



RADIO TEST REPORT

Test Report No. : 10833047H-A-R1

Applicant : INTELLIGENT SYSTEMS CO., LTD.
Type of Equipment : IS-CLOSER-CTRL
Model No. : SZKFULLC-CTRL
Test regulation : FCC Part 15 Subpart C: 2015
FCC ID : SRX-SZK002
Test Result : **Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
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 10833047H-A. 10833047H-A is replaced with this report.

Date of test: June 25 to 30, 2015

Representative test engineer:

S. Matsuyama

Satofumi Matsuyama
Engineer

Consumer Technology Division

Approved by:

T. Hatahara

Takahiro Hatahara
Leader

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://japan.ul.com/resources/emc_accredited/

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

13-EM-F0429

REVISION HISTORY

Original Test Report No.: 10833047H-A

[illegible]

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	8
SECTION 5: Conducted emission	11
SECTION 6: Radiated emission (Fundamental , Spurious Emission and Spectrum Mask). ..	12
SECTION 7: Other test	13
APPENDIX 1: Test data	14
Conducted emission	14
Fundamental emission and Spectrum Mask	17
Spurious emission	20
20dB Bandwidth and 99% Occupied Bandwidth	25
Frequency Tolerance	29
APPENDIX 2: Test instruments	30
APPENDIX 3: Photographs of test setup	31
Conducted emission	31
Radiated emission	32
Worst Case Position	33

SECTION 1: Customer information

Company Name : INTELLIGENT SYSTEMS CO., LTD.
Address : 10 Daimatsu-cho Kamitoba Minami-ku Kyoto-shi Kyoto-fu, 601-8121,
Japan
Telephone Number : +81-75-671-3100
Facsimile Number : +81-75-671-3105
Contact Person : Takeshi Narita

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

2.1 Identification of E.U.T.

Type of Equipment : IS-CLOSER-CTRL
Model No. : SZKFULLC-CTRL
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 3.8 V
Receipt Date of Sample : June 20, 2015
Country of Mass-production : Japan
Condition of EUT : Production model
Modification of EUT : No Modification by the test lab

2.2 Product Description

General Specification

Clock frequency(ies) in the system : 432 MHz

Radio Specification

Radio Type : Transceiver
Frequency of Operation : 13.56 MHz
Modulation : ASK
Power Supply (radio part input) : DC 1.8 V
Operating Temperature : +10 deg. C to +40 deg. C

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2015, final revised on June 12, 2015 and effective July 13, 2015

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.225 : Operation within the band 13.110-14.010MHz

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted emission	ANSI C63.4:2009 7. AC powerline conducted emission measurements	Section 15.207	[QP] 10.3 dB, 0.17751 MHz, N	Complied	-
	<IC>RSS-Gen 8.8	<IC>RSS-Gen 8.8	[AV] 1.7 dB, 0.17751 MHz, N		
Electric Field Strength of Fundamental Emission	ANSI C63.4:2009 13. Measurement of intentional radiators	Section 15.225(a)	63.2 dB, 13.56000 MHz, QP,	Complied	Radiated
	<IC> RSS-Gen 6.4, 6.12	<IC>RSS-210 A2.6	0 deg.		
Spectrum Mask	ANSI C63.4:2009 13. Measurement of intentional radiators	Section 15.225(b)(c)	42.7 dB, 12.92290 MHz, QP,	Complied	Radiated
	<IC>RSS-Gen 6.4, 6.13	<IC> RSS-210 A2.6	0 deg.		
20dB Bandwidth	ANSI C63.4:2009 13. Measurement of intentional radiators	Section15.215(c)	See data	Complied	Radiated
	<IC> -	<IC> -			
Electric Field Strength of Spurious Emission	ANSI C63.4:2009 13. Measurement of intentional radiators	Section15.209, Section 15.225 (d)	7.6 dB 108.480 MHz,	Complied	Radiated
	<IC>RSS-Gen 6.4, 6.13	<IC>RSS-210 A2.6	Vertical, QP		
Frequency Tolerance	ANSI C63.4:2009 13. Measurement of intentional radiators	Section15.225(e)	See data	Complied	Radiated
	<IC>RSS-Gen 6.11, 8.11	<IC> RSS-210 A2.6			
Note: UL Japan, Inc.'s EMI Work Procedures No. 13-EM-W0420 and 13-EM-W0422					

FCC Part 15.31 (e)

This EUT provides stable voltage (DC 1.8 V) constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

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

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

3.3 Addition to standard

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	RSS-Gen 6.6	-	Radiated	N/A	N/A	N/A

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)
	150 kHz - 30 MHz
No.1	3.5 dB
No.2	3.5 dB
No.3	3.4 dB
No.4	3.5 dB

Test room (semi-anechoic chamber)	Radiated emission						
	(3 m*)(+dB)				(1 m*)(+dB)		(0.5 m*)(+dB)
	9 kHz - 30 MHz	30 MHz - 300 MHz	300 MHz - 1 GHz	1 GHz - 10 GHz	10 GHz - 18 GHz	18 GHz - 26.5 GHz	26.5 GHz - 40 GHz
No.1	4.3 dB	5.5 dB	6.3 dB	5.5 dB	5.8 dB	5.8 dB	4.3 dB
No.2	4.2 dB	5.4 dB	6.3 dB	5.4 dB	5.7 dB	5.9 dB	5.6 dB
No.3	4.4 dB	5.4 dB	6.4 dB	5.2 dB	5.5 dB	5.8 dB	5.5 dB
No.4	4.7 dB	5.6 dB	6.4 dB	5.3 dB	5.7 dB	5.9 dB	5.5 dB

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

Frequency counter (+)	
Normal condition	Extreme condition
7×10^{-6}	9×10^{-6}

Conducted emission test

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

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

Radiated emission test (3 m)

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

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

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 Test set up, Test data, and Test instruments

Refer to APPENDIX.

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

4.1 Operating Modes

The mode is used :

Mode	Remarks
Transmitting mode (Tx 13.56 MHz) -TypeA (106kbps) -TypeB (106kbps) -TypeF (106kbps)	With Tag Without Tag
The EUT was operated in a manner similar to typical use during the tests.	

Test Item	Operating mode*1)
Electric Field Strength of Fundamental Emission	Tx Mod on, without Tag, with Tag
Spectrum Mask	Tx Mod on, without Tag
20 dB Bandwidth 99 % OccupiedBandwidth	Tx Mod on, without Tag, with Tag
Electric Field Strength of Spurious Emission	Tx Mod on, without Tag
Frequency Tolerance	Tx Mod off, without Tag

*1) This EUT has two modes which Tag is attached to the EUT or not. The worst case was confirmed with and without Tag. The test was performed with worst case each type of Tag.

Justification: The system was configured in typical fashion (as a customer would normally use it) for testing.

Frequency Tolerance:

Temperature	:	-20deg.C to +50deg.C	Step 10deg.C
Voltage	:	Normal Voltage	: AC 120 V
		Maximum Voltage	: AC 138 V
		Minimum Voltage	: AC 102 V
			(AC 120 V ±15 %)

*This EUT provides stable voltage (DC 1.8 V) constantly to RF Module regardless of input voltage.

*EUT operates as one of the device within the system including IS-SNAKE-BOX and AC adapter.

The power supply of EUT (DC3.8V) is supplied from IS-SNAKE-BOX certainly through the special connector.

Therefore, Extreme test was performed with input voltage (AC120V) supplied by AC adapter of IS-SNAKE-BOX.

UL Japan, Inc.

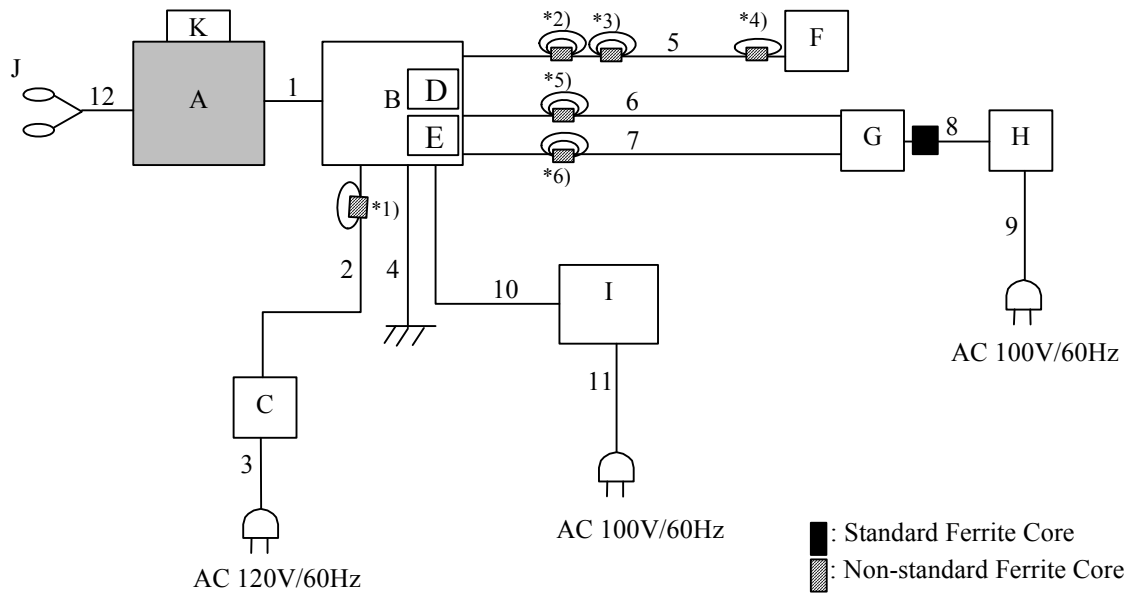
Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

4.2 Configuration and peripherals



*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	IS-CLOSER-CTRL	SZKFULLC-CTRL	I3101022[3]	INTELLIGENT SYSTEMS	EUT
B	IS-SNAKE-BOX	SZKFULLC-BOX	3101022-3	INTELLIGENT SYSTEMS	-
C	AC Adapter	RVL-002(USA)	A8VT210	Nintendo	-
D	SD Card	RVL-038	SS1KN051481	Nintendo	-
E	Flash Card	E203344	-	Nintendo	-
F	Controller	RVL-005	-	Nintendo	-
G	Laptop PC	CF-W5LWYAXP	6KKSA68320R	Panasonic	-
H	AC adapter	CF-AA1625A	1625AM507208662G	Panasonic	-
I	Monitor	M2700HD	ETF4A03403026	BENQ	-
J	Earphone	-	-	-	-
K	Tag	TypeA	CARD T-1(A)	Nintendo	-
		TypeB	CARD T-4(B)	Nintendo	
		TypeF	CARD T-3(F)	Nintendo	

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC + Signal Cable	1.0	Shielded	Shielded	-
2	DC Cable	0.9	Unshielded	Unshielded	*1)
3	AC Cable	1.6	Unshielded	Unshielded	-
4	FG Cable	1.2	Unshielded	Unshielded	-
5	Controller Cable	0.9	Shielded	Shielded	*2), *3), *4)
6	USB Cable	1.5	Shielded	Shielded	*5)
7	USB Cable	1.5	Shielded	Shielded	*6)
8	DC Cable	1.1	Shielded	Shielded	-
9	AC Cable	0.8	Unshielded	Unshielded	-
10	HDMI Cable	2.0	Shielded	Shielded	-
11	AC Cable	2.4	Unshielded	Unshielded	-
12	Earphone Cable	1.0	Unshielded	Unshielded	-

<Notes for Ferrite cores>

- *1) 1 Ferrite Core, Model No. E04SR211132 (Manufacturer: SEIWA), 5cm from Item B, 2 turns
- *2) 1 Ferrite Core, Model No. ZCAT3035-1330 (Manufacturer: TDK), 5cm from Item B, 3 turns
- *3) 1 Ferrite Core, Model No. E04SR211132 (Manufacturer: SEIWA), 2cm from Ferrite core: *2), 3 turns
- *4) 1 Ferrite Core, Model No. E04SR211132 (Manufacturer: SEIWA), 1cm from Item F, 2 turns
- *5) 1 Ferrite Core, Model No. E04SR211132 (Manufacturer: SEIWA), 5cm from Item B, 3 turns
- *6) 1 Ferrite Core, Model No. E04SR211132 (Manufacturer: SEIWA), 5cm from Item B, 3 turns

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

SECTION 5: Conducted emission

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.

The rear of tabletop was located 40 cm 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 80 cm from any other grounded conducting surface. EUT was located 80 cm 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 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. All unused 50 ohm connectors of the LISN (AMN) were resistivity terminated in 50 ohm 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 MHz - 30 MHz
Test data	: APPENDIX
Test result	: Pass

SECTION 6: Radiated emission (Fundamental, Spurious Emission and Spectrum Mask)

Test Procedure

EUT was placed on a urethane platform of nominal size, 1.0 m by 1.5 m, raised 0.8 m above the conducting ground plane.

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

Frequency: From 9 kHz to 30 MHz

The EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for vertical polarization (antenna angle: 0 deg., 45 deg., 90 deg., 135 deg., and 180 deg.) and horizontal polarization.

*Refer to Figure 1 about Direction of the Loop Antenna.

Frequency: From 30 MHz to 1 GHz

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

The measurements were performed for both vertical and horizontal antenna polarization.

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 30 MHz	30 MHz to 300 MHz	300 MHz to 1 GHz
Antenna Type	Loop	Biconical	Logperiodic

Frequency	From 9 kHz to 90 kHz and From 110 kHz to 150 kHz	From 90 kHz to 110 kHz	From 150 kHz to 490 kHz	From 490 kHz to 30 MHz	From 30 MHz to 1 GHz
Instrument used	Test Receiver				
Detector	PK / AV	QP	PK / AV	QP	QP
IF Bandwidth	200 Hz	200 Hz	9 kHz	9 kHz	120 kHz
Test Distance	3 m *1)	3 m *1)	3 m *1)	3 m *2)	3 m

*1) Distance Factor: $40 \times \log(3 \text{ m} / 300 \text{ m}) = -80 \text{ dB}$

*2) Distance Factor: $40 \times \log(3 \text{ m} / 30 \text{ m}) = -40 \text{ dB}$

Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 30 m open field test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 937606.

These tests were performed in semi anechoic chamber. Therefore the measured level of emissions may be higher than if measurements were made without a ground plane.

However test results were confirmed to pass against standard limit.

- 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 : 9 kHz - 1 GHz

Test data : APPENDIX 1

Test result : Pass

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

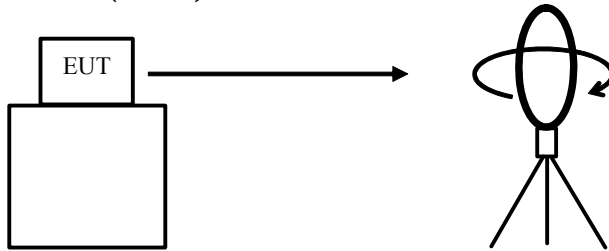
SECTION 7: Other test

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
20dB Bandwidth 99% Occupied Bandwidth	50 kHz	1 kHz	3 kHz	Auto (Simple)	Sample	Clear Write	Spectrum Analyzer
Frequency Tolerance	-	-	-	-	-	-	Frequency counter

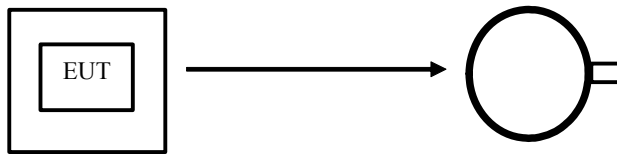
Test data : APPENDIX
Test result : Pass

Figure 1: Direction of the Loop Antenna

Side View (Vertical)

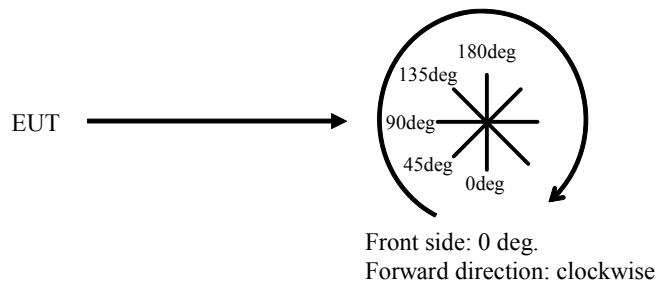


Top View (Horizontal)



Antenna was not rotated.

Top View (Vertical)



UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

APPENDIX 1: Test data

Conducted emission TypeA

DATA OF CONDUCTED EMISSION TEST

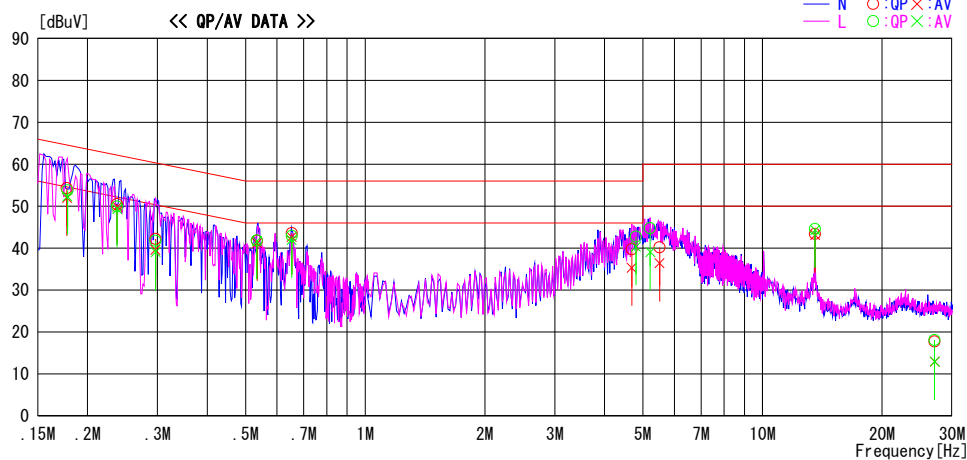
UL Japan, Inc. Ise EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2015/06/27

Report No. : 10833047H

Temp./Humi. : 23deg. C / 55% RH
Engineer : Kazuya Yoshioka

Mode / Remarks : Tx 13.56MHz Modulation Type A without Tag

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.17735	40.9	38.7	13.3	54.2	52.0	64.6	54.6	10.4	2.6	N	
0.23753	37.2	36.6	13.3	50.5	49.9	62.2	52.2	11.7	2.3	N	
0.29625	28.9	26.3	13.3	42.2	39.6	60.3	50.3	18.2	10.7	N	
0.53447	28.4	27.9	13.4	41.8	41.3	56.0	46.0	14.2	4.7	N	
0.65272	30.1	29.3	13.4	43.5	42.7	56.0	46.0	12.5	3.3	N	
4.68550	26.1	21.7	13.7	39.8	35.4	56.0	46.0	16.2	10.6	N	
5.50665	26.4	22.6	13.8	40.2	36.4	60.0	50.0	19.8	13.6	N	
13.56000	29.1	28.9	14.3	43.4	43.2	60.0	50.0	16.6	6.8	N	
27.12000	2.7	-2.0	15.0	17.7	13.0	60.0	50.0	42.3	37.0	N	
0.17796	40.4	39.0	13.3	53.7	52.3	64.6	54.6	10.9	2.3	L	
0.23747	36.7	36.0	13.3	50.0	49.3	62.2	52.2	12.2	2.9	L	
0.29663	28.4	25.7	13.3	41.7	39.0	60.3	50.3	18.6	11.3	L	
0.53369	28.4	28.3	13.4	41.8	41.7	56.0	46.0	14.2	4.3	L	
0.65276	29.5	28.6	13.4	42.9	42.0	56.0	46.0	13.1	4.0	L	
4.80154	29.1	26.6	13.7	42.8	40.3	56.0	46.0	13.2	5.7	L	
5.21704	30.9	25.3	13.8	44.7	39.1	60.0	50.0	15.3	10.9	L	
13.56000	30.3	30.1	14.3	44.6	44.4	60.0	50.0	15.4	5.6	L	
27.12000	3.1	-2.0	15.0	18.1	13.0	60.0	50.0	41.9	37.0	L	

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

UL Japan, Inc.
Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Conducted emission TypeB

DATA OF CONDUCTED EMISSION TEST

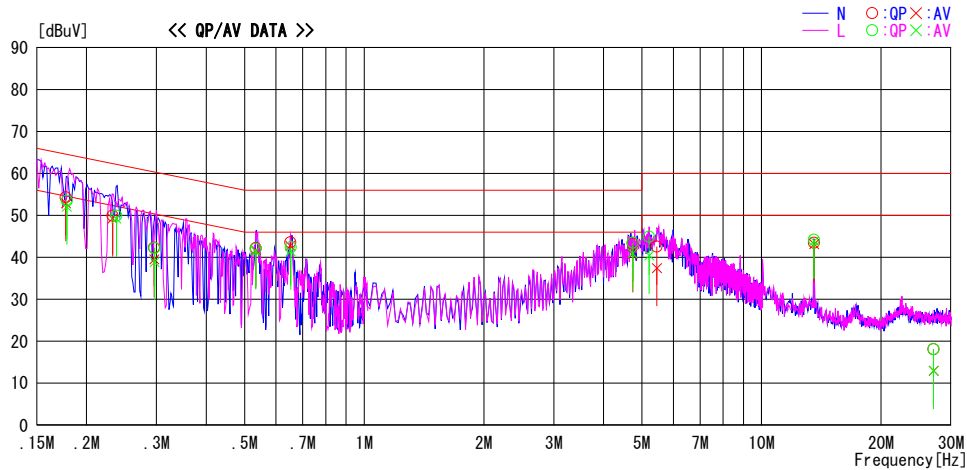
UL Japan, Inc. Ise EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2015/06/27

Report No. : 10833047H

Temp./Humi. : 23deg. C / 55% RH
Engineer : Kazuya Yoshioka

Mode / Remarks : Tx 13.56MHz Modulation Type B without Tag

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.17751	41.0	39.6	13.3	54.3	52.9	64.6	54.6	10.3	1.7	N	
0.23256	36.6	36.0	13.3	49.9	49.3	62.4	52.4	12.5	3.1	N	
0.29605	29.0	26.2	13.3	42.3	39.5	60.4	50.4	18.1	10.9	N	
0.53379	28.8	28.2	13.4	42.2	41.6	56.0	46.0	13.8	4.4	N	
0.65158	30.1	29.3	13.4	43.5	42.7	56.0	46.0	12.5	3.3	N	
4.73841	29.6	27.1	13.7	43.3	40.8	56.0	46.0	12.7	5.2	N	
5.45140	28.8	23.7	13.8	42.6	37.5	60.0	50.0	17.4	12.5	N	
13.56000	29.2	28.8	14.3	43.5	43.1	60.0	50.0	16.5	6.9	N	
27.12000	3.1	-2.0	15.0	18.1	13.0	60.0	50.0	41.9	37.0	N	
0.17846	40.2	38.8	13.3	53.5	52.1	64.6	54.6	11.1	2.5	L	
0.23765	36.6	35.9	13.3	49.9	49.2	62.2	52.2	12.3	3.0	L	
0.29687	28.9	25.6	13.3	42.2	38.9	60.3	50.3	18.1	11.4	L	
0.53325	28.6	28.1	13.4	42.0	41.5	56.0	46.0	14.0	4.5	L	
0.65319	29.0	28.0	13.4	42.4	41.4	56.0	46.0	13.6	4.6	L	
4.74004	29.8	27.3	13.7	43.5	41.0	56.0	46.0	12.5	5.0	L	
5.21417	31.1	26.6	13.8	44.9	40.4	60.0	50.0	15.1	9.6	L	
13.56000	29.9	29.6	14.3	44.2	43.9	60.0	50.0	15.8	6.1	L	
27.12000	3.1	-2.0	15.0	18.1	13.0	60.0	50.0	41.9	37.0	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 TypeF

DATA OF CONDUCTED EMISSION TEST

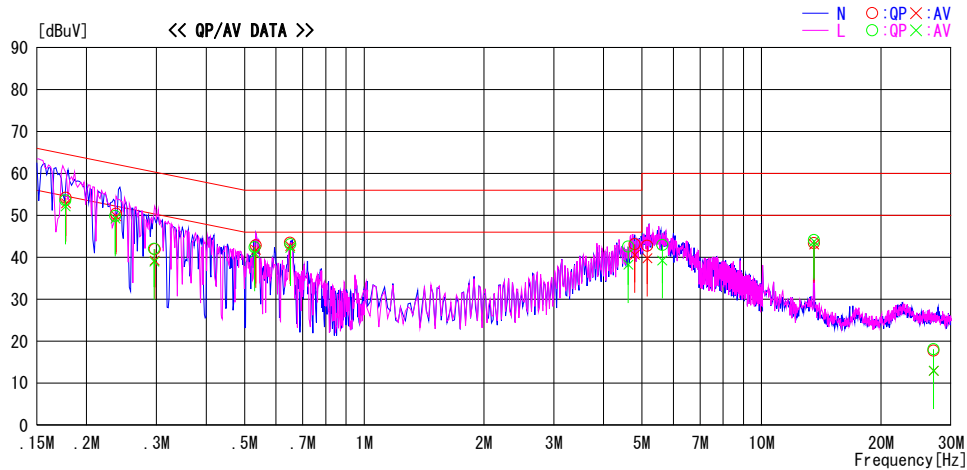
UL Japan, Inc. Ise EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2015/06/27

Report No. : 10833047H

Temp./Humi. : 23deg. C / 55% RH
Engineer : Kazuya Yoshioka

Mode / Remarks : Tx 13.56MHz Modulation Type F without Tag

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.17751	40.9	39.5	13.3	54.2	52.8	64.6	54.6	10.4	1.8	N	
0.23756	37.0	36.5	13.3	50.3	49.8	62.2	52.2	11.9	2.4	N	
0.29709	28.6	25.9	13.3	41.9	39.2	60.3	50.3	18.4	11.1	N	
0.53394	29.4	28.4	13.4	42.8	41.8	56.0	46.0	13.2	4.2	N	
0.65106	30.0	29.3	13.4	43.4	42.7	56.0	46.0	12.6	3.3	N	
4.79747	29.4	26.9	13.7	43.1	40.6	56.0	46.0	12.9	5.4	N	
5.15500	29.1	26.1	13.7	42.8	39.8	60.0	50.0	17.2	10.3	N	
13.56000	29.1	28.8	14.3	43.4	43.1	60.0	50.0	16.6	7.0	N	
27.12000	2.7	-2.0	15.0	17.7	13.0	60.0	50.0	42.3	37.0	N	
0.17705	40.2	38.9	13.3	53.5	52.2	64.6	54.6	11.1	2.4	L	
0.23628	36.6	36.0	13.3	49.9	49.3	62.2	52.2	12.3	3.0	L	
0.29593	28.7	25.7	13.3	42.0	39.0	60.4	50.4	18.4	11.4	L	
0.53019	28.9	27.6	13.4	42.3	41.0	56.0	46.0	13.7	5.0	L	
0.65184	29.7	28.9	13.4	43.1	42.3	56.0	46.0	12.9	3.8	L	
4.62068	28.8	24.5	13.7	42.5	38.2	56.0	46.0	13.5	7.8	L	
5.62721	29.2	25.4	13.8	43.0	39.2	60.0	50.0	17.0	10.8	L	
13.56000	29.8	29.5	14.3	44.1	43.8	60.0	50.0	15.9	6.2	L	
27.12000	3.1	-2.0	15.0	18.1	13.0	60.0	50.0	41.9	37.0	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.

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Fundamental emission and Spectrum Mask TypeA

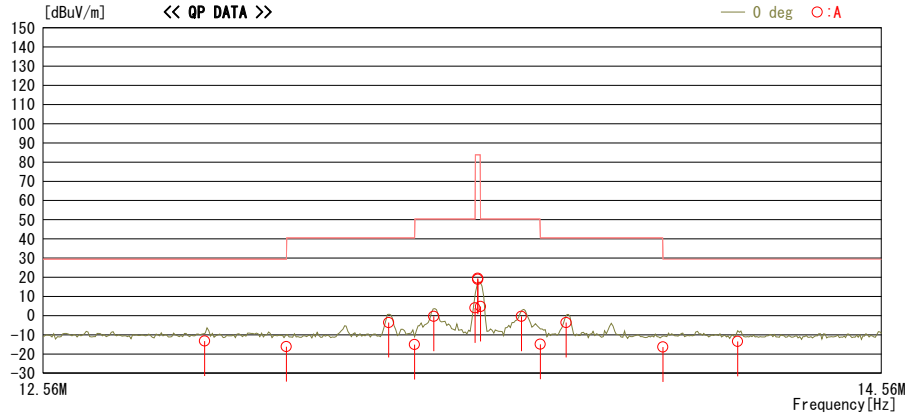
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/06/25

Report No. : 10833047H
Temp. / Humi. : 24deg. C / 60 % RH
Engineer : Yuta Moriya

Mode / Remarks : Tx 13.56MHz, Modulation Type A without Tag, Worst Axis Y

LIMIT : FCC15_225_PKQP, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15_225_AVQP, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[deg]	[deg]	
12.92290	32.2	QP	19.5	-32.8	32.1	-13.2	29.5	42.7	0	A	179
13.11000	29.2	QP	19.5	-32.8	32.1	-16.2	29.5	45.7	0	A	179
13.34880	41.8	QP	19.4	-32.7	32.1	-3.6	40.5	44.1	0	A	179
13.41000	30.4	QP	19.4	-32.7	32.1	-15.0	40.5	55.5	0	A	179
13.45520	45.0	QP	19.4	-32.7	32.1	-0.4	50.4	50.8	0	A	179
13.55300	49.4	QP	19.4	-32.7	32.1	4.0	50.4	46.4	0	A	179
13.56000	64.3	QP	19.4	-32.7	32.1	18.9	83.9	65.0	0	A	179 with Tag
13.56000	64.9	QP	19.4	-32.7	32.1	19.5	83.9	64.4	0	A	179
13.56700	50.1	QP	19.4	-32.7	32.1	4.7	50.4	45.7	0	A	179
13.66500	45.1	QP	19.4	-32.7	32.1	-0.3	50.4	50.7	0	A	179
13.71000	30.6	QP	19.4	-32.7	32.1	-14.8	40.5	55.3	0	A	179
13.77260	41.8	QP	19.4	-32.7	32.1	-3.6	40.5	44.1	0	A	179
14.01000	29.2	QP	19.3	-32.7	32.1	-16.3	29.5	45.8	0	A	179
14.19541	32.0	QP	19.3	-32.7	32.1	-13.5	29.5	43.0	0	A	179

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

Result of the fundamental emission at 3 m without Distance factor

QP

Ant Deg [deg]	Frequency	Detector	Reading	Ant Factor	Loss	Gain	Duty Factor	Result	Limit	Margin	Remark
	[MHz]		[dBuV]	[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
0	13.56000	QP	64.9	19.4	7.3	32.1	-	59.5	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier)

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Fundamental emission and Spectrum Mask TypeB

DATA OF RADIATED EMISSION TEST

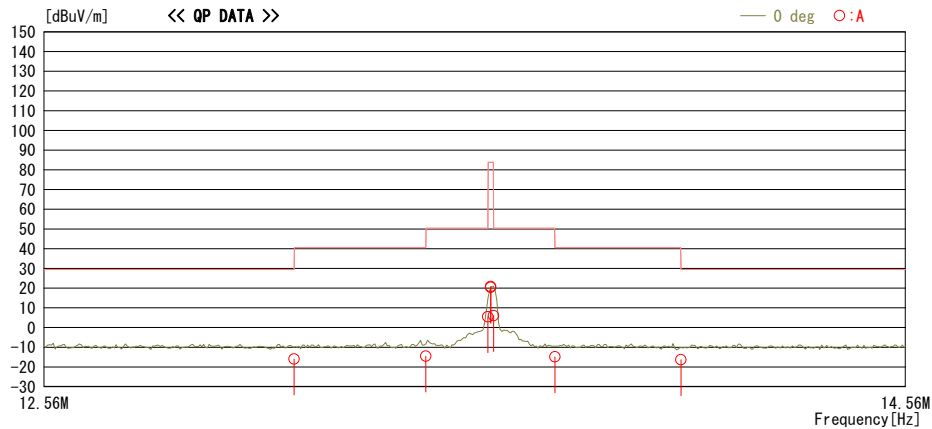
UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/06/25

Report No. : 10833047H

Temp. / Humi. : 24deg. C / 60 % RH
Engineer : Yuta Moriya

Mode / Remarks : Tx 13.56MHz, Modulation Type B without Tag, Worst Axis Y

LIMIT : FCC15_225_PKQP, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15_225_AVQP, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[deg]	[deg]	
13.11000	29.4	QP	19.5	-32.8	32.1	-16.0	29.5	45.5	0	A	177
13.41000	30.9	QP	19.4	-32.7	32.1	-14.5	40.5	55.0	0	A	177
13.53000	50.9	QP	19.4	-32.7	32.1	5.5	50.4	44.9	0	A	177
13.56000	65.7	QP	19.4	-32.7	32.1	20.3	83.9	63.6	0	A	177 with Tag
13.56000	66.1	QP	19.4	-32.7	32.1	20.7	83.9	63.2	0	A	177
13.56700	51.5	QP	19.4	-32.7	32.1	6.1	50.4	44.3	0	A	177
13.71000	30.6	QP	19.4	-32.7	32.1	-14.8	40.5	55.3	0	A	177
14.01000	29.2	QP	19.3	-32.7	32.1	-16.3	29.5	45.8	0	A	177

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

Result of the fundamental emission at 3 m without Distance factor

QP

Ant Deg [deg]	Frequency	Detector	Reading	Ant Factor	Loss	Gain	Duty Factor	Result	Limit	Margin	Remark
	[MHz]		[dBuV]	[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
0	13.56000	QP	66.1	19.4	7.3	32.1	-	60.7	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier)

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Fundamental emission and Spectrum Mask TypeF

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/06/25

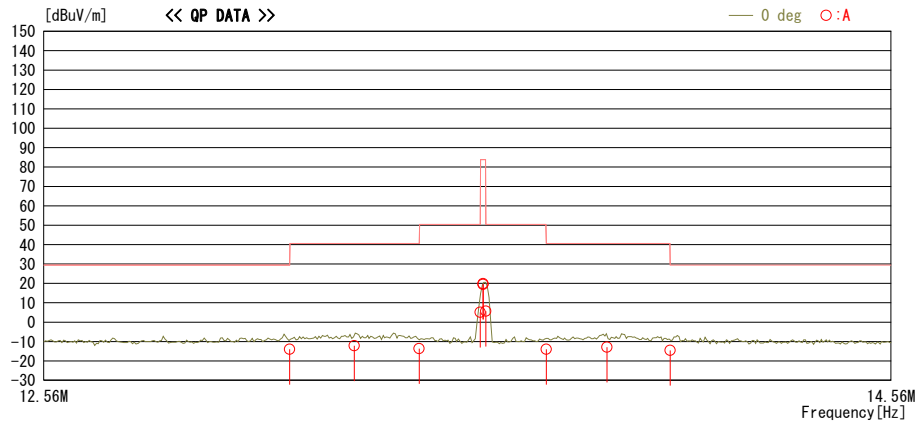
Report No. : 10833047H

Temp./ Humi. : 24deg. C / 60 % RH

Engineer : Yuta Moriya

Mode / Remarks : Tx 13.56MHz, Modulation Type F without Tag, Worst Axis Y

LIMIT : FCC15_225_PKQP, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15_225_AVQP, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[deg]	[deg]	
13.11000	31.5	QP	19.5	-32.8	32.1	-13.9	29.5	43.4	0	A	356
13.25920	33.2	QP	19.5	-32.8	32.1	-12.2	40.5	52.7	0	A	356
13.41000	31.8	QP	19.4	-32.7	32.1	-13.6	40.5	54.1	0	A	356
13.55300	50.5	QP	19.4	-32.7	32.1	5.1	50.4	45.3	0	A	356
13.56000	64.9	QP	19.4	-32.7	32.1	19.5	83.9	64.4	0	A	356 with Tag
13.56000	65.3	QP	19.4	-32.7	32.1	19.9	83.9	64.0	0	A	356
13.56700	51.1	QP	19.4	-32.7	32.1	5.7	50.4	44.7	0	A	356
13.71000	31.5	QP	19.4	-32.7	32.1	-13.9	40.5	54.4	0	A	356
13.85580	32.6	QP	19.4	-32.7	32.1	-12.8	40.5	53.3	0	A	356
14.01000	31.0	QP	19.3	-32.7	32.1	-14.5	29.5	44.0	0	A	356

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

Result of the fundamental emission at 3 m without Distance factor

QP

Ant Deg [deg]	Frequency	Detector	Reading	Ant Factor	Loss	Gain	Duty Factor	Result	Limit	Margin	Remark
	[MHz]		[dBuV]	[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
0	13.56000	QP	65.3	19.4	7.3	32.1	-	59.9	-	-	Fundamental

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier)

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

Spurious emission
(Below 30MHz)
Type A

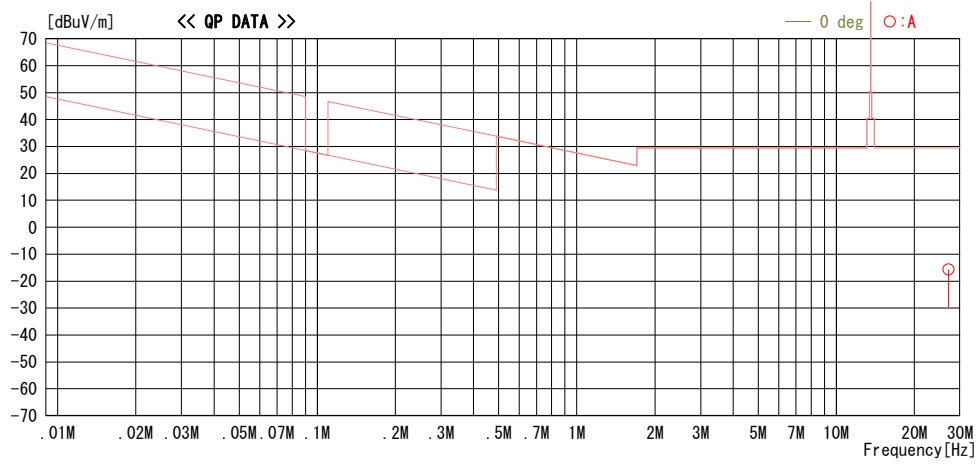
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/06/25

Report No. : 10833047H
Temp. / Humi. : 24deg.C / 60% RH
Engineer : Yuta Moriya

Mode / Remarks : Tx 13.56MHz, Modulation Type A without Tag, Worst Axis Y

LIMIT : FCC15_225_PKQP, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15_225_AVQP, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[deg]	[deg]	
27.12000	28.9	QP	19.7	-32.2	32.1	-15.7	29.5	45.2	0	A	0

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

Spurious emission
(Below 30MHz)
Type B

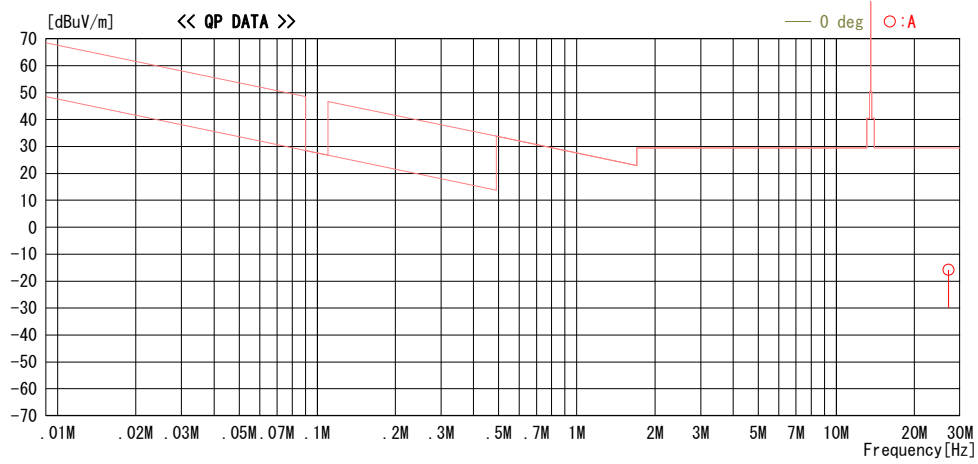
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/06/25

Report No. : 10833047H
Temp. / Humi. : 24deg. C / 60% RH
Engineer : Yuta Moriya

Mode / Remarks : Tx 13.56MHz, Modulation Type B without Tag, Worst Axis Y

LIMIT : FCC15_225_PKQP, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15_225_AVQP, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[deg]	[deg]	
27.12000	28.8	QP	19.7	-32.2	32.1	-15.8	29.5	45.3	0	0	

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

Spurious emission
(Below 30MHz)
Type F

DATA OF RADIATED EMISSION TEST

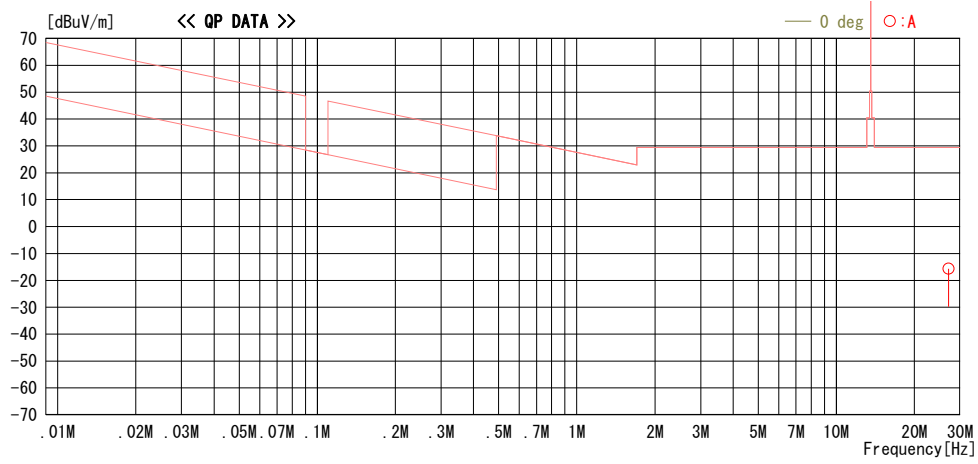
UL Japan, Inc. Ise EMC Lab. No.1 Semi Anechoic Chamber
Date : 2015/06/25

Report No. : 10833047H

Temp./Humi. : 24deg.C / 60% RH
Engineer : Yuta Moriya

Mode / Remarks : Tx 13.56MHz, Modulation Type F without Tag, Worst Axis Y

LIMIT : FCC15_225_PKQP, 9-90kHz:PK, 110-490kHz:PK, other:QP
FCC15_225_AVQP, 9-90kHz:AV, 110-490kHz:AV, other:QP



Freq.	Reading	DET	Ant. Fac	Loss	Gain	Result	Limit	Margin	Antenna	Table	Comment
[MHz]	[dBuV]		[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[deg]	[deg]	
27.12000	28.9	QP	19.7	-32.2	32.1	-15.7	29.5	45.2	0	0	

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

Spurious emission
Type A
(Above 30MHz)

DATA OF RADIATED EMISSION TEST

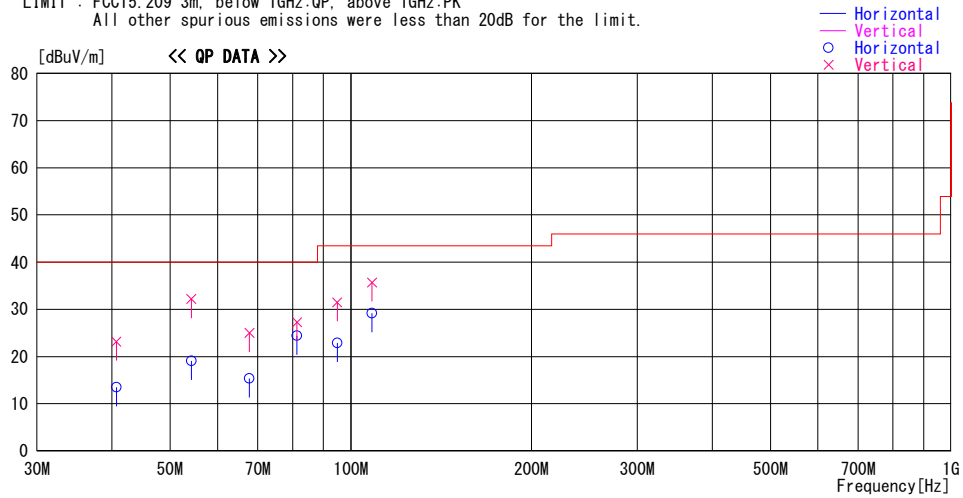
UL Japan, Inc. Ise EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2015/06/27

Report No. : 10833047H

Temp./Humi. : 23deg. C / 55% RH
Engineer : Kazuya Yoshioka

Mode / Remarks : Tx 13.56MHz, Modulation Type A without Tag Worst axis(Hori:Y Vert:Y)

LIMIT : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



Frequency	Reading	DET	Antenna	Loss&	Level	Angle	Height	Polar.	Limit	Margin	Comment
			Factor	Gain					[dBuV/m]	[dB]	
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]				
40.680	31.1	QP	13.9	-31.5	13.5	63	294	Hori.	40.0	26.5	
40.680	40.8	QP	13.9	-31.5	23.2	256	100	Vert.	40.0	16.8	
54.240	41.2	QP	9.2	-31.3	19.1	72	360	Hori.	40.0	20.9	
54.240	54.3	QP	9.2	-31.3	32.2	96	100	Vert.	40.0	7.8	
67.800	49.7	QP	6.4	-31.1	25.0	94	100	Vert.	40.0	15.0	
67.800	40.1	QP	6.4	-31.1	15.4	66	295	Hori.	40.0	24.6	
81.360	48.3	QP	7.0	-30.9	24.4	83	248	Hori.	40.0	15.6	
81.360	51.2	QP	7.0	-30.9	27.3	32	100	Vert.	40.0	12.7	
94.920	53.0	QP	9.3	-30.8	31.5	0	100	Vert.	43.5	12.0	
94.920	44.4	QP	9.3	-30.8	22.9	75	189	Hori.	43.5	20.6	
108.480	48.5	QP	11.3	-30.6	29.2	0	187	Hori.	43.5	14.3	
108.480	55.0	QP	11.3	-30.6	35.7	46	100	Vert.	43.5	7.8	

CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS(CABLE + ATTEN. - GAIN(AMP))

Spurious emission
Type F
(Above 30MHz)

DATA OF RADIATED EMISSION TEST

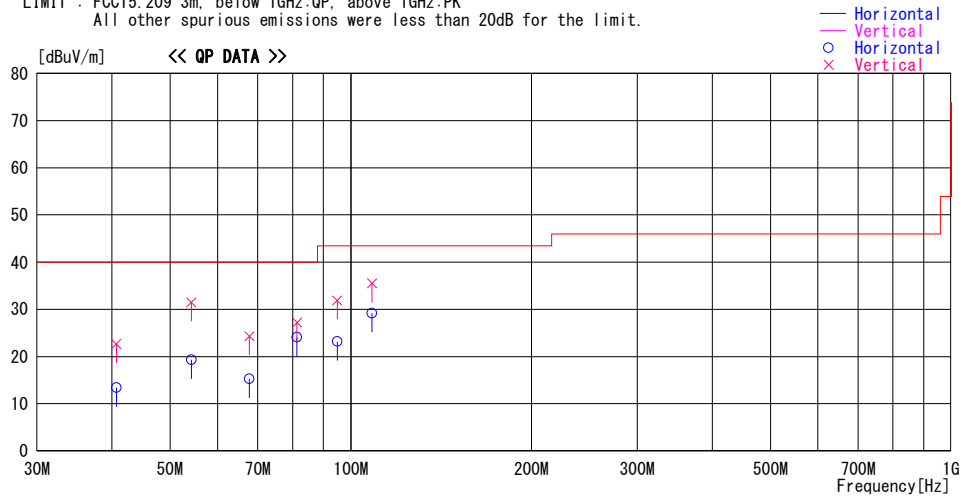
UL Japan, Inc. Ise EMC Lab. No. 4 Semi Anechoic Chamber
Date : 2015/06/27

Report No. : 10833047H

Temp./Humi. : 23deg. C / 55% RH
Engineer : Kazuya Yoshioka

Mode / Remarks : Tx 13.56MHz, Modulation Type F without Tag Worst axis(Hori:Y Vert:Y)

LIMIT : FCC15.209 3m, below 1GHz:QP, above 1GHz:PK
All other spurious emissions were less than 20dB for the limit.



Frequency [MHz]	Reading [dBuV]	DET	Antenna	Loss&	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit	Margin	Comment
			Factor [dB/m]	Gain [dB]					[dBuV/m]	[dB]	
40.680	31.0	QP	13.9	-31.5	13.4	68	296	Hori.	40.0	26.6	
40.680	40.3	QP	13.9	-31.5	22.7	255	100	Vert.	40.0	17.3	
54.240	41.4	QP	9.2	-31.3	19.3	73	360	Hori.	40.0	20.7	
54.240	53.6	QP	9.2	-31.3	31.5	92	100	Vert.	40.0	8.5	
67.800	49.0	QP	6.4	-31.1	24.3	96	100	Vert.	40.0	15.7	
67.800	40.0	QP	6.4	-31.1	15.3	68	292	Hori.	40.0	24.7	
81.360	48.0	QP	7.0	-30.9	24.1	80	250	Hori.	40.0	15.9	
81.360	51.1	QP	7.0	-30.9	27.2	38	100	Vert.	40.0	12.8	
94.920	53.4	QP	9.3	-30.8	31.9	0	100	Vert.	43.5	11.6	
94.920	44.7	QP	9.3	-30.8	23.2	75	188	Hori.	43.5	20.3	
108.480	48.5	QP	11.3	-30.6	29.2	0	188	Hori.	43.5	14.3	
108.480	54.8	QP	11.3	-30.6	35.5	50	100	Vert.	43.5	8.0	

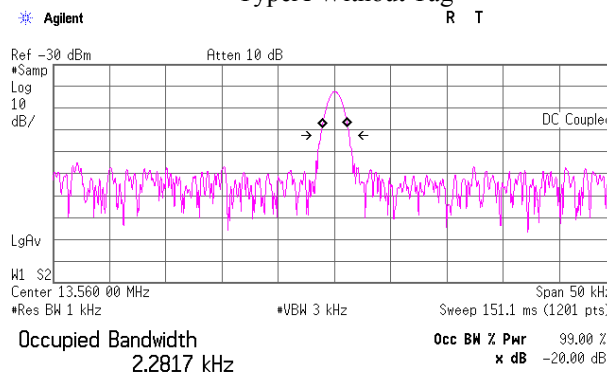
CHART:WITH FACTOR ANT TYPE: -30MHz:LOOP, 30-300MHz:BICONICAL, 300MHz-1000MHz:LOGPERIODIC, 1000MHz:-:HORN
CALCULATION:RESULT = READING + ANT FACTOR + LOSS (CABLE + ATTEN. - GAIN(AMP))

20dB Bandwidth and 99% Occupied Bandwidth TypeA

Test place : Ise EMC Lab. No.1 Semi Anechoic Chamber
Report No. : 10833047
Date : 06/25/2015
Temperature/ Humidity : 24 deg. C / 60 % RH
Engineer : Takafumi Noguchi
Mode : Tx Mod on (Type A)

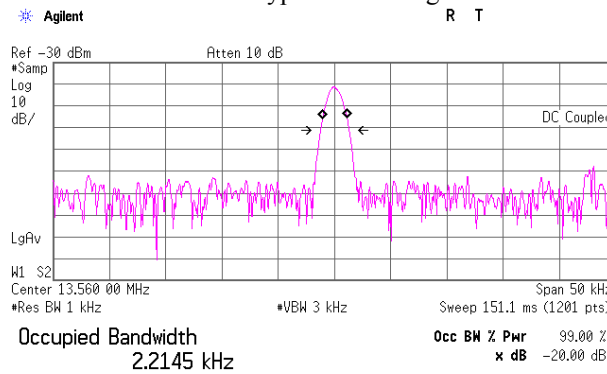
FREQ [MHz]	Mode	20dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
13.56	Without Tag	2.569	2.2817
	With Tag	2.556	2.2145

TypeA Without Tag



Transmit Freq Error 45.334 Hz
x dB Bandwidth 2.569 kHz*

Type A With Tag



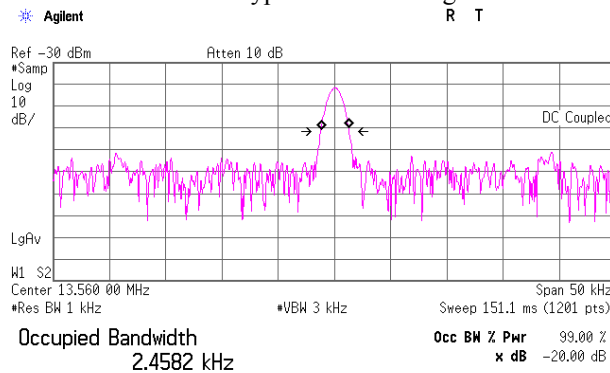
Transmit Freq Error 57.396 Hz
x dB Bandwidth 2.556 kHz*

20dB Bandwidth and 99% Occupied Bandwidth Type B

Test place	Ise EMC Lab. No.1 Semi Anechoic Chamber
Report No.	10833047
Date	06/25/2015
Temperature/ Humidity	24 deg. C / 60 % RH
Engineer	Takafumi Noguchi
Mode	Tx Mod on (Type B)

FREQ [MHz]	Mode	20dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
13.56	Without Tag	2.574	2.4582
	With Tag	2.559	2.1821

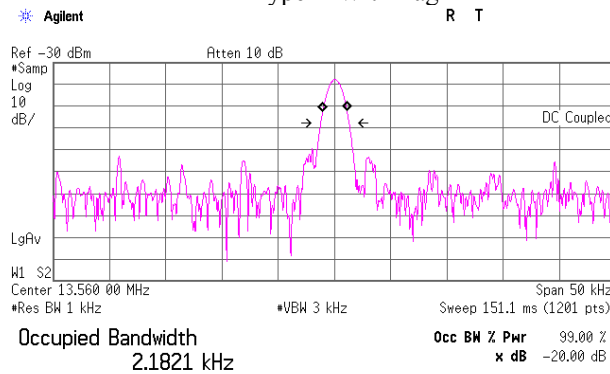
Type B Without Tag



Transmit Freq Error 45.957 Hz

x dB Bandwidth 2.574 kHz*

Type B With Tag



Transmit Freq Error 52.023 Hz

x dB Bandwidth 2.559 kHz*

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

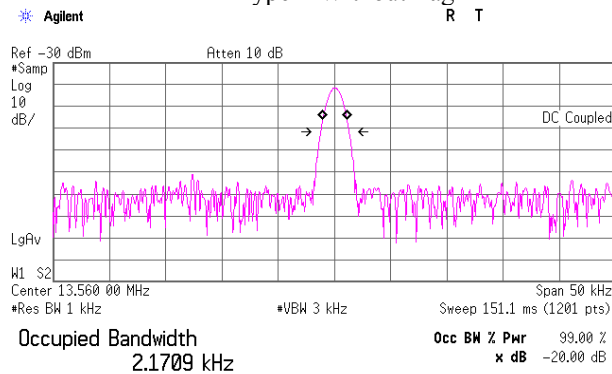
Facsimile : +81 596 24 8124

20dB Bandwidth and 99% Occupied Bandwidth Type F

Test place	Ise EMC Lab. No.1 Semi Anechoic Chamber
Report No.	10833047
Date	06/25/2015
Temperature/ Humidity	24 deg. C / 60 % RH
Engineer	Takafumi Noguchi
Mode	Tx Mod on (Type F)

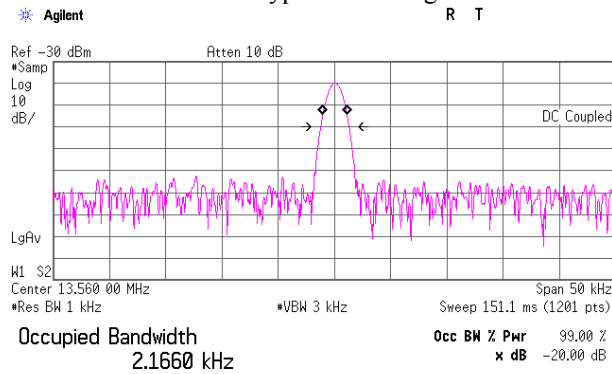
FREQ [MHz]	Mode	20dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
13.56	Without Tag	2.531	2.1709
	With Tag	2.548	2.1660

Type F Without Tag



Transmit Freq Error 54.289 Hz
x dB Bandwidth 2.531 kHz*

Type F With Tag



Transmit Freq Error 56.013 Hz
x dB Bandwidth 2.548 kHz*

Frequency Tolerance

Test place : Ise EMC Lab. No.6 measurement room
Report No. : 10833047H
Date : 06/30/2015
Temperature/ Humidity : 23 deg. C / 62 % RH
Engineer : Satofumi Matsuyama
Mode : Tx Mod off

Test condition		Tested timing	Measured frequency [MHz]	Frequency error [MHz]	Result		Limit
Temp. [deg. C]	Voltage [V]				[%]	[ppm]	
50	120	Power on	13.560056	0.000056	0.00041	4.1	0.01
		+ 2 min.	13.560064	0.000064	0.00047	4.7	0.01
		+ 5 min.	13.560071	0.000071	0.00052	5.2	0.01
		+ 10 min.	13.560081	0.000081	0.00060	6.0	0.01
40	120	Power on	13.560060	0.000060	0.00044	4.4	0.01
		+ 2 min.	13.560058	0.000058	0.00043	4.3	0.01
		+ 5 min.	13.560059	0.000059	0.00044	4.4	0.01
		+ 10 min.	13.560062	0.000062	0.00046	4.6	0.01
30	120	Power on	13.560070	0.000070	0.00052	5.2	0.01
		+ 2 min.	13.560063	0.000063	0.00046	4.6	0.01
		+ 5 min.	13.560059	0.000059	0.00044	4.4	0.01
		+ 10 min.	13.560058	0.000058	0.00043	4.3	0.01
20	120	Power on	13.560077	0.000077	0.00057	5.7	0.01
		+ 2 min.	13.560070	0.000070	0.00052	5.2	0.01
		+ 5 min.	13.560069	0.000069	0.00051	5.1	0.01
		+ 10 min.	13.560064	0.000064	0.00047	4.7	0.01
20	102 (120V -15%)	Power on	13.560077	0.000077	0.00057	5.7	0.01
		+ 2 min.	13.560070	0.000070	0.00052	5.2	0.01
		+ 5 min.	13.560067	0.000067	0.00049	4.9	0.01
		+ 10 min.	13.560064	0.000064	0.00047	4.7	0.01
20	138 (120V +15%)	Power on	13.560079	0.000079	0.00058	5.8	0.01
		+ 2 min.	13.560071	0.000071	0.00052	5.2	0.01
		+ 5 min.	13.560068	0.000068	0.00050	5.0	0.01
		+ 10 min.	13.560065	0.000065	0.00048	4.8	0.01
10	120	Power on	13.560084	0.000084	0.00062	6.2	0.01
		+ 2 min.	13.560082	0.000082	0.00060	6.0	0.01
		+ 5 min.	13.560079	0.000079	0.00058	5.8	0.01
		+ 10 min.	13.560076	0.000076	0.00056	5.6	0.01
0	120	Power on	13.560083	0.000083	0.00061	6.1	0.01
		+ 2 min.	13.560086	0.000086	0.00063	6.3	0.01
		+ 5 min.	13.560085	0.000085	0.00063	6.3	0.01
		+ 10 min.	13.560085	0.000085	0.00063	6.3	0.01
-10	120	Power on	13.560078	0.000078	0.00058	5.8	0.01
		+ 2 min.	13.560086	0.000086	0.00063	6.3	0.01
		+ 5 min.	13.560087	0.000087	0.00064	6.4	0.01
		+ 10 min.	13.560087	0.000087	0.00064	6.4	0.01
-20	120	Power on	13.560041	0.000041	0.00030	3.0	0.01
		+ 2 min.	13.560069	0.000069	0.00051	5.1	0.01
		+ 5 min.	13.560073	0.000073	0.00054	5.4	0.01
		+ 10 min.	13.560075	0.000075	0.00055	5.5	0.01

Calculation formula: Frequency error = Measured frequency - Tested frequency
Result [%] = Frequency error / Tested frequency * 100

Tested frequency: 13.56 MHz
Limit (+/-): 0.01 % (+/- 100ppm)

*The test was begun from 50 deg.C and the temperature was lowered each 10 deg.C.

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-01	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 10m	DA-06881	RE	2014/09/01 * 12
MOS-27	Thermo-Hygrometer	CUSTOM	CTH-201	A08Q26	RE	2015/01/13 * 12
MJM-21	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	100635	RE	2015/04/03 * 12
MLPA-01	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100017	RE	2014/10/04 * 12
MCC-143	Coaxial Cable	UL Japan	-	-	RE	2015/06/24 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/TSJ	5D-2W(20m)/ 3D-2W(7.5m)/ RG400u(1.5m)/ RFM-E421(Switcher)	-/01068(Switcher)	RE	2014/09/12 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2015/03/09 * 12
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE,CE	2015/02/26 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	1501	RE,CE	2015/01/13 * 12
MJM-23	Measure	ASKUL	-	-	RE,CE	-
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	100084	RE,CE	2014/11/10 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2014/11/22 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2014/11/22 * 12
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2015/06/19 * 12
MAT-68	Attenuator	Anritsu	MP721B	6200961025	RE	2014/11/11 * 12
MPA-19	Pre Amplifier	MITEQ	MLA-10K01-B01-35	1237616	RE	2015/02/03 * 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	2015/01/19 * 12
MAT-67	Attenuator	JFW Industries, Inc.	50FP-013H2 N	-	CE	2015/01/29 * 12
MCC-113	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/ SFM141(5m)/ 421-010(1m)/ suoform141-PE(1m)/ RFM-E121(Switcher)	-/04178	CE	2014/07/15 * 12
MFC-01	Microwave Counter	Advantest	R5373	120100309	FT	2014/08/11 * 12
MCH-04	Temperature and Humidity Chamber	Tabai Espec	PL-2KP	14015723	FT	2014/08/06 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	1401	FT	2015/01/13 * 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
FT: Frequency Tolerance

UL Japan, Inc.

Ise EMC Lab.

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

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124