



RADIO TEST REPORT

Test Report No.: 10004229S-A-R1

Applicant : OLYMPUS IMAGING CORP.

Type of Equipment : Wireless LAN Module

Model No. : S044WIFI-PCA

FCC ID : YSKWP5

Test regulation : FCC Part15 Subpart C: 2012

Test result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
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6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
7. This report is a revised version of 10004229S-A. 10004229S-A is replaced with this report.

Date of test: March 11 to April 26, 2013

Tested by:

Tatsuya Arai

Engineer of WiSE Japan,
UL Verification Service

Approved by :

Toyokazu Imamura

Leader of WiSE Japan,
UL Verification Service



- ☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
- ☒ There is no testing item of "Non-accreditation".

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13-EM-F0429

Original Test Report No.: 10004229S-A

[illegible]

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SECTION 1: Customer information

Applicant Name : OLYMPUS IMAGING CORP.
Contact Person : Hiroyuki Kaneko
Company Name : OLYMPUS CORPORATION
Address : 2951, Ishikawa-machi, Hachioji-shi, Tokyo 192-8507, Japan
Telephone Number : +81-42-642-2283
Facsimile Number : +81-42-642-2398

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

Type of Equipment : Wireless LAN Module
Model Number : S044WIFI-PCA
Serial Number : Refer to 4.2.
Rating : DC3.20V for Radio Frequency Block
DC3.15V for logic control of I/O (SDIO)
Country of Mass-production : China
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample : March 11, 2013
Modification of EUT : No modification by the test lab.

2.2 Product description

Model: S044WIFI-PCA (referred to as the EUT in this report) is a Wireless LAN Module.

Clock frequency(ies) in the system : 26MHz

<Radio part>

Equipment type : Transceiver
Frequency of operation : 2412-2462MHz
Bandwidth : 20MHz
Channel spacing : 5MHz
Type of modulation : DSSS (IEEE 802.11b), OFDM (IEEE 802.11g/n)
Antenna type : $\lambda/4$ Monopole Antenna
Antenna connector type : None
Antenna gain : -1.4dBi
ITU code : G1D, D1D
Operation temperature range : -20 to +80 deg.C

FCC 15.31 (e) / 212

The module is constantly provided the stable voltage from the host device regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC 15.203 / 212

It is impossible for end users to replace the antenna, because it is soldered on the circuit board. Therefore the equipment complies with the requirement.

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SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2012, final revised on December 27, 2012 and effective January 28, 2013
 Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
 Section 15.207 Conducted limits
 Section 15.209 Radiated emission limits, general requirements
 Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz,
 and 5725-5850MHz

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	16.9dB Freq.: 11.51826MHz Detector: Average Phase: N Mode: Tx 2412MHz, IEEE 802.11g	Complied
6dB bandwidth	ANSI C63.10:2009	FCC 15.247 (a)(2)	Conducted	N/A	* See data	Complied
Maximum peak 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 15.109, 15.247 (d) & 15.209	Conducted / Radiated	N/A	7.3dB Freq.: 624.002MHz Detector: Quasi-Peak Polarization: Horizontal Mode: Tx 2412MHz, IEEE 802.11g	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 (FCC), "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied bandwidth (99%)	ANSI C63.10:2009, RSS-Gen 4.6.1	-	Conducted	-	-

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

* Other than above, no addition, exclusion nor deviation has been made from the standard.

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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	4.9 dB	5.1 dB	4.9 dB
	300MHz-1GHz	5.0 dB	5.2 dB	4.9 dB
	1GHz-15GHz	4.8 dB	4.8 dB	4.9 dB
Radiated emission (Measurement distance: 1m)	1GHz-18GHz	5.6 dB	5.6 dB	5.6 dB
	18GHz-40GHz	4.6 dB	4.3 dB	4.4 dB

*1: SAC=Semi-Anechoic Chamber

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

Conducted emission test

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

Radiated emission test

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

Antenna port conducted test

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

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

Spurious emission (Conducted) measurement (1G-3GHz) uncertainty for this test was: (±) 2.3dB

Spurious emission (Conducted) measurement (3G-18GHz) uncertainty for this test was: (±) 3.0dB

Spurious emission (Conducted) measurement (18G-26.5GHz) uncertainty for this test was: (±) 2.9dB

Bandwidth measurement uncertainty for this test was: (±) 5.4%

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3.5 Test location

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JAB Accreditation No. : RTL02610

	FCC Registration No.	IC Registration No.	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
<input type="checkbox"/> No.1 semi-anechoic chamber	697847	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
<input checked="" type="checkbox"/> No.2 semi-anechoic chamber	697847	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
<input checked="" type="checkbox"/> No.3 semi-anechoic chamber	697847	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
<input type="checkbox"/> No.4 semi-anechoic chamber	-	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
<input checked="" 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 type="checkbox"/> No.5 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
<input checked="" type="checkbox"/> No.6 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-

3.6 Test setup, Test data & Test instruments

Refer to APPENDIX 1 to 3.

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

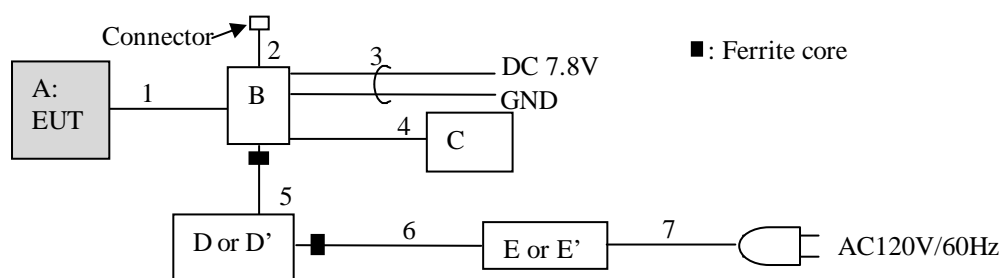
4.1 Operating mode

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

*1) Software used for the test: S0044 RF test Firmware
 *2) The worst condition was determined based on the test result of Maximum Peak Output Power.
 *3) Test operating mode was determined as follows according to "Section 1 of 6 802.11 a/b/g/n testing- Managing Complex Regulatory Approvals - "of TCB Council Workshop October 2009.

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

4.2 Configuration and peripherals



* Test data was taken under worse case conditions.

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Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless LAN Module	S044WIFI-PCA	*1)	OLYMPUS	EUT
B	Jig	CMKW-PB2	2	OLYMPUS	-
C	Jig	S044REAR-PCB	1	OLYMPUS	-
D	Laptop	CF-T2FW1AXS	5CKSA03932	Panasonic	*2)
D'	Laptop	PC-LL7001D	1Y018720A	NEC	*3)
E	AC Adapter	CF-AA1625A M3	1625AM305208896C	Panasonic	*2)
E'	AC Adapter	ADP-60DB	1902807DB	NEC	*3)

*1) Antenna terminal conducted test: 3, Conducted / Radiated emission: 5

*2) All test items except for Conducted emission

*3) Conducted emission only

List of cables used

No.	Cable Name	Length (m)	Shield (Cable)	Shield (Connector)	Remark
1	Signal	0.1	Unshielded	Unshielded	-
2	Jig	0.05	Unshielded	Unshielded	-
3	DC	1.0	Unshielded	Unshielded	-
4	Signal	0.1	Unshielded	Unshielded	-
5	USB	1.3	Shielded	Shielded	*4)
6	DC	1.2	Unshielded	Unshielded	*5)
7	AC	0.8	Unshielded	Unshielded	-

*4) The ferrite core was attached during spurious emission measurement to remove the effect of spurious emission from Jig.

*5) The ferrite core was not attached to reduce the noise from the EUT but was used to reduce the noise from Laptop PC. Therefore, that does not affect the emission level of the EUT. Since it was difficult to prepare a cable for Laptop PC to which a ferrite core was not attached, the measurement was performed with the cable with the ferrite core.

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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. All unused 50ohm connectors of the LISN were resistively terminated in 50ohm when not connected to the measuring equipment.

Photographs of the set up are shown in APPENDIX 3.

5.3 Test conditions

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

5.4 Test procedure

The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT via DC power supply within a Shielded room. The EUT was connected to a Line Impedance Stabilization Network (LISN) via DC power supply.

An overview sweep with peak detection has been performed.

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

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

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

5.5 Results

Summary of the test results : Pass
Refer to APPENDIX 1

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SECTION 6: Radiated emission

6.1 Operating environment

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

6.2 Test configuration

EUT was placed on a urethane platform of nominal size, 0.5m by 0.5m, raised 0.8m above the conducting ground plane. Photographs of the set up are shown in APPENDIX 3.

6.3 Test conditions

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

6.4 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 Detector: Peak	RBW: 1MHz VBW: 3MHz Detector: RMS	RBW: 100kHz VBW: 300kHz

*1) Average Power Measurement was measured based on 10.2.3.3 and 8.2.1 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

Since the duty cycle of test mode was more than 98%, 8.2.4 Alternative 1 was not applied.

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	1-25GHz
Horizontal	Y	X	Y
Vertical	Z	X	Z

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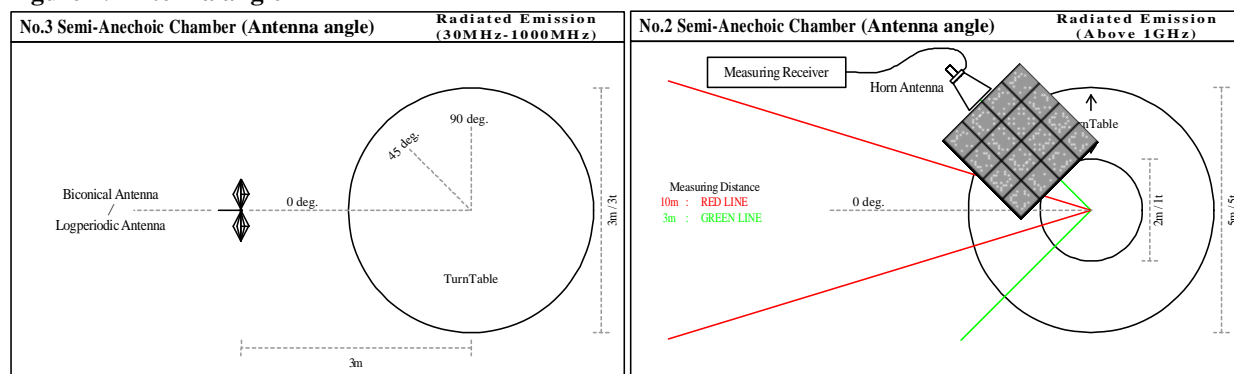
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Figure 1. Antenna angle



6.5 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.

6.6 Results

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

Refer to APPENDIX 1

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SECTION 7: Out of band emissions (Antenna port conducted)

Test procedure

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

Summary of the test results: Pass
Refer to APPENDIX 1

SECTION 8: 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 7.1 Option 1 and 7.2 Option 2 of "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 9: Maximum peak 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 8.1.3 Option 3 of "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) Testing using an average detector was performed in order to confirm that the output power of the EUT met the exclusion limits stated in FCC Part 2 Section 2.1093 and FCC radio frequency (RF) Exposure Guidelines in Supplement C to OET 65 and the EUT was exempt from RF exposure SAR evaluation.

SECTION 10: Peak power density

Test procedure

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

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

The test was measured based on Method 9.1 Option 1 of "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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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 worst position

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APPENDIX 1: Data of Radio tests

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/04/26

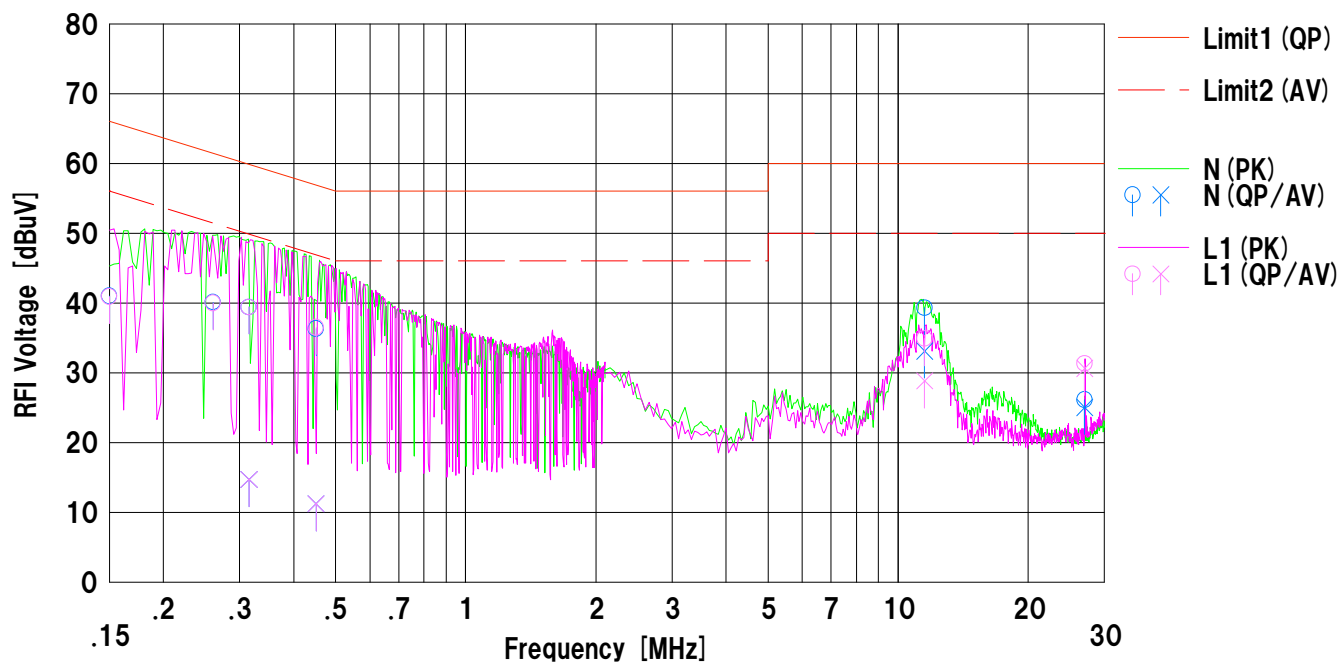
Company : Olympus Corporation
Kind of EUT : Wireless LAN Module
Model No. : SO44WIFI-PCA
Serial No. : 5

Mode : IEEE802.11g, Tx 24 2MHz
Report No. : 10004229S-A
Power : AC 120V / 60Hz (DC Power Supply)
Temp./Humi. : 24deg.C / 48%RH

Remarks : -

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

Engineer : Hikaru Shirasawa



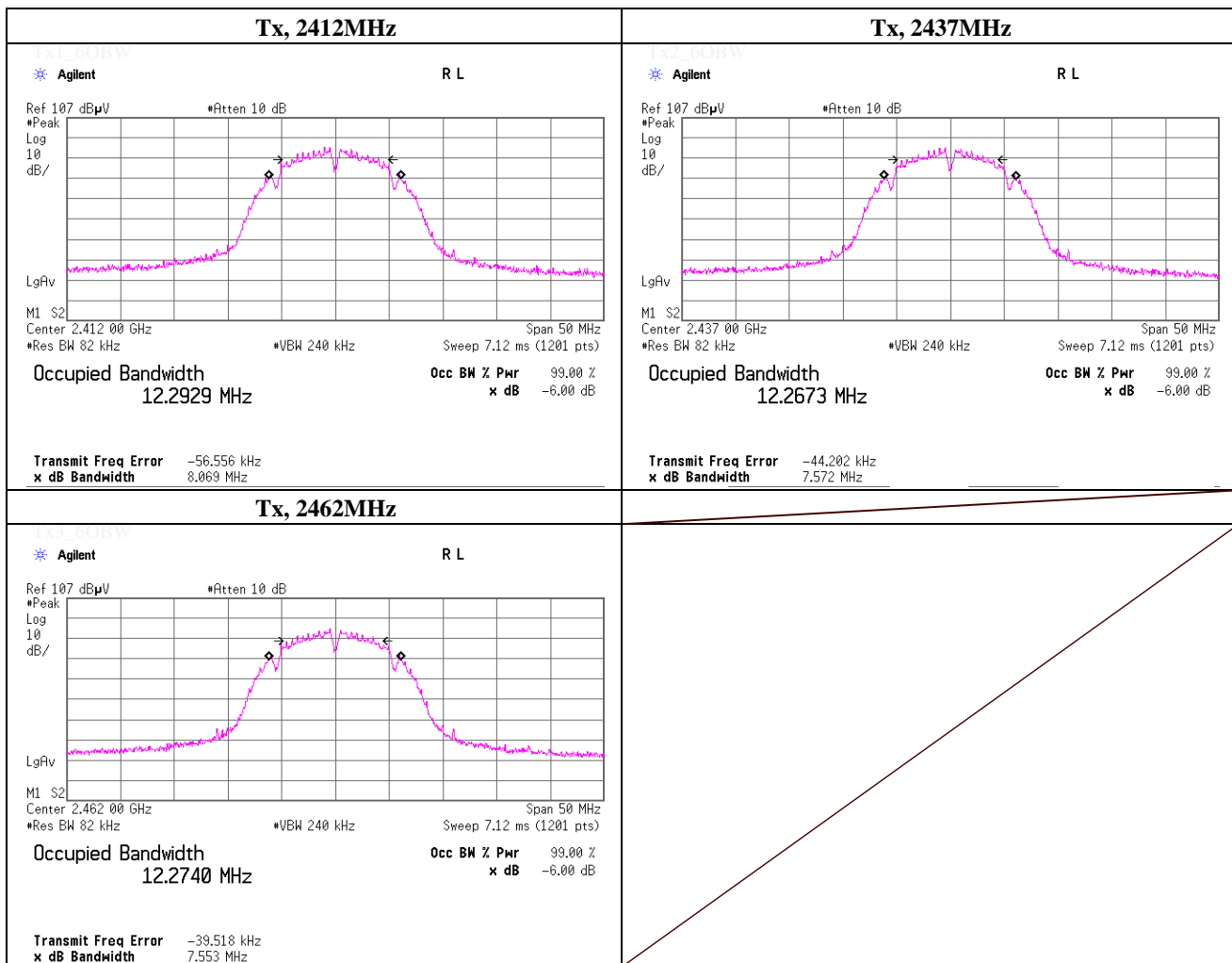
No.	Freq. [MHz]	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	28.3	---	12.7	41.0	---	66.0	56.0	25.0	---	N	
2	0.26032	27.4	---	12.7	40.1	---	61.4	51.4	21.3	---	N	
3	0.31540	26.7	2.0	12.7	39.4	14.7	59.8	49.8	20.4	35.1	N	
4	0.45076	23.6	-1.5	12.7	36.3	11.2	56.8	46.8	20.5	35.6	N	
5	11.51826	26.1	19.9	13.2	39.3	33.1	60.0	50.0	20.7	16.9	N	
6	27.00045	12.3	11.2	13.8	26.1	25.0	60.0	50.0	33.9	25.0	N	
7	0.15000	28.2	---	12.7	40.9	---	66.0	56.0	25.1	---	L1	
8	0.26032	27.3	---	12.7	40.0	---	61.4	51.4	21.4	---	L1	
9	0.31540	26.7	2.0	12.7	39.4	14.7	59.8	49.8	20.4	35.1	L1	
10	0.45076	23.8	-1.5	12.7	36.5	11.2	56.8	46.8	20.3	35.6	L1	
11	11.51826	21.7	15.6	13.2	34.9	28.8	60.0	50.0	25.1	21.2	L1	
12	27.00045	17.5	16.8	13.8	31.3	30.6	60.0	50.0	28.7	19.4	L1	

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

-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Shielded Room
Date	March 12, 2013	
Temperature / Humidity	22deg.C , 33% RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11b, PN9, worst data mode 1Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	8.069	> 0.500
2437.0000	7.572	> 0.500
2462.0000	7.553	> 0.500



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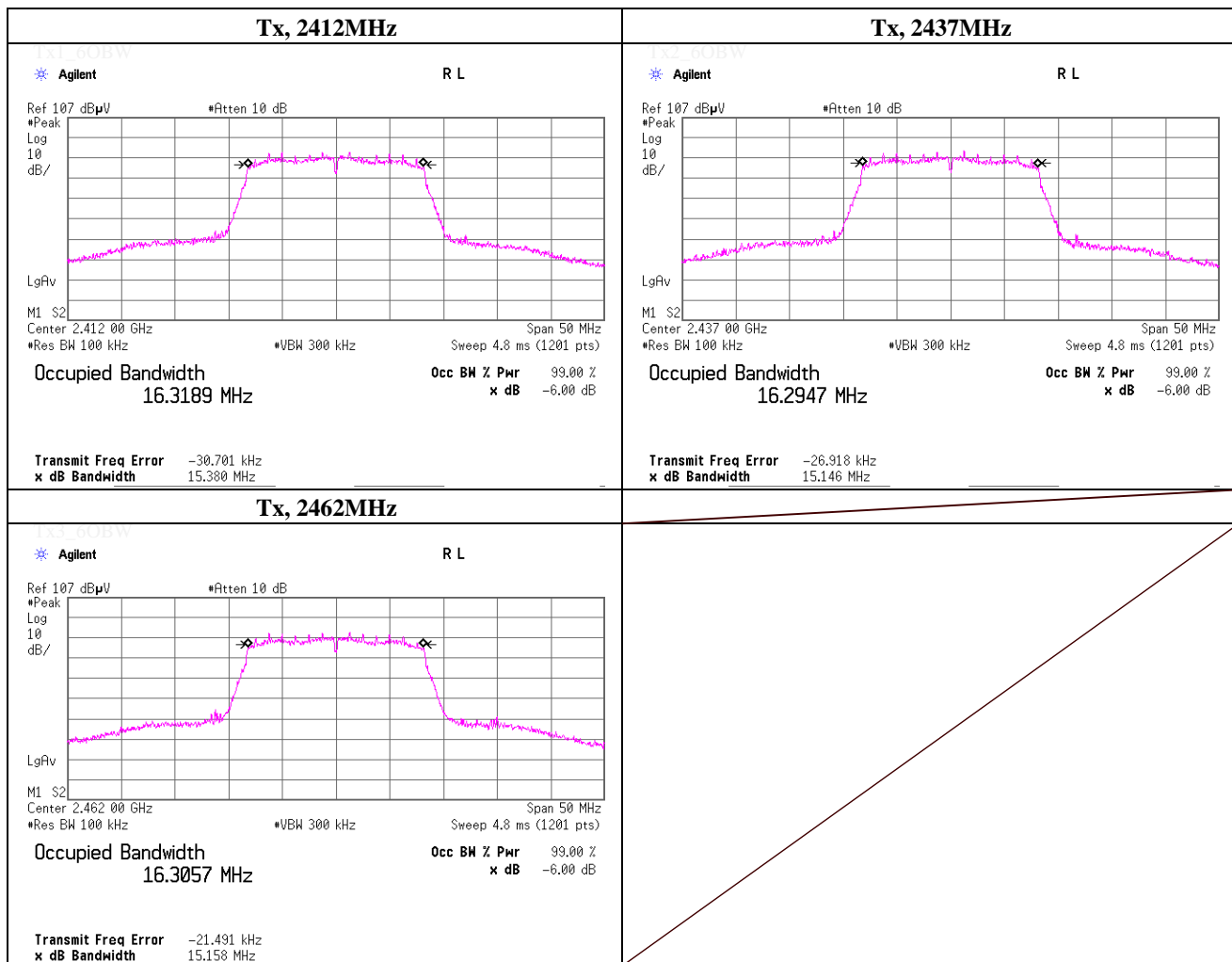
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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Shielded Room
Date	March 12, 2013	
Temperature / Humidity	22deg.C , 33% RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	15.380	> 0.500
2437.0000	15.146	> 0.500
2462.0000	15.158	> 0.500



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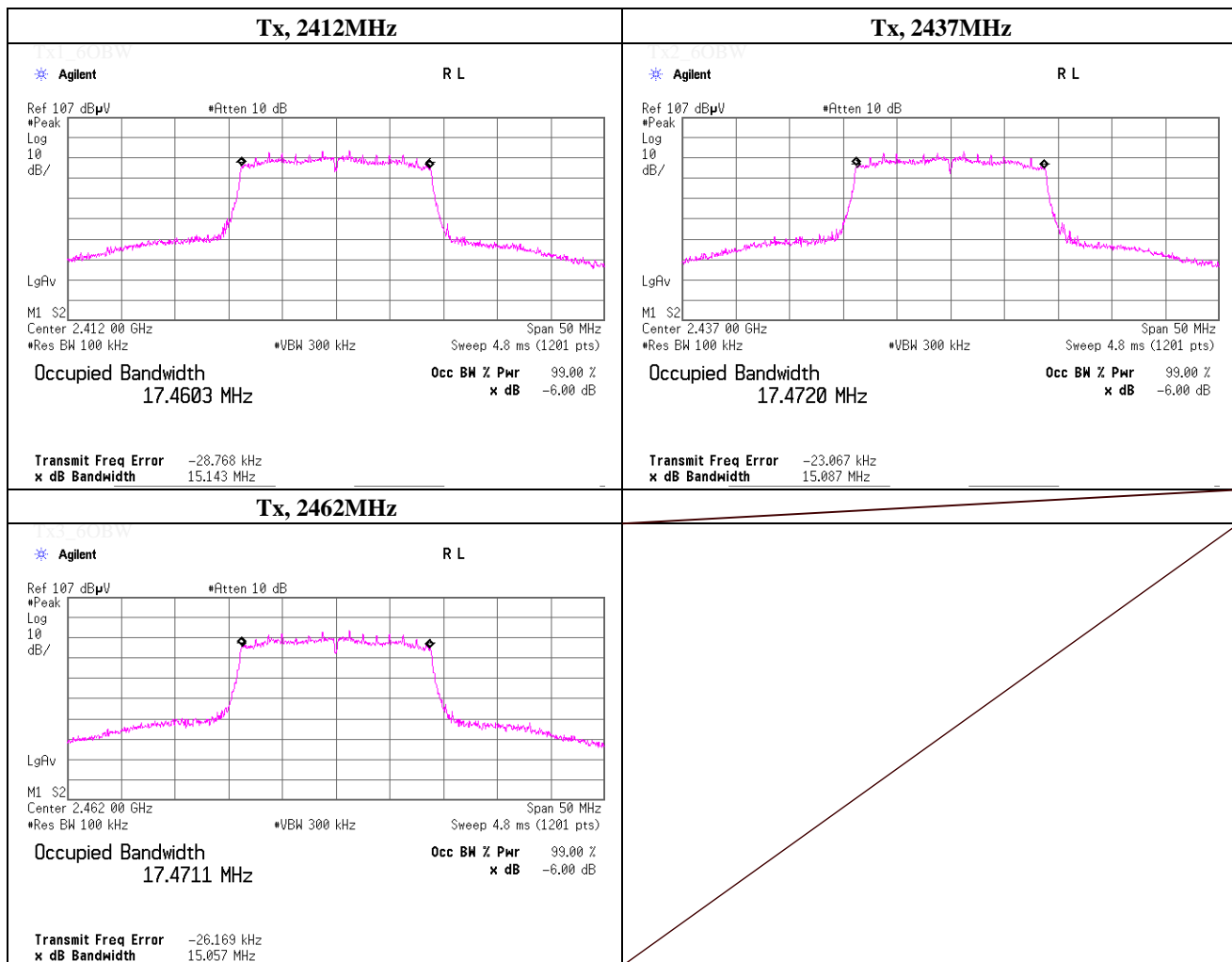
Telephone : +81 463 50 6400

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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Shielded Room
Date	March 12, 2013	
Temperature / Humidity	22deg.C , 33%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	15.143	> 0.500
2437.0000	15.087	> 0.500
2462.0000	15.057	> 0.500

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Maximum Peak Conducted Output Power

(Option 3)

Test place UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
 Date March 11, 2013
 Temperature / Humidity 23deg.C , 29%RH
 Engineer Kenichi Adachi
 Mode Tx, IEEE802.11b, PN9, worst data mode : 1 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin
					[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	-3.28	1.30	9.62	7.64	5.81	30.00	1000	22.36
Mid	2437.0	-3.61	1.30	9.63	7.32	5.40	30.00	1000	22.68
High	2462.0	-3.86	1.31	9.63	7.08	5.11	30.00	1000	22.92

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
						[dBm]	[mW]	[dBm]	[mW]	[dB]
	1	2437.0	-3.61	1.30	9.63	7.32	5.40	30.00	1000	22.68
	2	2437.0	-3.62	1.30	9.63	7.31	5.39	30.00	1000	22.69
	5.5	2437.0	-3.77	1.30	9.63	7.16	5.20	30.00	1000	22.84
	11	2437.0	-3.64	1.30	9.63	7.29	5.36	30.00	1000	22.71

Worst

Sample Calculation:

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

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(Reference data)

Maximum Conducted Output Power

(Option 3)

Test place UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
Date March 11, 2013
Temperature / Humidity 23deg.C , 29%RH
Engineer Kenichi Adachi
Mode Tx, IEEE802.11b, PN9, worst data mode : 1 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		Limit		Margin [dB]
						[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	-6.34	1.30	9.62	0.01	4.59	2.88	30.00	1000	25.41
Mid	2437.0	-6.73	1.30	9.63	0.01	4.21	2.64	30.00	1000	25.79
High	2462.0	-6.84	1.31	9.63	0.01	4.11	2.58	30.00	1000	25.89

Sample Calculation:

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

[Pre check]

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result		Limit		Margin [dB]	
							[dBm]	[mW]	[dBm]	[mW]		
	1	2437.0	-6.73	1.30	9.63	0.01	4.21	2.64	30.00	1000	25.79	Worst
	2	2437.0	-6.76	1.30	9.63	0.01	4.18	2.62	30.00	1000	25.82	
	6	2437.0	-6.83	1.30	9.63	0.04	4.14	2.60	30.00	1000	25.86	
	11	2437.0	-6.94	1.30	9.63	0.06	4.05	2.54	30.00	1000	25.95	

Sample Calculation:

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

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Maximum Peak Conducted Output Power

(Option 3)

Test place UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
 Date March 11, 2013
 Temperature / Humidity 23deg.C , 29%RH
 Engineer Kenichi Adachi
 Mode Tx, IEEE802.11g, PN9, worst data mode : 6 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin
					[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	5.43	1.30	9.62	16.35	43.19	30.00	1000	13.65
Mid	2437.0	5.26	1.30	9.63	16.19	41.62	30.00	1000	13.81
High	2462.0	5.23	1.31	9.63	16.17	41.43	30.00	1000	13.83

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
						[dBm]	[mW]	[dBm]	[mW]	[dB]
	6	2437.0	5.26	1.30	9.63	16.19	41.62	30.00	1000	13.81
	9	2437.0	4.61	1.30	9.63	15.54	35.84	30.00	1000	14.46
	12	2437.0	4.28	1.30	9.63	15.21	33.21	30.00	1000	14.79
	18	2437.0	4.78	1.30	9.63	15.71	37.27	30.00	1000	14.29
	24	2437.0	4.41	1.30	9.63	15.34	34.22	30.00	1000	14.66
	36	2437.0	4.89	1.30	9.63	15.82	38.22	30.00	1000	14.18
	48	2437.0	4.45	1.30	9.63	15.38	34.54	30.00	1000	14.62
	54	2437.0	4.08	1.30	9.63	15.01	31.72	30.00	1000	14.99

Worst

Sample Calculation:

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

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(Reference data)

Maximum Conducted Output Power

(Option 3)

Test place UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
 Date March 11, 2013
 Temperature / Humidity 23deg.C , 29%RH
 Engineer Kenichi Adachi
 Mode Tx, IEEE802.11g, PN9, worst data mode : 6 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		Limit		Margin
						[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	-6.22	1.30	9.62	0.06	4.76	2.99	30.00	1000	25.24
Mid	2437.0	-6.42	1.30	9.63	0.06	4.57	2.86	30.00	1000	25.43
High	2462.0	-6.67	1.31	9.63	0.06	4.33	2.71	30.00	1000	25.67

Sample Calculation:

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

[Pre check]

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result		Limit		Margin	
							[dBm]	[mW]	[dBm]	[mW]	[dB]	
	6	2437.0	-6.42	1.30	9.63	0.06	4.57	2.86	30.00	1000	25.43	Worst
	9	2437.0	-6.46	1.30	9.63	0.09	4.56	2.86	30.00	1000	25.44	
	12	2437.0	-6.49	1.30	9.63	0.12	4.56	2.86	30.00	1000	25.44	
	18	2437.0	-6.54	1.30	9.63	0.17	4.56	2.86	30.00	1000	25.44	
	24	2437.0	-6.59	1.30	9.63	0.22	4.56	2.86	30.00	1000	25.44	
	36	2437.0	-6.78	1.30	9.63	0.32	4.47	2.80	30.00	1000	25.53	
	48	2437.0	-6.88	1.30	9.63	0.42	4.47	2.80	30.00	1000	25.53	
	54	2437.0	-6.89	1.30	9.63	0.45	4.49	2.81	30.00	1000	25.51	

Sample Calculation:

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

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Maximum Peak Conducted Output Power

(Option 3)

Test place UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
 Date March 11, 2013
 Temperature / Humidity 23deg.C , 29%RH
 Engineer Kenichi Adachi
 Mode Tx, IEEE802.11n (HT20), PN9, worst data mode : 0 (MCS)

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin
					[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	5.24	1.30	9.62	16.16	41.34	30.00	1000	13.84
Mid	2437.0	5.08	1.30	9.63	16.01	39.93	30.00	1000	13.99
High	2462.0	4.65	1.31	9.63	15.59	36.25	30.00	1000	14.41

Sample Calculation:

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

[Pre check]

	Mode (MCS)	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin
						[dBm]	[mW]	[dBm]	[mW]	[dB]
	0	2437.0	5.08	1.30	9.63	16.01	39.93	30.00	1000	13.99
	1	2437.0	5.00	1.30	9.63	15.93	39.20	30.00	1000	14.07
	2	2437.0	4.48	1.30	9.63	15.41	34.78	30.00	1000	14.59
	3	2437.0	4.54	1.30	9.63	15.47	35.26	30.00	1000	14.53
	4	2437.0	4.40	1.30	9.63	15.33	34.15	30.00	1000	14.67
	5	2437.0	3.96	1.30	9.63	14.89	30.86	30.00	1000	15.11
	6	2437.0	4.80	1.30	9.63	15.73	37.44	30.00	1000	14.27
	7	2437.0	4.78	1.30	9.63	15.71	37.27	30.00	1000	14.29

Worst

Sample Calculation:

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

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(Reference data)

Maximum Conducted Output Power

(Option 3)

Test place UL Japan, Inc. Shonan EMC Lab. No.6 Shielded Room
 Date March 11, 2013
 Temperature / Humidity 23deg.C , 29%RH
 Engineer Kenichi Adachi
 Mode Tx, IEEE802.11n (HT20), PN9, 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		Limit		Margin
						[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	-6.28	1.30	9.62	0.06	4.70	2.95	30.00	1000	25.30
Mid	2437.0	-6.42	1.30	9.63	0.06	4.57	2.86	30.00	1000	25.43
High	2462.0	-6.81	1.31	9.63	0.06	4.19	2.62	30.00	1000	25.81

Sample Calculation:

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

[Pre check]

Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty Factor [dB]	Result		Limit		Margin
						[dBm]	[mW]	[dBm]	[mW]	[dB]
0	2437.0	-6.42	1.30	9.63	0.06	4.57	2.86	30.00	1000	25.43
1	2437.0	-6.57	1.30	9.63	0.13	4.49	2.81	30.00	1000	25.51
2	2437.0	-6.61	1.30	9.63	0.18	4.50	2.82	30.00	1000	25.50
3	2437.0	-6.60	1.30	9.63	0.23	4.56	2.86	30.00	1000	25.44
4	2437.0	-6.81	1.30	9.63	0.34	4.46	2.79	30.00	1000	25.54
5	2437.0	-6.85	1.30	9.63	0.41	4.49	2.81	30.00	1000	25.51
6	2437.0	-6.87	1.30	9.63	0.44	4.50	2.82	30.00	1000	25.50
7	2437.0	-6.92	1.30	9.63	0.48	4.49	2.81	30.00	1000	25.51

Worst

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 and 3 Semi Anechoic Chamber
 Date March 17, 2013 (No.2SAC) March 18, 2013 (No.3SAC)
 Temperature / Humidity 26 deg.C, 34 %RH 23 deg.C, 39 %RH
 Engineer Wataru Kojima Shinichi Takano
 Mode Tx, 2412 MHz
 Tx, IEEE802.11b, PN9, worst data mode 1Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2332.000	PK	43.6	27.1	14.0	38.2	46.5	73.9	27.4	100	359	
Hori.	2360.000	PK	45.3	27.2	14.0	38.2	48.3	73.9	25.6	100	359	
Hori.	2390.000	PK	44.9	27.2	14.1	38.2	48.0	73.9	25.9	100	359	
Hori.	3617.982	PK	45.0	29.1	5.5	37.8	41.8	73.9	32.1	100	55	
Hori.	4824.000	PK	42.7	30.8	6.6	37.0	43.1	73.9	30.8	100	23	
Hori.	7236.000	PK	43.4	36.2	7.9	39.0	48.5	73.9	25.4	100	0	
Hori.	9648.000	PK	40.7	38.3	9.3	37.2	51.1	73.9	22.8	100	0	
Hori.	12060.000	PK	41.4	39.2	10.6	37.9	53.3	73.9	20.6	100	0	
Hori.	2332.000	AV	35.7	27.1	14.0	38.2	38.6	53.9	15.3	100	359	
Hori.	2360.000	AV	37.3	27.2	14.0	38.2	40.3	53.9	13.6	100	359	
Hori.	2390.000	AV	37.8	27.2	14.1	38.2	40.9	53.9	13.0	100	359	
Hori.	3617.982	AV	40.5	29.1	5.5	37.8	37.3	53.9	16.6	100	55	
Hori.	4824.000	AV	34.5	30.8	6.6	37.0	34.9	53.9	19.0	100	23	
Hori.	7236.000	AV	35.9	36.2	7.9	39.0	41.0	53.9	12.9	100	0	
Hori.	9648.000	AV	33.4	38.3	9.3	37.2	43.8	53.9	10.1	100	0	
Hori.	12060.000	AV	34.3	39.2	10.6	37.9	46.2	53.9	7.7	100	0	
Vert.	2332.000	PK	43.9	27.1	14.0	38.2	46.8	73.9	27.1	100	15	
Vert.	2360.000	PK	44.1	27.2	14.0	38.2	47.1	73.9	26.8	100	15	
Vert.	2390.000	PK	44.5	27.2	14.1	38.2	47.6	73.9	26.3	100	15	
Vert.	3617.982	PK	45.4	29.1	5.5	37.8	42.2	73.9	31.7	100	303	
Vert.	4824.000	PK	43.5	30.8	6.6	37.0	43.9	73.9	30.0	100	325	
Vert.	7236.000	PK	42.8	36.2	7.9	39.0	47.9	73.9	26.0	100	0	
Vert.	9648.000	PK	40.3	38.3	9.3	37.2	50.7	73.9	23.2	100	0	
Vert.	12060.000	PK	42.1	39.2	10.6	37.9	54.0	73.9	19.9	100	0	
Vert.	2332.000	AV	35.9	27.1	14.0	38.2	38.8	53.9	15.1	100	15	
Vert.	2360.000	AV	36.6	27.2	14.0	38.2	39.6	53.9	14.3	100	15	
Vert.	2390.000	AV	36.7	27.2	14.1	38.2	39.8	53.9	14.1	100	15	
Vert.	3617.982	AV	38.9	29.1	5.5	37.8	35.7	53.9	18.2	100	303	
Vert.	4824.000	AV	34.6	30.8	6.6	37.0	35.0	53.9	18.9	100	325	
Vert.	7236.000	AV	35.5	36.2	7.9	39.0	40.6	53.9	13.3	100	0	
Vert.	9648.000	AV	33.5	38.3	9.3	37.2	43.9	53.9	10.0	100	0	
Vert.	12060.000	AV	34.6	39.2	10.6	37.9	46.5	53.9	7.4	100	0	

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

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

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	86.7	27.3	14.1	38.2	89.9	-	-	Carrier
Hori.	2400.000	PK	40.2	27.3	14.1	38.2	43.4	69.9	26.5	
Vert.	2412.000	PK	87.3	27.3	14.1	38.2	90.5	-	-	Carrier
Vert.	2400.000	PK	40.3	27.3	14.1	38.2	43.5	70.5	27.0	

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

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Radiated Emission

Test place No.2 and 3 Semi Anechoic Chamber
 Date March 17, 2013 (No.2SAC) March 18, 2013 (No.3SAC)
 Temperature / Humidity 26 deg.C, 34 %RH 23 deg.C, 39 %RH
 Engineer Wataru Kojima Shinichi Takano
 Mode Tx, 2437 MHz
 Tx, IEEE802.11b, PN9, worst data mode 1Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	3655.530	PK	46.4	29.2	5.6	37.8	43.4	73.9	30.5	100	37	
Hori.	4874.000	PK	41.4	31.0	6.6	36.9	42.1	73.9	31.8	100	294	
Hori.	7311.000	PK	43.5	36.2	8.0	39.0	48.7	73.9	25.2	100	0	
Hori.	9748.000	PK	41.0	38.4	9.3	37.2	51.5	73.9	22.4	100	0	
Hori.	12185.000	PK	42.0	39.2	10.6	37.7	54.1	73.9	19.8	100	0	
Hori.	3655.530	AV	41.8	29.2	5.6	37.8	38.8	53.9	15.1	100	37	
Hori.	4874.000	AV	33.7	31.0	6.6	36.9	34.4	53.9	19.5	100	294	
Hori.	7311.000	AV	35.0	36.2	8.0	39.0	40.2	53.9	13.7	100	0	
Hori.	9748.000	AV	32.7	38.4	9.3	37.2	43.2	53.9	10.7	100	0	
Hori.	12185.000	AV	34.1	39.2	10.6	37.7	46.2	53.9	7.7	100	0	
Vert.	3655.530	PK	46.2	29.2	5.6	37.8	43.2	73.9	30.7	100	126	
Vert.	4874.000	PK	42.3	31.0	6.6	36.9	43.0	73.9	30.9	100	35	
Vert.	7311.000	PK	43.4	36.2	8.0	39.0	48.6	73.9	25.3	100	0	
Vert.	9748.000	PK	40.8	38.4	9.3	37.2	51.3	73.9	22.6	100	0	
Vert.	12185.000	PK	41.9	39.2	10.6	37.7	54.0	73.9	19.9	100	0	
Vert.	3655.530	AV	40.5	29.2	5.6	37.8	37.5	53.9	16.4	100	126	
Vert.	4874.000	AV	33.7	31.0	6.6	36.9	34.4	53.9	19.5	100	35	
Vert.	7311.000	AV	35.7	36.2	8.0	39.0	40.9	53.9	13.0	100	0	
Vert.	9748.000	AV	33.0	38.4	9.3	37.2	43.5	53.9	10.4	100	0	
Vert.	12185.000	AV	34.3	39.2	10.6	37.7	46.4	53.9	7.5	100	0	

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

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

Radiated Emission

Test place No.2 and 3 Semi Anechoic Chamber
 Date March 17, 2013 (No.2SAC) March 18, 2013 (No.3SAC)
 Temperature / Humidity 26 deg.C, 34 %RH 23 deg.C, 39 %RH
 Engineer Wataru Kojima Shinichi Takano
 Mode Tx, 2462 MHz
 Tx, IEEE802.11b, PN9, worst data mode 1Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	43.4	27.4	14.1	38.1	46.8	73.9	27.1	100	2	
Hori.	3693.000	PK	45.1	29.2	5.7	37.8	42.2	73.9	31.7	100	239	
Hori.	4924.000	PK	42.2	31.1	6.6	36.9	43.0	73.9	30.9	100	12	
Hori.	7386.000	PK	44.9	36.3	8.0	39.0	50.2	73.9	23.7	100	0	
Hori.	9848.000	PK	40.7	38.6	9.3	37.2	51.4	73.9	22.5	100	0	
Hori.	12310.000	PK	41.8	39.1	10.7	37.6	54.0	73.9	19.9	100	0	
Hori.	2483.500	AV	34.3	27.4	14.1	38.1	37.7	53.9	16.2	100	2	
Hori.	3693.000	AV	38.8	29.2	5.7	37.8	35.9	53.9	18.0	100	239	
Hori.	4924.000	AV	33.0	31.1	6.6	36.9	33.8	53.9	20.1	100	12	
Hori.	7386.000	AV	35.5	36.3	8.0	39.0	40.8	53.9	13.1	100	0	
Hori.	9848.000	AV	31.3	38.6	9.3	37.2	42.0	53.9	11.9	100	0	
Hori.	12310.000	AV	32.6	39.1	10.7	37.6	44.8	53.9	9.1	100	0	
Vert.	2483.500	PK	44.3	27.4	14.1	38.1	47.7	73.9	26.2	121	295	
Vert.	3693.000	PK	46.0	29.2	5.7	37.8	43.1	73.9	30.8	100	138	
Vert.	4924.000	PK	42.6	31.1	6.6	36.9	43.4	73.9	30.5	100	244	
Vert.	7386.000	PK	46.0	36.3	8.0	39.0	51.3	73.9	22.6	100	0	
Vert.	9848.000	PK	41.4	38.6	9.3	37.2	52.1	73.9	21.8	100	0	
Vert.	12310.000	PK	42.8	39.1	10.7	37.6	55.0	73.9	18.9	100	0	
Vert.	2483.500	AV	35.0	27.4	14.1	38.1	38.4	53.9	15.5	121	295	
Vert.	3693.000	AV	39.5	29.2	5.7	37.8	36.6	53.9	17.3	100	138	
Vert.	4924.000	AV	34.0	31.1	6.6	36.9	34.8	53.9	19.1	100	244	
Vert.	7386.000	AV	35.7	36.3	8.0	39.0	41.0	53.9	12.9	100	0	
Vert.	9848.000	AV	32.1	38.6	9.3	37.2	42.8	53.9	11.1	100	0	
Vert.	12310.000	AV	33.5	39.1	10.7	37.6	45.7	53.9	8.2	100	0	

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

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

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Radiated Emission

Test place No.2 and 3 Semi Anechoic Chamber
 Date March 17, 2013 (No.2SAC) March 18, 2013 (No.3SAC) March 19, 2013 (No.3SAC)
 Temperature / Humidity 26 deg.C, 34 %RH 23 deg.C, 39 %RH 22 deg.C, 52 %RH
 Engineer Wataru Kojima Shinichi Takano Makoto Hosaka
 Mode Tx, 2412 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	576.009	QP	40.5	18.5	9.7	32.0	36.7	46.0	9.3	161	85	
Hori.	624.002	QP	41.6	19.2	9.9	32.0	38.7	46.0	7.3	154	97	
Hori.	720.008	QP	34.4	20.4	10.2	31.8	33.2	46.0	12.8	131	213	
Hori.	2390.000	PK	48.0	27.2	14.1	38.2	51.1	73.9	22.8	100	359	
Hori.	3618.000	PK	46.1	29.1	5.5	37.8	42.9	73.9	31.0	100	58	
Hori.	4824.000	PK	42.5	30.8	6.6	37.0	42.9	73.9	31.0	100	25	
Hori.	7236.000	PK	44.1	36.2	7.9	39.0	49.2	73.9	24.7	100	0	
Hori.	9648.000	PK	41.4	38.3	9.3	37.2	51.8	73.9	22.1	100	0	
Hori.	12060.000	PK	42.2	39.2	10.6	37.9	54.1	73.9	19.8	100	0	
Hori.	2390.000	AV	38.9	27.2	14.1	38.2	42.0	53.9	11.9	100	359	
Hori.	3618.000	AV	40.9	29.1	5.5	37.8	37.7	53.9	16.2	100	58	
Hori.	4824.000	AV	32.8	30.8	6.6	37.0	33.2	53.9	20.7	100	25	
Hori.	7236.000	AV	35.0	36.2	7.9	39.0	40.1	53.9	13.8	100	0	
Hori.	9648.000	AV	32.4	38.3	9.3	37.2	42.8	53.9	11.1	100	0	
Hori.	12060.000	AV	33.4	39.2	10.6	37.9	45.3	53.9	8.6	100	0	
Vert.	48.003	QP	46.5	11.5	6.8	32.2	32.6	40.0	7.4	100	218	
Vert.	576.009	QP	35.1	18.5	9.7	32.0	31.3	46.0	14.7	100	197	
Vert.	624.002	QP	37.2	19.2	9.9	32.0	34.3	46.0	11.7	111	9	
Vert.	720.008	QP	31.2	20.4	10.2	31.8	30.0	46.0	16.0	100	0	
Vert.	2390.000	PK	48.4	27.2	14.1	38.2	51.5	73.9	22.4	122	8	
Vert.	3618.000	PK	46.0	29.1	5.5	37.8	42.8	73.9	31.1	100	309	
Vert.	4824.000	PK	42.7	30.8	6.6	37.0	43.1	73.9	30.8	100	328	
Vert.	7236.000	PK	43.5	36.2	7.9	39.0	48.6	73.9	25.3	100	0	
Vert.	9648.000	PK	42.1	38.3	9.3	37.2	52.5	73.9	21.4	100	0	
Vert.	12060.000	PK	42.6	39.2	10.6	37.9	54.5	73.9	19.4	100	0	
Vert.	2390.000	AV	40.7	27.2	14.1	38.2	43.8	53.9	10.1	122	8	
Vert.	3618.000	AV	40.2	29.1	5.5	37.8	37.0	53.9	16.9	100	309	
Vert.	4824.000	AV	32.8	30.8	6.6	37.0	33.2	53.9	20.7	100	328	
Vert.	7236.000	AV	34.8	36.2	7.9	39.0	39.9	53.9	14.0	100	0	
Vert.	9648.000	AV	32.7	38.3	9.3	37.2	43.1	53.9	10.8	100	0	
Vert.	12060.000	AV	33.7	39.2	10.6	37.9	45.6	53.9	8.3	100	0	

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

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

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	83.7	27.3	14.1	38.2	86.9	-	-	Carrier
Hori.	2394.830	PK	41.0	27.3	14.1	38.2	44.2	66.9	22.7	
Hori.	2400.000	PK	43.2	27.3	14.1	38.2	46.4	66.9	20.5	
Vert.	2412.000	PK	84.8	27.3	14.1	38.2	88.0	-	-	Carrier
Vert.	2394.830	PK	42.0	27.3	14.1	38.2	45.2	68.0	22.8	
Vert.	2400.000	PK	42.2	27.3	14.1	38.2	45.4	68.0	22.6	

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

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Radiated Emission

Test place No.2 and 3 Semi Anechoic Chamber
 Date March 17, 2013 (No.2SAC) March 18, 2013 (No.3SAC)
 Temperature / Humidity 26 deg.C, 34 %RH 23 deg.C, 39 %RH
 Engineer Wataru Kojima Shinichi Takano
 Mode Tx, 2437 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	3655.500	PK	46.9	29.2	5.6	37.8	43.9	73.9	30.0	100	48	
Hori.	4874.000	PK	42.7	31.0	6.6	36.9	43.4	73.9	30.5	100	300	
Hori.	7311.000	PK	42.3	36.2	8.0	39.0	47.5	73.9	26.4	100	0	
Hori.	9748.000	PK	40.5	38.4	9.3	37.2	51.0	73.9	22.9	100	0	
Hori.	12185.000	PK	41.5	39.2	10.6	37.7	53.6	73.9	20.3	100	0	
Hori.	3655.500	AV	41.3	29.2	5.6	37.8	38.3	53.9	15.6	100	48	
Hori.	4874.000	AV	33.1	31.0	6.6	36.9	33.8	53.9	20.1	100	300	
Hori.	7311.000	AV	34.2	36.2	8.0	39.0	39.4	53.9	14.5	100	0	
Hori.	9748.000	AV	31.6	38.4	9.3	37.2	42.1	53.9	11.8	100	0	
Hori.	12185.000	AV	33.0	39.2	10.6	37.7	45.1	53.9	8.8	100	0	
Vert.	3655.500	PK	46.7	29.2	5.6	37.8	43.7	73.9	30.2	100	138	
Vert.	4874.000	PK	41.1	31.0	6.6	36.9	41.8	73.9	32.1	100	38	
Vert.	7311.000	PK	42.7	36.2	8.0	39.0	47.9	73.9	26.0	100	0	
Vert.	9748.000	PK	40.4	38.4	9.3	37.2	50.9	73.9	23.0	100	0	
Vert.	12185.000	PK	42.3	39.2	10.6	37.7	54.4	73.9	19.5	100	0	
Vert.	3655.500	AV	40.5	29.2	5.6	37.8	37.5	53.9	16.4	100	138	
Vert.	4874.000	AV	32.6	31.0	6.6	36.9	33.3	53.9	20.6	100	38	
Vert.	7311.000	AV	34.9	36.2	8.0	39.0	40.1	53.9	13.8	100	0	
Vert.	9748.000	AV	31.8	38.4	9.3	37.2	42.3	53.9	11.6	100	0	
Vert.	12185.000	AV	33.3	39.2	10.6	37.7	45.4	53.9	8.5	100	0	

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

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

Radiated Emission

Test place No.2 and 3 Semi Anechoic Chamber
 Date March 17, 2013 (No.2SAC) March 18, 2013 (No.3SAC)
 Temperature / Humidity 26 deg.C, 34 %RH 23 deg.C, 39 %RH
 Engineer Wataru Kojima Shinichi Takano
 Mode Tx, 2462 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	45.0	27.4	14.1	38.1	48.4	73.9	25.5	100	357	
Hori.	3693.000	PK	46.2	29.2	5.7	37.8	43.3	73.9	30.6	100	63	
Hori.	4924.000	PK	43.3	31.1	6.6	36.9	44.1	73.9	29.8	100	298	
Hori.	7386.000	PK	45.2	36.3	8.0	39.0	50.5	73.9	23.4	100	0	
Hori.	9848.000	PK	41.0	38.6	9.3	37.2	51.7	73.9	22.2	100	0	
Hori.	12310.000	PK	42.0	39.1	10.7	37.6	54.2	73.9	19.7	100	0	
Hori.	2483.500	AV	36.9	27.4	14.1	38.1	40.3	53.9	13.6	100	357	
Hori.	3693.000	AV	40.5	29.2	5.7	37.8	37.6	53.9	16.3	100	63	
Hori.	4924.000	AV	33.5	31.1	6.6	36.9	34.3	53.9	19.6	100	298	
Hori.	7386.000	AV	35.3	36.3	8.0	39.0	40.6	53.9	13.3	100	0	
Hori.	9848.000	AV	31.5	38.6	9.3	37.2	42.2	53.9	11.7	100	0	
Hori.	12310.000	AV	33.1	39.1	10.7	37.6	45.3	53.9	8.6	100	0	
Vert.	2483.500	PK	45.8	27.4	14.1	38.1	49.2	73.9	24.7	123	322	
Vert.	3693.000	PK	46.1	29.2	5.7	37.8	43.2	73.9	30.7	100	135	
Vert.	4924.000	PK	43.1	31.1	6.6	36.9	43.9	73.9	30.0	100	240	
Vert.	7386.000	PK	44.7	36.3	8.0	39.0	50.0	73.9	23.9	100	0	
Vert.	9848.000	PK	40.8	38.6	9.3	37.2	51.5	73.9	22.4	100	0	
Vert.	12310.000	PK	43.5	39.1	10.7	37.6	55.7	73.9	18.2	100	0	
Vert.	2483.500	AV	36.9	27.4	14.1	38.1	40.3	53.9	13.6	123	322	
Vert.	3693.000	AV	41.3	29.2	5.7	37.8	38.4	53.9	15.5	100	135	
Vert.	4924.000	AV	33.8	31.1	6.6	36.9	34.6	53.9	19.3	100	240	
Vert.	7386.000	AV	36.1	36.3	8.0	39.0	41.4	53.9	12.5	100	0	
Vert.	9848.000	AV	32.0	38.6	9.3	37.2	42.7	53.9	11.2	100	0	
Vert.	12310.000	AV	33.1	39.1	10.7	37.6	45.3	53.9	8.6	100	0	

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

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

Radiated Emission

Test place No.2 and 3 Semi Anechoic Chamber
 Date March 17, 2013 (No.2SAC) March 18, 2013 (No.3SAC)
 Temperature / Humidity 26 deg.C, 34 %RH 23 deg.C, 39 %RH
 Engineer Wataru Kojima Shinichi Takano
 Mode Tx, 2412 MHz
 Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	48.2	27.2	14.1	38.2	51.3	73.9	22.6	122	359	
Hori.	3618.000	PK	46.0	29.1	5.5	37.8	42.8	73.9	31.1	100	45	
Hori.	4824.000	PK	42.9	30.8	6.6	37.0	43.3	73.9	30.6	100	225	
Hori.	7236.000	PK	45.0	36.2	7.9	39.0	50.1	73.9	23.8	100	0	
Hori.	9648.000	PK	41.0	38.3	9.3	37.2	51.4	73.9	22.5	100	0	
Hori.	12060.000	PK	43.3	39.2	10.6	37.9	55.2	73.9	18.7	100	0	
Hori.	2390.000	AV	39.9	27.2	14.1	38.2	43.0	53.9	10.9	122	359	
Hori.	3618.000	AV	40.3	29.1	5.5	37.8	37.1	53.9	16.8	100	45	
Hori.	4824.000	AV	33.2	30.8	6.6	37.0	33.6	53.9	20.3	100	225	
Hori.	7236.000	AV	36.2	36.2	7.9	39.0	41.3	53.9	12.6	100	0	
Hori.	9648.000	AV	32.9	38.3	9.3	37.2	43.3	53.9	10.6	100	0	
Hori.	12060.000	AV	34.5	39.2	10.6	37.9	46.4	53.9	7.5	100	0	
Vert.	2390.000	PK	48.0	27.2	14.1	38.2	51.1	73.9	22.8	126	24	
Vert.	3618.000	PK	45.5	29.1	5.5	37.8	42.3	73.9	31.6	100	320	
Vert.	4824.000	PK	41.8	30.8	6.6	37.0	42.2	73.9	31.7	100	213	
Vert.	7236.000	PK	44.6	36.2	7.9	39.0	49.7	73.9	24.2	100	0	
Vert.	9648.000	PK	41.1	38.3	9.3	37.2	51.5	73.9	22.4	100	0	
Vert.	12060.000	PK	42.2	39.2	10.6	37.9	54.1	73.9	19.8	100	0	
Vert.	2390.000	AV	40.7	27.2	14.1	38.2	43.8	53.9	10.1	126	24	
Vert.	3618.000	AV	39.4	29.1	5.5	37.8	36.2	53.9	17.7	100	320	
Vert.	4824.000	AV	33.4	30.8	6.6	37.0	33.8	53.9	20.1	100	213	
Vert.	7236.000	AV	36.2	36.2	7.9	39.0	41.3	53.9	12.6	100	0	
Vert.	9648.000	AV	32.6	38.3	9.3	37.2	43.0	53.9	10.9	100	0	
Vert.	12060.000	AV	33.4	39.2	10.6	37.9	45.3	53.9	8.6	100	0	

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

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

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	84.0	27.3	14.1	38.2	87.2	-	-	Carrier
Hori.	2400.000	PK	44.3	27.3	14.1	38.2	47.5	67.2	19.7	
Vert.	2412.000	PK	84.0	27.3	14.1	38.2	87.2	-	-	Carrier
Vert.	2400.000	PK	44.1	27.3	14.1	38.2	47.3	67.2	19.9	

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

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Radiated Emission

Test place No.2 and 3 Semi Anechoic Chamber
 Date March 17, 2013 (No.2SAC) March 18, 2013 (No.3SAC)
 Temperature / Humidity 26 deg.C, 34 %RH 23 deg.C, 39 %RH
 Engineer Wataru Kojima Shinichi Takano
 Mode Tx, 2437 MHz
 Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	3655.500	PK	46.1	29.2	5.6	37.8	43.1	73.9	30.8	100	63	
Hori.	4874.000	PK	41.7	31.0	6.6	36.9	42.4	73.9	31.5	100	311	
Hori.	7311.000	PK	43.8	36.2	8.0	39.0	49.0	73.9	24.9	100	0	
Hori.	9748.000	PK	41.1	38.4	9.3	37.2	51.6	73.9	22.3	100	0	
Hori.	12185.000	PK	42.0	39.2	10.6	37.7	54.1	73.9	19.8	100	0	
Hori.	3655.500	AV	40.6	29.2	5.6	37.8	37.6	53.9	16.3	100	63	
Hori.	4874.000	AV	32.6	31.0	6.6	36.9	33.3	53.9	20.6	100	311	
Hori.	7311.000	AV	34.4	36.2	8.0	39.0	39.6	53.9	14.3	100	0	
Hori.	9748.000	AV	31.7	38.4	9.3	37.2	42.2	53.9	11.7	100	0	
Hori.	12185.000	AV	33.2	39.2	10.6	37.7	45.3	53.9	8.6	100	0	
Vert.	3655.500	PK	47.1	29.2	5.6	37.8	44.1	73.9	29.8	100	137	
Vert.	4874.000	PK	40.9	31.0	6.6	36.9	41.6	73.9	32.3	100	38	
Vert.	7311.000	PK	43.2	36.2	8.0	39.0	48.4	73.9	25.5	100	0	
Vert.	9748.000	PK	40.8	38.4	9.3	37.2	51.3	73.9	22.6	100	0	
Vert.	12185.000	PK	42.2	39.2	10.6	37.7	54.3	73.9	19.6	100	0	
Vert.	3655.500	AV	40.6	29.2	5.6	37.8	37.6	53.9	16.3	100	137	
Vert.	4874.000	AV	33.5	31.0	6.6	36.9	34.2	53.9	19.7	100	38	
Vert.	7311.000	AV	34.6	36.2	8.0	39.0	39.8	53.9	14.1	100	0	
Vert.	9748.000	AV	31.8	38.4	9.3	37.2	42.3	53.9	11.6	100	0	
Vert.	12185.000	AV	33.0	39.2	10.6	37.7	45.1	53.9	8.8	100	0	

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

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

UL Japan, Inc.

Shonan EMC Lab.

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Radiated Emission

Test place No.2 and 3 Semi Anechoic Chamber
 Date March 17, 2013 (No.2SAC) March 18, 2013 (No.3SAC)
 Temperature / Humidity 26 deg.C, 34 %RH 23 deg.C, 39 %RH
 Engineer Wataru Kojima Shinichi Takano
 Mode Tx, 2462 MHz
 Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)

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

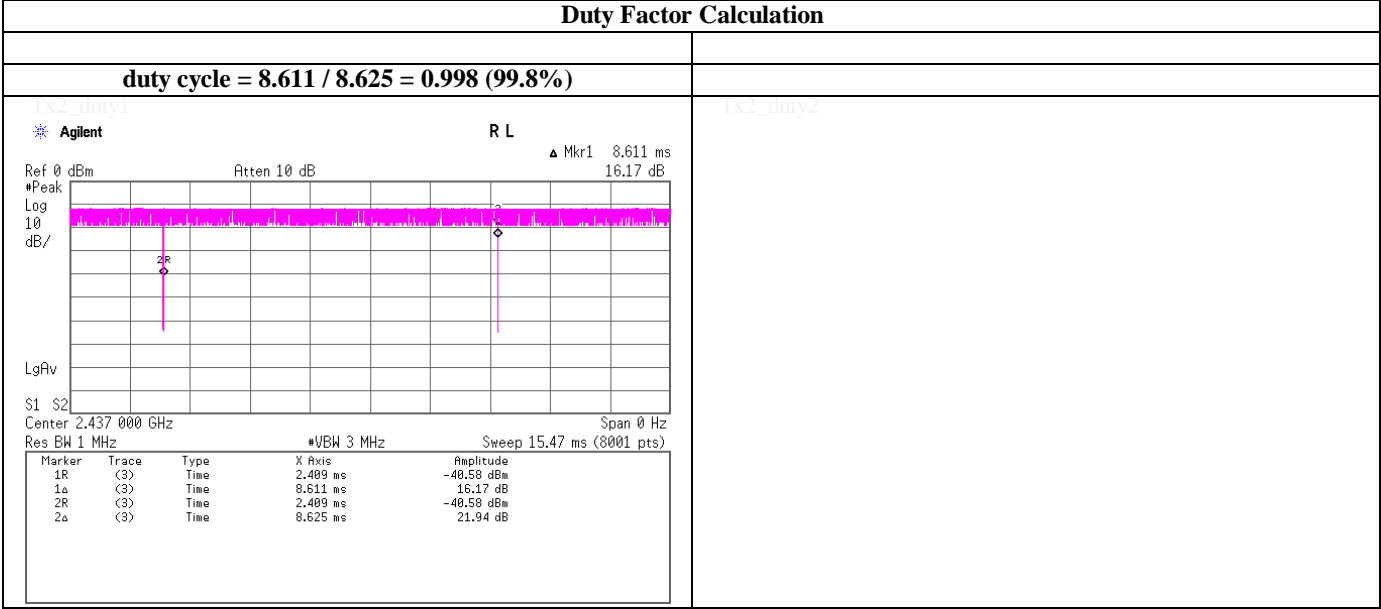
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	46.5	27.4	14.1	38.1	49.9	73.9	24.0	100	357	
Hori.	3693.000	PK	46.1	29.2	5.7	37.8	43.2	73.9	30.7	100	41	
Hori.	4924.000	PK	41.3	31.1	6.6	36.9	42.1	73.9	31.8	100	298	
Hori.	7386.000	PK	43.9	36.3	8.0	39.0	49.2	73.9	24.7	100	0	
Hori.	9848.000	PK	39.5	38.6	9.3	37.2	50.2	73.9	23.7	100	0	
Hori.	12310.000	PK	42.0	39.1	10.7	37.6	54.2	73.9	19.7	100	0	
Hori.	2483.500	AV	38.6	27.4	14.1	38.1	42.0	53.9	11.9	100	357	
Hori.	3693.000	AV	41.5	29.2	5.7	37.8	38.6	53.9	15.3	100	41	
Hori.	4924.000	AV	32.8	31.1	6.6	36.9	33.6	53.9	20.3	100	298	
Hori.	7386.000	AV	35.3	36.3	8.0	39.0	40.6	53.9	13.3	100	0	
Hori.	9848.000	AV	30.6	38.6	9.3	37.2	41.3	53.9	12.6	100	0	
Hori.	12310.000	AV	33.0	39.1	10.7	37.6	45.2	53.9	8.7	100	0	
Vert.	2483.500	PK	45.5	27.4	14.1	38.1	48.9	73.9	25.0	117	324	
Vert.	3693.000	PK	46.2	29.2	5.7	37.8	43.3	73.9	30.6	100	144	
Vert.	4924.000	PK	41.5	31.1	6.6	36.9	42.3	73.9	31.6	100	254	
Vert.	7386.000	PK	44.2	36.3	8.0	39.0	49.5	73.9	24.4	100	0	
Vert.	9848.000	PK	39.6	38.6	9.3	37.2	50.3	73.9	23.6	100	0	
Vert.	12310.000	PK	42.5	39.1	10.7	37.6	54.7	73.9	19.2	100	0	
Vert.	2483.500	AV	37.0	27.4	14.1	38.1	40.4	53.9	13.5	117	324	
Vert.	3693.000	AV	40.7	29.2	5.7	37.8	37.8	53.9	16.1	100	144	
Vert.	4924.000	AV	33.7	31.1	6.6	36.9	34.5	53.9	19.4	100	254	
Vert.	7386.000	AV	35.6	36.3	8.0	39.0	40.9	53.9	13.0	100	0	
Vert.	9848.000	AV	32.3	38.6	9.3	37.2	43.0	53.9	10.9	100	0	
Vert.	12310.000	AV	33.4	39.1	10.7	37.6	45.6	53.9	8.3	100	0	

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

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

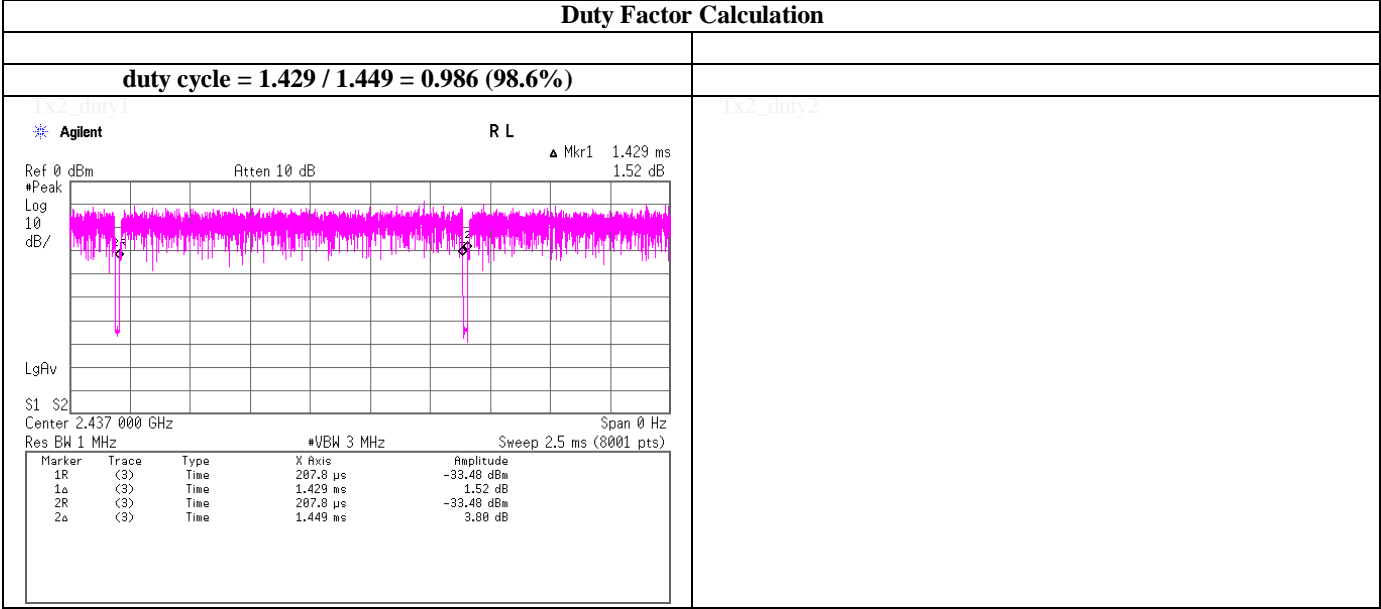
Duty Factor Calculation chart

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



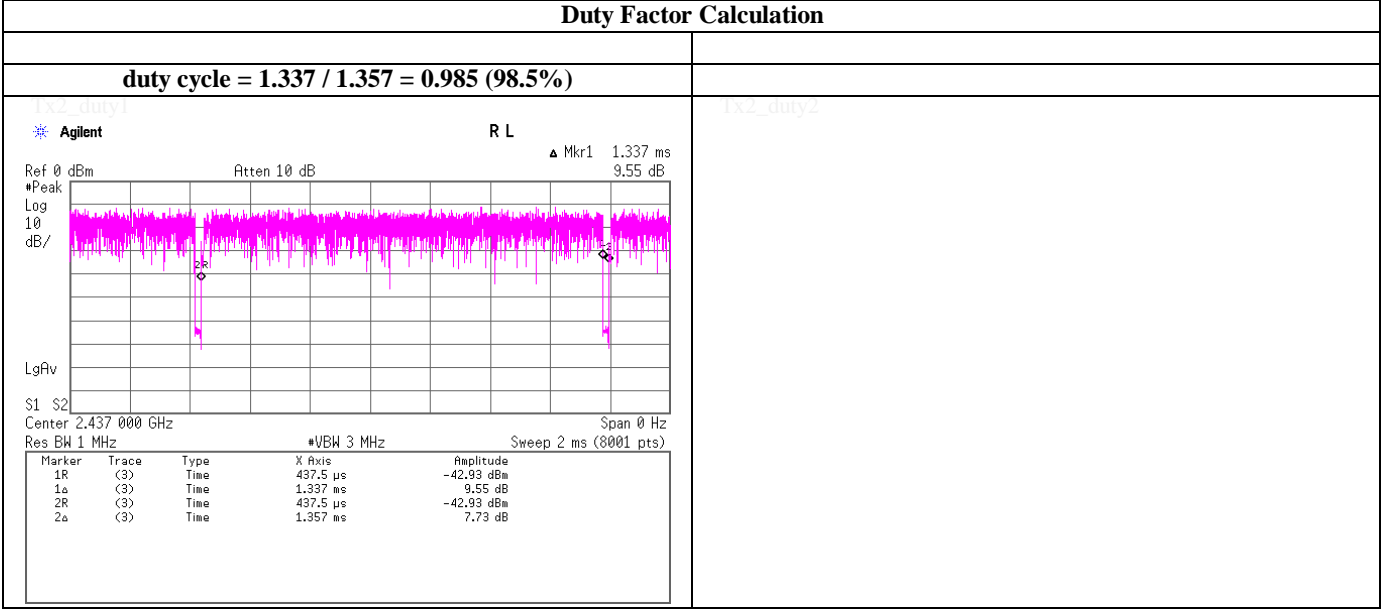
Duty Factor Calculation chart

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



Duty Factor Calculation chart

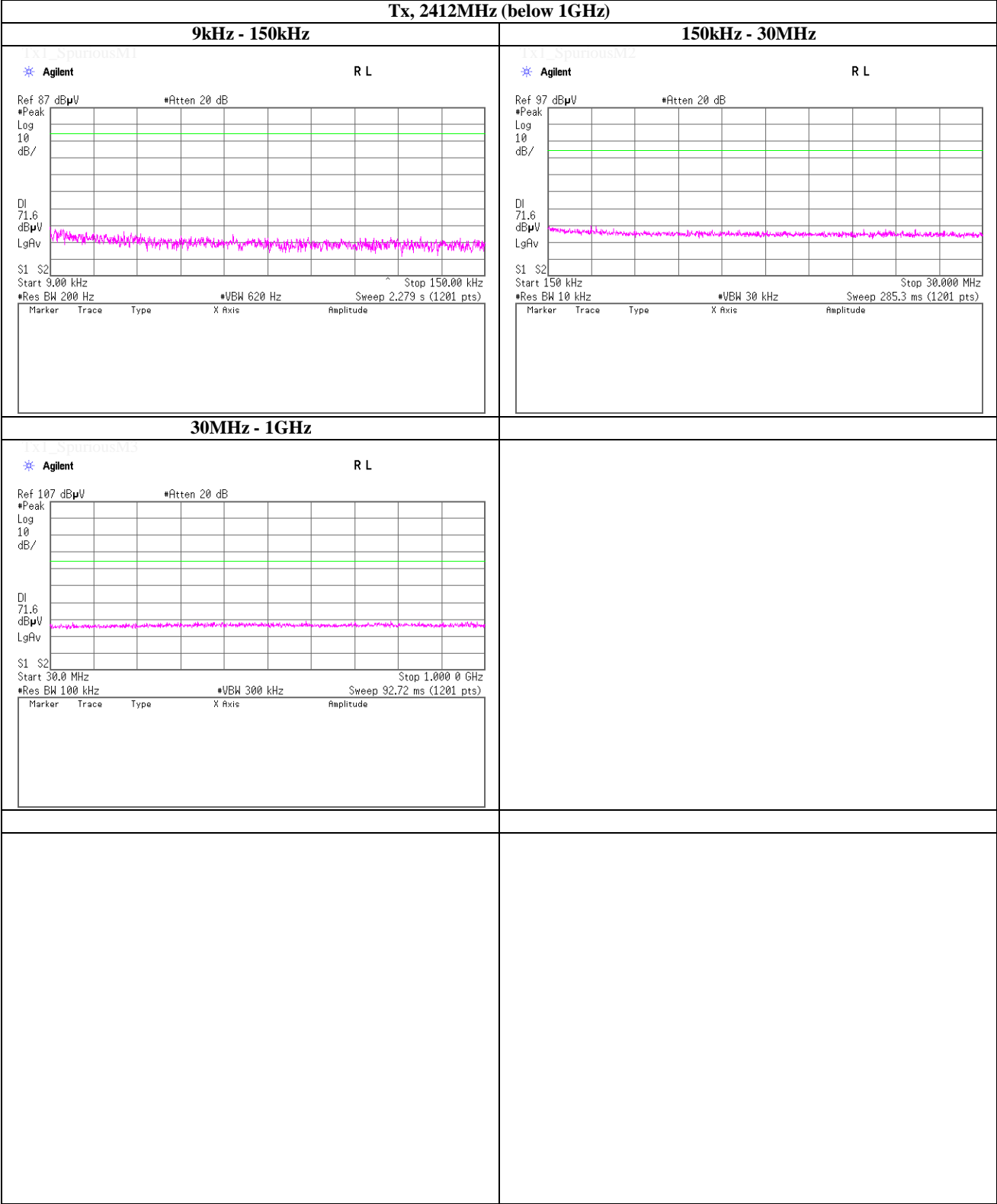
Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)

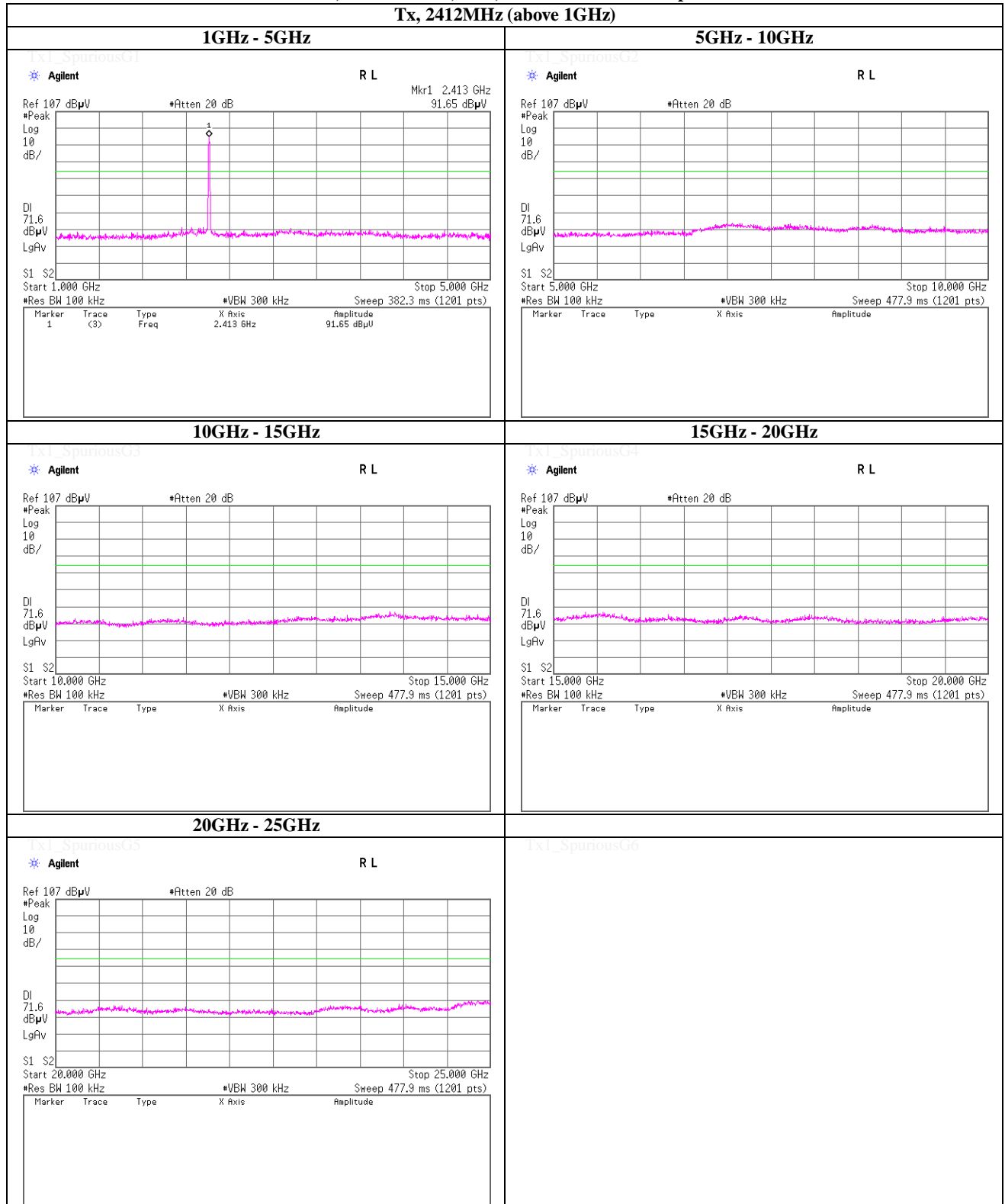


(Reference chart) Spurious emission (Conducted)

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

Tx, 2412MHz (below 1GHz)

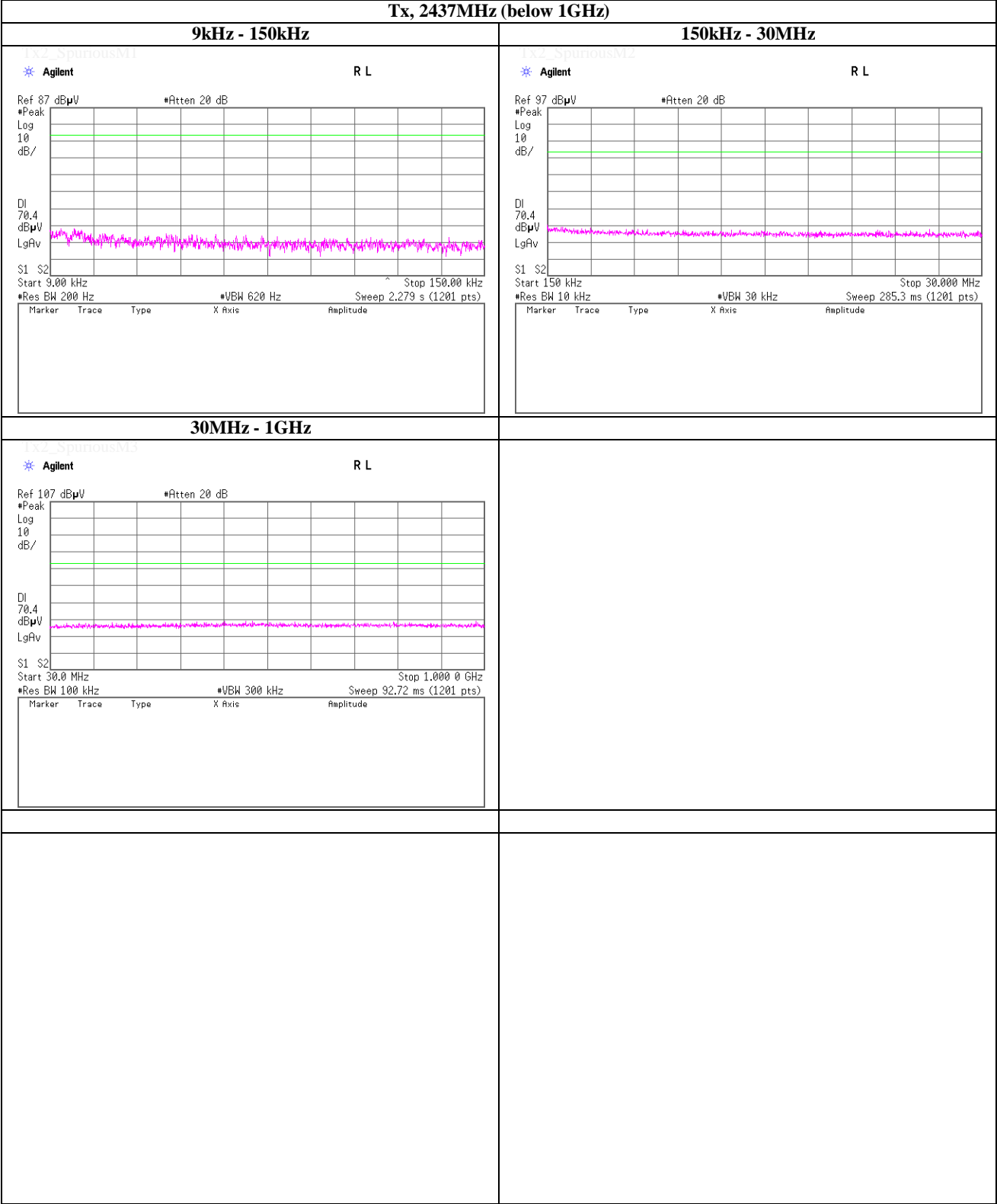


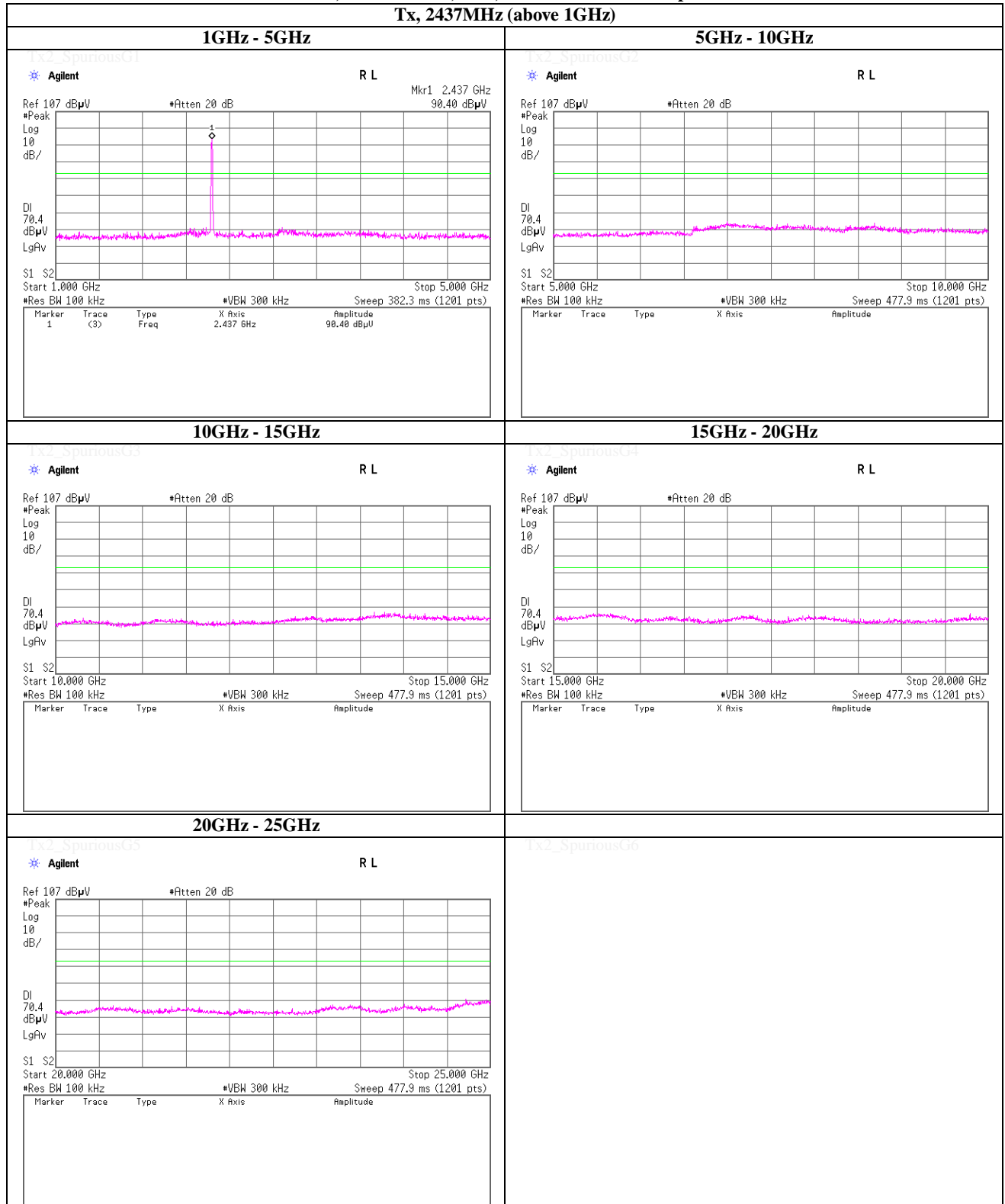
(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11b, PN9, worst data mode 1Mbps****Tx, 2412MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

(Reference chart) Spurious emission (Conducted)

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

Tx, 2437MHz (below 1GHz)

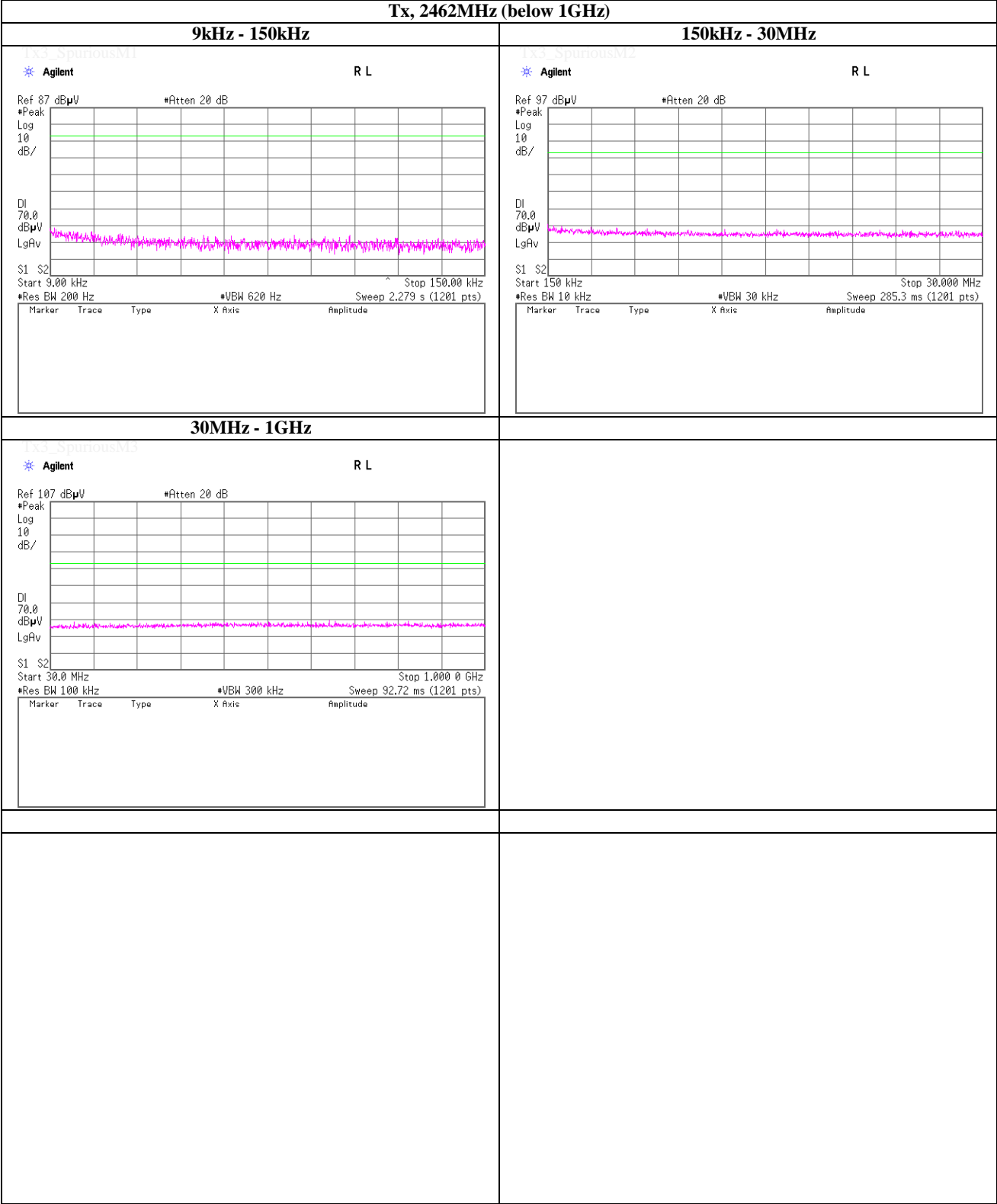


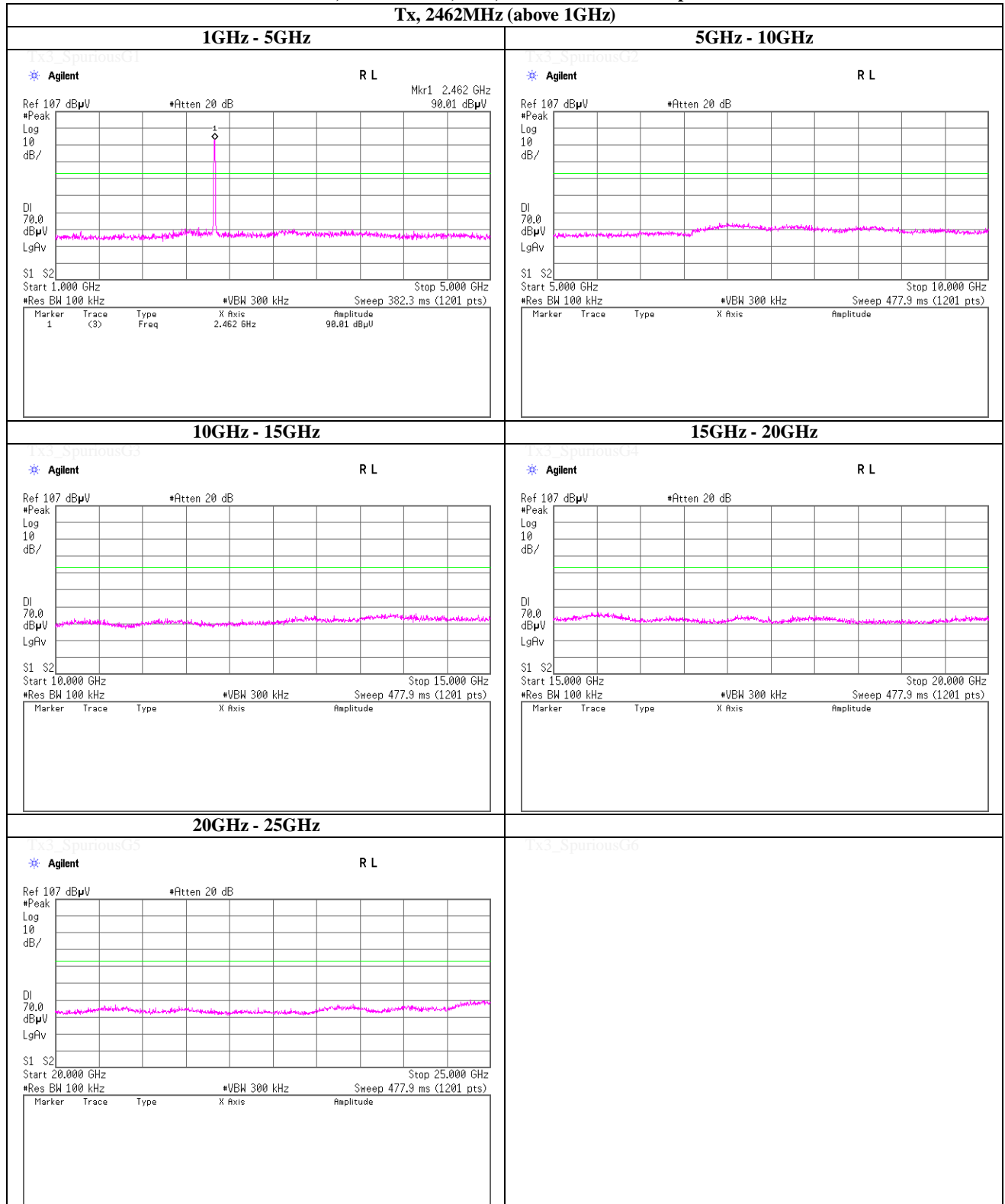
(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11b, PN9, worst data mode 1Mbps****Tx, 2437MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

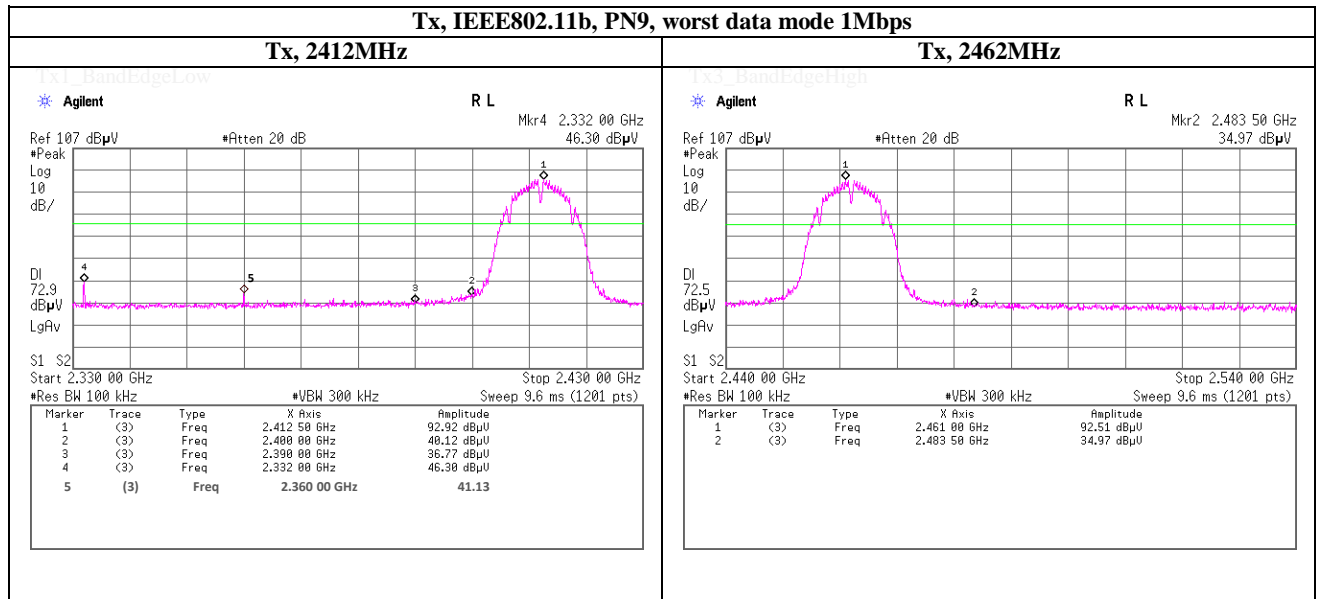
(Reference chart) Spurious emission (Conducted)

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

Tx, 2462MHz (below 1GHz)



(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11b, PN9, worst data mode 1Mbps****Tx, 2462MHz (above 1GHz)****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

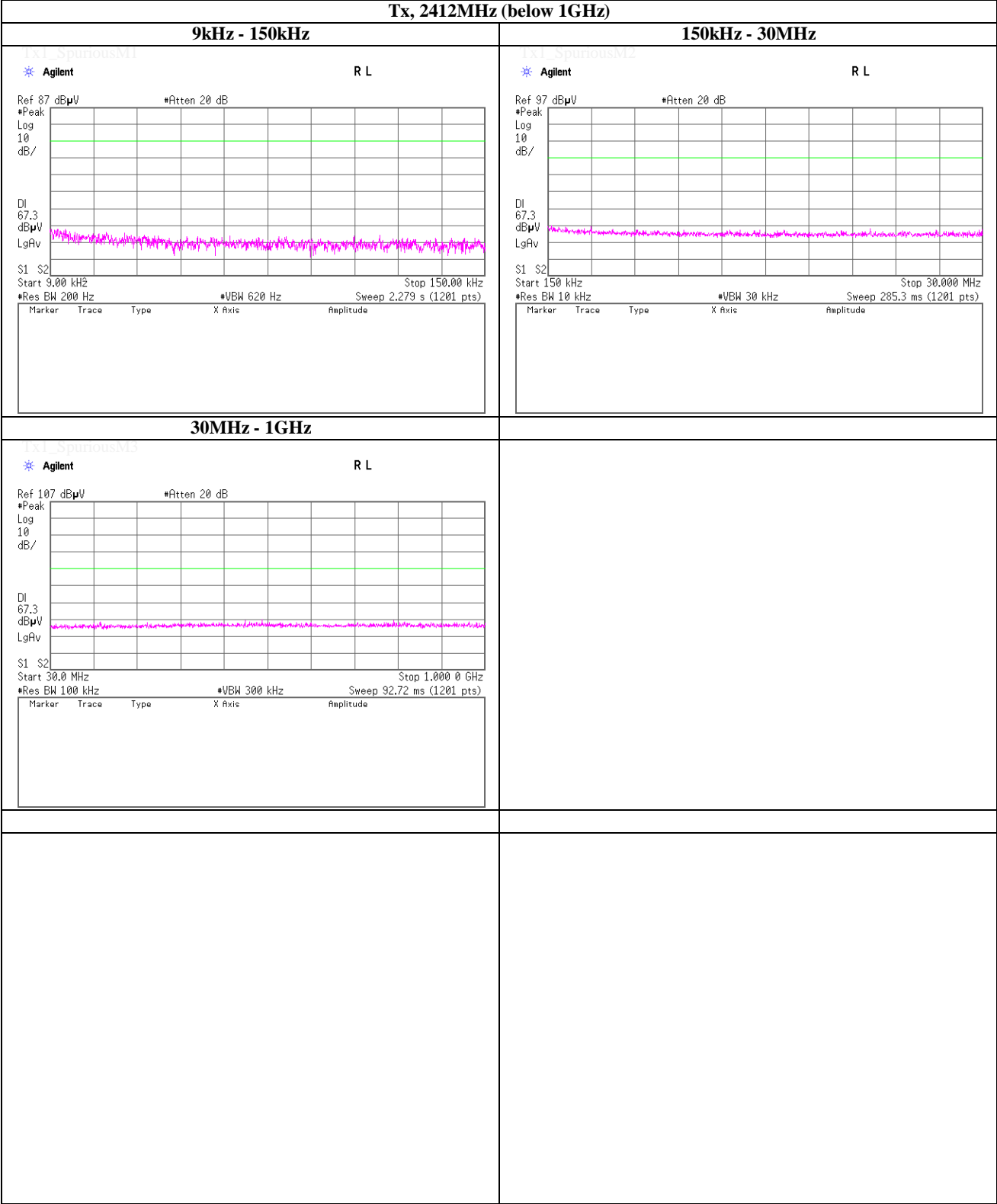
Telephone : +81 463 50 6400

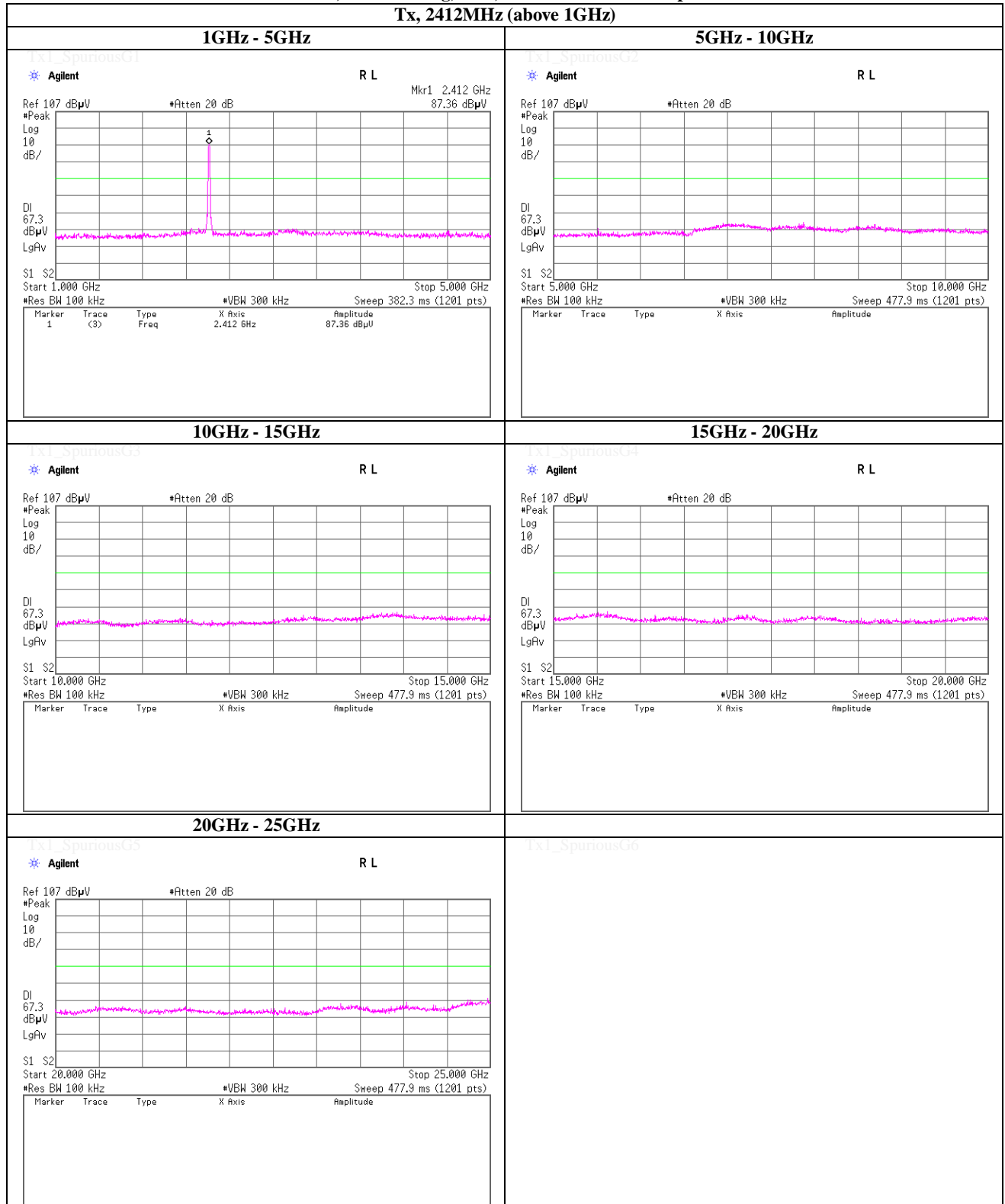
Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

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

Tx, 2412MHz (below 1GHz)



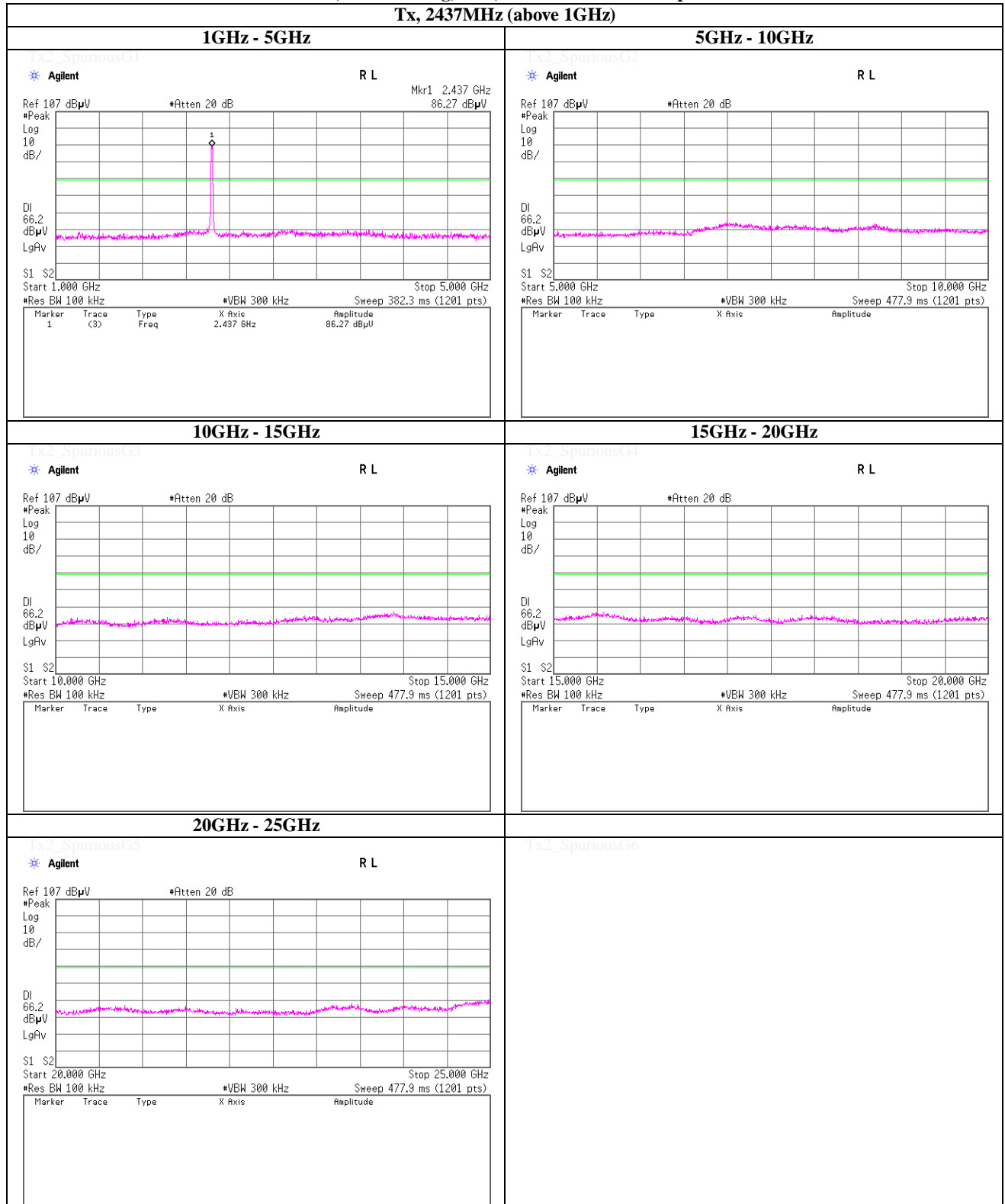
(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11g, PN9, worst data mode 6Mbps****Tx, 2412MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

(Reference chart) Spurious emission (Conducted)

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

Tx, 2437MHz (below 1GHz)

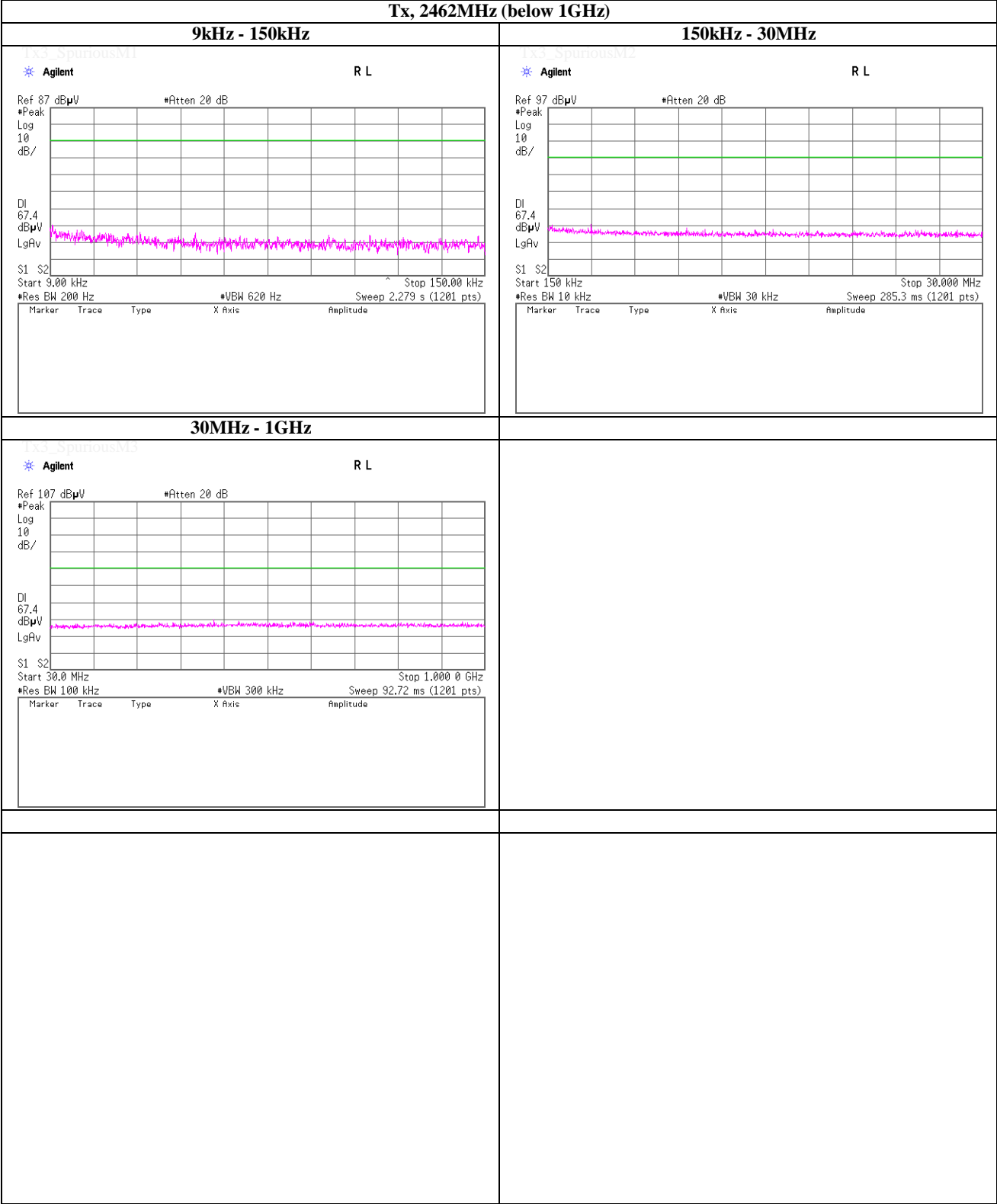


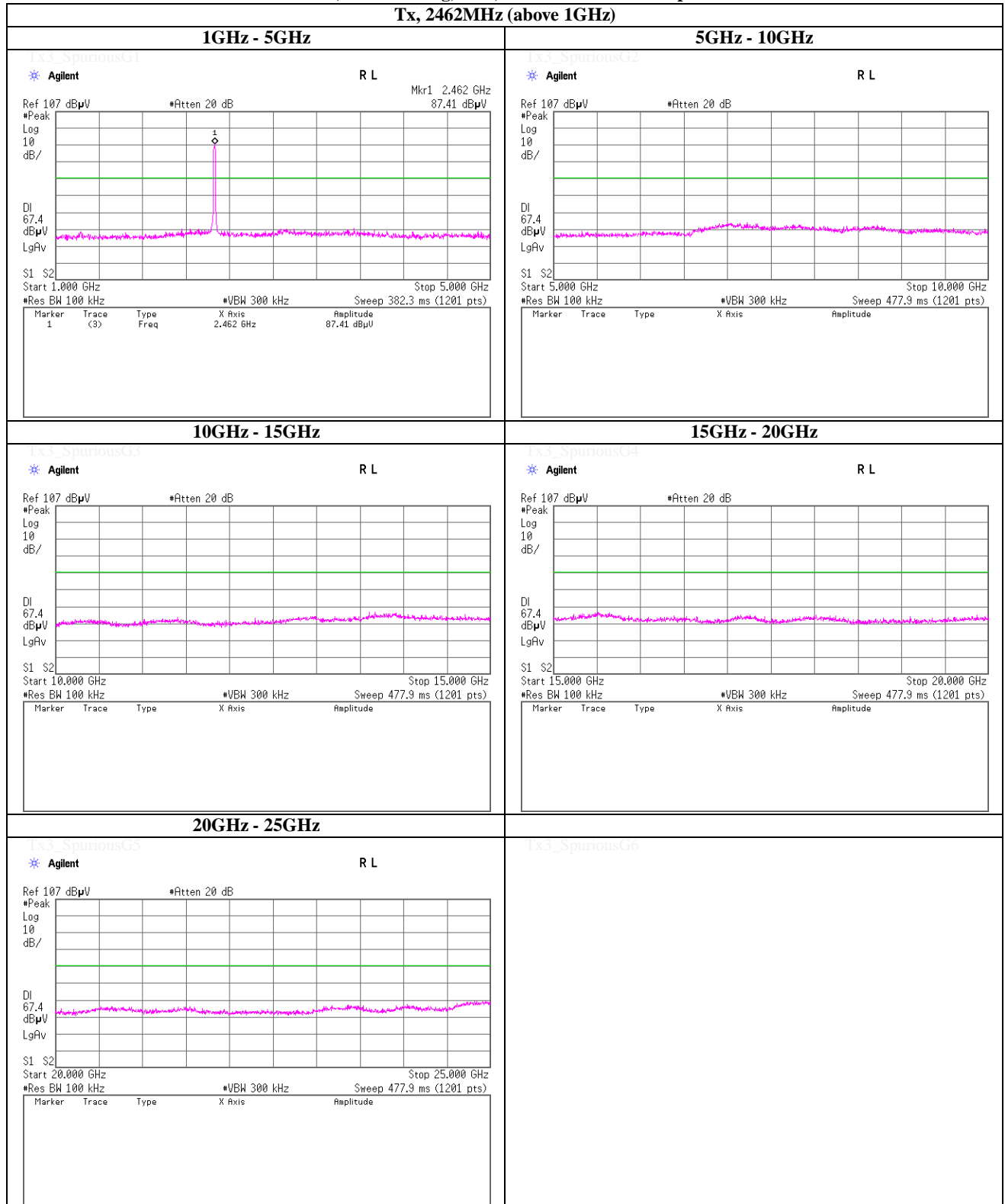
(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11g, PN9, worst data mode 6Mbps****Tx, 2437MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

(Reference chart) Spurious emission (Conducted)

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

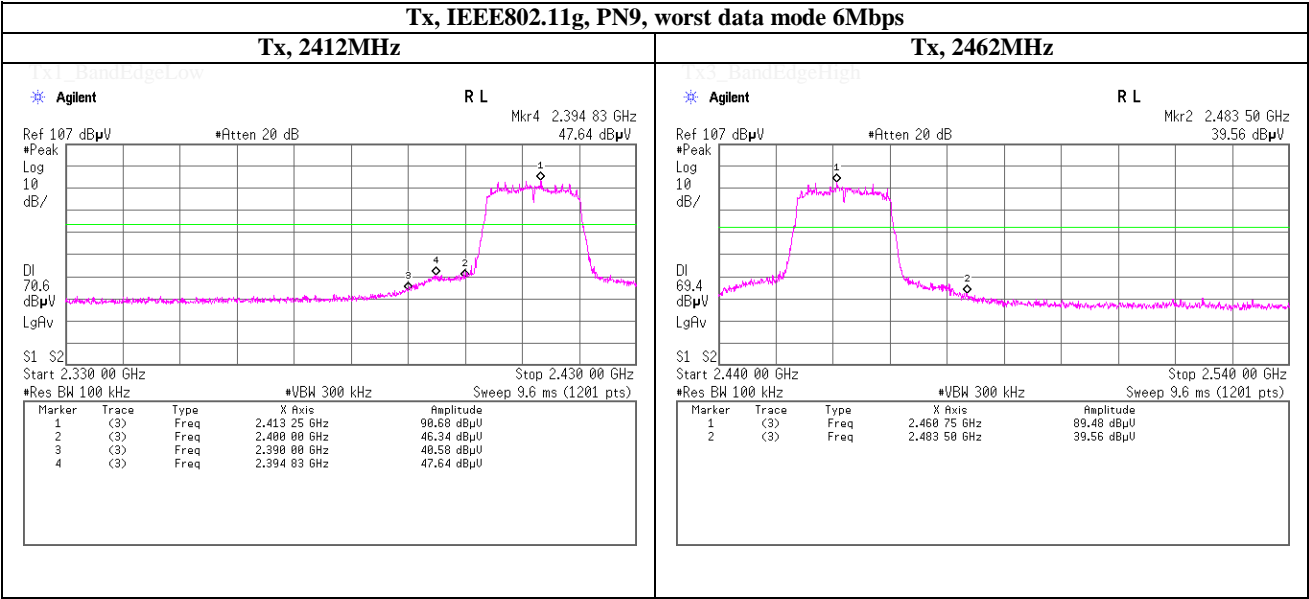
Tx, 2462MHz (below 1GHz)



(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11g, PN9, worst data mode 6Mbps****Tx, 2462MHz (above 1GHz)****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**

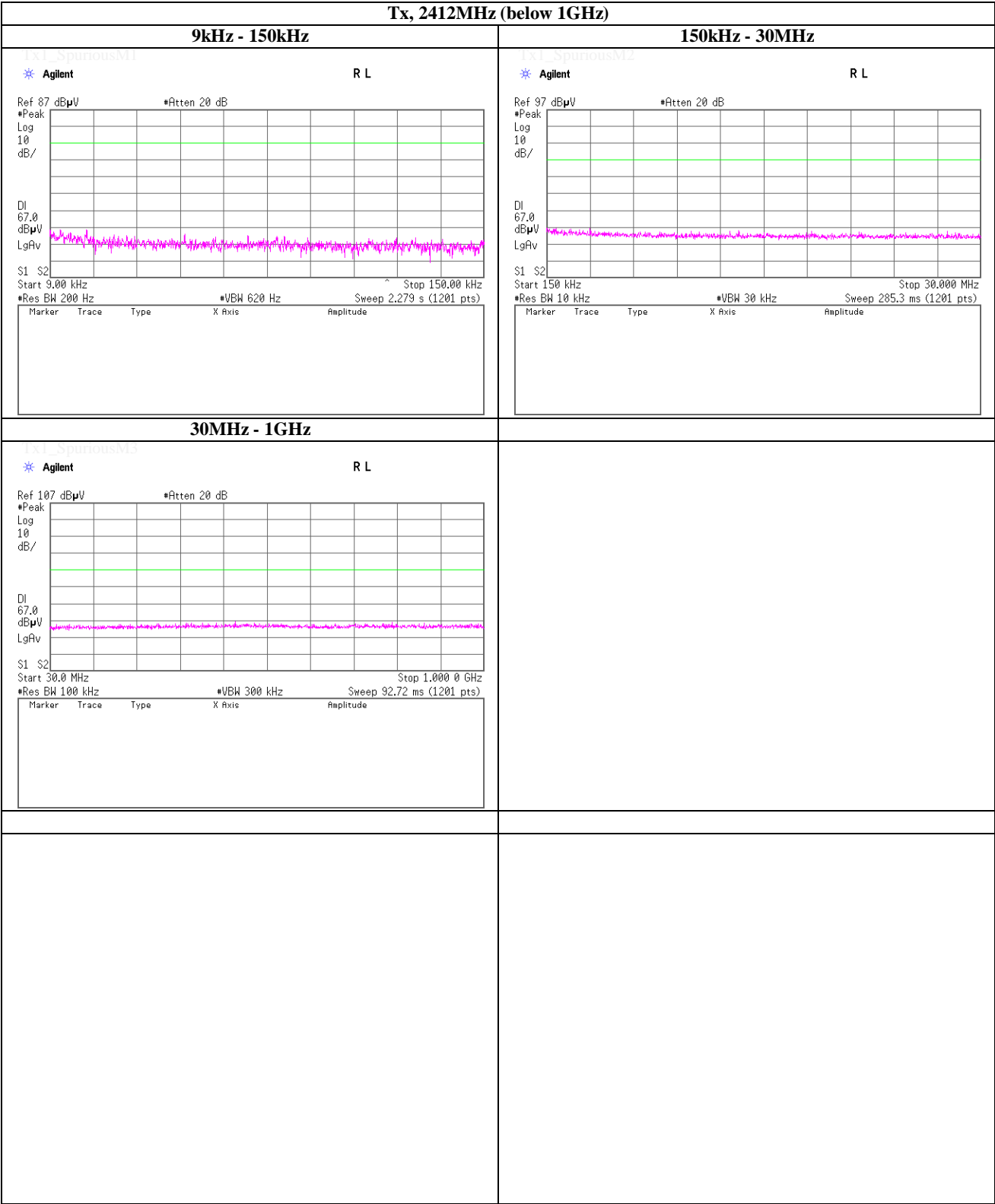
(Reference chart) Spurious emission (Conducted)

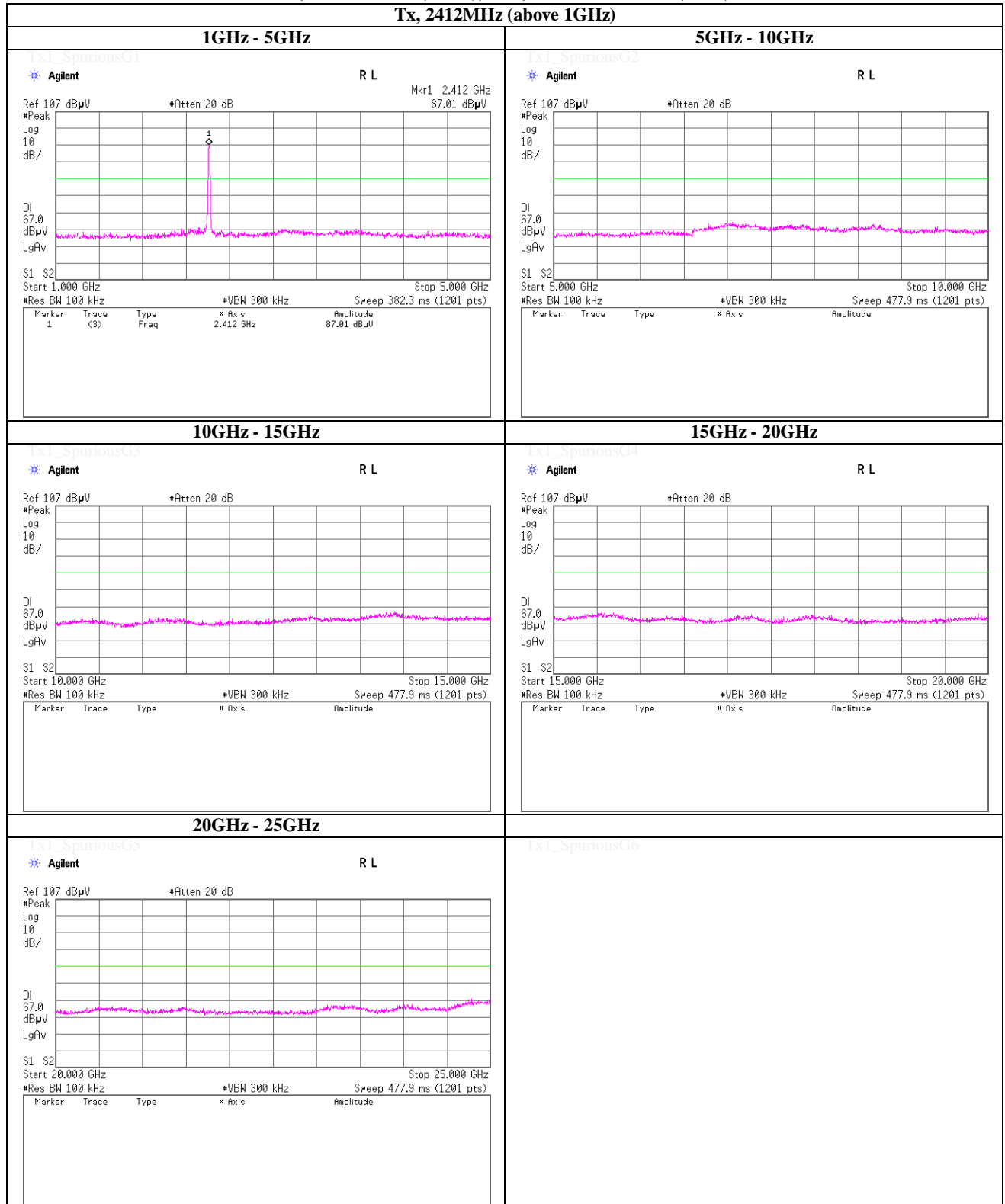
Band Edge compliance



(Reference chart) Spurious emission (Conducted)

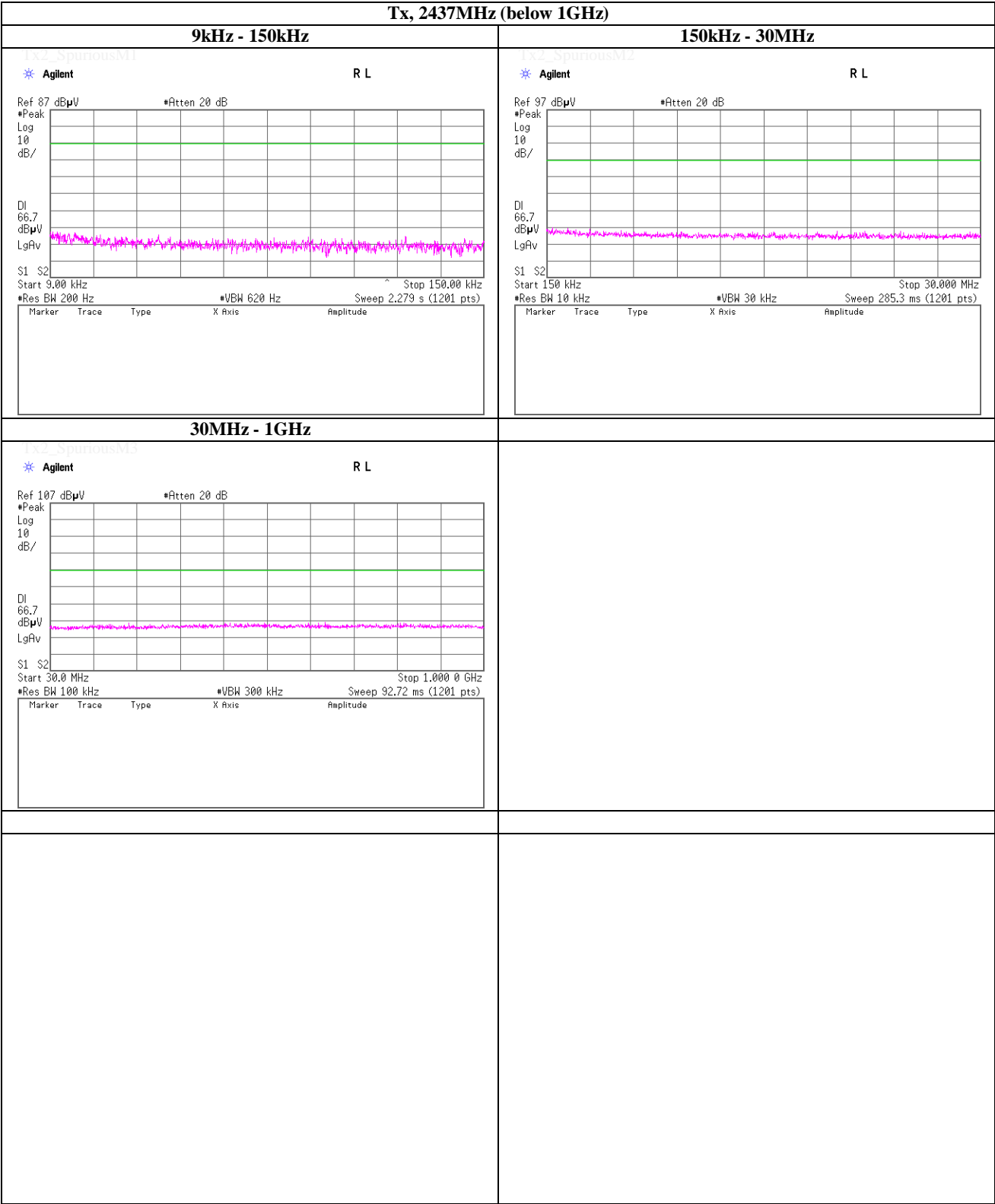
Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)

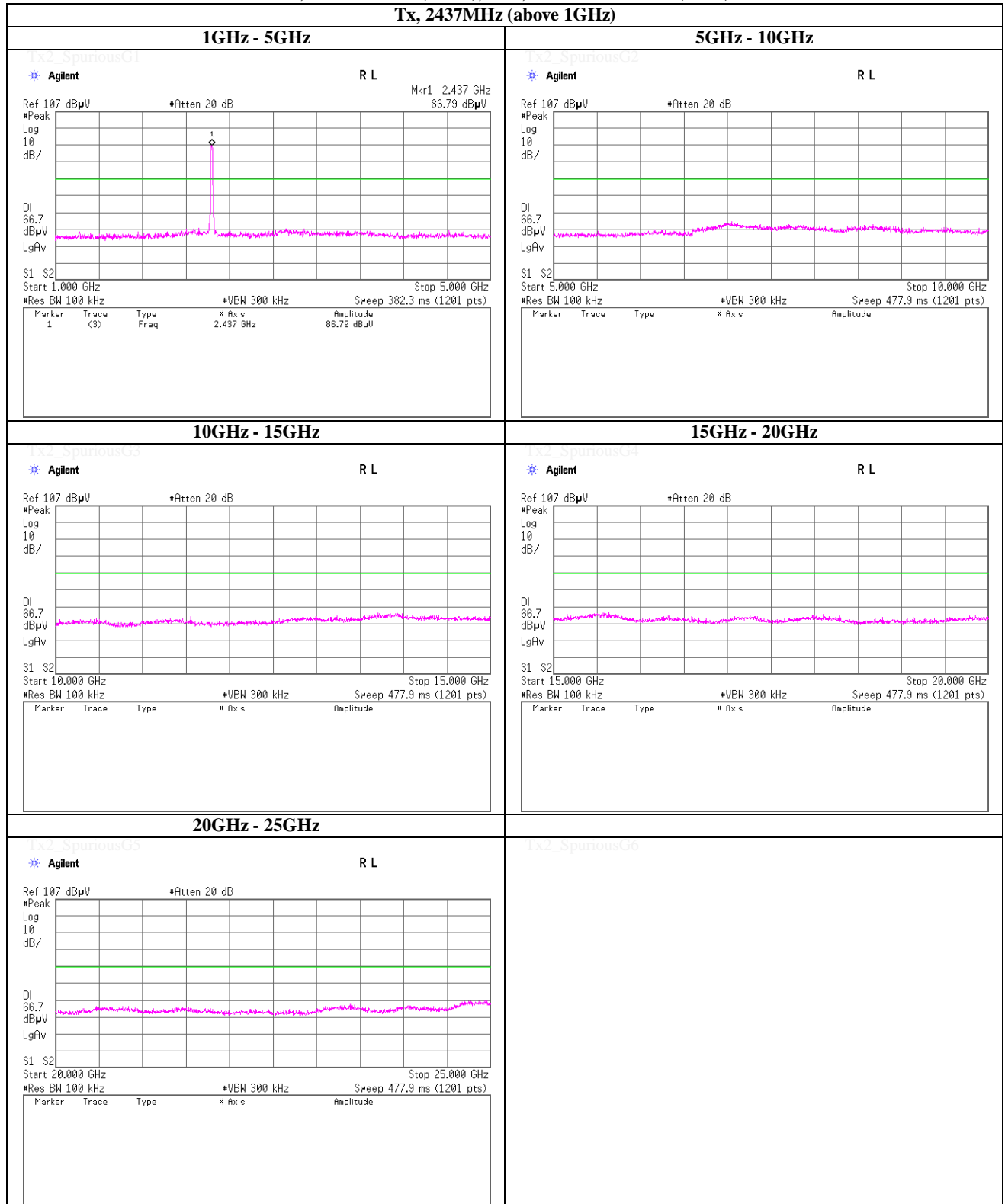


(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)****Tx, 2412MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

(Reference chart) Spurious emission (Conducted)

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

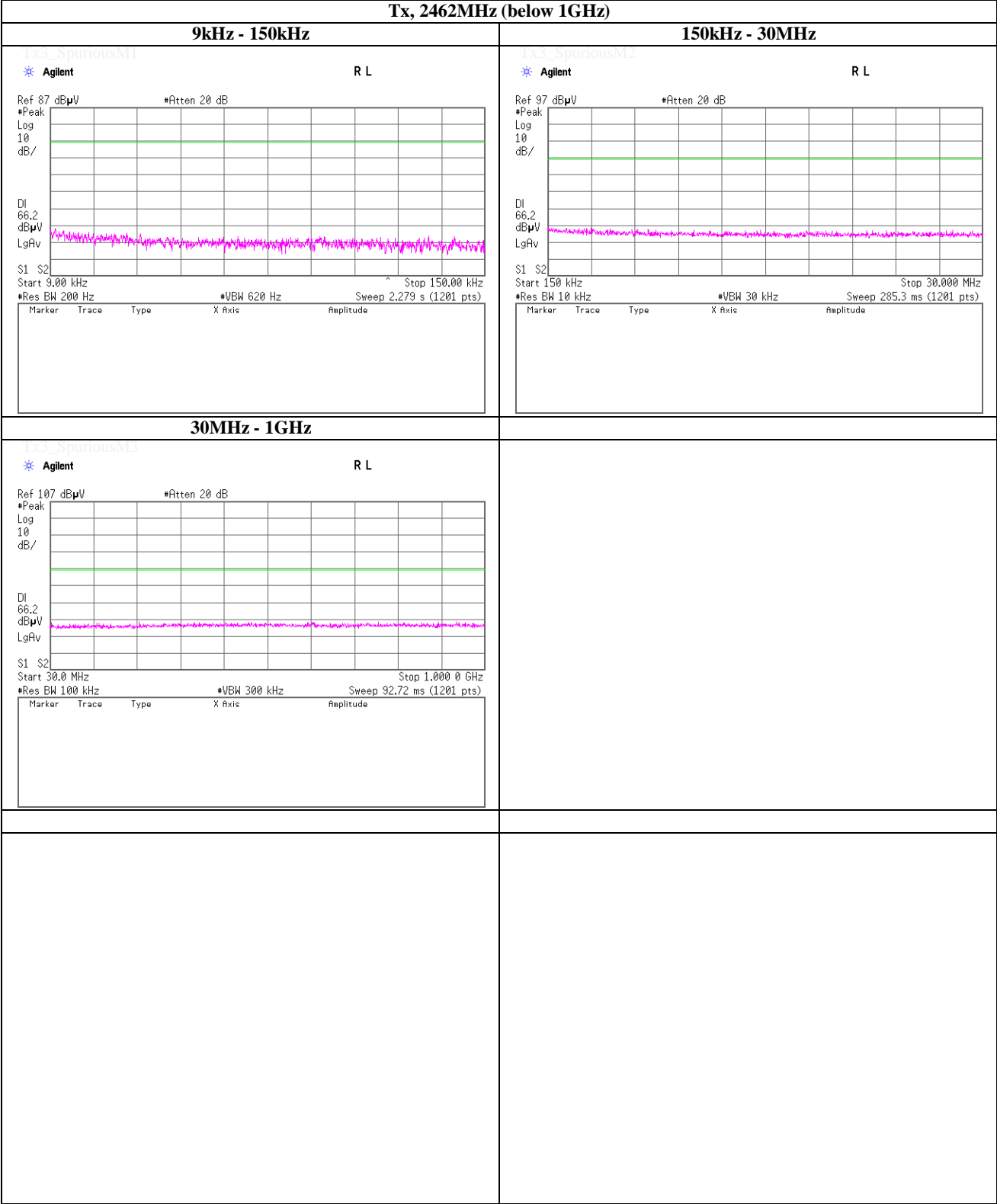


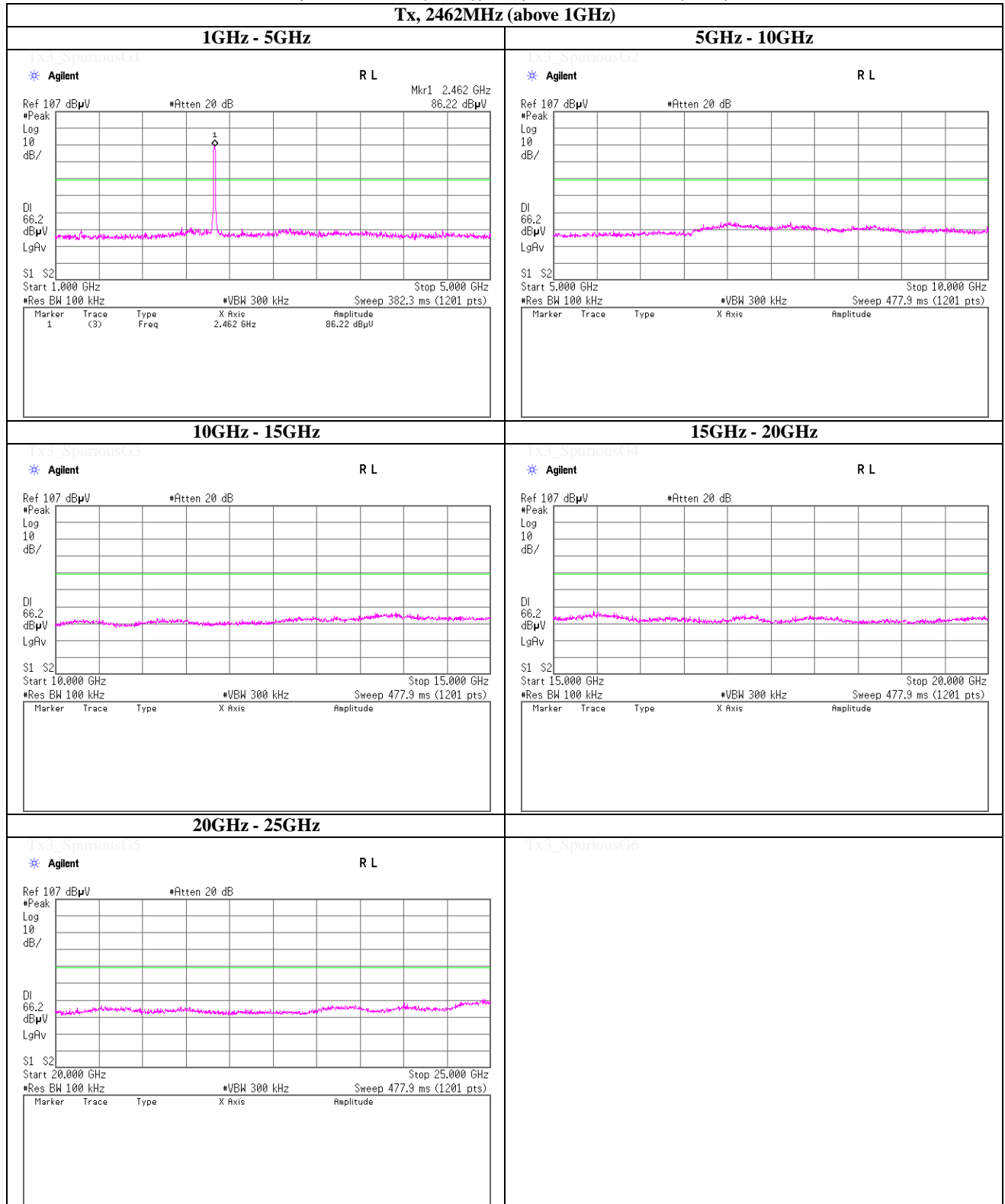
(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)****Tx, 2437MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

(Reference chart) Spurious emission (Conducted)

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

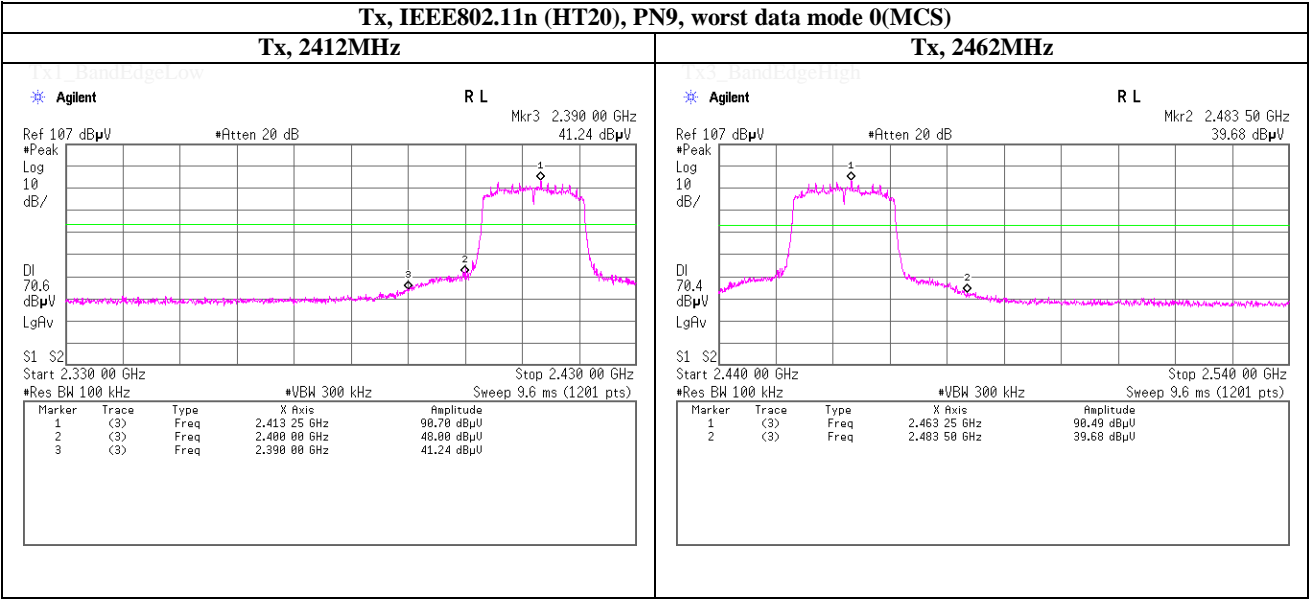
Tx, 2462MHz (below 1GHz)



(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)****Tx, 2462MHz (above 1GHz)****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



Maximum Power Spectral Density

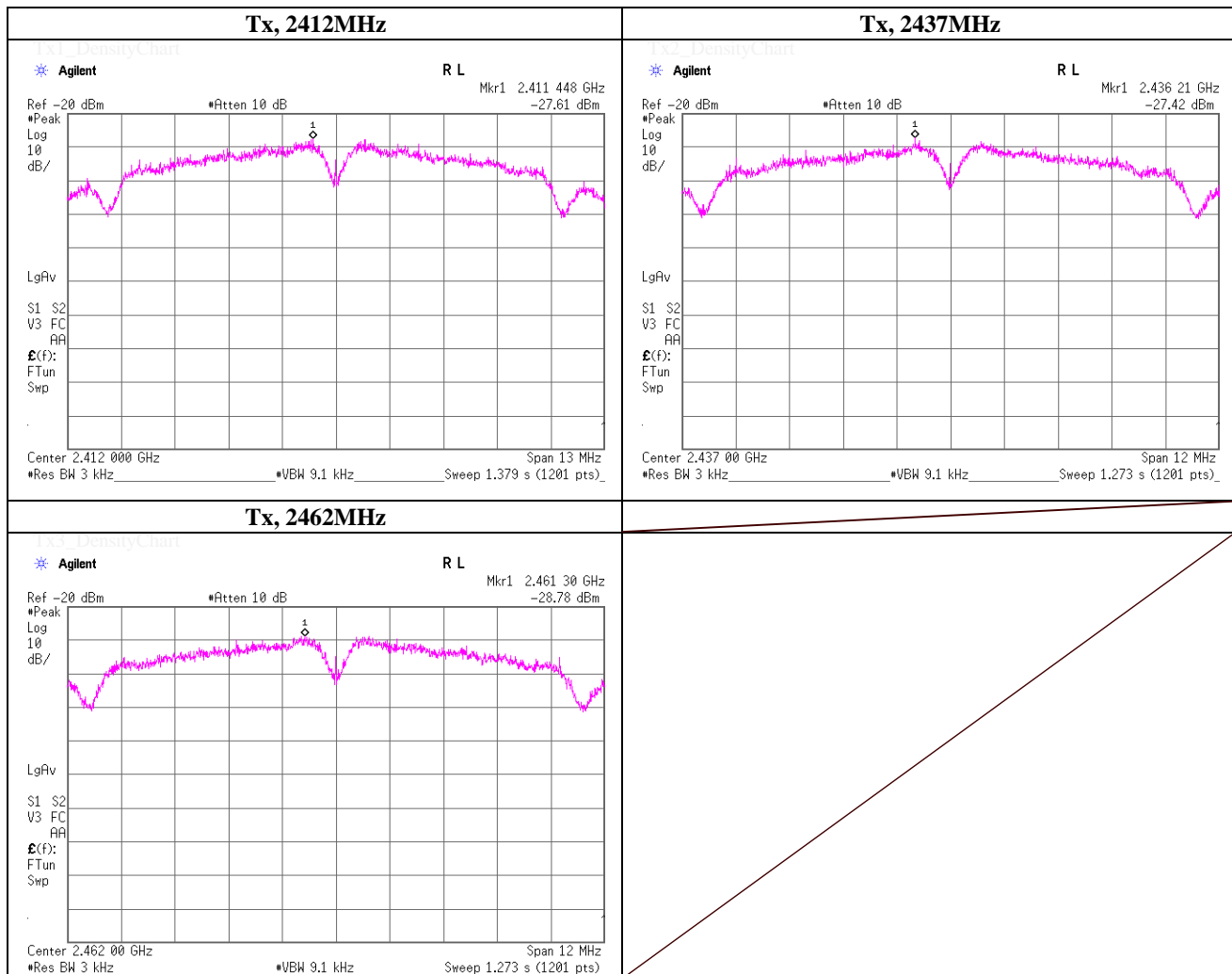
(Option 1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Shielded Room
Date	March 12, 2013	
Temperature / Humidity	22deg.C , 33%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11b, PN9, worst data mode 1Mbps	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2411.45	-27.61	1.30	9.62	-16.68	8.00	24.68
2437.0000	2436.21	-27.42	1.30	9.63	-16.49	8.00	24.49
2462.0000	2461.30	-28.78	1.31	9.63	-17.84	8.00	25.84

Sample Calculation:

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

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Maximum Power Spectral Density

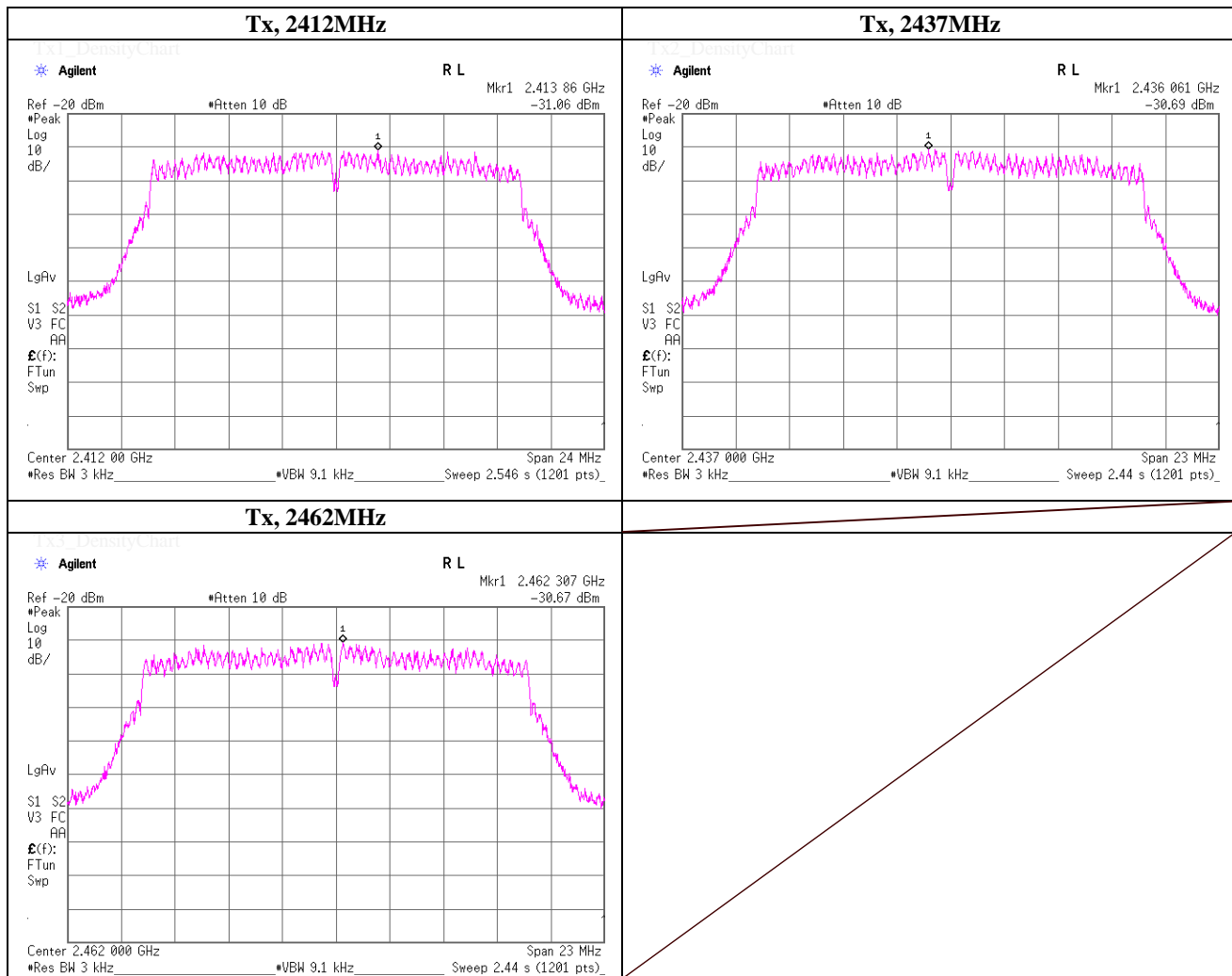
(Option 1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Shielded Room
Date	March 12, 2013	
Temperature / Humidity	22deg.C , 33%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2413.86	-31.06	1.30	9.62	-20.14	8.00	28.14
2437.0000	2436.06	-30.69	1.30	9.63	-19.76	8.00	27.76
2462.0000	2462.31	-30.67	1.31	9.63	-19.73	8.00	27.73

Sample Calculation:

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

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Maximum Power Spectral Density

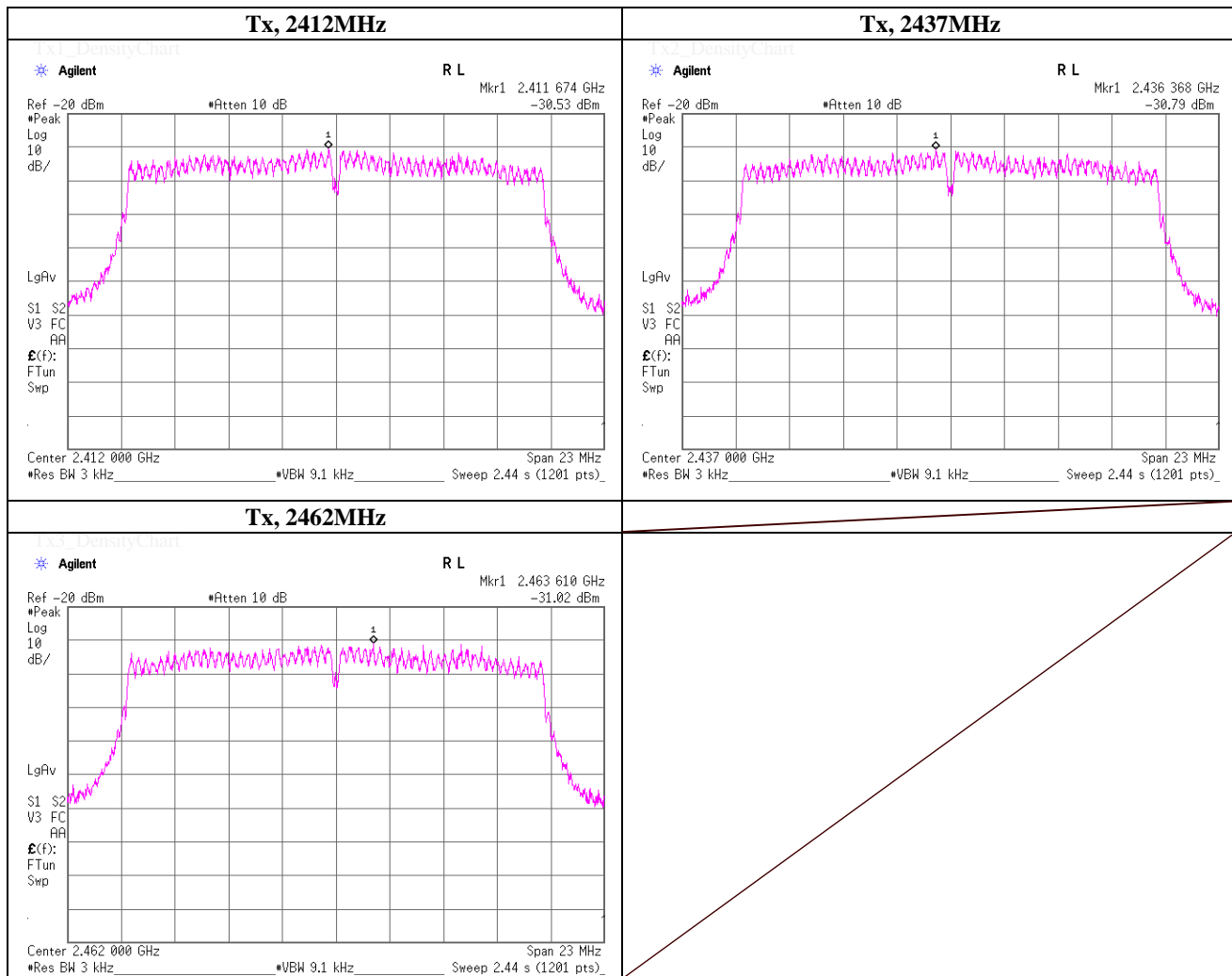
(Option 1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Shielded Room
Date	March 12, 2013	
Temperature / Humidity	22deg.C , 33%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11n (HT20), PN9, worst data mode 0(MCS)	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2411.67	-30.53	1.30	9.62	-19.60	8.00	27.60
2437.0000	2436.37	-30.79	1.30	9.63	-19.86	8.00	27.86
2462.0000	2463.61	-31.02	1.31	9.63	-20.08	8.00	28.08

Sample Calculation:

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

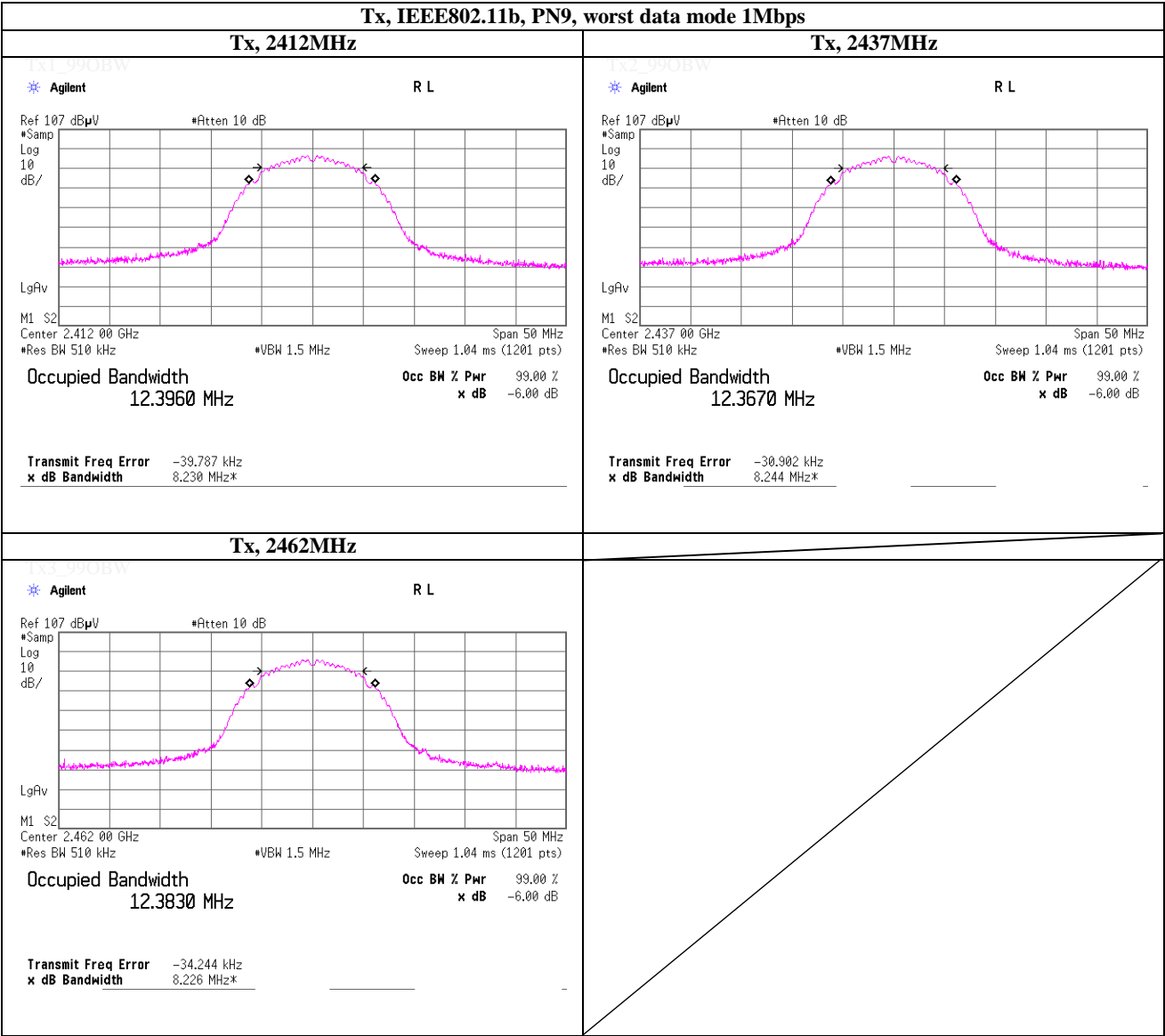
**UL Japan, Inc.****Shonan EMC Lab.**

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

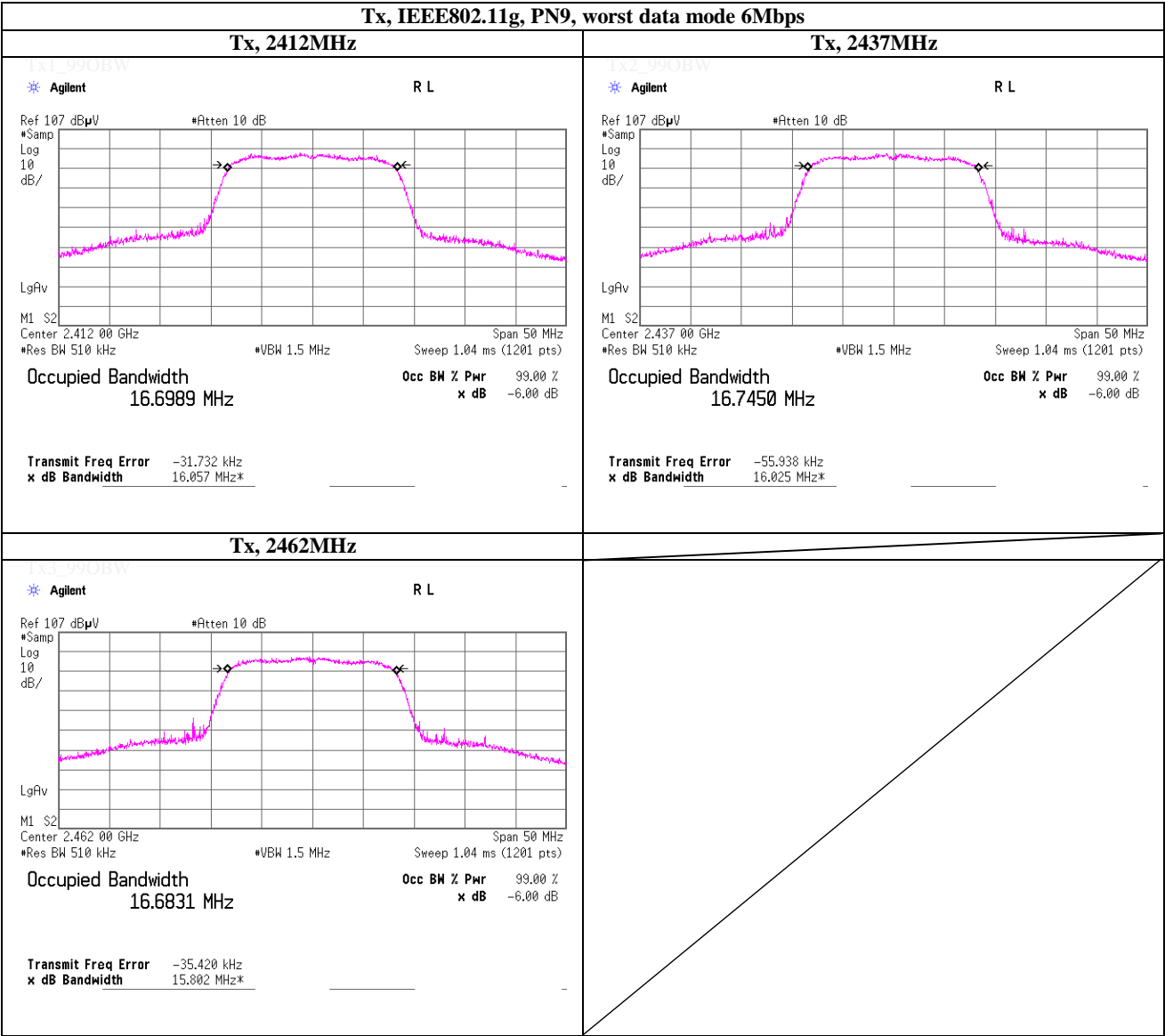
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

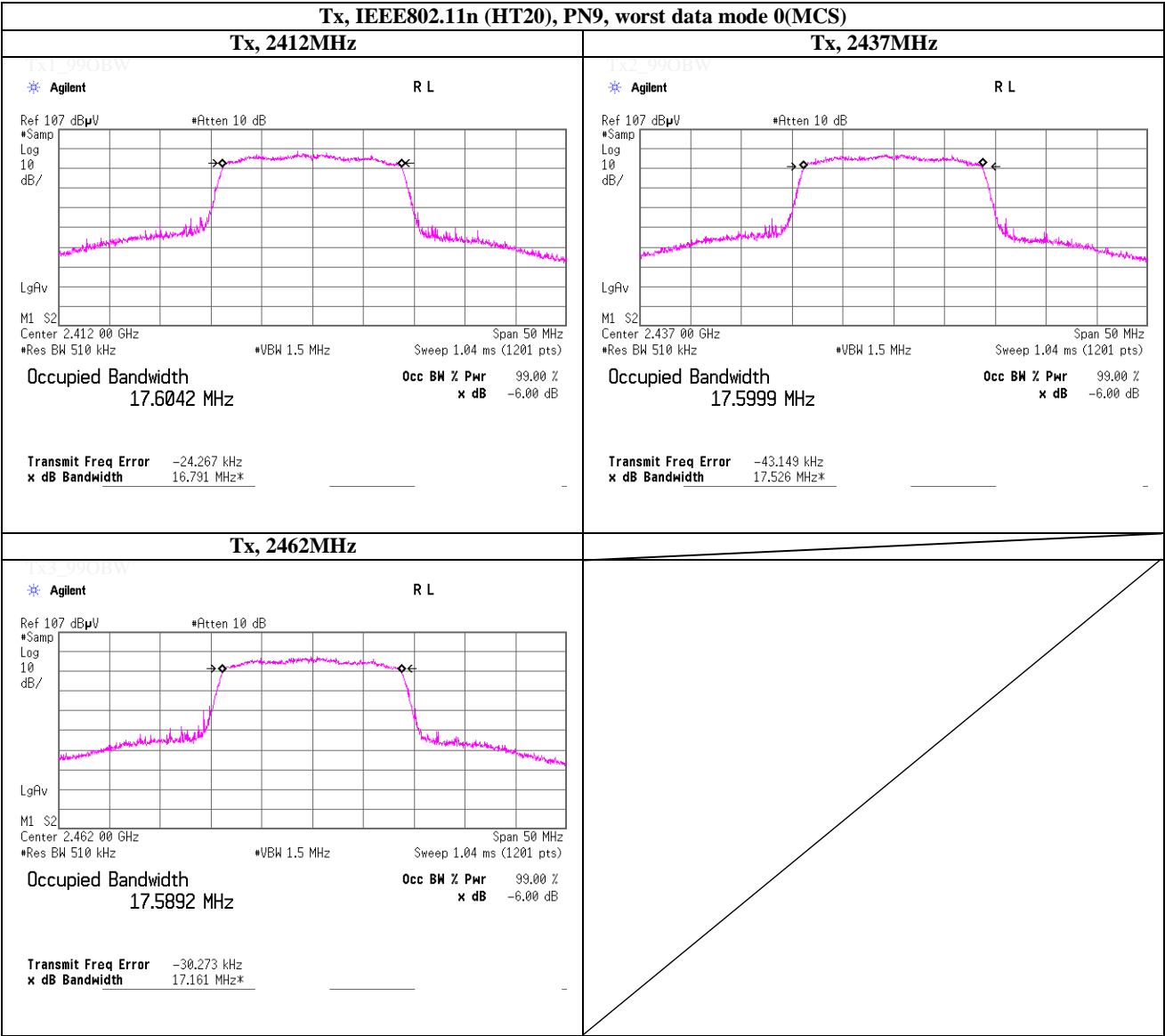
99% Occupied Bandwidth



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)
KPM-08	Power meter	Anritsu	ML2495A	6K00003356	AT	2012/09/14 * 12
KPSS-04	Power sensor	Anritsu	MA2411B	012088	AT	2012/09/14 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	AT	2012/03/16 * 12
SAT10-09	Attenuator	Weinschel Corp.	54A-10	W5692	AT	2012/11/15 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	AT	2012/03/12 * 12
SOS-10	Humidity Indicator	A&D	AD-5681	4064561	AT	2013/02/27 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT	2013/03/04 * 12
SOS-02	Humidity Indicator	A&D	AD-5681	4063343	AT	2013/03/07 * 12
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2012/09/21 * 12
SAF-05	Pre Amplifier	TOYO Corporation	TPA0118-36	1440490	RE	2012/03/12 * 12
SCC-G02	Coaxial Cable	Suhner	SUCOFLEX 104A	46498/4A	RE	2012/04/10 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2012/05/22 * 12
SHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	RE	2012/08/17 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2013/02/27 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2013/03/04 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RF, MF)	-	RE	-
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2012/12/18 * 12
SAT10-05	Attenuator(above1GHz)	Agilent	8493C-010	74864	RE	2012/12/18 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2012/09/21 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2012/07/18 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	2012/04/10 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2012/05/22 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2012/08/17 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2013/02/27 * 12
SJM-11	Measure	PROMART	SEN1935	-	RE	-
SAH-05	Artificial Hand RC-Element	UL Japan	-	005	RE	2013/02/20 * 12
SAF-09	Pre Amplifier	TOYO Corporation	HAP18-26W	00000018	RE	2012/03/12 * 12
SCC-G18	Coaxial Cable	Suhner	SUCOFLEX 104A	46292/4A	RE	2012/03/12 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2013/02/12 * 12
SAT6-03	Attenuator	JFW	50HF-006N	-	RE	2013/02/12 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2012/10/08 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2012/04/10 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2012/10/08 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE	2013/02/27 * 12

The expiration date of the calibration is the end of the expired month .

As for some calibrations performed after the tested dates , those test equipment have been controlled by means of an unbroken chains of calibrations .

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

Test Item :

CE: Conducted emission,
RE: Radiated emission,
AT: Antenna terminal conducted

APPENDIX 3 Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SCC-C9/C10/SRSE-03	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/N S4906	-/0901-271 (RF Selector)	CE	2013/04/03 * 12
SLS-05	LISN	Rohde & Schwarz	ENV216	100516	CE(EUT)	2013/02/25 * 12
SLS-02	LISN	Rohde & Schwarz	ENV216	100512	CE(AE)	2013/02/21 * 12
SAT3-06	Attenuator	JFW	50HF-003N	-	CE	2013/02/12 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2013/03/07 * 12
STM-05	Terminator	TME	CT-01 BP	-	CE	2013/01/16 * 12
STR-03	Test Receiver	Rohde & Schwarz	ESI40	100054/040	CE	2012/06/14 * 12
SJM-11	Measure	PROMART	SEN1935	-	CE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFI,MF)	-	CE	-

The expiration date of the calibration is the end of the expired month .

As for some calibrations performed after the tested dates , those test equipment have been controlled by means of an unbroken chains of calibrations .

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

Test Item :

CE: Conducted emission ,

RE: Radiated emission ,

AT: Antenna terminal disturbance voltage