



Test report No. : 10004954H-D-R2
Page : 1 of 94
Issued date : May 7, 2013
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FCC ID : AK8SVD132A1WL

RADIO TEST REPORT

Test Report No. : 10004954H-D-R2

Applicant : Sony Corporation
Type of Equipment : Personal Computer
Model No. : SVD132A1WL
FCC ID : AK8SVD132A1WL
Test regulation : FCC Part 15 Subpart C: 2012
*Conducted Emission and Spurious Emission test only
for Bluetooth Low Energy
Test Result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
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6. This report is a revised version of 10004954H-D-R1. 10004954H-D-R1 is replaced with this report.

Date of test: March 29 to April 29, 2013

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NVLAP LAB CODE: 200572-0

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13-EM-F0429

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SECTION 1: Customer information

Company Name : Sony Corporation.
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Contact Person : Hirofumi Kojima

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

2.1 Identification of E.U.T.

Type of Equipment : Personal Computer
Model No. : SVD132A1WL
Serial No. : Refer to Clause 4.2
Rating : INPUT: 100-240V, 1.2A, 50/60Hz
OUTPUT: DC 10.5V, 3.8A, 39.9W
DC 5V, 1A, 5W
Receipt Date of Sample : February 27, 2013
Country of Mass-production : Japan
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product Description

General Specification

Feature of EUT	This model is co-located with Wireless LAN and Bluetooth module(IEEE802.11 a/b/g/n, Bluetooth) and Wireless-WAN module(GSM850/PCS/UMTS/LTE) and NFC module. Each antenna is included in the Personal computer. This model can co-operate Wireless LAN(5GHz band) + Bluetooth + Wireless WAN + NFC.
Operation Clock	CPU: 1.0GHz

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Radio Specification

Bluetooth (BDR/EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Type	PIFA
Antenna Gain	-0.56 dBi (peak) (Including Cable Loss)

Bluetooth (Low Energy)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	GFSK
Bandwidth & Channel spacing	1MHz & 2MHz
Antenna Type	PIFA
Antenna Gain	-0.56 dBi (peak) (Including Cable Loss)

WLAN (IEEE802.11a/b/g/n-20)

Equipment Type	Transceiver	
Frequency of Operation	2412-2462MHz	5180-5320MHz 5500-5700MHz * 5745-5825MHz
Type of Modulation	DSSS, OFDM	OFDM
Bandwidth & Channel spacing	20MHz & 5MHz	20MHz & 20MHz
Antenna Type	PIFA	
Antenna Gain	Ant 0: -0.56dBi (peak) Ant 1: -4.07dBi (peak) (Including Cable Loss)	Ant 0: 5150-5350MHz -0.46dBi (peak) 5470-5725MHz -1.25dBi (peak) 5825-5850MHz -2.63dBi (peak) Ant 1: 5150-5350MHz +1.32dBi (peak) 5470-5725MHz +1.20dBi (peak) 5825-5850MHz -2.73dBi (peak) (Including Cable Loss)

*5600MHz-5640MHz is not used in Canada.

WLAN (IEEE802.11n-40)

Equipment Type	Transceiver	
Frequency of Operation	2422-2452MHz	5190-5310MHz 5510-5670MHz * 5755-5795MHz
Type of Modulation	OFDM	OFDM
Bandwidth & Channel spacing	40MHz & 5MHz	40MHz & 40MHz
Antenna Type	PIFA	
Antenna Gain	Ant 0: -0.56dBi (peak) Ant 1: -4.07dBi (peak) (Including Cable Loss)	Ant 0: 5150-5350MHz -0.46dBi (peak) 5470-5725MHz -1.25dBi (peak) 5825-5850MHz -2.63dBi (peak) Ant 1: 5150-5350MHz +1.32dBi (peak) 5470-5725MHz +1.20dBi (peak) 5825-5850MHz -2.73dBi (peak) (Including Cable Loss)

*5590MHz-5630MHz is not used in Canada.

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GSM

Equipment Type	Transceiver
Frequency of Operation	[Up Link] GSM850: 824 – 849MHz PCS: 1850 – 1910MHz [Down Link] GSM850: 869 – 894MHz PCS: 1930 – 1990MHz
Type of Modulation	GMSK , 8PSK
Emission Designator	GSM850: 249KGXW, 248KG7W PCS: 247KGXW, 247KG7W
Antenna Type	PIFA
Antenna Gain	GSM850: 824-849MHz: +0.64dBi (peak) PCS: 1850-1910MHz: +1.21dBi (peak) (Including Cable Loss)

W-CDMA

Equipment Type	Transceiver
Frequency of Operation	[Up Link] Band V: 824 – 849MHz Band II: 1850 – 1910MHz [Down Link] Band V: 869 – 894MHz Band II: 1930 – 1990MHz
Type of Modulation	QPSK
Emission Designator	Band V: 4M17F9W Band II: 4M16F9W
Antenna Type	PIFA
Antenna Gain	Band V: 824-849MHz: +0.64dBi (peak) Band II: 1850-1910MHz: +1.21dBi (peak) (Including Cable Loss)

LTE

Equipment Type	Transceiver
Frequency of Operation	[Up Link] Band IV: 1710 – 1755MHz Band X VII: 704 – 716MHz [Down Link] Band IV: 2110 – 2155MHz Band X VII: 734 – 746MHz
Type of Modulation	QPSK, 16QAM
Emission Designator	Band IV: 1M11G7D, 1M09W7D, 2M71G7D, 2M70W7D, 4M50G7D, 4M50W7D, 8M97G7D, 8M98W7D, 13M43G7D, 13M45W7D, 17M95G7D, 17M95W7D Band X VII: 4M51G7D, 4M52W7D, 8M96G7D, 8M97W7D
Antenna Type	PIFA
Antenna Gain	Band IV: 1710-1755MHz: +1.21dBi (peak) Band X VII: 704-716MHz: -1.35dBi (peak) (Including Cable Loss)

NFC (FCC ID: NKR-DFCN67H)

Equipment Type	Transceiver
Frequency of Operation	13.56MHz
Type of Modulation	ASK

*This test report applies for WLAN (IEEE802.11a/11b/11g/11n-20/11n-40[2412-2462MHz, 5745-5825MHz]) and Bluetooth (Low Energy).

*NFC module was operated by polling mode during the testing.

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : Test specification: FCC Part 15 Subpart C: 2012, final revised on December 27, 2012 and effective January 28, 2013

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.247 Operation within the bands 902-928MHz,
2400-2483.5MHz, and 5725-5850MHz

* The EUT complies with FCC Part 15 Subpart B: 2012, final revised on December 27, 2012 and effective January 28, 2013.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC: ANSI C63.4:2003 7. AC powerline Conducted Emission measurements ----- IC: RSS-Gen 7.2.4	FCC: Section 15.207 ----- IC: RSS-Gen 7.2.4	[WLAN] QP 20.8dB, 18.51539MHz, N AV 17.1dB, 18.51539MHz, N [BT LE] QP 20.7dB, 0.15000MHz, N AV 17.3dB, 17.40410MHz, L	Complied	-
6dB Bandwidth	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on October 4, 2012)" ----- IC: RSS-Gen 4.6.2	FCC: Section 15.247(a)(2) ----- IC: RSS-210 A8.2(a)	See data.	[WLAN] Complied [BT LE] N/A *1)	Conducted
Maximum Peak Output Power	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on October 4, 2012)" ----- IC: RSS-Gen 4.8	FCC: Section 15.247(b)(3) ----- IC: RSS-210 A8.4(4)		[WLAN] Complied [BT LE] N/A *1)	Conducted
Power Density	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on October 4, 2012)" ----- IC: -	FCC: Section 15.247 (e) ----- IC: RSS-210 A8.2(b)		[WLAN] Complied [BT LE] N/A *1)	Conducted
Spurious Emission Restricted Band Edges	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on October 4, 2012)" ----- IC: RSS-Gen 4.9	FCC: Section15.247(d) ----- IC: RSS-210 A8.5 RSS-Gen 7.2.3		[WLAN] 0.1dB 2483.5MHz, AV, Horizontal/ 17235.000MHz, AV, Horizontal [BT LE] 7.9dB 9920.000MHz, AV, Horizontal	Complied

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

*1) For BT LE part, the test was performed with embedded Bluetooth module (FCC ID: QDS-BRCM1073, Test Report No. FR330410AD issued by SPORTON International Inc.).

* In case any questions arise about test procedure, ANSI C63.4: 2003 is also referred.

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FCC 15.31 (e)

This EUT provides stable voltage(DC3.3V) constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

It is impossible for end users to replace the antenna, because the antenna is mounted inside of the EUT. Therefore, the equipment complies with the antenna requirement of Section 15.203.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	IC: RSS-Gen 4.6.1	IC: RSS-Gen 4.6.1	N/A	-	Conducted

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

3.4 Uncertainty

EMI

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

Test room (semi-anechoic chamber)	Conducted emission (+dB)
	150kHz-30MHz
No.1	3.5dB
No.2	3.6dB
No.3	3.6dB
No.4	3.6dB

Test room (semi-anechoic chamber)	Radiated emission						
	(3m*)(+dB)				(1m*)(+dB)		(0.5m*)(+dB)
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.3dB	5.0dB	5.1dB	4.9dB	5.8dB	4.4dB	4.3dB
No.2	4.3dB	5.2dB	5.1dB	5.0dB	5.7dB	4.3dB	4.2dB
No.3	4.6dB	5.0dB	5.1dB	5.0dB	5.7dB	4.5dB	4.2dB
No.4	4.8dB	5.2dB	5.0dB	5.0dB	5.7dB	5.2dB	4.2dB

*3m/1m/0.5m = Measurement distance

Power meter (+dB)	
Below 1GHz	Above 1GHz
0.7dB	1.5dB

Antenna terminal conducted emission and Power density (+dB)			Antenna terminal conducted emission (+dB)		Channel power (±dB)
Below 1GHz	1GHz-3GHz	3GHz-18GHz	18GHz-26.5GHz	26.5GHz-40GHz	
1.5dB	1.7dB	2.8dB	2.8dB	2.9dB	2.6dB

Conducted Emission test

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

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

Radiated emission test(3m)

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

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

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3.5 Test Location

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	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.5 x 2.8m	2.0 x 2.0m	-
No.10 measurement room	-	-	2.6 x 2.8 x 2.5m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Data of EMI, Test instruments, and Test set up

Refer to APPENDIX.

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

4.1 Operating Mode(s)

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.

Mode	Remarks*
IEEE 802.11a (11a)	54Mbps, PN9, Antenna 0
IEEE 802.11b (11b)	2Mbps, PN9, Antenna 0
IEEE 802.11g (11g)	48Mbps, PN9, Antenna 0
IEEE 802.11n MISO 20MHz BW (11n-20): 2.4G Band	MCS 7, PN9, Antenna 0
IEEE 802.11n MIMO 20MHz BW (11n-20): 2.4G Band	MCS 15, PN9, Antenna 0+1
IEEE 802.11n MISO 20MHz BW (11n-20): 5G Band	MCS 7, PN9, Antenna 0
IEEE 802.11n MIMO 20MHz BW (11n-20): 5G Band	MCS 15, PN9, Antenna 0+1
IEEE 802.11n MISO 40MHz BW (11n-40): 2.4G Band	MCS 7, PN9, Antenna 0
IEEE 802.11n MIMO 40MHz BW (11n-40): 2.4G Band	MCS 15, PN9, Antenna 0+1
IEEE 802.11n MISO 40MHz BW (11n-40): 5G Band	MCS 7, PN9, Antenna 0
IEEE 802.11n MIMO 40MHz BW (11n-40): 5G Band	MCS 15, PN9, Antenna 0+1
Bluetooth(BT) LE(Low Energy)	Maximum Packet Size, PN9
<p>*The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel).</p> <p>*For 11a, 11b, 11g, 11n-20(MISO), and 11n-40(MISO): Only Antenna 0 can be used as transmitting and receiving antenna.</p> <p>*For 11n-20(MIMO), 11n-40(MIMO): Both Antenna 0 and Antenna 1 can be used as transmitting and receiving antenna. Antenna 0 and Antenna 1 can both transmit/receive simultaneously.</p> <p>*EUT has the power settings by the software as follows: Power settings: WLAN: See below tables Bluetooth (LE): 0 Software: WLAN: 43241_B4_mfg_tool_package, Version 1.3 Bluetooth (LE): Bluetooth, Version 1.7.4.4</p>	

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Table 1: Power Settings for 20MHz bandwidth system (2.4GHz) :

Channel	Frequency [MHz]	11b	11g	11n-20 MISO	11n-20 MIMO
1	2412	54	36	35	18
6	2437	60	81	87	49
11	2462	50	21	20	20

Table 2: Power Settings for 20MHz bandwidth system (5GHz) :

Channel	Frequency [MHz]	11a	11n-20 MISO	11n-20 MIMO
149	5745	97	92	82
157	5785	99	93	91
165	5825	99	98	86

Table 3: Power Settings for 40MHz bandwidth system (2.4GHz) :

Channel	Frequency [MHz]	11n-40 MISO	11n-40 MIMO
3	2422	20	12
6	2437	32	27
9	2452	20	10

Table 4: Power Settings for 40MHz bandwidth system (5GHz) :

Channel	Frequency [MHz]	11n-40 MISO	11n-40 MIMO
151	5755	100	73
159	5795	98	73

*The above setting of the software is the worst case.
Any conditions under the normal use do not exceed the condition of setting.
In addition, end users cannot change the settings of the output power of the product.

*Details of Operating mode(s): 2.4GHz

Test Item	Operating Mode	Tested Antenna	Tested frequency	
Spurious Emission (Radiated)	11b Tx 11g Tx	0	2412MHz 2437MHz 2462MHz	
	11n-20 MIMO Tx	0+1 (Multi-out)	2412MHz 2437MHz 2462MHz	
	11n-40 MIMO Tx	0+1 (Multi-out)	2422MHz 2437MHz 2452MHz	
	6dB Bandwidth 99% Occupied Bandwidth	11b Tx	0	2412MHz 2437MHz 2462MHz
		11n-20 MIMO Tx *1)	1 *2)	2412MHz 2437MHz 2462MHz
		11n-40 MIMO Tx	1 *2)	2422MHz 2437MHz 2452MHz
Maximum Peak Output Power	11b Tx 11g Tx	0	2412MHz 2437MHz 2462MHz	
	11n-20 MISO Tx	0	2412MHz 2437MHz 2462MHz	
	11n-20 MIMO Tx	0, 1	2412MHz 2437MHz 2462MHz	
	11n-40 MISO Tx	0	2422MHz 2437MHz 2452MHz	
	11n-40 MIMO Tx	0, 1	2422MHz 2437MHz 2452MHz	
	Power Density	11b Tx	0	2412MHz 2437MHz 2462MHz
11n-20 MIMO Tx *1)		0, 1	2412MHz 2437MHz 2462MHz	
11n-40 MIMO Tx		0, 1	2422MHz 2437MHz 2452MHz	

*1) Since 11g and 11n-20 have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest peak output power.

*2) After the comparison between Antenna 0 and Antenna 1, test was performed with the antenna that had higher power as a representative.

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*Details of Operating mode(s): 5GHz

Test Item	Operating Mode	Tested Antenna	Tested frequency
Conducted emission	11n-20 MIMO Tx *1)	0+1 (Multi out)	5785MHz
Spurious Emission (Radiated)	11n-20 MIMO Tx *2)	0+1 (Multi out)	5745MHz 5785MHz 5825MHz
	11n-40 MIMO Tx	0+1 (Multi out)	5755MHz 5795MHz
	11n-20 MIMO Tx + Bluetooth DH5 2441MHz *3)	0+1 (Multi out)	5785MHz
Spurious Emission (Conducted)	11n-20 MIMO Tx *1)	0 *4)	5785MHz
6dB Bandwidth 99% Occupied Bandwidth	11n-20 MIMO Tx *2)	0 *4)	5745MHz 5785MHz 5825MHz
	11n-40 MIMO Tx	0 *4)	5755MHz 5795MHz
Maximum Peak Output Power	11a Tx	0	5745MHz 5785MHz 5825MHz
	11n-20 MISO Tx	0	5745MHz 5785MHz 5825MHz
	11n-20 MIMO Tx	0, 1	5745MHz 5785MHz 5825MHz
	11n-40 MISO Tx	0	5755MHz 5795MHz
	11n-40 MIMO Tx	0, 1	5755MHz 5795MHz
Power Density	11n-20 MIMO Tx *2)	0, 1	5745MHz 5785MHz 5825MHz
	11n-40 MIMO Tx	0, 1	5755MHz 5795MHz

- *1) The mode was tested as a representative, because it had the highest power at antenna terminal test.
*2) Since 11a and 11n-20 have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the highest peak output power.
*3) EUT can transmit 2.4GHz Bluetooth and 5GHz WLAN simultaneously. Therefore, co-location tests are added for simultaneous transmitting of 2.4GHz / 5GHz WLAN function and Bluetooth function.
*4) After the comparison between Antenna 0 and Antenna 1, test was performed with the antenna that had higher power as a representative.

*Details of Operating mode(s): Bluetooth LE

Test Item	Operating Mode	Tested frequency
Conducted Emission	BT LE	2402MHz
Spurious Emission		2440MHz
		2480MHz

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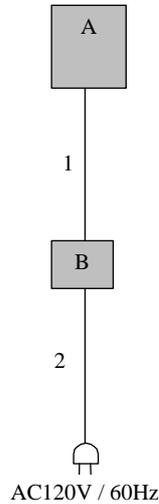
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4.2 Configuration and peripherals



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Personal Computer	SVD132A1WL	ZOPJJPB 11 *1) XTS3-2 3 *2) XTS2-1 8 *3)	SONY	EUT
B	AC Adaptor	VGP-AC10V10	000006701 0000346	SONY	EUT

*1) Used for Radiated Spurious Emission test on Bluetooth LE mode and 11n-20 MIMO Tx +Bluetooth DH5 2441MHz mode

*2) Used for Conducted Emission and Radiated Spurious Emission on other modes than above

*3) Used for Antenna Terminal Conducted test

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	1.7	Unshielded	Unshielded	-
2	AC Cable	1.5	Unshielded	Unshielded	-

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SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and 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 a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

For the tests on EUT with other peripherals (as a whole system)

I/O cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane. All unused 50ohm connectors of the LISN(AMN) were resistivity terminated in 50ohm when not connected to the measuring equipment.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber. The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

Detector	: QP and CISPR AV
Measurement range	: 0.15-30MHz
Test data	: APPENDIX
Test result	: Pass

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SECTION 6: Radiated Spurious Emission

Test Procedure

It was measured based on "10.0 MAXIMUM UNWANTED EMISSION LEVELS" of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 (Issued on October 4, 2012)".

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

The height of the measuring antenna varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.

The measurements were made with the following detector function of the test receiver and the Spectrum analyzer (in linear mode).

The test was made with the detector (RBW/VBW) in the following table.

When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

Test Antennas are used as below;

Frequency	Below 30MHz	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Loop	Biconical	Logperiodic	Horn

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In any 100kHz bandwidth outside the restricted band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

20dBc was applied to the frequency over the limit of FCC 15.209 / Table 5 of RSS-Gen 7.2.5(IC) and outside the restricted band of FCC15.205 / Table 3 of RSS-Gen 7.2.2 (IC).

Frequency	From 9kHz to 90kHz and From 110kHz to 150kHz	From 90kHz to 110kHz	From 150kHz to 490kHz	From 490kHz to 30MHz
Instrument used	Test Receiver	Test Receiver	Test Receiver	Test Receiver
Detector	QP	QP	QP	QP
F Bandwidth	200Hz	200Hz	9kHz	9kHz
Test Distance	3m	3m	3m	3m

Frequency	Below 1GHz	Above 1GHz		20dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV	PK
F Bandwidth	BW 120kHz(T/R)	RBW: 1MHz VBW: 3MHz	Average Power Method: Alternative 1 *1) RBW: 1MHz VBW: 3MHz Trace: Free Run Detector: Power Averaging (RMS) Duty factor was added to the results.	RBW: 100kHz VBW: 300kHz (S/A)
Test Distance	3m	3m (below 10GHz), 1m *2) (above 10GHz), 0.5m *3) (above 26.5GHz)		3m (below 10GHz), 1m *2) (above 10GHz), 0.5m *3) (above 26.5GHz)

*1) Average Power Measurement was performed based on 8.2.1 & 10.2.3.3 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 (Issued on October 4, 2012)"

*2) Distance Factor: $20 \times \log(3.0\text{m}/1.0\text{m}) = 9.5\text{dB}$

*3) Distance Factor: $20 \times \log(3.0\text{m}/0.5\text{m}) = 15.6\text{dB}$

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

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

Measurement range : 9k-40GHz
Test data : APPENDIX
Test result : Pass

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SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

The tests were made with below setting connected to the antenna port.

[WLAN]

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
6dB Bandwidth	20MHz 40MHz	100kHz	300kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	50MHz 100MHz	1 to 3% of Span	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/ Average *1)	-	Power Meter (Option 3) (Sensor: 50MHz BW)
Peak Power Density	1.5 times the 6dB bandwidth	3kHz	10kHz	Auto	Peak	Max Hold	Spectrum Analyzer *2)

*1) Reference data
*2) PSD Option 1 of "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 (Issued on October 4, 2012)".

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

Test data : **APPENDIX**
Test result : **Pass**

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APPENDIX 1: Data of EMI test

**Conducted Emission
WLAN**

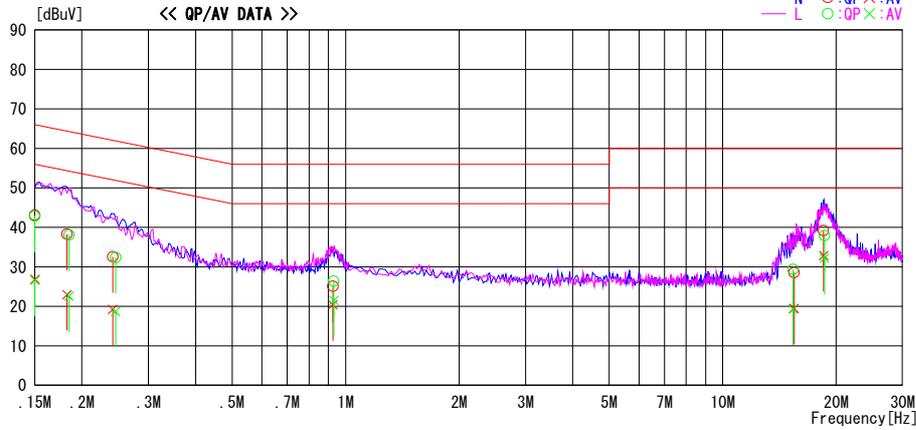
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2013/04/11

Report No. : 10004954H
 Temp./Humi. : 21deg. C / 38% RH
 Engineer : Kazuya Yoshioka

Mode / Remarks : Tx 11n-20 MCS15 5785MHz MIMO

LIMIT : FCC15.207 QP
 FCC15.207 AV



Frequency [MHz]	Reading		Level [dBuV]	Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]			QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15000	29.8	13.6	13.3	43.1	26.9	66.0	56.0	22.9	29.1	N		
0.18263	25.0	9.7	13.3	38.3	23.0	64.4	54.4	26.1	31.4	N		
0.24135	19.3	5.9	13.3	32.6	19.2	62.0	52.0	29.4	32.8	N		
0.92587	11.6	6.9	13.5	25.1	20.4	56.0	46.0	30.9	25.6	N		
15.46376	13.9	4.8	14.7	28.6	19.5	60.0	50.0	31.4	30.5	N		
18.51539	24.3	18.0	14.9	39.2	32.9	60.0	50.0	20.8	17.1	N		
0.15000	29.5	13.3	13.3	42.8	26.6	66.0	56.0	23.2	29.4	L		
0.18480	24.8	9.3	13.3	38.1	22.6	64.3	54.3	26.2	31.7	L		
0.24570	19.1	5.4	13.3	32.4	18.7	61.9	51.9	29.5	33.2	L		
0.93037	12.9	8.0	13.5	26.4	21.5	56.0	46.0	29.6	24.5	L		
15.36351	14.7	4.6	14.7	29.4	19.3	60.0	50.0	30.6	30.7	L		
18.60239	23.0	17.3	14.9	37.9	32.2	60.0	50.0	22.1	17.8	L		

CHART:WITH FACTOR,Peak hold data. CALCULATION:RESULT=READING+C.F(LISN LOSS+ATT LOSS +CABLE LOSS)
 Except for the above table : adequate margin data below the limits.

Conducted Emission BT LE

DATA OF CONDUCTED EMISSION TEST

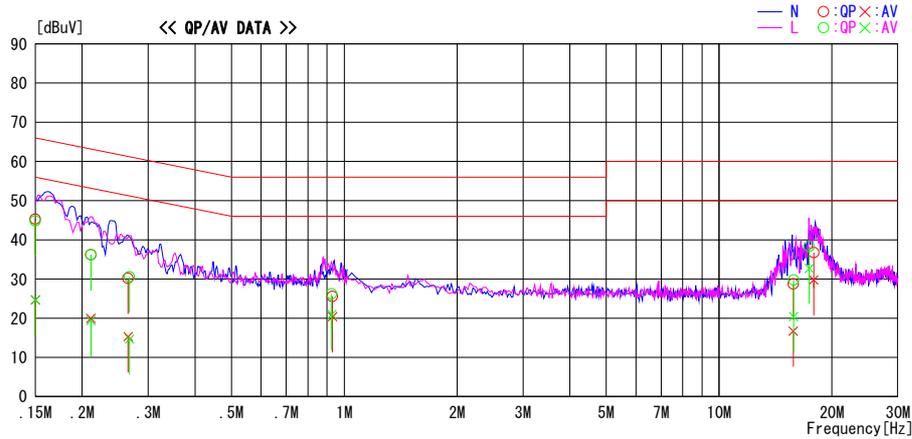
UL Japan, Inc. Head Office EMC Lab. No.4 Semi Anechoic Chamber
 Date : 2013/04/30

Report No. : 10004954H

Temp./Humi. : 21deg. C / 38% RH
 Engineer : Kazuya Yoshioka

Mode / Remarks : Tx LE 2402MHz

LIMIT : FCC15.207 QP
 FCC15.207 AV

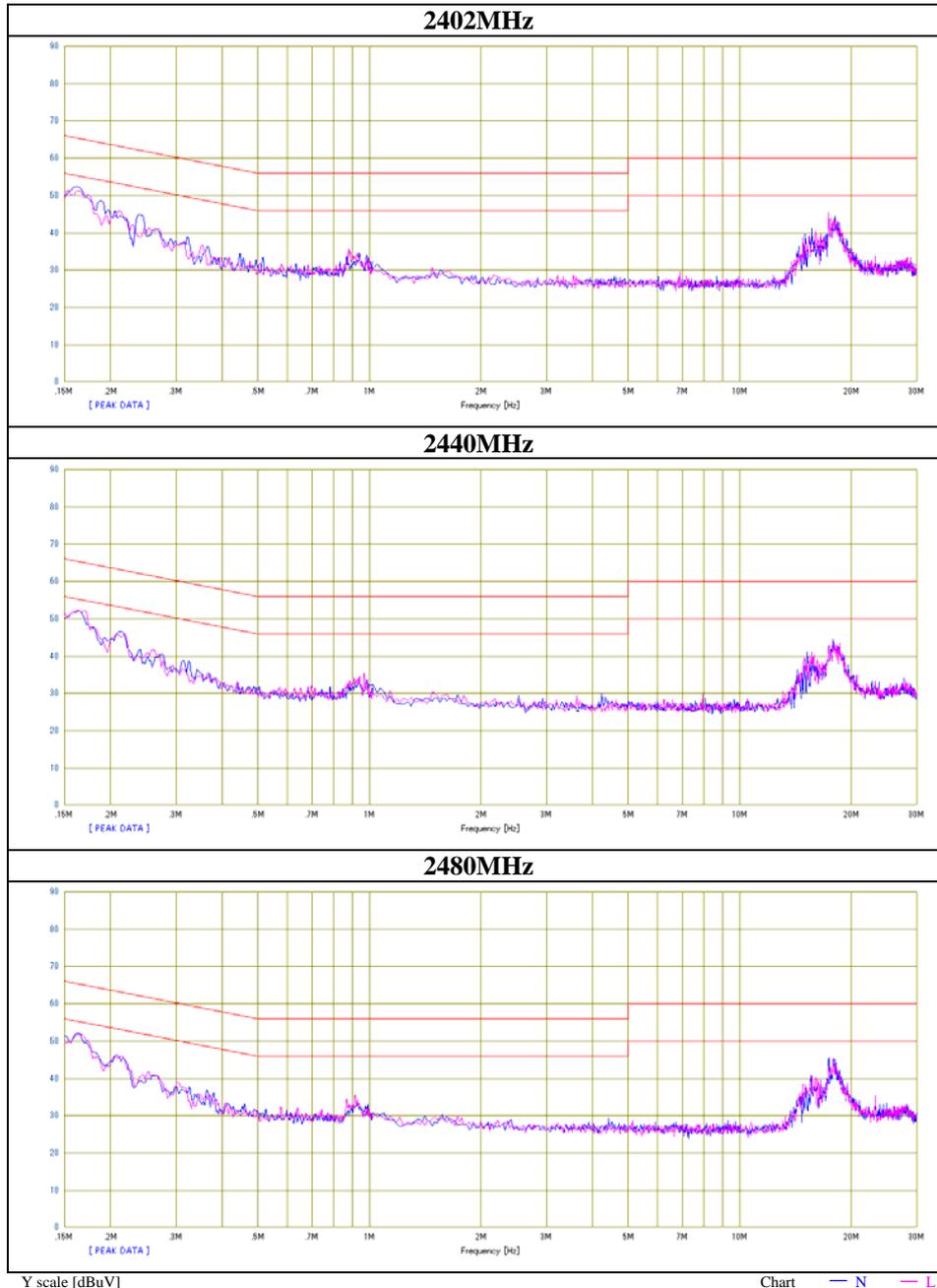


Frequency [MHz]	Reading_Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.15000	32.0	11.4	13.3	45.3	24.7	66.0	56.0	20.7	31.3	N	
0.21090	22.9	6.7	13.3	36.2	20.0	63.2	53.2	27.0	33.2	N	
0.26528	16.9	2.0	13.3	30.2	15.3	61.3	51.3	31.1	36.0	N	
0.93021	12.1	6.9	13.5	25.6	20.4	56.0	46.0	30.4	25.6	N	
15.76451	14.0	2.0	14.7	28.7	16.7	60.0	50.0	31.3	33.3	N	
17.87820	21.9	15.0	14.8	36.7	29.8	60.0	50.0	23.3	20.2	N	
0.15000	31.5	11.4	13.3	44.8	24.7	66.0	56.0	21.2	31.3	L	
0.21090	22.9	6.1	13.3	36.2	19.4	63.2	53.2	27.0	33.8	L	
0.26745	17.3	1.4	13.3	30.6	14.7	61.2	51.2	30.6	36.5	L	
0.92621	12.7	7.5	13.5	26.2	21.0	56.0	46.0	29.8	25.0	L	
15.81464	15.0	5.7	14.7	29.7	20.4	60.0	50.0	30.3	29.6	L	
17.40410	23.5	17.9	14.8	38.3	32.7	60.0	50.0	21.7	17.3	L	

CHART: WITH FACTOR, Peak hold data. CALCULATION: RESULT=READING+C.F (LISN LOSS+ATT LOSS +CABLE LOSS)
 Except for the above table : adequate margin data below the limits.

Conducted Emission BT LE

Test place	Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No.	10004954H
Date	04/30/2013
Temperature/ Humidity	21 deg. C / 38% RH
Engineer	Kazuya Yoshioka
Mode	Tx BT LE



6dB Bandwidth
WLAN

Test place Head Office EMC Lab. No.4 Measurement Room
Report No. 10004954H
Date 04/04/2013
Temperature/ Humidity 25 deg. C / 38% RH
Engineer Satofumi Matsuyama
Mode Tx

11b

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2412	7.727	>500
2437	8.109	>500
2462	8.224	>500

11n-20 MIMO

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2412	17.012	>500
2437	17.224	>500
2462	17.544	>500

11n-40 MIMO

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2422	36.387	>500
2437	36.376	>500
2452	36.361	>500

11n-20 MIMO

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
5745	15.472	>500
5785	15.590	>500
5825	15.474	>500

11n-40 MIMO

Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
5755	36.035	>500
5795	36.280	>500

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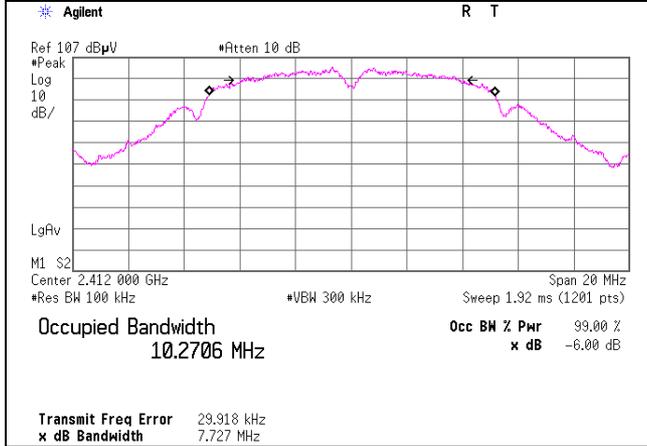
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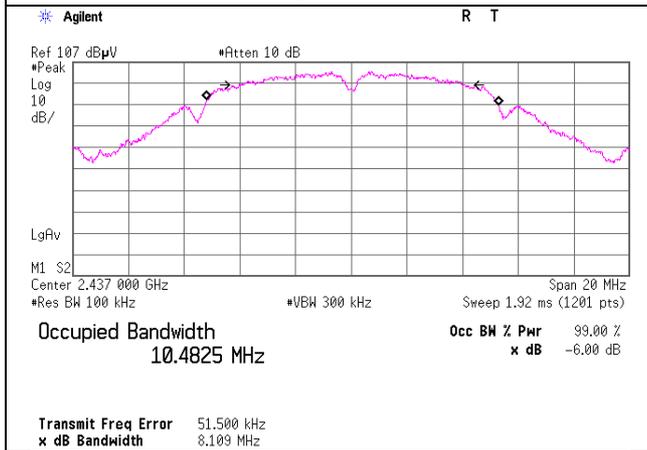
6dB Bandwidth
WLAN

11b

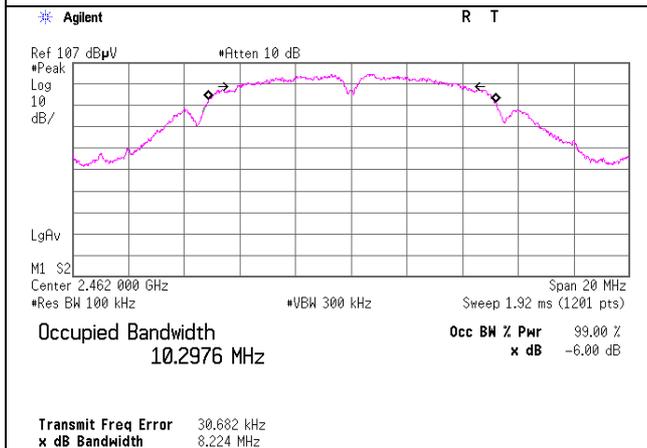
2412MHz



2437MHz



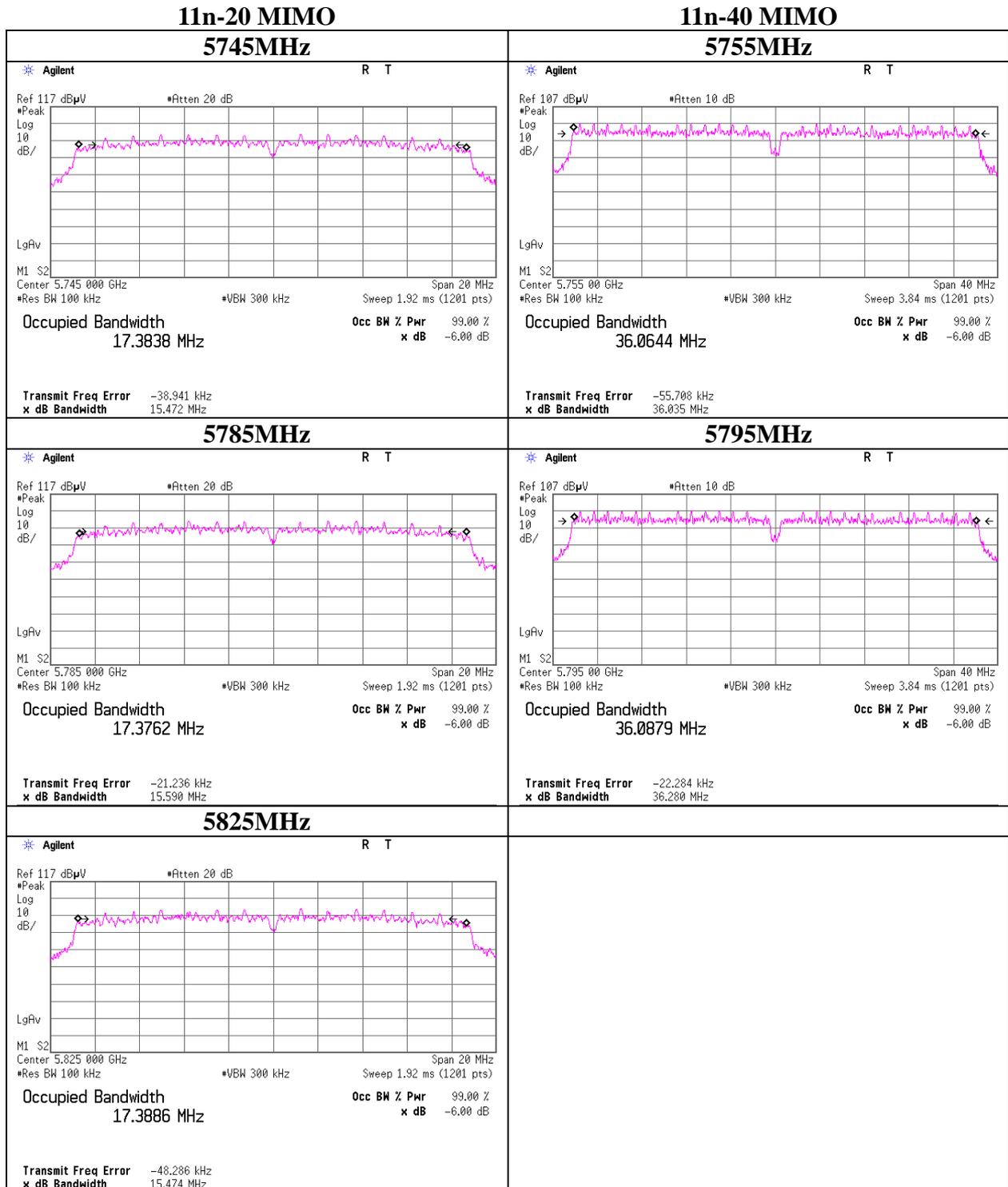
2462MHz



6dB Bandwidth
WLAN



6dB Bandwidth
WLAN



Maximum Peak Output Power
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
 Report No. : 10004954H
 Date : 04/01/2013
 Temperature/ Humidity : 24deg. C / 46% RH
 Engineer : Yutaka Yoshida
 Mode : 11b Tx

Antenna 0 2Mbps

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	7.75	1.76	10.07	19.58	90.78	30.00	1000	10.42
2437	9.00	1.78	10.07	20.85	121.62	30.00	1000	9.15
2462	8.63	1.75	10.07	20.45	110.92	30.00	1000	9.55

Sample Calculation:

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

Antenna 0, 2437MHz

Rate [Mbps]	Reading PK [dBm]	Remark
1	8.55	
2	8.85	*
5.5	8.77	
11	8.84	

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

*Difference between worst rate check data and formal test result is due to the different test condition.

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Maximum Peak Output Power
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/01/2013
Temperature/ Humidity : 24deg. C / 46% RH
Engineer : Yutaka Yoshida
Mode : 11g Tx

Antenna 0 48Mbps

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	9.87	1.76	10.07	21.70	147.91	30.00	1000	8.30
2437	11.86	1.78	10.07	23.71	234.96	30.00	1000	6.29
2462	10.31	1.75	10.07	22.13	163.31	30.00	1000	7.87

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

Antenna 0, 2437MHz

Rate [Mbps]	Reading [dBm]	Remark
6	11.76	
9	12.03	
12	11.98	
18	12.00	
24	12.06	
36	12.05	
48	12.08	*
54	12.02	

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

*Difference between worst rate check data and formal test result is due to the different test condition.

Maximum Peak Output Power
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/01/2013
Temperature/ Humidity : 24deg. C / 46% RH
Engineer : Yutaka Yoshida
Mode : 11n-20 2.4GHz MISO Tx

Antenna 0		MCS7		Result		Limit		Margin
Freq.	Reading	Cable Loss	Atten.	[dBm]	[mW]	[dBm]	[mW]	[dB]
[MHz]	[dBm]	[dB]	[dB]					
2412	9.84	1.76	10.07	21.67	146.89	30.00	1000	8.33
2437	12.00	1.78	10.07	23.85	242.66	30.00	1000	6.15
2462	10.18	1.75	10.07	22.00	158.49	30.00	1000	8.00

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

Antenna 0, 2437MHz

MCS Number	Reading [dBm]	Remark
0	11.73	
1	11.83	
2	11.88	
3	11.88	
4	11.99	
5	11.98	
6	11.97	
7	12.01	*

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

*Difference between worst rate check data and formal test result is due to the different test condition.

Maximum Peak Output Power
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/01/2013
Temperature/ Humidity : 24deg. C / 46% RH
Engineer : Yutaka Yoshida
Mode : 11n-40 2.4GHz MISO Tx

Antenna 0 MCS7

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2422	9.06	1.77	10.07	20.90	123.03	30.00	1000	9.10
2437	10.59	1.78	10.07	22.44	175.39	30.00	1000	7.56
2452	9.91	1.77	10.07	21.75	149.62	30.00	1000	8.25

Sample Calculation:

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

Antenna 0, 2437MHz

MCS Number	Reading [dBm]	Remark
0	10.51	
1	10.54	
2	10.60	
3	10.72	
4	10.74	
5	10.85	
6	10.81	
7	10.86	*

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

*Difference between worst rate check data and formal test result is due to the different test condition.

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Maximum Peak Output Power
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/01/2013
Temperature/ Humidity : 24deg. C / 46% RH
Engineer : Yutaka Yoshida
Mode : 11n-20 2.4GHz MIMO Tx

Antenna 0 + 1 MCS15

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result		Limit		Margin [dB]
			[dBm]	[mW]	[dBm]	[mW]	
2412	95.28	101.86	22.95	197.14	30.00	1000	7.05
2437	204.17	222.84	26.30	427.02	30.00	1000	3.70
2462	149.62	154.53	24.83	304.15	30.00	1000	5.17

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	7.96	1.76	10.07	19.79	95.28	30.00	1000	10.21
2437	11.25	1.78	10.07	23.10	204.17	30.00	1000	6.90
2462	9.93	1.75	10.07	21.75	149.62	30.00	1000	8.25

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2412	8.29	1.76	10.03	20.08	101.86	30.00	1000	9.92
2437	11.67	1.78	10.03	23.48	222.84	30.00	1000	6.52
2462	10.11	1.75	10.03	21.89	154.53	30.00	1000	8.11

Sample Calculation:

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

Antenna 0+1, 2437MHz

MCS Number	Ant	Reading [dBm]	Result Total [dBm]	Remark
	Ant1	11.69		
9	Ant0	11.29	14.64	
	Ant1	11.94		
10	Ant0	11.27	14.63	
	Ant1	11.95		
11	Ant0	11.30	14.66	
	Ant1	11.97		
12	Ant0	11.41	14.71	
	Ant1	11.98		
13	Ant0	11.49	14.78	
	Ant1	12.03		
14	Ant0	11.47	14.77	
	Ant1	12.03		
15	Ant0	11.49	14.79	*
	Ant1	12.05		

* Worst Condition

All comparison were carried out on same frequency and measurement factors.

*Difference between worst rate check data and formal test result is due to the different test condition.

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Maximum Peak Output Power
WLAN

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 10004954H
Date 04/01/2013
Temperature/ Humidity 24deg. C / 46% RH
Engineer Yutaka Yoshida
Mode 11n-40 2.4GHz MIMO Tx

Antenna 0 + 1 MCS15

Freq. [MHz]	Antenna 1 Result [mW]	Antenna 2 Result [mW]	Result		Limit		Margin [dB]
			[dBm]	[mW]	[dBm]	[mW]	
2422	75.86	69.82	21.63	145.68	30.00	1000	8.37
2437	153.46	158.12	24.94	311.59	30.00	1000	5.06
2452	74.82	74.30	21.74	149.12	30.00	1000	8.26

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2422	6.96	1.77	10.07	18.80	75.86	30.00	1000	11.20
2437	10.01	1.78	10.07	21.86	153.46	30.00	1000	8.14
2452	6.90	1.77	10.07	18.74	74.82	30.00	1000	11.26

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
2422	6.65	1.76	10.03	18.44	69.82	30.00	1000	11.56
2437	10.18	1.78	10.03	21.99	158.12	30.00	1000	8.01
2452	6.93	1.75	10.03	18.71	74.30	30.00	1000	11.29

Sample Calculation:

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

Antenna 0+1, 2437MHz

MCS Number	Ant	Reading [dBm]	Result Total [dBm]	Remark
	Ant1	10.90		
9	Ant0	10.50	13.82	
	Ant1	11.09		
10	Ant0	10.60	13.88	
	Ant1	11.12		
11	Ant0	10.56	13.84	
	Ant1	11.08		
12	Ant0	10.59	13.86	
	Ant1	11.10		
13	Ant0	10.56	13.85	
	Ant1	11.10		
14	Ant0	10.61	13.89	
	Ant1	11.13		
15	Ant0	10.63	13.91	*
	Ant1	11.15		

* Worst Condition

All comparison were carried out on same frequency and measurement factors.

*Difference between worst rate check data and formal test result is due to the different test condition.

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Maximum Peak Output Power
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
 Report No. : 10004954H
 Date : 04/01/2013
 Temperature/ Humidity : 24deg. C / 46% RH
 Engineer : Yutaka Yoshida
 Mode : 11a Tx

Antenna 0 54Mbps

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
5745	10.63	3.10	10.14	23.87	243.78	30.00	1000	6.13
5785	10.52	3.34	10.14	24.00	251.19	30.00	1000	6.00
5825	10.41	3.04	10.14	23.59	228.56	30.00	1000	6.41

Sample Calculation:

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

Antenna 0, 2437MHz

Rate [Mbps]	Reading [dBm]	Remark
6	10.33	
9	10.23	
12	10.22	
18	10.32	
24	10.37	
36	10.44	
48	10.51	
54	10.52	*

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

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Maximum Peak Output Power
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/01/2013
Temperature/ Humidity : 24deg. C / 46% RH
Engineer : Yutaka Yoshida
Mode : 11n-20 5GHz MISO Tx

Antenna 0 MCS7

Freq. [MHz]	Reading PK [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
5745	10.63	3.10	10.14	23.87	243.78	30.00	1000	6.13
5785	10.58	3.34	10.14	24.06	254.68	30.00	1000	5.94
5825	10.46	3.04	10.14	23.64	231.21	30.00	1000	6.36

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

Antenna 0, 5785MHz

MCS Number	Reading PK [dBm]	Remark
0	10.14	
1	10.23	
2	10.24	
3	10.32	
4	10.42	
5	10.50	
6	10.53	
7	10.58	*

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

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Maximum Peak Output Power
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/01/2013
Temperature/ Humidity : 24deg. C / 46% RH
Engineer : Yutaka Yoshida
Mode : 11n-40 5GHz MISO Tx

Antenna 0 MCS7

Freq. [MHz]	Reading PK [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
5755	10.64	3.19	10.14	23.97	249.46	30.00	1000	6.03
5795	10.56	3.30	10.14	24.00	251.19	30.00	1000	6.00

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

Antenna 0, 5755MHz

MCS Number	Reading PK [dBm]	Remark
0	10.11	
1	10.26	
2	10.35	
3	10.40	
4	10.49	
5	10.56	
6	10.61	
7	10.64	*

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

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Maximum Peak Output Power
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/01/2013
Temperature/ Humidity : 24deg. C / 46% RH
Engineer : Yutaka Yoshida
Mode : 11n-20 5GHz MIMO Tx

Antenna 0 + 1 MCS15

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result		Limit		Margin [dB]
			[dBm]	[mW]	[dBm]	[mW]	
5745	228.56	208.45	26.40	437.01	30.00	1000	3.60
5785	239.33	222.84	26.65	462.18	30.00	1000	3.35
5825	217.27	206.06	26.27	423.33	30.00	1000	3.73

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
5745	10.35	3.10	10.14	23.59	228.56	30.00	1000	6.41
5785	10.31	3.34	10.14	23.79	239.33	30.00	1000	6.21
5825	10.19	3.04	10.14	23.37	217.27	30.00	1000	6.63

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
5745	9.98	3.10	10.11	23.19	208.45	30.00	1000	6.81
5785	10.03	3.34	10.11	23.48	222.84	30.00	1000	6.52
5825	9.99	3.04	10.11	23.14	206.06	30.00	1000	6.86

Sample Calculation:

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

5785MHz

MCS Number	Reading PK [dBm]	Reading Total [dBm]	Remark
8	9.46	12.32	
	9.15	-	
9	9.66	12.52	
	9.35	-	
10	9.81	12.68	
	9.52	-	
11	9.93	12.79	
	9.63	-	
12	10.09	12.96	
	9.80	-	
13	10.20	13.07	
	9.92	-	
14	10.28	13.15	
	9.99	-	
15	10.31	13.18	*
	10.03	-	

* Worst Condition

All comparison were carried out on same frequency and measurement factors.

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Maximum Peak Output Power
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/01/2013
Temperature/ Humidity : 24deg. C / 46% RH
Engineer : Yutaka Yoshida
Mode : 11n-40 5GHz MIMO Tx

Antenna 0 + 1 MCS15

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result		Limit		Margin [dB]
			[dBm]	[mW]	[dBm]	[mW]	
5755	231.74	211.84	26.47	443.58	30.00	1000	3.53
5795	230.14	213.80	26.47	443.94	30.00	1000	3.53

Sample Calculation:
Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
5755	10.32	3.19	10.14	23.65	231.74	30.00	1000	6.35
5795	10.18	3.30	10.14	23.62	230.14	30.00	1000	6.38

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit		Margin [dB]
				[dBm]	[mW]	[dBm]	[mW]	
5755	9.96	3.19	10.11	23.26	211.84	30.00	1000	6.74
5795	9.89	3.30	10.11	23.30	213.80	30.00	1000	6.70

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

5755MHz

MCS Number	Reading PK [dBm]	Reading Total [dBm]	Remark
8	9.68	12.48	
	9.25	-	
9	9.80	12.60	
	9.37	-	
10	9.96	12.78	
	9.57	-	
11	10.09	12.90	
	9.67	-	
12	10.20	13.03	
	9.84	-	
13	10.29	13.11	
	9.90	-	
14	10.30	13.14	
	9.95	-	
15	10.32	13.15	*
	9.96	-	

* Worst Condition

All comparison were carried out on same frequency and measurement factors.

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Maximum Average Output Power (Reference data for RF EXposure)
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
 Report No. : 10004954H
 Date : 04/01/2013
 Temperature/ Humidity : 24deg. C / 46% RH
 Engineer : Yutaka Yoshida
 Mode : 11b Tx

Antenna 0 1Mbps

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	4.06	1.76	10.07	15.89	38.82
2437	5.50	1.78	10.07	17.35	54.33
2462	5.05	1.75	10.07	16.87	48.64

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

Antenna 0, 2437MHz

Rate [Mbps]	Reading AV [dBm]	Remark
1	5.50	*
2	5.45	
5.5	5.32	
11	5.27	

*: Worst Rate
 All comparison were carried out on same frequency and measurement factors.

Maximum Average Output Power (Reference data for RF EXposure)
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
 Report No. : 10004954H
 Date : 04/01/2013
 Temperature/ Humidity : 24deg. C / 46% RH
 Engineer : Yutaka Yoshida
 Mode : 11g Tx

Antenna 0 6Mbps

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	2.14	1.76	10.07	13.97	24.95
2437	6.29	1.78	10.07	18.14	65.16
2462	1.12	1.75	10.07	12.94	19.68

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

Antenna 0, 2437MHz

Rate [Mbps]	Reading AV [dBm]	Remark
6	6.29	*
9	6.17	
12	6.02	
18	5.81	
24	5.58	
36	5.19	
48	4.84	
54	4.61	

*: Worst Rate
 All comparison were carried out on same frequency and measurement factors.

Maximum Average Output Power (Reference data for RF EXposure)
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/01/2013
Temperature/ Humidity : 24deg. C / 46% RH
Engineer : Yutaka Yoshida
Mode : 11n-20 2.4GHz MISO Tx

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	2.12	1.76	10.07	13.95	24.83
2437	6.49	1.78	10.07	18.34	68.23
2462	0.96	1.75	10.07	12.78	18.97

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

AV, Antenna 0, 2437MHz

MCS Number	Reading AV [dBm]	Remark
0	6.49	*
1	6.12	
2	5.88	
3	5.65	
4	5.22	
5	4.94	
6	4.72	
7	4.54	

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

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Maximum Average Output Power (Reference data for RF EXposure)
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/01/2013
Temperature/ Humidity : 24deg. C / 46% RH
Engineer : Yutaka Yoshida
Mode : 11n-40 2.4GHz MISO Tx

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2422	-0.07	1.77	10.07	11.77	15.03
2437	2.42	1.78	10.07	14.27	26.73
2452	0.67	1.77	10.07	12.51	17.82

Sample Calculation:

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

AV, Antenna 0, 2437MHz

MCS Number	Reading AV [dBm]	Remark
0	2.42	*
1	1.90	
2	1.47	
3	1.14	
4	0.53	
5	0.27	
6	0.00	
7	-0.14	

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

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Maximum Average Output Power (Reference data for RF EXposure)
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/01/2013
Temperature/ Humidity : 24deg. C / 46% RH
Engineer : Yutaka Yoshida
Mode : 11n-20 2.4GHz MIMO Tx

Antenna 0 + 1 MCS8

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result	
			[dBm]	[mW]
2412	11.97	10.67	13.55	22.63
2437	38.46	33.73	18.58	72.19
2462	17.82	15.74	15.26	33.56

Sample Calculation:
Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	-1.05	1.76	10.07	10.78	11.97
2437	4.00	1.78	10.07	15.85	38.46
2462	0.69	1.75	10.07	12.51	17.82

Antenna 1

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	-1.51	1.76	10.03	10.28	10.67
2437	3.47	1.78	10.03	15.28	33.73
2462	0.19	1.75	10.03	11.97	15.74

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

Antenna 0+1, 2437MHz

MCS Number	Ant	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result Total		Remark
					[dBm]	[dBm]	
8	Ant0	4.00	1.78	10.07	15.85	18.58	*
	Ant1	3.47	1.78	10.03	15.28		
9	Ant0	3.40	1.78	10.07	15.25	18.06	
	Ant1	3.02	1.78	10.03	14.83		
10	Ant0	2.98	1.78	10.07	14.83	17.69	
	Ant1	2.72	1.78	10.03	14.53		
11	Ant0	2.75	1.78	10.07	14.60	17.33	
	Ant1	2.21	1.78	10.03	14.02		
12	Ant0	2.33	1.78	10.07	14.18	16.92	
	Ant1	1.81	1.78	10.03	13.62		
13	Ant0	1.89	1.78	10.07	13.74	16.48	
	Ant1	1.38	1.78	10.03	13.19		
14	Ant0	1.61	1.78	10.07	13.46	16.17	
	Ant1	1.02	1.78	10.03	12.83		
15	Ant0	1.49	1.78	10.07	13.34	16.04	
	Ant1	0.88	1.78	10.03	12.69		

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

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Maximum Average Output Power (Reference data for RF EXposure)
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/01/2013
Temperature/ Humidity : 24deg. C / 46% RH
Engineer : Yutaka Yoshida
Mode : 11n-40 2.4GHz MIMO Tx

Antenna 0 + 1 MCS8

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result	
			[dBm]	[mW]
2412	7.73	7.18	11.73	14.90
2437	20.89	17.34	15.82	38.23
2462	7.41	6.41	11.41	13.83

Sample Calculation:
Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	-2.95	1.76	10.07	8.88	7.73
2437	1.35	1.78	10.07	13.20	20.89
2462	-3.12	1.75	10.07	8.70	7.41

Antenna 1

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
2412	-3.23	1.76	10.03	8.56	7.18
2437	0.58	1.78	10.03	12.39	17.34
2462	-3.71	1.75	10.03	8.07	6.41

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

Antenna 0+1, 2437MHz

MCS Number	Ant	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result Total		Remark
					[dBm]	[dBm]	
8	Ant0	1.35	1.78	10.07	13.20	15.82	*
	Ant1	0.58	1.78	10.03	12.39	-	
9	Ant0	0.74	1.78	10.07	12.59	15.04	
	Ant1	-0.43	1.78	10.03	11.38	-	
10	Ant0	0.17	1.78	10.07	12.02	14.49	
	Ant1	-0.95	1.78	10.03	10.86	-	
11	Ant0	-0.54	1.78	10.07	11.31	13.95	
	Ant1	-1.28	1.78	10.03	10.53	-	
12	Ant0	-1.07	1.78	10.07	10.78	13.52	
	Ant1	-1.58	1.78	10.03	10.23	-	
13	Ant0	-1.57	1.78	10.07	10.28	13.02	
	Ant1	-2.08	1.78	10.03	9.73	-	
14	Ant0	-1.85	1.78	10.07	10.00	12.75	
	Ant1	-2.35	1.78	10.03	9.46	-	
15	Ant0	-2.01	1.78	10.07	9.84	12.54	
	Ant1	-2.61	1.78	10.03	9.20	-	

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

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Maximum Average Output Power (Reference data for RF EXposure)
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
 Report No. : 10004954H
 Date : 04/01/2013
 Temperature/ Humidity : 24deg. C / 46% RH
 Engineer : Yutaka Yoshida
 Mode : 11a Tx

Antenna 0 6Mbps

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5745	6.03	3.10	10.14	19.27	84.53
5765	6.24	3.27	10.14	19.65	92.26
5785	6.13	3.34	10.14	19.61	91.41
5805	6.31	3.22	10.14	19.67	92.68
5825	6.13	3.04	10.14	19.31	85.31

Sample Calculation:

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

Antenna 0, 5785MHz

Rate [Mbps]	Reading AV [dBm]	Remark
6	6.13	*
9	6.03	
12	5.84	
18	5.61	
24	5.46	
36	5.01	
48	4.70	
54	4.56	

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

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Maximum Average Output Power (Reference data for RF EXposure)
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
 Report No. : 10004954H
 Date : 04/01/2013
 Temperature/ Humidity : 24deg. C / 46% RH
 Engineer : Yutaka Yoshida
 Mode : 11n-20 5GHz MISO Tx

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5745	6.01	3.10	10.14	19.25	84.14
5765	6.21	3.27	10.14	19.62	91.62
5785	6.07	3.34	10.14	19.55	90.16
5805	6.33	3.22	10.14	19.69	93.11
5825	6.03	3.04	10.14	19.21	83.37

Sample Calculation:

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

Antenna 0, 5785MHz

MCS Number	Reading AV [dBm]	Remark
0	6.07	*
1	5.78	
2	5.43	
3	5.26	
4	4.89	
5	4.56	
6	4.47	
7	4.24	

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

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Maximum Average Output Power (Reference data for RF EXposure)
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
 Report No. : 10004954H
 Date : 04/01/2013
 Temperature/ Humidity : 24deg. C / 46% RH
 Engineer : Yutaka Yoshida
 Mode : 11n-40 5GHz MISO Tx

Antenna 0		MCS0		Result	
Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	[dBm]	[mW]
5755	6.18	3.19	10.14	19.51	89.33
5795	6.11	3.30	10.14	19.55	90.16

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

Antenna 0, 5755MHz

MCS Number	Reading AV [dBm]	Remark
0	6.18	*
1	5.66	
2	5.19	
3	4.95	
4	4.24	
5	3.93	
6	3.72	
7	3.62	

*: Worst Rate
 All comparison were carried out on same frequency and measurement factors.

Maximum Average Output Power (Reference data for RF EXposure)
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/01/2013
Temperature/ Humidity : 24deg. C / 46% RH
Engineer : Yutaka Yoshida
Mode : 11n-20 5GHz MIMO Tx

Antenna 0 + 1 MCS8

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result	
			[dBm]	[mW]
5745	68.39	59.84	21.08	128.23
5765	74.30	64.27	21.42	138.57
5785	74.47	64.12	21.42	138.59
5805	72.78	63.24	21.34	136.02
5825	66.99	58.21	20.98	125.20

Sample Calculation:
Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5745	5.11	3.10	10.14	18.35	68.39
5765	5.30	3.27	10.14	18.71	74.30
5785	5.24	3.34	10.14	18.72	74.47
5805	5.26	3.22	10.14	18.62	72.78
5825	5.08	3.04	10.14	18.26	66.99

Antenna 1

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5745	4.56	3.10	10.11	17.77	59.84
5765	4.70	3.27	10.11	18.08	64.27
5785	4.62	3.34	10.11	18.07	64.12
5805	4.68	3.22	10.11	18.01	63.24
5825	4.50	3.04	10.11	17.65	58.21

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

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Antenna 0+1, 5785MHz

Freq. [MHz]	MCS Number	Ant	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Remark
						[dBm]	Total [dBm]	
5785	8	Ant0	5.24	3.34	10.14	18.72	21.42	*
		Ant1	4.62	3.34	10.11	18.07		
5785	9	Ant0	4.91	3.34	10.14	18.39	21.04	
		Ant1	4.19	3.34	10.11	17.64		
5785	10	Ant0	4.46	3.34	10.14	17.94	20.57	
		Ant1	3.70	3.34	10.11	17.15		
5785	11	Ant0	4.13	3.34	10.14	17.61	20.29	
		Ant1	3.48	3.34	10.11	16.93		
5785	12	Ant0	3.63	3.34	10.14	17.11	19.75	
		Ant1	2.88	3.34	10.11	16.33		
5785	13	Ant0	3.10	3.34	10.14	16.58	19.30	
		Ant1	2.53	3.34	10.11	15.98		
5785	14	Ant0	2.97	3.34	10.14	16.45	19.13	
		Ant1	2.31	3.34	10.11	15.76		
5785	15	Ant0	2.79	3.34	10.14	16.27	18.93	
		Ant1	2.09	3.34	10.11	15.54		

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

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Maximum Average Output Power (Reference data for RF EXposure)
WLAN

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 10004954H
Date : 04/01/2013
Temperature/ Humidity : 24deg. C / 46% RH
Engineer : Yutaka Yoshida
Mode : 11n-40 5GHz MIMO Tx

Antenna 0 + 1 MCS8

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result	
			[dBm]	[mW]
5755	59.16	52.00	20.46	111.16
5795	61.66	53.09	20.60	114.75

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5755	4.39	3.19	10.14	17.72	59.16
5795	4.46	3.30	10.14	17.90	61.66

Antenna 1

Freq. [MHz]	Reading AV [dBm]	Cable Loss [dB]	Atten. [dB]	Result	
				[dBm]	[mW]
5755	3.86	3.19	10.11	17.16	52.00
5795	3.84	3.30	10.11	17.25	53.09

Sample Calculation:

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

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Antenna 0+1, 5755MHz

Freq. [MHz]	MCS Number	Ant	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Remark
						[dBm]	Total [dBm]	
5755	8	Ant0	4.39	3.19	10.14	17.72	20.46	*
		Ant1	3.86	3.19	10.11	17.16		
5755	9	Ant0	3.56	3.19	10.14	16.89	19.66	
		Ant1	3.09	3.19	10.11	16.39		
5755	10	Ant0	3.03	3.19	10.14	16.36	19.13	
		Ant1	2.57	3.19	10.11	15.87		
5755	11	Ant0	2.59	3.19	10.14	15.92	18.70	
		Ant1	2.15	3.19	10.11	15.45		
5755	12	Ant0	1.91	3.19	10.14	15.24	17.99	
		Ant1	1.40	3.19	10.11	14.70		
5755	13	Ant0	1.52	3.19	10.14	14.85	17.63	
		Ant1	1.08	3.19	10.11	14.38		
5755	14	Ant0	1.41	3.19	10.14	14.74	17.51	
		Ant1	0.95	3.19	10.11	14.25		
5755	15	Ant0	1.28	3.19	10.14	14.61	17.38	
		Ant1	0.82	3.19	10.11	14.12		

*: Worst Rate

All comparison were carried out on same frequency and measurement factors.

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Radiated Spurious Emission
WLAN

Test place Head Office EMC Lab. No.3 and 4 Semi Anechoic Chamber
Report No. 10004954H
Date 03/29/2013 04/02/2013 04/03/2013
Temperature/ Humidity 23 deg. C / 39% RH 24 deg. C / 42% RH 23 deg. C / 38% RH
Engineer Hironobu Ohnishi Keisuke Kawamura Hiroshi Kukita
(1-10GHz) (10-18GHz) (18-26.5GHz)
Mode 11b Tx 2412MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	61.4	27.4	2.3	32.4	-	58.7	73.9	15.2	
Hori	2613.000	PK	52.3	28.1	2.4	32.3	-	50.5	73.9	23.4	
Hori	4824.000	PK	43.7	31.7	4.1	31.4	-	48.1	73.9	25.8	
Hori	7236.000	PK	44.0	36.3	4.7	32.3	-	52.7	73.9	21.2	
Hori	9648.000	PK	41.7	38.2	5.4	33.0	-	52.3	73.9	21.6	
Hori	2390.000	AV	56.1	27.4	2.3	32.4	0.1	53.5	53.9	0.4	Not Out of band emission(Leakage Power)
Hori	2613.000	AV	47.8	28.1	2.4	32.3	0.1	46.1	53.9	7.8	
Hori	4824.000	AV	37.9	31.7	4.1	31.4	0.1	42.4	53.9	11.5	
Hori	7236.000	AV	37.1	36.3	4.7	32.3	0.1	45.9	53.9	8.0	
Hori	9648.000	AV	33.6	38.2	5.4	33.0	0.1	44.3	53.9	9.6	
Vert	2390.000	PK	60.4	27.4	2.3	32.4	-	57.7	73.9	16.2	
Vert	2613.000	PK	52.2	28.1	2.4	32.3	-	50.4	73.9	23.5	
Vert	4824.000	PK	44.2	31.7	4.1	31.4	-	48.6	73.9	25.3	
Vert	7236.000	PK	44.0	36.3	4.7	32.3	-	52.7	73.9	21.2	
Vert	9648.000	PK	42.1	38.2	5.4	33.0	-	52.7	73.9	21.2	
Vert	2390.000	AV	55.5	27.4	2.3	32.4	0.1	52.9	53.9	1.0	Not Out of band emission(Leakage Power)
Vert	2613.000	AV	47.3	28.1	2.4	32.3	0.1	45.6	53.9	8.3	
Vert	4824.000	AV	37.8	31.7	4.1	31.4	0.1	42.3	53.9	11.6	
Vert	7236.000	AV	36.3	36.3	4.7	32.3	0.1	45.1	53.9	8.8	
Vert	9648.000	AV	33.7	38.2	5.4	33.0	0.1	44.4	53.9	9.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	103.0	27.5	2.3	32.4	100.4	-	-	Carrier
Hori	2397.917	PK	59.7	27.4	2.3	32.4	57.0	80.4	23.4	
Hori	2400.000	PK	61.1	27.4	2.3	32.4	58.4	80.4	22.0	
Vert	2412.000	PK	103.6	27.5	2.3	32.4	101.0	-	-	Carrier
Vert	2397.917	PK	61.5	27.4	2.3	32.4	58.8	81.0	22.2	
Vert	2400.000	PK	63.1	27.4	2.3	32.4	60.4	81.0	20.6	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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Radiated Spurious Emission
WLAN

Test place Head Office EMC Lab. No.3 and 4 Semi Anechoic Chamber
Report No. 10004954H
Date 03/29/2013 04/02/2013 04/03/2013
Temperature/ Humidity 23 deg. C / 39% RH 24 deg. C / 42% RH 23 deg. C / 38% RH
Engineer Hironobu Ohnishi Keisuke Kawamura Hiroshi Kukita
(1-10GHz) (10-18GHz) (18-26.5GHz)
Mode 11b Tx 2437MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2640.000	PK	51.2	28.2	2.4	32.2	-	49.6	73.9	24.3	
Hori	4874.000	PK	46.3	31.9	4.0	31.4	-	50.8	73.9	23.1	
Hori	7311.000	PK	44.5	36.5	4.7	32.4	-	53.3	73.9	20.6	
Hori	9748.000	PK	42.5	38.3	5.4	33.0	-	53.2	73.9	20.7	
Hori	2640.000	AV	44.4	28.2	2.4	32.2	0.1	42.9	53.9	11.0	
Hori	4874.000	AV	40.5	31.9	4.0	31.4	0.1	45.1	53.9	8.8	
Hori	7311.000	AV	38.3	36.5	4.7	32.4	0.1	47.2	53.9	6.7	
Hori	9748.000	AV	33.7	38.3	5.4	33.0	0.1	44.5	53.9	9.4	
Vert	2640.000	PK	50.8	28.2	2.4	32.2	-	49.2	73.9	24.7	
Vert	4874.000	PK	46.4	31.9	4.0	31.4	-	50.9	73.9	23.0	
Vert	7311.000	PK	45.7	36.5	4.7	32.4	-	54.5	73.9	19.4	
Vert	9748.000	PK	42.9	38.3	5.4	33.0	-	53.6	73.9	20.3	
Vert	2640.000	AV	45.2	28.2	2.4	32.2	0.1	43.7	53.9	10.2	
Vert	4874.000	AV	41.8	31.9	4.0	31.4	0.1	46.4	53.9	7.5	
Vert	7311.000	AV	38.5	36.5	4.7	32.4	0.1	47.4	53.9	6.5	
Vert	9748.000	AV	33.8	38.3	5.4	33.0	0.1	44.6	53.9	9.3	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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Radiated Spurious Emission
WLAN

Test place Head Office EMC Lab. No.3 and 4 Semi Anechoic Chamber
Report No. 10004954H
Date 03/29/2013 04/02/2013 04/03/2013
Temperature/ Humidity 23 deg. C / 39% RH 24 deg. C / 42% RH 23 deg. C / 38% RH
Engineer Hironobu Ohnishi Keisuke Kawamura Hiroshi Kukita
(1-10GHz) (10-18GHz) (18-26.5GHz)
Mode 11b Tx 2462MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4924.000	PK	44.6	32.1	4.0	31.4	-	49.3	73.9	24.6	
Hori	7386.000	PK	46.1	36.6	4.7	32.4	-	55.0	73.9	18.9	
Hori	9848.000	PK	42.3	38.5	5.4	33.1	-	53.1	73.9	20.8	
Hori	4924.000	AV	38.5	32.1	4.0	31.4	0.1	43.3	53.9	10.6	
Hori	7386.000	AV	40.4	36.6	4.7	32.4	0.1	49.4	53.9	4.5	
Hori	9848.000	AV	33.7	38.5	5.4	33.1	0.1	44.6	53.9	9.3	
Vert	4924.000	PK	45.6	32.1	4.0	31.4	-	50.3	73.9	23.6	
Vert	7386.000	PK	45.9	36.6	4.7	32.4	-	54.8	73.9	19.1	
Vert	9848.000	PK	43.0	38.5	5.4	33.1	-	53.8	73.9	20.1	
Vert	4924.000	AV	39.3	32.1	4.0	31.4	0.1	44.1	53.9	9.8	
Vert	7386.000	AV	39.7	36.6	4.7	32.4	0.1	48.7	53.9	5.2	
Vert	9848.000	AV	33.7	38.5	5.4	33.1	0.1	44.6	53.9	9.3	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Marker-Delta Method Data Sheet (RBW:30kHz)

FREQ [MHz]	Field strength of band-edge*		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
	HOR [dBuV]	VER [dBuV]					HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
PK DETECT											
2483.5	58.1	55.8	27.7	32.3	2.3	0.0	55.8	53.5	73.9	18.1	20.4
AV DETECT											
2483.5	56.0	54.4	27.7	32.3	2.3	0.0	53.7	52.1	53.9	0.2	1.8

*Field Strength of band-edge
Spectrum Analyzer Reading

	Polarity	Hor [dBuV]			Ver [dBuV]			
		Detector	PK	AV(RMS)	PK	PK	AV(RMS)	PK
			RBW	VBW	3MHz	3MHz	100kHz	3MHz
Step 1)	Fundamental(2462MHz)	1MHz	107.1	105.0	-	106.0	104.6	-
Step 2)	Fundamental(2462MHz)	30kHz	-	-	102.6	-	-	101.2
	Band-edge(2483.5MHz)	30kHz	-	-	53.6	-	-	51.0
	Amplitude delta *1	-	-	-	49.0	-	-	50.2
Step 3)	Field strength of band-edge *2	-	58.1	56.0	-	55.8	54.4	-

*1 Amplitude delta = Fundamental(RBW:30kHz) - Band-edge(RBW:30kHz)

*2 Field strength of band-edge = Fundamental(RBW:1MHz) - Amplitude delta

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Radiated Spurious Emission
WLAN

Test place Head Office EMC Lab. No.3 and 4 Semi Anechoic Chamber
Report No. 10004954H
Date 03/29/2013 04/02/2013 04/03/2013
Temperature/ Humidity 23 deg. C / 39% RH 24 deg. C / 42% RH 23 deg. C / 38% RH
Engineer Hironobu Ohnishi Keisuke Kawamura Hiroshi Kukita
(1-10GHz) (10-18GHz) (18-26.5GHz)
Mode 11g Tx 2412MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	72.6	27.4	2.3	32.4	-	69.9	73.9	4.0	
Hori	2613.000	PK	54.4	28.1	2.4	32.3	-	52.6	73.9	21.3	
Hori	4824.000	PK	42.0	31.7	4.1	31.4	-	46.4	73.9	27.5	
Hori	7236.000	PK	42.5	36.3	4.7	32.3	-	51.2	73.9	22.7	
Hori	9648.000	PK	43.3	38.2	5.4	33.0	-	53.9	73.9	20.0	
Hori	2390.000	AV	54.7	27.4	2.3	32.4	1.7	53.7	53.9	0.2	Not Out of band emission(Leakage Power)
Hori	2613.000	AV	43.8	28.1	2.4	32.3	1.7	43.7	53.9	10.2	
Hori	4824.000	AV	32.5	31.7	4.1	31.4	1.7	38.6	53.9	15.3	
Hori	7236.000	AV	33.8	36.3	4.7	32.3	1.7	44.2	53.9	9.7	
Hori	9648.000	AV	33.7	38.2	5.4	33.0	1.7	46.0	53.9	7.9	
Vert	2390.000	PK	71.8	27.4	2.3	32.4	-	69.1	73.9	4.8	
Vert	2613.000	PK	53.4	28.1	2.4	32.3	-	51.6	73.9	22.3	
Vert	4824.000	PK	41.6	31.7	4.1	31.4	-	46.0	73.9	27.9	
Vert	7236.000	PK	42.5	36.3	4.7	32.3	-	51.2	73.9	22.7	
Vert	9648.000	PK	42.6	38.2	5.4	33.0	-	53.2	73.9	20.7	
Vert	2390.000	AV	54.4	27.4	2.3	32.4	1.7	53.4	53.9	0.5	Not Out of band emission(Leakage Power)
Vert	2613.000	AV	43.2	28.1	2.4	32.3	1.7	43.1	53.9	10.8	
Vert	4824.000	AV	32.7	31.7	4.1	31.4	1.7	38.8	53.9	15.1	
Vert	7236.000	AV	33.6	36.3	4.7	32.3	1.7	44.0	53.9	9.9	
Vert	9648.000	AV	33.7	38.2	5.4	33.0	1.7	46.0	53.9	7.9	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	98.3	27.5	2.3	32.4	95.7	-	-	Carrier
Hori	2400.000	PK	66.2	27.4	2.3	32.4	63.5	75.7	12.2	
Vert	2412.000	PK	99.3	27.5	2.3	32.4	96.7	-	-	Carrier
Vert	2400.000	PK	65.9	27.4	2.3	32.4	63.2	76.7	13.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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Radiated Spurious Emission
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Test place Head Office EMC Lab. No.3 and 4 Semi Anechoic Chamber
Report No. 10004954H
Date 03/29/2013 04/02/2013 04/03/2013
Temperature/ Humidity 23 deg. C / 39% RH 24 deg. C / 42% RH 23 deg. C / 38% RH
Engineer Hironobu Ohnishi Keisuke Kawamura Hiroshi Kukita
(1-10GHz) (10-18GHz) (18-26.5GHz)
Mode 11g Tx 2437MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	68.1	27.4	2.3	32.4	-	65.4	73.9	8.5	
Hori	2483.500	PK	71.3	27.7	2.3	32.3	-	69.0	73.9	4.9	
Hori	4874.000	PK	42.9	31.9	4.0	31.4	-	47.4	73.9	26.5	
Hori	7311.000	PK	44.0	36.5	4.7	32.4	-	52.8	73.9	21.1	
Hori	9748.000	PK	42.0	38.3	5.4	33.0	-	52.7	73.9	21.2	
Hori	2390.000	AV	53.7	27.4	2.3	32.4	1.7	52.7	53.9	1.2	Not Out of band emission(Leakage Power)
Hori	2483.500	AV	54.3	27.7	2.3	32.3	1.7	53.7	53.9	0.2	Not Out of band emission(Leakage Power)
Hori	4874.000	AV	33.0	31.9	4.0	31.4	1.7	39.2	53.9	14.7	
Hori	7311.000	AV	35.2	36.5	4.7	32.4	1.7	45.7	53.9	8.2	
Hori	9748.000	AV	33.7	38.3	5.4	33.0	1.7	46.1	53.9	7.8	
Vert	2390.000	PK	68.4	27.4	2.3	32.4	-	65.7	73.9	8.2	
Vert	2483.500	PK	69.2	27.7	2.3	32.3	-	66.9	73.9	7.0	
Vert	4874.000	PK	41.6	31.9	4.0	31.4	-	46.1	73.9	27.8	
Vert	7311.000	PK	45.0	36.5	4.7	32.4	-	53.8	73.9	20.1	
Vert	9748.000	PK	42.5	38.3	5.4	33.0	-	53.2	73.9	20.7	
Vert	2390.000	AV	54.0	27.4	2.3	32.4	1.7	53.0	53.9	0.9	Not Out of band emission(Leakage Power)
Vert	2483.500	AV	52.2	27.7	2.3	32.3	1.7	51.6	53.9	2.3	Not Out of band emission(Leakage Power)
Vert	4874.000	AV	33.3	31.9	4.0	31.4	1.7	39.5	53.9	14.4	
Vert	7311.000	AV	35.5	36.5	4.7	32.4	1.7	46.0	53.9	7.9	
Vert	9748.000	AV	33.7	38.3	5.4	33.0	1.7	46.1	53.9	7.8	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2437.000	PK	103.5	27.6	2.3	32.3	101.1	-	-	Carrier
Hori	2400.000	PK	57.0	27.4	2.3	32.4	54.3	81.1	26.8	
Vert	2437.000	PK	103.4	27.6	2.3	32.3	101.0	-	-	Carrier
Vert	2400.000	PK	57.8	27.4	2.3	32.4	55.1	81.0	25.9	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

Radiated Spurious Emission
WLAN

Test place Head Office EMC Lab. No.3 and 4 Semi Anechoic Chamber
Report No. 10004954H
Date 03/29/2013 04/02/2013 04/03/2013
Temperature/ Humidity 23 deg. C / 39% RH 24 deg. C / 42% RH 23 deg. C / 38% RH
Engineer Hironobu Ohnishi Keisuke Kawamura Hiroshi Kukita
(1-10GHz) (10-18GHz) (18-26.5GHz)
Mode 11g Tx 2462MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4924.000	PK	40.6	32.1	4.0	31.4	-	45.3	73.9	28.6	
Hori	7386.000	PK	42.7	36.6	4.7	32.4	-	51.6	73.9	22.3	
Hori	9848.000	PK	42.1	38.5	5.4	33.1	-	52.9	73.9	21.0	
Hori	4924.000	AV	31.9	32.1	4.0	31.4	1.7	38.3	53.9	15.6	
Hori	7386.000	AV	34.0	36.6	4.7	32.4	1.7	44.6	53.9	9.3	
Hori	9848.000	AV	33.8	38.5	5.4	33.1	1.7	46.3	53.9	7.6	
Vert	4924.000	PK	41.2	32.1	4.0	31.4	-	45.9	73.9	28.0	
Vert	7386.000	PK	42.3	36.6	4.7	32.4	-	51.2	73.9	22.7	
Vert	9848.000	PK	42.6	38.5	5.4	33.1	-	53.4	73.9	20.5	
Vert	4924.000	AV	32.2	32.1	4.0	31.4	1.7	38.6	53.9	15.3	
Vert	7386.000	AV	33.8	36.6	4.7	32.4	1.7	44.4	53.9	9.5	
Vert	9848.000	AV	33.7	38.5	5.4	33.1	1.7	46.2	53.9	7.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Marker-Delta Method Data Sheet (RBW:30kHz)

FREQ [MHz]	Field strength of band-edge*		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT [dB]	RESULT		Limit AV [dBuV/m]	MARGIN		
	HOR [dBuV]	VER [dBuV]					HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]	
PK DETECT												
2483.5	63.3	61.4	27.7	32.3	2.3	0.0	61.0	59.1	73.9	12.9	14.8	
AV DETECT												
2483.5	54.1	52.1	27.7	32.3	2.3	0.0	51.8	49.8	53.9	2.1	4.1	

*Field Strength of band-edge
Spectrum Analyzer Reading

	Polarity	Hor [dBuV]			Ver [dBuV]			
		Detector	PK	AV(RMS)	PK	PK	AV(RMS)	PK
			RBW	VBW	3MHz	3MHz	100kHz	3MHz
Step 1)	Fundamental(2462MHz)	1MHz	106.0	96.8	-	105.1	95.8	-
Step 2)	Fundamental(2462MHz)	30kHz	-	-	94.1	-	-	92.9
	Band-edge(2483.5MHz)	30kHz	-	-	51.4	-	-	49.2
	Amplitude delta *1	-	-	-	42.7	-	-	43.7
Step 3)	Field strength of band-edge *2	-	63.3	54.1	-	61.4	52.1	-

*1 Amplitude delta = Fundamental(RBW:30kHz) - Band-edge(RBW:30kHz)

*2 Field strength of band-edge = Fundamental(RBW:1MHz) - Amplitude delta

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Radiated Spurious Emission
WLAN

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 10004954H
Date 04/02/2013 04/02/2013 04/03/2013
Temperature/ Humidity 23 deg. C / 40% RH 24 deg. C / 42% RH 23 deg. C / 38% RH
Engineer Hiroshi Kukita Keisuke Kawamura Hiroshi Kukita
(1-10GHz) (10-18GHz) (18-26.5GHz)
Mode 11n-20 MIMO Tx 2412MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	65.9	27.5	2.4	32.4	-	63.4	73.9	10.5	
Hori	2496.333	PK	56.4	27.5	2.4	32.4	-	53.9	73.9	20.0	
Hori	4824.000	PK	42.6	31.4	4.3	31.6	-	46.7	73.9	27.2	
Hori	7236.000	PK	42.4	35.8	5.0	32.7	-	50.5	73.9	23.4	
Hori	9648.000	PK	42.3	38.3	5.8	33.3	-	53.1	73.9	20.8	
Hori	2390.000	AV	49.5	27.5	2.4	32.4	2.96	50.0	53.9	3.9	Not Out of band emission(Leakage Power)
Hori	2496.333	AV	45.0	27.5	2.4	32.4	2.96	45.5	53.9	8.4	
Hori	4824.000	AV	32.1	31.4	4.3	31.6	2.96	39.2	53.9	14.7	
Hori	7236.000	AV	33.8	35.8	5.0	32.7	2.96	44.9	53.9	9.0	
Hori	9648.000	AV	34.1	38.3	5.8	33.3	2.96	47.9	53.9	6.0	
Vert	2390.000	PK	63.7	27.5	2.4	32.4	-	61.2	73.9	12.7	
Vert	2497.400	PK	53.4	27.5	2.4	32.4	-	50.9	73.9	23.0	
Vert	4824.000	PK	42.0	31.4	4.3	31.6	-	46.1	73.9	27.8	
Vert	7236.000	PK	43.0	35.8	5.0	32.7	-	51.1	73.9	22.8	
Vert	9648.000	PK	42.3	38.3	5.8	33.3	-	53.1	73.9	20.8	
Vert	2390.000	AV	48.4	27.5	2.4	32.4	2.96	48.9	53.9	5.0	Not Out of band emission(Leakage Power)
Vert	2497.400	AV	43.0	27.5	2.4	32.4	2.96	43.5	53.9	10.4	
Vert	4824.000	AV	32.4	31.4	4.3	31.6	2.96	39.5	53.9	14.4	
Vert	7236.000	AV	34.0	35.8	5.0	32.7	2.96	45.1	53.9	8.8	
Vert	9648.000	AV	34.3	38.3	5.8	33.3	2.96	48.1	53.9	5.8	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	96.0	27.5	2.4	32.4	93.5	-	-	Carrier
Hori	2397.875	PK	58.8	27.5	2.4	32.4	56.3	73.5	17.2	
Hori	2400.000	PK	60.5	27.5	2.4	32.4	58.0	73.5	15.5	
Vert	2412.000	PK	96.5	27.5	2.4	32.4	94.0	-	-	Carrier
Vert	2398.223	PK	57.4	27.5	2.4	32.4	54.9	74.0	19.1	
Vert	2400.000	PK	58.4	27.5	2.4	32.4	55.9	74.0	18.1	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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Radiated Spurious Emission
WLAN

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 10004954H
Date 04/02/2013 04/02/2013 04/03/2013
Temperature/ Humidity 23 deg.C./ 40% RH 24 deg.C./ 42% RH 23 deg. C / 38% RH
Engineer Hiroshi Kukita Keisuke Kawamura Hiroshi Kukita
(1-10GHz) (10-18GHz) (18-26.5GHz)
Mode 11n-20 MIMO Tx 2437MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2640.056	PK	51.5	27.8	2.5	32.3	-	49.5	73.9	24.4	
Hori	4874.000	PK	47.0	31.5	4.3	31.6	-	51.2	73.9	22.7	
Hori	7311.000	PK	42.0	35.8	5.0	32.7	-	50.1	73.9	23.8	
Hori	9748.000	PK	42.8	38.4	5.9	33.4	-	53.7	73.9	20.2	
Hori	2640.056	AV	39.5	27.8	2.5	32.3	2.96	40.5	53.9	13.4	
Hori	4874.000	AV	37.0	31.5	4.3	31.6	2.96	44.2	53.9	9.7	
Hori	7311.000	AV	33.6	35.8	5.0	32.7	2.96	44.7	53.9	9.2	
Hori	9748.000	AV	34.4	38.4	5.9	33.4	2.96	48.3	53.9	5.6	
Vert	2640.056	PK	48.7	27.8	2.5	32.3	-	46.7	73.9	27.2	
Vert	4874.000	PK	43.4	31.5	4.3	31.6	-	47.6	73.9	26.3	
Vert	7311.000	PK	42.6	35.8	5.0	32.7	-	50.7	73.9	23.2	
Vert	9748.000	PK	43.0	38.4	5.9	33.4	-	53.9	73.9	20.0	
Vert	2640.056	AV	36.6	27.8	2.5	32.3	2.96	37.6	53.9	16.3	
Vert	4874.000	AV	33.8	31.5	4.3	31.6	2.96	41.0	53.9	12.9	
Vert	7311.000	AV	33.7	35.8	5.0	32.7	2.96	44.8	53.9	9.1	
Vert	9748.000	AV	34.5	38.4	5.9	33.4	2.96	48.4	53.9	5.5	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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Radiated Spurious Emission
WLAN

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 10004954H
Date 04/02/2013 04/02/2013 04/03/2013
Temperature/ Humidity 23 deg. C / 40% RH 24 deg. C / 42% RH 23 deg. C / 38% RH
Engineer Hiroshi Kukita Keisuke Kawamura Hiroshi Kukita
(1-10GHz) (10-18GHz) (18-26.5GHz)
Mode 11n-20 MIMO Tx 2462MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4924.000	PK	43.0	31.7	4.3	31.6	-	47.4	73.9	26.5	
Hori	7386.000	PK	43.2	35.9	5.1	32.8	-	51.4	73.9	22.5	
Hori	9848.000	PK	42.1	38.5	5.9	33.4	-	53.1	73.9	20.8	
Hori	4924.000	AV	32.0	31.7	4.3	31.6	2.96	39.4	53.9	14.5	
Hori	7386.000	AV	34.1	35.9	5.1	32.8	2.96	45.3	53.9	8.6	
Hori	9848.000	AV	34.0	38.5	5.9	33.4	2.96	48.0	53.9	5.9	
Vert	4924.000	PK	42.1	31.7	4.3	31.6	-	46.5	73.9	27.4	
Vert	7386.000	PK	43.4	35.9	5.1	32.8	-	51.6	73.9	22.3	
Vert	9848.000	PK	42.4	38.5	5.9	33.4	-	53.4	73.9	20.5	
Vert	4924.000	AV	32.3	31.7	4.3	31.6	2.96	39.7	53.9	14.2	
Vert	7386.000	AV	33.8	35.9	5.1	32.8	2.96	45.0	53.9	8.9	
Vert	9848.000	AV	33.9	38.5	5.9	33.4	2.96	47.9	53.9	6.0	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Marker-Delta Method Data Sheet (RBW:30kHz)

FREQ [MHz]	Field strength of band-edge*		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT [dB]	RESULT [dBuV/m]		Limit AV [dBuV/m]	MARGIN [dB]		
	HOR	VER					HOR	VER		HOR	VER	
PK DETECT												
2483.5	61.7	64.0	27.7	32.3	2.3	0.0	59.4	61.7	73.9	14.5	12.2	
AV DETECT												
2483.5	55.9	56.0	27.7	32.3	2.3	0.0	53.6	53.7	53.9	0.3	0.2	

*Field Strength of band-edge
Spectrum Analyzer Reading

	Polarity	Detector	Hor [dBuV]			Ver [dBuV]		
			PK	AV(RMS)	PK	PK	AV(RMS)	PK
			3MHz	3MHz	100kHz	3MHz	3MHz	100kHz
Step 1)	Fundamental(2462MHz)	1MHz	103.4	97.6	-	106.0	98.0	-
	Fundamental(2462MHz)	30kHz	-	-	90.5	-	-	92.8
Step 2)	Band-edge(2483.5MHz)	30kHz	-	-	48.8	-	-	50.8
	Amplitude delta *1	-	-	-	41.7	-	-	42.0
Step 3)	Field strength of band-edge *2	-	61.7	55.9	-	64.0	56.0	-

*1 Amplitude delta = Fundamental(RBW:30kHz) - Band-edge(RBW:30kHz)

*2 Field strength of band-edge = Fundamental(RBW:1MHz) - Amplitude delta

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Radiated Spurious Emission
WLAN

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 10004954H
Date 04/02/2013 04/03/2013
Temperature/ Humidity 24 deg. C / 42% RH 23 deg. C / 38% RH
Engineer Keisuke Kawamura Hiroshi Kukita
(1-10GHz) (18-26.5GHz)
Mode 11n-40 MIMO Tx 2422MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	65.7	27.5	2.4	32.4	-	63.2	73.9	10.7	
Hori	4844.000	PK	40.5	31.4	4.3	31.6	-	44.6	73.9	29.3	
Hori	7266.000	PK	41.7	35.8	5.0	32.7	-	49.8	73.9	24.1	
Hori	9688.000	PK	41.6	38.4	5.8	33.4	-	52.4	73.9	21.5	
Hori	2390.000	AV	48.5	27.5	2.4	32.4	4.0	50.0	53.9	3.9	Not Out of band emission(Leakage Power)
Hori	4844.000	AV	31.9	31.4	4.3	31.6	4.0	40.0	53.9	13.9	
Hori	7266.000	AV	33.4	35.8	5.0	32.7	4.0	45.5	53.9	8.4	
Hori	9688.000	AV	33.8	38.4	5.8	33.4	4.0	48.6	53.9	5.3	
Vert	2390.000	PK	65.1	27.5	2.4	32.4	-	62.6	73.9	11.3	
Vert	4844.000	PK	40.4	31.4	4.3	31.6	-	44.5	73.9	29.4	
Vert	7266.000	PK	42.2	35.8	5.0	32.7	-	50.3	73.9	23.6	
Vert	9688.000	PK	42.1	38.4	5.8	33.4	-	52.9	73.9	21.0	
Vert	2390.000	AV	48.2	27.5	2.4	32.4	4.0	49.7	53.9	4.2	Not Out of band emission(Leakage Power)
Vert	4844.000	AV	32.0	31.4	4.3	31.6	4.0	40.1	53.9	13.8	
Vert	7266.000	AV	33.6	35.8	5.0	32.7	4.0	45.7	53.9	8.2	
Vert	9688.000	AV	33.8	38.4	5.8	33.4	4.0	48.6	53.9	5.3	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2422.000	PK	91.2	27.5	2.4	32.4	88.7	-	-	Carrier
Hori	2400.000	PK	66.2	27.5	2.4	32.4	63.7	68.7	5.0	
Vert	2422.000	PK	91.4	27.5	2.4	32.4	88.9	-	-	Carrier
Vert	2400.000	PK	66.0	27.5	2.4	32.4	63.5	68.9	5.4	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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Radiated Spurious Emission
WLAN

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 10004954H
Date 04/02/2013 04/03/2013
Temperature/ Humidity 24 deg. C / 42% RH 23 deg. C / 38% RH
Engineer Keisuke Kawamura Hiroshi Kukita
(1-10GHz) (18-26.5GHz)
Mode 11n-40 MIMO Tx 2437MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4874.000	PK	43.8	31.5	4.3	31.6	-	48.0	73.9	25.9	
Hori	7311.000	PK	41.8	35.8	5.0	32.7	-	49.9	73.9	24.0	
Hori	9748.000	PK	41.6	38.4	5.9	33.4	-	52.5	73.9	21.4	
Hori	4874.000	AV	32.9	31.5	4.3	31.6	4.0	41.1	53.9	12.8	
Hori	7311.000	AV	33.4	35.8	5.0	32.7	4.0	45.5	53.9	8.4	
Hori	9748.000	AV	33.8	38.4	5.9	33.4	4.0	48.7	53.9	5.2	
Vert	4874.000	PK	41.0	31.5	4.3	31.6	-	45.2	73.9	28.7	
Vert	7311.000	PK	42.2	35.8	5.0	32.7	-	50.3	73.9	23.6	
Vert	9748.000	PK	42.1	38.4	5.9	33.4	-	53.0	73.9	20.9	
Vert	4874.000	AV	31.9	31.5	4.3	31.6	4.0	40.1	53.9	13.8	
Vert	7311.000	AV	33.6	35.8	5.0	32.7	4.0	45.7	53.9	8.2	
Vert	9748.000	AV	33.8	38.4	5.9	33.4	4.0	48.7	53.9	5.2	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

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Radiated Spurious Emission WLAN

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 10004954H
Date 04/02/2013 04/03/2013
Temperature/ Humidity 24 deg. C / 42% RH 23 deg. C / 38% RH
Engineer Keisuke Kawamura Hiroshi Kukita
(1-10GHz) (18-26.5GHz)
Mode 11n-40 MIMO Tx 2452MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4904.000	PK	42.1	31.6	4.3	31.6	-	46.4	73.9	27.5	
Hori	7356.000	PK	41.8	35.9	5.1	32.8	-	50.0	73.9	23.9	
Hori	9808.000	PK	41.6	38.5	5.9	33.4	-	52.6	73.9	21.3	
Hori	4904.000	AV	32.8	31.6	4.3	31.6	4.0	41.1	53.9	12.8	
Hori	7356.000	AV	33.4	35.9	5.1	32.8	4.0	45.6	53.9	8.3	
Hori	9808.000	AV	33.8	38.5	5.9	33.4	4.0	48.8	53.9	5.1	
Vert	4904.000	PK	40.2	31.6	4.3	31.6	-	44.5	73.9	29.4	
Vert	7356.000	PK	42.2	35.9	4.5	32.8	-	49.8	73.9	24.1	
Vert	9808.000	PK	42.1	38.5	5.2	33.4	-	52.4	73.9	21.5	
Vert	4904.000	AV	32.4	31.6	4.3	31.6	4.0	40.7	53.9	13.2	
Vert	7356.000	AV	33.6	35.9	4.5	32.8	4.0	45.2	53.9	8.7	
Vert	9808.000	AV	33.8	38.5	5.2	33.4	4.0	48.1	53.9	5.8	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

Marker-Delta Method Data Sheet (RBW:30kHz)

FREQ [MHz]	Field strength of band-edge*		ANT Factor [dB/m]	AMP GAIN [dB]	CABLE LOSS [dB]	ATT [dB]	RESULT		Limit AV [dBuV/m]	MARGIN	
	HOR [dBuV]	VER [dBuV]					HOR [dBuV/m]	VER [dBuV/m]		HOR [dB]	VER [dB]
PK DETECT											
2483.5	63.0	60.0	27.5	32.4	2.4	0.0	60.5	57.5	73.9	13.4	16.4
AV DETECT											
2483.5	56.3	54.0	27.5	32.4	2.4	0.0	53.8	51.5	53.9	0.1	2.4

*Field Strength of band-edge
Spectrum Analyzer Reading

	Polarity	Hor [dBuV]			Ver [dBuV]			
		Detector			Detector			
		PK	AV(RMS)	PK	PK	AV(RMS)	PK	
		3MHz	3MHz	100kHz	3MHz	3MHz	100kHz	
Step 1)	Fundamental(2452MHz)	1MHz	98.9	92.3	-	99.3	93.3	-
Step 2)	Fundamental(2452MHz)	30kHz	-	-	87.0	-	-	90.0
	Band-edge(2483.5MHz)	30kHz	-	-	51.1	-	-	50.7
	Amplitude delta *1	-	-	-	36.0	-	-	39.3
Step 3)	Field strength of band-edge *2	-	63.0	56.3	-	60.0	54.0	-

*1 Amplitude delta = Fundamental(RBW:30kHz) - Band-edge(RBW:30kHz)

*2 Field strength of band-edge = Fundamental(RBW:1MHz) - Amplitude delta

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Radiated Spurious Emission
WLAN

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 10004954H
Date 04/02/2013 04/03/2013
Temperature/ Humidity 24 deg. C / 42% RH 23 deg. C / 38% RH
Engineer Keisuke Kawamura Hiroshi Kukita
(1-10GHz) (10-40GHz)
Mode 11n-20 MIMO Tx 5745MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5525.960	PK	49.1	32.2	3.8	31.7	-	53.4	73.9	20.5	
Hori	5962.170	PK	49.5	33.0	3.9	31.8	-	54.6	73.9	19.3	
Hori	11490.000	PK	48.9	39.9	-2.2	33.5	-	53.1	73.9	20.8	
Hori	17235.000	PK	52.4	41.1	-0.6	32.6	-	60.3	73.9	13.6	
Hori	5525.960	AV	39.3	32.2	3.8	31.7	2.95	46.6	53.9	7.4	
Hori	5962.170	AV	39.2	33.0	3.9	31.8	2.95	47.3	53.9	6.6	
Hori	11490.000	AV	38.8	39.9	-2.2	33.5	2.95	46.0	53.9	8.0	
Hori	17235.000	AV	42.9	41.1	-0.6	32.6	2.95	53.8	53.9	0.1	
Vert	5525.960	PK	48.2	32.2	3.8	31.7	-	52.5	73.9	21.4	
Vert	5962.170	PK	46.8	33.0	3.9	31.8	-	51.9	73.9	22.0	
Vert	11490.000	PK	47.7	39.9	-2.2	33.5	-	51.9	73.9	22.0	
Vert	17235.000	PK	53.2	41.1	-0.6	32.6	-	61.1	73.9	12.8	
Vert	5525.960	AV	38.1	32.2	3.8	31.7	2.95	45.4	53.9	8.5	
Vert	5962.170	AV	36.9	33.0	3.9	31.8	2.95	45.0	53.9	8.9	
Vert	11490.000	AV	37.0	39.9	-2.2	33.5	2.95	44.2	53.9	9.7	
Vert	17235.000	AV	42.2	41.1	-0.6	32.6	2.95	53.1	53.9	0.8	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5745.000	PK	98.5	32.6	3.9	31.7	103.3	-	-	Carrier
Hori	5725.000	PK	66.0	32.6	3.9	31.7	70.8	83.3	12.5	
Vert	5745.000	PK	100.5	32.6	3.9	31.7	105.3	-	-	Carrier
Vert	5725.000	PK	66.1	32.6	3.9	31.7	70.9	85.3	14.4	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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Radiated Spurious Emission
WLAN

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 10004954H
Date 04/02/2013 04/03/2013 04/05/2013
Temperature/ Humidity 24 deg. C / 42% RH 23 deg. C / 38% RH 26 deg. C / 37% RH
Engineer Keisuke Kawamura Hiroshi Kukita Keisuke Kawamura
(1-10GHz) (10-40GHz) (30M-1000MHz)
Mode 11n-20 MIMO Tx 5785MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	259.799	QP	38.1	18.0	9.5	31.9	-	33.7	46.0	12.3	
Hori	304.026	QP	38.5	16.4	9.8	32.0	-	32.7	46.0	13.3	
Hori	336.029	QP	35.4	16.9	10.1	32.0	-	30.4	46.0	15.6	
Hori	352.031	QP	33.7	17.2	10.2	32.0	-	29.1	46.0	16.9	
Hori	368.026	QP	33.8	17.4	10.3	32.0	-	29.5	46.0	16.5	
Hori	519.858	QP	29.0	19.2	11.2	32.0	-	27.4	46.0	18.6	
Hori	5565.000	PK	46.8	32.3	3.8	31.7	-	51.2	73.9	22.7	
Hori	11570.000	PK	46.5	39.9	-2.2	33.5	-	50.7	73.9	23.2	
Hori	17355.000	PK	49.2	41.7	-0.6	32.5	-	57.8	73.9	16.1	
Hori	5565.000	AV	38.3	32.3	3.8	31.7	2.95	45.7	53.9	8.3	
Hori	11570.000	AV	38.4	39.9	-2.2	33.5	2.95	45.6	53.9	8.4	
Hori	17355.000	AV	41.0	41.7	-0.6	32.5	2.95	52.6	53.9	1.3	
Vert	80.311	QP	43.9	6.7	7.8	32.1	-	26.3	40.0	13.7	
Vert	193.349	QP	31.8	17.0	9.0	31.9	-	25.9	43.5	17.6	
Vert	260.379	QP	35.4	18.0	9.5	31.9	-	31.0	46.0	15.0	
Vert	288.029	QP	31.9	18.8	9.7	32.0	-	28.4	46.0	17.6	
Vert	304.026	QP	32.9	16.4	9.8	32.0	-	27.1	46.0	18.9	
Vert	519.318	QP	29.4	19.2	11.2	32.0	-	27.8	46.0	18.2	
Vert	5565.000	PK	47.3	32.3	3.8	31.7	-	51.7	73.9	22.2	
Vert	11570.000	PK	48.0	39.9	-2.2	33.5	-	52.2	73.9	21.7	
Vert	17355.000	PK	50.1	41.7	-0.6	32.5	-	58.7	73.9	15.2	
Vert	5565.000	AV	38.9	32.3	3.8	31.7	2.95	46.3	53.9	7.7	
Vert	11570.000	AV	38.3	39.9	-2.2	33.5	2.95	45.5	53.9	8.5	
Vert	17355.000	AV	40.2	41.7	-0.6	32.5	2.95	51.8	53.9	2.1	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

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Radiated Spurious Emission
WLAN

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 10004954H
Date 04/02/2013 04/03/2013
Temperature/ Humidity 24 deg. C / 42% RH 23 deg. C / 38% RH
Engineer Keisuke Kawamura Hiroshi Kukita
(1-10GHz) (10-40GHz)
Mode 11n-20 MIMO Tx 5825MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5604.290	PK	47.7	32.4	3.8	31.7	-	52.2	73.9	21.7	
Hori	11650.000	PK	51.0	39.9	-2.1	33.5	-	55.3	73.9	18.6	
Hori	17475.000	PK	52.7	42.3	-0.7	32.5	-	61.8	73.9	12.1	
Hori	5604.290	AV	37.3	32.4	3.8	31.7	2.95	44.8	53.9	9.2	
Hori	11650.000	AV	40.4	39.9	-2.1	33.5	2.95	47.7	53.9	6.2	
Hori	17475.000	AV	41.4	42.3	-0.7	32.5	2.95	53.5	53.9	0.5	
Vert	5604.290	PK	49.5	32.4	3.8	31.7	-	54.0	73.9	19.9	
Vert	11650.000	PK	49.7	39.9	-2.1	33.5	-	54.0	73.9	19.9	
Vert	17475.000	PK	50.5	42.3	-0.7	32.5	-	59.6	73.9	14.3	
Vert	5604.290	AV	39.7	32.4	3.8	31.7	2.95	47.2	53.9	6.8	
Vert	11650.000	AV	40.0	39.9	-2.1	33.5	2.95	47.3	53.9	6.6	
Vert	17475.000	AV	40.0	42.3	-0.7	32.5	2.95	52.1	53.9	1.9	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5825.000	PK	101.9	32.8	3.9	31.8	106.8	-	-	Carrier
Hori	5850.000	PK	58.5	32.8	3.9	31.8	63.4	86.8	23.4	
Vert	5825.000	PK	99.9	32.8	3.9	31.8	104.8	-	-	Carrier
Vert	5850.000	PK	57.5	32.8	3.9	31.8	62.4	84.8	22.4	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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Radiated Spurious Emission
WLAN

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 10004954H
Date 04/02/2013 04/03/2013
Temperature/ Humidity 24 deg. C / 42% RH 23 deg. C / 38% RH
Engineer Keisuke Kawamura Hiroshi Kukita
(1-10GHz) (10-40GHz)
Mode 11n-40 MIMO Tx 5755MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	11510.000	PK	45.0	39.9	-2.2	33.5	-	49.2	73.9	24.7	
Hori	17265.000	PK	49.0	41.2	-0.6	32.6	-	57.0	73.9	16.9	
Hori	11510.000	AV	34.4	39.9	-2.2	33.5	3.92	42.5	53.9	11.4	
Hori	17265.000	AV	38.4	41.2	-0.6	32.6	3.92	50.3	53.9	3.6	
Vert	11510.000	PK	43.9	39.9	-2.2	33.5	-	48.1	73.9	25.8	
Vert	17265.000	PK	49.0	41.2	-0.6	32.6	-	57.0	73.9	16.9	
Vert	11510.000	AV	34.1	39.9	-2.2	33.5	3.92	42.2	53.9	11.7	
Vert	17265.000	AV	39.0	41.2	-0.6	32.6	3.92	50.9	53.9	3.0	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5755.000	PK	94.2	32.6	3.9	31.7	99.0	-	-	Carrier
Hori	5725.000	PK	69.1	32.6	3.9	31.7	73.9	79.0	5.1	
Vert	5755.000	PK	97.6	32.6	3.9	31.7	102.4	-	-	Carrier
Vert	5725.000	PK	66.9	32.6	3.9	31.7	71.7	82.4	10.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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Radiated Spurious Emission
WLAN

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 10004954H
Date 04/02/2013 04/03/2013
Temperature/ Humidity 24 deg. C / 42% RH 23 deg. C / 38% RH
Engineer Keisuke Kawamura Hiroshi Kukita
(1-10GHz) (10-40GHz)
Mode 11n-40 MIMO Tx 5795MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	11590.000	PK	45.0	39.9	-2.2	33.5	-	49.2	73.9	24.7	
Hori	17385.000	PK	47.4	41.8	-0.7	32.5	-	56.0	73.9	17.9	
Hori	11590.000	AV	34.9	39.9	-2.2	33.5	3.92	43.0	53.9	10.9	
Hori	17385.000	AV	37.2	41.8	-0.7	32.5	3.92	49.7	53.9	4.2	
Vert	11590.000	PK	45.8	39.9	-2.2	33.5	-	50.0	73.9	23.9	
Vert	17385.000	PK	46.0	41.8	-0.7	32.5	-	54.6	73.9	19.3	
Vert	11590.000	AV	35.2	39.9	-2.2	33.5	3.92	43.3	53.9	10.6	
Vert	17385.000	AV	35.8	41.8	-0.7	32.5	3.92	48.3	53.9	5.6	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5795.000	PK	95.1	32.7	3.9	31.8	99.9	-	-	Carrier
Hori	5850.000	PK	55.0	32.8	3.9	31.8	59.9	79.9	20.0	
Vert	5795.000	PK	97.3	32.7	3.9	31.8	102.1	-	-	Carrier
Vert	5850.000	PK	55.0	32.8	3.9	31.8	59.9	82.1	22.2	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

UL Japan, Inc.

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Radiated Spurious Emission
WLAN

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 10004954H
Date 04/29/2013 04/30/2013
Temperature/ Humidity 22 deg. C / 32% RH 22 deg. C / 32% RH
Engineer Motoya Imura Tomohisa Nakagawa
(1-40GHz) Below 1GHz
Mode 11n-20 MIMO Tx 5785MHz + Bluetooth DH5 2441MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	48.312	QP	28.9	11.3	7.0	28.6		18.6	40.0	21.4	
Hori	54.343	QP	36.0	9.5	7.0	28.6		23.9	40.0	16.1	
Hori	110.382	QP	33.6	11.6	7.5	28.3		24.4	43.5	19.1	
Hori	118.762	QP	32.5	12.7	7.6	28.2		24.6	43.5	18.9	
Hori	199.250	QP	38.9	16.6	8.1	27.8		35.8	43.5	7.7	
Hori	336.020	QP	35.2	15.3	9.0	27.9		31.6	46.0	14.4	
Hori	3339.220	PK	64.2	28.0	2.8	35.0		60.0	73.9	13.9	
Hori	11570.000	PK	49.6	39.3	-2.0	34.5		52.4	73.9	21.5	
Hori	3339.220	AV	52.0	28.0	2.8	35.0	3.0	50.8	53.9	3.1	
Hori	11570.000	AV	39.8	39.3	-2.0	34.5	3.0	45.6	53.9	8.3	
Vert	51.320	QP	45.8	10.4	7.0	28.6		34.6	40.0	5.4	
Vert	54.341	QP	46.5	9.5	7.0	28.6		34.4	40.0	5.6	
Vert	110.028	QP	39.2	11.6	7.5	28.3		30.0	43.5	13.5	
Vert	123.770	QP	34.6	13.2	7.7	28.2		27.3	43.5	16.2	
Vert	199.234	QP	29.1	16.6	8.1	27.8		26.0	43.5	17.5	
Vert	336.020	QP	30.6	15.3	9.0	27.9		27.0	46.0	19.0	
Vert	3339.220	PK	62.1	28.0	2.8	35.0		57.9	73.9	16.0	
Vert	11570.000	PK	48.7	39.3	-2.0	34.5		51.5	73.9	22.4	
Vert	3339.220	AV	51.2	28.0	2.8	35.0	3.0	50.0	53.9	3.9	
Vert	11570.000	AV	38.9	39.3	-2.0	34.5	3.0	44.7	73.9	29.2	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

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

*The 10th harmonic was not seen so the result was its base noise level.

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	5785.000	PK	101.6	31.8	3.8	34.6	102.6	-	-	Carrier
Hori	5565.651	PK	42.9	31.5	3.7	34.6	43.5	82.6	39.1	
Hori	6004.644	PK	43.7	32.1	3.9	34.6	45.1	82.6	37.5	
Vert	5785.000	PK	104.0	31.8	3.8	34.6	105.0	-	-	Carrier
Vert	5565.620	PK	47.5	31.5	3.7	34.6	48.1	85.0	36.9	
Vert	6004.644	PK	42.8	32.1	3.9	34.6	44.2	85.0	40.8	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

UL Japan, Inc.

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Radiated Spurious Emission Below 30MHz

DATA OF RADIATED EMISSION TEST

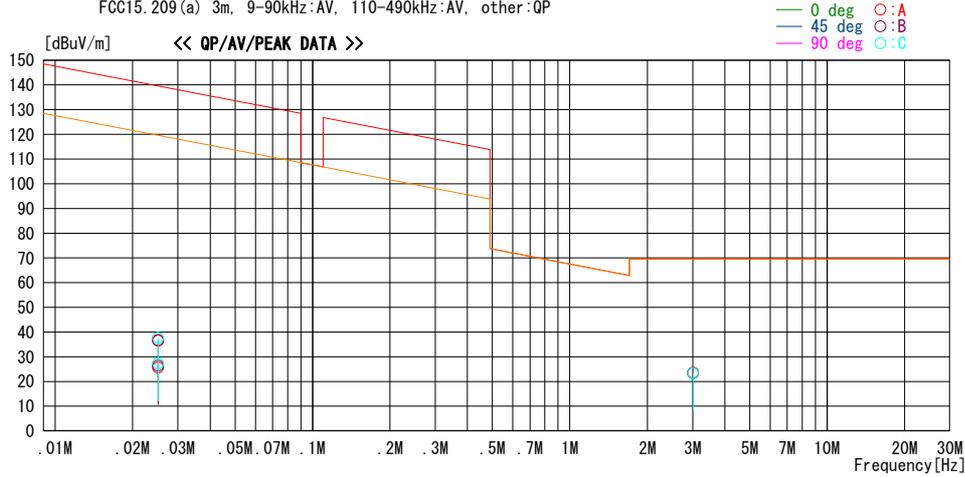
UL Japan, Inc. Head Office EMC Lab. No.1 Semi Anechoic Chamber
 Date : 2013/04/06

Report No. : 10004954H

Temp./ Humi. : 23deg. C / 48% RH
 Engineer : Keisuke kawamura

Mode / Remarks : Tx 11n20 MCS15 5785MHz Ant0+1(MIMO) Worst-Axis:PC

LIMIT : FCC15.209(a) 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP
 FCC15.209(a) 3m, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[deg]	[deg]	
0.02510	43.1	PEAK	19.3	6.0	31.8	36.6	139.6	103.0	0	A	359
0.02510	44.1	PEAK	19.3	6.0	31.8	37.6	139.6	102.0	90	C	359
0.02510	33.8	AV	19.3	6.0	31.8	27.3	119.6	92.3	90	C	359
0.02510	43.2	PEAK	19.3	6.0	31.8	36.7	139.6	102.9	45	B	359
0.02510	32.9	AV	19.3	6.0	31.8	26.4	119.6	93.2	45	B	359
0.02510	32.1	AV	19.3	6.0	31.8	25.6	119.6	94.0	0	A	359
3.01100	30.1	QP	19.2	6.5	32.3	23.5	69.5	46.0	0	A	359
3.01100	30.0	QP	19.2	6.5	32.3	23.4	69.5	46.1	45	B	359
3.01100	30.0	QP	19.2	6.5	32.3	23.4	69.5	46.1	90	C	359

CHART: WITH FACTOR, ANT TYPE: LOOP Except for the data below : adequate margin data below the limits.
 CALCULATION : RESULT = READING + ANT FACTOR + LOSS (CABLE + ATTEN.) - GAIN (AMP.)

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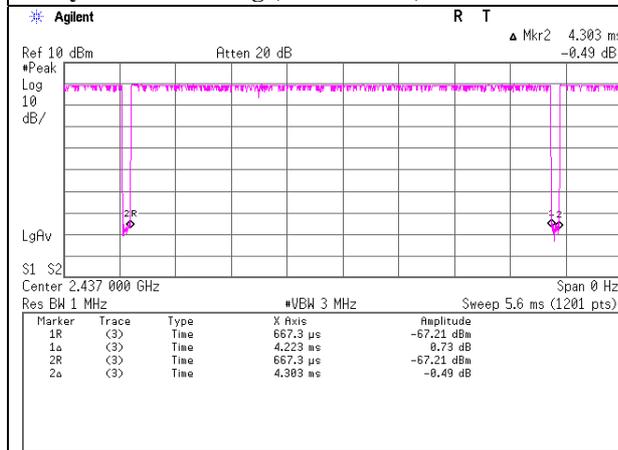
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Burst rate confirmation WLAN

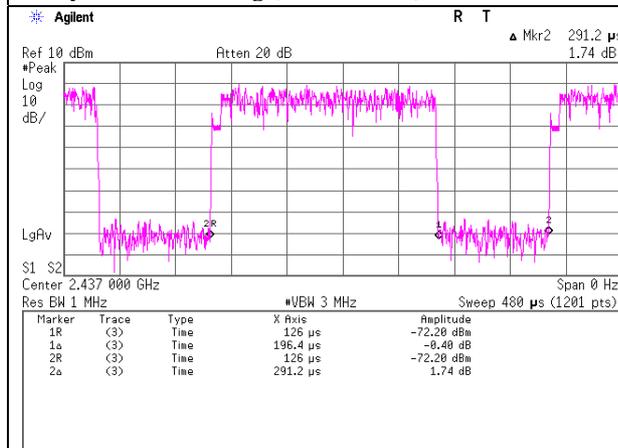
11b 2Mbps

Tx on / (Tx on + Tx off) = 0.981
Tx on / (Tx on + Tx off) * 100 = 98.1 %
Duty factor = 10 * log (4.303 / 4.223) = 0.08 dB



11g 48Mbps

Tx on / (Tx on + Tx off) = 0.674
Tx on / (Tx on + Tx off) * 100 = 67.4 %
Duty factor = 10 * log (291.2 / 196.4) = 1.71 dB



UL Japan, Inc.

Head Office EMC Lab.

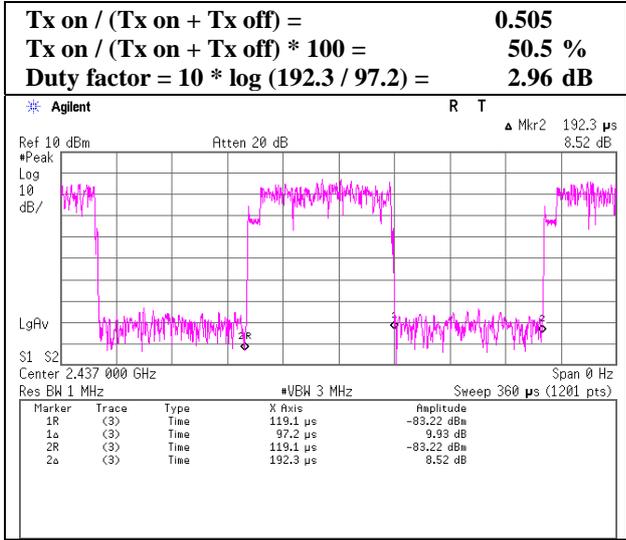
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Telephone : +81 596 24 8999

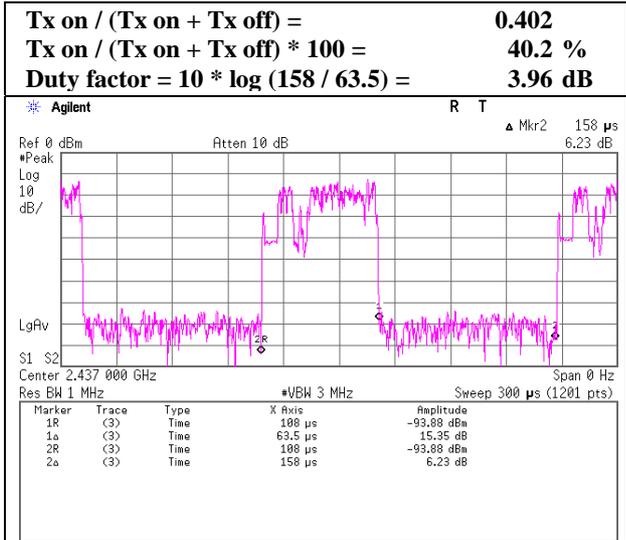
Facsimile : +81 596 24 8124

Burst rate confirmation
WLAN

11n 2.4GHz 20MBand MIMO MCS15



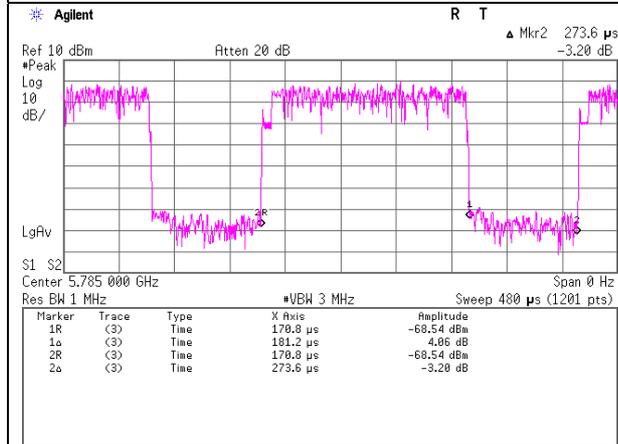
11n 2.4GHz 40MBand MIMO MCS15



Burst rate confirmation
WLAN

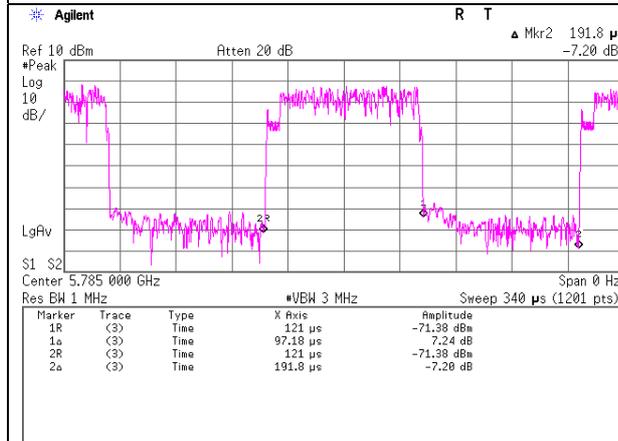
11a 54Mbps

Tx on / (Tx on + Tx off) = 0.662
Tx on / (Tx on + Tx off) * 100 = 66.2 %
Duty factor = 10 * log (273.6 / 181.2) = 1.79 dB



11n 5GHz 20MBand MIMO MCS15

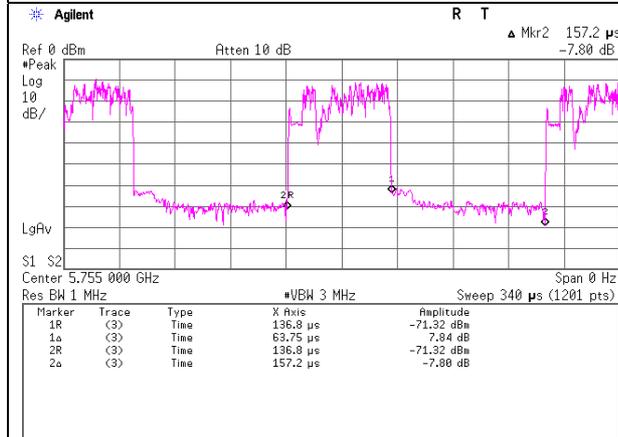
Tx on / (Tx on + Tx off) = 0.507
Tx on / (Tx on + Tx off) * 100 = 50.7 %
Duty factor = 10 * log (191.8 / 97.18) = 2.95 dB



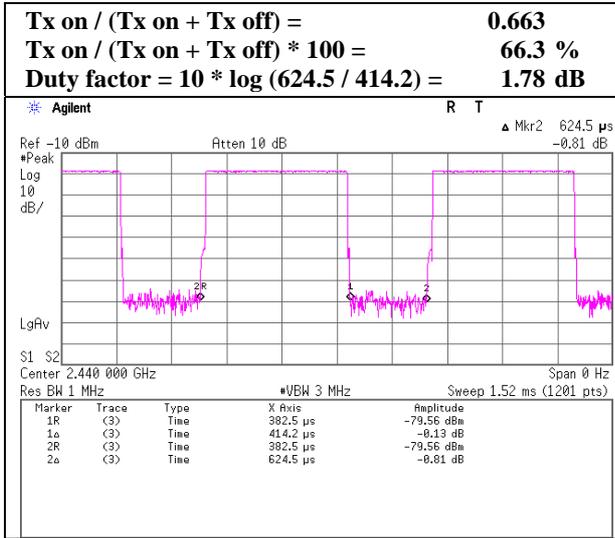
Burst rate confirmation
WLAN

11n 5GHz 40MBand MIMO MCS15

Tx on / (Tx on + Tx off) = 0.406
Tx on / (Tx on + Tx off) * 100 = 40.6 %
Duty factor = 10 * log (157.2 / 63.75) = 3.92 dB



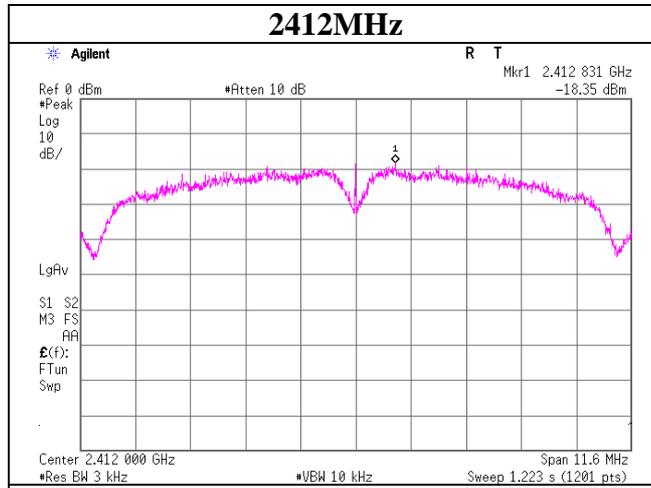
Burst rate confirmation
BT LE



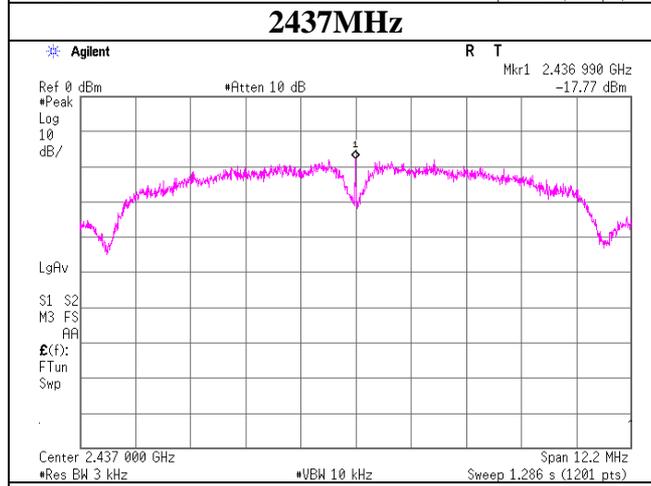
Power Density
WLAN

11b

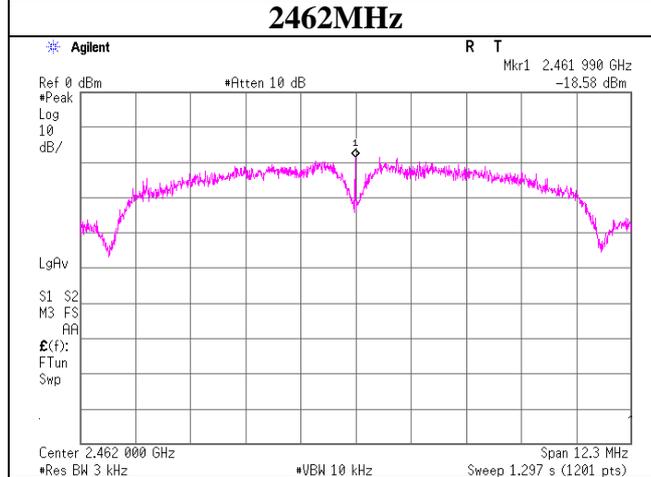
2412MHz



2437MHz



2462MHz



Power Density
WLAN

Test place : Head Office EMC Lab. No.4 Measurement Room
Report No. : 10004954H
Date : 04/04/2013
Temperature/ Humidity : 25 deg. C / 38% RH
Engineer : Satofumi Matsuyama
Mode : 11n-20 MIMO Tx

Antenna 0 + 1

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result		Limit [dBm]	Margin [dB]
			[dBm]	[mW]		
2412.00	0.04	0.03	-11.78	0.07	8.00	19.78
2437.00	0.08	0.11	-7.23	0.19	8.00	15.23
2462.00	0.05	0.04	-10.82	0.08	8.00	18.82

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit [dBm]	Margin [dB]
				[dBm]	[mW]		
2412.00	-27.62	3.13	10.01	-14.48	0.04	8.00	22.48
2437.00	-23.93	3.15	10.01	-10.77	0.08	8.00	18.77
2462.00	-26.43	3.13	10.01	-13.29	0.05	8.00	21.29

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit [dBm]	Margin [dB]
				[dBm]	[mW]		
2412.00	-28.27	3.13	10.01	-15.13	0.03	8.00	23.13
2437.00	-22.92	3.15	10.01	-9.76	0.11	8.00	17.76
2462.00	-27.59	3.13	10.01	-14.45	0.04	8.00	22.45

Sample Calculation:

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

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Head Office EMC Lab.

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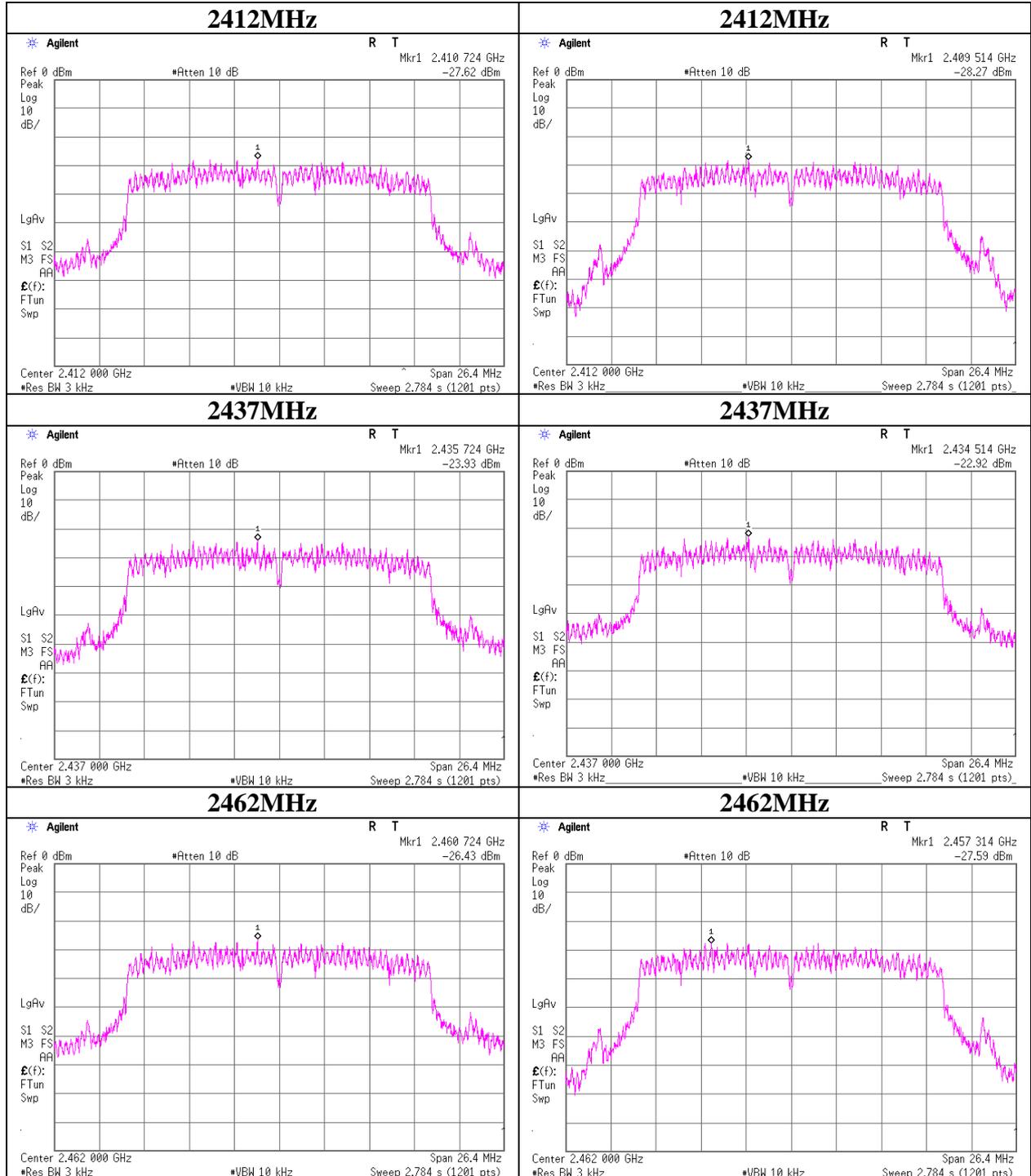
Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

**Power Density
WLAN**

11n-20 Antenna 0

11n-20 Antenna 1



Power Density
WLAN

Test place : Head Office EMC Lab. No.4 Measurement Room
Report No. : 10004954H
Date : 04/04/2013
Temperature/ Humidity : 25 deg. C / 38% RH
Engineer : Satofumi Matsuyama
Mode : 11n-40 MIMO Tx

Antenna 0 + 1

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result		Limit [dBm]	Margin [dB]
			[dBm]	[mW]		
2422.00	0.01	0.01	-17.18	0.02	8.00	25.18
2437.00	0.02	0.02	-13.65	0.04	8.00	21.65
2452.00	0.01	0.01	-17.95	0.02	8.00	25.95

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit [dBm]	Margin [dB]
				[dBm]	[mW]		
2422.00	-32.77	3.13	10.01	-19.63	0.01	8.00	27.63
2437.00	-29.33	3.15	10.01	-16.17	0.02	8.00	24.17
2452.00	-33.58	3.13	10.01	-20.44	0.01	8.00	28.44

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit [dBm]	Margin [dB]
				[dBm]	[mW]		
2422.00	-33.97	3.13	10.01	-20.83	0.01	8.00	28.83
2437.00	-30.38	3.15	10.01	-17.22	0.02	8.00	25.22
2452.00	-34.70	3.13	10.01	-21.56	0.01	8.00	29.56

Sample Calculation:

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

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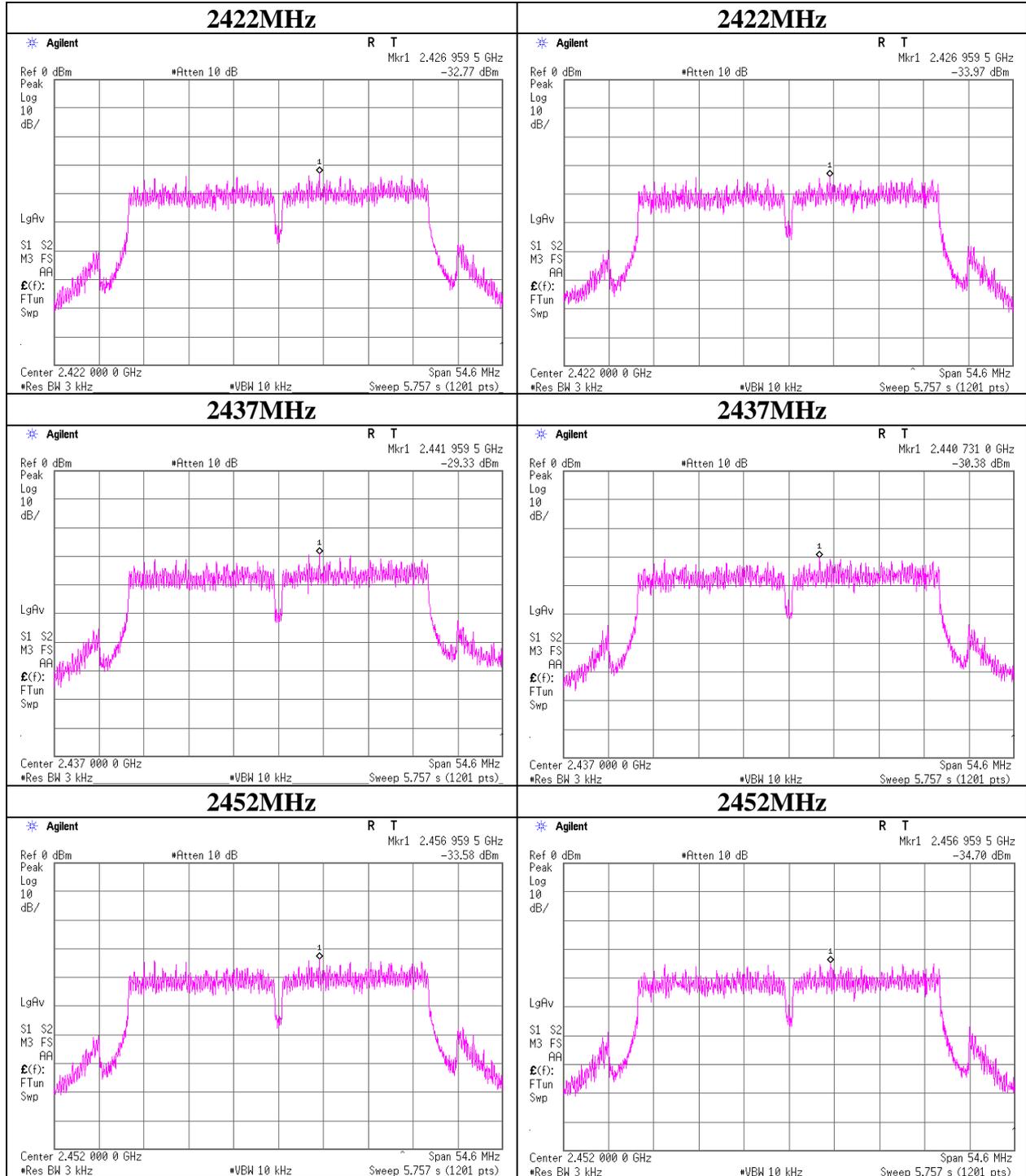
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**Power Density
WLAN**

11n-40 Antenna 0

11n-40 Antenna 1



Power Density
WLAN

Test place : Head Office EMC Lab. No.4 Measurement Room
Report No. : 10004954H
Date : 04/04/2013
Temperature/ Humidity : 25 deg. C / 38% RH
Engineer : Satofumi Matsuyama
Mode : 11n-20 MIMO Tx

Antenna 0 + 1

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result		Limit [dBm]	Margin [dB]
			[dBm]	[mW]		
5745.00	0.21	0.22	-3.69	0.43	8.00	11.69
5785.00	0.27	0.22	-3.05	0.50	8.00	11.05
5825.00	0.17	0.18	-4.66	0.34	8.00	12.66

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit [dBm]	Margin [dB]
				[dBm]	[mW]		
5745.00	-22.97	6.09	10.03	-6.85	0.21	8.00	14.85
5785.00	-21.97	6.33	10.03	-5.61	0.27	8.00	13.61
5825.00	-22.88	5.04	10.03	-7.81	0.17	8.00	15.81

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit [dBm]	Margin [dB]
				[dBm]	[mW]		
5745.00	-22.67	6.09	10.03	-6.55	0.22	8.00	14.55
5785.00	-22.93	6.33	10.03	-6.57	0.22	8.00	14.57
5825.00	-22.60	5.04	10.03	-7.53	0.18	8.00	15.53

Sample Calculation:

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

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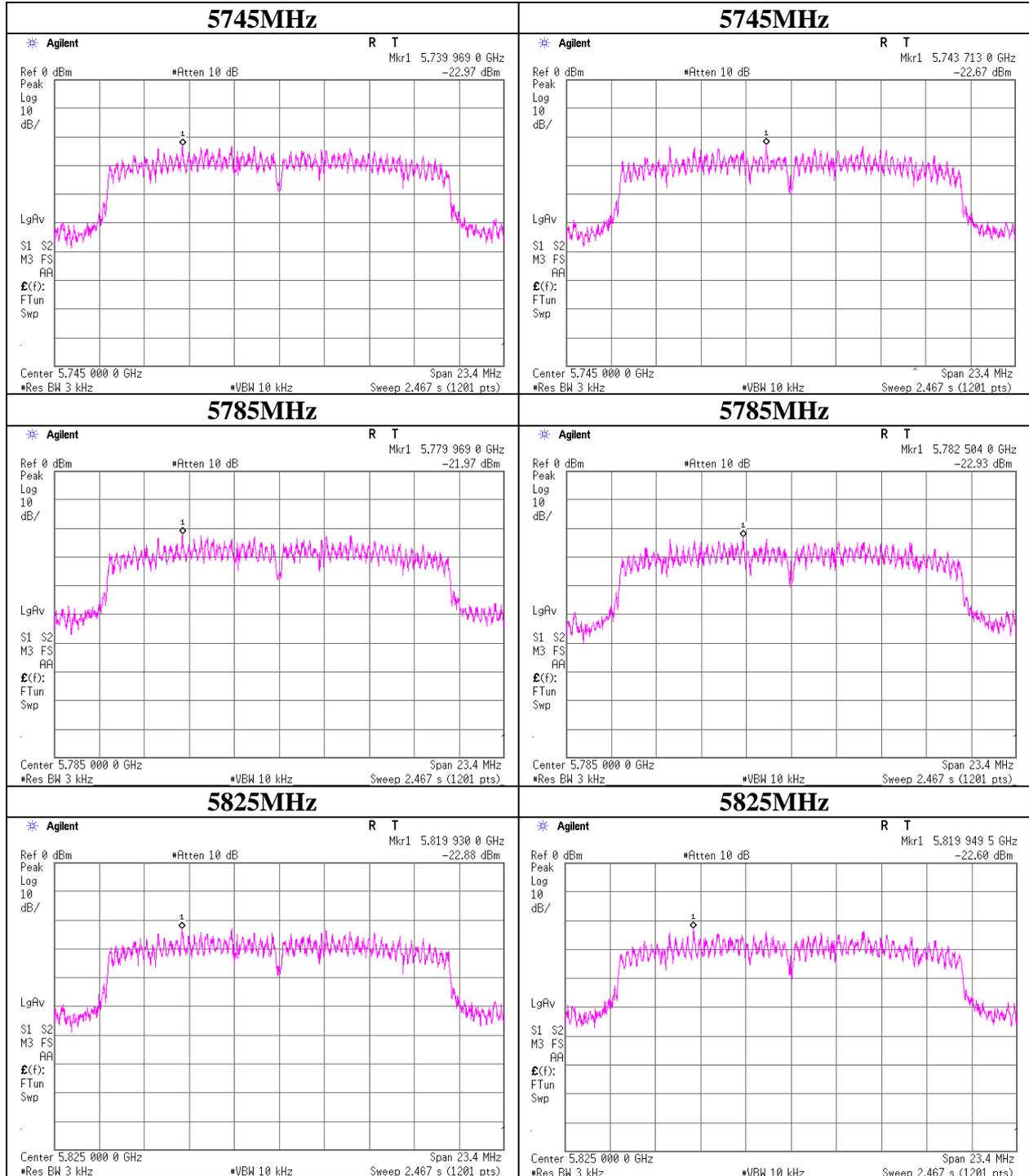
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**Power Density
WLAN**

11n-20 Antenna 0

11n-20 Antenna 1



Power Density
WLAN

Test place : Head Office EMC Lab. No.4 Measurement Room
Report No. : 10004954H
Date : 04/04/2013
Temperature/ Humidity : 25 deg. C / 38% RH
Engineer : Satofumi Matsuyama
Mode : 11n-40 MIMO Tx

Antenna 0 + 1

Freq. [MHz]	Antenna 0 Result [mW]	Antenna 1 Result [mW]	Result		Limit [dBm]	Margin [dB]
			[dBm]	[mW]		
5755.00	0.10	0.08	-7.50	0.18	8.00	15.50
5795.00	0.11	0.09	-6.99	0.20	8.00	14.99

Sample Calculation:

Result = Antenna 0 + 1

Antenna 0

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit [dBm]	Margin [dB]
				[dBm]	[mW]		
5755.00	-26.04	6.09	10.03	-9.92	0.10	8.00	17.92
5795.00	-25.76	6.33	10.03	-9.40	0.11	8.00	17.40

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result		Limit [dBm]	Margin [dB]
				[dBm]	[mW]		
5755.00	-27.32	6.09	10.03	-11.20	0.08	8.00	19.20
5795.00	-27.06	6.33	10.03	-10.70	0.09	8.00	18.70

Sample Calculation:

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

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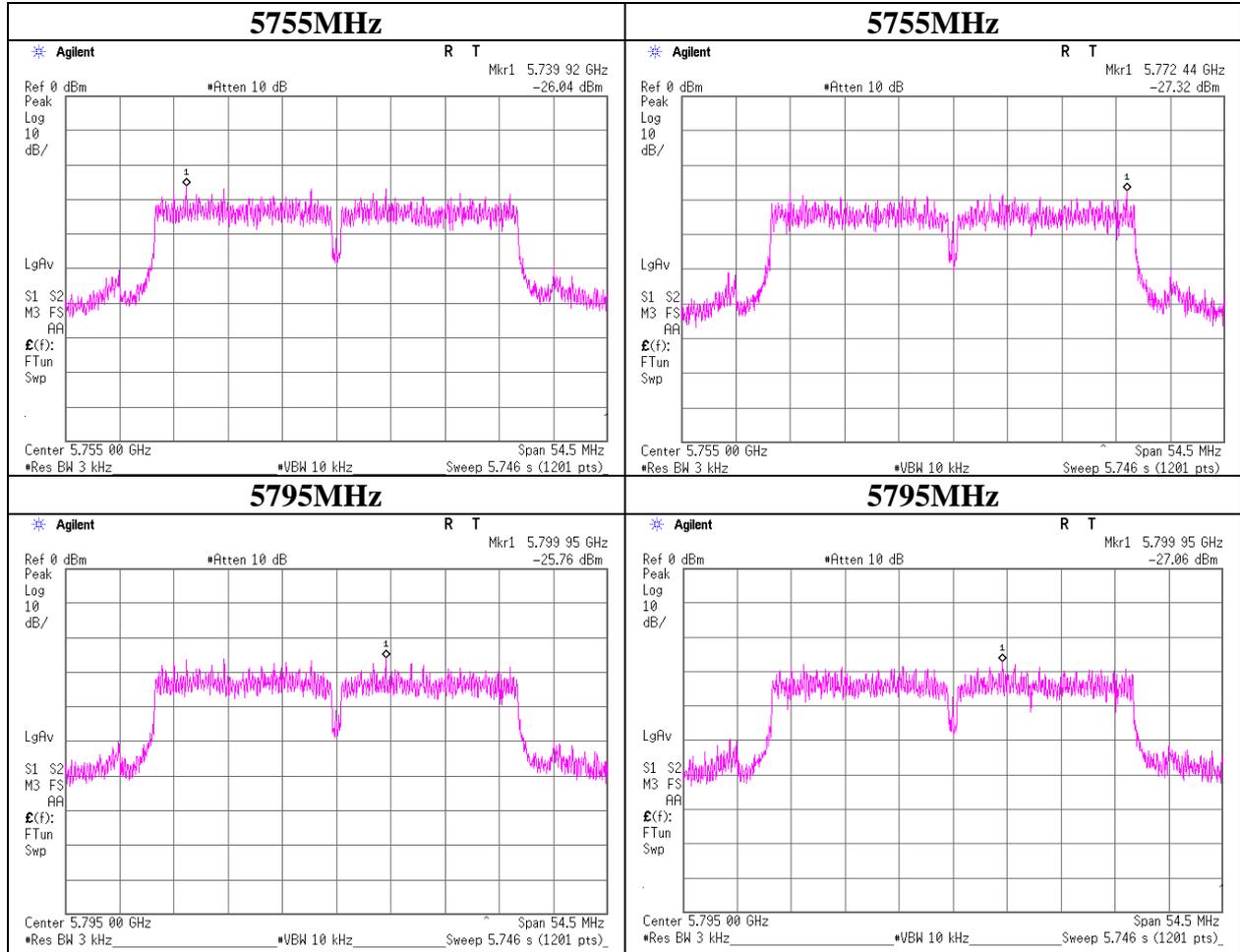
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Power Density
WLAN

11n-40 Antenna 0

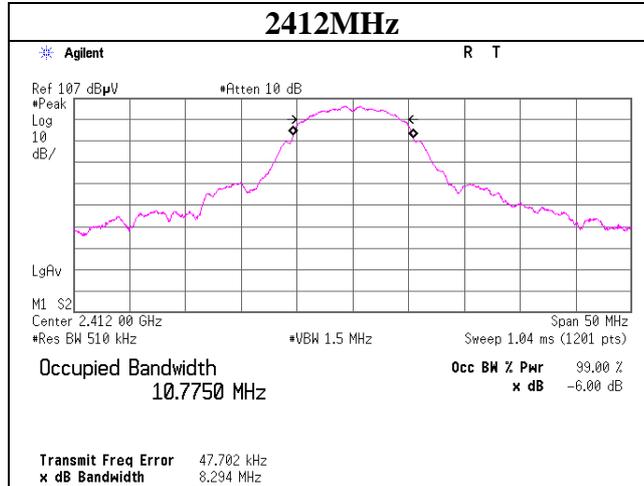
11n-40 Antenna 1



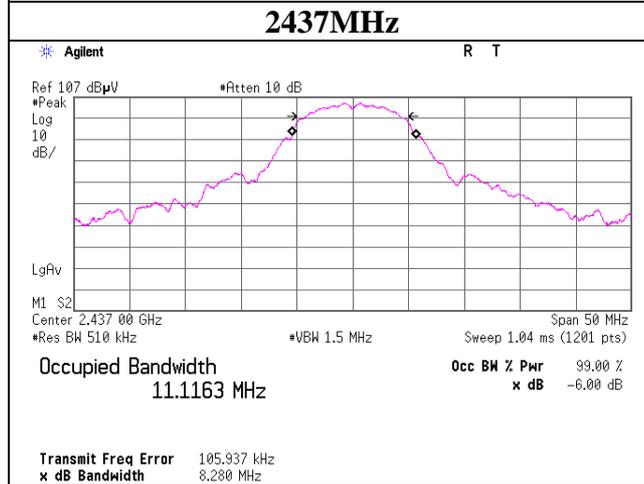
99% Occupied Bandwidth
WLAN

11b

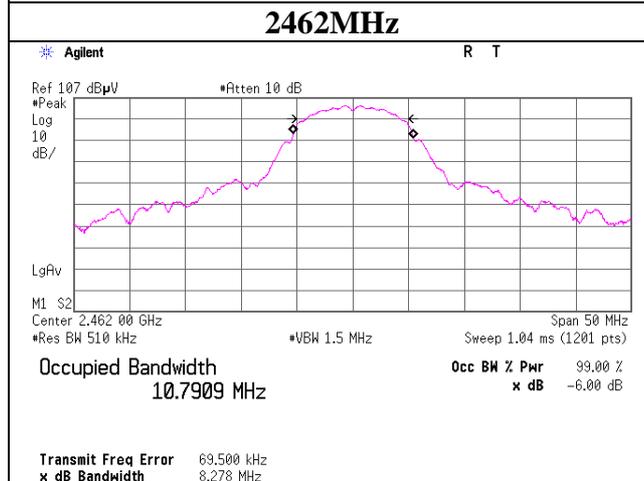
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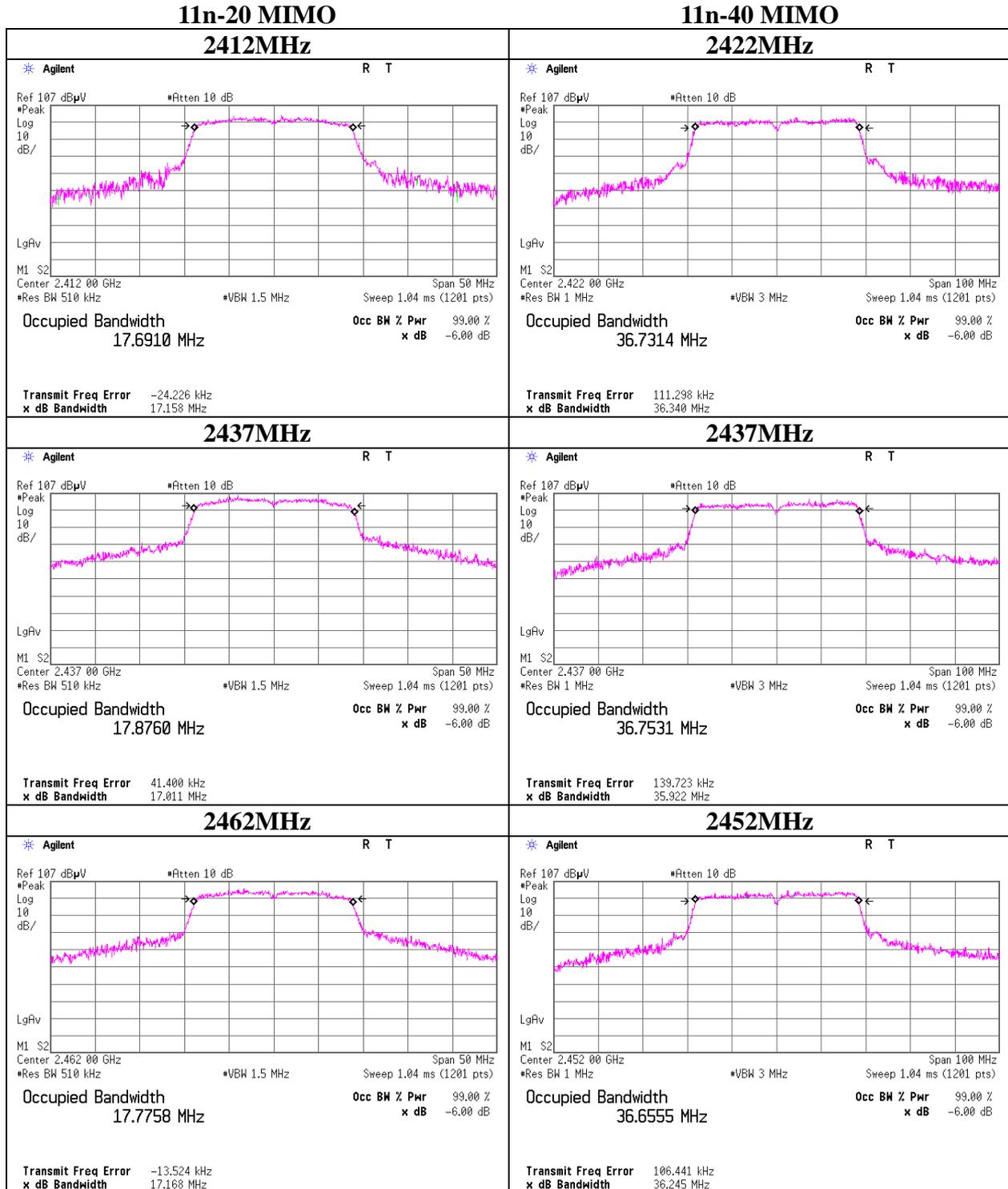
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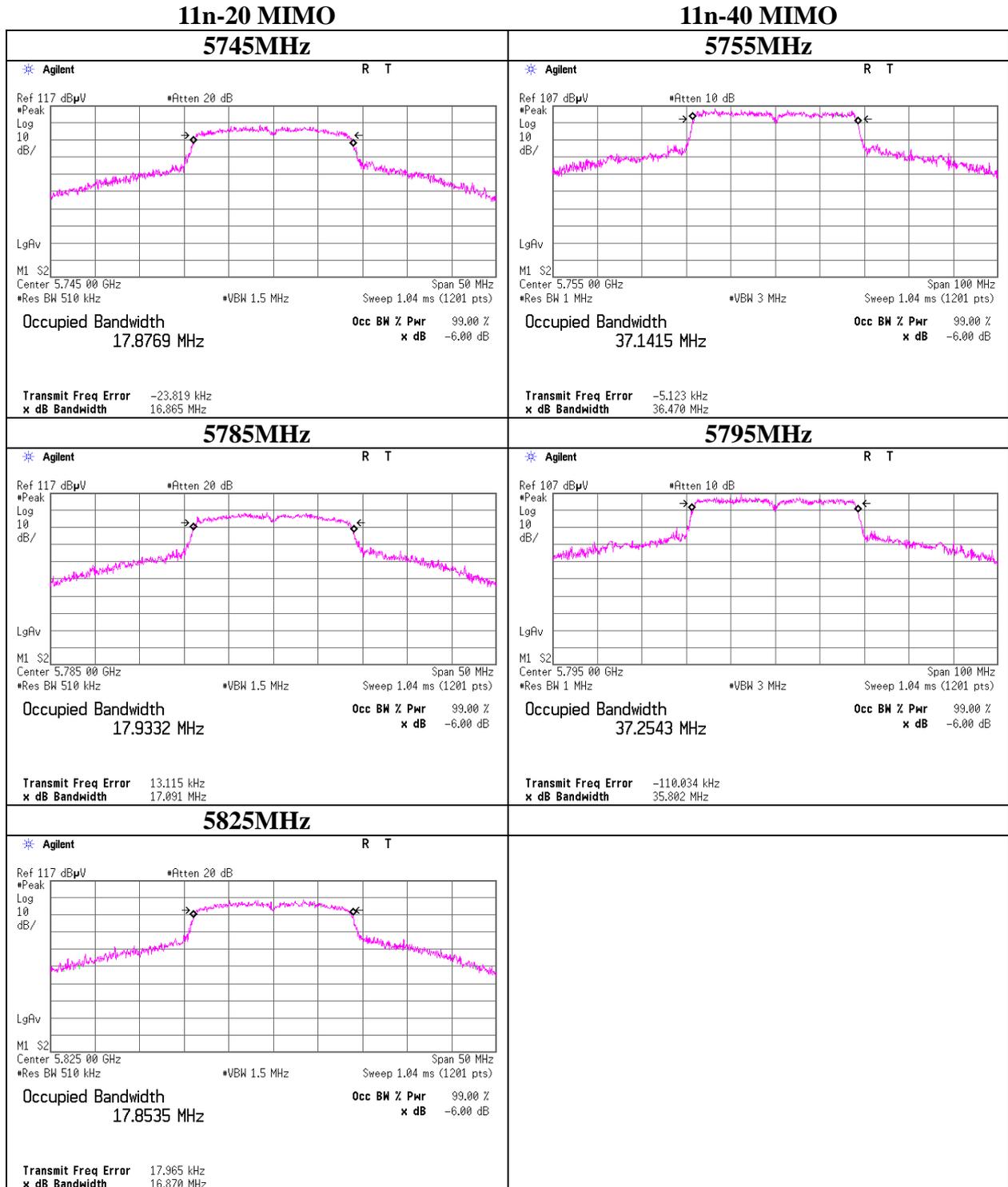
2462MHz



99% Occupied Bandwidth
WLAN



99% Occupied Bandwidth
WLAN



APPENDIX 2: Test instruments

EMI test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2013/02/28 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE	2013/02/26 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	RE	2012/06/19 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2012/05/25 * 12
MCC-133	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336164/4(1m)/ 340640(5m)	RE	2012/09/05 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2013/03/12 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2012/05/30 * 12
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	AT	2012/10/08 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	011737	AT	2012/10/08 * 12
MPM-12	Power Meter	Anritsu	ML2495A	0825002	AT	2012/06/01 * 12
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	AT	2012/06/01 * 12
MAT-25	Attenuator(10dB) (above1GHz)	Agilent	8493C	71642	AT	2012/06/27 * 12
MAT-20	Attenuator(10dB) (above1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	AT	2013/01/09 * 12
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	AT	2013/02/22 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2013/02/26 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2012/08/17 * 12
MCC-141	Microwave Cable	Junkosha	MWX221	1203S212(1m)/ 1204S062(5m)	RE	2012/04/23 * 12
MCC-54	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	RE	2013/03/19 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	3950M00205	RE	2012/06/22 * 12
MHF-23	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCC	603	RE	2013/01/10 * 12
MCC-79	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278923/4	RE	2012/12/24 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE(EUT)	2013/01/07 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2013/04/03 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2012/11/18 * 12
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2012/06/01 * 12
MAEC-01	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 10m	DA-06881	RE	2012/08/01 * 12
MOS-27	Thermo-Hygrometer	CUSTOM	CTH-201	A08Q26	RE	2013/02/26 * 12
MJM-01	Measure	KDS	ES19-55	-	RE	-
MTR-09	EMI Test Receiver	Rohde & Schwarz	ESU26	100412	RE	2012/06/14 * 12
MLPA-01	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100017	RE	2012/10/12 * 12
MCC-143	Coaxial Cable	UL Japan	-	-	RE	2012/07/27 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/TSJ	5D-2W(20m)/ 3D-2W(7.5m)/ RG400u(1.5m)/ RFM-E421(Switcher)	-/01068 (Switcher)	RE	2013/01/23 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2013/03/12 * 12

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EMI test equipment (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAT-08	Attenuator(6dB)	Weinschel Corp	2	BK7971	RE	2012/11/06 * 12
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE/CE	2013/02/28 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	RE/CE	2013/02/26 * 12
MJM-09	Measure	KDS	E19-55	-	RE/CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE/CE	2012/11/20 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	MY39500780	RE	2013/03/19 * 12
MHA-17	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170307	RE	2012/06/27 * 12
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	100635	RE/CE	2013/04/10 * 12
MAT-67	Attenuator	JFW Industries, Inc.	50FP-013H2 N	-	CE	2013/01/09 * 12
MCC-113	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/ SFM141(5m)/ 421-010(1m)/ suciform141-PE(1m)/ RFM-E121(Switcher)	-/04178	CE	2012/07/12 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2012/11/18 * 12
MAT-68	Attenuator	Anritsu	MP721B	6200961025	RE	2012/11/21 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2013/03/12 * 12
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2012/06/29 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2013/02/26 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2013/02/15 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2013/01/10 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2013/02/15 * 12
MCC-132	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336161/4(1m) / 340639(5m)	RE	2012/09/05 * 12
MHF-16	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCA	7001	RE	2012/09/06 * 12
MCC-77	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278942/4	RE	2012/12/14 * 12
MHA-04	Horn Antenna 26.5-40GHz	EMCO	3160-10	1140	RE	2012/11/07 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2013/04/10 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2012/10/08 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2012/10/08 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2013/02/06 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2012/11/06 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2012/09/11 * 12

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

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

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

**Test Item: CE: Conducted Emission
RE: Radiated Emission
AT: Antenna Terminal Conducted test**

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