



RADIO TEST REPORT

Test Report No.: 10004216S-A

Applicant : Canon Inc.
Type of Equipment : Wireless Module
Model No. : WM318
FCC ID : AZD318
Test regulation : FCC Part15 Subpart C: 2013
Test result : Complied

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3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
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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 22 to 28, 2013

Tested by:

S. Takano

Shinichi Takano
Engineer of WiSE Japan,
UL Verification Service

Approved by :

T. Imamura

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".

UL Japan, Inc.

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 10004216S-A

[illegible]

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SECTION 1: Customer information

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

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

2.1 Identification of E.U.T.

Type of Equipment : Wireless Module
Model No. : WM318
Serial No. : Refer to 4.2 in this report.
Rating : DC3.3V
Receipt Date of Sample : July 16, 2013
Country of Mass-production : China
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No modification by the test lab.

2.2 Product description

Model: WM318 (referred to as the EUT in this report) is a Wireless Module.

Clock frequency(ies) in the system : 38.4MHz

Radio specification

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

FCC 15.31 (e)

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

FCC 15.203

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: 2013, final revised on June 11, 2013 and effective July 11, 2013
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.209 Radiated emission limits, general requirements
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz,
and 5725-5850MHz

3.2 Procedures & Results

Item	Test Procedure *1)	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.10:2009	FCC 15.207	-	N/A	6.4dB Freq.: 0.44620MHz Detector: Average Phase: N Mode: IEEE 802.11g, 2412MHz	Complied
6dB bandwidth	ANSI C63.10:2009	FCC 15.247 (a)(2)	Conducted	N/A	* See data	Complied
Maximum peak conducted output power	ANSI C63.10:2009	FCC 15.247 (b)(3)	Conducted	N/A		Complied
Out of band emission & Restricted band edges	ANSI C63.10:2009	FCC 15.109, 15.247 (d) & 15.209	Conducted / Radiated	N/A	2.7dB Freq.: 2483.500MHz Polarization: Horizontal Detection: Average Mode: IEEE 802.11g, 2462MHz	Complied
Power density	ANSI C63.10:2009	FCC 15.247 (e)	Conducted	N/A	* See data	Complied

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

*1) These tests were also referred to KDB 558074 v03 r01 (FCC), "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

3.3 Addition to standard

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

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

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

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3.4 Uncertainty

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

Item	Frequency range	No.1 SAC ^{*1} /SR ^{*2} (±)	No.2 SAC/SR (±)	No.3 SAC/SR (±)
Conducted emission (AC Mains) LISN	150kHz-30MHz	3.6 dB	3.6 dB	3.5 dB
Radiated emission (Measurement distance: 3m)	9kHz-30MHz	3.7 dB	3.7 dB	3.6 dB
	30MHz-300MHz	4.9 dB	5.1 dB	4.9 dB
	300MHz-1GHz	5.0 dB	5.2 dB	4.9 dB
	1GHz-15GHz	4.8 dB	4.8 dB	4.9 dB
Radiated emission (Measurement distance: 1m)	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 test & Test instruments

Refer to APPENDIX 1 to 3.

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

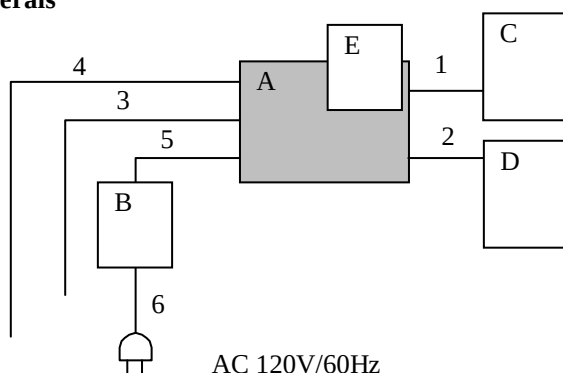
4.1 Operating mode

Test item	Mode	Tested frequency	Power setting *1) (Average)	Worst data rate *2)
Radiated emission (below 1GHz) *3)	Transmitting IEEE 802.11g	2412MHz	12dBm	6Mbps, PN9
Other items	Transmitting IEEE 802.11b	2412MHz, 2437MHz, 2462MHz	13dBm	2Mbps, PN9
	Transmitting IEEE 802.11g	2412MHz, 2437MHz, 2462MHz	12dBm	6Mbps, PN9

*1) Software used for the test: MFG-Tool.exe. ver.1.0.0.0
*2) The worst condition was determined based on the test result of Maximum Peak Conducted Output Power.
*3) Test operating mode was determined as follows according to "Section 1 of 6 802.11 a/b/g/n testing- Managing Complex Regulatory Approvals - "of TCB Council Workshop October 2009.

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

4.2 Configuration and peripherals



* Test data was taken under worst case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless Module	WM318	*1)	Canon	EUT
B	AC adapter	CA-CP200 B	05	Canon	-
C	Switch board	-	-	Canon	-
D	LCD unit	-	-	Canon	-
E	SDHC memory card	MF-FSDH08GC6	-	ELECOM	-

*1) Conducted / Radiated emission: 330N000450C, Other test: 330N000570C

List of cables used

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

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SECTION 5: Conducted emission

5.1 Operating environment

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

5.2 Test configuration

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

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

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

Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source.

Photographs of the set up are shown in APPENDIX 3.

5.3 Test conditions

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

5.4 Test procedure

The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT within a Shielded room.

The EUT was connected to a Line Impedance Stabilization Network (LISN).

An overview sweep with peak detection has been performed.

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

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

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

5.5 Results

Summary of the test results : Pass

Refer to APPENDIX 1.

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 (below 15GHz) / 1m (above 15GHz) above the conducting ground plane. Photographs of the set up are shown in APPENDIX 3.

6.3 Test conditions

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

6.4 Test procedure

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

The radiated emission measurements were made with the following detection.

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

*1) Average Power Measurement was measured based on 12.2.5 of KDB 558074 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

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

Worst case:

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

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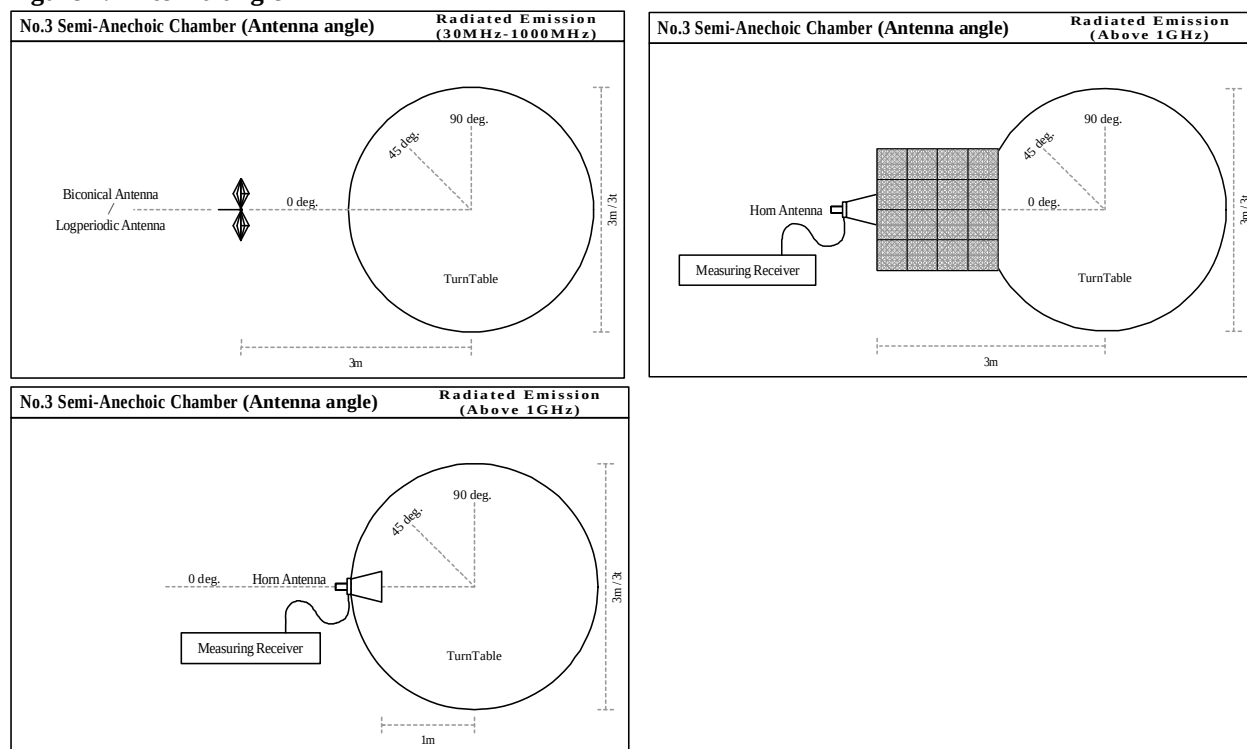
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Figure 1. Antenna angle



6.5 Band edge

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

6.6 Results

Summary of the test results :

Pass

* No noise was detected above the 5th order harmonics.

Refer to APPENDIX 1.

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

Test procedure

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

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

SECTION 8: 6dB bandwidth & Occupied bandwidth (99%)

Test procedure

The bandwidth was measured with a spectrum analyzer connected to the antenna port. The test was measured based on Method 8.1 Option 1 and 8.2 Option 2 of KDB 558074 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

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

SECTION 9: Maximum peak conducted output power

Test procedure

The Maximum Peak Output Power was measured with a power meter connected to the antenna port. The test was measured based on Method 9.1.3 PKPM1 of KDB 558074 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

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

SECTION 10: Peak power density

Test procedure

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

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

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

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

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Contents of APPENDIXES

APPENDIX 1: Data of Radio tests

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

APPENDIX 2: Test instruments

Test instruments

APPENDIX 3: Photographs of test setup

Conducted emission
Radiated emission
Pre-check of the worst position

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DATA OF CONDUCTED EMISSION TEST

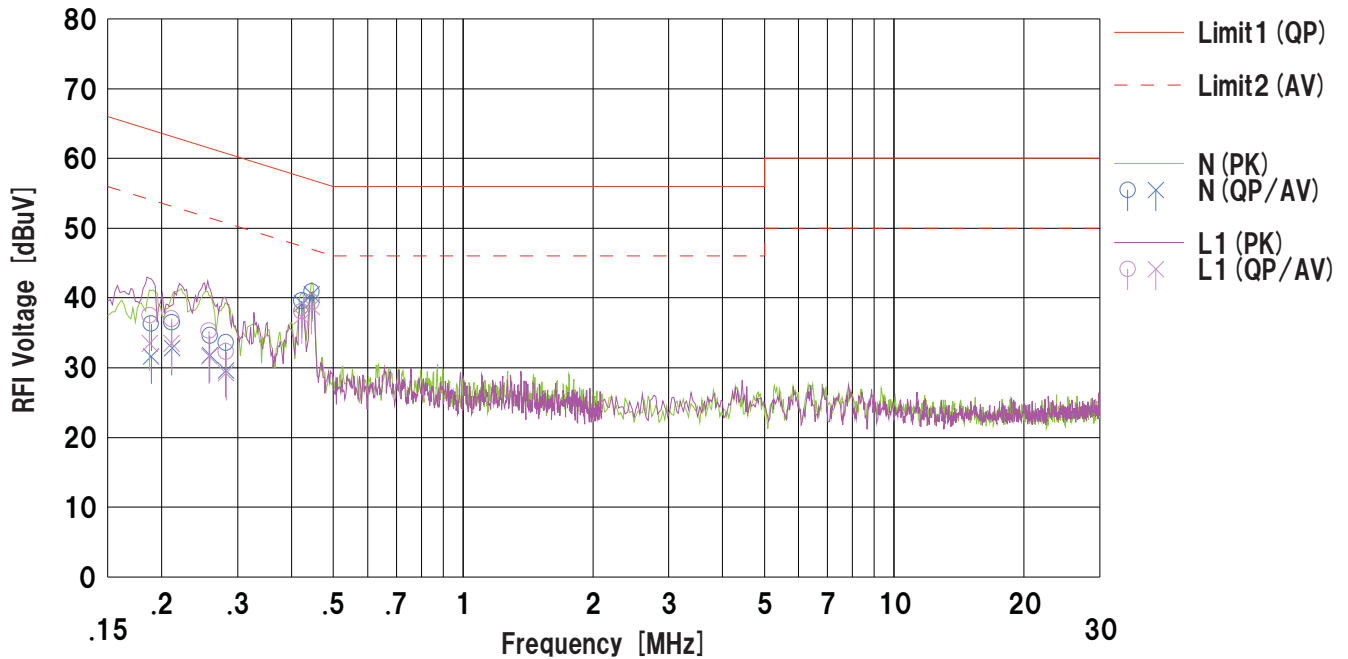
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/08/25

Company : Canon Inc.
Kind of EUT : Wireless Module
Model No. : WM318
Serial No. : 330N000450C
Remarks : -

Mode : Tx 11g 2412MHz
Order No. : 10004216S
Power : AC 120V / 60Hz
Temp./Humi. : 24deg.C. / 60%RH

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

Engineer : Shinichi Takano

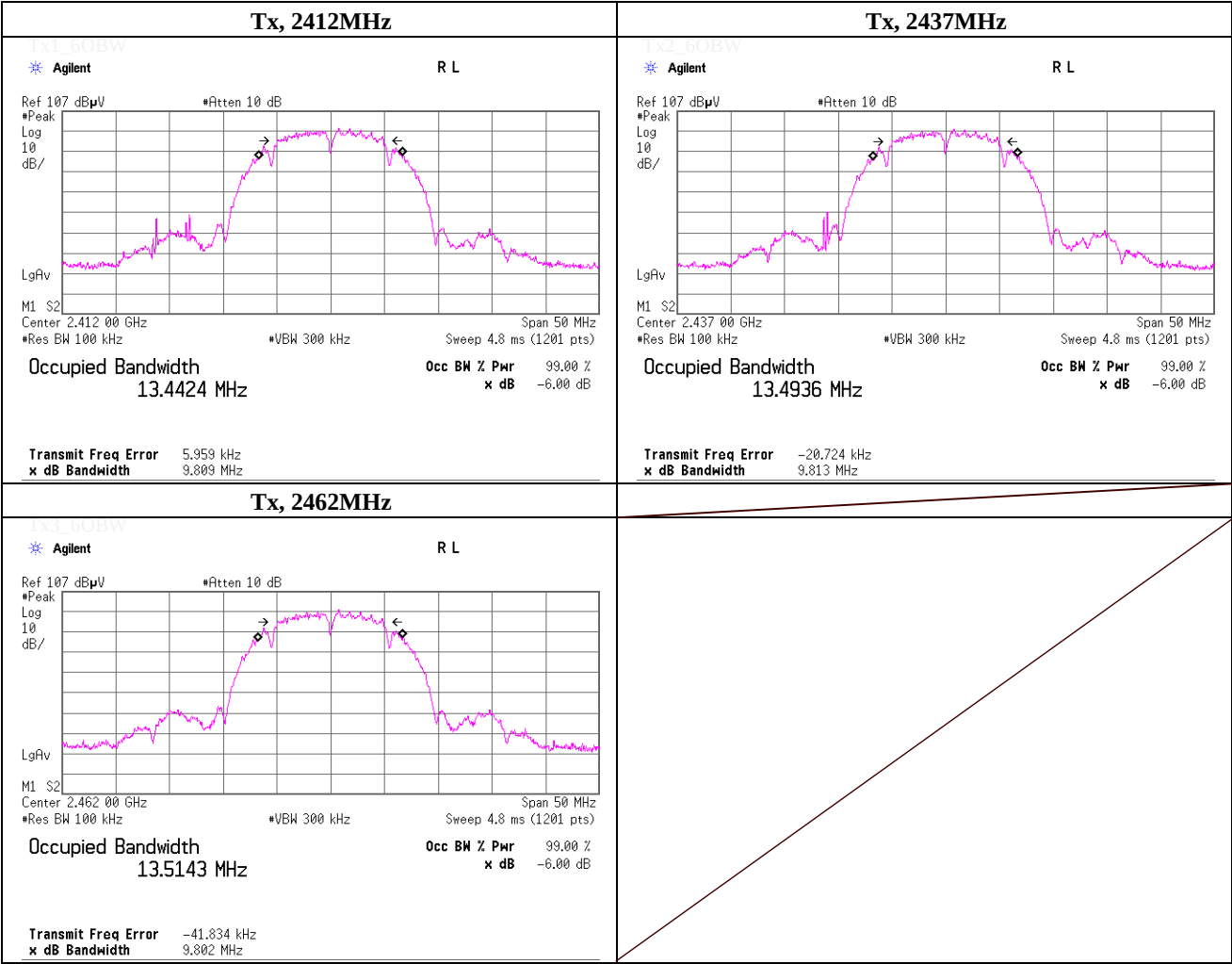


No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.18890	23.6	18.9	12.7	36.3	31.6	64.0	54.0	27.7	22.4	N	
2	0.21120	23.8	20.1	12.7	36.5	32.8	63.1	53.1	26.6	20.3	N	
3	0.25830	21.9	19.1	12.7	34.6	31.8	61.4	51.4	26.8	19.6	N	
4	0.28160	20.9	16.9	12.7	33.6	29.6	60.7	50.7	27.1	21.1	N	
5	0.42280	26.9	26.5	12.7	39.6	39.2	57.3	47.3	17.7	8.1	N	
6	0.44620	28.2	27.8	12.7	40.9	40.5	56.9	46.9	16.0	6.4	N	
7	0.18760	24.8	20.8	12.7	37.5	33.5	64.1	54.1	26.6	20.6	L1	
8	0.21100	24.3	20.8	12.7	37.0	33.5	63.1	53.1	26.1	19.6	L1	
9	0.25740	22.6	18.9	12.7	35.3	31.6	61.5	51.5	26.2	19.9	L1	
10	0.28210	19.6	16.5	12.7	32.3	29.2	60.7	50.7	28.4	21.5	L1	
11	0.42230	25.4	24.6	12.7	38.1	37.3	57.4	47.4	19.3	10.1	L1	
12	0.44530	26.7	26.0	12.7	39.4	38.7	56.9	46.9	17.5	8.2	L1	

-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 28, 2013	
Temperature / Humidity	26deg.C , 54%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11b, PN9, worst data mode 2Mbps	

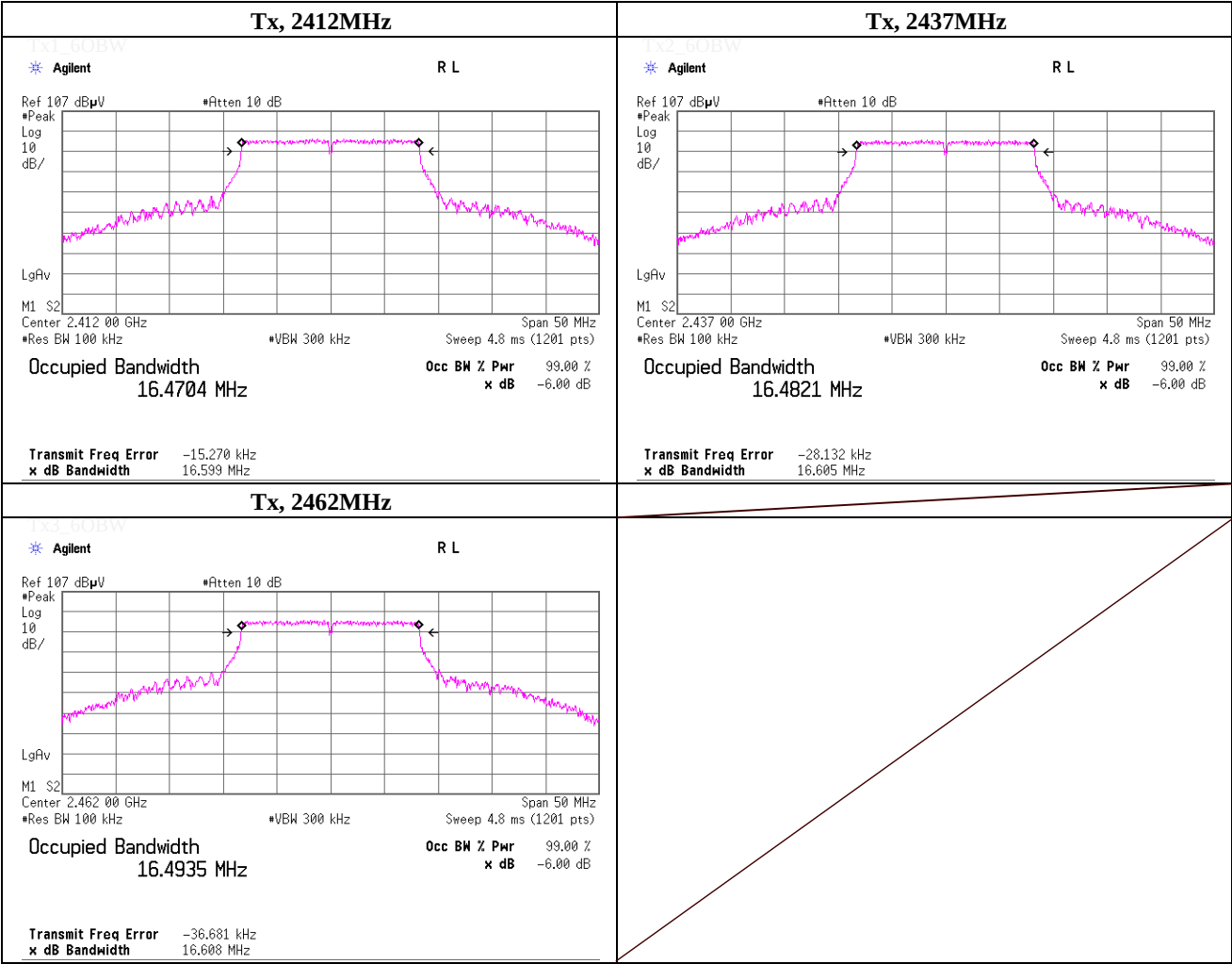
Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	9.809	> 0.500
2437.0000	9.813	> 0.500
2462.0000	9.802	> 0.500



-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 28, 2013	
Temperature / Humidity	26deg.C , 54%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.599	> 0.500
2437.0000	16.605	> 0.500
2462.0000	16.608	> 0.500



Maximum Peak Conducted Output Power

(PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date August 28, 2013
 Temperature / Humidity 26deg.C , 54%RH
 Engineer Shinichi Takano
 Mode Tx, IEEE802.11b, PN9, worst data mode : 2 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin
					[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	4.18	1.79	10.04	16.01	39.90	30.00	1000	13.99
Mid	2437.0	3.71	1.79	10.04	15.54	35.81	30.00	1000	14.46
High	2462.0	3.21	1.80	10.04	15.05	31.99	30.00	1000	14.95

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	2437.0	3.68	1.79	10.04	15.51	35.56	30.00	1000	14.49
	2	2437.0	3.71	1.79	10.04	15.54	35.81	30.00	1000	14.46
	5.5	2437.0	3.07	1.79	10.04	14.90	30.90	30.00	1000	15.10
	11	2437.0	3.65	1.79	10.04	15.48	35.32	30.00	1000	14.52

Worst

Sample Calculation:

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

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Maximum Peak Conducted Output Power

(PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date August 28, 2013
 Temperature / Humidity 26deg.C , 54%RH
 Engineer Shinichi Takano
 Mode Tx, IEEE802.11g, PN9, worst data mode : 6 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin
					[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	9.31	1.79	10.04	21.14	130.02	30.00	1000	8.86
Mid	2437.0	8.74	1.79	10.04	20.57	114.02	30.00	1000	9.43
High	2462.0	8.18	1.80	10.04	20.02	100.46	30.00	1000	9.98

Sample Calculation:

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

[Pre check]

	Data rate [Mbps]	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin
						[dBm]	[mW]	[dBm]	[mW]	[dB]
	6	2437.0	8.74	1.79	10.04	20.57	114.02	30.00	1000	9.43
	9	2437.0	8.46	1.79	10.04	20.29	106.91	30.00	1000	9.71
	12	2437.0	8.15	1.79	10.04	19.98	99.54	30.00	1000	10.02
	18	2437.0	8.14	1.79	10.04	19.97	99.31	30.00	1000	10.03
	24	2437.0	8.54	1.79	10.04	20.37	108.89	30.00	1000	9.63
	36	2437.0	8.31	1.79	10.04	20.14	103.28	30.00	1000	9.86
	48	2437.0	8.55	1.79	10.04	20.38	109.14	30.00	1000	9.62
	54	2437.0	8.43	1.79	10.04	20.26	106.17	30.00	1000	9.74

Worst

Sample Calculation:

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date August 23, 2013
 Temperature / Humidity 23 deg.C, 56 %RH
 Engineer Shinichi Takano
 Mode Tx, 2412 MHz
 Tx, IEEE802.11b, PN9, worst data mode 2Mbps

(* 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	47.4	27.4	14.7	41.1	48.4	73.9	25.5	100	275	
Hori.	4824.000	PK	48.0	31.1	7.5	41.2	45.4	73.9	28.5	100	135	
Hori.	6432.013	PK	48.6	34.9	8.3	40.7	51.1	73.9	22.8	100	336	
Hori.	7236.000	PK	46.8	36.6	9.0	41.0	51.4	73.9	22.5	100	0	
Hori.	9648.000	PK	43.2	38.6	10.2	38.9	53.1	73.9	20.8	100	0	
Hori.	12060.000	PK	46.8	39.5	11.5	39.1	58.7	73.9	15.2	100	0	
Hori.	2390.000	AV	37.5	27.4	14.7	41.1	38.5	53.9	15.4	100	275	
Hori.	4824.000	AV	38.8	31.1	7.5	41.2	36.2	53.9	17.7	100	135	
Hori.	6432.013	AV	40.8	34.9	8.3	40.7	43.3	53.9	10.6	100	336	
Hori.	7236.000	AV	38.4	36.6	9.0	41.0	43.0	53.9	10.9	100	0	
Hori.	9648.000	AV	35.6	38.6	10.2	38.9	45.5	53.9	8.4	100	0	
Hori.	12060.000	AV	35.6	39.5	11.5	39.1	47.5	53.9	6.4	100	0	
Vert.	2390.000	PK	47.0	27.4	14.7	41.1	48.0	73.9	25.9	100	232	
Vert.	4824.000	PK	46.7	31.1	7.5	41.2	44.1	73.9	29.8	100	237	
Vert.	6431.986	PK	48.6	34.9	8.3	40.7	51.1	73.9	22.8	100	359	
Vert.	7236.000	PK	47.2	36.6	9.0	41.0	51.8	73.9	22.1	100	0	
Vert.	9648.000	PK	44.7	38.6	10.2	38.9	54.6	73.9	19.3	100	0	
Vert.	12060.000	PK	45.0	39.5	11.5	39.1	56.9	73.9	17.0	100	0	
Vert.	2390.000	AV	37.6	27.4	14.7	41.1	38.6	53.9	15.3	100	232	
Vert.	4824.000	AV	37.9	31.1	7.5	41.2	35.3	53.9	18.6	100	237	
Vert.	6431.986	AV	39.6	34.9	8.3	40.7	42.1	53.9	11.8	100	359	
Vert.	7236.000	AV	38.1	36.6	9.0	41.0	42.7	53.9	11.2	100	0	
Vert.	9648.000	AV	35.4	38.6	10.2	38.9	45.3	53.9	8.6	100	0	
Vert.	12060.000	AV	35.8	39.5	11.5	39.1	47.7	53.9	6.2	100	0	

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	97.8	27.5	14.7	41.1	98.9	-	-	
Hori.	2397.772	PK	49.6	27.4	14.7	41.1	50.6	78.9	28.3	
Hori.	2400.000	PK	43.2	27.4	14.7	41.1	44.2	78.9	34.7	
Vert.	2412.000	PK	98.4	27.5	14.7	41.1	99.5	-	-	
Vert.	2397.782	PK	50.8	27.4	14.7	41.1	51.8	79.5	27.7	
Vert.	2400.000	PK	44.2	27.4	14.7	41.1	45.2	79.5	34.3	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date August 23, 2013
 Temperature / Humidity 23 deg.C, 56 %RH
 Engineer Shinichi Takano
 Mode Tx, 2437 MHz
 Tx, IEEE802.11b, PN9, worst data mode 2Mbps

(* 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	47.8	31.3	7.5	41.2	45.4	73.9	28.5	100	312	
Hori.	6498.529	PK	48.3	35.2	8.3	40.7	51.1	73.9	22.8	100	340	
Hori.	7311.000	PK	46.5	36.6	9.0	41.1	51.0	73.9	22.9	100	0	
Hori.	9748.000	PK	44.2	38.7	10.1	38.8	54.2	73.9	19.7	100	0	
Hori.	12185.000	PK	45.1	39.5	11.4	39.1	56.9	73.9	17.0	100	0	
Hori.	4874.000	AV	39.2	31.3	7.5	41.2	36.8	53.9	17.1	100	312	
Hori.	6498.529	AV	40.5	35.2	8.3	40.7	43.3	53.9	10.6	100	340	
Hori.	7311.000	AV	37.6	36.6	9.0	41.1	42.1	53.9	11.8	100	0	
Hori.	9748.000	AV	35.1	38.7	10.1	38.8	45.1	53.9	8.8	100	0	
Hori.	12185.000	AV	35.2	39.5	11.4	39.1	47.0	53.9	6.9	100	0	
Vert.	4874.000	PK	46.9	31.3	7.5	41.2	44.5	73.9	29.4	100	238	
Vert.	6498.682	PK	47.5	35.2	8.3	40.7	50.3	73.9	23.6	100	359	
Vert.	7311.000	PK	46.1	36.6	9.0	41.1	50.6	73.9	23.3	100	0	
Vert.	9748.000	PK	44.1	38.7	10.1	38.8	54.1	73.9	19.8	100	0	
Vert.	12185.000	PK	44.6	39.5	11.4	39.1	56.4	73.9	17.5	100	0	
Vert.	4874.000	AV	38.1	31.3	7.5	41.2	35.7	53.9	18.2	100	238	
Vert.	6498.682	AV	38.9	35.2	8.3	40.7	41.7	53.9	12.2	100	359	
Vert.	7311.000	AV	37.5	36.6	9.0	41.1	42.0	53.9	11.9	100	0	
Vert.	9748.000	AV	34.8	38.7	10.1	38.8	44.8	53.9	9.1	100	0	
Vert.	12185.000	AV	35.0	39.5	11.4	39.1	46.8	53.9	7.1	100	0	

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

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

Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date August 23, 2013
 Temperature / Humidity 23 deg.C, 56 %RH
 Engineer Shinichi Takano
 Mode Tx, 2462 MHz
 Tx, IEEE802.11b, PN9, worst data mode 2Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	46.7	27.5	14.8	41.0	48.0	73.9	25.9	100	264	
Hori.	4924.000	PK	48.9	31.5	7.5	41.1	46.8	73.9	27.1	100	318	
Hori.	6565.149	PK	48.5	35.3	8.4	40.8	51.4	73.9	22.5	100	335	
Hori.	7386.000	PK	46.9	36.7	9.0	41.1	51.5	73.9	22.4	100	0	
Hori.	9848.000	PK	43.6	38.9	10.0	38.8	53.7	73.9	20.2	100	0	
Hori.	12310.000	PK	43.4	39.5	11.3	39.1	55.1	73.9	18.8	100	0	
Hori.	2483.500	AV	38.1	27.5	14.8	41.0	39.4	53.9	14.5	100	264	
Hori.	4924.000	AV	40.1	31.5	7.5	41.1	38.0	53.9	15.9	100	318	
Hori.	6565.149	AV	40.9	35.3	8.4	40.8	43.8	53.9	10.1	100	335	
Hori.	7386.000	AV	34.5	36.7	9.0	41.1	39.1	53.9	14.8	100	0	
Hori.	9848.000	AV	34.6	38.9	10.0	38.8	44.7	53.9	9.2	100	0	
Hori.	12310.000	AV	35.0	39.5	11.3	39.1	46.7	53.9	7.2	100	0	
Vert.	2483.500	PK	47.2	27.5	14.8	41.0	48.5	73.9	25.4	115	236	
Vert.	4924.000	PK	47.7	31.5	7.5	41.1	45.6	73.9	28.3	108	236	
Vert.	6565.308	PK	47.3	35.3	8.4	40.8	50.2	73.9	23.7	100	359	
Vert.	7386.000	PK	47.7	36.7	9.0	41.1	52.3	73.9	21.6	100	0	
Vert.	9848.000	PK	44.3	38.9	10.0	38.8	54.4	73.9	19.5	100	0	
Vert.	12310.000	PK	44.8	39.5	11.3	39.1	56.5	73.9	17.4	100	0	
Vert.	2483.500	AV	37.9	27.5	14.8	41.0	39.2	53.9	14.7	115	236	
Vert.	4924.000	AV	38.4	31.5	7.5	41.1	36.3	53.9	17.6	108	236	
Vert.	6565.308	AV	39.1	35.3	8.4	40.8	42.0	53.9	11.9	100	359	
Vert.	7386.000	AV	37.5	36.7	9.0	41.1	42.1	53.9	11.8	100	0	
Vert.	9848.000	AV	34.5	38.9	10.0	38.8	44.6	53.9	9.3	100	0	
Vert.	12310.000	AV	34.5	39.5	11.3	39.1	46.2	53.9	7.7	100	0	

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

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

Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date August 22, 2013 August 23, 2013 August 25, 2013
 Temperature / Humidity 24 deg.C, 58 %RH 23 deg.C, 56 %RH 25 deg.C, 65 %RH
 Engineer Shinichi Takano Shinichi Takano Shinichi Takano
 Mode Tx, 2412 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	294.429	QP	26.5	19.3	8.5	32.0	22.3	46.0	23.7	150	89	
Hori.	340.614	QP	28.2	14.9	8.8	31.9	20.0	46.0	26.0	100	0	
Hori.	956.336	QP	21.5	22.7	11.0	30.5	24.7	46.0	21.3	100	109	
Hori.	2390.000	PK	58.2	27.6	14.7	41.1	59.4	73.9	14.5	100	278	
Hori.	4824.000	PK	45.7	31.1	7.5	41.2	43.1	73.9	30.8	100	0	
Hori.	6431.963	PK	48.4	34.9	8.3	40.7	50.9	73.9	23.0	100	337	
Hori.	7236.000	PK	47.8	36.6	9.0	41.0	52.4	73.9	21.5	100	0	
Hori.	9648.000	PK	44.5	38.6	10.2	38.9	54.4	73.9	19.5	100	0	
Hori.	12060.000	PK	45.7	39.5	11.5	39.1	57.6	73.9	16.3	100	0	
Hori.	2390.000	AV	45.9	27.6	14.7	41.1	47.1	53.9	6.8	100	278	
Hori.	4824.000	AV	37.1	31.1	7.5	41.2	34.5	53.9	19.4	100	0	
Hori.	6431.963	AV	41.0	34.9	8.3	40.7	43.5	53.9	10.4	100	337	
Hori.	7236.000	AV	38.2	36.6	9.0	41.0	42.8	53.9	11.1	100	0	
Hori.	9648.000	AV	35.6	38.6	10.2	38.9	45.5	53.9	8.4	100	0	
Hori.	12060.000	AV	35.2	39.5	11.5	39.1	47.1	53.9	6.8	100	0	
Vert.	31.088	QP	22.8	17.6	6.5	32.2	14.7	40.0	25.3	100	2	
Vert.	46.147	QP	23.9	12.1	6.7	32.2	10.5	40.0	29.5	100	61	
Vert.	126.603	QP	28.0	13.5	7.2	32.1	16.6	43.5	26.9	100	29	
Vert.	2390.000	PK	60.6	27.6	14.7	41.1	61.8	73.9	12.1	100	200	
Vert.	4824.000	PK	46.1	31.1	7.5	41.2	43.5	73.9	30.4	100	0	
Vert.	6431.953	PK	48.2	34.9	8.3	40.7	50.7	73.9	23.2	100	359	
Vert.	7236.000	PK	47.1	36.6	9.0	41.0	51.7	73.9	22.2	100	0	
Vert.	9648.000	PK	45.4	38.6	10.2	38.9	55.3	73.9	18.6	100	0	
Vert.	12060.000	PK	46.7	39.5	11.5	39.1	58.6	73.9	15.3	100	0	
Vert.	2390.000	AV	45.5	27.6	14.7	41.1	46.7	53.9	7.2	100	200	
Vert.	4824.000	AV	36.7	31.1	7.5	41.2	34.1	53.9	19.8	100	0	
Vert.	6431.953	AV	39.4	34.9	8.3	40.7	41.9	53.9	12.0	100	359	
Vert.	7236.000	AV	37.4	36.6	9.0	41.0	42.0	53.9	11.9	100	0	
Vert.	9648.000	AV	34.8	38.6	10.2	38.9	44.7	53.9	9.2	100	0	
Vert.	12060.000	AV	35.7	39.5	11.5	39.1	47.6	53.9	6.3	100	0	

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	93.1	27.6	14.7	41.1	94.3	-	-	
Hori.	2400.000	PK	63.9	27.6	14.7	41.1	65.1	74.3	9.2	
Vert.	2412.000	PK	92.8	27.6	14.7	41.1	94.0	-	-	
Vert.	2400.000	PK	63.2	27.6	14.7	41.1	64.4	74.0	9.6	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date August 23, 2013
 Temperature / Humidity 23 deg.C, 56 %RH
 Engineer Shinichi Takano
 Mode Tx, 2437 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	46.2	31.3	7.5	41.2	43.8	73.9	30.1	100	0	
Hori.	6498.623	PK	48.6	35.2	8.3	40.7	51.4	73.9	22.5	100	340	
Hori.	7311.000	PK	45.9	36.6	9.0	41.1	50.4	73.9	23.5	100	0	
Hori.	9748.000	PK	44.1	38.7	10.1	38.8	54.1	73.9	19.8	100	0	
Hori.	12185.000	PK	43.9	39.5	11.4	39.1	55.7	73.9	18.2	100	0	
Hori.	4874.000	AV	36.8	31.3	7.5	41.2	34.4	53.9	19.5	100	0	
Hori.	6498.623	AV	41.0	35.2	8.3	40.7	43.8	53.9	10.1	100	340	
Hori.	7311.000	AV	37.6	36.6	9.0	41.1	42.1	53.9	11.8	100	0	
Hori.	9748.000	AV	35.0	38.7	10.1	38.8	45.0	53.9	8.9	100	0	
Hori.	12185.000	AV	35.1	39.5	11.4	39.1	46.9	53.9	7.0	100	0	
Vert.	4874.000	PK	45.7	31.3	7.5	41.2	43.3	73.9	30.6	100	0	
Vert.	6498.703	PK	47.1	35.2	8.3	40.7	49.9	73.9	24.0	100	359	
Vert.	7311.000	PK	46.3	36.6	9.0	41.1	50.8	73.9	23.1	100	0	
Vert.	9748.000	PK	44.5	38.7	10.1	38.8	54.5	73.9	19.4	100	0	
Vert.	12185.000	PK	45.5	39.5	11.4	39.1	57.3	73.9	16.6	100	0	
Vert.	4874.000	AV	36.3	31.3	7.5	41.2	33.9	53.9	20.0	100	0	
Vert.	6498.703	AV	38.7	35.2	8.3	40.7	41.5	53.9	12.4	100	359	
Vert.	7311.000	AV	37.3	36.6	9.0	41.1	41.8	53.9	12.1	100	0	
Vert.	9748.000	AV	34.8	38.7	10.1	38.8	44.8	53.9	9.1	100	0	
Vert.	12185.000	AV	35.0	39.5	11.4	39.1	46.8	53.9	7.1	100	0	

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

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

Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date August 22, 2013 August 23, 2013
 Temperature / Humidity 24 deg.C, 58 %RH 23 deg.C, 56 %RH
 Engineer Shinichi Takano Shinichi Takano
 Mode Tx, 2462 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps

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

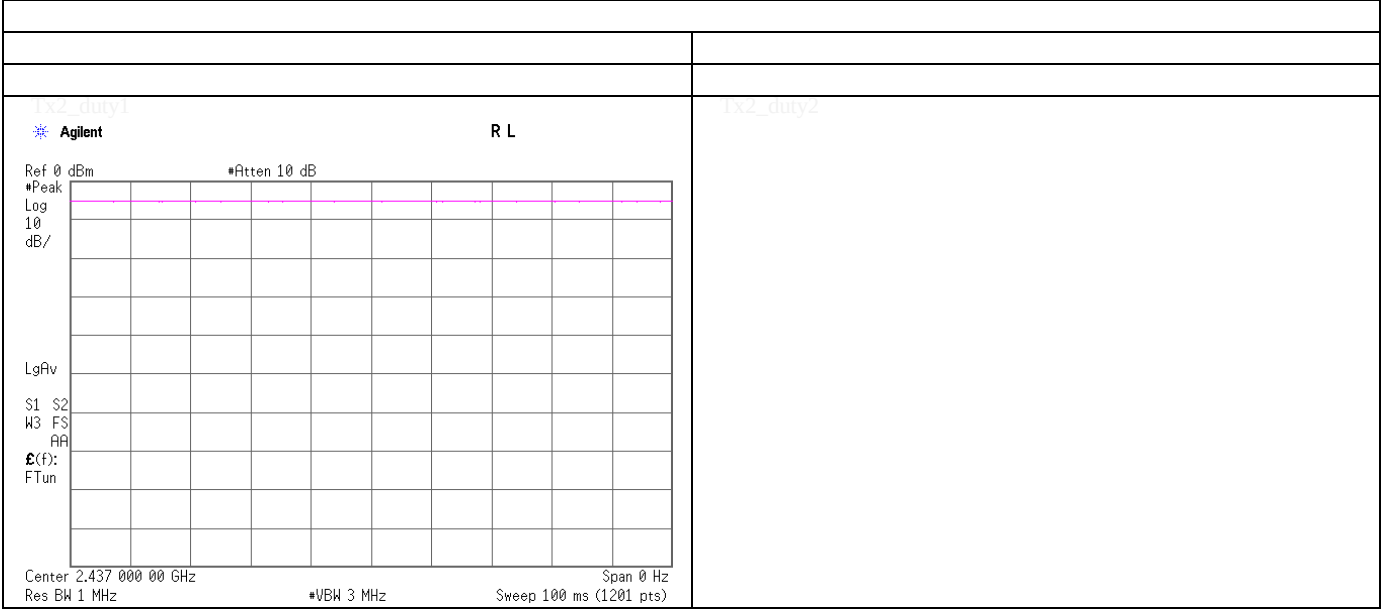
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	64.3	27.6	14.8	41.0	65.7	73.9	8.2	100	266	
Hori.	4924.000	PK	45.4	31.5	7.5	41.1	43.3	73.9	30.6	100	0	
Hori.	6565.288	PK	48.4	35.3	8.4	40.8	51.3	73.9	22.6	100	339	
Hori.	7386.000	PK	45.7	36.7	9.0	41.1	50.3	73.9	23.6	100	0	
Hori.	9848.000	PK	42.1	38.9	10.0	38.8	52.2	73.9	21.7	100	0	
Hori.	12310.000	PK	43.6	39.5	11.3	39.1	55.3	73.9	18.6	100	0	
Hori.	2483.500	AV	49.8	27.6	14.8	41.0	51.2	53.9	2.7	100	266	
Hori.	4924.000	AV	37.2	31.5	7.5	41.1	35.1	53.9	18.8	100	0	
Hori.	6565.288	AV	41.0	35.3	8.4	40.8	43.9	53.9	10.0	100	339	
Hori.	7386.000	AV	37.7	36.7	9.0	41.1	42.3	53.9	11.6	100	0	
Hori.	9848.000	AV	34.7	38.9	10.0	38.8	44.8	53.9	9.1	100	0	
Hori.	12310.000	AV	35.0	39.5	11.3	39.1	46.7	53.9	7.2	100	0	
Vert.	2483.500	PK	64.5	27.6	14.8	41.0	65.9	73.9	8.0	100	231	
Vert.	4924.000	PK	45.6	31.5	7.5	41.1	43.5	73.9	30.4	100	0	
Vert.	6565.153	PK	48.2	35.3	8.4	40.8	51.1	73.9	22.8	100	359	
Vert.	7386.000	PK	45.6	36.7	9.0	41.1	50.2	73.9	23.7	100	0	
Vert.	9848.000	PK	43.6	38.9	10.0	38.8	53.7	73.9	20.2	100	0	
Vert.	12310.000	PK	43.8	39.5	11.3	39.1	55.5	73.9	18.4	100	0	
Vert.	2483.500	AV	49.2	27.6	14.8	41.0	50.6	53.9	3.3	100	231	
Vert.	4924.000	AV	37.1	31.5	7.5	41.1	35.0	53.9	18.9	100	0	
Vert.	6565.153	AV	39.2	35.3	8.4	40.8	42.1	53.9	11.8	100	359	
Vert.	7386.000	AV	37.7	36.7	9.0	41.1	42.3	53.9	11.6	100	0	
Vert.	9848.000	AV	34.6	38.9	10.0	38.8	44.7	53.9	9.2	100	0	
Vert.	12310.000	AV	34.7	39.5	11.3	39.1	46.4	53.9	7.5	100	0	

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

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

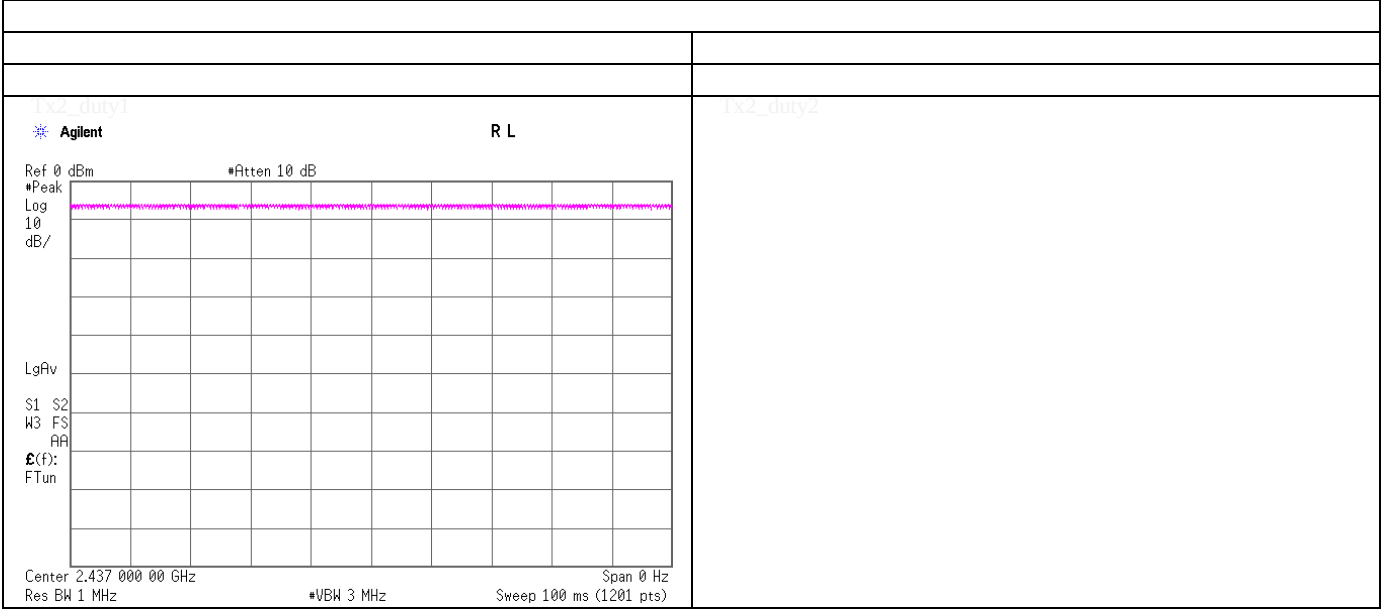
Burst rate confirmation

Tx, IEEE802.11b, PN9, worst data mode 2Mbps



Burst rate confirmation

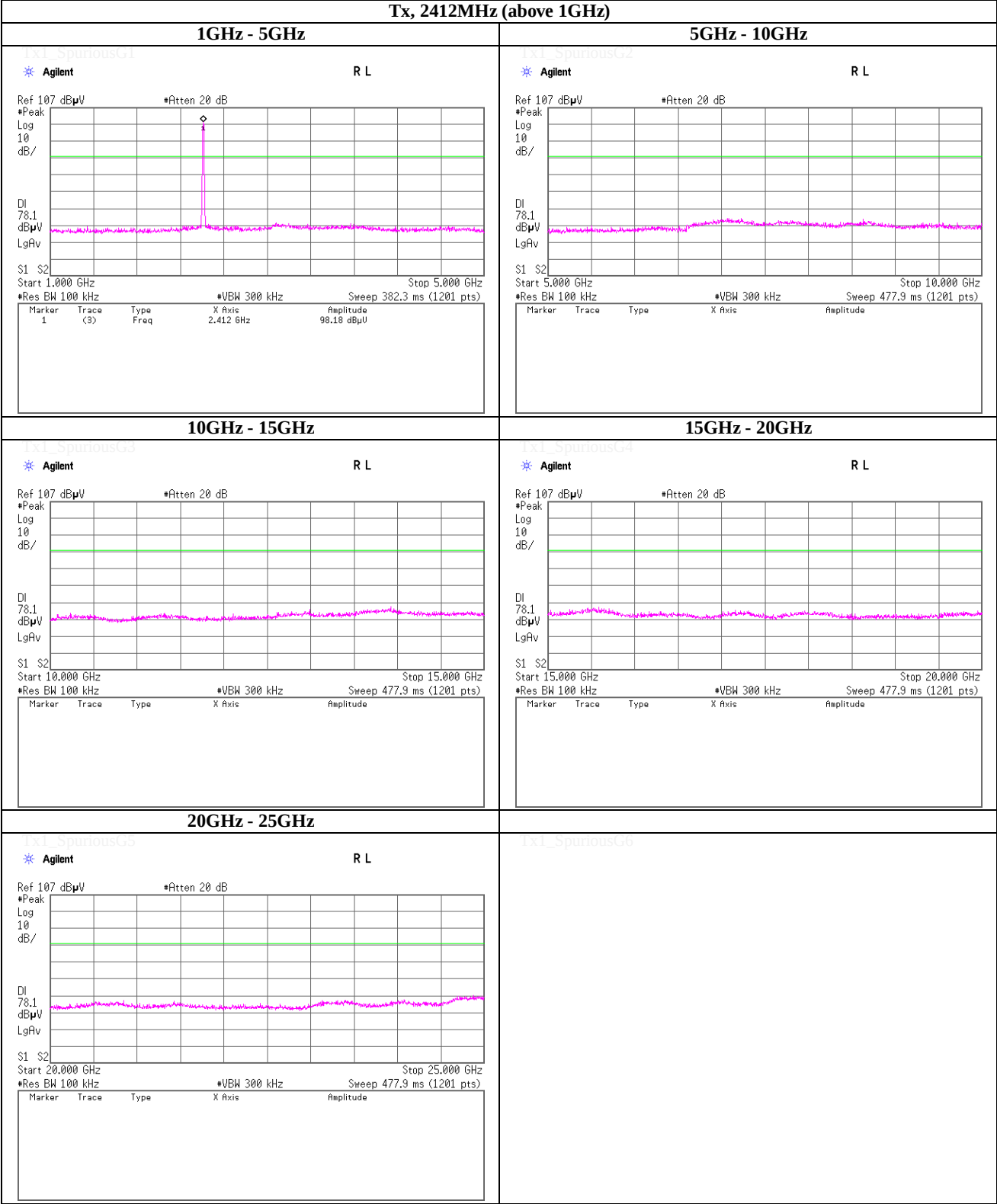
Tx, IEEE802.11g, PN9, worst data mode 6Mbps



(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11b, PN9, worst data mode 2Mbps

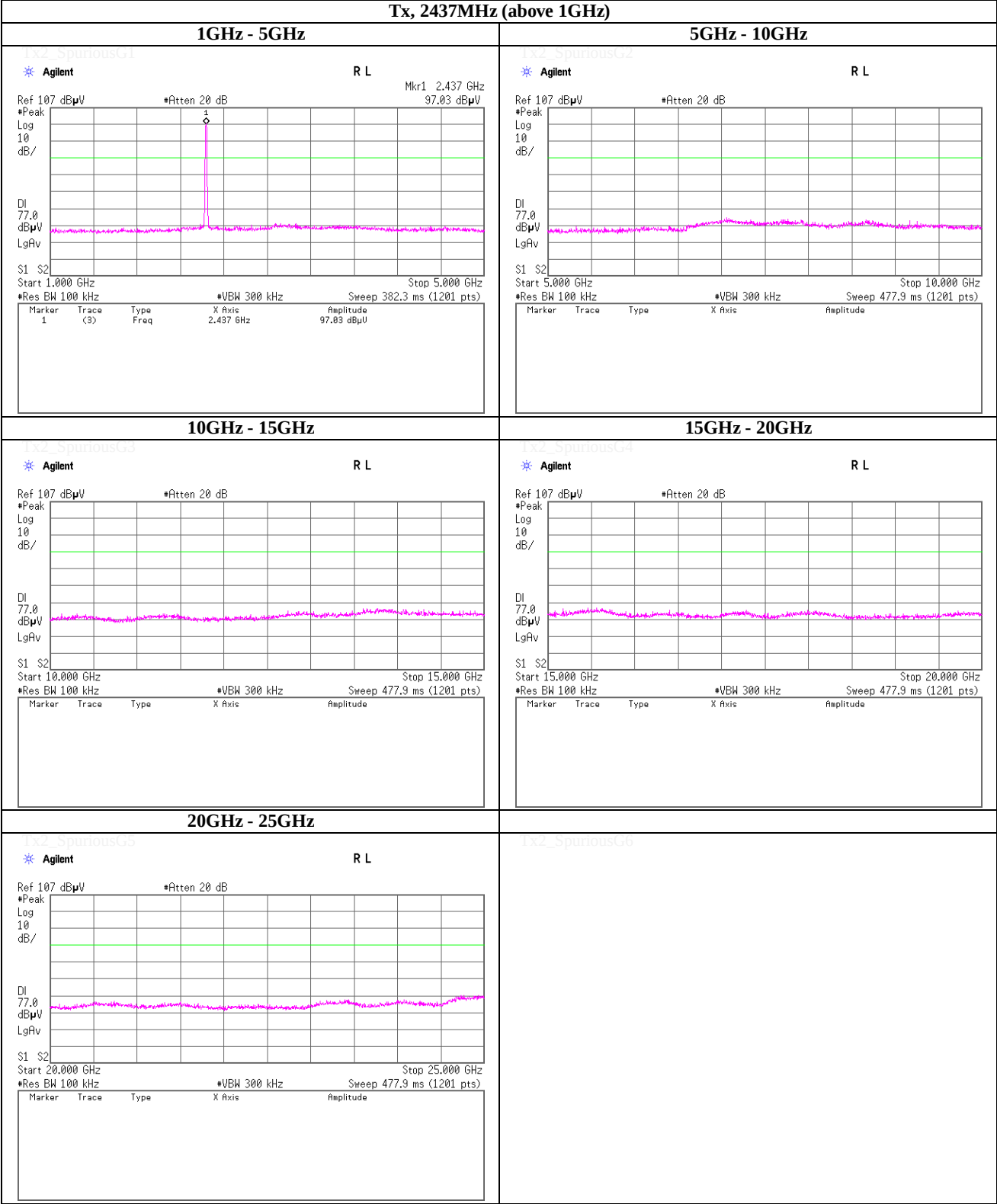
Tx, 2412MHz (above 1GHz)

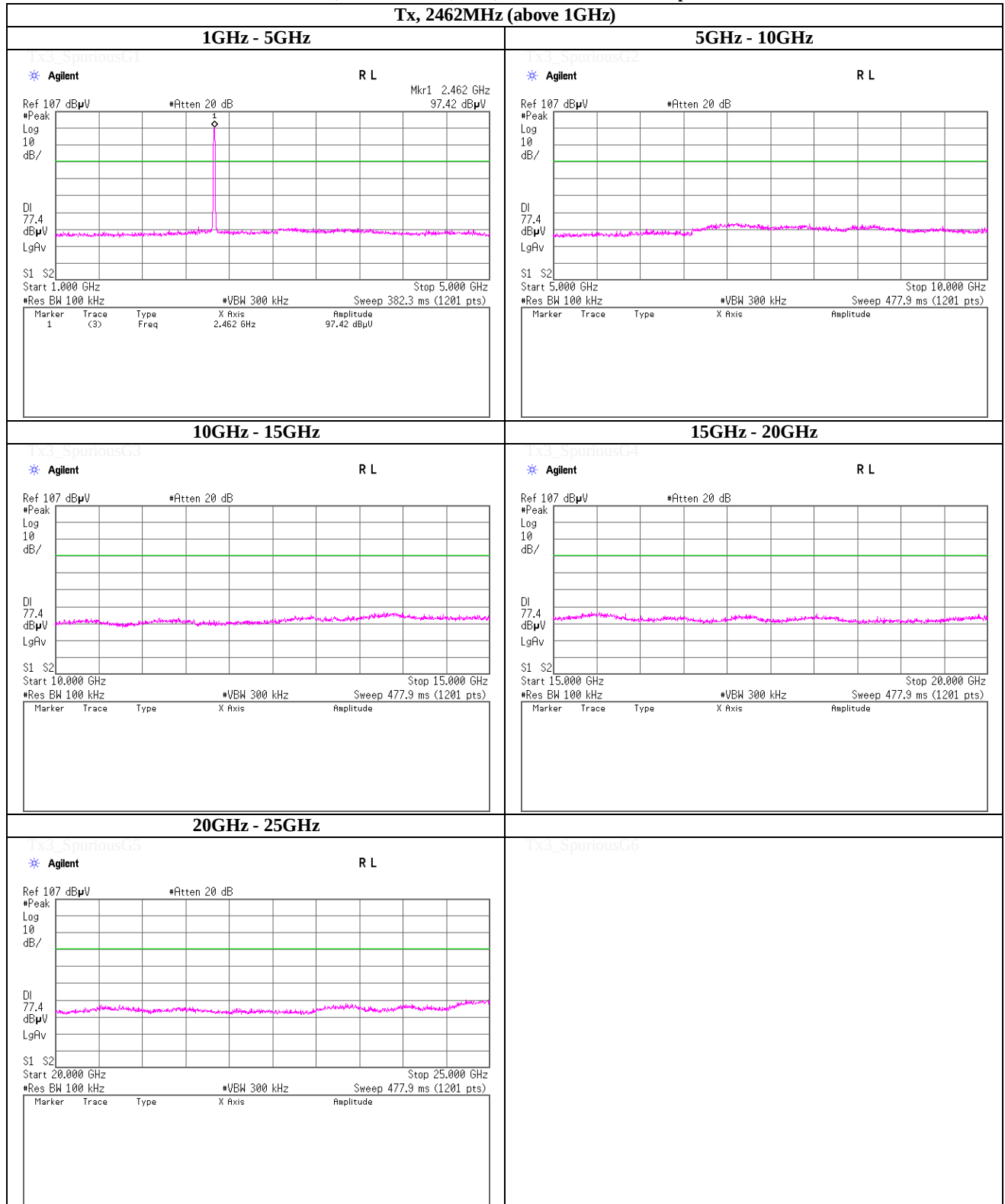


(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11b, PN9, worst data mode 2Mbps

Tx, 2437MHz (above 1GHz)

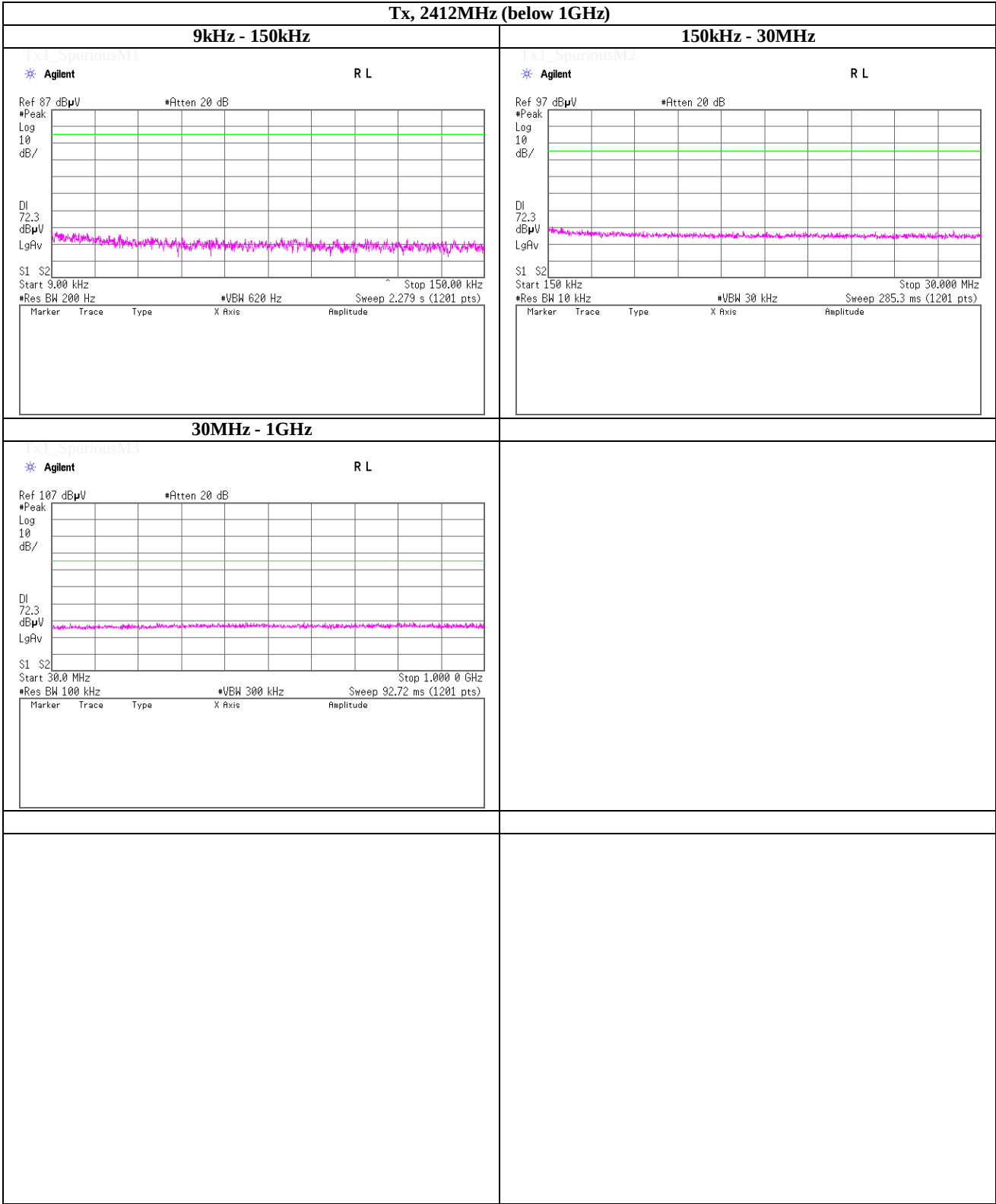


(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11b, PN9, worst data mode 2Mbps****Tx, 2462MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

(Reference chart) Spurious emission (Conducted)

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

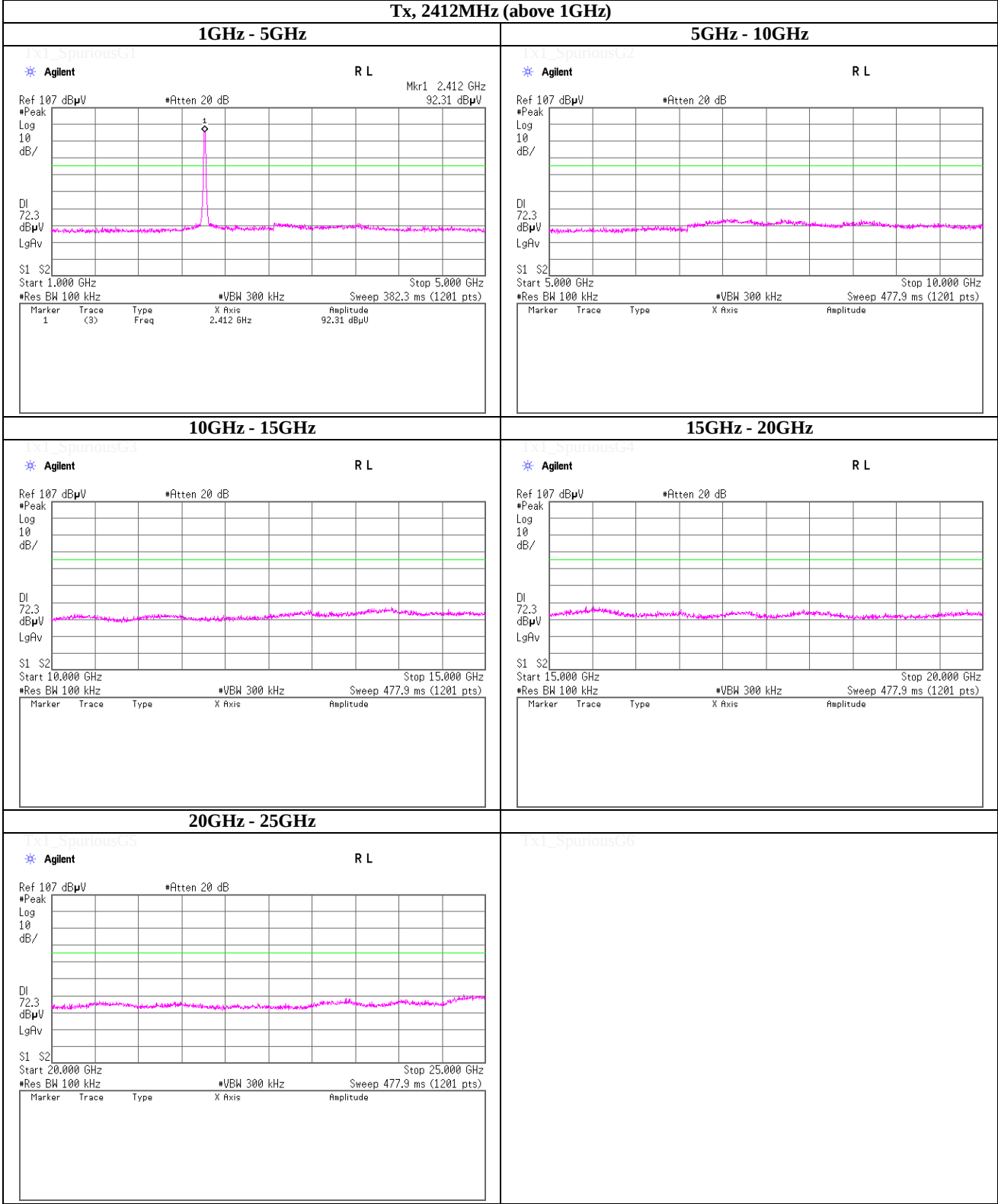
Tx, 2412MHz (below 1GHz)



(Reference chart) Spurious emission (Conducted)

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

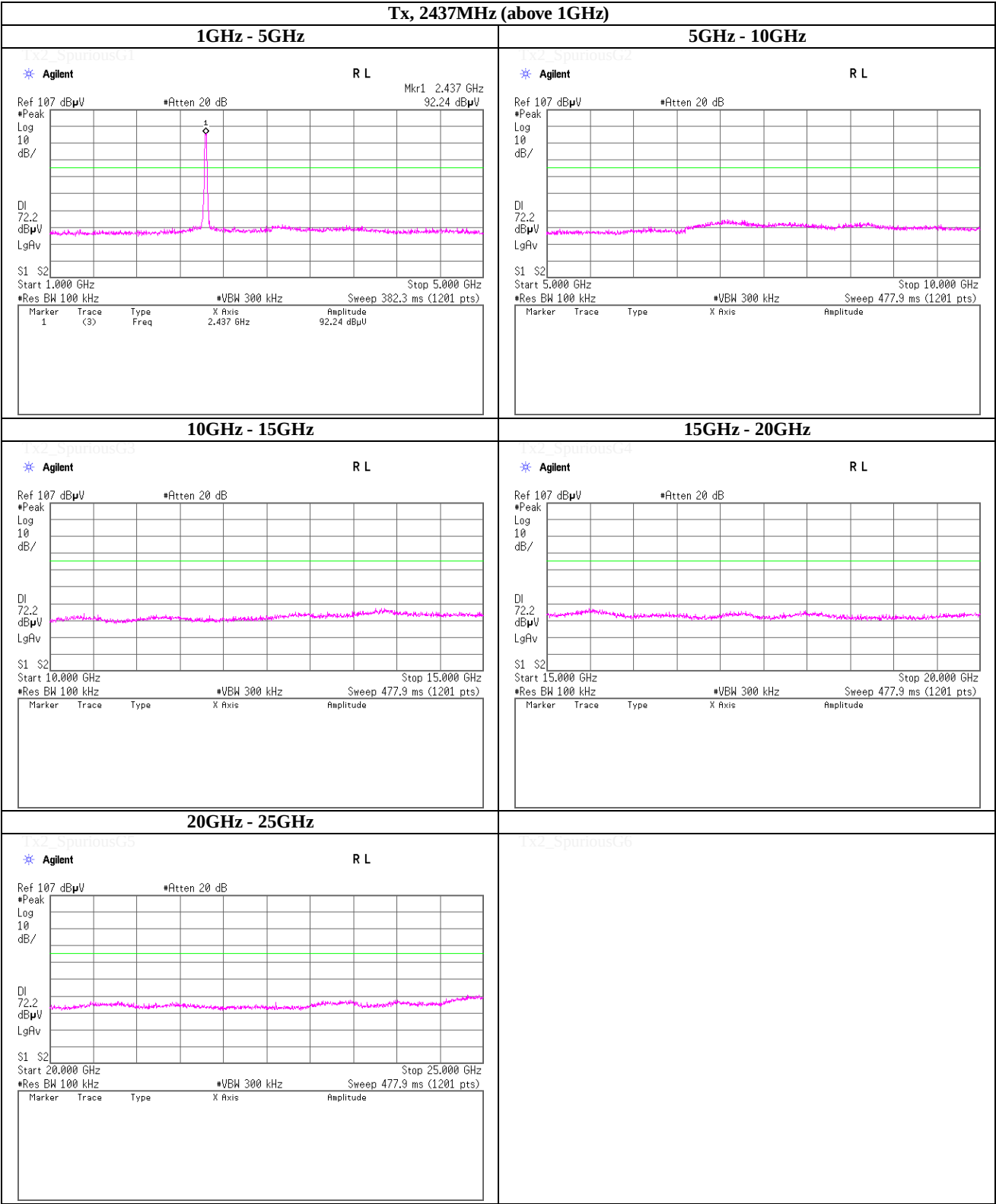
Tx, 2412MHz (above 1GHz)



(Reference chart) Spurious emission (Conducted)

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

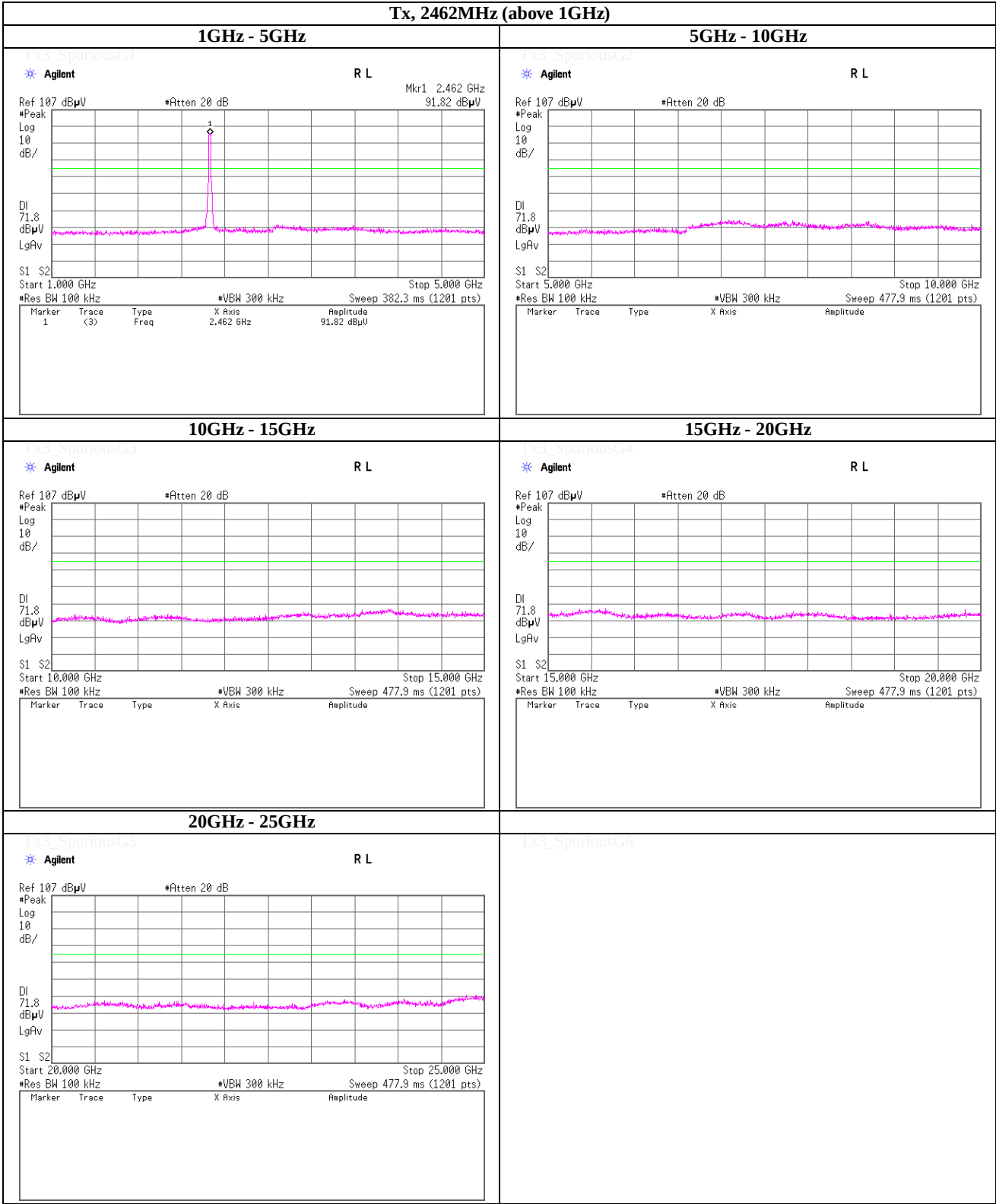
Tx, 2437MHz (above 1GHz)



(Reference chart) Spurious emission (Conducted)

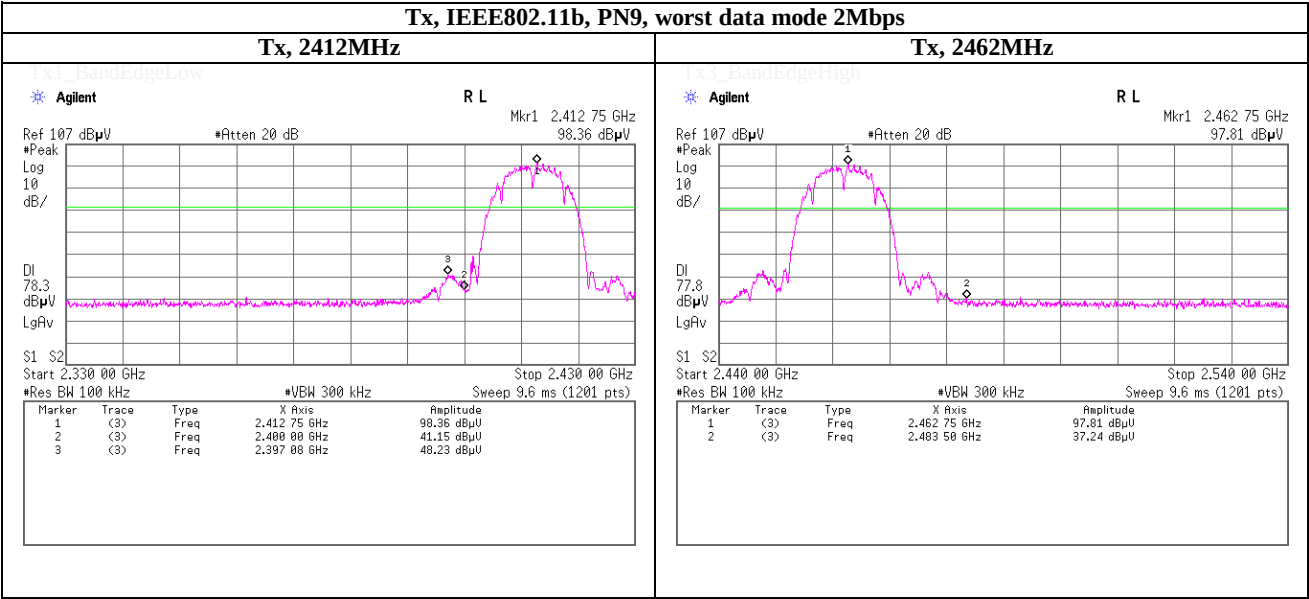
Tx, IEEE802.11g, PN9, worst data mode 6Mbps

Tx, 2462MHz (above 1GHz)



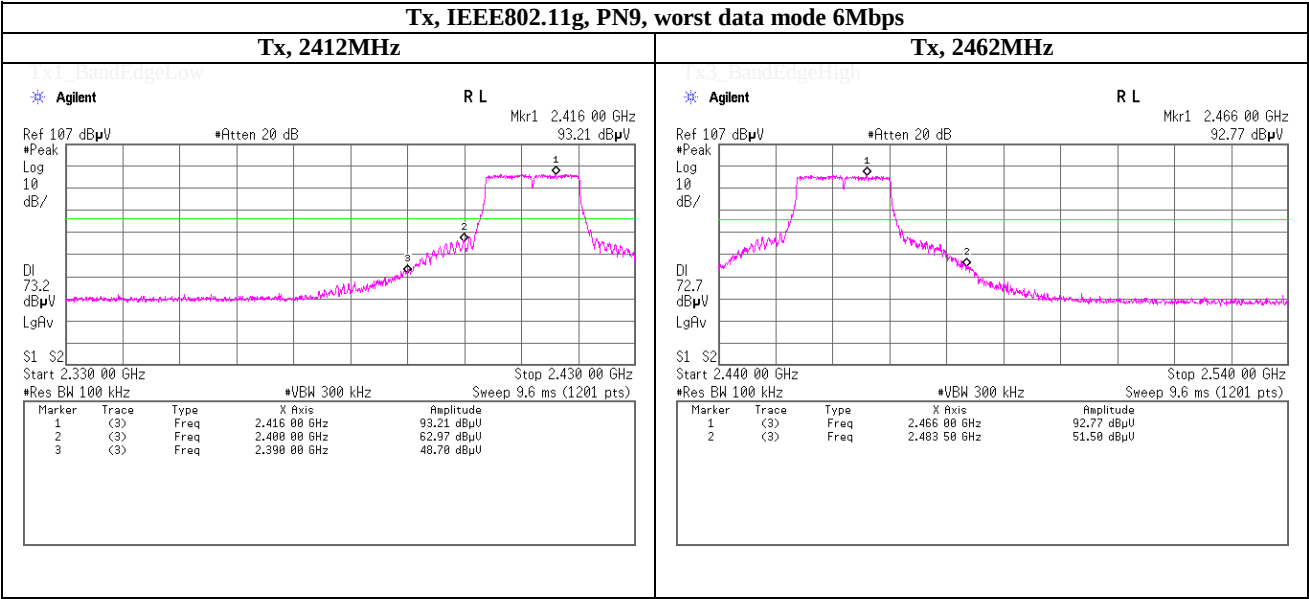
(Reference chart) Spurious emission (Conducted)

Band Edge compliance



(Reference chart) Spurious emission (Conducted)

Band Edge compliance



Maximum Power Spectral Density

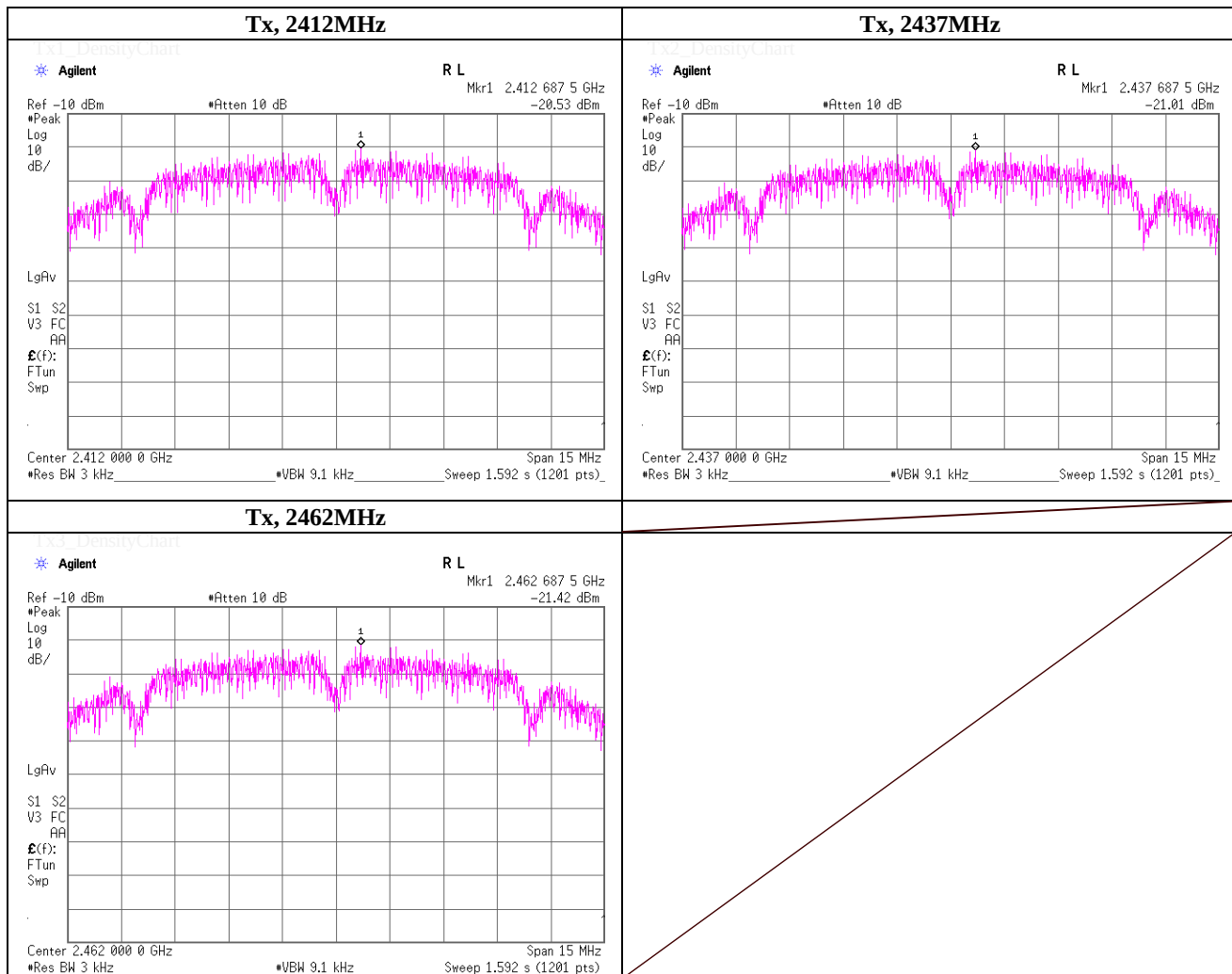
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 28, 2013	
Temperature / Humidity	26deg.C , 54%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11b, PN9, worst data mode 2Mbps	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2412.69	-20.53	1.79	10.04	-8.70	8.00	16.70
2437.0000	2437.69	-21.01	1.79	10.04	-9.18	8.00	17.18
2462.0000	2462.69	-21.42	1.80	10.04	-9.58	8.00	17.58

Sample Calculation:

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

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Maximum Power Spectral Density

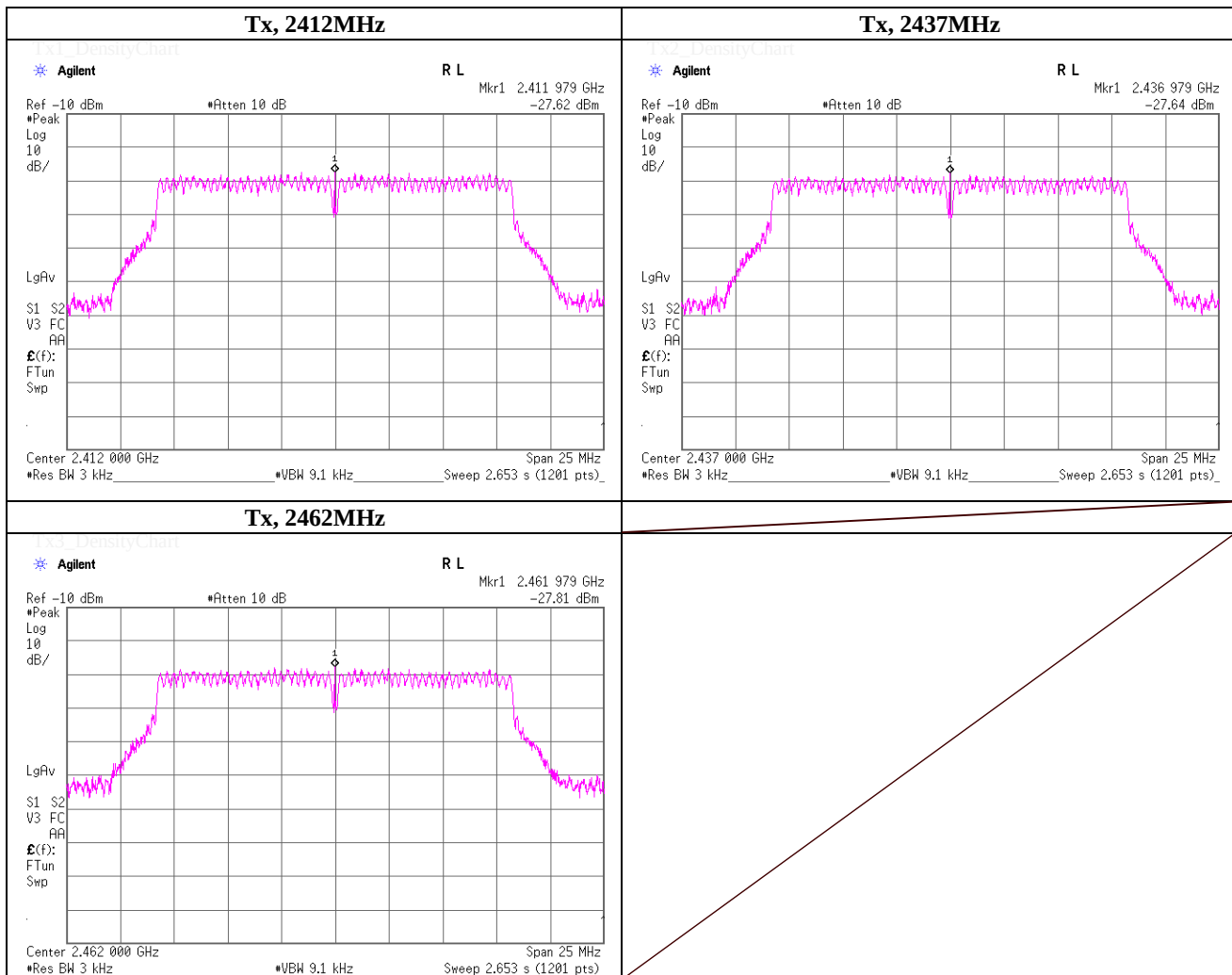
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	August 28, 2013	
Temperature / Humidity	26deg.C , 54%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2411.98	-27.62	1.79	10.04	-15.79	8.00	23.79
2437.0000	2436.98	-27.64	1.79	10.04	-15.81	8.00	23.81
2462.0000	2461.98	-27.81	1.80	10.04	-15.97	8.00	23.97

Sample Calculation:

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



UL Japan, Inc.

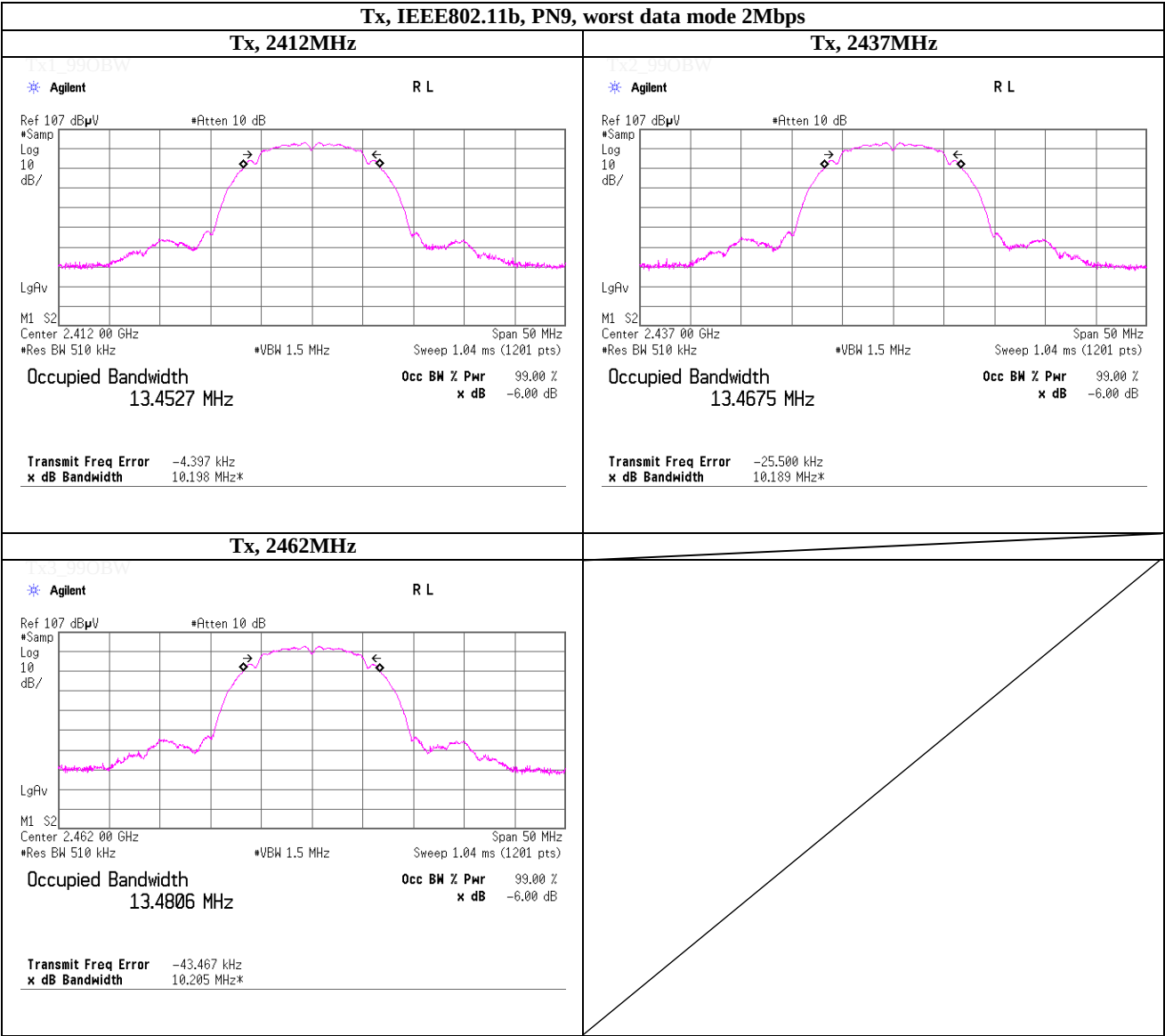
Shonan EMC Lab.

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

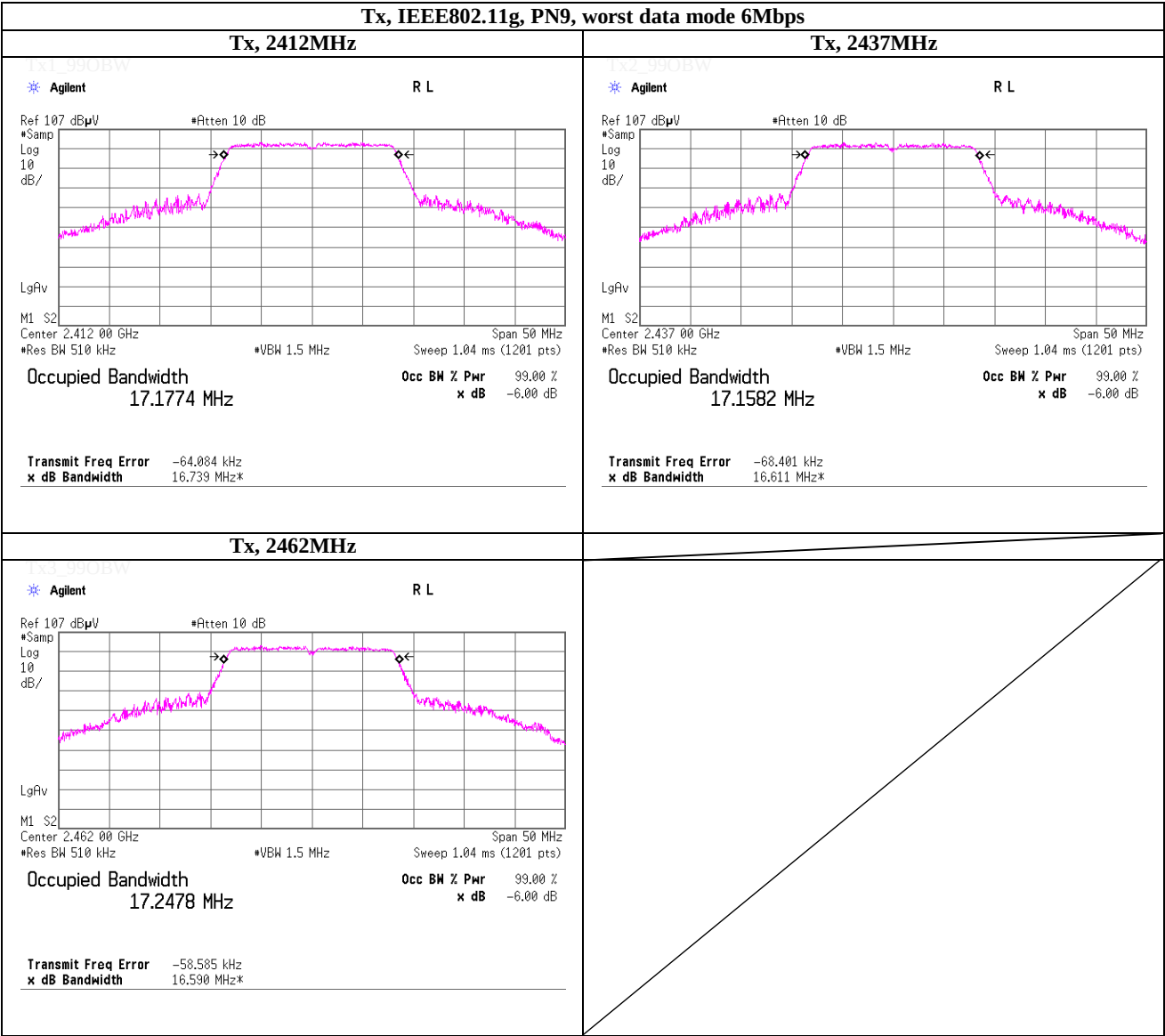
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99% Occupied Bandwidth



99% Occupied Bandwidth



APPENDIX 2

Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT	2013/03/04 * 12
SCC-G13	Coaxial Cable	Suhner	SUCOFLEX 102	31599/2	AT	2013/03/16 * 12
SAT10-11	Attenuator	Weinschel Corp.	54A-10	37588	AT	2013/04/09 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2013/04/09 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2013/04/09 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2013/03/07 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2013/07/09 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2013/07/22 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	2013/04/11 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2013/05/22 * 12
SHA-01	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	RE	2013/08/12 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2013/02/27 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2013/03/28 * 12
SJM-11	Measure	PROMART	SEN1935	-	RE, CE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFLMF)	-	RE, CE	-
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2012/12/18 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2012/12/18 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2013/08/19 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2013/03/14 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2013/03/19 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2013/03/16 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2013/02/12 * 12
SAT6-06	Attenuator	JFW	50HF-006N	-	RE	2013/02/12 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2012/10/08 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2013/04/03 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2012/10/08 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE, CE	2013/02/27 * 12
SCC-C9/C10/SRSE-03	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-271(RF Selector)	CE	2013/04/03 * 12
SLS-05	LISN	Rohde & Schwarz	ENV216	100516	CE	2013/02/25 * 12
SAT3-06	Attenuator	JFW	50HF-003N	-	CE	2013/02/12 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2013/03/07 * 12

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