RADIO TEST REPORT

Test Report No.: 10446024S-A

Applicant	:	**PIONEER CORPORATION**
Type of Equipment	:	**Car Audio with Bluetooth**
Model No.	:	**NXF-1258**
FCC ID	:	**AJDK086**
Test regulation	:	**FCC Part 15 Subpart C: 2014**
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: October 7 to 29, 2014

Representative test engineer:

Akio Hayashi
Engineer
Consumer Technology Division

Approved by :

Toyokazu Imamura
Leader
Consumer Technology Division

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

RTL02610

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REVISION HISTORY

Original Test Report No.: 10446024S-A

Revision	Test report No.	Date	Page revised	Contents
-(Original)	10446024S-A	November 17, 2014	-	-
1	10446024S-A	December 9, 2014	p.18, 19, 21,22,25,26	Deleted blank table.

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Contents

SECTION 1: Customer information

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

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

2.1 Identification of E.U.T.

Type of Equipment	:	Car Audio with Bluetooth
Model No.	:	NXF-1258
Serial No.	:	Refer to 4.2 in this report.
Rating	:	DC 13.2V
Country of Mass-production	:	Japan
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No modification by the test lab.
Receipt Date of Sample	:	October 6, 2014

2.2 Product description

Model: NXF-1258 (referred to as the EUT in this report) is a Car Audio with Bluetooth.

Radio specification:
Bluetooth:

Equipment type	:	Transceiver
Frequency of operation	:	2402-2480MHz
Bandwidth & channel spacing	:	79MHz & 1MHz
Type of modulation	:	GFSK, π/4DQPSK, 8DPSK
Antenna type	:	Pattern inverted F
Antenna gain	:	-0.42dBi (max)
Antenna connector type	:	20279-001E-01
Operation temperature range	:	-20 to +65 deg.C.

Wireless LAN:

Equipment type	:	Transceiver
Frequency of operation	:	2412-2462MHz
Bandwidth & channel spacing	:	20MHz & 5MHz
Type of modulation	:	BPSK, QPSK, CCK, 16QAM, 64QAM
Antenna type	:	Pattern inverted F
Antenna gain	:	-0.53dBi (max)
Antenna connector type	:	20279-001E-01
Operation temperature range	:	-20 to +65 deg.C.

* For Bluetooth part, refer to the test report: 10446024S-B.

FCC 15.31 (e)
The EUT provides stable voltage (DC3.3V) constantly to the wireless transmitter regardless of input voltage. Instead of a new battery, DC power supply was used for the test. That does not affect the test result, therefore the EUT complies with the requirement.

FCC 15.203
The equipment and its antenna comply with the requirement since the antenna is built in the equipment and it cannot be replaced by end users.

Clock frequency: 26MHz (crystal and oscillator)

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2014,
final revised on August 15, 2014 and effective October 14, 2014
Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.209 Radiated emission limits, general requirements
Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz

* The revision on August 15, 2014 does not affect the test specification applied to the EUT.

3.2 Procedures & Results

Item	Test Procedure *1)	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.10:2009	FCC 15.207	-	N/A *2)	-	-
6dB bandwidth	ANSI C63.10:2009	FCC 15.247 (a)(2)	Conducted	N/A	* See data	Complied
Maximum peak output power	ANSI C63.10:2009	FCC 15.247 (b)(3)	Conducted	N/A		Complied
Out of band emission & Restricted band edges	ANSI C63.10:2009	FCC 15.109, 15.247 (d) & 15.209	Conducted / Radiated	N/A	6.2dB Freq.: 2390.000MHz Polarization: Vertical Detection: Average Mode: Tx 2412MHz, IEEE 802.11n HT20	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 r02 (FCC), "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".
*2) The test is not applicable since the EUT has no AC mains.

3.3 Addition to standard

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

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

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

3.4 Uncertainty

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

Item	Frequency range	No.1 SAC*1/SR*2 (±)	No.2 SAC/SR (±)	No.3 SAC/SR (±)
Radiated emission (Measurement distance: 3m)	9kHz-30MHz	3.7 dB	3.5 dB	3.5 dB
	30MHz-300MHz	4.8 dB	4.9 dB	4.7 dB
	300MHz-1GHz	5.0 dB	5.0 dB	4.8 dB
	1GHz-15GHz	4.9 dB	4.9 dB	4.9 dB
Radiated emission (Measurement distance: 1m)	15GHz-18GHz	5.7 dB	5.7 dB	5.7 dB
	18GHz-40GHz	4.5 dB	4.3 dB	4.3 dB

*1: SAC=Semi-Anechoic Chamber
*2: SR= Shielded Room is applied besides radiated emission

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

Antenna port conducted test
Power Measurement uncertainty above 1GHz for this test was: (±) 0.68dB
Spurious emission (Conducted), Power density measurement (below 1GHz) uncertainty for this test was: (±) 1.5dB
Spurious emission (Conducted), Power density measurement (1G-3GHz) uncertainty for this test was: (±) 1.7dB
Spurious emission (Conducted), Power density measurement (3G-18GHz) uncertainty for this test was: (±) 2.4dB
Spurious emission (Conducted) measurement (18G-26.5GHz) uncertainty for this test was: (±) 2.5dB
Bandwidth Measurement uncertainty for this test was: (±) 0.66%

3.5 Test location

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JAB Accreditation No. : RTL02610

	IC Registration No.	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
☐ No.1 semi-anechoic chamber	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☐ No.2 semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☒ No.3 semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
☐ No.4 semi-anechoic chamber	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
☐ No.1 shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
☐ No.2 shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
☐ No.3 shielded room	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
☐ No.4 shielded room	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
☐ No.5 shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
☐ No.6 shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
☒ No.1 measurement room	-	2.55 x 4.1 x 2.5	-	-

3.6 Test setup, Test data & Test instruments

Refer to APPENDIX 1 to 3.

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

4.1 Operating mode

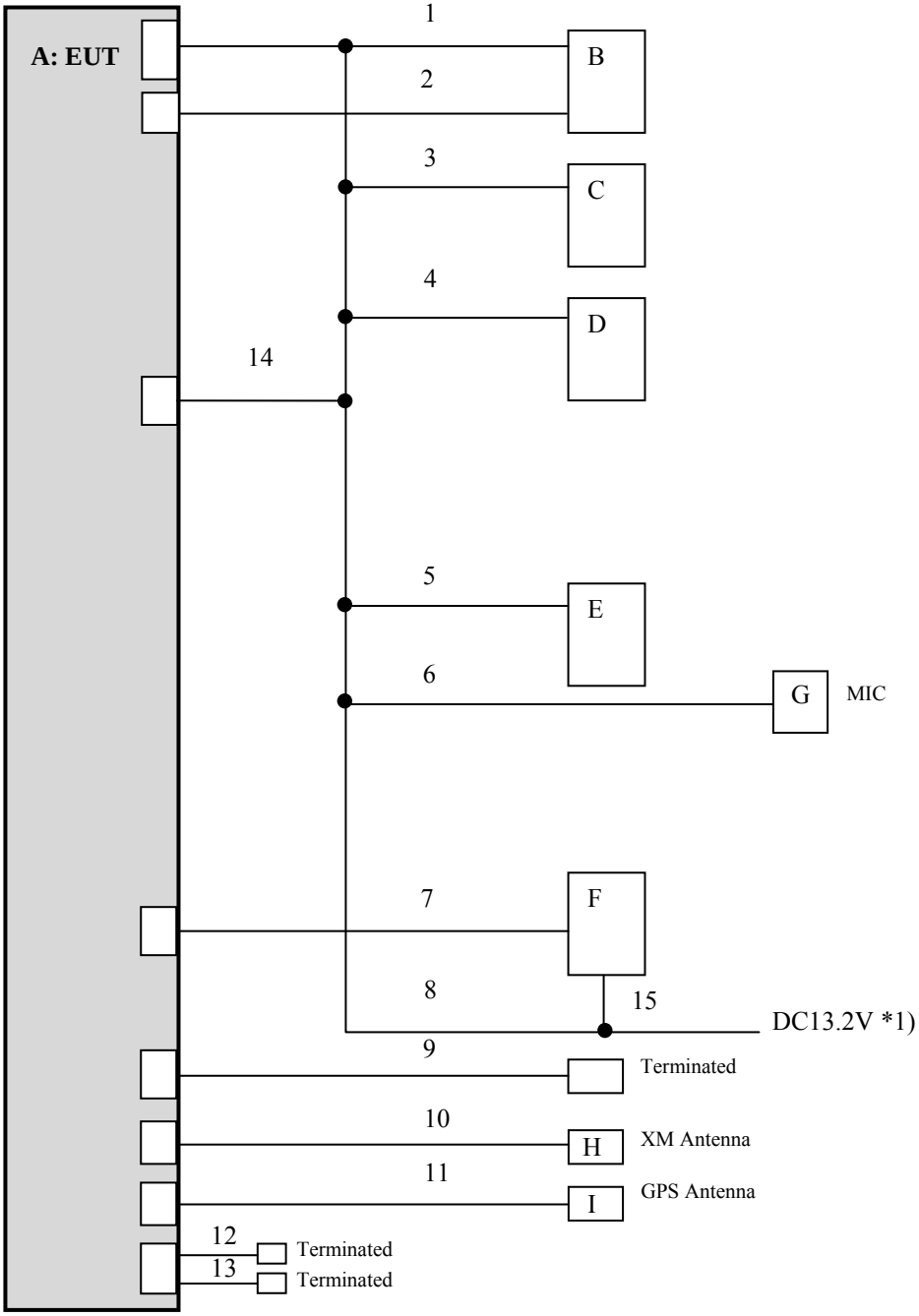
Test item	Mode	Tested frequency	Worst data mode *1)
Radiated emission (below 1GHz), Out of band emission (Antenna port conducted) *2)	Transmitting IEEE 802.11g	2462MHz	PN9, 6Mbps
Other items	Transmitting IEEE 802.11b	2412MHz, 2437MHz, 2462MHz	PN9, 1Mbps
	Transmitting IEEE 802.11g	2412MHz, 2437MHz, 2462MHz	PN9, 6Mbps
	Transmitting IEEE 802.11n HT20	2412MHz, 2437MHz, 2462MHz	PN9, MCS0
*1) The worst condition was determined based on the test result of Maximum Peak Output Power. *2) Test operating mode was determined as follows according to "Section 1 of 6 802.11 a/b/g/n testing- Managing Complex Regulatory Approvals - "of TCB Council Workshop October 2009.			

EUT has the power settings by the software as follows;

Power settings	Fixed
Software	Uni Test App ver 7.2.1.5

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

4.2 Configuration and peripherals



* Test data was taken under worse case conditions.

Description of EUT and Auxiliary equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Car Audio with Bluetooth	NXF-1258	*2)	Pioneer	EUT
B	Display	86110-30330	329012561	DENSO	-
C	Remote Control Device	84780-30080	12Mar09 0248AA	DENSO	-
D	Steering Switch	-	-	-	-
E	Rear Camera	86790-30151	3YC02976	-	-
F	Amplifier	GM-4038ZT/WL (86280-53190)	TPJA000140WL	Pioneer	-
G	Microphone	-	-	-	-
H	XM Antenna	86760-48050-A0	-	-	-
I	GPS Antenna	86860-22090	-	AISIN	-

*1) DC power supply (Model No.: PAN35-10A) was used for DC 13.2V input.
*2) Antenna port conducted tests: NGPKTP0044US, Radiated emission tests: NGPKTP0012US

List of cables used

No.	Item	Length(m)	Shield (Cable)	Shield (Connector)	Remarks
1	Signal cable for Display	1.9	Unshielded	Unshielded	-
2	GVIF cable	1.9	Unshielded	Unshielded	-
3	Signal cable for Remote control	1.9	Unshielded	Unshielded	-
4	Signal cable for Steering Switch	2.0	Unshielded	Unshielded	-
5	Signal cable for Rear Camera	2.0	Unshielded	Unshielded	-
6	Signal cable for Microphone	4.0	Shielded	Shielded	-
7	Bus cable	2.0	Shielded	Shielded	-
8	DC power cable	3.1	Unshielded	Unshielded	-
9	USB cable	2.0	Shielded	Shielded	-
10	Antenna cable for XM	1.3	Shielded	Shielded	-
11	Antenna cable for GPS	1.7	Shielded	Shielded	-
12	HCI cable	3.3	Shielded	Shielded	-
13	HCI cable	3.3	Shielded	Shielded	-
14	Bus cable	1.6	Unshielded	Unshielded	-
15	Wire harness for amplifier	1.6	Unshielded	Unshielded	-

SECTION 5: 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 8.2 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 6: Maximum peak output power

Test procedure
The Maximum Output Power was measured with a power meter connected to the antenna port.
The test was measured based on Method 9.1.2 PKPM1 of KDB 558074 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247" .

Detection type: Peak / Average *1)

Summary of the test results: Pass
Refer to APPENDIX 1

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

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.
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: 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

SECTION 9: Radiated emission

9.1 Operating environment

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

9.2 Test configuration

EUT was placed on a platform of nominal size, 1.0m 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 EUT, including its peripherals was aligned and flushed with rear of tabletop. I/O cables that were connected to the peripherals were bundled in center. They were folded back and for the forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.
Photographs of the set up are shown in APPENDIX 3.

9.3 Test conditions

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

9.4 Test procedure

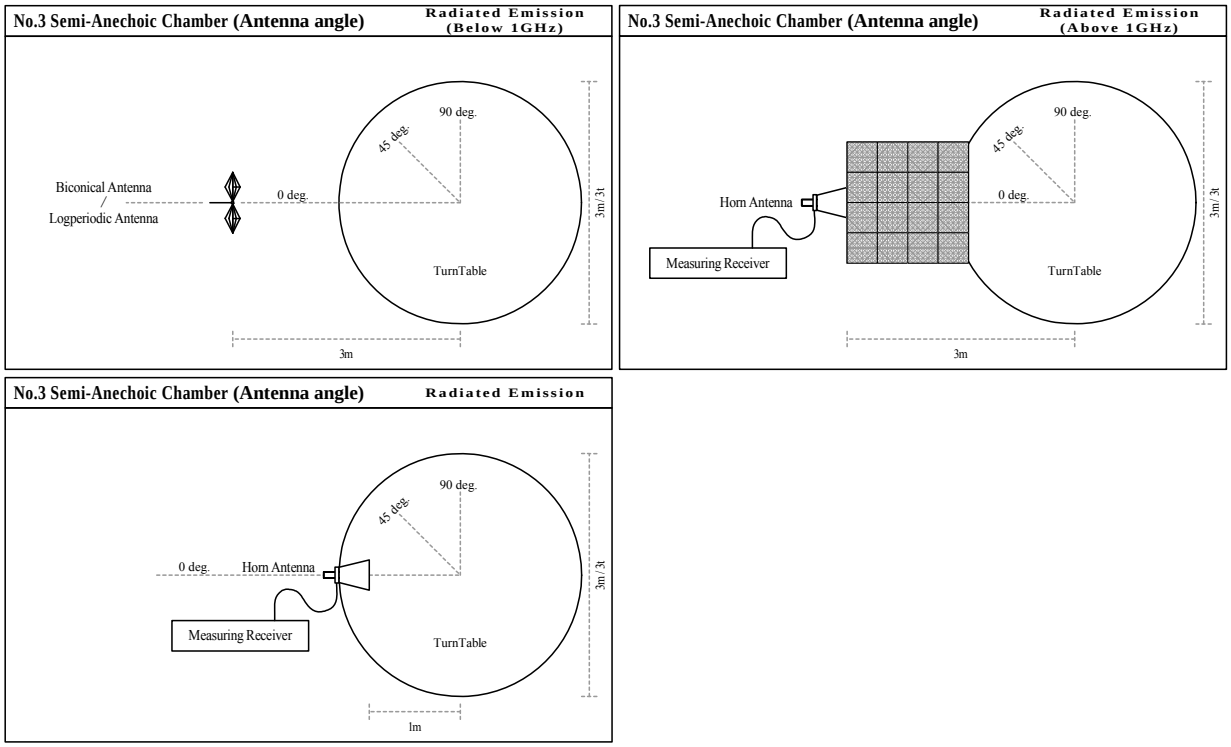
The Radiated Electric Field Strength intensity has been measured on a semi-anechoic chamber with a ground plane and at a distance of 3m (below 15GHz) / 1m (above 15GHz) (Refer to Figure 1). Measurements were performed with quasi-peak, peak and average detector. The measuring antenna height was varied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

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

*1) Average Power Measurement was measured based on 13.3.2 of KDB 558074 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247".

The EUT was set at 14.31 degree as normal position according to the EUT's specification.

Figure 1. Antenna angle



9.5 Band edge

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

9.6 Results

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

Refer to APPENDIX 1

Contents of APPENDIXES

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

APPENDIX 2: Test instruments

Test instruments

APPENDIX 3: Photographs of test setup

Radiated emission

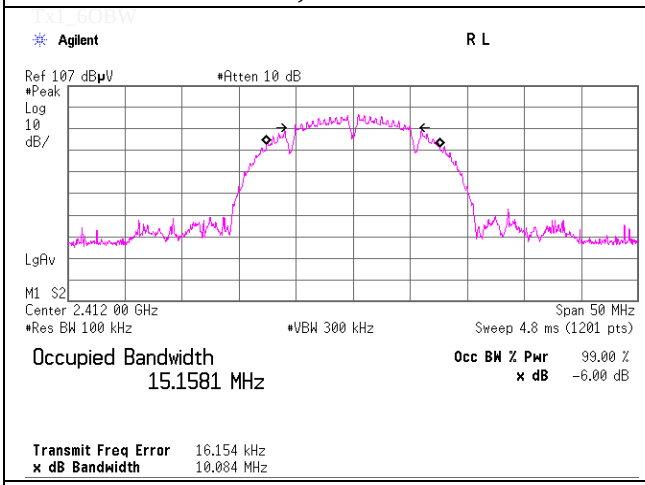
APPENDIX 1: Data of Radio tests

-6dB Bandwidth

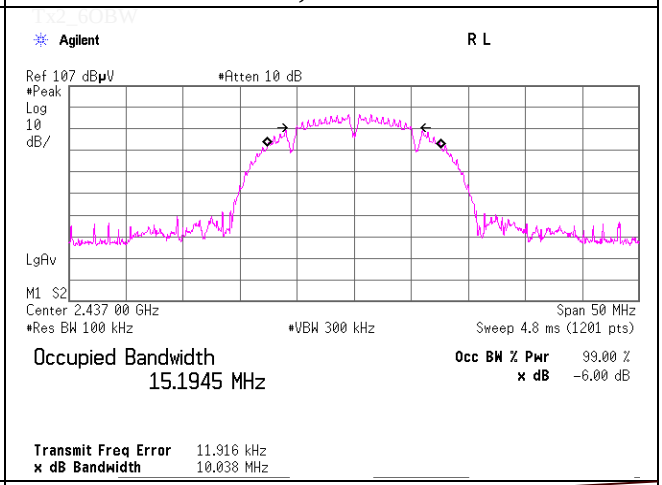
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 7, 2014	
Temperature / Humidity	23deg.C , 61%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11b, PN9, worst data mode 1Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	10.084	> 0.500
2437.0000	10.038	> 0.500
2462.0000	10.112	> 0.500

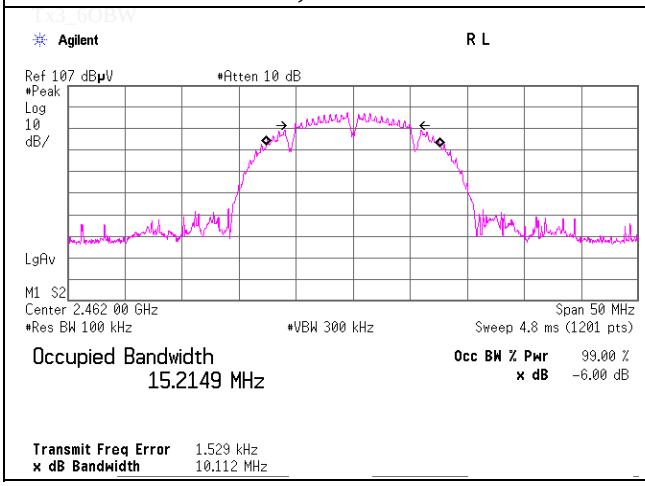
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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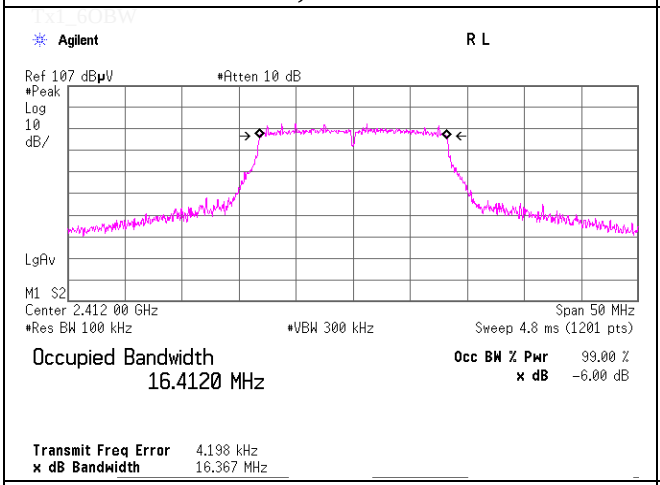
-6dB Bandwidth

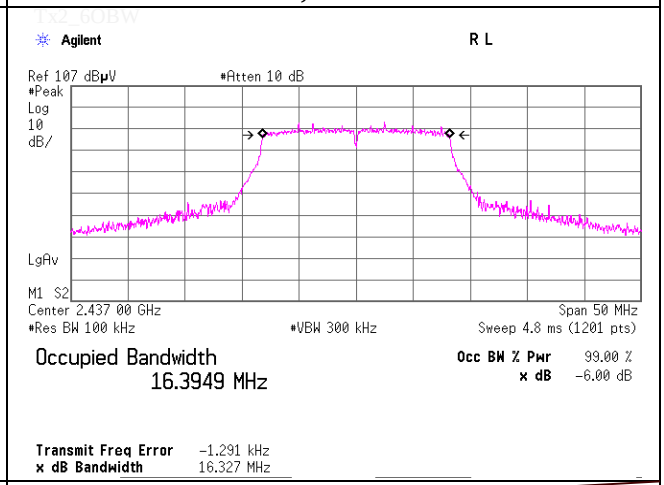
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 7, 2014	
Temperature / Humidity	23deg.C , 61%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.367	> 0.500
2437.0000	16.327	> 0.500
2462.0000	16.333	> 0.500

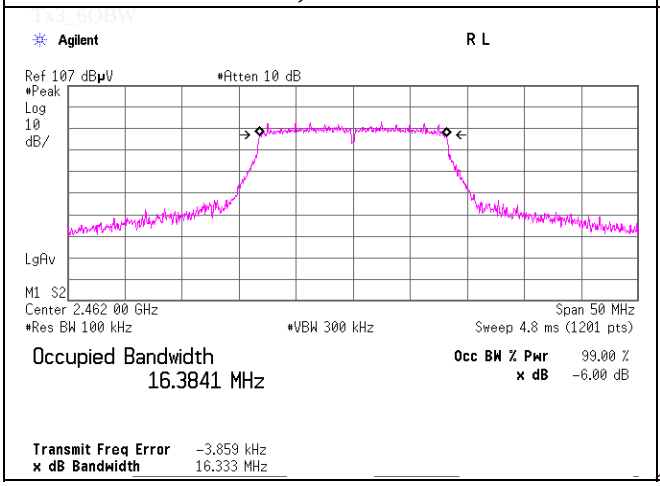
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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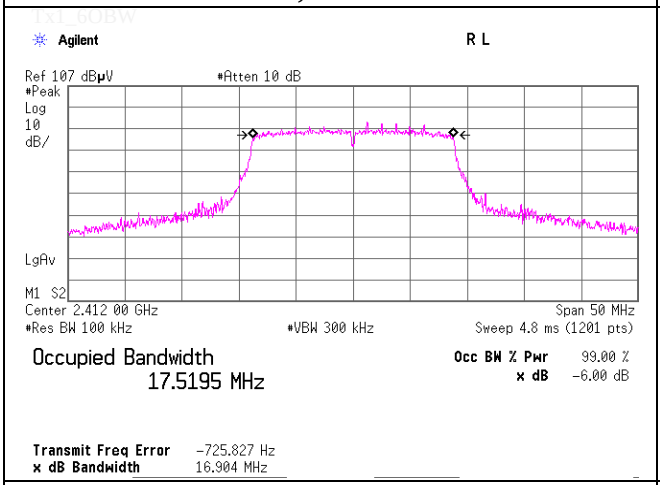
-6dB Bandwidth

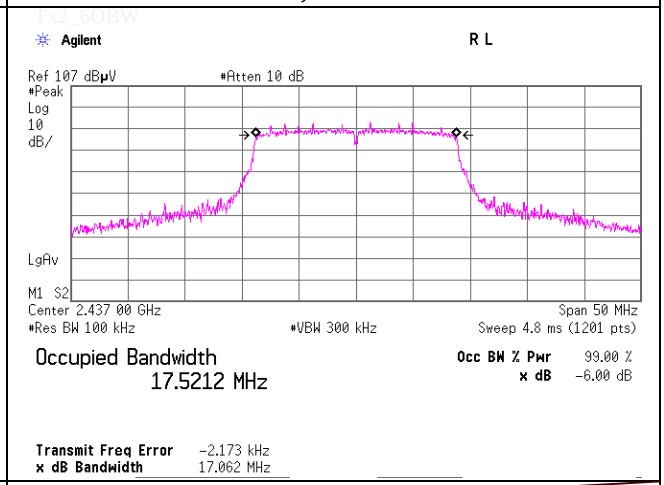
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 7, 2014	
Temperature / Humidity	23deg.C , 61%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11n HT20, PN9, worst data mode 0(MCS)	

Freq. [MHz]	-6dB Bandwidth [MHz]	Limit [MHz]
2412.0000	16.904	> 0.500
2437.0000	17.062	> 0.500
2462.0000	17.089	> 0.500

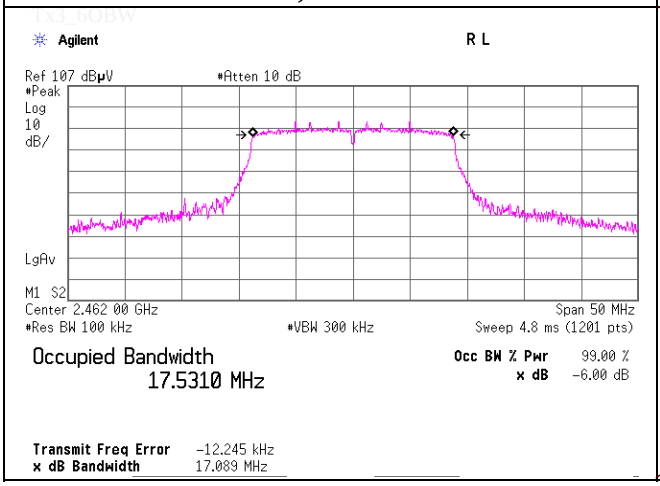
Tx, 2412MHz

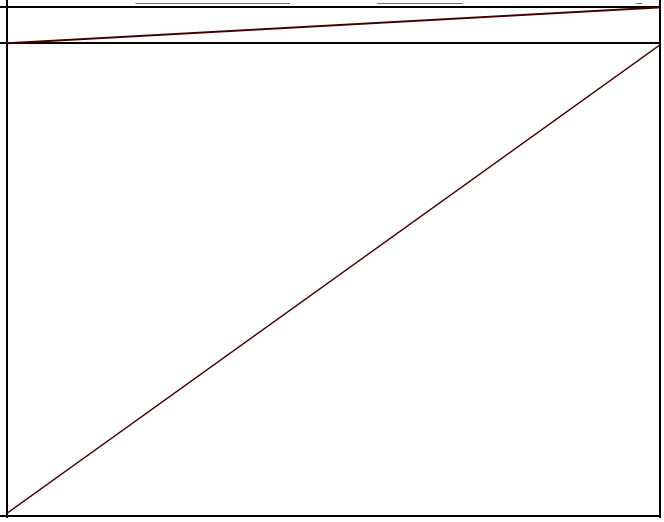


Tx, 2437MHz



Tx, 2462MHz





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Revised date : December 9, 2014

Maximum Peak Conducted Output Power

(PKPM1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 7, 2014	
Temperature / Humidity	23deg.C , 61%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11b, PN9,	worst data mode : 1 Mbps

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

Ch	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	4.16	1.49	9.90	15.55	35.89	30.00	1000	14.45
Mid	2437.0	4.12	1.49	9.90	15.51	35.56	30.00	1000	14.49
High	2462.0	4.24	1.49	9.89	15.62	36.48	30.00	1000	14.38

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

[Pre check]

	Data rate	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin	
	[Mbps]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	
	1	2437.0	4.12	1.49	9.90	**15.51**	35.56	30.00	1000	**14.49**	**Worst**
	2	2437.0	4.10	1.49	9.90	15.49	35.40	30.00	1000	14.51	
	5.5	2437.0	4.09	1.49	9.90	15.48	35.32	30.00	1000	14.52	
	11	2437.0	4.09	1.49	9.90	15.48	35.32	30.00	1000	14.52	

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

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Revised date : December 9, 2014

Maximum Conducted Output Power (Reference data)

(AVGPM)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 7, 2014	
Temperature / Humidity	23deg.C , 61%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11b, PN9,	worst data mode : 1 Mbps

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

Ch	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty Factor	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	2.06	1.49	9.90	0.01	13.46	22.18	30.00	1000	16.54
Mid	2437.0	2.10	1.49	9.90	0.01	13.50	22.39	30.00	1000	16.50
High	2462.0	2.23	1.49	9.89	0.01	13.62	23.01	30.00	1000	16.38

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

[Pre check]

	Data rate	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty Factor	Result		Limit		Margin	
	[Mbps]	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	
	1	2437.0	2.10	1.49	9.90	0.01	**13.50**	22.39	30.00	1000	**16.50**	**Worst**
	2	2437.0	2.05	1.49	9.90	0.01	13.45	22.13	30.00	1000	16.55	
	5.5	2437.0	2.04	1.49	9.90	0.04	13.47	22.23	30.00	1000	16.53	
	11	2437.0	2.02	1.49	9.90	0.07	13.48	22.28	30.00	1000	16.52	

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

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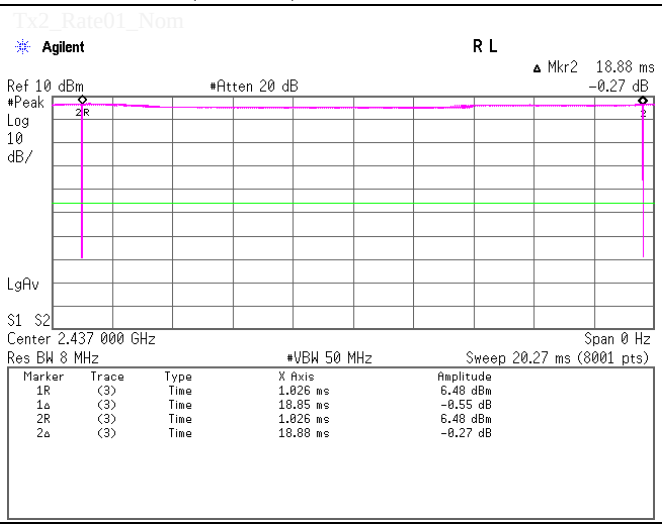
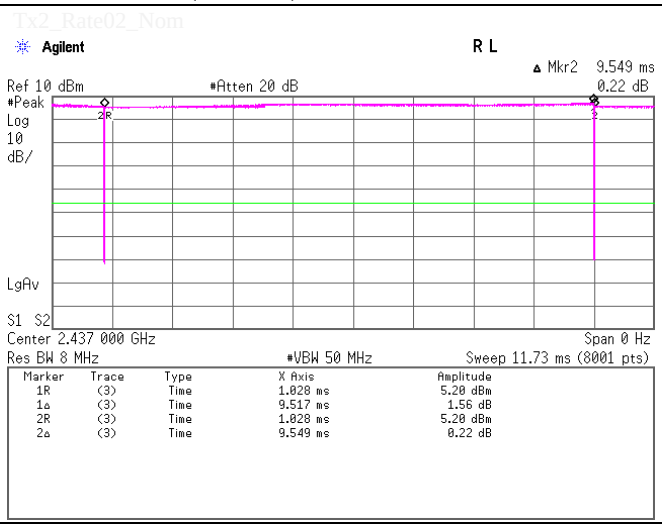
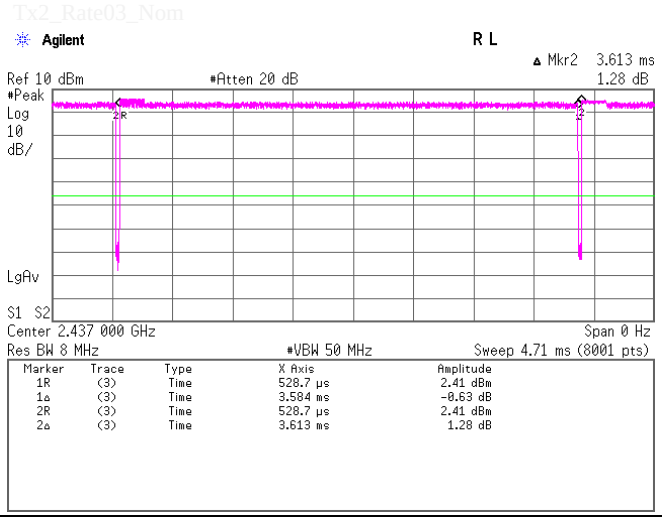
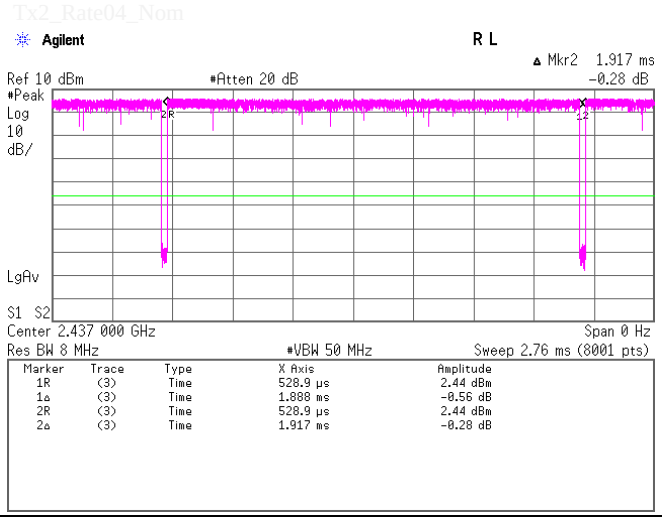
Duty Factor Caliculation chart for Maximum Conducted Output Power

1[Mbps]: Duty Factor =10*log(1/x)= 0.01 dB **x:Ton/(Ton+Toff)= 18.85 / 18.88**	**2[Mbps]: Duty Factor =10*log(1/x)= 0.01 dB** **x:Ton/(Ton+Toff)= 9.52 / 9.55**
	
5.5[Mbps]: Duty Factor =10*log(1/x)= 0.04 dB **x:Ton/(Ton+Toff)= 3.58 / 3.61**	**11[Mbps]: Duty Factor =10*log(1/x)= 0.07 dB** **x:Ton/(Ton+Toff)= 1.89 / 1.92**
	

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Revised date : December 9, 2014

Maximum Peak Conducted Output Power

(PKPM1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room	
Date	October 7, 2014		
Temperature / Humidity	23deg.C , 61%RH		
Engineer	Tatsuya Arai		
Mode	Tx, IEEE802.11g, PN9,	worst data mode :	6 Mbps

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

Ch	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	8.90	1.49	9.90	20.29	106.91	30.00	1000	9.71
Mid	2437.0	9.17	1.49	9.90	20.56	113.76	30.00	1000	9.44
High	2462.0	9.42	1.49	9.89	20.80	120.23	30.00	1000	9.20

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

[Pre check]

	Data rate	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin	
	[Mbps]	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	
	6	2437.0	9.17	1.49	9.90	**20.56**	113.76	30.00	1000	**9.44**	**Worst**
	9	2437.0	9.12	1.49	9.90	20.51	112.46	30.00	1000	9.49	
	12	2437.0	9.13	1.49	9.90	20.52	112.72	30.00	1000	9.48	
	18	2437.0	9.14	1.49	9.90	20.53	112.98	30.00	1000	9.47	
	24	2437.0	9.16	1.49	9.90	20.55	113.50	30.00	1000	9.45	
	36	2437.0	9.10	1.49	9.90	20.49	111.94	30.00	1000	9.51	
	48	2437.0	9.14	1.49	9.90	20.53	112.98	30.00	1000	9.47	
	54	2437.0	9.15	1.49	9.90	20.54	113.24	30.00	1000	9.46	

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

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Revised date : December 9, 2014

Maximum Conducted Output Power (Reference data)

(AVGPM)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 7, 2014	
Temperature / Humidity	23deg.C , 61%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11g, PN9,	worst data mode : 9 Mbps

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

Ch	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty Factor	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	0.35	1.49	9.90	0.07	11.81	15.17	30.00	1000	18.19
Mid	2437.0	0.39	1.49	9.90	0.07	11.85	15.31	30.00	1000	18.15
High	2462.0	0.50	1.49	9.89	0.07	11.95	15.67	30.00	1000	18.05

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

[Pre check]

	Data rate	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty Factor	Result		Limit		Margin	
	[Mbps]	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	
	6	2437.0	0.36	1.49	9.90	0.05	11.80	15.14	30.00	1000	18.20	
	9	2437.0	0.39	1.49	9.90	0.07	**11.85**	15.31	30.00	1000	**18.15**	**Worst**
	12	2437.0	0.28	1.49	9.90	0.10	11.77	15.03	30.00	1000	18.23	
	18	2437.0	0.30	1.49	9.90	0.14	11.83	15.24	30.00	1000	18.17	
	24	2437.0	0.18	1.49	9.90	0.19	11.76	15.00	30.00	1000	18.24	
	36	2437.0	0.15	1.49	9.90	0.27	11.81	15.17	30.00	1000	18.19	
	48	2437.0	0.04	1.49	9.90	0.35	11.78	15.07	30.00	1000	18.22	
	54	2437.0	-0.03	1.49	9.90	0.40	11.76	15.00	30.00	1000	18.24	

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

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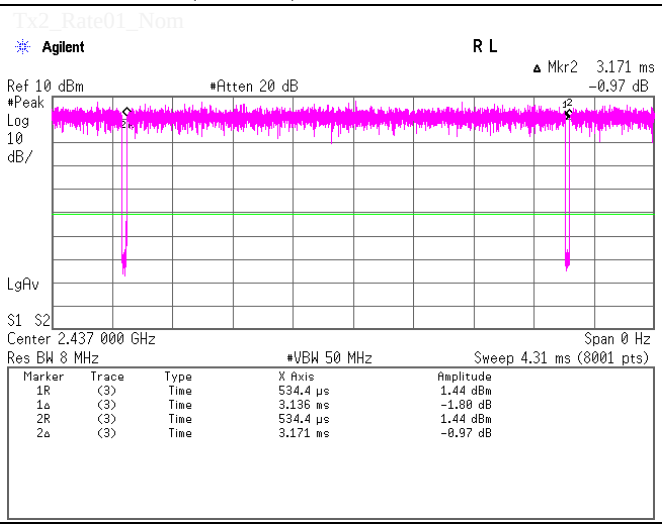
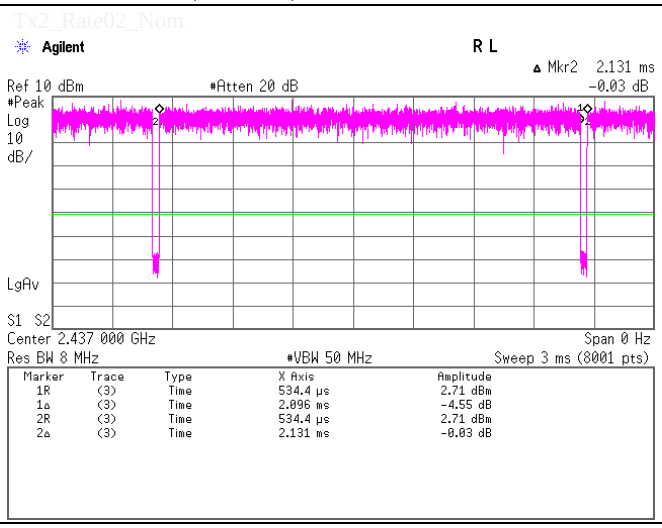
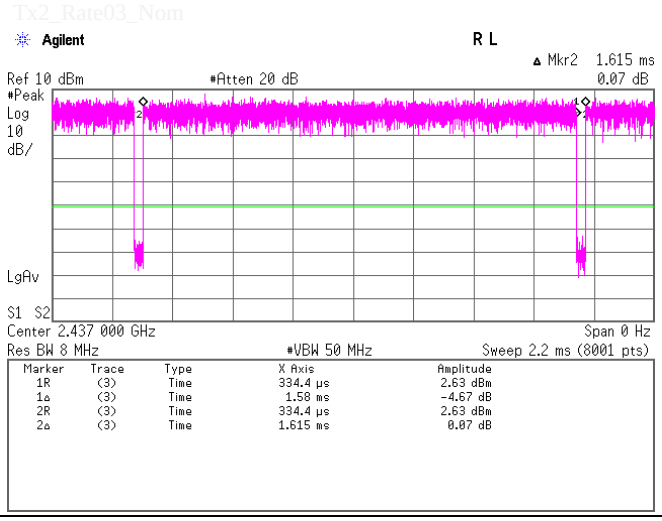
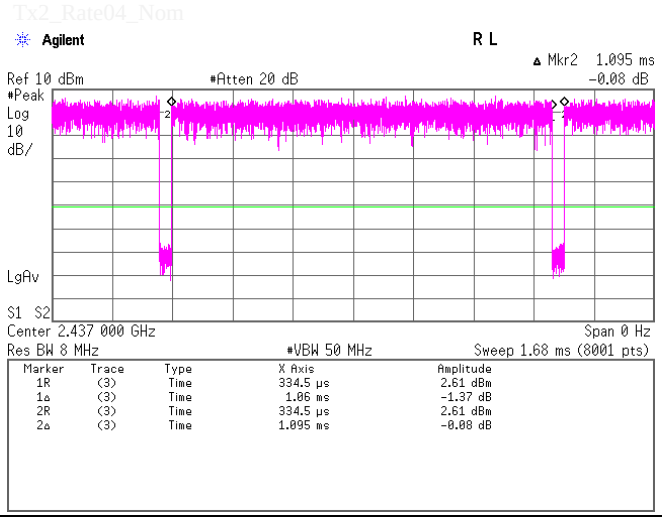
Duty Factor Caliculation chart for Maximum Conducted Output Power

6[Mbps]: Duty Factor =10*log(1/x)= 0.05 dB **x:Ton/(Ton+Toff)= 3.14 / 3.17**	**9[Mbps]: Duty Factor =10*log(1/x)= 0.07 dB** **x:Ton/(Ton+Toff)= 2.10 / 2.13**
	
12[Mbps]: Duty Factor =10*log(1/x)= 0.1 dB **x:Ton/(Ton+Toff)= 1.58 / 1.61**	**18[Mbps]: Duty Factor =10*log(1/x)= 0.14 dB** **x:Ton/(Ton+Toff)= 1.06 / 1.09**
	

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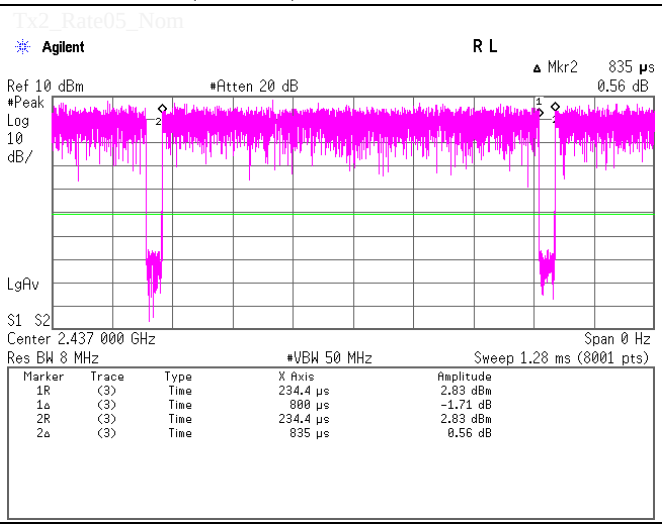
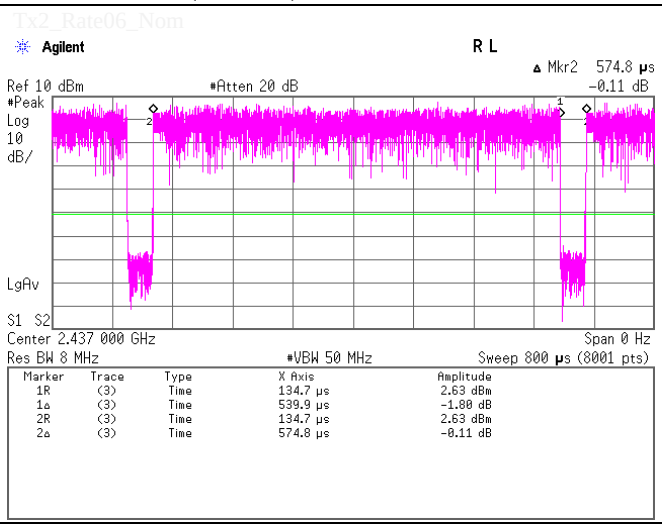
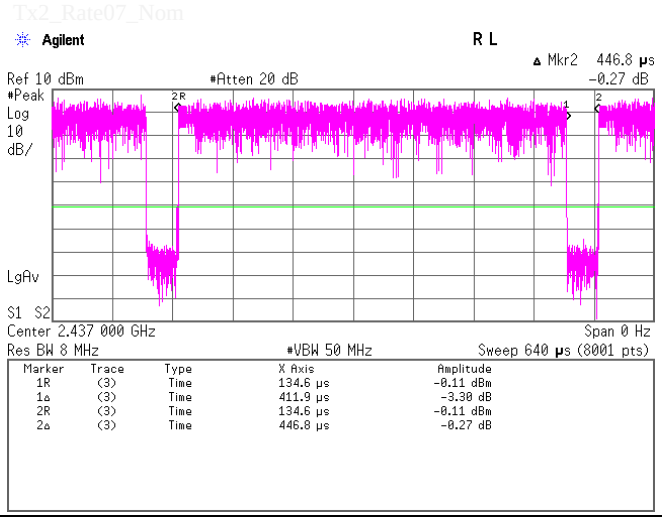
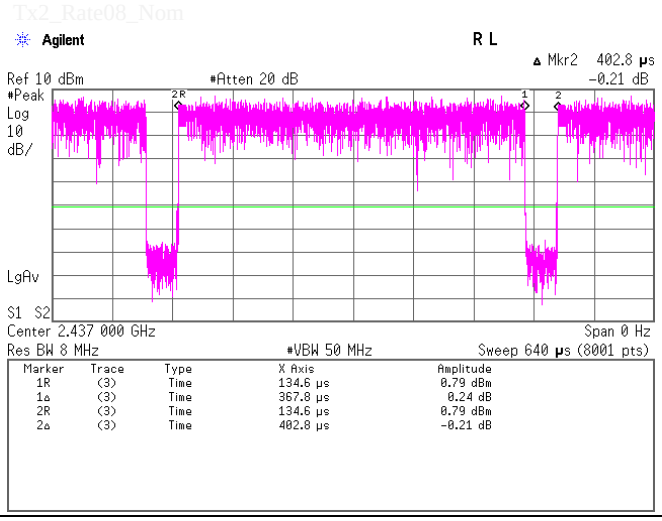
Duty Factor Caliculation chart for Maximum Conducted Output Power

24[Mbps]: Duty Factor =10*log(1/x)= 0.19 dB **x:Ton/(Ton+Toff)= 0.80 / 0.84**	**36[Mbps]: Duty Factor =10*log(1/x)= 0.27 dB** **x:Ton/(Ton+Toff)= 0.54 / 0.57**
	
48[Mbps]: Duty Factor =10*log(1/x)= 0.35 dB **x:Ton/(Ton+Toff)= 0.41 / 0.45**	**54[Mbps]: Duty Factor =10*log(1/x)= 0.4 dB** **x:Ton/(Ton+Toff)= 0.37 / 0.40**
	

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Revised date : December 9, 2014

Maximum Peak Conducted Output Power

(PKPM1)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room	
Date	October 7, 2014		
Temperature / Humidity	23deg.C , 61%RH		
Engineer	Tatsuya Arai		
Mode	Tx, IEEE802.11n HT20, PN9,	worst data mode :	0 (MCS)

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

Ch	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	8.91	1.49	9.90	20.30	107.15	30.00	1000	9.70
Mid	2437.0	9.24	1.49	9.90	20.63	115.61	30.00	1000	9.37
High	2462.0	9.33	1.49	9.89	20.71	117.76	30.00	1000	9.29

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

[Pre check]

	Mode	Freq.	P/M (Peak) Reading	Cable Loss	Atten. Loss	Result		Limit		Margin	
	(MCS)	[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	
	0	2437.0	9.24	1.49	9.90	**20.63**	115.61	30.00	1000	**9.37**	**Worst**
	1	2437.0	9.19	1.49	9.90	20.58	114.29	30.00	1000	9.42	
	2	2437.0	9.21	1.49	9.90	20.60	114.82	30.00	1000	9.40	
	3	2437.0	9.23	1.49	9.90	20.62	115.35	30.00	1000	9.38	
	4	2437.0	9.17	1.49	9.90	20.56	113.76	30.00	1000	9.44	
	5	2437.0	8.12	1.49	9.90	19.51	89.33	30.00	1000	10.49	
	6	2437.0	8.11	1.49	9.90	19.50	89.13	30.00	1000	10.50	
	7	2437.0	8.19	1.49	9.90	19.58	90.78	30.00	1000	10.42	

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

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Revised date : December 9, 2014

Maximum Conducted Output Power (Reference data)

(AVGPM)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room	
Date	October 7, 2014		
Temperature / Humidity	23deg.C , 61%RH		
Engineer	Tatsuya Arai		
Mode	Tx, IEEE802.11n HT20, PN9,	worst data mode :	0 (MCS)

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

Ch	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty Factor	Result		Limit		Margin
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	2412.0	0.25	1.49	9.90	0.05	11.69	14.76	30.00	1000	18.31
Mid	2437.0	0.31	1.49	9.90	0.05	11.75	14.96	30.00	1000	18.25
High	2462.0	0.46	1.49	9.89	0.05	11.89	15.45	30.00	1000	18.11

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

[Pre check]

	Mode	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty Factor	Result		Limit		Margin	
	(MCS)	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]	
	0	2437.0	0.31	1.49	9.90	0.05	**11.75**	14.96	30.00	1000	**18.25**	**Worst**
	1	2437.0	0.25	1.49	9.90	0.10	11.74	14.93	30.00	1000	18.26	
	2	2437.0	0.11	1.49	9.90	0.15	11.65	14.62	30.00	1000	18.35	
	3	2437.0	0.10	1.49	9.90	0.20	11.69	14.76	30.00	1000	18.31	
	4	2437.0	0.04	1.49	9.90	0.28	11.71	14.83	30.00	1000	18.29	
	5	2437.0	-1.75	1.49	9.90	0.37	10.01	10.02	30.00	1000	19.99	
	6	2437.0	-1.80	1.49	9.90	0.41	10.00	10.00	30.00	1000	20.00	
	7	2437.0	-1.92	1.49	9.90	0.45	9.92	9.82	30.00	1000	20.08	

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

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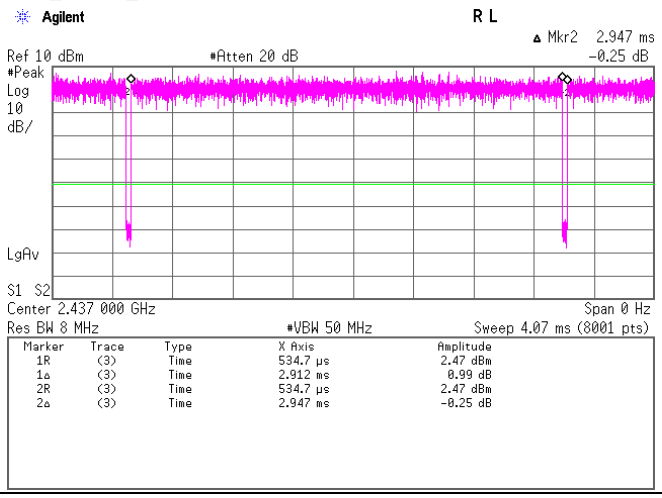
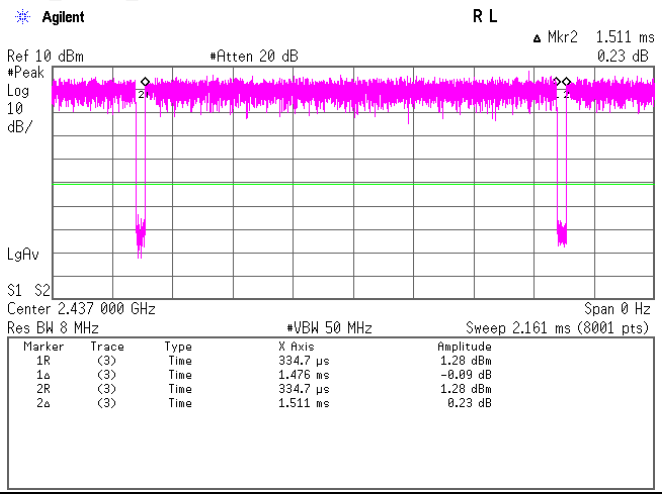
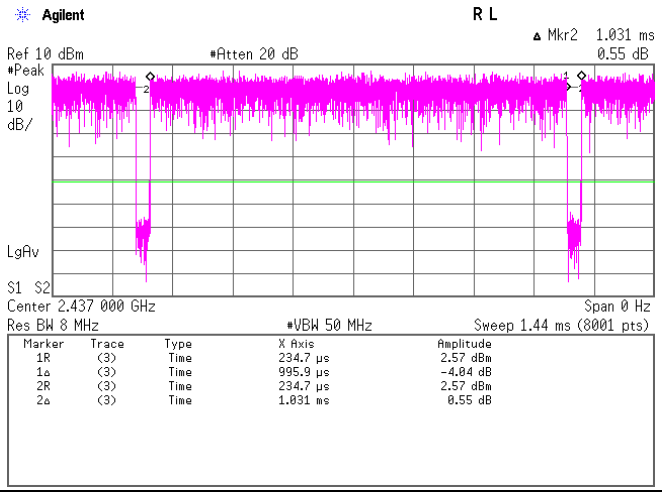
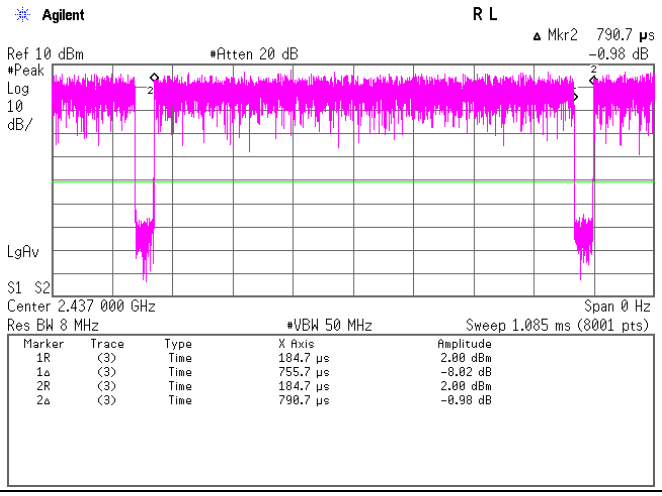
Duty Factor Caliculation chart for Maximum Conducted Output Power

0(MCS): Duty Factor =10*log(1/x)= 0.05 dB **x:Ton/(Ton+Toff)= 2.91 / 2.95**	**1(MCS): Duty Factor =10*log(1/x)= 0.1 dB** **x:Ton/(Ton+Toff)= 1.48 / 1.51**
Tx2_Rate01_Nom 	Tx2_Rate02_Nom 
2(MCS): Duty Factor =10*log(1/x)= 0.15 dB **x:Ton/(Ton+Toff)= 1.00 / 1.03**	**3(MCS): Duty Factor =10*log(1/x)= 0.2 dB** **x:Ton/(Ton+Toff)= 0.76 / 0.79**
Tx2_Rate03_Nom 	Tx2_Rate04_Nom 

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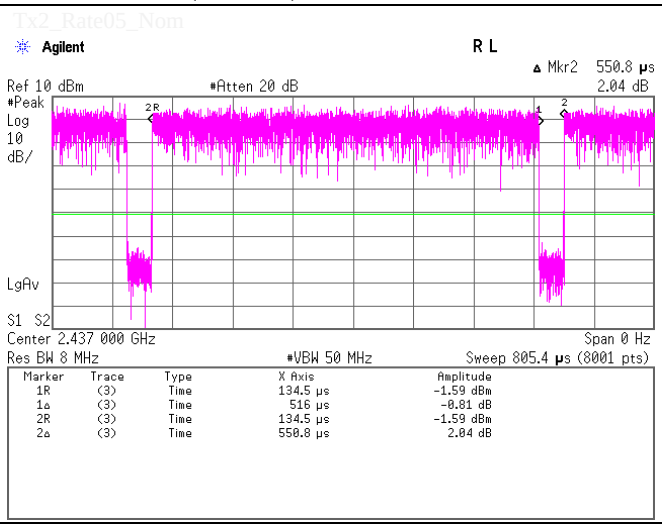
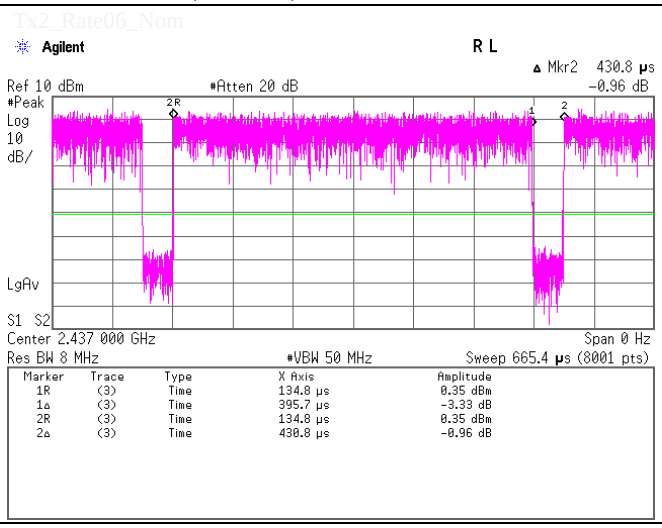
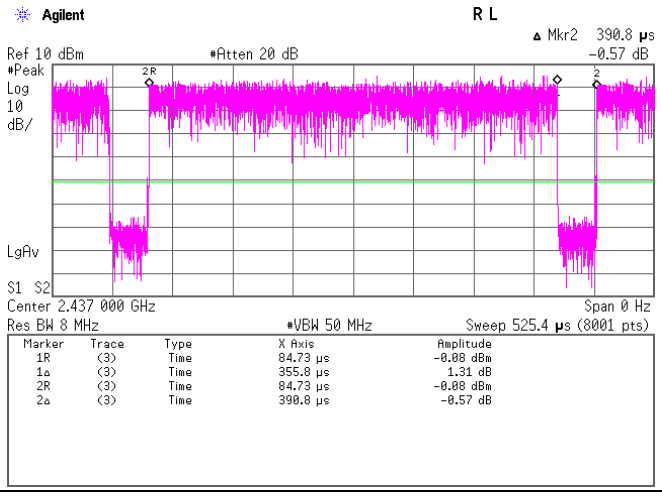
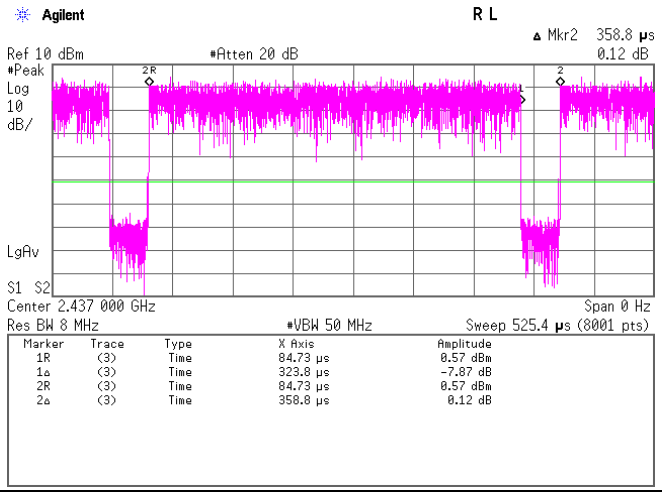
Duty Factor Caliculation chart for Maximum Conducted Output Power

4(MCS): Duty Factor =10*log(1/x)= 0.28 dB **x:Ton/(Ton+Toff)= 0.52 / 0.55**	**5(MCS): Duty Factor =10*log(1/x)= 0.37 dB** **x:Ton/(Ton+Toff)= 0.40 / 0.43**
	
6(MCS): Duty Factor =10*log(1/x)= 0.41 dB **x:Ton/(Ton+Toff)= 0.36 / 0.39**	**7(MCS): Duty Factor =10*log(1/x)= 0.45 dB** **x:Ton/(Ton+Toff)= 0.32 / 0.36**
	

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Radiated Emission

Test place	No.3 Semi Anechoic Chamber	
Date	October 28, 2014	October 29, 2014
Temperature / Humidity	22 deg.C, 45 %RH	23 deg.C, 37 %RH
Engineer	Akio Hayashi	Akio Hayashi
Mode	Tx, 2412 MHz	
	Tx, IEEE802.11b	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2390.000	PK	59.8	26.4	13.6	41.1	58.7	73.9	15.2	133	319	
Hori.	4824.000	PK	45.6	30.7	6.0	39.8	42.5	73.9	31.4	144	232	
Hori.	5551.004	PK	47.8	31.7	6.3	38.8	47.0	73.9	26.9	100	174	
Hori.	7236.000	PK	44.7	36.7	7.1	40.2	48.3	73.9	25.6	100	0	
Hori.	9648.000	PK	44.5	38.5	8.3	40.1	51.2	73.9	22.7	100	0	
Hori.	12060.000	PK	44.6	39.5	9.3	39.6	53.8	73.9	20.1	100	0	
Hori.	2390.000	AV	38.1	26.4	13.6	41.1	37.0	53.9	16.9	133	319	
Hori.	4824.000	AV	37.8	30.7	6.0	39.8	34.7	53.9	19.2	144	232	
Hori.	5551.004	AV	42.7	31.7	6.3	38.8	41.9	53.9	12.0	100	174	
Hori.	7236.000	AV	36.0	36.7	7.1	40.2	39.6	53.9	14.3	100	0	
Hori.	9648.000	AV	34.9	38.5	8.3	40.1	41.6	53.9	12.3	100	0	
Hori.	12060.000	AV	35.6	39.5	9.3	39.6	44.8	53.9	9.1	100	0	
Vert.	2390.000	PK	65.5	26.4	13.6	41.1	64.4	73.9	9.5	128	357	
Vert.	4824.000	PK	47.4	30.7	6.0	39.8	44.3	73.9	29.6	100	330	
Vert.	5550.991	PK	49.9	31.7	6.3	38.8	49.1	73.9	24.8	100	350	
Vert.	7236.000	PK	44.6	36.7	7.1	40.2	48.2	73.9	25.7	100	0	
Vert.	9648.000	PK	45.3	38.5	8.3	40.1	52.0	73.9	21.9	100	0	
Vert.	12060.000	PK	44.6	39.5	9.3	39.6	53.8	73.9	20.1	100	0	
Vert.	2390.000	AV	41.2	26.4	13.6	41.1	40.1	53.9	13.8	128	357	
Vert.	4824.000	AV	42.1	30.7	6.0	39.8	39.0	53.9	14.9	100	330	
Vert.	5550.991	AV	45.1	31.7	6.3	38.8	44.3	53.9	9.6	100	350	
Vert.	7236.000	AV	35.9	36.7	7.1	40.2	39.5	53.9	14.4	100	0	
Vert.	9648.000	AV	35.0	38.5	8.3	40.1	41.7	53.9	12.2	100	0	
Vert.	12060.000	AV	35.8	39.5	9.3	39.6	45.0	53.9	**8.9**	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
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]	Remark
Hori.	2412.000	PK	91.2	26.4	13.6	41.1	90.1	-	-	Carrier
Hori.	2400.000	PK	48.2	26.4	13.6	41.1	47.1	70.1	23.0	
Vert.	2412.000	PK	97.3	26.4	13.6	41.1	96.2	-	-	Carrier
Vert.	2400.000	PK	54.2	26.4	13.6	41.1	53.1	76.2	23.1	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
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	October 28, 2014	October 29, 2014
Temperature / Humidity	22 deg.C, 45 %RH	23 deg.C, 37 %RH
Engineer	Akio Hayashi	Akio Hayashi
Mode	Tx, 2437 MHz	
	Tx, IEEE802.11b	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	1194.223	PK	61.2	24.1	12.4	40.9	56.8	73.9	17.1	154	147	
Hori.	4874.000	PK	47.0	30.9	6.0	39.7	44.2	73.9	29.7	107	75	
Hori.	7311.000	PK	45.3	36.8	7.1	40.3	48.9	73.9	25.0	100	0	
Hori.	9748.000	PK	45.1	38.6	8.1	40.0	51.8	73.9	22.1	100	0	
Hori.	12185.000	PK	44.3	39.4	9.4	39.8	53.3	73.9	20.6	100	0	
Hori.	1194.223	AV	45.3	24.1	12.4	40.9	40.9	53.9	13.0	154	147	
Hori.	4874.000	AV	39.3	30.9	6.0	39.7	36.5	53.9	17.4	107	75	
Hori.	7311.000	AV	36.5	36.8	7.1	40.3	40.1	53.9	13.8	100	0	
Hori.	9748.000	AV	35.2	38.6	8.1	40.0	41.9	53.9	12.0	100	0	
Hori.	12185.000	AV	35.6	39.4	9.4	39.8	44.6	53.9	9.3	100	0	
Vert.	1196.258	PK	66.4	24.1	12.4	40.9	62.0	73.9	11.9	120	144	
Vert.	4874.000	PK	46.6	30.9	6.0	39.7	43.8	73.9	30.1	123	346	
Vert.	7311.000	PK	45.8	36.8	7.1	40.3	49.4	73.9	24.5	100	0	
Vert.	9748.000	PK	45.3	38.6	8.1	40.0	52.0	73.9	21.9	100	0	
Vert.	12185.000	PK	46.0	39.4	9.4	39.8	55.0	73.9	18.9	100	0	
Vert.	1196.258	AV	49.7	24.1	12.4	40.9	45.3	53.9	**8.6**	120	144	
Vert.	4874.000	AV	41.0	30.9	6.0	39.7	38.2	53.9	15.7	123	346	
Vert.	7311.000	AV	36.4	36.8	7.1	40.3	40.0	53.9	13.9	100	0	
Vert.	9748.000	AV	35.0	38.6	8.1	40.0	41.7	53.9	12.2	100	0	
Vert.	12185.000	AV	35.7	39.4	9.4	39.8	44.7	53.9	9.2	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
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	October 28, 2014	October 29, 2014
Temperature / Humidity	22 deg.C, 45 %RH	23 deg.C, 37 %RH
Engineer	Akio Hayashi	Akio Hayashi
Mode	Tx, 2462 MHz	
	Tx, IEEE802.11b	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	2483.500	PK	61.8	26.6	13.6	41.1	60.9	73.9	13.0	100	231	
Hori.	4924.000	PK	45.7	31.1	5.9	39.6	43.1	73.9	30.8	100	142	
Hori.	5551.051	PK	49.9	31.7	6.3	38.8	49.1	73.9	24.8	100	195	
Hori.	7386.000	PK	44.9	36.9	7.2	40.4	48.6	73.9	25.3	100	0	
Hori.	9848.000	PK	44.7	38.6	8.1	39.9	51.5	73.9	22.4	100	0	
Hori.	12310.000	PK	44.7	39.3	9.4	39.9	53.5	73.9	20.4	100	0	
Hori.	2483.500	AV	39.5	26.6	13.6	41.1	38.6	53.9	15.3	100	231	
Hori.	4924.000	AV	39.0	31.1	5.9	39.6	36.4	53.9	17.5	100	142	
Hori.	5551.051	AV	45.6	31.7	6.3	38.8	44.8	53.9	**9.1**	100	195	
Hori.	7386.000	AV	36.5	36.9	7.2	40.4	40.2	53.9	13.7	100	0	
Hori.	9848.000	AV	35.5	38.6	8.1	39.9	42.3	53.9	11.6	100	0	
Hori.	12310.000	AV	35.7	39.3	9.4	39.9	44.5	53.9	9.4	100	0	
Vert.	2483.500	PK	65.7	26.6	13.6	41.1	64.8	73.9	**9.1**	100	291	
Vert.	4924.000	PK	46.7	31.1	5.9	39.6	44.1	73.9	29.8	190	316	
Vert.	5551.000	PK	49.3	31.7	6.3	38.8	48.5	73.9	25.4	100	173	
Vert.	7386.000	PK	45.4	36.9	7.2	40.4	49.1	73.9	24.8	100	0	
Vert.	9848.000	PK	45.7	38.6	8.1	39.9	52.5	73.9	21.4	100	0	
Vert.	12310.000	PK	45.2	39.3	9.4	39.9	54.0	73.9	19.9	100	0	
Vert.	2483.500	AV	41.7	26.6	13.6	41.1	40.8	53.9	13.1	100	291	
Vert.	4924.000	AV	39.4	31.1	5.9	39.6	36.8	53.9	17.1	190	316	
Vert.	5551.000	AV	45.3	31.7	6.3	38.8	44.5	53.9	9.4	100	173	
Vert.	7386.000	AV	36.9	36.9	7.2	40.4	40.6	53.9	13.3	100	0	
Vert.	9848.000	AV	35.4	38.6	8.1	39.9	42.2	53.9	11.7	100	0	
Vert.	12310.000	AV	35.9	39.3	9.4	39.9	44.7	53.9	9.2	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
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	October 28, 2014	October 29, 2014
Temperature / Humidity	22 deg.C, 45 %RH	23 deg.C, 37 %RH
Engineer	Akio Hayashi	Akio Hayashi
Mode	Tx, 2412 MHz	
	Tx, IEEE802.11g	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	1199.360	PK	62.8	24.1	12.4	40.9	58.4	73.9	15.5	100	209	
Hori.	2390.000	PK	56.1	26.4	13.6	41.1	55.0	73.9	18.9	100	232	
Hori.	4824.000	PK	45.2	30.7	6.0	39.8	42.1	73.9	31.8	100	77	
Hori.	7236.000	PK	45.1	36.7	7.1	40.2	48.7	73.9	25.2	100	0	
Hori.	9648.000	PK	44.7	38.5	8.3	40.1	51.4	73.9	22.5	100	0	
Hori.	12060.000	PK	45.8	39.5	9.3	39.6	55.0	73.9	18.9	100	0	
Hori.	1199.360	AV	45.8	24.1	12.4	40.9	41.4	53.9	12.5	100	209	
Hori.	2390.000	AV	41.5	26.4	13.6	41.1	40.4	53.9	13.5	100	232	
Hori.	4824.000	AV	35.6	30.7	6.0	39.8	32.5	53.9	21.4	100	77	
Hori.	7236.000	AV	36.1	36.7	7.1	40.2	39.7	53.9	14.2	100	0	
Hori.	9648.000	AV	35.2	38.5	8.3	40.1	41.9	53.9	12.0	100	0	
Hori.	12060.000	AV	36.0	39.5	9.3	39.6	45.2	53.9	8.7	100	0	
Vert.	1198.172	PK	60.9	24.1	12.4	40.9	56.5	73.9	17.4	100	359	
Vert.	2390.000	PK	63.2	26.4	13.6	41.1	62.1	73.9	11.8	133	359	
Vert.	4824.000	PK	44.8	30.7	6.0	39.8	41.7	73.9	32.2	100	145	
Vert.	7236.000	PK	46.4	36.7	7.1	40.2	50.0	73.9	23.9	100	0	
Vert.	9648.000	PK	44.6	38.5	8.3	40.1	51.3	73.9	22.6	100	0	
Vert.	12060.000	PK	45.3	39.5	9.3	39.6	54.5	73.9	19.4	100	0	
Vert.	1198.172	AV	42.3	24.1	12.4	40.9	37.9	53.9	16.0	100	359	
Vert.	2390.000	AV	46.8	26.4	13.6	41.1	45.7	53.9	**8.2**	133	359	
Vert.	4824.000	AV	35.7	30.7	6.0	39.8	32.6	53.9	21.3	100	145	
Vert.	7236.000	AV	36.0	36.7	7.1	40.2	39.6	53.9	14.3	100	0	
Vert.	9648.000	AV	35.5	38.5	8.3	40.1	42.2	53.9	11.7	100	0	
Vert.	12060.000	AV	35.9	39.5	9.3	39.6	45.1	53.9	8.8	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
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]	Remark
Hori.	2412.000	PK	87.3	26.4	13.6	41.1	86.2	-	-	Carrier
Hori.	2400.000	PK	54.2	26.4	13.6	41.1	53.1	66.2	13.1	
Vert.	2412.000	PK	94.3	26.4	13.6	41.1	93.2	-	-	Carrier
Vert.	2400.000	PK	61.8	26.4	13.6	41.1	60.7	73.2	12.5	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
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	October 28, 2014	October 29, 2014
Temperature / Humidity	22 deg.C, 45 %RH	23 deg.C, 37 %RH
Engineer	Akio Hayashi	Akio Hayashi
Mode	Tx, 2437 MHz	
	Tx, IEEE802.11g	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	1197.137	PK	63.3	24.1	12.4	40.9	58.9	73.9	15.0	100	210	
Hori.	4874.000	PK	45.1	30.9	6.0	39.7	42.3	73.9	31.6	100	359	
Hori.	7311.000	PK	46.2	36.8	7.1	40.3	49.8	73.9	24.1	100	0	
Hori.	9748.000	PK	44.3	38.6	8.1	40.0	51.0	73.9	22.9	100	0	
Hori.	12185.000	PK	45.0	39.4	9.4	39.8	54.0	73.9	19.9	100	0	
Hori.	1197.137	AV	46.0	24.1	12.4	40.9	41.6	53.9	12.3	100	210	
Hori.	4874.000	AV	35.5	30.9	6.0	39.7	32.7	53.9	21.2	100	359	
Hori.	7311.000	AV	36.4	36.8	7.1	40.3	40.0	53.9	13.9	100	0	
Hori.	9748.000	AV	35.2	38.6	8.1	40.0	41.9	53.9	12.0	100	0	
Hori.	12185.000	AV	35.8	39.4	9.4	39.8	44.8	53.9	9.1	100	0	
Vert.	1196.220	PK	60.0	24.1	12.4	40.9	55.6	73.9	18.3	231	0	
Vert.	4874.000	PK	44.9	30.9	6.0	39.7	42.1	73.9	31.8	100	359	
Vert.	7311.000	PK	46.3	36.8	7.1	40.3	49.9	73.9	24.0	100	0	
Vert.	9748.000	PK	44.4	38.6	8.1	40.0	51.1	73.9	22.8	100	0	
Vert.	12185.000	PK	45.1	39.4	9.4	39.8	54.1	73.9	19.8	100	0	
Vert.	1196.220	AV	42.0	24.1	12.4	40.9	37.6	53.9	16.3	231	0	
Vert.	4874.000	AV	35.7	30.9	6.0	39.7	32.9	53.9	21.0	100	359	
Vert.	7311.000	AV	36.7	36.8	7.1	40.3	40.3	53.9	13.6	100	0	
Vert.	9748.000	AV	35.3	38.6	8.1	40.0	42.0	53.9	11.9	100	0	
Vert.	12185.000	AV	35.9	39.4	9.4	39.8	44.9	53.9	**9.0**	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
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	October 28, 2014	October 29, 2014
Temperature / Humidity	22 deg.C, 45 %RH	23 deg.C, 37 %RH
Engineer	Akio Hayashi	Akio Hayashi
Mode	Tx, 2462 MHz	
	Tx, IEEE802.11g	

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg]	Remark
Hori.	55.500	QP	39.9	9.3	6.6	32.2	23.6	40.0	16.4	400	284	
Hori.	219.081	QP	38.4	16.7	8.0	32.0	31.1	46.0	14.9	156	130	
Hori.	481.079	QP	43.4	17.1	9.2	32.1	37.6	46.0	**8.4**	100	352	
Hori.	518.089	QP	39.9	17.5	9.3	32.1	34.6	46.0	11.4	100	13	
Hori.	1195.974	PK	62.3	24.1	12.4	40.9	57.9	73.9	16.0	100	211	
Hori.	2483.500	PK	57.5	26.6	13.6	41.1	56.6	73.9	17.3	107	240	
Hori.	4924.000	PK	44.6	31.1	5.9	39.6	42.0	73.9	31.9	100	359	
Hori.	7386.000	PK	45.4	36.9	7.2	40.4	49.1	73.9	24.8	100	0	
Hori.	9848.000	PK	45.0	38.6	8.1	39.9	51.8	73.9	22.1	100	0	
Hori.	12310.000	PK	45.6	39.3	9.4	39.9	54.4	73.9	19.5	100	0	
Hori.	1195.974	AV	44.0	24.1	12.4	40.9	39.6	53.9	14.3	100	211	
Hori.	2483.500	AV	42.4	26.6	13.6	41.1	41.5	53.9	12.4	107	240	
Hori.	4924.000	AV	36.0	31.1	5.9	39.6	33.4	53.9	20.5	100	359	
Hori.	7386.000	AV	36.7	36.9	7.2	40.4	40.4	53.9	13.5	100	0	
Hori.	9848.000	AV	35.8	38.6	8.1	39.9	42.6	53.9	11.3	100	0	
Hori.	12310.000	AV	35.7	39.3	9.4	39.9	44.5	53.9	9.4	100	0	
Vert.	55.190	QP	33.9	9.4	6.7	32.2	17.8	40.0	22.2	100	89	
Vert.	481.095	QP	40.8	17.1	9.2	32.1	35.0	46.0	11.0	154	275	
Vert.	592.099	QP	41.5	18.5	9.6	32.1	37.5	46.0	8.5	100	207	
Vert.	1196.947	PK	57.8	24.1	12.4	40.9	53.4	73.9	20.5	100	2	
Vert.	2483.500	PK	62.4	26.6	13.6	41.1	61.5	73.9	12.4	100	290	
Vert.	4924.000	PK	44.9	31.1	5.9	39.6	42.3	73.9	31.6	100	359	
Vert.	7386.000	PK	44.9	36.9	7.2	40.4	48.6	73.9	25.3	100	0	
Vert.	9848.000	PK	44.8	38.6	8.1	39.9	51.6	73.9	22.3	100	0	
Vert.	12310.000	PK	45.0	39.3	9.4	39.9	53.8	73.9	20.1	100	0	
Vert.	1196.947	AV	42.1	24.1	12.4	40.9	37.7	53.9	16.2	100	2	
Vert.	2483.500	AV	44.6	26.6	13.6	41.1	43.7	53.9	10.2	100	290	
Vert.	4924.000	AV	35.9	31.1	5.9	39.6	33.3	53.9	20.6	100	359	
Vert.	7386.000	AV	36.4	36.9	7.2	40.4	40.1	53.9	13.8	100	0	
Vert.	9848.000	AV	35.7	38.6	8.1	39.9	42.5	53.9	11.4	100	0	
Vert.	12310.000	AV	36.0	39.3	9.4	39.9	44.8	53.9	9.1	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
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	October 28, 2014	October 29, 2014
Temperature / Humidity	22 deg.C, 45 %RH	23 deg.C, 37 %RH
Engineer	Akio Hayashi	Akio Hayashi
Mode	Tx, 2412 MHz	
	Tx, IEEE802.11n HT20	

(* 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.	1196.518	PK	61.4	24.1	12.4	40.9	57.0	73.9	16.9	163	216	
Hori.	2390.000	PK	57.0	26.4	13.6	41.1	55.9	73.9	18.0	100	359	
Hori.	4824.000	PK	44.3	30.7	6.0	39.8	41.2	73.9	32.7	100	0	
Hori.	7236.000	PK	44.8	36.7	7.1	40.2	48.4	73.9	25.5	100	0	
Hori.	9648.000	PK	44.7	38.5	8.3	40.1	51.4	73.9	22.5	100	0	
Hori.	12060.000	PK	45.1	39.5	9.3	39.6	54.3	73.9	19.6	100	0	
Hori.	1196.518	AV	44.6	24.1	12.4	40.9	40.2	53.9	13.7	163	216	
Hori.	2390.000	AV	41.6	26.4	13.6	41.1	40.5	53.9	13.4	100	359	
Hori.	4824.000	AV	35.8	30.7	6.0	39.8	32.7	53.9	21.2	100	0	
Hori.	7236.000	AV	36.1	36.7	7.1	40.2	39.7	53.9	14.2	100	0	
Hori.	9648.000	AV	35.3	38.5	8.3	40.1	42.0	53.9	11.9	100	0	
Hori.	12060.000	AV	35.7	39.5	9.3	39.6	44.9	53.9	9.0	100	0	
Vert.	1193.983	PK	59.5	24.1	12.4	40.9	55.1	73.9	18.8	100	3	
Vert.	2390.000	PK	65.4	26.4	13.6	41.1	64.3	73.9	9.6	128	359	
Vert.	4824.000	PK	44.9	30.7	6.0	39.8	41.8	73.9	32.1	100	345	
Vert.	7236.000	PK	45.6	36.7	7.1	40.2	49.2	73.9	24.7	100	0	
Vert.	9648.000	PK	45.0	38.5	8.3	40.1	51.7	73.9	22.2	100	0	
Vert.	12060.000	PK	45.5	39.5	9.3	39.6	54.7	73.9	19.2	100	0	
Vert.	1193.983	AV	42.6	24.1	12.4	40.9	38.2	53.9	15.7	100	3	
Vert.	2390.000	AV	48.8	26.4	13.6	41.1	47.7	53.9	**6.2**	128	359	
Vert.	4824.000	AV	35.9	30.7	6.0	39.8	32.8	53.9	21.1	100	345	
Vert.	7236.000	AV	36.2	36.7	7.1	40.2	39.8	53.9	14.1	100	0	
Vert.	9648.000	AV	35.3	38.5	8.3	40.1	42.0	53.9	11.9	100	0	
Vert.	12060.000	AV	35.6	39.5	9.3	39.6	44.8	53.9	9.1	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
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]	Remark
Hori.	2412.000	PK	86.5	26.4	13.6	41.1	85.4	-	-	Carrier
Hori.	2400.000	PK	53.3	26.4	13.6	41.1	52.2	65.4	13.2	
Vert.	2412.000	PK	94.7	26.4	13.6	41.1	93.6	-	-	Carrier
Vert.	2400.000	PK	62.8	26.4	13.6	41.1	61.7	73.6	11.9	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
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	October 28, 2014	October 29, 2014
Temperature / Humidity	22 deg.C, 45 %RH	23 deg.C, 37 %RH
Engineer	Akio Hayashi	Akio Hayashi
Mode	Tx, 2437 MHz	
	Tx, IEEE802.11n HT20	

(* 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.	1198.067	PK	61.5	24.1	12.4	40.9	57.1	73.9	16.8	100	213	
Hori.	4874.000	PK	44.1	30.9	6.0	39.7	41.3	73.9	32.6	100	289	
Hori.	7311.000	PK	45.5	36.8	7.1	40.3	49.1	73.9	24.8	100	0	
Hori.	9748.000	PK	44.1	38.6	8.1	40.0	50.8	73.9	23.1	100	0	
Hori.	12185.000	PK	45.8	39.4	9.4	39.8	54.8	73.9	19.1	100	0	
Hori.	1198.067	AV	43.9	24.1	12.4	40.9	39.5	53.9	14.4	100	213	
Hori.	4874.000	AV	35.4	30.9	6.0	39.7	32.6	53.9	21.3	100	289	
Hori.	7311.000	AV	36.3	36.8	7.1	40.3	39.9	53.9	14.0	100	0	
Hori.	9748.000	AV	35.5	38.6	8.1	40.0	42.2	53.9	11.7	100	0	
Hori.	12185.000	AV	36.0	39.4	9.4	39.8	45.0	53.9	**8.9**	100	0	
Vert.	1196.824	PK	59.1	24.1	12.4	40.9	54.7	73.9	19.2	100	3	
Vert.	4874.000	PK	43.7	30.9	6.0	39.7	40.9	73.9	33.0	100	355	
Vert.	7311.000	PK	46.1	36.8	7.1	40.3	49.7	73.9	24.2	100	0	
Vert.	9748.000	PK	44.7	38.6	8.1	40.0	51.4	73.9	22.5	100	0	
Vert.	12185.000	PK	45.3	39.4	9.4	39.8	54.3	73.9	19.6	100	0	
Vert.	1196.824	AV	42.9	24.1	12.4	40.9	38.5	53.9	15.4	100	3	
Vert.	4874.000	AV	35.0	30.9	6.0	39.7	32.2	53.9	21.7	100	355	
Vert.	7311.000	AV	36.5	36.8	7.1	40.3	40.1	53.9	13.8	100	0	
Vert.	9748.000	AV	35.3	38.6	8.1	40.0	42.0	53.9	11.9	100	0	
Vert.	12185.000	AV	36.0	39.4	9.4	39.8	45.0	53.9	**8.9**	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
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	October 28, 2014	October 29, 2014
Temperature / Humidity	22 deg.C, 45 %RH	23 deg.C, 37 %RH
Engineer	Akio Hayashi	Akio Hayashi
Mode	Tx, 2462 MHz	
	Tx, IEEE802.11n HT20	

(* 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.	1197.249	PK	61.5	24.1	12.4	40.9	57.1	73.9	16.8	157	212	
Hori.	2483.500	PK	58.5	26.6	13.6	41.1	57.6	73.9	16.3	103	241	
Hori.	4924.000	PK	44.4	31.1	5.9	39.6	41.8	73.9	32.1	100	252	
Hori.	7386.000	PK	45.9	36.9	7.2	40.4	49.6	73.9	24.3	100	0	
Hori.	9848.000	PK	44.8	38.6	8.1	39.9	51.6	73.9	22.3	100	0	
Hori.	12310.000	PK	44.9	39.3	9.4	39.9	53.7	73.9	20.2	100	0	
Hori.	1197.249	AV	43.8	24.1	12.4	40.9	39.4	53.9	14.5	157	212	
Hori.	2483.500	AV	42.0	26.6	13.6	41.1	41.1	53.9	12.8	103	241	
Hori.	4924.000	AV	35.7	31.1	5.9	39.6	33.1	53.9	20.8	100	252	
Hori.	7386.000	AV	36.5	36.9	7.2	40.4	40.2	53.9	13.7	100	0	
Hori.	9848.000	AV	35.4	38.6	8.1	39.9	42.2	53.9	11.7	100	0	
Hori.	12310.000	AV	36.0	39.3	9.4	39.9	44.8	53.9	**9.1**	100	0	
Vert.	1197.819	PK	60.2	24.1	12.4	40.9	55.8	73.9	18.1	130	138	
Vert.	2483.500	PK	62.4	26.6	13.6	41.1	61.5	73.9	12.4	104	289	
Vert.	4924.000	PK	44.9	31.1	5.9	39.6	42.3	73.9	31.6	100	302	
Vert.	7386.000	PK	46.6	36.9	7.2	40.4	50.3	73.9	23.6	100	0	
Vert.	9848.000	PK	44.5	38.6	8.1	39.9	51.3	73.9	22.6	100	0	
Vert.	12310.000	PK	46.3	39.3	9.4	39.9	55.1	73.9	18.8	100	0	
Vert.	1197.819	AV	44.9	24.1	12.4	40.9	40.5	53.9	13.4	130	138	
Vert.	2483.500	AV	44.8	26.6	13.6	41.1	43.9	53.9	10.0	104	289	
Vert.	4924.000	AV	35.6	31.1	5.9	39.6	33.0	53.9	20.9	100	302	
Vert.	7386.000	AV	36.5	36.9	7.2	40.4	40.2	53.9	13.7	100	0	
Vert.	9848.000	AV	35.5	38.6	8.1	39.9	42.3	53.9	11.6	100	0	
Vert.	12310.000	AV	35.8	39.3	9.4	39.9	44.6	53.9	9.3	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)
Distance factor : 15GHz -40GHz : 20log(3.0m/1.0m)= 9.5dB

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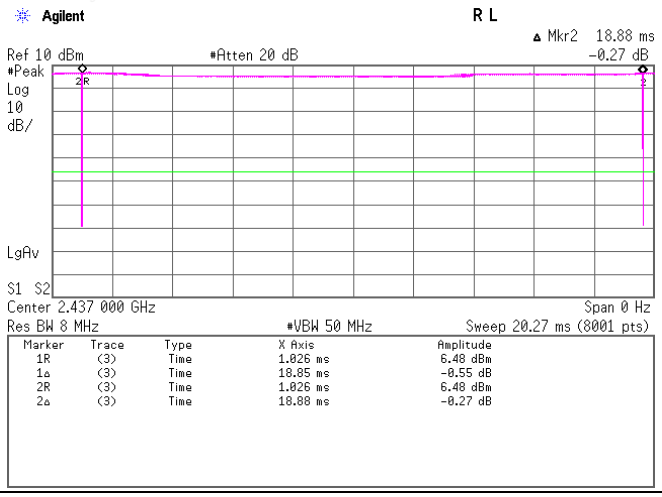
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 7, 2014	
Temperature / Humidity	23deg.C , 61%RH	
Engineer	Tatsuya Arai	

Burst rate confirmation

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

duty cycle = 18.85 / 18.88 = 0.998 (99.8%)	
1x2_duty1	1x2_duty2



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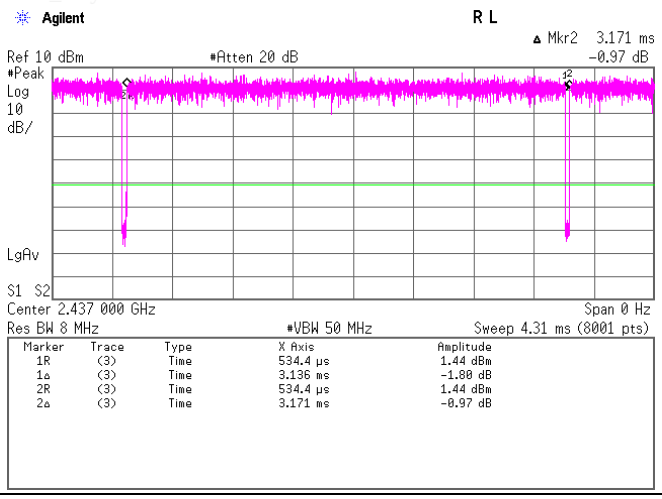
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 7, 2014	
Temperature / Humidity	23deg.C , 61%RH	
Engineer	Tatsuya Arai	

Burst rate confirmation

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

duty cycle = 3.136 / 3.171 = 0.989 (98.9%)	
1x2_duty1	1x2_duty2



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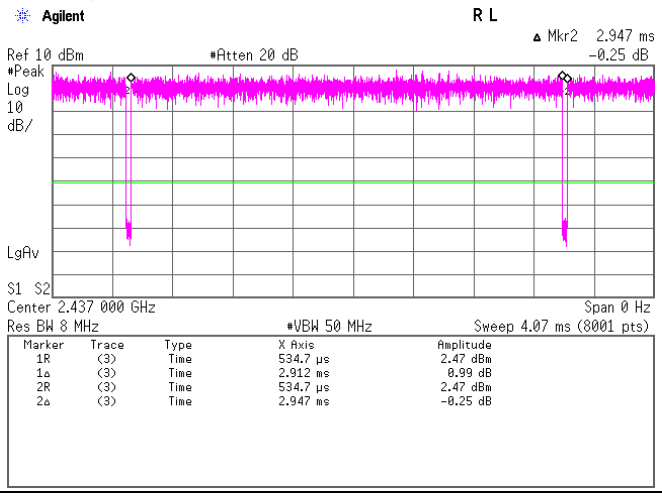
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 7, 2014	
Temperature / Humidity	23deg.C , 61%RH	
Engineer	Tatsuya Arai	

Burst rate confirmation

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

duty cycle = 2.912 / 2.947 = 0.988 (98.8%)	
1x2_duty1	1x2_duty2



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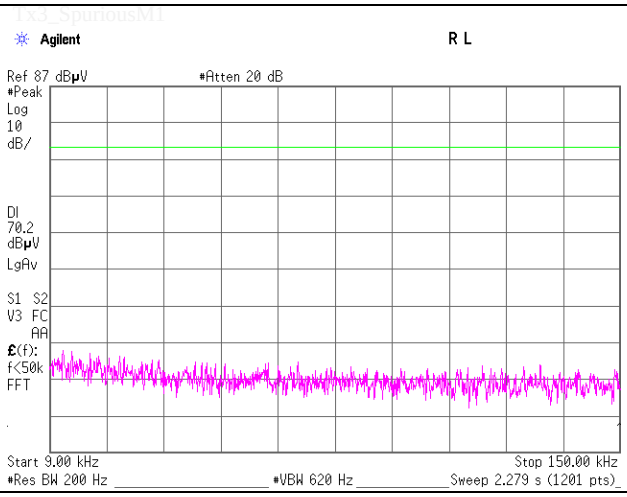
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 7, 2014	
Temperature / Humidity	23deg.C , 61%RH	
Engineer	Tatsuya Arai	

Spurious emission (Conducted)

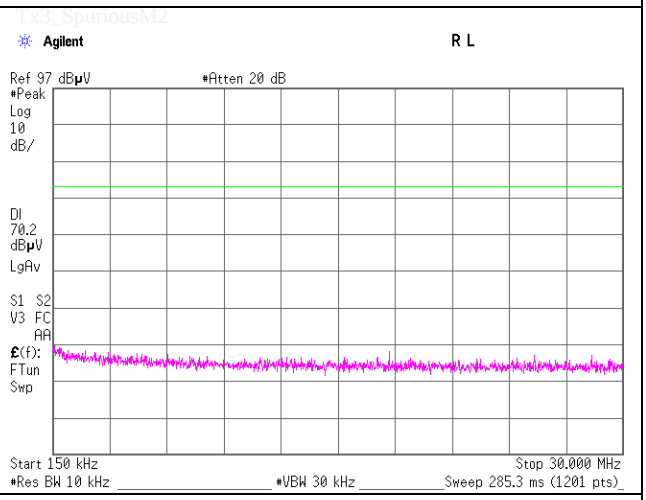
Tx, IEEE802.11g, PN9, worst data mode 6Mbps

Tx, 2462MHz (below 30MHz)

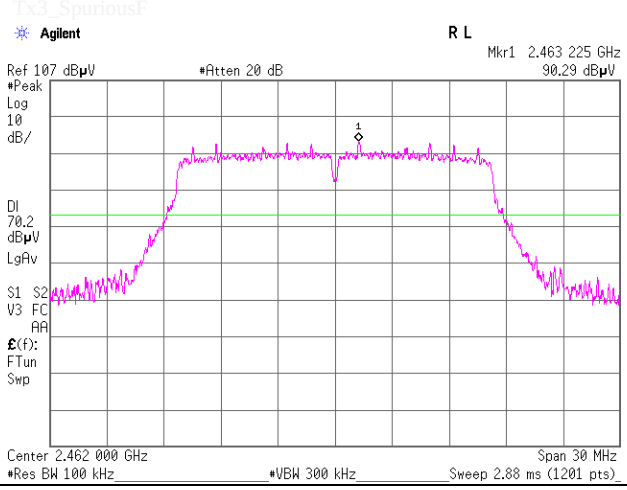
9kHz - 150kHz



150kHz - 30MHz



Carrier, 20dBc Limit



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Maximum Power Spectral Density

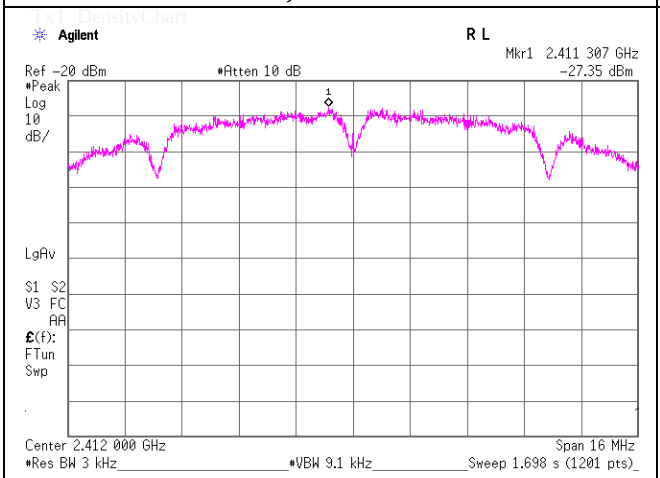
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 7, 2014	
Temperature / Humidity	23deg.C , 61%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11b, PN9, worst data mode 1Mbps	

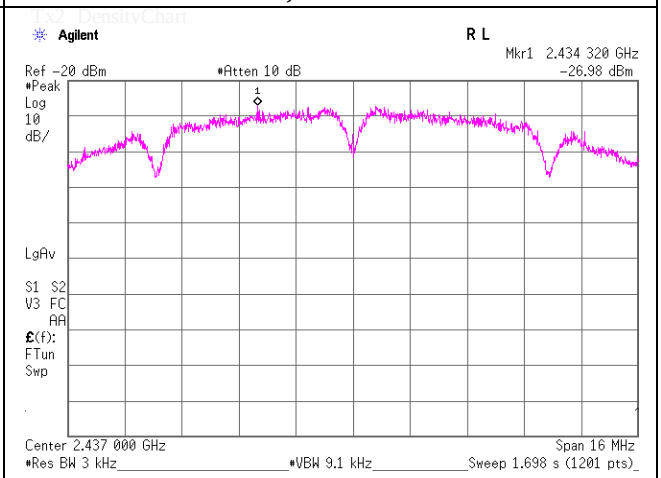
Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2411.31	-27.35	1.49	9.90	-15.96	8.00	23.96
2437.0000	2434.32	-26.98	1.49	9.90	-15.59	8.00	23.59
2462.0000	2460.49	-26.09	1.49	9.89	-14.71	8.00	22.71

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

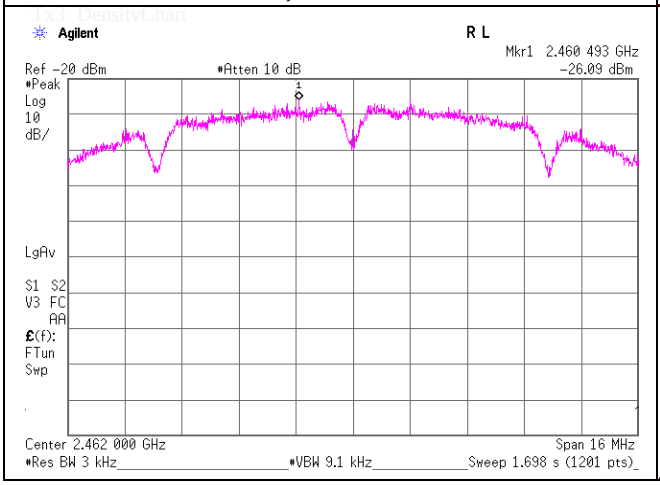
Tx, 2412MHz

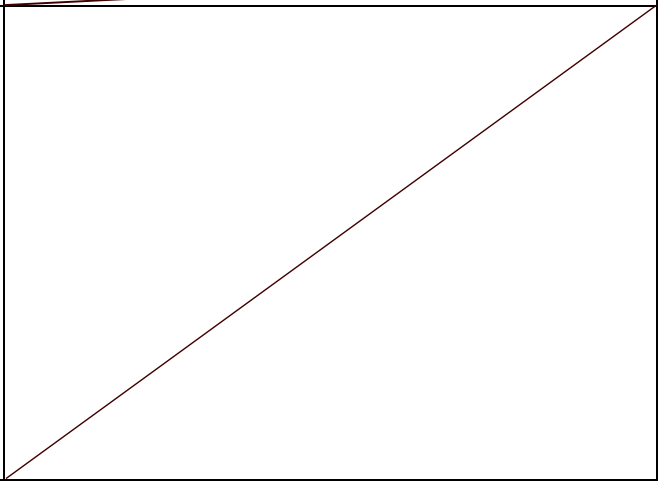


Tx, 2437MHz



Tx, 2462MHz





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Maximum Power Spectral Density

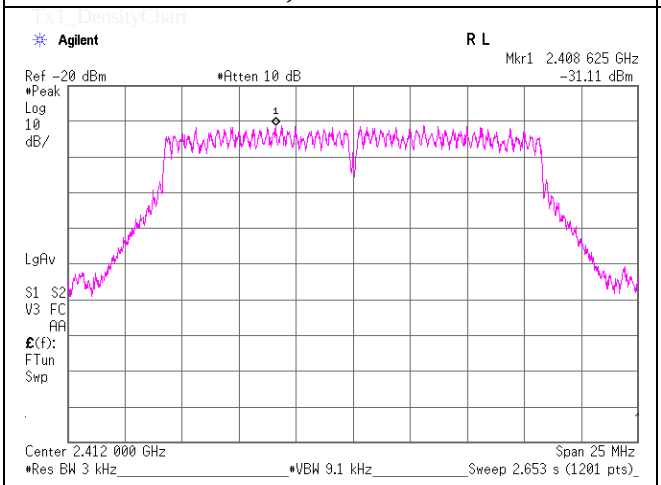
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 7, 2014	
Temperature / Humidity	23deg.C , 61%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11g, PN9, worst data mode 6Mbps	

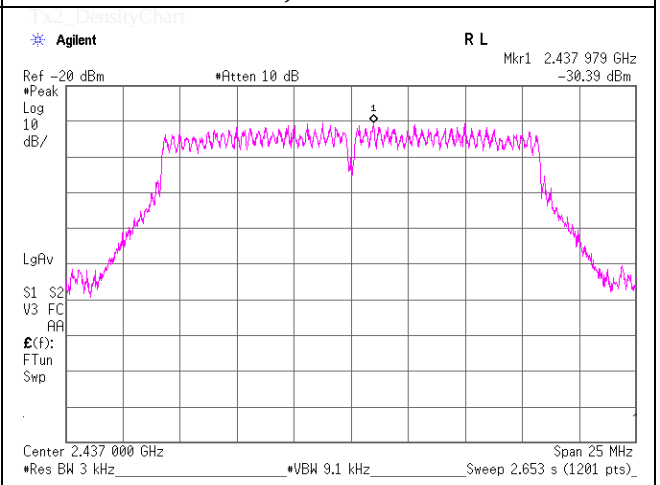
Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2408.63	-31.11	1.49	9.90	-19.72	8.00	27.72
2437.0000	2437.98	-30.39	1.49	9.90	-19.00	8.00	27.00
2462.0000	2458.88	-29.93	1.49	9.89	-18.55	8.00	26.55

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

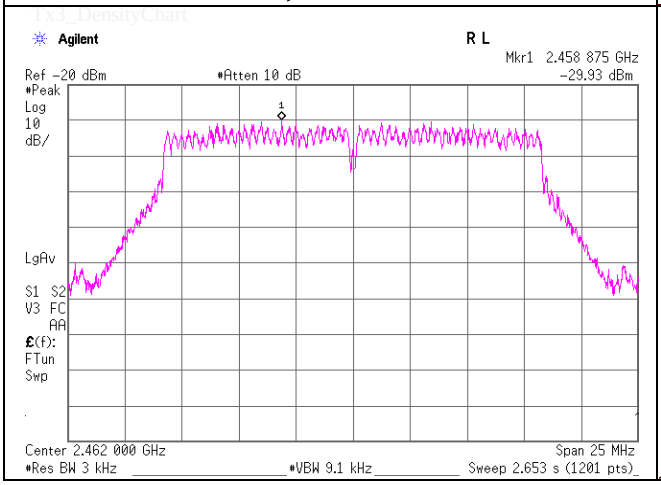
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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Maximum Power Spectral Density

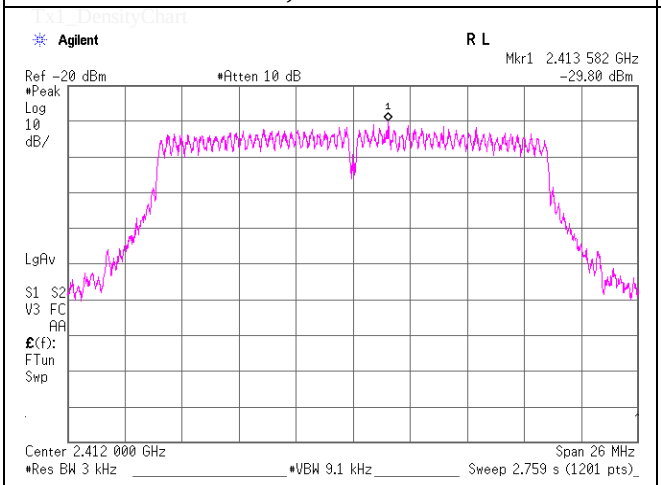
(PKPSD)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 7, 2014	
Temperature / Humidity	23deg.C , 61%RH	
Engineer	Tatsuya Arai	
Mode	Tx, IEEE802.11n HT20, PN9, worst data mode 0(MCS)	

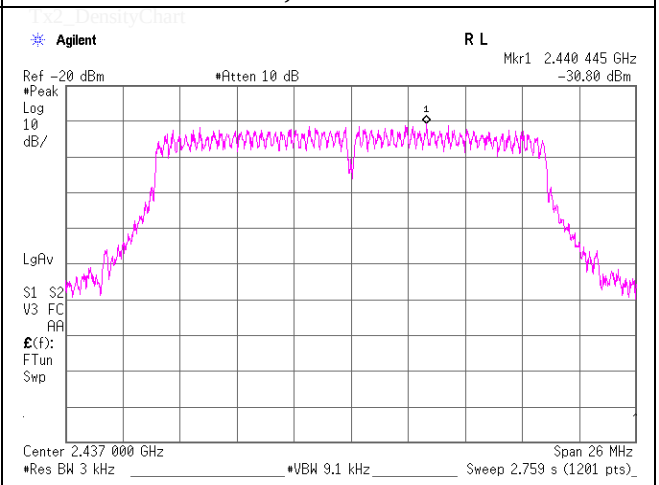
Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2412.0000	2413.58	-29.80	1.49	9.90	-18.41	8.00	26.41
2437.0000	2440.45	-30.80	1.49	9.90	-19.41	8.00	27.41
2462.0000	2458.23	-27.28	1.49	9.89	-15.90	8.00	23.90

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

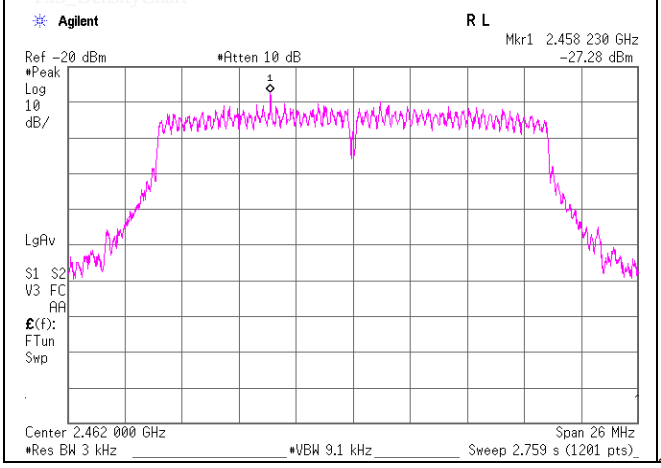
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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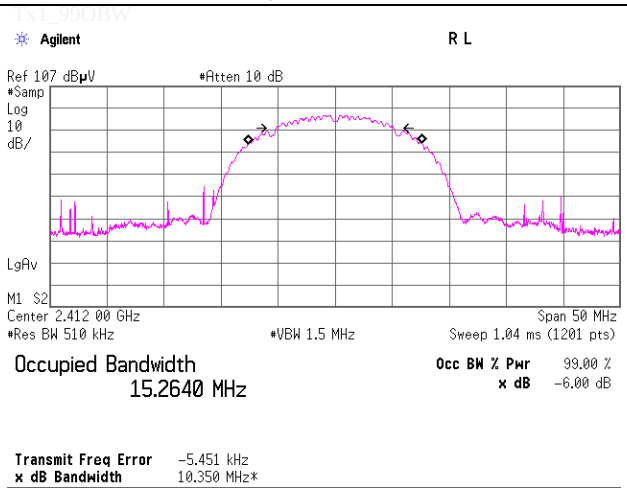
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 7, 2014	
Temperature / Humidity	23deg.C , 61%RH	
Engineer	Tatsuya Arai	

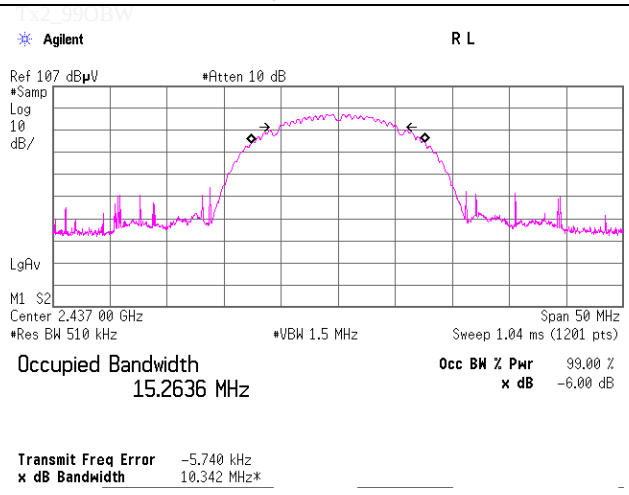
99% Occupied Bandwidth

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

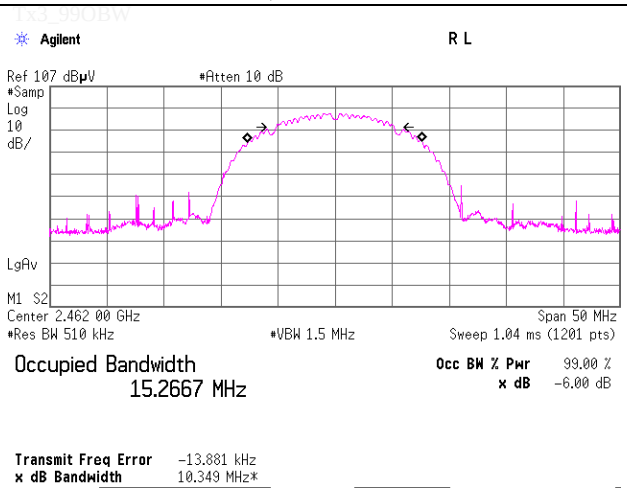
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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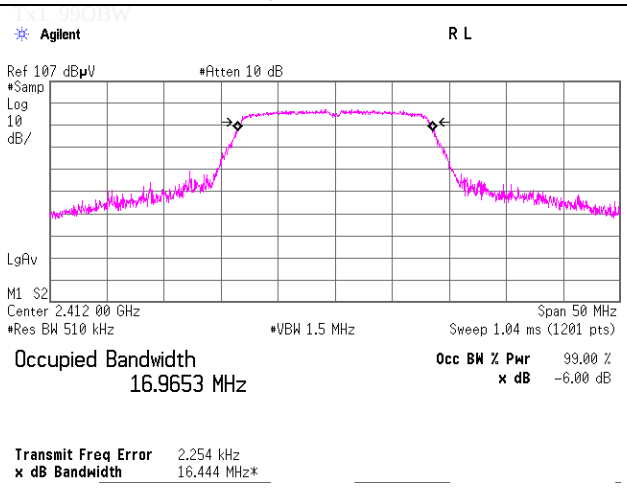
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 7, 2014	
Temperature / Humidity	23deg.C , 61%RH	
Engineer	Tatsuya Arai	

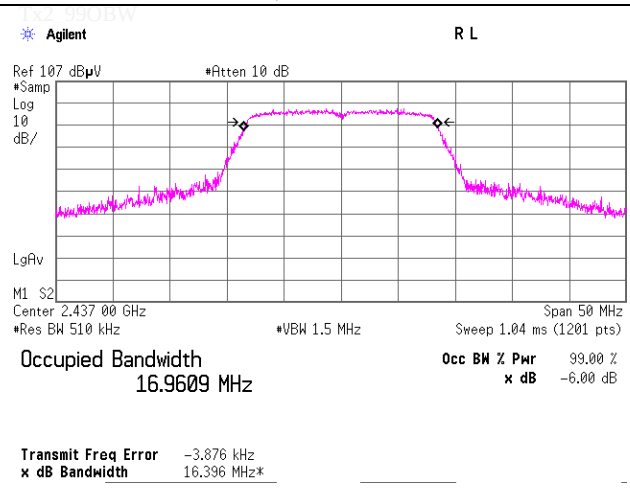
99% Occupied Bandwidth

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

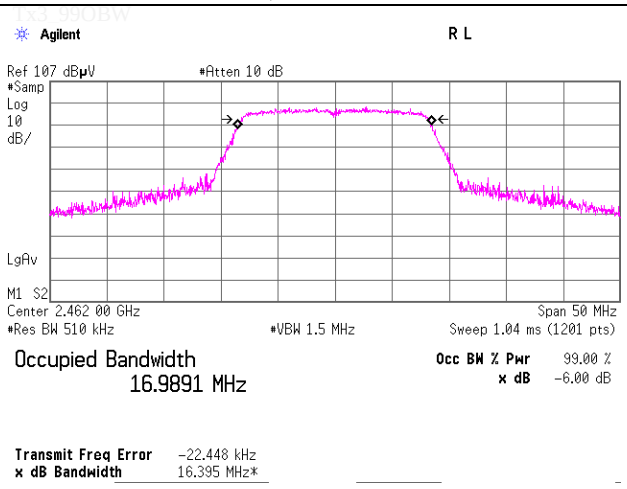
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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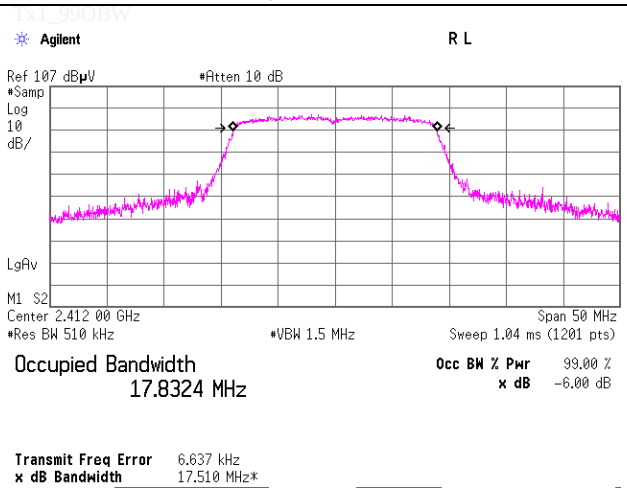
Test place	UL Japan, Inc. Shonan EMC Lab.	No.1 Measurement Room
Date	October 7, 2014	
Temperature / Humidity	23deg.C , 61%RH	
Engineer	Tatsuya Arai	

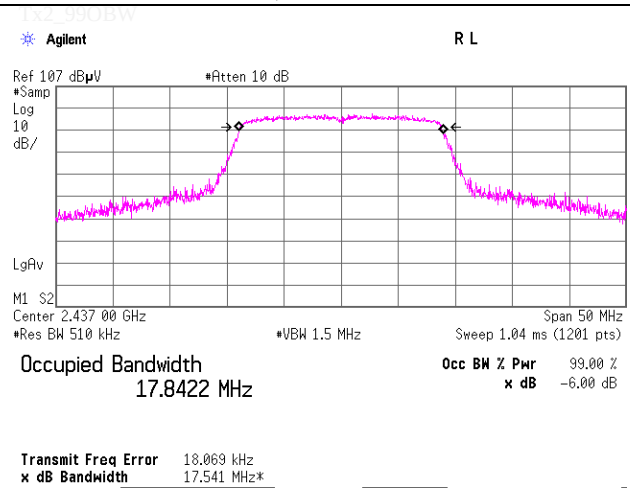
99% Occupied Bandwidth

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

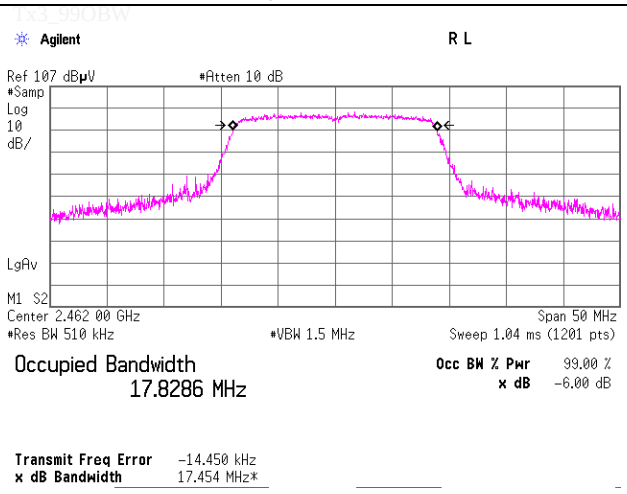
Tx, 2412MHz



Tx, 2437MHz



Tx, 2462MHz



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APPENDIX 2
Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SSA-02	Spectrum Analyzer	Agilent	E4448A	MY48250106	AT	2014/03/17 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2014/04/08 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2014/04/08 * 12
SAT10-11	Attenuator	Weinschel Corp.	54A-10	37588	AT	2014/04/22 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	2014/03/13 * 12
SOS-13	Humidity Indicator	Custom	CTH-202	Q.C.17	AT	2014/04/22 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2014/07/14 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2014/05/23 * 12
SCC-G04	Coaxial Cable	Junkosha	J12J102207-00	JUN-12-14-018	RE	2014/06/24 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2014/05/15 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2014/08/12 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2014/02/21 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	RE	2014/03/04 * 12
SJM-15	Measure	ASKUL	-	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE	-
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE	2013/11/22 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2013/11/22 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2014/02/14 * 12
SAT6-06	Attenuator	JFW	50HF-006N	-	RE	2014/02/17 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2014/10/18 * 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	2014/04/25 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2014/10/18 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE	2014/03/04 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2014/03/15 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2014/03/14 * 12
SCC-G15	Coaxial Cable	Suhner	SUCOFLEX 102	32703/2	RE	2014/03/13 * 12

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

All equipment is calibrated with valid calibrations . Each measurement data is traceable to the national or international standards .
Test Item :
RE: Out of Band Emission (Radiated)
AT: Antenna terminal conducted test