



RADIO TEST REPORT

Test Report No.: 4786001498S-B

Applicant : PIONEER CORPORATION
Type of Equipment : Car Audio with Bluetooth
Model No. : CVX-2628
FCC ID : AJDK066
Test regulation : FCC Part15 Subpart C: 2012
Test result : Complied

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2. The results in this report apply only to the sample tested.
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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: November 28 to December 21, 2012

Tested by:

Tatsuya Arai
Engineer of WiSE Japan,
UL Verification Service

Approved by :

Toyokazu Imamura
Leader of WiSE Japan,
UL Verification Service



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

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 4786001498S-B

[illegible]

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SECTION 1: Customer information

Company Name : PIONEER CORPORATION
Brand name : Pioneer
Address : 25-1 Aza-Nishi-machi, Yamada, Kawagoe-shi, Saitama, 350-8555, JAPAN
Telephone Number : +81-49-228-6415
Facsimile Number : +81-49-228-6493
Contact Person : Makoto Kaieda

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

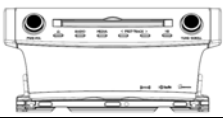
2.1 Identification of E.U.T.

Type of Equipment : Car Audio with Bluetooth
Model No. : CVX-2628
Serial No. : See Section 4.
Rating : DC 12V
Country of Mass-production : Japan
Condition of EUT : Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No modification by the test lab.
Receipt Date of Sample : November 27, 2012

2.2 Product description

Model: CVX-2628 (referred to as the EUT in this report) is a Car Audio with Bluetooth.

The derived model and differences (both models were pre-checked with Radiated emission and the test has been performed with the worse model CVX-2628 as a representative):

Pioneer Number	CVH-2438ZTS1/XHUC	CVX-2628ZT/US
Sell	U.S.A/Canada	U.S.A
Country of Mass-production	U.S.A.	Japan
Audio Amplifier Supplier	internal Amplifier	external Pioneer's Amplifier
Display	6.1InchWVGA	external other's 7 Inch
Front side Design		
Back side Design		

Radio specification:

Wireless LAN:

Equipment type : Transceiver
Frequency of operation : 2412-2462MHz
Bandwidth & channel spacing : 20MHz & 5MHz
Type of modulation : BPSK, QPSK, CCK, 16QAM, 64QAM
Antenna type : Pattern
Antenna gain with cable loss : -2.52dBi (max)
Antenna connector type : U.FL-LP-066
Operation temperature range : -20 to +65 deg.C.

Bluetooth:

Equipment type : Transceiver
Frequency of operation : 2402-2480MHz
Bandwidth & channel spacing : 79MHz & 1MHz
Type of modulation : GFSK, $\pi/4$ DQPSK, 8DPSK
Antenna type : Pattern
Antenna gain with cable loss : -3.74dBi (max)
Antenna connector type : U.FL-LP-066
Operation temperature range : -20 to +65 deg.C.

Refer to the test report: 4786001498S-A for Bluetooth part.

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FCC 15.31 (e)

The equipment provides the wireless transmitter with stable power supply (DC3.3V). Therefore, the equipment complies with the requirement.

FCC 15.203

The equipment and its antenna comply with the requirement since the antenna is built in the equipment and it cannot be replaced by end users.

Clock Frequency:

Reason For Use	Frequency
SYSTEM MICROCOMPUTER	16MHz
CAN MICROCOMPUTER	8MHz
Dirana	41.6MHz
VDEC	32MHz
GVIF TX	24MHz
GPS RX	26MHz
SoC int CLK (33M PLL)	1066.667MHz
SoC int CLK (48M PLL)	864.0MHz
SoC MASTER CLK	33.33MHz
SoC DOTCLK	37MHz
SoC USBCLK	48.0MHz
VCXO (SoC)	27.0MHz
Audio PLL IC (SoC)	24.576MHz
Audio PLL IC (SoC)	16.934MHz
Audio PLL IC(ADC for MIC)	6.144MHz
DSP MCLK (HD)	24.0MHz
SYS CLK (XM)	24.265MHz
I2C communication SYS uCom ↔E2PROM	100k~400kHz
I2C communication SYS uCom ↔VDEC	0.4MHz
I2C communication SYS uCom ↔LVDS	400kbps
I2C communication SYS uCom ↔GVIF	100kHz or 400kHz
I2C communication SYS uCom ↔Dirana	0.3MHz
I2C communication Dirana↔L-Dice	0.4MHz
I2C communication Dirana↔Hero	0.4MHz
I2C communication SoC↔iPod	100~400kHz
SPI communication SYS uCom↔KeyScan IC	0.4MHz
SPI communication SYS uCom↔CAN uCom	0.6MHz
SPI communication SYS uCom↔GVIF	0.4MHz
SPI communication SoC↔HD Module	0.8MHz
UART communication SYS uCom↔HD Module	115kbps
UART communication SYS uCom↔SoC	1.5Mbps
UART communication SYS uCom↔CD Meca	19.2kbps
UART communication SoC↔BT Module	3Mbps
CAN communication	500kbps
LBSC communication Soc↔NorFlash	66.66MHz
DBSC3 communication Soc↔DDR3	533.33MHz
SD IF SoC↔SD Card	48MHz
SD IF SoC↔WiFi Module	24MHz
Audio data (I2S)	3.072MHz
Audio data (SPDIF)	2.82MHz
D.RGB666 (Video)	37.007MHz
Digital IF Dirana↔HD Module	0.65MHz
USB2.0 signal	480Mbps
LVDS signal	500MHz
GVIF signal	500MHz
Global CAN	500kbps
Local CAN	500kbps
AVC-LAN	12Mbps
DCDC converter	444.444kHz, 480.000kHz
HERO (For HD DATA)	62.4MHz

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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 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 EUT has been tested for compliance with FCC Part 15 Subpart B by the customer.

3.2 Procedures & Results

Item	Test Procedure *1)	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.10:2009	FCC 15.207	-	N/A *2)	N/A	N/A
6dB bandwidth	ANSI C63.10:2009	FCC 15.247 (a)(2)	Conducted	N/A	* See data	Complied
Maximum peak output power	ANSI C63.10:2009	FCC 15.247 (b)(3)	Conducted	N/A		Complied
Out of band emission & Restricted band edges	ANSI C63.10:2009	FCC 15.109, 15.247 (d) & 15.209	Conducted / Radiated	N/A	2.8dB Freq.: 7386MHz Polarization: Horizontal Detection: Average Mode: Tx 2462MHz, IEEE 802.11g	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

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

Antenna port conducted test

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

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

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

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

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

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

3.5 Test location

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JAB Accreditation No. : RTL02610

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

3.6 Test setup, Data of test & Test instruments

Refer to APPENDIX 1 to 3.

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

4.1 Operating mode

Test item	Mode	Tested frequency	Power setting *1)	Worst data rate *2)
Radiated emission (below 1GHz) *3)	Transmitting IEEE 802.11g	2437MHz	Fixed	54Mbps, PN9
Other items	Transmitting IEEE 802.11b	2412MHz, 2437MHz, 2462MHz	Fixed	11Mbps, PN9
	Transmitting IEEE 802.11g	2412MHz, 2437MHz, 2462MHz	Fixed	54Mbps, PN9
	Transmitting IEEE 802.11n(HT20)	2412MHz, 2437MHz, 2462MHz	Fixed	MCS4, PN9
*1) Software: UniTest Ver. 7.2.1.5 *2) The worst condition was determined based on the test result of Maximum Peak Output Power. (11n (HT20) mode has “(short)” (= short guard interval = 400ns) and “(long)” (=long guard interval = 800ns)) *3) Test operating mode was determined as follows according to “Section 1 of 6 802.11 a/b/g/n testing- Managing Complex Regulatory Approvals - ”of TCB Council Workshop October 2009.				

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

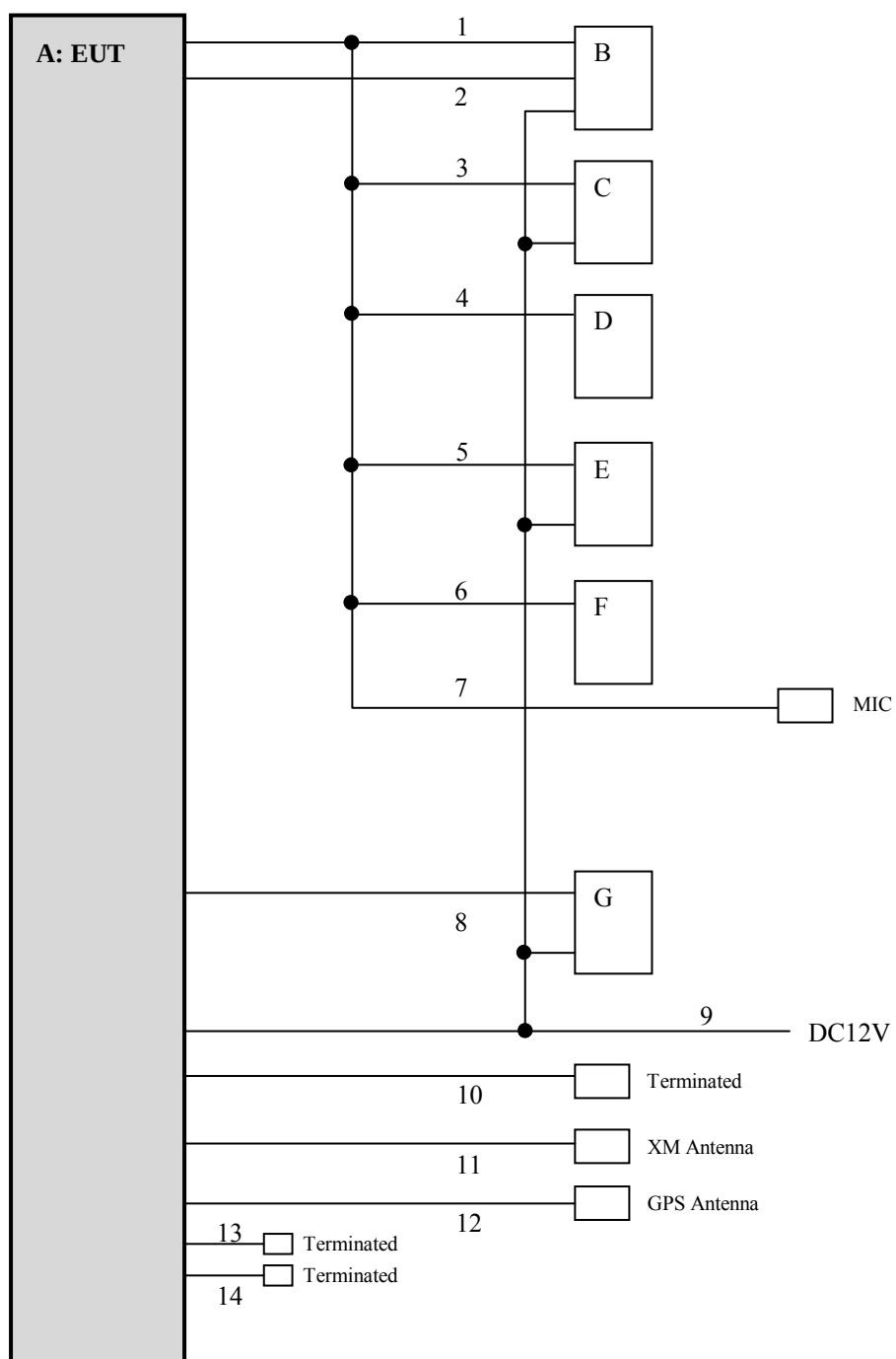
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4.2 Configuration of tested system



* Test data was taken under worse case conditions.

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Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Audio with Bluetooth	CVX-2628	*1)	Pioneer	EUT
B	Display	86110-30330	462200-3296	DENSO	-
C	Remote Control Device	84780-48080	-	Tokai Rika	-
D	Steering Switch	-	-	-	-
E	Air-Condition ECU	886650-30P80	177700-6524	DENSO	-
F	Rear Camera	86790-30150	23C08003	-	-
G	Amplifier	86280-53180	K1LD024	Pioneer	-

*1) Antenna terminal conducted tests: AABB999998US, Radiated emission tests: AABB999999CA

List of cables used

No.	Cable name	Length (m)	Shield		Remark
			Cable	Connector	
1	Signal cable for Display	2.0	Unshielded	Unshielded	-
2	Image output cable	2.0	Unshielded	Unshielded	-
3	Signal cable for Remote control	2.0	Unshielded	Unshielded	-
4	Signal cable for Steering Switch	2.0	Unshielded	Unshielded	-
5	Signal cable for Air-Condition ECU	2.0	Unshielded	Unshielded	-
6	Signal cable for Rear Camera	2.0	Unshielded	Unshielded	-
7	Signal cable for MIC	4.0	Shielded	Shielded	-
8	Signal cable for Amplifier	2.0	Shielded	Shielded	-
9	DC power cable	4.0	Unshielded	Unshielded	-
10	USB cable	2.0	Shielded	Shielded	-
11	Antenna cable for XM	1.4	Shielded	Shielded	-
12	Antenna cable for GPS	1.6	Shielded	Shielded	-
13	Antenna cable for Radio	0.15	Shielded	Shielded	-
14	Antenna cable for Radio	0.15	Shielded	Shielded	-

*All cables used for the measurement are exclusive use or marketed.

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SECTION 5: 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 6: 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 7: 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

SECTION 8: 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

SECTION 9: Radiated emission

9.1 Operating environment

Test room : See test data (APPENDIX)
Temperature : See test data (APPENDIX)
Humidity : See test data (APPENDIX)

9.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 2.0m, 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 EUT, including its peripherals was aligned and flushed with rear of tabletop. I/O cables that were connected to the peripherals were bundled in center. They were folded back and for the forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. Photographs of the set up are shown in APPENDIX.

9.3 Test conditions

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

9.4 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.

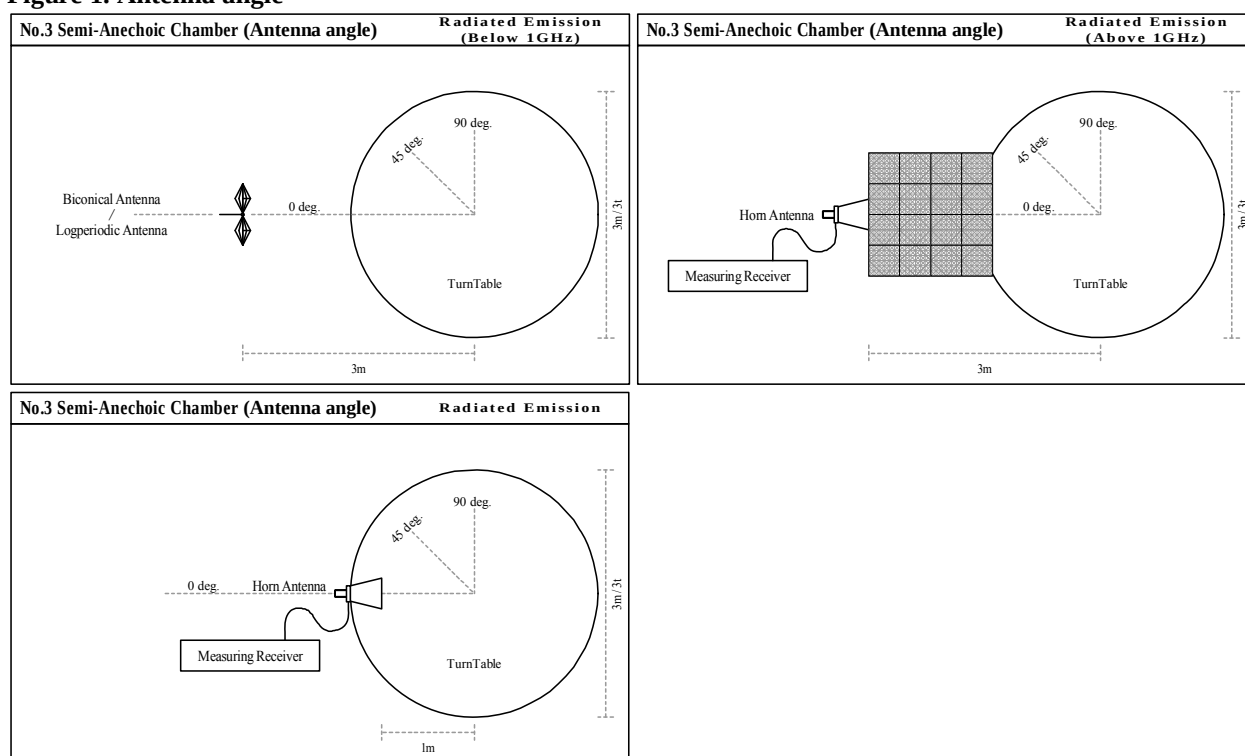
The radiated emission measurements were made with the following detection.

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 level and noise levels were fixed at angle of 23.5 deg. based on the product specification.

Figure 1. Antenna angle



9.5 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.

9.6 Results

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

Refer to APPENDIX

Contents of APPENDIXES

APPENDIX 1: Data of Radio tests

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

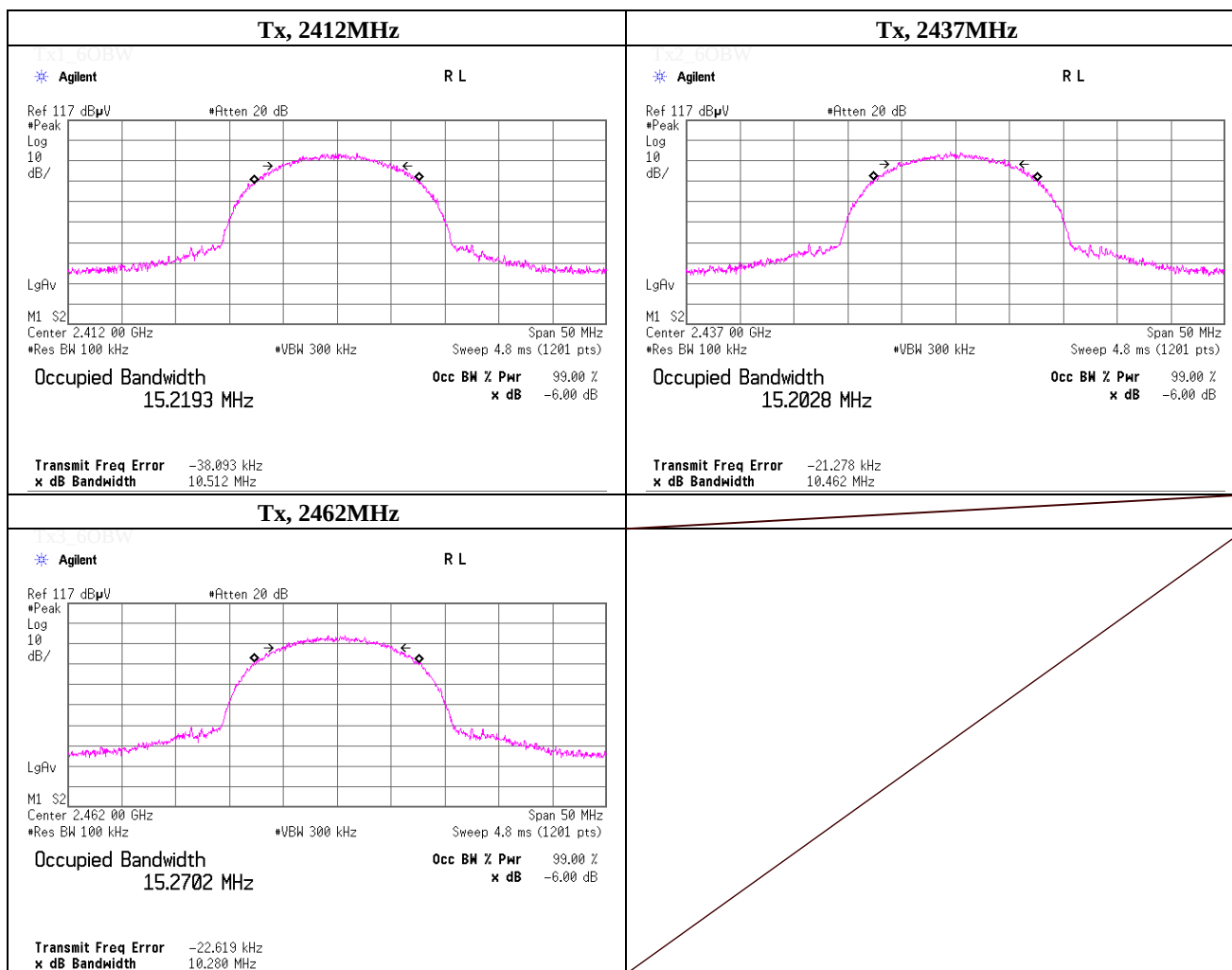
Radiated emission

APPENDIX 1: Data of Radio tests

-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Shielded Room
Date	November 28, 2012	
Temperature / Humidity	23deg.C , 33%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11b, PN9, worst data mode 11Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	10.512	> 0.500
2437.0000	10.462	> 0.500
2462.0000	10.280	> 0.500



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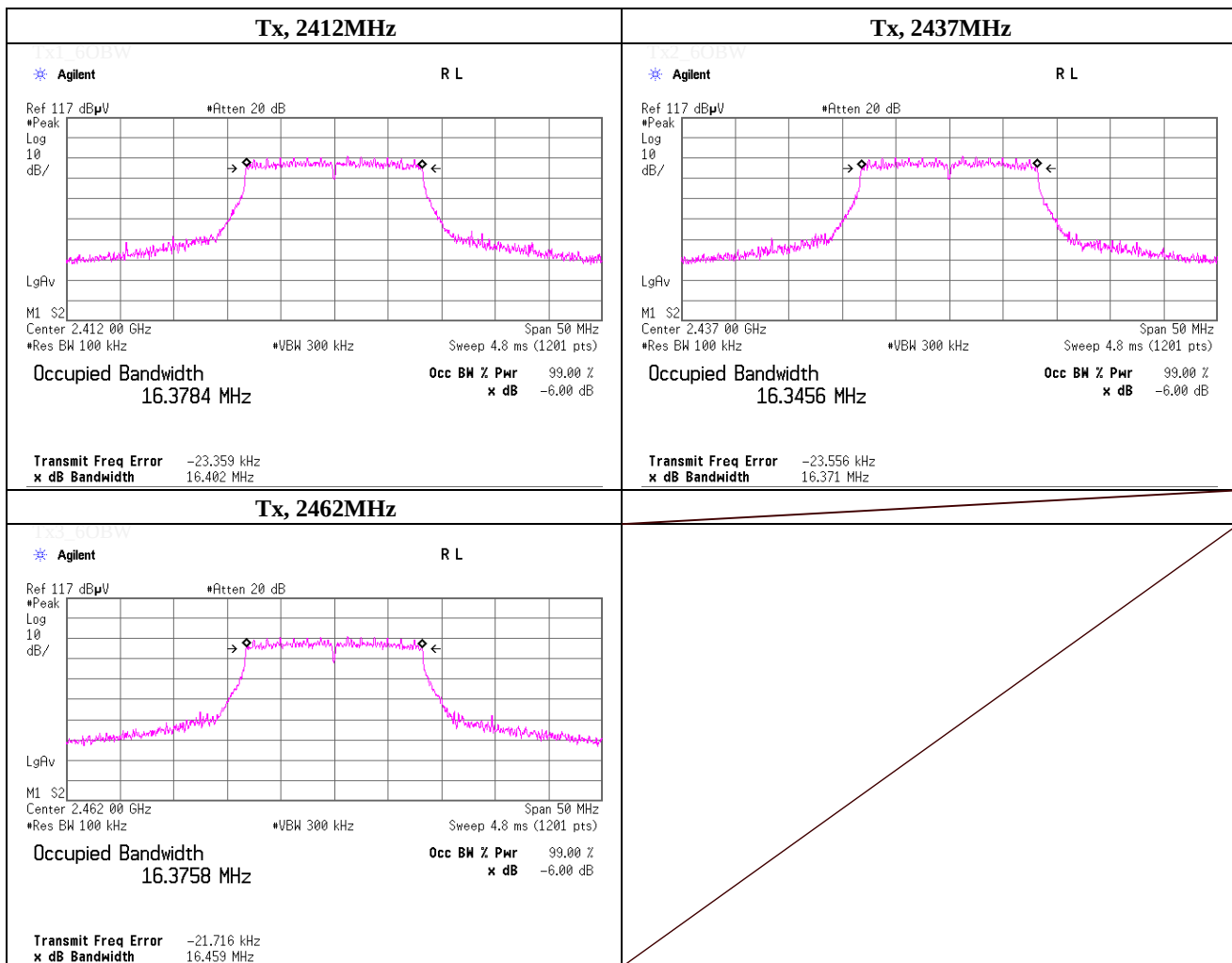
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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Shielded Room
Date	November 28, 2012	
Temperature / Humidity	23deg.C , 33%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11g, PN9, worst data mode 54Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.402	> 0.500
2437.0000	16.371	> 0.500
2462.0000	16.459	> 0.500



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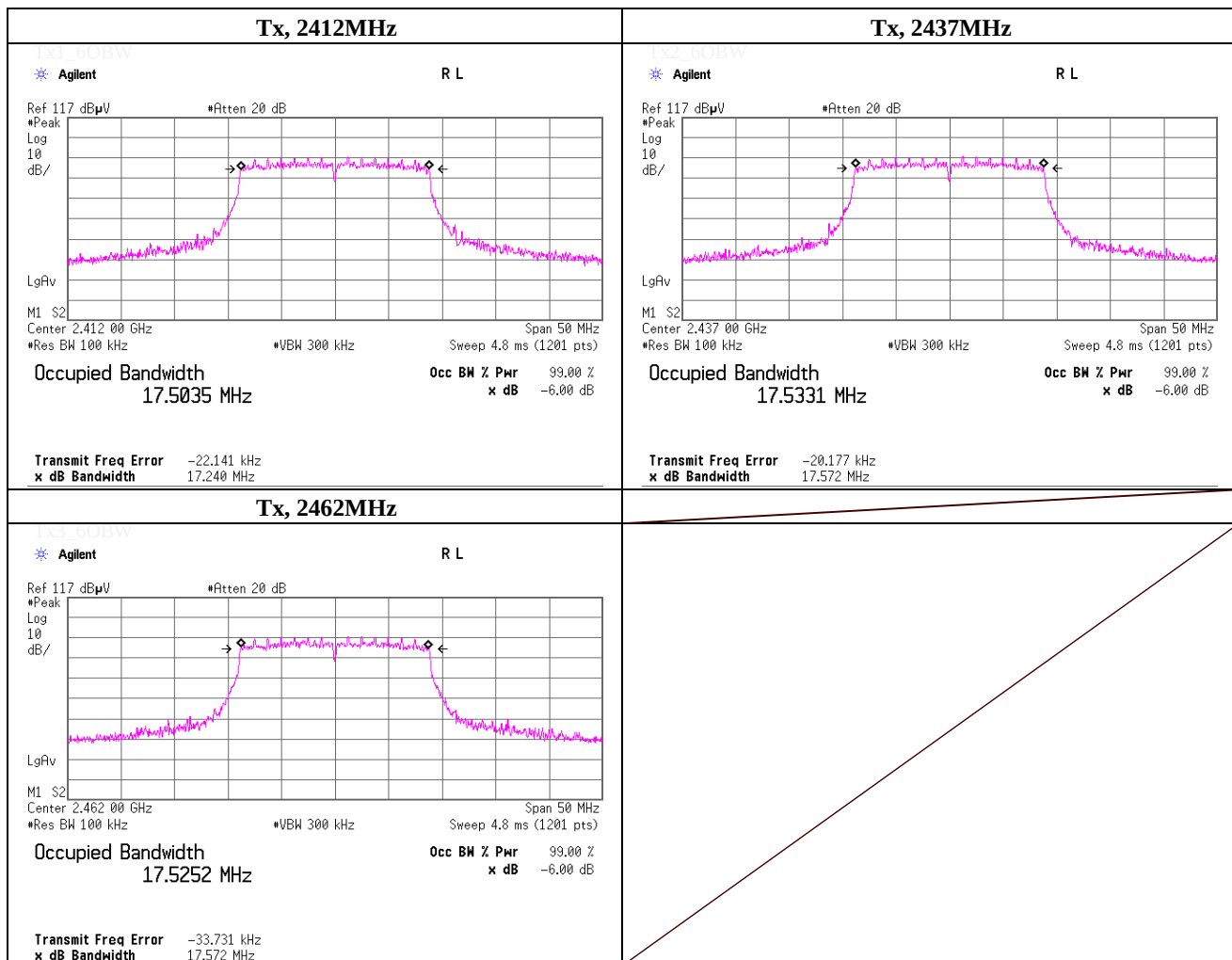
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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Shielded Room
Date	November 28, 2012	
Temperature / Humidity	23deg.C , 33%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11n (HT20), PN9, worst data mode (long) 4 (MCS)	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	17.240	> 0.500
2437.0000	17.572	> 0.500
2462.0000	17.572	> 0.500



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Maximum Peak Conducted Output Power

(Option 3)

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
 Date November 28, 2012
 Temperature / Humidity 23deg.C , 33%RH
 Engineer Kenichi Adachi
 Mode Tx, IEEE802.11b, PN9,

worst data mode : 11 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin
					[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	5.31	1.97	9.86	17.14	51.76	30.00	1000	12.86
Mid	2437.0	5.35	1.97	9.86	17.18	52.24	30.00	1000	12.82
High	2462.0	5.44	1.98	9.86	17.28	53.46	30.00	1000	12.72

Sample Calculation:

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

[Pre check]

	Data rate [Mbps]	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin
						[dBm]	[mW]	[dBm]	[mW]	[dB]
	1	2437.0	5.14	1.97	9.86	16.97	49.77	30.00	1000	13.03
	2	2437.0	5.22	1.97	9.86	17.05	50.70	30.00	1000	12.95
	5.5	2437.0	5.24	1.97	9.86	17.07	50.93	30.00	1000	12.93
	11	2437.0	5.35	1.97	9.86	17.18	52.24	30.00	1000	12.82

Worst

Sample Calculation:

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

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Maximum Peak Conducted Output Power

(Option 3)

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
 Date November 28, 2012
 Temperature / Humidity 23deg.C , 33%RH
 Engineer Kenichi Adachi
 Mode Tx, IEEE802.11g, PN9, worst data mode : 54 Mbps

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin
					[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	10.52	1.97	9.86	22.35	171.79	30.00	1000	7.65
Mid	2437.0	10.58	1.97	9.86	22.41	174.18	30.00	1000	7.59
High	2462.0	10.53	1.98	9.86	22.37	172.58	30.00	1000	7.63

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
						[dBm]	[mW]	[dBm]	[mW]	[dB]
	6	2437.0	10.22	1.97	9.86	22.05	160.32	30.00	1000	7.95
	9	2437.0	10.28	1.97	9.86	22.11	162.55	30.00	1000	7.89
	12	2437.0	10.32	1.97	9.86	22.15	164.06	30.00	1000	7.85
	18	2437.0	10.36	1.97	9.86	22.19	165.58	30.00	1000	7.81
	24	2437.0	10.48	1.97	9.86	22.31	170.22	30.00	1000	7.69
	36	2437.0	10.54	1.97	9.86	22.37	172.58	30.00	1000	7.63
	48	2437.0	10.56	1.97	9.86	22.39	173.38	30.00	1000	7.61
	54	2437.0	10.58	1.97	9.86	22.41	174.18	30.00	1000	7.59

Worst

Sample Calculation:

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

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Maximum Peak Conducted Output Power

(Option 3)

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
 Date November 28, 2012
 Temperature / Humidity 23deg.C , 33%RH
 Engineer Kenichi Adachi
 Mode Tx, IEEE802.11n (HT20), PN9, worst data mode : (long) 4 (MCS)

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

Ch	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin
					[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	10.49	1.97	9.86	22.32	170.61	30.00	1000	7.68
Mid	2437.0	10.45	1.97	9.86	22.28	169.04	30.00	1000	7.72
High	2462.0	10.41	1.98	9.86	22.25	167.88	30.00	1000	7.75

Sample Calculation:

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

[Pre check]

(Short Guard Interval)

	Mode (MCS)	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin	
						[dBm]	[mW]	[dBm]	[mW]	[dB]	
	(short) 0	2437.0	10.12	1.97	9.86	21.95	156.68	30.00	1000	8.05	(7.2Mbps)
	(short) 1	2437.0	10.14	1.97	9.86	21.97	157.40	30.00	1000	8.03	(14.4Mbps)
	(short) 2	2437.0	10.15	1.97	9.86	21.98	157.76	30.00	1000	8.02	(21.7Mbps)
	(short) 3	2437.0	10.25	1.97	9.86	22.08	161.44	30.00	1000	7.92	(28.9Mbps)
	(short) 4	2437.0	10.34	1.97	9.86	22.17	164.82	30.00	1000	7.83	(43.3Mbps)
	(short) 5	2437.0	9.11	1.97	9.86	20.94	124.17	30.00	1000	9.06	(57.8Mbps)
	(short) 6	2437.0	9.16	1.97	9.86	20.99	125.60	30.00	1000	9.01	(65.0Mbps)
	(short) 7	2437.0	9.18	1.97	9.86	21.01	126.18	30.00	1000	8.99	(72.2Mbps)

(Long Guard Interval)

	Mode (MCS)	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin	
						[dBm]	[mW]	[dBm]	[mW]	[dB]	
	(long) 0	2437.0	10.17	1.97	9.86	22.00	158.49	30.00	1000	8.00	(6.5Mbps)
	(long) 1	2437.0	10.27	1.97	9.86	22.10	162.18	30.00	1000	7.90	(13.0Mbps)
	(long) 2	2437.0	10.44	1.97	9.86	22.27	168.66	30.00	1000	7.73	(19.5Mbps)
	(long) 3	2437.0	10.42	1.97	9.86	22.25	167.88	30.00	1000	7.75	(26.0Mbps)
	(long) 4	2437.0	10.45	1.97	9.86	22.28	169.04	30.00	1000	7.72	Worst (39.0Mbps)
	(long) 5	2437.0	9.16	1.97	9.86	20.99	125.60	30.00	1000	9.01	(52.0Mbps)
	(long) 6	2437.0	9.18	1.97	9.86	21.01	126.18	30.00	1000	8.99	(58.5Mbps)
	(long) 7	2437.0	9.19	1.97	9.86	21.02	126.47	30.00	1000	8.98	(65.0Mbps)

Sample Calculation:

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

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Radiated Emission

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 29, 2012	December 18, 2012	December 21, 2012
Temperature / Humidity	21 deg.C , 35%RH	22 deg.C , 36%RH	24 deg.C , 32%RH
Engineer	Tatsuya Arai	Tatsuya Arai	Tatsuya Arai
Mode	Tx, 2412.0 MHz Tx, IEEE802.11b		

(* 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	61.3	27.4	14.2	41.4	61.5	73.9	12.4	243	2	
Hori.	2490.753	PK	53.6	27.5	14.3	41.4	54.0	73.9	19.9	239	359	
Hori.	2886.584	PK	52.5	28.3	6.2	41.4	45.6	73.9	28.3	102	344	
Hori.	3774.690	PK	54.2	29.5	6.0	41.8	47.9	73.9	26.0	100	304	
Hori.	3996.754	PK	53.4	29.7	6.2	41.8	47.5	73.9	26.4	100	202	
Hori.	4823.968	PK	51.4	31.1	6.8	41.2	48.1	73.9	25.8	164	286	
Hori.	7236.000	PK	47.3	36.6	8.5	41.4	51.0	73.9	22.9	100	0	
Hori.	2886.584	AV	46.4	28.3	6.2	41.4	39.5	53.9	14.4	102	344	
Hori.	3774.690	AV	49.7	29.5	6.0	41.8	43.4	53.9	10.5	100	304	
Hori.	3996.754	AV	47.8	29.7	6.2	41.8	41.9	53.9	12.0	100	202	
Vert.	2390.000	PK	64.1	27.4	14.2	41.4	64.3	73.9	9.6	100	324	
Vert.	2490.753	PK	58.7	27.5	14.3	41.4	59.1	73.9	14.8	128	26	
Vert.	2886.518	PK	52.9	28.2	6.2	41.4	45.9	73.9	28.0	100	320	
Vert.	3774.693	PK	54.8	29.5	6.0	41.8	48.5	73.9	25.4	100	309	
Vert.	3996.587	PK	51.6	29.7	6.2	41.8	45.7	73.9	28.2	100	308	
Vert.	4824.000	PK	52.5	31.1	6.8	41.2	49.2	73.9	24.7	107	193	
Vert.	7236.000	PK	43.7	36.6	8.5	41.4	47.4	73.9	26.5	100	0	
Vert.	2886.518	AV	44.4	28.2	6.2	41.4	37.4	53.9	16.5	100	320	
Vert.	3774.693	AV	50.1	29.5	6.0	41.8	43.8	53.9	10.1	100	309	
Vert.	3996.587	AV	43.8	29.7	6.2	41.8	37.9	53.9	16.0	100	308	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	38.9	27.4	14.2	41.4	0.4	39.5	53.9	14.4	
Hori.	2490.753	AV	40.5	27.5	14.3	41.4	0.4	41.3	53.9	12.6	
Hori.	4823.968	AV	42.5	31.1	6.8	41.2	0.4	39.6	53.9	14.3	
Hori.	7236.000	AV	38.1	36.6	8.5	41.4	0.4	42.2	53.9	11.7	
Vert.	2390.000	AV	40.7	27.4	14.2	41.4	0.4	41.3	53.9	12.6	
Vert.	2490.753	AV	43.7	27.5	14.3	41.4	0.4	44.5	53.9	9.4	
Vert.	4824.000	AV	43.7	31.1	6.8	41.2	0.4	40.8	53.9	13.1	
Vert.	7236.000	AV	34.5	36.6	8.5	41.4	0.4	38.6	53.9	15.3	

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

*Since the emission at 2390MHz and 2483.5MHz is not the out of band emission shown in the chart of Band Edge, normally the duty cycle correction does not need to be carried out. But 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.

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

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	93.5	27.5	14.2	41.4	93.8	-	-	
Hori.	2400.000	PK	51.5	27.4	14.2	41.4	51.7	73.8	22.1	
Hori.	3126.456	PK	44.5	28.7	5.7	41.5	37.4	73.8	36.4	
Vert.	2412.000	PK	96.5	27.5	14.2	41.4	96.8	-	-	
Vert.	2400.000	PK	53.1	27.4	14.2	41.4	53.3	76.8	23.5	
Vert.	3126.530	PK	54.2	28.7	5.7	41.5	47.1	76.8	29.7	

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

Radiated Emission

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 29, 2012	December 18, 2012	December 21, 2012
Temperature / Humidity	21 deg.C , 35%RH	22 deg.C , 36%RH	24 deg.C , 32%RH
Engineer	Tatsuya Arai	Tatsuya Arai	Tatsuya Arai
Mode	Tx, 2437.0 MHz Tx, IEEE802.11b (* 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.	2514.850	PK	51.6	27.6	14.3	41.4	52.1	73.9	21.8	100	39	
Hori.	2886.727	PK	52.6	28.2	6.2	41.4	45.6	73.9	28.3	101	335	
Hori.	3772.758	PK	51.6	29.5	6.0	41.8	45.3	73.9	28.6	200	11	
Hori.	3996.693	PK	53.6	29.7	6.2	41.8	47.7	73.9	26.2	100	215	
Hori.	4874.000	PK	50.1	31.3	6.9	41.1	47.2	73.9	26.7	100	0	
Hori.	7311.000	PK	46.1	36.6	8.6	41.4	49.9	73.9	24.0	100	0	
Hori.	2886.727	AV	47.6	28.2	6.2	41.4	40.6	53.9	13.3	101	335	
Hori.	3772.758	AV	44.1	29.5	6.0	41.8	37.8	53.9	16.1	200	11	
Hori.	3996.693	AV	47.6	29.7	6.2	41.8	41.7	53.9	12.2	100	215	
Vert.	2514.850	PK	55.9	27.6	14.3	41.4	56.4	73.9	17.5	100	320	
Vert.	2886.592	PK	52.6	28.3	6.2	41.4	45.7	73.9	28.2	150	179	
Vert.	3774.678	PK	54.1	29.5	6.0	41.8	47.8	73.9	26.1	254	9	
Vert.	3996.693	PK	51.3	29.7	6.2	41.8	45.4	73.9	28.5	100	310	
Vert.	4874.000	PK	53.6	31.3	6.9	41.1	50.7	73.9	23.2	100	60	
Vert.	7311.000	PK	47.8	36.6	8.6	41.4	51.6	73.9	22.3	100	0	
Vert.	2886.592	AV	46.9	28.3	6.2	41.4	40.0	53.9	13.9	150	179	
Vert.	3774.678	AV	49.9	29.5	6.0	41.8	43.6	53.9	10.3	254	9	
Vert.	3996.693	AV	42.9	29.7	6.2	41.8	37.0	53.9	16.9	100	310	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2514.850	AV	40.2	27.6	14.3	41.4	0.4	41.1	53.9	12.8	
Hori.	4874.000	AV	41.2	31.3	6.9	41.1	0.4	38.7	53.9	15.2	
Hori.	7311.000	AV	38.0	36.6	8.6	41.4	0.4	42.2	53.9	11.7	
Vert.	2514.850	AV	42.8	27.6	14.3	41.4	0.4	43.7	53.9	10.2	
Vert.	4874.000	AV	45.2	31.3	6.9	41.1	0.4	42.7	53.9	11.2	
Vert.	7311.000	AV	38.3	36.6	8.6	41.4	0.4	42.5	53.9	11.4	

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

*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.

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

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.	2437.000	PK	95.4	27.5	14.2	41.4	95.7	-	-	
Hori.	3126.527	PK	49.2	28.7	5.7	41.5	42.1	75.7	33.6	
Vert.	2437.000	PK	97.7	27.5	14.2	41.4	98.0	-	-	
Vert.	3126.461	PK	54.7	28.7	5.7	41.5	47.6	78.0	30.4	

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

Radiated Emission

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 29, 2012	December 18, 2012	December 21, 2012
Temperature / Humidity	21 deg.C, 35%RH	22 deg.C, 36%RH	24 deg.C, 32%RH
Engineer	Tatsuya Arai	Tatsuya Arai	Tatsuya Arai
Mode	Tx, 2462.0 MHz		
	Tx, IEEE802.11b		

(* 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	63.8	27.5	14.3	41.4	64.2	73.9	9.7	111	40	
Hori.	2540.134	PK	54.5	27.6	14.3	41.4	55.0	73.9	18.9	100	38	
Hori.	3774.651	PK	53.6	29.5	6.0	41.8	47.3	73.9	26.6	100	302	
Hori.	3996.709	PK	53.5	29.7	6.2	41.8	47.6	73.9	26.3	100	216	
Hori.	4924.000	PK	52.1	31.5	6.9	41.0	49.5	73.9	24.4	100	111	
Hori.	7386.000	PK	46.2	36.7	8.7	41.5	50.1	73.9	23.8	100	0	
Hori.	3774.651	AV	48.4	29.5	6.0	41.8	42.1	53.9	11.8	100	302	
Hori.	3996.709	AV	48.4	29.7	6.2	41.8	42.5	53.9	11.4	100	216	
Vert.	2483.500	PK	67.7	27.5	14.3	41.4	68.1	73.9	5.8	100	323	
Vert.	2540.134	PK	57.5	27.6	14.3	41.4	58.0	73.9	15.9	127	333	
Vert.	3774.594	PK	54.1	29.5	6.0	41.8	47.8	73.9	26.1	102	12	
Vert.	3996.660	PK	52.3	29.7	6.2	41.8	46.4	73.9	27.5	100	223	
Vert.	4924.000	PK	55.2	31.5	6.9	41.0	52.6	73.9	21.3	100	62	
Vert.	7386.000	PK	46.6	36.7	8.7	41.5	50.5	73.9	23.4	100	0	
Vert.	3774.594	AV	48.6	29.5	6.0	41.8	42.3	53.9	11.6	102	12	
Vert.	3996.660	AV	45.3	29.7	6.2	41.8	39.4	53.9	14.5	100	223	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	40.1	27.5	14.3	41.4	0.4	40.9	53.9	13.0	
Hori.	2540.134	AV	39.8	27.6	14.3	41.4	0.4	40.7	53.9	13.2	
Hori.	4924.000	AV	43.5	31.5	6.9	41.0	0.4	41.3	53.9	12.6	
Hori.	7386.000	AV	38.2	36.7	8.7	41.5	0.4	42.5	53.9	11.4	
Vert.	2483.500	AV	42.4	27.5	14.3	41.4	0.4	43.2	53.9	10.7	
Vert.	2540.134	AV	42.7	27.6	14.3	41.4	0.4	43.6	53.9	10.3	
Vert.	4924.000	AV	47.5	31.5	6.9	41.0	0.4	45.3	53.9	8.6	
Vert.	7386.000	AV	38.7	36.7	8.7	41.5	0.4	43.0	53.9	10.9	

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

*Since the emission at 2390MHz and 2483.5MHz is not the out of band emission shown in the chart of Band Edge, normally the duty cycle correction does not need to be carried out. But 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.

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

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.	2462.000	PK	93.7	27.5	14.2	41.4	94.0	-	-	
Hori.	3126.442	PK	49.1	28.7	5.7	41.5	42.0	74.0	32.0	
Vert.	2462.000	PK	97.6	27.5	14.2	41.4	97.9	-	-	
Vert.	3126.445	PK	54.4	28.7	5.7	41.5	47.3	77.9	30.6	

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

Radiated Emission

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 29, 2012	December 18, 2012	December 21, 2012
Temperature / Humidity	21 deg.C , 35%RH	22 deg.C , 36%RH	24 deg.C , 32%RH
Engineer	Tatsuya Arai	Tatsuya Arai	Tatsuya Arai
Mode	Tx, 2412.0 MHz		
	Tx, IEEE802.11g		

(* 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	53.7	27.4	14.2	41.4	53.9	73.9	20.0	128	43	
Hori.	2494.215	PK	52.2	27.6	14.3	41.4	52.7	73.9	21.2	106	41	
Hori.	3774.728	PK	53.2	29.5	6.0	41.8	46.9	73.9	27.0	100	203	
Hori.	3996.767	PK	53.1	29.7	6.2	41.8	47.2	73.9	26.7	100	215	
Hori.	4924.000	PK	47.1	31.5	6.9	41.0	44.5	73.9	29.4	100	0	
Hori.	7386.000	PK	47.5	36.7	8.7	41.5	51.4	73.9	22.5	100	0	
Hori.	3774.728	AV	47.3	29.5	6.0	41.8	41.0	53.9	12.9	100	203	
Hori.	3996.767	AV	47.3	29.7	6.2	41.8	41.4	53.9	12.5	100	215	
Vert.	2390.000	PK	56.4	27.4	14.2	41.4	56.6	73.9	17.3	100	355	
Vert.	2494.215	PK	55.1	27.6	14.3	41.4	55.6	73.9	18.3	100	321	
Vert.	3774.642	PK	55.1	29.5	6.0	41.8	48.8	73.9	25.1	187	13	
Vert.	3997.207	PK	51.1	29.7	6.2	41.8	45.2	73.9	28.7	100	14	
Vert.	4924.000	PK	46.7	31.5	6.9	41.0	44.1	73.9	29.8	100	0	
Vert.	7386.000	PK	46.5	36.7	8.7	41.5	50.4	73.9	23.5	100	0	
Vert.	3774.642	AV	49.2	29.5	6.0	41.8	42.9	53.9	11.0	187	13	
Vert.	3997.207	AV	42.1	29.7	6.2	41.8	36.2	53.9	17.7	100	14	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	38.8	27.4	14.2	41.4	8.4	47.4	53.9	6.5	
Hori.	2494.215	AV	39.4	27.6	14.3	41.4	8.4	48.3	53.9	5.6	
Hori.	4924.000	AV	38.2	31.5	6.9	41.0	8.4	44.0	53.9	9.9	
Hori.	7386.000	AV	38.6	36.7	8.7	41.5	8.4	50.9	53.9	3.0	
Vert.	2390.000	AV	39.8	27.4	14.2	41.4	8.4	48.4	53.9	5.5	
Vert.	2494.215	AV	41.1	27.6	14.3	41.4	8.4	50.0	53.9	3.9	
Vert.	4924.000	AV	37.2	31.5	6.9	41.0	8.4	43.0	53.9	10.9	
Vert.	7386.000	AV	38.2	36.7	8.7	41.5	8.4	50.5	53.9	3.4	

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

*Since the emission at 2390MHz and 2483.5MHz is not the out of band emission shown in the chart of Band Edge, normally the duty cycle correction does not need to be carried out. But 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.

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

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	88.9	27.5	14.2	41.4	89.2	-	-	
Hori.	2400.000	PK	49.6	27.4	14.2	41.4	49.8	69.2	19.4	
Hori.	3126.463	PK	48.7	28.7	5.7	41.5	41.6	69.2	27.6	
Vert.	2412.000	PK	92.9	27.5	14.2	41.4	93.2	-	-	
Vert.	2400.000	PK	54.9	27.4	14.2	41.4	55.1	73.2	18.1	
Vert.	3127.731	PK	54.3	28.7	5.7	41.5	47.2	73.2	26.0	

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

Radiated Emission

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 29, 2012	December 18, 2012	December 21, 2012
Temperature / Humidity	21 deg.C , 35%RH	22 deg.C , 36%RH	24 deg.C , 32%RH
Engineer	Tatsuya Arai	Tatsuya Arai	Tatsuya Arai
Mode	Tx, 2437.0 MHz		
	Tx, IEEE802.11g		

(* 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.	144.007	QP	33.3	14.6	7.7	32.1	23.5	43.5	20.0	220	76	
Hori.	240.014	QP	41.1	16.9	8.2	32.0	34.2	46.0	11.8	145	242	
Hori.	333.066	QP	43.3	14.7	8.7	32.0	34.7	46.0	11.3	100	93	
Hori.	407.082	QP	46.1	16.3	9.0	32.0	39.4	46.0	6.6	110	353	
Hori.	2519.270	PK	50.4	27.6	14.3	41.4	50.9	73.9	23.0	111	24	
Hori.	3774.190	PK	53.4	29.5	6.0	41.8	47.1	73.9	26.8	100	198	
Hori.	3997.072	PK	53.4	29.7	6.2	41.8	47.5	73.9	26.4	100	205	
Hori.	4874.000	PK	46.1	31.3	6.9	41.1	43.2	73.9	30.7	100	0	
Hori.	7311.000	PK	46.9	36.6	8.6	41.4	50.7	73.9	23.2	100	0	
Hori.	3774.190	AV	48.7	29.5	6.0	41.8	42.4	53.9	11.5	100	198	
Hori.	3997.072	AV	47.2	29.7	6.2	41.8	41.3	53.9	12.6	100	205	
Vert.	144.007	QP	35.8	14.6	7.7	32.1	26.0	43.5	17.5	100	114	
Vert.	240.014	QP	37.8	16.9	8.2	32.0	30.9	46.0	15.1	100	358	
Vert.	407.082	QP	40.3	16.3	9.0	32.0	33.6	46.0	12.4	137	349	
Vert.	2519.270	PK	53.5	27.6	14.3	41.4	54.0	73.9	19.9	100	332	
Vert.	3774.787	PK	54.3	29.5	6.0	41.8	48.0	73.9	25.9	222	15	
Vert.	3996.681	PK	51.5	29.7	6.2	41.8	45.6	73.9	28.3	100	219	
Vert.	4874.000	PK	47.4	31.3	6.9	41.1	44.5	73.9	29.4	100	0	
Vert.	7311.000	PK	47.8	36.6	8.6	41.4	51.6	73.9	22.3	100	0	
Vert.	3774.787	AV	49.4	29.5	6.0	41.8	43.1	53.9	10.8	222	15	
Vert.	3996.681	AV	43.5	29.7	6.2	41.8	37.6	53.9	16.3	100	219	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2519.270	AV	39.1	27.6	14.3	41.4	8.4	48.0	53.9	5.9	
Hori.	4874.000	AV	37.1	31.3	6.9	41.1	8.4	42.6	53.9	11.3	
Hori.	7311.000	AV	38.3	36.6	8.6	41.4	8.4	50.5	53.9	3.4	
Vert.	2519.270	AV	40.5	27.6	14.3	41.4	8.4	49.4	53.9	4.5	
Vert.	4874.000	AV	37.8	31.3	6.9	41.1	8.4	43.3	53.9	10.6	
Vert.	7311.000	AV	38.2	36.6	8.6	41.4	8.4	50.4	53.9	3.5	

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

*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.

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

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.	2437.000	PK	91.2	27.5	14.2	41.4	91.5	-	-	
Hori.	481.092	QP	48.2	17.2	9.4	32.0	42.8	71.5	28.7	
Hori.	528.009	QP	44.0	17.9	9.5	32.0	39.4	71.5	32.1	
Hori.	816.006	QP	40.8	21.1	10.5	31.6	40.8	71.5	30.7	
Hori.	3127.269	PK	46.6	28.7	5.7	41.5	39.5	71.5	32.0	
Vert.	2437.000	PK	94.3	27.5	14.2	41.4	94.6	-	-	
Vert.	528.009	QP	37.5	17.9	9.5	32.0	32.9	74.6	41.7	
Vert.	816.006	QP	44.6	21.1	10.5	31.6	44.6	74.6	30.0	
Vert.	3126.468	PK	54.6	28.7	5.7	41.5	47.5	74.6	27.1	

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

Radiated Emission

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 29, 2012	December 18, 2012	December 21, 2012
Temperature / Humidity	21 deg.C, 35%RH	22 deg.C, 36%RH	24 deg.C, 32%RH
Engineer	Tatsuya Arai	Tatsuya Arai	Tatsuya Arai
Mode	Tx, 2462.0 MHz		
	Tx, IEEE802.11g		

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	56.9	27.5	14.3	41.4	57.3	73.9	16.6	100	242	
Hori.	2539.550	PK	50.5	27.6	14.3	41.4	51.0	73.9	22.9	100	22	
Hori.	3774.670	PK	53.3	29.5	6.0	41.8	47.0	73.9	26.9	100	198	
Hori.	3996.695	PK	53.2	29.7	6.2	41.8	47.3	73.9	26.6	100	216	
Hori.	4924.000	PK	47.1	31.5	6.9	41.0	44.5	73.9	29.4	100	0	
Hori.	7386.000	PK	47.2	36.7	8.7	41.5	51.1	73.9	22.8	100	0	
Hori.	3774.670	AV	48.8	29.5	6.0	41.8	42.5	53.9	11.4	100	198	
Hori.	3996.695	AV	47.8	29.7	6.2	41.8	41.9	53.9	12.0	100	216	
Vert.	2483.500	PK	62.3	27.5	14.3	41.4	62.7	73.9	11.2	131	25	
Vert.	2539.550	PK	53.1	27.6	14.3	41.4	53.6	73.9	20.3	100	318	
Vert.	3774.748	PK	54.1	29.5	6.0	41.8	47.8	73.9	26.1	100	11	
Vert.	3996.760	PK	51.3	29.7	6.2	41.8	45.4	73.9	28.5	100	308	
Vert.	4924.000	PK	46.8	31.5	6.9	41.0	44.2	73.9	29.7	100	0	
Vert.	7386.000	PK	47.8	36.7	8.7	41.5	51.7	73.9	22.2	100	0	
Vert.	3774.748	AV	50.1	29.5	6.0	41.8	43.8	53.9	10.1	100	11	
Vert.	3996.760	AV	43.5	29.7	6.2	41.8	37.6	53.9	16.3	100	308	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	39.0	27.5	14.3	41.4	8.4	47.8	53.9	6.1	
Hori.	2539.550	AV	38.5	27.6	14.3	41.4	8.4	47.4	53.9	6.5	
Hori.	4924.000	AV	37.9	31.5	6.9	41.0	8.4	43.7	53.9	10.2	
Hori.	7386.000	AV	38.8	36.7	8.7	41.5	8.4	51.1	53.9	2.8	
Vert.	2483.500	AV	41.7	27.5	14.3	41.4	8.4	50.5	53.9	3.4	
Vert.	2539.550	AV	40.9	27.6	14.3	41.4	8.4	49.8	53.9	4.1	
Vert.	4924.000	AV	37.8	31.5	6.9	41.0	8.4	43.6	53.9	10.3	
Vert.	7386.000	AV	38.5	36.7	8.7	41.5	8.4	50.8	53.9	3.1	

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

*Since the emission at 2390MHz and 2483.5MHz is not the out of band emission shown in the chart of Band Edge, normally the duty cycle correction does not need to be carried out. But 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.

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

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.	2462.000	PK	90.6	27.5	14.2	41.4	90.9	-	-	
Hori.	3126.465	PK	45.7	28.7	5.7	41.5	38.6	70.9	32.3	
Vert.	2462.000	PK	95.6	27.5	14.2	41.4	95.9	-	-	
Vert.	3126.467	PK	54.6	28.7	5.7	41.5	47.5	75.9	28.4	

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

Radiated Emission

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 29, 2012	December 18, 2012	December 21, 2012
Temperature / Humidity	21 deg.C, 35%RH	22 deg.C, 36%RH	24 deg.C, 32%RH
Engineer	Tatsuya Arai	Tatsuya Arai	Tatsuya Arai
Mode	Tx, 2412.0 MHz		
	Tx, IEEE802.11n		

(* 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	53.7	27.4	14.2	41.4	53.9	73.9	20.0	128	42	
Hori.	2494.810	PK	51.4	27.6	14.3	41.4	51.9	73.9	22.0	117	24	
Hori.	3773.047	PK	53.8	29.5	6.0	41.8	47.5	73.9	26.4	100	328	
Hori.	3997.470	PK	51.2	29.7	6.2	41.8	45.3	73.9	28.6	100	201	
Hori.	4824.000	PK	46.1	31.1	6.8	41.2	42.8	73.9	31.1	100	0	
Hori.	7236.000	PK	46.2	36.6	8.5	41.4	49.9	73.9	24.0	100	0	
Hori.	3773.047	AV	47.6	29.5	6.0	41.8	41.3	53.9	12.6	100	328	
Hori.	3997.470	AV	44.2	29.7	6.2	41.8	38.3	53.9	15.6	100	201	
Vert.	2390.000	PK	58.1	27.4	14.2	41.4	58.3	73.9	15.6	100	324	
Vert.	2494.810	PK	54.4	27.6	14.3	41.4	54.9	73.9	19.0	100	320	
Vert.	3774.761	PK	53.8	29.5	6.0	41.8	47.5	73.9	26.4	100	328	
Vert.	3996.634	PK	51.5	29.7	6.2	41.8	45.6	73.9	28.3	116	225	
Vert.	4824.000	PK	46.2	31.1	6.8	41.2	42.9	73.9	31.0	100	0	
Vert.	7236.000	PK	46.7	36.6	8.5	41.4	50.4	73.9	23.5	100	0	
Vert.	3774.761	AV	47.7	29.5	6.0	41.8	41.4	53.9	12.5	100	328	
Vert.	3996.634	AV	45.7	29.7	6.2	41.8	39.8	53.9	14.1	116	225	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2390.000	AV	39.2	27.4	14.2	41.4	5.5	44.9	53.9	9.0	
Hori.	2494.810	AV	40.1	27.6	14.3	41.4	5.5	46.1	53.9	7.8	
Hori.	4824.000	AV	37.8	31.1	6.8	41.2	5.5	40.0	53.9	13.9	
Hori.	7236.000	AV	38.0	36.6	8.5	41.4	5.5	47.2	53.9	6.7	
Vert.	2390.000	AV	41.6	27.4	14.2	41.4	5.5	47.3	53.9	6.6	
Vert.	2494.810	AV	42.6	27.6	14.3	41.4	5.5	48.6	53.9	5.3	
Vert.	4824.000	AV	37.2	31.1	6.8	41.2	5.5	39.4	53.9	14.5	
Vert.	7236.000	AV	38.2	36.6	8.5	41.4	5.5	47.4	53.9	6.5	

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

*Since the emission at 2390MHz and 2483.5MHz is not the out of band emission shown in the chart of Band Edge, normally the duty cycle correction does not need to be carried out. But 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.

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

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	89.0	27.5	14.2	41.4	89.3	-	-	
Hori.	2400.000	PK	49.7	27.4	14.2	41.4	49.9	69.3	19.4	
Hori.	3126.452	PK	54.1	28.7	5.7	41.5	47.0	69.3	22.3	
Vert.	2412.000	PK	93.3	27.5	14.2	41.4	93.6	-	-	
Vert.	2400.000	PK	54.8	27.4	14.2	41.4	55.0	73.6	18.6	
Vert.	3126.466	PK	54.2	28.7	5.7	41.5	47.1	73.6	26.5	

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

Radiated Emission

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 29, 2012	December 18, 2012	December 21, 2012
Temperature / Humidity	21 deg.C , 35%RH	22 deg.C , 36%RH	24 deg.C , 32%RH
Engineer	Tatsuya Arai	Tatsuya Arai	Tatsuya Arai
Mode	Tx, 2437.0 MHz		
	Tx, IEEE802.11n		

(* 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.	2519.850	PK	50.7	27.6	14.3	41.4	51.2	73.9	22.7	115	356	
Hori.	3775.046	PK	53.5	29.5	6.0	41.8	47.2	73.9	26.7	100	222	
Hori.	3997.293	PK	53.9	29.7	6.2	41.8	48.0	73.9	25.9	100	239	
Hori.	4874.000	PK	46.5	31.3	6.9	41.1	43.6	73.9	30.3	100	0	
Hori.	7311.000	PK	46.4	36.6	8.6	41.4	50.2	73.9	23.7	100	0	
Hori.	3775.046	AV	48.6	29.5	6.0	41.8	42.3	53.9	11.6	100	222	
Hori.	3997.293	AV	47.3	29.7	6.2	41.8	41.4	53.9	12.5	100	239	
Vert.	2519.850	PK	55.2	27.6	14.3	41.4	55.7	73.9	18.2	126	24	
Vert.	3775.046	PK	54.4	29.5	6.0	41.8	48.1	73.9	25.8	224	25	
Vert.	3997.293	PK	50.6	29.7	6.2	41.8	44.7	73.9	29.2	100	224	
Vert.	4874.000	PK	47.6	31.3	6.9	41.1	44.7	73.9	29.2	100	0	
Vert.	7311.000	PK	47.9	36.6	8.6	41.4	51.7	73.9	22.2	100	0	
Vert.	3775.046	AV	48.3	29.5	6.0	41.8	42.0	53.9	11.9	224	25	
Vert.	3997.293	AV	44.2	29.7	6.2	41.8	38.3	53.9	15.6	100	224	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2519.850	AV	39.6	27.6	14.3	41.4	5.5	45.6	53.9	8.3	
Hori.	4874.000	AV	37.6	31.3	6.9	41.1	5.5	40.2	53.9	13.7	
Hori.	7311.000	AV	38.9	36.6	8.6	41.4	5.5	48.2	53.9	5.7	
Vert.	2519.850	AV	43.6	27.6	14.3	41.4	5.5	49.6	53.9	4.3	
Vert.	4874.000	AV	37.9	31.3	6.9	41.1	5.5	40.5	53.9	13.4	
Vert.	7311.000	AV	38.8	36.6	8.6	41.4	5.5	48.1	53.9	5.8	

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

*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.

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

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.	2437.000	PK	90.2	27.5	14.2	41.4	90.5	-	-	
Hori.	3126.729	PK	46.0	28.7	5.7	41.5	38.9	70.5	31.6	
Vert.	2437.000	PK	94.1	27.5	14.2	41.4	94.4	-	-	
Vert.	3126.465	PK	54.2	28.7	5.7	41.5	47.1	74.4	27.3	

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

Radiated Emission

Test place	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 29, 2012	December 18, 2012	December 21, 2012
Temperature / Humidity	21 deg.C , 35%RH	22 deg.C , 36%RH	24 deg.C , 32%RH
Engineer	Tatsuya Arai	Tatsuya Arai	Tatsuya Arai
Mode	Tx, 2462.0 MHz		
	Tx, IEEE802.11n		

(* 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	61.9	27.5	14.3	41.4	62.3	73.9	11.6	111	40	
Hori.	2536.750	PK	52.2	27.6	14.3	41.4	52.7	73.9	21.2	100	40	
Hori.	3774.360	PK	53.1	29.5	6.0	41.8	46.8	73.9	27.1	100	192	
Hori.	3997.149	PK	53.4	29.7	6.2	41.8	47.5	73.9	26.4	100	212	
Hori.	4924.000	PK	47.0	31.5	6.9	41.0	44.4	73.9	29.5	100	0	
Hori.	7386.000	PK	47.3	36.7	8.7	41.5	51.2	73.9	22.7	100	0	
Hori.	3774.360	AV	48.2	29.5	6.0	41.8	41.9	53.9	12.0	100	192	
Hori.	3997.149	AV	47.3	29.7	6.2	41.8	41.4	53.9	12.5	100	212	
Vert.	2483.500	PK	64.0	27.5	14.3	41.4	64.4	73.9	9.5	100	321	
Vert.	2536.750	PK	53.4	27.6	14.3	41.4	53.9	73.9	20.0	100	334	
Vert.	3774.360	PK	54.0	29.5	6.0	41.8	47.7	73.9	26.2	201	33	
Vert.	3997.149	PK	51.0	29.7	6.2	41.8	45.1	73.9	28.8	100	251	
Vert.	4924.000	PK	47.4	31.5	6.9	41.0	44.8	73.9	29.1	100	0	
Vert.	7386.000	PK	47.5	36.7	8.7	41.5	51.4	73.9	22.5	100	0	
Vert.	3774.360	AV	49.5	29.5	6.0	41.8	43.2	53.9	10.7	201	33	
Vert.	3997.149	AV	44.5	29.7	6.2	41.8	38.6	53.9	15.3	100	251	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2483.500	AV	42.1	27.5	14.3	41.4	5.5	48.0	53.9	5.9	
Hori.	2536.750	AV	39.9	27.6	14.3	41.4	5.5	45.9	53.9	8.0	
Hori.	4924.000	AV	37.8	31.5	6.9	41.0	5.5	40.7	53.9	13.2	
Hori.	7386.000	AV	38.5	36.7	8.7	41.5	5.5	47.9	53.9	6.0	
Vert.	2483.500	AV	43.7	27.5	14.3	41.4	5.5	49.6	53.9	4.3	
Vert.	2536.750	AV	42.0	27.6	14.3	41.4	5.5	48.0	53.9	5.9	
Vert.	4924.000	AV	37.2	31.5	6.9	41.0	5.5	40.1	53.9	13.8	
Vert.	7386.000	AV	28.1	36.7	8.7	41.5	5.5	37.5	53.9	16.4	

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

*Since the emission at 2390MHz and 2483.5MHz is not the out of band emission shown in the chart of Band Edge, normally the duty cycle correction does not need to be carried out. But 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.

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

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

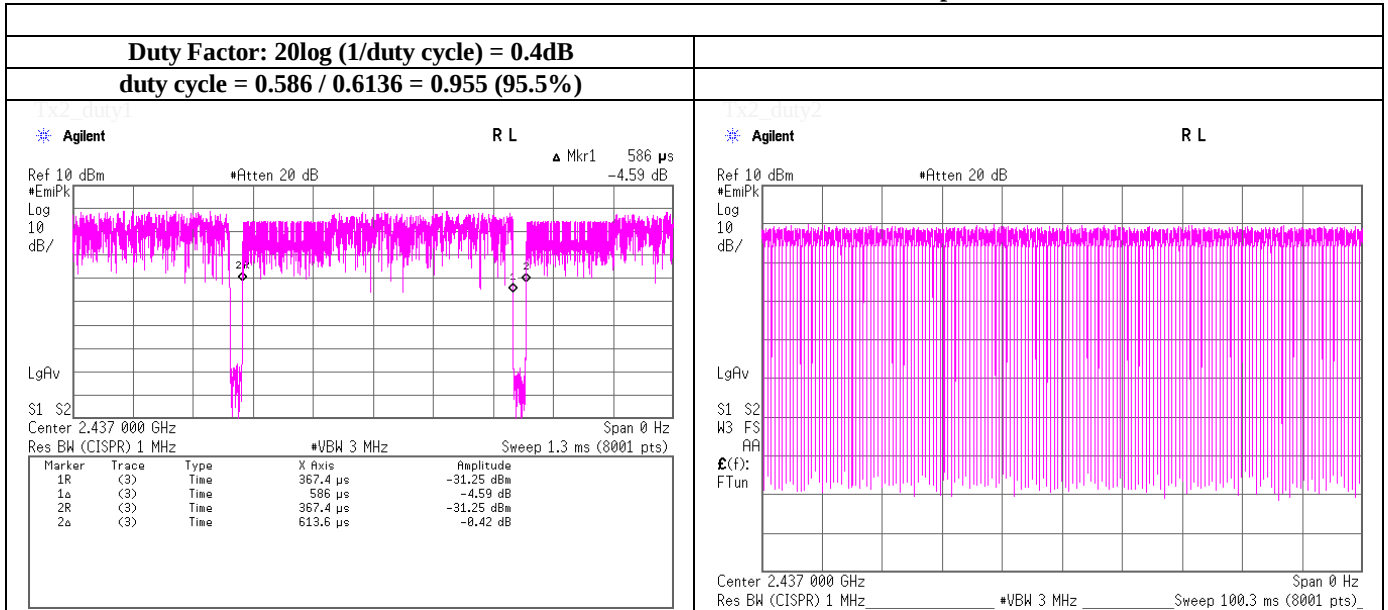
20dBc Data Sheet (RBW 100kHz, VBW 300kHz)

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2462.000	PK	91.7	27.5	14.2	41.4	92.0	-	-	
Hori.	3127.415	PK	46.7	28.7	5.7	41.5	39.6	72.0	32.4	
Vert.	2462.000	PK	94.5	27.5	14.2	41.4	94.8	-	-	
Vert.	3127.415	PK	55.1	28.7	5.7	41.5	48.0	74.8	26.8	

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

Duty Factor Calculation chart

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



UL Japan, Inc.

Shonan EMC Lab.

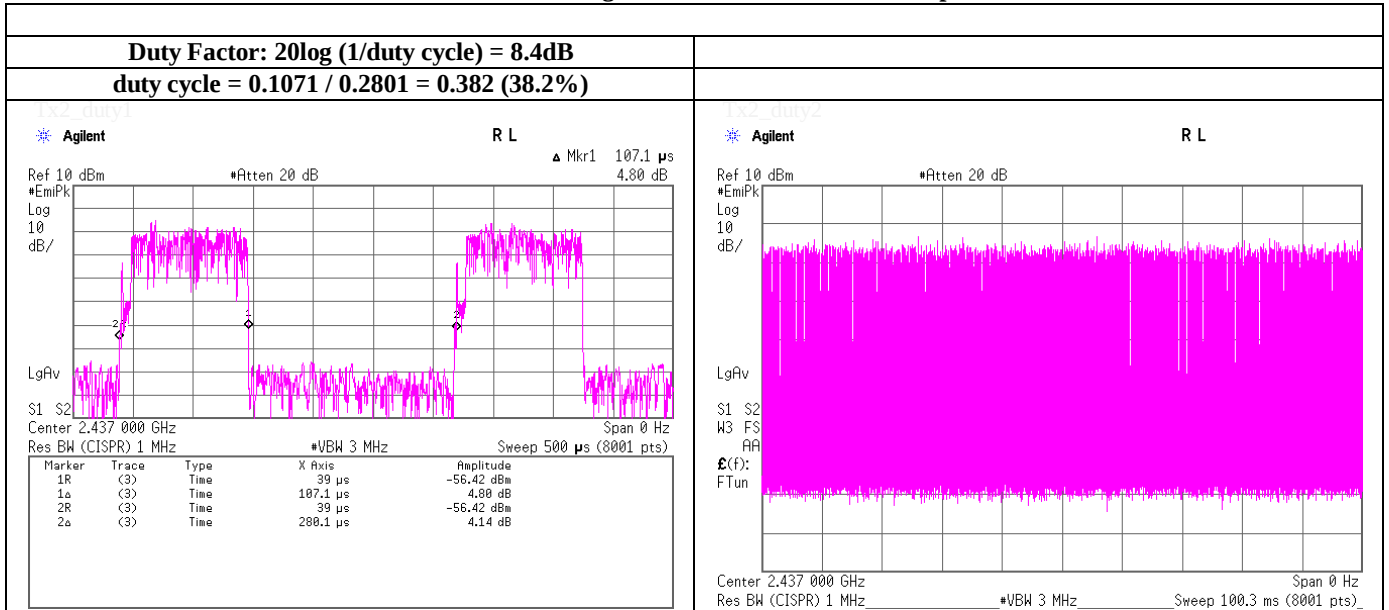
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

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Duty Factor Calculation chart

Tx, IEEE802.11g, PN9, worst data mode 54Mbps



UL Japan, Inc.

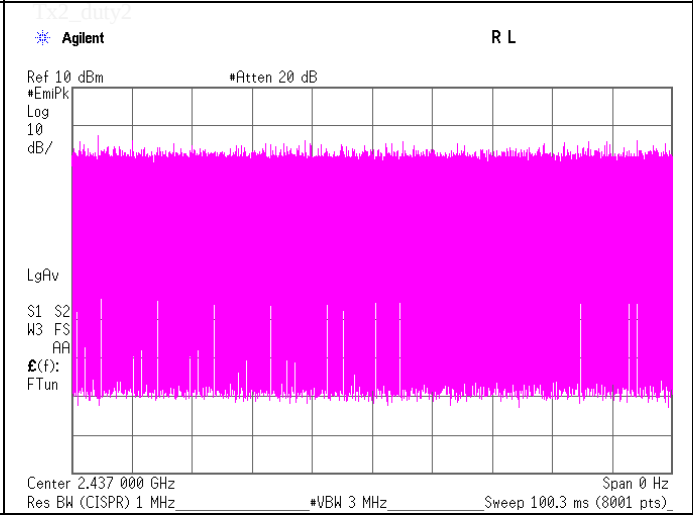
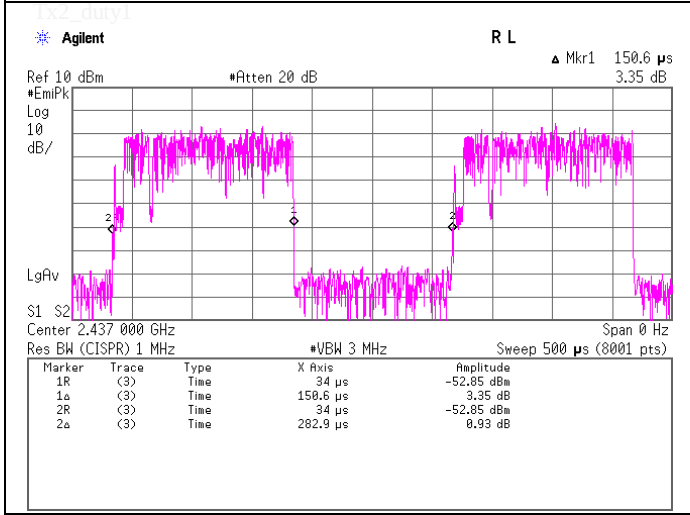
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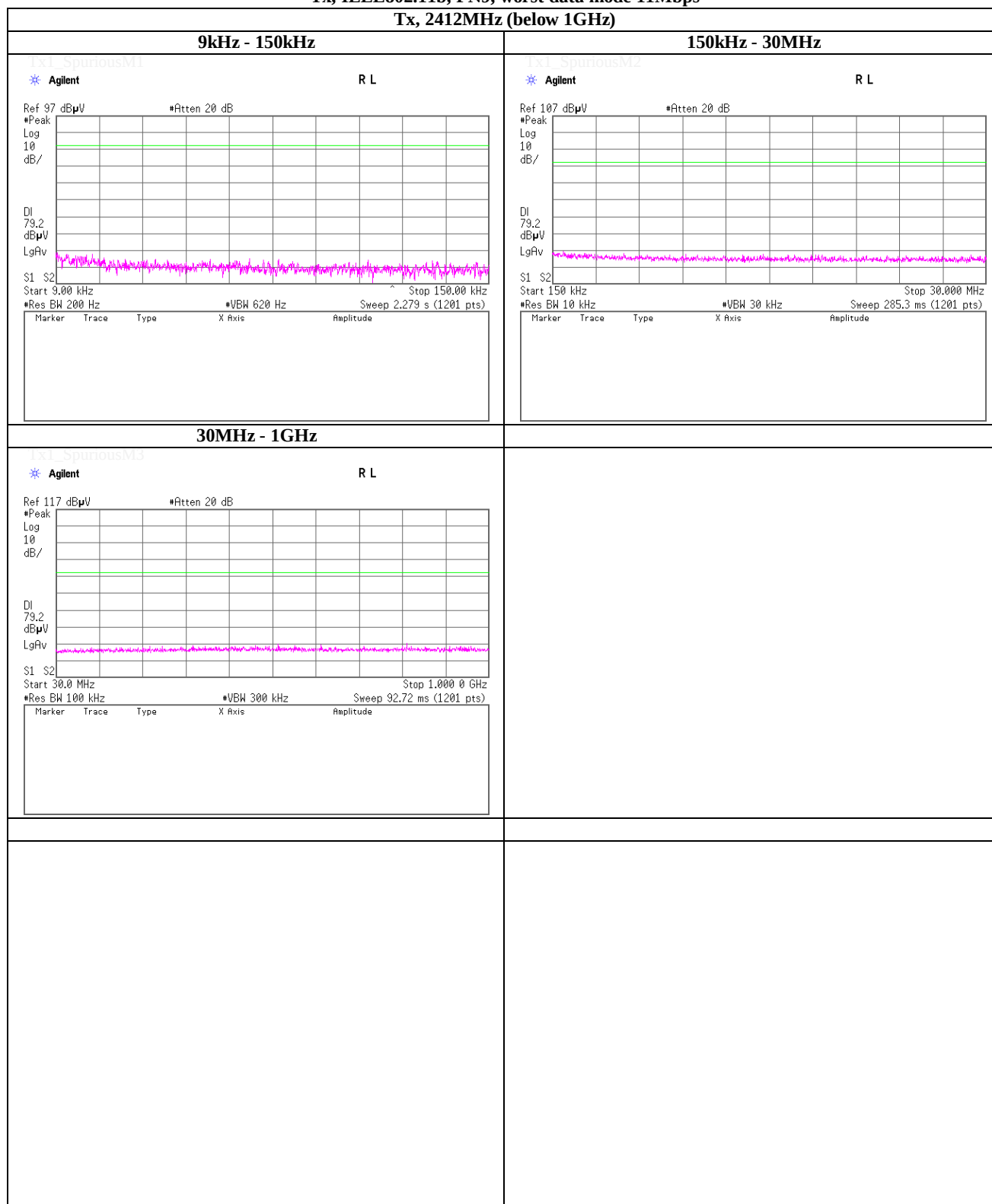
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Duty Factor: $20\log(1/\text{duty cycle}) = 5.5\text{dB}$
duty cycle = $0.1506 / 0.2829 = 0.532$ (53.2%)

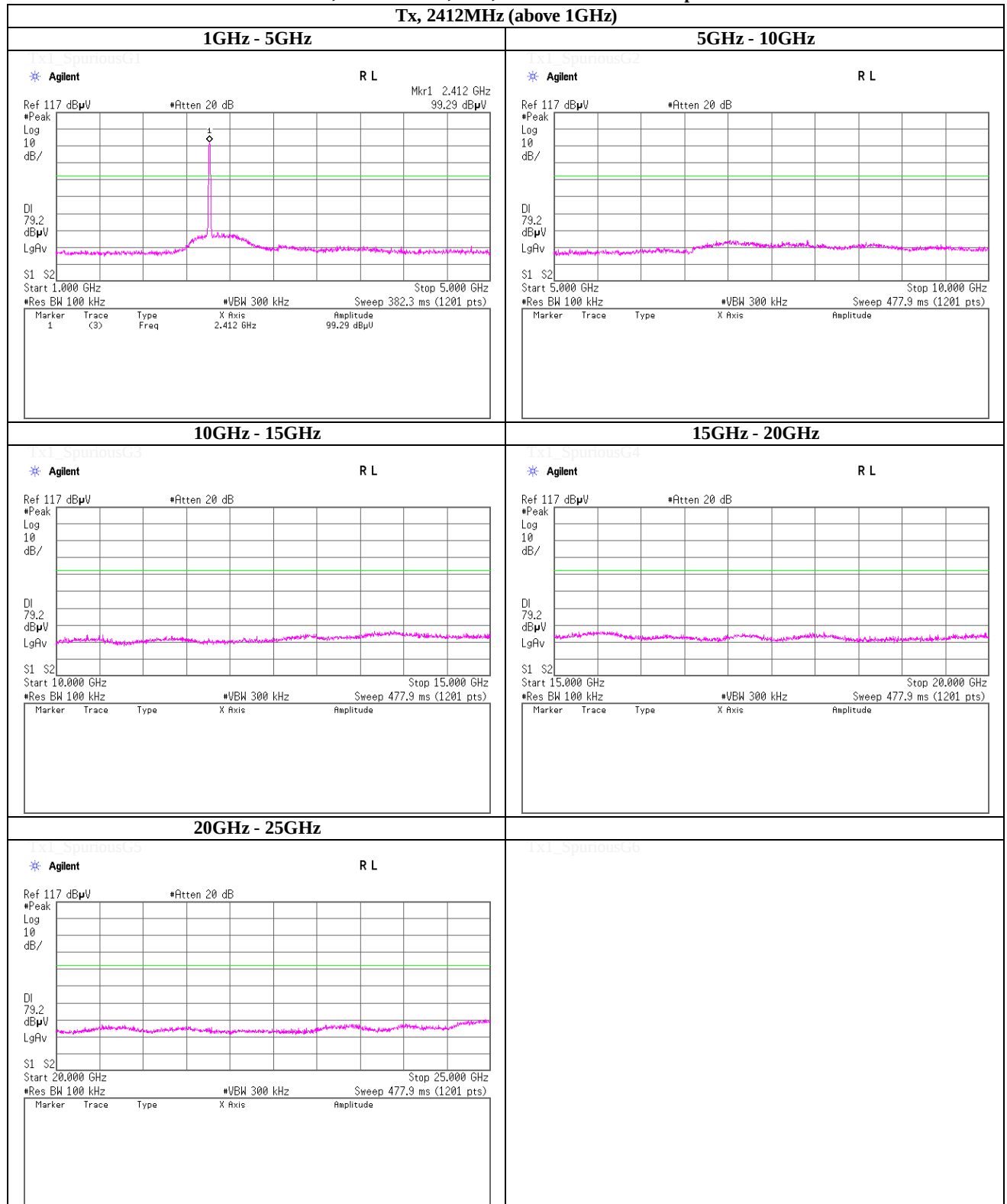


(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11b, PN9, worst data mode 11Mbps****Tx, 2412MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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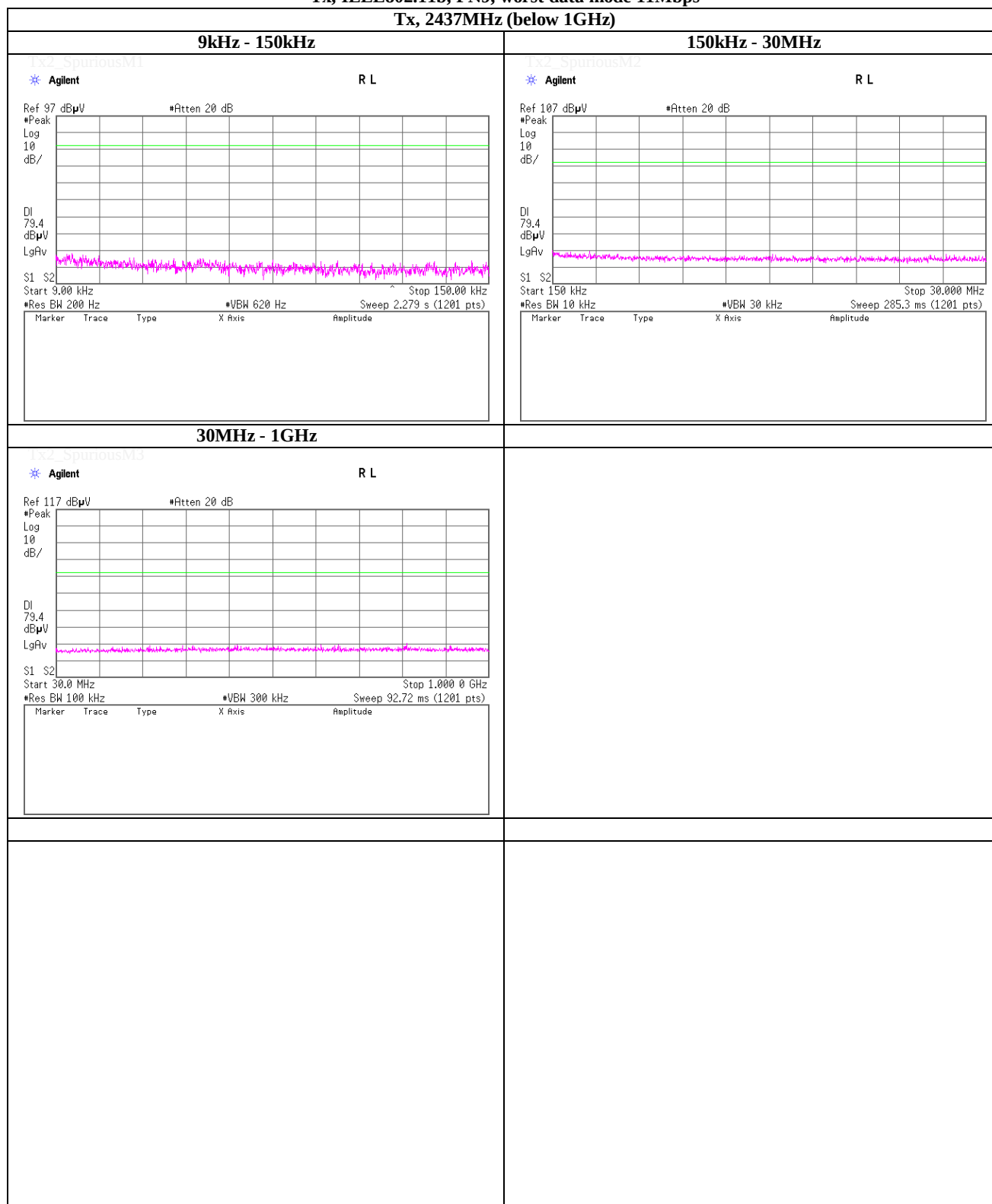
Facsimile : +81 463 50 6401

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

(Reference chart) Spurious emission (Conducted)

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

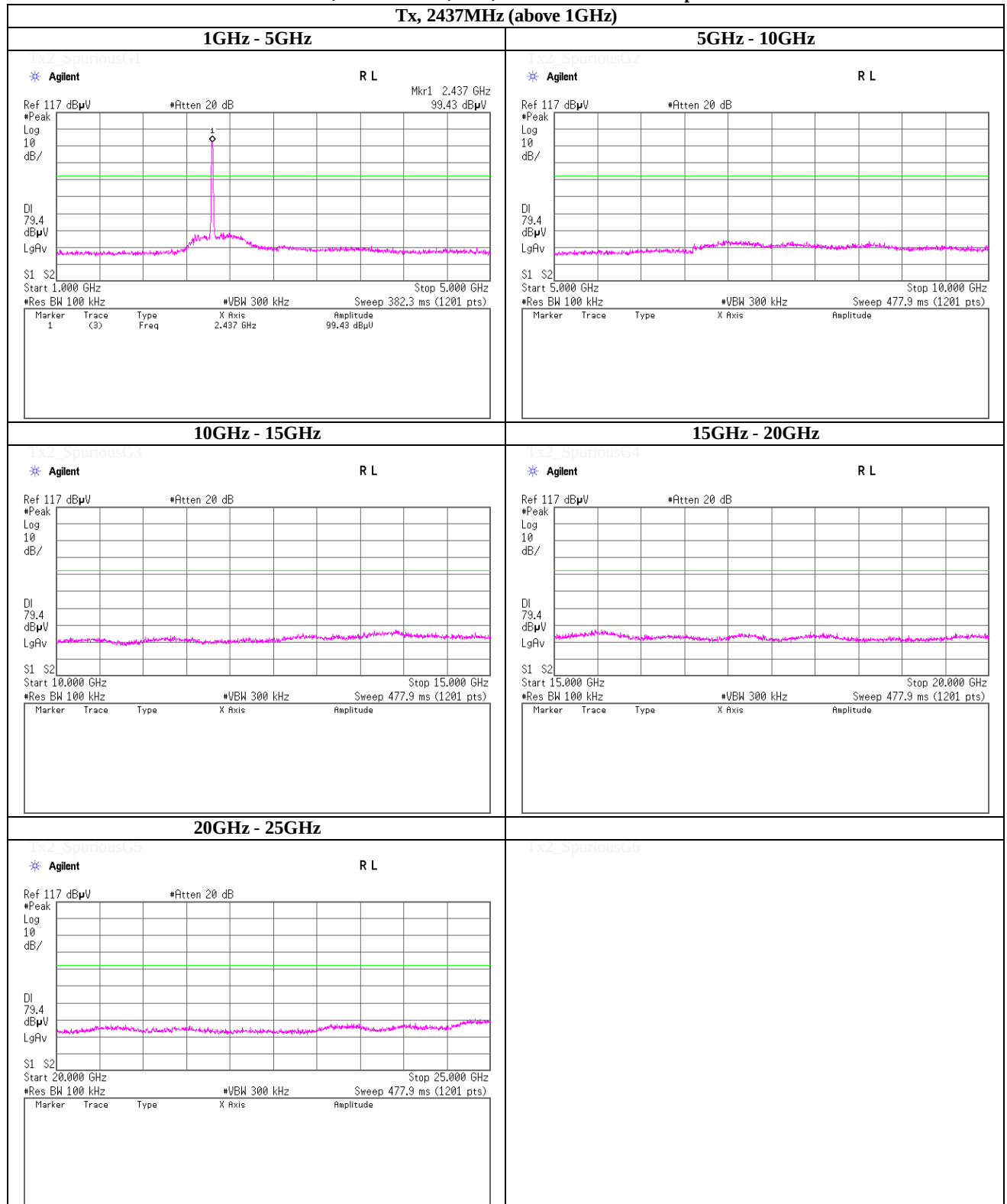
Tx, 2437MHz (below 1GHz)

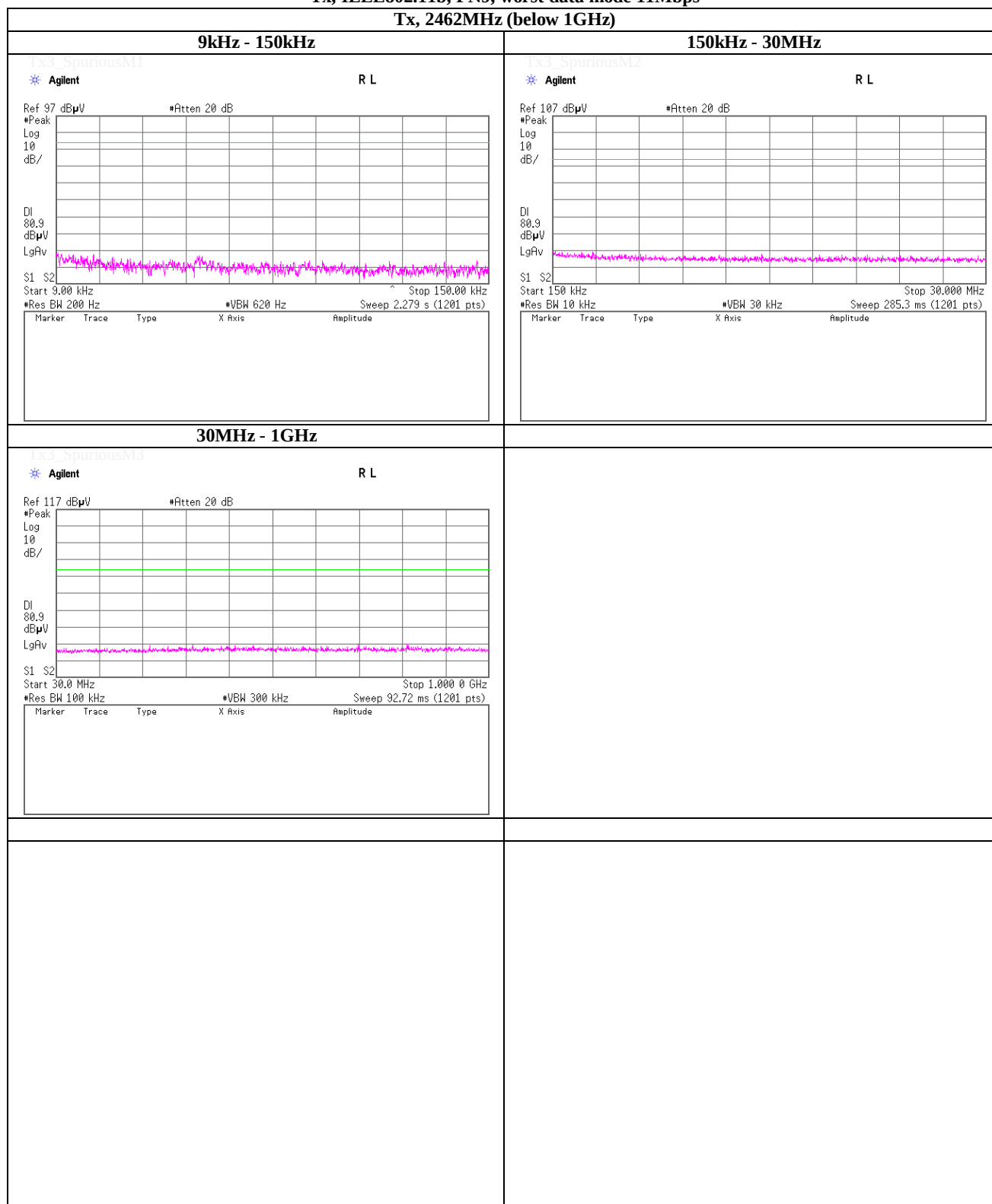
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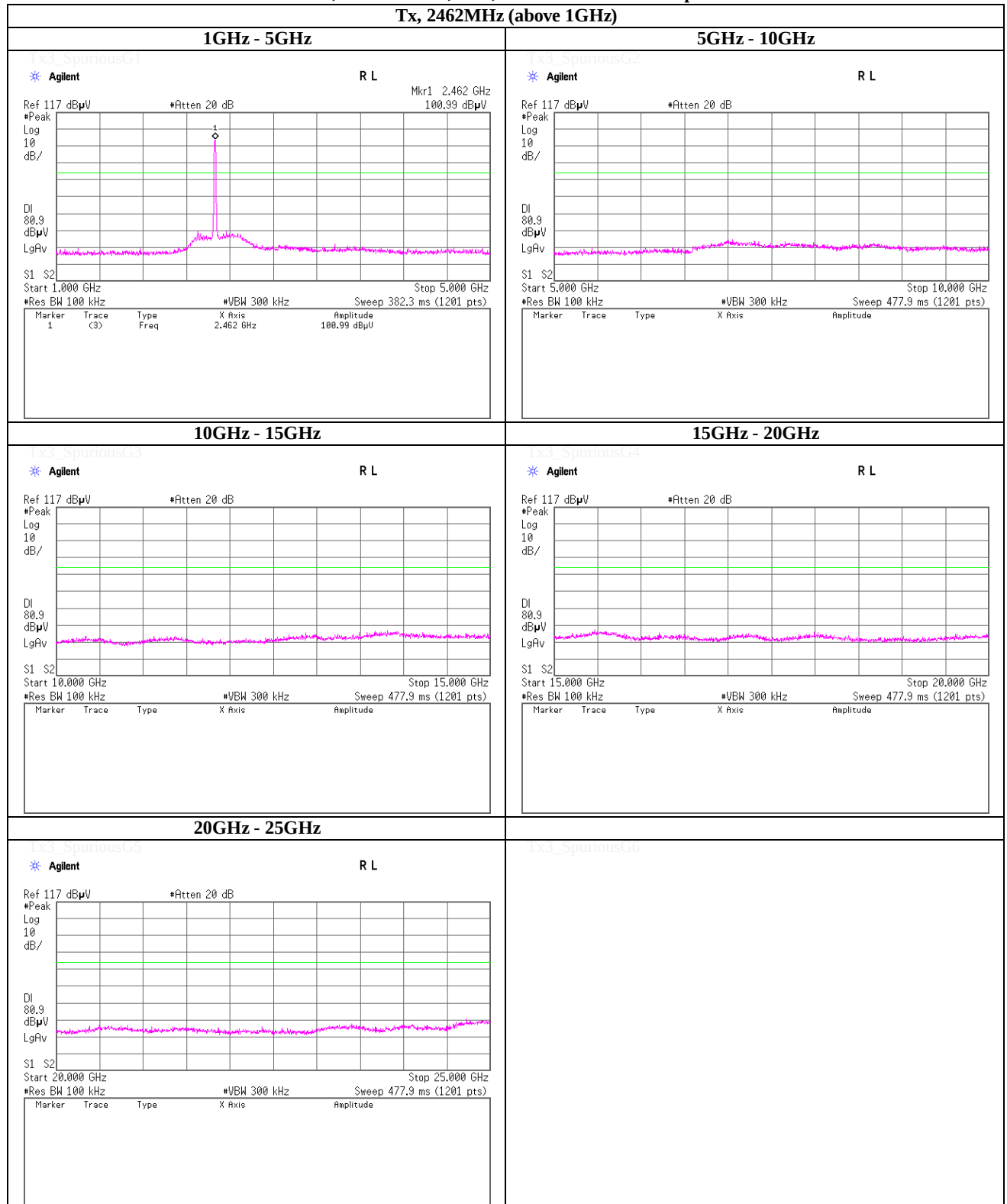
(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11b, PN9, worst data mode 11Mbps****Tx, 2437MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

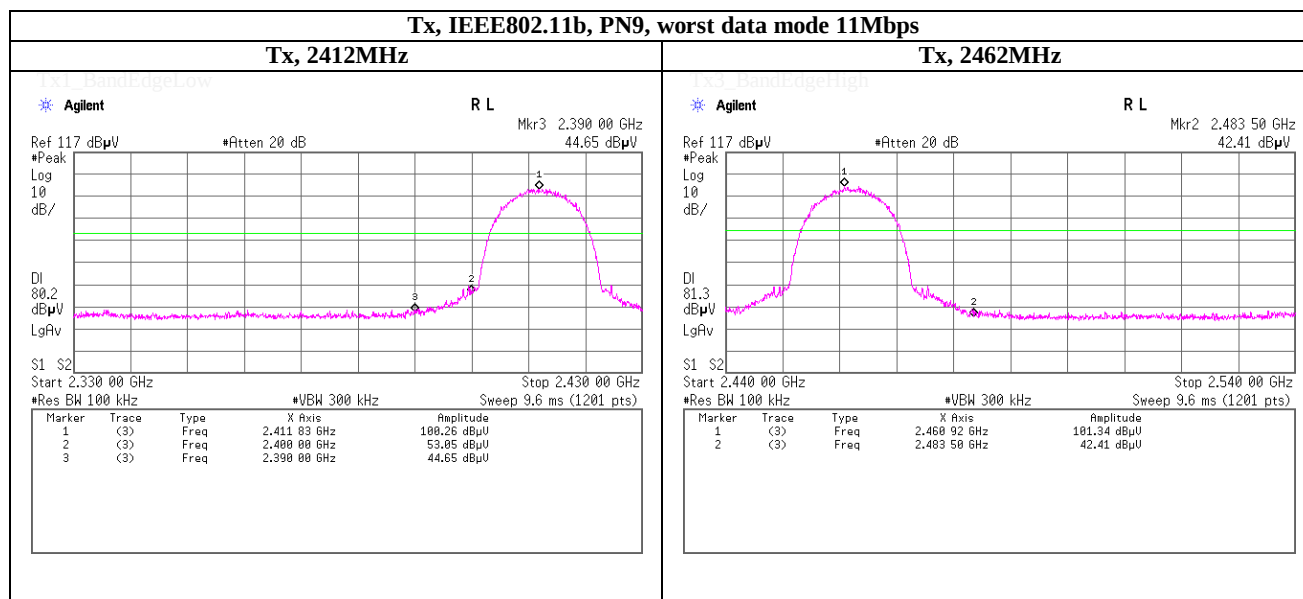
(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11b, PN9, worst data mode 11Mbps****Tx, 2462MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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

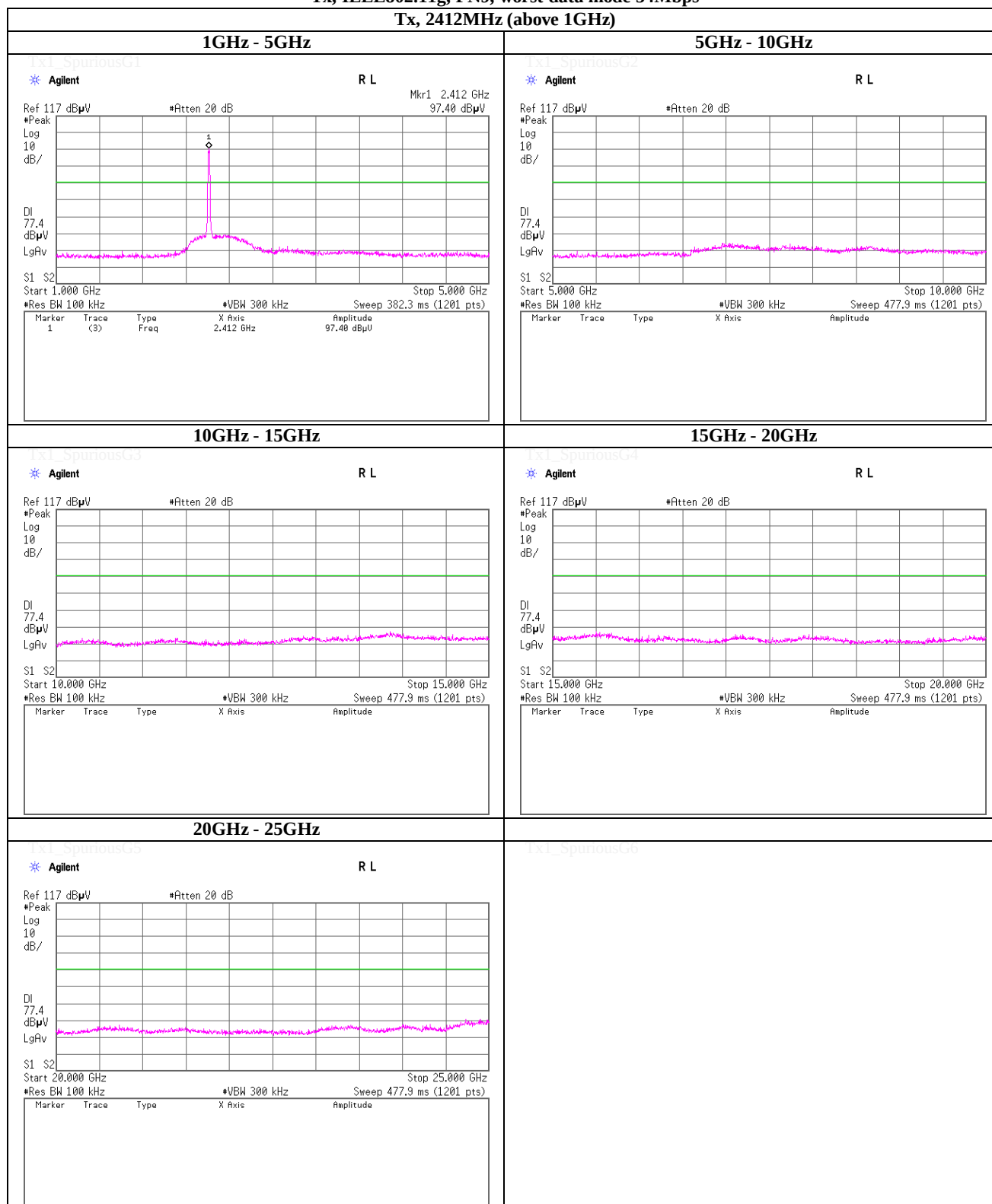
(Reference chart) Spurious emission (Conducted)**Band Edge compliance****Tx, IEEE802.11b, PN9, worst data mode 11Mbps****UL Japan, Inc.****Shonan EMC Lab.**

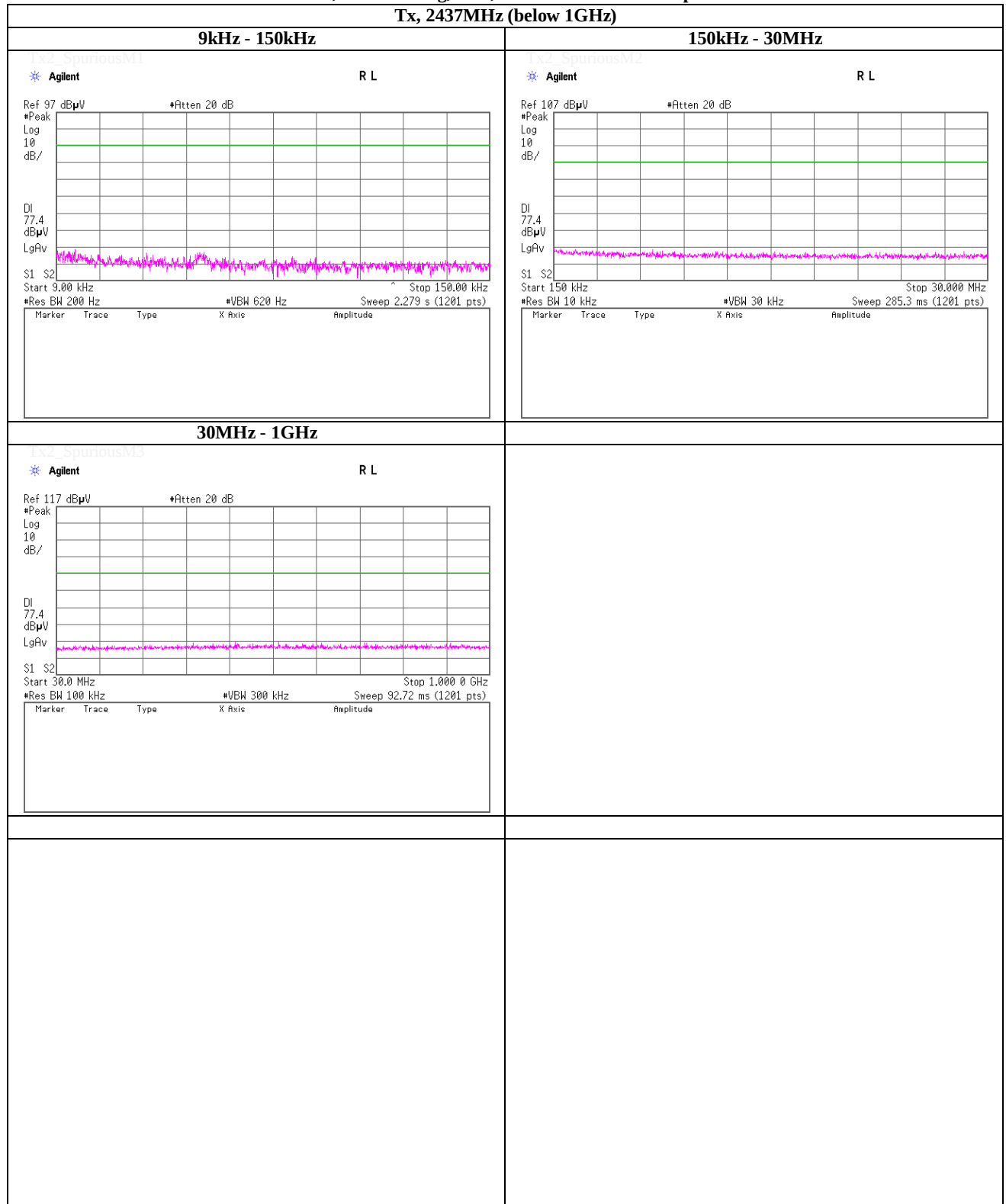
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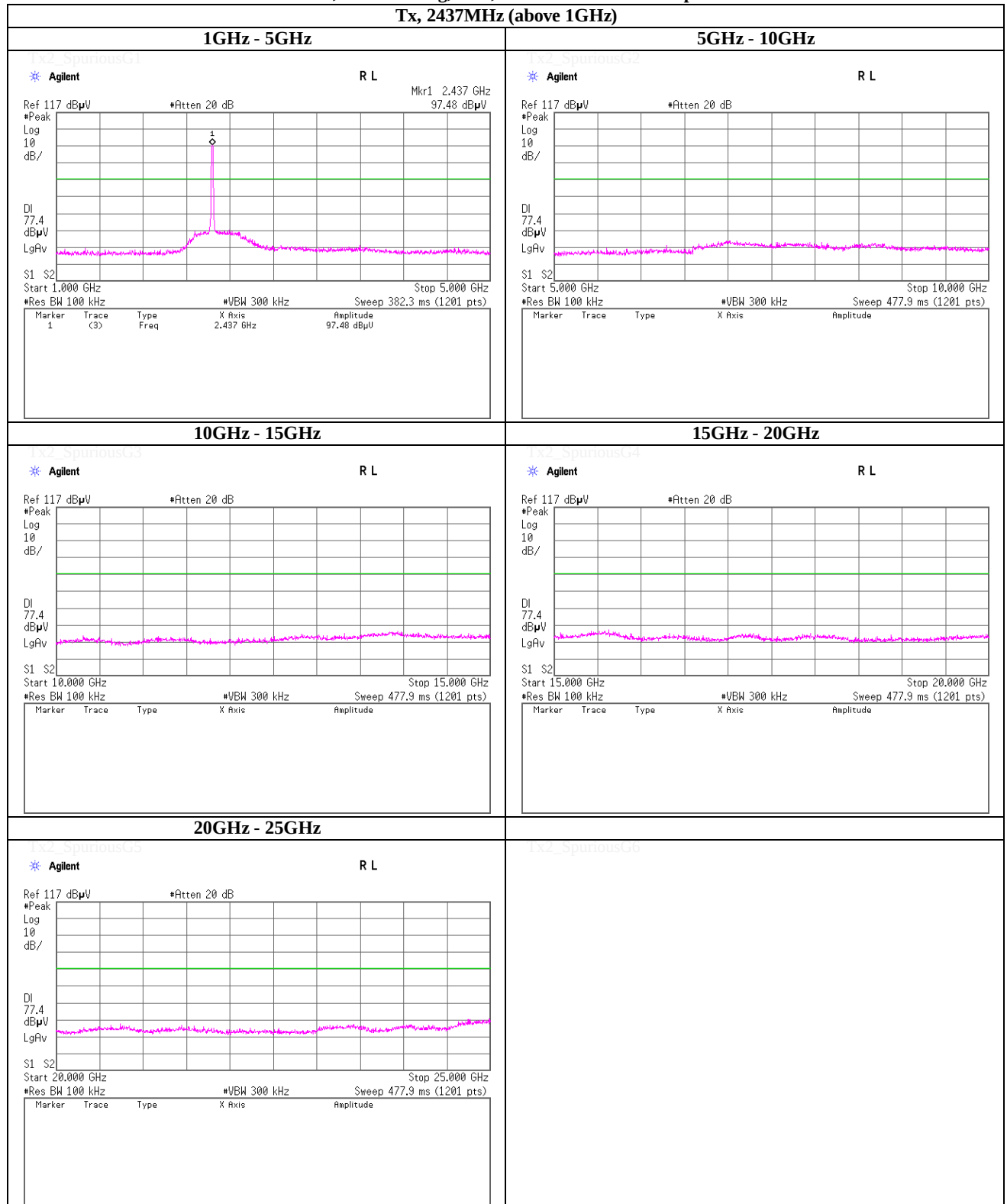
Telephone : +81 463 50 6400

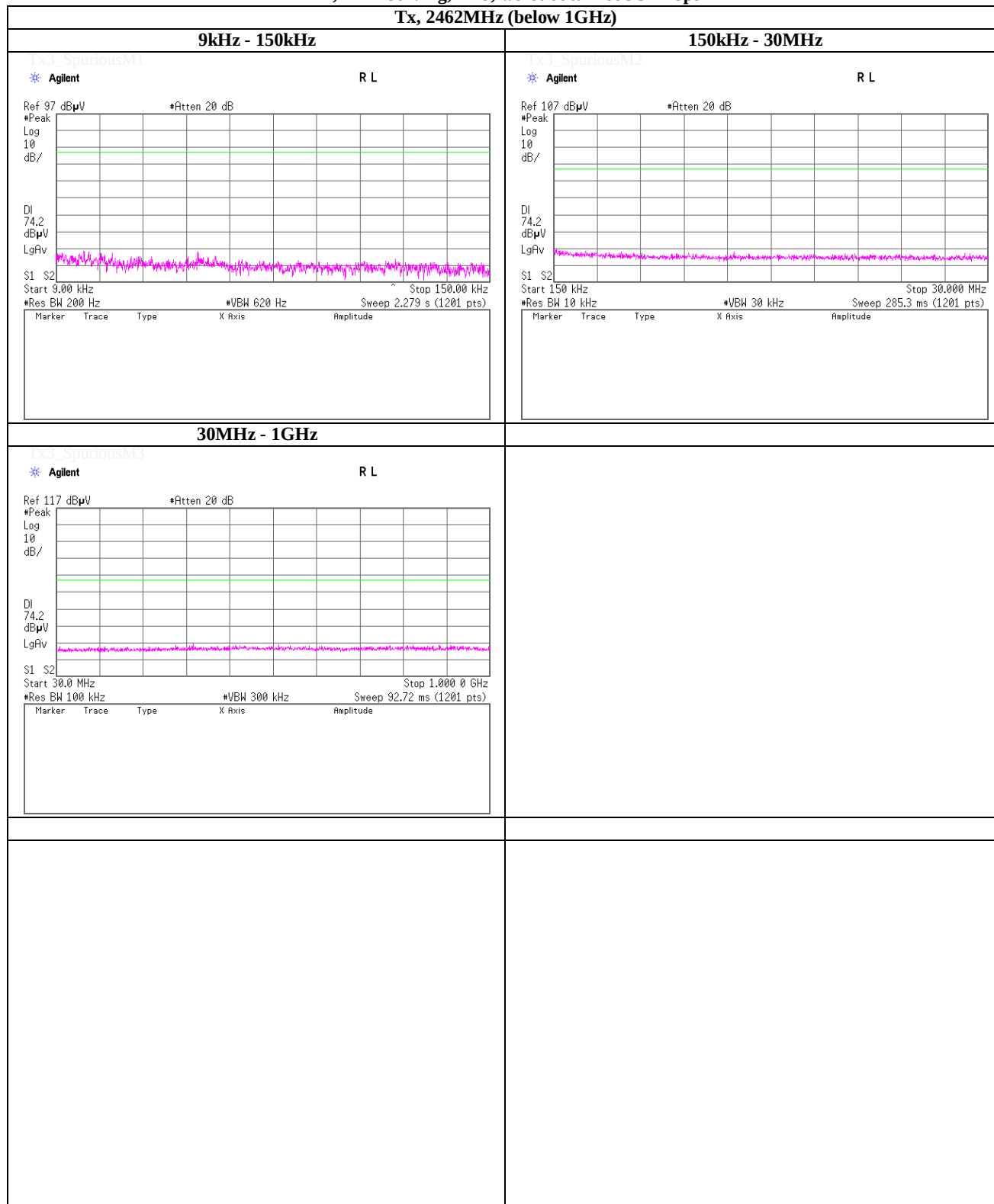
Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11g, PN9, worst data mode 54Mbps****Tx, 2412MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11g, PN9, worst data mode 54Mbps****Tx, 2412MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11g, PN9, worst data mode 54Mbps****Tx, 2437MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

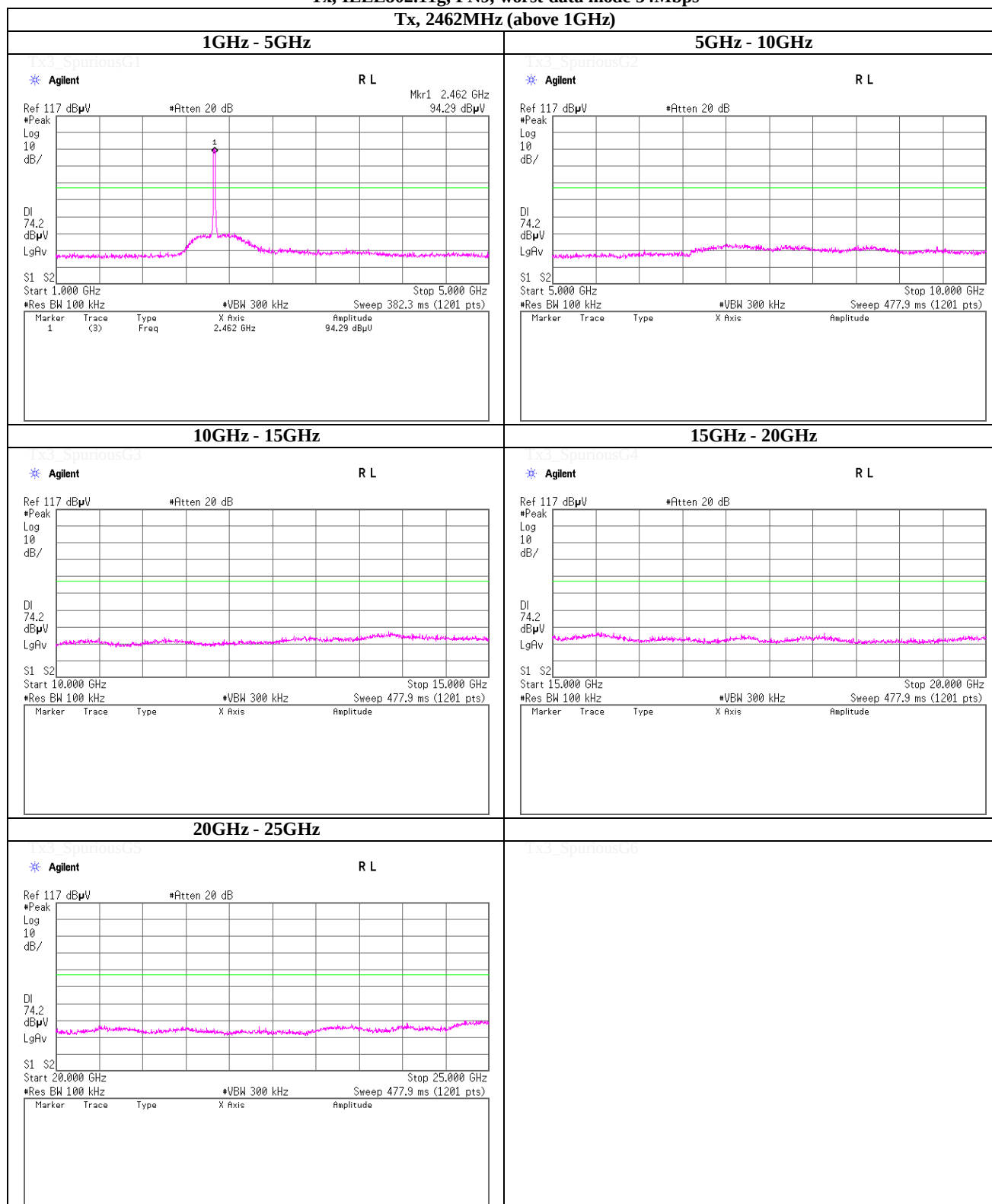
(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11g, PN9, worst data mode 54Mbps****Tx, 2437MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

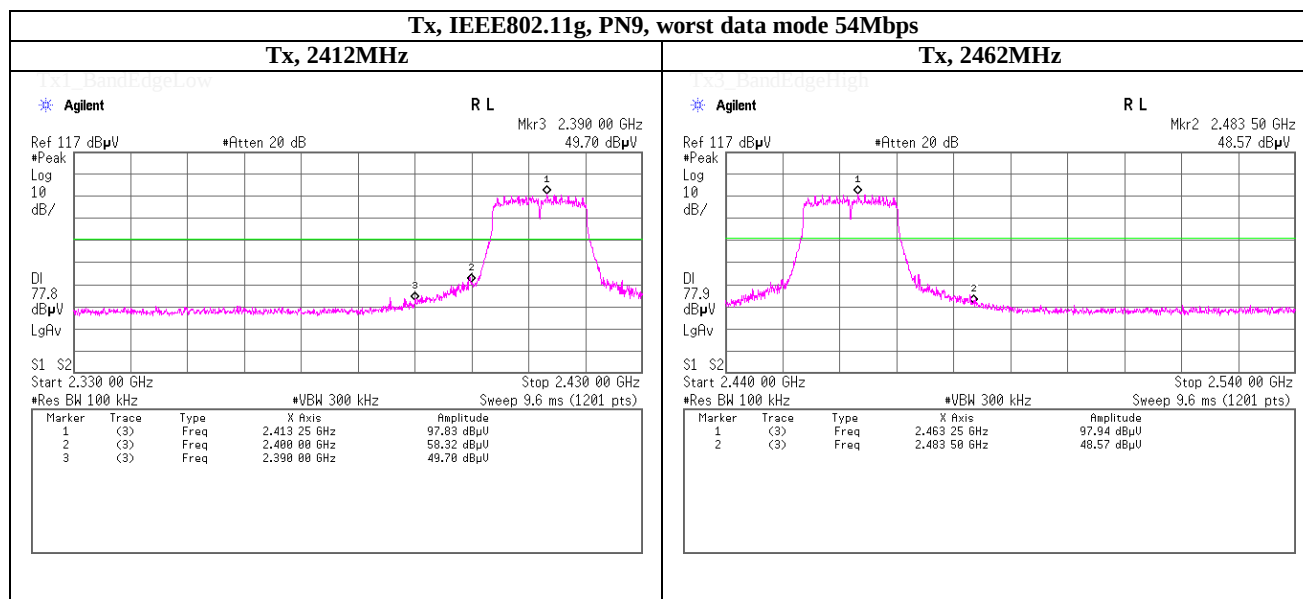
(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11g, PN9, worst data mode 54Mbps****Tx, 2462MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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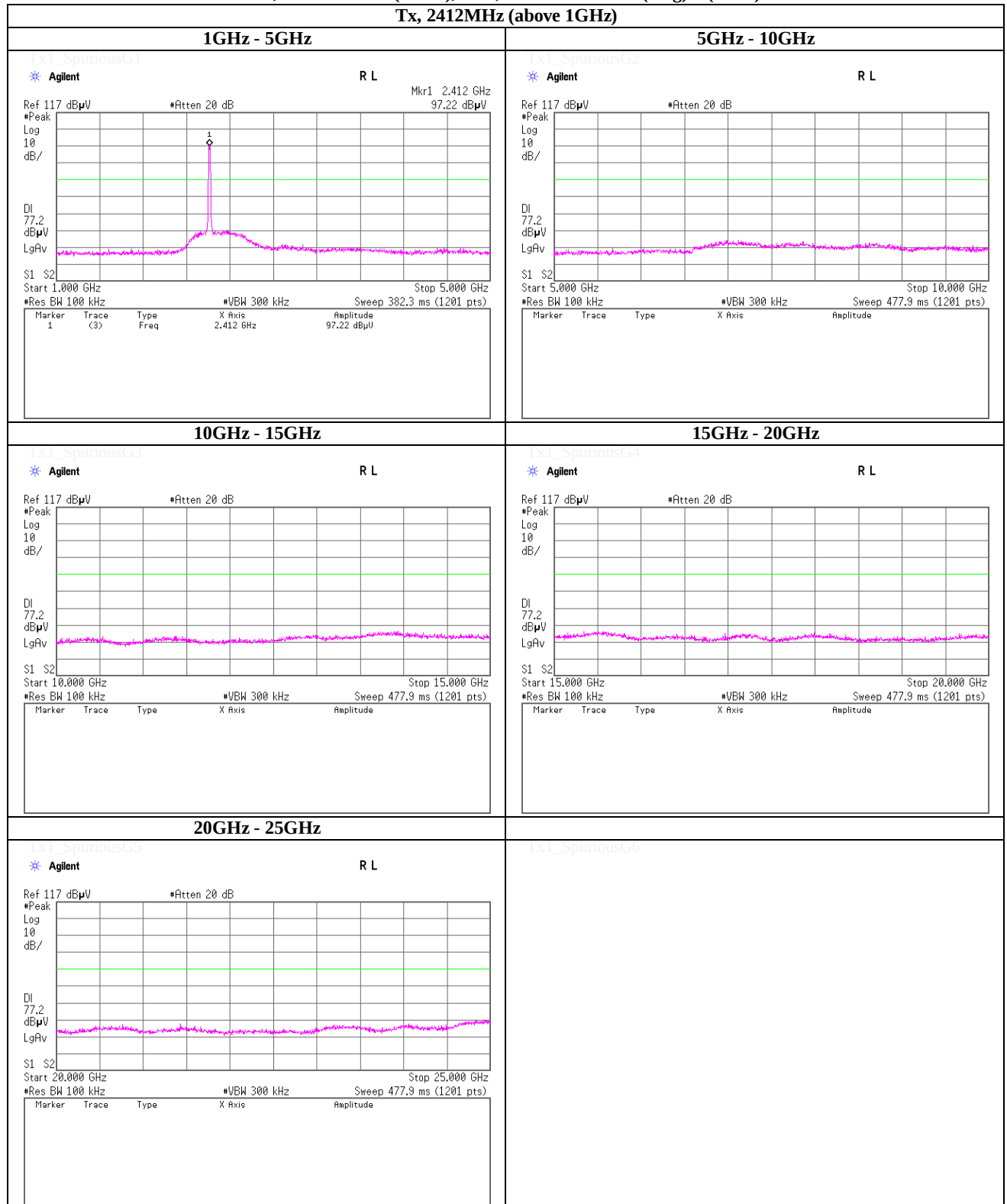
(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11g, PN9, worst data mode 54Mbps****Tx, 2462MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

(Reference chart) Spurious emission (Conducted)**Band Edge compliance****Tx, IEEE802.11g, PN9, worst data mode 54Mbps****UL Japan, Inc.****Shonan EMC Lab.**

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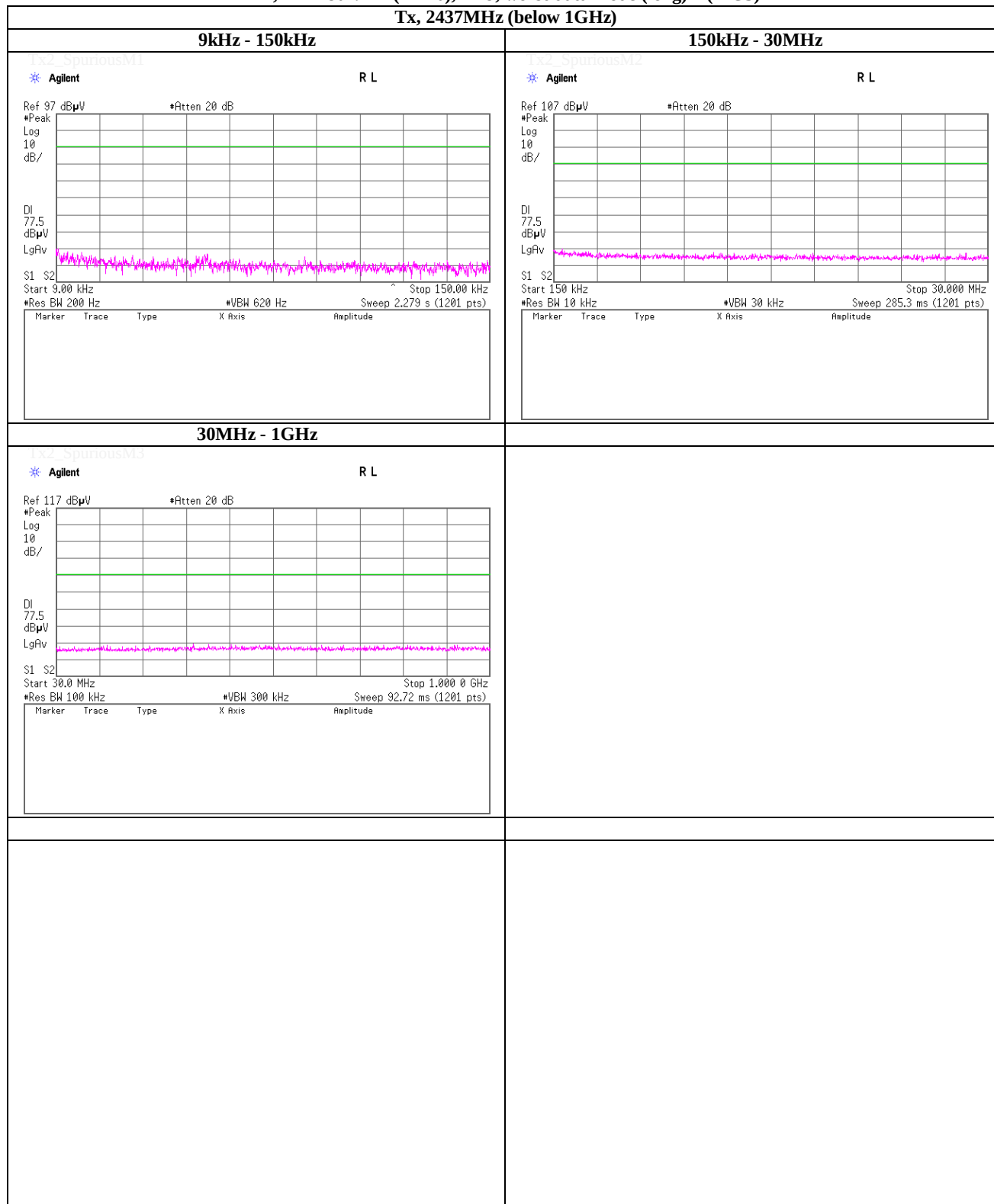
Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11n (HT20), PN9, worst data mode (long) 4 (MCS)****Tx, 2412MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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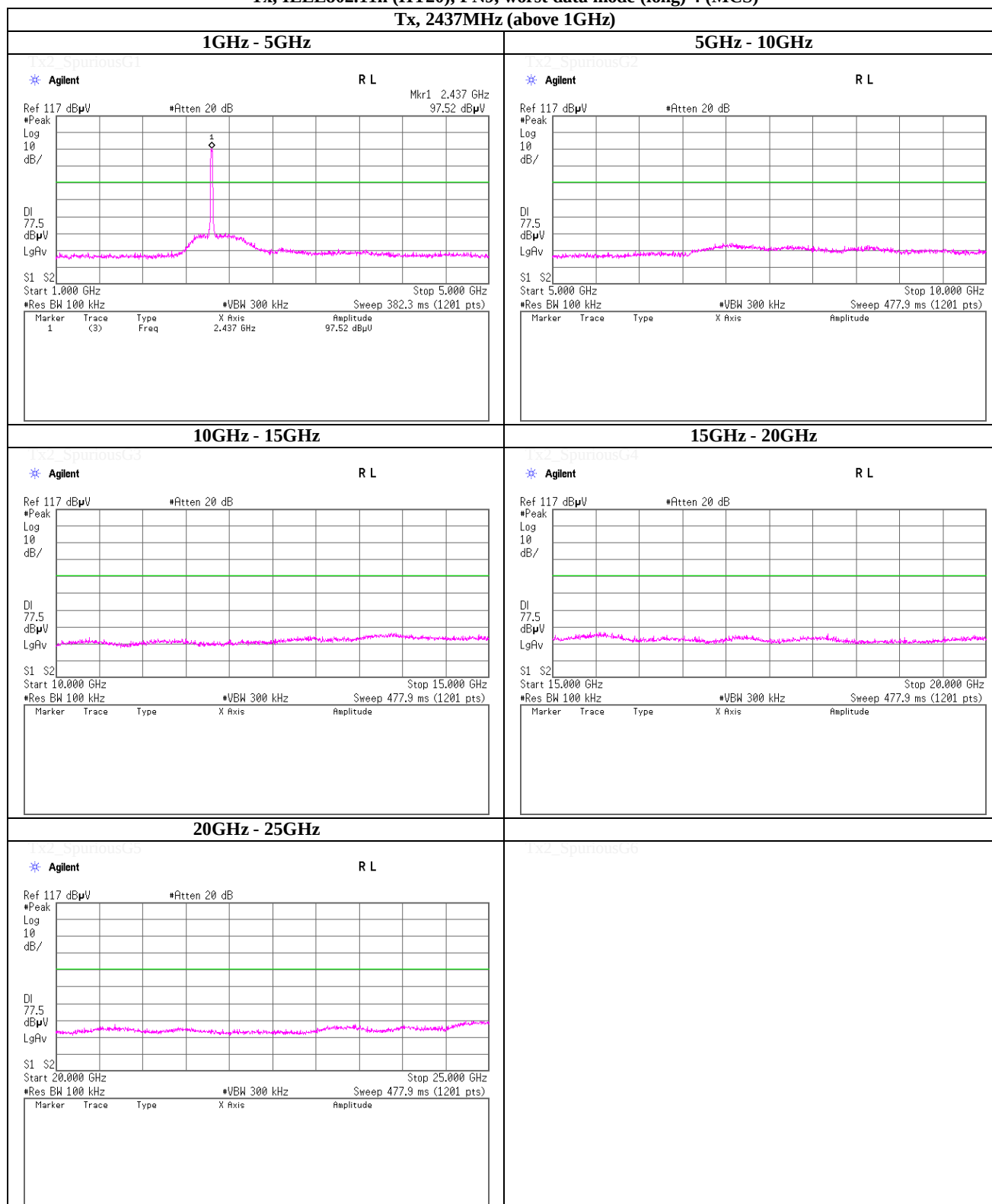
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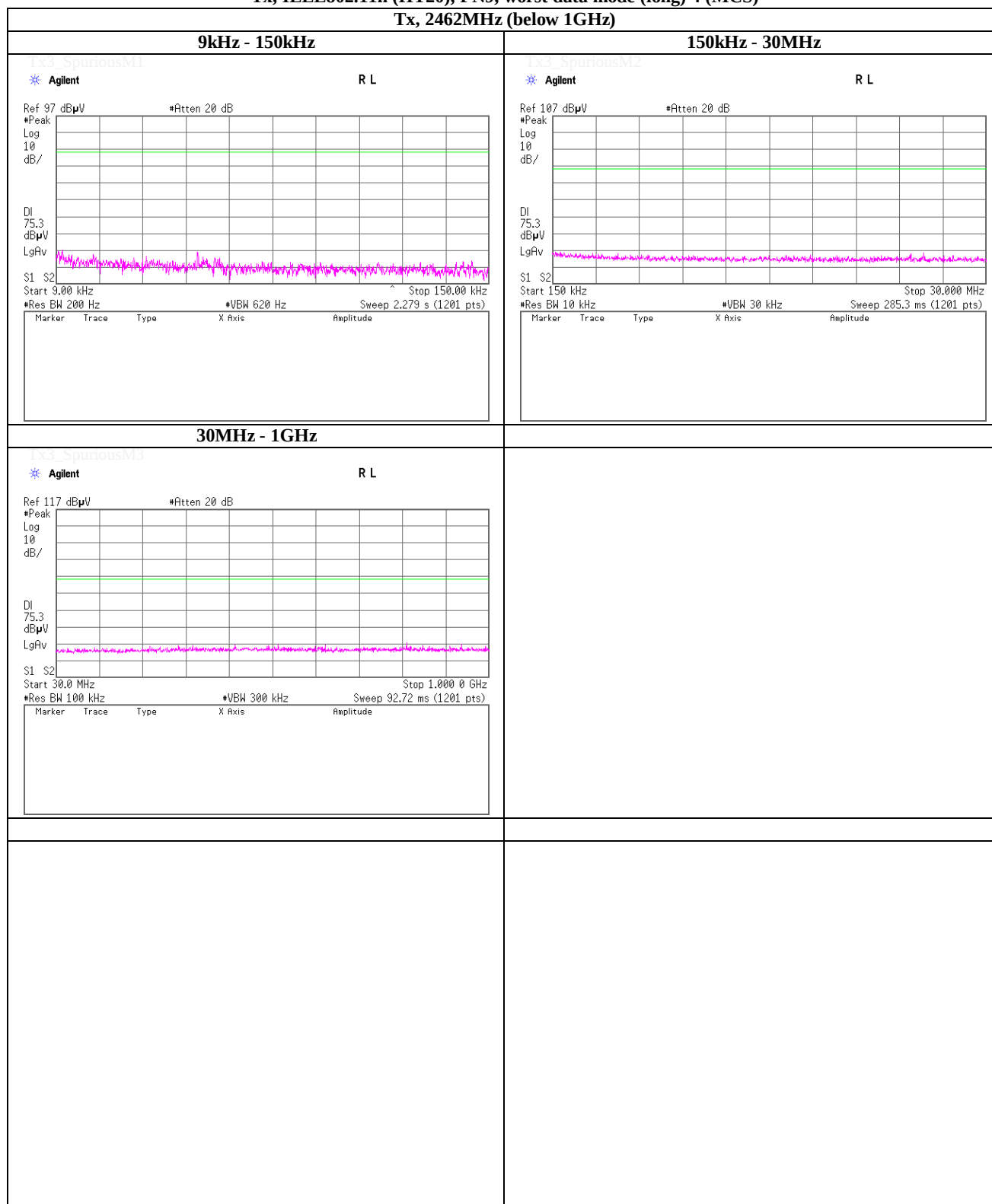
(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11n (HT20), PN9, worst data mode (long) 4 (MCS)****Tx, 2437MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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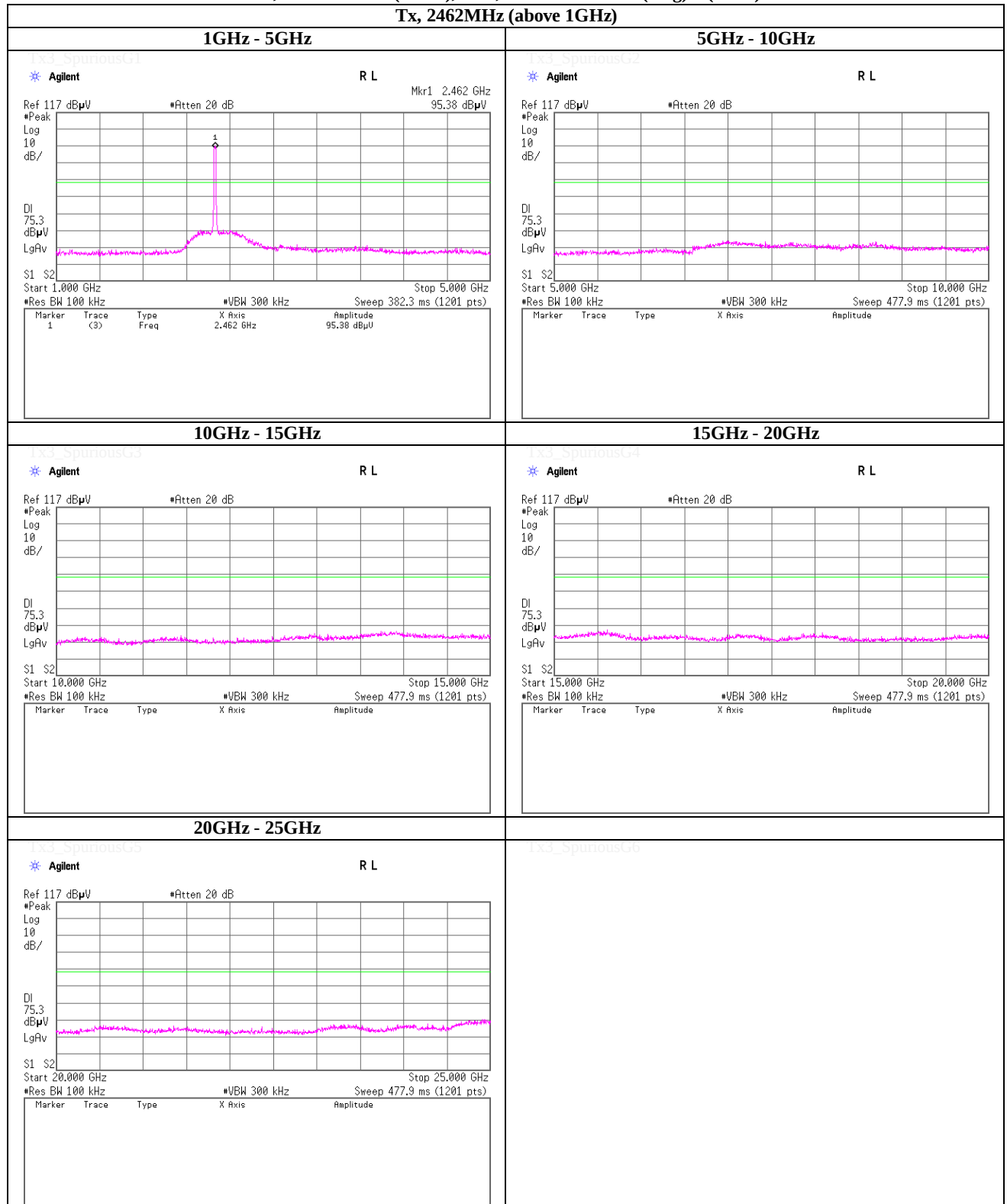
(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11n (HT20), PN9, worst data mode (long) 4 (MCS)****Tx, 2437MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

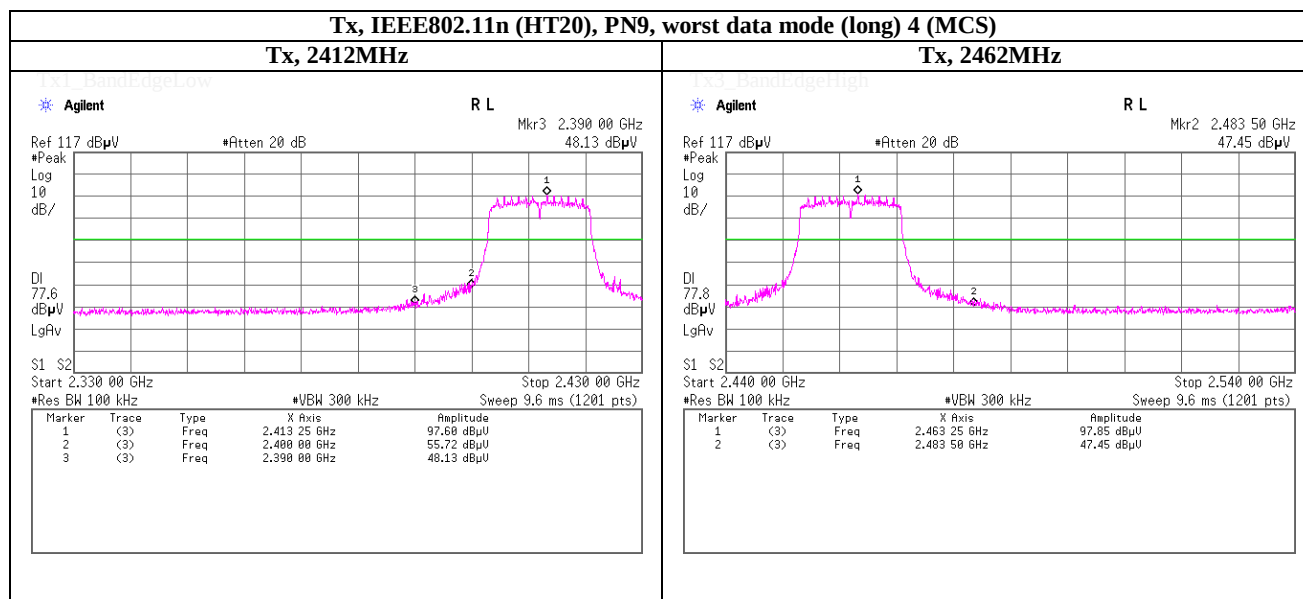
(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11n (HT20), PN9, worst data mode (long) 4 (MCS)****Tx, 2462MHz (below 1GHz)****UL Japan, Inc.****Shonan EMC Lab.**

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(Reference chart) Spurious emission (Conducted)**Tx, IEEE802.11n (HT20), PN9, worst data mode (long) 4 (MCS)****Tx, 2462MHz (above 1GHz)****UL Japan, Inc.****Shonan EMC Lab.****1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN****Telephone : +81 463 50 6400****Facsimile : +81 463 50 6401**

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

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Maximum Power Spectral Density

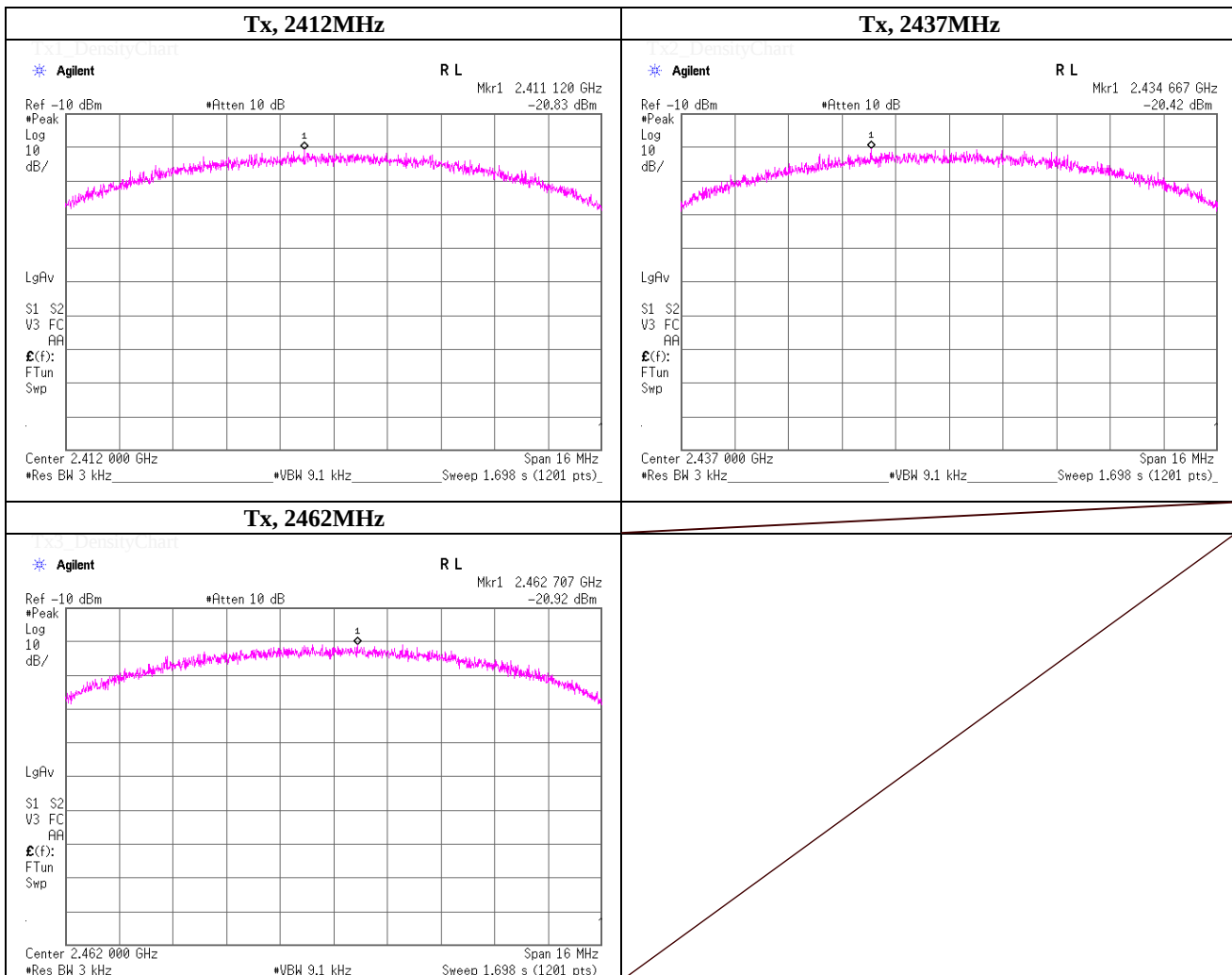
(Option 1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Shielded Room
Date	November 28, 2012	
Temperature / Humidity	23deg.C , 33%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11b, PN9, worst data mode 11Mbps	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2411.12	-20.83	1.97	9.86	-9.00	8.00	17.00
2437.0000	2434.67	-20.42	1.97	9.86	-8.59	8.00	16.59
2462.0000	2462.71	-20.92	1.98	9.86	-9.08	8.00	17.08

Sample Calculation:

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

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Maximum Power Spectral Density

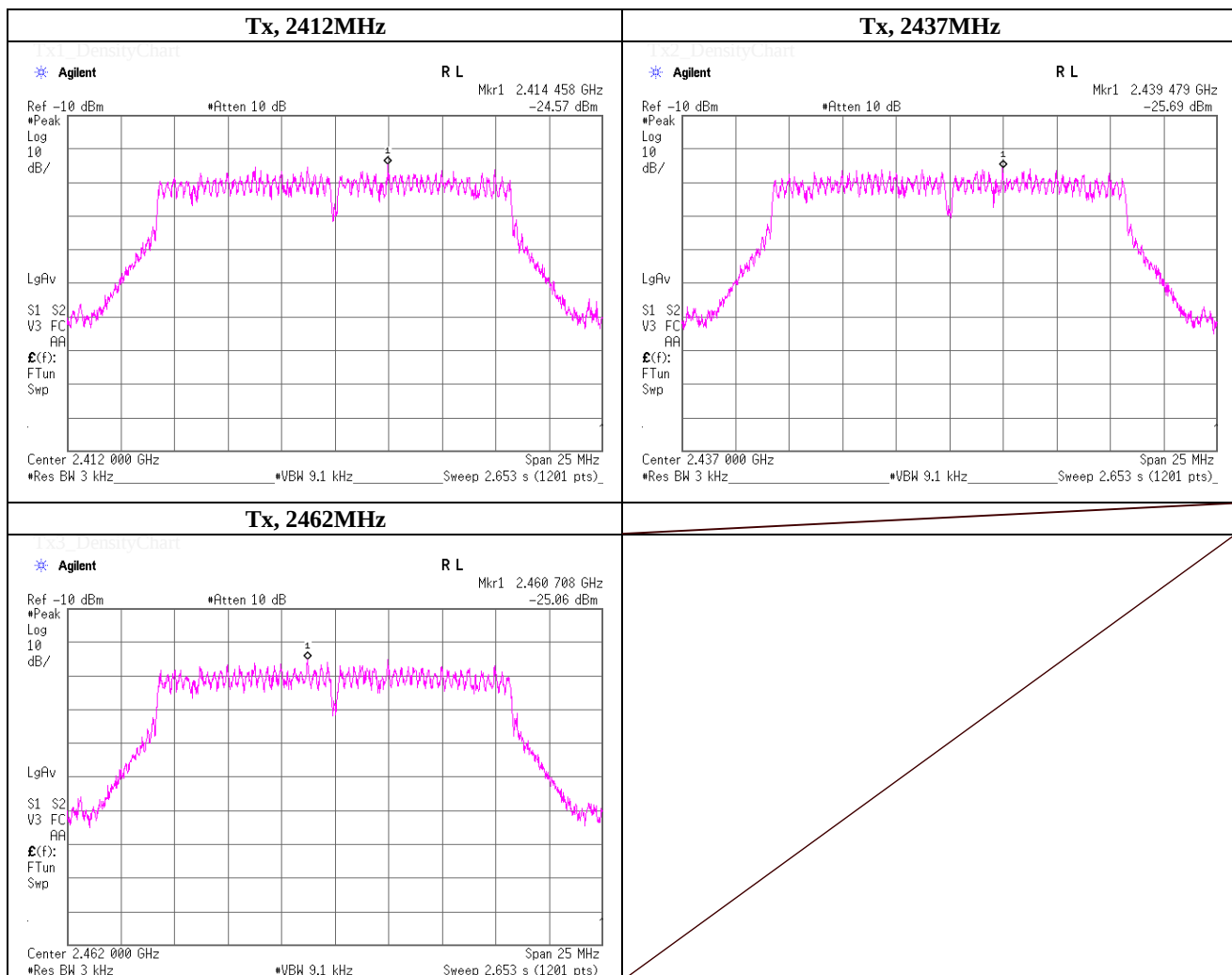
(Option 1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Shielded Room
Date	November 28, 2012	
Temperature / Humidity	23deg.C , 33%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11g, PN9, worst data mode 54Mbps	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2414.46	-24.57	1.97	9.86	-12.74	8.00	20.74
2437.0000	2439.48	-25.69	1.97	9.86	-13.86	8.00	21.86
2462.0000	2460.71	-25.06	1.98	9.86	-13.22	8.00	21.22

Sample Calculation:

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

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Maximum Power Spectral Density

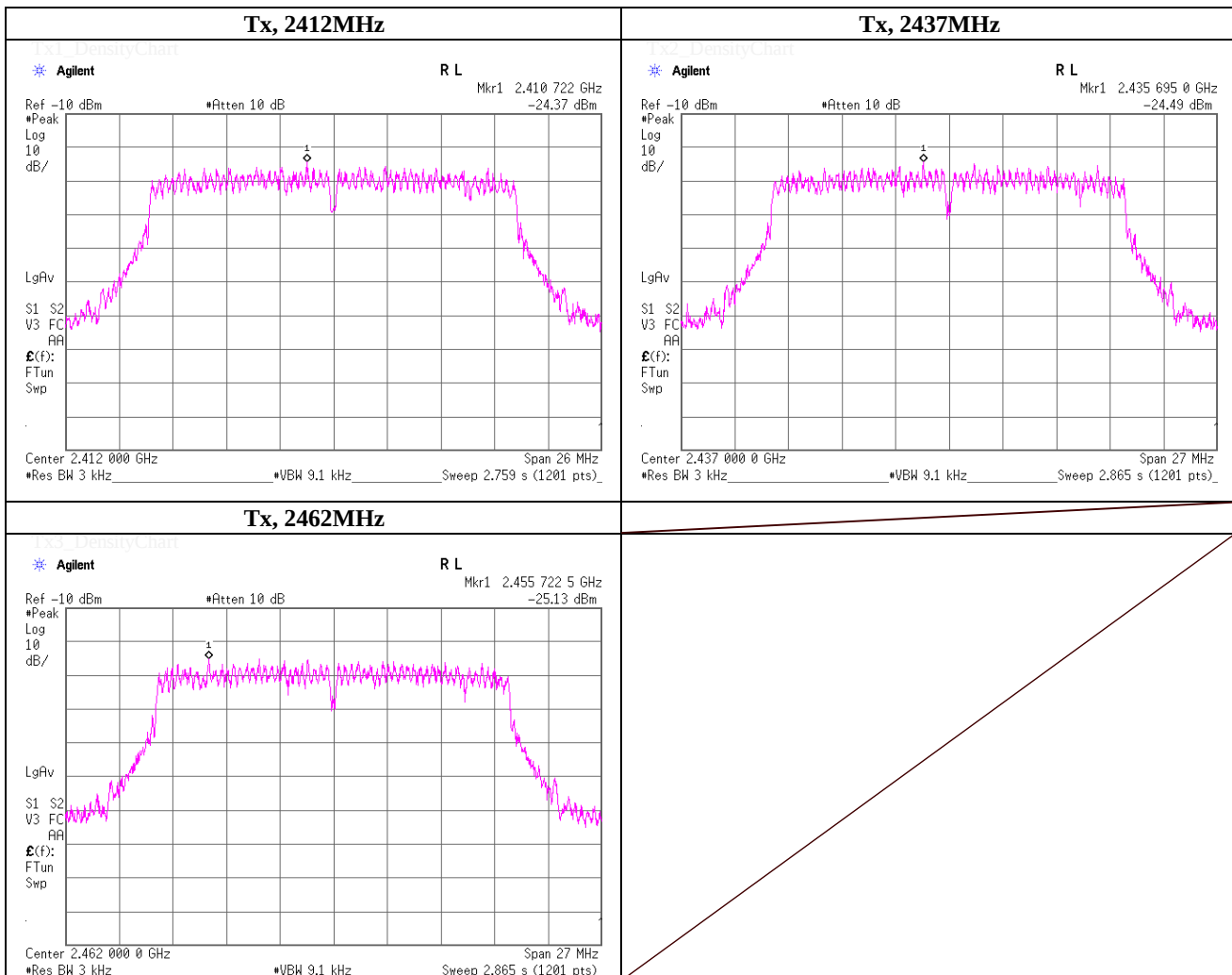
(Option 1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Shielded Room
Date	November 28, 2012	
Temperature / Humidity	23deg.C , 33%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11n (HT20), PN9, worst data mode (long) 4 (MCS)	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2410.72	-24.37	1.97	9.86	-12.54	8.00	20.54
2437.0000	2435.70	-24.49	1.97	9.86	-12.66	8.00	20.66
2462.0000	2455.72	-25.13	1.98	9.86	-13.29	8.00	21.29

Sample Calculation:

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

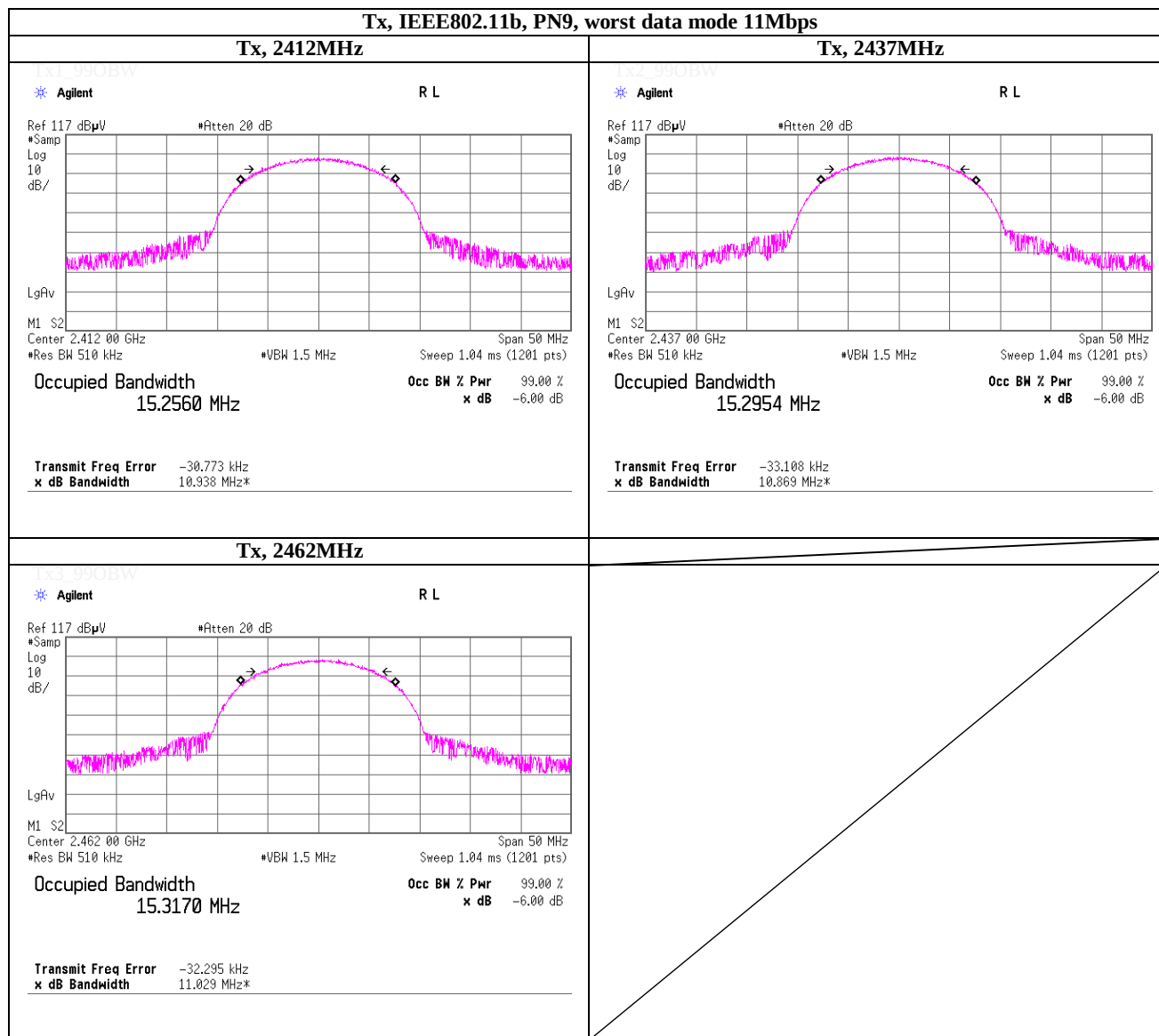
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99% Occupied Bandwidth



UL Japan, Inc.

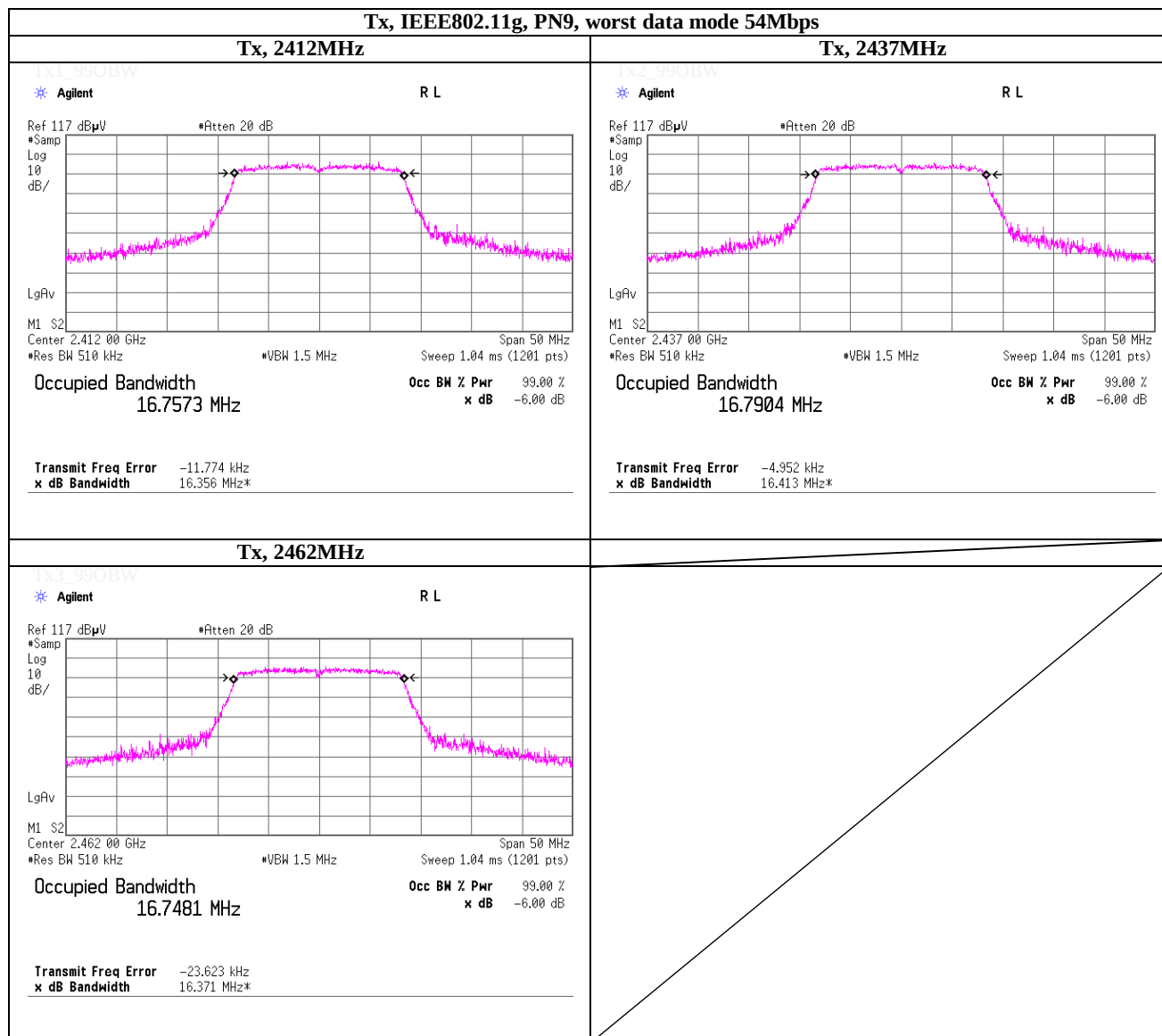
Shonan EMC Lab.

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99% Occupied Bandwidth



UL Japan, Inc.

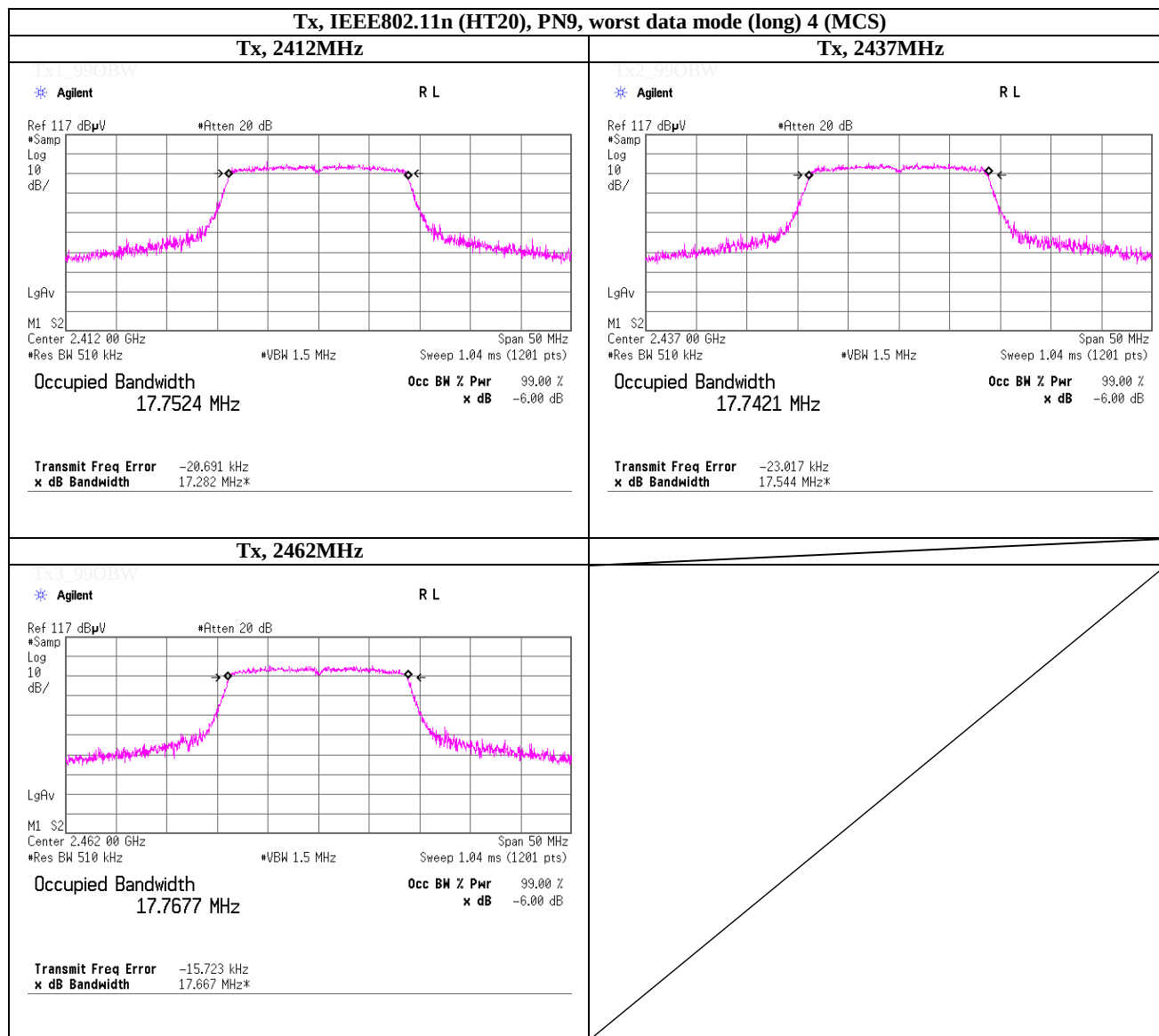
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APPENDIX 2

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
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT	2012/02/16 * 12
SAT10-08	Attenuator	Weinschel	W54-10	-	AT	2012/03/12 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	AT	2012/03/12 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	AT	2012/03/26 * 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	2012/02/06 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2012/03/16 * 12
SJM-11	Measure	PROMART	SEN1935	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFL,MF)	-	RE	-
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2012/12/18 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2012/02/10 * 12
SAT6-03	Attenuator	JFW	50HF-006N	-	RE	2012/02/10 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	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-A 0901	RE	2012/10/08 * 12
STR-03	Test Receiver	Rohde & Schwarz	ES140	100054/040	RE	2012/06/14 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2012/03/30 * 12
SCC-G17	Coaxial Cable	Suhner	SUCOFLEX 104A	46291/4A	RE	2012/03/12 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2012/03/12 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2012/12/18 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2012/02/16 * 12

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

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

Test Item :

RE: Radiated emission ,

AT: Antenna terminal conducted tests ,