



RADIO TEST REPORT

Test Report No.: 10006272S-B

Applicant : Clarion Co., Ltd.
Type of Equipment : Digital Wireless Camera System Receiver
Model No. : EE-2178
FCC ID : AX2EE2178
Test regulation : FCC Part15 Subpart C: 2012
Test result : Complied

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3. This sample tested is in compliance with the limits of the above regulation.
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6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.

Date of test: March 25 to 27, 2013

Tested by: T. Arai
Tatsuya Arai
Engineer of WiSE Japan,
UL Verification Service

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



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 There is no testing item of "Non-accreditation".

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 10006272S-B

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10006272S-B	May 27, 2013	-	-
1	10006272S-B	February 19, 2014	4	Update of antenna information

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SECTION 1: Customer information

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

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

2.1 Identification of E.U.T.

Type of Equipment : Digital Wireless Camera System Receiver
Model Number : EE-2178
Serial Number : Refer to 4.2 in this report.
Rating : 12VDC (10.8V - 15.6V)
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 : March 23 and April 9, 2013
Modification of EUT : No modification by the test lab.

2.2 Product description

Model: EE-2178 (referred to as the EUT in this report) is a Digital Wireless Camera System Receiver.

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

Radio specification:

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

Antenna information:

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

*1) Each antenna connection is the limited by Reverse-SMA with the connector housing. High gain antenna cannot be connected to EUT directly.

FCC 15.31 (e)

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

FCC 15.203

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

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SECTION 3: Test specification, procedures & results

3.1 Test specification

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

3.2 Procedures & Results

Item	Test Procedure *1)	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.10:2009	FCC 15.207	-	N/A *2)	N/A	N/A
6dB bandwidth	ANSI C63.10:2009	FCC 15.247 (a)(2)	Conducted	N/A	* See data	Complied
Maximum peak output power	ANSI C63.10:2009	FCC 15.247 (b)(3)	Conducted	N/A		Complied
Out of band emission & Restricted band edges	ANSI C63.10:2009	FCC 15.109, 15.247 (d) & 15.209	Conducted / Radiated	N/A	1.8dB Freq.: 2483.500MHz Polarization: Horizontal Detection: Peak Mode: Tx 2462MHz, IEEE 802.11b Antenna: 5dBi antenna	Complied
Power density	ANSI C63.10:2009	FCC 15.247 (e)	Conducted	N/A	* See data	Complied

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

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

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

3.3 Addition to standard

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

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

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

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3.4 Uncertainty

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

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

*1: SAC=Semi-Anechoic Chamber

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

Radiated emission test

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

Antenna port conducted test

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

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

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

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

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

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

3.5 Test location

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JAB Accreditation No. : RTL02610

	FCC Registration No.	IC Registration No.	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
<input type="checkbox"/> No.1 semi-anechoic chamber	697847	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
<input type="checkbox"/> No.2 semi-anechoic chamber	697847	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
<input checked="" type="checkbox"/> No.3 semi-anechoic chamber	697847	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
<input type="checkbox"/> No.4 semi-anechoic chamber	-	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
<input 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	-
<input type="checkbox"/> No.7 shielded room	-	-	2.76 x 3.76 x 2.4	2.76 x 3.76	-

3.6 Test setup, Test data & Test instruments

Refer to APPENDIX 1 to 3.

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

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

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

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

*3) Test operating mode was determined as follows according to "Section 1 of 6 802.11 a/b/g/n testing- Managing Complex Regulatory Approvals - "of TCB Council Workshop October 2009.

Antenna used:

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

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

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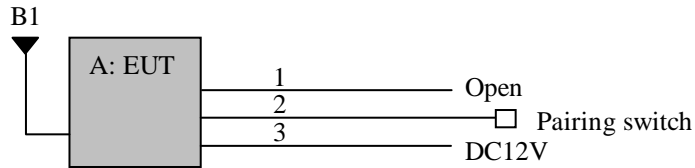
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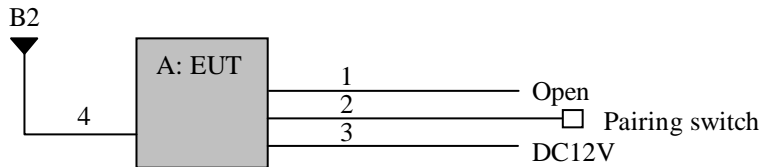
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4.2 Configuration and peripherals

4.2.1 2dBi antenna



4.2.2 5dBi antenna



* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Digital Wireless Camera System Receiver	EE-2178	41	Clarion Co., Ltd.	EUT
B1	Antenna	AN-DP005008	-	HARUMOTO PRECISION CO., LTD.	2dBi
B2	Antenna	IWX-1511RSXX	-	JOYMAX ELECTRONICS CO., LTD.	5dBi

List of cables used

No.	Cable Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Video	2.4	Shielded	Shielded	-
2	Pairing switch	2.5	Shielded	Shielded	-
3	DC	3.0	Unshielded	Unshielded	-
4	Antenna	3.0	Shielded	Shielded	-

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SECTION 5: Radiated emission

5.1 Operating environment

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

5.2 Test configuration

EUT was placed on a urethane platform of nominal size, 0.5m by 0.5m, raised 0.8m above the conducting ground plane. The rear of EUT was aligned and flushed with rear of tabletop.

Photographs of the set up are shown in APPENDIX 3.

5.3 Test conditions

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

5.4 Test procedure

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

The radiated emission measurements were made with the following detection.

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

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

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

Worst case:

Subject	Antenna polarization	Carrier	Spurious (Below 1GHz)	Spurious (Above 1GHz)
Antenna type of the EUT: 2dBi antenna				
Main unit	Horizontal	X	X	X
Antenna		Y	X	Y
Main unit	Vertical	X	X	X
Antenna		X	X	X
Antenna type of the EUT: 5dBi antenna				
Main unit	Horizontal	Z	X	X
Antenna		Y	Y	Y
Main unit	Vertical	Z	X	X
Antenna		X	X	X

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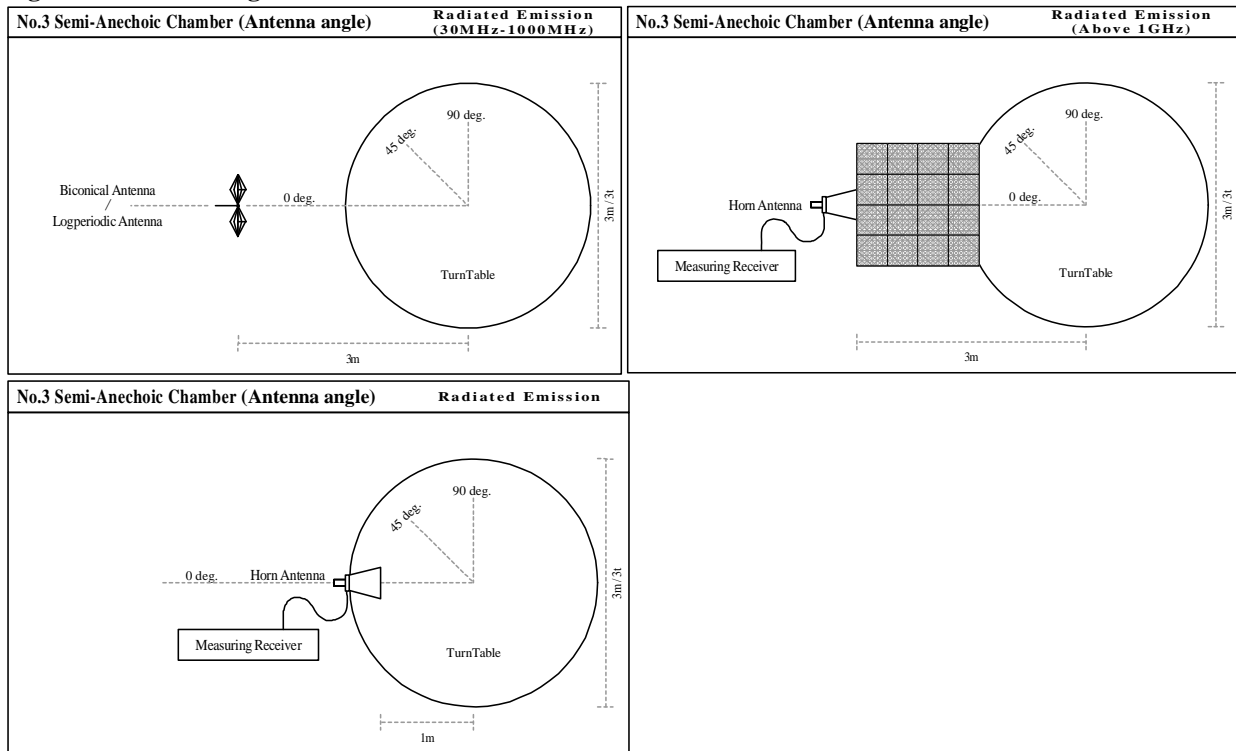
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Figure 1. Antenna angle



5.5 Band edge

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

5.6 Results

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

Refer to APPENDIX 1

SECTION 6: Out of band emissions (Antenna port conducted)

Test procedure

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

Summary of the test results: Pass
Refer to APPENDIX

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

Test procedure

The bandwidth was measured with a spectrum analyzer connected to the antenna port. The test was measured based on Method 7.1 Option 1 and 7.2 Option 2 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

Summary of the test results: Pass
Refer to APPENDIX

SECTION 8: Maximum peak output power

Test procedure

The Maximum Peak Output Power was measured with a power meter connected to the antenna port. The test was measured based on Method 8.1.3 Option 3 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

Summary of the test results: Pass
Refer to APPENDIX 1

SECTION 9: Peak power density

Test procedure

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

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

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

Summary of the test results: Pass
Refer to APPENDIX

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6dB bandwidth
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Spurious emission (Antenna port conducted)
Peak power density
Occupied bandwidth

APPENDIX 2: Test instruments

Test instruments

APPENDIX 3: Photographs of test setup

Radiated emission

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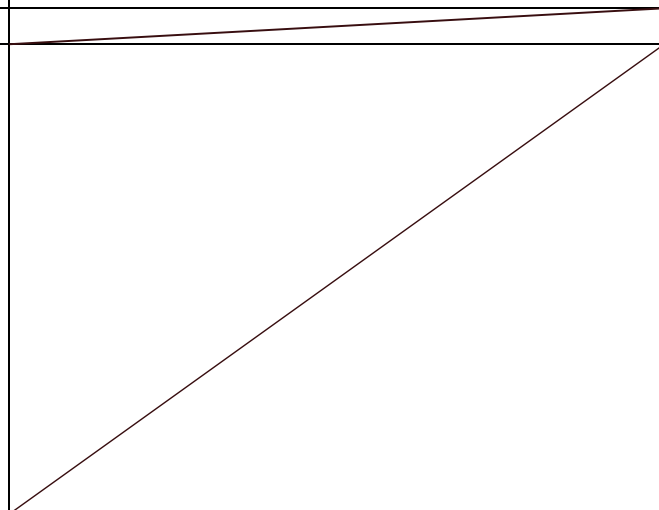
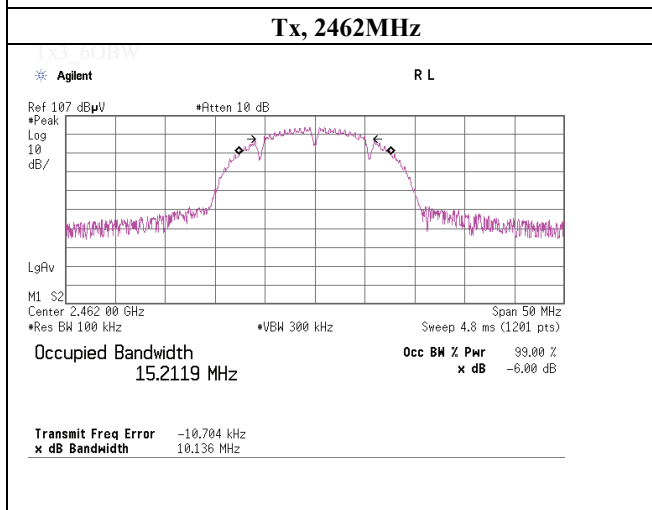
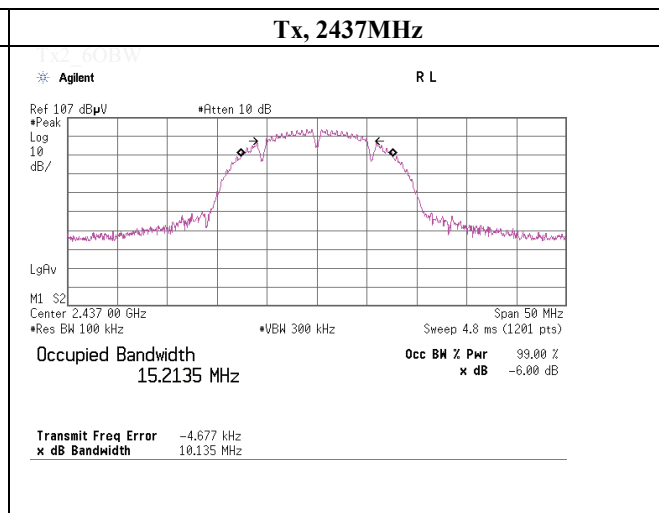
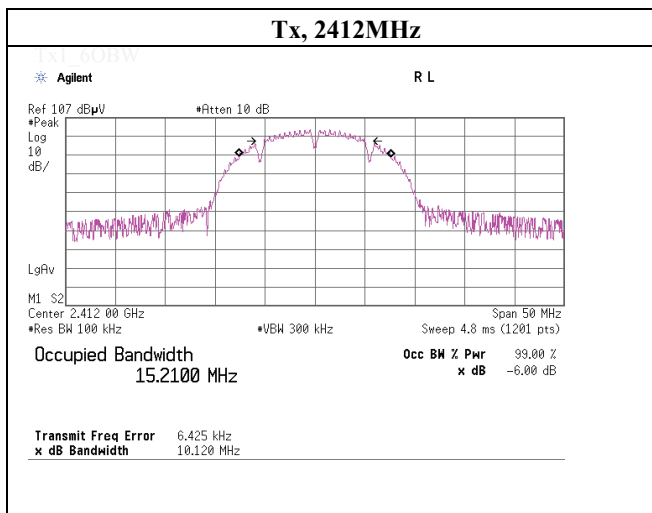
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APPENDIX 1: Data of Radio tests

-6dB Bandwidth

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

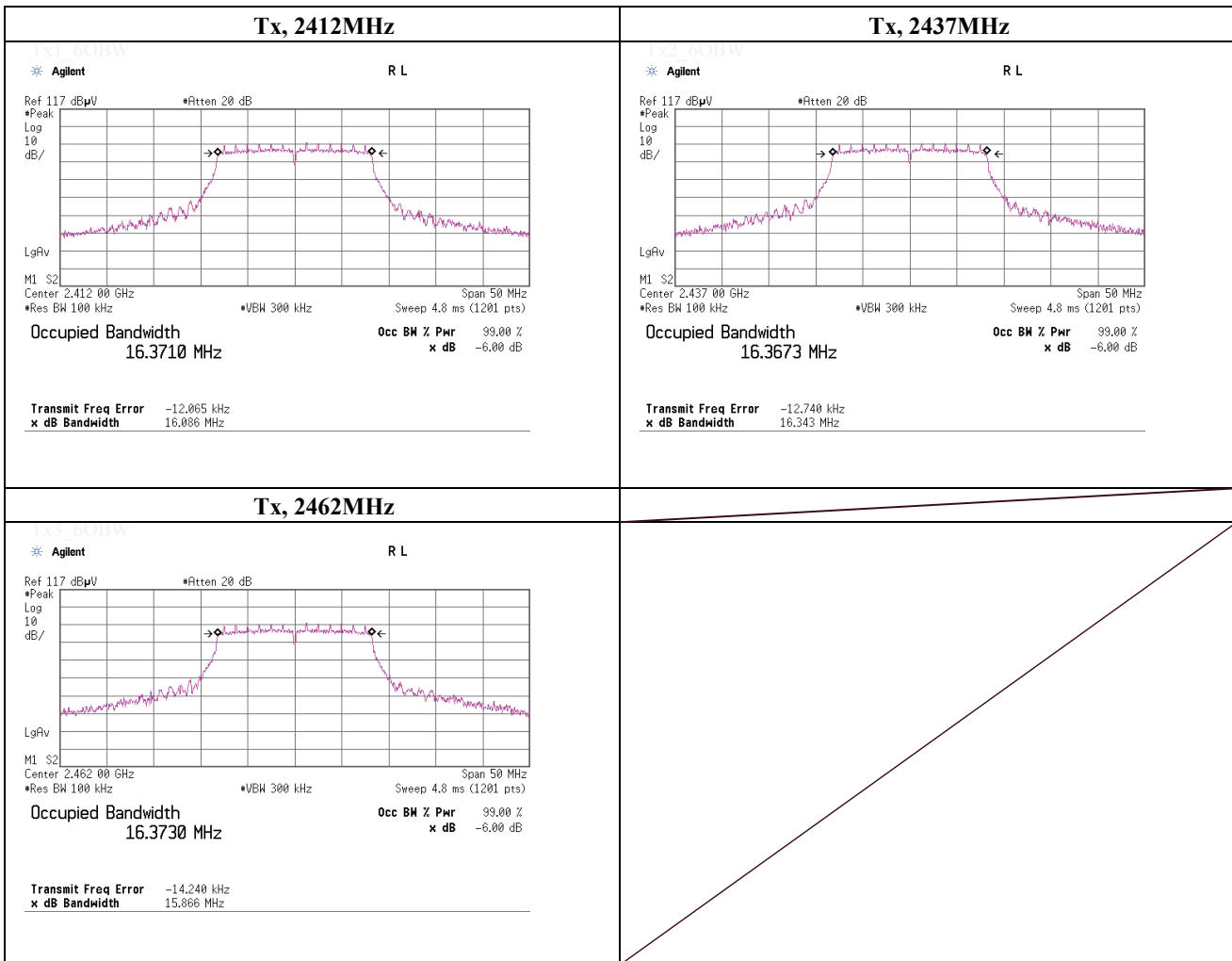
Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	10.120	> 0.500
2437.0000	10.135	> 0.500
2462.0000	10.136	> 0.500



-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	March 25, 2013	
Temperature / Humidity	23deg.C , 45%RH	
Engineer	Makoto Hosaka	
Mode	Tx, IEEE802.11g , PN9, worst data mode 6Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.086	> 0.500
2437.0000	16.343	> 0.500
2462.0000	15.866	> 0.500



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Maximum Peak Conducted Output Power

(Option 3)

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

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	6.06	0.74	9.97	16.77	47.53	30.00	1000	13.23
Mid	2437.0	6.19	0.74	9.97	16.90	48.98	30.00	1000	13.10
High	2462.0	6.15	0.74	9.97	16.86	48.53	30.00	1000	13.14

Sample Calculation:
 Result = Reading + Cable Loss + Atten. Loss

[Pre check]

	Data rate [Mbps]	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
						[dBm]	[mW]	[dBm]	[mW]	
	1	2437.0	6.19	0.74	9.97	16.90	48.98	30.00	1000	13.10
	2	2437.0	6.13	0.74	9.97	16.84	48.31	30.00	1000	13.16
	5.5	2437.0	6.15	0.74	9.97	16.86	48.53	30.00	1000	13.14
	11	2437.0	5.79	0.74	9.97	16.50	44.67	30.00	1000	13.50

Worst

Sample Calculation:
 Result = Reading + Cable Loss + Atten. Loss

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Maximum Peak Conducted Output Power

(Option 3)

Test place: UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date: March 25, 2013
 Temperature / Humidity: 23deg.C , 45%RH
 Engineer: Makoto Hosaka
 Mode: Tx, IEEE802.11g , PN9, worst data mode : 6 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	11.29	0.74	9.97	22.00	158.49	30.00	1000	8.00
Mid	2437.0	10.88	0.74	9.97	21.59	144.21	30.00	1000	8.41
High	2462.0	10.92	0.74	9.97	21.63	145.55	30.00	1000	8.37

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

[Pre check]

	Data rate	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
	[Mbps]					[dBm]	[mW]	[dBm]	[mW]	
	6	2437.0	10.88	0.74	9.97	21.59	144.21	30.00	1000	8.41
	9	2437.0	10.17	0.74	9.97	20.88	122.46	30.00	1000	9.12
	12	2437.0	10.72	0.74	9.97	21.43	139.00	30.00	1000	8.57
	18	2437.0	10.43	0.74	9.97	21.14	130.02	30.00	1000	8.86
	24	2437.0	10.79	0.74	9.97	21.50	141.25	30.00	1000	8.50
	36	2437.0	10.87	0.74	9.97	21.58	143.88	30.00	1000	8.42
	48	2437.0	10.85	0.74	9.97	21.56	143.22	30.00	1000	8.44
	54	2437.0	10.85	0.74	9.97	21.56	143.22	30.00	1000	8.44

Worst

Sample Calculation:

Result = Reading + Cable Loss + Atten. Loss

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date March 25, 2013 March 27, 2013
 Temperature / Humidity 25 deg.C, 35 %RH 26 deg.C, 29 %RH
 Engineer Tatsuya Arai
 Mode Tx, 2412 MHz Antenna: 2dBi antenna
 Tx, IEEE802.11b , PN9, worst data mode 1Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	61.1	27.4	14.2	41.4	61.3	73.9	12.6	100	314	
Hori.	2489.091	PK	53.9	27.5	14.3	41.4	54.3	73.9	19.6	100	314	
Hori.	4824.000	PK	56.9	31.1	6.8	41.2	53.6	73.9	20.3	107	327	
Hori.	7236.000	PK	48.3	36.6	8.4	41.4	51.9	73.9	22.0	100	44	
Hori.	9648.000	PK	45.2	38.6	9.5	38.9	54.4	73.9	19.5	100	0	
Hori.	12060.000	PK	45.0	39.5	10.8	39.4	55.9	73.9	18.0	100	0	
Hori.	2390.000	AV	43.9	27.4	14.2	41.4	44.1	53.9	9.8	100	314	
Hori.	2489.091	AV	44.0	27.5	14.3	41.4	44.4	53.9	9.5	100	314	
Hori.	4824.000	AV	54.2	31.1	6.8	41.2	50.9	53.9	3.0	107	327	
Hori.	7236.000	AV	39.1	36.6	8.4	41.4	42.7	53.9	11.2	100	44	
Hori.	9648.000	AV	35.6	38.6	9.5	38.9	44.8	53.9	9.1	100	0	
Hori.	12060.000	AV	36.3	39.5	10.8	39.4	47.2	53.9	6.7	100	0	
Vert.	2390.000	PK	59.5	27.4	14.2	41.4	59.7	73.9	14.2	100	338	
Vert.	2489.091	PK	51.6	27.5	14.3	41.4	52.0	73.9	21.9	100	338	
Vert.	4824.000	PK	54.4	31.1	6.8	41.2	51.1	73.9	22.8	107	276	
Vert.	7236.000	PK	47.7	36.6	8.4	41.4	51.3	73.9	22.6	100	0	
Vert.	9648.000	PK	45.2	38.6	9.5	38.9	54.4	73.9	19.5	100	0	
Vert.	12060.000	PK	46.0	39.5	10.8	39.4	56.9	73.9	17.0	100	0	
Vert.	2390.000	AV	42.7	27.4	14.2	41.4	42.9	53.9	11.0	100	338	
Vert.	2489.091	AV	41.8	27.5	14.3	41.4	42.2	53.9	11.7	100	338	
Vert.	4824.000	AV	51.2	31.1	6.8	41.2	47.9	53.9	6.0	107	276	
Vert.	7236.000	AV	37.9	36.6	8.4	41.4	41.5	53.9	12.4	100	0	
Vert.	9648.000	AV	34.9	38.6	9.5	38.9	44.1	53.9	9.8	100	0	
Vert.	12060.000	AV	36.5	39.5	10.8	39.4	47.4	53.9	6.5	100	0	

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

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	99.4	27.5	14.2	41.4	99.7	-	-	100kHz/300kHz
Hori.	2400.000	PK	54.8	27.4	14.2	41.4	55.0	79.7	24.7	100kHz/300kHz
Vert.	2412.000	PK	99.0	27.5	14.2	41.4	99.3	-	-	100kHz/300kHz
Vert.	2400.000	PK	53.8	27.4	14.2	41.4	54.0	79.3	25.3	100kHz/300kHz

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date March 25, 2013 March 27, 2013
 Temperature / Humidity 25 deg.C, 35 %RH 26 deg.C, 29 %RH
 Engineer Tatsuya Arai
 Mode Tx, 2437 MHz Antenna: 2dBi antenna
 Tx, IEEE802.11b , PN9, worst data mode 1Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2594.560	PK	54.6	27.7	14.3	41.4	55.2	73.9	18.7	100	314	
Hori.	4874.000	PK	56.4	31.3	6.9	41.1	53.5	73.9	20.4	100	328	
Hori.	7311.000	PK	47.6	36.6	8.4	41.4	51.2	73.9	22.7	100	40	
Hori.	9748.000	PK	45.4	38.7	9.5	38.9	54.7	73.9	19.2	100	359	
Hori.	12185.000	PK	45.1	39.5	10.8	39.3	56.1	73.9	17.8	100	0	
Hori.	2594.560	AV	44.2	27.7	14.3	41.4	44.8	53.9	9.1	100	314	
Hori.	4874.000	AV	54.1	31.3	6.9	41.1	51.2	53.9	2.7	100	328	
Hori.	7311.000	AV	37.6	36.6	8.4	41.4	41.2	53.9	12.7	100	40	
Hori.	9748.000	AV	35.8	38.7	9.5	38.9	45.1	53.9	8.8	100	359	
Hori.	12185.000	AV	35.9	39.5	10.8	39.3	46.9	53.9	7.0	100	0	
Vert.	2594.560	PK	50.8	27.7	14.3	41.4	51.4	73.9	22.5	100	0	
Vert.	4874.000	PK	52.8	31.3	6.9	41.1	49.9	73.9	24.0	100	276	
Vert.	7311.000	PK	47.3	36.6	8.4	41.4	50.9	73.9	23.0	100	0	
Vert.	9748.000	PK	44.5	38.7	9.5	38.9	53.8	73.9	20.1	100	0	
Vert.	12185.000	PK	44.6	39.5	10.8	39.3	55.6	73.9	18.3	100	0	
Vert.	2594.560	AV	41.1	27.7	14.3	41.4	41.7	53.9	12.2	100	0	
Vert.	4874.000	AV	47.4	31.3	6.9	41.1	44.5	53.9	9.4	100	276	
Vert.	7311.000	AV	37.4	36.6	8.4	41.4	41.0	53.9	12.9	100	0	
Vert.	9748.000	AV	35.1	38.7	9.5	38.9	44.4	53.9	9.5	100	0	
Vert.	12185.000	AV	35.7	39.5	10.8	39.3	46.7	53.9	7.2	100	0	

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

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

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

Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date March 25, 2013 March 27, 2013
 Temperature / Humidity 25 deg.C, 35 %RH 26 deg.C, 29 %RH
 Engineer Tatsuya Arai
 Mode Tx, 2462 MHz Antenna: 2dBi antenna
 Tx, IEEE802.11b , PN9, worst data mode 1Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	66.8	27.5	14.3	41.4	67.2	73.9	6.7	100	312	
Hori.	2619.590	PK	53.2	27.8	14.4	41.4	54.0	73.9	19.9	100	312	
Hori.	4924.000	PK	56.9	31.5	6.9	41.0	54.3	73.9	19.6	100	327	
Hori.	7386.000	PK	47.9	36.7	8.4	41.5	51.5	73.9	22.4	100	37	
Hori.	9848.000	PK	46.1	38.9	9.5	38.9	55.6	73.9	18.3	100	359	
Hori.	12310.000	PK	43.8	39.5	10.8	39.3	54.8	73.9	19.1	100	0	
Hori.	2483.500	AV	43.1	27.5	14.3	41.4	43.5	53.9	10.4	100	312	
Hori.	2619.590	AV	43.0	27.8	14.4	41.4	43.8	53.9	10.1	100	312	
Hori.	4924.000	AV	54.5	31.5	6.9	41.0	51.9	53.9	2.0	100	327	
Hori.	7386.000	AV	37.6	36.7	8.4	41.5	41.2	53.9	12.7	100	37	
Hori.	9848.000	AV	36.1	38.9	9.5	38.9	45.6	53.9	8.3	100	359	
Hori.	12310.000	AV	35.1	39.5	10.8	39.3	46.1	53.9	7.8	100	0	
Vert.	2483.500	PK	66.3	27.5	14.3	41.4	66.7	73.9	7.2	116	19	
Vert.	2619.590	PK	53.0	27.8	14.4	41.4	53.8	73.9	20.1	116	19	
Vert.	4924.000	PK	54.5	31.5	6.9	41.0	51.9	73.9	22.0	100	273	
Vert.	7386.000	PK	46.5	36.7	8.4	41.5	50.1	73.9	23.8	100	0	
Vert.	9848.000	PK	43.9	38.9	9.5	38.9	53.4	73.9	20.5	100	0	
Vert.	12310.000	PK	44.5	39.5	10.8	39.3	55.5	73.9	18.4	100	0	
Vert.	2483.500	AV	42.6	27.5	14.3	41.4	43.0	53.9	10.9	116	19	
Vert.	2619.590	AV	42.8	27.8	14.4	41.4	43.6	53.9	10.3	116	19	
Vert.	4924.000	AV	50.7	31.5	6.9	41.0	48.1	53.9	5.8	100	273	
Vert.	7386.000	AV	37.4	36.7	8.4	41.5	41.0	53.9	12.9	100	0	
Vert.	9848.000	AV	35.0	38.9	9.5	38.9	44.5	53.9	9.4	100	0	
Vert.	12310.000	AV	35.3	39.5	10.8	39.3	46.3	53.9	7.6	100	0	

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

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

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date March 25, 2013 March 27, 2013
 Temperature / Humidity 25 deg.C, 35 %RH 26 deg.C, 29 %RH
 Engineer Tatsuya Arai
 Mode Tx, 2412 MHz Antenna: 2dBi antenna
 Tx, IEEE802.11g , PN9, worst data mode 6Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	161.986	QP	40.5	15.3	7.8	32.1	31.5	43.5	12.0	194	70	
Hori.	215.987	QP	45.6	16.6	8.0	32.0	38.2	43.5	5.3	148	85	
Hori.	269.988	QP	41.3	18.1	8.4	32.0	35.8	46.0	10.2	131	85	
Hori.	350.986	QP	44.6	15.1	8.8	31.9	36.6	46.0	9.4	100	57	
Hori.	2390.000	PK	61.8	27.4	14.2	41.4	62.0	73.9	11.9	100	312	
Hori.	2572.265	PK	56.8	27.7	14.3	41.4	57.4	73.9	16.5	100	238	
Hori.	4824.000	PK	52.7	31.1	6.8	41.2	49.4	73.9	24.5	100	325	
Hori.	7236.000	PK	46.5	36.6	8.4	41.4	50.1	73.9	23.8	100	0	
Hori.	9648.000	PK	44.0	38.6	9.5	38.9	53.2	73.9	20.7	100	0	
Hori.	12060.000	PK	45.9	39.5	10.8	39.4	56.8	73.9	17.1	100	0	
Hori.	2390.000	AV	47.6	27.4	14.2	41.4	47.8	53.9	6.1	100	312	
Hori.	2572.265	AV	47.0	27.7	14.3	41.4	47.6	53.9	6.3	100	238	
Vert.	215.987	QP	43.3	16.6	8.0	32.0	35.9	43.5	7.6	100	205	
Vert.	2390.000	PK	57.3	27.4	14.2	41.4	57.5	73.9	16.4	100	334	
Vert.	2572.265	PK	53.7	27.7	14.3	41.4	54.3	73.9	19.6	108	33	
Vert.	4824.000	PK	48.6	31.1	6.8	41.2	45.3	73.9	28.6	100	66	
Vert.	7236.000	PK	47.3	36.6	8.4	41.4	50.9	73.9	23.0	100	0	
Vert.	9648.000	PK	44.3	38.6	9.5	38.9	53.5	73.9	20.4	100	0	
Vert.	12060.000	PK	45.4	39.5	10.8	39.4	56.3	73.9	17.6	100	0	
Vert.	2390.000	AV	44.8	27.4	14.2	41.4	45.0	53.9	8.9	100	334	
Vert.	2572.265	AV	43.3	27.7	14.3	41.4	43.9	53.9	10.0	108	33	

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

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4824.000	AV	41.9	31.1	6.8	41.2	0.4	39.0	53.9	14.9	
Hori.	7236.000	AV	38.0	36.6	8.4	41.4	0.4	42.0	53.9	11.9	
Hori.	9648.000	AV	35.5	38.6	9.5	38.9	0.4	45.1	53.9	8.8	
Hori.	12060.000	AV	36.5	39.5	10.8	39.4	0.4	47.8	53.9	6.1	
Vert.	4824.000	AV	39.1	31.1	6.8	41.2	0.4	36.2	53.9	17.7	
Vert.	7236.000	AV	37.8	36.6	8.4	41.4	0.4	41.8	53.9	12.1	
Vert.	9648.000	AV	35.1	38.6	9.5	38.9	0.4	44.7	53.9	9.2	
Vert.	12060.000	AV	36.3	39.5	10.8	39.4	0.4	47.6	53.9	6.3	

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

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

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	96.4	27.5	14.2	41.4	96.7	-	-	100k/300k
Hori.	2400.000	PK	59.7	27.4	14.2	41.4	59.9	76.7	16.8	100k/300k
Vert.	2412.000	PK	95.4	27.5	14.2	41.4	95.7	-	-	100k/300k
Vert.	2400.000	PK	58.6	27.4	14.2	41.4	58.8	75.7	16.9	100k/300k

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date March 25, 2013 March 27, 2013
 Temperature / Humidity 25 deg.C, 35 %RH 26 deg.C, 29 %RH
 Engineer Tatsuya Arai
 Mode Tx, 2437 MHz Antenna: 2dBi antenna
 Tx, IEEE802.11g , PN9, worst data mode 6Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2565.400	PK	57.3	27.7	14.3	41.4	57.9	73.9	16.0	100	230	
Hori.	4874.000	PK	52.9	31.3	6.9	41.1	50.0	73.9	23.9	100	330	
Hori.	7311.000	PK	46.0	36.6	8.4	41.4	49.6	73.9	24.3	100	0	
Hori.	9748.000	PK	44.5	38.7	9.5	38.9	53.8	73.9	20.1	100	0	
Hori.	12185.000	PK	45.1	39.5	10.8	39.3	56.1	73.9	17.8	100	0	
Hori.	2565.400	AV	47.3	27.7	14.3	41.4	47.9	53.9	6.0	100	230	
Vert.	2565.400	PK	51.5	27.7	14.3	41.4	52.1	73.9	21.8	100	327	
Vert.	4874.000	PK	48.0	31.3	6.9	41.1	45.1	73.9	28.8	100	67	
Vert.	7311.000	PK	47.5	36.6	8.4	41.4	51.1	73.9	22.8	100	0	
Vert.	9748.000	PK	44.1	38.7	9.5	38.9	53.4	73.9	20.5	100	0	
Vert.	12185.000	PK	45.2	39.5	10.8	39.3	56.2	73.9	17.7	100	0	
Vert.	2565.400	AV	41.3	27.7	14.3	41.4	41.9	53.9	12.0	100	327	

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

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	42.5	31.3	6.9	41.1	0.4	40.0	53.9	13.9	
Hori.	7311.000	AV	37.2	36.6	8.4	41.4	0.4	41.2	53.9	12.7	
Hori.	9748.000	AV	35.4	38.7	9.5	38.9	0.4	45.1	53.9	8.8	
Hori.	12185.000	AV	35.6	39.5	10.8	39.3	0.4	47.0	53.9	6.9	
Vert.	4874.000	AV	38.5	31.3	6.9	41.1	0.4	36.0	53.9	17.9	
Vert.	7311.000	AV	37.4	36.6	8.4	41.4	0.4	41.4	53.9	12.5	
Vert.	9748.000	AV	35.1	38.7	9.5	38.9	0.4	44.8	53.9	9.1	
Vert.	12185.000	AV	35.7	39.5	10.8	39.3	0.4	47.1	53.9	6.8	

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

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

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

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date March 25, 2013 March 27, 2013
 Temperature / Humidity 25 deg.C, 35 %RH 26 deg.C, 29 %RH
 Engineer Tatsuya Arai
 Mode Tx, 2462 MHz Antenna: 2dBi antenna
 Tx, IEEE802.11g , PN9, worst data mode 6Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	63.1	27.5	14.3	41.4	63.5	73.9	10.4	100	229	
Hori.	2596.526	PK	56.4	27.7	14.4	41.4	57.1	73.9	16.8	100	229	
Hori.	4924.000	PK	52.2	31.5	6.9	41.0	49.6	73.9	24.3	100	329	
Hori.	7386.000	PK	46.8	36.7	8.4	41.5	50.4	73.9	23.5	100	0	
Hori.	9848.000	PK	44.3	38.9	9.5	38.9	53.8	73.9	20.1	100	0	
Hori.	12310.000	PK	44.6	39.5	10.8	39.3	55.6	73.9	18.3	100	0	
Hori.	2483.500	AV	46.2	27.5	14.3	41.4	46.6	53.9	7.3	100	229	
Hori.	2596.526	AV	46.7	27.7	14.4	41.4	47.4	53.9	6.5	100	229	
Vert.	2483.500	PK	61.7	27.5	14.3	41.4	62.1	73.9	11.8	100	218	
Vert.	2596.526	PK	51.8	27.7	14.4	41.4	52.5	73.9	21.4	100	218	
Vert.	4924.000	PK	48.8	31.5	6.9	41.0	46.2	73.9	27.7	100	275	
Vert.	7386.000	PK	47.3	36.7	8.4	41.5	50.9	73.9	23.0	100	0	
Vert.	9848.000	PK	44.0	38.9	9.5	38.9	53.5	73.9	20.4	100	0	
Vert.	12310.000	PK	44.9	39.5	10.8	39.3	55.9	73.9	18.0	100	0	
Vert.	2483.500	AV	45.3	27.5	14.3	41.4	45.7	53.9	8.2	100	218	
Vert.	2596.526	AV	41.9	27.7	14.4	41.4	42.6	53.9	11.3	100	218	

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

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4924.000	AV	41.9	31.5	6.9	41.0	0.4	39.7	53.9	14.2	
Hori.	7386.000	AV	37.2	36.7	8.4	41.5	0.4	41.2	53.9	12.7	
Hori.	9848.000	AV	35.6	38.9	9.5	38.9	0.4	45.5	53.9	8.4	
Hori.	12310.000	AV	35.2	39.5	10.8	39.3	0.4	46.6	53.9	7.3	
Vert.	4924.000	AV	39.6	31.5	6.9	41.0	0.4	37.4	53.9	16.5	
Vert.	7386.000	AV	37.4	36.7	8.4	41.5	0.4	41.4	53.9	12.5	
Vert.	9848.000	AV	34.5	38.9	9.5	38.9	0.4	44.4	53.9	9.5	
Vert.	12310.000	AV	35.2	39.5	10.8	39.3	0.4	46.6	53.9	7.3	

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

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

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

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date March 26, 2013 March 27, 2013
 Temperature / Humidity 23 deg.C, 28 %RH 26 deg.C, 29 %RH
 Engineer Tatsuya Arai
 Mode Tx, 2412 MHz Antenna: 5dBi antenna + 3m Cable
 Tx, IEEE802.11b , PN9, worst data mode 1Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	61.8	27.4	14.2	41.4	62.0	73.9	11.9	100	268	
Hori.	2569.745	PK	55.0	27.7	14.3	41.4	55.6	73.9	18.3	100	268	
Hori.	4824.000	PK	57.1	31.1	6.8	41.2	53.8	73.9	20.1	100	43	
Hori.	7236.000	PK	47.3	36.6	8.4	41.4	50.9	73.9	23.0	100	0	
Hori.	9648.000	PK	43.4	38.6	9.5	38.9	52.6	73.9	21.3	100	0	
Hori.	12060.000	PK	45.4	39.5	10.8	39.4	56.3	73.9	17.6	100	0	
Hori.	2390.000	AV	44.5	27.4	14.2	41.4	44.7	53.9	9.2	100	268	
Hori.	2569.745	AV	46.2	27.7	14.3	41.4	46.8	53.9	7.1	100	268	
Hori.	4824.000	AV	54.2	31.1	6.8	41.2	50.9	53.9	3.0	100	43	
Hori.	7236.000	AV	37.7	36.6	8.4	41.4	41.3	53.9	12.6	100	0	
Hori.	9648.000	AV	34.2	38.6	9.5	38.9	43.4	53.9	10.5	100	0	
Hori.	12060.000	AV	35.1	39.5	10.8	39.4	46.0	53.9	7.9	100	0	
Vert.	2390.000	PK	61.1	27.4	14.2	41.4	61.3	73.9	12.6	112	41	
Vert.	2569.745	PK	55.1	27.7	14.3	41.4	55.7	73.9	18.2	112	41	
Vert.	4824.000	PK	52.2	31.1	6.8	41.2	48.9	73.9	25.0	100	154	
Vert.	7236.000	PK	46.8	36.6	8.4	41.4	50.4	73.9	23.5	100	0	
Vert.	9648.000	PK	43.6	38.6	9.5	38.9	52.8	73.9	21.1	100	0	
Vert.	12060.000	PK	44.4	39.5	10.8	39.4	55.3	73.9	18.6	100	0	
Vert.	2390.000	AV	43.9	27.4	14.2	41.4	44.1	53.9	9.8	112	41	
Vert.	2569.745	AV	45.7	27.7	14.3	41.4	46.3	53.9	7.6	112	41	
Vert.	4824.000	AV	48.2	31.1	6.8	41.2	44.9	53.9	9.0	100	154	
Vert.	7236.000	AV	37.5	36.6	8.4	41.4	41.1	53.9	12.8	100	0	
Vert.	9648.000	AV	34.0	38.6	9.5	38.9	43.2	53.9	10.7	100	0	
Vert.	12060.000	AV	35.1	39.5	10.8	39.4	46.0	53.9	7.9	100	0	

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

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	101.5	27.5	14.2	41.4	101.8	-	-	100k/300k
Hori.	2400.000	PK	57.3	27.4	14.2	41.4	57.5	81.8	24.3	100k/300k
Vert.	2412.000	PK	100.5	27.5	14.2	41.4	100.8	-	-	100k/300k
Vert.	2400.000	PK	55.7	27.4	14.2	41.4	55.9	80.8	24.9	100k/300k

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date March 26, 2013 March 27, 2013
 Temperature / Humidity 23 deg.C, 28 %RH 26 deg.C, 29 %RH
 Engineer Tatsuya Arai
 Mode Tx, 2437 MHz Antenna: 5dBi antenna + 3m Cable
 Tx, IEEE802.11b , PN9, worst data mode 1Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2594.888	PK	54.8	27.7	14.3	41.4	55.4	73.9	18.5	100	266	
Hori.	4874.000	PK	55.7	31.3	6.9	41.1	52.8	73.9	21.1	100	45	
Hori.	7311.000	PK	47.4	36.6	8.4	41.4	51.0	73.9	22.9	100	0	
Hori.	9648.000	PK	44.0	38.6	9.5	38.9	53.2	73.9	20.7	100	0	
Hori.	12185.000	PK	44.3	39.5	10.8	39.3	55.3	73.9	18.6	100	0	
Hori.	2594.888	AV	46.0	27.7	14.3	41.4	46.6	53.9	7.3	100	266	
Hori.	4874.000	AV	52.7	31.3	6.9	41.1	49.8	53.9	4.1	100	45	
Hori.	7311.000	AV	37.3	36.6	8.4	41.4	40.9	53.9	13.0	100	0	
Hori.	9648.000	AV	34.1	38.6	9.5	38.9	43.3	53.9	10.6	100	0	
Hori.	12185.000	AV	35.0	39.5	10.8	39.3	46.0	53.9	7.9	100	0	
Vert.	2594.888	PK	56.3	27.7	14.3	41.4	56.9	73.9	17.0	116	38	
Vert.	4874.000	PK	53.9	31.3	6.9	41.1	51.0	73.9	22.9	100	70	
Vert.	7311.000	PK	46.5	36.6	8.4	41.4	50.1	73.9	23.8	100	0	
Vert.	9648.000	PK	44.1	38.6	9.5	38.9	53.3	73.9	20.6	100	0	
Vert.	12185.000	PK	44.7	39.5	10.8	39.3	55.7	73.9	18.2	100	0	
Vert.	2594.888	AV	46.2	27.7	14.3	41.4	46.8	53.9	7.1	116	38	
Vert.	4874.000	AV	49.9	31.3	6.9	41.1	47.0	53.9	6.9	100	70	
Vert.	7311.000	AV	37.4	36.6	8.4	41.4	41.0	53.9	12.9	100	0	
Vert.	9648.000	AV	34.4	38.6	9.5	38.9	43.6	53.9	10.3	100	0	
Vert.	12185.000	AV	34.9	39.5	10.8	39.3	45.9	53.9	8.0	100	0	

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

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

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date March 26, 2013 March 27, 2013
 Temperature / Humidity 23 deg.C, 28 %RH 26 deg.C, 29 %RH
 Engineer Tatsuya Arai
 Mode Tx, 2462 MHz Antenna: 5dBi antenna + 3m Cable
 Tx, IEEE802.11b , PN9, worst data mode 1Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	71.7	27.5	14.3	41.4	72.1	73.9	1.8	119	269	
Hori.	2620.106	PK	56.1	27.8	14.4	41.4	56.9	73.9	17.0	119	269	
Hori.	4924.000	PK	54.0	31.5	6.9	41.0	51.4	73.9	22.5	100	44	
Hori.	7386.000	PK	47.3	36.7	8.4	41.5	50.9	73.9	23.0	100	0	
Hori.	9848.000	PK	44.1	38.9	9.5	38.9	53.6	73.9	20.3	100	0	
Hori.	12310.000	PK	44.4	39.5	10.8	39.3	55.4	73.9	18.5	100	0	
Hori.	2483.500	AV	45.5	27.5	14.3	41.4	45.9	53.9	8.0	119	269	
Hori.	2620.106	AV	46.3	27.8	14.4	41.4	47.1	53.9	6.8	119	269	
Hori.	4924.000	AV	50.3	31.5	6.9	41.0	47.7	53.9	6.2	100	44	
Hori.	7386.000	AV	37.8	36.7	8.4	41.5	41.4	53.9	12.5	100	0	
Hori.	9848.000	AV	34.2	38.9	9.5	38.9	43.7	53.9	10.2	100	0	
Hori.	12310.000	AV	34.9	39.5	10.8	39.3	45.9	53.9	8.0	100	0	
Vert.	2483.500	PK	70.2	27.5	14.3	41.4	70.6	73.9	3.3	114	39	
Vert.	2620.106	PK	54.6	27.8	14.4	41.4	55.4	73.9	18.5	114	39	
Vert.	4924.000	PK	53.8	31.5	6.9	41.0	51.2	73.9	22.7	100	68	
Vert.	7386.000	PK	47.6	36.7	8.4	41.5	51.2	73.9	22.7	100	0	
Vert.	9848.000	PK	43.9	38.9	9.5	38.9	53.4	73.9	20.5	100	0	
Vert.	12310.000	PK	44.2	39.5	10.8	39.3	55.2	73.9	18.7	100	0	
Vert.	2483.500	AV	44.6	27.5	14.3	41.4	45.0	53.9	8.9	114	39	
Vert.	2620.106	AV	45.1	27.8	14.4	41.4	45.9	53.9	8.0	114	39	
Vert.	4924.000	AV	49.6	31.5	6.9	41.0	47.0	53.9	6.9	100	68	
Vert.	7386.000	AV	37.6	36.7	8.4	41.5	41.2	53.9	12.7	100	0	
Vert.	9848.000	AV	34.7	38.9	9.5	38.9	44.2	53.9	9.7	100	0	
Vert.	12310.000	AV	34.8	39.5	10.8	39.3	45.8	53.9	8.1	100	0	

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

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

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date March 26, 2013 March 27, 2013
 Temperature / Humidity 23 deg.C, 28 %RH 26 deg.C, 29 %RH
 Engineer Tatsuya Arai
 Mode Tx, 2412 MHz Antenna: 5dBi antenna + 3m Cable
 Tx, IEEE802.11g , PN9, worst data mode 6Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	215.986	QP	45.6	16.6	8.0	32.0	38.2	43.5	5.3	152	276	
Hori.	269.988	QP	37.7	18.1	8.4	32.0	32.2	46.0	13.8	123	84	
Hori.	350.988	QP	45.0	15.1	8.8	31.9	37.0	46.0	9.0	105	196	
Hori.	2390.000	PK	62.9	27.4	14.2	41.4	63.1	73.9	10.8	100	271	
Hori.	2493.342	PK	57.1	27.6	14.3	41.4	57.6	73.9	16.3	100	271	
Hori.	4824.000	PK	54.3	31.1	6.8	41.2	51.0	73.9	22.9	107	44	
Hori.	7236.000	PK	47.3	36.6	8.4	41.4	50.9	73.9	23.0	100	0	
Hori.	9648.000	PK	43.8	38.6	9.5	38.9	53.0	73.9	20.9	100	0	
Hori.	12060.000	PK	44.5	39.5	10.8	39.4	55.4	73.9	18.5	100	0	
Hori.	2390.000	AV	49.0	27.4	14.2	41.4	49.2	53.9	4.7	100	271	
Hori.	2493.342	AV	46.9	27.6	14.3	41.4	47.4	53.9	6.5	100	271	
Vert.	53.987	QP	46.7	9.7	6.7	32.2	30.9	40.0	9.1	100	156	
Vert.	134.986	QP	49.3	14.1	7.4	32.1	38.7	43.5	4.8	100	123	
Vert.	2390.000	PK	62.4	27.4	14.2	41.4	62.6	73.9	11.3	113	40	
Vert.	2493.342	PK	57.0	27.6	14.3	41.4	57.5	73.9	16.4	113	40	
Vert.	4824.000	PK	49.2	31.1	6.8	41.2	45.9	73.9	28.0	100	65	
Vert.	7236.000	PK	46.8	36.6	8.4	41.4	50.4	73.9	23.5	100	0	
Vert.	9648.000	PK	43.2	38.6	9.5	38.9	52.4	73.9	21.5	100	0	
Vert.	12060.000	PK	44.2	39.5	10.8	39.4	55.1	73.9	18.8	100	0	
Vert.	2390.000	AV	48.9	27.4	14.2	41.4	49.1	53.9	4.8	113	40	
Vert.	2493.342	AV	47.5	27.6	14.3	41.4	48.0	53.9	5.9	113	40	

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

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4824.000	AV	44.2	31.1	6.8	41.2	0.4	41.3	53.9	12.6	
Hori.	7236.000	AV	37.4	36.6	8.4	41.4	0.4	41.4	53.9	12.5	
Hori.	9648.000	AV	34.6	38.6	9.5	38.9	0.4	44.2	53.9	9.7	
Hori.	12060.000	AV	35.0	39.5	10.8	39.4	0.4	46.3	53.9	7.6	
Vert.	4824.000	AV	39.4	31.1	6.8	41.2	0.4	36.5	53.9	17.4	
Vert.	7236.000	AV	37.3	36.6	8.4	41.4	0.4	41.3	53.9	12.6	
Vert.	9648.000	AV	34.0	38.6	9.5	38.9	0.4	43.6	53.9	10.3	
Vert.	12060.000	AV	34.9	39.5	10.8	39.4	0.4	46.2	53.9	7.7	

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

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

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	99.6	27.5	14.2	41.4	99.9	-	-	100k/300k
Hori.	2400.000	PK	64.8	27.4	14.2	41.4	65.0	79.9	14.9	100k/300k
Vert.	2412.000	PK	98.8	27.5	14.2	41.4	99.1	-	-	100k/300k
Vert.	2400.000	PK	64.0	27.4	14.2	41.4	64.2	79.1	14.9	100k/300k

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

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 Date March 26, 2013 March 27, 2013
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 Engineer Tatsuya Arai
 Mode Tx, 2437 MHz Antenna: 5dBi antenna + 3m Cable
 Tx, IEEE802.11g , PN9, worst data mode 6Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2592.500	PK	56.0	27.7	14.3	41.4	56.6	73.9	17.3	100	271	
Hori.	4874.000	PK	51.1	31.3	6.9	41.1	48.2	73.9	25.7	100	44	
Hori.	7311.000	PK	46.6	36.6	8.4	41.4	50.2	73.9	23.7	100	0	
Hori.	9748.000	PK	43.8	38.7	9.5	38.9	53.1	73.9	20.8	100	0	
Hori.	12185.000	PK	44.4	39.5	10.8	39.3	55.4	73.9	18.5	100	0	
Hori.	2592.500	AV	46.1	27.7	14.3	41.4	46.7	53.9	7.2	100	271	
Vert.	2592.500	PK	57.2	27.7	14.3	41.4	57.8	73.9	16.1	111	40	
Vert.	4874.000	PK	50.2	31.3	6.9	41.1	47.3	73.9	26.6	100	70	
Vert.	7311.000	PK	47.3	36.6	8.4	41.4	50.9	73.9	23.0	100	0	
Vert.	9748.000	PK	43.8	38.7	9.5	38.9	53.1	73.9	20.8	100	0	
Vert.	12185.000	PK	43.9	39.5	10.8	39.3	54.9	73.9	19.0	100	0	
Vert.	2592.500	AV	47.1	27.7	14.3	41.4	47.7	53.9	6.2	111	40	

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

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4874.000	AV	41.0	31.3	6.9	41.1	0.4	38.5	53.9	15.4	
Hori.	7311.000	AV	37.2	36.6	8.4	41.4	0.4	41.2	53.9	12.7	
Hori.	9748.000	AV	34.7	38.7	9.5	38.9	0.4	44.4	53.9	9.5	
Hori.	12185.000	AV	34.9	39.5	10.8	39.3	0.4	46.3	53.9	7.6	
Vert.	4874.000	AV	39.5	31.3	6.9	41.1	0.4	37.0	53.9	16.9	
Vert.	7311.000	AV	37.1	36.6	8.4	41.4	0.4	41.1	53.9	12.8	
Vert.	9748.000	AV	34.2	38.7	9.5	38.9	0.4	43.9	53.9	10.0	
Vert.	12185.000	AV	34.8	39.5	10.8	39.3	0.4	46.2	53.9	7.7	

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

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

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

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date March 26, 2013 March 27, 2013
 Temperature / Humidity 23 deg.C, 28 %RH 26 deg.C, 29 %RH
 Engineer Tatsuya Arai
 Mode Tx, 2462 MHz Antenna: 5dBi antenna + 3m Cable
 Tx, IEEE802.11g , PN9, worst data mode 6Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	66.6	27.5	14.3	41.4	67.0	73.9	6.9	124	268	
Hori.	4924.000	PK	49.3	31.5	6.9	41.0	46.7	73.9	27.2	100	46	
Hori.	7386.000	PK	47.6	36.7	8.4	41.5	51.2	73.9	22.7	100	0	
Hori.	9848.000	PK	44.9	38.9	9.5	38.9	54.4	73.9	19.5	100	0	
Hori.	12310.000	PK	44.3	39.5	10.8	39.3	55.3	73.9	18.6	100	0	
Hori.	2483.500	AV	50.3	27.5	14.3	41.4	50.7	53.9	3.2	124	268	
Vert.	2483.500	PK	65.7	27.5	14.3	41.4	66.1	73.9	7.8	115	39	
Vert.	4924.000	PK	48.8	31.5	6.9	41.0	46.2	73.9	27.7	100	71	
Vert.	7386.000	PK	46.8	36.7	8.4	41.5	50.4	73.9	23.5	100	0	
Vert.	9848.000	PK	43.8	38.9	9.5	38.9	53.3	73.9	20.6	100	0	
Vert.	12310.000	PK	45.0	39.5	10.8	39.3	56.0	73.9	17.9	100	0	
Vert.	2483.500	AV	49.4	27.5	14.3	41.4	49.8	53.9	4.1	115	39	

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

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

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

Average measurement value with duty factor

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	4924.000	AV	39.5	31.5	6.9	41.0	0.4	37.3	53.9	16.6	
Hori.	7386.000	AV	37.8	36.7	8.4	41.5	0.4	41.8	53.9	12.1	
Hori.	9848.000	AV	34.4	38.9	9.5	38.9	0.4	44.3	53.9	9.6	
Hori.	12310.000	AV	34.7	39.5	10.8	39.3	0.4	46.1	53.9	7.8	
Vert.	4924.000	AV	39.3	31.5	6.9	41.0	0.4	37.1	53.9	16.8	
Vert.	7386.000	AV	37.5	36.7	8.4	41.5	0.4	41.5	53.9	12.4	
Vert.	9848.000	AV	34.2	38.9	9.5	38.9	0.4	44.1	53.9	9.8	
Vert.	12310.000	AV	34.8	39.5	10.8	39.3	0.4	46.2	53.9	7.7	

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

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

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

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

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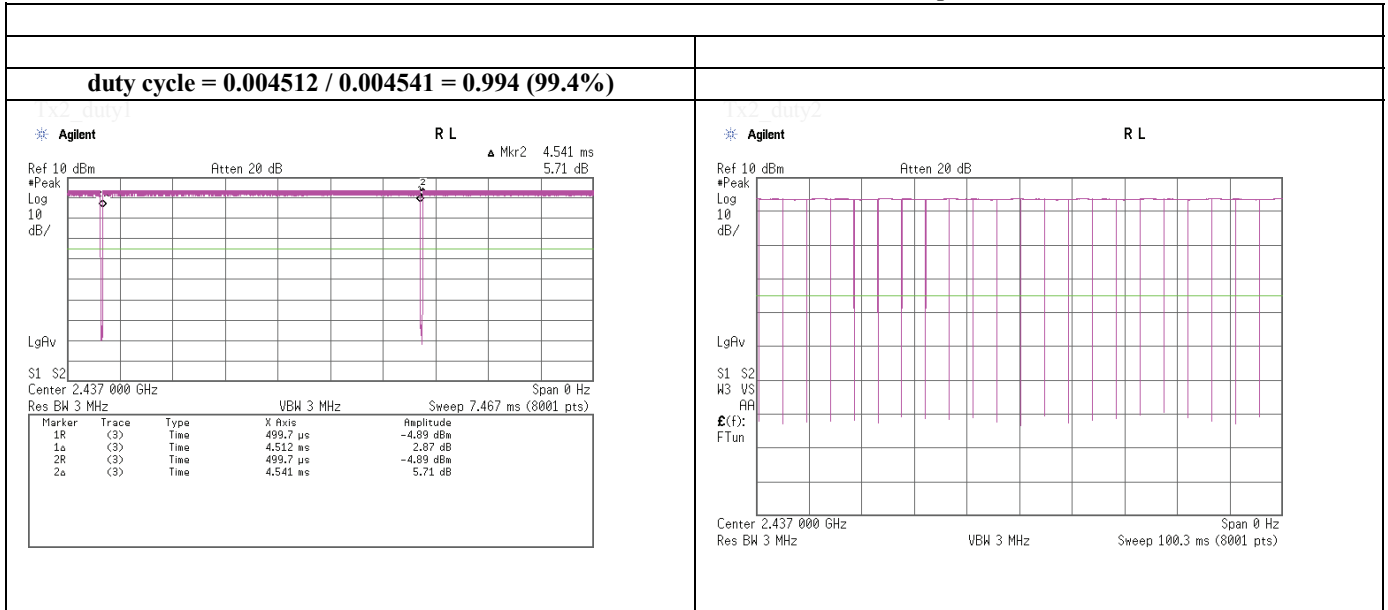
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Burst rate confirmation

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



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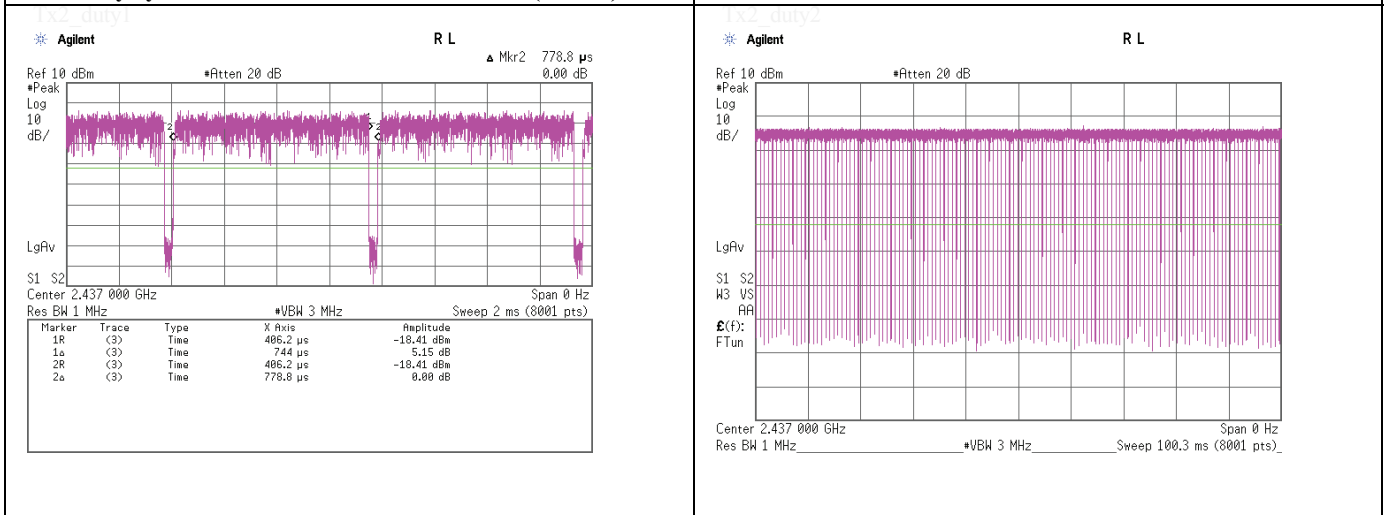
Facsimile : +81 463 50 6401

Duty Factor Calculation chart

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

Duty Factor Calculation

**Duty Factor: $20\log(1/\text{duty cycle}) = 0.4\text{dB}$
 duty cycle = $0.000744 / 0.0007788 = 0.955$ (95.5%)**



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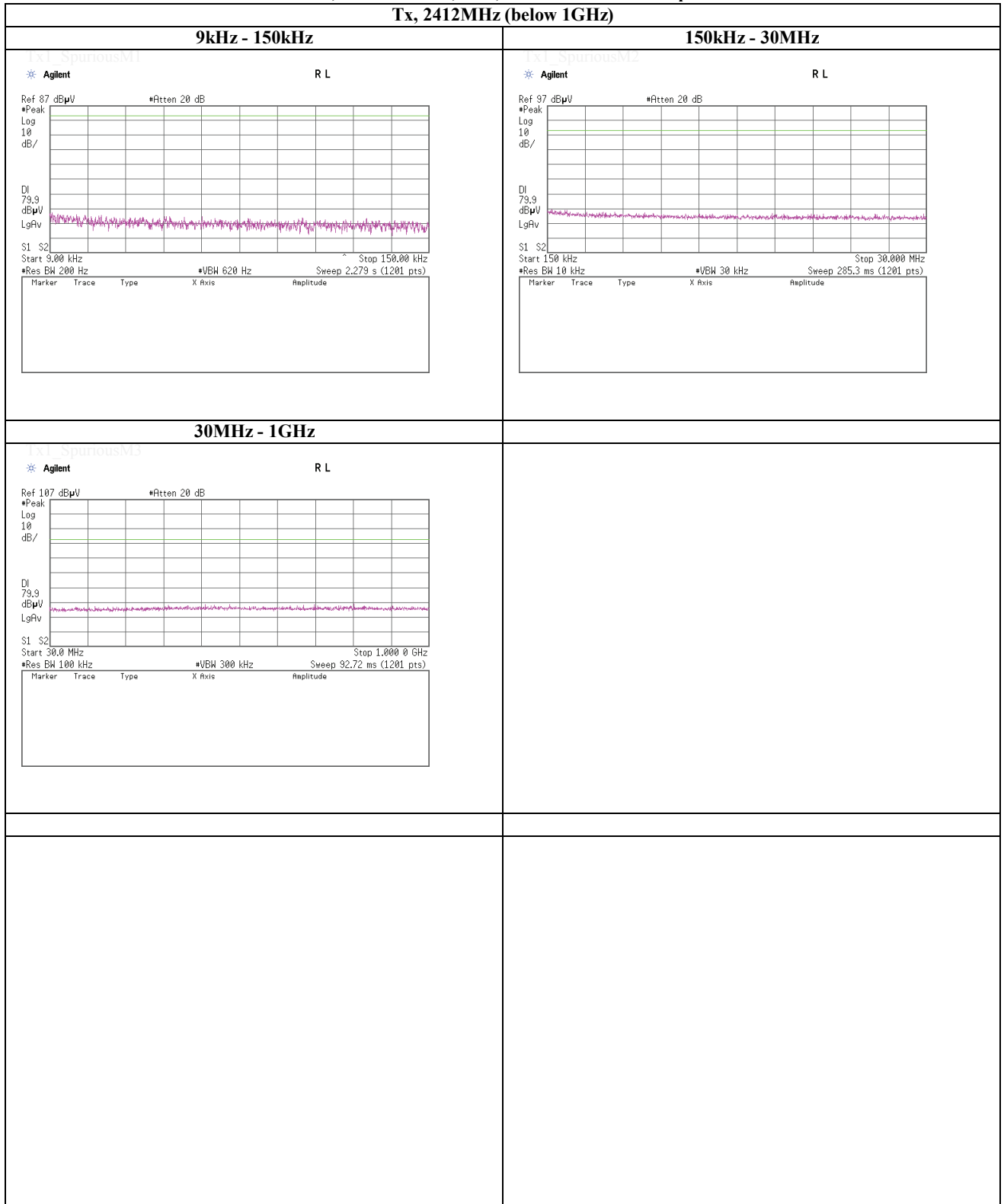
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(Reference chart) Spurious emission (Conducted)

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

Tx, 2412MHz (below 1GHz)



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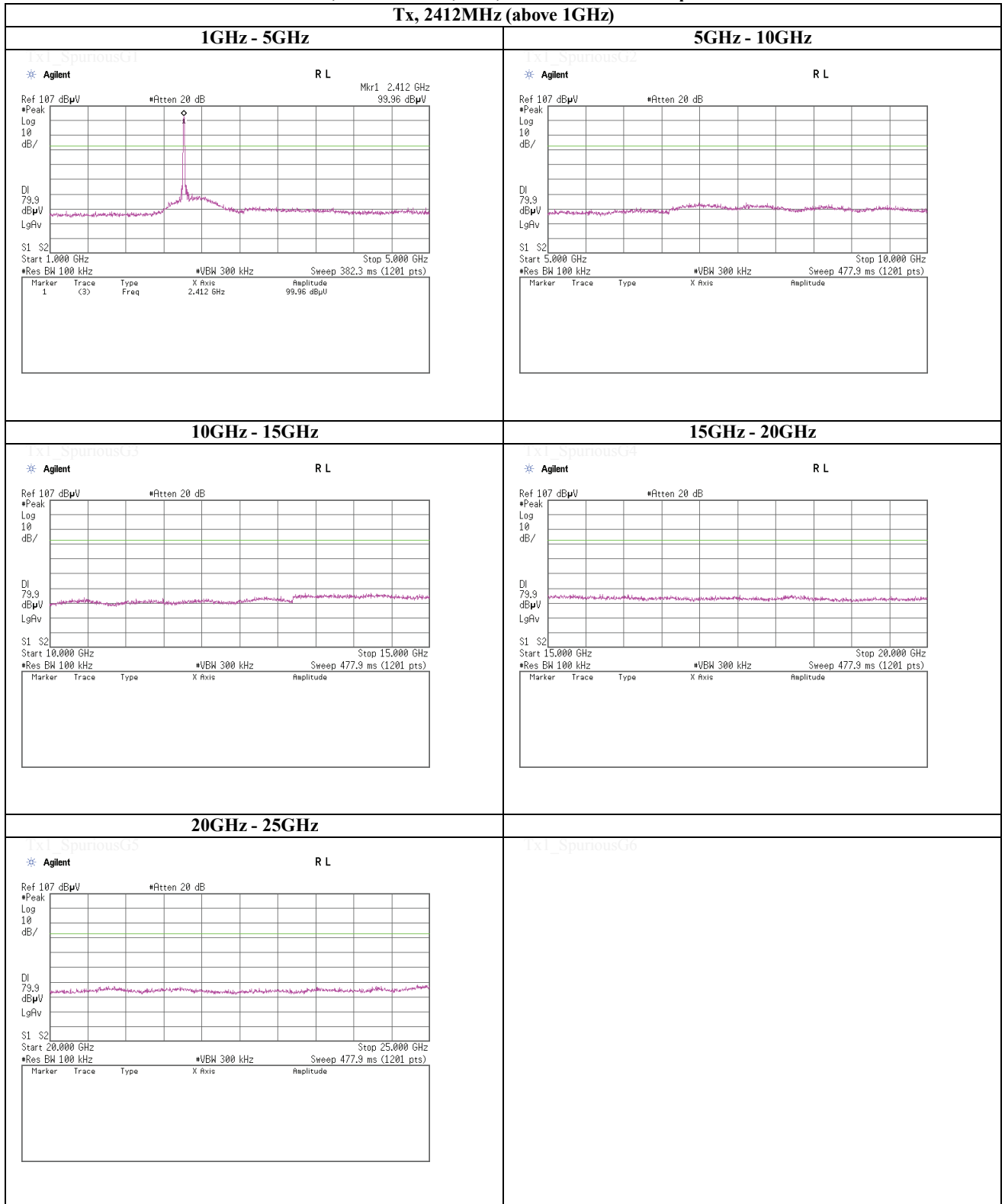
Telephone : +81 463 50 6400

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(Reference chart) Spurious emission (Conducted)

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

Tx, 2412MHz (above 1GHz)



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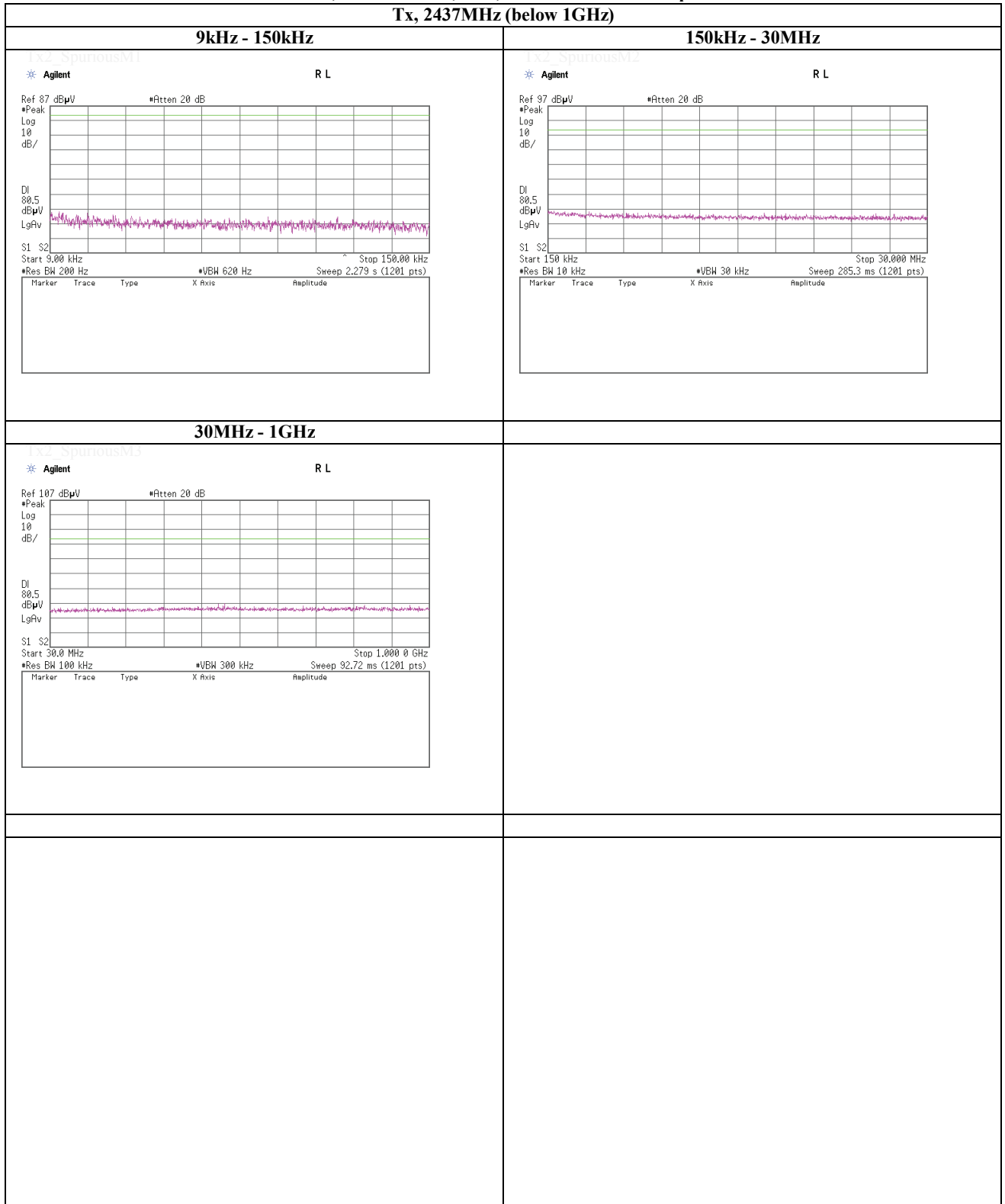
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(Reference chart) Spurious emission (Conducted)

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

Tx, 2437MHz (below 1GHz)



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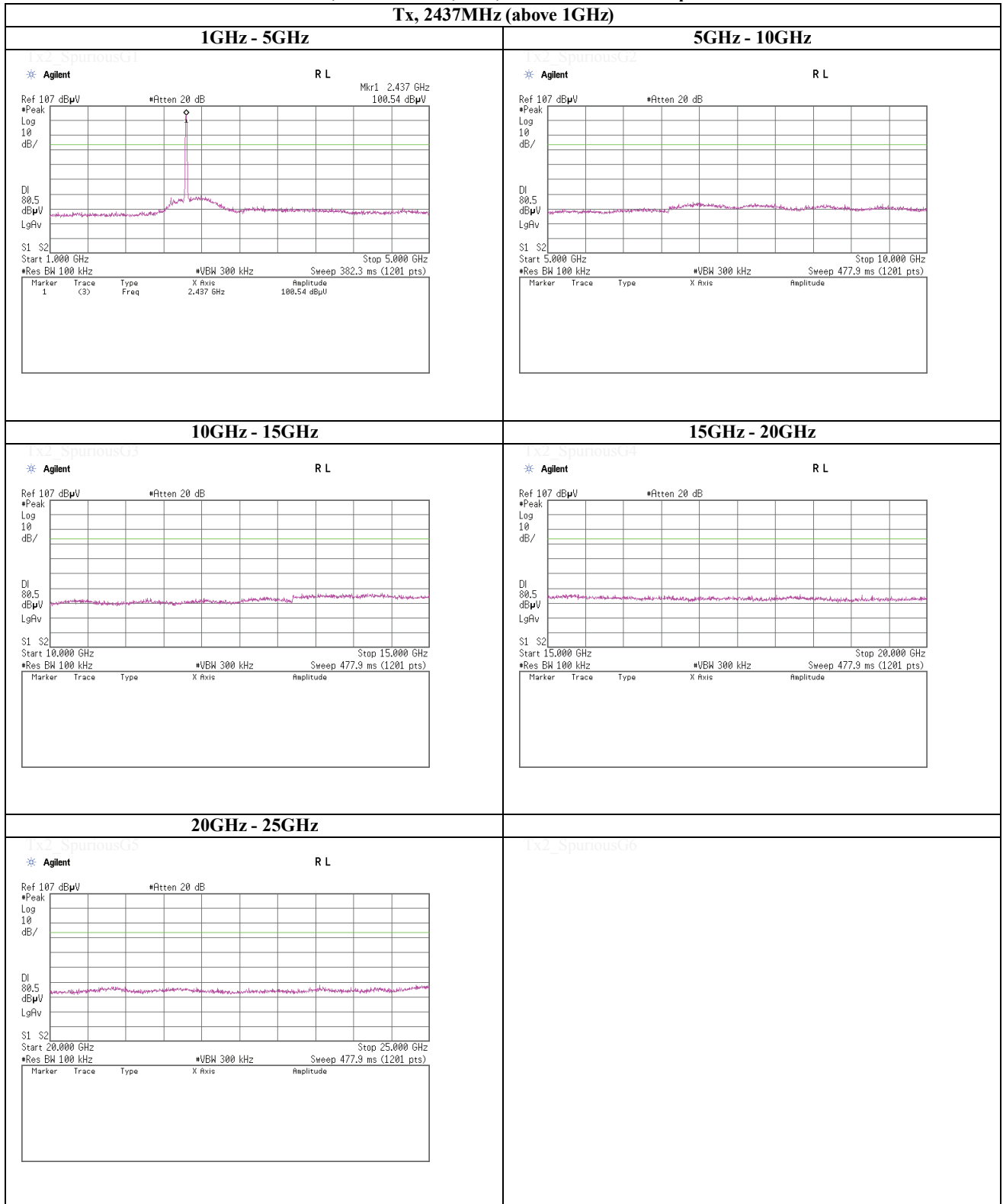
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

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

Tx, 2437MHz (above 1GHz)



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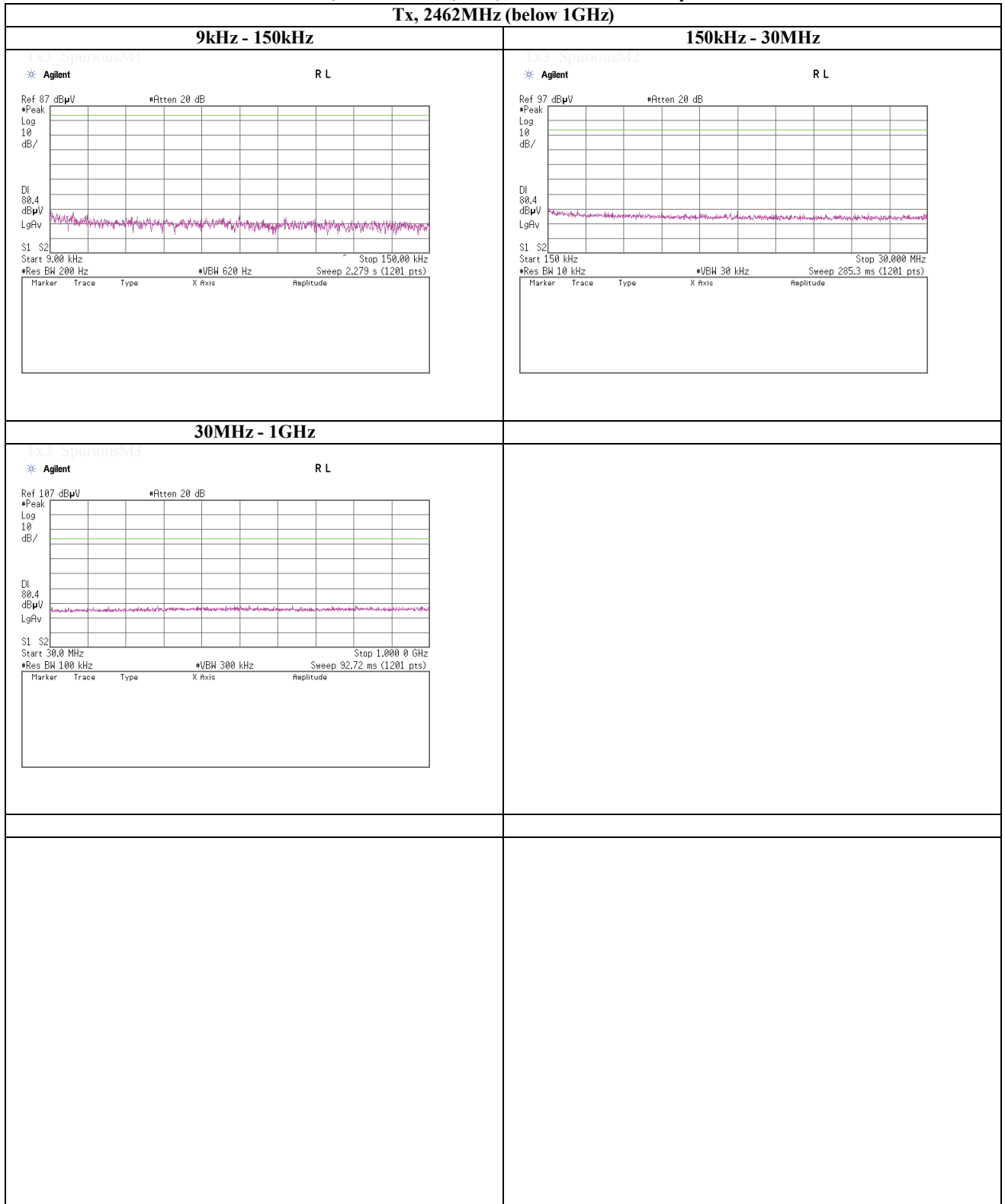
Telephone : +81 463 50 6400

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(Reference chart) Spurious emission (Conducted)

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

Tx, 2462MHz (below 1GHz)



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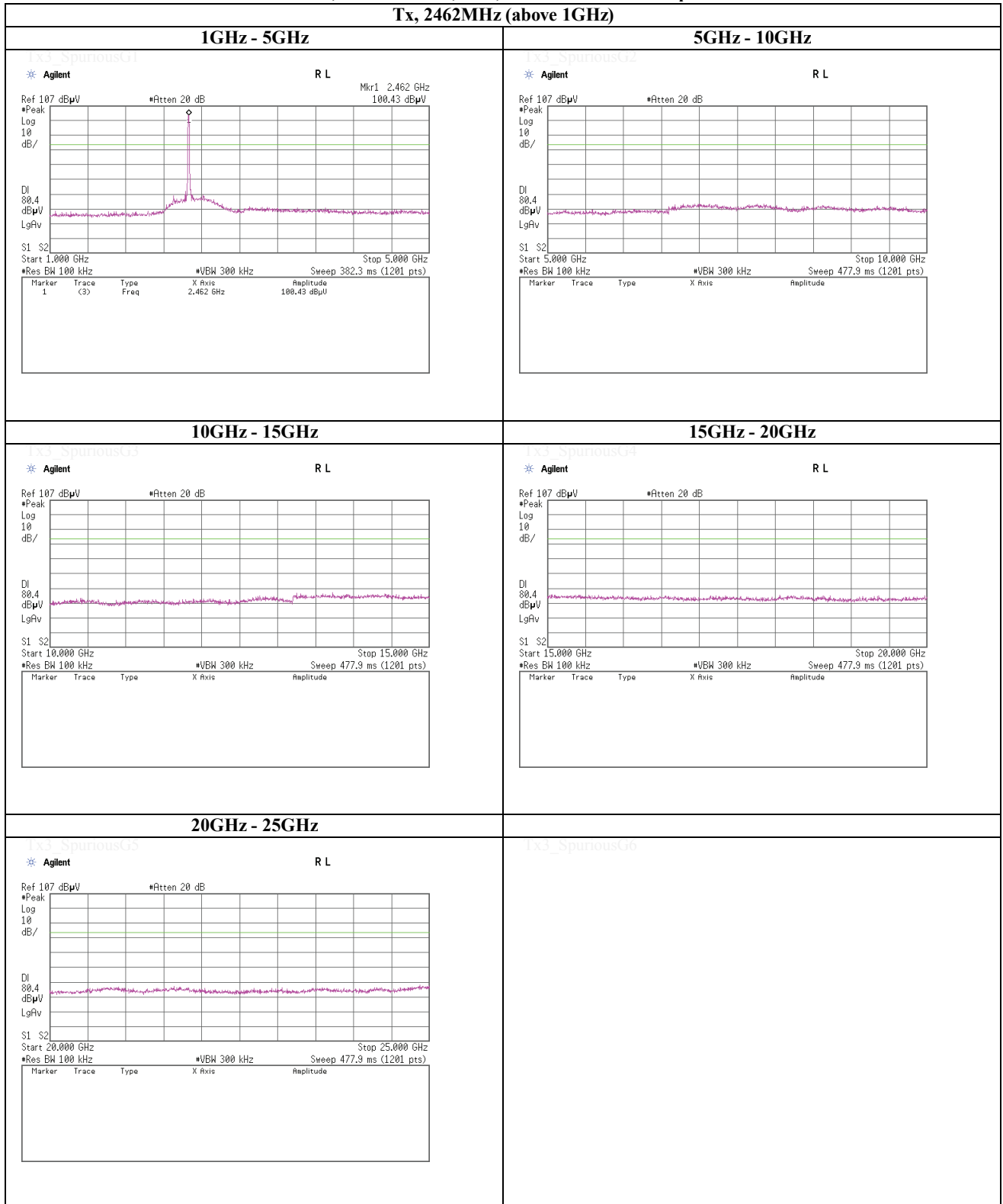
Telephone : +81 463 50 6400

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(Reference chart) Spurious emission (Conducted)

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

Tx, 2462MHz (above 1GHz)



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Shonan EMC Lab.

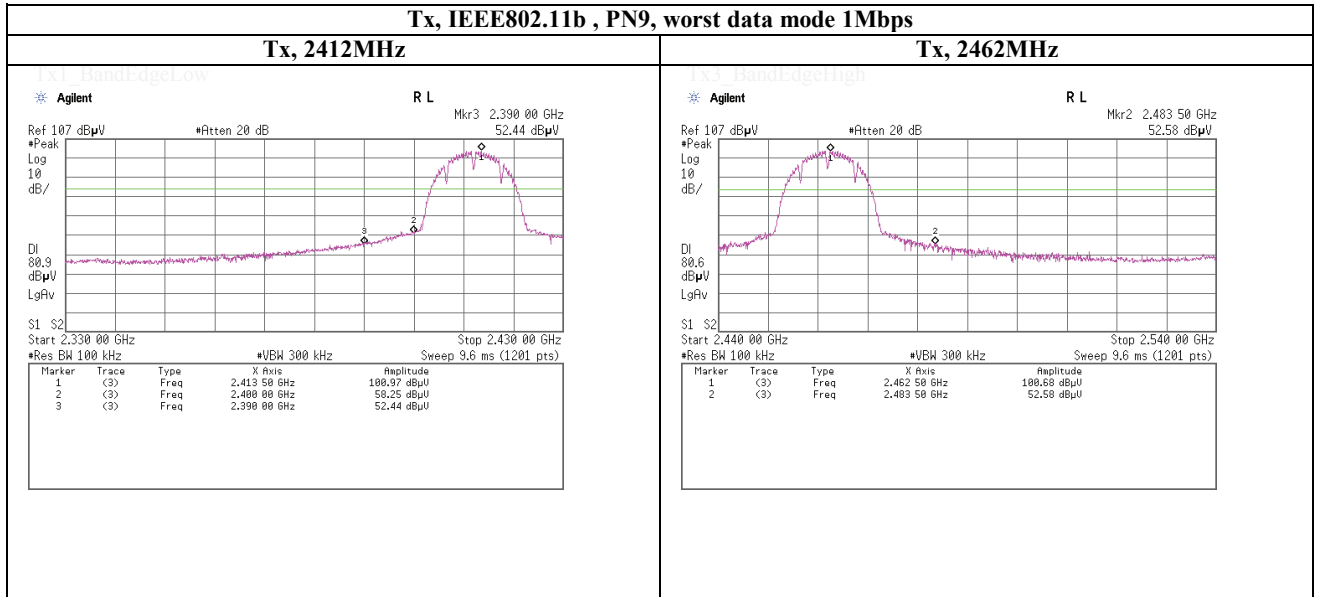
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(Reference chart) Spurious emission (Conducted)

Band Edge compliance



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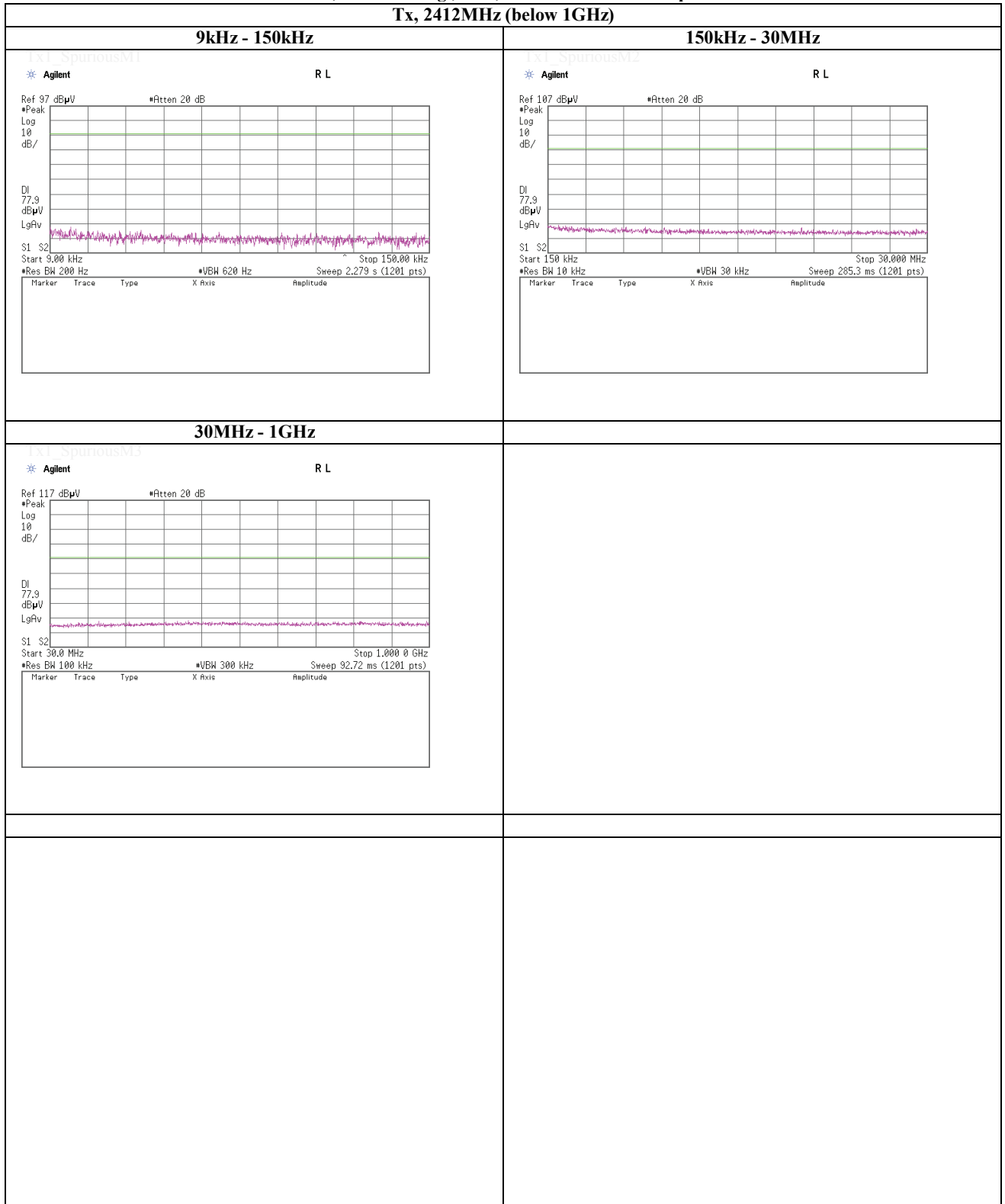
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(Reference chart) Spurious emission (Conducted)

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

Tx, 2412MHz (below 1GHz)



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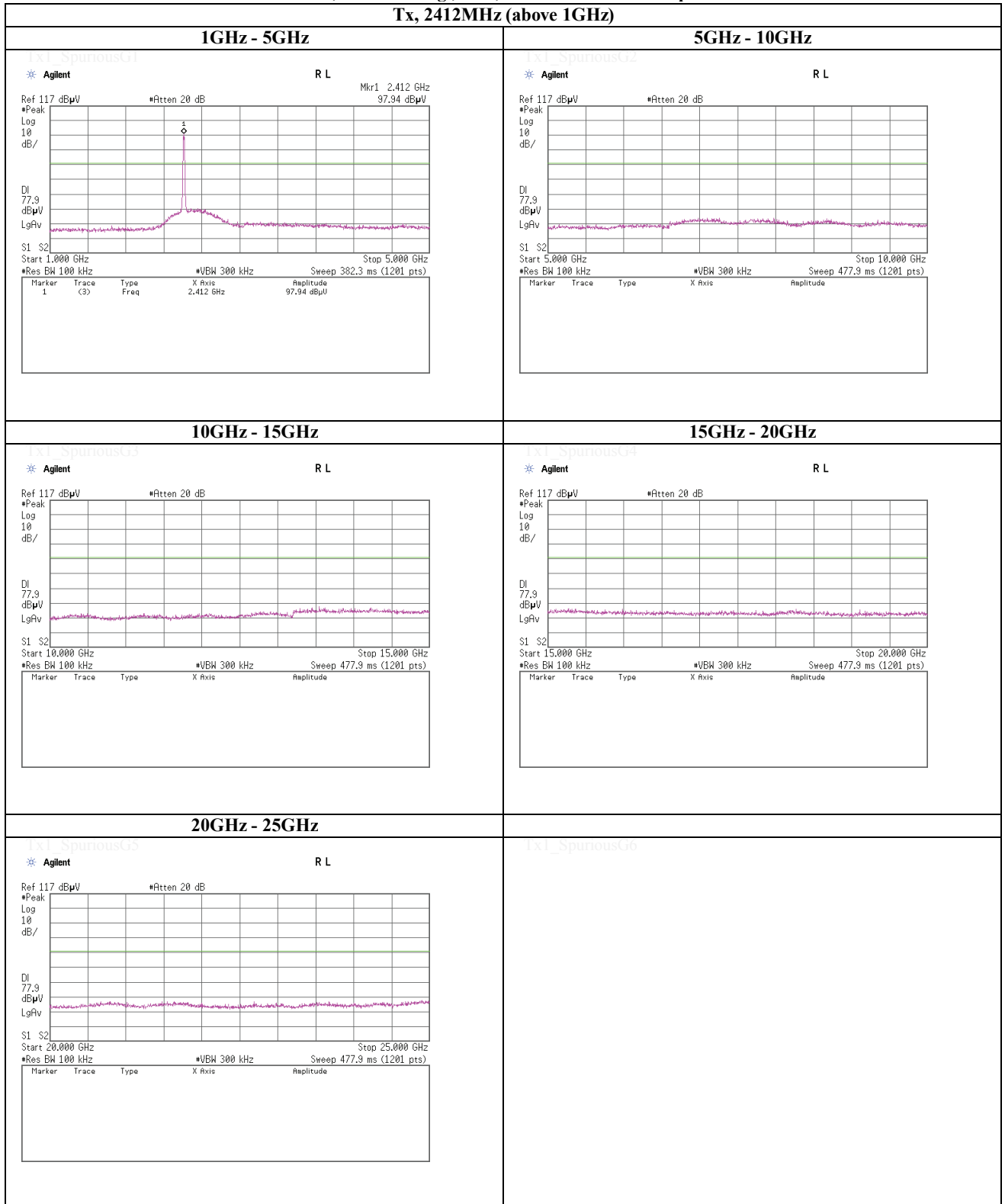
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

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

Tx, 2412MHz (above 1GHz)



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(Reference chart) Spurious emission (Conducted)

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

Tx, 2437MHz (below 1GHz)



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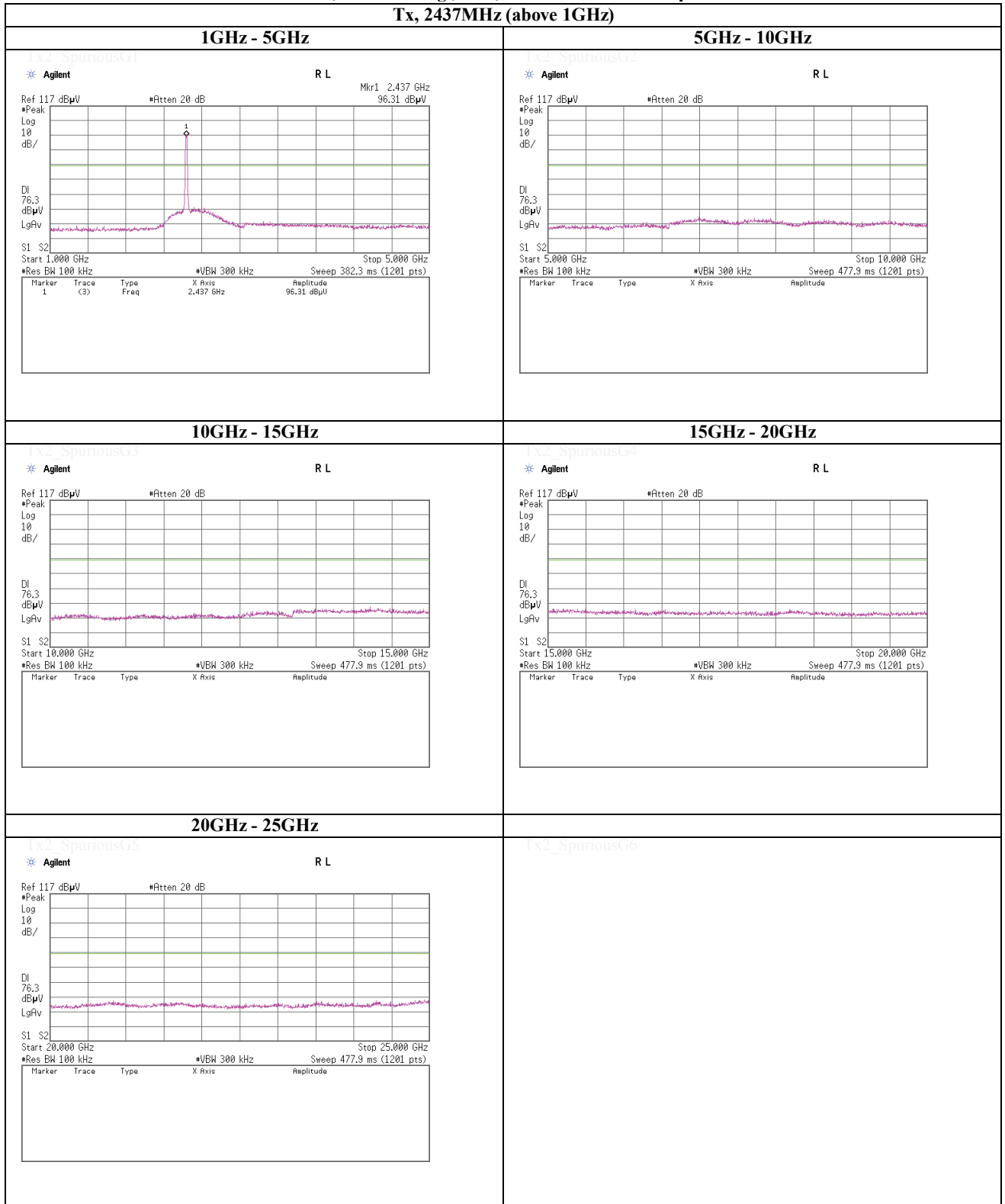
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(Reference chart) Spurious emission (Conducted)

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

Tx, 2437MHz (above 1GHz)



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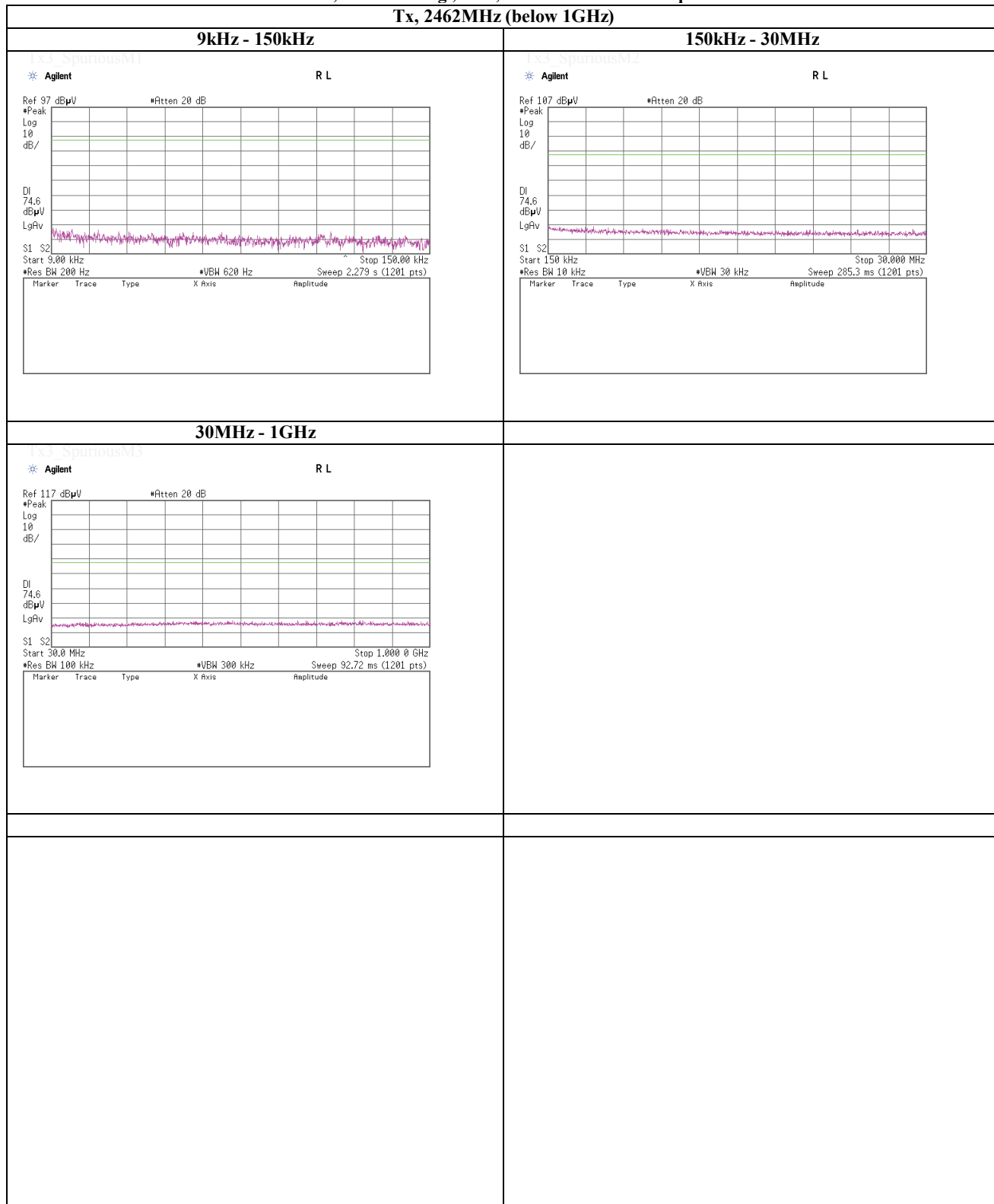
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(Reference chart) Spurious emission (Conducted)

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

Tx, 2462MHz (below 1GHz)



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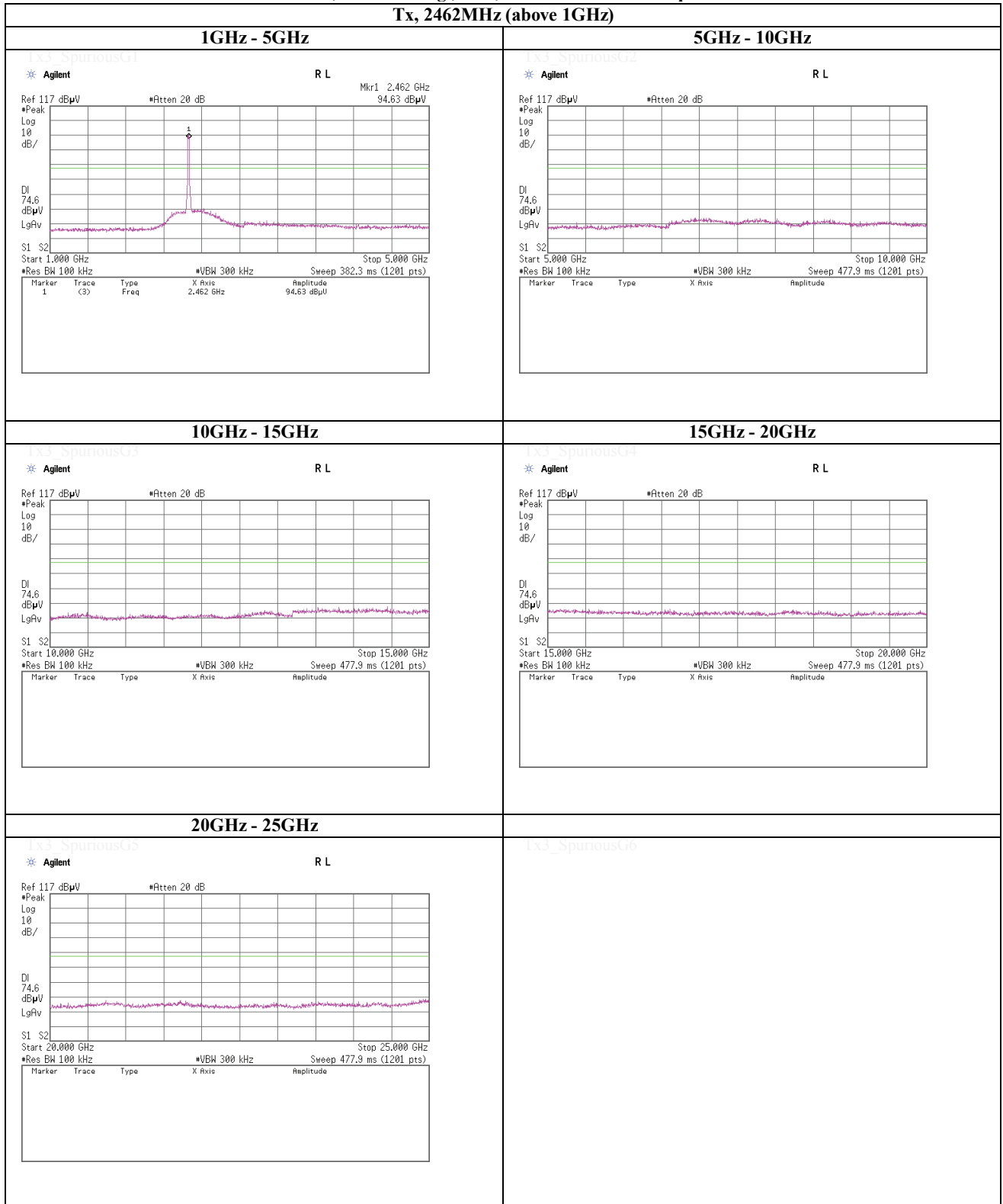
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

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

Tx, 2462MHz (above 1GHz)



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Shonan EMC Lab.

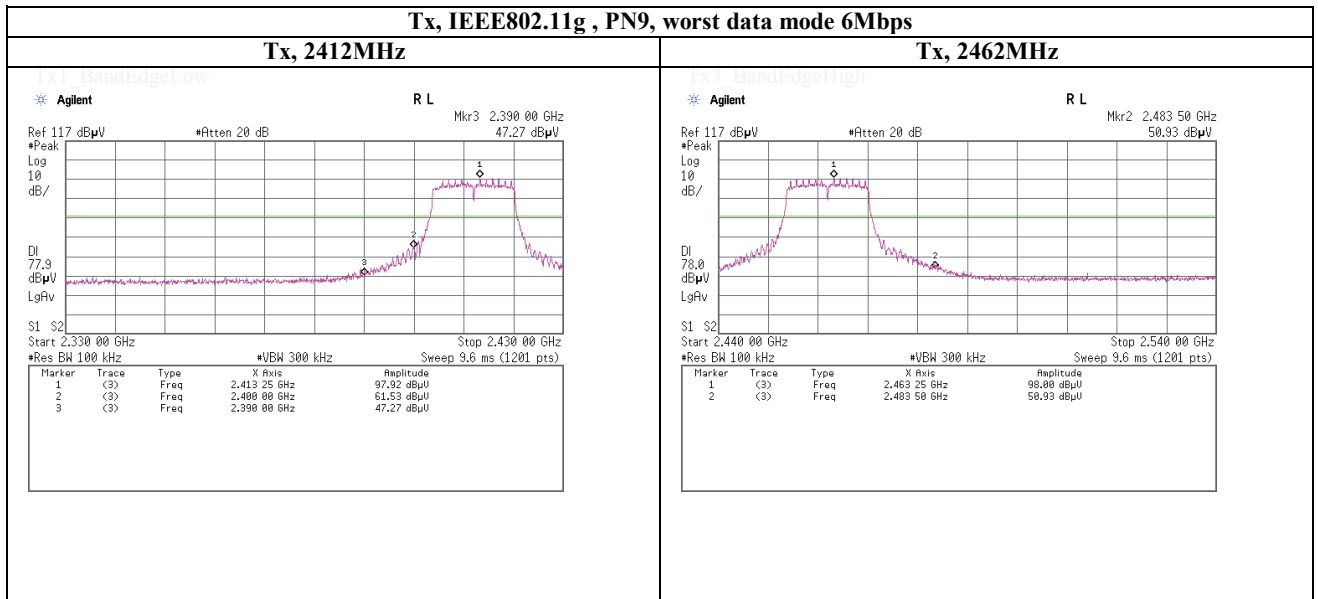
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(Reference chart) Spurious emission (Conducted)

Band Edge compliance



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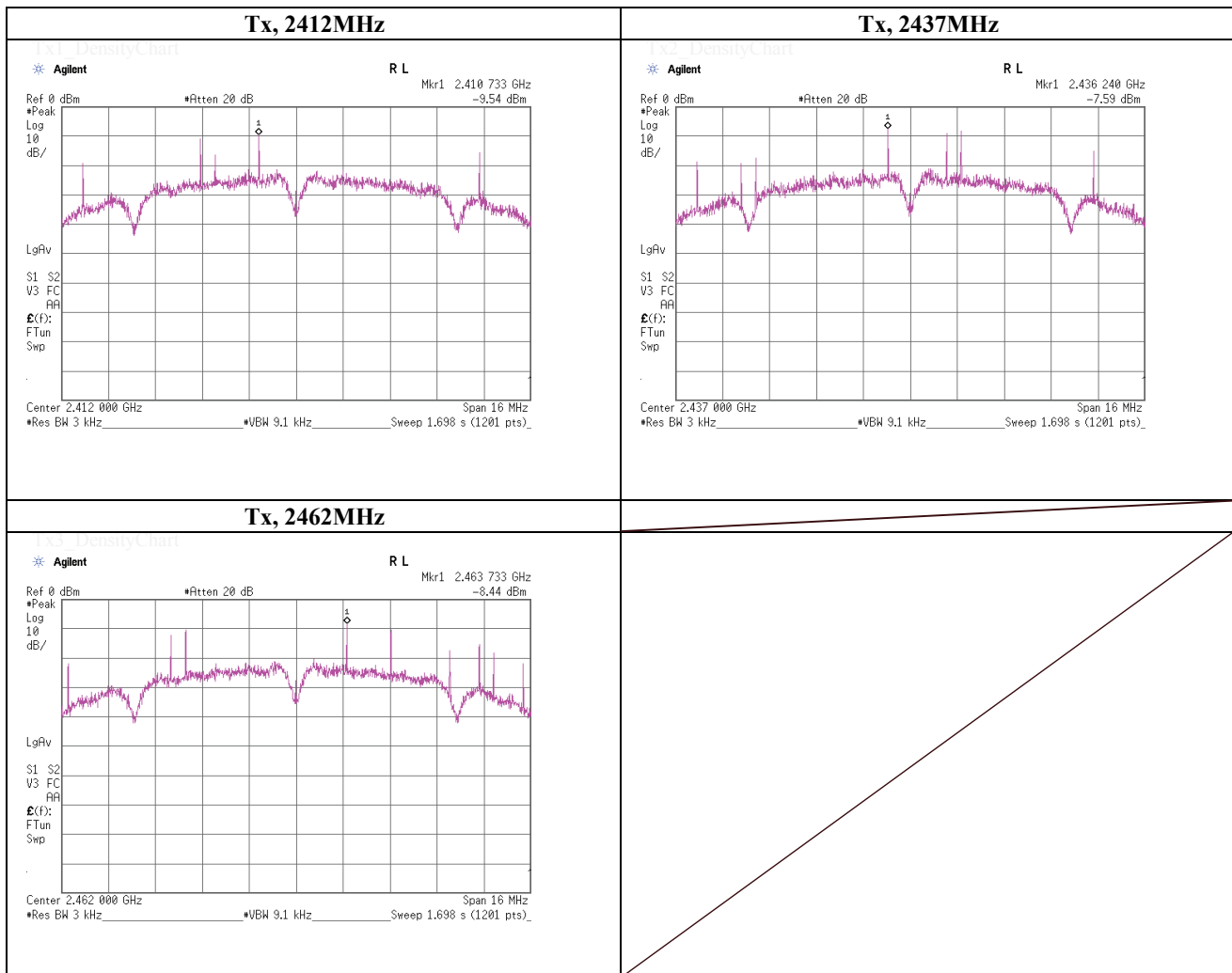
Maximum Power Spectral Density

(Option 1)

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

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2410.73	-9.54	0.74	9.97	1.17	8.00	6.83
2437.0000	2436.24	-7.59	0.74	9.97	3.13	8.00	4.88
2462.0000	2463.73	-8.44	0.74	9.97	2.27	8.00	5.73

Sample Calculation:
Result = Reading + Cable Loss + Atten. Loss



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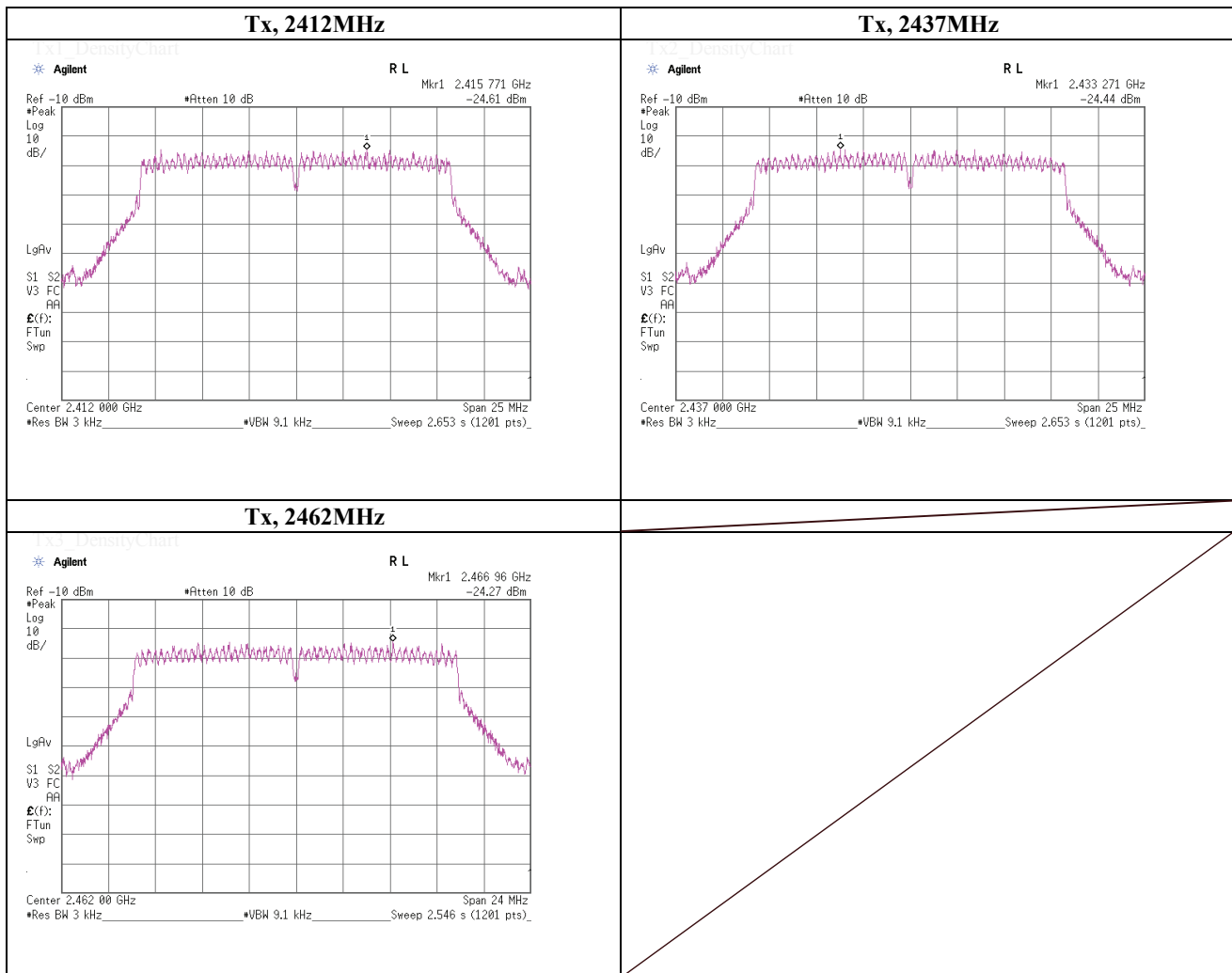
Maximum Power Spectral Density

(Option 1)

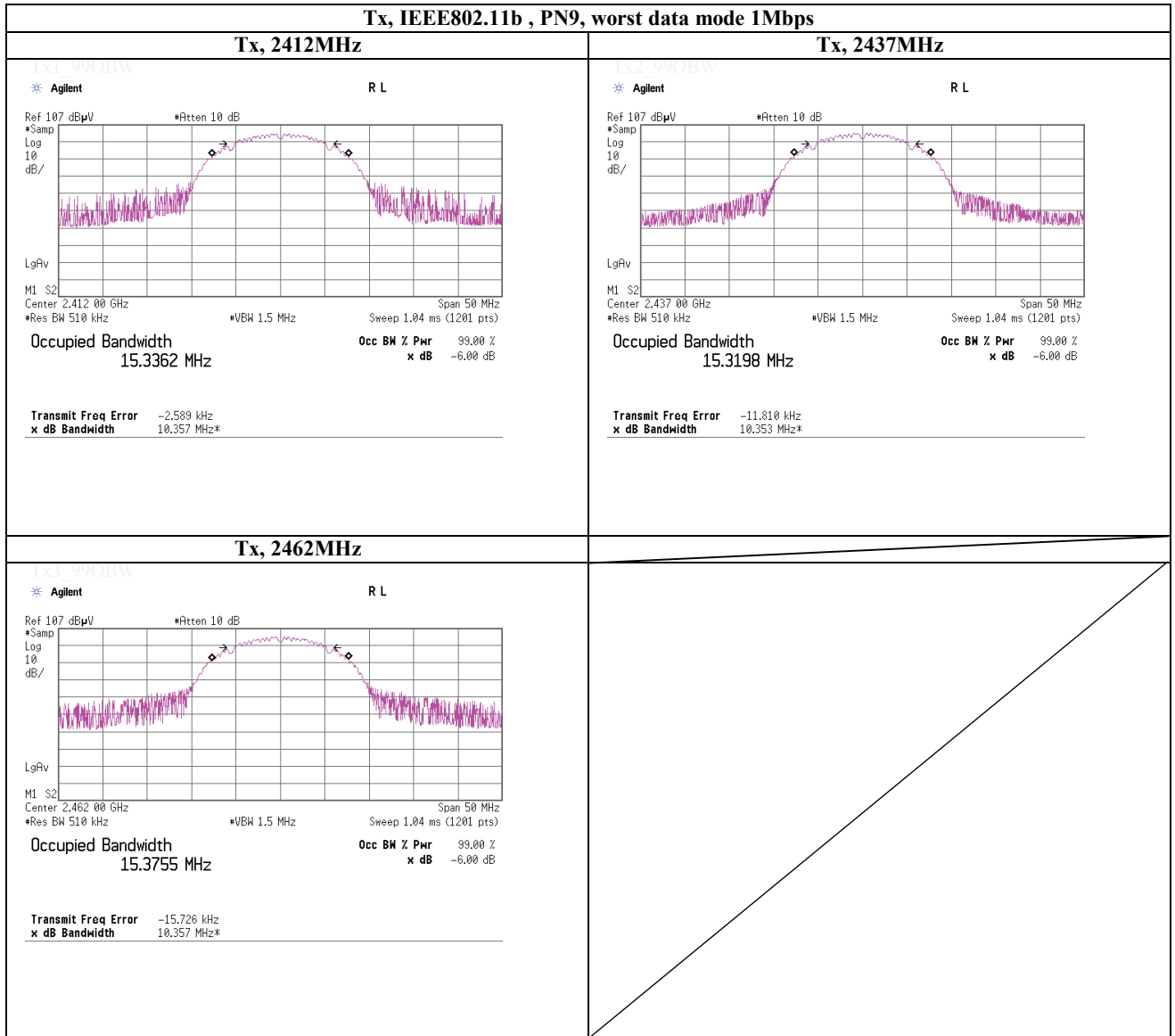
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	March 25, 2013	
Temperature / Humidity	23deg.C , 45%RH	
Engineer	Makoto Hosaka	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2415.77	-24.61	0.74	9.97	-13.90	8.00	21.90
2437.0000	2433.27	-24.44	0.74	9.97	-13.73	8.00	21.73
2462.0000	2466.96	-24.27	0.74	9.97	-13.56	8.00	21.56

Sample Calculation:
Result = Reading + Cable Loss + Atten. Loss



99% Occupied Bandwidth



UL Japan, Inc.

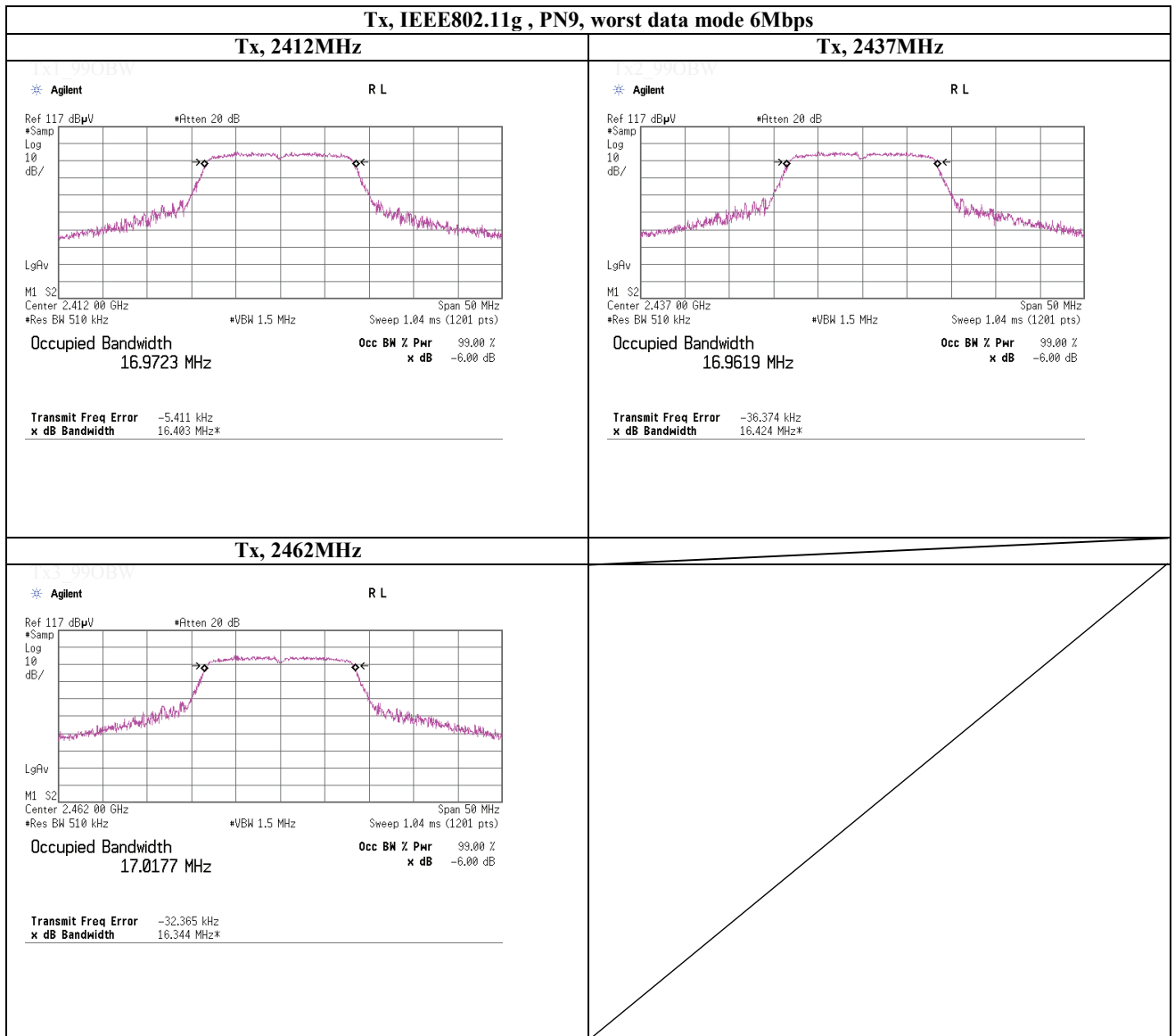
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99% Occupied Bandwidth



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APPENDIX 2 Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2012/04/19 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2012/04/19 * 12
SAt10-10	Attenuator	Weinschel Corp.	54A-10	37584	AT	2012/04/06 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2013/03/16 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	AT/RE	2012/03/16 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2013/03/07 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2012/09/21 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2012/07/18 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	2012/04/10 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2012/05/22 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2012/08/17 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2013/02/27 * 12
SJM-11	Measure	PROMART	SEN1935	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE	-
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2012/12/18 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2012/12/18 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE/AT	2013/03/04 * 12
SHA-05	Horn Antenna	ETS LINDGREN	3160-09	LM4210	RE	2013/03/14 * 12
SCC-G18	Coaxial Cable	Suhner	SUCOFLEX 104A	46292/4A	RE	2013/03/16 * 12
SAF-09	Pre Amplifier	TOYO Corporation	HAP18-26W	00000018	RE	2013/03/19 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2013/02/12 * 12
SAT6-03	Attenuator	JFW	50HF-006N	-	RE	2013/02/12 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2012/10/08 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2012/04/10 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A0901	RE	2012/10/08 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE	2013/02/27 * 12

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

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

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

Test Item :

RE: Radiated emission,

AT: Antenna terminal conducted