




RADIO TEST REPORT


Test Report No.: 10028551S-F

Applicant : ALPS ELECTRIC CO., LTD.
Type of Equipment : Wi-Fi™ and BLUETOOTH™ Combination Module
Model No. : UGZZF-1
FCC ID : CWTUGZZF1
Test regulation : FCC Part15 Subpart C: 2013
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: July 11 to 15, 2013

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

Approved by : 
Go Ishiwata
Manager 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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Shonan EMC Lab.

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13-EM-F0429

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SECTION 1: Customer information

Company Name : ALPS ELECTRIC CO., LTD.
Address : 6-3-36 Furukawa-nakazato, Osaki-shi, Miyagi-ken, 989-6181 Japan
Telephone Number : +81 229 24 6341
Facsimile Number : +81 229 24 7016
Contact Person : Yuji Ouchi

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

2.1 Identification of E.U.T.

Type of Equipment : Wi-Fi™ and BLUETOOTH™ Combination Module
Model Number : UGZZF-1
Serial Number : Refer to Section 4.2
Rating : DC3.3V / 1.25V
Country of Mass-production : Japan
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample : July 6, 2013
Modification of EUT : No modification by the test lab.

2.2 Product description

Model: UGZZF-1 (referred to as the EUT in this report) is a Wi-Fi™ and BLUETOOTH™ Combination Module.

Clock frequency(ies) in the system : 26MHz, 12.288MHz, 48MHz

<Radio part>

Equipment type : Transceiver
Frequency of operation : 2412-2462MHz
Bandwidth : 20MHz
Channel spacing : 5MHz
Type of modulation : DSSS, OFDM
ITU code : D1D, G1D
Operation temperature range : -40 to +85 deg.C
Antenna type & Antenna gain : Printed antenna ($\lambda/2$ Dipole), 2.6dBi max
Printed antenna ($\lambda/4$ PIFA), 2.5dBi max
Chip antenna (Monopole), 1.8dBi max
Antenna connector type : 60pin connector, M/N: 60P3.0-JMCS-G-B-TF (N)

* For Bluetooth part, Refer to the test report: 10028551S-G.

FCC 15.31 (e) / 212

The stable voltage (DC3.3V / 1.25V) is constantly provided to RF Module from the host device regardless of input voltage. Therefore, the EUT complies with the requirement.

FCC 15.203 / 212

The EUT has a unique coupling/antenna connector (60pin Connector, M/N: 60P3.0-JMCS-G-B-TF (N)). Therefore, the equipment complies with the antenna requirement.

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SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2013, final revised on June 11, 2013 and effective July 11, 2013
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.209 Radiated emission limits, general requirements
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz,
and 5725-5850MHz

3.2 Procedures & Results

Item	Test Procedure *1)	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.10:2009	FCC 15.207	-	N/A	11.4dB Freq.: 0.54862MHz Detector: Quasi-Peak Phase: N Mode: IEEE 802.11n, 2412MHz Antenna: Dipole	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	0.3dB Freq.: 4874.000MHz Polarization: Horizontal Detection: Average Mode: IEEE 802.11b, 2437MHz Antenna: PIFA	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 v03 r01 (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 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

UL Japan, Inc. Shonan EMC Lab.

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Telephone number : +81 463 50 6400

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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 test & Test instruments

Refer to APPENDIX 1 to 3.

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

4.1 Operating mode

Test item	Mode	Tested frequency	Power setting *1)	Worst data rate *2)
Radiated emission (below 1GHz) *3)	Transmitting IEEE 802.11g	2412MHz	Fixed	6Mbps, PN9
Other items	Transmitting IEEE 802.11b	2412MHz, 2437MHz, 2462MHz	Fixed	1Mbps, PN9
	Transmitting IEEE 802.11g	2412MHz, 2437MHz, 2462MHz	Fixed	6Mbps, PN9
	Transmitting IEEE 802.11n (HT20)	2412MHz, 2437MHz, 2462MHz	Fixed	MCS0, PN9

*1) Software used for the test: Uni Test Ver.1.2.1.5

*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.

* Conducted emission test was performed on the mode as a representative that had the highest power at antenna terminal test, because there was no difference in results on all the modes at preliminary test.

Used antenna	Data of Radiated emission *4)
Dipole antenna	Full data
Other antennas	Band edge Second order harmonics (worst point)

*4) There is 3-type of antenna. The carrier level was checked with each antenna, and full data was obtained with Dipole antenna, which output the highest power. For other antennas, the above data was obtained to show the compliance.

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

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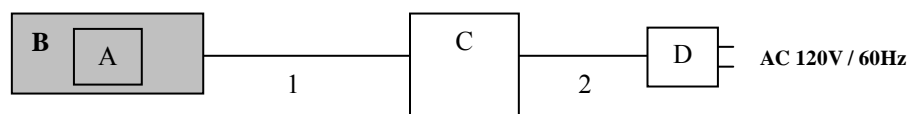
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4.2 Configuration and peripherals



* Test data was taken under worst case conditions.

Description of EUT and support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wi-Fi™ and BLUETOOTH™ Combination Module	UGZZF-1	3	ALPS	EUT
B1	$\lambda/2$ Dipole Antenna	FZ164Z15-3	001	ALPS	EUT
B2	PIFA Antenna	FZ164Z15-2	001	ALPS	EUT
B3	Chip Antenna	FZ164Z15-1	001	TAIYO YUDEN	EUT
C	Jig	-	-	ALPS	-
D	AC Adaptor	GF12-US0520	120704-54	GO FORWARD ENTERPRISE	-

List of cables used

No.	Cable	Length (m)	Shield-Cable	Shield-Connector	Remarks
1	Signal / DC	0.3	Unshielded	Unshielded	-
2	DC	1.5	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 within a Shielded room. The EUT was connected to a Line Impedance Stabilization Network (LISN). An overview sweep with peak detection has been performed. The measurements had been performed with a quasi-peak detector and if required, a CISPR average detector. The conducted emission measurements were made with the following detection of the test receiver.

Detection Type : Quasi-Peak/ CISPR 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 (below 15GHz) / 1m (above 15GHz) above the conducting ground plane. Photographs of the set up are shown in APPENDIX 3.

6.3 Test conditions

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

*1) Average Power Measurement was measured based on 12.2.5 of KDB 558074 "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 (Module and Antennas) to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Worst case:

	Antenna polarization	Carrier (Band edge)	Spurious			
			Below 1GHz	Above 1GHz		
				1-2.8GHz	2.8-15GHz	15-25GHz
Module and Dipole antenna	Horizontal	X	Y	Z	Z	Y
	Vertical	Z	Y	Y	Y	Z
Module and PIFA antenna	Horizontal	X	Y	Y	Y	Y
	Vertical	Y	Y	Z	Z	Z
Module and Chip antenna	Horizontal	Z	Y	Z	Z	Z
	Vertical	Y	Y	Y	Y	Y

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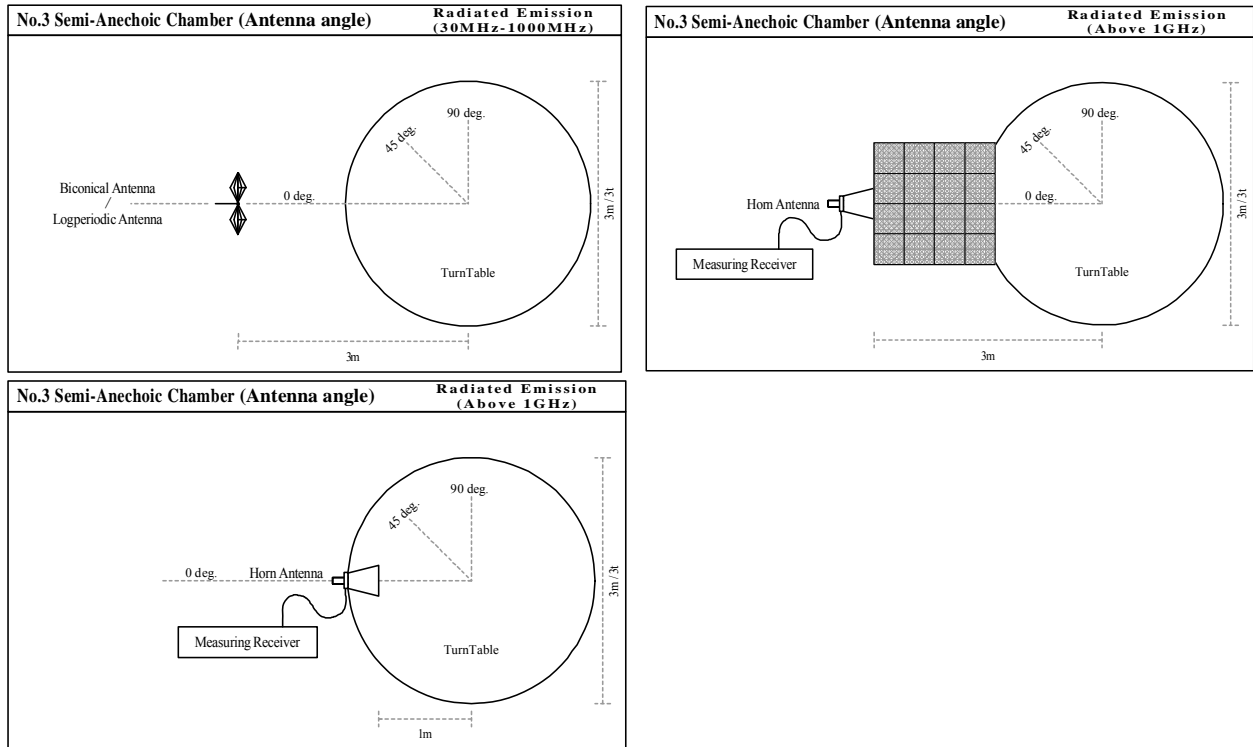
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Figure 1. Antenna angle



6.5 Band edge

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

6.6 Results

Summary of the test results :

Pass

* No noise was detected above the 5th order harmonics.

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 8.1 Option 1 and 8.2 Option 2 of KDB 558074 "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 9.1.3 PKPM1 of KDB 558074 "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 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 10.2 PKPSD of KDB 558074 "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 the worst position

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DATA OF CONDUCTED EMISSION TEST

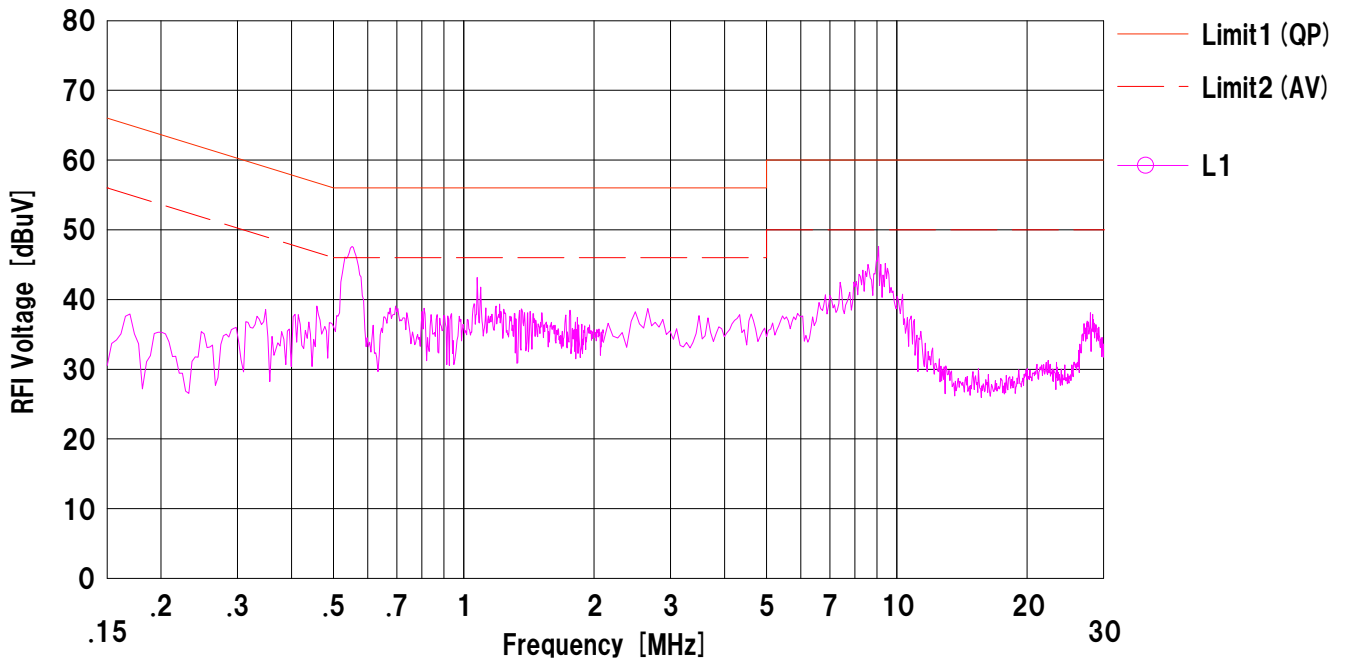
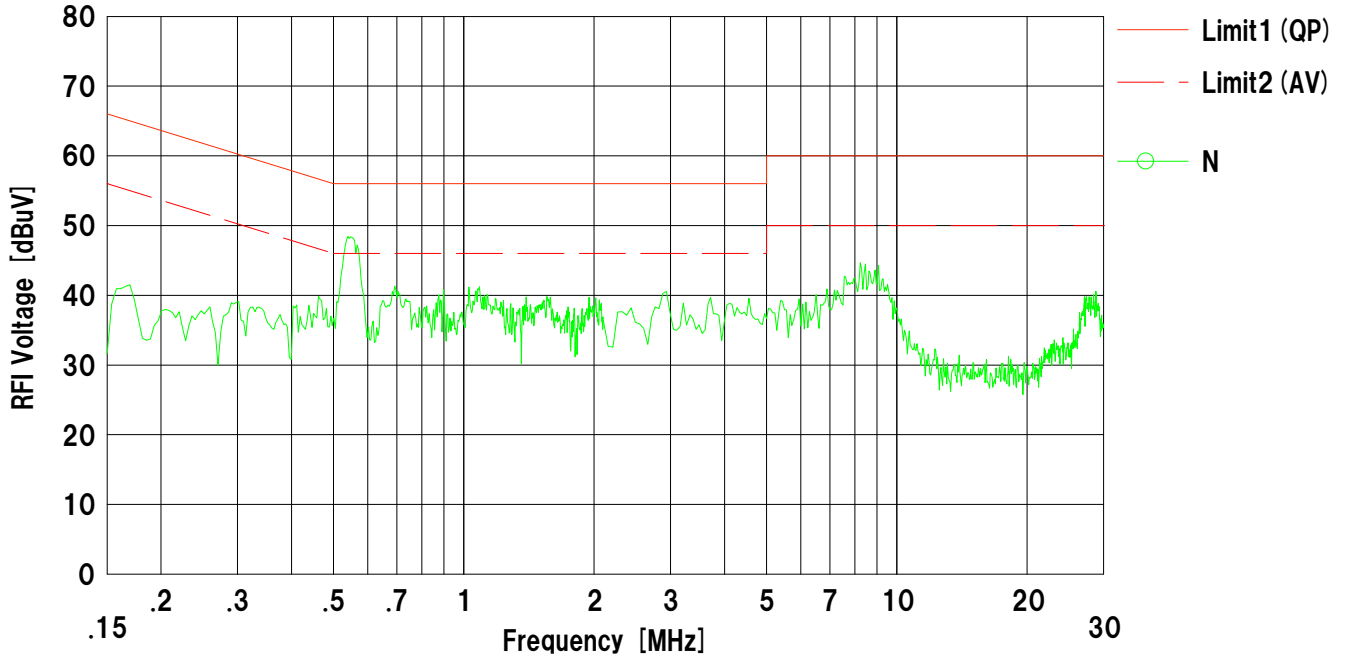
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11b 2412MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Dipole Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

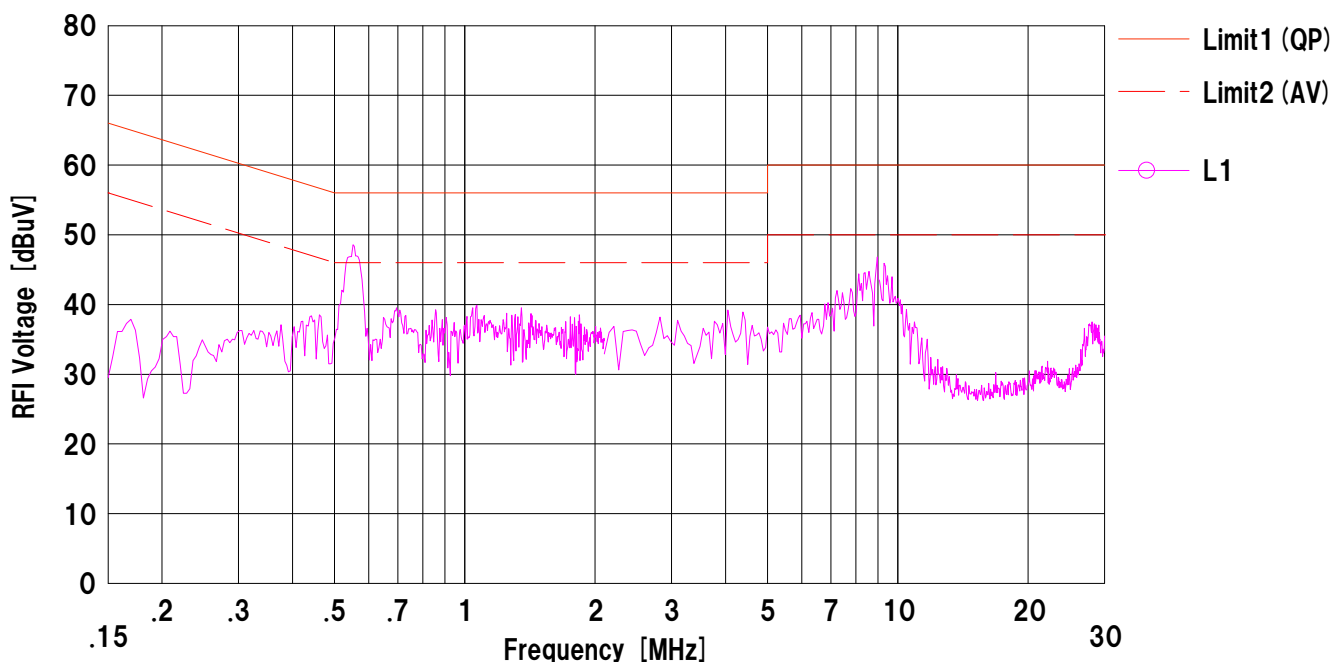
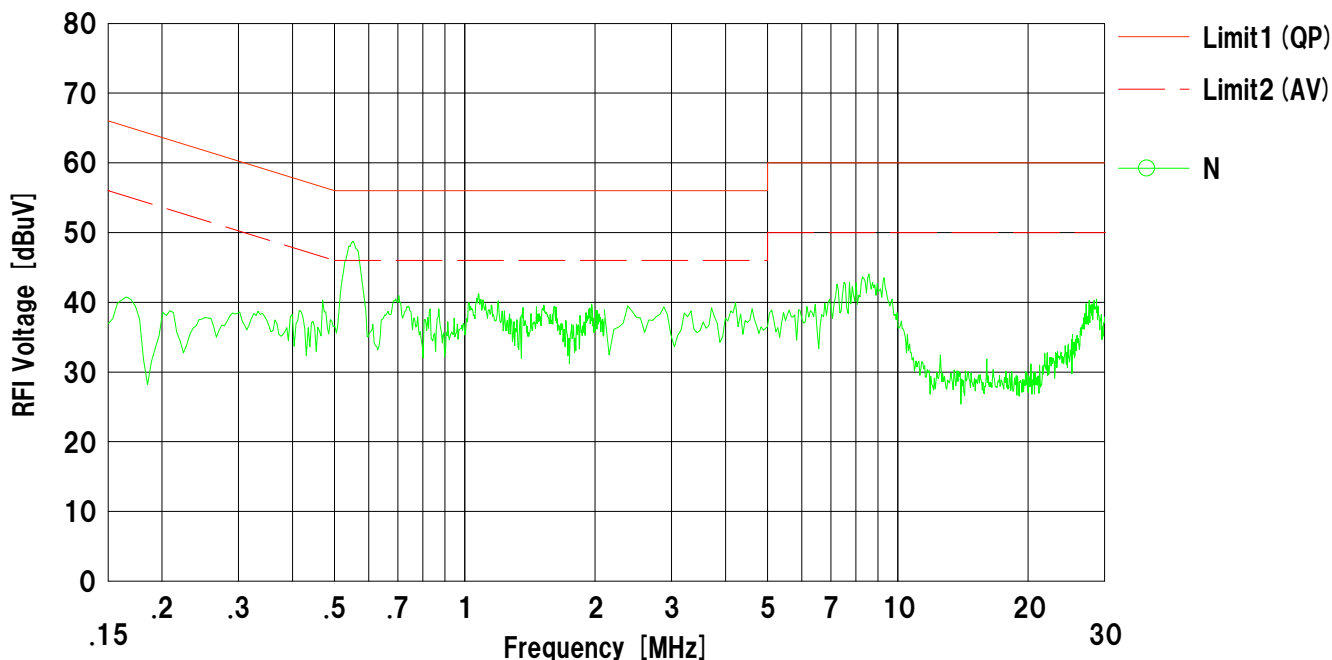
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11b 2437MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Dipole Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

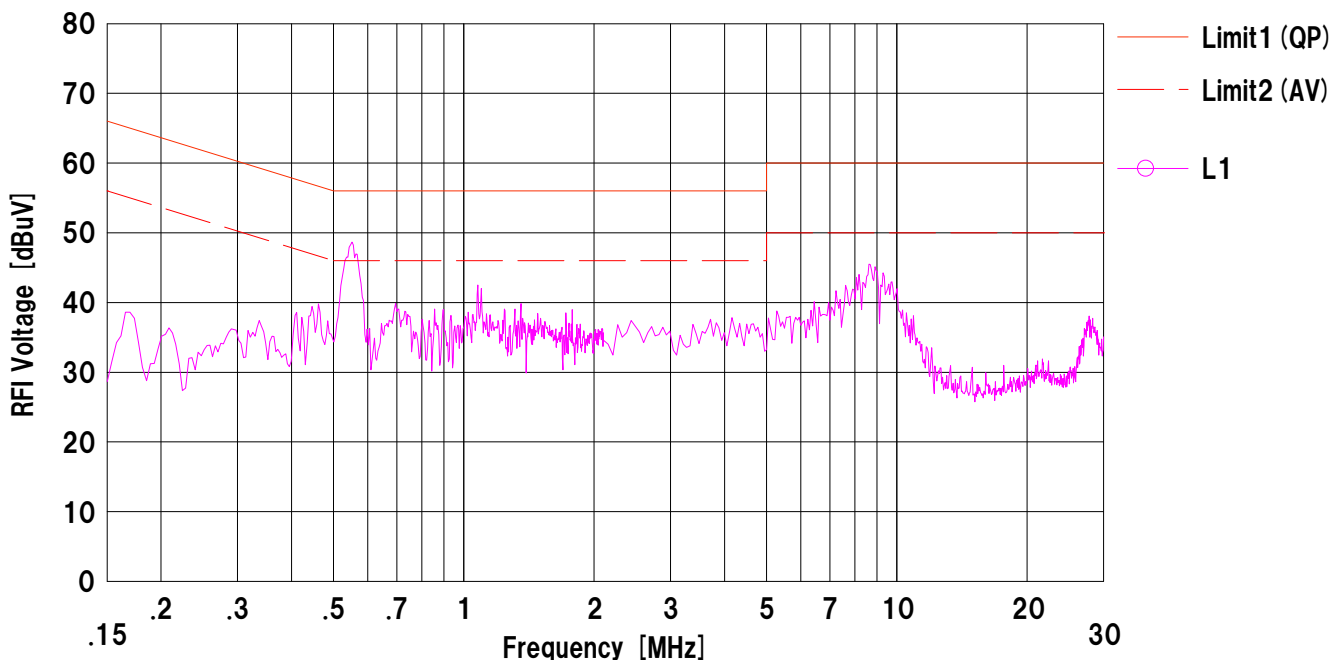
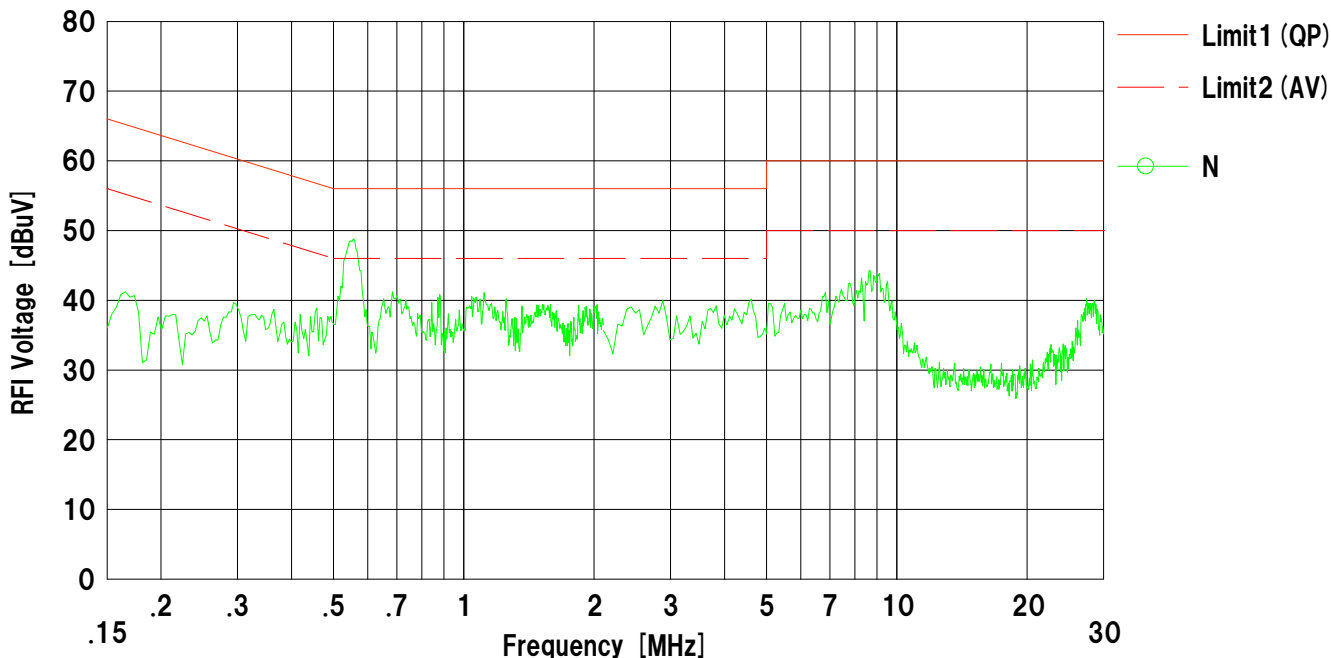
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11b 2462MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Dipole Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-O2 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

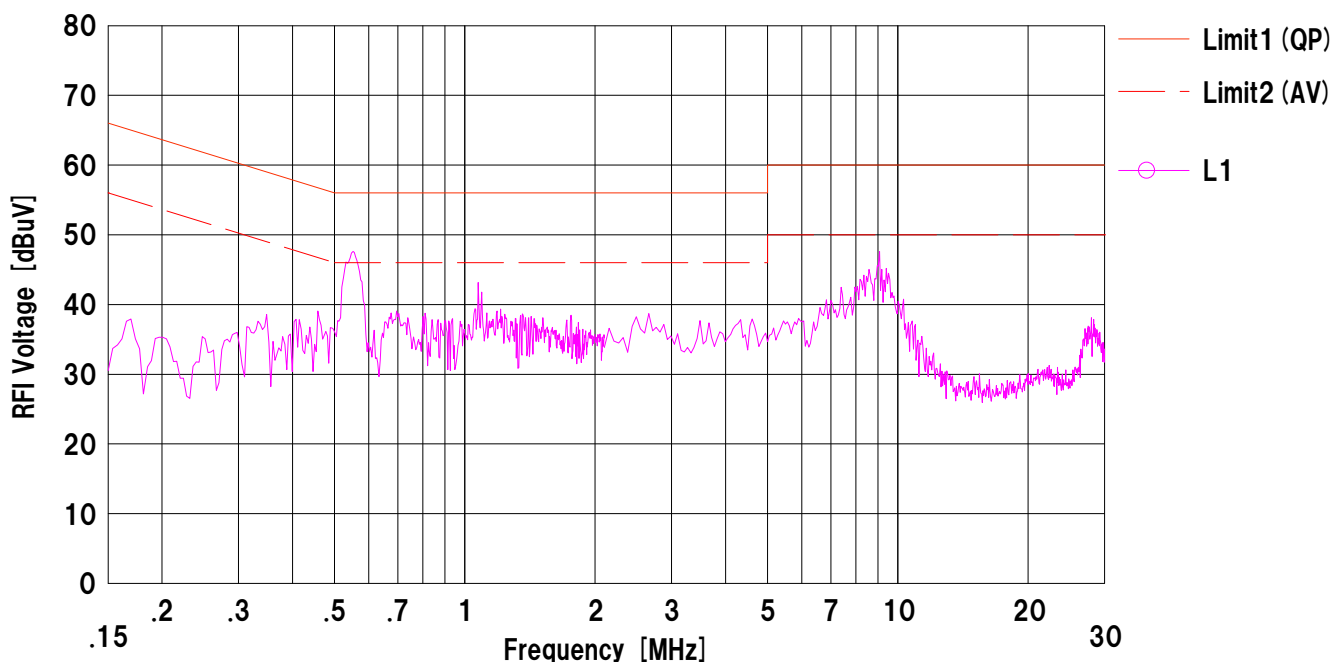
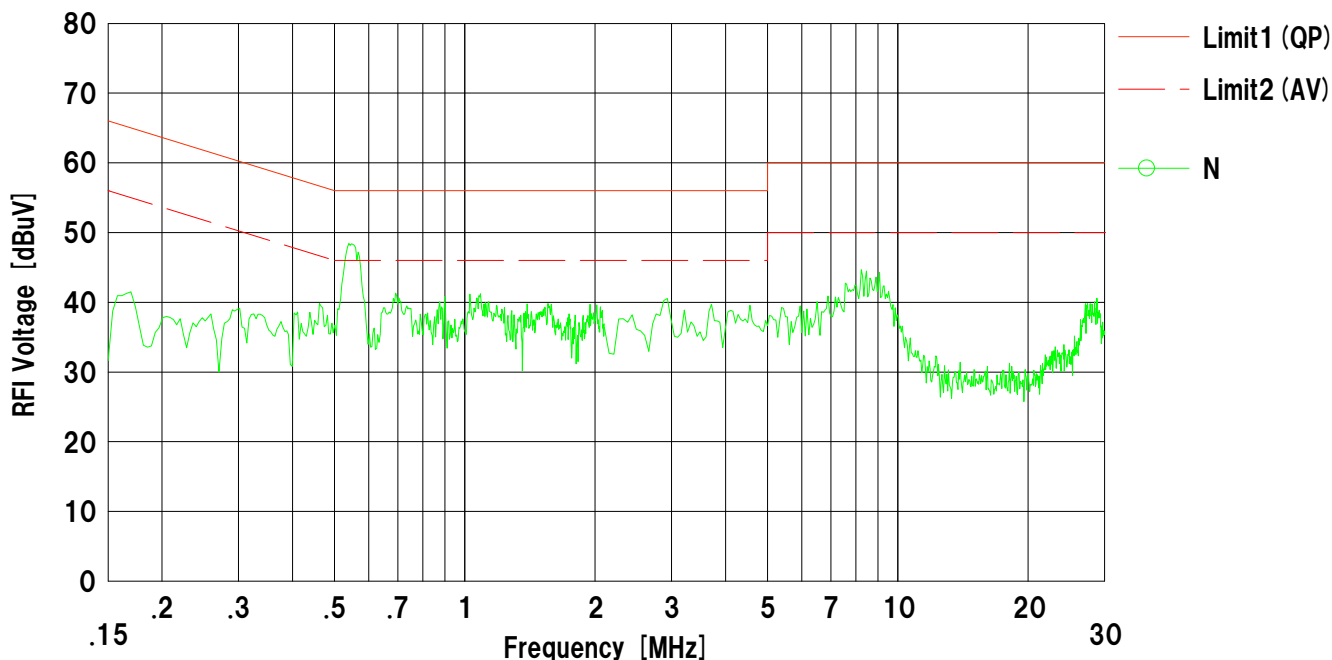
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Date : 2013/07/15

Mode : Tx 11g 2412MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Dipole Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-O2 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

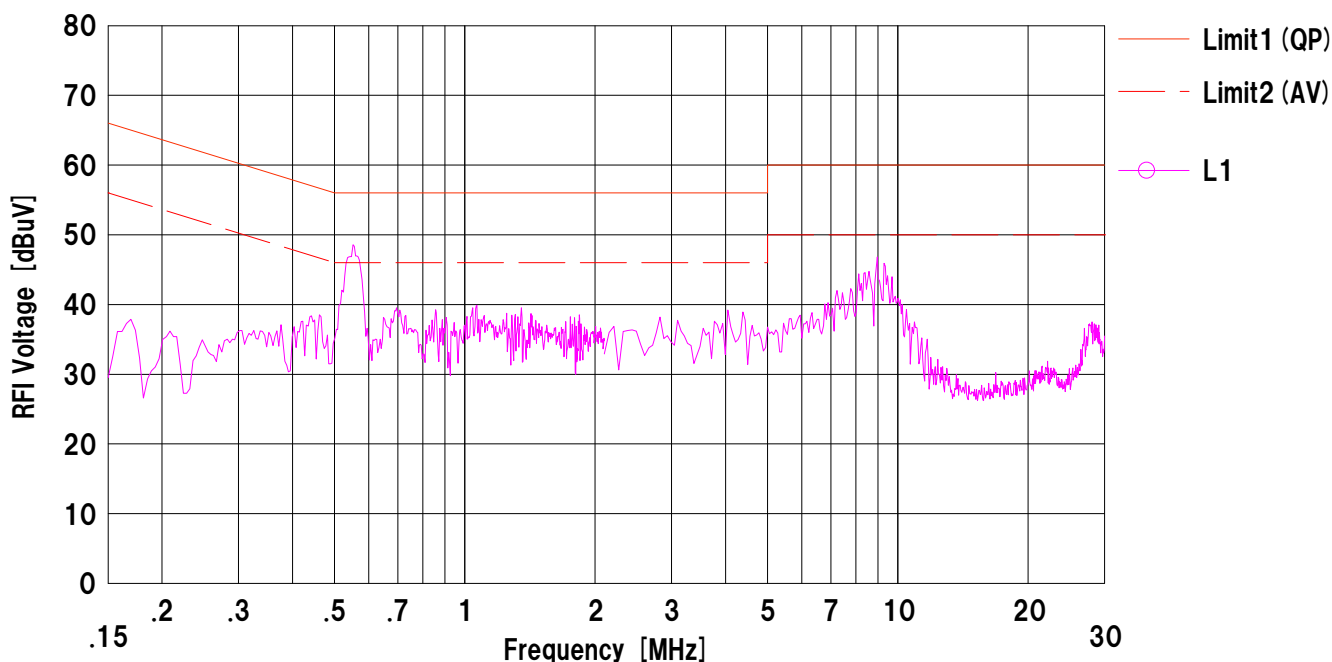
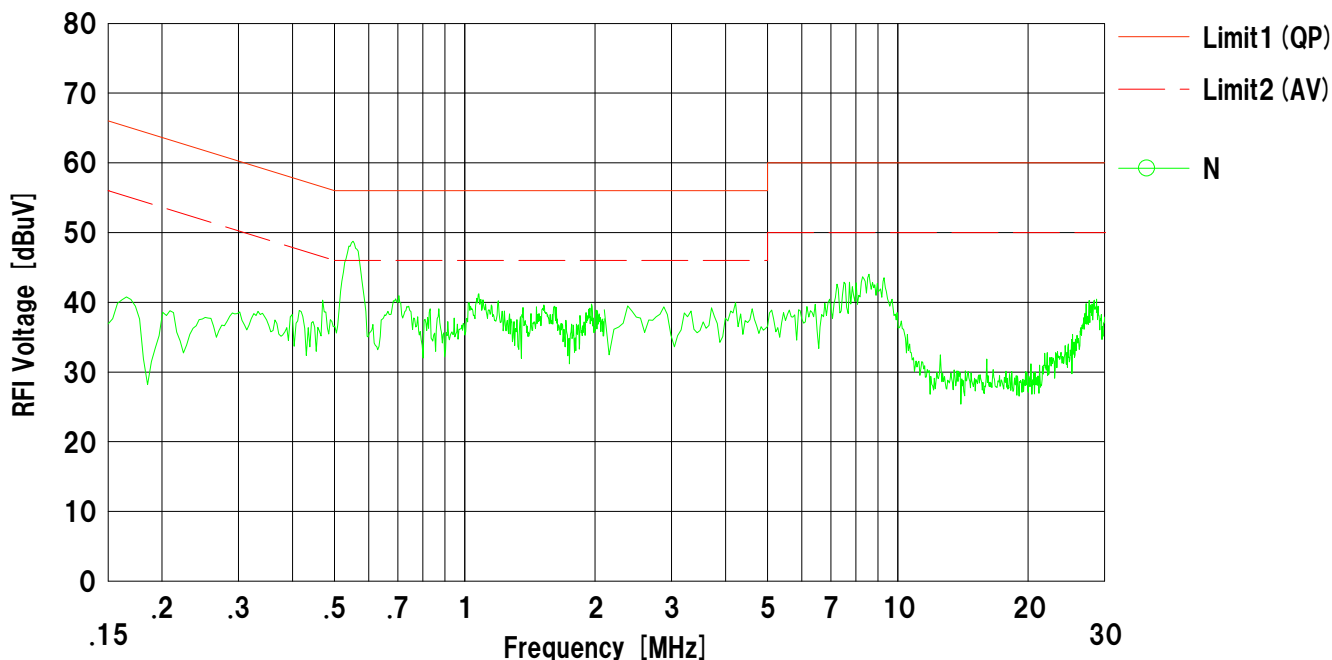
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11g 2437MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Dipole Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-O2 with AC extention cable

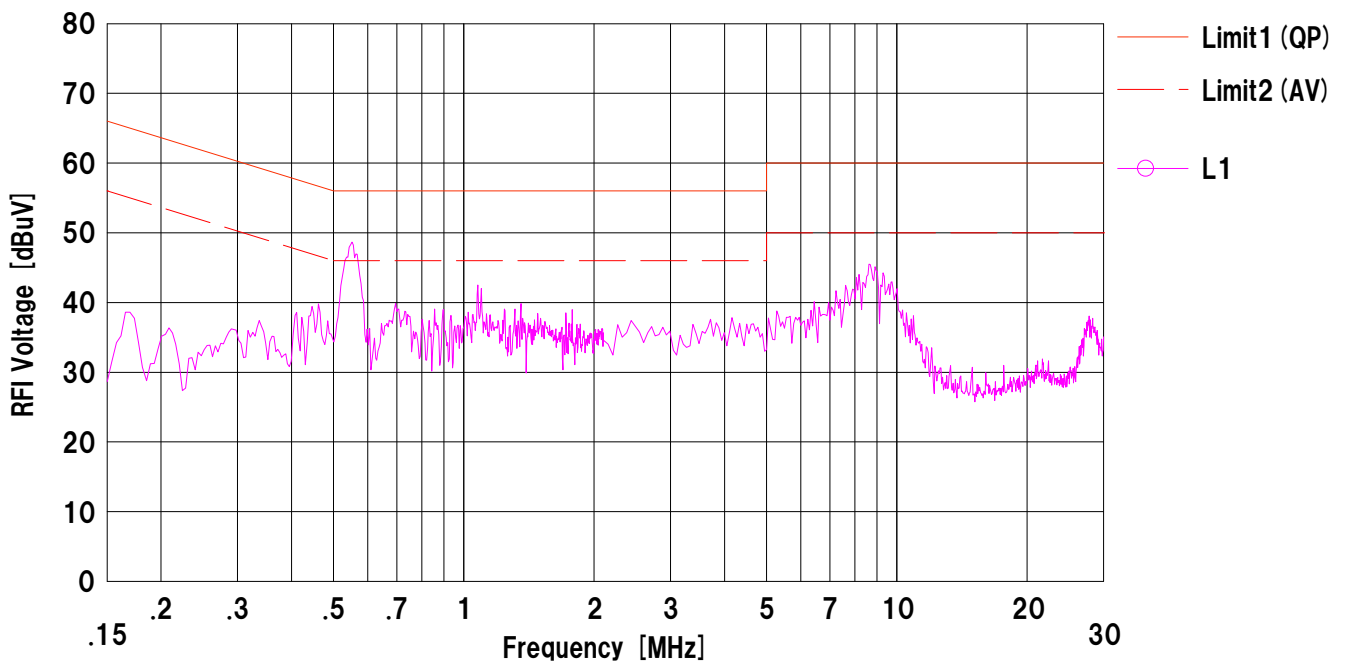
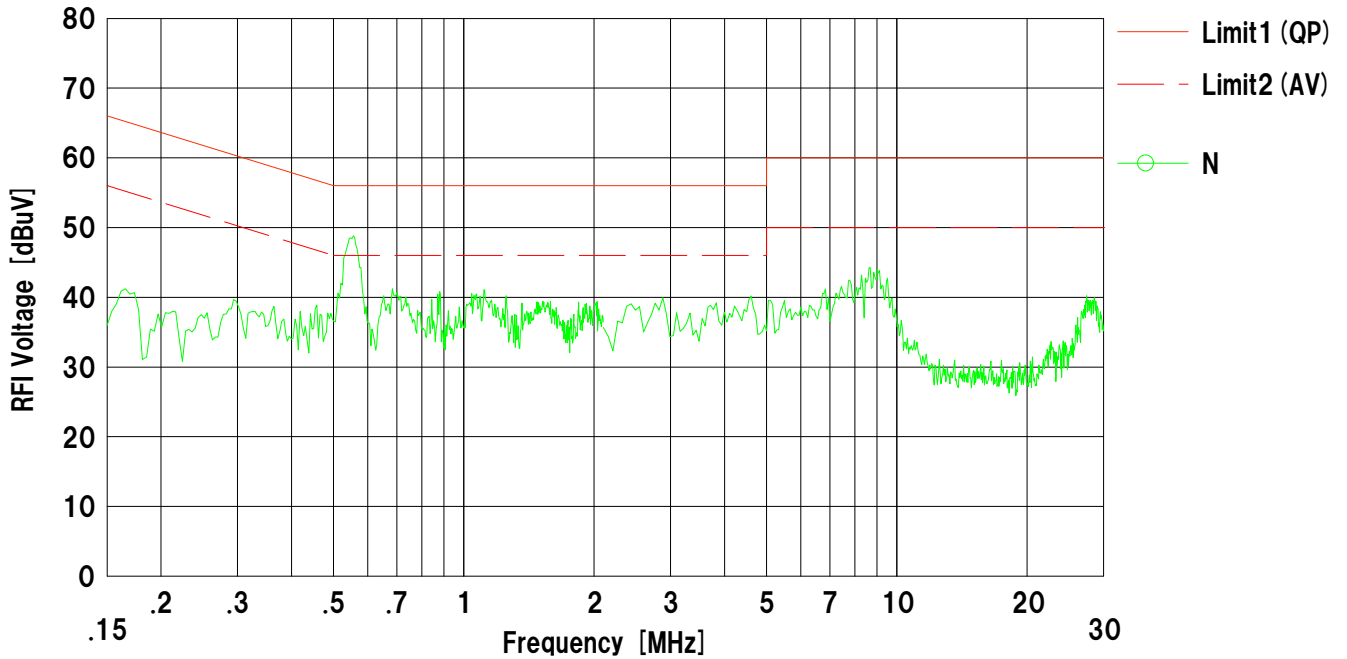
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Remarks : Dipole Antenna	Mode : Tx 11g 2462MHz Report No. : 10028551S Power : DC3.3V/1.25V (adapter:AC120V/60Hz) Temp./Humi. : 26deg.C / 43%RH
--------------------------	--------------------------------------------------------------------------------------------------------------------------------

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

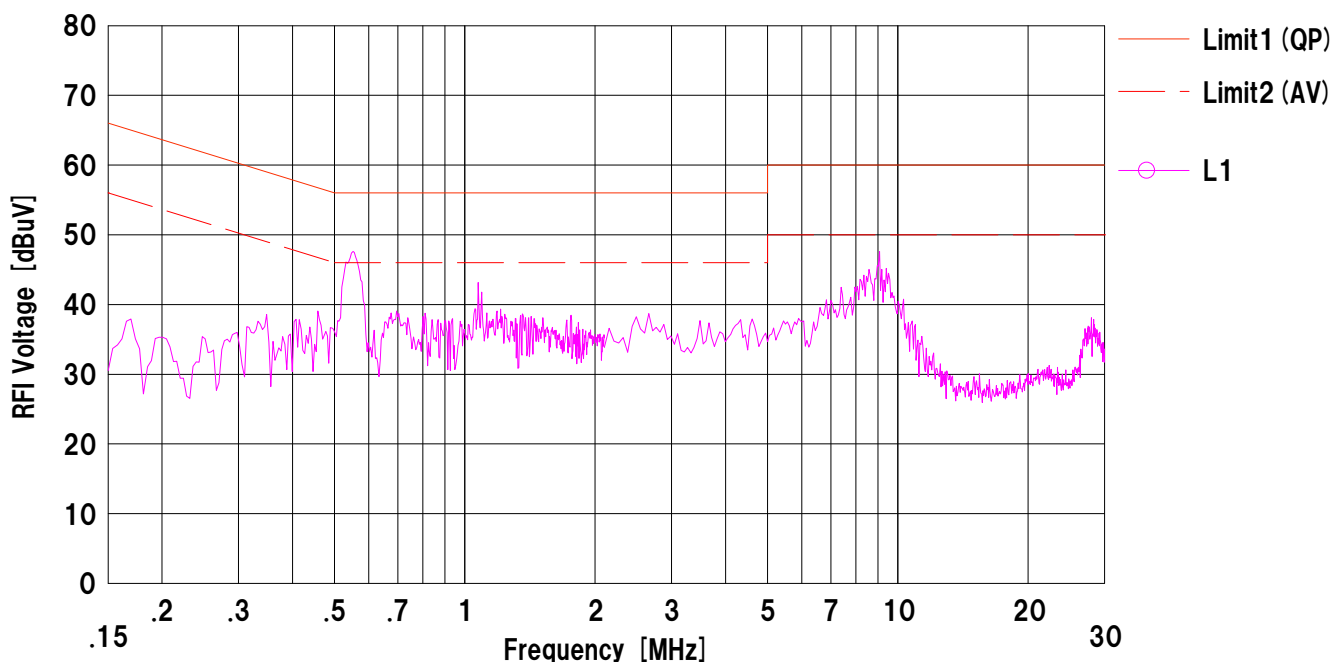
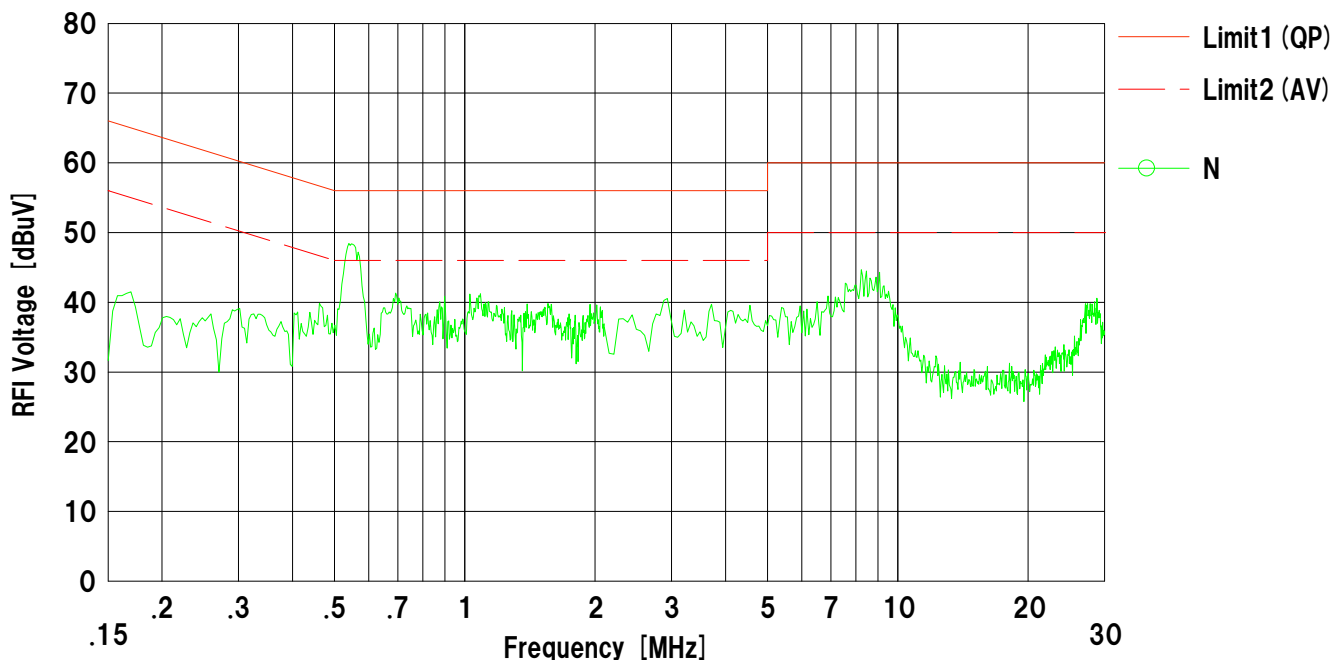
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11n (HT20) 2412MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Dipole Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

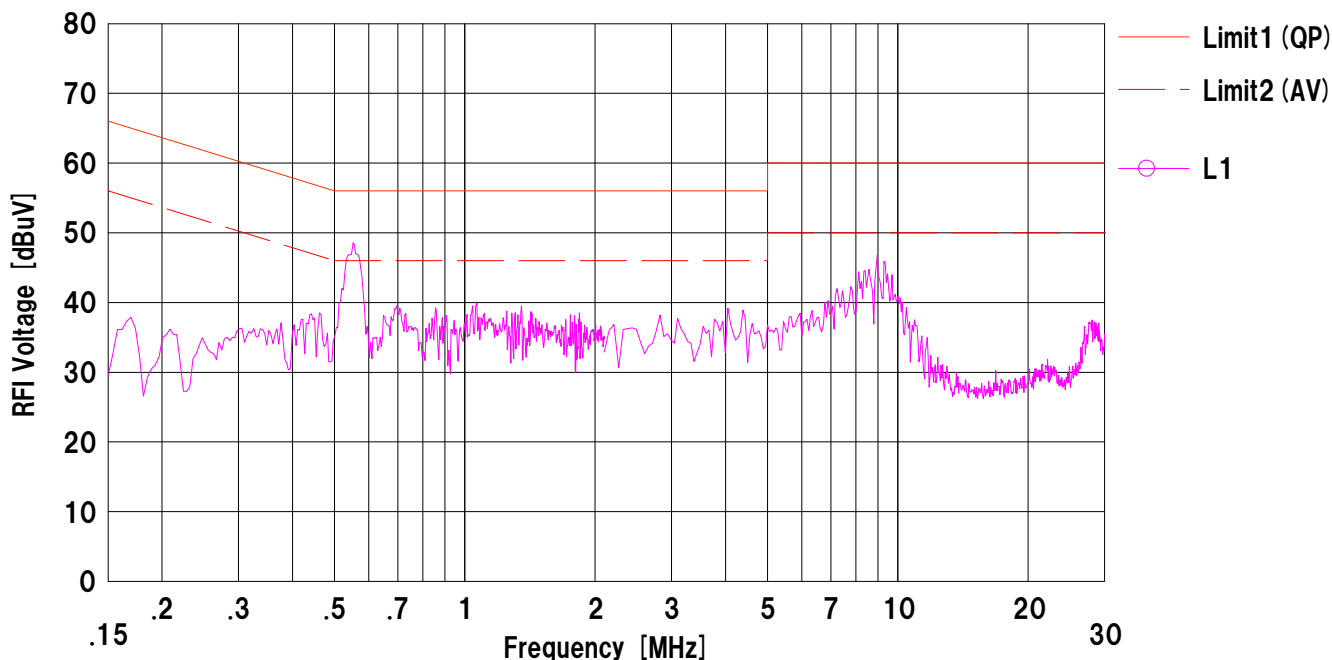
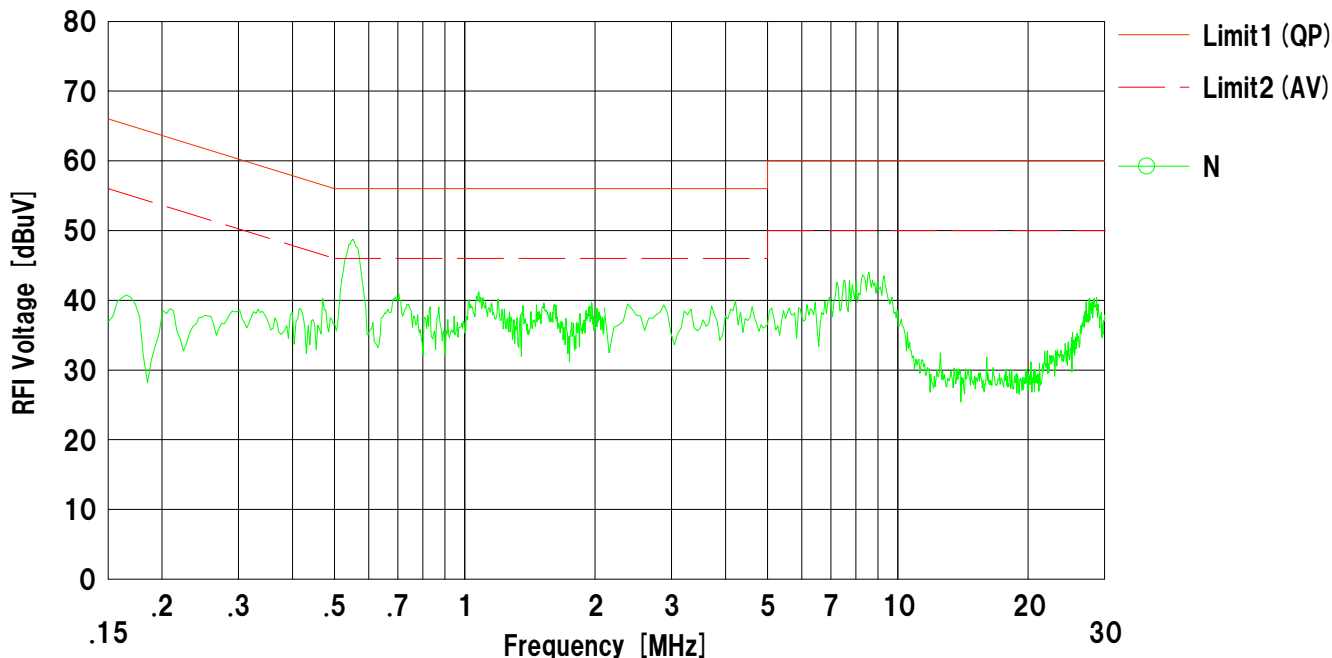
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11n (HT20) 2437MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Dipole Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

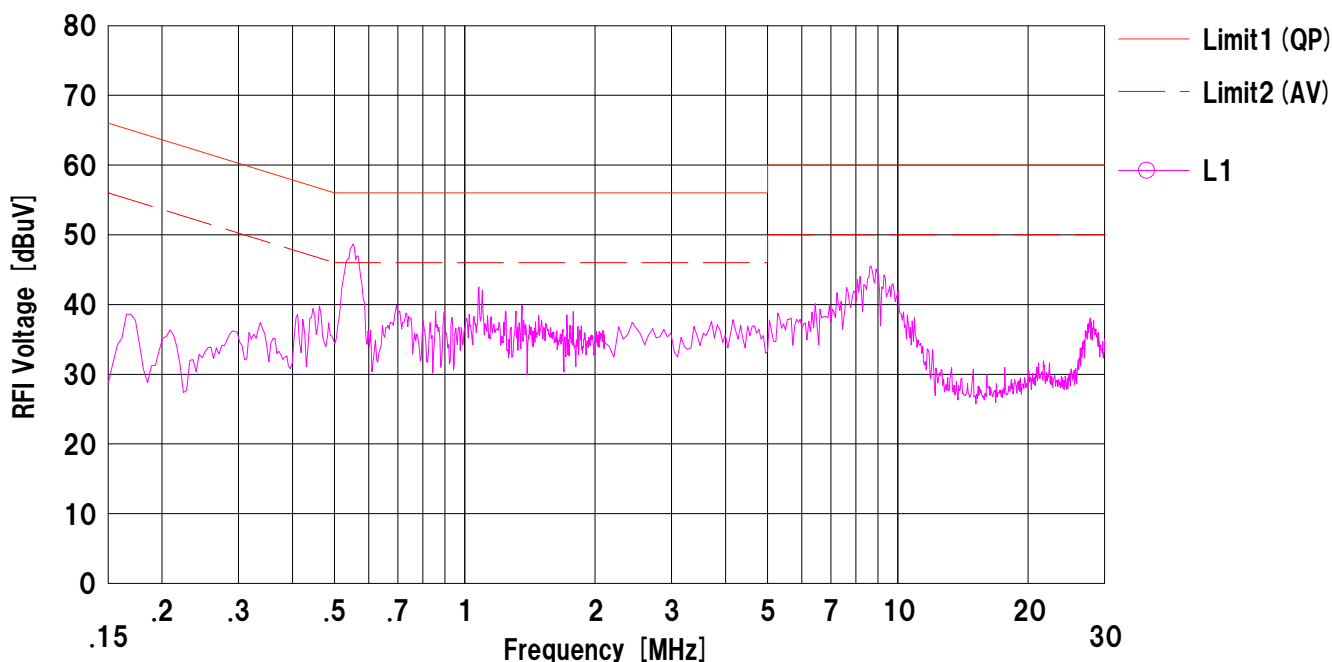
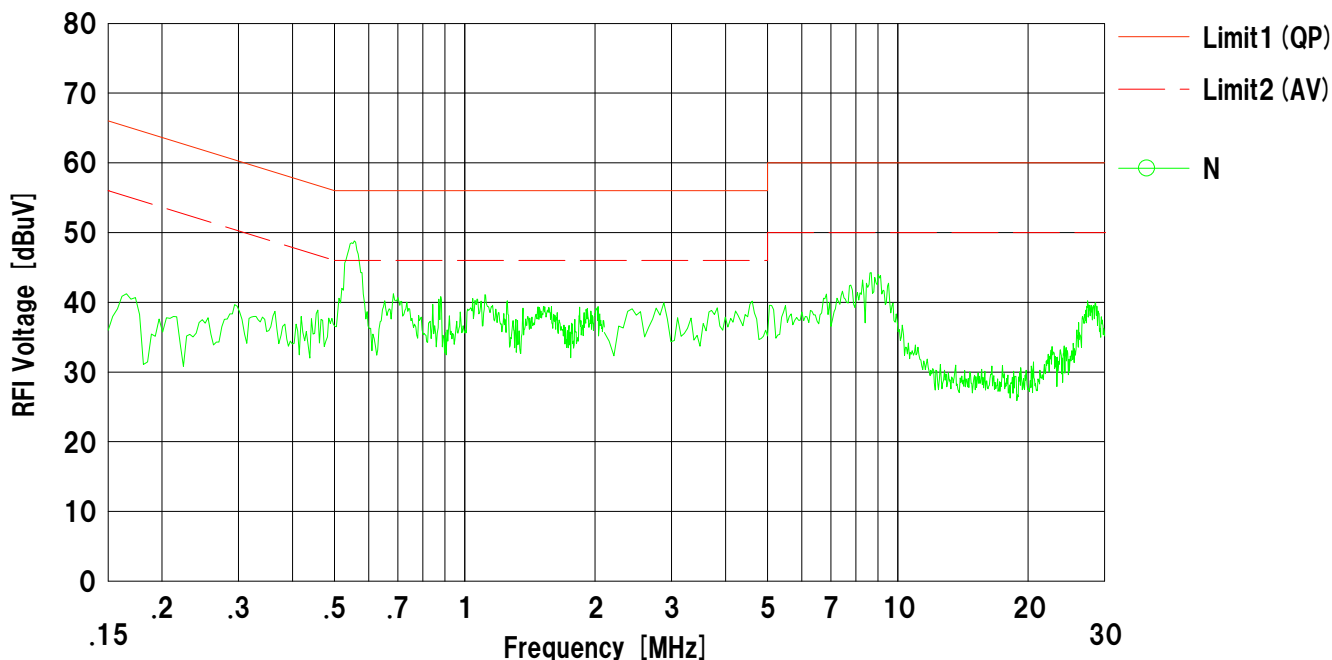
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11n (HT20) 2462MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Dipole Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-O2 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

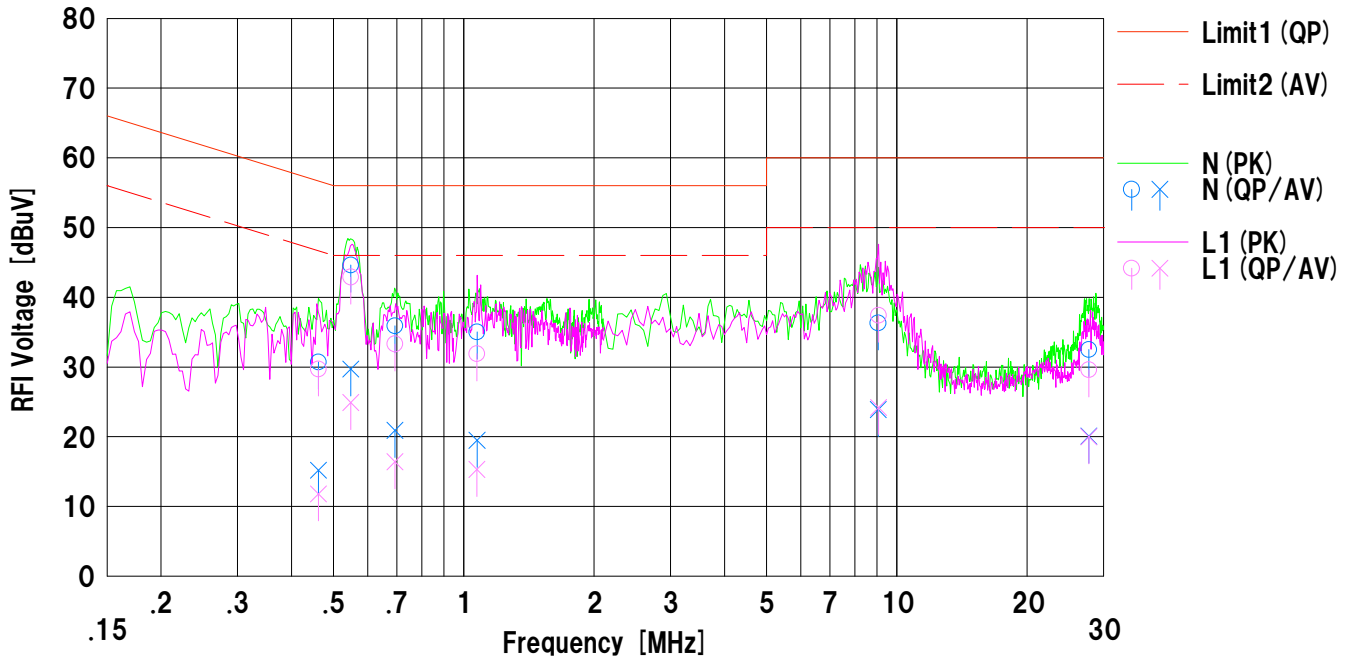
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11n (HT20) 2412MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Dipole Antenna

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	0.46161	17.8	2.3	12.9	30.7	15.2	56.6	46.6	25.9	31.4	N	
2	0.54862	31.7	16.8	12.9	44.6	29.7	56.0	46.0	11.4	16.3	N	
3	0.69379	23.0	8.0	12.9	35.9	20.9	56.0	46.0	20.1	25.1	N	
4	1.07356	22.1	6.6	12.9	35.0	19.5	56.0	46.0	21.0	26.5	N	
5	9.05585	22.4	10.0	13.9	36.3	23.9	60.0	50.0	23.7	26.1	N	
6	27.76345	17.2	4.8	15.3	32.5	20.1	60.0	50.0	27.5	29.9	N	
7	0.46161	16.8	-1.1	12.9	29.7	11.8	56.6	46.6	26.9	34.8	L1	
8	0.54862	30.0	12.0	12.9	42.9	24.9	56.0	46.0	13.1	21.1	L1	
9	0.69379	20.4	3.5	12.9	33.3	16.4	56.0	46.0	22.7	29.6	L1	
10	1.07283	19.0	2.4	12.9	31.9	15.3	56.0	46.0	24.1	30.7	L1	
11	9.07934	23.5	10.3	13.9	37.4	24.2	60.0	50.0	22.6	25.8	L1	
12	27.76345	14.3	4.7	15.3	29.6	20.0	60.0	50.0	30.4	30.0	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

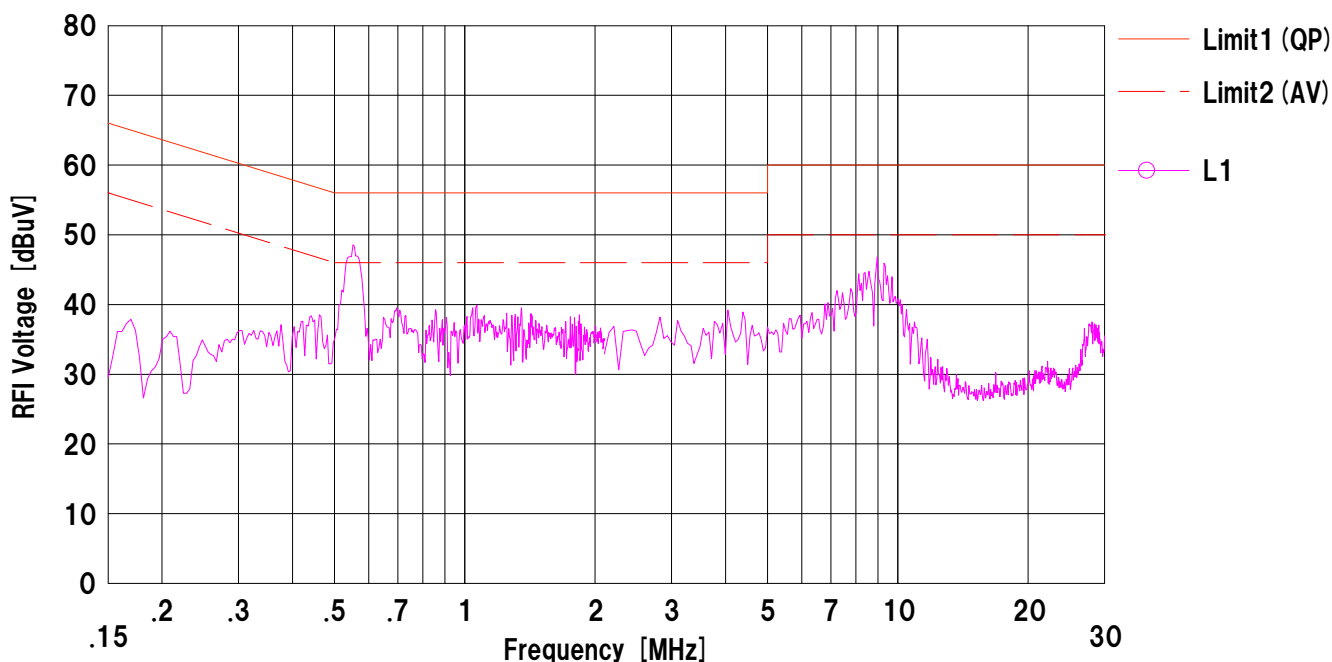
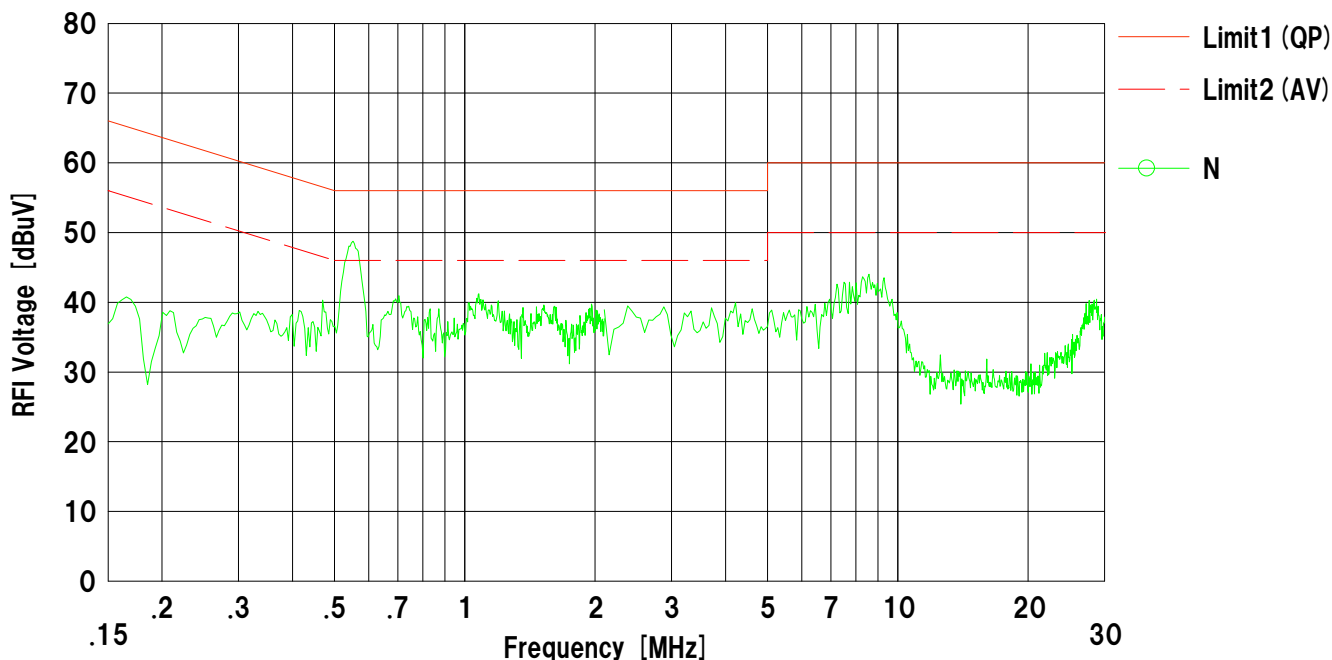
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11b 2412MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : PIFA Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

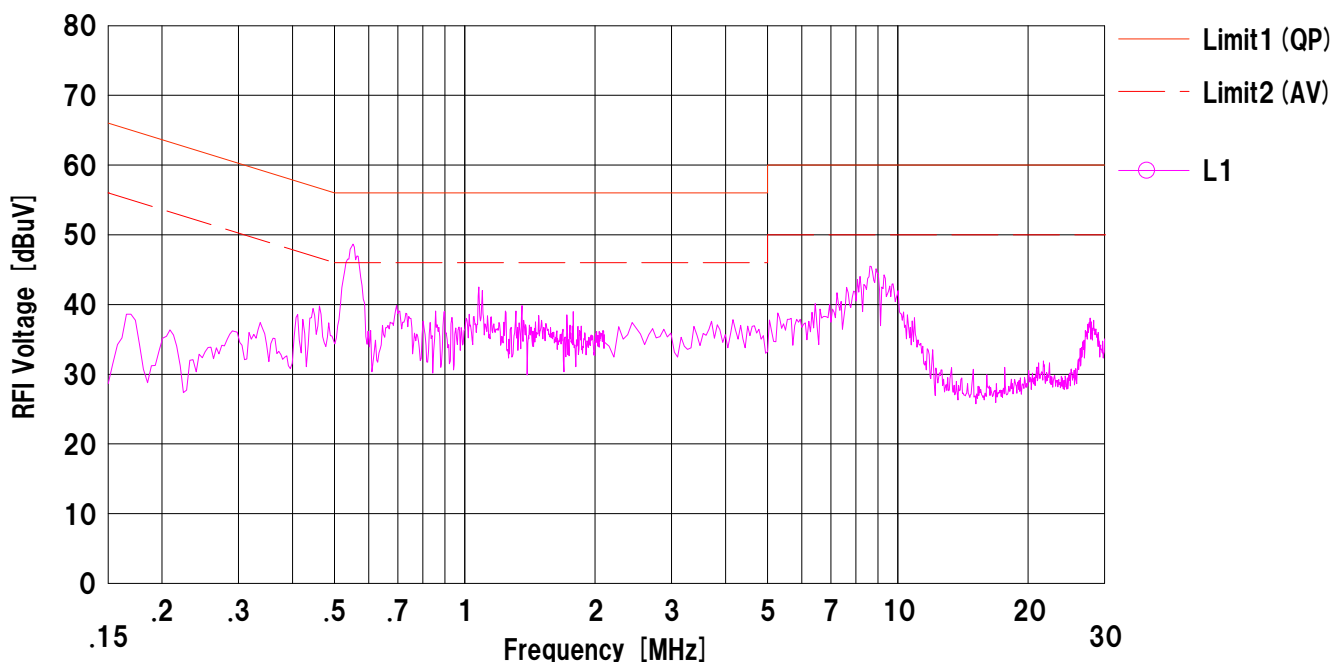
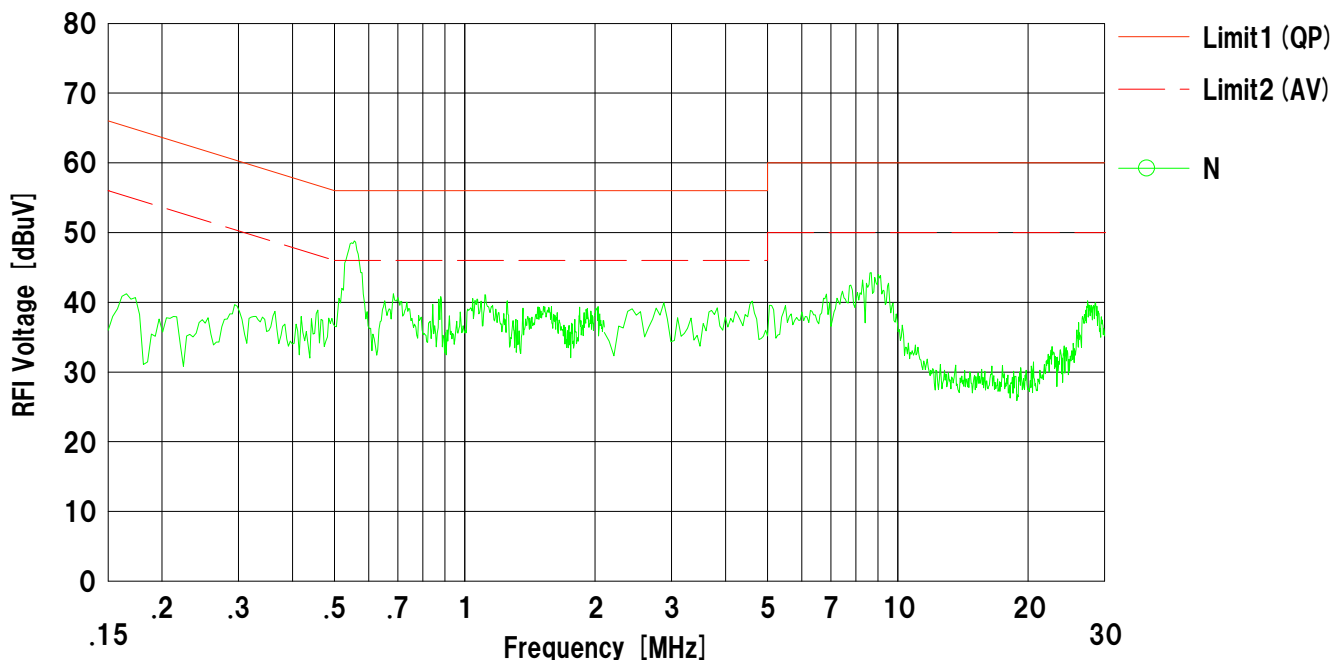
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11b 2437MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : PIFA Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

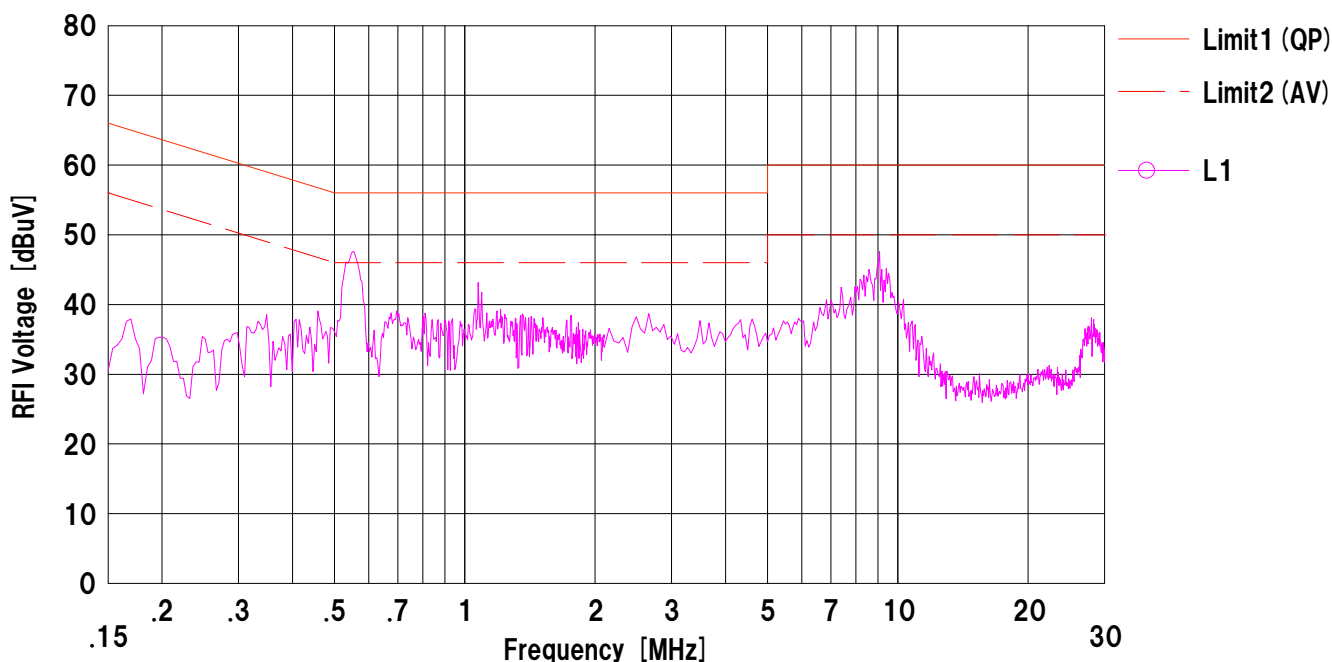
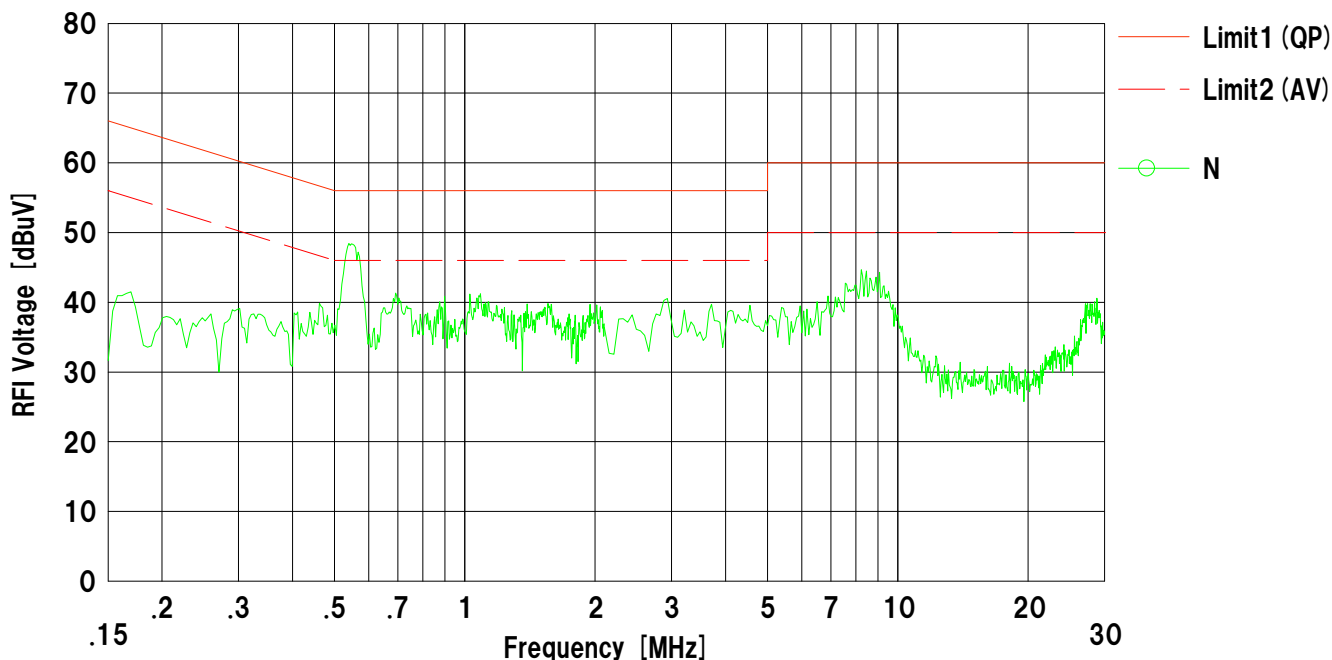
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11b 2462MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
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Limit1 : FCC 15C (15.207) QP
 Limit2 : FCC 15C (15.207) AV

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

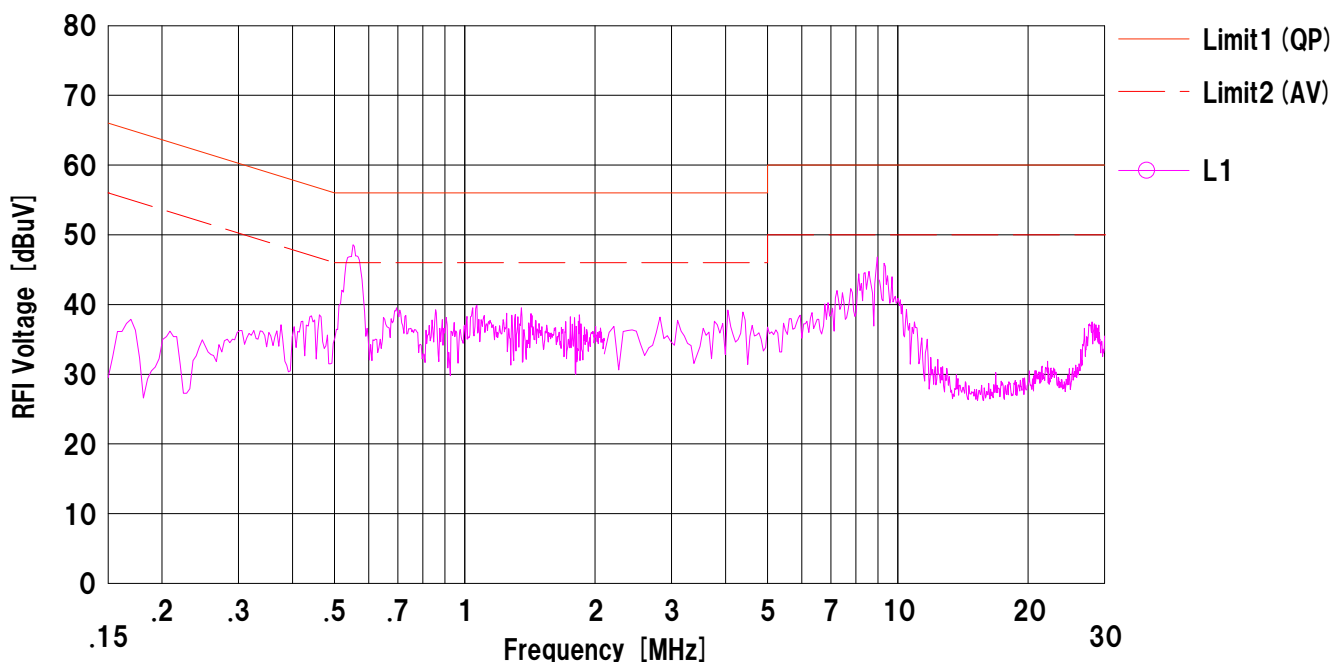
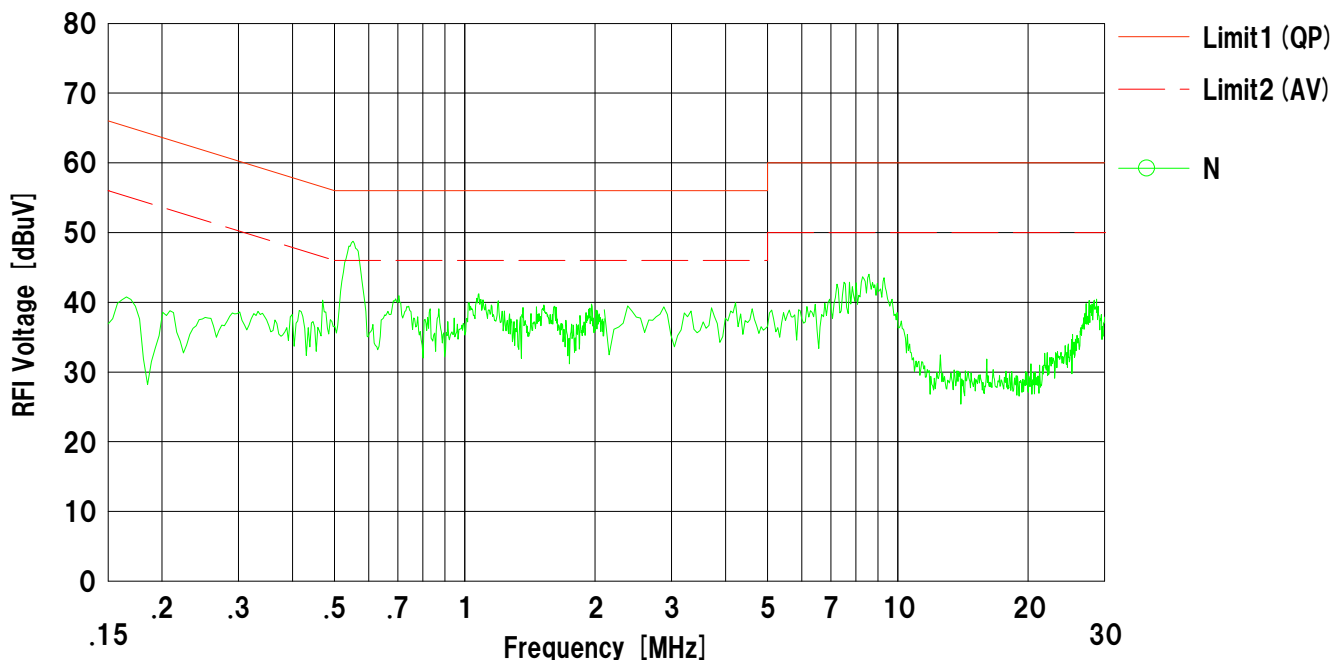
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11g 2412MHz
 Report No. : 10028551S
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DATA OF CONDUCTED EMISSION TEST

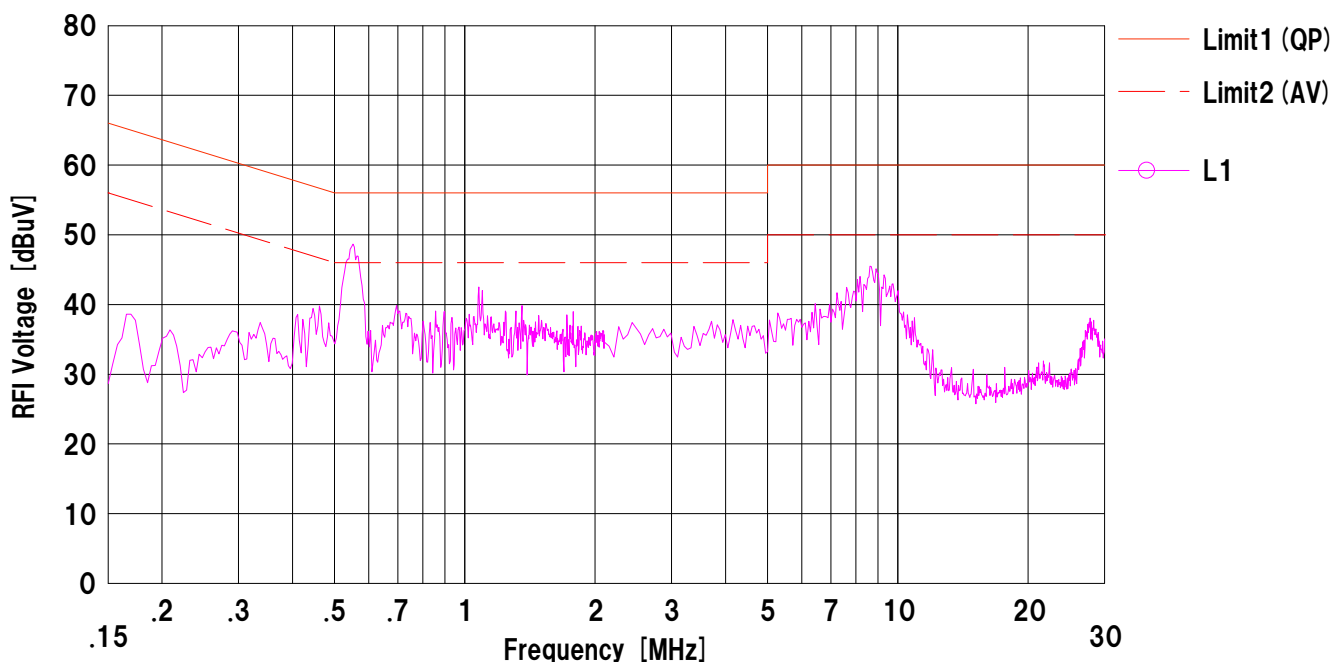
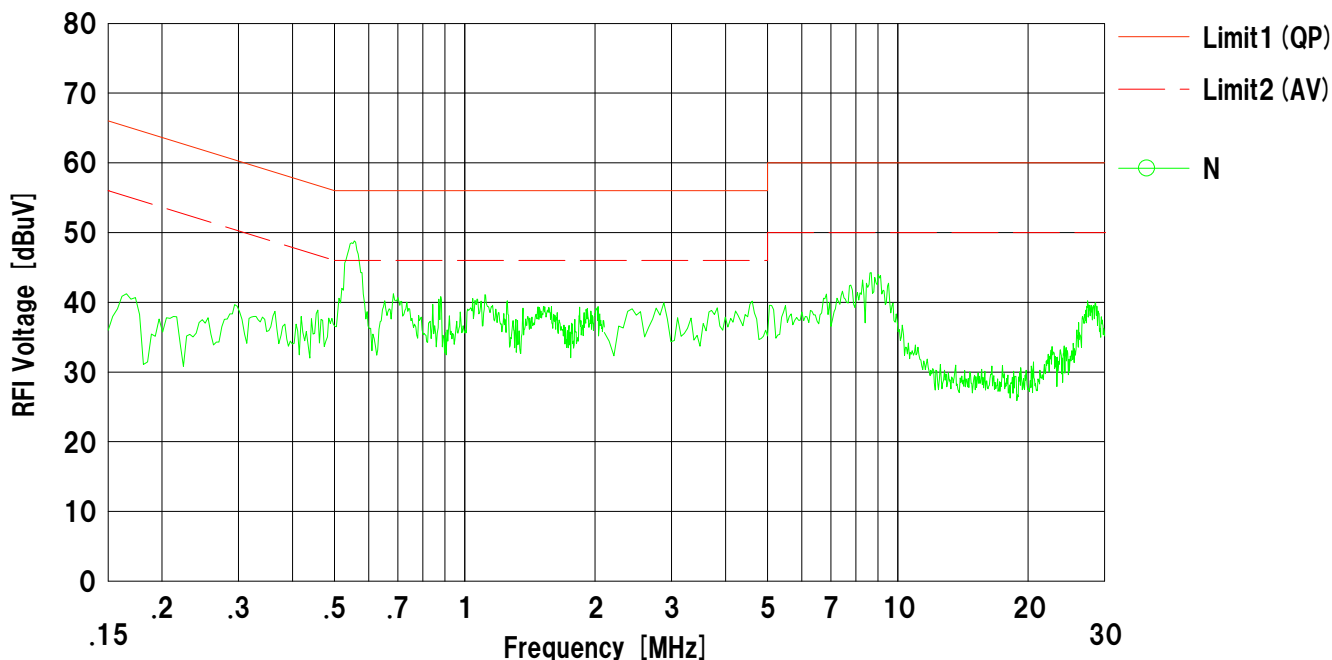
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11g 2437MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : PIFA Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-O2 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

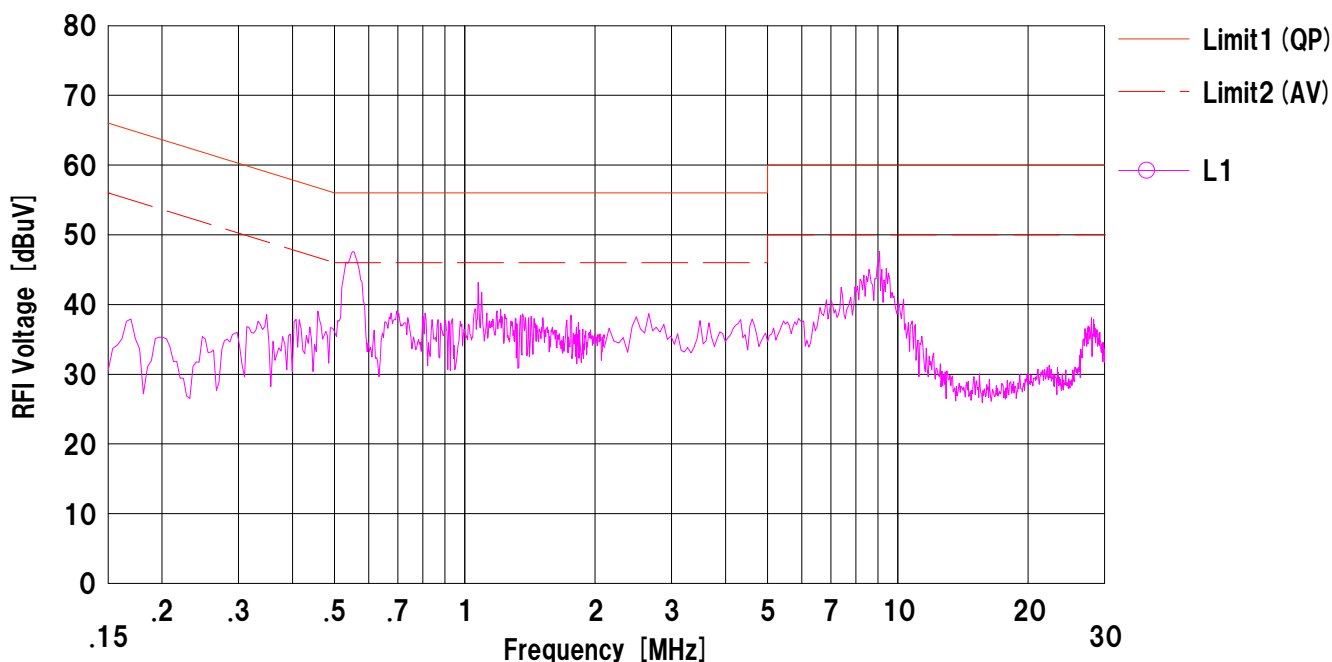
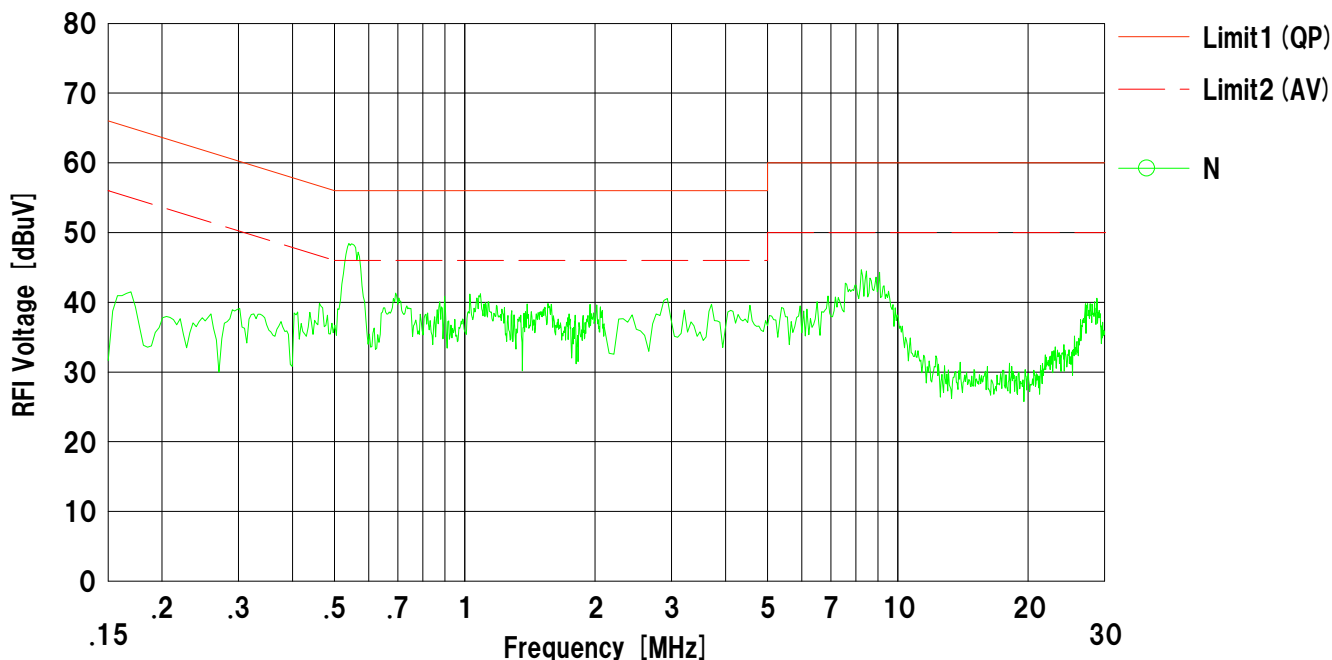
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11g 2462MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : PIFA Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

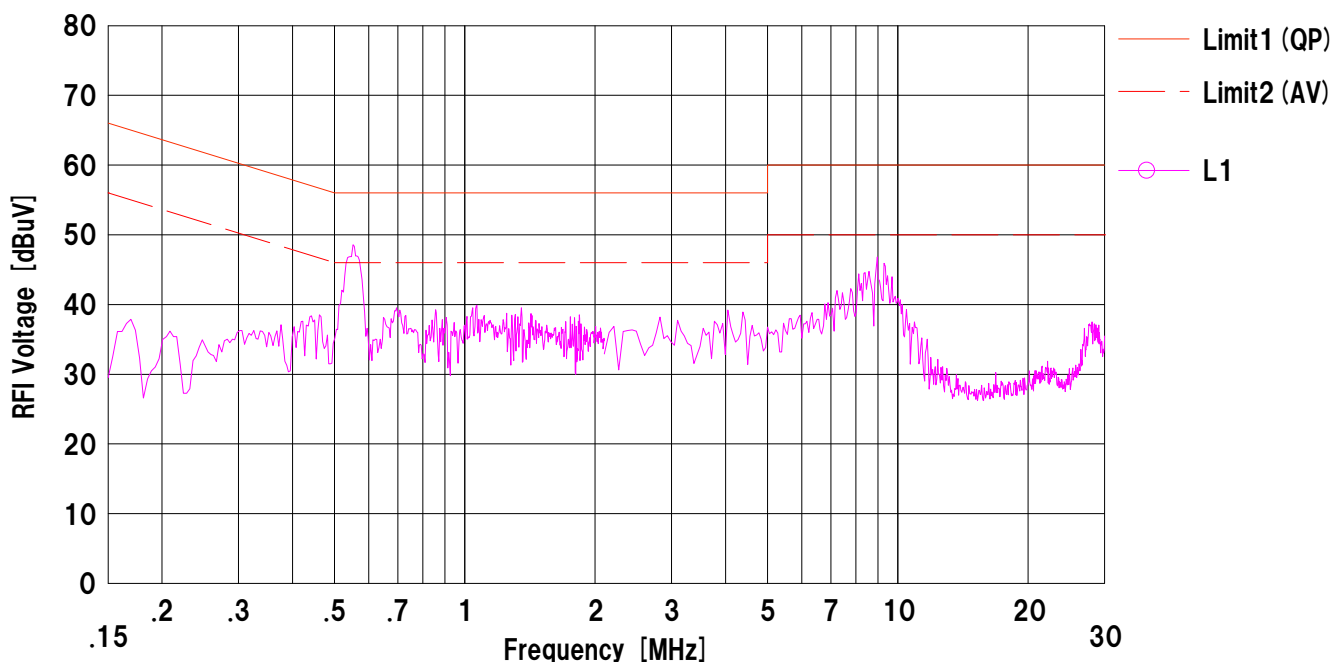
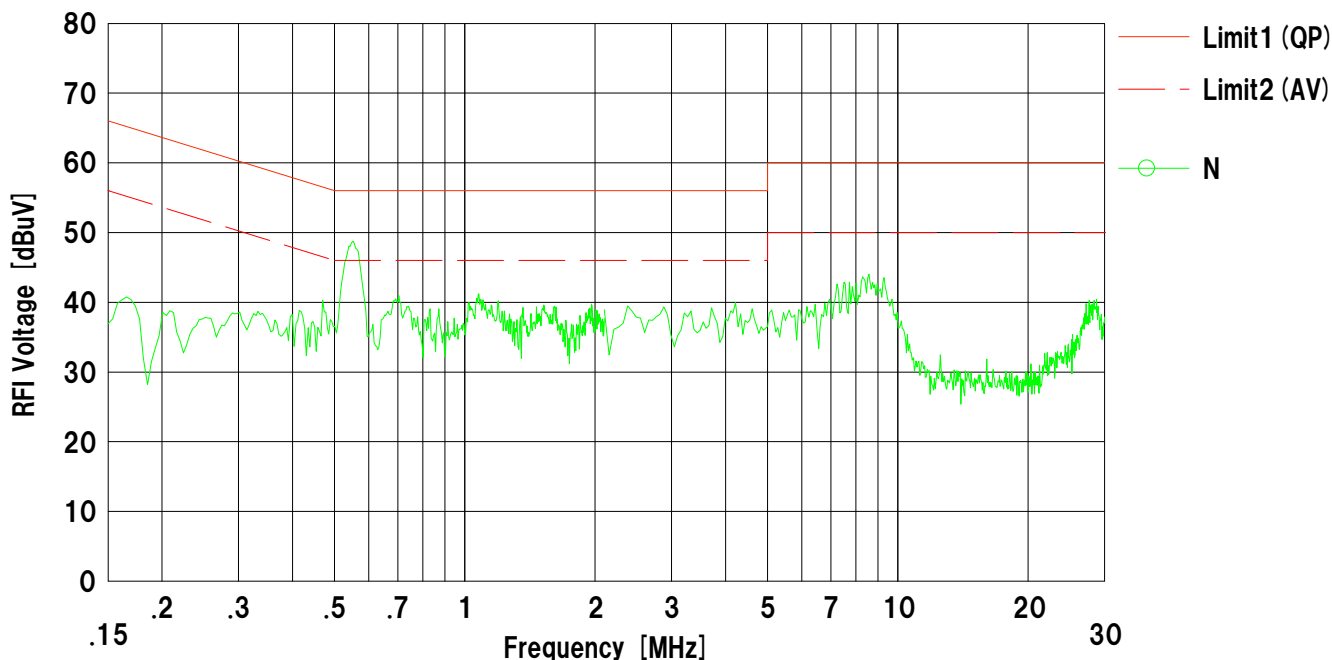
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11n (HT20) 2412MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : PIFA Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-O2 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

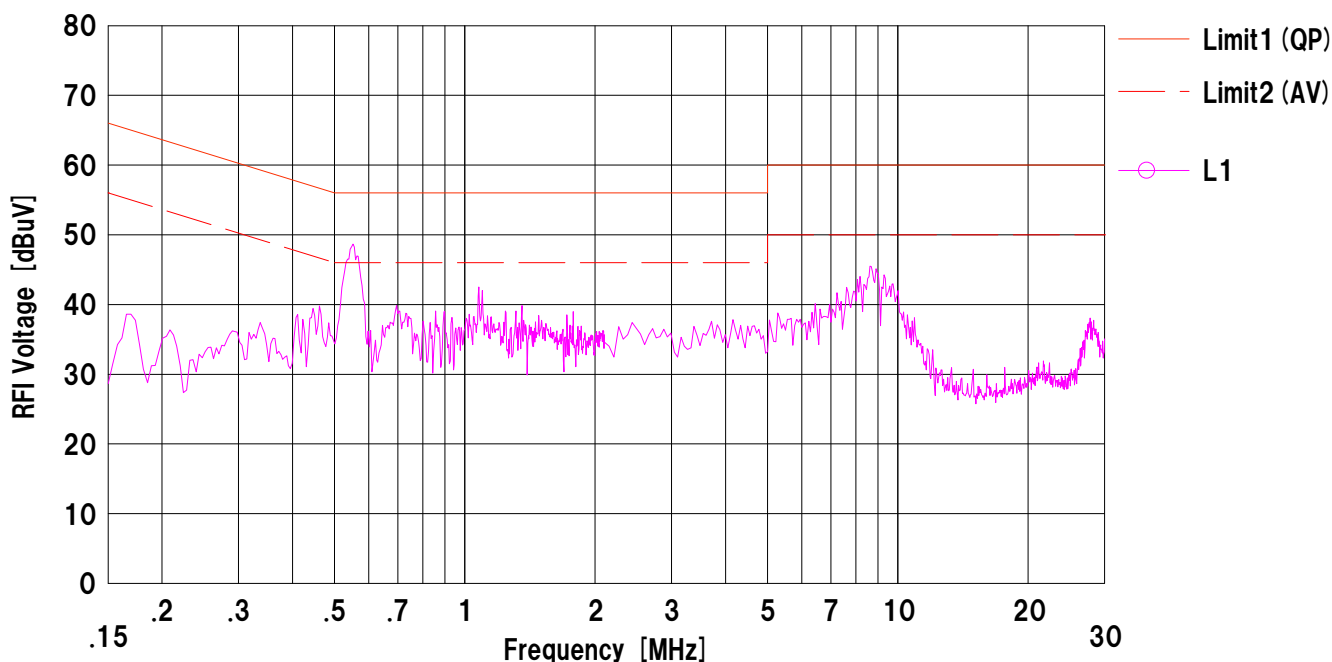
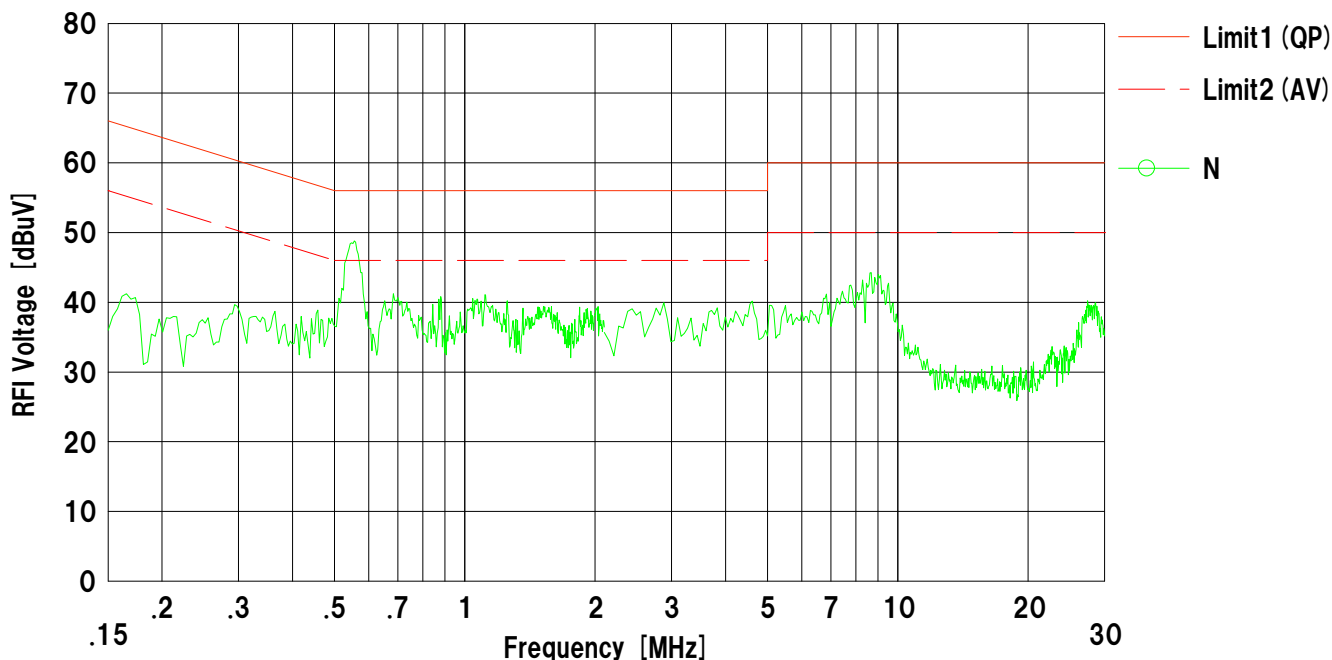
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11n (HT20) 2437MHz
 Report No. : 10028551S
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DATA OF CONDUCTED EMISSION TEST

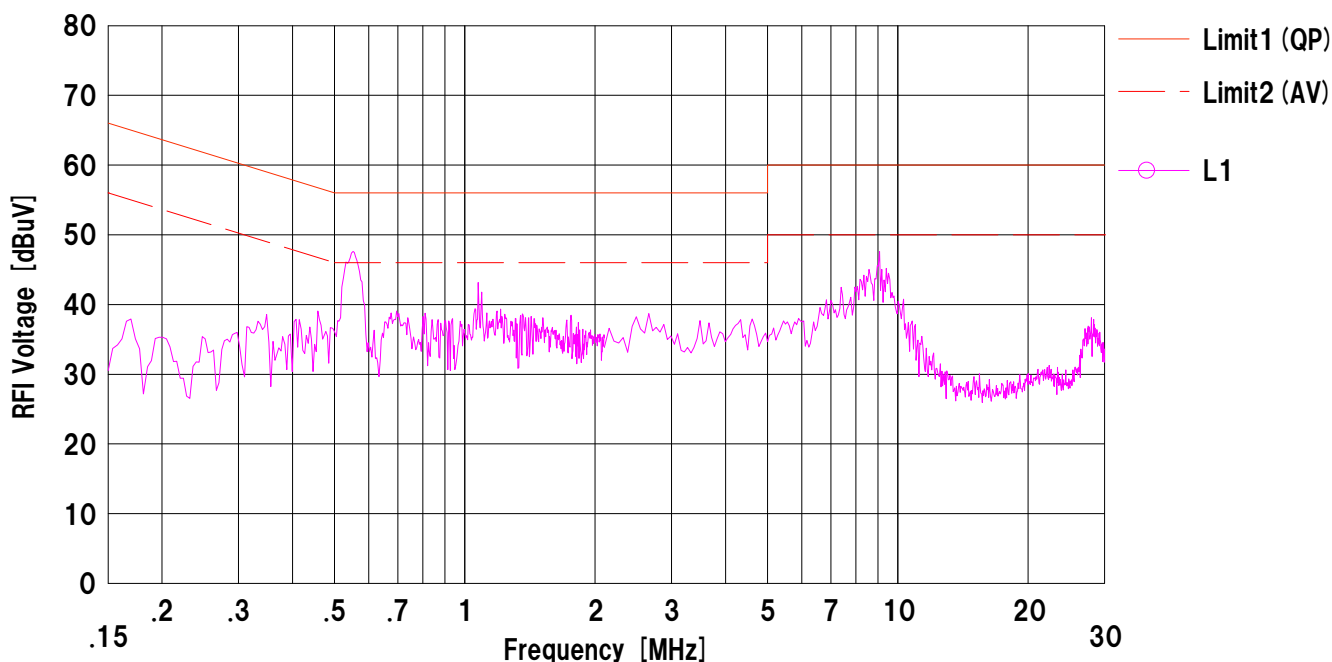
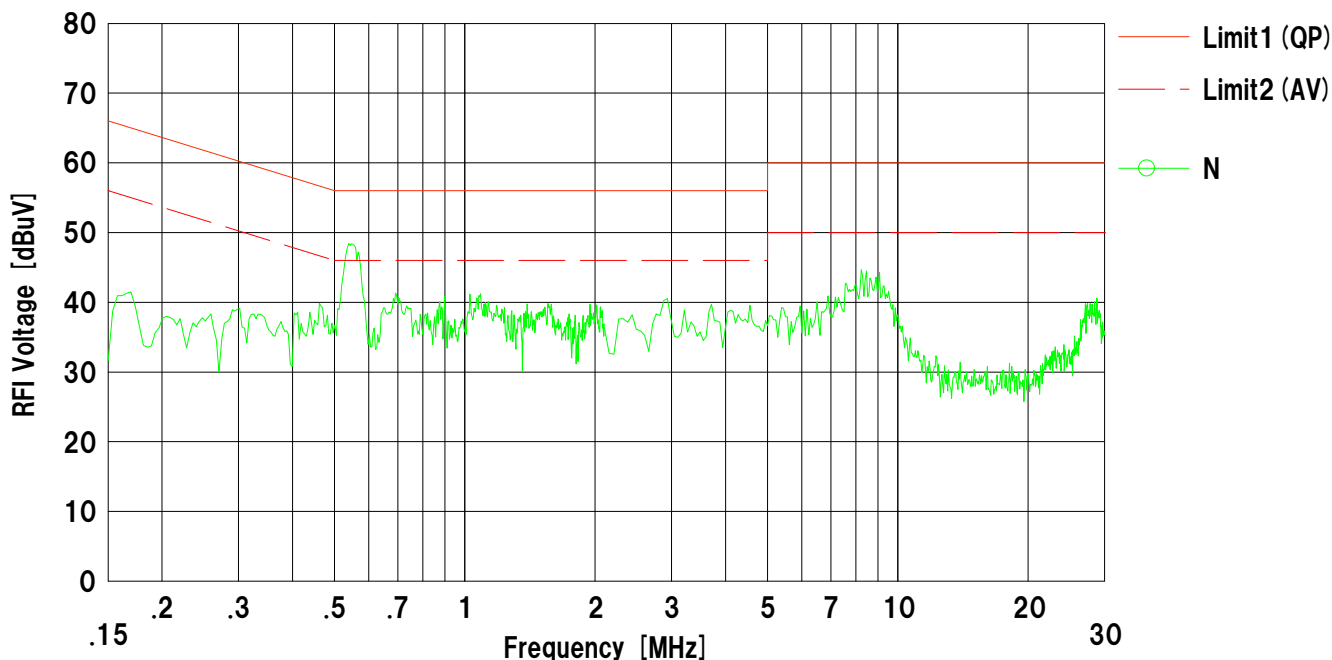
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
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 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

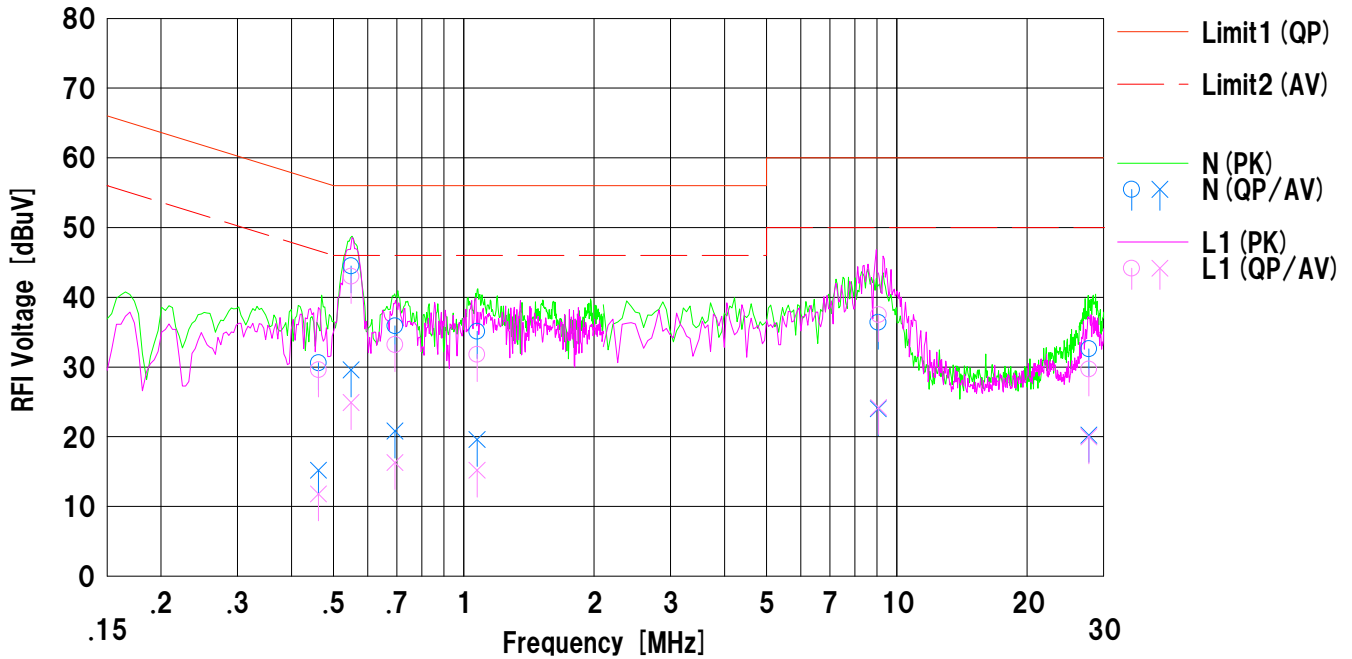
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11n (HT20) 2412MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : PIFA Antenna

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	0.46189	17.7	2.3	12.9	30.6	15.2	56.6	46.6	26.0	31.4	N	
2	0.54883	31.6	16.7	12.9	44.5	29.6	56.0	46.0	11.5	16.4	N	
3	0.69384	23.0	7.9	12.9	35.9	20.8	56.0	46.0	20.1	25.2	N	
4	1.07355	22.2	6.7	12.9	35.1	19.6	56.0	46.0	20.9	26.4	N	
5	9.05493	22.5	10.1	13.9	36.4	24.0	60.0	50.0	23.6	26.0	N	
6	27.76389	17.3	4.9	15.3	32.6	20.2	60.0	50.0	27.4	29.8	N	
7	0.46189	16.7	-1.1	12.9	29.6	11.8	56.6	46.6	27.0	34.8	L1	
8	0.54883	30.1	12.0	12.9	43.0	24.9	56.0	46.0	13.0	21.1	L1	
9	0.69384	20.3	3.4	12.9	33.2	16.3	56.0	46.0	22.8	29.7	L1	
10	1.07355	18.9	2.3	12.9	31.8	15.2	56.0	46.0	24.2	30.8	L1	
11	9.07921	23.6	10.3	13.9	37.5	24.2	60.0	50.0	22.5	25.8	L1	
12	27.76392	14.4	4.7	15.3	29.7	20.0	60.0	50.0	30.3	30.0	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

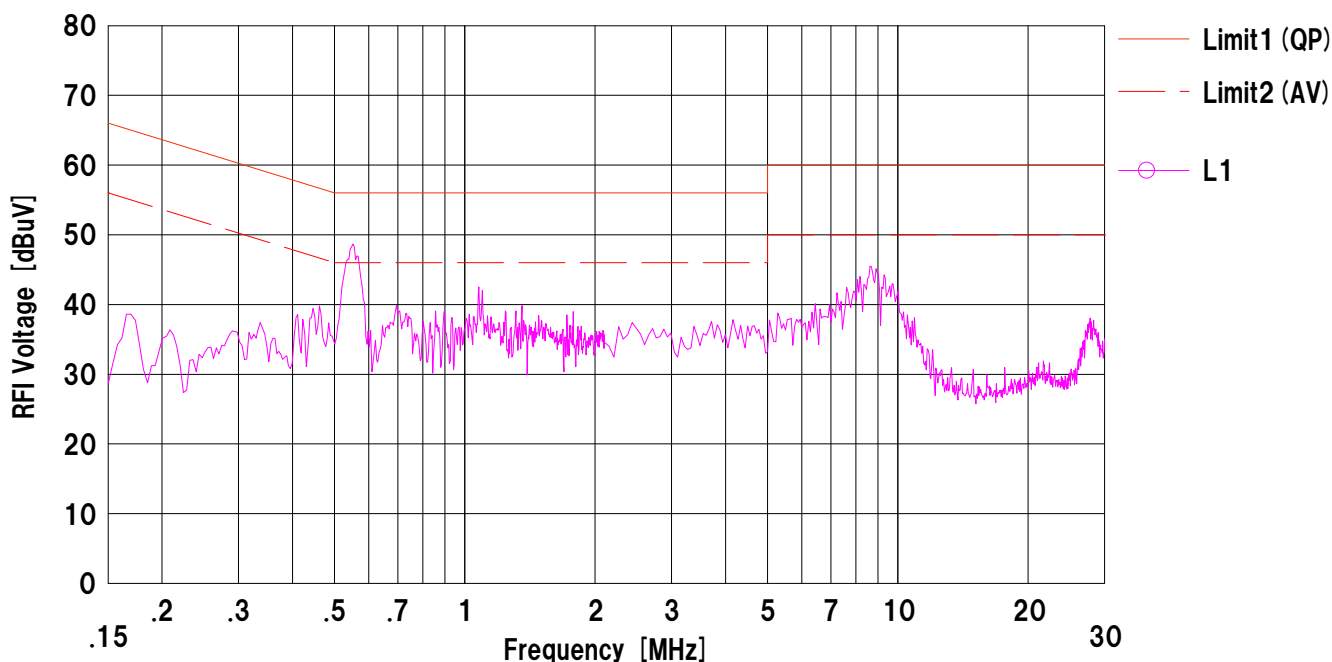
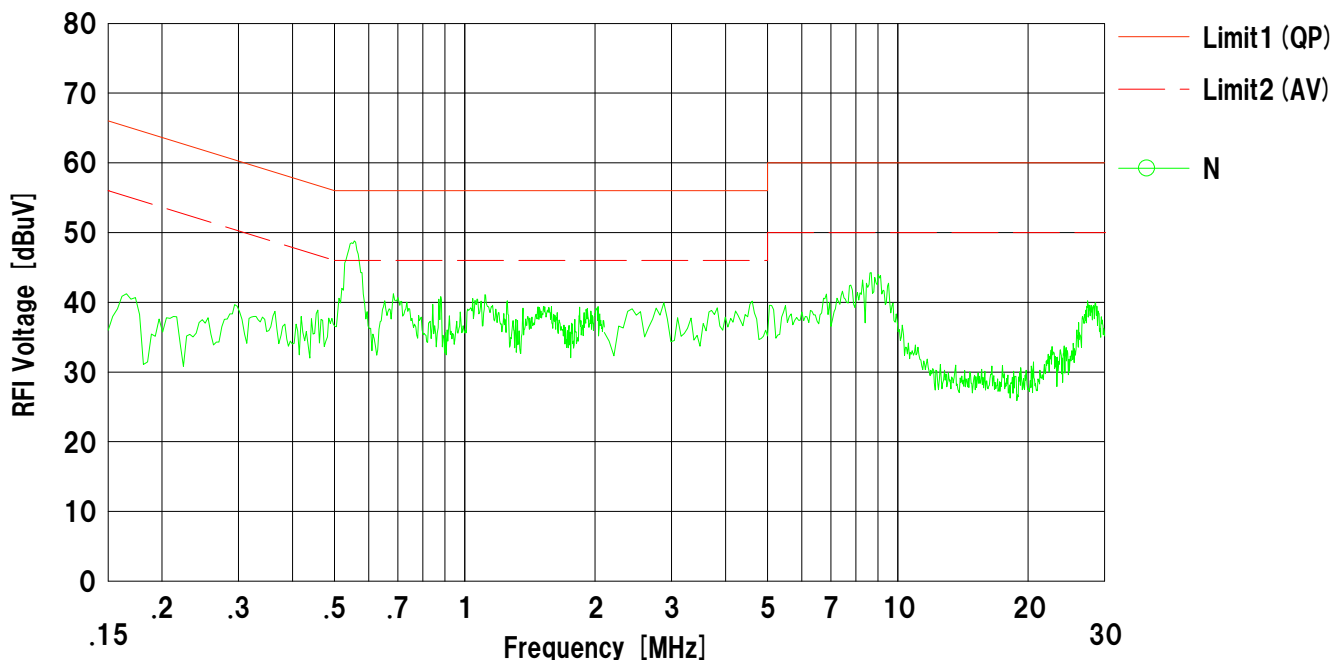
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11b 2412MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Chip Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-O2 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

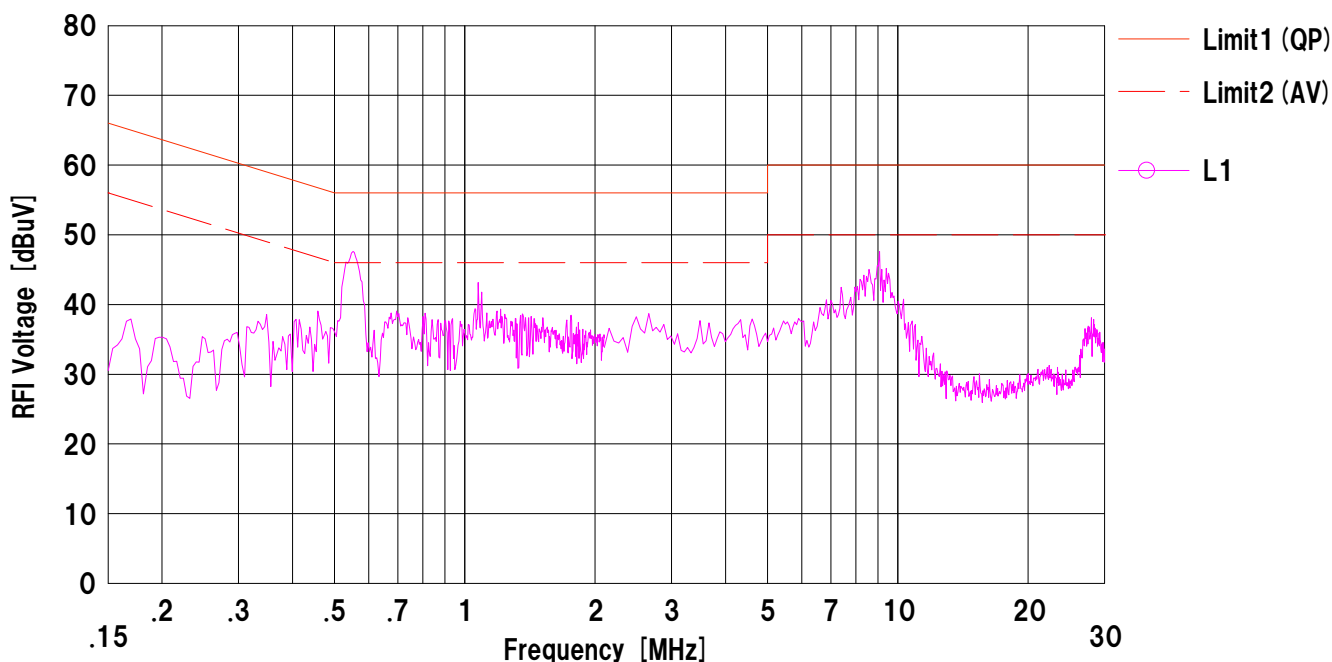
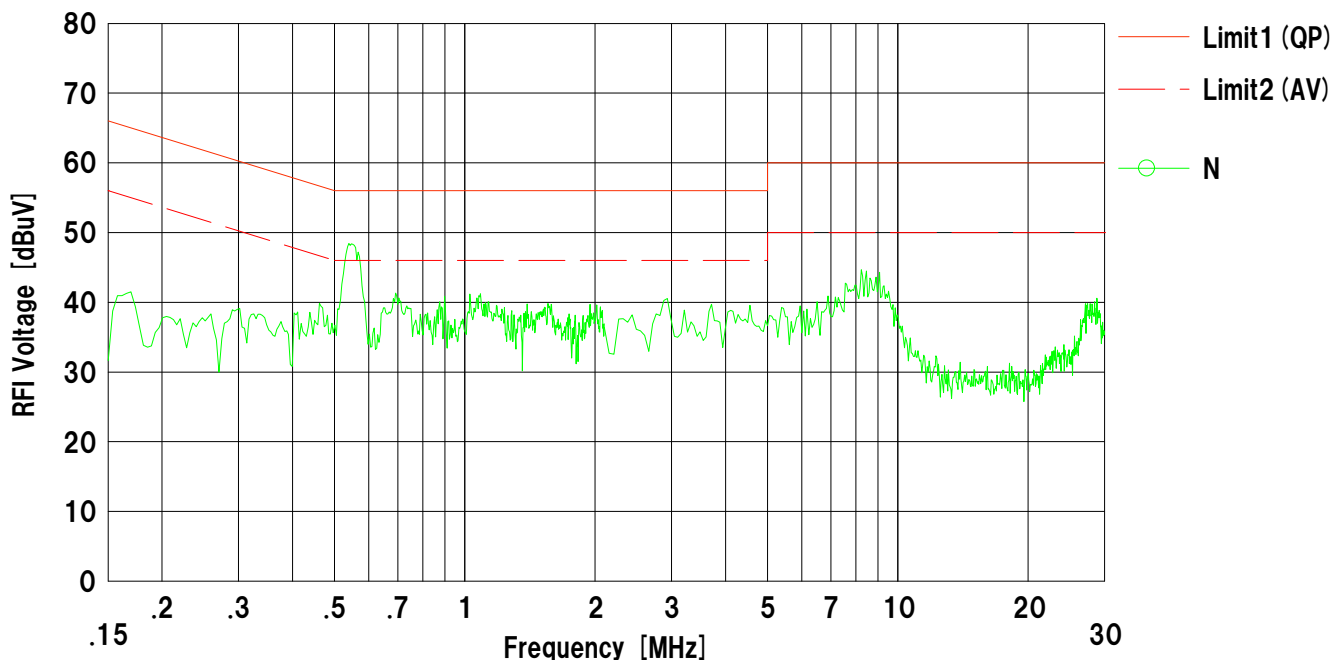
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11b 2437MHz
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 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

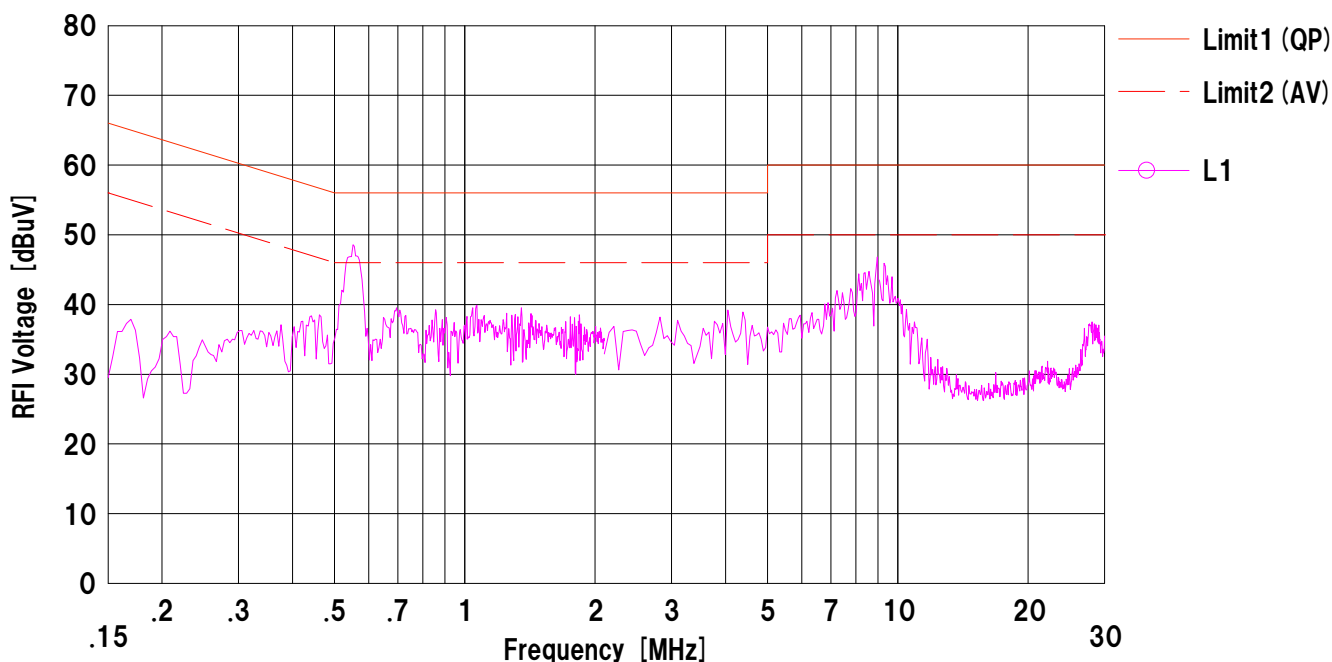
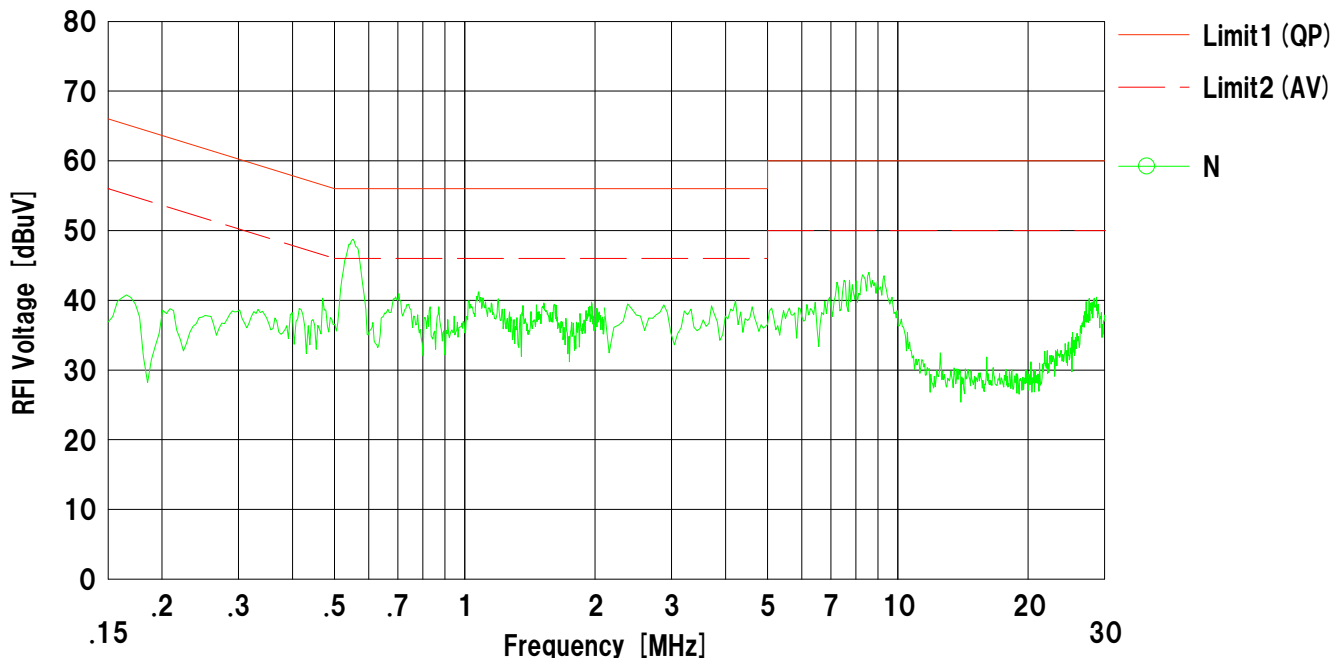
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
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DATA OF CONDUCTED EMISSION TEST

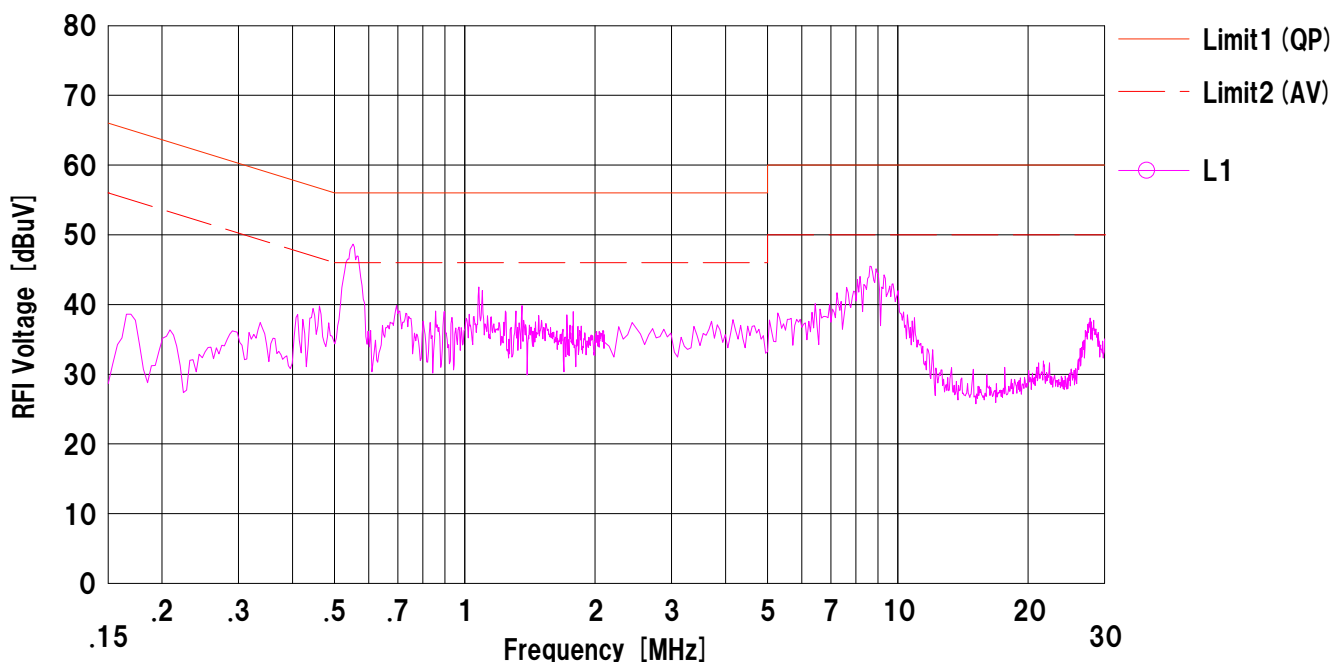
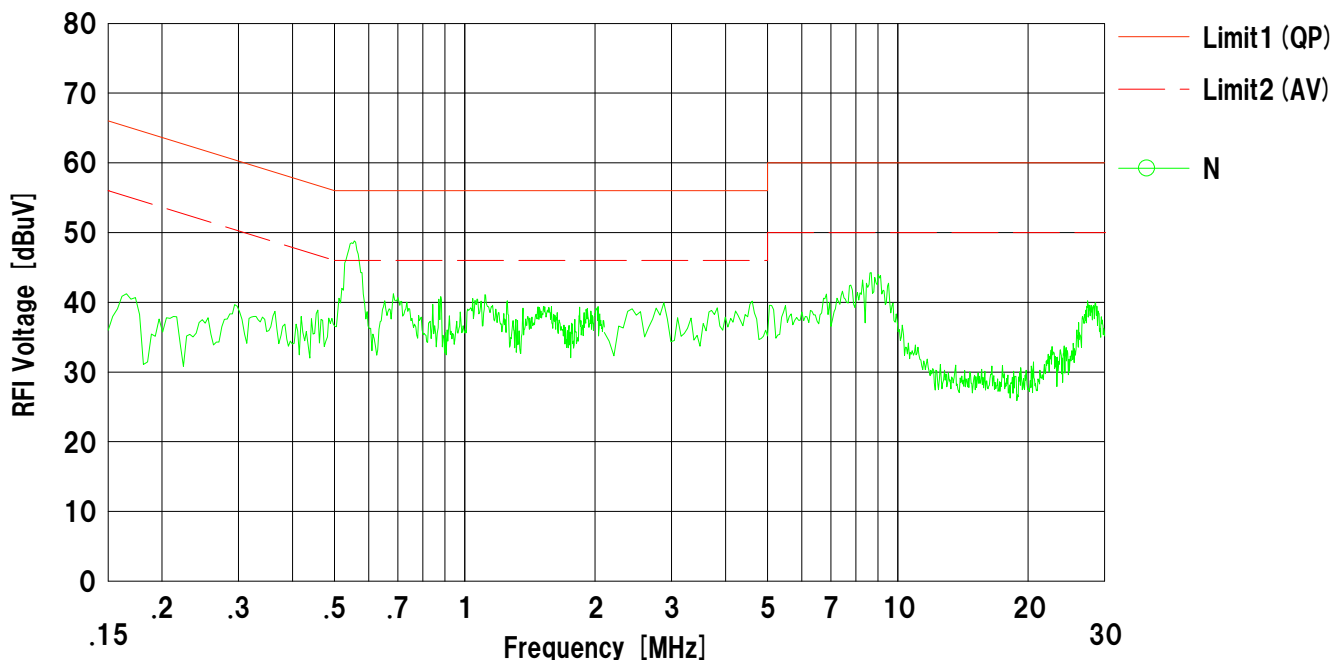
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11g 2412MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Chip Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

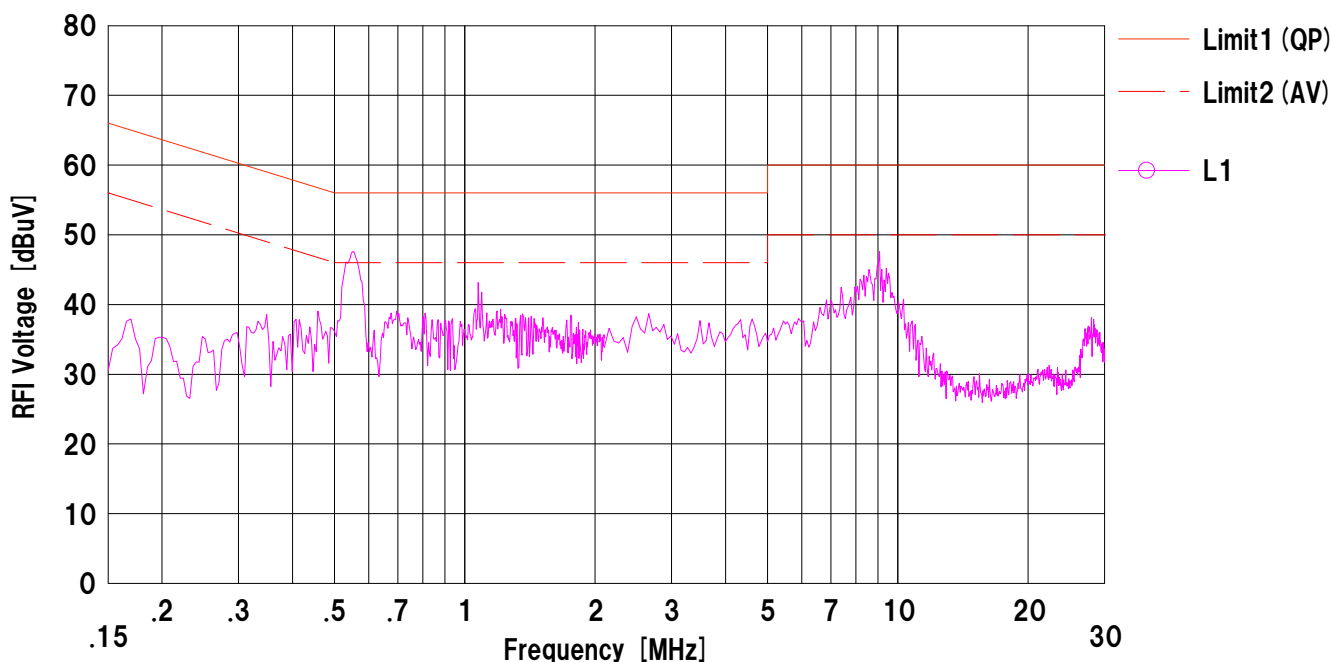
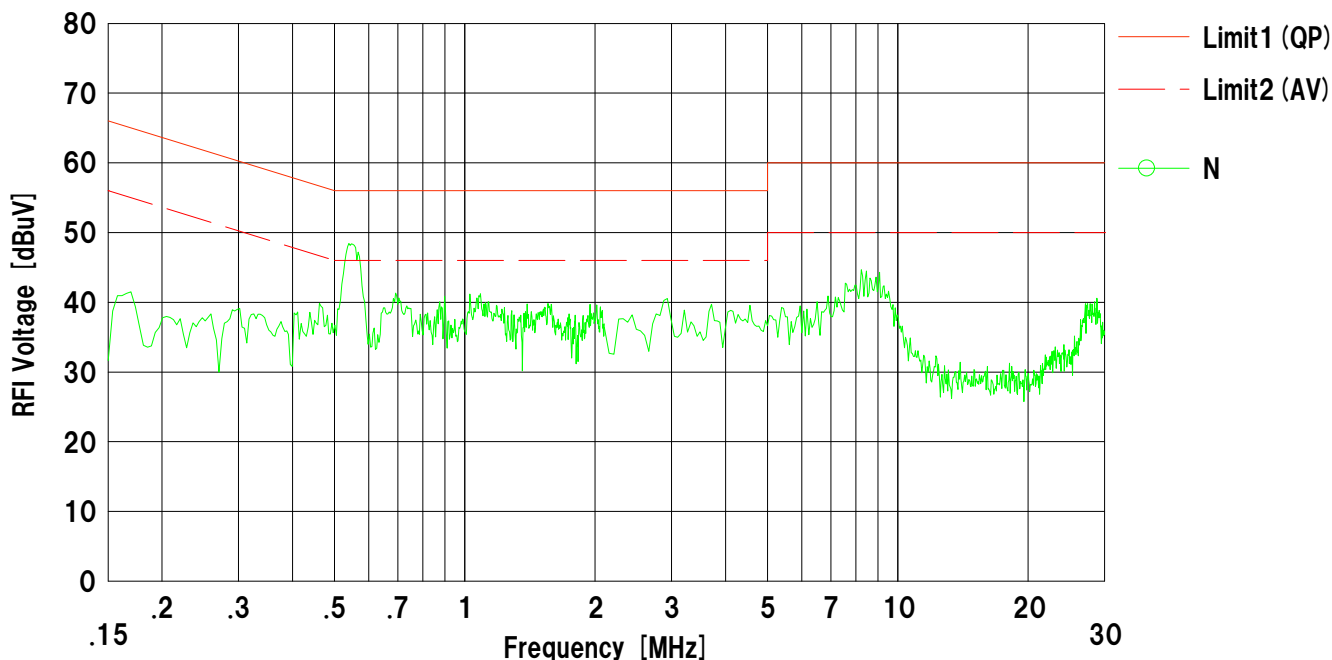
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11g 2437MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Chip Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

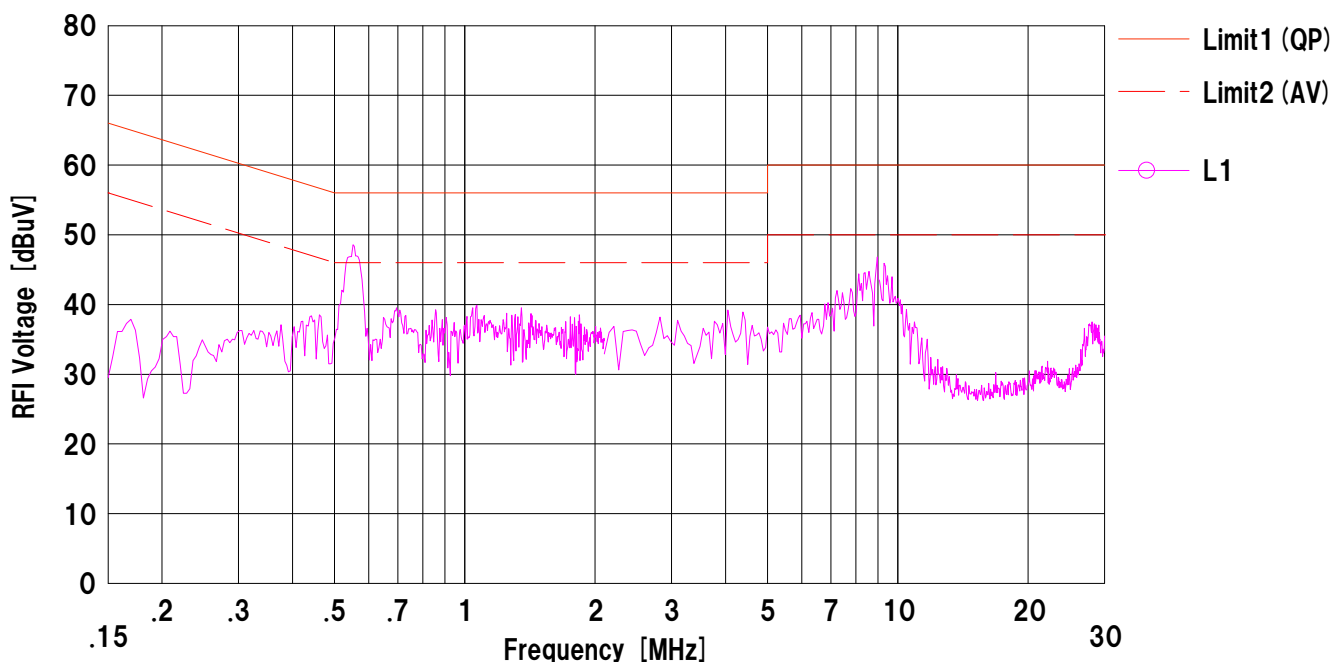
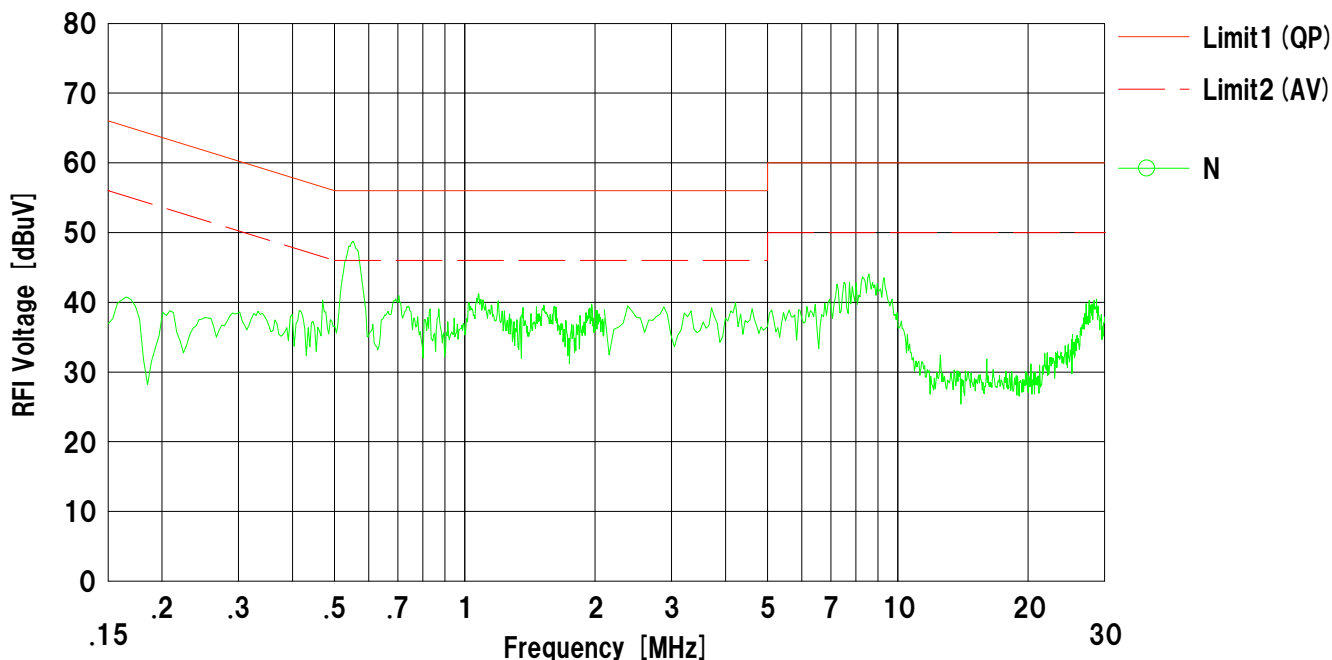
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11g 2462MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Chip Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-O2 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

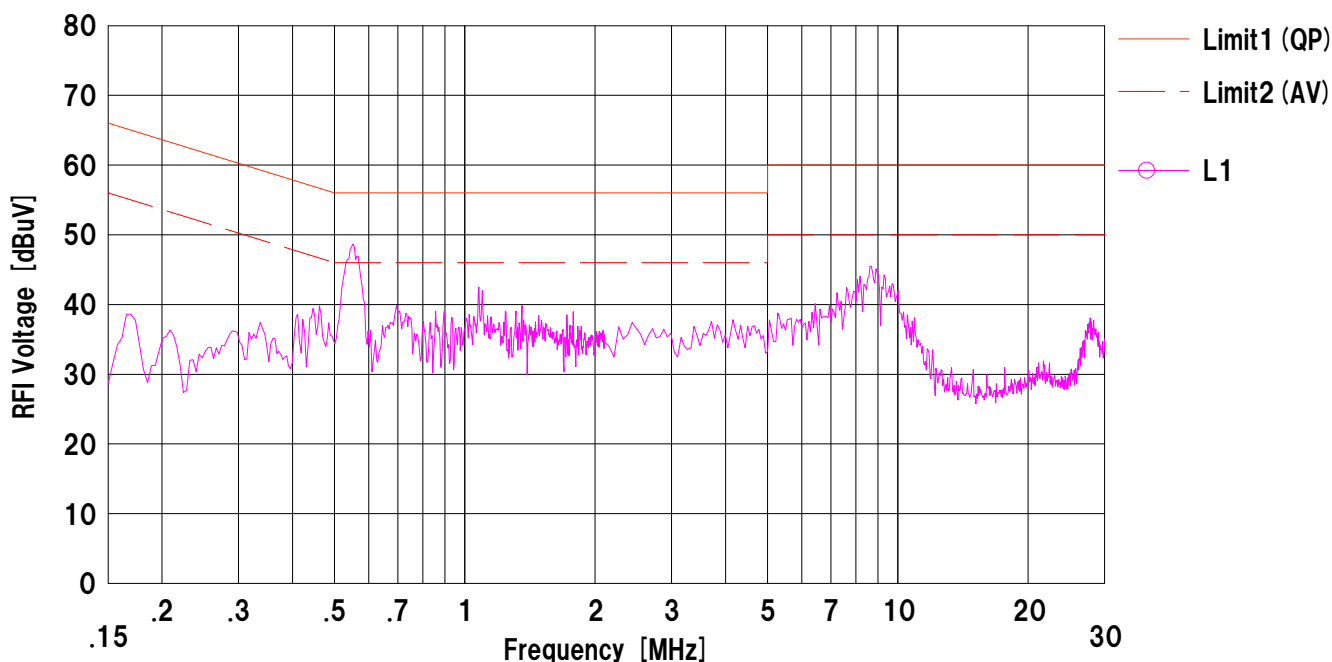
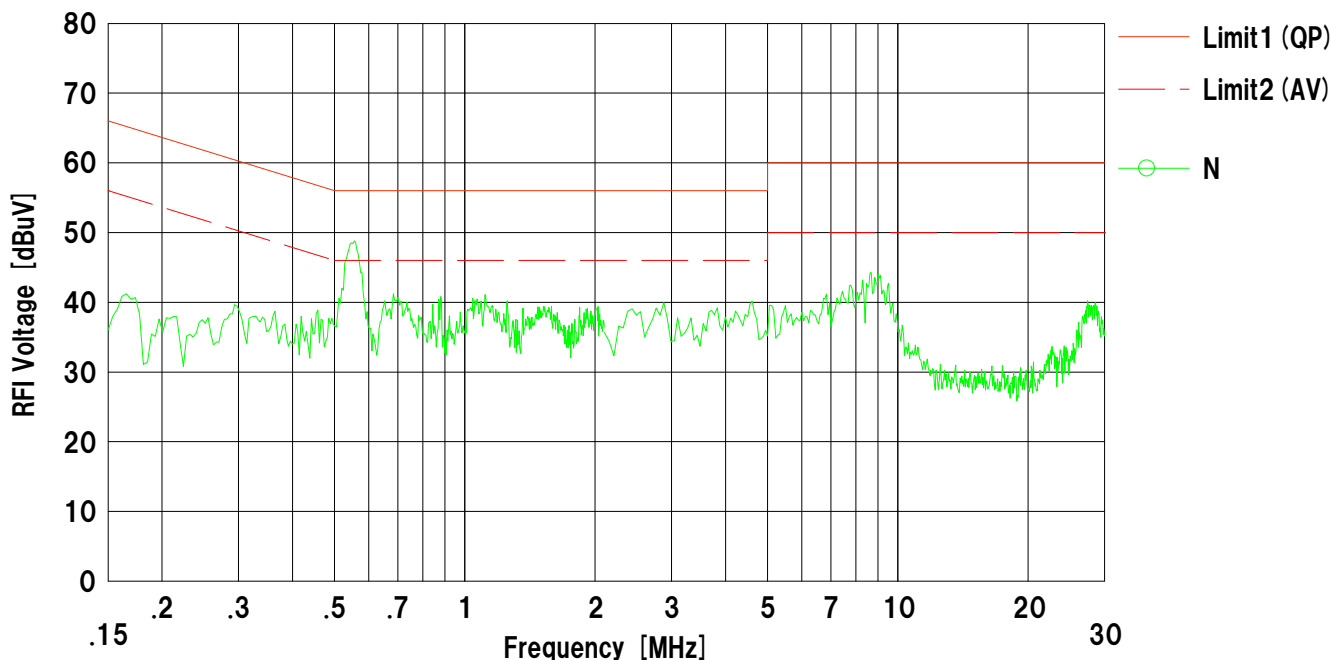
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11n (HT20) 2412MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Chip Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

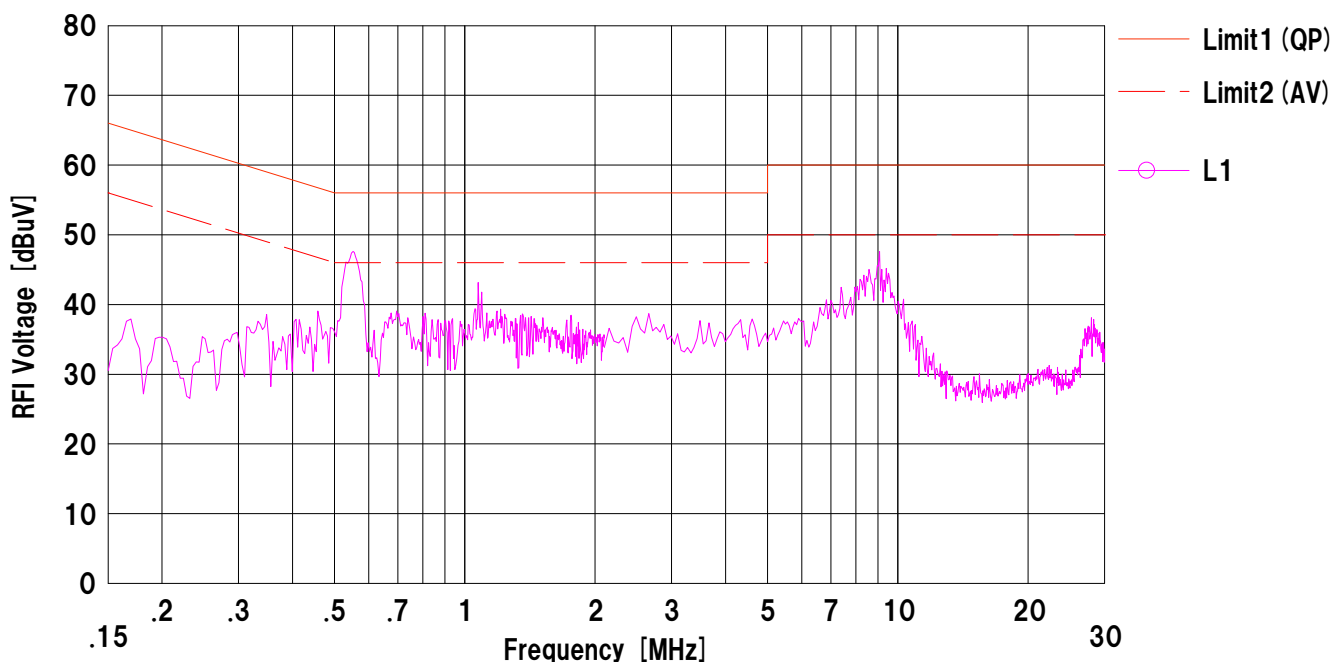
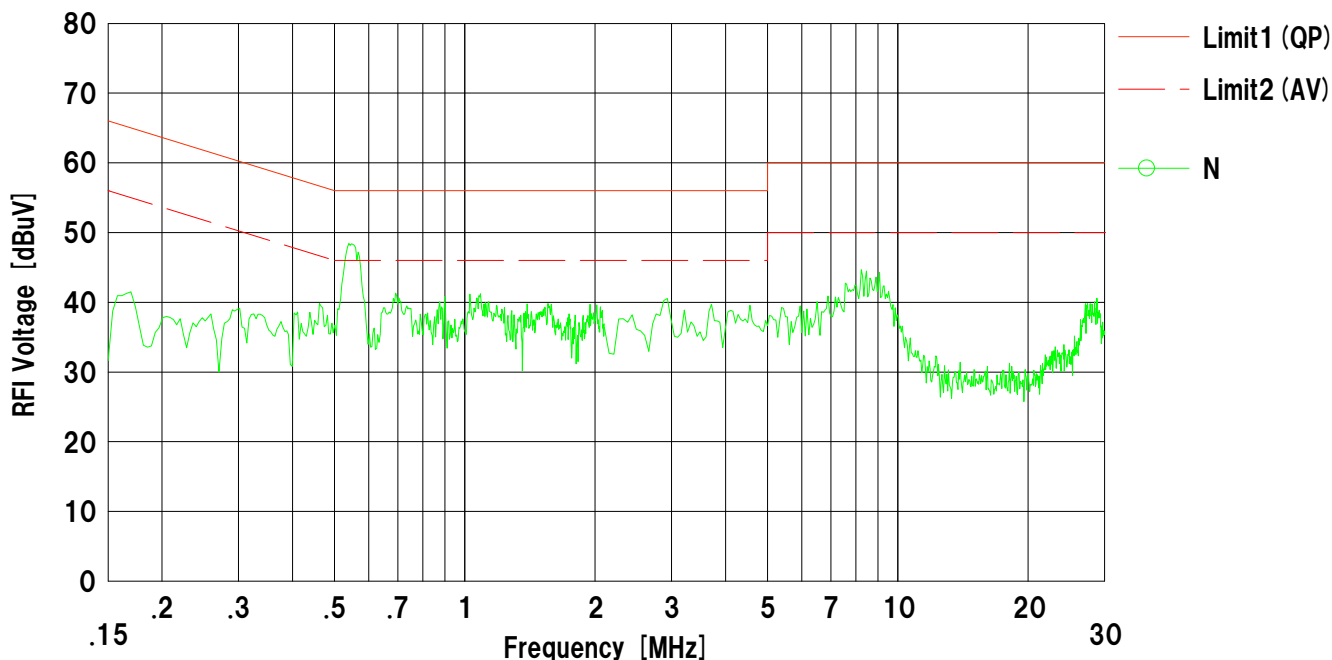
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11n (HT20) 2437MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Chip Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

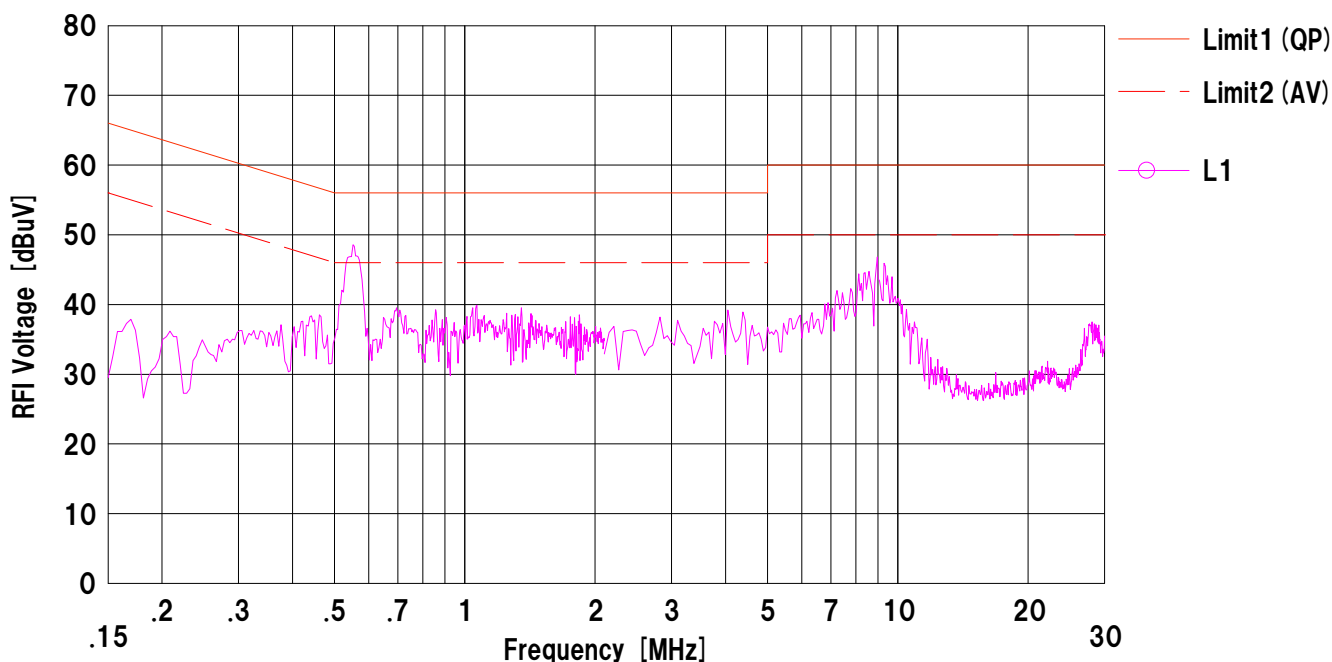
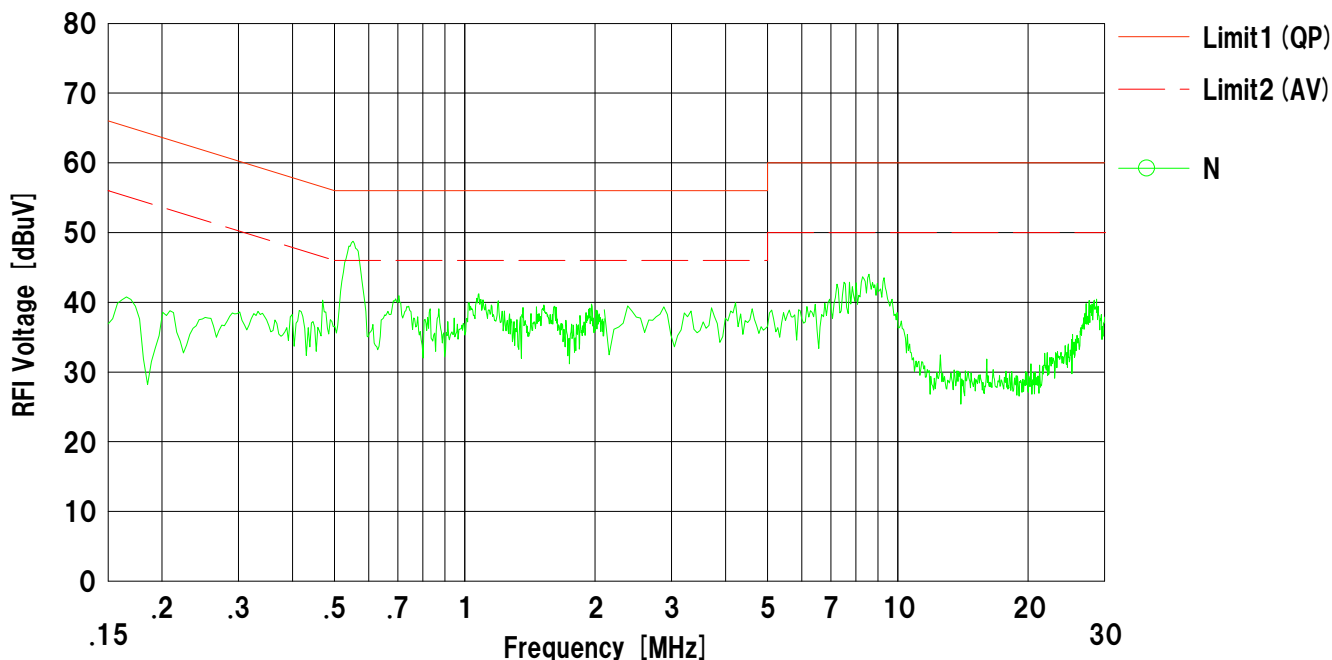
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11n (HT20) 2462MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Chip Antenna

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

Engineer : Kenichi Adachi



Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

DATA OF CONDUCTED EMISSION TEST

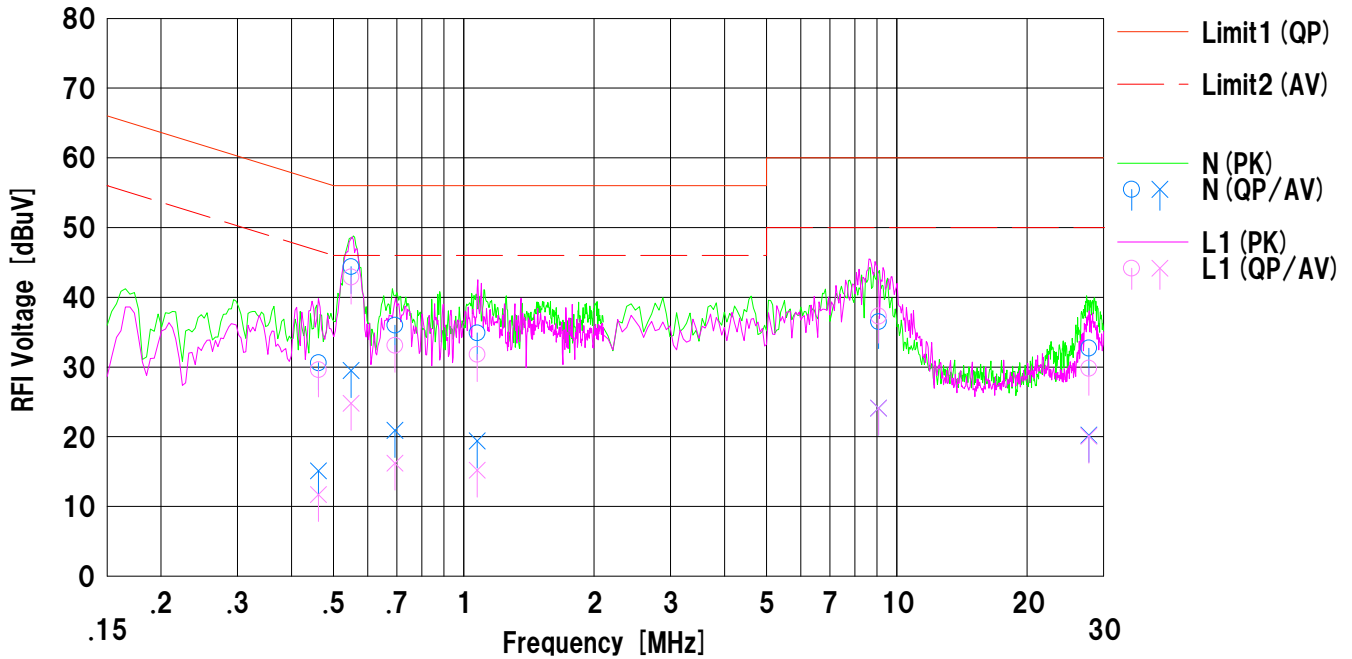
UL Japan, Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/07/15

Mode : Tx 11n (HT20) 2412MHz
 Report No. : 10028551S
 Power : DC3.3V/1.25V (adapter:AC120V/60Hz)
 Temp./Humi. : 26deg.C / 43%RH

Remarks : Chip Antenna

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

Engineer : Kenichi Adachi



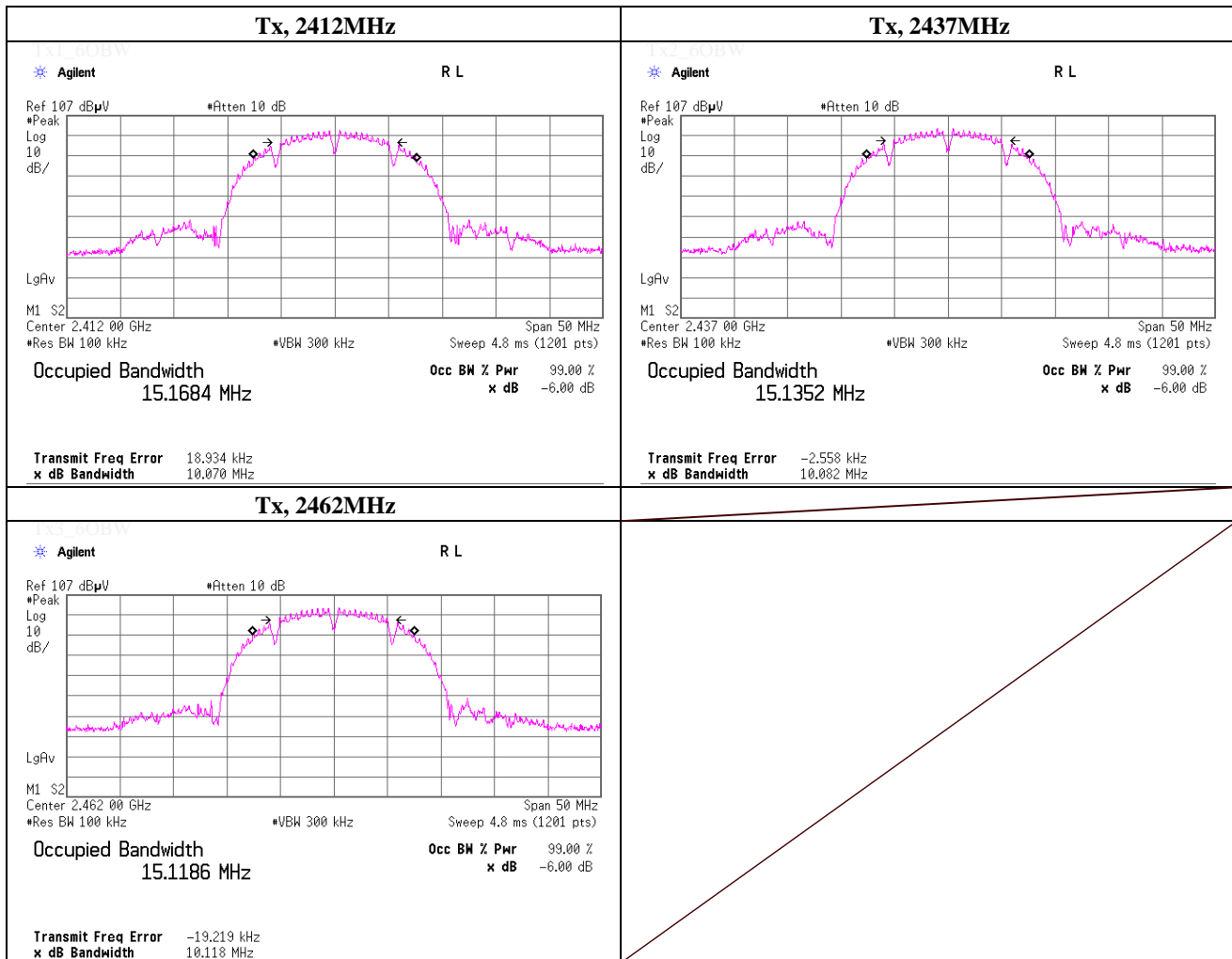
No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.46195	17.7	2.2	12.9	30.6	15.1	56.6	46.6	26.0	31.5	N	
2	0.54934	31.5	16.6	12.9	44.4	29.5	56.0	46.0	11.6	16.5	N	
3	0.69392	23.1	8.0	12.9	36.0	20.9	56.0	46.0	20.0	25.1	N	
4	1.07363	22.0	6.5	12.9	34.9	19.4	56.0	46.0	21.1	26.6	N	
5	9.07358	22.6	10.2	13.9	36.5	24.1	60.0	50.0	23.5	25.9	N	
6	27.76371	17.4	4.9	15.3	32.7	20.2	60.0	50.0	27.3	29.8	N	
7	0.46195	16.7	-1.2	12.9	29.6	11.7	56.6	46.6	27.0	34.9	L1	
8	0.54934	30.0	11.9	12.9	42.9	24.8	56.0	46.0	13.1	21.2	L1	
9	0.69392	20.2	3.3	12.9	33.1	16.2	56.0	46.0	22.9	29.8	L1	
10	1.07363	18.9	2.3	12.9	31.8	15.2	56.0	46.0	24.2	30.8	L1	
11	9.07358	23.4	10.2	13.9	37.3	24.1	60.0	50.0	22.7	25.9	L1	
12	27.76371	14.5	4.8	15.3	29.8	20.1	60.0	50.0	30.2	29.9	L1	

Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
 LISN:SLS-02 with AC extention cable

-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	July 11, 2013	
Temperature / Humidity	24deg.C , 54%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11b, PN9, worst data mode 1Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	10.070	> 0.500
2437.0000	10.082	> 0.500
2462.0000	10.118	> 0.500

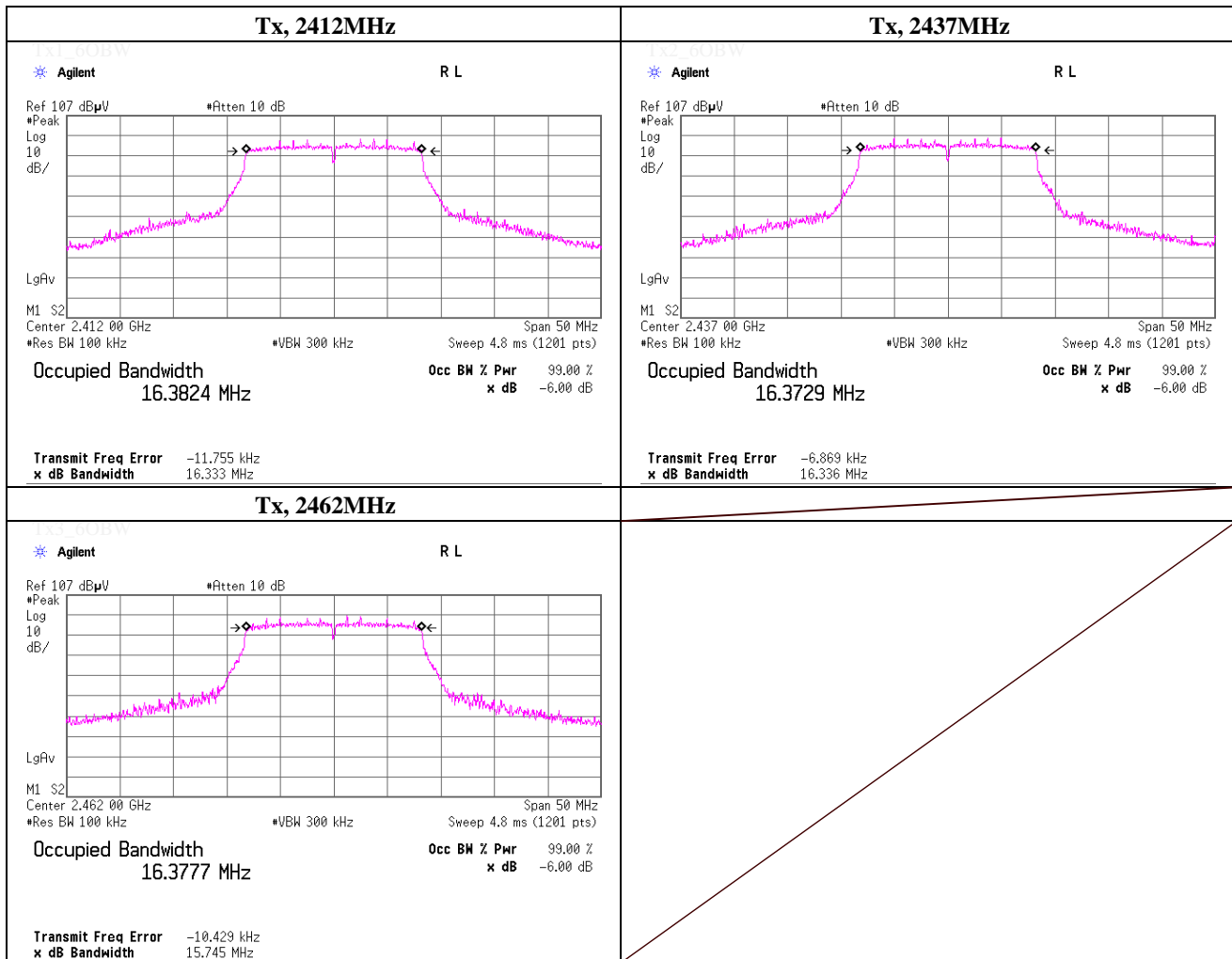


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 Facsimile : +81 463 50 6401

-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	July 11, 2013	
Temperature / Humidity	24deg.C , 54%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.333	> 0.500
2437.0000	16.336	> 0.500
2462.0000	15.745	> 0.500

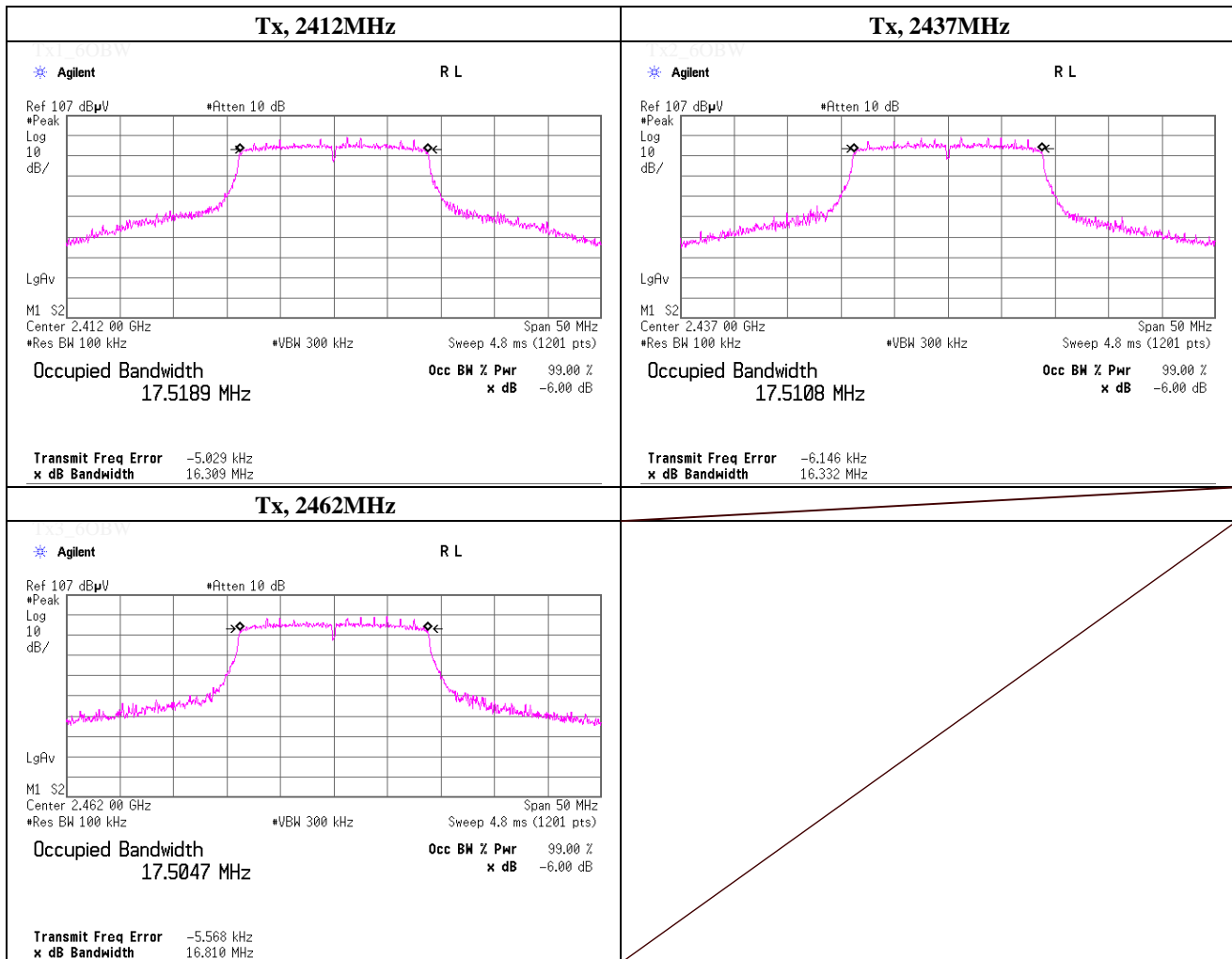


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-6dB Bandwidth

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	July 11, 2013	
Temperature / Humidity	24deg.C , 54%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11n (HT20), PN9, worst data mode 0 (Long)(MCS)	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.309	> 0.500
2437.0000	16.332	> 0.500
2462.0000	16.810	> 0.500



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Maximum Peak Conducted Output Power

(PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date July 11, 2013
 Temperature / Humidity 24deg.C , 54%RH S/N: 3
 Engineer Kenichi Adachi
 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	5.19	1.53	9.62	16.34	43.05	30.00	1000	13.66
Mid	2437.0	5.16	1.51	9.63	16.30	42.66	30.00	1000	13.70
High	2462.0	5.12	1.51	9.63	16.26	42.27	30.00	1000	13.74

Sample Calculation:

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

[Pre check]

	Data rate [Mbps]	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
						[dBm]	[mW]	[dBm]	[mW]	
	1	2437.0	5.16	1.51	9.63	16.30	42.66	30.00	1000	13.70
	2	2437.0	5.10	1.51	9.63	16.24	42.07	30.00	1000	13.76
	5.5	2437.0	5.07	1.51	9.63	16.21	41.78	30.00	1000	13.79
	11	2437.0	5.05	1.51	9.63	16.19	41.59	30.00	1000	13.81

Worst

Sample Calculation:

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

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Maximum Peak Conducted Output Power

(PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
 Date July 11, 2013
 Temperature / Humidity 24deg.C , 54%RH S/N: 3
 Engineer Kenichi Adachi
 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	9.91	1.53	9.62	21.06	127.64	30.00	1000	8.94
Mid	2437.0	9.83	1.51	9.63	20.97	125.03	30.00	1000	9.03
High	2462.0	9.77	1.51	9.63	20.91	123.31	30.00	1000	9.09

Sample Calculation:

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

[Pre check]

Data rate [Mbps]	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
6	2437.0	9.83	1.51	9.63	20.97	125.03	30.00	1000	9.03
9	2437.0	9.59	1.51	9.63	20.73	118.30	30.00	1000	9.27
12	2437.0	9.49	1.51	9.63	20.63	115.61	30.00	1000	9.37
18	2437.0	9.71	1.51	9.63	20.85	121.62	30.00	1000	9.15
24	2437.0	9.67	1.51	9.63	20.81	120.50	30.00	1000	9.19
36	2437.0	9.61	1.51	9.63	20.75	118.85	30.00	1000	9.25
48	2437.0	9.71	1.51	9.63	20.85	121.62	30.00	1000	9.15
54	2437.0	9.73	1.51	9.63	20.87	122.18	30.00	1000	9.13

Worst

Sample Calculation:

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

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Maximum Peak Conducted Output Power

(PKPM1)

Test place UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date July 11, 2013
Temperature / Humidity 24deg.C , 54%RH S/N: 3
Engineer Kenichi Adachi
Mode Tx, IEEE802.11n (HT20), PN9, worst data mode : 0 (Long) (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	9.97	1.53	9.62	21.12	129.42	30.00	1000	8.88
Mid	2437.0	9.93	1.51	9.63	21.07	127.94	30.00	1000	8.93
High	2462.0	9.87	1.51	9.63	21.01	126.18	30.00	1000	8.99

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 (Long)	2437.0	9.93	1.51	9.63	21.07	127.94	30.00	1000	8.93
1 (Long)	2437.0	9.83	1.51	9.63	20.97	125.03	30.00	1000	9.03
2 (Long)	2437.0	9.91	1.51	9.63	21.05	127.35	30.00	1000	8.95
3 (Long)	2437.0	9.74	1.51	9.63	20.88	122.46	30.00	1000	9.12
4 (Long)	2437.0	9.73	1.51	9.63	20.87	122.18	30.00	1000	9.13
5 (Long)	2437.0	8.84	1.51	9.63	19.98	99.54	30.00	1000	10.02
6 (Long)	2437.0	8.72	1.51	9.63	19.86	96.83	30.00	1000	10.14
7 (Long)	2437.0	8.67	1.51	9.63	19.81	95.72	30.00	1000	10.19

Worst

Mode (MCS)	Freq. [MHz]	P/M (Peak) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result		Limit		Margin [dB]
					[dBm]	[mW]	[dBm]	[mW]	
0 (Short)	2437.0	9.85	1.51	9.63	20.99	125.60	30.00	1000	9.01
1 (Short)	2437.0	9.84	1.51	9.63	20.98	125.31	30.00	1000	9.02
2 (Short)	2437.0	9.60	1.51	9.63	20.74	118.58	30.00	1000	9.26
3 (Short)	2437.0	9.83	1.51	9.63	20.97	125.03	30.00	1000	9.03
4 (Short)	2437.0	9.73	1.51	9.63	20.87	122.18	30.00	1000	9.13
5 (Short)	2437.0	8.78	1.51	9.63	19.92	98.17	30.00	1000	10.08
6 (Short)	2437.0	8.88	1.51	9.63	20.02	100.46	30.00	1000	9.98
7 (Short)	2437.0	8.70	1.51	9.63	19.84	96.38	30.00	1000	10.16

Sample Calculation:

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013 July 14, 2013 July 15, 2013
 Temperature / Humidity 24deg.C / 68%RH 24deg.C / 43%RH 25deg.C / 59%RH
 Engineer Tatsuya Arai Tadaomi Yamano Kenichi Adachi
 Mode Tx 2412 MHz
 IEEE 802.11b, 1Mbps, PN9, Antenna: Dipole

(* 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	66.8	27.4	14.7	41.4	67.5	73.9	6.4	100	358	
Hori.	4824.000	PK	54.3	31.1	7.5	41.2	51.7	73.9	22.2	100	53	
Hori.	7236.000	PK	48.8	36.6	9.0	41.4	53.0	73.9	20.9	130	33	
Hori.	9648.000	PK	44.2	38.6	10.2	38.9	54.1	73.9	19.8	100	0	
Hori.	19296.000	PK	48.8	41.1	2.2	48.0	44.1	73.9	29.8	100	285	
Hori.	2390.000	AV	43.8	27.4	14.7	41.4	44.5	53.9	9.4	100	358	
Hori.	4824.000	AV	50.8	31.1	7.5	41.2	48.2	53.9	5.7	100	53	
Hori.	7236.000	AV	40.3	36.6	9.0	41.4	44.5	53.9	9.4	130	33	
Hori.	9648.000	AV	34.8	38.6	10.2	38.9	44.7	53.9	9.2	100	0	
Hori.	19296.000	AV	44.8	41.1	2.2	48.0	40.1	53.9	13.8	100	285	
Vert.	2390.000	PK	67.4	27.4	14.7	41.4	68.1	73.9	5.8	100	231	
Vert.	4824.000	PK	55.1	31.1	7.5	41.2	52.5	73.9	21.4	100	337	
Vert.	7236.000	PK	48.9	36.6	9.0	41.4	53.1	73.9	20.8	100	45	
Vert.	9648.000	PK	44.7	38.6	10.2	38.9	54.6	73.9	19.3	100	345	
Vert.	19296.000	PK	46.3	41.1	2.2	48.0	41.6	73.9	32.3	100	345	
Vert.	2390.000	AV	44.5	27.4	14.7	41.4	45.2	53.9	8.7	100	231	
Vert.	4824.000	AV	52.2	31.1	7.5	41.2	49.6	53.9	4.3	100	337	
Vert.	7236.000	AV	40.1	36.6	9.0	41.4	44.3	53.9	9.6	100	45	
Vert.	9648.000	AV	35.5	38.6	10.2	38.9	45.4	53.9	8.5	100	345	
Vert.	19296.000	AV	41.7	41.1	2.2	48.0	37.0	53.9	16.9	100	345	

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

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]	Height [cm]	Angle [deg]	Remark
Hori.	2412.000	PK	101.7	27.5	14.7	41.4	102.5	-	-	100	358	Carrier
Hori.	2397.700	PK	55.4	27.4	14.7	41.4	56.1	82.5	26.4	100	358	
Hori.	2400.000	PK	56.1	27.4	14.7	41.4	56.8	82.5	25.7	100	358	
Vert.	2412.000	PK	102.5	27.5	14.7	41.4	103.3	-	-	100	231	Carrier
Vert.	2397.365	PK	55.8	27.4	14.7	41.4	56.5	83.3	26.8	100	231	
Vert.	2400.000	PK	56.1	27.4	14.7	41.4	56.8	83.3	26.5	100	231	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013 July 14, 2013 July 15, 2013
 Temperature / Humidity 24deg.C / 68%RH 24deg.C / 43%RH 25deg.C / 59%RH
 Engineer Tatsuya Arai Tadaomi Yamano Kenichi Adachi
 Mode Tx, 2437 MHz
 IEEE 802.11b, 1Mbps, PN9, Antenna: Dipole

(* 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	54.2	31.3	7.5	41.1	51.9	73.9	22.0	100	192	
Hori.	7311.000	PK	49.2	36.6	9.0	41.4	53.4	73.9	20.5	144	47	
Hori.	9748.000	PK	44.1	38.7	10.1	38.9	54.0	73.9	19.9	106	314	
Hori.	19496.000	PK	47.8	41.1	2.2	47.6	43.5	73.9	30.4	100	283	
Hori.	4874.000	AV	50.5	31.3	7.5	41.1	48.2	53.9	5.7	100	192	
Hori.	7311.000	AV	41.0	36.6	9.0	41.4	45.2	53.9	8.7	144	47	
Hori.	9748.000	AV	35.2	38.7	10.1	38.9	45.1	53.9	8.8	106	314	
Hori.	19496.000	AV	43.1	41.1	2.2	47.6	38.8	53.9	15.1	100	283	
Vert.	4874.000	PK	54.9	31.3	7.5	41.1	52.6	73.9	21.3	108	334	
Vert.	7311.000	PK	49.8	36.6	9.0	41.4	54.0	73.9	19.9	136	41	
Vert.	9748.000	PK	45.6	38.7	10.1	38.9	55.5	73.9	18.4	129	345	
Vert.	19496.000	PK	45.8	41.1	2.2	47.6	41.5	73.9	32.4	100	343	
Vert.	4874.000	AV	52.0	31.3	7.5	41.1	49.7	53.9	4.2	108	334	
Vert.	7311.000	AV	41.8	36.6	9.0	41.4	46.0	53.9	7.9	136	41	
Vert.	9748.000	AV	35.4	38.7	10.1	38.9	45.3	53.9	8.6	129	345	
Vert.	19496.000	AV	40.7	41.1	2.2	47.6	36.4	53.9	17.5	100	343	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013 July 14, 2013 July 15, 2013
 Temperature / Humidity 24deg.C / 68%RH 24deg.C / 43%RH 25deg.C / 59%RH
 Engineer Tatsuya Arai Tadaomi Yamano Kenichi Adachi
 Mode Tx, 2462 MHz
 IEEE 802.11b, 1Mbps, PN9, Antenna: Dipole

(* 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	69.5	27.5	14.8	41.4	70.4	73.9	3.5	100	359	
Hori.	4924.000	PK	55.7	31.5	7.5	41.0	53.7	73.9	20.2	100	191	
Hori.	7386.000	PK	49.4	36.7	9.0	41.5	53.6	73.9	20.3	141	58	
Hori.	9848.000	PK	45.8	38.9	10.0	38.9	55.8	73.9	18.1	100	359	
Hori.	19696.000	PK	47.2	41.1	2.3	47.7	42.9	73.9	31.0	100	284	
Hori.	2483.500	AV	43.6	27.5	14.8	41.4	44.5	53.9	9.4	100	359	
Hori.	4924.000	AV	52.7	31.5	7.5	41.0	50.7	53.9	3.2	100	191	
Hori.	7386.000	AV	41.2	36.7	9.0	41.5	45.4	53.9	8.5	141	58	
Hori.	9848.000	AV	35.7	38.9	10.0	38.9	45.7	53.9	8.2	100	359	
Hori.	19696.000	AV	41.3	41.1	2.3	47.7	37.0	53.9	16.9	100	284	
Vert.	2483.500	PK	70.9	27.5	14.8	41.4	71.8	73.9	2.1	100	229	
Vert.	4924.000	PK	53.3	31.5	7.5	41.0	51.3	73.9	22.6	100	321	
Vert.	7386.000	PK	50.8	36.7	9.0	41.5	55.0	73.9	18.9	186	41	
Vert.	9848.000	PK	45.9	38.9	10.0	38.9	55.9	73.9	18.0	143	325	
Vert.	19696.000	PK	45.7	41.1	2.3	47.7	41.4	73.9	32.5	100	344	
Vert.	2483.500	AV	44.7	27.5	14.8	41.4	45.6	53.9	8.3	100	229	
Vert.	4924.000	AV	48.9	31.5	7.5	41.0	46.9	53.9	7.0	100	321	
Vert.	7386.000	AV	42.8	36.7	9.0	41.5	47.0	53.9	6.9	186	41	
Vert.	9848.000	AV	37.2	38.9	10.0	38.9	47.2	53.9	6.7	143	325	
Vert.	19696.000	AV	39.4	41.1	2.3	47.7	35.1	53.9	18.8	100	344	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013 July 14, 2013 July 15, 2013
 Temperature / Humidity 24deg.C / 68%RH 24deg.C / 43%RH 25deg.C / 59%RH
 Engineer Tatsuya Arai Tadaomi Yamano Kenichi Adachi
 Mode Tx, 2412 MHz
 IEEE 802.11g, 6Mbps, PN9, Antenna: Dipole

(* 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	68.0	27.4	14.7	41.4	68.7	73.9	5.2	100	359	
Hori.	4824.000	PK	54.3	31.1	7.5	41.2	51.7	73.9	22.2	100	53	
Hori.	7236.000	PK	49.6	36.6	9.0	41.4	53.8	73.9	20.1	100	12	
Hori.	9648.000	PK	44.7	38.6	10.2	38.9	54.6	73.9	19.3	100	359	
Hori.	19296.000	PK	49.0	41.1	2.2	48.0	44.3	73.9	29.6	100	283	
Hori.	2390.000	AV	48.2	27.4	14.7	41.4	48.9	53.9	5.0	100	359	
Hori.	4824.000	AV	42.1	31.1	7.5	41.2	39.5	53.9	14.4	100	53	
Hori.	7236.000	AV	39.3	36.6	9.0	41.4	43.5	53.9	10.4	100	12	
Hori.	9648.000	AV	35.0	38.6	10.2	38.9	44.9	53.9	9.0	100	359	
Hori.	19296.000	AV	44.9	41.1	2.2	48.0	40.2	53.9	13.7	100	283	
Vert.	2390.000	PK	69.3	27.4	14.7	41.4	70.0	73.9	3.9	100	277	
Vert.	4824.000	PK	54.1	31.1	7.5	41.2	51.5	73.9	22.4	100	337	
Vert.	7236.000	PK	49.8	36.6	9.0	41.4	54.0	73.9	19.9	157	37	
Vert.	9648.000	PK	45.4	38.6	10.2	38.9	55.3	73.9	18.6	146	350	
Vert.	19296.000	PK	47.2	41.1	2.2	48.0	42.5	73.9	31.4	100	342	
Vert.	2390.000	AV	48.2	27.4	14.7	41.4	48.9	53.9	5.0	100	277	
Vert.	4824.000	AV	42.5	31.1	7.5	41.2	39.9	53.9	14.0	100	337	
Vert.	7236.000	AV	39.3	36.6	9.0	41.4	43.5	53.9	10.4	157	37	
Vert.	9648.000	AV	35.9	38.6	10.2	38.9	45.8	53.9	8.1	146	350	
Vert.	19296.000	AV	41.6	41.1	2.2	48.0	36.9	53.9	17.0	100	342	

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

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]	Height [cm]	Angle [deg]	Remark
Hori.	2412.000	PK	98.1	27.5	14.7	41.4	98.9	-	-	100	359	Carrier
Hori.	2400.000	PK	65.6	27.4	14.7	41.4	66.3	78.9	12.6	100	359	
Vert.	2412.000	PK	98.5	27.5	14.7	41.4	99.3	-	-	100	277	Carrier
Vert.	2400.000	PK	66.8	27.4	14.7	41.4	67.5	79.3	11.8	100	277	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013 July 14, 2013 July 15, 2013
 Temperature / Humidity 24deg.C / 68%RH 24deg.C / 43%RH 25deg.C / 59%RH
 Engineer Tatsuya Arai Tadaomi Yamano Kenichi Adachi
 Mode Tx, 2437 MHz
 IEEE 802.11g, 6Mbps, PN9, Antenna: Dipole

(* 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	51.1	31.3	7.5	41.1	48.8	73.9	25.1	100	192	
Hori.	7311.000	PK	48.8	36.6	9.0	41.4	53.0	73.9	20.9	147	34	
Hori.	9748.000	PK	44.6	38.7	10.1	38.9	54.5	73.9	19.4	107	357	
Hori.	19496.000	PK	47.7	41.1	2.2	47.6	43.4	73.9	30.5	100	285	
Hori.	4874.000	AV	40.4	31.3	7.5	41.1	38.1	53.9	15.8	100	192	
Hori.	7311.000	AV	39.1	36.6	9.0	41.4	43.3	53.9	10.6	147	34	
Hori.	9748.000	AV	35.2	38.7	10.1	38.9	45.1	53.9	8.8	107	357	
Hori.	19496.000	AV	43.9	41.1	2.2	47.6	39.6	53.9	14.3	100	285	
Vert.	4874.000	PK	52.6	31.3	7.5	41.1	50.3	73.9	23.6	111	338	
Vert.	7311.000	PK	50.1	36.6	9.0	41.4	54.3	73.9	19.6	180	37	
Vert.	9748.000	PK	45.4	38.7	10.1	38.9	55.3	73.9	18.6	156	354	
Vert.	19496.000	PK	45.5	41.1	2.2	47.6	41.2	73.9	32.7	100	344	
Vert.	4874.000	AV	41.7	31.3	7.5	41.1	39.4	53.9	14.5	111	338	
Vert.	7311.000	AV	39.5	36.6	9.0	41.4	43.7	53.9	10.2	180	37	
Vert.	9748.000	AV	35.7	38.7	10.1	38.9	45.6	53.9	8.3	156	354	
Vert.	19496.000	AV	40.3	41.1	2.2	47.6	36.0	53.9	17.9	100	344	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013 July 14, 2013 July 15, 2013
 Temperature / Humidity 24deg.C / 68%RH 24deg.C / 43%RH 25deg.C / 59%RH
 Engineer Tatsuya Arai Tadaomi Yamano Kenichi Adachi
 Mode Tx, 2462 MHz
 IEEE 802.11g, 6Mbps, PN9, Antenna: Dipole

(* 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	64.2	27.5	14.8	41.4	65.1	73.9	8.8	100	356	
Hori.	4924.000	PK	52.2	31.5	7.5	41.0	50.2	73.9	23.7	100	192	
Hori.	7386.000	PK	49.7	36.7	9.0	41.5	53.9	73.9	20.0	151	53	
Hori.	9848.000	PK	44.2	38.9	10.0	38.9	54.2	73.9	19.7	100	0	
Hori.	19696.000	PK	47.0	41.1	2.3	47.7	42.7	73.9	31.2	100	283	
Hori.	2483.500	AV	46.1	27.5	14.8	41.4	47.0	53.9	6.9	100	356	
Hori.	4924.000	AV	41.2	31.5	7.5	41.0	39.2	53.9	14.7	100	192	
Hori.	7386.000	AV	39.1	36.7	9.0	41.5	43.3	53.9	10.6	151	53	
Hori.	9848.000	AV	35.0	38.9	10.0	38.9	45.0	53.9	8.9	100	0	
Hori.	19696.000	AV	41.1	41.1	2.3	47.7	36.8	53.9	17.1	100	283	
Vert.	2483.500	PK	65.4	27.5	14.8	41.4	66.3	73.9	7.6	100	258	
Vert.	4924.000	PK	52.3	31.5	7.5	41.0	50.3	73.9	23.6	100	334	
Vert.	7386.000	PK	51.4	36.7	9.0	41.5	55.6	73.9	18.3	170	39	
Vert.	9848.000	PK	44.9	38.9	10.0	38.9	54.9	73.9	19.0	139	344	
Vert.	19696.000	PK	45.6	41.1	2.3	47.7	41.3	73.9	32.6	100	346	
Vert.	2483.500	AV	47.0	27.5	14.8	41.4	47.9	53.9	6.0	100	258	
Vert.	4924.000	AV	40.3	31.5	7.5	41.0	38.3	53.9	15.6	100	334	
Vert.	7386.000	AV	39.8	36.7	9.0	41.5	44.0	53.9	9.9	170	39	
Vert.	9848.000	AV	35.9	38.9	10.0	38.9	45.9	53.9	8.0	139	344	
Vert.	19696.000	AV	39.3	41.1	2.3	47.7	35.0	53.9	18.9	100	346	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 11, 2013 July 12, 2013 July 14, 2013 July 15, 2013
 Temperature / Humidity 25deg.C / 53%RH 24deg.C / 68%RH 24deg.C / 43%RH 25deg.C / 59%RH
 Engineer Tatsuya Arai Tatsuya Arai Tadaomi Yamano Kenichi Adachi
 Mode Tx, 2412 MHz
 IEEE 802.11n (HT20), MCS0 (Long, 6.5Mbps), PN9, Antenna: Dipole

(* 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.	216.009	QP	33.8	16.6	8.0	32.0	26.4	46.0	19.6	151	277	
Hori.	2390.000	PK	69.7	27.4	14.7	41.4	70.4	73.9	3.5	100	358	
Hori.	4824.000	PK	53.1	31.1	7.5	41.2	50.5	73.9	23.4	100	52	
Hori.	7236.000	PK	50.2	36.6	9.0	41.4	54.4	73.9	19.5	142	359	
Hori.	9648.000	PK	44.9	38.6	10.2	38.9	54.8	73.9	19.1	100	5	
Hori.	19296.000	PK	48.9	41.1	2.2	48.0	44.2	73.9	29.7	100	282	
Hori.	2390.000	AV	48.8	27.4	14.7	41.4	49.5	53.9	4.4	100	358	
Hori.	4824.000	AV	42.0	31.1	7.5	41.2	39.4	53.9	14.5	100	52	
Hori.	7236.000	AV	39.3	36.6	9.0	41.4	43.5	53.9	10.4	142	359	
Hori.	9648.000	AV	35.0	38.6	10.2	38.9	44.9	53.9	9.0	100	5	
Hori.	19296.000	AV	44.8	41.1	2.2	48.0	40.1	53.9	13.8	100	282	
Vert.	30.056	QP	28.2	17.9	6.4	32.2	20.3	40.0	19.7	100	71	
Vert.	89.356	QP	38.5	8.1	7.5	32.1	22.0	43.5	21.5	100	324	
Vert.	216.009	QP	31.8	16.6	8.0	32.0	24.4	46.0	21.6	100	7	
Vert.	2390.000	PK	69.8	27.4	14.7	41.4	70.5	73.9	3.4	100	234	
Vert.	4824.000	PK	51.8	31.1	7.5	41.2	49.2	73.9	24.7	100	334	
Vert.	7236.000	PK	50.9	36.6	9.0	41.4	55.1	73.9	18.8	170	41	
Vert.	9648.000	PK	45.4	38.6	10.2	38.9	55.3	73.9	18.6	147	352	
Vert.	19296.000	PK	47.1	41.1	2.2	48.0	42.4	73.9	31.5	100	340	
Vert.	2390.000	AV	49.9	27.4	14.7	41.4	50.6	53.9	3.3	100	234	
Vert.	4824.000	AV	41.4	31.1	7.5	41.2	38.8	53.9	15.1	100	334	
Vert.	7236.000	AV	39.5	36.6	9.0	41.4	43.7	53.9	10.2	170	41	
Vert.	9648.000	AV	35.3	38.6	10.2	38.9	45.2	53.9	8.7	147	352	
Vert.	19296.000	AV	41.5	41.1	2.2	48.0	36.8	53.9	17.1	100	340	

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

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]	Height [cm]	Angle [deg]	Remark
Hori.	2412.000	PK	97.7	27.5	14.7	41.4	98.5	-	-	100	358	Carrier
Hori.	2400.000	PK	64.2	27.4	14.7	41.4	64.9	78.5	13.6	100	358	
Vert.	2412.000	PK	98.7	27.5	14.7	41.4	99.5	-	-	100	234	Carrier
Vert.	2400.000	PK	65.7	27.4	14.7	41.4	66.4	79.5	13.1	100	234	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013 July 14, 2013 July 15, 2013
 Temperature / Humidity 24deg.C / 68%RH 24deg.C / 43%RH 25deg.C / 59%RH
 Engineer Tatsuya Arai Tadaomi Yamano Kenichi Adachi
 Mode Tx, 2437 MHz
 IEEE 802.11n (HT20), MCS0 (Long, 6.5Mbps), PN9, Antenna: Dipole

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	50.6	31.3	7.5	41.1	48.3	73.9	25.6	100	193	
Hori.	7311.000	PK	48.6	36.6	9.0	41.4	52.8	73.9	21.1	116	24	
Hori.	9748.000	PK	44.7	38.7	10.1	38.9	54.6	73.9	19.3	100	359	
Hori.	19496.000	PK	47.5	41.1	2.2	47.6	43.2	73.9	30.7	100	282	
Hori.	4874.000	AV	39.7	31.3	7.5	41.1	37.4	53.9	16.5	100	193	
Hori.	7311.000	AV	38.7	36.6	9.0	41.4	42.9	53.9	11.0	116	24	
Hori.	9748.000	AV	35.1	38.7	10.1	38.9	45.0	53.9	8.9	100	359	
Hori.	19496.000	AV	43.6	41.1	2.2	47.6	39.3	53.9	14.6	100	282	
Vert.	4874.000	PK	52.5	31.3	7.5	41.1	50.2	73.9	23.7	100	341	
Vert.	7311.000	PK	50.1	36.6	9.0	41.4	54.3	73.9	19.6	161	43	
Vert.	9748.000	PK	45.2	38.7	10.1	38.9	55.1	73.9	18.8	150	348	
Vert.	19496.000	PK	45.2	41.1	2.2	47.6	40.9	73.9	33.0	100	343	
Vert.	4874.000	AV	41.5	31.3	7.5	41.1	39.2	53.9	14.7	100	341	
Vert.	7311.000	AV	39.4	36.6	9.0	41.4	43.6	53.9	10.3	161	43	
Vert.	9748.000	AV	35.9	38.7	10.1	38.9	45.8	53.9	8.1	150	348	
Vert.	19496.000	AV	39.8	41.1	2.2	47.6	35.5	53.9	18.4	100	343	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013 July 14, 2013 July 15, 2013
 Temperature / Humidity 24deg.C / 68%RH 24deg.C / 43%RH 25deg.C / 59%RH
 Engineer Tatsuya Arai Tadaomi Yamano Kenichi Adachi
 Mode Tx, 2462 MHz
 IEEE 802.11n (HT20), MCS0 (Long, 6.5Mbps), PN9, Antenna: Dipole

(* 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	64.5	27.5	14.8	41.4	65.4	73.9	8.5	100	0	
Hori.	4924.000	PK	51.3	31.5	7.5	41.0	49.3	73.9	24.6	100	191	
Hori.	7386.000	PK	49.1	36.7	9.0	41.5	53.3	73.9	20.6	150	60	
Hori.	9848.000	PK	44.9	38.9	10.0	38.9	54.9	73.9	19.0	100	359	
Hori.	19696.000	PK	47.1	41.1	2.3	47.7	42.8	73.9	31.1	100	283	
Hori.	2483.500	AV	45.6	27.5	14.8	41.4	46.5	53.9	7.4	100	0	
Hori.	4924.000	AV	40.8	31.5	7.5	41.0	38.8	53.9	15.1	100	191	
Hori.	7386.000	AV	39.2	36.7	9.0	41.5	43.4	53.9	10.5	150	60	
Hori.	9848.000	AV	35.4	38.9	10.0	38.9	45.4	53.9	8.5	100	359	
Hori.	19696.000	AV	41.2	41.1	2.3	47.7	36.9	53.9	17.0	100	283	
Vert.	2483.500	PK	64.8	27.5	14.8	41.4	65.7	73.9	8.2	100	263	
Vert.	4924.000	PK	50.9	31.5	7.5	41.0	48.9	73.9	25.0	100	333	
Vert.	7386.000	PK	50.5	36.7	9.0	41.5	54.7	73.9	19.2	177	43	
Vert.	9848.000	PK	45.2	38.9	10.0	38.9	55.2	73.9	18.7	146	349	
Vert.	19696.000	PK	45.4	41.1	2.3	47.7	41.1	73.9	32.8	100	342	
Vert.	2483.500	AV	46.5	27.5	14.8	41.4	47.4	53.9	6.5	100	263	
Vert.	4924.000	AV	40.4	31.5	7.5	41.0	38.4	53.9	15.5	100	333	
Vert.	7386.000	AV	40.0	36.7	9.0	41.5	44.2	53.9	9.7	177	43	
Vert.	9848.000	AV	35.9	38.9	10.0	38.9	45.9	53.9	8.0	146	349	
Vert.	19696.000	AV	39.2	41.1	2.3	47.7	34.9	53.9	19.0	100	342	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2412 MHz
 IEEE 802.11b, 1Mbps, PN9, Antenna: PIFA

(* 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	68.2	27.4	14.7	41.4	68.9	73.9	5.0	100	308	
Hori.	4824.000	PK	58.4	31.1	7.5	41.2	55.8	73.9	18.1	100	181	
Hori.	2390.000	AV	43.2	27.4	14.7	41.4	43.9	53.9	10.0	100	308	
Hori.	4824.000	AV	55.5	31.1	7.5	41.2	52.9	53.9	1.0	100	181	
Vert.	2390.000	PK	66.7	27.4	14.7	41.4	67.4	73.9	6.5	100	268	
Vert.	4824.000	PK	58.7	31.1	7.5	41.2	56.1	73.9	17.8	100	174	
Vert.	2390.000	AV	41.8	27.4	14.7	41.4	42.5	53.9	11.4	100	268	
Vert.	4824.000	AV	56.0	31.1	7.5	41.2	53.4	53.9	0.5	100	174	

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

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]	Height [cm]	Angle [deg]	Remark
Hori.	2412.000	PK	100.5	27.5	14.7	41.4	101.3	-	-	100	308	Carrier
Hori.	2397.555	PK	55.9	27.4	14.7	41.4	56.6	81.3	24.7	100	308	
Hori.	2400.000	PK	56.9	27.4	14.7	41.4	57.6	81.3	23.7	100	308	
Vert.	2412.000	PK	99.0	27.5	14.7	41.4	99.8	-	-	100	268	Carrier
Vert.	2397.860	PK	55.9	27.4	14.7	41.4	56.6	79.8	23.2	100	268	
Vert.	2400.000	PK	55.2	27.4	14.7	41.4	55.9	79.8	23.9	100	268	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2437 MHz
 IEEE 802.11b, 1Mbps, PN9, Antenna: PIFA

(* 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	58.7	31.3	7.5	41.1	56.4	73.9	17.5	100	0	
Hori.	4874.000	AV	55.9	31.3	7.5	41.1	53.6	53.9	0.3	100	0	
Vert.	4874.000	PK	58.4	31.3	7.5	41.1	56.1	73.9	17.8	100	188	
Vert.	4874.000	AV	55.5	31.3	7.5	41.1	53.2	53.9	0.7	100	188	

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

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2462 MHz
 IEEE 802.11b, 1Mbps, PN9, Antenna: PIFA

(* 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	67.3	27.5	14.8	41.4	68.2	73.9	5.7	100	307	
Hori.	4924.000	PK	57.7	31.5	7.5	41.0	55.7	73.9	18.2	100	183	
Hori.	2483.500	AV	44.2	27.5	14.8	41.4	45.1	53.9	8.8	100	307	
Hori.	4924.000	AV	54.6	31.5	7.5	41.0	52.6	53.9	1.3	100	183	
Vert.	2483.500	PK	65.6	27.5	14.8	41.4	66.5	73.9	7.4	100	1	
Vert.	4924.000	PK	57.6	31.5	7.5	41.0	55.6	73.9	18.3	100	202	
Vert.	2483.500	AV	43.0	27.5	14.8	41.4	43.9	53.9	10.0	100	1	
Vert.	4924.000	AV	54.1	31.5	7.5	41.0	52.1	53.9	1.8	100	202	

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

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2412 MHz
 IEEE 802.11g, 6Mbps, PN9, Antenna: PIFA

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	61.5	27.4	14.7	41.4	62.2	73.9	11.7	100	309	
Hori.	4824.000	PK	56.3	31.1	7.5	41.2	53.7	73.9	20.2	100	231	
Hori.	2390.000	AV	47.2	27.4	14.7	41.4	47.9	53.9	6.0	100	309	
Hori.	4824.000	AV	45.1	31.1	7.5	41.2	42.5	53.9	11.4	100	231	
Vert.	2390.000	PK	64.5	27.4	14.7	41.4	65.2	73.9	8.7	100	8	
Vert.	4824.000	PK	56.1	31.1	7.5	41.2	53.5	73.9	20.4	100	176	
Vert.	2390.000	AV	46.3	27.4	14.7	41.4	47.0	53.9	6.9	100	8	
Vert.	4824.000	AV	45.6	31.1	7.5	41.2	43.0	53.9	10.9	100	176	

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

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

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]	Height [cm]	Angle [deg]	Remark
Hori.	2412.000	PK	96.9	27.5	14.7	41.4	97.7	-	-	100	309	Carrier
Hori.	2400.000	PK	62.2	27.4	14.7	41.4	62.9	77.7	14.8	100	309	
Vert.	2412.000	PK	95.6	27.5	14.7	41.4	96.4	-	-	100	8	Carrier
Vert.	2400.000	PK	60.6	27.4	14.7	41.4	61.3	76.4	15.1	100	8	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2437 MHz
 IEEE 802.11g, 6Mbps, PN9, Antenna: PIFA

(* 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	56.9	31.3	7.5	41.1	54.6	73.9	19.3	100	181	
Hori.	4874.000	AV	45.5	31.3	7.5	41.1	43.2	53.9	10.7	100	181	
Vert.	4874.000	PK	56.5	31.3	7.5	41.1	54.2	73.9	19.7	100	178	
Vert.	4874.000	AV	45.5	31.3	7.5	41.1	43.2	53.9	10.7	100	178	

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

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2462 MHz
 IEEE 802.11g, 6Mbps, PN9, Antenna: PIFA

(* 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	62.9	27.5	14.8	41.4	63.8	73.9	10.1	100	303	
Hori.	4924.000	PK	55.2	31.5	7.5	41.0	53.2	73.9	20.7	100	0	
Hori.	2483.500	AV	47.1	27.5	14.8	41.4	48.0	53.9	5.9	100	303	
Hori.	4924.000	AV	44.0	31.5	7.5	41.0	42.0	53.9	11.9	100	0	
Vert.	2483.500	PK	63.4	27.5	14.8	41.4	64.3	73.9	9.6	100	0	
Vert.	4924.000	PK	55.4	31.5	7.5	41.0	53.4	73.9	20.5	100	181	
Vert.	2483.500	AV	45.3	27.5	14.8	41.4	46.2	53.9	7.7	100	0	
Vert.	4924.000	AV	44.1	31.5	7.5	41.0	42.1	53.9	11.8	100	181	

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

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2412 MHz
 IEEE 802.11n (HT20), MCS0 (Long, 6.5Mbps), PN9, Antenna: PIFA

(* 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	66.4	27.4	14.7	41.4	67.1	73.9	6.8	100	303	
Hori.	4824.000	PK	56.0	31.1	7.5	41.2	53.4	73.9	20.5	100	180	
Hori.	2390.000	AV	49.5	27.4	14.7	41.4	50.2	53.9	3.7	100	303	
Hori.	4824.000	AV	45.0	31.1	7.5	41.2	42.4	53.9	11.5	100	180	
Vert.	2390.000	PK	63.9	27.4	14.7	41.4	64.6	73.9	9.3	100	3	
Vert.	4824.000	PK	57.8	31.1	7.5	41.2	55.2	73.9	18.7	100	0	
Vert.	2390.000	AV	47.7	27.4	14.7	41.4	48.4	53.9	5.5	100	3	
Vert.	4824.000	AV	45.7	31.1	7.5	41.2	43.1	53.9	10.8	100	0	

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

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

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]	Height [cm]	Angle [deg]	Remark
Hori.	2412.000	PK	97.2	27.5	14.7	41.4	98.0	-	-	100	303	Carrier
Hori.	2400.000	PK	63.4	27.4	14.7	41.4	64.1	78.0	13.9	100	303	
Vert.	2412.000	PK	95.7	27.5	14.7	41.4	96.5	-	-	100	3	Carrier
Vert.	2400.000	PK	61.9	27.4	14.7	41.4	62.6	76.5	13.9	100	3	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2437 MHz
 IEEE 802.11n (HT20), MCS0 (Long, 6.5Mbps), PN9, Antenna: PIFA

(* 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	55.3	31.3	7.5	41.1	53.0	73.9	20.9	100	183	
Hori.	4874.000	AV	43.7	31.3	7.5	41.1	41.4	53.9	12.5	100	183	
Vert.	4874.000	PK	56.0	31.3	7.5	41.1	53.7	73.9	20.2	100	173	
Vert.	4874.000	AV	44.4	31.3	7.5	41.1	42.1	53.9	11.8	100	173	

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

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2462 MHz
 IEEE 802.11n (HT20), MCS0 (Long, 6.5Mbps), PN9, Antenna: PIFA

(* 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	64.4	27.5	14.8	41.4	65.3	73.9	8.6	100	301	
Hori.	4924.000	PK	54.5	31.5	7.5	41.0	52.5	73.9	21.4	100	184	
Hori.	2483.500	AV	47.2	27.5	14.8	41.4	48.1	53.9	5.8	100	301	
Hori.	4924.000	AV	43.7	31.5	7.5	41.0	41.7	53.9	12.2	100	184	
Vert.	2483.500	PK	63.6	27.5	14.8	41.4	64.5	73.9	9.4	100	359	
Vert.	4924.000	PK	54.1	31.5	7.5	41.0	52.1	73.9	21.8	100	210	
Vert.	2483.500	AV	45.6	27.5	14.8	41.4	46.5	53.9	7.4	100	359	
Vert.	4924.000	AV	43.1	31.5	7.5	41.0	41.1	53.9	12.8	100	210	

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

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2412 MHz
 IEEE 802.11b, 1Mbps, PN9, Antenna: Chip

(* 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	68.0	27.4	14.7	41.4	68.7	73.9	5.2	100	12	
Hori.	4824.000	PK	55.3	31.1	7.5	41.2	52.7	73.9	21.2	100	0	
Hori.	2390.000	AV	43.2	27.4	14.7	41.4	43.9	53.9	10.0	100	12	
Hori.	4824.000	AV	52.2	31.1	7.5	41.2	49.6	53.9	4.3	100	0	
Vert.	2390.000	PK	69.3	27.4	14.7	41.4	70.0	73.9	3.9	100	359	
Vert.	4824.000	PK	54.6	31.1	7.5	41.2	52.0	73.9	21.9	100	230	
Vert.	2390.000	AV	44.3	27.4	14.7	41.4	45.0	53.9	8.9	100	359	
Vert.	4824.000	AV	51.6	31.1	7.5	41.2	49.0	53.9	4.9	100	230	

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

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

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]	Height [cm]	Angle [deg]	Remark
Hori.	2412.000	PK	101.4	27.5	14.7	41.4	102.2	-	-	100	12	Carrier
Hori.	2397.515	PK	56.1	27.4	14.7	41.4	56.8	82.2	25.4	100	12	
Hori.	2400.000	PK	57.2	27.4	14.7	41.4	57.9	82.2	24.3	100	12	
Vert.	2412.000	PK	101.3	27.5	14.7	41.4	102.1	-	-	100	359	Carrier
Vert.	2397.515	PK	56.7	27.4	14.7	41.4	57.4	82.1	24.7	100	359	
Vert.	2400.000	PK	58.0	27.4	14.7	41.4	58.7	82.1	23.4	100	359	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2437 MHz
 IEEE 802.11b, 1Mbps, PN9, Antenna: Chip

(* 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	56.1	31.3	7.5	41.1	53.8	73.9	20.1	100	192	
Hori.	4874.000	AV	52.4	31.3	7.5	41.1	50.1	53.9	3.8	100	192	
Vert.	4874.000	PK	55.1	31.3	7.5	41.1	52.8	73.9	21.1	100	225	
Vert.	4874.000	AV	52.1	31.3	7.5	41.1	49.8	53.9	4.1	100	225	

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

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2462 MHz
 IEEE 802.11b, 1Mbps, PN9, Antenna: Chip

(* 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	69.5	27.5	14.8	41.4	70.4	73.9	3.5	100	12	
Hori.	4924.000	PK	55.7	31.5	7.5	41.0	53.7	73.9	20.2	100	195	
Hori.	2483.500	AV	44.0	27.5	14.8	41.4	44.9	53.9	9.0	100	12	
Hori.	4924.000	AV	52.8	31.5	7.5	41.0	50.8	53.9	3.1	100	195	
Vert.	2483.500	PK	70.0	27.5	14.8	41.4	70.9	73.9	3.0	122	356	
Vert.	4924.000	PK	55.2	31.5	7.5	41.0	53.2	73.9	20.7	100	339	
Vert.	2483.500	AV	43.6	27.5	14.8	41.4	44.5	53.9	9.4	122	356	
Vert.	4924.000	AV	52.1	31.5	7.5	41.0	50.1	53.9	3.8	100	339	

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

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2412 MHz
 IEEE 802.11g, 6Mbps, PN9, Antenna: Chip

(* 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	66.0	27.4	14.7	41.4	66.7	73.9	7.2	100	359	
Hori.	4824.000	PK	53.2	31.1	7.5	41.2	50.6	73.9	23.3	100	52	
Hori.	2390.000	AV	47.7	27.4	14.7	41.4	48.4	53.9	5.5	100	359	
Hori.	4824.000	AV	42.1	31.1	7.5	41.2	39.5	53.9	14.4	100	52	
Vert.	2390.000	PK	68.2	27.4	14.7	41.4	68.9	73.9	5.0	100	12	
Vert.	4824.000	PK	52.2	31.1	7.5	41.2	49.6	73.9	24.3	100	339	
Vert.	2390.000	AV	49.0	27.4	14.7	41.4	49.7	53.9	4.2	100	12	
Vert.	4824.000	AV	40.8	31.1	7.5	41.2	38.2	53.9	15.7	100	339	

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

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]	Height [cm]	Angle [deg]	Remark
Hori.	2412.000	PK	97.0	27.5	14.7	41.4	97.8	-	-	100	359	Carrier
Hori.	2400.000	PK	65.1	27.4	14.7	41.4	65.8	77.8	12.0	100	359	
Vert.	2412.000	PK	97.7	27.5	14.7	41.4	98.5	-	-	100	12	Carrier
Vert.	2400.000	PK	66.0	27.4	14.7	41.4	66.7	78.5	11.8	100	12	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2437 MHz
 IEEE 802.11g, 6Mbps, PN9, Antenna: Chip

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	4874.000	PK	50.6	31.3	7.5	41.1	48.3	73.9	25.6	100	19	
Hori.	4874.000	AV	40.7	31.3	7.5	41.1	38.4	53.9	15.5	100	19	
Vert.	4874.000	PK	52.3	31.3	7.5	41.1	50.0	73.9	23.9	100	351	
Vert.	4874.000	AV	41.5	31.3	7.5	41.1	39.2	53.9	14.7	100	351	

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

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2462 MHz
 IEEE 802.11g, 6Mbps, PN9, Antenna: Chip

(* 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	65.2	27.5	14.8	41.4	66.1	73.9	7.8	100	13	
Hori.	4924.000	PK	51.6	31.5	7.5	41.0	49.6	73.9	24.3	100	193	
Hori.	2483.500	AV	47.0	27.5	14.8	41.4	47.9	53.9	6.0	100	13	
Hori.	4924.000	AV	41.1	31.5	7.5	41.0	39.1	53.9	14.8	100	193	
Vert.	2483.500	PK	64.5	27.5	14.8	41.4	65.4	73.9	8.5	123	358	
Vert.	4924.000	PK	51.0	31.5	7.5	41.0	49.0	73.9	24.9	100	0	
Vert.	2483.500	AV	47.5	27.5	14.8	41.4	48.4	53.9	5.5	123	358	
Vert.	4924.000	AV	41.3	31.5	7.5	41.0	39.3	53.9	14.6	100	0	

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

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2412 MHz
 IEEE 802.11n (HT20), MCS0 (Long, 6.5Mbps), PN9, Antenna: Chip

(* 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	67.2	27.4	14.7	41.4	67.9	73.9	6.0	122	16	
Hori.	4824.000	PK	52.7	31.1	7.5	41.2	50.1	73.9	23.8	100	50	
Hori.	2390.000	AV	48.6	27.4	14.7	41.4	49.3	53.9	4.6	122	16	
Hori.	4824.000	AV	41.7	31.1	7.5	41.2	39.1	53.9	14.8	100	50	
Vert.	2390.000	PK	68.3	27.4	14.7	41.4	69.0	73.9	4.9	129	0	
Vert.	4824.000	PK	51.6	31.1	7.5	41.2	49.0	73.9	24.9	100	346	
Vert.	2390.000	AV	51.1	27.4	14.7	41.4	51.8	53.9	2.1	129	0	
Vert.	4824.000	AV	41.2	31.1	7.5	41.2	38.6	53.9	15.3	100	346	

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

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]	Height [cm]	Angle [deg]	Remark
Hori.	2412.000	PK	97.5	27.5	14.7	41.4	98.3	-	-	122	16	Carrier
Hori.	2400.000	PK	66.1	27.4	14.7	41.4	66.8	78.3	11.5	122	16	
Vert.	2412.000	PK	98.0	27.5	14.7	41.4	98.8	-	-	129	0	Carrier
Vert.	2400.000	PK	65.2	27.4	14.7	41.4	65.9	78.8	12.9	129	0	

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

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Radiated Emission

Test place No.3 Semi Anechoic Chamber
 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2437 MHz
 IEEE 802.11n (HT20), MCS0 (Long, 6.5Mbps), PN9, Antenna: Chip

(* 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	51.7	31.3	7.5	41.1	49.4	73.9	24.5	100	197	
Hori.	4874.000	AV	41.2	31.3	7.5	41.1	38.9	53.9	15.0	100	197	
Vert.	4874.000	PK	51.4	31.3	7.5	41.1	49.1	73.9	24.8	100	179	
Vert.	4874.000	AV	41.1	31.3	7.5	41.1	38.8	53.9	15.1	100	179	

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

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

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 Date July 12, 2013
 Temperature / Humidity 24deg.C / 68%RH
 Engineer Tatsuya Arai
 Mode Tx, 2462 MHz
 IEEE 802.11n (HT20), MCS0 (Long, 6.5Mbps), PN9, Antenna: Chip

(* 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	65.4	27.5	14.8	41.4	66.3	73.9	7.6	100	19	
Hori.	4924.000	PK	52.6	31.5	7.5	41.0	50.6	73.9	23.3	100	192	
Hori.	2483.500	AV	47.3	27.5	14.8	41.4	48.2	53.9	5.7	100	19	
Hori.	4924.000	AV	41.9	31.5	7.5	41.0	39.9	53.9	14.0	100	192	
Vert.	2483.500	PK	65.0	27.5	14.8	41.4	65.9	73.9	8.0	100	349	
Vert.	4924.000	PK	52.6	31.5	7.5	41.0	50.6	73.9	23.3	100	244	
Vert.	2483.500	AV	47.4	27.5	14.8	41.4	48.3	53.9	5.6	100	349	
Vert.	4924.000	AV	41.8	31.5	7.5	41.0	39.8	53.9	14.1	100	244	

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

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

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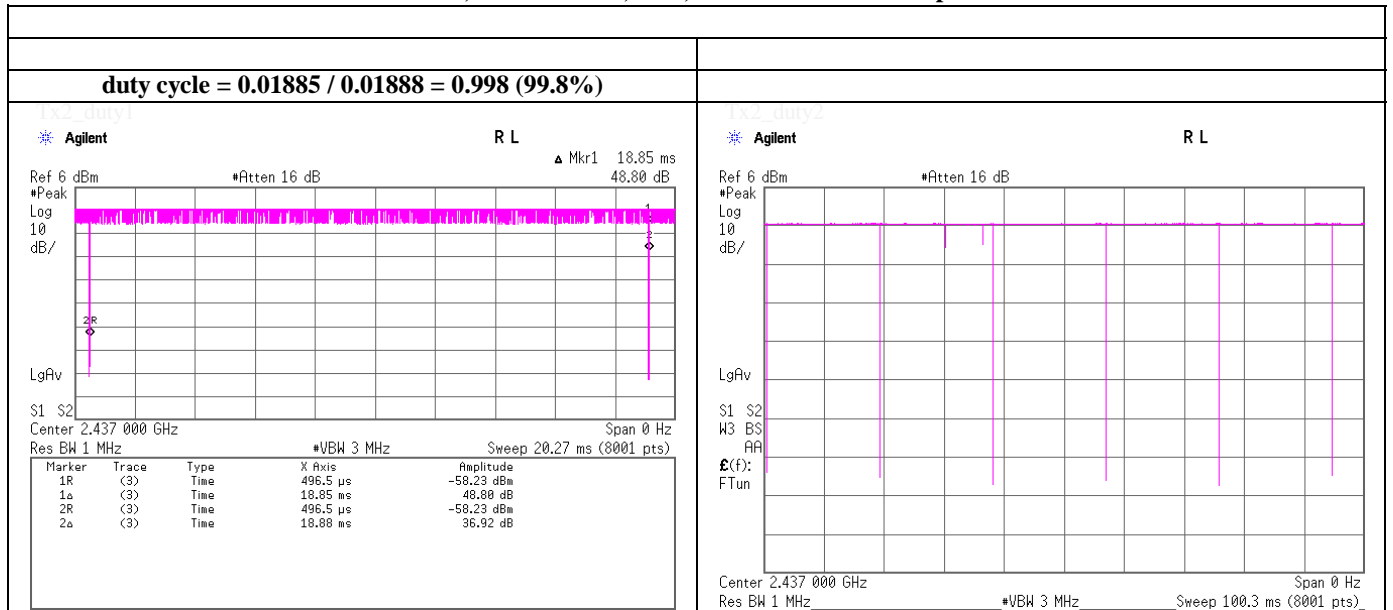
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

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Burst rate confirmation

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



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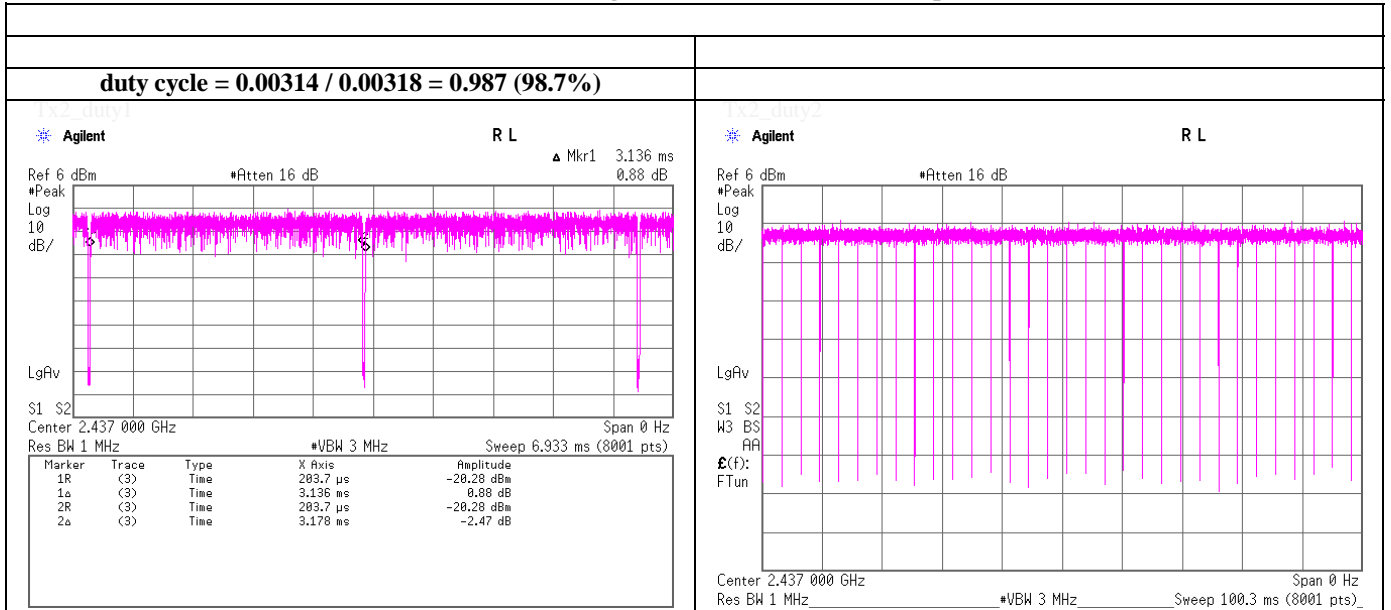
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

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Burst rate confirmation

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



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Shonan EMC Lab.

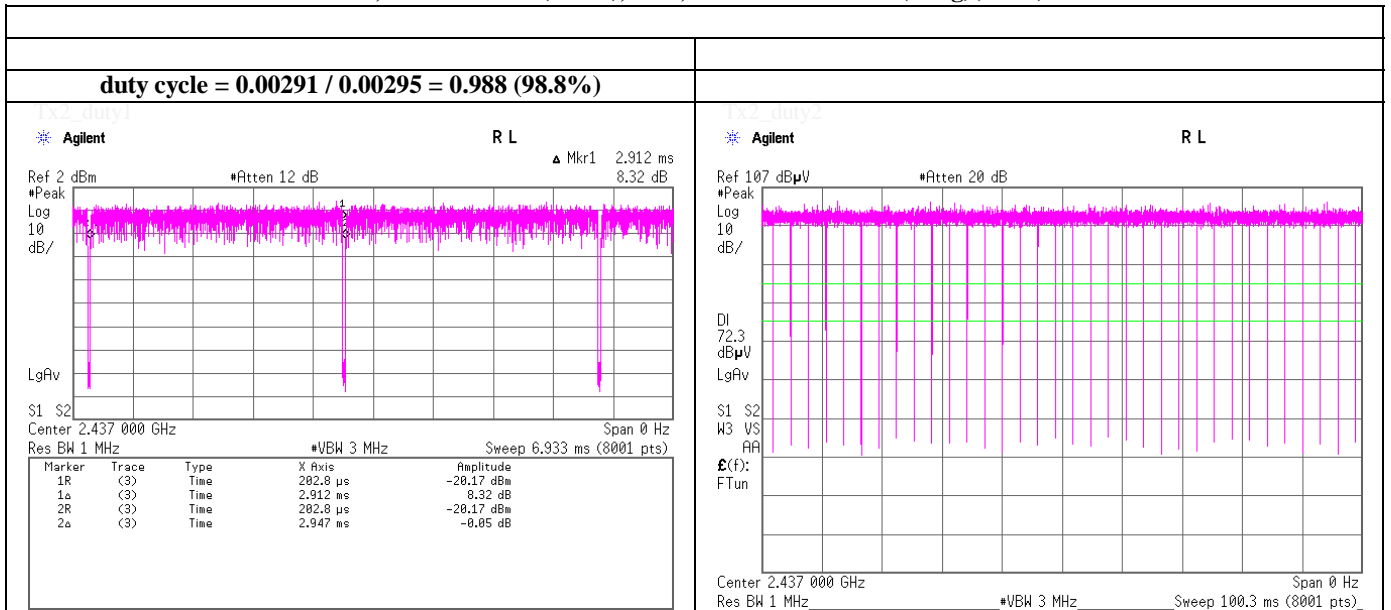
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

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Burst rate confirmation

Tx, IEEE802.11n (HT20), PN9, worst data mode 0 (Long)(MCS)



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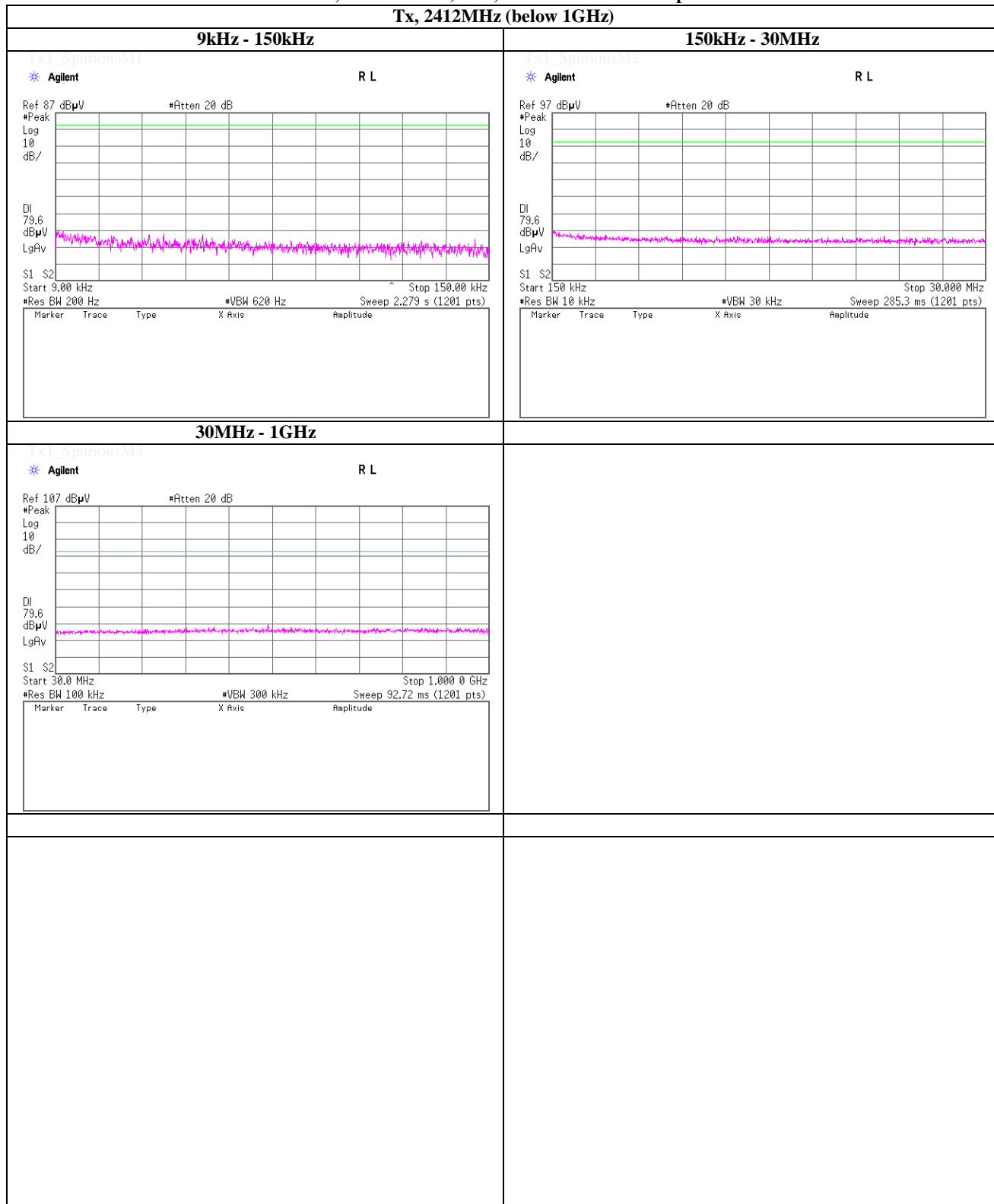
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(Reference chart) Spurious emission (Conducted)

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

Tx, 2412MHz (below 1GHz)

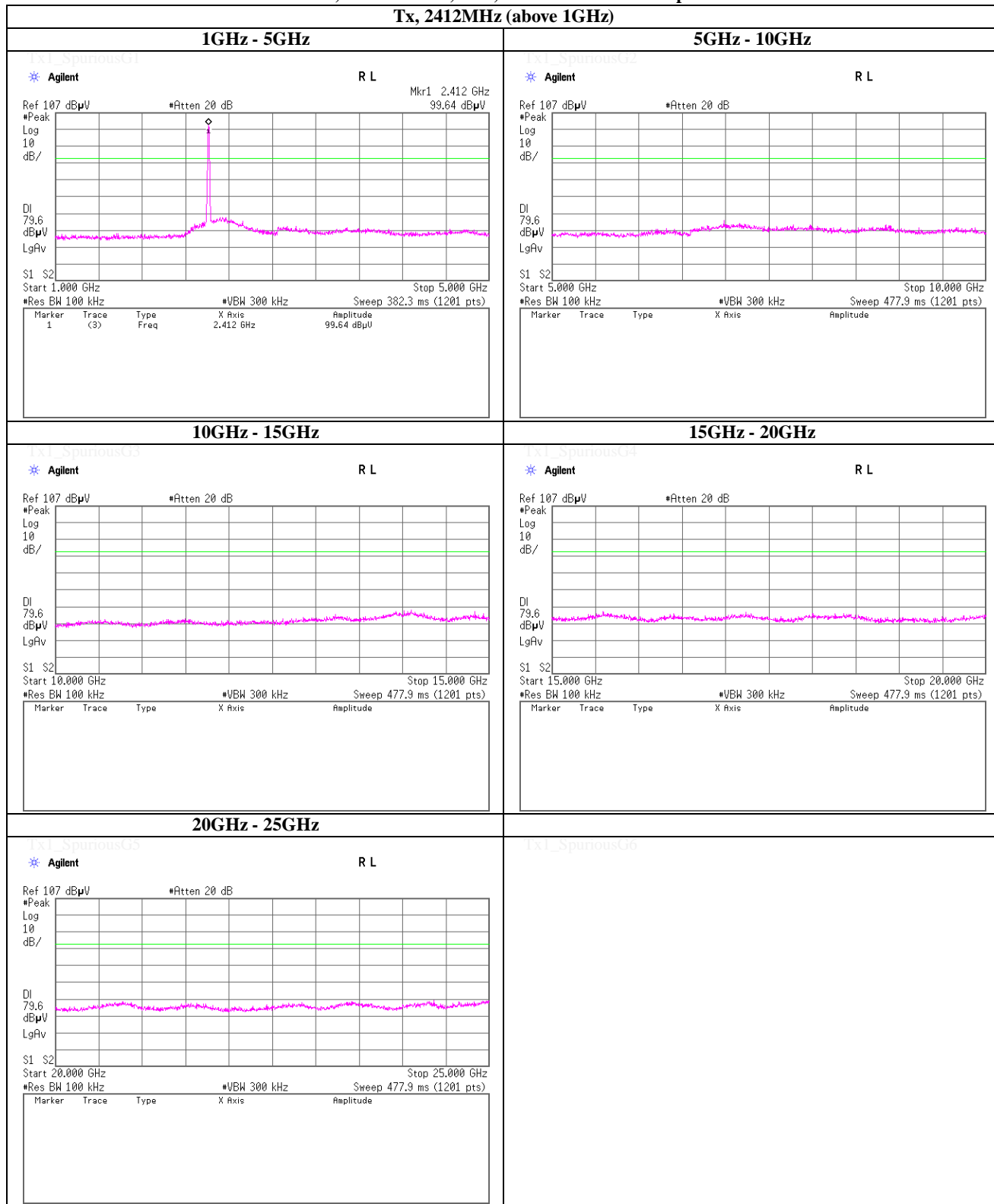


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 1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN
 Telephone : +81 463 50 6400
 Facsimile : +81 463 50 6401

(Reference chart) Spurious emission (Conducted)

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

Tx, 2412MHz (above 1GHz)



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(Reference chart) Spurious emission (Conducted)

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

Tx, 2437MHz (below 1GHz)



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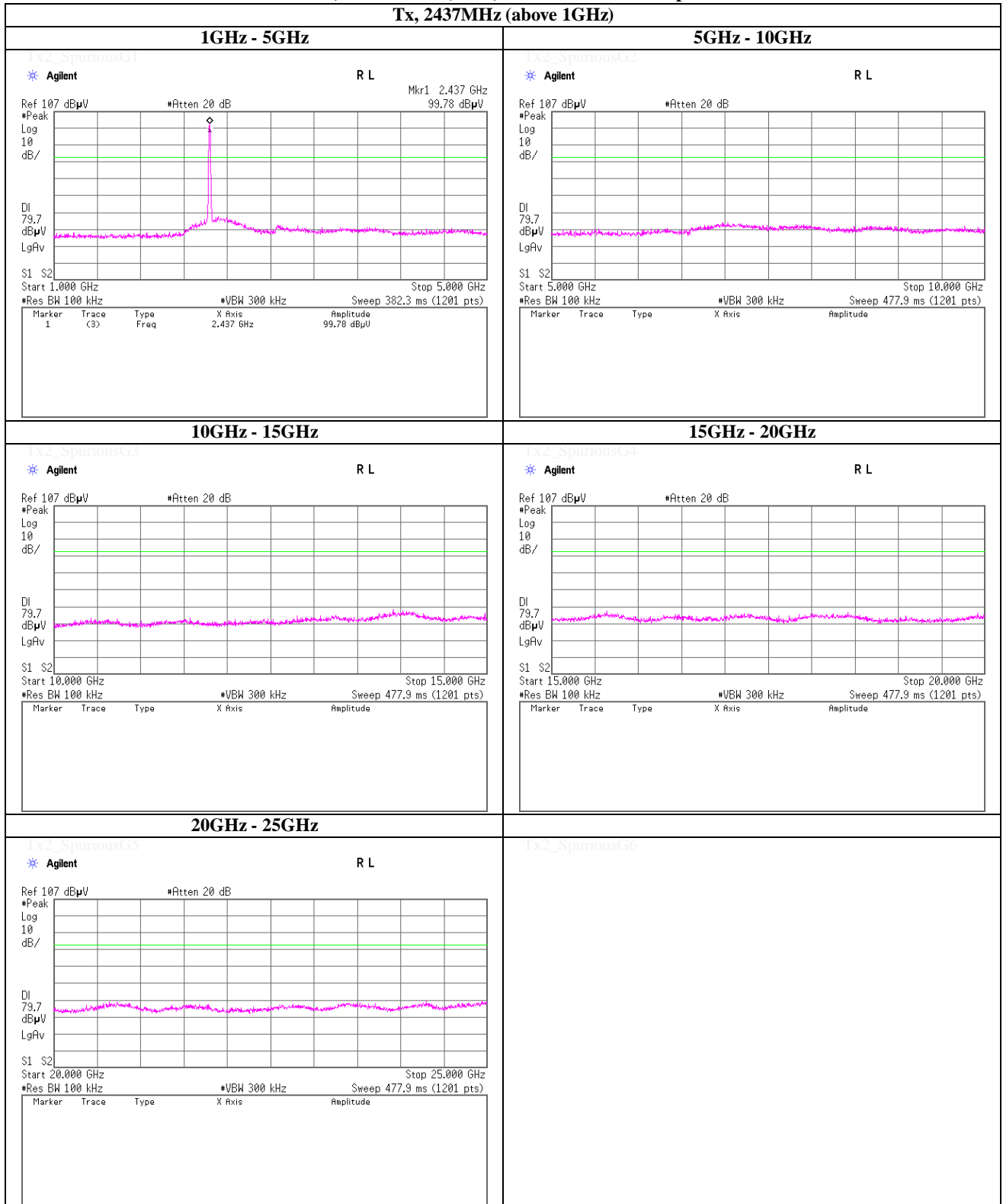
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(Reference chart) Spurious emission (Conducted)

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

Tx, 2437MHz (above 1GHz)



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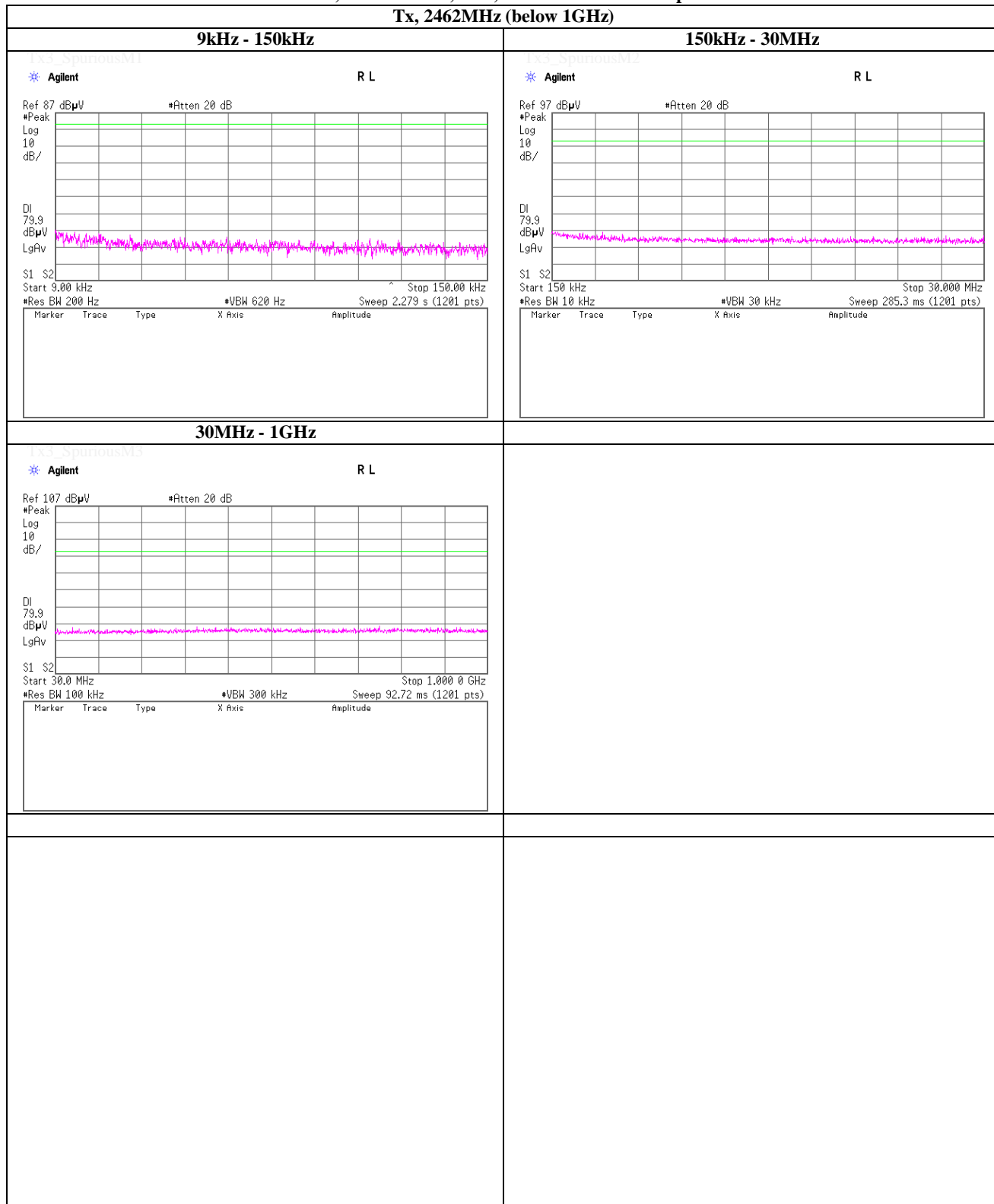
Telephone : +81 463 50 6400

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(Reference chart) Spurious emission (Conducted)

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

Tx, 2462MHz (below 1GHz)



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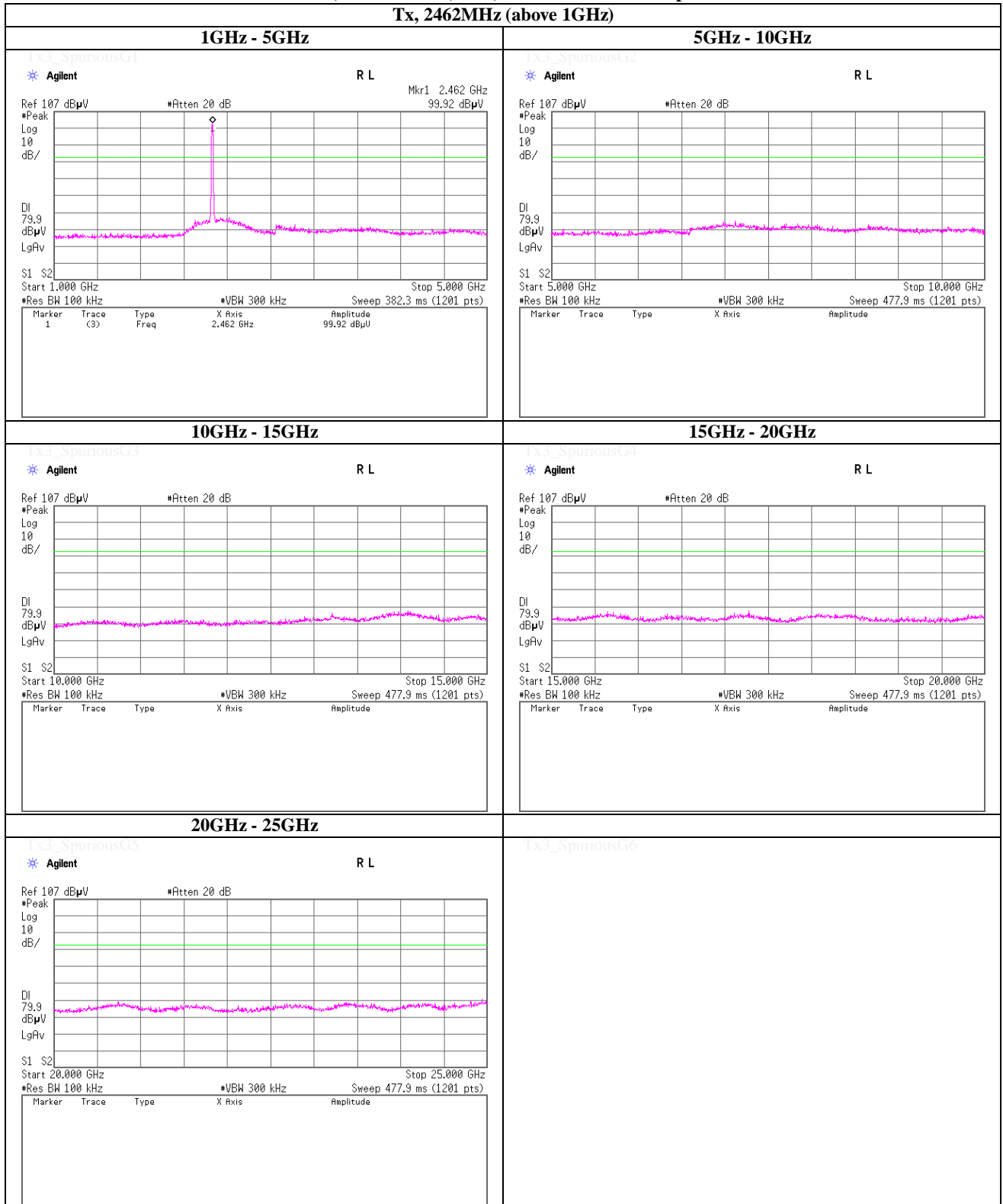
Telephone : +81 463 50 6400

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(Reference chart) Spurious emission (Conducted)

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

Tx, 2462MHz (above 1GHz)



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Shonan EMC Lab.

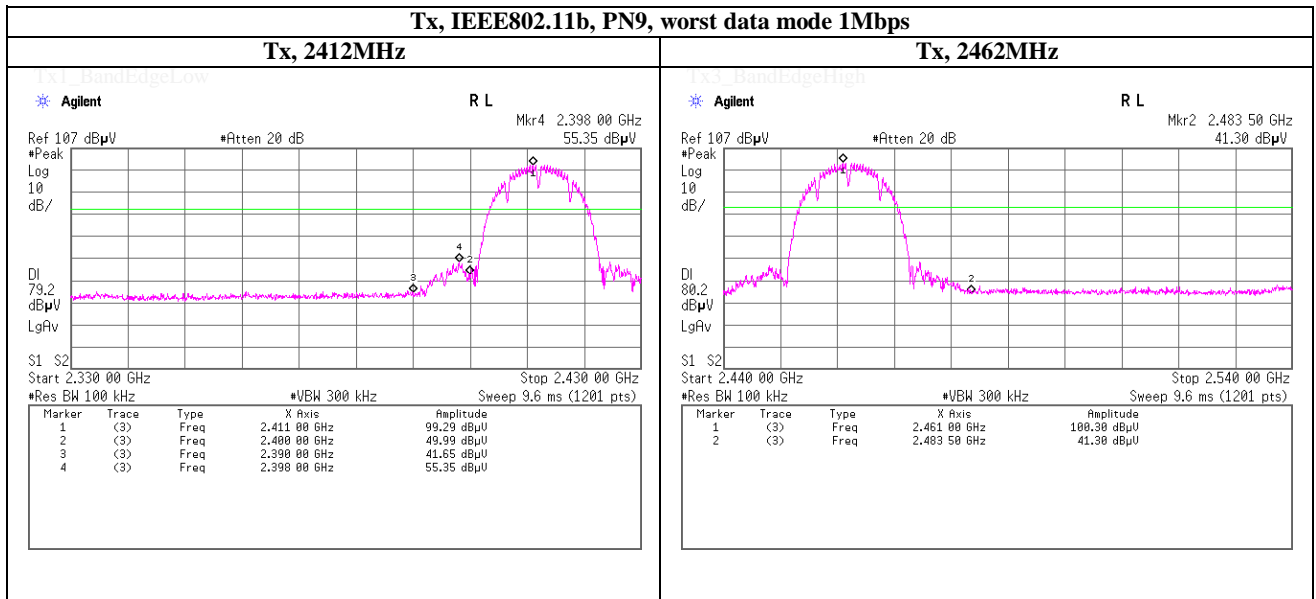
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

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(Reference chart) Spurious emission (Conducted)

Band Edge compliance



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(Reference chart) Spurious emission (Conducted)

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

Tx, 2412MHz (below 1GHz)

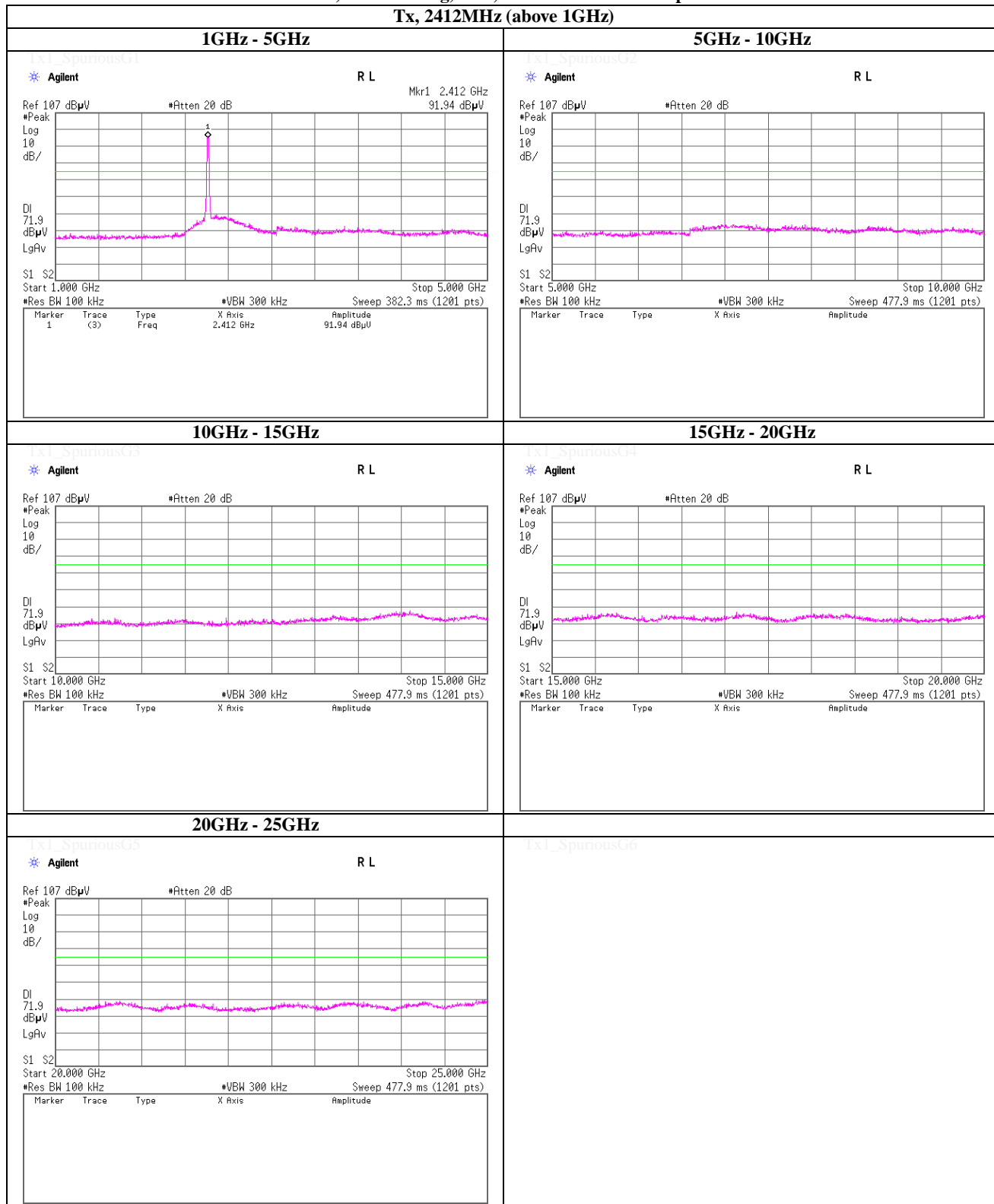


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(Reference chart) Spurious emission (Conducted)

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

Tx, 2412MHz (above 1GHz)



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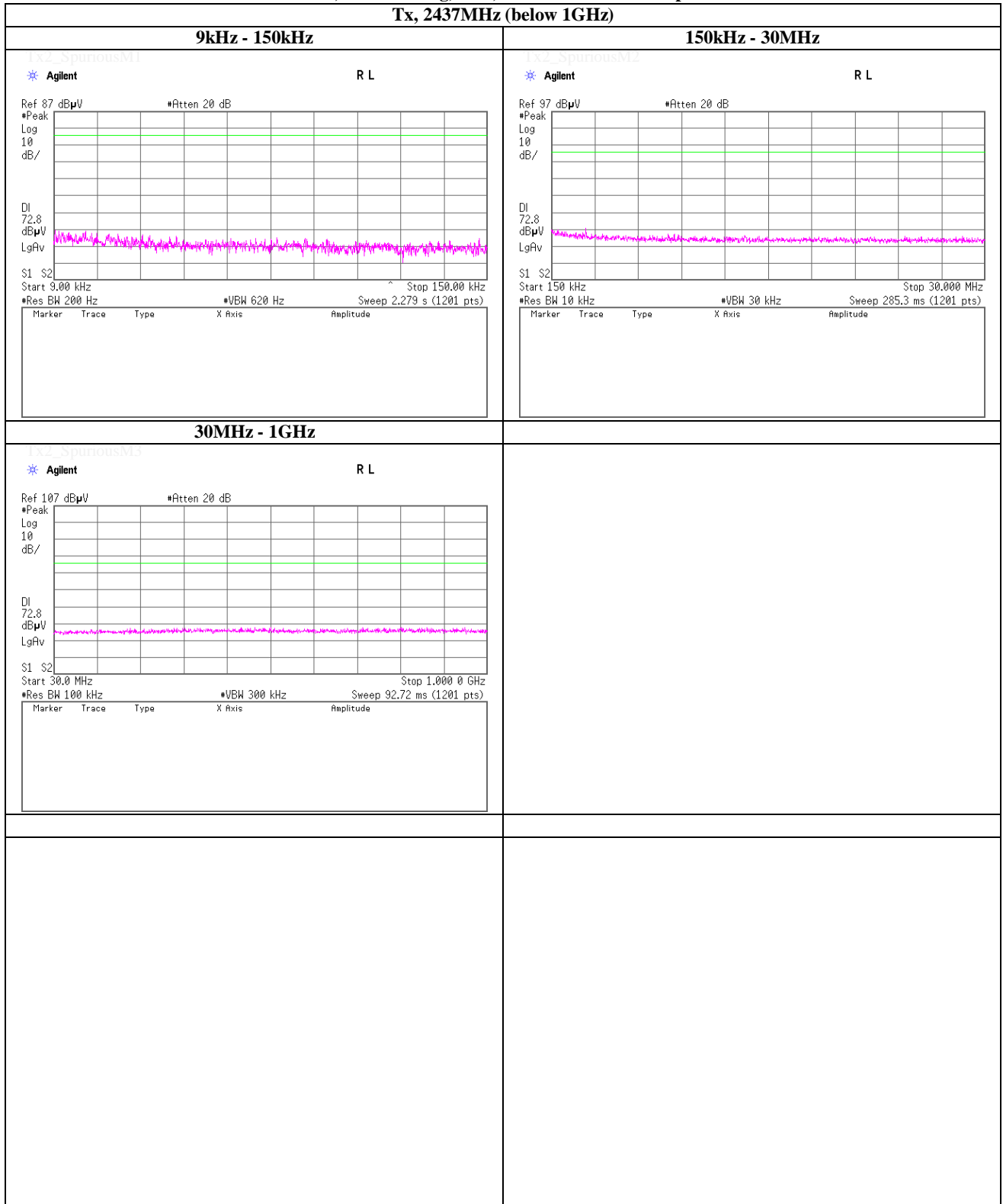
Telephone : +81 463 50 6400

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(Reference chart) Spurious emission (Conducted)

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

Tx, 2437MHz (below 1GHz)



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Shonan EMC Lab.

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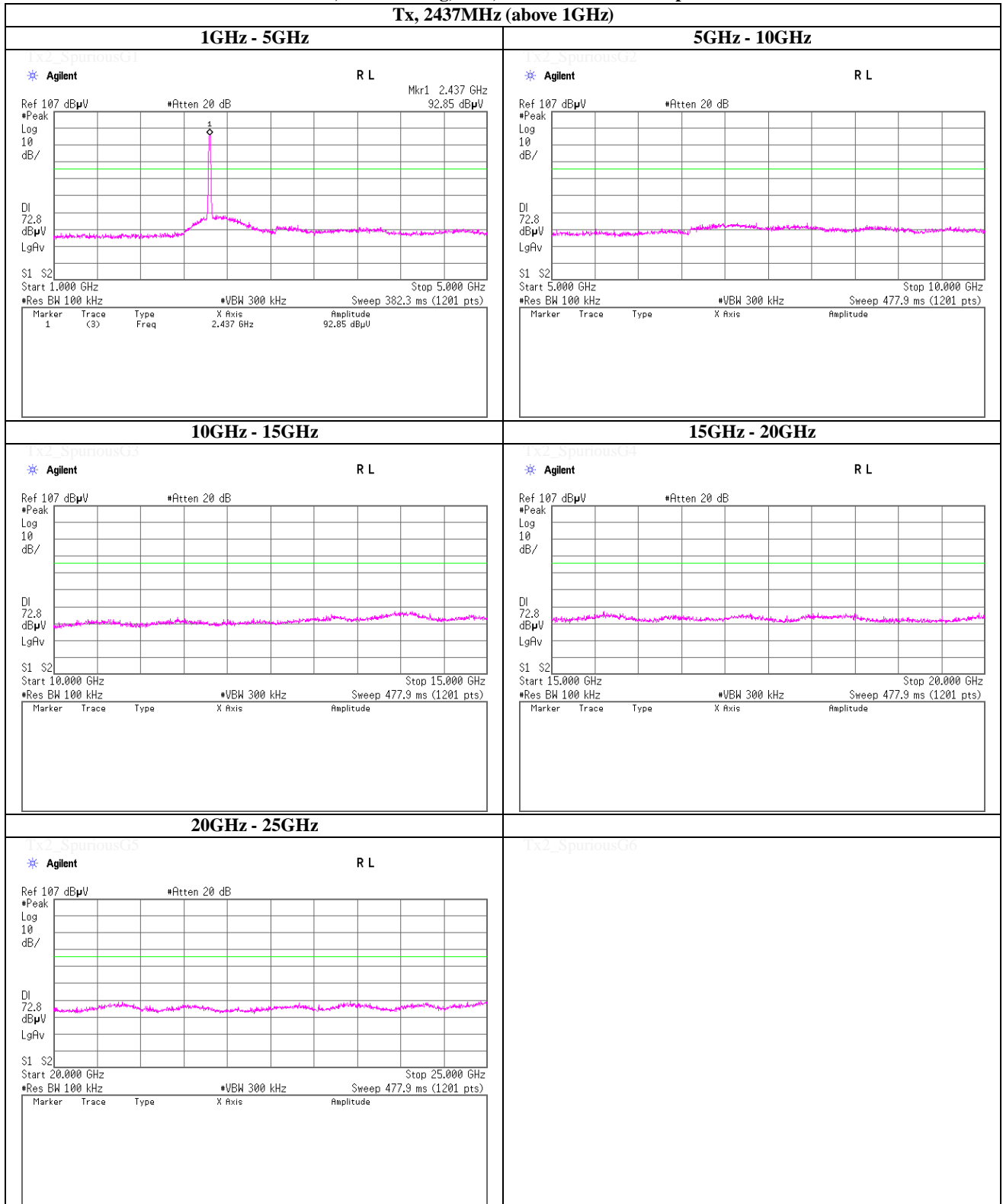
Telephone : +81 463 50 6400

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(Reference chart) Spurious emission (Conducted)

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

Tx, 2437MHz (above 1GHz)



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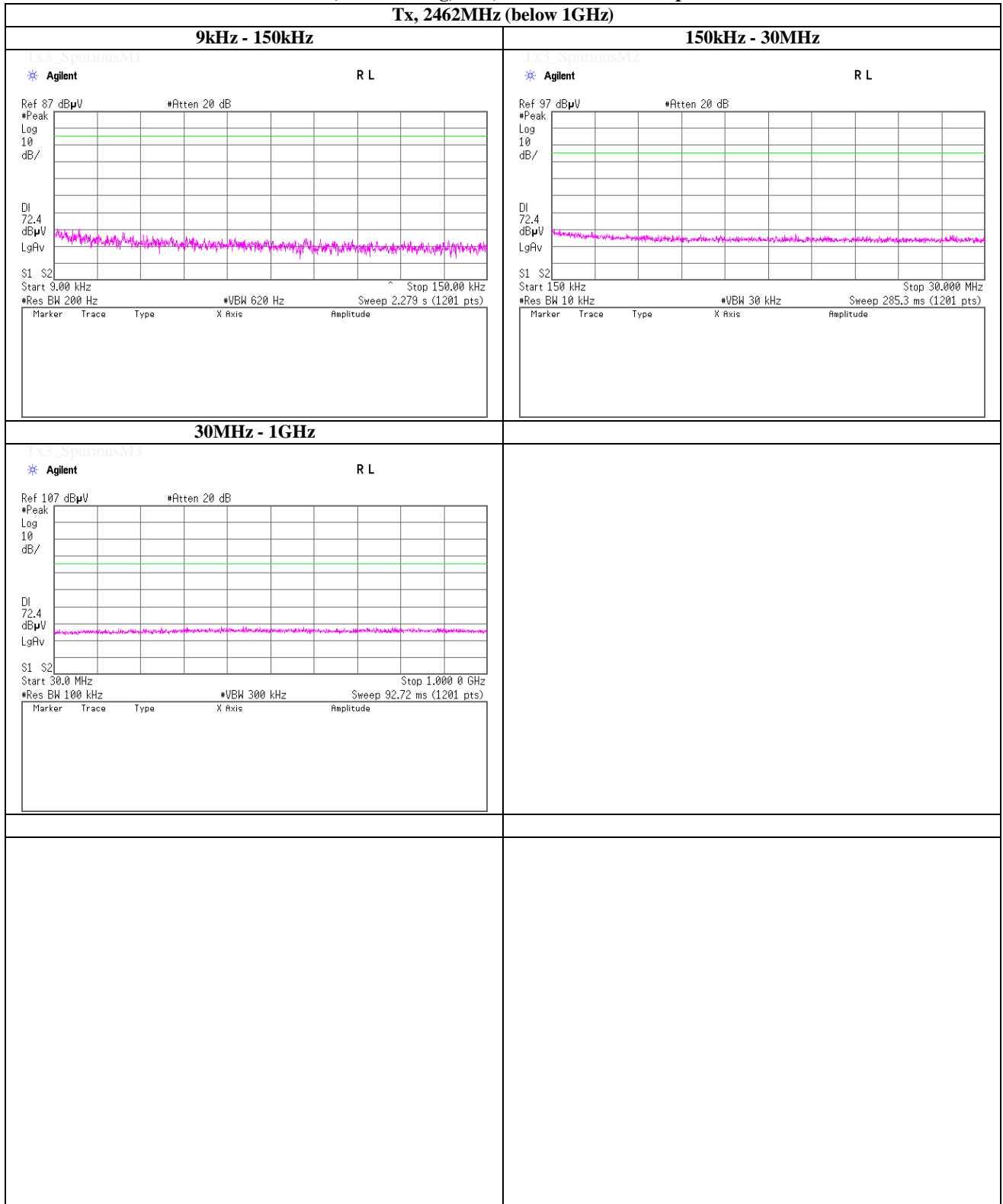
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(Reference chart) Spurious emission (Conducted)

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

Tx, 2462MHz (below 1GHz)



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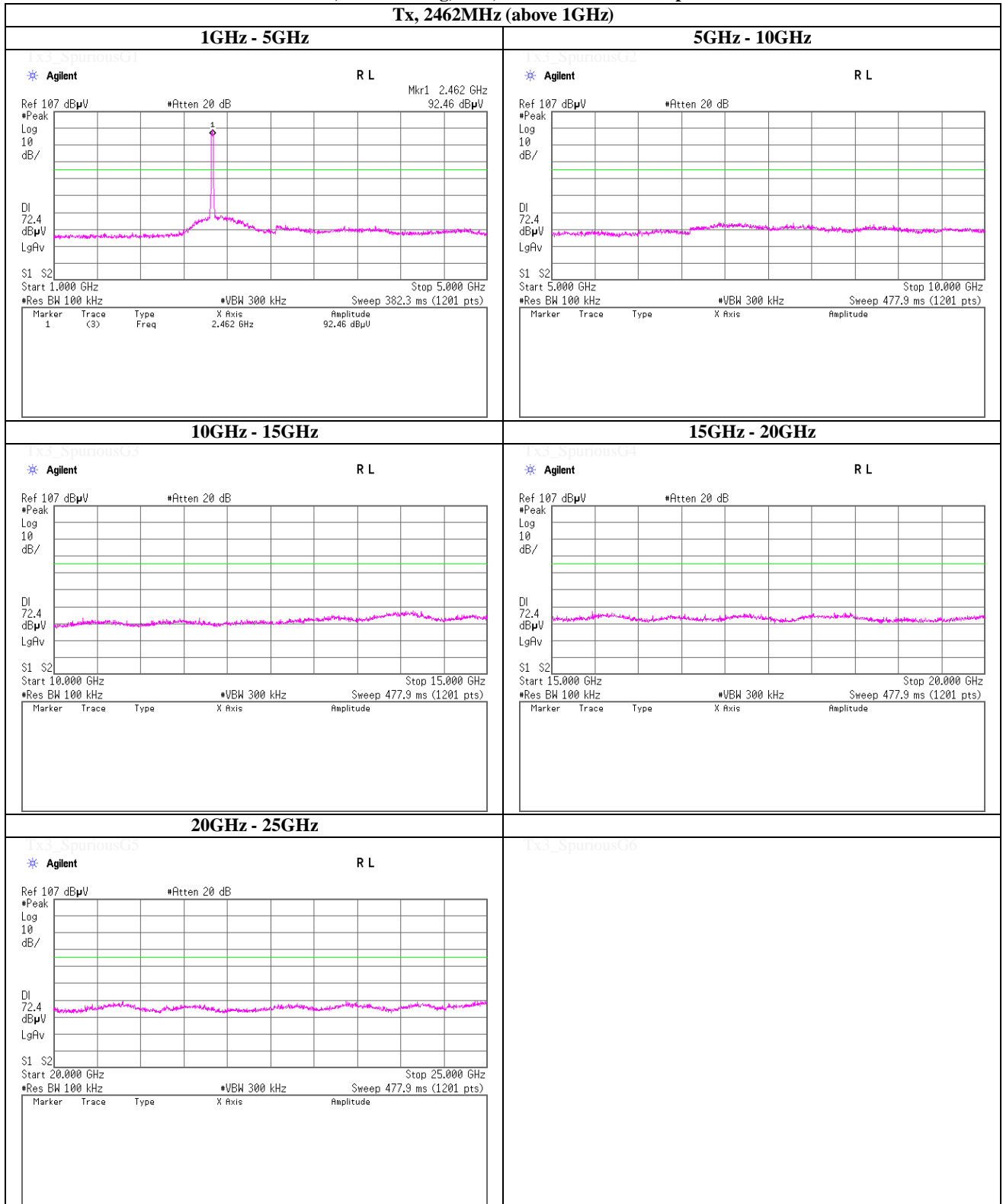
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(Reference chart) Spurious emission (Conducted)

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

Tx, 2462MHz (above 1GHz)



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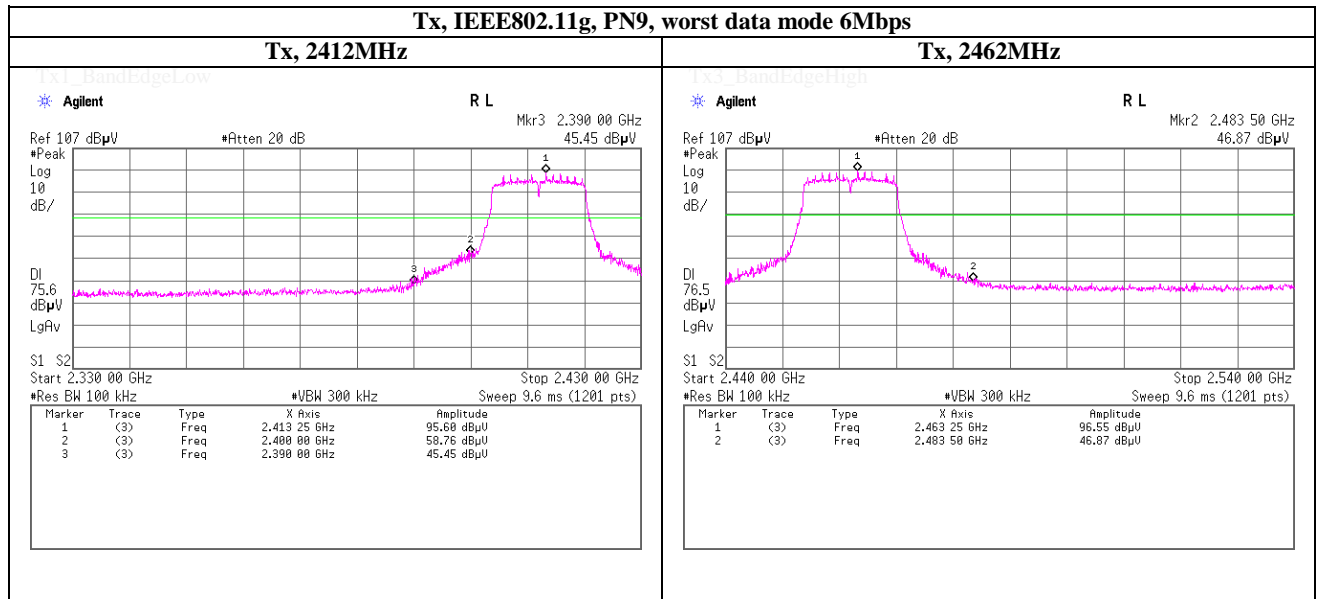
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Band Edge compliance



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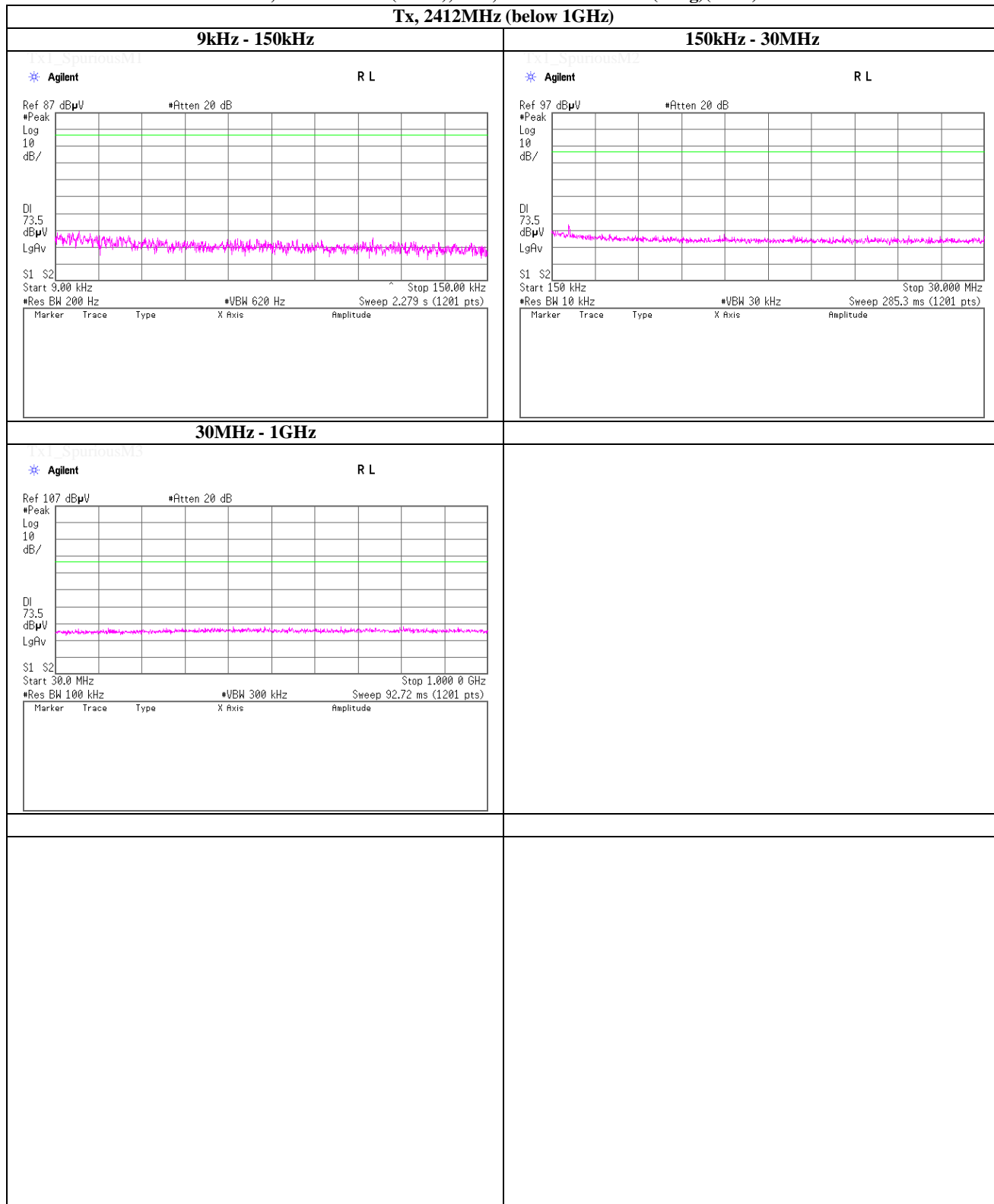
Telephone : +81 463 50 6400

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(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n (HT20), PN9, worst data mode 0 (Long)(MCS)

Tx, 2412MHz (below 1GHz)



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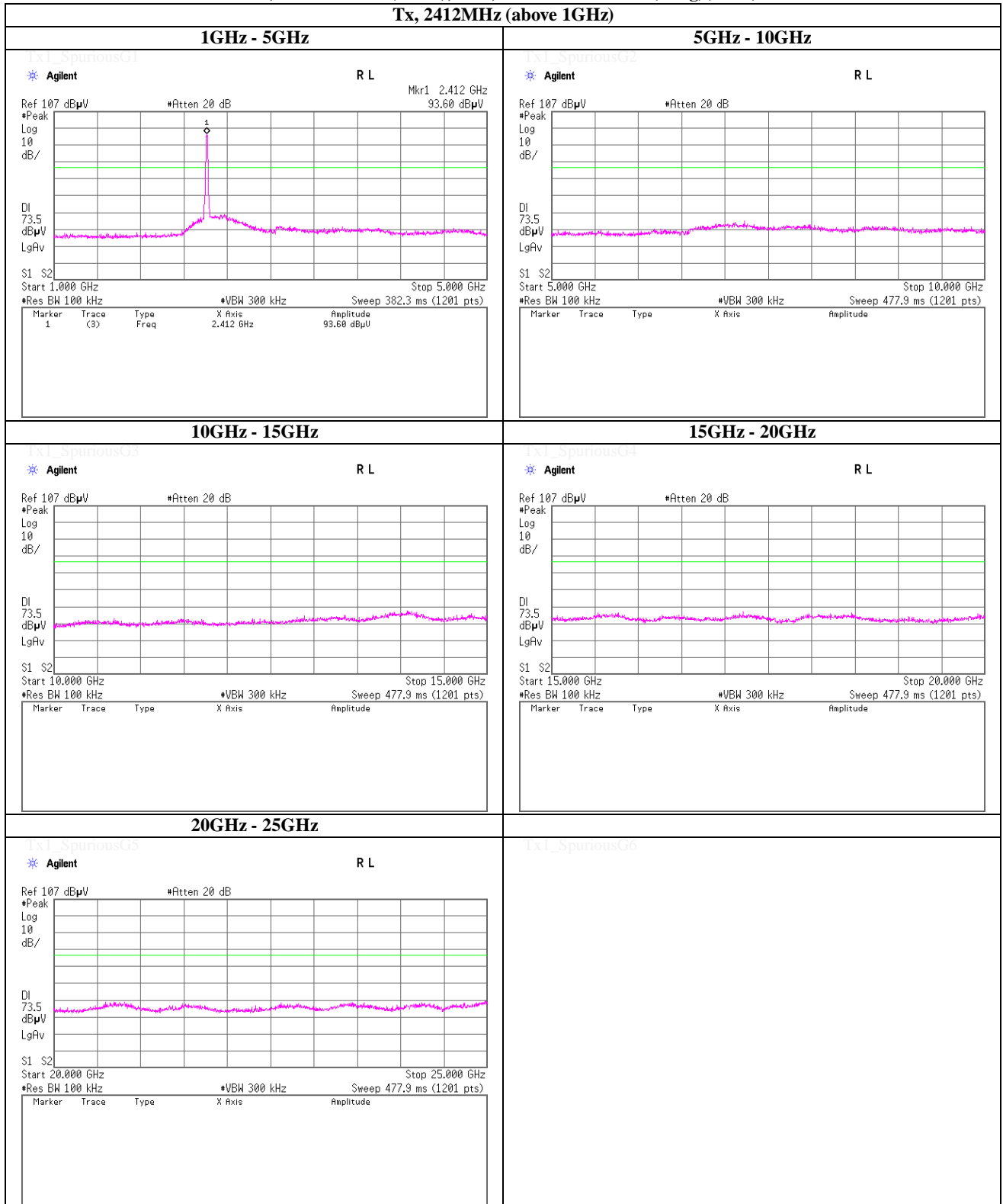
Telephone : +81 463 50 6400

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(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n (HT20), PN9, worst data mode 0 (Long)(MCS)

Tx, 2412MHz (above 1GHz)



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Shonan EMC Lab.

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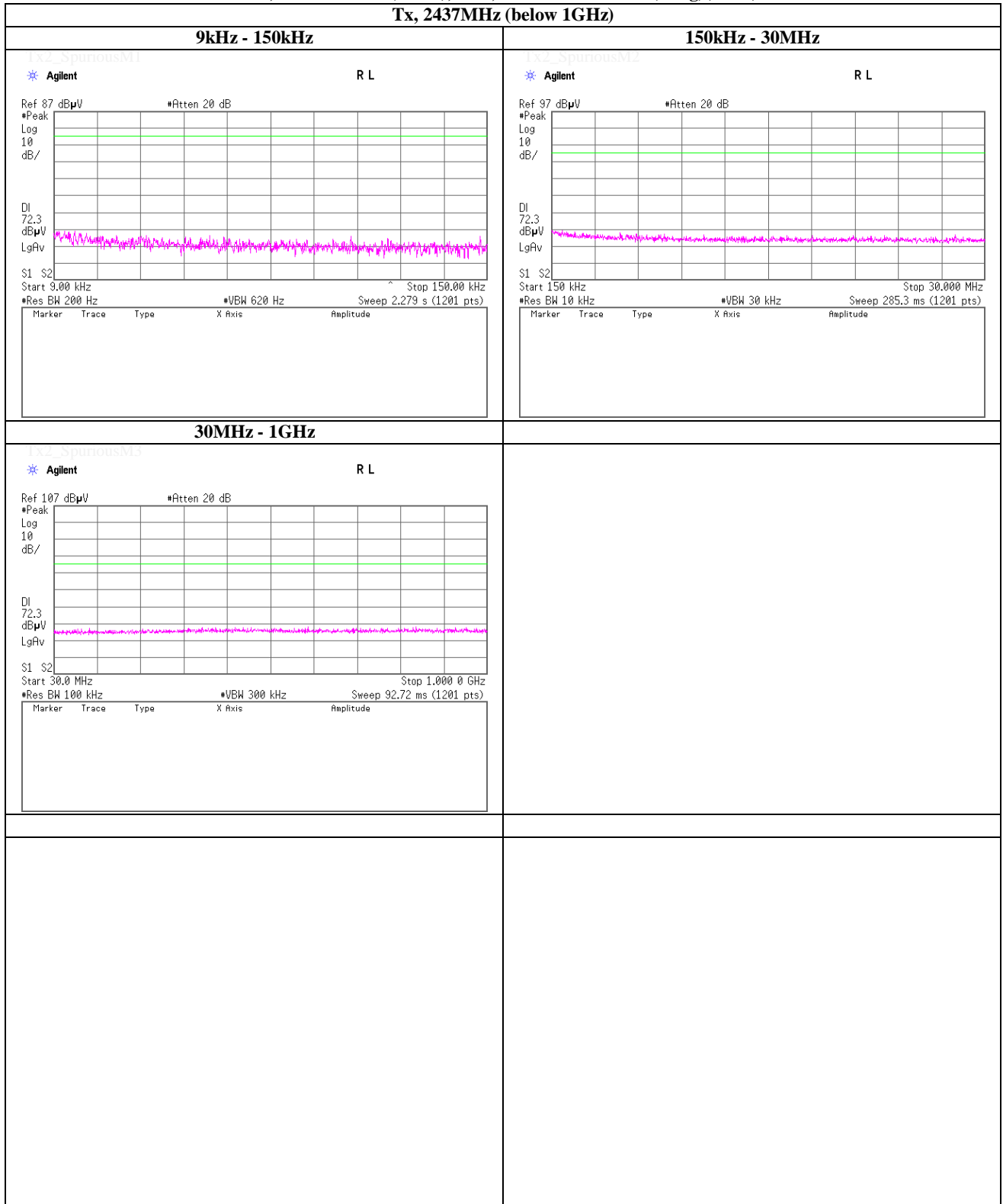
Telephone : +81 463 50 6400

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(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n (HT20), PN9, worst data mode 0 (Long)(MCS)

Tx, 2437MHz (below 1GHz)



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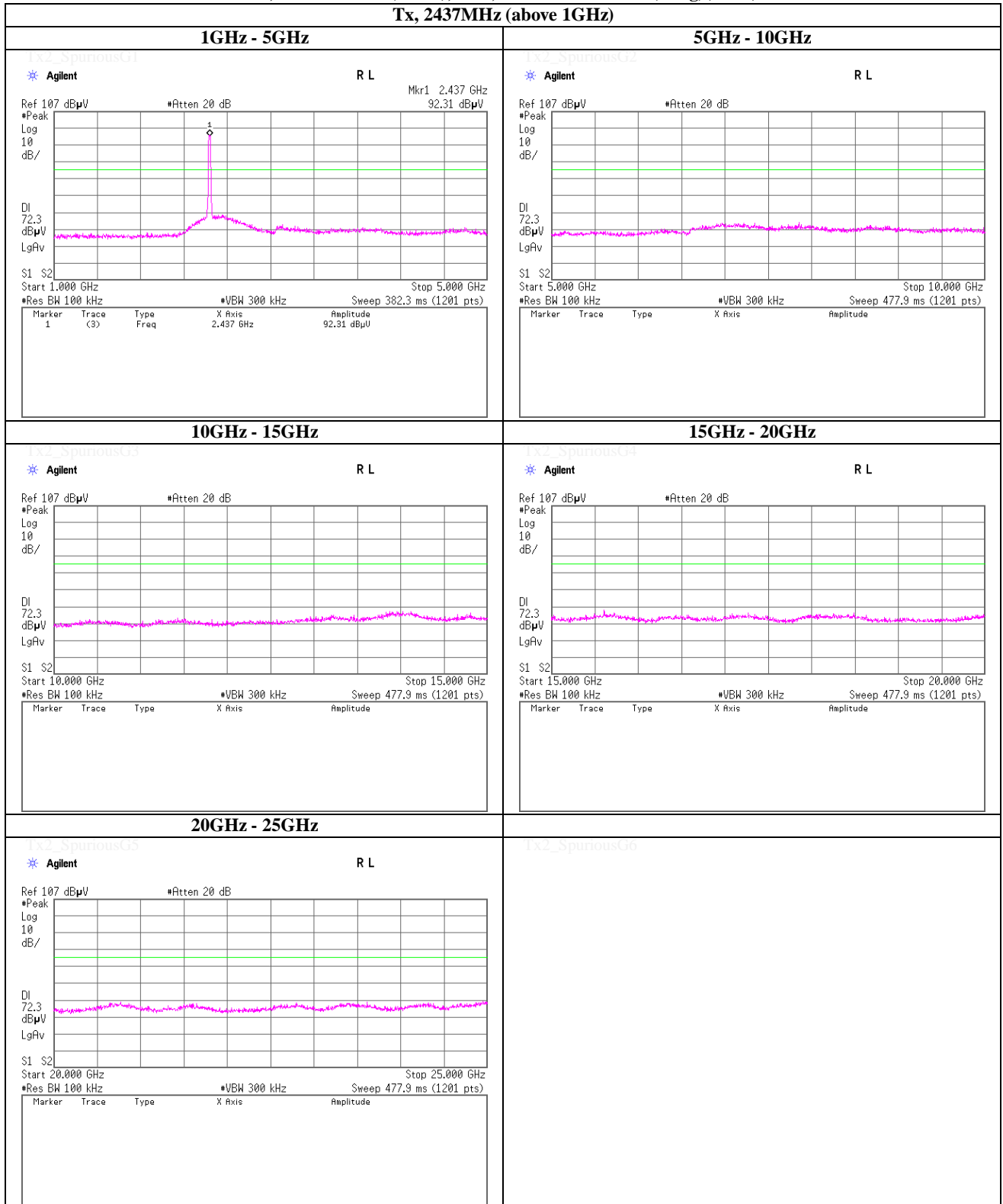
Telephone : +81 463 50 6400

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(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n (HT20), PN9, worst data mode 0 (Long)(MCS)

Tx, 2437MHz (above 1GHz)



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(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n (HT20), PN9, worst data mode 0 (Long)(MCS)

Tx, 2462MHz (below 1GHz)

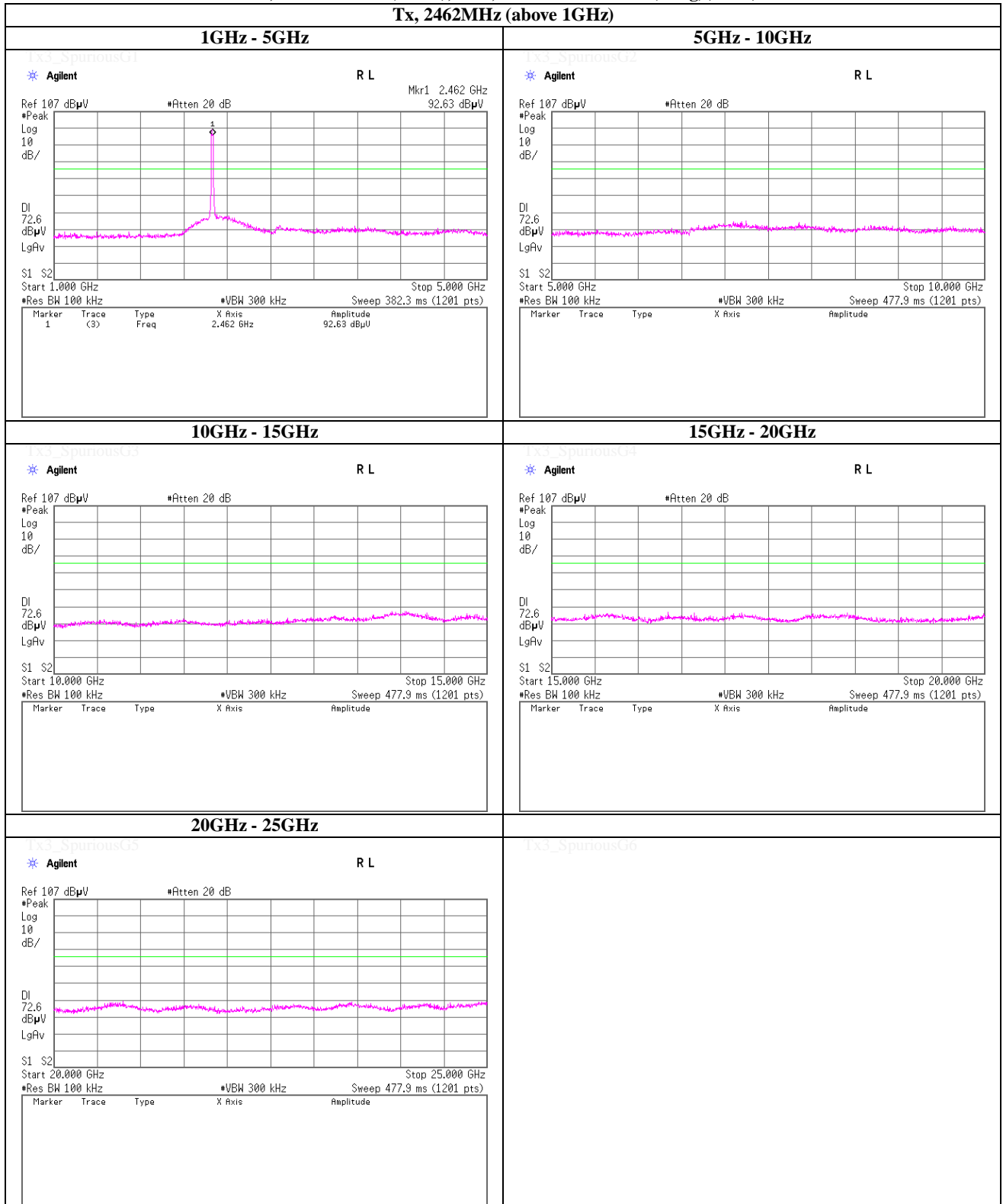


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(Reference chart) Spurious emission (Conducted)

Tx, IEEE802.11n (HT20), PN9, worst data mode 0 (Long)(MCS)

Tx, 2462MHz (above 1GHz)



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Shonan EMC Lab.

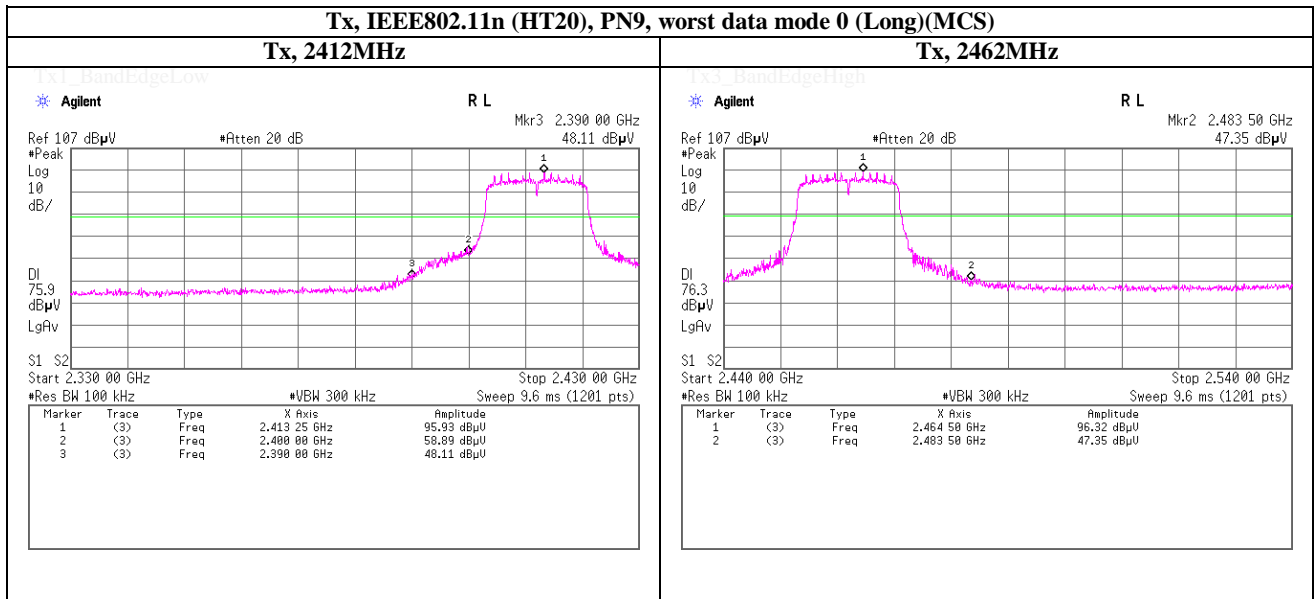
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

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(Reference chart) Spurious emission (Conducted)

Band Edge compliance



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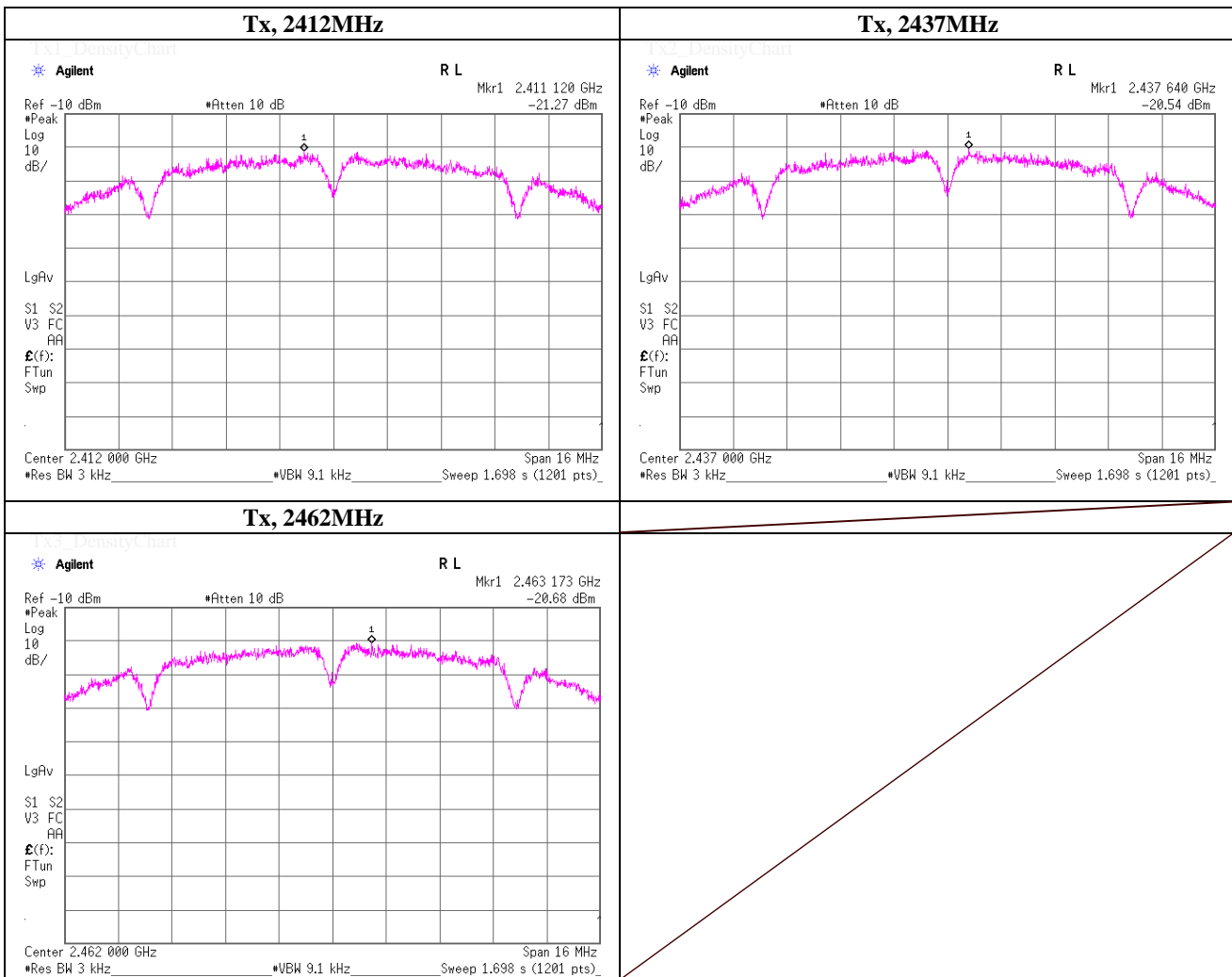
Maximum Power Spectral Density

(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	July 11, 2013	
Temperature / Humidity	24deg.C , 54%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11b, PN9, worst data mode 1Mbps	

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2411.12	-21.27	1.53	9.62	-10.12	8.00	18.12
2437.0000	2437.64	-20.54	1.51	9.63	-9.40	8.00	17.40
2462.0000	2463.17	-20.68	1.51	9.63	-9.54	8.00	17.54

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



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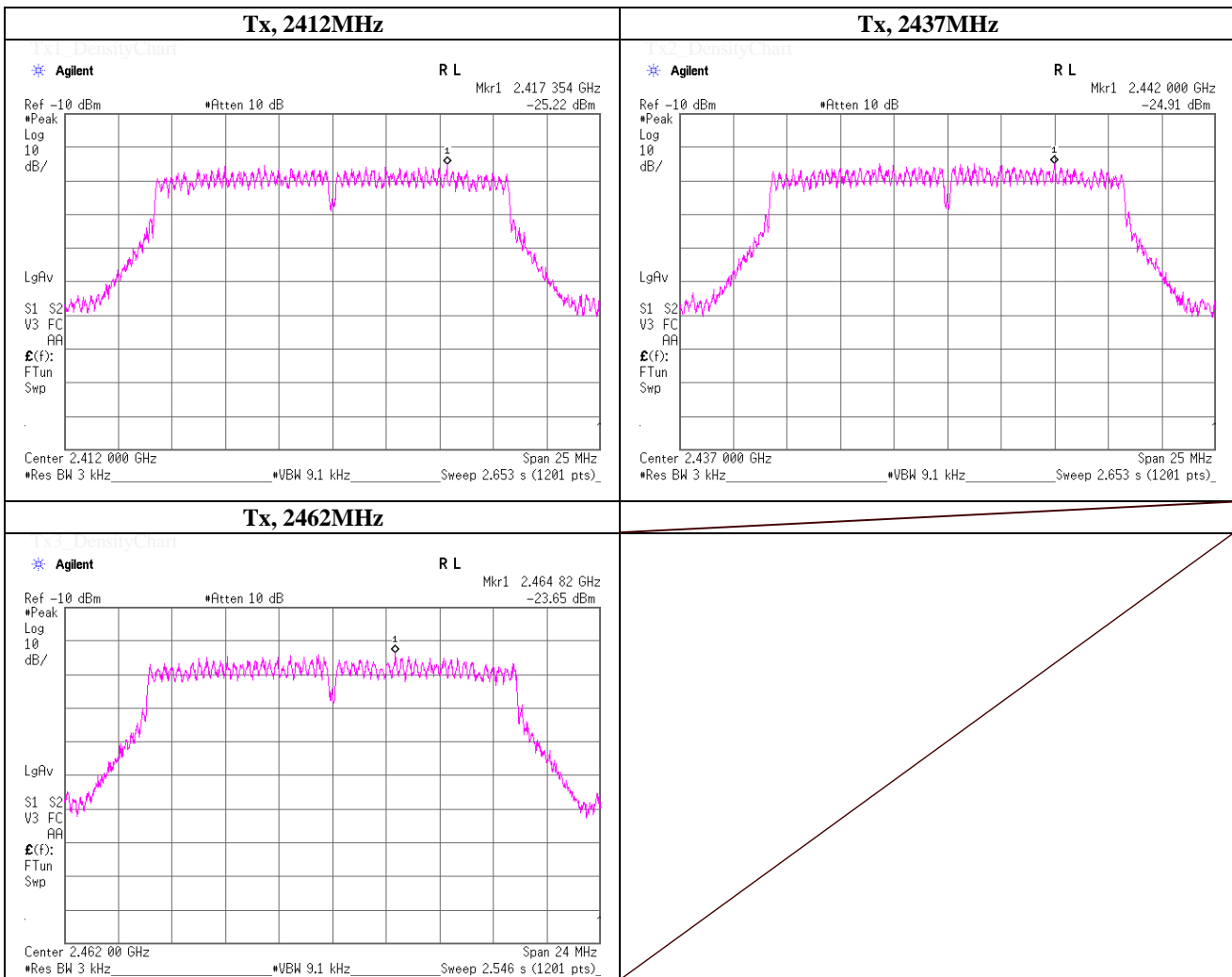
Maximum Power Spectral Density

(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	July 11, 2013	
Temperature / Humidity	24deg.C , 54%RH	
Engineer	Kenichi Adachi	
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	2417.35	-25.22	1.53	9.62	-14.07	8.00	22.07
2437.0000	2442.00	-24.91	1.51	9.63	-13.77	8.00	21.77
2462.0000	2464.82	-23.65	1.51	9.63	-12.51	8.00	20.51

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



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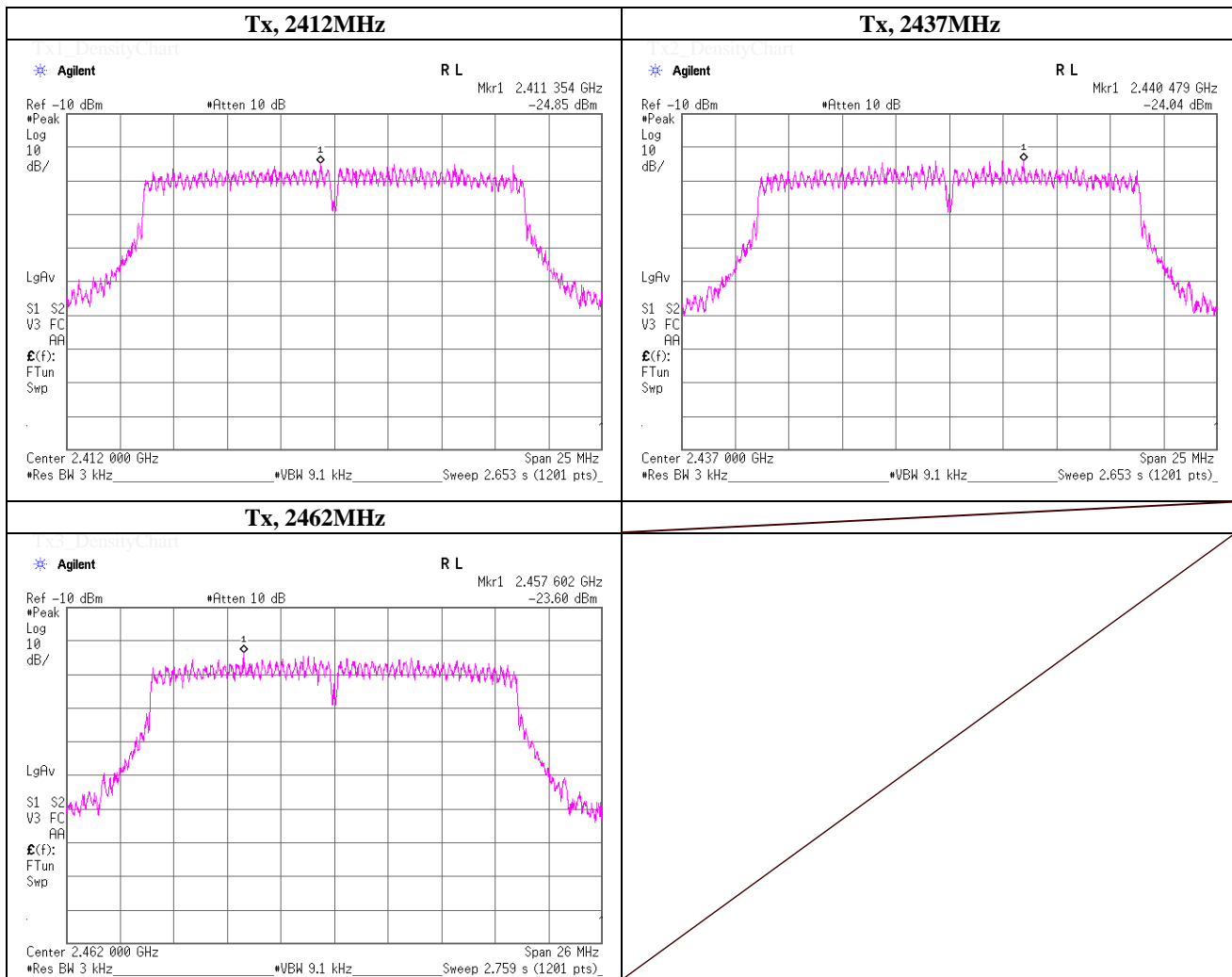
Maximum Power Spectral Density

(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	July 11, 2013	
Temperature / Humidity	24deg.C , 54%RH	
Engineer	Kenichi Adachi	
Mode	Tx, IEEE802.11n (HT20), PN9, worst data mode 0 (Long)(MCS)	

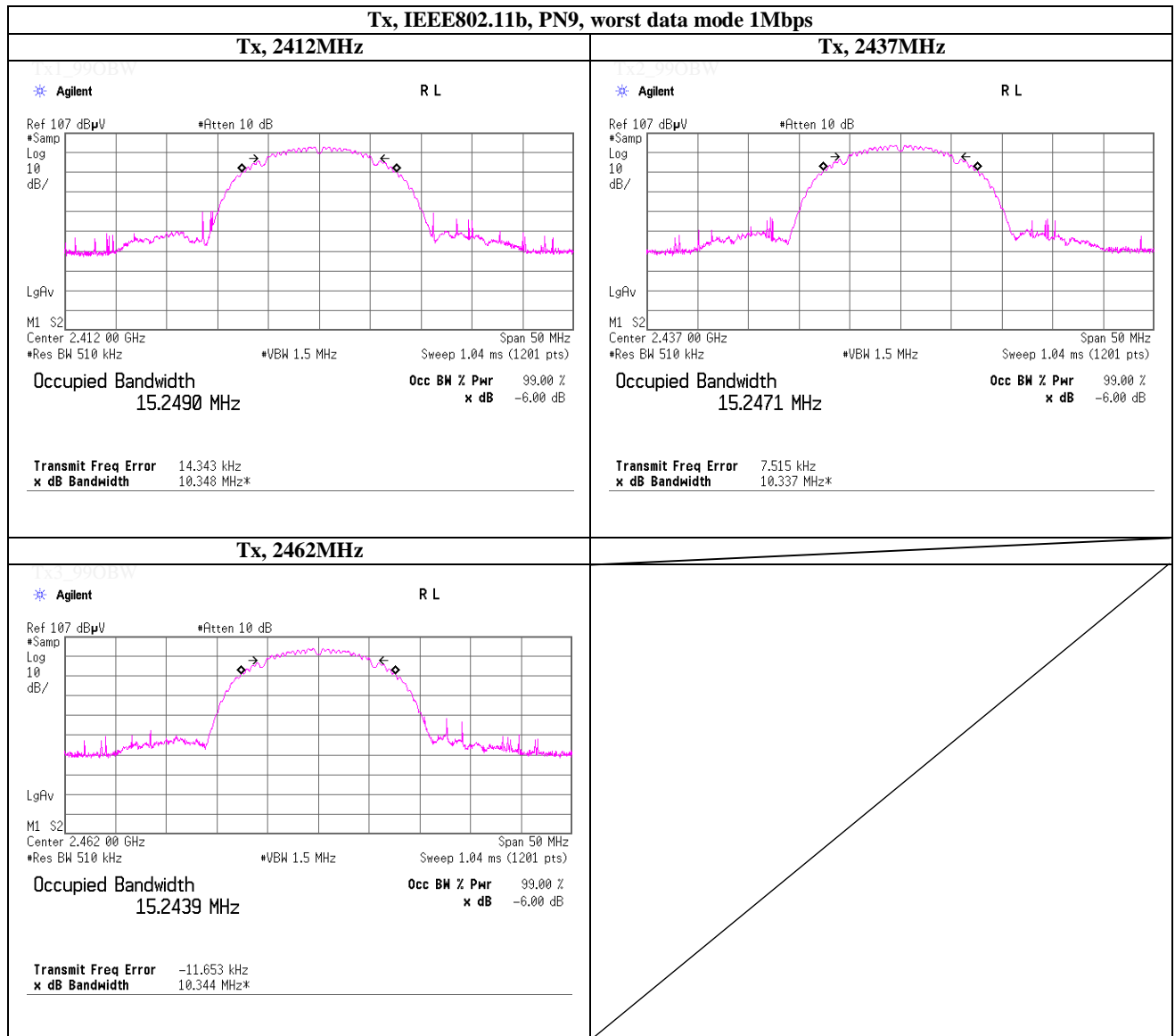
Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2411.35	-24.85	1.53	9.62	-13.70	8.00	21.70
2437.0000	2440.48	-24.04	1.51	9.63	-12.90	8.00	20.90
2462.0000	2457.60	-23.60	1.51	9.63	-12.46	8.00	20.46

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



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99% Occupied Bandwidth



UL Japan, Inc.

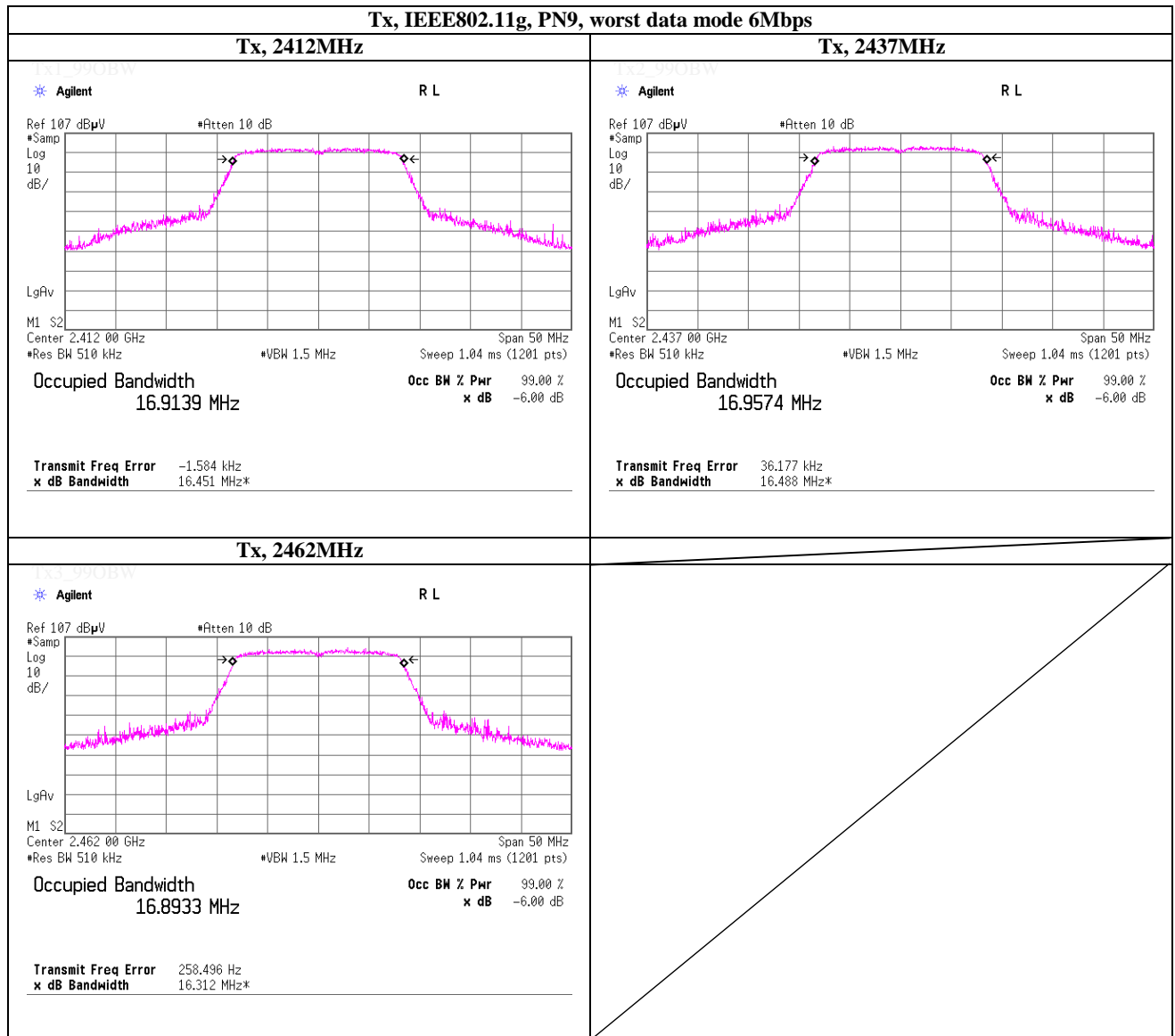
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99% Occupied Bandwidth



UL Japan, Inc.

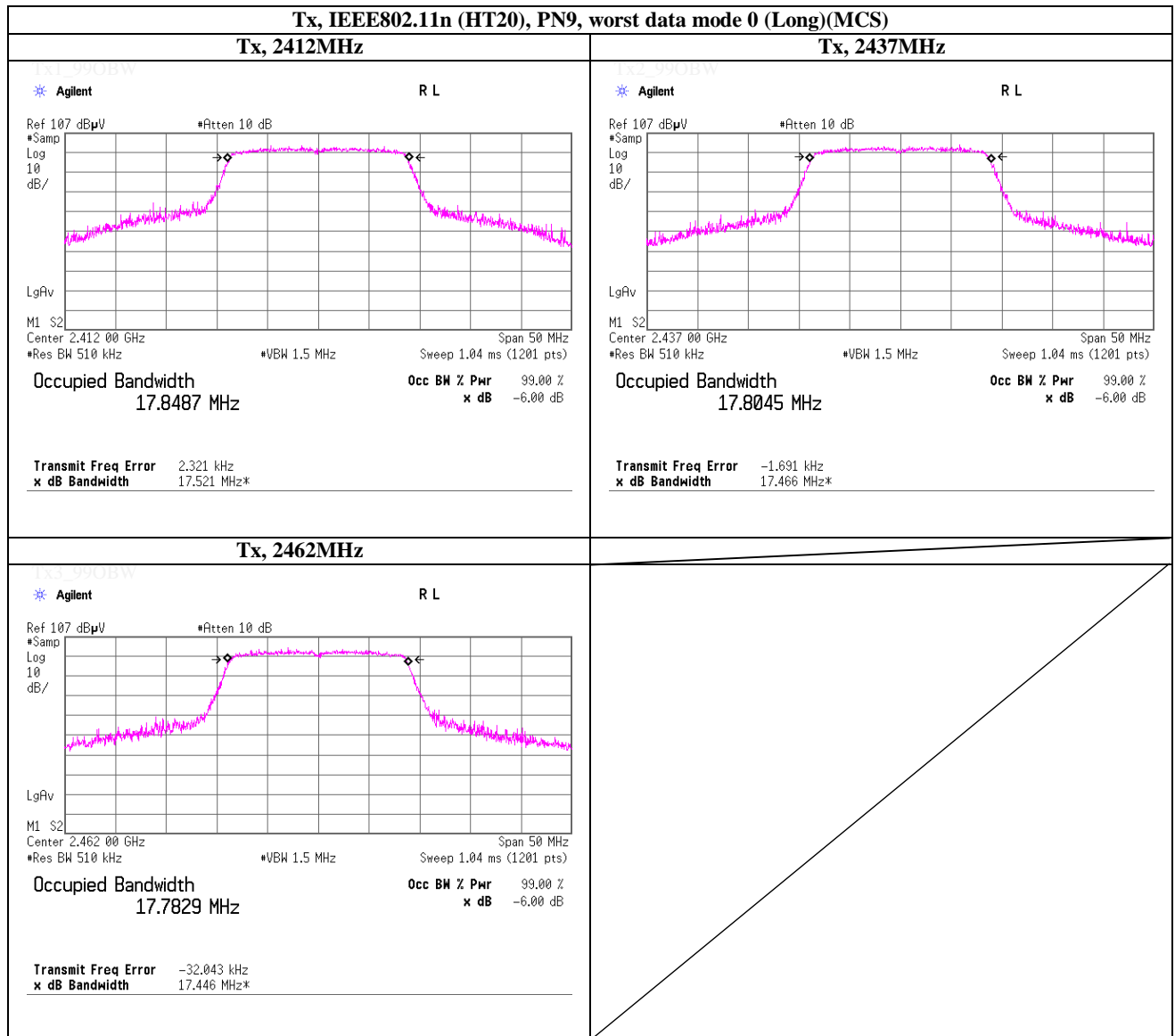
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99% Occupied Bandwidth



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APPENDIX 2 Test Instruments

EMI test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2013/04/09 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2013/04/09 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	AT	2013/01/08 * 12
SAT10-09	Attenuator	Weinschel Corp.	54A-10	W5692	AT	2012/11/15 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2013/03/16 * 12
SCC-H1	Microwave cable	Hirose Electric	U.FL-2LP-066J1-A-(200)	-	AT	Pre Check
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2013/03/07 * 12
SAEC-01(NSA)	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	RE	2013/07/03 * 12
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2013/03/19 * 12
SCC-G01	Coaxial Cable	Suhner	SUCOFLEX 104A	46497/4A	RE	2013/04/09 * 12
SCC-G21	Coaxial Cable	Suhner	SUCOFLEX 104	296169/4	RE	2013/05/22 * 12
SHA-01	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	RE	2012/08/20 * 12
SOS-01	Humidity Indicator	A&D	AD-5681	4062555	RE	2013/02/27 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2013/03/04 * 12
SJM-08	Measure	PROMART	SEN1935	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE, CE	-
SAT20-01	Attenuator(above1GHz)	Agilent	8493C-020	74889	RE	2012/12/18 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2012/12/18 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2013/07/09 * 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	2013/04/11 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2013/05/22 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2012/08/17 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2013/02/27 * 12
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	RE	2013/03/28 * 12
SJM-11	Measure	PROMART	SEN1935	-	RE, CE	-
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2012/12/18 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2013/03/14 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2013/03/19 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2013/03/16 * 12

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

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

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

Test Item :

CE: Conducted emission ,

RE: Radiated emission ,

AT: Antenna terminal conducted tests ,

APPENDIX 2 Test Instruments

EMI test equipment (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2013/02/12 * 12
SAT6-06	Attenuator	JFW	50HF-006N	-	RE	2013/02/12 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2012/10/08 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2013/04/03 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2012/10/08 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE, CE	2013/02/27 * 12
SCC-C9/C10/SRSE-03	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-271(RF Selector)	CE	2013/04/03 * 12
SAT3-05	Attenuator	JFW	50HF-003N	-	CE	2013/02/12 * 12
SLS-02	LISN	Rohde & Schwarz	ENV216	100512	CE	2013/02/21 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2013/03/07 * 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 :

CE: Conducted emission ,

RE: Radiated emission ,

AT: Antenna terminal conducted tests ,