



RADIO TEST REPORT

Test Report No.: 32CE0252-SH-02-A

Applicant : Yokogawa Electric Corporation
Type of Equipment : WLAN Redundant Module
Model No. : F9195KJ
FCC ID : SGJ-WFC009
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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Date of test: May 23 to July 25 , 2012

Tested by: M. Hosaka
Makoto Hosaka
Engineer of WiSE Japan,
UL Verification Service

Approved by : T. Imamura
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Leader of WiSE Japan,
UL Verification Service

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13-EM-F0429

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SECTION 1: Customer information

Company Name : Yokogawa Electric Corporation
Brand Name : YOKOGAWA
Address : 2-9-32, Nakacho, Musashino, Tokyo, 180-8750, Japan
Telephone Number : +81-422-52-5885
Facsimile Number : +81-422-52-2102
Contact Person : Yoshio Yoshida

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

2.1 Identification of E.U.T.

Type of Equipment : WLAN Redundant Module
Model Number : F9195KJ
Serial Number : 130
Rating : DC5.0V
Country of Mass-production : Japan
Condition of EUT : Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample : May 21, 2012
Modification of EUT : No modification by the test lab.

2.2 Product description

Model: F9195KJ (referred to as the EUT in this report) is a WLAN Redundant Module.
Similar model: F9195KH (WLAN Single Module). Two Wireless LAN Modules are installed in F9195KJ and one Wireless LAN Module is installed in F9195KH.

Clock frequency(ies) in the system : 40MHz
Equipment type : Transceiver
Frequency of operation *1) : 2.4GHz: 2412-2462MHz (IEEE 802.11b, 11g)
W52: 5180-5240MHz (IEEE 802.11a)
W53: 5260-5320MHz (IEEE 802.11a)
W56: 5500-5700MHz (IEEE 802.11a)
W58: 5745-5825MHz (IEEE 802.11a)
Bandwidth : 20MHz
Channel spacing : 5MHz (2.4GHz), 20MHz (5GHz)
Type of modulation : DSSS (IEEE 802.11b), OFDM (IEEE 802.11a/g)
ITU code : D1D, G1D
Operation temperature range : -40 to +70 deg.C

*1) Refer to the test report 32CE0252-SH-02-B/C for FCC 15.407.

Antenna type	Type:1 Sleeve antenna (Dual) *3)	Type:2 Sleeve antenna (Single)	Type:3 Collinear antenna	Type: 4 Collinear antenna	Type: 5 Patch compound antenna
Antenna Model Name	MTA-11DAD2-YO	ASSL-NP-00400	ASCL-NP-00200	ASCL-NP-00300	MTA-11PA15-Y0
Frequency band	2.4G/5GHz	2.4GHz	2.4GHz	2.4GHz	2.4GHz
External antenna connector type	N Connector				
External antenna cable	Coax antenna cable (less than cable loss: 3.1dB for 2.4GHz, 6.6dB for 5GHz)				
Antenna gain with internal cable loss (direct connecting)	2.14dBi	2.14dBi	6dBi (6.1dBi *2)	9dBi (8.6dBi *2)	15dBi

*2) Actual measured value

*3) The "Dual" means common use of 2.4GHz and 5GHz, and the antenna cannot perform the concurrent transmission.

FCC 15.31 (e) / 212

The RF Module has its own regulator. The RF Module is constantly provided voltage (DC3.3V) through the regulator regardless of input voltage. Therefore, the EUT complies with the requirement.

FCC 15.203 / 212

The EUT has an external antenna connector, but it is installed by the professionals. Therefore the EUT complies with the requirement.

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SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2012,
final revised on August 13, 2012 and effective September 12, 2012
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.209 Radiated emission limits, general requirements
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz,
and 5725-5850MHz

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

3.2 Procedures & Results

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.4:2009 7. AC powerline conducted emission measurements	FCC 15.207	-	N/A	11.6dB Freq.: 10.09181MHz Detector: Average Phase: N Mode: Tx 5745MHz, IEEE 802.11a Antenna: 2.14dBi (Dual)	Complied
6dB bandwidth	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (a)(2)	Conducted	N/A	* See data	Complied
Maximum peak output power	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (b)(3)	Conducted	N/A		Complied
Out of band emission & Restricted band edges	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.109, 15.247 (d) & 15.209	Conducted / Radiated	N/A	0.3dB Freq.: 2483.500MHz Detector: Average Polarization: Vertical Mode: Tx 2462MHz, IEEE 802.11g Antenna: 15dBi (Single)	Complied
Power density	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.247 (e)	Conducted	N/A	* See data	Complied

Note: UL Japan's EMI Work Procedures No.13-EM-W0420 and 13-EM-W0422.
These tests were also referred to "Guidance on Measurement for Digital Transmission Systems Section15.247".

3.3 Addition to standard

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

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

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

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3.4 Uncertainty

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

Item	Frequency range	No.1 SAC*1/SR*2 (±)	No.2 SAC/SR (±)	No.3 SAC/SR (±)
Conducted emission (AC Mains) LISN	150kHz-30MHz	3.6 dB	3.6 dB	3.5 dB
Radiated emission (Measurement distance: 3m)	9kHz-30MHz	3.7 dB	3.7 dB	3.6 dB
	30MHz-300MHz	4.9 dB	5.1 dB	4.9 dB
	300MHz-1GHz	5.0 dB	5.2 dB	4.9 dB
	1GHz-15GHz	4.8 dB	4.8 dB	4.9 dB
Radiated emission (Measurement distance: 1m)	15GHz-18GHz	5.6 dB	5.6 dB	5.6 dB
	18GHz-40GHz	4.6 dB	4.3 dB	4.4 dB

*1: SAC=Semi-Anechoic Chamber

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

Conducted emission test

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

Radiated emission test

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

Antenna port conducted test

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

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

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

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

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

Spurious emission (Conducted) measurement (26.5G-50GHz) uncertainty for this test was: (±) 2.8dB

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

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3.5 Test location

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JAB Accreditation No. : RTL02610

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

3.6 Test setup, Data of test & Test instruments

Refer to APPENDIX 3 to 3.

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

4.1 Operating mode

Test item	Mode	Tested frequency	Worst data rate *1)
Conducted emission *2)	Transmitting IEEE 802.11g	2412MHz	6Mbps, PN9
	Transmitting IEEE 802.11a (W58)	5745MHz	24Mbps, PN9
Radiated emission (below 1GHz) *2)	Transmitting IEEE 802.11b	2412MHz	6Mbps, PN9
	Transmitting IEEE 802.11g	2412MHz	2Mbps, PN9
	Transmitting IEEE 802.11a (W58)	5745MHz, 5785MHz, 5825MHz	24Mbps, PN9
Other items	Transmitting IEEE 802.11b	2412MHz, 2437MHz, 2462MHz	2Mbps, PN9
	Transmitting IEEE 802.11g	2412MHz, 2437MHz, 2462MHz	6Mbps, PN9
	Transmitting IEEE 802.11a (W58)	5745MHz, 5785MHz, 5825MHz	24Mbps, PN9

*1) The worst condition was determined based on the test result of Maximum Peak Output Power.
*2) 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.

Power setting:

Antenna type	2.14 dBi (Single)	2.14 dBi (Dual)	6 dBi	9 dBi	15 dBi
Attenuator setting:					
IEEE 802.11b	0 dB	0 dB	0 dB	0 dB	0 dB
IEEE 802.11g	0 dB	2 dB	4 dB	5 dB	0 dB
IEEE 802.11a	-	0 dB	-	-	-

*3) Software: YFGW510 Tool, Revision: 0326

Since the attenuator value is adjusted for each antenna to change the output power, all test items have been performed for each antenna.

*4) Two of the same WLAN modules are installed in the equipment, and the module which outputs the higher power is selected for the test, based on the result of pre-check measurement.

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

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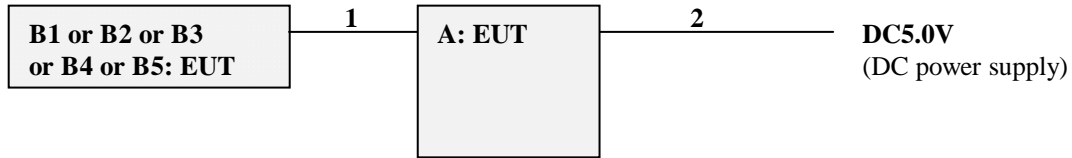
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4.2 Configuration and peripherals



* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	WLAN Redundant Module	F9195KJ	130	YOKOGAWA	EUT
B1	Sleeve antenna	ASSL-NP-0400	-	HOKO ELECTRONICS CO., LTD.	EUT (2.14dBi, Single)
B2	Sleeve antenna	MTA-11DAD2	-	Alfact	EUT (2.14dBi, Dual)
B3	Collinear Antenna	ASCL-NP-00200	-	HOKO ELECTRONICS CO., LTD.	EUT (6dBi)
B4	Collinear Antenna	ASCL-NP-00300	-	HOKO ELECTRONICS CO., LTD.	EUT (9dBi)
B5	Patch compound Antenna	MTA-11PA15-YO	0001	Alfact	EUT (15dBi)

List of cables used

No.	Cable Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Antenna	0.1	Shielded	Shielded	-
2	DC	1.4	Unshielded	Unshielded	-
3	DC	2.6	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 was aligned and was flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from LISN.
Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source. All unused 50ohm connectors of the LISN were resistively terminated in 50ohm when not connected to the measuring equipment.
Photographs of the set up are shown in APPENDIX 3.

5.3 Test conditions

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

5.4 Test procedure

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

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

5.5 Results

Summary of the test results : Pass
Refer to APPENDIX 1

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SECTION 6: Radiated emission

6.1 Operating environment

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

6.2 Test configuration

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

6.3 Test conditions

Frequency range : 30MHz to 40GHz
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	1-40GHz		20dBc
Detection type	Quasi-Peak	Peak	*1) Average	Peak
IF Bandwidth	120kHz	RBW: 1MHz VBW: 3MHz	RBW: 1MHz VBW: 10Hz *2)	RBW: 100kHz VBW: 300kHz

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

*2) VBW was set to 10Hz since the EUT has 100% of duty.

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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.

Combinations of the worst case

2.4GHz band:

Subject	Antenna polarization	Carrier (Band edge)	Spurious	
			Below 1GHz	Above 1GHz
Antenna type of the EUT: 2.14dBi, Single				
Module	Horizontal	Z	X	Z
Antenna		Y	Y	Y
Module	Vertical	Z	Z	X
Antenna		X	Y	X
Antenna type of the EUT: 2.14dBi, Dual				
Module	Horizontal	Z	X	Z
Antenna		Y	Y	Y
Module	Vertical	Z	Z	X
Antenna		X	Y	X
Antenna type of the EUT: 6dBi, Single				
Module	Horizontal	X	Z	Z
Antenna		Y	Y	Y
Module	Vertical	X	Z	Z
Antenna		X	Y	Y
Antenna type of the EUT: 9dBi, Single				
Module	Horizontal	Z	Z	Z
Antenna		Y	Y	X
Module	Vertical	Z	Z	Z
Antenna		X	Y	X
Antenna type of the EUT: 15dBi, Single				
Module	Horizontal	Z	Z	Y
Antenna		X *3)		
Module	Vertical	Z	Z	X
Antenna		X *3)		

5GHz band:

Subject	Antenna polarization	Carrier (Band edge)	Spurious	
			Below 1GHz	Above 1GHz
Antenna type of the EUT: 2.14dBi, Dual				
Module	Horizontal	Z	X	Z
Antenna		Y	Y	Y
Module	Vertical	Z	Z	Z
Antenna		X	X	X

* The definition of the axis was listed in a 'Pre-check of the worst position' in APPENDIX.

*3) Antenna (15dBi): X axis only

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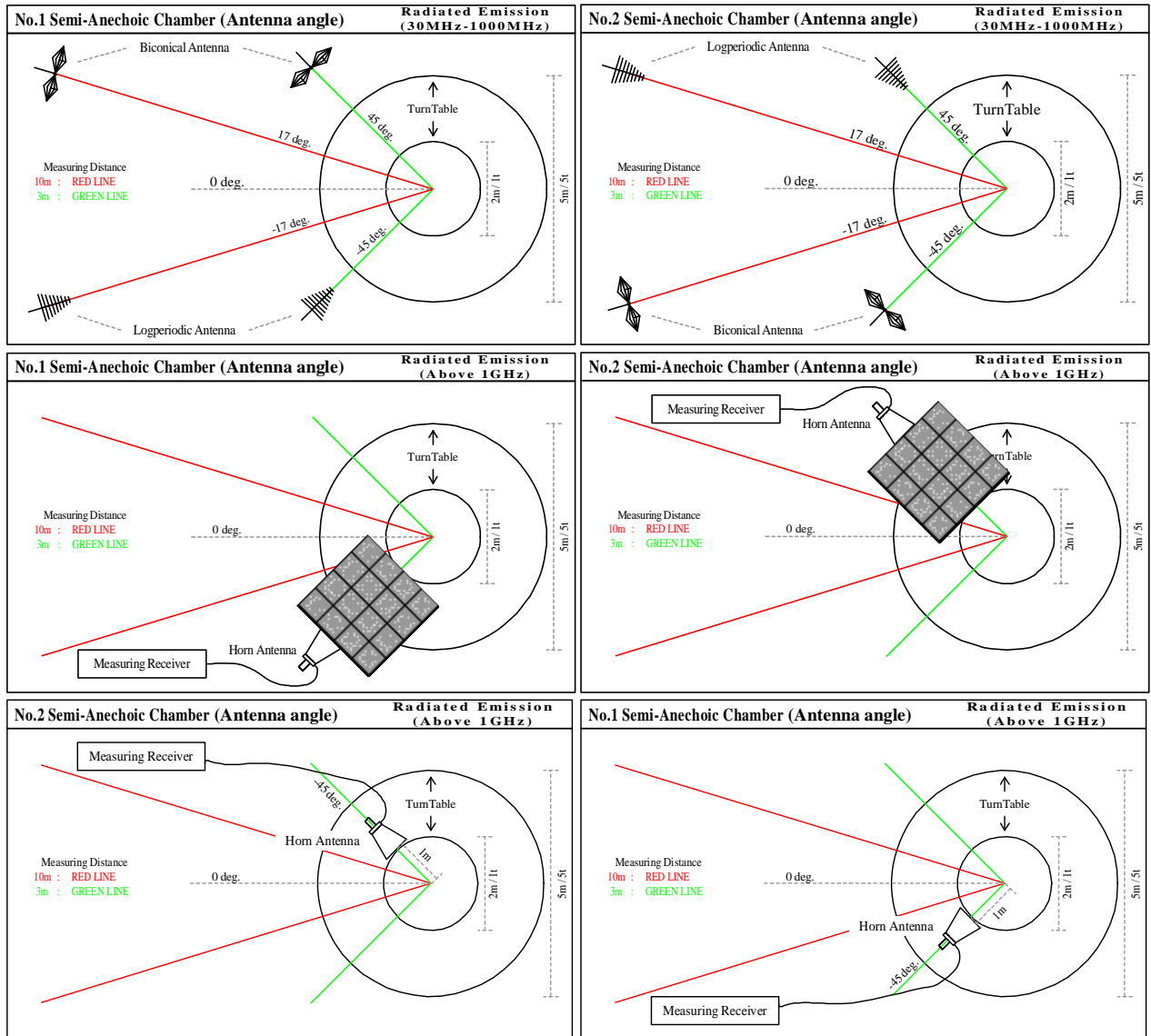
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Figure 1. Antenna angle



6.5 Band edge

Band edge level at 2390MHz, 2483.5MHz, 5725MHz and 5850MHz 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 other than listed points.

Refer to APPENDIX 1

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

Test procedure

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

Summary of the test results: Pass
Refer to APPENDIX 1

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

Test procedure

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

Summary of the test results: Pass
Refer to APPENDIX 1

SECTION 9: Maximum peak output power

Test procedure

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

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 *1)
RBW / VBW : 30kHz / 100kHz *2)

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

Summary of the test results: Pass
Refer to APPENDIX 1

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Contents of APPENDIXES

APPENDIX 1: Data of Radio tests

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

APPENDIX 2: Test instruments

Test instruments

APPENDIX 3: Photographs of test setup

Conducted emission
Radiated emission
Pre-check of worst position

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APPENDIX 1: Data of Radio tests

DATA OF CONDUCTED EMISSION TEST

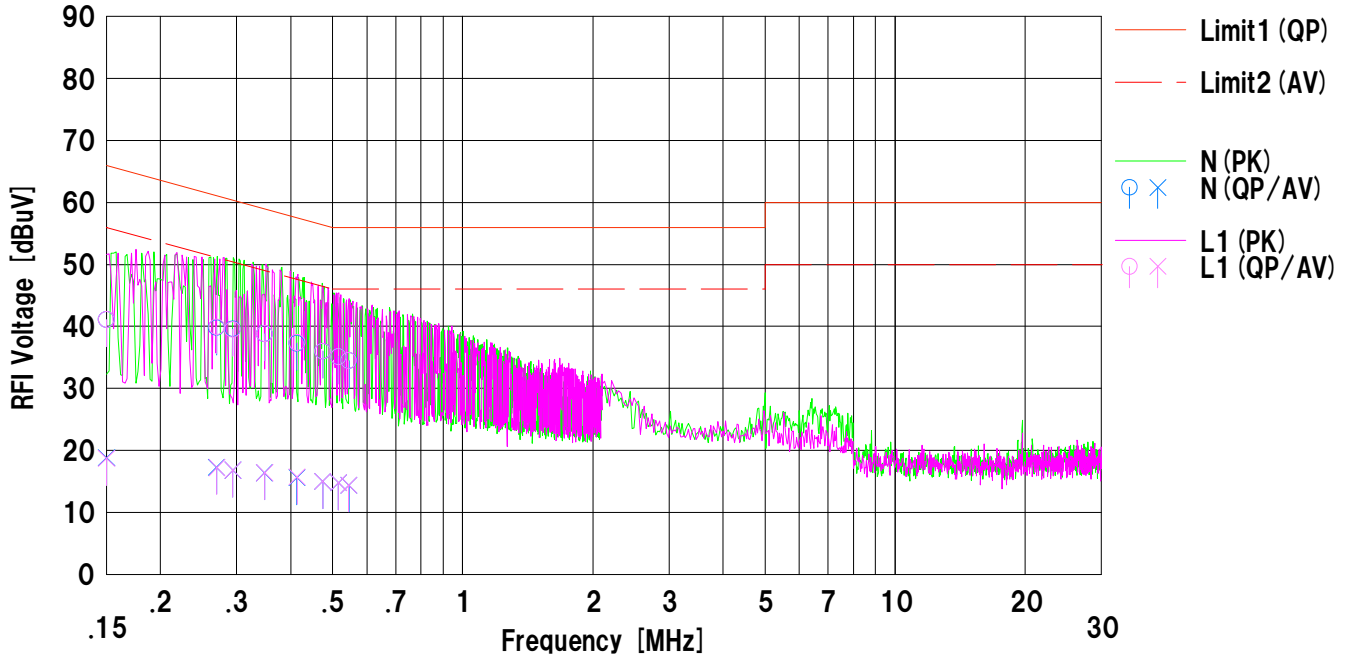
UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2012/07/06

Model No. : F9195KJ
Serial No. : 130
Remarks : 2.14dBi Single Antenna

Mode : Tx 11g 2412MHz
Report No. : 32CE0252-SH-02-A
Power : DC 5.0V
Temp./Humi. : 24deg.C / 66%RH

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

Engineer : Yasumasa Owaki



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP>	<AV>		<QP>	<AV>	<QP>	<AV>	<QP>	<AV>		
		[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.15000	28.5	6.2	12.6	41.1	18.8	66.0	56.0	24.9	37.2	N	
2	0.26975	27.2	4.7	12.6	39.8	17.3	61.1	51.1	21.3	33.8	N	
3	0.29423	27.0	4.2	12.6	39.6	16.8	60.4	50.4	20.8	33.6	N	
4	0.34779	26.2	3.8	12.6	38.8	16.4	59.0	49.0	20.2	32.6	N	
5	0.41340	24.7	3.0	12.6	37.3	15.6	57.5	47.5	20.2	31.9	N	
6	0.47476	23.4	2.4	12.6	36.0	15.0	56.4	46.4	20.4	31.4	N	
7	0.51568	22.5	2.2	12.6	35.1	14.8	56.0	46.0	20.9	31.2	N	
8	0.54552	21.9	1.8	12.6	34.5	14.4	56.0	46.0	21.5	31.6	N	
9	0.15000	28.5	6.1	12.6	41.1	18.7	66.0	56.0	24.9	37.3	L1	
10	0.27012	27.3	4.6	12.6	39.9	17.2	61.1	51.1	21.2	33.9	L1	
11	0.29391	26.9	4.2	12.6	39.5	16.8	60.4	50.4	20.9	33.6	L1	
12	0.34832	26.2	3.8	12.6	38.8	16.4	59.0	49.0	20.2	32.6	L1	
13	0.41389	24.8	3.1	12.6	37.4	15.7	57.5	47.5	20.1	31.8	L1	
14	0.47440	23.4	2.4	12.6	36.0	15.0	56.4	46.4	20.4	31.4	L1	
15	0.51615	22.5	2.2	12.6	35.1	14.8	56.0	46.0	20.9	31.2	L1	
16	0.54512	21.9	1.8	12.6	34.5	14.4	56.0	46.0	21.5	31.6	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-01

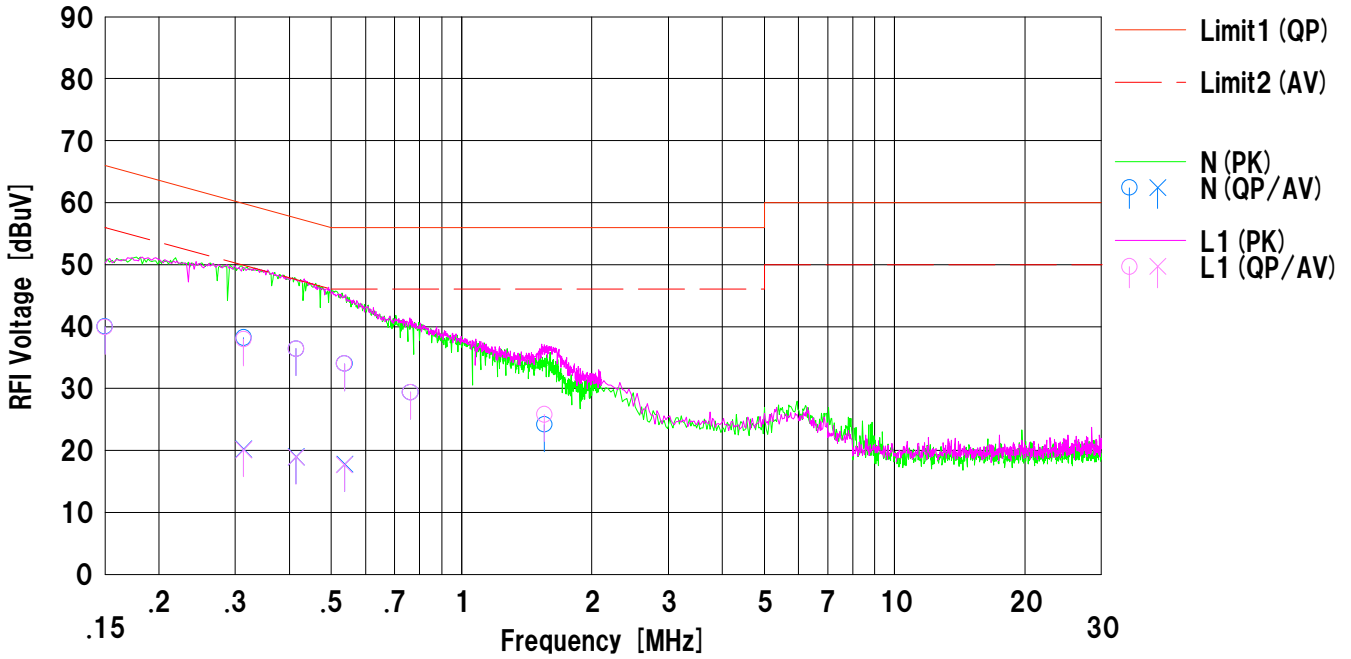
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2012/07/10

Model No. : F9195KJ	Mode : Tx 11g 2412MHz
Serial No. : 130	Report No. : 32CE0252-SH-02-A
	Power : DC 5.0V
Remarks : 2.14dBi Dual Antenna	Temp./Humi. : 21deg.C / 64%RH

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

Engineer : Makoto Hosaka



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	27.4	---	12.6	40.0	---	66.0	56.0	26.0	---	N	
2	0.31392	25.6	7.6	12.6	38.2	20.2	59.8	49.8	21.6	29.6	N	
3	0.41507	23.8	6.4	12.6	36.4	19.0	57.5	47.5	21.1	28.5	N	
4	0.53700	21.4	5.2	12.6	34.0	17.8	56.0	46.0	22.0	28.2	N	
5	0.76281	16.8	---	12.6	29.4	---	56.0	46.0	26.6	---	N	
6	1.55387	11.5	---	12.7	24.2	---	56.0	46.0	31.8	---	N	
7	0.15000	27.3	---	12.6	39.9	---	66.0	56.0	26.1	---	L1	
8	0.31392	25.4	7.5	12.6	38.0	20.1	59.8	49.8	21.8	29.7	L1	
9	0.41507	23.8	6.3	12.6	36.4	18.9	57.5	47.5	21.1	28.6	L1	
10	0.53657	21.4	5.1	12.6	34.0	17.7	56.0	46.0	22.0	28.3	L1	
11	0.76281	16.8	---	12.6	29.4	---	56.0	46.0	26.6	---	L1	
12	1.55387	13.1	---	12.7	25.8	---	56.0	46.0	30.2	---	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-01

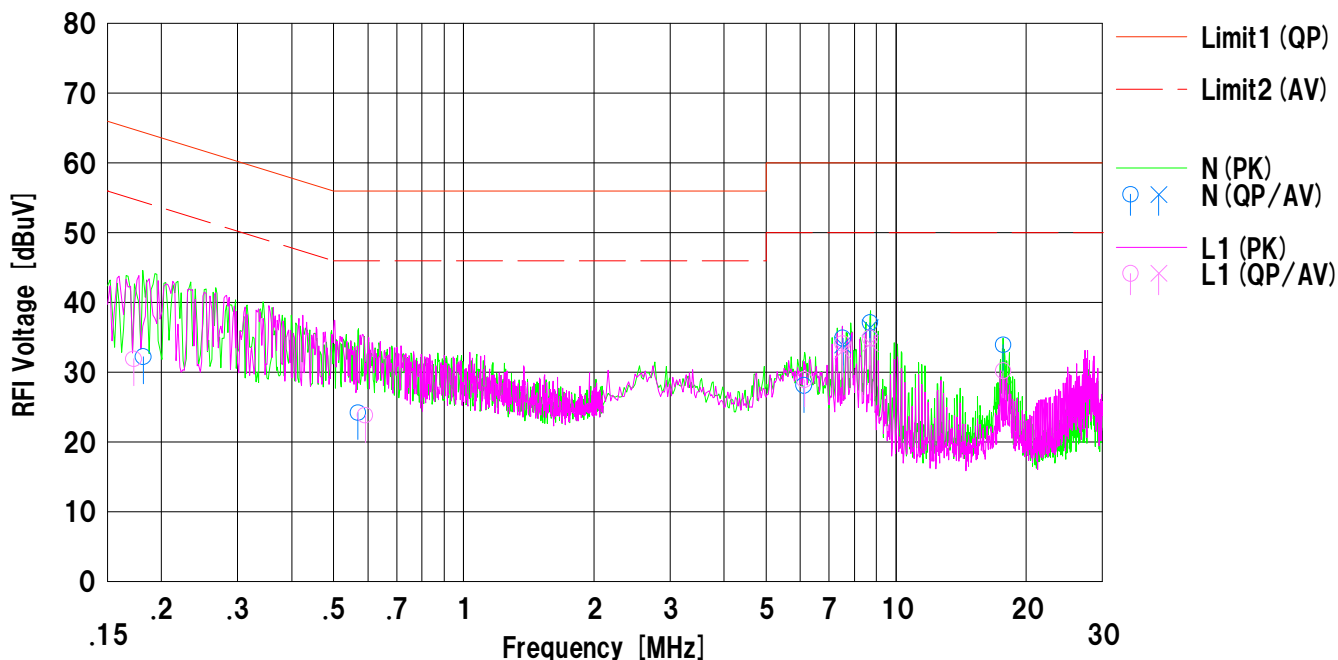
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2012/07/25

Model No. : F9195KJ Serial No. : 130 Remarks : 6dBi Antenna	Mode : Tx 11g 2412MHz Report No. : 32CE0252-SH-02-A Power : DC 5.0V Temp./Humi. : 26deg.C / 63%RH
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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>	<AV>		<QP>	<AV>	<QP>	<AV>	<QP>	<AV>		
		[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.18155	19.6	---	12.6	32.2	---	64.4	54.4	32.2	---	N	
2	0.56991	11.6	---	12.6	24.2	---	56.0	46.0	31.8	---	N	
3	6.12032	15.1	---	13.0	28.1	---	60.0	50.0	31.9	---	N	
4	7.52202	21.9	20.9	13.0	34.9	33.9	60.0	50.0	25.1	16.1	N	
5	8.70940	24.0	23.3	13.1	37.1	36.4	60.0	50.0	22.9	13.6	N	
6	17.69346	20.5	---	13.4	33.9	---	60.0	50.0	26.1	---	N	
7	0.17251	19.3	---	12.6	31.9	---	64.8	54.8	32.9	---	L1	
8	0.59177	11.2	---	12.6	23.8	---	56.0	46.0	32.2	---	L1	
9	6.13704	15.9	---	13.0	28.9	---	60.0	50.0	31.1	---	L1	
10	7.52132	21.1	20.1	13.0	34.1	33.1	60.0	50.0	25.9	16.9	L1	
11	8.70939	21.8	21.0	13.1	34.9	34.1	60.0	50.0	25.1	15.9	L1	
12	17.69303	16.8	---	13.4	30.2	---	60.0	50.0	29.8	---	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-01

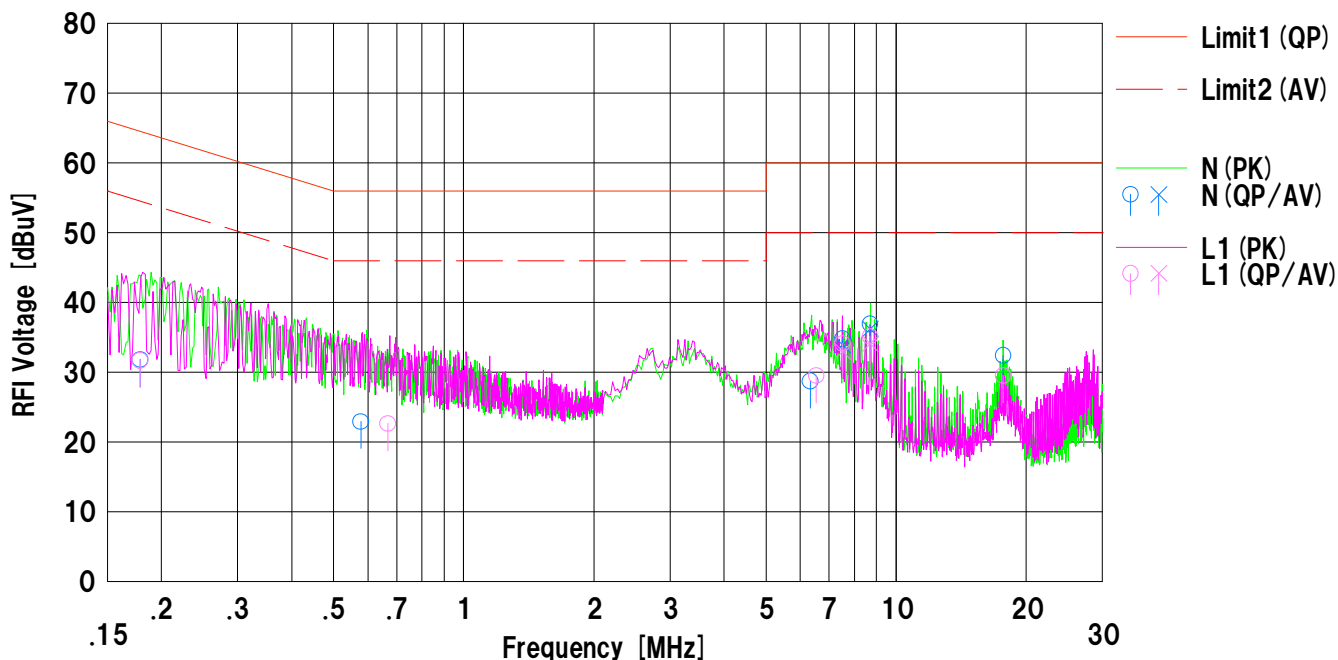
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2012/07/25

Model No.	: F9195KJ	Mode	: Tx 11g 2412MHz
Serial No.	: 130	Report No.	: 32CE0252-SH-02-A
		Power	: DC 5.0V
		Temp./Humi.	: 26deg.C / 63%RH
Remarks	: 9dBi Antenna		

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>	<AV>		<QP>	<AV>	<QP>	<AV>	<QP>	<AV>		
		[dBuV]	[dBuV]		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.17862	19.2	---	12.6	31.8	---	64.5	54.5	32.7	---	N	
2	0.57775	10.3	---	12.6	22.9	---	56.0	46.0	33.1	---	N	
3	6.33201	15.7	---	13.0	28.7	---	60.0	50.0	31.3	---	N	
4	7.52030	21.8	209	13.0	34.8	33.9	60.0	50.0	25.2	16.1	N	
5	8.71012	23.8	23.1	13.1	36.9	36.2	60.0	50.0	23.1	13.8	N	
6	17.69550	19.0	---	13.4	32.4	---	60.0	50.0	27.6	---	N	
7	0.17845	19.1	---	12.6	31.7	---	64.5	54.5	32.8	---	L1	
8	0.66750	10.0	---	12.6	22.6	---	56.0	46.0	33.4	---	L1	
9	6.53200	16.5	---	13.0	29.5	---	60.0	50.0	30.5	---	L1	
10	7.52008	21.1	200	13.0	34.1	33.0	60.0	50.0	25.9	17.0	L1	
11	8.70830	22.0	21.0	13.1	35.1	34.1	60.0	50.0	24.9	15.9	L1	
12	17.69445	16.1	---	13.4	29.5	---	60.0	50.0	30.5	---	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-01

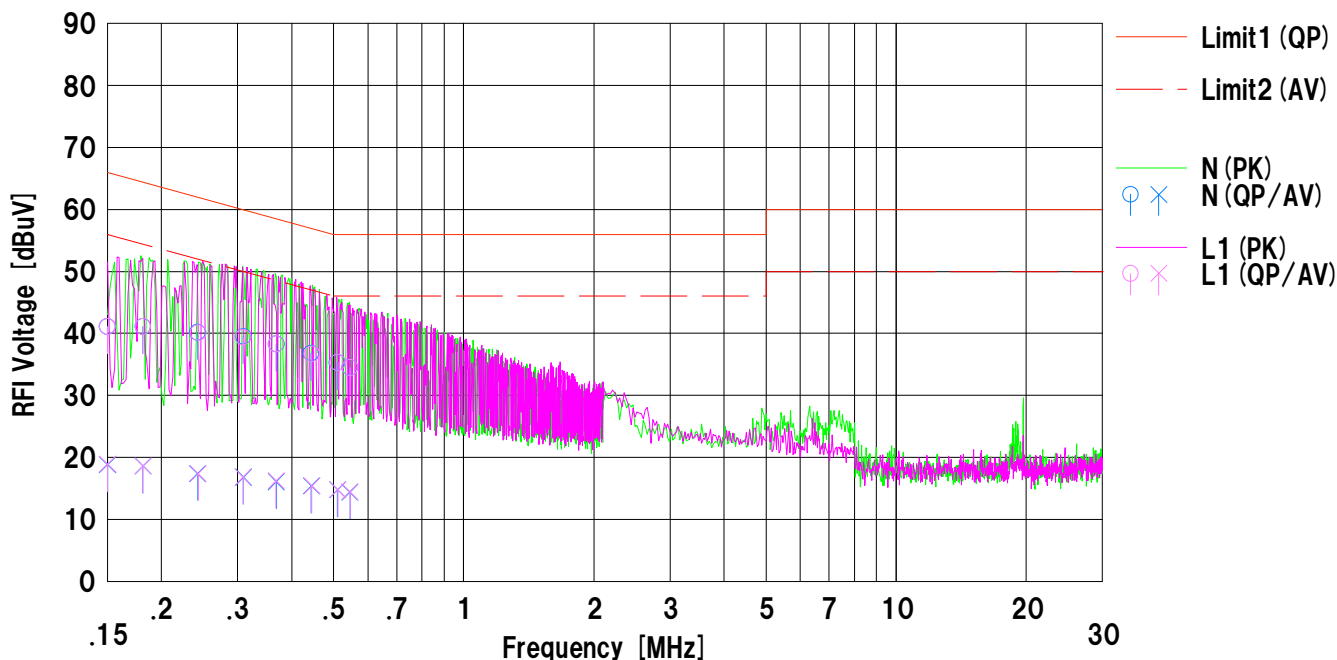
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2012/07/06

Model No. : F9195KJ
 Serial No. : 130
 Remarks : 15dBi Antenna
 Mode : Tx 11g 2412MHz
 Report No. : 32CE0252-SH-02-A
 Power : DC 5.0V
 Temp./Humi. : 24deg.C / 66%RH

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

Engineer : Yasumasa Owaki



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	28.5	6.2	12.6	41.1	18.8	66.0	56.0	24.9	37.2	N	
2	0.18124	28.5	6.0	12.6	41.1	18.6	64.4	54.4	23.3	35.8	N	
3	0.24245	27.6	4.8	12.6	40.2	17.4	62.0	52.0	21.8	34.6	N	
4	0.30943	26.9	4.2	12.6	39.5	16.8	59.9	49.9	20.4	33.1	N	
5	0.36882	25.7	3.5	12.6	38.3	16.1	58.5	48.5	20.2	32.4	N	
6	0.44398	24.2	2.8	12.6	36.8	15.4	56.9	46.9	20.1	31.5	N	
7	0.51067	22.7	2.2	12.6	35.3	14.8	56.0	46.0	20.7	31.2	N	
8	0.54541	21.9	1.8	12.6	34.5	14.4	56.0	46.0	21.5	31.6	N	
9	0.15000	28.5	6.3	12.6	41.1	18.9	66.0	56.0	24.9	37.1	L1	
10	0.18127	28.5	6.0	12.6	41.1	18.6	64.4	54.4	23.3	35.8	L1	
11	0.24328	27.5	4.8	12.6	40.1	17.4	61.9	51.9	21.8	34.5	L1	
12	0.30888	26.8	4.2	12.6	39.4	16.8	60.0	50.0	20.6	33.2	L1	
13	0.36827	25.7	3.6	12.6	38.3	16.2	58.5	48.5	20.2	32.3	L1	
14	0.44537	24.1	2.8	12.6	36.7	15.4	56.9	46.9	20.2	31.5	L1	
15	0.51110	22.7	2.2	12.6	35.3	14.8	56.0	46.0	20.7	31.2	L1	
16	0.54589	21.9	1.9	12.6	34.5	14.5	56.0	46.0	21.5	31.5	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]
 LISN: SLS-01

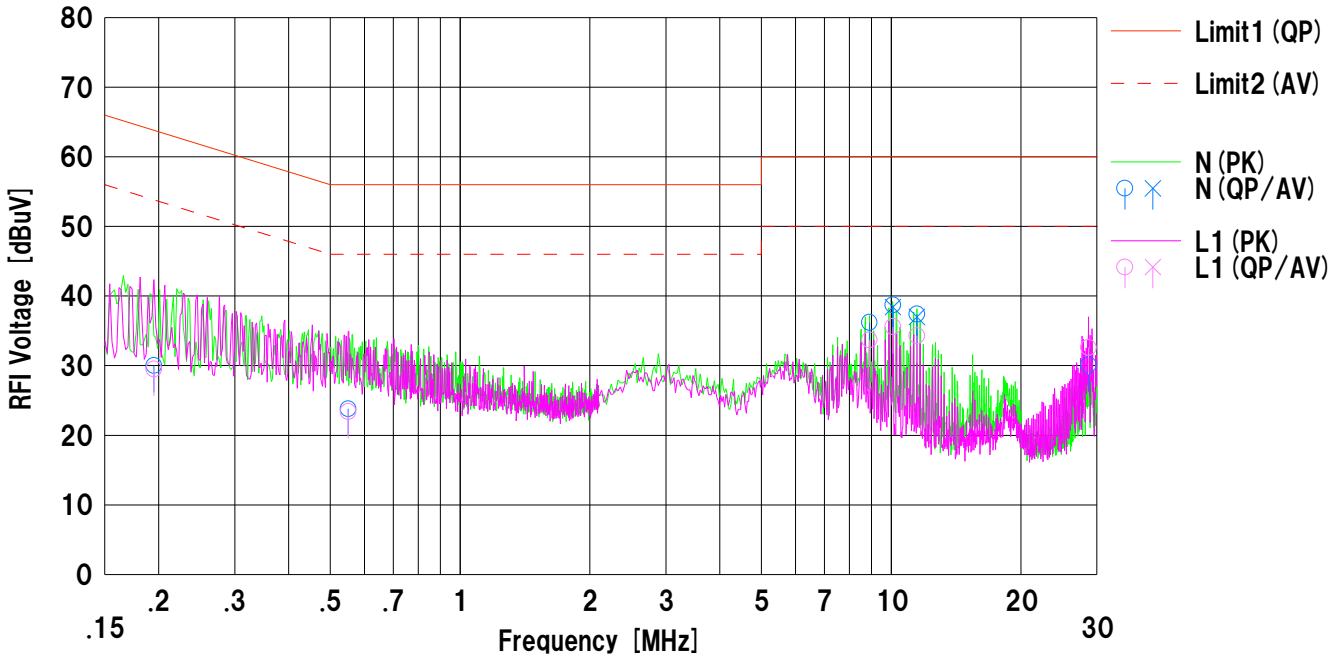
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.1 Shielded Room
Date : 2012/07/18

Model No.	: F9195KJ	Mode	: Tx 11a 5745MHz
Serial No.	: 130	Report No.	: 32CE0252-SH-02-A
		Power	: DC 5.0V
		Temp./Humi.	: 26deg.C / 54%RH
Remarks	: 2.14dBi Dual Antenna		

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

Engineer : Wataru Kojima



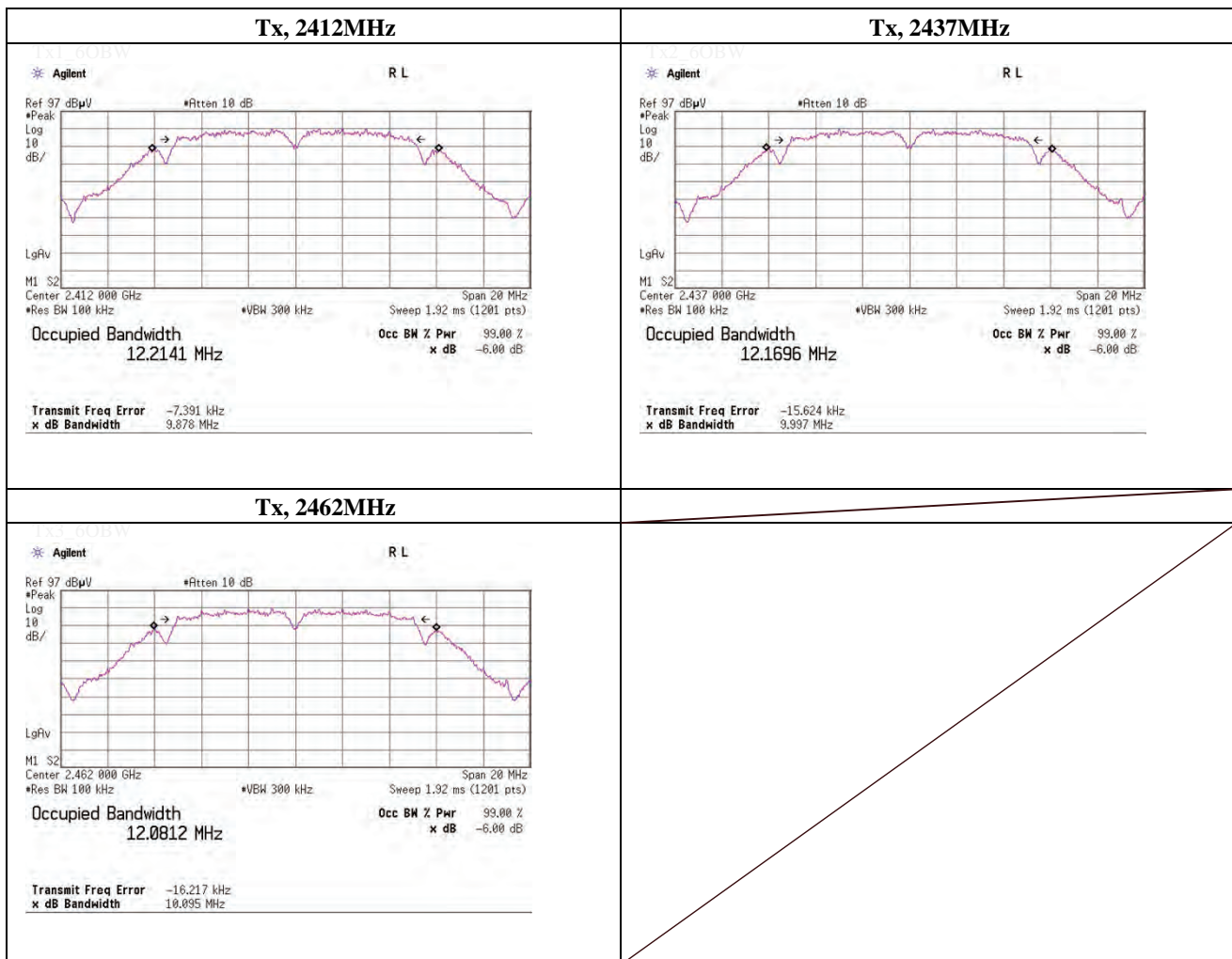
No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.19481	17.4	---	12.6	30.0	---	63.8	53.8	33.8	---	N	
2	0.54982	11.2	---	12.6	23.8	---	56.0	46.0	32.2	---	N	
3	8.90455	23.1	---	13.1	36.2	---	60.0	50.0	23.8	---	N	
4	10.09181	25.6	25.3	13.1	38.7	38.4	60.0	50.0	21.3	11.6	N	
5	11.47815	24.3	23.9	13.1	37.4	37.0	60.0	50.0	22.6	13.0	N	
6	28.68920	16.3	---	13.8	30.1	---	60.0	50.0	29.9	---	N	
7	0.19481	16.9	---	12.6	29.5	---	63.8	53.8	34.3	---	L1	
8	0.54982	10.8	---	12.6	23.4	---	56.0	46.0	32.6	---	L1	
9	8.90545	20.6	---	13.1	33.7	---	60.0	50.0	26.3	---	L1	
10	10.09199	22.5	---	13.1	35.6	---	60.0	50.0	24.4	---	L1	
11	11.47780	21.2	---	13.1	34.3	---	60.0	50.0	25.7	---	L1	
12	28.68920	18.8	---	13.8	32.6	---	60.0	50.0	27.4	---	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-01

-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	May 23, 2012	
Temperature / Humidity	23deg.C , 45%RH	
Engineer	Makoto Hosaka	
Mode	Tx, IEEE802.11b, PN9, worst data mode 2Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	9.878	> 0.500
2437.0000	9.997	> 0.500
2462.0000	10.095	> 0.500

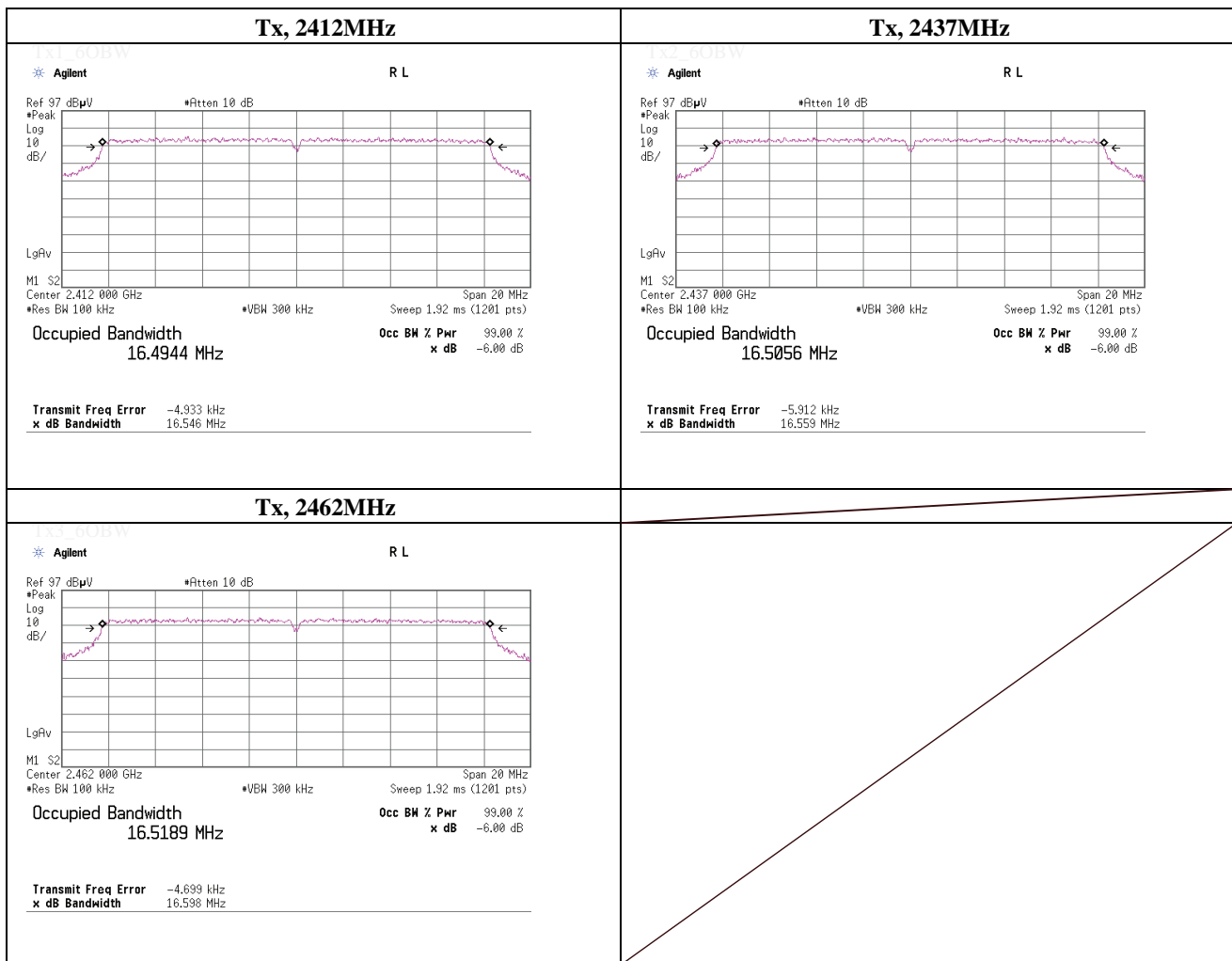


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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	May 23, 2012	
Temperature / Humidity	23deg.C , 45%RH	
Engineer	Makoto Hosaka	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	Antenna: 2.14dBi Single, 15dBi Single

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.546	> 0.500
2437.0000	16.559	> 0.500
2462.0000	16.598	> 0.500

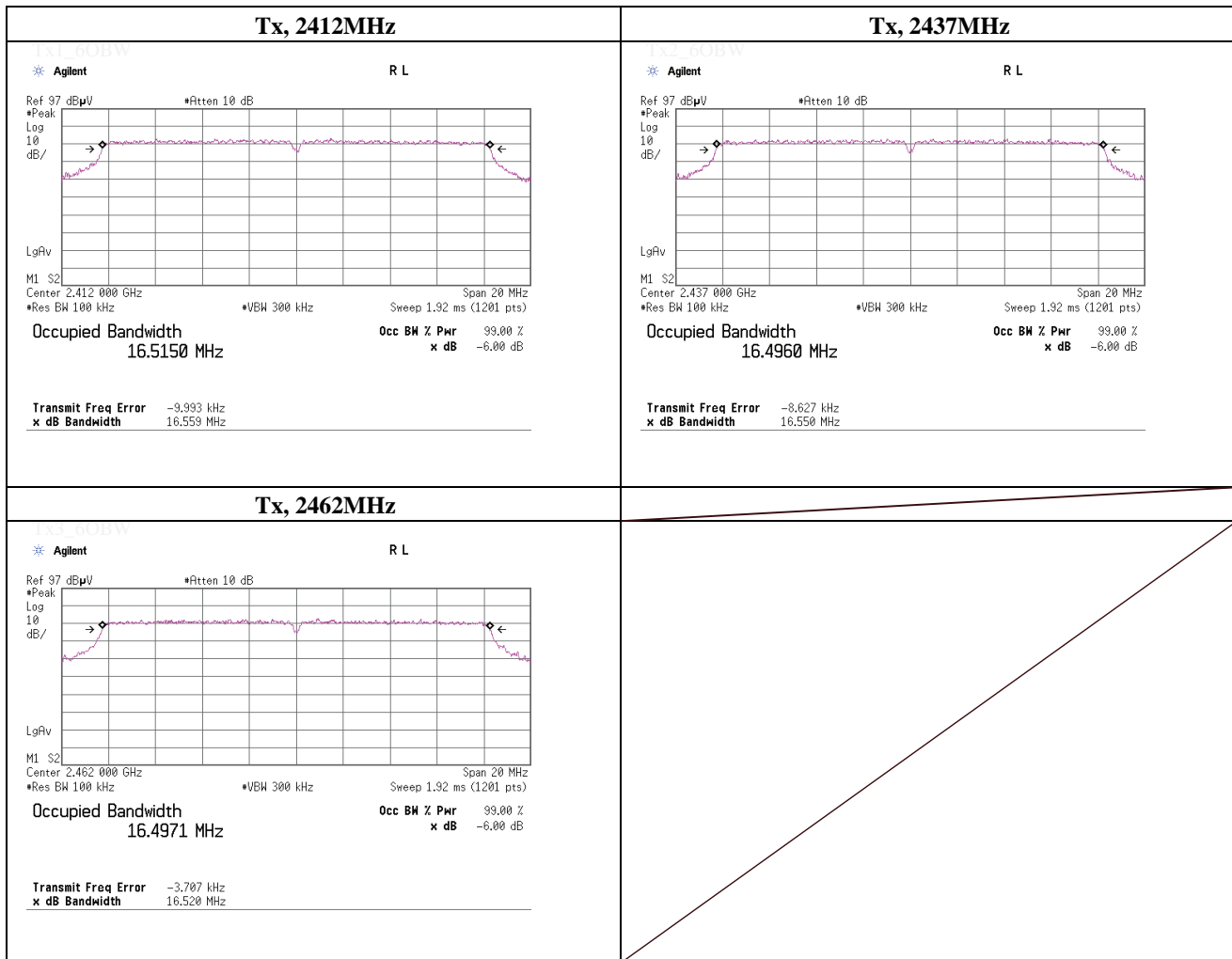


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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	July 25, 2012	
Temperature / Humidity	25deg.C , 53%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	Antenna: 2.14dBi Dual

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.559	> 0.500
2437.0000	16.550	> 0.500
2462.0000	16.520	> 0.500

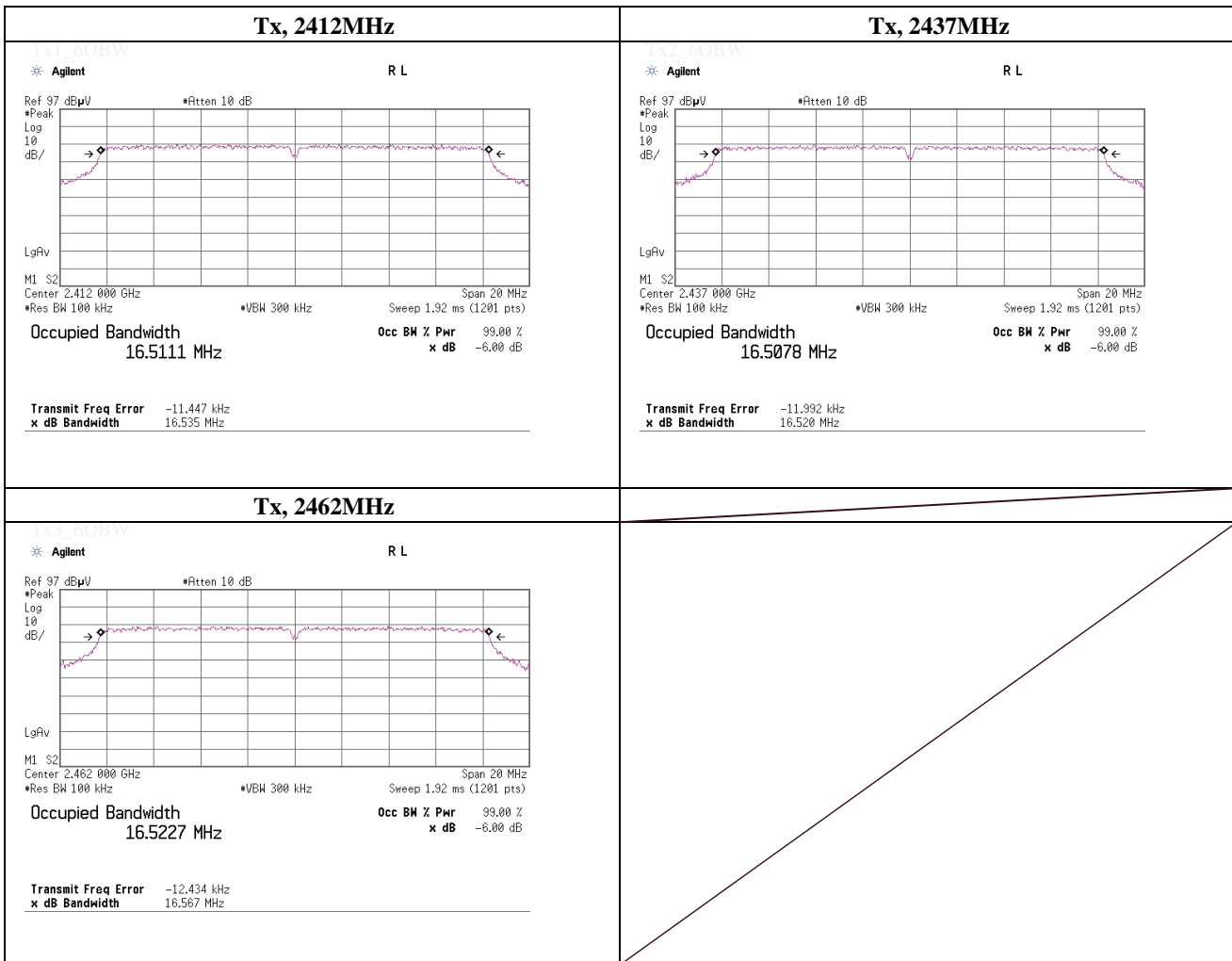


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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	July 25, 2012	
Temperature / Humidity	25deg.C , 53%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	Antenna: 9dBi Single

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.535	> 0.500
2437.0000	16.520	> 0.500
2462.0000	16.567	> 0.500

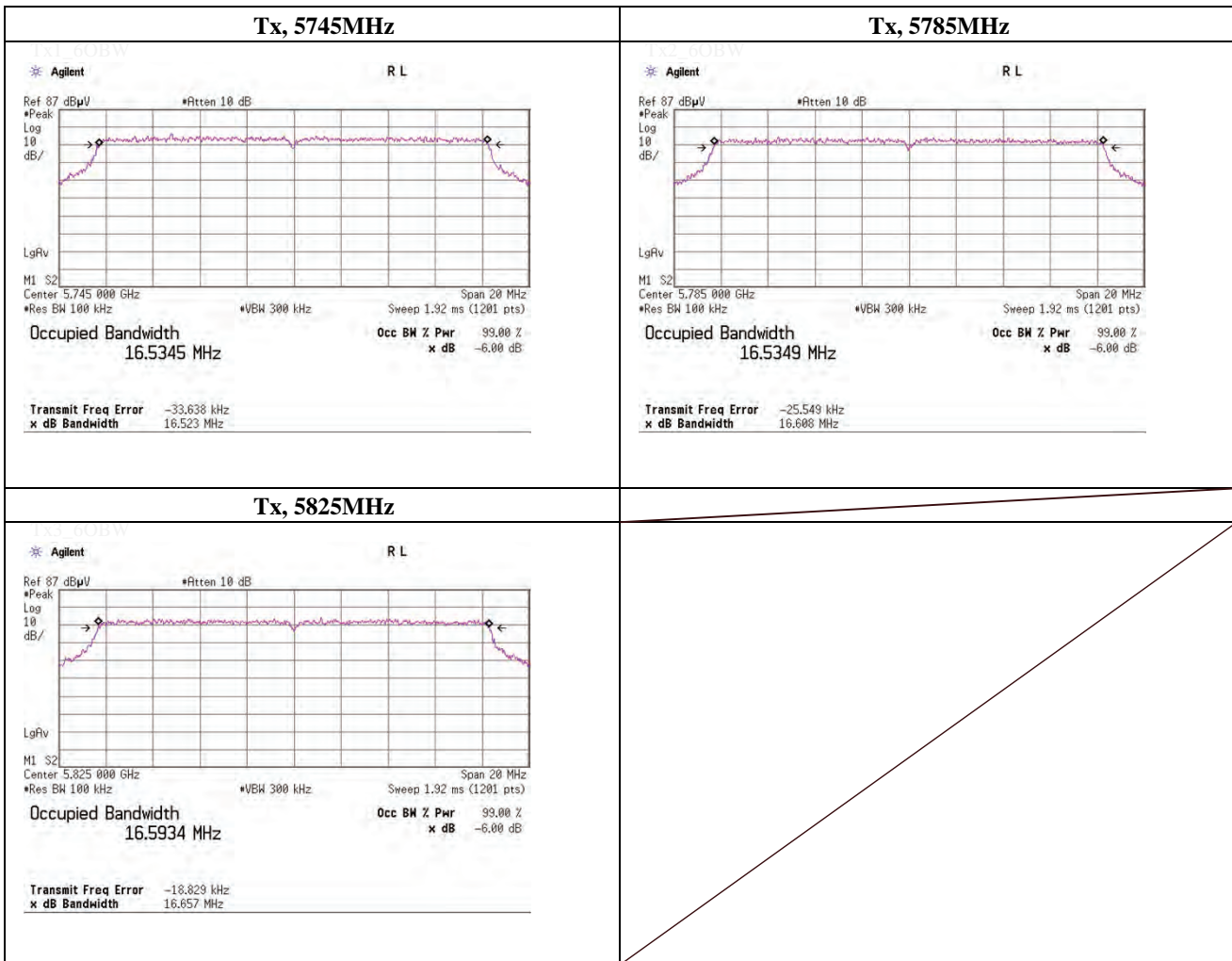


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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	May 23, 2012	
Temperature / Humidity	23deg.C , 45%RH	
Engineer	Makoto Hosaka	
Mode	Tx, IEEE802.11a, PN9, worst data mode 24Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
5745.0000	16.523	> 0.500
5785.0000	16.608	> 0.500
5825.0000	16.657	> 0.500



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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date May 23, 2012
 Temperature / Humidity 23deg.C , 45%RH
 Engineer Makoto Hosaka
 Mode Tx, IEEE802.11b, PN9, Antenna: 2.14dBi single/ Dual worst data mode : 2 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	-6.75	2.76	20.22	16.23	41.98	30.00	1000	13.77
Mid	2437.0	-7.08	2.76	20.22	15.90	38.90	30.00	1000	14.10
High	2462.0	-7.45	2.77	20.22	15.54	35.81	30.00	1000	14.46

Sample Calculation:

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

[Pre check]

	Data rate [Mbps]	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
						[dBm]	[mW]	[dBm]	[mW]	
	1	2437.0	-7.14	2.76	20.22	15.84	38.37	30.00	1000	14.16
	2	2437.0	-7.08	2.76	20.22	15.90	38.90	30.00	1000	14.10
	5.5	2437.0	-7.92	2.76	20.22	15.06	32.06	30.00	1000	14.94
	11	2437.0	-7.11	2.76	20.22	15.87	38.64	30.00	1000	14.13

Worst

Sample Calculation:

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

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date May 23, 2012
 Temperature / Humidity 23deg.C , 45%RH
 Engineer Makoto Hosaka
 Mode Tx, IEEE802.11b, PN9, Antenna: 6dBi Single 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 (*1)		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	-6.75	2.76	20.22	16.23	41.98	29.90	977	13.67
Mid	2437.0	-7.08	2.76	20.22	15.90	38.90	29.90	977	14.00
High	2462.0	-7.45	2.77	20.22	15.54	35.81	29.90	977	14.36

Sample Calculation:

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

*1) Limit: 30dBm-(6.1dBi-6dBi)=29.9dBm [15.247, b, (4)]

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date May 23, 2012
 Temperature / Humidity 23deg.C , 45%RH
 Engineer Makoto Hosaka
 Mode Tx, IEEE802.11b, PN9, Antenna: 9dBi Single 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 (*1)		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	-6.75	2.76	20.22	16.23	41.98	27.40	549	11.17
Mid	2437.0	-7.08	2.76	20.22	15.90	38.90	27.40	549	11.50
High	2462.0	-7.45	2.77	20.22	15.54	35.81	27.40	549	11.86

Sample Calculation:

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

*1) Limit: 30dBm-(8.6dBi-6dBi)=27.4dBm [15.247, b, (4)]

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date May 23, 2012
 Temperature / Humidity 23deg.C , 45%RH
 Engineer Makoto Hosaka
 Mode Tx, IEEE802.11b, PN9, Antenna: 15dBi Single 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 (*1)		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	-6.75	2.76	20.22	16.23	41.98	21.00	125	4.77
Mid	2437.0	-7.08	2.76	20.22	15.90	38.90	21.00	125	5.10
High	2462.0	-7.45	2.77	20.22	15.54	35.81	21.00	125	5.46

Sample Calculation:

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

*1) Limit: 30dBm-(15dBi-6dBi)=21dBm [15.247, b, (4)]

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date May 23, 2012
 Temperature / Humidity 23deg.C , 45%RH
 Engineer Makoto Hosaka
 Mode Tx, IEEE802.11g, PN9, Antenna: 2.14dBi Single worst data mode : 6 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	-4.73	2.76	20.22	18.25	66.83	30.00	1000	11.75
Mid	2437.0	-4.87	2.76	20.22	18.11	64.71	30.00	1000	11.89
High	2462.0	-5.12	2.77	20.22	17.87	61.24	30.00	1000	12.13

Sample Calculation:

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

[Pre check]

Data rate [Mbps]	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
6	2437.0	-4.87	2.76	20.22	18.11	64.71	30.00	1000	11.89
9	2437.0	-4.88	2.76	20.22	18.10	64.57	30.00	1000	11.90
12	2437.0	-4.89	2.76	20.22	18.09	64.42	30.00	1000	11.91
18	2437.0	-4.98	2.76	20.22	18.00	63.10	30.00	1000	12.00
24	2437.0	-5.19	2.76	20.22	17.79	60.12	30.00	1000	12.21
36	2437.0	-5.24	2.76	20.22	17.74	59.43	30.00	1000	12.26
48	2437.0	-5.18	2.76	20.22	17.80	60.26	30.00	1000	12.20
54	2437.0	-5.22	2.76	20.22	17.76	59.70	30.00	1000	12.24

Worst

Sample Calculation:

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

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date July 25, 2012
 Temperature / Humidity 25deg.C , 53%RH
 Engineer Shinichi Takano
 Mode Tx, IEEE802.11g, PN9, Antenna: 2.14dBi Dual worst data mode : 6 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	-6.53	2.76	20.22	16.45	44.16	30.00	1000	13.55
Mid	2437.0	-6.79	2.76	20.22	16.19	41.59	30.00	1000	13.81
High	2462.0	-7.19	2.77	20.22	15.80	38.02	30.00	1000	14.20

Sample Calculation:

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

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date July 25, 2012
 Temperature / Humidity 25deg.C , 53%RH
 Engineer Shinichi Takano
 Mode Tx, IEEE802.11g, PN9, Antenna: 6dBi Single 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 (*1)		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	-8.61	2.76	20.22	14.37	27.35	29.90	977	15.53
Mid	2437.0	-8.84	2.76	20.22	14.14	25.94	29.90	977	15.76
High	2462.0	-9.14	2.77	20.22	13.85	24.27	29.90	977	16.05

Sample Calculation:

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

*1) Limit: 30dBm-(6.1dBi-6dBi)=29.9dBm [15.247, b, (4)]

Sample Calculation:

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

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date July 25, 2012
 Temperature / Humidity 25deg.C , 53%RH
 Engineer Shinichi Takano
 Mode Tx, IEEE802.11g, PN9, Antenna: 9dBi Single 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 (*1)		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	-9.63	2.76	20.22	13.35	21.63	27.40	549	14.05
Mid	2437.0	-9.81	2.76	20.22	13.17	20.75	27.40	549	14.23
High	2462.0	-10.17	2.77	20.22	12.82	19.14	27.40	549	14.58

Sample Calculation:

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

*1) Limit: 30dBm-(8.6dBi-6dBi)=27.4dBm [15.247, b, (4)]

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date May 23, 2012
 Temperature / Humidity 23deg.C , 45%RH
 Engineer Makoto Hosaka
 Mode Tx, IEEE802.11g, PN9, Antenna: 15dBi Single 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 (*1)		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	-4.73	2.76	20.22	18.25	66.83	21.00	125	2.75
Mid	2437.0	-4.87	2.76	20.22	18.11	64.71	21.00	125	2.89
High	2462.0	-5.12	2.77	20.22	17.87	61.24	21.00	125	3.13

Sample Calculation:

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

*1) Limit: 30dBm-(15dBi-6dBi)=21dBm [15.247, b, (4)]

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Peak Output Power (Conducted)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date May 23, 2012
 Temperature / Humidity 23deg.C , 45%RH
 Engineer Makoto Hosaka
 Mode Tx, IEEE802.11a, PN9, Antenna: 2.14dBi Dual worst data mode : 24 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	5745.0	-12.25	3.48	20.18	11.41	13.84	30.00	1000	18.59
Mid	5785.0	-12.98	3.49	20.18	10.69	11.72	30.00	1000	19.31
High	5825.0	-13.31	3.50	20.18	10.37	10.89	30.00	1000	19.63

Sample Calculation:

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

[Pre check]

	Data rate [Mbps]	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
						[dBm]	[mW]	[dBm]	[mW]	
	6	5785.0	-13.04	3.49	20.18	10.63	11.56	30.00	1000	19.37
	9	5785.0	-13.03	3.49	20.18	10.64	11.59	30.00	1000	19.36
	12	5785.0	-13.05	3.49	20.18	10.62	11.53	30.00	1000	19.38
	18	5785.0	-13.42	3.49	20.18	10.25	10.59	30.00	1000	19.75
	24	5785.0	-12.98	3.49	20.18	10.69	11.72	30.00	1000	19.31
	36	5785.0	-13.61	3.49	20.18	10.06	10.14	30.00	1000	19.94
	48	5785.0	-13.16	3.49	20.18	10.51	11.25	30.00	1000	19.49
	54	5785.0	-13.40	3.49	20.18	10.27	10.64	30.00	1000	19.73

Worst

Sample Calculation:

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date July 2, 2012 July 4, 2012
Temperature / Humidity 25 deg.C , 61%RH 24 deg.C , 64%RH
Engineer Yasumasa Owaki Yasumasa Owaki
Mode Tx, 2462 MHz
 Tx, IEEE802.11b, PN9, worst data mode 2Mbps Antenna: 2.14dBi Single

(* 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	46.2	28.7	14.0	40.7	48.2	73.9	25.7	100	26	
Hori.	4924.000	PK	50.2	31.5	6.5	41.5	46.7	73.9	27.2	100	101	
Hori.	7386.000	PK	48.1	36.3	8.2	41.3	51.3	73.9	22.6	100	0	
Hori.	9848.000	PK	46.3	38.8	8.9	40.4	53.6	73.9	20.3	100	356	
Hori.	12310.000	PK	45.0	39.6	10.3	39.1	55.8	73.9	18.1	100	0	
Hori.	2483.500	AV	35.8	28.7	14.0	40.7	37.8	53.9	16.1	100	26	
Hori.	4924.000	AV	40.9	31.5	6.5	41.5	37.4	53.9	16.5	100	101	
Hori.	7386.000	AV	35.6	36.3	8.2	41.3	38.8	53.9	15.1	100	0	
Hori.	9848.000	AV	34.4	38.8	8.9	40.4	41.7	53.9	12.2	100	356	
Hori.	12310.000	AV	32.4	39.6	10.3	39.1	43.2	53.9	10.7	100	0	
Vert.	2483.500	PK	45.3	28.7	14.0	40.7	47.3	73.9	26.6	100	326	
Vert.	4924.000	PK	49.8	31.5	6.5	41.5	46.3	73.9	27.6	111	159	
Vert.	7386.000	PK	47.8	36.3	8.2	41.3	51.0	73.9	22.9	100	0	
Vert.	9848.000	PK	46.7	38.8	8.9	40.4	54.0	73.9	19.9	141	261	
Vert.	12310.000	PK	44.7	39.6	10.3	39.1	55.5	73.9	18.4	100	0	
Vert.	2483.500	AV	35.7	28.7	14.0	40.7	37.7	53.9	16.2	100	326	
Vert.	4924.000	AV	40.1	31.5	6.5	41.5	36.6	53.9	17.3	111	159	
Vert.	7386.000	AV	35.7	36.3	8.2	41.3	38.9	53.9	15.0	100	0	
Vert.	9848.000	AV	34.9	38.8	8.9	40.4	42.2	53.9	11.7	141	261	
Vert.	12310.000	AV	32.5	39.6	10.3	39.1	43.3	53.9	10.6	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
 Date July 3, 2012 July 9, 2012
 Temperature / Humidity 23 deg.C , 64%RH 23 deg.C , 64%RH
 Engineer Yasumasa Owaki Makoto Hosaka
 Mode Tx, 2412 MHz
 Tx, IEEE802.11b, PN9, worst data mode 2Mbps Antenna: 2.14dBi Dual

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	2390.000	PK	47.1	28.2	13.9	40.7	48.5	73.9	25.4	100	28	
Hori.	4824.000	PK	54.2	31.2	6.4	41.6	50.2	73.9	23.7	100	240	
Hori.	7236.000	PK	47.6	36.1	7.8	41.2	50.3	73.9	23.6	100	0	
Hori.	9648.000	PK	46.4	38.6	8.9	40.4	53.5	73.9	20.4	100	295	
Hori.	12060.000	PK	47.9	39.5	10.2	39.4	58.2	73.9	15.7	100	0	
Hori.	2390.000	AV	37.6	28.2	13.9	40.7	39.0	53.9	14.9	100	28	
Hori.	4824.000	AV	45.9	31.2	6.4	41.6	41.9	53.9	12.0	100	240	
Hori.	7236.000	AV	36.1	36.1	7.8	41.2	38.8	53.9	15.1	100	0	
Hori.	9648.000	AV	35.8	38.6	8.9	40.4	42.9	53.9	11.0	100	295	
Hori.	12060.000	AV	35.4	39.5	10.2	39.4	45.7	53.9	8.2	100	0	
Vert.	2390.000	PK	48.0	28.2	13.9	40.7	49.4	73.9	24.5	116	34	
Vert.	4824.000	PK	53.5	31.2	6.4	41.6	49.5	73.9	24.4	100	176	
Vert.	7236.000	PK	47.7	36.1	7.8	41.2	50.4	73.9	23.5	100	0	
Vert.	9648.000	PK	46.3	38.6	8.9	40.4	53.4	73.9	20.5	131	285	
Vert.	12060.000	PK	47.3	39.5	10.2	39.4	57.6	73.9	16.3	100	0	
Vert.	2390.000	AV	37.3	28.2	13.9	40.7	38.7	53.9	15.2	116	34	
Vert.	4824.000	AV	44.3	31.2	6.4	41.6	40.3	53.9	13.6	100	176	
Vert.	7236.000	AV	35.7	36.1	7.8	41.2	38.4	53.9	15.5	100	0	
Vert.	9648.000	AV	35.8	38.6	8.9	40.4	42.9	53.9	11.0	131	285	
Vert.	12060.000	AV	34.9	39.5	10.2	39.4	45.2	53.9	8.7	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	100.6	28.3	14.0	40.7	102.2	-	-	Carrier
Hori.	2400.000	PK	60.9	28.2	13.9	40.7	62.3	82.2	19.9	
Vert.	2412.000	PK	100.1	28.3	14.0	40.7	101.7	-	-	Carrier
Vert.	2400.000	PK	60.7	28.2	13.9	40.7	62.1	81.7	19.6	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date July 6, 2012 July 9, 2012
Temperature / Humidity 26 deg.C , 66%RH 23 deg.C , 64%RH
Engineer Hikaru Shirasawa Makoto Hosaka
Mode Tx, 2437 MHz
 Tx, IEEE802.11b, PN9, worst data mode 2Mbps Antenna: 2.14dBi Dual

(* 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	52.6	31.4	6.4	41.5	48.9	73.9	25.0	101	260	
Hori.	7311.000	PK	49.7	36.2	8.1	41.2	52.8	73.9	21.1	100	0	
Hori.	9748.000	PK	48.4	38.7	8.9	40.4	55.6	73.9	18.3	121	172	
Hori.	12185.000	PK	48.3	39.6	10.2	39.2	58.9	73.9	15.0	100	0	
Hori.	4874.000	AV	42.7	31.4	6.4	41.5	39.0	53.9	14.9	101	260	
Hori.	7311.000	AV	36.3	36.2	8.1	41.2	39.4	53.9	14.5	100	0	
Hori.	9748.000	AV	36.0	38.7	8.9	40.4	43.2	53.9	10.7	121	172	
Hori.	12185.000	AV	34.3	39.6	10.2	39.2	44.9	53.9	9.0	100	0	
Vert.	4874.000	PK	52.9	31.4	6.4	41.5	49.2	73.9	24.7	112	152	
Vert.	7311.000	PK	49.6	36.2	8.1	41.2	52.7	73.9	21.2	100	0	
Vert.	9748.000	PK	48.6	38.7	8.9	40.4	55.8	73.9	18.1	106	210	
Vert.	12185.000	PK	48.2	39.6	10.2	39.2	58.8	73.9	15.1	100	0	
Vert.	4874.000	AV	42.8	31.4	6.4	41.5	39.1	53.9	14.8	112	152	
Vert.	7311.000	AV	36.5	36.2	8.1	41.2	39.6	53.9	14.3	100	0	
Vert.	9748.000	AV	35.6	38.7	8.9	40.4	42.8	53.9	11.1	106	210	
Vert.	12185.000	AV	34.6	39.6	10.2	39.2	45.2	53.9	8.7	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date July 3, 2012 July 6, 2012 July 9, 2012
Temperature / Humidity 23 deg.C , 64%RH 26 deg.C , 66%RH 23 deg.C , 64%RH
Engineer Yasumasa Owaki Hikaru Shirasawa Makoto Hosaka
Mode Tx, 2462 MHz
 Tx, IEEE802.11b, PN9, worst data mode 2Mbps Antenna: 2.14dBi Dual

(* 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	48.4	28.7	14.0	40.7	50.4	73.9	23.5	100	32	
Hori.	4924.000	PK	52.7	31.5	6.5	41.5	49.2	73.9	24.7	100	12	
Hori.	7386.000	PK	48.7	36.3	8.2	41.3	51.9	73.9	22.0	100	0	
Hori.	9848.000	PK	48.5	38.8	8.9	40.4	55.8	73.9	18.1	100	48	
Hori.	12310.000	PK	46.0	39.6	10.3	39.1	56.8	73.9	17.1	100	0	
Hori.	2483.500	AV	36.2	28.7	14.0	40.7	38.2	53.9	15.7	100	32	
Hori.	4924.000	AV	42.5	31.5	6.5	41.5	39.0	53.9	14.9	100	12	
Hori.	7386.000	AV	35.6	36.3	8.2	41.3	38.8	53.9	15.1	100	0	
Hori.	9848.000	AV	35.1	38.8	8.9	40.4	42.4	53.9	11.5	100	48	
Hori.	12310.000	AV	33.7	39.6	10.3	39.1	44.5	53.9	9.4	100	0	
Vert.	2483.500	PK	48.7	28.7	14.0	40.7	50.7	73.9	23.2	113	31	
Vert.	4924.000	PK	53.2	31.5	6.5	41.5	49.7	73.9	24.2	127	152	
Vert.	7386.000	PK	48.8	36.3	8.2	41.3	52.0	73.9	21.9	100	0	
Vert.	9848.000	PK	48.6	38.8	8.9	40.4	55.9	73.9	18.0	100	153	
Vert.	12310.000	PK	46.1	39.6	10.3	39.1	56.9	73.9	17.0	100	0	
Vert.	2483.500	AV	36.7	28.7	14.0	40.7	38.7	53.9	15.2	113	31	
Vert.	4924.000	AV	42.6	31.5	6.5	41.5	39.1	53.9	14.8	127	152	
Vert.	7386.000	AV	35.8	36.3	8.2	41.3	39.0	53.9	14.9	100	0	
Vert.	9848.000	AV	35.3	38.8	8.9	40.4	42.6	53.9	11.3	100	153	
Vert.	12310.000	AV	33.6	39.6	10.3	39.1	44.4	53.9	9.5	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

UL Japan, Inc.

Shonan EMC Lab.

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date July 20, 2012 July 21, 2012
Temperature / Humidity 25 deg.C , 58%RH 24 deg.C , 58%RH
Engineer Akio Hayashi Shinichi Takano
Mode Tx, 2412 MHz
 Tx, IEEE802.11b, PN9, worst data mode 2Mbps Antenna: 6dBi Single

(* 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.	239.999	QP	39.5	17.1	9.7	31.7	34.6	46.0	11.4	100	360	
Hori.	319.999	QP	47.9	14.5	7.1	31.7	37.8	46.0	8.2	100	277	
Hori.	399.999	QP	46.6	15.9	7.7	31.8	38.4	46.0	7.6	100	257	
Hori.	799.998	QP	37.8	20.8	9.6	31.8	36.4	46.0	9.6	111	34	
Hori.	2390.000	PK	45.2	27.2	24.4	38.2	58.6	73.9	15.3	100	219	
Hori.	4824.000	PK	43.7	31.2	6.6	37.0	44.5	73.9	29.4	100	257	
Hori.	7236.000	PK	44.3	36.5	8.0	39.0	49.8	73.9	24.1	100	0	
Hori.	9648.000	PK	42.6	38.4	9.2	37.2	53.0	73.9	20.9	100	116	
Hori.	12060.000	PK	43.6	39.3	10.5	37.9	55.5	73.9	18.4	100	0	
Hori.	2390.000	AV	32.6	27.2	24.4	38.2	46.0	53.9	7.9	100	219	
Hori.	4824.000	AV	33.1	31.2	6.6	37.0	33.9	53.9	20.0	100	257	
Hori.	7236.000	AV	33.6	36.5	8.0	39.0	39.1	53.9	14.8	100	0	
Hori.	9648.000	AV	31.0	38.4	9.2	37.2	41.4	53.9	12.5	100	116	
Hori.	12060.000	AV	31.1	39.3	10.5	37.9	43.0	53.9	10.9	100	0	
Vert.	39.997	QP	46.2	14.9	7.0	31.8	36.3	40.0	3.7	100	203	
Vert.	399.997	QP	45.7	15.9	7.7	31.8	37.5	46.0	8.5	127	111	
Vert.	439.996	QP	43.9	16.6	8.0	31.8	36.7	46.0	9.3	100	76	
Vert.	2390.000	PK	45.2	27.2	24.4	38.2	58.6	73.9	15.3	100	152	
Vert.	4824.000	PK	43.4	31.2	6.6	37.0	44.2	73.9	29.7	100	261	
Vert.	7236.000	PK	45.3	36.5	8.0	39.0	50.8	73.9	23.1	100	0	
Vert.	9648.000	PK	42.8	38.4	9.2	37.2	53.2	73.9	20.7	100	71	
Vert.	12060.000	PK	43.7	39.3	10.5	37.9	55.6	73.9	18.3	100	0	
Vert.	2390.000	AV	32.4	27.2	24.4	38.2	45.8	53.9	8.1	100	152	
Vert.	4824.000	AV	32.7	31.2	6.6	37.0	33.5	53.9	20.4	100	261	
Vert.	7236.000	AV	34.1	36.5	8.0	39.0	39.6	53.9	14.3	100	0	
Vert.	9648.000	AV	31.1	38.4	9.2	37.2	41.5	53.9	12.4	100	71	
Vert.	12060.000	AV	31.0	39.3	10.5	37.9	42.9	53.9	11.0	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	90.5	27.3	24.4	38.2	104.0	-	-	Carrier
Hori.	2400.000	PK	51.9	27.3	24.4	38.2	65.4	84.0	18.6	
Vert.	2412.000	PK	89.6	27.3	24.4	38.2	103.1	-	-	Carrier
Vert.	2400.000	PK	50.9	27.3	24.4	38.2	64.4	83.1	18.7	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
 Date July 20, 2012 July 21, 2012
 Temperature / Humidity 25 deg.C , 58%RH 24 deg.C , 58%RH
 Engineer Akio Hayashi Shinichi Takano
 Mode Tx, 2437 MHz
 Tx, IEEE802.11b, PN9, worst data mode 2Mbps Antenna: 6dBi Single

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	4874.000	PK	42.6	31.3	6.6	36.9	43.6	73.9	30.3	100	357	
Hori.	7311.000	PK	45.3	36.7	8.2	39.0	51.2	73.9	22.7	100	0	
Hori.	9748.000	PK	42.5	38.6	9.3	37.2	53.2	73.9	20.7	100	325	
Hori.	12185.000	PK	43.1	39.4	10.5	37.7	55.3	73.9	18.6	100	0	
Hori.	4874.000	AV	34.7	31.3	6.6	36.9	35.7	53.9	18.2	100	357	
Hori.	7311.000	AV	33.4	36.7	8.2	39.0	39.3	53.9	14.6	100	0	
Hori.	9748.000	AV	31.1	38.6	9.3	37.2	41.8	53.9	12.1	100	325	
Hori.	12185.000	AV	31.2	39.4	10.5	37.7	43.4	53.9	10.5	100	0	
Vert.	4874.000	PK	43.0	31.3	6.6	36.9	44.0	73.9	29.9	100	240	
Vert.	7311.000	PK	44.3	36.7	8.2	39.0	50.2	73.9	23.7	100	0	
Vert.	9748.000	PK	43.6	38.6	9.3	37.2	54.3	73.9	19.6	100	259	
Vert.	12185.000	PK	43.2	39.4	10.5	37.7	55.4	73.9	18.5	100	0	
Vert.	4874.000	AV	31.4	31.3	6.6	36.9	32.4	53.9	21.5	100	240	
Vert.	7311.000	AV	33.2	36.7	8.2	39.0	39.1	53.9	14.8	100	0	
Vert.	9748.000	AV	31.3	38.6	9.3	37.2	42.0	53.9	11.9	100	259	
Vert.	12185.000	AV	31.1	39.4	10.5	37.7	43.3	53.9	10.6	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
 Date July 20, 2012 July 21, 2012
 Temperature / Humidity 25 deg.C , 58%RH 24 deg.C , 58%RH
 Engineer Akio Hayashi Shinichi Takano
 Mode Tx, 2462 MHz
 Tx, IEEE802.11b, PN9, worst data mode 2Mbps Antenna: 6dBi Single

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	2483.500	PK	44.3	27.5	24.4	38.1	58.1	73.9	15.8	100	219	
Hori.	4924.000	PK	43.2	31.5	6.6	36.9	44.4	73.9	29.5	100	357	
Hori.	7386.000	PK	45.3	36.9	8.3	39.0	51.5	73.9	22.4	100	0	
Hori.	9848.000	PK	41.3	38.8	9.3	37.2	52.2	73.9	21.7	100	277	
Hori.	12310.000	PK	43.5	39.4	10.7	37.6	56.0	73.9	17.9	100	0	
Hori.	2483.500	AV	32.0	27.5	24.4	38.1	45.8	53.9	8.1	100	219	
Hori.	4924.000	AV	33.5	31.5	6.6	36.9	34.7	53.9	19.2	100	357	
Hori.	7386.000	AV	33.8	36.9	8.3	39.0	40.0	53.9	13.9	100	0	
Hori.	9848.000	AV	31.3	38.8	9.3	37.2	42.2	53.9	11.7	100	277	
Hori.	12310.000	AV	30.9	39.4	10.7	37.6	43.4	53.9	10.5	100	0	
Vert.	2483.500	PK	44.1	27.5	24.4	38.1	57.9	73.9	16.0	100	152	
Vert.	4924.000	PK	43.6	31.5	6.6	36.9	44.8	73.9	29.1	100	256	
Vert.	7386.000	PK	45.5	36.9	8.3	39.0	51.7	73.9	22.2	100	0	
Vert.	9848.000	PK	41.8	38.8	9.3	37.2	52.7	73.9	21.2	100	277	
Vert.	12310.000	PK	43.7	39.4	10.7	37.6	56.2	73.9	17.7	100	0	
Vert.	2483.500	AV	32.0	27.5	24.4	38.1	45.8	53.9	8.1	100	152	
Vert.	4924.000	AV	33.6	31.5	6.6	36.9	34.8	53.9	19.1	100	256	
Vert.	7386.000	AV	34.1	36.9	8.3	39.0	40.3	53.9	13.6	100	0	
Vert.	9848.000	AV	31.4	38.8	9.3	37.2	42.3	53.9	11.6	100	277	
Vert.	12310.000	AV	30.8	39.4	10.7	37.6	43.3	53.9	10.6	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 and No.2 Semi Anechoic Chamber
Date July 18, 2012(No.1 SAC) July 4, 2012(No.2 SAC) July 21, 2012(No.2 SAC)
Temperature / Humidity 24 deg.C , 63%RH 25 deg.C , 58%RH 24 deg.C , 58%RH
Engineer Wataru Kojima Akio Hayashi Shinichi Takano
Mode Tx, 2412 MHz
 Tx, IEEE802.11b, PN9, worst data mode 2Mbps Antenna: 9dBi Single

(* 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.	199.999	QP	44.5	16.3	9.0	31.8	38.0	43.5	5.5	159	338	
Hori.	319.996	QP	50.0	14.5	7.1	31.7	39.9	46.0	6.1	102	272	
Hori.	359.998	QP	46.7	15.2	7.4	31.7	37.6	46.0	8.4	100	176	
Hori.	399.998	QP	50.0	15.9	7.7	31.8	41.8	46.0	4.2	100	283	
Hori.	519.997	QP	44.0	17.9	8.4	31.9	38.4	46.0	7.6	100	205	
Hori.	2390.000	PK	55.2	28.2	13.9	40.7	56.6	73.9	17.3	100	36	
Hori.	4824.000	PK	44.1	31.2	6.6	37.0	44.9	73.9	29.0	100	18	
Hori.	7236.000	PK	44.1	36.5	8.0	39.0	49.6	73.9	24.3	100	0	
Hori.	9648.000	PK	42.7	38.4	9.2	37.2	53.1	73.9	20.8	100	288	
Hori.	12060.000	PK	43.4	39.3	10.5	37.9	55.3	73.9	18.6	100	0	
Hori.	2390.000	AV	42.5	28.2	13.9	40.7	43.9	53.9	10.0	100	36	
Hori.	4824.000	AV	32.1	31.2	6.6	37.0	32.9	53.9	21.0	100	18	
Hori.	7236.000	AV	32.3	36.5	8.0	39.0	37.8	53.9	16.1	100	0	
Hori.	9648.000	AV	30.5	38.4	9.2	37.2	40.9	53.9	13.0	100	288	
Hori.	12060.000	AV	31.0	39.3	10.5	37.9	42.9	53.9	11.0	100	0	
Vert.	39.990	QP	37.1	14.9	7.0	31.8	27.2	40.0	12.8	100	2	
Vert.	159.997	QP	42.3	15.0	8.8	31.8	34.3	43.5	9.2	100	234	
Vert.	199.999	QP	44.4	16.3	9.0	31.8	37.9	43.5	5.6	100	205	
Vert.	400.002	QP	53.8	15.9	7.7	31.8	45.6	46.0	0.4	100	97	
Vert.	2390.000	PK	54.4	28.2	13.9	40.7	55.8	73.9	18.1	126	318	
Vert.	4824.000	PK	43.2	31.2	6.6	37.0	44.0	73.9	29.9	106	83	
Vert.	7236.000	PK	44.6	36.5	8.0	39.0	50.1	73.9	23.8	100	0	
Vert.	9648.000	PK	43.3	38.4	9.2	37.2	53.7	73.9	20.2	113	126	
Vert.	12060.000	PK	43.7	39.3	10.5	37.9	55.6	73.9	18.3	100	0	
Vert.	2390.000	AV	41.3	28.2	13.9	40.7	42.7	53.9	11.2	126	318	
Vert.	4824.000	AV	30.8	31.2	6.6	37.0	31.6	53.9	22.3	106	83	
Vert.	7236.000	AV	32.0	36.5	8.0	39.0	37.5	53.9	16.4	100	0	
Vert.	9648.000	AV	31.0	38.4	9.2	37.2	41.4	53.9	12.5	113	126	
Vert.	12060.000	AV	30.8	39.3	10.5	37.9	42.7	53.9	11.2	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	104.5	28.3	14.0	40.7	106.1	-	-	Carrier
Hori.	2400.000	PK	66.7	28.2	13.9	40.7	68.1	86.1	18.0	
Vert.	2412.000	PK	103.6	28.3	14.0	40.7	105.2	-	-	Carrier
Vert.	2400.000	PK	65.6	28.2	13.9	40.7	67.0	85.2	18.2	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 and No.2 Semi Anechoic Chamber
Date July 18, 2012(No.1 SAC) July 4, 2012(No.2 SAC) July 21, 2012(No.2 SAC)
Temperature / Humidity 24 deg.C , 63%RH 25 deg.C , 58%RH 24 deg.C , 58%RH
Engineer Wataru Kojima Akio Hayashi Shinichi Takano
Mode Tx, 2437 MHz
 Tx, IEEE802.11b, PN9, worst data mode 2Mbps Antenna: 9dBi Single

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	4874.000	PK	41.5	31.3	6.6	36.9	42.5	73.9	31.4	100	9	
Hori.	7311.000	PK	44.7	36.7	8.2	39.0	50.6	73.9	23.3	100	0	
Hori.	9748.000	PK	42.5	38.6	9.3	37.2	53.2	73.9	20.7	100	58	
Hori.	12185.000	PK	42.8	39.4	10.5	37.7	55.0	73.9	18.9	100	0	
Hori.	4874.000	AV	30.3	31.3	6.6	36.9	31.3	53.9	22.6	100	9	
Hori.	7311.000	AV	32.3	36.7	8.2	39.0	38.2	53.9	15.7	100	0	
Hori.	9748.000	AV	29.7	38.6	9.3	37.2	40.4	53.9	13.5	100	58	
Hori.	12185.000	AV	31.2	39.4	10.5	37.7	43.4	53.9	10.5	100	0	
Vert.	4874.000	PK	41.4	31.3	6.6	36.9	42.4	73.9	31.5	100	85	
Vert.	7311.000	PK	44.4	36.7	8.2	39.0	50.3	73.9	23.6	100	0	
Vert.	9748.000	PK	42.5	38.6	9.3	37.2	53.2	73.9	20.7	107	127	
Vert.	12185.000	PK	43.1	39.4	10.5	37.7	55.3	73.9	18.6	100	0	
Vert.	4874.000	AV	29.4	31.3	6.6	36.9	30.4	53.9	23.5	100	85	
Vert.	7311.000	AV	32.0	36.7	8.2	39.0	37.9	53.9	16.0	100	0	
Vert.	9748.000	AV	30.2	38.6	9.3	37.2	40.9	53.9	13.0	107	127	
Vert.	12185.000	AV	31.0	39.4	10.5	37.7	43.2	53.9	10.7	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

UL Japan, Inc.

Shonan EMC Lab.

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

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 and No.2 Semi Anechoic Chamber
Date July 18, 2012(No.1 SAC) July 4, 2012(No.2 SAC) July 21, 2012(No.2 SAC)
Temperature / Humidity 24 deg.C , 63%RH 25 deg.C , 58%RH 24 deg.C , 58%RH
Engineer Wataru Kojima Akio Hayashi Shinichi Takano
Mode Tx, 2462 MHz
 Tx, IEEE802.11b, PN9, worst data mode 2Mbps Antenna: 9dBi Single

(* 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	52.1	28.7	14.0	40.7	54.1	73.9	19.8	100	228	
Hori.	4924.000	PK	43.9	31.5	6.6	36.9	45.1	73.9	28.8	100	55	
Hori.	7386.000	PK	45.8	36.9	8.3	39.0	52.0	73.9	21.9	100	0	
Hori.	9848.000	PK	43.2	38.8	9.3	37.2	54.1	73.9	19.8	100	286	
Hori.	12310.000	PK	42.6	39.4	10.7	37.6	55.1	73.9	18.8	100	0	
Hori.	2483.500	AV	38.3	28.7	14.0	40.7	40.3	53.9	13.6	100	228	
Hori.	4924.000	AV	32.0	31.5	6.6	36.9	33.2	53.9	20.7	100	55	
Hori.	7386.000	AV	32.9	36.9	8.3	39.0	39.1	53.9	14.8	100	0	
Hori.	9848.000	AV	29.6	38.8	9.3	37.2	40.5	53.9	13.4	100	286	
Hori.	12310.000	AV	30.6	39.4	10.7	37.6	43.1	53.9	10.8	100	0	
Vert.	2483.500	PK	50.7	28.7	14.0	40.7	52.7	73.9	21.2	125	278	
Vert.	4924.000	PK	43.0	31.5	6.6	36.9	44.2	73.9	29.7	100	85	
Vert.	7386.000	PK	45.8	36.9	8.3	39.0	52.0	73.9	21.9	100	0	
Vert.	9848.000	PK	43.3	38.8	9.3	37.2	54.2	73.9	19.7	129	120	
Vert.	12310.000	PK	42.9	39.4	10.7	37.6	55.4	73.9	18.5	100	0	
Vert.	2483.500	AV	38.2	28.7	14.0	40.7	40.2	53.9	13.7	125	278	
Vert.	4924.000	AV	30.5	31.5	6.6	36.9	31.7	53.9	22.2	100	85	
Vert.	7386.000	AV	32.9	36.9	8.3	39.0	39.1	53.9	14.8	100	0	
Vert.	9848.000	AV	29.7	38.8	9.3	37.2	40.6	53.9	13.3	129	120	
Vert.	12310.000	AV	30.6	39.4	10.7	37.6	43.1	53.9	10.8	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

UL Japan, Inc.

Shonan EMC Lab.

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Telephone : +81 463 50 6400

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date May 30, 2012 July 4, 2012
Temperature / Humidity 24 deg.C , 54%RH 24 deg.C , 64%RH
Engineer Shinichi Takano Yasumasa Owaki
Mode Tx, 2412 MHz
 Tx, IEEE802.11b, PN9, worst data mode 2Mbps Antenna: 15dBi Single

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	2390.000	PK	46.1	28.2	13.9	40.7	47.5	73.9	26.4	100	350	
Hori.	4824.000	PK	53.2	31.2	6.4	41.6	49.2	73.9	24.7	105	239	
Hori.	7236.000	PK	47.3	36.1	7.8	41.2	50.0	73.9	23.9	100	0	
Hori.	9648.000	PK	44.8	38.6	8.9	40.4	51.9	73.9	22.0	100	242	
Hori.	12060.000	PK	44.6	39.5	10.2	39.4	54.9	73.9	19.0	100	0	
Hori.	2390.000	AV	34.0	28.2	13.9	40.7	35.4	53.9	18.5	100	350	
Hori.	4824.000	AV	44.2	31.2	6.4	41.6	40.2	53.9	13.7	105	239	
Hori.	7236.000	AV	35.8	36.1	7.8	41.2	38.5	53.9	15.4	100	0	
Hori.	9648.000	AV	35.3	38.6	8.9	40.4	42.4	53.9	11.5	100	242	
Hori.	12060.000	AV	33.7	39.5	10.2	39.4	44.0	53.9	9.9	100	0	
Vert.	2390.000	PK	48.2	28.2	13.9	40.7	49.6	73.9	24.3	113	40	
Vert.	4824.000	PK	53.0	31.2	6.4	41.6	49.0	73.9	24.9	100	353	
Vert.	7236.000	PK	46.3	36.1	7.8	41.2	49.0	73.9	24.9	100	0	
Vert.	9648.000	PK	45.2	38.6	8.9	40.4	52.3	73.9	21.6	124	201	
Vert.	12060.000	PK	45.1	39.5	10.2	39.4	55.4	73.9	18.5	100	0	
Vert.	2390.000	AV	36.7	28.2	13.9	40.7	38.1	53.9	15.8	113	40	
Vert.	4824.000	AV	44.8	31.2	6.4	41.6	40.8	53.9	13.1	100	353	
Vert.	7236.000	AV	35.5	36.1	7.8	41.2	38.2	53.9	15.7	100	0	
Vert.	9648.000	AV	34.9	38.6	8.9	40.4	42.0	53.9	11.9	124	201	
Vert.	12060.000	AV	33.9	39.5	10.2	39.4	44.2	53.9	9.7	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	81.7	28.3	14.0	40.7	83.3	-	-	Carrier
Hori.	2400.000	PK	42.8	28.2	13.9	40.7	44.2	63.3	19.1	
Vert.	2412.000	PK	98.5	28.3	14.0	40.7	100.1	-	-	Carrier
Vert.	2400.000	PK	59.7	28.2	13.9	40.7	61.1	80.1	19.0	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
 Date May 30, 2012 July 4, 2012
 Temperature / Humidity 24 deg.C , 54%RH 24 deg.C , 64%RH
 Engineer Shinichi Takano Yasumasa Owaki
 Mode Tx, 2437 MHz
 Tx, IEEE802.11b, PN9, worst data mode 2Mbps Antenna: 15dBi Single

(* 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	50.1	31.4	6.4	41.5	46.4	73.9	27.5	100	242	
Hori.	7311.000	PK	46.8	36.2	8.1	41.2	49.9	73.9	24.0	100	0	
Hori.	9748.000	PK	45.1	38.7	8.9	40.4	52.3	73.9	21.6	100	244	
Hori.	12185.000	PK	45.3	39.6	10.2	39.2	55.9	73.9	18.0	100	0	
Hori.	4874.000	AV	40.9	31.4	6.4	41.5	37.2	53.9	16.7	100	242	
Hori.	7311.000	AV	35.8	36.2	8.1	41.2	38.9	53.9	15.0	100	0	
Hori.	9748.000	AV	34.8	38.7	8.9	40.4	42.0	53.9	11.9	100	244	
Hori.	12185.000	AV	33.3	39.6	10.2	39.2	43.9	53.9	10.0	100	0	
Vert.	4874.000	PK	50.3	31.4	6.4	41.5	46.6	73.9	27.3	108	352	
Vert.	7311.000	PK	47.3	36.2	8.1	41.2	50.4	73.9	23.5	100	0	
Vert.	9748.000	PK	45.8	38.7	8.9	40.4	53.0	73.9	20.9	100	228	
Vert.	12185.000	PK	44.7	39.6	10.2	39.2	55.3	73.9	18.6	100	0	
Vert.	4874.000	AV	42.1	31.4	6.4	41.5	38.4	53.9	15.5	108	352	
Vert.	7311.000	AV	35.8	36.2	8.1	41.2	38.9	53.9	15.0	100	0	
Vert.	9748.000	AV	33.9	38.7	8.9	40.4	41.1	53.9	12.8	100	228	
Vert.	12185.000	AV	33.4	39.6	10.2	39.2	44.0	53.9	9.9	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date May 30, 2012 July 4, 2012
Temperature / Humidity 24 deg.C , 54%RH 24 deg.C , 64%RH
Engineer Shinichi Takano Yasumasa Owaki
Mode Tx, 2462 MHz
 Tx, IEEE802.11b, PN9, worst data mode 2Mbps Antenna: 15dBi Single

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	2483.500	PK	46.5	28.7	14.0	40.7	48.5	73.9	25.4	124	350	
Hori.	4924.000	PK	49.3	31.5	6.5	41.5	45.8	73.9	28.1	121	237	
Hori.	7386.000	PK	47.8	36.3	8.2	41.3	51.0	73.9	22.9	100	0	
Hori.	9848.000	PK	45.7	38.8	8.9	40.4	53.0	73.9	20.9	100	238	
Hori.	12310.000	PK	45.1	39.6	10.3	39.1	55.9	73.9	18.0	100	0	
Hori.	2483.500	AV	33.9	28.7	14.0	40.7	35.9	53.9	18.0	124	350	
Hori.	4924.000	AV	39.0	31.5	6.5	41.5	35.5	53.9	18.4	121	237	
Hori.	7386.000	AV	36.0	36.3	8.2	41.3	39.2	53.9	14.7	100	0	
Hori.	9848.000	AV	34.3	38.8	8.9	40.4	41.6	53.9	12.3	100	238	
Hori.	12310.000	AV	33.3	39.6	10.3	39.1	44.1	53.9	9.8	100	0	
Vert.	2483.500	PK	49.2	28.7	14.0	40.7	51.2	73.9	22.7	111	41	
Vert.	4924.000	PK	49.8	31.5	6.5	41.5	46.3	73.9	27.6	104	341	
Vert.	7386.000	PK	47.6	36.3	8.2	41.3	50.8	73.9	23.1	100	0	
Vert.	9848.000	PK	45.6	38.8	8.9	40.4	52.9	73.9	21.0	131	205	
Vert.	12310.000	PK	44.3	39.6	10.3	39.1	55.1	73.9	18.8	100	0	
Vert.	2483.500	AV	36.3	28.7	14.0	40.7	38.3	53.9	15.6	111	41	
Vert.	4924.000	AV	40.6	31.5	6.5	41.5	37.1	53.9	16.8	104	341	
Vert.	7386.000	AV	35.7	36.3	8.2	41.3	38.9	53.9	15.0	100	0	
Vert.	9848.000	AV	34.4	38.8	8.9	40.4	41.7	53.9	12.2	131	205	
Vert.	12310.000	AV	33.3	39.6	10.3	39.1	44.1	53.9	9.8	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

UL Japan, Inc.

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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date July 2, 2012 July 4, 2012 July 5, 2012
Temperature / Humidity 25 deg.C , 61%RH 24 deg.C , 64%RH 26 deg.C , 66%RH
Engineer Yasumasa Owaki Yasumasa Owaki Yasumasa Owaki
Mode Tx, 2412 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps Antenna: 2.14dBi single

(* 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.	199.997	QP	42.6	16.3	9.1	31.8	36.2	43.5	7.3	168	141	
Hori.	319.999	QP	50.5	14.5	7.1	31.7	40.4	46.0	5.6	100	18	
Hori.	399.998	QP	53.4	15.9	7.7	31.8	45.2	46.0	0.8	100	276	
Hori.	519.999	QP	43.5	17.9	8.4	31.9	37.9	46.0	8.1	283	187	
Hori.	2390.000	PK	67.6	28.2	13.9	40.7	69.0	73.9	4.9	100	251	
Hori.	4824.000	PK	49.5	31.2	6.4	41.6	45.5	73.9	28.4	111	86	
Hori.	7236.000	PK	49.3	36.1	7.8	41.2	52.0	73.9	21.9	100	0	
Hori.	9648.000	PK	47.3	38.6	8.9	40.4	54.4	73.9	19.5	100	356	
Hori.	12060.000	PK	47.5	39.5	10.2	39.4	57.8	73.9	16.1	100	0	
Hori.	2390.000	AV	51.4	28.2	13.9	40.7	52.8	53.9	1.1	100	251	
Hori.	4824.000	AV	40.3	31.2	6.4	41.6	36.3	53.9	17.6	111	86	
Hori.	7236.000	AV	36.2	36.1	7.8	41.2	38.9	53.9	15.0	100	0	
Hori.	9648.000	AV	35.1	38.6	8.9	40.4	42.2	53.9	11.7	100	356	
Hori.	12060.000	AV	35.1	39.5	10.2	39.4	45.4	53.9	8.5	100	0	
Vert.	39.999	QP	42.2	14.9	7.1	31.8	32.4	40.0	7.6	100	350	
Vert.	119.999	QP	48.5	13.0	8.2	31.8	37.9	43.5	5.6	100	213	
Vert.	199.998	QP	42.7	16.3	9.1	31.8	36.3	43.5	7.2	100	266	
Vert.	399.999	QP	52.4	15.9	7.7	31.8	44.2	46.0	1.8	103	147	
Vert.	519.900	QP	42.6	17.9	8.4	31.9	37.0	46.0	9.0	100	92	
Vert.	2390.000	PK	67.8	28.2	13.9	40.7	69.2	73.9	4.7	108	255	
Vert.	4824.000	PK	50.4	31.2	6.4	41.6	46.4	73.9	27.5	100	188	
Vert.	7236.000	PK	47.6	36.1	7.8	41.2	50.3	73.9	23.6	100	0	
Vert.	9648.000	PK	46.4	38.6	8.9	40.4	53.5	73.9	20.4	138	243	
Vert.	12060.000	PK	47.0	39.5	10.2	39.4	57.3	73.9	16.6	100	0	
Vert.	2390.000	AV	51.1	28.2	13.9	40.7	52.5	53.9	1.4	108	255	
Vert.	4824.000	AV	41.3	31.2	6.4	41.6	37.3	53.9	16.6	100	188	
Vert.	7236.000	AV	36.3	36.1	7.8	41.2	39.0	53.9	14.9	100	0	
Vert.	9648.000	AV	35.3	38.6	8.9	40.4	42.4	53.9	11.5	138	243	
Vert.	12060.000	AV	35.1	39.5	10.2	39.4	45.4	53.9	8.5	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	93.8	28.3	14.0	40.7	95.4	-	-	Carrier
Hori.	2400.000	PK	67.1	28.2	13.9	40.7	68.5	75.4	6.9	
Vert.	2412.000	PK	93.2	28.3	14.0	40.7	94.8	-	-	Carrier
Vert.	2400.000	PK	66.9	28.2	13.9	40.7	68.3	74.8	6.5	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
 Date July 2, 2012 July 4, 2012
 Temperature / Humidity 25 deg.C , 61%RH 24 deg.C , 64%RH
 Engineer Yasumasa Owaki Yasumasa Owaki
 Mode Tx, 2437 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps Antenna: 2.14dBi single

(* 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	49.5	31.4	6.4	41.5	45.8	73.9	28.1	111	87	
Hori.	7311.000	PK	47.1	36.2	8.1	41.2	50.2	73.9	23.7	100	0	
Hori.	9748.000	PK	46.6	38.7	8.9	40.4	53.8	73.9	20.1	100	275	
Hori.	12185.000	PK	45.2	39.6	10.2	39.2	55.8	73.9	18.1	100	0	
Hori.	4874.000	AV	40.6	31.4	6.4	41.5	36.9	53.9	17.0	111	87	
Hori.	7311.000	AV	35.6	36.2	8.1	41.2	38.7	53.9	15.2	100	0	
Hori.	9748.000	AV	34.7	38.7	8.9	40.4	41.9	53.9	12.0	100	275	
Hori.	12185.000	AV	33.7	39.6	10.2	39.2	44.3	53.9	9.6	100	0	
Vert.	4874.000	PK	49.2	31.4	6.4	41.5	45.5	73.9	28.4	107	209	
Vert.	7311.000	PK	47.0	36.2	8.1	41.2	50.1	73.9	23.8	100	0	
Vert.	9748.000	PK	46.8	38.7	8.9	40.4	54.0	73.9	19.9	141	256	
Vert.	12185.000	PK	46.3	39.6	10.2	39.2	56.9	73.9	17.0	100	0	
Vert.	4874.000	AV	40.0	31.4	6.4	41.5	36.3	53.9	17.6	107	209	
Vert.	7311.000	AV	35.6	36.2	8.1	41.2	38.7	53.9	15.2	100	0	
Vert.	9748.000	AV	34.9	38.7	8.9	40.4	42.1	53.9	11.8	141	256	
Vert.	12185.000	AV	33.6	39.6	10.2	39.2	44.2	53.9	9.7	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

UL Japan, Inc.

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
 Date July 2, 2012 July 4, 2012
 Temperature / Humidity 25 deg.C , 61%RH 24 deg.C , 64%RH
 Engineer Yasumasa Owaki Yasumasa Owaki
 Mode Tx, 2462 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps Antenna: 2.14dBi single

(* 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	66.3	28.7	14.0	40.7	68.3	73.9	5.6	100	24	
Hori.	4924.000	PK	49.4	31.5	6.5	41.5	45.9	73.9	28.0	100	98	
Hori.	7386.000	PK	46.9	36.3	8.2	41.3	50.1	73.9	23.8	100	0	
Hori.	9848.000	PK	45.9	38.8	8.9	40.4	53.2	73.9	20.7	100	268	
Hori.	12310.000	PK	44.8	39.6	10.3	39.1	55.6	73.9	18.3	100	0	
Hori.	2483.500	AV	51.2	28.7	14.0	40.7	53.2	53.9	0.7	100	24	
Hori.	4924.000	AV	40.3	31.5	6.5	41.5	36.8	53.9	17.1	100	98	
Hori.	7386.000	AV	35.6	36.3	8.2	41.3	38.8	53.9	15.1	100	0	
Hori.	9848.000	AV	34.3	38.8	8.9	40.4	41.6	53.9	12.3	100	268	
Hori.	12310.000	AV	32.2	39.6	10.3	39.1	43.0	53.9	10.9	100	0	
Vert.	2483.500	PK	66.3	28.7	14.0	40.7	68.3	73.9	5.6	109	329	
Vert.	4924.000	PK	48.9	31.5	6.5	41.5	45.4	73.9	28.5	106	180	
Vert.	7386.000	PK	47.8	36.3	8.2	41.3	51.0	73.9	22.9	100	0	
Vert.	9848.000	PK	45.7	38.8	8.9	40.4	53.0	73.9	20.9	145	282	
Vert.	12310.000	PK	44.8	39.6	10.3	39.1	55.6	73.9	18.3	100	0	
Vert.	2483.500	AV	50.5	28.7	14.0	40.7	52.5	53.9	1.4	109	329	
Vert.	4924.000	AV	39.9	31.5	6.5	41.5	36.4	53.9	17.5	106	180	
Vert.	7386.000	AV	35.7	36.3	8.2	41.3	38.9	53.9	15.0	100	0	
Vert.	9848.000	AV	34.5	38.8	8.9	40.4	41.8	53.9	12.1	145	282	
Vert.	12310.000	AV	32.4	39.6	10.3	39.1	43.2	53.9	10.7	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
 Date July 6, 2012 July 9, 2012
 Temperature / Humidity 26 deg.C , 66%RH 23 deg.C , 64%RH
 Engineer Hikaru Shirasawa Makoto Hosaka
 Mode Tx, 2437 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps Antenna: 2.14dBi Dual

(* 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	50.0	31.4	6.4	41.5	46.3	73.9	27.6	110	251	
Hori.	7311.000	PK	48.8	36.2	8.1	41.2	51.9	73.9	22.0	100	0	
Hori.	9748.000	PK	47.1	38.7	8.9	40.4	54.3	73.9	19.6	100	249	
Hori.	12185.000	PK	45.8	39.6	10.2	39.2	56.4	73.9	17.5	100	0	
Hori.	4874.000	AV	38.9	31.4	6.4	41.5	35.2	53.9	18.7	110	251	
Hori.	7311.000	AV	35.7	36.2	8.1	41.2	38.8	53.9	15.1	100	0	
Hori.	9748.000	AV	34.6	38.7	8.9	40.4	41.8	53.9	12.1	100	249	
Hori.	12185.000	AV	33.6	39.6	10.2	39.2	44.2	53.9	9.7	100	0	
Vert.	4874.000	PK	50.7	31.4	6.4	41.5	47.0	73.9	26.9	103	178	
Vert.	7311.000	PK	49.7	36.2	8.1	41.2	52.8	73.9	21.1	100	0	
Vert.	9748.000	PK	47.8	38.7	8.9	40.4	55.0	73.9	18.9	104	182	
Vert.	12185.000	PK	46.0	39.6	10.2	39.2	56.6	73.9	17.3	100	0	
Vert.	4874.000	AV	39.3	31.4	6.4	41.5	35.6	53.9	18.3	103	178	
Vert.	7311.000	AV	36.2	36.2	8.1	41.2	39.3	53.9	14.6	100	0	
Vert.	9748.000	AV	35.1	38.7	8.9	40.4	42.3	53.9	11.6	104	182	
Vert.	12185.000	AV	34.1	39.6	10.2	39.2	44.7	53.9	9.2	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date July 6, 2012 July 9, 2012
Temperature / Humidity 26 deg.C , 66%RH 23 deg.C , 64%RH
Engineer Hikaru Shirasawa Makoto Hosaka
Mode Tx, 2462 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps Antenna: 2.14dBi Dual

(* 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	68.0	28.7	14.0	40.7	70.0	73.9	3.9	100	36	
Hori.	4924.000	PK	49.2	31.5	6.5	41.5	45.7	73.9	28.2	100	7	
Hori.	7386.000	PK	47.9	36.3	8.2	41.3	51.1	73.9	22.8	100	0	
Hori.	9848.000	PK	46.8	38.8	8.9	40.4	54.1	73.9	19.8	100	153	
Hori.	12310.000	PK	45.9	39.6	10.3	39.1	56.7	73.9	17.2	100	0	
Hori.	2483.500	AV	47.8	28.7	14.0	40.7	49.8	53.9	4.1	100	36	
Hori.	4924.000	AV	38.2	31.5	6.5	41.5	34.7	53.9	19.2	100	7	
Hori.	7386.000	AV	35.3	36.3	8.2	41.3	38.5	53.9	15.4	100	0	
Hori.	9848.000	AV	34.3	38.8	8.9	40.4	41.6	53.9	12.3	100	153	
Hori.	12310.000	AV	33.4	39.6	10.3	39.1	44.2	53.9	9.7	100	0	
Vert.	2483.500	PK	66.9	28.7	14.0	40.7	68.9	73.9	5.0	111	312	
Vert.	4924.000	PK	49.8	31.5	6.5	41.5	46.3	73.9	27.6	110	179	
Vert.	7386.000	PK	48.2	36.3	8.2	41.3	51.4	73.9	22.5	100	0	
Vert.	9848.000	PK	47.0	38.8	8.9	40.4	54.3	73.9	19.6	100	43	
Vert.	12310.000	PK	46.0	39.6	10.3	39.1	56.8	73.9	17.1	100	0	
Vert.	2483.500	AV	47.7	28.7	14.0	40.7	49.7	53.9	4.2	111	312	
Vert.	4924.000	AV	38.2	31.5	6.5	41.5	34.7	53.9	19.2	110	179	
Vert.	7386.000	AV	34.8	36.3	8.2	41.3	38.0	53.9	15.9	100	0	
Vert.	9848.000	AV	34.6	38.8	8.9	40.4	41.9	53.9	12.0	100	43	
Vert.	12310.000	AV	33.3	39.6	10.3	39.1	44.1	53.9	9.8	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.2 Semi Anechoic Chamber
 Date July 20, 2012 July 21, 2012
 Temperature / Humidity 25 deg.C , 58%RH 24 deg.C , 58%RH
 Engineer Akio Hayashi Shinichi Takano
 Mode Tx, 2412 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps Antenna: 6dBi Single

(* 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	57.7	27.2	24.4	38.2	71.1	73.9	2.8	100	214	
Hori.	4824.000	PK	43.3	31.2	6.6	37.0	44.1	73.9	29.8	100	59	
Hori.	7236.000	PK	44.4	36.5	8.0	39.0	49.9	73.9	24.0	100	0	
Hori.	9648.000	PK	41.4	38.4	9.2	37.2	51.8	73.9	22.1	100	0	
Hori.	12060.000	PK	43.5	39.3	10.5	37.9	55.4	73.9	18.5	100	0	
Hori.	2390.000	AV	40.0	27.2	24.4	38.2	53.4	53.9	0.5	100	214	
Hori.	4824.000	AV	33.5	31.2	6.6	37.0	34.3	53.9	19.6	100	59	
Hori.	7236.000	AV	33.4	36.5	8.0	39.0	38.9	53.9	15.0	100	0	
Hori.	9648.000	AV	30.7	38.4	9.2	37.2	41.1	53.9	12.8	100	0	
Hori.	12060.000	AV	31.0	39.3	10.5	37.9	42.9	53.9	11.0	100	0	
Vert.	2390.000	PK	56.8	27.2	24.4	38.2	70.2	73.9	3.7	100	152	
Vert.	4824.000	PK	42.0	31.2	6.6	37.0	42.8	73.9	31.1	100	30	
Vert.	7236.000	PK	44.2	36.5	8.0	39.0	49.7	73.9	24.2	100	0	
Vert.	9648.000	PK	41.2	38.4	9.2	37.2	51.6	73.9	22.3	100	0	
Vert.	12060.000	PK	43.5	39.3	10.5	37.9	55.4	73.9	18.5	100	0	
Vert.	2390.000	AV	39.3	27.2	24.4	38.2	52.7	53.9	1.2	100	152	
Vert.	4824.000	AV	32.7	31.2	6.6	37.0	33.5	53.9	20.4	100	30	
Vert.	7236.000	AV	33.3	36.5	8.0	39.0	38.8	53.9	15.1	100	0	
Vert.	9648.000	AV	30.6	38.4	9.2	37.2	41.0	53.9	12.9	100	0	
Vert.	12060.000	AV	31.1	39.3	10.5	37.9	43.0	53.9	10.9	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	75.1	28.3	14.0	40.7	76.7	-	-	Carrier
Hori.	2400.000	PK	49.8	28.2	13.9	40.7	51.2	56.7	5.5	
Vert.	2412.000	PK	93.3	28.3	14.0	40.7	94.9	-	-	Carrier
Vert.	2400.000	PK	67.7	28.2	13.9	40.7	69.1	74.9	5.8	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date July 20, 2012 July 21, 2012
Temperature / Humidity 25 deg.C , 58%RH 24 deg.C , 58%RH
Engineer Akio Hayashi Shinichi Takano
Mode Tx, 2437 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps Antenna: 6dBi Single

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	4874.000	PK	42.4	31.3	6.6	36.9	43.4	73.9	30.5	100	3	
Hori.	7311.000	PK	44.3	36.7	8.2	39.0	50.2	73.9	23.7	100	0	
Hori.	9748.000	PK	41.0	38.6	9.3	37.2	51.7	73.9	22.2	100	0	
Hori.	12185.000	PK	42.7	39.4	10.5	37.7	54.9	73.9	19.0	100	0	
Hori.	4874.000	AV	32.1	31.3	6.6	36.9	33.1	53.9	20.8	100	3	
Hori.	7311.000	AV	33.7	36.7	8.2	39.0	39.6	53.9	14.3	100	0	
Hori.	9748.000	AV	31.5	38.6	9.3	37.2	42.2	53.9	11.7	100	0	
Hori.	12185.000	AV	32.0	39.4	10.5	37.7	44.2	53.9	9.7	100	0	
Vert.	4874.000	PK	41.9	31.3	6.6	36.9	42.9	73.9	31.0	100	25	
Vert.	7311.000	PK	43.4	36.7	8.2	39.0	49.3	73.9	24.6	100	0	
Vert.	9748.000	PK	41.1	38.6	9.3	37.2	51.8	73.9	22.1	100	0	
Vert.	12185.000	PK	42.8	39.4	10.5	37.7	55.0	73.9	18.9	100	0	
Vert.	4874.000	AV	31.7	31.3	6.6	36.9	32.7	53.9	21.2	100	25	
Vert.	7311.000	AV	34.3	36.7	8.2	39.0	40.2	53.9	13.7	100	0	
Vert.	9748.000	AV	31.4	38.6	9.3	37.2	42.1	53.9	11.8	100	0	
Vert.	12185.000	AV	32.0	39.4	10.5	37.7	44.2	53.9	9.7	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date July 20, 2012 July 21, 2012
Temperature / Humidity 25 deg.C , 58%RH 24 deg.C , 58%RH
Engineer Akio Hayashi Shinichi Takano
Mode Tx, 2462 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps Antenna: 6dBi Single

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	2483.500	PK	55.4	27.5	24.4	38.1	69.2	73.9	4.7	100	47	
Hori.	4924.000	PK	42.6	31.5	6.6	36.9	43.8	73.9	30.1	100	57	
Hori.	7386.000	PK	44.4	36.9	8.3	39.0	50.6	73.9	23.3	100	0	
Hori.	9848.000	PK	41.0	38.8	9.3	37.2	51.9	73.9	22.0	100	0	
Hori.	12310.000	PK	43.3	39.4	10.7	37.6	55.8	73.9	18.1	100	0	
Hori.	2483.500	AV	38.7	27.5	24.4	38.1	52.5	53.9	1.4	100	47	
Hori.	4924.000	AV	32.8	31.5	6.6	36.9	34.0	53.9	19.9	100	57	
Hori.	7386.000	AV	33.0	36.9	8.3	39.0	39.2	53.9	14.7	100	0	
Hori.	9848.000	AV	30.9	38.8	9.3	37.2	41.8	53.9	12.1	100	0	
Hori.	12310.000	AV	30.7	39.4	10.7	37.6	43.2	53.9	10.7	100	0	
Vert.	2483.500	PK	55.3	27.5	24.4	38.1	69.1	73.9	4.8	100	137	
Vert.	4924.000	PK	42.0	31.5	6.6	36.9	43.2	73.9	30.7	100	242	
Vert.	7386.000	PK	45.2	36.9	8.3	39.0	51.4	73.9	22.5	100	0	
Vert.	9848.000	PK	41.6	38.8	9.3	37.2	52.5	73.9	21.4	100	0	
Vert.	12310.000	PK	43.0	39.4	10.7	37.6	55.5	73.9	18.4	100	0	
Vert.	2483.500	AV	38.4	27.5	24.4	38.1	52.2	53.9	1.7	100	137	
Vert.	4924.000	AV	32.4	31.5	6.6	36.9	33.6	53.9	20.3	100	242	
Vert.	7386.000	AV	33.8	36.9	8.3	39.0	40.0	53.9	13.9	100	0	
Vert.	9848.000	AV	31.2	38.8	9.3	37.2	42.1	53.9	11.8	100	0	
Vert.	12310.000	AV	31.0	39.4	10.7	37.6	43.5	53.9	10.4	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 and No.2 Semi Anechoic Chamber
Date July 18, 2012(No.1 SAC) July 4, 2012(No.2 SAC) July 21, 2012(No.2 SAC)
Temperature / Humidity 24 deg.C , 63%RH 25 deg.C , 58%RH 24 deg.C , 58%RH
Engineer Wataru Kojima Akio Hayashi Shinichi Takano
Mode Tx, 2412 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps Antenna: 9dBi Single

(* 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	70.3	28.2	13.9	40.7	71.7	73.9	2.2	100	227	
Hori.	4824.000	PK	43.7	31.2	6.6	37.0	44.5	73.9	29.4	100	14	
Hori.	7236.000	PK	45.7	36.5	8.0	39.0	51.2	73.9	22.7	100	0	
Hori.	9648.000	PK	42.2	38.4	9.2	37.2	52.6	73.9	21.3	100	324	
Hori.	12060.000	PK	44.1	39.3	10.5	37.9	56.0	73.9	17.9	100	0	
Hori.	2390.000	AV	52.0	28.2	13.9	40.7	53.4	53.9	0.5	100	227	
Hori.	4824.000	AV	32.2	31.2	6.6	37.0	33.0	53.9	20.9	100	14	
Hori.	7236.000	AV	32.1	36.5	8.0	39.0	37.6	53.9	16.3	100	0	
Hori.	9648.000	AV	29.9	38.4	9.2	37.2	40.3	53.9	13.6	100	324	
Hori.	12060.000	AV	30.8	39.3	10.5	37.9	42.7	53.9	11.2	100	0	
Vert.	2390.000	PK	69.7	28.2	13.9	40.7	71.1	73.9	2.8	103	11	
Vert.	4824.000	PK	42.9	31.2	6.6	37.0	43.7	73.9	30.2	100	80	
Vert.	7236.000	PK	44.6	36.5	8.0	39.0	50.1	73.9	23.8	100	0	
Vert.	9648.000	PK	43.0	38.4	9.2	37.2	53.4	73.9	20.5	155	113	
Vert.	12060.000	PK	44.0	39.3	10.5	37.9	55.9	73.9	18.0	100	0	
Vert.	2390.000	AV	51.1	28.2	13.9	40.7	52.5	53.9	1.4	103	11	
Vert.	4824.000	AV	31.0	31.2	6.6	37.0	31.8	53.9	22.1	100	80	
Vert.	7236.000	AV	32.3	36.5	8.0	39.0	37.8	53.9	16.1	100	0	
Vert.	9648.000	AV	30.0	38.4	9.2	37.2	40.4	53.9	13.5	155	113	
Vert.	12060.000	AV	31.0	39.3	10.5	37.9	42.9	53.9	11.0	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	93.1	28.3	14.0	40.7	94.7	-	-	Carrier
Hori.	2400.000	PK	66.0	28.2	13.9	40.7	67.4	74.7	7.3	
Vert.	2412.000	PK	92.5	28.3	14.0	40.7	94.1	-	-	Carrier
Vert.	2400.000	PK	66.0	28.2	13.9	40.7	67.4	74.1	6.7	

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

UL Japan, Inc.

Shonan EMC Lab.

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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 and No.2 Semi Anechoic Chamber
Date July 18, 2012(No.1 SAC) July 4, 2012(No.2 SAC) July 21, 2012(No.2 SAC)
Temperature / Humidity 24 deg.C , 63%RH 25 deg.C , 58%RH 24 deg.C , 58%RH
Engineer Wataru Kojima Akio Hayashi Shinichi Takano
Mode Tx, 2437 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps Antenna: 9dBi Single

(* 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	43.6	31.3	6.6	36.9	44.6	73.9	29.3	100	47	
Hori.	7311.000	PK	44.1	36.7	8.2	39.0	50.0	73.9	23.9	100	0	
Hori.	9748.000	PK	41.6	38.6	9.3	37.2	52.3	73.9	21.6	100	0	
Hori.	12185.000	PK	43.3	39.4	10.5	37.7	55.5	73.9	18.4	100	0	
Hori.	4874.000	AV	31.8	31.3	6.6	36.9	32.8	53.9	21.1	100	47	
Hori.	7311.000	AV	30.6	36.7	8.2	39.0	36.5	53.9	17.4	100	0	
Hori.	9748.000	AV	29.1	38.6	9.3	37.2	39.8	53.9	14.1	100	0	
Hori.	12185.000	AV	30.8	39.4	10.5	37.7	43.0	53.9	10.9	100	0	
Vert.	4874.000	PK	42.1	31.3	6.6	36.9	43.1	73.9	30.8	100	83	
Vert.	7311.000	PK	44.0	36.7	8.2	39.0	49.9	73.9	24.0	100	0	
Vert.	9748.000	PK	42.0	38.6	9.3	37.2	52.7	73.9	21.2	125	127	
Vert.	12185.000	PK	42.7	39.4	10.5	37.7	54.9	73.9	19.0	100	0	
Vert.	4874.000	AV	30.4	31.3	6.6	36.9	31.4	53.9	22.5	100	83	
Vert.	7311.000	AV	31.4	36.7	8.2	39.0	37.3	53.9	16.6	100	0	
Vert.	9748.000	AV	29.3	38.6	9.3	37.2	40.0	53.9	13.9	125	127	
Vert.	12185.000	AV	30.8	39.4	10.5	37.7	43.0	53.9	10.9	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

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Facsimile : +81 463 50 6401

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 and No.2 Semi Anechoic Chamber
Date July 18, 2012(No.1 SAC) July 4, 2012(No.2 SAC) July 21, 2012(No.2 SAC)
Temperature / Humidity 24 deg.C , 63%RH 25 deg.C , 58%RH 24 deg.C , 58%RH
Engineer Wataru Kojima Akio Hayashi Shinichi Takano
Mode Tx, 2462 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps Antenna: 9dBi Single

(* 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	68.1	28.7	14.0	40.7	70.1	73.9	3.8	100	36	
Hori.	4924.000	PK	43.3	31.5	6.6	36.9	44.5	73.9	29.4	100	54	
Hori.	7386.000	PK	45.9	36.9	8.3	39.0	52.1	73.9	21.8	100	0	
Hori.	9848.000	PK	41.3	38.8	9.3	37.2	52.2	73.9	21.7	100	0	
Hori.	12310.000	PK	43.3	39.4	10.7	37.6	55.8	73.9	18.1	100	0	
Hori.	2483.500	AV	50.3	28.7	14.0	40.7	52.3	53.9	1.6	100	36	
Hori.	4924.000	AV	32.3	31.5	6.6	36.9	33.5	53.9	20.4	100	54	
Hori.	7386.000	AV	33.1	36.9	8.3	39.0	39.3	53.9	14.6	100	0	
Hori.	9848.000	AV	29.4	38.8	9.3	37.2	40.3	53.9	13.6	100	0	
Hori.	12310.000	AV	30.7	39.4	10.7	37.6	43.2	53.9	10.7	100	0	
Vert.	2483.500	PK	67.5	28.7	14.0	40.7	69.5	73.9	4.4	129	289	
Vert.	4924.000	PK	43.1	31.5	6.6	36.9	44.3	73.9	29.6	100	88	
Vert.	7386.000	PK	46.3	36.9	8.3	39.0	52.5	73.9	21.4	100	0	
Vert.	9848.000	PK	43.0	38.8	9.3	37.2	53.9	73.9	20.0	126	121	
Vert.	12310.000	PK	43.4	39.4	10.7	37.6	55.9	73.9	18.0	100	0	
Vert.	2483.500	AV	49.6	28.7	14.0	40.7	51.6	53.9	2.3	129	289	
Vert.	4924.000	AV	31.0	31.5	6.6	36.9	32.2	53.9	21.7	100	88	
Vert.	7386.000	AV	32.8	36.9	8.3	39.0	39.0	53.9	14.9	100	0	
Vert.	9848.000	AV	29.8	38.8	9.3	37.2	40.7	53.9	13.2	126	121	
Vert.	12310.000	AV	30.5	39.4	10.7	37.6	43.0	53.9	10.9	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

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Facsimile : +81 463 50 6401

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date May 30, 2012 July 4, 2012 July 5, 2012
Temperature / Humidity 24 deg.C , 54%RH 24 deg.C , 64%RH 26 deg.C , 66%RH
Engineer Shinichi Takano Yasumasa Owaki Yasumasa Owaki
Mode Tx, 2412 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps Antenna: 15dBi Single

(* 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.	239.997	QP	38.3	17.1	9.7	31.7	33.4	46.0	12.6	144	58	
Hori.	319.999	QP	52.4	14.5	7.1	31.7	42.3	46.0	3.7	103	10	
Hori.	400.000	QP	45.7	15.9	7.7	31.8	37.5	46.0	8.5	100	89	
Hori.	560.000	QP	40.5	18.4	8.6	31.9	35.6	46.0	10.4	171	218	
Hori.	600.000	QP	48.4	18.9	8.8	31.9	44.2	46.0	1.8	150	213	
Hori.	800.000	QP	40.1	20.8	9.6	31.8	38.7	46.0	7.3	111	209	
Hori.	2390.000	PK	52.3	28.2	13.9	40.7	53.7	73.9	20.2	110	351	
Hori.	4824.000	PK	51.5	31.2	6.4	41.6	47.5	73.9	26.4	106	240	
Hori.	7236.000	PK	48.0	36.1	7.8	41.2	50.7	73.9	23.2	100	0	
Hori.	9648.000	PK	44.3	38.6	8.9	40.4	51.4	73.9	22.5	100	0	
Hori.	12060.000	PK	45.4	39.5	10.2	39.4	55.7	73.9	18.2	100	0	
Hori.	2390.000	AV	36.7	28.2	13.9	40.7	38.1	53.9	15.8	110	351	
Hori.	4824.000	AV	41.9	31.2	6.4	41.6	37.9	53.9	16.0	106	240	
Hori.	7236.000	AV	35.8	36.1	7.8	41.2	38.5	53.9	15.4	100	0	
Hori.	9648.000	AV	33.4	38.6	8.9	40.4	40.5	53.9	13.4	100	0	
Hori.	12060.000	AV	33.8	39.5	10.2	39.4	44.1	53.9	9.8	100	0	
Vert.	319.999	QP	47.0	14.5	7.1	31.7	36.9	46.0	9.1	149	259	
Vert.	399.999	QP	45.8	15.9	7.7	31.8	37.6	46.0	8.4	112	143	
Vert.	519.996	QP	42.7	17.9	8.4	31.9	37.1	46.0	8.9	100	69	
Vert.	600.000	QP	45.4	18.9	8.8	31.9	41.2	46.0	4.8	100	82	
Vert.	2390.000	PK	69.4	28.2	13.9	40.7	70.8	73.9	3.1	112	42	
Vert.	4824.000	PK	51.8	31.2	6.4	41.6	47.8	73.9	26.1	106	344	
Vert.	7236.000	PK	48.3	36.1	7.8	41.2	51.0	73.9	22.9	100	0	
Vert.	9648.000	PK	44.2	38.6	8.9	40.4	51.3	73.9	22.6	100	0	
Vert.	12060.000	PK	45.0	39.5	10.2	39.4	55.3	73.9	18.6	100	0	
Vert.	2390.000	AV	51.4	28.2	13.9	40.7	52.8	53.9	1.1	112	42	
Vert.	4824.000	AV	41.7	31.2	6.4	41.6	37.7	53.9	16.2	106	344	
Vert.	7236.000	AV	35.8	36.1	7.8	41.2	38.5	53.9	15.4	100	0	
Vert.	9648.000	AV	33.3	38.6	8.9	40.4	40.4	53.9	13.5	100	0	
Vert.	12060.000	AV	33.8	39.5	10.2	39.4	44.1	53.9	9.8	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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 Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	75.1	28.3	14.0	40.7	76.7	-	-	Carrier
Hori.	2400.000	PK	49.8	28.2	13.9	40.7	51.2	56.7	5.5	
Vert.	2412.000	PK	93.3	28.3	14.0	40.7	94.9	-	-	Carrier
Vert.	2400.000	PK	67.7	28.2	13.9	40.7	69.1	74.9	5.8	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
 Date May 30, 2012 July 4, 2012
 Temperature / Humidity 24 deg.C , 54%RH 24 deg.C , 64%RH
 Engineer Shinichi Takano Yasumasa Owaki
 Mode Tx, 2437 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps Antenna: 15dBi Single

(* 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	49.2	31.4	6.4	41.5	45.5	73.9	28.4	100	238	
Hori.	7311.000	PK	47.2	36.2	8.1	41.2	50.3	73.9	23.6	100	0	
Hori.	9748.000	PK	44.6	38.7	8.9	40.4	51.8	73.9	22.1	100	0	
Hori.	12185.000	PK	45.2	39.6	10.2	39.2	55.8	73.9	18.1	100	0	
Hori.	4874.000	AV	39.2	31.4	6.4	41.5	35.5	53.9	18.4	100	238	
Hori.	7311.000	AV	35.6	36.2	8.1	41.2	38.7	53.9	15.2	100	0	
Hori.	9748.000	AV	33.4	38.7	8.9	40.4	40.6	53.9	13.3	100	0	
Hori.	12185.000	AV	33.6	39.6	10.2	39.2	44.2	53.9	9.7	100	0	
Vert.	4874.000	PK	50.9	31.4	6.4	41.5	47.2	73.9	26.7	103	336	
Vert.	7311.000	PK	47.0	36.2	8.1	41.2	50.1	73.9	23.8	100	0	
Vert.	9748.000	PK	44.8	38.7	8.9	40.4	52.0	73.9	21.9	100	0	
Vert.	12185.000	PK	45.5	39.6	10.2	39.2	56.1	73.9	17.8	100	0	
Vert.	4874.000	AV	40.6	31.4	6.4	41.5	36.9	53.9	17.0	103	336	
Vert.	7311.000	AV	35.8	36.2	8.1	41.2	38.9	53.9	15.0	100	0	
Vert.	9748.000	AV	33.7	38.7	8.9	40.4	40.9	53.9	13.0	100	0	
Vert.	12185.000	AV	33.6	39.6	10.2	39.2	44.2	53.9	9.7	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date May 30, 2012 July 4, 2012
Temperature / Humidity 24 deg.C , 54%RH 24 deg.C , 64%RH
Engineer Shinichi Takano Yasumasa Owaki
Mode Tx, 2462 MHz
 Tx, IEEE802.11g, PN9, worst data mode 6Mbps Antenna: 15dBi Single

(* 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	54.2	28.7	14.0	40.7	56.2	73.9	17.7	120	352	
Hori.	4924.000	PK	48.6	31.5	6.5	41.5	45.1	73.9	28.8	125	238	
Hori.	7386.000	PK	48.2	36.3	8.2	41.3	51.4	73.9	22.5	100	0	
Hori.	9848.000	PK	45.3	38.8	8.9	40.4	52.6	73.9	21.3	100	0	
Hori.	12310.000	PK	44.7	39.6	10.3	39.1	55.5	73.9	18.4	100	0	
Hori.	2483.500	AV	38.2	28.7	14.0	40.7	40.2	53.9	13.7	120	352	
Hori.	4924.000	AV	38.7	31.5	6.5	41.5	35.2	53.9	18.7	125	238	
Hori.	7386.000	AV	35.9	36.3	8.2	41.3	39.1	53.9	14.8	100	0	
Hori.	9848.000	AV	33.7	38.8	8.9	40.4	41.0	53.9	12.9	100	0	
Hori.	12310.000	AV	33.4	39.6	10.3	39.1	44.2	53.9	9.7	100	0	
Vert.	2483.500	PK	69.4	28.7	14.0	40.7	71.4	73.9	2.5	112	42	
Vert.	4924.000	PK	50.8	31.5	6.5	41.5	47.3	73.9	26.6	100	338	
Vert.	7386.000	PK	47.2	36.3	8.2	41.3	50.4	73.9	23.5	100	0	
Vert.	9848.000	PK	45.1	38.8	8.9	40.4	52.4	73.9	21.5	100	0	
Vert.	12310.000	PK	45.8	39.6	10.3	39.1	56.6	73.9	17.3	100	0	
Vert.	2483.500	AV	51.6	28.7	14.0	40.7	53.6	53.9	0.3	112	42	
Vert.	4924.000	AV	40.2	31.5	6.5	41.5	36.7	53.9	17.2	100	338	
Vert.	7386.000	AV	36.1	36.3	8.2	41.3	39.3	53.9	14.6	100	0	
Vert.	9848.000	AV	33.8	38.8	8.9	40.4	41.1	53.9	12.8	100	0	
Vert.	12310.000	AV	33.4	39.6	10.3	39.1	44.2	53.9	9.7	100	0	

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

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

*The 10th harmonic was not seen so the result was its base noise level.

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

UL Japan, Inc.

Shonan EMC Lab.

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

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date July 12, 2012 July 13, 2012 July 17, 2012
Temperature / Humidity 26deg.C , 69%RH 26deg.C , 58%RH 23deg.C , 64%RH
Engineer Kenichi Adachi Kenichi Adachi Wataru Kojima
Mode Tx, 5745 MHz
 Tx, IEEE802.11a, PN9, worst data mode 24Mbps Antenna: 2.14dBi Dual

(* 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.	120.001	QP	50.0	13.0	8.0	31.8	39.2	43.5	4.3	159	136	
Hori.	280.001	QP	40.7	18.3	10.2	31.7	37.5	46.0	8.5	121	238	
Hori.	320.000	QP	51.4	14.5	7.1	31.7	41.3	46.0	4.7	100	129	
Hori.	399.999	QP	50.3	15.9	7.7	31.8	42.1	46.0	3.9	100	187	
Hori.	440.000	QP	42.8	16.6	8.0	31.8	35.6	46.0	10.4	100	99	
Hori.	3829.995	PK	52.7	29.6	15.0	41.8	55.5	73.9	18.4	103	219	
Hori.	5725.000	PK	54.8	32.3	16.3	40.5	62.9	73.9	11.0	100	23	
Hori.	11490.000	PK	46.8	40.1	9.5	40.0	56.4	73.9	17.5	100	0	noise floor level
Hori.	3829.995	AV	43.9	29.6	15.0	41.8	46.7	53.9	7.2	103	219	
Hori.	5725.000	AV	38.6	32.3	16.3	40.5	46.7	53.9	7.2	100	23	
Hori.	11490.000	AV	33.6	40.1	9.5	40.0	43.2	53.9	10.7	100	0	noise floor level
Vert.	39.999	QP	40.2	14.9	7.0	31.8	30.3	40.0	9.7	100	224	
Vert.	160.001	QP	40.1	15.0	8.8	31.8	32.1	43.5	11.4	100	182	
Vert.	200.000	QP	41.2	16.3	9.2	31.8	34.9	43.5	8.6	100	216	
Vert.	399.999	QP	45.7	15.9	7.7	31.8	37.5	46.0	8.5	100	82	
Vert.	3829.995	PK	52.4	29.6	15.0	41.8	55.2	73.9	18.7	114	252	
Vert.	5725.000	PK	54.5	32.3	16.3	40.5	62.6	73.9	11.3	129	23	
Vert.	11490.000	PK	46.9	40.1	9.5	40.0	56.5	73.9	17.4	100	0	noise floor level
Vert.	3829.995	AV	43.7	29.6	15.0	41.8	46.5	53.9	7.4	114	252	
Vert.	5725.000	AV	38.4	32.3	16.3	40.5	46.5	53.9	7.4	129	23	
Vert.	11490.000	AV	33.7	40.1	9.5	40.0	43.3	53.9	10.6	100	0	noise floor level

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

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

*The 2nd harmonic was not seen so the result was its base noise level.

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

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date July 12, 2012 July 13, 2012 July 17, 2012
Temperature / Humidity 26deg.C , 69%RH 26deg.C , 58%RH 23deg.C , 64%RH
Engineer Kenichi Adachi Kenichi Adachi Wataru Kojima
Mode Tx, 5785 MHz
 Tx, IEEE802.11a, PN9, worst data mode 24Mbps Antenna: 2.14dBi Dual

(* 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.	120.000	QP	50.1	13.0	8.0	31.8	39.3	43.5	4.2	152	134	
Hori.	280.003	QP	40.8	18.3	10.2	31.7	37.6	46.0	8.4	125	241	
Hori.	320.000	QP	51.1	14.5	7.1	31.7	41.0	46.0	5.0	100	125	
Hori.	399.998	QP	50.2	15.9	7.7	31.8	42.0	46.0	4.0	100	191	
Hori.	440.000	QP	42.4	16.6	8.0	31.8	35.2	46.0	10.8	100	207	
Hori.	3856.659	PK	54.2	29.6	15.0	41.8	57.0	73.9	16.9	105	220	
Hori.	11570.000	PK	47.0	40.1	9.5	39.9	56.7	73.9	17.2	100	0	noise floor level
Hori.	3856.659	AV	44.0	29.6	15.0	41.8	46.8	53.9	7.1	105	220	
Hori.	11570.000	AV	33.8	40.1	9.5	39.9	43.5	53.9	10.4	100	0	noise floor level
Vert.	40.000	QP	40.1	14.8	7.0	31.8	30.1	40.0	9.9	100	11	
Vert.	160.000	QP	39.9	15.0	8.8	31.8	31.9	43.5	11.6	100	352	
Vert.	199.999	QP	41.0	16.3	9.0	31.8	34.5	43.5	9.0	100	244	
Vert.	399.998	QP	45.8	15.9	7.7	31.8	37.6	46.0	8.4	100	235	
Vert.	3856.659	PK	53.8	29.6	15.0	41.8	56.6	73.9	17.3	117	253	
Vert.	11570.000	PK	47.1	40.1	9.5	39.9	56.8	73.9	17.1	100	0	noise floor level
Vert.	3856.659	AV	43.9	29.6	15.0	41.8	46.7	53.9	7.2	117	253	
Vert.	11570.000	AV	33.9	40.1	9.5	39.9	43.6	53.9	10.3	100	0	noise floor level

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

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

*The 2nd harmonic was not seen so the result was its base noise level.

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

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.1 Semi Anechoic Chamber
Date July 12, 2012 July 13, 2012 July 17, 2012
Temperature / Humidity 26deg.C , 69%RH 26deg.C , 58%RH 23deg.C , 64%RH
Engineer Kenichi Adachi Kenichi Adachi Wataru Kojima
Mode Tx, 5825 MHz
 Tx, IEEE802.11a, PN9, worst data mode 24Mbps Antenna: 2.14dBi Dual

(* 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.	120.000	QP	50.0	13.0	8.0	31.8	39.2	43.5	4.3	155	135	
Hori.	280.001	QP	40.8	18.3	10.2	31.7	37.6	46.0	8.4	123	240	
Hori.	320.000	QP	51.2	14.5	7.1	31.7	41.1	46.0	4.9	100	127	
Hori.	399.999	QP	50.2	15.9	7.7	31.8	42.0	46.0	4.0	100	192	
Hori.	440.000	QP	42.6	16.6	8.0	31.8	35.4	46.0	10.6	100	82	
Hori.	3883.325	PK	53.7	29.7	15.0	41.8	56.6	73.9	17.3	102	223	
Hori.	5850.000	PK	48.5	32.5	16.3	40.6	56.7	73.9	17.2	100	22	
Hori.	11650.000	PK	46.2	39.9	9.5	39.8	55.8	73.9	18.1	100	0	noise floor level
Hori.	3883.325	AV	44.3	29.7	15.0	41.8	47.2	53.9	6.7	102	223	
Hori.	5850.000	AV	35.9	32.5	16.3	40.6	44.1	53.9	9.8	100	22	
Hori.	11650.000	AV	33.4	39.9	9.5	39.8	43.0	53.9	10.9	100	0	noise floor level
Vert.	40.000	QP	40.1	14.9	7.0	31.8	30.2	40.0	9.8	100	126	
Vert.	160.000	QP	40.0	15.0	8.8	31.8	32.0	43.5	11.5	100	177	
Vert.	200.000	QP	41.2	16.3	9.0	31.8	34.7	43.5	8.8	100	20	
Vert.	399.999	QP	45.7	15.9	7.7	31.8	37.5	46.0	8.5	100	110	
Vert.	3883.325	PK	53.4	29.7	15.0	41.8	56.3	73.9	17.6	116	250	
Vert.	5850.000	PK	48.2	32.5	16.3	40.6	56.4	73.9	17.5	135	20	
Vert.	11650.000	PK	46.3	39.9	9.5	39.8	55.9	73.9	18.0	100	0	noise floor level
Vert.	3883.325	AV	44.2	29.7	15.0	41.8	47.1	53.9	6.8	116	250	
Vert.	5850.000	AV	35.7	32.5	16.3	40.6	43.9	53.9	10.0	135	20	
Vert.	11650.000	AV	33.3	39.9	9.5	39.8	42.9	53.9	11.0	100	0	noise floor level

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

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

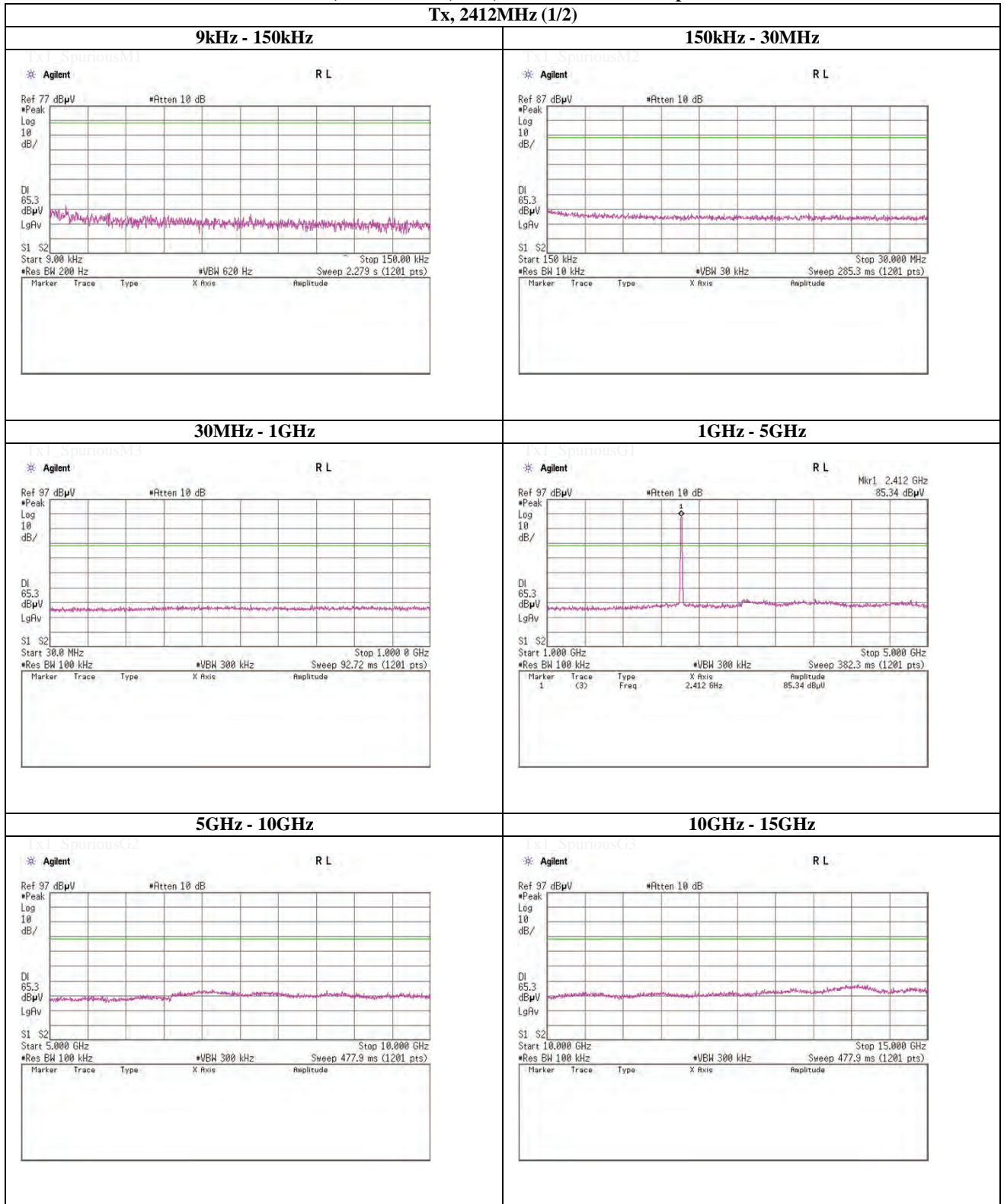
*The 2nd harmonic was not seen so the result was its base noise level.

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

Spurious emission (Conducted)

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

Tx, 2412MHz (1/2)



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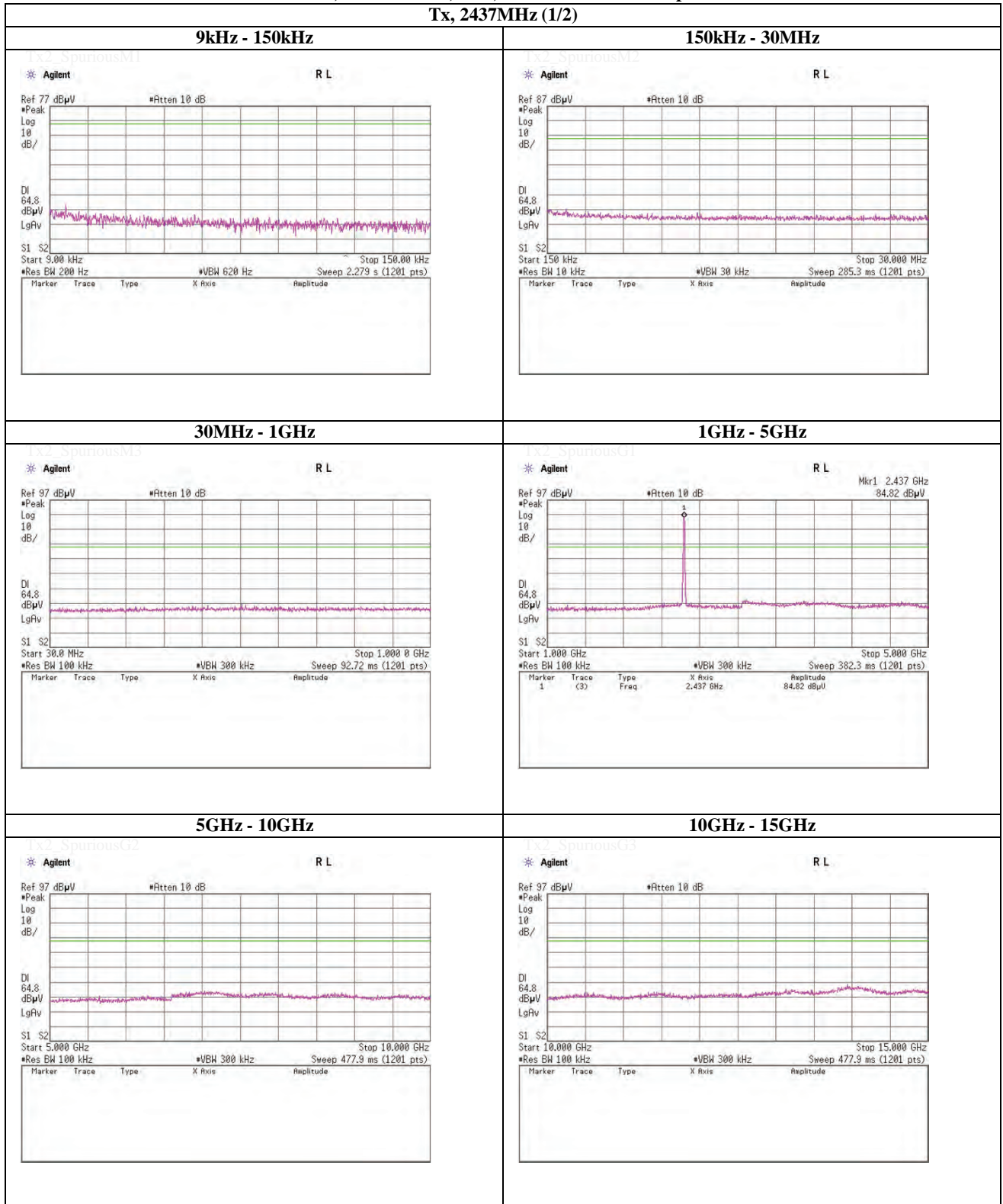
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

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

Tx, 2437MHz (1/2)



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Telephone : +81 463 50 6400

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Spurious emission (Conducted)

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

Tx, 2437MHz (2/2)



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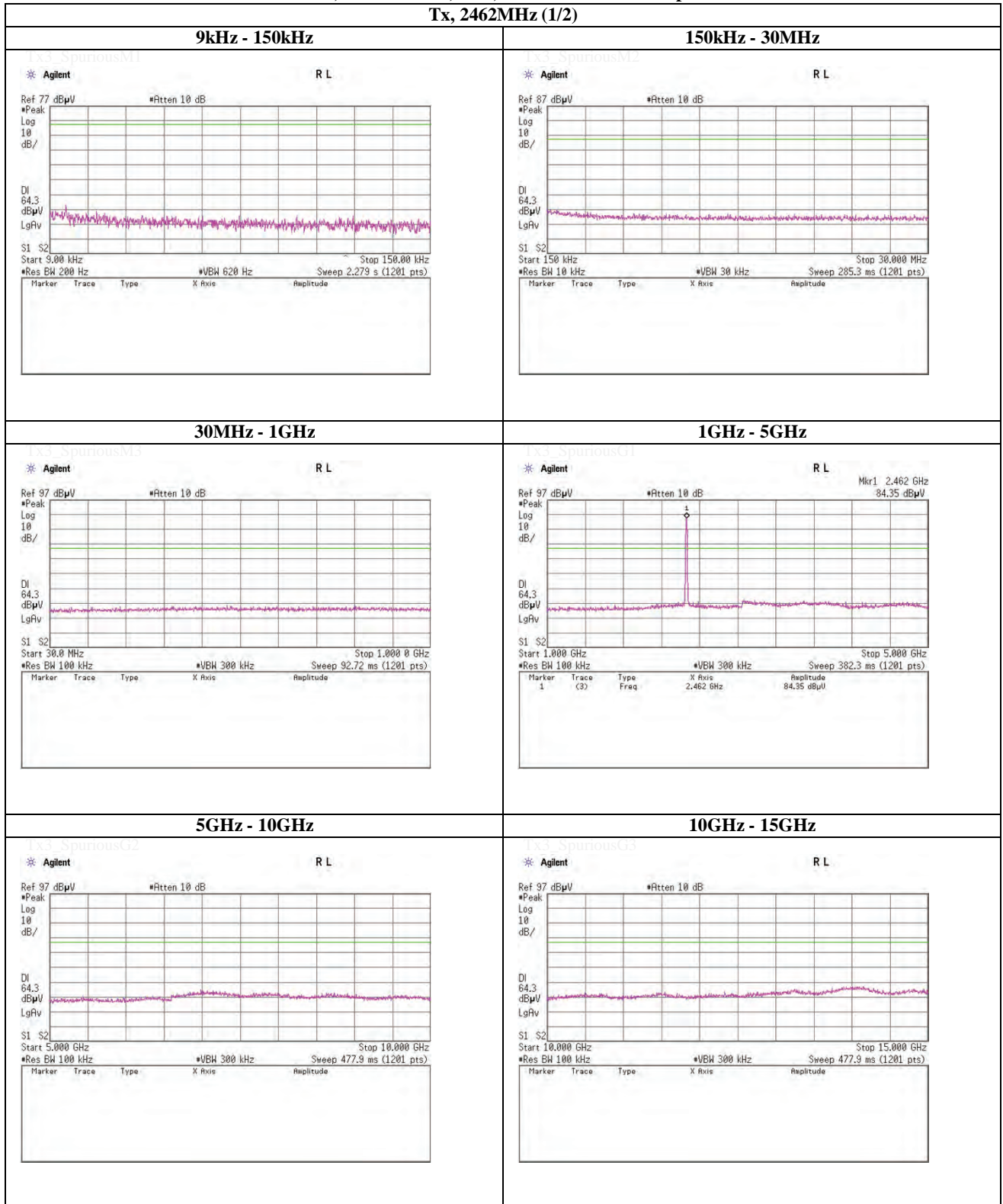
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

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

Tx, 2462MHz (1/2)



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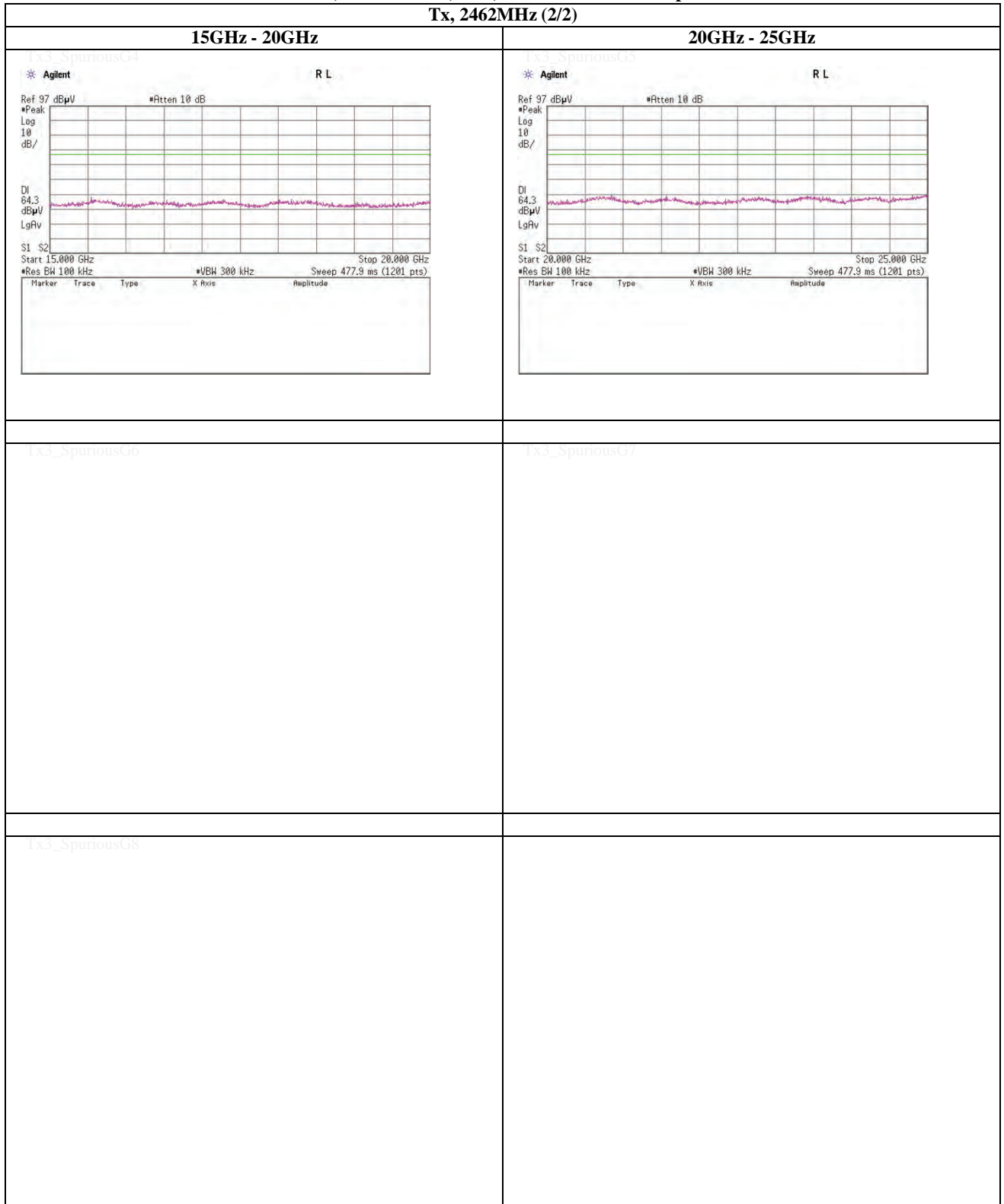
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

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

Tx, 2462MHz (2/2)



UL Japan, Inc.

Shonan EMC Lab.

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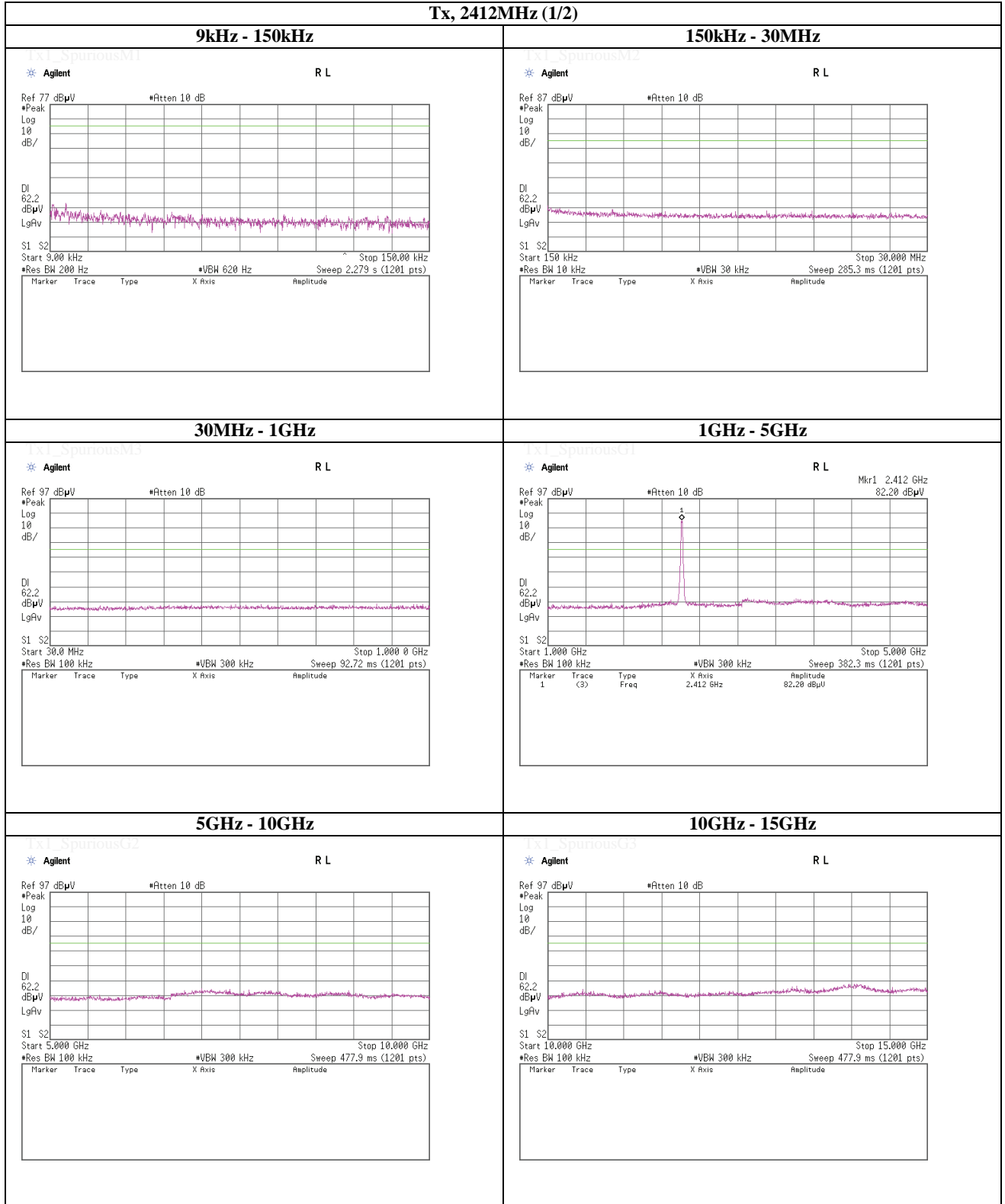
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 2.14dBi Single/15dBi Single)

Tx, 2412MHz (1/2)



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Shonan EMC Lab.

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Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 2.14dBi Single/15dBi Single)

Tx, 2412MHz (2/2)

15GHz - 20GHz	20GHz - 25GHz																				
<p style="color: #808080;">Tx1_SpuriousG4</p> <p style="text-align: right;">R L</p> <p>※ Agilent #Atten 10 dB</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Marker	Trace	Type	X Axis	Amplitude						<p style="color: #808080;">Tx1_SpuriousG5</p> <p style="text-align: right;">R L</p> <p>※ Agilent #Atten 10 dB</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th>Marker</th> <th>Trace</th> <th>Type</th> <th>X Axis</th> <th>Amplitude</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Marker	Trace	Type	X Axis	Amplitude					
Marker	Trace	Type	X Axis	Amplitude																	
Marker	Trace	Type	X Axis	Amplitude																	
<p style="color: #808080;">Tx1_SpuriousG6</p>	<p style="color: #808080;">Tx1_SpuriousG7</p>																				
<p style="color: #808080;">Tx1_SpuriousG8</p>																					

UL Japan, Inc.

Shonan EMC Lab.

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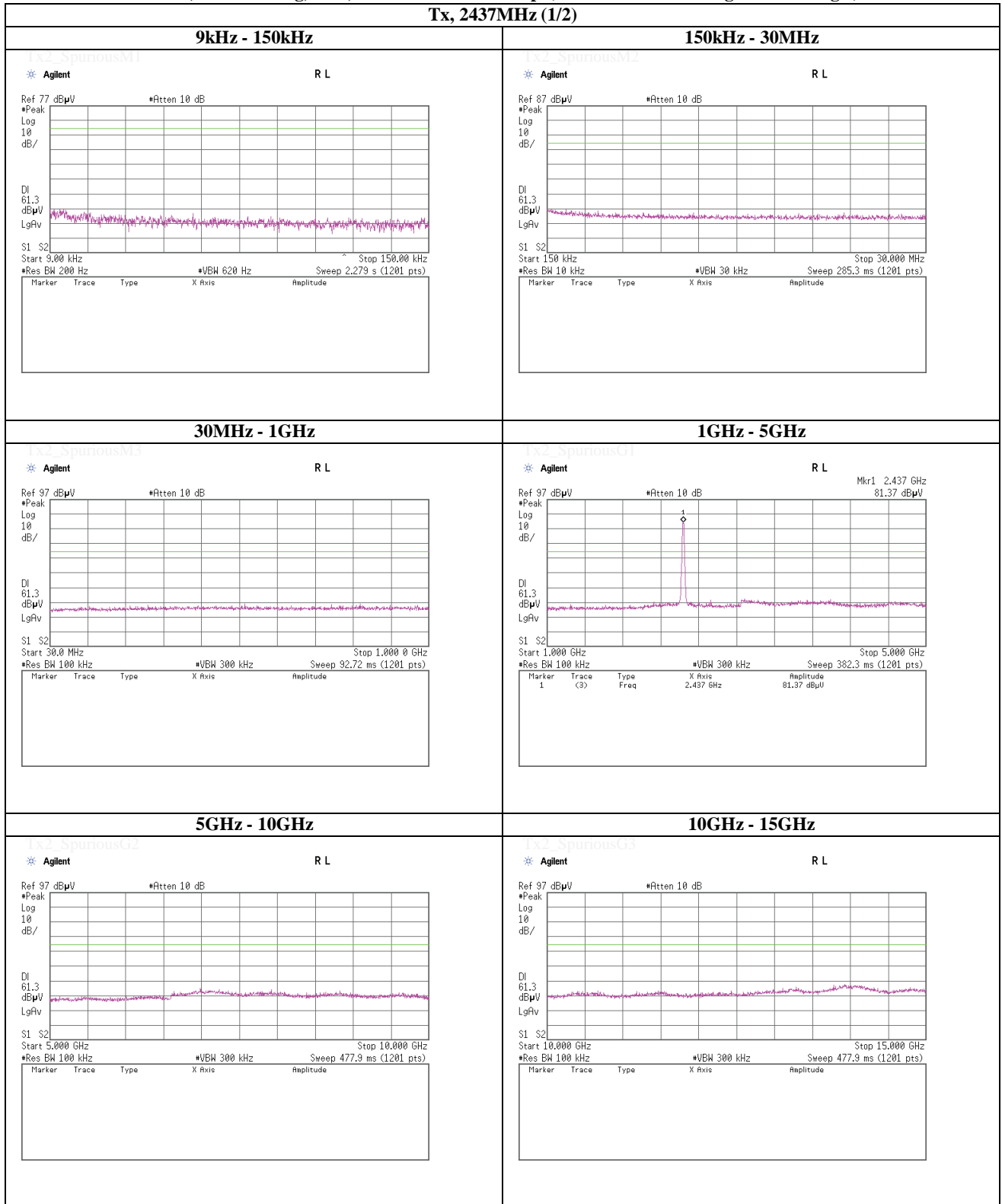
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 2.14dBi Single/15dBi Single)

Tx, 2437MHz (1/2)



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Shonan EMC Lab.

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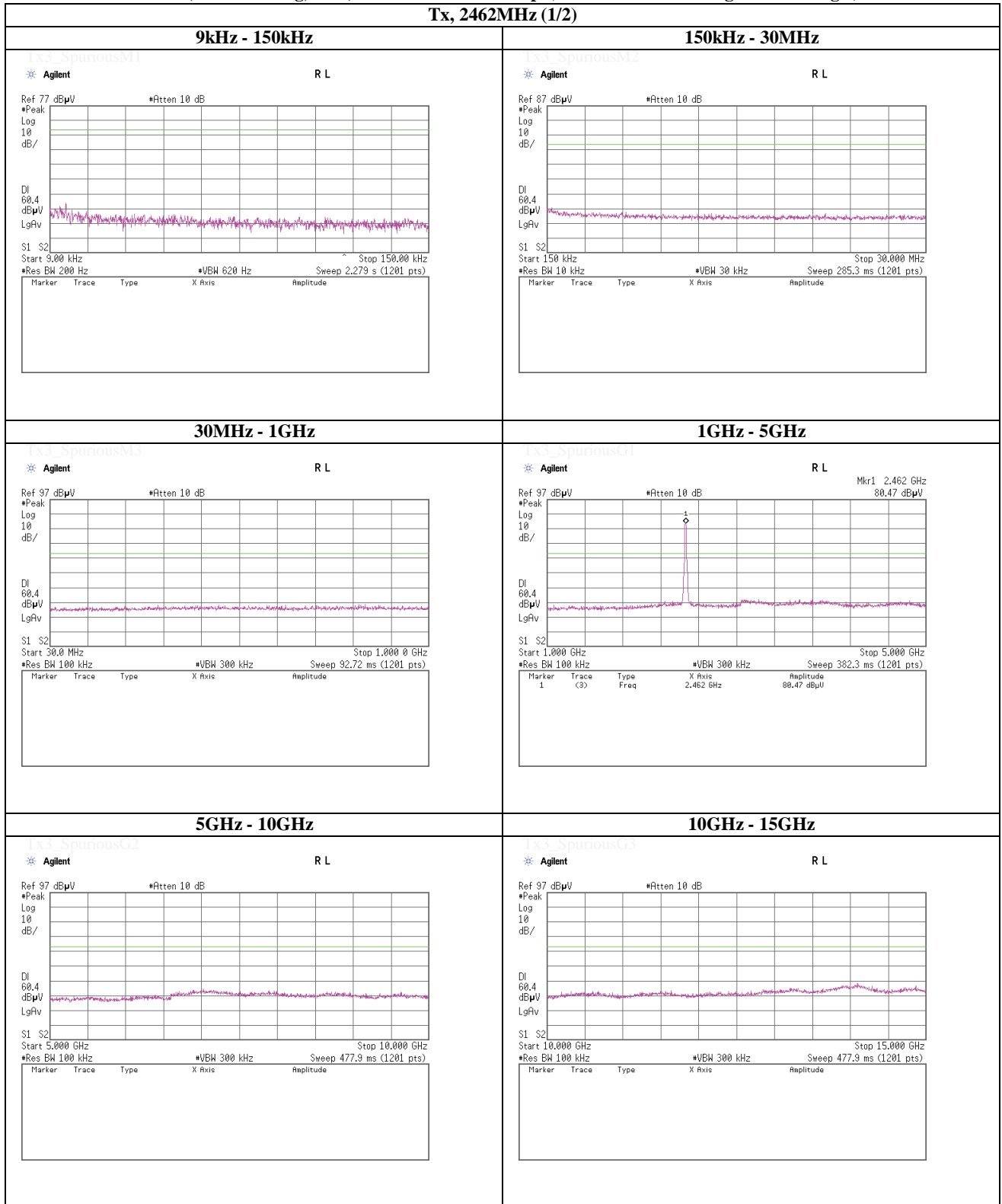
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 2.14dBi Single/15dBi Single)

Tx, 2462MHz (1/2)



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Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 2.14dBi Single/15dBi Single)

Tx, 2462MHz (2/2)



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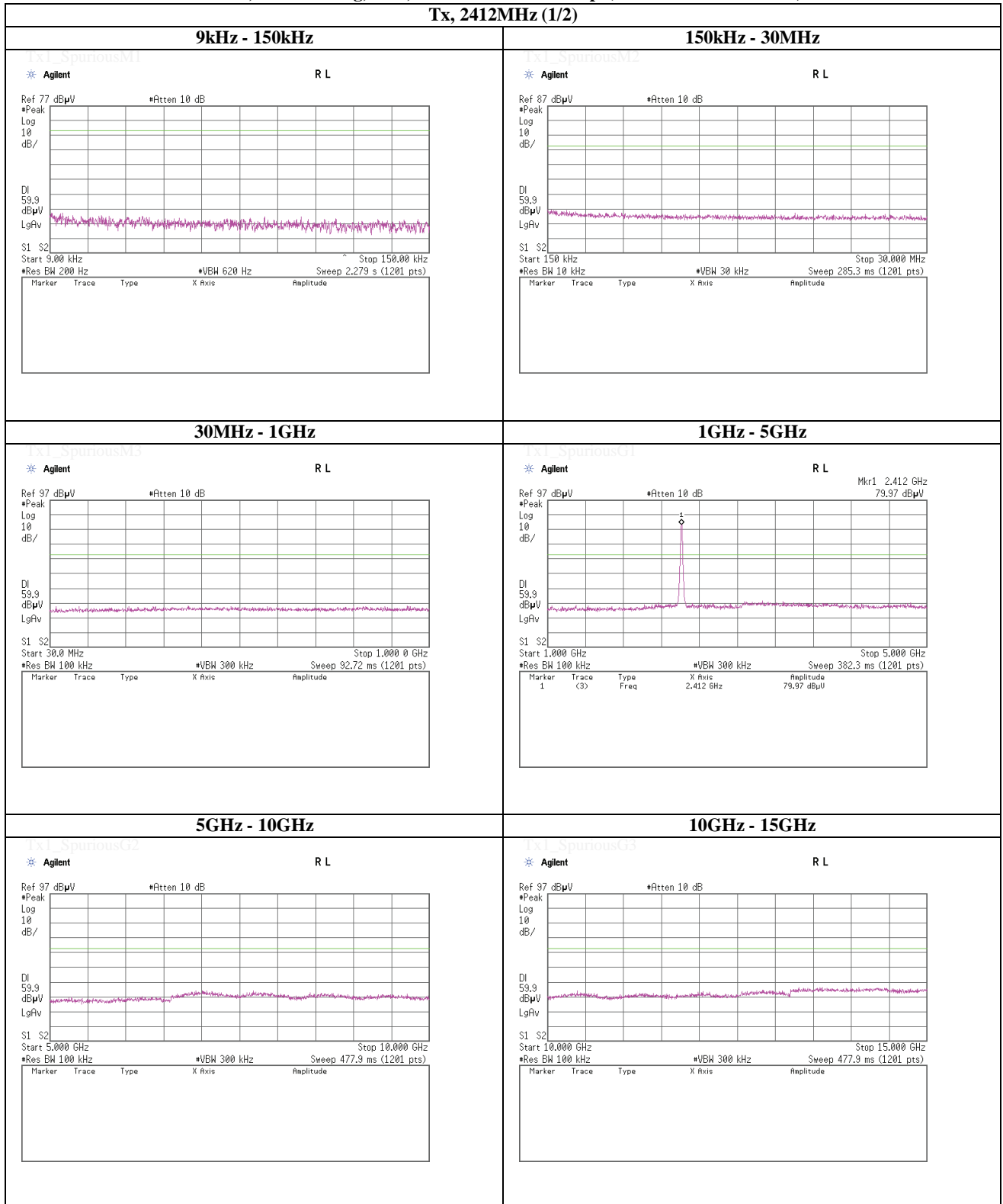
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 2.14dBi Dual)

Tx, 2412MHz (1/2)



UL Japan, Inc.

Shonan EMC Lab.

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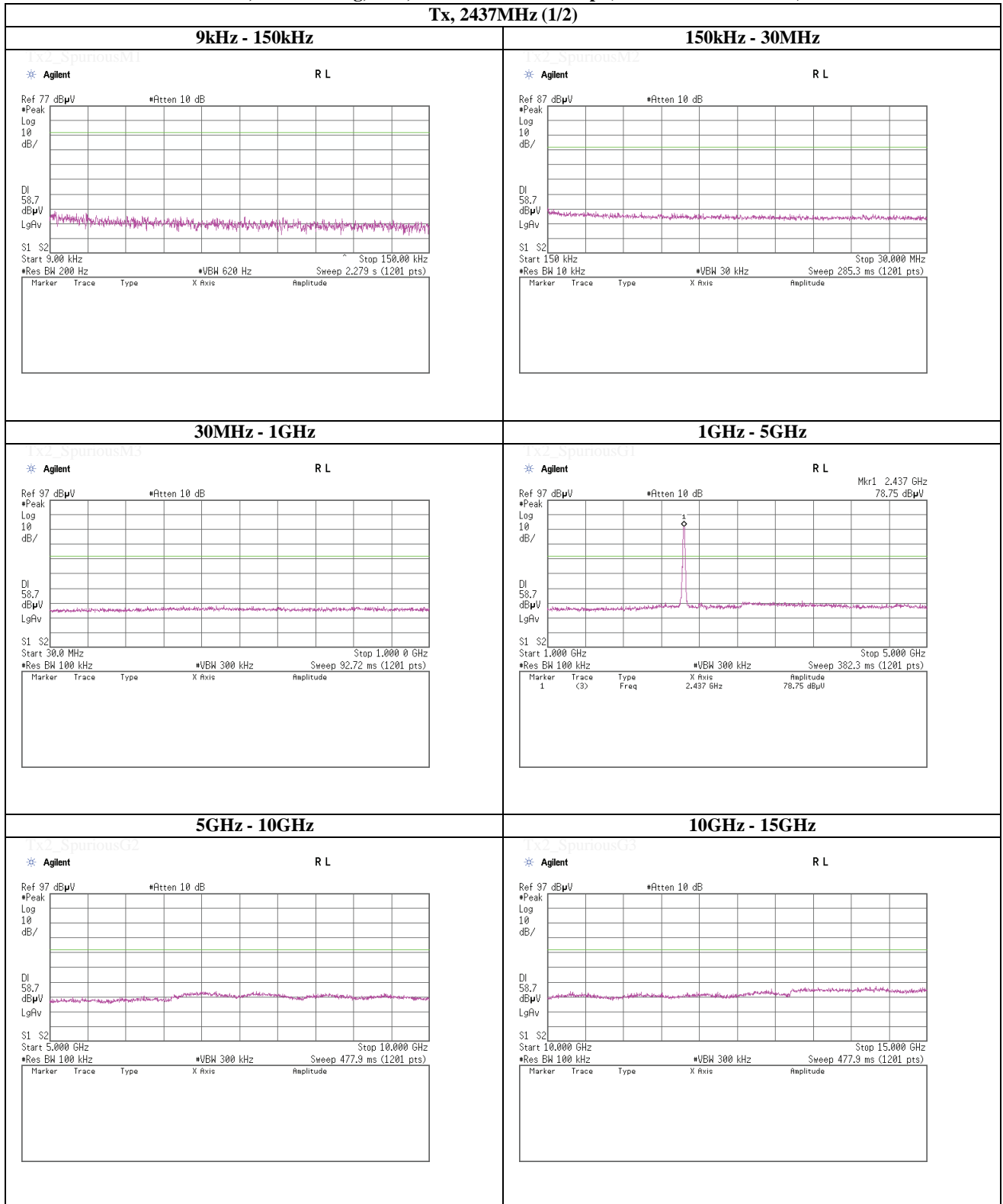
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Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 2.14dBi Dual)

Tx, 2437MHz (1/2)



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Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 2.14dBi Dual)

Tx, 2437MHz (2/2)



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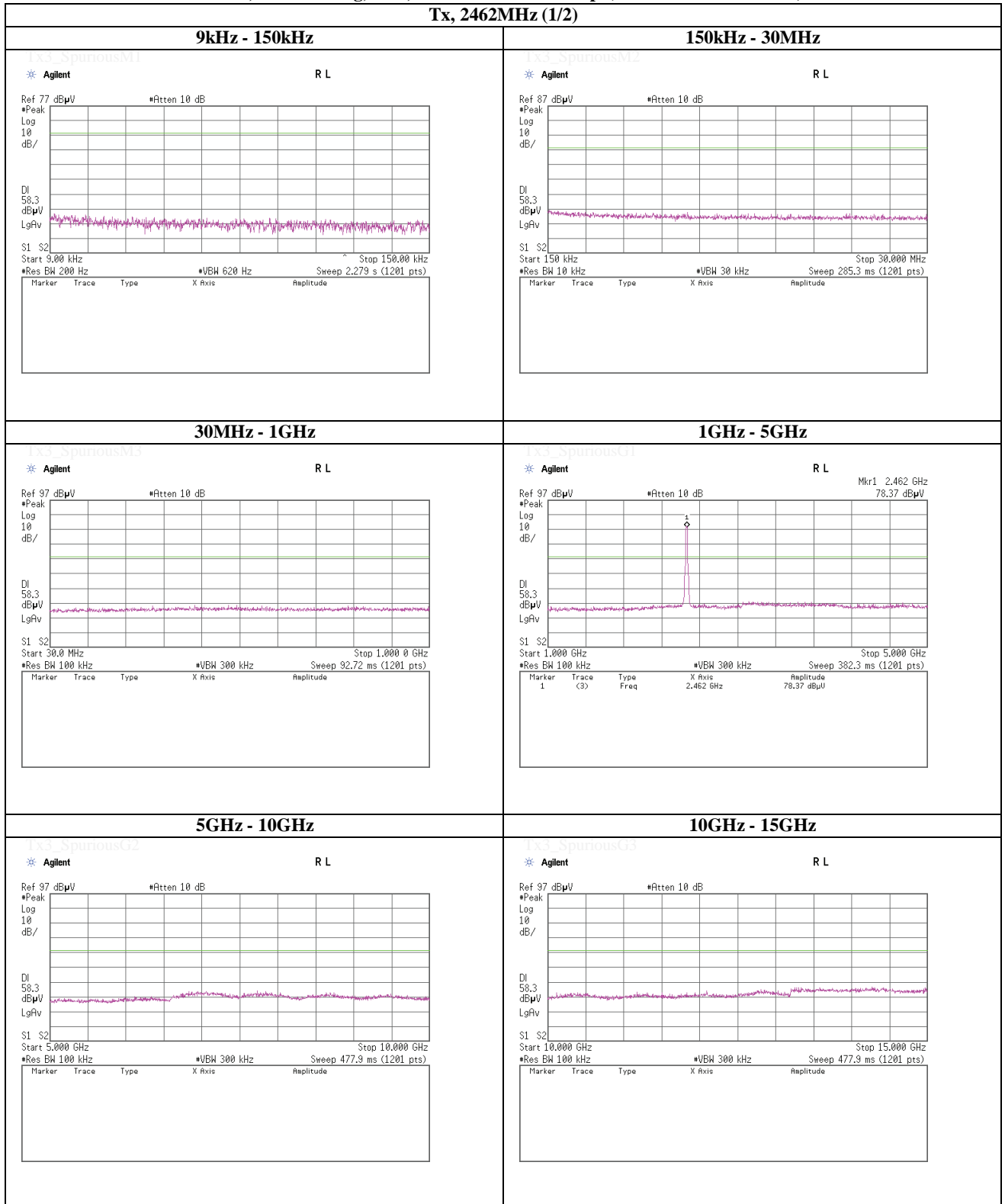
Telephone : +81 463 50 6400

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Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 2.14dBi Dual)

Tx, 2462MHz (1/2)



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Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 2.14dBi Dual)

Tx, 2462MHz (2/2)



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Shonan EMC Lab.

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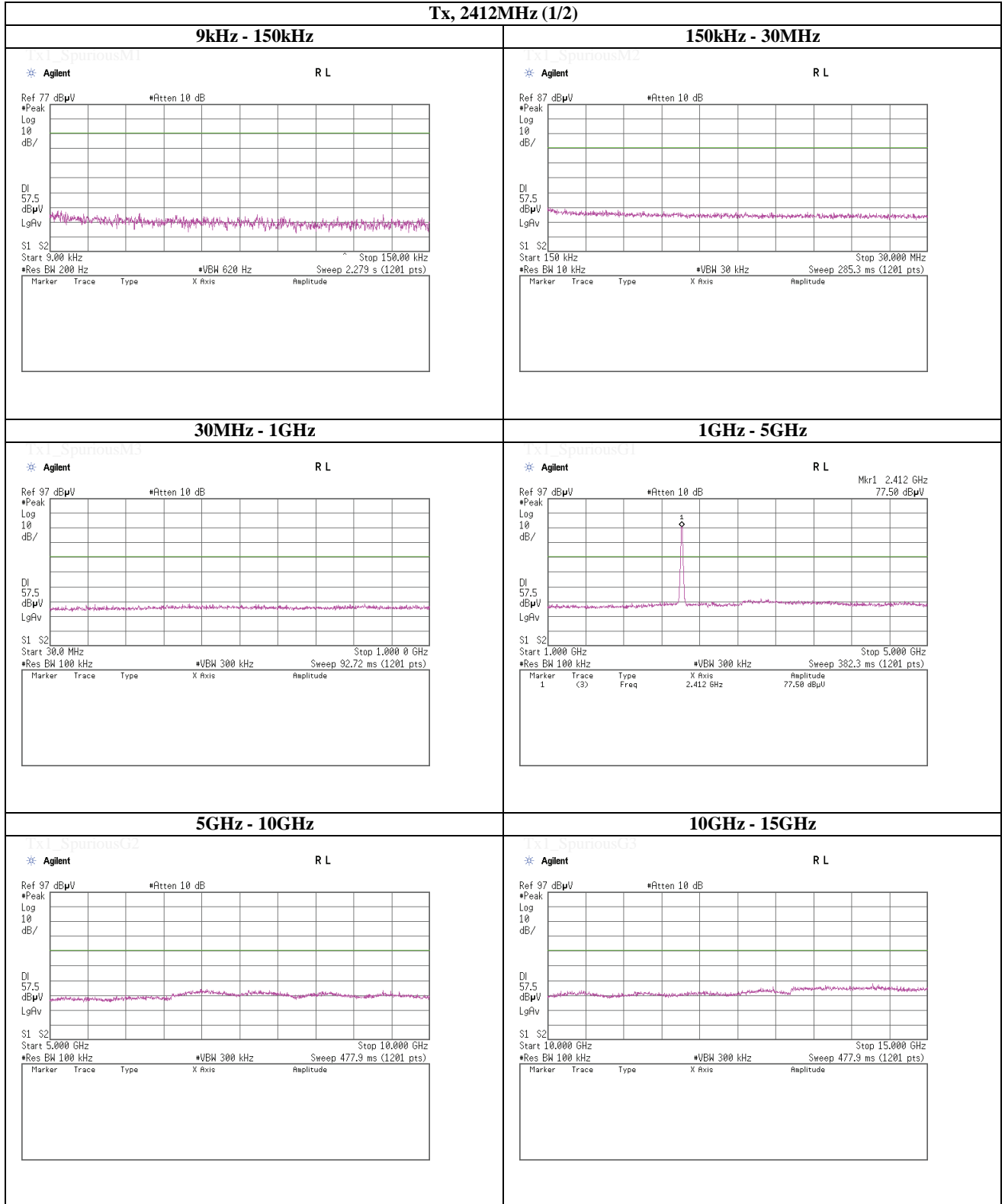
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 6dBi Single)

Tx, 2412MHz (1/2)



UL Japan, Inc.

Shonan EMC Lab.

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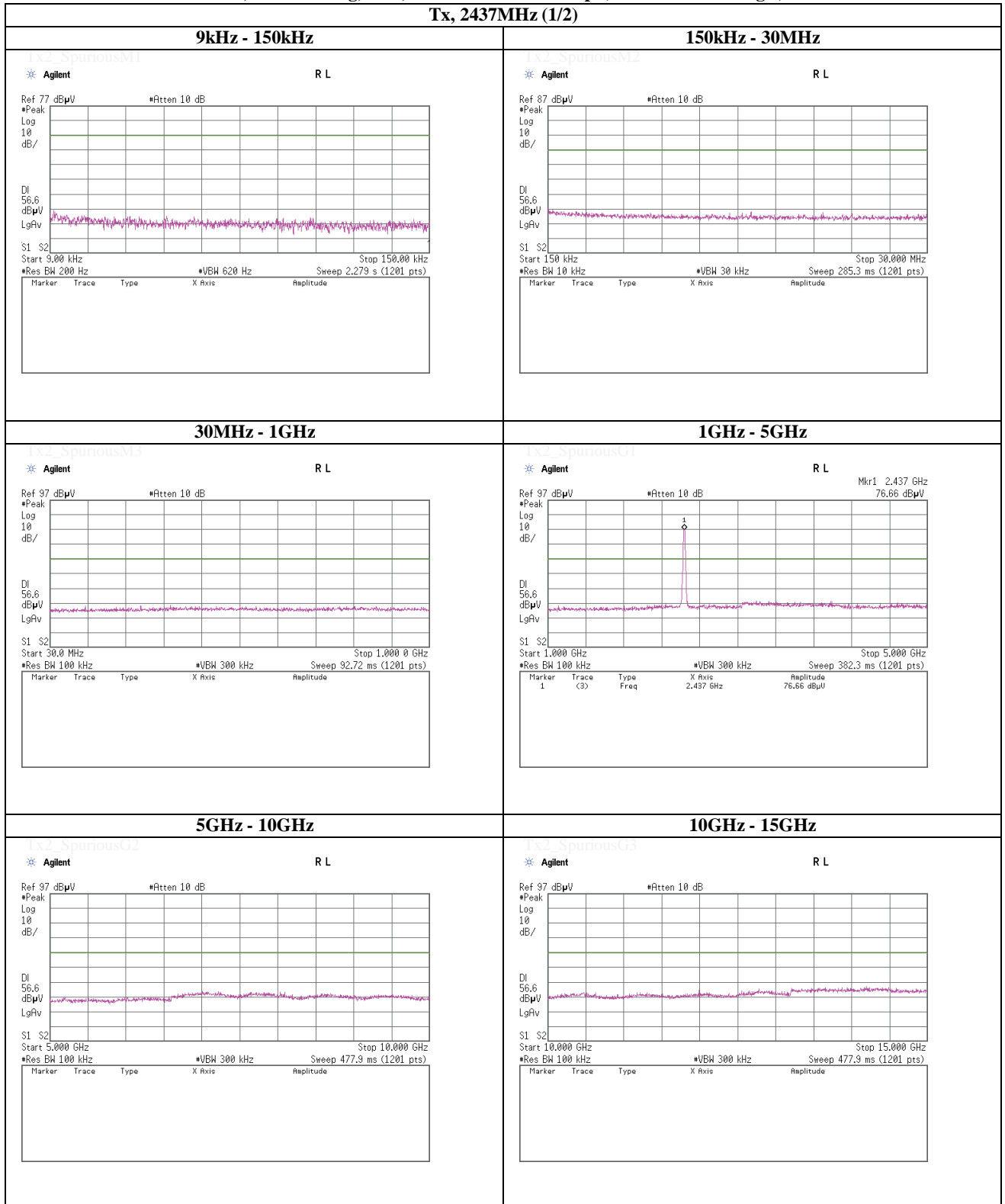
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 6dBi Single)

Tx, 2437MHz (1/2)



UL Japan, Inc.

Shonan EMC Lab.

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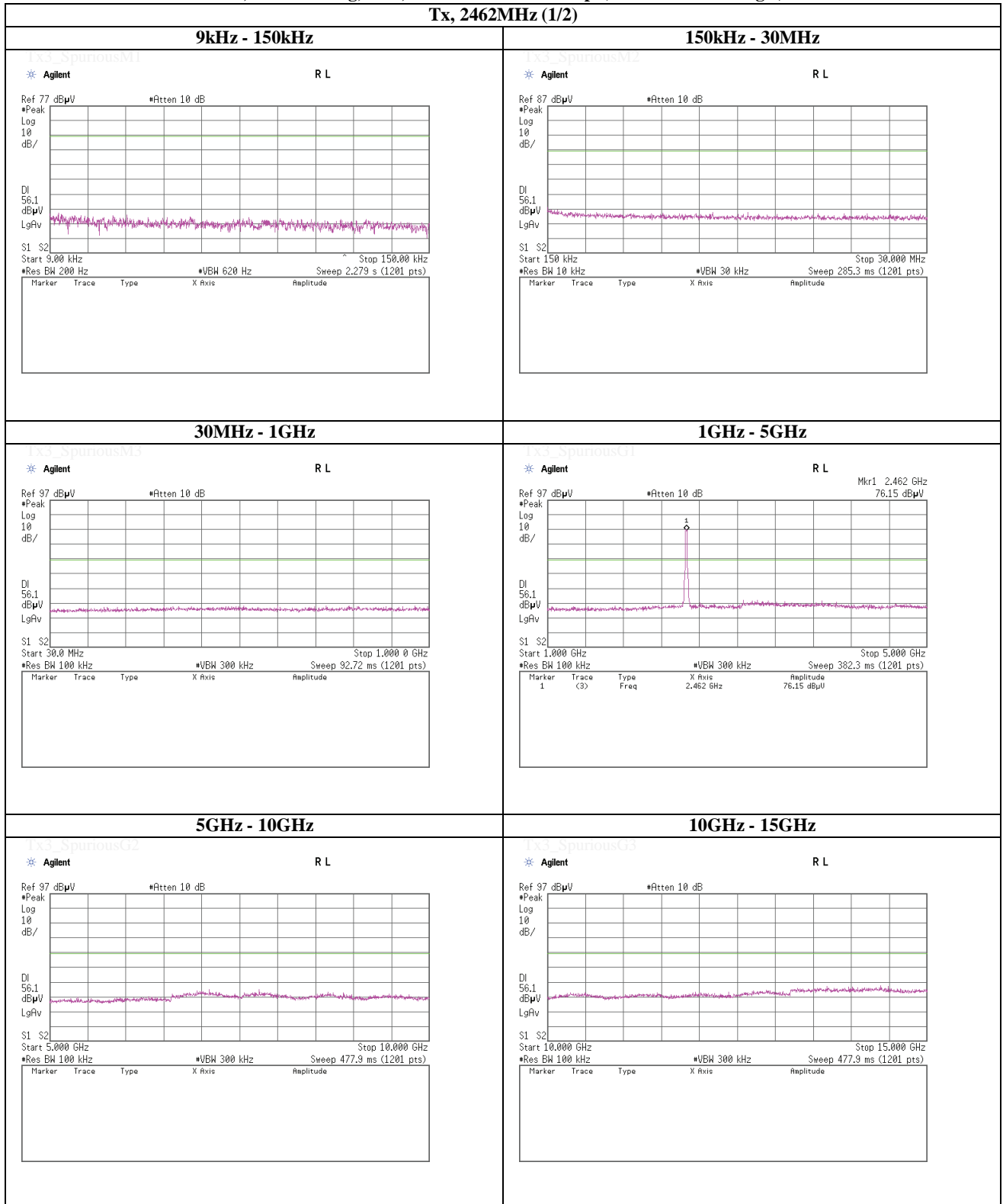
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 6dBi Single)

Tx, 2462MHz (1/2)



UL Japan, Inc.

Shonan EMC Lab.

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

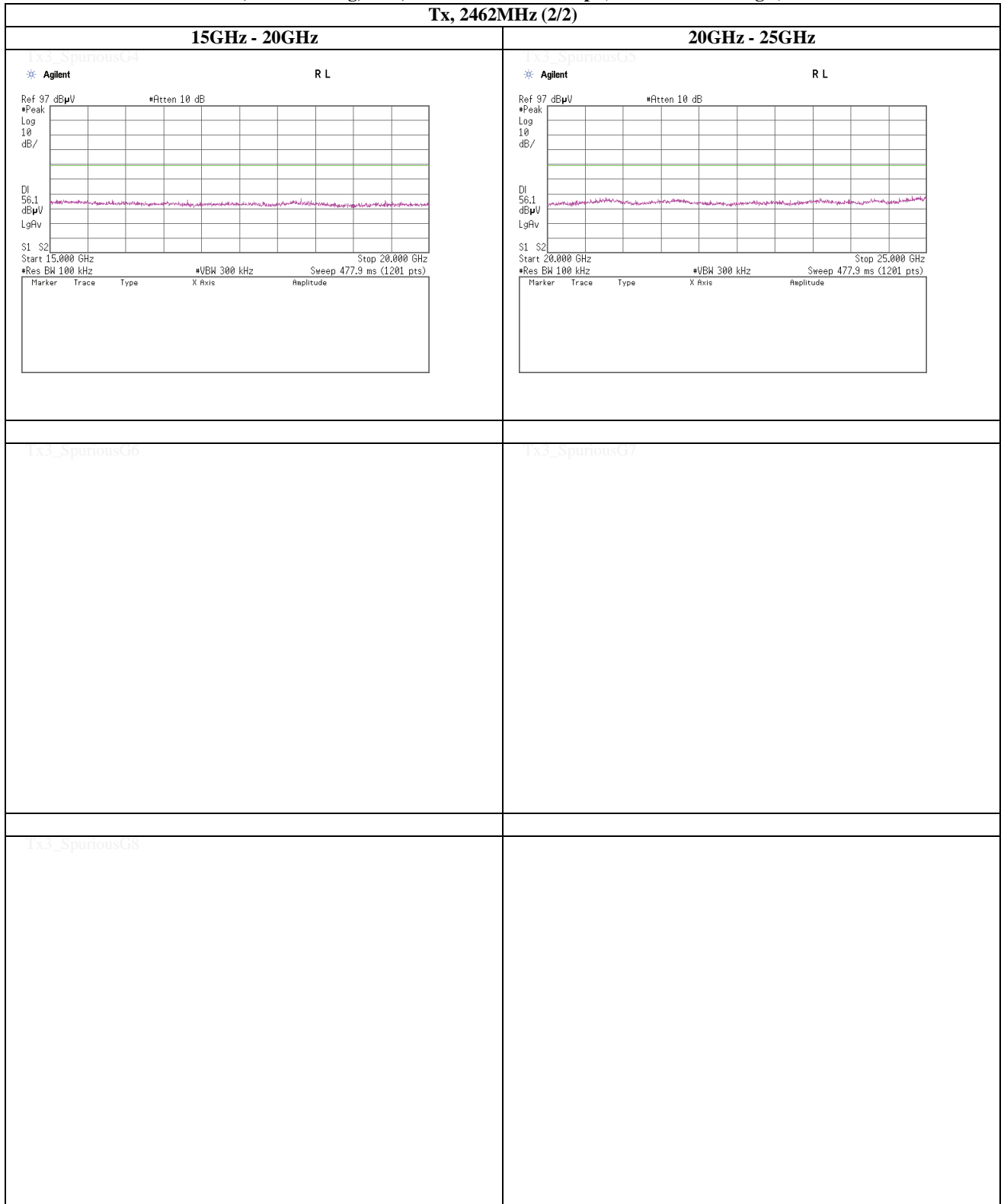
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 6dBi Single)

Tx, 2462MHz (2/2)



UL Japan, Inc.

Shonan EMC Lab.

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

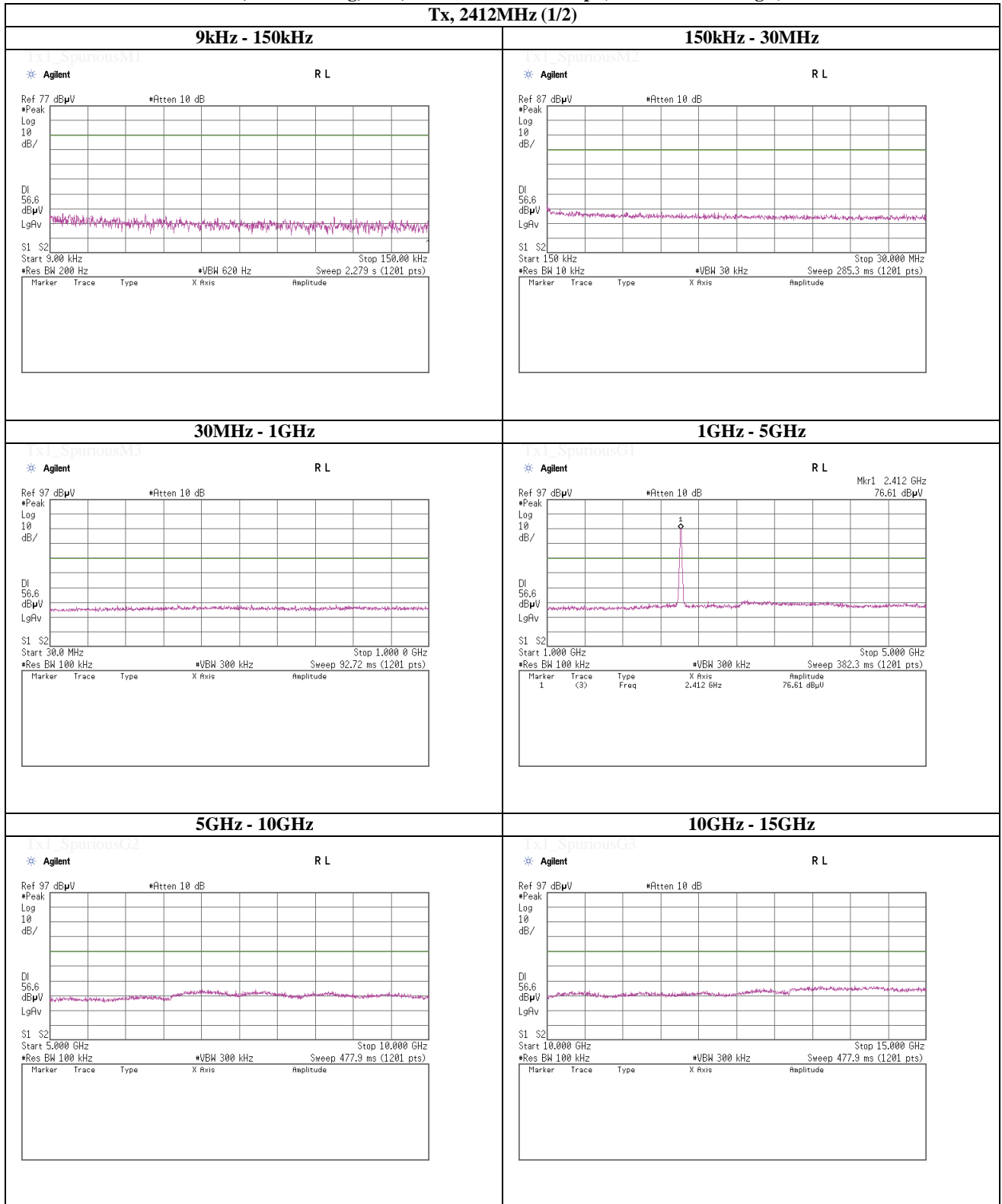
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 9dBi Single)

Tx, 2412MHz (1/2)



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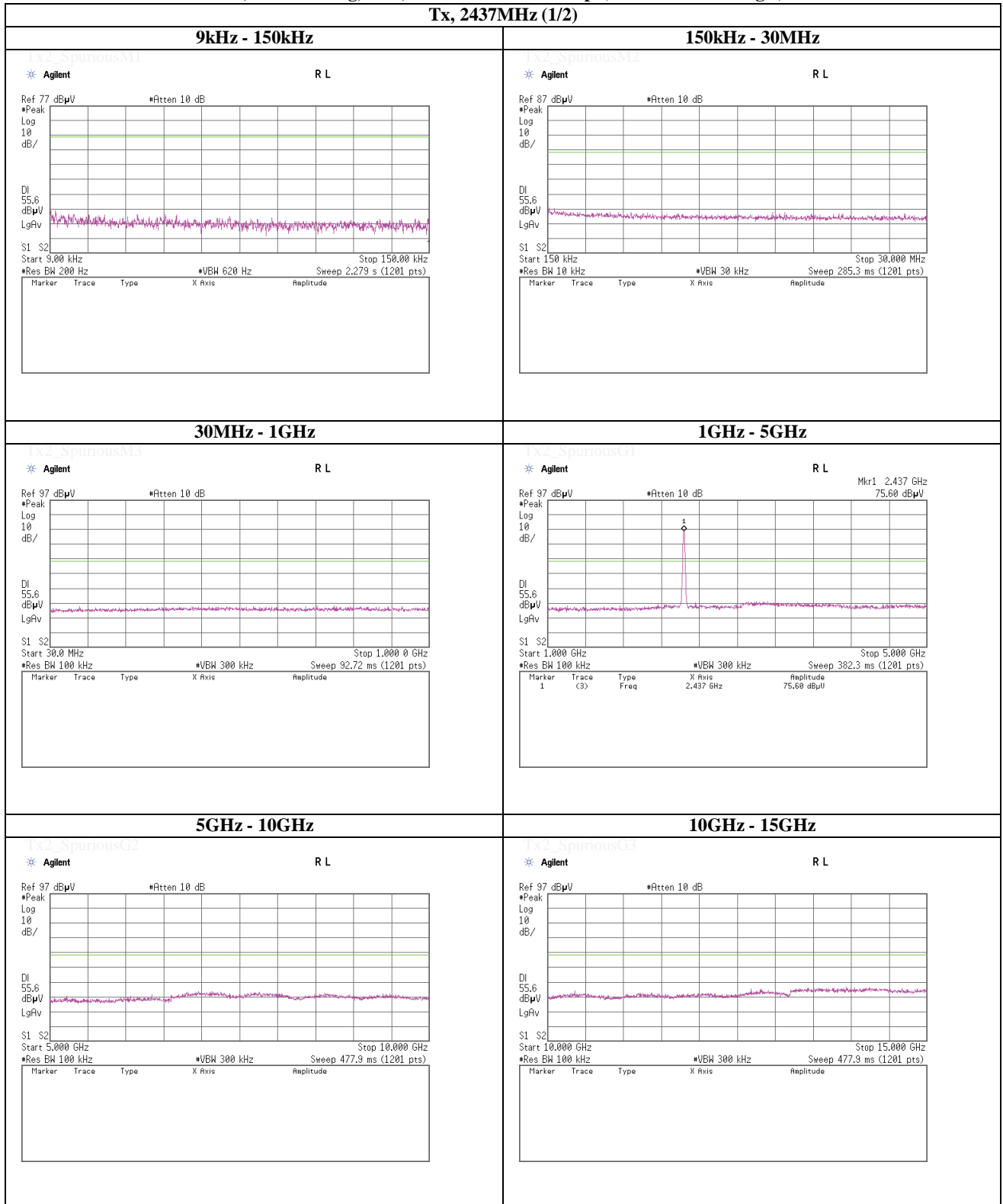
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 9dBi Single)

Tx, 2437MHz (1/2)



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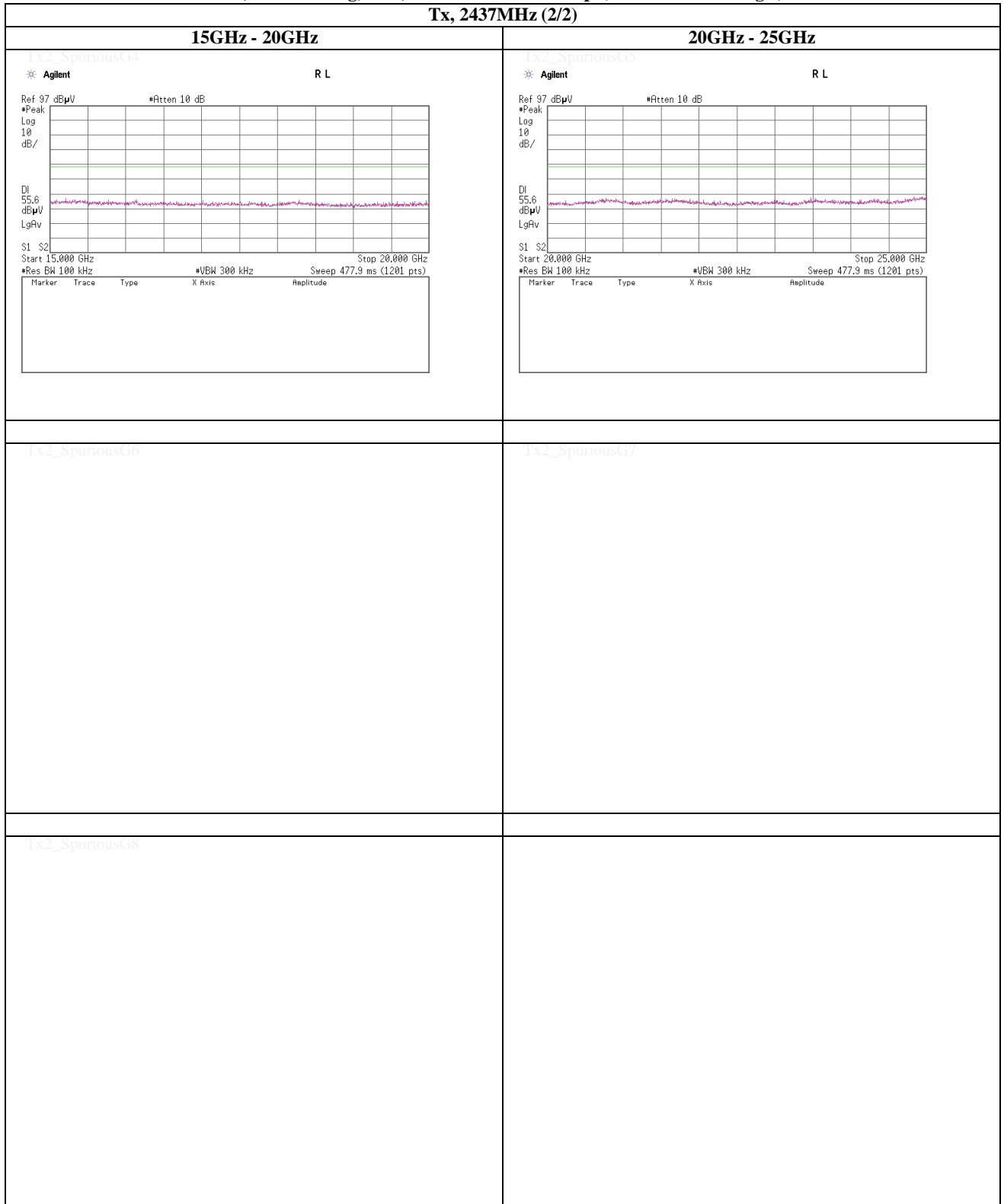
Telephone : +81 463 50 6400

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Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 9dBi Single)

Tx, 2437MHz (2/2)



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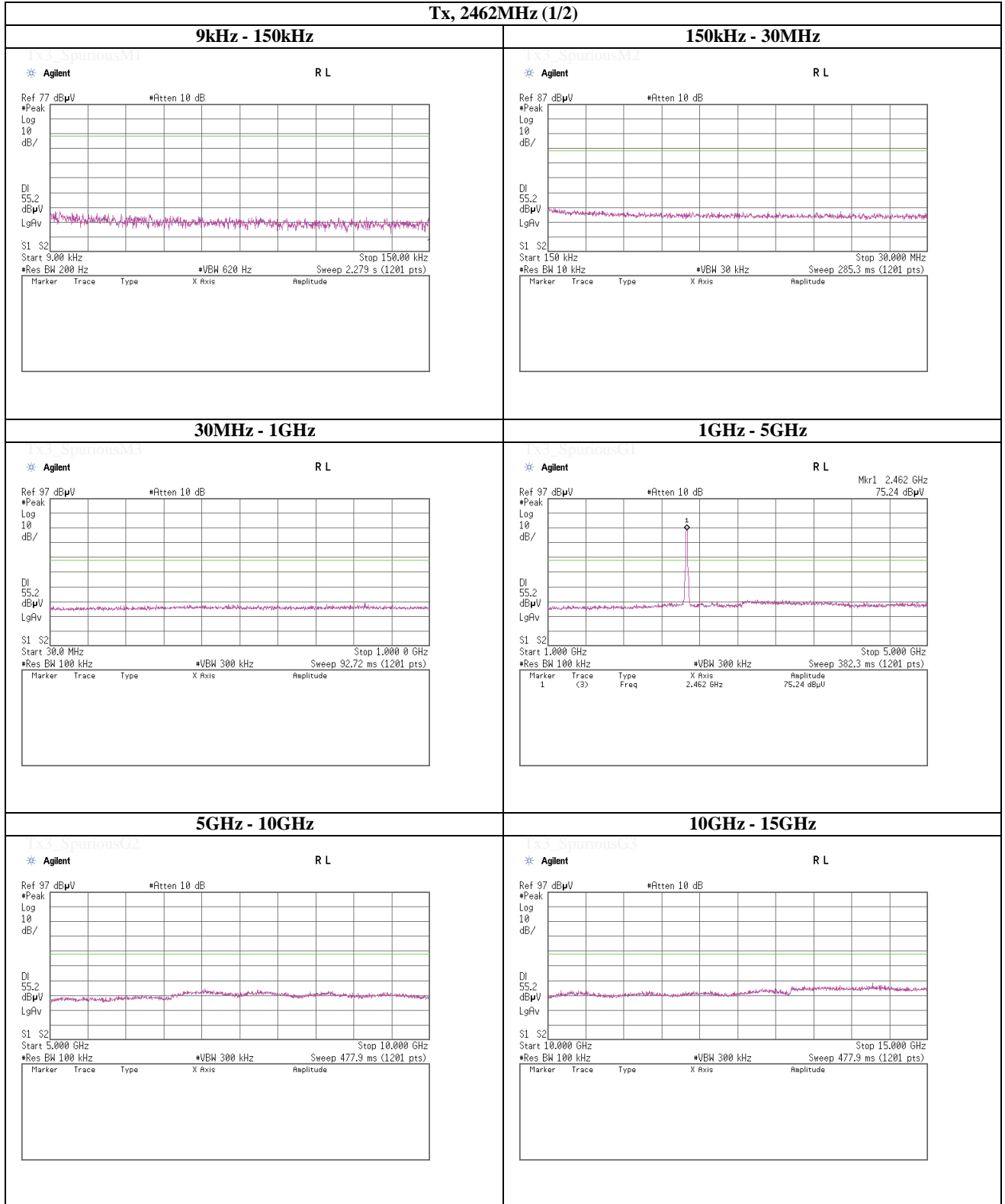
Telephone : +81 463 50 6400

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Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 9dBi Single)

Tx, 2462MHz (1/2)



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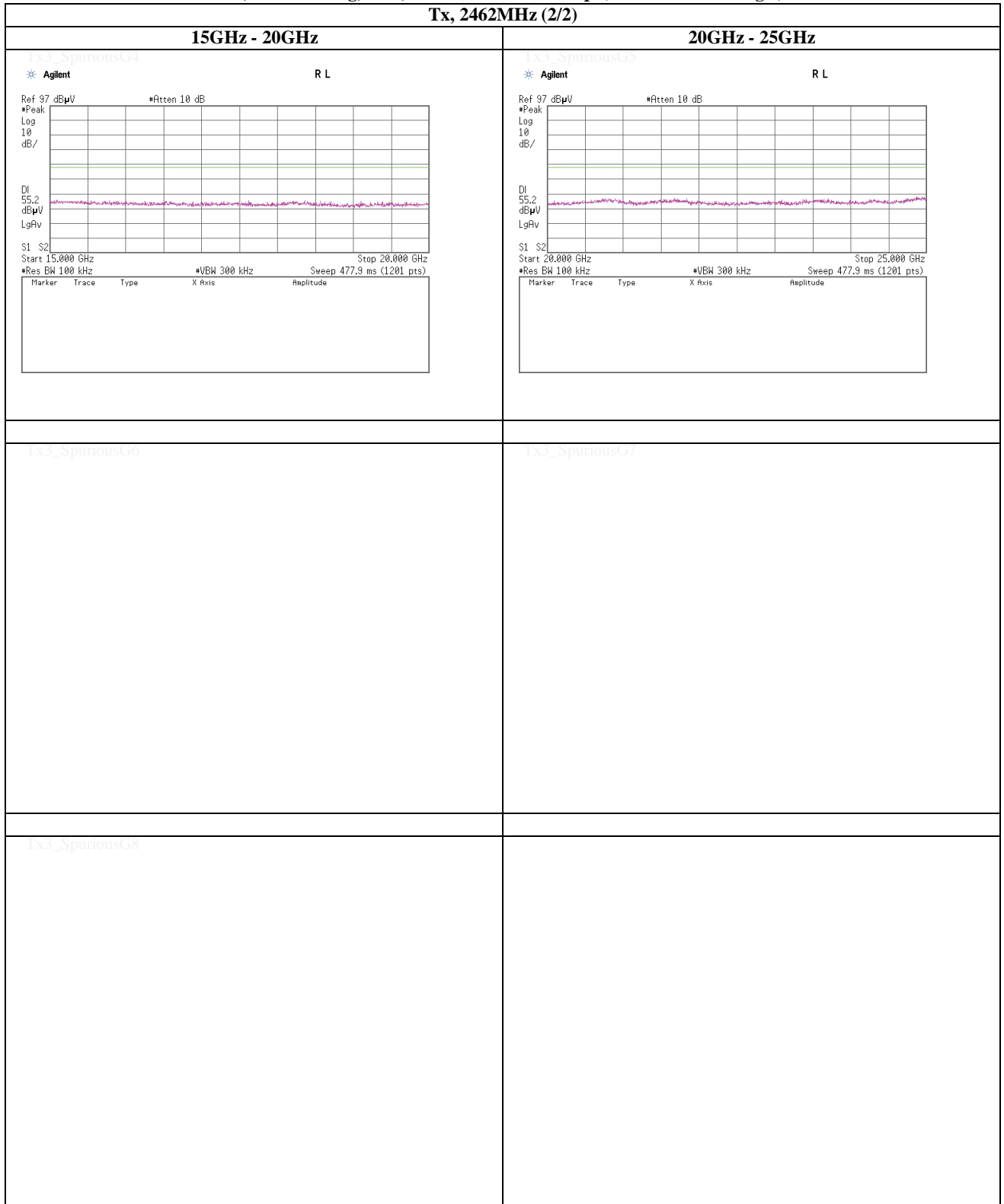
Telephone : +81 463 50 6400

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Spurious emission (Conducted)

Tx, IEEE802.11g, PN9, worst data mode 6Mbps(Antenna: 9dBi Single)

Tx, 2462MHz (2/2)



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