



RADIO TEST REPORT

Test Report No. : 10005900H-A-R1

Applicant : Murata Manufacturing Co., Ltd.
Type of Equipment : Communication Module
Model No. : Type XN
FCC ID : VPYLBXN604
Test regulation : FCC Part 15 Subpart C: 2012
*Radiated Spurious Emission only
Class II Permissive Change
Test Result : Complied

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
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.
6. This report is a revised version of 10005900H-A. 10005900H-A is replaced with this report.

Date of test: March 6, 2013

Representative test engineer: T. Shimada
Takumi Shimada
Engineer of WiSE Japan,
UL Verification Service

Approved by: Masanori Nishiyama
Masanori Nishiyama
Manager of WiSE Japan,
UL Verification Service



NVLAP LAB CODE: 200572-0

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>

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CONTENTS	PAGE
SECTION 1: Customer information.....	4
SECTION 2: Equipment under test (E.U.T.).....	4
SECTION 3: Test specification, procedures & results.....	5
SECTION 4: Operation of E.U.T. during testing.....	7
SECTION 5: Radiated Spurious Emission	9
APPENDIX 1: Data of EMI test.....	10
Radiated Spurious Emission	10
APPENDIX 2: Test instruments	17
APPENDIX 3: Photographs of test setup	18
Radiated Spurious Emission	18
Worst Case Position (Horizontal: X-axis/ Vertical:Z-axis)	19

SECTION 1: Customer information

Company Name : Murata Manufacturing Co., Ltd.
Address : 10-1, Higashikotari 1-chome, Nagaokakyo-shi, Kyoto 617-8555 Japan
Telephone Number : +81-75-955-6735
Facsimile Number : +81-75-955-6634
Contact Person : TAKAHARU KAWAKATSU

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

2.1 Identification of E.U.T.

Type of Equipment : Communication Module
Model No. : Type XN
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 3.8V
Receipt Date of Sample : March 1, 2013
Country of Mass-production : China/Japan
Condition of EUT : Engineering prototype
(Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT : No Modification by the test lab

2.2 Product Description

General Specification

The EUT is Communication Module which is installed in Compact Digital camera.

Specification of WLAN (IEEE802.11b/g/n)

Type of radio	Wireless LAN (IEEE802.11b/g)	Wireless LAN (IEEE802.11n) 2.4G Band SISO (20M Band)
Equipment Type	Transceiver	
Frequency of Operation	2412MHz - 2462MHz	
Bandwidth & Channel spacing	Bandwidth : 20MHz Ch spacing : 5MHz	
Type of Modulation	11b: DSSS 11g: OFDM	OFDM
Antenna Type	Monopole	
Antenna Gain	-1.5 dBi	
Power Supply (inner)	DC 3.8V	
Operating temperature range	-20 to +55 deg. C.	

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

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

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

*Radiated Spurious Emission test only

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Spurious Emission Restricted Band Edges	FCC: "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on October 4, 2012)"	FCC: Section15.247(d)	1.4dB 4824.000MHz Hori, AV	Complied	Radiated
	IC: RSS-Gen 4.9	IC: RSS-210 A8.5 RSS-Gen 7.2.3			

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

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

FCC 15.31 (e)

The EUT has the power supply regulator. However one of the input voltages to RF part doesn't go through the regulator. The stable voltage will be supplied by the end product, which will be required to have a power supply regulator. Therefore the EUT complies with the requirement.

FCC Part 15.203/212 Antenna requirement

It is impossible for end users to replace the antenna, because it is soldered on the circuit board. Therefore, the equipment complies with the antenna requirement of Section 15.203/212.

3.3 Addition to standard

No addition, exclusion nor deviation has been made from the standard.

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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)	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

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.

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

4.1 Operating Mode(s)

Test operating mode was determined as follows according to “Section 1 of 6 802.11 a/b/g/n testing- Managing Complex Regulatory Approvals - ” of TCB Council Workshop October 2009.

Mode	Remarks*
IEEE 802.11b (11b)	2Mbps, PN9
IEEE 802.11n SISO 20MHz BW (11n-20)	MCS 0, PN9
*The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel) of the original model.	
*Power of the EUT was set by the software as follows; Power settings: 5dBm Software: wifitest, Version: 0.5 *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.	

*Details of Operating mode(s)

Test Item	Operating Mode	Tested frequency
Spurious Emission (Radiated)	11b Tx	2412MHz
	11n-20 Tx *1)	2437MHz
		2462MHz
*1) Since 11g and 11n-20 have the same modulation method and no differences in transmitting specification, test was performed on the representative mode that had the higher peak output power.		

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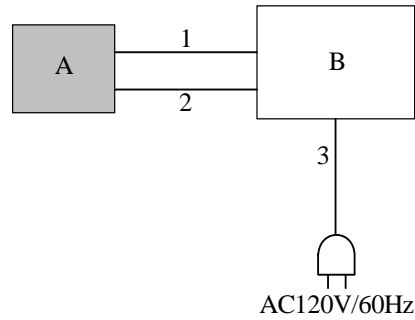
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4.2 Configuration and peripherals



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

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Communication Module	Type XN	1	Murata Manufacturing Co., Ltd.	EUT
B	DC Power supply	PW18-1.3AT	08016530	JVC KENWOOD	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	DC Cable	1.2	Unshielded	Unshielded	-
2	DC Cable	1.2	Unshielded	Unshielded	-
3	AC Cable	2.2	Unshielded	Unshielded	-

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SECTION 5: Radiated Spurious Emission

Test Procedure

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

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane.

The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane.

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

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

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

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

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

Test Antennas are used as below;

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

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

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

Frequency	Below 1GHz	Above 1GHz		20dBc
Instrument used	Test Receiver	Spectrum Analyzer		Spectrum Analyzer
Detector	QP	PK	AV *2)	PK
IF Bandwidth	BW 120kHz(T/R)	RBW: 1MHz VBW: 3MHz	RBW: 1MHz VBW: 3MHz Detector: Power Averaging (RMS) Trace: Free Run	RBW: 100kHz VBW: 300kHz (S/A)
Test Distance	3m	3m (below 10GHz), 1m *1) (above 10GHz)		3m (below 10GHz), 1m *1) (above 10GHz)

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

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

- 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-26.5GHz
Test data : APPENDIX
Test result : Pass

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APPENDIX 1: Data of EMI test

Radiated Spurious Emission

Test place : Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. : 10005900H
Date : 03/06/2013
Temperature/ Humidity : 21 deg. C / 35% RH
Engineer : Takumi Shimada
Mode : 11b Tx 2412MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	45.5	26.8	2.4	35.7	39.0	73.9	34.9	
Hori	4824.000	PK	55.2	30.7	4.3	34.9	55.3	73.9	18.6	
Hori	2390.000	AV	38.0	26.8	2.4	35.7	31.5	53.9	22.4	
Hori	4824.000	AV	52.4	30.7	4.3	34.9	52.5	53.9	1.4	
Vert	2390.000	PK	45.4	26.8	2.4	35.7	38.9	73.9	35.0	
Vert	4824.000	PK	53.0	30.7	4.3	34.9	53.1	73.9	20.8	
Vert	2390.000	AV	37.9	26.8	2.4	35.7	31.4	53.9	22.5	
Vert	4824.000	AV	49.0	30.7	4.3	34.9	49.1	53.9	4.8	

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

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

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	95.6	26.8	2.4	35.7	89.1	-	-	Carrier
Hori	2400.000	PK	40.4	26.8	2.4	35.7	33.9	69.1	35.2	
Hori	6431.970	PK	53.4	33.9	4.7	34.7	57.3	69.1	11.8	
Vert	2412.000	PK	95.0	26.8	2.4	35.7	88.5	-	-	Carrier
Vert	2400.000	PK	41.8	26.8	2.4	35.7	35.3	68.5	33.2	
Vert	6431.970	PK	53.8	33.9	4.7	34.7	57.7	68.5	10.8	

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

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Radiated Spurious Emission

Test place : Head Office EMC Lab. No. 2 Semi Anechoic Chamber
Report No. : 10005900H
Date : 03/06/2013
Temperature/ Humidity : 21 deg. C / 35% RH
Engineer : Takumi Shimada
Mode : 11b Tx 2437MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4874.000	PK	52.6	30.8	4.2	34.9	52.7	73.9	21.2	
Hori	4874.000	AV	49.7	30.8	4.2	34.9	49.8	53.9	4.1	
Vert	4874.000	PK	51.0	30.8	4.2	34.9	51.1	73.9	22.8	
Vert	4874.000	AV	46.7	30.8	4.2	34.9	46.8	53.9	7.2	

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

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

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2437.000	PK	96.5	26.8	2.4	35.7	90.0	-	-	Carrier
Hori	6498.633	PK	53.3	34.1	4.8	34.7	57.5	70.0	12.5	
Vert	2437.000	PK	96.8	26.8	2.4	35.7	90.3	-	-	Carrier
Vert	6498.633	PK	49.3	34.1	4.8	34.7	53.5	70.3	16.8	

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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No.2 Semi Anechoic Chamber
Report No. 10005900H
Date 03/06/2013
Temperature/ Humidity 21 deg. C / 35% RH
Engineer Takumi Shimada
Mode 11b Tx 2462MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2483.500	PK	45.0	26.7	2.4	35.7	38.4	73.9	35.5	
Hori	4924.000	PK	52.5	31.0	4.2	34.9	52.8	73.9	21.1	
Hori	2483.500	AV	37.6	26.7	2.4	35.7	31.0	53.9	22.9	
Hori	4924.000	AV	50.2	31.0	4.2	34.9	50.5	53.9	3.4	
Vert	2483.500	PK	46.5	26.7	2.4	35.7	39.9	73.9	34.0	
Vert	4924.000	PK	52.0	31.0	4.2	34.9	52.3	73.9	21.6	
Vert	2483.500	AV	38.7	26.7	2.4	35.7	32.1	53.9	21.8	
Vert	4924.000	AV	49.3	31.0	4.2	34.9	49.6	53.9	4.3	

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

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

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2462.000	PK	94.4	26.7	2.4	35.7	87.8	-	-	Carrier
Hori	6565.302	PK	54.6	34.3	4.8	34.7	59.0	67.8	8.8	
Vert	2462.000	PK	96.2	26.7	2.4	35.7	89.6	-	-	Carrier
Vert	6565.302	PK	55.0	34.3	4.8	34.7	59.4	69.6	10.2	

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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No. 2 Semi Anechoic Chamber
Report No. 10005900H
Date 03/06/2013
Temperature/ Humidity 21 deg. C / 35% RH
Engineer Takumi Shimada
 (1-10GHz)
Mode 11n-20 Tx 2412MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2390.000	PK	47.8	26.8	2.4	35.7	41.3	73.9	32.7	
Hori	4824.000	PK	53.9	30.7	4.3	34.9	54.0	73.9	20.0	
Hori	2390.000	AV	39.2	26.8	2.4	35.7	32.7	53.9	21.2	
Hori	4824.000	AV	52.1	30.7	4.3	34.9	52.2	53.9	1.7	
Vert	2390.000	PK	49.8	26.8	2.4	35.7	43.3	73.9	30.6	
Vert	4824.000	PK	52.2	30.7	4.3	34.9	52.3	73.9	21.6	
Vert	2390.000	AV	40.4	26.8	2.4	35.7	33.9	53.9	20.0	
Vert	4824.000	AV	48.5	30.7	4.3	34.9	48.6	53.9	5.3	

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

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

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2412.000	PK	91.3	26.8	2.4	35.7	84.8	-	-	Carrier
Hori	2400.000	PK	43.9	26.8	2.4	35.7	37.4	64.8	27.4	
Hori	6431.970	PK	53.2	33.9	4.7	34.7	57.1	64.8	7.7	
Vert	2412.000	PK	92.5	26.8	2.4	35.7	86.0	-	-	Carrier
Vert	2400.000	PK	46.3	26.8	2.4	35.7	39.8	66.0	26.2	
Vert	6431.970	PK	50.6	33.9	4.7	34.7	54.5	66.0	11.5	

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

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Radiated Spurious Emission

Test place Head Office EMC Lab. No. 2 Semi Anechoic Chamber
Report No. 10005900H
Date 03/06/2013
Temperature/ Humidity 21 deg. C / 35% RH
Engineer Takumi Shimada
Mode 11n-20 Tx 2437MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	4874.000	PK	53.0	30.8	4.2	34.9	53.1	73.9	20.9	
Hori	4874.000	AV	50.8	30.8	4.2	34.9	50.9	53.9	3.0	
Vert	4874.000	PK	51.8	30.8	4.2	34.9	51.9	73.9	22.0	
Vert	4874.000	AV	49.0	30.8	4.2	34.9	49.1	53.9	4.8	

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

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

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2437.000	PK	93.7	26.8	2.4	35.7	87.2	-	-	Carrier
Hori	6498.633	PK	54.2	34.1	4.8	34.7	58.4	67.2	8.8	
Vert	2437.000	PK	94.0	26.8	2.4	35.7	87.5	-	-	Carrier
Vert	6498.633	PK	53.0	34.1	4.8	34.7	57.2	67.5	10.3	

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

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Radiated Spurious Emission

Test place : Head Office EMC Lab. No. 2 Semi Anechoic Chamber
Report No. : 10005900H
Date : 03/06/2013
Temperature/ Humidity : 21 deg. C / 35% RH
Engineer : Takumi Shimada
Mode : 11n-20 Tx 2462MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	126.178	QP	30.9	13.4	7.7	28.2	23.8	43.5	19.7	
Hori	274.258	QP	31.2	18.5	8.7	27.6	30.8	46.0	15.2	
Hori	311.654	QP	33.7	14.4	8.9	27.7	29.3	46.0	16.7	
Hori	324.117	QP	33.8	14.9	9.0	27.8	29.9	46.0	16.1	
Hori	386.437	QP	33.9	17.0	9.3	28.3	31.9	46.0	14.1	
Hori	411.378	QP	33.3	17.5	9.4	28.4	31.8	46.0	14.2	
Hori	2483.500	PK	53.0	26.7	2.4	35.7	46.4	73.9	27.5	
Hori	4924.000	PK	52.9	31.0	4.2	34.9	53.2	73.9	20.7	
Hori	2483.500	AV	40.9	26.7	2.4	35.7	34.3	53.9	19.6	
Hori	4924.000	AV	50.8	31.0	4.2	34.9	51.1	53.9	2.8	
Vert	126.204	QP	34.2	13.4	7.7	28.2	27.1	43.5	16.4	
Vert	274.259	QP	32.1	18.5	8.7	27.6	31.7	46.0	14.3	
Vert	311.645	QP	31.6	14.4	8.9	27.7	27.2	46.0	18.8	
Vert	324.110	QP	34.6	14.9	9.0	27.8	30.7	46.0	15.3	
Vert	386.447	QP	32.1	17.0	9.3	28.3	30.1	46.0	15.9	
Vert	411.378	QP	30.4	17.5	9.4	28.4	28.9	46.0	17.1	
Vert	2483.500	PK	52.3	26.7	2.4	35.7	45.7	73.9	28.2	
Vert	4924.000	PK	51.5	31.0	4.2	34.9	51.8	73.9	22.1	
Vert	2483.500	AV	43.5	26.7	2.4	35.7	36.9	53.9	17.0	
Vert	4924.000	AV	48.7	31.0	4.2	34.9	49.0	53.9	4.9	

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

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

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

20dBc Data Sheet

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2462.000	PK	93.6	26.7	2.4	35.7	87.0	-	-	Carrier
Hori	6565.302	PK	54.2	34.3	4.8	34.7	58.6	67.0	8.4	
Vert	2462.000	PK	92.6	26.7	2.4	35.7	86.0	-	-	Carrier
Vert	6565.302	PK	54.6	34.3	4.8	34.7	59.0	66.0	7.0	

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

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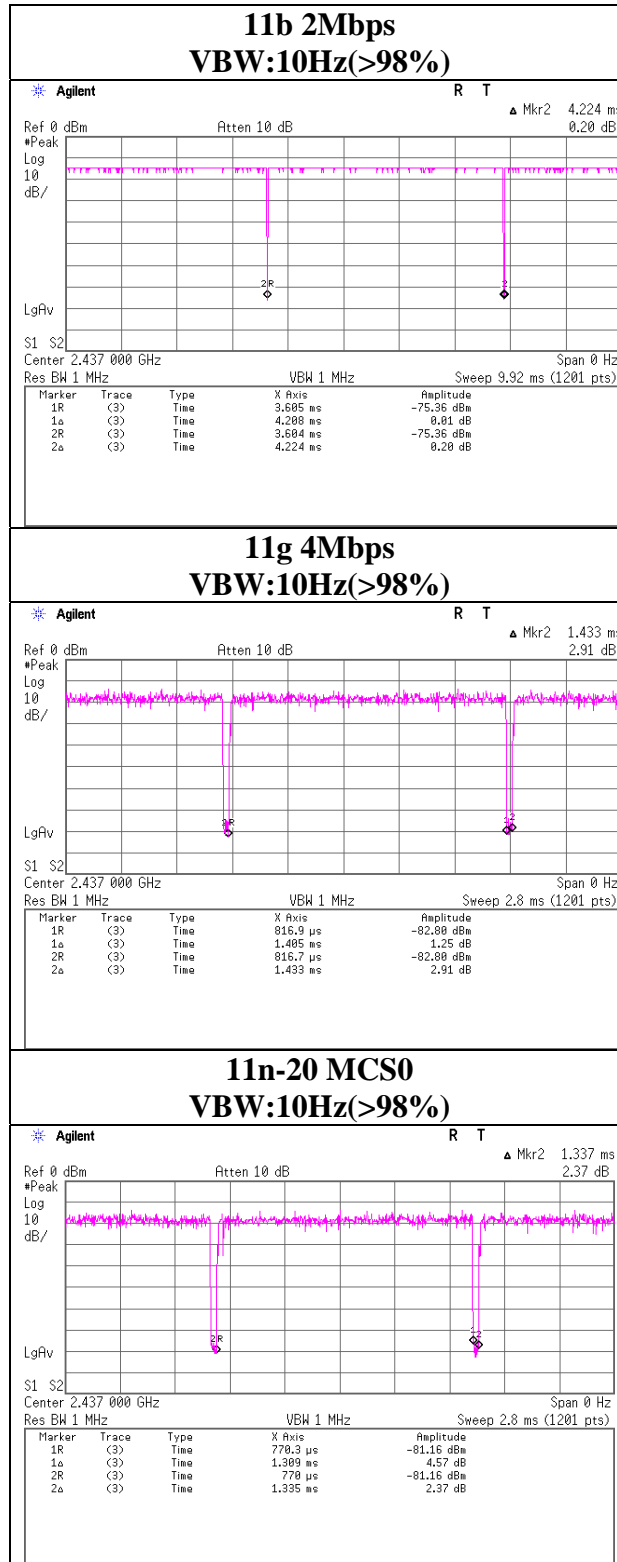
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Burst rate confirmation



APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2012/06/29 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2013/02/26 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	RE	2012/06/19 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2012/04/03 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2012/10/08 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2012/10/08 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2013/02/06 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2012/11/06 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2012/09/11 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2013/02/15 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2013/01/10 * 12
MHA-02	Horn Antenna 18-26.5GHz	EMCO	3160-09	1265	RE	2013/02/15 * 12
MCC-132	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336161/4(1m)/ 340639(5m)	RE	2012/09/05 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2012/05/30 * 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: RE: Radiated Emission

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