	-5.46	1.76	10.00	6.30	4.27
Mid	2437.0	-5.34	1.77	10.00	6.43	4.40
High	2462.0	-5.92	1.78	10.00	5.86	3.85

Sample Calculation:

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

**[Pre check]**

(\* P/M: Power Meter with power sensor, AV: Average with gate trigger mode)

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result	
						[dBm]	[mW]
	1	2437.0	-5.43	1.77	10.00	6.34	4.31
	2	2437.0	-5.39	1.77	10.00	6.38	4.35
	5.5	2437.0	-5.34	1.77	10.00	<b>6.43</b>	4.40
	11	2437.0	-5.41	1.77	10.00	6.36	4.33

**Worst**

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.2 Semi Anechoic Chamber  
 Date 2012/7/7 2012/7/8 2012/7/9  
 Temperature / Humidity 24 deg.C , 54%RH 24 deg.C , 54%RH 24 deg.C , 54%RH  
 Engineer Tatsuya Arai  
 Mode Tx, 2412 MHz  
 Tx, IEEE802.11b, PN9, worst data mode 5.5Mbps

(\* 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.	2385.920	PK	44.7	27.2	14.0	38.2	47.7	73.9	26.2	100	180	
Hori.	2390.000	PK	45.2	27.2	14.1	38.2	48.3	73.9	25.6	100	173	
Hori.	2397.000	PK	44.7	27.2	14.1	38.2	47.8	73.9	26.1	100	132	
Hori.	2400.000	PK	46.1	27.3	14.1	38.2	49.3	73.9	24.6	100	155	
Hori.	4824.000	PK	42.6	31.2	6.6	37.0	43.4	73.9	30.5	100	0	
Hori.	7236.000	PK	45.9	36.5	8.0	39.0	51.4	73.9	22.5	100	0	
Hori.	9648.000	PK	43.6	38.4	9.2	37.2	54.0	73.9	19.9	100	0	
Hori.	12060.000	PK	45.1	39.3	10.5	37.9	57.0	73.9	16.9	100	0	
Hori.	2385.920	AV	32.4	27.2	14.0	38.2	35.4	53.9	18.5	100	180	
Hori.	2390.000	AV	32.4	27.2	14.1	38.2	35.5	53.9	18.4	100	173	
Hori.	2397.000	AV	32.2	27.2	14.1	38.2	35.3	53.9	18.6	100	132	
Hori.	2400.000	AV	33.0	27.3	14.1	38.2	36.2	53.9	17.7	100	155	
Hori.	4824.000	AV	31.5	31.2	6.6	37.0	32.3	53.9	21.6	100	0	
Hori.	7236.000	AV	34.2	36.5	8.0	39.0	39.7	53.9	14.2	100	0	
Hori.	9648.000	AV	31.9	38.4	9.2	37.2	42.3	53.9	11.6	100	0	
Hori.	12060.000	AV	33.6	39.3	10.5	37.9	45.5	53.9	8.4	100	0	
Vert.	2385.920	PK	44.7	27.2	14.0	38.2	47.7	73.9	26.2	100	176	
Vert.	2390.000	PK	44.2	27.2	14.1	38.2	47.3	73.9	26.6	100	213	
Vert.	2397.000	PK	43.3	27.2	14.1	38.2	46.4	73.9	27.5	100	220	
Vert.	2400.000	PK	45.2	27.3	14.1	38.2	48.4	73.9	25.5	100	156	
Vert.	4824.000	PK	43.2	31.2	6.6	37.0	44.0	73.9	29.9	100	0	
Vert.	7236.000	PK	45.3	36.5	8.0	39.0	50.8	73.9	23.1	100	0	
Vert.	9648.000	PK	41.6	38.4	9.2	37.2	52.0	73.9	21.9	100	0	
Vert.	12060.000	PK	45.4	39.3	10.5	37.9	57.3	73.9	16.6	100	0	
Vert.	2385.920	AV	32.5	27.2	14.0	38.2	35.5	53.9	18.4	100	176	
Vert.	2390.000	AV	32.4	27.2	14.1	38.2	35.5	53.9	18.4	100	213	
Vert.	2397.000	AV	32.5	27.2	14.1	38.2	35.6	53.9	18.3	100	220	
Vert.	2400.000	AV	33.8	27.3	14.1	38.2	37.0	53.9	16.9	100	156	
Vert.	4824.000	AV	31.4	31.2	6.6	37.0	32.2	53.9	21.7	100	0	
Vert.	7236.000	AV	34.0	36.5	8.0	39.0	39.5	53.9	14.4	100	0	
Vert.	9648.000	AV	31.8	38.4	9.2	37.2	42.2	53.9	11.7	100	0	
Vert.	12060.000	AV	33.6	39.3	10.5	37.9	45.5	53.9	8.4	100	0	

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).

\*The 10th harmonic was not seen so the result was its base noise level.

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

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 Facsimile : +81 463 50 6401

**Radiated Emission**

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.2 Semi Anechoic Chamber  
 Date                         2012/7/7   2012/7/8   2012/7/9  
 Temperature / Humidity   24 deg.C , 54%RH                                 24 deg.C , 54%RH                                 24 deg.C , 54%RH  
 Engineer                    Tatsuya Arai  
 Mode                         Tx,   2437 MHz  
                                   Tx, IEEE802.11b, PN9, worst data mode 5.5Mbps

(\* 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.	2500.000	PK	44.9	27.6	14.1	38.1	48.5	73.9	25.4	100	178	
Hori.	4874.000	PK	43.1	31.3	6.6	36.9	44.1	73.9	29.8	100	0	
Hori.	7311.000	PK	46.0	36.7	8.2	39.0	51.9	73.9	22.0	100	0	
Hori.	9748.000	PK	43.2	38.6	9.3	37.2	53.9	73.9	20.0	100	0	
Hori.	12185.000	PK	43.5	39.4	10.5	37.7	55.7	73.9	18.2	100	0	
Hori.	2500.000	AV	32.5	27.6	14.1	38.1	36.1	53.9	17.8	100	178	
Hori.	4874.000	AV	31.1	31.3	6.6	36.9	32.1	53.9	21.8	100	0	
Hori.	7311.000	AV	33.3	36.7	8.2	39.0	39.2	53.9	14.7	100	0	
Hori.	9748.000	AV	31.2	38.6	9.3	37.2	41.9	53.9	12.0	100	0	
Hori.	12185.000	AV	32.0	39.4	10.5	37.7	44.2	53.9	9.7	100	0	
Vert.	2500.000	PK	44.8	27.6	14.1	38.1	48.4	73.9	25.5	100	260	
Vert.	4874.000	PK	43.5	31.3	6.6	36.9	44.5	73.9	29.4	100	0	
Vert.	7311.000	PK	44.8	36.7	8.2	39.0	50.7	73.9	23.2	100	0	
Vert.	9748.000	PK	43.1	38.6	9.3	37.2	53.8	73.9	20.1	100	0	
Vert.	12185.000	PK	42.8	39.4	10.5	37.7	55.0	73.9	18.9	100	0	
Vert.	2500.000	AV	32.1	27.6	14.1	38.1	35.7	53.9	18.2	100	260	
Vert.	4874.000	AV	31.1	31.3	6.6	36.9	32.1	53.9	21.8	100	0	
Vert.	7311.000	AV	33.4	36.7	8.2	39.0	39.3	53.9	14.6	100	0	
Vert.	9748.000	AV	31.4	38.6	9.3	37.2	42.1	53.9	11.8	100	0	
Vert.	12185.000	AV	32.1	39.4	10.5	37.7	44.3	53.9	9.6	100	0	

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).

\*The 10th harmonic was not seen so the result was its base noise level.

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.2 Semi Anechoic Chamber  
 Date                         2012/7/7   2012/7/8   2012/7/9  
 Temperature / Humidity   24 deg.C , 54%RH                                 24 deg.C , 54%RH                                 24 deg.C , 54%RH  
 Engineer                    Tatsuya Arai  
 Mode                         Tx,   2462 MHz  
                                   Tx, IEEE802.11b, PN9, worst data mode 5.5Mbps

(\* 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	45.1	27.5	14.1	38.1	48.6	73.9	25.3	100	22	
Hori.	2485.000	PK	46.2	27.5	14.1	38.1	49.7	73.9	24.2	100	0	
Hori.	4924.000	PK	43.6	31.5	6.6	36.9	44.8	73.9	29.1	100	0	
Hori.	7386.000	PK	45.3	36.9	8.3	39.0	51.5	73.9	22.4	100	0	
Hori.	9848.000	PK	42.5	38.8	9.3	37.2	53.4	73.9	20.5	100	0	
Hori.	12310.000	PK	42.4	39.4	10.7	37.6	54.9	73.9	19.0	100	0	
Hori.	2483.500	AV	32.2	27.5	14.1	38.1	35.7	53.9	18.2	100	22	
Hori.	2485.000	AV	32.5	27.5	14.1	38.1	36.0	53.9	17.9	100	0	
Hori.	4924.000	AV	31.3	31.5	6.6	36.9	32.5	53.9	21.4	100	0	
Hori.	7386.000	AV	33.2	36.9	8.3	39.0	39.4	53.9	14.5	100	0	
Hori.	9848.000	AV	31.1	38.8	9.3	37.2	42.0	53.9	11.9	100	0	
Hori.	12310.000	AV	31.2	39.4	10.7	37.6	43.7	53.9	10.2	100	0	
Vert.	2483.500	PK	44.2	27.5	14.1	38.1	47.7	73.9	26.2	100	145	
Vert.	2485.000	PK	44.5	27.5	14.1	38.1	48.0	73.9	25.9	100	0	
Vert.	4924.000	PK	43.1	31.5	6.6	36.9	44.3	73.9	29.6	100	0	
Vert.	7386.000	PK	43.5	36.9	8.3	39.0	49.7	73.9	24.2	100	0	
Vert.	9848.000	PK	42.5	38.8	9.3	37.2	53.4	73.9	20.5	100	0	
Vert.	12310.000	PK	42.2	39.4	10.7	37.6	54.7	73.9	19.2	100	0	
Vert.	2483.500	AV	31.9	27.5	14.1	38.1	35.4	53.9	18.5	100	145	
Vert.	2485.000	AV	32.5	27.5	14.1	38.1	36.0	53.9	17.9	100	0	
Vert.	4924.000	AV	31.3	31.5	6.6	36.9	32.5	53.9	21.4	100	0	
Vert.	7386.000	AV	33.1	36.9	8.3	39.0	39.3	53.9	14.6	100	0	
Vert.	9848.000	AV	30.9	38.8	9.3	37.2	41.8	53.9	12.1	100	0	
Vert.	12310.000	AV	31.1	39.4	10.7	37.6	43.6	53.9	10.3	100	0	

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).

\*The 10th harmonic was not seen so the result was its base noise level.

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.2 Semi Anechoic Chamber  
 Date                         2012/7/7   2012/7/8   2012/7/9  
 Temperature / Humidity   24 deg.C , 54%RH                                 24 deg.C , 54%RH                                 24 deg.C , 54%RH  
 Engineer                    Tatsuya Arai  
 Mode                        Tx,   2412 MHz  
                                   Tx, IEEE802.11g, PN9, worst data mode 24Mbps

(\* 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	46.1	27.2	14.1	38.2	49.2	73.9	24.7	100	264	
Hori.	2400.000	PK	59.2	27.3	14.1	38.2	62.4	73.9	11.5	120	135	
Hori.	4824.000	PK	45.1	31.2	6.6	37.0	45.9	73.9	28.0	100	0	
Hori.	7236.000	PK	44.7	36.5	8.0	39.0	50.2	73.9	23.7	100	0	
Hori.	9648.000	PK	43.2	38.4	9.2	37.2	53.6	73.9	20.3	100	0	
Hori.	12060.000	PK	46.2	39.3	10.5	37.9	58.1	73.9	15.8	100	0	
Hori.	2390.000	AV	33.2	27.2	14.1	38.2	36.3	53.9	17.6	100	264	
Hori.	2400.000	AV	44.5	27.3	14.1	38.2	47.7	53.9	6.2	120	135	
Hori.	4824.000	AV	34.0	31.2	6.6	37.0	34.8	53.9	19.1	100	0	
Hori.	7236.000	AV	34.2	36.5	8.0	39.0	39.7	53.9	14.2	100	0	
Hori.	9648.000	AV	33.0	38.4	9.2	37.2	43.4	53.9	10.5	100	0	
Hori.	12060.000	AV	34.2	39.3	10.5	37.9	46.1	53.9	7.8	100	0	
Vert.	2390.000	PK	45.4	27.2	14.1	38.2	48.5	73.9	25.4	100	0	
Vert.	2400.000	PK	59.6	27.3	14.1	38.2	62.8	73.9	11.1	100	262	
Vert.	4824.000	PK	42.3	31.2	6.6	37.0	43.1	73.9	30.8	100	0	
Vert.	7236.000	PK	45.0	36.5	8.0	39.0	50.5	73.9	23.4	100	0	
Vert.	9648.000	PK	44.6	38.4	9.2	37.2	55.0	73.9	18.9	100	0	
Vert.	12060.000	PK	45.5	39.3	10.5	37.9	57.4	73.9	16.5	100	0	
Vert.	2390.000	AV	33.2	27.2	14.1	38.2	36.3	53.9	17.6	100	0	
Vert.	2400.000	AV	44.9	27.3	14.1	38.2	48.1	53.9	5.8	100	262	
Vert.	4824.000	AV	32.2	31.2	6.6	37.0	33.0	53.9	20.9	100	0	
Vert.	7236.000	AV	33.5	36.5	8.0	39.0	39.0	53.9	14.9	100	0	
Vert.	9648.000	AV	33.0	38.4	9.2	37.2	43.4	53.9	10.5	100	0	
Vert.	12060.000	AV	34.5	39.3	10.5	37.9	46.4	53.9	7.5	100	0	

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).

\*The 10th harmonic was not seen so the result was its base noise level.

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.2 and No.3 Semi Anechoic Chamber  
 Date                         2012/7/7   2012/7/8   2012/7/9  
 Temperature / Humidity   24 deg.C , 54%RH                                 24 deg.C , 54%RH                                 24 deg.C , 54%RH  
 Engineer                    Tatsuya Arai  
 Mode                         Tx,   2437 MHz  
                                   Tx, IEEE802.11g, PN9, worst data mode 24Mbps

(\* 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.	135.001	QP	45.3	14.0	7.4	32.1	34.6	43.5	8.9	353	193	
Hori.	148.499	QP	44.4	14.7	7.7	32.1	34.7	43.5	8.8	217	190	
Hori.	162.001	QP	45.7	15.3	7.8	32.1	36.7	43.5	6.8	186	178	
Hori.	593.998	QP	40.8	18.9	9.8	32.0	37.5	46.0	8.5	178	134	
Hori.	623.999	QP	37.9	19.4	9.9	32.0	35.2	46.0	10.8	163	224	
Hori.	2484.000	PK	44.4	27.5	14.1	38.1	47.9	73.9	26.0	100	0	
Hori.	4874.000	PK	42.1	31.3	6.6	36.9	43.1	73.9	30.8	100	0	
Hori.	7311.000	PK	45.2	36.7	8.2	39.0	51.1	73.9	22.8	100	0	
Hori.	9748.000	PK	42.3	38.6	9.3	37.2	53.0	73.9	20.9	100	0	
Hori.	12185.000	PK	43.1	39.4	10.5	37.7	55.3	73.9	18.6	100	0	
Hori.	2484.000	AV	32.9	27.5	14.1	38.1	36.4	53.9	17.5	100	0	
Hori.	4874.000	AV	31.9	31.3	6.6	36.9	32.9	53.9	21.0	100	0	
Hori.	7311.000	AV	34.2	36.7	8.2	39.0	40.1	53.9	13.8	100	0	
Hori.	9748.000	AV	32.0	38.6	9.3	37.2	42.7	53.9	11.2	100	0	
Hori.	12185.000	AV	33.1	39.4	10.5	37.7	45.3	53.9	8.6	100	0	
Vert.	76.501	QP	51.6	6.3	7.2	32.2	32.9	40.0	7.1	107	236	
Vert.	125.998	QP	46.1	13.2	7.2	32.1	34.4	43.5	9.1	100	47	
Vert.	162.001	QP	46.3	15.3	7.8	32.1	37.3	43.5	6.2	100	200	
Vert.	166.497	QP	43.3	15.4	7.8	32.1	34.4	43.5	9.1	100	178	
Vert.	593.998	QP	42.3	18.9	9.8	32.0	39.0	46.0	7.0	100	160	
Vert.	782.998	QP	38.2	21.0	10.4	31.7	37.9	46.0	8.1	100	333	
Vert.	2484.000	PK	43.6	27.5	14.1	38.1	47.1	73.9	26.8	100	0	
Vert.	4874.000	PK	43.2	31.3	6.6	36.9	44.2	73.9	29.7	100	0	
Vert.	7311.000	PK	44.7	36.7	8.2	39.0	50.6	73.9	23.3	100	0	
Vert.	9748.000	PK	43.2	38.6	9.3	37.2	53.9	73.9	20.0	100	0	
Vert.	12185.000	PK	43.6	39.4	10.5	37.7	55.8	73.9	18.1	100	0	
Vert.	2484.000	AV	33.0	27.5	14.1	38.1	36.5	53.9	17.4	100	0	
Vert.	4874.000	AV	32.6	31.3	6.6	36.9	33.6	53.9	20.3	100	0	
Vert.	7311.000	AV	34.2	36.7	8.2	39.0	40.1	53.9	13.8	100	0	
Vert.	9748.000	AV	32.1	38.6	9.3	37.2	42.8	53.9	11.1	100	0	
Vert.	12185.000	AV	32.9	39.4	10.5	37.7	45.1	53.9	8.8	100	0	

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).

\*The 10th harmonic was not seen so the result was its base noise level.

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

**UL Japan, Inc.**

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### Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.2 Semi Anechoic Chamber  
 Date                         2012/7/7   2012/7/8   2012/7/9  
 Temperature / Humidity   24 deg.C , 54%RH                                 24 deg.C , 54%RH                                 24 deg.C , 54%RH  
 Engineer                    Tatsuya Arai  
 Mode                         Tx,   2462 MHz  
                                   Tx, IEEE802.11g, PN9, worst data mode 24Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	2483.500	PK	48.5	27.5	14.1	38.1	52.0	73.9	21.9	100	0	
Hori.	4924.000	PK	43.1	31.5	6.6	36.9	44.3	73.9	29.6	100	0	
Hori.	7386.000	PK	45.0	36.9	8.3	39.0	51.2	73.9	22.7	100	0	
Hori.	9848.000	PK	42.5	38.8	9.3	37.2	53.4	73.9	20.5	100	0	
Hori.	12310.000	PK	42.2	39.4	10.7	37.6	54.7	73.9	19.2	100	0	
Hori.	2483.500	AV	34.8	27.5	14.1	38.1	38.3	53.9	15.6	100	0	
Hori.	4924.000	AV	31.9	31.5	6.6	36.9	33.1	53.9	20.8	100	0	
Hori.	7386.000	AV	33.8	36.9	8.3	39.0	40.0	53.9	13.9	100	0	
Hori.	9848.000	AV	31.5	38.8	9.3	37.2	42.4	53.9	11.5	100	0	
Hori.	12310.000	AV	31.7	39.4	10.7	37.6	44.2	53.9	9.7	100	0	
Vert.	2483.500	PK	50.6	27.5	14.1	38.1	54.1	73.9	19.8	110	266	
Vert.	4924.000	PK	43.1	31.5	6.6	36.9	44.3	73.9	29.6	100	0	
Vert.	7386.000	PK	44.0	36.9	8.3	39.0	50.2	73.9	23.7	100	0	
Vert.	9848.000	PK	42.6	38.8	9.3	37.2	53.5	73.9	20.4	100	0	
Vert.	12310.000	PK	42.2	39.4	10.7	37.6	54.7	73.9	19.2	100	0	
Vert.	2483.500	AV	36.1	27.5	14.1	38.1	39.6	53.9	14.3	110	266	
Vert.	4924.000	AV	32.3	31.5	6.6	36.9	33.5	53.9	20.4	100	0	
Vert.	7386.000	AV	33.7	36.9	8.3	39.0	39.9	53.9	14.0	100	0	
Vert.	9848.000	AV	31.5	38.8	9.3	37.2	42.4	53.9	11.5	100	0	
Vert.	12310.000	AV	31.9	39.4	10.7	37.6	44.4	53.9	9.5	100	0	

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).

\*The 10th harmonic was not seen so the result was its base noise level.

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.2 Semi Anechoic Chamber  
 Date 2012/7/7 2012/7/8 2012/7/9  
 Temperature / Humidity 24 deg.C , 54%RH 24 deg.C , 54%RH 24 deg.C , 54%RH  
 Engineer Tatsuya Arai  
 Mode Tx, 2412 MHz  
 Tx, IEEE802.11n (HT20), PN9, worst data mode 0(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	49.0	27.2	14.1	38.2	52.1	73.9	21.8	125	133	
Hori.	2400.000	PK	65.4	27.3	14.1	38.2	68.6	73.9	5.3	125	133	
Hori.	4824.000	PK	42.7	31.2	6.6	37.0	43.5	73.9	30.4	100	0	
Hori.	7236.000	PK	45.1	36.5	8.0	39.0	50.6	73.9	23.3	100	0	
Hori.	9648.000	PK	43.4	38.4	9.2	37.2	53.8	73.9	20.1	100	0	
Hori.	12060.000	PK	44.6	39.3	10.5	37.9	56.5	73.9	17.4	100	0	
Hori.	2390.000	AV	33.6	27.2	14.1	38.2	36.7	53.9	17.2	125	133	
Hori.	2400.000	AV	44.5	27.3	14.1	38.2	47.7	53.9	6.2	125	133	
Hori.	4824.000	AV	31.8	31.2	6.6	37.0	32.6	53.9	21.3	100	0	
Hori.	7236.000	AV	34.2	36.5	8.0	39.0	39.7	53.9	14.2	100	0	
Hori.	9648.000	AV	31.9	38.4	9.2	37.2	42.3	53.9	11.6	100	0	
Hori.	12060.000	AV	33.7	39.3	10.5	37.9	45.6	53.9	8.3	100	0	
Vert.	2390.000	PK	47.3	27.2	14.1	38.2	50.4	73.9	23.5	105	258	
Vert.	2400.000	PK	61.4	27.3	14.1	38.2	64.6	73.9	9.3	105	258	
Vert.	4824.000	PK	43.4	31.2	6.6	37.0	44.2	73.9	29.7	100	0	
Vert.	7236.000	PK	45.8	36.5	8.0	39.0	51.3	73.9	22.6	100	0	
Vert.	9648.000	PK	43.9	38.4	9.2	37.2	54.3	73.9	19.6	100	0	
Vert.	12060.000	PK	44.8	39.3	10.5	37.9	56.7	73.9	17.2	100	0	
Vert.	2390.000	AV	34.2	27.2	14.1	38.2	37.3	53.9	16.6	105	258	
Vert.	2400.000	AV	45.9	27.3	14.1	38.2	49.1	53.9	4.8	105	258	
Vert.	4824.000	AV	31.5	31.2	6.6	37.0	32.3	53.9	21.6	100	0	
Vert.	7236.000	AV	34.2	36.5	8.0	39.0	39.7	53.9	14.2	100	0	
Vert.	9648.000	AV	32.1	38.4	9.2	37.2	42.5	53.9	11.4	100	0	
Vert.	12060.000	AV	33.7	39.3	10.5	37.9	45.6	53.9	8.3	100	0	

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).

\*The 10th harmonic was not seen so the result was its base noise level.

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

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 Facsimile : +81 463 50 6401

### Radiated Emission

Test place                   UL Japan, Inc. Shonan EMC Lab.                   No.2 Semi Anechoic Chamber  
 Date                         2012/7/7   2012/7/8   2012/7/9  
 Temperature / Humidity   24 deg.C , 54%RH                                 24 deg.C , 54%RH                                 24 deg.C , 54%RH  
 Engineer                    Tatsuya Arai  
 Mode                         Tx,   2437 MHz  
                                   Tx, IEEE802.11n (HT20), PN9, worst data mode 0(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.	2490.000	PK	43.4	27.5	14.1	38.1	46.9	73.9	27.0	100	0	
Hori.	4874.000	PK	42.3	31.3	6.6	36.9	43.3	73.9	30.6	100	0	
Hori.	7311.000	PK	44.7	36.7	8.2	39.0	50.6	73.9	23.3	100	0	
Hori.	9748.000	PK	42.9	38.6	9.3	37.2	53.6	73.9	20.3	100	0	
Hori.	12185.000	PK	43.9	39.4	10.5	37.7	56.1	73.9	17.8	100	0	
Hori.	2490.000	AV	31.9	27.5	14.1	38.1	35.4	53.9	18.5	100	0	
Hori.	4874.000	AV	31.2	31.3	6.6	36.9	32.2	53.9	21.7	100	0	
Hori.	7311.000	AV	33.7	36.7	8.2	39.0	39.6	53.9	14.3	100	0	
Hori.	9748.000	AV	31.6	38.6	9.3	37.2	42.3	53.9	11.6	100	0	
Hori.	12185.000	AV	32.6	39.4	10.5	37.7	44.8	53.9	9.1	100	0	
Vert.	2490.000	PK	44.5	27.5	14.1	38.1	48.0	73.9	25.9	100	0	
Vert.	4874.000	PK	42.9	31.3	6.6	36.9	43.8	73.9	30.1	100	0	
Vert.	7311.000	PK	45.3	36.7	8.2	39.0	51.2	73.9	22.7	100	0	
Vert.	9748.000	PK	42.4	38.6	9.3	37.2	53.1	73.9	20.8	100	0	
Vert.	12185.000	PK	43.1	39.4	10.5	37.7	55.3	73.9	18.6	100	0	
Vert.	2490.000	AV	32.2	27.5	14.1	38.1	35.7	53.9	18.2	100	0	
Vert.	4874.000	AV	31.2	31.3	6.6	36.9	32.2	53.9	21.7	100	0	
Vert.	7311.000	AV	33.6	36.7	8.2	39.0	39.5	53.9	14.4	100	0	
Vert.	9748.000	AV	31.5	38.6	9.3	37.2	42.2	53.9	11.7	100	0	
Vert.	12185.000	AV	32.6	39.4	10.5	37.7	44.8	53.9	9.1	100	0	

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).

\*The 10th harmonic was not seen so the result was its base noise level.

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.2 Semi Anechoic Chamber  
 Date                           2012/7/7   2012/7/8   2012/7/9  
 Temperature / Humidity   24 deg.C , 54%RH                                   24 deg.C , 54%RH                                   24 deg.C , 54%RH  
 Engineer                     Tatsuya Arai  
 Mode                         Tx,   2462 MHz  
                                   Tx, IEEE802.11n (HT20), PN9, worst data mode 0(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.	2483.500	PK	50.0	27.5	14.1	38.1	53.5	73.9	20.4	119	131	
Hori.	4924.000	PK	42.7	31.5	6.6	36.9	43.9	73.9	30.0	100	0	
Hori.	7386.000	PK	44.7	36.9	8.3	39.0	50.9	73.9	23.0	100	0	
Hori.	9848.000	PK	41.8	38.8	9.3	37.2	52.7	73.9	21.2	100	0	
Hori.	12310.000	PK	42.1	39.4	10.7	37.6	54.6	73.9	19.3	100	0	
Hori.	2483.500	AV	34.1	27.5	14.1	38.1	37.6	53.9	16.3	119	131	
Hori.	4924.000	AV	31.3	31.5	6.6	36.9	32.5	53.9	21.4	100	0	
Hori.	7386.000	AV	33.3	36.9	8.3	39.0	39.5	53.9	14.4	100	0	
Hori.	9848.000	AV	31.4	38.8	9.3	37.2	42.3	53.9	11.6	100	0	
Hori.	12310.000	AV	31.4	39.4	10.7	37.6	43.9	53.9	10.0	100	0	
Vert.	2483.500	PK	53.1	27.5	14.1	38.1	56.6	73.9	17.3	111	253	
Vert.	4924.000	PK	44.2	31.5	6.6	36.9	45.4	73.9	28.5	100	0	
Vert.	7386.000	PK	44.0	36.9	8.3	39.0	50.2	73.9	23.7	100	0	
Vert.	9848.000	PK	42.8	38.8	9.3	37.2	53.7	73.9	20.2	100	0	
Vert.	12310.000	PK	42.2	39.4	10.7	37.6	54.7	73.9	19.2	100	0	
Vert.	2483.500	AV	34.8	27.5	14.1	38.1	38.3	53.9	15.6	111	253	
Vert.	4924.000	AV	31.4	31.5	6.6	36.9	32.6	53.9	21.3	100	0	
Vert.	7386.000	AV	33.4	36.9	8.3	39.0	39.6	53.9	14.3	100	0	
Vert.	9848.000	AV	31.6	38.8	9.3	37.2	42.5	53.9	11.4	100	0	
Vert.	12310.000	AV	31.5	39.4	10.7	37.6	44.0	53.9	9.9	100	0	

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).

\*The 10th harmonic was not seen so the result was its base noise level.

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

**UL Japan, Inc.**

**Shonan EMC Lab.**

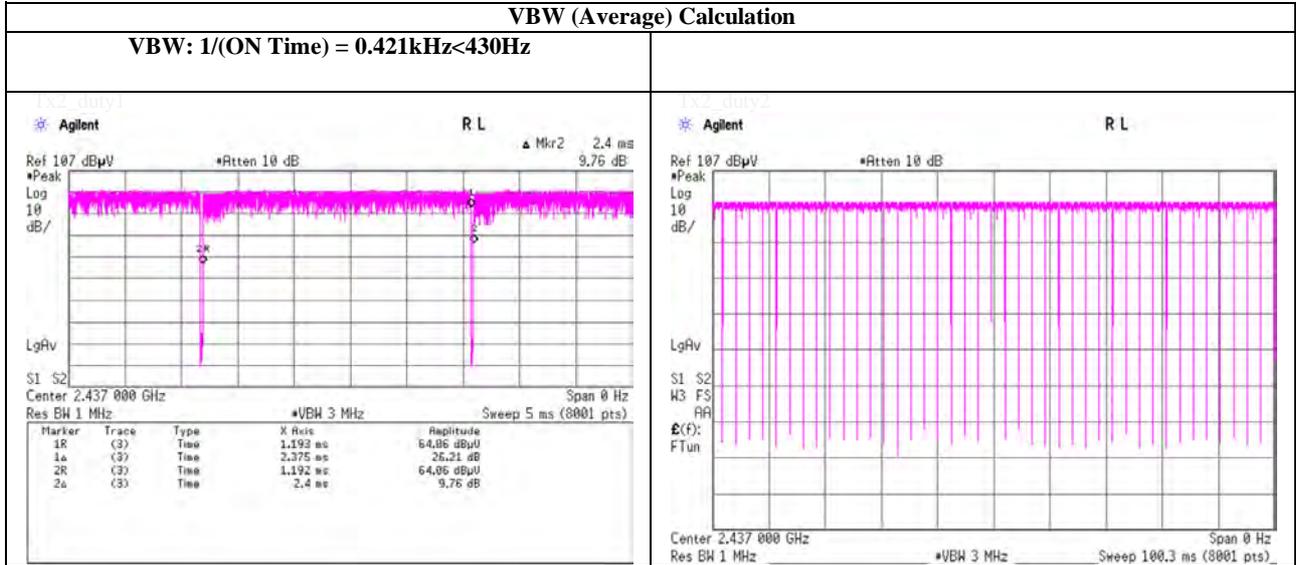
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## VBW(Average) Calculation chart

Tx, IEEE802.11b, PN9, worst data mode 5.5Mbps



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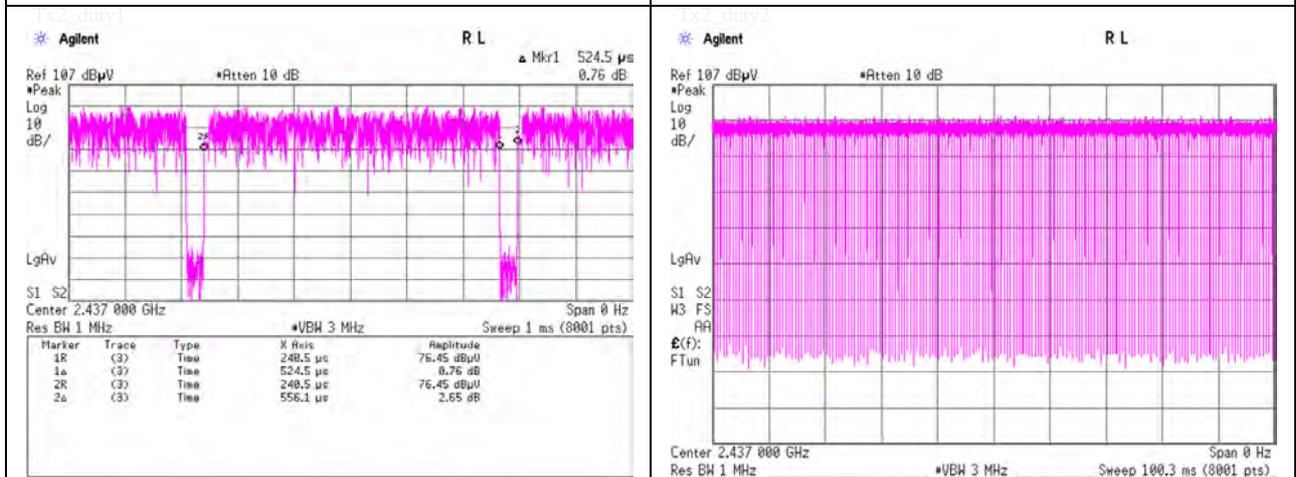
Facsimile : +81 463 50 6401

## VBW(Average) Calculation chart

Tx, IEEE802.11g, PN9, worst data mode 24Mbps

### VBW (Average) Calculation

VBW: 1/(ON Time) = 1.907kHz < 2kHz



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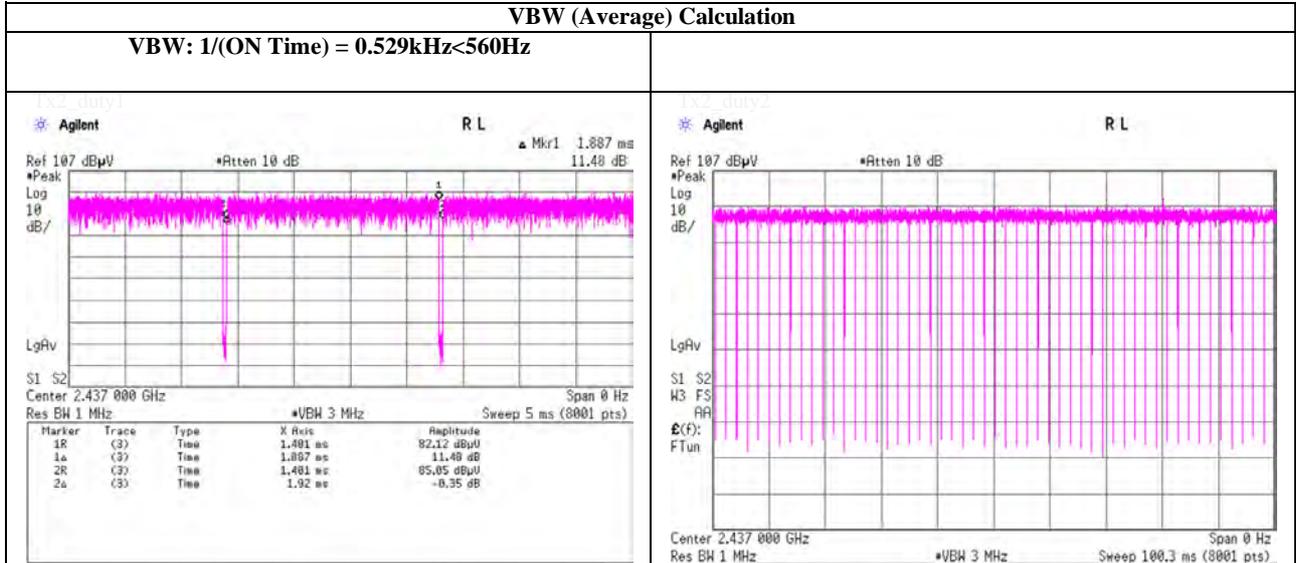
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## VBW(Average) Calculation chart

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

### VBW (Average) Calculation



**UL Japan, Inc.**

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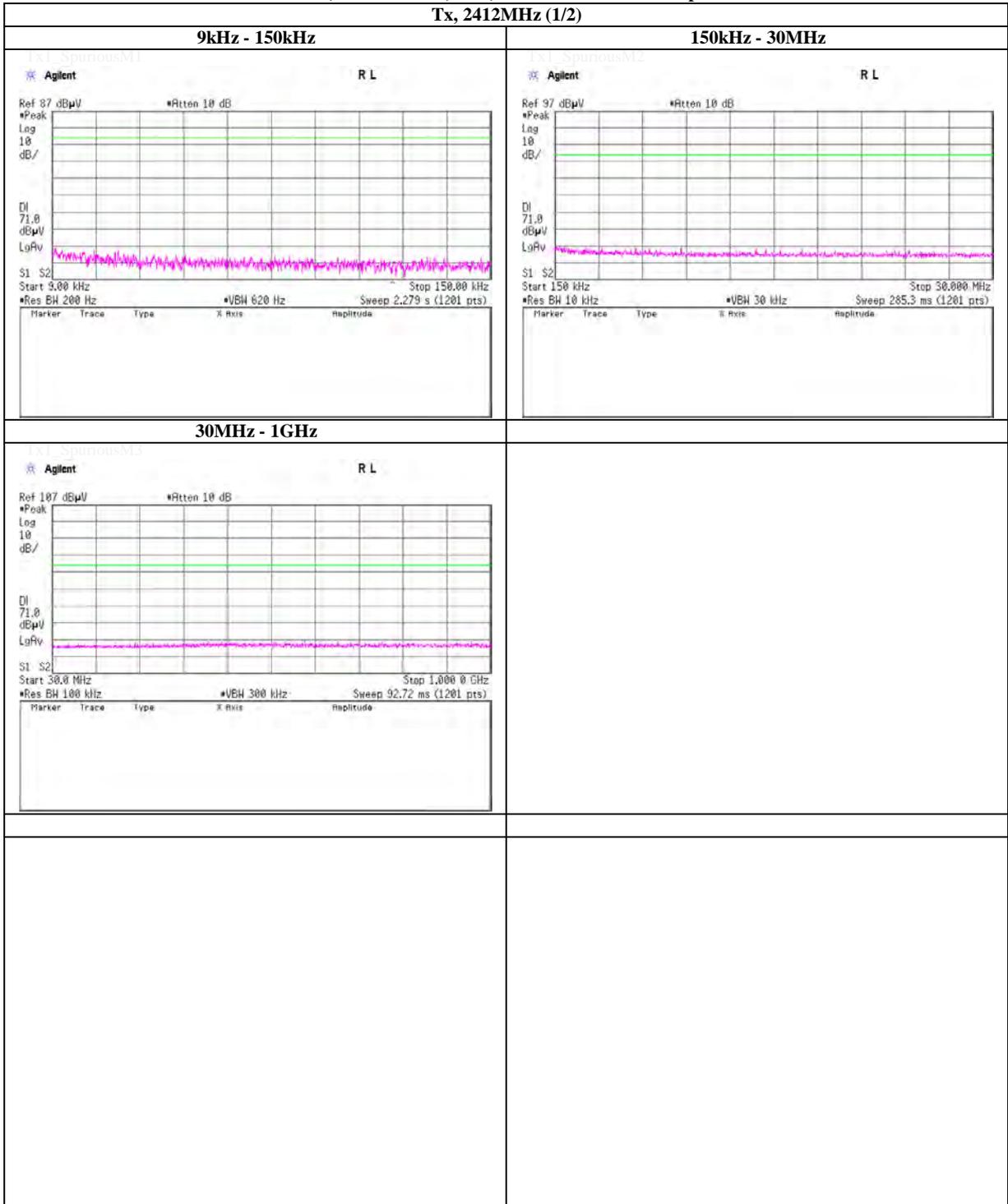
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**Spurious emission (Conducted)**

Tx, IEEE802.11b, PN9, worst data mode 5.5Mbps

Tx, 2412MHz (1/2)



**UL Japan, Inc.**

**Shonan EMC Lab.**

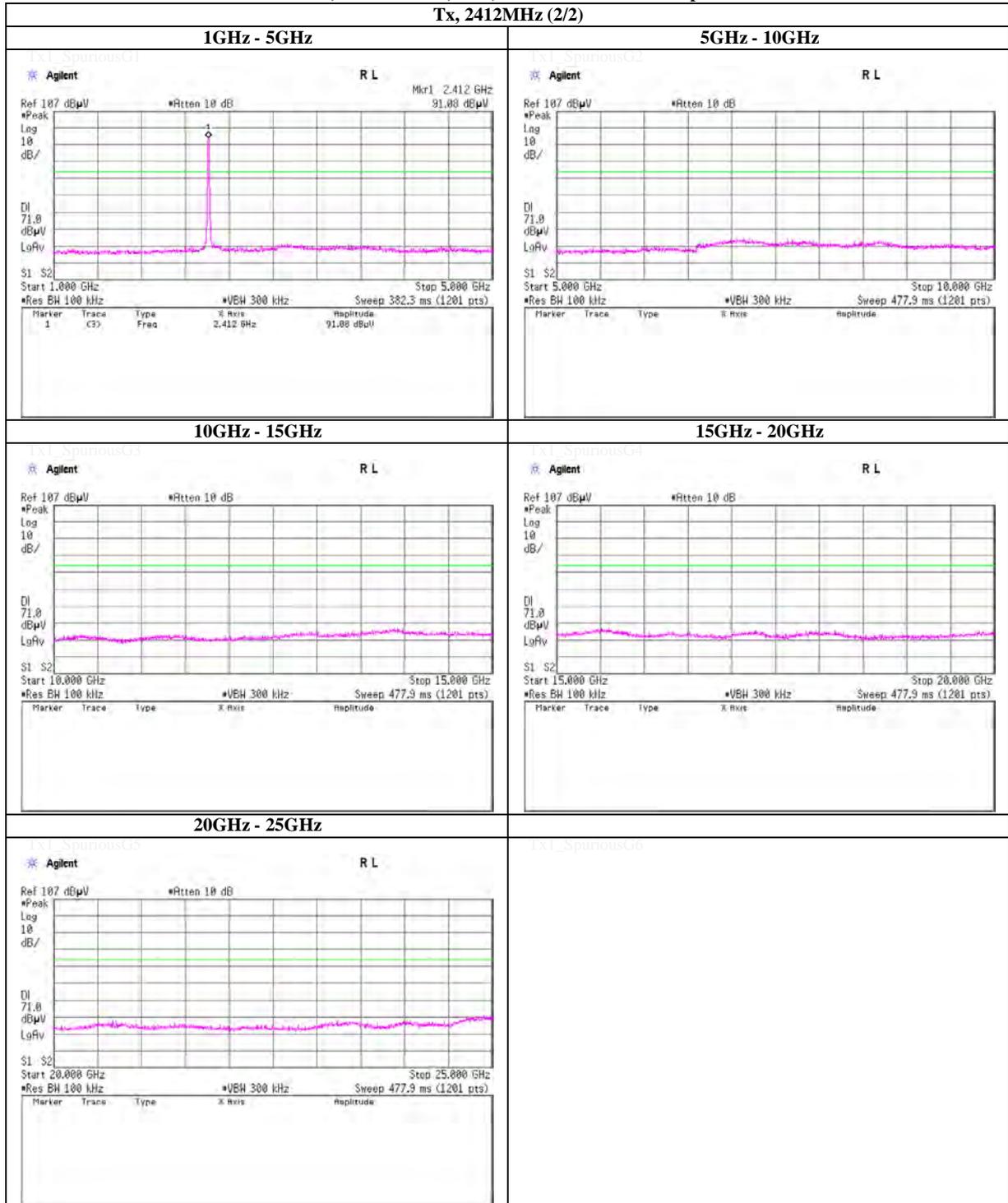
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### Spurious emission (Conducted)

Tx, IEEE802.11b, PN9, worst data mode 5.5Mbps



**UL Japan, Inc.**

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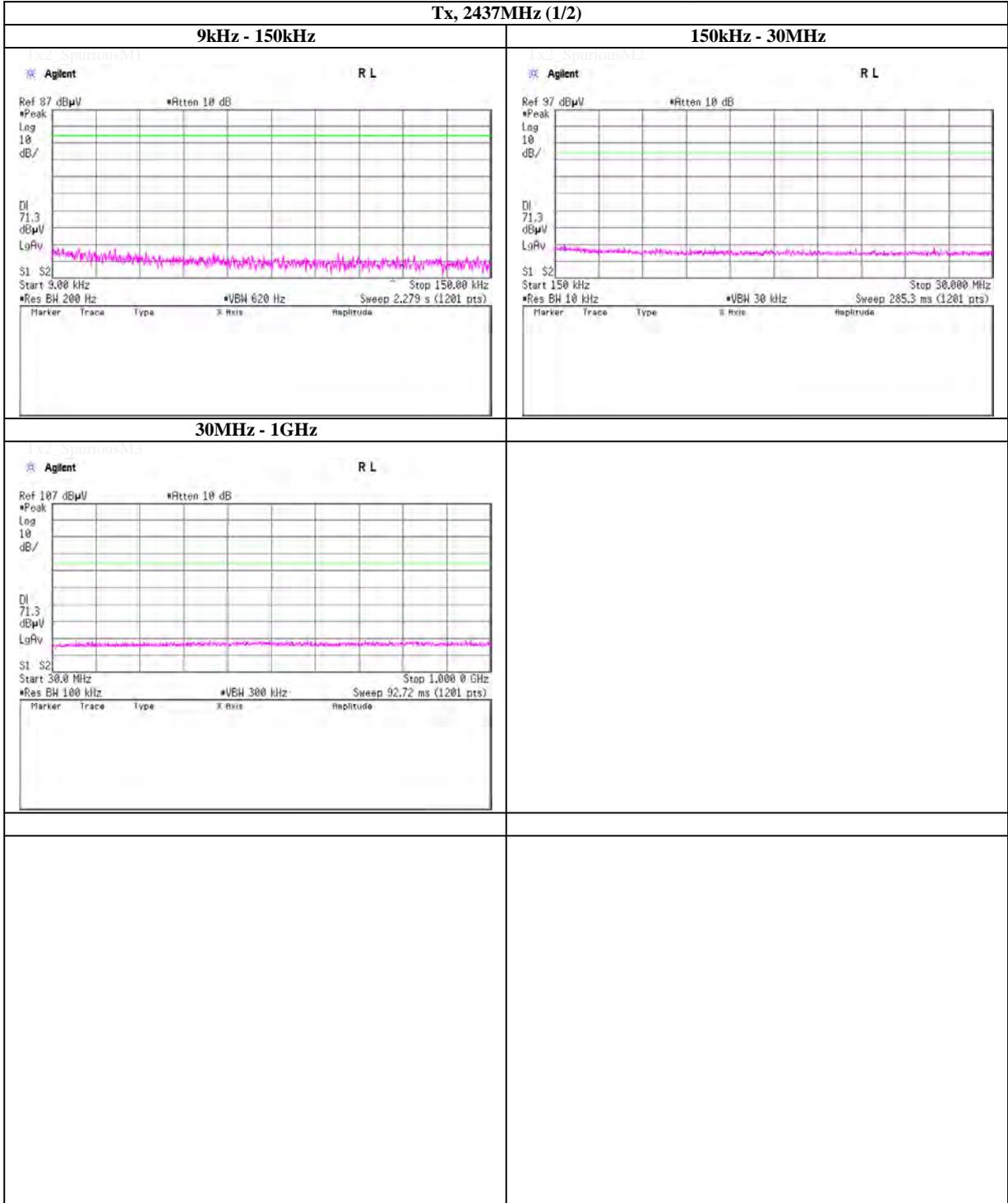
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**Spurious emission (Conducted)**

Tx, IEEE802.11b, PN9, worst data mode 5.5Mbps

Tx, 2437MHz (1/2)



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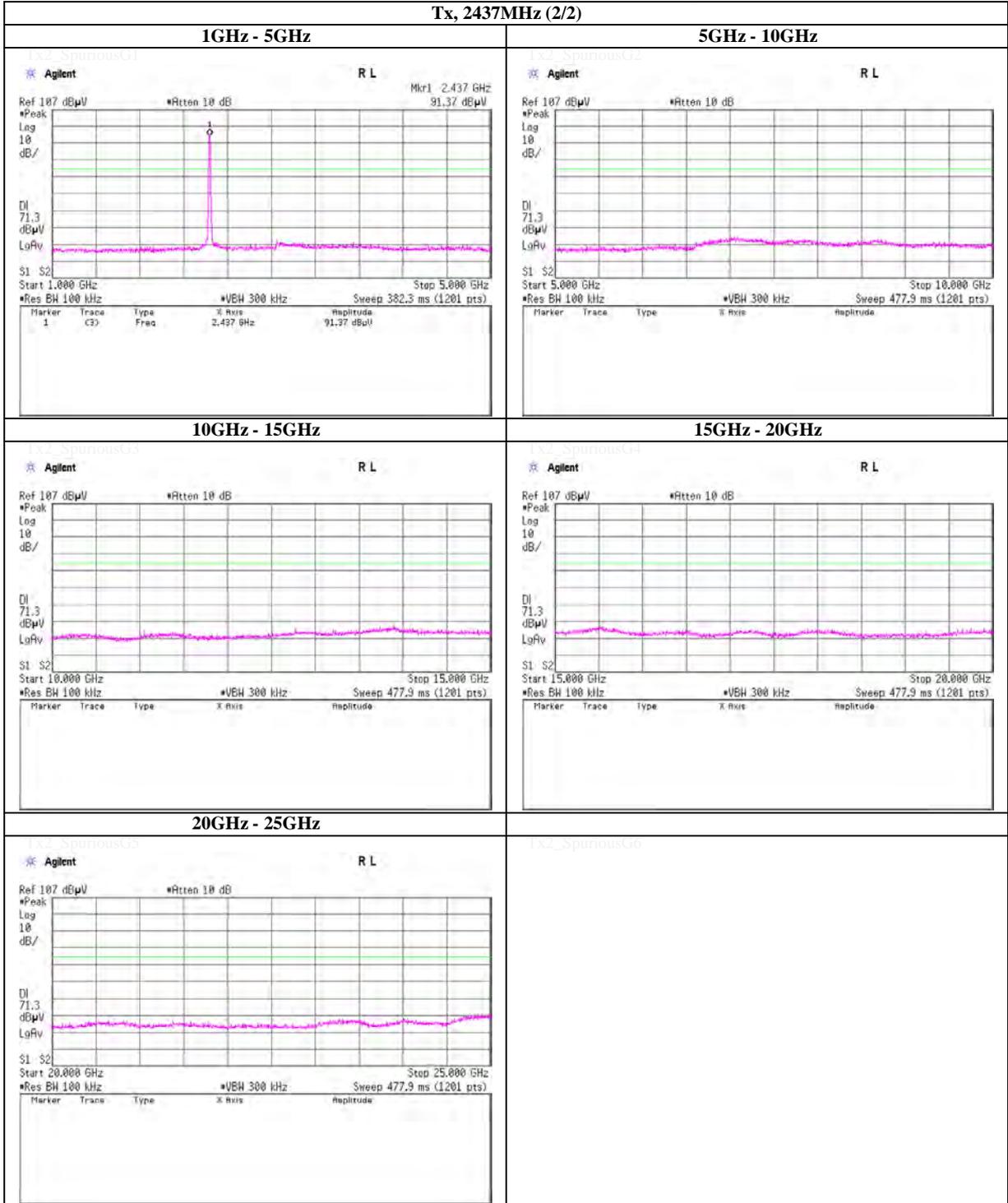
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**Spurious emission (Conducted)**

Tx, IEEE802.11b, PN9, worst data mode 5.5Mbps

Tx, 2437MHz (2/2)



**UL Japan, Inc.**

**Shonan EMC Lab.**

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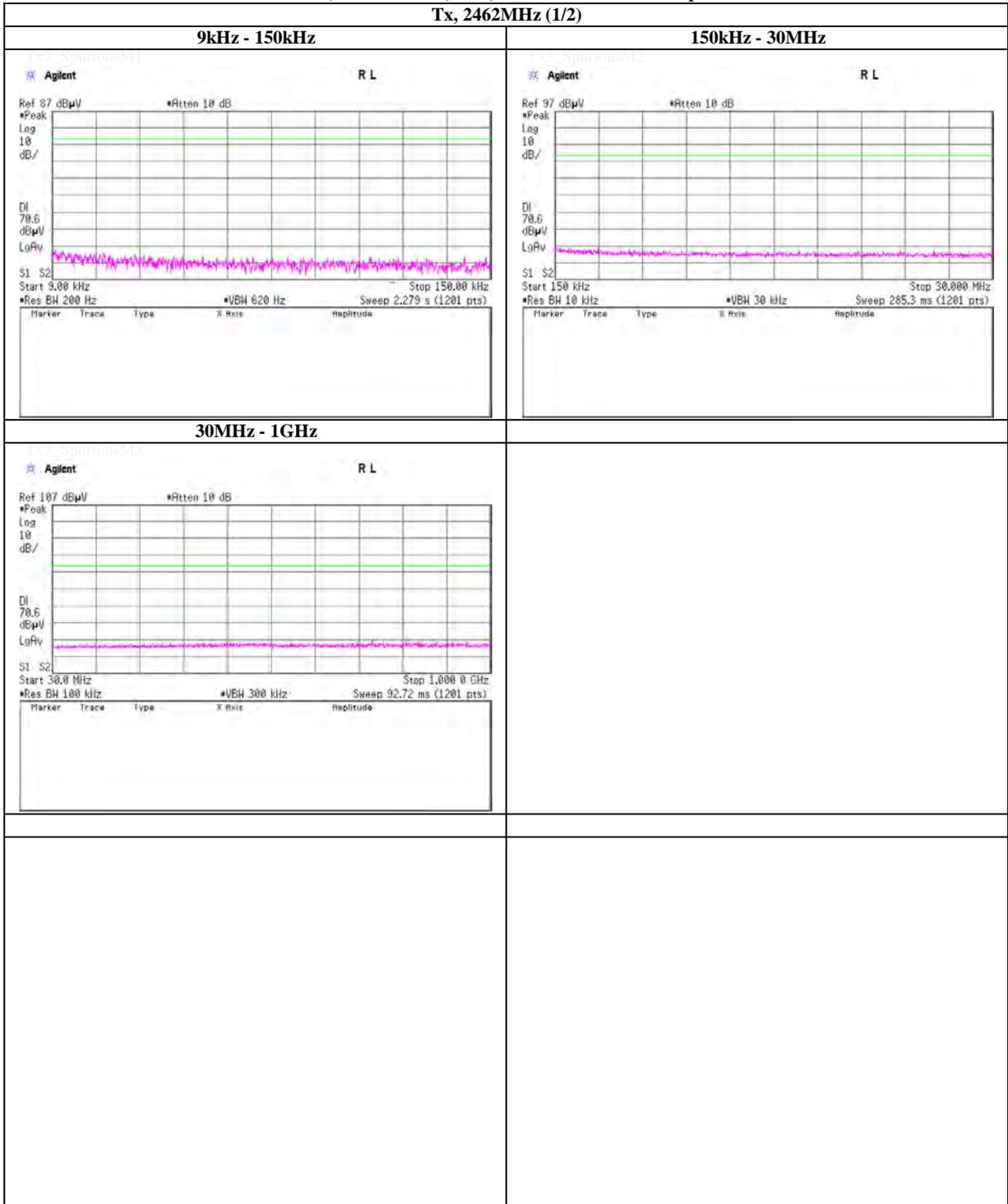
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Conducted)**

Tx, IEEE802.11b, PN9, worst data mode 5.5Mbps

Tx, 2462MHz (1/2)



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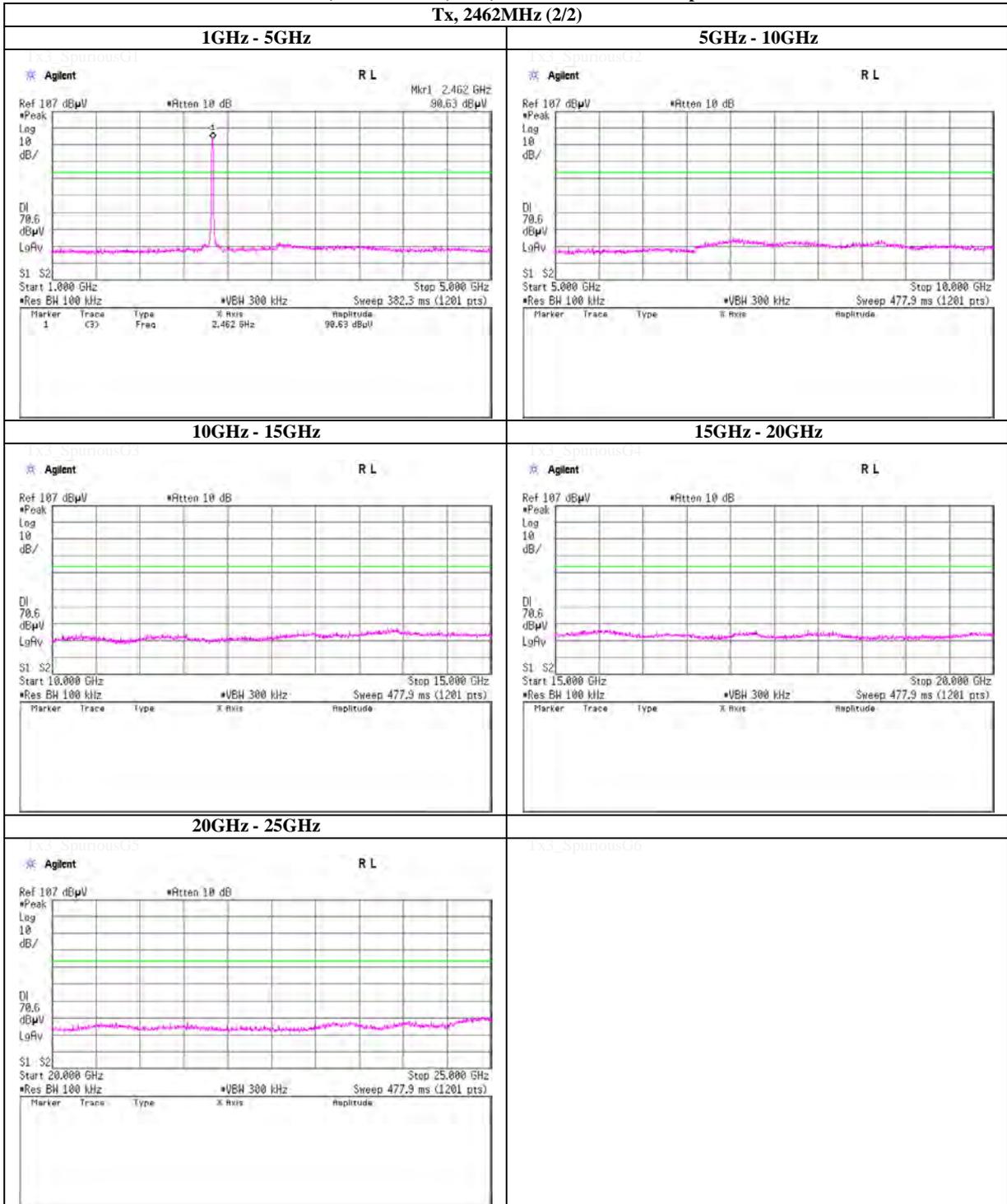
Telephone : +81 463 50 6400

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### Spurious emission (Conducted)

Tx, IEEE802.11b, PN9, worst data mode 5.5Mbps

Tx, 2462MHz (2/2)



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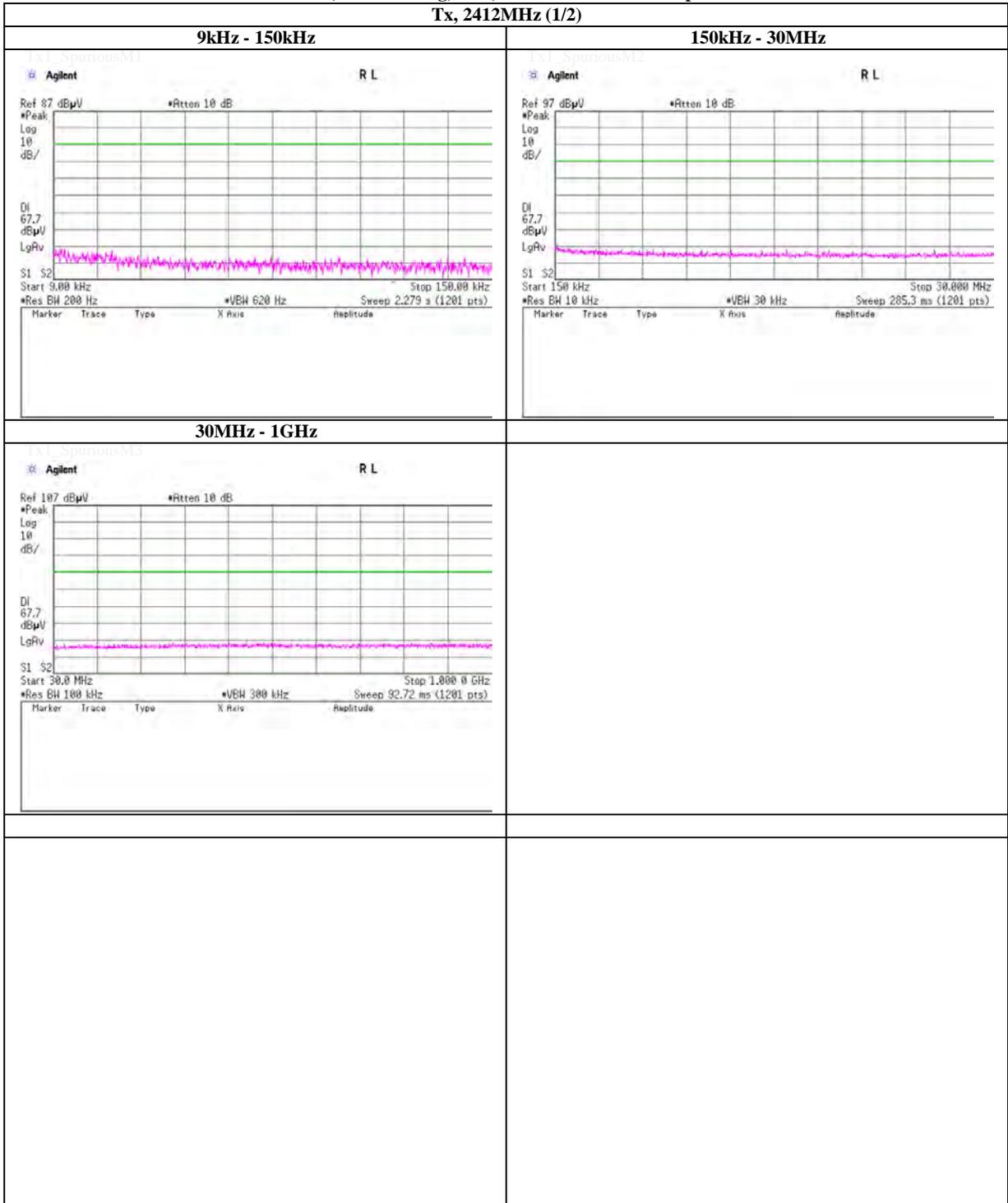
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Conducted)**

Tx, IEEE802.11g, PN9, worst data mode 24Mbps

Tx, 2412MHz (1/2)



**UL Japan, Inc.**

**Shonan EMC Lab.**

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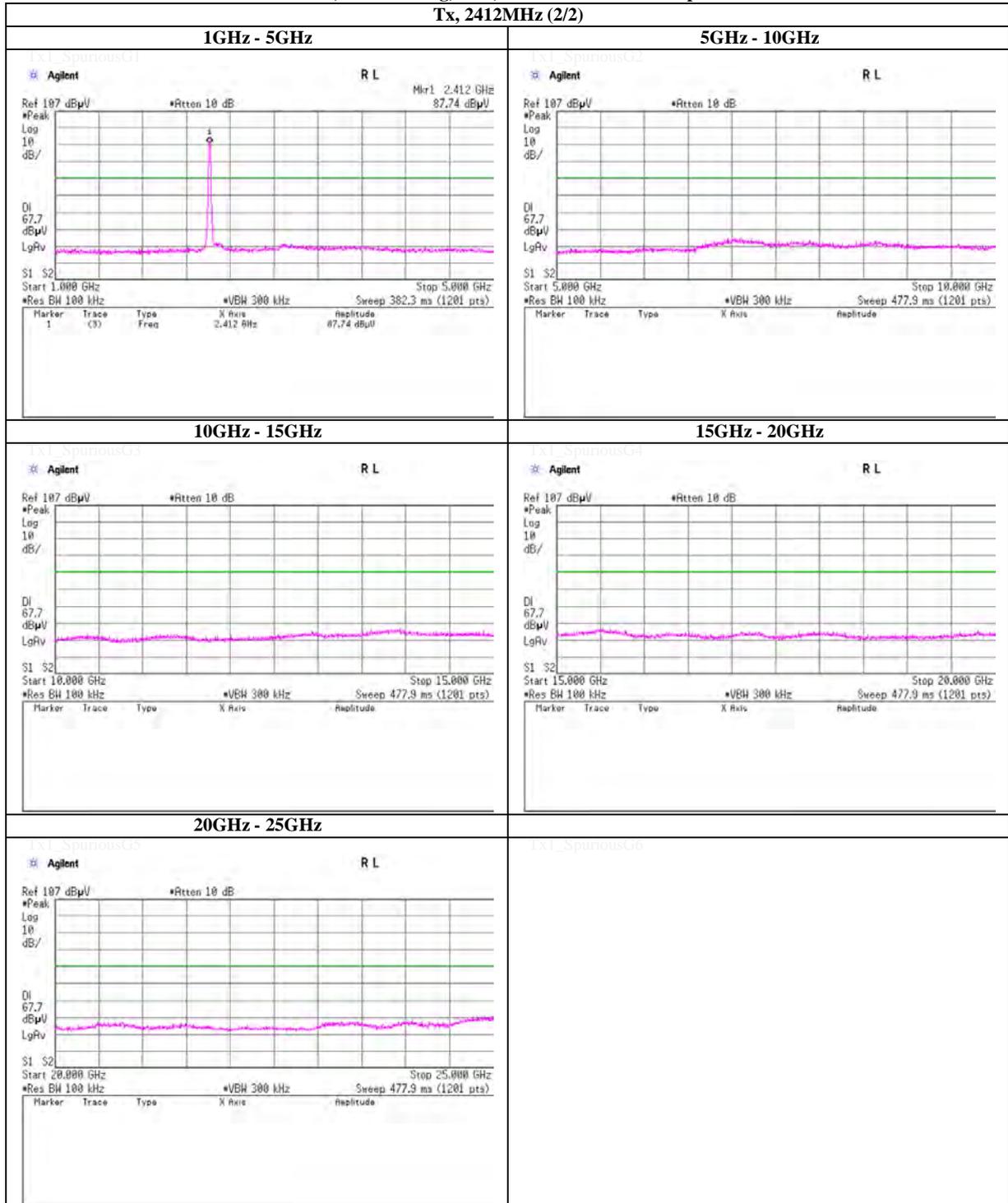
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

### Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 24Mbps

Tx, 2412MHz (2/2)



**UL Japan, Inc.**

**Shonan EMC Lab.**

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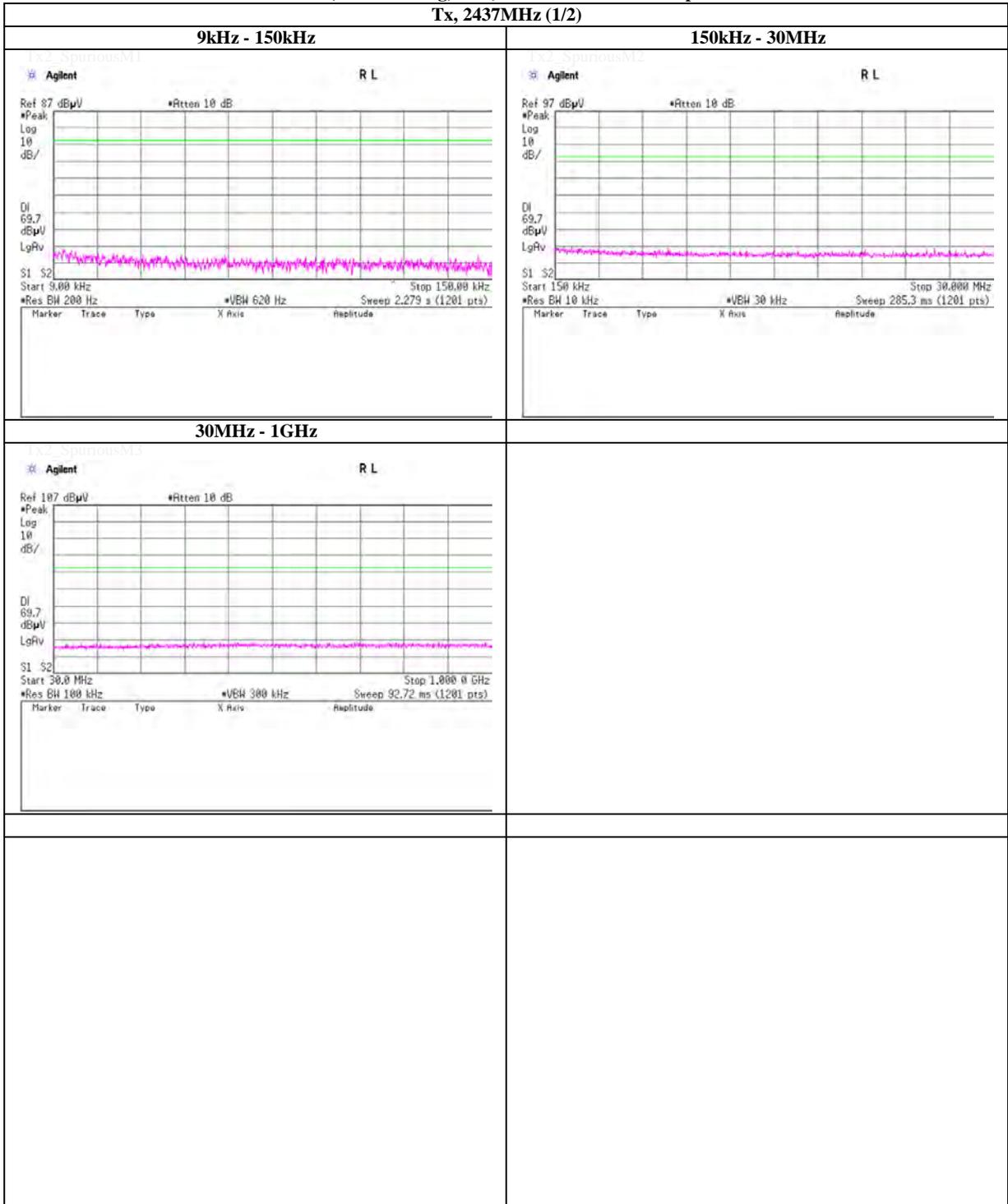
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Conducted)**

Tx, IEEE802.11g, PN9, worst data mode 24Mbps

Tx, 2437MHz (1/2)



**UL Japan, Inc.**

**Shonan EMC Lab.**

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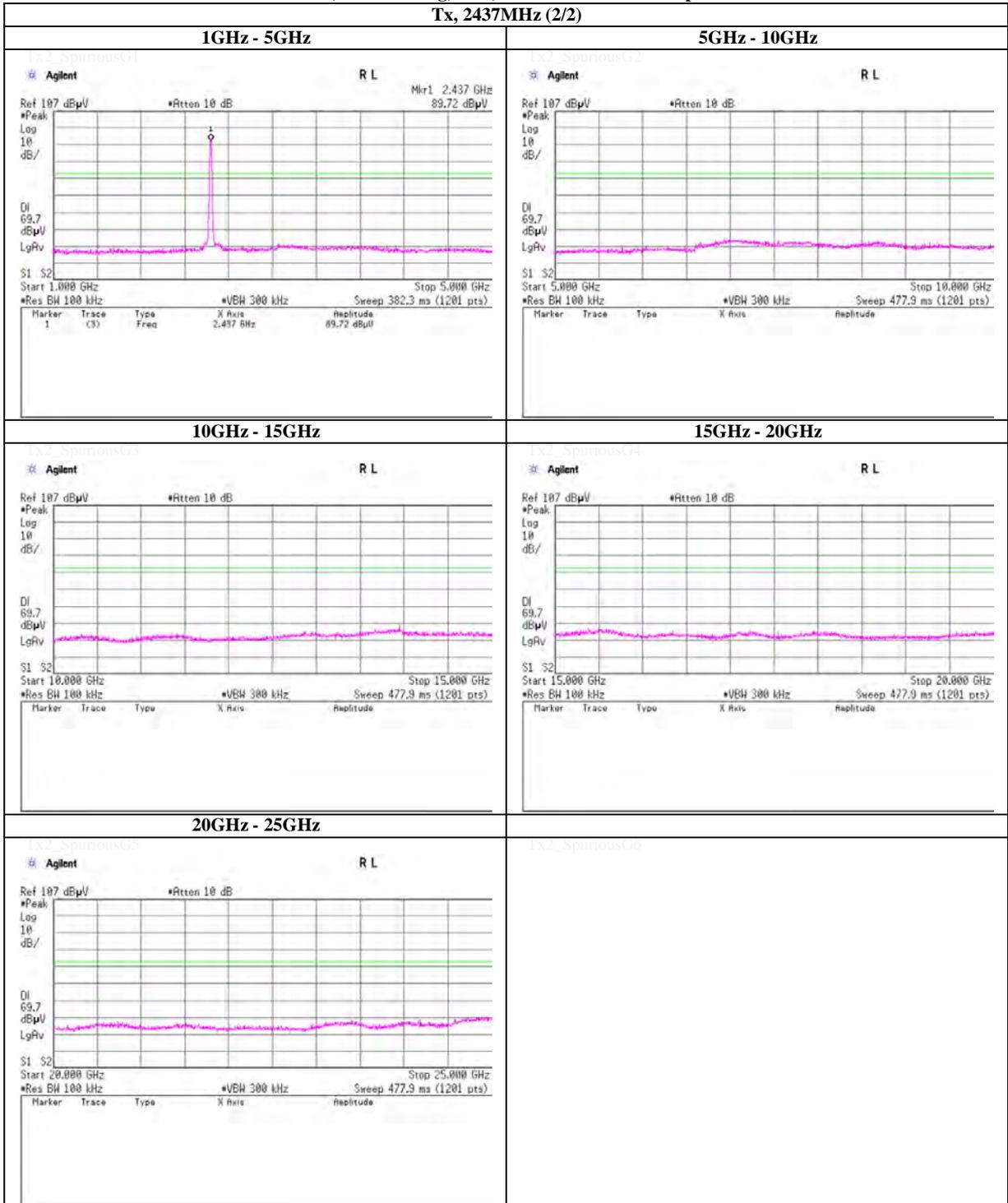
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Conducted)**

Tx, IEEE802.11g, PN9, worst data mode 24Mbps

Tx, 2437MHz (2/2)



**UL Japan, Inc.**

**Shonan EMC Lab.**

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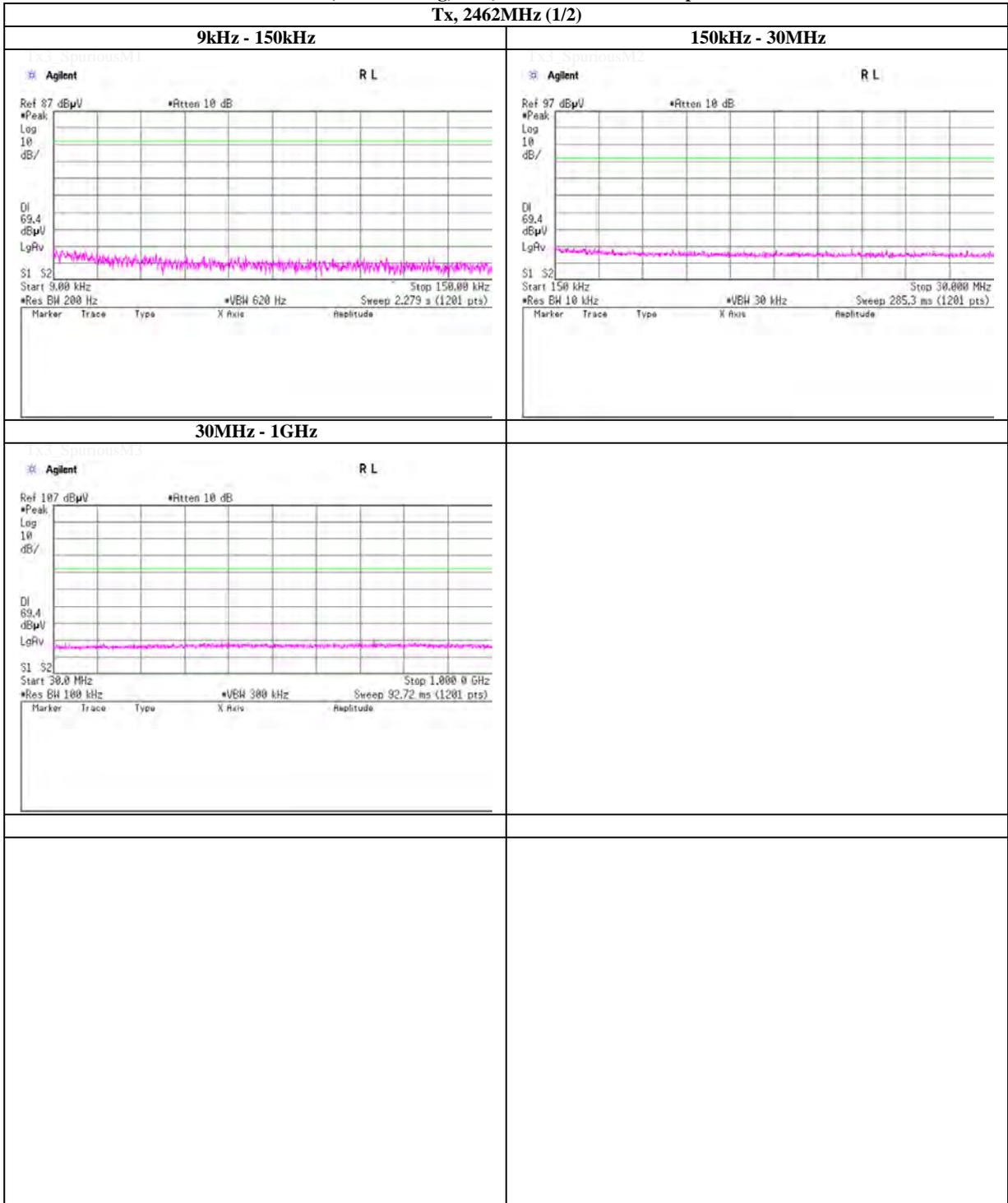
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Conducted)**

Tx, IEEE802.11g, PN9, worst data mode 24Mbps

Tx, 2462MHz (1/2)



**UL Japan, Inc.**

**Shonan EMC Lab.**

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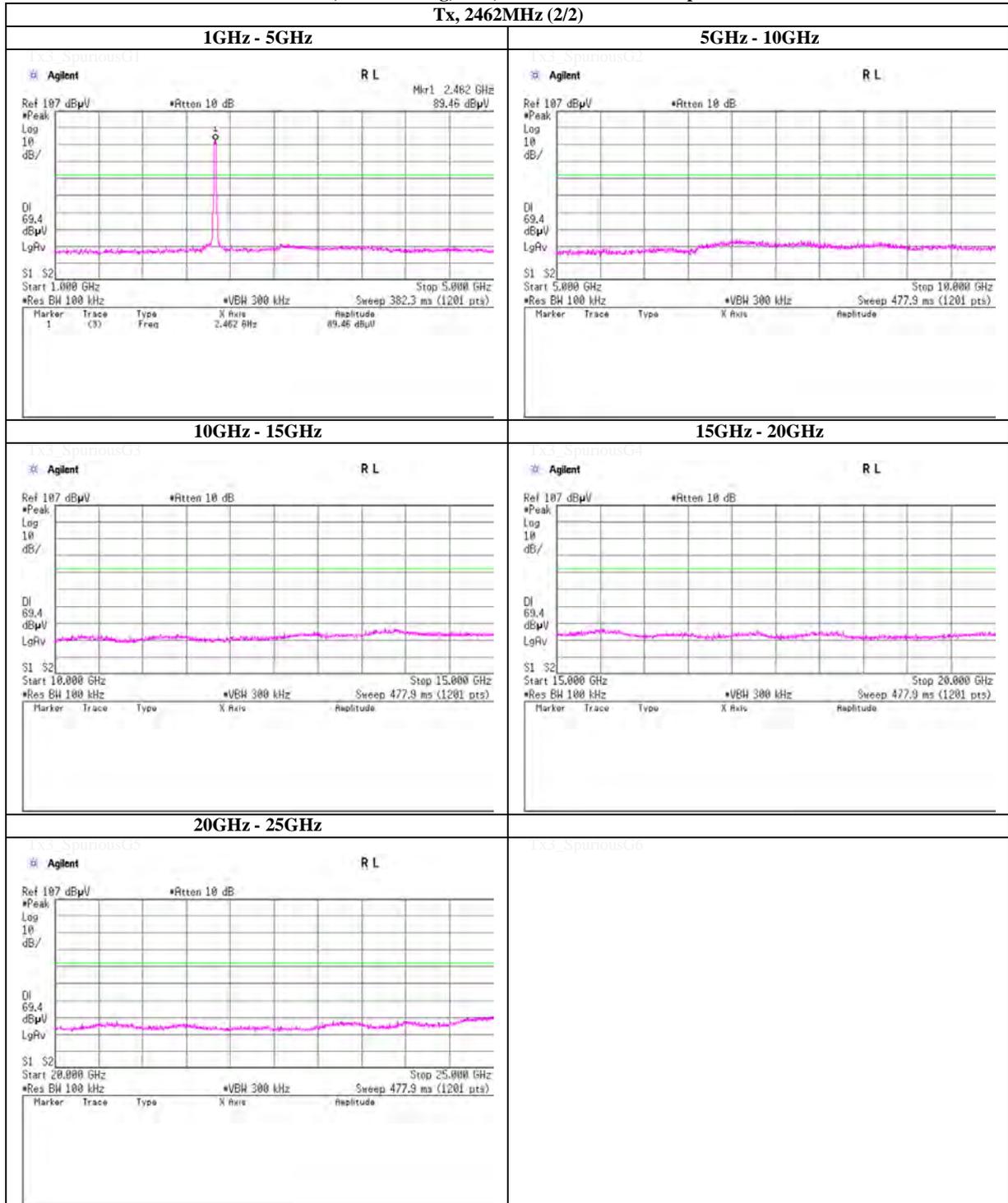
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**Spurious emission (Conducted)**

Tx, IEEE802.11g, PN9, worst data mode 24Mbps

Tx, 2462MHz (2/2)



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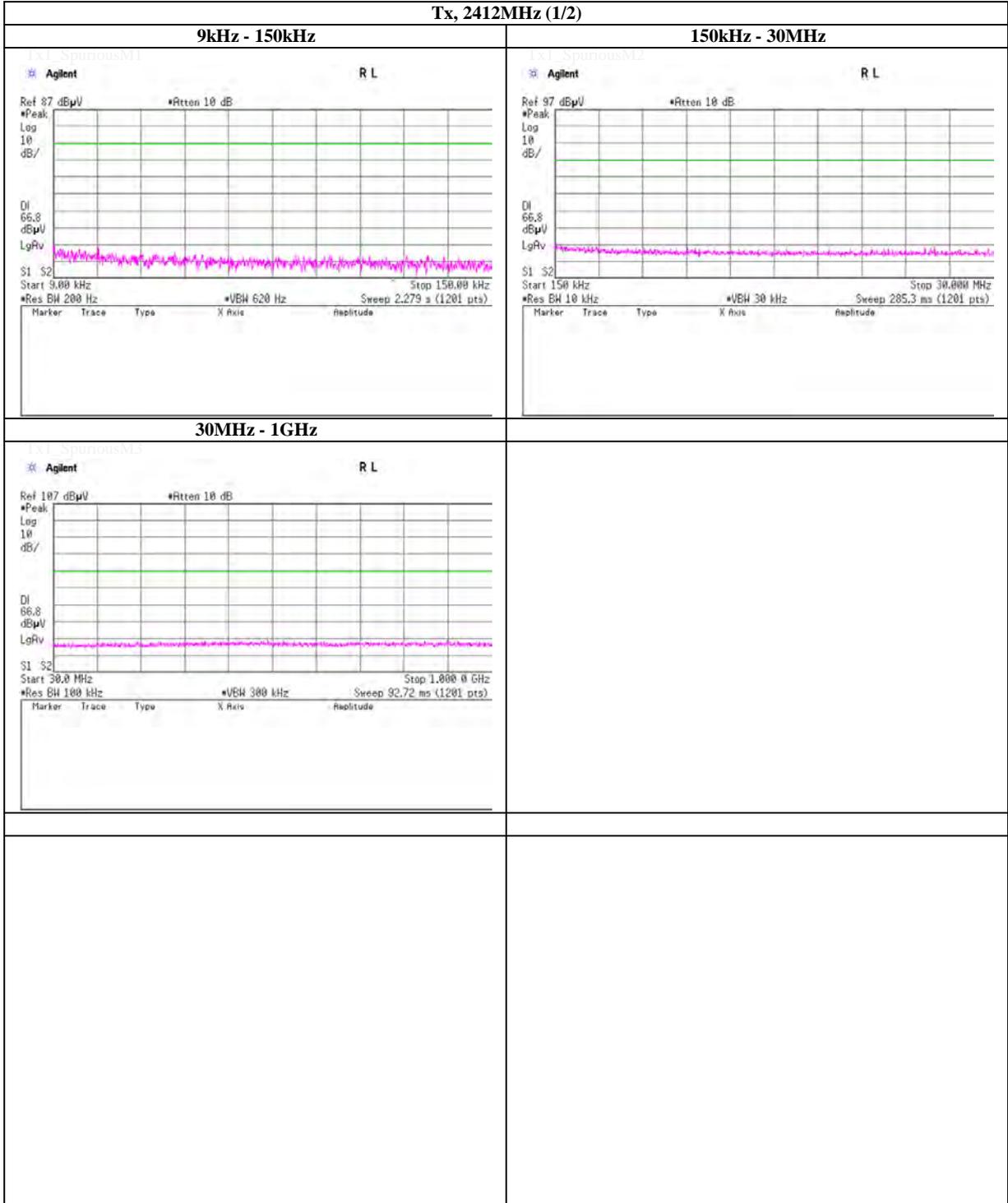
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Conducted)**

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

Tx, 2412MHz (1/2)



**UL Japan, Inc.**

**Shonan EMC Lab.**

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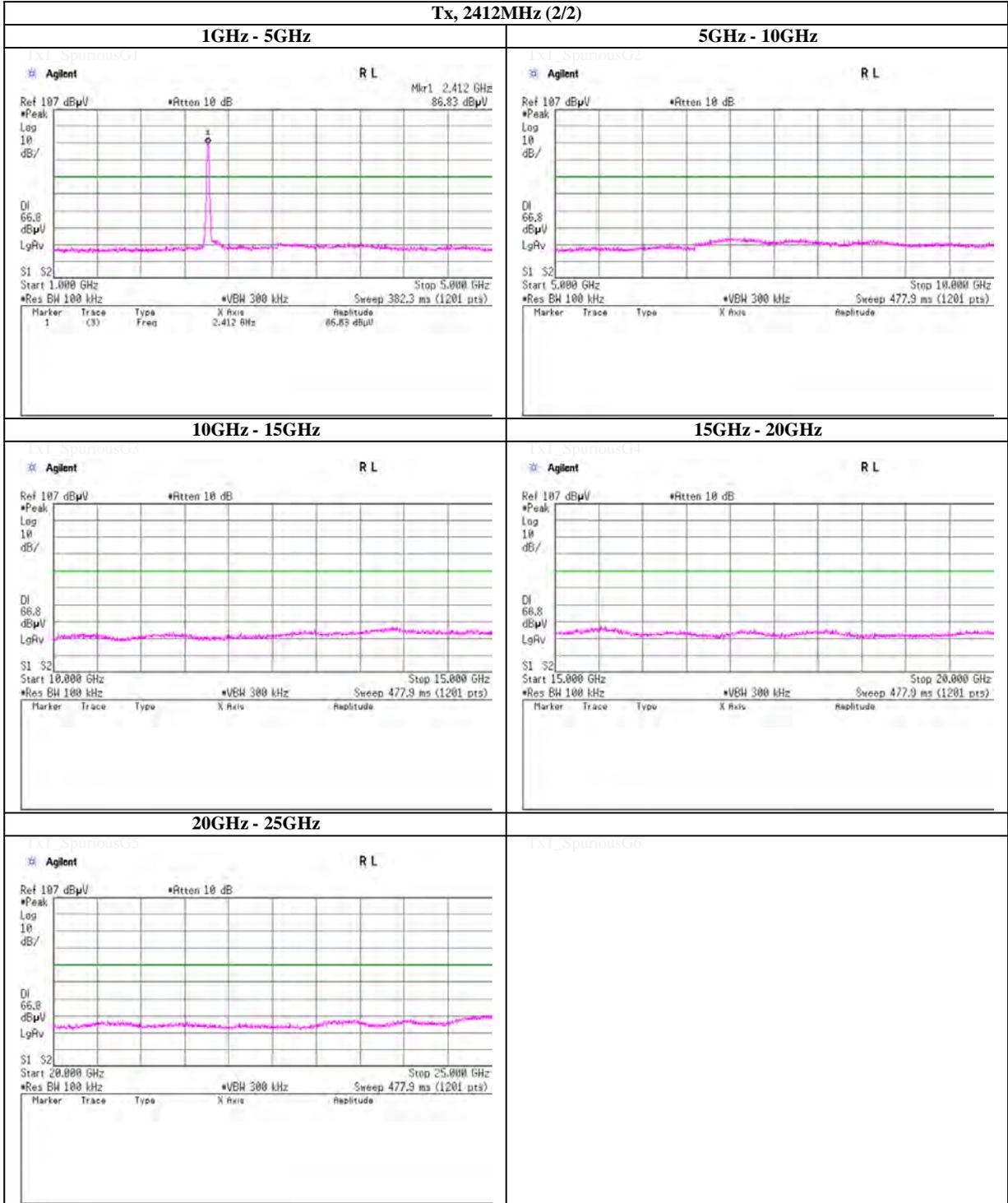
Telephone : +81 463 50 6400

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**Spurious emission (Conducted)**

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

**Tx, 2412MHz (2/2)**



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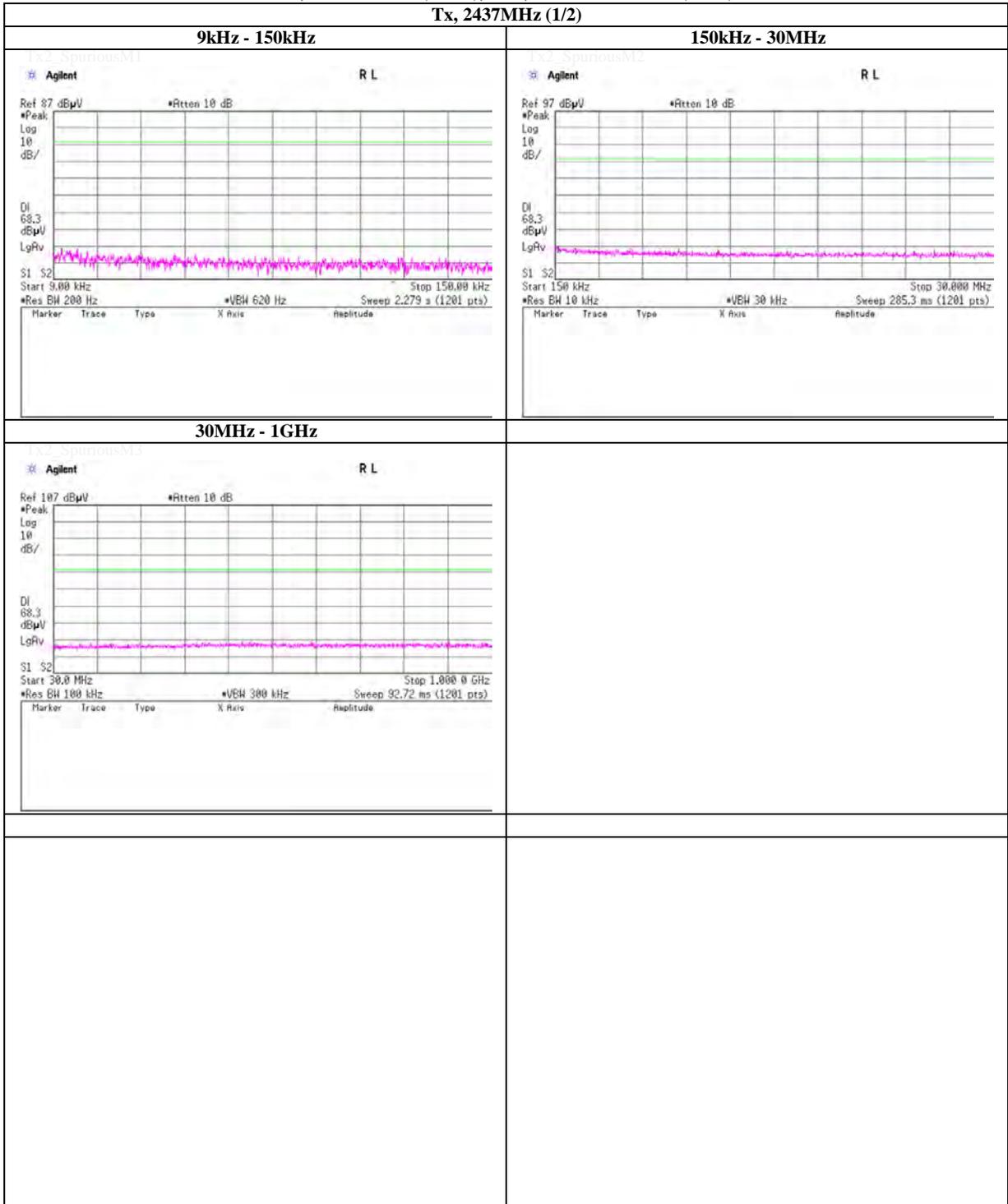
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Conducted)**

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

**Tx, 2437MHz (1/2)**



**UL Japan, Inc.**

**Shonan EMC Lab.**

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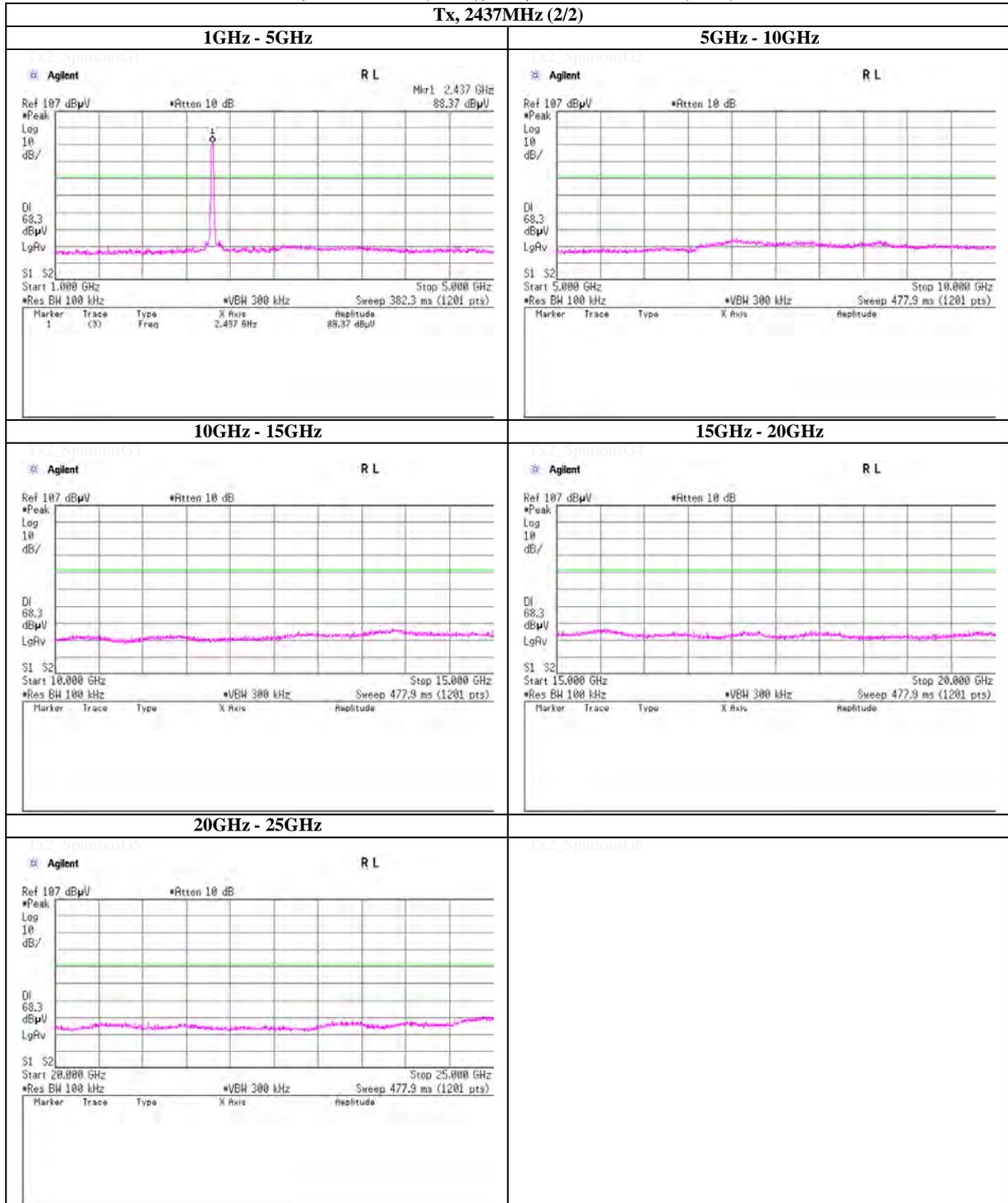
Telephone : +81 463 50 6400

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**Spurious emission (Conducted)**

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

**Tx, 2437MHz (2/2)**



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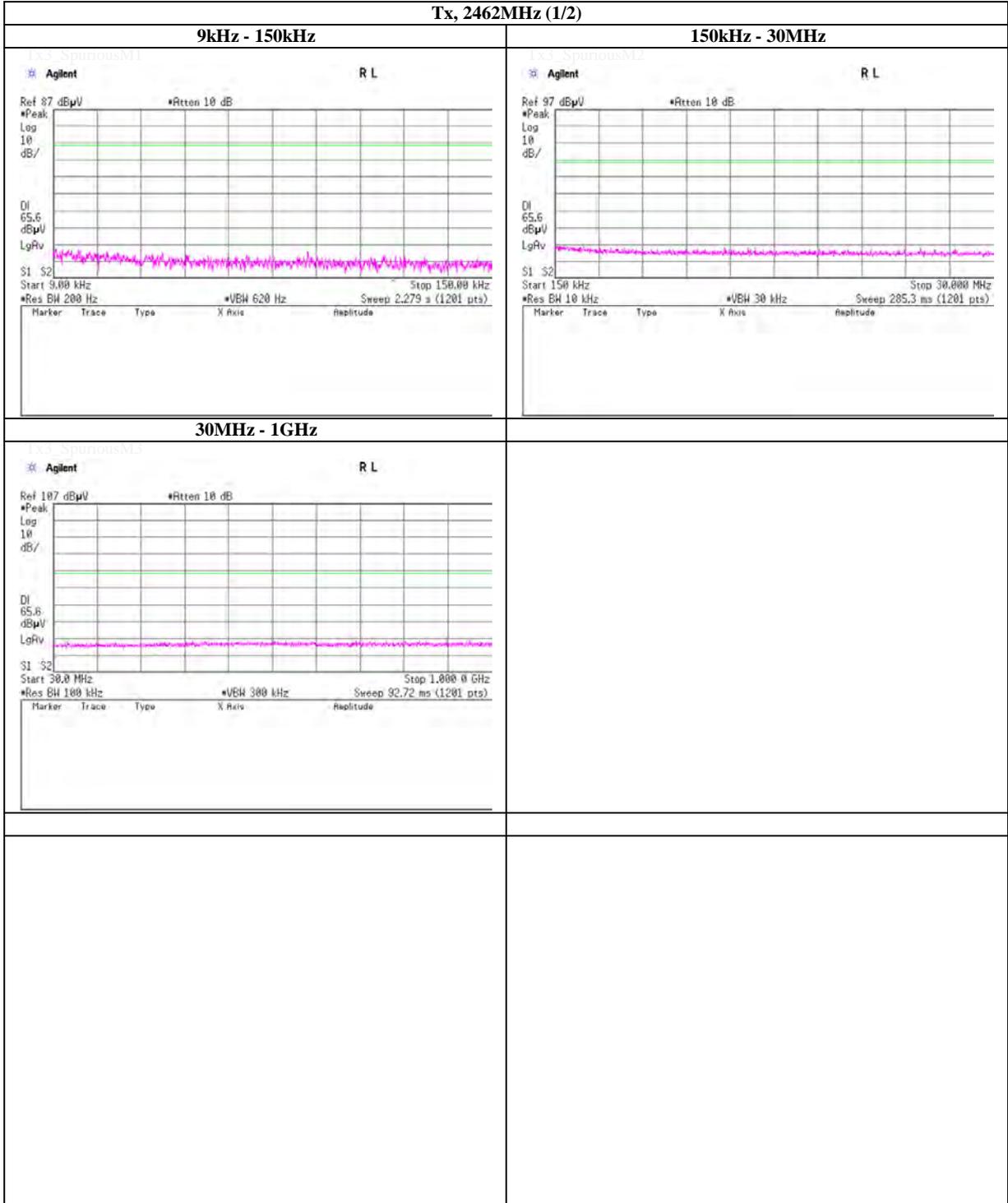
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

**Spurious emission (Conducted)**

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

Tx, 2462MHz (1/2)



**UL Japan, Inc.**

**Shonan EMC Lab.**

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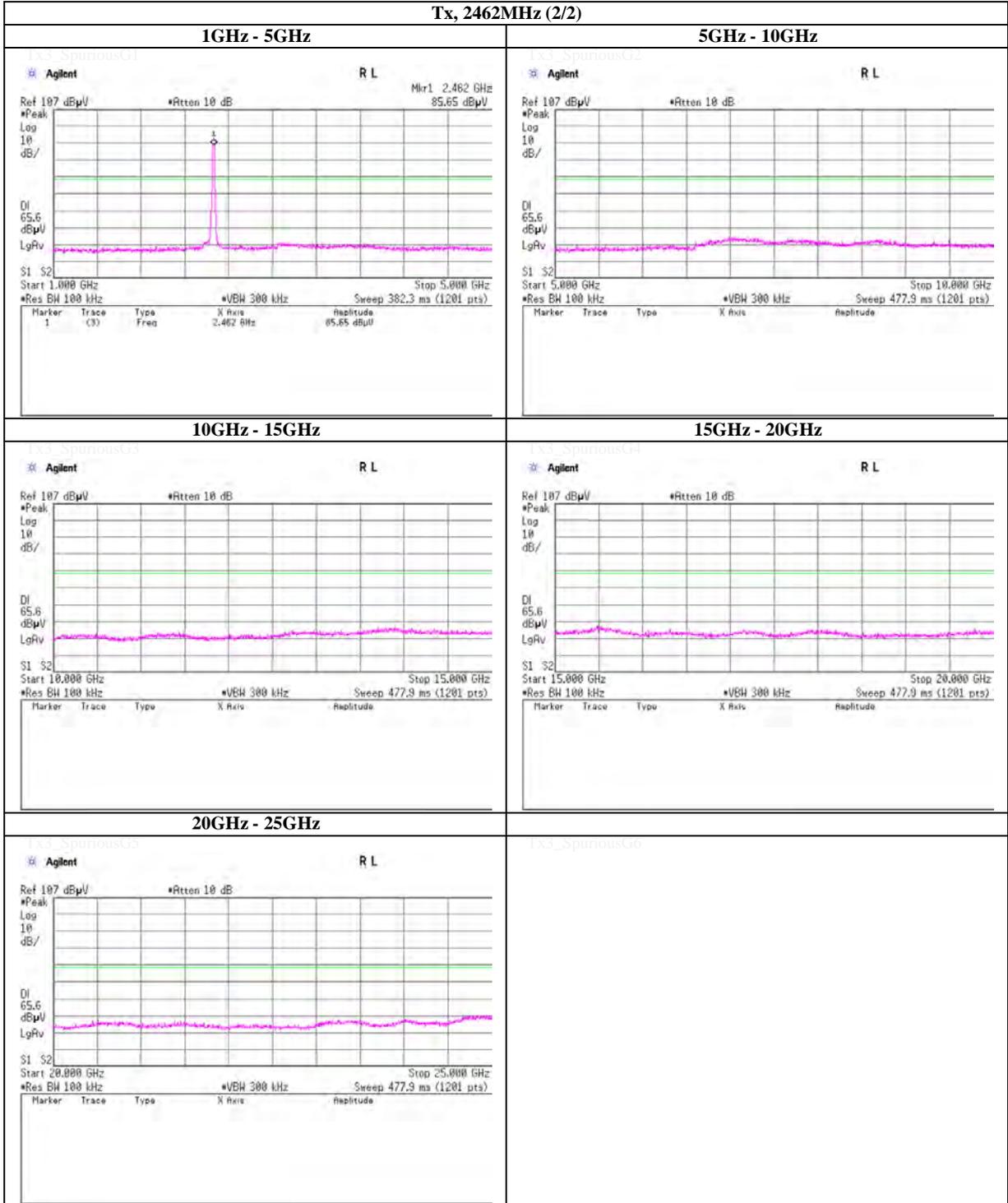
Telephone : +81 463 50 6400

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**Spurious emission (Conducted)**

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

**Tx, 2462MHz (2/2)**



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**Shonan EMC Lab.**

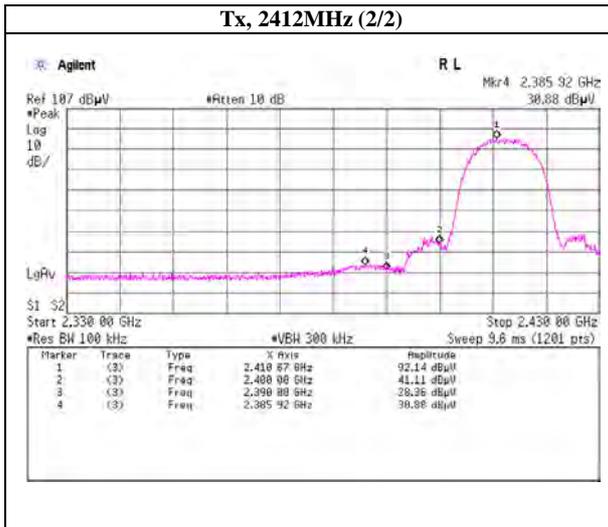
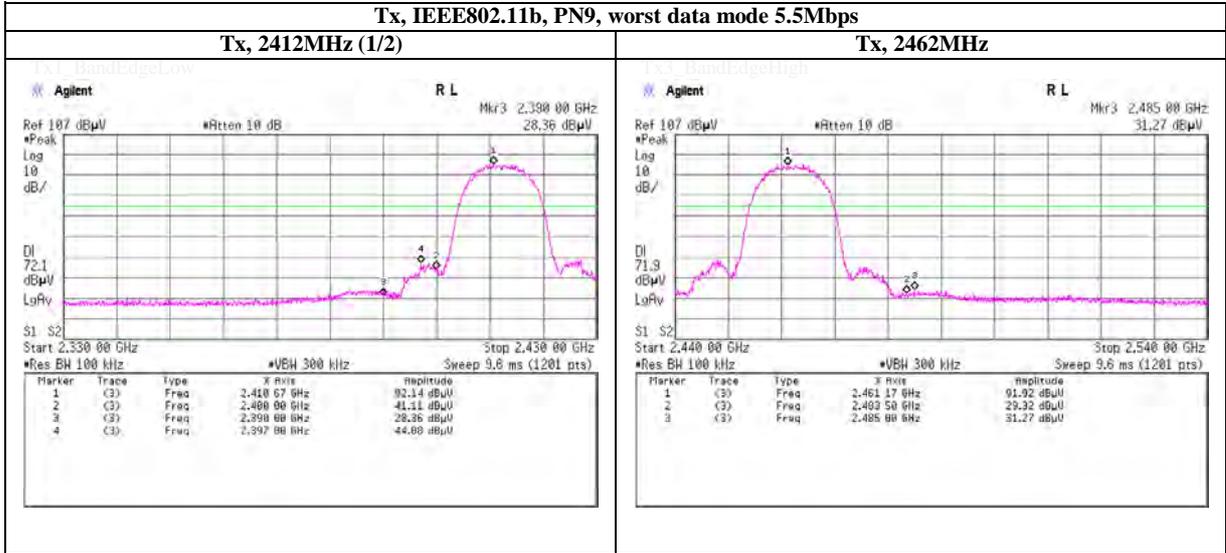
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Telephone : +81 463 50 6400

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## Spurious emission (Conducted)

### Band Edge compliance



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**Shonan EMC Lab.**

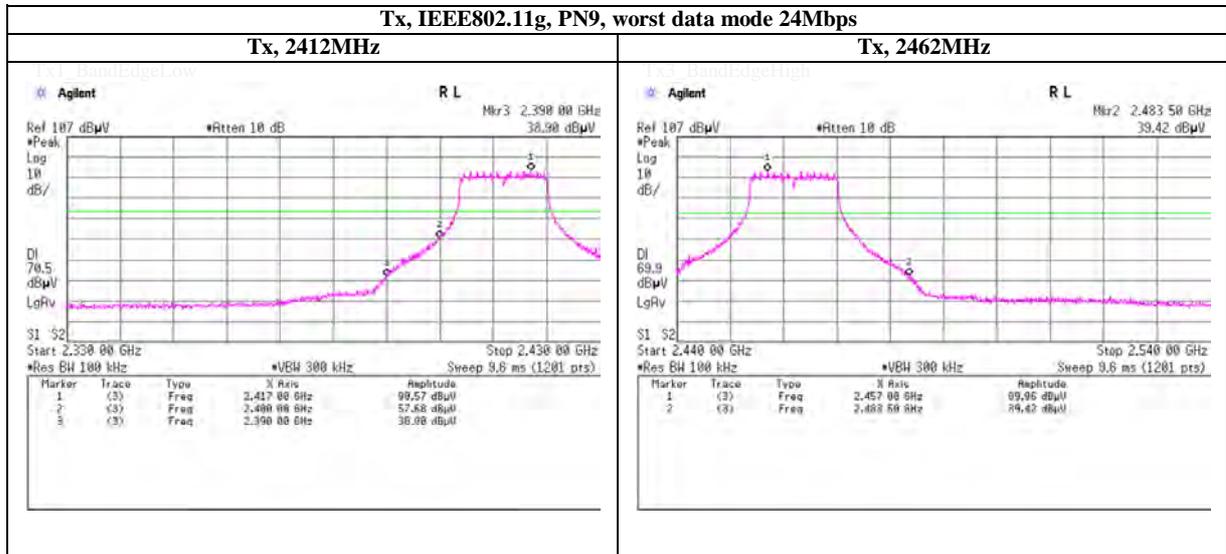
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

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## Spurious emission (Conducted)

### Band Edge compliance



**UL Japan, Inc.**

**Shonan EMC Lab.**

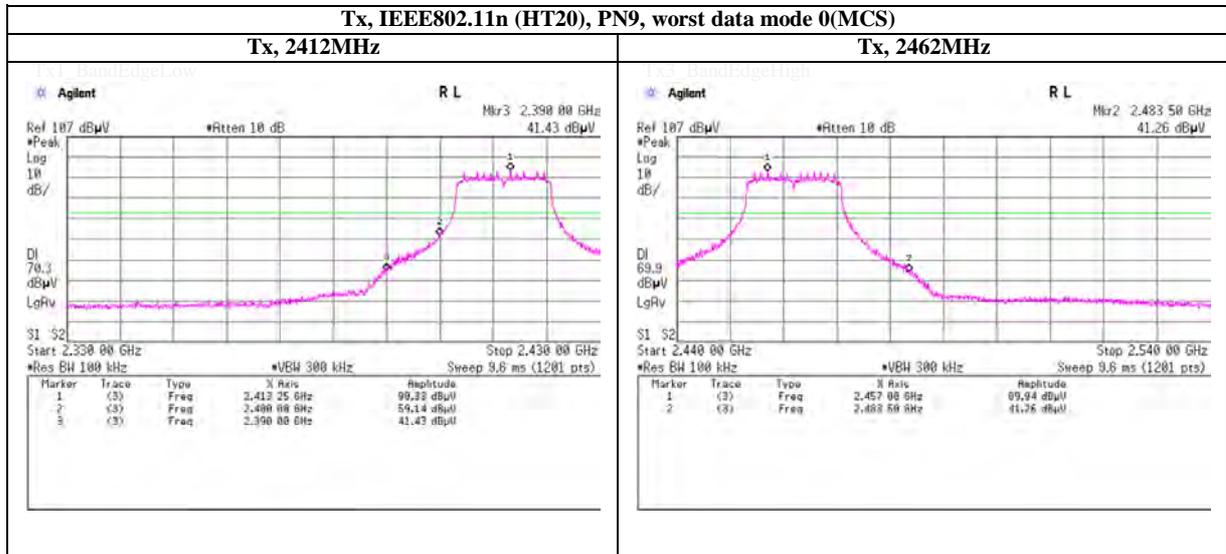
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

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## Spurious emission (Conducted)

### Band Edge compliance



**UL Japan, Inc.**

**Shonan EMC Lab.**

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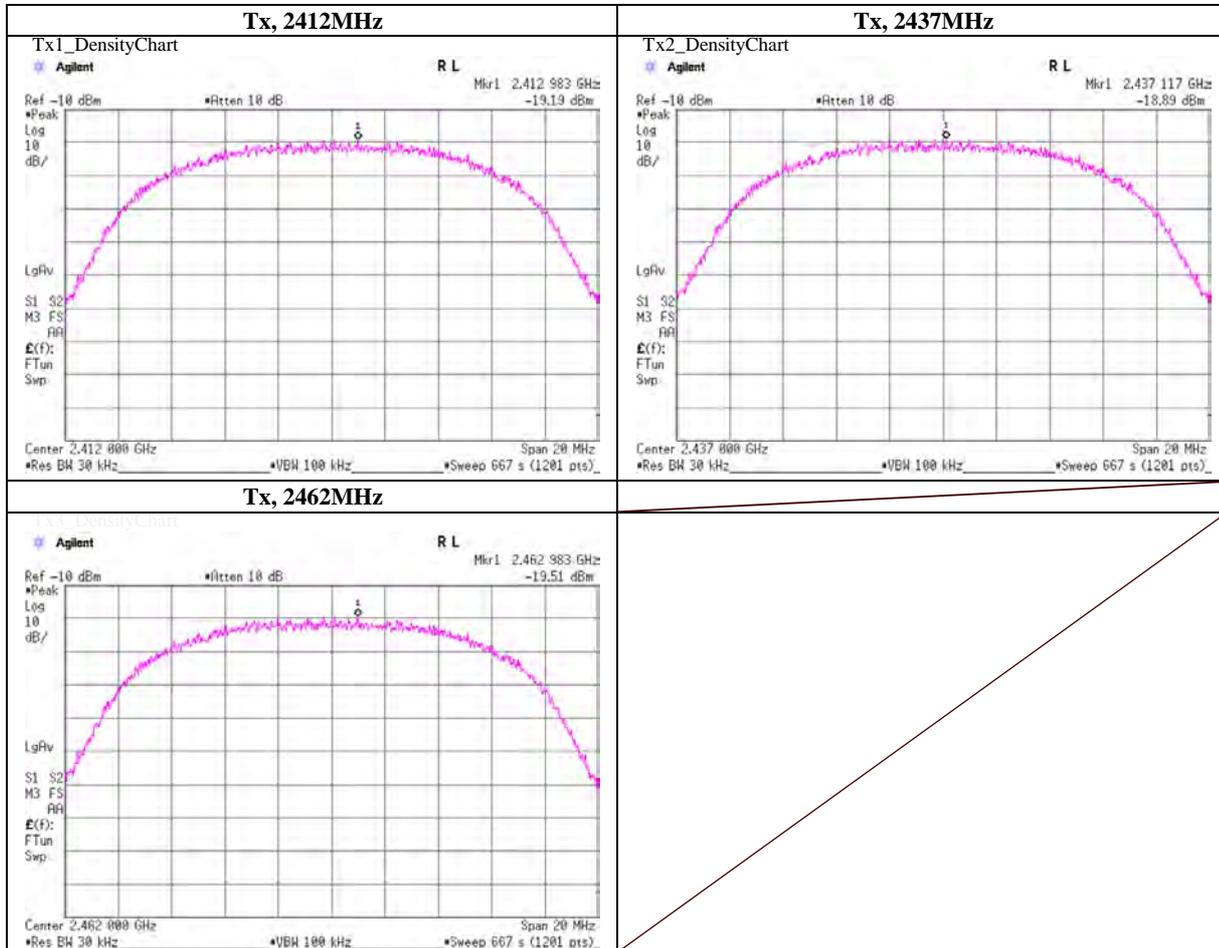
Facsimile : +81 463 50 6401

### Power Density

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	June 18, 2012	
Temperature / Humidity	26deg.C , 69%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11b, PN9, worst data mode 5.5Mbps	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2412.98	-19.20	1.76	10.00	-7.44	8.00	15.44
2437.0000	2437.12	-18.89	1.77	10.00	-7.12	8.00	15.12
2462.0000	2462.98	-19.51	1.78	10.00	-7.73	8.00	15.73

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



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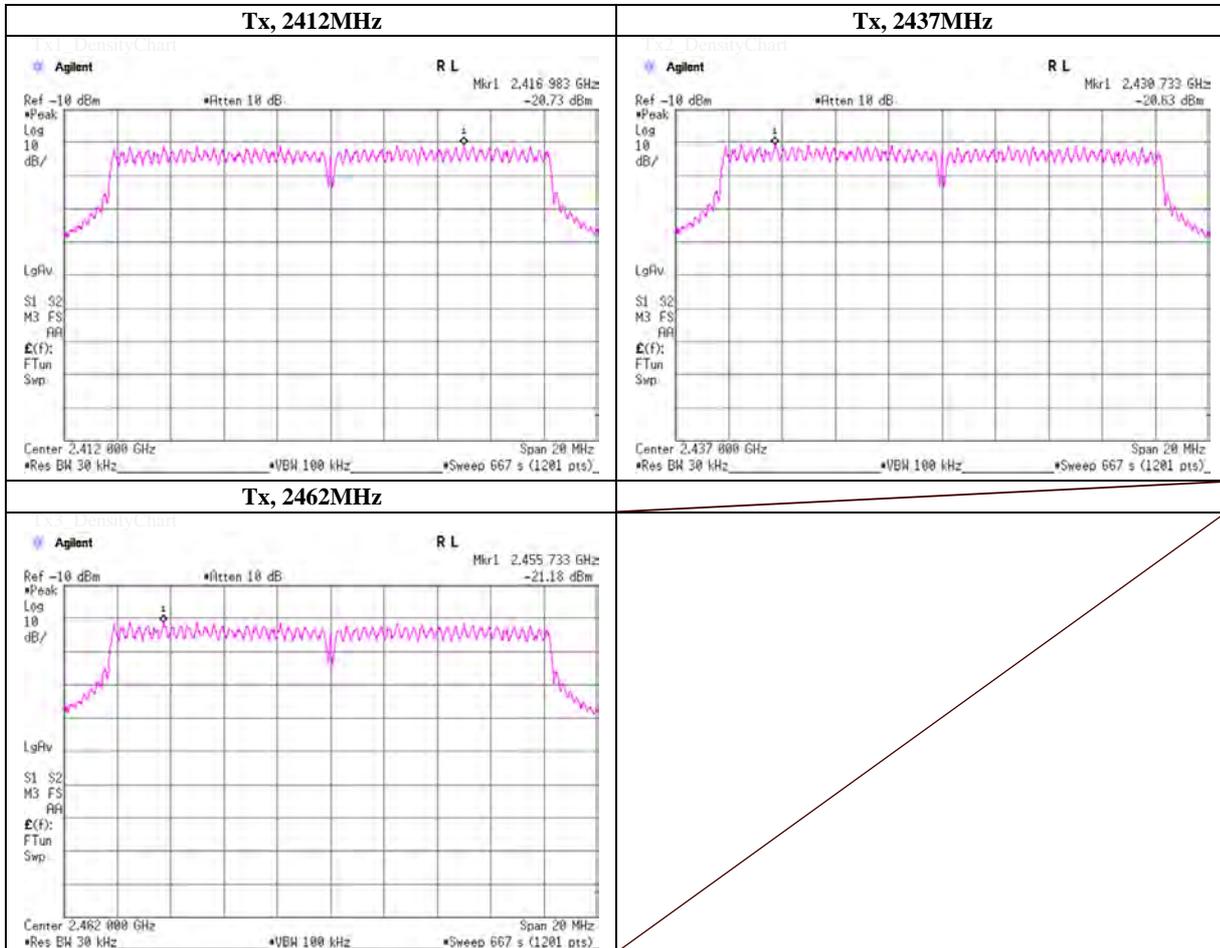
### Power Density

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	June 18, 2012	
Temperature / Humidity	26deg.C , 69%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11g, PN9, worst data mode 24Mbps	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2416.98	-20.73	1.76	10.00	-8.97	8.00	16.97
2437.0000	2430.73	-20.63	1.77	10.00	-8.86	8.00	16.86
2462.0000	2455.73	-21.18	1.78	10.00	-9.40	8.00	17.40

Sample Calculation:

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



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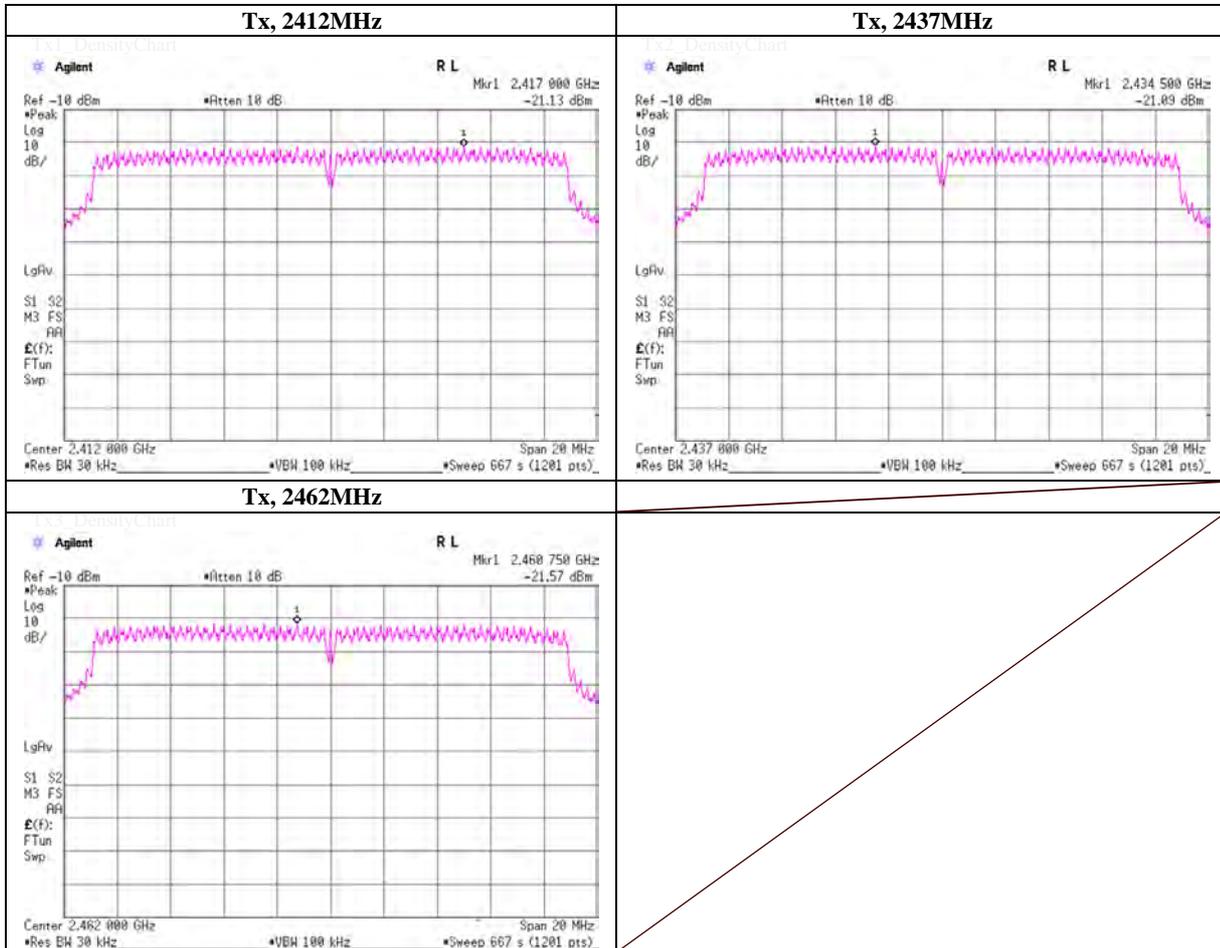
### Power Density

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	June 18, 2012	
Temperature / Humidity	26deg.C , 69%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2417.00	-21.13	1.76	10.00	-9.37	8.00	17.37
2437.0000	2434.50	-21.09	1.77	10.00	-9.32	8.00	17.32
2462.0000	2460.75	-21.57	1.78	10.00	-9.79	8.00	17.79

Sample Calculation:

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



**UL Japan, Inc.**

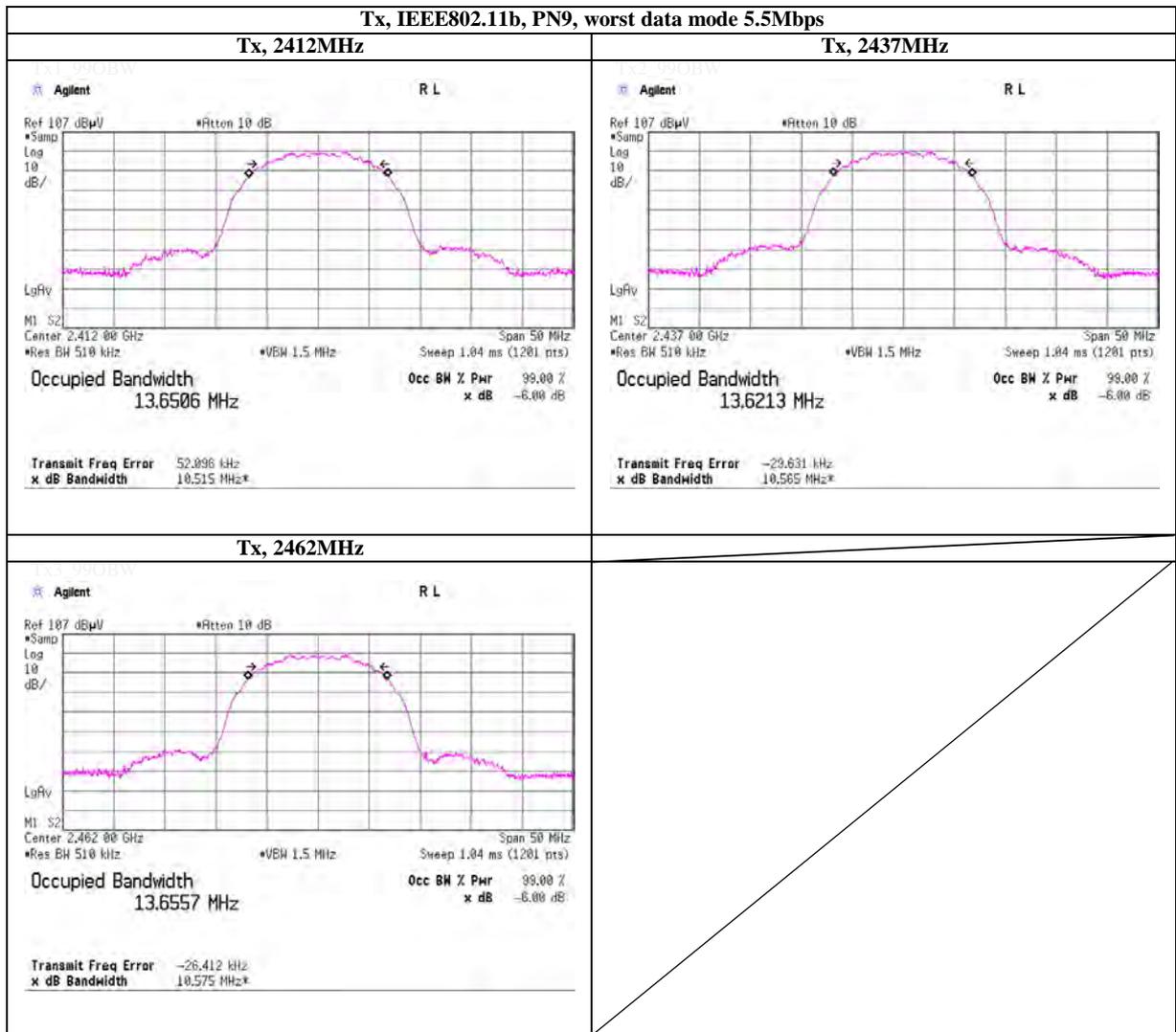
**Shonan EMC Lab.**

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### 99% Occupied Bandwidth



**UL Japan, Inc.**

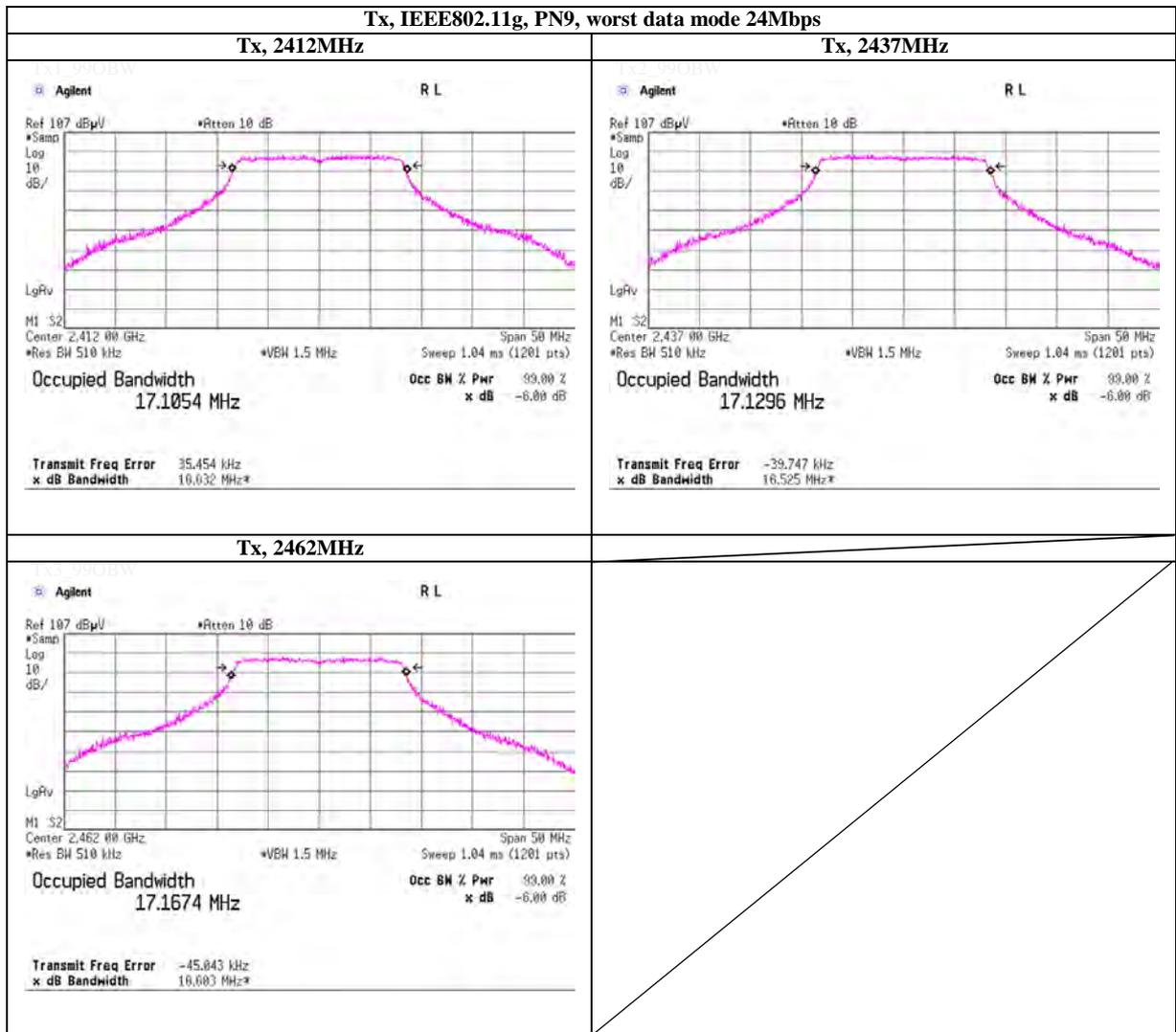
**Shonan EMC Lab.**

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### 99% Occupied Bandwidth



**UL Japan, Inc.**

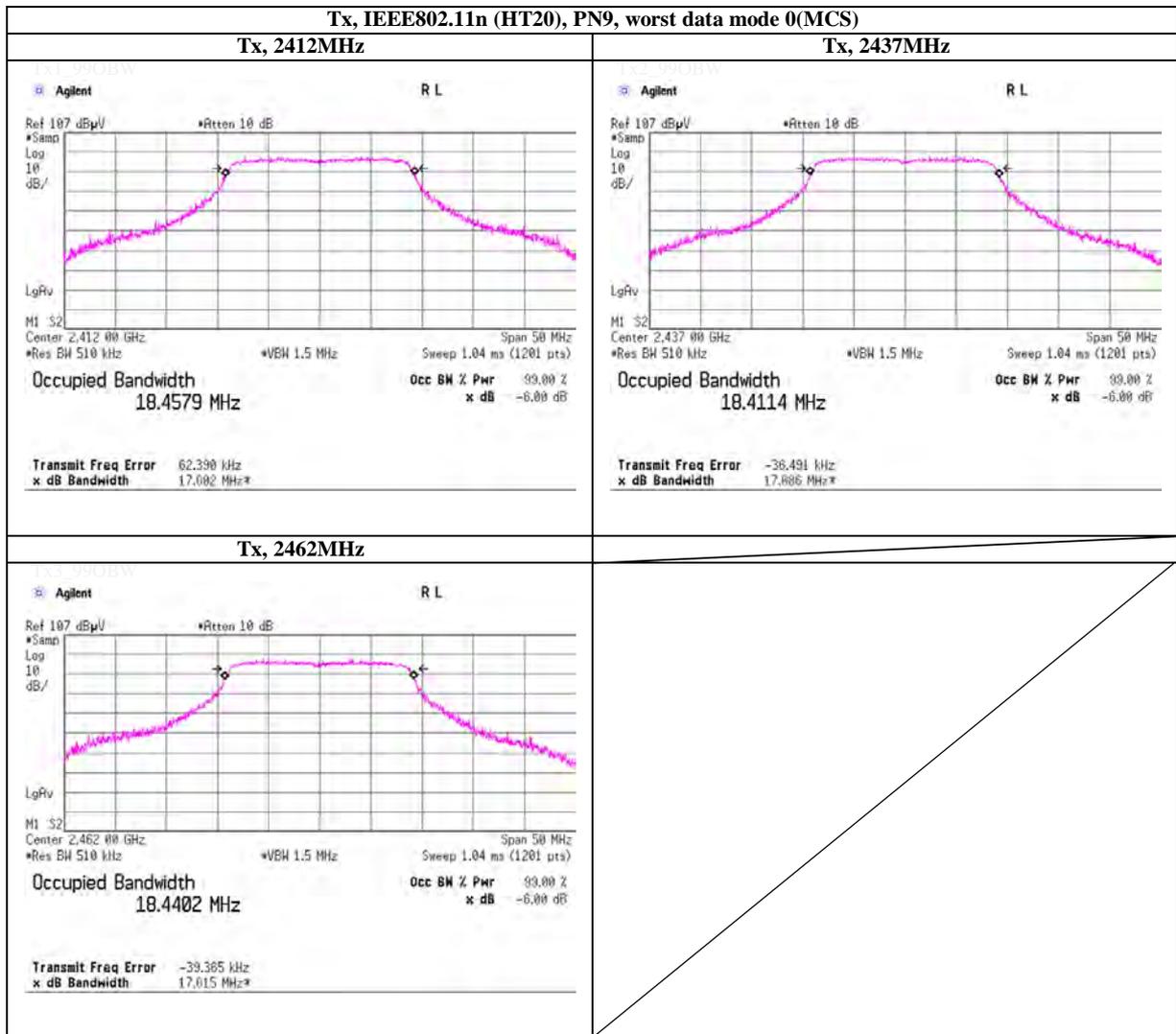
**Shonan EMC Lab.**

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### 99% Occupied Bandwidth



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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)
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2012/04/19 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2012/04/19 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT	2012/02/16 * 12
SAT10-11	Attenuator	Weinschel Corp.	54A-10	37588	AT	2012/04/06 * 12
SCC-G13	Coaxial Cable	Suhner	SUCOFLEX 102	31599/2	AT	2012/03/12 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2012/03/26 * 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/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
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2012/02/06 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE	2012/02/07 * 12
SJM-10	Measure	PROMART	SEN1935	-	RE	-
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2011/09/23 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTQ-DV(RE,CE, RFI,MF)	-	RE	-
SAF-05	Pre Amplifier	TOYO Corporation	TPA0118-36	1440490	RE	2012/03/12 * 12
SCC-G02	Coaxial Cable	Suhner	SUCOFLEX 104A	46498/4A	RE	2012/04/10 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2012/05/22 * 12
SHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	RE	2011/08/28 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2012/02/06 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2012/03/16 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2011/12/27 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2011/12/27 * 12
SCC-G17	Coaxial Cable	Suhner	SUCOFLEX 104A	46291/4A	RE	2012/03/12 12
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

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 conducted tests ,

**APPENDIX 2**  
**Test Instruments**

**EMI test equipment**

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SCC-B12/B13/SRSE-02	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-270(RF Selector)	CE	2012/04/10 * 12
SLS-03	LISN	Rohde & Schwarz	ENV216	100513	CE(EUT)	2012/02/23 * 12
SLS-04	LISN	Rohde & Schwarz	ENV216	100514	CE(AE)	2012/02/20 * 12
SAT3-05	Attenuator	JFW	50HF-003N	-	CE	2012/02/17 * 12
SOS-04	Humidity Indicator	A&D	AD-5681	4061512	CE	2012/03/26 * 12
STM-03	Terminator	TME	CT-01 BP	-	CE	2012/01/05 * 12
STR-02	Test Receiver	Rohde & Schwarz	ESCI	100575	CE	2011/08/04 * 12
SJM-02	Measure	KOMELON	KMC-36	-	CE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	CE	-

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