



RADIO TEST REPORT

Test Report No.: 10407961S-N

Applicant : **Canon Inc.**
Type of Equipment : **Wireless Module**
Model No. : **WM236**
FCC ID : **AZD236**
Test regulation : **FCC Part15 Subpart C: 2015**
Test result : **Complied**

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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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7. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)

Date of test: August 19, 2014 to May 29, 2015

Representative test engineer:

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Shinichi Takano
Engineer
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Approved by :

T. Imamura

Toyokazu Imamura
Leader
Consumer Technology Division



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Shonan EMC Lab.

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13-EM-F0429

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SECTION 1: Customer information

Company Name : Canon Inc.
Address : 30-2, Shimomaruko 3-chome, Ohta-ku, Tokyo, 146-8501 Japan
Telephone Number : +81-3-5482-8070
Facsimile Number : +81-3-3757-8431
Contact Person : Hironobu Saida

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

2.1 Identification of E.U.T.

Type of Equipment : Wireless Module
Model No. : WM236
Serial No. : Refer to 4.2
Rating : DC 3.3 V, DC 1.8 V
Receipt Date of Sample : July 25, 2014
Country of Mass-production : Philippines
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No modification by the test lab.

2.2 Product description

Model: WM236 (referred to as the EUT in this report) is a Wireless Module.

Clock frequency(ies) in the system : 38.4 MHz

Radio specification:

Equipment type : Transceiver
Frequency of operation : 2412-2462 MHz
Bandwidth : 20 MHz
Channel spacing : 5 MHz
Type of modulation : DSSS (IEEE 802.11b), OFDM (IEEE 802.11g/n)
Antenna type : Monopole type chip
Antenna connector type : None
Antenna gain : -3.10 dBi (2442 MHz)
ITU code : D1D, G1D
Operation temperature range : -20 deg.C to +85 deg.C

FCC 15.31 (e) / 212

The host device provides stable voltage (DC 3.3 V and DC 1.8 V) constantly to the EUT regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC 15.203 / 212

The antenna is not removable from 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 2015, final revised on November 23, 2015
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

*Some parts are effective on and after December 17, 2015 or December 23, 2015. The revision does not affect the test specification applied to the EUT.

All the revisions made after testing date do not affect the test specification applied to the EUT.

3.2 Procedures & Results

Item	Test Procedure *1)	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.10:2009	FCC 15.207	-	N/A	20.7 dB Freq.: 0.17822 MHz Detector: Quasi-Peak Phase: L1 Mode: Tx 2437 MHz, IEEE 802.11n-20HT Power setting: 10 dBm	Complied
6dB bandwidth	ANSI C63.10:2009	FCC 15.247 (a)(2)	Conducted	N/A	* See data	Complied
Maximum peak conducted output power	ANSI C63.10:2009	FCC 15.247 (b)(3)	Conducted	N/A		Complied
Out of band emission & Restricted band edges	ANSI C63.10:2009	FCC 15.247 (d) & 15.209	Conducted / Radiated	N/A *2)	1.0 dB Freq.: 527.991 MHz Polarization: Horizontal Detection: Quasi-Peak Mode: Tx 2437 MHz, IEEE 802.11n-20HT Power setting: 10 dBm	Complied
Power density	ANSI C63.10:2009	FCC 15.247 (e)	Conducted	N/A	* See data	Complied

Note: UL Japan's EMI Work Procedures No.13-EM-W0420 and 13-EM-W0422.

*1) These tests were also referred to KDB 558074 v03 r03 (FCC), "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

*2) Radiated test was selected over 30 MHz based on section 15.247(d) and KDB 558074 D01 12.2.7.

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied bandwidth (99%)	ANSI C63.4:2009 RSS-Gen 6.6	-	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 ^{*1} /SR ^{*2} (±)	No.2 SAC/SR (±)	No.3 SAC/SR (±)
Conducted emission (AC Mains) LISN	150kHz-30MHz	3.6 dB	3.6 dB	3.5 dB
Radiated emission (Measurement distance: 3m)	9kHz-30MHz	3.7 dB	3.7 dB	3.6 dB
	30MHz-300MHz	4.8 dB	5.0 dB	4.8 dB
	300MHz-1GHz	5.0 dB	5.0 dB	4.8 dB
	1GHz-15GHz	4.9 dB	4.9 dB	4.9 dB
Radiated emission (Measurement distance: 1m)	15GHz-18GHz	5.7 dB	5.6 dB	5.6 dB
	18GHz-40GHz	5.2 dB	4.3 dB	4.3 dB

*1: SAC=Semi-Anechoic Chamber

*2: SR= Shielded Room is applied besides radiated emission

Conducted emission test

The data listed in this test report has enough margin, more than the site margin.

Radiated emission test

The data listed in this test report meets the limits unless the uncertainty is taken into consideration.

Antenna port conducted test

Power measurement uncertainty above 1GHz for this test was: (±) 1.5dB

Spurious emission (Conducted) measurement (below 1GHz) uncertainty for this test was: (±) 1.7dB

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

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Telephone number : +81 463 50 6400

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JAB Accreditation No. : RTL02610

	IC Registration No.	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
<input type="checkbox"/> No.1 semi-anechoic chamber	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	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
<input type="checkbox"/> No.3 semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
<input type="checkbox"/> No.4 semi-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 type="checkbox"/> No.2 shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
<input checked="" 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

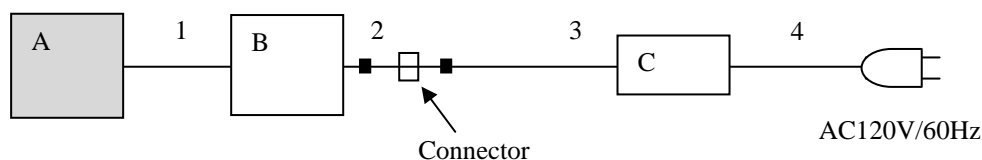
Test item	Mode	Tested frequency	Power setting *1)	Worst data rate *2)
Conducted emission Radiated emission (below 1GHz) *3)	Transmitting IEEE 802.11n-20HT	2437MHz	10 (10dBm)	MCS6, PN9
			13 (12dBm)	MCS6, PN9
Other items	Transmitting IEEE 802.11b	2412MHz, 2437MHz, 2462MHz	10 (10dBm)	2Mbps, PN9
			13 (12dBm)	1Mbps, PN9
				2Mbps, PN9 *4)
	Transmitting IEEE 802.11g	2412MHz, 2437MHz, 2462MHz	10 (10dBm)	48Mbps, PN9
			13 (12dBm)	54Mbps, PN9
	Transmitting IEEE 802.11n-20HT	2412MHz, 2437MHz, 2462MHz	10 (10dBm)	MCS6, PN9
13 (12dBm)			MCS6, PN9	

*1) The actual output power differs from the setting value. Software used for the test: RFTTEST ver. 14.1.36.p27
*2) The worst condition was determined based on the test result of Maximum Peak Conducted Output Power.
*3) Test operating mode was determined as follows according to "Section 1 of 6 802.11 a/b/g/n testing- Managing Complex Regulatory Approvals - "of TCB Council Workshop October 2009.
*4) The rate of -6dB Bandwidth and Maximum Power Spectral Density was selected considering the worst rate of Maximum Power Spectral Density.

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

4.2 Configuration and peripherals

■: Ferrite core *7)



* Test data was taken under worst case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless Module	WM236	*5)	Canon	EUT
B	Digital Camera	PC2052	821060038906	Canon	*6)
C	Compact Power Adapter	-	49576-28-01	Canon	-

*5) F48139F1C482: Conducted emission and Radiated emission, F48139F1C442: Antenna port conducted test (Band Edge compliance), F48139F1C455: Antenna port conducted test (other tests)

*6) This item is not a host device of the EUT and it was used as a test jig.

List of cables used

No.	Cable	Length (m)	Shield-Cable	Shield-Connector	Remarks
1	Jig	0.15	Unshielded	Unshielded	-
2	DC	0.15	Unshielded	Unshielded	-
3	DC	2.0	Unshielded	Unshielded	-
4	AC	2.0	Unshielded	Unshielded	-

*7) The core is a standard ferrite core attached to DC cable and not used to reduce the noise from the EUT. The core is equivalent to the one which is attached to the DC cable of host device the EUT is installed.

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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. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source. Photographs of the set up are shown in APPENDIX 3.

5.3 Test conditions

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

5.4 Test procedure

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

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

5.5 Results

Summary of the test results : Pass
Refer to APPENDIX 1.

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

Test procedure

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

Summary of the test results: Pass

Refer to APPENDIX 1.

SECTION 7: Maximum peak conducted output power

Test procedure

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

Detection type: Peak / Average *1)

Summary of the test results: Pass

Refer to APPENDIX 1

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

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

Test procedure

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

Summary of the test results: Pass

Refer to APPENDIX 1.

SECTION 9: Peak power density

Test procedure

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

Instrument used : Spectrum Analyzer
RBW / VBW : 3kHz / 9.1kHz

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

Summary of the test results: Pass

Refer to APPENDIX 1.

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SECTION 10: Radiated emission

10.1 Operating environment

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

10.2 Test configuration

EUT was placed on a urethane platform of nominal size, 0.25m by 0.25m, raised 0.8m above the conducting ground plane. Photographs of the set up are shown in APPENDIX 3.

10.3 Test conditions

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

10.4 Test procedure

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

The radiated emission measurements were made with the following detection.

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

*1) Average Power Measurement was measured based on 13.3.2 of KDB 558074 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

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

Worst case:

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

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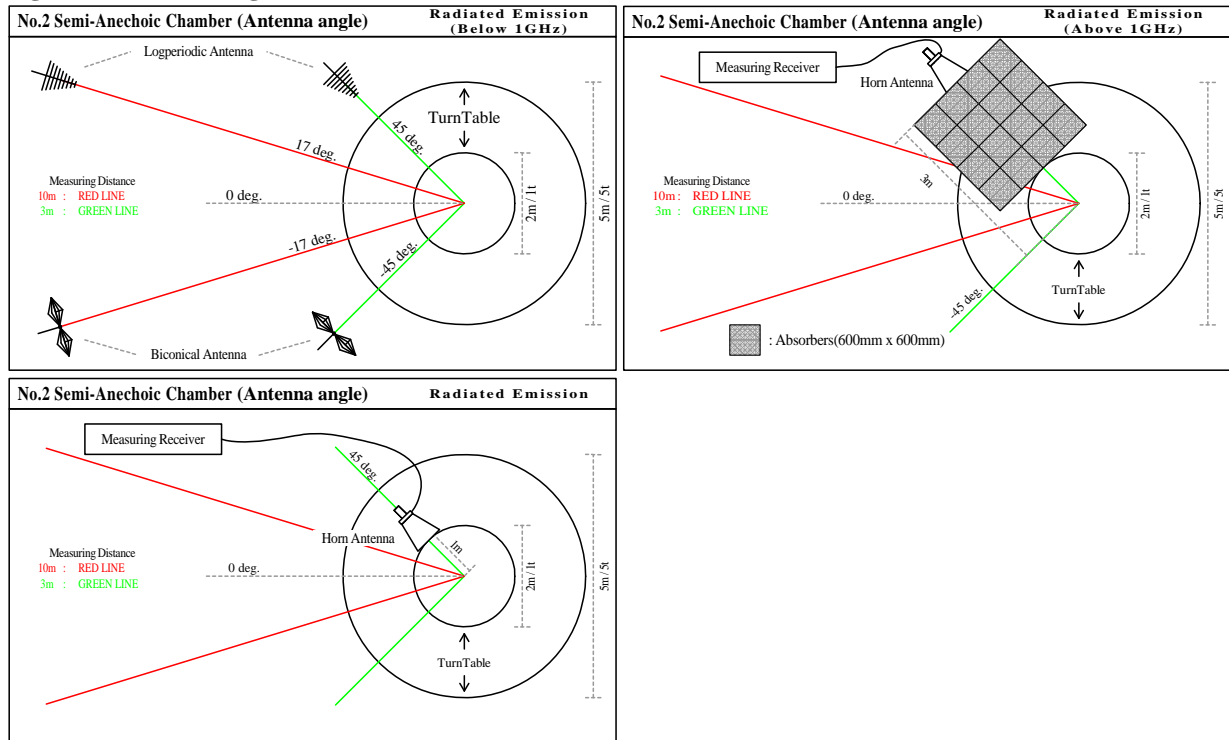
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Figure 1. Antenna angle



10.5 Band edge

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

10.6 Results

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

Refer to APPENDIX 1.

Contents of APPENDIXES

APPENDIX 1: Data of Radio tests

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

APPENDIX 2: Test instruments

Test instruments

APPENDIX 3: Photographs of test setup

Conducted emission
Radiated emission
Pre-check of the worst position

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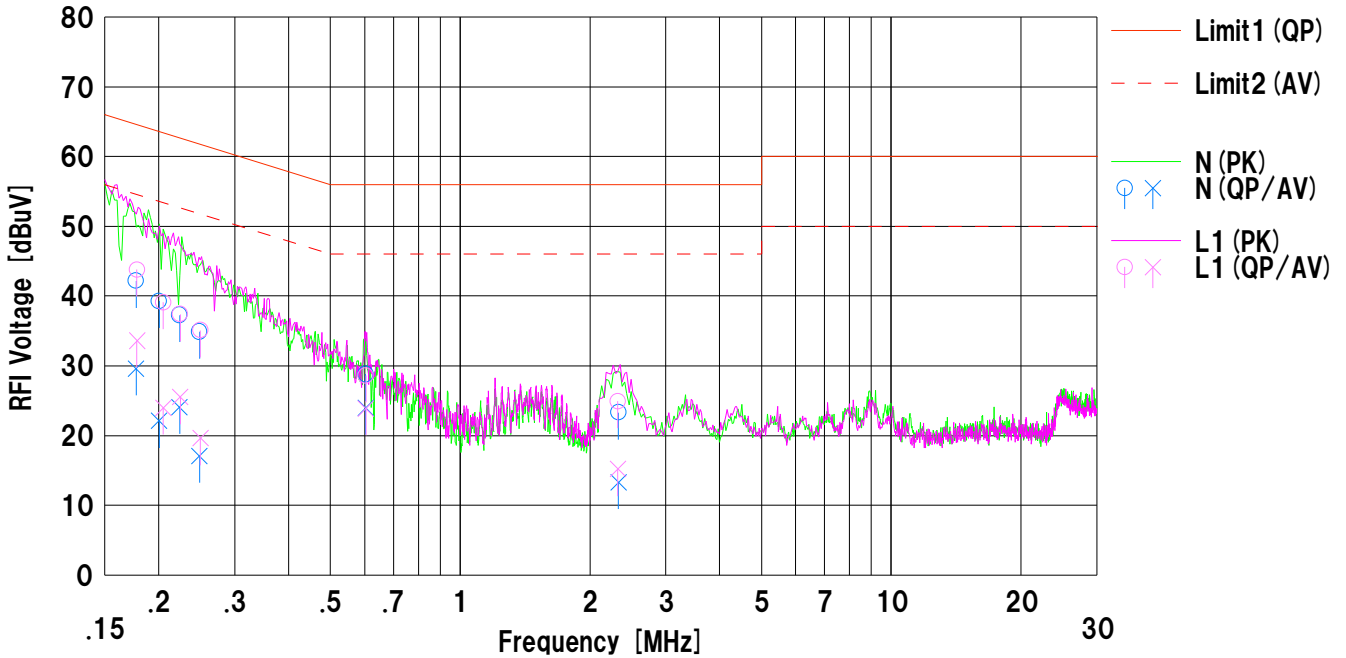
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2014/08/30

Mode : Tx 11n20-HT 2437MHz Power 10dBm
Report No. : 10407961S
Power : AC 120V / 60Hz (AC Adapter)
Temp./Humi. : 26deg.C. / 63%RH

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

Engineer : Wataru Kojima



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	0.17711	29.6	17.0	12.6	42.2	29.6	64.6	54.6	22.4	25.0	N	
2	0.20032	26.7	9.5	12.6	39.3	22.1	63.5	53.5	24.2	31.4	N	
3	0.22372	24.7	11.5	12.6	37.3	24.1	62.6	52.6	25.3	28.5	N	
4	0.24852	22.3	4.5	12.6	34.9	17.1	61.8	51.8	26.9	34.7	N	
5	0.60385	16.2	11.4	12.6	28.8	24.0	56.0	46.0	27.2	22.0	N	
6	2.32967	10.6	0.6	12.7	23.3	13.3	56.0	46.0	32.7	32.7	N	
7	0.17822	31.2	21.0	12.6	43.8	33.6	64.5	54.5	20.7	20.9	L1	
8	0.20498	26.5	11.4	12.6	39.1	24.0	63.4	53.4	24.3	29.4	L1	
9	0.22430	24.8	12.9	12.6	37.4	25.5	62.6	52.6	25.2	27.1	L1	
10	0.24971	22.5	7.0	12.6	35.1	19.6	61.7	51.7	26.6	32.1	L1	
11	0.60433	16.0	11.3	12.6	28.6	23.9	56.0	46.0	27.4	22.1	L1	
12	2.32377	12.2	2.5	12.7	24.9	15.2	56.0	46.0	31.1	30.8	L1	

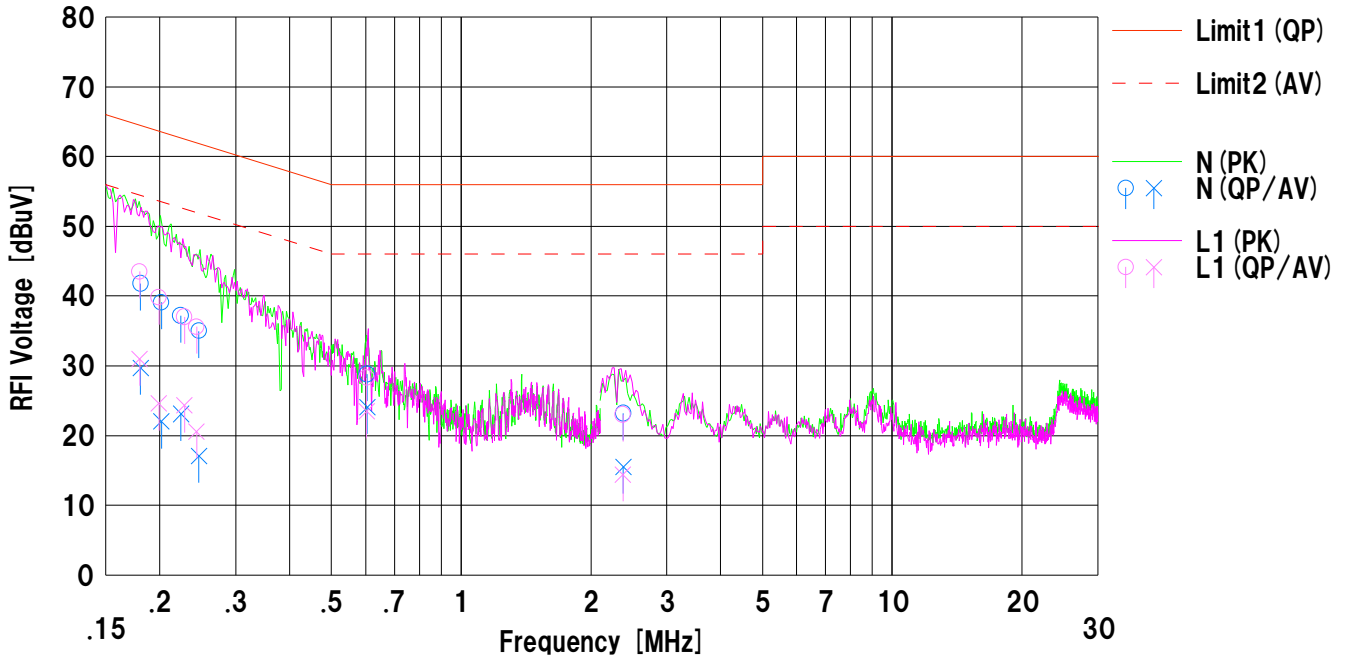
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2014/08/30

Mode : Tx 11n20-HT 2437MHz Power 12dBm
Report No. : 10407961S
Power : AC 120V / 60Hz (AC Adapter)
Temp./Humi. : 26deg.C. / 63%RH

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

Engineer : Wataru Kojima

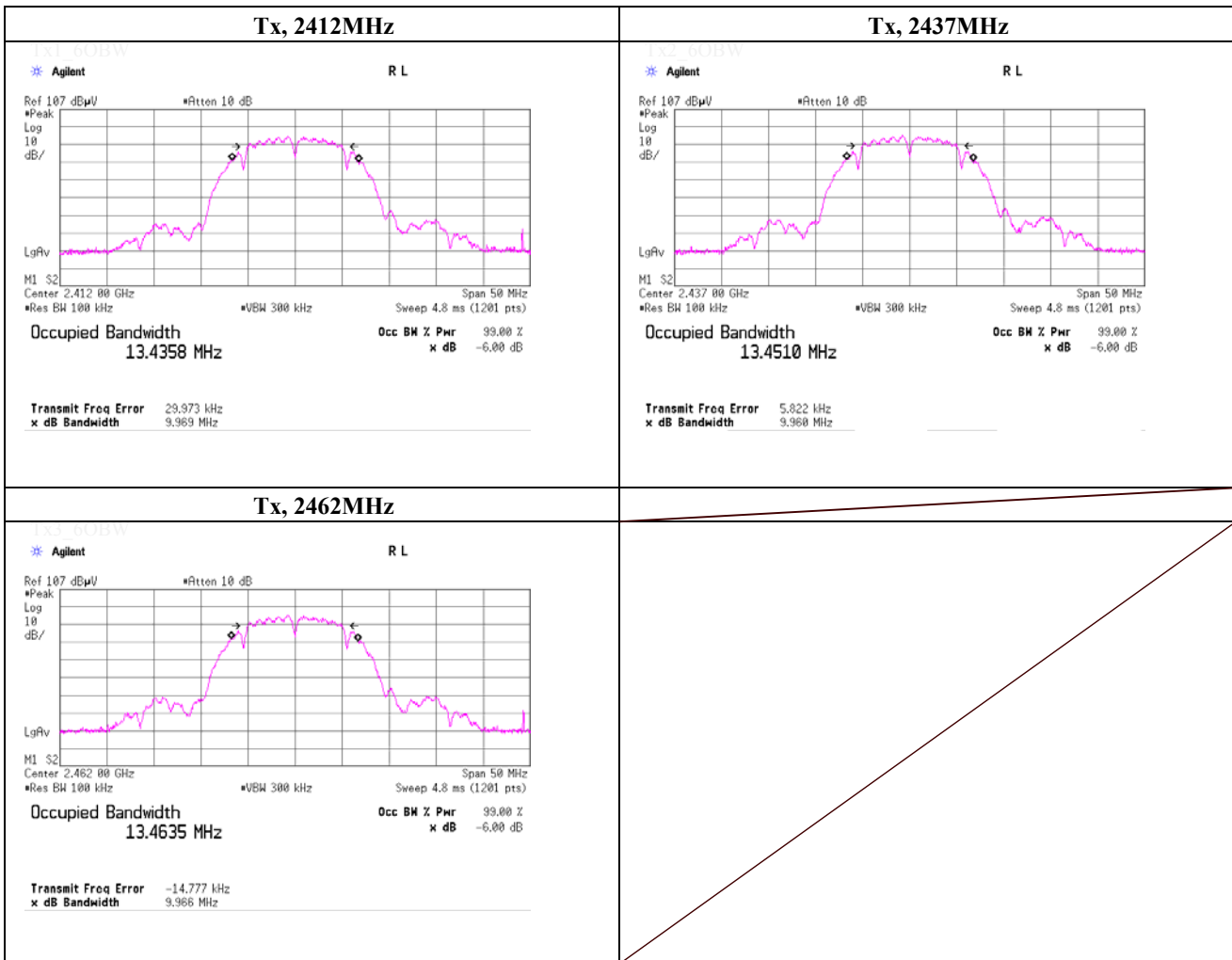


No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.18056	29.2	17.1	12.6	41.8	29.7	64.4	54.4	22.6	24.7	N	
2	0.20179	26.5	9.4	12.6	39.1	22.0	63.5	53.5	24.4	31.5	N	
3	0.22383	24.6	10.5	12.6	37.2	23.1	62.6	52.6	25.4	29.5	N	
4	0.24641	22.4	4.5	12.6	35.0	17.1	61.8	51.8	26.8	34.7	N	
5	0.60527	16.2	11.5	12.6	28.8	24.1	56.0	46.0	27.2	21.9	N	
6	2.37823	10.5	2.8	12.7	23.2	15.5	56.0	46.0	32.8	30.5	N	
7	0.17972	30.9	18.4	12.6	43.5	31.0	64.4	54.4	20.9	23.4	L1	
8	0.19882	27.2	12.0	12.6	39.8	24.6	63.6	53.6	23.8	29.0	L1	
9	0.22827	24.4	11.7	12.6	37.0	24.3	62.5	52.5	25.5	28.2	L1	
10	0.24340	23.0	8.0	12.6	35.6	20.6	61.9	51.9	26.3	31.3	L1	
11	0.60394	15.7	10.9	12.6	28.3	23.5	56.0	46.0	27.7	22.5	L1	
12	2.37425	10.3	1.7	12.7	23.0	14.4	56.0	46.0	33.0	31.6	L1	

-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 22, 2014	
Temperature / Humidity	26deg.C , 47%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11b, PN9, worst data mode 2Mbps, power setting 10dBm	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	9.969	> 0.500
2437.0000	9.960	> 0.500
2462.0000	9.966	> 0.500

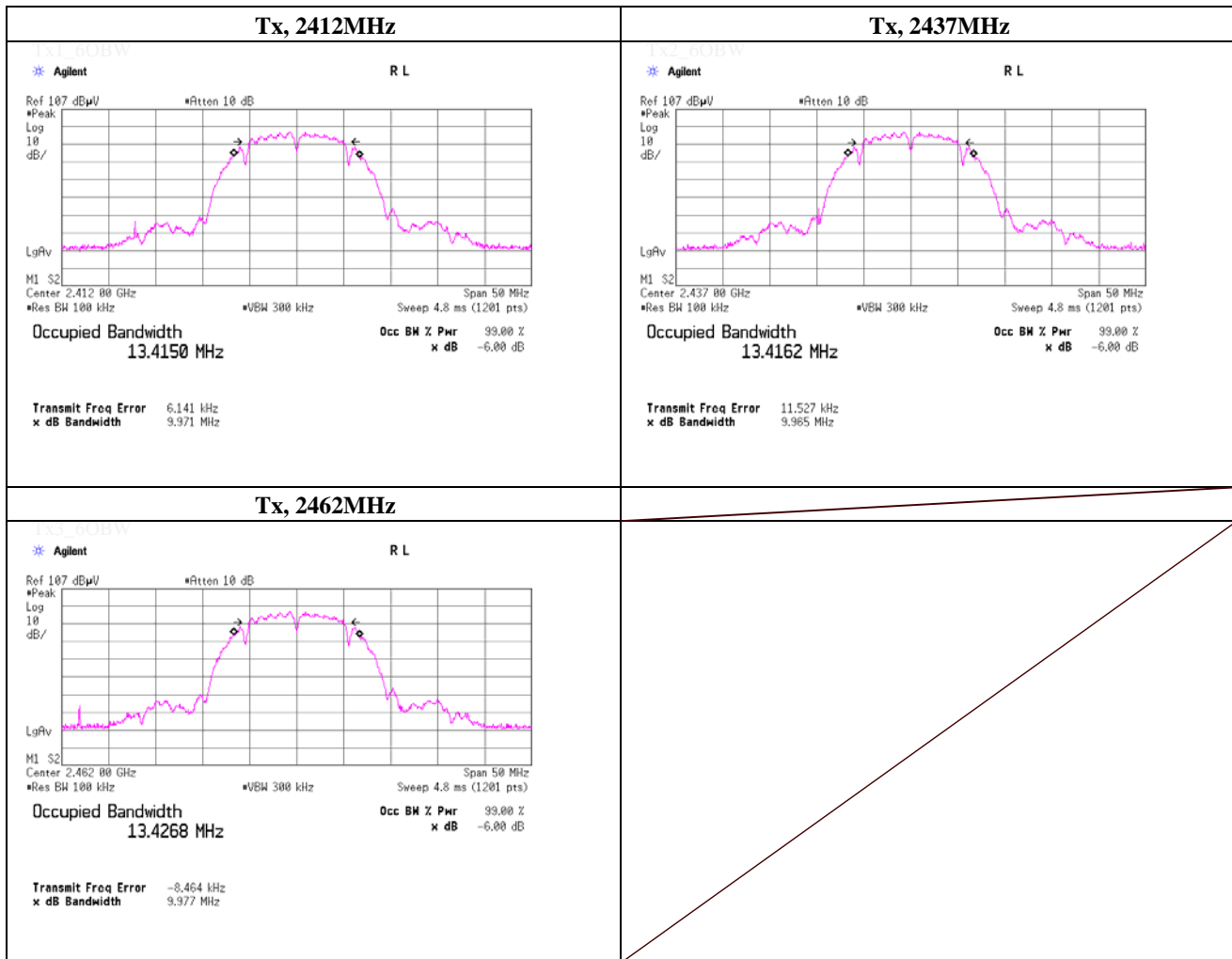


-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	October 15, 2014	
Temperature / Humidity	26deg.C , 50%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11b, PN9, worst data mode 2Mbps ,power setting 12dBm	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	9.971	> 0.500
2437.0000	9.965	> 0.500
2462.0000	9.977	> 0.500

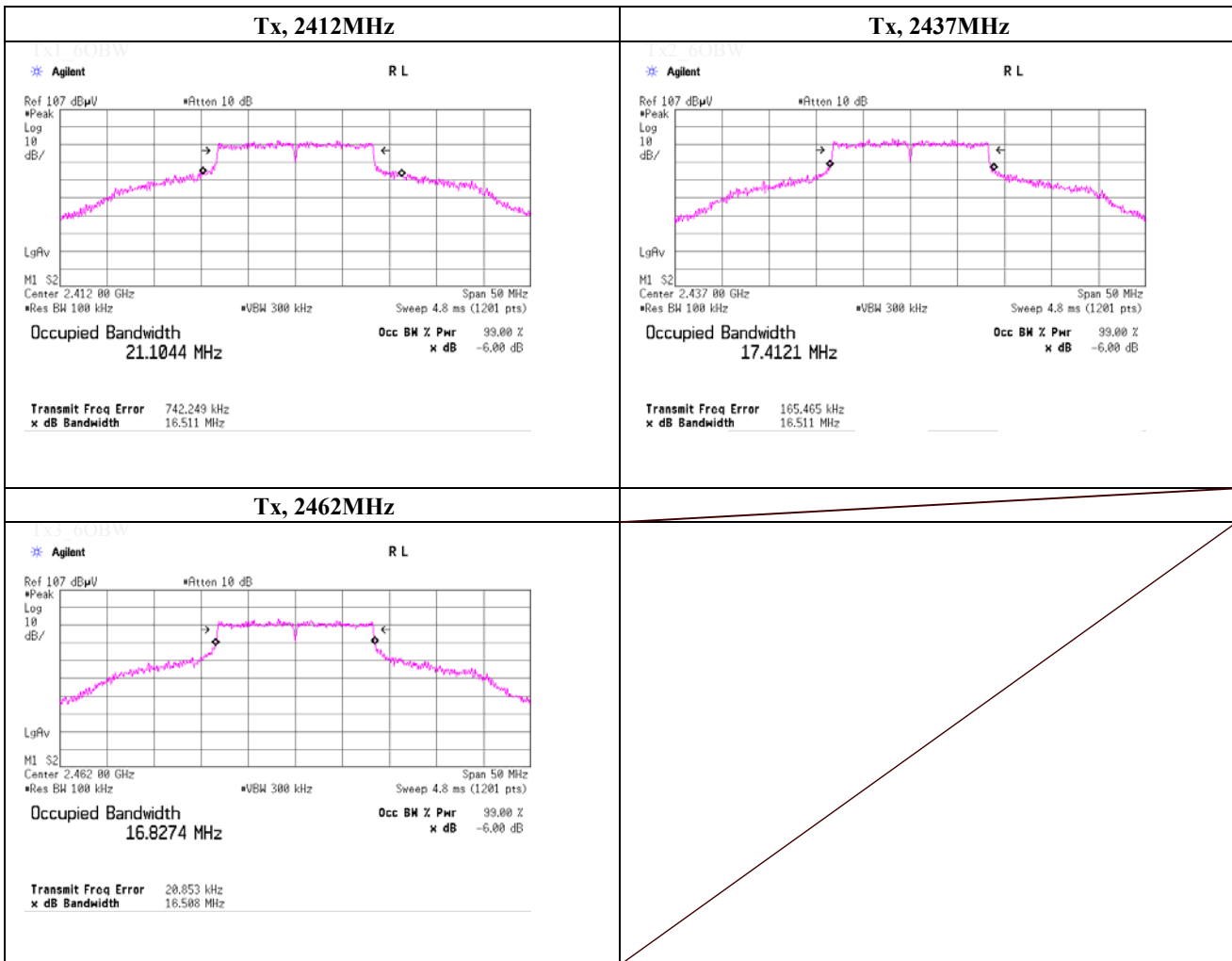
The worst rate is selected considering the worst margin of Power Spectral Density



-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 22, 2014	
Temperature / Humidity	26deg.C , 47%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11g, PN9, worst data mode 48Mbps, power setting 10dBm	

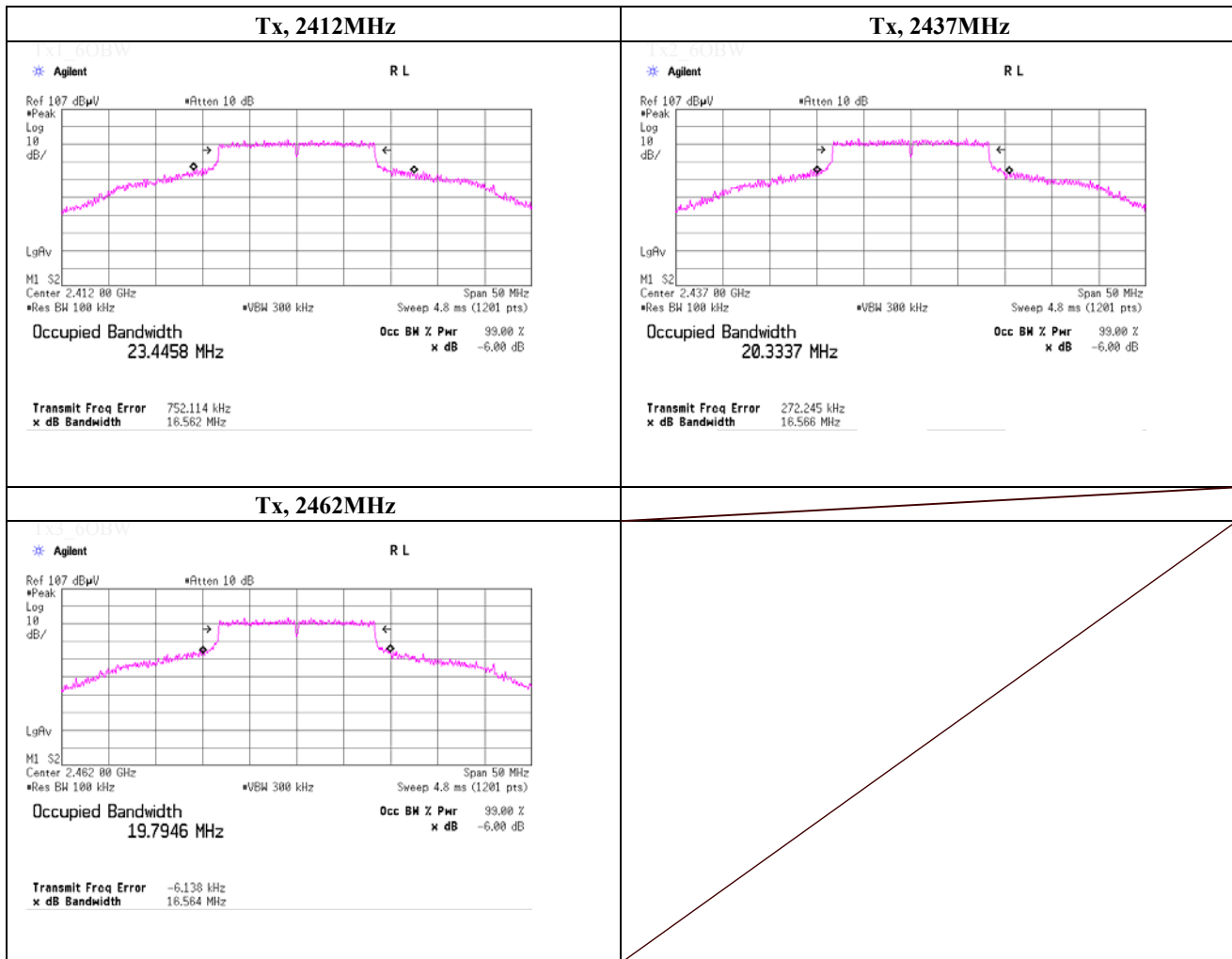
Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.511	> 0.500
2437.0000	16.511	> 0.500
2462.0000	16.508	> 0.500



-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 21, 2014	
Temperature / Humidity	26deg.C , 57%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11g, PN9, worst data mode 54Mbps, power setting 12dBm	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.562	> 0.500
2437.0000	16.566	> 0.500
2462.0000	16.564	> 0.500



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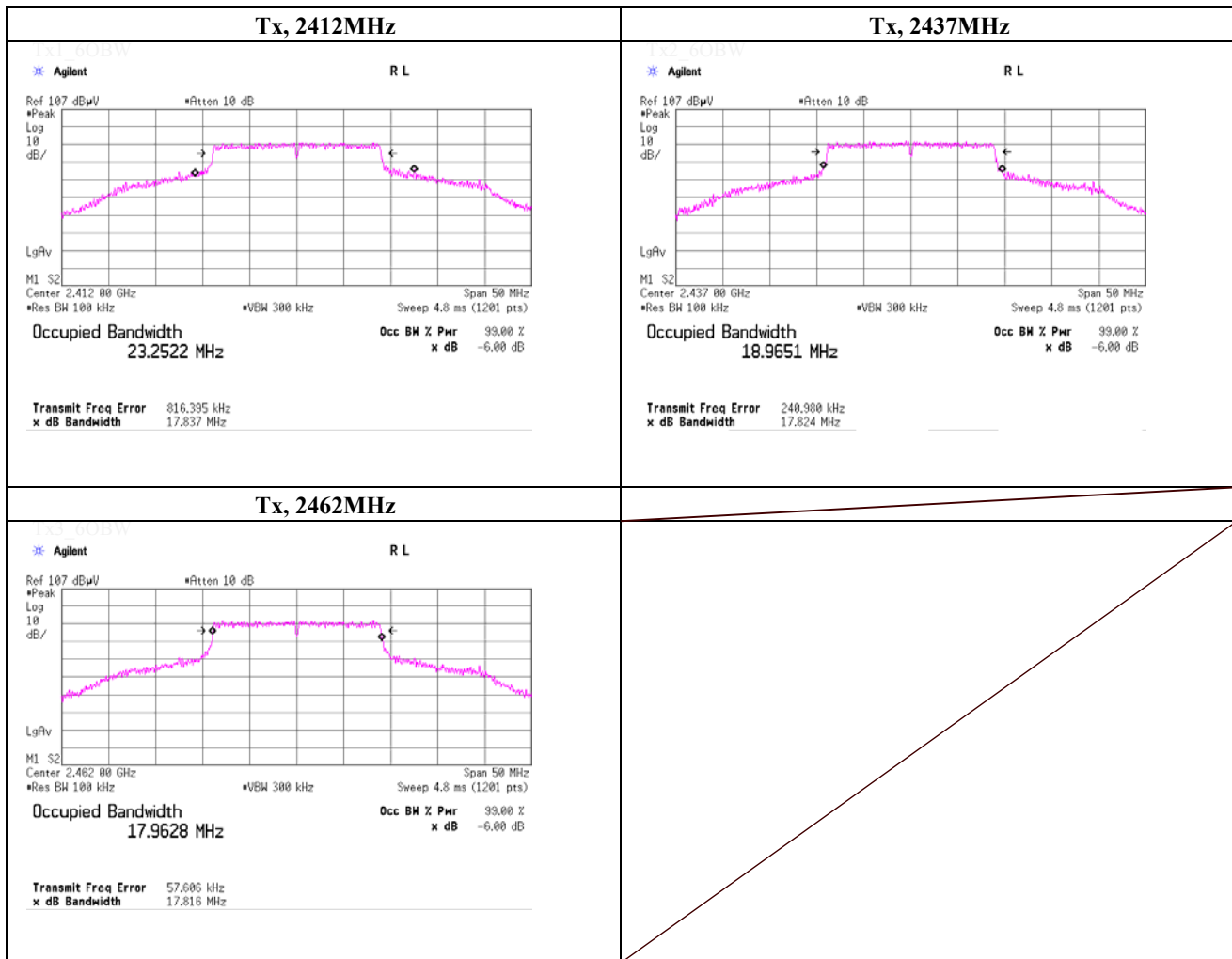
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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 22, 2014	
Temperature / Humidity	26deg.C , 47%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11n-20HT, PN9, worst data mode 6(MCS), power setting 10dBm	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	17.837	> 0.500
2437.0000	17.824	> 0.500
2462.0000	17.816	> 0.500



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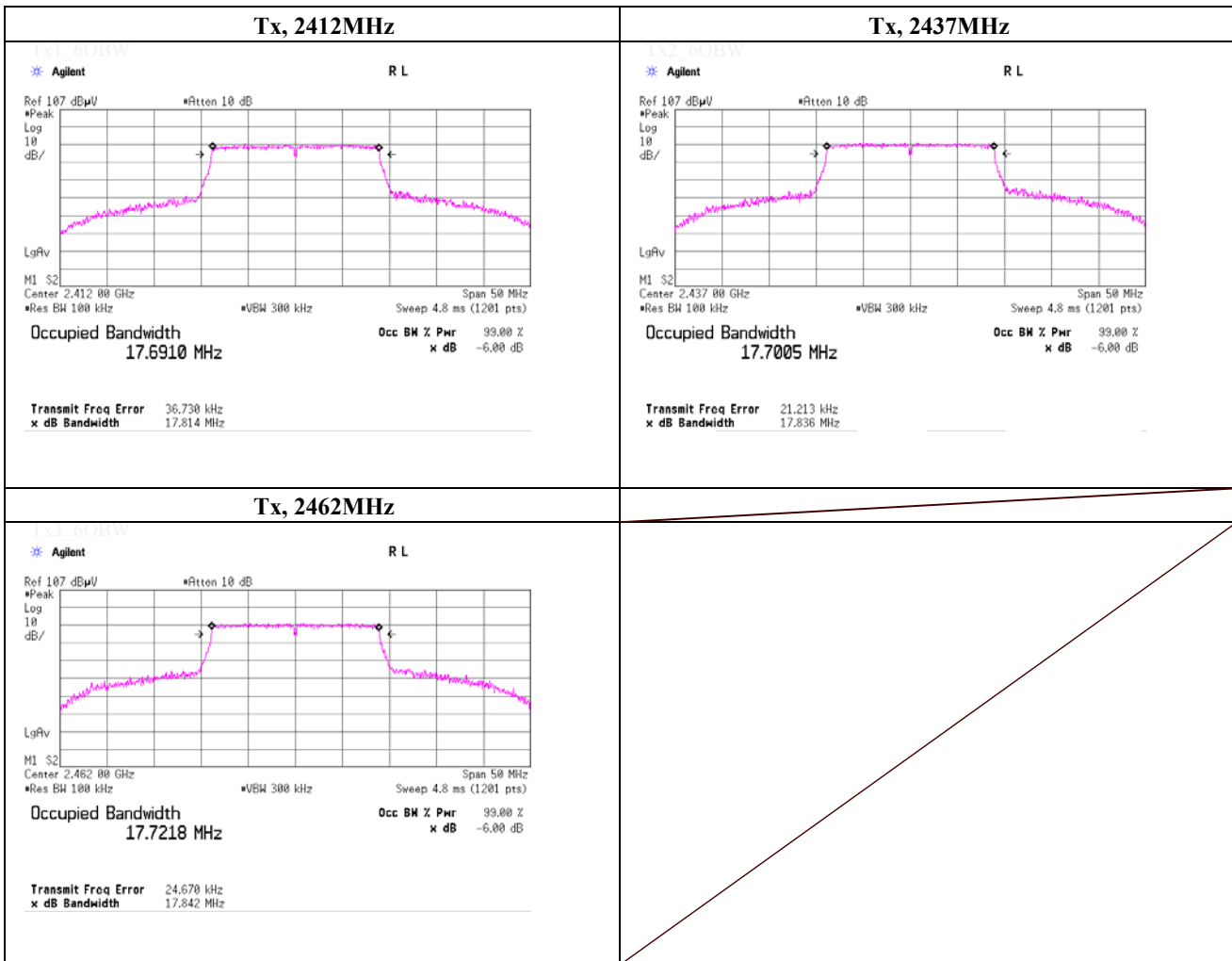
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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 21, 2014	
Temperature / Humidity	26deg.C , 57%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11n-20HT, PN9, worst data mode 6(MCS), power setting 12dBm	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	17.814	> 0.500
2437.0000	17.836	> 0.500
2462.0000	17.842	> 0.500



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Maximum Peak Conducted Output Power (PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date August 19, 2014
 Temperature / Humidity 25 deg.C , 50 %RH
 Engineer Tatsuya Arai
 Mode Tx, IEEE802.11b, PN9, power setting 10dBm worst data mode : 2 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	1.35	1.85	9.65	12.85	19.28	30.00	1000	17.15
Mid	2437.0	1.46	1.86	9.66	12.98	19.86	30.00	1000	17.02
High	2462.0	1.47	1.87	9.66	13.00	19.95	30.00	1000	17.00

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	1.36	1.86	9.66	12.88	19.41	30.00	1000	17.12
	2	2437.0	1.46	1.86	9.66	12.98	19.86	30.00	1000	17.02
	5.5	2437.0	0.62	1.86	9.66	12.14	16.37	30.00	1000	17.86
	11	2437.0	0.69	1.86	9.66	12.21	16.63	30.00	1000	17.79

Worst

Sample Calculation:

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

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Maximum Conducted Output Power (Reference data)

(AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date August 19, 2014
Temperature / Humidity 25 deg.C , 50 %RH
Engineer Tatsuya Arai
Mode Tx, IEEE802.11b, PN9, power setting 10dBm worst data mode : 5.5 Mbps

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

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
Low	2412.0	-1.50	1.85	9.65	0.00	10.00	10.00
Mid	2437.0	-1.40	1.86	9.66	0.00	10.12	10.28
High	2462.0	-1.37	1.87	9.66	0.00	10.16	10.38

Sample Calculation:

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

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

[Pre check]

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
							[dBm]	[mW]
	1	2437.0	-1.15	1.86	9.66	0.00	10.37	10.89
	2	2437.0	-1.10	1.86	9.66	0.00	10.42	11.02
	5.5	2437.0	-1.09	1.86	9.66	0.00	10.43	11.04
	11	2437.0	-1.73	1.86	9.66	0.00	9.79	9.53

Sample Calculation:

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

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Maximum Conducted Output Power (Reference data)

(AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date August 19, 2014
 Temperature / Humidity 25 deg.C , 50 %RH
 Engineer Tatsuya Arai
 Mode Tx, IEEE802.11g, PN9, power setting 10dBm worst data mode : 48 Mbps

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

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
Low	2412.0	-1.80	1.85	9.65	0.00	9.70	9.33
Mid	2437.0	-1.70	1.86	9.66	0.00	9.82	9.59
High	2462.0	-1.74	1.87	9.66	0.00	9.79	9.53

Sample Calculation:

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

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

[Pre check]

Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
6	2437.0	-1.66	1.86	9.66	0.00	9.86	9.68
9	2437.0	-1.94	1.86	9.66	0.00	9.58	9.08
12	2437.0	-1.61	1.86	9.66	0.00	9.91	9.79
18	2437.0	-1.83	1.86	9.66	0.00	9.69	9.31
24	2437.0	-1.56	1.86	9.66	0.00	9.96	9.91
36	2437.0	-1.62	1.86	9.66	0.00	9.90	9.77
48	2437.0	-1.45	1.86	9.66	0.00	10.07	10.16
54	2437.0	-1.74	1.86	9.66	0.00	9.78	9.51

Sample Calculation:

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

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Maximum Conducted Output Power (Reference data)

(AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date August 19, 2014
Temperature / Humidity 25 deg.C , 50 %RH
Engineer Tatsuya Arai
Mode Tx, IEEE802.11g, PN9, power setting 12dBm worst data mode : 18 Mbps

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

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
Low	2412.0	0.55	1.85	9.65	0.00	12.05	16.03
Mid	2437.0	0.88	1.86	9.66	0.00	12.40	17.38
High	2462.0	1.18	1.87	9.66	0.00	12.71	18.66

Sample Calculation:

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

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

[Pre check]

Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
6	2437.0	0.89	1.86	9.66	0.00	12.41	17.42
9	2437.0	0.80	1.86	9.66	0.00	12.32	17.06
12	2437.0	0.67	1.86	9.66	0.00	12.19	16.56
18	2437.0	1.08	1.86	9.66	0.00	12.60	18.20
24	2437.0	0.76	1.86	9.66	0.00	12.28	16.90
36	2437.0	0.53	1.86	9.66	0.00	12.05	16.03
48	2437.0	1.07	1.86	9.66	0.00	12.59	18.16
54	2437.0	0.51	1.86	9.66	0.00	12.03	15.96

Sample Calculation:

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

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Maximum Conducted Output Power (Reference data)

(AVGPM)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date August 19, 2014
 Temperature / Humidity 25 deg.C , 50 %RH
 Engineer Tatsuya Arai
 Mode Tx, IEEE802.11n-20HT, PN9,power setting 12dB; worst data mode : 0 (MCS)

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

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
Low	2412.0	0.93	1.85	9.65	0.00	12.43	17.50
Mid	2437.0	1.01	1.86	9.66	0.00	12.53	17.91
High	2462.0	0.95	1.87	9.66	0.00	12.48	17.70

Sample Calculation:

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

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

[Pre check]

Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result	
						[dBm]	[mW]
0	2437.0	1.21	1.86	9.66	0.00	12.73	18.75
1	2437.0	1.15	1.86	9.66	0.00	12.67	18.49
2	2437.0	1.20	1.86	9.66	0.00	12.72	18.71
3	2437.0	0.97	1.86	9.66	0.00	12.49	17.74
4	2437.0	1.04	1.86	9.66	0.00	12.56	18.03
5	2437.0	0.95	1.86	9.66	0.00	12.47	17.66
6	2437.0	1.10	1.86	9.66	0.00	12.62	18.28
7	2437.0	1.05	1.86	9.66	0.00	12.57	18.07

Sample Calculation:

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

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Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 21, 2014 August 23, 2014
 Temperature / Humidity 24 deg.C, 58 %RH 24 deg.C, 57 %RH
 Engineer Wataru Kojima Akio Hayashi
 Mode Tx, 2412 MHz
 Tx, IEEE802.11b, PN9, power setting 10dBm

(* 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	43.4	25.9	14.5	38.2	45.6	73.9	28.3	100	186	
Hori.	4824.000	PK	40.8	30.5	7.5	37.1	41.7	73.9	32.2	100	274	
Hori.	7236.000	PK	43.1	36.3	8.8	39.4	48.8	73.9	25.1	100	0	
Hori.	9648.000	PK	41.6	38.3	9.6	37.6	51.9	73.9	22.0	100	206	
Hori.	12060.000	PK	42.5	39.3	10.9	38.5	54.2	73.9	19.7	100	0	
Hori.	2390.000	AV	33.8	25.9	14.5	38.2	36.0	53.9	17.9	100	186	
Hori.	4824.000	AV	31.8	30.5	7.5	37.1	32.7	53.9	21.2	100	274	
Hori.	7236.000	AV	33.6	36.3	8.8	39.4	39.3	53.9	14.6	100	0	
Hori.	9648.000	AV	32.7	38.3	9.6	37.6	43.0	53.9	10.9	100	206	
Hori.	12060.000	AV	33.2	39.3	10.9	38.5	44.9	53.9	9.0	100	0	
Vert.	2390.000	PK	42.6	25.9	14.5	38.2	44.8	73.9	29.1	100	57	
Vert.	4824.000	PK	40.7	30.5	7.5	37.1	41.6	73.9	32.3	100	21	
Vert.	7236.000	PK	42.5	36.3	8.8	39.4	48.2	73.9	25.7	100	0	
Vert.	9648.000	PK	42.5	38.3	9.6	37.6	52.8	73.9	21.1	100	191	
Vert.	12060.000	PK	42.2	39.3	10.9	38.5	53.9	73.9	20.0	100	0	
Vert.	2390.000	AV	33.9	25.9	14.5	38.2	36.1	53.9	17.8	100	57	
Vert.	4824.000	AV	31.7	30.5	7.5	37.1	32.6	53.9	21.3	100	21	
Vert.	7236.000	AV	33.8	36.3	8.8	39.4	39.5	53.9	14.4	100	0	
Vert.	9648.000	AV	33.2	38.3	9.6	37.6	43.5	53.9	10.4	100	191	
Vert.	12060.000	AV	33.2	39.3	10.9	38.5	44.9	53.9	9.0	100	0	

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	85.3	25.9	14.6	38.2	87.6	-	-	- Carrier
Hori.	2400.000	PK	35.8	25.9	14.5	38.2	38.0	67.6	29.6	20dBc
Vert.	2412.000	PK	81.9	25.9	14.6	38.2	84.2	-	-	- Carrier
Vert.	2400.000	PK	34.6	25.9	14.5	38.2	36.8	64.2	27.4	20dBc

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

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

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Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 21, 2014 August 23, 2014
 Temperature / Humidity 24 deg.C, 58 %RH 24 deg.C, 57 %RH
 Engineer Wataru Kojima Akio Hayashi
 Mode Tx, 2437 MHz
 Tx, IEEE802.11b, PN9, power setting 10dBm

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	40.9	30.7	7.5	37.1	42.0	73.9	31.9	100	275	
Hori.	7311.000	PK	43.8	36.4	8.7	39.4	49.5	73.9	24.4	100	0	
Hori.	9748.000	PK	41.1	38.3	9.8	37.6	51.6	73.9	22.3	100	220	
Hori.	12185.000	PK	43.3	39.2	10.9	38.4	55.0	73.9	18.9	100	0	
Hori.	4874.000	AV	30.9	30.7	7.5	37.1	32.0	53.9	21.9	100	275	
Hori.	7311.000	AV	33.3	36.4	8.7	39.4	39.0	53.9	14.9	100	0	
Hori.	9748.000	AV	31.3	38.3	9.8	37.6	41.8	53.9	12.1	100	220	
Hori.	12185.000	AV	33.4	39.2	10.9	38.4	45.1	53.9	8.8	100	0	
Vert.	4874.000	PK	40.4	30.7	7.5	37.1	41.5	73.9	32.4	100	194	
Vert.	7311.000	PK	43.0	36.4	8.7	39.4	48.7	73.9	25.2	100	0	
Vert.	9748.000	PK	40.3	38.3	9.8	37.6	50.8	73.9	23.1	100	213	
Vert.	12185.000	PK	43.3	39.2	10.9	38.4	55.0	73.9	18.9	100	0	
Vert.	4874.000	AV	31.9	30.7	7.5	37.1	33.0	53.9	20.9	100	194	
Vert.	7311.000	AV	33.1	36.4	8.7	39.4	38.8	53.9	15.1	100	0	
Vert.	9748.000	AV	31.5	38.3	9.8	37.6	42.0	53.9	11.9	100	213	
Vert.	12185.000	AV	33.4	39.2	10.9	38.4	45.1	53.9	8.8	100	0	

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

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

UL Japan, Inc.

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Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 21, 2014 August 23, 2014
 Temperature / Humidity 24 deg.C, 58 %RH 24 deg.C, 57 %RH
 Engineer Wataru Kojima Akio Hayashi
 Mode Tx, 2462 MHz
 Tx, IEEE802.11b, PN9, power setting 10dBm

(* 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	43.0	25.9	14.6	38.1	45.4	73.9	28.5	100	306	
Hori.	4924.000	PK	41.4	30.9	7.6	37.0	42.9	73.9	31.0	100	272	
Hori.	7386.000	PK	44.4	36.5	8.7	39.4	50.2	73.9	23.7	100	0	
Hori.	9848.000	PK	40.3	38.3	9.8	37.5	50.9	73.9	23.0	100	97	
Hori.	12310.000	PK	43.1	39.1	11.0	38.3	54.9	73.9	19.0	100	0	
Hori.	2483.500	AV	30.1	25.9	14.6	38.1	32.5	53.9	21.4	100	306	
Hori.	4924.000	AV	33.0	30.9	7.6	37.0	34.5	53.9	19.4	100	272	
Hori.	7386.000	AV	35.4	36.5	8.7	39.4	41.2	53.9	12.7	100	0	
Hori.	9848.000	AV	32.6	38.3	9.8	37.5	43.2	53.9	10.7	100	97	
Hori.	12310.000	AV	33.0	39.1	11.0	38.3	44.8	53.9	9.1	100	0	
Vert.	2483.500	PK	43.0	25.9	14.6	38.1	45.4	73.9	28.5	100	320	
Vert.	4924.000	PK	41.4	30.9	7.6	37.0	42.9	73.9	31.0	100	196	
Vert.	7386.000	PK	44.3	36.5	8.7	39.4	50.1	73.9	23.8	100	0	
Vert.	9848.000	PK	40.6	38.3	9.8	37.5	51.2	73.9	22.7	100	214	
Vert.	12310.000	PK	42.3	39.1	11.0	38.3	54.1	73.9	19.8	100	0	
Vert.	2483.500	AV	34.6	25.9	14.6	38.1	37.0	53.9	16.9	100	320	
Vert.	4924.000	AV	33.1	30.9	7.6	37.0	34.6	53.9	19.3	100	196	
Vert.	7386.000	AV	35.2	36.5	8.7	39.4	41.0	53.9	12.9	100	0	
Vert.	9848.000	AV	32.8	38.3	9.8	37.5	43.4	53.9	10.5	100	214	
Vert.	12310.000	AV	33.1	39.1	11.0	38.3	44.9	53.9	9.0	100	0	

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

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

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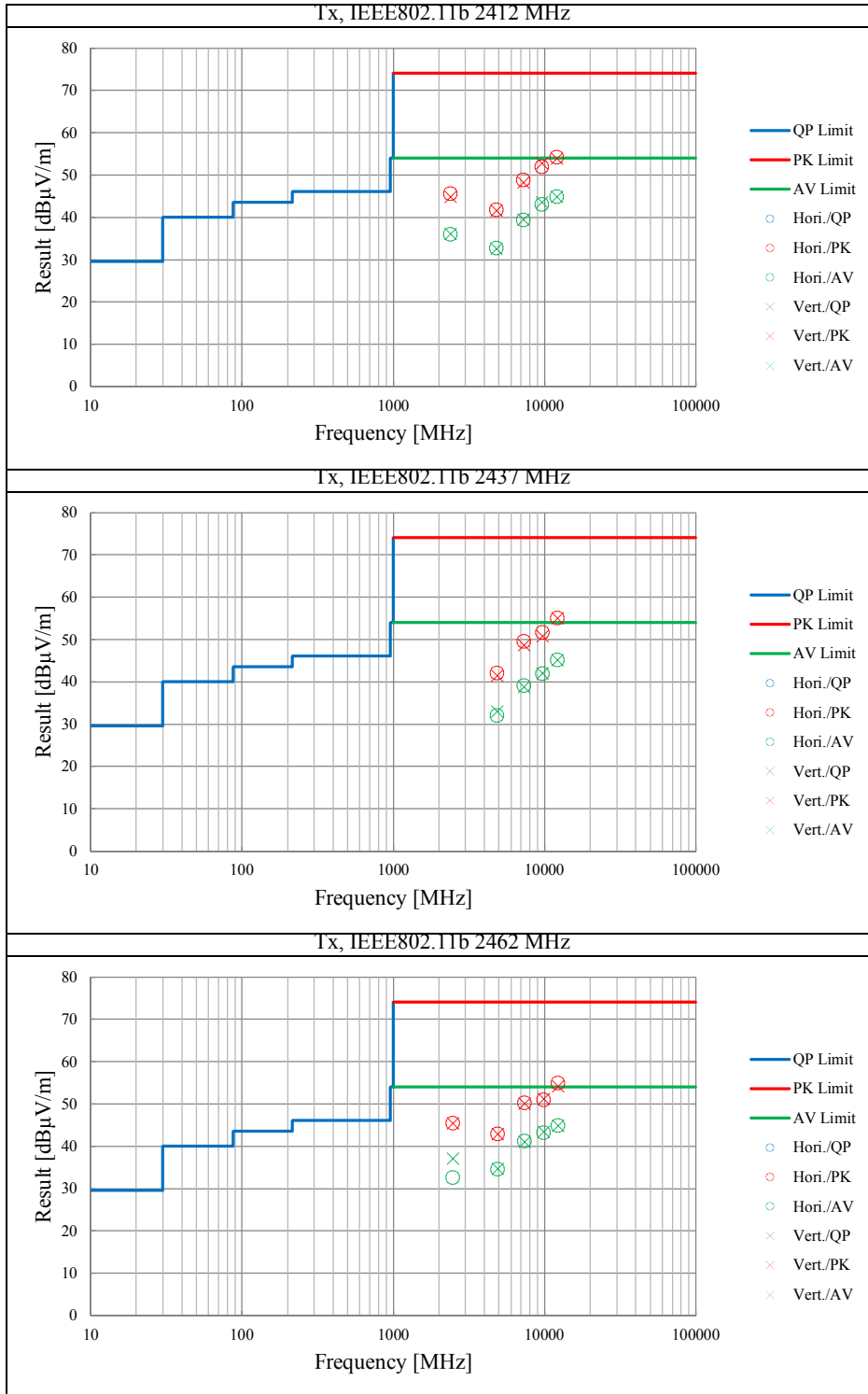
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Facsimile : +81 463 50 6401

Radiated Emission

Test place Refer to previous sheet
 Date Refer to previous sheet
 Temperature / Humidity Refer to previous sheet
 Engineer Refer to previous sheet
 Mode Tx, IEEE802.11b, PN9, power setting 10dBm



Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 21, 2014 August 19, 2014
 Temperature / Humidity 24 deg.C, 58 %RH 24 deg.C, 60 %RH
 Engineer Wataru Kojima Wataru Kojima
 Mode Tx, 2412 MHz
 Tx, IEEE802.11b, PN9, power setting 12dBm

(* 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	44.7	27.5	14.5	38.2	48.5	73.9	25.4	100	0	
Hori.	2397.500	PK	45.3	27.5	14.5	38.2	49.1	73.9	24.8	100	169	
Hori.	4824.000	PK	42.4	31.0	8.0	37.1	44.3	73.9	29.6	100	0	
Hori.	7236.000	PK	44.7	36.6	9.0	39.4	50.9	73.9	23.0	100	0	
Hori.	9648.000	PK	43.1	39.1	9.9	37.6	54.5	73.9	19.4	100	0	
Hori.	12060.000	PK	45.0	39.9	11.3	38.5	57.7	73.9	16.2	100	0	
Hori.	2390.000	AV	34.6	27.5	14.5	38.2	38.4	53.9	15.5	100	0	
Hori.	2397.500	AV	36.2	27.5	14.5	38.2	40.0	53.9	13.9	100	169	
Hori.	4824.000	AV	31.3	31.0	8.0	37.1	33.2	53.9	20.7	100	0	
Hori.	7236.000	AV	32.4	36.6	9.0	39.4	38.6	53.9	15.3	100	0	
Hori.	9648.000	AV	31.6	39.1	9.9	37.6	43.0	53.9	10.9	100	0	
Hori.	12060.000	AV	32.3	39.9	11.3	38.5	45.0	53.9	8.9	100	0	
Vert.	2390.000	PK	42.5	27.5	14.5	38.2	46.3	73.9	27.6	100	210	
Vert.	2397.500	PK	44.2	27.5	14.5	38.2	48.0	73.9	25.9	100	210	
Vert.	4824.000	PK	42.5	31.0	8.0	37.1	44.4	73.9	29.5	100	0	
Vert.	7236.000	PK	44.9	36.6	9.0	39.4	51.1	73.9	22.8	100	0	
Vert.	9648.000	PK	43.4	39.1	9.9	37.6	54.8	73.9	19.1	100	0	
Vert.	12060.000	PK	45.5	39.9	11.3	38.5	58.2	73.9	15.7	100	0	
Vert.	2390.000	AV	34.4	27.5	14.5	38.2	38.2	53.9	15.7	100	210	
Vert.	2397.500	AV	35.8	27.5	14.5	38.2	39.6	53.9	14.3	100	210	
Vert.	4824.000	AV	31.6	31.0	8.0	37.1	33.5	53.9	20.4	100	0	
Vert.	7236.000	AV	33.6	36.6	9.0	39.4	39.8	53.9	14.1	100	0	
Vert.	9648.000	AV	31.5	39.1	9.9	37.6	42.9	53.9	11.0	100	0	
Vert.	12060.000	AV	32.4	39.9	11.3	38.5	45.1	53.9	8.8	100	0	

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	87.2	27.6	14.6	38.2	91.2	-	-	100k/300k
Hori.	2400.000	PK	36.2	27.5	14.5	38.2	40.0	71.2	31.2	100k/300k
Vert.	2412.000	PK	84.6	27.6	14.6	38.2	88.6	-	-	100k/300k
Vert.	2400.000	PK	35.3	27.5	14.5	38.2	39.1	68.6	29.5	100k/300k

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

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

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Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 19, 2014 August 21, 2014
 Temperature / Humidity 24 deg.C, 60 %RH 24 deg.C, 58 %RH
 Engineer Wataru Kojima Wataru Kojima
 Mode Tx, 2437 MHz
 Tx, IEEE802.11b, PN9, power setting 12dBm

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	42.5	31.3	8.0	37.1	44.7	73.9	29.2	100	0	
Hori.	7311.000	PK	44.9	36.7	9.0	39.4	51.2	73.9	22.7	100	0	
Hori.	9748.000	PK	41.0	39.0	9.9	37.6	52.3	73.9	21.6	100	0	
Hori.	12185.000	PK	43.8	39.9	11.3	38.4	56.6	73.9	17.3	100	0	
Hori.	4874.000	AV	32.4	31.3	8.0	37.1	34.6	53.9	19.3	100	0	
Hori.	7311.000	AV	33.8	36.7	9.0	39.4	40.1	53.9	13.8	100	0	
Hori.	9748.000	AV	32.1	39.0	9.9	37.6	43.4	53.9	10.5	100	0	
Hori.	12185.000	AV	32.8	39.9	11.3	38.4	45.6	53.9	8.3	100	0	
Vert.	4874.000	PK	42.7	31.3	8.0	37.1	44.9	73.9	29.0	100	0	
Vert.	7311.000	PK	44.4	36.7	9.0	39.4	50.7	73.9	23.2	100	0	
Vert.	9748.000	PK	42.0	39.0	9.9	37.6	53.3	73.9	20.6	100	0	
Vert.	12185.000	PK	43.3	39.9	11.3	38.4	56.1	73.9	17.8	100	0	
Vert.	4874.000	AV	32.3	31.3	8.0	37.1	34.5	53.9	19.4	100	0	
Vert.	7311.000	AV	34.0	36.7	9.0	39.4	40.3	53.9	13.6	100	0	
Vert.	9748.000	AV	32.2	39.0	9.9	37.6	43.5	53.9	10.4	100	0	
Vert.	12185.000	AV	32.7	39.9	11.3	38.4	45.5	53.9	8.4	100	0	

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

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

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Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 19, 2014 August 21, 2014
 Temperature / Humidity 24 deg.C, 60 %RH 24 deg.C, 58 %RH
 Engineer Wataru Kojima Wataru Kojima
 Mode Tx, 2462 MHz
 Tx, IEEE802.11b, PN9, power setting 12dBm

(* 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	43.6	27.8	14.6	38.1	47.9	73.9	26.0	100	0	
Hori.	4924.000	PK	40.9	31.6	8.0	37.0	43.5	73.9	30.4	100	0	
Hori.	7386.000	PK	42.6	36.8	9.1	39.4	49.1	73.9	24.8	100	0	
Hori.	9848.000	PK	39.7	38.9	9.9	37.5	51.0	73.9	22.9	100	0	
Hori.	12310.000	PK	40.4	39.9	11.4	38.3	53.4	73.9	20.5	100	0	
Hori.	2483.500	AV	35.1	27.8	14.6	38.1	39.4	53.9	14.5	100	0	
Hori.	4924.000	AV	34.2	31.6	8.0	37.0	36.8	53.9	17.1	100	0	
Hori.	7386.000	AV	35.5	36.8	9.1	39.4	42.0	53.9	11.9	100	0	
Hori.	9848.000	AV	31.5	38.9	9.9	37.5	42.8	53.9	11.1	100	0	
Hori.	12310.000	AV	31.9	39.9	11.4	38.3	44.9	53.9	9.0	100	0	
Vert.	2483.500	PK	43.4	27.8	14.6	38.1	47.7	73.9	26.2	100	209	
Vert.	4924.000	PK	41.1	31.6	8.0	37.0	43.7	73.9	30.2	100	0	
Vert.	7386.000	PK	42.9	36.8	9.1	39.4	49.4	73.9	24.5	100	0	
Vert.	9848.000	PK	39.8	38.9	9.9	37.5	51.1	73.9	22.8	100	0	
Vert.	12310.000	PK	40.1	39.9	11.4	38.3	53.1	73.9	20.8	100	0	
Vert.	2483.500	AV	34.9	27.8	14.6	38.1	39.2	53.9	14.7	100	209	
Vert.	4924.000	AV	34.3	31.6	8.0	37.0	36.9	53.9	17.0	100	0	
Vert.	7386.000	AV	35.6	36.8	9.1	39.4	42.1	53.9	11.8	100	0	
Vert.	9848.000	AV	31.6	38.9	9.9	37.5	42.9	53.9	11.0	100	0	
Vert.	12310.000	AV	31.8	39.9	11.4	38.3	44.8	53.9	9.1	100	0	

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

Distance factor : 15GHz -40GHz : $20\log(3.0m/1.0m) = 9.5dB$ **UL Japan, Inc.****Shonan EMC Lab.**

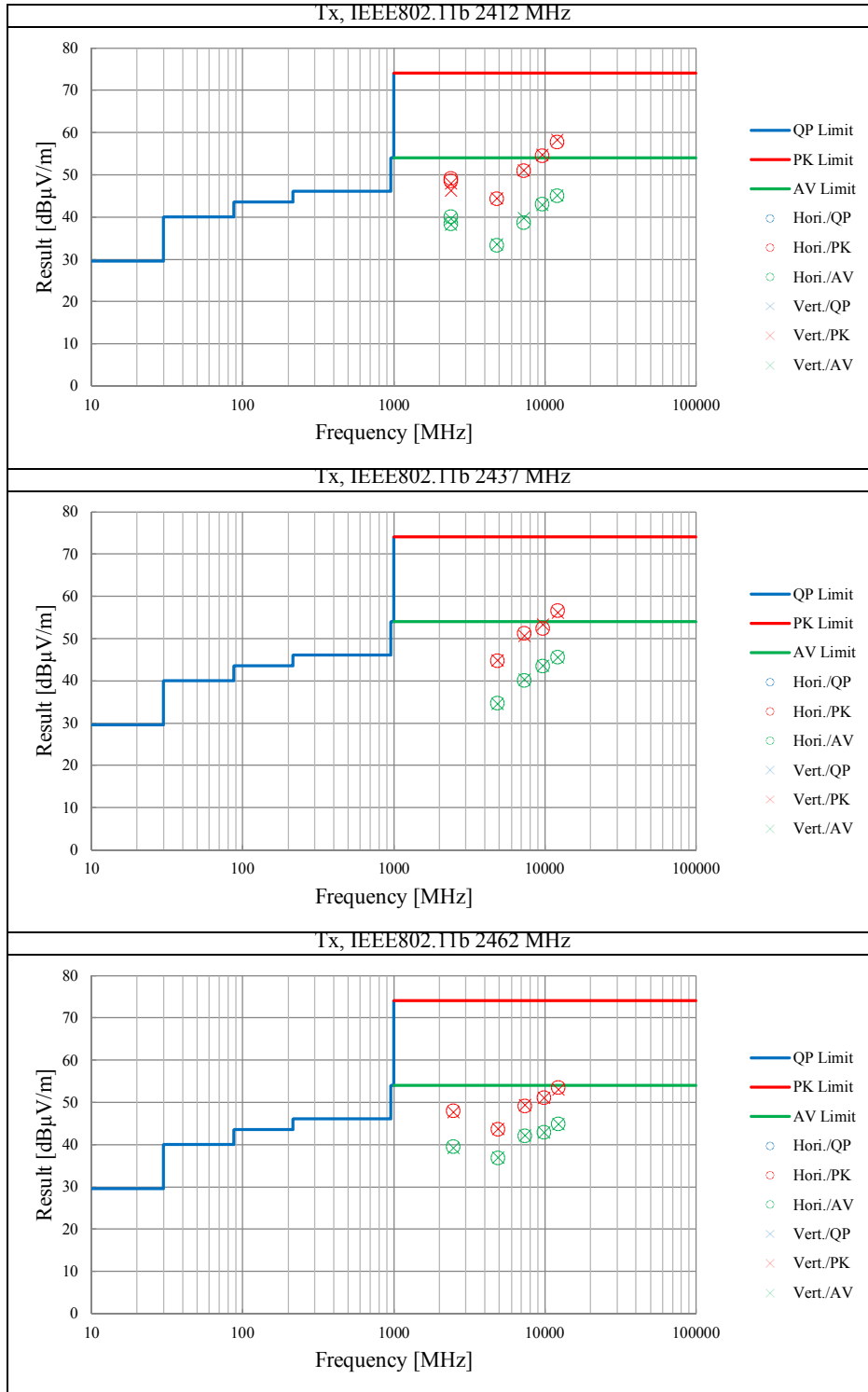
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Radiated Emission

Test place Refer to previous sheet
 Date Refer to previous sheet
 Temperature / Humidity Refer to previous sheet
 Engineer Refer to previous sheet
 Mode Tx, IEEE802.11b, PN9, power setting 12dBm



Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 21, 2014 August 23, 2014
 Temperature / Humidity 24 deg.C, 58 %RH 24 deg.C, 57 %RH
 Engineer Wataru Kojima Akio Hayashi
 Mode Tx, 2412 MHz
 Tx, IEEE802.11g, PN9, power setting 10dBm

(* 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	46.0	25.9	14.5	38.2	48.2	73.9	25.7	100	300	
Hori.	4824.000	PK	40.3	30.5	7.5	37.1	41.2	73.9	32.7	100	275	
Hori.	7236.000	PK	42.6	36.3	8.8	39.4	48.3	73.9	25.6	100	0	
Hori.	9648.000	PK	41.7	38.3	9.6	37.6	52.0	73.9	21.9	100	210	
Hori.	12060.000	PK	42.0	39.3	10.9	38.5	53.7	73.9	20.2	100	0	
Hori.	2390.000	AV	35.4	25.9	14.5	38.2	37.6	53.9	16.3	100	300	
Hori.	4824.000	AV	32.7	30.5	7.5	37.1	33.6	53.9	20.3	100	275	
Hori.	7236.000	AV	34.6	36.3	8.8	39.4	40.3	53.9	13.6	100	0	
Hori.	9648.000	AV	33.6	38.3	9.6	37.6	43.9	53.9	10.0	100	210	
Hori.	12060.000	AV	33.9	39.3	10.9	38.5	45.6	53.9	8.3	100	0	
Vert.	2390.000	PK	44.6	25.9	14.5	38.2	46.8	73.9	27.1	100	54	
Vert.	4824.000	PK	40.6	30.5	7.5	37.1	41.5	73.9	32.4	100	194	
Vert.	7236.000	PK	42.9	36.3	8.8	39.4	48.6	73.9	25.3	100	0	
Vert.	9648.000	PK	42.0	38.3	9.6	37.6	52.3	73.9	21.6	191	202	
Vert.	12060.000	PK	42.2	39.3	10.9	38.5	53.9	73.9	20.0	100	0	
Vert.	2390.000	AV	35.1	25.9	14.5	38.2	37.3	53.9	16.6	100	54	
Vert.	4824.000	AV	32.5	30.5	7.5	37.1	33.4	53.9	20.5	100	194	
Vert.	7236.000	AV	34.8	36.3	8.8	39.4	40.5	53.9	13.4	100	0	
Vert.	9648.000	AV	33.5	38.3	9.6	37.6	43.8	53.9	10.1	191	202	
Vert.	12060.000	AV	34.3	39.3	10.9	38.5	46.0	53.9	7.9	100	0	

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	78.5	25.9	14.6	38.2	80.8	-	-	Carrier
Hori.	2400.000	PK	47.7	25.9	14.5	38.2	49.9	60.8	10.9	20dBc
Vert.	2412.000	PK	76.4	25.9	14.6	38.2	78.7	-	-	Carrier
Vert.	2400.000	PK	47.1	25.9	14.5	38.2	49.3	58.7	9.4	20dBc

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

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

Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 21, 2014 August 23, 2014
 Temperature / Humidity 24 deg.C, 58 %RH 24 deg.C, 57 %RH
 Engineer Wataru Kojima Akio Hayashi
 Mode Tx, 2437 MHz
 Tx, IEEE802.11g, PN9, power setting 10dBm

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	40.0	30.7	7.5	37.1	41.1	73.9	32.8	100	274	
Hori.	7311.000	PK	42.6	36.4	8.7	39.4	48.3	73.9	25.6	100	0	
Hori.	9748.000	PK	39.7	38.3	9.8	37.6	50.2	73.9	23.7	100	212	
Hori.	12185.000	PK	42.3	39.2	10.9	38.4	54.0	73.9	19.9	100	0	
Hori.	4874.000	AV	31.2	30.7	7.5	37.1	32.3	53.9	21.6	100	274	
Hori.	7311.000	AV	33.5	36.4	8.7	39.4	39.2	53.9	14.7	100	0	
Hori.	9748.000	AV	31.2	38.3	9.8	37.6	41.7	53.9	12.2	100	212	
Hori.	12185.000	AV	33.8	39.2	10.9	38.4	45.5	53.9	8.4	100	0	
Vert.	4874.000	PK	40.1	30.7	7.5	37.1	41.2	73.9	32.7	100	216	
Vert.	7311.000	PK	41.9	36.4	8.7	39.4	47.6	73.9	26.3	100	0	
Vert.	9748.000	PK	40.1	38.3	9.8	37.6	50.6	73.9	23.3	192	211	
Vert.	12185.000	PK	42.6	39.2	10.9	38.4	54.3	73.9	19.6	100	0	
Vert.	4874.000	AV	31.6	30.7	7.5	37.1	32.7	53.9	21.2	100	216	
Vert.	7311.000	AV	33.4	36.4	8.7	39.4	39.1	53.9	14.8	100	0	
Vert.	9748.000	AV	31.3	38.3	9.8	37.6	41.8	53.9	12.1	192	211	
Vert.	12185.000	AV	33.8	39.2	10.9	38.4	45.5	53.9	8.4	100	0	

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

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

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Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 21, 2014 August 23, 2014
 Temperature / Humidity 24 deg.C, 58 %RH 24 deg.C, 57 %RH
 Engineer Wataru Kojima Akio Hayashi
 Mode Tx, 2462 MHz
 Tx, IEEE802.11g, PN9, power setting 10dBm

(* 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	25.9	14.6	38.1	47.5	73.9	26.4	100	301	
Hori.	4924.000	PK	40.6	30.9	7.6	37.0	42.1	73.9	31.8	100	276	
Hori.	7386.000	PK	44.7	36.5	8.7	39.4	50.5	73.9	23.4	100	0	
Hori.	9848.000	PK	40.9	38.3	9.8	37.5	51.5	73.9	22.4	100	205	
Hori.	12310.000	PK	40.5	39.1	11.0	38.3	52.3	73.9	21.6	100	0	
Hori.	2483.500	AV	34.2	25.9	14.6	38.1	36.6	53.9	17.3	100	301	
Hori.	4924.000	AV	31.5	30.9	7.6	37.0	33.0	53.9	20.9	100	276	
Hori.	7386.000	AV	34.5	36.5	8.7	39.4	40.3	53.9	13.6	100	0	
Hori.	9848.000	AV	31.5	38.3	9.8	37.5	42.1	53.9	11.8	100	205	
Hori.	12310.000	AV	32.3	39.1	11.0	38.3	44.1	53.9	9.8	100	0	
Vert.	2483.500	PK	44.5	25.9	14.6	38.1	46.9	73.9	27.0	100	43	
Vert.	4924.000	PK	40.4	30.9	7.6	37.0	41.9	73.9	32.0	100	200	
Vert.	7386.000	PK	42.9	36.5	8.7	39.4	48.7	73.9	25.2	100	0	
Vert.	9848.000	PK	40.9	38.3	9.8	37.5	51.5	73.9	22.4	180	212	
Vert.	12310.000	PK	41.3	39.1	11.0	38.3	53.1	73.9	20.8	100	0	
Vert.	2483.500	AV	34.3	25.9	14.6	38.1	36.7	53.9	17.2	100	43	
Vert.	4924.000	AV	31.6	30.9	7.6	37.0	33.1	53.9	20.8	100	200	
Vert.	7386.000	AV	34.2	36.5	8.7	39.4	40.0	53.9	13.9	100	0	
Vert.	9848.000	AV	32.0	38.3	9.8	37.5	42.6	53.9	11.3	180	212	
Vert.	12310.000	AV	32.2	39.1	11.0	38.3	44.0	53.9	9.9	100	0	

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

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

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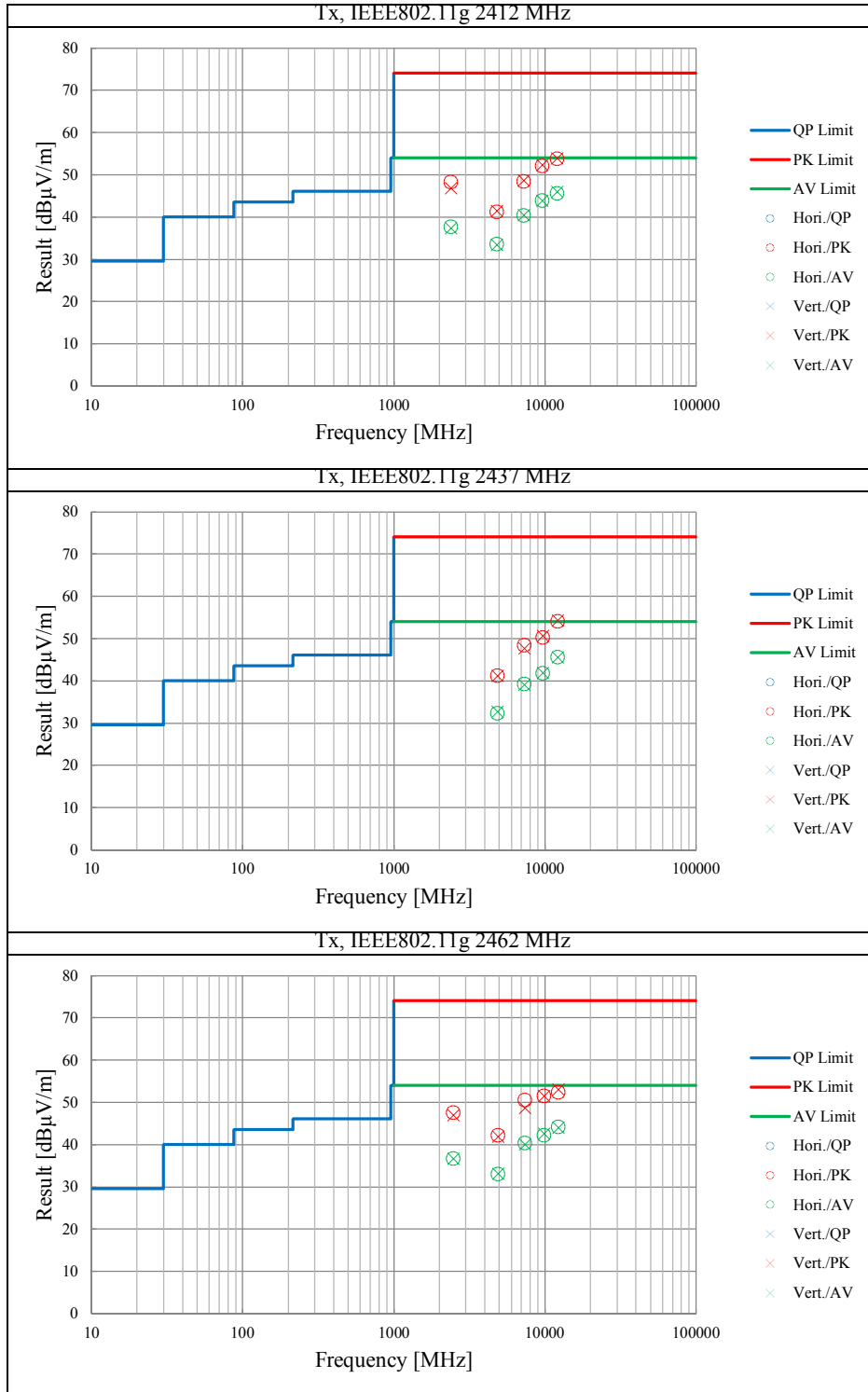
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Radiated Emission

Test place Refer to previous sheet
 Date Refer to previous sheet
 Temperature / Humidity Refer to previous sheet
 Engineer Refer to previous sheet
 Mode Tx, IEEE802.11g, PN9, power setting 10dBm



Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 19, 2014 August 21, 2014
 Temperature / Humidity 24 deg.C, 60 %RH 24 deg.C, 58 %RH
 Engineer Wataru Kojima Wataru Kojima
 Mode Tx, 2412 MHz
 Tx, IEEE802.11g, PN9, power setting 12dBm

(* 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	51.1	27.5	14.5	38.2	54.9	73.9	19.0	100	168	
Hori.	4824.000	PK	44.0	31.0	8.0	37.1	45.9	73.9	28.0	100	0	
Hori.	7236.000	PK	45.5	36.6	9.0	39.4	51.7	73.9	22.2	100	0	
Hori.	9648.000	PK	43.8	39.1	9.9	37.6	55.2	73.9	18.7	100	0	
Hori.	12060.000	PK	44.4	39.9	11.3	38.5	57.1	73.9	16.8	100	0	
Hori.	2390.000	AV	39.6	27.5	14.5	38.2	43.4	53.9	10.5	100	168	
Hori.	4824.000	AV	33.9	31.0	8.0	37.1	35.8	53.9	18.1	100	0	
Hori.	7236.000	AV	35.9	36.6	9.0	39.4	42.1	53.9	11.8	100	0	
Hori.	9648.000	AV	33.8	39.1	9.9	37.6	45.2	53.9	8.7	100	0	
Hori.	12060.000	AV	34.7	39.9	11.3	38.5	47.4	53.9	6.5	100	0	
Vert.	2390.000	PK	49.4	27.5	14.5	38.2	53.2	73.9	20.7	100	207	
Vert.	4824.000	PK	44.5	31.0	8.0	37.1	46.4	73.9	27.5	100	0	
Vert.	7236.000	PK	45.9	36.6	9.0	39.4	52.1	73.9	21.8	100	0	
Vert.	9648.000	PK	44.0	39.1	9.9	37.6	55.4	73.9	18.5	100	0	
Vert.	12060.000	PK	45.2	39.9	11.3	38.5	57.9	73.9	16.0	100	0	
Vert.	2390.000	AV	38.4	27.5	14.5	38.2	42.2	53.9	11.7	100	207	
Vert.	4824.000	AV	34.0	31.0	8.0	37.1	35.9	53.9	18.0	100	0	
Vert.	7236.000	AV	36.2	36.6	9.0	39.4	42.4	53.9	11.5	100	0	
Vert.	9648.000	AV	34.3	39.1	9.9	37.6	45.7	53.9	8.2	100	0	
Vert.	12060.000	AV	35.1	39.9	11.3	38.5	47.8	53.9	6.1	100	0	

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	85.0	27.6	14.6	38.2	89.0	-	-	100k/300k
Hori.	2400.000	PK	52.8	27.5	14.5	38.2	56.6	69.0	12.4	100k/300k
Vert.	2412.000	PK	81.3	27.6	14.6	38.2	85.3	-	-	100k/300k
Vert.	2400.000	PK	50.1	27.5	14.5	38.2	53.9	65.3	11.4	100k/300k

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

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

Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 19, 2014 August 21, 2014
 Temperature / Humidity 24 deg.C, 60 %RH 24 deg.C, 58 %RH
 Engineer Wataru Kojima Wataru Kojima
 Mode Tx, 2437 MHz
 Tx, IEEE802.11g, PN9, power setting 12dBm

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	45.4	31.3	8.0	37.1	47.6	73.9	26.3	100	0	
Hori.	7311.000	PK	44.5	36.7	9.0	39.4	50.8	73.9	23.1	100	0	
Hori.	9748.000	PK	42.1	39.0	9.9	37.6	53.4	73.9	20.5	100	0	
Hori.	12185.000	PK	42.5	39.9	11.3	38.4	55.3	73.9	18.6	100	0	
Hori.	4874.000	AV	33.7	31.3	8.0	37.1	35.9	53.9	18.0	100	0	
Hori.	7311.000	AV	35.2	36.7	9.0	39.4	41.5	53.9	12.4	100	0	
Hori.	9748.000	AV	32.9	39.0	9.9	37.6	44.2	53.9	9.7	100	0	
Hori.	12185.000	AV	33.1	39.9	11.3	38.4	45.9	53.9	8.0	100	0	
Vert.	4874.000	PK	43.5	31.3	8.0	37.1	45.7	73.9	28.2	100	0	
Vert.	7311.000	PK	44.9	36.7	9.0	39.4	51.2	73.9	22.7	100	0	
Vert.	9748.000	PK	43.7	39.0	9.9	37.6	55.0	73.9	18.9	100	0	
Vert.	12185.000	PK	43.2	39.9	11.3	38.4	56.0	73.9	17.9	100	0	
Vert.	4874.000	AV	33.6	31.3	8.0	37.1	35.8	53.9	18.1	100	0	
Vert.	7311.000	AV	35.3	36.7	9.0	39.4	41.6	53.9	12.3	100	0	
Vert.	9748.000	AV	33.1	39.0	9.9	37.6	44.4	53.9	9.5	100	0	
Vert.	12185.000	AV	33.2	39.9	11.3	38.4	46.0	53.9	7.9	100	0	

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

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

Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 19, 2014 August 21, 2014
 Temperature / Humidity 24 deg.C, 60 %RH 24 deg.C, 58 %RH
 Engineer Wataru Kojima Wataru Kojima
 Mode Tx, 2462 MHz
 Tx, IEEE802.11g, PN9, power setting 12dBm

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	52.8	27.8	14.6	38.1	57.1	73.9	16.8	100	163	
Hori.	4924.000	PK	44.1	31.6	8.0	37.0	46.7	73.9	27.2	100	0	
Hori.	7386.000	PK	44.8	36.8	9.1	39.4	51.3	73.9	22.6	100	0	
Hori.	9848.000	PK	41.3	38.9	9.9	37.5	52.6	73.9	21.3	100	0	
Hori.	12310.000	PK	41.8	39.9	11.4	38.3	54.8	73.9	19.1	100	0	
Hori.	2483.500	AV	41.2	27.8	14.6	38.1	45.5	53.9	8.4	100	163	
Hori.	4924.000	AV	33.6	31.6	8.0	37.0	36.2	53.9	17.7	100	0	
Hori.	7386.000	AV	34.5	36.8	9.1	39.4	41.0	53.9	12.9	100	0	
Hori.	9848.000	AV	31.3	38.9	9.9	37.5	42.6	53.9	11.3	100	0	
Hori.	12310.000	AV	32.3	39.9	11.4	38.3	45.3	53.9	8.6	100	0	
Vert.	2483.500	PK	50.6	27.8	14.6	38.1	54.9	73.9	19.0	100	204	
Vert.	4924.000	PK	43.6	31.6	8.0	37.0	46.2	73.9	27.7	100	0	
Vert.	7386.000	PK	45.1	36.8	9.1	39.4	51.6	73.9	22.3	100	0	
Vert.	9848.000	PK	42.1	38.9	9.9	37.5	53.4	73.9	20.5	100	0	
Vert.	12310.000	PK	41.7	39.9	11.4	38.3	54.7	73.9	19.2	100	0	
Vert.	2483.500	AV	38.8	27.8	14.6	38.1	43.1	53.9	10.8	100	204	
Vert.	4924.000	AV	33.5	31.6	8.0	37.0	36.1	53.9	17.8	100	0	
Vert.	7386.000	AV	34.8	36.8	9.1	39.4	41.3	53.9	12.6	100	0	
Vert.	9848.000	AV	31.6	38.9	9.9	37.5	42.9	53.9	11.0	100	0	
Vert.	12310.000	AV	32.1	39.9	11.4	38.3	45.1	53.9	8.8	100	0	

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

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

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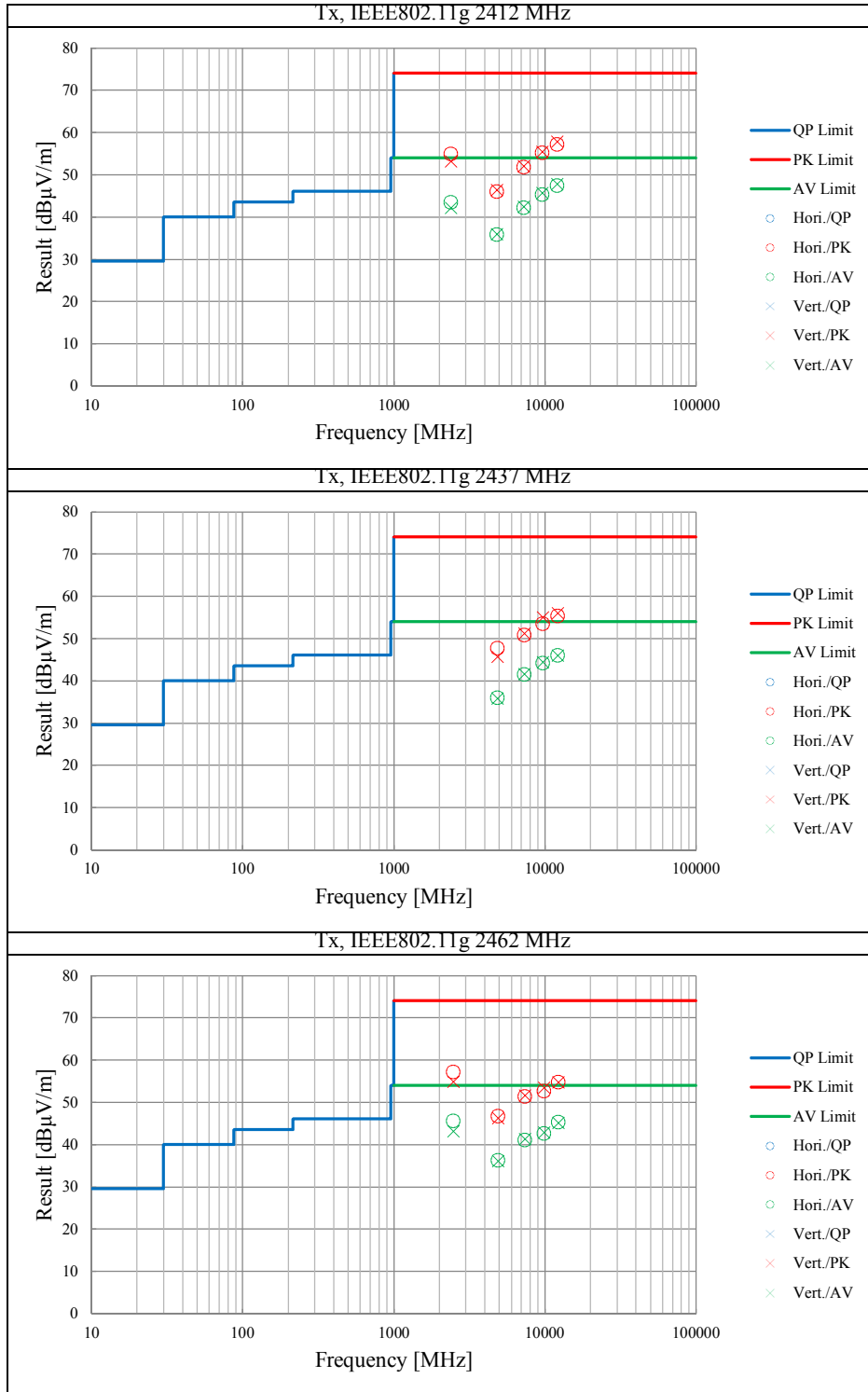
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Radiated Emission

Test place Refer to previous sheet
 Date Refer to previous sheet
 Temperature / Humidity Refer to previous sheet
 Engineer Refer to previous sheet
 Mode Tx, IEEE802.11g, PN9, power setting 12dBm



Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 19, 2014 August 21, 2014
 Temperature / Humidity 24 deg.C, 60 %RH 24 deg.C, 58 %RH
 Engineer Wataru Kojima Wataru Kojima
 Mode Tx, 2412 MHz
 Tx, IEEE802.11n-20HT, PN9, power setting 10dBm

(* 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	48.5	27.5	14.5	38.2	52.3	73.9	21.6	100	189	
Hori.	4824.000	PK	42.8	31.0	7.5	37.1	44.2	73.9	29.7	100	0	
Hori.	7236.000	PK	44.6	36.6	8.8	39.4	50.6	73.9	23.3	100	0	
Hori.	9648.000	PK	43.6	39.1	9.6	37.6	54.7	73.9	19.2	100	0	
Hori.	12060.000	PK	43.7	39.9	10.9	38.5	56.0	73.9	17.9	100	0	
Hori.	2390.000	AV	38.2	27.5	14.5	38.2	42.0	53.9	11.9	100	189	
Hori.	4824.000	AV	33.1	31.0	7.5	37.1	34.5	53.9	19.4	100	0	
Hori.	7236.000	AV	35.5	36.6	8.8	39.4	41.5	53.9	12.4	100	0	
Hori.	9648.000	AV	34.5	39.1	9.6	37.6	45.6	53.9	8.3	100	0	
Hori.	12060.000	AV	34.7	39.9	10.9	38.5	47.0	53.9	6.9	100	0	
Vert.	2390.000	PK	46.3	27.5	14.5	38.2	50.1	73.9	23.8	100	53	
Vert.	4824.000	PK	43.1	31.0	7.5	37.1	44.5	73.9	29.4	100	0	
Vert.	7236.000	PK	44.6	36.6	8.8	39.4	50.6	73.9	23.3	100	0	
Vert.	9648.000	PK	43.0	39.1	9.6	37.6	54.1	73.9	19.8	100	0	
Vert.	12060.000	PK	44.1	39.9	10.9	38.5	56.4	73.9	17.5	100	0	
Vert.	2390.000	AV	37.3	27.5	14.5	38.2	41.1	53.9	12.8	100	53	
Vert.	4824.000	AV	33.2	31.0	7.5	37.1	34.6	53.9	19.3	100	0	
Vert.	7236.000	AV	35.6	36.6	8.8	39.4	41.6	53.9	12.3	100	0	
Vert.	9648.000	AV	34.4	39.1	9.6	37.6	45.5	53.9	8.4	100	0	
Vert.	12060.000	AV	34.8	39.9	10.9	38.5	47.1	53.9	6.8	100	0	

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	81.6	27.6	14.6	38.2	85.6	-	-	100k/300k
Hori.	2400.000	PK	45.8	27.5	14.5	38.2	49.6	65.6	16.0	100k/300k
Vert.	2412.000	PK	79.2	27.6	14.6	38.2	83.2	-	-	100k/300k
Vert.	2400.000	PK	42.7	27.5	14.5	38.2	46.5	63.2	16.7	100k/300k

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

Radiated Emission

Test place No.2 Semi Anechoic Chamber
Date August 19, 2014 August 21, 2014 August 24, 2014
Temperature / Humidity 24 deg.C, 60 %RH 24 deg.C, 58 %RH 26 deg.C, 61 %RH
Engineer Wataru Kojima Wataru Kojima Akio Hayashi
Mode Tx, 2437 MHz
 Tx, IEEE802.11n-20HT, PN9, power setting 10dBm

(* 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.	335.998	QP	50.5	14.7	6.7	31.7	40.2	46.0	5.8	100	136	
Hori.	431.995	QP	51.3	16.6	7.3	31.7	43.5	46.0	2.5	100	116	
Hori.	527.991	QP	51.0	17.8	7.9	31.7	45.0	46.0	1.0	180	123	
Hori.	4874.000	PK	43.9	31.3	7.5	37.1	45.6	73.9	28.3	100	0	
Hori.	7311.000	PK	45.0	36.7	8.7	39.4	51.0	73.9	22.9	100	0	
Hori.	9748.000	PK	42.6	39.0	9.8	37.6	53.8	73.9	20.1	100	0	
Hori.	12185.000	PK	45.1	39.9	10.9	38.4	57.5	73.9	16.4	100	0	
Hori.	4874.000	AV	30.3	31.3	7.5	37.1	32.0	53.9	21.9	100	0	
Hori.	7311.000	AV	32.5	36.7	8.7	39.4	38.5	53.9	15.4	100	0	
Hori.	9748.000	AV	30.0	39.0	9.8	37.6	41.2	53.9	12.7	100	0	
Hori.	12185.000	AV	32.5	39.9	10.9	38.4	44.9	53.9	9.0	100	0	
Vert.	48.006	QP	50.3	11.2	7.2	31.9	36.8	40.0	3.2	119	93	
Vert.	431.996	QP	44.0	16.6	7.3	31.7	36.2	46.0	9.8	106	264	
Vert.	527.993	QP	50.9	17.8	7.9	31.7	44.9	46.0	1.1	100	96	
Vert.	4874.000	PK	42.6	31.3	7.5	37.1	44.3	73.9	29.6	100	0	
Vert.	7311.000	PK	44.8	36.7	8.7	39.4	50.8	73.9	23.1	100	0	
Vert.	9748.000	PK	43.7	39.0	9.8	37.6	54.9	73.9	19.0	100	0	
Vert.	12185.000	PK	44.6	39.9	10.9	38.4	57.0	73.9	16.9	100	0	
Vert.	4874.000	AV	30.3	31.3	7.5	37.1	32.0	53.9	21.9	100	0	
Vert.	7311.000	AV	32.4	36.7	8.7	39.4	38.4	53.9	15.5	100	0	
Vert.	9748.000	AV	30.1	39.0	9.8	37.6	41.3	53.9	12.6	100	0	
Vert.	12185.000	AV	32.3	39.9	10.9	38.4	44.7	53.9	9.2	100	0	

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

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

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

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Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 21, 2014 August 22, 2014
 Temperature / Humidity 24 deg.C, 58 %RH 24 deg.C, 58 %RH
 Engineer Wataru Kojima Wataru Kojima
 Mode Tx, 2462 MHz
 Tx, IEEE802.11n-20HT, PN9, power setting 10dBm

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	46.7	27.8	14.6	38.1	51.0	73.9	22.9	100	181	
Hori.	4924.000	PK	43.2	31.6	7.6	37.0	45.4	73.9	28.5	100	0	
Hori.	7386.000	PK	44.3	36.8	8.7	39.4	50.4	73.9	23.5	100	0	
Hori.	9848.000	PK	43.7	38.9	9.8	37.5	54.9	73.9	19.0	100	0	
Hori.	12310.000	PK	44.2	39.9	11.0	38.3	56.8	73.9	17.1	100	0	
Hori.	2483.500	AV	36.4	27.8	14.6	38.1	40.7	53.9	13.2	100	181	
Hori.	4924.000	AV	32.2	31.6	7.6	37.0	34.4	53.9	19.5	100	0	
Hori.	7386.000	AV	35.0	36.8	8.7	39.4	41.1	53.9	12.8	100	0	
Hori.	9848.000	AV	32.4	38.9	9.8	37.5	43.6	53.9	10.3	100	0	
Hori.	12310.000	AV	33.3	39.9	11.0	38.3	45.9	53.9	8.0	100	0	
Vert.	2483.500	PK	46.3	27.8	14.6	38.1	50.6	73.9	23.3	100	40	
Vert.	4924.000	PK	42.7	31.6	7.6	37.0	44.9	73.9	29.0	100	0	
Vert.	7386.000	PK	44.4	36.8	8.7	39.4	50.5	73.9	23.4	100	0	
Vert.	9848.000	PK	44.2	38.9	9.8	37.5	55.4	73.9	18.5	100	0	
Vert.	12310.000	PK	44.3	39.9	11.0	38.3	56.9	73.9	17.0	100	0	
Vert.	2483.500	AV	34.2	27.8	14.6	38.1	38.5	53.9	15.4	100	40	
Vert.	4924.000	AV	32.1	31.6	7.6	37.0	34.3	53.9	19.6	100	0	
Vert.	7386.000	AV	35.1	36.8	8.7	39.4	41.2	53.9	12.7	100	0	
Vert.	9848.000	AV	32.5	38.9	9.8	37.5	43.7	53.9	10.2	100	0	
Vert.	12310.000	AV	33.5	39.9	11.0	38.3	46.1	53.9	7.8	100	0	

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

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

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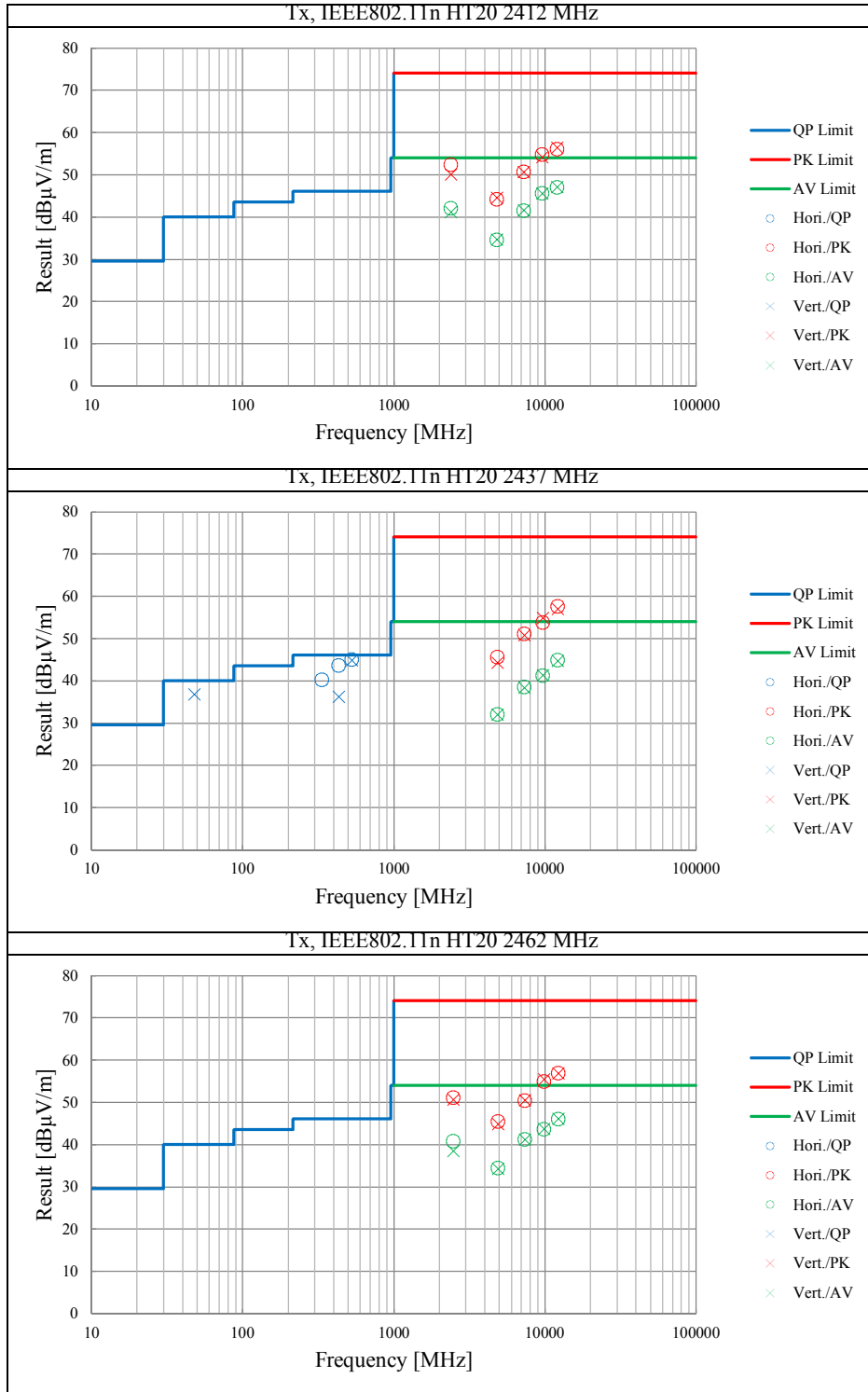
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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Emission

Test place Refer to previous sheet
 Date Refer to previous sheet
 Temperature / Humidity Refer to previous sheet
 Engineer Refer to previous sheet
 Mode Tx, IEEE802.11n-20HT, PN9, power setting 10dBm



Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 21, 2014 August 22, 2014
 Temperature / Humidity 24 deg.C, 58 %RH 24 deg.C, 58 %RH
 Engineer Wataru Kojima Wataru Kojima
 Mode Tx, 2412 MHz
 Tx, IEEE802.11n-20HT, PN9, power setting 12dBm

(* 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	56.6	27.5	14.5	38.2	60.4	73.9	13.5	100	181	
Hori.	4824.000	PK	43.9	31.0	7.5	37.1	45.3	73.9	28.6	100	0	
Hori.	7236.000	PK	44.7	36.6	8.8	39.4	50.7	73.9	23.2	100	0	
Hori.	9648.000	PK	43.6	39.1	9.6	37.6	54.7	73.9	19.2	100	0	
Hori.	12060.000	PK	44.9	39.9	10.9	38.5	57.2	73.9	16.7	100	0	
Hori.	2390.000	AV	41.6	27.5	14.5	38.2	45.4	53.9	8.5	100	181	
Hori.	4824.000	AV	30.1	31.0	7.5	37.1	31.5	53.9	22.4	100	0	
Hori.	7236.000	AV	32.3	36.6	8.8	39.4	38.3	53.9	15.6	100	0	
Hori.	9648.000	AV	31.8	39.1	9.6	37.6	42.9	53.9	11.0	100	0	
Hori.	12060.000	AV	32.3	39.9	10.9	38.5	44.6	53.9	9.3	100	0	
Vert.	2390.000	PK	55.7	27.5	14.5	38.2	59.5	73.9	14.4	100	218	
Vert.	4824.000	PK	43.4	31.0	7.5	37.1	44.8	73.9	29.1	100	0	
Vert.	7236.000	PK	45.2	36.6	8.8	39.4	51.2	73.9	22.7	100	0	
Vert.	9648.000	PK	43.5	39.1	9.6	37.6	54.6	73.9	19.3	100	0	
Vert.	12060.000	PK	44.7	39.9	10.9	38.5	57.0	73.9	16.9	100	0	
Vert.	2390.000	AV	40.4	27.5	14.5	38.2	44.2	53.9	9.7	100	218	
Vert.	4824.000	AV	30.0	31.0	7.5	37.1	31.4	53.9	22.5	100	0	
Vert.	7236.000	AV	32.4	36.6	8.8	39.4	38.4	53.9	15.5	100	0	
Vert.	9648.000	AV	31.6	39.1	9.6	37.6	42.7	53.9	11.2	100	0	
Vert.	12060.000	AV	31.7	39.9	10.9	38.5	44.0	53.9	9.9	100	0	

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	84.1	27.6	14.6	38.2	88.1	-	-	100k/300k
Hori.	2400.000	PK	56.5	27.5	14.5	38.2	60.3	68.1	7.8	100k/300k
Vert.	2412.000	PK	82.4	27.6	14.6	38.2	86.4	-	-	100k/300k
Vert.	2400.000	PK	54.8	27.5	14.5	38.2	58.6	66.4	7.8	100k/300k

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

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

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Facsimile : +81 463 50 6401

Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 21, 2014 August 22, 2014 August 24, 2014
 Temperature / Humidity 24 deg.C, 58 %RH 24 deg.C, 58 %RH 26 deg.C, 61 %RH
 Engineer Wataru Kojima Wataru Kojima Akio Hayashi
 Mode Tx, 2437 MHz
 Tx, IEEE802.11n-20HT, PN9, power setting 12dBm

(* 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.	431.954	QP	51.2	16.6	7.3	31.7	43.4	46.0	2.6	100	117	
Hori.	448.720	QP	48.1	16.7	7.4	31.7	40.5	46.0	5.5	100	118	
Hori.	527.988	QP	50.2	17.8	7.9	31.7	44.2	46.0	1.8	183	116	
Hori.	4874.000	PK	43.1	31.3	7.5	37.1	44.8	73.9	29.1	100	0	
Hori.	7311.000	PK	45.6	36.7	8.7	39.4	51.6	73.9	22.3	100	0	
Hori.	9748.000	PK	44.1	39.0	9.8	37.6	55.3	73.9	18.6	100	0	
Hori.	12185.000	PK	44.5	39.9	10.9	38.4	56.9	73.9	17.0	100	0	
Hori.	4874.000	AV	30.1	31.3	7.5	37.1	31.8	53.9	22.1	100	0	
Hori.	7311.000	AV	32.6	36.7	8.7	39.4	38.6	53.9	15.3	100	0	
Hori.	9748.000	AV	30.2	39.0	9.8	37.6	41.4	53.9	12.5	100	0	
Hori.	12185.000	AV	32.4	39.9	10.9	38.4	44.8	53.9	9.1	100	0	
Vert.	48.000	QP	50.7	11.2	7.2	31.9	37.2	40.0	2.8	118	105	
Vert.	434.042	QP	45.0	16.6	7.3	31.7	37.2	46.0	8.8	118	260	
Vert.	527.995	QP	49.8	17.8	7.9	31.7	43.8	46.0	2.2	102	96	
Vert.	4874.000	PK	43.2	31.3	7.5	37.1	44.9	73.9	29.0	100	0	
Vert.	7311.000	PK	45.3	36.7	8.7	39.4	51.3	73.9	22.6	100	0	
Vert.	9748.000	PK	43.1	39.0	9.8	37.6	54.3	73.9	19.6	100	0	
Vert.	12185.000	PK	45.0	39.9	10.9	38.4	57.4	73.9	16.5	100	0	
Vert.	4874.000	AV	30.3	31.3	7.5	37.1	32.0	53.9	21.9	100	0	
Vert.	7311.000	AV	32.5	36.7	8.7	39.4	38.5	53.9	15.4	100	0	
Vert.	9748.000	AV	30.0	39.0	9.8	37.6	41.2	53.9	12.7	100	0	
Vert.	12185.000	AV	32.7	39.9	10.9	38.4	45.1	53.9	8.8	100	0	

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

Radiated Emission

Test place No.2 Semi Anechoic Chamber
 Date August 21, 2014 August 22, 2014
 Temperature / Humidity 24 deg.C, 58 %RH 24 deg.C, 58 %RH
 Engineer Wataru Kojima Wataru Kojima
 Mode Tx, 2462 MHz
 Tx, IEEE802.11n-20HT, PN9, power setting 12dBm

(* 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	51.6	27.8	14.6	38.1	55.9	73.9	18.0	100	189	
Hori.	4924.000	PK	42.2	31.6	7.6	37.0	44.4	73.9	29.5	100	0	
Hori.	7386.000	PK	46.1	36.8	8.7	39.4	52.2	73.9	21.7	100	0	
Hori.	9848.000	PK	43.1	38.9	9.8	37.5	54.3	73.9	19.6	100	0	
Hori.	12310.000	PK	44.5	39.9	11.0	38.3	57.1	73.9	16.8	100	0	
Hori.	2483.500	AV	40.4	27.8	14.6	38.1	44.7	53.9	9.2	100	189	
Hori.	4924.000	AV	32.0	31.6	7.6	37.0	34.2	53.9	19.7	100	0	
Hori.	7386.000	AV	35.1	36.8	8.7	39.4	41.2	53.9	12.7	100	0	
Hori.	9848.000	AV	32.1	38.9	9.8	37.5	43.3	53.9	10.6	100	0	
Hori.	12310.000	AV	33.1	39.9	11.0	38.3	45.7	53.9	8.2	100	0	
Vert.	2483.500	PK	51.2	27.8	14.6	38.1	55.5	73.9	18.4	100	53	
Vert.	4924.000	PK	42.4	31.6	7.6	37.0	44.6	73.9	29.3	100	0	
Vert.	7386.000	PK	44.9	36.8	8.7	39.4	51.0	73.9	22.9	100	0	
Vert.	9848.000	PK	43.6	38.9	9.8	37.5	54.8	73.9	19.1	100	0	
Vert.	12310.000	PK	45.1	39.9	11.0	38.3	57.7	73.9	16.2	100	0	
Vert.	2483.500	AV	39.6	27.8	14.6	38.1	43.9	53.9	10.0	100	53	
Vert.	4924.000	AV	32.1	31.6	7.6	37.0	34.3	53.9	19.6	100	0	
Vert.	7386.000	AV	35.0	36.8	8.7	39.4	41.1	53.9	12.8	100	0	
Vert.	9848.000	AV	32.3	38.9	9.8	37.5	43.5	53.9	10.4	100	0	
Vert.	12310.000	AV	33.2	39.9	11.0	38.3	45.8	53.9	8.1	100	0	

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

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

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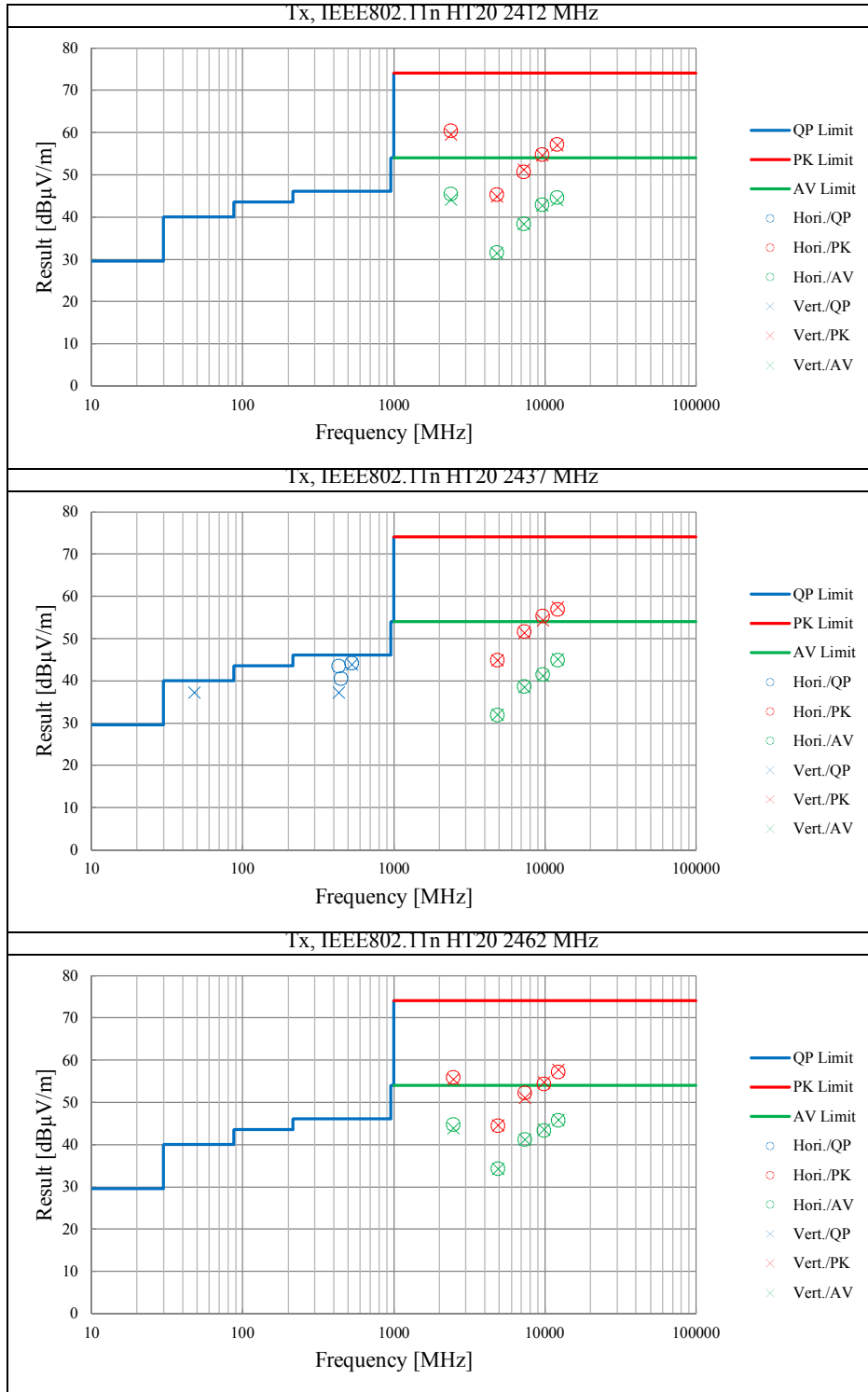
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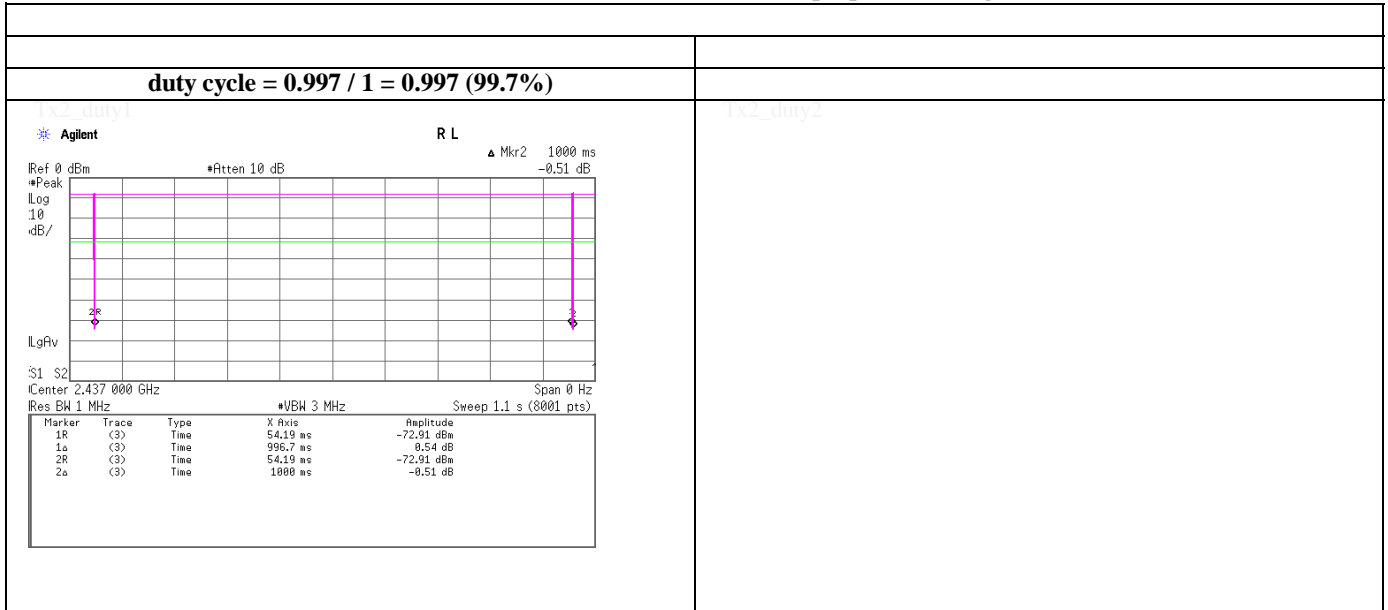
Radiated Emission

Test place Refer to previous sheet
 Date Refer to previous sheet
 Temperature / Humidity Refer to previous sheet
 Engineer Refer to previous sheet
 Mode Tx, IEEE802.11n-20HT, PN9, power setting 12dBm



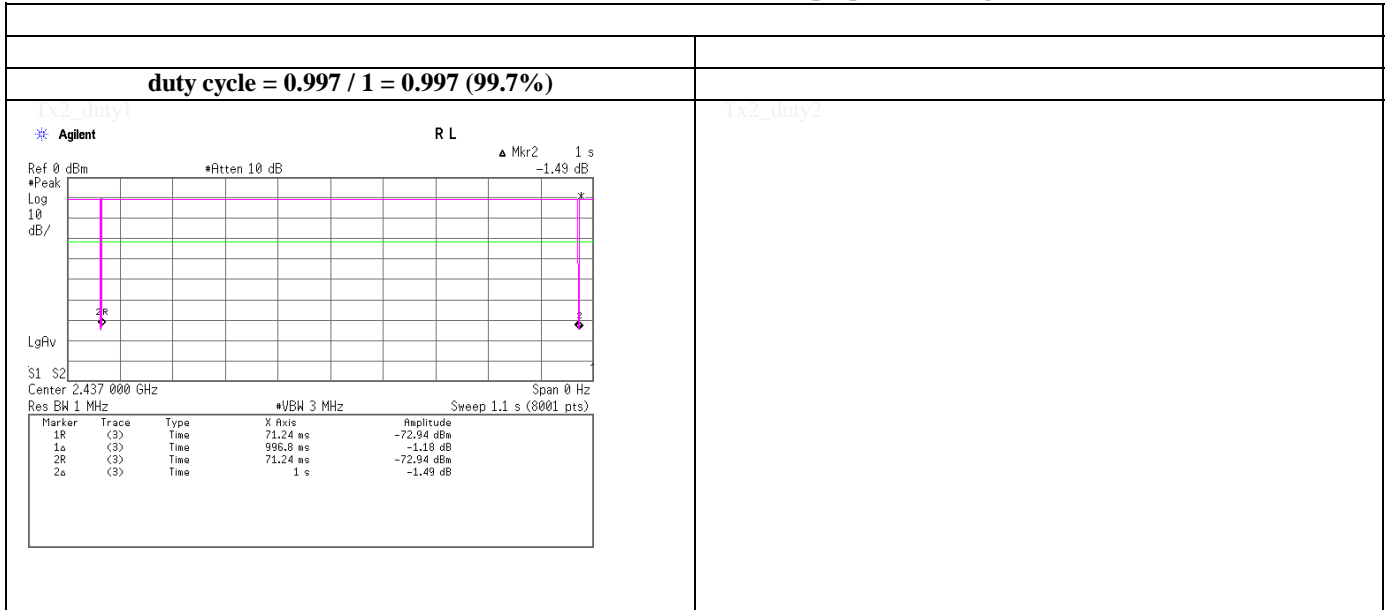
Burst Rate Confirmation

Tx, IEEE802.11b, PN9, worst data mode 1Mbps ,power setting 12dBm



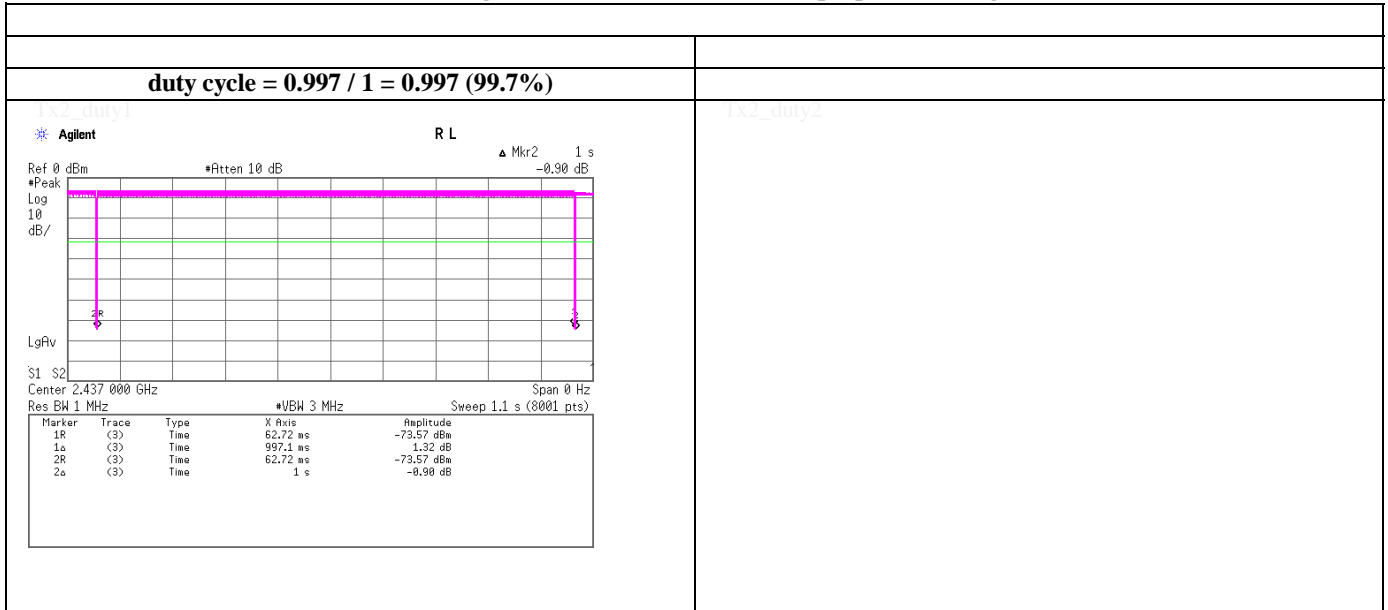
Burst Rate Confirmation

Tx, IEEE802.11b, PN9, worst data mode 2Mbps, power setting 10dBm



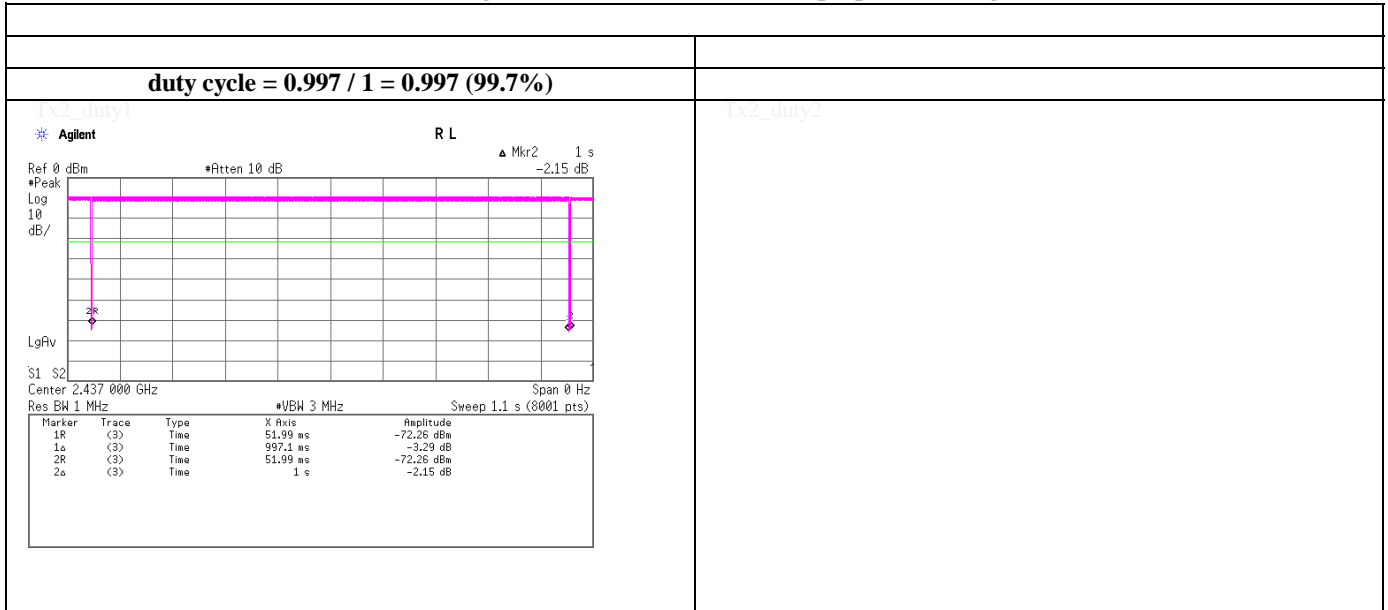
Burst Rate Confirmation

Tx, IEEE802.11g, PN9, worst data mode 54Mbps ,power setting 12dBm



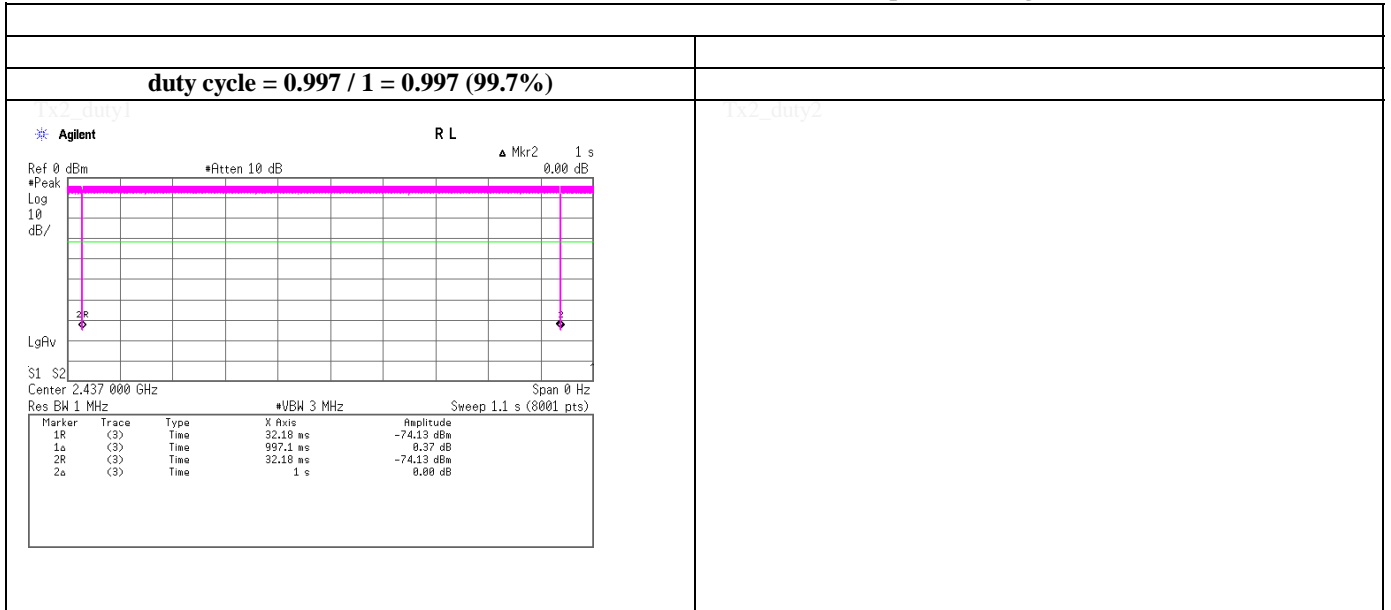
Burst Rate Confirmation

Tx, IEEE802.11g, PN9, worst data mode 54Mbps, power setting 10dBm



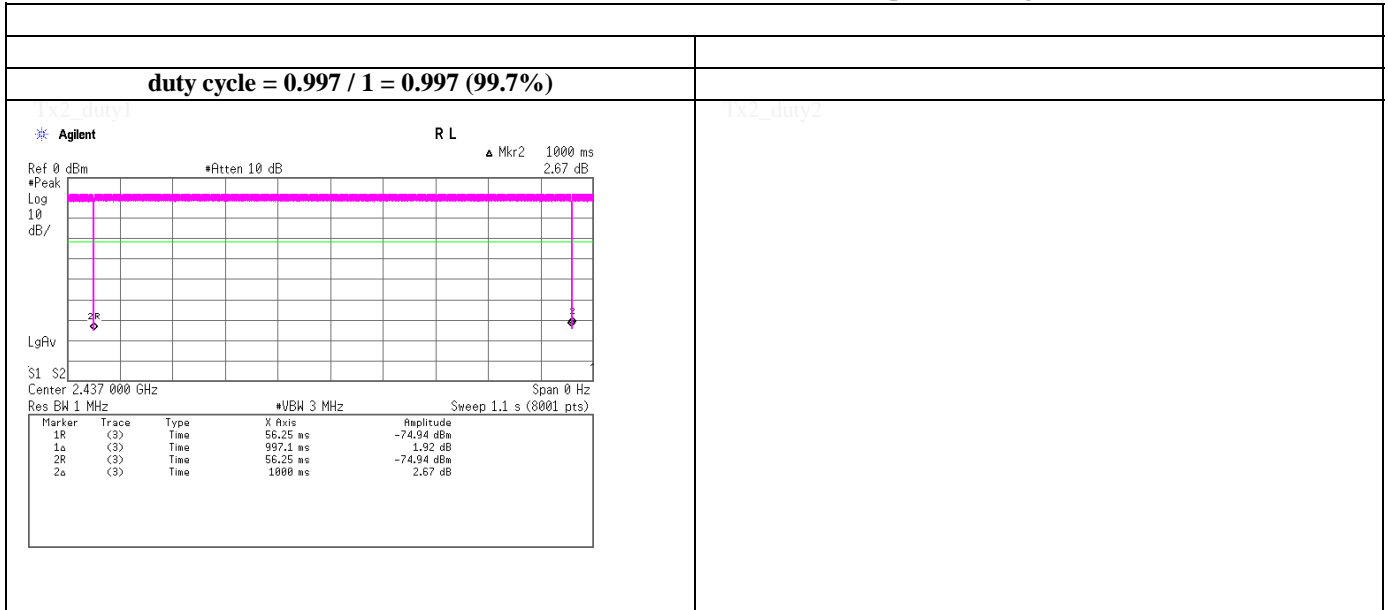
Burst Rate Confirmation

Tx, IEEE802.11n-20HT, PN9, worst data mode 6(MCS) ,power setting 12dBm



Burst Rate Confirmation

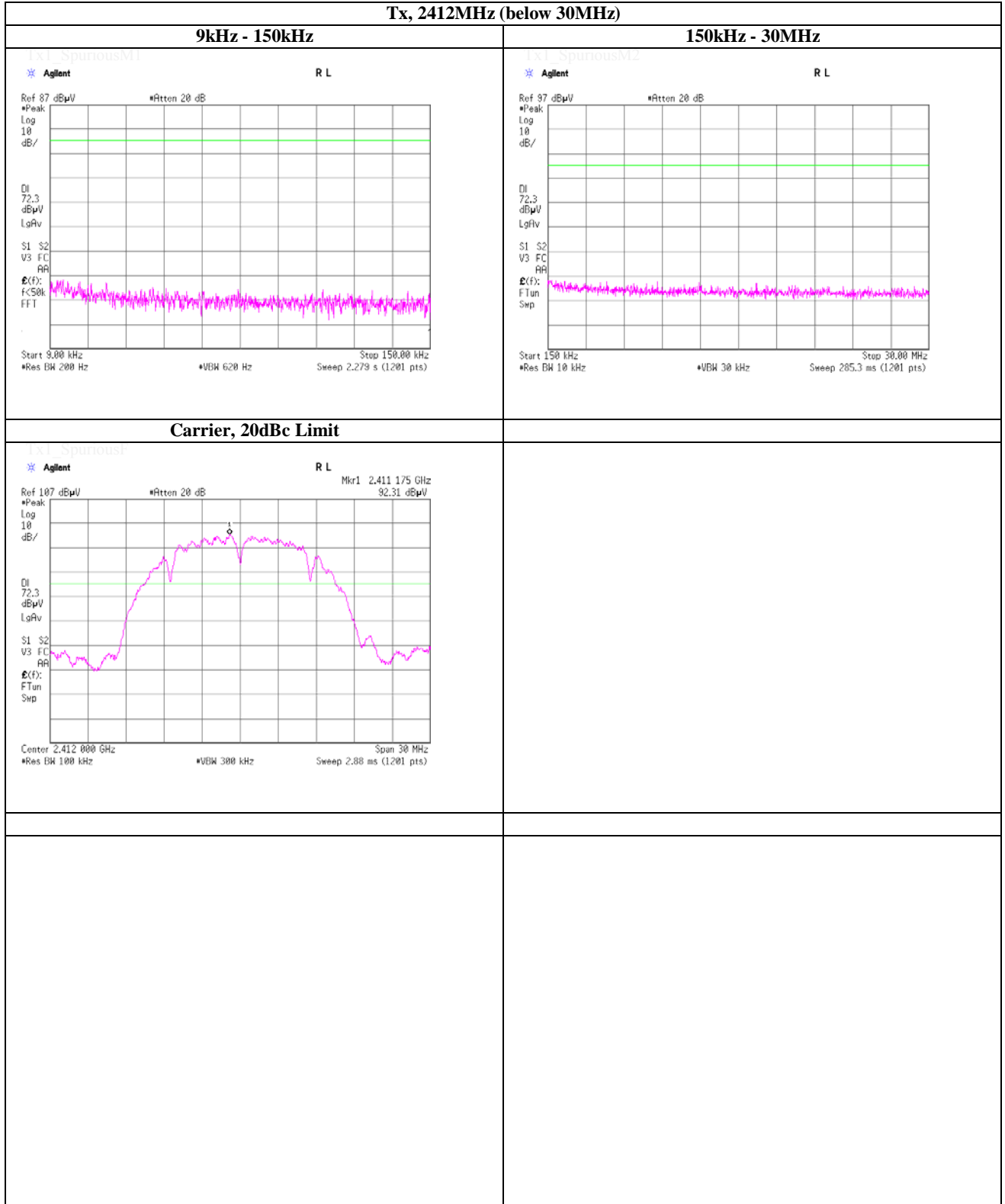
Tx, IEEE802.11n-20HT, PN9, worst data mode 6(MCS), power setting 10dBm



Spurious emission (Conducted)

Tx, IEEE802.11b, PN9, worst data mode 2Mbps, power setting 10dBm

Tx, 2412MHz (below 30MHz)



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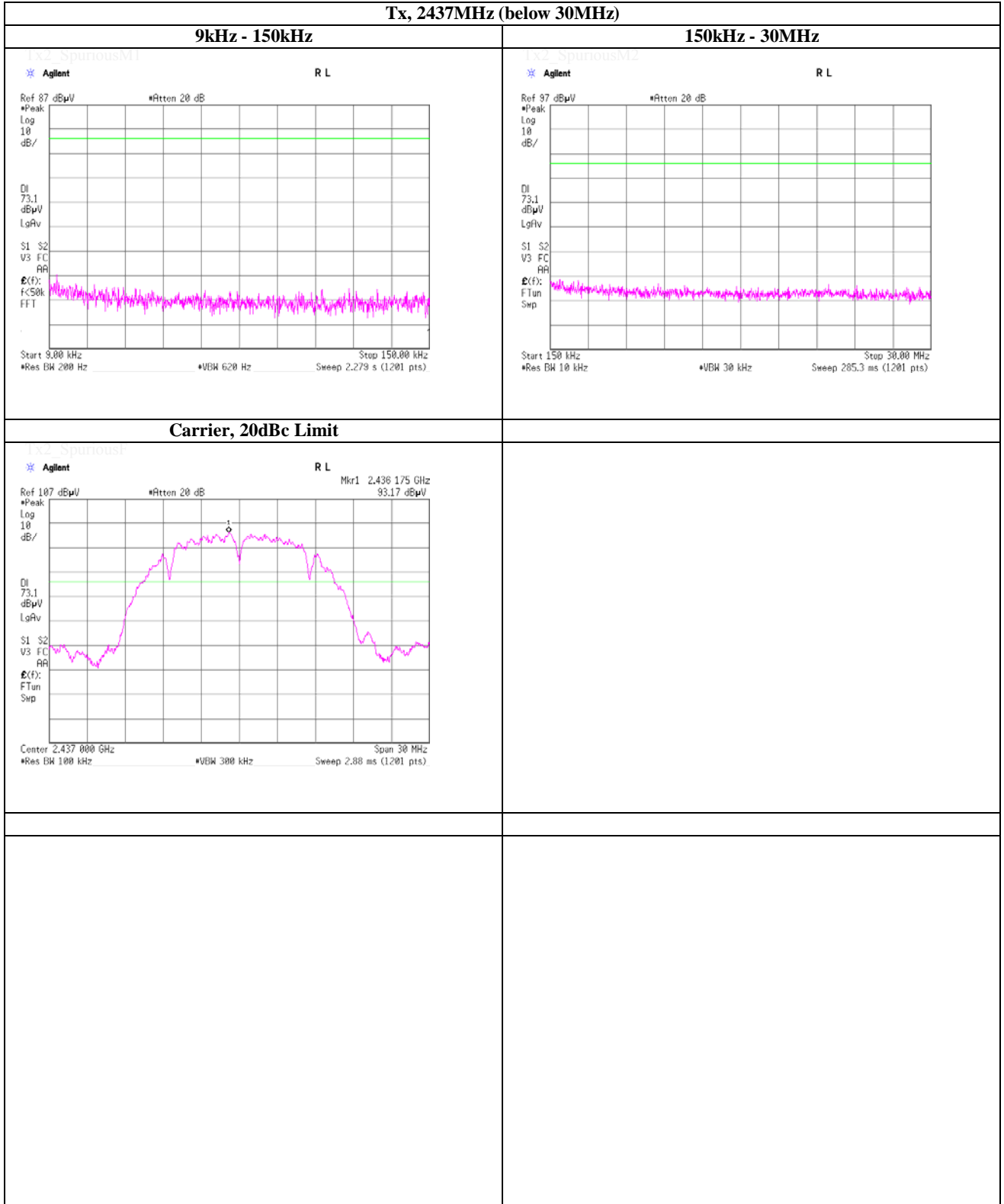
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Spurious emission (Conducted)

Tx, IEEE802.11b, PN9, worst data mode 2Mbps, power setting 10dBm

Tx, 2437MHz (below 30MHz)



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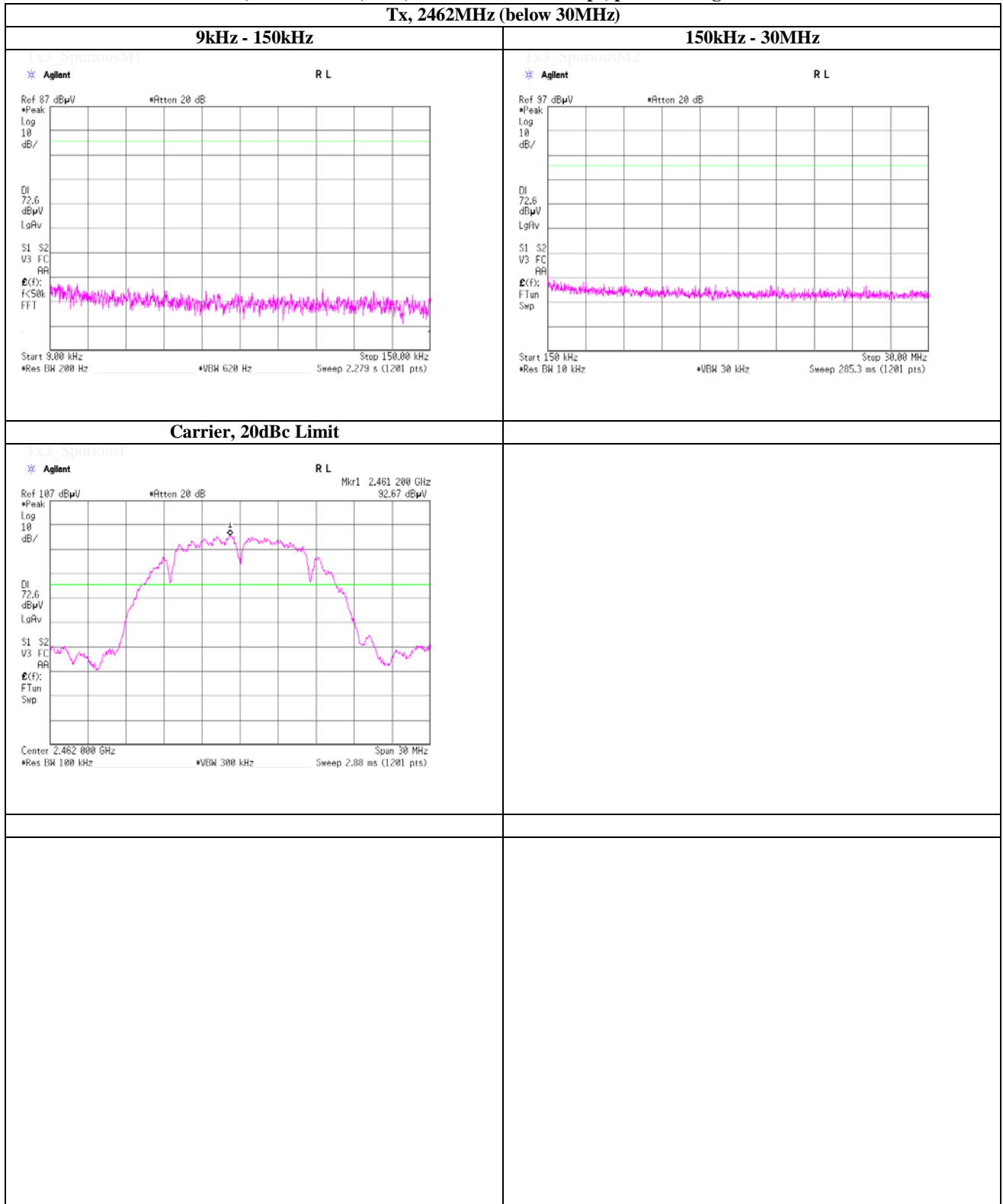
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Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11b, PN9, worst data mode 2Mbps, power setting 10dBm

Tx, 2462MHz (below 30MHz)



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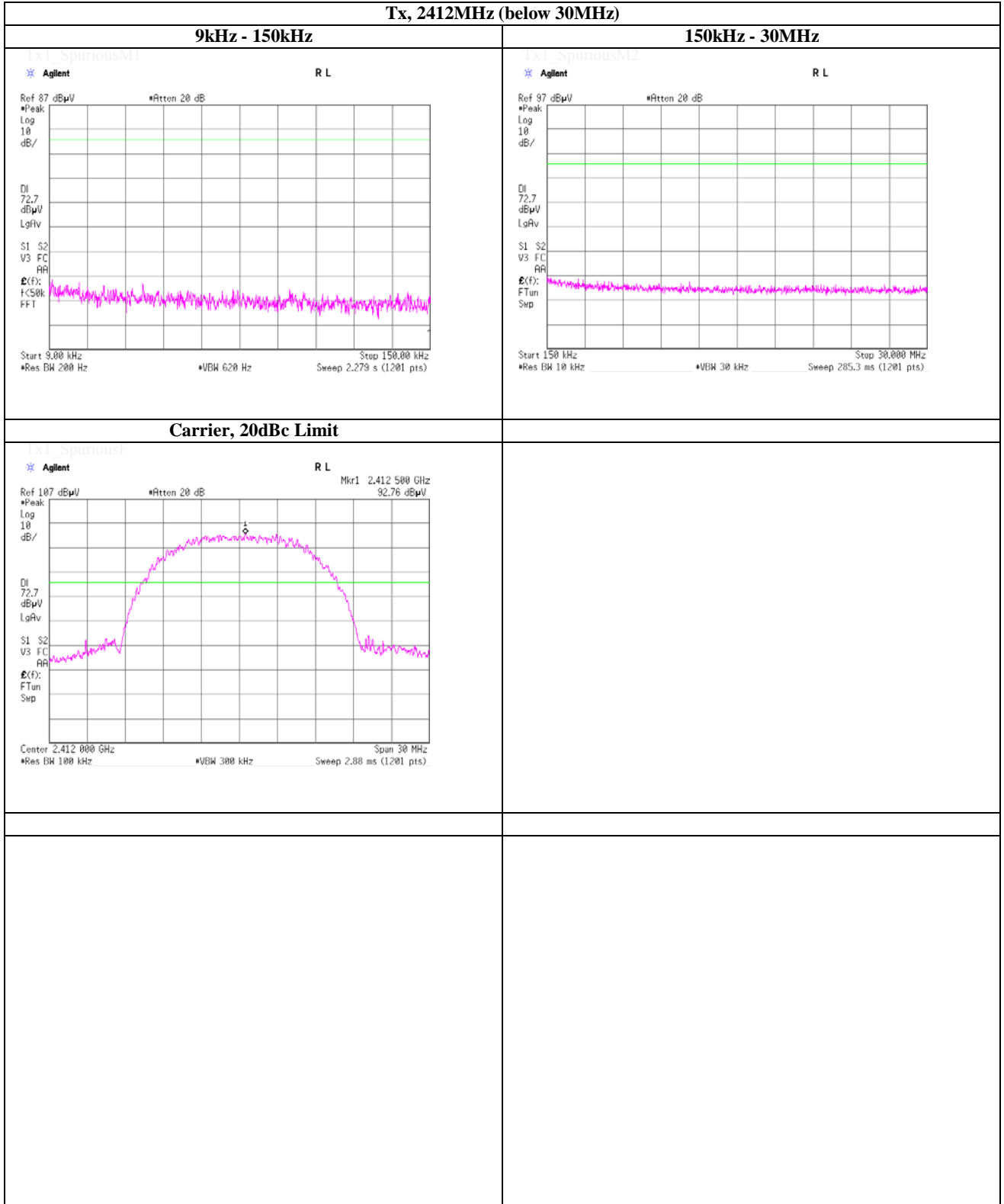
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Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11b, PN9, worst data mode 1Mbps ,power setting 12dBm

Tx, 2412MHz (below 30MHz)



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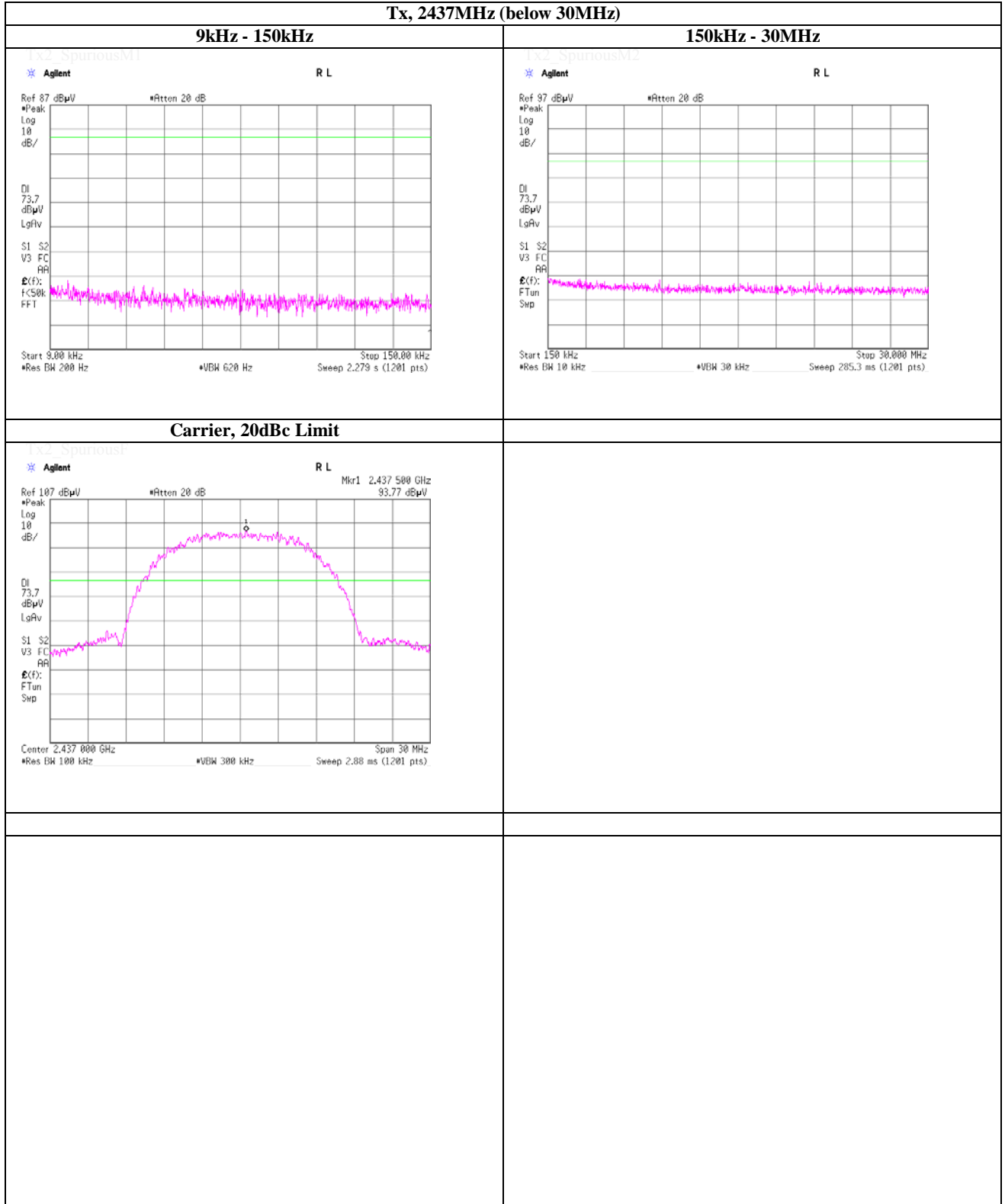
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Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11b, PN9, worst data mode 1Mbps ,power setting 12dBm

Tx, 2437MHz (below 30MHz)



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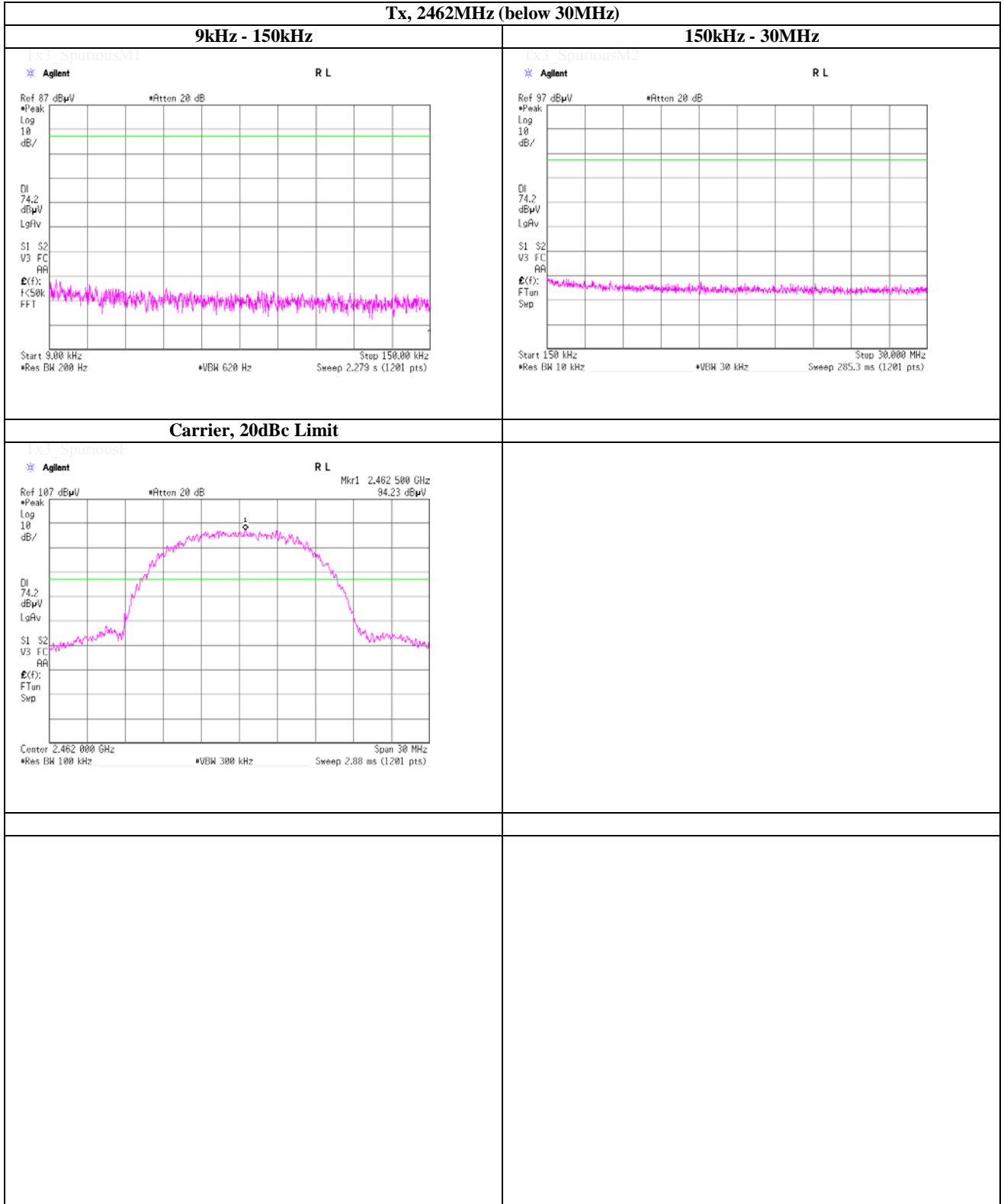
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Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11b, PN9, worst data mode 1Mbps ,power setting 12dBm

Tx, 2462MHz (below 30MHz)



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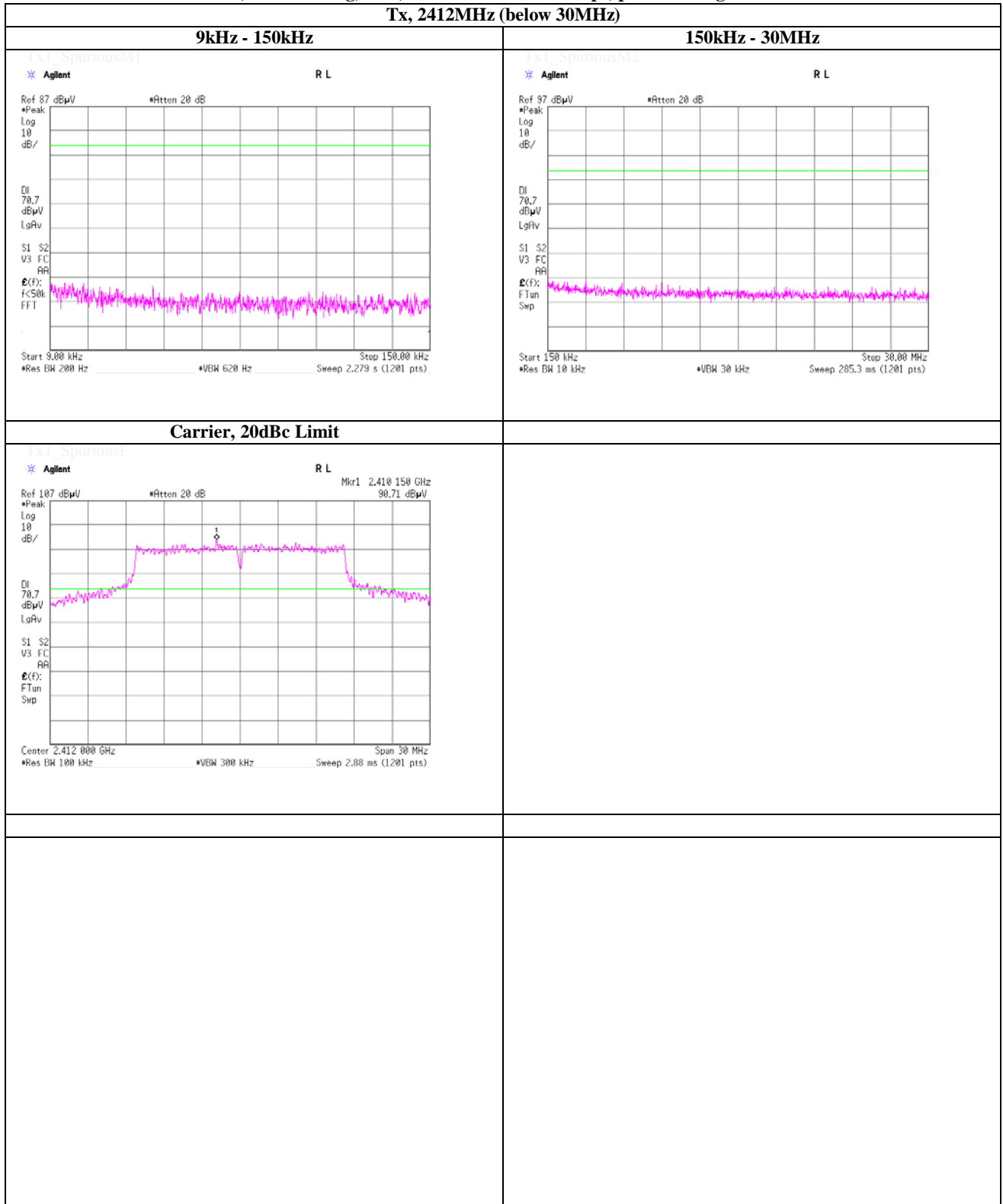
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 54Mbps, power setting 10dBm

Tx, 2412MHz (below 30MHz)



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Shonan EMC Lab.

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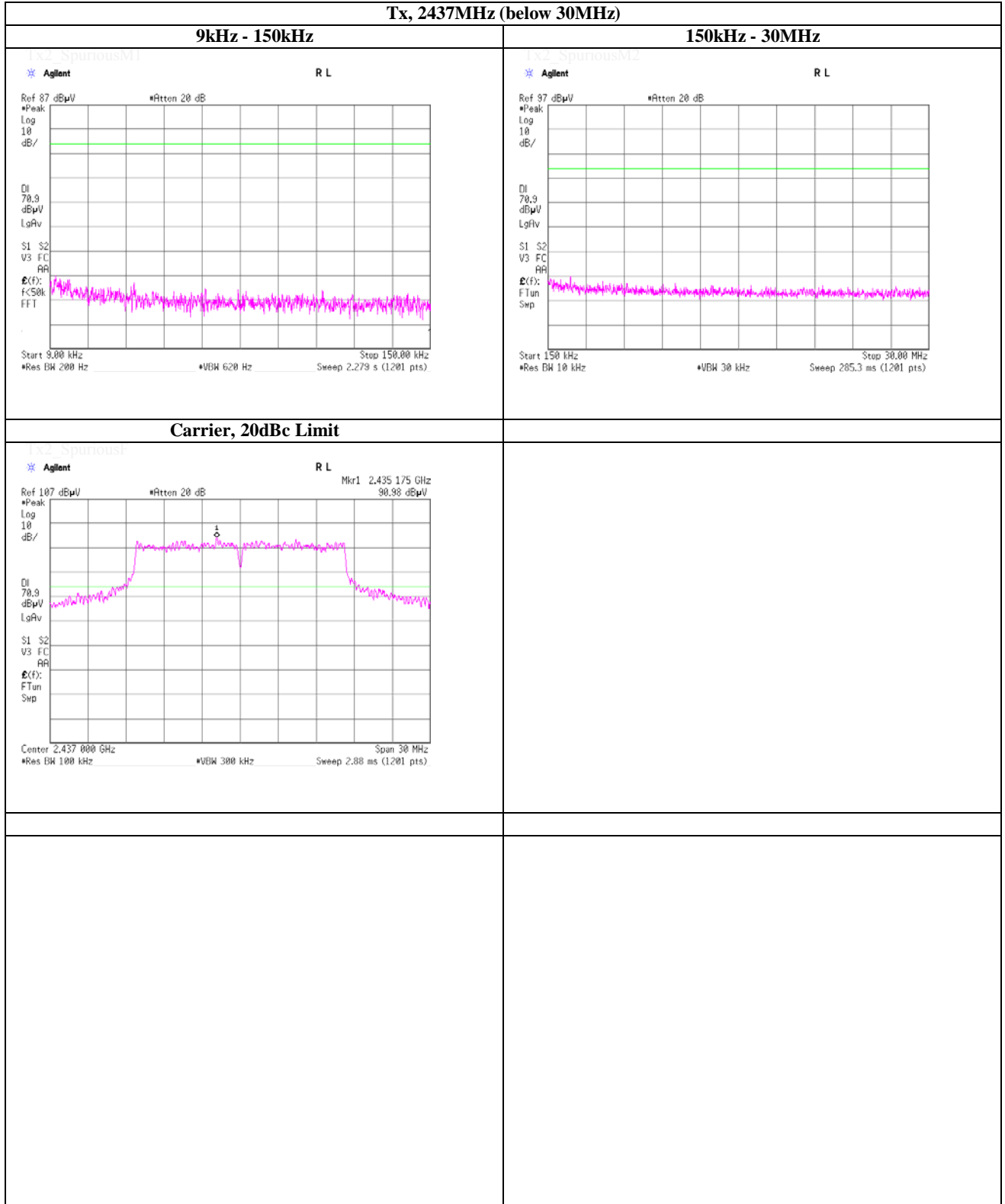
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 54Mbps, power setting 10dBm

Tx, 2437MHz (below 30MHz)



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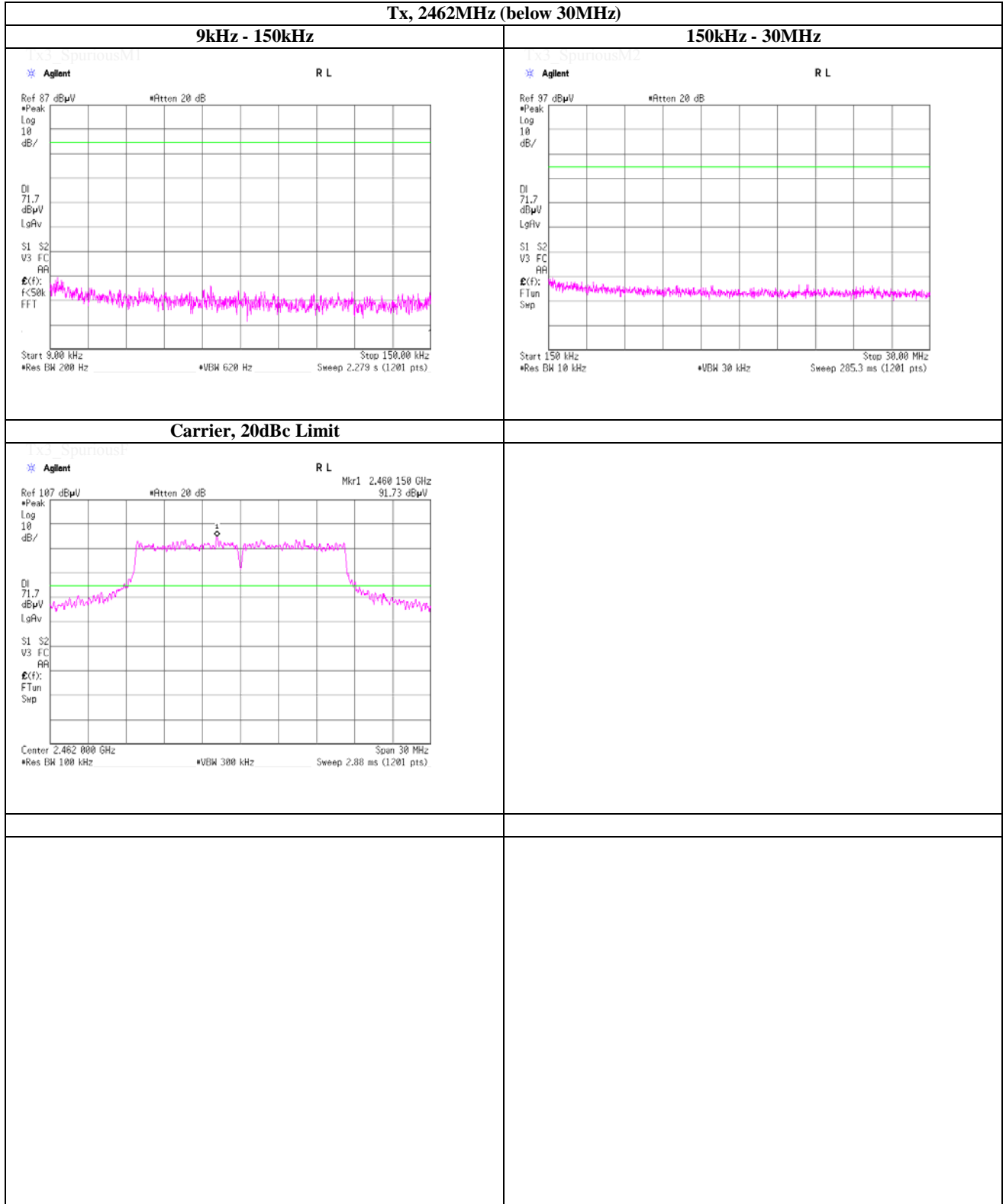
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 54Mbps, power setting 10dBm

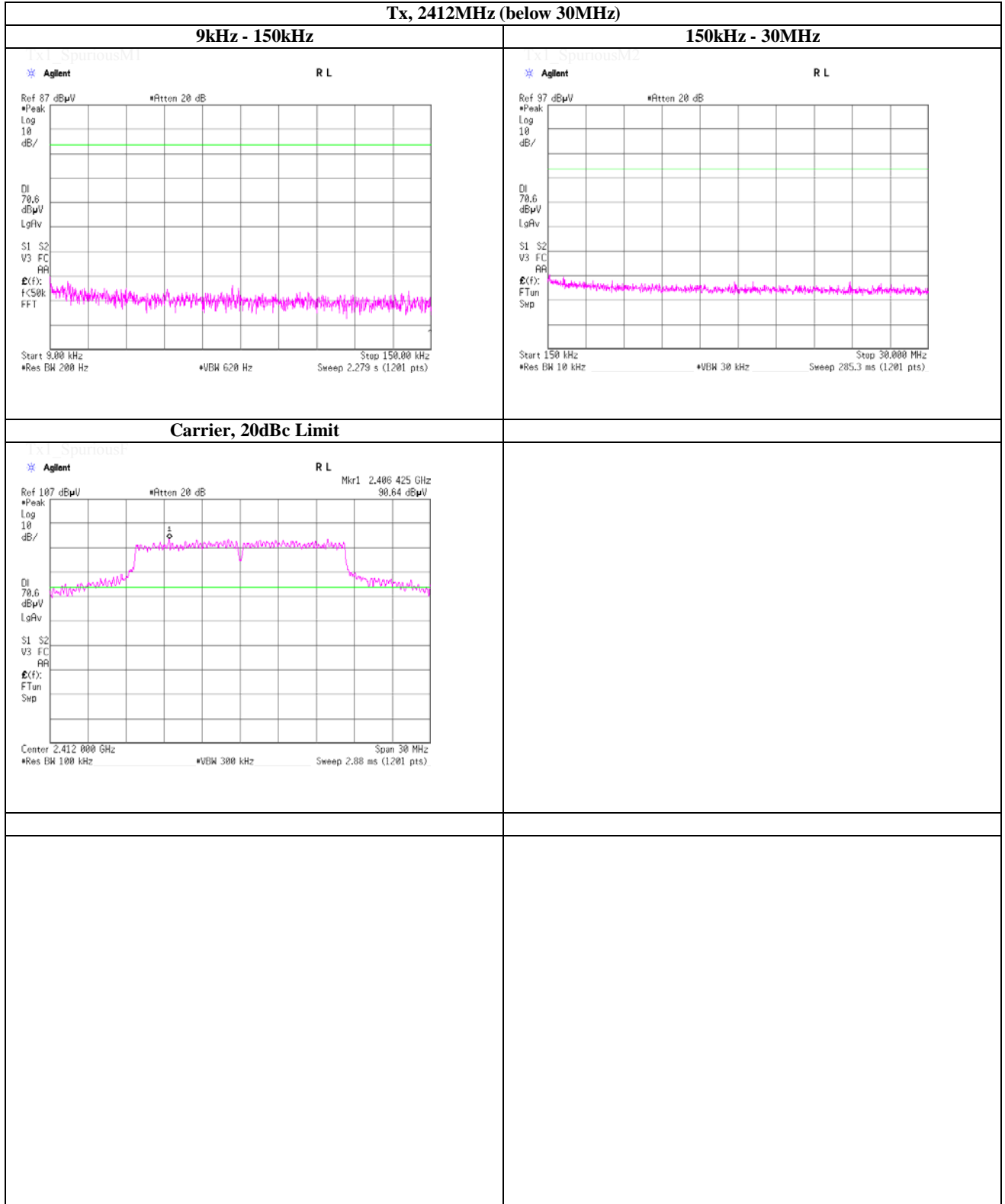
Tx, 2462MHz (below 30MHz)



Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 54Mbps ,power setting 12dBm

Tx, 2412MHz (below 30MHz)



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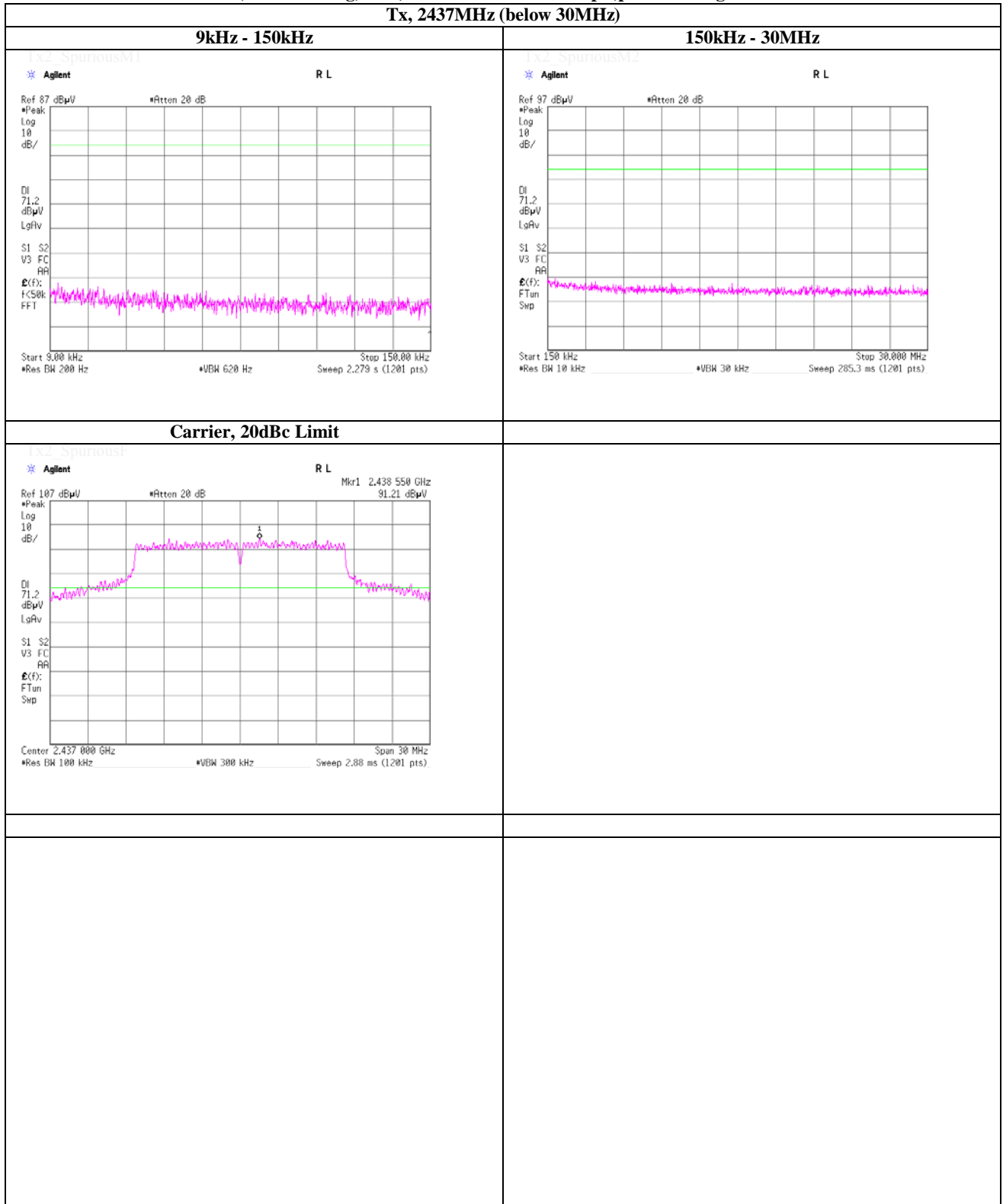
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Tx, IEEE802.11g, PN9, worst data mode 54Mbps ,power setting 12dBm

Tx, 2437MHz (below 30MHz)



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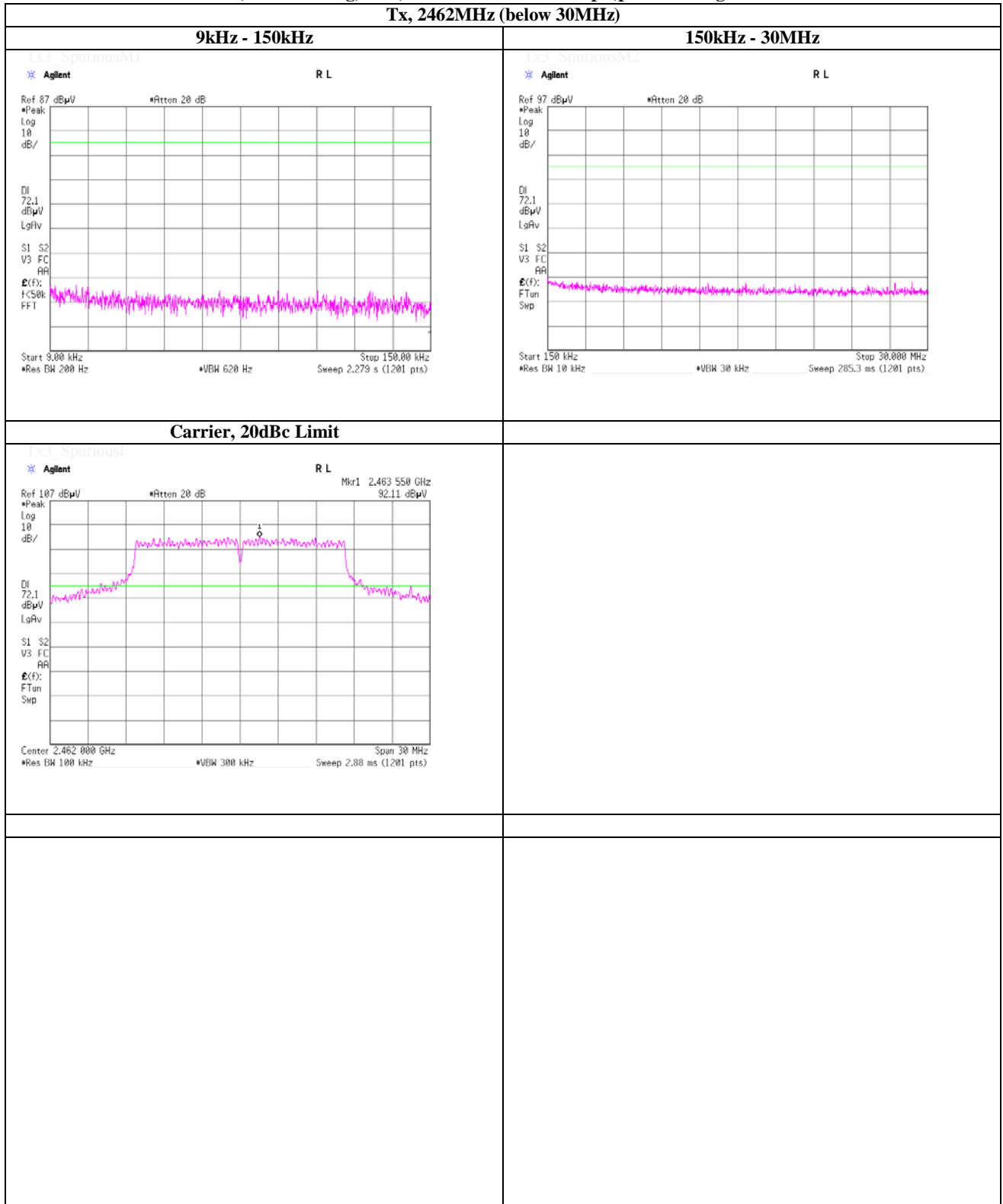
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 54Mbps ,power setting 12dBm

Tx, 2462MHz (below 30MHz)



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

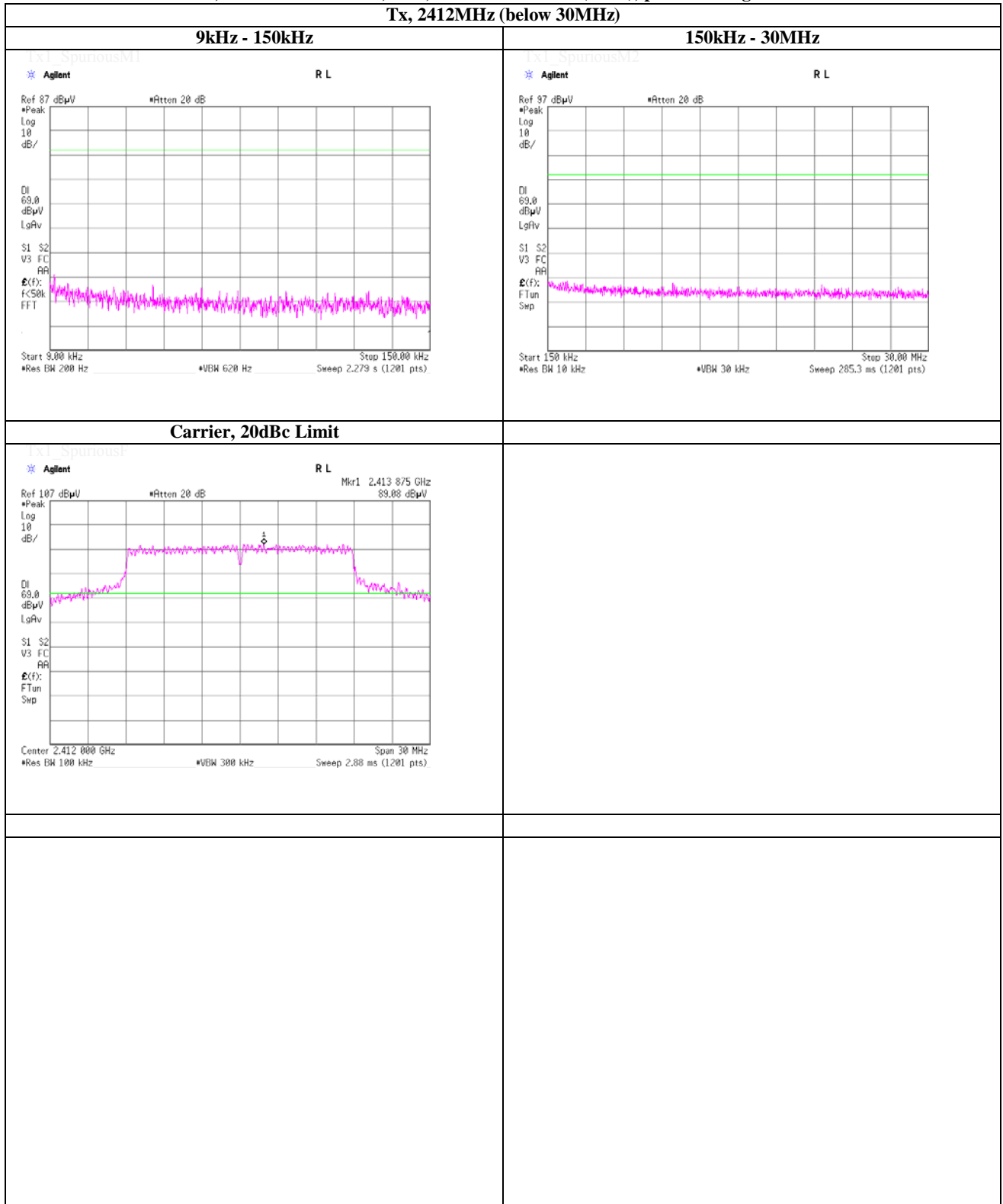
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11n-20HT, PN9, worst data mode 6(MCS), power setting 10dBm

Tx, 2412MHz (below 30MHz)



UL Japan, Inc.

Shonan EMC Lab.

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

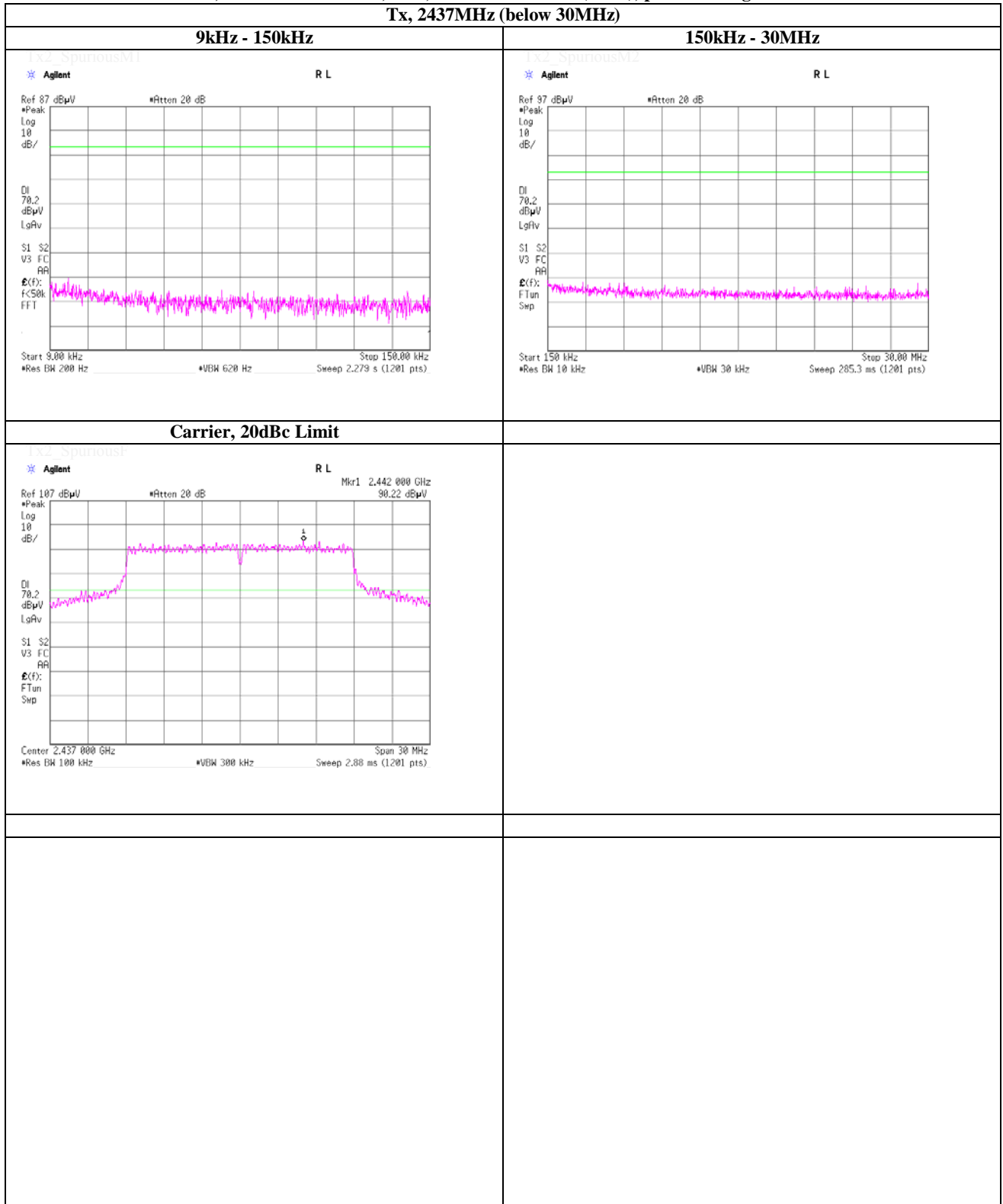
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11n-20HT, PN9, worst data mode 6(MCS), power setting 10dBm

Tx, 2437MHz (below 30MHz)



UL Japan, Inc.

Shonan EMC Lab.

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

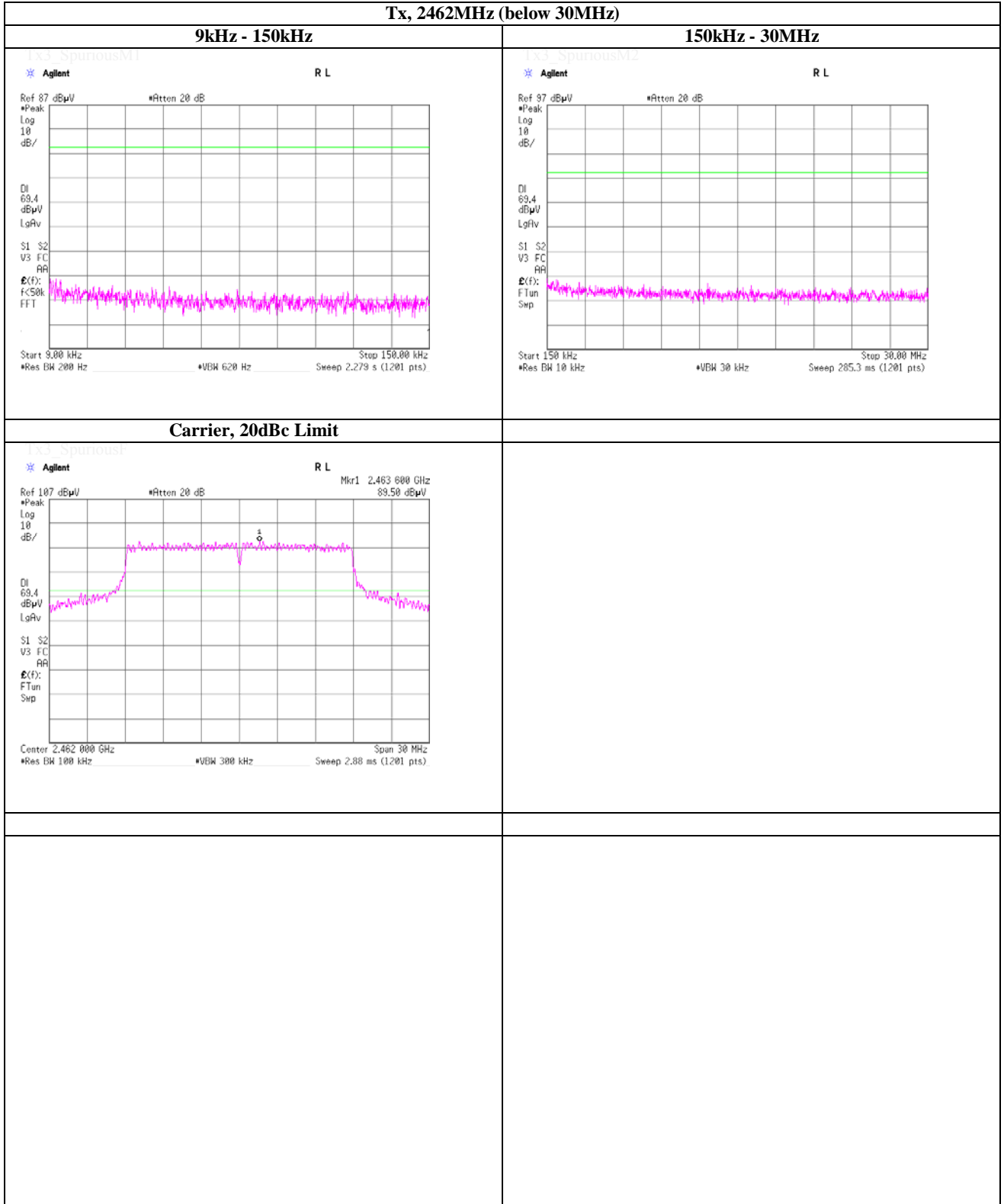
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11n-20HT, PN9, worst data mode 6(MCS), power setting 10dBm

Tx, 2462MHz (below 30MHz)



UL Japan, Inc.

Shonan EMC Lab.

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

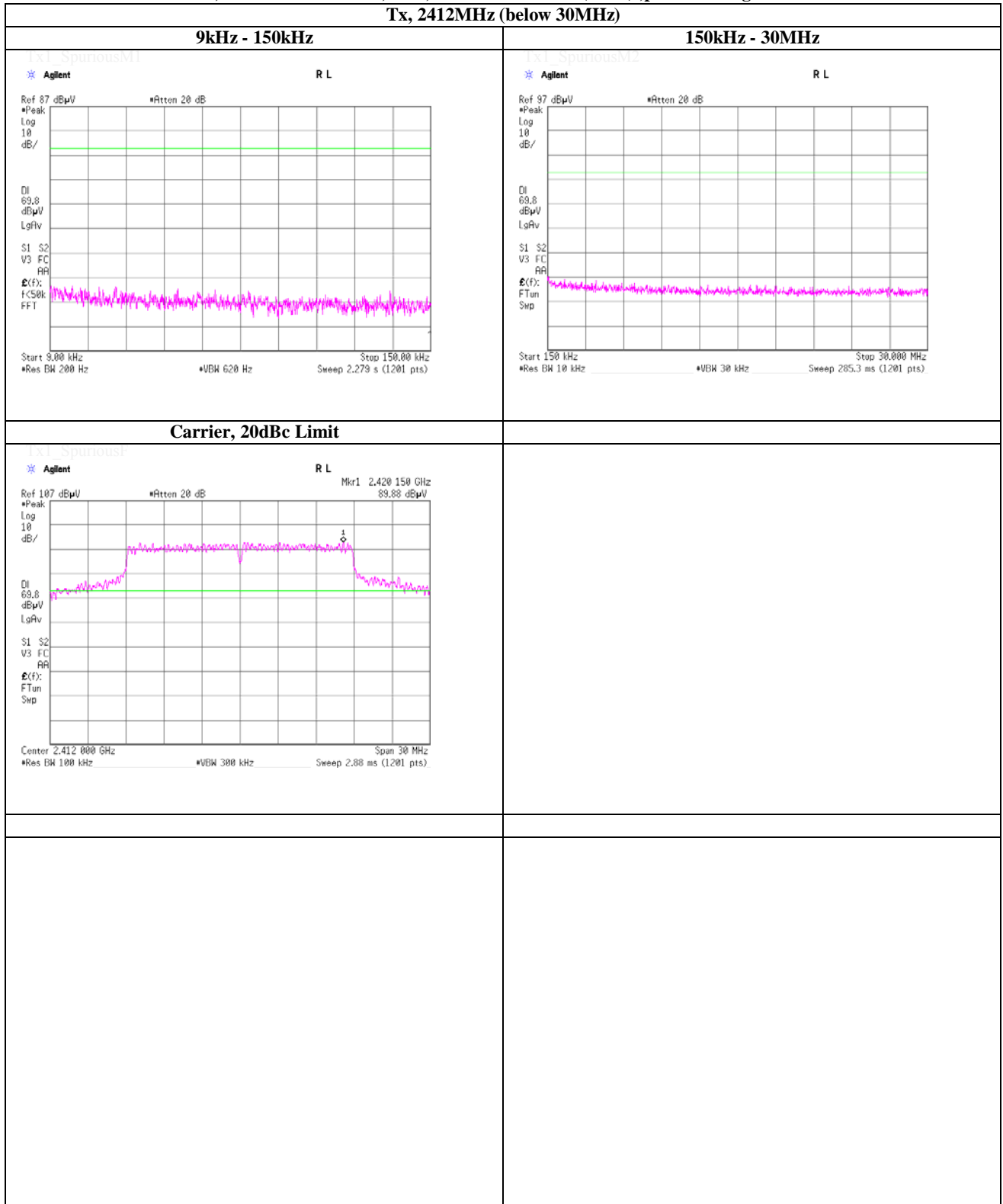
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11n-20HT, PN9, worst data mode 6(MCS) ,power setting 12dBm

Tx, 2412MHz (below 30MHz)



UL Japan, Inc.

Shonan EMC Lab.

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

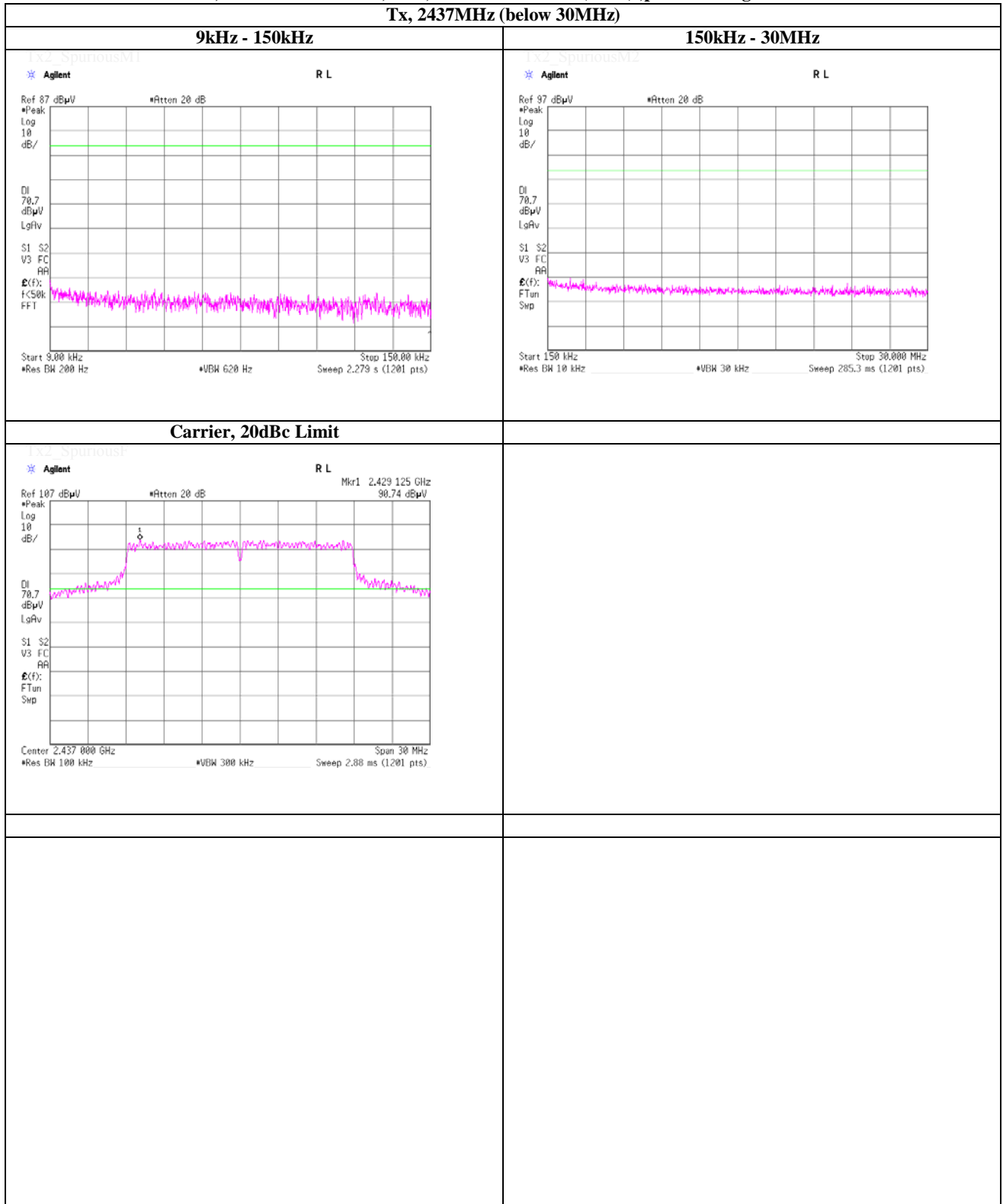
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11n-20HT, PN9, worst data mode 6(MCS) ,power setting 12dBm

Tx, 2437MHz (below 30MHz)



UL Japan, Inc.

Shonan EMC Lab.

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

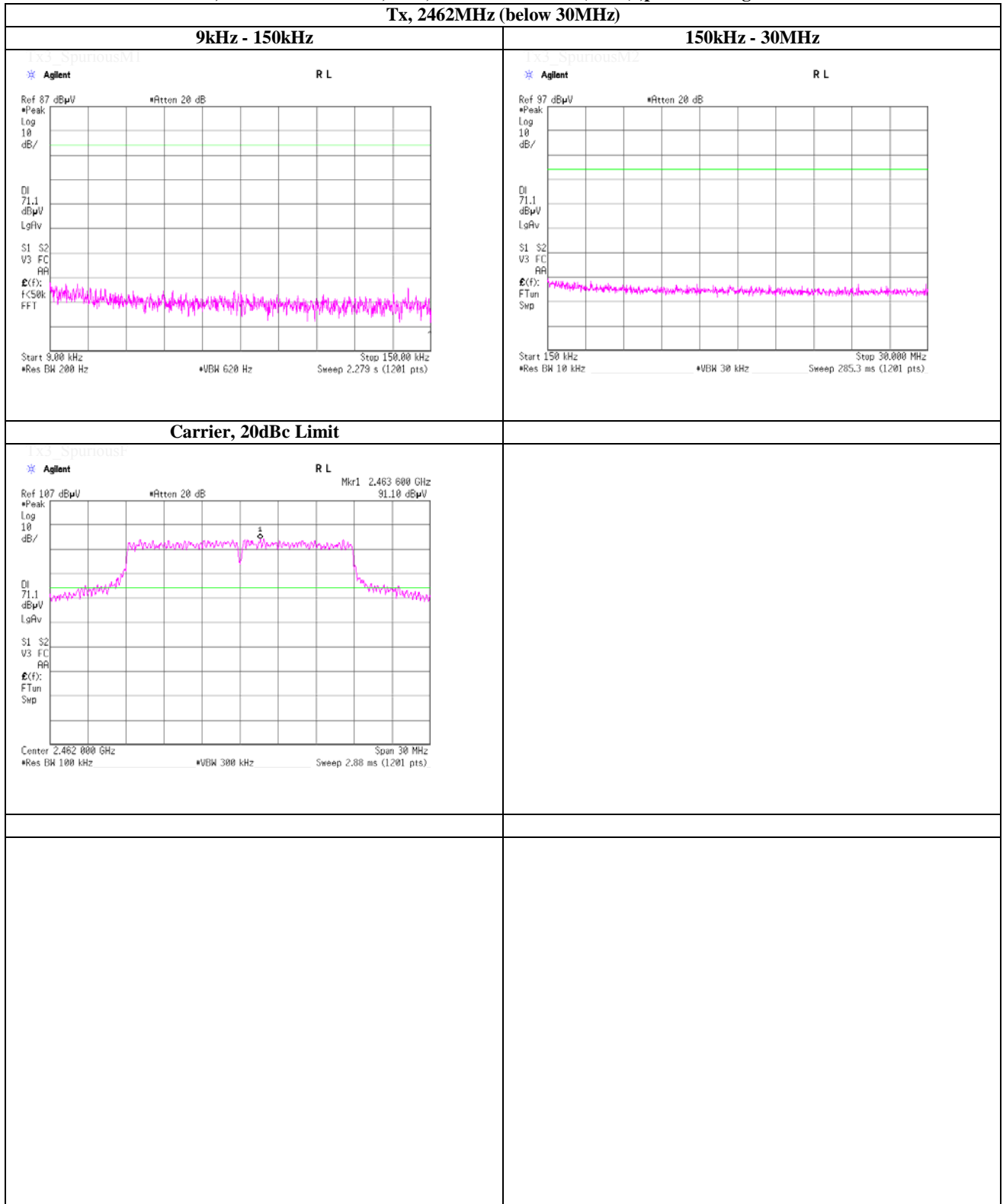
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11n-20HT, PN9, worst data mode 6(MCS) ,power setting 12dBm

Tx, 2462MHz (below 30MHz)



UL Japan, Inc.

Shonan EMC Lab.

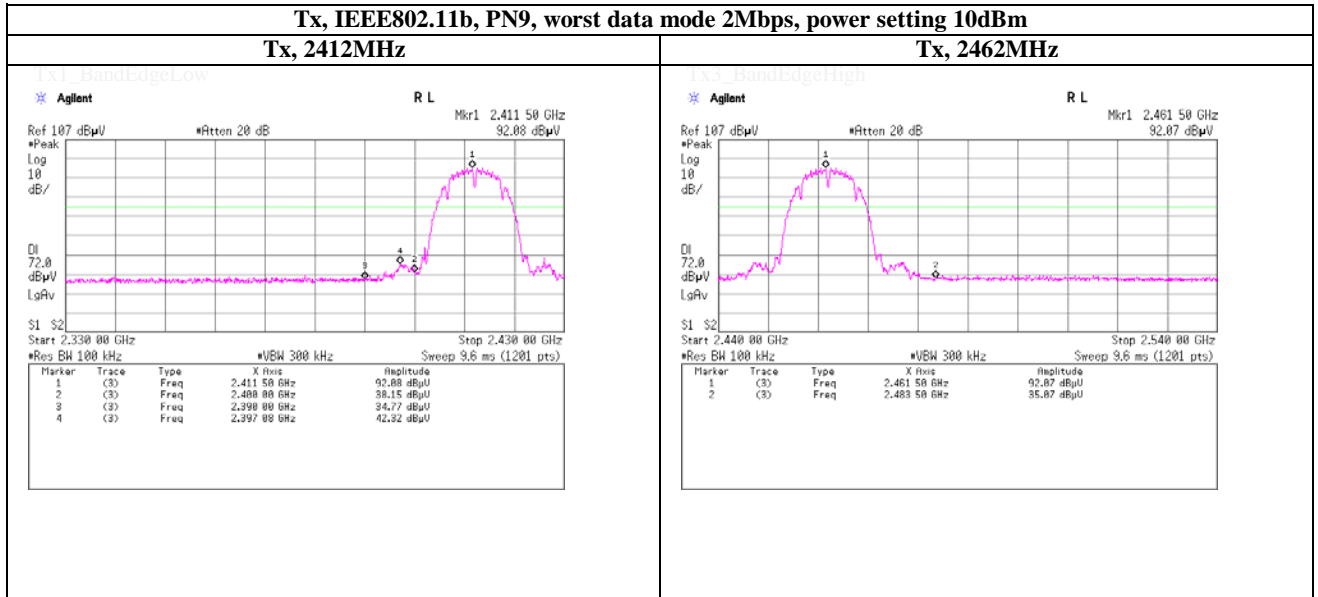
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Band Edge compliance



* At Spurious emission (Radiated) measuring, there are no emissions in out of band domain.

UL Japan, Inc.

Shonan EMC Lab.

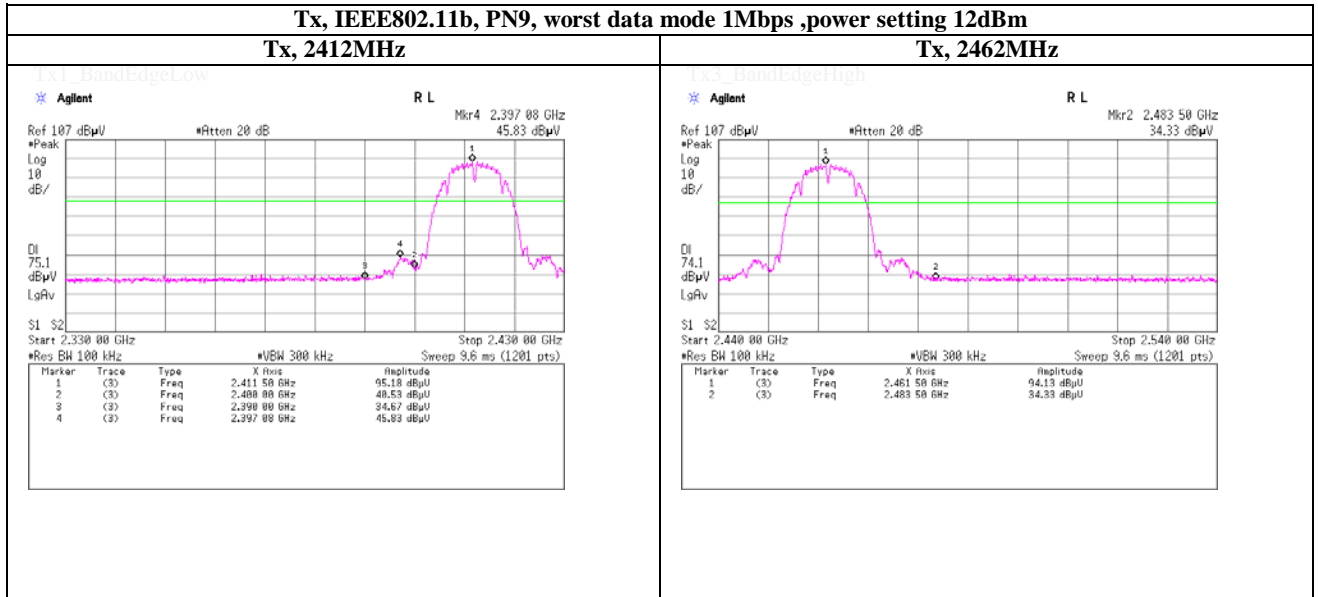
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Band Edge compliance



UL Japan, Inc.

Shonan EMC Lab.

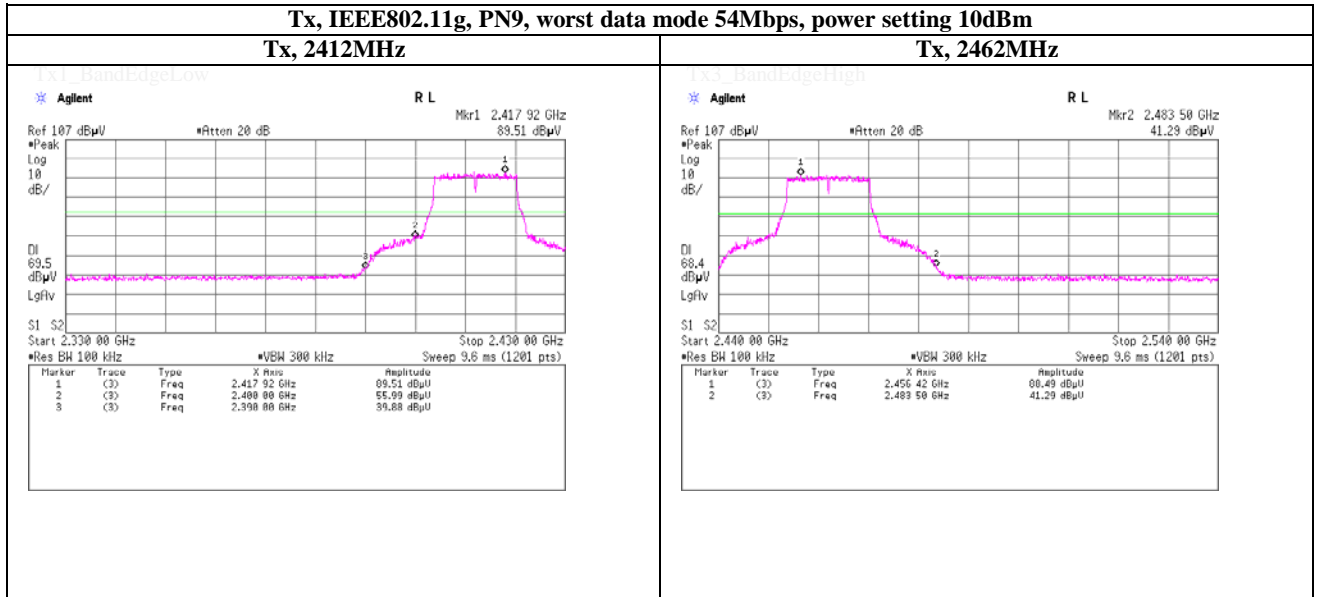
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

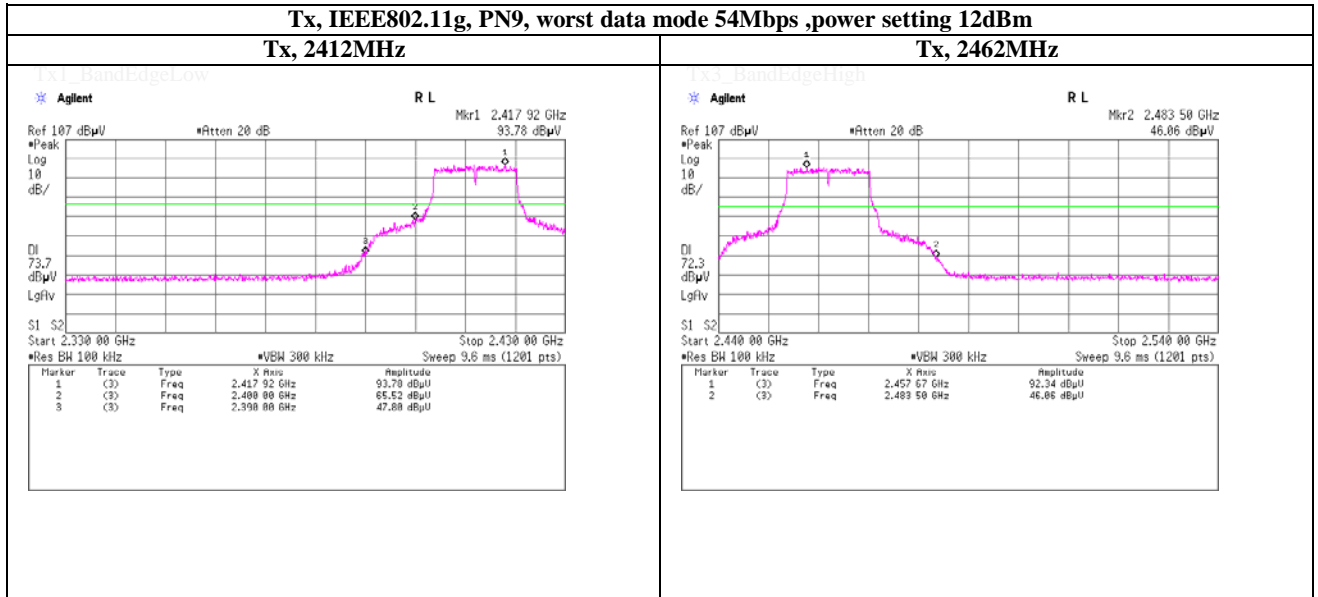
(Reference chart) Spurious emission (Conducted)

Band Edge compliance



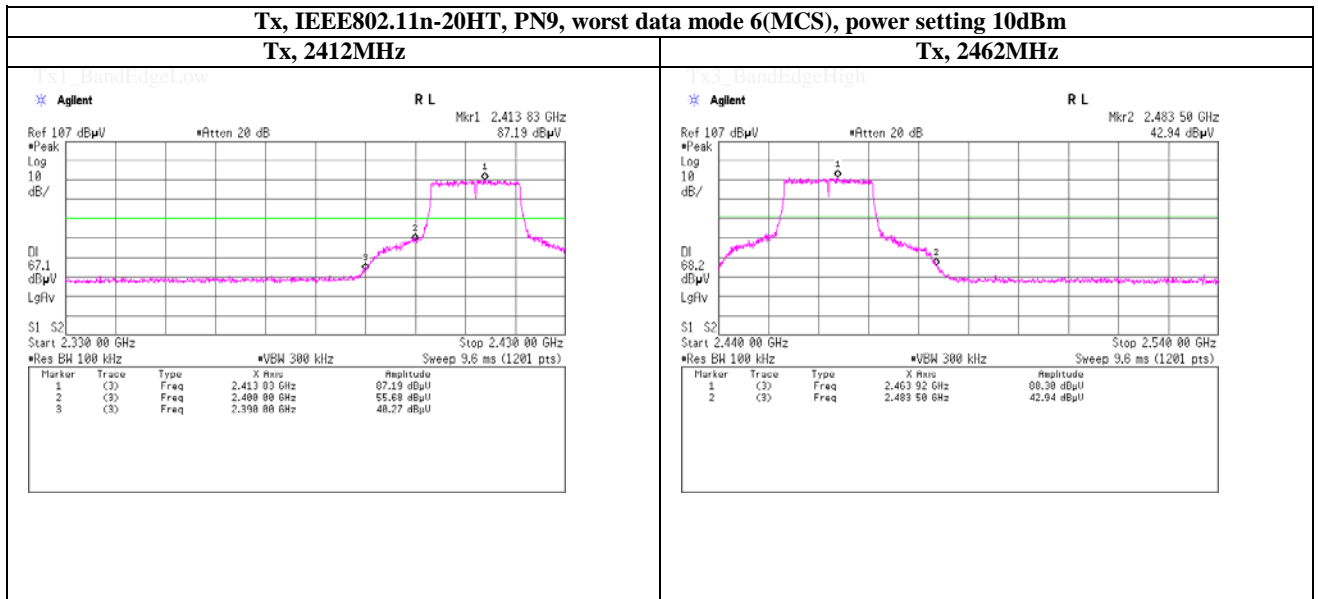
(Reference chart) Spurious emission (Conducted)

Band Edge compliance



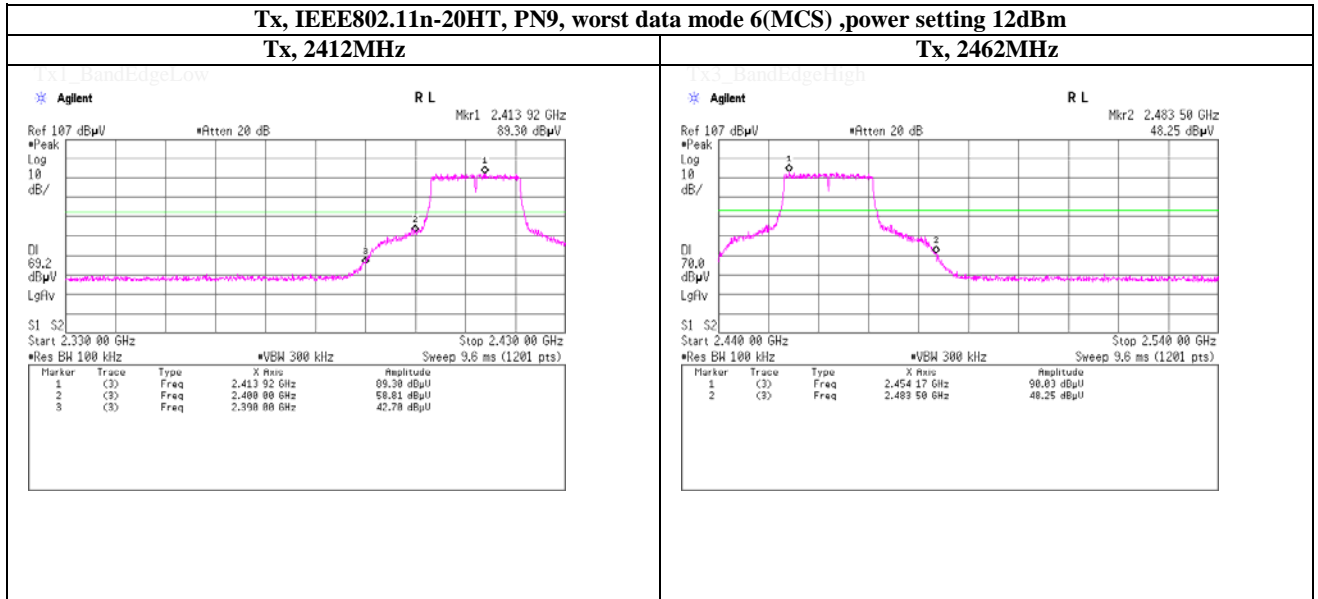
(Reference chart) Spurious emission (Conducted)

Band Edge compliance



(Reference chart) Spurious emission (Conducted)

Band Edge compliance



Maximum Power Spectral Density

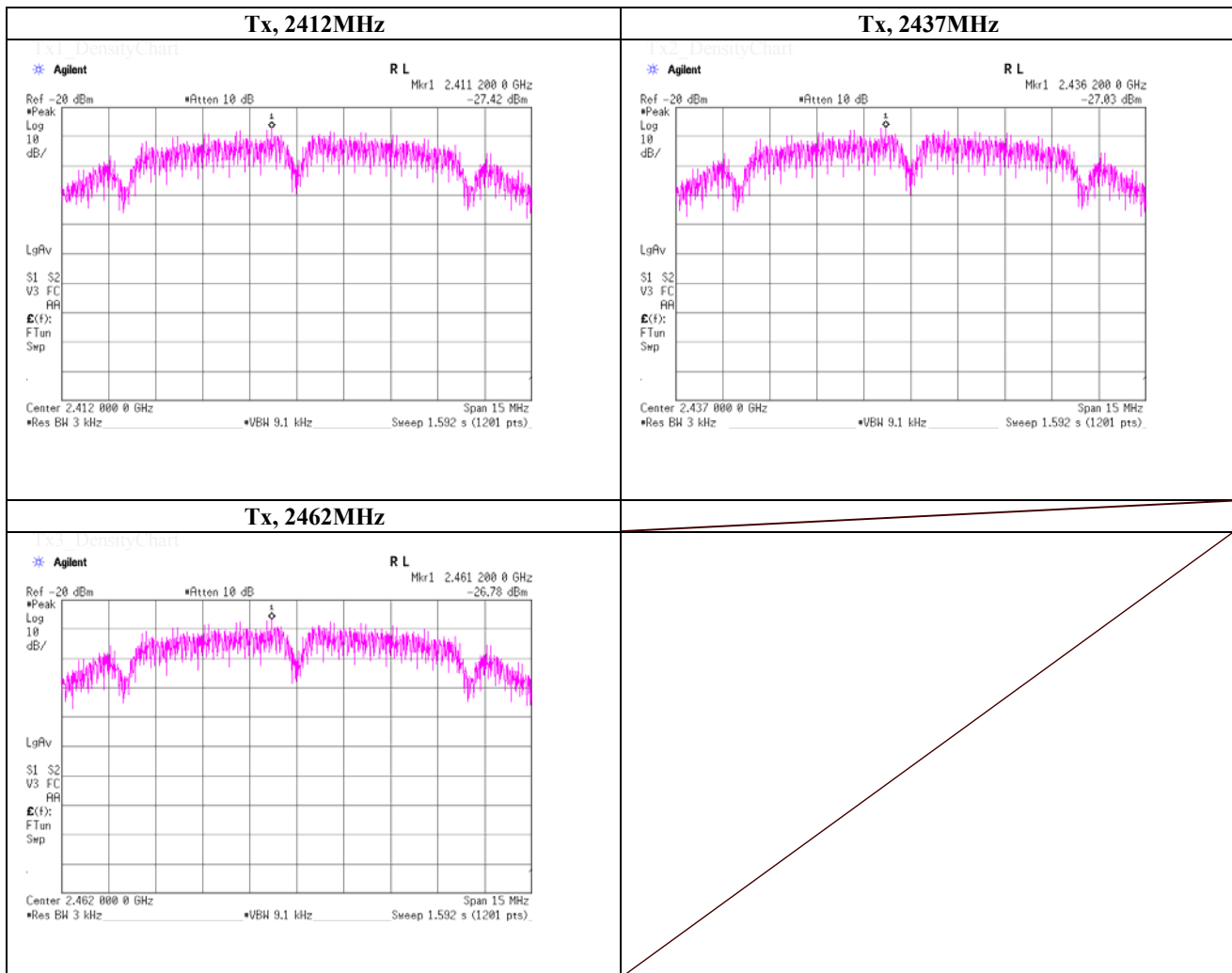
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 22, 2014	
Temperature / Humidity	26deg.C , 47%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11b, PN9, worst data mode 2Mbps, power setting 10dBm	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2411.20	-27.42	1.85	9.65	-15.92	8.00	23.92
2437.0000	2436.20	-27.03	1.86	9.66	-15.51	8.00	23.51
2462.0000	2461.20	-26.78	1.87	9.66	-15.25	8.00	23.25

Sample Calculation:

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



UL Japan, Inc.

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Maximum Power Spectral Density

(PKPSD)

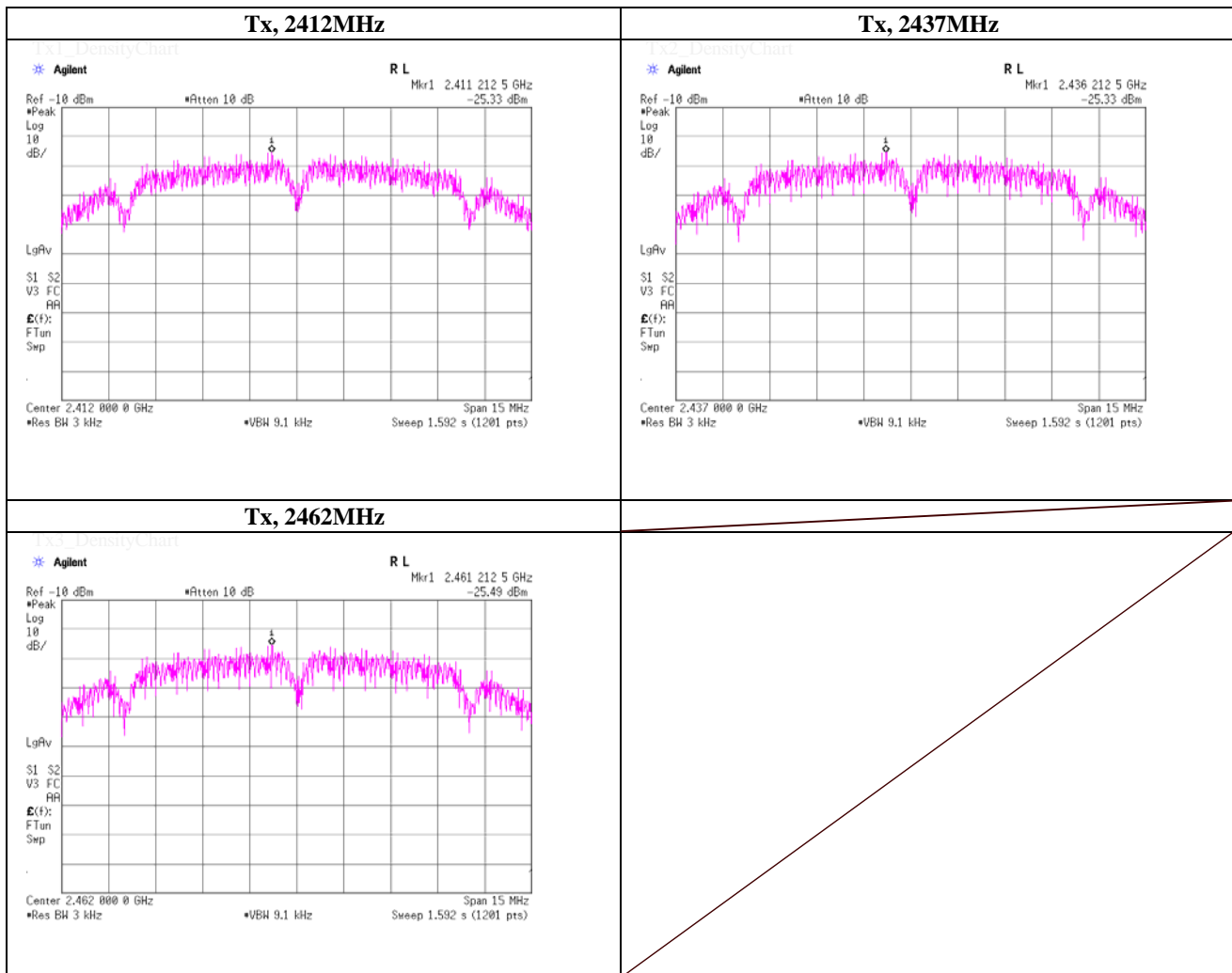
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	October 15, 2014	
Temperature / Humidity	26deg.C , 50%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11b, PN9, worst data mode 2Mbps ,power setting 12dBm	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2411.21	-25.33	1.54	9.90	-13.89	8.00	21.89
2437.0000	2436.21	-25.33	1.52	9.90	-13.91	8.00	21.91
2462.0000	2461.21	-25.49	1.52	9.90	-14.07	8.00	22.07

Sample Calculation:

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

The worst rate is selected considering the worst margin of Power Spectral Density



UL Japan, Inc.

Shonan EMC Lab.

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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

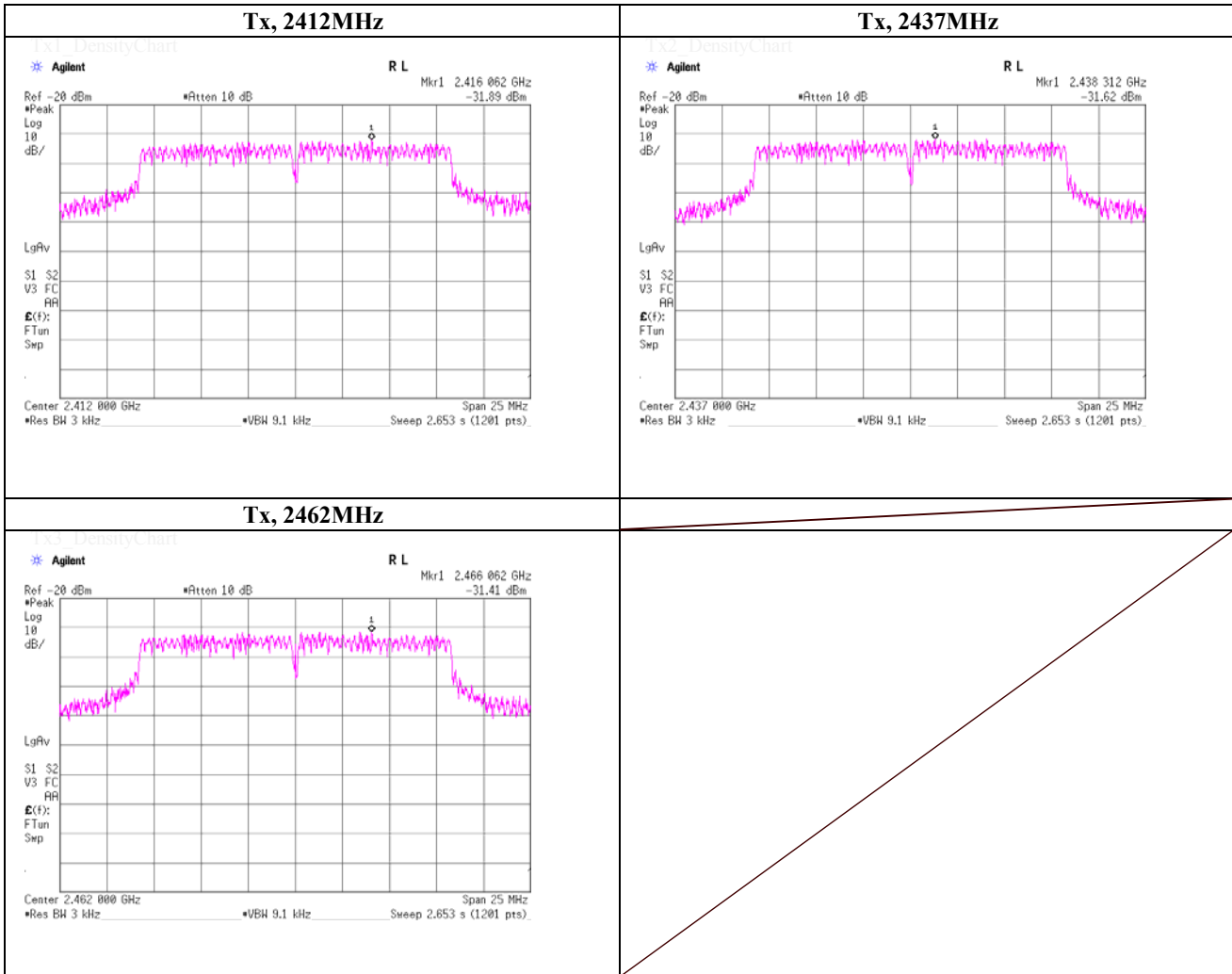
Maximum Power Spectral Density

(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 22, 2014	
Temperature / Humidity	26deg.C , 47%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11g, PN9, worst data mode 48Mbps, power setting 10dBm	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2416.06	-31.89	1.85	9.65	-20.39	8.00	28.39
2437.0000	2438.31	-31.62	1.86	9.66	-20.10	8.00	28.10
2462.0000	2466.06	-31.41	1.87	9.66	-19.88	8.00	27.88

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



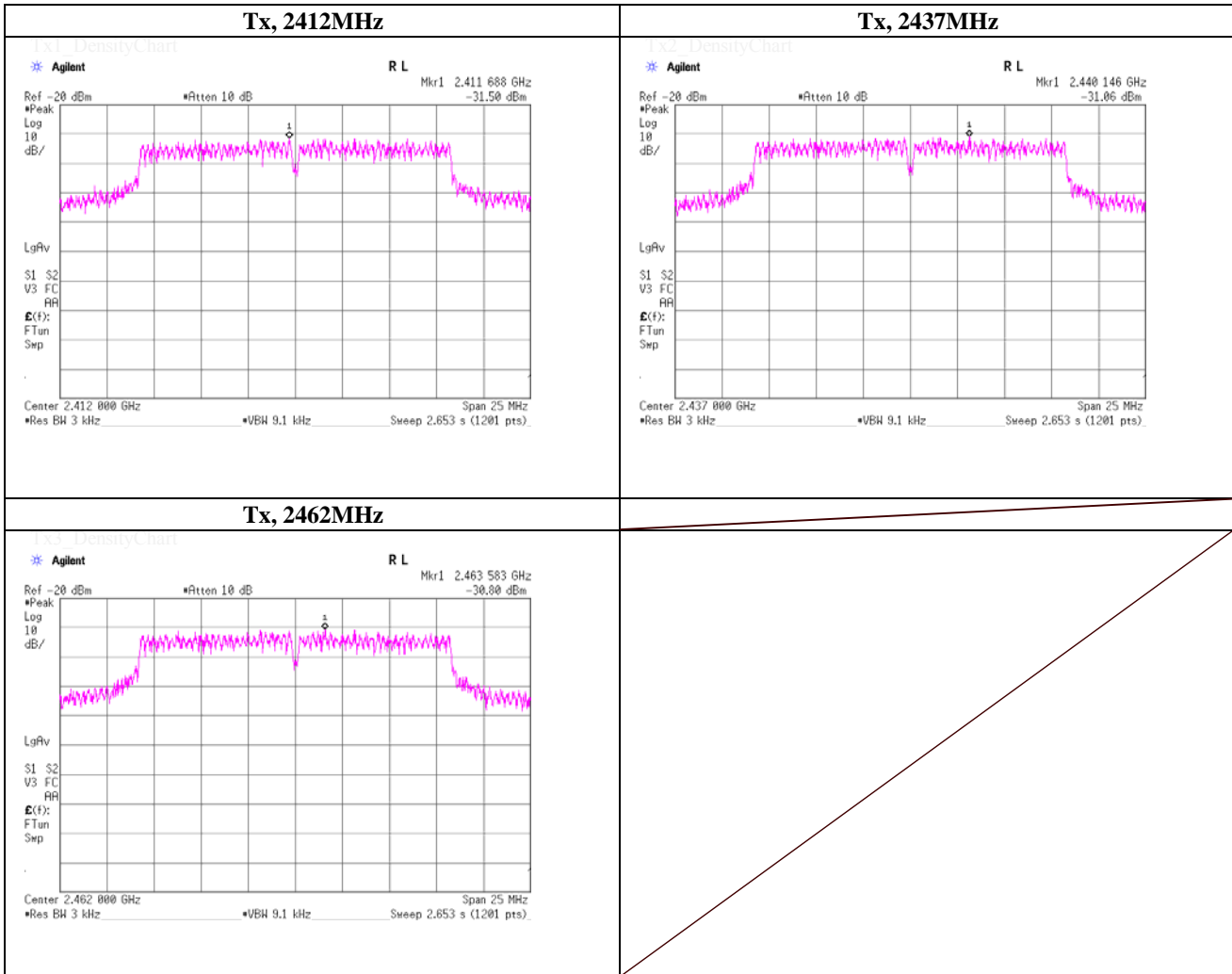
Maximum Power Spectral Density

(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 21, 2014	
Temperature / Humidity	26deg.C , 57%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11g, PN9, worst data mode 54Mbps ,power setting 12dBm	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2411.69	-31.50	1.85	9.65	-20.00	8.00	28.00
2437.0000	2440.15	-31.06	1.86	9.66	-19.54	8.00	27.54
2462.0000	2463.58	-30.80	1.87	9.66	-19.27	8.00	27.27

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



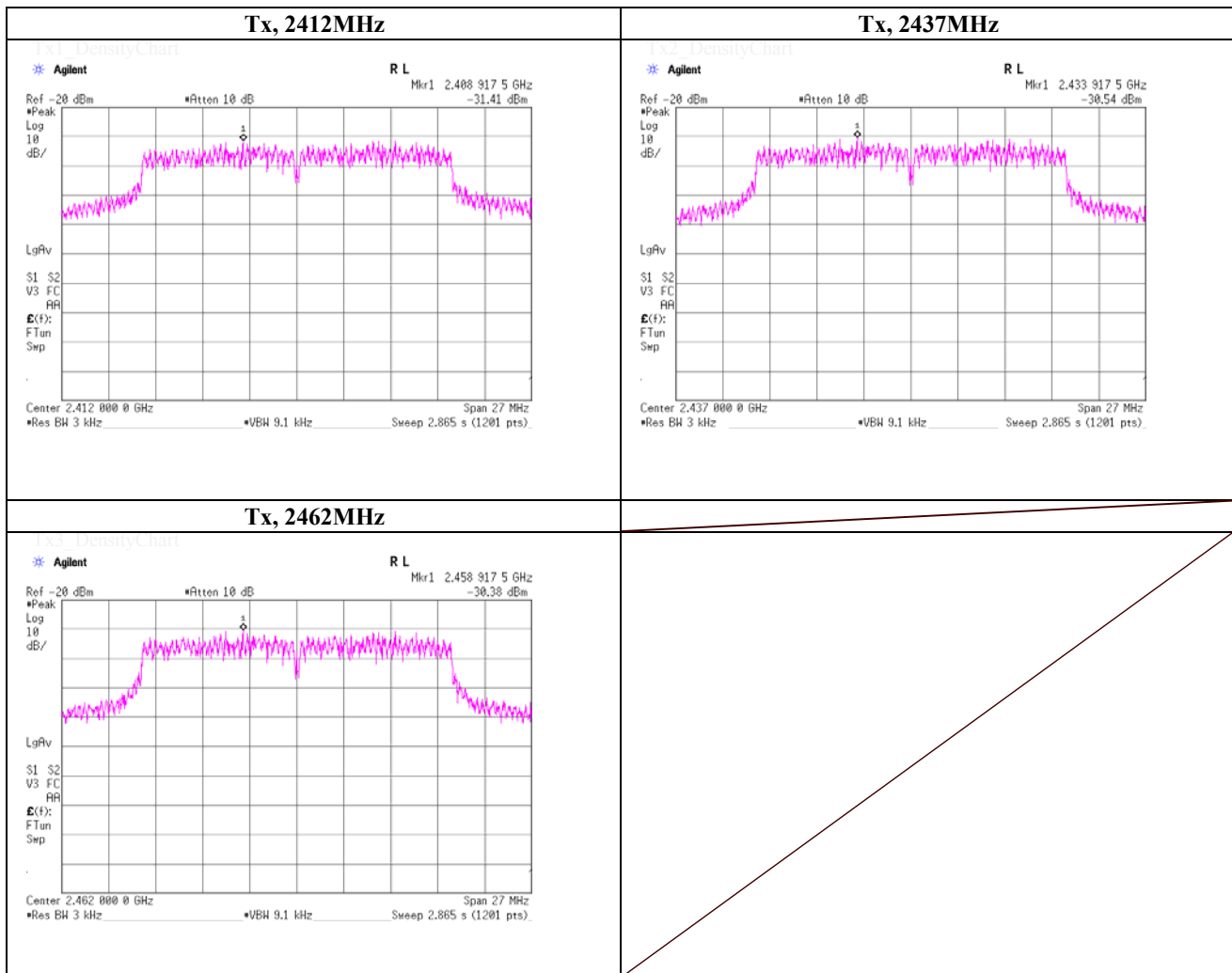
Maximum Power Spectral Density

(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 22, 2014	
Temperature / Humidity	26deg.C , 47%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11n-20HT, PN9, worst data mode 6(MCS), power setting 10dBm	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2408.92	-31.41	1.85	9.65	-19.91	8.00	27.91
2437.0000	2433.92	-30.54	1.86	9.66	-19.02	8.00	27.02
2462.0000	2458.92	-30.38	1.87	9.66	-18.85	8.00	26.85

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



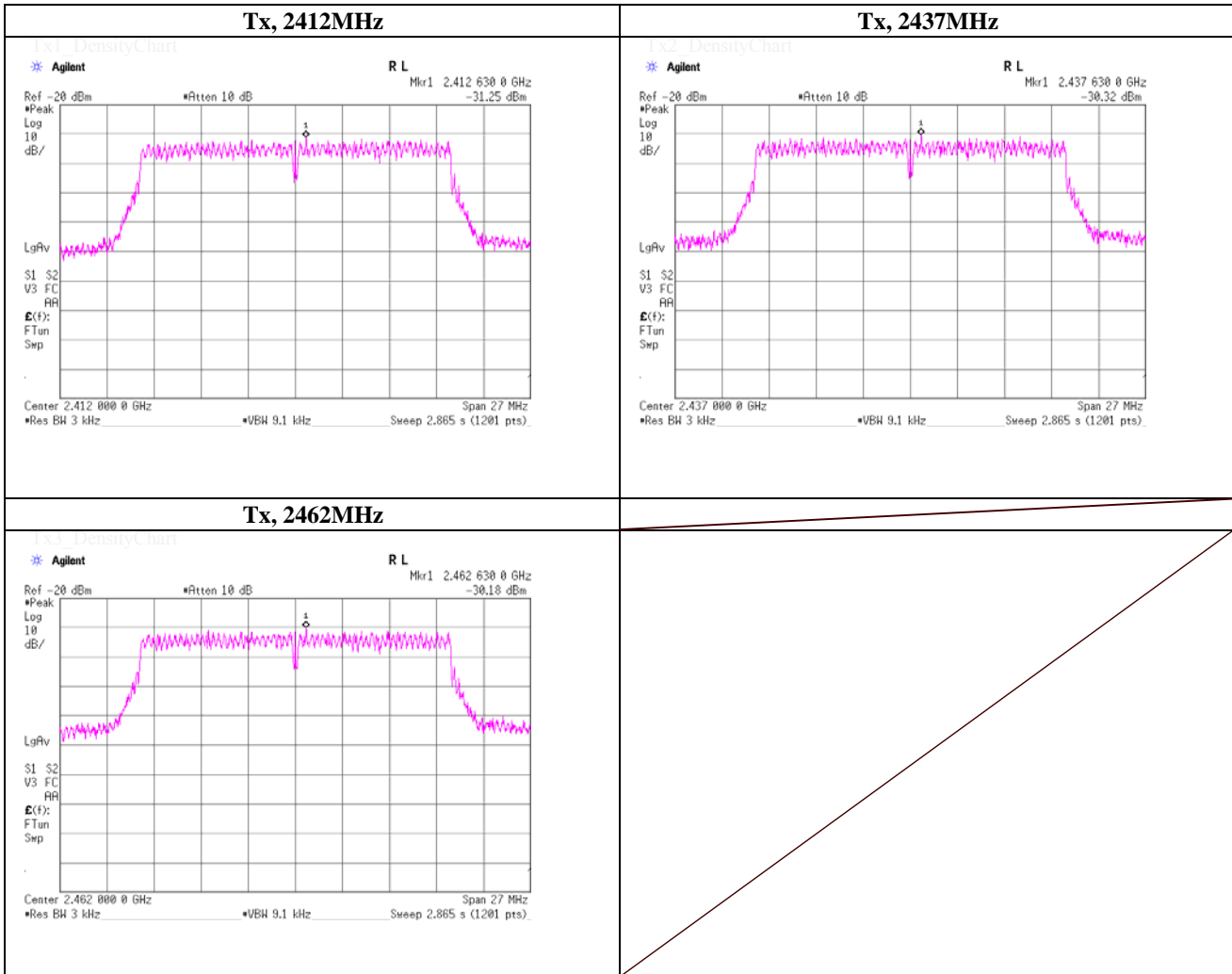
Maximum Power Spectral Density

(PKPSD)

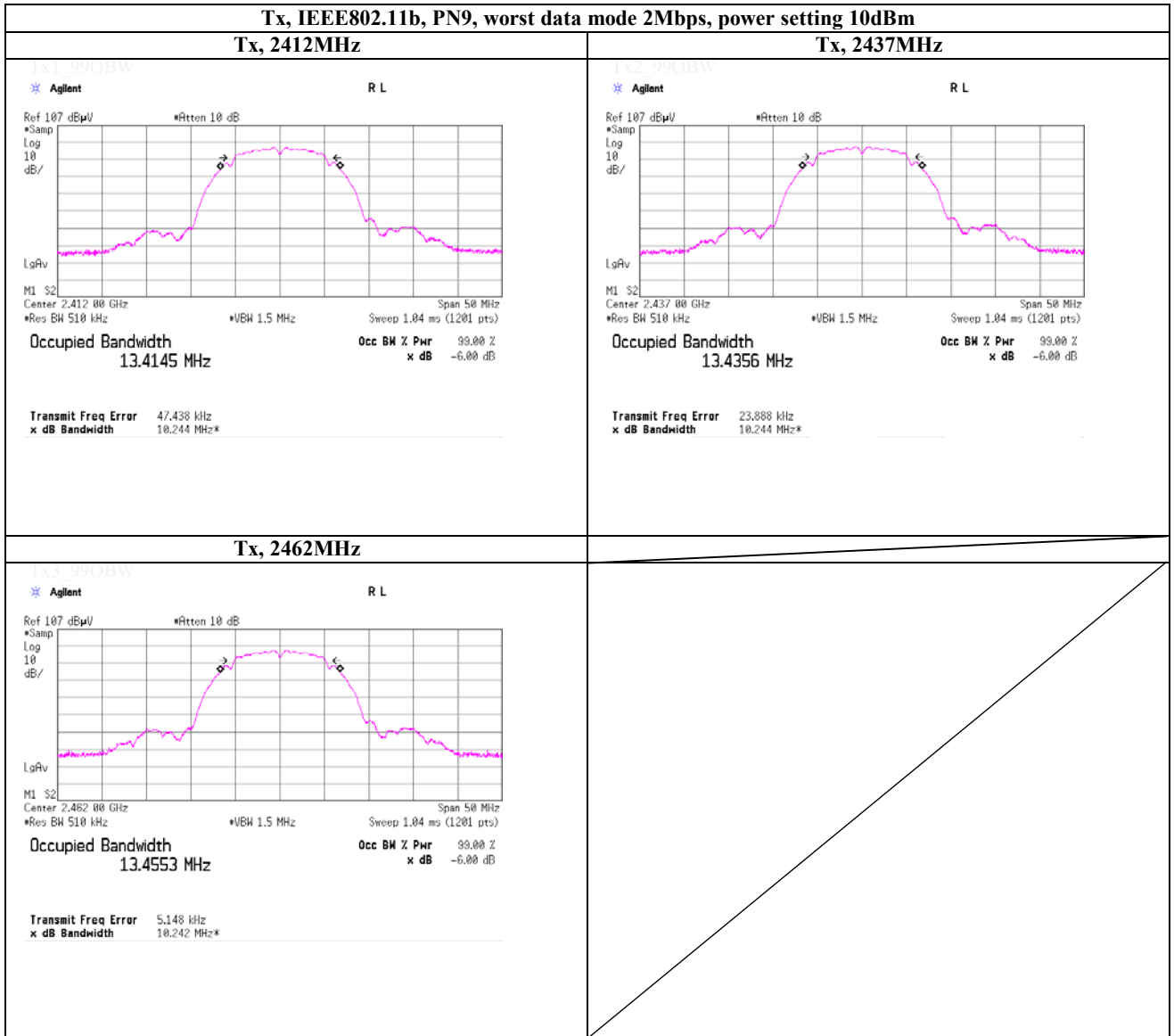
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 21, 2014	
Temperature / Humidity	26deg.C , 57%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11n-20HT, PN9, worst data mode 6(MCS) ,power setting 12dBm	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2412.63	-31.25	1.85	9.65	-19.75	8.00	27.75
2437.0000	2437.63	-30.32	1.86	9.66	-18.80	8.00	26.80
2462.0000	2462.63	-30.18	1.87	9.66	-18.65	8.00	26.65

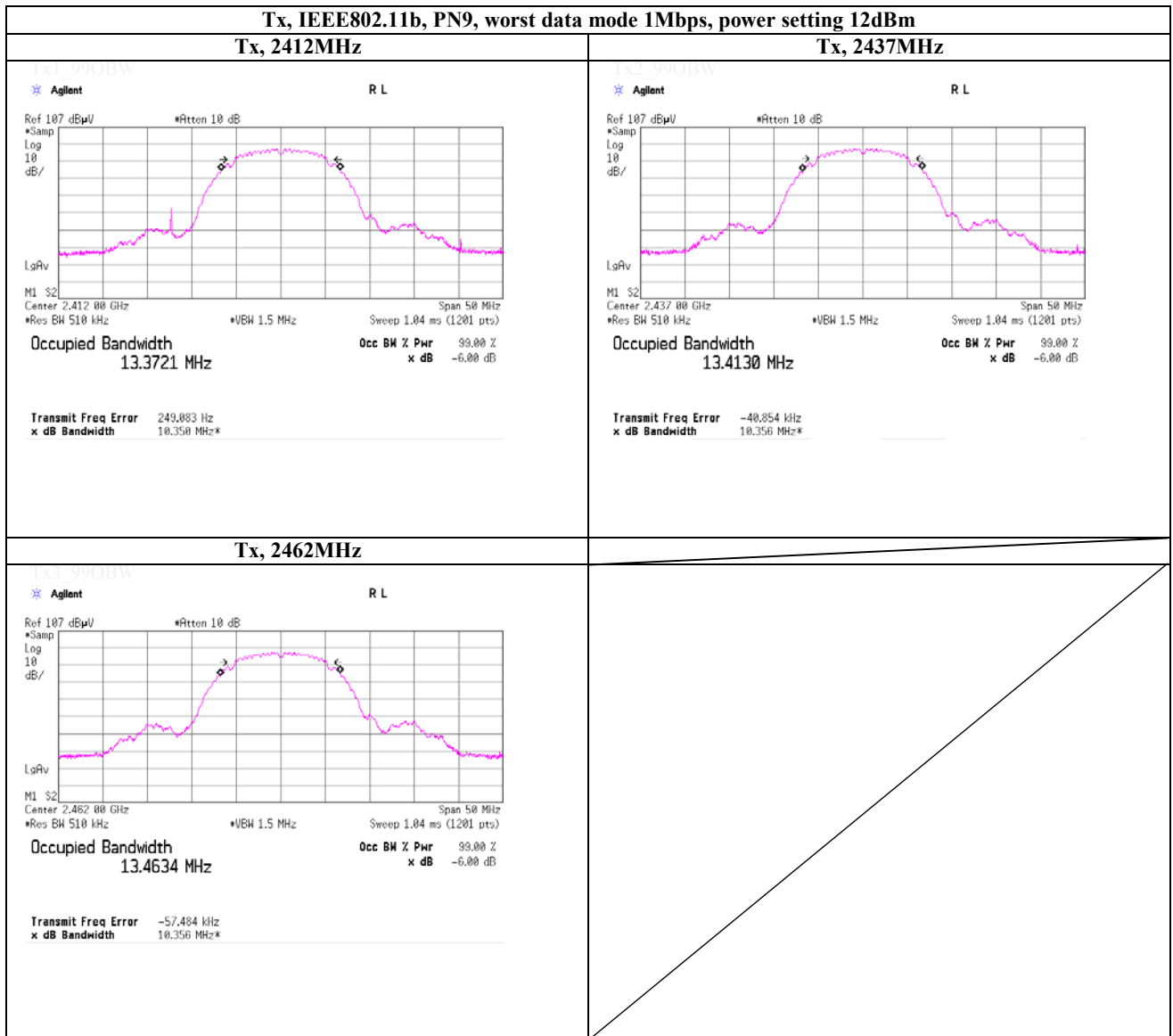
Sample Calculation:
 Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss



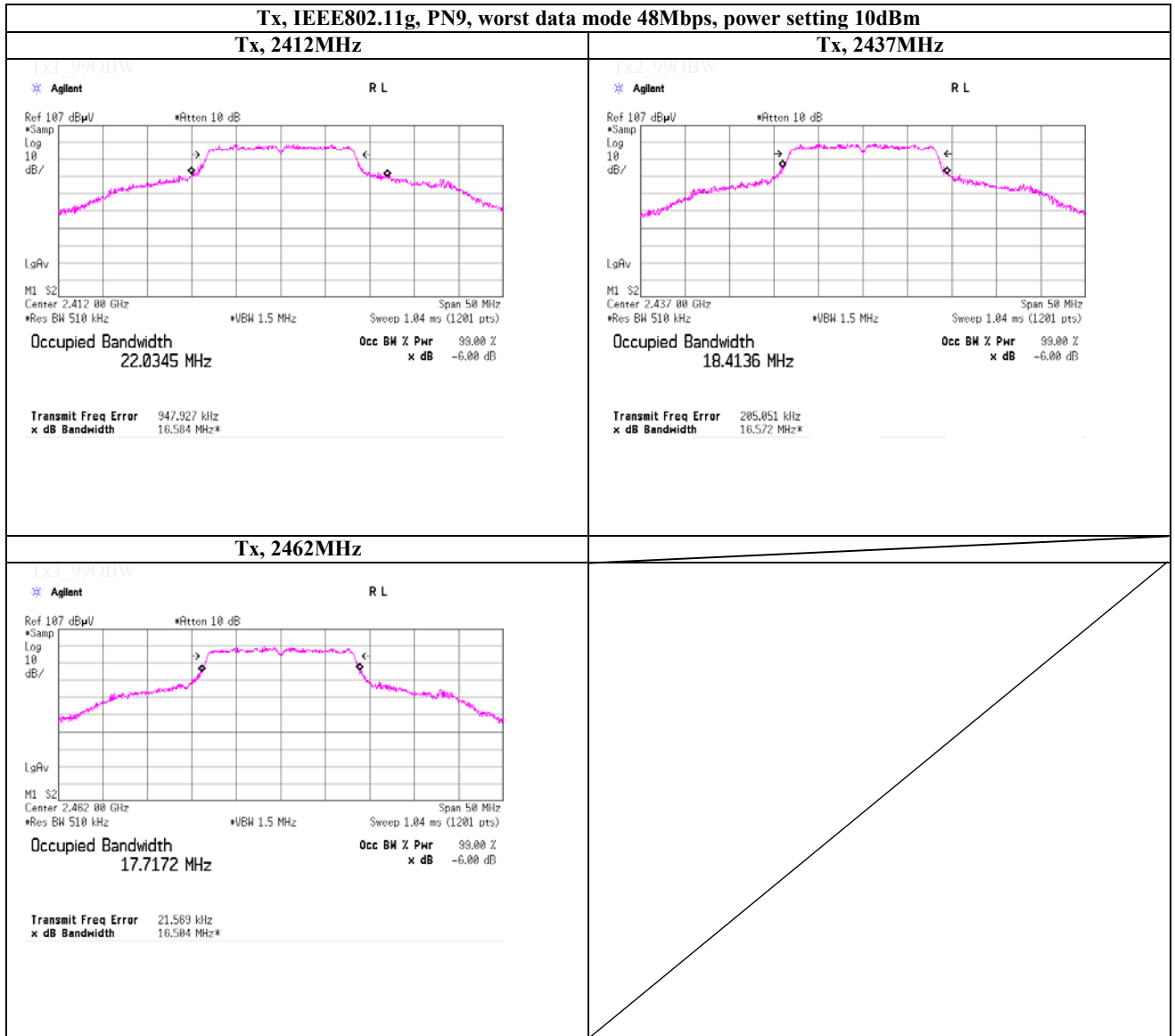
99% Occupied Bandwidth



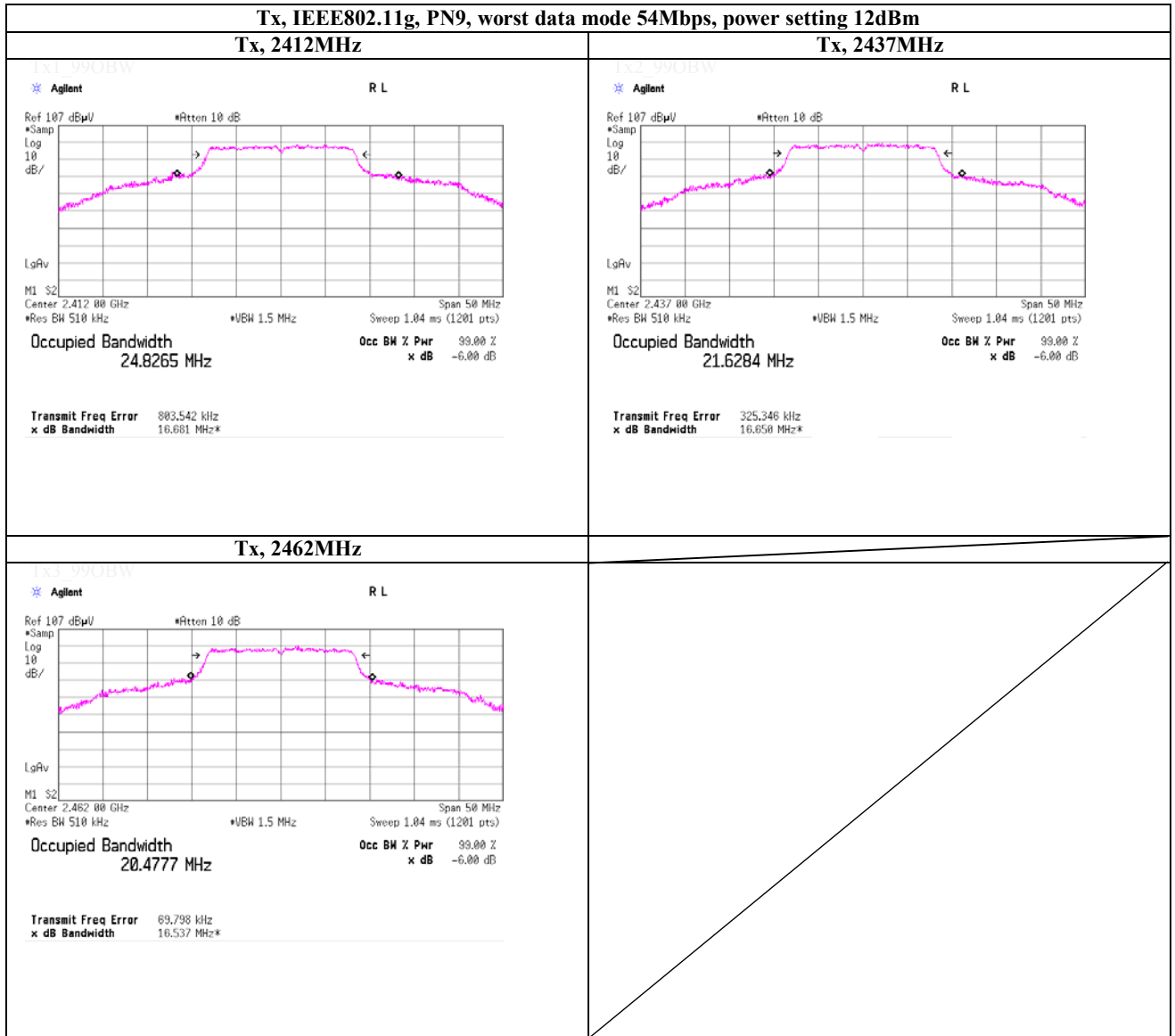
99% Occupied Bandwidth



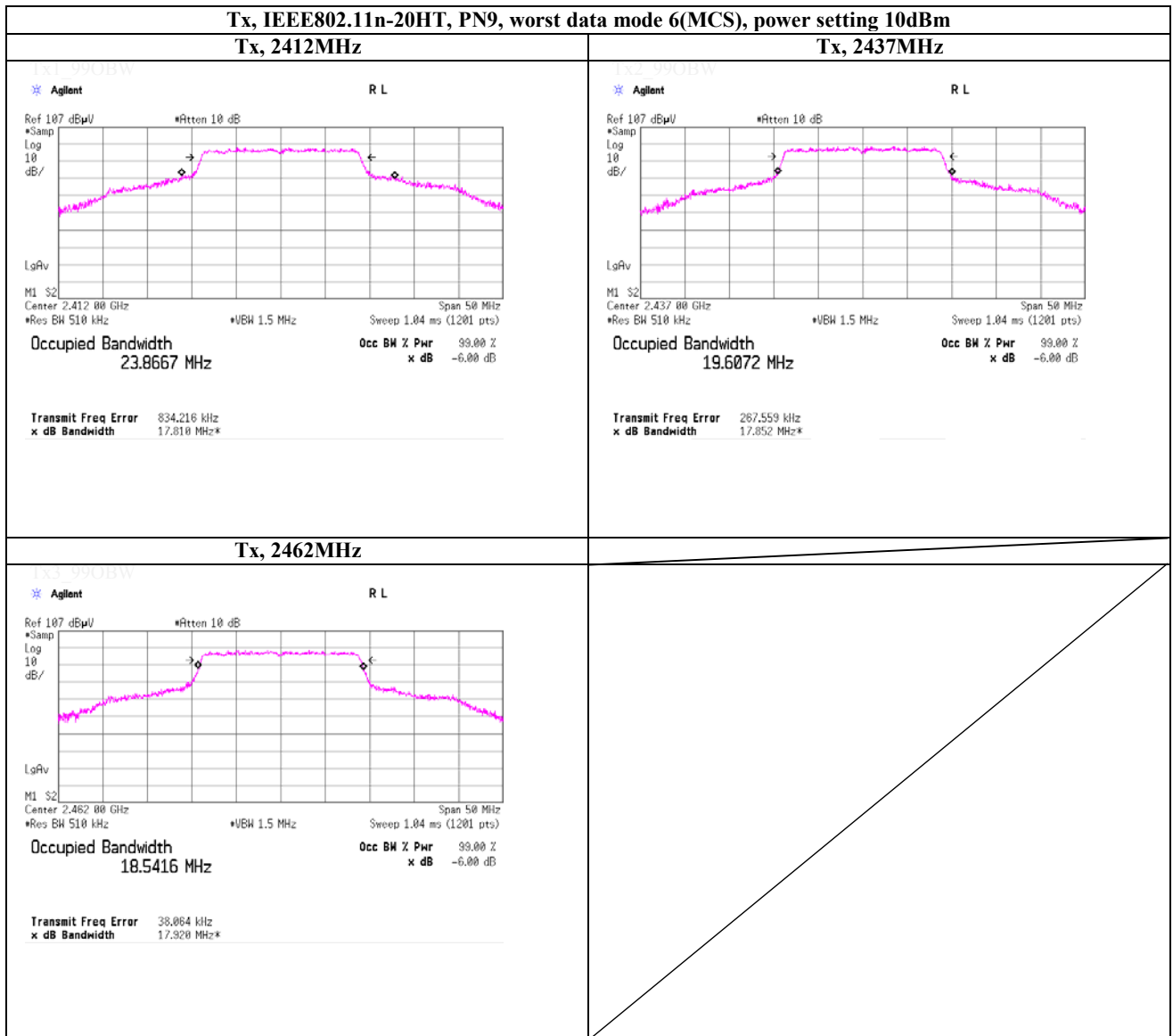
99% Occupied Bandwidth



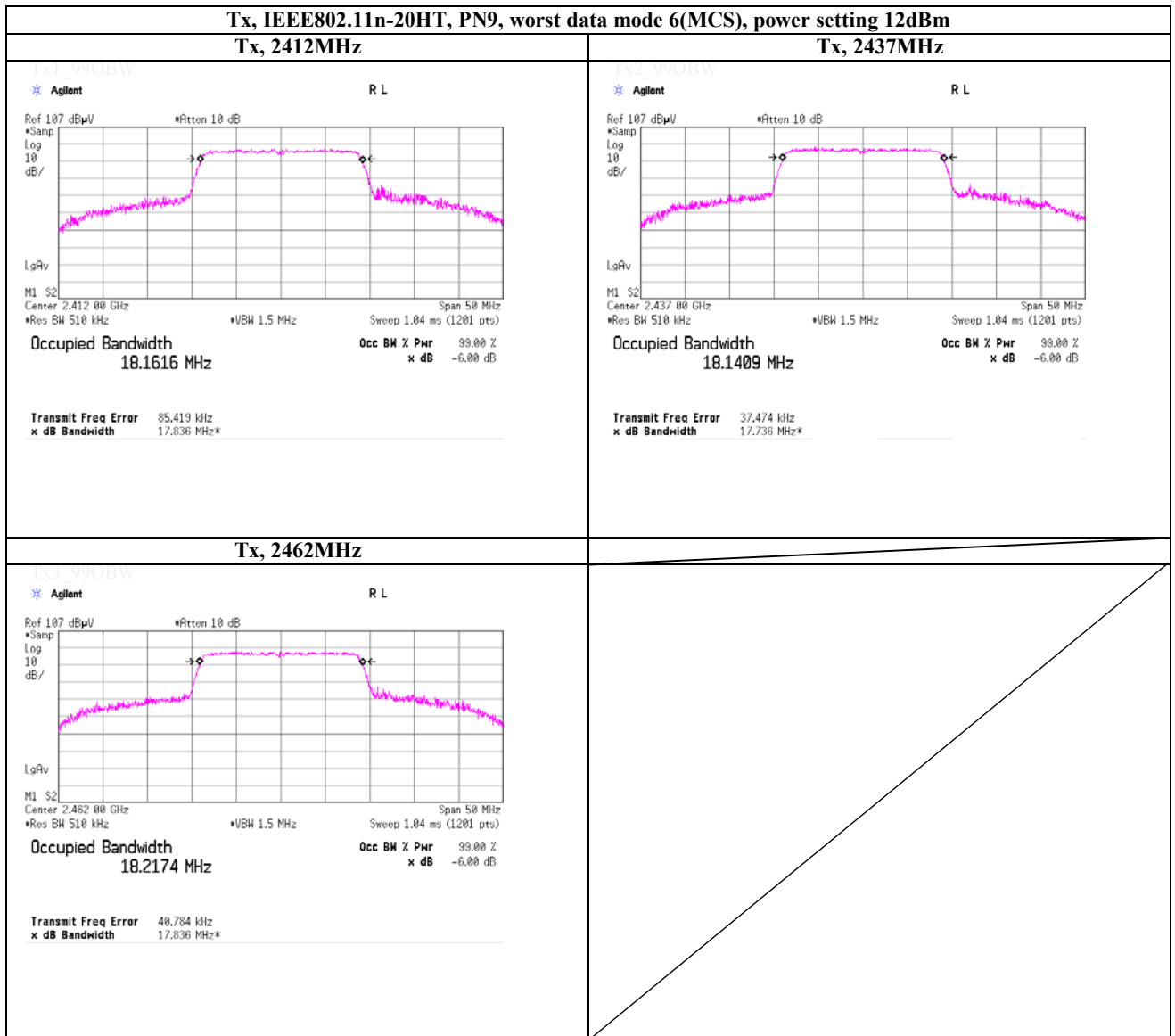
99% Occupied Bandwidth



99% Occupied Bandwidth



99% Occupied Bandwidth



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	2014/03/04 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	AT	2014/03/13 * 12
SAT10-09	Attenuator	Weinschel Corp.	54A-10	W5692	AT	2013/11/27 * 12
SPM-07	Power Meter	Agilent	8990B	MY5100272	AT	2014/04/04 * 12
SPSS-04	Power sensor	Agilent	N1923A	MY5326009	AT	2014/04/04 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2014/03/07 * 12
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2014/07/08 * 12
SAF-05	Pre Amplifier	TOYO Corporation	TPA0118-36	1440490	RE	2013/11/22 * 12
SCC-G02	Coaxial Cable	Suhner	SUCOFLEX 104A	46498/4A	RE	2014/04/22 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2014/05/15 * 12
SHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	RE	2014/08/12 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2014/02/21 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2014/03/17 * 12
SJM-14	Measure	ASKUL	-	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RF,MF)	-	RE,CE	-
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2013/11/22 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2013/11/22 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	AT	2014/03/17 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2014/03/15 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2014/03/14 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2014/03/13 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE	2013/11/20 * 12
SFL-03	Highpass Filter	MICRO-TRONICS	HPM50112	028	RE	2013/11/22 * 12
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2013/11/22 * 12
SFL-18	Highpass Filter	MICRO-TRONICS	HPM50111	119	RE	2014/04/22 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	RE	2014/02/03 * 12
SCC-C9/C10/SRSE-03	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/N S4906	-/0901-271(RF Selector)	CE	2014/04/25 * 12
SLS-05	LISN	Rohde & Schwarz	ENV216	100516	CE	2014/02/26 * 12
SAT3-05	Attenuator	JFW	50HF-003N	-	CE	2014/02/17 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2014/03/07 * 12
STM-05	Terminator	TME	CT-01 BP	-	CE	2013/12/26 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	CE	2014/03/04 * 12
SJM-15	Measure	ASKUL	-	-	CE	-

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

All equipment is calibrated with valid calibrations . Each measurement data is traceable to the national or international standards .

Test Item :

- CE: Conducted emission ,
- RE: Radiated emission ,
- AT: Antenna terminal disturbance voltage

APPENDIX 2
Test Instruments (Date of test: May 29, 2015)

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2015/02/24 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	AT	2015/03/11 * 12
SAT10-09	Attenuator	Weinschel Corp.	54A-10	W5692	AT	2014/11/21 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2014/12/24 * 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 :

AT: Antenna terminal conducted test