



Test report No. : 32IE0154-HO-01-C-R1
Page : 1 of 67
Issued date : July 20, 2012
Revised date : August 6, 2012
FCC ID : N6C-SDMAN

This test report shows the test data of original RF module that has the same specification as this application. As this original module has the different antenna, class 2 permissive change application was done for it. Please refer to the test report 1019552-001H-B-R1 for antenna change. In addition, the module will be controlled not to use Bluetooth function and 802.11n-HT40 mode by software of host device.

RADIO TEST REPORT

Test Report No. : 32IE0154-HO-01-C-R1

Applicant : silex technology, Inc.
Type of Equipment : SDIO Wireless Module
Model No. : SX-SDMAN
FCC ID : N6C-SDMAN
Test regulation : FCC Part 15 Subpart E: 2012
Test Result : Complied

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3. This sample tested is in compliance with above regulation.
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6. This report is a revised version of 32IE0154-HO-01-C. 32IE0154-HO-01-C is replaced with this report.

Date of test: May 21 to July 13, 2012

Representative test engineer:

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*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>

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13-EM-F0429

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SECTION 1: Customer information

Company Name	:	silex technology, Inc.
Address	:	2-3-1 Hikaridai, Seika-cho, Kyoto 619-0237, Japan
Telephone Number	:	+81-774-98-3878
Facsimile Number	:	+81-774-98-3758
Contact Person	:	Toshiro Kometani

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

2.1 Identification of E.U.T.

Type of Equipment	:	SDIO Wireless Module
Model No.	:	SX-SDMAN
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	DC3.3V
Receipt Date of Sample	:	April 11, 2012
Country of Mass-production	:	Japan
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model No: SX-SDMAN (referred to as the EUT in this report) is the SDIO Wireless Module.

General Specification

Clock frequency(ies) in the system : 26MHz

Radio Specification

Radio Type : Transceiver
 Method of Frequency Generation : Synthesizer
 Power Supply (inner) : DC1.2V

Specification of Wireless LAN (IEEE802.11b/g/a/n-20/n-40)

Type of radio	IEEE802.11b	IEEE802.11g	IEEE802.11a	IEEE802.11n (20 M band)	IEEE802.11n (40 M band)
Frequency of operation	2412-2462MHz	2412-2462MHz	5180-5320MHz 5745-5825MHz	2412 - 2462MHz 5180-5320MHz 5745-5825MHz	5190 - 5310MHz 5755 - 5795MHz
Type of modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (64QAM, 16QAM, QPSK, BPSK)	OFDM (64QAM, 16QAM, QPSK, BPSK)		
Channel spacing	5MHz		20MHz	<u>2.4GHz band</u> 5MHz <u>5GHz band</u> 20MHz	40MHz
Antenna type	Sleeve antenna: Sansei Embedded antenna: Ethertronics				
Antenna Gain	Sleeve antenna: 1.0dBi (2.4GHz including cableloss 0.5dB), 1.1dBi (5GHz including cableloss 1.0dB) Embedded antenna: 2.0dBi (2.4GHz including cableloss 0.5dB), 2.5dBi (5GHz including cableloss 1.0dB)				
Antenna Connector type	U.FL connector				

Specification of Bluetooth (Ver.4.0 + EDR)

Type of radio	Bluetooth
Frequency of Operation	2402-2480MHz
Type of Modulation	FHSS
Channel spacing	1MHz
Antenna type	Embedded antenna: Ethertronics
Antenna Gain	2.0dBi (2.4GHz including cableloss 0.5dB), 2.5dBi (5GHz including cableloss 1.0dB)
Antenna Connector Type	U.FL Alternative connector

Specification of Low Energy (Ver.4.0 + EDR/LE Dual mode)

Type of radio	Low Energy
Frequency of Operation	2402-2480MHz
Type of Modulation	DSSS
Channel spacing	2MHz
Antenna type	Embedded antenna: Ethertronics
Antenna Gain	2.0dBi (2.4GHz including cableloss 0.5dB), 2.5dBi (5GHz including cableloss 1.0dB)
Antenna Connector Type	U.FL Alternative connector

*This test report applies for Wireless LAN (IEEE802.11a/n-20/n-40).

Wireless LAN and Bluetooth do not transmit simultaneously.

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart E: 2012, final revised on May 17, 2012 and effective June 18, 2012

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

*The revision on May 17, 2012 does not affect the test specification applied to the EUT.

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 9.4dB, 5.71515MHz, N AV 9.2dB, 5.71515MHz, N	Complied	-
	IC: RSS-Gen 7.2.4	IC: RSS-Gen 7.2.4			
26dB Emission Bandwidth	FCC :ANSI C63.4:2003 FCC KDB 789033 D01 v01r01	FCC : 15.407(a)(1)(2)(3)	See data	N/A	Conducted
	IC: -	IC: -			
Maximum Peak Output Power	FCC :ANSI C63.4:2003, FCC KDB 789033 D01 v01r01	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 KDB 789033 D01 v01r01	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 KDB 789033 D01 v01r01	FCC : 15.407(a)(6)	Complied	Conducted	
	IC: -	IC: -			
Spurious Emission Restricted Band Edge	FCC: ANSI C63.4:2003 FCC KDB 789033 D01 v01r01	FCC : 15.407(b), 15.205 and 15.209	1.2dB 186.784MHz, QP, Hori.	Complied	Conducted / Radiated
	IC: -	IC: RSS-210 A.9.2(1)(2)(3)			
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422. For DFS tests, please see the test report number 32IE0154-HO-01-D issued by UL Japan, Inc.					

FCC 15.31 (e)

The RF Module has own regulator.

The RF Module is constantly provided voltage through own regulator regardless of input voltage (DC3.3V).

Therefore, this EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

The EUT has a unique antenna connector (U.FL).

Therefore the equipment complies with the requirement of 15.203/212.

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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						
	(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	4.2dB	5.0dB	5.1dB	4.7dB	5.7dB	4.4dB	4.3dB
No.2	4.1dB	5.2dB	5.1dB	4.8dB	5.6dB	4.3dB	4.2dB
No.3	4.5dB	5.0dB	5.2dB	4.8dB	5.6dB	4.5dB	4.2dB
No.4	4.7dB	5.2dB	5.2dB	4.8dB	5.6dB	5.1dB	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 report meets the limits unless the uncertainty is taken into consideration.

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 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)	24Mbps, PN9
IEEE 802.11n 20MHz BW (11n-20)	MCS 1 (Long GI), PN9
IEEE 802.11n 40MHz BW (11n-40)	MCS 3 (Long 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. *EUT has the power settings by the software as follows; Power settings: 11a W52, W53(24Mbps, Long GI): 5180MHz: 13.0dBm, others: 14.0dBm 11n-20 W52, W53(MCS 1, Long GI): 5180MHz: 13.0dBm, others: 14.0dBm 11n-40 W52, W53(MCS 3, Long GI): 5190MHz: 9.5dBm, 5310MHz: 11.5dBm, others: 14.0dBm Software: Atheros Radio Test (ART) - Revision 0.2 BUILD #33 ART_11n - Customer Version (ANWI BUILD) *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.	

*The details of Operating mode(s)

Test Item	Operating Mode	Tested Antenna port	Tested Frequency	
			Low Band	Middle Band
Conducted emission	11n-20 Tx *1)	1 *3)	-	5320MHz
26dB Emission Bandwidth, 99% Occupied Bandwidth, Peak Excursion Ratio, Spurious Emission(Conducted), Maximum Peak Output Power, Peak Power Spectral Density	11a Tx	1 *3)	5180MHz	5260MHz
			5220MHz	5300MHz
			5240MHz	5320MHz
	11n-20 Tx	1 *3)	5180MHz	5260MHz
			5220MHz	5300MHz
			5240MHz	5320MHz
	11n-40 Tx	1 *3)	5190MHz	5270MHz
			5230MHz	5310MHz
Spurious Emission(Radiated)	11n-20 Tx *2)	1 *3)	5180MHz	5320MHz
			5240MHz	
	11n-40 Tx	1 *3)	5190MHz	5310MHz
			5230MHz	

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

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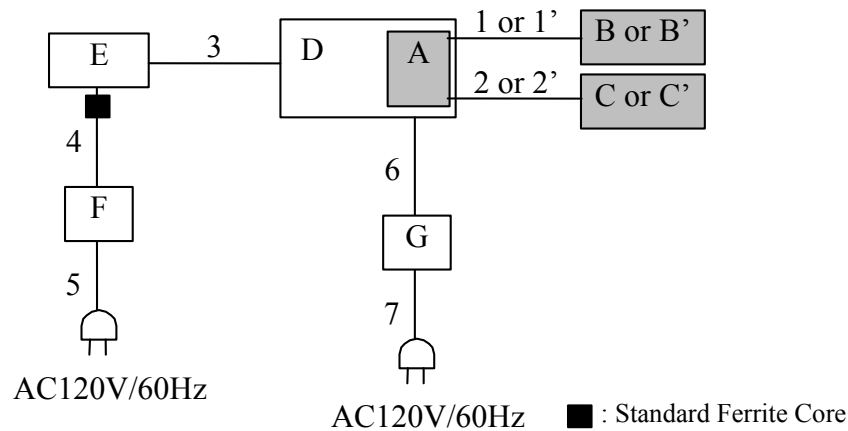
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4.2 Configuration and peripherals



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

* Sleeve antenna and Embadded antenna are not used in combination.

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	SDIO Wireless Module	SX-SDMAN	008092-0129C8	silex technology, Inc.	EUT
B	Embedded Antenna	1000418	001	Ethertronics	EUT
B'	Sleeve Antenna	ANTB98-061A0	001	Sansei Denki	EUT
C	Embedded Antenna	1000418	002	Ethertronics	EUT
C'	Sleeve Antenna	ANTB98-061A0	002	Sansei Denki	EUT
D	Jig Board	-	-	silex technology, Inc.	-
E	Laptop PC	Latitude E6510	CFGY2A00	DELL	-
F	AC Adaptor	LA90PE0-01	CN-03T6XF-71615-1AK-0927-A01	DELL	-
G	DC Power Supply	PW8-3ATP	09067054	KENWOOD TMI	*1)

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Antenna Cable (for Embedded Antenna)	0.1	Shielded	Shielded	-
1'	Antenna Cable (for Sleeve Antenna)	0.12	Shielded	Shielded	-
2	Antenna Cable (for Embedded Antenna)	0.1	Shielded	Shielded	-
2'	Antenna Cable (for Sleeve Antenna)	0.12	Shielded	Shielded	-
3	SD Card slot Cable	0.3	Unshielded	Unshielded	-
4	DC Cable	1.8	Unshielded	Unshielded	-
5	AC Cable	0.9	Unshielded	Unshielded	-
6	DC Cable	1.5	Unshielded	Unshielded	*1)
7	AC Cable	2.0	Unshielded	Unshielded	*1)

*1) Used for Conducted emission test only

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SECTION 5: Conducted Emission

Test Procedure

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, 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

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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).

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

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

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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 1 *1) RBW: 1MHz VBW: 3MHz Detector and averaging type set for linear voltage averaging. Method 2*1) RBW: 1MHz When duty cycle $\geq$ 98 percent, VBW was set at 10Hz. duty cycle is < 98 percent, set VBW $\geq$ 1/T
Test Distance	3m	3m (below 10GHz), 1m*2) (above 10GHz) 0.5m*3) (above 26.5GHz)	

*1) The test method was also referred to FCC KDB 789033 D01 "Guidelines for Compliance Testing of unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E".

*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 EUT, Embedded antenna and of X(0 and 90), Y(0 and 90) and Z(0 and 90) axes of Sleeve antenna 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	Peak RMS Power Averaging (100 times)	Max Hold Clear Write	Spectrum Analyzer
Conducted Spurious Emission	9kHz-150kHz 150kHz-30MHz	200Hz 9.1kHz	620Hz 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 [Sleeve antenna]

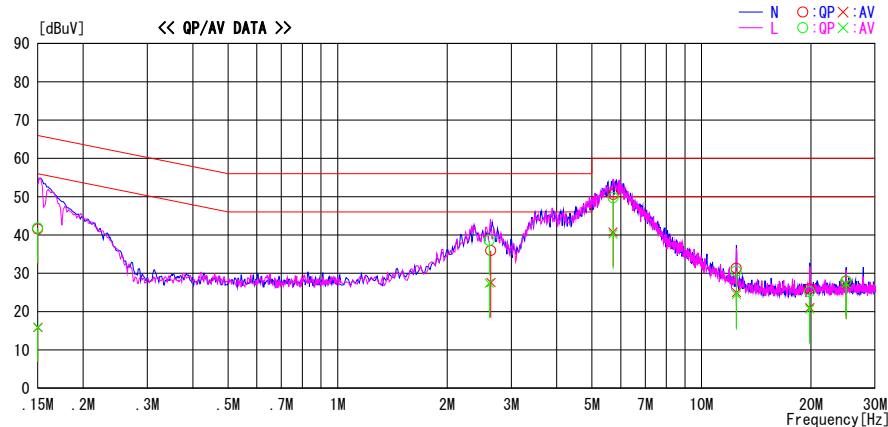
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2012/06/29

Report No. : 32IE0154-HO-01
Power : AC 120V / 60Hz
Temp./Humi. : 24deg. C / 62% RH
Engineer : Satofumi Matsuyama

Mode / Remarks : WLAN 11n-20 5320MHz

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	28.4	2.7	13.2	41.6	15.9	66.0	56.0	24.4	40.1	N	
2.63796	22.3	14.0	13.6	35.9	27.6	56.0	46.0	20.1	18.4	N	
5.71515	36.7	26.9	13.9	50.6	40.8	60.0	50.0	9.4	9.2	N	
12.46876	16.7	10.4	14.6	31.3	25.0	60.0	50.0	28.7	25.0	N	
19.81871	10.7	5.9	15.2	25.9	21.1	60.0	50.0	34.1	28.9	N	
24.95451	12.4	11.6	15.5	27.9	27.1	60.0	50.0	32.1	22.9	N	
0.15000	28.6	2.8	13.2	41.8	16.0	66.0	56.0	24.2	40.0	L	
2.61246	25.1	13.9	13.5	38.6	27.4	56.0	46.0	17.4	18.6	L	
5.71552	35.8	26.3	13.9	49.7	40.2	60.0	50.0	10.3	9.8	L	
12.46896	16.0	9.8	14.6	30.6	24.4	60.0	50.0	29.4	25.6	L	
19.81781	10.0	5.5	15.2	25.2	20.7	60.0	50.0	34.8	29.3	L	
24.95471	12.5	11.8	15.5	28.0	27.3	60.0	50.0	32.0	22.7	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 [Embedded antenna]

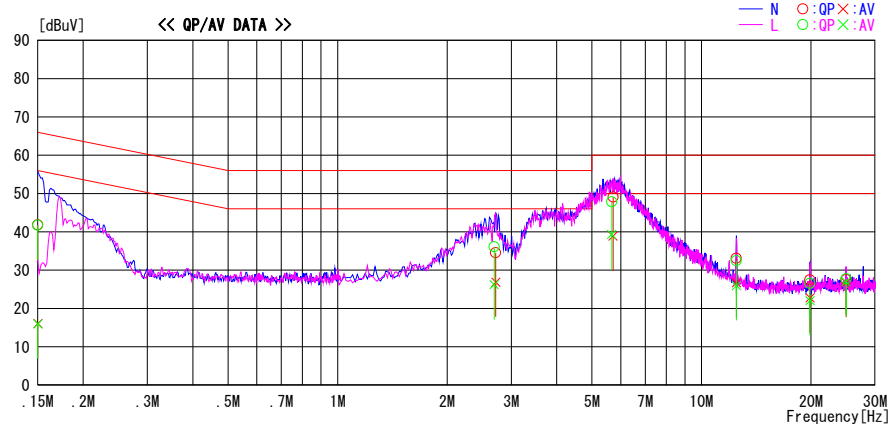
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.2 Semi Anechoic Chamber
Date : 2012/06/29

Report No. : 32IE0154-HO-01
Power : AC 120V / 60Hz
Temp./Humi. : 24deg. C / 62% RH
Engineer : Satofumi Matsuyama

Mode / Remarks : WLAN 11n-20 5320MHz

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	28.6	2.9	13.2	41.8	16.1	66.0	56.0	24.2	39.9	N	
2.71842	21.0	13.3	13.6	34.6	26.9	56.0	46.0	21.4	19.1	N	
5.71732	35.2	25.0	13.9	49.1	38.9	60.0	50.0	10.9	11.1	N	
12.46878	18.5	12.1	14.6	33.1	26.7	60.0	50.0	26.9	23.3	N	
19.85678	12.3	7.6	15.2	27.5	22.8	60.0	50.0	32.5	27.2	N	
24.95548	12.1	11.3	15.5	27.6	26.8	60.0	50.0	32.4	23.2	N	
0.15000	28.5	2.8	13.2	41.7	16.0	66.0	56.0	24.3	40.0	L	
2.69227	22.5	12.6	13.6	36.1	26.2	56.0	46.0	19.9	19.8	L	
5.66653	33.9	25.4	13.9	47.8	39.3	60.0	50.0	12.2	10.7	L	
12.46822	17.9	11.4	14.6	32.5	26.0	60.0	50.0	27.5	24.0	L	
19.85718	11.4	6.9	15.2	26.6	22.1	60.0	50.0	33.4	27.9	L	
24.95564	12.2	11.5	15.5	27.7	27.0	60.0	50.0	32.3	23.0	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.

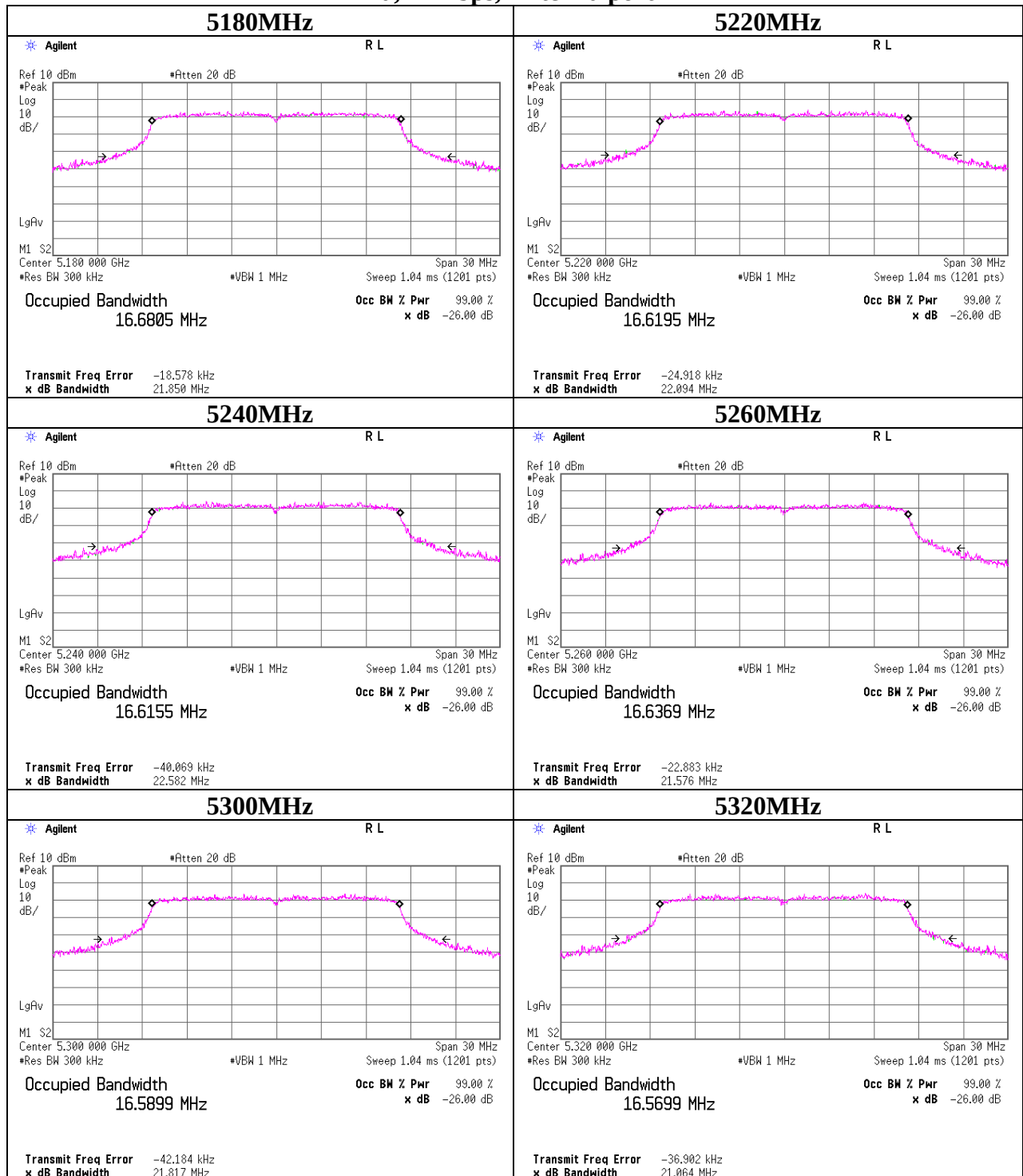
26dB Emission Bandwidth and 99% Occupied Bandwidth

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32IE0154-HO-01
Date 07/13/2012
Temperature/ Humidity 23deg. C / 62% RH
Engineer Satofumi Matsuyama
Mode 11a Tx, 24Mbps

Antenna port	Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
1	5180	21.850	16.681	-
	5220	22.094	16.620	-
	5240	22.582	16.616	-
	5260	21.576	16.637	-
	5300	21.817	16.590	-
	5320	21.064	16.570	-

26dB Emission Bandwidth

11a, 24Mbps, Antenna port 1



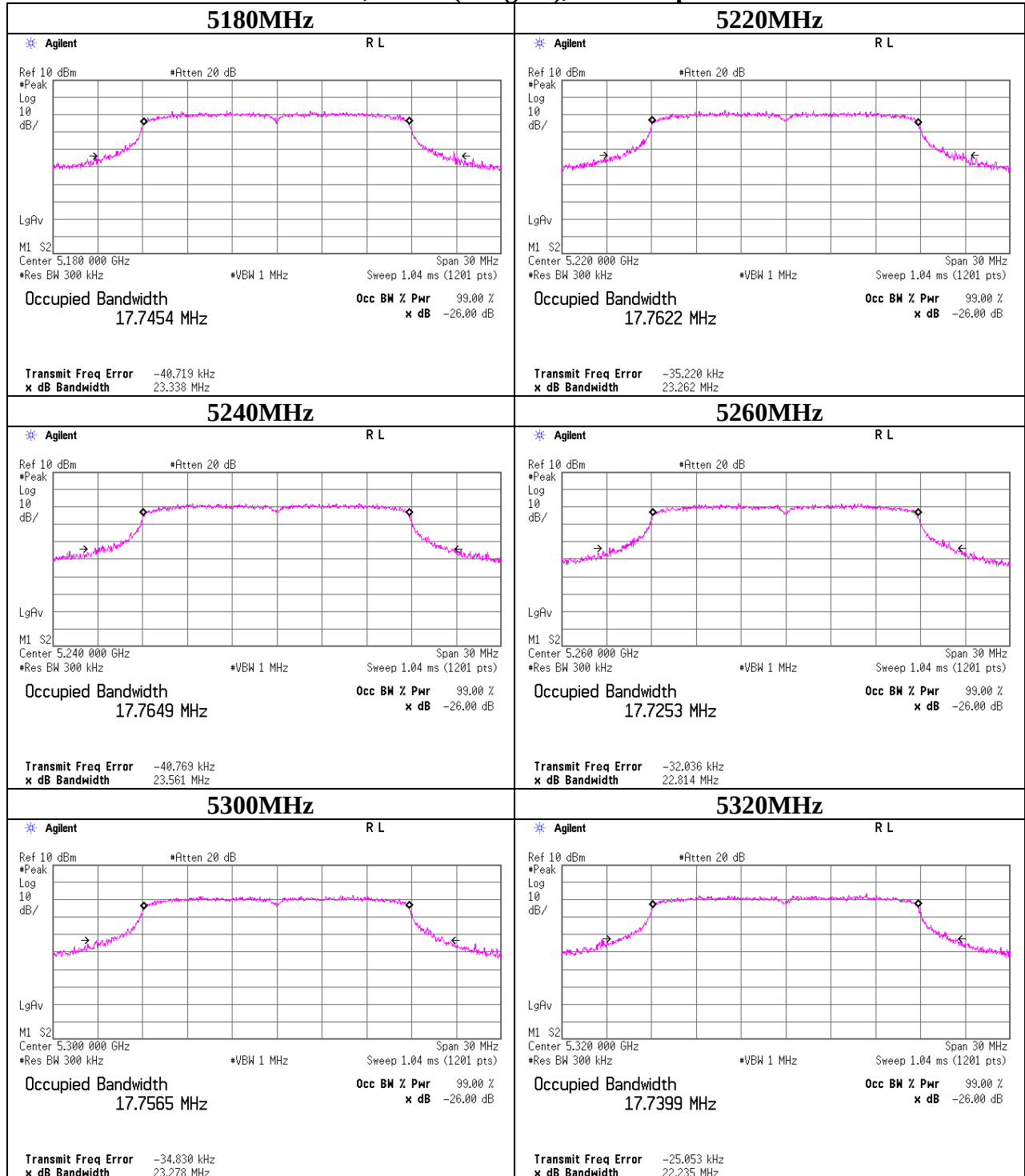
26dB Emission Bandwidth and 99% Occupied Bandwidth

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32IE0154-HO-01
Date 07/13/2012
Temperature/ Humidity 23deg. C / 62% RH
Engineer Satofumi Matsuyama
Mode 11n-20 Tx, MCS 1(Long GI)

Antenna port	Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
1	5180	23.338	17.745	-
	5220	23.262	17.762	-
	5240	23.561	17.765	-
	5260	22.814	17.725	-
	5300	23.278	17.757	-
	5320	22.235	17.740	-

26dB Emission Bandwidth

11n-20, MCS 1(Long GI), Antenna port 1



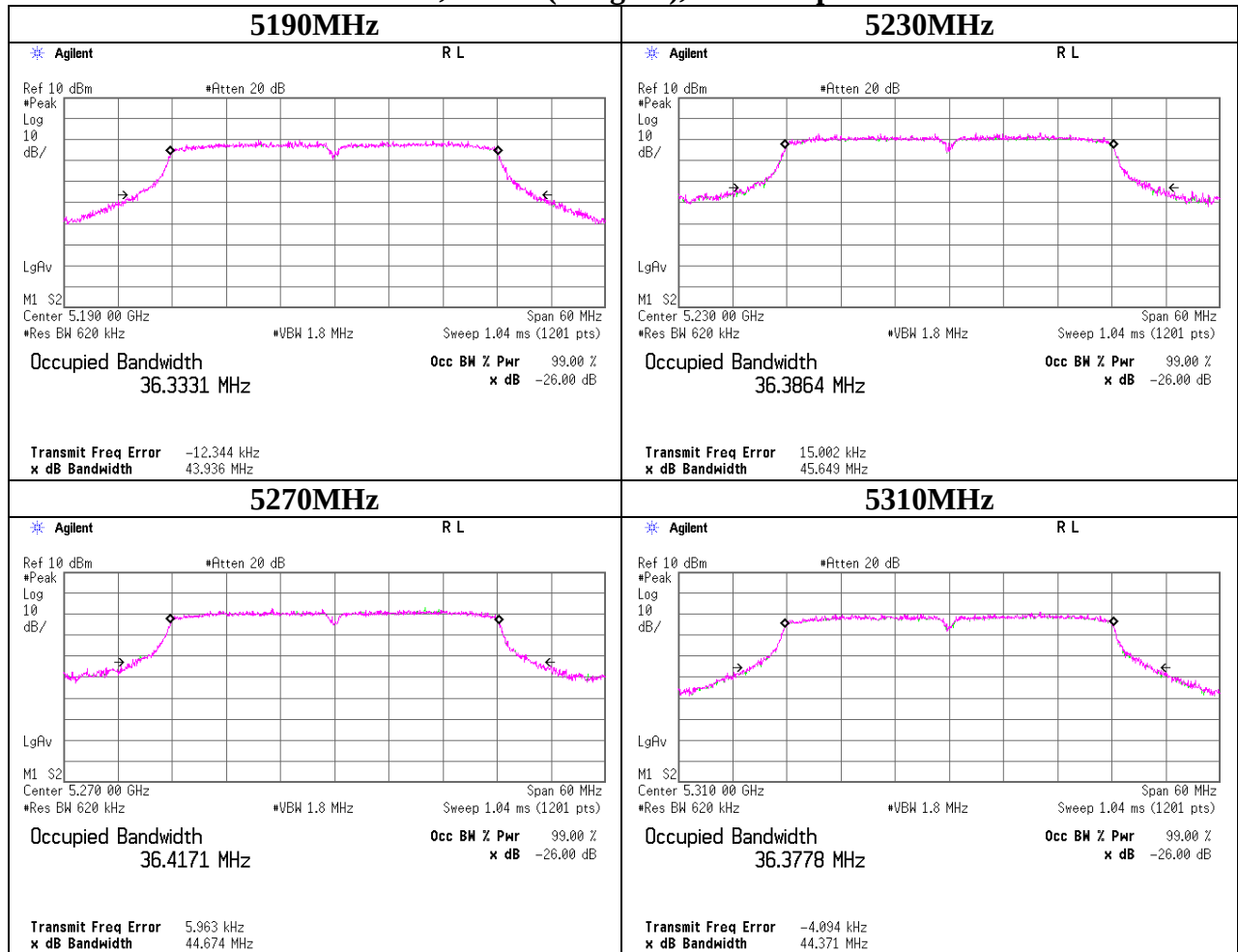
26dB Emission Bandwidth and 99% Occupied Bandwidth

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32IE0154-HO-01
Date 07/13/2012
Temperature/ Humidity 23deg. C / 62% RH
Engineer Satofumi Matsuyama
Mode 11n-40 Tx, MCS 3(Long GI)

Antenna port	Frequency [MHz]	26dB Emission Bandwidth [MHz]	99% Occupied Bandwidth [MHz]	Limit [MHz]
1	5190	43.936	36.333	-
	5230	45.649	36.386	-
	5270	44.674	36.417	-
	5310	44.371	36.378	-

26dB Emission Bandwidth

11n-40, MCS 3(Long GI), Antenna port 1



Maximum Peak Output Power

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 32IE0154-HO-01
Date : 07/13/2012
Temperature/ Humidity : 23deg. C / 62% RH
Engineer : Satofumi Matsuyama
Mode : 11a Tx, 24Mbps

Antenna port 1

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	1.15	2.56	10.00	2.50	13.71	16.21	16.98	-	3.27	-
5220.0	1.33	2.57	10.00	2.50	13.90	16.40	16.98	-	3.08	-
5240.0	1.25	2.57	10.00	2.50	13.82	16.32	16.98	-	3.16	-
5260.0	0.56	2.58	9.99	2.50	13.13	15.63	23.97	-	10.84	-
5300.0	0.95	2.59	9.99	2.50	13.53	16.03	23.97	-	10.44	-
5320.0	1.08	2.60	9.99	2.50	13.67	16.17	23.97	-	10.30	-

Result(Cond.) = Reading + Cable Loss + Atten.Loss

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

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

*ON time was only measured using Gate Function.

Maximum Peak Output Power

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 32IE0154-HO-01
Date : 07/13/2012
Temperature/ Humidity : 23deg. C / 62% RH
Engineer : Satofumi Matsuyama
Mode : 11n-20 Tx, MCS 1(Long GI)

Antenna port 1

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	1.08	2.56	10.00	2.50	13.64	16.14	16.98	-	3.34	-
5220.0	1.35	2.57	10.00	2.50	13.92	16.42	16.98	-	3.06	-
5240.0	1.24	2.57	10.00	2.50	13.81	16.31	16.98	-	3.17	-
5260.0	0.38	2.58	9.99	2.50	12.95	15.45	23.97	-	11.02	-
5300.0	1.03	2.59	9.99	2.50	13.61	16.11	23.97	-	10.36	-
5320.0	1.15	2.60	9.99	2.50	13.74	16.24	23.97	-	10.23	-

Result(Cond.) = Reading + Cable Loss + Atten.Loss

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

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

*ON time was only measured using Gate Function.

Maximum Peak Output Power

Test place : Head Office EMC Lab. No.6 Measurement Room
Report No. : 32IE0154-HO-01
Date : 07/13/2012
Temperature/ Humidity : 23deg. C / 62% RH
Engineer : Satofumi Matsuyama
Mode : 11n-40 Tx, MCS 3(Long GI)

Antenna port 1

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	-2.60	2.56	10.00	2.50	9.96	12.46	16.98	-	7.02	-
5230.0	0.42	2.57	10.00	2.50	12.99	15.49	16.98	-	3.99	-
5270.0	0.50	2.58	9.99	2.50	13.07	15.57	23.97	-	10.90	-
5310.0	-1.71	2.59	9.99	2.50	10.87	13.37	23.97	-	13.10	-

Result(Cond.) = Reading + Cable Loss + Atten.Loss

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

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

*ON time was only measured using Gate Function.

Peak Power Spectral Density

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32IE0154-HO-01
Date 07/13/2012
Temperature/ Humidity 23deg. C / 62% RH
Engineer Satofumi Matsuyama
Mode 11a Tx, 24Mbps

Antenna port 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
5180.0	-10.27	2.56	10.00	2.29	4.00	1.71
5220.0	-10.05	2.57	10.00	2.52	4.00	1.48
5240.0	-10.15	2.57	10.00	2.42	4.00	1.58
5260.0	-10.84	2.58	9.99	1.74	11.00	9.27
5300.0	-10.41	2.59	9.99	2.17	11.00	8.83
5320.0	-10.21	2.60	9.99	2.38	11.00	8.62

Result = Reading + Cable Loss + Attenuator

*ON time was only measured using Gate Function.

Peak Power Spectral Density

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32IE0154-HO-01
Date 07/13/2012
Temperature/ Humidity 23deg. C / 62% RH
Engineer Satofumi Matsuyama
Mode 11n-20 Tx, MCS 1(Long GI)

Antenna port 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
5180.0	-10.51	2.56	10.00	2.05	4.00	1.95
5220.0	-10.28	2.57	10.00	2.29	4.00	1.71
5240.0	-10.34	2.57	10.00	2.23	4.00	1.77
5260.0	-11.25	2.58	9.99	1.32	11.00	9.68
5300.0	-10.61	2.59	9.99	1.98	11.00	9.03
5320.0	-10.44	2.60	9.99	2.15	11.00	8.85

Result = Reading + Cable Loss+ Attenuator

*ON time was only measured using Gate Function.

Peak Power Spectral Density

Test place Head Office EMC Lab. No.6 Measurement Room
Report No. 32IE0154-HO-01
Date 07/13/2012
Temperature/ Humidity 23deg. C / 62% RH
Engineer Satofumi Matsuyama
Mode 11n-40 Tx, MCS 3(Long GI)

Antenna port 1

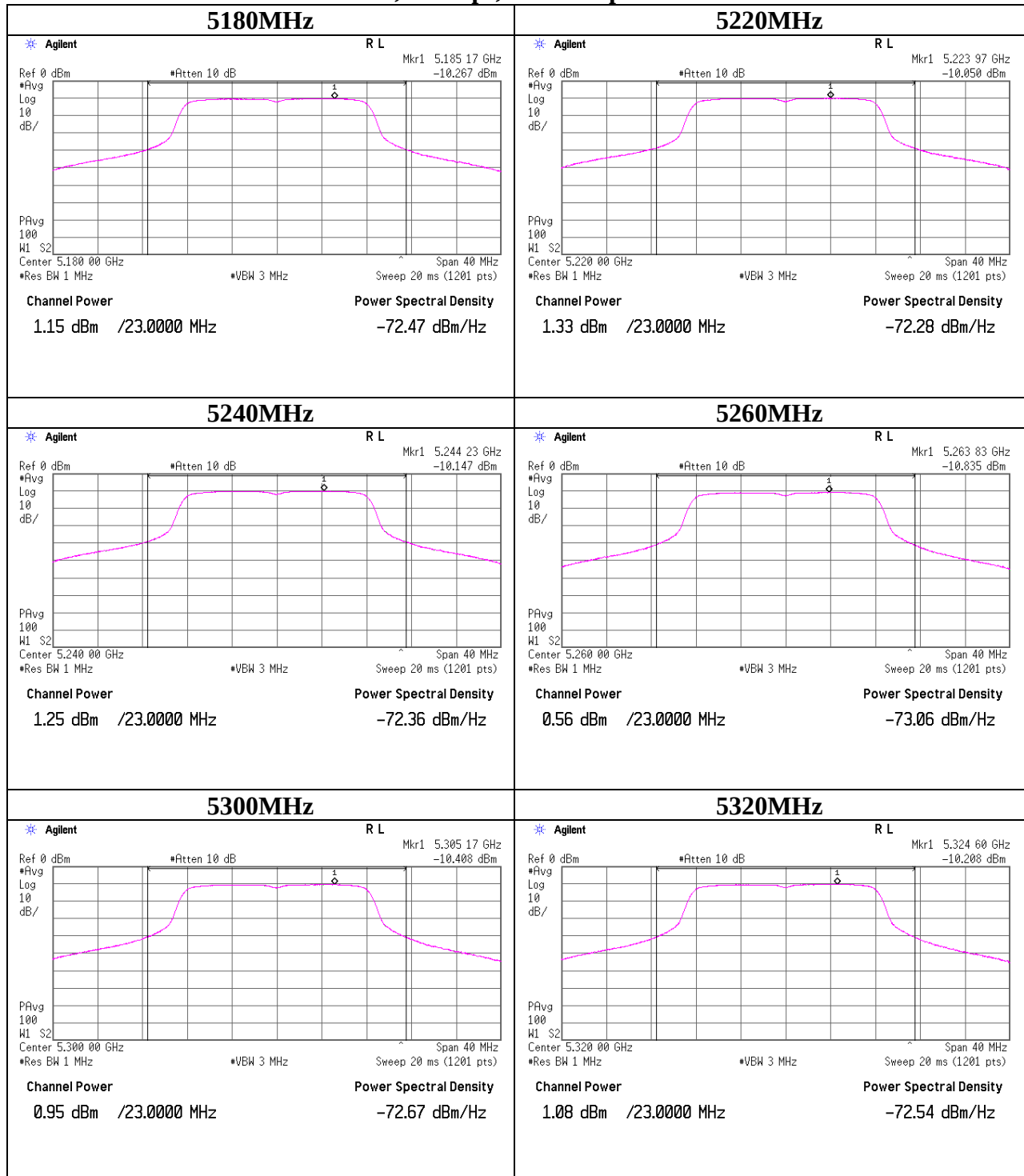
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
5190.0	-17.26	2.56	10.00	-4.70	4.00	8.70
5230.0	-14.10	2.57	10.00	-1.53	4.00	5.53
5270.0	-14.13	2.58	9.99	-1.56	11.00	12.56
5310.0	-16.20	2.59	9.99	-3.62	11.00	14.62

Result = Reading + Cable Loss + Attenuator

*ON time was only measured using Gate Function.

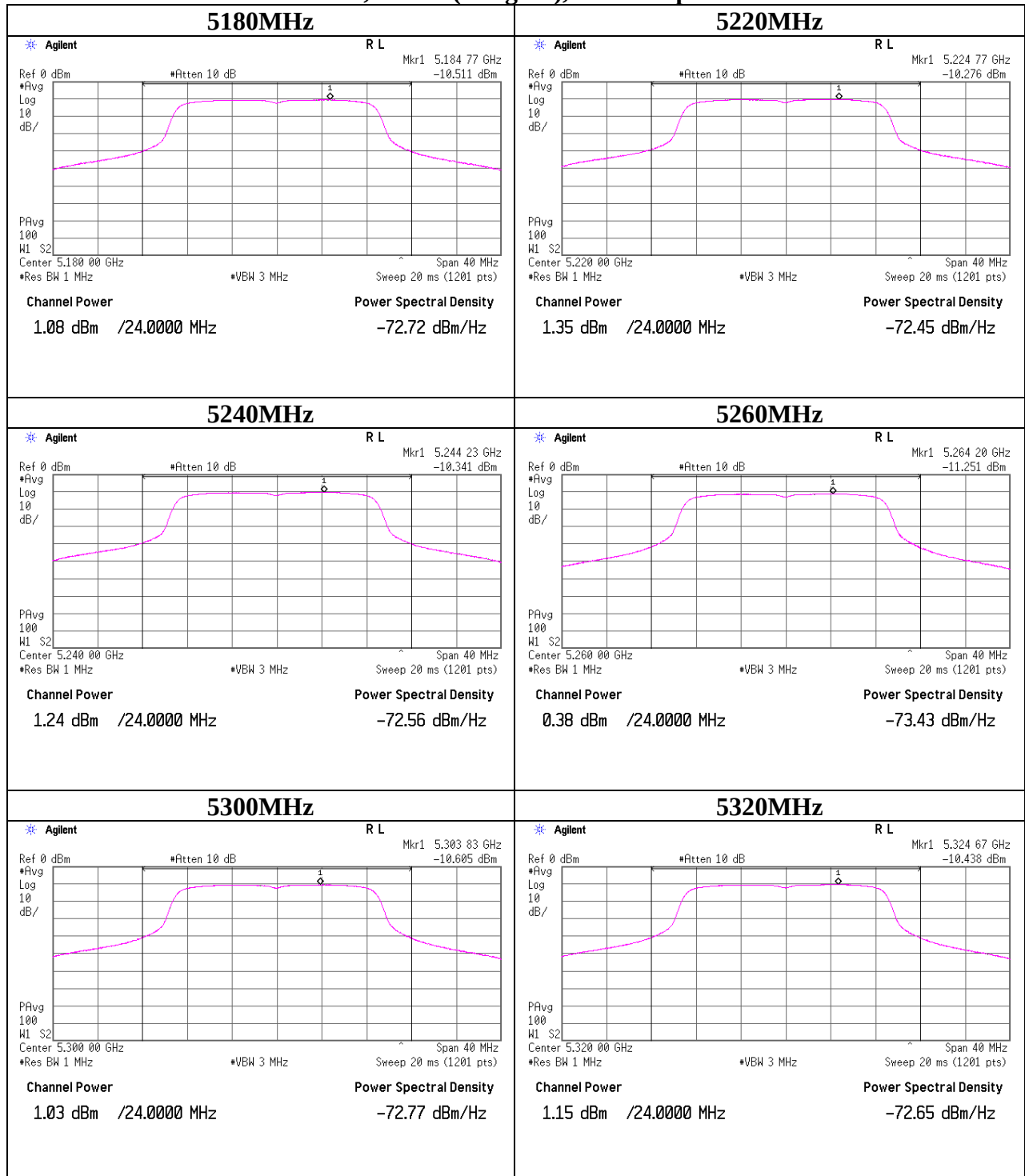
Maximum Peak Output Power & Peak Power Spectral Density

11a, 24Mbps, Antenna port 1



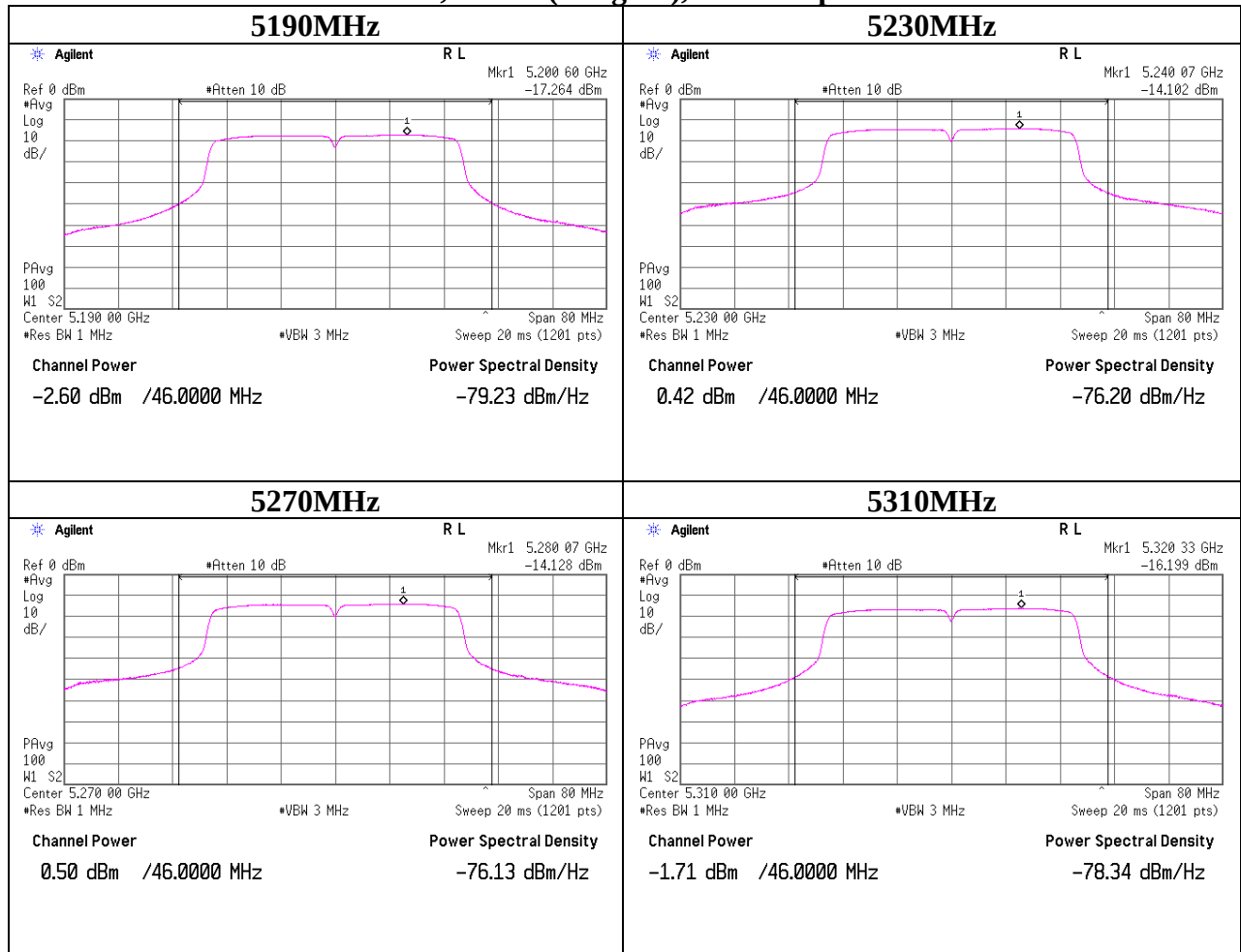
Maximum Peak Output Power & Peak Power Spectral Density

11n-20, MCS 1(Long GI), Antenna port 1



Maximum Peak Output Power & Peak Power Spectral Density

11n-40, MCS 3(Long GI), Antenna port 1



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

Test place : Head Office EMC Lab. No.11 Measurement Room
Report No. : 32IE0154-HO-01
Date : 5/21/2012
Temperature/ Humidity : 24deg.C. / 52% RH
Engineer : Satofumi Matsuyama
Mode : 11a Tx

Antenna port 0, 5180MHz

Data Rate [Mbps]	Reading [dBm]	Remark
6	1.07	
9	1.06	
12	1.17	
18	0.94	
24	1.07	
36	1.19	
48	-0.74	
54	-1.59	

Antenna port 1, 5180MHz

Data Rate [Mbps]	Reading [dBm]	Remark
6	1.30	
9	1.21	
12	1.21	
18	1.17	
24	1.35	*
36	1.30	
48	-0.53	
54	-1.17	

* Worst Rate

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

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

Test place : Head Office EMC Lab. No.11 Measurement Room
Report No. : 32IE0154-HO-01
Date : 5/21/2012
Temperature/ Humidity : 24deg.C. / 52% RH
Engineer : Satofumi Matsuyama
Mode : 11n-20 Tx

Antenna port 0, 5180MHz

MCS Number	Long GI		Short GI	
	Reading [dBm]	Remark	Reading [dBm]	Remark
0	0.92		1.00	
1	1.04		1.19	
2	1.10		1.05	
3	1.04		0.97	
4	0.82		0.81	
5	-1.05		-1.14	
6	-2.69		-2.52	
7	-2.38		-2.36	

Antenna port 1, 5180MHz

MCS Number	Long GI		Short GI	
	Reading [dBm]	Remark	Reading [dBm]	Remark
0	1.16		1.11	
1	1.30	*	1.24	
2	1.17		0.95	
3	1.07		0.88	
4	0.96		0.70	
5	-0.95		-0.84	
6	-2.36		-2.29	
7	-2.26		-2.27	

* Worst MCS

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

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

Test place : Head Office EMC Lab. No.11 Measurement Room
Report No. : 32IE0154-HO-01
Date : 5/21/2012
Temperature/ Humidity : 24deg.C. / 52% RH
Engineer : Satofumi Matsuyama
Mode : 11n-40 Tx

Antenna port 0, 5190MHz

MCS Number	Long GI		Short GI	
	Reading [dBm]	Remark	Reading [dBm]	Remark
0	1.12		0.95	
1	0.95		0.92	
2	1.03		0.87	
3	1.14		0.99	
4	1.11		1.09	
5	-0.45		-0.93	
6	-2.19		-2.11	
7	-2.28		-2.04	

Antenna port 1, 5190MHz

MCS Number	Long GI		Short GI	
	Reading [dBm]	Remark	Reading [dBm]	Remark
0	1.21		1.00	
1	1.04		0.94	
2	1.09		0.95	
3	1.30	*	1.01	
4	1.10		0.95	
5	-0.55		-0.79	
6	-1.80		-2.17	
7	-1.97		-2.17	

* Worst MCS

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

Radiated Spurious Emission [Sleeve antenna]

Test place : Head Office EMC Lab. No.2 Anechoic Chamber
Report No. : 32IE0154-HO-01
Date : 6/28/2012 6/28/2012
Temperature/ Humidity : 23deg. C / 64% RH 24deg. C / 62% RH
Engineer : Katsunori Okai Satofumi Matsuyama
(10-40GHz) (Below 10GHz)
Mode : 11n-20 Tx 5180MHz

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	4757.970	PK	53.8	31.1	3.2	34.0	-	54.1	73.9	19.8	Inside	
Hori	5150.000	PK	64.4	31.9	3.3	34.0	-	65.6	68.2	2.6	Bandedge	
Hori	5413.271	PK	53.2	32.1	3.4	33.8	-	54.9	73.9	19.0	Inside	
Hori	10360.000	PK	45.4	39.7	-2.3	34.4	-	48.4	68.2	19.8	Outside	
Hori	4757.970	AV	48.3	31.1	3.2	34.0	-	48.6	53.9	5.3	Inside	AV: Method 2
Hori	5150.000	AV	50.2	31.9	3.3	34.0	0.2	51.6	53.9	2.3	Bandedge	AV: Method 1
Hori	5413.271	AV	45.1	32.1	3.4	33.8	0.2	47.0	53.9	6.9	Inside	AV: Method 1
Vert	4757.912	PK	52.6	31.1	3.2	34.0	-	52.9	73.9	21.0	Inside	
Vert	5150.000	PK	60.7	31.9	3.3	34.0	-	61.9	68.2	6.3	Bandedge	
Vert	5412.603	PK	52.1	32.1	3.4	33.8	-	53.8	73.9	20.1	Inside	
Vert	10360.000	PK	47.6	39.7	-2.3	34.4	-	50.6	68.2	17.6	Outside	
Vert	4757.912	AV	46.8	31.1	3.2	34.0	-	47.1	53.9	6.8	Inside	AV: Method 2
Vert	5150.000	AV	47.9	31.9	3.3	34.0	0.2	49.3	53.9	4.6	Bandedge	AV: Method 1
Vert	5412.603	AV	44.2	32.1	3.4	33.8	0.2	46.1	53.9	7.8	Inside	AV: Method 1

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

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

Radiated Spurious Emission [Sleeve antenna]

Test place Head Office EMC Lab. No.2 Anechoic Chamber
Report No. 32IE0154-HO-01
Date 6/28/2012 6/28/2012
Temperature/ Humidity 23deg. C / 64% RH 24deg. C / 62% RH
Engineer Katsunori Okai Satofumi Matsuyama
(10-40GHz) (1-10GHz)
Mode 11n-20 Tx 5240MHz

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	4758.032	PK	53.6	31.1	3.2	34.0	-	53.9	73.9	20.0	Inside	
Hori	5413.787	PK	52.9	32.1	3.4	33.8	-	54.6	73.9	19.3	Inside	
Hori	10480.000	PK	47.5	39.8	-2.3	34.3	-	50.7	68.2	17.5	Outside	
Hori	4758.032	AV	48.3	31.1	3.2	34.0	-	48.6	53.9	5.3	Inside	AV: Method 2
Hori	5413.787	AV	44.8	32.1	3.4	33.8	0.2	46.7	53.9	7.2	Inside	AV: Method 1
Vert	4758.231	PK	52.6	31.1	3.2	34.0	-	52.9	73.9	21.0	Inside	
Vert	5410.125	PK	53.6	32.1	3.4	33.8	-	55.3	73.9	18.6	Inside	
Vert	10480.000	PK	50.4	39.8	-2.3	34.3	-	53.6	68.2	14.6	Outside	
Vert	4758.231	AV	47.2	31.1	3.2	34.0	-	47.5	53.9	6.4	Inside	AV: Method 2
Vert	5410.125	AV	46.5	32.1	3.4	33.8	0.2	48.4	53.9	5.5	Inside	AV: Method 1

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

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

Radiated Spurious Emission [Sleeve antenna]

Test place	Head Office EMC Lab. No.2 Anechoic Chamber	
Report No.	32IE0154-HO-01	
Date	6/28/2012	6/28/2012
Temperature/ Humidity	23deg. C / 64% RH	24deg. C / 62% RH
Engineer	Katsunori Okai	Satofumi Matsuyama
	(10-40GHz)	(Below 10GHz)
Mode	11n-20 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	179.349	QP	40.8	16.0	8.0	28.1	-	36.7	43.5	6.8	Outside	
Hori	186.784	QP	46.1	16.1	8.1	28.0	-	42.3	43.5	1.2	Outside	
Hori	195.394	QP	41.4	16.2	8.1	28.0	-	37.7	43.5	5.8	Outside	
Hori	314.923	QP	40.9	14.9	8.9	27.7	-	37.0	46.0	9.0	Outside	
Hori	361.256	QP	38.8	16.3	9.2	28.0	-	36.3	46.0	9.7	Outside	
Hori	600.004	QP	42.3	19.8	10.2	28.8	-	43.5	46.0	2.5	Outside	
Hori	4758.097	PK	53.5	31.1	3.2	34.0	-	53.8	73.9	20.1	Inside	
Hori	5350.000	PK	59.7	32.0	3.4	33.8	-	61.3	68.2	6.9	Bandedge	
Hori	10640.000	PK	50.9	39.9	-2.2	34.2	-	54.4	73.9	19.5	Inside	
Hori	4758.097	AV	48.1	31.1	3.2	34.0	-	48.4	53.9	5.5	Inside	AV: Method 2
Hori	5350.000	AV	47.2	32.0	3.4	33.8	0.2	49.0	53.9	4.9	Bandedge	AV: Method 1
Hori	10640.000	AV	42.3	39.9	-2.2	34.2	0.2	46.0	53.9	7.9	Inside	AV: Method 1
Vert	179.449	QP	32.3	16.0	8.0	28.1	-	28.2	43.5	15.3	Outside	
Vert	186.796	QP	38.7	16.1	8.1	28.0	-	34.9	43.5	8.6	Outside	
Vert	195.444	QP	33.0	16.2	8.1	28.0	-	29.3	43.5	14.2	Outside	
Vert	434.348	QP	33.5	17.7	9.5	28.5	-	32.2	46.0	13.8	Outside	
Vert	450.472	QP	33.6	17.9	9.6	28.5	-	32.6	46.0	13.4	Outside	
Vert	600.003	QP	36.2	19.8	10.2	28.8	-	37.4	46.0	8.6	Outside	
Vert	4758.014	PK	52.8	31.1	3.2	34.0	-	53.1	73.9	20.8	Inside	
Vert	5350.000	PK	60.5	32.0	3.4	33.8	-	62.1	68.2	6.1	Bandedge	
Vert	10640.000	PK	55.0	39.9	-2.2	34.2	-	58.5	73.9	15.4	Inside	
Vert	4758.014	AV	46.9	31.1	3.2	34.0	-	47.2	53.9	6.7	Inside	AV: Method 2
Vert	5350.000	AV	47.9	32.0	3.4	33.8	0.2	49.7	53.9	4.2	Bandedge	AV: Method 1
Vert	10640.000	AV	44.5	39.9	-2.2	34.2	0.2	48.2	53.9	5.7	Inside	AV: Method 1

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier) + Duty Factor(AV)
*Other frequency noises omitted in this report were not seen or have 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

Radiated Spurious Emission [Sleeve antenna]

Test place : Head Office EMC Lab. No.2 Anechoic Chamber
Report No. : 32IE0154-HO-01
Date : 5/25/2012 6/28/2012
Temperature/ Humidity : 22deg. C / 45% RH 23deg. C / 64% RH
Engineer : Katsunori Okai Katsunori Okai
(1-10GHz) (10-40GHz)
Mode : 11n-40 Tx 5190MHz

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	3456.011	PK	48.0	28.5	2.7	31.9	-	47.3	68.2	20.9	Outside	
Hori	4758.065	PK	46.8	30.3	3.2	31.4	-	48.9	73.9	25.0	Inside	
Hori	5150.000	PK	61.9	30.8	3.3	31.4	-	64.6	68.2	3.6	Bandedge	
Hori	10380.000	PK	45.0	39.7	-2.3	34.4	-	48.0	68.2	20.2	Outside	
Hori	4758.065	AV	40.7	30.3	3.2	31.4	-	42.8	53.9	11.1	Inside	AV: Method 2
Hori	5150.000	AV	48.4	30.8	3.3	31.4	0.8	51.9	53.9	2.0	Bandedge	AV: Method 1
Vert	3456.003	PK	49.8	28.5	2.7	31.9	-	49.1	68.2	19.1	Outside	
Vert	4758.009	PK	46.4	30.3	3.2	31.4	-	48.5	73.9	25.4	Inside	
Vert	5150.000	PK	57.8	30.8	3.3	31.4	-	60.5	68.2	7.7	Bandedge	
Vert	10380.000	PK	46.9	39.7	-2.3	34.4	-	49.9	68.2	18.3	Outside	
Vert	4758.009	AV	39.5	30.3	3.2	31.4	-	41.6	53.9	12.3	Inside	AV: Method 2
Vert	5150.000	AV	43.7	30.8	3.3	31.4	0.8	47.2	53.9	6.7	Bandedge	AV: Method 1

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

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

Radiated Spurious Emission [Sleeve antenna]

Test place : Head Office EMC Lab. No.2 Anechoic Chamber
Report No. : 32IE0154-HO-01
Date : 5/25/2012 6/28/2012
Temperature/ Humidity : 22deg. C / 45% RH 23deg. C / 64% RH
Engineer : Katsunori Okai Katsunori Okai
(1-10GHz) (10-40GHz)
Mode : 11n-40 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	3456.065	PK	46.5	28.5	2.7	31.9	-	45.8	68.2	22.4	Outside	
Hori	4758.043	PK	47.8	30.3	3.2	31.4	-	49.9	73.9	24.0	Inside	
Hori	10460.000	PK	49.6	39.8	-2.3	34.3	-	52.8	68.2	15.4	Outside	
Hori	4758.043	AV	41.5	30.3	3.2	31.4	-	43.6	53.9	10.3	Inside	AV: Method 2
Vert	3456.011	PK	49.8	28.5	2.7	31.9	-	49.1	68.2	19.1	Outside	
Vert	4757.998	PK	46.5	30.3	3.2	31.4	-	48.6	73.9	25.3	Inside	
Vert	10460.000	PK	53.5	39.8	-2.3	34.3	-	56.7	68.2	11.5	Outside	
Vert	4757.998	AV	39.1	30.3	3.2	31.4	-	41.2	53.9	12.7	Inside	AV: Method 2

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

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

Radiated Spurious Emission [Sleeve antenna]

Test place : Head Office EMC Lab. No.2 Anechoic Chamber
Report No. : 32IE0154-HO-01
Date : 5/25/2012 6/28/2012
Temperature/ Humidity : 22deg. C / 45% RH 23deg. C / 64% RH
Engineer : Katsunori Okai Katsunori Okai
(1-10GHz) (10-40GHz)
Mode : 11n-40 Tx 5310MHz

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	3456.037	PK	45.3	28.5	2.7	31.9	-	44.6	68.2	23.6	Outside	
Hori	4758.033	PK	48.1	30.3	3.2	31.4	-	50.2	73.9	23.7	Inside	
Hori	5350.000	PK	61.8	31.0	3.4	31.4	-	64.8	68.2	3.4	Bandedge	
Hori	10620.000	PK	48.8	39.9	-2.2	34.2	-	52.3	73.9	21.6	Inside	
Hori	4758.033	AV	42.0	30.3	3.2	31.4	-	44.1	53.9	9.8	Inside	AV: Method 2
Hori	5350.000	AV	48.0	31.0	3.4	31.4	0.8	51.8	53.9	2.1	Bandedge	AV: Method 1
Hori	10620.000	AV	38.2	39.9	-2.2	34.2	0.8	42.5	53.9	11.4	Inside	AV: Method 1
Vert	3456.082	PK	49.6	28.5	2.7	31.9	-	48.9	68.2	19.3	Outside	
Vert	4758.019	PK	45.5	30.3	3.2	31.4	-	47.6	73.9	26.3	Inside	
Vert	5350.000	PK	61.5	31.0	3.4	31.4	-	64.5	68.2	3.7	Bandedge	
Vert	10620.000	PK	49.3	39.9	-2.2	34.2	-	52.8	73.9	21.1	Inside	
Vert	4758.019	AV	38.8	30.3	3.2	31.4	-	40.9	53.9	13.0	Inside	AV: Method 2
Vert	5350.000	AV	47.2	31.0	3.4	31.4	0.8	51.0	53.9	2.9	Bandedge	AV: Method 1
Vert	10620.000	AV	39.3	39.9	-2.2	34.2	0.8	43.6	53.9	10.3	Inside	AV: Method 1

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

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

Radiated Spurious Emission [Embedded antenna]

Test place	Head Office EMC Lab. No.2 Anechoic Chamber		
Report No.	32IE0154-HO-01		
Date	6/26/2012	6/27/2012	6/15/2012
Temperature/ Humidity	25deg. C / 59% RH	23deg. C / 48% RH	23deg. C / 60% RH
Engineer	Satofumi Matsuyama (10-26.5GHz)	Katsunori Okai (Above 26.5GHz)	Yutaka Yoshida (1-10GHz)
Mode	11n-20 Tx 5180MHz		

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	5150.000	PK	64.6	31.9	3.3	34.0	-	65.8	68.2	2.4	Bandedge	
Hori	10360.000	PK	44.3	39.7	-2.3	34.4	-	47.3	68.2	20.9	Outside	
Hori	5150.000	AV	48.4	31.9	3.3	34.0	0.2	49.8	53.9	4.1	Bandedge	AV: Method 1
Vert	5150.000	PK	64.6	31.9	3.3	34.0	-	65.8	68.2	2.4	Bandedge	
Vert	10360.000	PK	47.2	39.7	-2.3	34.4	-	50.2	68.2	18.0	Outside	
Vert	5150.000	AV	47.7	31.9	3.3	34.0	0.2	49.1	53.9	4.8	Bandedge	AV: Method 1

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

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

Radiated Spurious Emission [Embedded antenna]

Test place	Head Office EMC Lab. No.2 Anechoic Chamber		
Report No.	32IE0154-HO-01		
Date	6/26/2012	6/27/2012	6/15/2012
Temperature/ Humidity	25deg. C / 59% RH	23deg. C / 48% RH	23deg. C / 60% RH
Engineer	Satofumi Matsuyama (1-10GHz, 18-26.5GHz)	Katsunori Okai (Above 26.5GHz)	Yutaka Yoshida (10-18GHz)
Mode	11n-20 Tx 5240MHz		

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	3455.947	PK	49.7	29.3	2.7	34.2	-	47.5	68.2	20.7	Outside	
Hori	4758.037	PK	51.0	31.1	3.2	34.0	-	51.3	73.9	22.6	Inside	
Hori	10480.000	PK	48.1	39.8	-2.3	34.3	-	51.3	68.2	16.9	Outside	
Hori	4758.037	AV	45.7	31.1	3.2	34.0	-	46.0	53.9	7.9	Inside	AV: Method 2
Vert	3456.036	PK	52.1	29.3	2.7	34.2	-	49.9	68.2	18.3	Outside	
Vert	4758.008	PK	50.1	31.1	3.2	34.0	-	50.4	73.9	23.5	Inside	
Vert	10480.000	PK	47.2	39.8	-2.3	34.3	-	50.4	68.2	17.8	Outside	
Vert	4758.008	AV	44.2	31.1	3.2	34.0	-	44.5	53.9	9.4	Inside	AV: Method 2

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

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

Radiated Spurious Emission [Embedded antenna]

Test place Head Office EMC Lab. No.2 Anechoic Chamber
Report No. 32IE0154-HO-01
Date 6/26/2012 6/27/2012 6/15/2012 6/28/2012
Temperature/ Humidity 25deg. C / 59% RH 23deg. C / 48% RH 23deg. C / 60% RH 24deg. C / 62% RH
Engineer Satofumi Matsuyama Katsunori Okai Yutaka Yoshida Satofumi Matsuyama
(10-26.5GHz) (Above 26.5GHz) (1-10GHz) (Below 1GHz)
Mode 11n-20 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	179.650	QP	37.3	16.0	8.1	28.1	-	33.3	43.5	10.2	Outside	
Hori	186.772	QP	44.1	16.1	8.1	28.0	-	40.3	43.5	3.2	Outside	
Hori	195.679	QP	39.1	16.2	8.1	28.0	-	35.4	43.5	8.1	Outside	
Hori	323.406	QP	40.0	15.1	9.0	27.8	-	36.3	46.0	9.7	Inside	
Hori	361.058	QP	42.6	16.3	9.2	28.0	-	40.1	46.0	5.9	Outside	
Hori	600.003	QP	35.1	19.8	10.2	28.8	-	36.3	46.0	9.7	Outside	
Hori	5350.000	PK	59.7	32.0	3.4	33.8	-	61.3	68.2	6.9	Bandedge	
Hori	10640.000	PK	51.7	39.9	-2.2	34.2	-	55.2	73.9	18.7	Inside	
Hori	5350.000	AV	45.2	32.0	3.4	33.8	0.2	47.0	53.9	6.9	Bandedge	AV: Method 1
Hori	10640.000	AV	41.6	39.9	-2.2	34.2	0.2	45.3	53.9	8.6	Inside	AV: Method 1
Vert	179.689	QP	31.6	16.0	8.1	28.1	-	27.6	43.5	15.9	Outside	
Vert	186.767	QP	37.2	16.1	8.1	28.0	-	33.4	43.5	10.1	Outside	
Vert	195.716	QP	32.0	16.2	8.1	28.0	-	28.3	43.5	15.2	Outside	
Vert	460.621	QP	37.9	18.0	9.6	28.6	-	36.9	46.0	9.1	Outside	
Vert	467.096	QP	33.8	18.0	9.6	28.6	-	32.8	46.0	13.2	Outside	
Vert	600.002	QP	35.5	19.8	10.2	28.8	-	36.7	46.0	9.3	Outside	
Vert	5350.000	PK	58.8	32.0	3.4	33.8	-	60.4	68.2	7.8	Bandedge	
Vert	10640.000	PK	51.6	39.9	-2.2	34.2	-	55.1	73.9	18.8	Inside	
Vert	5350.000	AV	45.6	32.0	3.4	33.8	0.2	47.4	53.9	6.5	Bandedge	AV: Method 1
Vert	10640.000	AV	43.8	39.9	-2.2	34.2	0.2	47.5	53.9	6.4	Inside	AV: Method 1

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

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

Radiated Spurious Emission [Embedded antenna]

Test place	Head Office EMC Lab. No.2 Anechoic Chamber		
Report No.	32IE0154-HO-01		
Date	6/26/2012	6/27/2012	6/15/2012
Temperature/ Humidity	25deg. C / 59% RH	23deg. C / 48% RH	23deg. C / 60% RH
Engineer	Satofumi Matsuyama (10-26.5GHz)	Katsunori Okai (Above 26.5GHz)	Yutaka Yoshida (1-10GHz)
Mode	11n-40 Tx 5190MHz		

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	5150.000	PK	63.5	31.9	3.3	34.0	-	64.7	68.2	3.5	Bandedge	
Hori	5150.000	AV	50.3	31.9	3.3	34.0	0.8	52.3	53.9	1.6	Bandedge	AV: Method 1
Vert	5150.000	PK	60.5	31.9	3.3	34.0	-	61.7	68.2	6.5	Bandedge	
Vert	5150.000	AV	47.7	31.9	3.3	34.0	0.8	49.7	53.9	4.2	Bandedge	AV: Method 1

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

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

Radiated Spurious Emission [Embedded antenna]

Test place	Head Office EMC Lab. No.2 Anechoic Chamber		
Report No.	32IE0154-HO-01		
Date	6/26/2012	6/27/2012	6/15/2012
Temperature/ Humidity	25deg. C / 59% RH	23deg. C / 48% RH	23deg. C / 60% RH
Engineer	Satofumi Matsuyama	Katsunori Okai	Yutaka Yoshida
	(1-10GHz, 18-26.5GHz)	(Above 26.5GHz)	(10-18GHz)
Mode	11n-40 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	3456.040	PK	49.5	29.3	2.7	34.2	-	47.3	68.2	20.9	Outside	
Hori	4758.063	PK	51.5	31.1	3.2	34.0	-	51.8	73.9	22.1	Inside	
Hori	10460.000	PK	45.1	39.8	-2.3	34.3	-	48.3	68.2	19.9	Outside	
Hori	4758.063	AV	45.5	31.1	3.2	34.0	-	45.8	53.9	8.1	Inside	AV: Method 2
Vert	3456.088	PK	51.9	29.3	2.7	34.2	-	49.7	68.2	18.5	Outside	
Vert	4757.960	PK	51.0	31.1	3.2	34.0	-	51.3	73.9	22.6	Inside	
Vert	10460.000	PK	46.8	39.8	-2.3	34.3	-	50.0	68.2	18.2	Outside	
Vert	4757.960	AV	45.1	31.1	3.2	34.0	-	45.4	53.9	8.5	Inside	AV: Method 2

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

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

Radiated Spurious Emission [Embedded antenna]

Test place : Head Office EMC Lab. No.2 Anechoic Chamber
Report No. : 32IE0154-HO-01
Date : 6/26/2012 6/27/2012
Temperature/ Humidity : 25deg. C / 59% RH 23deg. C / 48% RH
Engineer : Satofumi Matsuyama Katsunori Okai
(10-26.5GHz) (1-10GHz, Above 26.5GHz)
Mode : 11n-40 Tx 5310MHz

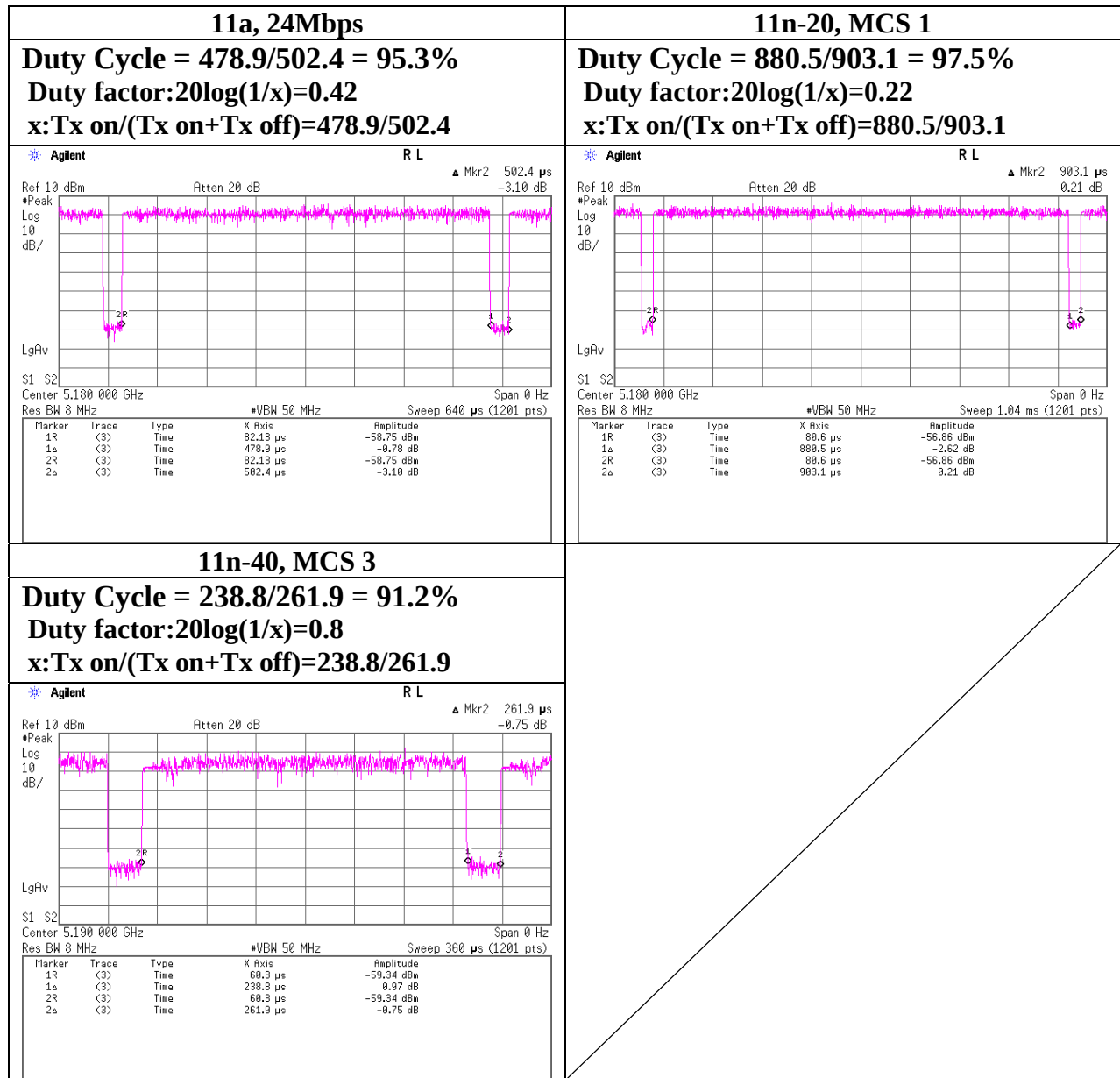
Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Inside or Outside of Restricted Bands	Remark
Hori	5350.000	PK	62.4	32.0	3.4	33.8	-	64.0	68.2	4.2	Bandedge	
Hori	10620.000	PK	45.5	39.9	-2.2	34.2	-	49.0	73.9	24.9	Inside	
Hori	5350.000	AV	49.1	32.0	3.4	33.8	0.8	51.5	53.9	2.4	Bandedge	AV: Method 1
Hori	10620.000	AV	36.8	39.9	-2.2	34.2	0.8	41.1	53.9	12.8	Inside	AV: Method 1
Vert	5350.000	PK	62.5	32.0	3.4	33.8	-	64.1	68.2	4.1	Bandedge	
Vert	10620.000	PK	45.7	39.9	-2.2	34.2	-	49.2	73.9	24.7	Inside	
Vert	5350.000	AV	49.3	32.0	3.4	33.8	0.8	51.7	53.9	2.2	Bandedge	AV: Method 1
Vert	10620.000	AV	37.0	39.9	-2.2	34.2	0.8	41.3	53.9	12.6	Inside	AV: Method 1

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

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

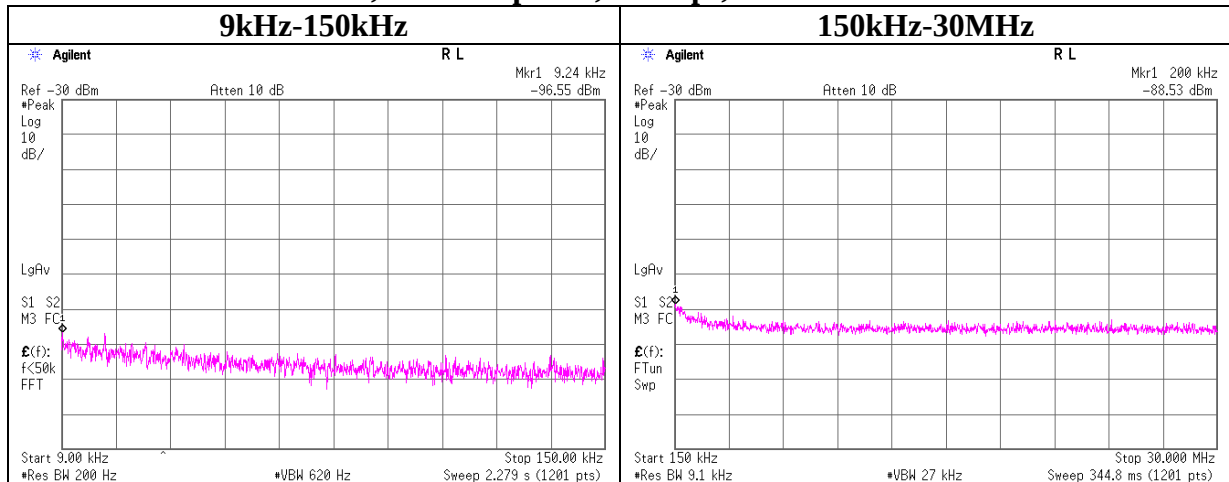
Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB
26.5GHz-40GHz 20log(3.0m/0.5m)=15.6dB

Duty Cycle



Conducted Spurious Emission

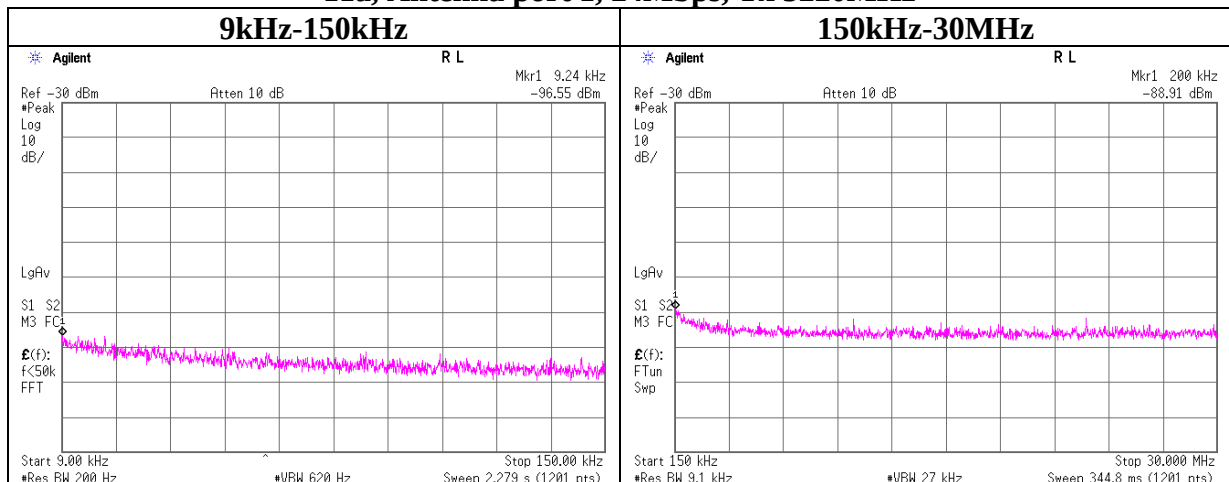
11a, Antenna port 1, 24Mbps, Tx 5180MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dB]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.24	-96.6	0.0	5.9	2.5	37.0	-51.1	-27.0	24.1	
200.00	-88.5	0.0	5.9	2.5	20.4	-59.8	-27.0	32.8	

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

11a, Antenna port 1, 24Mbps, Tx 5220MHz

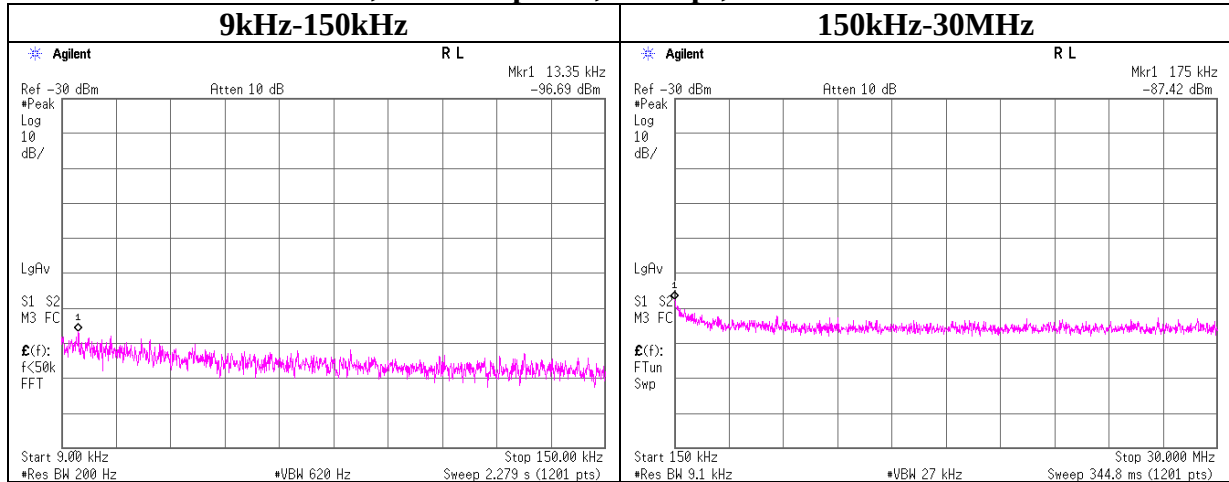


Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dB]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
9.24	-96.6	0.0	5.9	2.5	37.0	-51.1	-27.0	24.1	
200.00	-88.9	0.0	5.9	2.5	20.4	-60.1	-27.0	33.1	

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

Conducted Spurious Emission

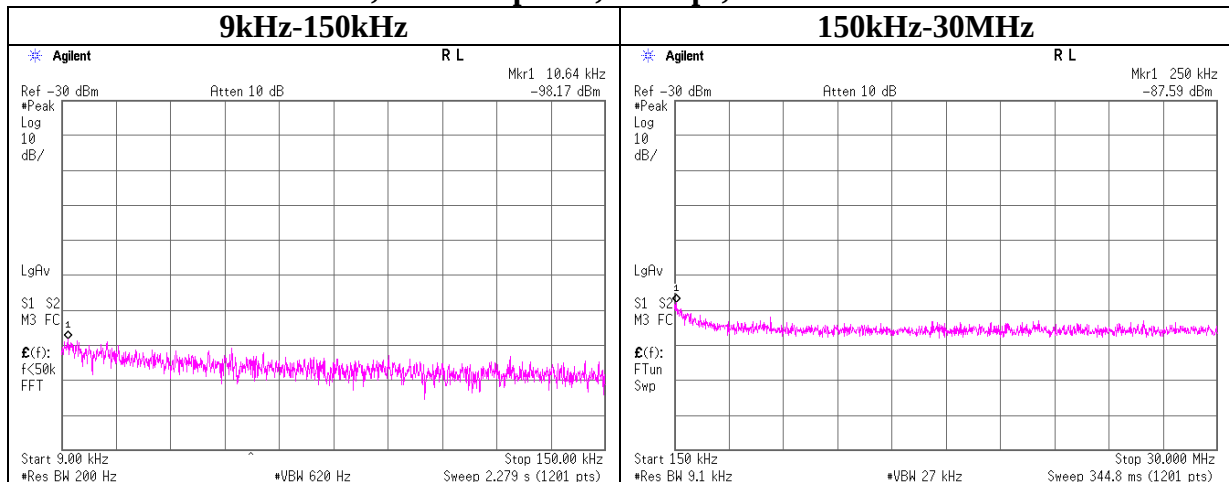
11a, Antenna port 1, 24Mbps, Tx 5240MHz



Frequency	Reading	Cable Loss	Attenuator	Antenna Gain	RBW factor	EIRP	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dBm]	[dBm]	[dB]	
13.35	-96.7	0.0	5.9	2.5	37.0	-51.3	-27.0	24.3	
175.00	-87.4	0.0	5.9	2.5	20.4	-58.7	-27.0	31.7	

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

11a, Antenna port 1, 24Mbps, Tx 5260MHz

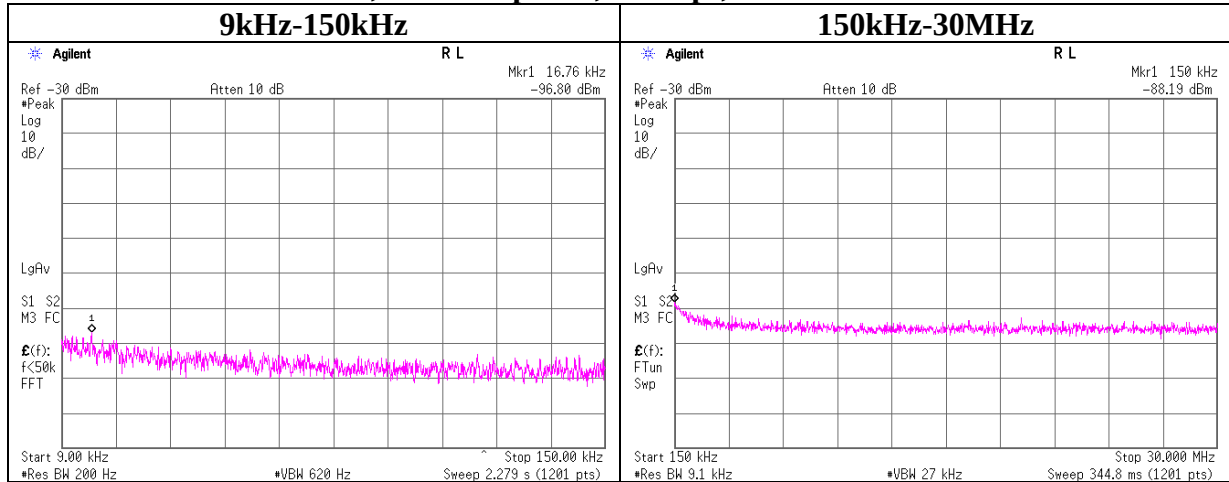


Frequency	Reading	Cable Loss	Attenuator	Antenna Gain	RBW factor	EIRP	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dBm]	[dBm]	[dB]	
10.64	-98.2	0.0	5.9	2.5	37.0	-52.7	-27.0	25.7	
250.00	-87.6	0.0	5.9	2.5	20.4	-58.8	-27.0	31.8	

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

Conducted Spurious Emission

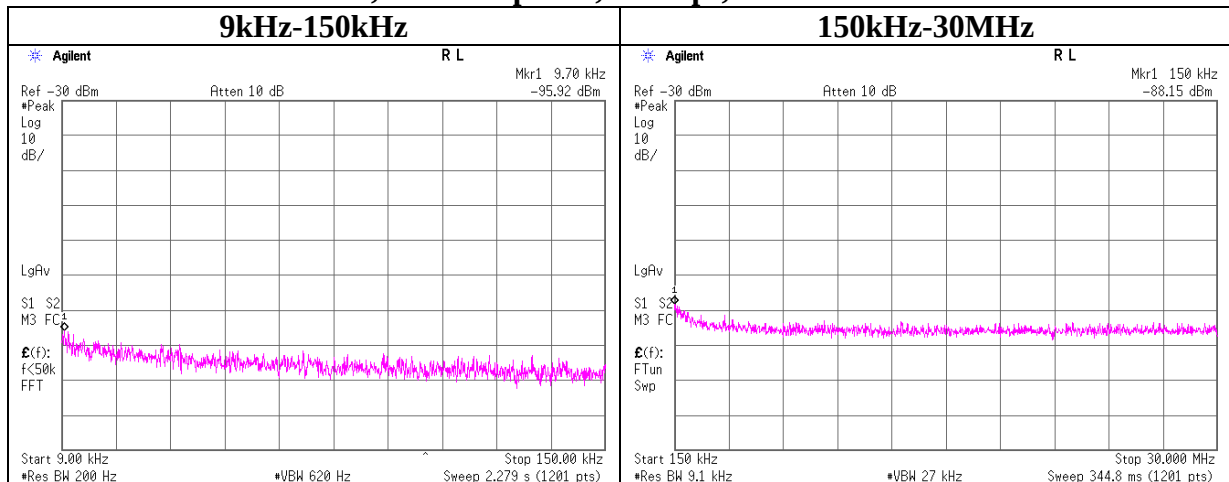
11a, Antenna port 1, 24Mbps, Tx 5300MHz



Frequency	Reading	Cable Loss	Attenuator	Antenna Gain	RBW factor	EIRP	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dBm]	[dBm]	[dB]	
16.76	-96.8	0.0	5.9	2.5	37.0	-51.4	-27.0	24.4	
150.00	-88.2	0.0	5.9	2.5	20.4	-59.4	-27.0	32.4	

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

11a, Antenna port 1, 24Mbps, Tx 5320MHz

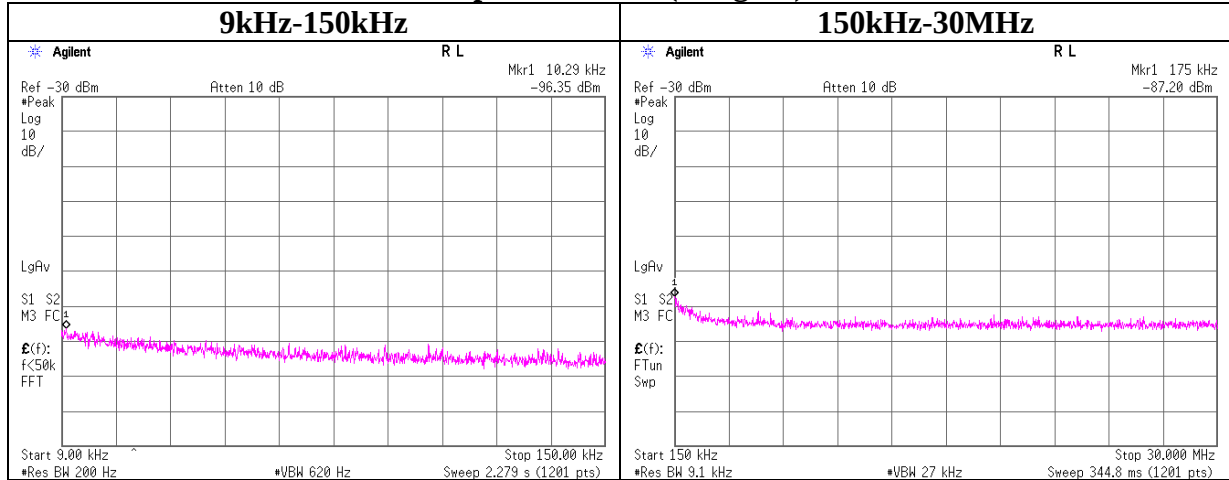


Frequency	Reading	Cable Loss	Attenuator	Antenna Gain	RBW factor	EIRP	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dBm]	[dBm]	[dB]	
9.70	-95.9	0.0	5.9	2.5	37.0	-50.5	-27.0	23.5	
150.00	-88.2	0.0	5.9	2.5	20.4	-59.4	-27.0	32.4	

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

Conducted Spurious Emission

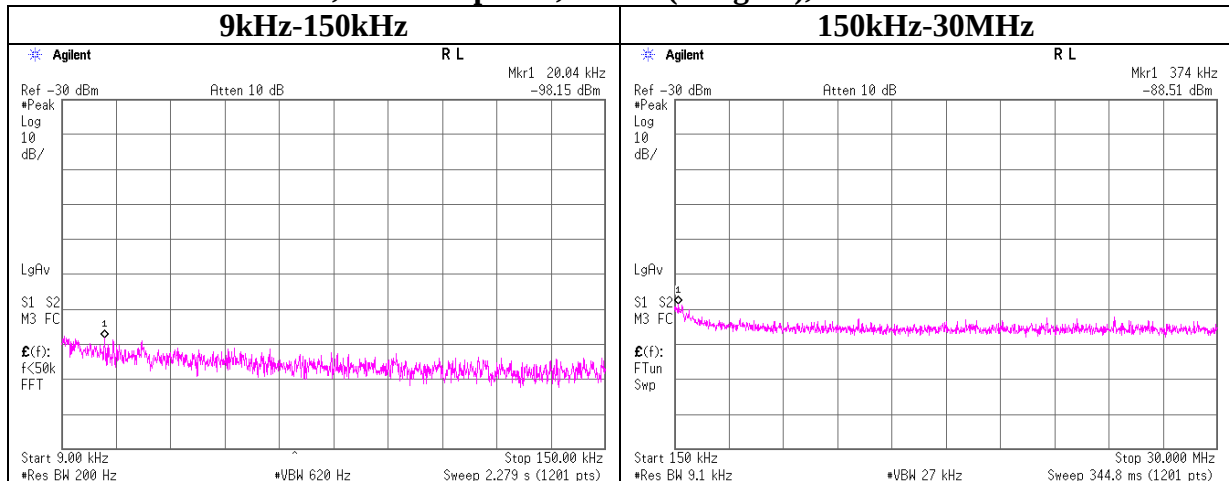
11n-20, Antenna port 1, MCS 1(Long GI), Tx 5180MHz



Frequency	Reading	Cable Loss	Attenuator	Antenna Gain	RBW factor	EIRP	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dBm]	[dBm]	[dB]	
10.29	-96.4	0.0	5.9	2.5	37.0	-50.9	-27.0	23.9	
175.00	-87.2	0.0	5.9	2.5	20.4	-58.4	-27.0	31.4	

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

11n-20, Antenna port 1, MCS 1(Long GI), Tx 5220MHz

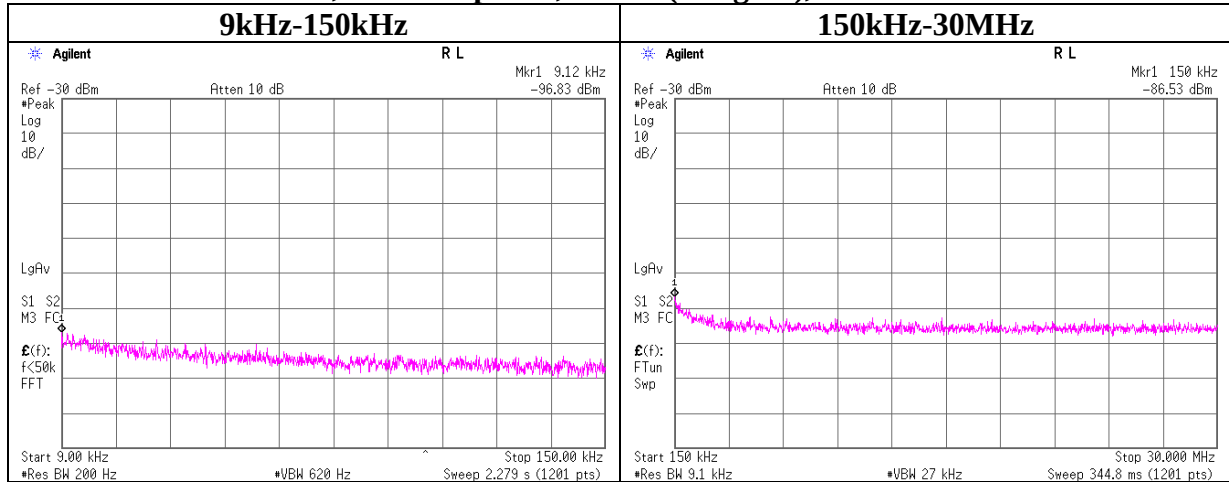


Frequency	Reading	Cable Loss	Attenuator	Antenna Gain	RBW factor	EIRP	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dBm]	[dBm]	[dB]	
20.04	-98.2	0.0	5.9	2.5	37.0	-52.7	-27.0	25.7	
374.00	-88.5	0.0	5.9	2.5	20.4	-59.7	-27.0	32.7	

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

Conducted Spurious Emission

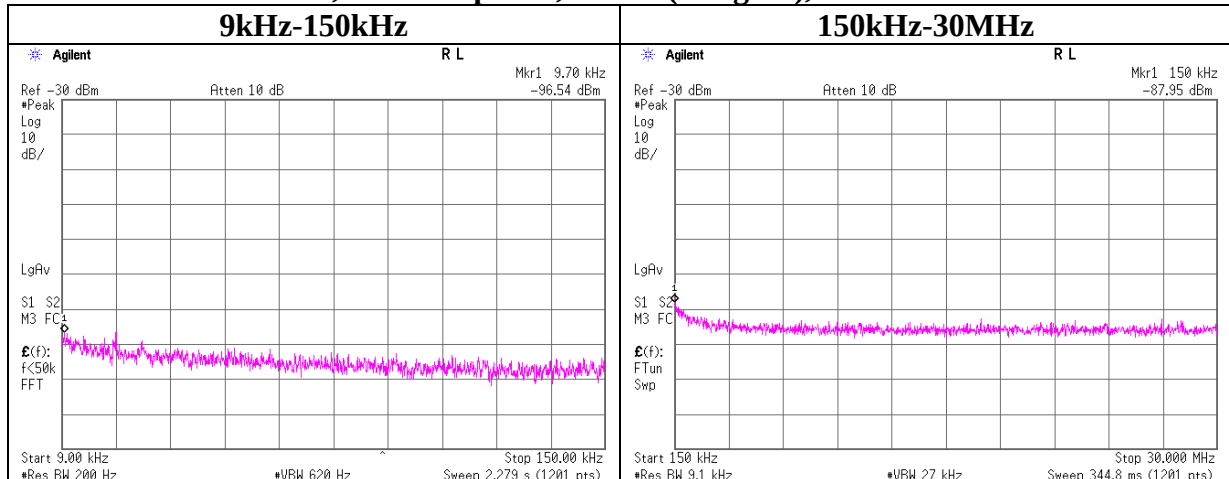
11n-20, Antenna port 1, MCS 1(Long GI), Tx 5240MHz



Frequency	Reading	Cable Loss	Attenuator	Antenna Gain	RBW factor	EIRP	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dBm]	[dBm]	[dB]	
9.12	-96.8	0.0	5.9	2.5	37.0	-51.4	-27.0	24.4	
150.00	-86.5	0.0	5.9	2.5	20.4	-57.8	-27.0	30.8	

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

11n-20, Antenna port 1, MCS 1(Long GI), Tx 5260MHz

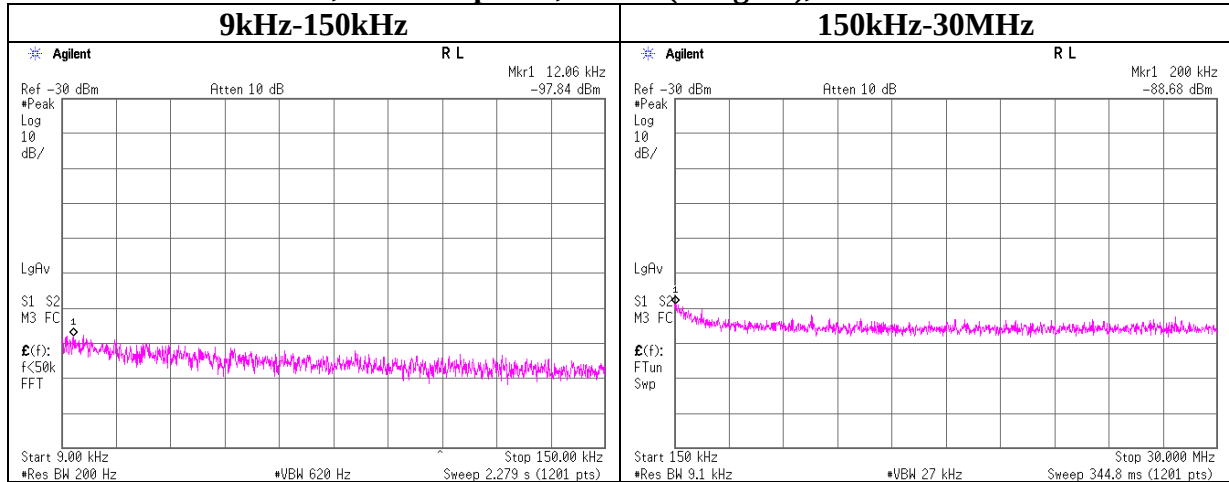


Frequency	Reading	Cable Loss	Attenuator	Antenna Gain	RBW factor	EIRP	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dBm]	[dBm]	[dB]	
9.70	-96.5	0.0	5.9	2.5	37.0	-51.1	-27.0	24.1	
150.00	-88.0	0.0	5.9	2.5	20.4	-59.2	-27.0	32.2	

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

Conducted Spurious Emission

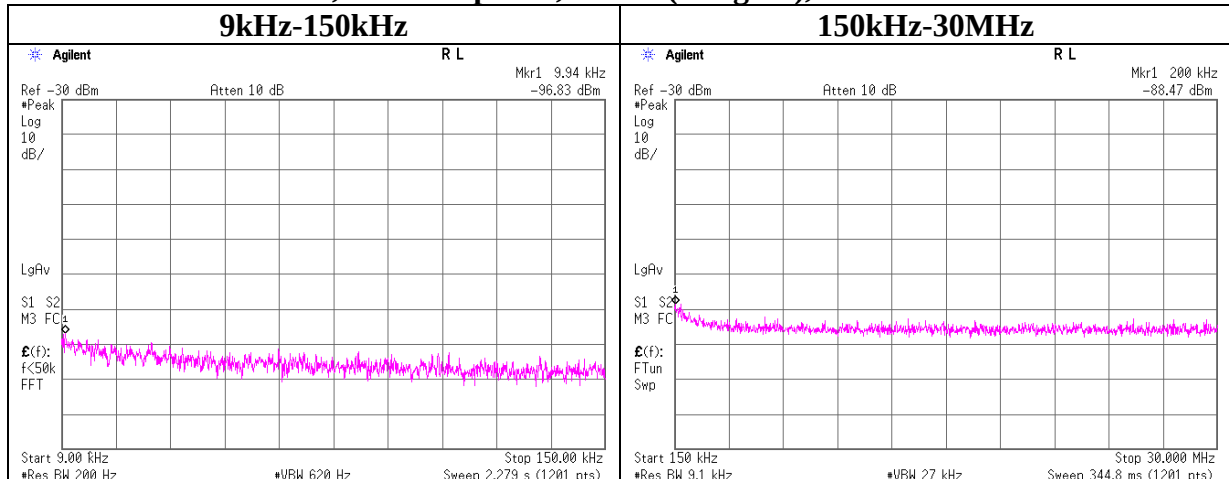
11n-20, Antenna port 1, MCS 1(Long GI), Tx 5300MHz



Frequency	Reading	Cable Loss	Attenuator	Antenna Gain	RBW factor	EIRP	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dBm]	[dBm]	[dB]	
12.06	-97.8	0.0	5.9	2.5	37.0	-52.4	-27.0	25.4	
200.00	-88.7	0.0	5.9	2.5	20.4	-59.9	-27.0	32.9	

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

11n-20, Antenna port 1, MCS 1(Long GI), Tx 5320MHz

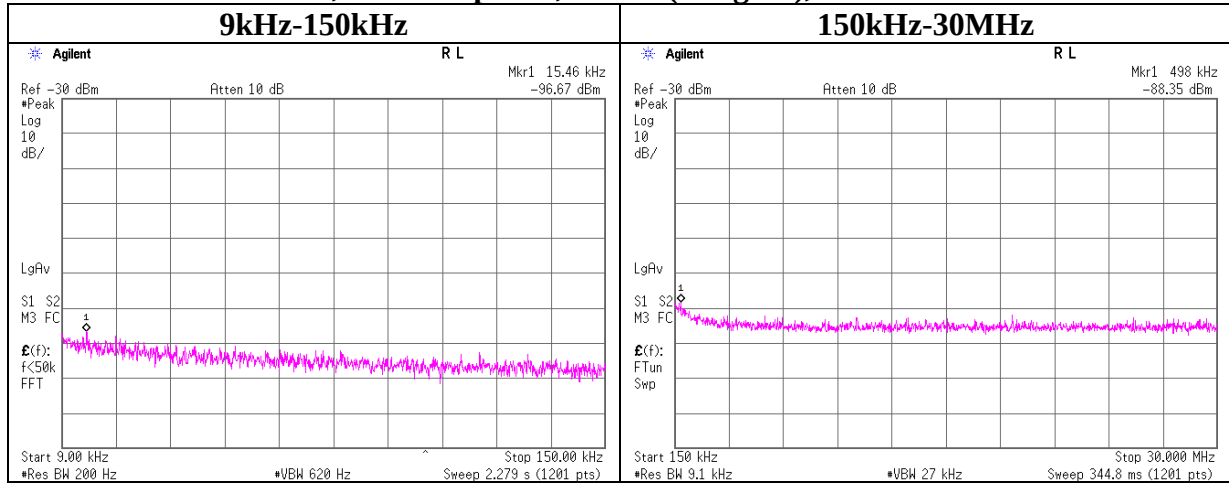


Frequency	Reading	Cable Loss	Attenuator	Antenna Gain	RBW factor	EIRP	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dBm]	[dBm]	[dB]	
9.94	-96.8	0.0	5.9	2.5	37.0	-51.4	-27.0	24.4	
200.00	-88.5	0.0	5.9	2.5	20.4	-59.7	-27.0	32.7	

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

Conducted Spurious Emission

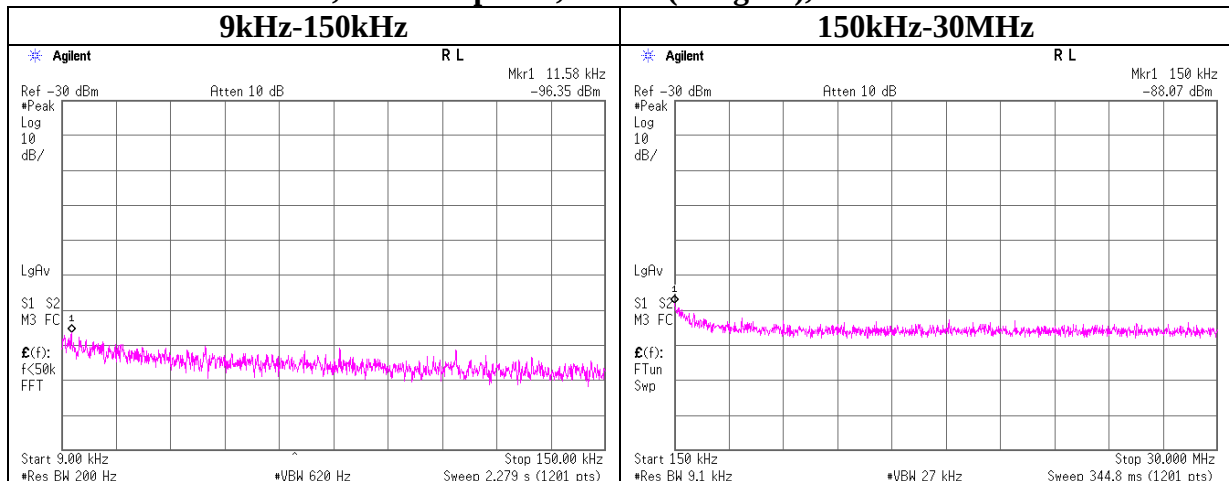
11n-40, Antenna port 1, MCS 3(Long GI), Tx 5190MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dB]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
15.46	-96.7	0.0	5.9	2.5	37.0	-51.2	-27.0	24.2	
498.00	-88.4	0.0	5.9	2.5	20.4	-59.6	-27.0	32.6	

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

11n-40, Antenna port 1, MCS 3(Long GI), Tx 5230MHz

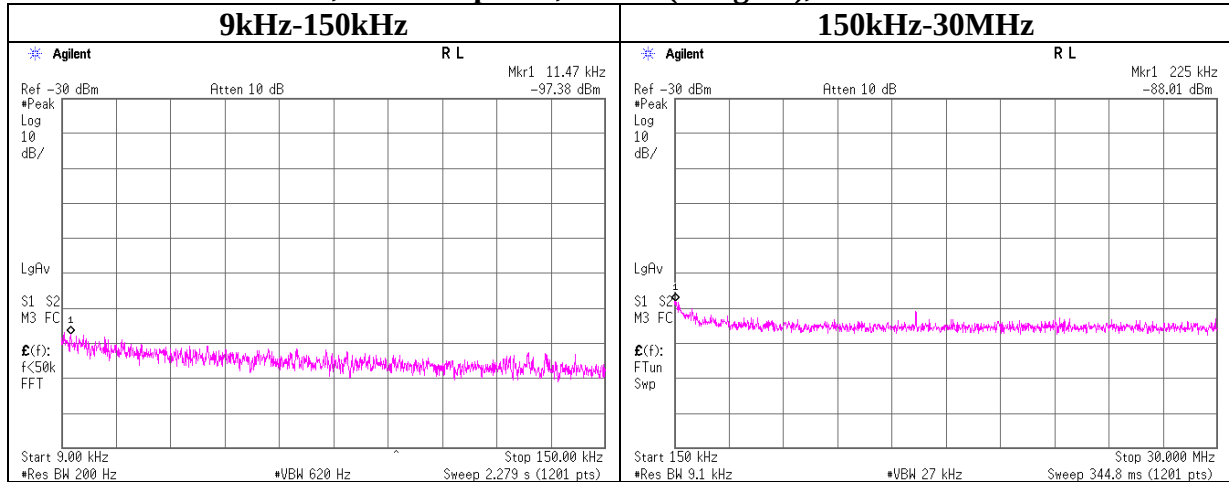


Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator [dB]	Antenna Gain [dB]	RBW factor [dB]	EIRP [dBm]	Limit [dBm]	Margin [dB]	Remark
11.58	-96.4	0.0	5.9	2.5	37.0	-50.9	-27.0	23.9	
150.00	-88.1	0.0	5.9	2.5	20.4	-59.3	-27.0	32.3	

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

Conducted Spurious Emission

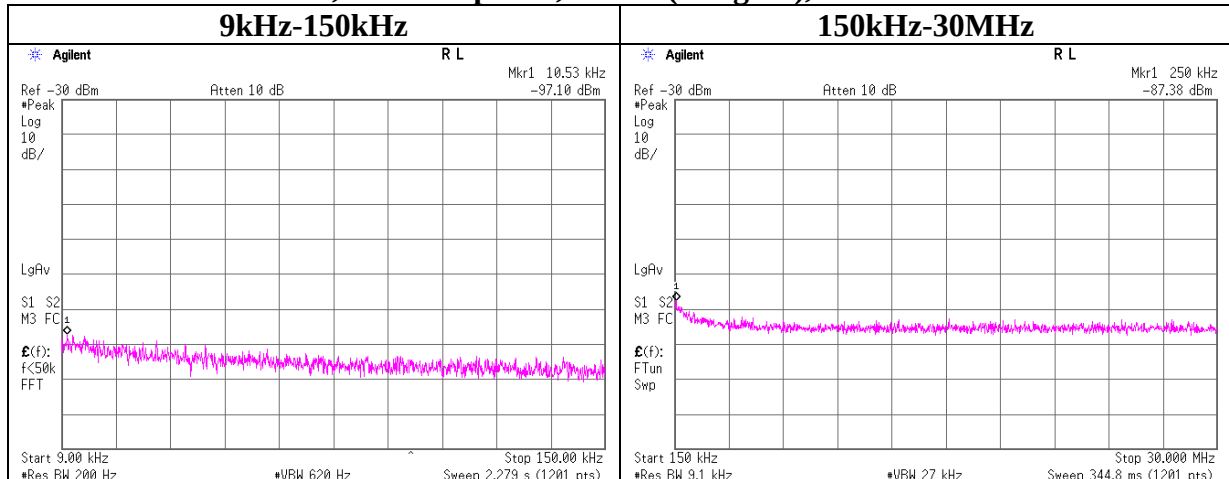
11n-40, Antenna port 1, MCS 3(Long GI), Tx 5270MHz



Frequency	Reading	Cable Loss	Attenuator	Antenna Gain	RBW factor	EIRP	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dBm]	[dBm]	[dB]	
11.47	-97.4	0.0	5.9	2.5	37.0	-51.9	-27.0	24.9	
225.00	-88.0	0.0	5.9	2.5	20.4	-59.2	-27.0	32.2	

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

11n-40, Antenna port 1, MCS 3(Long GI), Tx 5310MHz



Frequency	Reading	Cable Loss	Attenuator	Antenna Gain	RBW factor	EIRP	Limit	Margin	Remark
[kHz]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dBm]	[dBm]	[dB]	
10.53	-97.1	0.0	5.9	2.5	37.0	-51.7	-27.0	24.7	
250.00	-87.4	0.0	5.9	2.5	20.4	-58.6	-27.0	31.6	

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

Peak Excursion Ratio

Test place	Head Office EMC Lab. No.6 Measurement Room
Report No.	32IE0154-HO-01
Date	05/24/2012
Temperature/ Humidity	23deg. C / 49% RH
Engineer	Yutaka Yoshida
Mode	11a Tx, 24Mbps
Mode	11n-20 Tx, MCS 1(Long GI)
Mode	11n-40 Tx, MCS 3(Long GI)

11a

Antenna port	Frequency [MHz]	Peak Power Excursion [dB]	Limit [dB]
1	5180	10.68	13.00
	5220	10.63	13.00
	5240	10.71	13.00
	5260	10.79	13.00
	5300	10.76	13.00
	5320	10.91	13.00

11n-20

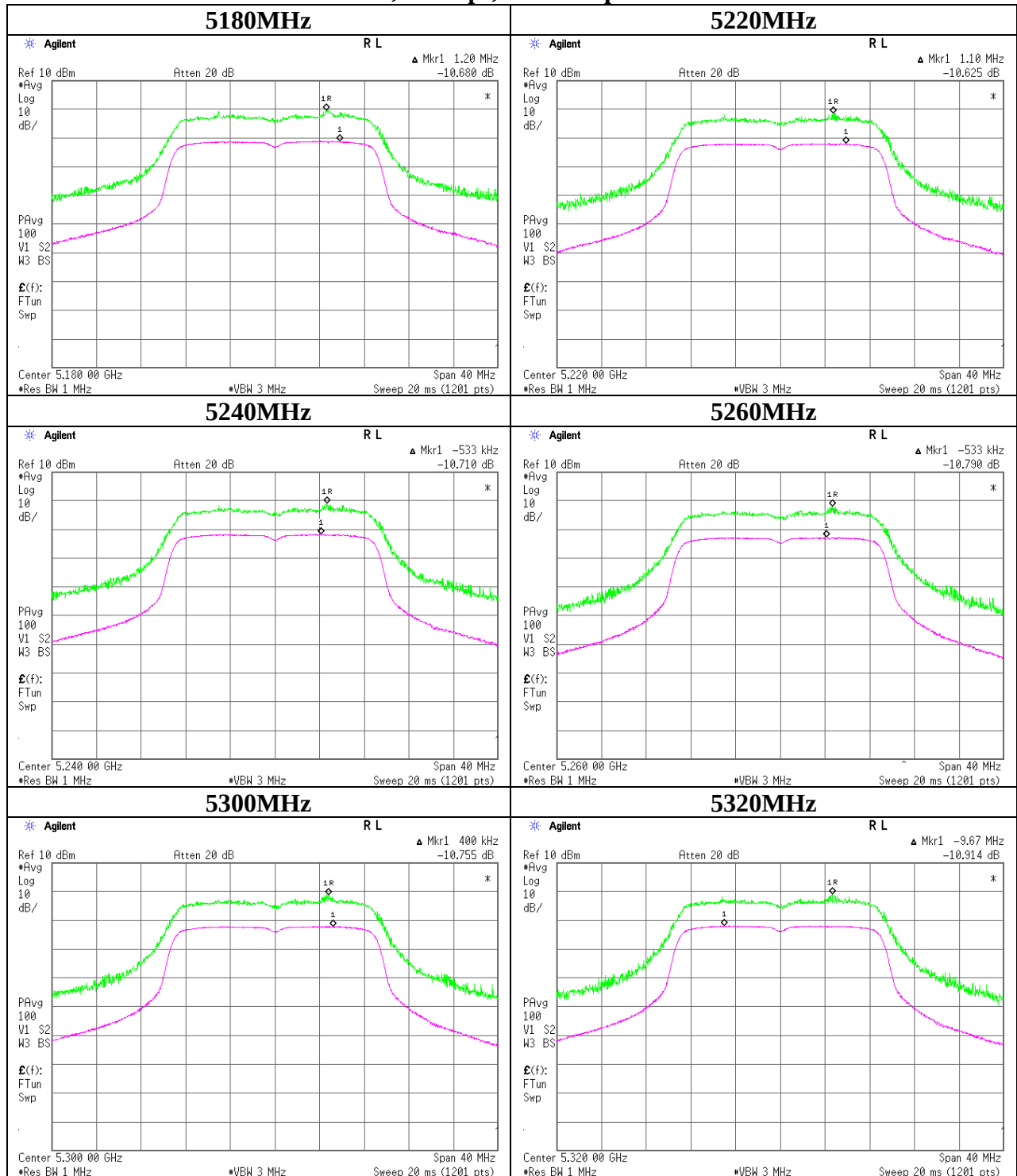
Antenna port	Frequency [MHz]	Peak Power Excursion [dB]	Limit [dB]
1	5180	9.86	13.00
	5220	9.86	13.00
	5240	9.90	13.00
	5260	9.95	13.00
	5300	9.79	13.00
	5320	9.77	13.00

11n-40

Antenna port	Frequency [MHz]	Peak Power Excursion [dB]	Limit [dB]
1	5190	9.45	13.00
	5230	9.20	13.00
	5270	9.28	13.00
	5310	9.63	13.00

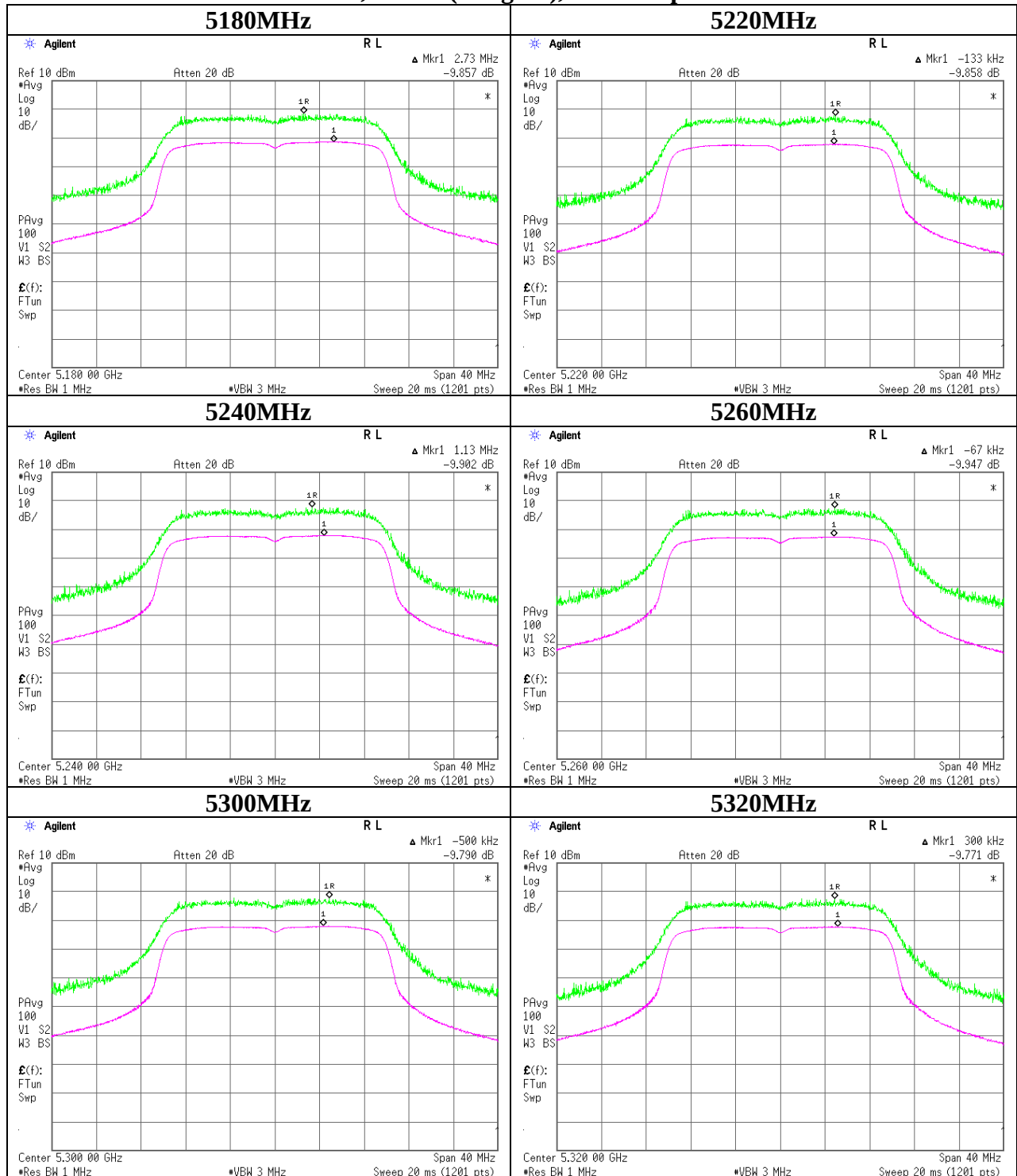
Peak Excursion Ratio

11a, 24Mbps, Antenna port 1



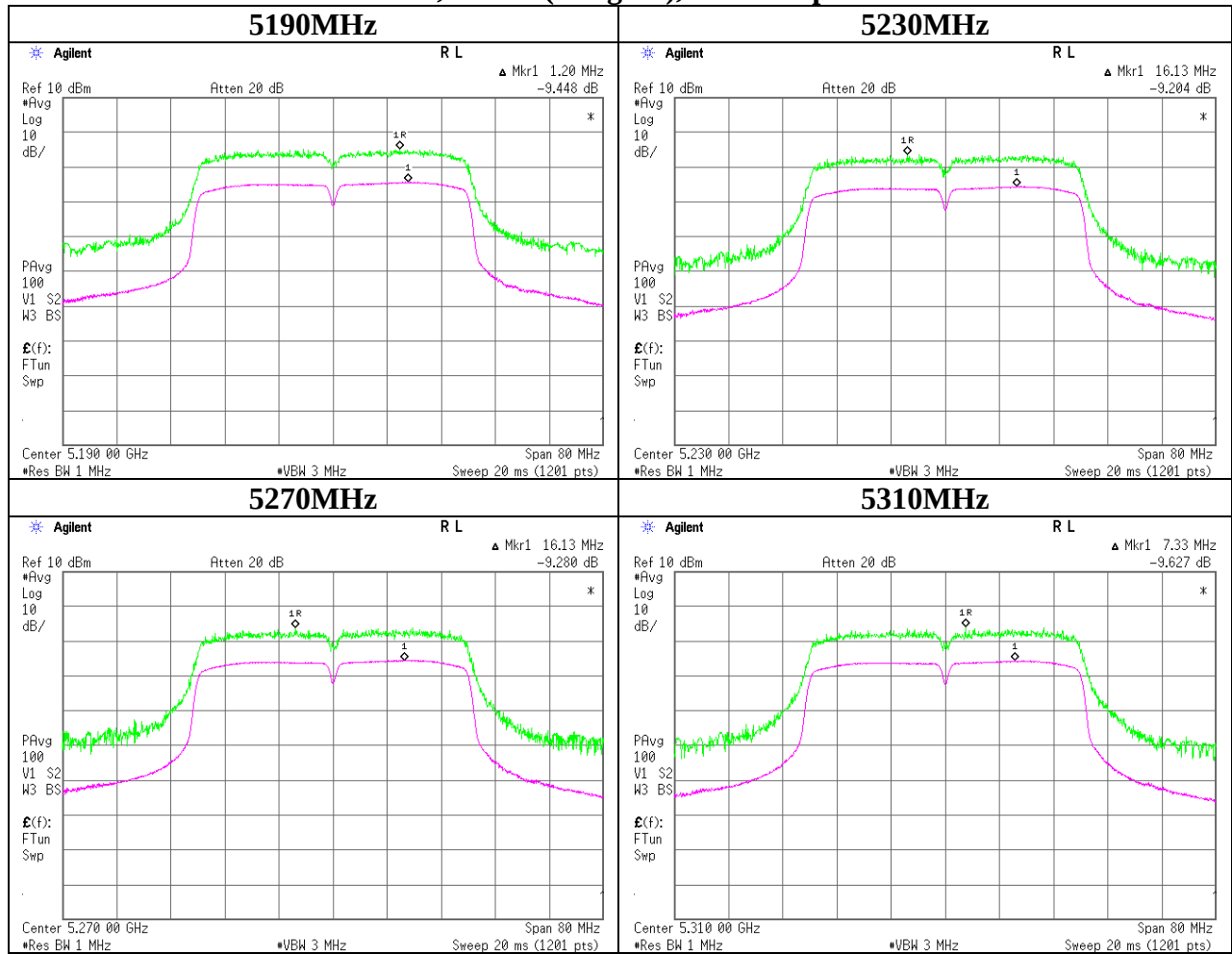
Peak Excursion Ratio

11n-20, MCS 1(Long GI), Antenna port 1



Peak Excursion Ratio

11n-40, MCS 3(Long GI), Antenna port 1



APPENDIX 2: Test instruments

EMI test equipment(1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAT-20	Attenuator(10dB)(above 1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	AT	2012/01/12 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2012/03/27 * 12
MAT-24	Attenuator(10dB)(above 1GHz)	Agilent	8493C	71389	AT	2012/06/27 * 12
MCC-137	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37954/2	AT	2011/10/28 * 12
MCC-138	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37953/2	AT	2011/10/28 * 12
MCC-35	Microwave Cable	Hirose Electric	U.FL-2LP-066-A-(200)	-	AT	2011/09/30 * 12
MCC-36	Microwave Cable	Hirose Electric	U.FL-2LP-066-A-(200)	-	AT	2011/09/30 * 12
MCC-37	Microwave Cable	Hirose Electric	U.FL-2LP-066-A-(200)	-	AT	2011/09/30 * 12
MCC-67	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	28635/2	AT	2012/04/25 * 12
MMM-11	Digital HiTESTER	Hioki	3805	060100600	AT	2012/05/18 * 12
MOS-04	Digital Humidity Indicator	N.T	NT-1800	MOS04	AT	2012/02/06 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2012/02/06 * 12
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2011/12/09 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	AT	2011/11/23 * 12
MAT-65	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28 * 12
MCC-13	Coaxial Cable	Fujikura	3D-2W(12m)/ 5D-2W(5m)/5D- 2W(0.8m)/5D-2W(1m)	-	CE	2012/02/16 * 12
MTA-31	Terminator	TME	CT-01	-	CE	2012/01/11 * 12
MLS-03	LISN(AMN)	Schwarzbeck	NSLK8127	8127384	CE(AE)	2012/03/01 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2011/11/02 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2011/10/23 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2012/02/16 * 12
MCC-132	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336161/4(1m) / 340639(5m)	RE	2011/09/06 * 12
MCC-54	Microwave Cable	Suhner	SUCOFLEX101	2873(1m) / 2876(5m)	RE	2012/03/21 * 12
MCC-77	Microwave Cable 1G-26.5GHz	Suhner	SUCOFLEX104	278942/4	RE	2011/12/08 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2012/02/22 * 12
MHA-04	Horn Antenna 26.5-40GHz	EMCO	3160-10	1140	RE	2011/10/22 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2012/02/22 * 12
MHF-16	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCA	7001	RE	2011/09/08 * 12
MPA-03	Microwave System Power Amplifier	Agilent	83050A	3950M00205	RE	2012/06/22 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2011/09/26 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2012/01/25 * 12
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE/CE	2012/06/29 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE/CE	-
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE/CE	2011/10/23 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE/CE	2012/02/06 * 12
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	RE/CE	2012/06/19 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE/CE	2012/04/03 * 12

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

EMI test equipment(2/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	AT	2012/02/03 * 12
MCC-115	Microwave Cable 1G- 26.5GHz	Suhner	SUCOFLEX104	290211/4	AT	2011/08/24 * 12
MCC-103	Microwave Cable	Hirose Electric	U.FL-2LP-066J1- A(200)	-	AT	2012/06/27 * 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

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Facsimile : +81 596 24 8124