



RADIO TEST REPORT

Test Report No.: 32IE0082-SH-02-A

Applicant : **Canon Inc.**
Type of Equipment : **Wireless Module**
Model No. : **WM219**
FCC ID : **AZD219**
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.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by any agency of the Federal Government.
6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.

Date of test: August 21 to September 7, 2012

Tested by:

S. Takano

Shinichi Takano
Engineer of WiSE Japan,
UL Verification Service

Approved by :

T. Amamura

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

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REVISION HISTORY

Original Test Report No.: 32IE0082-SH-02-A

[illegible]

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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 : +81-3-3757-6218
Facsimile Number : +81-3-3757-8431
Contact Person : Ryoji Kon

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

2.1 Identification of E.U.T.

Type of Equipment : Wireless Module
Model Number : WM219
Serial Number : Refer to clause 4.2
Rating : DC3.3V
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 : August 6, 2012
Modification of EUT : No modification by the test lab.

2.2 Product description

Model: WM219 (referred to as the EUT in this report) is a Wireless Module.

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

<Radio part>

Equipment type : Transceiver
Frequency of operation : 2412-2462MHz (IEEE 802.11b, 11g, 11n-HT20)
2422-2452MHz (IEEE 802.11n-HT40)
Bandwidth : 20MHz (IEEE 802.11b, 11g, 11n-HT20), 40MHz (IEEE 802.11n-HT40)
Channel spacing : 5MHz
Type of modulation : DSSS (IEEE 802.11b), OFDM (IEEE 802.11g/n)
Antenna type : Monopole type chip
Antenna connector type : None
Antenna gain : 1.3 dBi
ITU code : D1D, G1D
Operation temperature range : -20 to +55 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

The antenna is not removable from the EUT. Therefore, the equipment complies with the antenna 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 August 13, 2012 and effective September 12, 2012
 Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
 Section 15.207 Conducted limits
 Section 15.209 Radiated emission limits, general requirements
 Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz,
 and 5725-5850MHz

* The revision on August 13, 2012 does not affect the test specification applied to the EUT.

3.2 Procedures & Results

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.4:2009 7. AC powerline conducted emission measurements	FCC 15.207	-	N/A	16.9dB Freq.: 0.21775MHz Detector: Average Phase: N Mode: Tx 2437MHz, IEEE 802.11g	Complied
6dB bandwidth	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (a)(2)	Conducted	N/A	* See data	Complied
Maximum peak output power	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (b)(3)	Conducted	N/A		Complied
Out of band emission & Restricted band edges	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.109, 15.247 (d) & 15.209	Conducted / Radiated	N/A	0.5dB Freq.: 2483.5MHz Detector: Average Polarization: Horizontal Mode: Tx 2452MHz, IEEE 802.11n-40	Complied
Power density	ANSI C63.4:2009 13. Measurement of intentional radiators	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.

These tests were also referred to "Guidance on Measurement for Digital Transmission Systems Section15.247".

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied bandwidth (99%)	ANSI C63.4:2009 13. Measurement of intentional radiators, RSS-Gen 4.6.1	-	Conducted	-	-

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

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

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3.4 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

Item	Frequency range	No.1 SAC ^{*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)	15GHz-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 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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JAB Accreditation No. : RTL02610

	FCC Registration No.	IC Registration No.	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
☐ No.1 semi-anechoic chamber	697847	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☒ No.2 semi-anechoic chamber	697847	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☒ No.3 semi-anechoic chamber	697847	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
☐ No.4 semi-anechoic chamber	-	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
☐ No.1 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
☐ No.2 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
☒ No.3 shielded room	-	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
☐ No.4 shielded room	-	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
☒ No.5 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
☐ No.6 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-

3.6 Test setup, Data of EMI & Test instruments

Refer to APPENDIX 3 to 3.

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

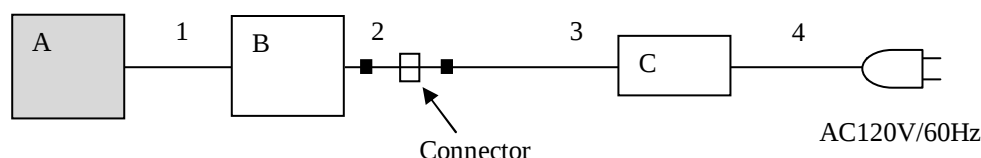
4.1 Operating mode

Test item	Mode	Tested frequency	Power setting *1)	Worst data rate *2)
Conducted emission Radiated emission (below 1GHz) *3)	Transmitting IEEE 802.11g	2437MHz	Max.: 12dBm	6Mbps, PN9
			Min.: 10dBm	
Other items	Transmitting IEEE 802.11b	2412MHz, 2437MHz, 2462MHz	Max.: 14dBm	1Mbps, PN9
			Min.: 11dBm	
	Transmitting IEEE 802.11g	2412MHz, 2437MHz, 2462MHz	Max.: 12dBm	6Mbps, PN9
			Min.: 10dBm	
	Transmitting IEEE 802.11n-20	2412MHz, 2437MHz, 2462MHz	Max.: 12dBm	MCS2, PN9
			Min.: 10dBm	
	Transmitting IEEE 802.11n-40	2422MHz, 2437MHz, 2452MHz	Max.: 11dBm	MCS5, PN9
			Min.: 9dBm	
*1) The actual output power differs from the setting value. Based on the specifications, the maximum and minimum values are set. Software used for the test: RFTTEST ver .14.0				
*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

■: Ferrite core (Standard attachment)



* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless Module	WM219	*1)	Canon	EUT
B	Digital Camera	PC1739	431030032123	Canon	-
C	Compact Power Adapter	CA-DC10 N	1152	Canon	-

*1) Conducted / Radiated emission: D377, Other test: D37E

List of cables used

No.	Cable Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Jig	0.15	Unshielded	Unshielded	-
2	DC	0.15	Unshielded	Unshielded	-
3	DC	1.9	Unshielded	Unshielded	-
4	AC	1.9	Unshielded	Unshielded	-

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SECTION 5: Conducted emission

5.1 Operating environment

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

5.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 0.8m above the conducting ground plane.

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

The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals was aligned and was flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from LISN.

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 host device 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, 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. The rear of EUT was aligned and flushed with rear of tabletop.
 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	RBW: 1MHz VBW: 10Hz	RBW: 100kHz VBW: 300kHz

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

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

Worst case:

Antenna polarization	Carrier (Band edge)	Spurious			
		Below 1GHz	1-2.8GHz	2.8-15GHz	15-25GHz
Horizontal	X	Z	X	X	X
Vertical	Z	Z	X	X	X

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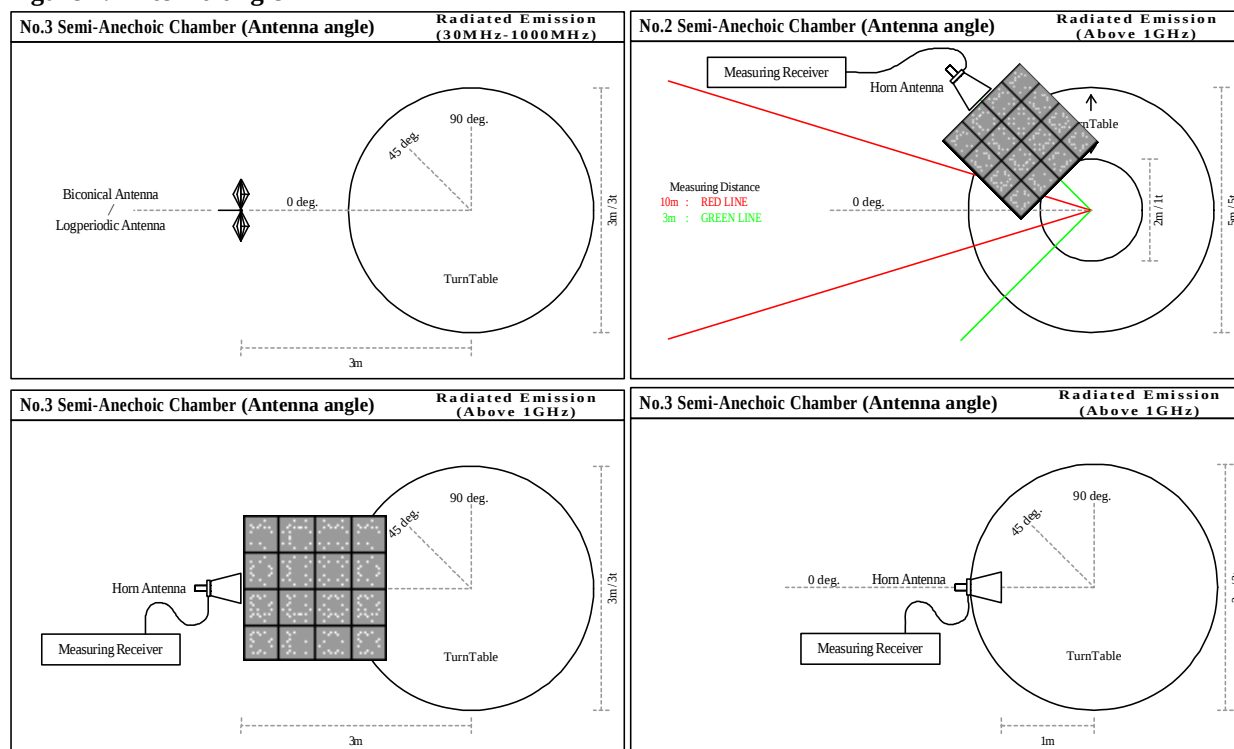
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Figure 1. Antenna angle



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.

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.
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 10: Peak power density

Test procedure

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

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

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

Summary of the test results: Pass
Refer to APPENDIX 1

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Contents of APPENDIXES

APPENDIX 1: Data of Radio tests

Conducted emission
6dB bandwidth
Maximum peak output power
Radiated emission
Spurious emission (Antenna port conducted)
Peak power density
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 : 2012/08/28

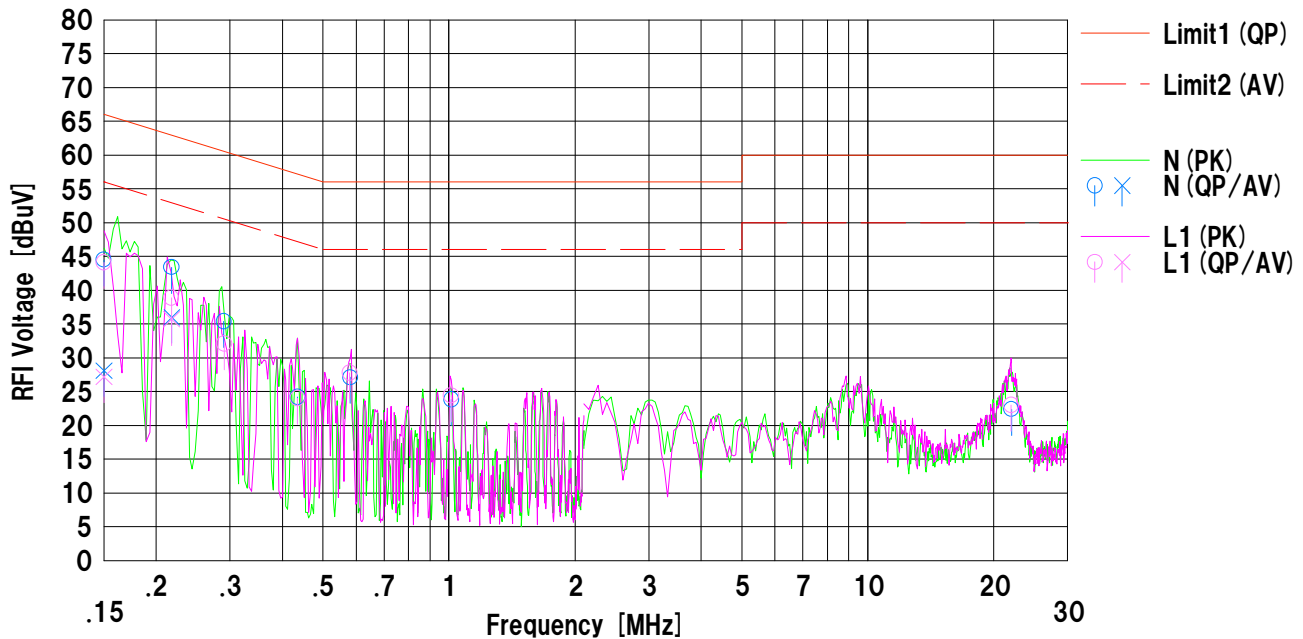
Company : Canon Inc.
Kind of EUT : Wireless Module
Model No. : WM219
Serial No. : D377

Mode : Tx 11g 2437MHz Power 12dBm
Report No. : 32IE0082-SH-02-A
Power : AC 120V / 60Hz
Temp./Humi. : 26deg.C. / 58%RH

Remarks : -

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

Engineer : Tatsuya Arai



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	31.8	15.4	12.7	44.5	28.1	66.0	56.0	21.5	27.9	N	
2	0.21775	30.7	23.3	12.7	43.4	36.0	62.9	52.9	19.5	16.9	N	
3	0.29000	22.7	---	12.7	35.4	---	60.5	50.5	25.1	---	N	
4	0.43525	11.5	---	12.7	24.2	---	57.1	47.1	32.9	---	N	
5	0.58100	14.4	---	12.7	27.1	---	56.0	46.0	28.9	---	N	
6	1.01350	11.1	---	12.7	23.8	---	56.0	46.0	32.2	---	N	
7	22.04200	8.8	---	13.6	22.4	---	60.0	50.0	37.6	---	N	
8	0.15000	31.4	14.5	12.7	44.1	27.2	66.0	56.0	21.9	28.8	L1	
9	0.21750	26.2	23.0	12.7	38.9	35.7	62.9	52.9	24.0	17.2	L1	
10	0.29075	19.4	---	12.7	32.1	---	60.5	50.5	28.4	---	L1	
11	0.43500	11.3	---	12.7	24.0	---	57.1	47.1	33.1	---	L1	
12	0.57950	15.1	---	12.7	27.8	---	56.0	46.0	28.2	---	L1	
13	1.01250	11.7	---	12.7	24.4	---	56.0	46.0	31.6	---	L1	
14	22.01000	9.4	---	13.6	23.0	---	60.0	50.0	37.0	---	L1	

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

DATA OF CONDUCTED EMISSION TEST

UL Japan,Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2012/08/29

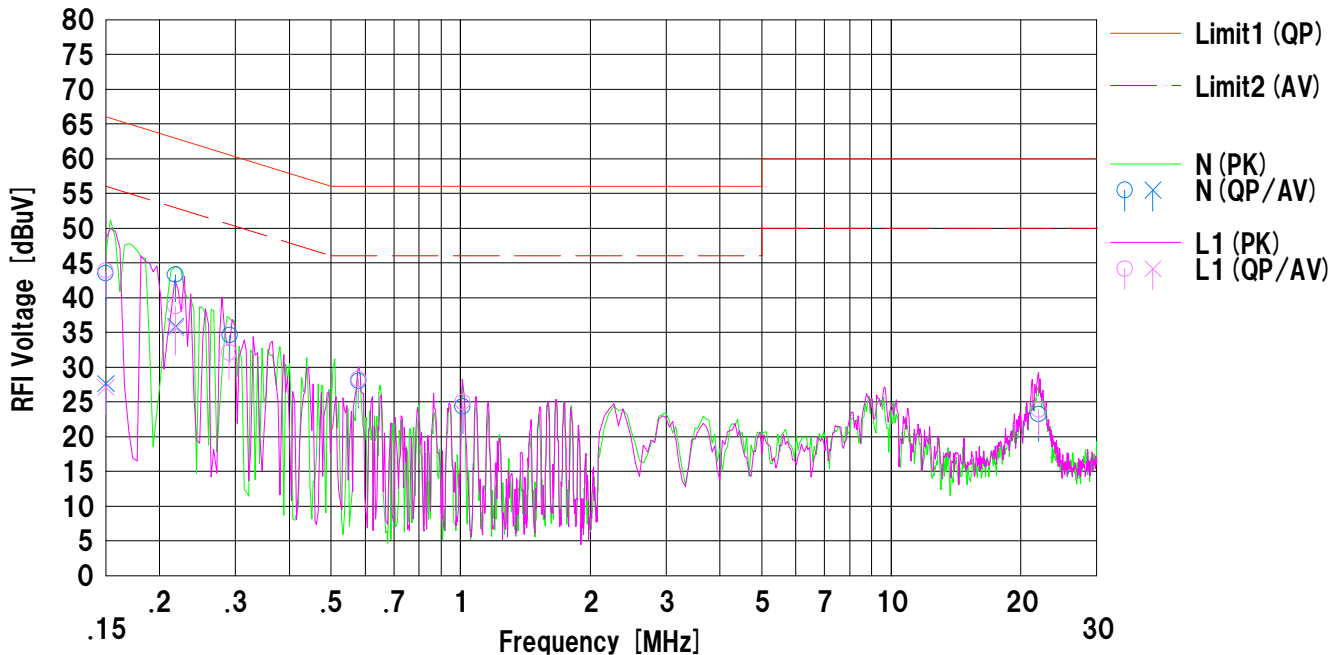
Company : Canon Inc.
Kind of EUT : Wireless Module
Model No. : WM219
Serial No. : D377

Mode : Tx 11g 2437MHz Power 10dBm
Report No. : 32IE0082-SH-02-A
Power : AC 120V / 60Hz
Temp./Humi. : 26deg.C. / 58%RH

Remarks : -

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

Engineer : Tatsuya Arai



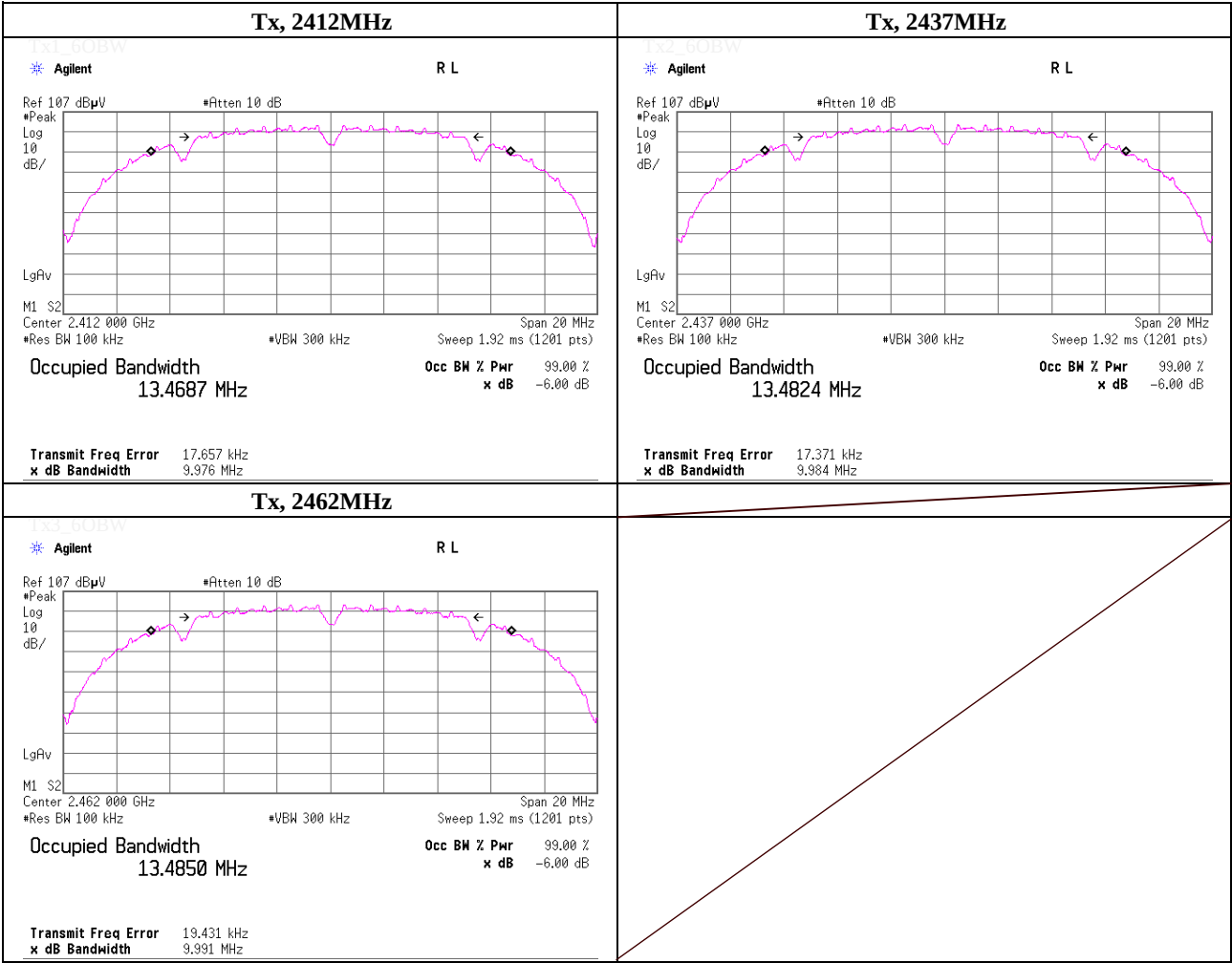
No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	30.8	14.9	12.7	43.5	27.6	66.0	56.0	22.5	28.4	N	
2	0.21775	30.6	23.2	12.7	43.3	35.9	62.9	52.9	19.6	17.0	N	
3	0.29100	21.9	---	12.7	34.6	---	60.4	50.4	25.8	---	N	
4	0.57925	15.3	---	12.7	28.0	---	56.0	46.0	28.0	---	N	
5	1.01125	11.6	---	12.7	24.3	---	56.0	46.0	31.7	---	N	
6	2.199400	9.6	---	13.6	23.2	---	60.0	50.0	36.8	---	N	
7	0.15000	31.2	14.4	12.7	43.9	27.1	66.0	56.0	22.1	28.9	L1	
8	0.21775	26.1	22.9	12.7	38.8	35.6	62.9	52.9	24.1	17.3	L1	
9	0.29000	19.4	---	12.7	32.1	---	60.5	50.5	28.4	---	L1	
10	0.57900	15.6	---	12.7	28.3	---	56.0	46.0	27.7	---	L1	
11	1.01175	12.3	---	12.7	25.0	---	56.0	46.0	31.0	---	L1	
12	2.199400	10.3	---	13.6	23.9	---	60.0	50.0	36.1	---	L1	

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

-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 27, 2012	
Temperature / Humidity	28deg.C , 48%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11b, PN9, worst data mode 1Mbps, power setting 14dBm	

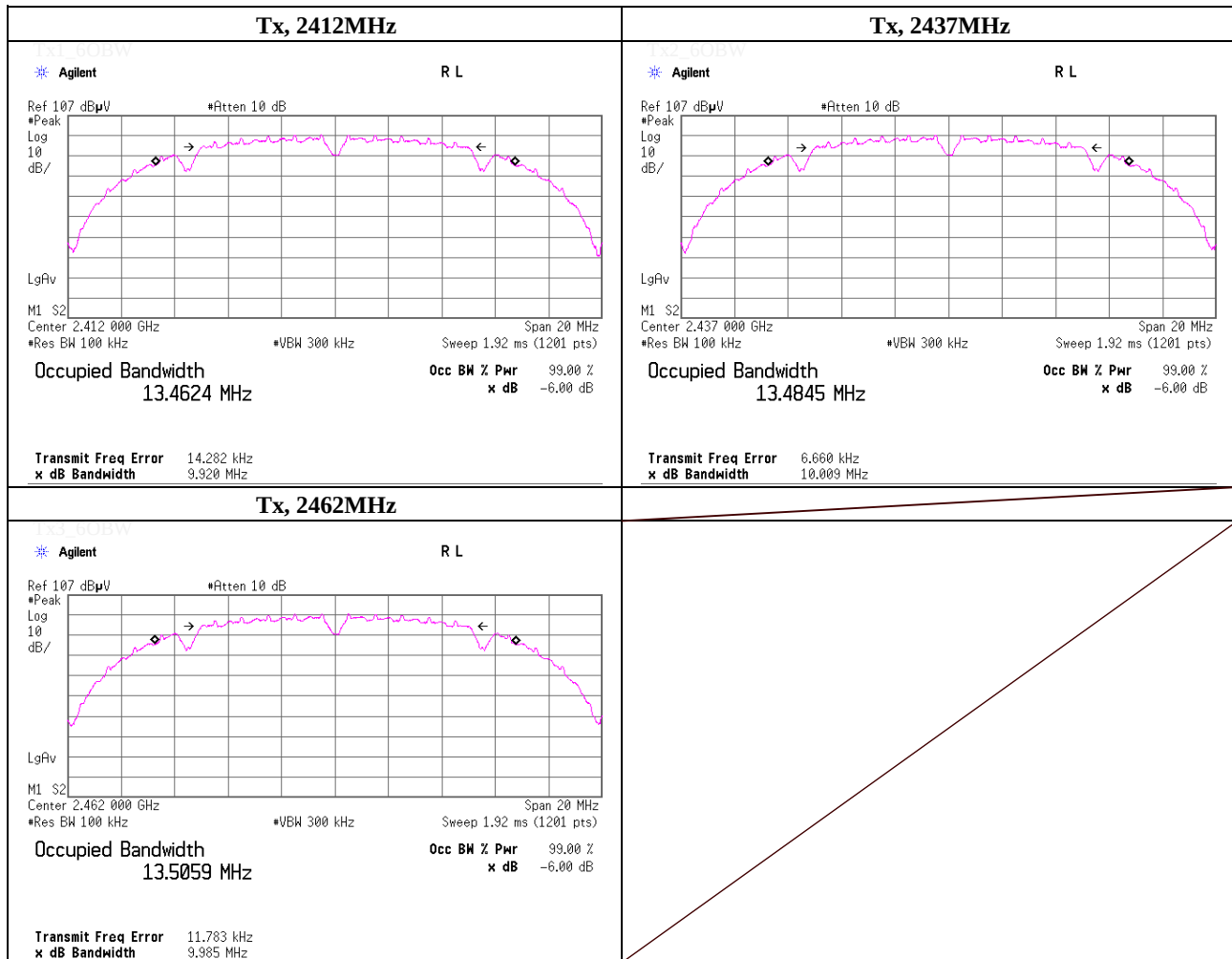
Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	9.976	> 0.500
2437.0000	9.984	> 0.500
2462.0000	9.991	> 0.500



-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 27, 2012	
Temperature / Humidity	28deg.C , 48%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11b, PN9, worst data mode 1Mbps, power setting 11dBm	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	9.920	> 0.500
2437.0000	10.009	> 0.500
2462.0000	9.985	> 0.500

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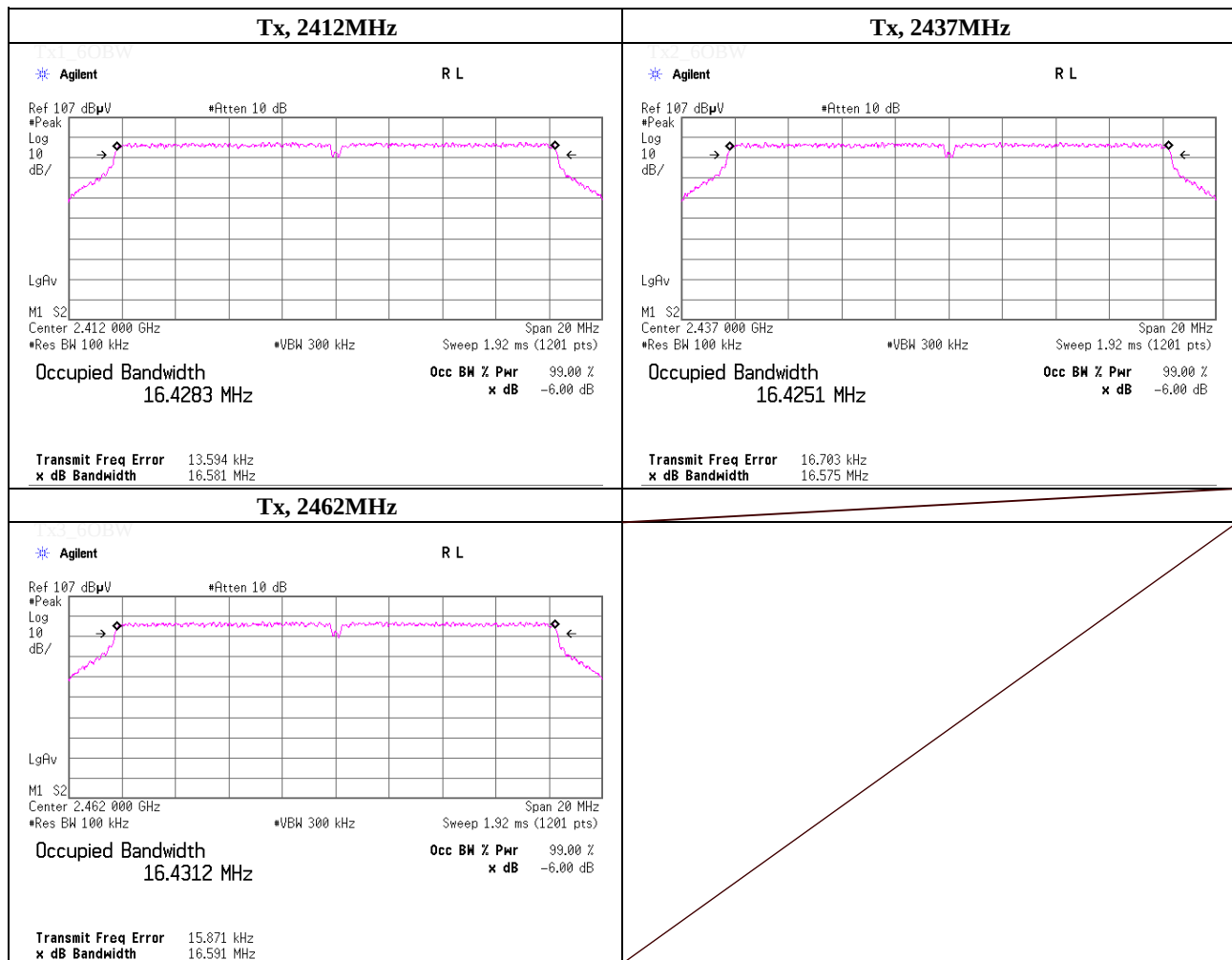
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Facsimile : +81 463 50 6401

-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 27, 2012	
Temperature / Humidity	28deg.C , 48%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps, power setting 12dBm	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.581	> 0.500
2437.0000	16.575	> 0.500
2462.0000	16.591	> 0.500

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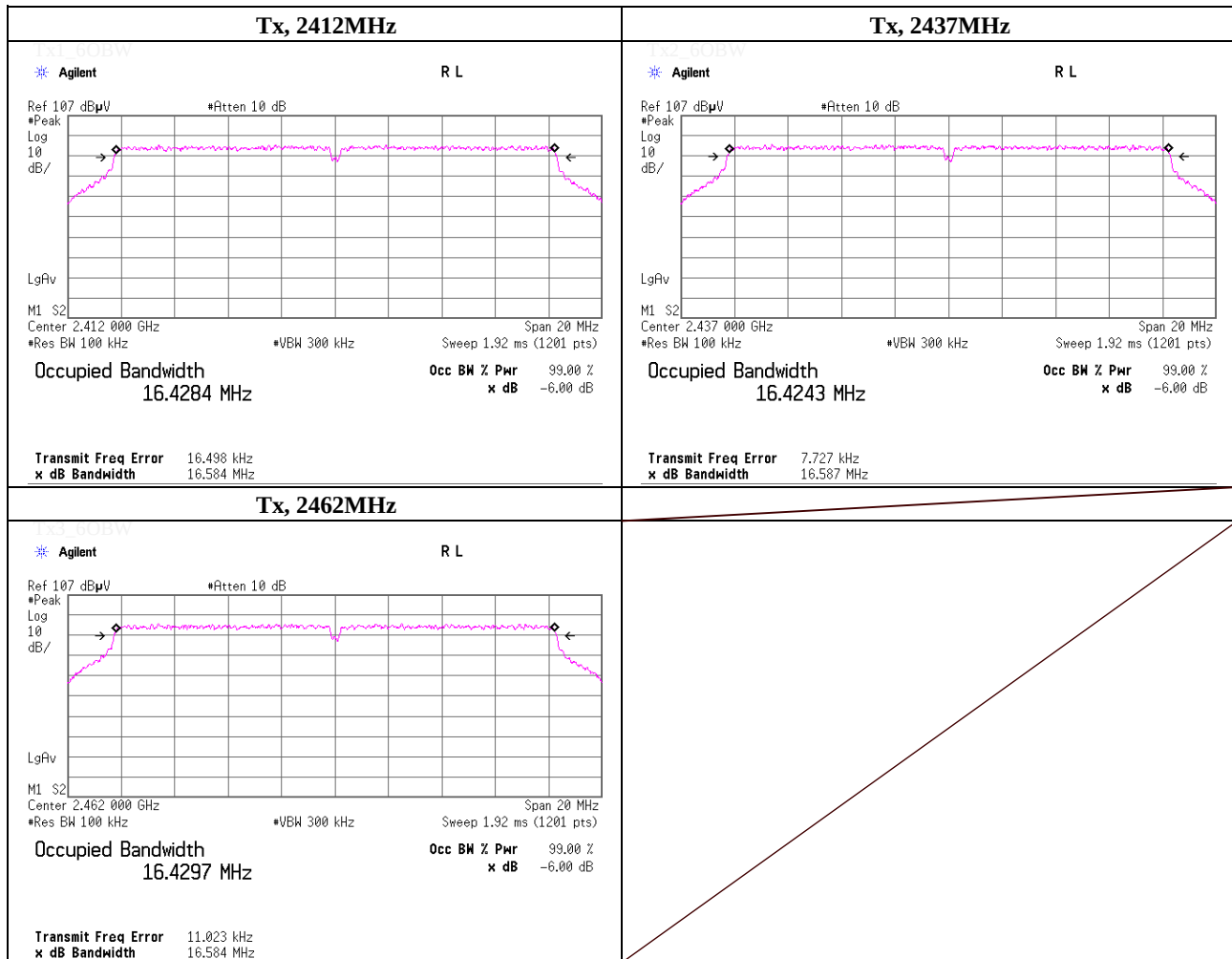
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Facsimile : +81 463 50 6401

-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 27, 2012	
Temperature / Humidity	28deg.C , 48%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps, power setting 10dBm	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.584	> 0.500
2437.0000	16.587	> 0.500
2462.0000	16.584	> 0.500

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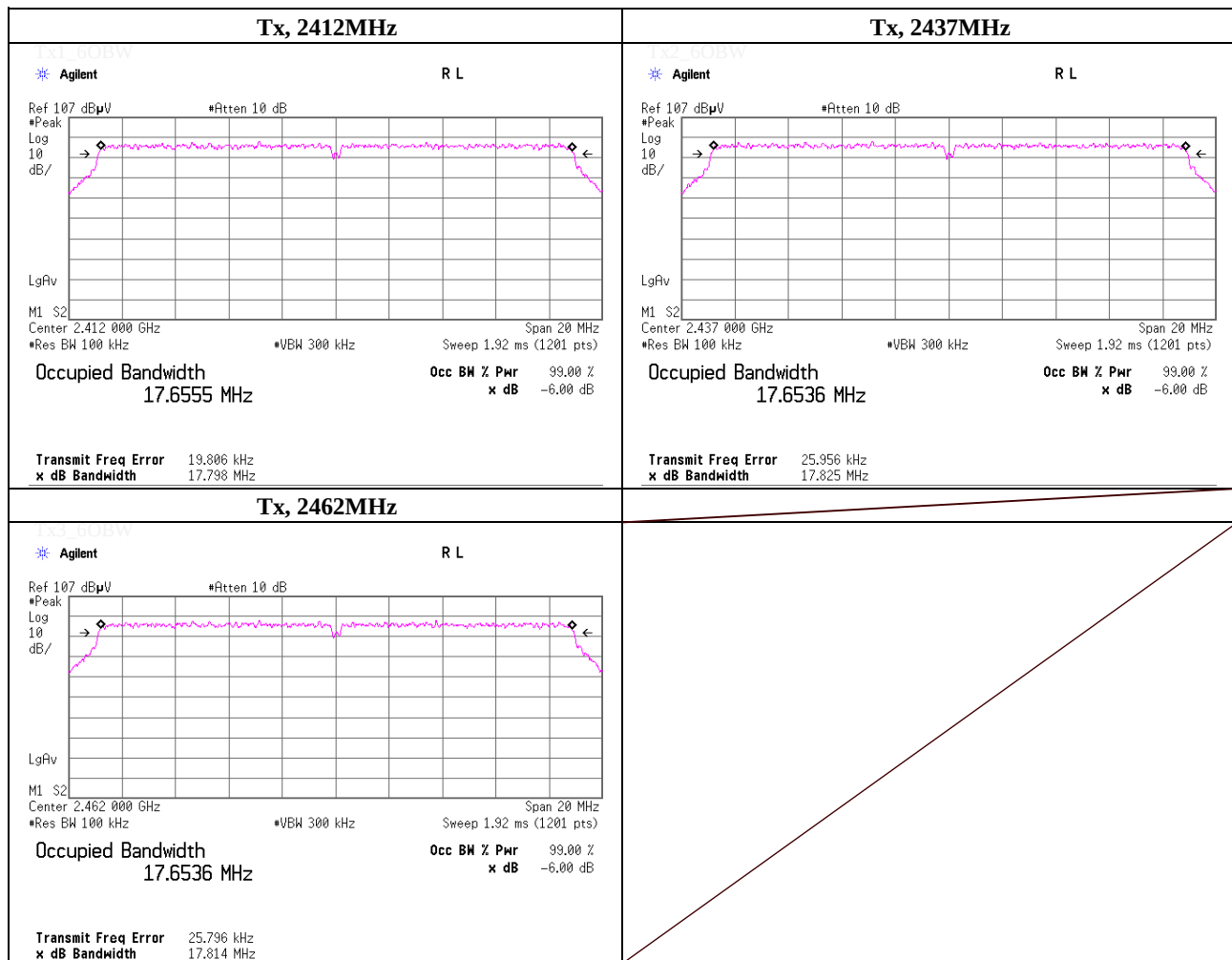
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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 27, 2012	
Temperature / Humidity	28deg.C , 48%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n-20HT, PN9, worst data mode 2(MCS), power setting 12dBm	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	17.798	> 0.500
2437.0000	17.825	> 0.500
2462.0000	17.814	> 0.500

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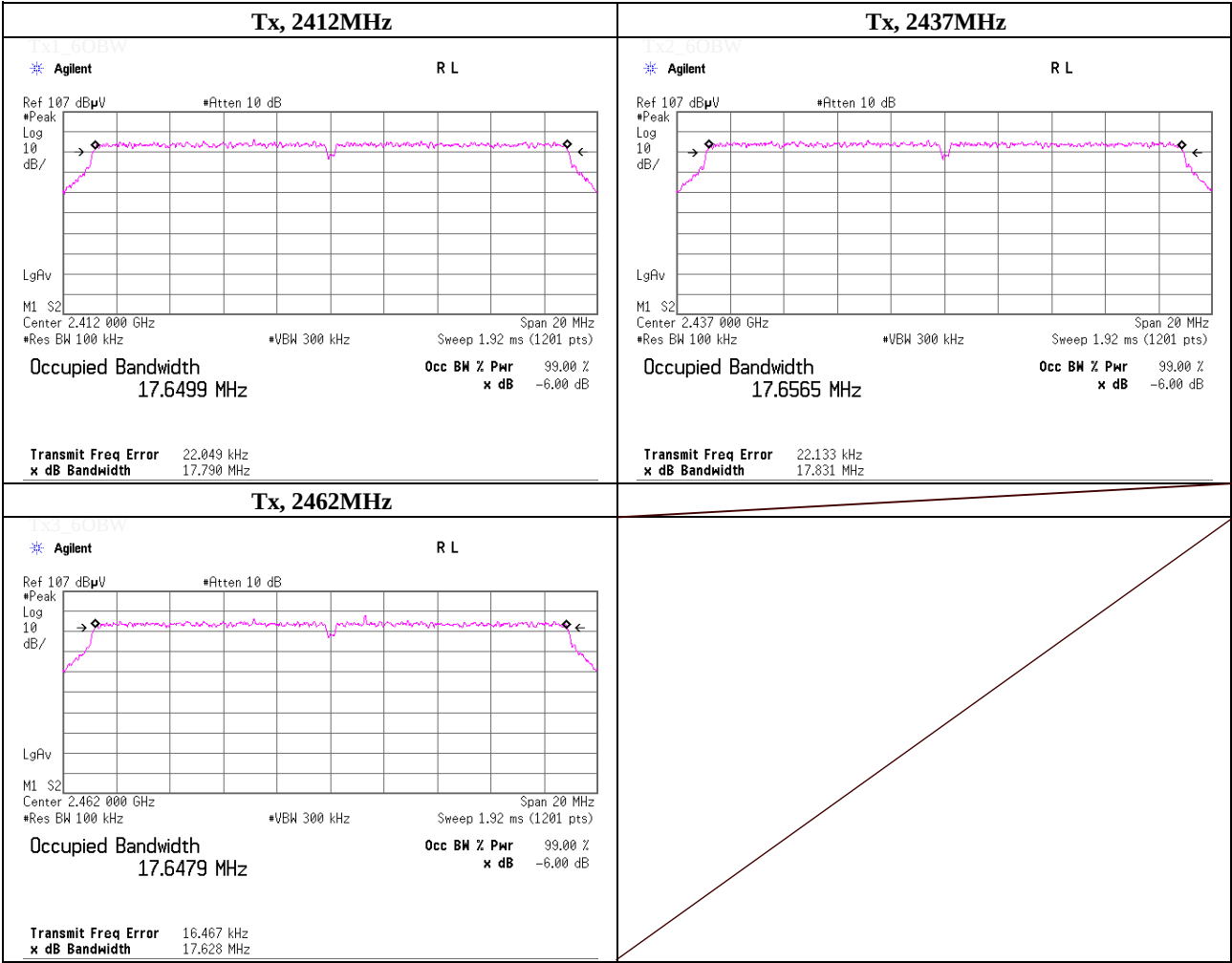
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-6dB Bandwidth

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date August 27, 2012
Temperature / Humidity 28deg.C , 48%RH
Engineer Shinichi Takano
Mode Tx, IEEE802.11n-20HT, PN9, worst data mode 2(MCS), power setting 10dBm

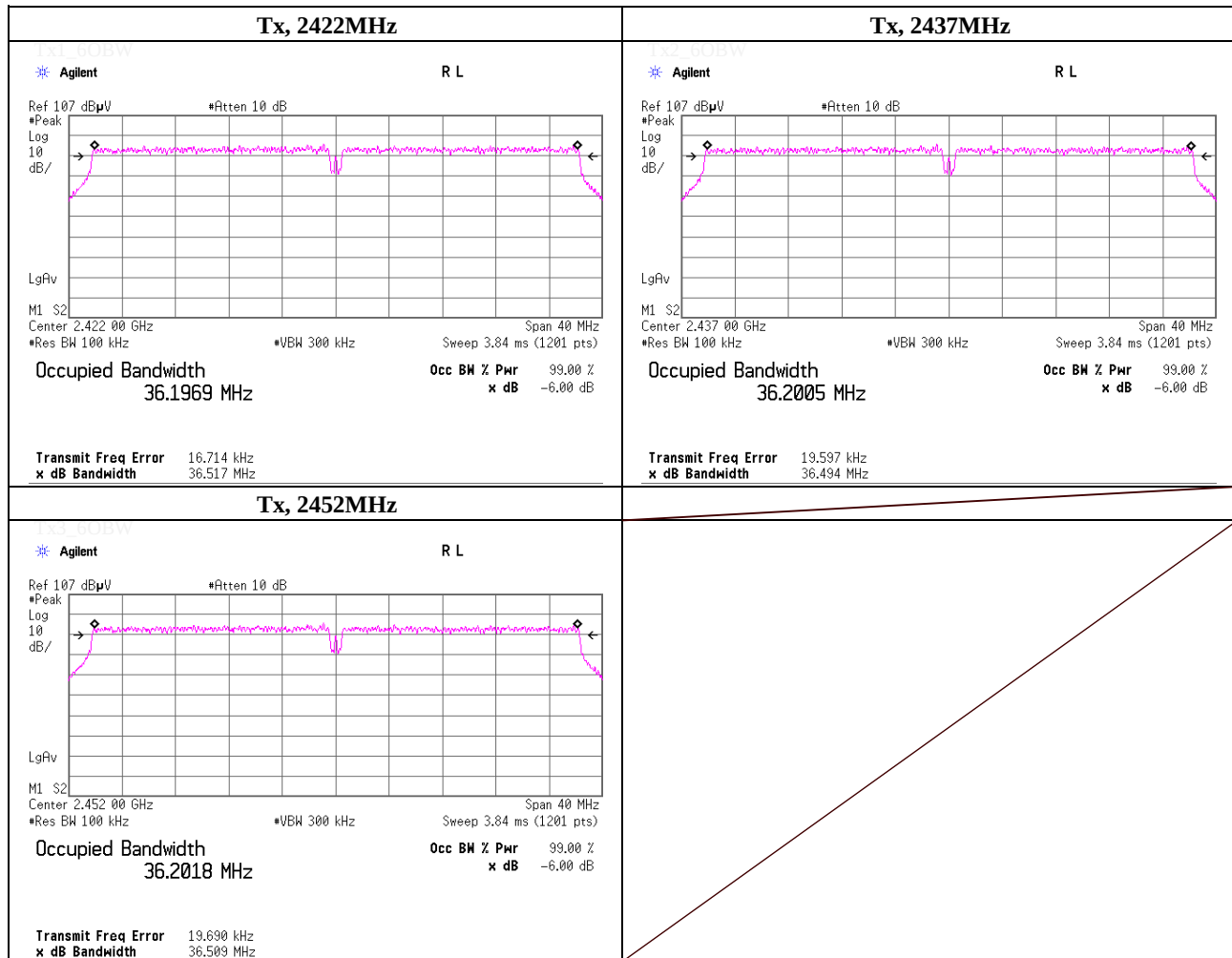
Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	17.790	> 0.500
2437.0000	17.831	> 0.500
2462.0000	17.628	> 0.500



-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 27, 2012	
Temperature / Humidity	28deg.C , 48%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n-40HT, PN9, worst data mode 5(MCS), power setting 11dBm	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2422.0000	36.517	> 0.500
2437.0000	36.494	> 0.500
2452.0000	36.509	> 0.500

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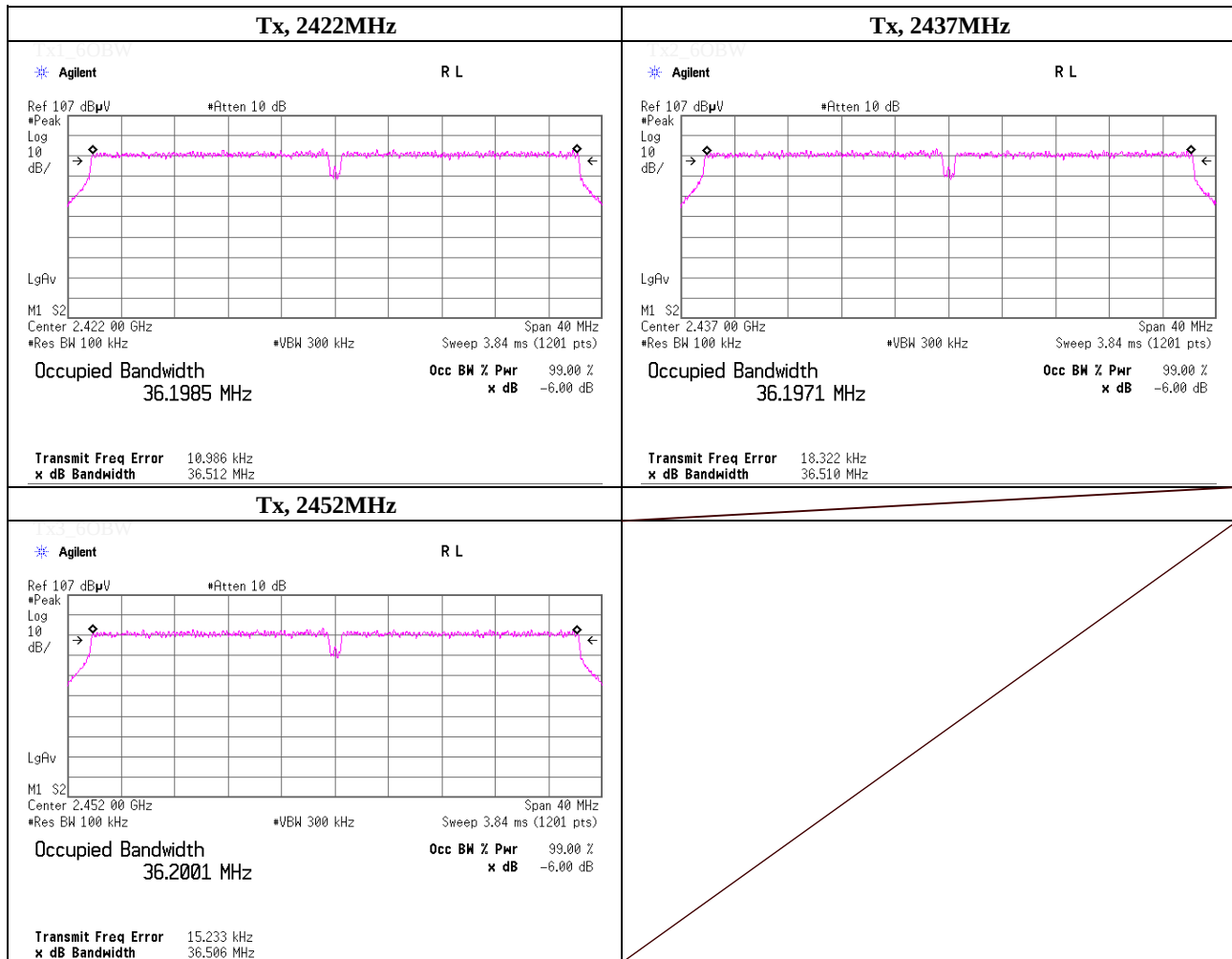
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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 27, 2012	
Temperature / Humidity	28deg.C , 48%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n-40HT, PN9, worst data mode 5(MCS), power setting 9dBm	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2422.0000	36.512	> 0.500
2437.0000	36.510	> 0.500
2452.0000	36.506	> 0.500

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date August 21, 2012
 Temperature / Humidity 25deg.C , 59%RH
 Engineer Shinchi Takano
 Mode Tx, IEEE802.11b, PN9, power setting 14dBm 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	6.28	0.84	9.97	17.09	51.17	30.00	1000	12.91
Mid	2437.0	6.30	0.84	9.97	17.11	51.40	30.00	1000	12.89
High	2462.0	6.23	0.85	9.97	17.05	50.70	30.00	1000	12.95

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	2412.0	6.28	0.84	9.97	17.09	51.17	30.00	1000	12.91
	2	2412.0	6.26	0.84	9.97	17.07	50.93	30.00	1000	12.93
	5.5	2412.0	5.72	0.84	9.97	16.53	44.98	30.00	1000	13.47
	11	2412.0	6.24	0.84	9.97	17.05	50.70	30.00	1000	12.95

Worst

Reference data for SAR testing

(* AV: Average)

	Data rate	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Result	
	Data rate	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
	1	2412.0	3.67	0.84	9.97	14.48	28.05
	2	2412.0	3.75	0.84	9.97	14.56	28.58
	5.5	2412.0	3.81	0.84	9.97	14.62	28.97
	11	2412.0	3.77	0.84	9.97	14.58	28.71

Sample Calculation:

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

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date August 21, 2012
 Temperature / Humidity 25deg.C , 59%RH
 Engineer Shinchi Takano
 Mode Tx, IEEE802.11b, PN9, power setting 11dBm worst data mode : 1 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	3.30	0.84	9.97	14.11	25.76	30.00	1000	15.89
Mid	2437.0	3.33	0.84	9.97	14.14	25.94	30.00	1000	15.86
High	2462.0	3.26	0.85	9.97	14.08	25.59	30.00	1000	15.92

Sample Calculation:

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

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date August 21, 2012
 Temperature / Humidity 25deg.C , 59%RH
 Engineer Shinchi Takano
 Mode Tx, IEEE802.11g, PN9, power setting 12dBm worst data mode : 6 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	10.50	0.84	9.97	21.31	135.21	30.00	1000	8.69
Mid	2437.0	10.71	0.84	9.97	21.52	141.91	30.00	1000	8.48
High	2462.0	10.63	0.85	9.97	21.45	139.64	30.00	1000	8.55

Sample Calculation:

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

[Pre check]

	Data rate	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin
	[Mbps]					[dBm]	[mW]	[dBm]	[mW]	
	6	2412.0	10.50	0.84	9.97	21.31	135.21	30.00	1000	8.69
	9	2412.0	10.12	0.84	9.97	20.93	123.88	30.00	1000	9.07
	12	2412.0	10.29	0.84	9.97	21.10	128.82	30.00	1000	8.90
	18	2412.0	10.02	0.84	9.97	20.83	121.06	30.00	1000	9.17
	24	2412.0	10.46	0.84	9.97	21.27	133.97	30.00	1000	8.73
	36	2412.0	10.40	0.84	9.97	21.21	132.13	30.00	1000	8.79
	48	2412.0	10.19	0.84	9.97	21.00	125.89	30.00	1000	9.00
	54	2412.0	10.43	0.84	9.97	21.24	133.05	30.00	1000	8.76

Worst

Reference data for SAR testing

(* AV: Average)

	Data rate	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result	
	Data rate					[dBm]	[mW]
	6	2412.0	1.88	0.84	9.97	12.69	18.58
	9	2412.0	1.84	0.84	9.97	12.65	18.41
	12	2412.0	1.87	0.84	9.97	12.68	18.54
	18	2412.0	1.90	0.84	9.97	12.71	18.66
	24	2412.0	1.80	0.84	9.97	12.61	18.24
	36	2412.0	1.76	0.84	9.97	12.57	18.07
	48	2412.0	1.82	0.84	9.97	12.63	18.32
	54	2412.0	1.78	0.84	9.97	12.59	18.16

Sample Calculation:

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

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date August 21, 2012
Temperature / Humidity 25deg.C , 59%RH
Engineer Shinchi Takano
Mode Tx, IEEE802.11g, PN9, power setting 10dBm worst data mode : 6 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	9.12	0.84	9.97	19.93	98.40	30.00	1000	10.07
Mid	2437.0	9.26	0.84	9.97	20.07	101.62	30.00	1000	9.93
High	2462.0	9.24	0.85	9.97	20.06	101.39	30.00	1000	9.94

Sample Calculation:

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

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date August 21, 2012
 Temperature / Humidity 25deg.C , 59%RH
 Engineer Shinchi Takano
 Mode Tx, IEEE802.11n-20HT, PN9, power setting 12dBm worst data mode : 2 (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 [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	10.02	0.84	9.97	20.83	121.06	30.00	1000	9.17
Mid	2437.0	10.20	0.84	9.97	21.01	126.18	30.00	1000	8.99
High	2462.0	10.16	0.85	9.97	20.98	125.31	30.00	1000	9.02

Sample Calculation:

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

[Pre check]

	Mode	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
	(MCS)					[dBm]	[mW]	[dBm]	[mW]	
	0	2412.0	9.93	0.84	9.97	20.74	118.58	30.00	1000	9.26
	1	2412.0	9.98	0.84	9.97	20.79	119.95	30.00	1000	9.21
	2	2412.0	10.02	0.84	9.97	20.83	121.06	30.00	1000	9.17
	3	2412.0	9.88	0.84	9.97	20.69	117.22	30.00	1000	9.31
	4	2412.0	9.91	0.84	9.97	20.72	118.03	30.00	1000	9.28
	5	2412.0	9.93	0.84	9.97	20.74	118.58	30.00	1000	9.26
	6	2412.0	9.90	0.84	9.97	20.71	117.76	30.00	1000	9.29
	7	2412.0	9.88	0.84	9.97	20.69	117.22	30.00	1000	9.31

Worst

Reference data for SAR testing

(* AV: Average)

	Mode	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result	
	Mode					[dBm]	[mW]
	0	2412.0	1.89	0.84	9.97	12.70	18.62
	1	2412.0	1.87	0.84	9.97	12.68	18.54
	2	2412.0	1.86	0.84	9.97	12.67	18.49
	3	2412.0	1.88	0.84	9.97	12.69	18.58
	4	2412.0	1.86	0.84	9.97	12.67	18.49
	5	2412.0	1.88	0.84	9.97	12.69	18.58
	6	2412.0	1.85	0.84	9.97	12.66	18.45
	7	2412.0	1.87	0.84	9.97	12.68	18.54

Sample Calculation:

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

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date August 21, 2012
 Temperature / Humidity 25deg.C , 59%RH
 Engineer Shinchi Takano
 Mode Tx, IEEE802.11n-20HT, PN9, power setting 10dBm worst data mode : 2 (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 [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	8.43	0.84	9.97	19.24	83.95	30.00	1000	10.76
Mid	2437.0	8.56	0.84	9.97	19.37	86.50	30.00	1000	10.63
High	2462.0	8.54	0.85	9.97	19.36	86.30	30.00	1000	10.64

Sample Calculation:

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

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date August 21, 2012
 Temperature / Humidity 25deg.C , 59%RH
 Engineer Shinichi Takano
 Mode Tx, IEEE802.11n-40HT, PN9, power setting 11dBm worst data mode : 5 (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 [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2422.0	10.12	0.84	9.97	20.93	123.88	30.00	1000	9.07
Mid	2437.0	10.25	0.84	9.97	21.06	127.64	30.00	1000	8.94
High	2452.0	10.23	0.85	9.97	21.05	127.35	30.00	1000	8.95

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 [dB]
						[dBm]	[mW]	[dBm]	[mW]	
	0	2422.0	9.62	0.84	9.97	20.43	110.41	30.00	1000	9.57
	1	2422.0	9.64	0.84	9.97	20.45	110.92	30.00	1000	9.55
	2	2422.0	9.95	0.84	9.97	20.76	119.12	30.00	1000	9.24
	3	2422.0	10.09	0.84	9.97	20.90	123.03	30.00	1000	9.10
	4	2422.0	9.94	0.84	9.97	20.75	118.85	30.00	1000	9.25
	5	2422.0	10.12	0.84	9.97	20.93	123.88	30.00	1000	9.07
	6	2422.0	9.91	0.84	9.97	20.72	118.03	30.00	1000	9.28
	7	2422.0	9.61	0.84	9.97	20.42	110.15	30.00	1000	9.58

Worst

Reference data for SAR testing

(* AV: Average)

	Mode	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result	
						[dBm]	[mW]
	0	2422.0	1.08	0.84	9.97	11.89	15.45
	1	2422.0	1.06	0.84	9.97	11.87	15.38
	2	2422.0	1.06	0.84	9.97	11.87	15.38
	3	2422.0	1.05	0.84	9.97	11.86	15.35
	4	2422.0	1.04	0.84	9.97	11.85	15.31
	5	2422.0	0.96	0.84	9.97	11.77	15.03
	6	2422.0	1.07	0.84	9.97	11.88	15.42
	7	2422.0	0.99	0.84	9.97	11.80	15.14

Sample Calculation:

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

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date August 21, 2012
 Temperature / Humidity 25deg.C , 59%RH
 Engineer Shinchi Takano
 Mode Tx, IEEE802.11n-40HT, PN9, power setting 9dBm worst data mode : 5 (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 [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2422.0	8.59	0.84	9.97	19.40	87.10	30.00	1000	10.60
Mid	2437.0	8.65	0.84	9.97	19.46	88.31	30.00	1000	10.54
High	2452.0	8.63	0.85	9.97	19.45	88.10	30.00	1000	10.55

Sample Calculation:

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

UL Japan, Inc.
Shonan EMC Lab.

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 Facsimile : +81 463 50 6401

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 August 22, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 28 deg.C , 60%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.3 SAC) (No.2 SAC)
 Mode Tx, 2412 MHz
 Tx, IEEE802.11b, PN9, worst data mode 1Mbps, power setting 14dBm

(* 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	46.4	27.4	24.5	41.4	56.9	73.9	17.0	100	308	
Hori.	4824.000	PK	45.9	31.1	6.8	41.2	42.6	73.9	31.3	100	0	
Hori.	7236.000	PK	46.6	36.6	8.5	41.4	50.3	73.9	23.6	100	0	
Hori.	9648.000	PK	45.3	38.6	9.4	38.9	54.4	73.9	19.5	100	0	
Hori.	12060.000	PK	44.4	39.5	10.7	39.4	55.2	73.9	18.7	100	0	
Hori.	2390.000	AV	34.1	27.4	24.5	41.4	44.6	53.9	9.3	100	308	
Hori.	4824.000	AV	32.8	31.1	6.8	41.2	29.5	53.9	24.4	100	0	
Hori.	7236.000	AV	34.7	36.6	8.5	41.4	38.4	53.9	15.5	100	0	
Hori.	9648.000	AV	31.1	38.6	9.4	38.9	40.2	53.9	13.7	100	0	
Hori.	12060.000	AV	31.9	39.5	10.7	39.4	42.7	53.9	11.2	100	0	
Vert.	2390.000	PK	44.8	27.4	24.5	41.4	55.3	73.9	18.6	100	1	
Vert.	4824.000	PK	45.9	31.1	6.8	41.2	42.6	73.9	31.3	100	0	
Vert.	7236.000	PK	46.9	36.6	8.5	41.4	50.6	73.9	23.3	100	0	
Vert.	9648.000	PK	45.3	38.6	9.4	38.9	54.4	73.9	19.5	100	0	
Vert.	12060.000	PK	44.2	39.5	10.7	39.4	55.0	73.9	18.9	100	0	
Vert.	2390.000	AV	32.8	27.4	24.5	41.4	43.3	53.9	10.6	100	1	
Vert.	4824.000	AV	32.9	31.1	6.8	41.2	29.6	53.9	24.3	100	0	
Vert.	7236.000	AV	34.7	36.6	8.5	41.4	38.4	53.9	15.5	100	0	
Vert.	9648.000	AV	30.9	38.6	9.4	38.9	40.0	53.9	13.9	100	0	
Vert.	12060.000	AV	32.8	39.5	10.7	39.4	43.6	53.9	10.3	100	0	

Result = Reading + Ant Factor + 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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	80.9	27.5	24.5	41.4	91.5	-	-	Carrier
Hori.	2397.080	PK	38.7	27.4	24.5	41.4	49.2	71.5	22.3	
Hori.	2400.000	PK	37.9	27.4	24.5	41.4	48.4	71.5	23.1	
Vert.	2412.000	PK	81.9	27.5	24.5	41.4	92.5	-	-	Carrier
Vert.	2397.080	PK	39.5	27.4	24.5	41.4	50.0	72.5	22.5	
Vert.	2400.000	PK	37.0	27.4	24.5	41.4	47.5	72.5	25.0	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 August 22, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 28 deg.C , 60%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.3 SAC) (No.2 SAC)
 Mode Tx, 2437 MHz
 Tx, IEEE802.11b, PN9, worst data mode 1Mbps, power setting 14dBm

(* 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.	4824.000	PK	46.9	31.1	6.8	41.2	43.6	73.9	30.3	100	0	
Hori.	7236.000	PK	48.2	36.6	8.5	41.4	51.9	73.9	22.0	100	0	
Hori.	9648.000	PK	44.7	38.6	9.4	38.9	53.8	73.9	20.1	100	0	
Hori.	12060.000	PK	45.6	39.5	10.7	39.4	56.4	73.9	17.5	100	0	
Hori.	4824.000	AV	33.2	31.1	6.8	41.2	29.9	53.9	24.0	100	0	
Hori.	7236.000	AV	35.2	36.6	8.5	41.4	38.9	53.9	15.0	100	0	
Hori.	9648.000	AV	32.1	38.6	9.4	38.9	41.2	53.9	12.7	100	0	
Hori.	12060.000	AV	32.3	39.5	10.7	39.4	43.1	53.9	10.8	100	0	
Vert.	4824.000	PK	47.7	31.1	6.8	41.2	44.4	73.9	29.5	100	0	
Vert.	7236.000	PK	47.2	36.6	8.5	41.4	50.9	73.9	23.0	100	0	
Vert.	9648.000	PK	45.5	38.6	9.4	38.9	54.6	73.9	19.3	100	0	
Vert.	12060.000	PK	47.6	39.5	10.7	39.4	58.4	73.9	15.5	100	0	
Vert.	4824.000	AV	33.1	31.1	6.8	41.2	29.8	53.9	24.1	100	0	
Vert.	7236.000	AV	35.0	36.6	8.5	41.4	38.7	53.9	15.2	100	0	
Vert.	9648.000	AV	34.7	38.6	9.4	38.9	43.8	53.9	10.1	100	0	
Vert.	12060.000	AV	32.4	39.5	10.7	39.4	43.2	53.9	10.7	100	0	

Result = Reading + Ant Factor + 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 UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 August 22, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 28 deg.C , 60%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.3 SAC) (No.2 SAC)
 Mode Tx, 2462 MHz
 Tx, IEEE802.11b, PN9, worst data mode 1Mbps, power setting 14dBm

(* 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	45.2	27.5	24.6	41.4	55.9	73.9	18.0	100	289	
Hori.	4924.000	PK	47.3	31.5	6.9	41.0	44.7	73.9	29.2	100	0	
Hori.	7386.000	PK	50.2	36.7	8.7	41.5	54.1	73.9	19.8	100	0	
Hori.	9848.000	PK	46.5	38.9	9.5	38.9	56.0	73.9	17.9	100	0	
Hori.	12310.000	PK	47.6	39.5	10.8	39.3	58.6	73.9	15.3	100	0	
Hori.	2483.500	AV	32.9	27.5	24.6	41.4	43.6	53.9	10.3	100	289	
Hori.	4924.000	AV	34.7	31.5	6.9	41.0	32.1	53.9	21.8	100	0	
Hori.	7386.000	AV	36.5	36.7	8.7	41.5	40.4	53.9	13.5	100	0	
Hori.	9848.000	AV	33.5	38.9	9.5	38.9	43.0	53.9	10.9	100	0	
Hori.	12310.000	AV	33.8	39.5	10.8	39.3	44.8	53.9	9.1	100	0	
Vert.	2483.500	PK	46.2	27.5	24.6	41.4	56.9	73.9	17.0	100	125	
Vert.	4924.000	PK	48.1	31.5	6.9	41.0	45.5	73.9	28.4	100	0	
Vert.	7386.000	PK	49.2	36.7	8.7	41.5	53.1	73.9	20.8	100	0	
Vert.	9848.000	PK	45.6	38.9	9.5	38.9	55.1	73.9	18.8	100	0	
Vert.	12310.000	PK	46.4	39.5	10.8	39.3	57.4	73.9	16.5	100	0	
Vert.	2483.500	AV	32.8	27.5	24.6	41.4	43.5	53.9	10.4	100	125	
Vert.	4924.000	AV	34.8	31.5	6.9	41.0	32.2	53.9	21.7	100	0	
Vert.	7386.000	AV	36.5	36.7	8.7	41.5	40.4	53.9	13.5	100	0	
Vert.	9848.000	AV	32.5	38.9	9.5	38.9	42.0	53.9	11.9	100	0	
Vert.	12310.000	AV	33.8	39.5	10.8	39.3	44.8	53.9	9.1	100	0	

Result = Reading + Ant Factor + 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 UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 August 22, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 28 deg.C , 60%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.3 SAC) (No.2 SAC)
 Mode Tx, 2412 MHz
 Tx, IEEE802.11b, PN9, worst data mode 1Mbps, power setting 11dBm

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	2390.000	PK	47.3	27.4	24.5	41.4	57.8	73.9	16.1	100	112	
Hori.	4874.000	PK	45.8	31.3	6.9	41.1	42.9	73.9	31.0	100	0	
Hori.	7311.000	PK	46.7	36.6	8.6	41.4	50.5	73.9	23.4	100	0	
Hori.	9748.000	PK	44.9	38.7	9.5	38.9	54.2	73.9	19.7	100	0	
Hori.	12185.000	PK	45.8	39.5	10.7	39.3	56.7	73.9	17.2	100	0	
Hori.	2390.000	AV	34.2	27.4	24.5	41.4	44.7	53.9	9.2	100	112	
Hori.	4874.000	AV	32.9	31.3	6.9	41.1	30.0	53.9	23.9	100	0	
Hori.	7311.000	AV	34.8	36.6	8.6	41.4	38.6	53.9	15.3	100	0	
Hori.	9748.000	AV	32.0	38.7	9.5	38.9	41.3	53.9	12.6	100	0	
Hori.	12185.000	AV	32.4	39.5	10.7	39.3	43.3	53.9	10.6	100	0	
Vert.	2390.000	PK	46.0	27.4	24.5	41.4	56.5	73.9	17.4	100	1	
Vert.	4874.000	PK	45.5	31.3	6.9	41.1	42.6	73.9	31.3	100	0	
Vert.	7311.000	PK	47.2	36.6	8.6	41.4	51.0	73.9	22.9	100	0	
Vert.	9748.000	PK	45.2	38.7	9.5	38.9	54.5	73.9	19.4	100	0	
Vert.	12185.000	PK	44.8	39.5	10.7	39.3	55.7	73.9	18.2	100	0	
Vert.	2390.000	AV	34.1	27.4	24.5	41.4	44.6	53.9	9.3	100	1	
Vert.	4874.000	AV	32.8	31.3	6.9	41.1	29.9	53.9	24.0	100	0	
Vert.	7311.000	AV	34.4	36.6	8.6	41.4	38.2	53.9	15.7	100	0	
Vert.	9748.000	AV	32.1	38.7	9.5	38.9	41.4	53.9	12.5	100	0	
Vert.	12185.000	AV	32.2	39.5	10.7	39.3	43.1	53.9	10.8	100	0	

Result = Reading + Ant Factor + 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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	76.7	27.5	24.5	41.4	87.3	-	-	Carrier
Hori.	2398.000	PK	38.0	27.4	24.5	41.4	48.5	67.3	18.8	
Hori.	2400.000	PK	37.2	27.4	24.5	41.4	47.7	67.3	19.6	
Vert.	2412.000	PK	81.3	27.5	24.5	41.4	91.9	-	-	Carrier
Vert.	2398.000	PK	38.8	27.4	24.5	41.4	49.3	71.9	22.6	
Vert.	2400.000	PK	37.7	27.4	24.5	41.4	48.2	71.9	23.7	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 August 22, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 28 deg.C , 60%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.3 SAC) (No.2 SAC)
 Mode Tx, 2437 MHz
 Tx, IEEE802.11b, PN9, worst data mode 1Mbps, power setting 11dBm

(* 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.	4924.000	PK	46.1	31.5	6.9	41.0	43.5	73.9	30.4	100	0	
Hori.	7386.000	PK	47.6	36.7	8.7	41.5	51.5	73.9	22.4	100	0	
Hori.	9845.145	PK	41.8	38.9	9.5	38.9	51.3	73.9	22.6	100	0	
Hori.	12310.000	PK	44.3	39.5	10.8	39.3	55.3	73.9	18.6	100	0	
Hori.	4924.000	AV	32.9	31.5	6.9	41.0	30.3	53.9	23.6	100	0	
Hori.	7386.000	AV	34.7	36.7	8.7	41.5	38.6	53.9	15.3	100	0	
Hori.	9845.145	AV	31.8	38.9	9.5	38.9	41.3	53.9	12.6	100	0	
Hori.	12310.000	AV	32.4	39.5	10.8	39.3	43.4	53.9	10.5	100	0	
Vert.	4924.000	PK	45.7	31.5	6.9	41.0	43.1	73.9	30.8	100	0	
Vert.	7386.000	PK	48.1	36.7	8.7	41.5	52.0	73.9	21.9	100	0	
Vert.	9848.000	PK	44.9	38.9	9.5	38.9	54.4	73.9	19.5	100	0	
Vert.	12310.000	PK	44.7	39.5	10.8	39.3	55.7	73.9	18.2	100	0	
Vert.	4924.000	AV	32.8	31.5	6.9	41.0	30.2	53.9	23.7	100	0	
Vert.	7386.000	AV	34.8	36.7	8.7	41.5	38.7	53.9	15.2	100	0	
Vert.	9848.000	AV	31.8	38.9	9.5	38.9	41.3	53.9	12.6	100	0	
Vert.	12310.000	AV	32.1	39.5	10.8	39.3	43.1	53.9	10.8	100	0	

Result = Reading + Ant Factor + 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 UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 August 22, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 28 deg.C , 60%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.3 SAC) (No.2 SAC)
 Mode Tx, 2462 MHz
 Tx, IEEE802.11b, PN9, worst data mode 1Mbps, power setting 11dBm

(* 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	44.9	27.5	24.6	41.4	55.6	73.9	18.3	100	62	
Hori.	4924.000	PK	45.5	31.5	6.9	41.0	42.9	73.9	31.0	100	0	
Hori.	7386.000	PK	47.3	36.7	8.7	41.5	51.2	73.9	22.7	100	0	
Hori.	9848.000	PK	44.6	38.9	9.5	38.9	54.1	73.9	19.8	100	0	
Hori.	12310.000	PK	44.1	39.5	10.8	39.3	55.1	73.9	18.8	100	0	
Hori.	2483.500	AV	32.8	27.5	24.6	41.4	43.5	53.9	10.4	100	62	
Hori.	4924.000	AV	32.8	31.5	6.9	41.0	30.2	53.9	23.7	100	0	
Hori.	7386.000	AV	34.5	36.7	8.7	41.5	38.4	53.9	15.5	100	0	
Hori.	9848.000	AV	31.0	38.9	9.5	38.9	40.5	53.9	13.4	100	0	
Hori.	12310.000	AV	31.8	39.5	10.8	39.3	42.8	53.9	11.1	100	0	
Vert.	2483.500	PK	45.5	27.5	24.6	41.4	56.2	73.9	17.7	100	23	
Vert.	4924.000	PK	47.3	31.5	6.9	41.0	44.7	73.9	29.2	100	0	
Vert.	7386.000	PK	48.0	36.7	8.7	41.5	51.9	73.9	22.0	100	0	
Vert.	9848.000	PK	45.9	38.9	9.5	38.9	55.4	73.9	18.5	100	0	
Vert.	12310.000	PK	44.3	39.5	10.8	39.3	55.3	73.9	18.6	100	0	
Vert.	2483.500	AV	32.9	27.5	24.6	41.4	43.6	53.9	10.3	100	23	
Vert.	4924.000	AV	33.1	31.5	6.9	41.0	30.5	53.9	23.4	100	0	
Vert.	7386.000	AV	34.8	36.7	8.7	41.5	38.7	53.9	15.2	100	0	
Vert.	9848.000	AV	31.2	38.9	9.5	38.9	40.7	53.9	13.2	100	0	
Vert.	12310.000	AV	32.8	39.5	10.8	39.3	43.8	53.9	10.1	100	0	

Result = Reading + Ant Factor + 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 UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 August 22, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 28 deg.C , 60%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.3 SAC) (No.2 SAC)
 Mode Tx, 2412 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps, 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	47.3	27.4	24.5	41.4	57.8	73.9	16.1	100	130	
Hori.	4824.000	PK	46.0	31.1	6.8	41.2	42.7	73.9	31.2	100	0	
Hori.	7236.000	PK	46.9	36.6	8.5	41.4	50.6	73.9	23.3	100	0	
Hori.	9648.000	PK	44.5	38.6	9.4	38.9	53.6	73.9	20.3	100	0	
Hori.	12060.000	PK	44.7	39.5	10.7	39.4	55.5	73.9	18.4	100	0	
Hori.	2390.000	AV	33.5	27.4	24.5	41.4	44.0	53.9	9.9	100	130	
Hori.	4824.000	AV	33.1	31.1	6.8	41.2	29.8	53.9	24.1	100	0	
Hori.	7236.000	AV	35.0	36.6	8.5	41.4	38.7	53.9	15.2	100	0	
Hori.	9648.000	AV	31.6	38.6	9.4	38.9	40.7	53.9	13.2	100	0	
Hori.	12060.000	AV	32.5	39.5	10.7	39.4	43.3	53.9	10.6	100	0	
Vert.	2390.000	PK	47.5	27.4	24.5	41.4	58.0	73.9	15.9	100	196	
Vert.	4824.000	PK	47.8	31.1	6.8	41.2	44.5	73.9	29.4	100	0	
Vert.	7236.000	PK	47.9	36.6	8.5	41.4	51.6	73.9	22.3	100	0	
Vert.	9648.000	PK	45.4	38.6	9.4	38.9	54.5	73.9	19.4	100	0	
Vert.	12060.000	PK	44.7	39.5	10.7	39.4	55.5	73.9	18.4	100	0	
Vert.	2390.000	AV	34.4	27.4	24.5	41.4	44.9	53.9	9.0	100	196	
Vert.	4824.000	AV	33.2	31.1	6.8	41.2	29.9	53.9	24.0	100	0	
Vert.	7236.000	AV	35.0	36.6	8.5	41.4	38.7	53.9	15.2	100	0	
Vert.	9648.000	AV	31.9	38.6	9.4	38.9	41.0	53.9	12.9	100	0	
Vert.	12060.000	AV	32.9	39.5	10.7	39.4	43.7	53.9	10.2	100	0	

Result = Reading + Ant Factor + 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	Detector	Reading	Ant Factor	Loss	Gain	Result	Limit	Margin	Remark
Hori.	2412.000	PK	79.8	27.5	24.5	41.4	90.4	-	-	Carrier
Hori.	2400.000	PK	41.9	27.4	24.5	41.4	52.4	70.4	18.0	
Vert.	2412.000	PK	80.8	27.5	24.5	41.4	91.4	-	-	Carrier
Vert.	2400.000	PK	43.2	27.4	24.5	41.4	53.7	71.4	17.7	

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

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.				No.2 and 3 Semi Anechoic Chamber	
Date	August 21, 2012	August 22, 2012	August 29, 2012	September 7, 2012		
Temperature / Humidity	28 deg.C , 60%RH	28 deg.C , 60%RH	25 deg.C , 57%RH	24 deg.C, 68%RH		
Engineer	Wataru Kojima	Wataru Kojima	Akira Sato	Wataru Kojima		
	(No.3 SAC)	(No.3 SAC)	(No.3 SAC)	(No.2 SAC)		
Mode	Tx, 2437 MHz					
	Tx, IEEE802.11g, PN9, worst data mode 6Mbps, 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.	240.000	QP	49.3	16.9	8.2	32.0	42.4	46.0	3.6	146	84	
Hori.	336.008	QP	53.1	14.8	8.7	32.0	44.6	46.0	1.4	100	240	
Hori.	432.022	QP	47.9	16.8	9.2	32.0	41.9	46.0	4.1	100	53	
Hori.	624.009	QP	46.9	19.4	9.9	32.0	44.2	46.0	1.8	161	32	
Hori.	672.009	QP	40.4	20.1	10.0	31.9	38.6	46.0	7.4	151	49	
Hori.	4874.000	PK	45.0	31.3	6.9	41.1	42.1	73.9	31.8	100	0	
Hori.	7311.000	PK	47.9	36.6	8.6	41.4	51.7	73.9	22.2	100	0	
Hori.	9750.735	PK	45.9	38.7	9.5	38.9	55.2	73.9	18.7	100	0	
Hori.	12185.000	PK	44.8	39.5	10.7	39.3	55.7	73.9	18.2	100	0	
Hori.	4874.000	AV	32.8	31.3	6.9	41.1	29.9	53.9	24.0	100	0	
Hori.	7311.000	AV	34.8	36.6	8.6	41.4	38.6	53.9	15.3	100	0	
Hori.	9750.735	AV	31.6	38.7	9.5	38.9	40.9	53.9	13.0	100	0	
Hori.	12185.000	AV	32.6	39.5	10.7	39.3	43.5	53.9	10.4	100	0	
Vert.	48.004	QP	51.6	11.7	6.8	32.2	37.9	40.0	2.1	104	257	
Vert.	624.004	QP	45.0	19.4	9.9	32.0	42.3	46.0	3.7	100	79	
Vert.	4874.000	PK	48.0	31.3	6.9	41.1	45.1	73.9	28.8	100	0	
Vert.	7311.000	PK	48.3	36.6	8.6	41.4	52.1	73.9	21.8	100	0	
Vert.	9748.000	PK	44.3	38.7	9.5	38.9	53.6	73.9	20.3	100	0	
Vert.	12185.000	PK	44.8	39.5	10.7	39.3	55.7	73.9	18.2	100	0	
Vert.	4874.000	AV	33.2	31.3	6.9	41.1	30.3	53.9	23.6	100	0	
Vert.	7311.000	AV	34.4	36.6	8.6	41.4	38.2	53.9	15.7	100	0	
Vert.	9748.000	AV	31.9	38.7	9.5	38.9	41.2	53.9	12.7	100	0	
Vert.	12185.000	AV	32.5	39.5	10.7	39.3	43.4	53.9	10.5	100	0	

Result = Reading + Ant Factor + 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.

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 August 22, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 28 deg.C , 60%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.3 SAC) (No.2 SAC)
 Mode Tx, 2462 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps, 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	46.6	27.5	24.6	41.4	57.3	73.9	16.6	100	303	
Hori.	4924.000	PK	48.6	31.5	6.9	41.0	46.0	73.9	27.9	100	0	
Hori.	7386.000	PK	49.5	36.7	8.7	41.5	53.4	73.9	20.5	100	0	
Hori.	9848.000	PK	46.9	38.9	9.5	38.9	56.4	73.9	17.5	100	0	
Hori.	12310.000	PK	46.5	39.5	10.8	39.3	57.5	73.9	16.4	100	0	
Hori.	2483.500	AV	33.3	27.5	24.6	41.4	44.0	53.9	9.9	100	303	
Hori.	4924.000	AV	36.5	31.5	6.9	41.0	33.9	53.9	20.0	100	0	
Hori.	7386.000	AV	36.4	36.7	8.7	41.5	40.3	53.9	13.6	100	0	
Hori.	9848.000	AV	33.2	38.9	9.5	38.9	42.7	53.9	11.2	100	0	
Hori.	12310.000	AV	32.9	39.5	10.8	39.3	43.9	53.9	10.0	100	0	
Vert.	2483.500	PK	47.7	27.5	24.6	41.4	58.4	73.9	15.5	100	74	
Vert.	4924.000	PK	48.6	31.5	6.9	41.0	46.0	73.9	27.9	100	0	
Vert.	7386.000	PK	49.8	36.7	8.7	41.5	53.7	73.9	20.2	100	0	
Vert.	9848.000	PK	46.2	38.9	9.5	38.9	55.7	73.9	18.2	100	0	
Vert.	12310.000	PK	46.8	39.5	10.8	39.3	57.8	73.9	16.1	100	0	
Vert.	2483.500	AV	33.4	27.5	24.6	41.4	44.1	53.9	9.8	100	74	
Vert.	4924.000	AV	34.8	31.5	6.9	41.0	32.2	53.9	21.7	100	0	
Vert.	7386.000	AV	36.4	36.7	8.7	41.5	40.3	53.9	13.6	100	0	
Vert.	9848.000	AV	33.0	38.9	9.5	38.9	42.5	53.9	11.4	100	0	
Vert.	12310.000	AV	33.5	39.5	10.8	39.3	44.5	53.9	9.4	100	0	

Result = Reading + Ant Factor + 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 UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
Date August 21, 2012 August 22, 2012 September 7, 2012
Temperature / Humidity 28 deg.C , 60%RH 28 deg.C , 60%RH 24 deg.C , 68%RH
Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.3 SAC) (No.2 SAC)
Mode Tx, 2412 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps, 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	45.2	27.4	24.5	41.4	55.7	73.9	18.2	100	138	
Hori.	4824.000	PK	48.3	31.1	6.8	41.2	45.0	73.9	28.9	100	0	
Hori.	7236.000	PK	49.3	36.6	8.5	41.4	53.0	73.9	20.9	100	0	
Hori.	9648.000	PK	46.5	38.6	9.4	38.9	55.6	73.9	18.3	100	0	
Hori.	12060.000	PK	47.2	39.5	10.7	39.4	58.0	73.9	15.9	100	0	
Hori.	2390.000	AV	32.6	27.4	24.5	41.4	43.1	53.9	10.8	100	138	
Hori.	4824.000	AV	34.8	31.1	6.8	41.2	31.5	53.9	22.4	100	0	
Hori.	7236.000	AV	36.7	36.6	8.5	41.4	40.4	53.9	13.5	100	0	
Hori.	9648.000	AV	33.8	38.6	9.4	38.9	42.9	53.9	11.0	100	0	
Hori.	12060.000	AV	33.9	39.5	10.7	39.4	44.7	53.9	9.2	100	0	
Vert.	2390.000	PK	45.3	27.4	24.5	41.4	55.8	73.9	18.1	100	1	
Vert.	4824.000	PK	47.8	31.1	6.8	41.2	44.5	73.9	29.4	100	0	
Vert.	7236.000	PK	49.8	36.6	8.5	41.4	53.5	73.9	20.4	100	0	
Vert.	9648.000	PK	47.0	38.6	9.4	38.9	56.1	73.9	17.8	100	0	
Vert.	12060.000	PK	46.1	39.5	10.7	39.4	56.9	73.9	17.0	100	0	
Vert.	2390.000	AV	32.9	27.4	24.5	41.4	43.4	53.9	10.5	100	1	
Vert.	4824.000	AV	34.8	31.1	6.8	41.2	31.5	53.9	22.4	100	0	
Vert.	7236.000	AV	36.8	36.6	8.5	41.4	40.5	53.9	13.4	100	0	
Vert.	9648.000	AV	33.5	38.6	9.4	38.9	42.6	53.9	11.3	100	0	
Vert.	12060.000	AV	33.9	39.5	10.7	39.4	44.7	53.9	9.2	100	0	

Result = Reading + Ant Factor + 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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	70.5	27.5	24.5	41.4	81.1	-	-	Carrier
Hori.	2400.000	PK	35.9	27.4	24.5	41.4	46.4	61.1	14.7	
Vert.	2412.000	PK	75.8	27.5	24.5	41.4	86.4	-	-	Carrier
Vert.	2400.000	PK	38.5	27.4	24.5	41.4	49.0	66.4	17.4	

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

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Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.				No.2 and 3 Semi Anechoic Chamber	
Date	August 21, 2012	August 22, 2012	August 29, 2012	September 7, 2012		
Temperature / Humidity	28 deg.C , 60%RH	28 deg.C , 60%RH	25 deg.C , 57%RH	24 deg.C, 68%RH		
Engineer	Wataru Kojima	Wataru Kojima	Akira Sato	Wataru Kojima		
	(No.3 SAC)	(No.3 SAC)	(No.3 SAC)	(No.2 SAC)		
Mode	Tx, 2437 MHz					
	Tx, IEEE802.11g, PN9, worst data mode 6Mbps, 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.	240.000	QP	49.4	16.9	8.2	32.0	42.5	46.0	3.5	137	75	
Hori.	336.002	QP	52.6	14.8	8.7	32.0	44.1	46.0	1.9	100	74	
Hori.	431.999	QP	47.8	16.8	9.2	32.0	41.8	46.0	4.2	100	45	
Hori.	623.995	QP	44.5	19.4	9.9	32.0	41.8	46.0	4.2	166	4	
Hori.	672.000	QP	40.6	20.1	10.0	31.9	38.8	46.0	7.2	154	50	
Hori.	4874.000	PK	46.1	31.3	6.9	41.1	43.2	73.9	30.7	100	0	
Hori.	7311.000	PK	46.5	36.6	8.6	41.4	50.3	73.9	23.6	100	0	
Hori.	9748.000	PK	44.5	38.7	9.5	38.9	53.8	73.9	20.1	100	0	
Hori.	12185.000	PK	44.9	39.5	10.7	39.3	55.8	73.9	18.1	100	0	
Hori.	4874.000	AV	33.4	31.3	6.9	41.1	30.5	53.9	23.4	100	0	
Hori.	7311.000	AV	34.5	36.6	8.6	41.4	38.3	53.9	15.6	100	0	
Hori.	9748.000	AV	31.7	38.7	9.5	38.9	41.0	53.9	12.9	100	0	
Hori.	12185.000	AV	32.0	39.5	10.7	39.3	42.9	53.9	11.0	100	0	
Vert.	48.001	QP	51.6	11.7	6.8	32.2	37.9	40.0	2.1	100	244	
Vert.	624.005	QP	43.5	19.4	9.9	32.0	40.8	46.0	5.2	100	84	
Vert.	4874.000	PK	45.9	31.3	6.9	41.1	43.0	73.9	30.9	100	0	
Vert.	7311.000	PK	47.3	36.6	8.6	41.4	51.1	73.9	22.8	100	0	
Vert.	9748.000	PK	44.8	38.7	9.5	38.9	54.1	73.9	19.8	100	0	
Vert.	12185.000	PK	44.7	39.5	10.7	39.3	55.6	73.9	18.3	100	0	
Vert.	4874.000	AV	32.9	31.3	6.9	41.1	30.0	53.9	23.9	100	0	
Vert.	7311.000	AV	34.6	36.6	8.6	41.4	38.4	53.9	15.5	100	0	
Vert.	9748.000	AV	31.2	38.7	9.5	38.9	40.5	53.9	13.4	100	0	
Vert.	12185.000	AV	32.2	39.5	10.7	39.3	43.1	53.9	10.8	100	0	

Result = Reading + Ant Factor + 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 UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 August 22, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 28 deg.C , 60%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.3 SAC) (No.2 SAC)
 Mode Tx, 2462 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps, 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	45.4	27.5	24.6	41.4	56.1	73.9	17.8	100	289	
Hori.	4924.000	PK	47.5	31.5	6.9	41.0	44.9	73.9	29.0	100	0	
Hori.	7386.000	PK	49.9	36.7	8.7	41.5	53.8	73.9	20.1	100	0	
Hori.	9848.000	PK	45.8	38.9	9.5	38.9	55.3	73.9	18.6	100	0	
Hori.	12310.000	PK	46.5	39.5	10.8	39.3	57.5	73.9	16.4	100	0	
Hori.	2483.500	AV	32.8	27.5	24.6	41.4	43.5	53.9	10.4	100	289	
Hori.	4924.000	AV	34.7	31.5	6.9	41.0	32.1	53.9	21.8	100	0	
Hori.	7386.000	AV	36.5	36.7	8.7	41.5	40.4	53.9	13.5	100	0	
Hori.	9848.000	AV	33.8	38.9	9.5	38.9	43.3	53.9	10.6	100	0	
Hori.	12310.000	AV	32.6	39.5	10.8	39.3	43.6	53.9	10.3	100	0	
Vert.	2483.500	PK	45.3	27.5	24.6	41.4	56.0	73.9	17.9	100	26	
Vert.	4924.000	PK	47.3	31.5	6.9	41.0	44.7	73.9	29.2	100	0	
Vert.	7386.000	PK	48.9	36.7	8.7	41.5	52.8	73.9	21.1	100	0	
Vert.	9848.000	PK	46.7	38.9	9.5	38.9	56.2	73.9	17.7	100	0	
Vert.	12310.000	PK	46.8	39.5	10.8	39.3	57.8	73.9	16.1	100	0	
Vert.	2483.500	AV	32.8	27.5	24.6	41.4	43.5	53.9	10.4	100	26	
Vert.	4924.000	AV	35.4	31.5	6.9	41.0	32.8	53.9	21.1	100	0	
Vert.	7386.000	AV	36.4	36.7	8.7	41.5	40.3	53.9	13.6	100	0	
Vert.	9848.000	AV	33.1	38.9	9.5	38.9	42.6	53.9	11.3	100	0	
Vert.	12310.000	AV	33.7	39.5	10.8	39.3	44.7	53.9	9.2	100	0	

Result = Reading + Ant Factor + 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 UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 August 22, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 28 deg.C , 60%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.3 SAC) (No.2 SAC)
 Mode Tx, 2412 MHz
 Tx, IEEE802.11n-20HT, PN9, worst data mode 2(MCS), 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	56.0	27.4	24.5	41.4	66.5	73.9	7.4	100	153	
Hori.	4824.000	PK	47.7	31.1	6.8	41.2	44.4	73.9	29.5	100	0	
Hori.	7236.000	PK	49.5	36.6	8.5	41.4	53.2	73.9	20.7	100	0	
Hori.	9648.000	PK	47.3	38.6	9.4	38.9	56.4	73.9	17.5	100	0	
Hori.	12060.000	PK	46.5	39.5	10.7	39.4	57.3	73.9	16.6	100	0	
Hori.	2390.000	AV	37.0	27.4	24.5	41.4	47.5	53.9	6.4	100	153	
Hori.	4824.000	AV	34.6	31.1	6.8	41.2	31.3	53.9	22.6	100	0	
Hori.	7236.000	AV	36.4	36.6	8.5	41.4	40.1	53.9	13.8	100	0	
Hori.	9648.000	AV	33.3	38.6	9.4	38.9	42.4	53.9	11.5	100	0	
Hori.	12060.000	AV	33.5	39.5	10.7	39.4	44.3	53.9	9.6	100	0	
Vert.	2390.000	PK	55.9	27.4	24.5	41.4	66.4	73.9	7.5	100	16	
Vert.	4824.000	PK	48.4	31.1	6.8	41.2	45.1	73.9	28.8	100	0	
Vert.	7236.000	PK	49.2	36.6	8.5	41.4	52.9	73.9	21.0	100	0	
Vert.	9648.000	PK	46.9	38.6	9.4	38.9	56.0	73.9	17.9	100	0	
Vert.	12060.000	PK	46.3	39.5	10.7	39.4	57.1	73.9	16.8	100	0	
Vert.	2390.000	AV	37.0	27.4	24.5	41.4	47.5	53.9	6.4	100	16	
Vert.	4824.000	AV	34.7	31.1	6.8	41.2	31.4	53.9	22.5	100	0	
Vert.	7236.000	AV	36.4	36.6	8.5	41.4	40.1	53.9	13.8	100	0	
Vert.	9648.000	AV	33.5	38.6	9.4	38.9	42.6	53.9	11.3	100	0	
Vert.	12060.000	AV	33.2	39.5	10.7	39.4	44.0	53.9	9.9	100	0	

Result = Reading + Ant Factor + 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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	75.6	27.5	24.5	41.4	86.2	-	-	Carrier
Hori.	2400.000	PK	48.3	27.4	24.5	41.4	58.8	66.2	7.4	
Vert.	2412.000	PK	78.5	27.5	24.5	41.4	89.1	-	-	Carrier
Vert.	2400.000	PK	48.4	27.4	24.5	41.4	58.9	69.1	10.2	

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

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 August 22, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 28 deg.C , 60%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.3 SAC) (No.2 SAC)
 Mode Tx, 2437 MHz
 Tx, IEEE802.11n-20HT, PN9, worst data mode 2(MCS), 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	45.6	31.3	6.9	41.1	42.7	73.9	31.2	100	0	
Hori.	7311.000	PK	47.8	36.6	8.6	41.4	51.6	73.9	22.3	100	0	
Hori.	9748.000	PK	45.1	38.7	9.5	38.9	54.4	73.9	19.5	100	0	
Hori.	12185.000	PK	44.9	39.5	10.7	39.3	55.8	73.9	18.1	100	0	
Hori.	4874.000	AV	32.9	31.3	6.9	41.1	30.0	53.9	23.9	100	0	
Hori.	7311.000	AV	34.9	36.6	8.6	41.4	38.7	53.9	15.2	100	0	
Hori.	9748.000	AV	31.8	38.7	9.5	38.9	41.1	53.9	12.8	100	0	
Hori.	12185.000	AV	32.5	39.5	10.7	39.3	43.4	53.9	10.5	100	0	
Vert.	4874.000	PK	45.9	31.3	6.9	41.1	43.0	73.9	30.9	100	0	
Vert.	7311.000	PK	46.5	36.6	8.6	41.4	50.3	73.9	23.6	100	0	
Vert.	9748.000	PK	44.4	38.7	9.5	38.9	53.7	73.9	20.2	100	0	
Vert.	12185.000	PK	45.4	39.5	10.7	39.3	56.3	73.9	17.6	100	0	
Vert.	4874.000	AV	32.9	31.3	6.9	41.1	30.0	53.9	23.9	100	0	
Vert.	7311.000	AV	34.8	36.6	8.6	41.4	38.6	53.9	15.3	100	0	
Vert.	9748.000	AV	31.9	38.7	9.5	38.9	41.2	53.9	12.7	100	0	
Vert.	12185.000	AV	32.3	39.5	10.7	39.3	43.2	53.9	10.7	100	0	

Result = Reading + Ant Factor + 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 UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 September 6, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 25 deg.C , 71%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.2 SAC) (No.2 SAC)
 Mode Tx, 2462 MHz
 Tx, IEEE802.11n-20HT, PN9, worst data mode 2(MCS), 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	50.0	27.5	24.6	41.4	60.7	73.9	13.2	100	284	
Hori.	4924.000	PK	42.3	31.1	6.6	34.0	46.0	73.9	27.9	100	0	
Hori.	7386.000	PK	44.3	36.3	8.3	33.9	55.0	73.9	18.9	100	0	
Hori.	9848.000	PK	42.8	38.6	9.3	34.5	56.2	73.9	17.7	100	0	
Hori.	12310.000	PK	43.6	39.1	10.7	33.9	59.5	73.9	14.4	100	0	
Hori.	2483.500	AV	34.1	27.5	24.6	41.4	44.8	53.9	9.1	100	284	
Hori.	4924.000	AV	30.9	31.1	6.6	34.0	34.6	53.9	19.3	100	0	
Hori.	7386.000	AV	32.4	36.3	8.3	33.9	43.1	53.9	10.8	100	0	
Hori.	9848.000	AV	31.8	38.6	9.3	34.5	45.2	53.9	8.7	100	0	
Hori.	12310.000	AV	32.3	39.1	10.7	33.9	48.2	53.9	5.7	100	0	
Vert.	2483.500	PK	48.7	27.5	24.6	41.4	59.4	73.9	14.5	100	13	
Vert.	4924.000	PK	42.8	31.1	6.6	34.0	46.5	73.9	27.4	100	0	
Vert.	7386.000	PK	44.5	36.3	8.3	33.9	55.2	73.9	18.7	100	0	
Vert.	9848.000	PK	43.1	38.6	9.3	34.5	56.5	73.9	17.4	100	0	
Vert.	12310.000	PK	44.4	39.1	10.7	33.9	60.3	73.9	13.6	100	0	
Vert.	2483.500	AV	33.6	27.5	24.6	41.4	44.3	53.9	9.6	100	13	
Vert.	4924.000	AV	31.6	31.1	6.6	34.0	35.3	53.9	18.6	100	0	
Vert.	7386.000	AV	32.1	36.3	8.3	33.9	42.8	53.9	11.1	100	0	
Vert.	9848.000	AV	31.7	38.6	9.3	34.5	45.1	53.9	8.8	100	0	
Vert.	12310.000	AV	32.2	39.1	10.7	33.9	48.1	53.9	5.8	100	0	

Result = Reading + Ant Factor + 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 UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 August 22, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 28 deg.C , 60%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.3 SAC) (No.2 SAC)
 Mode Tx, 2412 MHz
 Tx, IEEE802.11n-20HT, PN9, worst data mode 2(MCS), 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	47.1	27.4	24.5	41.4	57.6	73.9	16.3	100	63	
Hori.	4824.000	PK	47.8	31.1	6.8	41.2	44.5	73.9	29.4	100	0	
Hori.	7236.000	PK	49.2	36.6	8.5	41.4	52.9	73.9	21.0	100	0	
Hori.	9648.000	PK	46.0	38.6	9.4	38.9	55.1	73.9	18.8	100	0	
Hori.	12060.000	PK	47.6	39.5	10.7	39.4	58.4	73.9	15.5	100	0	
Hori.	2390.000	AV	34.3	27.4	24.5	41.4	44.8	53.9	9.1	100	63	
Hori.	4824.000	AV	34.7	31.1	6.8	41.2	31.4	53.9	22.5	100	0	
Hori.	7236.000	AV	36.5	36.6	8.5	41.4	40.2	53.9	13.7	100	0	
Hori.	9648.000	AV	33.4	38.6	9.4	38.9	42.5	53.9	11.4	100	0	
Hori.	12060.000	AV	33.7	39.5	10.7	39.4	44.5	53.9	9.4	100	0	
Vert.	2390.000	PK	47.3	27.4	24.5	41.4	57.8	73.9	16.1	100	1	
Vert.	4824.000	PK	48.5	31.1	6.8	41.2	45.2	73.9	28.7	100	0	
Vert.	7236.000	PK	50.3	36.6	8.5	41.4	54.0	73.9	19.9	100	0	
Vert.	9648.000	PK	46.5	38.6	9.4	38.9	55.6	73.9	18.3	100	0	
Vert.	12060.000	PK	47.4	39.5	10.7	39.4	58.2	73.9	15.7	100	0	
Vert.	2390.000	AV	33.0	27.4	24.5	41.4	43.5	53.9	10.4	100	1	
Vert.	4824.000	AV	34.6	31.1	6.8	41.2	31.3	53.9	22.6	100	0	
Vert.	7236.000	AV	36.5	36.6	8.5	41.4	40.2	53.9	13.7	100	0	
Vert.	9648.000	AV	33.3	38.6	9.4	38.9	42.4	53.9	11.5	100	0	
Vert.	12060.000	AV	33.0	39.5	10.7	39.4	43.8	53.9	10.1	100	0	

Result = Reading + Ant Factor + 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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	73.7	27.5	24.5	41.4	84.3	-	-	Carrier
Hori.	2400.000	PK	38.8	27.4	24.5	41.4	49.3	64.3	15.0	
Vert.	2412.000	PK	75.1	27.5	24.5	41.4	85.7	-	-	Carrier
Vert.	2400.000	PK	38.7	27.4	24.5	41.4	49.2	65.7	16.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 August 22, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 28 deg.C , 60%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.3 SAC) (No.2 SAC)
 Mode Tx, 2437 MHz
 Tx, IEEE802.11n-20HT, PN9, worst data mode 2(MCS), 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	47.6	31.3	6.9	41.1	44.7	73.9	29.2	100	0	
Hori.	7311.000	PK	48.7	36.6	8.6	41.4	52.5	73.9	21.4	100	0	
Hori.	9748.000	PK	47.3	38.7	9.5	38.9	56.6	73.9	17.3	100	0	
Hori.	12185.000	PK	47.6	39.5	10.7	39.3	58.5	73.9	15.4	100	0	
Hori.	4874.000	AV	34.5	31.3	6.9	41.1	31.6	53.9	22.3	100	0	
Hori.	7311.000	AV	35.9	36.6	8.6	41.4	39.7	53.9	14.2	100	0	
Hori.	9748.000	AV	33.4	38.7	9.5	38.9	42.7	53.9	11.2	100	0	
Hori.	12185.000	AV	33.9	39.5	10.7	39.3	44.8	53.9	9.1	100	0	
Vert.	4874.000	PK	47.6	31.3	6.9	41.1	44.7	73.9	29.2	100	0	
Vert.	7311.000	PK	49.5	36.6	8.6	41.4	53.3	73.9	20.6	100	0	
Vert.	9748.000	PK	46.7	38.7	9.5	38.9	56.0	73.9	17.9	100	0	
Vert.	12185.000	PK	46.2	39.5	10.7	39.3	57.1	73.9	16.8	100	0	
Vert.	4874.000	AV	34.8	31.3	6.9	41.1	31.9	53.9	22.0	100	0	
Vert.	7311.000	AV	35.2	36.6	8.6	41.4	39.0	53.9	14.9	100	0	
Vert.	9748.000	AV	33.3	38.7	9.5	38.9	42.6	53.9	11.3	100	0	
Vert.	12185.000	AV	33.8	39.5	10.7	39.3	44.7	53.9	9.2	100	0	

Result = Reading + Ant Factor + 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 UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 September 6, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 25 deg.C , 71%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.2 SAC) (No.2 SAC)
 Mode Tx, 2462 MHz
 Tx, IEEE802.11n-20HT, PN9, worst data mode 2(MCS), 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	45.2	27.5	24.6	41.4	55.9	73.9	18.0	100	294	
Hori.	4924.000	PK	42.7	31.1	6.6	34.0	46.4	73.9	27.5	100	0	
Hori.	7386.000	PK	44.4	36.3	8.3	33.9	55.1	73.9	18.8	100	0	
Hori.	9848.000	PK	43.0	38.6	9.3	34.5	56.4	73.9	17.5	100	0	
Hori.	12310.000	PK	44.3	39.1	10.7	33.9	60.2	73.9	13.7	100	0	
Hori.	2483.500	AV	32.8	27.5	24.6	41.4	43.5	53.9	10.4	100	294	
Hori.	4924.000	AV	30.8	31.1	6.6	34.0	34.5	53.9	19.4	100	0	
Hori.	7386.000	AV	31.9	36.3	8.3	33.9	42.6	53.9	11.3	100	0	
Hori.	9848.000	AV	31.6	38.6	9.3	34.5	45.0	53.9	8.9	100	0	
Hori.	12310.000	AV	32.3	39.1	10.7	33.9	48.2	53.9	5.7	100	0	
Vert.	2483.500	PK	45.5	27.5	24.6	41.4	56.2	73.9	17.7	100	69	
Vert.	4924.000	PK	44.4	31.1	6.6	34.0	48.1	73.9	25.8	100	0	
Vert.	7386.000	PK	44.3	36.3	8.3	33.9	55.0	73.9	18.9	100	0	
Vert.	9848.000	PK	43.1	38.6	9.3	34.5	56.5	73.9	17.4	100	0	
Vert.	12310.000	PK	44.4	39.1	10.7	33.9	60.3	73.9	13.6	100	0	
Vert.	2483.500	AV	32.8	27.5	24.6	41.4	43.5	53.9	10.4	100	69	
Vert.	4924.000	AV	31.1	31.1	6.6	34.0	34.8	53.9	19.1	100	0	
Vert.	7386.000	AV	32.1	36.3	8.3	33.9	42.8	53.9	11.1	100	0	
Vert.	9848.000	AV	31.7	38.6	9.3	34.5	45.1	53.9	8.8	100	0	
Vert.	12310.000	AV	32.2	39.1	10.7	33.9	48.1	53.9	5.8	100	0	

Result = Reading + Ant Factor + 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 UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 September 6, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 25 deg.C , 71%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.2 SAC) (No.2 SAC)
 Mode Tx, 2422 MHz
 Tx, IEEE802.11n-40HT, PN9, worst data mode 5(MCS), power setting 11dBm

(* 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	54.0	27.4	24.5	41.4	64.5	73.9	9.4	100	44	
Hori.	4844.000	PK	42.3	30.9	6.6	34.0	45.8	73.9	28.1	100	0	
Hori.	7266.000	PK	44.1	36.2	8.0	33.9	54.4	73.9	19.5	100	0	
Hori.	9688.000	PK	43.4	38.3	9.2	34.5	56.4	73.9	17.5	100	0	
Hori.	12110.000	PK	43.4	39.2	10.5	34.0	59.1	73.9	14.8	100	0	
Hori.	2390.000	AV	39.3	27.4	24.5	41.4	49.8	53.9	4.1	100	44	
Hori.	4844.000	AV	30.8	30.9	6.6	34.0	34.3	53.9	19.6	100	0	
Hori.	7266.000	AV	32.0	36.2	8.0	33.9	42.3	53.9	11.6	100	0	
Hori.	9688.000	AV	31.7	38.3	9.2	34.5	44.7	53.9	9.2	100	0	
Hori.	12110.000	AV	32.6	39.2	10.5	34.0	48.3	53.9	5.6	100	0	
Vert.	2390.000	PK	52.8	27.4	24.5	41.4	63.3	73.9	10.6	100	53	
Vert.	4844.000	PK	43.4	30.9	6.6	34.0	46.9	73.9	27.0	100	0	
Vert.	7266.000	PK	43.9	36.2	8.0	33.9	54.2	73.9	19.7	100	0	
Vert.	9688.000	PK	43.8	38.3	9.2	34.5	56.8	73.9	17.1	100	0	
Vert.	12110.000	PK	44.2	39.2	10.5	34.0	59.9	73.9	14.0	100	0	
Vert.	2390.000	AV	38.3	27.4	24.5	41.4	48.8	53.9	5.1	100	53	
Vert.	4844.000	AV	30.8	30.9	6.6	34.0	34.3	53.9	19.6	100	0	
Vert.	7266.000	AV	32.6	36.2	8.0	33.9	42.9	53.9	11.0	100	0	
Vert.	9688.000	AV	31.6	38.3	9.2	34.5	44.6	53.9	9.3	100	0	
Vert.	12110.000	AV	32.6	39.2	10.5	34.0	48.3	53.9	5.6	100	0	

Result = Reading + Ant Factor + 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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2422.000	PK	75.5	27.5	24.5	41.4	86.1	-	-	Carrier
Hori.	2400.000	PK	45.1	27.4	24.5	41.4	55.6	66.1	10.5	
Vert.	2422.000	PK	76.0	27.5	24.5	41.4	86.6	-	-	Carrier
Vert.	2400.000	PK	42.4	27.4	24.5	41.4	52.9	66.6	13.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 September 6, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 25 deg.C , 71%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.2 SAC) (No.2 SAC)
 Mode Tx, 2437 MHz
 Tx, IEEE802.11n-40HT, PN9, worst data mode 5(MCS), power setting 11dBm

(* 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	44.4	31.0	6.6	34.0	48.0	73.9	25.9	100	0	
Hori.	7311.000	PK	43.8	36.2	8.2	33.9	54.3	73.9	19.6	100	0	
Hori.	9748.000	PK	42.9	38.4	9.3	34.5	56.1	73.9	17.8	100	0	
Hori.	12185.000	PK	44.6	39.2	10.5	34.0	60.3	73.9	13.6	100	0	
Hori.	4874.000	AV	30.8	31.0	6.6	34.0	34.4	53.9	19.5	100	0	
Hori.	7311.000	AV	32.2	36.2	8.2	33.9	42.7	53.9	11.2	100	0	
Hori.	9748.000	AV	31.5	38.4	9.3	34.5	44.7	53.9	9.2	100	0	
Hori.	12185.000	AV	32.4	39.2	10.5	34.0	48.1	53.9	5.8	100	0	
Vert.	4874.000	PK	43.5	31.0	6.6	34.0	47.1	73.9	26.8	100	0	
Vert.	7311.000	PK	44.2	36.2	8.2	33.9	54.7	73.9	19.2	100	0	
Vert.	9748.000	PK	43.0	38.4	9.3	34.5	56.2	73.9	17.7	100	0	
Vert.	12185.000	PK	43.7	39.2	10.5	34.0	59.4	73.9	14.5	100	0	
Vert.	4874.000	AV	32.3	31.0	6.6	34.0	35.9	53.9	18.0	100	0	
Vert.	7311.000	AV	32.3	36.2	8.2	33.9	42.8	53.9	11.1	100	0	
Vert.	9748.000	AV	31.8	38.4	9.3	34.5	45.0	53.9	8.9	100	0	
Vert.	12185.000	AV	32.9	39.2	10.5	34.0	48.6	53.9	5.3	100	0	

Result = Reading + Ant Factor + 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 UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 September 6, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 25 deg.C , 71%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.2 SAC) (No.2 SAC)
 Mode Tx, 2452 MHz
 Tx, IEEE802.11n-40HT, PN9, worst data mode 5(MCS), power setting 11dBm

(* 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	59.5	27.5	24.6	41.4	70.2	73.9	3.7	100	127	
Hori.	4904.000	PK	43.5	31.1	6.6	34.0	47.2	73.9	26.7	100	0	
Hori.	7356.000	PK	43.7	36.3	8.2	33.9	54.3	73.9	19.6	100	0	
Hori.	9808.000	PK	42.9	38.5	9.3	34.5	56.2	73.9	17.7	100	0	
Hori.	12260.000	PK	43.8	39.2	10.6	33.9	59.7	73.9	14.2	100	0	
Hori.	2483.500	AV	42.7	27.5	24.6	41.4	53.4	53.9	0.5	100	127	
Hori.	4904.000	AV	30.9	31.1	6.6	34.0	34.6	53.9	19.3	100	0	
Hori.	7356.000	AV	32.1	36.3	8.2	33.9	42.7	53.9	11.2	100	0	
Hori.	9808.000	AV	31.7	38.5	9.3	34.5	45.0	53.9	8.9	100	0	
Hori.	12260.000	AV	32.6	39.2	10.6	33.9	48.5	53.9	5.4	100	0	
Vert.	2483.500	PK	56.2	27.5	24.6	41.4	66.9	73.9	7.0	100	66	
Vert.	4904.000	PK	42.4	31.1	6.6	34.0	46.1	73.9	27.8	100	0	
Vert.	7356.000	PK	44.2	36.3	8.2	33.9	54.8	73.9	19.1	100	0	
Vert.	9808.000	PK	42.9	38.5	9.3	34.5	56.2	73.9	17.7	100	0	
Vert.	12260.000	PK	44.3	39.2	10.6	33.9	60.2	73.9	13.7	100	0	
Vert.	2483.500	AV	40.8	27.5	24.6	41.4	51.5	53.9	2.4	100	66	
Vert.	4904.000	AV	30.9	31.1	6.6	34.0	34.6	53.9	19.3	100	0	
Vert.	7356.000	AV	31.9	36.3	8.2	33.9	42.5	53.9	11.4	100	0	
Vert.	9808.000	AV	31.5	38.5	9.3	34.5	44.8	53.9	9.1	100	0	
Vert.	12260.000	AV	32.6	39.2	10.6	33.9	48.5	53.9	5.4	100	0	

Result = Reading + Ant Factor + 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 UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 September 6, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 25 deg.C , 71%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.2 SAC) (No.2 SAC)
 Mode Tx, 2422 MHz
 Tx, IEEE802.11n-40HT, PN9, worst data mode 5(MCS), power setting 9dBm

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	2390.000	PK	49.9	27.4	24.5	41.4	60.4	73.9	13.5	100	65	
Hori.	4844.000	PK	42.3	30.9	6.6	34.0	45.8	73.9	28.1	100	0	
Hori.	7266.000	PK	44.2	36.2	8.0	33.9	54.5	73.9	19.4	100	0	
Hori.	9688.000	PK	40.8	38.3	9.2	34.5	53.8	73.9	20.1	100	0	
Hori.	12110.000	PK	44.1	39.2	10.5	34.0	59.8	73.9	14.1	100	0	
Hori.	2390.000	AV	35.5	27.4	24.5	41.4	46.0	53.9	7.9	100	65	
Hori.	4844.000	AV	31.2	30.9	6.6	34.0	34.7	53.9	19.2	100	0	
Hori.	7266.000	AV	32.9	36.2	8.0	33.9	43.2	53.9	10.7	100	0	
Hori.	9688.000	AV	31.7	38.3	9.2	34.5	44.7	53.9	9.2	100	0	
Hori.	12110.000	AV	32.5	39.2	10.5	34.0	48.2	53.9	5.7	100	0	
Vert.	2390.000	PK	50.3	27.4	24.5	41.4	60.8	73.9	13.1	100	26	
Vert.	4844.000	PK	43.3	30.9	6.6	34.0	46.8	73.9	27.1	100	0	
Vert.	7266.000	PK	43.9	36.2	8.0	33.9	54.2	73.9	19.7	100	0	
Vert.	9688.000	PK	43.5	38.3	9.2	34.5	56.5	73.9	17.4	100	0	
Vert.	12110.000	PK	43.9	39.2	10.5	34.0	59.6	73.9	14.3	100	0	
Vert.	2390.000	AV	36.3	27.4	24.5	41.4	46.8	53.9	7.1	100	26	
Vert.	4844.000	AV	30.9	30.9	6.6	34.0	34.4	53.9	19.5	100	0	
Vert.	7266.000	AV	32.1	36.2	8.0	33.9	42.4	53.9	11.5	100	0	
Vert.	9688.000	AV	32.0	38.3	9.2	34.5	45.0	53.9	8.9	100	0	
Vert.	12110.000	AV	32.7	39.2	10.5	34.0	48.4	53.9	5.5	100	0	

Result = Reading + Ant Factor + 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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2422.000	PK	73.5	27.5	24.5	41.4	84.1	-	-	Carrier
Hori.	2400.000	PK	40.3	27.4	24.5	41.4	50.8	64.1	13.3	
Vert.	2422.000	PK	75.7	27.5	24.5	41.4	86.3	-	-	Carrier
Vert.	2400.000	PK	40.0	27.4	24.5	41.4	50.5	66.3	15.8	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)

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

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 September 6, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 25 deg.C , 71%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.2 SAC) (No.2 SAC)
 Mode Tx, 2437 MHz
 Tx, IEEE802.11n-40HT, PN9, worst data mode 5(MCS), power setting 9dBm

(* 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	41.8	31.0	6.6	34.0	45.4	73.9	28.5	100	0	
Hori.	7311.000	PK	43.8	36.2	8.2	33.9	54.3	73.9	19.6	100	0	
Hori.	9748.000	PK	43.4	38.4	9.3	34.5	56.6	73.9	17.3	100	0	
Hori.	12185.000	PK	45.2	39.2	10.5	34.0	60.9	73.9	13.0	100	0	
Hori.	4874.000	AV	30.8	31.0	6.6	34.0	34.4	53.9	19.5	100	0	
Hori.	7311.000	AV	32.2	36.2	8.2	33.9	42.7	53.9	11.2	100	0	
Hori.	9748.000	AV	31.7	38.4	9.3	34.5	44.9	53.9	9.0	100	0	
Hori.	12185.000	AV	32.4	39.2	10.5	34.0	48.1	53.9	5.8	100	0	
Vert.	4874.000	PK	43.5	31.0	6.6	34.0	47.1	73.9	26.8	100	0	
Vert.	7311.000	PK	44.6	36.2	8.2	33.9	55.1	73.9	18.8	100	0	
Vert.	9748.000	PK	43.5	38.4	9.3	34.5	56.7	73.9	17.2	100	0	
Vert.	12185.000	PK	44.2	39.2	10.5	34.0	59.9	73.9	14.0	100	0	
Vert.	4874.000	AV	30.6	31.0	6.6	34.0	34.2	53.9	19.7	100	0	
Vert.	7311.000	AV	32.5	36.2	8.2	33.9	43.0	53.9	10.9	100	0	
Vert.	9748.000	AV	31.6	38.4	9.3	34.5	44.8	53.9	9.1	100	0	
Vert.	12185.000	AV	32.8	39.2	10.5	34.0	48.5	53.9	5.4	100	0	

Result = Reading + Ant Factor + 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 UL Japan, Inc. Shonan EMC Lab. No.2 and 3 Semi Anechoic Chamber
 Date August 21, 2012 September 6, 2012 September 7, 2012
 Temperature / Humidity 28 deg.C , 60%RH 25 deg.C , 71%RH 24 deg.C , 68%RH
 Engineer Wataru Kojima Wataru Kojima Wataru Kojima
 (No.3 SAC) (No.2 SAC) (No.2 SAC)
 Mode Tx, 2452 MHz
 Tx, IEEE802.11n-40HT, PN9, worst data mode 5(MCS), power setting 9dBm

(* 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	55.0	27.5	24.6	41.4	65.7	73.9	8.2	100	130	
Hori.	4904.000	PK	42.4	31.1	6.6	34.0	46.1	73.9	27.8	100	0	
Hori.	7356.000	PK	43.7	36.3	8.2	33.9	54.3	73.9	19.6	100	0	
Hori.	9808.000	PK	44.2	38.5	9.3	34.5	57.5	73.9	16.4	100	0	
Hori.	12260.000	PK	44.3	39.2	10.6	33.9	60.2	73.9	13.7	100	0	
Hori.	2483.500	AV	39.1	27.5	24.6	41.4	49.8	53.9	4.1	100	130	
Hori.	4904.000	AV	30.9	31.1	6.6	34.0	34.6	53.9	19.3	100	0	
Hori.	7356.000	AV	32.3	36.3	8.2	33.9	42.9	53.9	11.0	100	0	
Hori.	9808.000	AV	31.6	38.5	9.3	34.5	44.9	53.9	9.0	100	0	
Hori.	12260.000	AV	32.4	39.2	10.6	33.9	48.3	53.9	5.6	100	0	
Vert.	2483.500	PK	50.8	27.5	24.6	41.4	61.5	73.9	12.4	100	68	
Vert.	4904.000	PK	42.5	31.1	6.6	34.0	46.2	73.9	27.7	100	0	
Vert.	7356.000	PK	44.6	36.3	8.2	33.9	55.2	73.9	18.7	100	0	
Vert.	9808.000	PK	43.3	38.5	9.3	34.5	56.6	73.9	17.3	100	0	
Vert.	12260.000	PK	43.7	39.2	10.6	33.9	59.6	73.9	14.3	100	0	
Vert.	2483.500	AV	36.2	27.5	24.6	41.4	46.9	53.9	7.0	100	68	
Vert.	4904.000	AV	30.8	31.1	6.6	34.0	34.5	53.9	19.4	100	0	
Vert.	7356.000	AV	31.9	36.3	8.2	33.9	42.5	53.9	11.4	100	0	
Vert.	9808.000	AV	31.6	38.5	9.3	34.5	44.9	53.9	9.0	100	0	
Vert.	12260.000	AV	32.5	39.2	10.6	33.9	48.4	53.9	5.5	100	0	

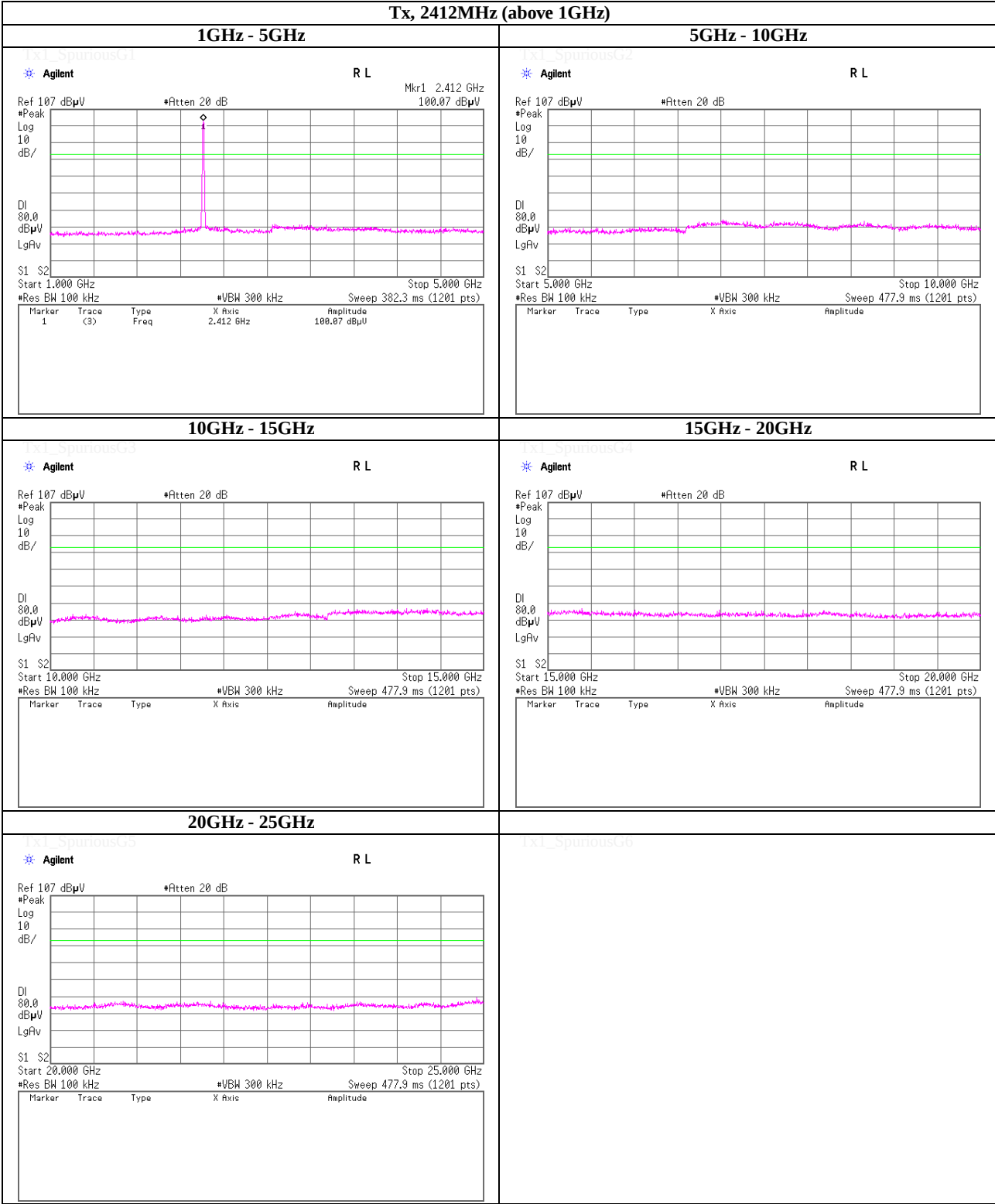
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier)

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

Spurious emission (Conducted)

Tx, IEEE802.11b, PN9, worst data mode 1Mbps, power setting 14dBm

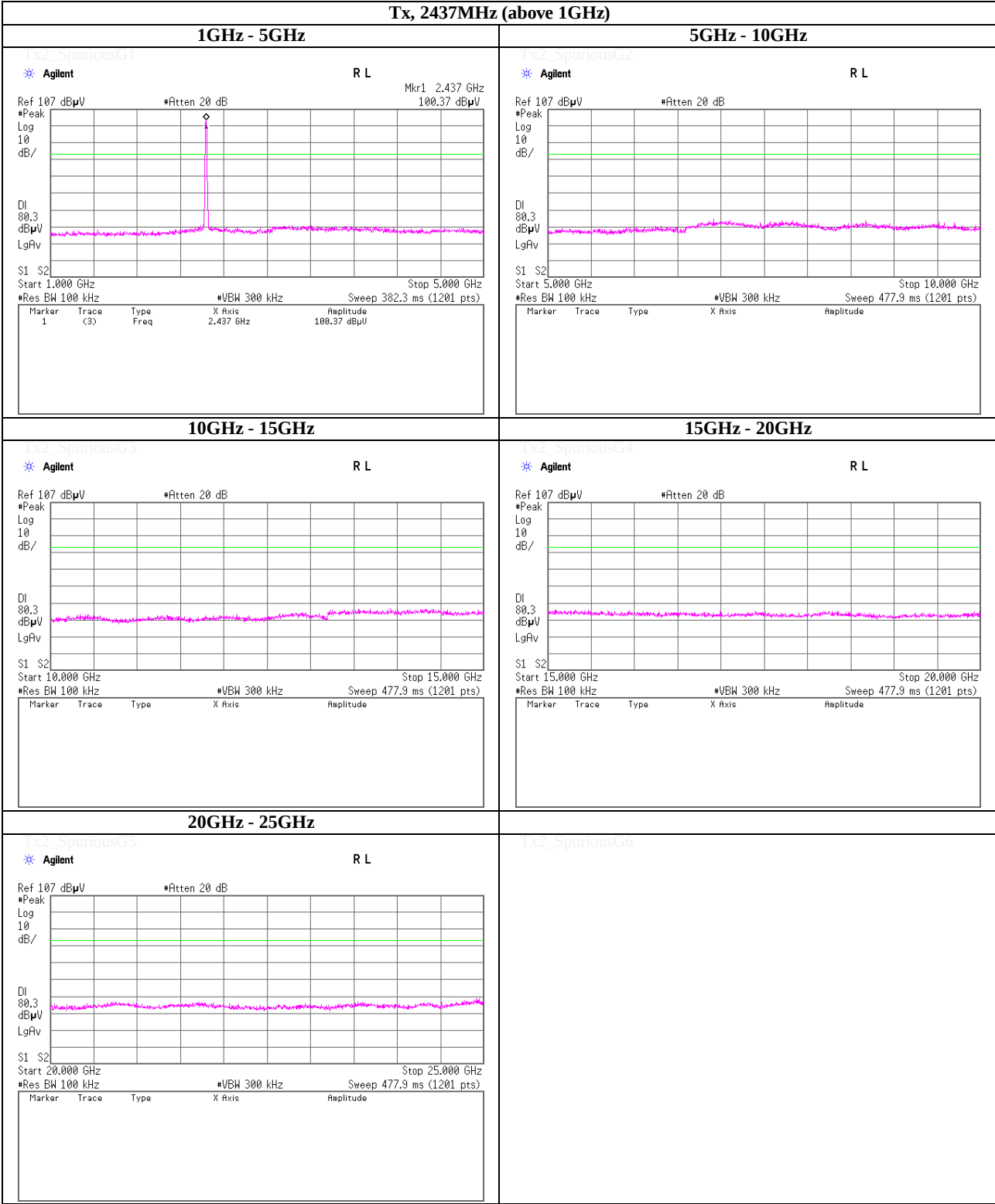
Tx, 2412MHz (above 1GHz)



Spurious emission (Conducted)

Tx, IEEE802.11b, PN9, worst data mode 1Mbps, power setting 14dBm

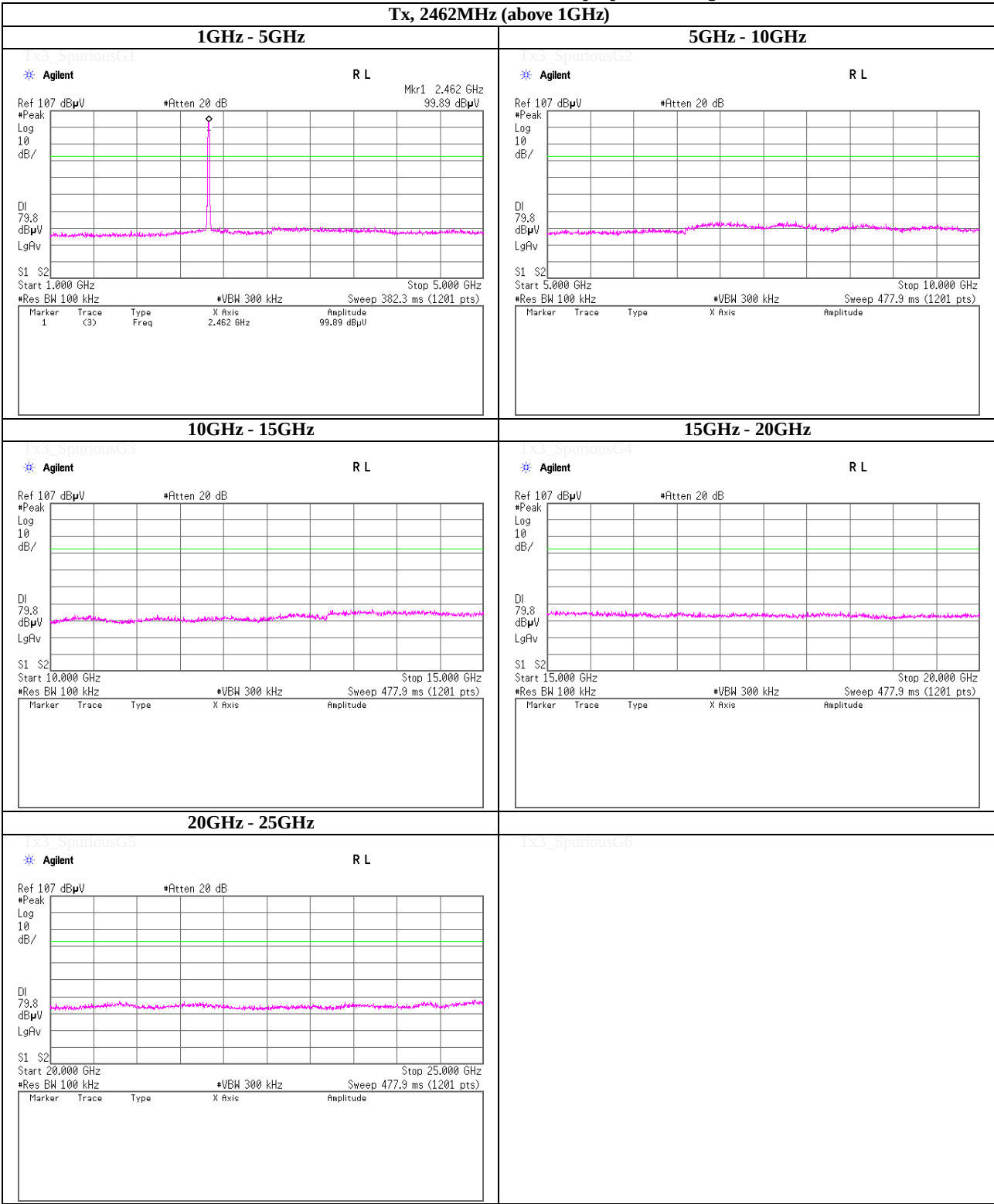
Tx, 2437MHz (above 1GHz)



Spurious emission (Conducted)

Tx, IEEE802.11b, PN9, worst data mode 1Mbps, power setting 14dBm

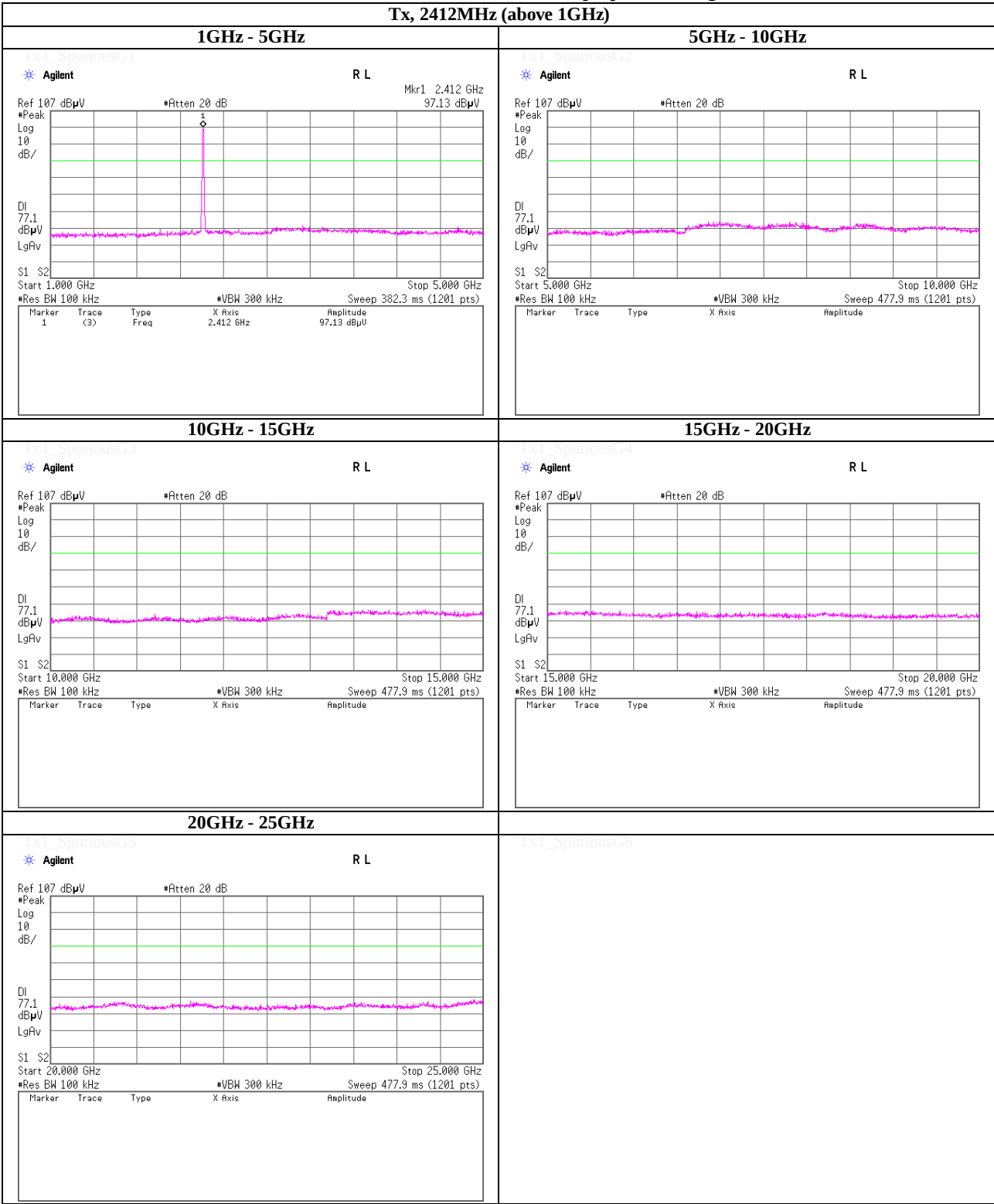
Tx, 2462MHz (above 1GHz)



Spurious emission (Conducted)

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

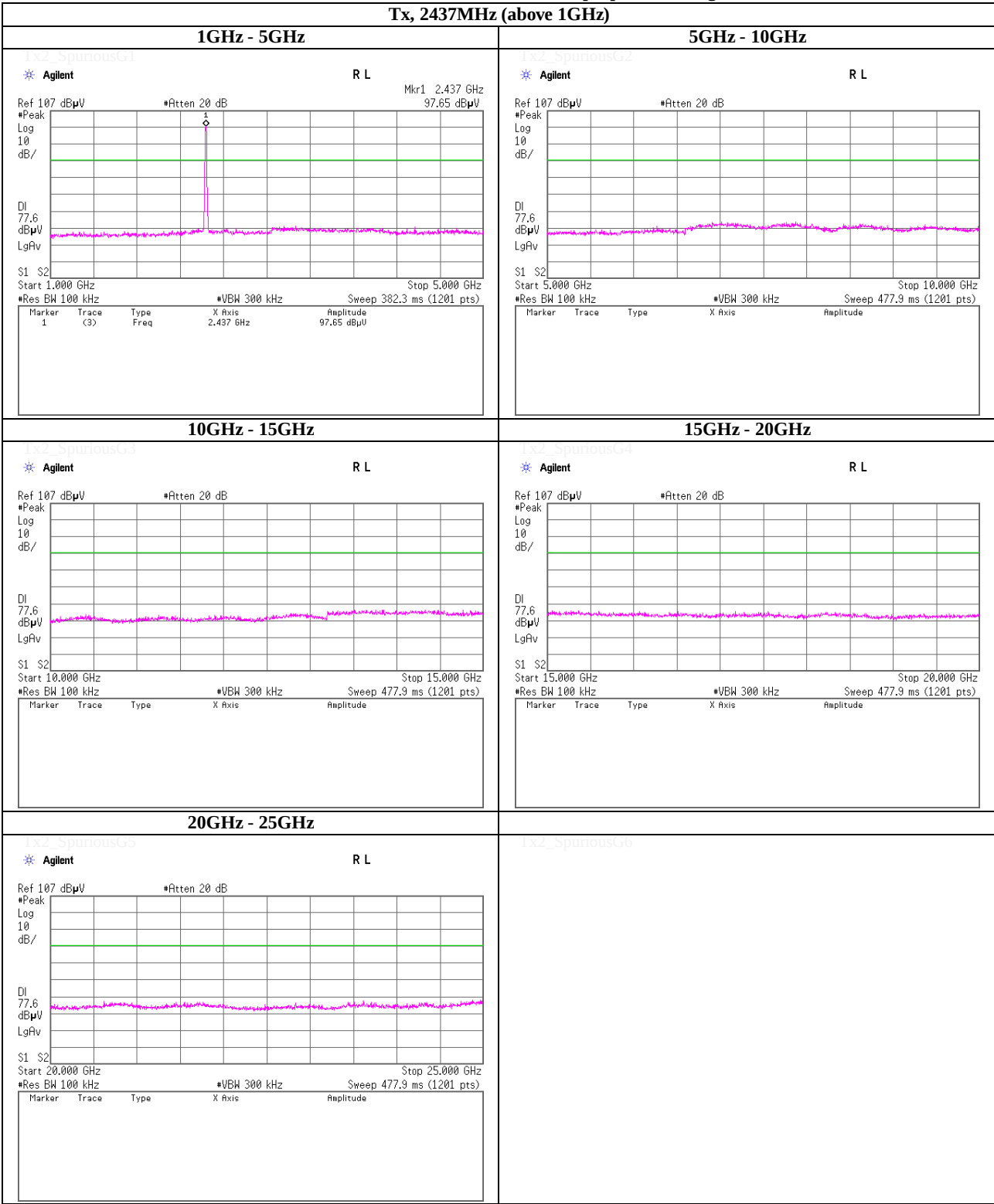
Tx, 2412MHz (above 1GHz)



Spurious emission (Conducted)

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

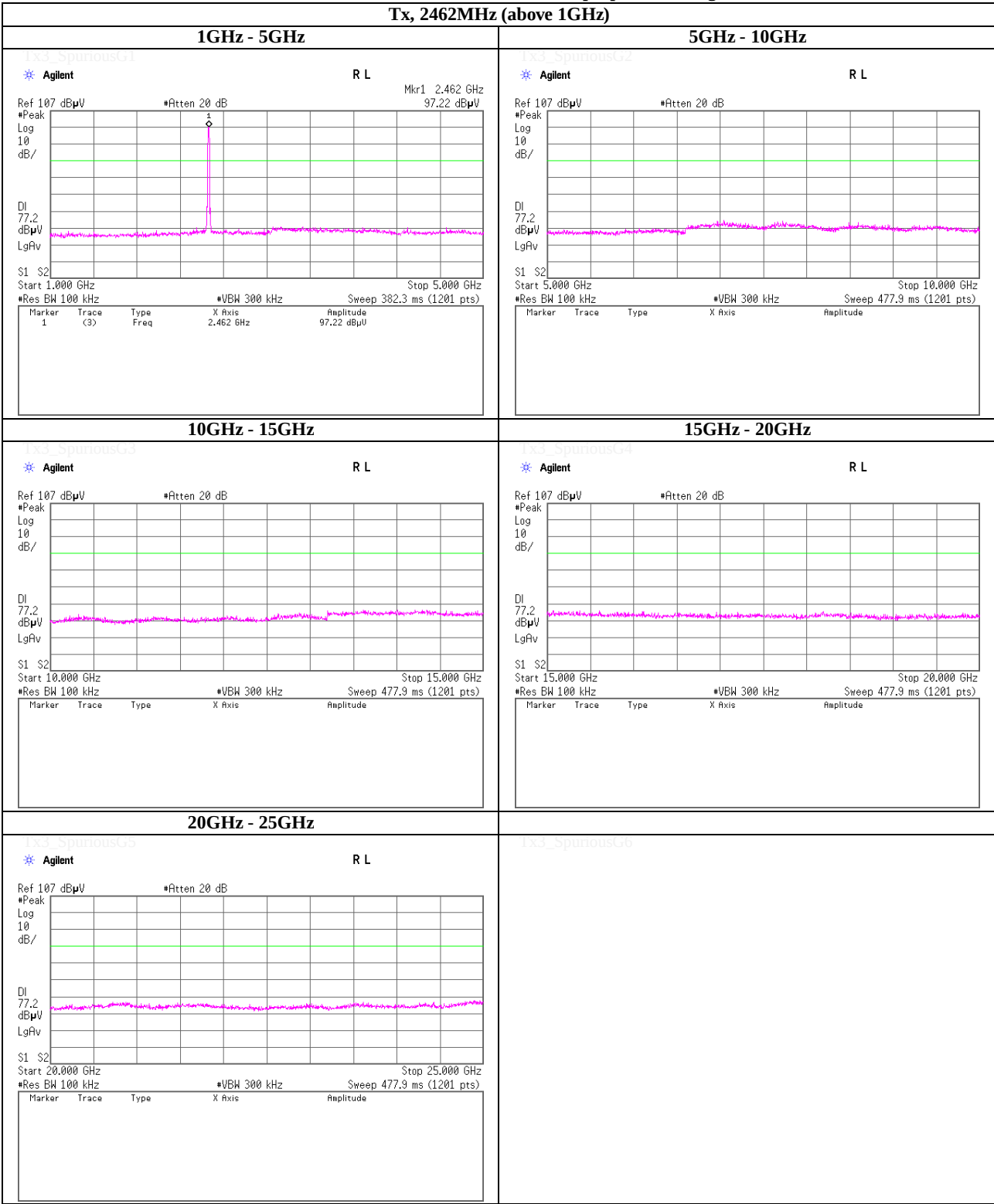
Tx, 2437MHz (above 1GHz)



Spurious emission (Conducted)

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

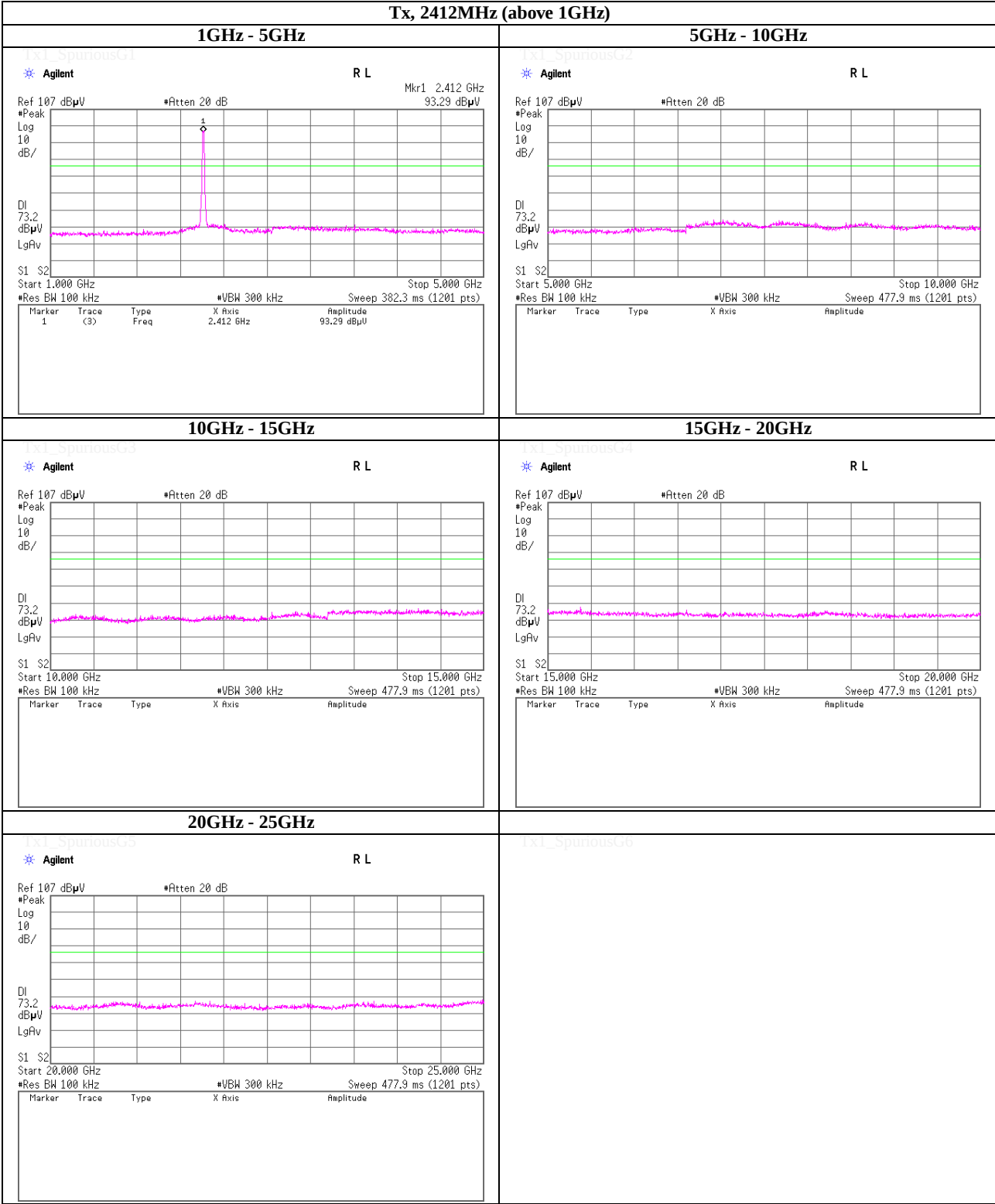
Tx, 2462MHz (above 1GHz)



Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps, power setting 12dBm

Tx, 2412MHz (above 1GHz)



Spurious emission (Conducted)

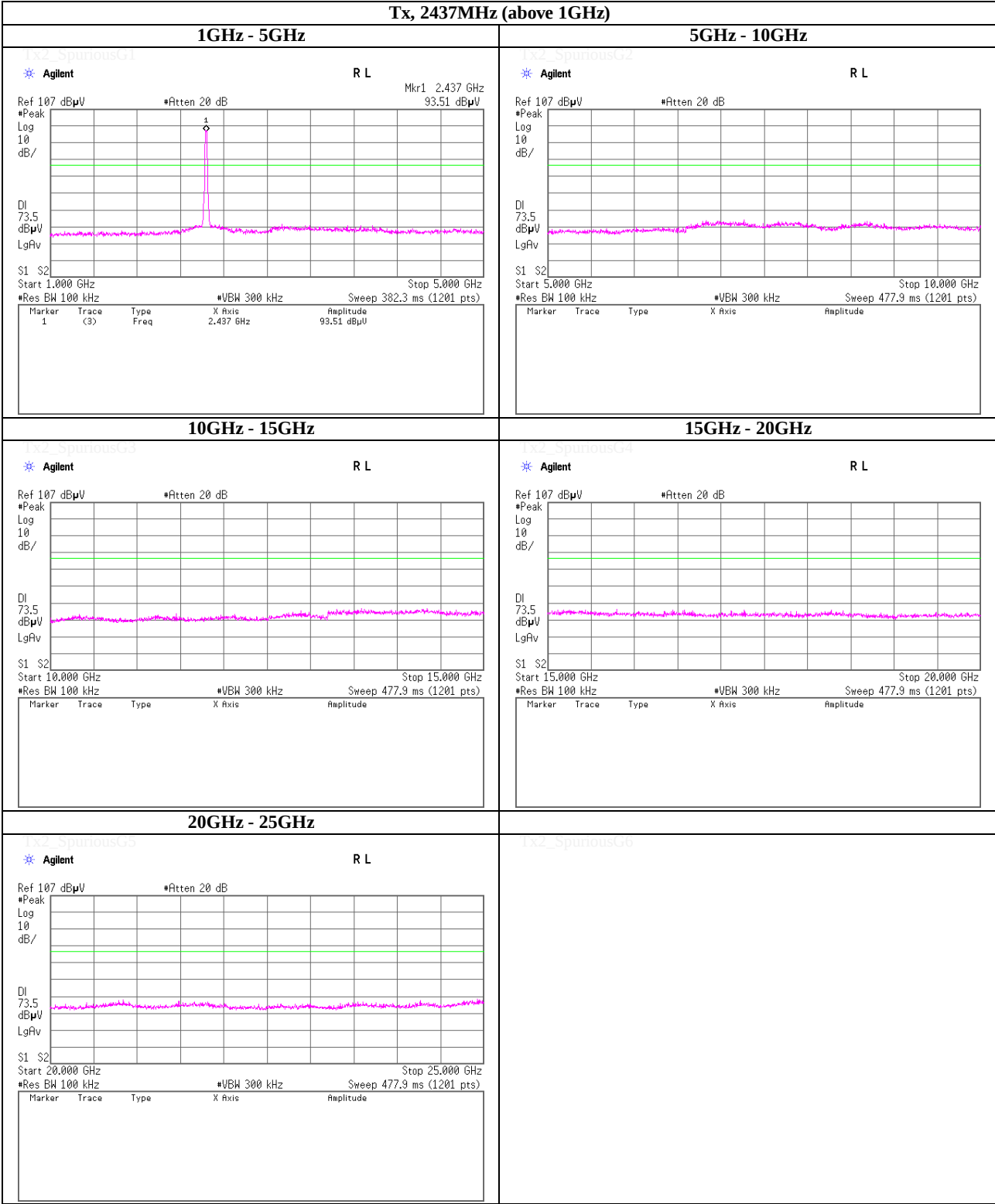
Tx, IEEE802.11g, PN9, worst data mode 6Mbps, power setting 12dBm

Tx, 2437MHz (below 1GHz)



Spurious emission (Conducted)

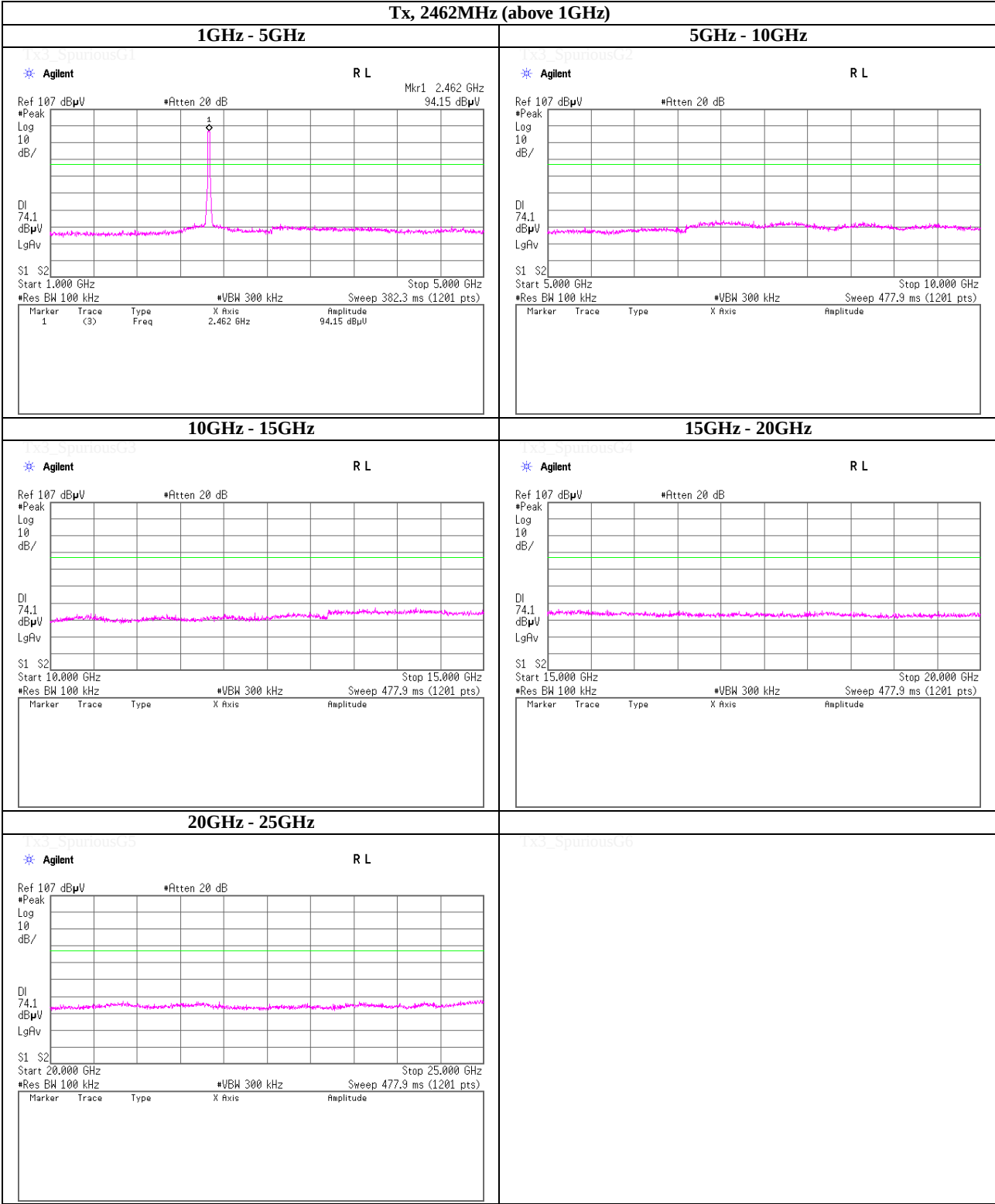
Tx, IEEE802.11g, PN9, worst data mode 6Mbps, power setting 12dBm
Tx, 2437MHz (above 1GHz)

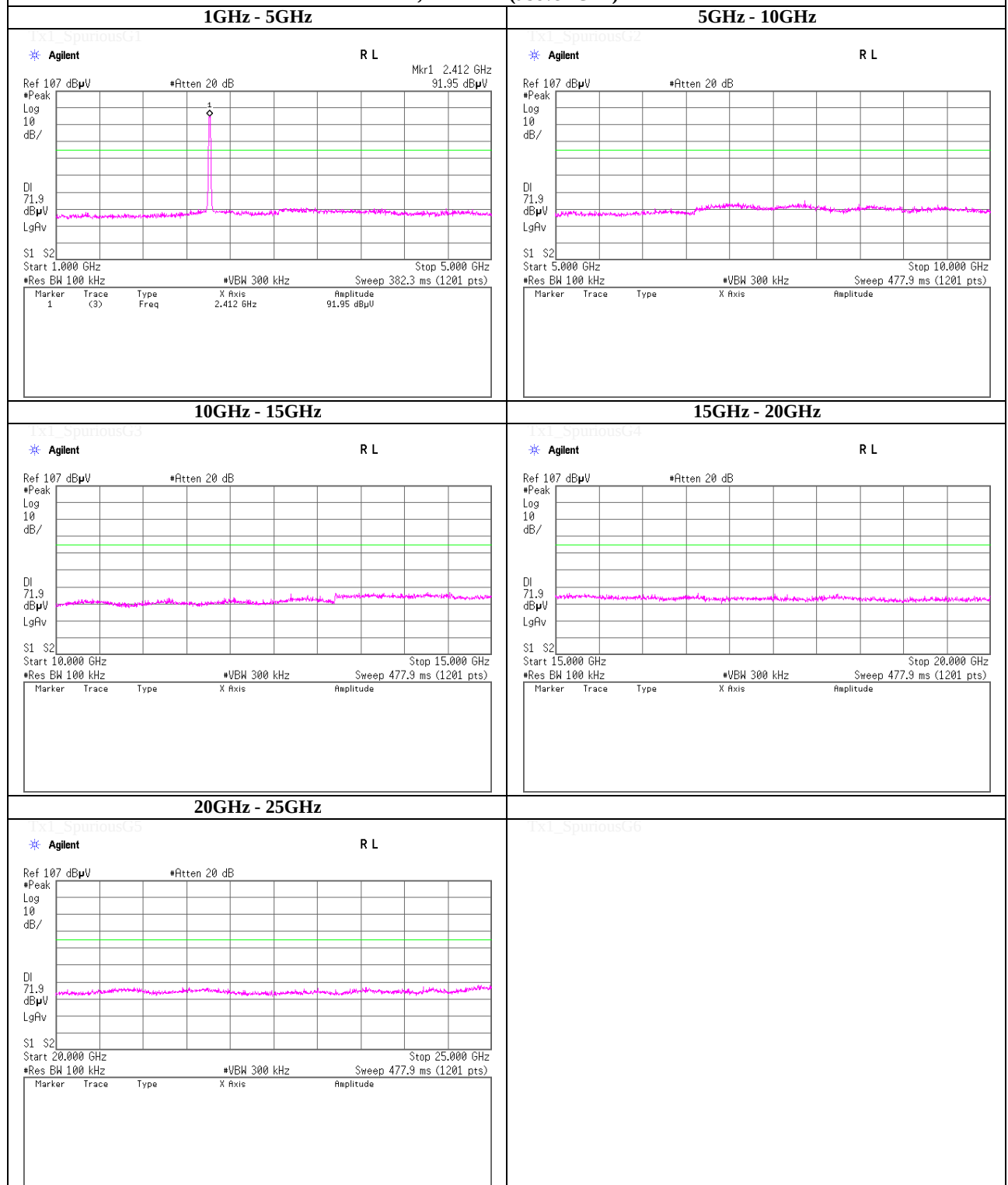


Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps, power setting 12dBm

Tx, 2462MHz (above 1GHz)



Spurious emission (Conducted)**Tx, IEEE802.11g, PN9, worst data mode 6Mbps, power setting 10dBm****Tx, 2412MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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

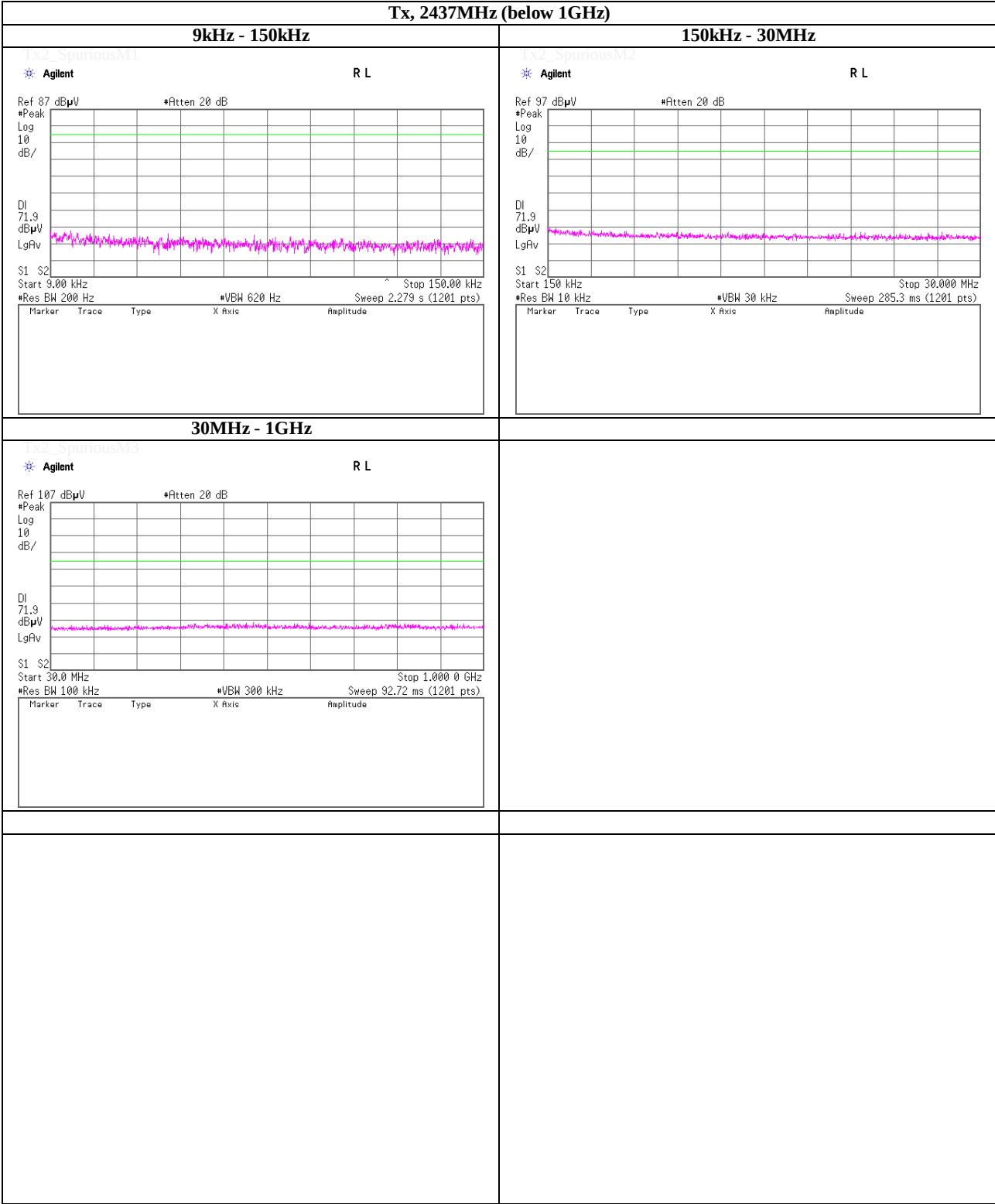
Telephone : +81 463 50 6400

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Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps, power setting 10dBm

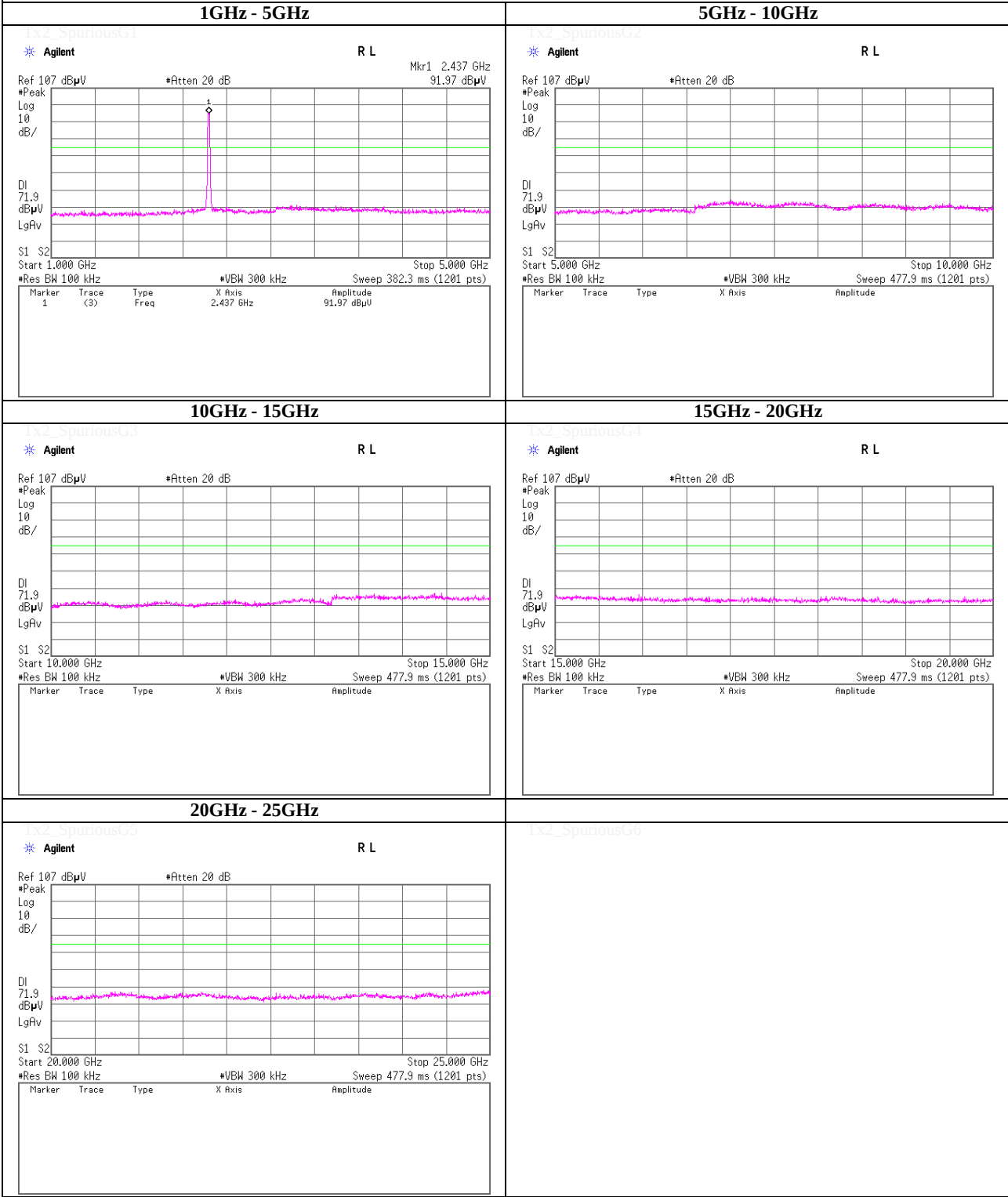
Tx, 2437MHz (below 1GHz)



Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps, power setting 10dBm

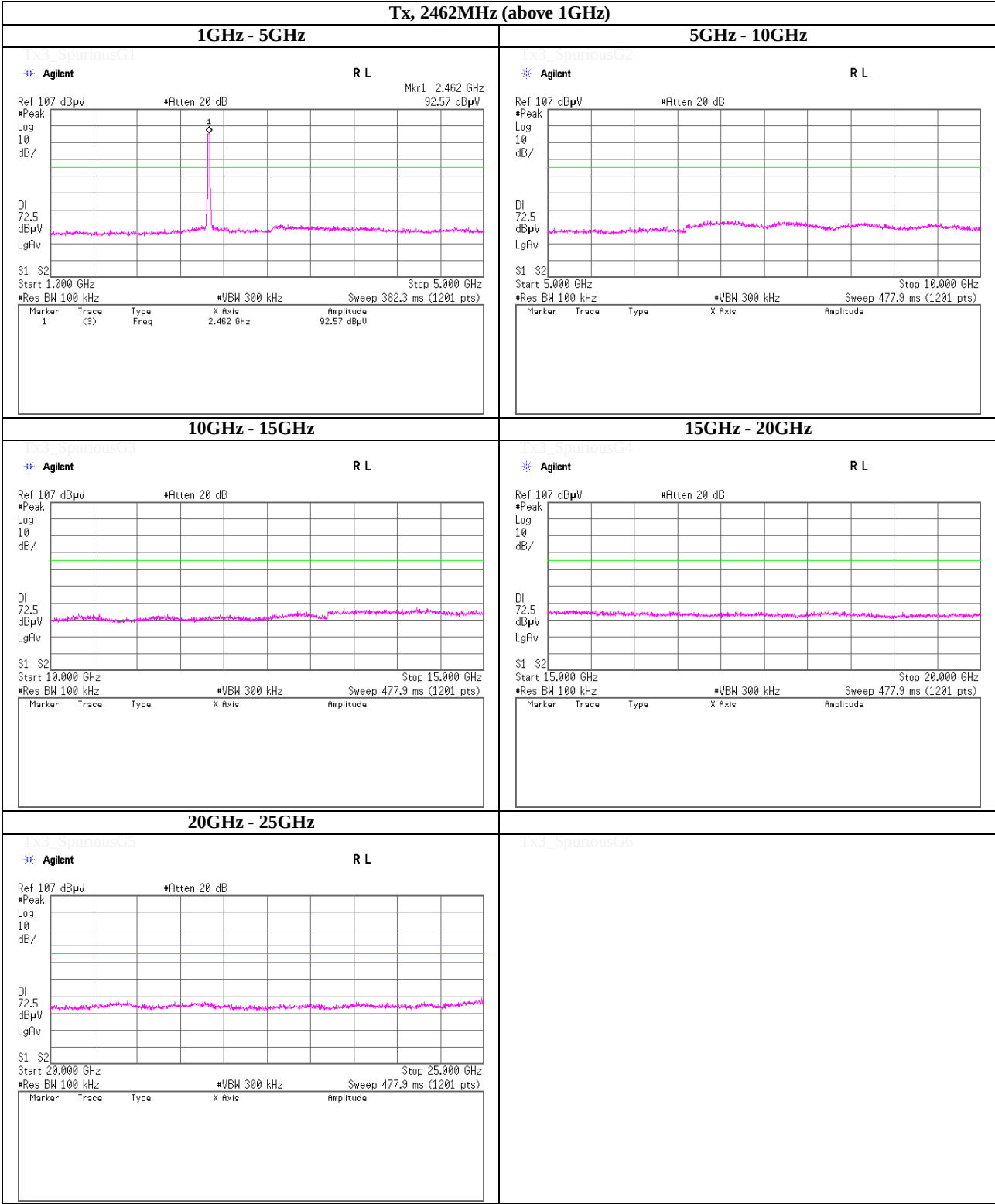
Tx, 2437MHz (above 1GHz)



Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps, power setting 10dBm

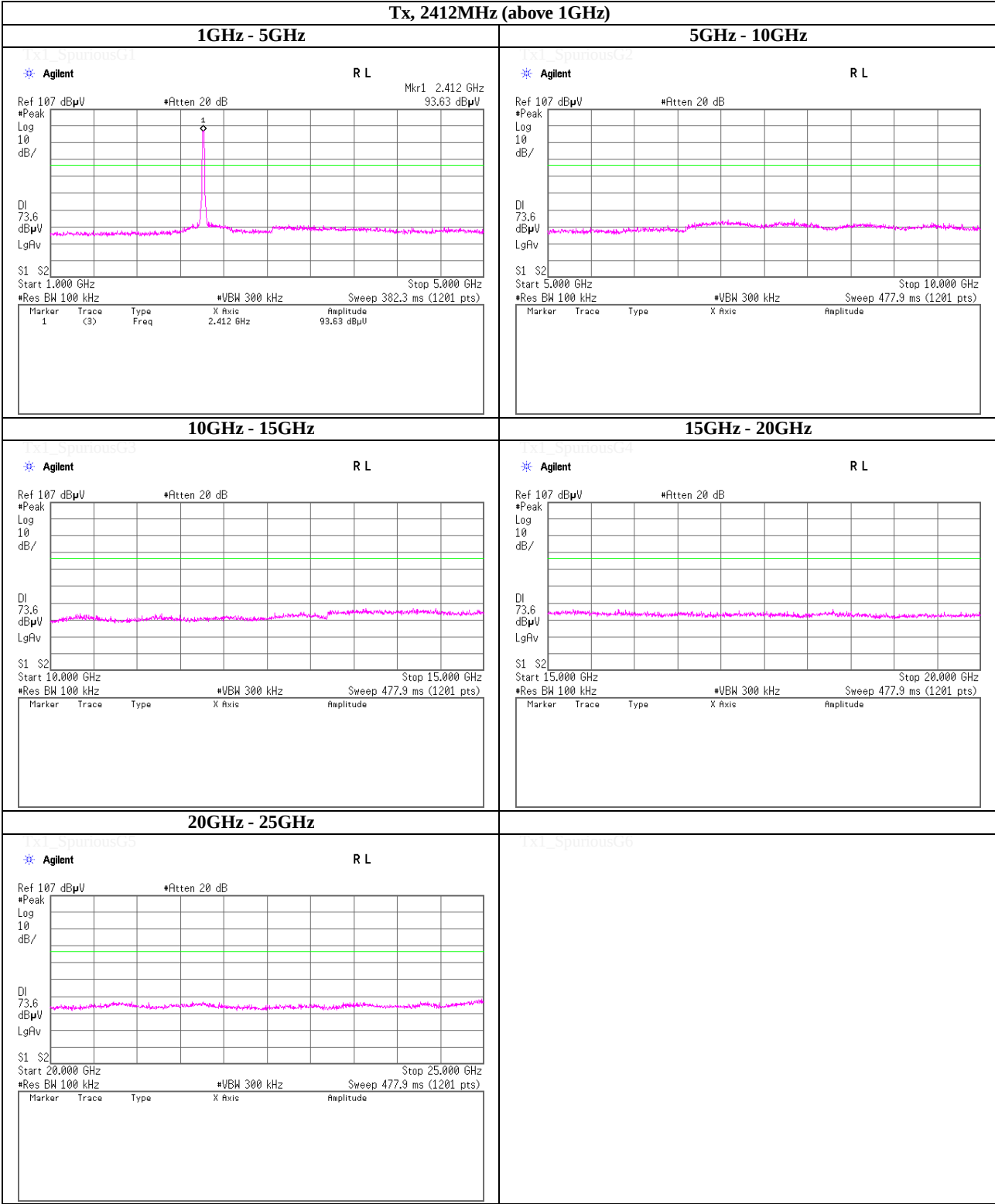
Tx, 2462MHz (above 1GHz)



Spurious emission (Conducted)

Tx, IEEE802.11n-20HT, PN9, worst data mode 2(MCS), power setting 12dBm

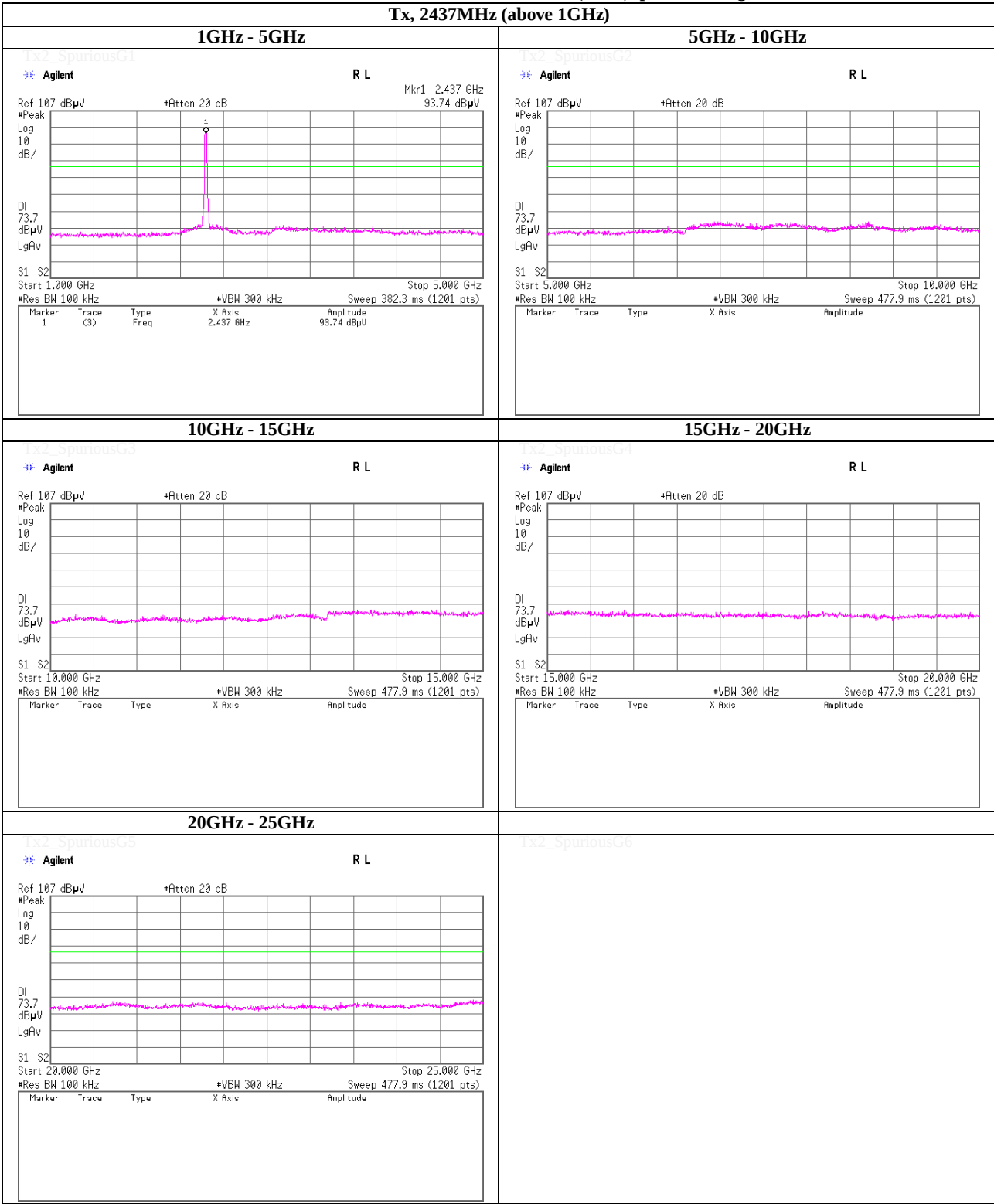
Tx, 2412MHz (above 1GHz)



Spurious emission (Conducted)

Tx, IEEE802.11n-20HT, PN9, worst data mode 2(MCS), power setting 12dBm

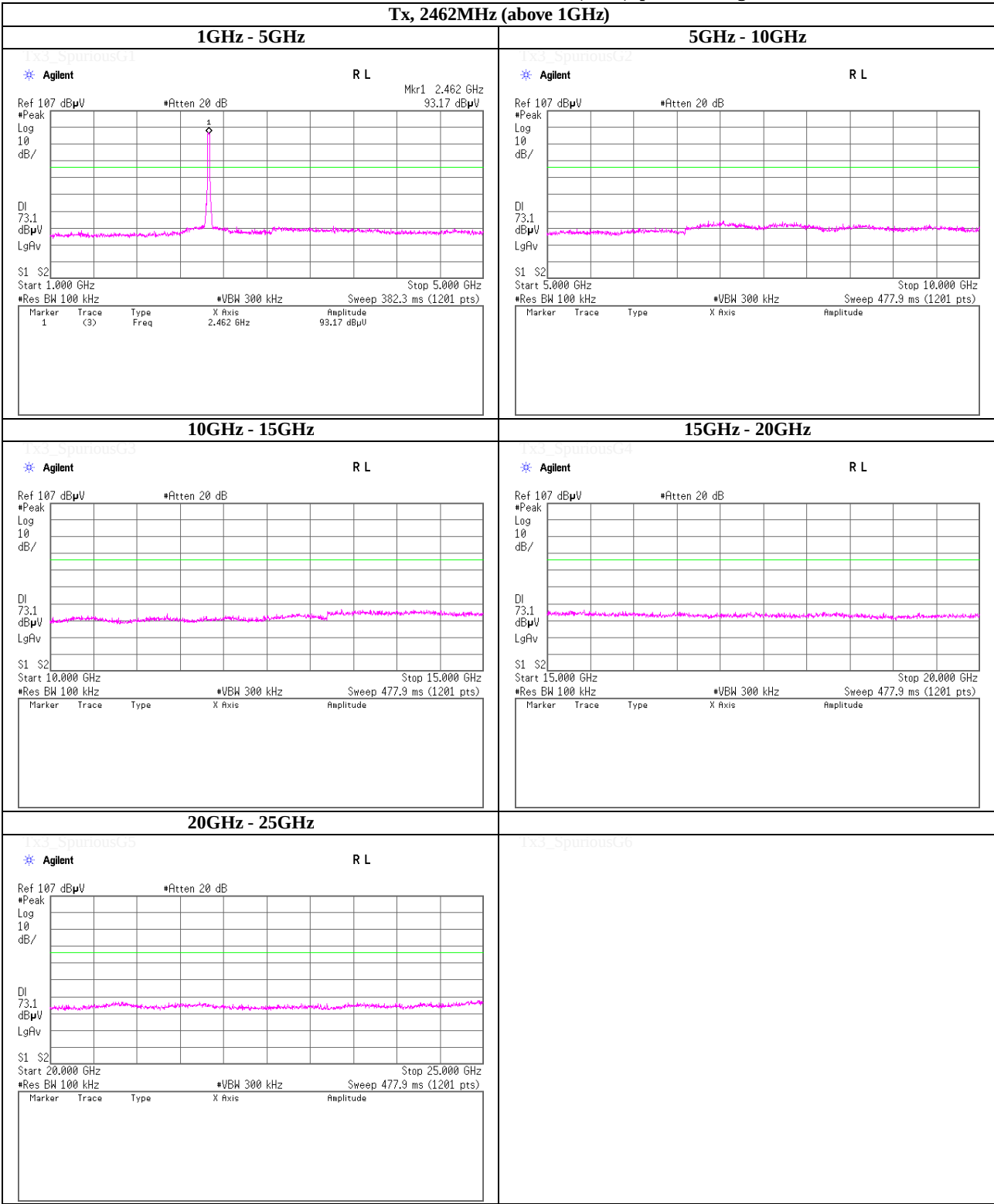
Tx, 2437MHz (above 1GHz)



Spurious emission (Conducted)

Tx, IEEE802.11n-20HT, PN9, worst data mode 2(MCS), power setting 12dBm

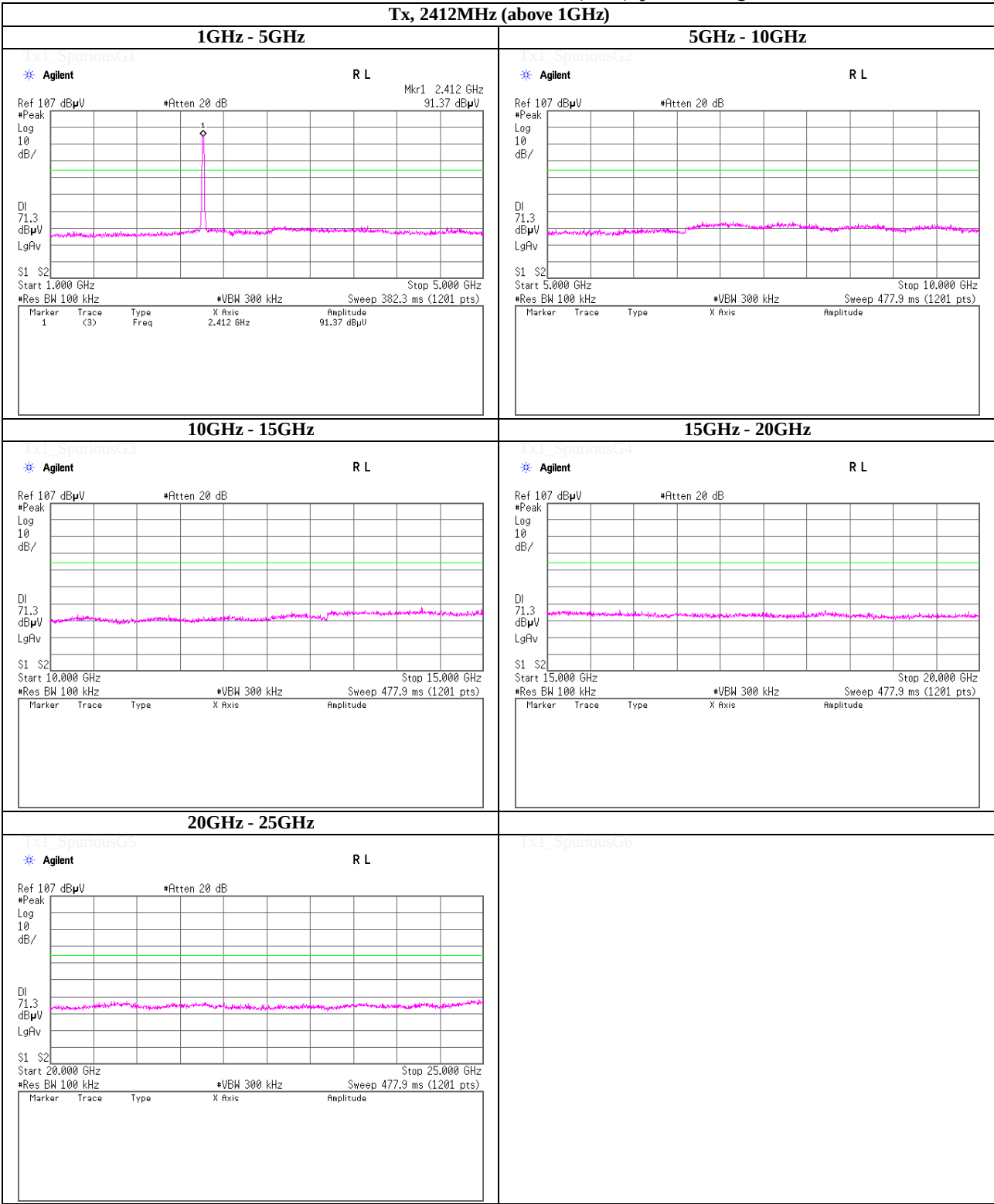
Tx, 2462MHz (above 1GHz)

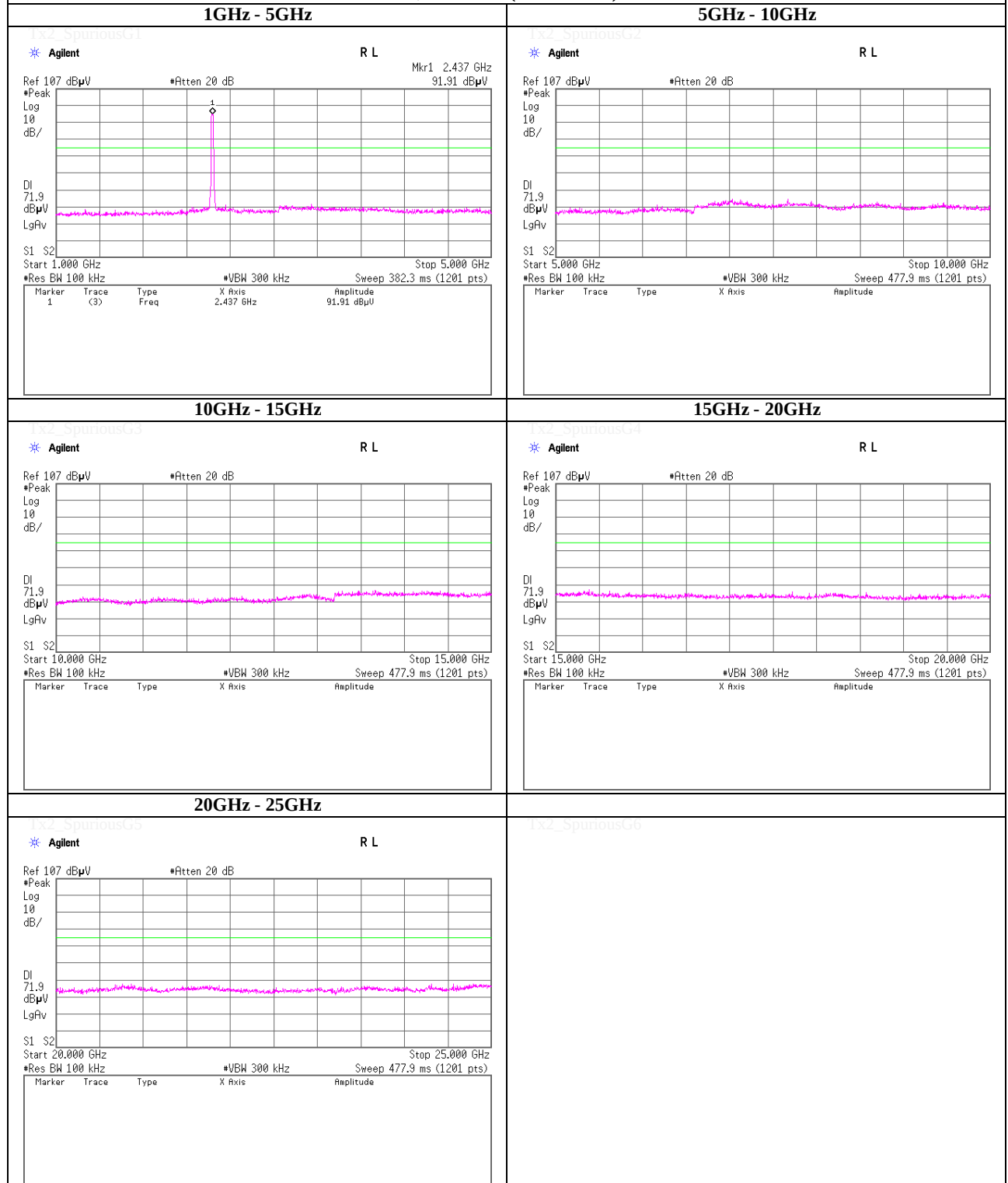


Spurious emission (Conducted)

Tx, IEEE802.11n-20HT, PN9, worst data mode 2(MCS), power setting 10dBm

Tx, 2412MHz (above 1GHz)



Spurious emission (Conducted)**Tx, IEEE802.11n-20HT, PN9, worst data mode 2(MCS), power setting 10dBm****Tx, 2437MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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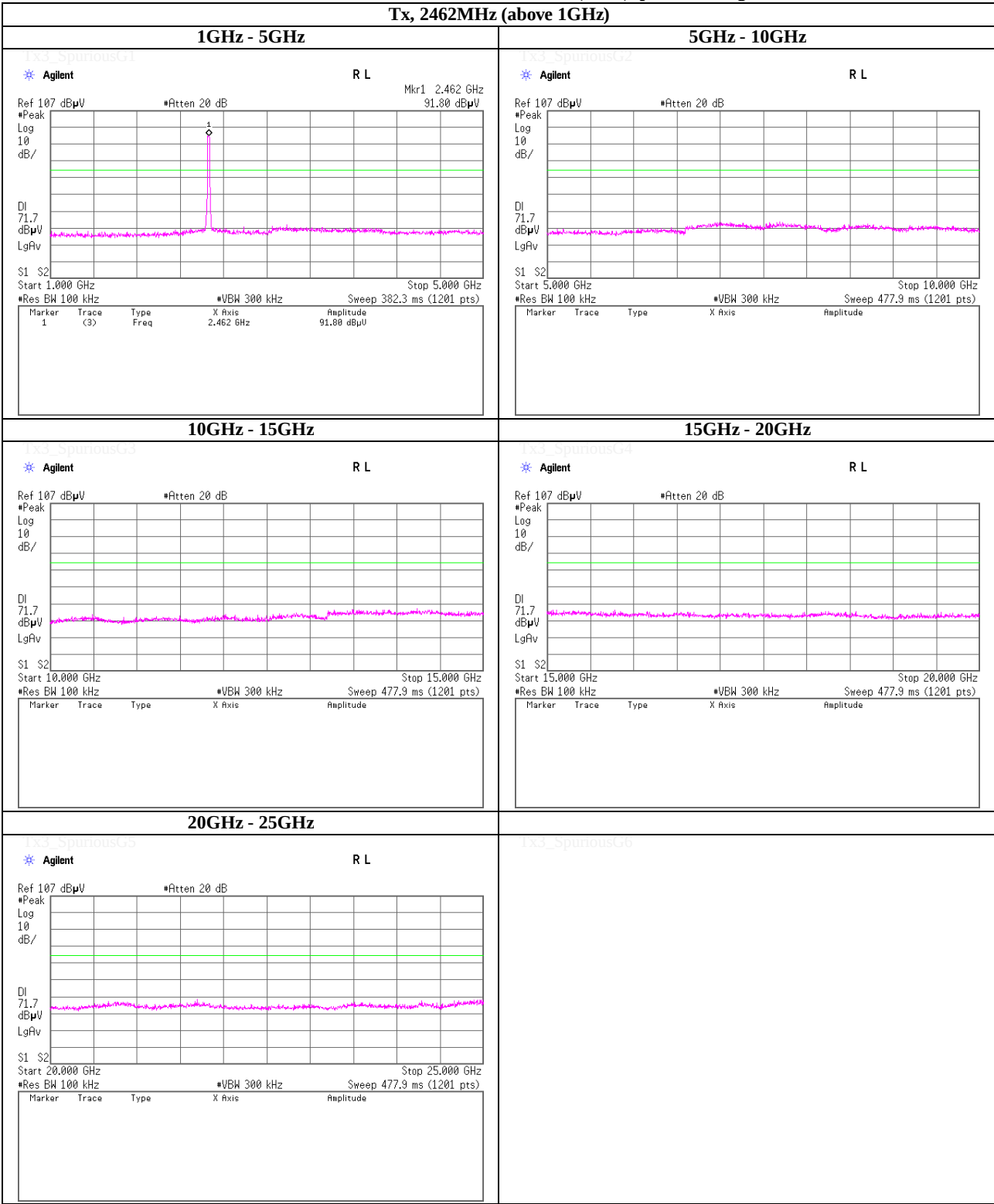
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Spurious emission (Conducted)

Tx, IEEE802.11n-20HT, PN9, worst data mode 2(MCS), power setting 10dBm

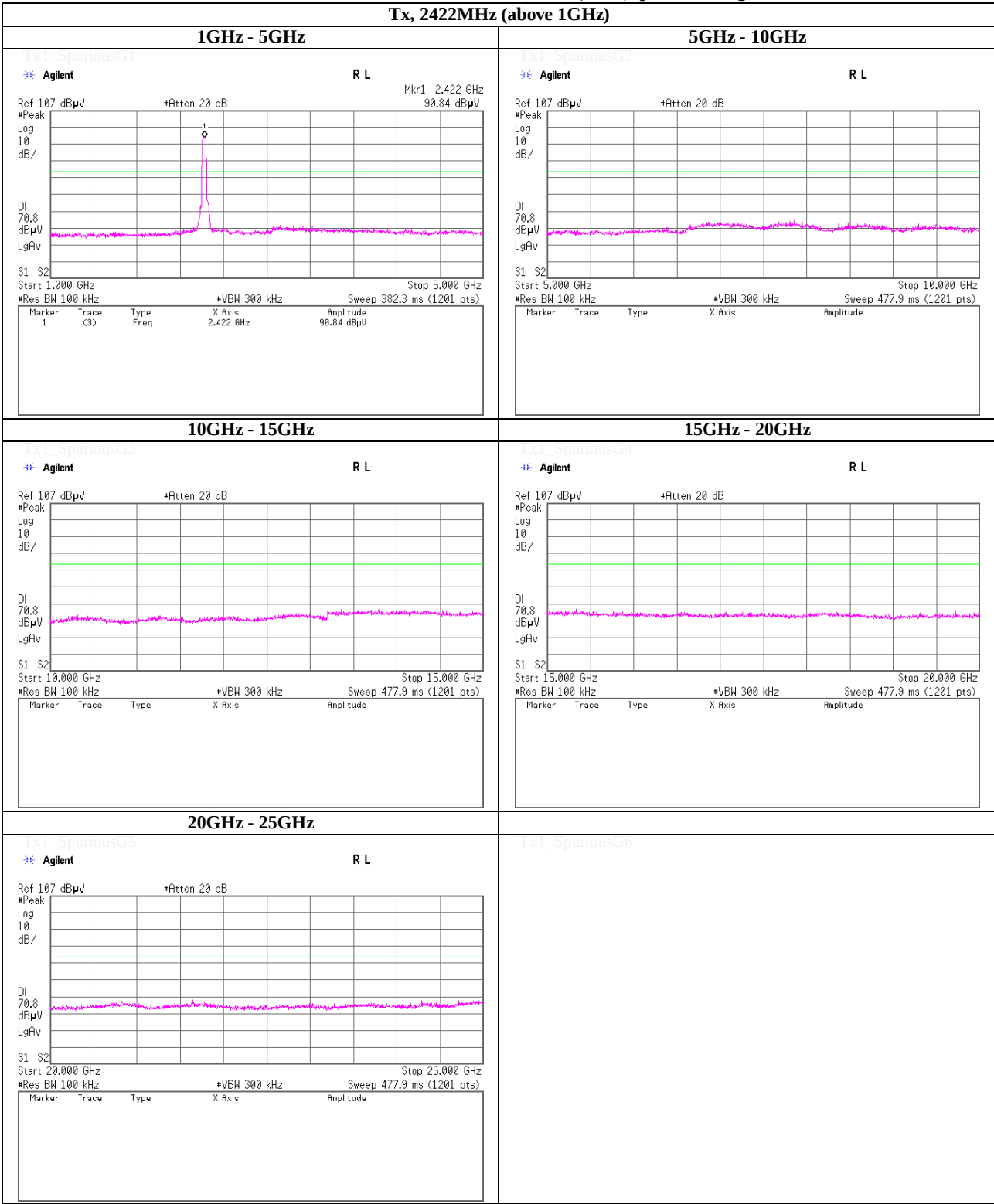
Tx, 2462MHz (above 1GHz)



Spurious emission (Conducted)

Tx, IEEE802.11n-40HT, PN9, worst data mode 5(MCS), power setting 11dBm

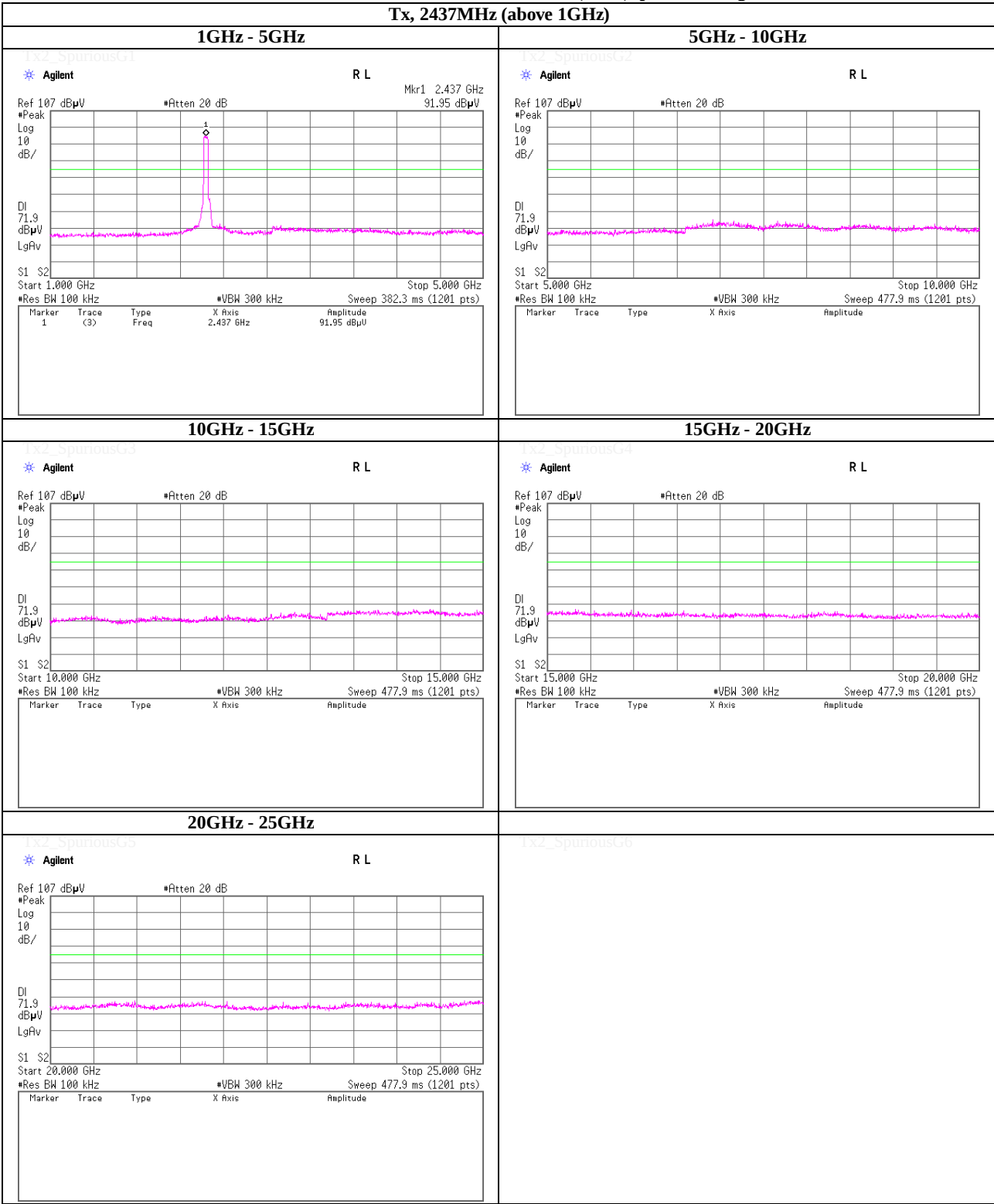
Tx, 2422MHz (above 1GHz)



Spurious emission (Conducted)

Tx, IEEE802.11n-40HT, PN9, worst data mode 5(MCS), power setting 11dBm

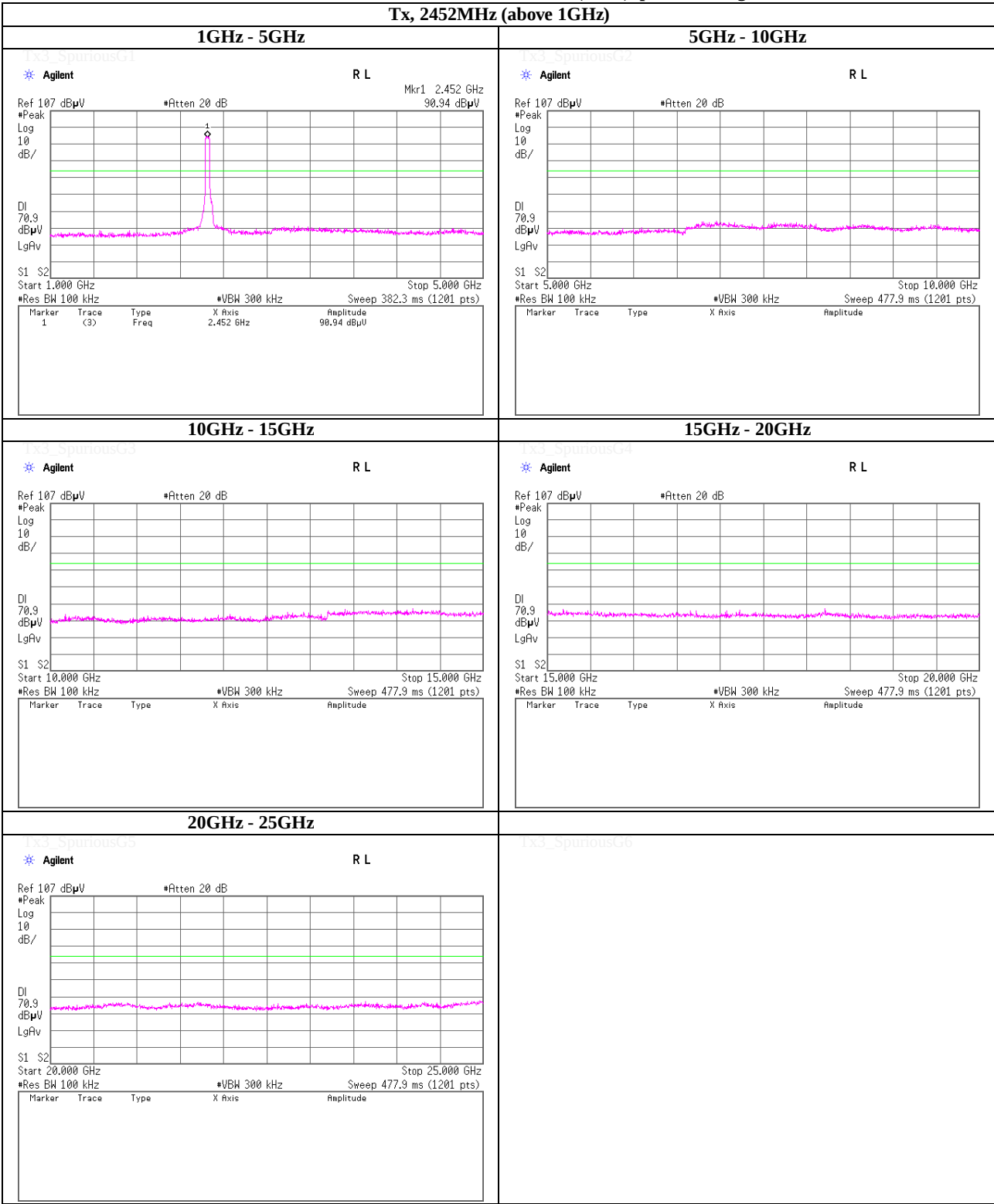
Tx, 2437MHz (above 1GHz)



Spurious emission (Conducted)

Tx, IEEE802.11n-40HT, PN9, worst data mode 5(MCS), power setting 11dBm

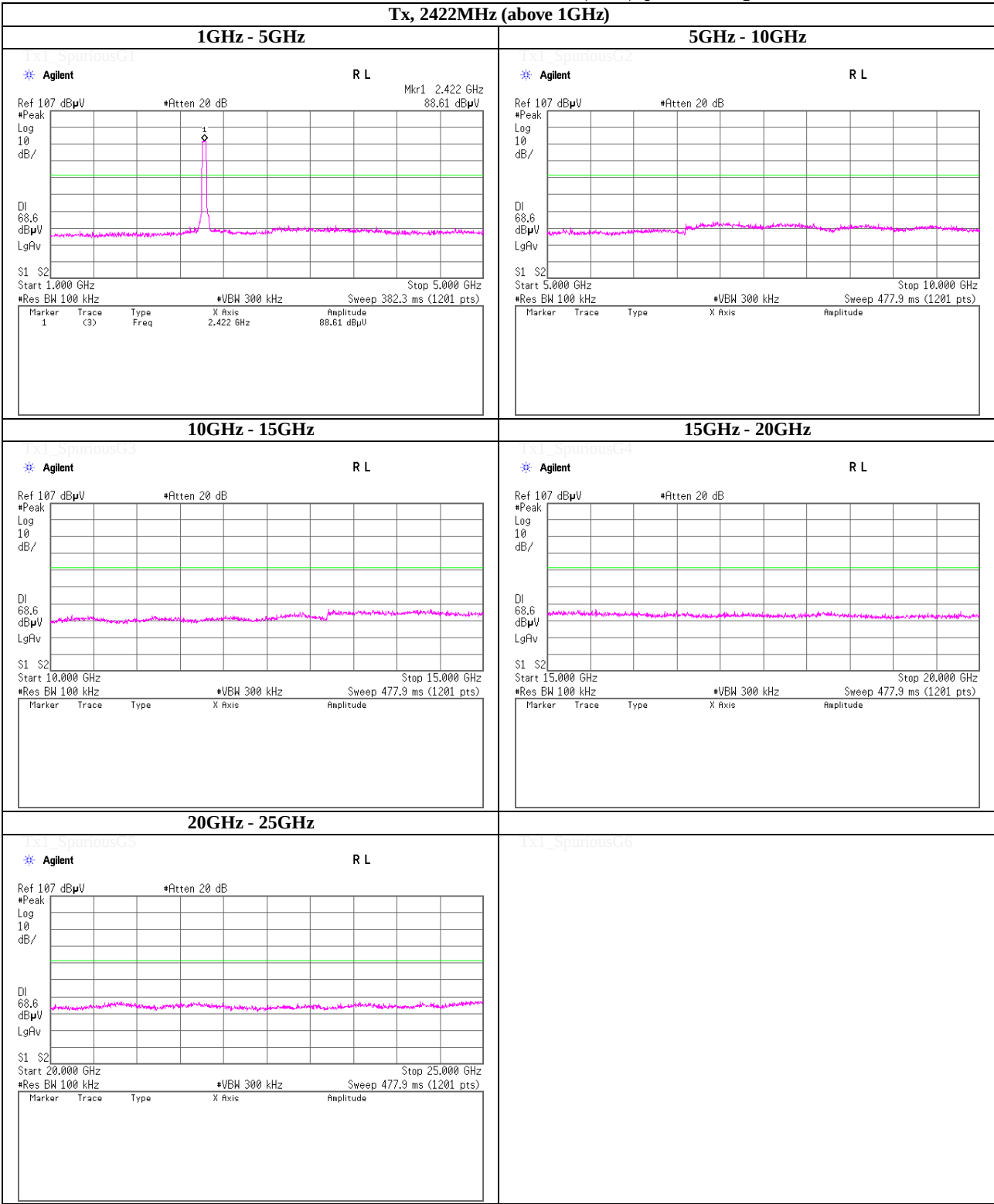
Tx, 2452MHz (above 1GHz)



Spurious emission (Conducted)

Tx, IEEE802.11n-40HT, PN9, worst data mode 5(MCS), power setting 9dBm

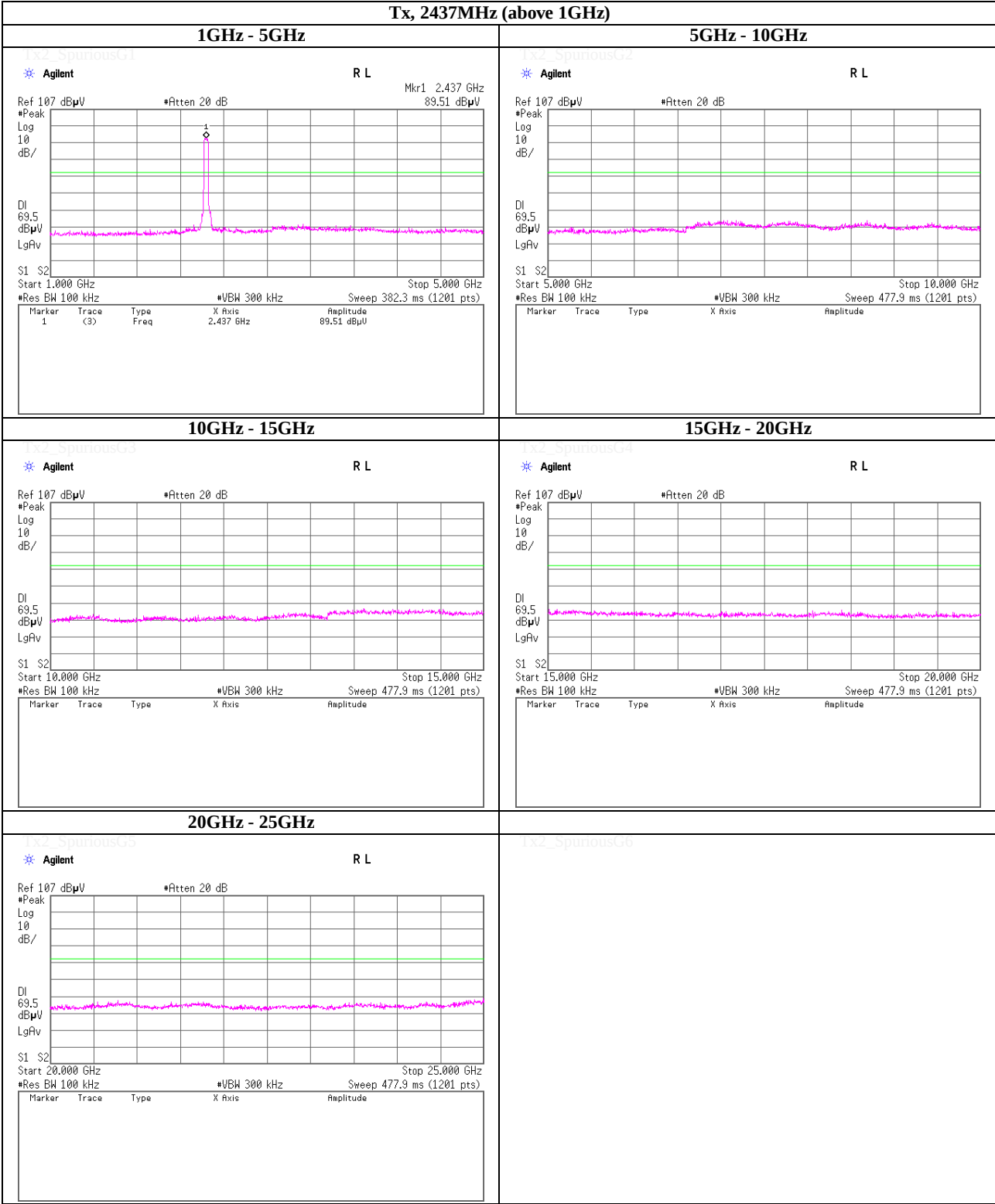
Tx, 2422MHz (above 1GHz)



Spurious emission (Conducted)

Tx, IEEE802.11n-40HT, PN9, worst data mode 5(MCS), power setting 9dBm

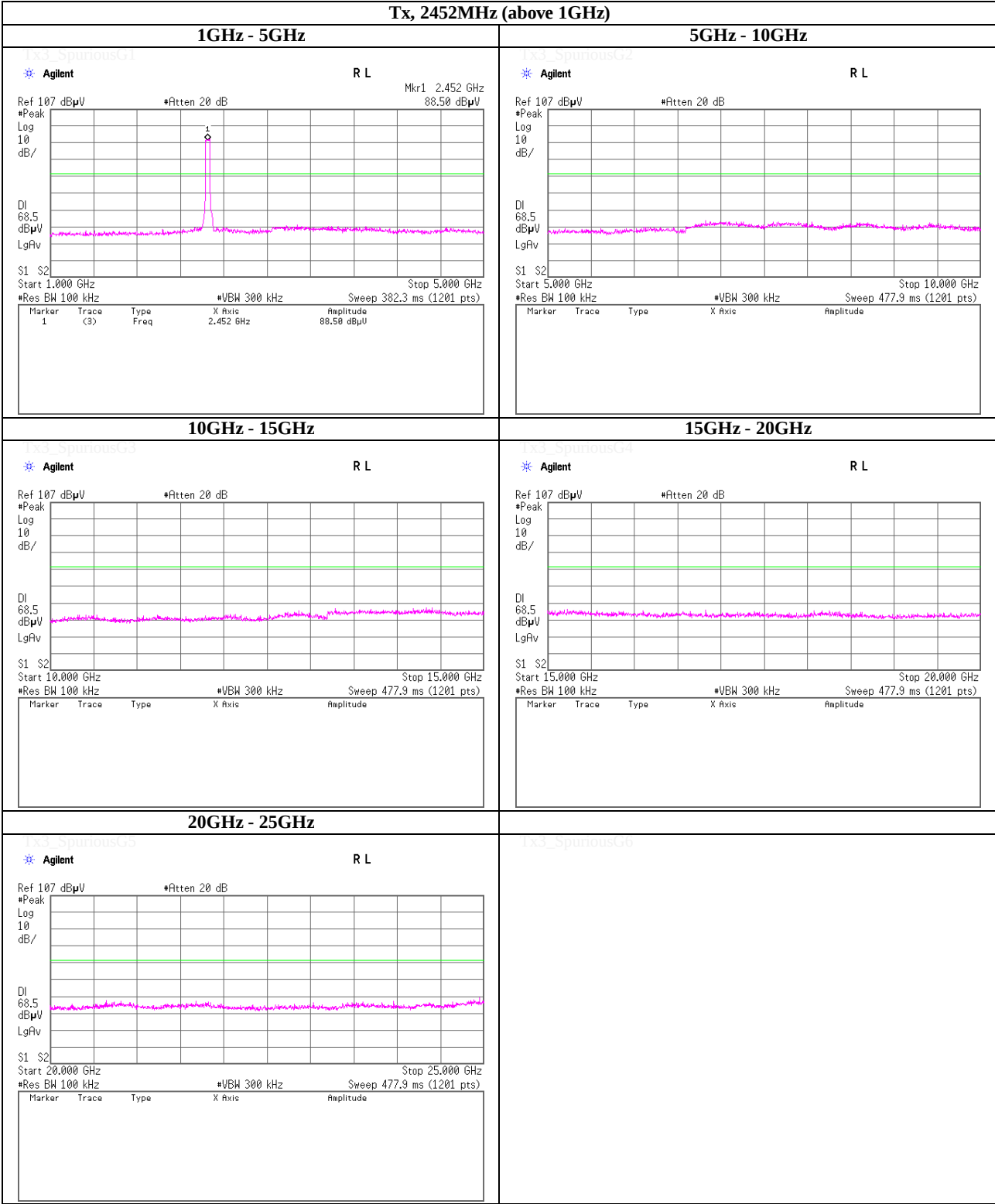
Tx, 2437MHz (above 1GHz)



Spurious emission (Conducted)

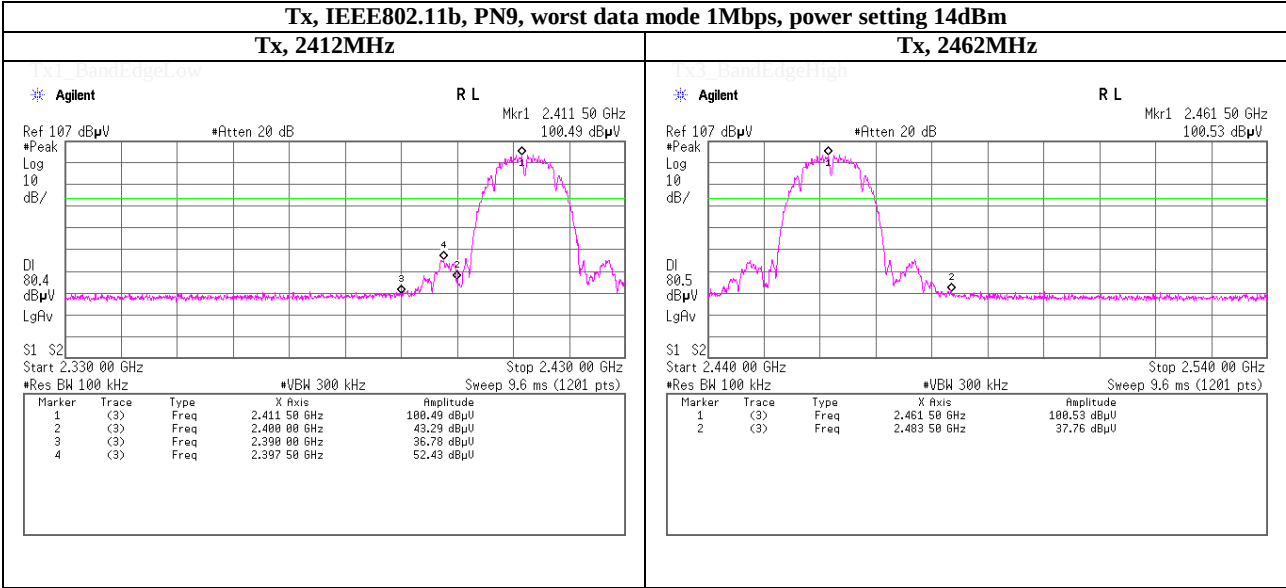
Tx, IEEE802.11n-40HT, PN9, worst data mode 5(MCS), power setting 9dBm

Tx, 2452MHz (above 1GHz)



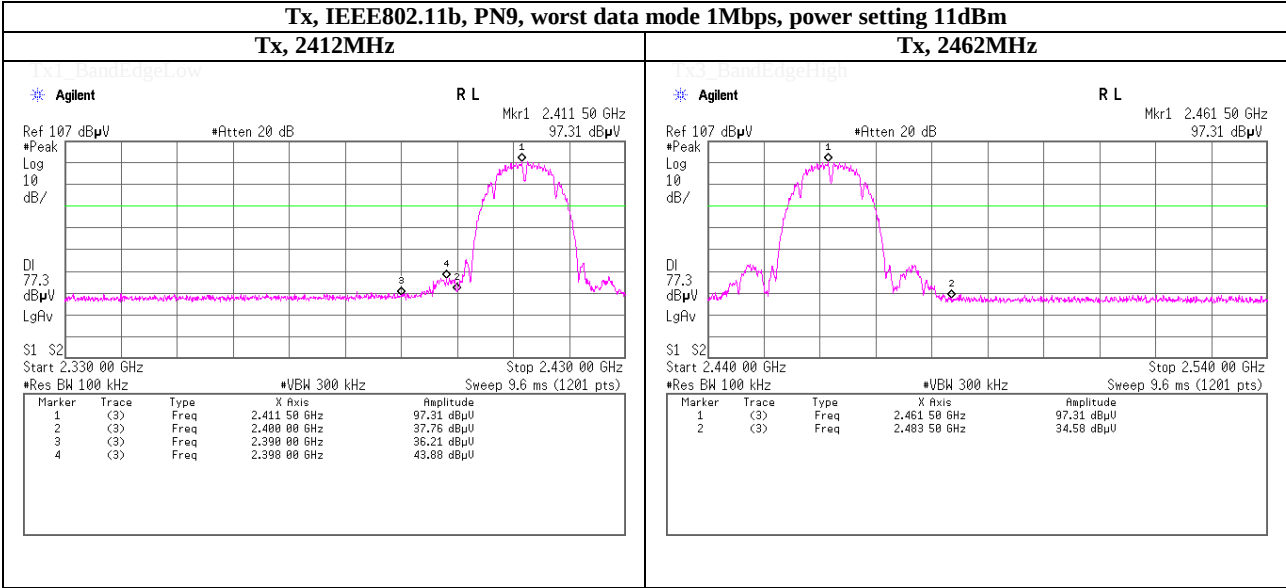
Spurious emission (Conducted)

Band Edge compliance



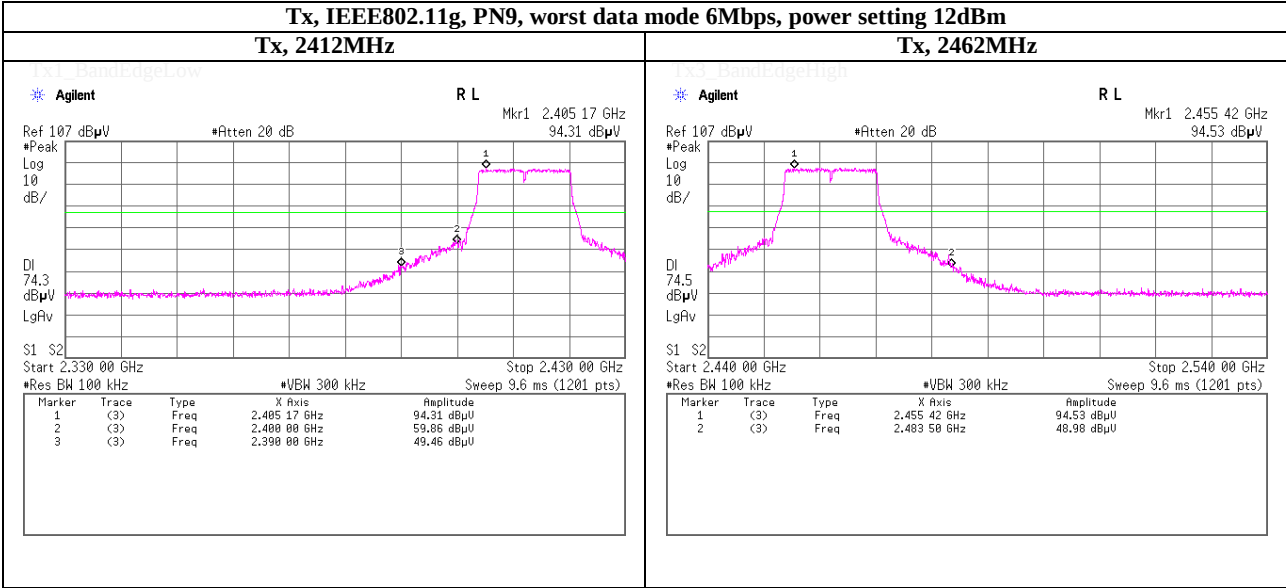
Spurious emission (Conducted)

Band Edge compliance



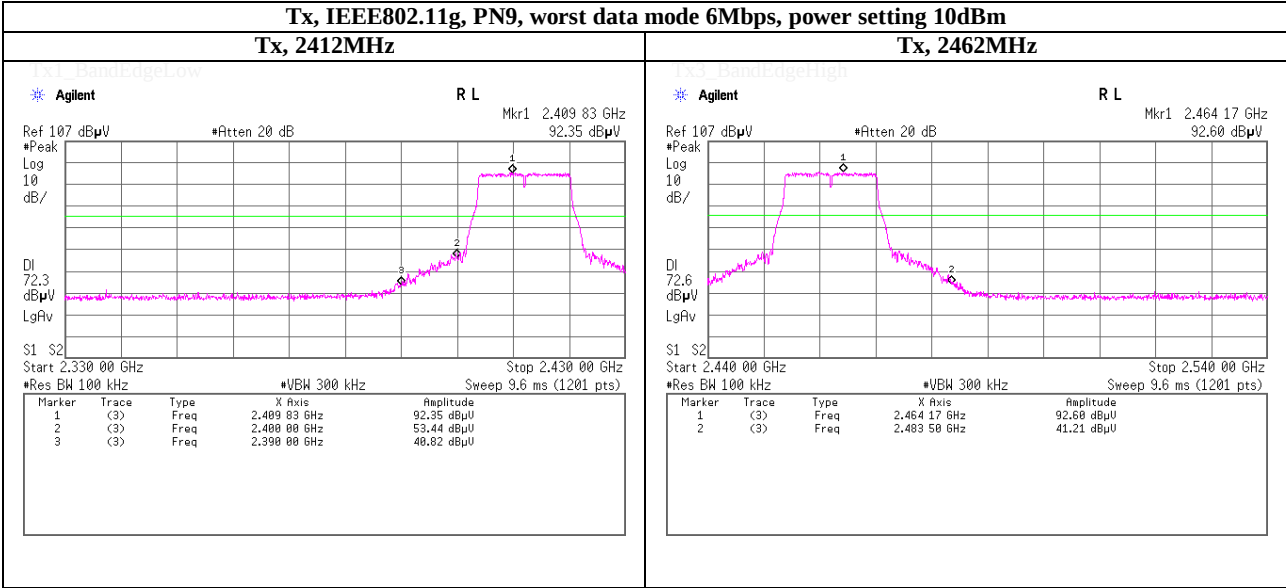
Spurious emission (Conducted)

Band Edge compliance



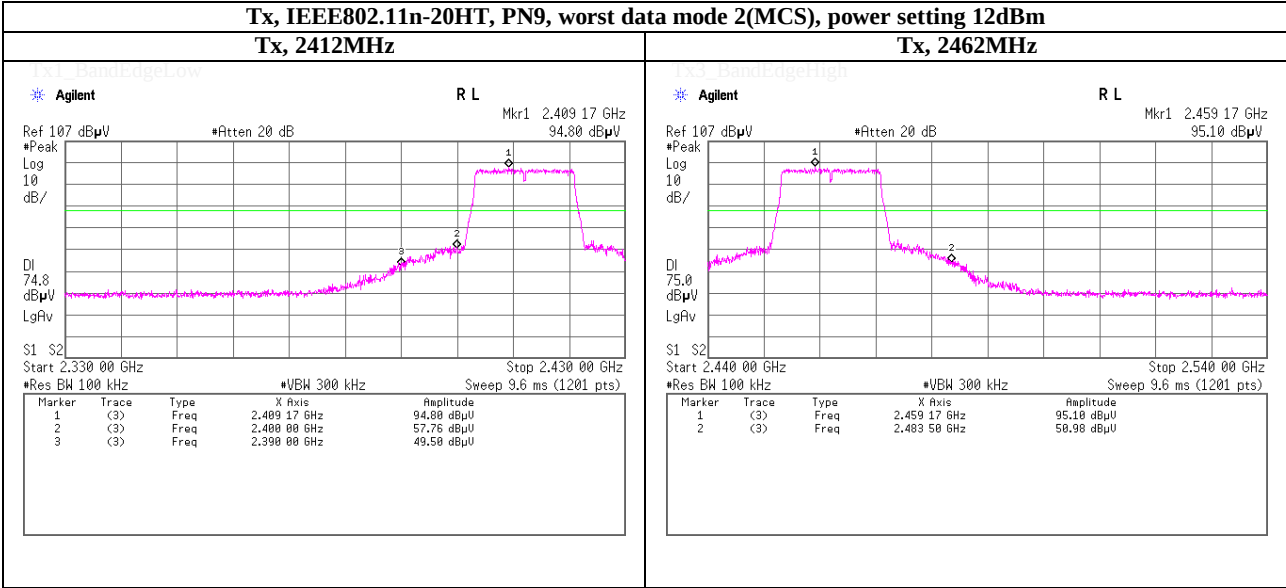
Spurious emission (Conducted)

Band Edge compliance



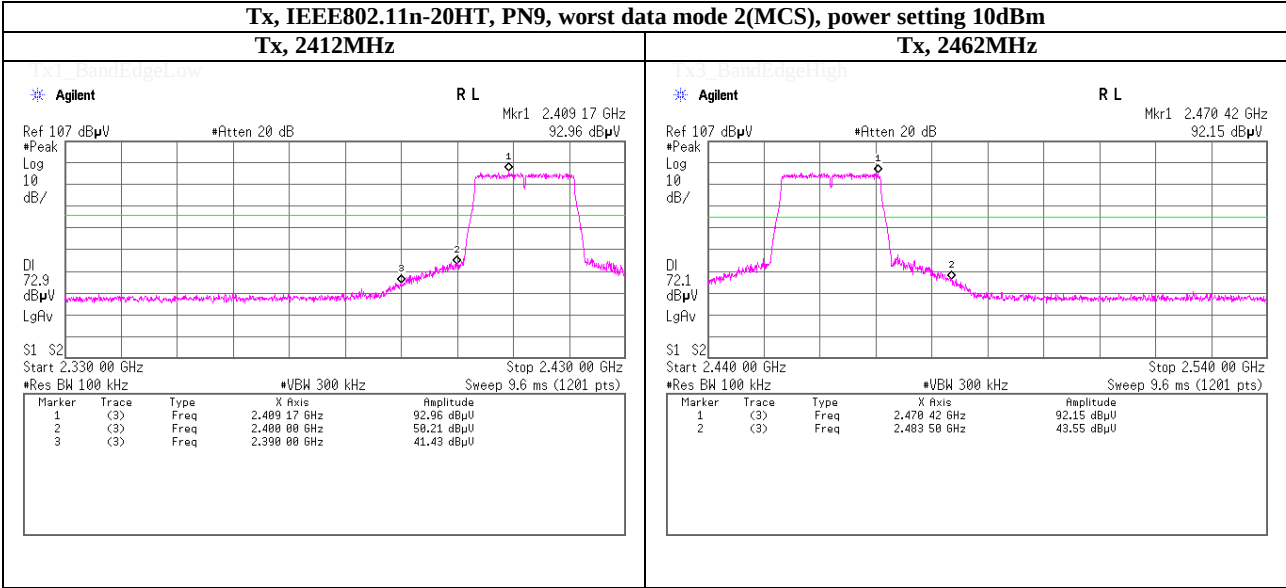
Spurious emission (Conducted)

Band Edge compliance



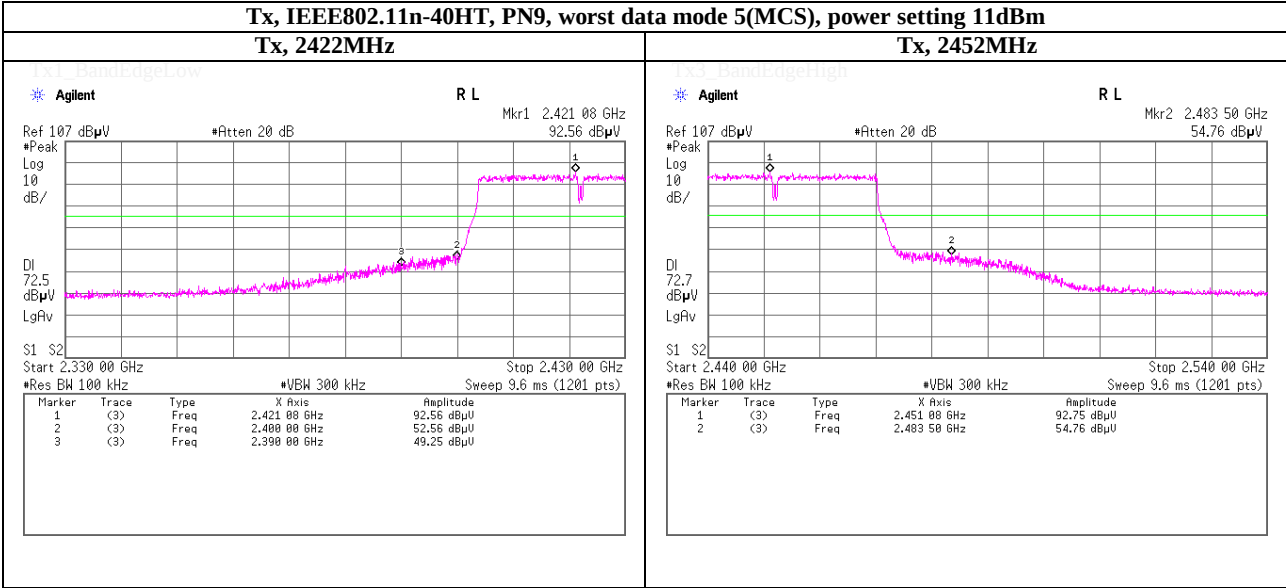
Spurious emission (Conducted)

Band Edge compliance



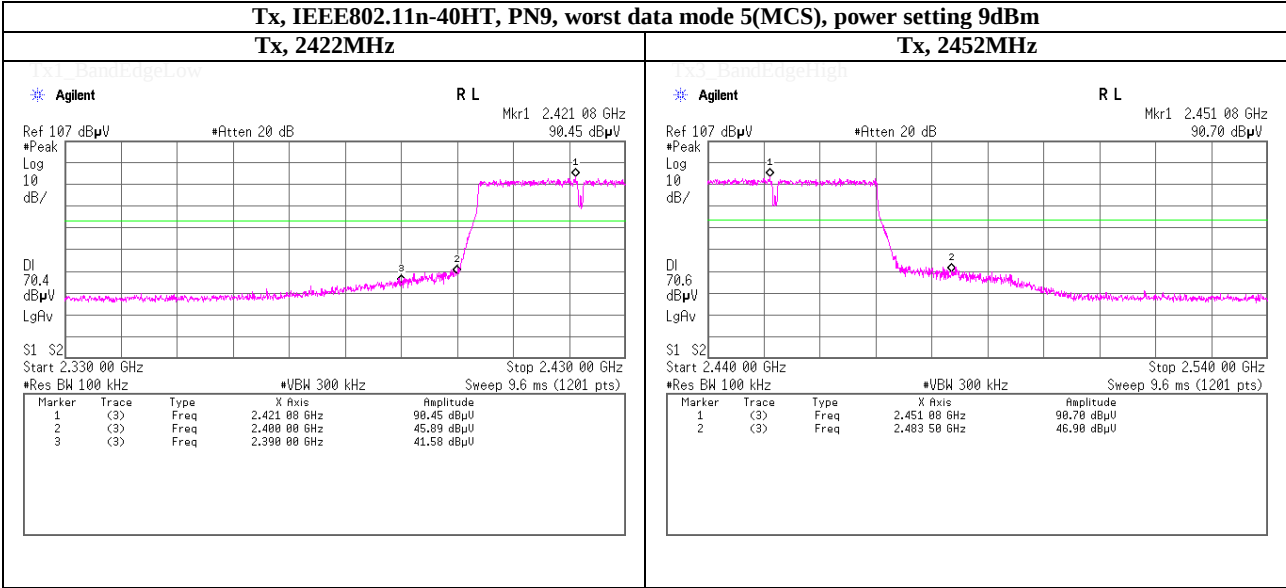
Spurious emission (Conducted)

Band Edge compliance



Spurious emission (Conducted)

Band Edge compliance



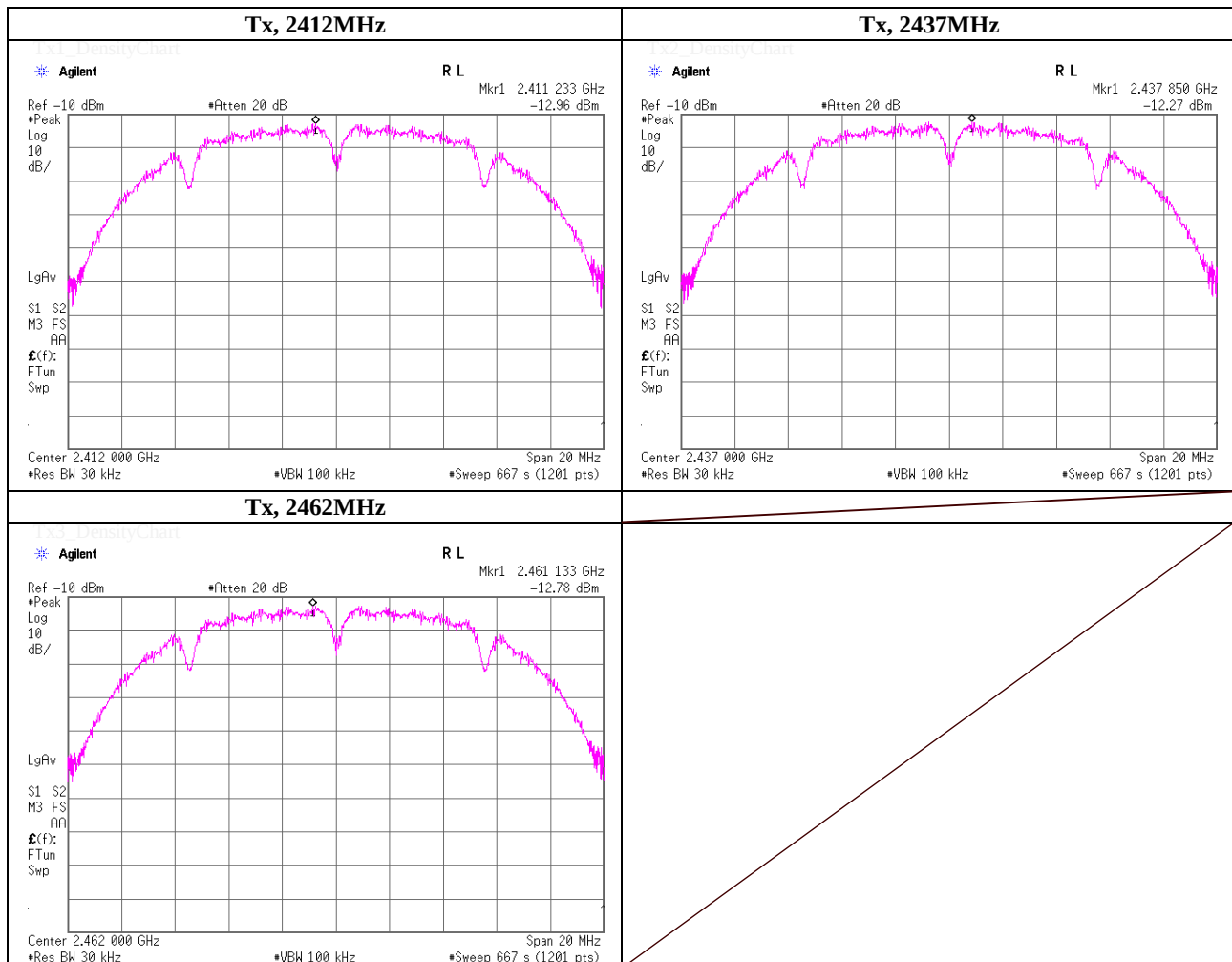
Power Density

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 27, 2012	
Temperature / Humidity	28deg.C , 48%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11b, PN9, worst data mode 1Mbps, power setting 14dBm	

Ch. Freq.	Freq. Reading	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.0000	2411.23	-12.96	0.84	9.97	-2.15	8.00	10.15
2437.0000	2437.85	-12.27	0.84	9.97	-1.46	8.00	9.46
2462.0000	2461.13	-12.78	0.85	9.97	-1.96	8.00	9.96

Sample Calculation:

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



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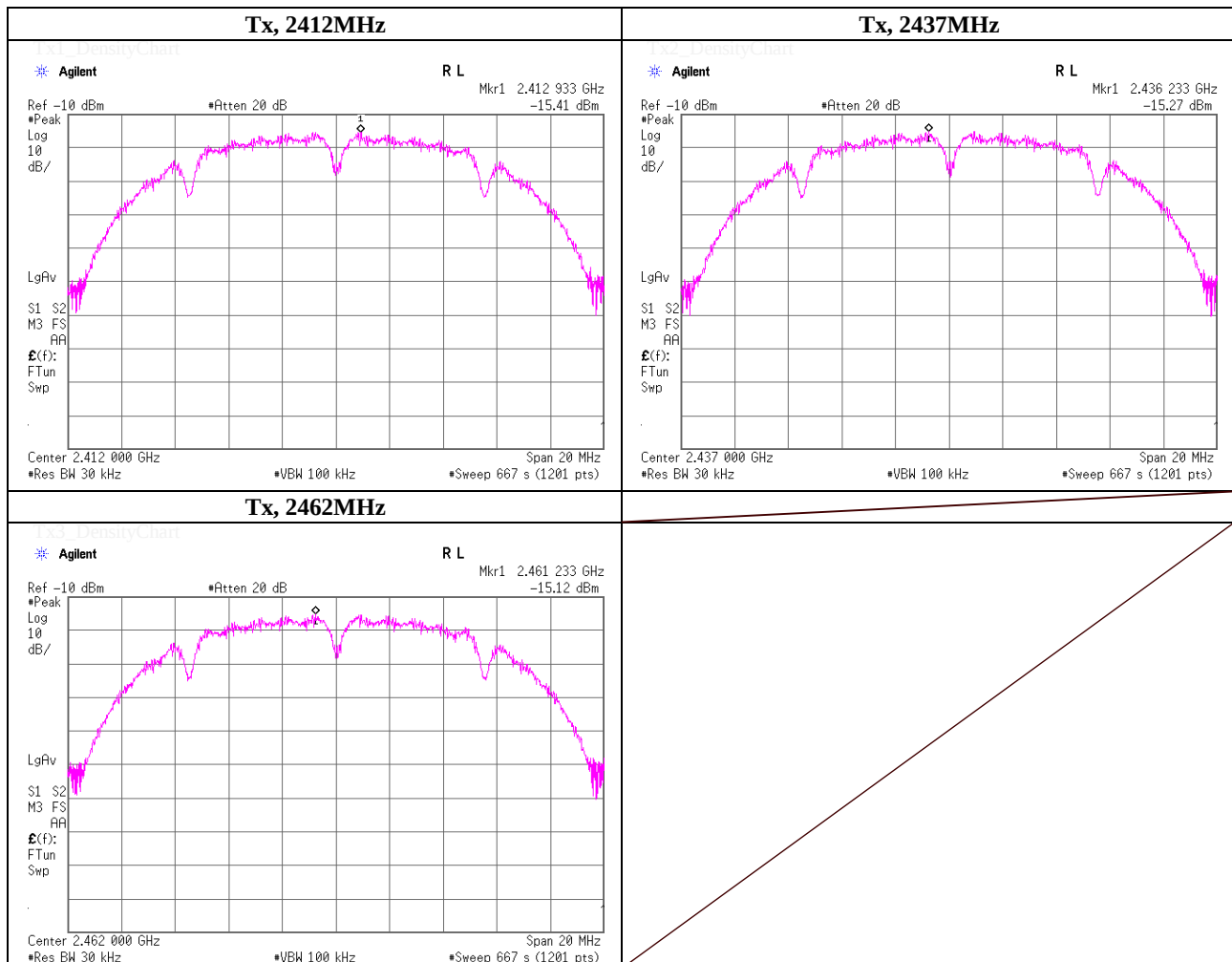
Power Density

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 27, 2012	
Temperature / Humidity	28deg.C , 48%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11b, PN9, worst data mode 1Mbps, power setting 11dBm	

Ch. Freq.	Freq. Reading	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.0000	2412.93	-15.41	0.84	9.97	-4.60	8.00	12.60
2437.0000	2436.23	-15.27	0.84	9.97	-4.46	8.00	12.46
2462.0000	2461.23	-15.12	0.85	9.97	-4.30	8.00	12.30

Sample Calculation:

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



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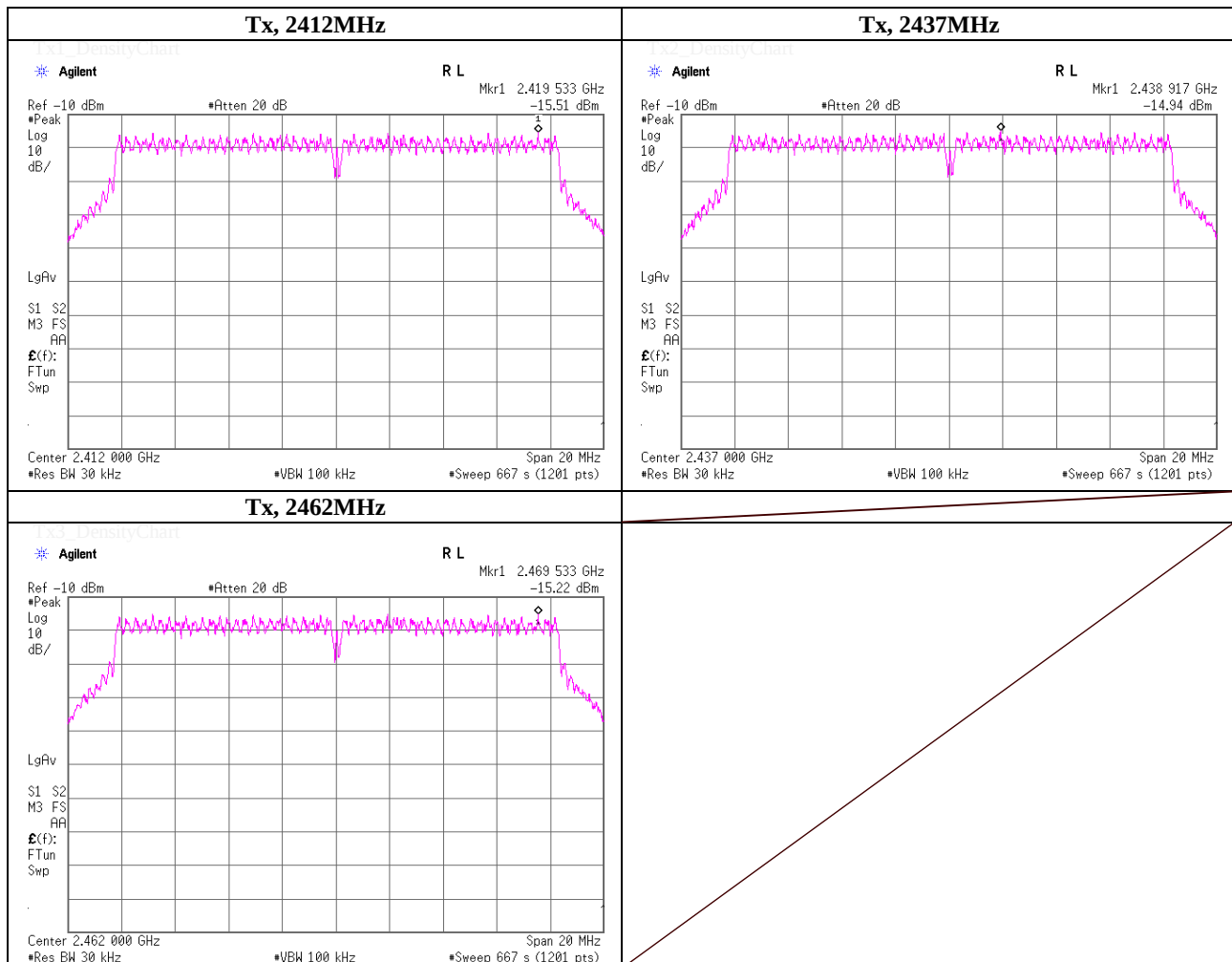
Power Density

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 27, 2012	
Temperature / Humidity	28deg.C , 48%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps, power setting 12dBm	

Ch. Freq.	Freq. Reading	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.0000	2419.53	-15.51	0.84	9.97	-4.70	8.00	12.70
2437.0000	2438.92	-14.94	0.84	9.97	-4.13	8.00	12.13
2462.0000	2469.53	-15.22	0.85	9.97	-4.40	8.00	12.40

Sample Calculation:

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



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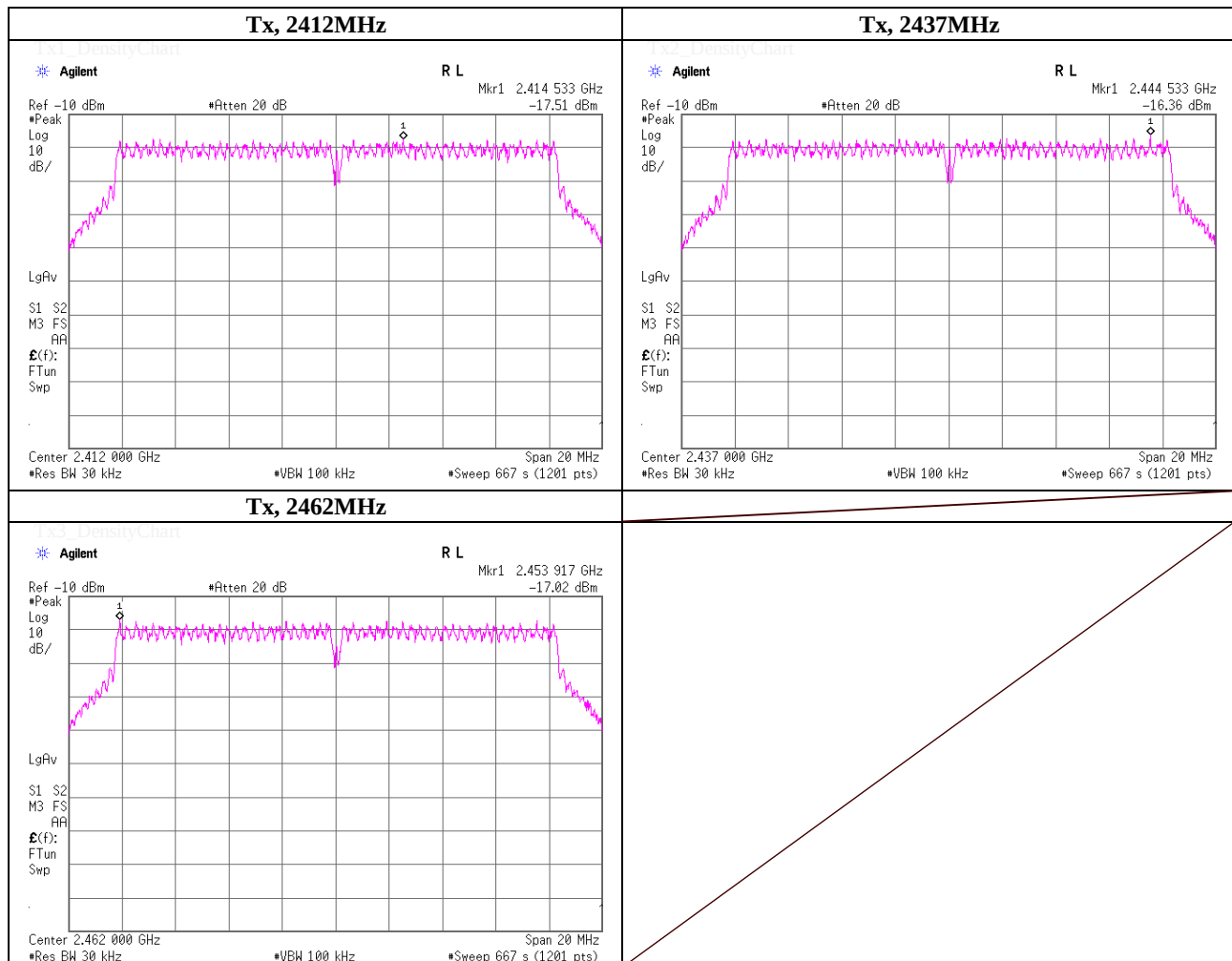
Power Density

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 27, 2012	
Temperature / Humidity	28deg.C , 48%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps, power setting 10dBm	

Ch. Freq.	Freq. Reading	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2412.0000	2414.53	-17.51	0.84	9.97	-6.70	8.00	14.70
2437.0000	2444.53	-16.36	0.84	9.97	-5.55	8.00	13.55
2462.0000	2453.92	-17.02	0.85	9.97	-6.20	8.00	14.20

Sample Calculation:

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



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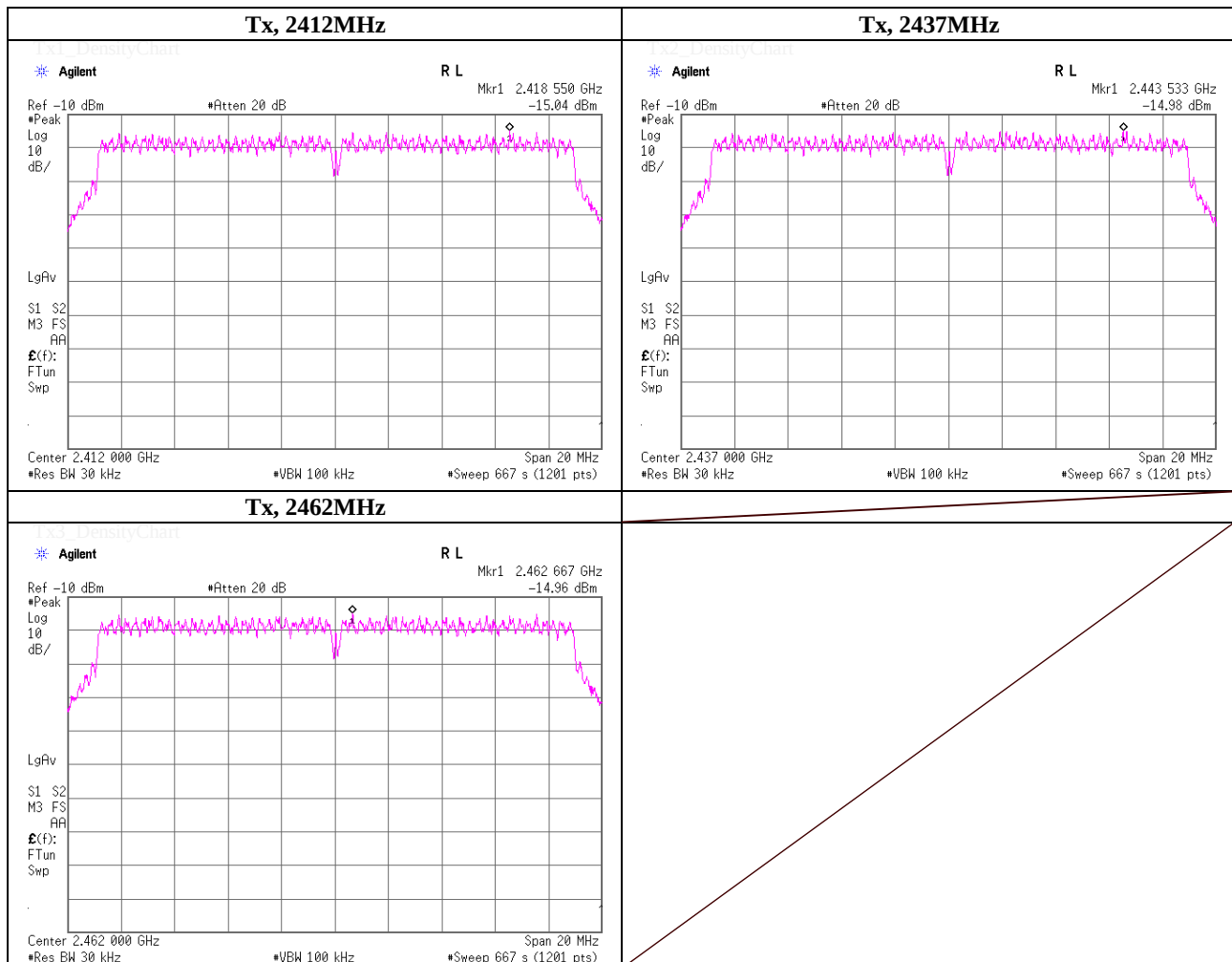
Power Density

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 27, 2012	
Temperature / Humidity	28deg.C , 48%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n-20HT, PN9, worst data mode 2(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	2418.55	-15.04	0.84	9.97	-4.23	8.00	12.23
2437.0000	2443.53	-14.98	0.84	9.97	-4.17	8.00	12.17
2462.0000	2462.67	-14.96	0.85	9.97	-4.14	8.00	12.14

Sample Calculation:

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



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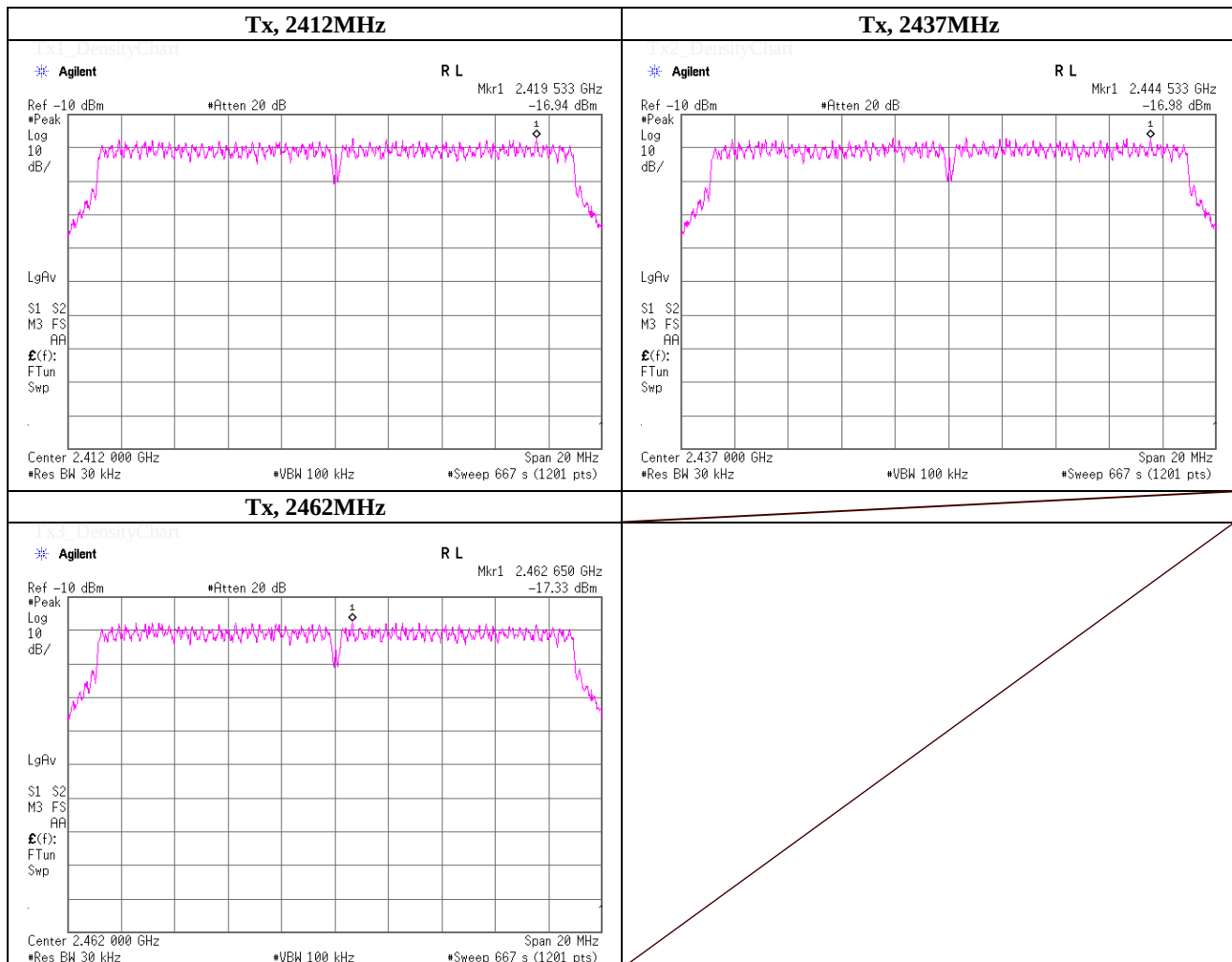
Power Density

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 27, 2012	
Temperature / Humidity	28deg.C , 48%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n-20HT, PN9, worst data mode 2(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	2419.53	-16.94	0.84	9.97	-6.13	8.00	14.13
2437.0000	2444.53	-16.98	0.84	9.97	-6.17	8.00	14.17
2462.0000	2462.65	-17.33	0.85	9.97	-6.51	8.00	14.51

Sample Calculation:

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



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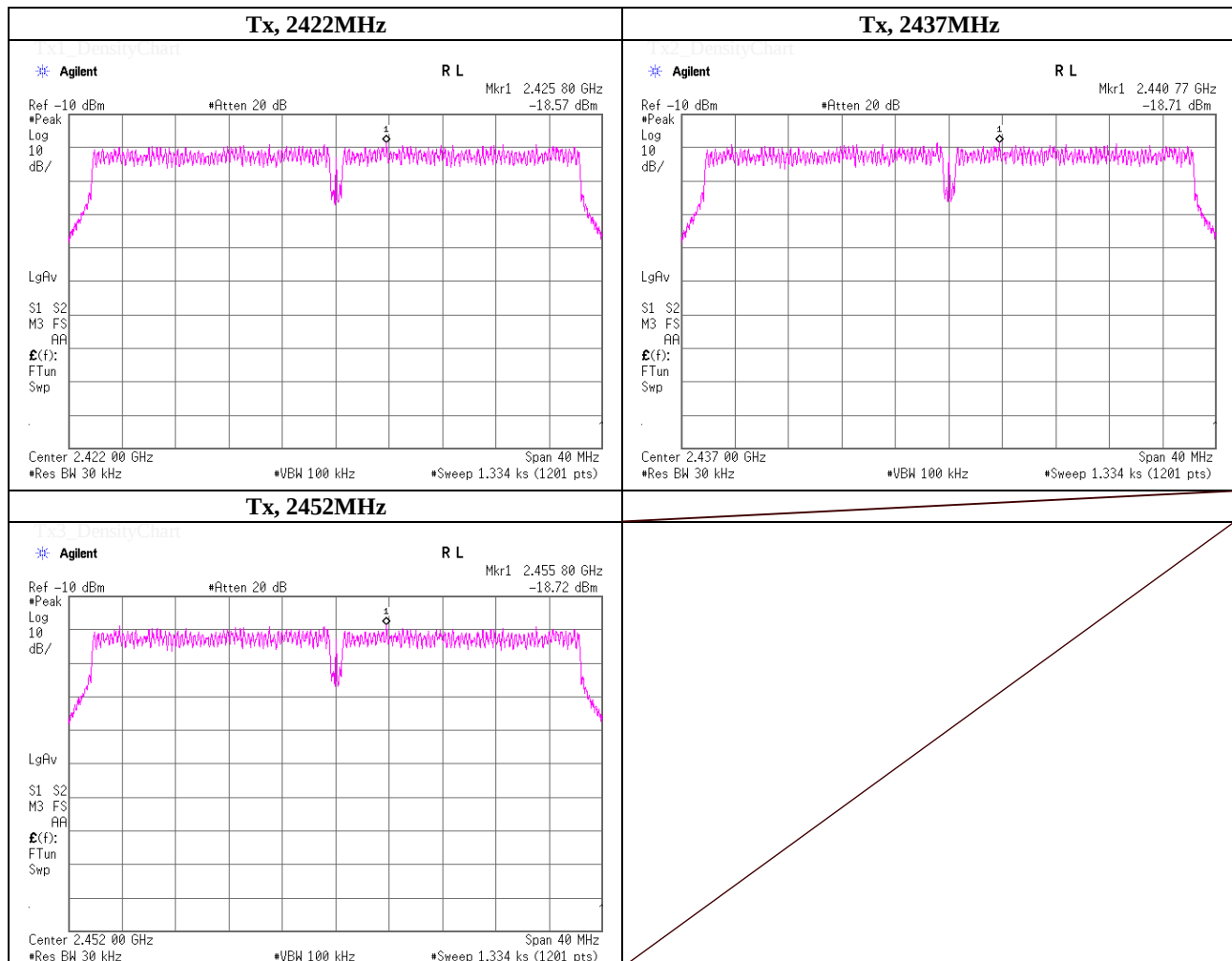
Power Density

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 27, 2012	
Temperature / Humidity	28deg.C , 48%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n-40HT, PN9, worst data mode 5(MCS), power setting 11dBm	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2422.0000	2425.80	-18.57	0.84	9.97	-7.76	8.00	15.76
2437.0000	2440.77	-18.71	0.84	9.97	-7.90	8.00	15.90
2452.0000	2455.80	-18.72	0.85	9.97	-7.90	8.00	15.90

Sample Calculation:

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



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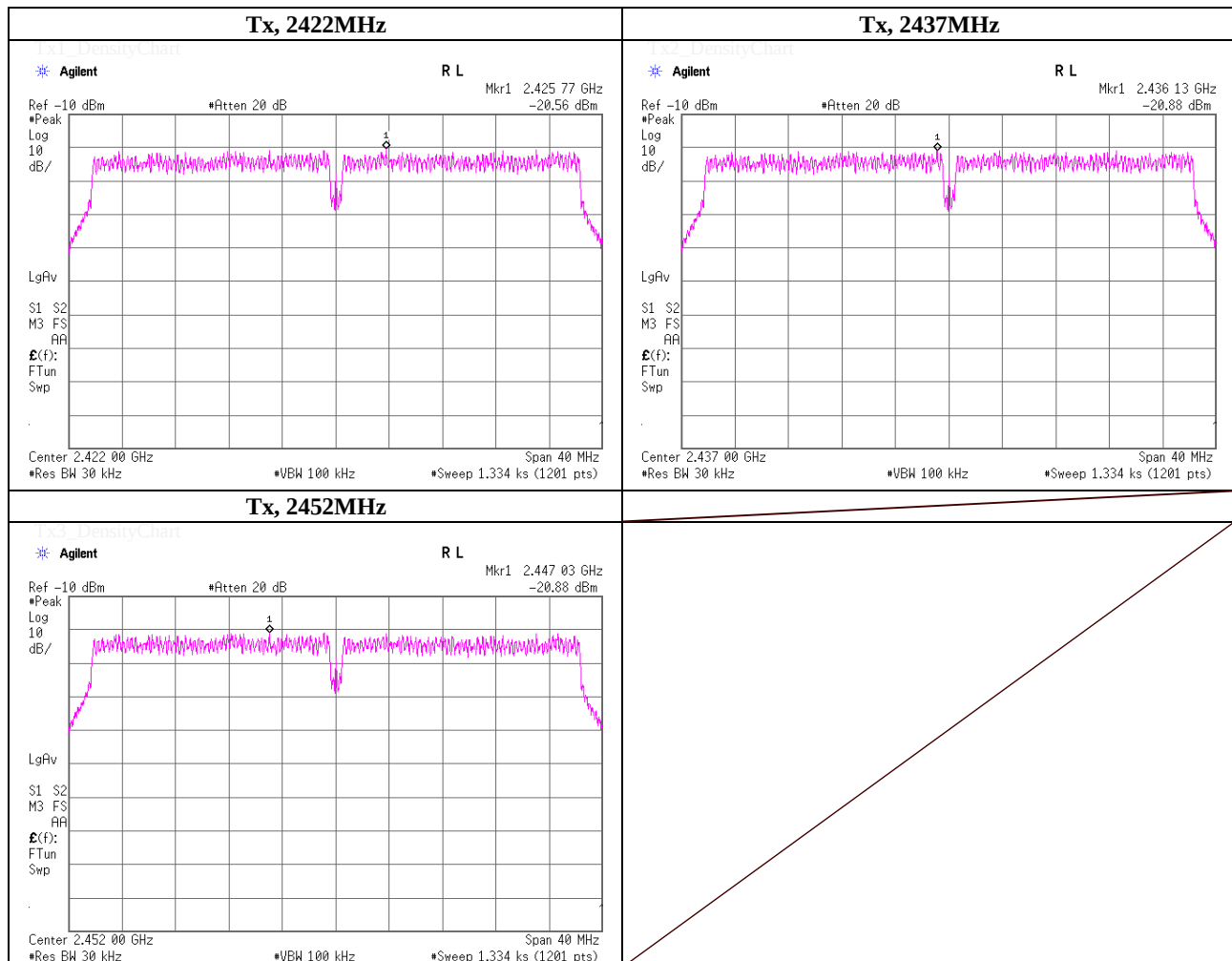
Power Density

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 27, 2012	
Temperature / Humidity	28deg.C , 48%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n-40HT, PN9, worst data mode 5(MCS), power setting 9dBm	

Ch. Freq.	Freq. Reading	Reading	Cable Loss	Atten.	Result	Limit	Margin
[MHz]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[dBm]	[dB]
2422.0000	2425.77	-20.56	0.84	9.97	-9.75	8.00	17.75
2437.0000	2436.13	-20.88	0.84	9.97	-10.07	8.00	18.07
2452.0000	2447.03	-20.88	0.85	9.97	-10.06	8.00	18.06

Sample Calculation:

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



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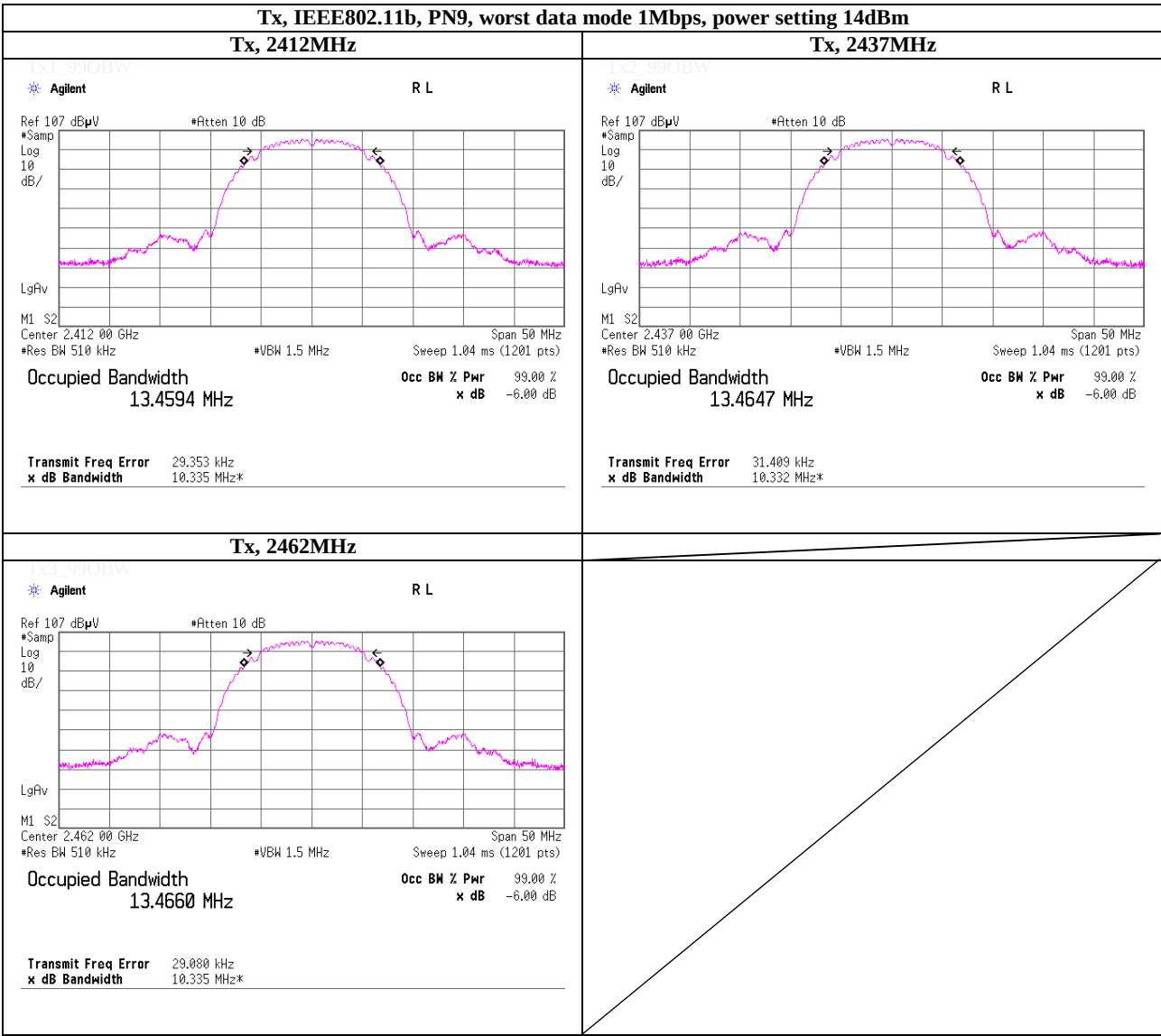
Shonan EMC Lab.

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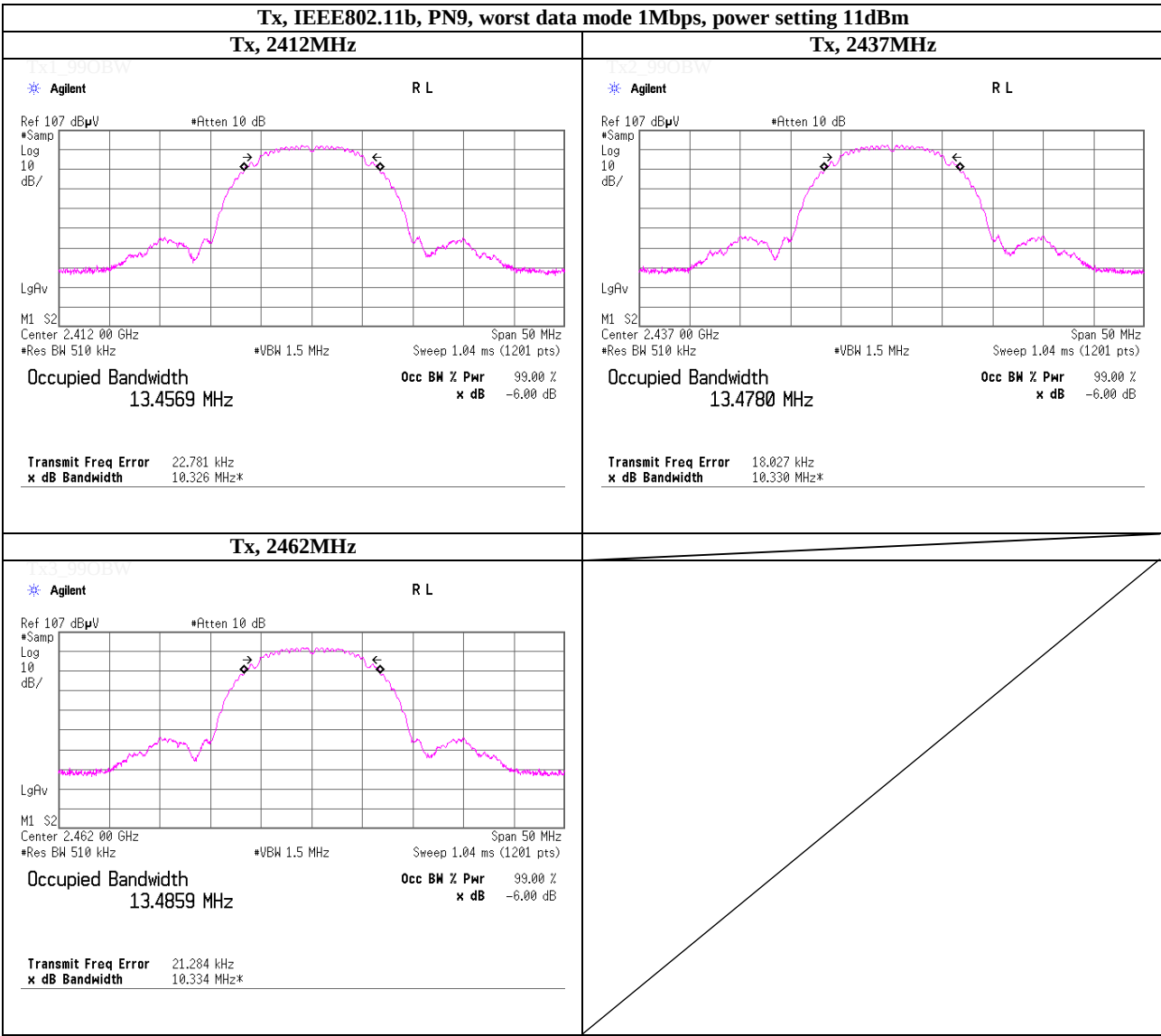
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

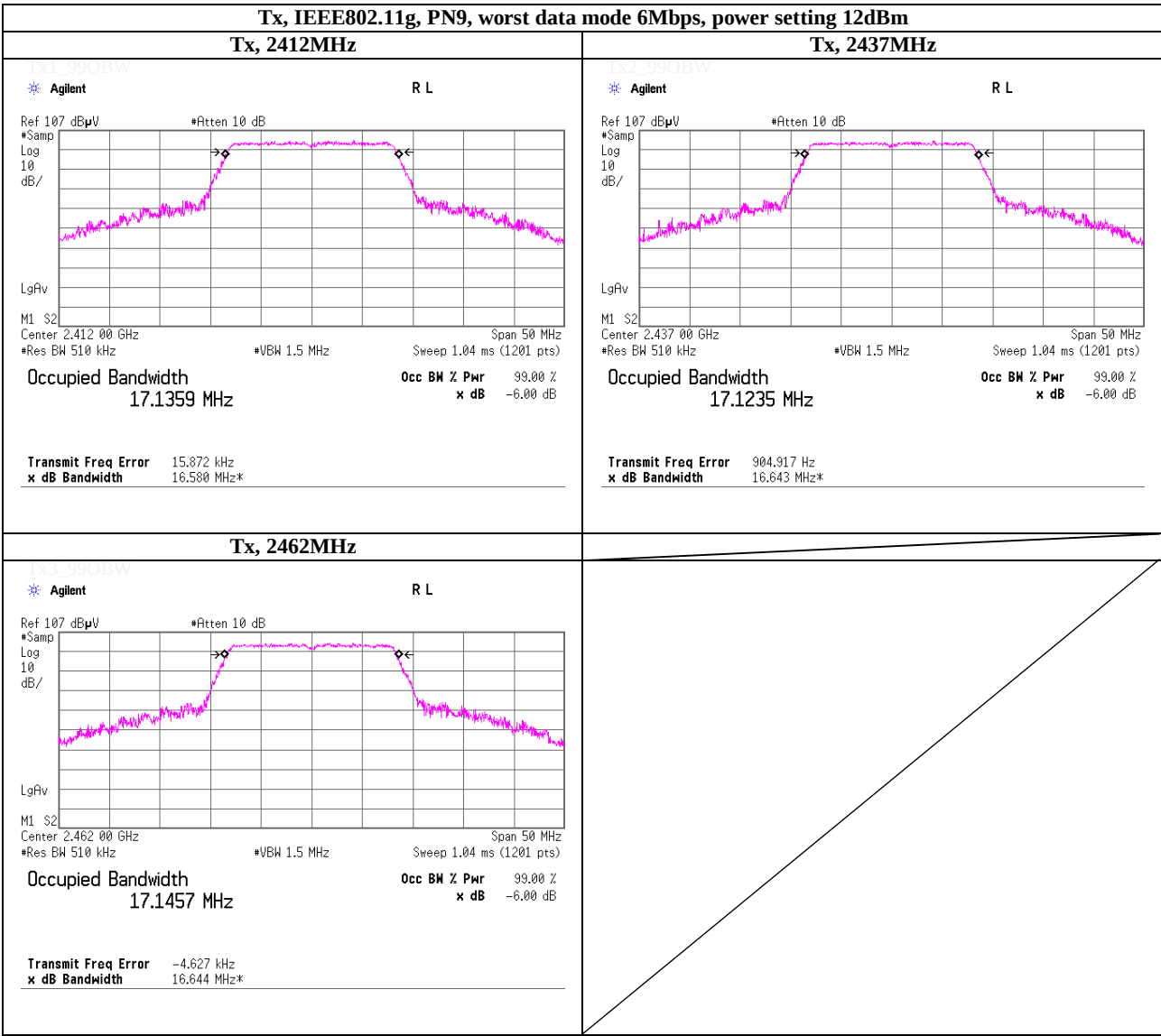
99% Occupied Bandwidth



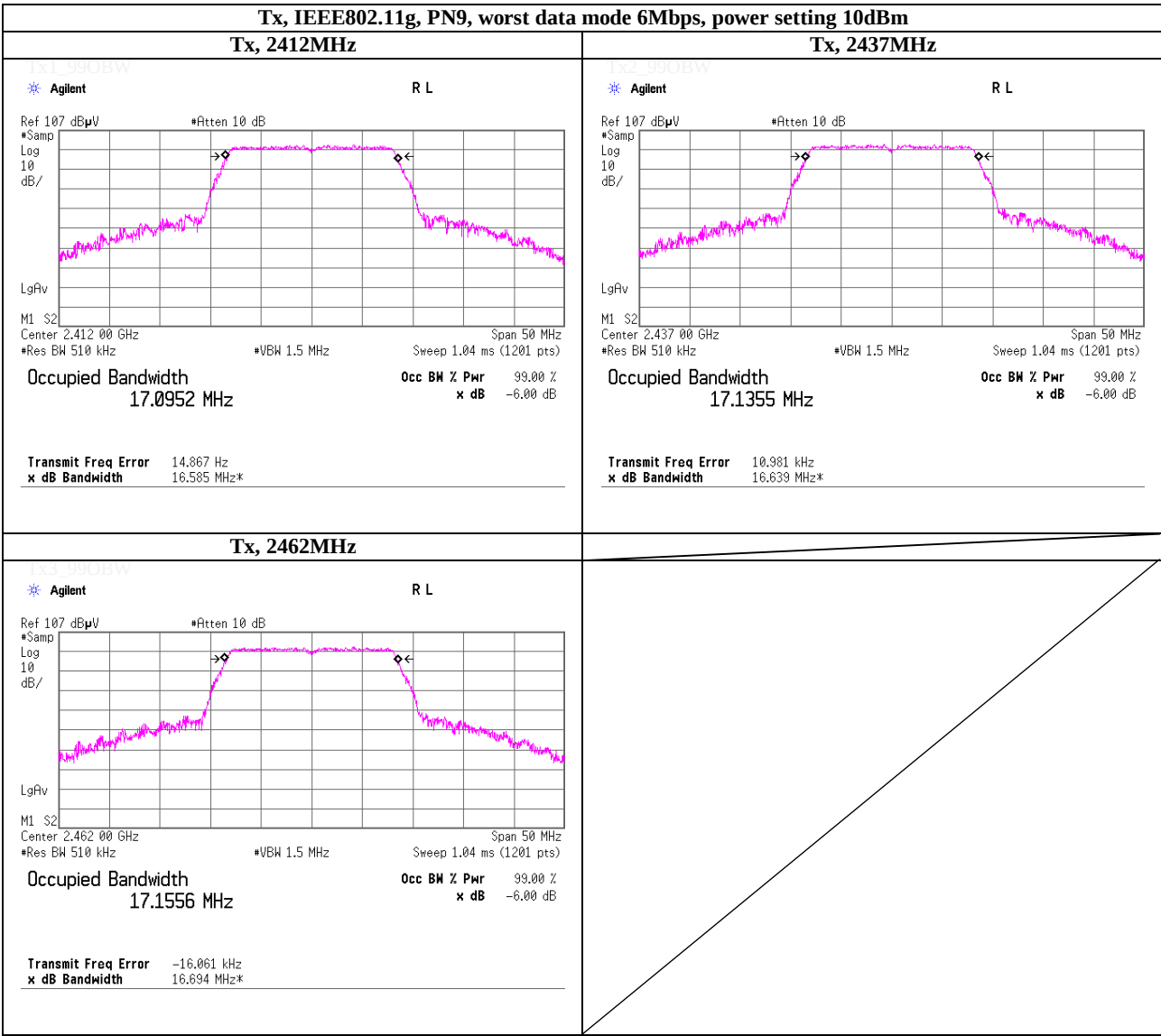
99% Occupied Bandwidth



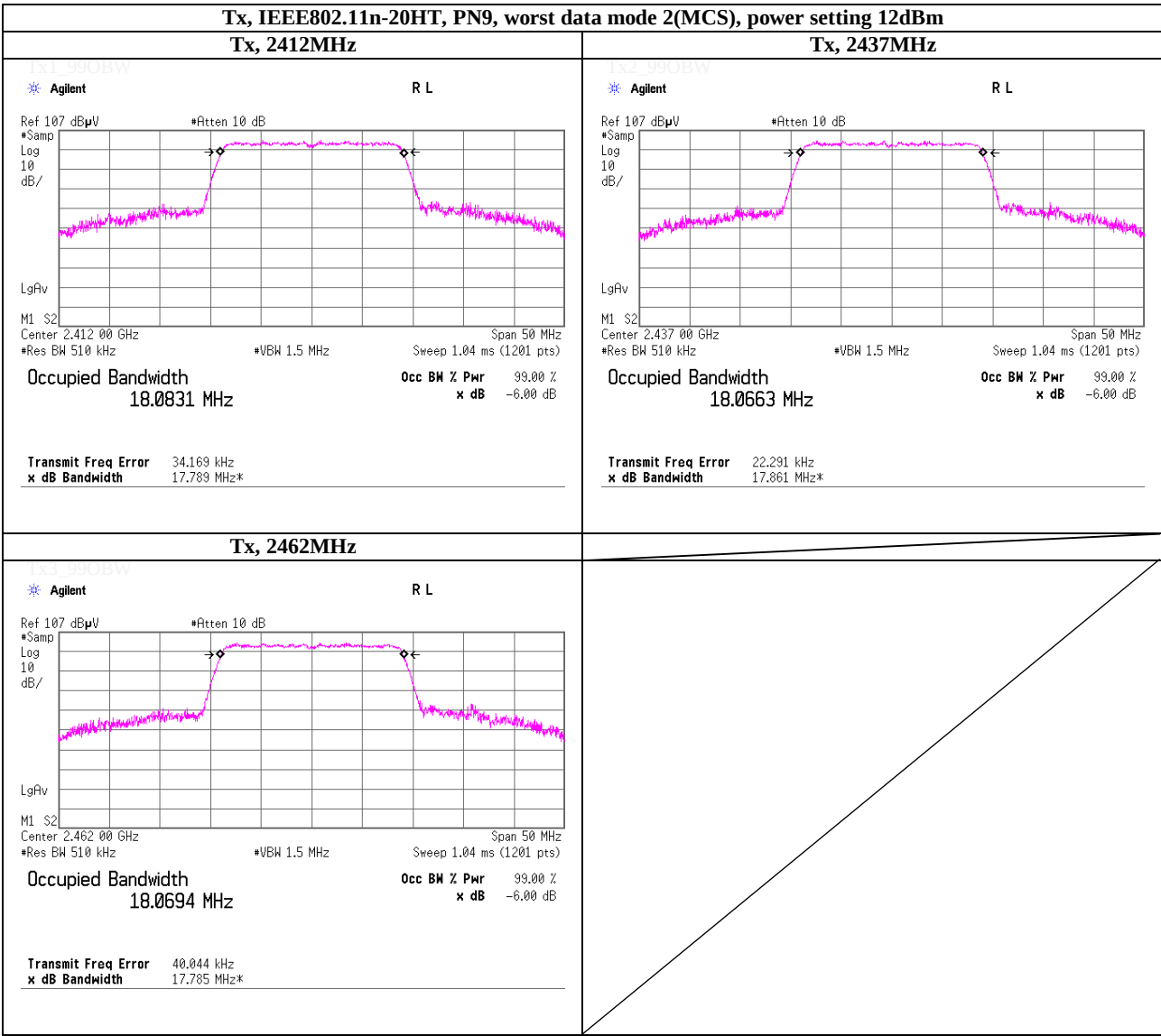
99% Occupied Bandwidth



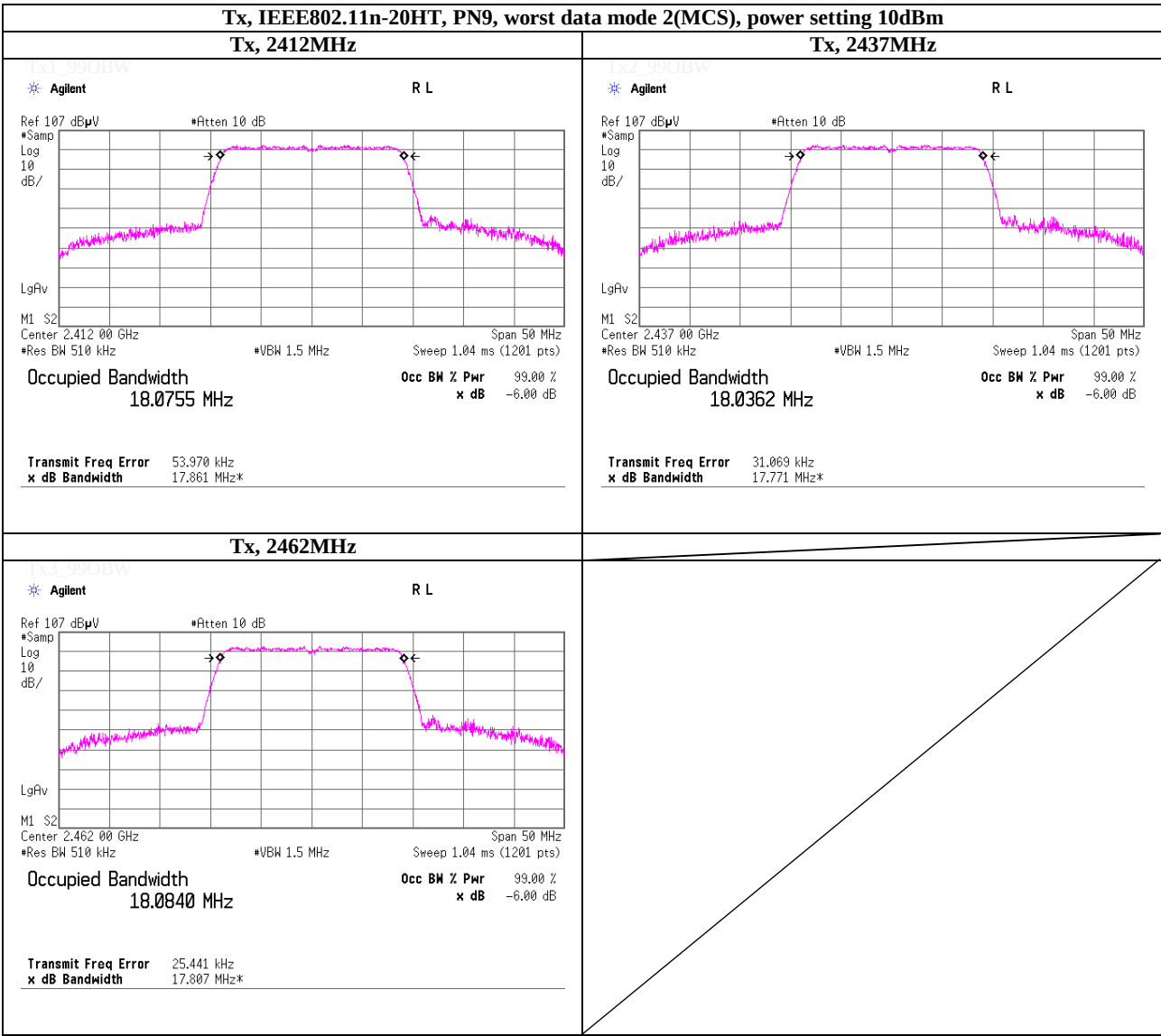
99% Occupied Bandwidth



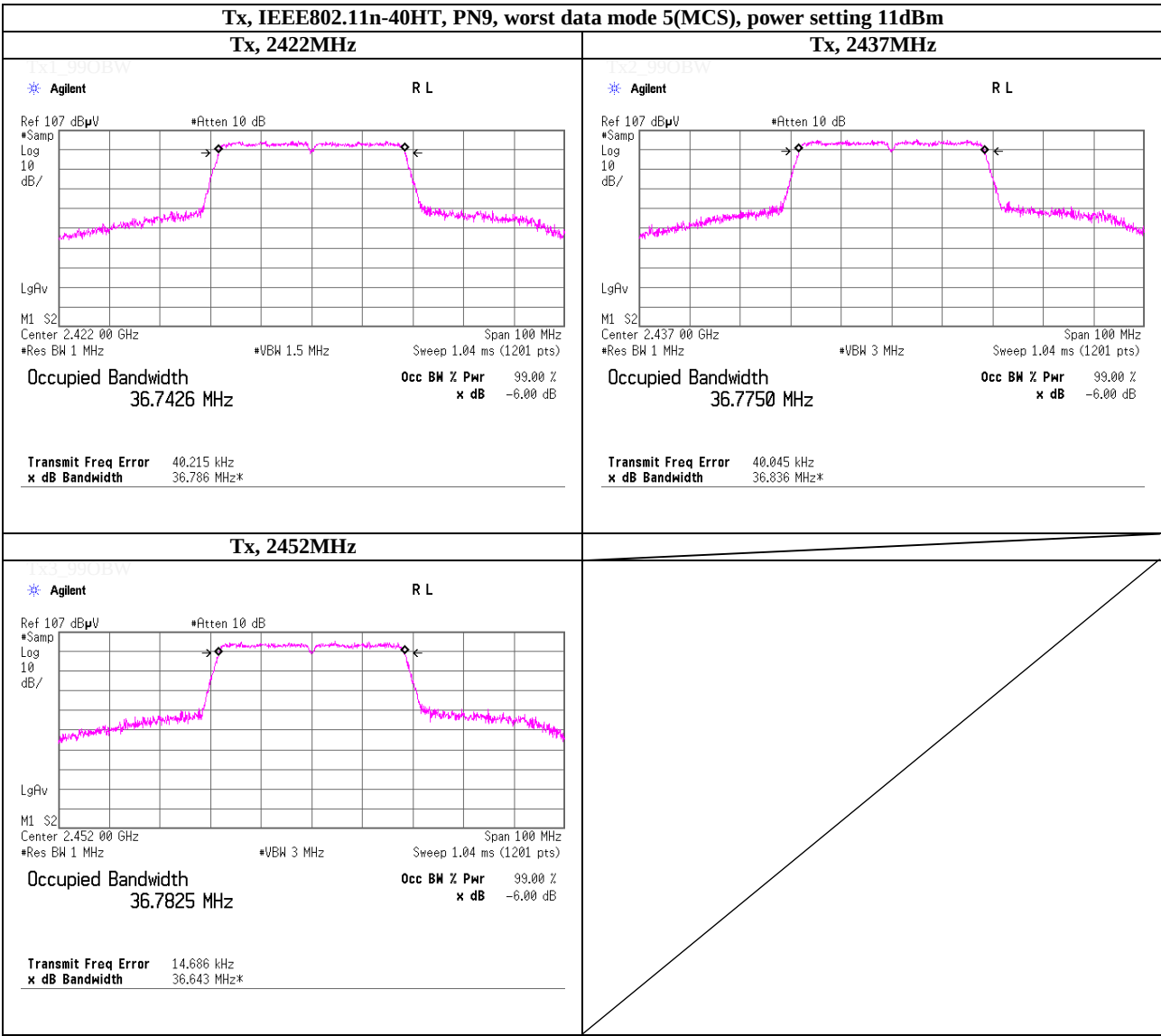
99% Occupied Bandwidth



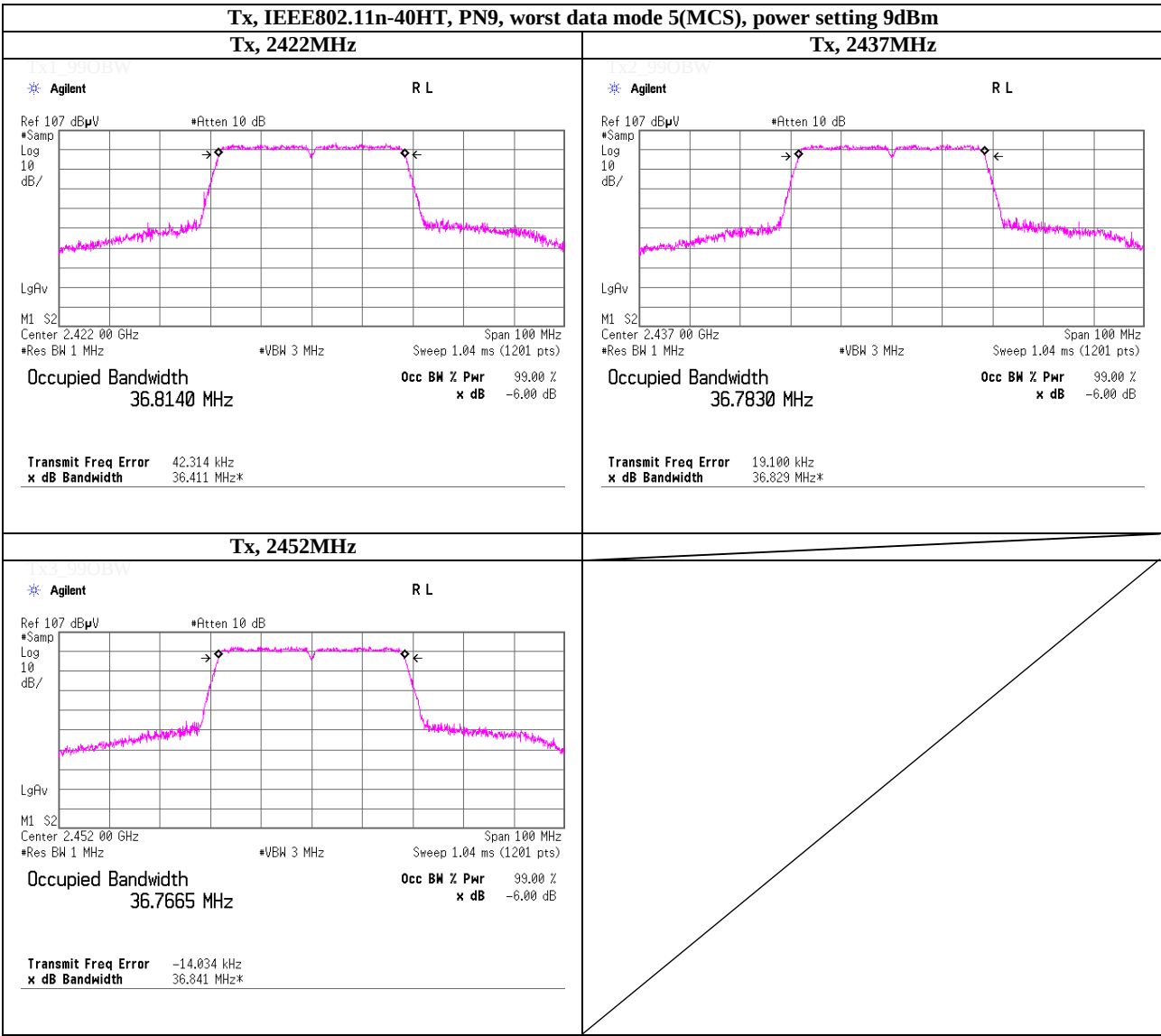
99% Occupied Bandwidth



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)
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	AT	2012/03/16 * 12
SCC-G11	Coaxial Cable	Suhner	SUCOFLEX 102	31595/2	AT	2012/03/12 * 12
SAT10-10	Attenuator	Weinschel Corp.	54A-10	37584	AT	2012/04/06 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2012/04/19 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2012/04/19 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2012/03/26 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT	2012/02/16 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2011/09/23 * 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	2012/02/06 * 12
STR-03	Test Receiver	Rohde & Schwarz	ESI40	100054/040	RE/CE	2012/06/14 * 12
SJM-10	Measure	PROMART	SEN1935	-	RE/CE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFLMF)	-	RE/CE	-
SCC-C9/C10/SRSE-03	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/N S4906	-/0901-271 (RF Selector)	CE	2012/04/10 * 12
SLS-05	LISN	Rohde & Schwarz	ENV216	100516	CE	2012/02/23 * 12
SAT3-06	Attenuator	JFW	50HF-003N	-	CE	2012/02/17 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2012/03/26 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2012/02/10 * 12
SAT6-03	Attenuator	JFW	50HF-006N	-	RE	2012/02/10 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2011/10/23 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271 (RF Selector)	RE	2012/04/10 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2011/10/23 * 12
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2011/09/25 * 12
KAF-04	Pre Amplifier	Agilent	8449B	3008A01600	RE	2012/04/06 * 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	2012/02/06 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2012/02/16 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2012/03/30 * 12
SCC-G17	Coaxial Cable	Suhner	SUCOFLEX 104A	46291/4A	RE	2012/03/12 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2012/03/12 * 12

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

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

Test Item :

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