RADIO TEST REPORT

Test Report No. : 10529469H-B-R1

Applicant	:	**Audio-Technica Corp.**
Type of Equipment	:	**Wireless Receiver Unit**
Model No.	:	**ATW-RU13**
FCC ID	:	**JFZRU13**
Test regulation	:	**FCC Part 15 Subpart C: 2014**
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 test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
7. This report is a revised version of 10529469H-B. 10529469H-B is replaced with this report.

Date of test: October 14 to 22, 2014

Representative test engineer:
S. Matsuyama
Satofumi Matsuyama
Engineer
Consumer Technology Division

Approved by:
Takayuki Shimada
Engineer
Consumer Technology Division

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

REVISION HISTORY

Original Test Report No.: 10529469H-B

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10529469H-B	November 12, 2014	-	-
1	10529469H-B-R1	November 21, 2014	P4	Addition of comment to clause 2.2
1	10529469H-B-R1	November 21, 2014	P5, 6	Correction of Test Procedure and Specification for IC
1	10529469H-B-R1	November 21, 2014	P24	Addition of comment: "Not Out of band emission(Leakage Power)"

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SECTION 1: Customer information

Company Name	:	Audio-Technica Fukui Inc.*
Address	:	87-1, Totani, Echizen-shi, Fukui, 915-0003 Japan
Telephone Number	:	+81-778-25-6715
Facsimile Number	:	+81-778-25-6705
Contact Person	:	Hiroki Takeichi

*Remarks:
Audio-Technica Fukui Inc. is on behalf of the applicant: Audio-Technica Corp.

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

2.1 Identification of E.U.T.

Type of Equipment	:	Wireless Receiver Unit
Model No.	:	ATW-RU13
Serial No.	:	Refer to Clause 4.2
Rating	:	DC 12V
Receipt Date of Sample	:	October 14, 2014
Country of Mass-production	:	China
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

Model No: ATW-RU13, referred to as the EUT in this report, is the Wireless Receiver Unit.

General Specification

Clock frequency(ies) in the system	:	24MHz

Radio Specification

Radio Type	:	Transceiver
Frequency of Operation	:	2403-2481MHz
Modulation	:	GFSK
Power Supply (inner)	:	DC 3.3V
Antenna type	:	1/2λ Sleeve Antenna
Antenna Gain	:	1.1dBi

*This EUT transmits simultaneously, but the evaluation for co-location was not conducted since transmitting channels (frequencies) were different.

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification	:	FCC Part 15 Subpart C: 2014, final revised on August 15, 2014 and effective October 14, 2014
Title	:	FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators Section 15.207 Conducted limits Section 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz

* The EUT complies with FCC Part 15 Subpart B: 2014, final revised on August 15, 2014 and effective October 14, 2014.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted Emission	**FCC:** ANSI C63.4:2003 7. AC powerline Conducted Emission measurements	**FCC:** Section 15.207	**QP** 7.5dB, 0.34014MHz, N **AV** 1.4dB, 0.33973MHz, L	Complied	-
	IC: RSS-Gen 8.8	**IC:** RSS-Gen 8.8			
6dB Bandwidth	**FCC:** "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on June 5, 2014)"	**FCC:** Section 15.247(a)(2)	See data.	Complied	Conducted
	IC: -	**IC:** RSS-210 A8.2(a)			
Maximum Peak Output Power	**FCC:** "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on June 5, 2014)"	**FCC:** Section 15.247(b)(3)		Complied	Conducted
	IC: RSS-Gen 6.12	**IC:** RSS-210 A8.4(4)			
Power Density	**FCC:** "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on June 5, 2014)"	**FCC:** Section 15.247 (e)		Complied	Conducted
	IC: -	**IC:** RSS-210 A8.2(b)			
Spurious Emission Restricted Band Edges	**FCC:** "Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247(issued on June 5, 2014)"	**FCC:** Section15.247(d)	0.6dB 2483.500MHz, AV, Vert.	Complied	Conducted/ Radiated
	IC: RSS-Gen 6.13	**IC:** RSS-210 A8.5 RSS-Gen 8.9 RSS-Gen 8.10			
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 Part 15.31 (e)
This EUT provides stable voltage (DC 3.3V) constantly to RF Part regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement
The EUT has a unique coupling/antenna connector (inverted SMA connector). Therefore the equipment complies with the requirement of 15.203.

3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	**IC:** RSS-Gen 6.6	**IC:** -	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	3.5dB
No.3	3.6dB
No.4	3.5dB

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	4.0dB	5.1dB	5.0dB	5.1dB	6.0dB	4.9dB	4.3dB
No.2	3.9dB	5.2dB	5.0dB	4.9dB	5.9dB	4.7dB	4.2dB
No.3	4.3dB	5.1dB	5.2dB	5.2dB	6.0dB	4.8dB	4.2dB
No.4	4.6dB	5.2dB	5.0dB	5.2dB	6.0dB	5.7dB	4.2dB

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

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

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

Conducted Emission test
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

Radiated emission test (3m)
The data listed in this report meets the limits unless the uncertainty is taken into consideration.

3.5 Test Location

UL Japan, Inc. Ise EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999 Facsimile : +81 596 24 8124

	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	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	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	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	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	4.0 x 4.5 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 4.6 x 2.8m	2.4 x 2.4m	-
No.11 measurement room	-	6.2 x 4.7 x 3.0m	4.8 x 4.6m	-

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

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

Refer to APPENDIX.

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

4.1 Operating Mode(s)

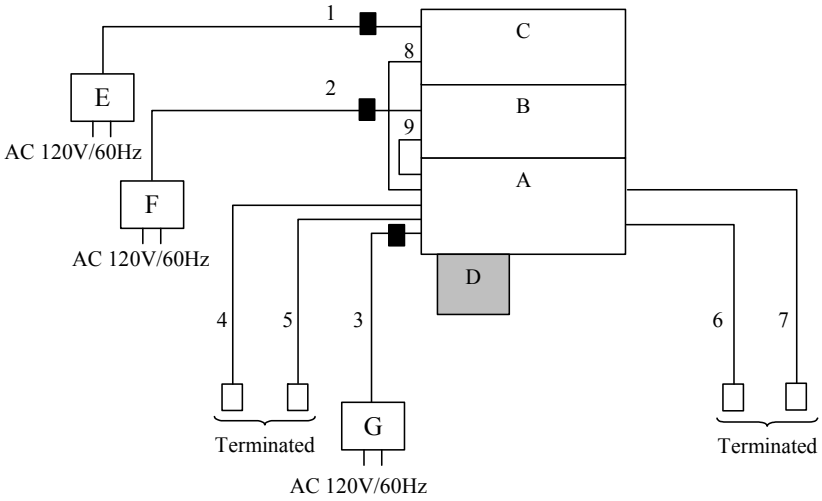
Mode	Remarks*
Transmitting (Tx) mode	Slot in / External connect
*The worst condition was determined based on the test result of Maximum Peak Output Power (Mid Channel)	
*Power of the EUT was set by the software as follows; -Power setting: 0046 -Hardware Version: TP -Software Version: V0013 *This setting 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	Tested frequency
Maximum Peak Output Power	Tx, (Slot in)	Antenna 1 Antenna 2	2403MHz 2441MHz 2481MHz
6dB Bandwidth, Conducted Spurious Emission, Power Density, 99% Occupied Bandwidth	Tx, (Slot in)	Antenna 1 *1)	2403MHz 2441MHz 2481MHz
Conducted Emission	Tx, (Slot in / External connect)	Antenna 1 *1)	2403MHz 2441MHz 2481MHz
Spurious Emission	Tx, (Slot in / External connect)	Antenna 1 *1)	2403MHz 2441MHz 2481MHz
*1) The antenna was tested as a representative, because it had the highest power at Maximum Peak Output power test.			

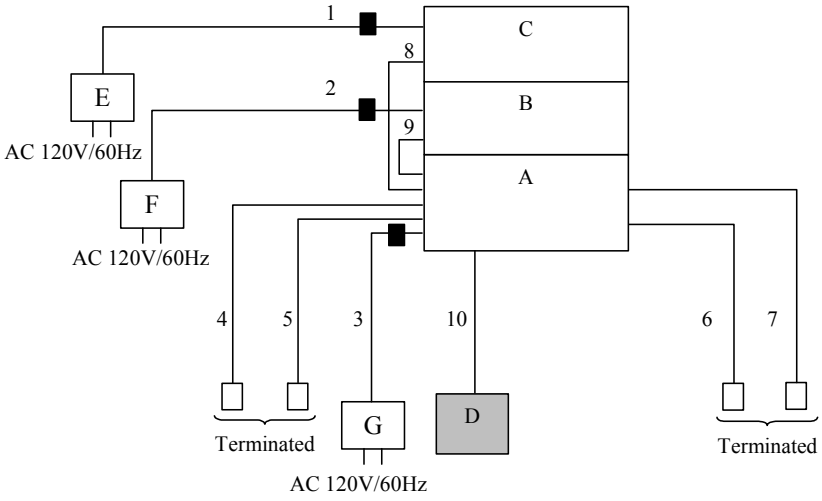
4.2 Configuration and peripherals

< Slot in >



■ : Standard Ferrite Core

< External Connect >



■ : Standard Ferrite Core

* Cabling and setup 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	Remark
A	Wireless Receiver Chassis	ATW-RC13	TP2 No.1	Audio-Technica Fukui Inc.	-
B	Wireless Receiver Chassis	ATW-RC13	TP2 No.3	Audio-Technica Fukui Inc.	-
C	Wireless Receiver Chassis	ATW-RC13	001	Audio-Technica Fukui Inc.	-
D	Wireless Receiver Unit	ATW-RU13	TP2 No.6 for RE* TP2 No.11 for AT*	Audio-Technica Fukui Inc.	EUT
E	AC Adapter	AD-SE1205AO	001	Audio-Technica Fukui Inc.	-
F	AC Adapter	AD-SE1205AO	002	Audio-Technica Fukui Inc.	-
G	AC Adapter	AD-SE1205AO	003	Audio-Technica Fukui Inc.	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC Cable	1.8	Unshielded	Unshielded	-
2	DC Cable	1.8	Unshielded	Unshielded	-
3	DC Cable	1.8	Unshielded	Unshielded	-
4	Balanced Cable	5.0	Shielded	Shielded	-
5	Balanced Cable	3.0	Shielded	Shielded	-
6	Unbalanced Cable	3.0	Shielded	Shielded	-
7	Unbalanced Cable	3.0	Shielded	Shielded	-
8	Link Cable	0.3	Unshielded	Unshielded	-
9	Link Cable	0.3	Unshielded	Unshielded	-
10	LAN Cable	1.9	Unshielded	Unshielded	For only External Connect

*RE: Radiated emission test
AT: Antenna Terminal Conducted test

SECTION 5: Conducted Emission

Test Procedure and conditions

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

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

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

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

SECTION 6: Radiated Spurious Emission

Test Procedure

It was measured based on "11.0 Emissions in non-restricted frequency bands" of "558074 D01 DTS Meas Guidance v03r02 (Issued on June 5, 2014)".

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 *1)	PK
IF Bandwidth	BW 120kHz	RBW: 1MHz VBW: 3MHz	Average Power Method: WLAN: 12.2.5.2 RBW: 1MHz VBW: 3MHz Detector: Power Averaging (RMS) Trace: Free Run Duty factor was added to the results.	RBW: 100kHz VBW: 300kHz
Test Distance	3m	3m (below 10GHz), 1m *2) (above 10GHz)		3m (below 10GHz), 1m *2) (above 10GHz)

*1) Average Power Measurement was performed based on 6.0 & 12.2.5 of "558074 D01 DTS Meas Guidance v03r02 (Issued on June 5, 2014)"
*2) Distance Factor: 20 x log (3.0m/1.0m) = 9.5dB

- 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

SECTION 7: Antenna Terminal Conducted Tests

Test Procedure

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

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
6dB Bandwidth	2MHz	100kHz	300kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	Enough width to display 20dB Bandwidth	1 to 3% of Span	Three times of RBW	Auto	Peak	Max Hold*1)	Spectrum Analyzer
Maximum Peak Output Power	-	-	-	Auto	Peak/ Average *2)	-	Power Meter (Sensor: 50MHz BW)
Peak Power Density	1.5 times the 6dB Bandwidth	3kHz	10kHz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
Conducted Spurious Emission *4)	9kHz to 150kHz	200Hz	620Hz	Auto	Peak	Max Hold	Spectrum Analyzer
	150kHz to 30MHz	9.1kHz	27kHz				

*1) The measurement was performed with Max Hold since the duty cycle was not 100%.
*2) Reference data
*3) Section 10.2 Method PKPSD (peak PSD) of "558074 D01 DTS Meas Guidance v03r02 (Issued on June 5, 2014)".
*4) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents.
Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.(9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=9.1kHz)

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

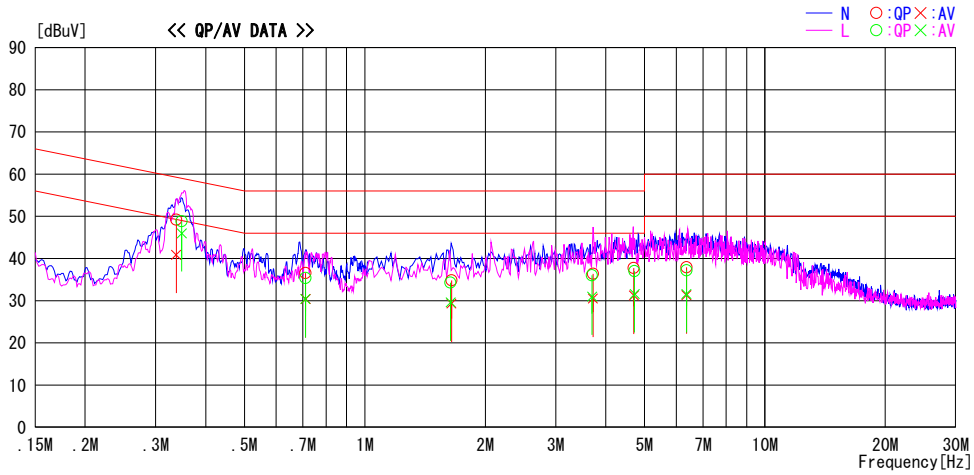
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No.2 Semi Anechoic Chamber
Date : 2014/10/14

Report No. : 10529469H
Power : AC 120V / 60Hz
Temp./Humi. : 23deg. C / 53% RH
Engineer : Satofumi Matsuyama

Mode / Remarks : Tx 2403MHz, Slot in

LIMIT : FCC15.207 QP
FCC15.207 AV



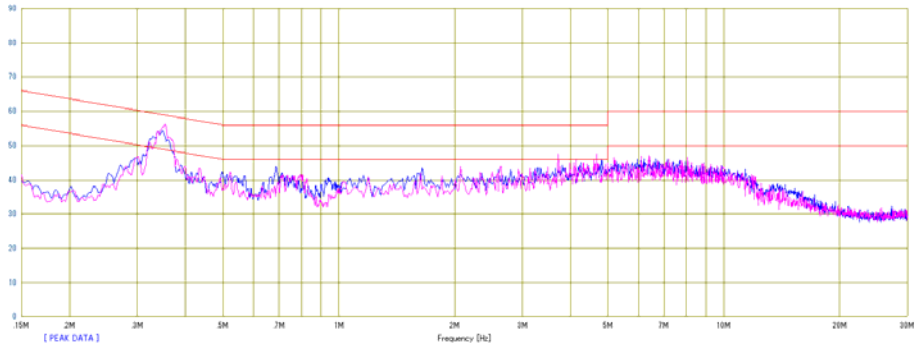
Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.33751	35.9	27.6	13.3	49.2	40.9	59.3	49.3	10.1	8.4	N	
0.71102	23.2	17.0	13.4	36.6	30.4	56.0	46.0	19.4	15.6	N	
1.64563	21.3	15.8	13.5	34.8	29.3	56.0	46.0	21.2	16.7	N	
3.71664	22.5	16.6	13.9	36.4	30.5	56.0	46.0	19.6	15.5	N	
4.70059	23.6	17.1	14.1	37.7	31.2	56.0	46.0	18.3	14.8	N	
6.36990	23.6	17.0	14.3	37.9	31.3	60.0	50.0	22.1	18.7	N	
0.34865	35.5	32.7	13.3	48.8	46.0	59.0	49.0	10.2	3.0	L	
0.71029	22.0	17.0	13.4	35.4	30.4	56.0	46.0	20.6	15.6	L	
1.63636	20.8	16.1	13.5	34.3	29.6	56.0	46.0	21.7	16.4	L	
3.69424	22.1	17.1	13.9	36.0	31.0	56.0	46.0	20.0	15.0	L	
4.72202	22.9	17.5	14.1	37.0	31.6	56.0	46.0	19.0	14.4	L	
6.36549	22.9	17.3	14.3	37.2	31.6	60.0	50.0	22.8	18.4	L	

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

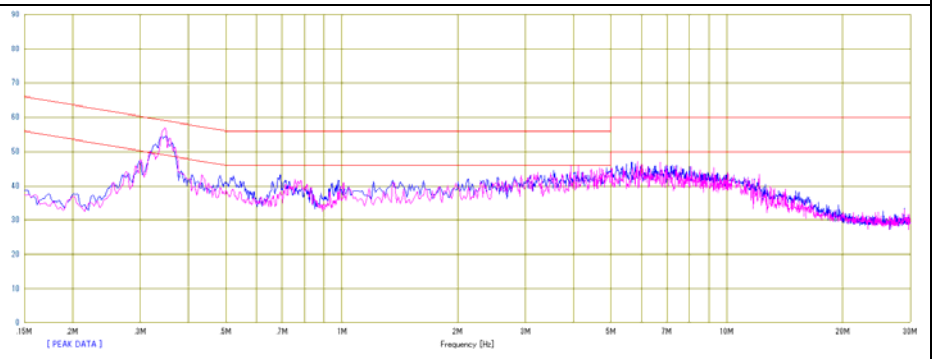
Conducted Emission

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	10529469H
Date	10/14/2014
Temperature/ Humidity	23 deg. C / 53% RH
Engineer	Satofumi Matsuyama
Mode	Tx, Slot in

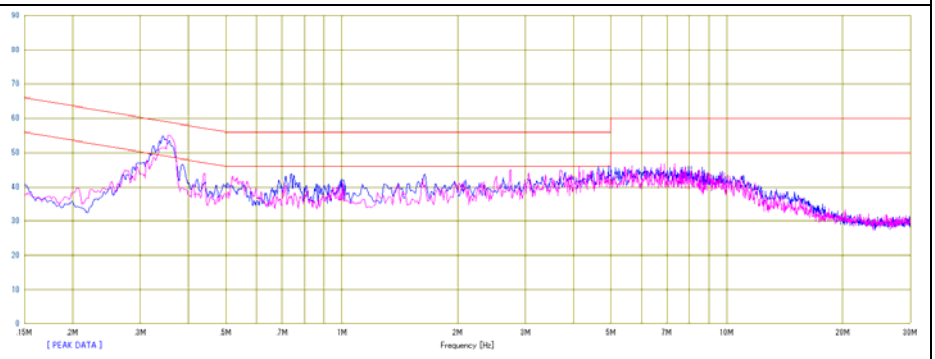
2403MHz



2441MHz



2481MHz



Y scale [dBuV] Chart — N — L

Conducted Emission

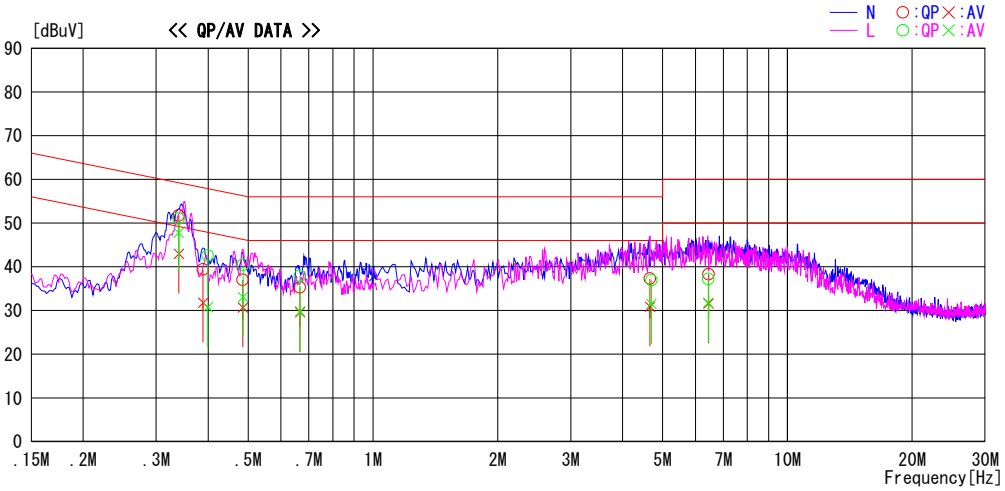
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No.2 Semi Anechoic Chamber
Date : 2014/10/14

Report No. : 10529469H
Power : AC 120V / 60Hz
Temp./Humi. : 23deg. C / 53% RH
Engineer : Satofumi Matsuyama

Mode / Remarks : Tx 2403MHz, External connect

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency	Reading Level		Corr.	Results		Limit		Margin		Phase	Comment
	QP	AV	Factor	QP	AV	QP	AV	QP	AV		
[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dB]	[dB]		
0.33973	37.7	34.5	13.3	51.0	47.8	59.2	49.2	8.2	1.4	L	
0.34014	38.4	29.7	13.3	51.7	43.0	59.2	49.2	7.5	6.2	N	
0.38945	26.1	18.5	13.3	39.4	31.8	58.1	48.1	18.7	16.3	N	
0.39951	29.3	17.5	13.3	42.6	30.8	57.9	47.9	15.3	17.1	L	
0.48537	23.7	17.4	13.3	37.0	30.7	56.2	46.2	19.2	15.5	N	
0.48605	27.2	19.8	13.3	40.5	33.1	56.2	46.2	15.7	13.1	L	
0.66686	21.9	16.2	13.4	35.3	29.6	56.0	46.0	20.7	16.4	N	
0.66689	24.5	16.4	13.4	37.9	29.8	56.0	46.0	18.1	16.2	L	
4.66157	23.3	16.9	14.0	37.3	30.9	56.0	46.0	18.7	15.1	N	
4.69739	22.8	17.4	14.1	36.9	31.5	56.0	46.0	19.1	14.5	L	
6.45141	23.9	17.2	14.4	38.3	31.6	60.0	50.0	21.7	18.4	N	
6.43832	22.8	17.4	14.4	37.2	31.8	60.0	50.0	22.8	18.2	L	

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

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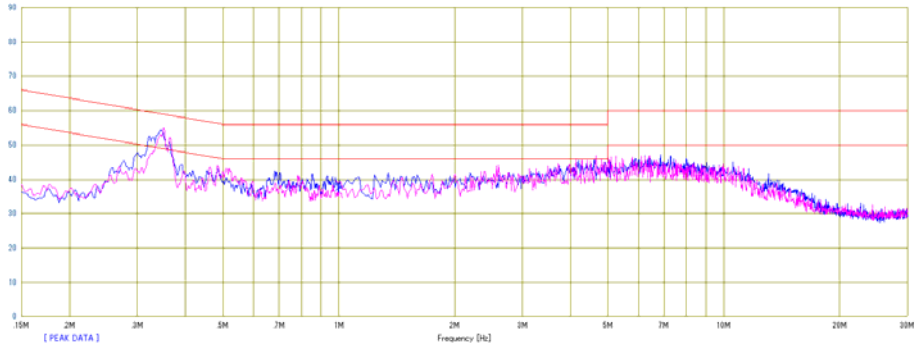
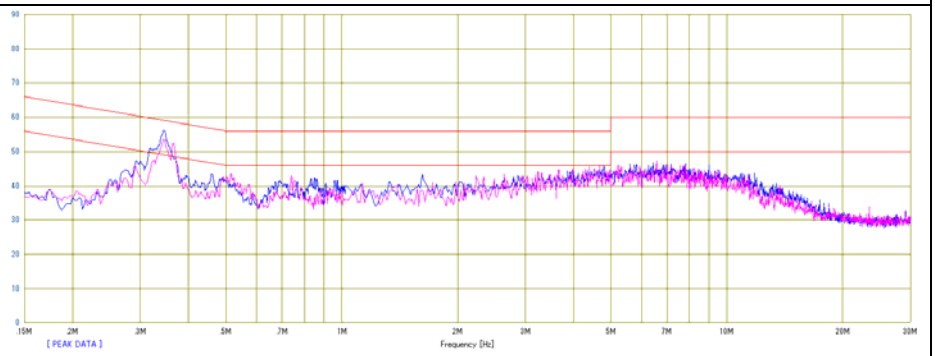
Conducted Emission

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	10529469H
Date	10/14/2014
Temperature/ Humidity	23 deg. C / 53% RH
Engineer	Satofumi Matsuyama
Mode	Tx, External connect

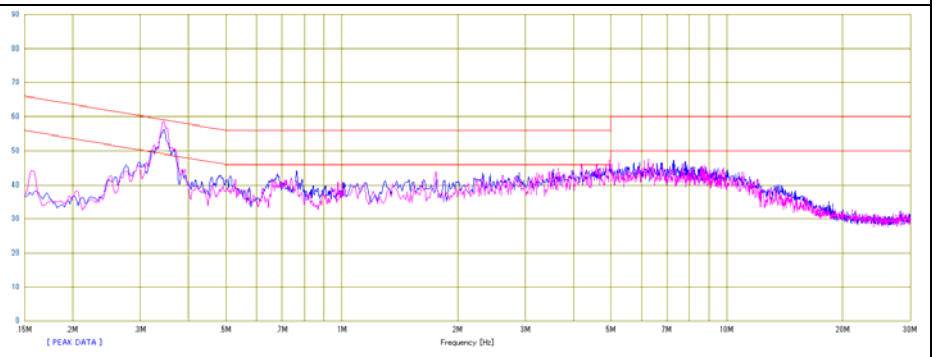
2403MHz



2441MHz



2481MHz



Y scale [dBuV] Chart — N — L

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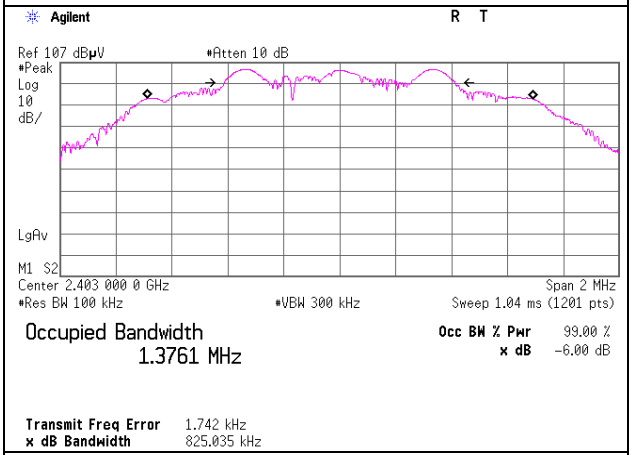
6dB Bandwidth

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10529469H
Date	10/16/2014
Temperature/ Humidity	25 deg. C / 40% RH
Engineer	Satofumi Matsuyama
Mode	Tx

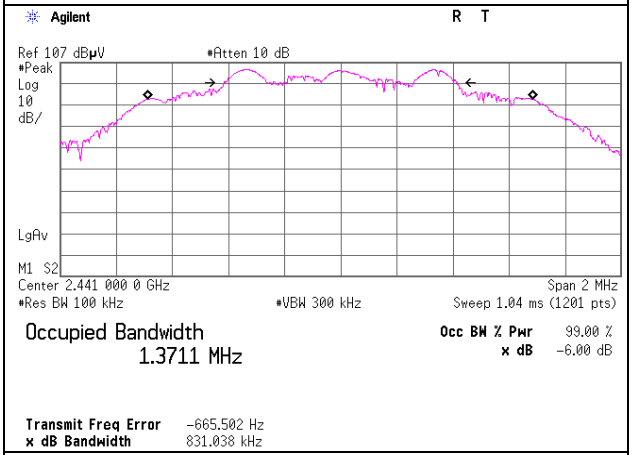
Frequency [MHz]	6dB Bandwidth [MHz]	Limit [kHz]
2403	0.825	>500
2441	0.831	>500
2481	0.822	>500

6dB Bandwidth

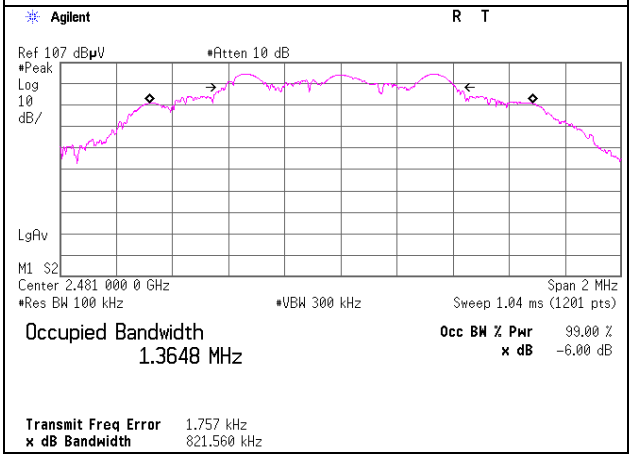
2403MHz



2441MHz



2481MHz



Maximum Peak Output Power

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10529469H
Date	10/16/2014
Temperature/ Humidity	25 deg. C / 40% RH
Engineer	Satofumi Matsuyama
Mode	Tx

Antenna 1

Freq.	Reading	Cable Loss	Atten.	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2403	7.53	0.38	0.00	7.91	6.18	30.00	1000	22.09
2441	7.20	0.39	0.00	7.59	5.74	30.00	1000	22.41
2481	5.58	0.39	0.00	5.97	3.95	30.00	1000	24.03

Antenna 2

Freq.	Reading	Cable Loss	Atten.	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2403	7.51	0.38	0.00	7.89	6.15	30.00	1000	22.11
2441	7.09	0.39	0.00	7.48	5.60	30.00	1000	22.52
2481	5.61	0.39	0.00	6.00	3.98	30.00	1000	24.00

Sample Calculation:
Result = Reading + Cable Loss + Attenuator

*The equipment and cables were not used for factor 0.0dB of the data sheets.

Average Output Power
(Reference data)

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10529469H
Date	10/16/2014
Temperature/ Humidity	25 deg. C / 40% RH
Engineer	Satofumi Matsuyama
Mode	Tx

Antenna 1

Freq.	Reading	Cable Loss	Atten.	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2403	-12.51	0.38	0.00	-12.13	0.06	30.00	1000	42.13
2441	-12.76	0.39	0.00	-12.37	0.06	30.00	1000	42.37
2481	-14.45	0.39	0.00	-14.06	0.04	30.00	1000	44.06

Antenna 2

Freq.	Reading	Cable Loss	Atten.	Result		Limit		Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[dB]
2403	-12.56	0.38	0.00	-12.18	0.06	30.00	1000	42.18
2441	-12.81	0.39	0.00	-12.42	0.06	30.00	1000	42.42
2481	-14.44	0.39	0.00	-14.05	0.04	30.00	1000	44.05

Sample Calculation:
Result = Reading + Cable Loss + Attenuator

*The equipment and cables were not used for factor 0.0dB of the data sheets.

Radiated Spurious Emission

Report No.	10529469H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.2	No.4
Date	10/16/2014	10/22/2014
Temperature/ Humidity	24 deg. C / 49% RH	23 deg. C / 50% RH
Engineer	Satofumi Matsuyama (Below 1GHz)	Masatoshi Nishiguchi (Above 1GHz)
Mode	Tx 2403MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	53.761	QP	31.3	9.8	7.5	32.1	-	16.5	40.0	23.5	
Hori	86.018	QP	34.8	7.6	7.9	32.1	-	18.2	40.0	21.8	
Hori	92.165	QP	35.9	8.7	8.0	32.1	-	20.5	43.5	23.0	
Hori	393.222	QP	42.3	17.5	10.5	31.9	-	38.4	46.0	7.6	
Hori	2390.000	PK	42.7	27.4	3.2	32.8	-	40.5	73.9	33.4	NS
Hori	4806.000	PK	41.4	31.5	5.4	31.9	-	46.4	73.9	27.5	NS
Hori	7209.000	PK	42.7	36.8	6.5	33.0	-	53.0	73.9	20.9	NS
Hori	9612.000	PK	42.7	38.8	7.3	33.4	-	55.4	73.9	18.5	NS
Hori	2390.000	AV	34.9	27.4	3.2	32.8	-	32.7	53.9	21.2	NS
Hori	4806.000	AV	31.7	31.5	5.4	31.9	-	36.7	53.9	17.2	NS
Hori	7209.000	AV	32.8	36.8	6.5	33.0	-	43.1	53.9	10.8	NS
Hori	9612.000	AV	31.8	38.8	7.3	33.4	-	44.5	53.9	9.4	NS
Vert	44.545	QP	40.3	12.7	7.4	32.1	-	28.3	40.0	11.7	
Vert	53.762	QP	45.0	9.8	7.5	32.1	-	30.2	40.0	9.8	
Vert	73.730	QP	43.1	6.5	7.8	32.1	-	25.3	40.0	14.7	
Vert	86.018	QP	43.3	7.6	7.9	32.1	-	26.7	40.0	13.3	
Vert	92.164	QP	43.7	8.7	8.0	32.1	-	28.3	43.5	15.2	
Vert	393.223	QP	34.6	17.5	10.5	31.9	-	30.7	46.0	15.3	
Vert	2390.000	PK	40.2	27.4	3.2	32.8	-	38.0	73.9	35.9	NS
Vert	4806.000	PK	38.9	31.5	5.4	31.9	-	43.9	73.9	30.0	NS
Vert	7209.000	PK	39.3	36.8	6.5	33.0	-	49.6	73.9	24.3	NS
Vert	9612.000	PK	39.2	38.8	6.4	33.4	-	51.0	73.9	22.9	NS
Vert	2390.000	AV	32.7	27.4	3.2	32.8	-	30.5	53.9	23.4	NS
Vert	4806.000	AV	30.6	31.5	5.4	31.9	-	35.6	53.9	18.3	NS
Vert	7209.000	AV	32.7	36.8	6.5	33.0	-	43.0	53.9	10.9	NS
Vert	9612.000	AV	33.0	38.8	6.4	33.4	-	44.8	53.9	9.1	NS

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

NS : No signal detected

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	2403.000	PK	106.1	27.4	3.2	32.8	103.9	-	-	Carrier
Hori	2400.000	PK	48.8	27.4	3.2	32.8	46.6	83.9	37.3	
Vert	2403.000	PK	109.0	27.4	3.2	32.8	106.8	-	-	Carrier
Vert	2400.000	PK	52.2	27.4	3.2	32.8	50.0	86.8	36.8	

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

Radiated Spurious Emission

Report No.	10529469H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.3	No.4
Date	10/18/2014	10/22/2014
Temperature/ Humidity	22 deg. C / 41% RH	23 deg. C / 50% RH
Engineer	Masatoshi Nishiguchi (Below 1GHz)	Masatoshi Nishiguchi (Above 1GHz)
Mode	Tx 2441MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	44.550	QP	30.2	12.7	7.3	32.2	-	18.0	40.0	22.0	
Hori	73.724	QP	32.2	6.5	7.7	32.1	-	14.3	40.0	25.7	
Hori	86.009	QP	35.3	8.0	7.9	32.1	-	19.1	40.0	20.9	
Hori	92.165	QP	35.6	9.0	7.9	32.1	-	20.4	43.5	23.1	
Hori	109.050	QP	27.5	11.5	8.2	32.1	-	15.1	43.5	28.4	
Hori	122.864	QP	33.1	13.1	8.3	32.1	-	22.4	43.5	21.1	
Hori	141.734	QP	34.0	14.6	8.5	32.1	-	25.0	43.5	18.5	
Hori	393.211	QP	42.5	17.0	10.5	31.9	-	38.1	46.0	7.9	
Hori	4882.000	PK	40.7	31.8	5.5	31.9	-	46.1	73.9	27.8	NS
Hori	7323.000	PK	42.1	37.0	6.5	33.0	-	52.6	73.9	21.3	NS
Hori	9764.000	PK	41.6	38.9	7.4	33.4	-	54.5	73.9	19.4	NS
Hori	4882.000	AV	31.8	31.8	5.5	31.9	-	37.2	53.9	16.7	NS
Hori	7323.000	AV	33.3	37.0	6.5	33.0	-	43.8	53.9	10.1	NS
Hori	9764.000	AV	32.6	38.9	7.4	33.4	-	45.5	53.9	8.4	NS
Vert	44.550	QP	42.4	12.7	7.3	32.2	-	30.2	40.0	9.8	
Vert	73.723	QP	40.4	6.5	7.7	32.1	-	22.5	40.0	17.5	
Vert	86.019	QP	42.4	8.0	7.9	32.1	-	26.2	40.0	13.8	
Vert	92.161	QP	42.1	9.0	7.9	32.1	-	26.9	43.5	16.6	
Vert	109.066	QP	31.6	11.5	8.2	32.1	-	19.2	43.5	24.3	
Vert	122.880	QP	39.1	13.1	8.3	32.1	-	28.4	43.5	15.1	
Vert	393.211	QP	35.0	17.0	10.5	31.9	-	30.6	46.0	15.4	
Vert	4882.000	PK	41.1	31.8	5.5	31.9	-	46.5	73.9	27.4	NS
Vert	7323.000	PK	41.9	37.0	6.5	33.0	-	52.4	73.9	21.5	NS
Vert	9764.000	PK	41.5	38.9	7.4	33.4	-	54.4	73.9	19.5	NS
Vert	4882.000	AV	31.1	31.8	5.5	31.9	-	36.5	53.9	17.4	NS
Vert	7323.000	AV	33.3	37.0	6.5	33.0	-	43.8	53.9	10.1	NS
Vert	9764.000	AV	32.6	38.9	7.4	33.4	-	45.5	53.9	8.4	NS

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

NS : No signal detected

Radiated Spurious Emission

Report No.	10529469H	
Test place	Ise EMC Lab.	
Semi Anechoic Chamber	No.3	No.4
Date	10/18/2014	10/22/2014
Temperature/ Humidity	22 deg. C / 41% RH	23 deg. C / 50% RH
Engineer	Masatoshi Nishiguchi (Below 1GHz)	Masatoshi Nishiguchi (Above 1GHz)
Mode	Tx 2481MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	44.541	QP	29.9	12.7	7.3	32.2	-	17.7	40.0	22.3	
Hori	73.733	QP	31.9	6.5	7.7	32.1	-	14.0	40.0	26.0	
Hori	86.007	QP	35.4	8.0	7.9	32.1	-	19.2	40.0	20.8	
Hori	92.168	QP	36.0	9.0	7.9	32.1	-	20.8	43.5	22.7	
Hori	109.060	QP	27.7	11.5	8.2	32.1	-	15.3	43.5	28.2	
Hori	122.872	QP	33.7	13.1	8.3	32.1	-	23.0	43.5	20.5	
Hori	141.744	QP	30.7	14.6	8.5	32.1	-	21.7	43.5	21.8	
Hori	393.211	QP	43.0	17.0	10.5	31.9	-	38.6	46.0	7.4	
Hori	2483.500	PK	52.8	27.6	3.3	32.7	-	51.0	73.9	22.9	Not Out of band emission(Leakage Power)
Hori	4962.000	PK	41.2	32.0	5.5	31.9	-	46.8	73.9	27.1	NS
Hori	7443.000	PK	42.3	37.2	6.5	33.1	-	52.9	73.9	21.0	NS
Hori	9924.000	PK	42.3	39.0	7.4	33.5	-	55.2	73.9	18.7	NS
Hori	2483.500	AV	35.3	27.6	3.3	32.7	19.1	52.6	53.9	1.3	Not Out of band emission(Leakage Power)
Hori	4962.000	AV	31.7	32.0	5.5	31.9	-	37.3	53.9	16.6	NS
Hori	7443.000	AV	33.5	37.2	6.5	33.1	-	44.1	53.9	9.8	NS
Hori	9924.000	AV	33.3	39.0	7.4	33.5	-	46.2	53.9	7.7	NS
Vert	44.543	QP	42.2	12.7	7.3	32.2	-	30.0	40.0	10.0	
Vert	73.728	QP	41.2	6.5	7.7	32.1	-	23.3	40.0	16.7	
Vert	86.022	QP	42.8	8.0	7.9	32.1	-	26.6	40.0	13.4	
Vert	92.156	QP	43.2	9.0	7.9	32.1	-	28.0	43.5	15.5	
Vert	109.056	QP	31.6	11.5	8.2	32.1	-	19.2	43.5	24.3	
Vert	122.886	QP	39.2	13.1	8.3	32.1	-	28.5	43.5	15.0	
Vert	393.211	QP	35.1	17.0	10.5	31.9	-	30.7	46.0	15.3	
Vert	2483.500	PK	55.7	27.6	3.3	32.7	-	53.9	73.9	20.0	Not Out of band emission(Leakage Power)
Vert	4962.000	PK	41.4	32.0	5.5	31.9	-	47.0	73.9	26.9	NS
Vert	7443.000	PK	42.0	37.2	6.5	33.1	-	52.6	73.9	21.3	NS
Vert	9924.000	PK	41.9	39.0	7.4	33.5	-	54.8	73.9	19.1	NS
Vert	2483.500	AV	36.0	27.6	3.3	32.7	19.1	53.3	53.9	0.6	Not Out of band emission(Leakage Power)
Vert	4962.000	AV	31.0	32.0	5.5	31.9	-	36.6	53.9	17.3	NS
Vert	7443.000	AV	33.5	37.2	6.5	33.1	-	44.1	53.9	9.8	NS
Vert	9924.000	AV	32.7	39.0	7.4	33.5	-	45.6	53.9	8.3	NS

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).

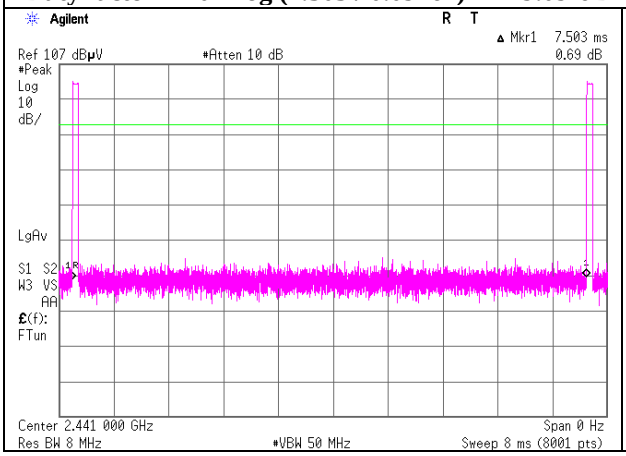
Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

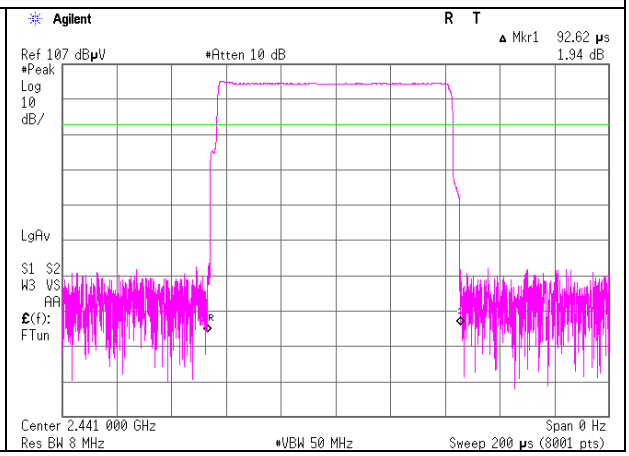
NS : No signal detected

Burst rate confirmation

Test place	Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No.	10529469H
Date	10/22/2014
Temperature/ Humidity	23 deg. C / 50% RH
Engineer	Masatoshi Nishiguchi
Mode	Tx 2441MHz

Tx on / (Tx on + Tx off) = 0.012
Tx on / (Tx on + Tx off) * 100 = 1.2 %
Duty factor = 10 * log (7.503 / 0.09262) 19.09 dB





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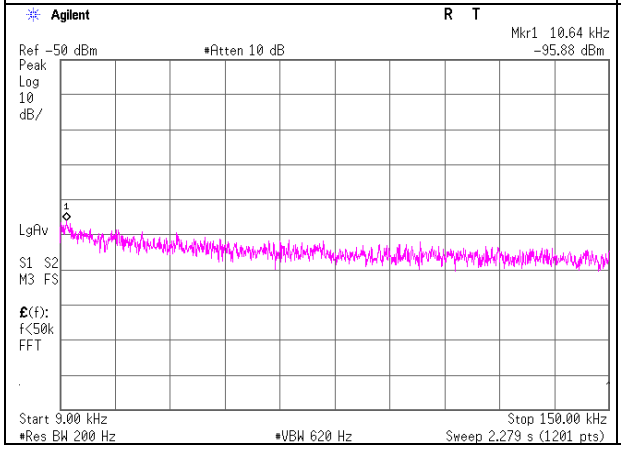
Conducted Spurious Emission

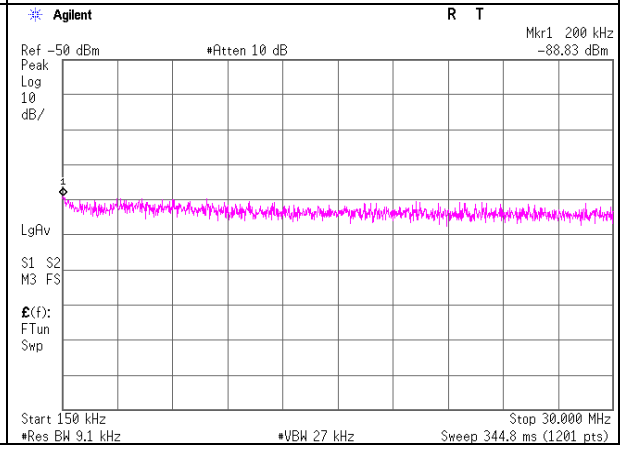
Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10529469H
Date	10/16/2014
Temperature/ Humidity	25 deg. C / 40% RH
Engineer	Satofumi Matsuyama
Mode	Tx

Tx Antenna 1 2403MHz

9kHz-150kHz



150kHz-30MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenator [dB]	Antenna Gain [dBi]	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]
10.64	-95.9	0.01	10.0	2.0	-83.9	300.0	6.0	-22.6	47.0
200	-88.8	0.01	10.0	2.0	-76.8	300.0	6.0	-15.6	21.5

E=EIRP-20log(D)+Ground bounce +104.8[dBuV/m]

EIRP=Reading+Cable Loss+Attenator+Antenna Gain

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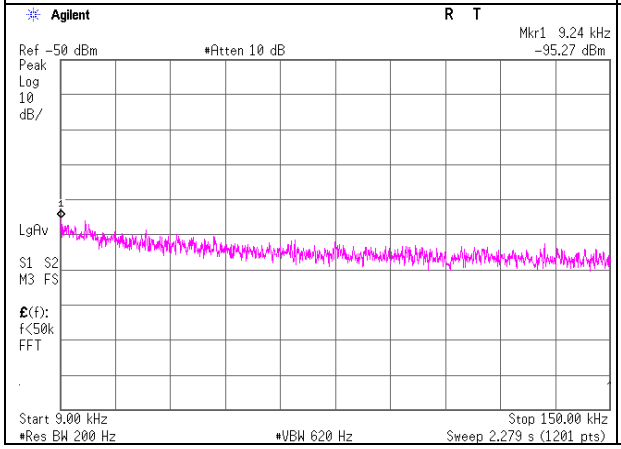
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

Conducted Spurious Emission

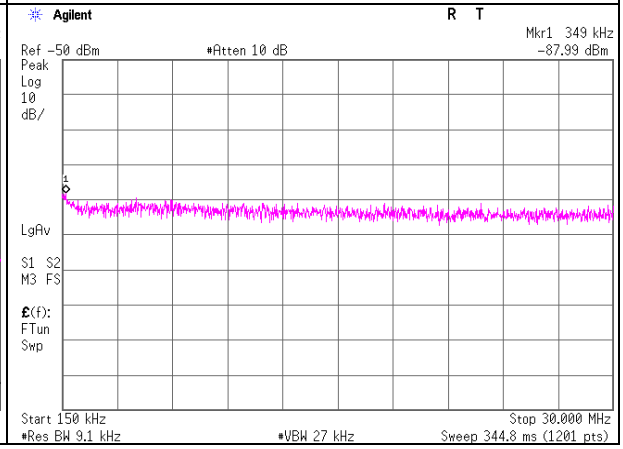
Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10529469H
Date	10/16/2014
Temperature/ Humidity	25 deg. C / 40% RH
Engineer	Satofumi Matsuyama
Mode	Tx

Tx Antenna 1 2441MHz

9kHz-150kHz



150kHz-30MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenator [dB]	Antenna Gain [dBi]	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]
9.24	-95.3	0.01	10.0	2.0	-83.3	300.0	6.0	-22.0	48.2
349	-88.0	0.01	10.0	2.0	-76.0	300.0	6.0	-14.7	16.7

E=EIRP-20log(D)+Ground bounce +104.8[dBuV/m]

EIRP=Reading+Cable Loss+Attenator+Antenna Gain

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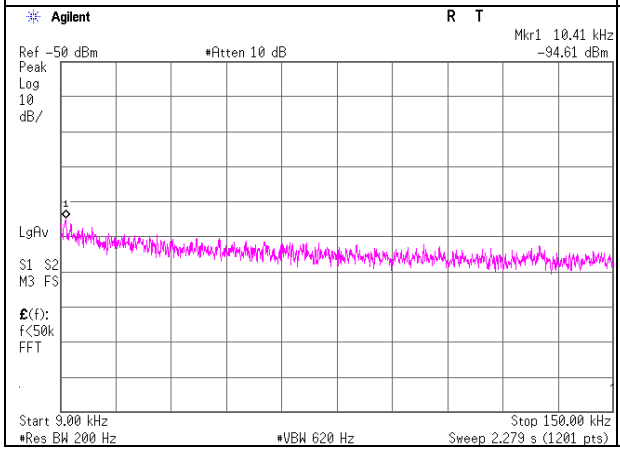
Conducted Spurious Emission

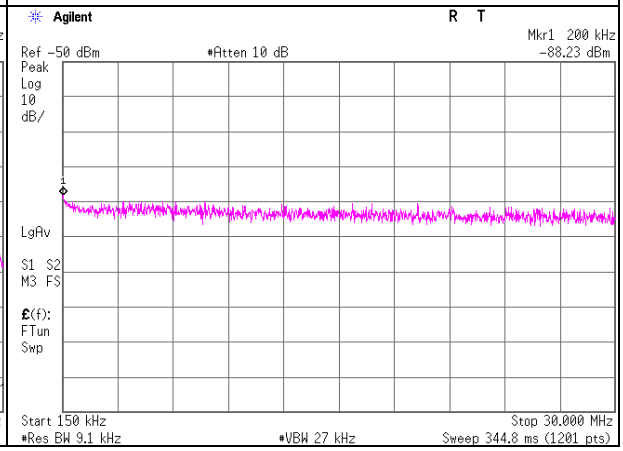
Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10529469H
Date	10/16/2014
Temperature/ Humidity	25 deg. C / 40% RH
Engineer	Satofumi Matsuyama
Mode	Tx

Tx Antenna 1 2481MHz

9kHz-150kHz



150kHz-30MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenator [dB]	Antenna Gain [dBi]	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]
10.41	-94.6	0.01	10.0	2.0	-82.6	300.0	6.0	-21.3	47.2
200	-88.2	0.01	10.0	2.0	-76.2	300.0	6.0	-15.0	21.5

E=EIRP-20log(D)+Ground bounce +104.8[dBuV/m]

EIRP=Reading+Cable Loss+Attenator+Antenna Gain

Power Density

Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10529469H
Date	10/16/2014
Temperature/ Humidity	25 deg. C / 40% RH
Engineer	Satofumi Matsuyama
Mode	Tx

Antenna 1

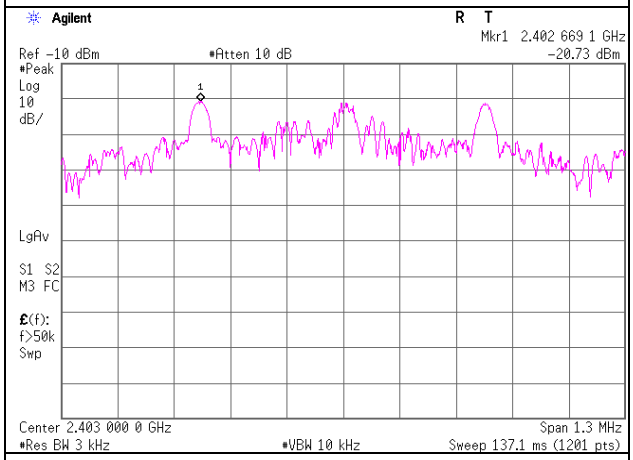
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
2403.00	-20.73	0.38	10.00	-10.35	8.00	18.35
2441.00	-20.71	0.39	10.00	-10.32	8.00	18.32
2481.00	-23.47	0.39	10.00	-13.08	8.00	21.08

Sample Calculation:
Result = Reading + Cable Loss + Attenuator

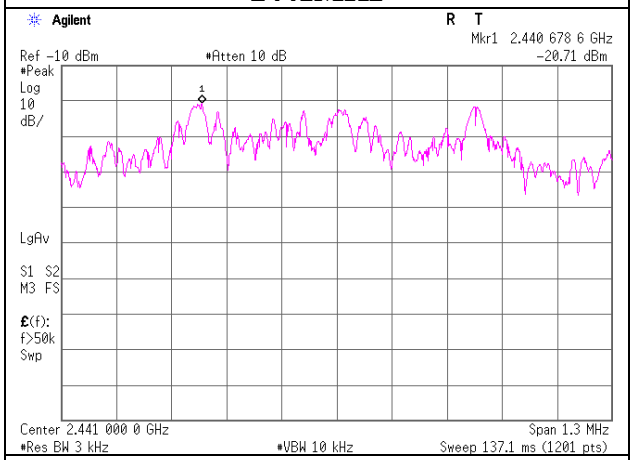
Power Density

Antenna 1

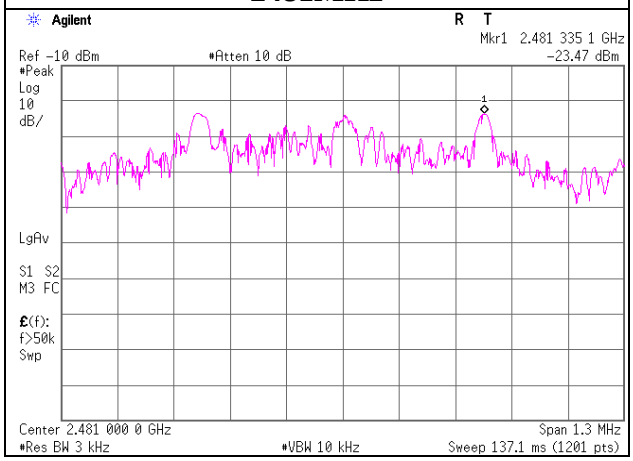
2403MHz



2441MHz



2481MHz

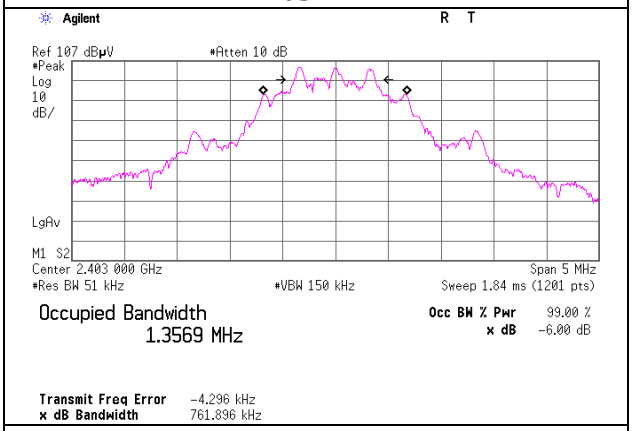


99%Occupied Bandwidth

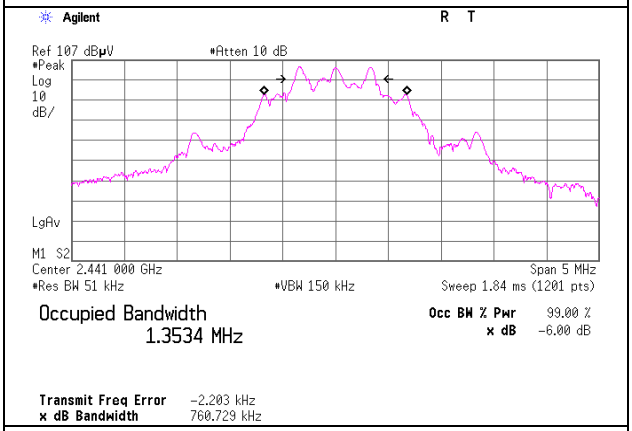
Test place	Ise EMC Lab. No.11 Measurement Room
Report No.	10529469H
Date	10/16/2014
Temperature/ Humidity	25 deg. C / 40% RH
Engineer	Satofumi Matsuyama
Mode	Tx

Antenna 1

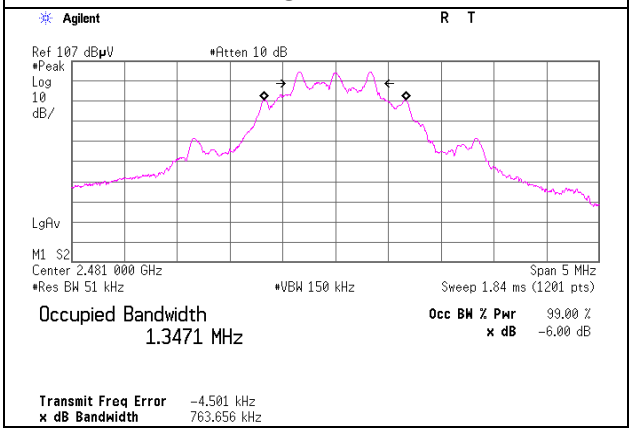
2403MHz



2441MHz



2481MHz



APPENDIX 2: Test instruments

EMI test equipment (1/2)

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2014/02/28 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	1501	RE	2014/02/20 * 12
MJM-22	Measure	ASKUL	-	-	RE	-
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	100084	RE	2013/11/12 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2013/11/24 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2013/11/24 * 12
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2014/06/02 * 12
MAT-68	Attenuator	Anritsu	MP721B	6200961025	RE	2013/11/26 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2014/03/14 * 12
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2014/02/27 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	1301	RE	2014/02/20 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
MRENT-116	Spectrum Analyzer	Agilent	E4440A	MY46187620	RE	2014/03/05 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2014/08/19 * 12
KLA-04	Logperiodic Antenna	Schwarzbeck	USLP9143	361	RE	2013/11/24 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2014/07/14 * 12
MAT-70	Attenuator(6dB)	Agilent	8491A-006	MY52460153	RE	2014/04/14 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2014/03/14 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2014/05/26 * 12
MCC-167	Microwave Cable	Junkosha	MWX221	1404S374(1m) / 1405S074(5m)	RE	2014/05/26 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2014/03/24 * 12
MHF-26	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	002	RE	2014/09/24 * 12
MRENT-112	Spectrum Analyzer	Agilent	E4440A	MY48250080	RE	2014/10/17 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2014/08/12 * 12
MCC-141	Microwave Cable	Junkosha	MWX221	1305S002R(1m) / 1405S146(5m)	RE	2014/06/11 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	MY39500780	RE	2014/03/11 * 12
MHA-17	Horn Antenna 15-40GHz	Schwarzbeck	BBHA9170	BBHA9170307	RE	2014/06/11 * 12

EMI test equipment (2/2)

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	CE	2014/06/25 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	CE	2014/02/20 * 12
MJM-14	Measure	KOMELON	KMC-36	-	CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	CE/RE	-
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	CE	2014/02/20 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	CE	2014/06/03 * 12
MLS-23	LISN(AMN)	Schwarzbeck	NSLK8127	8127-729	CE(AE)	2014/07/10 * 12
MLS-24	LISN(AMN)	Schwarzbeck	NSLK8127	8127-730	CE(EUT)	2014/07/10 * 12
MTA-31	Terminator	TME	CT-01	-	CE	2014/01/20 * 12
MCC-13	Coaxial Cable	Fujikura	3D-2W(12m)/5D-2W(5m)/5D-2W(0.8m)/5D-2W(1m)	-	CE	2014/02/20 * 12
MAT-65	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2014/01/29 * 12
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	AT	2013/11/25 * 12
MPM-12	Power Meter	Anritsu	ML2495A	0825002	AT	2014/06/16 * 12
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	AT	2014/06/16 * 12
MCC-99	Microwave Cable 1G-40GHz	Suhner	SUCOFLEX102	30820/2	AT	2014/05/16 * 12
MAT-22	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	AT	2014/03/13 * 12
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2013/12/17 * 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 test
RE: Radiated Emission test
AT: Antenna Terminal Conducted test