



RADIO TEST REPORT

Test Report No.: 10006272S-A

Applicant : Clarion Co., Ltd.
Type of Equipment : Digital Wireless Camera System Camera
With Transmitter
Model No. : CC-3500
FCC ID : AX2CC3500
Test regulation : FCC Part15 Subpart C: 2012
Test result : Complied

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3. This sample tested is in compliance with the limits of the above regulation.
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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: March 25 to April 22, 2013

Tested by:



Akio Hayashi
Engineer of WiSE Japan,
UL Verification Service

Approved by :



Toyokazu Imamura
Leader of WiSE Japan,
UL Verification Service



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

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 10006272S-A

[illegible]

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SECTION 1: Customer information

Company Name : Clarion Co., Ltd.
Address : 7-2 Shintoshin, Chuo-ku, Saitama-shi, Saitama, 330-0081 Japan
Telephone Number : +81-48-601-4121
Facsimile Number : +81-48-601-3802
Contact Person : Masahiko Shibata

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

2.1 Identification of E.U.T.

Type of Equipment : Digital Wireless Camera System Camera With Transmitter
Model Number : CC-3500
Serial Number : Refer to 4.2 in this report.
Rating : 12VDC (10.8V - 15.6V)
Country of Mass-production : Taiwan
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample : March 23 and April 9, 2013
Modification of EUT : No modification by the test lab.

2.2 Product description

Model: CC-3500 (referred to as the EUT in this report) is a Digital Wireless Camera System Camera with Transmitter.

Clock frequency(ies) in the system : 13.33MHz, 27MHz

Radio specification:

Equipment type : Transceiver
Frequency of operation : 2412-2462MHz
Bandwidth & Channel spacing : 20MHz & 5MHz
Type of modulation : DSSS, OFDM
ITU code : D1D, G1D
Operation temperature range : -30 to +70 deg.C

Antenna information:

Antenna	2dBi antenna	5dBi antenna + 3m Cable	7dBi antenna + 7m Cable
Antenna type	Dipole	Dipole	Dipole
Antenna connector type *1)	Reverse-SMA with connector housing to limit the connection		
Antenna gain	2.4dBi	2dBi (5dBi+Cable loss 3dB)	1dBi (7dBi+Cable loss 6dB)

*1) Each antenna connection is the limited by Reverse-SMA with the connector housing. High gain antenna cannot be connected to EUT directly. As an antenna with cable is shipped by individual package, the high gain antenna cannot be selected for shorter cable. But to consider the worst case (using shorter cable with 7dB high gain antenna), test report shows still compliance.

FCC 15.31 (e)

The EUT provides stable voltage (DC3.3V) constantly to the wireless transmitter regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC 15.203

The EUT has a unique coupling/antenna connector (Reverse SMA). Therefore the equipment complies with the requirement.

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SECTION 3: Test specification, procedures & results**3.1 Test specification**

Test specification : Test specification: FCC Part 15 Subpart C: 2012, final revised on December 27, 2012 and effective January 28, 2013

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

3.2 Procedures & Results

Item	Test Procedure *1)	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.10:2009	FCC 15.207	-	N/A *2)	N/A	N/A
6dB bandwidth	ANSI C63.10:2009	FCC 15.247 (a)(2)	Conducted	N/A	* See data	Complied
Maximum peak output power	ANSI C63.10:2009	FCC 15.247 (b)(3)	Conducted	N/A		Complied
Out of band emission & Restricted band edges	ANSI C63.10:2009	FCC 15.109, 15.247 (d) & 15.209	Conducted / Radiated	N/A	2.6dB Freq.: 2390.000MHz Polarization: Vertical Detection: Average Mode: Tx 2412MHz, IEEE 802.11g Antenna: 5dBi antenna	Complied
Power density	ANSI C63.10:2009	FCC 15.247 (e)	Conducted	N/A	* See data	Complied

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

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

*2) The test is not applicable since the EUT has no AC mains.

3.3 Addition to standard

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

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

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

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3.4 Uncertainty

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

Item	Frequency range	No.1 SAC ^{*1} /SR ^{*2} (±)	No.2 SAC/SR (±)	No.3 SAC/SR (±)
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

Radiated emission test

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

Antenna port conducted test

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

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

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

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

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

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

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	-
☐ No.7 shielded room	-	-	2.76 x 3.76 x 2.4	2.76 x 3.76	-

3.6 Test setup, Test data & Test instruments

Refer to APPENDIX 1 to 3.

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SECTION 4: Operation of E.U.T. during testing**4.1 Operating mode**

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

*1) Software used for the test: Tera Term Version 4.67

*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.

Antenna used:

Radiated emission	2dBi antenna, 5dBi antenna + 3m Cable *4)
Other tests	-

*4) The emission levels were compared with the two antennas (5dBi antenna + 3m Cable and 7dBi antenna + 7m Cable), and the test was made at the antenna with the higher level.

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

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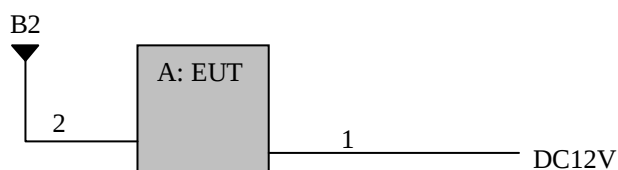
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4.2 Configuration and peripherals

4.2.1 2dBi antenna



4.2.2 5dBi antenna



* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Digital Wireless Camera System Camera With Transmitter	CC-3500	*1)	Clarion Co., Ltd.	EUT
B1	2dBi Antenna	AN-DP005008	-	HARUMOTO PRECISION CO., LTD.	-
B2	5dBi Antenna	IWX-1511RSXX	-	JOYMAX ELECTRONICS CO., LTD.	-

*1) No.2: Antenna terminal conducted test, No.9: Other test

List of cables used

No.	Cable Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC	2.8	Unshielded	Unshielded	-
2	Antenna	3.0	Shielded	Shielded	Used for 5dBi Antenna

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SECTION 5: Radiated 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 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.

5.3 Test conditions

Frequency range : 9kHz to 25GHz

EUT position : Table top

5.4 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).

Frequency: From 9kHz to 30MHz

The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for vertical polarization (antenna angle: 0deg.to 360deg.) and horizontal polarization. Drawing of the antenna direction is shown in Figure 1.

Frequency: From 30MHz to 25GHz (Refer to Figure 2)

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	9kHz to 90kHz & 110kHz to 150kHz	90kHz to 110kHz	150kHz to 490kHz	490kHz to 30MHz	30MHz to 1GHz
Detector Type	PK/AV	QP	PK/AV	QP	QP
IF Bandwidth	200Hz	200Hz	9kHz	9kHz	120kHz

* FCC 15 Section 15.31 (f)(2) (9kHz-30MHz)

9kHz – 490kHz [Limit at 3m]= [Limit at 300m]-40log (3[m]/300[m])

490kHz – 30MHz [Limit at 3m]= [Limit at 30m]-40log (3[m]/30[m])

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

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

The EUT was tested in the direction normally used. For antenna, the carrier levels and noise levels were confirmed at each position of X and Y axes to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Worst case:

Subject	Antenna polarization	Carrier	Spurious (Below 1GHz)	Spurious (Above 1GHz)
2dBi antenna	Horizontal	Y	Y	Y
5dBi antenna		Y	Y	Y
2dBi antenna	Vertical	X	Y	X
5dBi antenna		X	Y	X

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Figure 1. Direction of the Loop Antenna

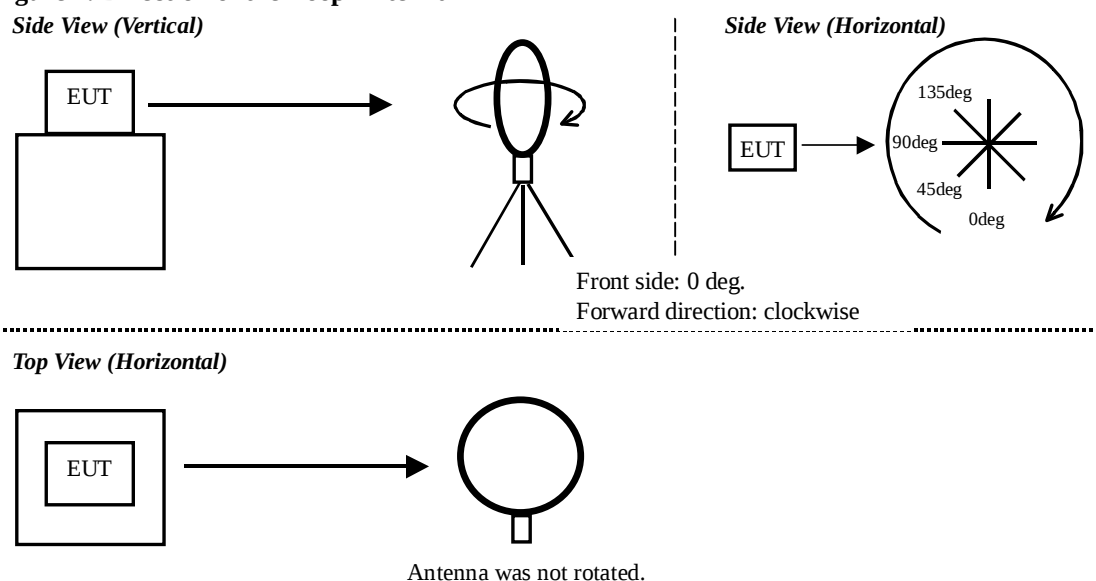
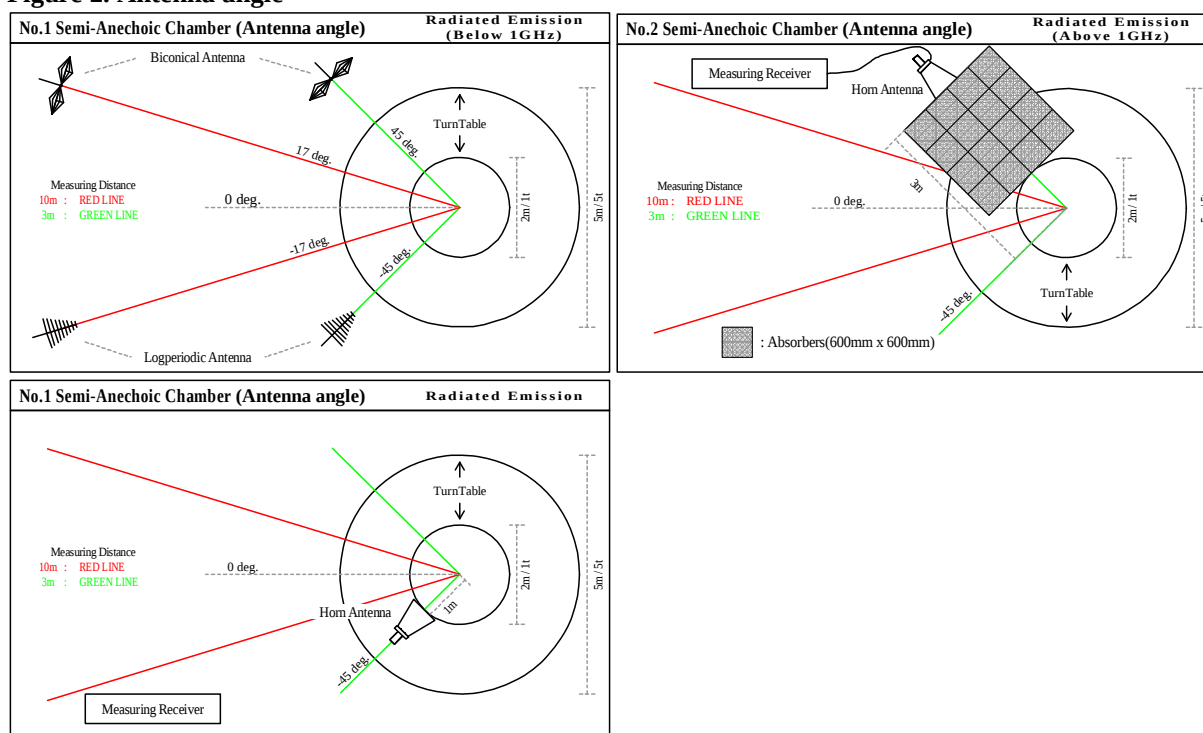


Figure 2. Antenna angle



5.5 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.

5.6 Results

Summary of the test results : Pass

* No noise was detected below 30MHz and above the 5th order harmonics.

Refer to APPENDIX 1

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SECTION 6: 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

SECTION 7: 6dB bandwidth & Occupied bandwidth (99%)**Test procedure**

The bandwidth was measured with a spectrum analyzer connected to the antenna port.

The test was measured based on Method 7.1 Option 1 and 7.2 Option 2 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

Summary of the test results: Pass

Refer to APPENDIX

SECTION 8: Maximum peak output power**Test procedure**

The Maximum Peak Output Power was measured with a power meter connected to the antenna port.

The test was measured based on Method 8.1.3 Option 3 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

Summary of the test results: Pass

Refer to APPENDIX 1

SECTION 9: Peak power density**Test procedure**

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

Instrument used : Spectrum Analyzer

RBW / VBW : 3kHz / 9.1kHz

The test was measured based on Method 9.1 Option 1 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

Summary of the test results: Pass

Refer to APPENDIX

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APPENDIX 2: Test instruments

Test instruments

APPENDIX 3: Photographs of test setup

Radiated emission

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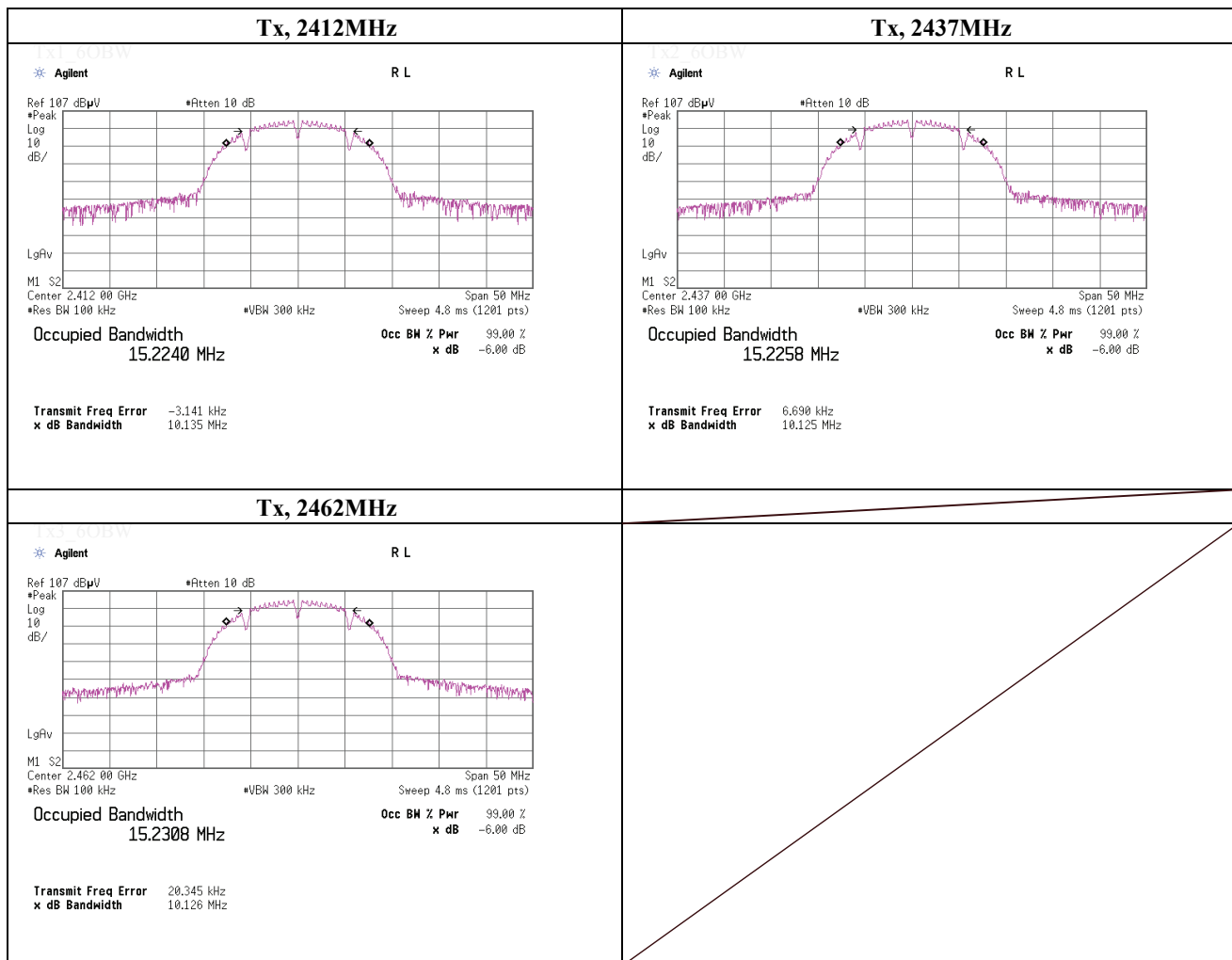
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APPENDIX 1: Data of Radio tests

-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	March 27, 2013	
Temperature / Humidity	21deg.C , 32%RH	
Engineer	Makoto Hosaka	
Mode	Tx, IEEE802.11b , PN9, worst data mode 1Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	10.135	> 0.500
2437.0000	10.125	> 0.500
2462.0000	10.126	> 0.500



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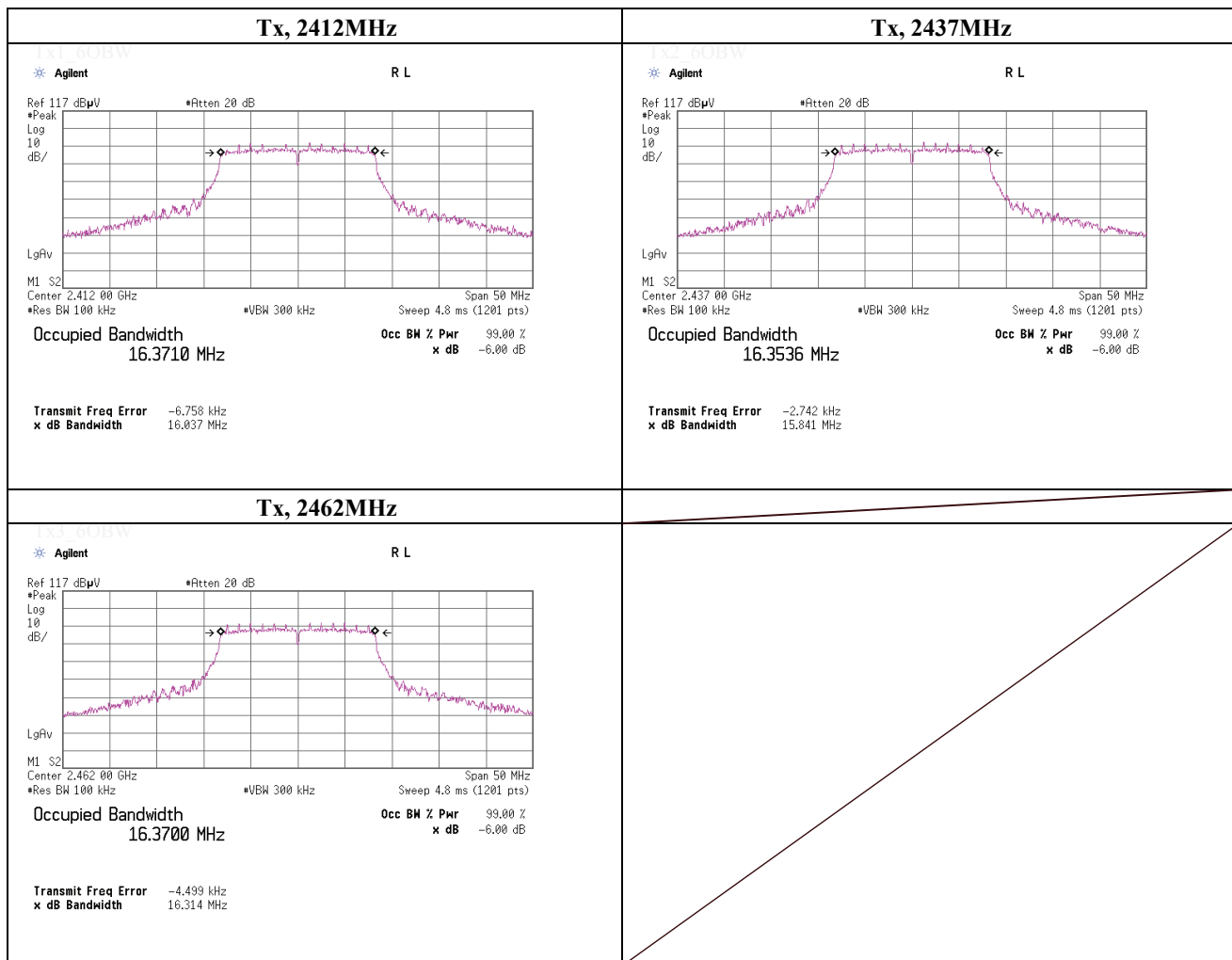
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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	March 27, 2013	
Temperature / Humidity	21deg.C , 32%RH	
Engineer	Makoto Hosaka	
Mode	Tx, IEEE802.11g , PN9, worst data mode 6Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.037	> 0.500
2437.0000	15.841	> 0.500
2462.0000	16.314	> 0.500

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Maximum Peak Conducted Output Power

(Option 3)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date March 25, 2013
 Temperature / Humidity 23deg.C , 45%RH
 Engineer Makoto Hosaka
 Mode Tx, IEEE802.11b , PN9, worst data mode : 1 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin
					[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	6.53	0.74	9.97	17.24	52.97	30.00	1000	12.76
Mid	2437.0	6.71	0.74	9.97	17.42	55.21	30.00	1000	12.58
High	2462.0	6.35	0.74	9.97	17.06	50.82	30.00	1000	12.94

Sample Calculation:

Result = Reading + Cable Loss + 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	6.71	0.74	9.97	17.42	55.21	30.00	1000	12.58
	2	2437.0	6.63	0.74	9.97	17.34	54.20	30.00	1000	12.66
	5.5	2437.0	6.64	0.74	9.97	17.35	54.33	30.00	1000	12.65
	11	2437.0	6.68	0.74	9.97	17.39	54.83	30.00	1000	12.61

Worst

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

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Maximum Peak Conducted Output Power

(Option 3)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date March 25, 2013
 Temperature / Humidity 23deg.C , 45%RH
 Engineer Makoto Hosaka
 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	11.34	0.74	9.97	22.05	160.32	30.00	1000	7.95
Mid	2437.0	11.45	0.74	9.97	22.16	164.44	30.00	1000	7.84
High	2462.0	11.30	0.74	9.97	22.01	158.85	30.00	1000	7.99

Sample Calculation:

Result = Reading + Cable Loss + 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	11.45	0.74	9.97	22.16	164.44	30.00	1000	7.84
	9	2437.0	11.06	0.74	9.97	21.77	150.31	30.00	1000	8.23
	12	2437.0	11.25	0.74	9.97	21.96	157.04	30.00	1000	8.04
	18	2437.0	11.10	0.74	9.97	21.81	151.71	30.00	1000	8.19
	24	2437.0	11.18	0.74	9.97	21.89	154.53	30.00	1000	8.11
	36	2437.0	11.43	0.74	9.97	22.14	163.68	30.00	1000	7.86
	48	2437.0	11.25	0.74	9.97	21.96	157.04	30.00	1000	8.04
	54	2437.0	11.21	0.74	9.97	21.92	155.60	30.00	1000	8.08

Worst

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.2 Semi Anechoic Chamber
Date	April 11, 2013	April 20, 2013
Temperature / Humidity	23 deg.C, 47 %RH	20 deg.C, 30 %RH
Engineer	Makoto Hosaka	Makoto Hosaka
Mode	Tx, 2412 MHz	Antenna: 2dBi antenna
	Tx, IEEE802.11b , PN9, worst data mode 1Mbps	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2254.543	PK	45.3	27.0	24.6	38.5	58.4	73.9	15.5	100	358	
Hori.	2390.000	PK	56.4	27.2	24.7	38.4	69.9	73.9	4.0	100	358	
Hori.	4824.000	PK	45.6	30.8	6.6	37.2	45.8	73.9	28.1	100	35	
Hori.	7236.000	PK	46.6	36.2	7.9	39.5	51.2	73.9	22.7	100	0	
Hori.	9648.000	PK	40.9	38.3	9.3	37.3	51.2	73.9	22.7	100	0	
Hori.	12060.000	PK	43.3	39.2	10.6	38.1	55.0	73.9	18.9	100	0	
Hori.	2254.543	AV	34.4	27.0	24.6	38.5	47.5	53.9	6.4	100	358	
Hori.	2390.000	AV	35.4	27.2	24.7	38.4	48.9	53.9	5.0	100	358	
Hori.	4824.000	AV	37.6	30.8	6.6	37.2	37.8	53.9	16.1	100	35	
Hori.	7236.000	AV	36.5	36.2	7.9	39.5	41.1	53.9	12.8	100	0	
Hori.	9648.000	AV	32.2	38.3	9.3	37.3	42.5	53.9	11.4	100	0	
Hori.	12060.000	AV	34.5	39.2	10.6	38.1	46.2	53.9	7.7	100	0	
Vert.	2254.543	PK	42.2	27.0	24.6	38.5	55.3	73.9	18.6	105	148	
Vert.	2390.000	PK	54.7	27.2	24.7	38.4	68.2	73.9	5.7	105	148	
Vert.	4824.000	PK	46.5	30.8	6.6	37.2	46.7	73.9	27.2	100	27	
Vert.	7236.000	PK	45.7	36.2	7.9	39.5	50.3	73.9	23.6	100	0	
Vert.	9648.000	PK	40.6	38.3	9.3	37.3	50.9	73.9	23.0	100	0	
Vert.	12060.000	PK	42.9	39.2	10.6	38.1	54.6	73.9	19.3	100	0	
Vert.	2254.543	AV	34.2	27.0	24.6	38.5	47.3	53.9	6.6	105	148	
Vert.	2390.000	AV	34.6	27.2	24.7	38.4	48.1	53.9	5.8	105	148	
Vert.	4824.000	AV	40.5	30.8	6.6	37.2	40.7	53.9	13.2	100	27	
Vert.	7236.000	AV	35.8	36.2	7.9	39.5	40.4	53.9	13.5	100	0	
Vert.	9648.000	AV	32.4	38.3	9.3	37.3	42.7	53.9	11.2	100	0	
Vert.	12060.000	AV	34.2	39.2	10.6	38.1	45.9	53.9	8.0	100	0	

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

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	88.2	27.3	24.7	38.3	101.9	-	-	
Hori.	2400.000	PK	43.6	27.3	24.7	38.4	57.2	81.9	24.7	
Vert.	2412.000	PK	85.7	27.3	24.7	38.3	99.4	-	-	
Vert.	2400.000	PK	45.7	27.3	24.7	38.4	59.3	79.4	20.1	

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.2 Semi Anechoic Chamber
Date	April 11, 2013	April 20, 2013
Temperature / Humidity	23 deg.C, 47 %RH	20 deg.C, 30 %RH
Engineer	Makoto Hosaka	Makoto Hosaka
Mode	Tx, 2437 MHz	Antenna: 2dBi antenna
	Tx, IEEE802.11b , PN9, worst data mode 1Mbps	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2280.520	PK	45.6	27.1	24.6	38.5	58.8	73.9	15.1	100	358	
Hori.	4874.000	PK	45.5	31.0	6.6	37.2	45.9	73.9	28.0	100	357	
Hori.	7311.000	PK	45.8	36.2	8.0	39.6	50.4	73.9	23.5	100	0	
Hori.	9748.000	PK	42.3	38.4	9.3	37.4	52.6	73.9	21.3	100	0	
Hori.	12185.000	PK	42.7	39.2	10.6	38.1	54.4	73.9	19.5	100	0	
Hori.	2280.520	AV	34.5	27.1	24.6	38.5	47.7	53.9	6.2	100	358	
Hori.	4874.000	AV	38.4	31.0	6.6	37.2	38.8	53.9	15.1	100	357	
Hori.	7311.000	AV	36.7	36.2	8.0	39.6	41.3	53.9	12.6	100	0	
Hori.	9748.000	AV	32.8	38.4	9.3	37.4	43.1	53.9	10.8	100	0	
Hori.	12185.000	AV	34.1	39.2	10.6	38.1	45.8	53.9	8.1	100	0	
Vert.	2280.520	PK	45.2	27.1	24.6	38.5	58.4	73.9	15.5	109	138	
Vert.	4874.000	PK	46.6	31.0	6.6	37.2	47.0	73.9	26.9	100	23	
Vert.	7311.000	PK	45.7	36.2	8.0	39.6	50.3	73.9	23.6	100	0	
Vert.	9748.000	PK	41.8	38.4	9.3	37.4	52.1	73.9	21.8	100	0	
Vert.	12185.000	PK	43.2	39.2	10.6	38.1	54.9	73.9	19.0	100	0	
Vert.	2280.520	AV	34.2	27.1	24.6	38.5	47.4	53.9	6.5	109	138	
Vert.	4874.000	AV	40.3	31.0	6.6	37.2	40.7	53.9	13.2	100	23	
Vert.	7311.000	AV	36.5	36.2	8.0	39.6	41.1	53.9	12.8	100	0	
Vert.	9748.000	AV	33.5	38.4	9.3	37.4	43.8	53.9	10.1	100	0	
Vert.	12185.000	AV	34.5	39.2	10.6	38.1	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 : $20\log(3.0\text{m}/1.0\text{m})= 9.5\text{dB}$

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

Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.2 Semi Anechoic Chamber
Date	April 11, 2013	April 20, 2013
Temperature / Humidity	23 deg.C, 47 %RH	20 deg.C, 30 %RH
Engineer	Makoto Hosaka	Makoto Hosaka
Mode	Tx, 2462 MHz	Antenna: 2dBi antenna
	Tx, IEEE802.11b , PN9, worst data mode 1Mbps	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2305.207	PK	45.2	27.1	24.6	38.5	58.4	73.9	15.5	100	358	
Hori.	2483.500	PK	55.1	27.4	24.8	38.3	69.0	73.9	4.9	100	358	
Hori.	4924.000	PK	45.6	31.1	6.6	37.2	46.1	73.9	27.8	100	356	
Hori.	7386.000	PK	45.0	36.3	8.0	39.6	49.7	73.9	24.2	100	0	
Hori.	9848.000	PK	41.2	38.6	9.3	37.5	51.6	73.9	22.3	100	0	
Hori.	12310.000	PK	43.9	39.1	10.7	38.1	55.6	73.9	18.3	100	0	
Hori.	2305.207	AV	35.5	27.1	24.6	38.5	48.7	53.9	5.2	100	358	
Hori.	2483.500	AV	34.6	27.4	24.8	38.3	48.5	53.9	5.4	100	358	
Hori.	4924.000	AV	38.5	31.1	6.6	37.2	39.0	53.9	14.9	100	356	
Hori.	7386.000	AV	36.2	36.3	8.0	39.6	40.9	53.9	13.0	100	0	
Hori.	9848.000	AV	33.5	38.6	9.3	37.5	43.9	53.9	10.0	100	0	
Hori.	12310.000	AV	35.4	39.1	10.7	38.1	47.1	53.9	6.8	100	0	
Vert.	2305.207	PK	45.4	27.1	24.6	38.5	58.6	73.9	15.3	109	138	
Vert.	2483.500	PK	54.2	27.4	24.8	38.3	68.1	73.9	5.8	109	138	
Vert.	4924.000	PK	46.7	31.1	6.6	37.2	47.2	73.9	26.7	128	68	
Vert.	7386.000	PK	45.2	36.3	8.0	39.6	49.9	73.9	24.0	100	0	
Vert.	9848.000	PK	41.6	38.6	9.3	37.5	52.0	73.9	21.9	100	0	
Vert.	12310.000	PK	44.4	39.1	10.7	38.1	56.1	73.9	17.8	100	0	
Vert.	2305.207	AV	34.6	27.1	24.6	38.5	47.8	53.9	6.1	109	138	
Vert.	2483.500	AV	35.7	27.4	24.8	38.3	49.6	53.9	4.3	109	138	
Vert.	4924.000	AV	41.3	31.1	6.6	37.2	41.8	53.9	12.1	128	68	
Vert.	7386.000	AV	36.7	36.3	8.0	39.6	41.4	53.9	12.5	100	0	
Vert.	9848.000	AV	33.5	38.6	9.3	37.5	43.9	53.9	10.0	100	0	
Vert.	12310.000	AV	34.1	39.1	10.7	38.1	45.8	53.9	8.1	100	0	

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

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

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.2 Semi Anechoic Chamber
Date	April 11, 2013	April 20, 2013
Temperature / Humidity	23 deg.C, 47 %RH	20 deg.C, 30 %RH
Engineer	Makoto Hosaka	Makoto Hosaka
Mode	Tx, 2412 MHz	Antenna: 2dBi antenna
	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.	2390.000	PK	51.1	27.2	24.7	38.4	64.6	73.9	9.3	100	358	
Hori.	4824.000	PK	42.7	30.8	6.6	37.2	42.9	73.9	31.0	100	0	
Hori.	7236.000	PK	44.1	36.2	7.9	39.5	48.7	73.9	25.2	100	0	
Hori.	9648.000	PK	42.2	38.3	9.3	37.3	52.5	73.9	21.4	100	0	
Hori.	12060.000	PK	43.1	39.2	10.6	38.1	54.8	73.9	19.1	100	0	
Hori.	2390.000	AV	37.4	27.2	24.7	38.4	50.9	53.9	3.0	100	358	
Vert.	2390.000	PK	48.7	27.2	24.7	38.4	62.2	73.9	11.7	112	145	
Vert.	4824.000	PK	42.9	30.8	6.6	37.2	43.1	73.9	30.8	100	0	
Vert.	7236.000	PK	44.2	36.2	7.9	39.5	48.8	73.9	25.1	100	0	
Vert.	9648.000	PK	41.8	38.3	9.3	37.3	52.1	73.9	21.8	100	0	
Vert.	12060.000	PK	41.3	39.2	10.6	38.1	53.0	73.9	20.9	100	0	
Vert.	2390.000	AV	36.1	27.2	24.7	38.4	49.6	53.9	4.3	112	145	

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4824.000	AV	33.9	30.8	6.6	37.2	0.4	34.5	53.9	19.4	
Hori.	7236.000	AV	36.5	36.2	7.9	39.5	0.4	41.5	53.9	12.4	
Hori.	9648.000	AV	33.0	38.3	9.3	37.3	0.4	43.7	53.9	10.2	
Hori.	12060.000	AV	33.1	39.2	10.6	38.1	0.4	45.2	53.9	8.7	
Vert.	4824.000	AV	33.8	30.8	6.6	37.2	0.4	34.4	53.9	19.5	
Vert.	7236.000	AV	36.4	36.2	7.9	39.5	0.4	41.4	53.9	12.5	
Vert.	9648.000	AV	32.7	38.3	9.3	37.3	0.4	43.4	53.9	10.5	
Vert.	12060.000	AV	32.3	39.2	10.6	38.1	0.4	44.4	53.9	9.5	

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

*8.2.4 Alternative 1 was applied to AV detection, since the duty cycle is less than 98% and video triggering or signal gating cannot be used.

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	85.8	27.3	24.7	38.3	99.5	-	-	
Hori.	2400.000	PK	50.0	27.3	24.7	38.4	63.6	79.5	15.9	
Vert.	2412.000	PK	83.8	27.3	24.7	38.3	97.5	-	-	
Vert.	2400.000	PK	47.8	27.3	24.7	38.4	61.4	77.5	16.1	

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.2 Semi Anechoic Chamber	No.1 Semi Anechoic Chamber
Date	April 11, 2013	April 20, 2013	April 22, 2013
Temperature / Humidity	23 deg.C, 47 %RH	20 deg.C, 30 %RH	19 deg.C, 34 %RH
Engineer	Makoto Hosaka	Makoto Hosaka	Akio Hayashi
Mode	Tx, 2437 MHz	Antenna: 2dBi antenna	
	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.	215.996	QP	26.7	16.8	9.3	31.8	21.0	43.5	22.5	151	116	
Hori.	269.998	QP	25.2	18.1	10.0	31.8	21.5	46.0	24.5	130	130	
Hori.	451.100	QP	21.8	16.9	8.1	31.9	14.9	46.0	31.1	100	0	
Hori.	4874.000	PK	42.7	31.0	6.6	37.2	43.1	73.9	30.8	100	0	
Hori.	7311.000	PK	45.6	36.2	8.0	39.6	50.2	73.9	23.7	100	0	
Hori.	9748.000	PK	42.1	38.4	9.3	37.4	52.4	73.9	21.5	100	0	
Hori.	12185.000	PK	44.8	39.2	10.6	38.1	56.5	73.9	17.4	100	0	
Vert.	53.999	QP	26.7	9.7	7.2	31.8	11.8	40.0	28.2	100	229	
Vert.	107.998	QP	30.6	11.4	8.0	31.8	18.2	43.5	25.3	100	251	
Vert.	162.001	QP	24.8	15.5	8.8	31.8	17.3	43.5	26.2	100	353	
Vert.	451.100	QP	21.8	16.9	8.1	31.9	14.9	46.0	31.1	100	0	
Vert.	540.002	QP	27.8	18.3	8.6	32.0	22.7	46.0	23.3	196	0	
Vert.	4874.000	PK	43.6	31.0	6.6	37.2	44.0	73.9	29.9	100	0	
Vert.	7311.000	PK	45.0	36.2	8.0	39.6	49.6	73.9	24.3	100	0	
Vert.	9748.000	PK	43.3	38.4	9.3	37.4	53.6	73.9	20.3	100	0	
Vert.	12185.000	PK	42.1	39.2	10.6	38.1	53.8	73.9	20.1	100	0	

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

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	33.5	31.0	6.6	37.2	0.4	34.3	53.9	19.6	
Hori.	7311.000	AV	36.5	36.2	8.0	39.6	0.4	41.5	53.9	12.4	
Hori.	9748.000	AV	33.0	38.4	9.3	37.4	0.4	43.7	53.9	10.2	
Hori.	12185.000	AV	34.5	39.2	10.6	38.1	0.4	46.6	53.9	7.3	
Vert.	4874.000	AV	33.2	31.0	6.6	37.2	0.4	34.0	53.9	19.9	
Vert.	7311.000	AV	36.9	36.2	8.0	39.6	0.4	41.9	53.9	12.0	
Vert.	9748.000	AV	34.0	38.4	9.3	37.4	0.4	44.7	53.9	9.2	
Vert.	12185.000	AV	33.5	39.2	10.6	38.1	0.4	45.6	53.9	8.3	

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

*8.2.4 Alternative 1 was applied to AV detection, since the duty cycle is less than 98% and video triggering or signal gating cannot be used.

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

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.2 Semi Anechoic Chamber
Date	April 11, 2013	April 20, 2013
Temperature / Humidity	23 deg.C, 47 %RH	20 deg.C, 30 %RH
Engineer	Makoto Hosaka	Makoto Hosaka
Mode	Tx, 2462 MHz	Antenna: 2dBi antenna
	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	52.0	27.4	24.8	38.3	65.9	73.9	8.0	100	358	
Hori.	4924.000	PK	42.6	31.1	6.6	37.2	43.1	73.9	30.8	100	0	
Hori.	7386.000	PK	44.5	36.3	8.0	39.6	49.2	73.9	24.7	100	0	
Hori.	9848.000	PK	43.3	38.6	9.3	37.5	53.7	73.9	20.2	100	0	
Hori.	12310.000	PK	43.3	39.1	10.7	38.1	55.0	73.9	18.9	100	0	
Hori.	2483.500	AV	36.8	27.4	24.8	38.3	50.7	53.9	3.2	100	358	
Vert.	2483.500	PK	51.7	27.4	24.8	38.3	65.6	73.9	8.3	106	147	
Vert.	4924.000	PK	42.4	31.1	6.6	37.2	42.9	73.9	31.0	100	0	
Vert.	7386.000	PK	42.3	36.3	8.0	39.6	47.0	73.9	26.9	100	0	
Vert.	9848.000	PK	42.2	38.6	9.3	37.5	52.6	73.9	21.3	100	0	
Vert.	12310.000	PK	42.5	39.1	10.7	38.1	54.2	73.9	19.7	100	0	
Vert.	2483.500	AV	35.7	27.4	24.8	38.3	49.6	53.9	4.3	106	147	

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

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4924.000	AV	33.5	31.1	6.6	37.2	0.4	34.4	53.9	19.5	
Hori.	7386.000	AV	36.4	36.3	8.0	39.6	0.4	41.5	53.9	12.4	
Hori.	9848.000	AV	34.5	38.6	9.3	37.5	0.4	45.3	53.9	8.6	
Hori.	12310.000	AV	34.5	39.1	10.7	38.1	0.4	46.6	53.9	7.3	
Vert.	4924.000	AV	34.5	31.1	6.6	37.2	0.4	35.4	53.9	18.5	
Vert.	7386.000	AV	34.2	36.3	8.0	39.6	0.4	39.3	53.9	14.6	
Vert.	9848.000	AV	33.4	38.6	9.3	37.5	0.4	44.2	53.9	9.7	
Vert.	12310.000	AV	35.8	39.1	10.7	38.1	0.4	47.9	53.9	6.0	

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

*8.2.4 Alternative 1 was applied to AV detection, since the duty cycle is less than 98% and video triggering or signal gating cannot be used.

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

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.1 Semi Anechoic Chamber
Date	April 20, 2013	April 22, 2013
Temperature / Humidity	20 deg.C, 30 %RH	22 deg.C, 44 %RH
Engineer	Makoto Hosaka	Makoto Hosaka
Mode	Tx, 2412 MHz	Antenna: 5dBi antenna + 3m Cable
	Tx, IEEE802.11b , PN9, worst data mode 1Mbps	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	56.2	27.2	24.7	38.4	69.7	73.9	4.2	128	229	
Hori.	4824.000	PK	50.1	31.2	6.8	41.7	46.4	73.9	27.5	100	35	
Hori.	7236.000	PK	46.7	36.1	7.8	41.4	49.2	73.9	24.7	100	0	
Hori.	9648.000	PK	44.0	38.1	9.4	40.6	50.9	73.9	23.0	100	0	
Hori.	12060.000	PK	44.3	39.0	10.0	39.9	53.4	73.9	20.5	100	0	
Hori.	2390.000	AV	35.8	27.2	24.7	38.4	49.3	53.9	4.6	128	229	
Hori.	4824.000	AV	43.6	31.2	6.8	41.7	39.9	53.9	14.0	100	35	
Hori.	7236.000	AV	36.5	36.1	7.8	41.4	39.0	53.9	14.9	100	0	
Hori.	9648.000	AV	36.4	38.1	9.4	40.6	43.3	53.9	10.6	100	0	
Hori.	12060.000	AV	35.6	39.0	10.0	39.9	44.7	53.9	9.2	100	0	
Vert.	2390.000	PK	56.4	27.2	24.7	38.4	69.9	73.9	4.0	112	2	
Vert.	4824.000	PK	53.2	31.2	6.8	41.7	49.5	73.9	24.4	121	9	
Vert.	7236.000	PK	46.2	36.1	7.8	41.4	48.7	73.9	25.2	100	0	
Vert.	9648.000	PK	43.5	38.1	9.4	40.6	50.4	73.9	23.5	100	0	
Vert.	12060.000	PK	44.1	39.0	10.0	39.9	53.2	73.9	20.7	100	0	
Vert.	2390.000	AV	35.2	27.2	24.7	38.4	48.7	53.9	5.2	112	2	
Vert.	4824.000	AV	47.7	31.2	6.8	41.7	44.0	53.9	9.9	121	9	
Vert.	7236.000	AV	36.3	36.1	7.8	41.4	38.8	53.9	15.1	100	0	
Vert.	9648.000	AV	34.6	38.1	9.4	40.6	41.5	53.9	12.4	100	0	
Vert.	12060.000	AV	34.5	39.0	10.0	39.9	43.6	53.9	10.3	100	0	

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

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	87.4	27.3	24.7	38.3	101.1	-	-	
Hori.	2400.000	PK	47.0	27.3	24.7	38.4	60.6	81.1	20.5	
Vert.	2412.000	PK	88.2	27.3	24.7	38.3	101.9	-	-	
Vert.	2400.000	PK	45.7	27.3	24.7	38.4	59.3	81.9	22.6	

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.1 Semi Anechoic Chamber
Date	April 20, 2013	April 22, 2013
Temperature / Humidity	20 deg.C, 30 %RH	22 deg.C, 44 %RH
Engineer	Makoto Hosaka	Makoto Hosaka
Mode	Tx, 2437 MHz	Antenna: 5dBi antenna + 3m Cable
	Tx, IEEE802.11b , PN9, worst data mode 1Mbps	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	50.6	31.3	6.8	41.7	47.0	73.9	26.9	100	111	
Hori.	7311.000	PK	46.7	36.1	7.9	41.4	49.3	73.9	24.6	100	0	
Hori.	9748.000	PK	44.3	38.1	9.4	40.6	51.2	73.9	22.7	100	0	
Hori.	12185.000	PK	43.4	38.9	9.9	39.9	52.3	73.9	21.6	100	0	
Hori.	4874.000	AV	45.3	31.3	6.8	41.7	41.7	53.9	12.2	100	111	
Hori.	7311.000	AV	36.5	36.1	7.9	41.4	39.1	53.9	14.8	100	0	
Hori.	9748.000	AV	35.4	38.1	9.4	40.6	42.3	53.9	11.6	100	0	
Hori.	12185.000	AV	33.2	38.9	9.9	39.9	42.1	53.9	11.8	100	0	
Vert.	4874.000	PK	52.3	31.3	6.8	41.7	48.7	73.9	25.2	100	16	
Vert.	7311.000	PK	45.6	36.1	7.9	41.4	48.2	73.9	25.7	100	0	
Vert.	9748.000	PK	43.6	38.1	9.4	40.6	50.5	73.9	23.4	100	0	
Vert.	12185.000	PK	43.3	38.9	9.9	39.9	52.2	73.9	21.7	100	0	
Vert.	4874.000	AV	46.2	31.3	6.8	41.7	42.6	53.9	11.3	100	16	
Vert.	7311.000	AV	36.5	36.1	7.9	41.4	39.1	53.9	14.8	100	0	
Vert.	9748.000	AV	35.7	38.1	9.4	40.6	42.6	53.9	11.3	100	0	
Vert.	12185.000	AV	34.5	38.9	9.9	39.9	43.4	53.9	10.5	100	0	

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

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

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

Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.1 Semi Anechoic Chamber
Date	April 20, 2013	April 22, 2013
Temperature / Humidity	20 deg.C, 30 %RH	22 deg.C, 44 %RH
Engineer	Makoto Hosaka	Makoto Hosaka
Mode	Tx, 2462 MHz	Antenna: 5dBi antenna + 3m Cable
	Tx, IEEE802.11b , PN9, worst data mode 1Mbps	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	56.4	27.4	24.8	38.3	70.3	73.9	3.6	123	38	
Hori.	4924.000	PK	51.0	31.4	6.8	41.6	47.6	73.9	26.3	100	193	
Hori.	7386.000	PK	45.7	36.2	8.0	41.4	48.5	73.9	25.4	100	0	
Hori.	9848.000	PK	44.1	38.1	9.5	40.7	51.0	73.9	22.9	100	0	
Hori.	12310.000	PK	43.5	38.9	9.9	39.8	52.5	73.9	21.4	100	0	
Hori.	2483.500	AV	35.5	27.4	24.8	38.3	49.4	53.9	4.5	123	38	
Hori.	4924.000	AV	46.5	31.4	6.8	41.6	43.1	53.9	10.8	100	193	
Hori.	7386.000	AV	36.7	36.2	8.0	41.4	39.5	53.9	14.4	100	0	
Hori.	9848.000	AV	36.7	38.1	9.5	40.7	43.6	53.9	10.3	100	0	
Hori.	12310.000	AV	34.6	38.9	9.9	39.8	43.6	53.9	10.3	100	0	
Vert.	2483.500	PK	57.0	27.4	24.8	38.3	70.9	73.9	3.0	106	356	
Vert.	4924.000	PK	51.4	31.4	6.8	41.6	48.0	73.9	25.9	100	14	
Vert.	7386.000	PK	45.6	36.2	8.0	41.4	48.4	73.9	25.5	100	0	
Vert.	9848.000	PK	44.9	38.1	9.5	40.7	51.8	73.9	22.1	100	0	
Vert.	12310.000	PK	44.0	38.9	9.9	39.8	53.0	73.9	20.9	100	0	
Vert.	2483.500	AV	35.8	27.4	24.8	38.3	49.7	53.9	4.2	106	356	
Vert.	4924.000	AV	45.7	31.4	6.8	41.6	42.3	53.9	11.6	100	14	
Vert.	7386.000	AV	36.5	36.2	8.0	41.4	39.3	53.9	14.6	100	0	
Vert.	9848.000	AV	35.2	38.1	9.5	40.7	42.1	53.9	11.8	100	0	
Vert.	12310.000	AV	34.4	38.9	9.9	39.8	43.4	53.9	10.5	100	0	

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

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

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

Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.1 Semi Anechoic Chamber
Date	April 20, 2013	April 22, 2013
Temperature / Humidity	20 deg.C, 30 %RH	22 deg.C, 44 %RH
Engineer	Makoto Hosaka	Makoto Hosaka
Mode	Tx, 2412 MHz	Antenna: 5dBi antenna + 3m Cable
	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.	2390.000	PK	51.0	27.2	24.7	38.4	64.5	73.9	9.4	120	222	
Hori.	4824.000	PK	46.7	31.2	6.8	41.7	43.0	73.9	30.9	100	0	
Hori.	7236.000	PK	46.2	36.1	7.8	41.4	48.7	73.9	25.2	100	0	
Hori.	9648.000	PK	44.6	38.1	9.4	40.6	51.5	73.9	22.4	100	0	
Hori.	12060.000	PK	44.0	39.0	10.0	39.9	53.1	73.9	20.8	100	0	
Hori.	2390.000	AV	37.4	27.2	24.7	38.4	50.9	53.9	3.0	120	222	
Vert.	2390.000	PK	50.8	27.2	24.7	38.4	64.3	73.9	9.6	115	357	
Vert.	4824.000	PK	48.8	31.2	6.8	41.7	45.1	73.9	28.8	121	9	
Vert.	7236.000	PK	46.0	36.1	7.8	41.4	48.5	73.9	25.4	100	0	
Vert.	9648.000	PK	44.0	38.1	9.4	40.6	50.9	73.9	23.0	100	0	
Vert.	12060.000	PK	44.0	39.0	10.0	39.9	53.1	73.9	20.8	100	0	
Vert.	2390.000	AV	37.8	27.2	24.7	38.4	51.3	53.9	2.6	115	357	

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4824.000	AV	38.7	31.2	6.8	41.7	0.4	35.4	53.9	18.5	
Hori.	7236.000	AV	36.1	36.1	7.8	41.4	0.4	39.0	53.9	14.9	
Hori.	9648.000	AV	36.2	38.1	9.4	40.6	0.4	43.5	53.9	10.4	
Hori.	12060.000	AV	34.8	39.0	10.0	39.9	0.4	44.3	53.9	9.6	
Vert.	4824.000	AV	37.5	31.2	6.8	41.7	0.4	34.2	53.9	19.7	
Vert.	7236.000	AV	36.1	36.1	7.8	41.4	0.4	39.0	53.9	14.9	
Vert.	9648.000	AV	34.3	38.1	9.4	40.6	0.4	41.6	53.9	12.3	
Vert.	12060.000	AV	34.1	39.0	10.0	39.9	0.4	43.6	53.9	10.3	

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

*8.2.4 Alternative 1 was applied to AV detection, since the duty cycle is less than 98% and video triggering or signal gating cannot be used.

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	84.7	27.3	24.7	38.3	98.4	-	-	
Hori.	2400.000	PK	48.6	27.3	24.7	38.4	62.2	78.4	16.2	
Vert.	2412.000	PK	85.4	27.3	24.7	38.3	99.1	-	-	
Vert.	2400.000	PK	48.8	27.3	24.7	38.4	62.4	79.1	16.7	

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.1 Semi Anechoic Chamber	No.1 Semi Anechoic Chamber
Date	April 20, 2013	April 22, 2013	April 22, 2013
Temperature / Humidity	20 deg.C, 30 %RH	22 deg.C, 44 %RH	19 deg.C, 34 %RH
Engineer	Makoto Hosaka	Makoto Hosaka	Akio Hayashi
Mode	Tx, 2437 MHz	Antenna: 5dBi antenna + 3m Cable	
	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.	215.999	QP	27.3	16.8	9.3	31.8	21.6	43.5	21.9	143	189	
Hori.	269.995	QP	26.7	18.1	10.0	31.8	23.0	46.0	23.0	139	230	
Hori.	451.100	QP	21.7	16.9	8.1	31.9	14.8	46.0	31.2	100	2	
Hori.	4874.000	PK	46.7	31.3	6.8	41.7	43.1	73.9	30.8	100	0	
Hori.	7311.000	PK	45.6	36.1	7.9	41.4	48.2	73.9	25.7	100	0	
Hori.	9748.000	PK	44.5	38.1	9.4	40.6	51.4	73.9	22.5	100	0	
Hori.	12185.000	PK	43.8	38.9	9.9	39.9	52.7	73.9	21.2	100	0	
Vert.	54.002	QP	27.4	9.7	7.2	31.8	12.5	40.0	27.5	100	212	
Vert.	91.888	QP	22.9	8.7	8.1	31.8	7.9	43.5	35.6	111	1	
Vert.	107.998	QP	36.0	11.4	8.0	31.8	23.6	43.5	19.9	100	269	
Vert.	451.100	QP	21.8	16.9	8.1	31.9	14.9	46.0	31.1	100	354	
Vert.	540.000	QP	26.1	18.3	8.6	32.0	21.0	46.0	25.0	100	164	
Vert.	4874.000	PK	48.9	31.3	6.8	41.7	45.3	73.9	28.6	100	0	
Vert.	7311.000	PK	46.2	36.1	7.9	41.4	48.8	73.9	25.1	100	0	
Vert.	9748.000	PK	44.3	38.1	9.4	40.6	51.2	73.9	22.7	100	0	
Vert.	12185.000	PK	43.8	38.9	9.9	39.9	52.7	73.9	21.2	100	0	

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

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	37.2	31.3	6.8	41.7	0.4	34.0	53.9	19.9	
Hori.	7311.000	AV	36.1	36.1	7.9	41.4	0.4	39.1	53.9	14.8	
Hori.	9748.000	AV	35.5	38.1	9.4	40.6	0.4	42.8	53.9	11.1	
Hori.	12185.000	AV	33.1	38.9	9.9	39.9	0.4	42.4	53.9	11.5	
Vert.	4874.000	AV	36.7	31.3	6.8	41.7	0.4	33.5	53.9	20.4	
Vert.	7311.000	AV	36.1	36.1	7.9	41.4	0.4	39.1	53.9	14.8	
Vert.	9748.000	AV	34.6	38.1	9.4	40.6	0.4	41.9	53.9	12.0	
Vert.	12185.000	AV	34.3	38.9	9.9	39.9	0.4	43.6	53.9	10.3	

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

*8.2.4 Alternative 1 was applied to AV detection, since the duty cycle is less than 98% and video triggering or signal gating cannot be used.

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

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.1 Semi Anechoic Chamber
Date	April 20, 2013	April 22, 2013
Temperature / Humidity	20 deg.C, 30 %RH	22 deg.C, 44 %RH
Engineer	Makoto Hosaka	Makoto Hosaka
Mode	Tx, 2462 MHz	Antenna: 5dBi antenna + 3m Cable
	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	51.0	27.4	24.8	38.3	64.9	73.9	9.0	100	226	
Hori.	4924.000	PK	48.3	31.4	6.8	41.6	44.9	73.9	29.0	100	0	
Hori.	7386.000	PK	46.6	36.2	8.0	41.4	49.4	73.9	24.5	100	0	
Hori.	9848.000	PK	44.3	38.1	9.5	40.7	51.2	73.9	22.7	100	0	
Hori.	12310.000	PK	43.4	38.9	9.9	39.8	52.4	73.9	21.5	100	0	
Hori.	2483.500	AV	36.0	27.4	24.8	38.3	49.9	53.9	4.0	100	226	
Vert.	2483.500	PK	51.7	27.4	24.8	38.3	65.6	73.9	8.3	105	354	
Vert.	4924.000	PK	46.7	31.4	6.8	41.6	43.3	73.9	30.6	100	0	
Vert.	7386.000	PK	45.7	36.2	8.0	41.4	48.5	73.9	25.4	100	0	
Vert.	9848.000	PK	45.3	38.1	9.5	40.7	52.2	73.9	21.7	100	0	
Vert.	12310.000	PK	44.5	38.9	9.9	39.8	53.5	73.9	20.4	100	0	
Vert.	2483.500	AV	36.1	27.4	24.8	38.3	50.0	53.9	3.9	105	354	

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

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4924.000	AV	37.6	31.4	6.8	41.6	0.4	34.6	53.9	19.3	
Hori.	7386.000	AV	37.1	36.2	8.0	41.4	0.4	40.3	53.9	13.6	
Hori.	9848.000	AV	35.5	38.1	9.5	40.7	0.4	42.8	53.9	11.1	
Hori.	12310.000	AV	34.5	38.9	9.9	39.8	0.4	43.9	53.9	10.0	
Vert.	4924.000	AV	37.6	31.4	6.8	41.6	0.4	34.6	53.9	19.3	
Vert.	7386.000	AV	36.0	36.2	8.0	41.4	0.4	39.2	53.9	14.7	
Vert.	9848.000	AV	35.0	38.1	9.5	40.7	0.4	42.3	53.9	11.6	
Vert.	12310.000	AV	34.9	38.9	9.9	39.8	0.4	44.3	53.9	9.6	

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

*8.2.4 Alternative 1 was applied to AV detection, since the duty cycle is less than 98% and video triggering or signal gating cannot be used.

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

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

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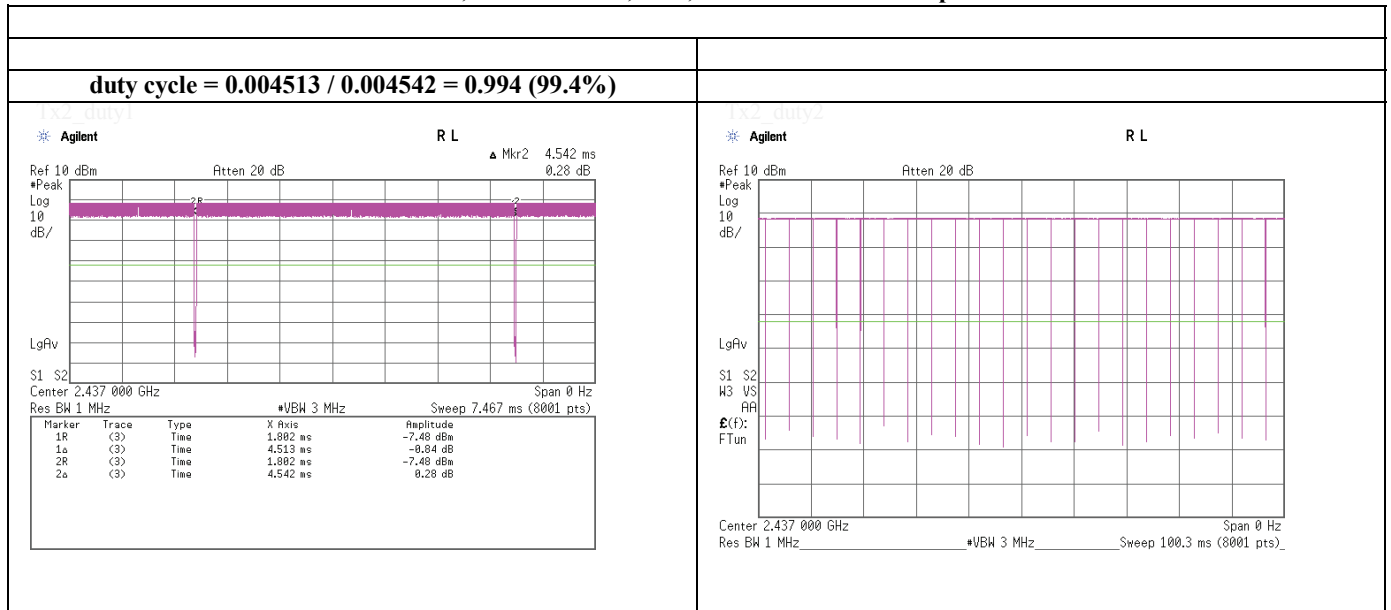
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Burst rate confirmation

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



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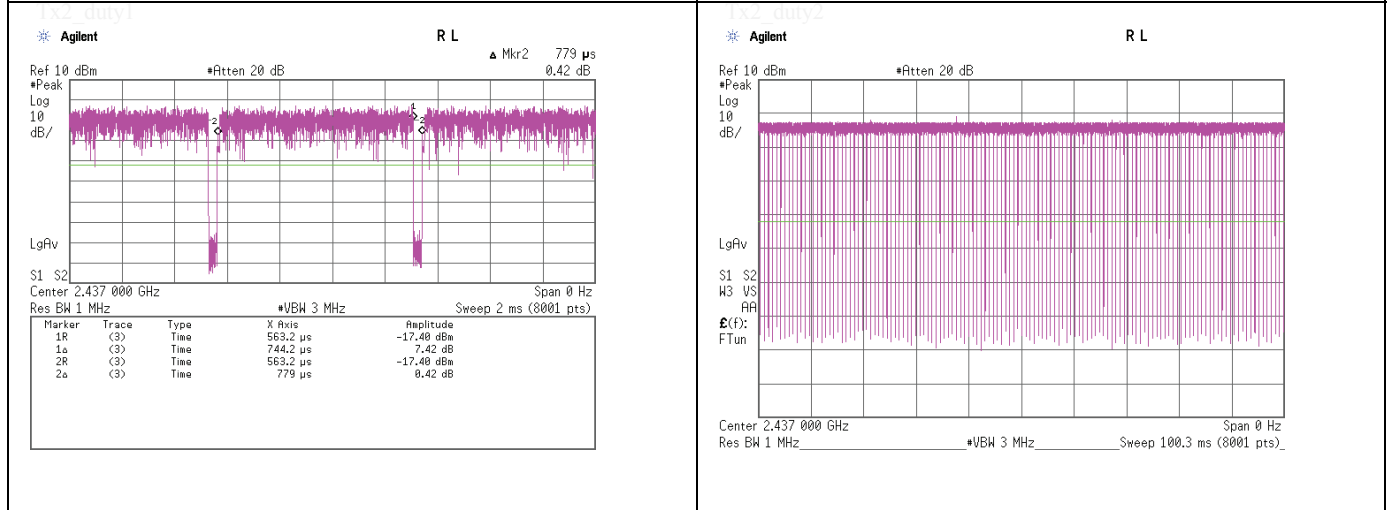
Duty Factor Calculation chart

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

Duty Factor Calculation

Duty Factor: $20\log(1/\text{duty cycle}) = 0.4\text{dB}$

duty cycle = $0.0007442 / 0.000779 = 0.955$ (95.5%)



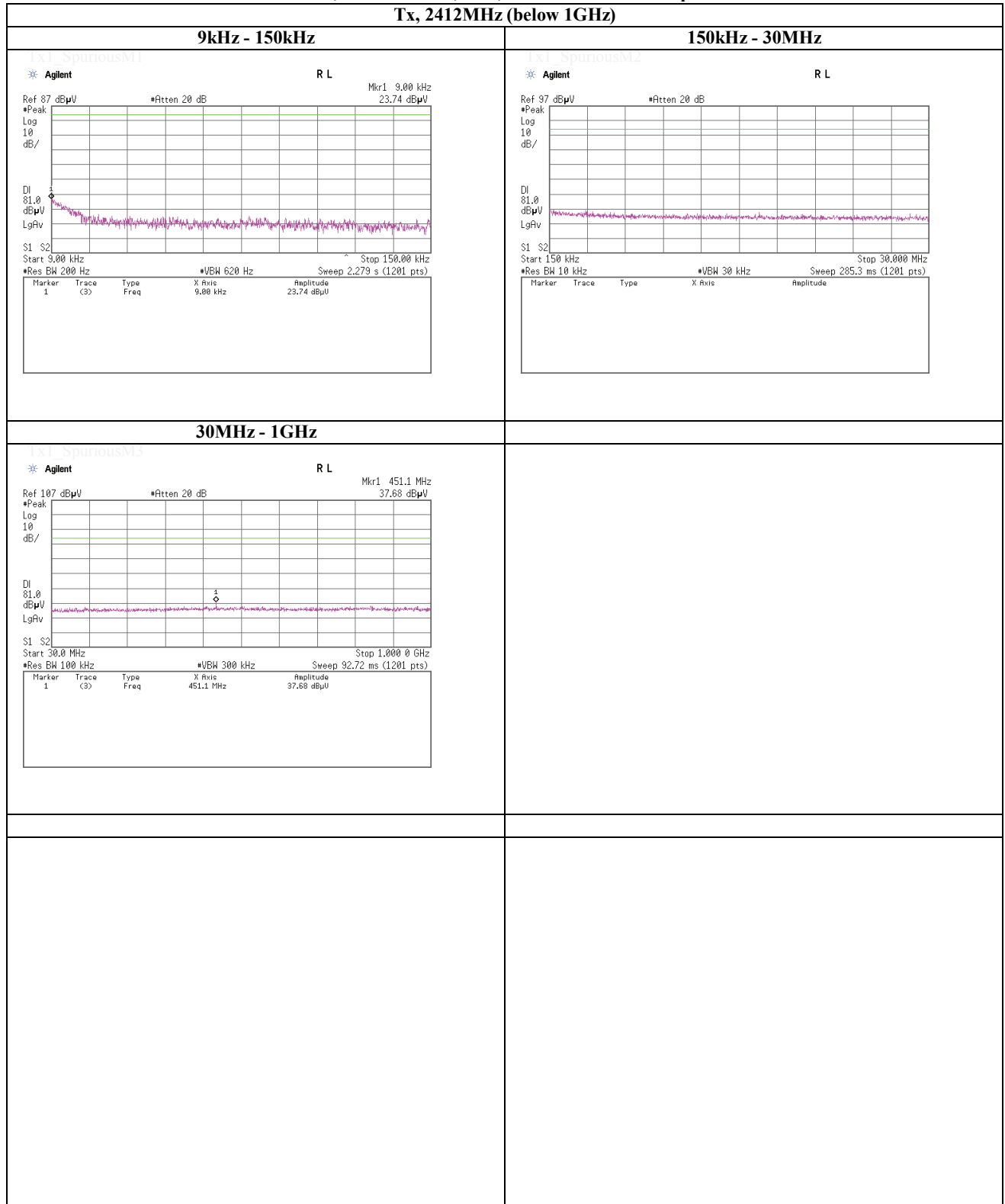
UL Japan, Inc.

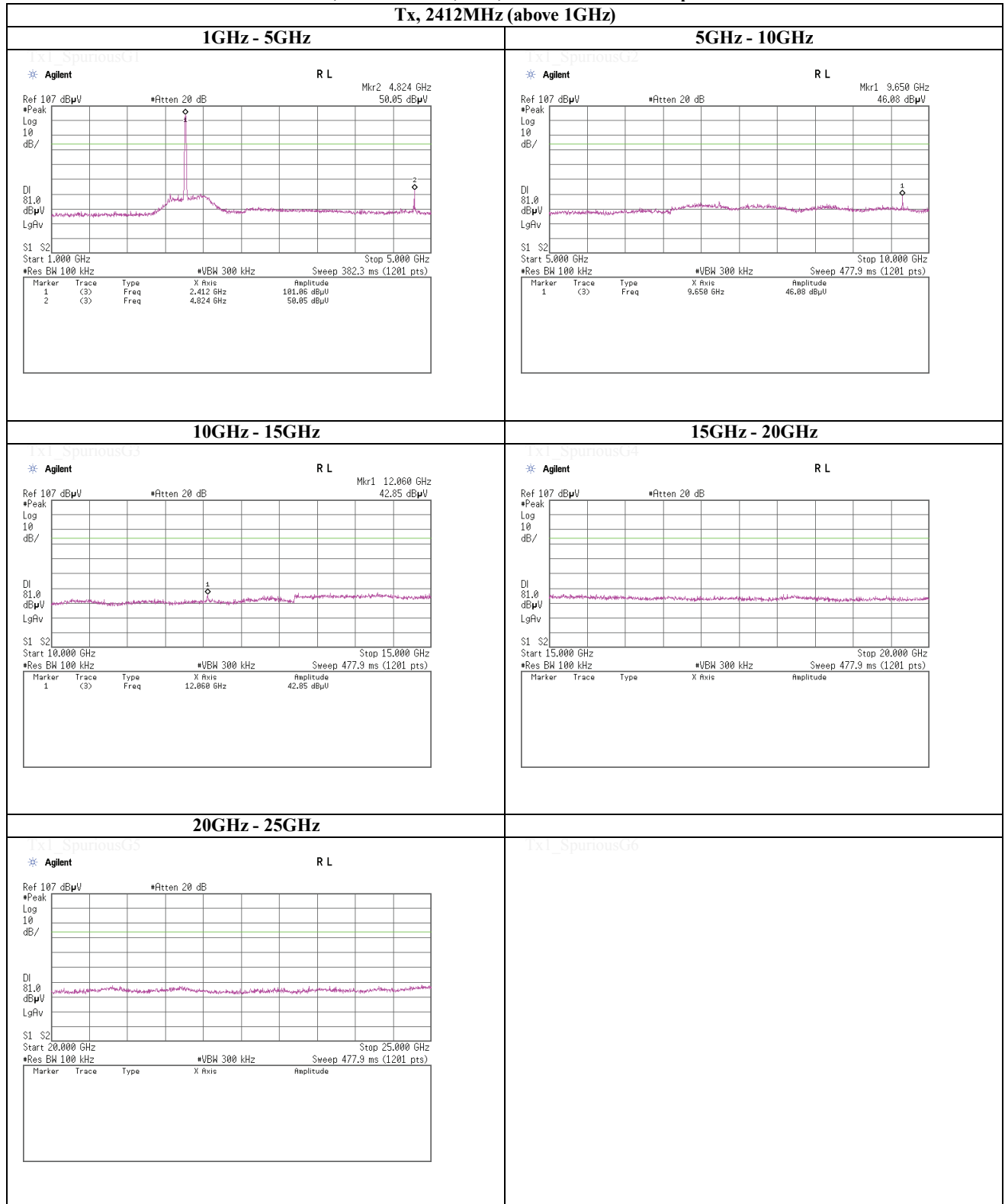
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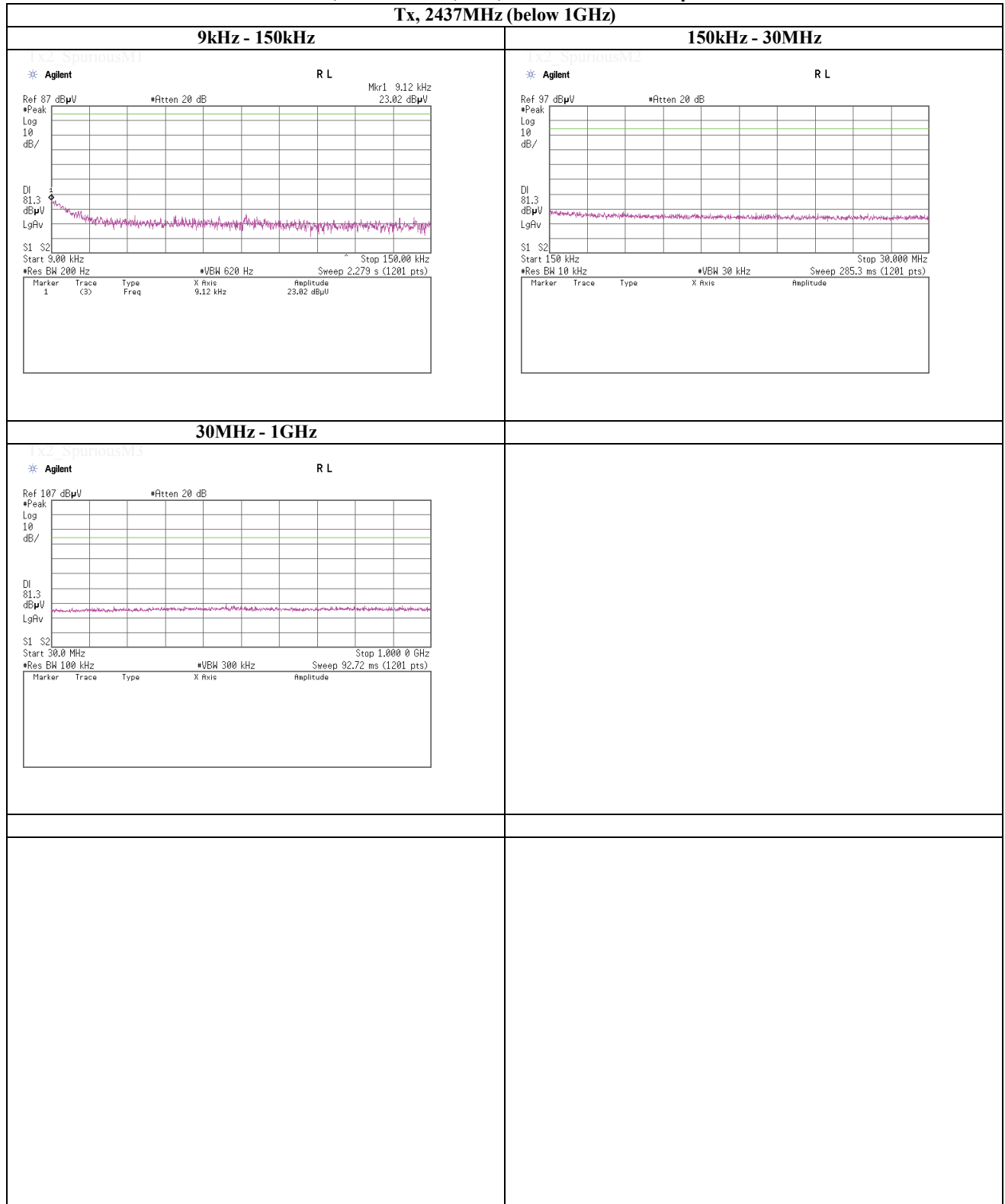
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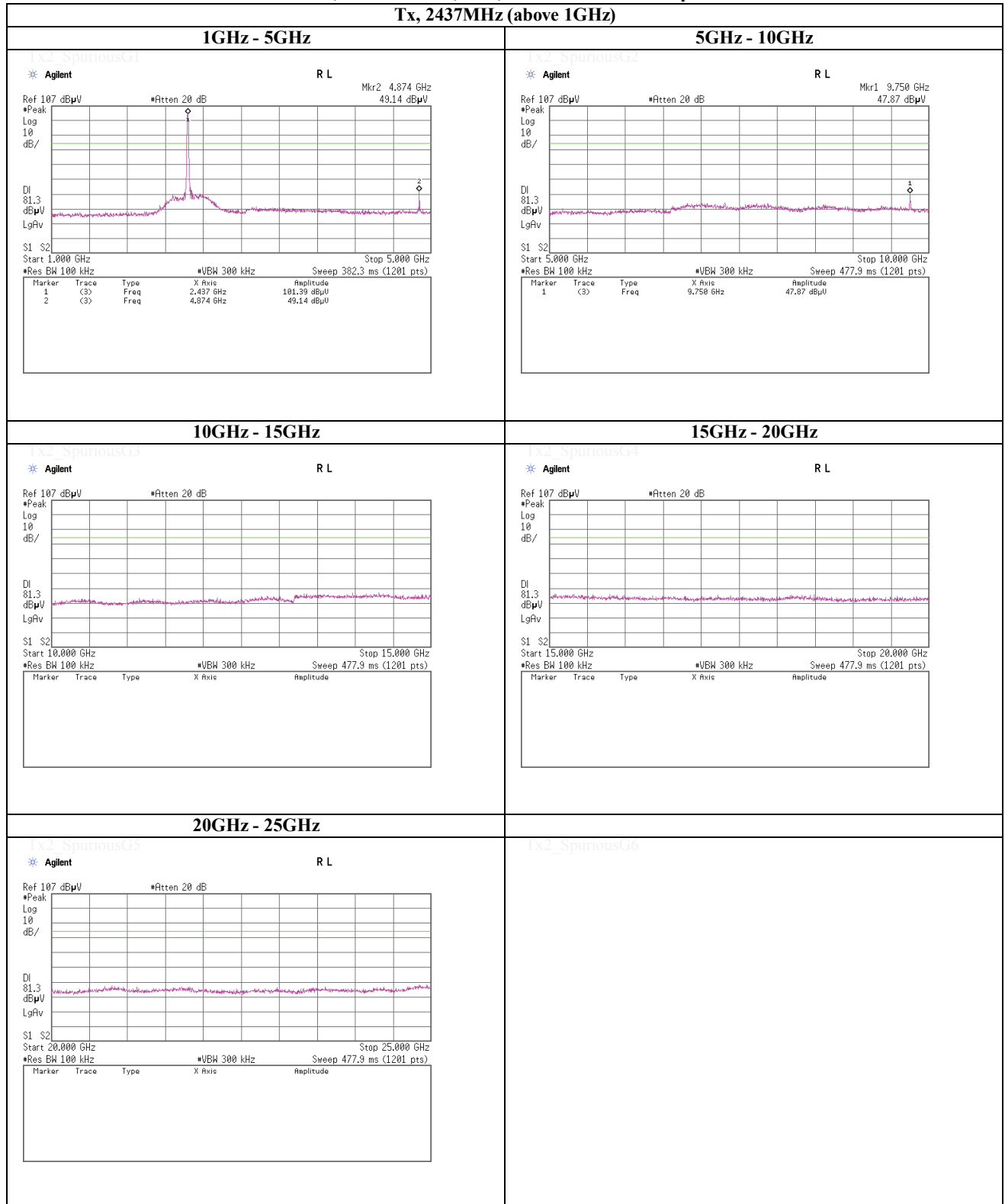
Telephone : +81 463 50 6400

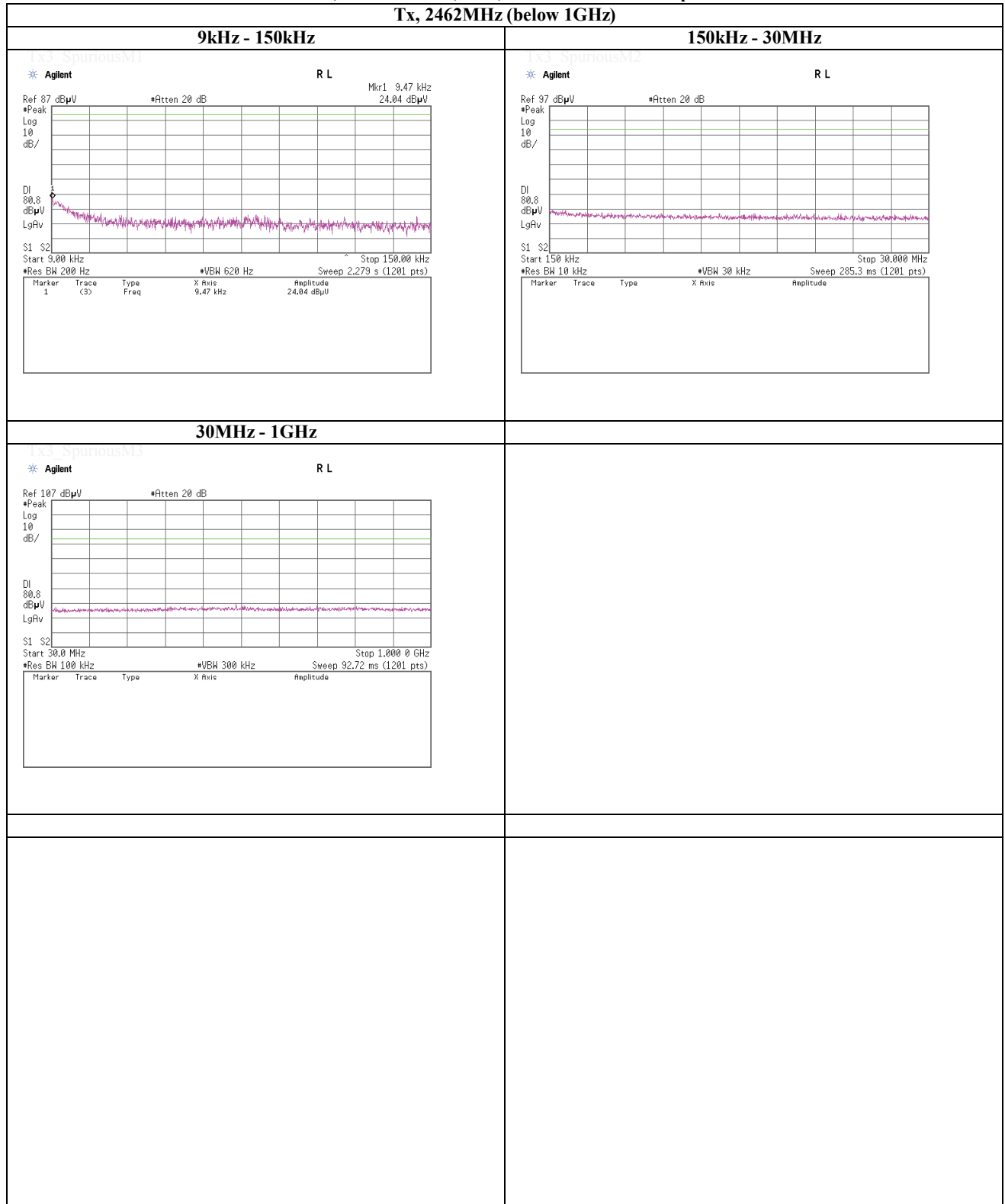
Facsimile : +81 463 50 6401

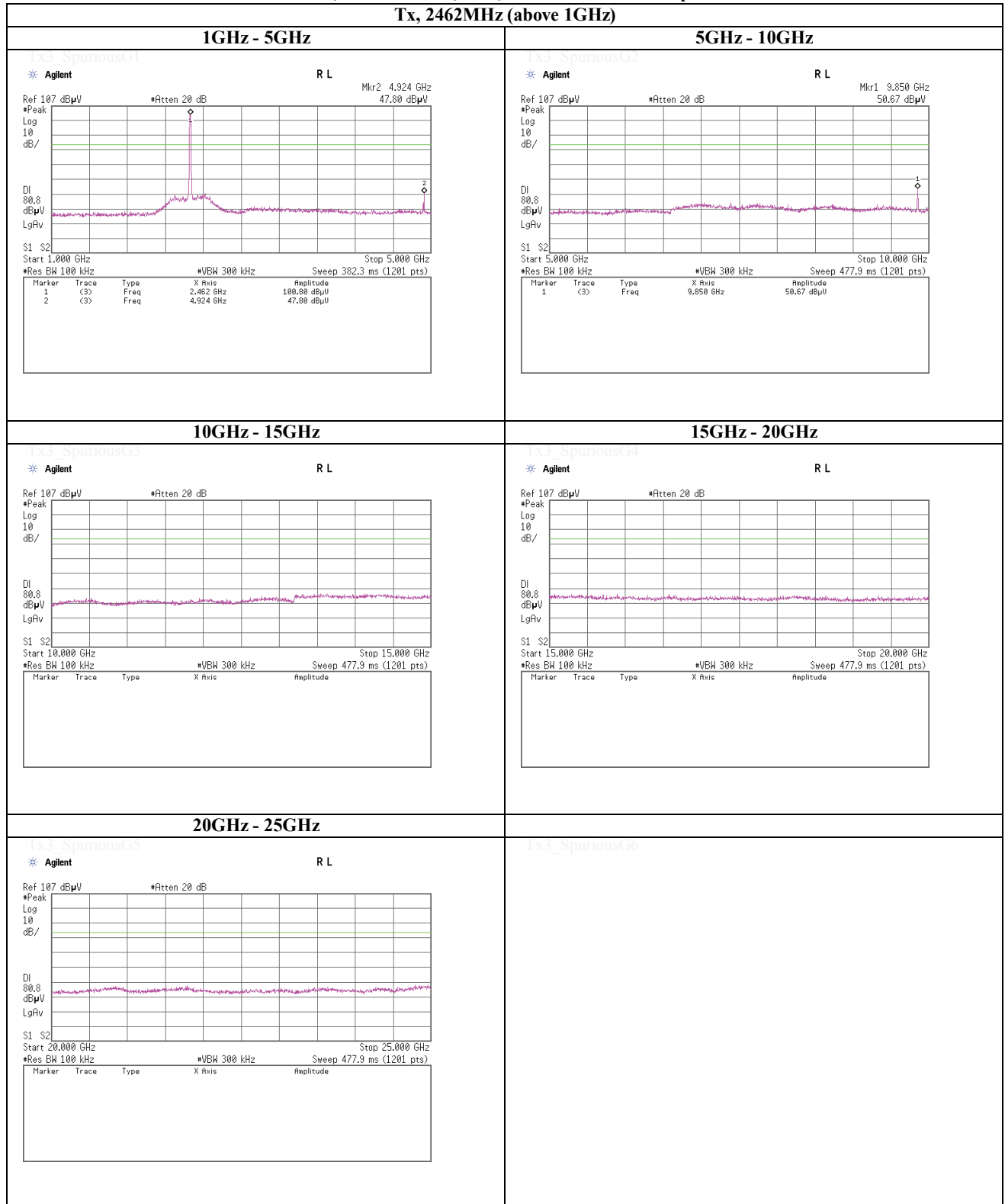
(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11b , PN9, worst data mode 1Mbps****Tx, 2412MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

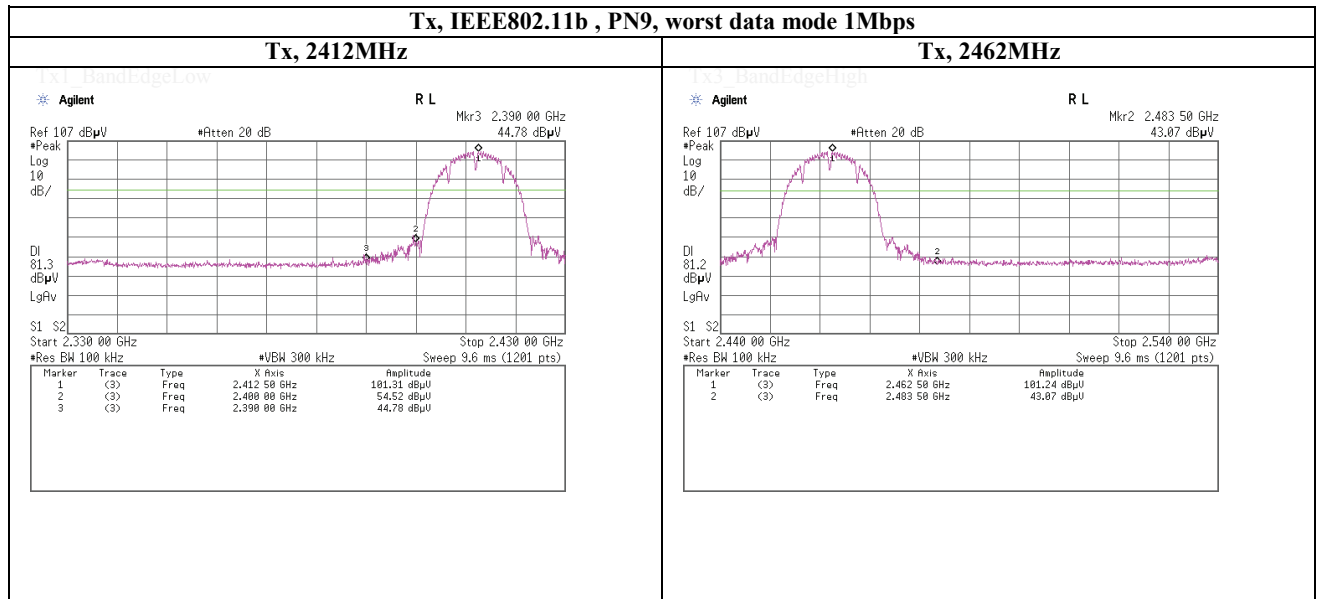
(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11b , PN9, worst data mode 1Mbps****Tx, 2412MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

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

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

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

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

(Reference chart) Spurious emission (Conducted)**Band Edge compliance****UL Japan, Inc.****Shonan EMC Lab.**

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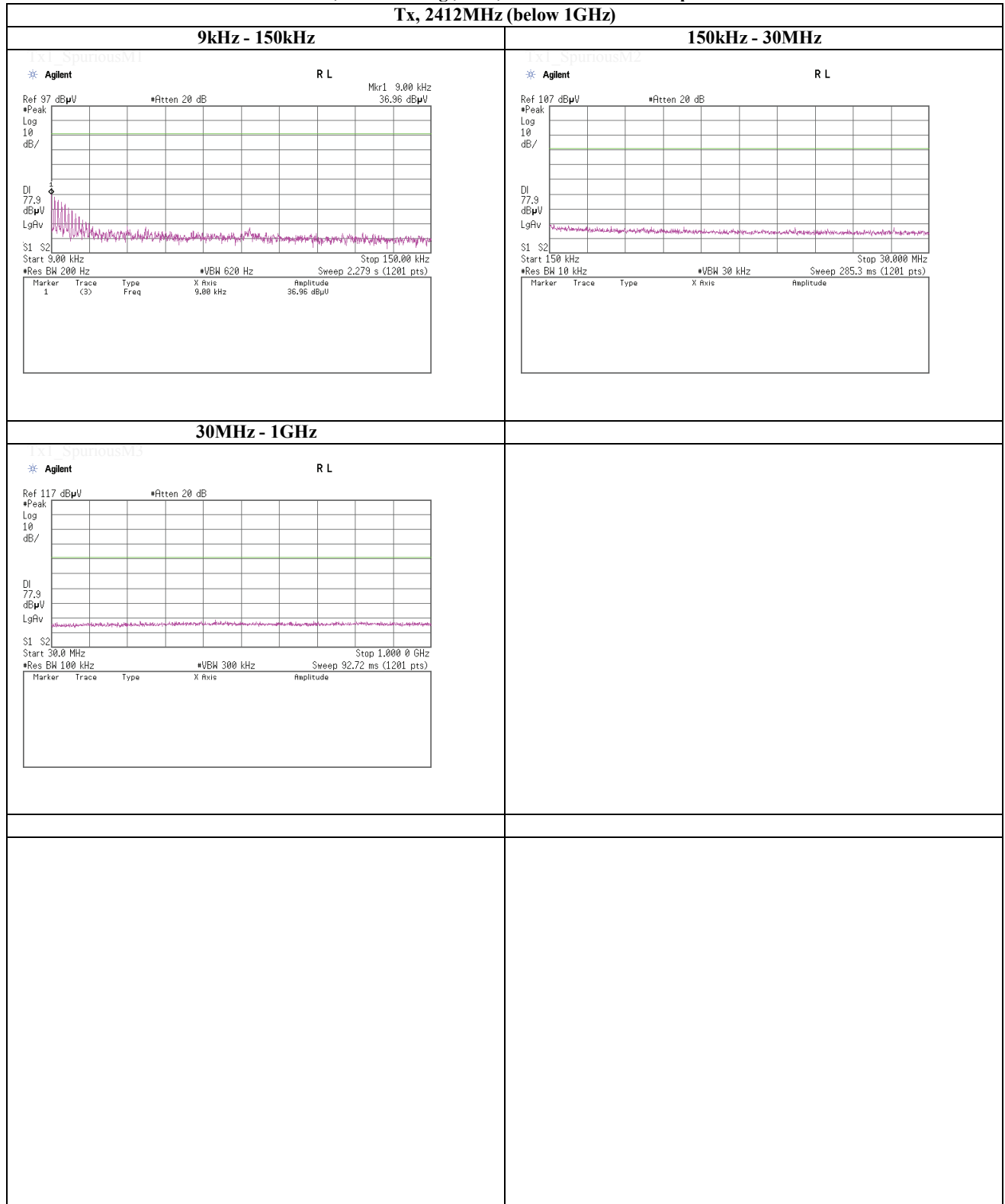
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(Reference chart) Spurious emission (Conducted)

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

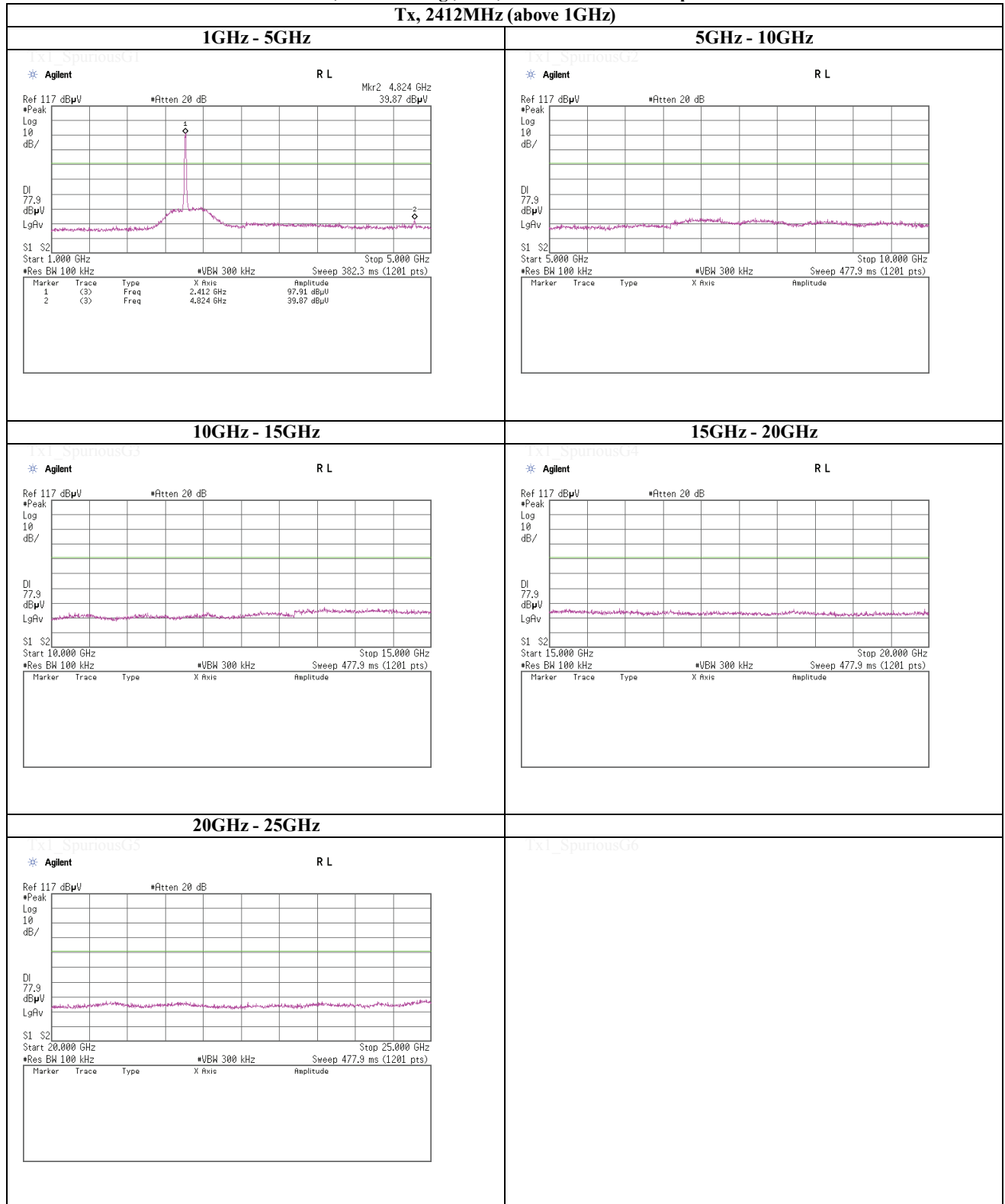
Tx, 2412MHz (below 1GHz)

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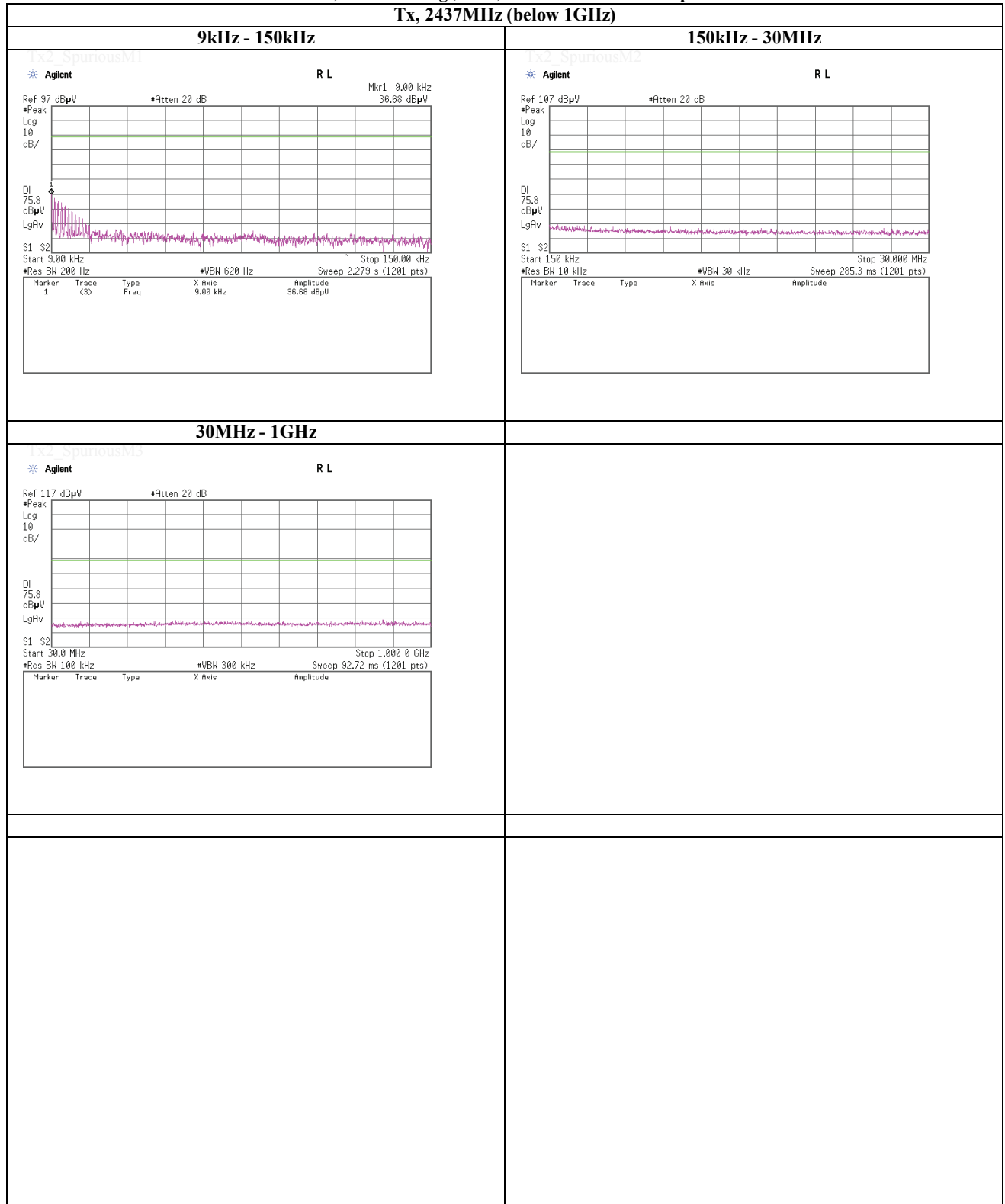
Facsimile : +81 463 50 6401

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

(Reference chart) Spurious emission (Conducted)

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

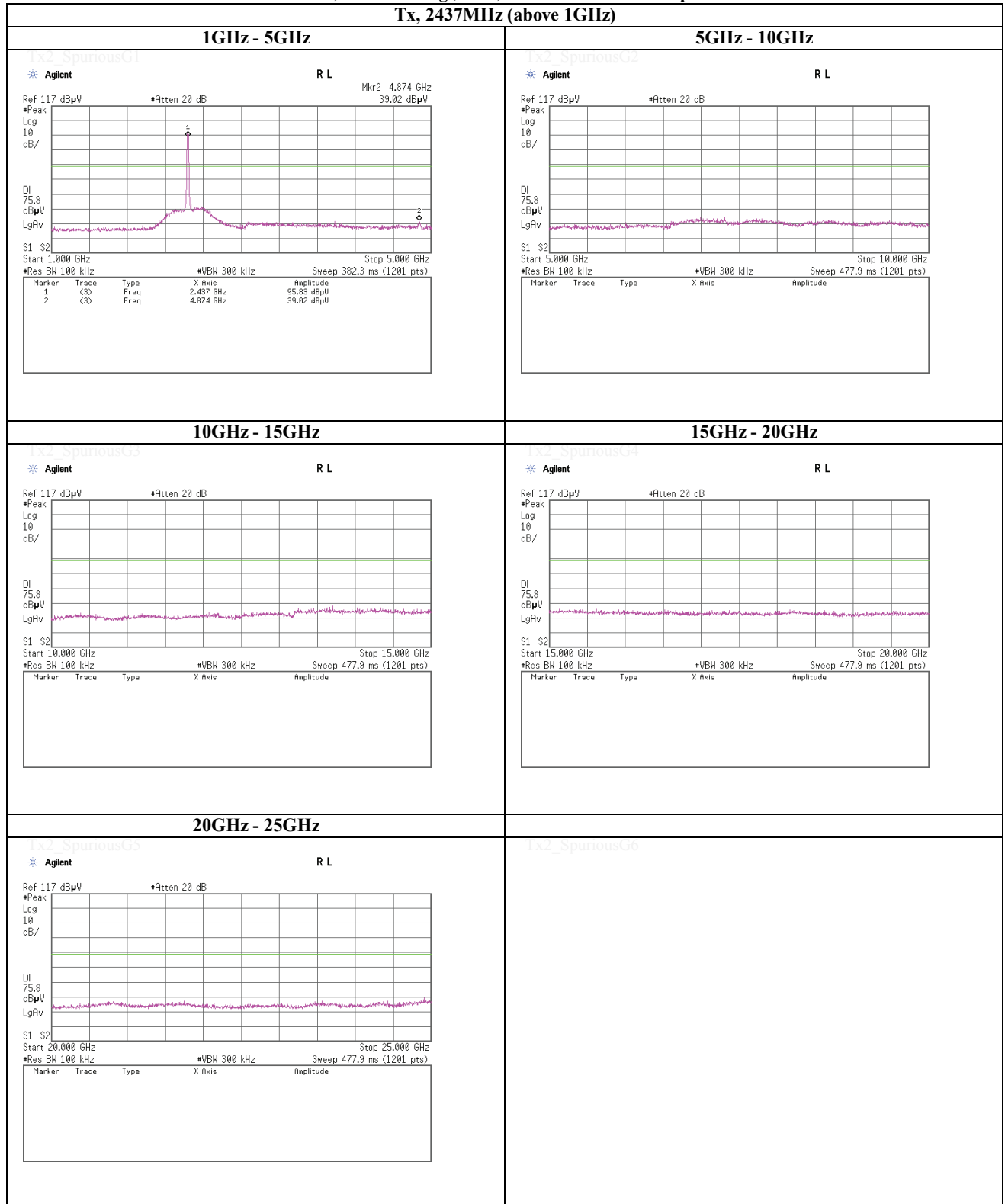
Tx, 2437MHz (below 1GHz)

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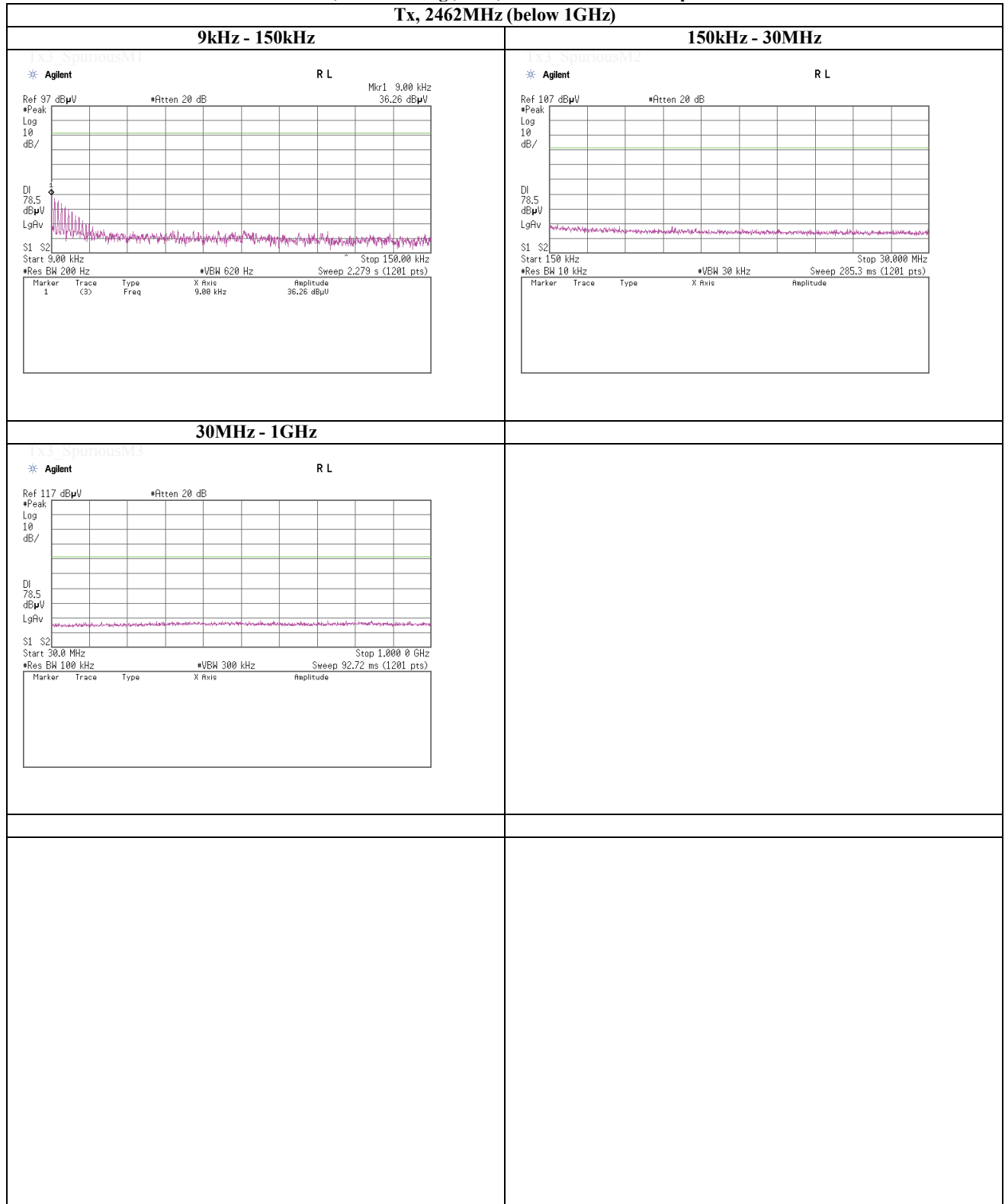
Facsimile : +81 463 50 6401

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

(Reference chart) Spurious emission (Conducted)

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

Tx, 2462MHz (below 1GHz)

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

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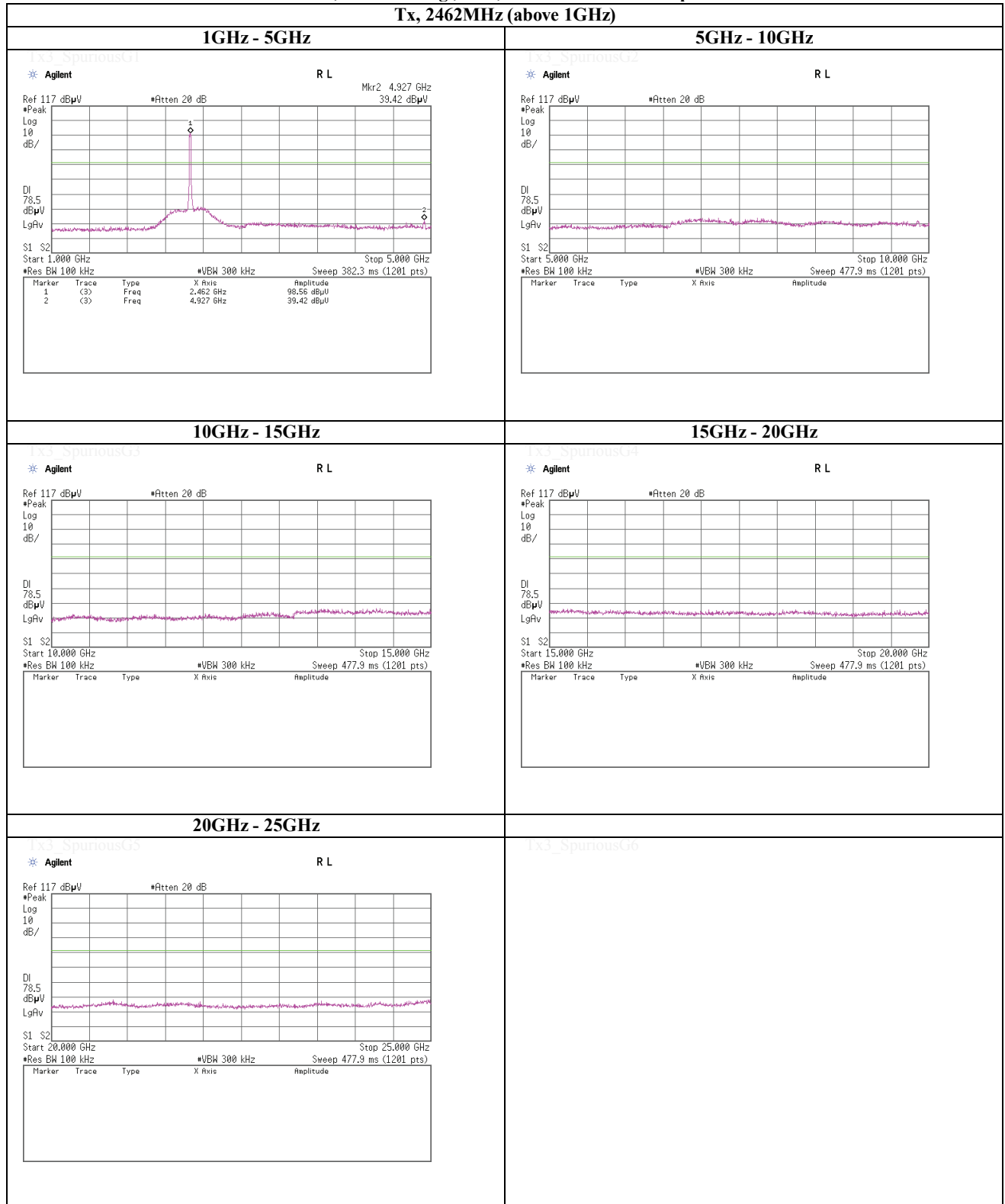
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Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

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

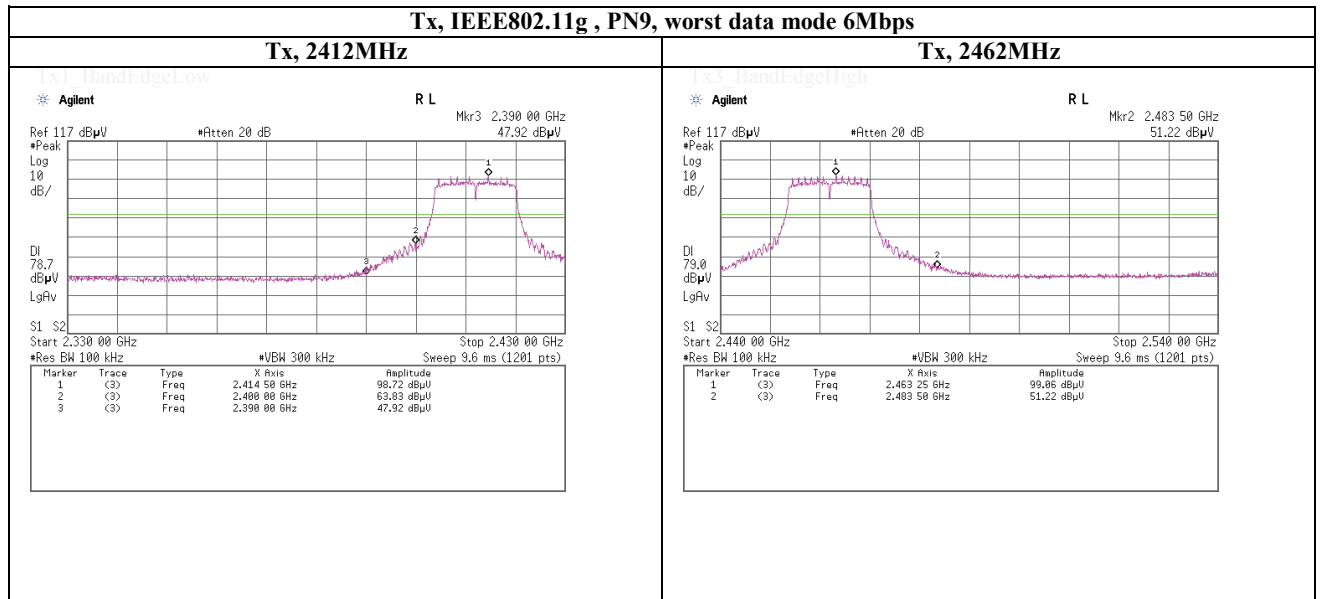
Tx, 2462MHz (above 1GHz)

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(Reference chart) Spurious emission (Conducted)**Band Edge compliance****UL Japan, Inc.****Shonan EMC Lab.**

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Maximum Power Spectral Density

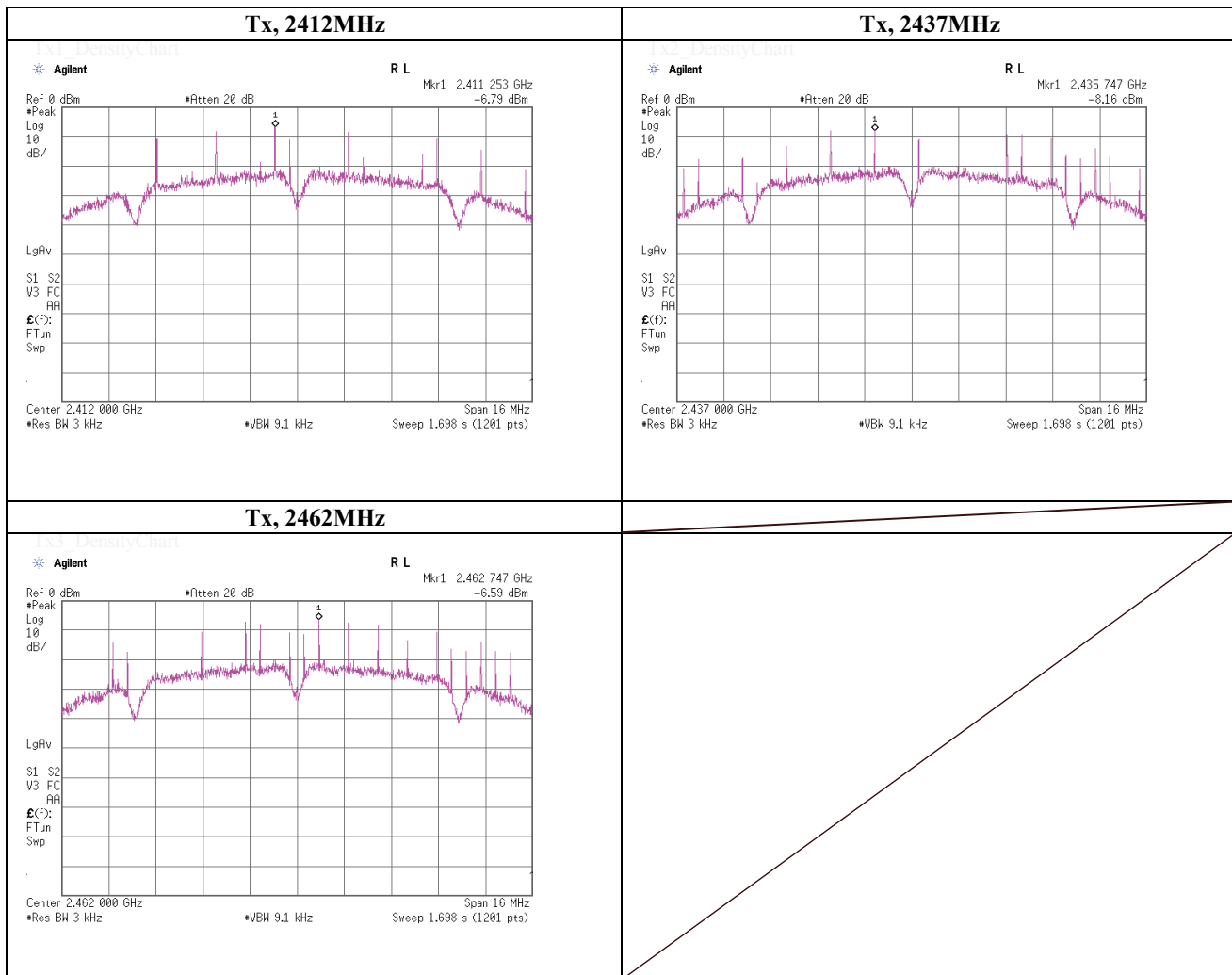
(Option 1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	March 27, 2013	
Temperature / Humidity	21deg.C , 32%RH	
Engineer	Makoto Hosaka	
Mode	Tx, IEEE802.11b , PN9, worst data mode 1Mbps	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2411.25	-6.79	0.74	9.97	3.92	8.00	4.08
2437.0000	2435.75	-8.16	0.74	9.97	2.55	8.00	5.45
2462.0000	2462.75	-6.59	0.74	9.97	4.13	8.00	3.88

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

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Maximum Power Spectral Density

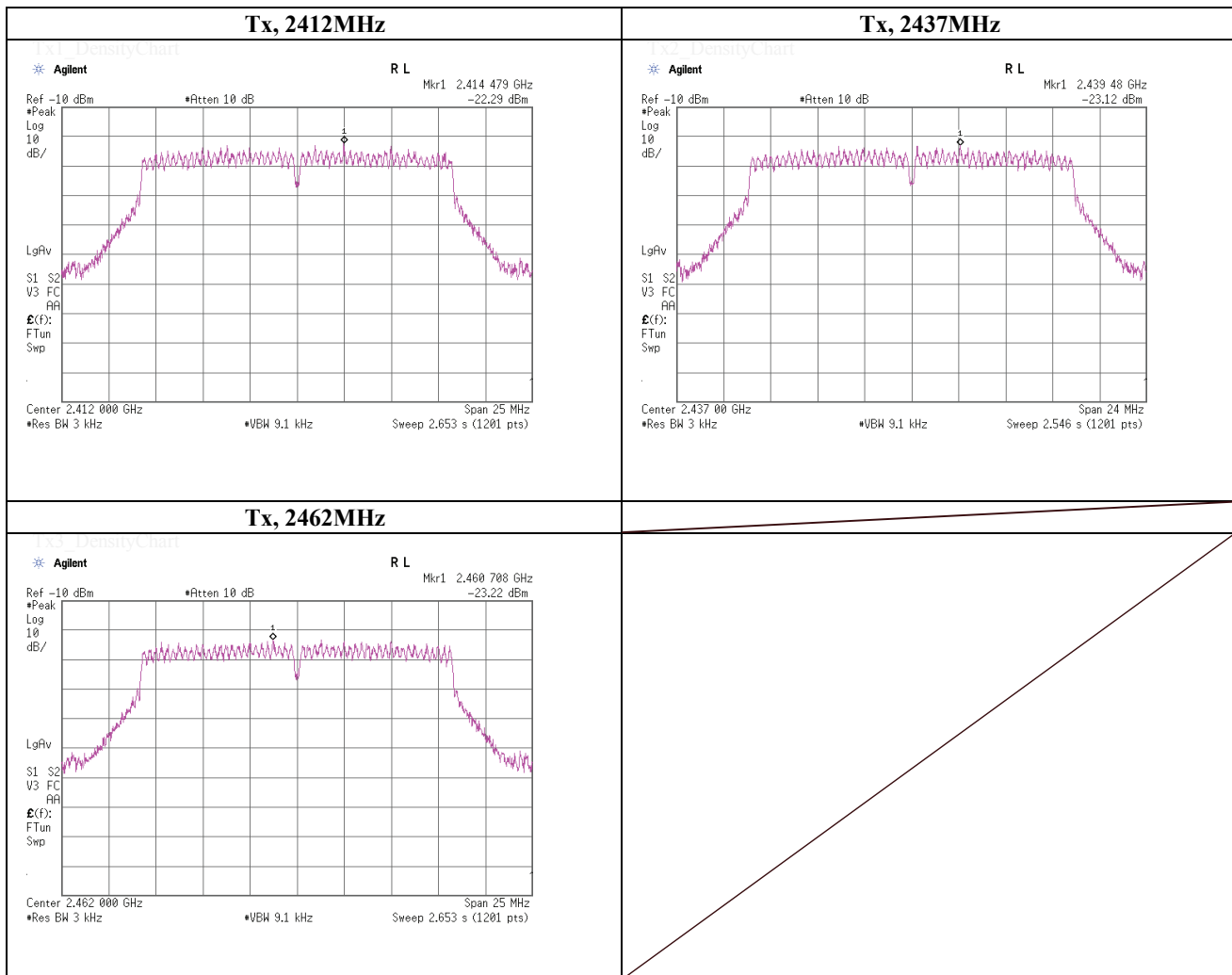
(Option 1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	March 27, 2013	
Temperature / Humidity	21deg.C , 32%RH	
Engineer	Makoto Hosaka	
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	2414.48	-22.29	0.74	9.97	-11.58	8.00	19.58
2437.0000	2439.48	-23.12	0.74	9.97	-12.41	8.00	20.41
2462.0000	2460.71	-23.22	0.74	9.97	-12.51	8.00	20.51

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

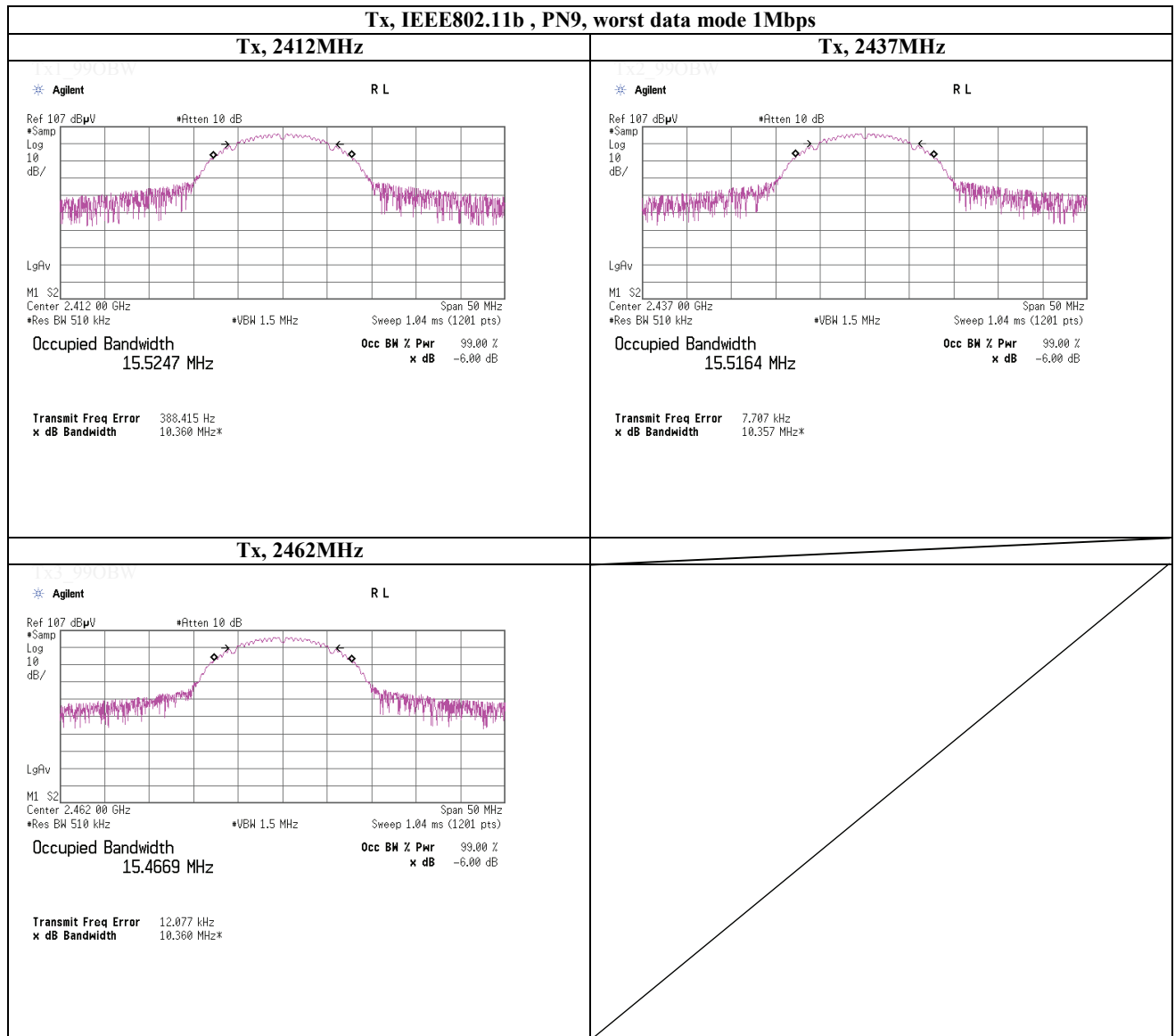
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99% Occupied Bandwidth



UL Japan, Inc.

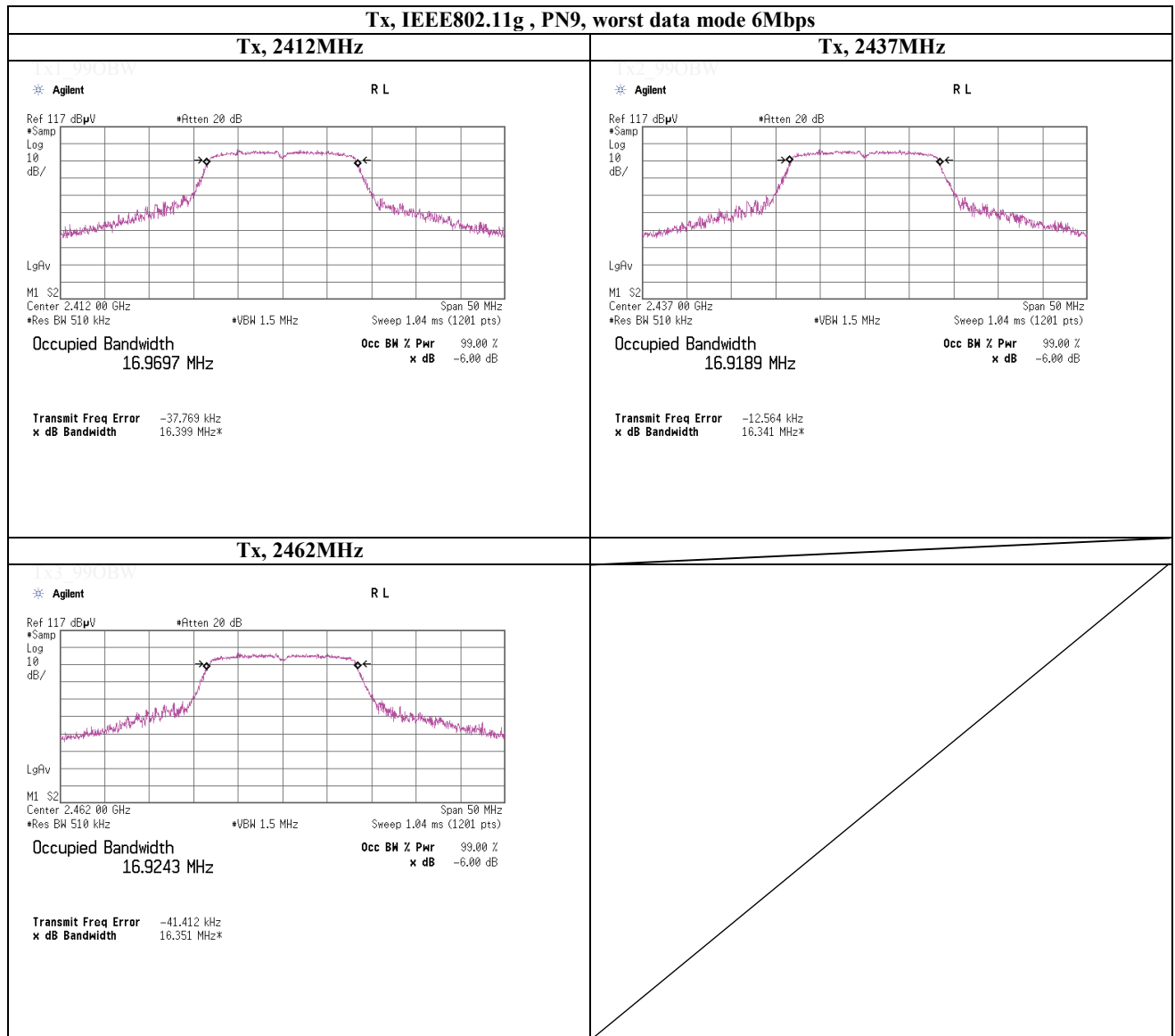
Shonan EMC Lab.

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99% Occupied Bandwidth



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APPENDIX 2

Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2013/04/09 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2013/04/09 * 12
SAT10-10	Attenuator	Weinschel Corp.	54A-10	37584	AT	2013/04/09 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2013/03/16 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	AT	2013/03/28 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT, RE	2013/03/04 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2013/03/07 * 12
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	RE	2012/09/11 * 12
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2013/03/19 * 12
SCC-G01	Coaxial Cable	Suhner	SUCOFLEX 104A	46497/4A	RE	2013/04/09 * 12
SCC-G21	Coaxial Cable	Suhner	SUCOFLEX 104	296169/4	RE	2012/05/22 * 12
SHA-01	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	RE	2012/08/20 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2013/02/27 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	RE	2013/01/08 * 12
SJM-08	Measure	PROMART	SEN1935	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE	-
SAT20-01	Attenuator(above 1GHz)	Agilent	8493C-020	74889	AT	2012/12/18 * 12
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2012/09/21 * 12
SAF-05	Pre Amplifier	TOYO Corporation	TPA0118-36	1440490	RE	2013/03/19 * 12
SCC-G02	Coaxial Cable	Suhner	SUCOFLEX 104A	46498/4A	RE	2013/04/09 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2012/05/22 * 12
SHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	RE	2012/08/17 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2013/02/27 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2012/12/18 * 12
KFL-01	Highpass Filter	Hewlett Packard	84300 80038	004	RE	2013/04/03 * 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

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 :

RE: Radiated emission ,

AT: Antenna terminal disturbance voltage

APPENDIX 2

Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SAF-01	Pre Amplifier	SONOMA	310N	290211	RE	2013/02/12 * 12
SAT6-05	Attenuator	JFW	50HF-006N	-	RE	2013/02/12 * 12
SAT3-04	Attenuator	JFW	50HF-003N	-	RE	2013/02/12 * 12
SBA-01	Biconical Antenna	Schwarzbeck	BBA9106	91032664	RE	2012/10/08 * 12
SCC-A1/A3/A5/A7/A8/A13/SRSE-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	2013/04/04 * 12
SCC-A2/A4/A6/A7/A8/A13/SRSE-01	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-269(RF Selector)	RE	2013/04/04 * 12
SLA-01	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP9108-A 0888	RE	2012/11/18 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2013/02/27 * 12
STR-01	Test Receiver	Rohde & Schwarz	ESU40	100093	RE	2012/10/04 * 12
SJM-08	Measure	PROMART	SEN1935	-	RE	-
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	RE	2012/09/11 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE	-
SLP-02	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100218	RE	2012/10/31 * 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 :

RE: Radiated emission ,

AT: Antenna terminal disturbance voltage