



RADIO TEST REPORT

Test Report No. : 32DE0228-SH-02-A

Applicant : Canon Inc.
Type of Equipment : Wireless Module
Model No. : WM317
FCC ID : AZD317
Test regulation : FCC Part15 Subpart C: 2012
Test result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
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6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.

Date of test: February 3 to 12, 2012

Representative test engineer:

Tatsuya Arai
Engineer of WiSE Japan,
UL Verification Service

Approved by :

Go Ishiwata
Manager 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

REVISION HISTORY

Original Test Report No.: 32DE0228-SH-02-A

[illegible]

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SECTION 1: Customer information

Company Name : Canon Inc.
Brand Name : CANON
Address : 30-2, Shimomaruko 3-chome, Ohta-ku, Tokyo 146-8501, Japan
Telephone Number : +81-3-3757-6218
Facsimile Number : +81-3-3757-8431
Contact Person : Ryoji Kon

SECTION 2: Equipment under test (E.U.T.)**2.1 Identification of E.U.T.**

Type of Equipment : Wireless Module
Model No. : WM317
Serial No. : Refer to 4.2 in this report.
Rating : DC3.3V
Receipt Date of Sample : February 3, 2012
Country of Mass-production : China
Condition of EUT : Production 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: WM317 (referred to as the EUT in this report) is a Wireless Module.

Clock frequency(ies) in the system : 32.768kHz, 38.4MHz

Radio specification

Equipment type : Transceiver
Frequency of operation : 2412-2462MHz
Bandwidth & channel spacing : 20MHz & 5MHz
Type of modulation : DSSS (IEEE 802.11b), OFDM (IEEE 802.11g)
Antenna type : $\lambda/4$ monopole
Antenna connector type : None
Antenna gain with cable loss : +1.6 dBi
ITU code : D1D, G1D
Operation temperature range : 0 to +60 deg.C.

FCC Part15.31 (e)

The Wireless Module is provided with stable power supply DC 3.3V and DC1.8V from the host device, therefore, the equipment complies power supply regulation.

FCC Part15.203

The antenna is not removable from the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

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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 February 1, 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 compliance with FCC Part 15 Subpart B: 2012.

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	6.3dB Freq.: 0.43976MHz Detector: Average Phase: N Mode: Tx 2412MHz, IEEE 802.11b ----- 6.3dB Freq.: 0.43912MHz Detector: Average Phase: N Mode: Tx 2462MHz, IEEE 802.11b ----- 6.3dB Freq.: 0.43976MHz Detector: Average Phase: N Mode: Tx 2412MHz, IEEE 802.11g ----- 6.3dB Freq.: 0.43992MHz Detector: Average Phase: N 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	3.1dB Freq.: 2483.500MHz Detector: Average Polarization: Horizontal Mode: Tx 2462MHz, IEEE 802.11g	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 EMI 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".

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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	RSS-Gen 4.6.1	Conducted	-	-

Note: UL Japan's EMI 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-13GHz	4.8 dB	4.8 dB	4.9 dB
Radiated emission (Measurement distance: 1m)	13GHz-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%

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3.5 Test location

UL Japan, Inc. Shonan EMC Lab.

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Telephone number : +81 463 50 6400

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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
☐ 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.

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

4.1 Operating mode

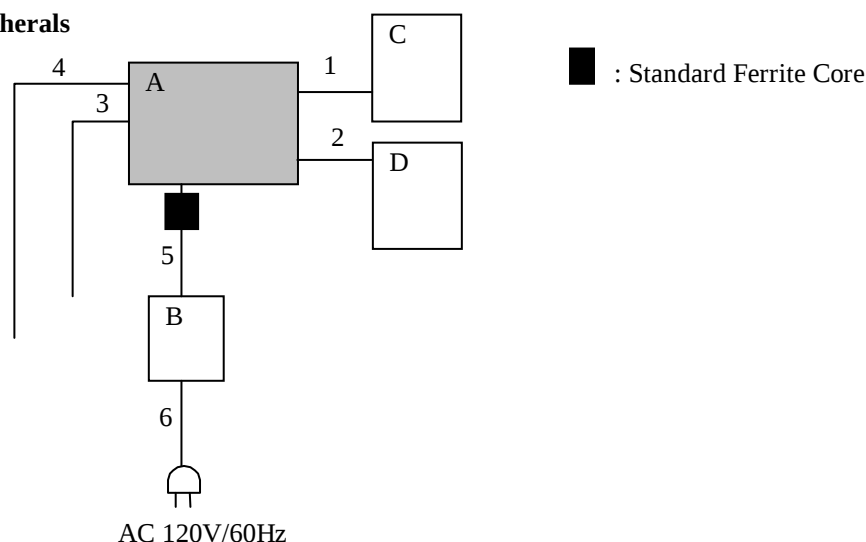
The EUT exercise program used during testing was designed to exercise the various system components in a manner similar to typical use.

Test item	Mode	Tested frequency	Power setting *1)	Worst data rate *2)
All items	Transmitting IEEE 802.11b	2412MHz, 2437MHz, 2462MHz	13dBm	1Mbps, PN9
	Transmitting IEEE 802.11g	2412MHz, 2437MHz, 2462MHz	12dBm	6Mbps, PN9

*1) Average power was set by the software: EMC-Tool.exe, Ver.1.0.0.0
*2) The worst condition was determined based on the test result of Maximum Peak Output Power (Low Channel)

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

4.2 Configuration and peripherals



* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	Wireless Module	WM317	*1)	Canon Inc.	EUT
B	AC adapter	CA-EC329	No.A14 DSNR119133	Canon Inc.	-
C	Switch board	-	-	Canon Inc.	-
D	LCD unit	-	-	Canon Inc.	-

*1) Conducted / Radiated emission: 1008, Other test: 0092

List of cables used

No.	Cable Name	Length (m)	Shield		Remark
			Cable	Connector	
1	FLAT	0.06	Unshielded	Unshielded	-
2	FLAT	0.09	Unshielded	Unshielded	-
3	USB	1.0	Shielded	Shielded	-
4	USB	2.0	Shielded	Shielded	-
5	DC	1.5	Unshielded	Unshielded	-
6	AC	2.0	Unshielded	Unshielded	-

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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 DC power supply was connected to a Line Impedance Stabilization Network (LISN).

An overview sweep with peak detection has been performed.

The measurements had been performed with a quasi-peak detector and if required, 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

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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.

Summary of the test results: Pass
Refer to APPENDIX 1

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

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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. The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity. 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.

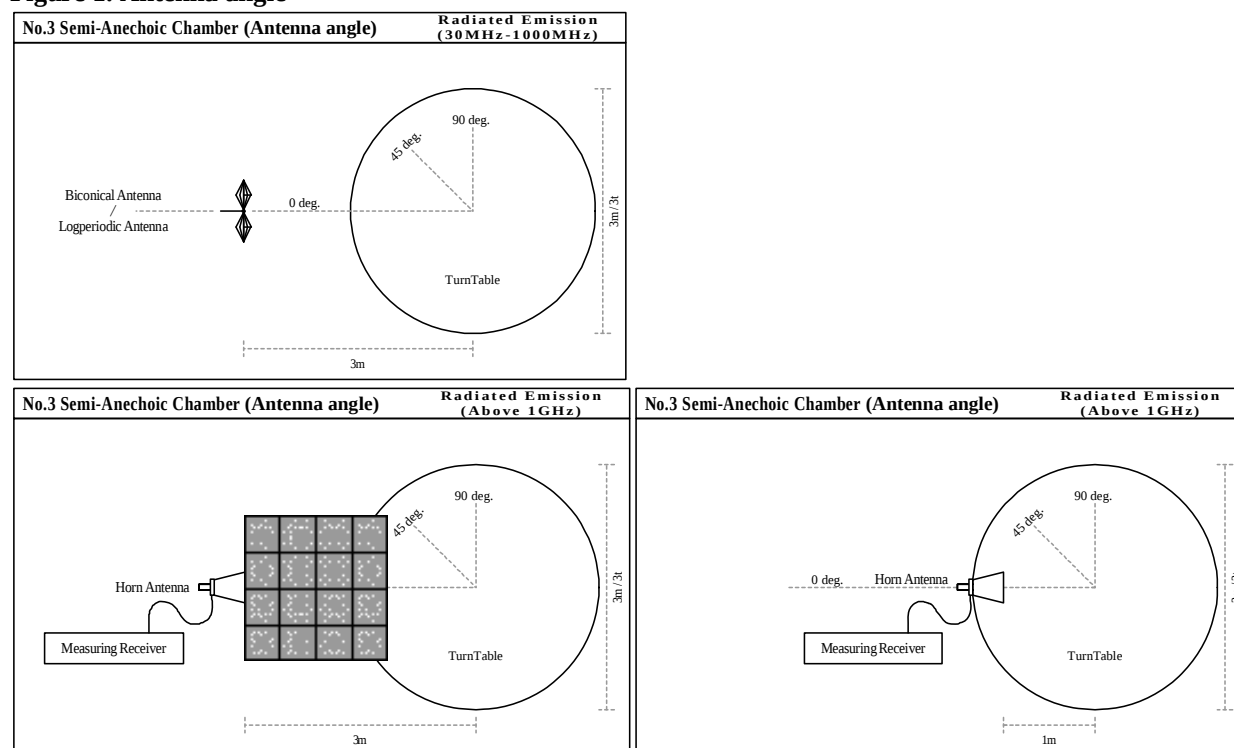
The radiated emission measurements were made with the following detection of the test receiver and spectrum analyzer.

Frequency	30-1000MHz	1-25GHz		20dBc
Detection type	Quasi-Peak	Peak	* Average	Peak
IF Bandwidth	120kHz	RBW: 1MHz VBW: 3MHz	RBW: 1MHz VBW: 10Hz	RBW: 100kHz VBW: 300kHz

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

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

Frequency	Worst position
Below 1GHz	Horizontal: Y, Vertical: Y
Above 1GHz	Horizontal: Y, Vertical: Z

Figure 1. Antenna angle

9.5 Band edge

Band edge level at 2400MHz is less than 20dB of peak point of the carrier. Band edge level at 2390MHz and 2483.5MHz 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

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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 : 2012/02/12

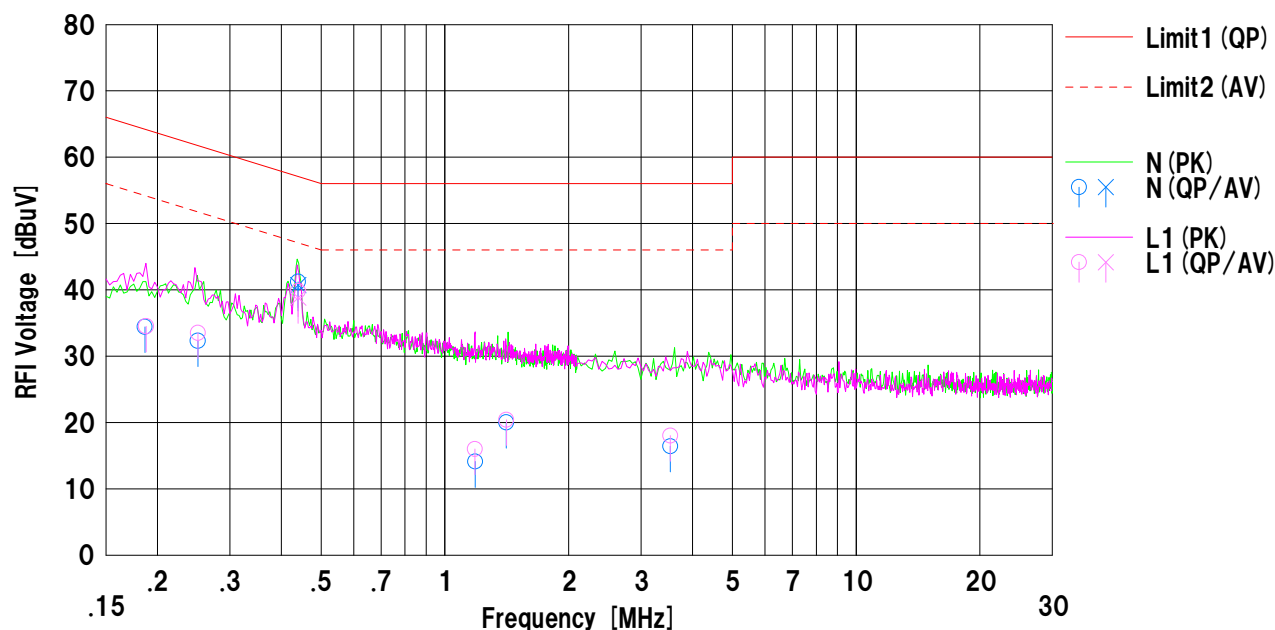
Company : Canon Inc.
Kind of EUT : Wireless Module
Model No. : WM317
Serial No. : 1008

Mode : Tx 11b 2412MHz
Report No. : 32DE0228-SH-02
Power : AC 120V / 60Hz
Temp./Humi. : 30deg.C. / 20%RH

Remarks : -

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

Engineer : Hikaru Shirasawa



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	0.18640	21.9	---	12.5	34.4	---	64.1	54.1	29.7	---	N	
2	0.25080	19.8	---	12.5	32.3	---	61.7	51.7	29.4	---	N	
3	0.43976	28.6	28.1	12.6	41.2	40.7	57.0	47.0	15.8	6.3	N	
4	1.18492	1.5	---	12.6	14.1	---	56.0	46.0	41.9	---	N	
5	1.41002	7.4	---	12.6	20.0	---	56.0	46.0	36.0	---	N	
6	3.53604	3.7	---	12.7	16.4	---	56.0	46.0	39.6	---	N	
7	0.18768	22.0	---	12.5	34.5	---	64.1	54.1	29.6	---	L1	
8	0.25085	21.0	---	12.5	33.5	---	61.7	51.7	28.2	---	L1	
9	0.43976	27.2	26.2	12.6	39.8	38.8	57.0	47.0	17.2	8.2	L1	
10	1.18272	3.4	---	12.6	16.0	---	56.0	46.0	40.0	---	L1	
11	1.41138	7.8	---	12.6	20.4	---	56.0	46.0	35.6	---	L1	
12	3.53655	5.3	---	12.7	18.0	---	56.0	46.0	38.0	---	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-05

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2012/02/12

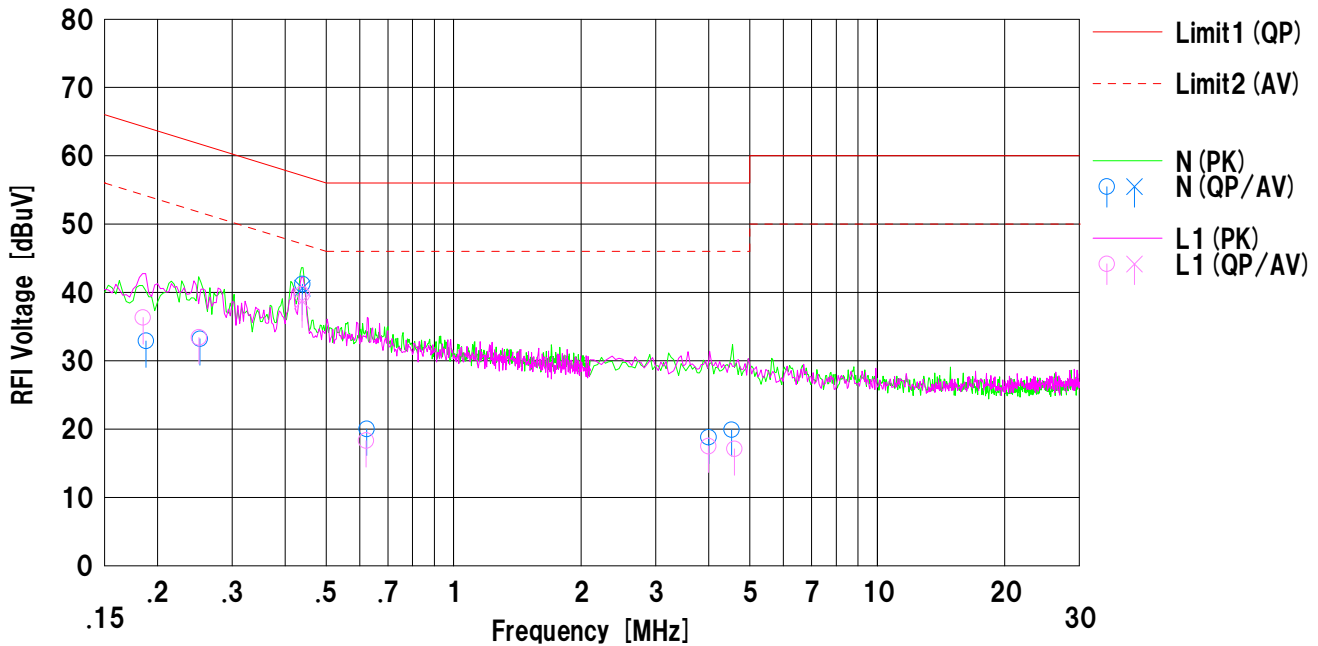
Company : Canon Inc.
Kind of EUT : Wireless Module
Model No. : WM317
Serial No. : 1008

Mode : Tx 11b 2437MHz
Report No. : 32DE0228-SH-02
Power : AC 120V / 60Hz
Temp./Humi. : 30deg.C. / 20%RH

Remarks : -

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

Engineer : Hikaru Shirasawa



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	0.18788	20.4	---	12.5	32.9	---	64.1	54.1	31.2	---	N	
2	0.25176	20.7	---	12.5	33.2	---	61.6	51.6	28.4	---	N	
3	0.43964	28.6	28.0	12.6	41.2	40.6	57.0	47.0	15.8	6.4	N	
4	0.62363	7.4	---	12.6	20.0	---	56.0	46.0	36.0	---	N	
5	4.00016	6.1	---	12.7	18.8	---	56.0	46.0	37.2	---	N	
6	4.53280	7.1	---	12.8	19.9	---	56.0	46.0	36.1	---	N	
7	0.18484	23.8	---	12.5	36.3	---	64.2	54.2	27.9	---	L1	
8	0.25041	20.9	---	12.5	33.4	---	61.7	51.7	28.3	---	L1	
9	0.43884	27.1	26.1	12.6	39.7	38.7	57.0	47.0	17.3	8.3	L1	
10	0.62139	5.7	---	12.6	18.3	---	56.0	46.0	37.7	---	L1	
11	3.99728	4.8	---	12.7	17.5	---	56.0	46.0	38.5	---	L1	
12	4.60283	4.3	---	12.8	17.1	---	56.0	46.0	38.9	---	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-05

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2012/02/12

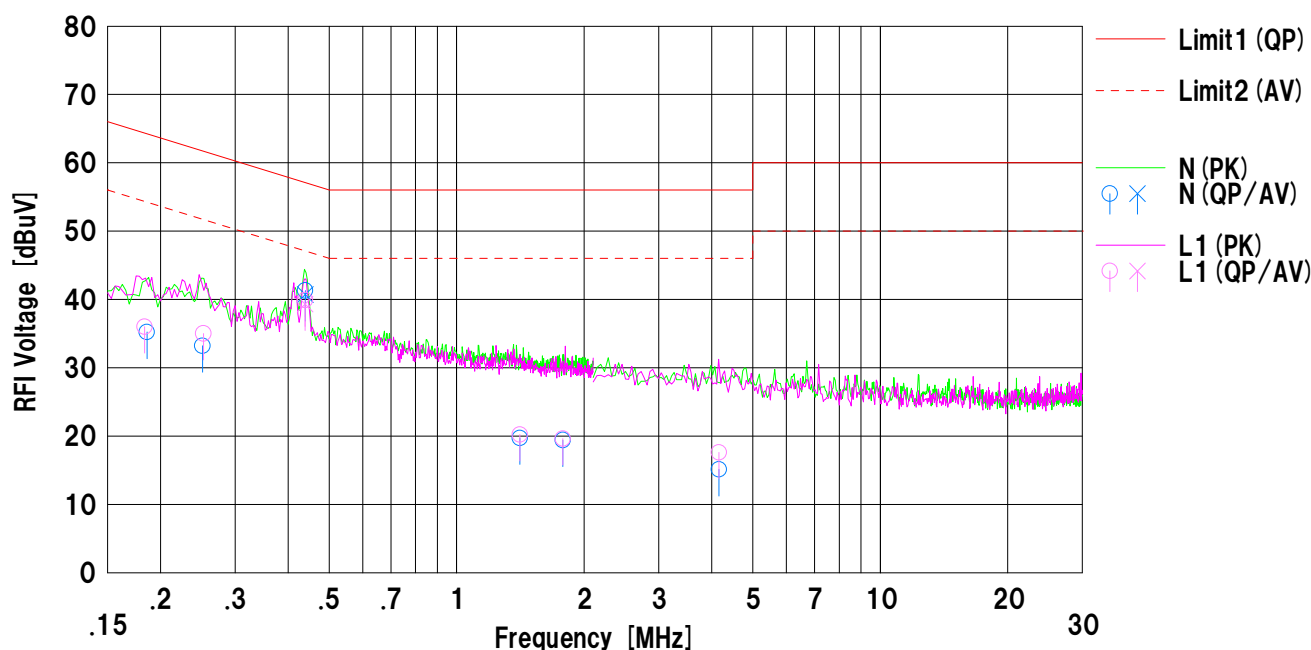
Company : Canon Inc.
Kind of EUT : Wireless Module
Model No. : WM317
Serial No. : 1008

Mode : Tx 11b 2462MHz
Report No. : 32DE0228-SH-02
Power : AC 120V / 60Hz
Temp./Humi. : 30deg.C. / 20%RH

Remarks : -

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

Engineer : Hikaru Shirasawa



No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.18572	22.7	---	12.5	35.2	---	64.2	54.2	29.0	---	N	
2	0.25128	20.7	---	12.5	33.2	---	61.7	51.7	28.5	---	N	
3	0.43912	28.7	28.1	12.6	41.3	40.7	57.0	47.0	15.7	6.3	N	
4	1.40912	7.1	---	12.6	19.7	---	56.0	46.0	36.3	---	N	
5	1.78180	6.7	---	12.7	19.4	---	56.0	46.0	36.6	---	N	
6	4.15917	2.4	---	12.7	15.1	---	56.0	46.0	40.9	---	N	
7	0.18333	23.4	---	12.6	36.0	---	64.3	54.3	28.3	---	L1	
8	0.25261	22.5	---	12.5	35.0	---	61.6	51.6	26.6	---	L1	
9	0.43896	27.3	26.7	12.6	39.9	39.3	57.0	47.0	17.1	7.7	L1	
10	1.40912	7.6	---	12.6	20.2	---	56.0	46.0	35.8	---	L1	
11	1.78196	6.9	---	12.7	19.6	---	56.0	46.0	36.4	---	L1	
12	4.16109	4.9	---	12.7	17.6	---	56.0	46.0	38.4	---	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-05

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2012/02/12

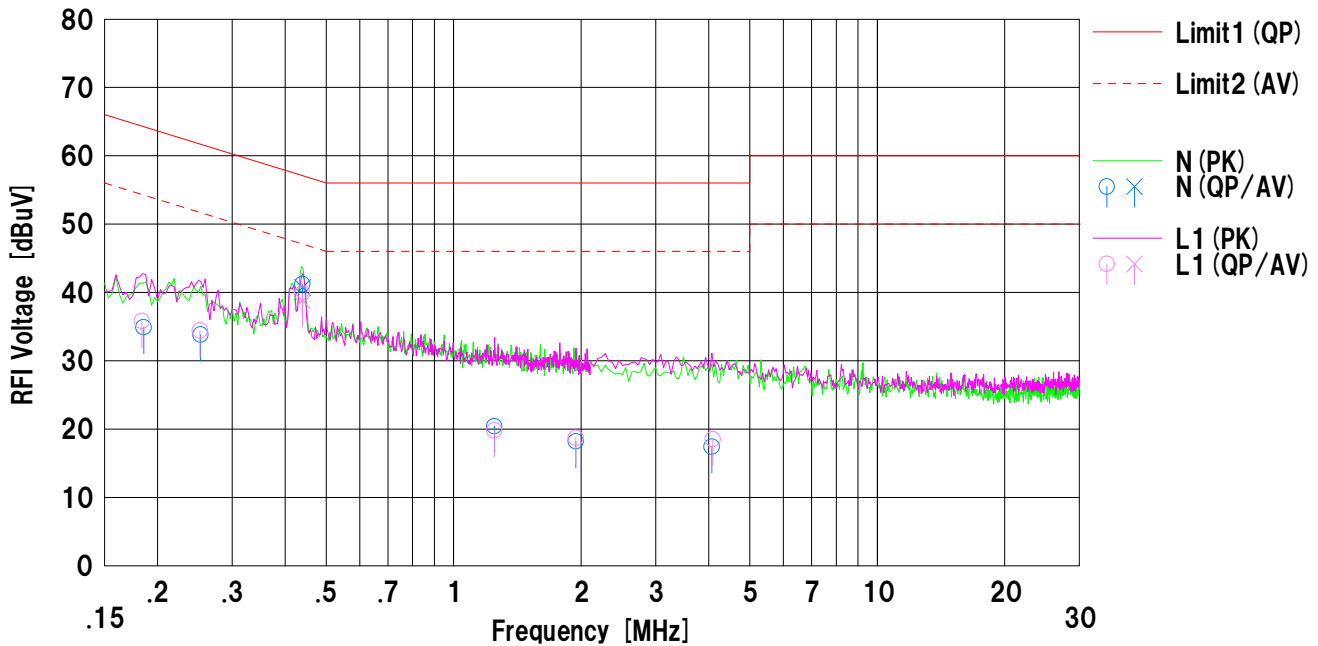
Company : Canon Inc.
Kind of EUT : Wireless Module
Model No. : WM317
Serial No. : 1008

Mode : Tx 11g 2412MHz
Report No. : 32DE0228-SH-02
Power : AC 120V / 60Hz
Temp./Humi. : 30deg.C. / 20%RH

Remarks : -

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

Engineer : Hikaru Shirasawa



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	0.18549	22.4	---	12.5	34.9	---	64.2	54.2	29.3	---	N	
2	0.25276	21.3	---	12.5	33.8	---	61.6	51.6	27.8	---	N	
3	0.43976	28.6	28.1	12.6	41.2	40.7	57.0	47.0	15.8	6.3	N	
4	1.24856	7.8	---	12.6	20.4	---	56.0	46.0	35.6	---	N	
5	1.94428	5.5	---	12.7	18.2	---	56.0	46.0	37.8	---	N	
6	4.07029	4.7	---	12.7	17.4	---	56.0	46.0	38.6	---	N	
7	0.18356	23.3	---	12.5	35.8	---	64.3	54.3	28.5	---	L1	
8	0.25180	21.9	---	12.5	34.4	---	61.6	51.6	27.2	---	L1	
9	0.43912	27.2	26.2	12.6	39.8	38.8	57.0	47.0	17.2	8.2	L1	
10	1.24696	7.2	---	12.6	19.8	---	56.0	46.0	36.2	---	L1	
11	1.94267	6.0	---	12.7	18.7	---	56.0	46.0	37.3	---	L1	
12	4.09369	5.8	---	12.7	18.5	---	56.0	46.0	37.5	---	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-05

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2012/02/12

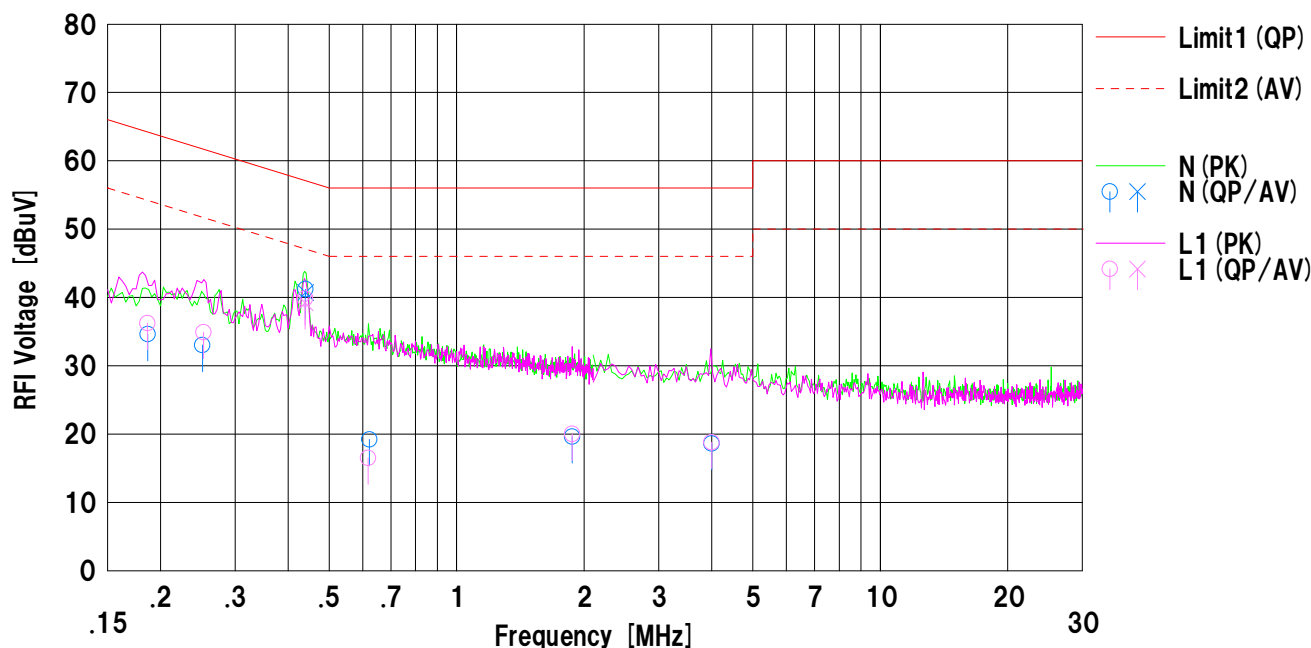
Company : Canon Inc.
Kind of EUT : Wireless Module
Model No. : WM317
Serial No. : 1008

Mode : Tx 11g 2437MHz
Report No. : 32DE0228-SH-02
Power : AC 120V / 60Hz
Temp./Humi. : 30deg.C. / 20%RH

Remarks : -

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

Engineer : Hikaru Shirasawa



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	0.18661	22.1	---	12.5	34.6	---	64.1	54.1	29.5	---	N	
2	0.25108	20.5	---	12.5	33.0	---	61.7	51.7	28.7	---	N	
3	0.43992	28.6	28.1	12.6	41.2	40.7	57.0	47.0	15.8	6.3	N	
4	0.62221	6.6	---	12.6	19.2	---	56.0	46.0	36.8	---	N	
5	1.87324	6.9	---	12.7	19.6	---	56.0	46.0	36.4	---	N	
6	3.99960	5.9	---	12.7	18.6	---	56.0	46.0	37.4	---	N	
7	0.18629	23.7	---	12.5	36.2	---	64.2	54.2	28.0	---	L1	
8	0.25268	22.4	---	12.5	34.9	---	61.6	51.6	26.7	---	L1	
9	0.43896	27.2	26.6	12.6	39.8	39.2	57.0	47.0	17.2	7.8	L1	
10	0.61804	3.9	---	12.6	16.5	---	56.0	46.0	39.5	---	L1	
11	1.87356	7.3	---	12.7	20.0	---	56.0	46.0	36.0	---	L1	
12	3.99928	6.1	---	12.7	18.8	---	56.0	46.0	37.2	---	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-05

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2012/02/12

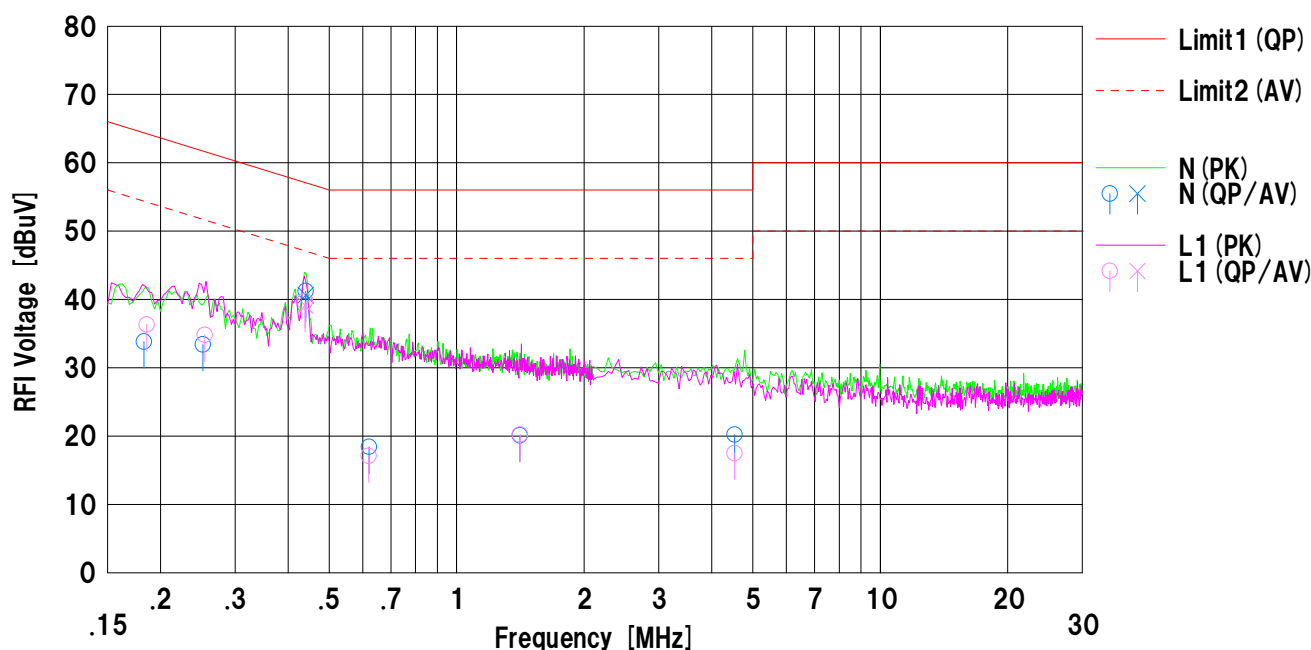
Company : Canon Inc.
Kind of EUT : Wireless Module
Model No. : WM317
Serial No. : 1008

Mode : Tx 11g 2462MHz
Report No. : 32DE0228-SH-02
Power : AC 120V / 60Hz
Temp./Humi. : 30deg.C. / 20%RH

Remarks : -

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

Engineer : Hikaru Shirasawa



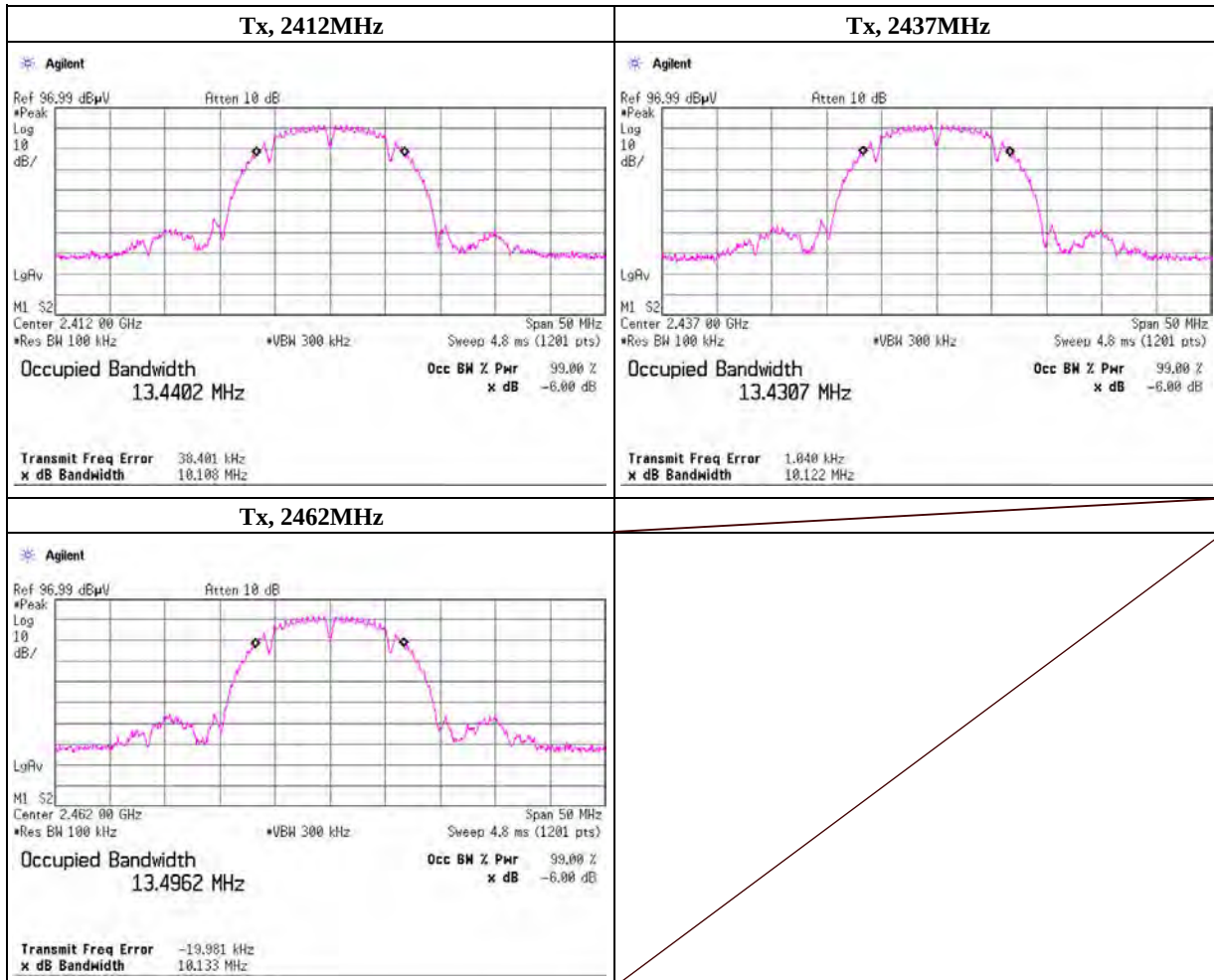
No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.18280	21.3	---	12.5	33.8	---	64.3	54.3	30.5	---	N	
2	0.25167	20.9	---	12.5	33.4	---	61.7	51.7	28.3	---	N	
3	0.44004	28.6	28.0	12.6	41.2	40.6	57.0	47.0	15.8	6.4	N	
4	0.62131	5.8	---	12.6	18.4	---	56.0	46.0	37.6	---	N	
5	1.41014	7.5	---	12.6	20.1	---	56.0	46.0	35.9	---	N	
6	4.53312	7.4	---	12.8	20.2	---	56.0	46.0	35.8	---	N	
7	0.18553	23.8	---	12.5	36.3	---	64.2	54.2	27.9	---	L1	
8	0.25456	22.3	---	12.5	34.8	---	61.6	51.6	26.8	---	L1	
9	0.43860	27.1	26.5	12.6	39.7	39.1	57.0	47.0	17.3	7.9	L1	
10	0.61971	4.5	---	12.6	17.1	---	56.0	46.0	38.9	---	L1	
11	1.41190	7.6	---	12.6	20.2	---	56.0	46.0	35.8	---	L1	
12	4.53192	4.7	---	12.8	17.5	---	56.0	46.0	38.5	---	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-05

-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	February 3, 2012	
Temperature / Humidity	22deg.C , 25%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11b, PN9, worst data mode 1Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	10.108	> 0.500
2437.0000	10.122	> 0.500
2462.0000	10.133	> 0.500



UL Japan, Inc.

Shonan EMC Lab.

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

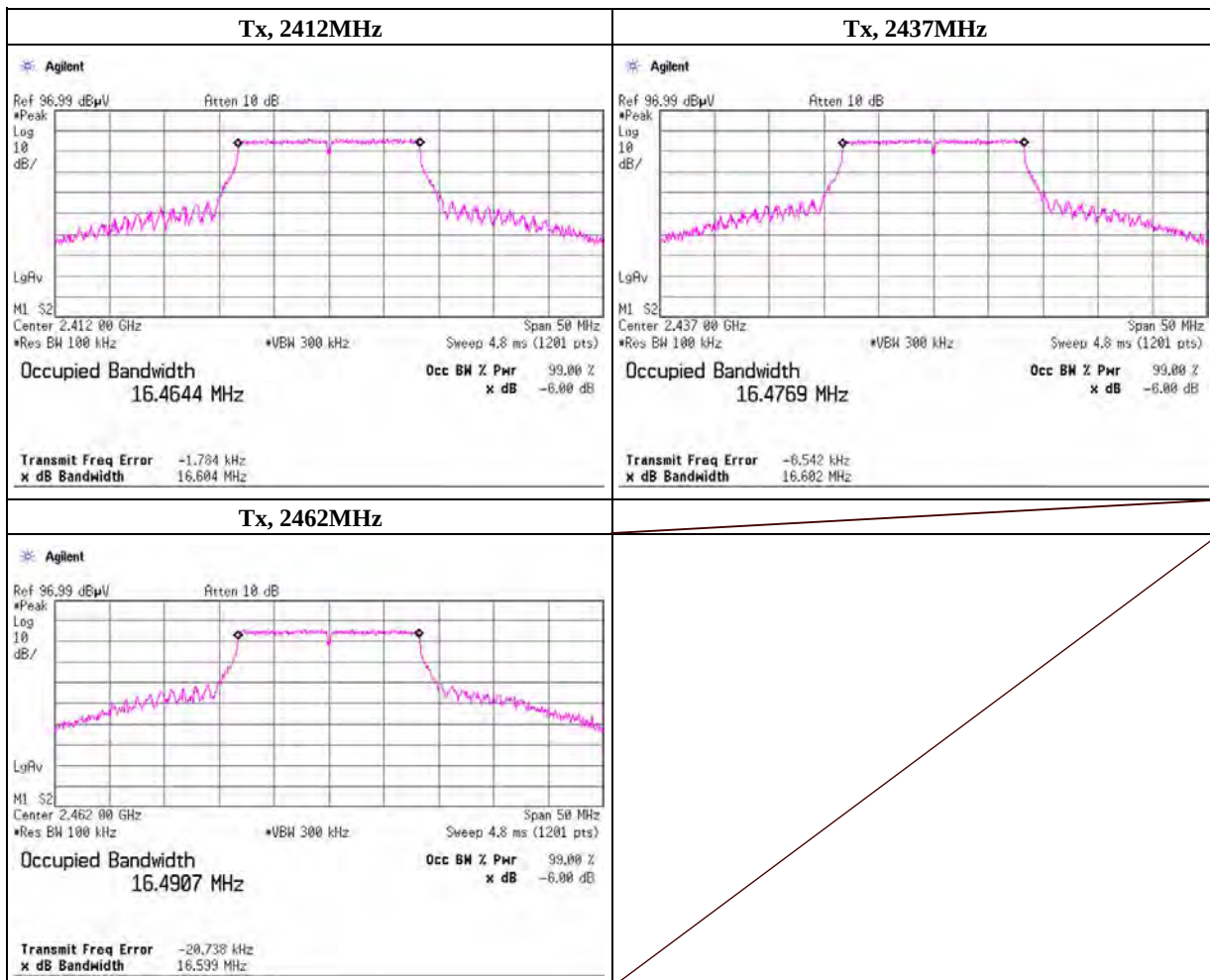
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	February 3, 2012	
Temperature / Humidity	22deg.C , 25%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.604	> 0.500
2437.0000	16.602	> 0.500
2462.0000	16.599	> 0.500

**UL Japan, Inc.****Shonan EMC Lab.**

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

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
 Date February 3, 2012
 Temperature / Humidity 22deg.C , 25%RH
 Engineer Tatsuya Arai
 Mode Tx, IEEE802.11b, PN9, worst data mode : 1 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	4.35	1.18	9.68	15.21	33.19	30.00	1000	14.79
Mid	2437.0	4.76	1.19	9.68	15.63	36.56	30.00	1000	14.37
High	2462.0	4.56	1.19	9.68	15.43	34.91	30.00	1000	14.57

Sample Calculation:

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

[Pre check]

	Data rate [Mbps]	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	
						[dBm]	[mW]	[dBm]	[mW]		
	1	2437.0	4.76	1.19	9.68	15.63	36.56	30.00	1000	14.37	Worst
	2	2437.0	4.74	1.19	9.68	15.61	36.39	30.00	1000	14.39	
	5.5	2437.0	4.17	1.19	9.68	15.04	31.92	30.00	1000	14.96	
	11	2437.0	4.70	1.19	9.68	15.57	36.06	30.00	1000	14.43	

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Shonan EMC Lab.

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

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Facsimile : +81 463 50 6401

Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
 Date February 3, 2012
 Temperature / Humidity 22deg.C , 25%RH
 Engineer Tatsuya Arai
 Mode Tx, IEEE802.11g, PN9, worst data mode : 6 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	10.02	1.18	9.68	20.88	122.46	30.00	1000	9.12
Mid	2437.0	9.76	1.19	9.68	20.63	115.61	30.00	1000	9.37
High	2462.0	8.85	1.19	9.68	19.72	93.76	30.00	1000	10.28

Sample Calculation:

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

[Pre check]

	Data rate [Mbps]	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]	
						[dBm]	[mW]	[dBm]	[mW]		
	6	2437.0	9.76	1.19	9.68	20.63	115.61	30.00	1000	9.37	Worst
	9	2437.0	9.24	1.19	9.68	20.11	102.57	30.00	1000	9.89	
	12	2437.0	9.03	1.19	9.68	19.90	97.72	30.00	1000	10.10	
	18	2437.0	8.96	1.19	9.68	19.83	96.16	30.00	1000	10.17	
	24	2437.0	9.55	1.19	9.68	20.42	110.15	30.00	1000	9.58	
	36	2437.0	9.12	1.19	9.68	19.99	99.77	30.00	1000	10.01	
	48	2437.0	9.60	1.19	9.68	20.47	111.43	30.00	1000	9.53	
	54	2437.0	9.33	1.19	9.68	20.20	104.71	30.00	1000	9.80	

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date February 11, 2012 February 12, 2012
Temperature / Humidity 22deg.C , 25%RH 22deg.C , 23%RH
Engineer Tatsuya Arai Hikaru Shirasawa
Mode Tx, 2412 MHz
 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.	148.597	QP	22.7	14.7	7.6	32.1	12.9	43.5	30.6	261	354	
Hori.	281.939	QP	25.4	18.4	8.5	32.0	20.3	46.0	25.7	126	152	
Hori.	320.829	QP	30.9	14.5	8.8	31.9	22.3	46.0	23.7	100	346	
Hori.	2390.000	PK	48.9	27.2	13.8	41.1	48.8	73.9	25.1	124	183	
Hori.	4824.000	PK	51.1	31.1	5.9	41.0	47.1	73.9	26.8	100	206	
Hori.	7236.000	PK	47.4	36.6	7.4	41.3	50.1	73.9	23.8	100	0	
Hori.	9648.000	PK	43.7	38.2	8.6	38.8	51.7	73.9	22.2	100	0	
Hori.	12060.000	PK	45.5	39.3	10.2	39.2	55.8	73.9	18.1	100	0	
Hori.	2390.000	AV	36.4	27.2	13.8	41.1	36.3	53.9	17.6	124	183	
Hori.	4824.000	AV	44.5	31.1	5.9	41.0	40.5	53.9	13.4	100	206	
Hori.	7236.000	AV	36.9	36.6	7.4	41.3	39.6	53.9	14.3	100	0	
Hori.	9648.000	AV	34.1	38.2	8.6	38.8	42.1	53.9	11.8	100	0	
Hori.	12060.000	AV	35.4	39.3	10.2	39.2	45.7	53.9	8.2	100	0	
Vert.	182.193	QP	25.7	15.9	7.8	32.0	17.4	43.5	26.1	100	333	
Vert.	293.573	QP	26.0	18.8	8.6	32.0	21.4	46.0	24.6	100	149	
Vert.	957.983	QP	21.0	23.0	10.9	30.5	24.4	46.0	21.6	100	172	
Vert.	2390.000	PK	47.8	27.2	13.8	41.1	47.7	73.9	26.2	117	213	
Vert.	4824.000	PK	50.0	31.1	5.9	41.0	46.0	73.9	27.9	100	197	
Vert.	7236.000	PK	48.6	36.6	7.4	41.3	51.3	73.9	22.6	100	0	
Vert.	9648.000	PK	45.8	38.2	8.6	38.8	53.8	73.9	20.1	100	358	
Vert.	12060.000	PK	45.8	39.3	10.2	39.2	56.1	73.9	17.8	100	0	
Vert.	2390.000	AV	36.0	27.2	13.8	41.1	35.9	53.9	18.0	117	213	
Vert.	4824.000	AV	43.9	31.1	5.9	41.0	39.9	53.9	14.0	100	197	
Vert.	7236.000	AV	37.0	36.6	7.4	41.3	39.7	53.9	14.2	100	0	
Vert.	9648.000	AV	34.2	38.2	8.6	38.8	42.2	53.9	11.7	100	358	
Vert.	12060.000	AV	35.4	39.3	10.2	39.2	45.7	53.9	8.2	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).

Distance factor: 15GHz-25GHz $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$

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	PK	100.1	27.3	13.8	41.1	100.1	-	-	Carrier
Hori.	2397.23	PK	51.9	27.3	13.8	41.1	51.9	80.1	28.2	
Hori.	2400	PK	43.5	27.3	13.8	41.1	43.5	80.1	36.6	
Vert.	2412	PK	99.6	27.3	13.8	41.1	99.6	-	-	Carrier
Vert.	2397.295	PK	53.8	27.3	13.8	41.1	53.8	79.6	25.8	
Vert.	2400	PK	43.9	27.3	13.8	41.1	43.9	79.6	35.7	

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

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date February 11, 2012 February 12, 2012
 Temperature / Humidity 22deg.C , 25%RH 22deg.C , 23%RH
 Engineer Tatsuya Arai Hikaru Shirasawa
 Mode Tx, 2437 MHz
 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.	148.308	QP	22.7	14.7	7.6	32.1	12.9	43.5	30.6	199	0	
Hori.	287.011	QP	25.2	18.6	8.5	32.0	20.3	46.0	25.7	125	1	
Hori.	317.912	QP	31.6	14.4	8.8	31.9	22.9	46.0	23.1	100	0	
Hori.	4874.000	PK	49.2	31.2	5.9	41.0	45.3	73.9	28.6	100	197	
Hori.	7311.000	PK	46.7	36.7	7.5	41.4	49.5	73.9	24.4	100	0	
Hori.	9748.000	PK	44.9	38.5	8.6	38.8	53.2	73.9	20.7	100	359	
Hori.	12185.000	PK	44.8	39.3	10.2	39.2	55.1	73.9	18.8	100	0	
Hori.	4874.000	AV	42.3	31.2	5.9	41.0	38.4	53.9	15.5	100	197	
Hori.	7311.000	AV	36.5	36.7	7.5	41.4	39.3	53.9	14.6	100	0	
Hori.	9748.000	AV	35.5	38.5	8.6	38.8	43.8	53.9	10.1	100	359	
Hori.	12185.000	AV	35.0	39.3	10.2	39.2	45.3	53.9	8.6	100	0	
Vert.	182.572	QP	25.5	15.9	7.8	32.0	17.2	43.5	26.3	100	300	
Vert.	293.212	QP	26.7	18.8	8.6	32.0	22.1	46.0	23.9	100	155	
Vert.	933.419	QP	21.1	22.7	10.8	30.7	23.9	46.0	22.1	100	175	
Vert.	4874.000	PK	48.2	31.2	5.9	41.0	44.3	73.9	29.6	104	173	
Vert.	7311.000	PK	46.9	36.7	7.5	41.4	49.7	73.9	24.2	100	0	
Vert.	9748.000	PK	46.4	38.5	8.6	38.8	54.7	73.9	19.2	100	357	
Vert.	12185.000	PK	45.0	39.3	10.2	39.2	55.3	73.9	18.6	100	0	
Vert.	4874.000	AV	41.5	31.2	5.9	41.0	37.6	53.9	16.3	104	173	
Vert.	7311.000	AV	36.4	36.7	7.5	41.4	39.2	53.9	14.7	100	0	
Vert.	9748.000	AV	35.6	38.5	8.6	38.8	43.9	53.9	10.0	100	357	
Vert.	12185.000	AV	35.0	39.3	10.2	39.2	45.3	53.9	8.6	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).

Distance factor: 15GHz-25GHz $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date February 11, 2012 February 12, 2012
 Temperature / Humidity 22deg.C , 25%RH 22deg.C , 23%RH
 Engineer Tatsuya Arai Hikaru Shirasawa
 Mode Tx, 2462 MHz
 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.	148.362	QP	22.6	14.7	7.6	32.1	12.8	43.5	30.7	150	2	
Hori.	286.722	QP	25.6	18.6	8.5	32.0	20.7	46.0	25.3	122	142	
Hori.	317.938	QP	30.1	14.4	8.8	31.9	21.4	46.0	24.6	100	0	
Hori.	2483.500	PK	46.8	27.5	13.8	41.1	47.0	73.9	26.9	117	186	
Hori.	4924.000	PK	48.1	31.3	5.9	40.9	44.4	73.9	29.5	100	196	
Hori.	7386.000	PK	47.4	36.9	7.5	41.4	50.4	73.9	23.5	100	0	
Hori.	9848.000	PK	45.2	38.7	8.6	38.8	53.7	73.9	20.2	100	359	
Hori.	12310.000	PK	45.3	39.4	10.2	39.2	55.7	73.9	18.2	100	0	
Hori.	2483.500	AV	36.9	27.5	13.8	41.1	37.1	53.9	16.8	117	186	
Hori.	4924.000	AV	39.2	31.3	5.9	40.9	35.5	53.9	18.4	100	196	
Hori.	7386.000	AV	36.6	36.9	7.5	41.4	39.6	53.9	14.3	100	0	
Hori.	9848.000	AV	35.1	38.7	8.6	38.8	43.6	53.9	10.3	100	359	
Hori.	12310.000	AV	34.3	39.4	10.2	39.2	44.7	53.9	9.2	100	0	
Vert.	182.534	QP	24.7	15.9	7.8	32.0	16.4	43.5	27.1	100	314	
Vert.	292.462	QP	26.2	18.8	8.6	32.0	21.6	46.0	24.4	100	137	
Vert.	932.876	QP	20.9	22.7	10.8	30.7	23.7	46.0	22.3	100	0	
Vert.	2483.500	PK	47.3	27.5	13.8	41.1	47.5	73.9	26.4	100	338	
Vert.	4924.000	PK	47.4	31.3	5.9	40.9	43.7	73.9	30.2	100	170	
Vert.	7386.000	PK	46.8	36.9	7.5	41.4	49.8	73.9	24.1	100	0	
Vert.	9848.000	PK	46.5	38.7	8.6	38.8	55.0	73.9	18.9	100	358	
Vert.	12310.000	PK	44.5	39.4	10.2	39.2	54.9	73.9	19.0	100	0	
Vert.	2483.500	AV	36.5	27.5	13.8	41.1	36.7	53.9	17.2	100	338	
Vert.	4924.000	AV	38.8	31.3	5.9	40.9	35.1	53.9	18.8	100	170	
Vert.	7386.000	AV	36.6	36.9	7.5	41.4	39.6	53.9	14.3	100	0	
Vert.	9848.000	AV	35.5	38.7	8.6	38.8	44.0	53.9	9.9	100	358	
Vert.	12310.000	AV	34.3	39.4	10.2	39.2	44.7	53.9	9.2	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).

Distance factor: 15GHz-25GHz $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date February 11, 2012 February 12, 2012
 Temperature / Humidity 22deg.C , 25%RH 22deg.C , 23%RH
 Engineer Tatsuya Arai Hikaru Shirasawa
 Mode Tx, 2412 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	169.448	QP	22.7	15.5	7.7	32.0	13.9	43.5	29.6	200	298	
Hori.	296.324	QP	22.5	18.9	8.6	32.0	18.0	46.0	28.0	152	140	
Hori.	320.297	QP	30.0	14.5	8.8	31.9	21.4	46.0	24.6	100	0	
Hori.	2390.000	PK	62.1	27.2	13.8	41.1	62.0	73.9	11.9	120	190	
Hori.	4824.000	PK	50.7	31.1	5.9	41.0	46.7	73.9	27.2	100	207	
Hori.	7236.000	PK	48.2	36.6	7.4	41.3	50.9	73.9	23.0	100	0	
Hori.	9648.000	PK	45.0	38.2	8.6	38.8	53.0	73.9	20.9	100	358	
Hori.	12060.000	PK	45.3	39.3	10.2	39.2	55.6	73.9	18.3	100	0	
Hori.	2390.000	AV	48.6	27.2	13.8	41.1	48.5	53.9	5.4	120	190	
Hori.	4824.000	AV	38.6	31.1	5.9	41.0	34.6	53.9	19.3	100	207	
Hori.	7236.000	AV	37.0	36.6	7.4	41.3	39.7	53.9	14.2	100	0	
Hori.	9648.000	AV	34.7	38.2	8.6	38.8	42.7	53.9	11.2	100	358	
Hori.	12060.000	AV	35.5	39.3	10.2	39.2	45.8	53.9	8.1	100	0	
Vert.	183.773	QP	24.4	15.9	7.8	32.0	16.1	43.5	27.4	100	289	
Vert.	286.712	QP	26.6	18.5	8.5	32.0	21.6	46.0	24.4	100	147	
Vert.	920.634	QP	21.3	22.6	10.7	30.8	23.8	46.0	22.2	100	359	
Vert.	2390.000	PK	61.0	27.2	13.8	41.1	60.9	73.9	13.0	123	210	
Vert.	4824.000	PK	50.0	31.1	5.9	41.0	46.0	73.9	27.9	100	0	
Vert.	7236.000	PK	47.4	36.6	7.4	41.3	50.1	73.9	23.8	100	0	
Vert.	9648.000	PK	45.8	38.2	8.6	38.8	53.8	73.9	20.1	100	359	
Vert.	12060.000	PK	45.8	39.3	10.2	39.2	56.1	73.9	17.8	100	0	
Vert.	2390.000	AV	48.3	27.2	13.8	41.1	48.2	53.9	5.7	123	210	
Vert.	4824.000	AV	38.4	31.1	5.9	41.0	34.4	53.9	19.5	100	0	
Vert.	7236.000	AV	36.9	36.6	7.4	41.3	39.6	53.9	14.3	100	0	
Vert.	9648.000	AV	34.8	38.2	8.6	38.8	42.8	53.9	11.1	100	359	
Vert.	12060.000	AV	35.5	39.3	10.2	39.2	45.8	53.9	8.1	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).

Distance factor: 15GHz-25GHz $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$

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	PK	94.2	27.3	13.8	41.1	94.2	-	-	Carrier
Hori.	2400	PK	65.1	27.3	13.8	41.1	65.1	74.2	9.1	
Vert.	2412	PK	94.4	27.3	13.8	41.1	94.4	-	-	Carrier
Vert.	2400	PK	66.3	27.3	13.8	41.1	66.3	74.4	8.1	

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

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date February 11, 2012 February 12, 2012
 Temperature / Humidity 22deg.C , 25%RH 22deg.C , 23%RH
 Engineer Tatsuya Arai Hikaru Shirasawa
 Mode Tx, 2437 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	169.504	QP	22.7	15.5	7.7	32.0	13.9	43.5	29.6	193	286	
Hori.	296.624	QP	22.4	18.9	8.6	32.0	17.9	46.0	28.1	158	169	
Hori.	320.912	QP	30.3	14.5	8.8	31.9	21.7	46.0	24.3	100	1	
Hori.	4874.000	PK	49.5	31.2	5.9	41.0	45.6	73.9	28.3	100	200	
Hori.	7311.000	PK	46.7	36.7	7.5	41.4	49.5	73.9	24.4	100	0	
Hori.	9748.000	PK	44.4	38.5	8.6	38.8	52.7	73.9	21.2	100	359	
Hori.	12185.000	PK	45.7	39.3	10.2	39.2	56.0	73.9	17.9	100	0	
Hori.	4874.000	AV	37.5	31.2	5.9	41.0	33.6	53.9	20.3	100	200	
Hori.	7311.000	AV	36.2	36.7	7.5	41.4	39.0	53.9	14.9	100	0	
Hori.	9748.000	AV	34.6	38.5	8.6	38.8	42.9	53.9	11.0	100	359	
Hori.	12185.000	AV	35.0	39.3	10.2	39.2	45.3	53.9	8.6	100	0	
Vert.	183.893	QP	24.7	15.9	7.8	32.0	16.4	43.5	27.1	100	304	
Vert.	287.502	QP	26.4	18.5	8.5	32.0	21.4	46.0	24.6	100	150	
Vert.	922.529	QP	21.1	22.6	10.7	30.8	23.6	46.0	22.4	100	1	
Vert.	4874.000	PK	48.0	31.2	5.9	41.0	44.1	73.9	29.8	100	188	
Vert.	7311.000	PK	46.4	36.7	7.5	41.4	49.2	73.9	24.7	100	0	
Vert.	9748.000	PK	44.5	38.5	8.6	38.8	52.8	73.9	21.1	100	358	
Vert.	12185.000	PK	46.0	39.3	10.2	39.2	56.3	73.9	17.6	100	0	
Vert.	4874.000	AV	37.0	31.2	5.9	41.0	33.1	53.9	20.8	100	188	
Vert.	7311.000	AV	36.3	36.7	7.5	41.4	39.1	53.9	14.8	100	0	
Vert.	9748.000	AV	34.7	38.5	8.6	38.8	43.0	53.9	10.9	100	358	
Vert.	12185.000	AV	34.9	39.3	10.2	39.2	45.2	53.9	8.7	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).

Distance factor: 15GHz-25GHz $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date February 11, 2012 February 12, 2012
 Temperature / Humidity 22deg.C , 25%RH 22deg.C , 23%RH
 Engineer Tatsuya Arai Hikaru Shirasawa
 Mode Tx, 2462 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps

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

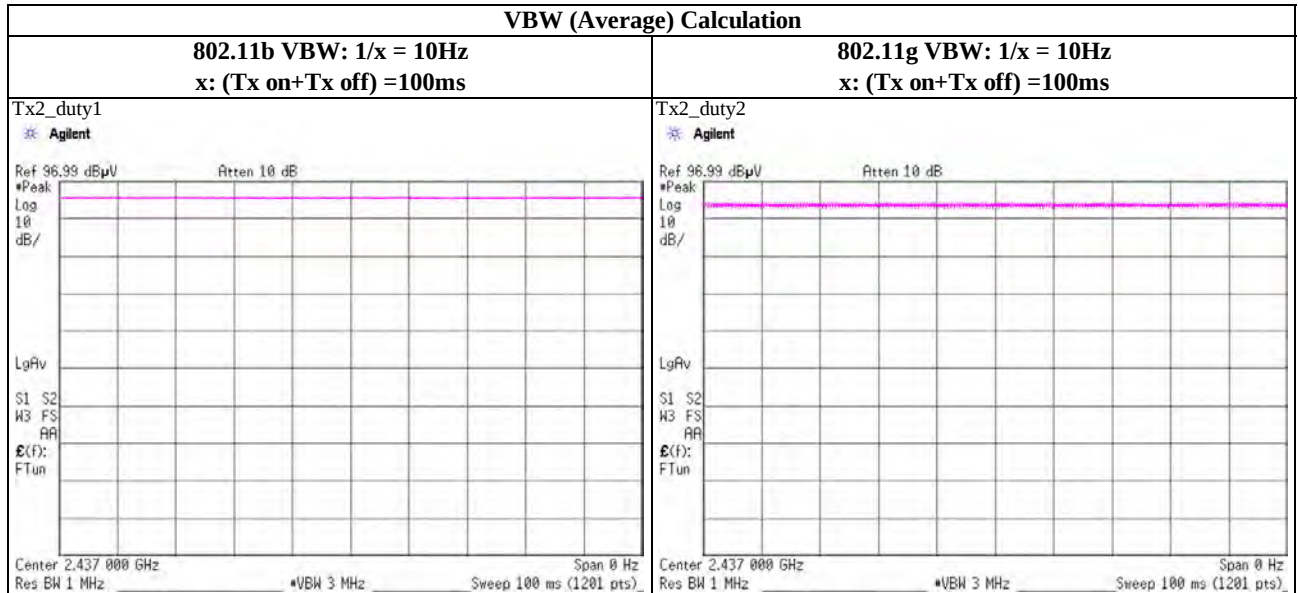
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	169.575	QP	22.7	15.5	7.7	32.0	13.9	43.5	29.6	201	298	
Hori.	295.444	QP	22.7	18.9	8.6	32.0	18.2	46.0	27.8	124	162	
Hori.	320.912	QP	30.6	14.5	8.8	31.9	22.0	46.0	24.0	100	0	
Hori.	2483.500	PK	63.6	27.5	13.8	41.1	63.8	73.9	10.1	100	189	
Hori.	4924.000	PK	50.0	31.3	5.9	40.9	46.3	73.9	27.6	100	197	
Hori.	7386.000	PK	46.7	36.9	7.5	41.4	49.7	73.9	24.2	100	0	
Hori.	9848.000	PK	44.2	38.7	8.6	38.8	52.7	73.9	21.2	100	359	
Hori.	12310.000	PK	44.8	39.4	10.2	39.2	55.2	73.9	18.7	100	0	
Hori.	2483.500	AV	50.6	27.5	13.8	41.1	50.8	53.9	3.1	100	189	
Hori.	4924.000	AV	37.2	31.3	5.9	40.9	33.5	53.9	20.4	100	197	
Hori.	7386.000	AV	36.5	36.9	7.5	41.4	39.5	53.9	14.4	100	0	
Hori.	9848.000	AV	34.9	38.7	8.6	38.8	43.4	53.9	10.5	100	359	
Hori.	12310.000	AV	34.3	39.4	10.2	39.2	44.7	53.9	9.2	100	0	
Vert.	183.661	QP	24.5	15.9	7.8	32.0	16.2	43.5	27.3	100	289	
Vert.	289.692	QP	26.1	18.6	8.6	32.0	21.3	46.0	24.7	100	144	
Vert.	922.435	QP	21.1	22.6	10.7	30.8	23.6	46.0	22.4	100	359	
Vert.	2483.500	PK	63.8	27.5	13.8	41.1	64.0	73.9	9.9	100	205	
Vert.	4924.000	PK	48.0	31.3	5.9	40.9	44.3	73.9	29.6	100	175	
Vert.	7386.000	PK	47.1	36.9	7.5	41.4	50.1	73.9	23.8	100	0	
Vert.	9848.000	PK	45.1	38.7	8.6	38.8	53.6	73.9	20.3	100	358	
Vert.	12310.000	PK	44.4	39.4	10.2	39.2	54.8	73.9	19.1	100	0	
Vert.	2483.500	AV	50.3	27.5	13.8	41.1	50.5	53.9	3.4	100	205	
Vert.	4924.000	AV	36.9	31.3	5.9	40.9	33.2	53.9	20.7	100	175	
Vert.	7386.000	AV	36.5	36.9	7.5	41.4	39.5	53.9	14.4	100	0	
Vert.	9848.000	AV	34.8	38.7	8.6	38.8	43.3	53.9	10.6	100	358	
Vert.	12310.000	AV	34.3	39.4	10.2	39.2	44.7	53.9	9.2	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).

Distance factor: 15GHz-25GHz $20\log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$

VBW(Average) Calculation chart



UL Japan, Inc.

Shonan EMC Lab.

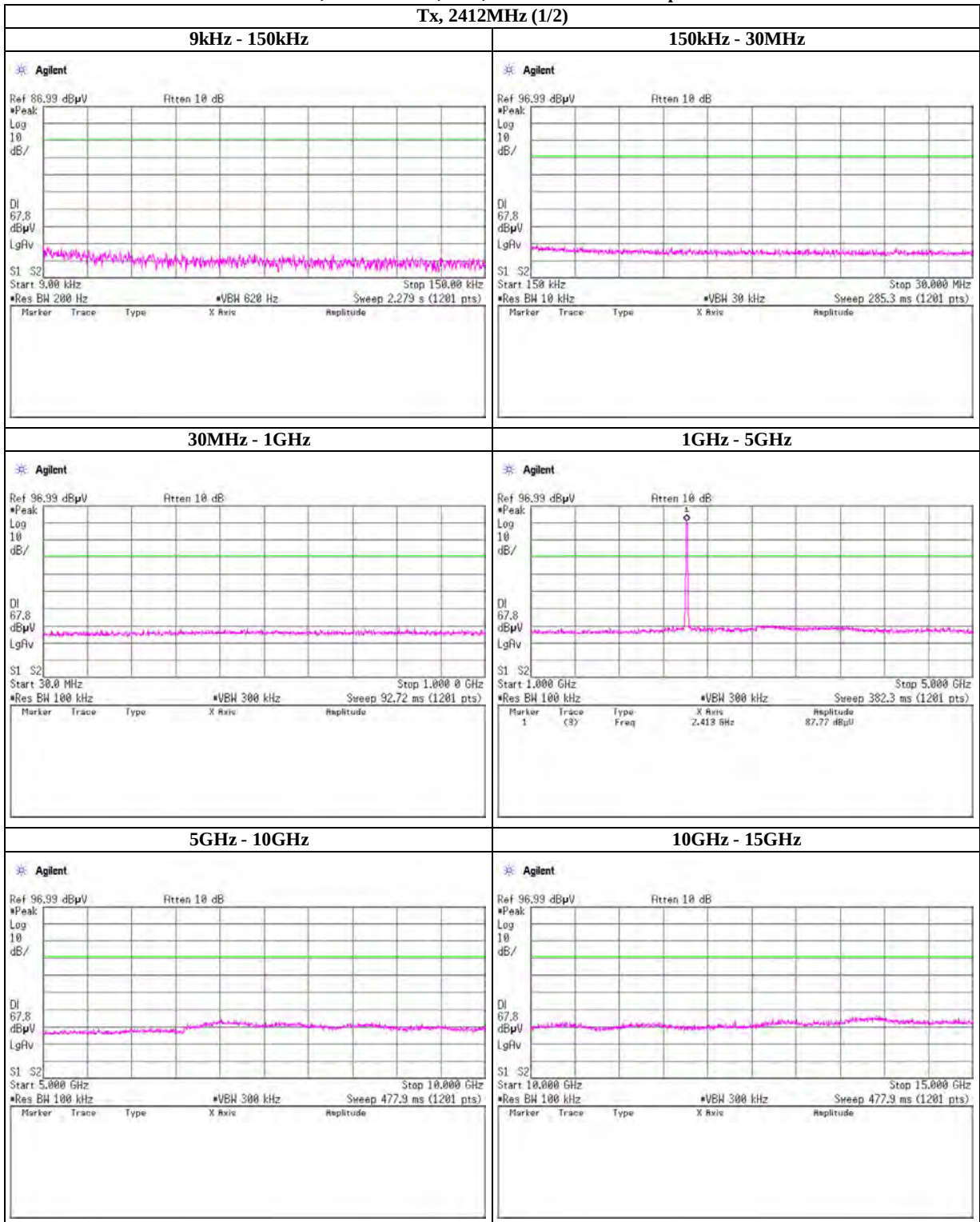
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

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



UL Japan, Inc.

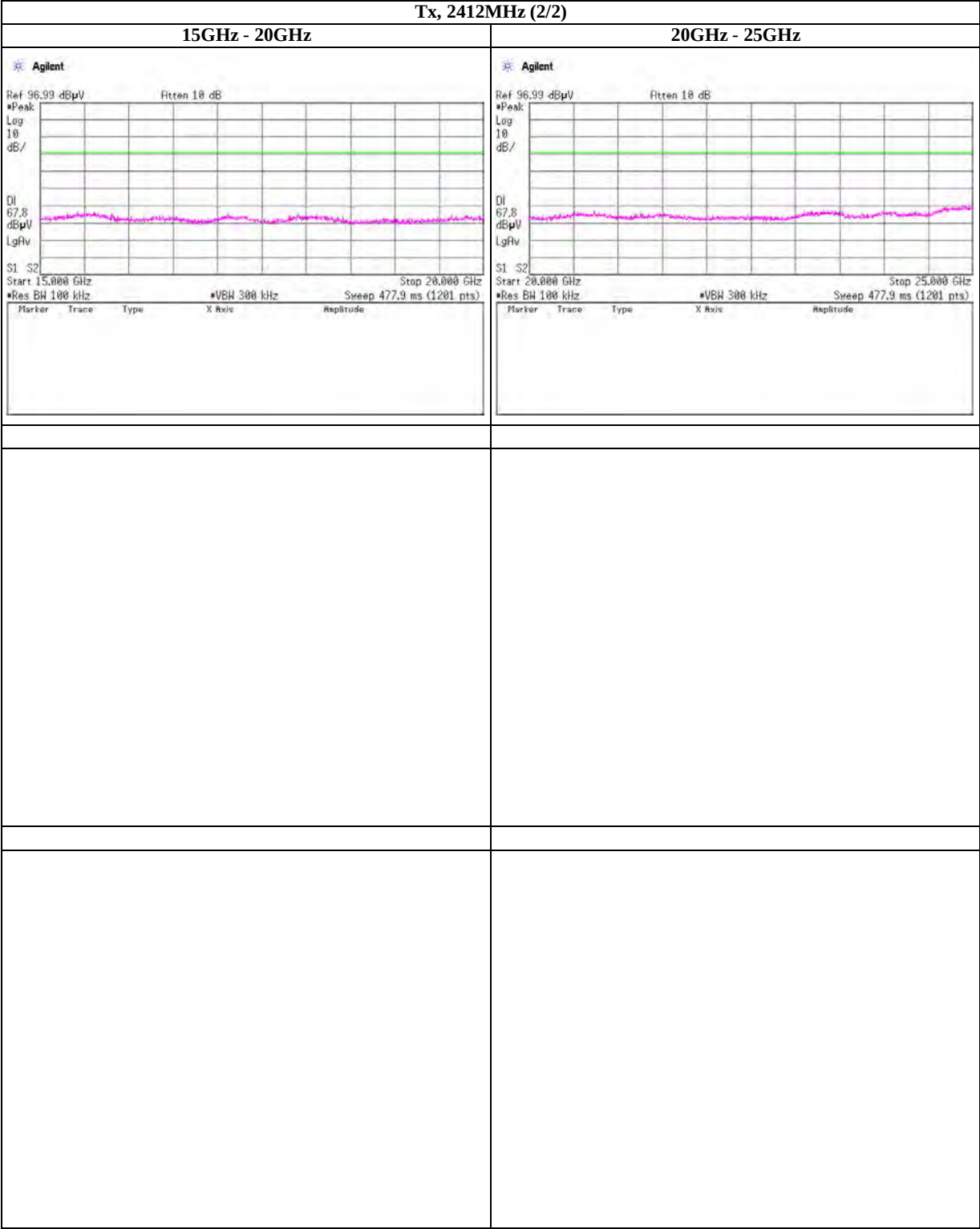
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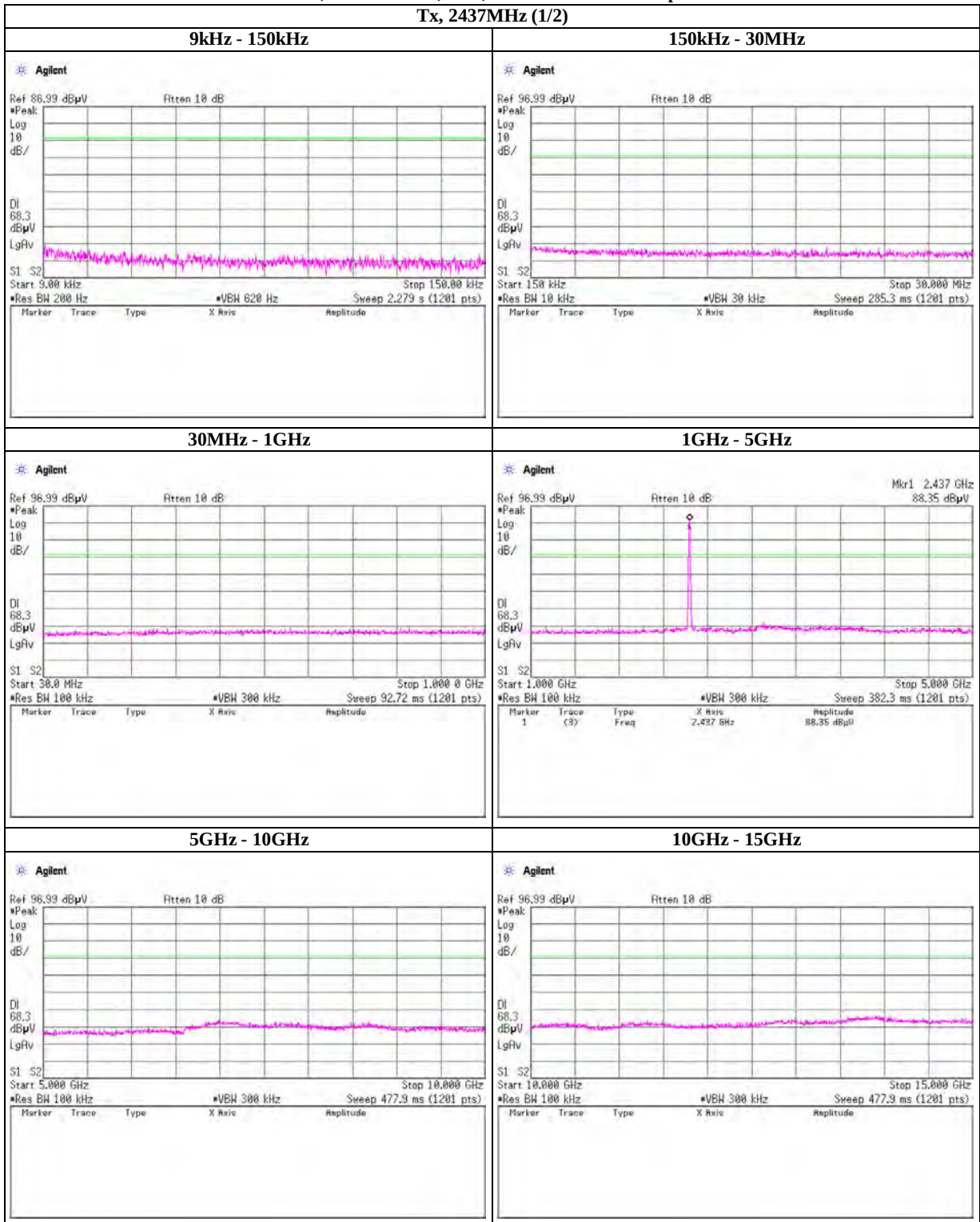


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Spurious emission (Conducted)

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

Tx, 2437MHz (1/2)



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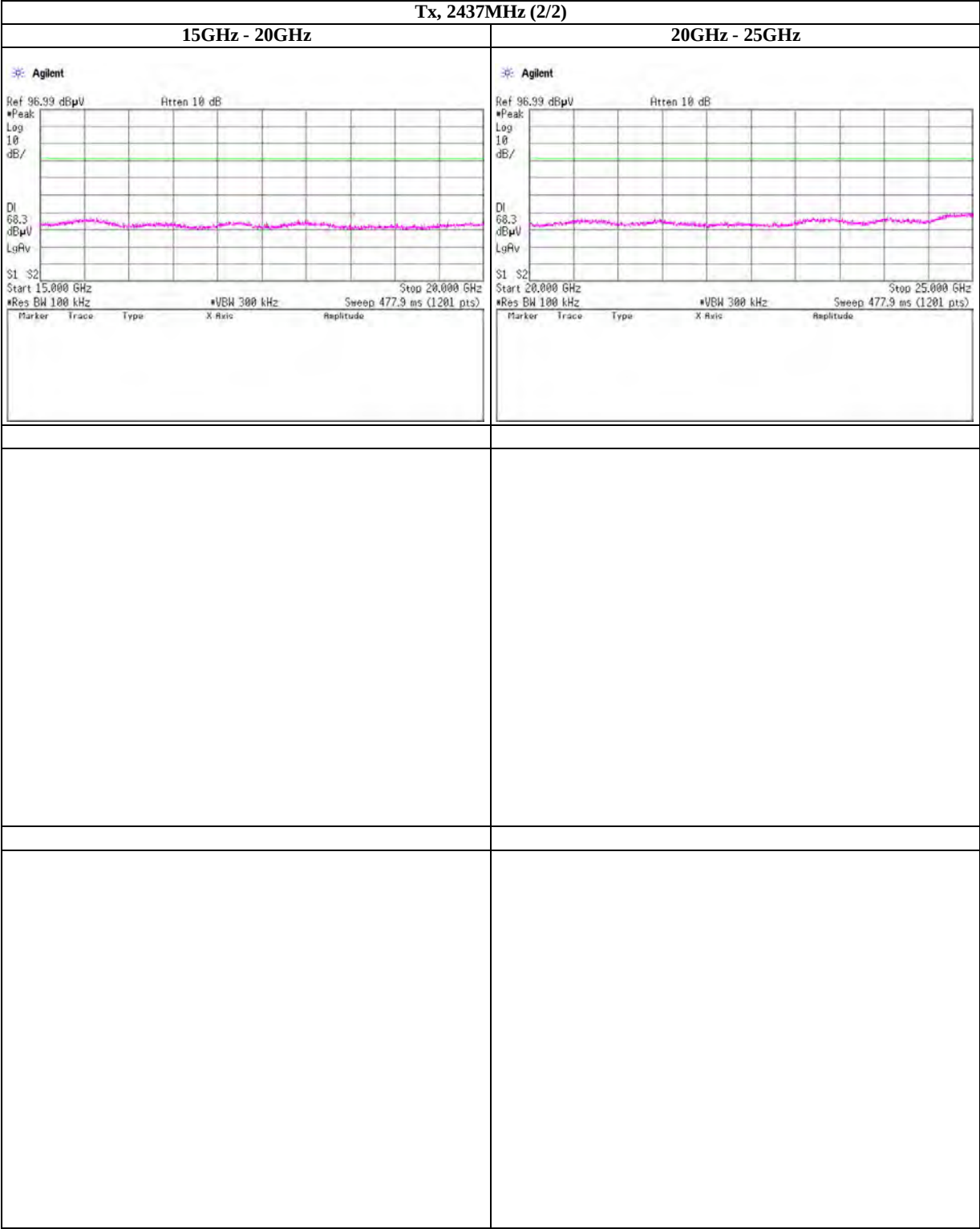
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Telephone : +81 463 50 6400

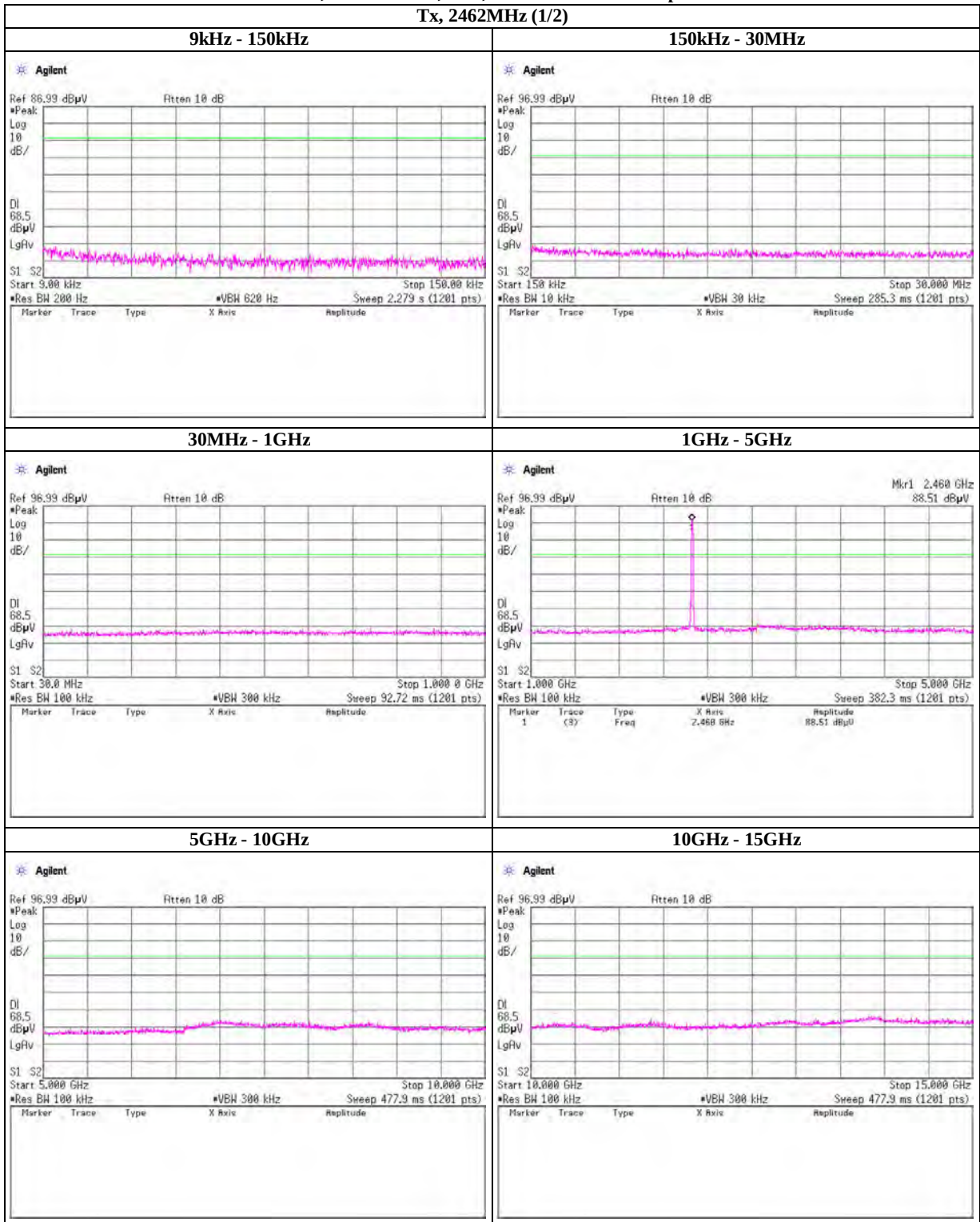
Facsimile : +81 463 50 6401

Spurious emission (Conducted)
Tx, IEEE802.11b, PN9, worst data mode 1Mbps
Tx, 2437MHz (2/2)



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Spurious emission (Conducted)
Tx, IEEE802.11b, PN9, worst data mode 1Mbps



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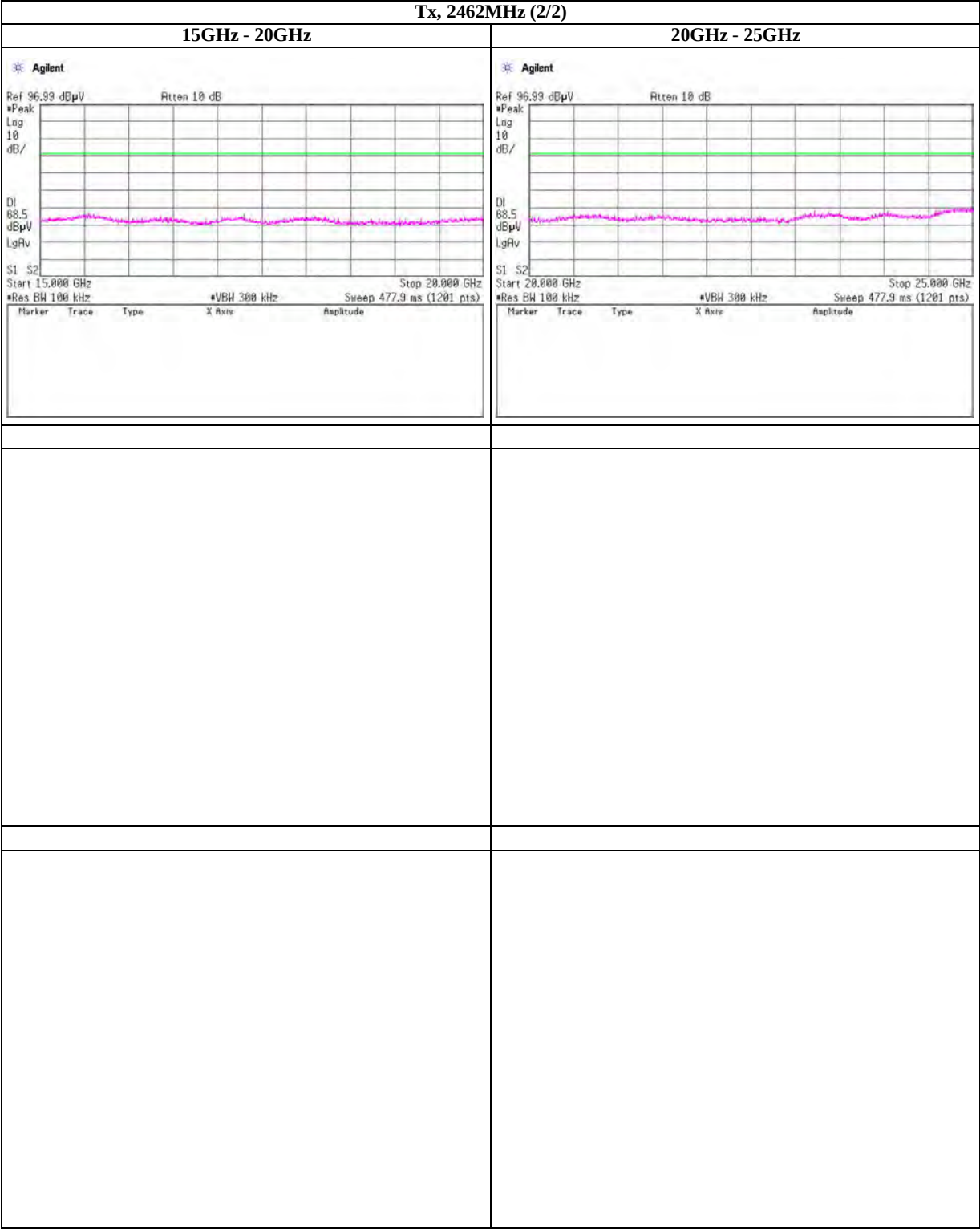
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Spurious emission (Conducted)
Tx, IEEE802.11b, PN9, worst data mode 1Mbps
Tx, 2462MHz (2/2)



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Spurious emission (Conducted)

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



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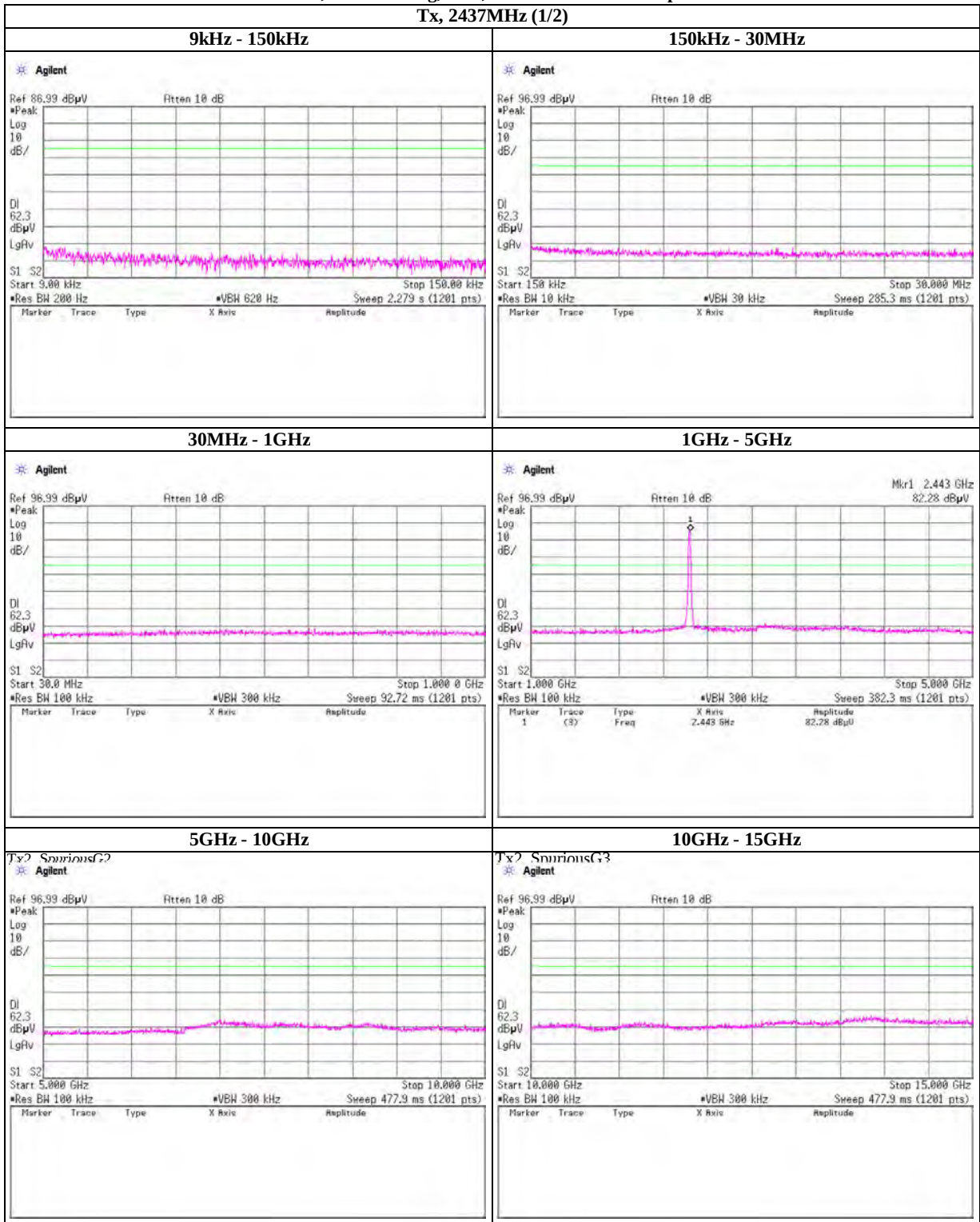
Facsimile : +81 463 50 6401

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Spurious emission (Conducted)

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

Tx, 2437MHz (1/2)



UL Japan, Inc.

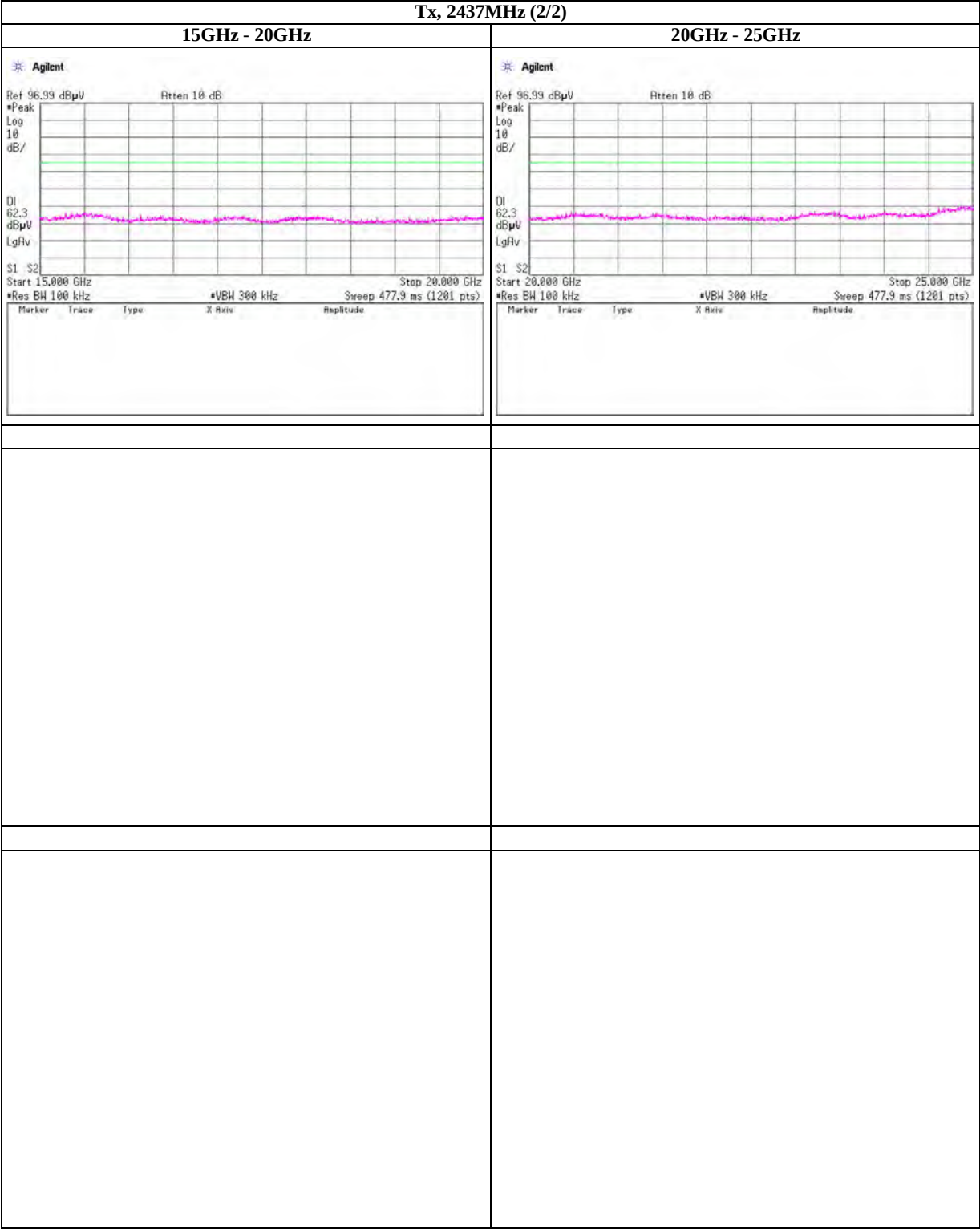
Shonan EMC Lab.

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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)
Tx, IEEE802.11g, PN9, worst data mode 6Mbps
Tx, 2437MHz (2/2)

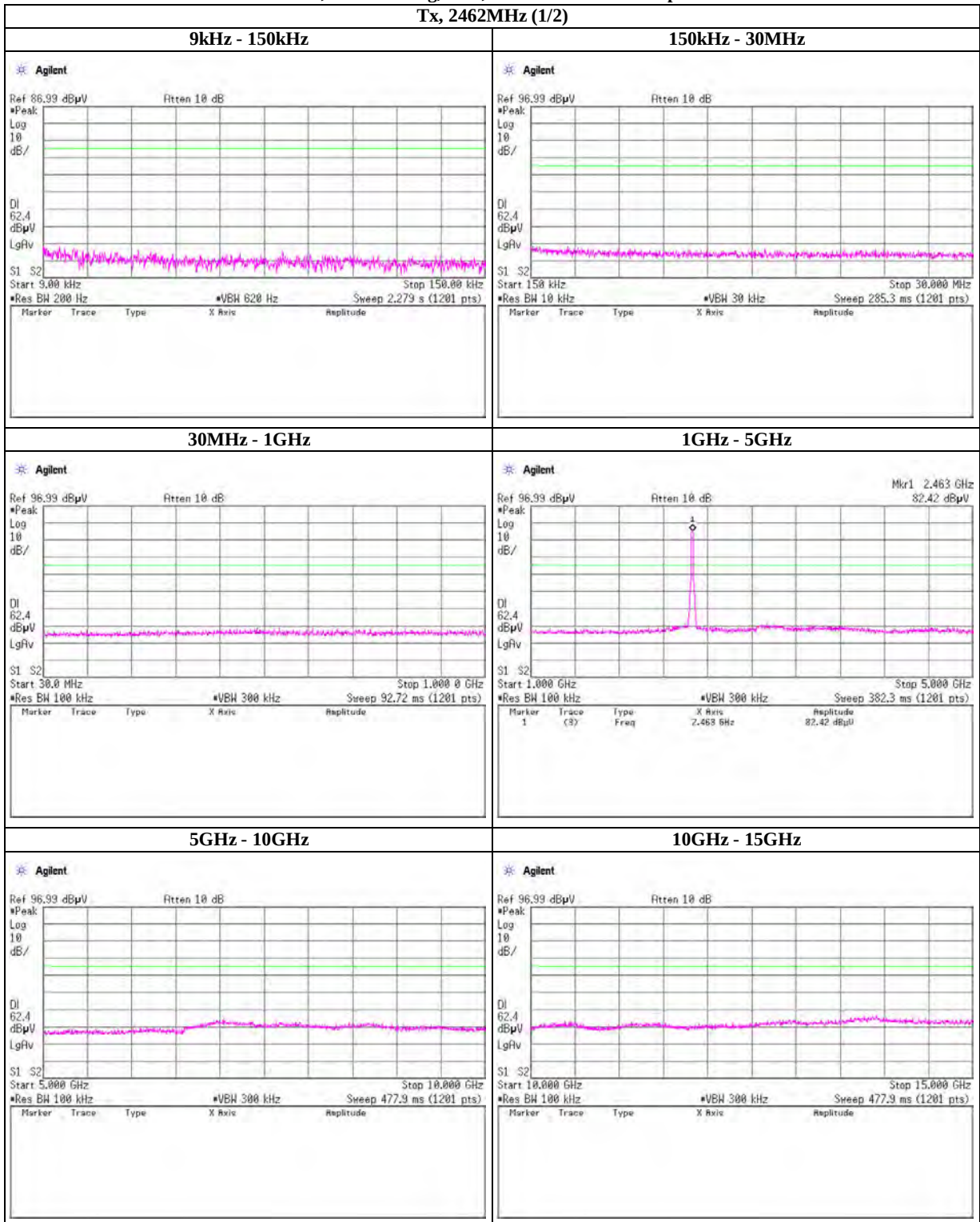


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Spurious emission (Conducted)

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

Tx, 2462MHz (1/2)



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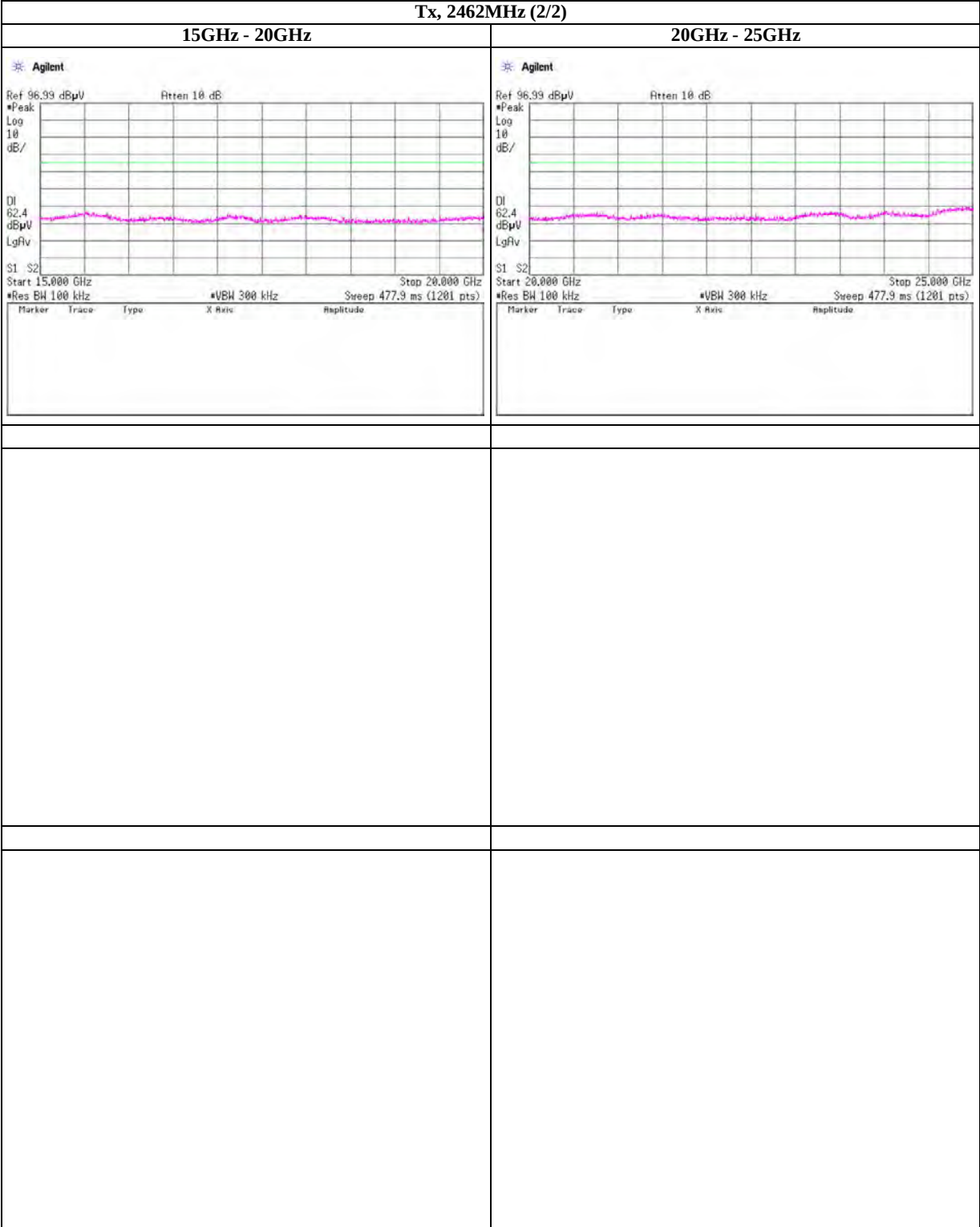
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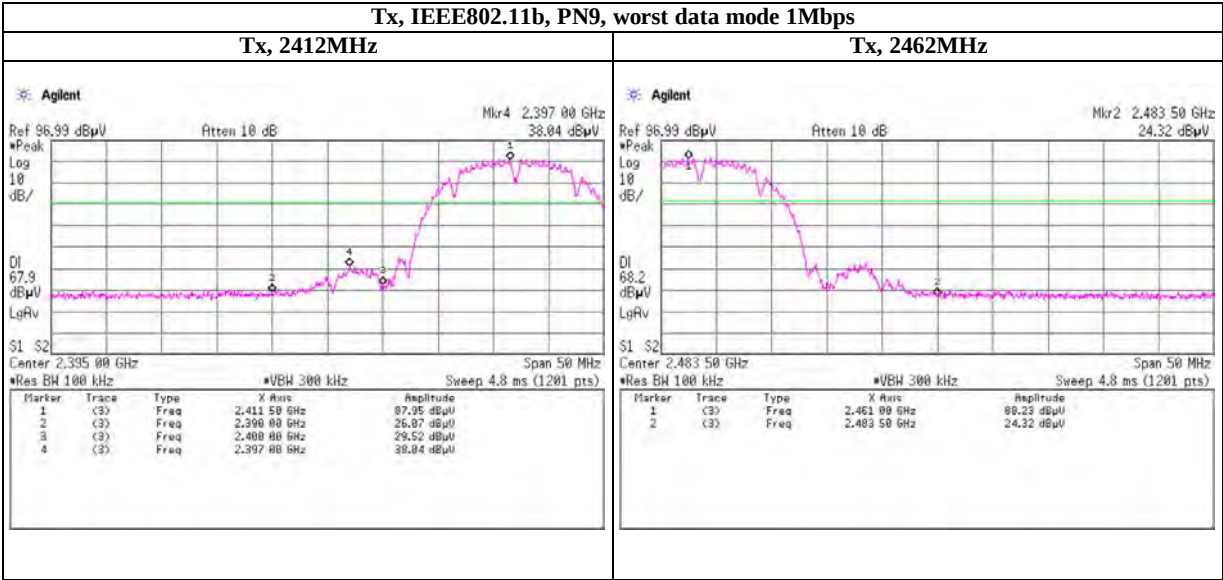
Spurious emission (Conducted)
Tx, IEEE802.11g, PN9, worst data mode 6Mbps
Tx, 2462MHz (2/2)



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Spurious emission (Conducted)

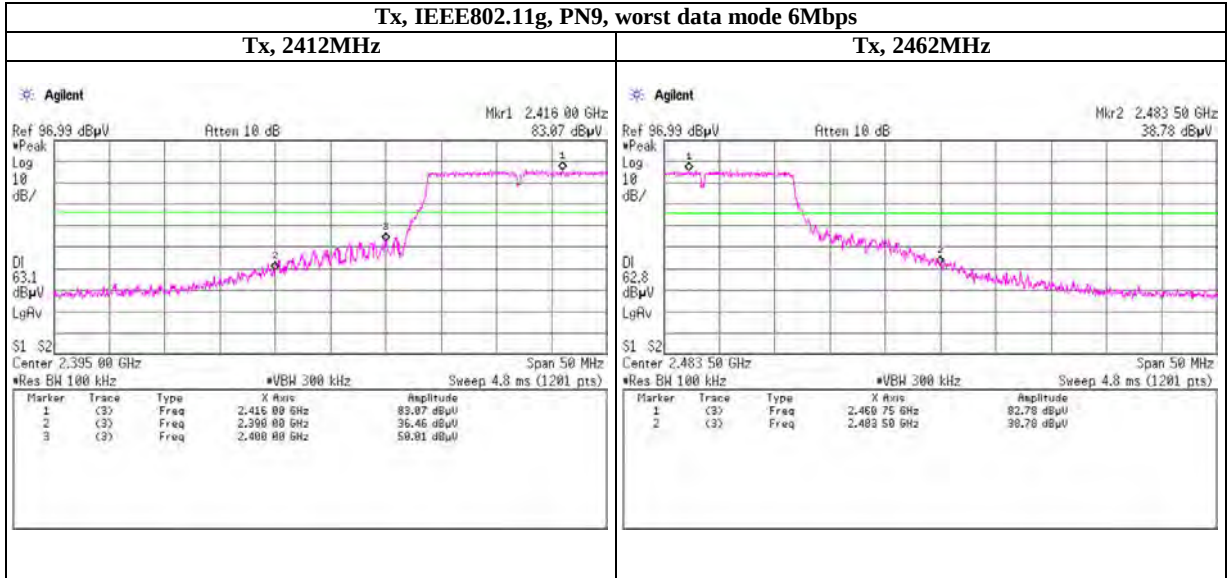
Band Edge compliance



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Spurious emission (Conducted)

Band Edge compliance



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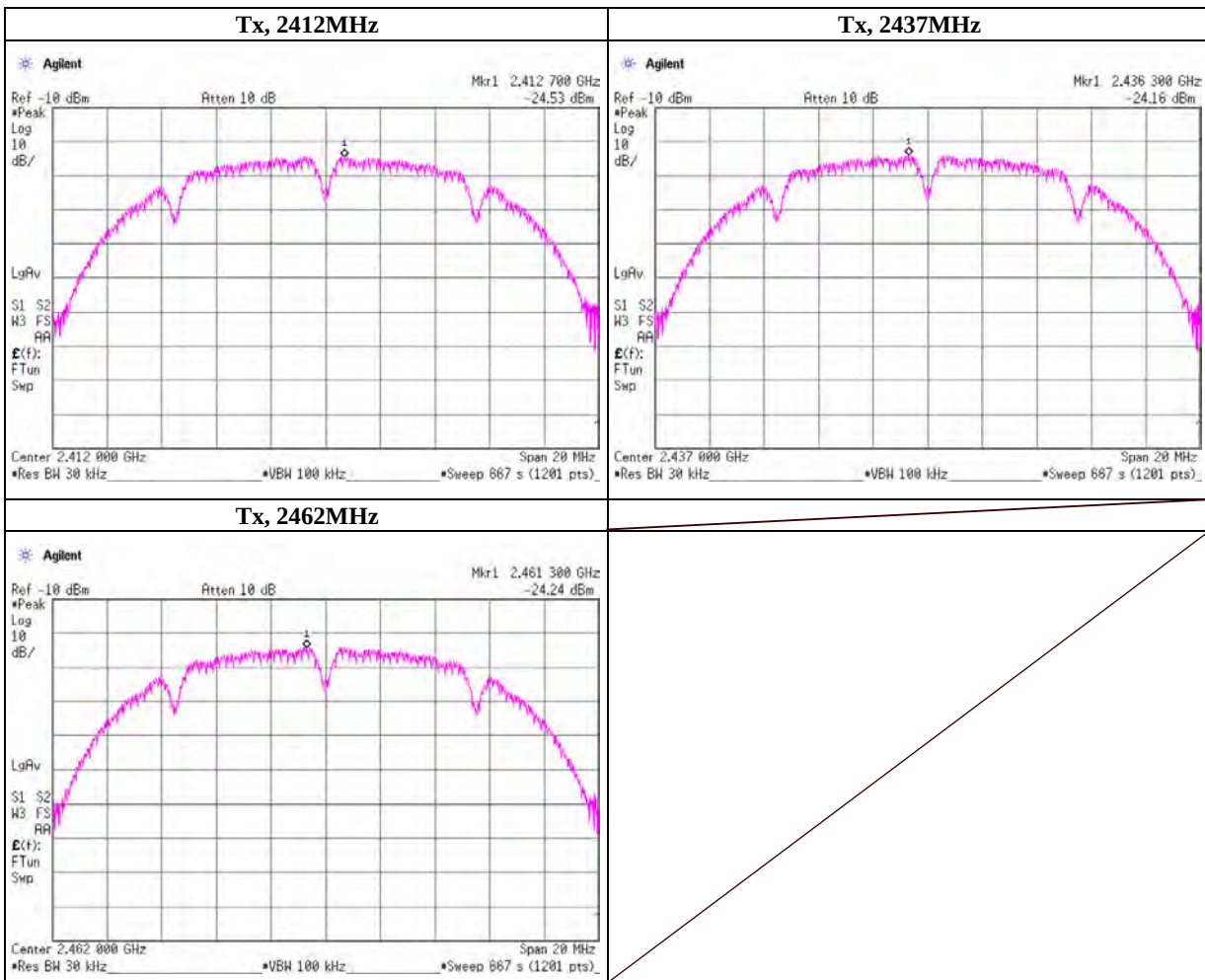
Power Density

Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	February 3, 2012	
Temperature / Humidity	22deg.C , 25%RH	
Engineer	Tatsuya Arai	
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	2412.70	-24.53	1.18	20.01	-3.34	8.00	11.34
2437.0000	2436.30	-24.16	1.19	20.01	-2.96	8.00	10.96
2462.0000	2461.30	-24.24	1.19	20.01	-3.04	8.00	11.04

Sample Calculation:

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



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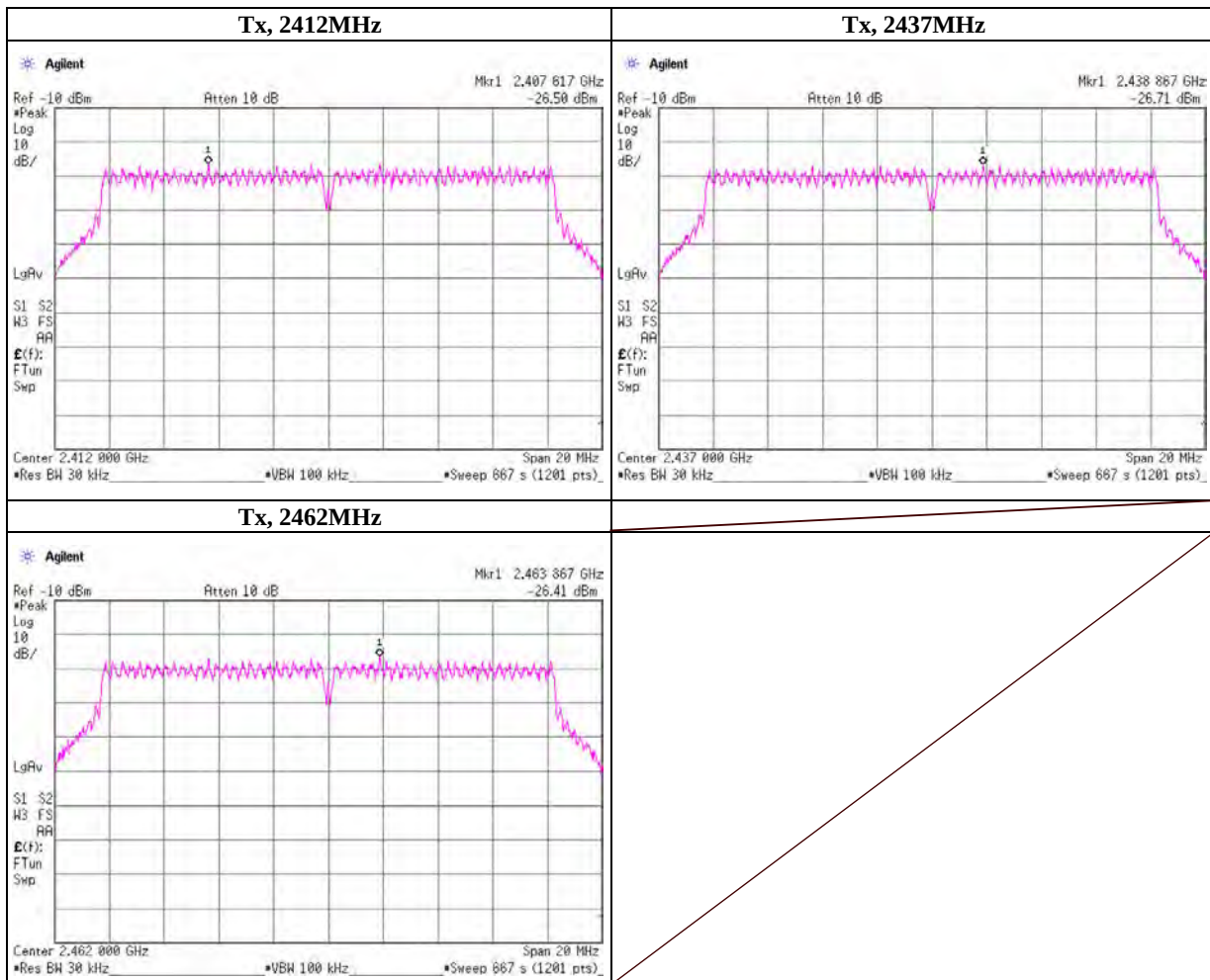
Power Density

Test place	UL Japan, Inc. Shonan EMC Lab.	No.6 Shielded Room
Date	February 3, 2012	
Temperature / Humidity	22deg.C , 25%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2407.62	-26.50	1.18	20.01	-5.31	8.00	13.31
2437.0000	2438.87	-26.71	1.19	20.01	-5.51	8.00	13.51
2462.0000	2463.87	-26.41	1.19	20.01	-5.21	8.00	13.21

Sample Calculation:

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



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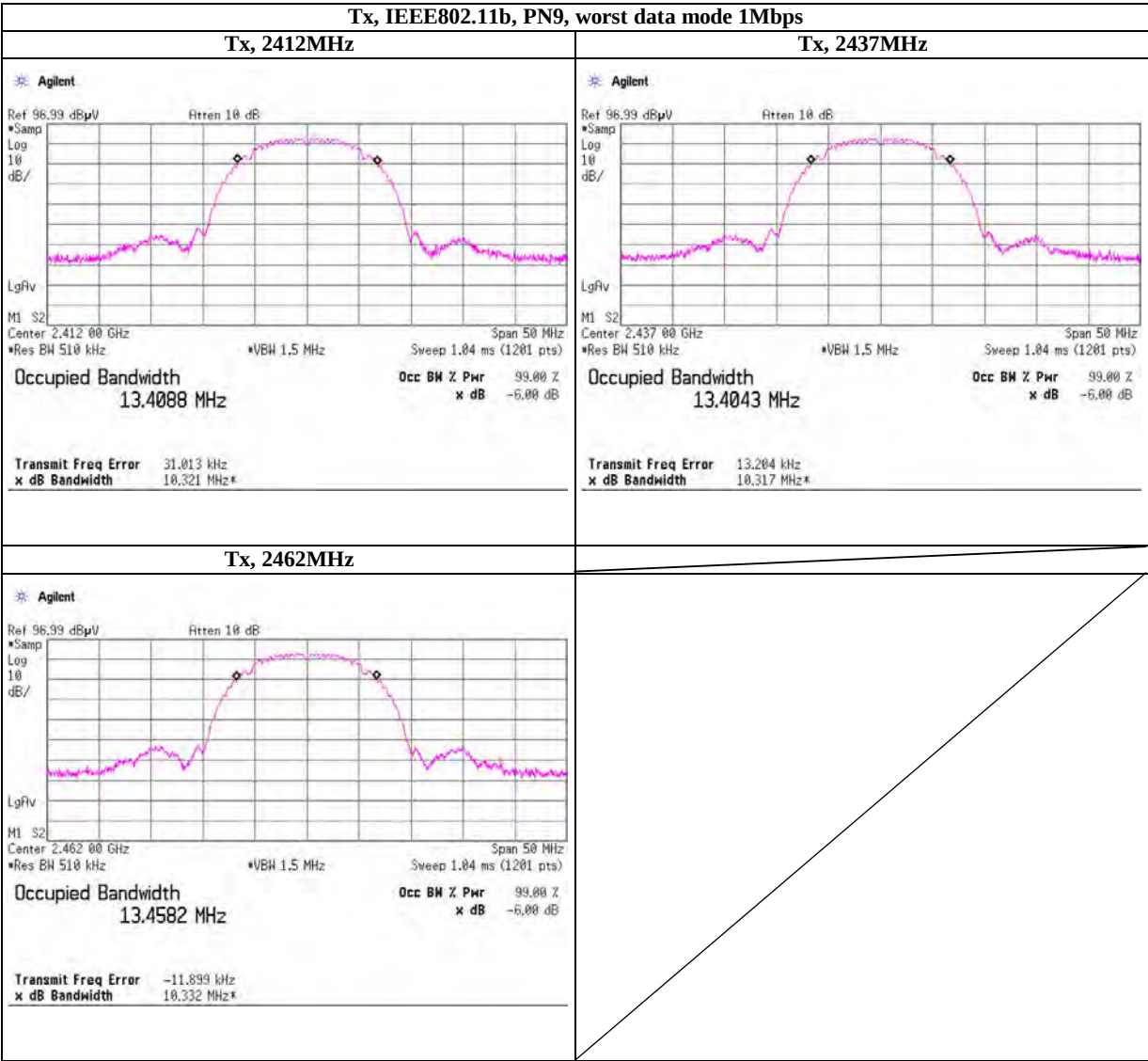
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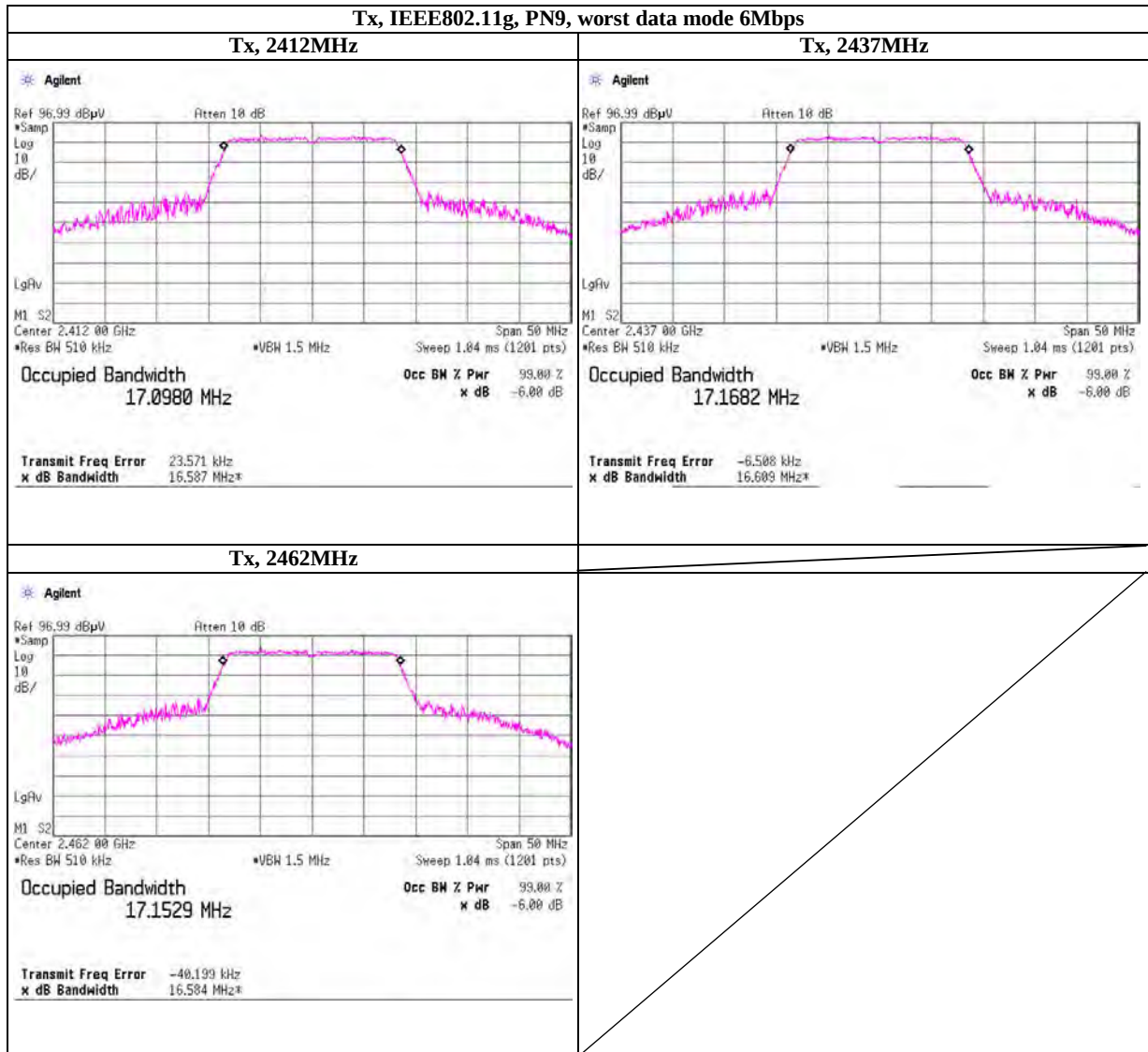
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99% Occupied Bandwidth



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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)
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT	2011/02/02 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2011/03/23 * 12
SAT10-09	Attenuator	Weinschel Corp.	54A-10	W5692	AT	2011/11/09 * 12
SAT20-02	Attenuator	Agilent	8493C-020	74890	AT	2011/03/23 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2011/04/12 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2011/04/12 * 12
SOS-10	Humidity Indicator	A&D	AD-5681	4064561	AT	2012/02/06 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2011/07/19 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	2011/04/28 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2011/05/27 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2011/08/28 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2012/02/06 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE,CE	2011/10/22 * 12
SJM-10	Measure	PROMART	SEN1935	-	RE,CE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RF,IMF)	-	RE,CE	-
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
SHA-05	Horn Antenna	ETS LINDGREN	3160-09	LM4210	RE	2011/03/15 * 12
SCC-G18	Coaxial Cable	Suhner	SUCOFLEX 104A	46292/4A	RE	2011/03/16 * 12
SAF-09	Pre Amplifier	TOYO Corporation	HAP18-26W	00000018	RE	2011/03/16 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2011/02/17 * 12
SAT6-03	Attenuator	JFW	50HF-006N	-	RE	2011/02/17 * 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/NS4906	-/0901-271(RF Selector)	RE	2011/04/28 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2011/10/23 * 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	2011/04/28 * 12
SLS-05	LISN	Rohde & Schwarz	ENV216	100516	CE	2011/02/23 * 12
SAT3-06	Attenuator	JFW	50HF-003N	-	CE	2011/02/17 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2011/03/02 * 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 conducted test