RADIO TEST REPORT

Test Report No.: 10068267S-I

Applicant	:	**Hitachi Maxell, Ltd.**
Type of Equipment	:	**Wireless Display Module**
Model No.	:	**WHD0070-D103**
FCC ID	:	**2ABS4-WHD0070**
Test regulation	:	**FCC Part15 Subpart E: 2013**
Test result	:	**Complied**

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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: November 19, 2013 to January 31, 2014

Tested by:
S. Takano
Shinichi Takano
Engineer of WiSE Japan,
UL Verification Service

Approved by :
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UL Verification Service

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

RTL02610

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REVISION HISTORY

Original Test Report No.: 10068267S-I

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10068267S-I	February 19, 2014	-	-
1	10068267S-I	February 28, 2014	38,41,50	Addition of description (Duty factor)

Contents

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SECTION 1: Customer information

Company Name	:	Hitachi Maxell, Ltd.
Address	:	292 Yoshida-cho, Totsuka-ku, Yokohama-shi, Kanagawa, 244-0817 Japan
Telephone Number	:	+81 50 3152 1784
Facsimile Number	:	+81 45 866 5936
Contact Person	:	Hiroyuki Urata

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

2.1 Identification of E.U.T.

Type of Equipment	:	Wireless Display Module
Model Number	:	WHD0070-D103
Serial Number	:	Refer to 4.2 in this report.
Rating	:	DC5V
Country of Mass-production	:	China
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Receipt Date of Sample	:	November 5, 2013
Modification of EUT	:	No modification by the test lab.

2.2 Product description

Model: WHD0070-D103 (referred to as the EUT in this report) is a Wireless Display Module.

Clock frequency(ies) in the system : 19.2MHz, 20MHz

Radio specification:

Equipment type	:	Transceiver	
Frequency of operation *1)	:	2.4GHz:	2412-2462MHz (IEEE 802.11b, 11g, 11n (HT20))
			2422-2452MHz (IEEE 802.11n (HT40))
		5GHz (W52):	5180-5240MHz (IEEE 802.11a, 11n (HT20))
			5190-5230MHz (IEEE 802.11n (HT40))
		5GHz (W58):	5745-5825MHz (IEEE 802.11a, 11n (HT20))
			5755-5795MHz (IEEE 802.11n (HT40))
Bandwidth	:	20MHz (IEEE 802.11a/b/g/n), 40MHz (IEEE 802.11n)	
Channel spacing	:	5MHz (2.4GHz), 20MHz (IEEE 802.11a, 11n (HT20, 5GHz)), 40MHz (IEEE 802.11n (HT40, 5GHz))	
Type of modulation	:	DSSS, OFDM	
Antenna type *2)	:	PCB Antenna	
Antenna connector type	:	U.FL	
ITU code	:	D1D, G1D	
Operation temperature range	:	0 to +40 deg.C	

*1) Refer to the test report 10068267S-H for FCC 15.247.
* The EUT does not perform simultaneous transmission of 2.4GHz and 5GHz Wireless LAN.

*2) The EUT has 3-type of antenna. One of the antennas is connected to the product.

No.	Antenna Brand	Antenna model	Antenna type	2.4G gain (dBi)	5G gain (dBi)	Cable length (mm)	Remark
1	Hitachi	WHD0070-A300	PIFA	0.49	1.77	300	-
2	Hitachi	WHD0070-A400	PIFA	0.34	1.09	400	-
3	Hitachi	WHD0070-A500	PIFA	-0.76	1.09	500	-

The testing has been performed using WHD0070-A300 which has the highest antenna gain.

FCC 15.31 (e) / 212
The RF Module has its own regulator. The RF Module is constantly provided voltage (DC3.3V, DC1.2V, DC1.8V) through the regulator regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC 15.203 / 212
The EUT has a unique coupling/antenna connector (U.FL). Therefore the equipment complies with the requirement.

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart E: 2013,
final revised on September 30, 2013 and effective October 30, 2013
Title : FCC 47CFR Part15 Radio Frequency Device Subpart E Unlicensed National Information Infrastructure Devices
Section 15.207 Conducted limits
Section 15.209 Radiated emission limits, general requirements
Section 15.407 General technical requirements

3.2 Procedures & Results

Item	Test Procedure *1)	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.4:2009 7. AC powerline conducted emission measurements	FCC 15.407 (b)(6) & 15.207	-	N/A	28.0dB Freq.: 0.34671MHz Detection: QP Phase: N Mode: Tx 5180MHz, IEEE 802.11n (HT20), CDD	Complied
26dB & 20dB emission bandwidth	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.407 (a)(1)(2)(3) FCC 15.215 (c)	Conducted	N/A	See data	-
Maximum conducted output power	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.407 (a)(1)(2)(3)	Conducted	N/A		Complied
Peak power spectral density	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.407 (a)(1)(2)(3)	Conducted	N/A		Complied
Peak excursion ratio	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.407 (a)(6)	Conducted	N/A		Complied
Spurious emission & Restricted band edges	ANSI C63.4:2009 13. Measurement of intentional radiators	FCC 15.109, 15.407 (b), 15.205 & 15.209	Radiated	N/A	1.3dB Freq.: 5150.000 MHz Detector: Average Polarization: Horizontal Mode: Tx 5190MHz, IEEE 802.11n (HT40), CDD	Complied
Dynamic frequency selection	FCC 06-96 APPENDIX	FCC 15.407 (h)	Conducted	N/A *2)	N/A	N/A

*1) These tests were also referred to KDB 789033 (FCC), "Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E".
*2) The test is not applicable since the EUT does not operate in the 5.25-5.35 GHz and 5.47-5.725 GHz bands.
Note: UL Japan's Work Procedures No. 13-EM-W0420 and 13-EM-W0422

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.

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	4.8 dB	5.0 dB	4.8 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	5.6 dB	5.6 dB
	18GHz-40GHz	5.2 dB	4.3 dB	4.3 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 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: (±) 1.6dB
Spurious emission (Conducted) measurement (1G-3GHz) uncertainty for this test was: (±) 1.4dB
Spurious emission (Conducted) measurement (3G-18GHz) uncertainty for this test was: (±) 2.8dB
Spurious emission (Conducted) measurement (18G-26.5GHz) uncertainty for this test was: (±) 2.5dB
Spurious emission (Conducted) measurement (26.5-50GHz) uncertainty for this test was: (±) 2.7dB
Bandwidth measurement uncertainty for this test was: (±) 5.4%

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
☐ No.1 semi-anechoic chamber	697847	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☒ No.2 semi-anechoic chamber	697847	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
☒ No.3 semi-anechoic chamber	697847	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
☐ No.4 semi-anechoic chamber	-	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
☐ No.1 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
☐ No.2 shielded room	-	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
☒ No.3 shielded room	-	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
☐ No.4 shielded room	-	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
☒ No.5 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
☐ No.6 shielded room	-	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
☐ No.7 shielded room	-	-	2.76 x 3.76 x 2.4	2.76 x 3.76	-
☐ 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)
Conducted emission Radiated emission (below 1GHz) *2)	Transmitting IEEE 802.11 (HT20), CDD *4)	5180MHz	PN9, MCS0
Radiated emission (above 1GHz) *5)	Transmitting IEEE 802.11a	5180MHz, 5220MHz, 5240MHz	PN9, 18Mbps
	Transmitting IEEE 802.11n (HT20), CDD *4)	5180MHz, 5220MHz, 5240MHz	PN9, MCS0
	Transmitting IEEE 802.11n (HT40), CDD *4)	5190MHz, 5230MHz	PN9, MCS0
Other items	Transmitting IEEE 802.11a	5180MHz, 5220MHz, 5240MHz	PN9, 18Mbps
	Transmitting IEEE 802.11n (HT20), SISO	5180MHz, 5220MHz, 5240MHz	PN9, MCS0
	Transmitting IEEE 802.11n (HT20), CDD *4)	5180MHz, 5220MHz, 5240MHz	PN9, MCS0
	Transmitting IEEE 802.11n (HT20), SDM(MIMO) *3)	5180MHz, 5220MHz, 5240MHz	PN9, MCS8
	Transmitting IEEE 802.11n (HT40), SISO	5190MHz, 5230MHz	PN9, MCS0
	Transmitting IEEE 802.11n (HT40), CDD *4)	5190MHz, 5230MHz	PN9, MCS0
	Transmitting IEEE 802.11n (HT40), SDM(MIMO) *3)	5190MHz, 5230MHz	PN9, MCS8

*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.
*3) As this transmitter has MIMO mode for only MCS8 to MCS15, we need not to consider array gains.
*4) The EUT has CDD mode for MCS0 to MCS7. Directional gain is below 6dB, if correlation gain is considered.
*5) CDD mode was selected in SISO / CDD / SDM (MIMO) for IEEE 802.11n (HT20) and IEEE 802.11n (HT40), based on the test result of Maximum Peak Output Power.

EUT has the power settings by the software as follows;
Test software: MTool.exe, ver. 1.0.0.9
Power settings:
5GHz: IEEE 802.11a: 50, IEEE 802.11n (HT20): 42, IEEE 802.11n (HT40): 32

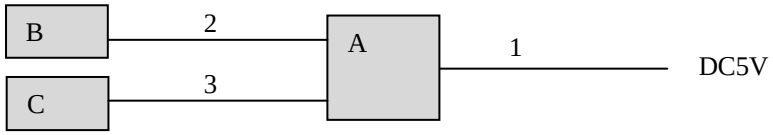
Measured antenna port:

	Single output (IEEE 802.11a, 11b, 11g, 11n SISO)	Multi output (IEEE 802.11n CDD, 11n SDM (MIMO))
Maximum peak output power	- Antenna 0 - Antenna 1	Antenna 0 + Antenna 1
Radiated emission	- Antenna 0 or Antenna 1 *1)	Antenna 0 + Antenna 1
Other tests	- Antenna 0 or Antenna 1 *1)	Antenna 0 or Antenna 1 *1)

*1) The worse antenna port was determined based on the test result of Maximum Peak Output Power.

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 support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Wireless Display Module	WHD0070-D103	*1)	Askey Computer Corp.	EUT
B	Planar Inverted F Antenna	WHD0070-A300	1	Askey Computer Corp.	EUT
C	Planar Inverted F Antenna	WHD0070-A300	2	Askey Computer Corp.	EUT

*1) Conducted / Radiated emission: C0:D9:62:FF:E6:F4, Other test: C0:D9:62:FF:E6:DA

List of cables used

No.	Cable Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB	2.1	Shielded	Shielded	-
2	Antenna	0.3	Shielded	Shielded	-
3	Antenna	0.3	Shielded	Shielded	-

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) via DC power supply.
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.

SECTION 6: Radiated emission

6.1 Operating environment

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

6.2 Test configuration

EUT was placed on a urethane platform of nominal size, 0.5m by 0.5m, raised 0.8m above the conducting ground plane. Photographs of the set up are shown in APPENDIX 3.

6.3 Test conditions

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

6.4 Test procedure

The Radiated Electric Field Strength intensity has been measured on a semi-anechoic chamber with a ground plane and at a distance of 3m (below 15GHz) / 1m (above 15GHz). 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. Drawing of the antenna direction is shown in Figure 1.
The radiated emission measurements were made with the following detection.

Frequency	30-1000MHz	1-40GHz	
Detection type	Quasi-Peak	Peak	Average *1)
IF Bandwidth	120kHz	RBW: 1MHz VBW: 3MHz	RBW: 1MHz VBW: *2

*1) The test method was referred to Section H) 6) d) Method VB (Averaging using reduced video bandwidth) of FCC KDB 789033 D01 "Guidelines for Compliance Testing of unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E"
*2) When duty cycle > 98 percent, VBW was set at 10Hz.
When duty cycle < 98 percent, VBW (Average) calculation sheet in APPENDIX 1.

Detector and averaging type set for linear voltage averaging.

Below 1GHz
The result also satisfied with the general limits specified in FCC 15.209 (a).

Above 1GHz
Inside of restricted bands (FCC 15.205): Limit in FCC 15.209 (a)
Outside of the restricted bands: Limit 68.2dBuV/m (-27dBm e.i.r.p.*) in FCC 15.407(b)(1)(2)(3)

Restricted band edge: Limit in FCC 15.209(a)
Since this limit is severer than the limit of the inside of restricted bands.

*Electric Field Strength to e.i.r.p. conversion
P [dBm] = E [dBuV/m] -95.2 [dB] or
P [dBm] = 10 x LOG (({ 10 ^ (E [dBuV/m] / 20) * 10 ^ (-6) * (Distance = 3[m])) ^ 2 } / 30) x 10^3) (uV/m):
P is the e.i.r.p. (Watts)

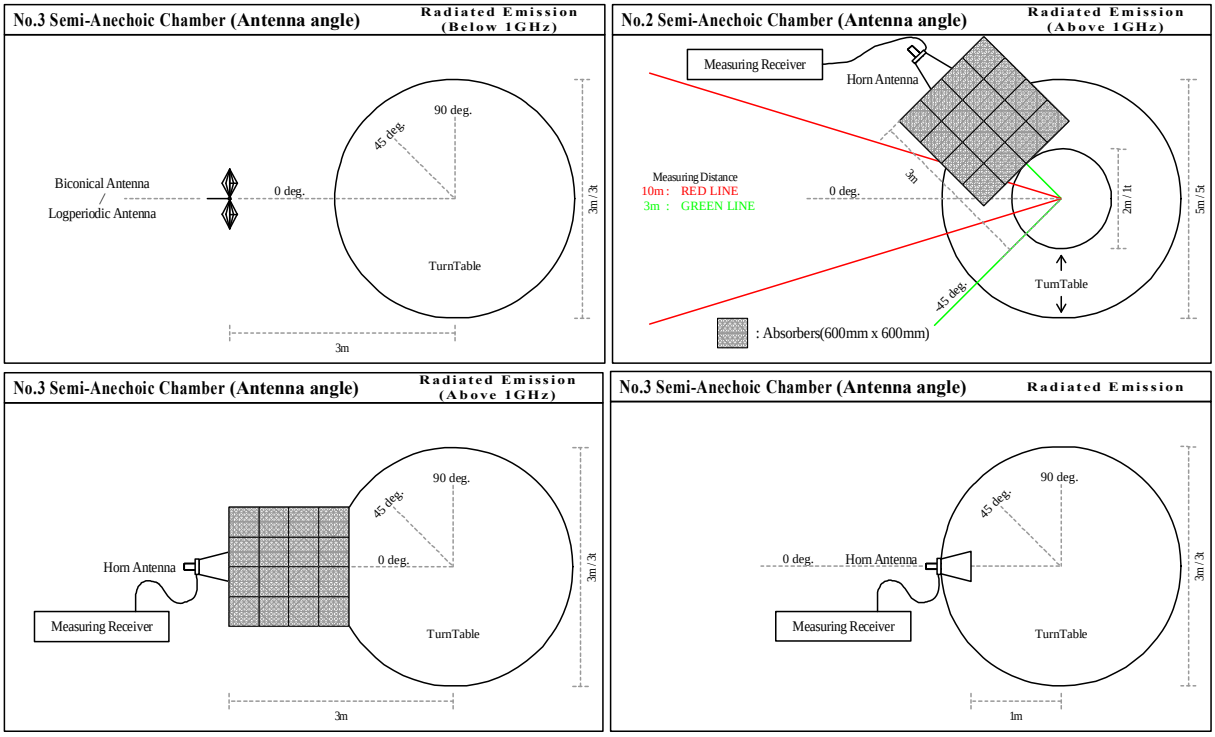
* Distance Factor for the measurement at 1m: 20 x log (3.0m/1.0m) = 9.5dB

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

Worst case:

Subject	Antenna polarization	Carrier	Spurious		
			Below 1GHz	1-6.4GHz	6.4-40GHz
Module	Horizontal	Y	Y	Y	Y
Antenna		Y	X	Y	X
Module	Vertical	Y	Y	Y	Y
Antenna		Z	X	Z	X

Figure 1. Antenna angle



6.5 Band edge

Band edge level at 5150MHz and 5350MHz are below the limits of FCC 15.209.

6.6 Results

Summary of the test results : Pass

* No noise was detected other than listed points.

Refer to APPENDIX 1.

SECTION 7: Antenna terminal conducted tests

Test Procedure
The tests were made with below setting connected to the antenna port with the test instrument.

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
26dB bandwidth	Enough width to display	Close to 1% of EBW	Greater than RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99% occupied bandwidth	Enough width to display	Close to 1% of Span	Three times of RBW	Auto	Sample	Max Hold	Spectrum Analyzer
20dB bandwidth	Enough width to display	Close 1% to 5% of OBW	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum conducted output power *1)	-	-	50MHz	-	-	-	Power Meter method PM
Peak power spectral density *2)	Enough width to display	1MHz	3MHz	Auto	RMS-Average Power Averaging (100 times)	Clear Write	Spectrum Analyzer method SA-2
Peak excursion ratio	Enough width to display	1MHz	3MHz	Auto	Peak RMS-Average Power Averaging (100 times)	Max Hold Clear Write	Spectrum Analyzer method SA-2

*EBW: Emission Bandwidth

*1) Maximum Conducted Output Power was measured based on Method PM of "Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E".
*2) PSD was measured based on Method SA-2 of "Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E".

The test results and limit are rounded off to two decimals place, so some differences might be observed.

Summary of the test results : Pass

Refer to APPENDIX 1.

Contents of APPENDIXES

DATA OF CONDUCTED EMISSION TEST

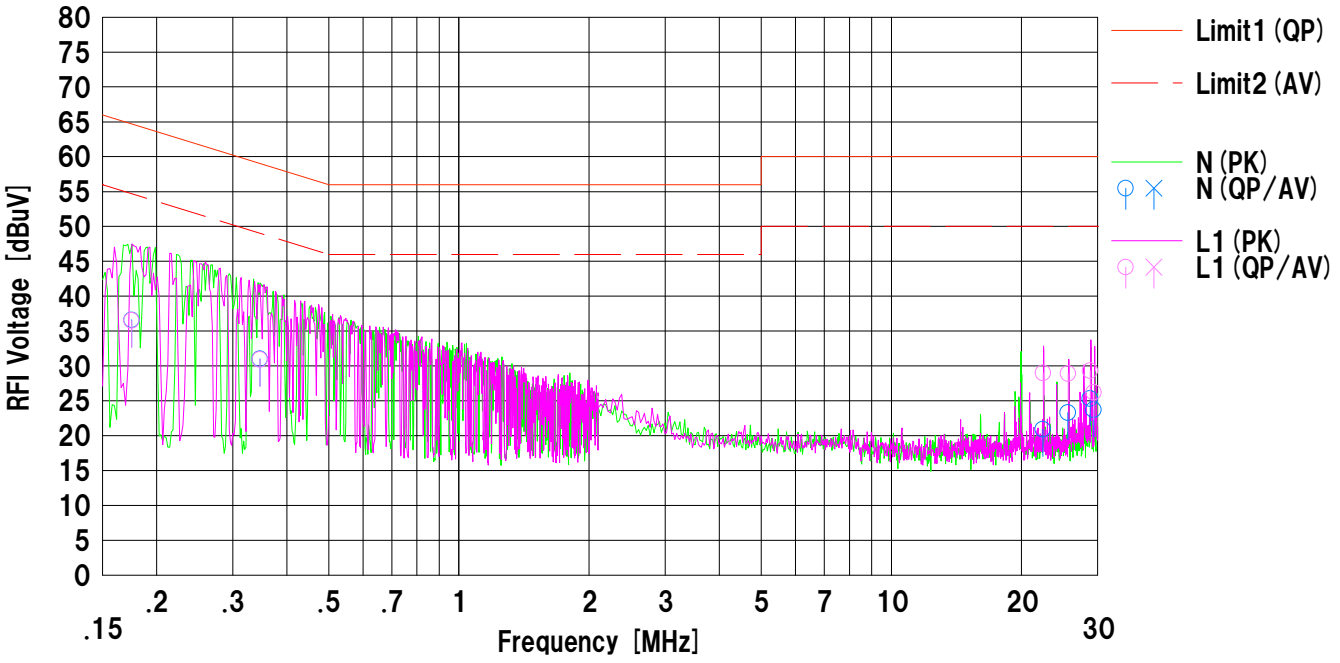
UL Japan,Inc. Shonan EMC Lab. No.3 Shielded Room
Date : 2013/11/27

Company : Hitachi Maxell, Ltd.
Kind of EUT : Wireless Display Module
Model No. : WHD0070-D103
Serial No. : C0:D9:62:FF:E6:F4
Remarks : -

Mode : Tx,11n(HT20),CDD,5180MHz
Order No. : 10068267S
Power : DC 5V
Temp./Humi. : 25deg.C / 42%RH

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

Engineer : Tatsuya Arai



No.	Freq.	Reading		C.Fac	Results		Limit		Margin		Phase	Comment
		<QP>	<AV>		<QP>	<AV>	<QP>	<AV>	<QP>	<AV>		
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
1	0.175210	23.9	---	12.7	36.6	---	64.7	54.7	28.1	---	N	
2	0.346710	18.3	---	12.7	31.0	---	59.0	49.0	28.0	---	N	
3	22.416500	7.3	---	13.6	20.9	---	60.0	50.0	39.1	---	N	
4	25.615000	9.6	---	13.7	23.3	---	60.0	50.0	36.7	---	N	
5	28.806500	11.4	---	13.9	25.3	---	60.0	50.0	34.7	---	N	
6	29.378000	9.8	---	13.9	23.7	---	60.0	50.0	36.3	---	N	
7	0.175210	23.8	---	12.7	36.5	---	64.7	54.7	28.2	---	L1	
8	0.346710	18.2	---	12.7	30.9	---	59.0	49.0	28.1	---	L1	
9	22.441000	15.4	---	13.6	29.0	---	60.0	50.0	31.0	---	L1	
10	25.639500	15.2	---	13.7	28.9	---	60.0	50.0	31.1	---	L1	
11	28.834500	15.4	---	13.9	29.3	---	60.0	50.0	30.7	---	L1	
12	29.404000	12.3	---	13.9	26.2	---	60.0	50.0	33.8	---	L1	

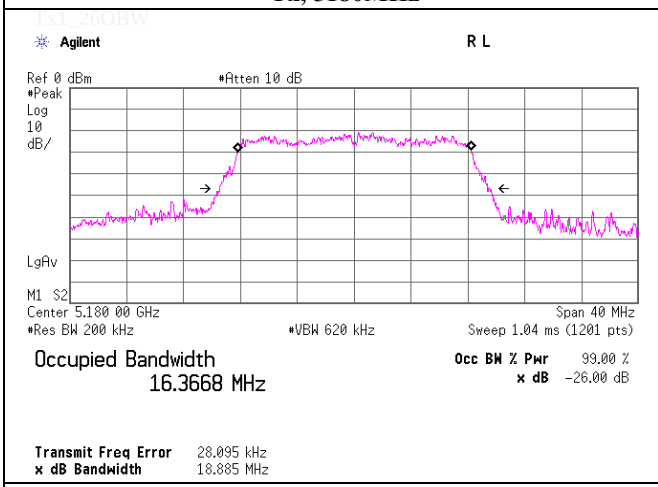
Calculation:Result [dBuV] =Reading [dBuV] +C.Fac (LISN+Cable+ATT) [dB]
LISN: SLS-05

-26dB Bandwidth

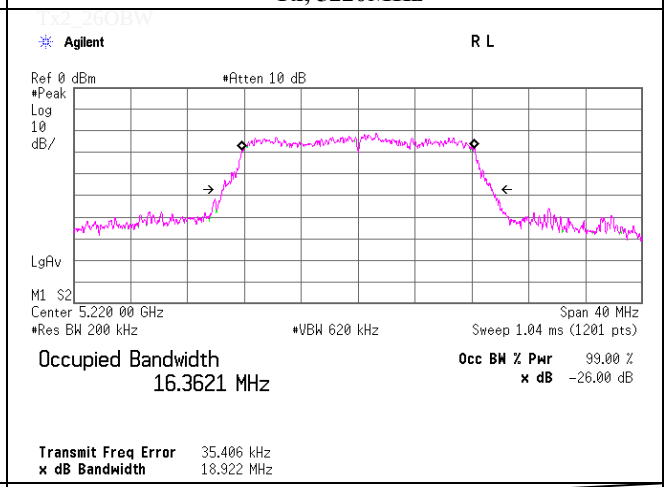
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11a, SISO, PN9, worst antenna port 1, worst data mode 18Mbps	

Freq. [MHz]	-26dB Bandwidth [MHz]
5180.0000	18.885
5220.0000	18.922
5240.0000	18.750

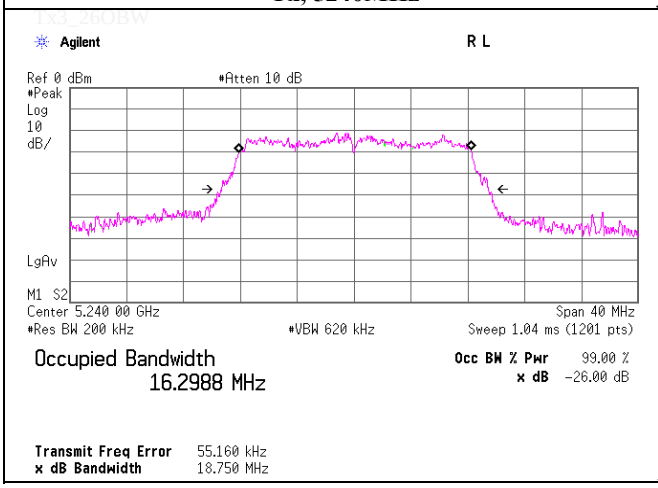
Tx, 5180MHz



Tx, 5220MHz



Tx, 5240MHz



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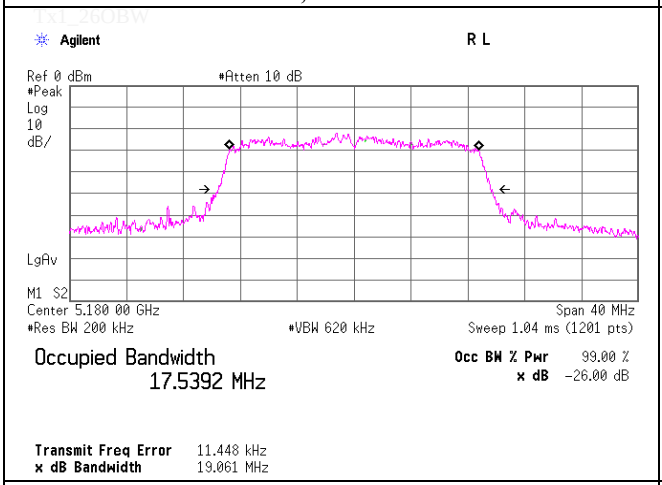
-26dB Bandwidth

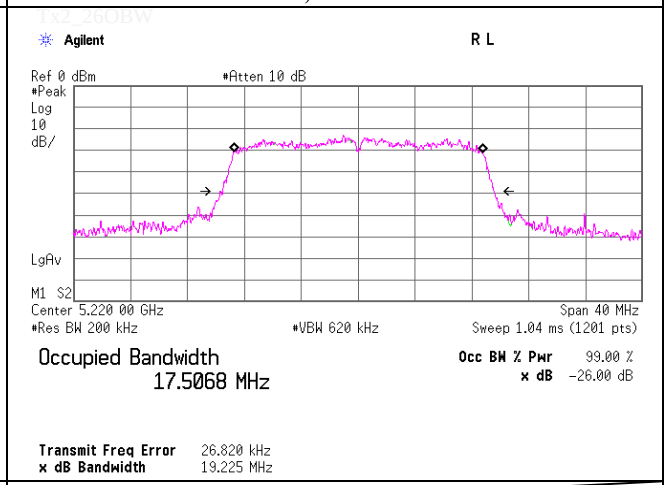
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n-HT20, SISO, PN9, worst antenna port 1, worst data mode 0(MCS)	

Freq. [MHz]	-26dB Bandwidth [MHz]
5180.0000	19.061
5220.0000	19.225
5240.0000	19.218

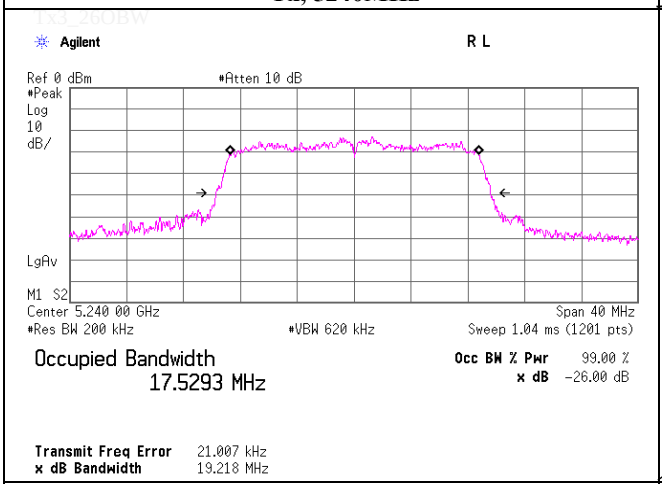
Tx, 5180MHz

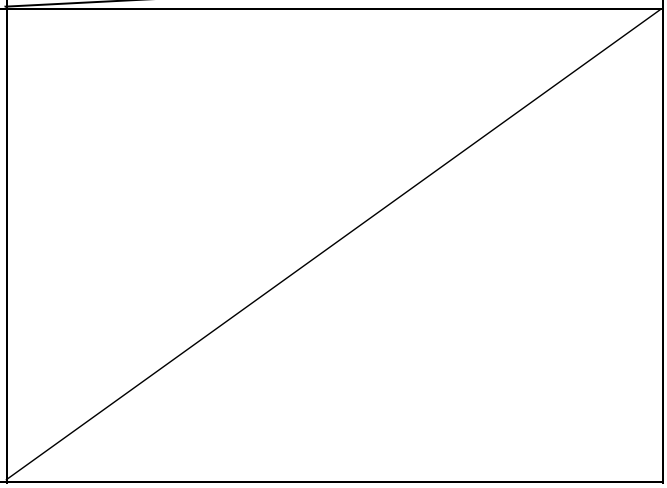


Tx, 5220MHz



Tx, 5240MHz





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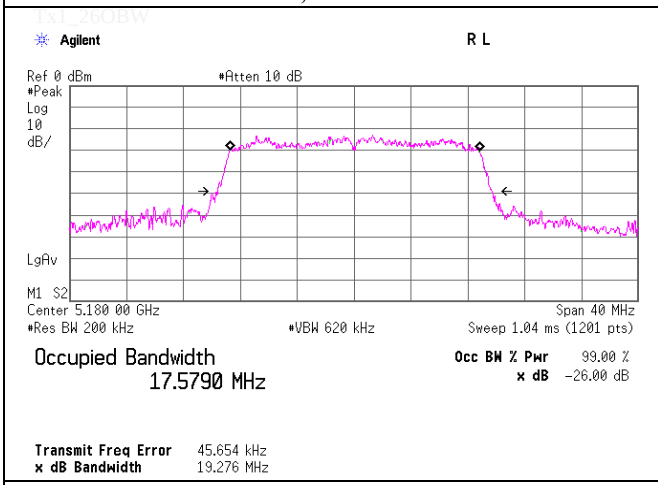
-26dB Bandwidth

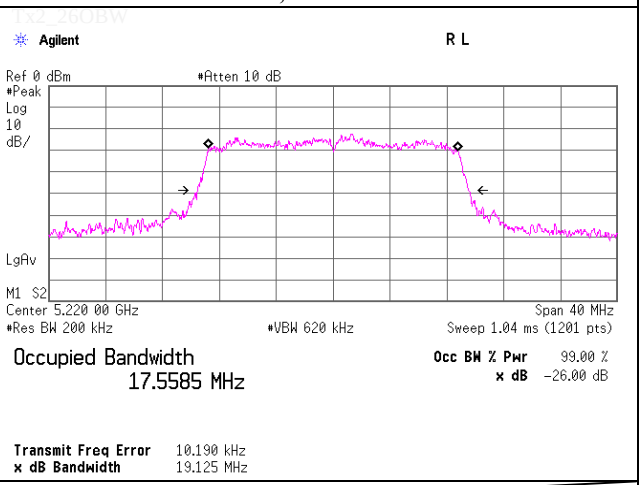
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT20), CDD, PN9, Antenna port 1, worst data mode 0 (MCS)	

Freq. [MHz]	-26dB Bandwidth [MHz]
5180.0000	19.276
5220.0000	19.125
5240.0000	19.279

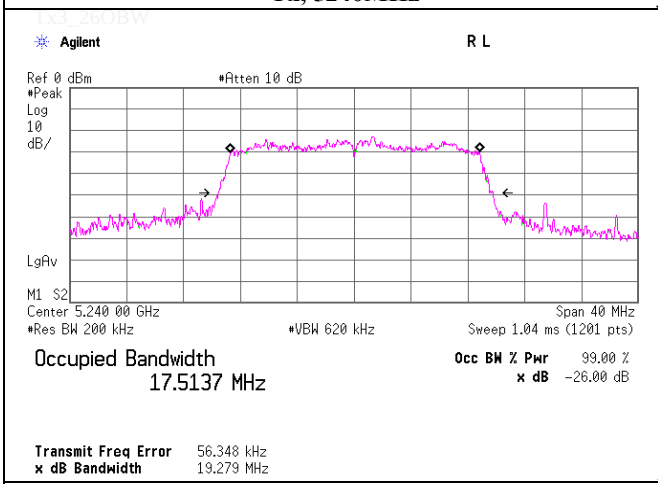
Tx, 5180MHz



Tx, 5220MHz



Tx, 5240MHz



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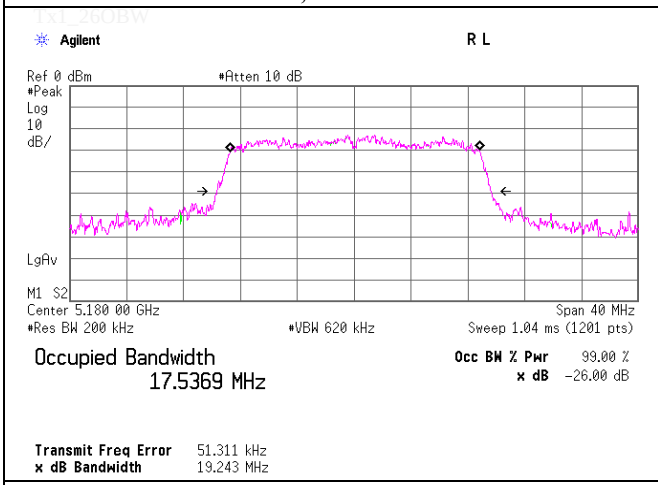
-26dB Bandwidth

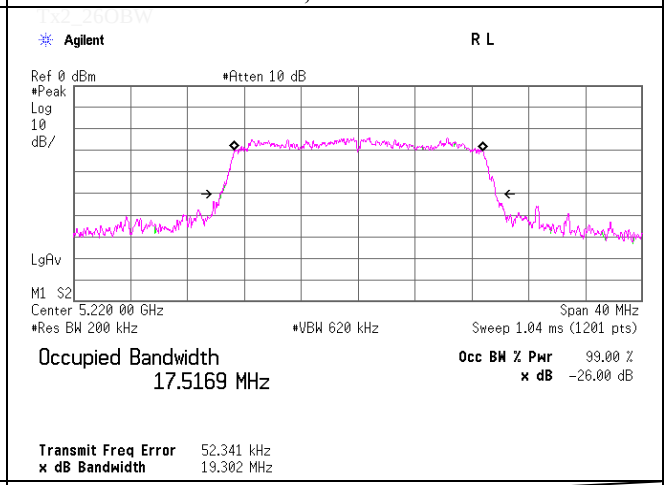
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT20), MIMO(SDM), PN9, Antenna port 1, worst data mode 8 (MCS)	

Freq. [MHz]	-26dB Bandwidth [MHz]
5180.0000	19.243
5220.0000	19.302
5240.0000	19.483

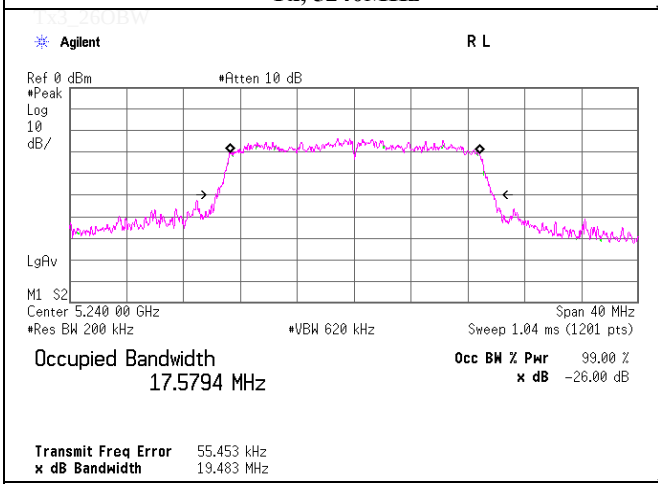
Tx, 5180MHz



Tx, 5220MHz



Tx, 5240MHz



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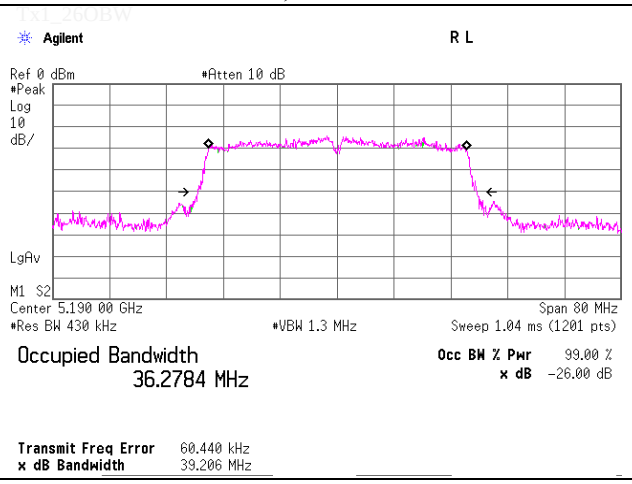
-26dB Bandwidth

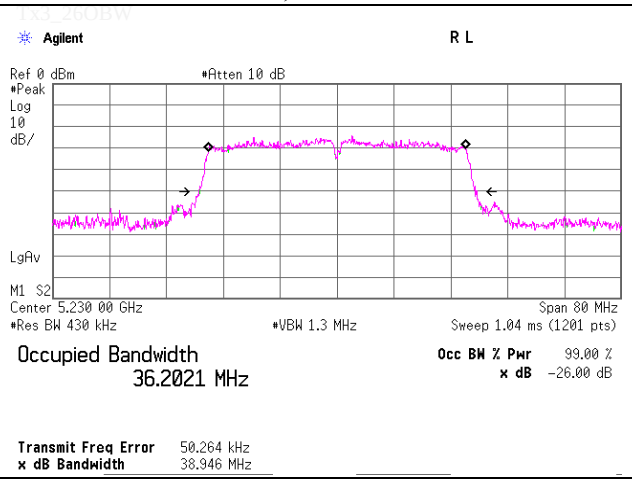
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n-HT40, SISO, PN9, worst antenna port 1, worst data mode 0(MCS)	

Freq. [MHz]	-26dB Bandwidth [MHz]
5190.0000	39.206
5230.0000	38.946

Tx, 5190MHz



Tx, 5230MHz



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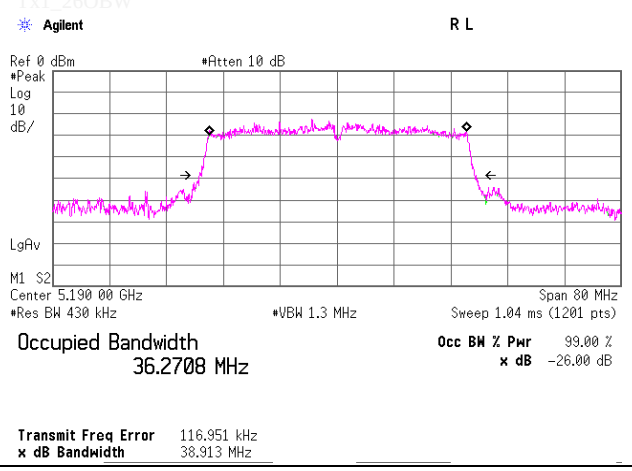
-26dB Bandwidth

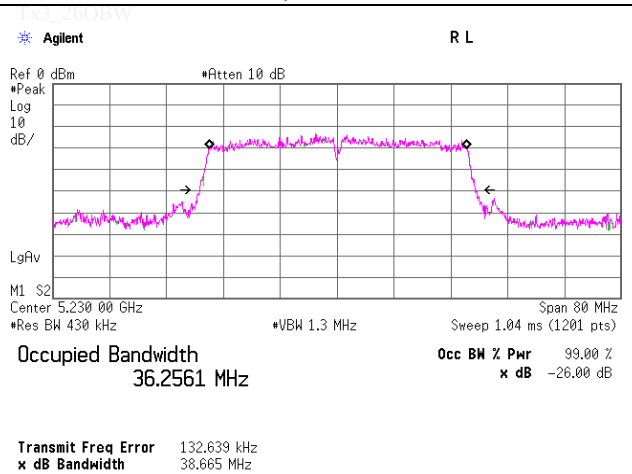
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT40), CDD, PN9, Antenna port 1, worst data mode 0 (MCS)	

Freq. [MHz]	-26dB Bandwidth [MHz]
5190.0000	38.913
5230.0000	38.665

Tx, 5190MHz



Tx, 5230MHz



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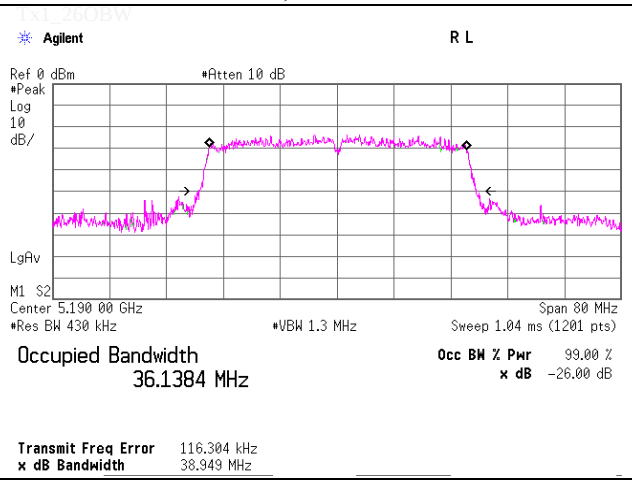
-26dB Bandwidth

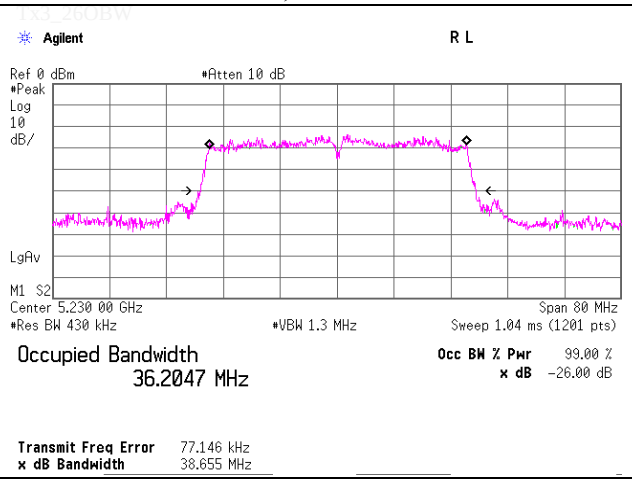
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT40), MIMO(SDM), PN9, Antenna port 1, worst data mode 8 (MCS)	

Freq. [MHz]	-26dB Bandwidth [MHz]
5190.0000	38.949
5230.0000	38.655

Tx, 5190MHz



Tx, 5230MHz



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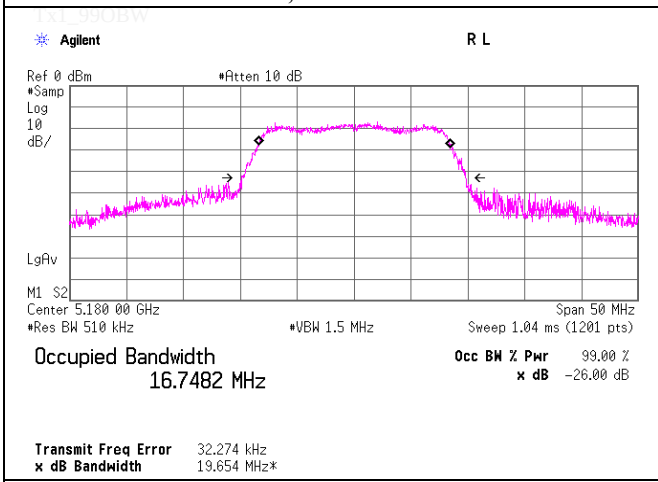
99% Occupied Bandwidth

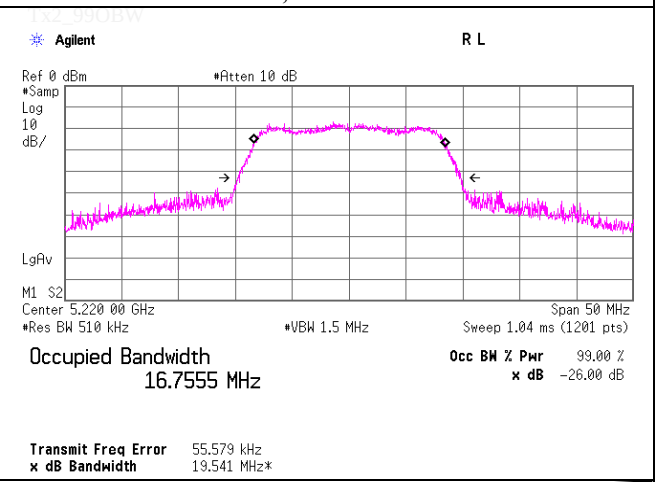
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11a, SISO, PN9, worst antenna port 1, worst data mode 18Mbps	

Freq. [MHz]	99% Occupied Bandwidth [MHz]
5180.0000	16.748
5220.0000	16.756
5240.0000	16.690

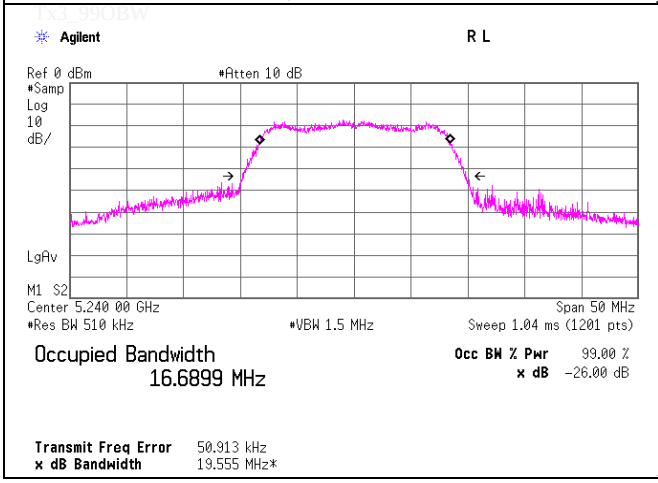
Tx, 5180MHz



Tx, 5220MHz



Tx, 5240MHz



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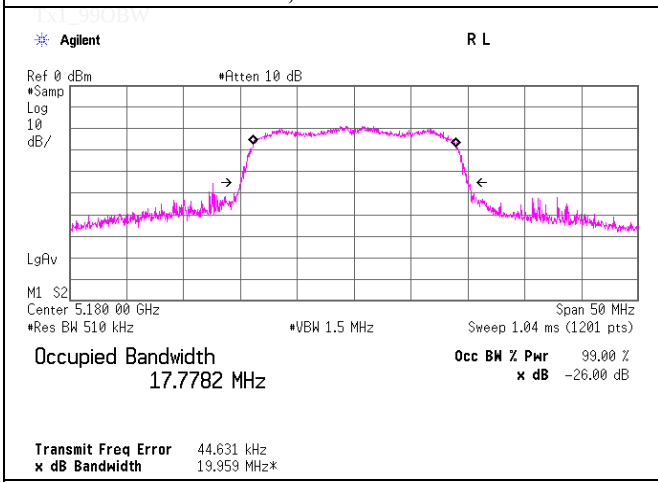
99% Occupied Bandwidth

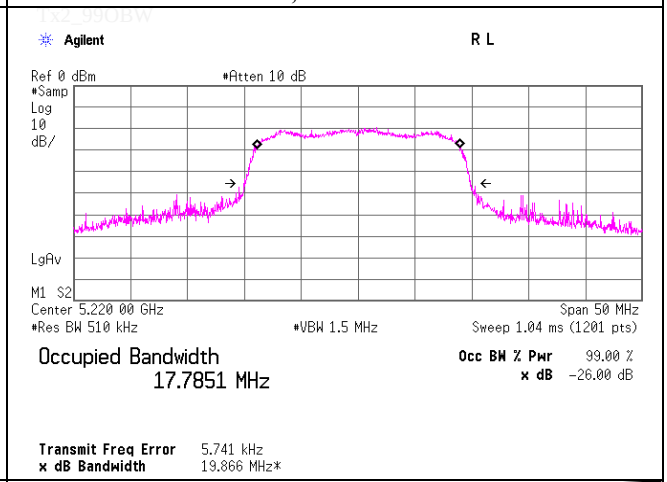
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n-HT20, SISO, PN9, worst antenna port 1, worst data mode 0(MCS)	

Freq. [MHz]	99% Occupied Bandwidth [MHz]
5180.0000	17.778
5220.0000	17.785
5240.0000	17.721

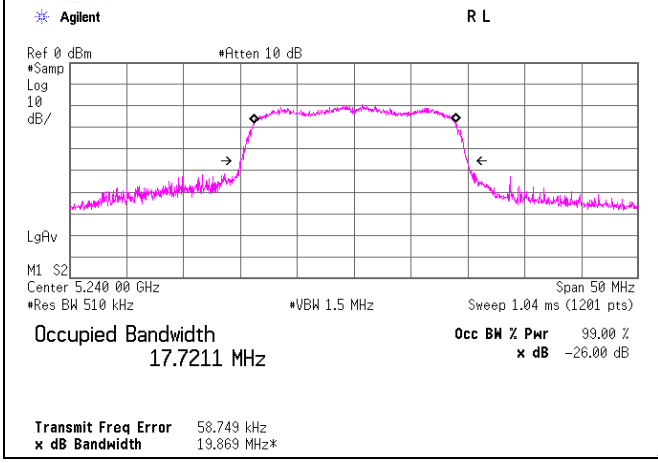
Tx, 5180MHz



Tx, 5220MHz



Tx, 5240MHz



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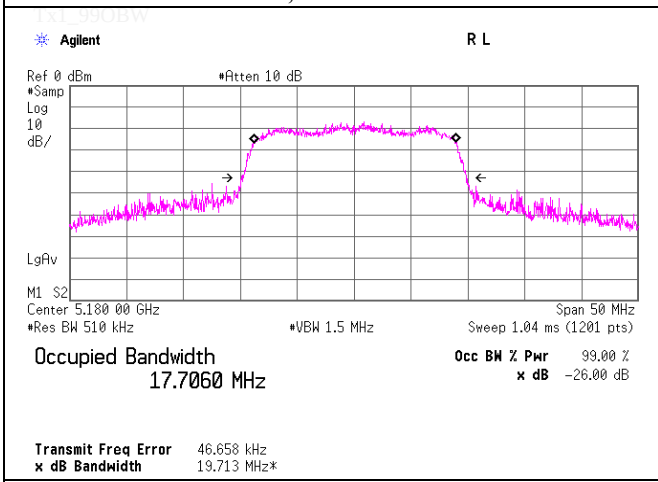
99% Occupied Bandwidth

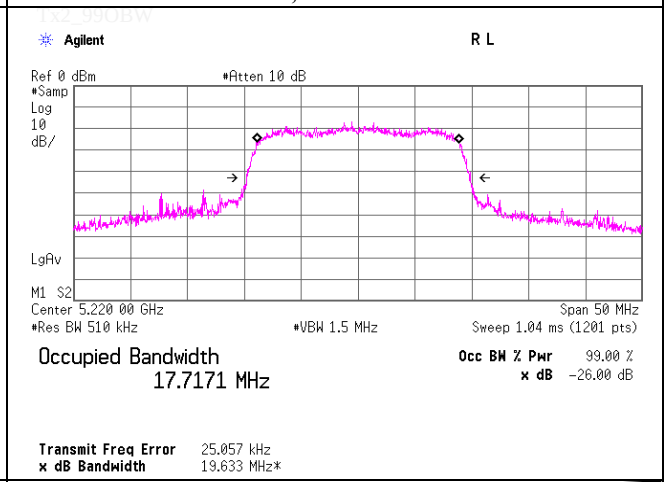
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT20), CDD, PN9, Antenna port 1, worst data mode 0 (MCS)	

Freq. [MHz]	99% Occupied Bandwidth [MHz]
5180.0000	17.706
5220.0000	17.717
5240.0000	17.681

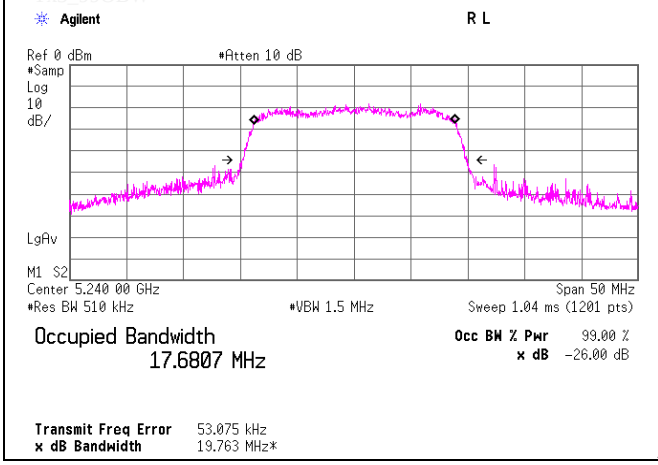
Tx, 5180MHz



Tx, 5220MHz



Tx, 5240MHz



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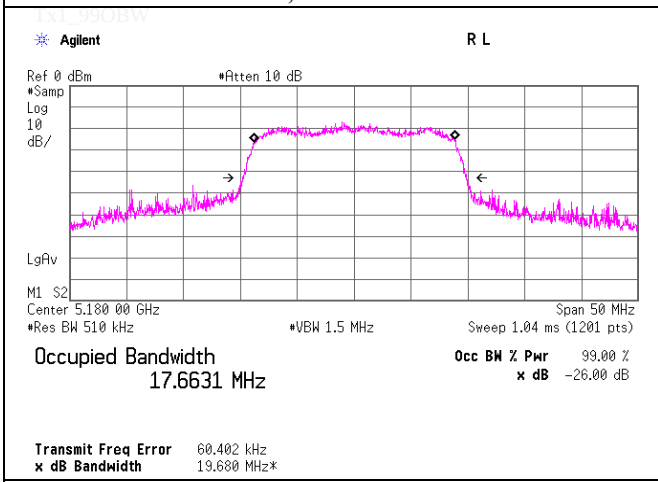
99% Occupied Bandwidth

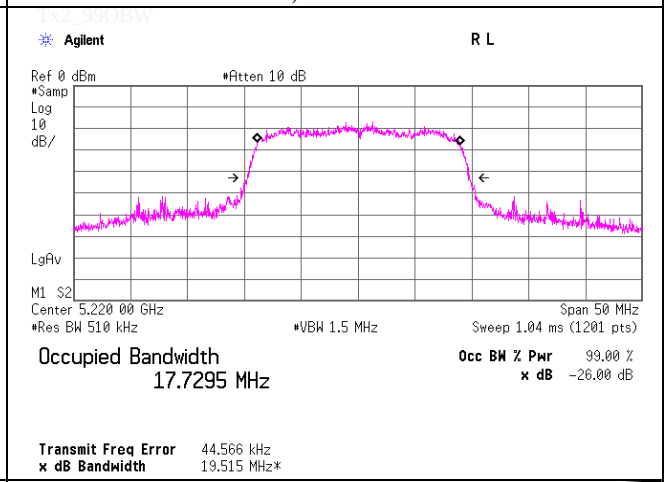
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT20), MIMO(SDM), PN9, Antenna port 1, worst data mode 8 (MCS)	

Freq. [MHz]	99% Occupied Bandwidth [MHz]
5180.0000	17.663
5220.0000	17.730
5240.0000	17.681

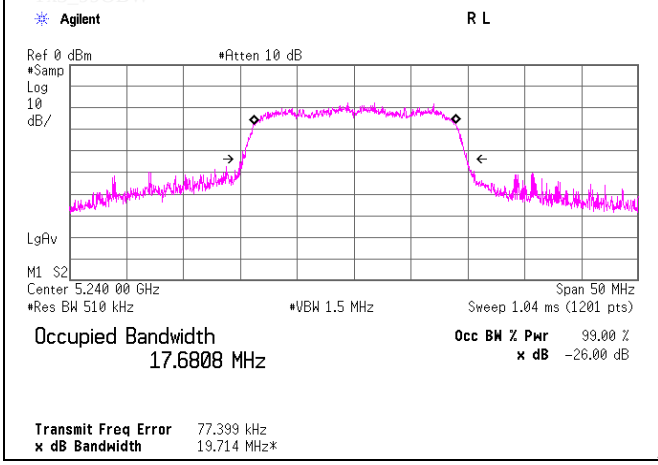
Tx, 5180MHz



Tx, 5220MHz



Tx, 5240MHz



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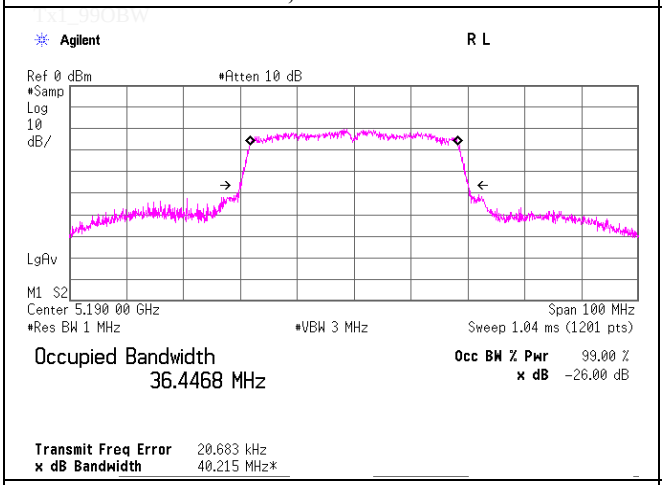
99% Occupied Bandwidth

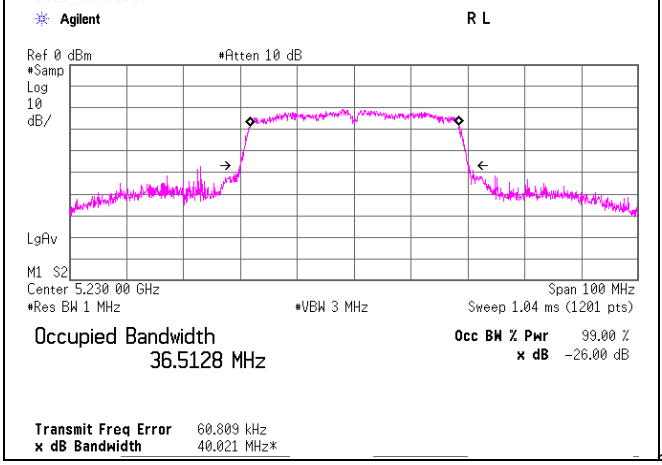
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n-HT40, SISO, PN9, worst antenna port 1, worst data mode 0(MCS)	

Freq. [MHz]	99% Occupied Bandwidth [MHz]
5190.0000	36.447
5230.0000	36.513

Tx, 5190MHz



Tx, 5230MHz



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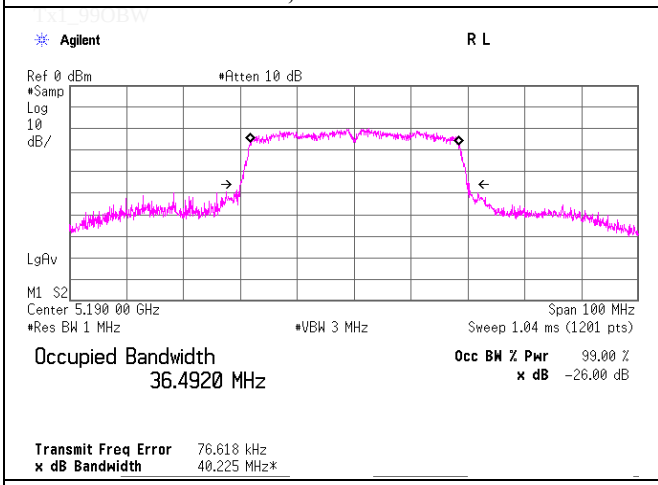
99% Occupied Bandwidth

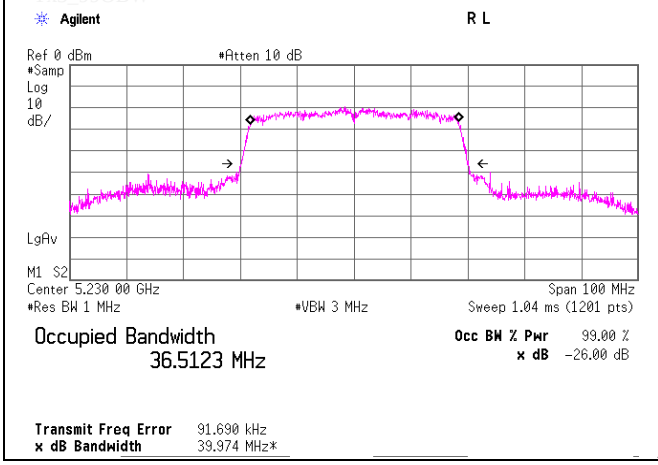
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT40), CDD, PN9, Antenna port 1, worst data mode 0 (MCS)	

Freq. [MHz]	99% Occupied Bandwidth [MHz]
5190.0000	36.492
5230.0000	36.512

Tx, 5190MHz



Tx, 5230MHz



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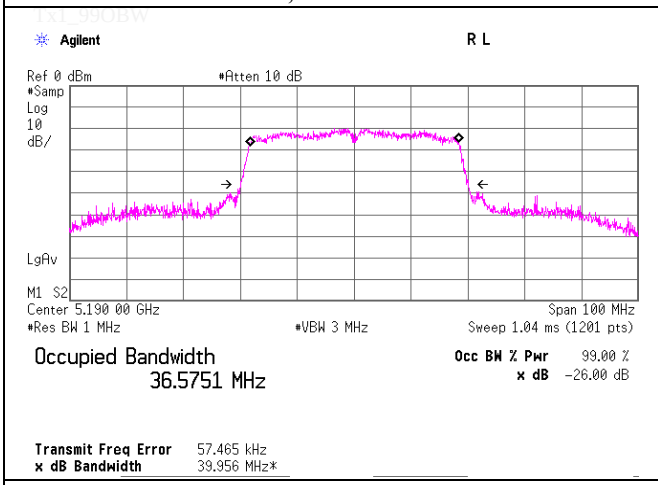
99% Occupied Bandwidth

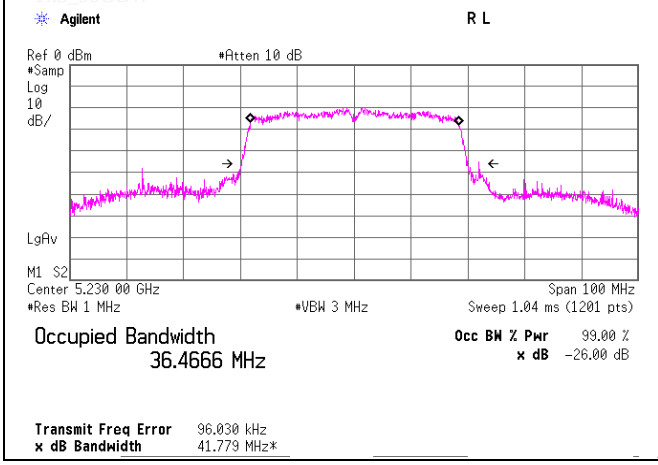
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT40), MIMO(SDM), PN9, Antenna port 1, worst data mode 8 (MCS)	

Freq. [MHz]	99% Occupied Bandwidth [MHz]
5190.0000	36.575
5230.0000	36.467

Tx, 5190MHz



Tx, 5230MHz



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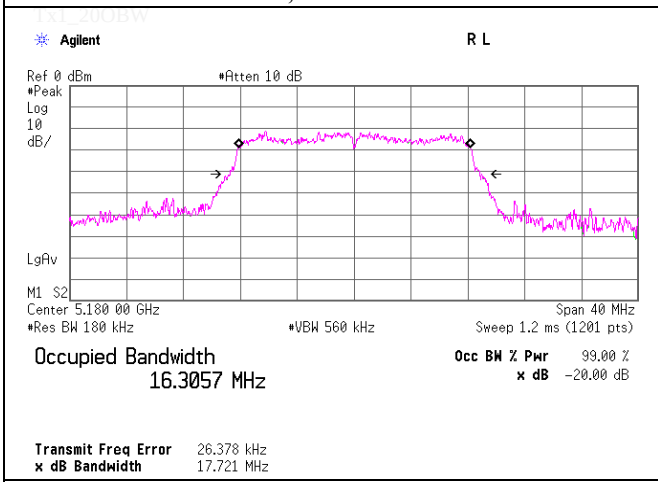
-20dB Bandwidth

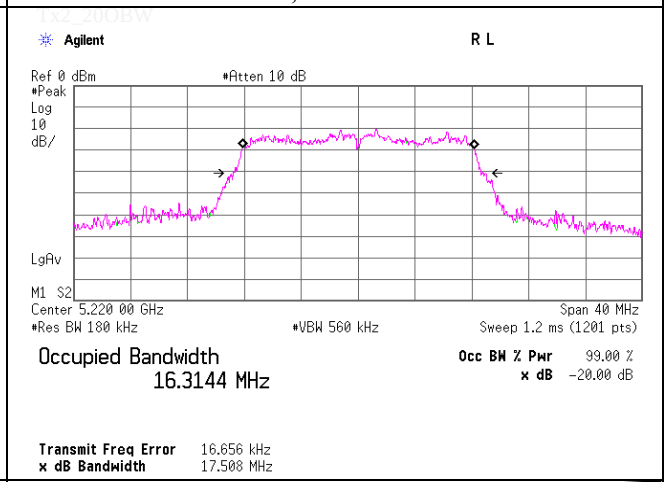
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11a, SISO, PN9, worst antenna port 1, worst data mode 18Mbps	

Freq. [MHz]	-20dB Bandwidth [MHz]
5180.0000	17.721
5220.0000	17.508
5240.0000	17.374

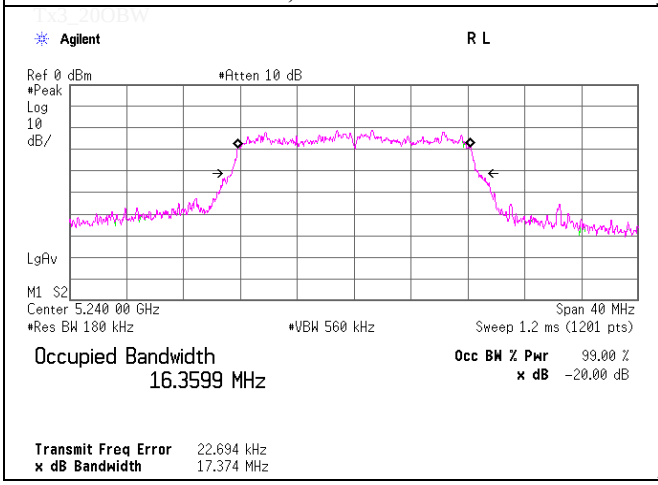
Tx, 5180MHz



Tx, 5220MHz



Tx, 5240MHz



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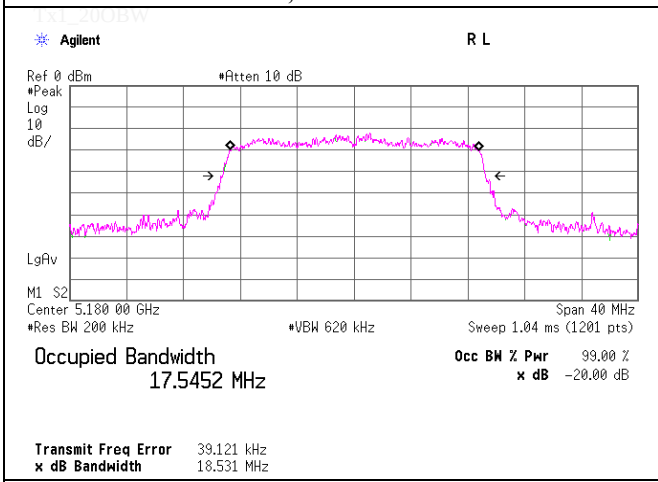
-20dB Bandwidth

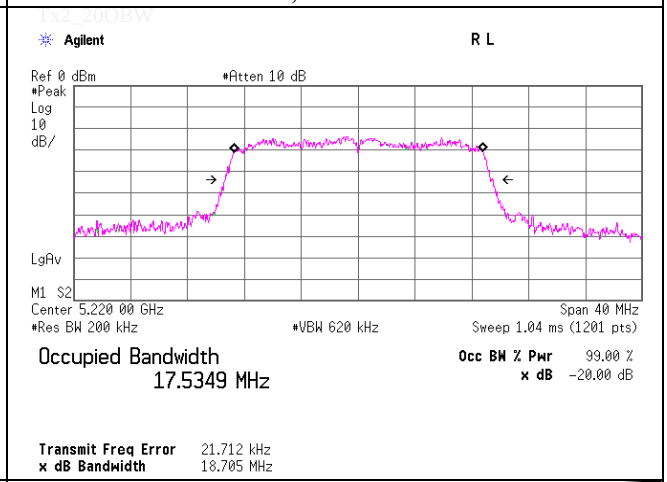
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Sielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n-HT20, SISO, PN9, worst antenna port 1, worst data mode 0(MCS)	

Freq. [MHz]	-20dB Bandwidth [MHz]
5180.0000	18.531
5220.0000	18.705
5240.0000	18.464

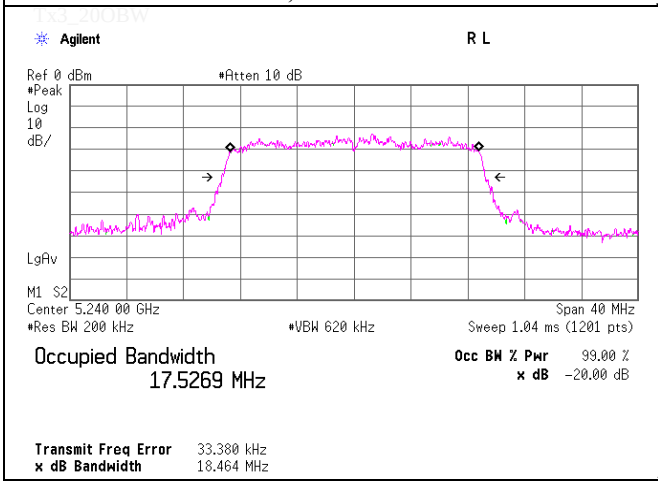
Tx, 5180MHz



Tx, 5220MHz



Tx, 5240MHz



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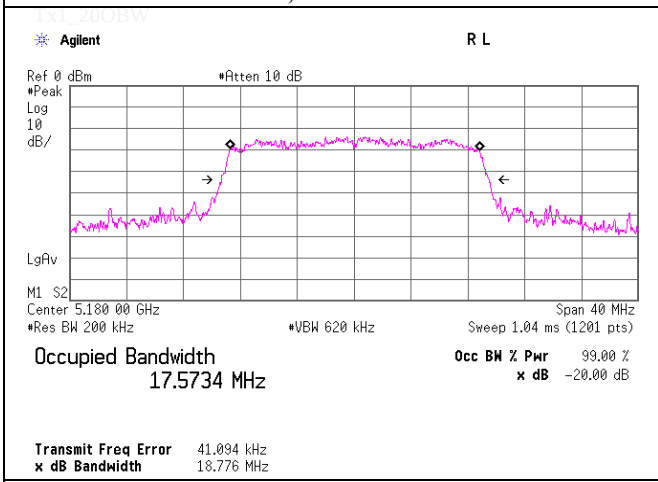
-20dB Bandwidth

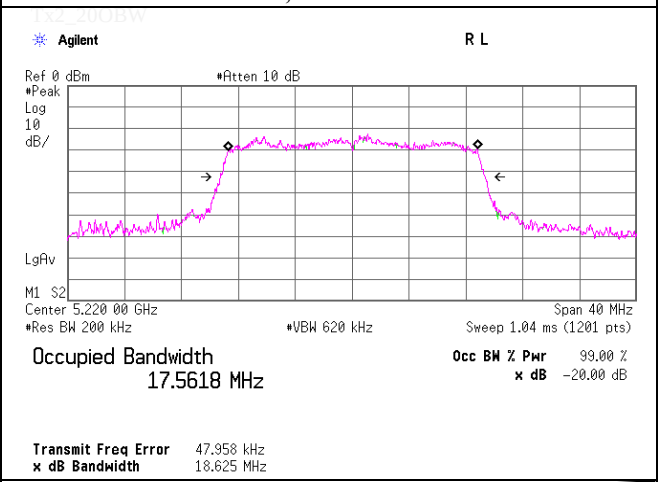
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT20), CDD, PN9, Antenna port 1, worst data mode 0 (MCS)	

Freq. [MHz]	-20dB Bandwidth [MHz]
5180.0000	18.776
5220.0000	18.625
5240.0000	18.665

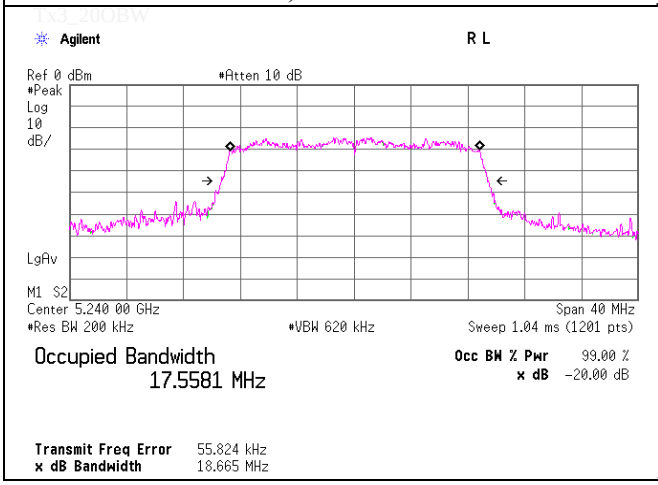
Tx, 5180MHz



Tx, 5220MHz



Tx, 5240MHz



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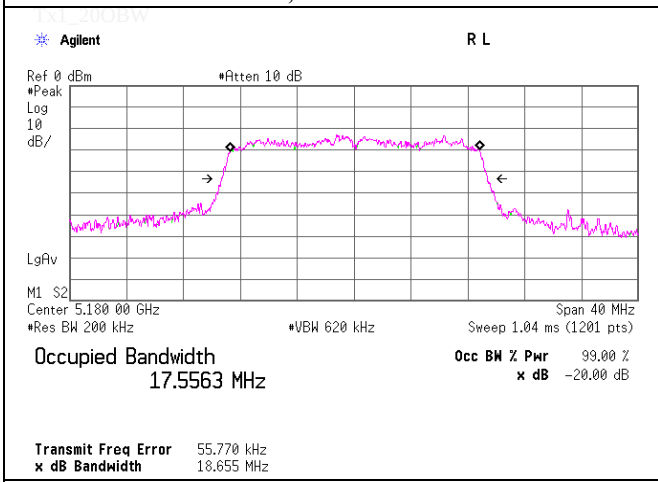
-20dB Bandwidth

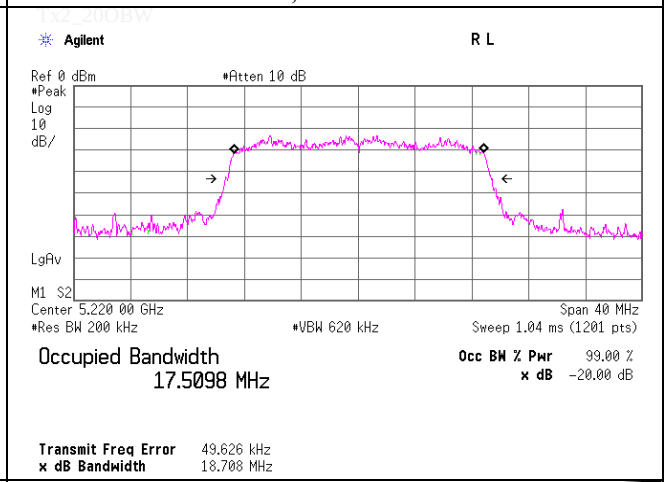
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT20), MIMO(SDM), PN9, Antenna port 1, worst data mode 8 (MCS)	

Freq. [MHz]	-20dB Bandwidth [MHz]
5180.0000	18.655
5220.0000	18.708
5240.0000	18.518

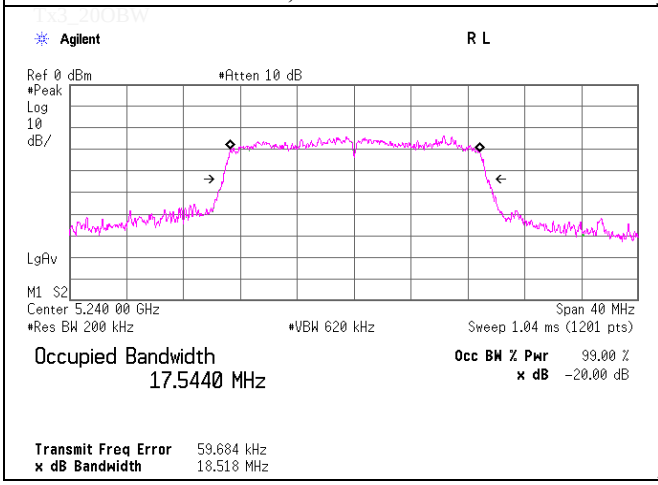
Tx, 5180MHz



Tx, 5220MHz



Tx, 5240MHz



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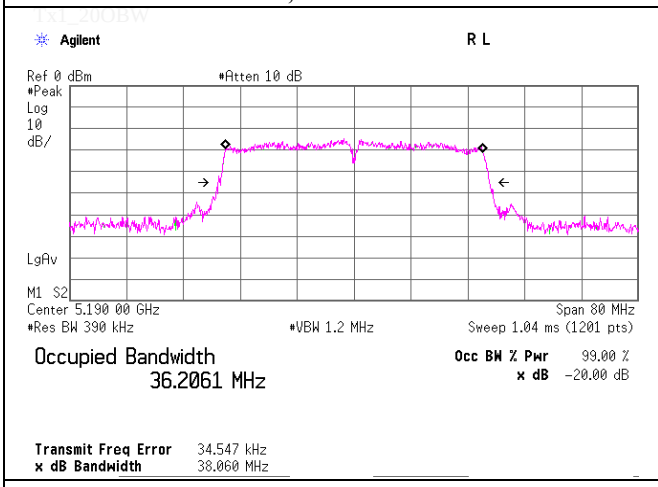
-20dB Bandwidth

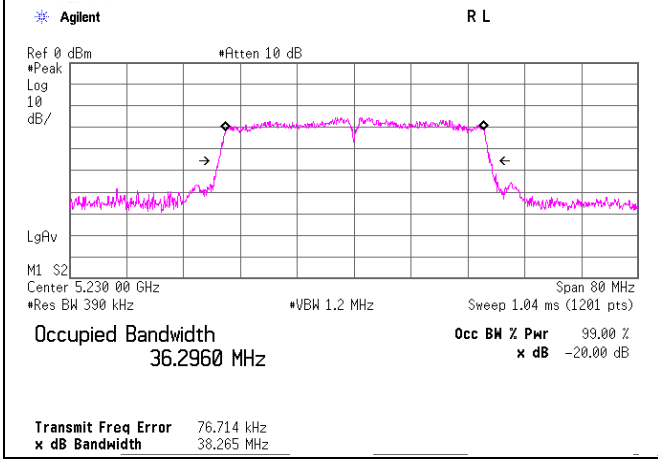
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n-HT40, SISO, PN9, worst antenna port 1, worst data mode 0(MCS)	

Freq. [MHz]	-20dB Bandwidth [MHz]
5190.0000	38.060
5230.0000	38.265

Tx, 5190MHz



Tx, 5230MHz



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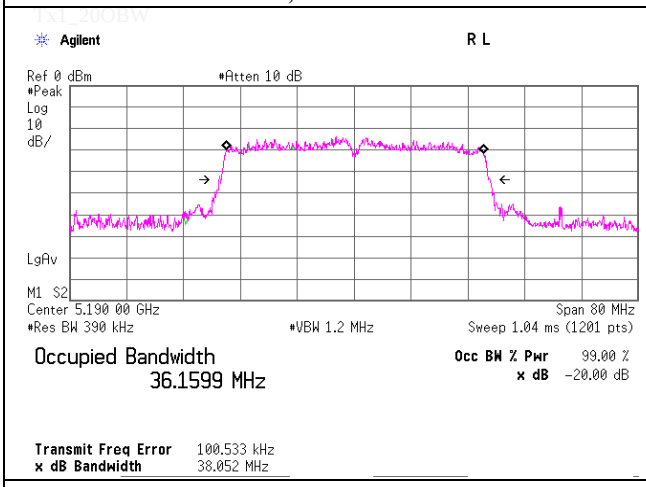
-20dB Bandwidth

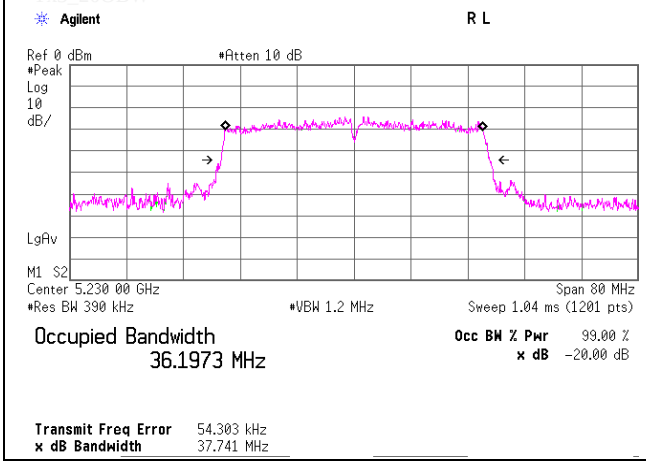
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT40), CDD, PN9, Antenna port 1, worst data mode 0 (MCS)	

Freq. [MHz]	-20dB Bandwidth [MHz]
5190.0000	38.052
5230.0000	37.741

Tx, 5190MHz



Tx, 5230MHz



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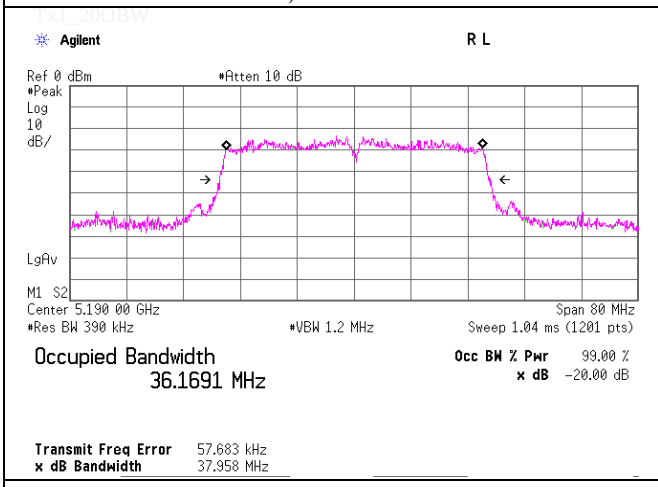
-20dB Bandwidth

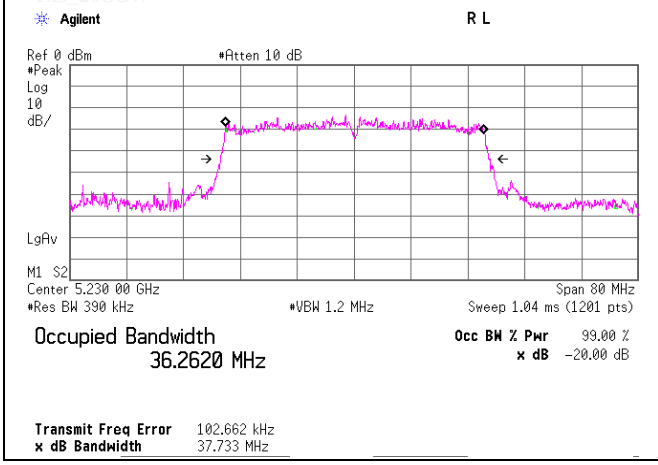
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT40), MIMO(SDM), PN9, Antenna port 1, worst data mode 8 (MCS)	

Freq. [MHz]	-20dB Bandwidth [MHz]
5190.0000	37.958
5230.0000	37.733

Tx, 5190MHz



Tx, 5230MHz



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Maximum Conducted Output Power (Conducted)

(Method: PM)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room	
Date	December 9, 2013		
Temperature / Humidity	23 deg.C , 32 %RH		
Engineer	Shinichi Takano		
Mode	Tx, IEEE802.11a, SISO, PN9,	worst antenna : 1	worst data mode : 18 Mbps

Antena terminal power (* P/M: Power Meter with power senser, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]		Result [dBm]	Result [mW]	Limit [dBm]	Limit [mW]	Margin [dB]
Low	5180.0	-10.39	1.74	20.10	0.24		11.69	14.76	16.73	47.10	5.04
Mid	5220.0	-10.58	1.74	20.09	0.24		11.49	14.09	16.73	47.10	5.24
High	5240.0	-11.15	1.93	20.09	0.24		11.11	12.91	16.73	47.10	5.62

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

EIRP (* P/M: Power Meter with power senser, AV: Average) **Reference Data**

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Antenna Gain [dBi]	Result (e.i.r.p.) [dBm]	Result (e.i.r.p.) [mW]	Limit (e.i.r.p.) [dBm]	Limit (e.i.r.p.) [mW]	Margin [dB]
Low	5180.0	-10.39	1.74	20.10	0.24	1.77	13.46	22.18	-	-	-
Mid	5220.0	-10.58	1.74	20.09	0.24	1.77	13.26	21.18	-	-	-
High	5240.0	-11.15	1.93	20.09	0.24	1.77	12.88	19.41	-	-	-

Sample Calculation: Result = Reading + Cable Loss + Atten. Loss + Duty factor + Antenna Gain

[Pre check]
Antenna 0

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Result [dBm]
0	6	5180.0	-10.51	1.74	20.09	0.23	11.55
0	9	5180.0	-10.59	1.74	20.09	0.21	11.45
0	12	5180.0	-10.50	1.74	20.09	0.20	11.53
0	18	5180.0	-10.45	1.74	20.09	0.24	11.62
0	24	5180.0	-10.51	1.74	20.09	0.24	11.56
0	36	5180.0	-10.64	1.74	20.09	0.35	11.54
0	48	5180.0	-10.65	1.74	20.09	0.39	11.57
0	54	5180.0	-10.73	1.74	20.09	0.33	11.43

Antenna 1

	Data rate [Mbps]	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Result [dBm]	
1	6	5180.0	-10.43	1.74	20.09	0.23	11.63	
1	9	5180.0	-10.46	1.74	20.09	0.21	11.58	
1	12	5180.0	-10.43	1.74	20.09	0.20	11.60	
1	18	5180.0	-10.39	1.74	20.09	0.24	11.68	**Worst**
1	24	5180.0	-10.46	1.74	20.09	0.24	11.61	
1	36	5180.0	-10.56	1.74	20.09	0.35	11.62	
1	48	5180.0	-10.63	1.74	20.09	0.39	11.59	
1	54	5180.0	-10.67	1.74	20.09	0.33	11.49	

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

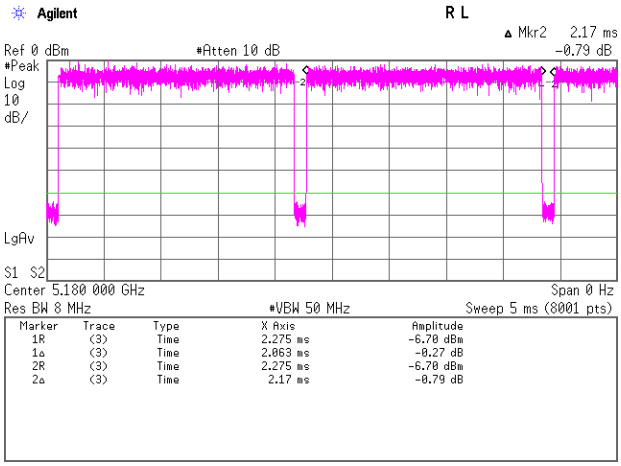
Maximum Conducted Output Power (Conducted)

(Reference) (duty chart)

Tx, IEEE802.11a, SISO, antenna port 1, (Tx 5180MHz)

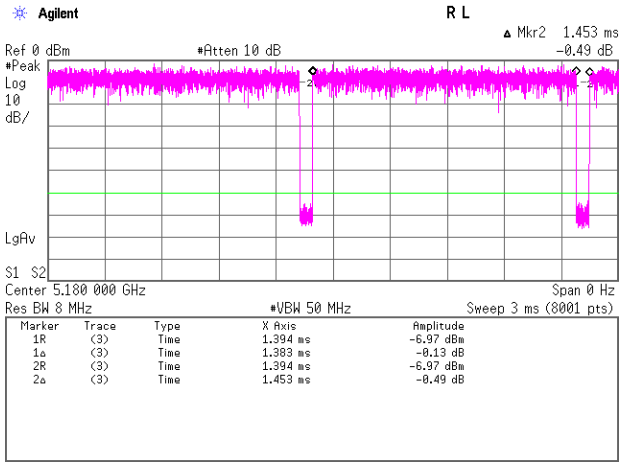
6Mbps

duty factor [dB] = 10 x log (2.17[ms] / 2.06[ms]) = 0.23 [dB]



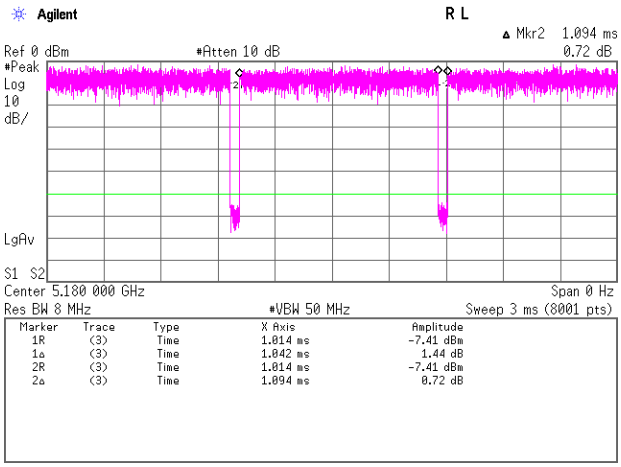
9Mbps

duty factor [dB] = 10 x log (1.45[ms] / 1.38[ms]) = 0.21 [dB]



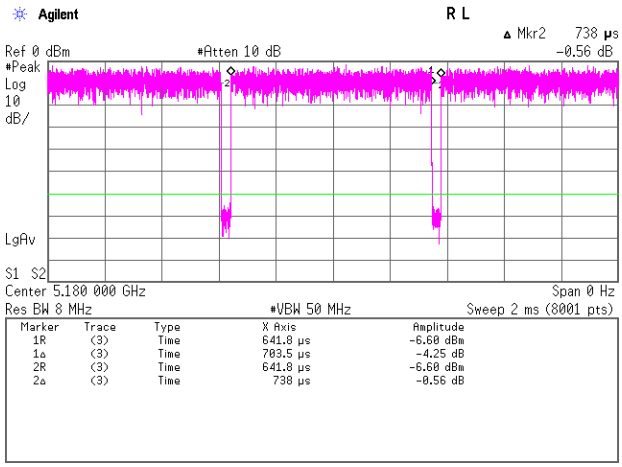
12Mbps

duty factor [dB] = 10 x log (1.09[ms] / 1.04[ms]) = 0.20 [dB]



18Mbps

duty factor [dB] = 10 x log (0.74[ms] / 0.7[ms]) = 0.24 [dB]



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Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

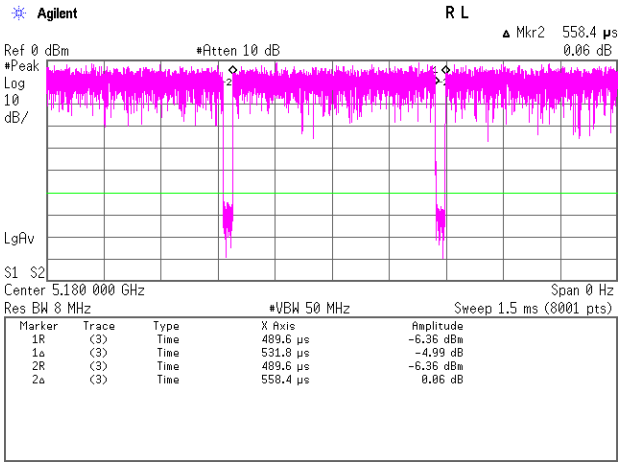
Maximum Conducted Output Power (Conducted)

(Reference) (duty chart)

Tx, IEEE802.11a, SISO, antenna port 1, (Tx 5180MHz)

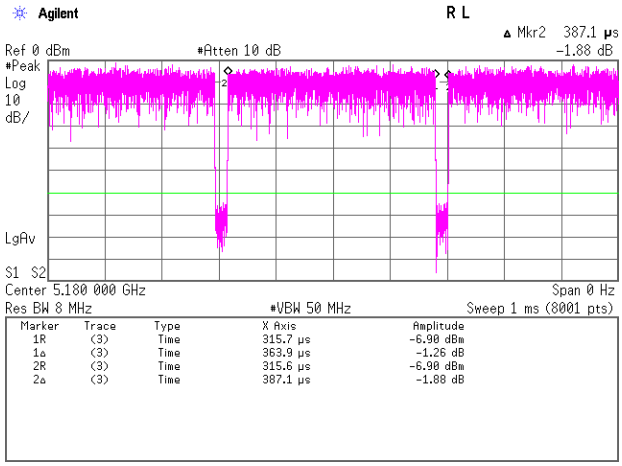
24Mbps

duty factor [dB] = 10 x log (0.56[ms] / 0.53[ms]) = 0.24 [dB]



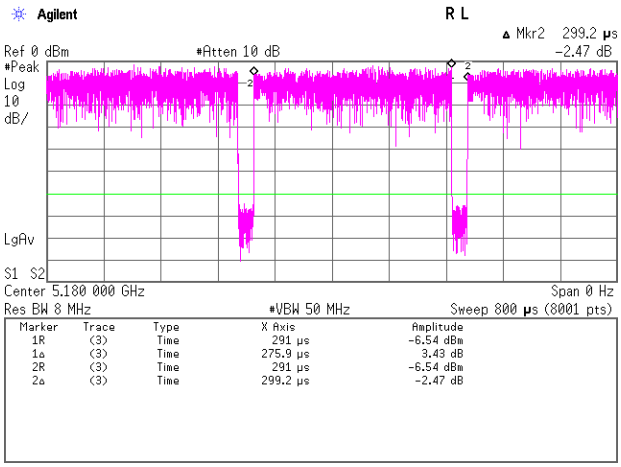
36Mbps

duty factor [dB] = 10 x log (0.39[ms] / 0.36[ms]) = 0.35 [dB]



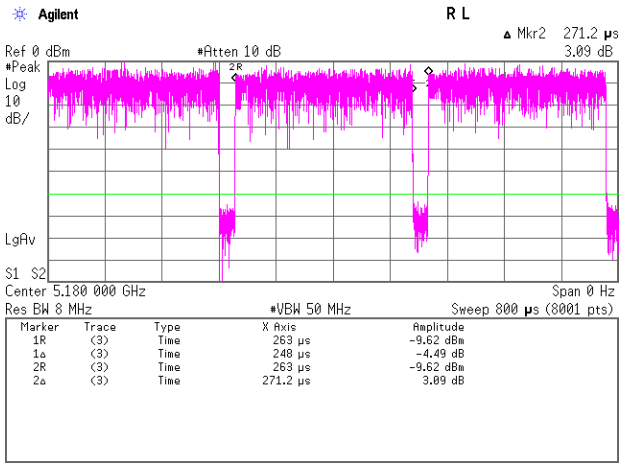
48Mbps

duty factor [dB] = 10 x log (0.3[ms] / 0.28[ms]) = 0.39 [dB]



54Mbps

duty factor [dB] = 10 x log (0.27[ms] / 0.25[ms]) = 0.33 [dB]



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Maximum Conducted Output Power (Conducted)

(Method: PM)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room	
Date	December 9, 2013		
Temperature / Humidity	23 deg.C , 32 %RH		
Engineer	Shinichi Takano		
Mode	Tx, IEEE802.11n-HT20, SISO, PN9,	worst antenna : 1	worst data mode : 0 (MCS)

Antena terminal power (* P/M: Power Meter with power senser, AV: Average)

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]		Result [dBm]	Result [mW]	Limit [dBm]	Limit [mW]	Margin [dB]
Low	5180.0	-11.92	1.74	20.10	0.24		10.16	10.38	16.80	47.89	6.64
Mid	5220.0	-12.44	1.74	20.09	0.24		9.63	9.18	16.80	47.89	7.17
High	5240.0	-12.78	1.93	20.09	0.24		9.48	8.87	16.80	47.89	7.32

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

EIRP (* P/M: Power Meter with power senser, AV: Average) **Reference Data**

Ch	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Antenna Gain [dBi]	Result (e.i.r.p.) [dBm]	Result (e.i.r.p.) [mW]	Limit (e.i.r.p.) [dBm]	Limit (e.i.r.p.) [mW]	Margin [dB]
Low	5180.0	-11.92	1.74	20.10	0.24	1.77	11.93	15.60	-	-	-
Mid	5220.0	-12.44	1.74	20.09	0.24	1.77	11.40	13.80	-	-	-
High	5240.0	-12.78	1.93	20.09	0.24	1.77	11.25	13.34	-	-	-

Sample Calculation: Result = Reading + Cable Loss + Atten. Loss + Duty factor + Antenna Gain

[Pre check]
Antenna 0

	Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Result [dBm]
0	0	5180.0	-12.53	1.74	20.09	0.22	9.52
0	1	5180.0	-12.55	1.74	20.09	0.22	9.50
0	2	5180.0	-12.60	1.74	20.09	0.26	9.49
0	3	5180.0	-12.62	1.74	20.09	0.17	9.38
0	4	5180.0	-12.66	1.74	20.09	0.25	9.42
0	5	5180.0	-12.91	1.74	20.09	0.32	9.24
0	6	5180.0	-12.95	1.74	20.09	0.45	9.33
0	7	5180.0	-13.01	1.74	20.09	0.38	9.20

Antenna 1

	Mode (MCS)	Freq. [MHz]	P/M (AV) Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Result [dBm]	
1	0	5180.0	-11.92	1.74	20.09	0.22	10.13	**Worst**
1	1	5180.0	-11.96	1.74	20.09	0.22	10.09	
1	2	5180.0	-12.01	1.74	20.09	0.26	10.08	
1	3	5180.0	-11.97	1.74	20.09	0.17	10.03	
1	4	5180.0	-12.08	1.74	20.09	0.25	10.00	
1	5	5180.0	-12.18	1.74	20.09	0.32	9.97	
1	6	5180.0	-12.22	1.74	20.09	0.45	10.06	
1	7	5180.0	-12.21	1.74	20.09	0.38	10.00	

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Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

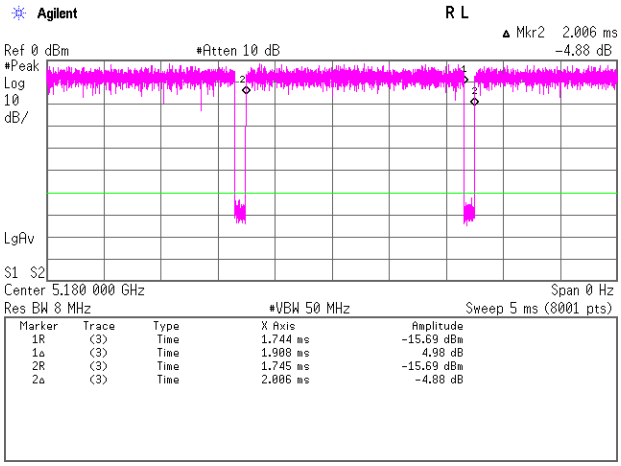
Maximum Conducted Output Power (Conducted)

(Reference) (duty chart)

Tx, IEEE802.11n-HT20, SISO, antenna port 1, (Tx 5180MHz)

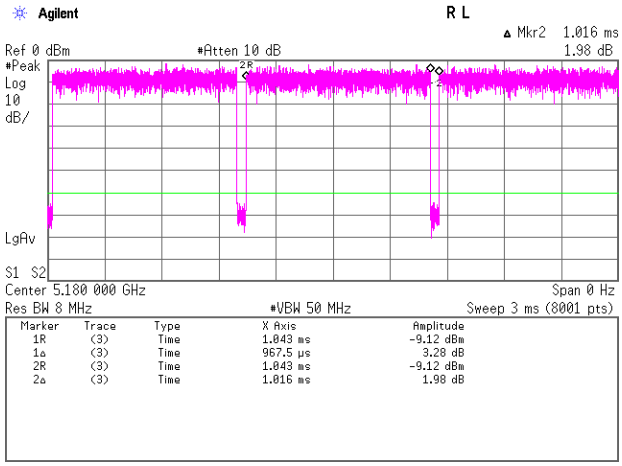
MCS0

duty factor [dB] = 10 x log (2.01[ms] / 1.91[ms]) = 0.22 [dB]



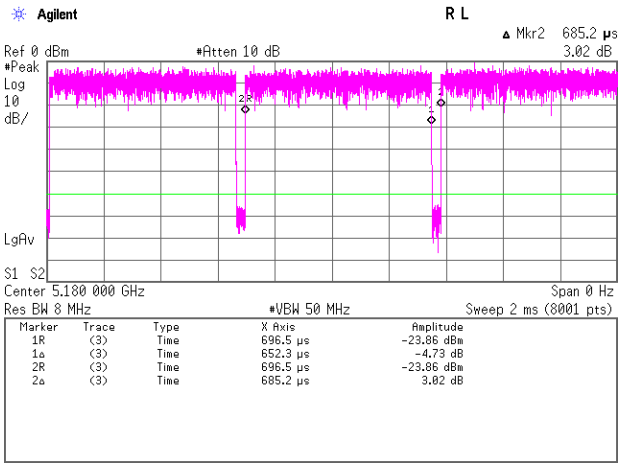
MCS1

duty factor [dB] = 10 x log (1.02[ms] / 0.97[ms]) = 0.22 [dB]



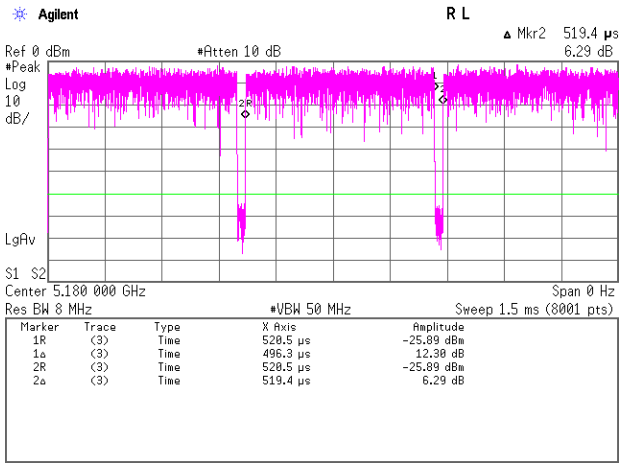
MCS2

duty factor [dB] = 10 x log (0.69[ms] / 0.65[ms]) = 0.26 [dB]



MCS3

duty factor [dB] = 10 x log (0.52[ms] / 0.5[ms]) = 0.17 [dB]



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Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

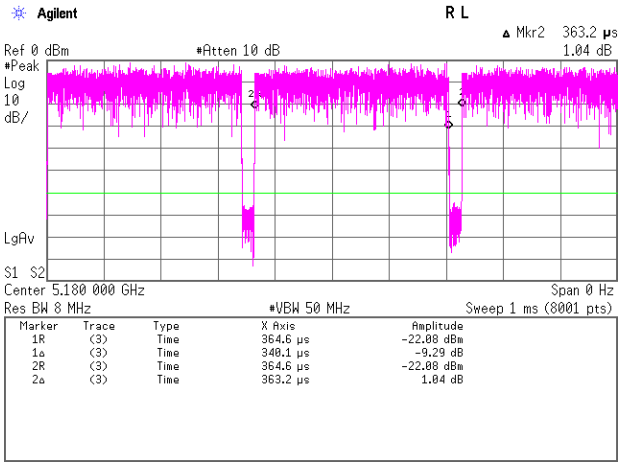
Maximum Conducted Output Power (Conducted)

(Reference) (duty chart)

Tx, IEEE802.11n-HT20, SISO, antenna port 1, (Tx 5180MHz)

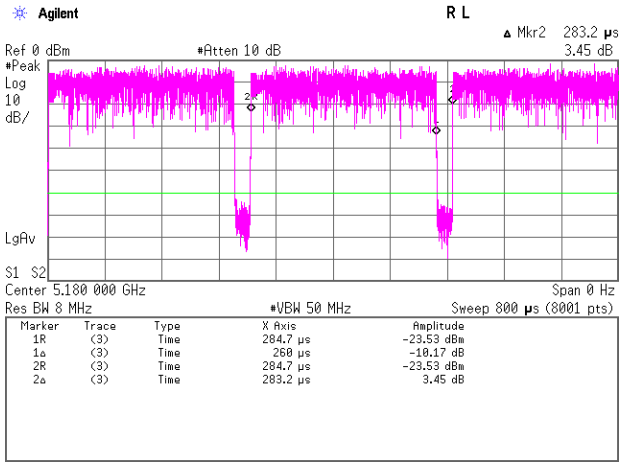
MCS4

duty factor [dB] = 10 x log (0.36[ms] / 0.34[ms]) = 0.25 [dB]



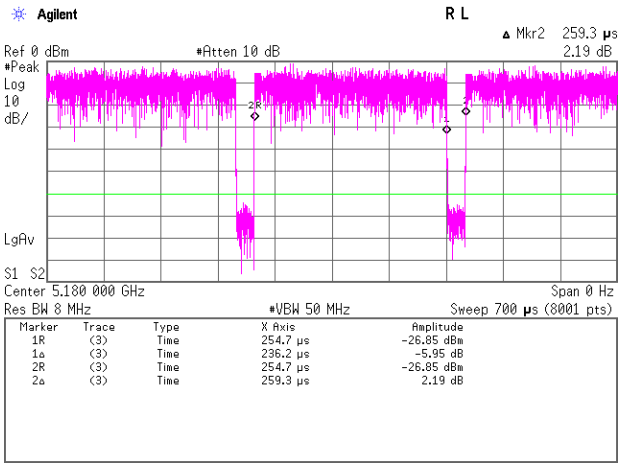
MCS5

duty factor [dB] = 10 x log (0.28[ms] / 0.26[ms]) = 0.32 [dB]



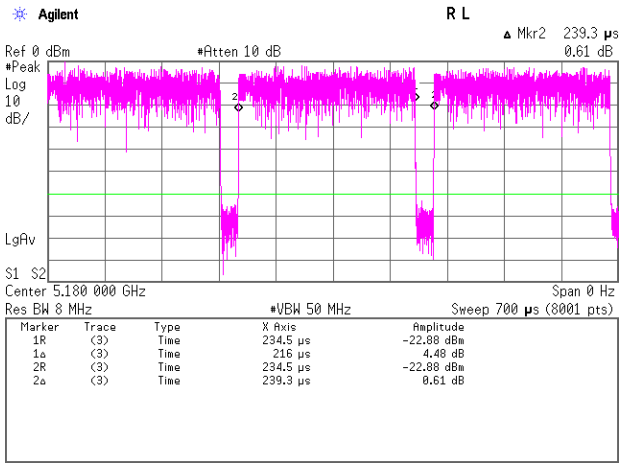
MCS6

duty factor [dB] = 10 x log (0.26[ms] / 0.24[ms]) = 0.45 [dB]



MCS7

duty factor [dB] = 10 x log (0.24[ms] / 0.22[ms]) = 0.38 [dB]



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Maximum Conducted Output Power (Conducted)

(Method: PM)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room	
Date	December 9, 2013		
Temperature / Humidity	23 deg.C , 32 %RH		
Engineer	Shinichi Takano		
Mode	Tx, IEEE802.11n (HT20), CDD, PN9,	worst data mode :	0 (MCS)

Antenna 0 + 1

Ch	Freq.	Result (Cond.)		Result (e.i.r.p.)		Limit (Cond.)		Limit (e.i.r.p.)		Margin (Cond.)	Margin (e.i.r.p.)
	[MHz]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[dBm]
Low	5180.0	13.06	20.24	14.83	30.42	16.82	48.04	-	-	3.75	-
Mid	5220.0	12.65	18.39	14.42	27.64	16.82	48.04	-	-	4.17	-
High	5240.0	12.73	18.74	14.50	28.17	16.82	48.04	-	-	4.09	-

Sample Calculation: Result [mW] = Antenna 0 Result [mW] + Antenna 1 Result [mW]

Antenna 0 (* P/M: Power Meter with power senser, AV: Average)

Ch	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty factor	Result (Cond.)		Antenna Gain	Result (e.i.r.p.)	
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]	[dBi]	[dBm]	[mW]
Low	5180.0	-12.13	1.74	20.10	0.22	9.93	9.84	1.77	11.70	14.79
Mid	5220.0	-12.39	1.74	20.09	0.22	9.66	9.25	1.77	11.43	13.90
High	5240.0	-12.36	1.93	20.09	0.22	9.88	9.73	1.77	11.65	14.62

Antenna 1 (* P/M: Power Meter with power senser, AV: Average)

Ch	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty factor	Result (Cond.)		Antenna Gain	Result (e.i.r.p.)	
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]	[dBi]	[dBm]	[mW]
Low	5180.0	-11.89	1.74	20.10	0.22	10.17	10.40	1.77	11.94	15.63
Mid	5220.0	-12.44	1.74	20.09	0.22	9.61	9.14	1.77	11.38	13.74
High	5240.0	-12.69	1.93	20.09	0.22	9.55	9.02	1.77	11.32	13.55

Sample Calculation: (Cond.) Result = Reading + Cable Loss + Atten. Loss + Duty factor

(e.i.r.p) Result = Reading + Cable Loss + Atten. Loss + Duty factor + Antenna Gain

[Pre check]

Mode	Freq.	Duty factor	Antenna 0 Reading	Antenna 0 Result		Antenna 1 Reading	Antenna 1 Result		Antenna 0 + 1 Result		
(MCS)	[MHz]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dBm]	[mW]	[dBm]	[mW]	
0	5180.0	0.22	**-12.13**	**-11.91**	0.06	**-11.89**	**-11.67**	0.07	-8.78	0.13	**Worst**
1	5180.0	0.21	-12.15	-11.94	0.06	-11.91	-11.70	0.07	-8.81	0.13	
2	5180.0	0.22	-12.21	-11.99	0.06	-11.96	-11.74	0.07	-8.85	0.13	
3	5180.0	0.20	-12.23	-12.03	0.06	-11.99	-11.79	0.07	-8.90	0.13	
4	5180.0	0.29	-12.27	-11.98	0.06	-12.06	-11.77	0.07	-8.86	0.13	
5	5180.0	0.38	-12.32	-11.94	0.06	-12.15	-11.77	0.07	-8.84	0.13	
6	5180.0	0.41	-12.47	-12.06	0.06	-12.19	-11.78	0.07	-8.91	0.13	
7	5180.0	0.45	-12.51	-12.06	0.06	-12.20	-11.75	0.07	-8.89	0.13	

Sample Calculation: Result = Duty factor + Reading

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Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

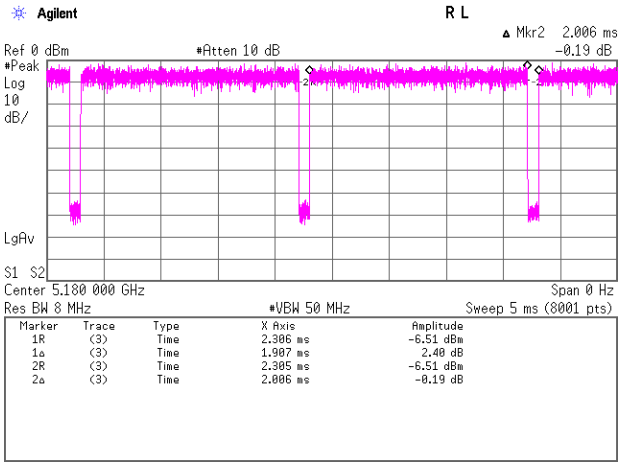
Maximum Conducted Output Power (Conducted)

(Reference) (duty chart)

Tx, IEEE802.11n (HT20), CDD, (Tx 5220MHz)

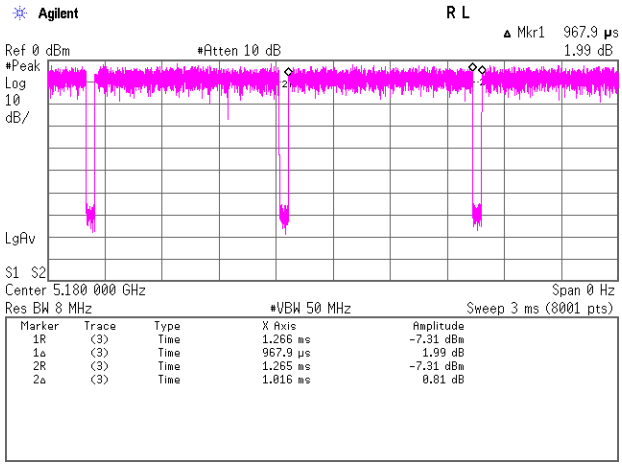
MCS0

duty factor [dB] = 10 x log (2.01[ms] / 1.91[ms]) = 0.22 [dB]



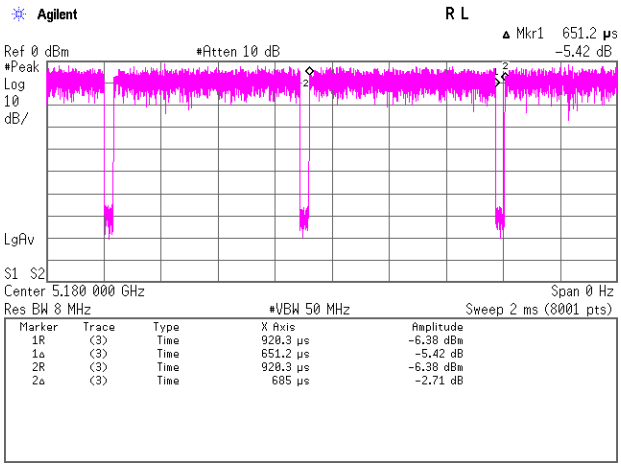
MCS1

duty factor [dB] = 10 x log (1.02[ms] / 0.97[ms]) = 0.21 [dB]



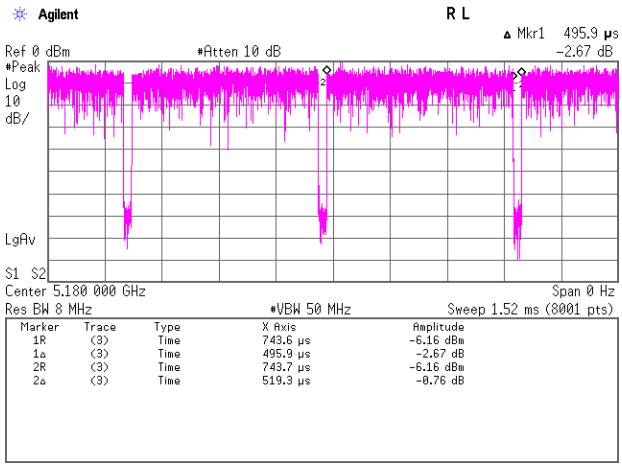
MCS2

duty factor [dB] = 10 x log (0.69[ms] / 0.65[ms]) = 0.22 [dB]



MCS3

duty factor [dB] = 10 x log (0.52[ms] / 0.5[ms]) = 0.2 [dB]



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Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

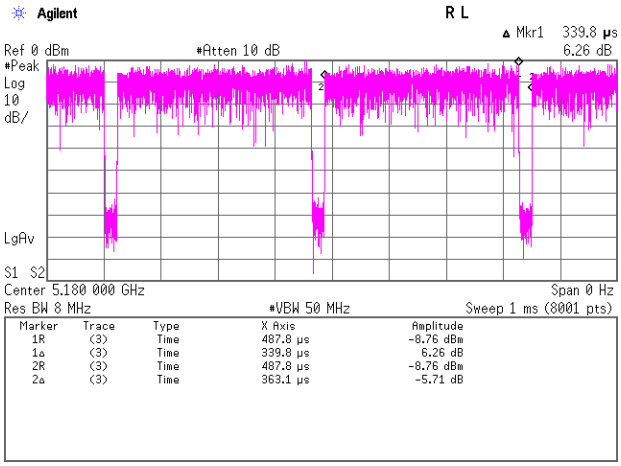
Maximum Conducted Output Power (Conducted)

(Reference) (duty chart)

Tx, IEEE802.11n (HT20), CDD, (Tx 5220MHz)

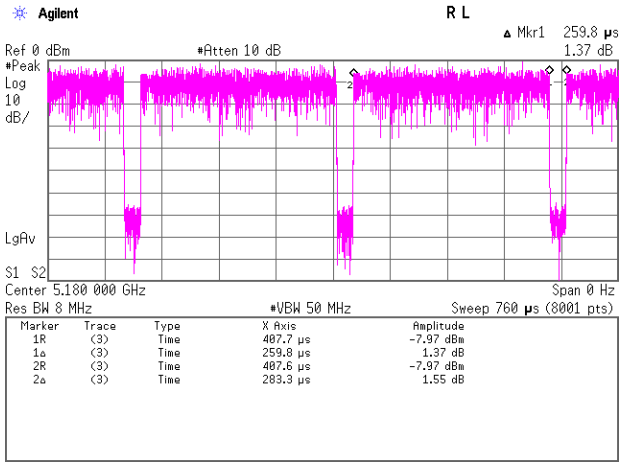
MCS4

duty factor [dB] = 10 x log (0.36[ms] / 0.34[ms]) = 0.29 [dB]



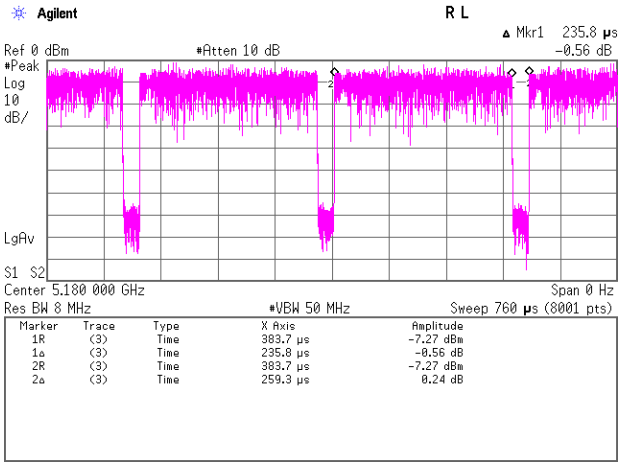
MCS5

duty factor [dB] = 10 x log (0.28[ms] / 0.26[ms]) = 0.38 [dB]



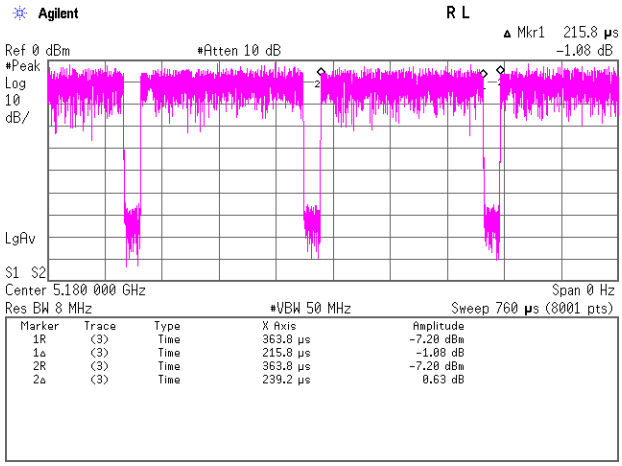
MCS6

duty factor [dB] = 10 x log (0.26[ms] / 0.24[ms]) = 0.41 [dB]



MCS7

duty factor [dB] = 10 x log (0.24[ms] / 0.22[ms]) = 0.45 [dB]



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Maximum Conducted Output Power (Conducted)

(Method: PM)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room	
Date	December 9, 2013		
Temperature / Humidity	23 deg.C , 32 %RH		
Engineer	Shinichi Takano		
Mode	Tx, IEEE802.11n (HT20), MIMO(SDM), PN9,	worst data mode :	8 (MCS)

Antenna 0 + 1

Ch	Freq.	Result (Cond.)		Result (e.i.r.p.)		Limit (Cond.)		Limit (e.i.r.p.)		Margin (Cond.)	Margin (e.i.r.p.)
	[MHz]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[dBm]
Low	5180.0	12.87	19.37	14.64	29.12	16.84	48.34	-	-	3.97	-
Mid	5220.0	12.56	18.03	14.33	27.10	16.84	48.34	-	-	4.28	-
High	5240.0	12.64	18.35	14.41	27.58	16.84	48.34	-	-	4.21	-

Sample Calculation: Result [mW] = Antenna 0 Result [mW] + Antenna 1 Result [mW]

Antenna 0 (* P/M: Power Meter with power senser, AV: Average)

Ch	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty factor	Result (Cond.)		Antenna Gain	Result (e.i.r.p.)	
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]	[dBi]	[dBm]	[mW]
Low	5180.0	-12.53	1.74	20.10	0.42	9.73	9.40	1.77	11.50	14.13
Mid	5220.0	-12.72	1.74	20.09	0.42	9.53	8.97	1.77	11.30	13.49
High	5240.0	-12.74	1.93	20.09	0.42	9.70	9.33	1.77	11.47	14.03

Antenna 1 (* P/M: Power Meter with power senser, AV: Average)

Ch	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty factor	Result (Cond.)		Antenna Gain	Result (e.i.r.p.)	
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]	[dBi]	[dBm]	[mW]
Low	5180.0	-12.27	1.74	20.10	0.42	9.99	9.98	1.77	11.76	15.00
Mid	5220.0	-12.68	1.74	20.09	0.42	9.57	9.06	1.77	11.34	13.61
High	5240.0	-12.89	1.93	20.09	0.42	9.55	9.02	1.77	11.32	13.55

Sample Calculation: (Cond.) Result = Reading + Cable Loss + Atten. Loss + Duty factor

(e.i.r.p) Result = Reading + Cable Loss + Atten. Loss + Duty factor + Antenna Gain

[Pre check]

Mode	Freq.	Duty factor	Antenna 0 Reading	Antenna 0 Result		Antenna 1 Reading	Antenna 1 Result		Antenna 0 + 1 Result		
(MCS)	[MHz]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dBm]	[mW]	[dBm]	[mW]	
8	5180.0	0.42	**-12.53**	**-12.11**	0.06	**-12.27**	**-11.85**	0.07	-8.97	0.13	**Worst**
9	5180.0	0.40	-12.56	-12.16	0.06	-12.32	-11.92	0.06	-9.03	0.13	
10	5180.0	0.40	-12.58	-12.18	0.06	-12.33	-11.93	0.06	-9.04	0.12	
11	5180.0	0.37	-12.55	-12.18	0.06	-12.37	-12.00	0.06	-9.08	0.12	
12	5180.0	0.50	-12.66	-12.16	0.06	-12.49	-11.99	0.06	-9.06	0.12	
13	5180.0	0.63	-12.80	-12.17	0.06	-12.63	-12.00	0.06	-9.07	0.12	
14	5180.0	0.68	-12.89	-12.21	0.06	-12.71	-12.03	0.06	-9.11	0.12	
15	5180.0	0.74	-12.90	-12.16	0.06	-12.76	-12.02	0.06	-9.08	0.12	

Sample Calculation: Result = Duty factor + Reading

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Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

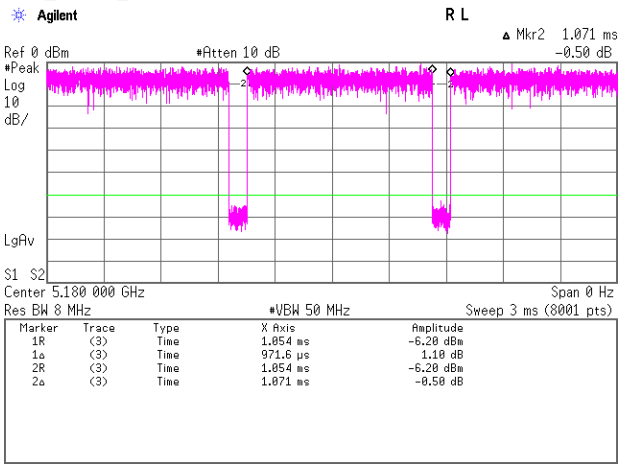
Maximum Conducted Output Power (Conducted)

(Reference) (duty chart)

Tx, IEEE802.11n (HT20), MIMO(SDM), (Tx 5180MHz)

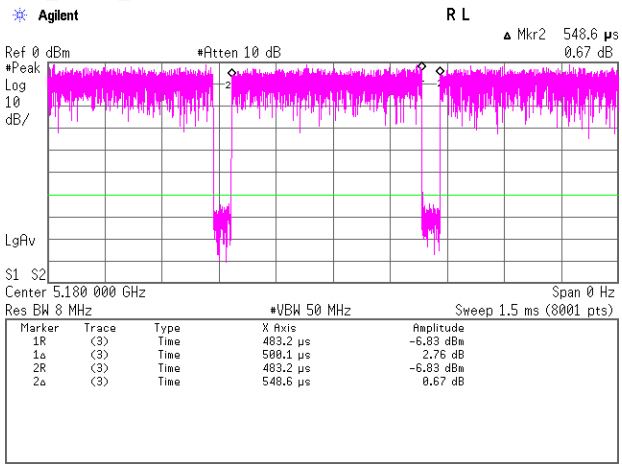
MCS8

duty factor [dB] = 10 x log (1.07[ms] / 0.97[ms]) = 0.42 [dB]



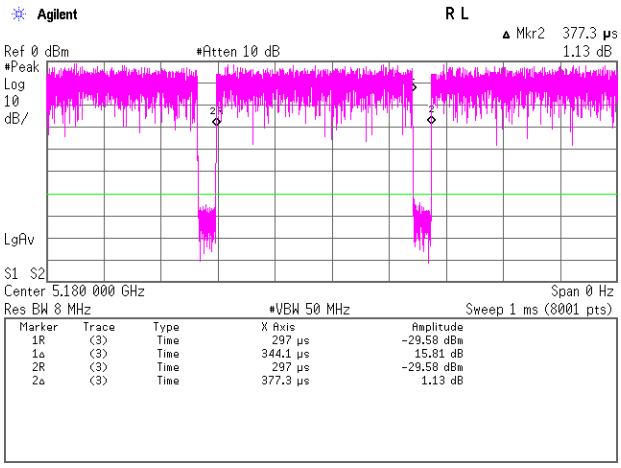
MCS9

duty factor [dB] = 10 x log (0.55[ms] / 0.5[ms]) = 0.4 [dB]



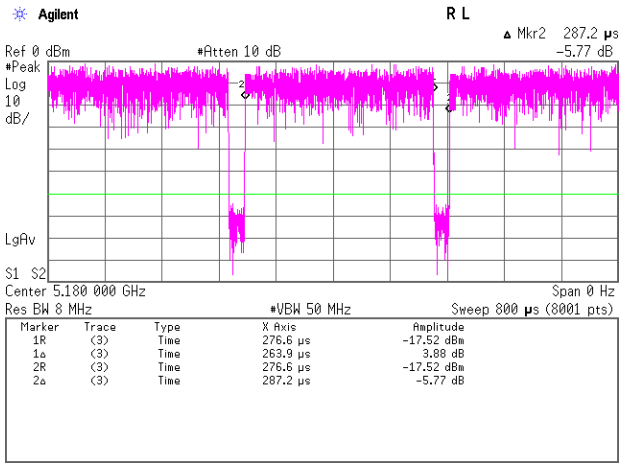
MCS10

duty factor [dB] = 10 x log (0.38[ms] / 0.34[ms]) = 0.4 [dB]



MCS11

duty factor [dB] = 10 x log (0.29[ms] / 0.26[ms]) = 0.37 [dB]



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Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

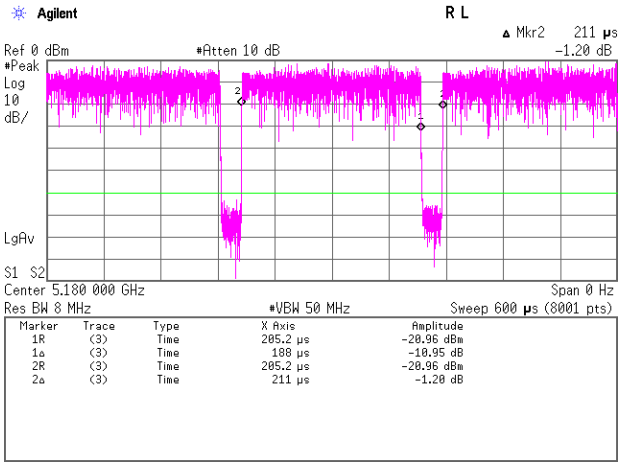
Maximum Conducted Output Power (Conducted)

(Reference) (duty chart)

Tx, IEEE802.11n (HT20), MIMO(SDM), (Tx 5180MHz)

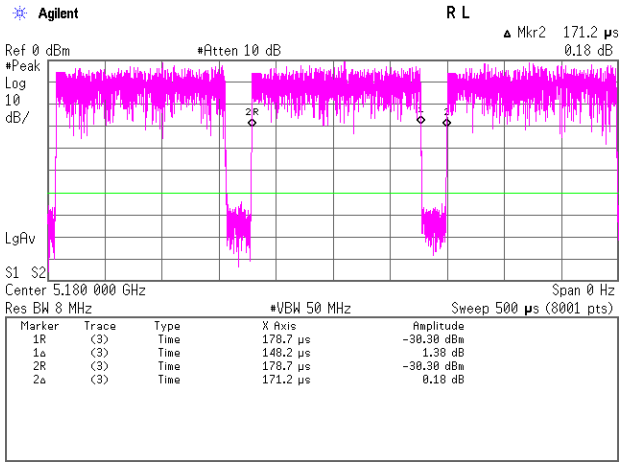
MCS12

duty factor [dB] = 10 x log (0.21[ms] / 0.19[ms]) = 0.5 [dB]



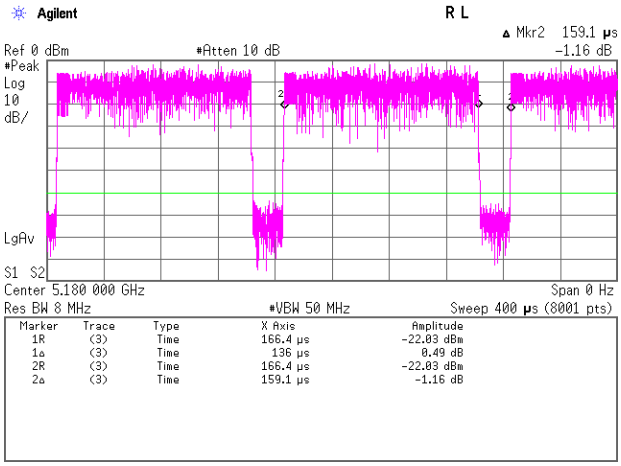
MCS13

duty factor [dB] = 10 x log (0.17[ms] / 0.15[ms]) = 0.63 [dB]



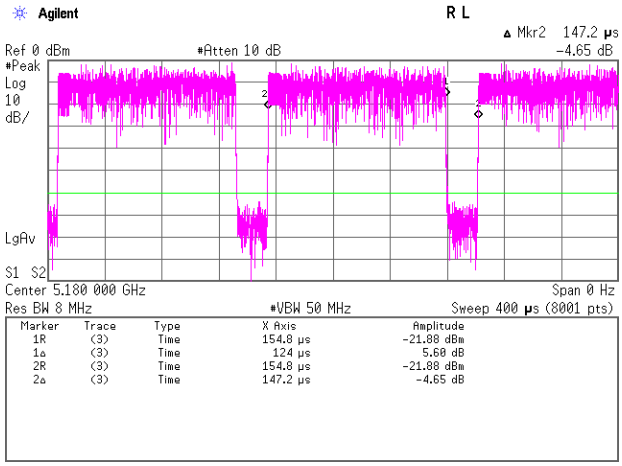
MCS14

duty factor [dB] = 10 x log (0.16[ms] / 0.14[ms]) = 0.68 [dB]



MCS15

duty factor [dB] = 10 x log (0.15[ms] / 0.12[ms]) = 0.74 [dB]



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Maximum Conducted Output Power (Conducted)

(Method: PM)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room	
Date	January 31, 2014		
Temperature / Humidity	26deg.C , 44%RH		
Engineer	Shinichi Takano		
Mode	Tx, IEEE802.11n-HT40, SISO, PN9,	worst antenna : 1	worst data mode : 0 (MCS)

Antena terminal power (* P/M: Power Meter with power senser, 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	5190.0	-14.11	1.74	20.09	0.44		8.16	6.55	16.99	50.00	8.83
High	5230.0	-14.38	1.74	20.09	0.44		7.89	6.15	16.99	50.00	9.10

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

EIRP (* P/M: Power Meter with power senser, AV: Average) **Reference Data**

Ch	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty factor	Antenna Gain	Result		Limit		Margin
							(e.i.r.p.)	(e.i.r.p.)	(e.i.r.p.)	(e.i.r.p.)	
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBi]	[dBm]	[mW]	[dBm]	[mW]	[dB]
Low	5190.0	-14.11	1.74	20.09	0.44	1.77	9.93	9.84	-	-	-
									-	-	-
High	5230.0	-14.38	1.74	20.09	0.44	1.77	9.66	9.25	-	-	-

Sample Calculation: Result = Reading + Cable Loss + Atten. Loss + Duty factor + Antenna Gain

[Pre check]

Antenna 0

	Mode	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty factor	Result
	(MCS)	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]
0	0	5190.0	-14.42	1.74	20.09	0.44	7.85
0	1	5190.0	-14.46	1.74	20.09	0.43	7.80
0	2	5190.0	-14.50	1.74	20.09	0.38	7.71
0	3	5190.0	-14.49	1.74	20.09	0.49	7.83
0	4	5190.0	-14.53	1.74	20.09	0.46	7.76
0	5	5190.0	-14.78	1.74	20.09	0.58	7.63
0	6	5190.0	-14.84	1.74	20.09	0.78	7.77
0	7	5190.0	-14.92	1.74	20.09	0.67	7.58

Antenna 1

	Mode	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty factor	Result	
	(MCS)	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	
1	0	5190.0	-14.11	1.74	20.09	0.44	8.16	**Worst**
1	1	5190.0	-14.19	1.74	20.09	0.43	8.07	
1	2	5190.0	-14.33	1.74	20.09	0.38	7.88	
1	3	5190.0	-14.28	1.74	20.09	0.49	8.04	
1	4	5190.0	-14.27	1.74	20.09	0.46	8.02	
1	5	5190.0	-14.46	1.74	20.09	0.58	7.95	
1	6	5190.0	-14.57	1.74	20.09	0.78	8.04	
1	7	5190.0	-14.53	1.74	20.09	0.67	7.97	

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 12, 2013	
Temperature / Humidity	25 deg.C , 51 %RH	
Engineer	Shinichi Takano	

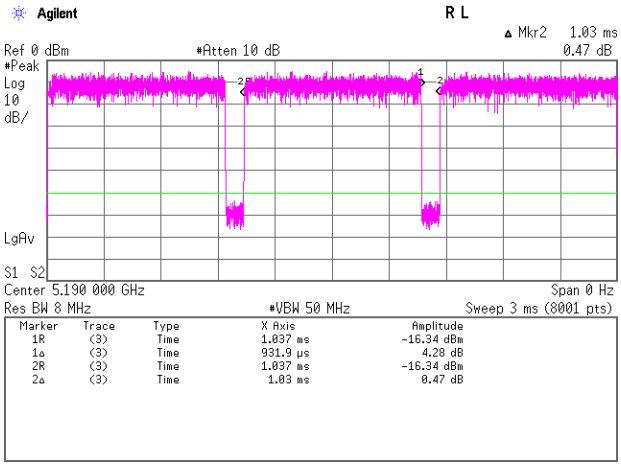
Maximum Conducted Output Power (Conducted)

(Reference) (duty chart)

Tx, IEEE802.11n-HT40, SISO, antenna port 1, (Tx 5190MHz)

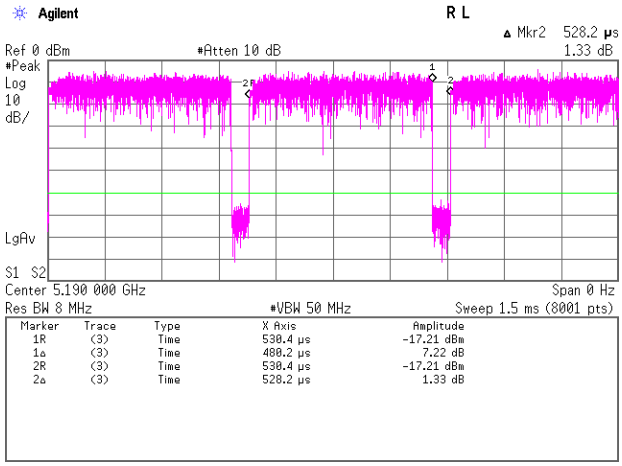
MCS0

duty factor [dB] = 10 x log (1.03[ms] / 0.93[ms]) = 0.44 [dB]



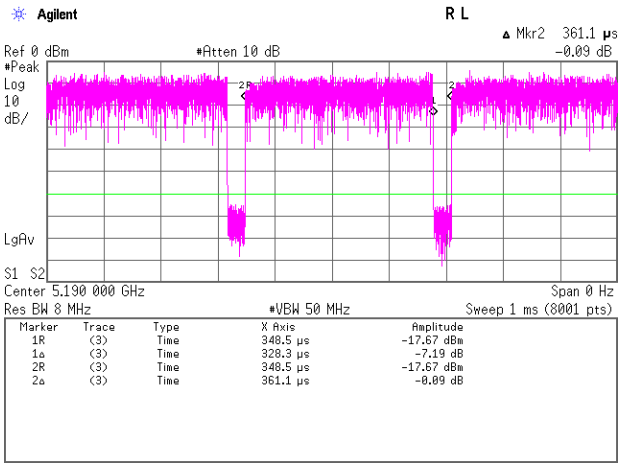
MCS1

duty factor [dB] = 10 x log (0.53[ms] / 0.48[ms]) = 0.43 [dB]



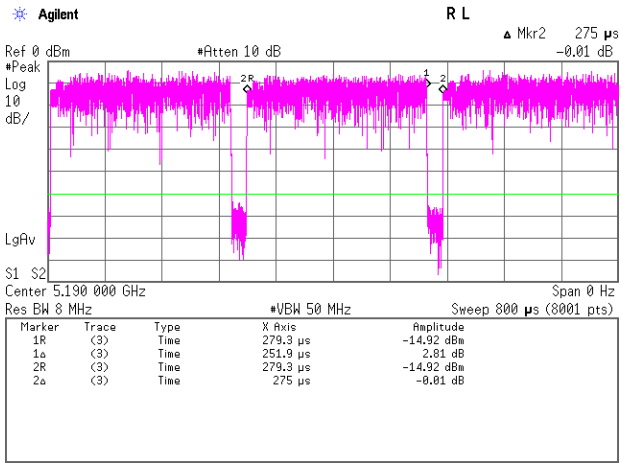
MCS2

duty factor [dB] = 10 x log (0.36[ms] / 0.33[ms]) = 0.38 [dB]



MCS3

duty factor [dB] = 10 x log (0.28[ms] / 0.25[ms]) = 0.49 [dB]



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Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 12, 2013	
Temperature / Humidity	25 deg.C , 51 %RH	
Engineer	Shinichi Takano	

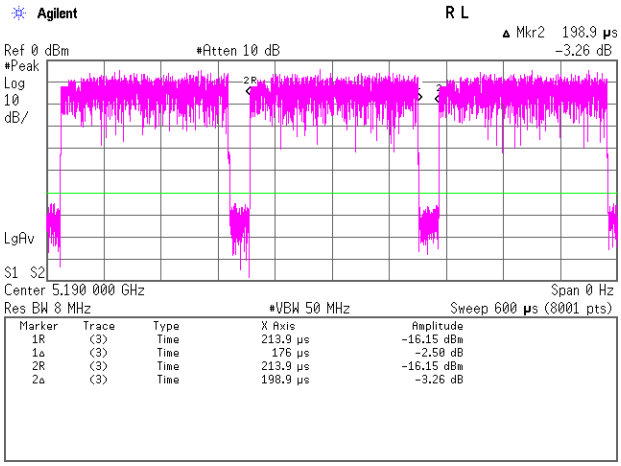
Maximum Conducted Output Power (Conducted)

(Reference) (duty chart)

Tx, IEEE802.11n-HT40, SISO, antenna port 1, (Tx 5190MHz)

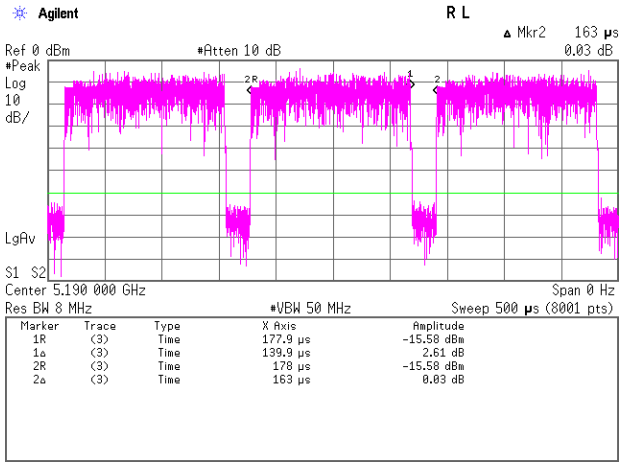
MCS4

duty factor [dB] = 10 x log (0.2[ms] / 0.18[ms]) = 0.46 [dB]



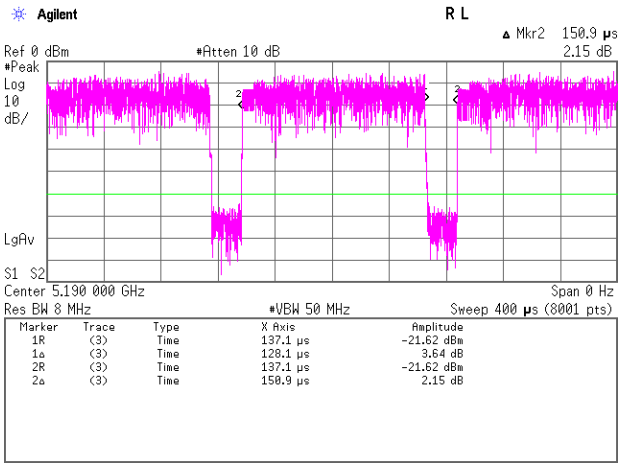
MCS5

duty factor [dB] = 10 x log (0.16[ms] / 0.14[ms]) = 0.58 [dB]



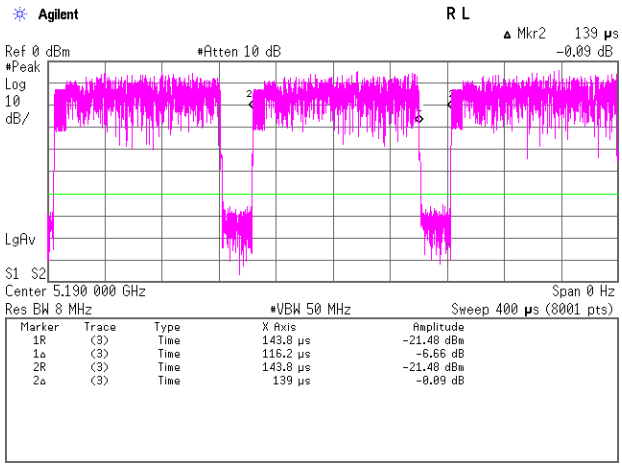
MCS6

duty factor [dB] = 10 x log (0.15[ms] / 0.13[ms]) = 0.78 [dB]



MCS7

duty factor [dB] = 10 x log (0.14[ms] / 0.12[ms]) = 0.67 [dB]



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Maximum Conducted Output Power (Conducted)

(Method: PM)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room	
Date	December 12, 2013		
Temperature / Humidity	25 deg.C , 51 %RH		
Engineer	Shinichi Takano		
Mode	Tx, IEEE802.11n (HT40), CDD, PN9,	worst data mode :	0 (MCS)

Antenna 0 + 1

Ch	Freq.	Result (Cond.)		Result (e.i.r.p.)		Limit (Cond.)		Limit (e.i.r.p.)		Margin (Cond.)	Margin (e.i.r.p.)
	[MHz]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[dBm]
Low	5190.0	11.28	13.42	13.05	20.18	16.99	50.00	-	-	5.71	-
High	5230.0	10.99	12.55	12.76	18.86	16.99	50.00	-	-	6.00	-

Sample Calculation: Result [mW] = Antenna 0 Result [mW] + Antenna 1 Result [mW]

Antenna 0 (* P/M: Power Meter with power senser, AV: Average)

Ch	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty factor	Result (Cond.)		Antenna Gain	Result (e.i.r.p.)	
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]	[dBi]	[dBm]	[mW]
Low	5190.0	-14.18	1.74	20.09	0.44	8.09	6.44	1.77	9.86	9.68
High	5230.0	-14.32	1.74	20.09	0.44	7.95	6.24	1.77	9.72	9.38

Antenna 1 (* P/M: Power Meter with power senser, AV: Average)

Ch	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty factor	Result (Cond.)		Antenna Gain	Result (e.i.r.p.)	
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]	[dBi]	[dBm]	[mW]
Low	5190.0	-13.83	1.74	20.09	0.44	8.44	6.98	1.77	10.21	10.50
High	5230.0	-14.27	1.74	20.09	0.44	8.00	6.31	1.77	9.77	9.48

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

(e.i.r.p) Result = Reading + Cable Loss (including the cable(s) customer supplied) + Atten. Loss + Duty Factor + Antenna Gain

[Pre check]

Mode	Freq.	Duty factor	Antenna 0 Reading	Antenna 0 Result		Antenna 1 Reading	Antenna 1 Result		Antenna 0 + 1 Result		
(MCS)	[MHz]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dBm]	[mW]	[dBm]	[mW]	
0	5190.0	0.44	**-14.18**	**-13.74**	0.04	**-13.83**	**-13.39**	0.05	-10.55	0.09	**Worst**
1	5190.0	0.41	-14.22	-13.81	0.04	-13.90	-13.49	0.04	-10.64	0.09	
2	5190.0	0.42	-14.29	-13.87	0.04	-13.88	-13.46	0.05	-10.65	0.09	
3	5190.0	0.38	-14.24	-13.86	0.04	-13.86	-13.48	0.04	-10.66	0.09	
4	5190.0	0.53	-14.33	-13.80	0.04	-13.98	-13.45	0.05	-10.61	0.09	
5	5190.0	0.66	-14.46	-13.80	0.04	-14.11	-13.45	0.05	-10.61	0.09	
6	5190.0	0.73	-14.54	-13.81	0.04	-14.22	-13.49	0.04	-10.64	0.09	
7	5190.0	0.78	-14.58	-13.80	0.04	-14.36	-13.58	0.04	-10.68	0.09	

Sample Calculation: Result = Duty factor + Reading

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Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 12, 2013	
Temperature / Humidity	25 deg.C , 51 %RH	
Engineer	Shinichi Takano	

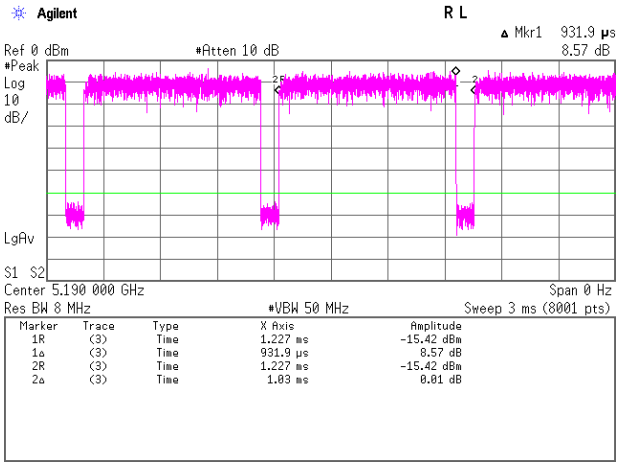
Maximum Conducted Output Power (Conducted)

(Reference) (duty chart)

Tx, IEEE802.11n (HT40), CDD, (Tx 5190MHz)

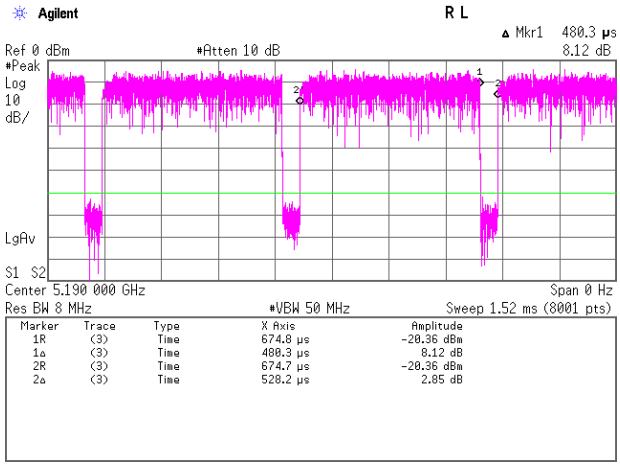
MCS0

duty factor [dB] = 10 x log (1.03[ms] / 0.93[ms]) = 0.44 [dB]



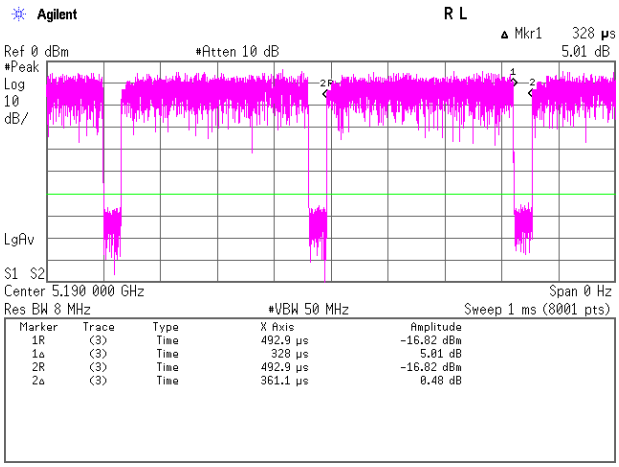
MCS1

duty factor [dB] = 10 x log (0.53[ms] / 0.48[ms]) = 0.41 [dB]



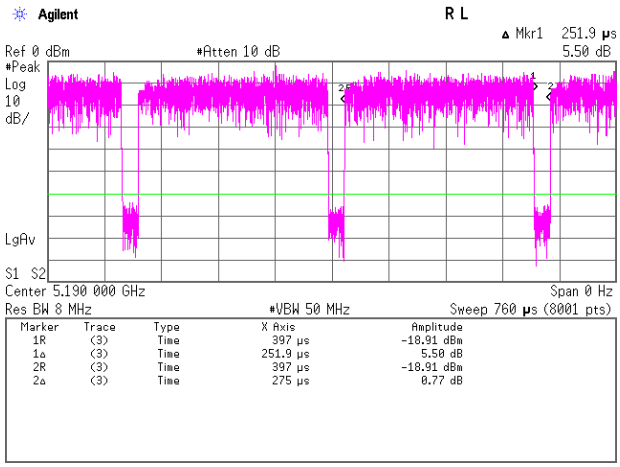
MCS2

duty factor [dB] = 10 x log (0.36[ms] / 0.33[ms]) = 0.42 [dB]



MCS3

duty factor [dB] = 10 x log (0.28[ms] / 0.25[ms]) = 0.38 [dB]



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Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 12, 2013	
Temperature / Humidity	25 deg.C , 51 %RH	
Engineer	Shinichi Takano	

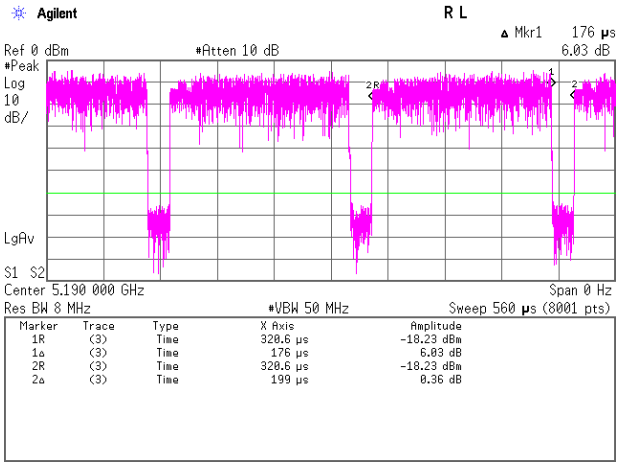
Maximum Conducted Output Power (Conducted)

(Reference) (duty chart)

Tx, IEEE802.11n (HT40), CDD, (Tx 5190MHz)

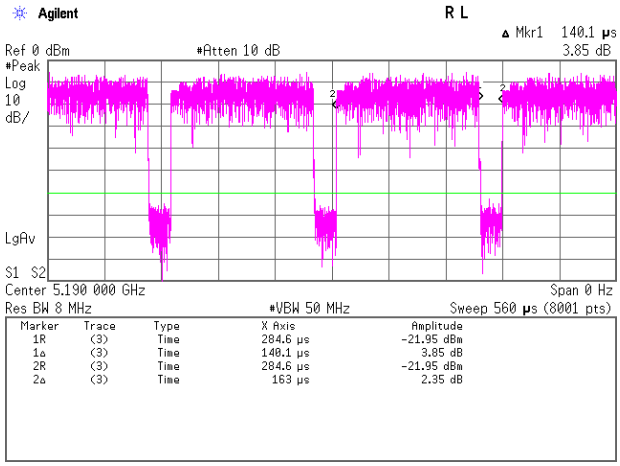
MCS4

duty factor [dB] = 10 x log (0.2[ms] / 0.18[ms]) = 0.53 [dB]



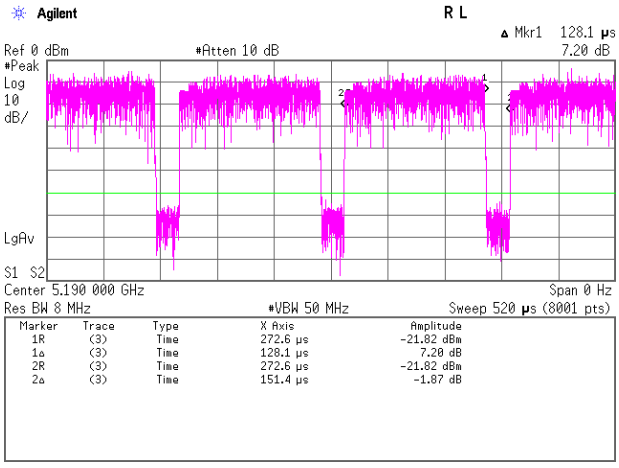
MCS5

duty factor [dB] = 10 x log (0.16[ms] / 0.14[ms]) = 0.66 [dB]



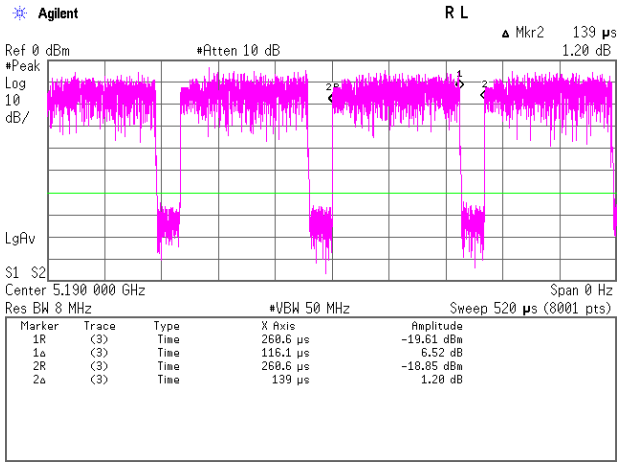
MCS6

duty factor [dB] = 10 x log (0.15[ms] / 0.13[ms]) = 0.73 [dB]



MCS7

duty factor [dB] = 10 x log (0.14[ms] / 0.12[ms]) = 0.78 [dB]



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Maximum Conducted Output Power (Conducted)

(Method: PM)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room	
Date	December 12, 2013		
Temperature / Humidity	25 deg.C , 51 %RH		
Engineer	Shinichi Takano		
Mode	Tx, IEEE802.11n (HT40), MIMO(SDM), PN9,	worst data mode :	8 (MCS)

Antenna 0 + 1

Ch	Freq.	Result (Cond.)		Result (e.i.r.p.)		Limit (Cond.)		Limit (e.i.r.p.)		Margin (Cond.)	Margin (e.i.r.p.)
	[MHz]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[mW]	[dBm]	[dBm]
Low	5190.0	11.22	13.25	12.99	19.92	16.99	50.00	-	-	5.77	-
High	5230.0	10.81	12.04	12.58	18.09	16.99	50.00	-	-	6.18	-

Sample Calculation: Result [mW] = Antenna 0 Result [mW] + Antenna 1 Result [mW]

Antenna 0 (* P/M: Power Meter with power senser, AV: Average)

Ch	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty factor	Result (Cond.)		Antenna Gain	Result (e.i.r.p.)	
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]	[dBi]	[dBm]	[mW]
Low	5190.0	-14.58	1.74	20.09	0.80	8.05	6.38	1.77	9.82	9.59
High	5230.0	-14.88	1.74	20.09	0.80	7.75	5.96	1.77	9.52	8.95

Antenna 1 (* P/M: Power Meter with power senser, AV: Average)

Ch	Freq.	P/M (AV) Reading	Cable Loss	Atten. Loss	Duty factor	Result (Cond.)		Antenna Gain	Result (e.i.r.p.)	
	[MHz]	[dBm]	[dB]	[dB]	[dB]	[dBm]	[mW]	[dBi]	[dBm]	[mW]
Low	5190.0	-14.26	1.74	20.09	0.80	8.37	6.87	1.77	10.14	10.33
High	5230.0	-14.79	1.74	20.09	0.80	7.84	6.08	1.77	9.61	9.14

Sample Calculation: (Cond.) Result = Reading + Cable Loss + Atten. Loss + Duty factor

(e.i.r.p) Result = Reading + Cable Loss + Atten. Loss + Duty factor + Antenna Gain

[Pre check]

Mode	Freq.	Duty factor	Antenna 0 Reading	Antenna 0 Result		Antenna 1 Reading	Antenna 1 Result		Antenna 0 + 1 Result		
(MCS)	[MHz]	[dB]	[dBm]	[dBm]	[mW]	[dBm]	[dBm]	[mW]	[dBm]	[mW]	
8	5190.0	0.80	**-14.58**	**-13.78**	0.04	**-14.26**	**-13.46**	0.05	-10.61	0.09	**Worst**
9	5190.0	0.75	-14.64	-13.89	0.04	-14.35	-13.60	0.04	-10.73	0.08	
10	5190.0	0.73	-14.68	-13.95	0.04	-14.38	-13.65	0.04	-10.79	0.08	
11	5190.0	0.64	-14.67	-14.03	0.04	-14.29	-13.65	0.04	-10.83	0.08	
12	5190.0	0.86	-14.79	-13.93	0.04	-14.52	-13.66	0.04	-10.78	0.08	
13	5190.0	1.00	-15.04	-14.04	0.04	-14.76	-13.76	0.04	-10.89	0.08	
14	5190.0	1.09	-15.12	-14.03	0.04	-14.81	-13.72	0.04	-10.86	0.08	
15	5190.0	1.14	-15.16	-14.02	0.04	-14.91	-13.77	0.04	-10.88	0.08	

Sample Calculation: Result = Duty factor + Reading

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Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 12, 2013	
Temperature / Humidity	25 deg.C , 51 %RH	
Engineer	Shinichi Takano	

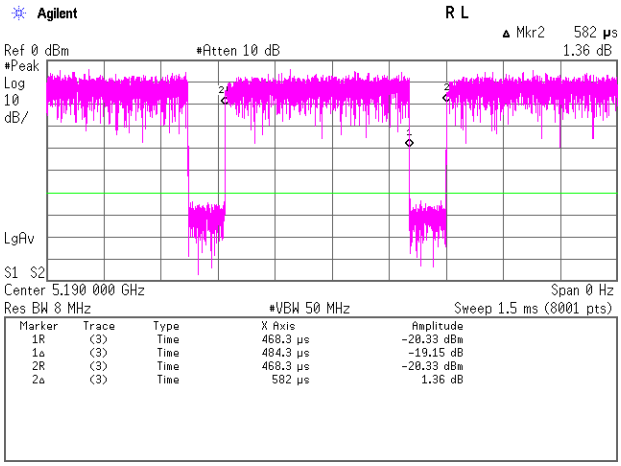
Maximum Conducted Output Power (Conducted)

(Reference) (duty chart)

Tx, IEEE802.11n (HT40), MIMO(SDM), (Tx 5190MHz)

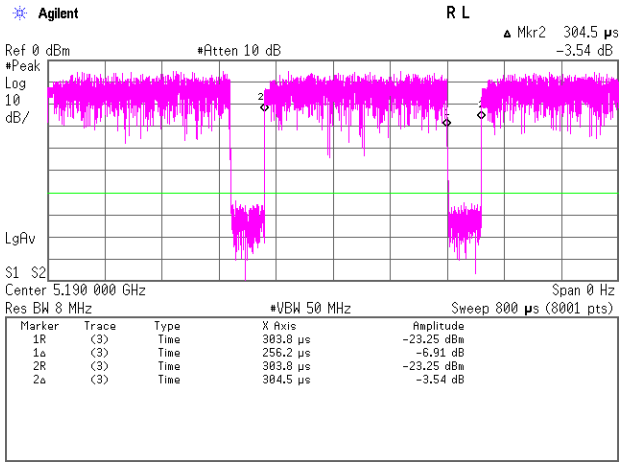
MCS8

duty factor [dB] = 10 x log (0.58[ms] / 0.48[ms]) = 0.8 [dB]



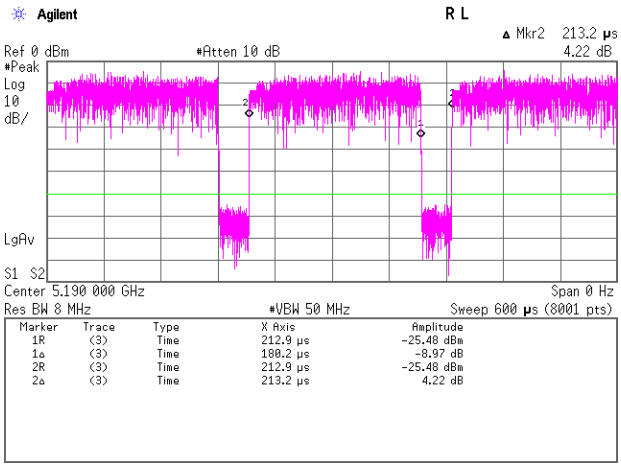
MCS9

duty factor [dB] = 10 x log (0.3[ms] / 0.26[ms]) = 0.75 [dB]



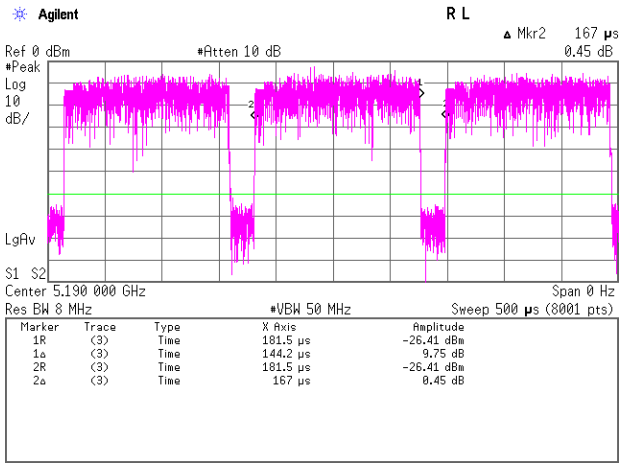
MCS10

duty factor [dB] = 10 x log (0.21[ms] / 0.18[ms]) = 0.73 [dB]



MCS11

duty factor [dB] = 10 x log (0.17[ms] / 0.14[ms]) = 0.64 [dB]



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Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 12, 2013	
Temperature / Humidity	25 deg.C , 51 %RH	
Engineer	Shinichi Takano	

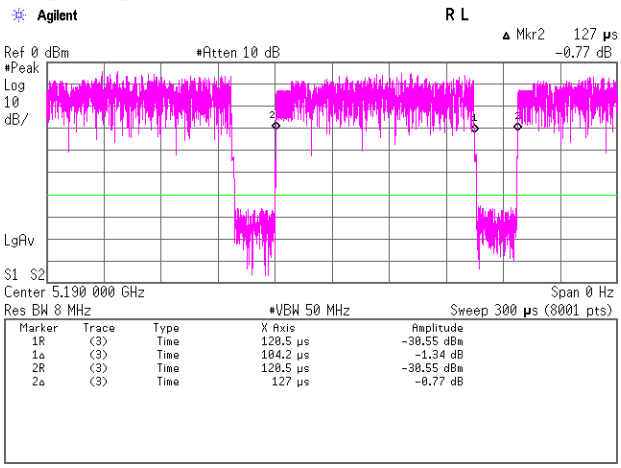
Maximum Conducted Output Power (Conducted)

(Reference) (duty chart)

Tx, IEEE802.11n (HT40), MIMO(SDM), (Tx 5190MHz)

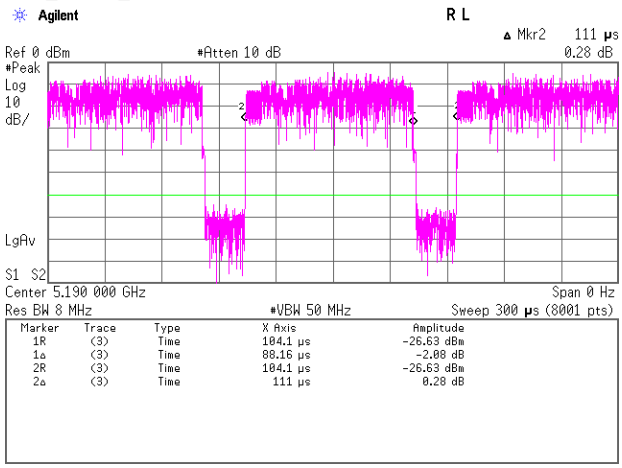
MCS12

duty factor [dB] = 10 x log (0.13[ms] / 0.1[ms]) = 0.86 [dB]



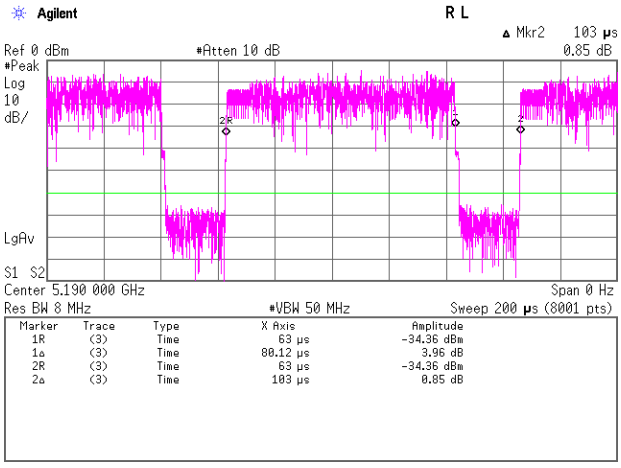
MCS13

duty factor [dB] = 10 x log (0.11[ms] / 0.09[ms]) = 1 [dB]



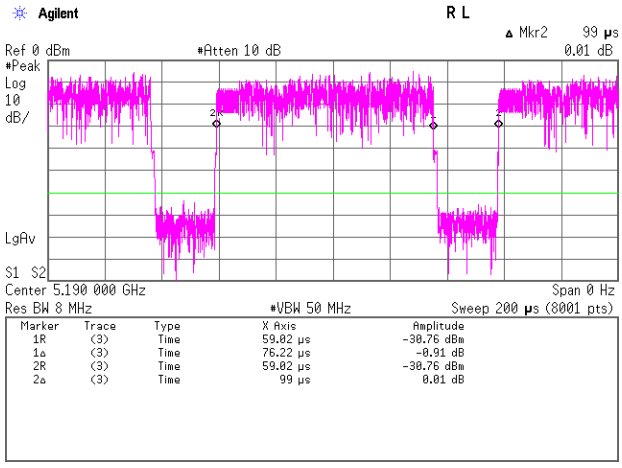
MCS14

duty factor [dB] = 10 x log (0.1[ms] / 0.08[ms]) = 1.09 [dB]



MCS15

duty factor [dB] = 10 x log (0.1[ms] / 0.08[ms]) = 1.14 [dB]



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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 19, 2013	November 25, 2013	December 11, 2013
Temperature / Humidity	24 deg.C , 40 %RH	26 deg.C , 35 %RH	26 deg.C , 31 %RH
Engineer	Akio Hayashi	Tatsuya Arai	Shinichi Takano
Mode	Tx, 5180 MHz		

Tx, IEEE802.11a, SISO, PN9, worst antenna port 1, worst data mode 18Mbps

(above 1GHz Inside of the restricted band)

(* 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.	5150.000	PK	57.0	32.1	17.2	37.0	69.3	73.9	4.6	100	94	
Hori.	15540.000	PK	46.7	37.7	2.3	38.7	48.0	73.9	25.9	116	255	
Hori.	5150.000	AV	38.7	32.1	17.2	37.0	51.0	53.9	**2.9**	100	94	
Hori.	15540.000	AV	34.0	37.7	2.3	38.7	35.3	53.9	18.6	116	255	
Vert.	5150.000	PK	55.6	32.1	17.2	37.0	67.9	73.9	6.0	100	95	
Vert.	15540.000	PK	48.2	37.7	2.3	38.7	49.5	73.9	24.4	114	105	
Vert.	5150.000	AV	38.2	32.1	17.2	37.0	50.5	53.9	3.4	100	95	
Vert.	15540.000	AV	35.4	37.7	2.3	38.7	36.7	53.9	17.2	114	105	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)

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

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

(Calculation) (above 1GHz Outside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	10360.000	PK	46.0	39.5	9.9	38.8	56.6	-38.63	-27.00	11.6	100	211	
Vert.	10360.000	PK	48.4	39.5	9.9	38.8	59.0	-36.23	-27.00	9.2	100	211	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)

Resrult(EIRP[dBm])=10*LOG（({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)

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

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 19, 2013	November 25, 2013
Temperature / Humidity	24 deg.C , 40 %RH	26 deg.C , 35 %RH
Engineer	Akio Hayashi	Tatsuya Arai
Mode	Tx, 5220 MHz	
	Tx, IEEE802.11a, SISO, PN9, worst antenna port 1, worst data mode 18Mbps	

(above 1GHz Inside of the restricted band)

(* 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.	15660.000	PK	46.9	37.2	2.3	38.8	47.6	73.9	26.3	100	0	
Hori.	15660.000	AV	33.5	37.2	2.3	38.8	34.2	53.9	19.7	100	0	
Vert.	15660.000	PK	46.7	37.2	2.3	38.8	47.4	73.9	26.5	100	0	
Vert.	15660.000	AV	33.6	37.2	2.3	38.8	34.3	53.9	19.6	100	0	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)

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

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

(Calculation) (above 1GHz Outside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	10440.000	PK	45.4	39.7	10.2	38.8	56.5	-38.73	-27.00	11.7	100	210	
Vert.	10440.000	PK	48.1	39.7	10.2	38.8	59.2	-36.03	-27.00	9.0	136	144	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)

Resrult(EIRP[dBm])=10*LOG（({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)

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

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 19, 2013	November 25, 2013
Temperature / Humidity	24 deg.C , 40 %RH	26 deg.C , 35 %RH
Engineer	Akio Hayashi	Tatsuya Arai
Mode	Tx, 5240 MHz	
	Tx, IEEE802.11a, SISO, PN9, worst antenna port 1, worst data mode 18Mbps	

(above 1GHz Inside of the restricted band)

(* 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.	5350.000	PK	47.0	32.3	16.7	40.8	55.2	73.9	18.7	100	123	
Hori.	15720.000	PK	45.3	37.0	2.3	38.9	45.7	73.9	28.2	100	269	
Hori.	5350.000	AV	34.6	32.3	16.7	40.8	42.8	53.9	11.1	100	123	
Hori.	15720.000	AV	32.9	37.0	2.3	38.9	33.3	53.9	20.6	100	269	
Vert.	5350.000	PK	46.9	32.3	16.7	40.8	55.1	73.9	18.8	100	219	
Vert.	15720.000	PK	45.7	37.0	2.3	38.9	46.1	73.9	27.8	100	98	
Vert.	5350.000	AV	34.7	32.3	16.7	40.8	42.9	53.9	11.0	100	219	
Vert.	15720.000	AV	33.1	37.0	2.3	38.9	33.5	53.9	20.4	100	98	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)

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

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

(Calculation) (above 1GHz Outside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	10480.000	PK	45.0	39.7	10.2	38.8	56.1	-39.13	-27.00	12.1	100	200	
Vert.	10480.000	PK	48.4	39.7	10.2	38.8	59.5	-35.73	-27.00	8.7	146	141	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)

Resrult(EIRP[dBm])=10*LOG（{ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)

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

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 19, 2013	November 25, 2013	November 26, 2013	December 11, 2013
Temperature / Humidity	24 deg.C , 40 %RH	26 deg.C , 35 %RH	25 deg.C, 42 %RH	26 deg.C , 31 %RH
Engineer	Akio Hayashi	Tatsuya Arai	Tatsuya Arai	Shinichi Takano
Mode	Tx, 5180 MHz			

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

(below 1GHz and above 1GHz Inside of the restricted band)

(* 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.	400.011	QP	31.5	16.3	9.0	32.0	24.8	46.0	21.2	100	266	
Hori.	5150.000	PK	57.2	32.1	17.2	37.0	69.5	73.9	4.4	100	280	
Hori.	15540.000	PK	48.1	37.7	2.3	38.7	49.4	73.9	24.5	100	138	
Hori.	5150.000	AV	40.2	32.1	17.2	37.0	52.5	53.9	1.4	100	280	
Hori.	15540.000	AV	34.7	37.7	2.3	38.7	36.0	53.9	17.9	100	138	
Vert.	80.683	QP	56.1	6.4	7.5	32.1	37.9	40.0	2.1	100	10	
Vert.	122.373	QP	50.2	13.2	7.2	32.1	38.5	43.5	5.0	100	219	
Vert.	154.483	QP	40.9	14.7	7.7	32.1	31.2	43.5	12.3	100	178	
Vert.	400.011	QP	30.9	16.3	9.0	32.0	24.2	46.0	21.8	130	190	
Vert.	5150.000	PK	55.7	32.1	17.2	37.0	68.0	73.9	5.9	100	206	
Vert.	15540.000	PK	50.5	37.7	2.3	38.7	51.8	73.9	22.1	100	106	
Vert.	5150.000	AV	40.0	32.1	17.2	37.0	52.3	53.9	1.6	100	206	
Vert.	15540.000	AV	36.5	37.7	2.3	38.7	37.8	53.9	16.1	100	106	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)

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

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

(Calculation) (above 1GHz Outside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	10360.000	PK	46.4	39.5	9.9	38.8	57.0	-38.23	-27.00	11.2	100	210	
Vert.	10360.000	PK	49.2	39.5	9.9	38.8	59.8	-35.43	-27.00	8.4	151	141	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)

Resrult(EIRP[dBm])=10*LOG（({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)

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

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 19, 2013	November 25, 2013
Temperature / Humidity	24 deg.C , 40 %RH	26 deg.C , 35 %RH
Engineer	Akio Hayashi	Tatsuya Arai
Mode	Tx, 5220 MHz	
	Tx, IEEE802.11n (HT20), CDD, PN9, worst data mode 0 (MCS)	

(above 1GHz Inside of the restricted band)

(* 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.	15660.000	PK	47	37.2	2.3	38.8	47.7	73.9	26.2	100	0	
Hori.	15660.000	AV	32.2	37.2	2.3	38.8	32.9	53.9	21.0	100	0	
Vert.	15660.000	PK	50.2	37.2	2.3	38.8	50.9	73.9	23.0	100	103	
Vert.	15660.000	AV	35.7	37.2	2.3	38.8	36.4	53.9	17.5	100	103	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)

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

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

(Calculation) (above 1GHz Outside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	10440.000	PK	45.0	39.7	10.2	38.8	56.1	-39.13	-27.00	12.1	100	212	
Vert.	10440.000	PK	49.7	39.7	10.2	38.8	60.8	-34.43	-27.00	7.4	151	144	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)

Resrult(EIRP[dBm])=10*LOG（({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)

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

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 19, 2013	November 25, 2013
Temperature / Humidity	24 deg.C , 40 %RH	26 deg.C , 35 %RH
Engineer	Akio Hayashi	Tatsuya Arai
Mode	Tx, 5240 MHz	
	Tx, IEEE802.11n (HT20), CDD, PN9, worst data mode 0 (MCS)	

(above 1GHz Inside of the restricted band)

(* 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.	15720.000	PK	47.2	37.0	2.3	38.9	47.6	73.9	26.3	100	126	
Hori.	15720.000	AV	33.3	37.0	2.3	38.9	33.7	53.9	20.2	100	126	
Vert.	15720.000	PK	49.8	37.0	2.3	38.9	50.2	73.9	23.7	100	105	
Vert.	15720.000	AV	35.2	37.0	2.3	38.9	35.6	53.9	18.3	100	105	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)

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

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

(Calculation) (above 1GHz Outside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	10480.000	PK	47.2	39.7	10.2	38.8	58.3	-36.93	-27.00	9.9	130	90	
Vert.	10480.000	PK	50.3	39.7	10.2	38.8	61.4	-33.83	-27.00	6.8	140	146	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)

Resrult(EIRP[dBm])=10*LOG（({ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)

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

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 19, 2013	November 25, 2013	January 25, 2014
Temperature / Humidity	24 deg.C , 40 %RH	26 deg.C , 35 %RH	23 deg.C , 31 %RH
Engineer	Akio Hayashi	Tatsuya Arai	Shinichi Takano
Mode	Tx, 5190 MHz		
	Tx, IEEE802.11n (HT40), CDD, PN9, worst data mode 0 (MCS)		

(above 1GHz Inside of the restricted band)

(* 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.	5150.000	PK	55.6	32.1	17.2	37.0	67.9	73.9	6.0	100	98	
Hori.	15570.000	PK	47.1	37.5	2.3	38.7	48.2	73.9	25.7	100	138	
Hori.	5150.000	AV	40.3	32.1	17.2	37.0	52.6	53.9	**1.3**	100	98	
Hori.	15570.000	AV	33.9	37.5	2.3	38.7	35.0	53.9	18.9	100	138	
Vert.	5150.000	PK	53.9	32.1	17.2	37.0	66.2	73.9	7.7	100	359	
Vert.	15570.000	PK	48.7	37.5	2.3	38.7	49.8	73.9	24.1	100	102	
Vert.	5150.000	AV	40.2	32.1	17.2	37.0	52.5	53.9	1.4	100	359	
Vert.	15570.000	AV	35.0	37.5	2.3	38.7	36.1	53.9	17.8	100	102	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)

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

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

(Calculation) (above 1GHz Outside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	10380.000	PK	44.7	39.6	9.9	38.8	55.4	-39.83	-27.00	12.8	100	211	
Vert.	10380.000	PK	49.4	39.6	9.9	38.8	60.1	-35.13	-27.00	8.1	136	141	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)

Resrult(EIRP[dBm])=10*LOG（{ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)

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

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

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Radiated Emission

Test place	No.2 Semi Anechoic Chamber	No.3 Semi Anechoic Chamber
Date	November 19, 2013	November 25, 2013
Temperature / Humidity	24 deg.C , 40 %RH	26 deg.C , 35 %RH
Engineer	Akio Hayashi	Tatsuya Arai
Mode	Tx, 5230 MHz	
	Tx, IEEE802.11n (HT40), CDD, PN9, worst data mode 0 (MCS)	

(above 1GHz Inside of the restricted band)

(* 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.	5350.000	PK	46.6	32.3	16.7	40.8	54.8	73.9	19.1	100	125	
Hori.	15690.000	PK	46.8	37.1	2.3	38.8	47.4	73.9	26.5	100	141	
Hori.	5350.000	AV	34.9	32.3	16.7	40.8	43.1	53.9	10.8	100	125	
Hori.	15690.000	AV	32.6	37.1	2.3	38.8	33.2	53.9	20.7	100	141	
Vert.	5350.000	PK	45.5	32.3	16.7	40.8	53.7	73.9	20.2	100	225	
Vert.	15690.000	PK	47.0	37.1	2.3	38.8	47.6	73.9	26.3	100	99	
Vert.	5350.000	AV	34.7	32.3	16.7	40.8	42.9	53.9	11.0	100	225	
Vert.	15690.000	AV	34.3	37.1	2.3	38.8	34.9	53.9	19.0	100	99	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)

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

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

(Calculation) (above 1GHz Outside of the restricted band)

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

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Result (EIRP) [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	10460.000	PK	44.3	39.7	10.2	38.8	55.4	-39.83	-27.00	12.8	130	89	
Vert.	10460.000	PK	47.7	39.7	10.2	38.8	58.8	-36.43	-27.00	9.4	142	143	

Result = Reading + Ant.Fac. + Loss (Cable+(Attenuator or Filter)(below 18GHz)-Distance factor(above 15GHz)) - Gain(Amprifier)

Resrult(EIRP[dBm])=10*LOG（{ 10 ^ (Electric Field Strength [dBuV/m] / 20) * 10 ^ (-6) * Distance:3[m]) ^ 2 } / 30) *10^3)

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

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

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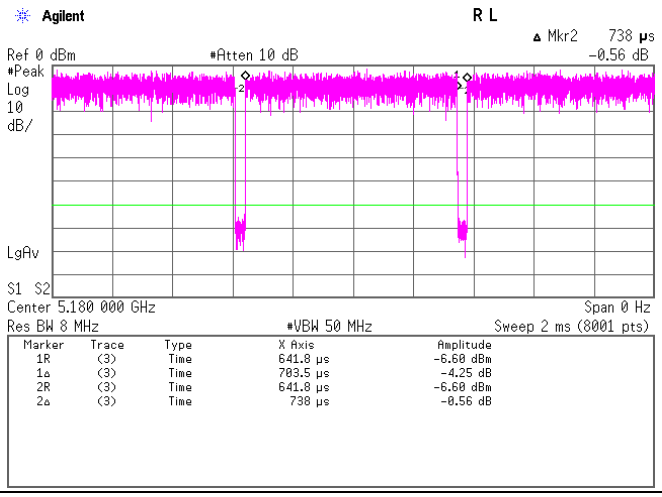
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

VBW (Average) Calculation & Duty chart

Tx, IEEE802.11a, SISO, PN9, worst antenna port 1, worst data mode 18Mbps

VBW: 1/（On time) = 1421.46Hz<1500Hz On time =0.7035ms	
	

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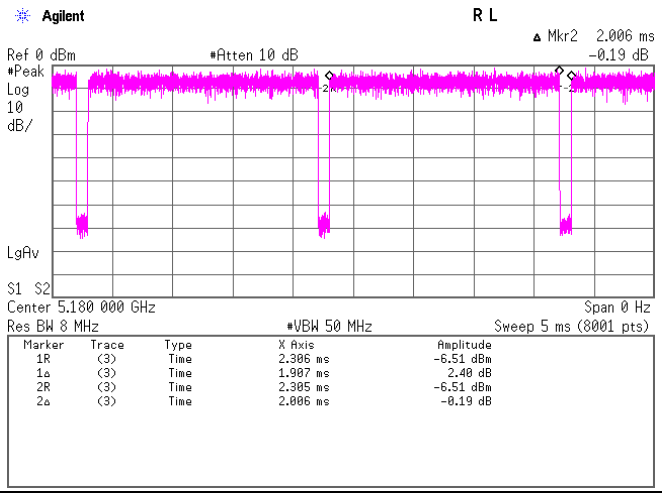
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

VBW (Average) Calculation & Duty chart

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

VBW: 1/（On time) = 524.38Hz<560Hz On time =1.907ms	
	

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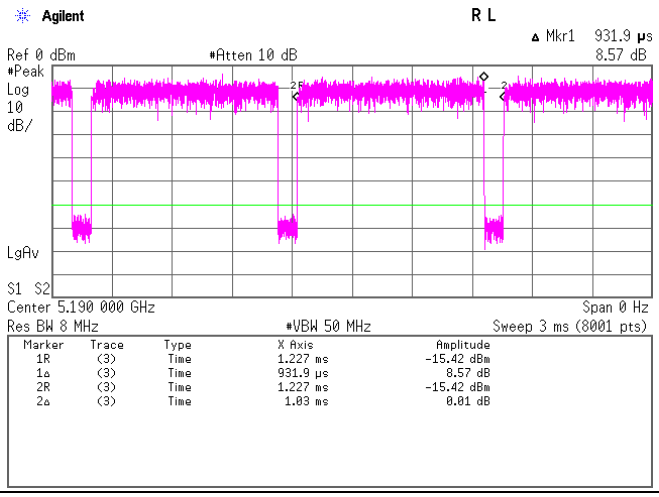
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 12, 2013	
Temperature / Humidity	25 deg.C , 51 %RH	
Engineer	Shinichi Takano	

VBW (Average) Calculation & Duty chart

Tx, IEEE802.11n (HT40), CDD, PN9, worst data mode 0 (MCS)

VBW: 1/（On time) = 1073.08Hz<1100Hz On time =0.9319ms	
	

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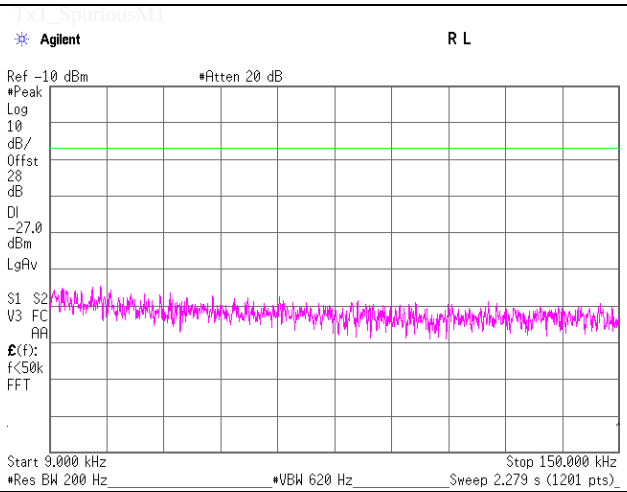
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	

Spurious emission (Conducted)

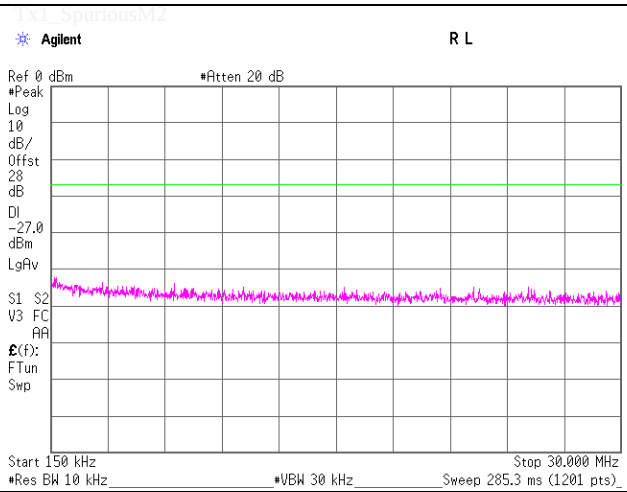
Tx, IEEE802.11n (HT20), CDD, PN9, Antenna port 1, worst data mode 0 (MCS)

Tx, 5180MHz (below 1GHz)

9kHz - 150kHz



150kHz - 30MHz



FREQ [MHz]	Regulation [dBm]	Atten. Loss [dB]	Directional Gain [dBi]	10log (N_{ANT}) [dB]	Offset [dB]
30.00	-27.00	20.14	4.78	3.01	27.93

Offset = Atten. Loss + Directional Gain + 10log(NANT)
Directional Gain = Antenna Gain + Array Gain (10log2)

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Peak Power Spectral Density

(Method: SA-2)

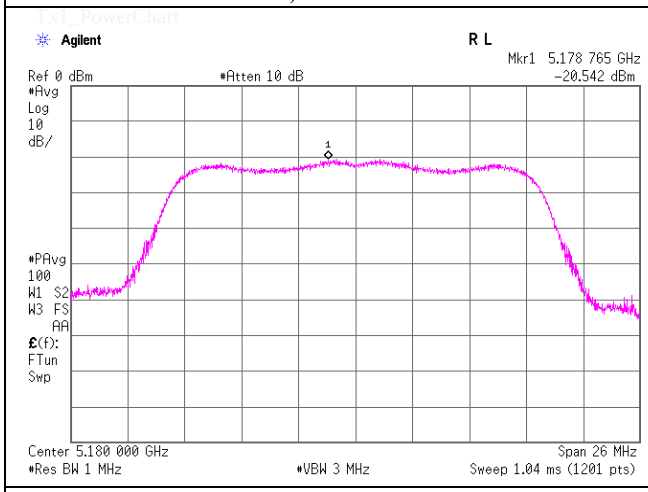
Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date	December 9, 2013
Temperature / Humidity	23 deg.C , 32 %RH
Engineer	Shinichi Takano
Mode	Tx, IEEE802.11a, SISO, PN9, worst antenna port 1, worst data mode 18Mbps

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]		Result [dBm/MHz]	Limit [dBm]	Margin [dB]
5180.0000	5178.77	-20.54	1.74	20.10	0.24		1.54	4.00	2.46
5220.0000	5218.98	-21.08	1.74	20.09	0.24		0.99	4.00	3.01
5240.0000	5238.90	-21.39	1.93	20.09	0.24		0.87	4.00	3.13

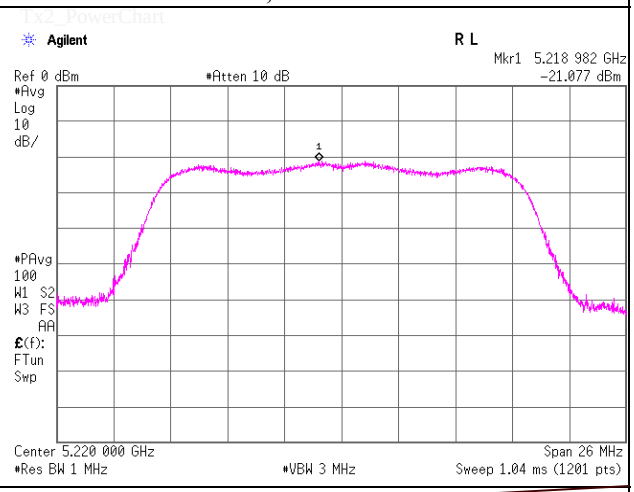
Sample Calculation:

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

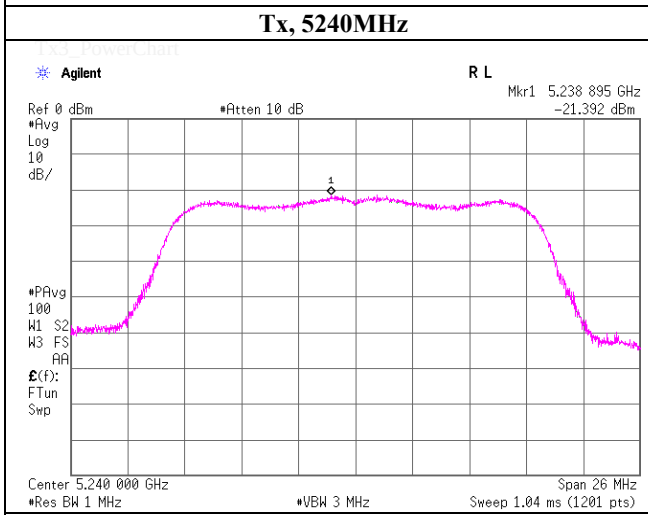
Tx, 5180MHz



Tx, 5220MHz



Tx, 5240MHz



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Peak Power Spectral Density

(Method: SA-2)

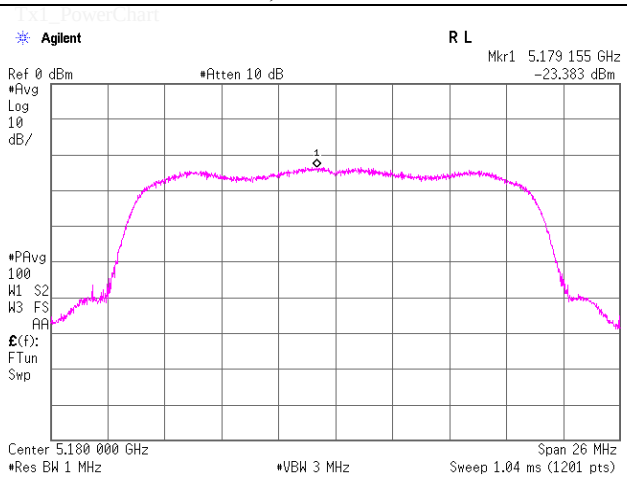
Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date	December 9, 2013
Temperature / Humidity	23 deg.C , 32 %RH
Engineer	Shinichi Takano
Mode	Tx, IEEE802.11n-HT20, SISO, PN9, worst antenna port 1, worst data mode 0(MCS)

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]		Result [dBm/MHz]	Limit [dBm]	Margin [dB]
5180.0000	5179.16	-23.38	1.74	20.10	0.24		-1.30	4.00	5.30
5220.0000	5218.92	-22.68	1.74	20.09	0.24		-0.61	4.00	4.61
5240.0000	5240.91	-22.63	1.93	20.09	0.24		-0.37	4.00	4.37

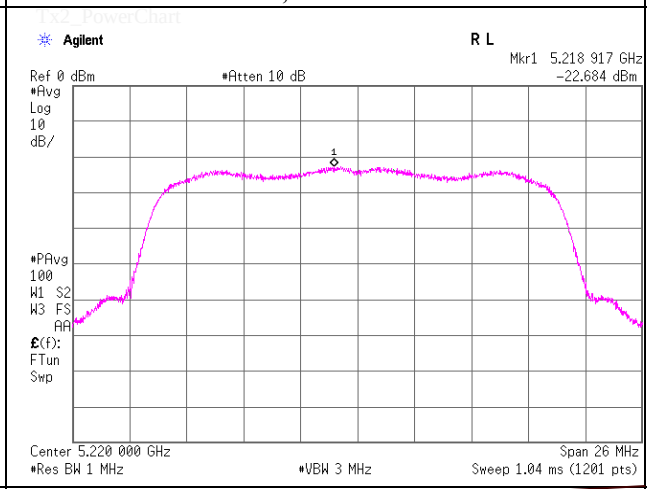
Sample Calculation:

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

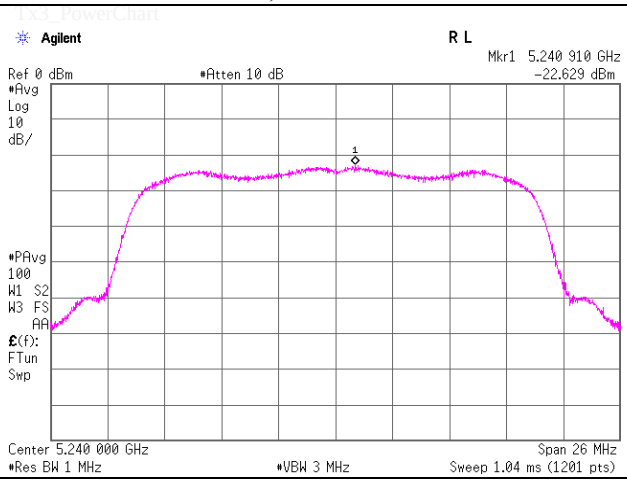
Tx, 5180MHz



Tx, 5220MHz



Tx, 5240MHz



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Power Spectral Density

(Method: SA-2)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT20), CDD, PN9, worst data mode 0 (MCS)	

Antenna 0 + Antenna 1

Ch. Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Antenna 0 + 1 [mW]	Result (0 + 1) [dBm]	Limit [dBm]	Margin [dB]
5180.0000	0.970	0.989	1.959	2.92	4.00	1.08
5220.0000	0.876	0.952	1.828	2.62	4.00	1.38
5240.0000	0.896	0.961	1.857	2.69	4.00	1.31

Sample Calculation:
each Antenna Result [mW] = 10 ^ (each antenna's Result [dBm] / 10)
Antenna 0 + 1 [mW] = Antenna 0 Result [mW] + Antenna 1 Result [mW]
Result [dBm] = 10 x log (Antenna 0 + 1 [mW])

Antenna 0

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Duty factor [dB]		Result [dBm]
5180.0000	5178.79	-22.19	1.74	20.10	0.22		-0.13
5220.0000	5219.24	-22.63	1.74	20.09	0.22		-0.58
5240.0000	5241.15	-22.72	1.93	20.09	0.22		-0.48

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

Antenna 1

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Duty factor [dB]		Result [dBm]
5180.0000	5178.94	-22.11	1.74	20.10	0.22		-0.05
5220.0000	5219.09	-22.27	1.74	20.09	0.22		-0.22
5240.0000	5239.22	-22.41	1.93	20.09	0.22		-0.17

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

*) This test was measured based on Method In-Band Power Spectral Density (PSD) Measurements E) 2) b) of
"Guidance for Summing Emission Measurements from Multiple Outputs of a Transmitter of from Multiple Transmitters (KDB662911 D1)"

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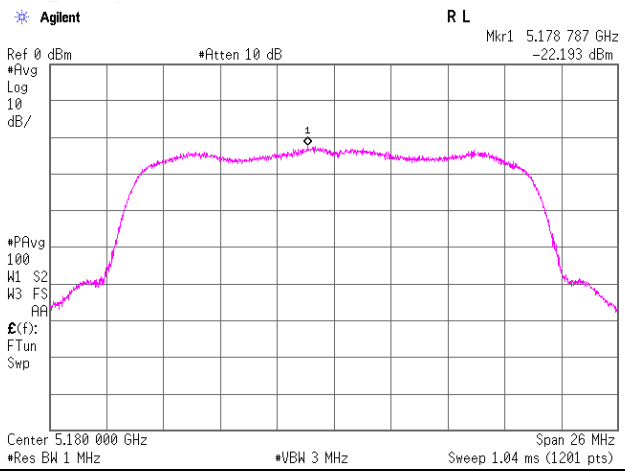
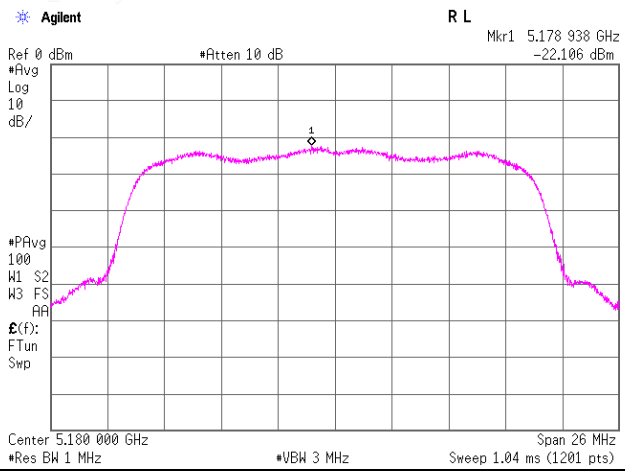
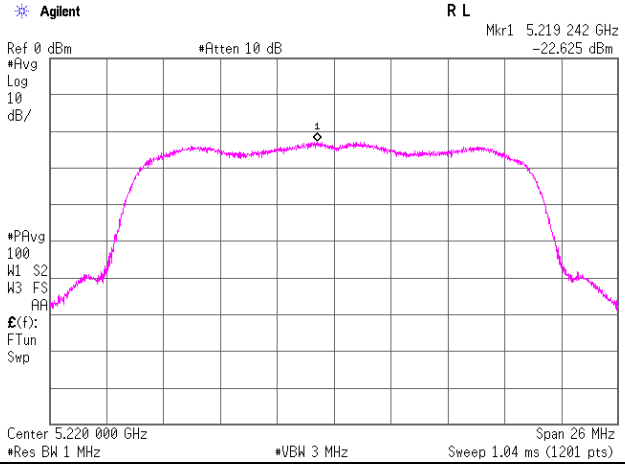
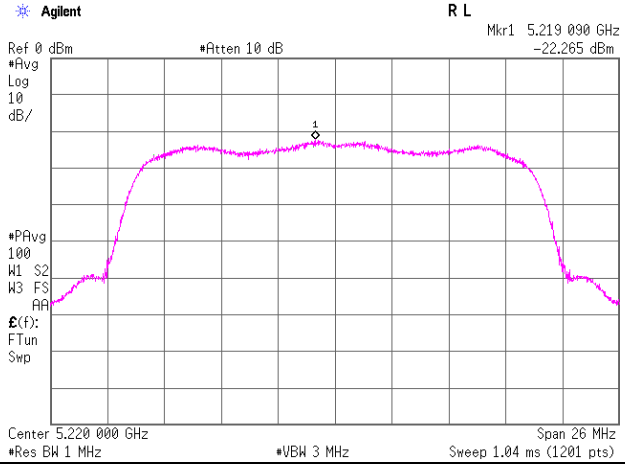
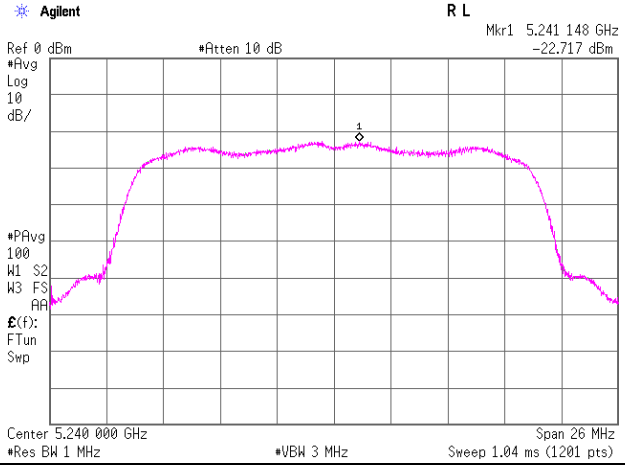
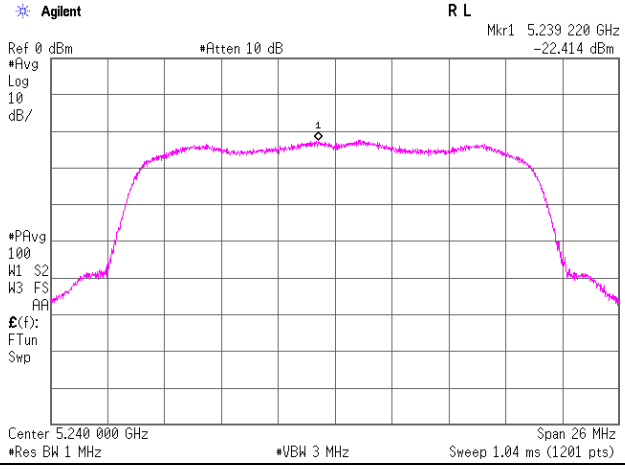
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

Power Spectral Density

Antenna 0	Antenna 1
Tx, 5180MHz	**Tx, 5180MHz**
	
Tx, 5220MHz	**Tx, 5220MHz**
	
Tx, 5240MHz	**Tx, 5240MHz**
	

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Power Spectral Density

(Method: SA-2)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT20), MIMO(SDM), PN9, worst data mode 8 (MCS)	

Antenna 0 + Antenna 1

Ch. Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Antenna 0 + 1 [mW]	Result (0 + 1) [dBm]	Limit [dBm]	Margin [dB]
5180.0000	0.870	0.876	1.746	2.42	4.00	1.58
5220.0000	0.817	0.873	1.690	2.28	4.00	1.72
5240.0000	0.916	0.938	1.854	2.68	4.00	1.32

Sample Calculation:
each Antenna Result [mW] = 10 ^ (each antenna's Result [dBm] / 10)
Antenna 0 + 1 [mW] = Antenna 0 Result [mW] + Antenna 1 Result [mW]
Result [dBm] = 10 x log (Antenna 0 + 1 [mW])

Antenna 0

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Duty factor [dB]		Result [dBm]
5180.0000	5179.24	-22.87	1.74	20.10	0.42		-0.61
5220.0000	5220.89	-23.13	1.74	20.09	0.42		-0.88
5240.0000	5240.91	-22.82	1.93	20.09	0.42		-0.38

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

Antenna 1

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Duty factor [dB]		Result [dBm]
5180.0000	5180.69	-22.83	1.74	20.10	0.42		-0.57
5220.0000	5221.37	-22.84	1.74	20.09	0.42		-0.59
5240.0000	5240.69	-22.72	1.93	20.09	0.42		-0.28

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

*) This test was measured based on Method In-Band Power Spectral Density (PSD) Measurements E) 2) b) of
"Guidance for Summing Emission Measurements from Multiple Outputs of a Transmitter of from Multiple Transmitters (KDB662911 D1)"

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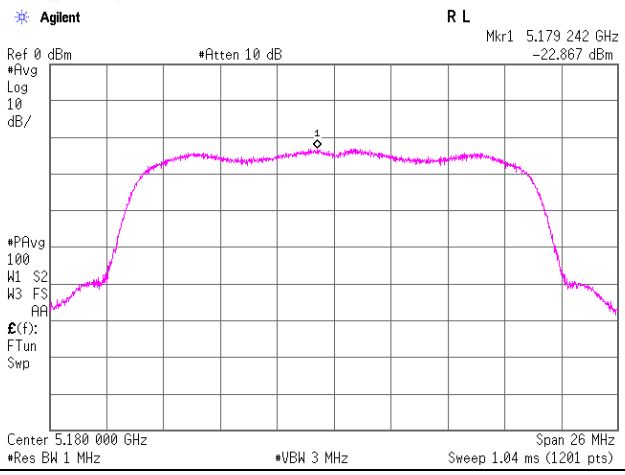
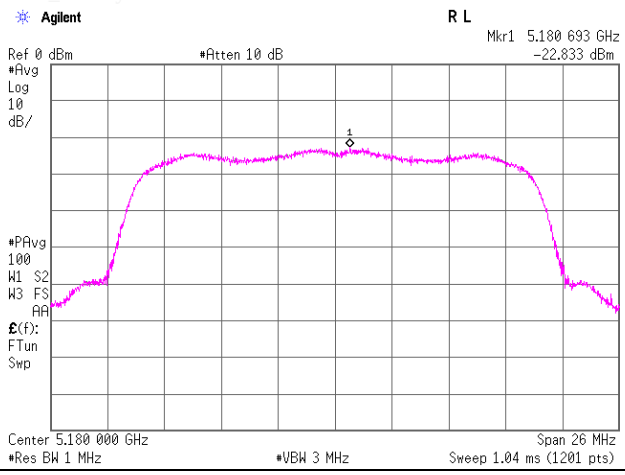
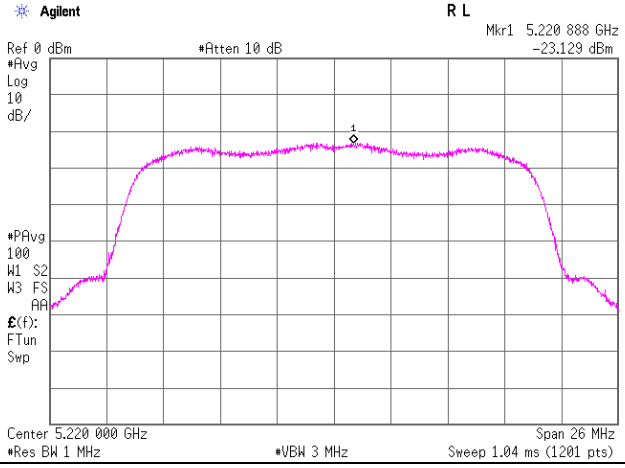
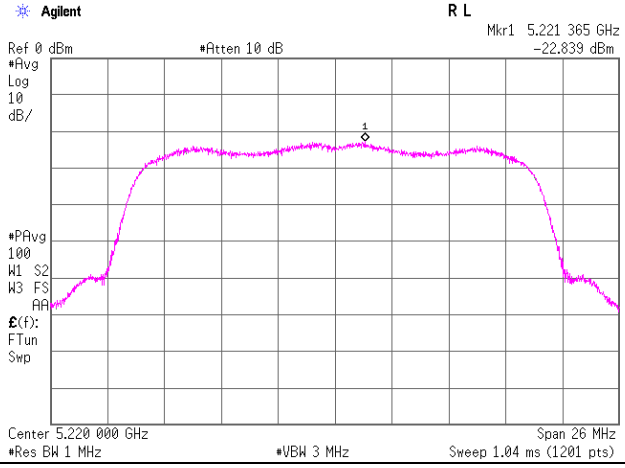
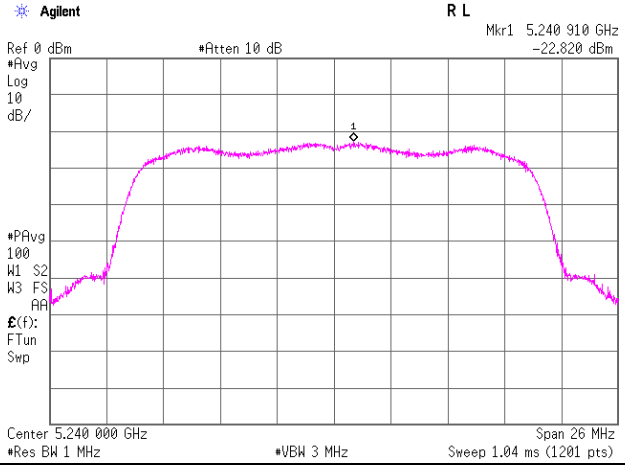
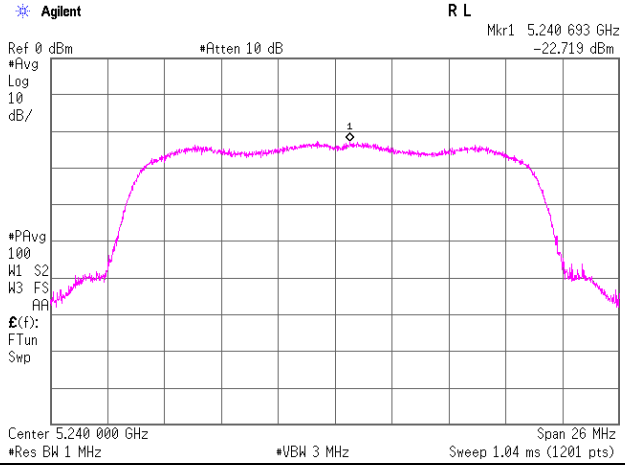
Facsimile : +81 463 50 6401

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

Power Spectral Density

Antenna 0	Antenna 1
Tx, 5180MHz	**Tx, 5180MHz**
	
Tx, 5220MHz	**Tx, 5220MHz**
	
Tx, 5240MHz	**Tx, 5240MHz**
	

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Peak Power Spectral Density

(Method: SA-2)

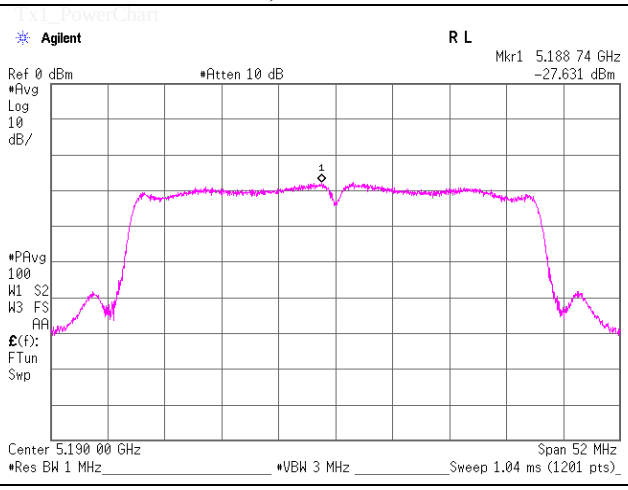
Test place	UL Japan, Inc. Shonan EMC Lab. No.5 Shielded Room
Date	January 31, 2014
Temperature / Humidity	26deg.C , 44%RH
Engineer	Shinichi Takano
Mode	Tx, IEEE802.11n-HT40, SISO, PN9, worst antenna port 1, worst data mode 0(MCS)

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm/MHz]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]		Result [dBm/MHz]	Limit [dBm]	Margin [dB]
5190.0000	5188.74	-27.63	1.74	20.09	0.44		-5.36	4.00	9.36
							-	4.00	-
5230.0000	5231.73	-28.38	1.74	20.09	0.44		-6.11	4.00	10.11

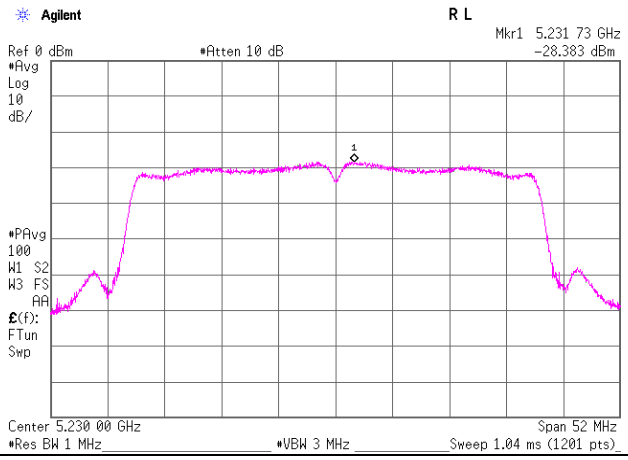
Sample Calculation:

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

Tx, 5190MHz



Tx, 5230MHz



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Power Spectral Density

(Method: SA-2)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT40), CDD, PN9, worst data mode 0 (MCS)	

Antenna 0 + Antenna 1

Ch. Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Antenna 0 + 1 [mW]	Result (0 + 1) [dBm]	Limit [dBm]	Margin [dB]
5190.0000	0.330	0.301	0.631	-2.00	4.00	6.00
5230.0000	0.324	0.312	0.636	-1.97	4.00	5.97

Sample Calculation:
each Antenna Result [mW] = 10 ^ (each antenna's Result [dBm] / 10)
Antenna 0 + 1 [mW] = Antenna 0 Result [mW] + Antenna 1 Result [mW]
Result [dBm] = 10 x log (Antenna 0 + 1 [mW])

Antenna 0

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Duty factor [dB]		Result [dBm]
5190.0000	5191.65	-27.08	1.74	20.09	0.44		-4.81
							-
5230.0000	5227.83	-27.16	1.74	20.09	0.44		-4.89

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

Antenna 1

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Duty factor [dB]		Result [dBm]
5190.0000	5191.34	-27.48	1.74	20.09	0.44		-5.21
							-
5230.0000	5231.47	-27.33	1.74	20.09	0.44		-5.06

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

*) This test was measured based on Method In-Band Power Spectral Density (PSD) Measurements E) 2) b) of
"Guidance for Summing Emission Measurements from Multiple Outputs of a Transmitter of from Multiple Transmitters (KDB662911 D1)"

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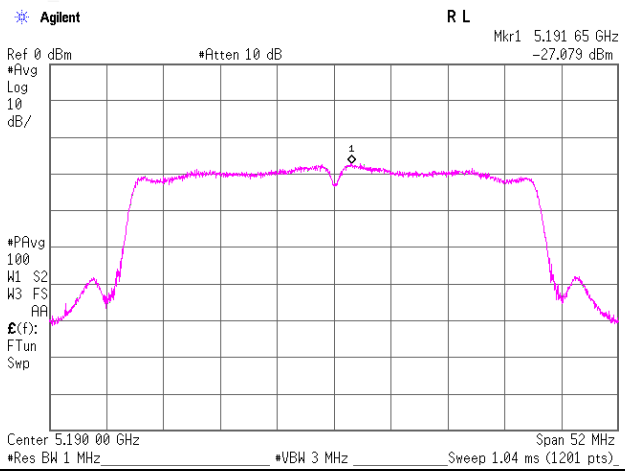
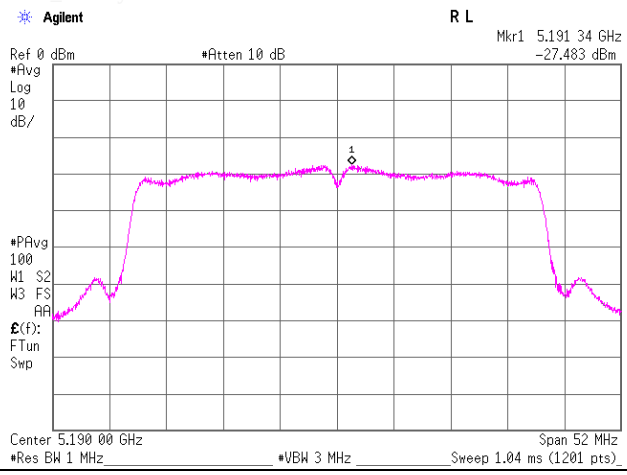
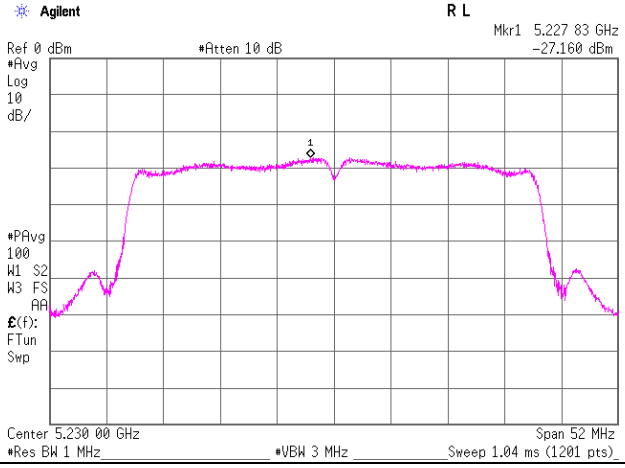
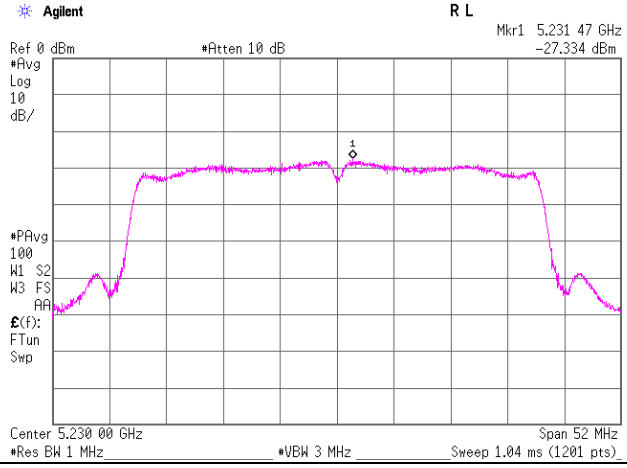
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	

Power Spectral Density

Antenna 0	Antenna 1
Tx, 5190MHz	**Tx, 5190MHz**
	
Tx, 5230MHz	**Tx, 5230MHz**
	

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Power Spectral Density

(Method: SA-2)

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT40), MIMO(SDM), PN9, worst data mode 8 (MCS)	

Antenna 0 + Antenna 1

Ch. Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Antenna 0 + 1 [mW]	Result (0 + 1) [dBm]	Limit [dBm]	Margin [dB]
5190.0000	0.316	0.299	0.615	-2.11	4.00	6.11
5230.0000	0.336	0.301	0.637	-1.96	4.00	5.96

Sample Calculation:
each Antenna Result [mW] = 10 ^ (each antenna's Result [dBm] / 10)
Antenna 0 + 1 [mW] = Antenna 0 Result [mW] + Antenna 1 Result [mW]
Result [dBm] = 10 x log (Antenna 0 + 1 [mW])

Antenna 0

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Duty factor [dB]		Result [dBm]
5190.0000	5187.96	-27.64	1.74	20.09	0.80		-5.01
							-
5230.0000	5228.09	-27.37	1.74	20.09	0.80		-4.74

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

Antenna 1

Ch. Freq. [MHz]	Freq. Reading [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Duty factor [dB]		Result [dBm]
5190.0000	5191.26	-27.88	1.74	20.09	0.80		-5.25
							-
5230.0000	5227.83	-27.84	1.74	20.09	0.80		-5.21

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

*) This test was measured based on Method In-Band Power Spectral Density (PSD) Measurements E) 2) b) of
"Guidance for Summing Emission Measurements from Multiple Outputs of a Transmitter of from Multiple Transmitters (KDB662911 D1)"

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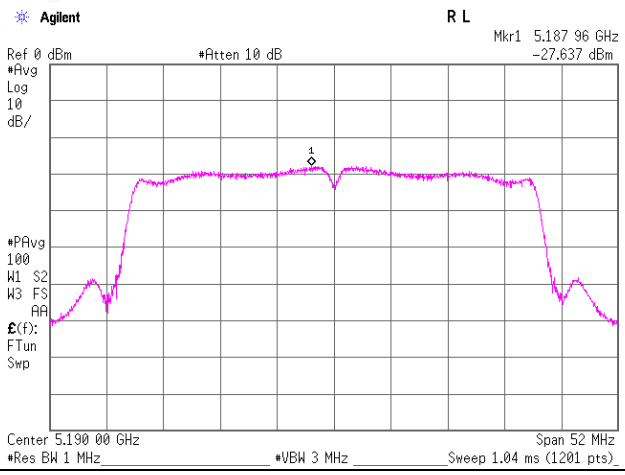
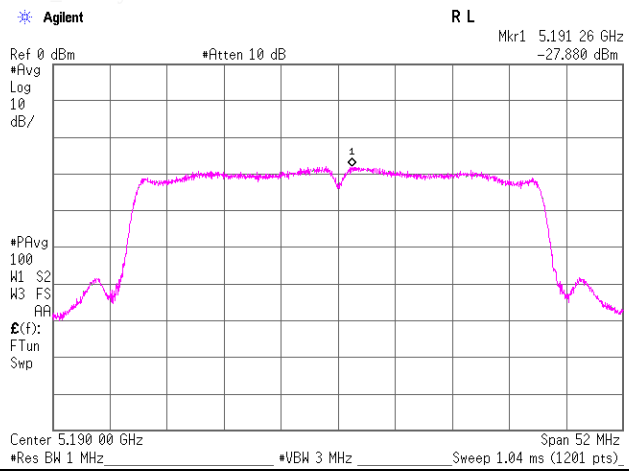
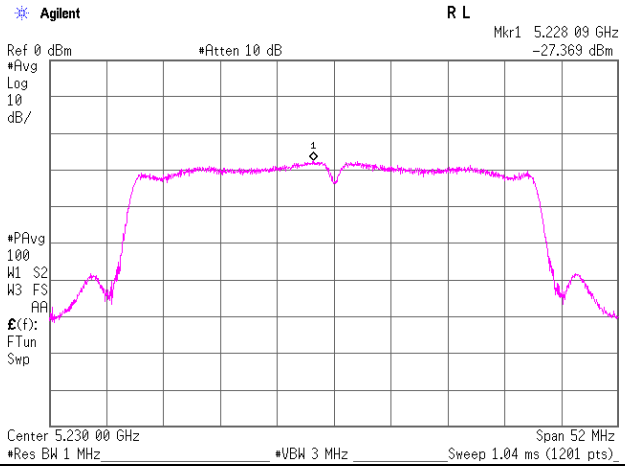
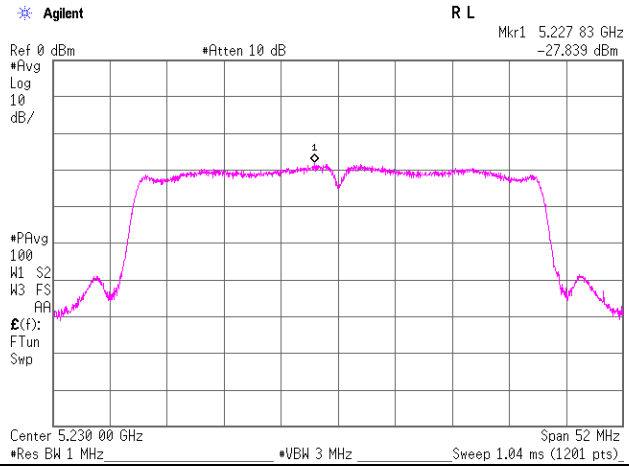
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	

Power Spectral Density

Antenna 0	Antenna 1
Tx, 5190MHz	**Tx, 5190MHz**
	
Tx, 5230MHz	**Tx, 5230MHz**
	

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Peak Excursion Ratio

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11a, SISO, PN9, worst antenna port 1	

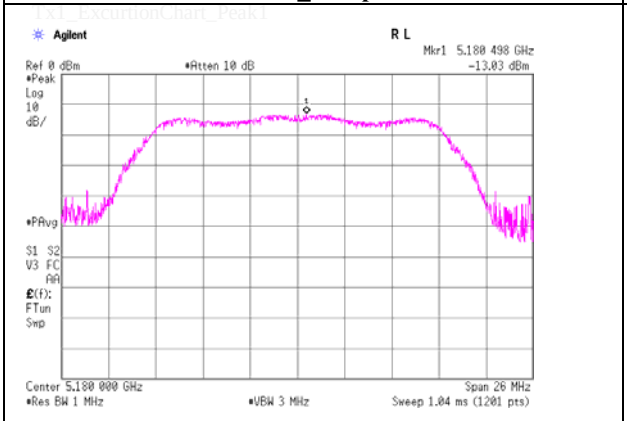
Ch. Freq. [MHz]	Data rate [Mbps]	Peak Reading [dBm]	PPSD Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Peak Result [dBm]	PPSD Result [dBm]	Peak Power Excursion [dB]	Limit [dB]	Margin [dB]
5180	6	-13.03	-20.84	1.74	20.09	0.23	8.80	1.22	7.58	=<13.0	5.42
	9	-12.26	-20.76	1.74	20.09	0.21	9.57	1.28	8.29	=<13.0	4.71
	12	-12.58	-20.73	1.74	20.09	0.20	9.25	1.30	7.95	=<13.0	5.05
	18	-12.65	-20.59	1.74	20.09	0.24	9.18	1.48	7.70	=<13.0	5.30
	24	-11.59	-20.75	1.74	20.09	0.24	10.24	1.32	8.92	=<13.0	4.08
	36	-10.82	-20.75	1.74	20.09	0.35	11.01	1.43	9.58	=<13.0	3.42
	48	-12.23	-21.30	1.74	20.09	0.39	9.60	0.92	8.68	=<13.0	4.32
	54	-11.22	-21.17	1.74	20.09	0.33	10.61	0.99	9.62	=<13.0	3.38

*Peak Power Excursion = Peak Result - PPSD Result

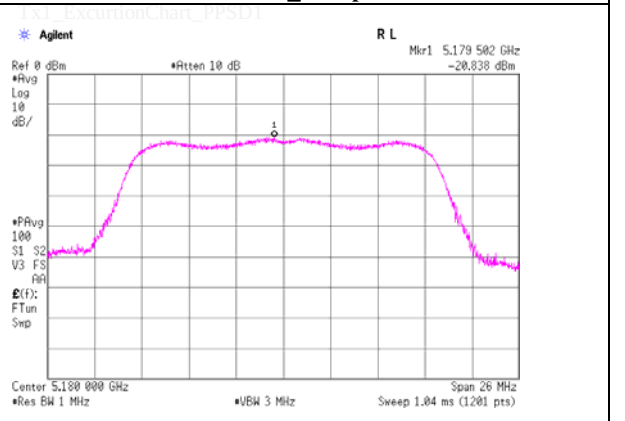
*Peak Result = Peak Reading + Cable Loss + Atten. Loss, PPSD Result = PPSD Reading + Cable Loss + Atten. Loss + Duty factor

*PPSD Reading, Cable Loss, Atten.Loss and Duty factor refer to Power Density sheet.

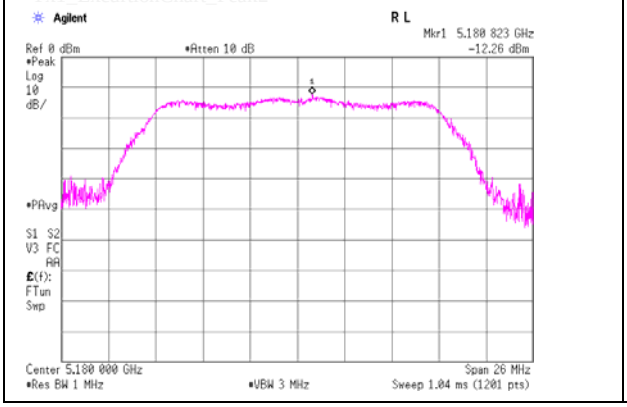
Peak_6Mbps



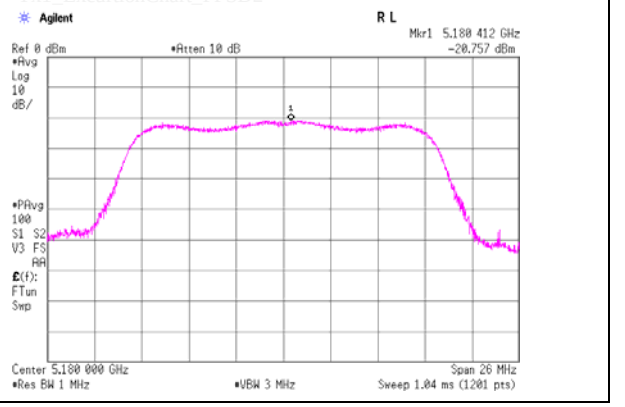
PPSD_6Mbps



Peak_9Mbps



PPSD_9Mbps



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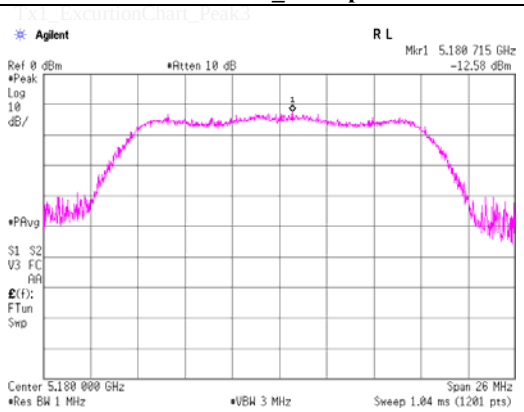
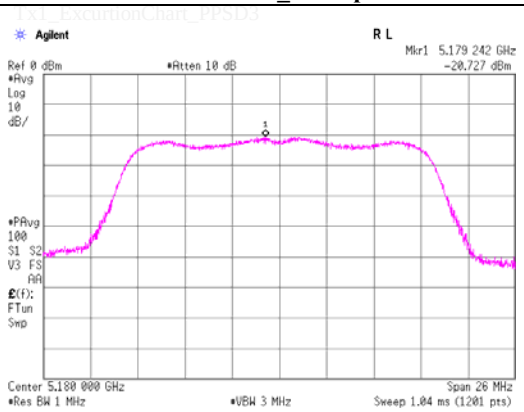
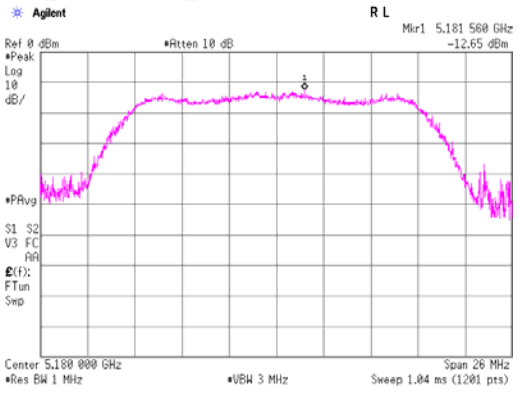
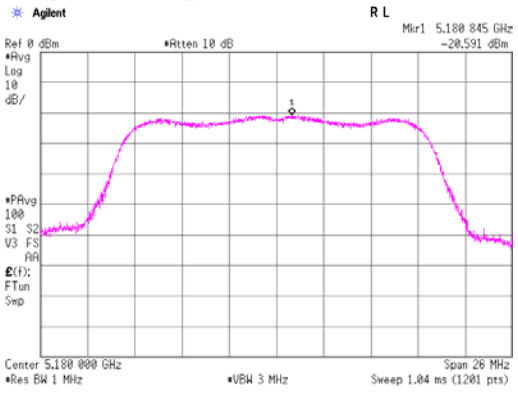
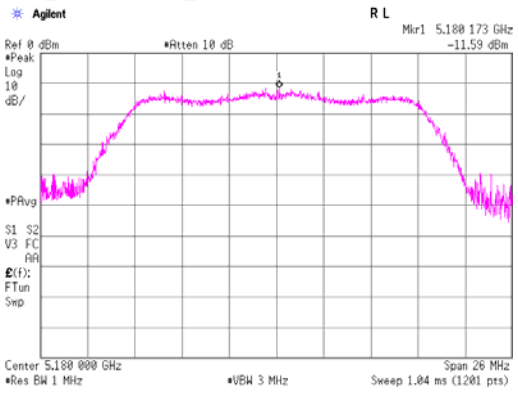
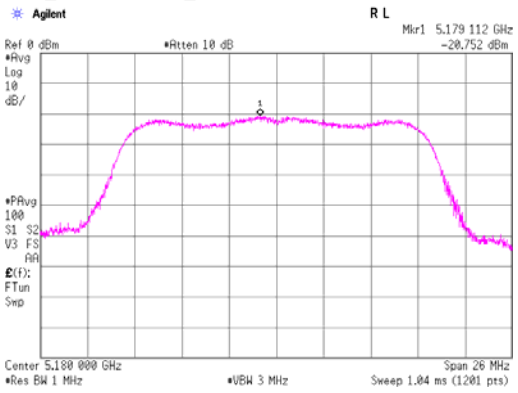
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

Peak Excursion Ratio

Peak_12Mbps	PPSD_12Mbps
	
Peak_18Mbps	**PPSD_18Mbps**
	
Peak_24Mbps	**PPSD_24Mbps**
	

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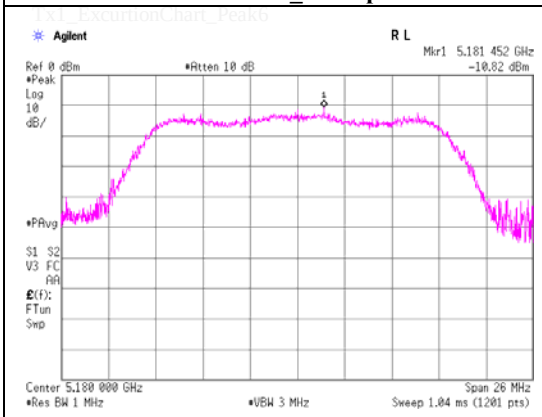
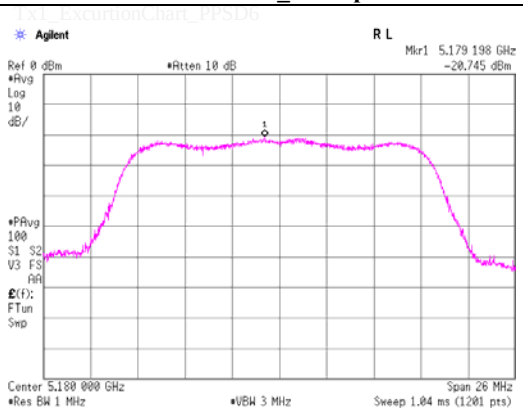
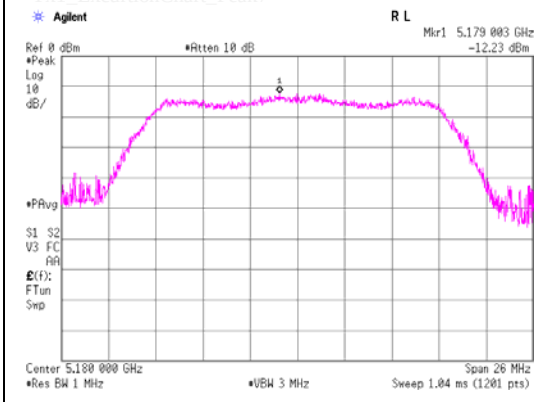
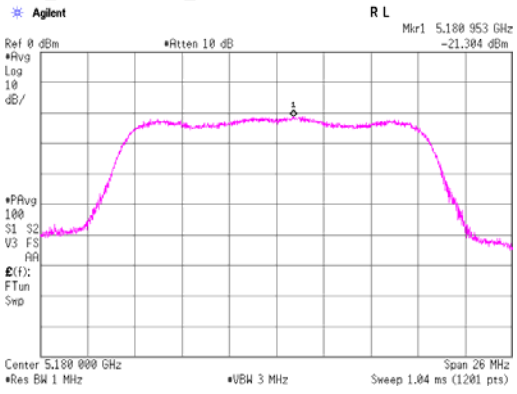
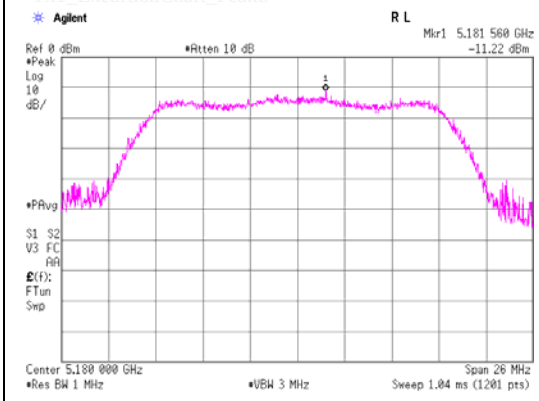
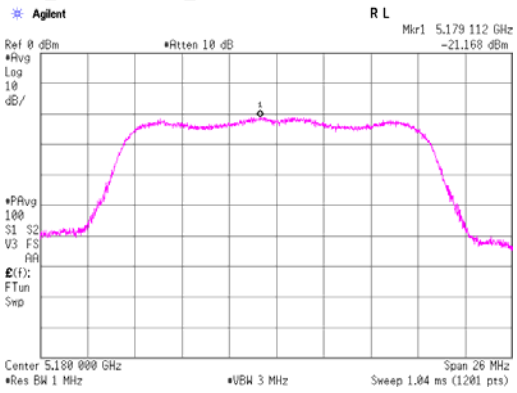
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

Peak Excursion Ratio

Peak_36Mbps	PPSD_36Mbps
	
Peak_48Mbps	**PPSD_48Mbps**
	
Peak_54Mbps	**PPSD_54Mbps**
	

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Peak Excursion Ratio

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n-HT20, SISO, PN9, worst antenna port 1	

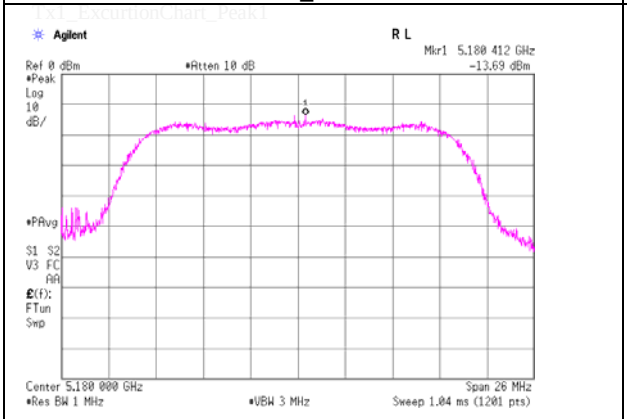
Ch. Freq. [MHz]	Mode (MCS)	Peak Reading [dBm]	PPSD Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Peak Result [dBm]	PPSD Result [dBm]	Peak Power Excursion [dB]	Limit [dB]	Margin [dB]
5180	0	-13.69	-22.48	1.74	20.09	0.22	8.14	-0.43	8.57	=<13.0	4.43
	1	-13.88	-22.64	1.74	20.09	0.22	7.95	-0.59	8.54	=<13.0	4.46
	2	-13.92	-22.61	1.74	20.09	0.26	7.91	-0.52	8.43	=<13.0	4.57
	3	-14.39	-22.72	1.74	20.09	0.17	7.44	-0.72	8.16	=<13.0	4.84
	4	-14.62	-22.67	1.74	20.09	0.25	7.21	-0.59	7.80	=<13.0	5.20
	5	-14.37	-22.63	1.74	20.09	0.32	7.46	-0.48	7.94	=<13.0	5.06
	6	-14.20	-22.89	1.74	20.09	0.45	7.63	-0.61	8.24	=<13.0	4.76
	7	-13.61	-22.94	1.74	20.09	0.38	8.22	-0.73	8.95	=<13.0	4.05

*Peak Power Excursion = Peak Result - PPSD Result

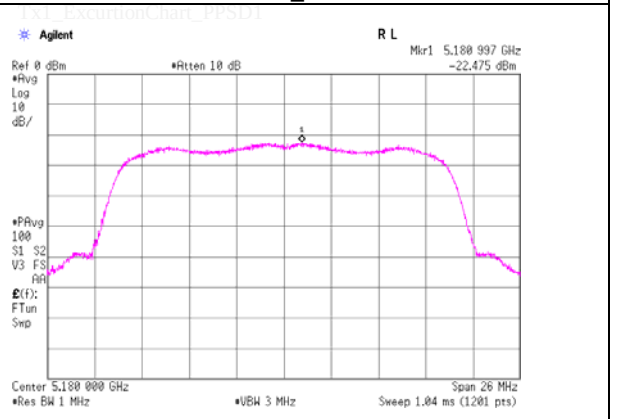
*Peak Result = Peak Reading + Cable Loss + Atten. Loss, PPSD Result = PPSD Reading + Cable Loss + Atten. Loss + Duty factor

*PPSD Reading, Cable Loss, Atten.Loss and Duty factor refer to Power Density sheet.

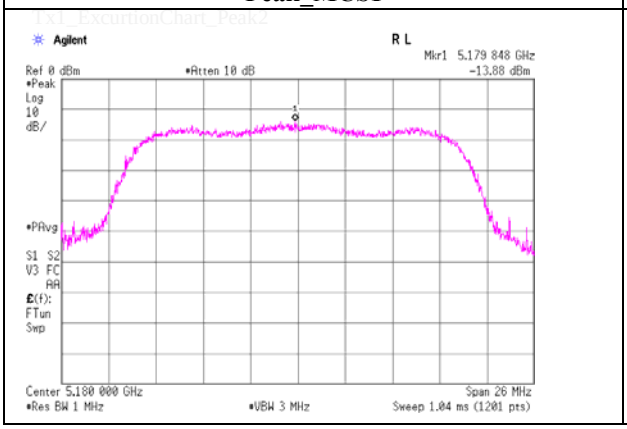
Peak_MCS0



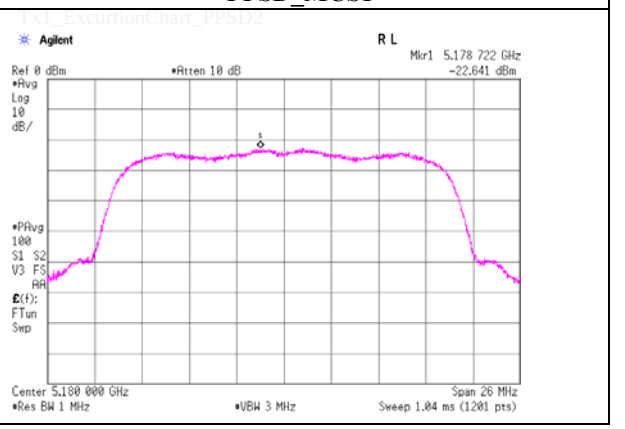
PPSD_MCS0



Peak_MCS1



PPSD_MCS1



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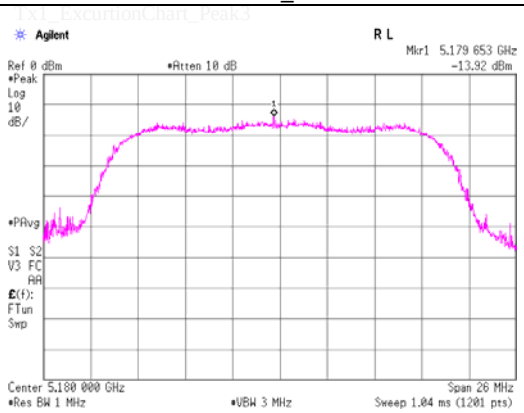
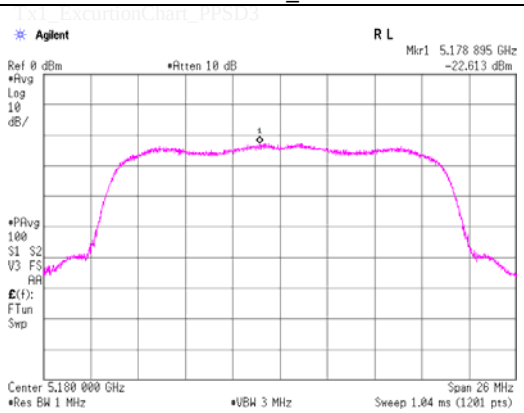
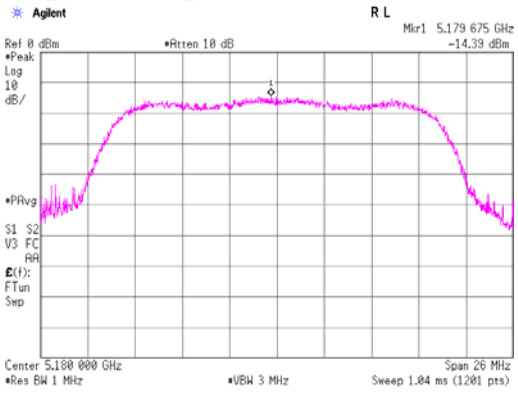
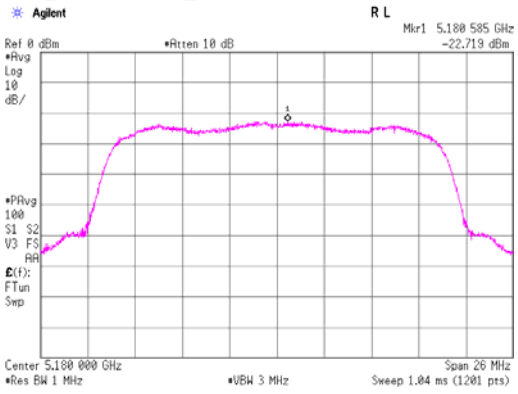
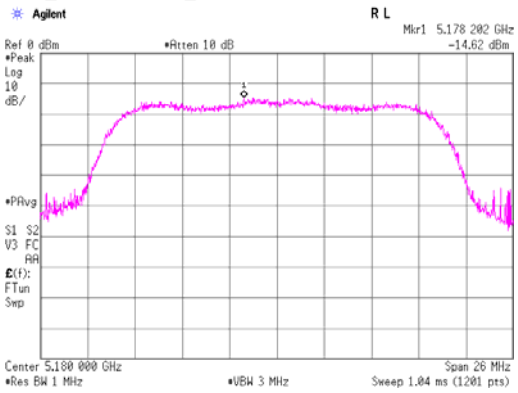
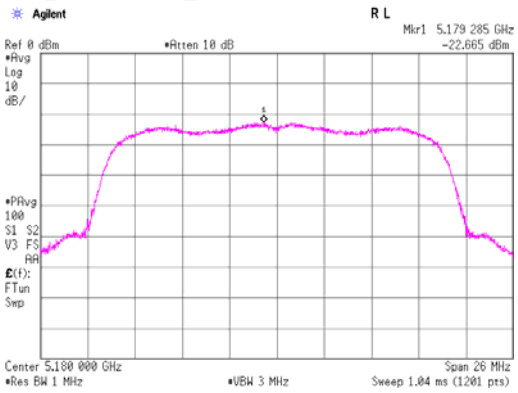
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

Peak Excursion Ratio

Peak_MCS2	PPSD_MCS2
	
Peak_MCS3	**PPSD_MCS3**
	
Peak_MCS4	**PPSD_MCS4**
	

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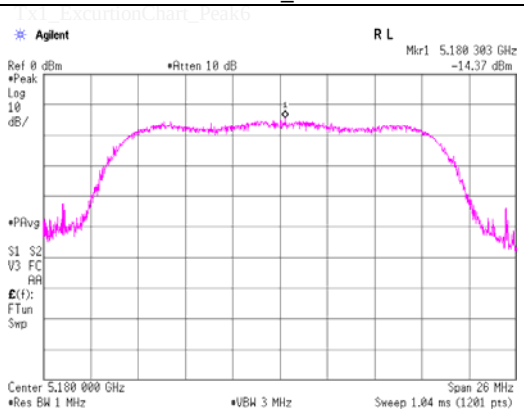
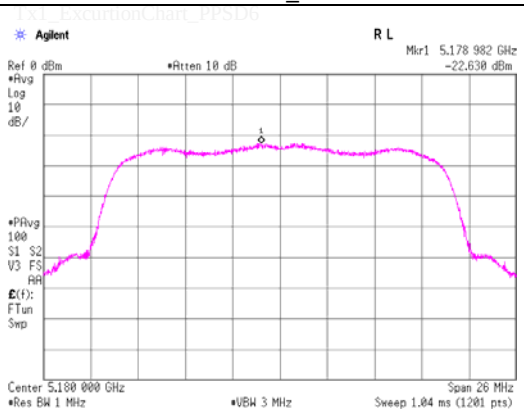
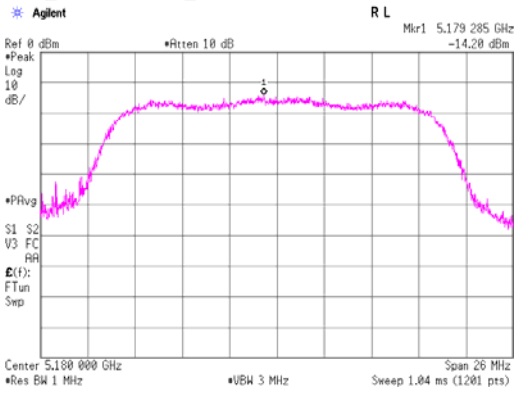
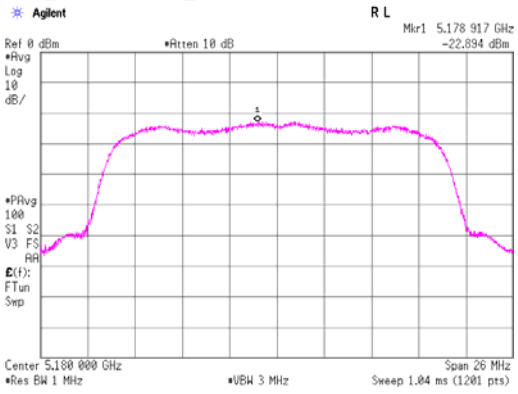
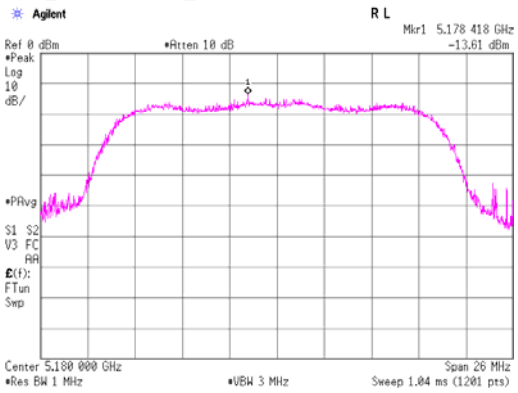
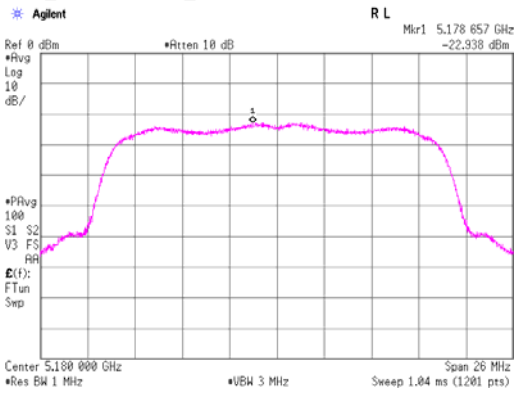
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

Peak Excursion Ratio

Peak_MCS5	PPSD_MCS5
	
Peak_MCS6	**PPSD_MCS6**
	
Peak_MCS7	**PPSD_MCS7**
	

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Peak Excursion Ratio

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT20), CDD, PN9, worst antenna port 1	

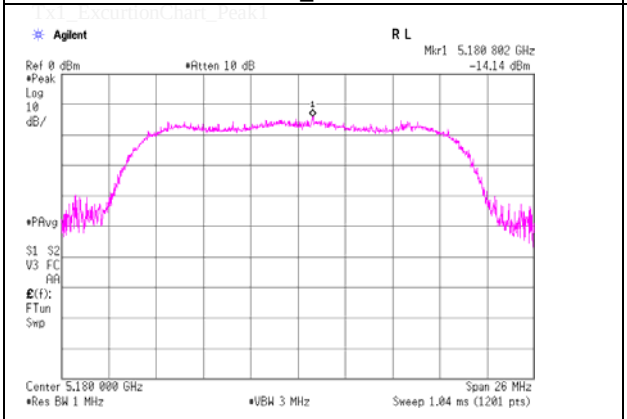
Ch. Freq. [MHz]	Mode (MCS)	Peak Reading [dBm]	PPSD Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Peak Result [dBm]	PPSD Result [dBm]	Peak Power Excursion [dB]	Limit [dB]	Margin [dB]
5180	0	-14.14	-22.30	1.74	20.09	0.22	7.69	-0.25	7.94	=<13.0	5.06
	1	-14.82	-22.42	1.74	20.09	0.21	7.01	-0.38	7.39	=<13.0	5.61
	2	-14.71	-22.38	1.74	20.09	0.22	7.12	-0.33	7.45	=<13.0	5.55
	3	-13.73	-22.60	1.74	20.09	0.20	8.10	-0.57	8.67	=<13.0	4.33
	4	-14.45	-22.66	1.74	20.09	0.29	7.38	-0.54	7.92	=<13.0	5.08
	5	-14.45	-22.53	1.74	20.09	0.38	7.38	-0.32	7.70	=<13.0	5.30
	6	-14.33	-22.61	1.74	20.09	0.41	7.50	-0.37	7.87	=<13.0	5.13
	7	-14.18	-22.63	1.74	20.09	0.45	7.65	-0.35	8.00	=<13.0	5.00

*Peak Power Excursion = Peak Result - PPSD Result

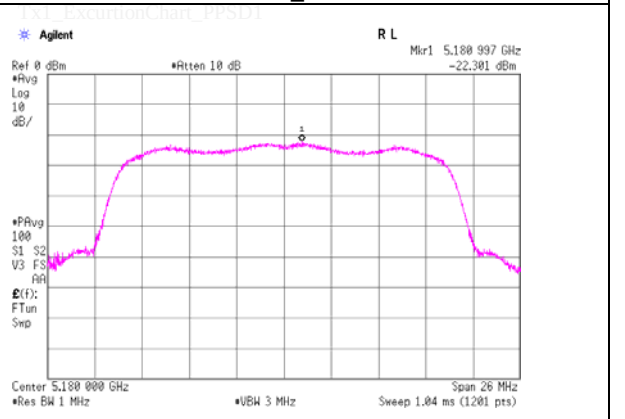
*Peak Result = Peak Reading + Cable Loss + Atten. Loss, PPSD Result = PPSD Reading + Cable Loss + Atten. Loss + Duty factor

*PPSD Reading, Cable Loss, Atten.Loss and Duty factor refer to Power Density sheet.

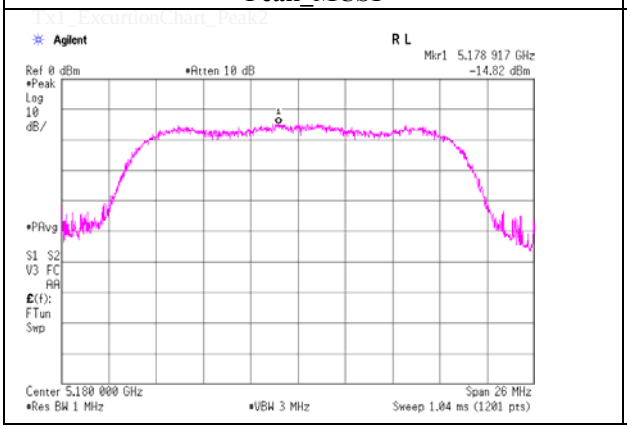
Peak_MCS0



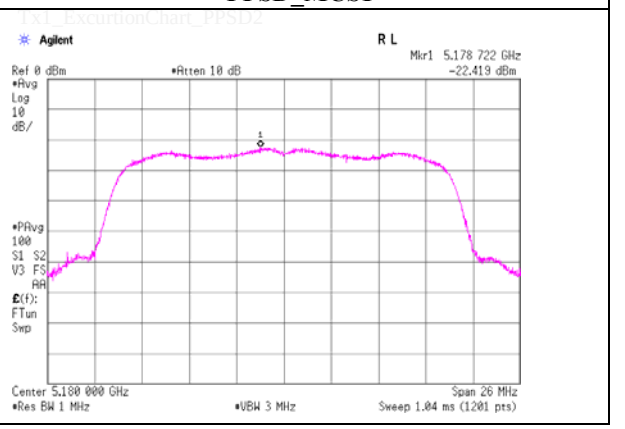
PPSD_MCS0



Peak_MCS1



PPSD_MCS1



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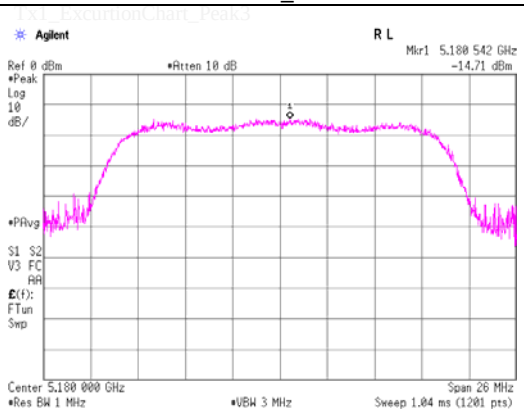
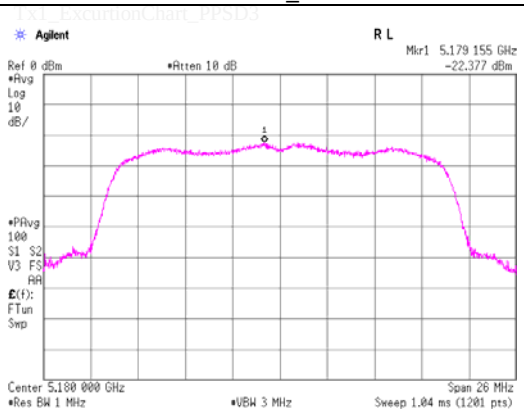
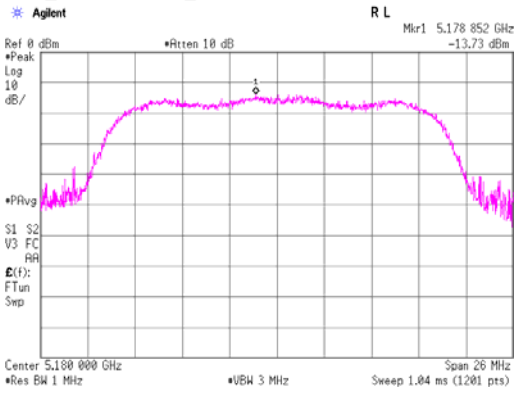
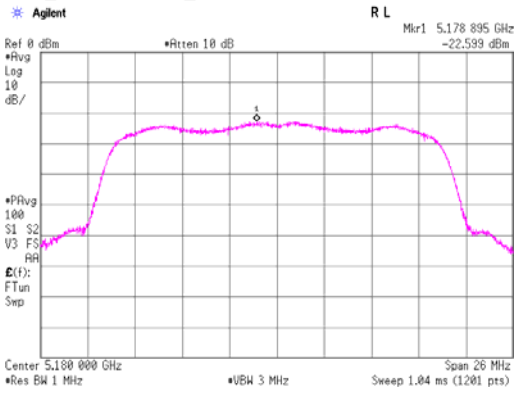
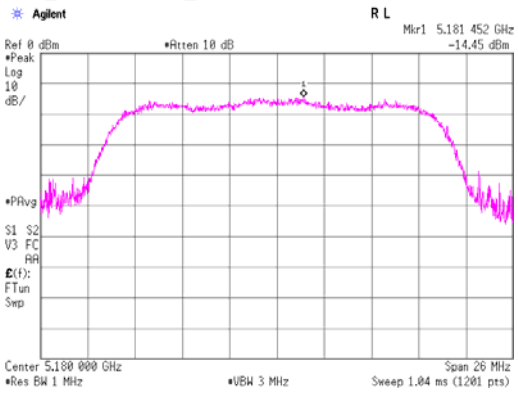
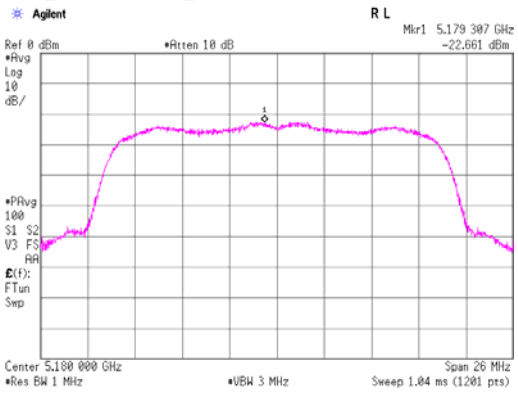
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

Peak Excursion Ratio

Peak_MCS2	PPSD_MCS2
	
Peak_MCS3	**PPSD_MCS3**
	
Peak_MCS4	**PPSD_MCS4**
	

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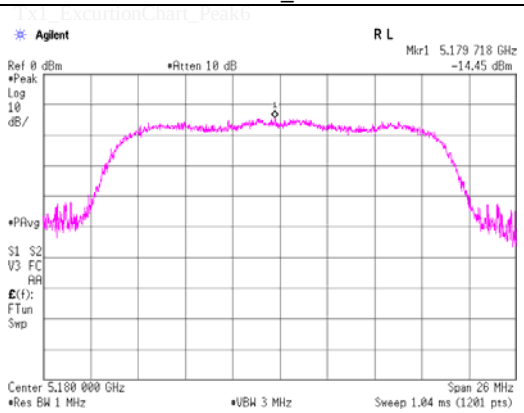
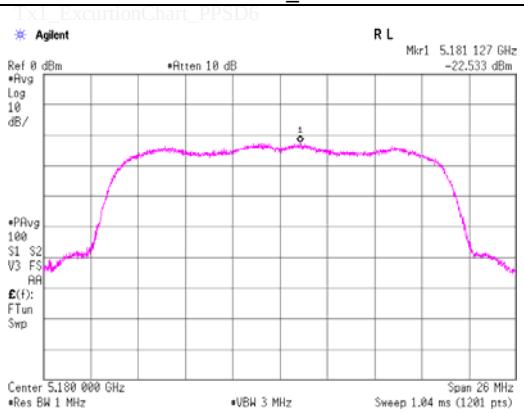
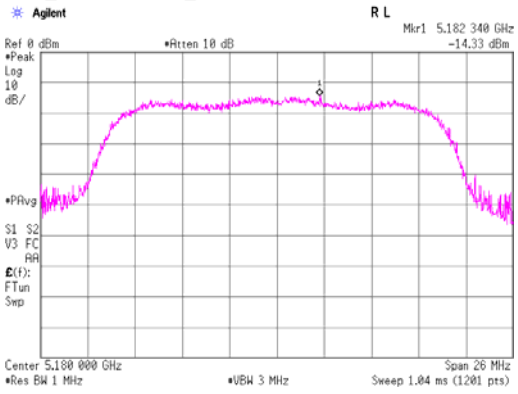
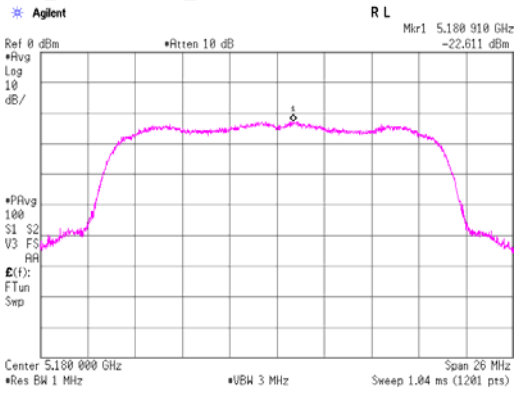
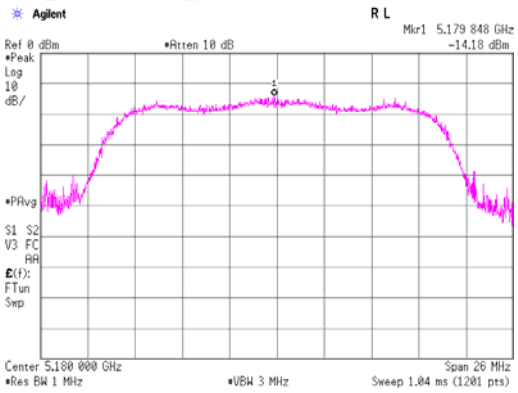
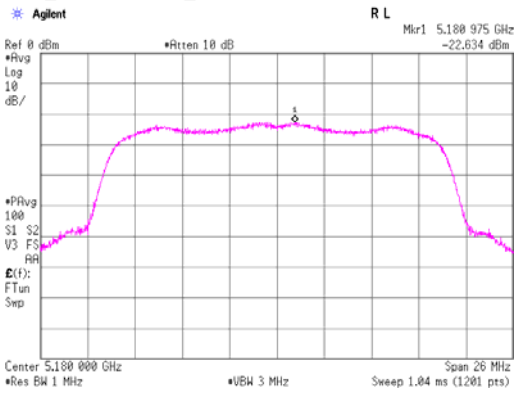
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

Peak Excursion Ratio

Peak_MCS5	PPSD_MCS5
	
Peak_MCS6	**PPSD_MCS6**
	
Peak_MCS7	**PPSD_MCS7**
	

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Peak Excursion Ratio

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT20), MIMO(SDM), PN9, worst antenna port 1	

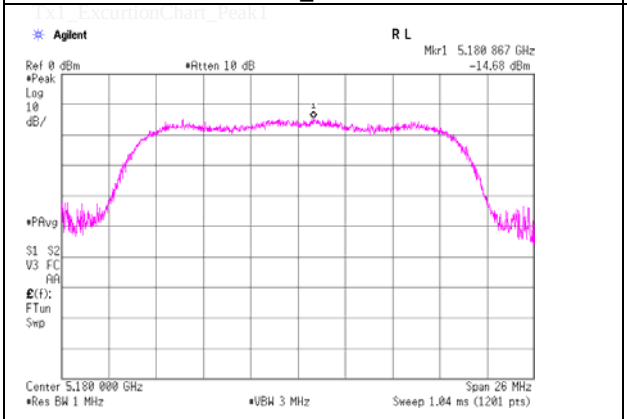
Ch. Freq. [MHz]	Mode (MCS)	Peak Reading [dBm]	PPSD Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Peak Result [dBm]	PPSD Result [dBm]	Peak Power Excursion [dB]	Limit [dB]	Margin [dB]
5180	8	-14.68	-22.61	1.74	20.09	0.42	7.15	-0.36	7.51	=<13.0	5.49
	9	-14.23	-22.66	1.74	20.09	0.40	7.60	-0.43	8.03	=<13.0	4.97
	10	-13.97	-22.81	1.74	20.09	0.40	7.86	-0.58	8.44	=<13.0	4.56
	11	-13.82	-22.80	1.74	20.09	0.37	8.01	-0.60	8.61	=<13.0	4.39
	12	-13.86	-22.88	1.74	20.09	0.50	7.97	-0.55	8.52	=<13.0	4.48
	13	-14.02	-22.97	1.74	20.09	0.63	7.81	-0.51	8.32	=<13.0	4.68
	14	-14.36	-23.04	1.74	20.09	0.68	7.47	-0.53	8.00	=<13.0	5.00
	15	-14.11	-23.20	1.74	20.09	0.74	7.72	-0.63	8.35	=<13.0	4.65

*Peak Power Excursion = Peak Result - PPSD Result

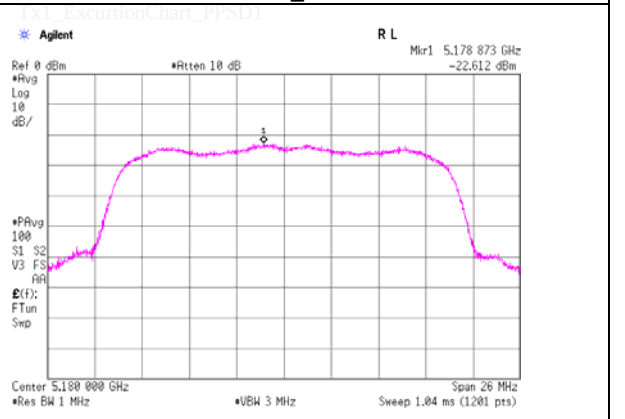
*Peak Result = Peak Reading + Cable Loss + Atten. Loss, PPSD Result = PPSD Reading + Cable Loss + Atten. Loss + Duty factor

*PPSD Reading, Cable Loss, Atten.Loss and Duty factor refer to Power Density sheet.

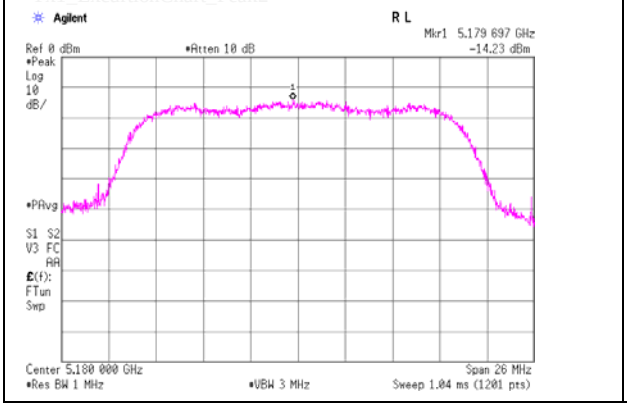
Peak_MCS8



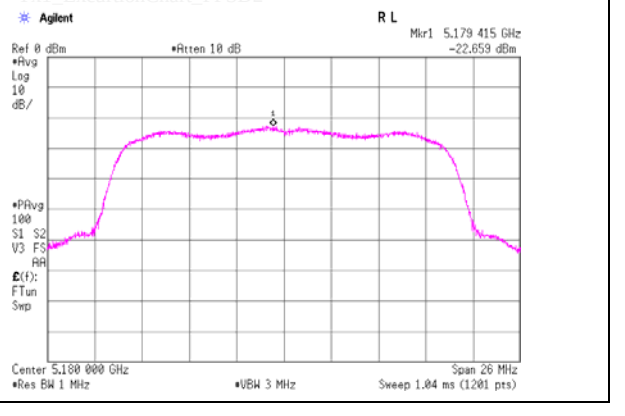
PPSD_MCS8



Peak_MCS9



PPSD_MCS9



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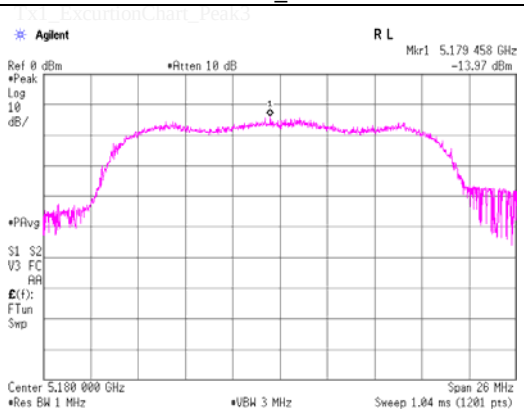
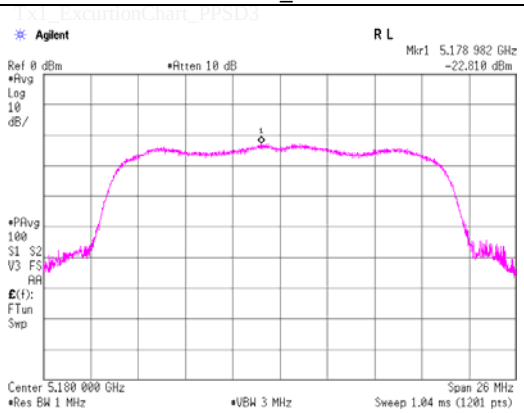
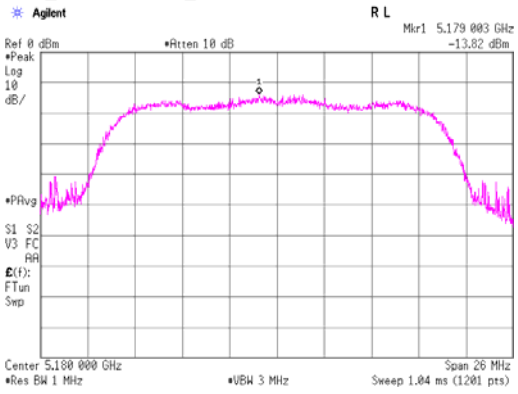
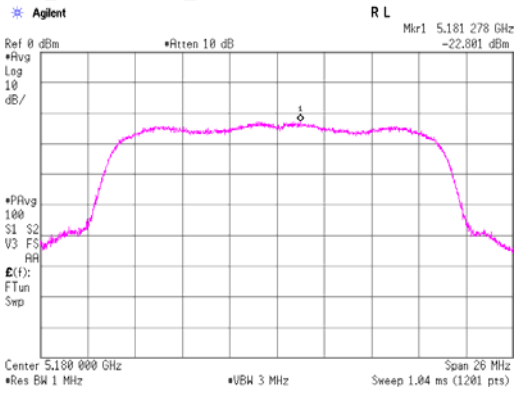
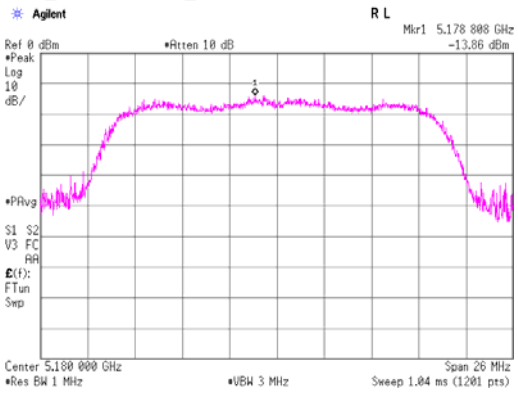
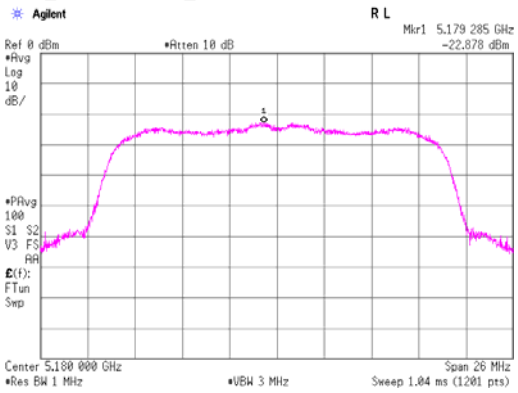
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

Peak Excursion Ratio

Peak_MCS10	PPSD_MCS10
	
Peak_MCS11	**PPSD_MCS11**
	
Peak_MCS12	**PPSD_MCS12**
	

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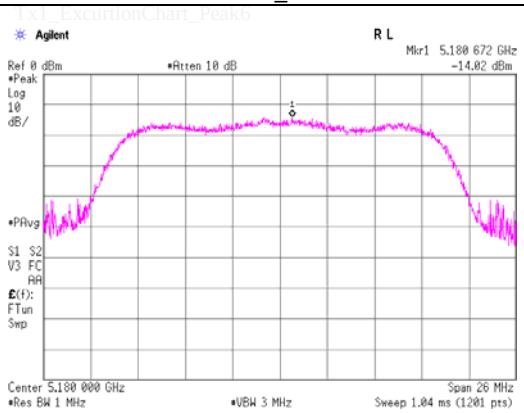
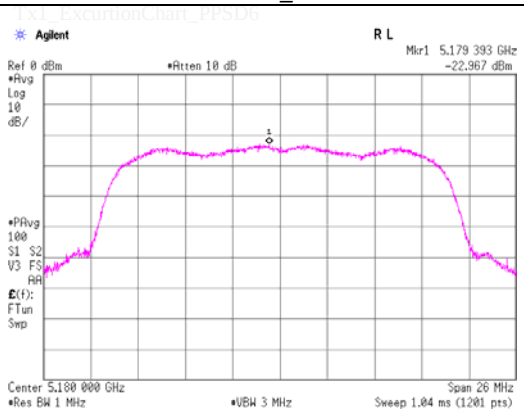
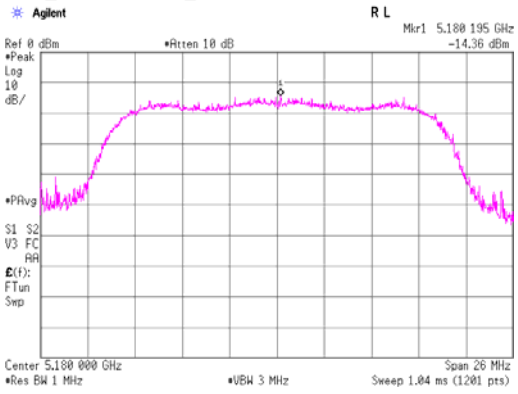
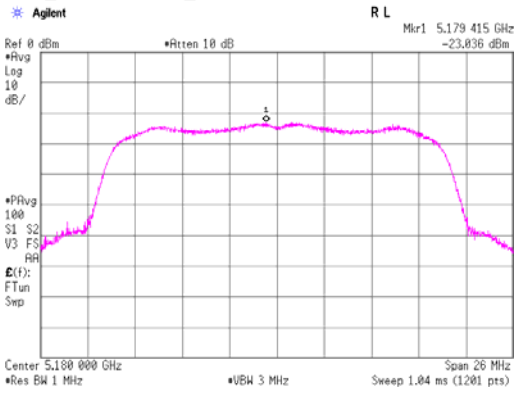
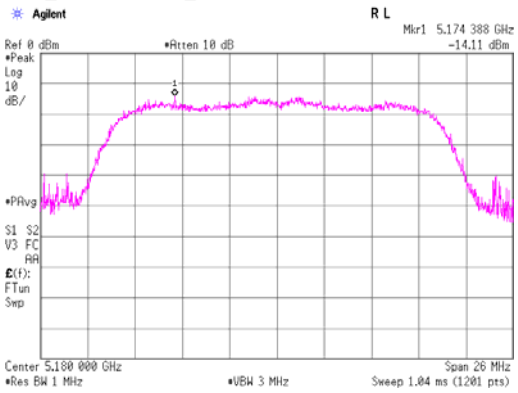
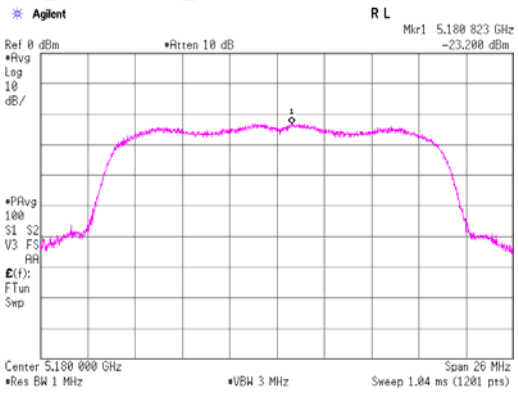
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	December 9, 2013	
Temperature / Humidity	23 deg.C , 32 %RH	
Engineer	Shinichi Takano	

Peak Excursion Ratio

Peak_MCS13	PPSD_MCS13
	
Peak_MCS14	**PPSD_MCS14**
	
Peak_MCS15	**PPSD_MCS15**
	

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Peak Excursion Ratio

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n-HT40, SISO, PN9, worst antenna port 1	

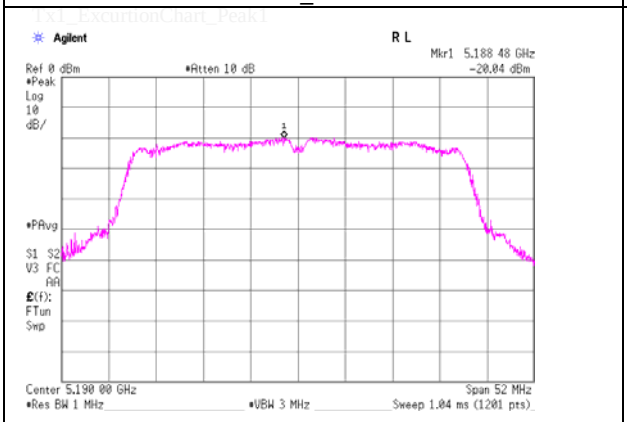
Ch. Freq. [MHz]	Mode (MCS)	Peak Reading [dBm]	PPSD Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Peak Result [dBm]	PPSD Result [dBm]	Peak Power Excursion [dB]	Limit [dB]	Margin [dB]
5190	0	-20.04	-27.47	1.74	20.09	0.44	1.79	-5.20	6.99	=<13.0	6.01
	1	-19.37	-27.57	1.74	20.09	0.43	2.46	-5.31	7.77	=<13.0	5.23
	2	-19.25	-27.70	1.74	20.09	0.38	2.58	-5.49	8.07	=<13.0	4.93
	3	-19.35	-27.63	1.74	20.09	0.49	2.48	-5.31	7.79	=<13.0	5.21
	4	-18.82	-27.85	1.74	20.09	0.46	3.01	-5.56	8.57	=<13.0	4.43
	5	-18.41	-27.78	1.74	20.09	0.58	3.42	-5.37	8.79	=<13.0	4.21
	6	-18.80	-28.01	1.74	20.09	0.78	3.03	-5.40	8.43	=<13.0	4.57
	7	-18.67	-28.05	1.74	20.09	0.67	3.16	-5.55	8.71	=<13.0	4.29

*Peak Power Excursion = Peak Result - PPSD Result

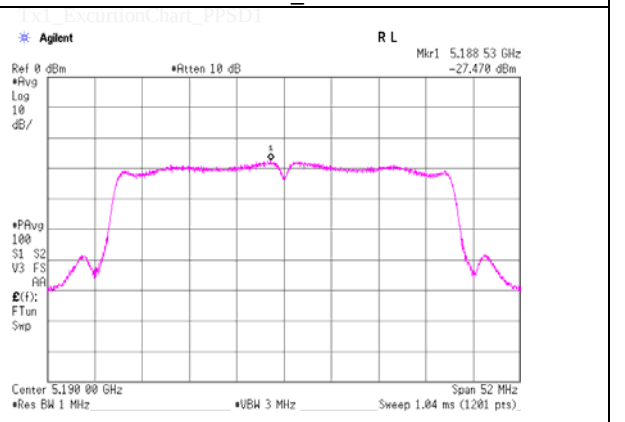
*Peak Result = Peak Reading + Cable Loss + Atten. Loss, PPSD Result = PPSD Reading + Cable Loss + Atten. Loss + Duty factor

*PPSD Reading, Cable Loss, Atten.Loss and Duty factor refer to Power Density sheet.

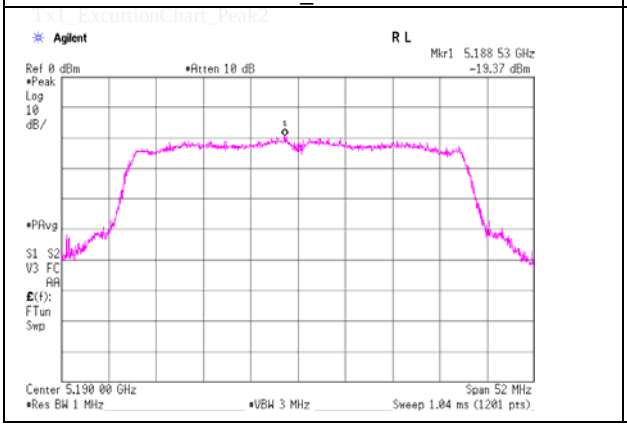
Peak_MCS0



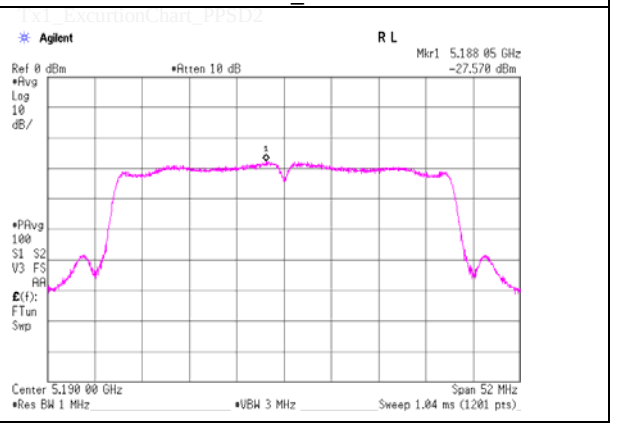
PPSD_MCS0



Peak_MCS1



PPSD_MCS1



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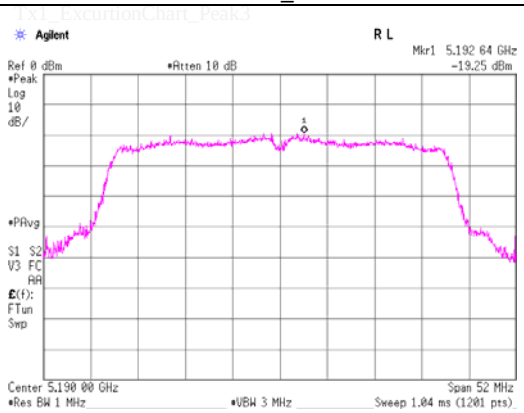
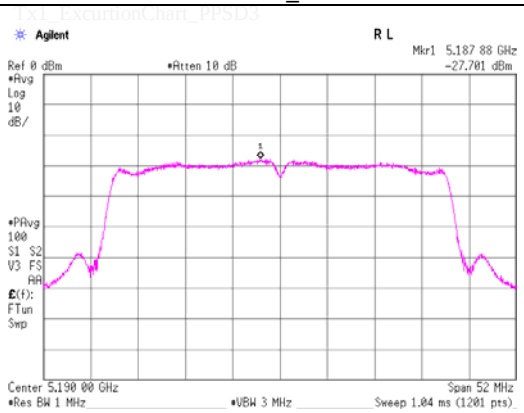
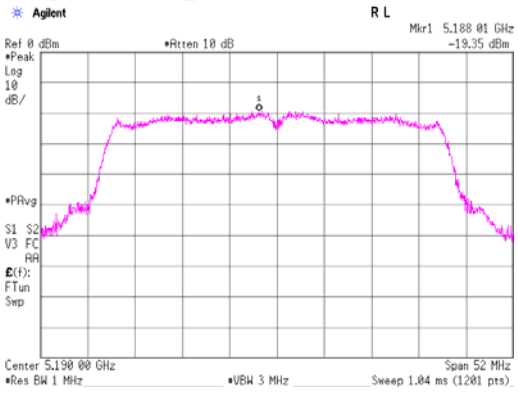
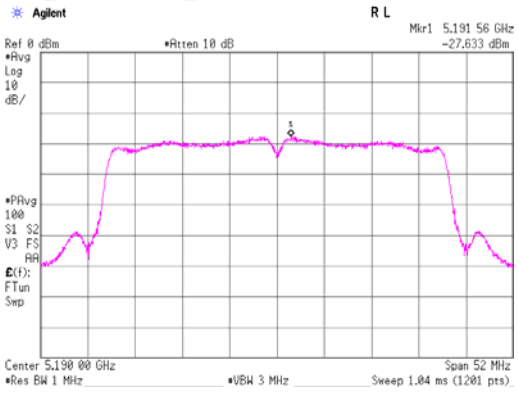
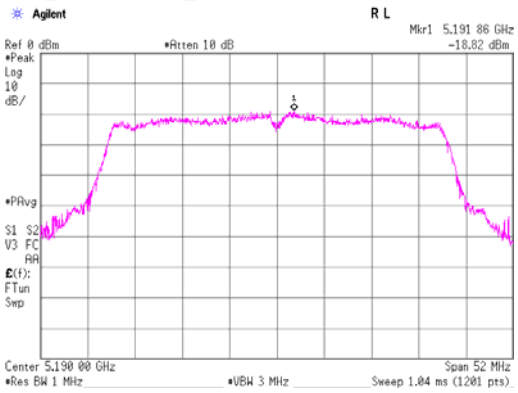
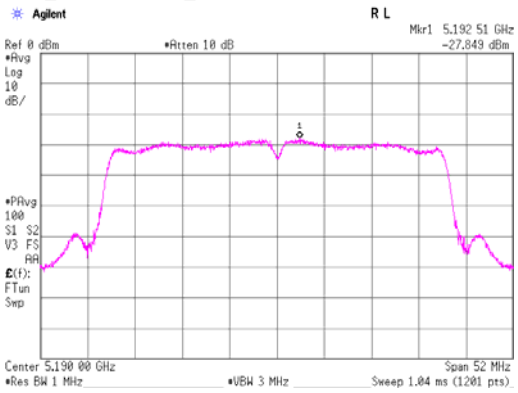
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	

Peak Excursion Ratio

Peak_MCS2	PPSD_MCS2
	
Peak_MCS3	**PPSD_MCS3**
	
Peak_MCS4	**PPSD_MCS4**
	

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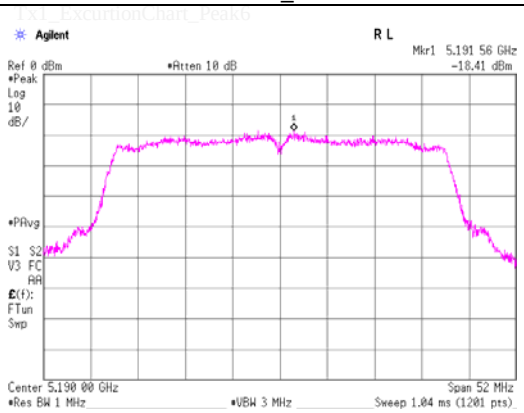
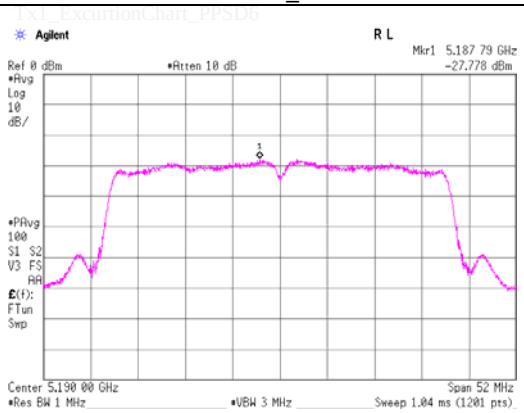
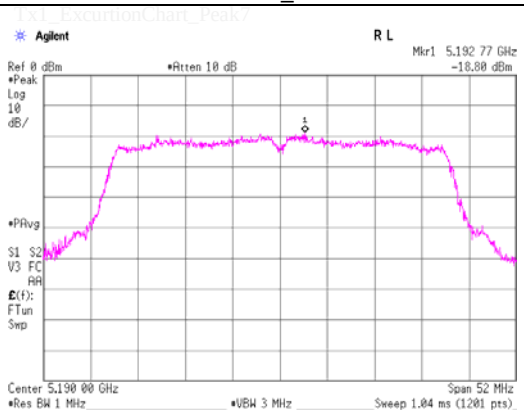
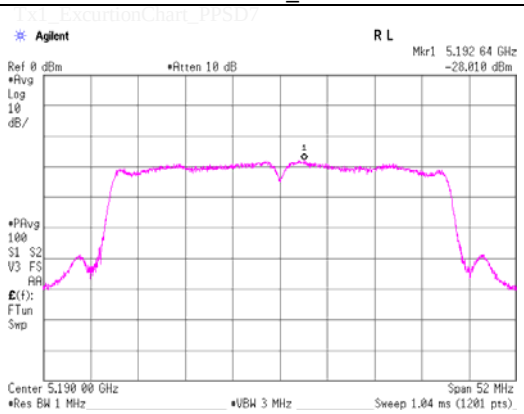
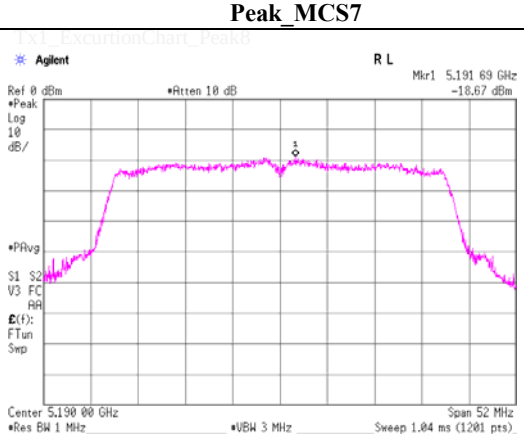
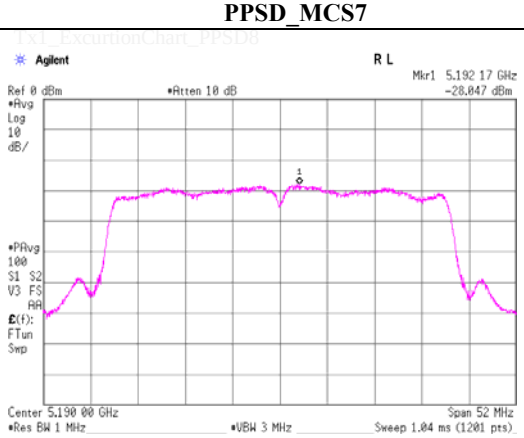
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	

Peak Excursion Ratio

Peak_MCS5	PPSD_MCS5
	
Peak_MCS6	**PPSD_MCS6**
	
Peak_MCS7	**PPSD_MCS7**
	

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Peak Excursion Ratio

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT40), CDD, PN9, worst antenna port 1	

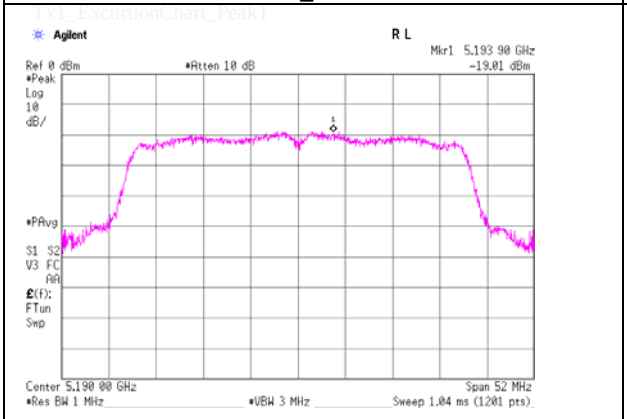
Ch. Freq. [MHz]	Mode (MCS)	Peak Reading [dBm]	PPSD Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Peak Result [dBm]	PPSD Result [dBm]	Peak Power Excursion [dB]	Limit [dB]	Margin [dB]
5190	0	-19.01	-27.32	1.74	20.09	0.44	2.82	-5.05	7.87	=<13.0	5.13
	1	-18.85	-27.36	1.74	20.09	0.41	2.98	-5.12	8.10	=<13.0	4.90
	2	-18.80	-27.37	1.74	20.09	0.42	3.03	-5.12	8.15	=<13.0	4.85
	3	-18.94	-27.37	1.74	20.09	0.38	2.89	-5.16	8.05	=<13.0	4.95
	4	-18.62	-27.45	1.74	20.09	0.53	3.21	-5.09	8.30	=<13.0	4.70
	5	-18.44	-27.91	1.74	20.09	0.66	3.39	-5.42	8.81	=<13.0	4.19
	6	-18.64	-27.82	1.74	20.09	0.73	3.19	-5.26	8.45	=<13.0	4.55
	7	-18.82	-27.99	1.74	20.09	0.78	3.01	-5.38	8.39	=<13.0	4.61

*Peak Power Excursion = Peak Result - PPSD Result

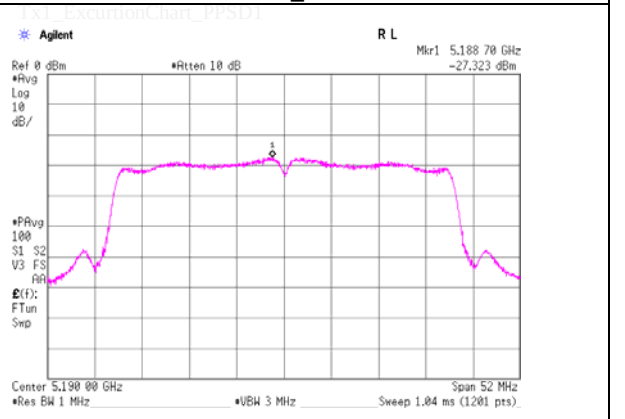
*Peak Result = Peak Reading + Cable Loss + Atten. Loss, PPSD Result = PPSD Reading + Cable Loss + Atten. Loss + Duty factor

*PPSD Reading, Cable Loss, Atten.Loss and Duty factor refer to Power Density sheet.

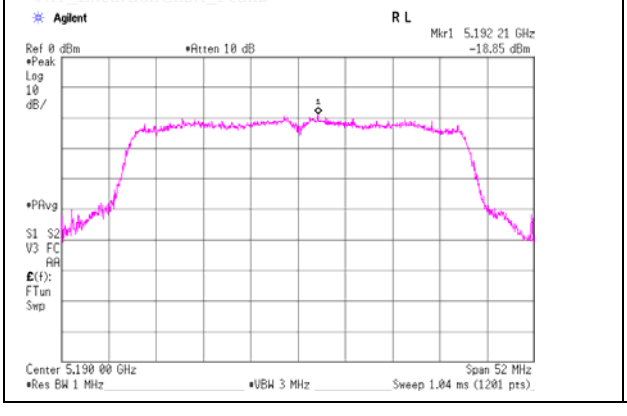
Peak_MCS0



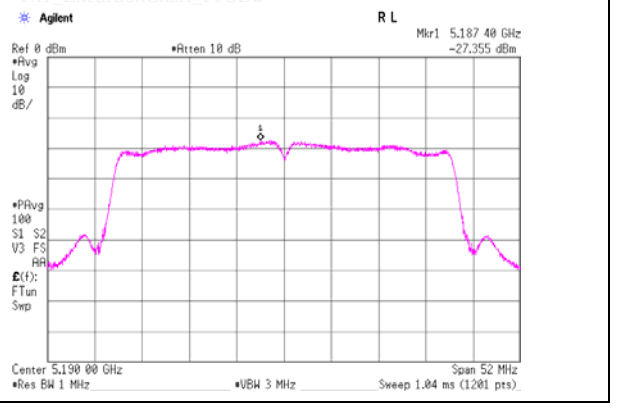
PPSD_MCS0



Peak_MCS1



PPSD_MCS1



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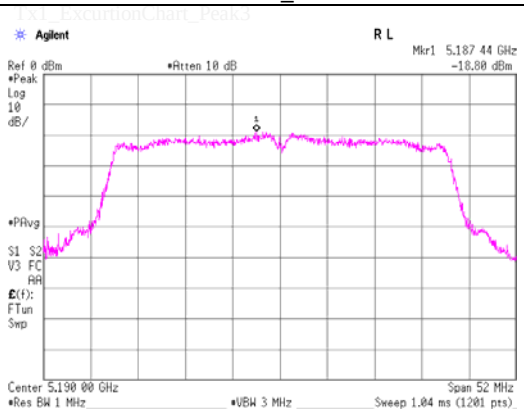
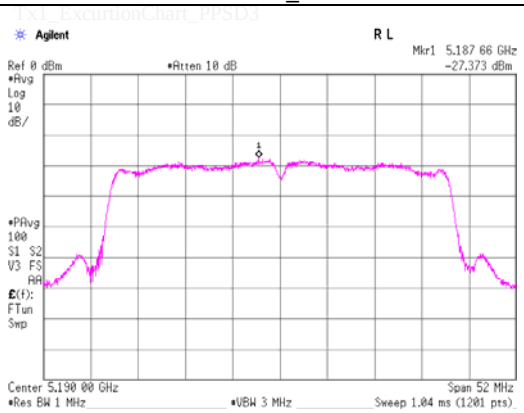
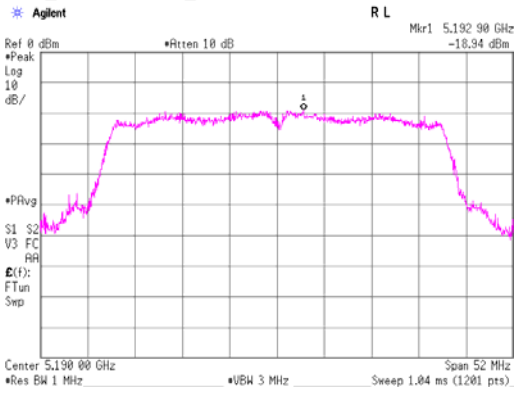
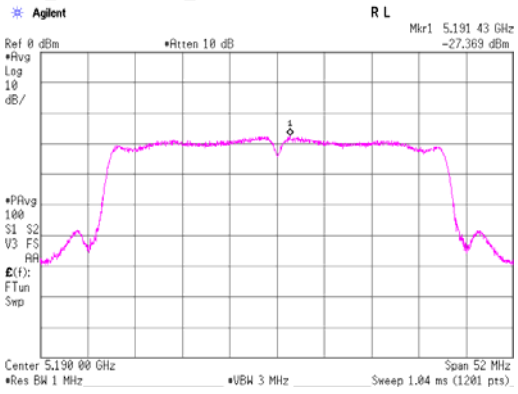
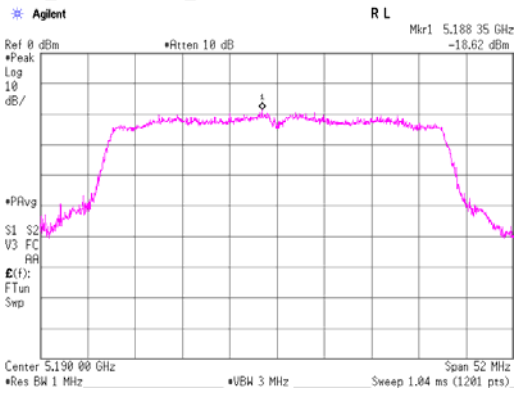
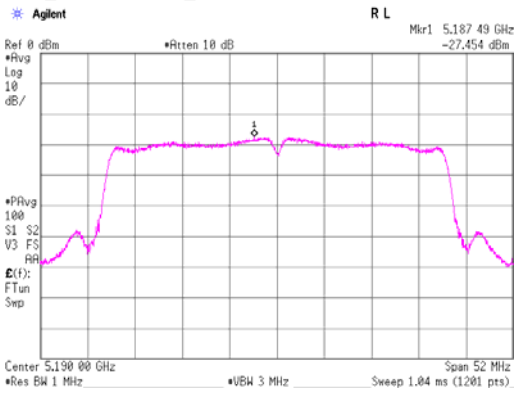
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	

Peak Excursion Ratio

Peak_MCS2	PPSD_MCS2
	
Peak_MCS3	**PPSD_MCS3**
	
Peak_MCS4	**PPSD_MCS4**
	

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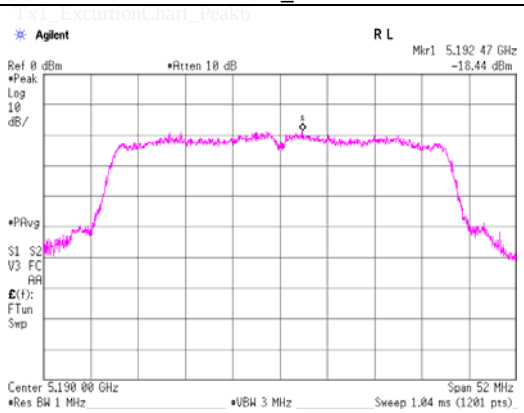
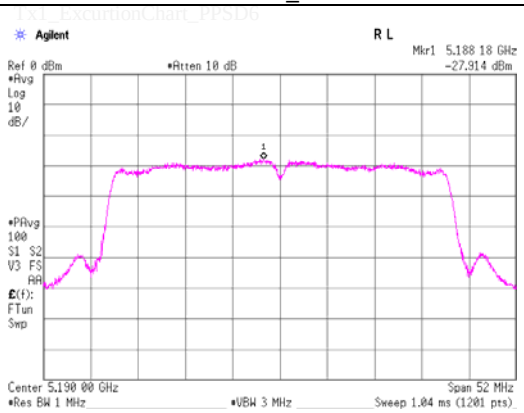
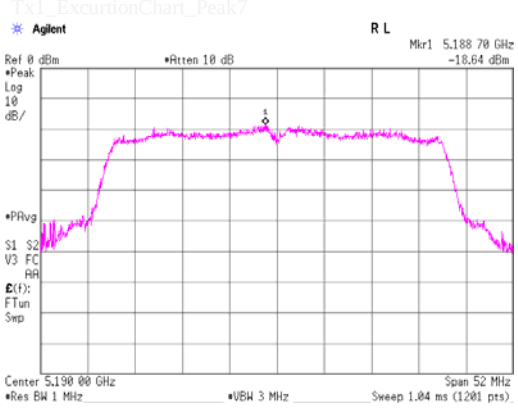
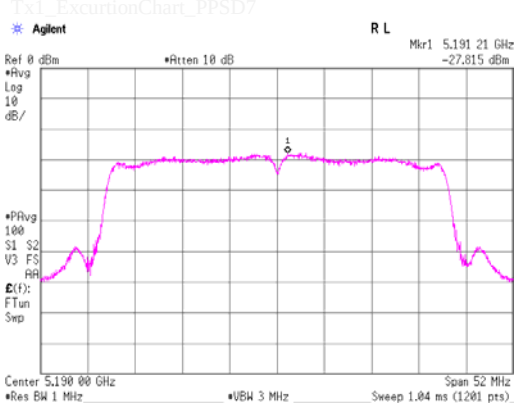
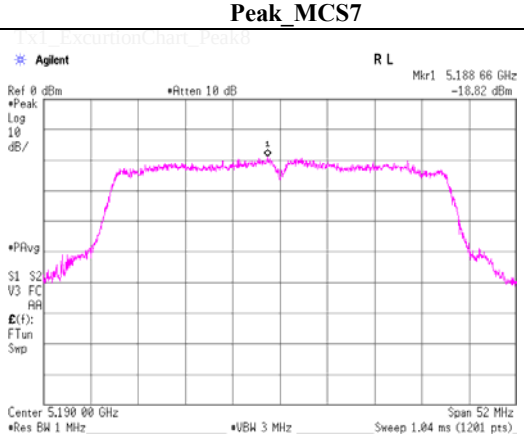
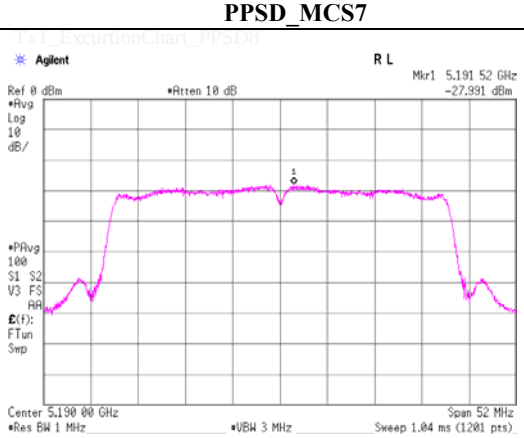
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	

Peak Excursion Ratio

Peak_MCS5	PPSD_MCS5
	
Peak_MCS6	**PPSD_MCS6**
	
Peak_MCS7	**PPSD_MCS7**
	

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Peak Excursion Ratio

Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	
Mode	Tx, IEEE802.11n (HT40), MIMO(SDM), PN9, worst antenna port 1	

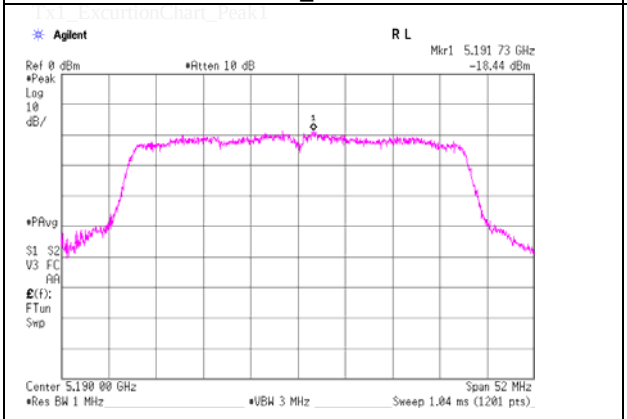
Ch. Freq. [MHz]	Mode (MCS)	Peak Reading [dBm]	PPSD Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Duty factor [dB]	Peak Result [dBm]	PPSD Result [dBm]	Peak Power Excursion [dB]	Limit [dB]	Margin [dB]
5190	8	-18.44	-27.75	1.74	20.09	0.80	3.39	-5.12	8.51	=<13.0	4.49
	9	-18.84	-27.78	1.74	20.09	0.75	2.99	-5.20	8.19	=<13.0	4.81
	10	-18.36	-27.69	1.74	20.09	0.73	3.47	-5.13	8.60	=<13.0	4.40
	11	-18.70	-27.84	1.74	20.09	0.64	3.13	-5.37	8.50	=<13.0	4.50
	12	-18.95	-27.85	1.74	20.09	0.86	2.88	-5.16	8.04	=<13.0	4.96
	13	-18.66	-28.00	1.74	20.09	1.00	3.17	-5.17	8.34	=<13.0	4.66
	14	-18.60	-28.45	1.74	20.09	1.09	3.23	-5.53	8.76	=<13.0	4.24
	15	-18.97	-28.46	1.74	20.09	1.14	2.86	-5.49	8.35	=<13.0	4.65

*Peak Power Excursion = Peak Result - PPSD Result

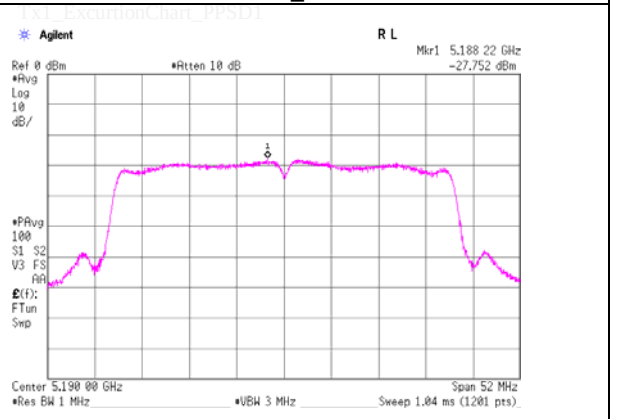
*Peak Result = Peak Reading + Cable Loss + Atten. Loss, PPSD Result = PPSD Reading + Cable Loss + Atten. Loss + Duty factor

*PPSD Reading, Cable Loss, Atten.Loss and Duty factor refer to Power Density sheet.

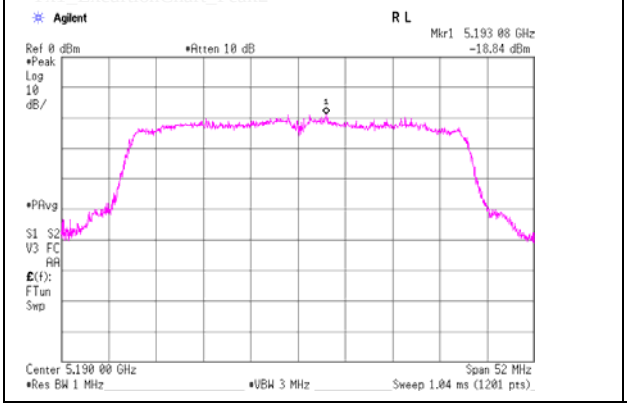
Peak_MCS8



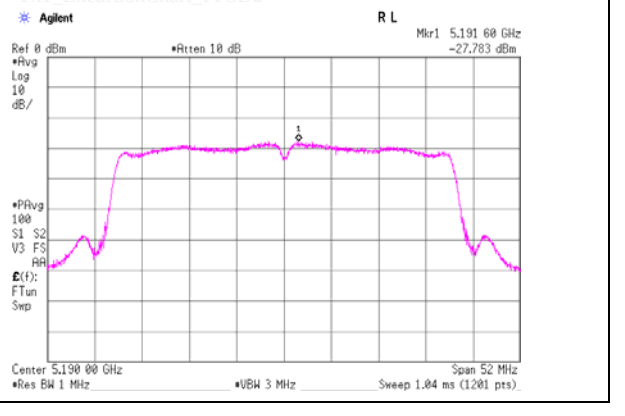
PPSD_MCS8



Peak_MCS9



PPSD_MCS9



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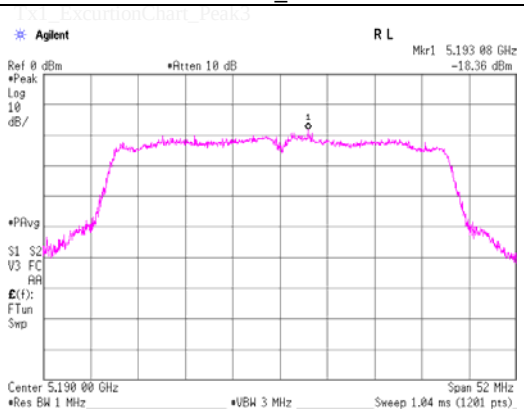
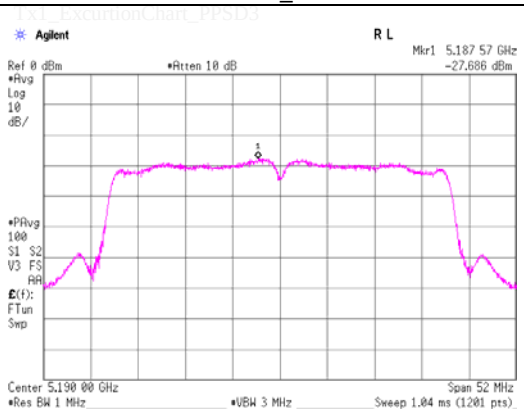
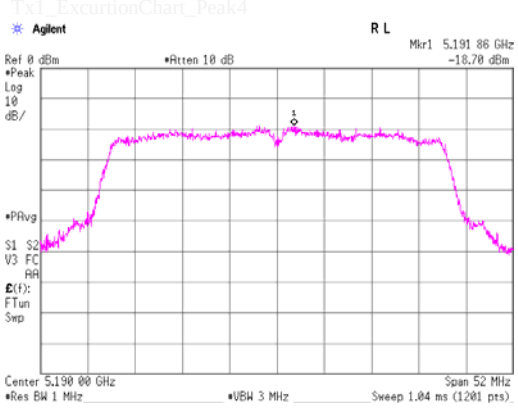
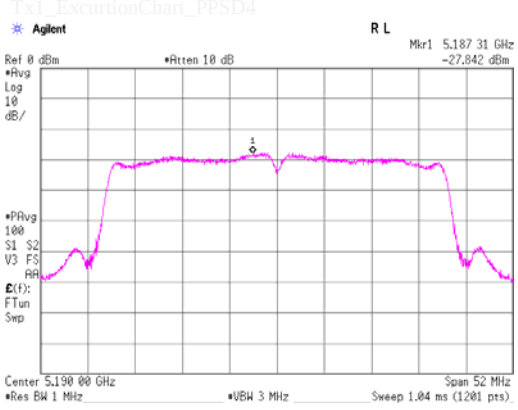
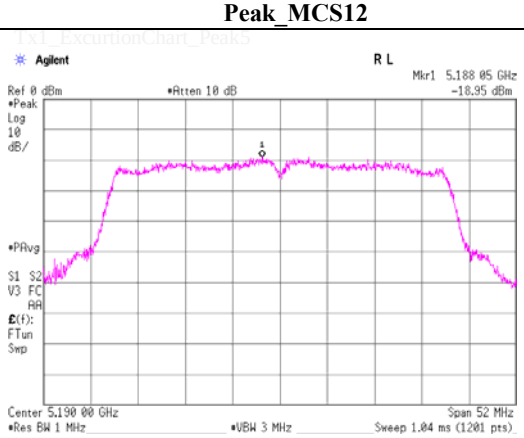
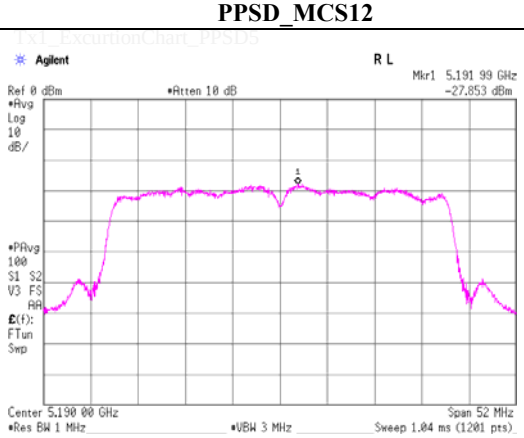
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	

Peak Excursion Ratio

Peak_MCS10	PPSD_MCS10
	
Peak_MCS11	**PPSD_MCS11**
	
Peak_MCS12	**PPSD_MCS12**
	

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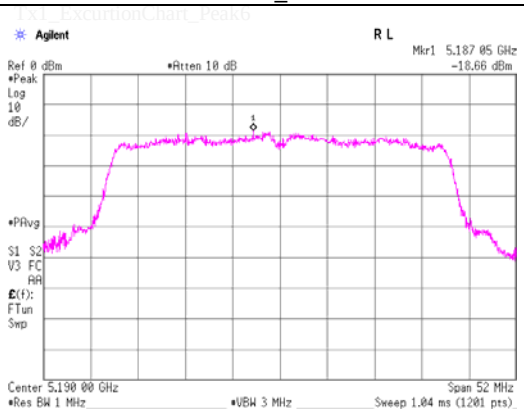
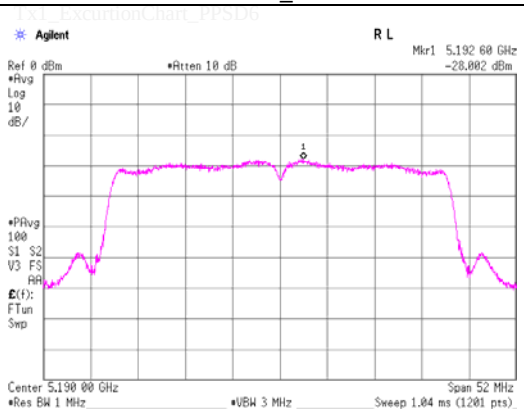
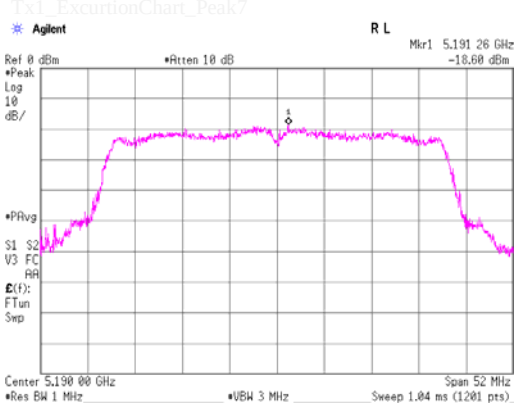
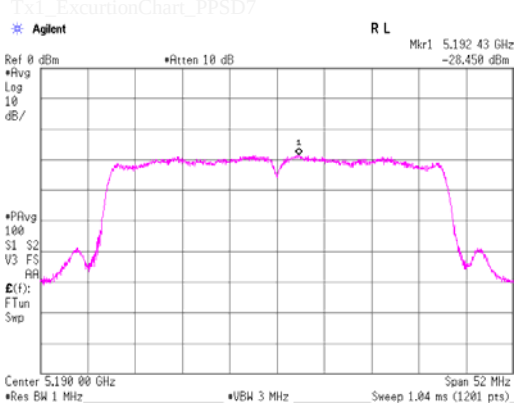
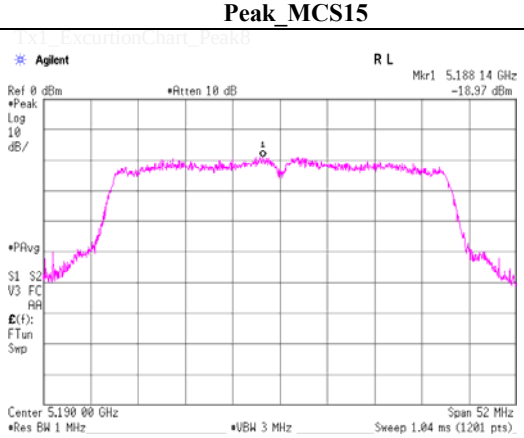
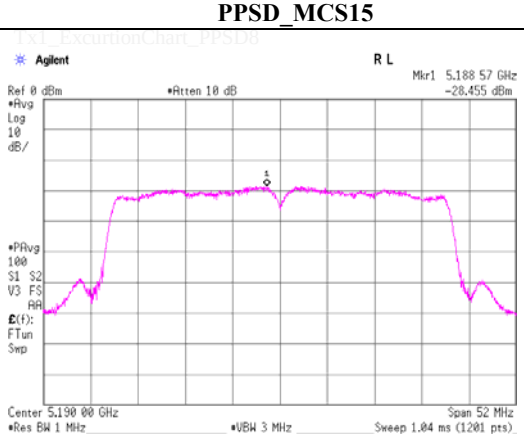
Test place	UL Japan, Inc. Shonan EMC Lab.	No.5 Shielded Room
Date	January 31, 2014	
Temperature / Humidity	26deg.C , 44%RH	
Engineer	Shinichi Takano	

Peak Excursion Ratio

Peak_MCS13	PPSD_MCS13
	
Peak_MCS14	**PPSD_MCS14**
	
Peak_MCS15	**PPSD_MCS15**
	

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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,RE	2013/03/28 * 12
SCC-G11	Coaxial Cable	Suhner	SUCOFLEX 102	31595/2	AT	2013/03/16 * 12
SAT20-05	Attenuator	Weinschel Corp.	54A-20	Y5649	AT	2013/11/27 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	2013/04/09 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	2013/04/09 * 12
SOS-10	Humidity Indicator	A&D	AD-5681	4064561	AT	2013/02/27 * 12
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT	2013/03/07 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2013/07/09 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2013/07/22 * 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	2013/08/19 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2013/02/27 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2013/11/22 * 12
SAT10-06	Attenuator	Agilent	8493C-010	74865	RE,AT	2013/11/22 * 12
SJM-11	Measure	PROMART	SEN1935	-	RE,CE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFI,MF)	-	RE,CE	-
SAEC-02(NSA)	Semi-Anechoic Chamber	TDK	SAEC-02(NSA)	2	RE	2013/07/06 * 12
SCC-G02	Coaxial Cable	Suhner	SUCOFLEX 104A	46498/4A	RE	2013/04/09 * 12
SCC-G22	Coaxial Cable	Suhner	SUCOFLEX 104	296199/4	RE	2013/05/22 * 12
SHA-02	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-726	RE	2013/08/12 * 12
SOS-03	Humidity Indicator	A&D	AD-5681	4063325	RE	2013/02/27 * 12
SJM-02	Measure	KOMELON	KMC-36	-	RE	-
SOS-02	Humidity Indicator	A&D	AD-5681	4063343	AT	2013/03/07 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT,RE	2013/03/04 * 12
SSA-01	Spectrum Analyzer	Agilent	N9010A-526	MY48031482	RE	2013/04/09 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	RE	2013/01/08 * 12
SFL-03	Highpass Filter	MICRO-TRONICS	HPM50112	028	RE	2013/11/22 * 12
SAF-04	Pre Amplifier	TOYO Corporation	TPA0118-36	1440489	RE	2013/03/19 * 12
SFL-18	Highpass Filter	MICRO-TRONICS	HPM50111	119	RE	2013/11/22 * 12
SAF-05	Pre Amplifier	TOYO Corporation	TPA0118-36	1440490	RE	2013/11/22 * 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

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
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
SHA-06	Horn Antenna	ETS LINDGREN	3160-10	LM3459	RE	2013/03/14 * 12
SAF-10	Pre Amplifier	TOYO Corporation	HAP26-40W	00000010	RE	2013/03/19 * 12
SCC-G19	Coaxial Cable	Suhner	SUCOFLEX 102A	1188/2A	RE	2013/03/16 * 12
SHA-05	Horn Antenna	ETS LINDGREN	3160-09	LM4210	RE	2013/03/14 * 12
SAF-09	Pre Amplifier	TOYO Corporation	HAP18-26W	00000018	RE	2013/03/19 * 12
SCC-G18	Coaxial Cable	Suhner	SUCOFLEX 104A	46292/4A	RE	2013/03/16 * 12
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	2013/10/26 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2013/04/03 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	2013/10/26 * 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
SLS-05	LISN	Rohde & Schwarz	ENV216	100516	CE	2013/02/25 * 12
SAT3-05	Attenuator	JFW	50HF-003N	-	CE	2013/02/12 * 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