



RADIO TEST REPORT

Test Report No.: 4786001102S-A

Applicant : **Canon Inc.**
Type of Equipment : **Wireless Module**
Model No. : **RF400**
FCC ID : **AZD400**
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.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
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6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.

Date of test: January 15 to 25, 2013

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

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



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

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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 4786001102S-A

Revision	Test report No.	Date	Page revised	Contents
- (Original)	4786001102S-A	March 5, 2013	-	-
1	4786001102S-A	April 1, 2013	1-2, 4	P4: Addition of description about simultaneous transmission
2	4786001102S-A	April 2, 2013	1-2, 4	P4: Change of specification

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SECTION 1: Customer information

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

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

2.1 Identification of E.U.T.

Type of Equipment : Wireless Module
Model Number : RF400
Serial Number : See Section 4.
Rating : DC3.3V
Country of Mass-production : China
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample : December 26, 2012
Modification of EUT : No modification by the test lab.

2.2 Product description

Model: RF400 (referred to as the EUT in this report) is a Wireless Module.

Clock frequency(ies) in the system : 32.768KHz, 38.4MHz

<Radio part>

Equipment type : Transceiver
Frequency of operation *1) : 2.4GHz: 2412-2462MHz (IEEE 802.11b, 11g, 11n (20HT))
2422-2452MHz (IEEE 802.11n (40HT))
W53: 5280-5320MHz (IEEE 802.11a, 11n (20HT))
5310MHz (IEEE 802.11n (40HT))
W58: 5745-5805MHz (IEEE 802.11a, 11n (20HT))
5755-5795MHz (IEEE 802.11n (40HT))
Bandwidth : 20MHz (IEEE 802.11a, b, 11g, 11n (20HT)), 40MHz (IEEE 802.11n (40HT))
Channel spacing : 5MHz (2.4GHz),
20MHz (11a, 11n (20HT, 5GHz)), 40MHz (11n (40HT, 5GHz))
Type of modulation : DSSS, OFDM
Antenna type : Monopole type chip antenna
Antenna connector type : None
Antenna gain : 2.1dBi (2.4GHz), 2.4dBi (5GHz)
ITU code : D1D, G1D
Operation temperature range : -20 to +80 deg.C

* The EUT does not perform simultaneous transmission of 2.4GHz and 5GHz Wireless LAN.

*1) Refer to the test report 4786001102S-B-R1 for FCC 15.407 part (except DFS tests), and 4786001102S-C for FCC 15.407(DFS).

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FCC 15.31 (e) / 212

The module is constantly provided the stable voltage from the host device regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC 15.203 / 212

It is impossible for end users to replace the antenna, because it is soldered on the circuit board. Therefore the equipment complies with the requirement of 15.203/212.

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SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2012, final revised on 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

* The revision on December 27, 2012 does not affect the test specification applied to the EUT.

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	14.2dB Freq.: 0.15000MHz Detector: QP Phase: L1 Mode: 11n(20HT) 5785MHz	Complied
6dB bandwidth	ANSI C63.10:2009	FCC 15.247 (a)(2)	Conducted	N/A	* See data	Complied
Maximum peak conducted output power	ANSI C63.10:2009	FCC 15.247 (b)(3)	Conducted	N/A		Complied
Out of band emission & Restricted band edges	ANSI C63.10:2009	FCC 15.109, 15.247 (d) & 15.209	Conducted / Radiated	N/A	0.6dB Freq.: 4924MHz Polarization: Horizontal Detection: Average Mode: 11b 2462MHz	Complied
Power density	ANSI C63.10:2009	FCC 15.247 (e)	Conducted	N/A	* See data	Complied

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

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

3.3 Addition to standard

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

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

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

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3.4 Uncertainty

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

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

*1: SAC=Semi-Anechoic Chamber

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

Conducted emission test

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

Radiated emission test

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

Antenna port conducted test

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

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

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

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

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

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

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3.5 Test location

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JAB Accreditation No. : RTL02610

	FCC Registration No.	IC Registration No.	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
<input 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 checked="" type="checkbox"/> No.3 shielded room	-	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
<input type="checkbox"/> No.4 shielded room	-	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
<input checked="" type="checkbox"/> No.5 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
<input type="checkbox"/> No.6 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-

3.6 Test setup, Data of EMI & 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)
Conducted emission Radiated emission (below 1GHz) *3)	Transmitting (Tx) IEEE 802.11n (40HT)	2437MHz	13dBm	MCS4, PN9
	Transmitting(Tx) IEEE 802.11n (20HT): 5G Band	5785MHz	12dBm	MCS0, PN9
Other items	Transmitting (Tx) IEEE 802.11b	2412MHz, 2437MHz, 2462MHz	13dBm	1Mbps, PN9
	Transmitting (Tx) IEEE 802.11g	2412MHz, 2437MHz, 2462MHz	13dBm	6Mbps, PN9
	Transmitting (Tx) IEEE 802.11n (20HT): 2.4G Band	2412MHz, 2437MHz, 2462MHz	13dBm	MCS0, PN9
	Transmitting (Tx) IEEE 802.11n(40HT): 2.4G Band	2422MHz, 2437MHz, 2452MHz	13dBm	MCS4, PN9
	Transmitting (Tx) IEEE 802.11a	5745MHz, 5785MHz, 5805MHz	12dBm	6Mbps, PN9
	Transmitting (Tx) IEEE 802.11n (20HT): 5G Band	5745MHz, 5785MHz, 5805MHz	12dBm	MCS0, PN9
	Transmitting (Tx) IEEE 802.11n (40HT): 5G Band	5755MHz, 5795MHz	12dBm	MCS4, PN9

*1) The actual output power differs from the setting value. Software used for the test: RFTTEST ver. 14.0.11.p51

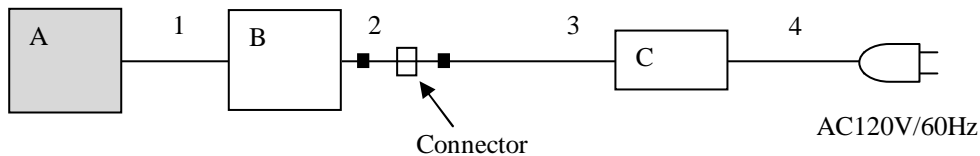
*2) The worst condition was determined based on the test result of Maximum Peak Conducted Output Power.

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

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

4.2 Configuration and peripherals

■: Ferrite core (Standard attachment)



* Test data was taken under worse case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless Module	RF400	#8	Canon	EUT
B	Digital Camera	PC1739	PR-MT000100	Canon	-
C	Compact Power Adapter	CA-DC10 N	1152	Canon	-

List of cables used

No.	Cable Name	Length (m)	Shield		Remark
			Cable	Connector	
1	Jig	0.05	Unshielded	Unshielded	-
2	DC	0.15	Unshielded	Unshielded	-
3	DC	1.9	Unshielded	Unshielded	-
4	AC	1.9	Unshielded	Unshielded	-

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SECTION 5: Conducted emission

5.1 Operating environment

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

5.2 Test configuration

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 0.8m above the conducting ground plane. The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals was aligned and was flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from LISN. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source. Photographs of the set up are shown in APPENDIX 3.

5.3 Test conditions

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

5.4 Test procedure

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

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

5.5 Results

Summary of the test results : Pass
Refer to APPENDIX 1

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SECTION 6: Radiated emission

6.1 Operating environment

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

6.2 Test configuration

EUT was placed on a urethane platform of nominal size, 0.5m by 0.5m, raised 0.8m above the conducting ground plane.

Photographs of the set up are shown in APPENDIX 3.

6.3 Test conditions

Frequency range : 30MHz to 40GHz
EUT position : Table top

6.4 Test procedure

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

The radiated emission measurements were made with the following detection.

Frequency	30-1000MHz	1-40GHz		20dBc
Detection type	Quasi-Peak	Peak	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 confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Worst case:

2.4GHz band

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

5GHz band (W58)

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

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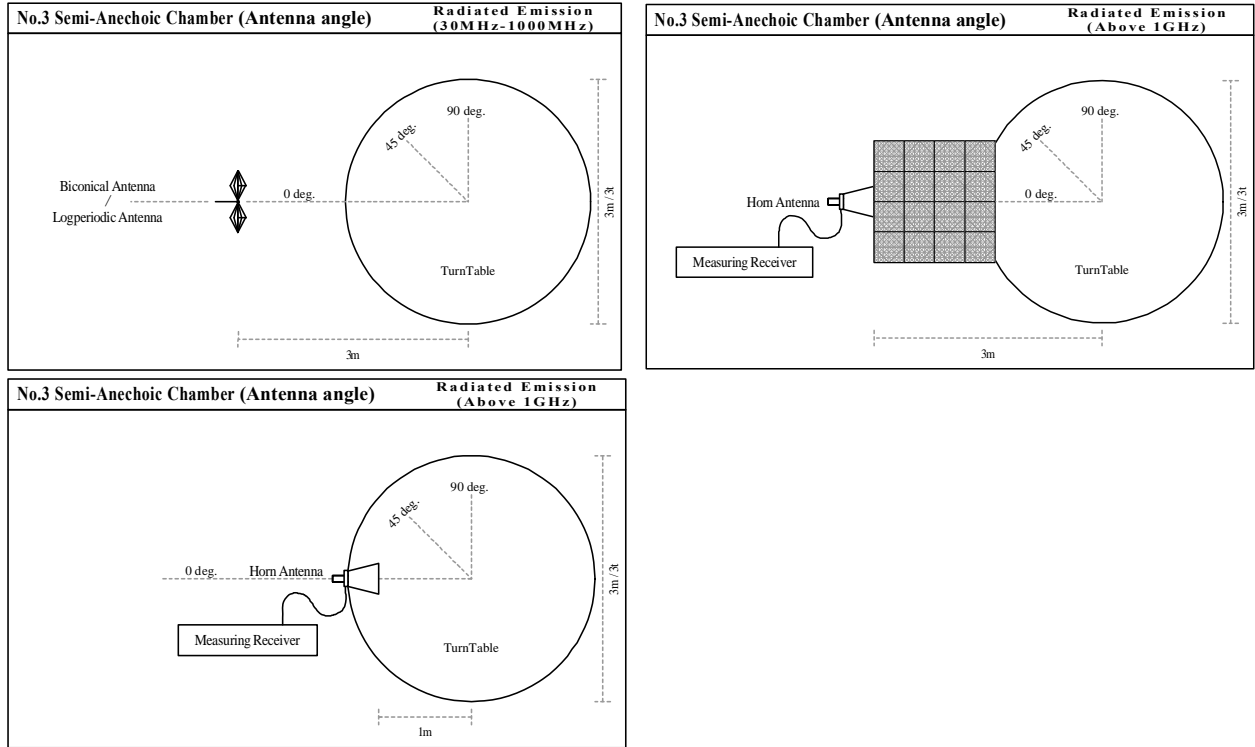
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Figure 1. Antenna angle



6.5 Band edge

Band edge level at 2390MHz, 2483.5MHz and 5850MHz is below the limits of FCC 15.209 and band edge level at 2400MHz and 5725MHz is below the 20dBc. Refer to the data.

6.6 Results

Summary of the test results :

Pass

- * No noise was detected above the 5th order harmonics (2.4GHz bands).
- * No noise was detected above the 3rd order harmonics (5GHz bands).

Refer to APPENDIX 1

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

Test procedure

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

Summary of the test results: Pass

Refer to APPENDIX 1

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

Test procedure

The bandwidth was measured with a spectrum analyzer connected to the antenna port. The test was measured based on Method 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 1

SECTION 9: Maximum peak conducted output power

Test procedure

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

Detection type: Peak / Average *1)

Summary of the test results: Pass

Refer to APPENDIX 1

*1) Average detector was used only for Reference data of SAR testing.

SECTION 10: Peak power density

Test procedure

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

Instrument used : Spectrum Analyzer

RBW / VBW : 3kHz / 9.1kHz

The test was measured based on Method 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 1

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Contents of APPENDIXES

APPENDIX 1: Data of Radio tests

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

APPENDIX 2: Test instruments

Test instruments

APPENDIX 3: Photographs of test setup

Conducted emission
Radiated emission
Pre-check of worst position

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APPENDIX 1: Data of Radio tests

DATA OF CONDUCTED EMISSION TEST

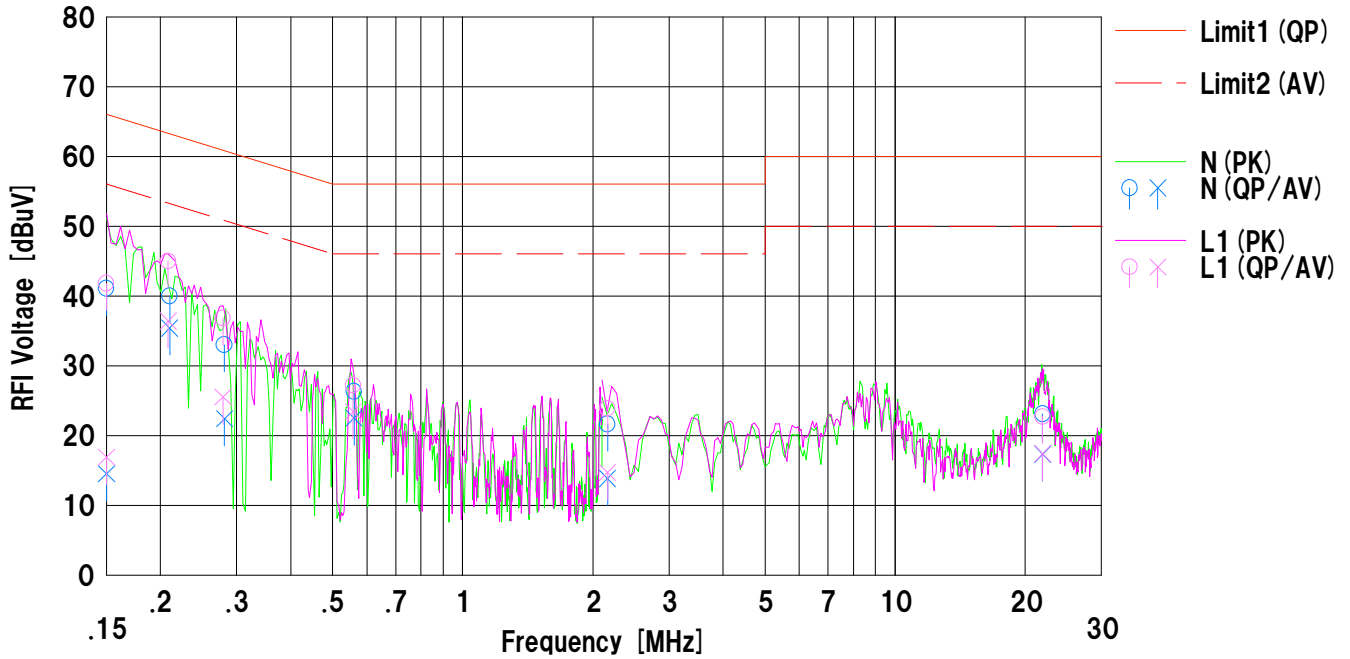
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/01/24

Company : Canon Inc.
Kind of EUT : Wireless Module
Model No. : RF400
Serial No. : #8
Remarks :

Mode : Tx 11n(40HT) 2437MHz
Report No. : 4786001102S-A
Power : AC 120V / 60Hz (AC Adaptor)
Temp./Humi. : 22deg.C. / 48%RH

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

Engineer : Kenichi Adachi



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	28.4	1.8	12.7	41.1	14.5	66.0	56.0	24.9	41.5	N	
2	0.21010	27.3	22.7	12.7	40.0	35.4	63.2	53.2	23.2	17.8	N	
3	0.28100	20.3	9.7	12.7	33.0	22.4	60.7	50.7	27.7	28.3	N	
4	0.56100	13.6	9.8	12.7	26.3	22.5	56.0	46.0	29.7	23.5	N	
5	2.16300	8.8	1.0	12.8	21.6	13.8	56.0	46.0	34.4	32.2	N	
6	2193600	9.5	3.7	13.6	23.1	17.3	60.0	50.0	36.9	32.7	N	
7	0.15000	29.1	4.2	12.7	41.8	16.9	66.0	56.0	24.2	39.1	L1	
8	0.20836	32.3	23.7	12.7	45.0	36.4	63.2	53.2	18.2	16.8	L1	
9	0.27900	24.1	12.8	12.7	36.8	25.5	60.8	50.8	24.0	25.3	L1	
10	0.55750	14.5	10.7	12.7	27.2	23.4	56.0	46.0	28.8	22.6	L1	
11	2.16300	11.1	1.9	12.8	23.9	14.7	56.0	46.0	32.1	31.3	L1	
12	2193600	9.1	3.8	13.6	22.7	17.4	60.0	50.0	37.3	32.6	L1	

DATA OF CONDUCTED EMISSION TEST

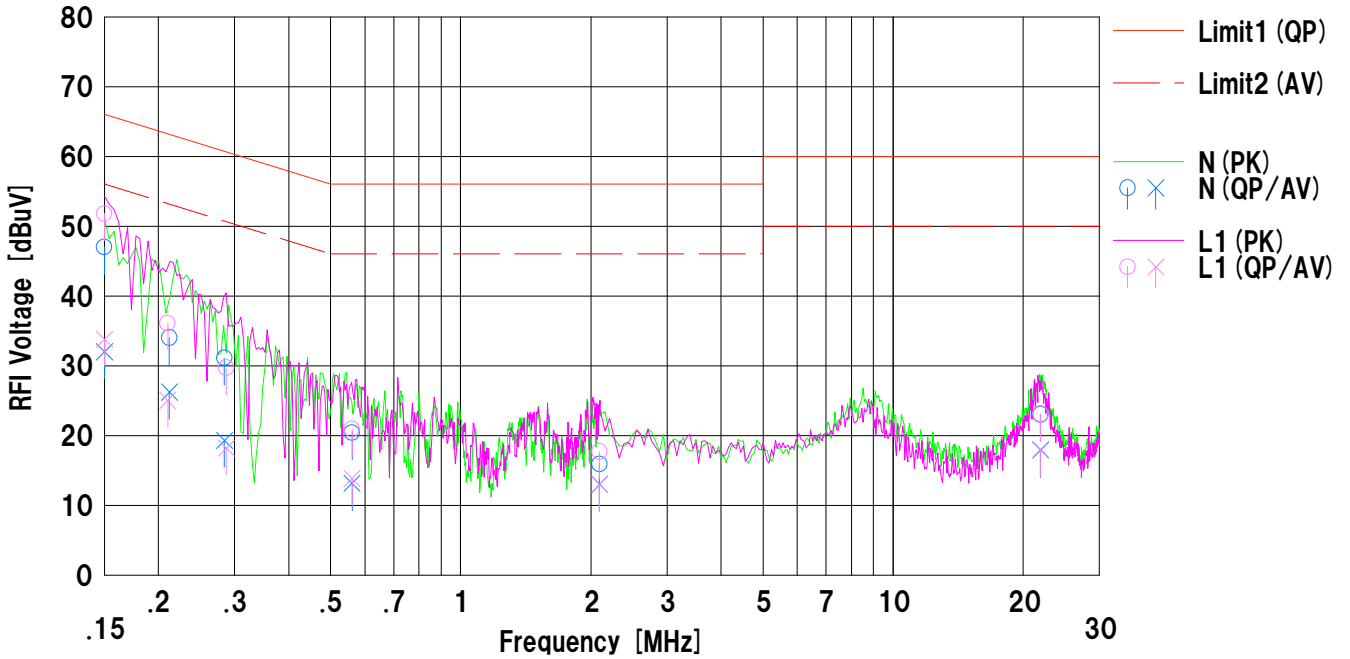
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/01/24

Company : Canon Inc.
Kind of EUT : Wireless Module
Model No. : RF400
Serial No. : #8
Remarks :

Mode : Tx 11n(20HT) 5785MHz
Report No. : 4786001102S-A
Power : AC 120V / 60Hz (AC Adaptor)
Temp./Humi. : 22deg.C. / 48%RH

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

Engineer : Kenichi Adachi

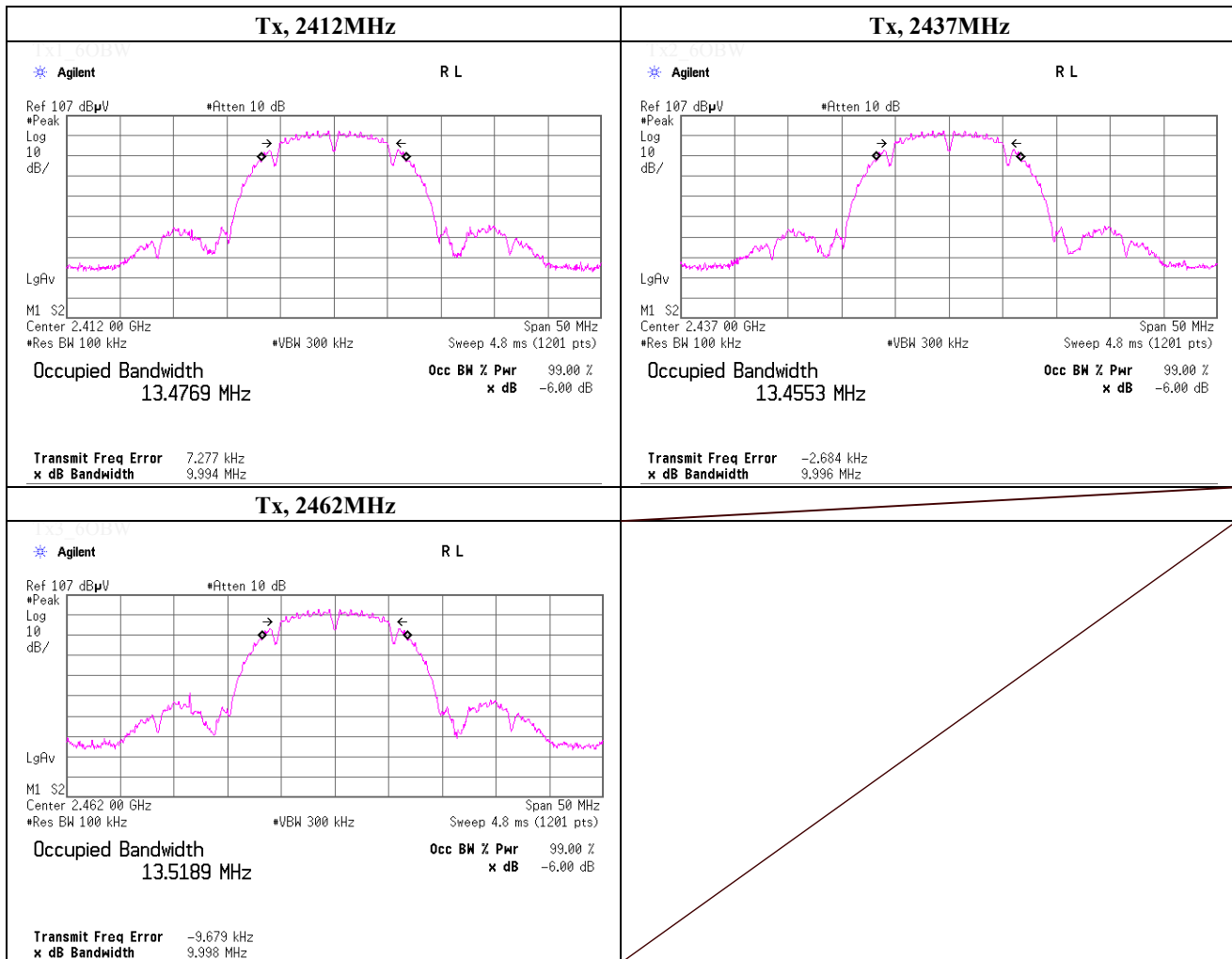


No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	34.3	19.3	12.7	47.0	32.0	66.0	56.0	19.0	24.0	N	
2	0.21200	21.3	13.5	12.7	34.0	26.2	63.1	53.1	29.1	26.9	N	
3	0.28400	18.3	6.5	12.8	31.1	19.3	60.6	50.6	29.5	31.3	N	
4	0.56100	7.7	0.4	12.7	20.4	13.1	56.0	46.0	35.6	32.9	N	
5	2.09500	3.1	0.2	12.8	15.9	13.0	56.0	46.0	40.1	33.0	N	
6	2193600	9.4	4.3	13.6	23.0	17.9	60.0	50.0	37.0	32.1	N	
7	0.15000	39.1	21.1	12.7	51.8	33.8	66.0	56.0	14.2	22.2	L1	
8	0.21000	23.4	12.3	12.7	36.1	25.0	63.2	53.2	27.1	28.2	L1	
9	0.28700	17.0	5.5	12.7	29.7	18.2	60.6	50.6	30.9	32.4	L1	
10	0.56100	8.2	1.1	12.7	20.9	13.8	56.0	46.0	35.1	32.2	L1	
11	2.09500	4.9	0.2	12.8	17.7	13.0	56.0	46.0	38.3	33.0	L1	
12	2193600	9.5	4.4	13.6	23.1	18.0	60.0	50.0	36.9	32.0	L1	

-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 16, 2013	
Temperature / Humidity	23deg.C , 36%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11b , PN9, worst data mode 1Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	9.994	> 0.500
2437.0000	9.996	> 0.500
2462.0000	9.998	> 0.500

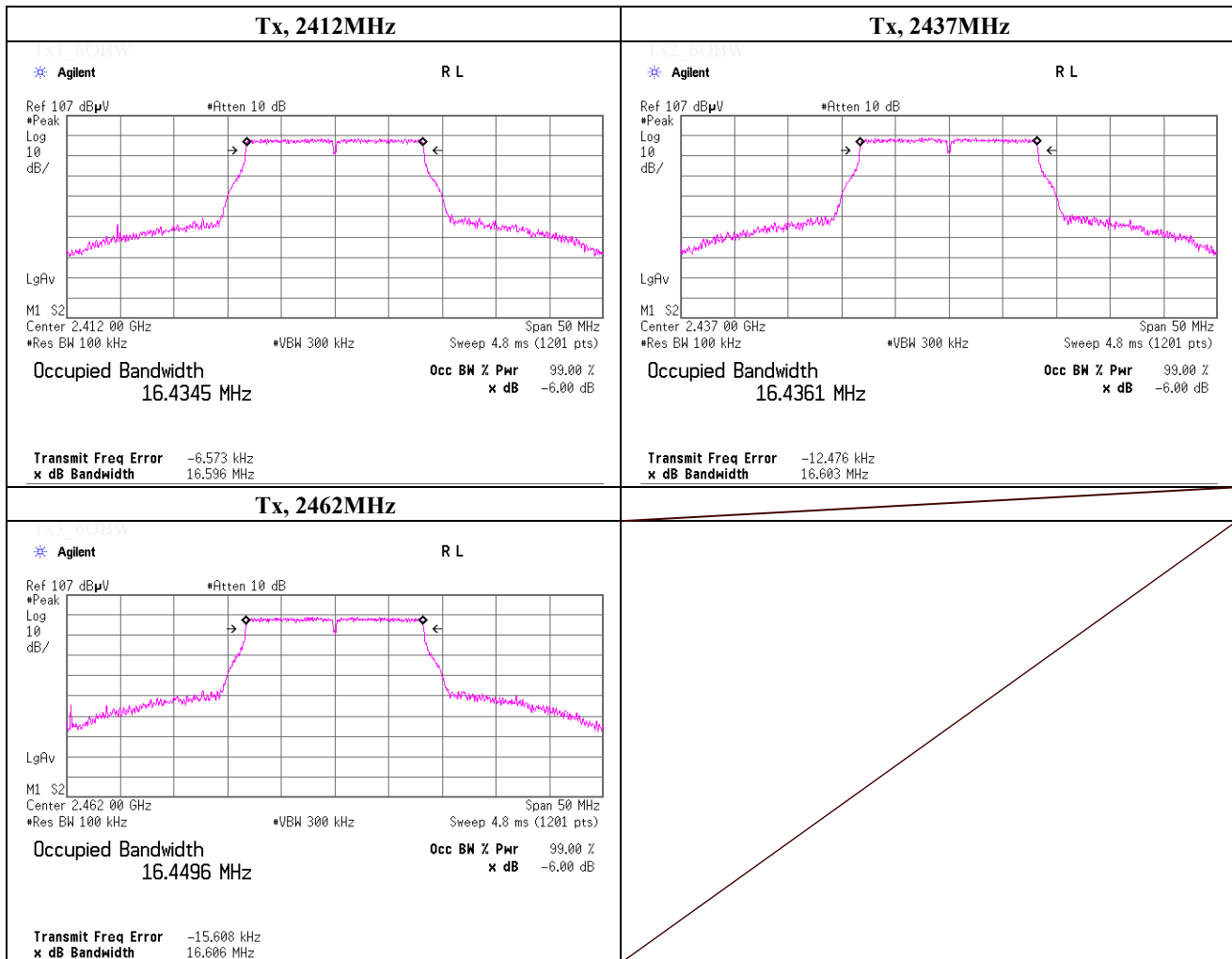


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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 16, 2013	
Temperature / Humidity	23deg.C , 36%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.596	> 0.500
2437.0000	16.603	> 0.500
2462.0000	16.606	> 0.500

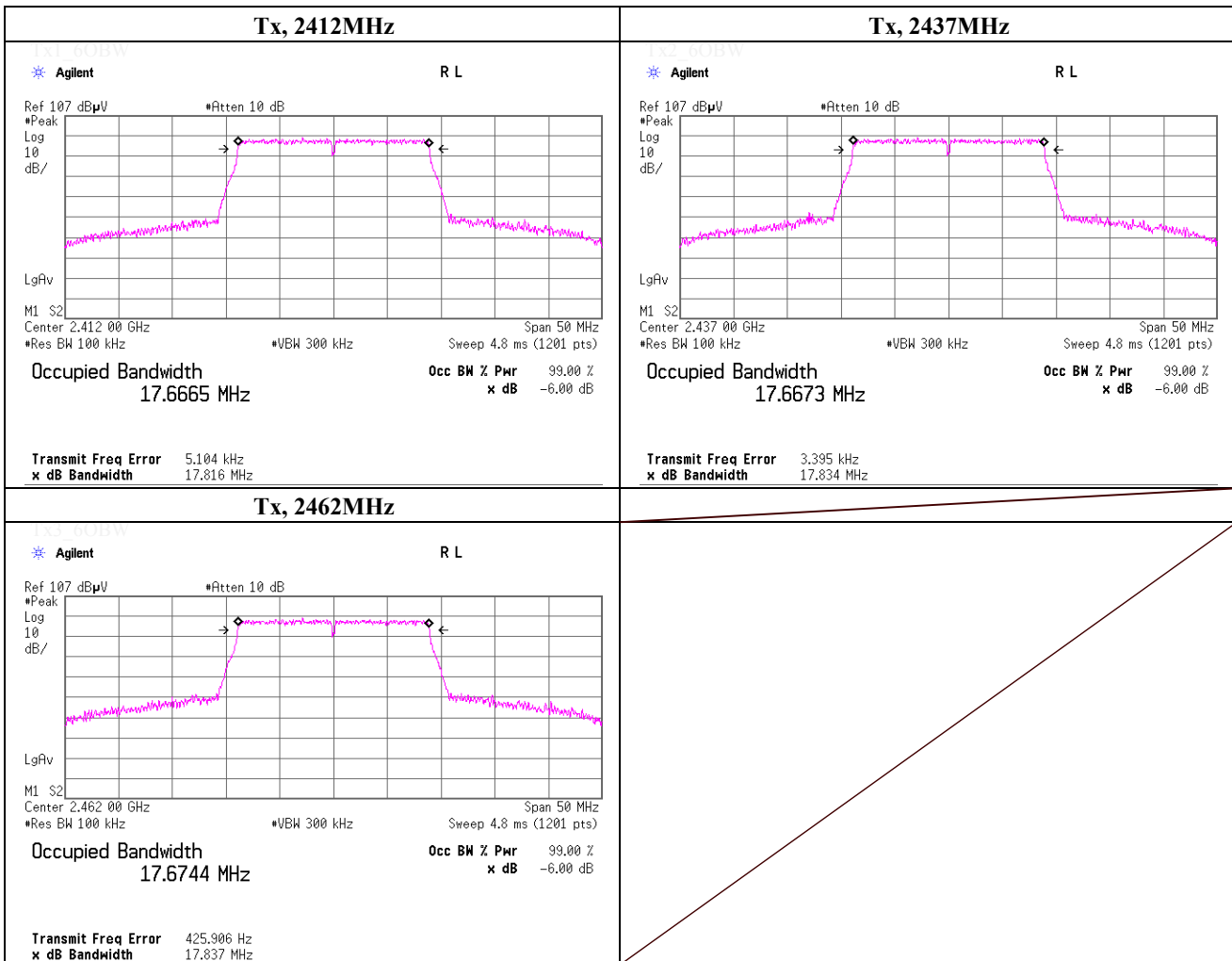


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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 16, 2013	
Temperature / Humidity	23deg.C , 36%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	17.816	> 0.500
2437.0000	17.834	> 0.500
2462.0000	17.837	> 0.500

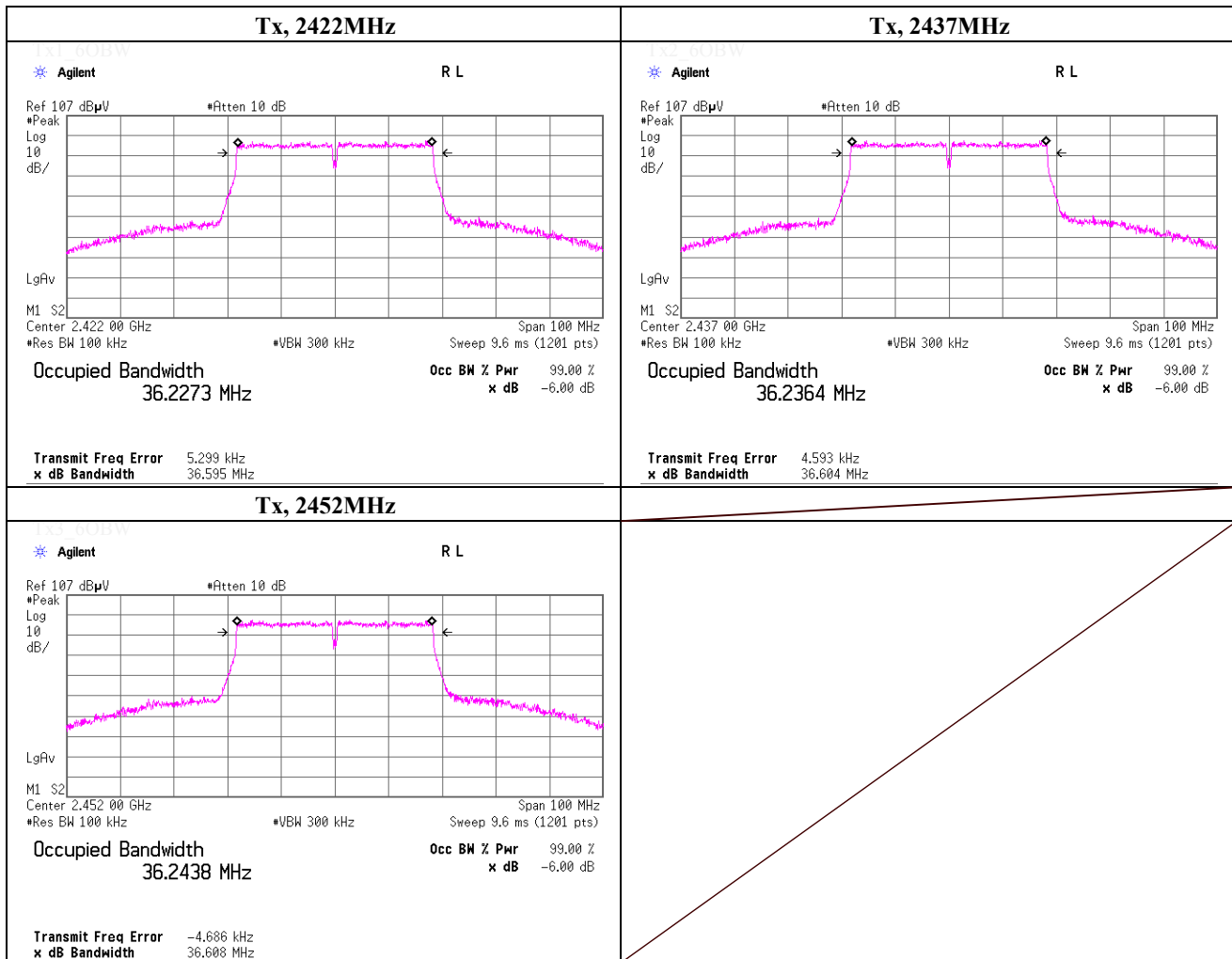


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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 16, 2013	
Temperature / Humidity	23deg.C , 36%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n(40HT), PN9, worst data mode 4(MCS)	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2422.0000	36.595	> 0.500
2437.0000	36.604	> 0.500
2452.0000	36.608	> 0.500

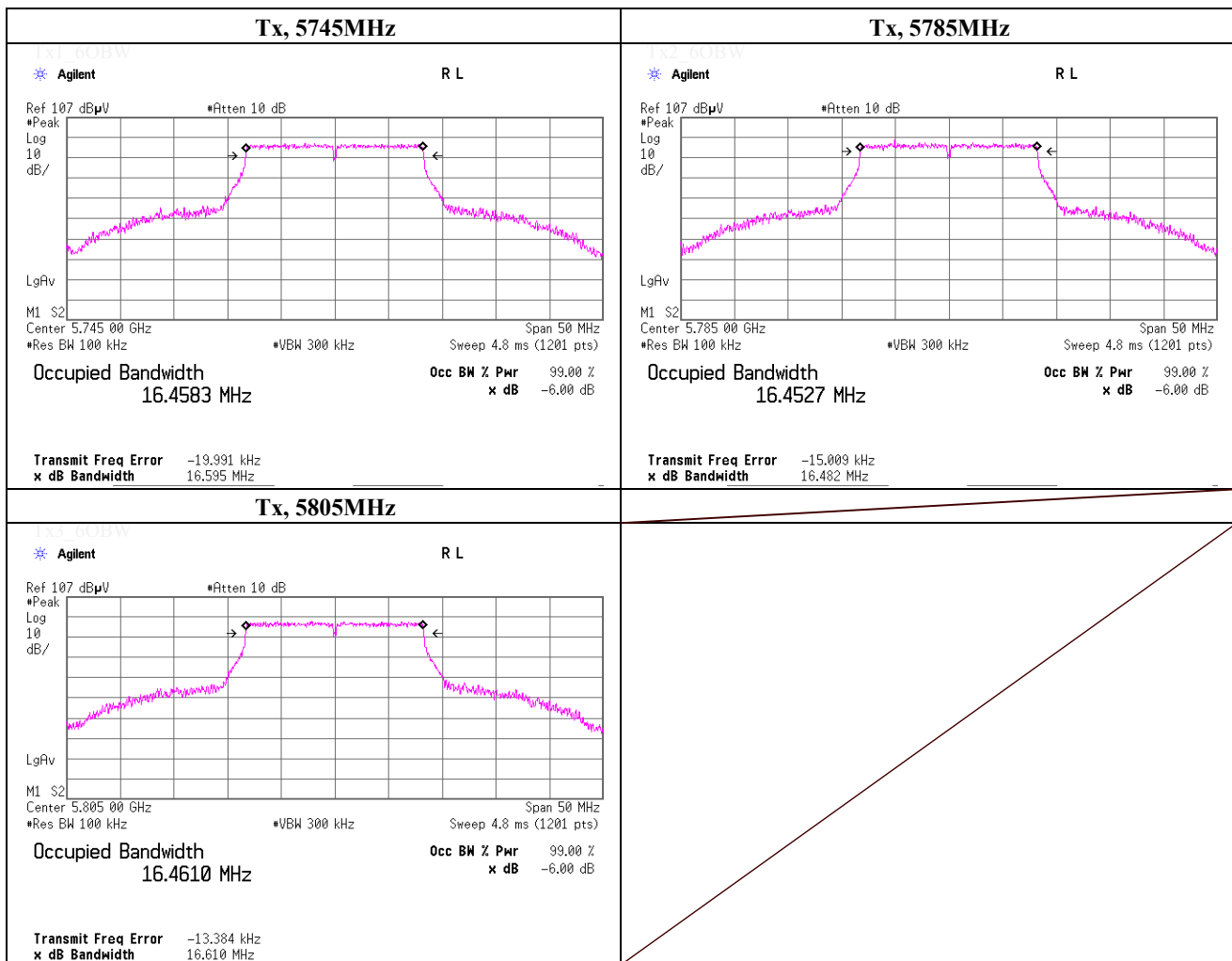


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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 17, 2013	
Temperature / Humidity	24deg.C , 32%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11a, PN9, worst data mode 6Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
5745.0000	16.595	> 0.500
5785.0000	16.482	> 0.500
5805.0000	16.610	> 0.500

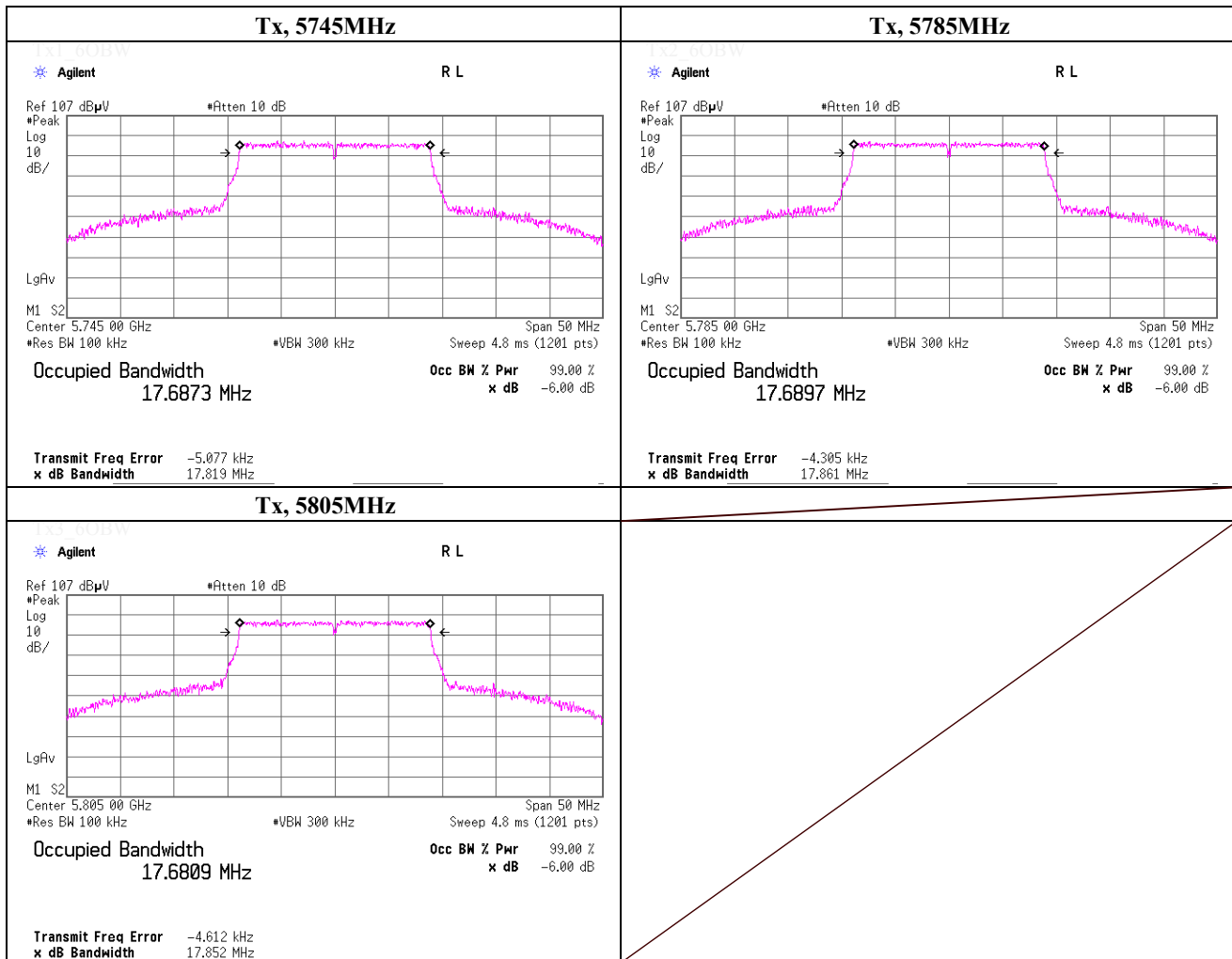


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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 17, 2013	
Temperature / Humidity	24deg.C , 32%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
5745.0000	17.819	> 0.500
5785.0000	17.861	> 0.500
5805.0000	17.852	> 0.500

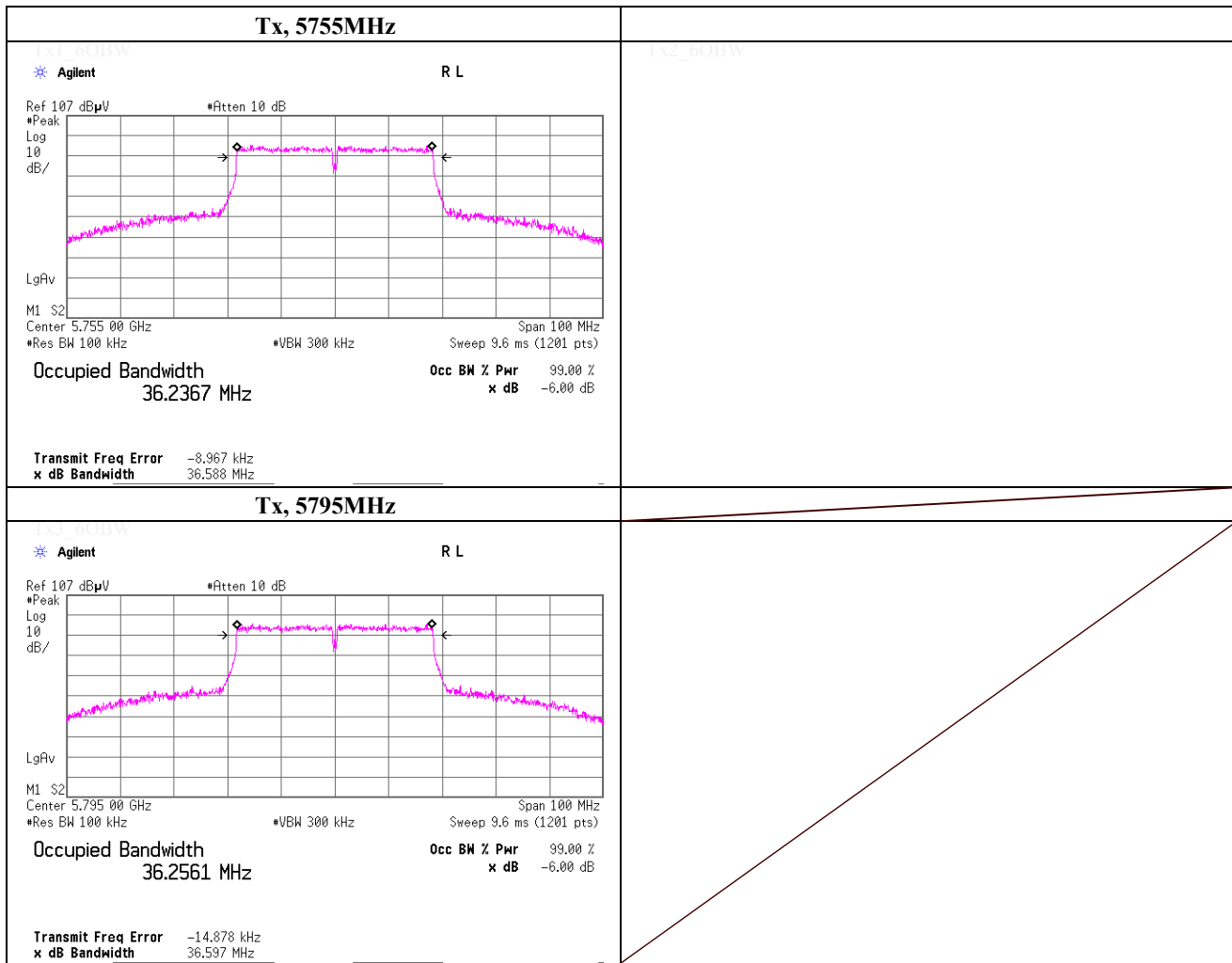


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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 17, 2013	
Temperature / Humidity	24deg.C , 32%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n(40HT), PN9, worst data mode 4(MCS)	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
5755.0000	36.588	> 0.500
5795.0000	36.597	> 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 January 15, 2013
 Temperature / Humidity 22deg.C , 40%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	5.40	0.42	9.97	15.79	37.93	30.00	1000	14.21
Mid	2437.0	5.56	0.42	9.97	15.95	39.36	30.00	1000	14.05
High	2462.0	5.52	0.42	9.97	15.91	38.99	30.00	1000	14.09

Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + 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]	
	1	2412.0	5.40	0.42	9.97	15.79	37.93	30.00	1000	14.21
	2	2412.0	5.32	0.42	9.97	15.71	37.24	30.00	1000	14.29
	5.5	2412.0	4.83	0.42	9.97	15.22	33.27	30.00	1000	14.78
	11	2412.0	5.35	0.42	9.97	15.74	37.50	30.00	1000	14.26

Worst

Reference data for SAR testing

(* AV: Average)

	Data rate	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result	
	[Mbps]					[dBm]	[mW]
	1	2412.0	2.50	0.42	9.97	12.89	19.45
	2	2412.0	2.84	0.42	9.97	13.23	21.04
	5.5	2412.0	2.90	0.42	9.97	13.29	21.33
	11	2412.0	2.85	0.42	9.97	13.24	21.09

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.5 Shielded Room
 Date January 15, 2013
 Temperature / Humidity 22deg.C , 40%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	12.95	0.42	9.97	23.34	215.77	30.00	1000	6.66
Mid	2437.0	13.01	0.42	9.97	23.40	218.78	30.00	1000	6.60
High	2462.0	12.89	0.42	9.97	23.28	212.81	30.00	1000	6.72

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 [dB]
					[dBm]	[mW]	[dBm]	[mW]	
6	2412.0	12.95	0.42	9.97	23.34	215.77	30.00	1000	6.66
9	2412.0	12.35	0.42	9.97	22.74	187.93	30.00	1000	7.26
12	2412.0	12.57	0.42	9.97	22.96	197.70	30.00	1000	7.04
18	2412.0	11.90	0.42	9.97	22.29	169.43	30.00	1000	7.71
24	2412.0	12.89	0.42	9.97	23.28	212.81	30.00	1000	6.72
36	2412.0	12.70	0.42	9.97	23.09	203.70	30.00	1000	6.91
48	2412.0	12.37	0.42	9.97	22.76	188.80	30.00	1000	7.24
54	2412.0	12.57	0.42	9.97	22.96	197.70	30.00	1000	7.04

Worst

Reference data for SAR testing

(* AV: Average)

Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result	
					[dBm]	[mW]
6	2412.0	2.43	0.42	9.97	12.82	19.14
9	2412.0	2.94	0.42	9.97	13.33	21.53
12	2412.0	2.68	0.42	9.97	13.07	20.28
18	2412.0	2.71	0.42	9.97	13.10	20.42
24	2412.0	2.65	0.42	9.97	13.04	20.14
36	2412.0	2.65	0.42	9.97	13.04	20.14
48	2412.0	2.67	0.42	9.97	13.06	20.23
54	2412.0	2.60	0.42	9.97	12.99	19.91

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.5 Shielded Room
 Date January 15, 2013
 Temperature / Humidity 22deg.C , 40%RH
 Engineer Makoto Hosaka
 Mode Tx, IEEE802.11n(20HT), PN9, worst data mode : 0 (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 [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2412.0	11.92	0.42	9.97	22.31	170.22	30.00	1000	7.69
Mid	2437.0	11.88	0.42	9.97	22.27	168.66	30.00	1000	7.73
High	2462.0	11.76	0.42	9.97	22.15	164.06	30.00	1000	7.85

Sample Calculation:

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

[Pre check]

Mode (MCS)	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
0	2412.0	11.92	0.42	9.97	22.31	170.22	30.00	1000	7.69
1	2412.0	11.85	0.42	9.97	22.24	167.49	30.00	1000	7.76
2	2412.0	11.75	0.42	9.97	22.14	163.68	30.00	1000	7.86
3	2412.0	11.88	0.42	9.97	22.27	168.66	30.00	1000	7.73
4	2412.0	11.89	0.42	9.97	22.28	169.04	30.00	1000	7.72
5	2412.0	11.87	0.42	9.97	22.26	168.27	30.00	1000	7.74
6	2412.0	11.86	0.42	9.97	22.25	167.88	30.00	1000	7.75
7	2412.0	11.84	0.42	9.97	22.23	167.11	30.00	1000	7.77

Worst

Reference data for SAR testing

(* AV: Average)

Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result	
					[dBm]	[mW]
0	2412.0	2.46	0.42	9.97	12.85	19.28
1	2412.0	2.75	0.42	9.97	13.14	20.61
2	2412.0	2.66	0.42	9.97	13.05	20.18
3	2412.0	2.72	0.42	9.97	13.11	20.46
4	2412.0	2.76	0.42	9.97	13.15	20.65
5	2412.0	2.67	0.42	9.97	13.06	20.23
6	2412.0	2.67	0.42	9.97	13.06	20.23
7	2412.0	2.65	0.42	9.97	13.04	20.14

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.5 Shielded Room
 Date January 15, 2013
 Temperature / Humidity 22deg.C , 40%RH
 Engineer Makoto Hosaka
 Mode Tx, IEEE802.11n(40HT), PN9, worst data mode : 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 [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	2422.0	13.09	0.42	9.97	23.48	222.84	30.00	1000	6.52
Mid	2437.0	13.11	0.42	9.97	23.50	223.87	30.00	1000	6.50
High	2452.0	13.13	0.42	9.97	23.52	224.91	30.00	1000	6.48

Sample Calculation:

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

[Pre check]

Mode (MCS)	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
0	2422.0	12.42	0.42	9.97	22.81	190.99	30.00	1000	7.19
1	2422.0	12.37	0.42	9.97	22.76	188.80	30.00	1000	7.24
2	2422.0	12.93	0.42	9.97	23.32	214.78	30.00	1000	6.68
3	2422.0	13.08	0.42	9.97	23.47	222.33	30.00	1000	6.53
4	2422.0	13.09	0.42	9.97	23.48	222.84	30.00	1000	6.52
5	2422.0	13.04	0.42	9.97	23.43	220.29	30.00	1000	6.57
6	2422.0	12.84	0.42	9.97	23.23	210.38	30.00	1000	6.77
7	2422.0	12.59	0.42	9.97	22.98	198.61	30.00	1000	7.02

Worst

Reference data for SAR testing

(* AV: Average)

Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result	
					[dBm]	[mW]
0	2422.0	2.52	0.42	9.97	12.91	19.54
1	2422.0	3.06	0.42	9.97	13.45	22.13
2	2422.0	2.80	0.42	9.97	13.19	20.84
3	2422.0	2.70	0.42	9.97	13.09	20.37
4	2422.0	3.13	0.42	9.97	13.52	22.49
5	2422.0	3.11	0.42	9.97	13.50	22.39
6	2422.0	3.06	0.42	9.97	13.45	22.13
7	2422.0	3.04	0.42	9.97	13.43	22.03

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.5 Shielded Room
 Date January 15, 2013
 Temperature / Humidity 22deg.C , 40%RH
 Engineer Makoto Hosaka
 Mode Tx, IEEE802.11a, 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	5745.0	10.18	0.85	9.98	21.01	126.18	30.00	1000	8.99
Mid	5785.0	10.35	0.85	9.99	21.19	131.52	30.00	1000	8.81
High	5805.0	10.37	0.85	9.99	21.21	132.13	30.00	1000	8.79

Sample Calculation:

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

[Pre check]

	Data rate [Mbps]	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
						[dBm]	[mW]	[dBm]	[mW]	
	6	5745.0	10.18	0.85	9.98	21.01	126.18	30.00	1000	8.99
	9	5745.0	9.50	0.85	9.98	20.33	107.89	30.00	1000	9.67
	12	5745.0	9.83	0.85	9.98	20.66	116.41	30.00	1000	9.34
	18	5745.0	9.44	0.85	9.98	20.27	106.41	30.00	1000	9.73
	24	5745.0	10.12	0.85	9.98	20.95	124.45	30.00	1000	9.05
	36	5745.0	10.15	0.85	9.98	20.98	125.31	30.00	1000	9.02
	48	5745.0	9.92	0.85	9.98	20.75	118.85	30.00	1000	9.25
	54	5745.0	10.16	0.85	9.98	20.99	125.60	30.00	1000	9.01

Worst

Reference data for SAR testing

(* AV: Average)

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result	
						[dBm]	[mW]
	6	5745.0	1.40	0.85	9.98	12.23	16.71
	9	5745.0	1.30	0.85	9.98	12.13	16.33
	12	5745.0	1.35	0.85	9.98	12.18	16.52
	18	5745.0	1.41	0.85	9.98	12.24	16.75
	24	5745.0	1.35	0.85	9.98	12.18	16.52
	36	5745.0	1.22	0.85	9.98	12.05	16.03
	48	5745.0	1.22	0.85	9.98	12.05	16.03
	54	5745.0	1.21	0.85	9.98	12.04	16.00

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.5 Shielded Room
 Date January 15, 2013
 Temperature / Humidity 22deg.C , 40%RH
 Engineer Makoto Hosaka
 Mode Tx, IEEE802.11n(20HT), PN9, worst data mode : 0 (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 [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	5745.0	9.85	0.85	9.98	20.68	116.95	30.00	1000	9.32
Mid	5785.0	10.51	0.85	9.99	21.35	136.46	30.00	1000	8.65
High	5805.0	10.14	0.85	9.99	20.98	125.31	30.00	1000	9.02

Sample Calculation:

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

[Pre check]

Mode (MCS)	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
0	5745.0	9.85	0.85	9.98	20.68	116.95	30.00	1000	9.32
1	5745.0	9.55	0.85	9.98	20.38	109.14	30.00	1000	9.62
2	5745.0	9.65	0.85	9.98	20.48	111.69	30.00	1000	9.52
3	5745.0	9.58	0.85	9.98	20.41	109.90	30.00	1000	9.59
4	5745.0	9.50	0.85	9.98	20.33	107.89	30.00	1000	9.67
5	5745.0	9.44	0.85	9.98	20.27	106.41	30.00	1000	9.73
6	5745.0	9.51	0.85	9.98	20.34	108.14	30.00	1000	9.66
7	5745.0	9.61	0.85	9.98	20.44	110.66	30.00	1000	9.56

Worst

Reference data for SAR testing

(* AV: Average)

Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result	
					[dBm]	[mW]
0	5745.0	1.28	0.85	9.98	12.11	16.26
1	5745.0	1.25	0.85	9.98	12.08	16.14
2	5745.0	1.30	0.85	9.98	12.13	16.33
3	5745.0	1.26	0.85	9.98	12.09	16.18
4	5745.0	1.27	0.85	9.98	12.10	16.22
5	5745.0	1.25	0.85	9.98	12.08	16.14
6	5745.0	1.21	0.85	9.98	12.04	16.00
7	5745.0	1.27	0.85	9.98	12.10	16.22

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.5 Shielded Room
 Date January 15, 2013
 Temperature / Humidity 22deg.C , 40%RH
 Engineer Makoto Hosaka
 Mode Tx, IEEE802.11n(40HT), PN9, worst data mode : 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 [dB]
					[dBm]	[mW]	[dBm]	[mW]	
Low	5755.0	10.07	0.85	9.99	20.91	123.31	30.00	1000	9.09
High	5795.0	10.06	0.85	9.99	20.90	123.03	30.00	1000	9.10

Sample Calculation:

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

[Pre check]

Mode (MCS)	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
0	5755.0	9.71	0.85	9.99	20.55	113.50	30.00	1000	9.45
1	5755.0	9.52	0.85	9.99	20.36	108.64	30.00	1000	9.64
2	5755.0	9.81	0.85	9.99	20.65	116.14	30.00	1000	9.35
3	5755.0	10.03	0.85	9.99	20.87	122.18	30.00	1000	9.13
4	5755.0	10.07	0.85	9.99	20.91	123.31	30.00	1000	9.09
5	5755.0	10.05	0.85	9.99	20.89	122.74	30.00	1000	9.11
6	5755.0	9.75	0.85	9.99	20.59	114.55	30.00	1000	9.41
7	5755.0	9.44	0.85	9.99	20.28	106.66	30.00	1000	9.72

Worst

Reference data for SAR testing

(* AV: Average)

Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result	
					[dBm]	[mW]
0	5755.0	1.29	0.85	9.99	12.13	16.33
1	5755.0	1.28	0.85	9.99	12.12	16.29
2	5755.0	1.24	0.85	9.99	12.08	16.14
3	5755.0	1.18	0.85	9.99	12.02	15.92
4	5755.0	1.22	0.85	9.99	12.06	16.07
5	5755.0	1.21	0.85	9.99	12.05	16.03
6	5755.0	1.24	0.85	9.99	12.08	16.14
7	5755.0	1.23	0.85	9.99	12.07	16.11

Sample Calculation:

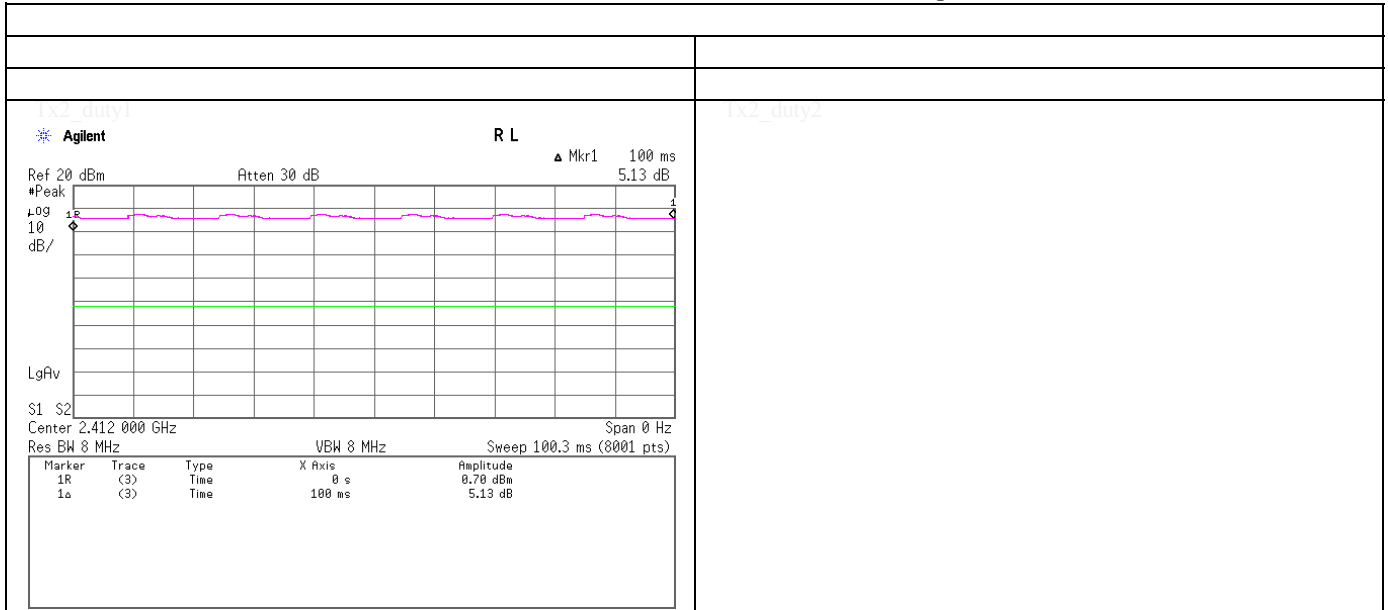
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss

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Burst rate confirmation

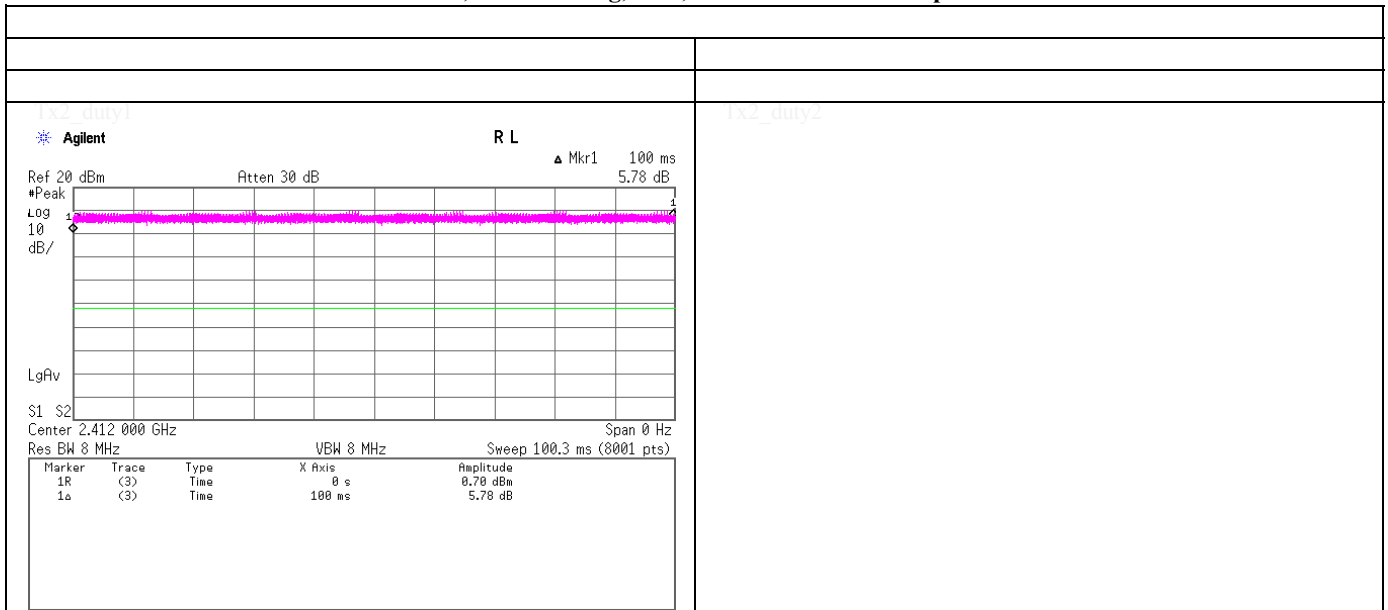
Tx, IEEE802.11b , PN9, worst data mode 1Mbps



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Burst rate confirmation

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



UL Japan, Inc.

Shonan EMC Lab.

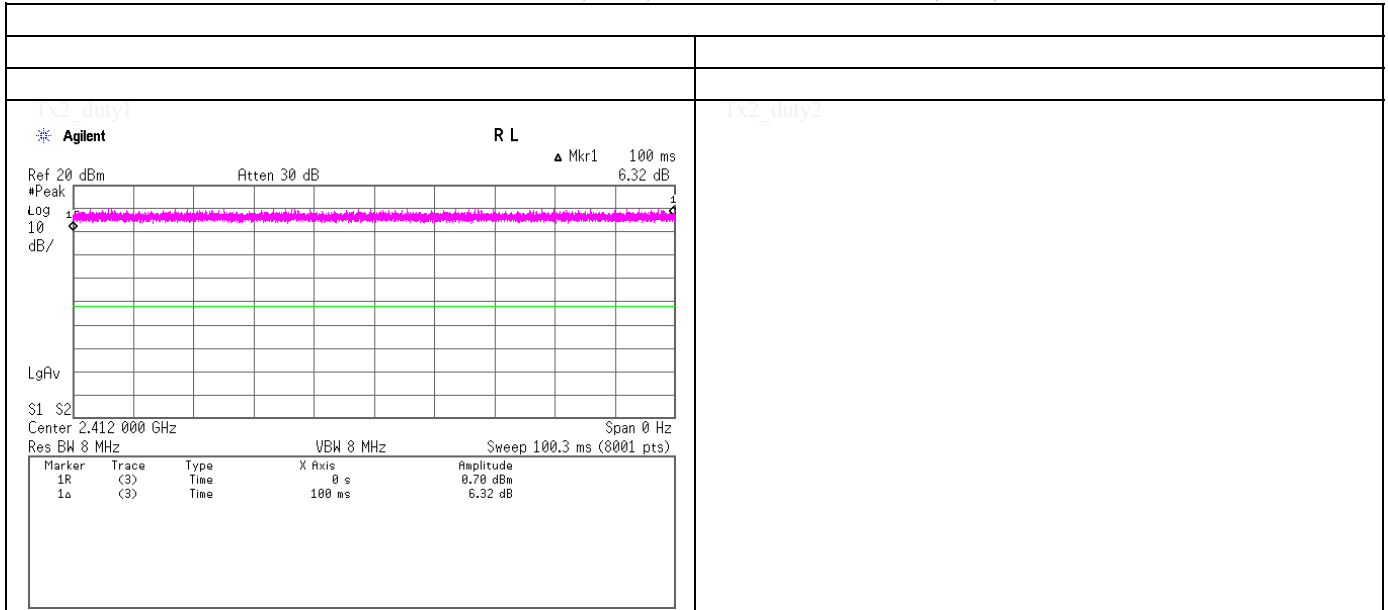
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

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Burst rate confirmation

Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)



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Shonan EMC Lab.

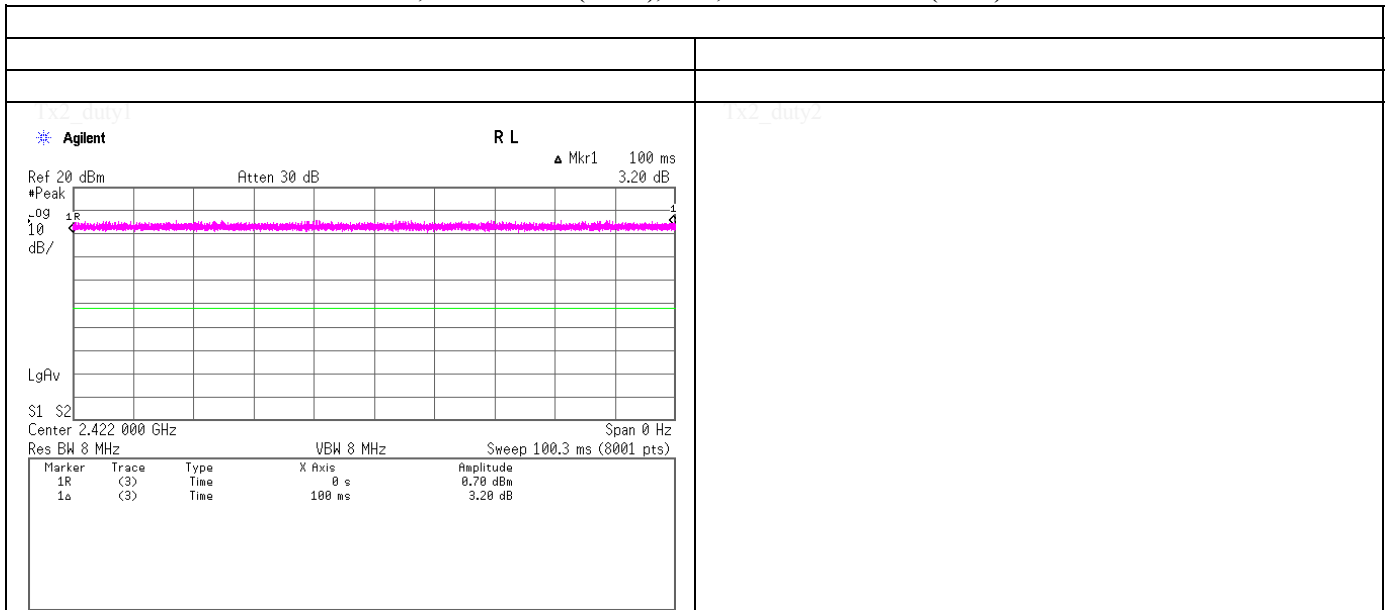
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Burst rate confirmation

Tx, IEEE802.11n(40HT), PN9, worst data mode 4(MCS)



UL Japan, Inc.

Shonan EMC Lab.

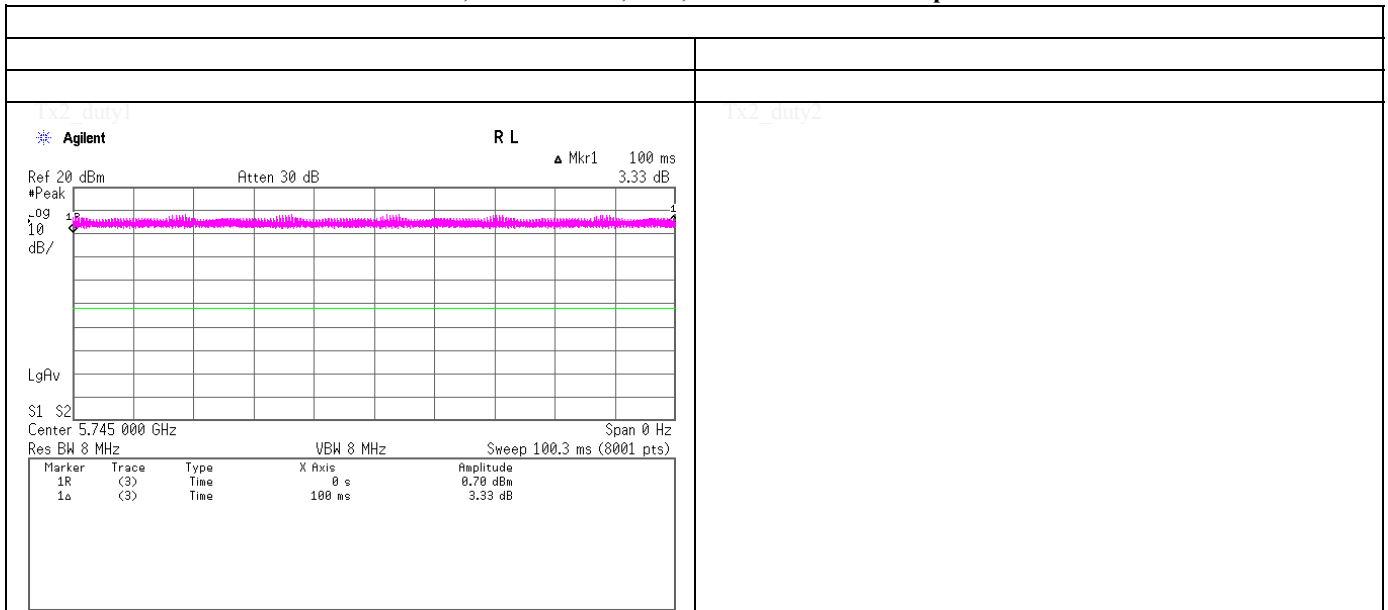
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Burst rate confirmation

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



UL Japan, Inc.

Shonan EMC Lab.

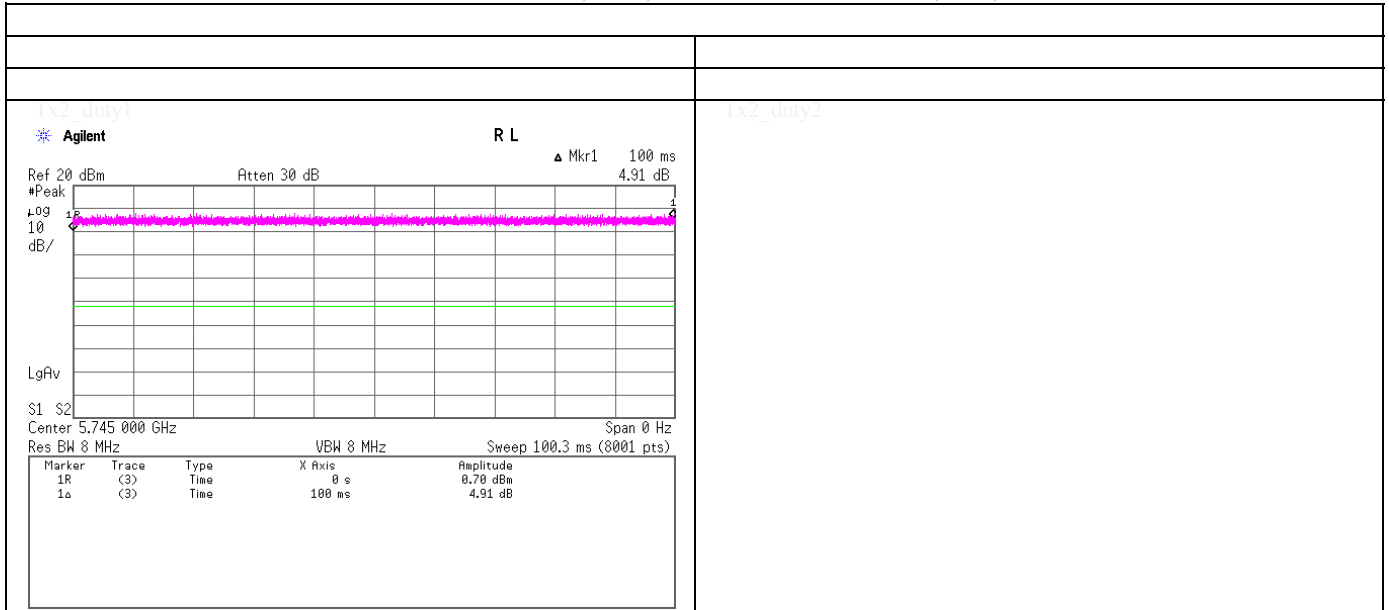
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Burst rate confirmation

Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)



UL Japan, Inc.

Shonan EMC Lab.

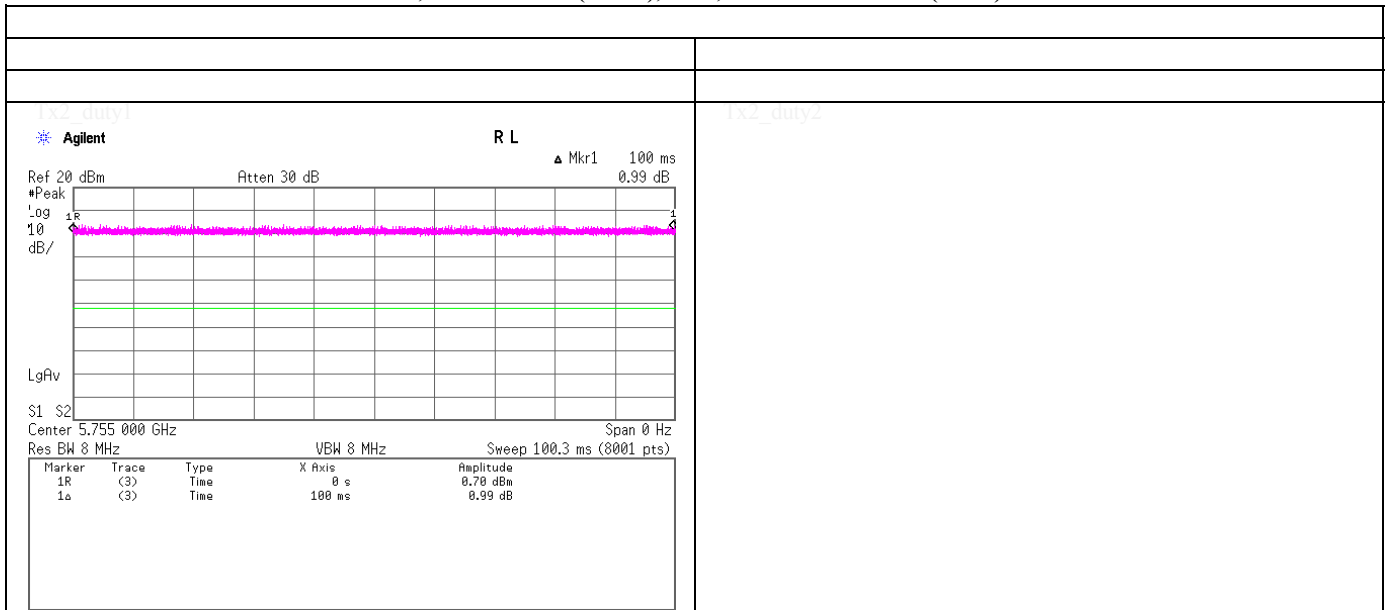
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Burst rate confirmation

Tx, IEEE802.11n(40HT), PN9, worst data mode 4(MCS)



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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 18, 2013 January 21, 2013 January 22, 2013
 Temperature / Humidity 26 deg.C, 58 %RH 22 deg.C, 38 %RH 22 deg.C, 48 %RH
 Engineer TatsuyaArai Makoto Hosaka Makoto Hosaka
 Mode Tx, 2412 MHz
 Tx, IEEE802.11b, 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	46.7	27.4	14.2	41.4	46.9	73.9	27.0	118	293	
Hori.	4824.000	PK	58.5	31.1	6.8	41.2	55.2	73.9	18.7	100	88	
Hori.	7236.000	PK	49.0	36.6	8.4	41.4	52.6	73.9	21.3	100	0	
Hori.	9648.000	PK	45.9	38.6	9.5	38.9	55.1	73.9	18.8	100	0	
Hori.	12060.000	PK	47.1	39.5	10.8	39.4	58.0	73.9	15.9	100	0	
Hori.	2390.000	AV	36.6	27.4	14.2	41.4	36.8	53.9	17.1	118	293	
Hori.	4824.000	AV	56.1	31.1	6.8	41.2	52.8	53.9	1.1	100	88	
Hori.	7236.000	AV	38.3	36.6	8.4	41.4	41.9	53.9	12.0	100	0	
Hori.	9648.000	AV	35.0	38.6	9.5	38.9	44.2	53.9	9.7	100	0	
Hori.	12060.000	AV	36.5	39.5	10.8	39.4	47.4	53.9	6.5	100	0	
Vert.	2390.000	PK	46.8	27.4	14.2	41.4	47.0	73.9	26.9	115	83	
Vert.	4824.000	PK	56.5	31.1	6.8	41.2	53.2	73.9	20.7	100	23	
Vert.	7236.000	PK	49.1	36.6	8.4	41.4	52.7	73.9	21.2	100	0	
Vert.	9648.000	PK	46.4	38.6	9.5	38.9	55.6	73.9	18.3	100	0	
Vert.	12060.000	PK	47.2	39.5	10.8	39.4	58.1	73.9	15.8	100	0	
Vert.	2390.000	AV	36.9	27.4	14.2	41.4	37.1	53.9	16.8	115	83	
Vert.	4824.000	AV	54.5	31.1	6.8	41.2	51.2	53.9	2.7	100	23	
Vert.	7236.000	AV	39.7	36.6	8.4	41.4	43.3	53.9	10.6	100	0	
Vert.	9648.000	AV	35.2	38.6	9.5	38.9	44.4	53.9	9.5	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	92.3	27.5	14.2	41.4	92.6	-	-	
Hori.	2397.270	PK	44.4	27.4	14.2	41.4	44.6	72.6	28.0	
Hori.	2400.000	PK	39.0	27.4	14.2	41.4	39.2	72.6	33.4	
Vert.	2412.000	PK	93.8	27.5	14.2	41.4	94.1	-	-	
Vert.	2397.270	PK	47.5	27.4	14.2	41.4	47.7	74.1	26.4	
Vert.	2400.000	PK	39.7	27.4	14.2	41.4	39.9	74.1	34.2	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 18, 2013 January 21, 2013 January 22, 2013
 Temperature / Humidity 26 deg.C, 58 %RH 22 deg.C, 38 %RH 22 deg.C, 48 %RH
 Engineer TatsuyaArai Makoto Hosaka Makoto Hosaka
 Mode Tx, 2437 MHz
 Tx, IEEE802.11b, 1Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	58.5	31.3	6.9	41.1	55.6	73.9	18.3	136	102	
Hori.	7311.000	PK	50.8	36.6	8.4	41.4	54.4	73.9	19.5	154	268	
Hori.	9748.000	PK	46.2	38.7	9.5	38.9	55.5	73.9	18.4	100	0	
Hori.	12185.000	PK	46.1	39.5	10.8	39.3	57.1	73.9	16.8	100	0	
Hori.	4874.000	AV	55.8	31.3	6.9	41.1	52.9	53.9	1.0	136	102	
Hori.	7311.000	AV	42.8	36.6	8.4	41.4	46.4	53.9	7.5	154	268	
Hori.	9748.000	AV	35.3	38.7	9.5	38.9	44.6	53.9	9.3	100	0	
Hori.	12185.000	AV	35.7	39.5	10.8	39.3	46.7	53.9	7.2	100	0	
Vert.	4874.000	PK	57.6	31.3	6.9	41.1	54.7	73.9	19.2	126	21	
Vert.	7311.000	PK	52.7	36.6	8.4	41.4	56.3	73.9	17.6	100	80	
Vert.	9748.000	PK	45.3	38.7	9.5	38.9	54.6	73.9	19.3	100	0	
Vert.	12185.000	PK	46.2	39.5	10.8	39.3	57.2	73.9	16.7	100	0	
Vert.	4874.000	AV	55.2	31.3	6.9	41.1	52.3	53.9	1.6	126	21	
Vert.	7311.000	AV	44.7	36.6	8.4	41.4	48.3	53.9	5.6	100	80	
Vert.	9748.000	AV	35.1	38.7	9.5	38.9	44.4	53.9	9.5	100	0	
Vert.	12185.000	AV	35.9	39.5	10.8	39.3	46.9	53.9	7.0	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 UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 18, 2013 January 21, 2013 January 22, 2013
 Temperature / Humidity 26 deg.C, 58 %RH 22 deg.C, 38 %RH 22 deg.C, 48 %RH
 Engineer TatsuyaArai Makoto Hosaka Makoto Hosaka
 Mode Tx, 2462 MHz
 Tx, IEEE802.11b, 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	47.2	27.5	14.3	41.4	47.6	73.9	26.3	122	148	
Hori.	4924.000	PK	58.3	31.5	6.9	41.0	55.7	73.9	18.2	100	92	
Hori.	7386.000	PK	53.2	36.7	8.4	41.5	56.8	73.9	17.1	148	300	
Hori.	9848.000	PK	46.2	38.9	9.5	38.9	55.7	73.9	18.2	100	0	
Hori.	12310.000	PK	47.1	39.5	10.8	39.3	58.1	73.9	15.8	100	0	
Hori.	2483.500	AV	37.7	27.5	14.3	41.4	38.1	53.9	15.8	122	148	
Hori.	4924.000	AV	55.9	31.5	6.9	41.0	53.3	53.9	0.6	100	92	
Hori.	7386.000	AV	46.6	36.7	8.4	41.5	50.2	53.9	3.7	148	300	
Hori.	9848.000	AV	35.4	38.9	9.5	38.9	44.9	53.9	9.0	100	0	
Hori.	12310.000	AV	35.5	39.5	10.8	39.3	46.5	53.9	7.4	100	0	
Vert.	2483.500	PK	47.2	27.5	14.3	41.4	47.6	73.9	26.3	116	111	
Vert.	4924.000	PK	56.8	31.5	6.9	41.0	54.2	73.9	19.7	100	20	
Vert.	7386.000	PK	54.5	36.7	8.4	41.5	58.1	73.9	15.8	100	87	
Vert.	9848.000	PK	46.3	38.9	9.5	38.9	55.8	73.9	18.1	100	0	
Vert.	12310.000	PK	45.8	39.5	10.8	39.3	56.8	73.9	17.1	100	0	
Vert.	2483.500	AV	37.4	27.5	14.3	41.4	37.8	53.9	16.1	116	111	
Vert.	4924.000	AV	53.9	31.5	6.9	41.0	51.3	53.9	2.6	100	20	
Vert.	7386.000	AV	47.4	36.7	8.4	41.5	51.0	53.9	2.9	100	87	
Vert.	9848.000	AV	35.3	38.9	9.5	38.9	44.8	53.9	9.1	100	0	
Vert.	12310.000	AV	35.4	39.5	10.8	39.3	46.4	53.9	7.5	100	0	

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

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

*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 UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date January 18, 2013 January 21, 2013 January 22, 2013
Temperature / Humidity 26 deg.C, 58 %RH 22 deg.C, 38 %RH 22 deg.C, 48 %RH
Engineer TatsuyaArai Makoto Hosaka Makoto Hosaka
Mode Tx, 2412 MHz
 Tx, IEEE802.11g, 6Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	54.0	27.4	14.2	41.4	54.2	73.9	19.7	100	150	
Hori.	4824.000	PK	57.8	31.1	6.8	41.2	54.5	73.9	19.4	100	103	
Hori.	7236.000	PK	51.2	36.6	8.4	41.4	54.8	73.9	19.1	100	0	
Hori.	9648.000	PK	45.3	38.6	9.5	38.9	54.5	73.9	19.4	100	0	
Hori.	12060.000	PK	47.1	39.5	10.8	39.4	58.0	73.9	15.9	100	0	
Hori.	2390.000	AV	41.3	27.4	14.2	41.4	41.5	53.9	12.4	100	150	
Hori.	4824.000	AV	46.7	31.1	6.8	41.2	43.4	53.9	10.5	100	103	
Hori.	7236.000	AV	39.1	36.6	8.4	41.4	42.7	53.9	11.2	100	0	
Hori.	9648.000	AV	35.2	38.6	9.5	38.9	44.4	53.9	9.5	100	0	
Hori.	12060.000	AV	36.4	39.5	10.8	39.4	47.3	53.9	6.6	100	0	
Vert.	2390.000	PK	54.4	27.4	14.2	41.4	54.6	73.9	19.3	118	88	
Vert.	4824.000	PK	56.9	31.1	6.8	41.2	53.6	73.9	20.3	100	24	
Vert.	7236.000	PK	50.4	36.6	8.4	41.4	54.0	73.9	19.9	100	82	
Vert.	9648.000	PK	46.2	38.6	9.5	38.9	55.4	73.9	18.5	100	0	
Vert.	12060.000	PK	48.3	39.5	10.8	39.4	59.2	73.9	14.7	100	0	
Vert.	2390.000	AV	41.8	27.4	14.2	41.4	42.0	53.9	11.9	118	88	
Vert.	4824.000	AV	45.3	31.1	6.8	41.2	42.0	53.9	11.9	100	24	
Vert.	7236.000	AV	40.2	36.6	8.4	41.4	43.8	53.9	10.1	100	82	
Vert.	9648.000	AV	35.5	38.6	9.5	38.9	44.7	53.9	9.2	100	0	
Vert.	12060.000	AV	36.7	39.5	10.8	39.4	47.6	53.9	6.3	100	0	

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

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

*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	89.2	27.5	14.2	41.4	89.5	-	-	
Hori.	2400.000	PK	48.4	27.4	14.2	41.4	48.6	69.5	20.9	
Vert.	2412.000	PK	90.2	27.5	14.2	41.4	90.5	-	-	
Vert.	2400.000	PK	49.4	27.4	14.2	41.4	49.6	70.5	20.9	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 18, 2013 January 21, 2013 January 22, 2013
 Temperature / Humidity 26 deg.C, 58 %RH 22 deg.C, 38 %RH 22 deg.C, 48 %RH
 Engineer TatsuyaArai Makoto Hosaka Makoto Hosaka
 Mode Tx, 2437 MHz
 Tx, IEEE802.11g, 6Mbps

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	58.2	31.3	6.9	41.1	55.3	73.9	18.6	100	104	
Hori.	7311.000	PK	51.5	36.6	8.4	41.4	55.1	73.9	18.8	155	280	
Hori.	9748.000	PK	46.2	38.7	9.5	38.9	55.5	73.9	18.4	100	0	
Hori.	12185.000	PK	46.8	39.5	10.8	39.3	57.8	73.9	16.1	100	0	
Hori.	4874.000	AV	46.7	31.3	6.9	41.1	43.8	53.9	10.1	100	104	
Hori.	7311.000	AV	40.7	36.6	8.4	41.4	44.3	53.9	9.6	155	280	
Hori.	9748.000	AV	35.5	38.7	9.5	38.9	44.8	53.9	9.1	100	0	
Hori.	12185.000	AV	35.8	39.5	10.8	39.3	46.8	53.9	7.1	100	0	
Vert.	4874.000	PK	57.0	31.3	6.9	41.1	54.1	73.9	19.8	100	28	
Vert.	7311.000	PK	54.0	36.6	8.4	41.4	57.6	73.9	16.3	100	84	
Vert.	9748.000	PK	45.9	38.7	9.5	38.9	55.2	73.9	18.7	100	0	
Vert.	12185.000	PK	46.7	39.5	10.8	39.3	57.7	73.9	16.2	100	0	
Vert.	4874.000	AV	45.4	31.3	6.9	41.1	42.5	53.9	11.4	100	28	
Vert.	7311.000	AV	42.9	36.6	8.4	41.4	46.5	53.9	7.4	100	84	
Vert.	9748.000	AV	35.4	38.7	9.5	38.9	44.7	53.9	9.2	100	0	
Vert.	12185.000	AV	35.8	39.5	10.8	39.3	46.8	53.9	7.1	100	0	

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

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

*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 UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date January 18, 2013 January 21, 2013 January 22, 2013
Temperature / Humidity 26 deg.C, 58 %RH 22 deg.C, 38 %RH 22 deg.C, 48 %RH
Engineer TatsuyaArai Makoto Hosaka Makoto Hosaka
Mode Tx, 2462 MHz
 Tx, IEEE802.11g, 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	57.1	27.5	14.3	41.4	57.5	73.9	16.4	121	148	
Hori.	4924.000	PK	58.9	31.5	6.9	41.0	56.3	73.9	17.6	100	104	
Hori.	7386.000	PK	54.2	36.7	8.4	41.5	57.8	73.9	16.1	156	245	
Hori.	9848.000	PK	45.4	38.9	9.5	38.9	54.9	73.9	19.0	100	0	
Hori.	12310.000	PK	45.6	39.5	10.8	39.3	56.6	73.9	17.3	100	0	
Hori.	2483.500	AV	44.6	27.5	14.3	41.4	45.0	53.9	8.9	121	148	
Hori.	4924.000	AV	47.9	31.5	6.9	41.0	45.3	53.9	8.6	100	104	
Hori.	7386.000	AV	43.3	36.7	8.4	41.5	46.9	53.9	7.0	156	245	
Hori.	9848.000	AV	35.3	38.9	9.5	38.9	44.8	53.9	9.1	100	0	
Hori.	12310.000	AV	35.3	39.5	10.8	39.3	46.3	53.9	7.6	100	0	
Vert.	2483.500	PK	58.3	27.5	14.3	41.4	58.7	73.9	15.2	115	113	
Vert.	4924.000	PK	57.2	31.5	6.9	41.0	54.6	73.9	19.3	100	26	
Vert.	7386.000	PK	56.3	36.7	8.4	41.5	59.9	73.9	14.0	100	82	
Vert.	9848.000	PK	45.4	38.9	9.5	38.9	54.9	73.9	19.0	100	0	
Vert.	12310.000	PK	45.3	39.5	10.8	39.3	56.3	73.9	17.6	100	0	
Vert.	2483.500	AV	45.6	27.5	14.3	41.4	46.0	53.9	7.9	115	113	
Vert.	4924.000	AV	46.3	31.5	6.9	41.0	43.7	53.9	10.2	100	26	
Vert.	7386.000	AV	45.5	36.7	8.4	41.5	49.1	53.9	4.8	100	82	
Vert.	9848.000	AV	35.3	38.9	9.5	38.9	44.8	53.9	9.1	100	0	
Vert.	12310.000	AV	36.0	39.5	10.8	39.3	47.0	53.9	6.9	100	0	

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

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

*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 UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 18, 2013 January 21, 2013 January 22, 2013
 Temperature / Humidity 26 deg.C, 58 %RH 22 deg.C, 38 %RH 22 deg.C, 48 %RH
 Engineer TatsuyaArai Makoto Hosaka Makoto Hosaka
 Mode Tx, 2412 MHz
 Tx, IEEE802.11n 20HT, MCS0

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	56.6	27.4	14.2	41.4	56.8	73.9	17.1	100	148	
Hori.	4824.000	PK	58.7	31.1	6.8	41.2	55.4	73.9	18.5	100	100	
Hori.	7236.000	PK	50.0	36.6	8.4	41.4	53.6	73.9	20.3	100	0	
Hori.	9648.000	PK	45.1	38.6	9.5	38.9	54.3	73.9	19.6	100	0	
Hori.	12060.000	PK	46.3	39.5	10.8	39.4	57.2	73.9	16.7	100	0	
Hori.	2390.000	AV	42.6	27.4	14.2	41.4	42.8	53.9	11.1	100	148	
Hori.	4824.000	AV	46.8	31.1	6.8	41.2	43.5	53.9	10.4	100	100	
Hori.	7236.000	AV	39.2	36.6	8.4	41.4	42.8	53.9	11.1	100	0	
Hori.	9648.000	AV	35.2	38.6	9.5	38.9	44.4	53.9	9.5	100	0	
Hori.	12060.000	AV	36.6	39.5	10.8	39.4	47.5	53.9	6.4	100	0	
Vert.	2390.000	PK	58.2	27.4	14.2	41.4	58.4	73.9	15.5	115	87	
Vert.	4824.000	PK	57.5	31.1	6.8	41.2	54.2	73.9	19.7	100	23	
Vert.	7236.000	PK	50.0	36.6	8.4	41.4	53.6	73.9	20.3	100	90	
Vert.	9648.000	PK	46.5	38.6	9.5	38.9	55.7	73.9	18.2	100	0	
Vert.	12060.000	PK	47.9	39.5	10.8	39.4	58.8	73.9	15.1	100	0	
Vert.	2390.000	AV	44.1	27.4	14.2	41.4	44.3	53.9	9.6	115	87	
Vert.	4824.000	AV	45.3	31.1	6.8	41.2	42.0	53.9	11.9	100	23	
Vert.	7236.000	AV	39.2	36.6	8.4	41.4	42.8	53.9	11.1	100	90	
Vert.	9648.000	AV	35.8	38.6	9.5	38.9	45.0	53.9	8.9	100	0	
Vert.	12060.000	AV	36.6	39.5	10.8	39.4	47.5	53.9	6.4	100	0	

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

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

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

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2412.000	PK	88.5	27.5	14.2	41.4	88.8	-	-	
Hori.	2400.000	PK	49.3	27.4	14.2	41.4	49.5	68.8	19.3	
Vert.	2412.000	PK	90.7	27.5	14.2	41.4	91.0	-	-	
Vert.	2400.000	PK	51.7	27.4	14.2	41.4	51.9	71.0	19.1	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date January 18, 2013 January 21, 2013 January 22, 2013
Temperature / Humidity 26 deg.C, 58 %RH 22 deg.C, 38 %RH 22 deg.C, 48 %RH
Engineer TatsuyaArai Makoto Hosaka Makoto Hosaka
Mode Tx, 2437 MHz
 Tx, IEEE802.11n 20HT, MCS0

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	58.8	31.3	6.9	41.1	55.9	73.9	18.0	100	103	
Hori.	7311.000	PK	53.9	36.6	8.4	41.4	57.5	73.9	16.4	148	256	
Hori.	9748.000	PK	45.2	38.7	9.5	38.9	54.5	73.9	19.4	100	0	
Hori.	12185.000	PK	46.0	39.5	10.8	39.3	57.0	73.9	16.9	100	0	
Hori.	4874.000	AV	46.6	31.3	6.9	41.1	43.7	53.9	10.2	100	103	
Hori.	7311.000	AV	41.2	36.6	8.4	41.4	44.8	53.9	9.1	148	256	
Hori.	9748.000	AV	35.8	38.7	9.5	38.9	45.1	53.9	8.8	100	0	
Hori.	12185.000	AV	36.0	39.5	10.8	39.3	47.0	53.9	6.9	100	0	
Vert.	4874.000	PK	57.5	31.3	6.9	41.1	54.6	73.9	19.3	100	27	
Vert.	7311.000	PK	54.4	36.6	8.4	41.4	58.0	73.9	15.9	100	87	
Vert.	9748.000	PK	45.8	38.7	9.5	38.9	55.1	73.9	18.8	100	0	
Vert.	12185.000	PK	46.0	39.5	10.8	39.3	57.0	73.9	16.9	100	0	
Vert.	4874.000	AV	44.8	31.3	6.9	41.1	41.9	53.9	12.0	100	27	
Vert.	7311.000	AV	41.9	36.6	8.4	41.4	45.5	53.9	8.4	100	87	
Vert.	9748.000	AV	35.5	38.7	9.5	38.9	44.8	53.9	9.1	100	0	
Vert.	12185.000	AV	35.8	39.5	10.8	39.3	46.8	53.9	7.1	100	0	

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

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

*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 UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 18, 2013 January 21, 2013 January 22, 2013
 Temperature / Humidity 26 deg.C, 58 %RH 22 deg.C, 38 %RH 22 deg.C, 48 %RH
 Engineer TatsuyaArai Makoto Hosaka Makoto Hosaka
 Mode Tx, 2462 MHz
 Tx, IEEE802.11n 20HT, MCS0

(* 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	60.1	27.5	14.3	41.4	60.5	73.9	13.4	120	148	
Hori.	4924.000	PK	60.3	31.5	6.9	41.0	57.7	73.9	16.2	100	100	
Hori.	7386.000	PK	55.8	36.7	8.4	41.5	59.4	73.9	14.5	149	309	
Hori.	9848.000	PK	45.2	38.9	9.5	38.9	54.7	73.9	19.2	100	0	
Hori.	12310.000	PK	45.5	39.5	10.8	39.3	56.5	73.9	17.4	100	0	
Hori.	2483.500	AV	46.7	27.5	14.3	41.4	47.1	53.9	6.8	120	148	
Hori.	4924.000	AV	48.5	31.5	6.9	41.0	45.9	53.9	8.0	100	100	
Hori.	7386.000	AV	43.4	36.7	8.4	41.5	47.0	53.9	6.9	149	309	
Hori.	9848.000	AV	35.1	38.9	9.5	38.9	44.6	53.9	9.3	100	0	
Hori.	12310.000	AV	35.6	39.5	10.8	39.3	46.6	53.9	7.3	100	0	
Vert.	2483.500	PK	61.3	27.5	14.3	41.4	61.7	73.9	12.2	112	112	
Vert.	4924.000	PK	58.7	31.5	6.9	41.0	56.1	73.9	17.8	100	26	
Vert.	7386.000	PK	58.2	36.7	8.4	41.5	61.8	73.9	12.1	100	85	
Vert.	9848.000	PK	46.2	38.9	9.5	38.9	55.7	73.9	18.2	100	0	
Vert.	12310.000	PK	46.0	39.5	10.8	39.3	57.0	73.9	16.9	100	0	
Vert.	2483.500	AV	48.3	27.5	14.3	41.4	48.7	53.9	5.2	112	112	
Vert.	4924.000	AV	45.8	31.5	6.9	41.0	43.2	53.9	10.7	100	26	
Vert.	7386.000	AV	44.7	36.7	8.4	41.5	48.3	53.9	5.6	100	85	
Vert.	9848.000	AV	35.7	38.9	9.5	38.9	45.2	53.9	8.7	100	0	
Vert.	12310.000	AV	35.6	39.5	10.8	39.3	46.6	53.9	7.3	100	0	

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

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

*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 UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 18, 2013 January 21, 2013 January 22, 2013
 Temperature / Humidity 26 deg.C, 58 %RH 22 deg.C, 38 %RH 22 deg.C, 48 %RH
 Engineer TatsuyaArai Makoto Hosaka Makoto Hosaka
 Mode Tx, 2422 MHz
 Tx, IEEE802.11n 40HT, MCS4

(* 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	59.0	27.4	14.2	41.4	59.2	73.9	14.7	100	149	
Hori.	4844.000	PK	55.2	31.2	6.8	41.1	52.1	73.9	21.8	100	101	
Hori.	7266.000	PK	50.3	36.6	8.4	41.4	53.9	73.9	20.0	100	0	
Hori.	9688.000	PK	46.0	38.6	9.5	38.9	55.2	73.9	18.7	100	0	
Hori.	12110.000	PK	47.4	39.5	10.9	39.4	58.4	73.9	15.5	100	0	
Hori.	2390.000	AV	47.0	27.4	14.2	41.4	47.2	53.9	6.7	100	149	
Hori.	4844.000	AV	43.9	31.2	6.8	41.1	40.8	53.9	13.1	100	101	
Hori.	7266.000	AV	38.9	36.6	8.4	41.4	42.5	53.9	11.4	100	0	
Hori.	9688.000	AV	35.6	38.6	9.5	38.9	44.8	53.9	9.1	100	0	
Hori.	12110.000	AV	36.7	39.5	10.9	39.4	47.7	53.9	6.2	100	0	
Vert.	2390.000	PK	60.0	27.4	14.2	41.4	60.2	73.9	13.7	114	81	
Vert.	4844.000	PK	54.1	31.2	6.8	41.1	51.0	73.9	22.9	100	21	
Vert.	7266.000	PK	49.0	36.6	8.4	41.4	52.6	73.9	21.3	100	0	
Vert.	9688.000	PK	45.5	38.6	9.5	38.9	54.7	73.9	19.2	100	0	
Vert.	12110.000	PK	47.1	39.5	10.9	39.4	58.1	73.9	15.8	100	0	
Vert.	2390.000	AV	48.0	27.4	14.2	41.4	48.2	53.9	5.7	114	81	
Vert.	4844.000	AV	43.4	31.2	6.8	41.1	40.3	53.9	13.6	100	21	
Vert.	7266.000	AV	38.4	36.6	8.4	41.4	42.0	53.9	11.9	100	0	
Vert.	9688.000	AV	35.4	38.6	9.5	38.9	44.6	53.9	9.3	100	0	
Vert.	12110.000	AV	36.5	39.5	10.9	39.4	47.5	53.9	6.4	100	0	

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

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

*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.	2422.000	PK	88.4	27.5	14.2	41.4	88.7	-	-	
Hori.	2400.000	PK	48.3	27.4	14.2	41.4	48.5	68.7	20.2	
Vert.	2422.000	PK	89.4	27.5	14.2	41.4	89.7	-	-	
Vert.	2400.000	PK	50.8	27.4	14.2	41.4	51.0	69.7	18.7	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 18, 2013 January 21, 2013 January 22, 2013 January 25, 2013
 Temperature / Humidity 26 deg.C, 58 %RH 22 deg.C, 38 %RH 22 deg.C, 48 %RH 23 deg.C, 32 %RH
 Engineer TatsuyaArai Makoto Hosaka Makoto Hosaka Tadaomi Yamano
 Mode Tx, 2437 MHz
 Tx, IEEE802.11n 40HT, MCS4

(* 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.	143.995	QP	41.9	14.6	7.6	32.1	32.0	43.5	11.5	230	268	
Hori.	240.060	QP	39.3	16.9	8.2	32.0	32.4	46.0	13.6	131	278	
Hori.	335.999	QP	50.5	14.8	8.7	32.0	42.0	46.0	4.0	100	286	
Hori.	431.934	QP	48.4	16.6	9.2	32.0	42.2	46.0	3.8	102	123	
Hori.	4874.000	PK	54.9	31.3	6.9	41.1	52.0	73.9	21.9	100	100	
Hori.	7311.000	PK	49.7	36.6	8.4	41.4	53.3	73.9	20.6	100	0	
Hori.	9748.000	PK	46.2	38.7	9.5	38.9	55.5	73.9	18.4	100	0	
Hori.	12185.000	PK	46.1	39.5	10.8	39.3	57.1	73.9	16.8	100	0	
Hori.	4874.000	AV	43.6	31.3	6.9	41.1	40.7	53.9	13.2	100	100	
Hori.	7311.000	AV	38.4	36.6	8.4	41.4	42.0	53.9	11.9	100	0	
Hori.	9748.000	AV	35.5	38.7	9.5	38.9	44.8	53.9	9.1	100	0	
Hori.	12185.000	AV	36.0	39.5	10.8	39.3	47.0	53.9	6.9	100	0	
Vert.	48.000	QP	45.0	11.5	6.8	32.2	31.1	40.0	8.9	100	137	
Vert.	527.989	QP	48.9	17.9	9.5	32.0	44.3	46.0	1.7	100	261	
Vert.	4874.000	PK	54.2	31.3	6.9	41.1	51.3	73.9	22.6	100	21	
Vert.	7311.000	PK	51.8	36.6	8.4	41.4	55.4	73.9	18.5	100	74	
Vert.	9748.000	PK	45.6	38.7	9.5	38.9	54.9	73.9	19.0	100	0	
Vert.	12185.000	PK	46.4	39.5	10.8	39.3	57.4	73.9	16.5	100	0	
Vert.	4874.000	AV	43.2	31.3	6.9	41.1	40.3	53.9	13.6	100	21	
Vert.	7311.000	AV	41.3	36.6	8.4	41.4	44.9	53.9	9.0	100	74	
Vert.	9748.000	AV	35.3	38.7	9.5	38.9	44.6	53.9	9.3	100	0	
Vert.	12185.000	AV	35.9	39.5	10.8	39.3	46.9	53.9	7.0	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 UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 18, 2013 January 21, 2013 January 22, 2013
 Temperature / Humidity 26 deg.C, 58 %RH 22 deg.C, 38 %RH 22 deg.C, 48 %RH
 Engineer TatsuyaArai Makoto Hosaka Makoto Hosaka
 Mode Tx, 2452 MHz
 Tx, IEEE802.11n 40HT, MCS4

(* 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	63.0	27.5	14.3	41.4	63.4	73.9	10.5	122	148	
Hori.	4904.000	PK	55.5	31.4	6.9	41.0	52.8	73.9	21.1	100	98	
Hori.	7356.000	PK	50.3	36.6	8.4	41.5	53.8	73.9	20.1	100	0	
Hori.	9808.000	PK	45.6	38.8	9.6	38.9	55.1	73.9	18.8	100	0	
Hori.	12260.000	PK	45.6	39.5	10.8	39.3	56.6	73.9	17.3	100	0	
Hori.	2483.500	AV	51.2	27.5	14.3	41.4	51.6	53.9	2.3	122	148	
Hori.	4904.000	AV	44.0	31.4	6.9	41.0	41.3	53.9	12.6	100	98	
Hori.	7356.000	AV	39.5	36.6	8.4	41.5	43.0	53.9	10.9	100	0	
Hori.	9808.000	AV	34.8	38.8	9.6	38.9	44.3	53.9	9.6	100	0	
Hori.	12260.000	AV	35.3	39.5	10.8	39.3	46.3	53.9	7.6	100	0	
Vert.	2483.500	PK	63.2	27.5	14.3	41.4	63.6	73.9	10.3	113	110	
Vert.	4904.000	PK	54.9	31.4	6.9	41.0	52.2	73.9	21.7	100	24	
Vert.	7356.000	PK	54.0	36.6	8.4	41.5	57.5	73.9	16.4	100	77	
Vert.	9808.000	PK	45.9	38.8	9.6	38.9	55.4	73.9	18.5	100	0	
Vert.	12260.000	PK	46.5	39.5	10.8	39.3	57.5	73.9	16.4	100	0	
Vert.	2483.500	AV	52.3	27.5	14.3	41.4	52.7	53.9	1.2	113	110	
Vert.	4904.000	AV	43.4	31.4	6.9	41.0	40.7	53.9	13.2	100	24	
Vert.	7356.000	AV	43.0	36.6	8.4	41.5	46.5	53.9	7.4	100	77	
Vert.	9808.000	AV	35.5	38.8	9.6	38.9	45.0	53.9	8.9	100	0	
Vert.	12260.000	AV	35.6	39.5	10.8	39.3	46.6	53.9	7.3	100	0	

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

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

*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 UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 19, 2013 January 23, 2013 January 24, 2013
 Temperature / Humidity 24 deg.C , 30 %RH 23 deg.C , 60 %RH 22 deg.C , 33 %RH
 Engineer Kenichi Adachi Kenichi Adachi Kenichi Adachi
 Mode Tx, 5745 MHz
 Tx, IEEE802.11a, 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.	7660.265	PK	48.9	36.9	8.6	41.3	53.1	73.9	20.8	136	146	
Hori.	11490.000	PK	45.0	40.1	9.8	39.5	55.4	73.9	18.5	100	0	
Hori.	17235.000	PK	45.2	42.5	2.6	39.5	50.8	73.9	23.1	100	0	
Hori.	7660.265	AV	40.7	36.9	8.6	41.3	44.9	53.9	9.0	136	146	
Hori.	11490.000	AV	36.7	40.1	9.8	39.5	47.1	53.9	6.8	100	0	
Hori.	17235.000	AV	34.4	42.5	2.6	39.5	40.0	53.9	13.9	100	0	
Vert.	7660.265	PK	46.6	36.9	8.6	41.3	50.8	73.9	23.1	100	92	
Vert.	11490.000	PK	44.9	40.1	9.8	39.5	55.3	73.9	18.6	100	0	
Vert.	17235.000	PK	44.9	42.5	2.6	39.5	50.5	73.9	23.4	100	0	
Vert.	7660.265	AV	38.6	36.9	8.6	41.3	42.8	53.9	11.1	100	92	
Vert.	11490.000	AV	36.4	40.1	9.8	39.5	46.8	53.9	7.1	100	0	
Vert.	17235.000	AV	35.8	42.5	2.6	39.5	41.4	53.9	12.5	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.	5745.000	PK	85.6	32.7	16.7	40.2	94.8	-	-	
Hori.	5725.000	PK	47.9	32.6	16.7	40.2	57.0	74.8	17.8	
Vert.	5745.000	PK	85.5	32.7	16.7	40.2	94.7	-	-	
Vert.	5725.000	PK	47.7	32.6	16.7	40.2	56.8	74.7	17.9	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 19, 2013 January 23, 2013 January 24, 2013
 Temperature / Humidity 24 deg.C , 30 %RH 23 deg.C , 60 %RH 22 deg.C , 33 %RH
 Engineer Kenichi Adachi Kenichi Adachi Kenichi Adachi
 Mode Tx, 5785 MHz
 Tx, IEEE802.11a, 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.	7713.611	PK	49.2	37.0	8.6	41.3	53.5	73.9	20.4	142	143	
Hori.	11570.000	PK	45.4	40.0	9.8	39.5	55.7	73.9	18.2	100	0	
Hori.	17355.000	PK	45.4	43.2	2.6	39.5	51.7	73.9	22.2	100	0	
Hori.	7713.611	AV	40.9	37.0	8.6	41.3	45.2	53.9	8.7	142	143	
Hori.	11570.000	AV	36.1	40.0	9.8	39.5	46.4	53.9	7.5	100	0	
Hori.	17355.000	AV	34.9	43.2	2.6	39.5	41.2	53.9	12.7	100	0	
Vert.	7713.611	PK	48.0	37.0	8.6	41.3	52.3	73.9	21.6	100	78	
Vert.	11570.000	PK	45.5	40.0	9.8	39.5	55.8	73.9	18.1	100	0	
Vert.	17355.000	PK	45.6	43.2	2.6	39.5	51.9	73.9	22.0	100	0	
Vert.	7713.611	AV	39.7	37.0	8.6	41.3	44.0	53.9	9.9	100	78	
Vert.	11570.000	AV	36.2	40.0	9.8	39.5	46.5	53.9	7.4	100	0	
Vert.	17355.000	AV	35.7	43.2	2.6	39.5	42.0	53.9	11.9	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 UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 19, 2013 January 23, 2013 January 24, 2013
 Temperature / Humidity 24 deg.C , 30 %RH 23 deg.C , 60 %RH 22 deg.C , 33 %RH
 Engineer Kenichi Adachi Kenichi Adachi Kenichi Adachi
 Mode Tx, 5805 MHz
 Tx, IEEE802.11a, 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.	5850.000	PK	45.9	33.0	16.8	40.3	55.4	73.9	18.5	100	118	
Hori.	7740.278	PK	49.2	37.0	8.6	41.3	53.5	73.9	20.4	139	143	
Hori.	11610.000	PK	45.3	40.0	9.8	39.5	55.6	73.9	18.3	100	0	
Hori.	17415.000	PK	46.1	43.6	2.6	39.5	52.8	73.9	21.1	100	0	
Hori.	5850.000	AV	37.8	33.0	16.8	40.3	47.3	53.9	6.6	100	118	
Hori.	7740.278	AV	41.2	37.0	8.6	41.3	45.5	53.9	8.4	139	143	
Hori.	11610.000	AV	36.0	40.0	9.8	39.5	46.3	53.9	7.6	100	0	
Hori.	17415.000	AV	36.2	43.6	2.6	39.5	42.9	53.9	11.0	100	0	
Vert.	5850.000	PK	46.0	33.0	16.8	40.3	55.5	73.9	18.4	100	359	
Vert.	7740.278	PK	48.1	37.0	8.6	41.3	52.4	73.9	21.5	100	79	
Vert.	11610.000	PK	45.2	40.0	9.8	39.5	55.5	73.9	18.4	100	0	
Vert.	17415.000	PK	46.0	43.6	2.6	39.5	52.7	73.9	21.2	100	0	
Vert.	5850.000	AV	37.9	33.0	16.8	40.3	47.4	53.9	6.5	100	359	
Vert.	7740.278	AV	40.0	37.0	8.6	41.3	44.3	53.9	9.6	100	79	
Vert.	11610.000	AV	35.8	40.0	9.8	39.5	46.1	53.9	7.8	100	0	
Vert.	17415.000	AV	36.0	43.6	2.6	39.5	42.7	53.9	11.2	100	0	

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

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

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

Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 19, 2013 January 23, 2013 January 24, 2013
 Temperature / Humidity 24 deg.C , 30 %RH 23 deg.C , 60 %RH 22 deg.C , 33 %RH
 Engineer Kenichi Adachi Kenichi Adachi Kenichi Adachi
 Mode Tx, 5745 MHz
 Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)

(* 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.	7660.264	PK	48.4	36.9	8.6	41.3	52.6	73.9	21.3	138	144	
Hori.	11490.000	PK	44.9	40.1	9.8	39.5	55.3	73.9	18.6	100	0	
Hori.	17235.000	PK	45.0	42.5	2.6	39.5	50.6	73.9	23.3	100	0	
Hori.	7660.264	AV	40.4	36.9	8.6	41.3	44.6	53.9	9.3	138	144	
Hori.	11490.000	AV	36.3	40.1	9.8	39.5	46.7	53.9	7.2	100	0	
Hori.	17235.000	AV	35.2	42.5	2.6	39.5	40.8	53.9	13.1	100	0	
Vert.	7660.264	PK	47.9	36.9	8.6	41.3	52.1	73.9	21.8	100	90	
Vert.	11490.000	PK	45.0	40.1	9.8	39.5	55.4	73.9	18.5	100	0	
Vert.	17235.000	PK	44.8	42.5	2.6	39.5	50.4	73.9	23.5	100	0	
Vert.	7660.264	AV	39.0	36.9	8.6	41.3	43.2	53.9	10.7	100	90	
Vert.	11490.000	AV	36.4	40.1	9.8	39.5	46.8	53.9	7.1	100	0	
Vert.	17235.000	AV	35.3	42.5	2.6	39.5	40.9	53.9	13.0	100	0	

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

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

*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.	5745.000	PK	85.2	32.7	16.7	40.2	94.4	-	-	
Hori.	5725.000	PK	52.3	32.6	16.7	40.2	61.4	74.4	13.0	
Vert.	5745.000	PK	85.1	32.7	16.7	40.2	94.3	-	-	
Vert.	5725.000	PK	51.6	32.6	16.7	40.2	60.7	74.3	13.6	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 19, 2013 January 23, 2013 January 24, 2013 41299.0
 Temperature / Humidity 24 deg.C , 30 %RH 23 deg.C , 60 %RH 22 deg.C , 33 %RH 23 deg.C , 32 %RH
 Engineer Kenichi Adachi Kenichi Adachi Kenichi Adachi Kenichi Adachi
 Mode Tx, 5785 MHz
 Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)

(* 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.	143.991	QP	41.7	14.6	7.6	32.1	31.8	43.5	11.7	237	254	
Hori.	240.000	QP	39.2	16.9	8.2	32.0	32.3	46.0	13.7	143	266	
Hori.	336.002	QP	50.0	14.8	8.7	32.0	41.5	46.0	4.5	100	274	
Hori.	431.928	QP	48.8	16.6	9.2	32.0	42.6	46.0	3.4	100	122	
Hori.	7713.614	PK	49.0	37.0	8.6	41.3	53.3	73.9	20.6	137	146	
Hori.	11570.000	PK	45.5	40.0	9.8	39.5	55.8	73.9	18.1	100	0	
Hori.	17355.000	PK	45.3	43.2	2.6	39.5	51.6	73.9	22.3	100	0	
Hori.	7713.614	AV	40.7	37.0	8.6	41.3	45.0	53.9	8.9	137	146	
Hori.	11570.000	AV	36.5	40.0	9.8	39.5	46.8	53.9	7.1	100	0	
Hori.	17355.000	AV	34.8	43.2	2.6	39.5	41.1	53.9	12.8	100	0	
Vert.	48.001	QP	45.2	11.5	6.8	32.2	31.3	40.0	8.7	100	130	
Vert.	527.988	QP	48.6	17.9	9.5	32.0	44.0	46.0	2.0	100	220	
Vert.	7713.614	PK	48.3	37.0	8.6	41.3	52.6	73.9	21.3	100	87	
Vert.	11570.000	PK	45.4	40.0	9.8	39.5	55.7	73.9	18.2	100	0	
Vert.	17355.000	PK	45.3	43.2	2.6	39.5	51.6	73.9	22.3	100	0	
Vert.	7713.614	AV	39.3	37.0	8.6	41.3	43.6	53.9	10.3	100	87	
Vert.	11570.000	AV	36.3	40.0	9.8	39.5	46.6	53.9	7.3	100	0	
Vert.	17355.000	AV	35.9	43.2	2.6	39.5	42.2	53.9	11.7	100	0	

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

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

*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 UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 19, 2013 January 23, 2013 January 24, 2013
 Temperature / Humidity 24 deg.C , 30 %RH 23 deg.C , 60 %RH 22 deg.C , 33 %RH
 Engineer Kenichi Adachi Kenichi Adachi Kenichi Adachi
 Mode Tx, 5805 MHz
 Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)

(* 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.	5850.000	PK	46.0	33.0	16.8	40.3	55.5	73.9	18.4	100	119	
Hori.	7740.277	PK	49.5	37.0	8.6	41.3	53.8	73.9	20.1	138	141	
Hori.	11610.000	PK	45.2	40.0	9.8	39.5	55.5	73.9	18.4	100	0	
Hori.	17415.000	PK	46.3	43.6	2.6	39.5	53.0	73.9	20.9	100	0	
Hori.	5850.000	AV	38.0	33.0	16.8	40.3	47.5	53.9	6.4	100	119	
Hori.	7740.277	AV	41.4	37.0	8.6	41.3	45.7	53.9	8.2	138	141	
Hori.	11610.000	AV	35.6	40.0	9.8	39.5	45.9	53.9	8.0	100	0	
Hori.	17415.000	AV	36.5	43.6	2.6	39.5	43.2	53.9	10.7	100	0	
Vert.	5850.000	PK	45.9	33.0	16.8	40.3	55.4	73.9	18.5	100	0	
Vert.	7740.277	PK	48.3	37.0	8.6	41.3	52.6	73.9	21.3	100	68	
Vert.	11610.000	PK	45.3	40.0	9.8	39.5	55.6	73.9	18.3	100	0	
Vert.	17415.000	PK	46.3	43.6	2.6	39.5	53.0	73.9	20.9	100	0	
Vert.	5850.000	AV	37.8	33.0	16.8	40.3	47.3	53.9	6.6	100	0	
Vert.	7740.277	AV	40.1	37.0	8.6	41.3	44.4	53.9	9.5	100	68	
Vert.	11610.000	AV	35.7	40.0	9.8	39.5	46.0	53.9	7.9	100	0	
Vert.	17415.000	AV	36.3	43.6	2.6	39.5	43.0	53.9	10.9	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).

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 19, 2013 January 23, 2013 January 24, 2013
 Temperature / Humidity 24 deg.C , 30 %RH 23 deg.C , 60 %RH 22 deg.C , 33 %RH
 Engineer Kenichi Adachi Kenichi Adachi Kenichi Adachi
 Mode Tx, 5755 MHz
 Tx, IEEE802.11n(40HT), PN9, worst data mode 4(MCS)

(* 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.	7673.588	PK	48.8	36.9	8.6	41.3	53.0	73.9	20.9	140	145	
Hori.	11510.000	PK	45.1	40.1	9.8	39.5	55.5	73.9	18.4	100	0	
Hori.	17265.000	PK	46.0	42.7	2.6	39.5	51.8	73.9	22.1	100	0	
Hori.	7673.588	AV	40.7	36.9	8.6	41.3	44.9	53.9	9.0	140	145	
Hori.	11510.000	AV	37.1	40.1	9.8	39.5	47.5	53.9	6.4	100	0	
Hori.	17265.000	AV	36.7	42.7	2.6	39.5	42.5	53.9	11.4	100	0	
Vert.	7673.588	PK	47.8	36.9	8.6	41.3	52.0	73.9	21.9	100	93	
Vert.	11510.000	PK	45.0	40.1	9.8	39.5	55.4	73.9	18.5	100	0	
Vert.	17265.000	PK	46.5	42.7	2.6	39.5	52.3	73.9	21.6	100	0	
Vert.	7673.588	AV	39.1	36.9	8.6	41.3	43.3	53.9	10.6	100	93	
Vert.	11510.000	AV	37.0	40.1	9.8	39.5	47.4	53.9	6.5	100	0	
Vert.	17265.000	AV	36.4	42.7	2.6	39.5	42.2	53.9	11.7	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.	5755.000	PK	84.6	32.7	16.8	40.2	93.9	-	-	
Hori.	5725.000	PK	51.9	32.6	16.7	40.2	61.0	73.9	12.9	
Vert.	5755.000	PK	84.4	32.7	16.8	40.2	93.7	-	-	
Vert.	5725.000	PK	49.3	32.6	16.7	40.2	58.4	73.7	15.3	

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

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Radiated Emission

Test place UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
 Date January 19, 2013 January 23, 2013 January 24, 2013
 Temperature / Humidity 24 deg.C , 30 %RH 23 deg.C , 60 %RH 22 deg.C , 33 %RH
 Engineer Kenichi Adachi Kenichi Adachi Kenichi Adachi
 Mode Tx, 5795 MHz
 Tx, IEEE802.11n(40HT), PN9, worst data mode 4(MCS)

(* 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.	5850.000	PK	47.6	33.0	16.8	40.3	57.1	73.9	16.8	100	117	
Hori.	7726.931	PK	48.1	37.0	8.6	41.3	52.4	73.9	21.5	137	146	
Hori.	11590.000	PK	45.4	40.0	9.8	39.5	55.7	73.9	18.2	100	0	
Hori.	17385.000	PK	46.2	43.4	2.6	39.5	52.7	73.9	21.2	100	0	
Hori.	5850.000	AV	38.5	33.0	16.8	40.3	48.0	53.9	5.9	100	117	
Hori.	7726.931	AV	41.0	37.0	8.6	41.3	45.3	53.9	8.6	137	146	
Hori.	11590.000	AV	37.4	40.0	9.8	39.5	47.7	53.9	6.2	100	0	
Hori.	17385.000	AV	36.5	43.4	2.6	39.5	43.0	53.9	10.9	100	0	
Vert.	5850.000	PK	47.4	33.0	16.8	40.3	56.9	73.9	17.0	100	359	
Vert.	7726.931	PK	47.6	37.0	8.6	41.3	51.9	73.9	22.0	100	88	
Vert.	11590.000	PK	45.3	40.0	9.8	39.5	55.6	73.9	18.3	100	0	
Vert.	17385.000	PK	46.2	43.4	2.6	39.5	52.7	73.9	21.2	100	0	
Vert.	5850.000	AV	38.4	33.0	16.8	40.3	47.9	53.9	6.0	100	359	
Vert.	7726.931	AV	40.4	37.0	8.6	41.3	44.7	53.9	9.2	100	88	
Vert.	11590.000	AV	37.3	40.0	9.8	39.5	47.6	53.9	6.3	100	0	
Vert.	17385.000	AV	36.2	43.4	2.6	39.5	42.7	53.9	11.2	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).

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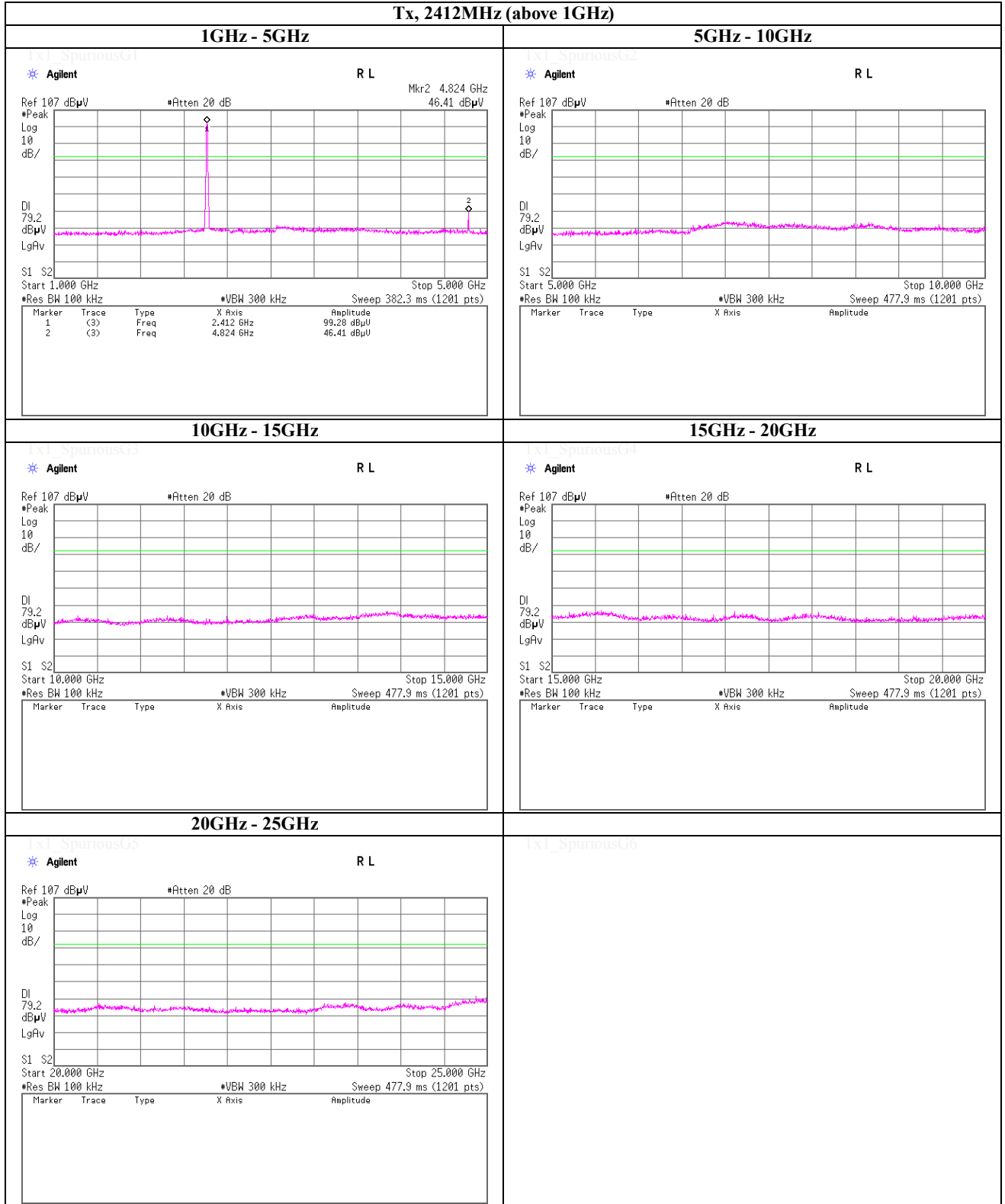
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(Reference chart) Spurious emission (Conducted)

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

Tx, 2412MHz (above 1GHz)

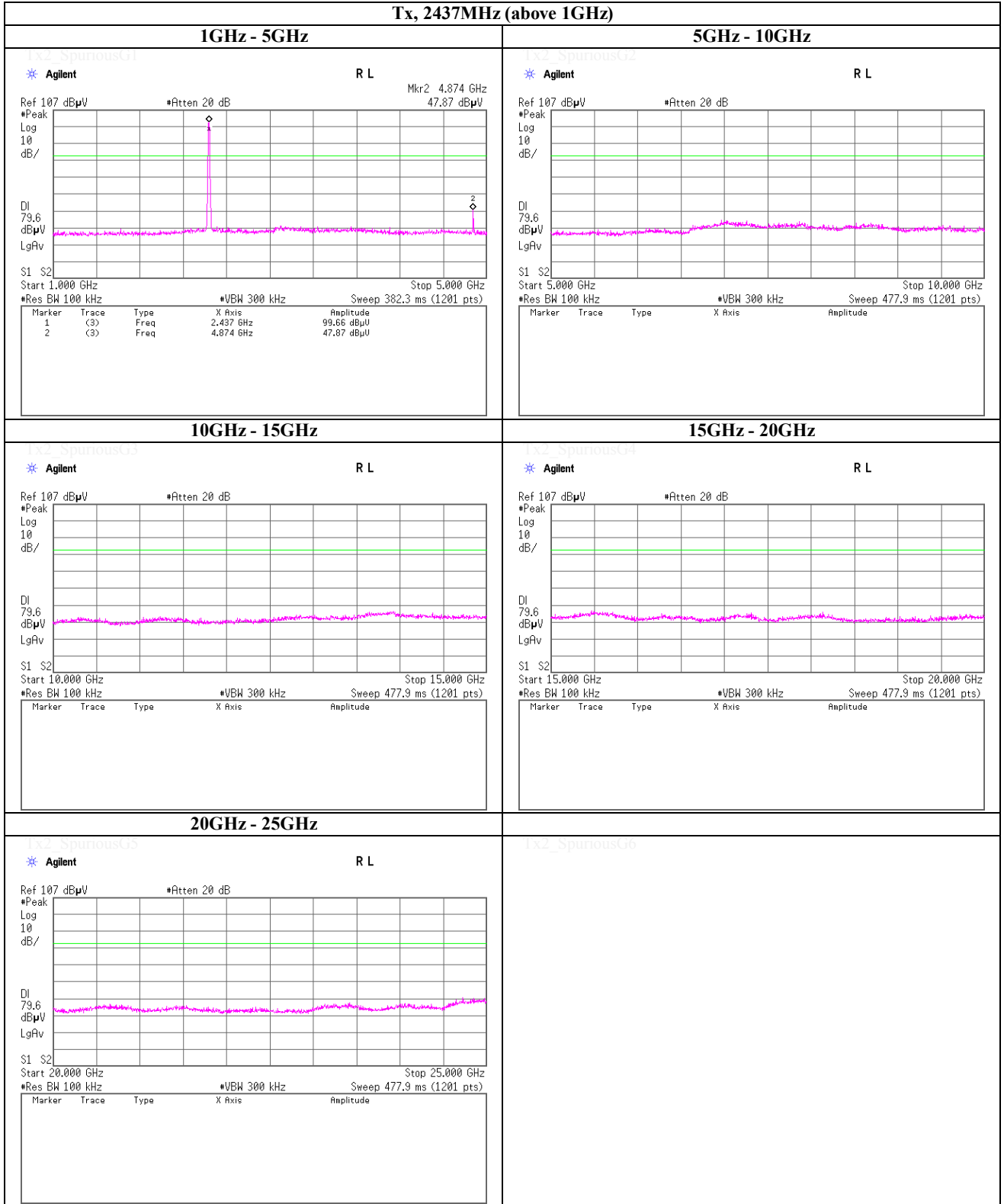


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(Reference chart) Spurious emission (Conducted)

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

Tx, 2437MHz (above 1GHz)



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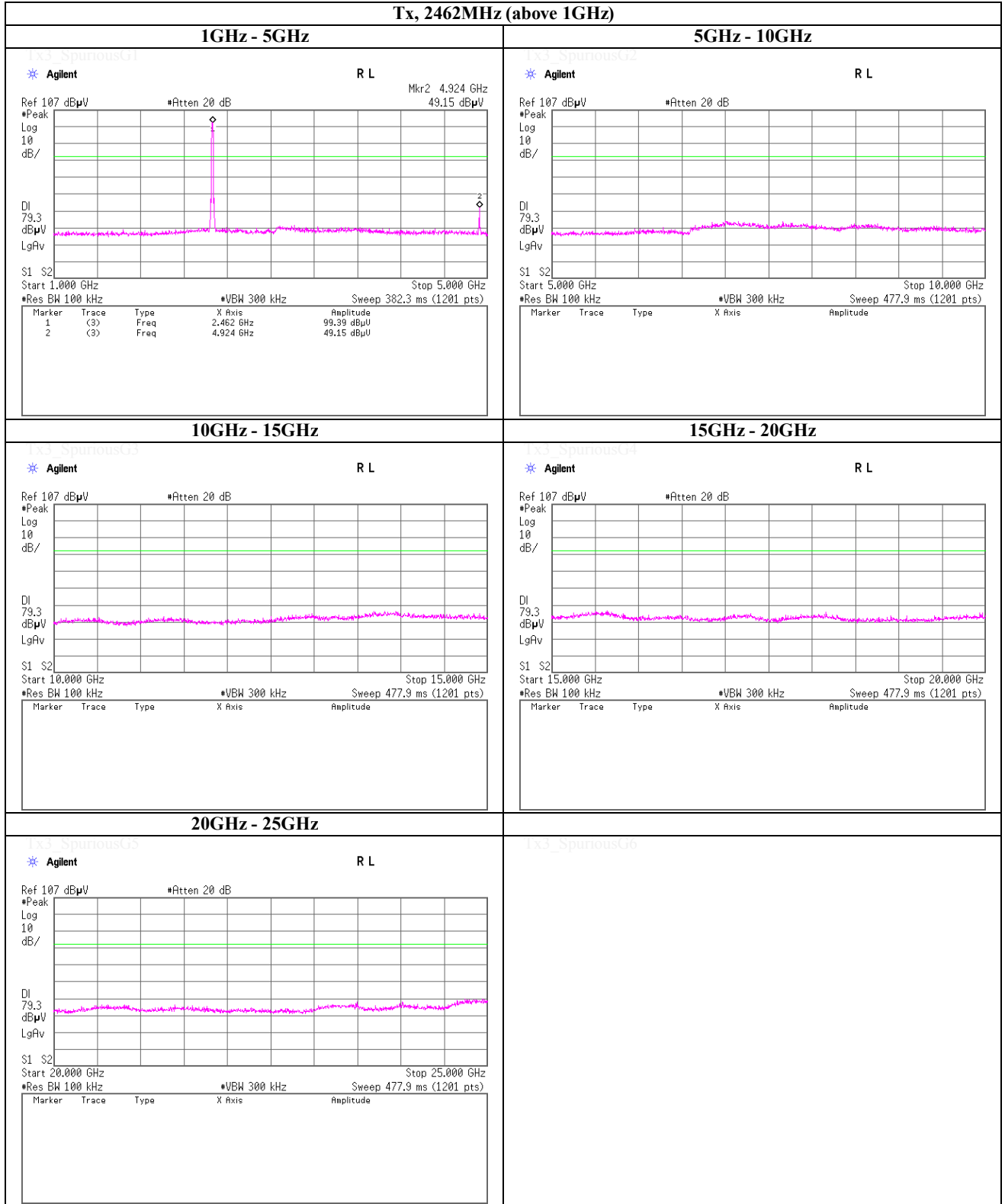
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(Reference chart) Spurious emission (Conducted)

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

Tx, 2462MHz (above 1GHz)



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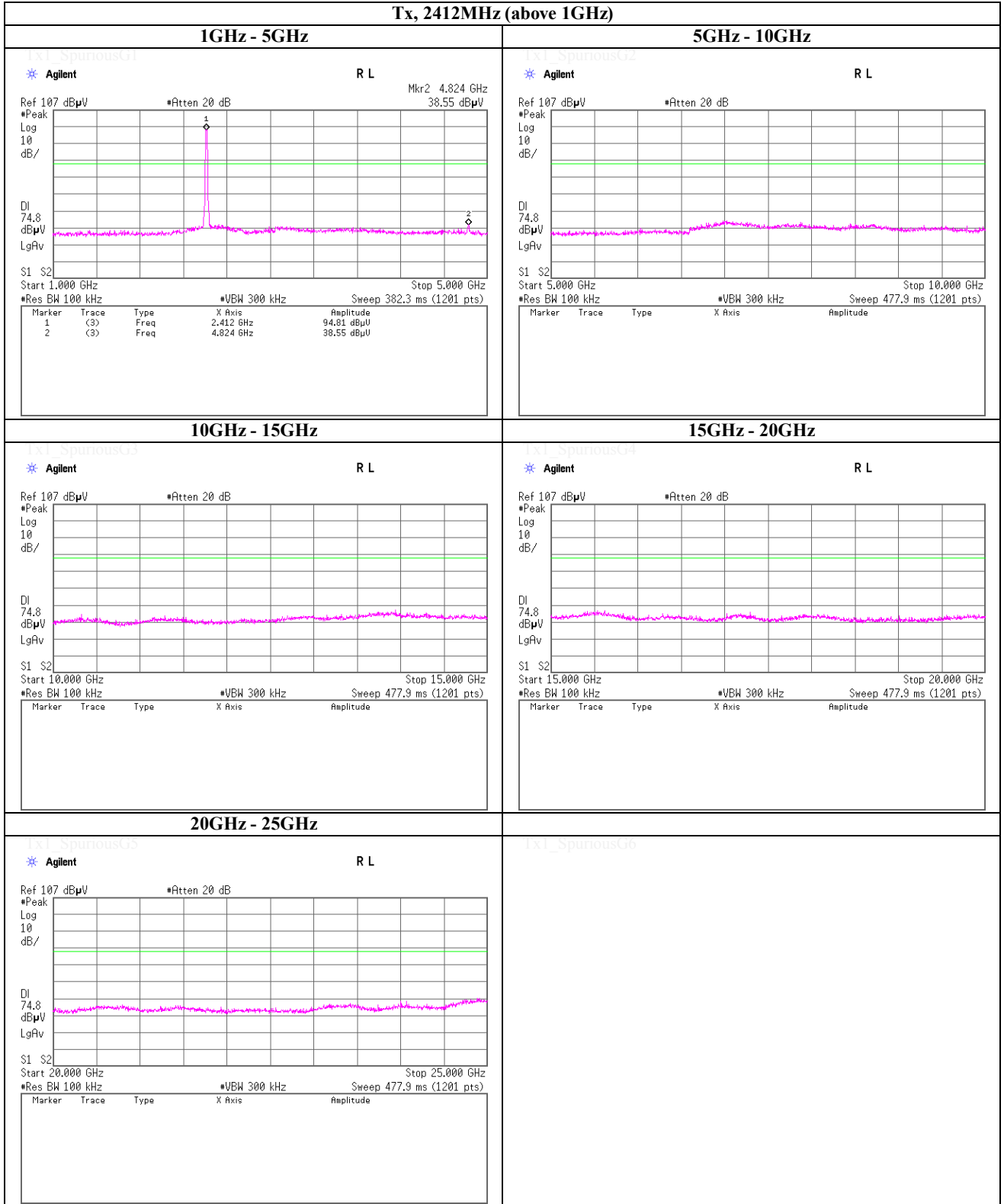
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

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

Tx, 2412MHz (above 1GHz)

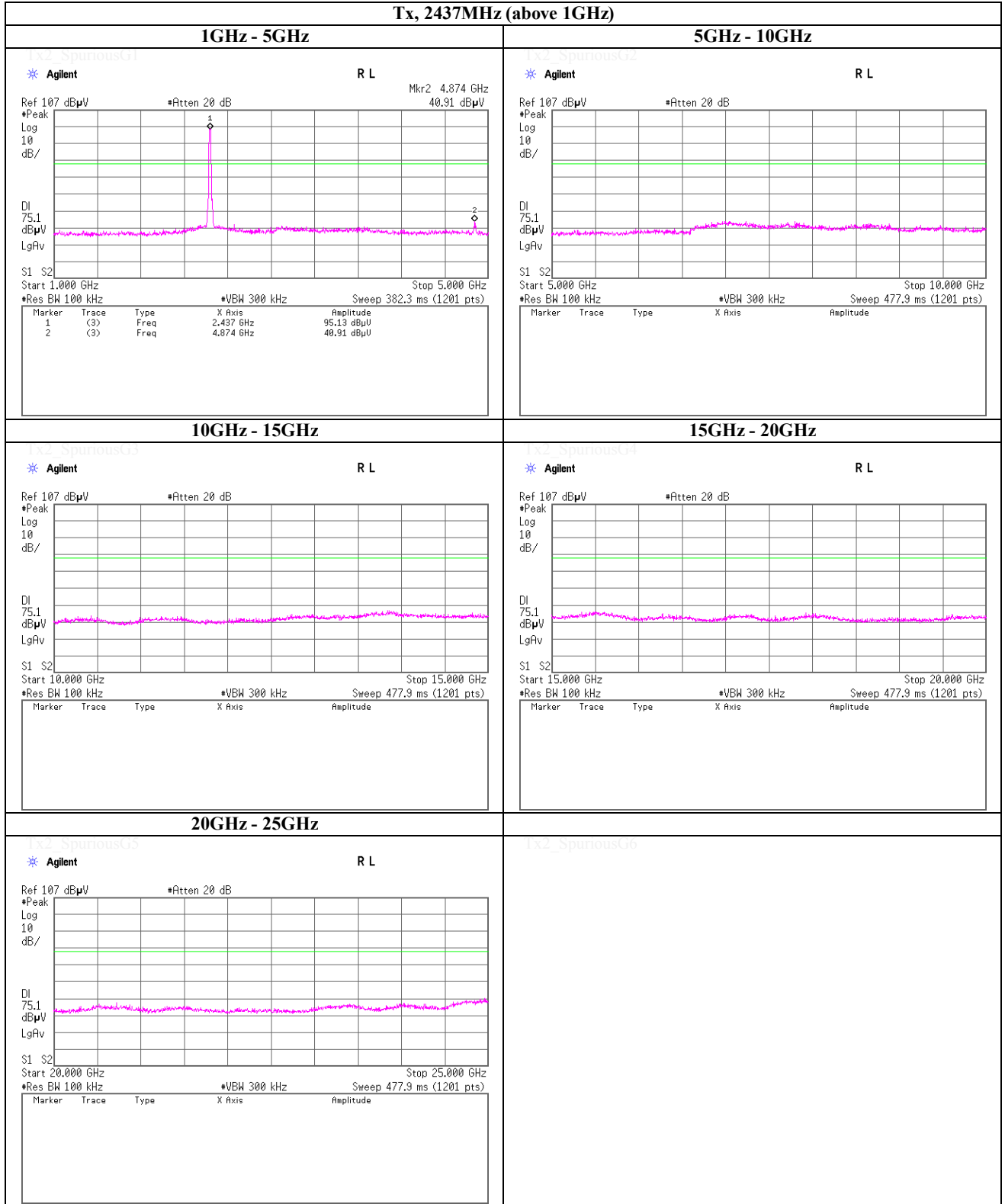


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(Reference chart) Spurious emission (Conducted)

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

Tx, 2437MHz (above 1GHz)



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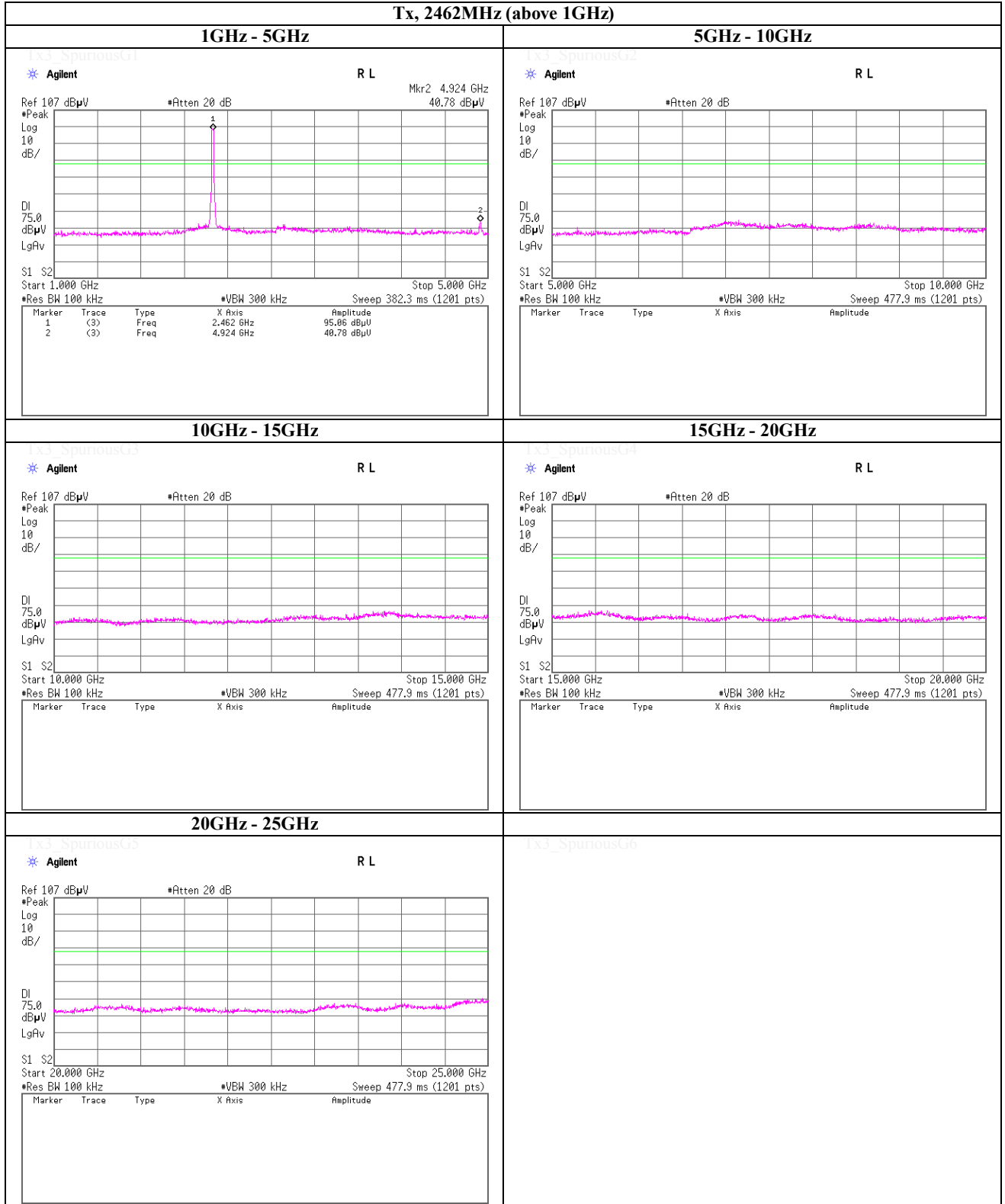
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(Reference chart) Spurious emission (Conducted)

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

Tx, 2462MHz (above 1GHz)



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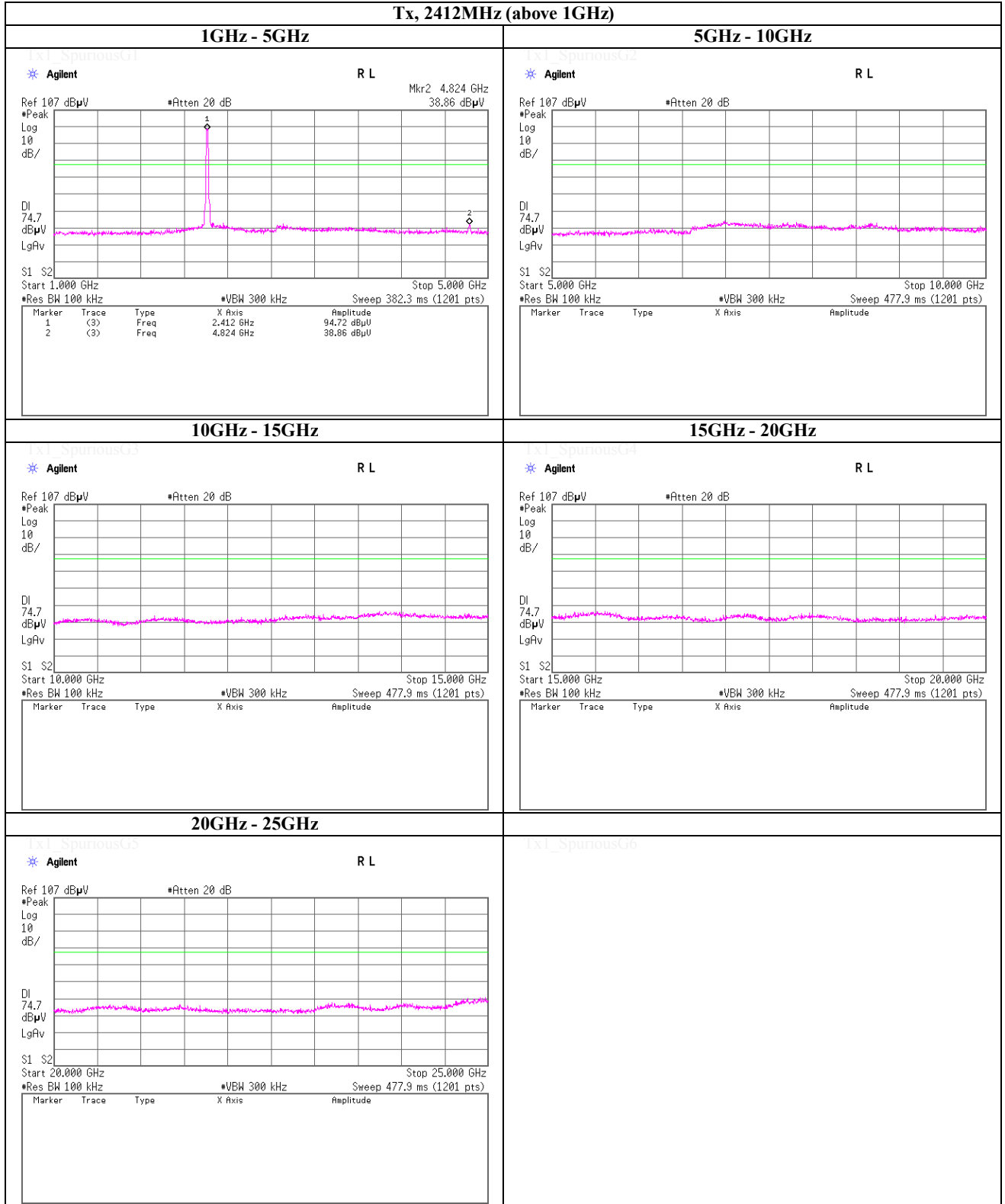
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(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)

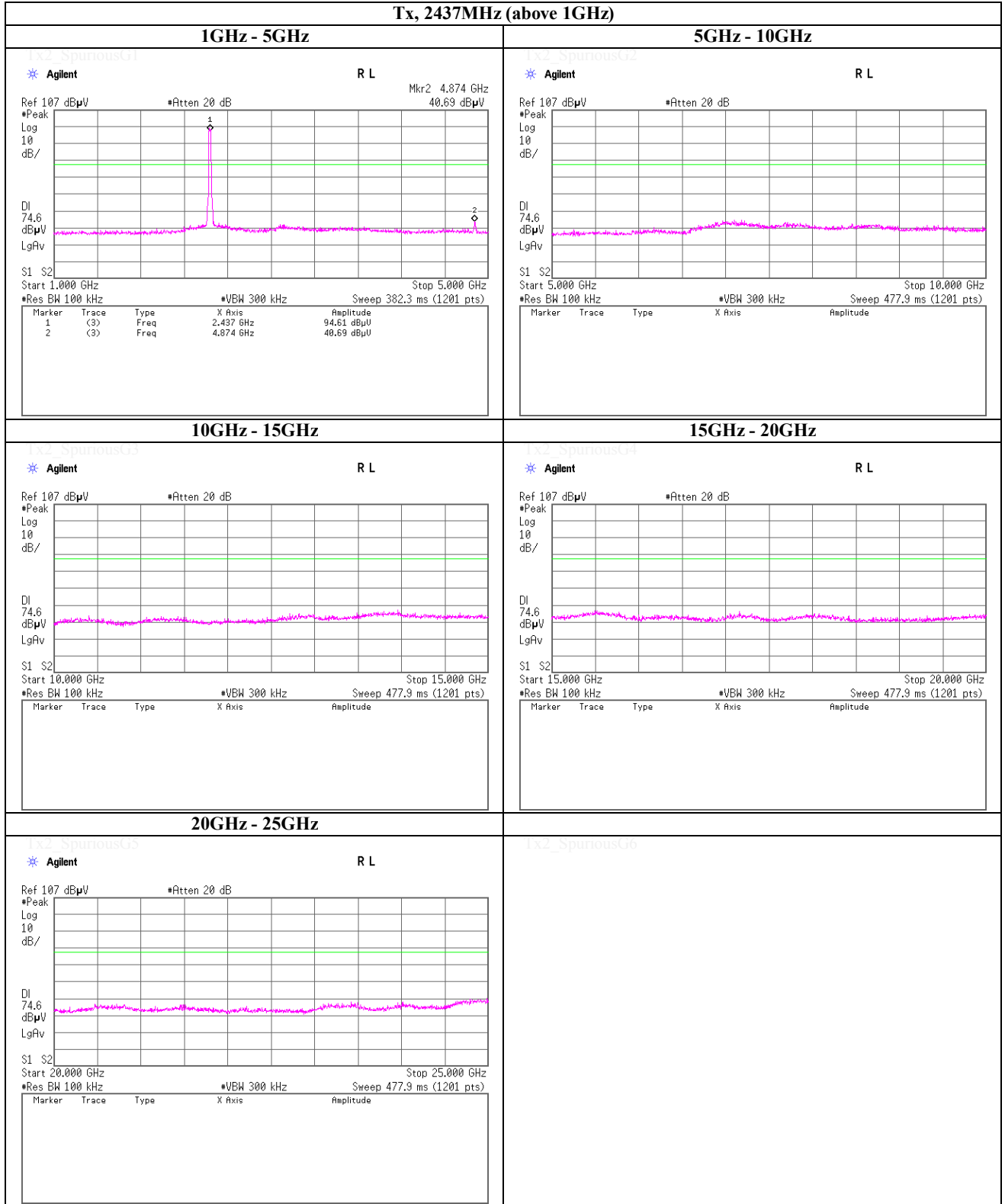
Tx, 2412MHz (above 1GHz)



(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)

Tx, 2437MHz (above 1GHz)

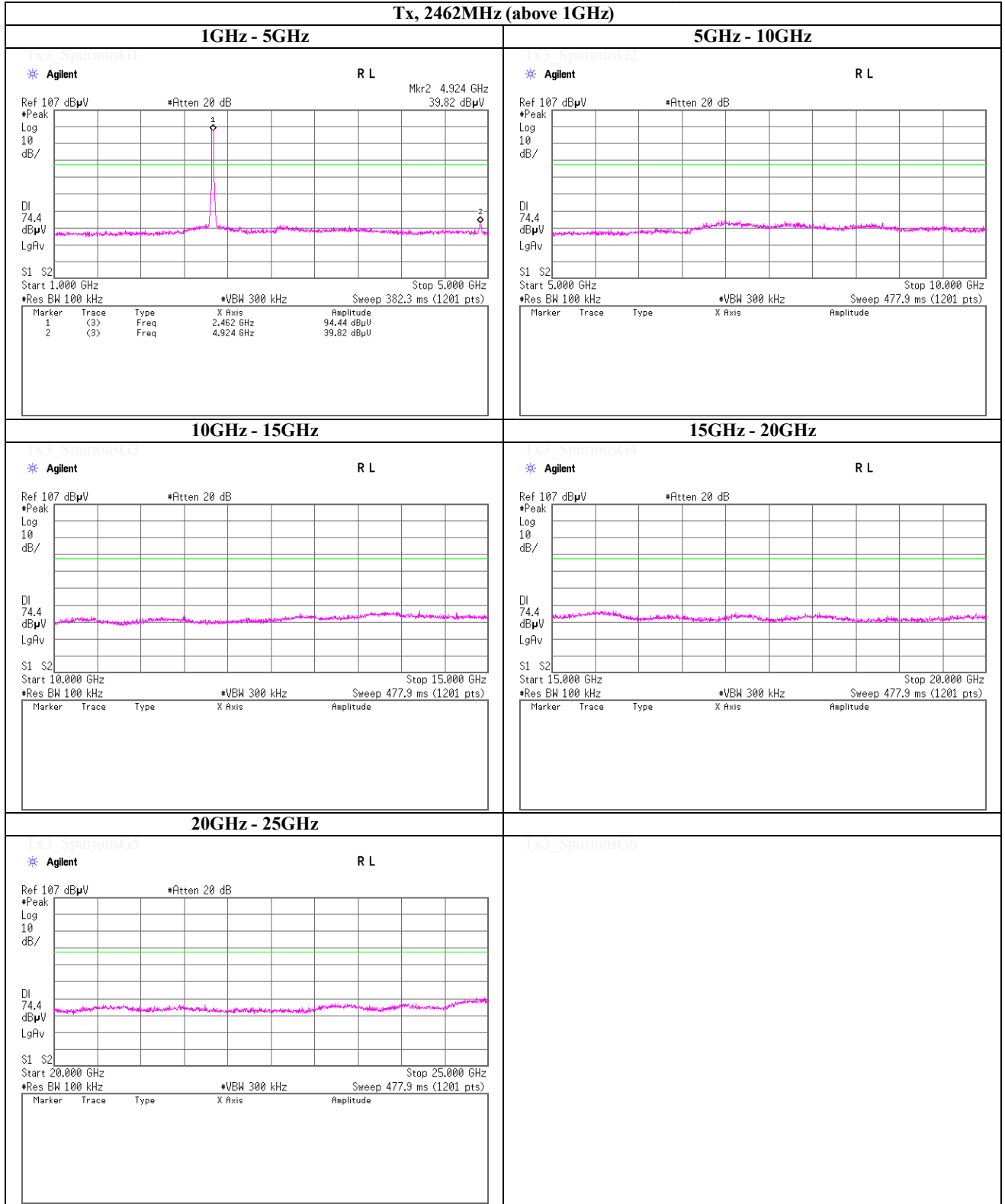


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(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)

Tx, 2462MHz (above 1GHz)

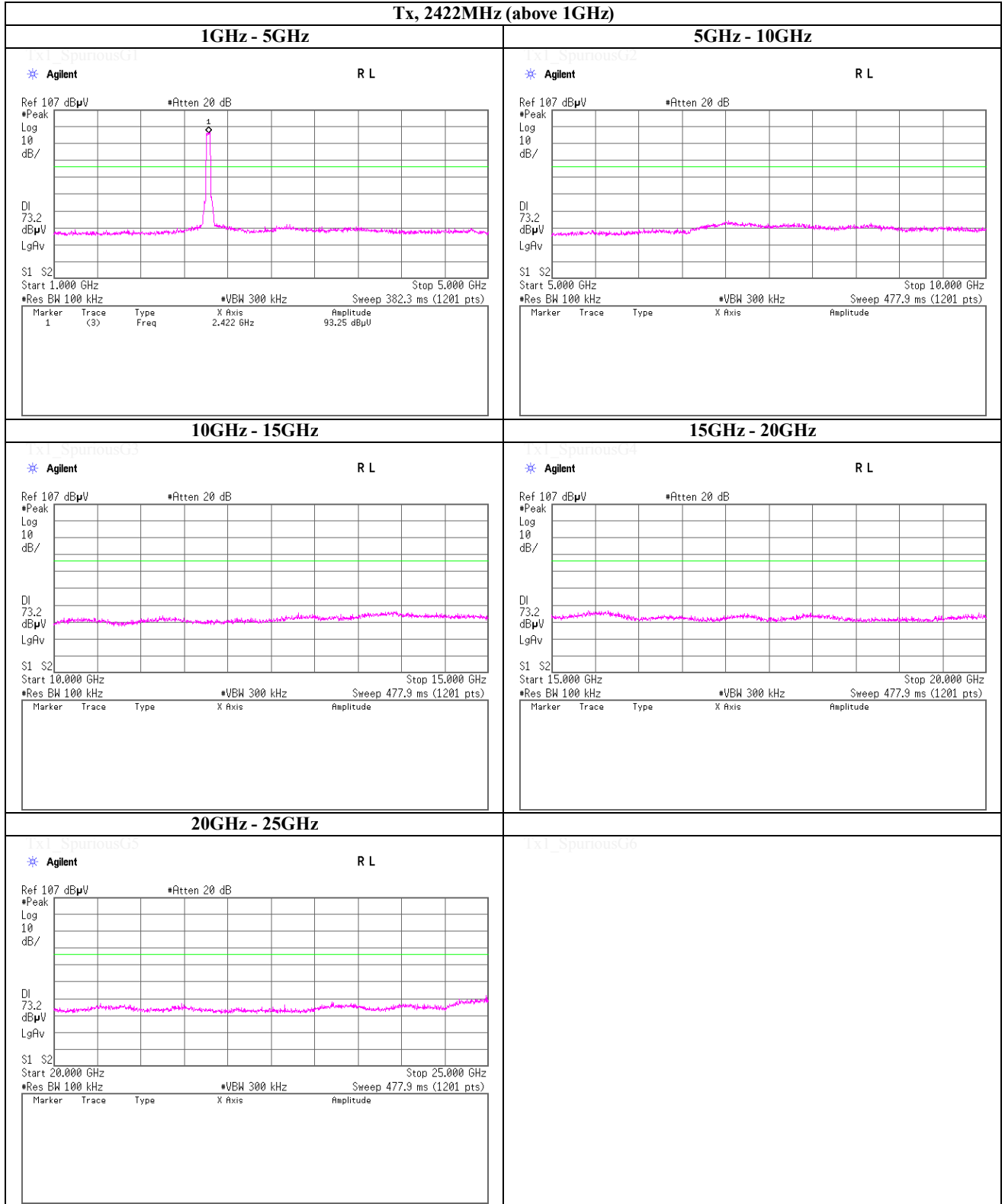


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(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(40HT), PN9, worst data mode 4(MCS)

Tx, 2422MHz (above 1GHz)



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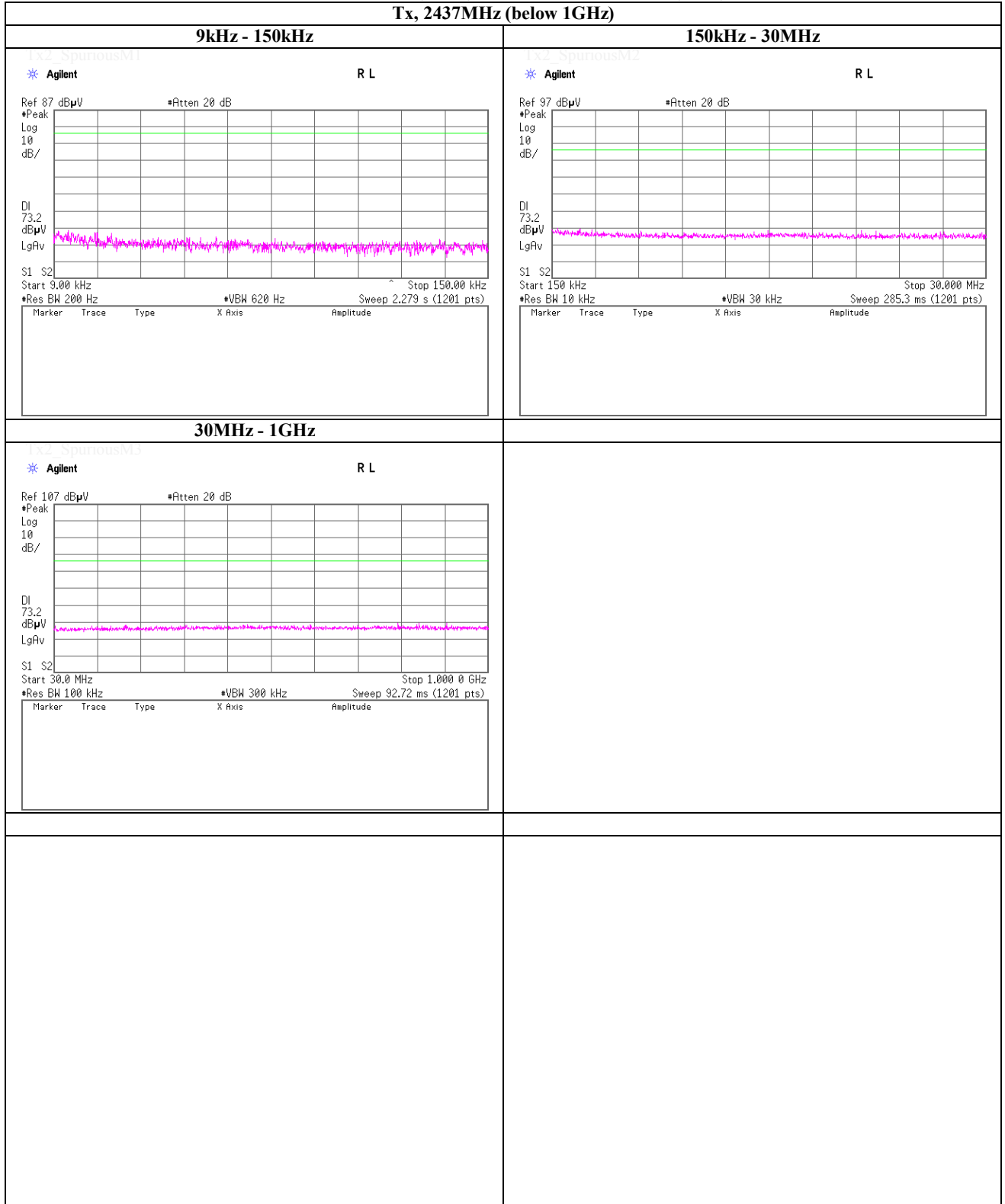
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(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(40HT), PN9, worst data mode 4(MCS)

Tx, 2437MHz (below 1GHz)

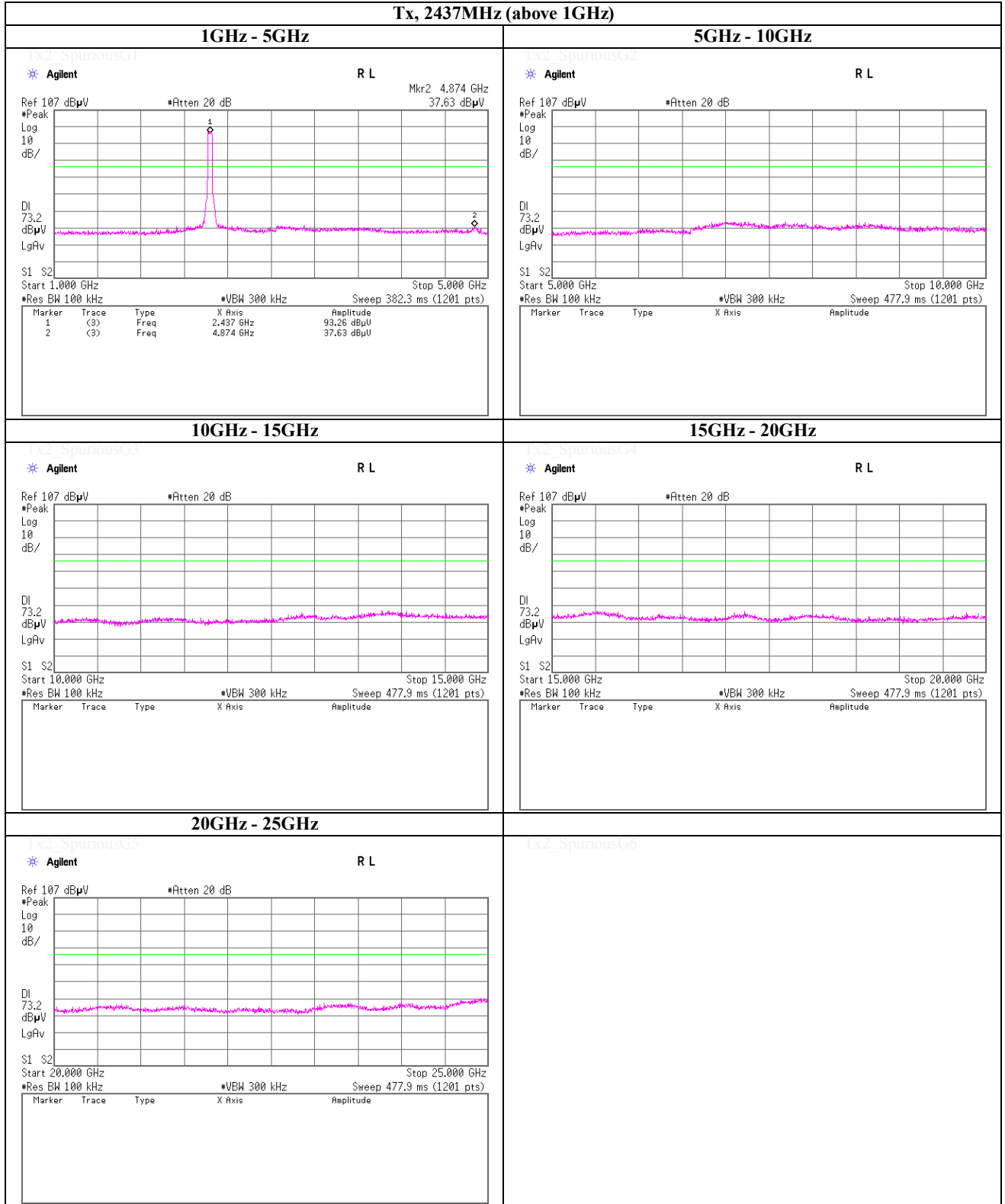


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(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(40HT), PN9, worst data mode 4(MCS)

Tx, 2437MHz (above 1GHz)



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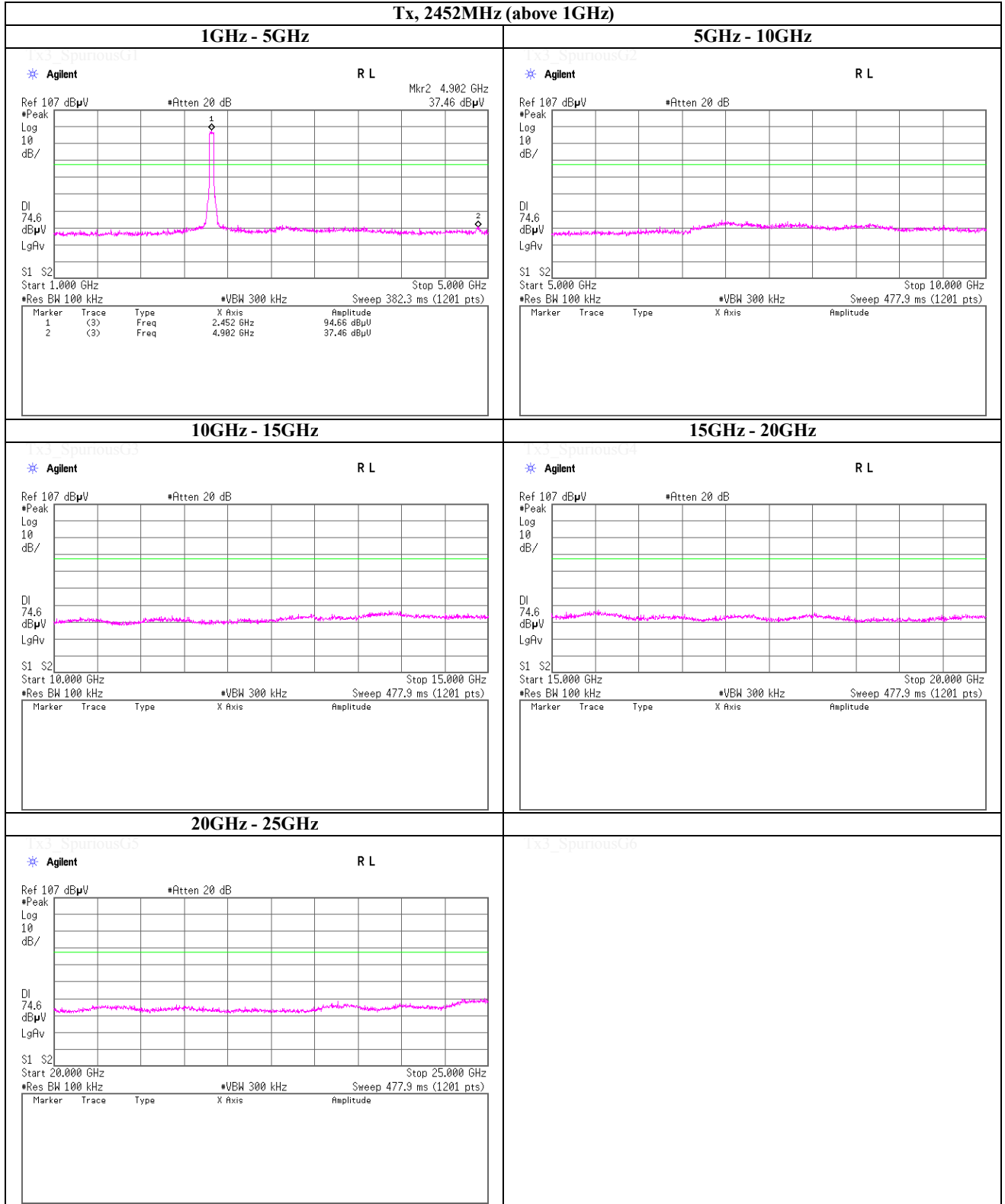
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(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(40HT), PN9, worst data mode 4(MCS)

Tx, 2452MHz (above 1GHz)

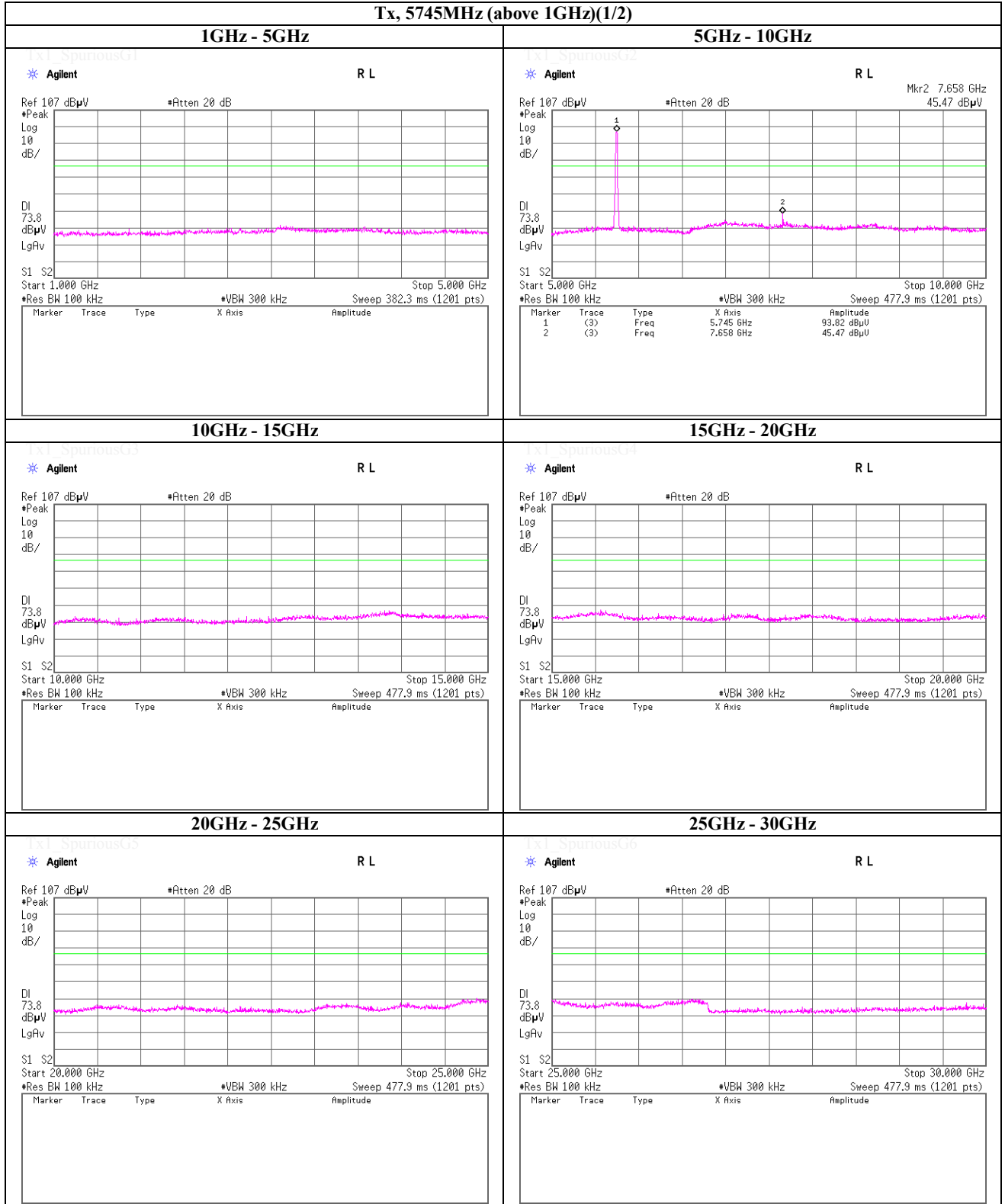


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(Reference chart) Spurious emission (Conducted)

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

Tx, 5745MHz (above 1GHz)(1/2)



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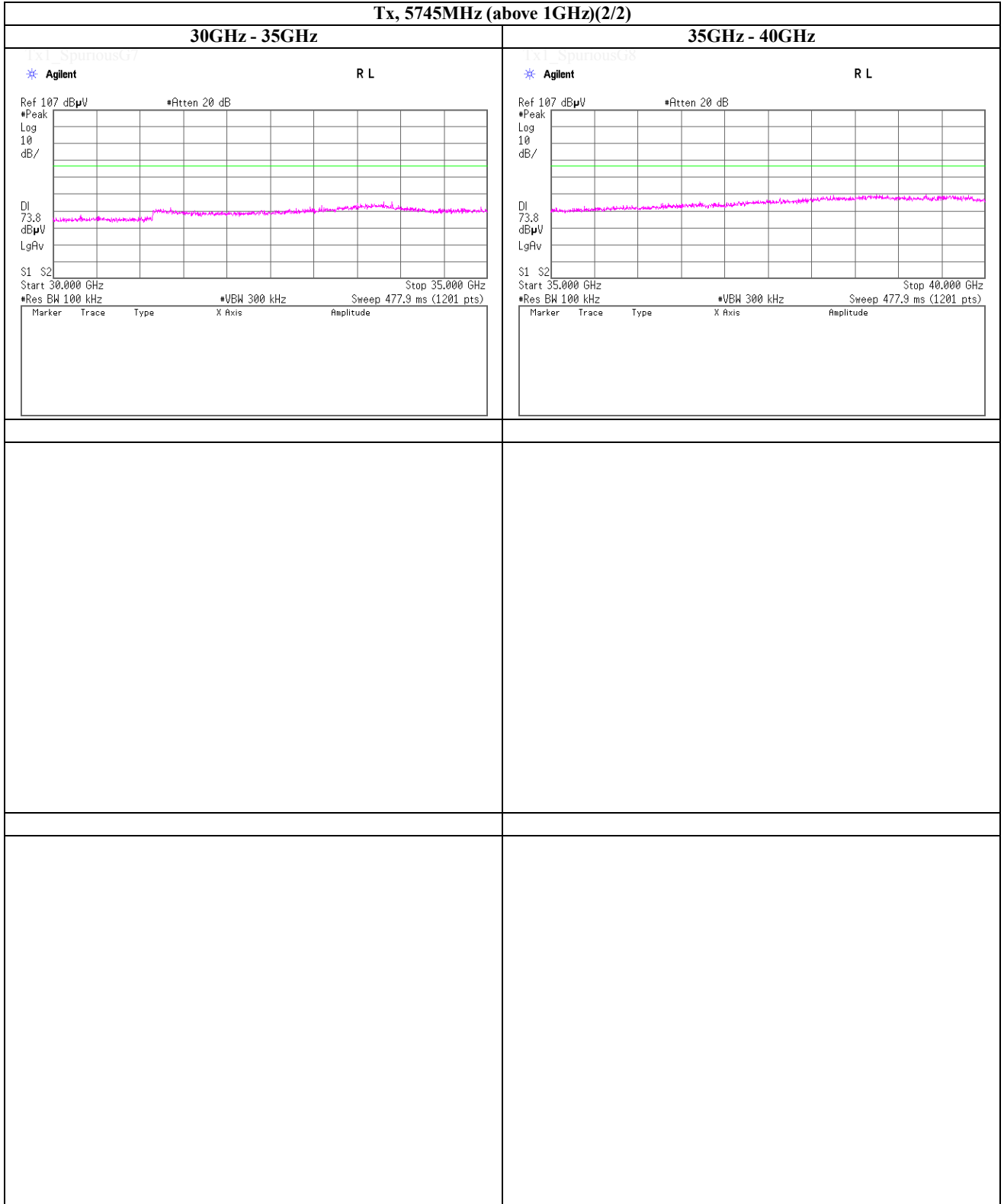
Telephone : +81 463 50 6400

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(Reference chart) Spurious emission (Conducted)

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

Tx, 5745MHz (above 1GHz)(2/2)

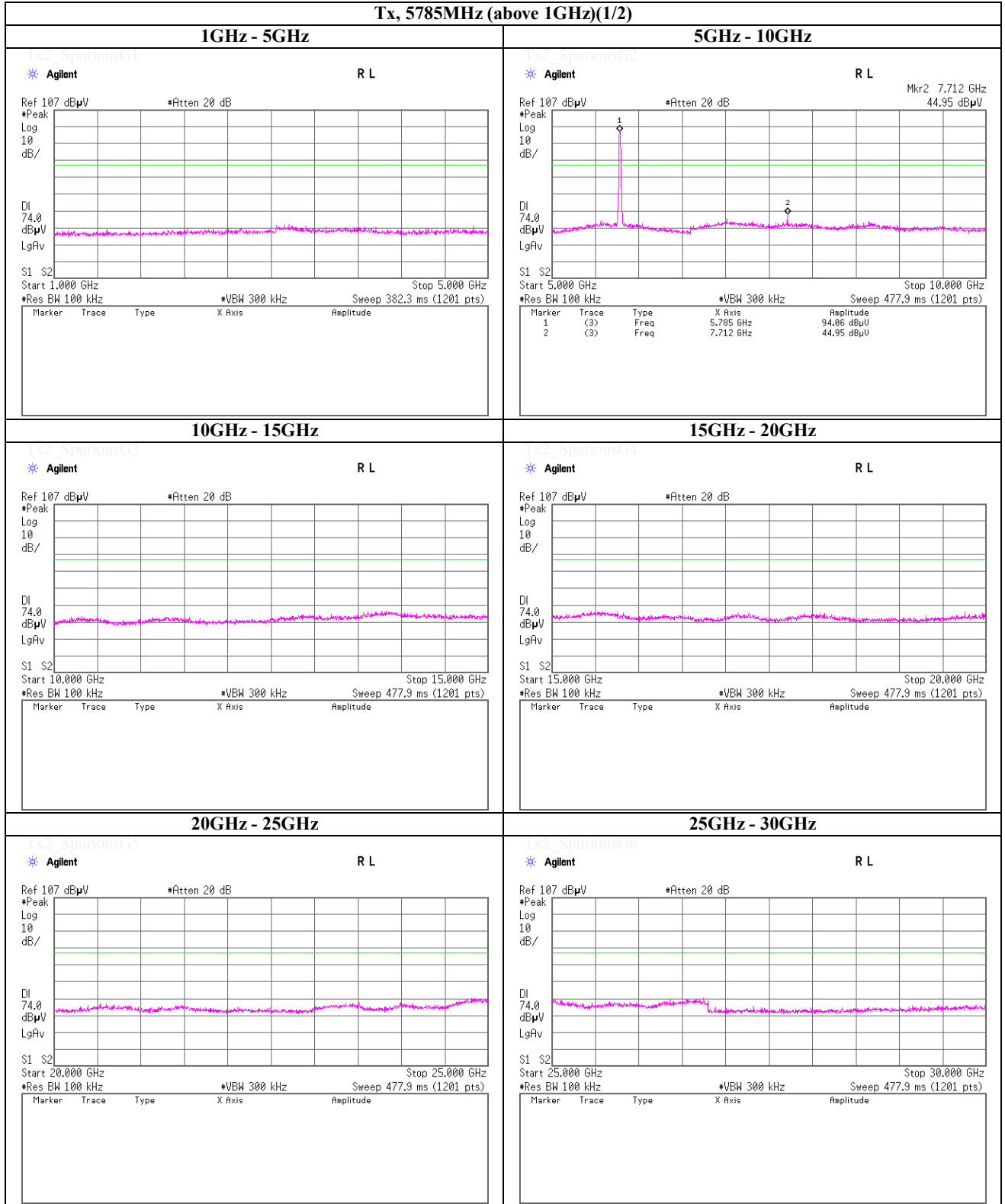


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(Reference chart) Spurious emission (Conducted)

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

Tx, 5785MHz (above 1GHz)(1/2)



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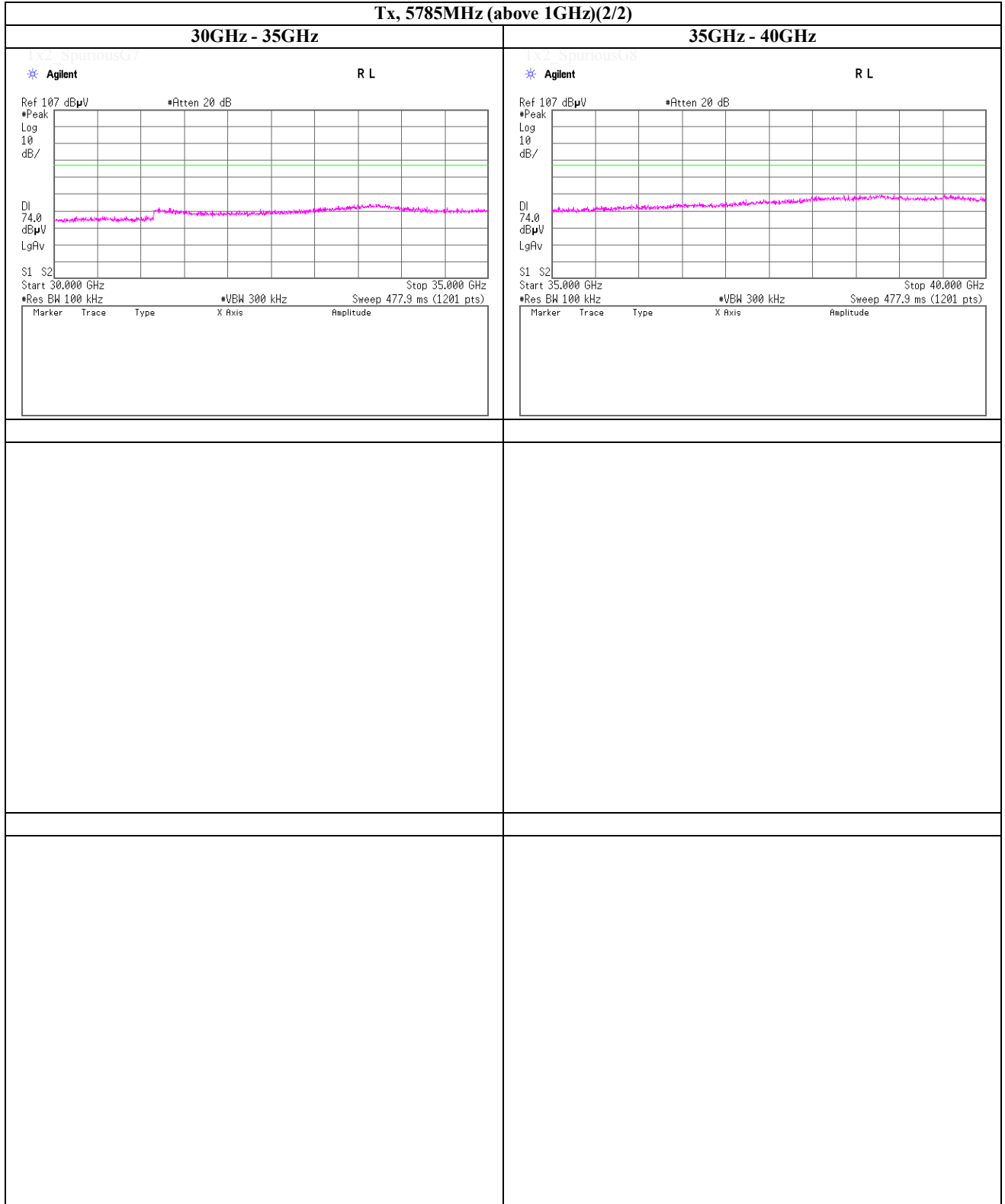
Telephone : +81 463 50 6400

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(Reference chart) Spurious emission (Conducted)

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

Tx, 5785MHz (above 1GHz)(2/2)



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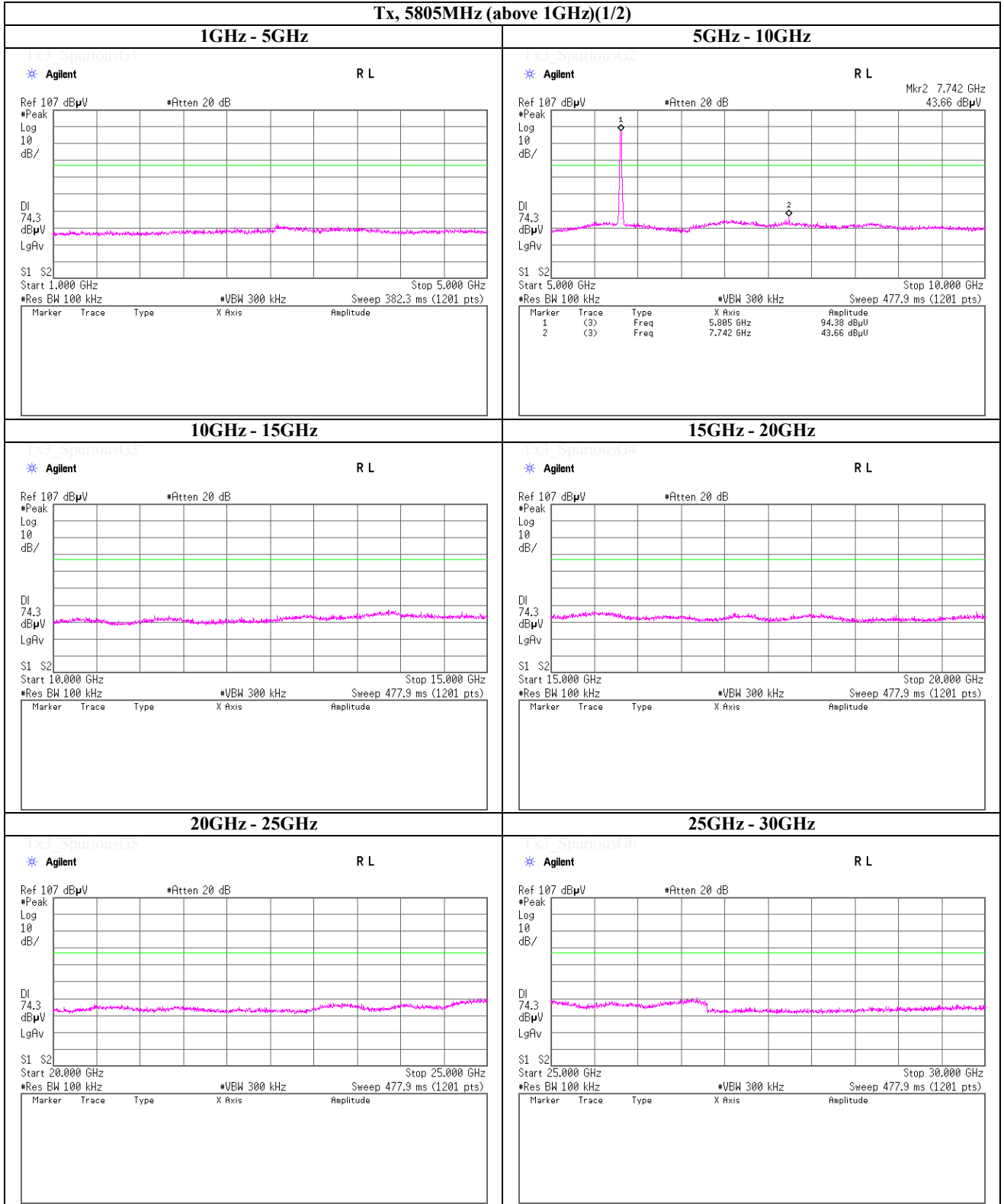
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(Reference chart) Spurious emission (Conducted)

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

Tx, 5805MHz (above 1GHz)(1/2)



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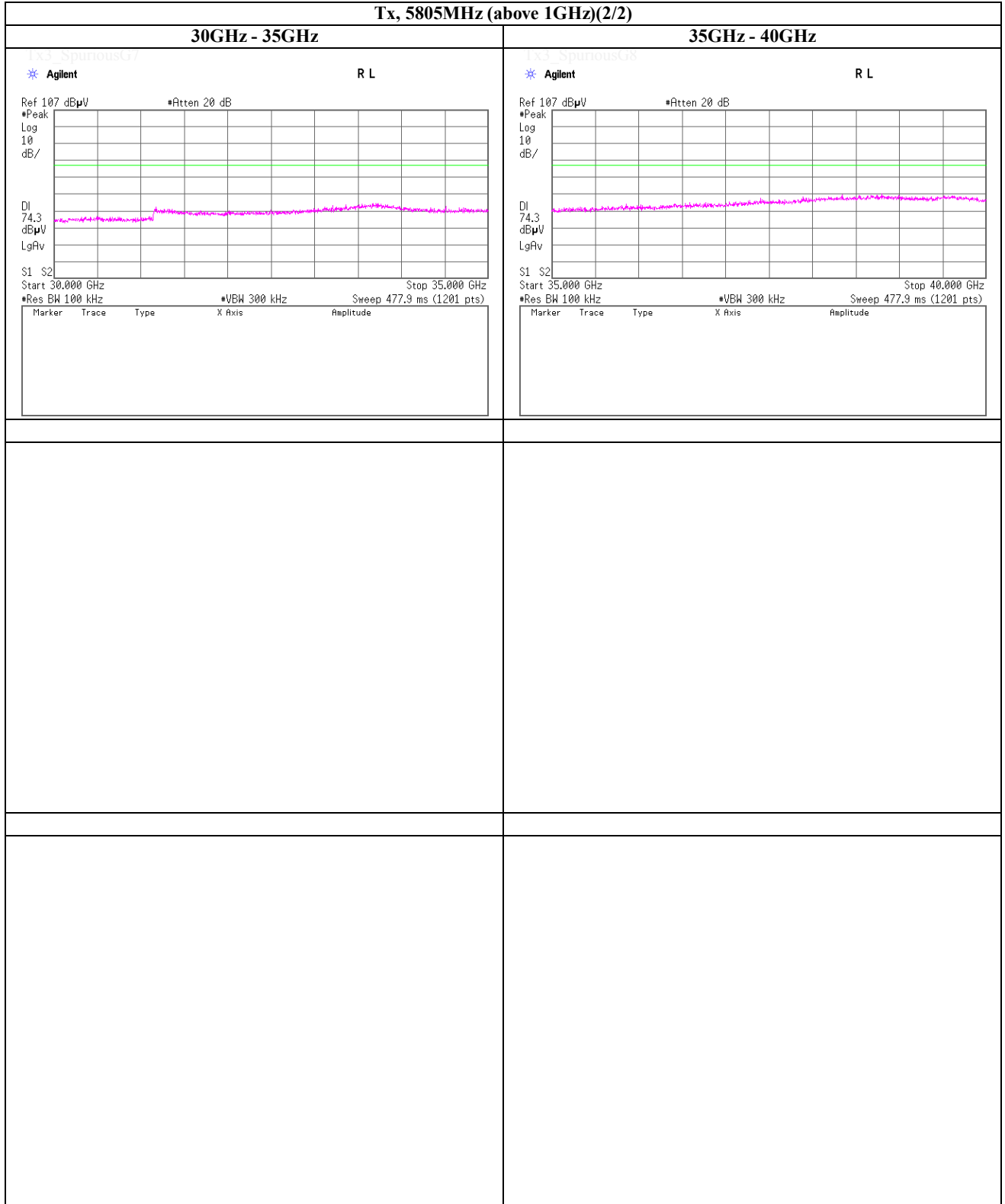
Telephone : +81 463 50 6400

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(Reference chart) Spurious emission (Conducted)

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

Tx, 5805MHz (above 1GHz)(2/2)



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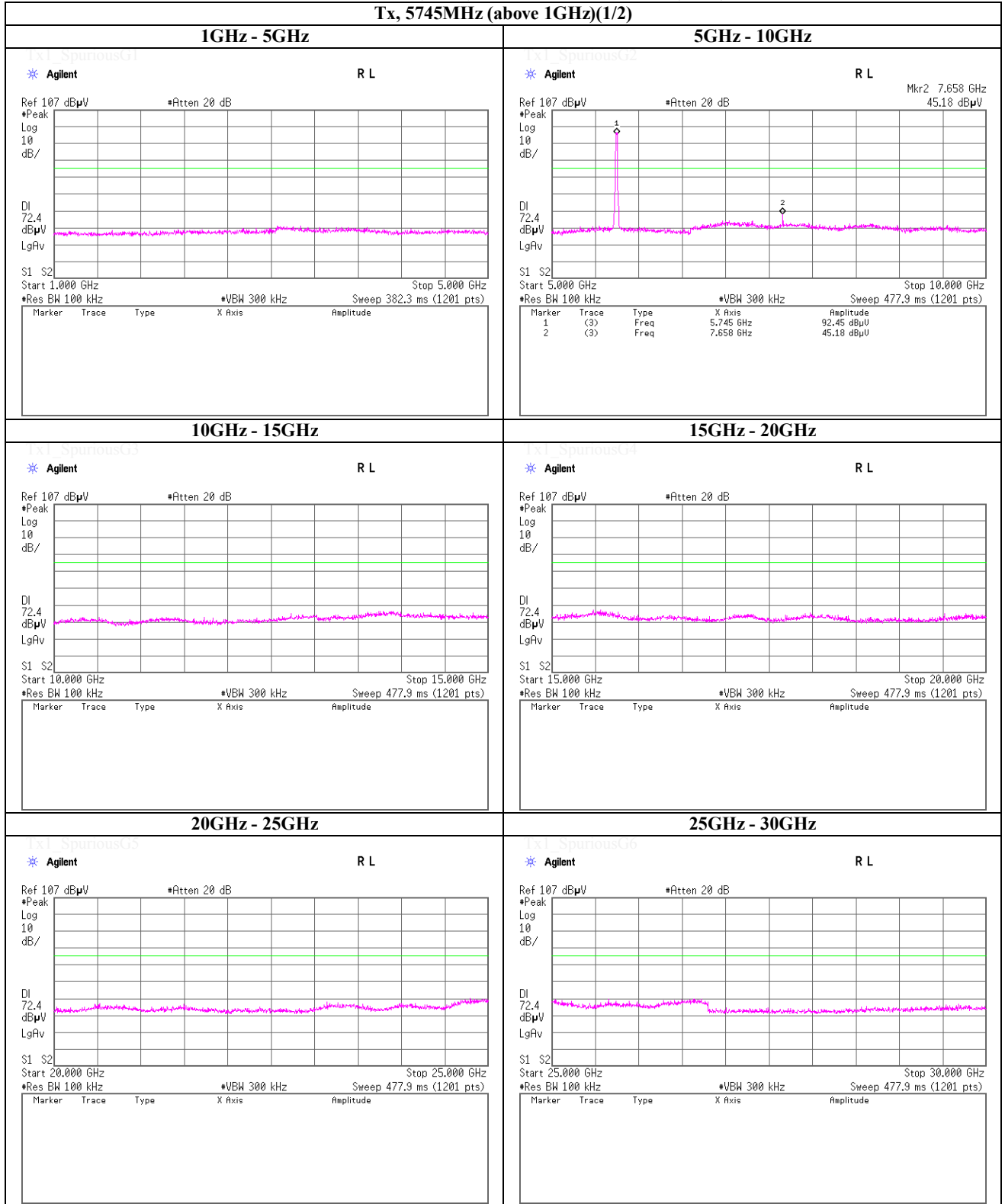
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Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)

Tx, 5745MHz (above 1GHz)(1/2)



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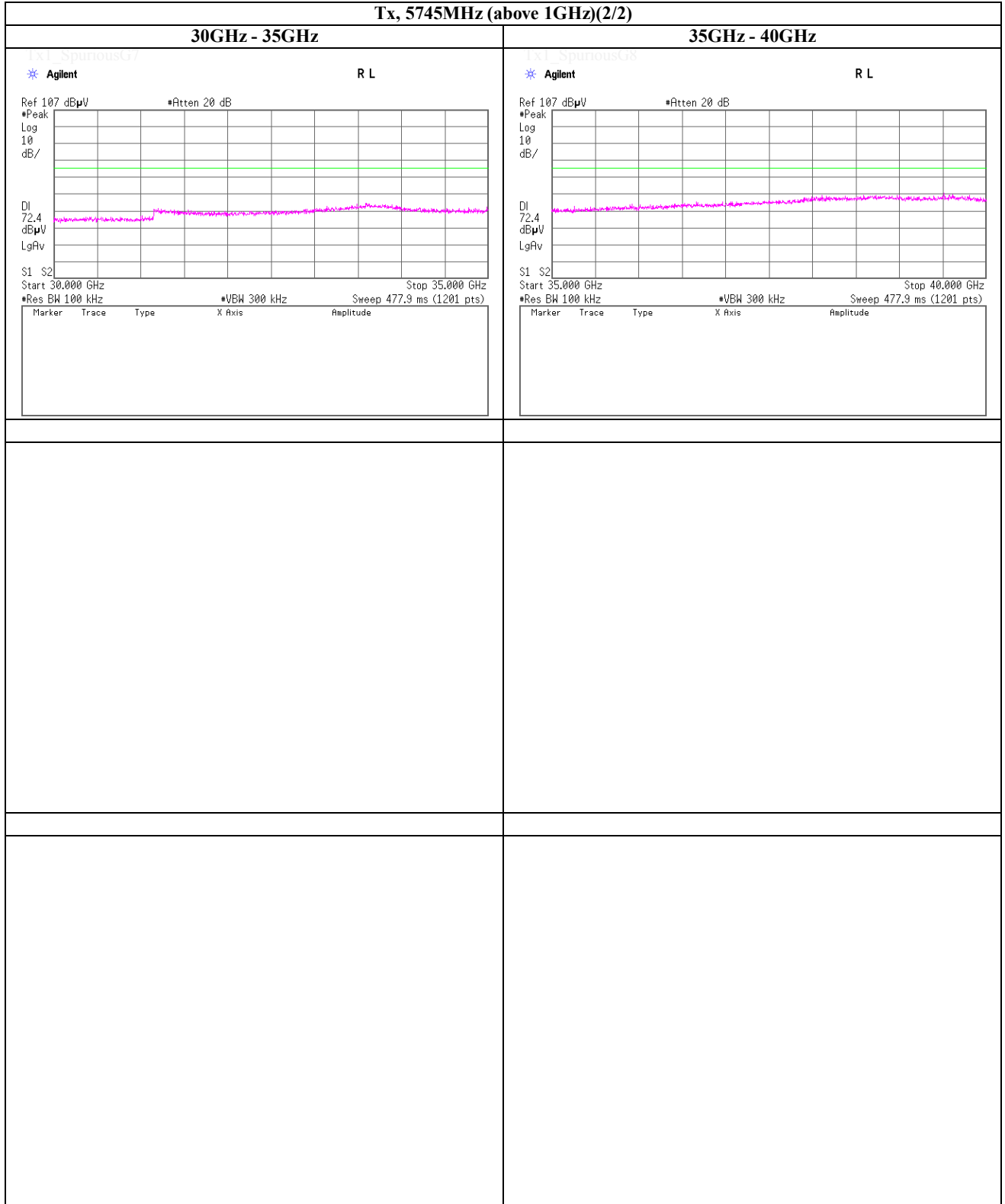
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)

Tx, 5745MHz (above 1GHz)(2/2)



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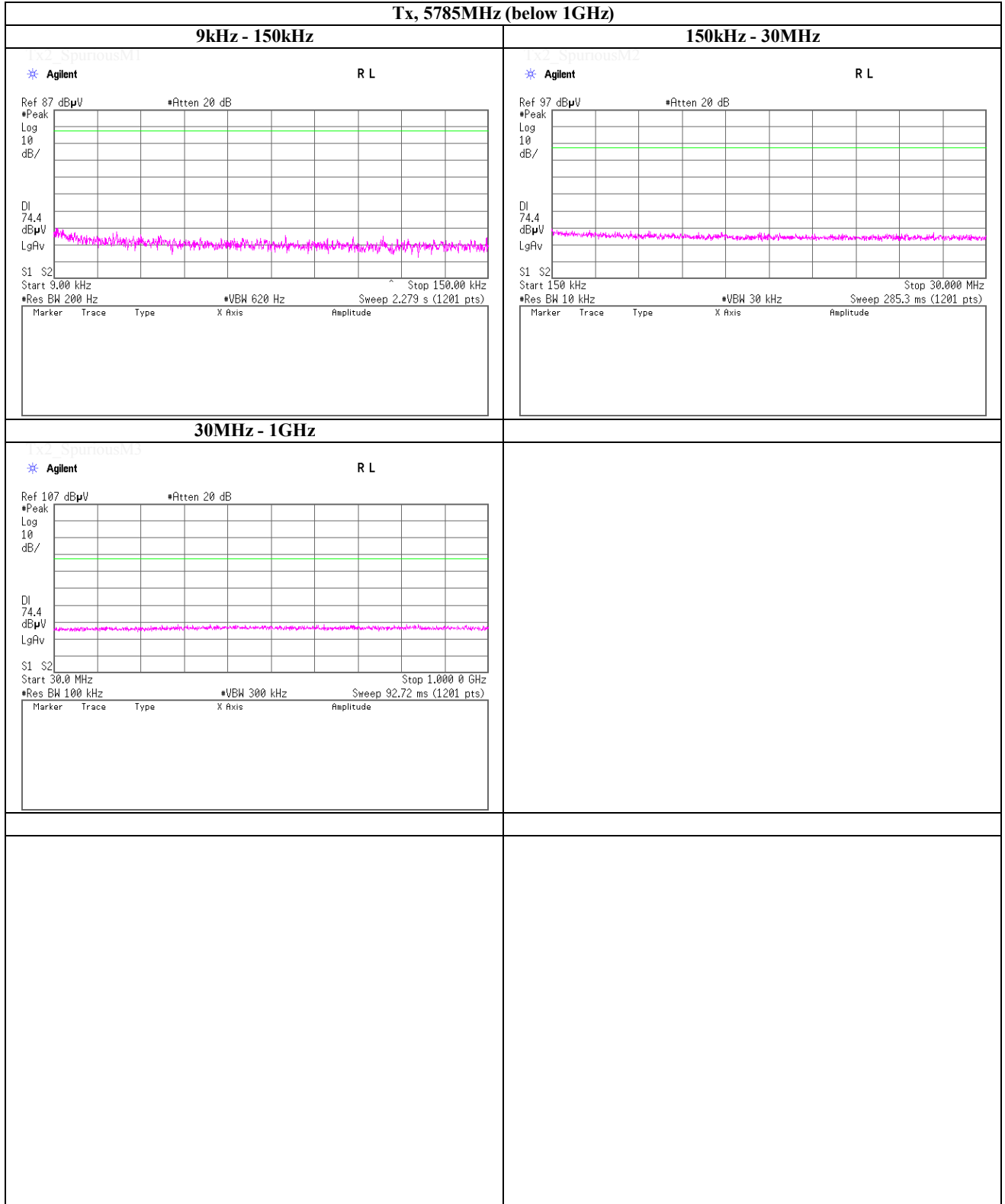
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)

Tx, 5785MHz (below 1GHz)



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Shonan EMC Lab.

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

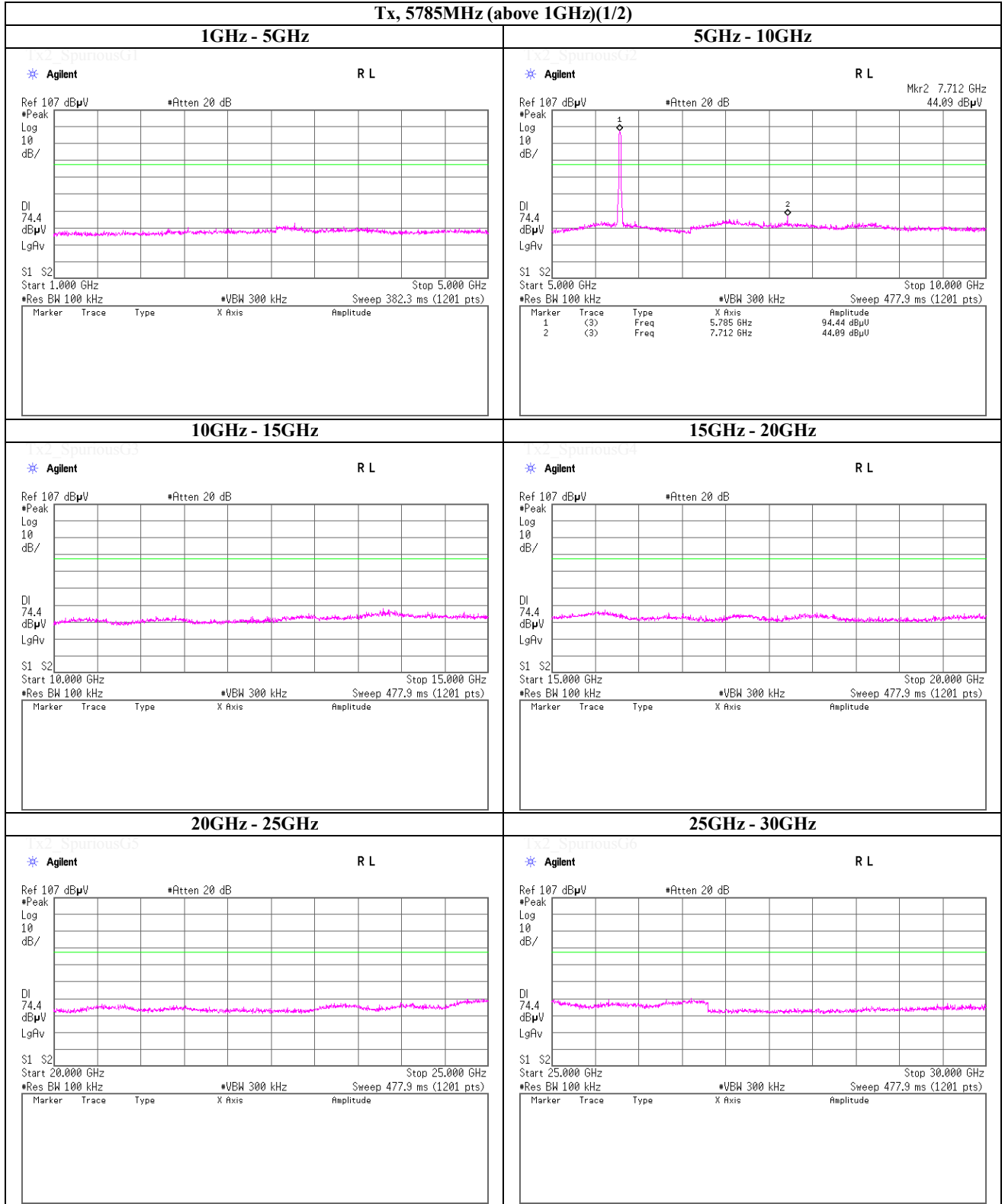
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)

Tx, 5785MHz (above 1GHz)(1/2)



UL Japan, Inc.

Shonan EMC Lab.

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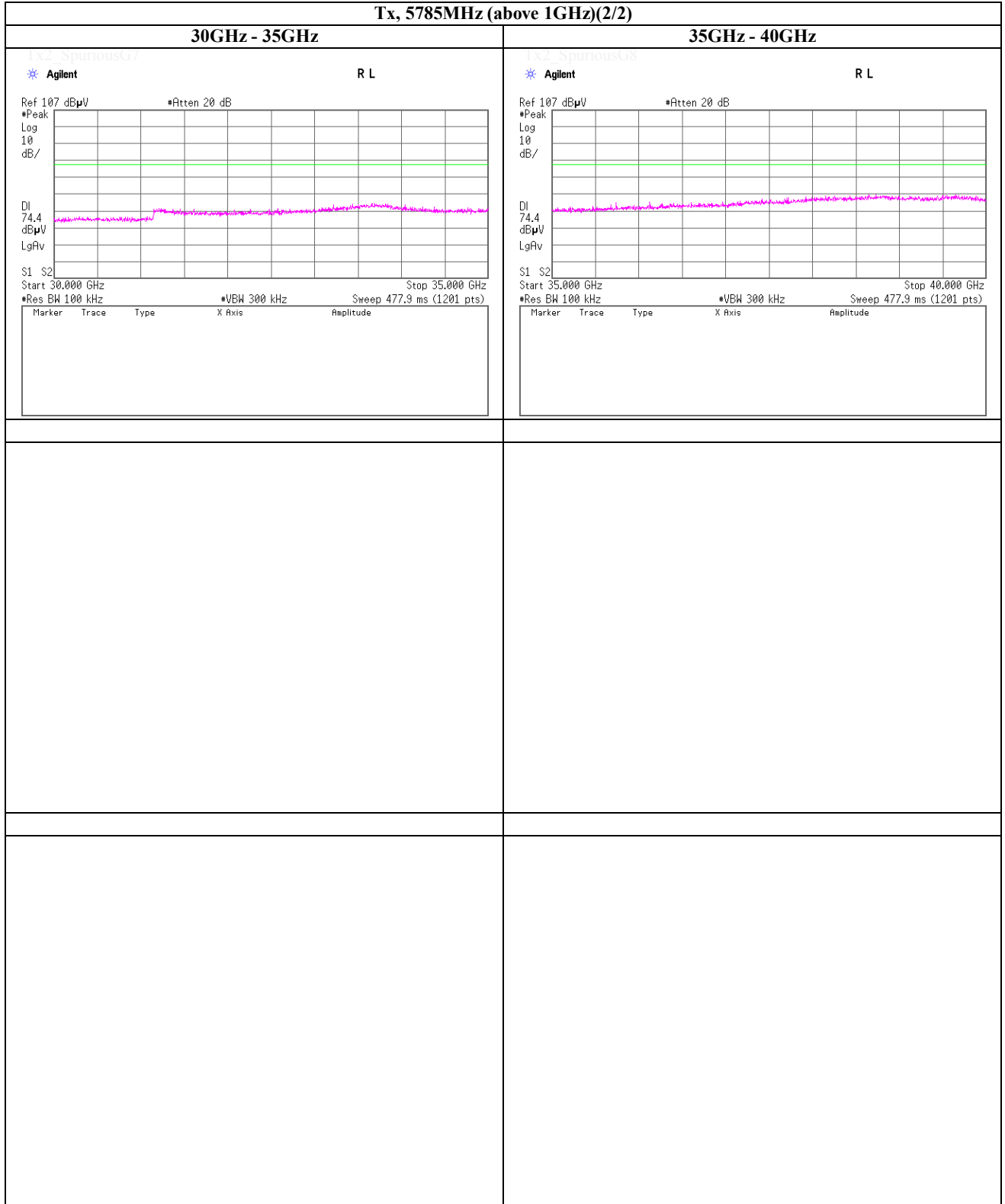
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)

Tx, 5785MHz (above 1GHz)(2/2)



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Shonan EMC Lab.

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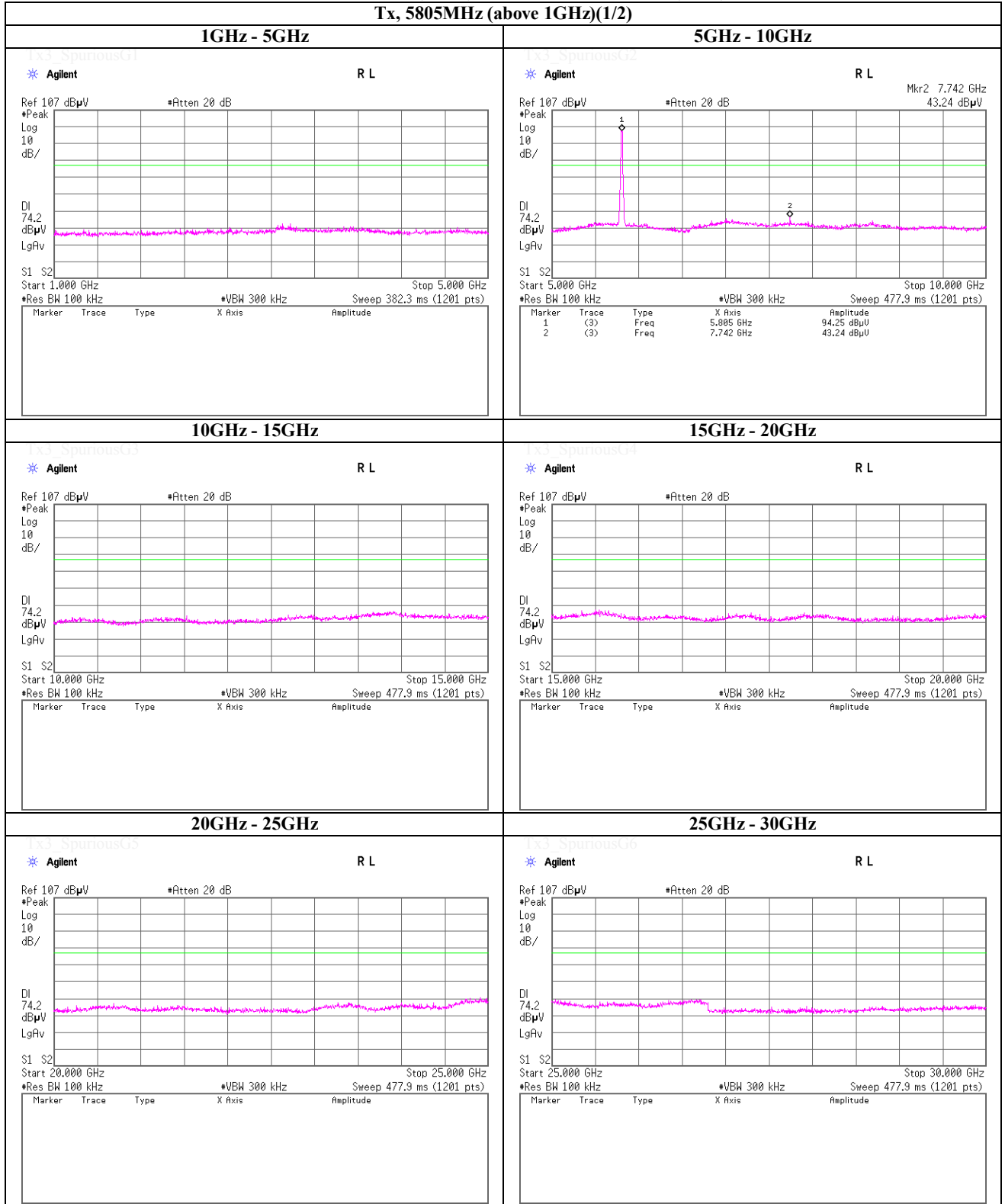
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)

Tx, 5805MHz (above 1GHz)(1/2)



UL Japan, Inc.

Shonan EMC Lab.

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

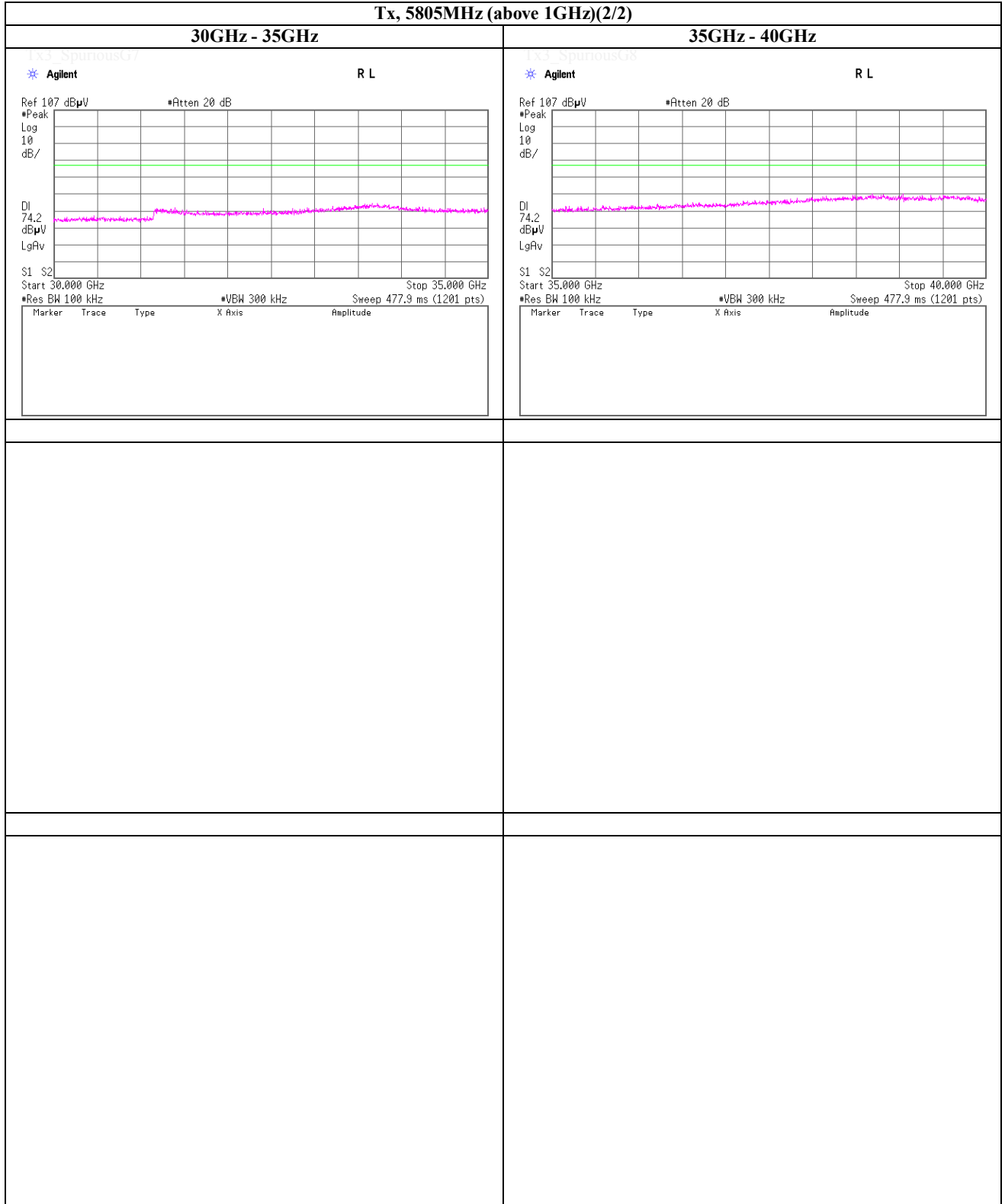
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)

Tx, 5805MHz (above 1GHz)(2/2)



UL Japan, Inc.

Shonan EMC Lab.

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

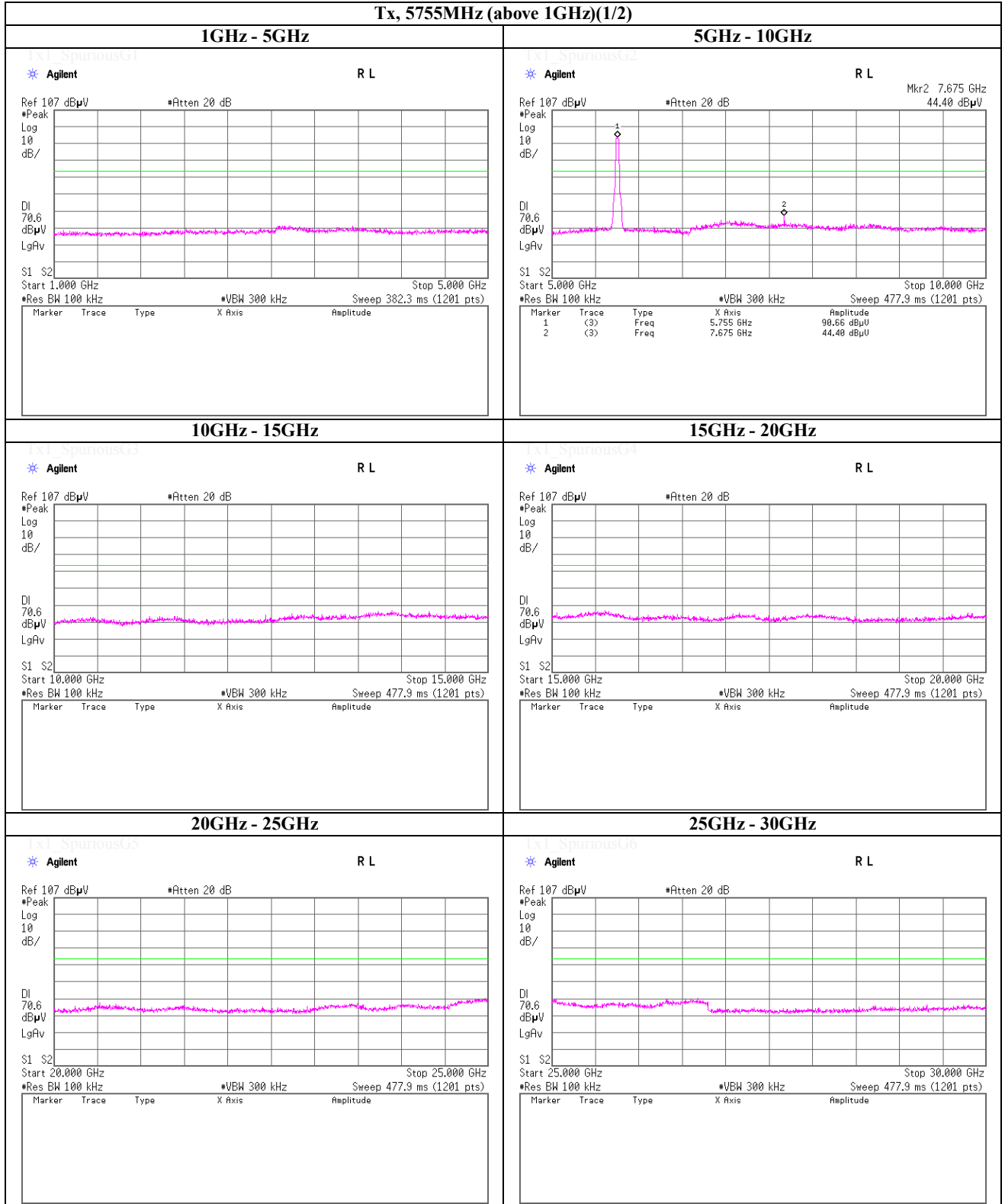
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(40HT), PN9, worst data mode 4(MCS)

Tx, 5755MHz (above 1GHz)(1/2)



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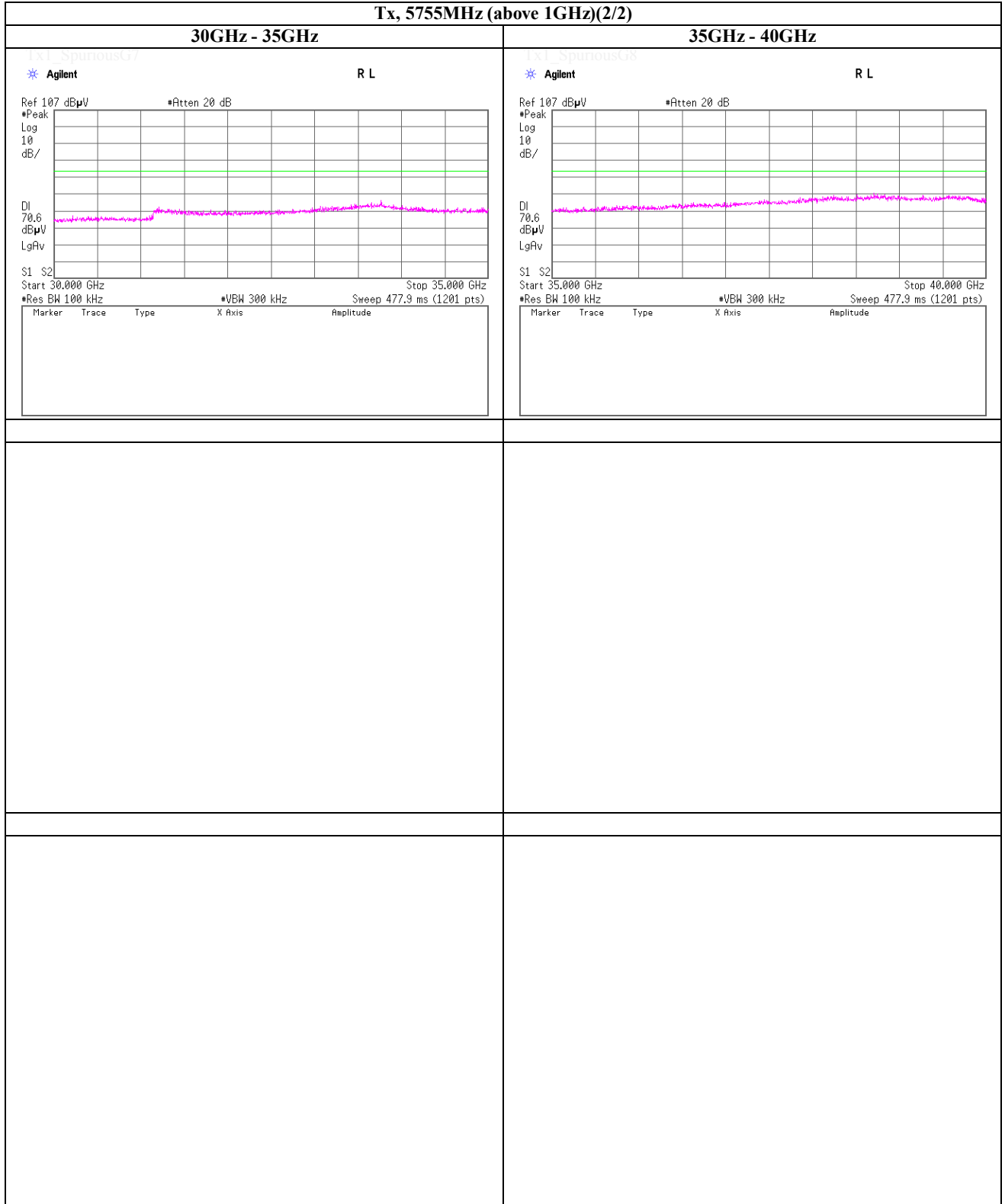
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(40HT), PN9, worst data mode 4(MCS)

Tx, 5755MHz (above 1GHz)(2/2)



UL Japan, Inc.

Shonan EMC Lab.

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

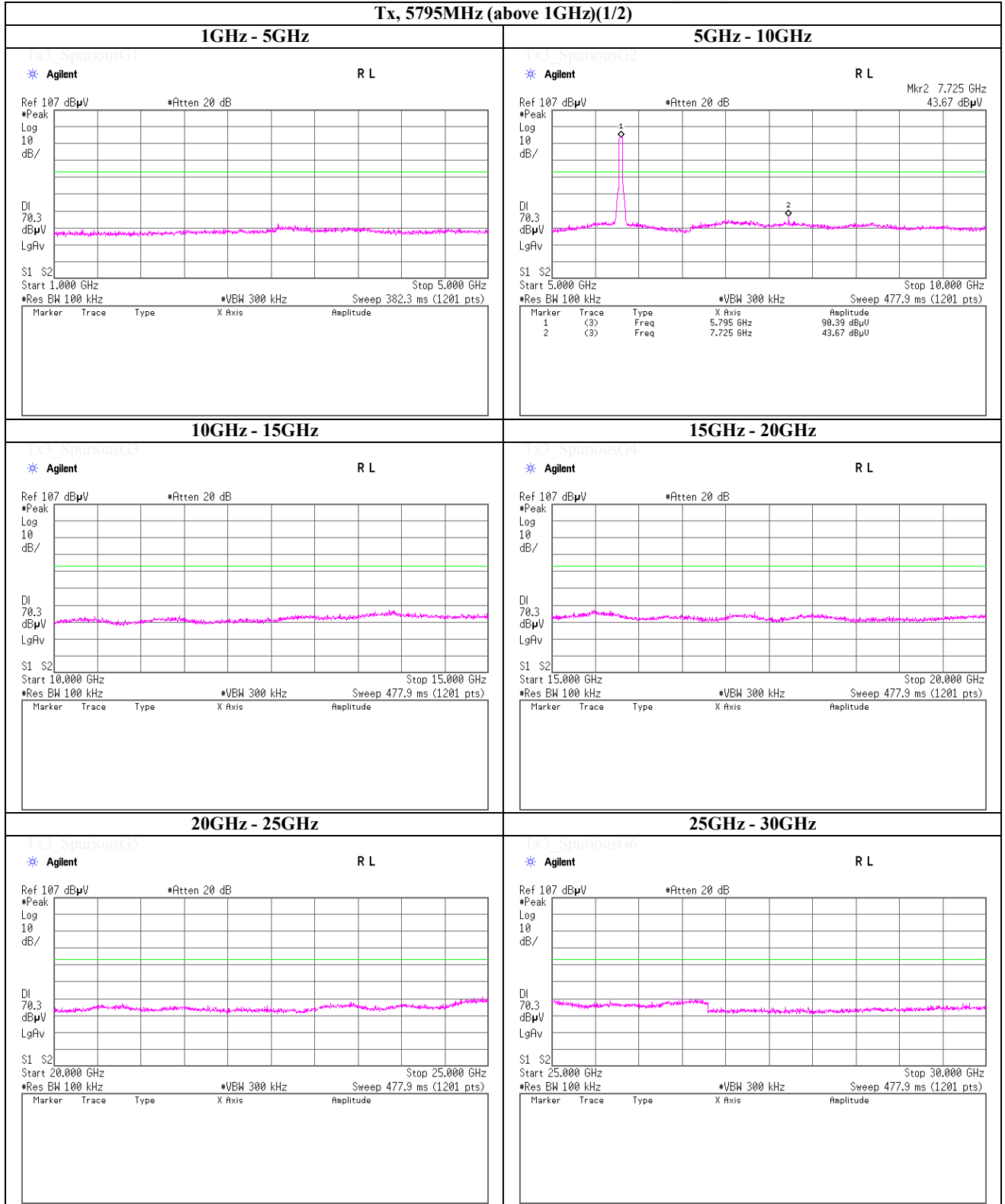
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(40HT), PN9, worst data mode 4(MCS)

Tx, 5795MHz (above 1GHz)(1/2)



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Shonan EMC Lab.

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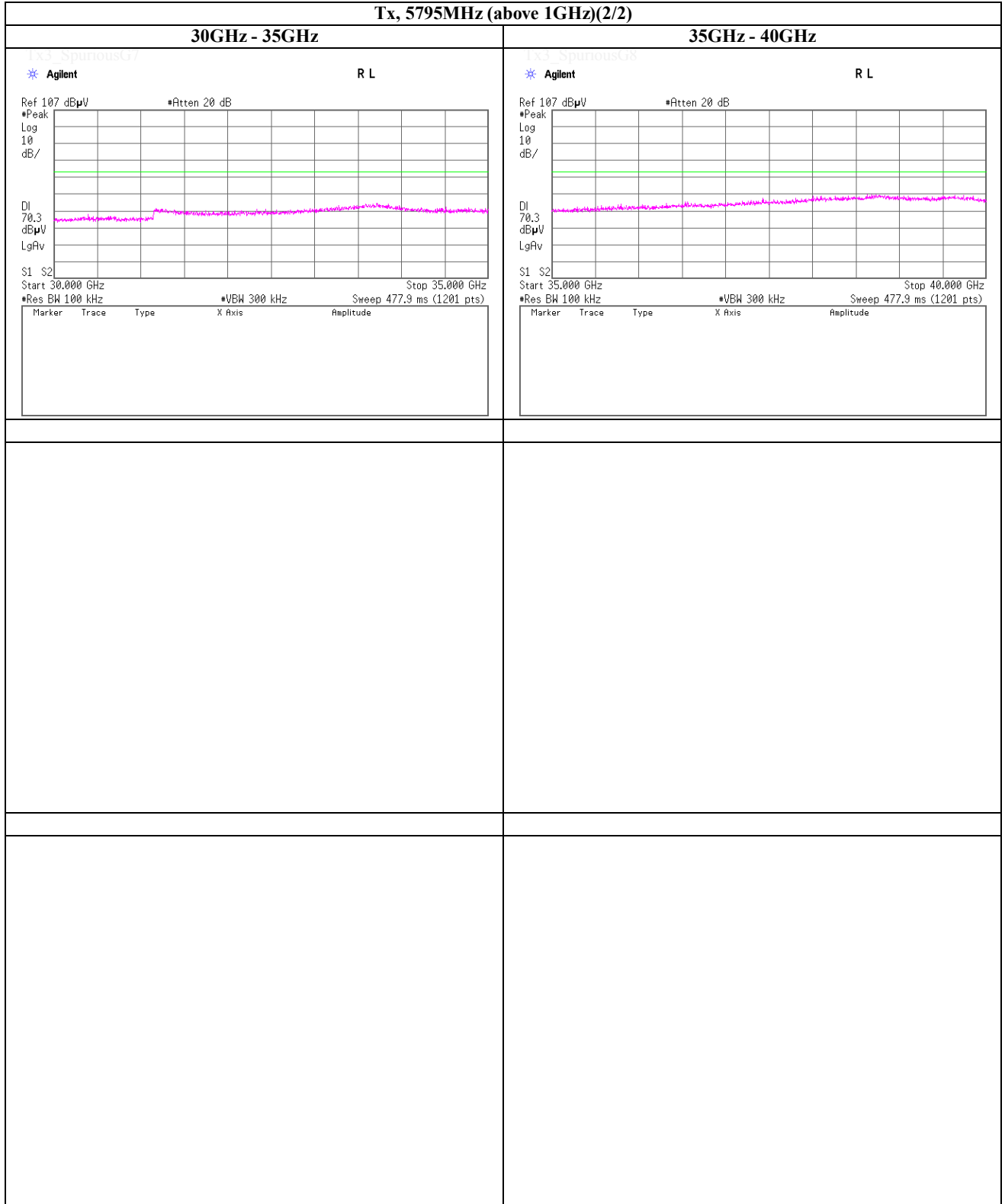
Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n(40HT), PN9, worst data mode 4(MCS)

Tx, 5795MHz (above 1GHz)(2/2)



UL Japan, Inc.

Shonan EMC Lab.

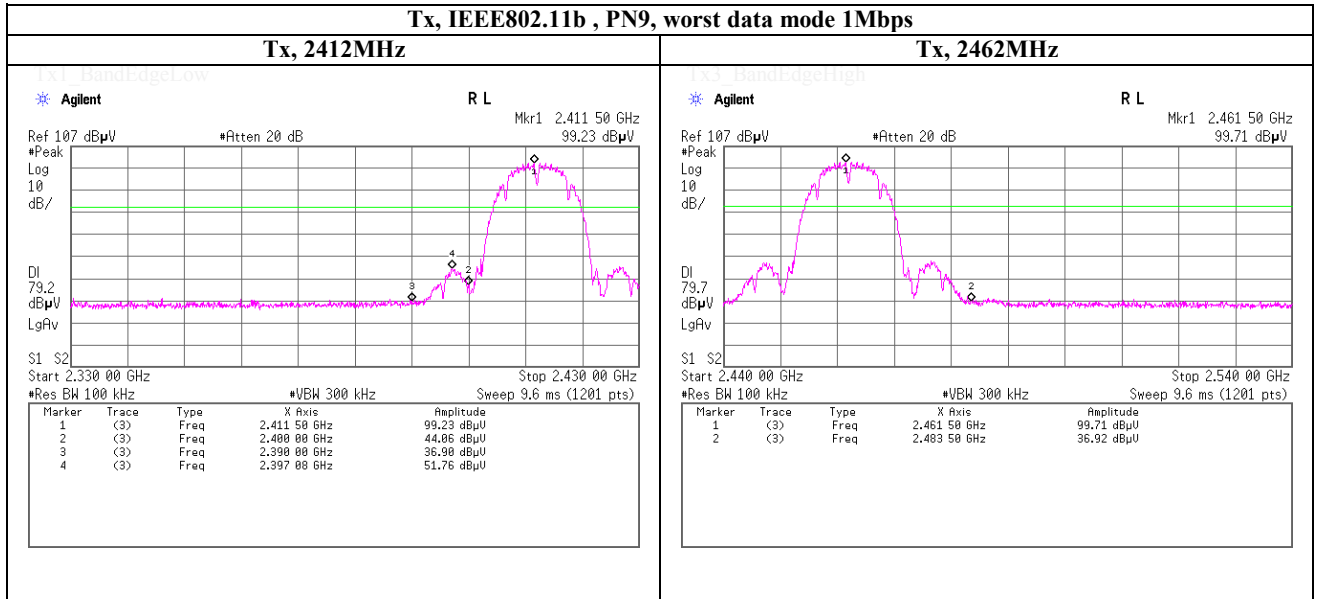
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Band Edge compliance



UL Japan, Inc.

Shonan EMC Lab.

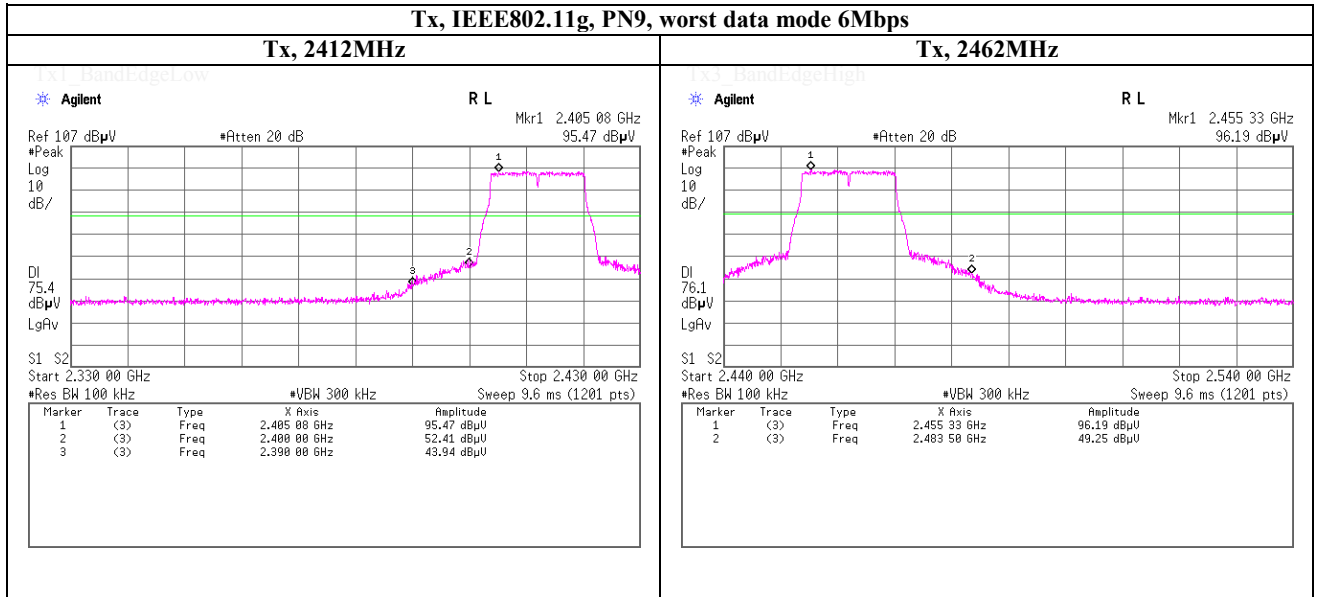
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Band Edge compliance



UL Japan, Inc.

Shonan EMC Lab.

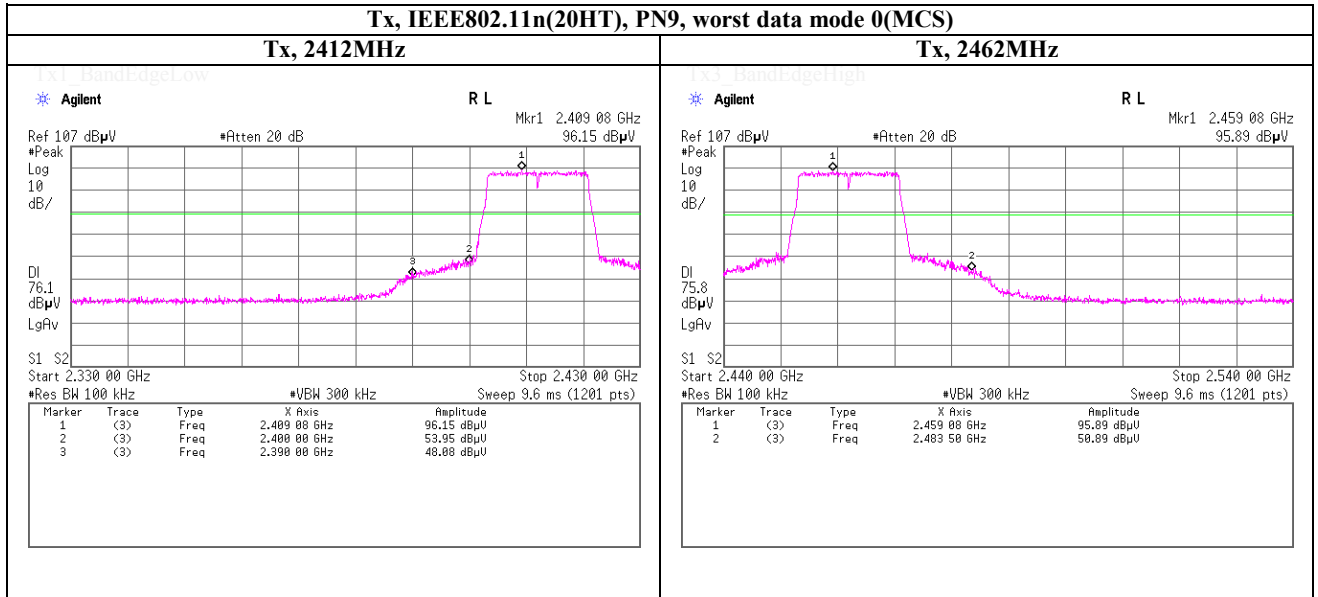
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Band Edge compliance



UL Japan, Inc.

Shonan EMC Lab.

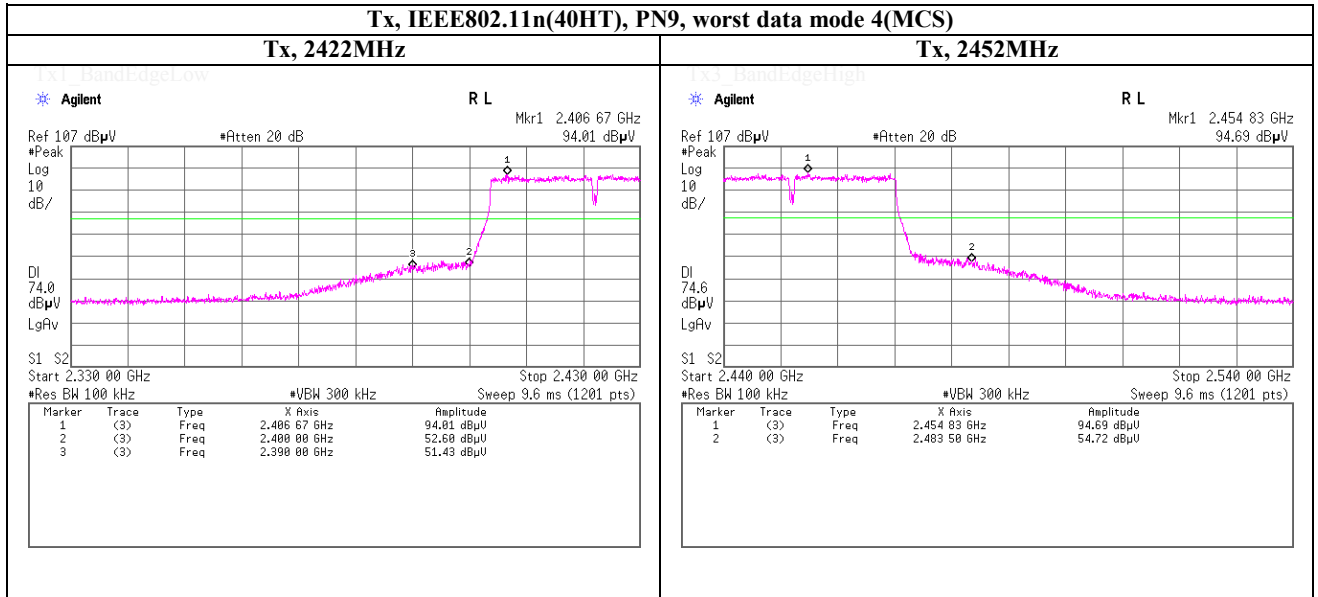
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Band Edge compliance



UL Japan, Inc.

Shonan EMC Lab.

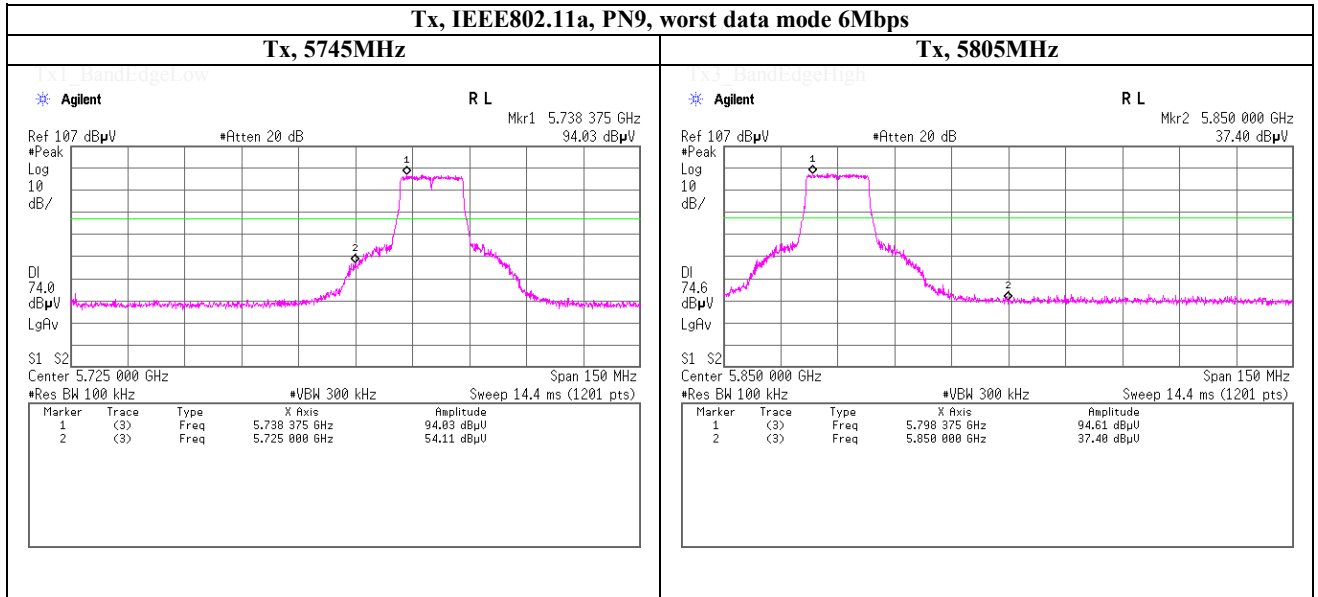
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Band Edge compliance



UL Japan, Inc.

Shonan EMC Lab.

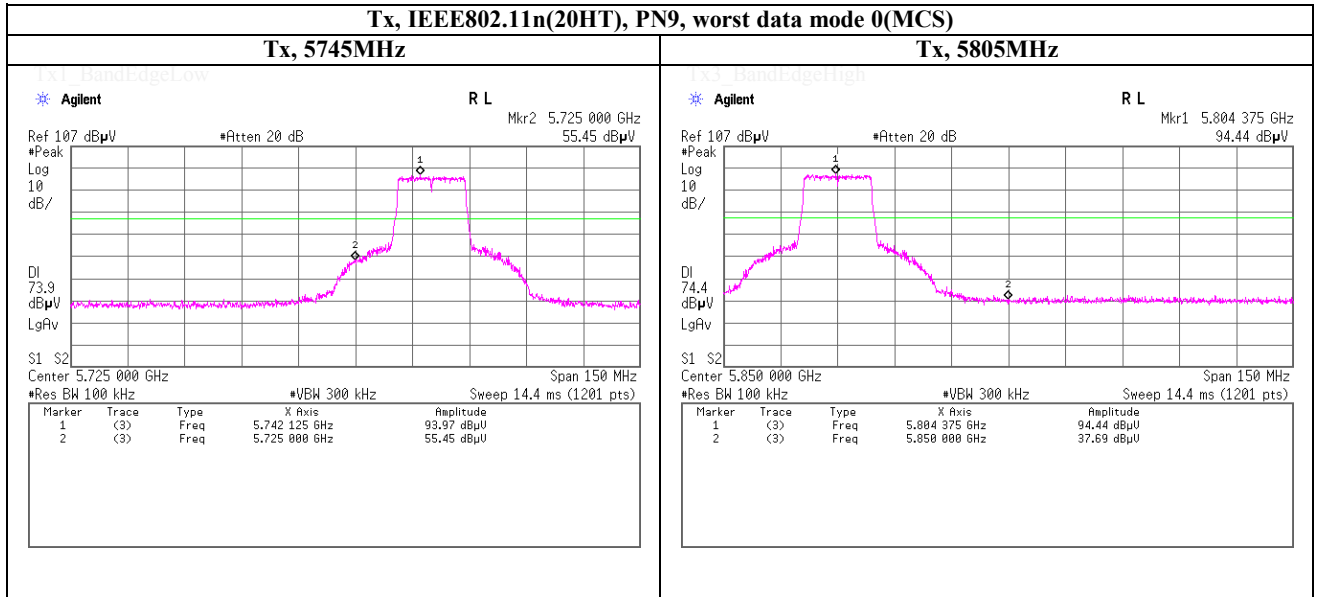
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Band Edge compliance



UL Japan, Inc.

Shonan EMC Lab.

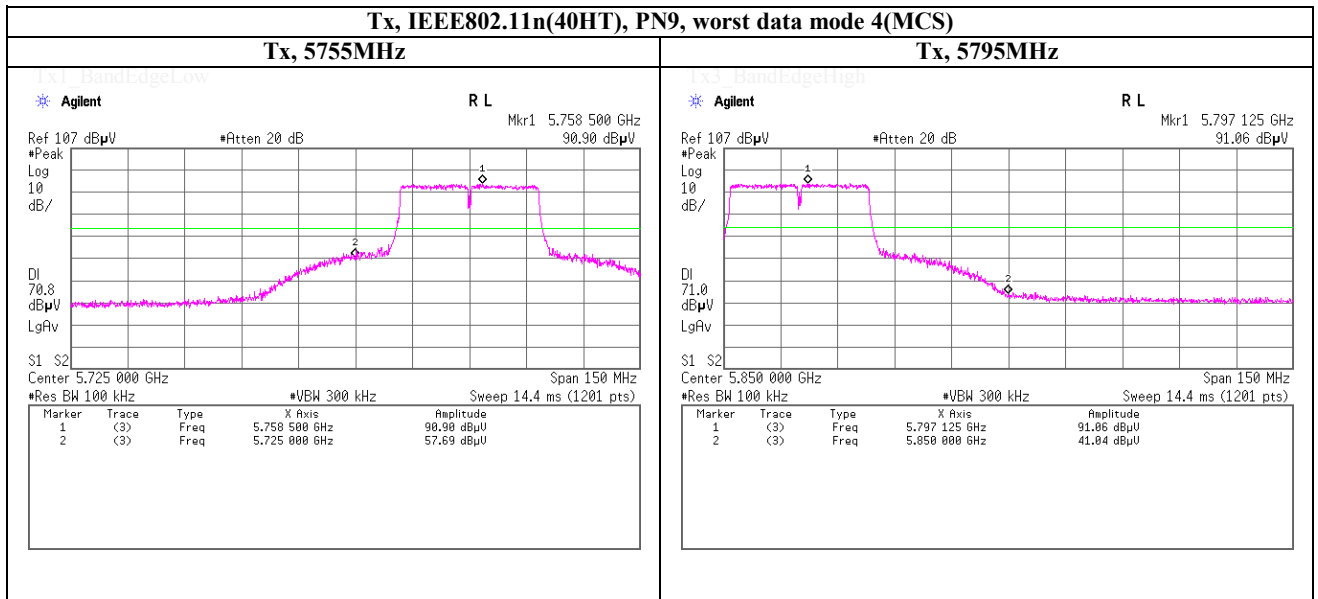
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

Band Edge compliance



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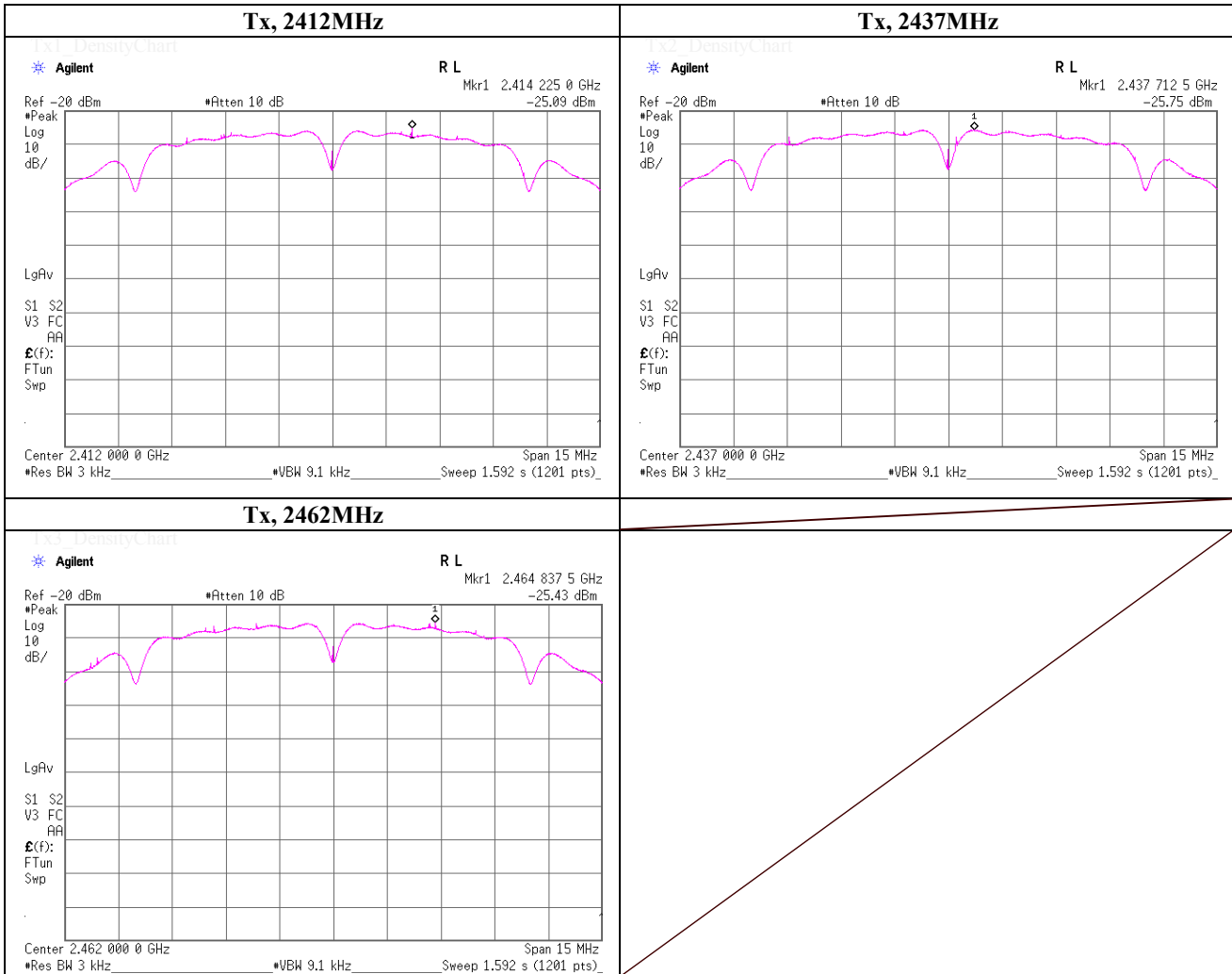
Maximum Power Spectral Density

(Option 1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 16, 2013	
Temperature / Humidity	23deg.C , 36%RH	
Engineer	Shinichi Takano	
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	2414.23	-25.09	0.42	9.97	-14.70	8.00	22.70
2437.0000	2437.71	-25.75	0.42	9.97	-15.36	8.00	23.36
2462.0000	2464.84	-25.43	0.42	9.97	-15.04	8.00	23.04

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



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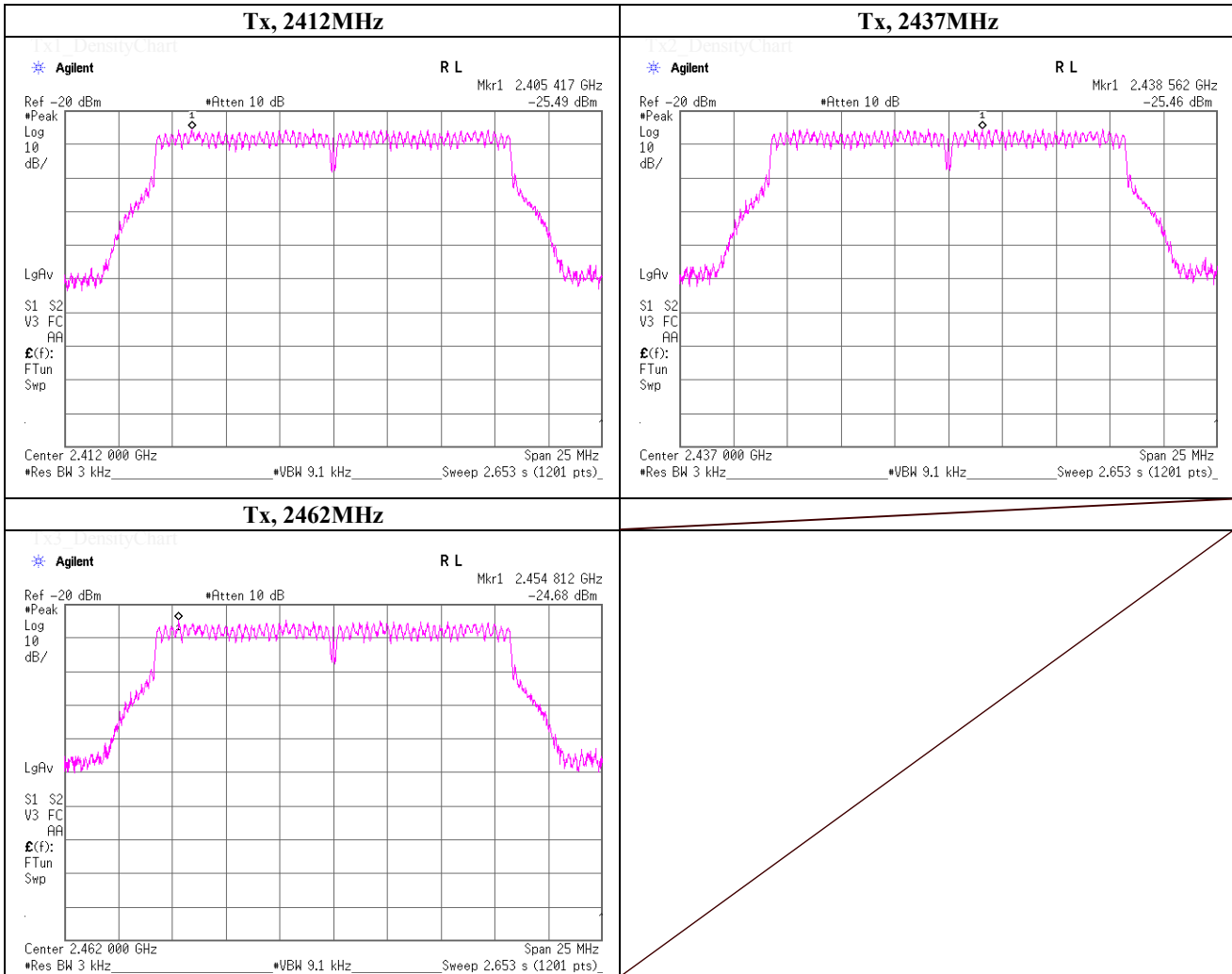
Maximum Power Spectral Density

(Option 1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 16, 2013	
Temperature / Humidity	23deg.C , 36%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2405.42	-25.49	0.42	9.97	-15.10	8.00	23.10
2437.0000	2438.56	-25.46	0.42	9.97	-15.07	8.00	23.07
2462.0000	2454.81	-24.68	0.42	9.97	-14.29	8.00	22.29

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



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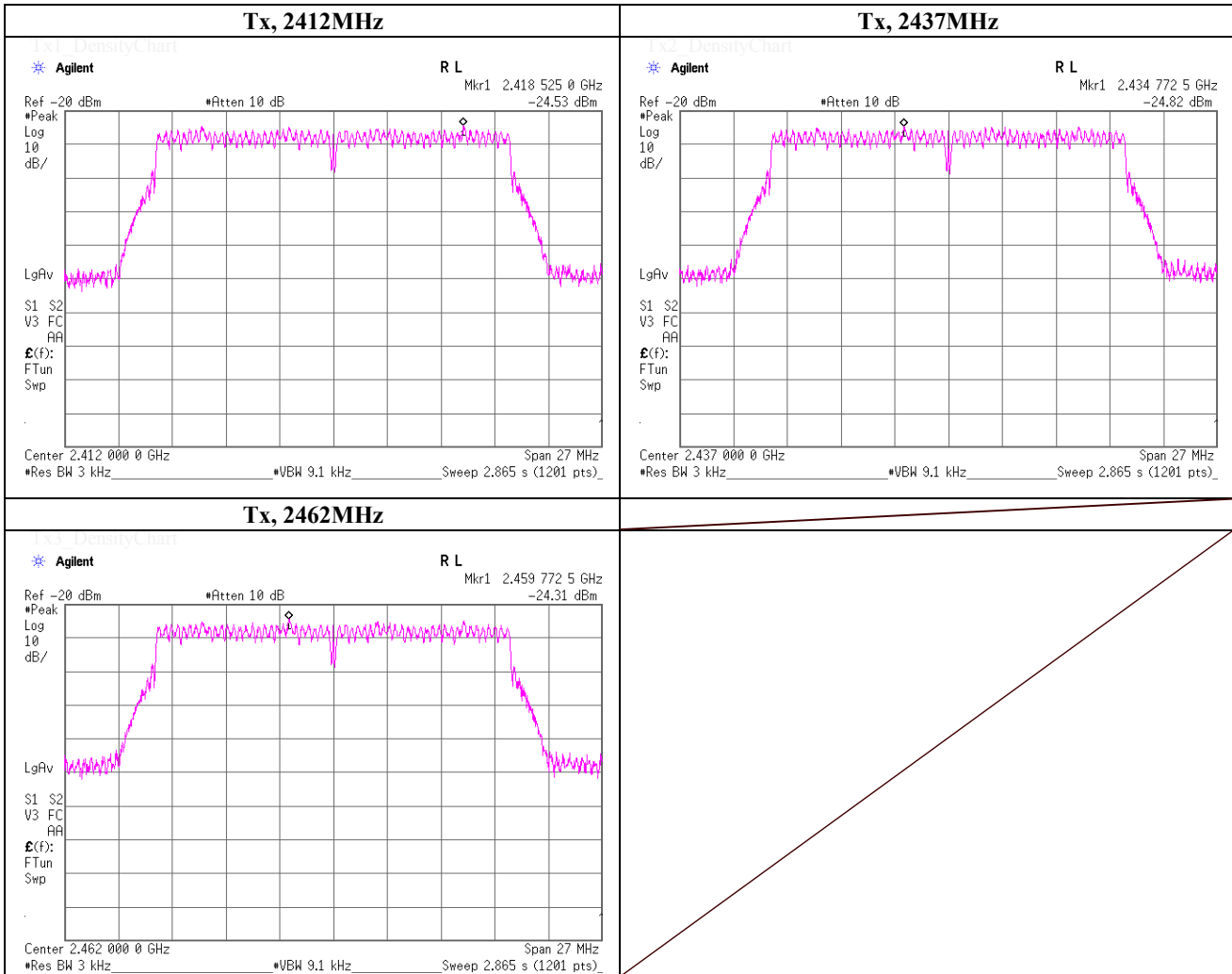
Maximum Power Spectral Density

(Option 1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 16, 2013	
Temperature / Humidity	23deg.C , 36%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2418.53	-24.53	0.42	9.97	-14.14	8.00	22.14
2437.0000	2434.77	-24.82	0.42	9.97	-14.43	8.00	22.43
2462.0000	2459.77	-24.31	0.42	9.97	-13.92	8.00	21.92

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



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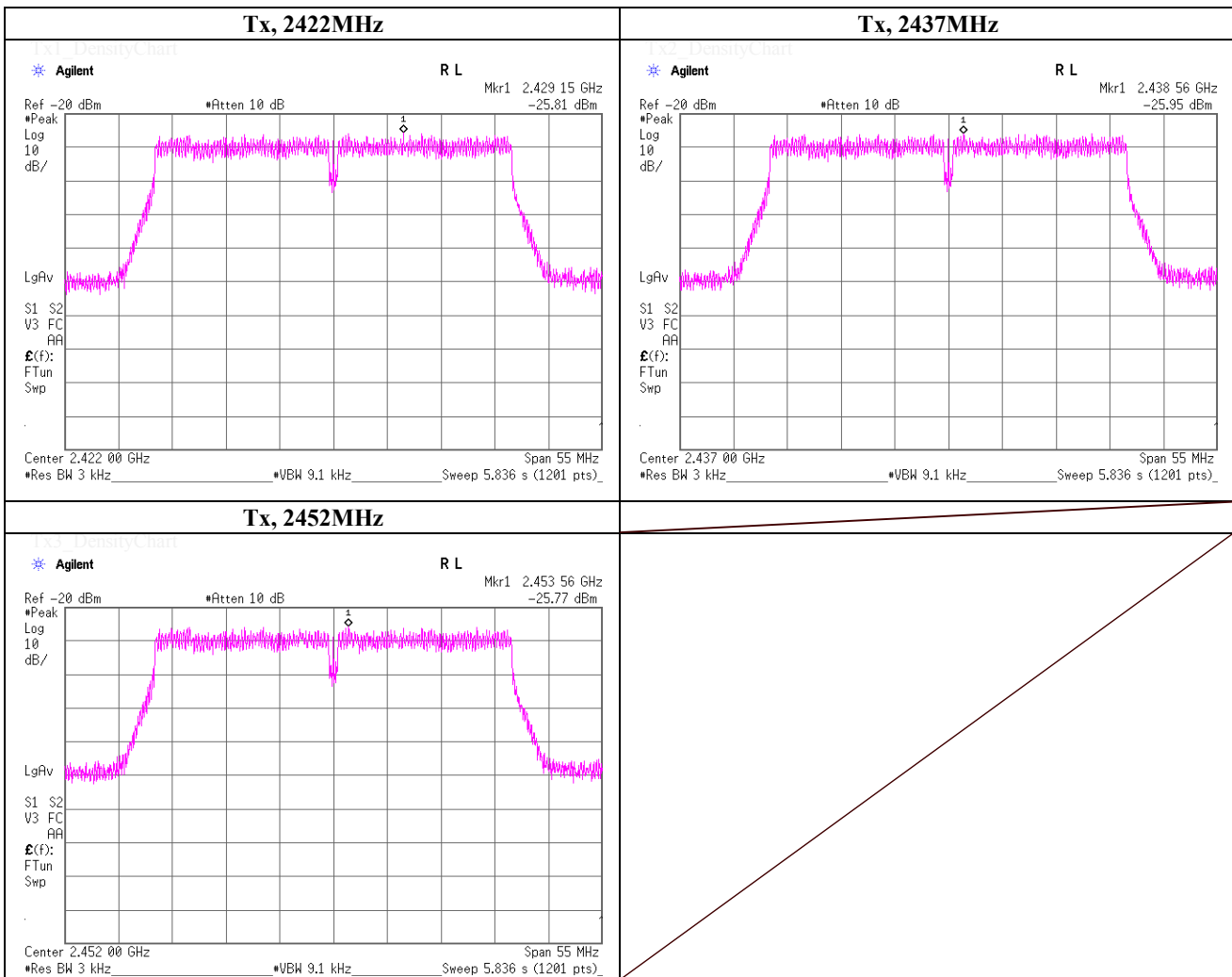
Maximum Power Spectral Density

(Option 1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 16, 2013	
Temperature / Humidity	23deg.C , 36%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n(40HT), PN9, worst data mode 4(MCS)	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2422.0000	2429.15	-25.81	0.42	9.97	-15.42	8.00	23.42
2437.0000	2438.56	-25.95	0.42	9.97	-15.56	8.00	23.56
2452.0000	2453.56	-25.77	0.42	9.97	-15.38	8.00	23.38

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



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 Telephone : +81 463 50 6400
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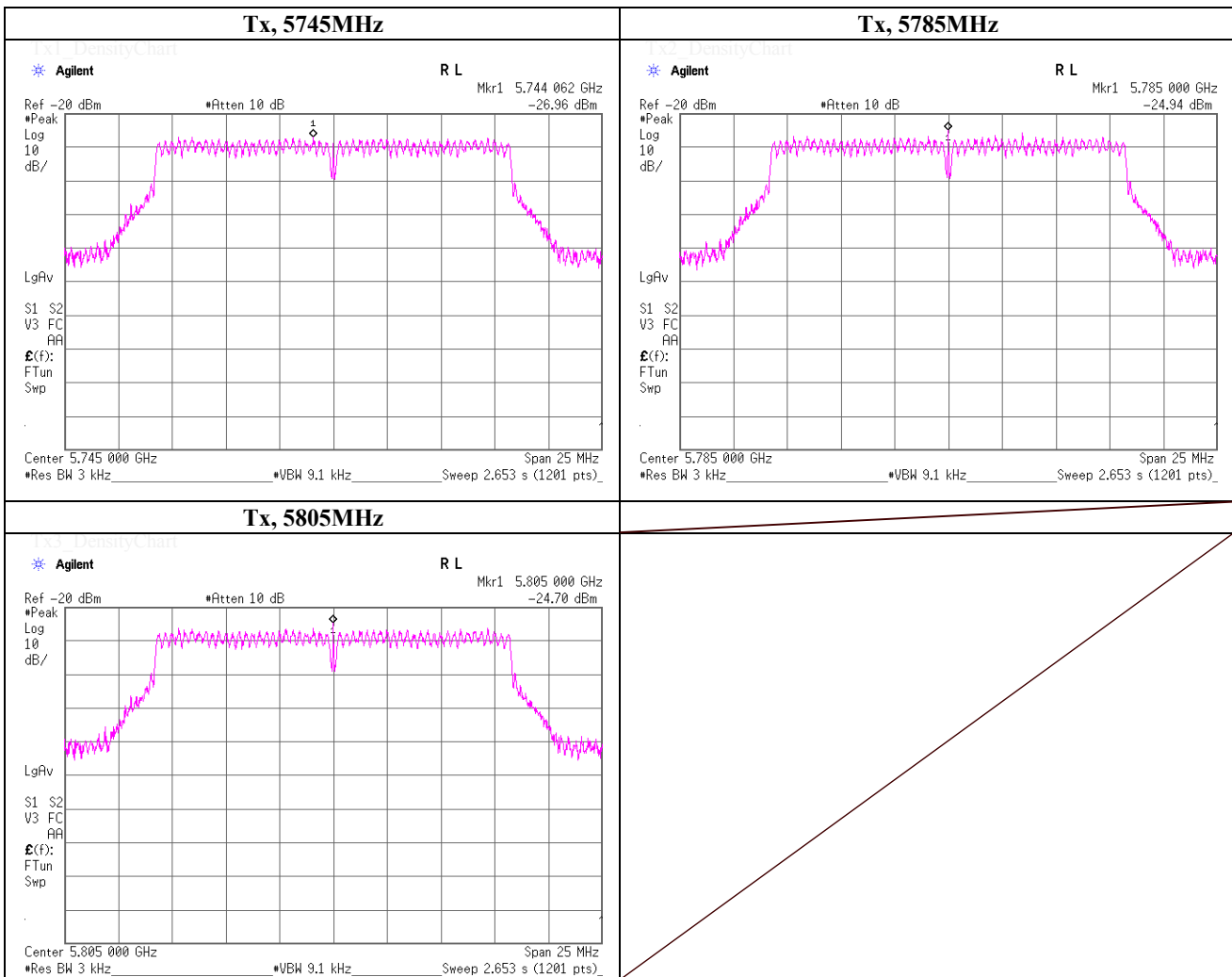
Maximum Power Spectral Density

(Option 1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 17, 2013	
Temperature / Humidity	24deg.C , 32%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11a, PN9, worst data mode 6Mbps	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
5745.0000	5744.06	-26.96	0.85	9.98	-16.13	8.00	24.13
5785.0000	5785.00	-24.94	0.85	9.99	-14.10	8.00	22.10
5805.0000	5805.00	-24.70	0.85	9.99	-13.86	8.00	21.86

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



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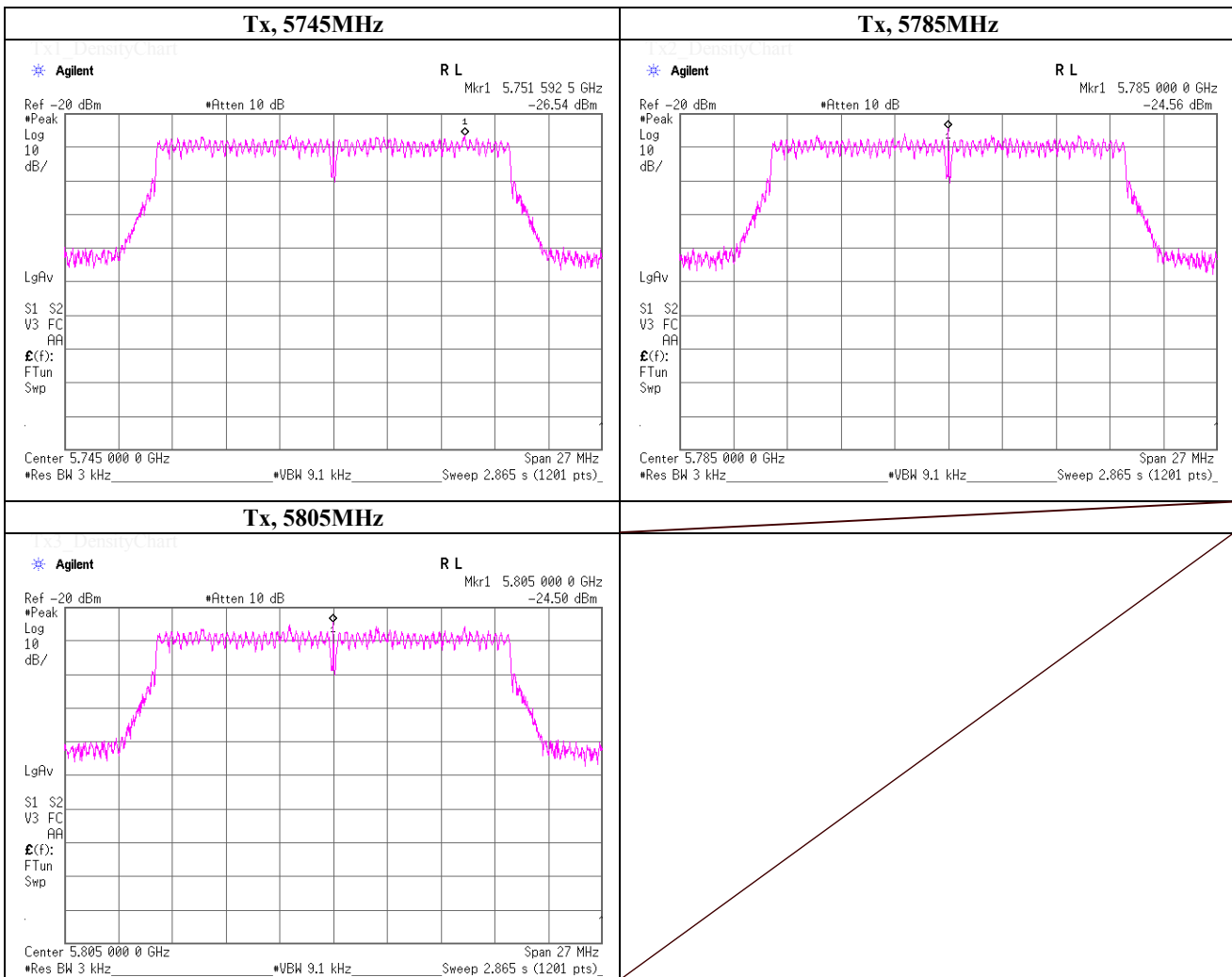
Maximum Power Spectral Density

(Option 1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 17, 2013	
Temperature / Humidity	24deg.C , 32%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n(20HT), PN9, worst data mode 0(MCS)	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
5745.0000	5751.59	-26.54	0.85	9.98	-15.71	8.00	23.71
5785.0000	5785.00	-24.56	0.85	9.99	-13.72	8.00	21.72
5805.0000	5805.00	-24.50	0.85	9.99	-13.66	8.00	21.66

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



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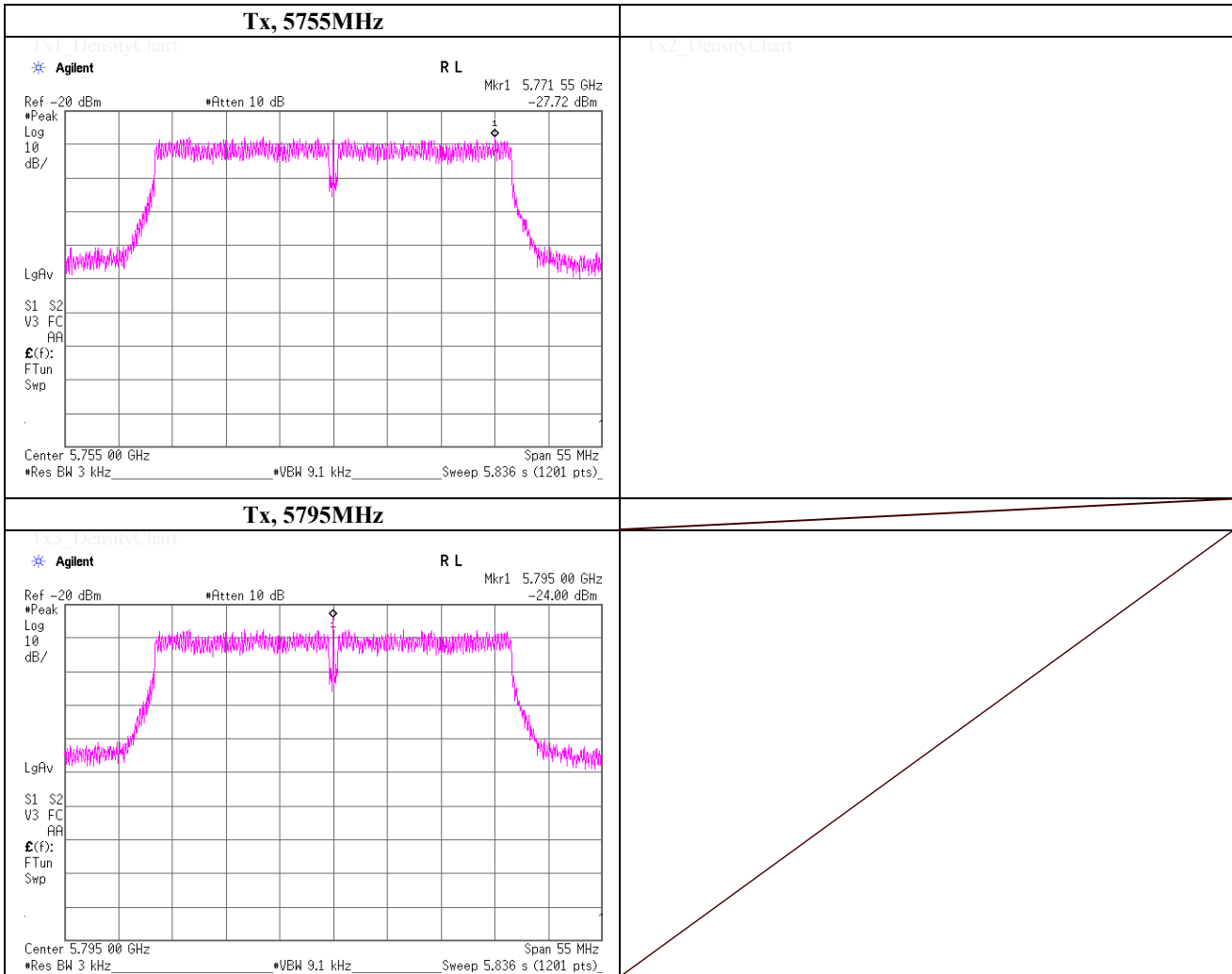
Maximum Power Spectral Density

(Option 1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 17, 2013	
Temperature / Humidity	24deg.C , 32%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n(40HT), PN9, worst data mode 4(MCS)	

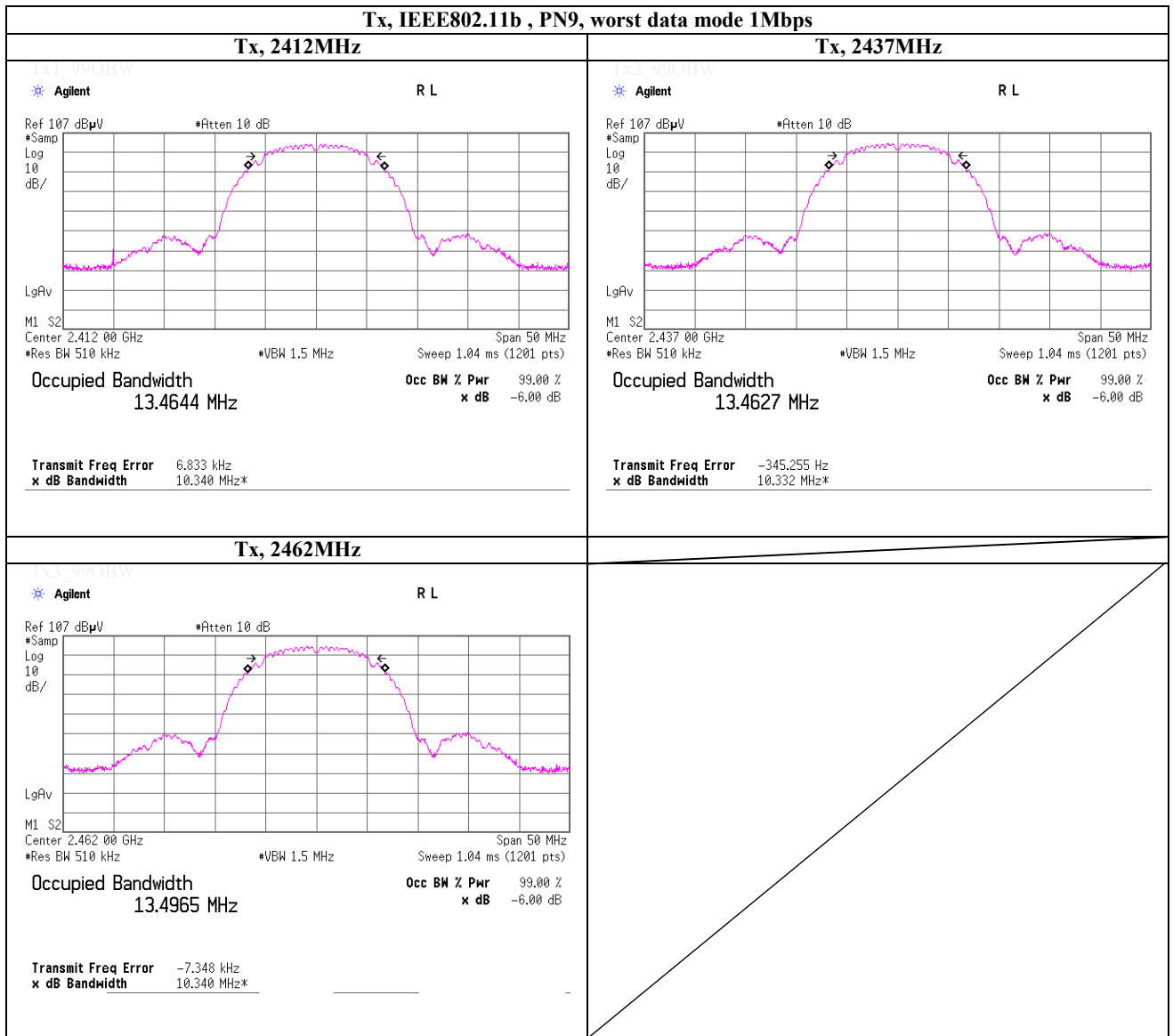
Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
5755.0000	5771.55	-27.72	0.85	9.99	-16.88	8.00	24.88
5795.0000	5795.00	-24.00	0.85	9.99	-13.16	8.00	21.16

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



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99% Occupied Bandwidth



UL Japan, Inc.

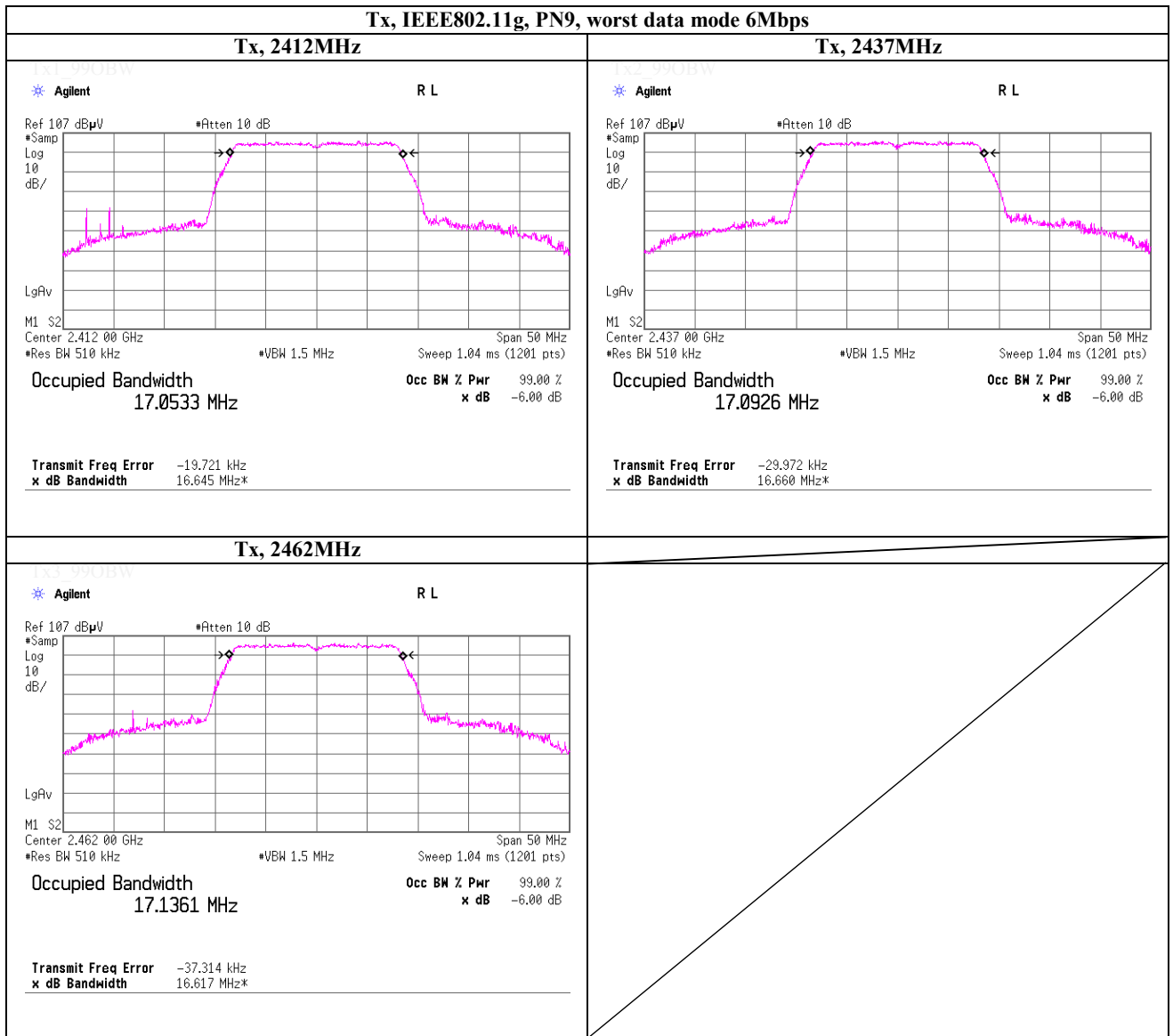
Shonan EMC Lab.

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

Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

99% Occupied Bandwidth



UL Japan, Inc.

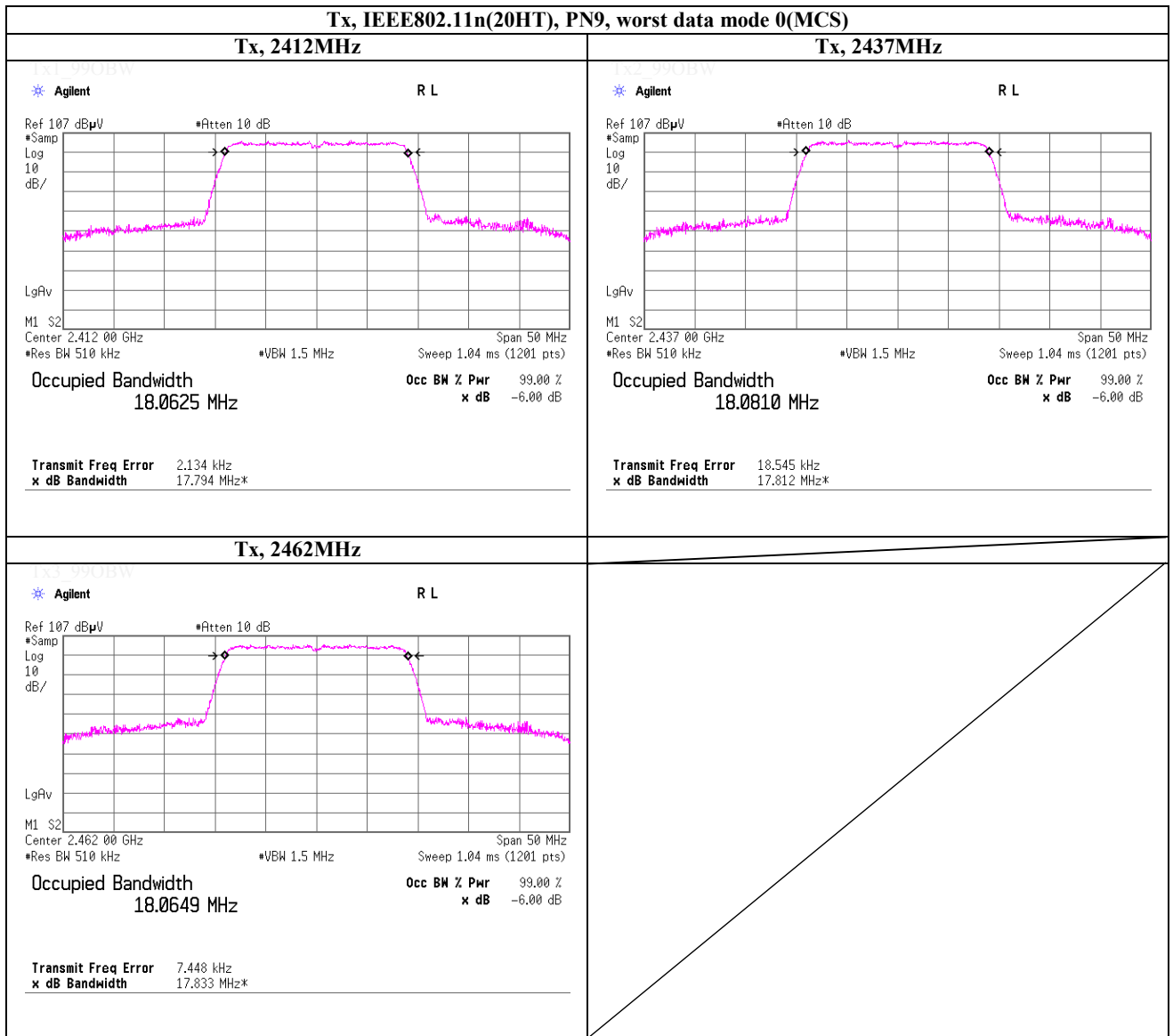
Shonan EMC Lab.

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Telephone : +81 463 50 6400

Facsimile : +81 463 50 6401

99% Occupied Bandwidth



UL Japan, Inc.

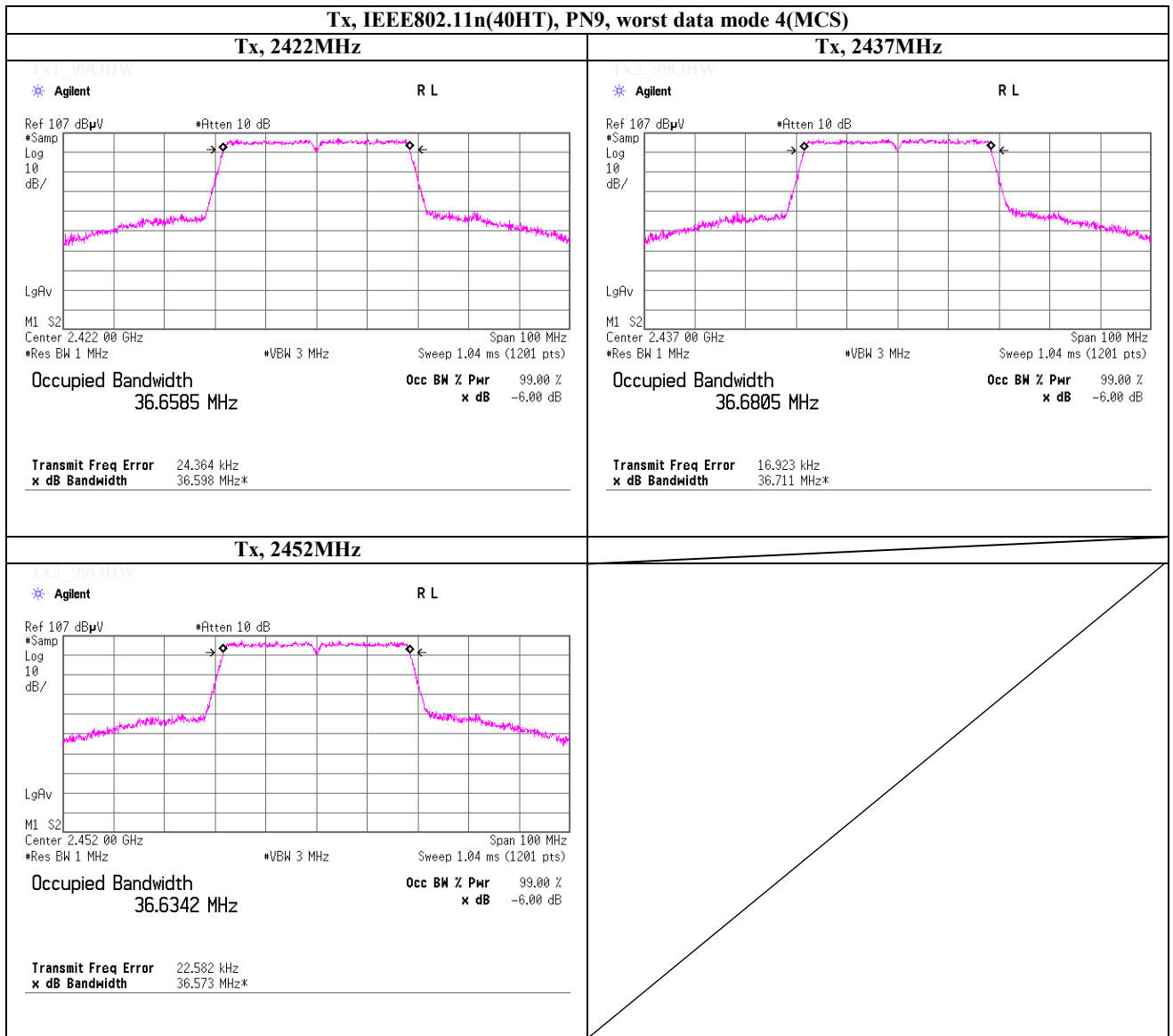
Shonan EMC Lab.

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99% Occupied Bandwidth



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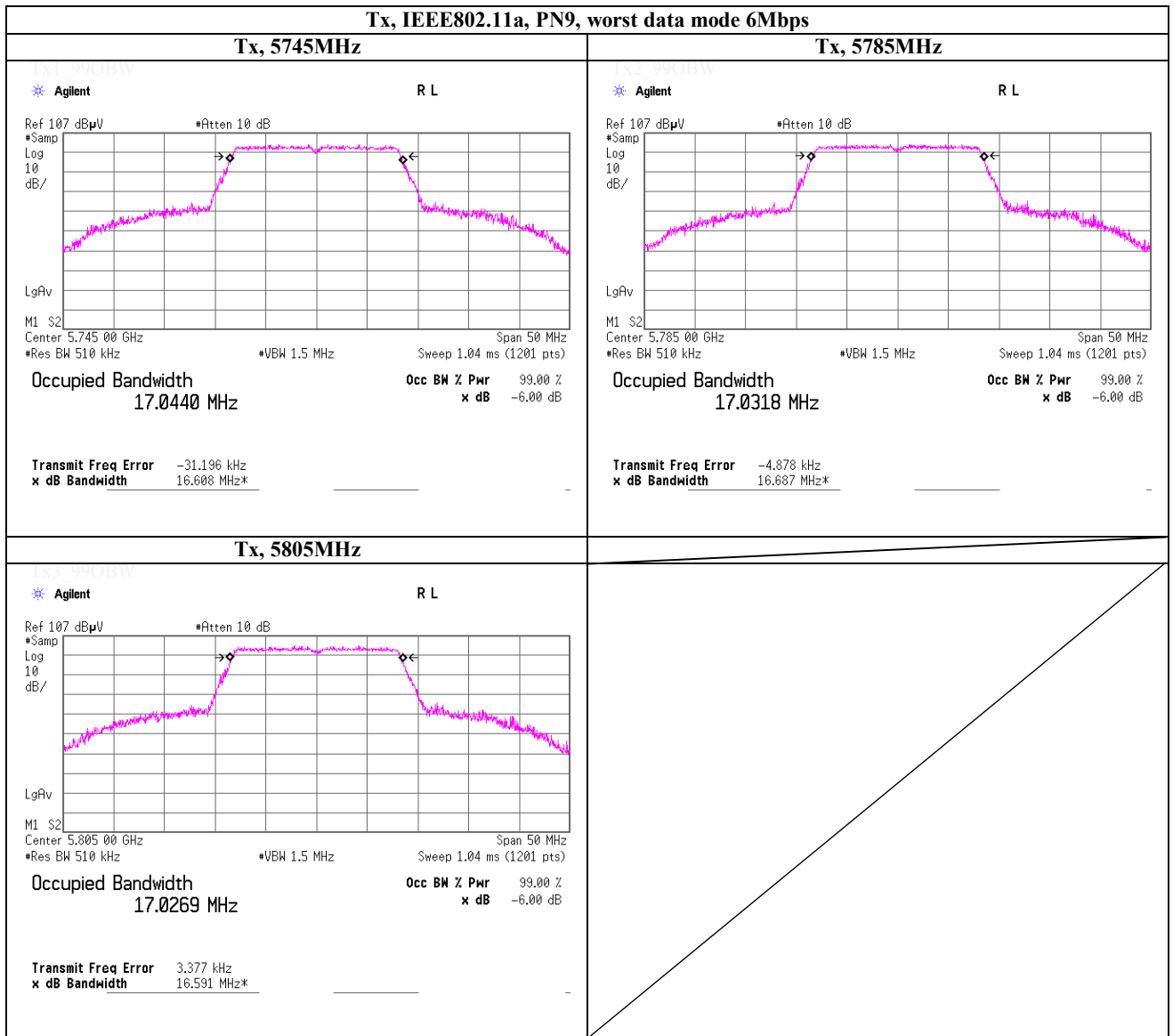
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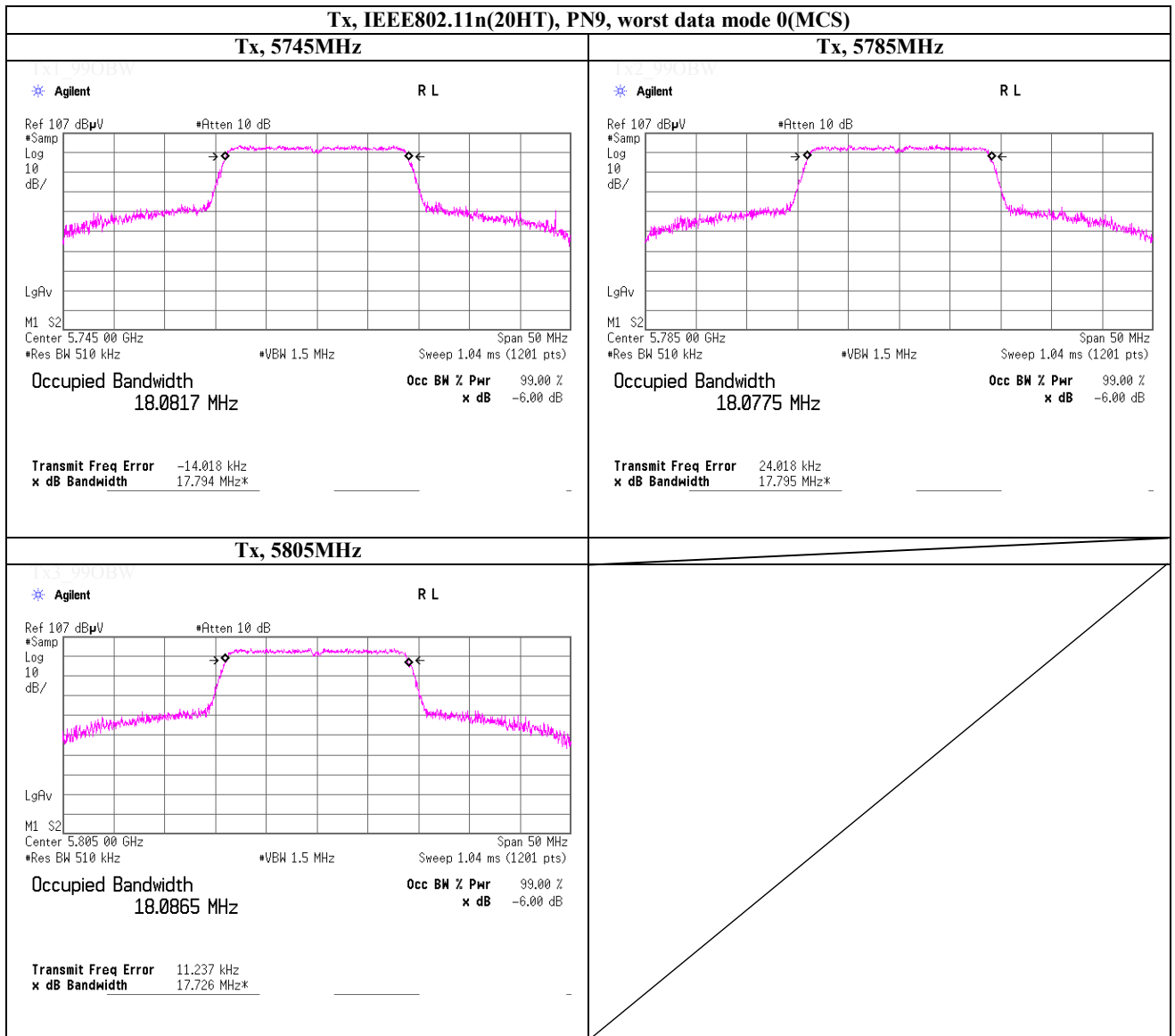
Shonan EMC Lab.

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99% Occupied Bandwidth



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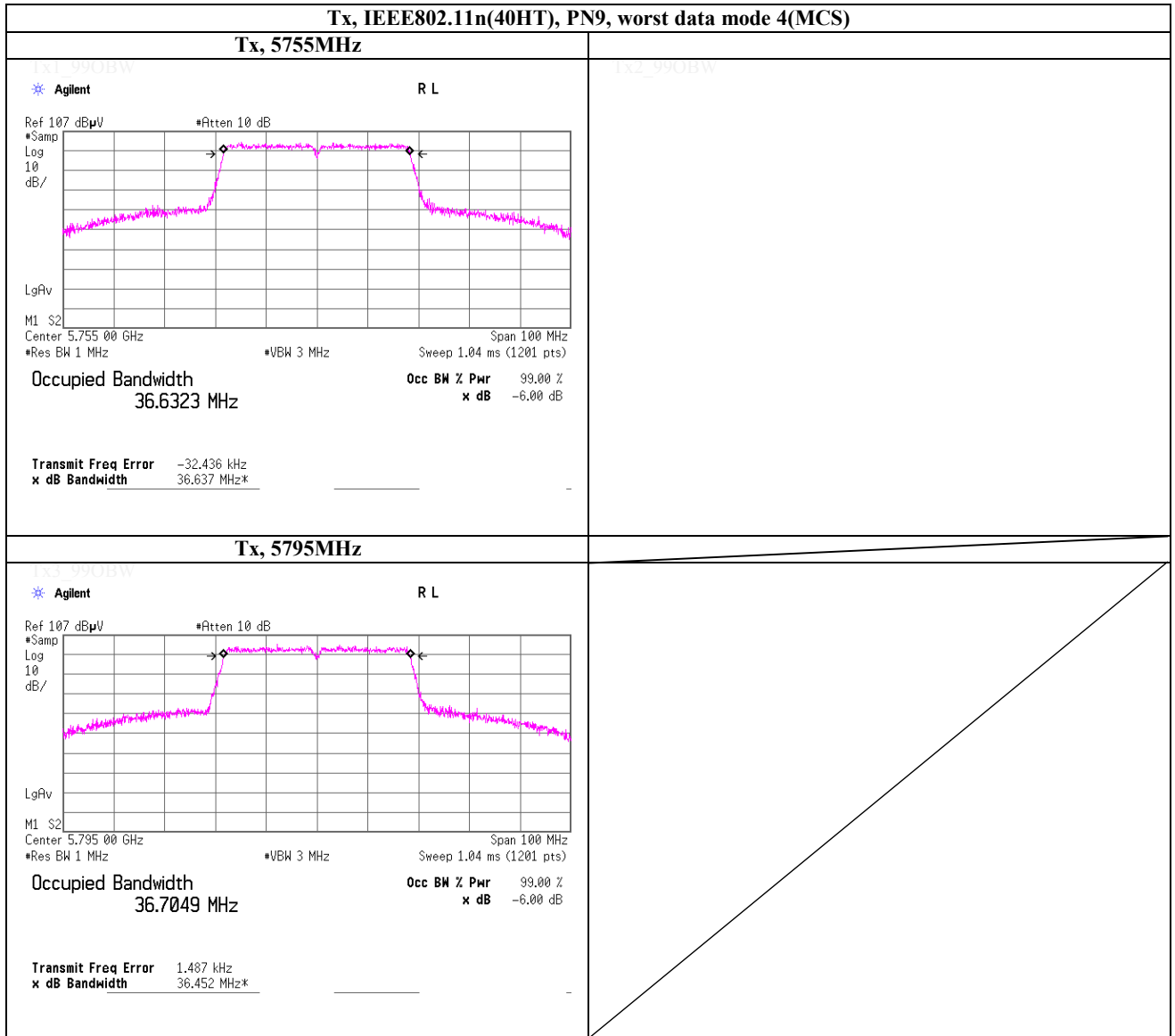
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APPENDIX 2

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	2012/03/12 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT	2012/02/16 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2012/03/26 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2012/09/21 * 12
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
SFL-03	Highpass Filter	MICRO-TRONICS	HPM50112	028	RE	2012/12/18 * 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,RF,IMF)	-	RE ,CE	-
SHA-05	Horn Antenna	ETS LINDGREN	3160-09	LM4210	RE	2012/03/30 * 12
SAF-09	Pre Amplifier	TOYO Corporation	HAP18-26W	00000018	RE	2012/03/12 * 12
SCC-G18	Coaxial Cable	Suhner	SUCOFLEX 104A	46292/4A	RE	2012/03/12 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2012/03/30 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2012/03/12 * 12
SCC-G17	Coaxial Cable	Suhner	SUCOFLEX 104A	46291/4A	RE	2012/03/12 * 12
SHA-06	Horn Antenna	ETS LINDGREN	3160-10	LM3459	RE	2012/03/30 * 12
SAF-10	Pre Amplifier	TOYO Corporation	HAP26-40W	00000010	RE	2012/03/12 * 12
SCC-G19	Coaxial Cable	Suhner	SUCOFLEX 102A	1188/2A	RE	2012/03/12 * 12
SCC-C9/C10/SRSE-03	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/N S4906	-/0901-271(RF Selector)	CE	2012/04/10 * 12
SLS-05	LISN	Rohde & Schwarz	ENV216	100516	CE	2012/02/23 * 12
SAT3-06	Attenuator	JFW	50HF-003N	-	CE	2012/02/17 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2012/03/26 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	CE	2012/02/07 * 12
SJM-11	Measure	PROMART	SEN1935	-	CE	-

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

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

Test Item :

- CE: Conducted emission ,
- RE: Radiated emission ,
- AT: Antenna terminal conducted test

APPENDIX 2
Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
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/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2012/04/10 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP9108-A 0901	RE	2012/10/08 * 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