



RADIO TEST REPORT

Test Report No. : 33CE0171-HO-F

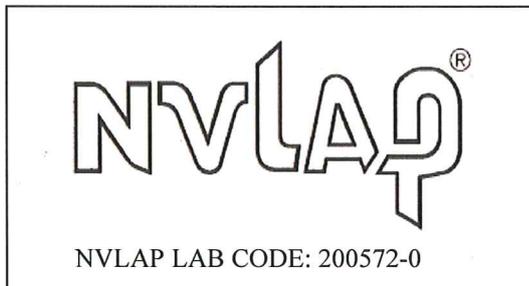
Applicant : Sharp Corporation, Communication Systems Group.
Type of Equipment : Cellular Phone
Model No. : 200SH
FCC ID : APYHRO00181
Test regulation : FCC Part 15 Subpart E: 2012
Test Result : Complied

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Date of test: October 19 to 24, 2012

Representative test engineer: 
Yutaka Yoshida
Engineer of WiSE Japan,
UL Verification Service

Approved by: 
Takahiro Hatakeda
Leader of WiSE Japan,
UL Verification Service



This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation. *As for the range of Accreditation in NVLAP, you may refer to the WEB address, <http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap>

CONTENTS	PAGE
SECTION 1: Customer information.....	3
SECTION 2: Equipment under test (E.U.T.).....	3
SECTION 3: Test specification, procedures & results.....	5
SECTION 4: Operation of E.U.T. during testing.....	8
SECTION 5: Conducted Emission.....	12
SECTION 6: Radiated Spurious Emission and Band Edge Compliance.....	13
SECTION 7: Antenna Terminal Conducted Tests.....	15
APPENDIX 1: Data of EMI test.....	16
Conducted Emission	16
26dB Emission Bandwidth and 99% Occupied Bandwidth.....	17
Maximum Conducted Output Power	26
Peak Power Spectral Density	33
Radiated Spurious Emission	43
Conducted Spurious Emission	60
Peak Excursion Ratio.....	61
APPENDIX 2: Test instruments	63
APPENDIX 3: Photographs of test setup.....	65
Conducted Emission	65
Radiated Spurious Emission	66
Worst Case Position	67

SECTION 1: Customer information

Company Name : Sharp Corporation, Communication Systems Group.
Address : 2-13-1 Iida Hachihonmatsu HigashiHiroshima-City, Hiroshima,
739-0192 Japan
Telephone Number : +81-82-420-1827
Facsimile Number : +81-82-420-1572
Contact Person : Hiroyuki Uwatoko

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

2.1 Identification of E.U.T.

Type of Equipment : Cellular Phone
Model No. : 200SH
Serial No. : Refer to Clause 4.2
Rating : AC110-240V, DC3.7V-4.0V
Receipt Date of Sample : October 13, 2012
Country of Mass-production : China
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product Description

Model No.: 200SH (referred to as the EUT in this report) is Cellular Phone.

General Specification

Clock frequency(ies) in the system : CPU: 1.512GHz (max)
RTC: 32.768kHz
Source oscillation: 19.2MHz / 27MHz (CPU) / 27.12MHz (NFC)

Radio Specification

RFID

Equipment Type	Transceiver
Frequency of Operation	13.56MHz
Type of Modulation	ASK
Antenna Type	Loop antenna
Antenna Gain	0dBi

Bluetooth (BDR/EDR)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS
Bandwidth & Channel spacing	1MHz & 1MHz
Antenna Type	L Type
Antenna Gain	0dBi

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Bluetooth (Low Energy)

Equipment Type	Transceiver
Frequency of Operation	2402-2480MHz
Type of Modulation	Digital modulation
Bandwidth & Channel spacing	1MHz & 2MHz
Antenna Type	L Type
Antenna Gain	0dBi

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

Equipment Type	Transceiver	
Frequency of Operation	2412-2462MHz	5180-5240MHz 5260-5320MHz 5500-5700MHz
Type of Modulation	DSSS, OFDM	OFDM
Bandwidth & Channel spacing	20MHz & 5MHz	20MHz & 20MHz
Antenna Type	L Type	
Antenna Gain	0dBi	

WLAN (IEEE802.11n-40)

Equipment Type	Transceiver
Frequency of Operation	5190-5230MHz 5270-5310MHz 5510-5670MHz
Type of Modulation	OFDM
Bandwidth & Channel spacing	40MHz & 40MHz
Antenna Type	L Type
Antenna Gain	0dBi

GSM (PCS 1900)

Equipment Type	Transceiver
Frequency of Operation	[Up Link] 1850 – 1910MHz [Down Link] 1930 – 1990MHz
Type of Modulation	GMSK
Emission Designator	249KGXW
Antenna Type	L Type
Antenna Gain	0dBi

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart E: 2012, final revised on August 13, 2012 and effective September 12, 2012

Title : FCC 47CFR Part15 Radio Frequency Device Subpart E
Unlicensed National Information Infrastructure Devices
Section 15.407 General technical requirements

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	FCC :ANSI C63.4:2003	FCC: 15.407(b)(6) / 15.207	QP 16.7dB, 1.30943MHz, N AV 26.5dB, 1.30943MHz, N	Complied	-
	IC: RSS-Gen 7.2.4	IC: RSS-Gen 7.2.4			
26dB Emission Bandwidth	FCC :ANSI C63.4:2003 FCC Public Notice 789033	FCC : 15.407(a)(1)(2)(3)	See data	N/A	Conducted
	IC: -	IC: -			
Maximum Peak Output Power	FCC :ANSI C63.4:2003, FCC Public Notice 789033	FCC : 15.407(a)(1)(2)(3)		Complied	Conducted
	IC: -	IC: RSS-210 A9.2(1)(2)(3)			
Peak Power Spectral Density	FCC :ANSI C63.4:2003, FCC Public Notice 789033	FCC : 15.407(a)(1)(2)(3)		Complied	Conducted
	IC: -	IC: RSS-210 A9.2(1)(2)(3)			
Peak Excursion Ratio	FCC :ANSI C63.4:2003, FCC Public Notice 789033	FCC : 15.407(a)(6)		Complied	Conducted
	IC: -	IC: -			
Spurious Emission Restricted Band Edge	FCC: ANSI C63.4:2003	FCC : 15.407(b), 15.205 and 15.209	5.3dB 5350MHz, AV, Hori.	Complied	Conducted / Radiated
	IC: -	IC: RSS-210 A.9.2(1)(2)(3)			
20dB Emission Bandwidth	FCC :ANSI C63.4:2003	FCC : 15.215(c)	See data	Complied	Conducted

Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420.
For DFS tests, please see the test report number 33CE0171-HO-G issued by UL Japan, Inc.

FCC 15.31 (e)

This EUT provides stable voltage (DC4.0V) constantly to RFpart 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 Band Width	RSS-Gen 4.6.1	RSS-210 A9.2 (1)(2)(3)	N/A	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 (10m*)(±dB)		
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz
No.1	4.2dB	5.0dB	4.8dB
No.2	-	-	-
No.3	-	-	-
No.4	-	-	-

*10m = Measurement distance

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

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	
1.0dB	1.1dB	2.7dB	3.2dB	3.3dB	1.5dB

Conducted Emission test

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

Radiated emission test(3m)

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

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8116 Facsimile : +81 596 24 8124

	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 Modes

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
IEEE 802.11n MIMO 20MHz BW (11n-20)	MCS 4(Long GI), PN9
IEEE 802.11n MIMO 40MHz BW (11n-40)	MCS 1 (Short GI), PN9
*Transmitting duty was close to 100% on all tests.	
*The worst condition was determined based on the test result of Maximum Peak Output Power.	

Power of the EUT was set by the software as follows;

[Power settings]

<IEEE 802.11a 5GHz Power Setting>

Mode	Channel	Data rate	Input command
TX	36ch	54Mbps	WBTX2 00360111450000020
TX	40ch	54Mbps	WBTX2 00400111450000020
TX	44ch	54Mbps	WBTX2 00440111450000020
TX	48ch	54Mbps	WBTX2 00480111450000020
TX	52ch	54Mbps	WBTX2 00520111400000020
TX	56ch	54Mbps	WBTX2 00560111400000020
TX	60ch	54Mbps	WBTX2 00600111400000020
TX	64ch	54Mbps	WBTX2 00640111400000020
TX	100ch	54Mbps	WBTX2 01000111400000020
TX	104ch	54Mbps	WBTX2 01040111400000020
TX	108ch	54Mbps	WBTX2 01080111400000020
TX	112ch	54Mbps	WBTX2 01120111400000020
TX	116ch	54Mbps	WBTX2 01160111400000020
TX	120ch	54Mbps	WBTX2 01200111400000020
TX	124ch	54Mbps	WBTX2 01240111400000020
TX	128ch	54Mbps	WBTX2 01280111400000020
TX	132ch	54Mbps	WBTX2 01320111400000020
TX	136ch	54Mbps	WBTX2 01360111400000020
TX	140ch	54Mbps	WBTX2 01400111400000020

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

<IEEE 802.11n-20 5GHz Power Setting>

Mode	Channel	Data rate	Input command
TX	36ch	39Mbps(MCS4)	WBTX2 00360161350000020
TX	40ch	39Mbps(MCS4)	WBTX2 00400161350000020
TX	44ch	39Mbps(MCS4)	WBTX2 00440161350000020
TX	48ch	39Mbps(MCS4)	WBTX2 00480161350000020
TX	52ch	39Mbps(MCS4)	WBTX2 00520161350000020
TX	56ch	39Mbps(MCS4)	WBTX2 00560161350000020
TX	60ch	39Mbps(MCS4)	WBTX2 00600161350000020
TX	64ch	39Mbps(MCS4)	WBTX2 00640161350000020
TX	100ch	39Mbps(MCS4)	WBTX2 01000161300000020
TX	104ch	39Mbps(MCS4)	WBTX2 01040161300000020
TX	108ch	39Mbps(MCS4)	WBTX2 01080161300000020
TX	112ch	39Mbps(MCS4)	WBTX2 01120161300000020
TX	116ch	39Mbps(MCS4)	WBTX2 01160161300000020
TX	120ch	39Mbps(MCS4)	WBTX2 01200161300000020
TX	124ch	39Mbps(MCS4)	WBTX2 01240161300000020
TX	128ch	39Mbps(MCS4)	WBTX2 01280161300000020
TX	132ch	39Mbps(MCS4)	WBTX2 01320161300000020
TX	136ch	39Mbps(MCS4)	WBTX2 01360161300000020
TX	140ch	39Mbps(MCS4)	WBTX2 01400161300000020

<IEEE 802.11n-40 5GHz Power Setting>

Mode	Channel	Data rate	Input command
TX	38ch	27Mbps(MCS1)	WBTX2 10380211500000020
TX	46ch	27Mbps(MCS1)	WBTX2 10460211500000020
TX	54ch	27Mbps(MCS1)	WBTX2 10540211500000020
TX	62ch	27Mbps(MCS1)	WBTX2 10620211500000020
TX	102ch	27Mbps(MCS1)	WBTX2 11020211500000020
TX	110ch	27Mbps(MCS1)	WBTX2 11100211500000020
TX	118ch	27Mbps(MCS1)	WBTX2 11180211500000020
TX	126ch	27Mbps(MCS1)	WBTX2 11260211500000020
TX	134ch	27Mbps(MCS1)	WBTX2 11340211500000020

[Software]

F8295

*This setting of 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.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

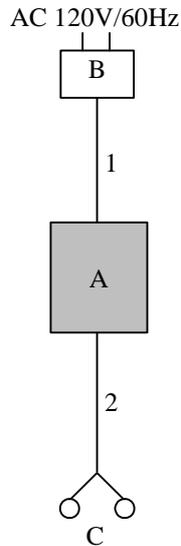
Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

*Details of Operating mode(s)

Test Item	Operating Mode	Tested Frequency		
		Low Band	Middle Band	Additional Band
Conducted emission (AC) Spurious Emission (Conducted)	11n-40 Tx *1)	-	-	5670MHz *1)
26dB Emission Bandwidth, 99% Occupied Bandwidth, Maximum Peak Output Power, Peak Power Spectral Density,	11a Tx	5180MHz 5220MHz 5240MHz	5260MHz 5300MHz 5320MHz	5500MHz 5600MHz 5700MHz
	11n-20 Tx	5180MHz 5220MHz 5240MHz	5260MHz 5300MHz 5320MHz	5500MHz 5600MHz 5700MHz
	11n-40 Tx	5190MHz 5230MHz	5270MHz 5310MHz	5510MHz 5590MHz 5670MHz
Spurious Emission(Radiated)	11a Tx	5180MHz 5240MHz	5320MHz	5500MHz 5600MHz 5700MHz
	11n-20 Tx	5180MHz	5320MHz	5500MHz 5700MHz
	11n-40 Tx	5190MHz 5230MHz	5310MHz	5510MHz 5590MHz 5670MHz
Peak Excursion Ratio	11a Tx	5180MHz	-	-
	11n-20 Tx	5180MHz	-	-
	11n-40 Tx	5190MHz	-	-
*1) The operating mode and the frequency was chosen as a representative, because it had the highest power at antenna terminal test, and the noise levels at the mode/tested frequencies were equivalent to those of other modes/tested frequencies.				

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	Cellular Phone	200SH	004401/11/441657/7 *1) 004401/11/441666/8 *2)	Sharp Corporation	EUT
B	AC Adapter	SHCEJ1	100	Sharp Corporation	-
C	Earphone	-	-	Sharp Corporation	-

*1) Used for Conducted Emission and Radiated Spurious Emission tests

*2) Used for Antenna Terminal Conducted tests

List of cables used

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

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

SECTION 5: Conducted Emission

Test Procedure

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 cable and AC 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 or a Measurement Room.

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

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

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

SECTION 6: Radiated Spurious Emission and Band Edge Compliance

Test Procedure

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

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

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.

Below 1GHz

The result also satisfied with the general limits specified in section 15.209(a).

Above 1GHz

Inside of restricted bands(Section 15.205): Apply to limit in the Section 15.209(a).

Outside of the restricted bands: Apply to limit 68.2dBuV/m(-27dBm e.i.r.p. *)
in the Section 15.407(b)(1)(2)(3).

Restricted bandedge: Apply to limit in the Section 15.209(a).

Since this limit is severer than the limit of the inside of restricted bands.

*Electric Field Strength to e.i.r.p. Conversion

$$E = \frac{1000000\sqrt{30P}}{3} \text{ (uV/m)} \quad : P \text{ is the e.i.r.p. (Watts)}$$

Test Antennas are used as below;

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

Frequency	Below 1GHz	Above 1GHz	
Instrument used	Test Receiver	Spectrum Analyzer	
Detector	QP	PK	AV
IF Bandwidth	BW 120kHz(T/R)	RBW: 1MHz VBW: 3MHz	Method AD (Average Detection): Primary method RBW: 1MHz VBW: 3MHz Detector: RMS (Power) Trace: - 100 traces (when duty cycle is $\geq 98\%$) - Numbers of traces were increased by a factor of 1/duty cycle. Duty factor was added to the results. (when duty cycle is <98%)
Test Distance	3m	3m (below 10GHz), 1m*1) (above 10GHz), 0.5m*2) (above 26.5GHz)	

*1) Distance Factor: $20 \times \log(3.0m/1.0m) = 9.5dB$

*2) Distance Factor: $20 \times \log(3.0m/0.5m) = 15.6dB$

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

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

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

Measurement range : 30M-40GHz
Test data : APPENDIX
Test result : Pass

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used and Test method
26dB Bandwidth	30MHz, 60MHz	Close to 1% of EBW	Greater than RBW	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	Enough width to display 20dB Bandwidth	Close to 1% of Span	Three times of RBW	Auto	Peak	Max Hold	Spectrum Analyzer
Maximum Peak Output Power Peak Power Spectral Density	40MHz, 80MHz	1MHz	3MHz	Auto	RMS Power Averaging (100 times)	Clear Write	SA-1
Peak Excursion Ratio	40MHz, 80MHz	1MHz	3MHz	Auto	RMS Sample Power Averaging (100 times)	Max Hold Clear Write	Spectrum Analyzer
Conducted Spurious Emission	9kHz – 150kHz	200Hz	620Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz – 30MHz	9.1kHz	27kHz	Auto	Peak	Max Hold	Spectrum Analyzer

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

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Data of EMI test

Conducted Emission

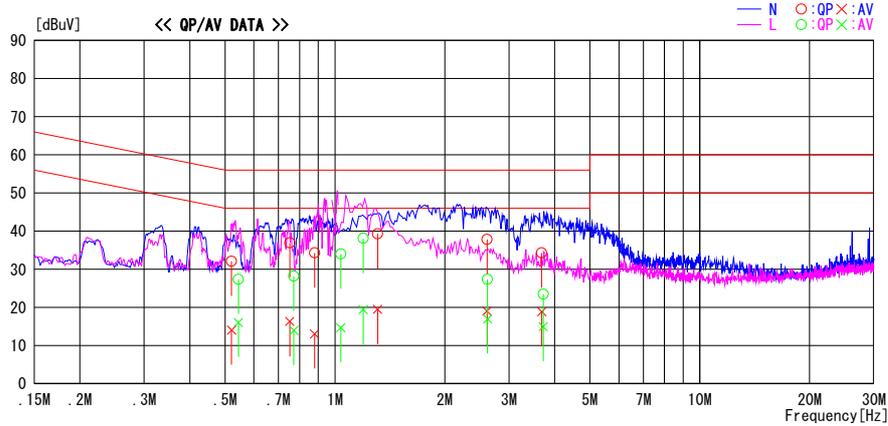
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber

Report No. : 33CE0171-HO
Temp./Humi. : 23deg. C / 52% RH
Engineer : Kazuya Yoshioka

Mode / Remarks : WLAN 11n-40 Tx 5670MHz

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]		
0.52061	18.7	0.7	13.4	32.1	14.1	56.0	46.0	23.9	31.9	N	
0.75185	23.5	2.9	13.4	36.9	16.3	56.0	46.0	19.1	29.7	N	
0.87981	20.9	-0.3	13.4	34.3	13.1	56.0	46.0	21.7	32.9	N	
1.30943	25.8	6.0	13.5	39.3	19.5	56.0	46.0	16.7	26.5	N	
2.61069	24.2	5.5	13.6	37.8	19.1	56.0	46.0	18.2	26.9	N	
3.68624	20.4	5.0	13.9	34.3	18.9	56.0	46.0	21.7	27.1	N	
0.54360	14.0	2.7	13.4	27.4	16.1	56.0	46.0	28.6	29.9	L	
0.77120	14.8	0.6	13.4	28.2	14.0	56.0	46.0	27.8	32.0	L	
1.03820	20.6	1.3	13.4	34.0	14.7	56.0	46.0	22.0	31.3	L	
1.19575	24.6	5.9	13.5	38.1	19.4	56.0	46.0	17.9	26.6	L	
2.62092	13.8	3.4	13.6	27.4	17.0	56.0	46.0	28.6	29.0	L	
3.72524	9.6	1.1	13.9	23.5	15.0	56.0	46.0	32.5	31.0	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.

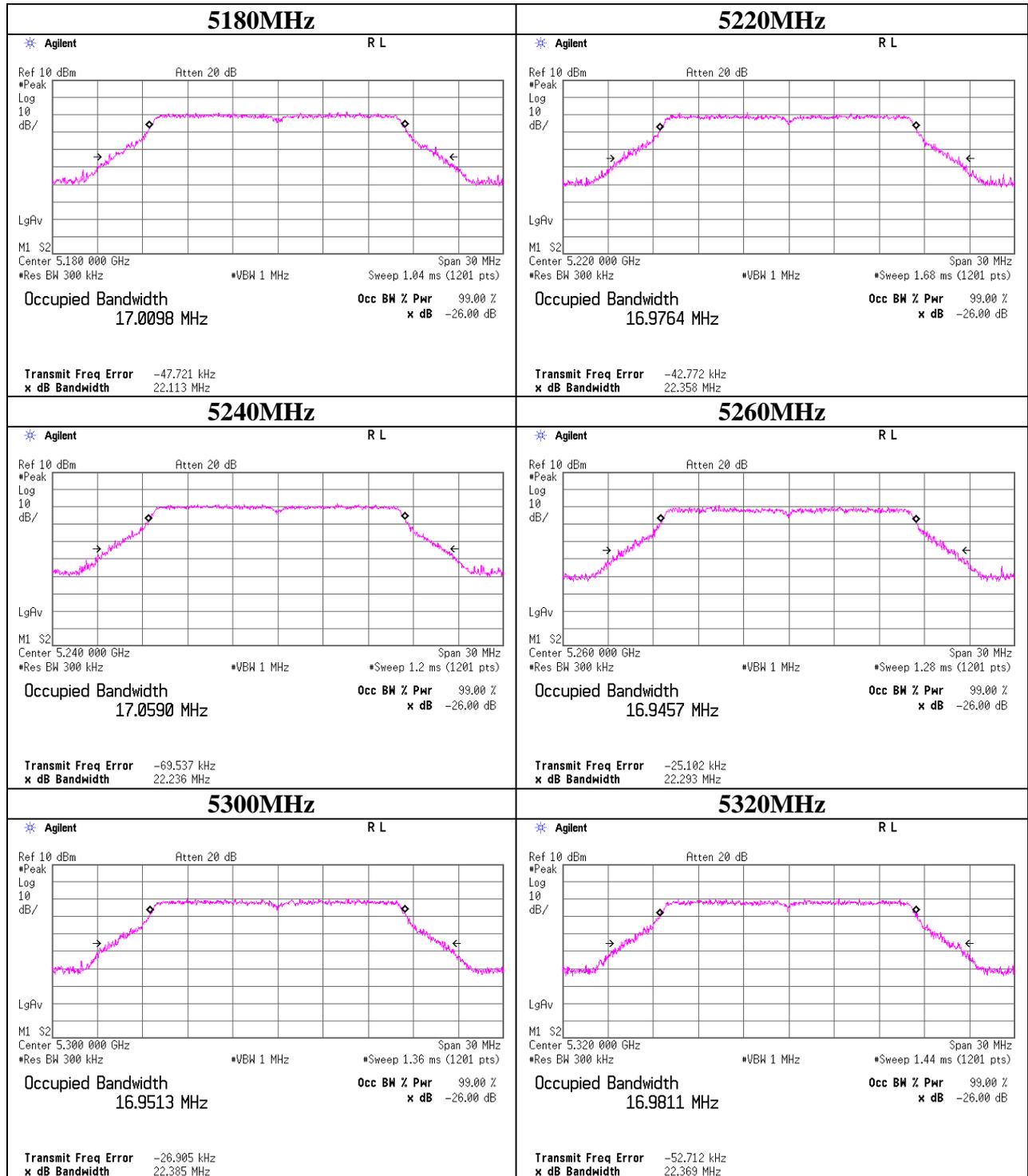
26dB Emission Bandwidth and 99% Occupied Bandwidth

Test place Head Office EMC Lab. No.6 Semi Anechoic Chamber
Report No. 33CE0171-HO
Date 10/19/2012
Temperature/ Humidity 24deg. C / 36% RH
Engineer Yutaka Yoshida
Mode 11a Tx

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5180	22.113	17.010	-
5220	22.358	16.976	-
5240	22.236	17.059	-
5260	22.293	16.946	-
5300	22.385	16.951	-
5320	22.369	16.981	-
5500	22.363	17.009	-
5600	22.034	17.018	-
5700	22.210	17.004	-

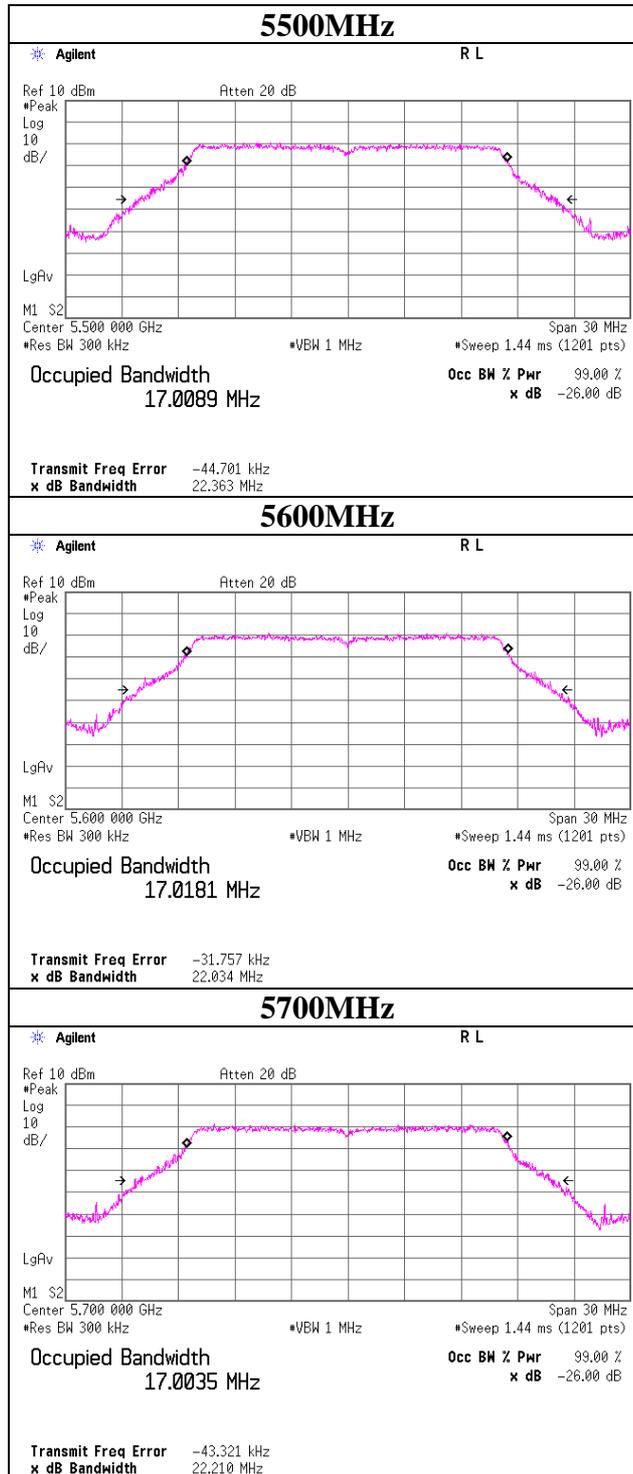
26dB Emission Bandwidth & 99% Occupied Bandwidth

11a



26dB Emission Bandwidth & 99% Occupied Bandwidth

11a



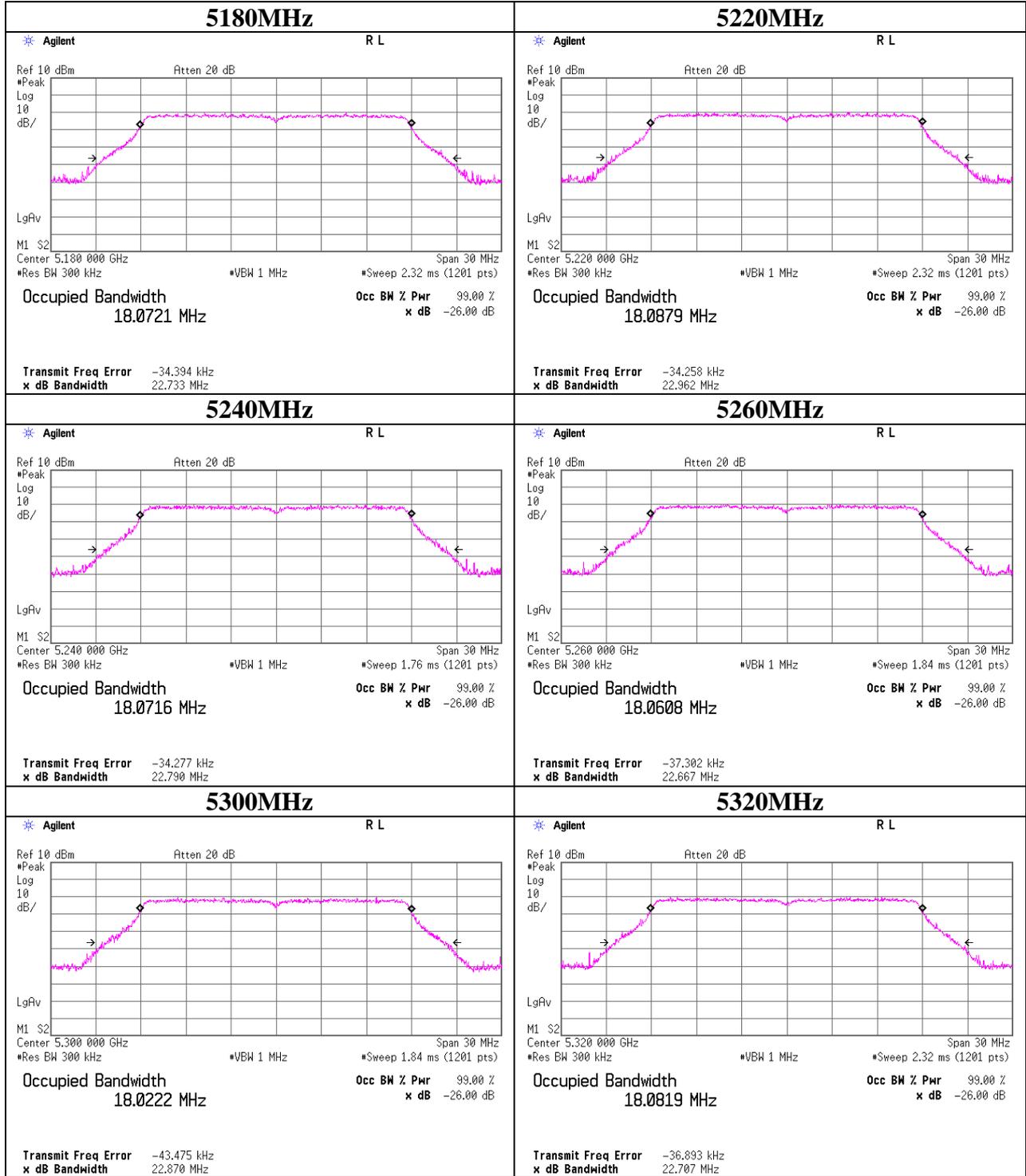
26dB Emission Bandwidth and 99% Occupied Bandwidth

Test place Head Office EMC Lab. No.6 Semi Anechoic Chamber
Report No. 33CE0171-HO
Date 10/19/2012
Temperature/ Humidity 24deg. C / 36% RH
Engineer Yutaka Yoshida
Mode 11n-20 Tx

Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5180	22.733	18.072	-
5220	22.962	18.088	-
5240	22.790	18.072	-
5260	22.667	18.061	-
5300	22.870	18.022	-
5320	22.707	18.082	-
5500	22.935	18.122	-
5600	22.636	18.059	-
5700	22.959	18.129	-

26dB Emission Bandwidth & 99% Occupied Bandwidth

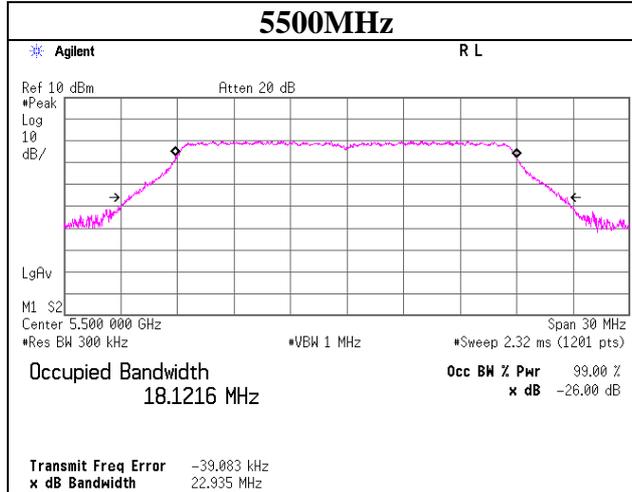
11n-20



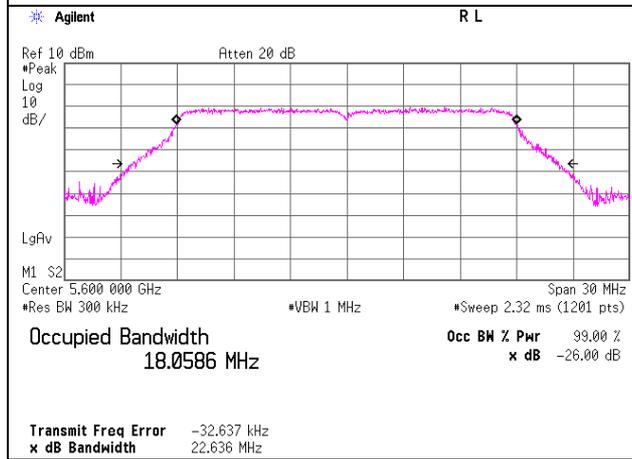
26dB Emission Bandwidth & 99% Occupied Bandwidth

11n-20

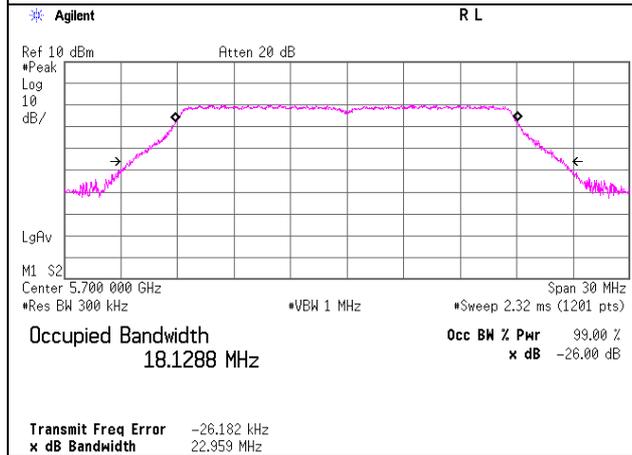
5500MHz



5600MHz



5700MHz



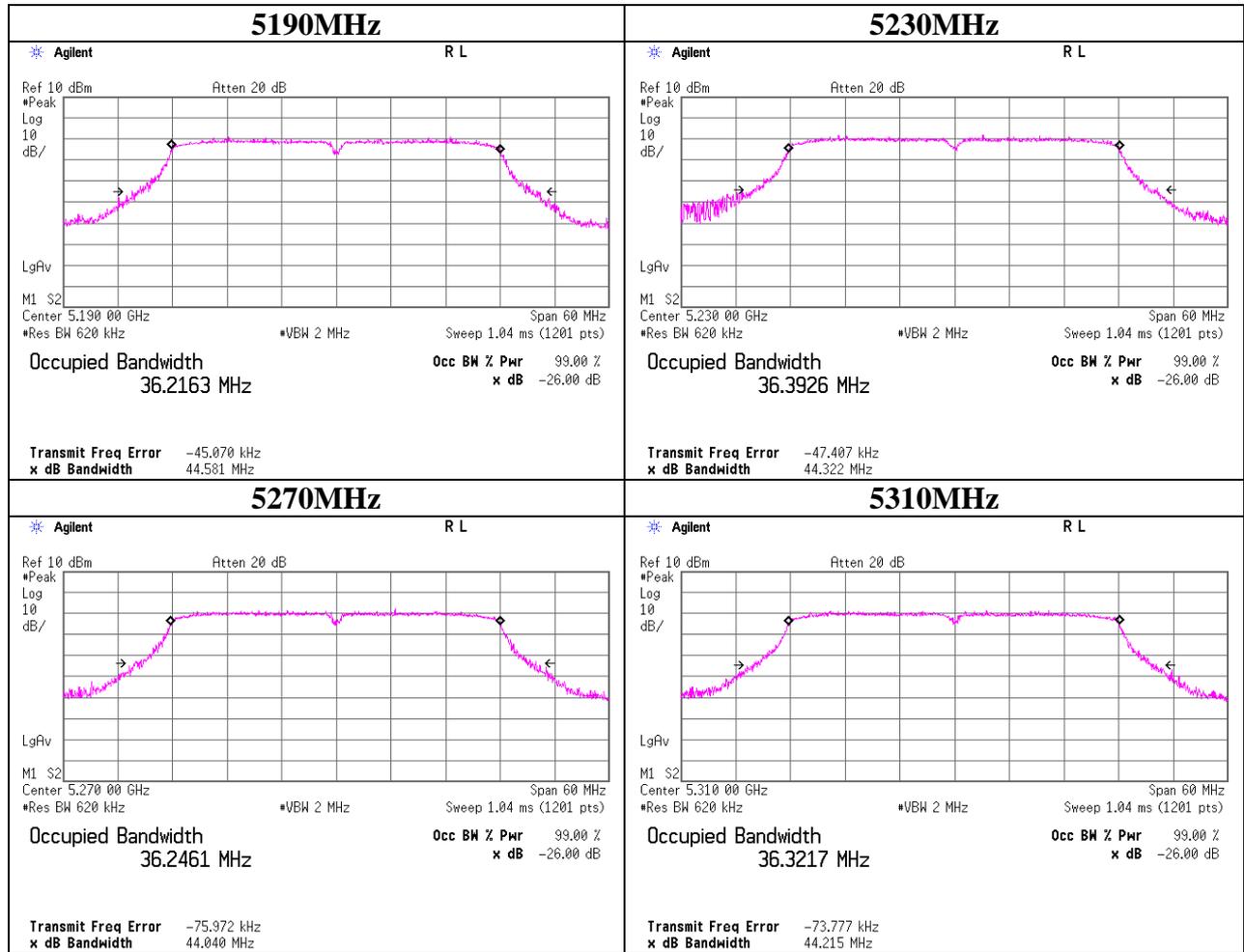
26dB Emission Bandwidth and 99% Occupied Bandwidth

Test place Head Office EMC Lab. No.7 Semi Anechoic Chamber
Report No. 33CE0171-HO
Date 10/22/2012
Temperature/ Humidity 23deg. C / 47% RH
Engineer Yutaka Yoshida
Mode 11n-40 Tx

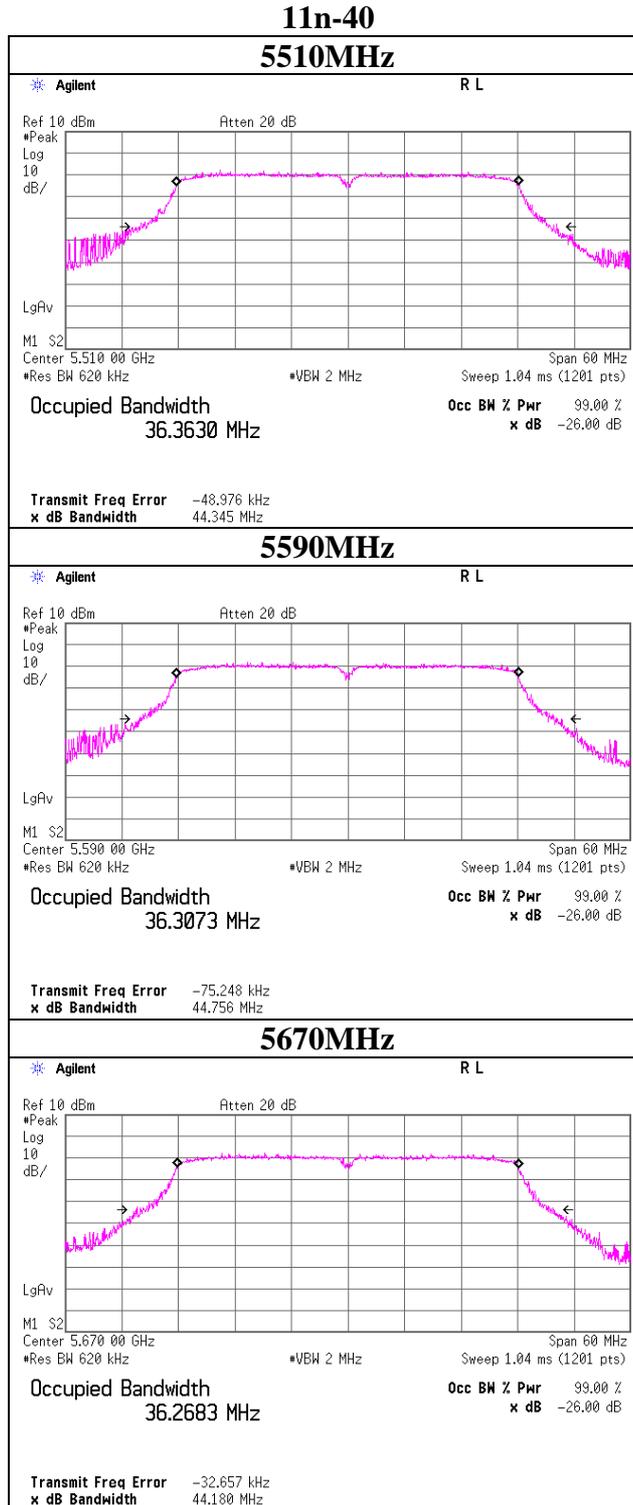
Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
5190	44.581	36.216	-
5230	44.322	36.393	-
5270	44.040	36.246	-
5310	44.215	36.322	-
5510	44.345	36.363	-
5590	44.756	36.307	-
5670	44.180	36.268	-

26dB Emission Bandwidth and 99% Occupied Bandwidth

11n-40



26dB Emission Bandwidth and 99% Occupied Bandwidth



Maximum Conducted Output Power

Test place Head Office EMC Lab. No.6 Semi Anechoic Chamber
Report No. 33CE0171-HO
Date 10/19/2012
Temperature/ Humidity 24deg. C / 36% RH
Engineer Yutaka Yoshida
Mode 11a Tx

Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result (Cond.) [dBm]	Result (e.i.r.p.) [dBm]	Limit (Cond.) [dBm]	Limit (e.i.r.p.) [dBm]	Margin (Cond.) [dB]	Margin (e.i.r.p.) [dB]
5180.0	-1.35	2.35	10.00	0.00	11.00	11.00	16.98	-	5.98	-
5220.0	-0.66	2.36	10.00	0.00	11.70	11.70	16.98	-	5.28	-
5240.0	-1.02	2.36	10.00	0.00	11.34	11.34	16.98	-	5.64	-
5260.0	-1.12	2.37	9.99	0.00	11.24	11.24	23.97	-	12.73	-
5300.0	-1.13	2.37	9.99	0.00	11.23	11.23	23.97	-	12.74	-
5320.0	-1.28	2.38	9.99	0.00	11.09	11.09	23.97	-	12.88	-
5500.0	-0.91	2.41	9.99	0.00	11.49	11.49	23.97	-	12.48	-
5600.0	-0.78	2.43	9.99	0.00	11.64	11.64	23.97	-	12.33	-
5700.0	-0.36	2.45	9.99	0.00	12.08	12.08	23.97	-	11.89	-

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

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

15.407(a)(1) Limit(Cond.) = 16.98dBm(50mW) or 4 + 10log(26dB BW) dBm

15.407(a)(2) Limit(Cond.) = 23.97dBm(250mW) or 11 + 10log(26dB BW) dBm

Maximum Conducted Output Power

Test place : Head Office EMC Lab. No.6 Semi Anechoic Chamber
Report No. : 33CE0171-HO
Date : 10/19/2012
Temperature/ Humidity : 24deg. C / 36% RH
Engineer : Yutaka Yoshida
Mode : 11n-20 Tx

Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result (Cond.) [dBm]	Result (e.i.r.p.) [dBm]	Limit (Cond.) [dBm]	Limit (e.i.r.p.) [dBm]	Margin (Cond.) [dB]	Margin (e.i.r.p.) [dB]
5180.0	-2.39	2.35	10.00	0.00	9.96	9.96	16.98	-	7.02	-
5220.0	-2.13	2.36	10.00	0.00	10.23	10.23	16.98	-	6.75	-
5240.0	-2.06	2.36	10.00	0.00	10.30	10.30	16.98	-	6.68	-
5260.0	-1.63	2.37	9.99	0.00	10.73	10.73	23.97	-	13.24	-
5300.0	-1.63	2.37	9.99	0.00	10.73	10.73	23.97	-	13.24	-
5320.0	-1.88	2.38	9.99	0.00	10.49	10.49	23.97	-	13.48	-
5500.0	-1.85	2.41	9.99	0.00	10.55	10.55	23.97	-	13.42	-
5600.0	-1.75	2.43	9.99	0.00	10.67	10.67	23.97	-	13.30	-
5700.0	-1.31	2.45	9.99	0.00	11.13	11.13	23.97	-	12.84	-

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

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

15.407(a)(1) Limit(Cond.) = 16.98dBm(50mW) or 4 + 10log(26dB BW) dBm

15.407(a)(2) Limit(Cond.) = 23.97dBm(250mW) or 11 + 10log(26dB BW) dBm

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Maximum Conducted Output Power

Test place Head Office EMC Lab. No.7 Semi Anechoic Chamber
Report No. 33CE0171-HO
Date 10/22/2012
Temperature/ Humidity 23deg. C. / 47% RH
Engineer Yutaka Yoshida
Mode 11n-40 Tx

Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result (Cond.) [dBm]	Result (e.i.r.p.) [dBm]	Limit (Cond.) [dBm]	Limit (e.i.r.p.) [dBm]	Margin (Cond.) [dB]	Margin (e.i.r.p.) [dB]
5190.0	-0.82	2.35	10.00	0.00	11.53	11.53	16.98	-	5.45	-
5230.0	-0.57	2.36	10.00	0.00	11.79	11.79	16.98	-	5.19	-
5270.0	0.00	2.37	9.99	0.00	12.36	12.36	23.97	-	11.61	-
5310.0	-0.52	2.37	9.99	0.00	11.84	11.84	23.97	-	12.13	-
5510.0	-0.18	2.41	9.99	0.00	12.22	12.22	23.97	-	11.75	-
5590.0	0.14	2.43	9.99	0.00	12.56	12.56	23.97	-	11.41	-
5670.0	0.70	2.45	9.99	0.00	13.14	13.14	23.97	-	10.83	-

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

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

15.407(a)(1) Limit(Cond.) = 16.98dBm(50mW) or 4 + 10log(26dB BW) dBm

15.407(a)(2) Limit(Cond.) = 23.97dBm(250mW) or 11 + 10log(26dB BW) dBm

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Maximum Average Output Power (Reference data for SAR testing)

IEEE802.11a 5180-5240MHz band 6Mbps

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
36	5180	0.05	0.50	10.00	10.55	11.35
40	5200	0.66	0.50	10.00	11.16	13.06
44	5220	0.54	0.50	10.00	11.04	12.71
48	5240	0.52	0.50	10.00	11.02	12.65

Sample Calculation: Result = Reading + Cable Loss + Attenuator

IEEE802.11n-20 5180-5240MHz band MCS0

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
36	5180	-0.74	0.50	10.00	9.76	9.46
40	5200	-0.90	0.50	10.00	9.60	9.12
44	5220	-1.17	0.50	10.00	9.33	8.57
48	5240	-0.35	0.50	10.00	10.15	10.35

IEEE802.11n-40 5190-5230MHz band MCS0

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
38	5190	0.11	0.50	10.00	10.61	11.51
46	5230	0.71	0.50	10.00	11.21	13.21

Sample Calculation: Result = Reading + Cable Loss + Attenuator

IEEE802.11a 5260-5320MHz band 6Mbps

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
52	5260	0.31	0.50	9.99	10.80	12.02
56	5280	0.06	0.50	9.99	10.55	11.35
60	5300	0.32	0.50	9.99	10.81	12.05
64	5320	0.15	0.50	9.99	10.64	11.59

Sample Calculation: Result = Reading + Cable Loss + Attenuator

IEEE802.11n-20 5260-5320MHz band MCS0

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
52	5260	-0.39	0.50	9.99	10.10	10.23
56	5280	-0.67	0.50	9.99	9.82	9.59
60	5300	-0.41	0.50	9.99	10.08	10.19
64	5320	-0.52	0.50	9.99	9.97	9.93

Sample Calculation: Result = Reading + Cable Loss + Attenuator

IEEE802.11n-40 5270-5310MHz band MCS0

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
54	5270	0.51	0.50	9.99	11.00	12.59
62	5310	0.79	0.50	9.99	11.28	13.43

Sample Calculation: Result = Reading + Cable Loss + Attenuator

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

[IEEE802.11a 5500-5700MHz band] band 6Mbps

Ch	Freq. [MHz]	P/M Reading	Cable Loss	Atten.	Result	
		[dBm]			[dBm]	[mW]
		AVG			AVG	AVG
100	5500	0.73	0.50	9.99	11.22	13.24
104	5520	0.80	0.50	9.99	11.29	13.46
108	5540	0.87	0.50	9.99	11.36	13.68
112	5560	0.92	0.50	9.99	11.41	13.84
116	5580	0.94	0.50	9.99	11.43	13.90
120	5600	0.80	0.50	9.99	11.29	13.46
124	5620	0.68	0.50	9.99	11.17	13.09
128	5640	0.93	0.50	9.99	11.42	13.87
132	5660	0.87	0.50	9.99	11.36	13.68
136	5680	1.21	0.50	9.99	11.70	14.79
140	5700	1.11	0.50	9.99	11.60	14.45

Sample Calculation: Result = Reading + Cable Loss + Attenuator

[IEEE802.11n-20 5500-5700MHz band] band MCS0

Ch	Freq. [MHz]	P/M Reading	Cable Loss	Atten.	Result	
		[dBm]			[dBm]	[mW]
		AVG			AVG	AVG
100	5500	-0.22	0.50	9.99	10.27	10.64
104	5520	-0.31	0.50	9.99	10.18	10.42
108*	5540	-0.57	0.50	9.99	9.92	9.82
112	5560	-0.30	0.50	9.99	10.19	10.45
116	5580	-0.03	0.50	9.99	10.46	11.12
120*	5600	-0.19	0.50	9.99	10.30	10.72
124	5620	-0.32	0.50	9.99	10.17	10.40
128	5640	-0.35	0.50	9.99	10.14	10.33
132*	5660	-0.11	0.50	9.99	10.38	10.91
136	5680	0.07	0.50	9.99	10.56	11.38
140	5700	0.13	0.50	9.99	10.62	11.53

Sample Calculation: Result = Reading + Cable Loss + Attenuator

[IEEE802.11n-40 5500-5700MHz band] band MCS0

Ch	Freq. [MHz]	P/M Reading [dBm] AVG	Cable Loss [dB]	Atten. [dB]	Result	
					[dBm] AVG	[mW] AVG
102	5510	1.48	0.50	9.99	11.97	15.74
110	5550	1.12	0.50	9.99	11.61	14.49
118	5590	1.69	0.50	9.99	12.18	16.52
126	5630	1.40	0.50	9.99	11.89	15.45
134	5670	1.51	0.50	9.99	12.00	15.85

Sample Calculation: Result = Reading + Cable Loss + Attenuator

Peak Power Spectral Density

Test place Head Office EMC Lab. No.6 Semi Anechoic Chamber
Report No. 33CE0171-HO
Date 10/19/2012
Temperature/ Humidity 24deg. C / 36% RH
Engineer Yutaka Yoshida
Mode 11a Tx

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
5180.0	-12.91	2.35	10.00	0.00	-0.56	4.00	4.56
5220.0	-12.13	2.36	10.00	0.00	0.23	4.00	3.77
5240.0	-12.55	2.36	10.00	0.00	-0.19	4.00	4.19
5260.0	-12.73	2.37	9.99	0.00	-0.37	11.00	11.37
5300.0	-12.66	2.37	9.99	0.00	-0.30	11.00	11.30
5320.0	-12.84	2.38	9.99	0.00	-0.47	11.00	11.47
5500.0	-12.47	2.41	9.99	0.00	-0.06	11.00	11.07
5600.0	-12.33	2.43	9.99	0.00	0.09	11.00	10.91
5700.0	-11.99	2.45	9.99	0.00	0.45	11.00	10.55

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator - ENBW
*ENBW: Equivalent Noise Band Width

Peak Power Spectral Density

Test place Head Office EMC Lab. No.6 Semi Anechoic Chamber
Report No. 33CE0171-HO
Date 10/19/2012
Temperature/ Humidity 24deg. C / 36% RH
Engineer Yutaka Yoshida
Mode 11n-20 Tx

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Antenna Gain [dBi]	Result [dBm]	Limit [dBm]	Margin [dB]
5180.0	-14.20	2.35	10.00	0.00	-1.85	4.00	5.85
5220.0	-14.06	2.36	10.00	0.00	-1.70	4.00	5.70
5240.0	-13.93	2.36	10.00	0.00	-1.57	4.00	5.57
5260.0	-13.53	2.37	9.99	0.00	-1.17	11.00	12.17
5300.0	-13.48	2.37	9.99	0.00	-1.12	11.00	12.12
5320.0	-13.88	2.38	9.99	0.00	-1.51	11.00	12.51
5500.0	-13.65	2.41	9.99	0.00	-1.25	11.00	12.25
5600.0	-13.66	2.43	9.99	0.00	-1.24	11.00	12.24
5700.0	-13.18	2.45	9.99	0.00	-0.74	11.00	11.74

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator - ENBW
*ENBW: Equivalent Noise Band Width

Peak Power Spectral Density

Test place Head Office EMC Lab. No.7 Semi Anechoic Chamber
Report No. 33CE0171-HO
Date 10/22/2012
Temperature/ Humidity 23deg. C / 47% RH
Engineer Yutaka Yoshida
Mode 11n-40 Tx

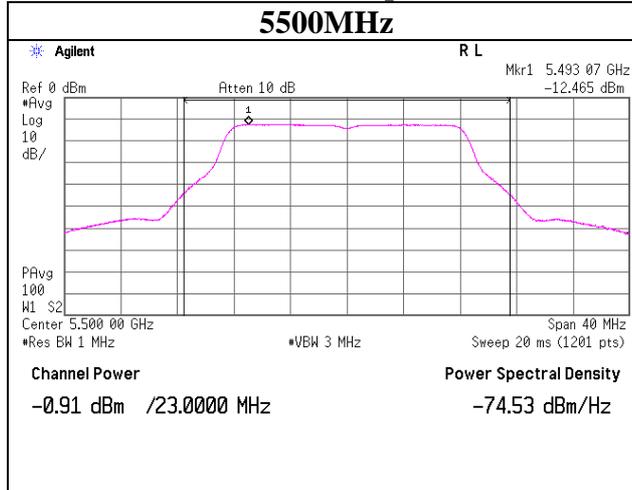
Freq.	Reading	Cable Loss	Atten.	Antenna Gain	Result	Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBi]	[dBm]	[dBm]	[dB]
5190.0	-15.52	2.35	10.00	0.00	-3.17	4.00	7.17
5230.0	-15.23	2.36	10.00	0.00	-2.87	4.00	6.87
5270.0	-14.70	2.37	9.99	0.00	-2.34	11.00	13.34
5310.0	-15.21	2.37	9.99	0.00	-2.85	11.00	13.85
5510.0	-14.82	2.41	9.99	0.00	-2.42	11.00	13.42
5550.0	-14.58	2.43	9.99	0.00	-2.16	11.00	13.16
5670.0	-14.06	2.45	9.99	0.00	-1.62	11.00	12.62

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

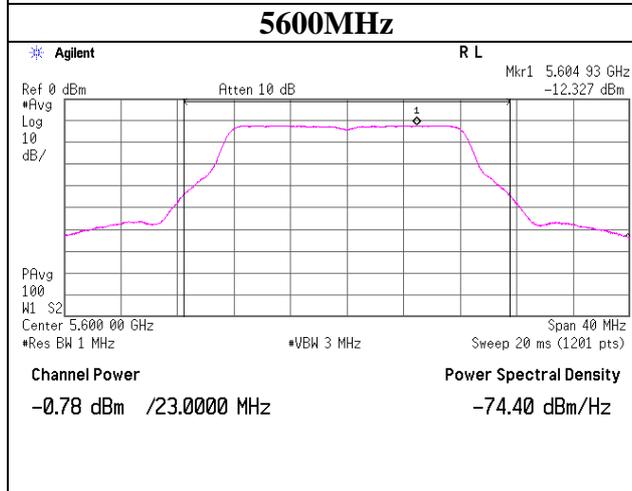
Maximum Peak Output Power & Peak Power Spectral Density

11a, 54Mbps

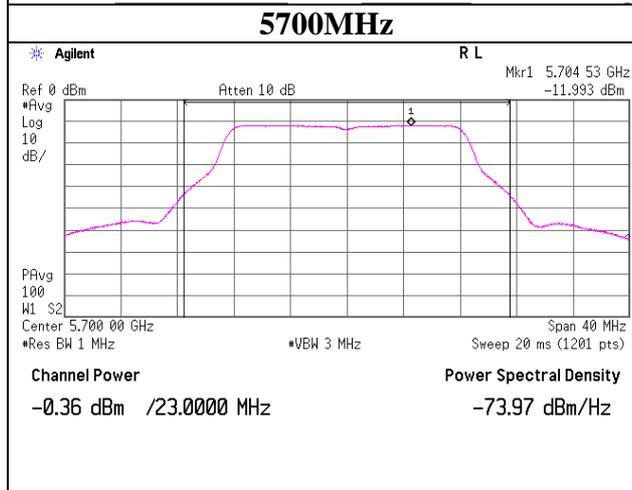
5500MHz



5600MHz

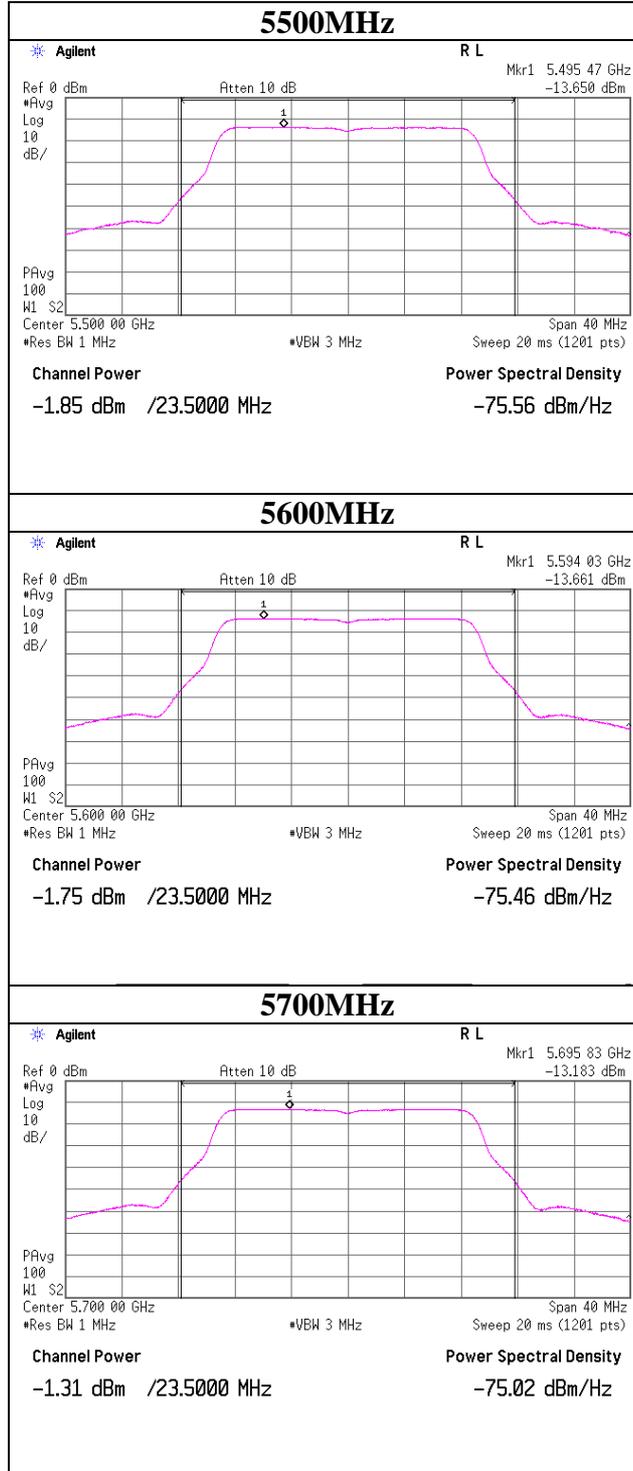


5700MHz



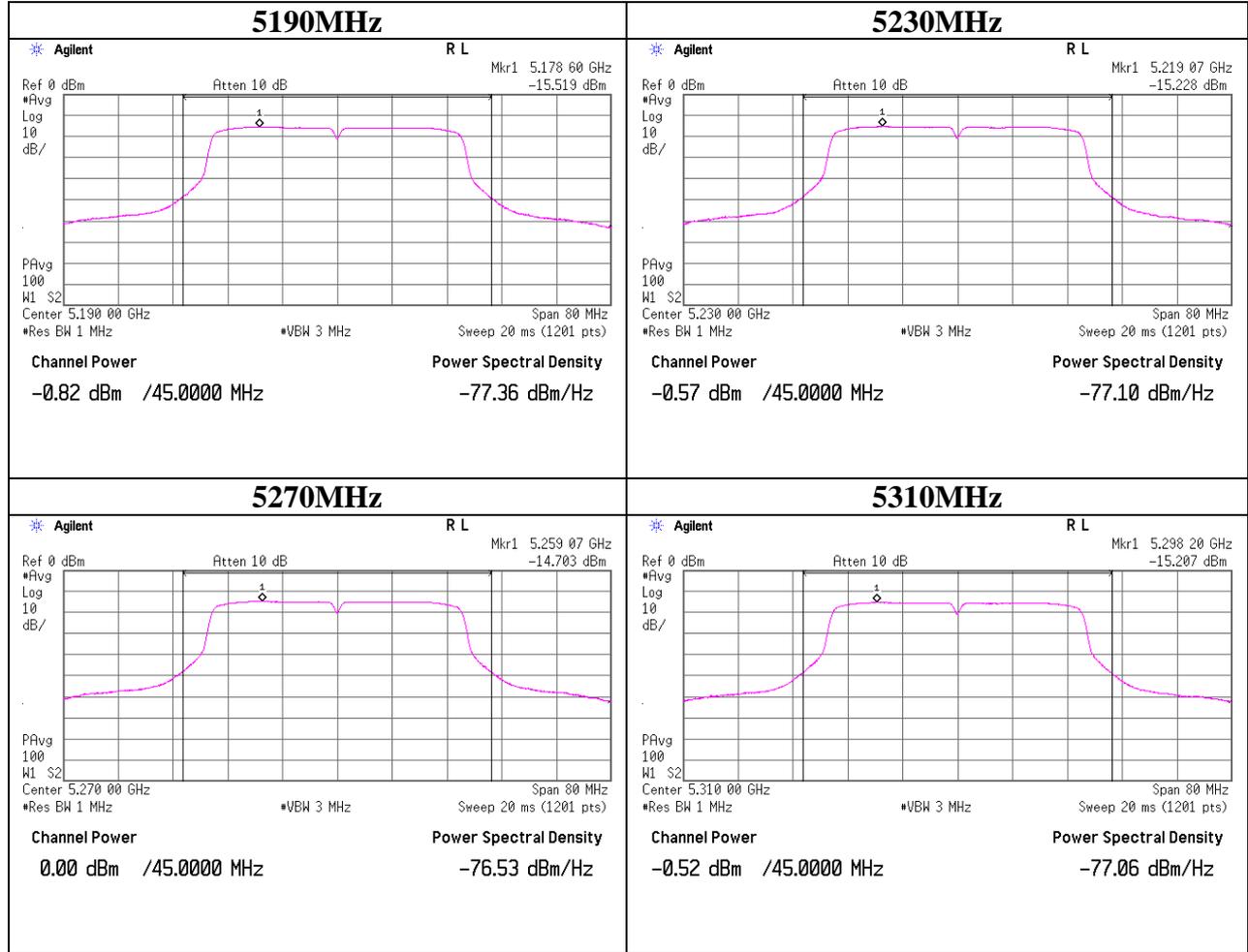
Maximum Peak Output Power & Peak Power Spectral Density

11n-20, MCS 4



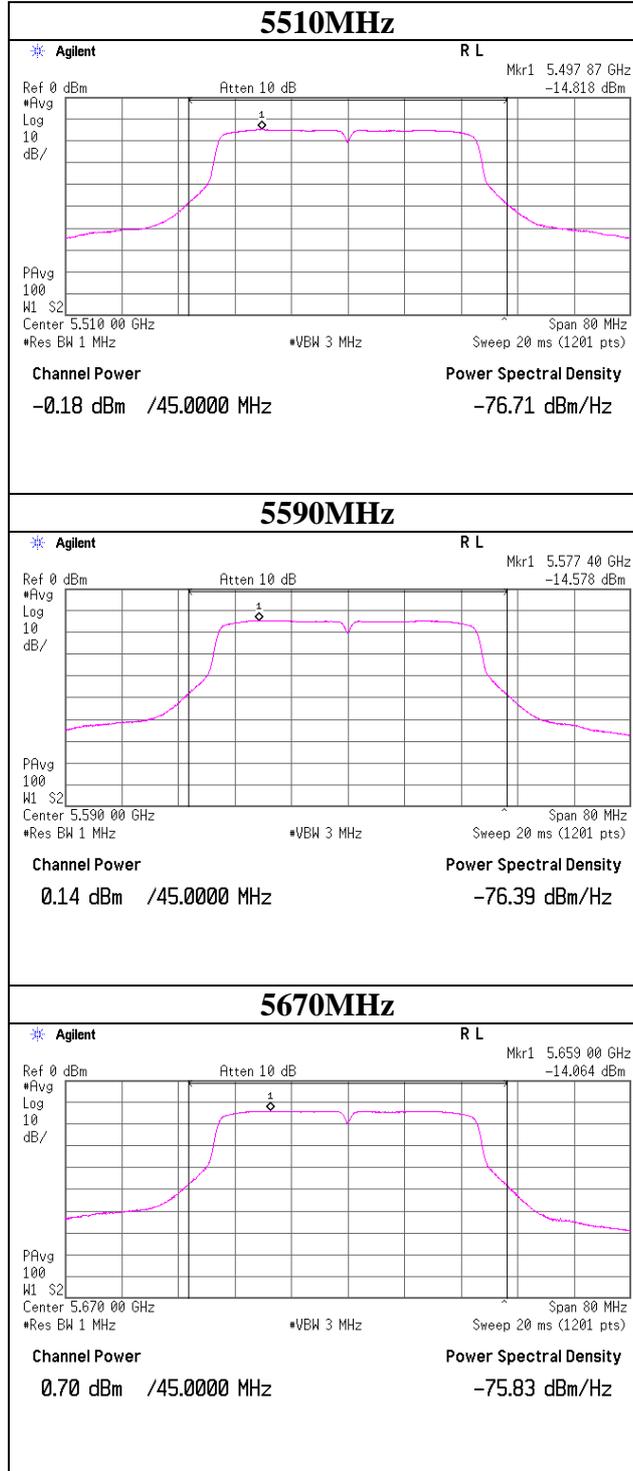
Maximum Peak Output Power & Peak Power Spectral Density

11n-40, MCS 1



Maximum Peak Output Power & Peak Power Spectral Density

11n-40, MCS 1



Maximum Peak Output Power & Peak Power Spectral Density
(Reference data)

Test place Head Office EMC Lab. No.6 Semi Anechoic Chamber
Report No. 33CE0171-HO
Date 10/19/2012 10/22/2012
Temperature/ Humidity 24deg. C / 36% RH 23deg. C / 47% RH
Engineer Yutaka Yoshida Yutaka Yoshida
Mode 11a Tx / 11n-20 Tx / 11n-40 Tx

11a Tx 5180MHz

Data Rate [Mbps]	Reading [dBm]	Remark
6	-1.46	
9	-1.46	
12	-1.42	
18	-1.37	
24	-1.37	
36	-1.36	
48	-1.36	
54	-1.35	*

11n-20 Tx, 5180MHz

MCS Number	Reading [dBm]	Remark
0	-2.48	
1	-2.41	
2	-2.62	
3	-2.51	
4	-2.39	*
5	-2.59	
6	-2.56	
7	-2.58	

11n-40 Tx, 5190MHz

MCS Number	Reading [dBm]	Remark
0	-1.08	
1	-0.82	*
2	-0.91	
3	-0.95	
4	-0.99	
5	-0.98	
6	-1.00	
7	-0.96	

* Worst Rate

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

Radiated Spurious Emission

Test place Head Office EMC Lab. No. 3 / No.4 Anechoic Chamber
Report No. 33CE0171-HO
Date 10/24/2012 10/27/2012
Temperature/ Humidity 22deg. C / 45%RH 26 deg. C / 42%RH
Engineer Tomotaka Sasagawa Takayuki Shimada
1-10GHz 10-40GHz
Mode 11a Tx 5320MHz

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]	Inside or Outside of Restricted Bands	Remark
Hori	5350.000	PK	47.8	32.1	3.7	31.5	-	52.1	68.2	16.1	Bandedge	
Hori	10640.000	PK	44.5	39.2	-2.4	33.2	-	48.1	73.9	25.8	Inside	
Hori	15960.000	PK	43.0	37.9	-0.9	32.2	-	47.8	73.9	26.1	Inside	
Hori	5350.000	AV	35.8	32.1	3.7	31.5	0.2	40.3	53.9	13.6	Bandedge	
Hori	10640.000	AV	35.2	39.2	-2.4	33.2	0.2	39.0	53.9	14.9	Inside	
Hori	15960.000	AV	34.0	37.9	-0.9	32.2	0.2	39.0	53.9	14.9	Inside	
Vert	5350.000	PK	45.5	32.1	3.7	31.5	-	49.8	68.2	18.4	Bandedge	
Vert	10640.000	PK	44.2	39.2	-2.4	33.2	-	47.8	73.9	26.1	Inside	
Vert	15960.000	PK	42.9	37.9	-0.9	32.2	-	47.7	73.9	26.2	Inside	
Vert	5350.000	AV	34.3	32.1	3.7	31.5	0.2	38.8	53.9	15.1	Bandedge	
Vert	10640.000	AV	35.0	39.2	-2.4	33.2	0.2	38.8	53.9	15.1	Inside	
Vert	15960.000	AV	34.0	37.9	-0.9	32.2	0.2	39.0	53.9	14.9	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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

Radiated Spurious Emission

Test place Head Office EMC Lab. No. 3 / No.4 Anechoic Chamber
Report No. 33CE0171-HO
Date 10/24/2012 10/27/2012
Temperature/ Humidity 22deg. C / 45%RH 26 deg. C / 42%RH
Engineer Tomotaka Sasagawa Takayuki Shimada
1-10GHz 10-40GHz
Mode 11a Tx 5500MHz

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]	Inside or Outside of Restricted Bands	Remark
Hori	5460.000	PK	44.6	32.2	3.8	31.5	-	49.1	73.9	24.8	Inside	
Hori	11000.000	PK	44.0	39.3	-2.2	33.2	-	47.9	73.9	26.0	Inside	
Hori	16500.000	PK	42.6	39.1	-0.8	32.2	-	48.7	68.2	19.5	Outside	
Hori	5460.000	AV	34.1	32.2	3.8	31.5	0.2	38.8	53.9	15.1	Inside	
Hori	11000.000	AV	35.2	39.3	-2.2	33.2	0.2	39.3	53.9	14.6	Inside	
Vert	5460.000	PK	45.6	32.2	3.8	31.5	-	50.1	73.9	23.8	Inside	
Vert	5470.000	PK	45.8	32.2	3.8	31.5	-	50.3	68.2	17.9	Outside	
Vert	11000.000	PK	43.9	39.3	-2.2	33.2	-	47.8	73.9	26.1	Inside	
Vert	16500.000	PK	42.8	39.1	-0.8	32.2	-	48.9	68.2	19.3	Outside	
Vert	5460.000	AV	34.2	32.2	3.8	31.5	0.2	38.9	53.9	15.0	Inside	
Vert	11000.000	AV	35.7	39.3	-2.2	33.2	0.2	39.8	53.9	14.1	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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

Radiated Spurious Emission

Test place Head Office EMC Lab. No. 3 / No.4 Anechoic Chamber
Report No. 33CE0171-HO
Date 10/24/2012 10/27/2012
Temperature/ Humidity 22deg. C / 45%RH 26 deg. C / 42%RH
Engineer Tomotaka Sasagawa Takayuki Shimada
1-10GHz 10-40GHz
Mode 11a Tx 5600MHz

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]	Inside or Outside of Restricted Bands	Remark
Hori	11200.000	PK	43.9	39.5	-2.1	33.2	-	48.1	73.9	25.8	Inside	
Hori	16800.000	PK	43.2	39.9	-0.7	32.3	-	50.1	68.2	18.1	Outside	
Hori	11200.000	AV	35.5	39.5	-2.1	33.2	0.2	39.9	53.9	14.0	Inside	
Vert	11200.000	PK	43.0	39.5	-2.1	33.2	-	47.2	73.9	26.7	Inside	
Vert	16800.000	PK	43.3	39.9	-0.7	32.3	-	50.2	68.2	18.0	Outside	
Vert	11200.000	AV	35.5	39.5	-2.1	33.2	0.2	39.9	53.9	14.0	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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

Radiated Spurious Emission

Test place	Head Office EMC Lab. No. 3 / No.4 Anechoic Chamber		
Report No.	33CE0171-HO		
Date	10/24/2012	10/27/2012	
Temperature/ Humidity	22deg. C / 45%RH	26 deg. C / 42%RH	
Engineer	Tomotaka Sasagawa	Takayuki Shimada	
	1-10GHz	10-40GHz	
Mode	11a Tx 5700MHz		

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]	Inside or Outside of Restricted Bands	Remark
Hori	5725.000	PK	45.4	32.6	3.9	31.6	-	50.3	68.2	17.9	Outside	
Hori	11400.000	PK	44.3	39.7	-2.0	33.1	-	48.9	73.9	25.0	Inside	
Hori	17100.000	PK	42.8	41.3	-0.5	32.3	-	51.3	68.2	16.9	Outside	
Hori	11400.000	AV	35.6	39.7	-2.0	33.1	0.2	40.4	53.9	13.5	Inside	
Vert	5725.000	PK	45.2	32.6	3.9	31.6	-	50.1	68.2	18.1	Outside	
Vert	11400.000	PK	44.8	39.7	-2.0	33.1	-	49.4	73.9	24.5	Inside	
Vert	17100.000	PK	42.6	41.3	-0.5	32.3	-	51.1	68.2	17.1	Outside	
Vert	11400.000	AV	37.0	39.7	-2.0	33.1	0.2	41.8	53.9	12.1	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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

Radiated Spurious Emission

Test place Head Office EMC Lab. No.4 Anechoic Chamber
Report No. 33CE0171-HO
Date 10/24/2012
Temperature/ Humidity 22deg. C / 45%RH
Engineer Tomotaka Sasagawa
 1-10GHz
Mode 11n20 Tx 5500MHz

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]	Inside or Outside of Restricted Bands	Remark
Hori	5460.000	PK	45.0	32.2	3.8	31.5	-	49.5	73.9	24.4	Inside	
Hori	5470.000	PK	44.7	32.2	3.8	31.5	-	49.2	68.2	19.0	Outside	
Hori	5460.000	AV	32.5	32.2	3.8	31.5	0.1	37.1	53.9	16.8	Inside	
Vert	5460.000	PK	45.1	32.2	3.8	31.5	-	49.6	73.9	24.3	Inside	
Vert	5470.000	PK	44.9	32.2	3.8	31.5	-	49.4	68.2	18.8	Outside	
Vert	5460.000	AV	32.4	32.2	3.8	31.5	0.1	37.0	53.9	16.9	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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

Radiated Spurious Emission

Test place	Head Office EMC Lab. No. 3 / No.4 Anechoic Chamber	
Report No.	33CE0171-HO	
Date	10/24/2012	10/27/2012
Temperature/ Humidity	22deg. C / 45%RH	26 deg. C / 42%RH
Engineer	Tomotaka Sasagawa	Takayuki Shimada
	1-10GHz	10-40GHz
Mode	11n40 Tx 5230MHz	

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]	Inside or Outside of Restricted Bands	Remark
Hori	10460.000	PK	42.7	39.2	-2.4	33.2	-	46.3	68.2	21.9	Outside	
Hori	15690.000	PK	42.8	38.7	-0.8	32.3	-	48.4	73.9	25.5	Inside	
Hori	15690.000	AV	34.0	38.7	-0.8	32.3	-	39.6	53.9	14.3	Inside	
Vert	10460.000	PK	42.5	39.2	-2.4	33.2	-	46.1	68.2	22.1	Outside	
Vert	15690.000	PK	42.9	38.7	-0.8	32.3	-	48.5	73.9	25.4	Inside	
Vert	15690.000	AV	34.0	38.7	-0.8	32.3	-	39.6	53.9	14.3	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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

Radiated Spurious Emission

Test place Head Office EMC Lab. No. 3 / No.4 Anechoic Chamber
Report No. 33CE0171-HO
Date 10/24/2012 10/27/2012
Temperature/ Humidity 22deg. C / 45%RH 26 deg. C / 42%RH
Engineer Tomotaka Sasagawa Takayuki Shimada
1-10GHz 10-40GHz
Mode 11n40 Tx 5510MHz

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]	Inside or Outside of Restricted Bands	Remark
Hori	5460.000	PK	52.1	32.2	3.8	31.5	-	56.6	73.9	17.3	Inside	
Hori	5470.000	PK	55.9	32.2	3.8	31.5	-	60.4	68.2	7.8	Outside	
Hori	11020.000	PK	42.5	39.3	-2.2	33.2	-	46.4	73.9	27.5	Inside	
Hori	16530.000	PK	42.8	39.2	-0.7	32.2	-	49.1	68.2	19.1	Outside	
Hori	5460.000	AV	40.0	32.2	3.8	31.5	-	44.5	53.9	9.4	Inside	
Hori	11020.000	AV	33.9	39.3	-2.2	33.2	-	37.8	53.9	16.1	Inside	
Vert	5460.000	PK	52.1	32.2	3.8	31.5	-	56.6	73.9	17.3	Inside	
Vert	5470.000	PK	54.6	32.2	3.8	31.5	-	59.1	68.2	9.1	Outside	
Vert	11020.000	PK	42.6	39.3	-2.2	33.2	-	46.5	73.9	27.4	Inside	
Vert	16530.000	PK	42.8	39.2	-0.7	32.2	-	49.1	68.2	19.1	Outside	
Vert	5460.000	AV	39.2	32.2	3.8	31.5	-	43.7	53.9	10.2	Inside	
Vert	11020.000	AV	33.9	39.3	-2.2	33.2	-	37.8	53.9	16.1	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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

Radiated Spurious Emission

Test place Head Office EMC Lab. No. 3 / No.4 Anechoic Chamber
Report No. 33CE0171-HO
Date 10/24/2012 10/27/2012
Temperature/ Humidity 22deg. C / 45%RH 26 deg. C / 42%RH
Engineer Tomotaka Sasagawa Takayuki Shimada
1-10GHz 10-40GHz
Mode 11n40 Tx 5590MHz

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]	Inside or Outside of Restricted Bands	Remark
Hori	11180.000	PK	42.6	39.5	-2.1	33.2	-	46.8	73.9	27.1	Inside	
Hori	16770.000	PK	42.7	39.8	-0.7	32.3	-	49.5	68.2	18.7	Outside	
Hori	11180.000	AV	34.0	39.5	-2.1	33.2	-	38.2	53.9	15.7	Inside	
Vert	11180.000	PK	42.8	39.5	-2.1	33.2	-	47.0	73.9	26.9	Inside	
Vert	16770.000	PK	42.8	39.8	-0.7	32.3	-	49.6	68.2	18.6	Outside	
Vert	11180.000	AV	34.0	39.5	-2.1	33.2	-	38.2	53.9	15.7	Inside	

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

*Other frequency noises omitted in this report were not seen or have 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

Radiated Spurious Emission

Test place Head Office EMC Lab. No. 3 / No.4 Anechoic Chamber
Report No. 33CE0171-HO
Date 10/24/2012 10/27/2012 10/28/2012
Temperature/ Humidity 22deg. C / 45%RH 26 deg. C / 42%RH 23 deg. C / 52%RH
Engineer Tomotaka Sasagawa Takayuki Shimada Kazuya Yoshioka
1-10GHz 10-40GHz 30-1000MHz
Mode 11n40 Tx 5670MHz

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]	Inside or Outside of Restricted Bands	Remark
Hori	40.602	QP	23.7	14.3	7.3	32.2	-	13.1	40.0	26.9	Outside	
Hori	135.000	QP	39.7	14.2	8.5	32.3	-	30.1	43.5	13.4	Inside	
Hori	162.005	QP	31.6	15.4	8.8	32.2	-	23.6	43.5	19.9	Outside	
Hori	460.798	QP	34.5	17.8	11.1	32.0	-	31.4	46.0	14.6	Outside	
Hori	623.999	QP	30.2	19.6	12.0	32.0	-	29.8	46.0	16.2	Outside	
Hori	649.595	QP	30.8	19.8	12.2	32.0	-	30.8	46.0	15.2	Outside	
Hori	5725.000	PK	50.0	32.6	3.9	31.6	-	54.9	68.2	13.3	Outside	
Hori	11340.000	PK	43.0	39.6	-2.0	33.1	-	47.5	73.9	26.4	Inside	
Hori	17010.000	PK	42.9	40.5	-0.5	32.3	-	50.6	68.2	17.6	Outside	
Hori	11340.000	AV	33.9	39.6	-2.0	33.1	-	38.4	53.9	15.5	Inside	
Vert	41.234	QP	27.0	14.0	7.3	32.2	-	16.1	40.0	23.9	Outside	
Vert	134.999	QP	37.2	14.2	8.5	32.3	-	27.6	43.5	15.9	Inside	
Vert	162.004	QP	33.2	15.4	8.8	32.2	-	25.2	43.5	18.3	Outside	
Vert	460.798	QP	33.7	17.8	11.1	32.0	-	30.6	46.0	15.4	Outside	
Vert	623.995	QP	34.0	19.6	12.0	32.0	-	33.6	46.0	12.4	Outside	
Vert	649.599	QP	33.8	19.8	12.2	32.0	-	33.8	46.0	12.2	Outside	
Vert	5725.000	PK	49.8	32.6	3.9	31.6	-	54.7	68.2	13.5	Outside	
Vert	11340.000	PK	42.8	39.6	-2.0	33.1	-	47.3	73.9	26.6	Inside	
Vert	17010.000	PK	42.7	40.5	-0.5	32.3	-	50.4	68.2	17.8	Outside	
Vert	11340.000	AV	33.9	39.6	-2.0	33.1	-	38.4	53.9	15.5	Inside	

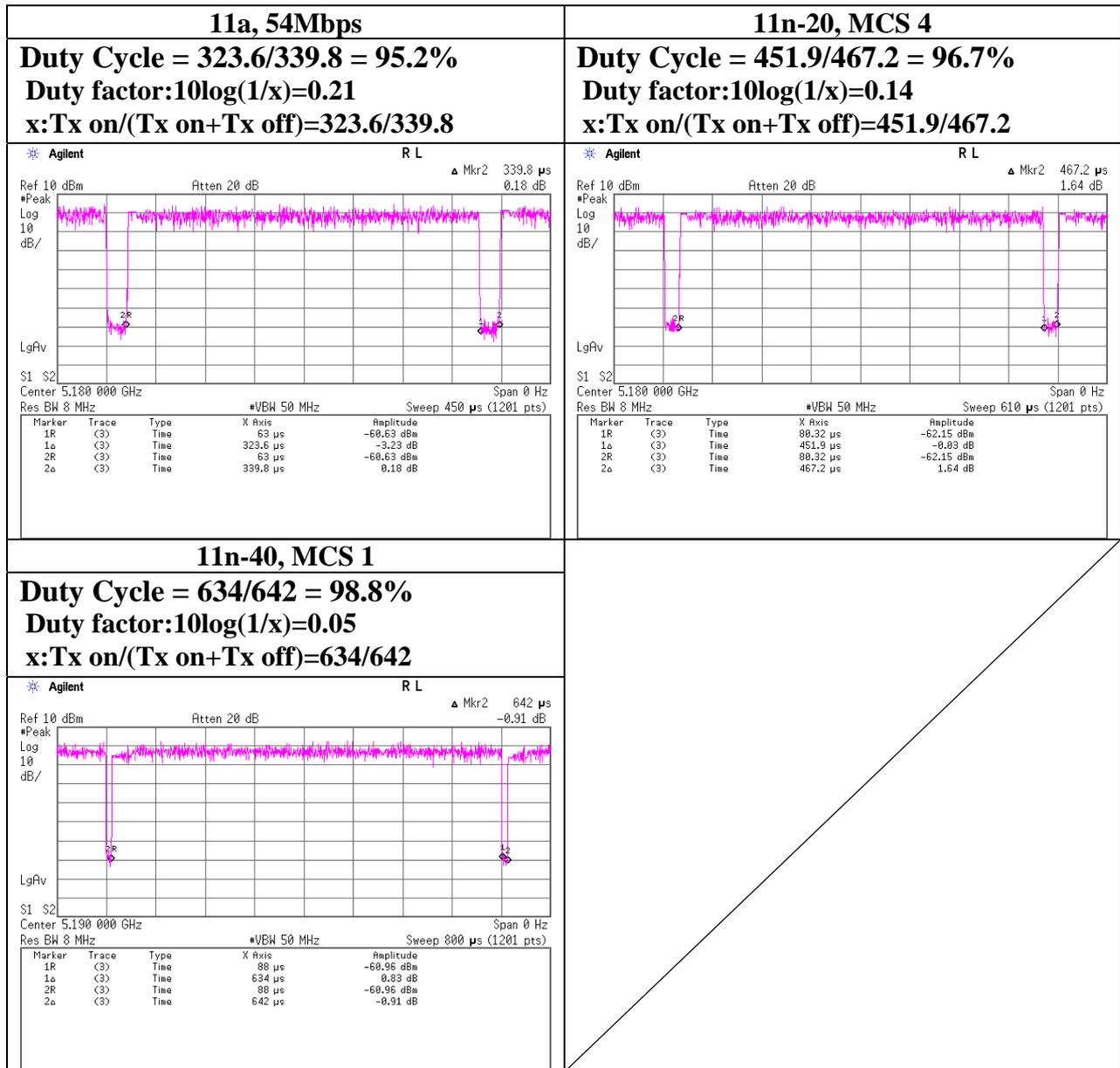
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)+Duty Factor

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

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

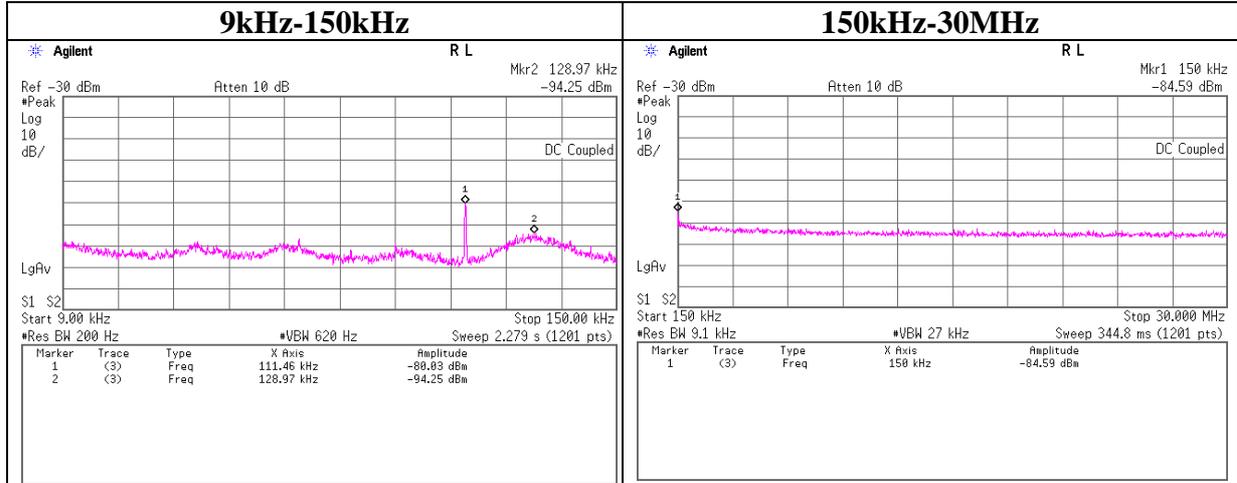
Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Duty Cycle



Conducted Spurious Emission

11n-40 Tx 5670MHz



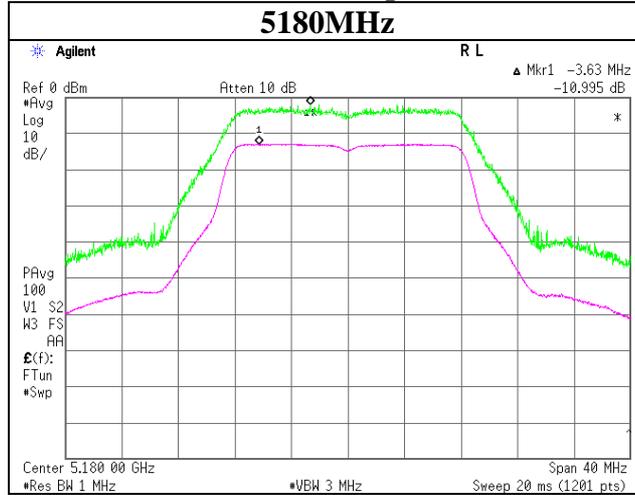
Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dB]	RBW Corr. factor [dB]	EIRP [dBm/MHz]	Limit [dBm/MHz]	Margin [dB]	Remark
111.46	-80.0	0.0	9.8	2.00	37.0	-31.2	-27.0	4.2	
128.97	-94.3	0.0	9.8	2.00	37.0	-45.4	-27.0	18.4	
150.00	-84.6	0.0	9.8	2.00	20.4	-52.3	-27.0	25.3	

EIRP=Reading + Cable Loss + Attenuator + Antenna Gain + RBW factor

Peak Excursion Ratio

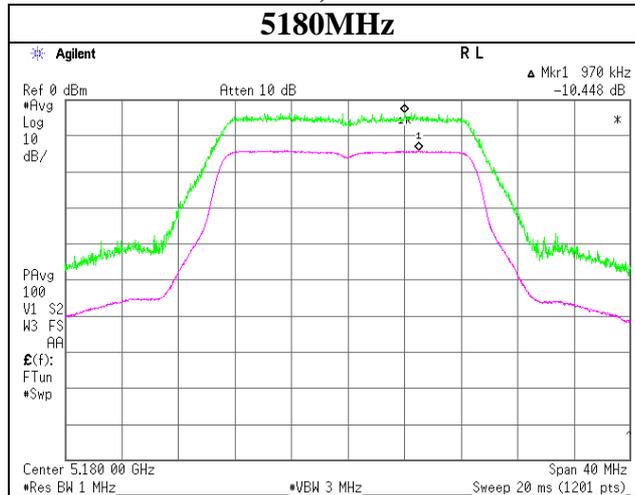
11a, 54Mbps

5180MHz



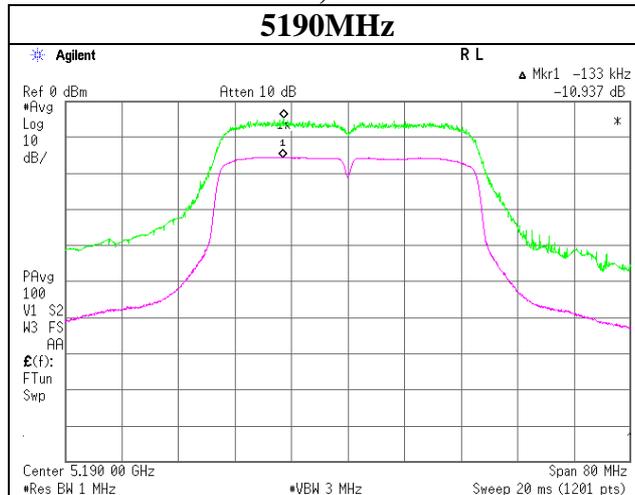
11n-20, MCS 4

5180MHz



11n-40, MCS 1

5190MHz



APPENDIX 2: Test instruments

EMI test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	AT/RE	2012/06/19 * 12
MCC-137	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37954/2	AT	2012/10/19 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2012/03/27 * 12
MMM-11	Digital HiTESTER	Hioki	3805	060100600	AT	2012/05/18 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2012/02/06 * 12
MSA-06	Spectrum Analyzer	Agilent	E4407B	MY45107638	AT	2012/04/04 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE/CE	2012/02/24 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE/CE	2012/02/06 * 12
MJM-15	Measure	KOMELON	KMC-36	-	RE/CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE/CE	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	2012/03/29 * 12
MHA-16	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA917030 6	RE	2012/05/21 * 12
MCC-76	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278967/4	RE	2011/12/08 * 12
MHF-22	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCB	602	RE	2012/01/28 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	3950M00205	RE	2012/06/22 * 12
MCC-54	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	RE	2012/03/21 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE/CE	2011/11/23 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE/CE	2012/08/23 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE(EUT)	2012/02/06 * 12
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/SFM141(3m)/sucoform141-PE(1m)/421-010(1.5m)/RFM-E321(Switcher)	-/00640	CE	2012/07/12 * 12

EMI test equipment (2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAT-66	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2012/10/08 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2012/10/08 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2012/07/12 * 12
MAT-09	Attenuator(6dB)	Weinschel Corp	2	BK7973	RE	2011/11/02 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2012/03/16 * 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

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124