



Test report No. : 10003538H-C-R1  
Page : 1 of 22  
Issued date : March 11, 2013  
Revised date : March 12, 2013  
FCC ID : ZQUCHC-S6245-5

# **RADIO TEST REPORT**

**Test Report No. : 10003538H-C-R1**

**Applicant** : SINFONIA TECHNOLOGY CO., LTD.  
**Type of Equipment** : Digital Photo Printer  
**Model No.** : CHC-S6245-5  
**Test regulation** : FCC Part 15 Subpart C: 2012  
**FCC ID** : ZQUCHC-S6245-5  
**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 report is a revised version of 10003538H-C. 10003538H-C is replaced with this report.

**Date of test:** January 21 to 25, 2013

**Representative test engineer:**

Shinya Watanabe  
Engineer of WiSE Japan,  
UL Verification Service

**Approved by:**

Takahiro Hatakeda  
Leader 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>

**UL Japan, Inc.**

**Head Office EMC Lab.**

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

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

13-EM-F0429

## REVISION HISTORY

**Original Test Report No.: 10003538H-C**

[illegible]

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## **SECTION 1: Customer information**

Company Name	:	SINFONIA TECHNOLOGY CO.,LTD.
Address	:	100 Takegahana-cho, Ise-shi, Mie-ken, 516-8550 JAPAN
Telephone Number	:	+81 596 36 1286
Facsimile Number	:	+81 596 36 3884
Contact Person	:	Tsutomu Inagaki

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

### **2.1 Identification of E.U.T.**

Type of Equipment	:	Digital Photo Printer
Model No.	:	CHC-S6245-5
Serial No.	:	Refer to Section 4, Clause 4.2
Rating	:	AC 100-240V
Receipt Date of Sample	:	January 19, 2013
Country of Mass-production	:	Malaysia
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

### **2.2 Product description**

Model No: CHC-S6245-5 (referred to as the EUT in this report) is the Digital Photo Printer.

Feature of EUT:

Clock frequency(ies) in the system	:	480MHz (Max)
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#### **Radio Specification**

Radio Type	:	Transceiver
Frequency of Operation	:	13.56MHz
Modulation	:	ASK
Power Supply (radio part input)	:	DC 3.3V
Antenna type	:	Pattern Antenna

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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 15.225 : Operation within the band 13.110-14.010MHz

\* The revision on December 27, 2012 does not affect the test specification applied to the EUT.

#### **3.2 Procedures and results**

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements ----- <IC>RSS-Gen 7.2.2	Section 15.207 ----- <IC>RSS-Gen 7.2.2	[QP]5.2dB 19.12625MHz, L [AV]7.7dB 19.12625MHz, L	Complied	Conducted
Electric Field Strength of Fundamental Emission	ANSI C63.4:2003 13. Measurement of intentional radiators ----- <IC> RSS-Gen 4.8, 4.11	Section 15.225(a) ----- <IC>RSS-210 A2.6	91.5dB, 13.56000MHz, QP, 0deg and 180deg.	Complied	Radiated
Spectrum Mask	ANSI C63.4:2003 13. Measurement of intentional radiators ----- <IC>RSS-Gen 4.9, 4.11	Section 15.225(b)(c) ----- <IC> RSS-210 A2.6	46.1dB, 14.01000MHz, QP, 0deg.	Complied	Radiated
20dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators ----- <IC> -	Section15.215(c) ----- <IC> -	See data	Complied	Radiated
Electric Field Strength of Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators ----- <IC>RSS-Gen 4.9, 4.11	Section15.209, Section 15.225 (d) ----- <IC>RSS-210 A2.6	17.2dB 501.710MHz, Vertical, QP	Complied	Radiated
Frequency Tolerance	ANSI C63.4:2003 13. Measurement of intentional radiators ----- <IC>RSS-Gen 4.7	Section15.225(e) ----- <IC> RSS-210 A2.6	See data	Complied	Radiated

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

#### **FCC 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**

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.

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### 3.3 Addition to standard

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	RSS-Gen 4.6.1	RSS-Gen 4.6.1	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) 150kHz-30MHz
No.1	3.5dB
No.2	3.6dB
No.3	3.6dB
No.4	3.6dB

Test room (semi-anechoic chamber)	Radiated emission						
	(3m*)(+dB)				(1m*)(+dB)		(0.5m*)(+dB)
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.3dB	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

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

#### Conducted emission test

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

#### Radiated emission test (3m)

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

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**Head Office EMC Lab.**

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

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Facsimile : +81 596 24 8124

### 3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. \*NVLAP Lab. code: 200572-0  
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN  
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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 Test set up, Data of EMI, 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
RFID Print mode	With Tag
The EUT was operated in a manner similar to typical use during the tests. The EUT Transmits and Receives at the same time and there is no receiving mode.	
*Power Setting: same as production model Software: T0199700-0017 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.	

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 120V (Rating: AC 100 - 240V)  
Maximum Voltage AC 276V(AC 240V +15%),  
Minimum Voltage AC 85V (AC 100V -15%)

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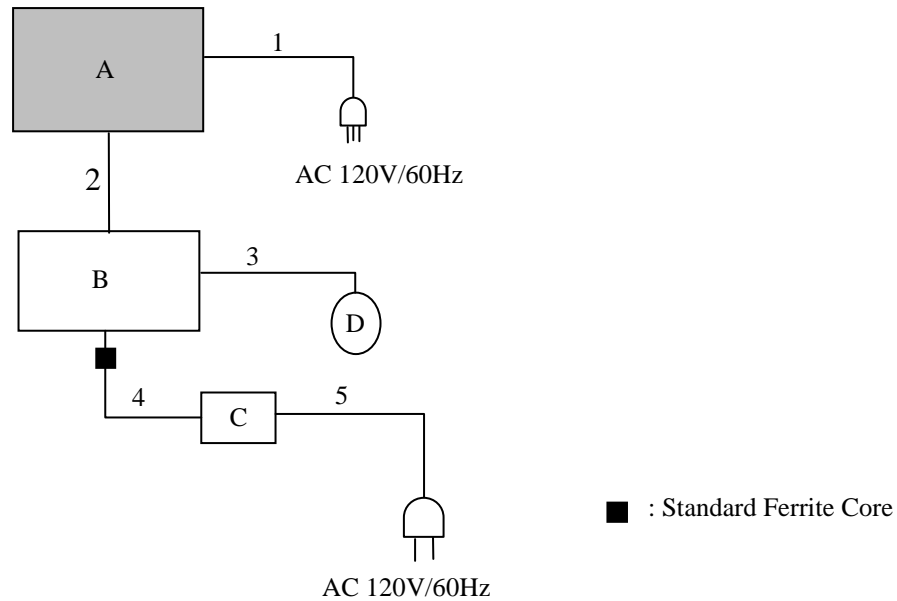
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Facsimile : +81 596 24 8124



## 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	Digital Photo Printer	CHC-S6245-5	PP002	SINFONIA TECHNOLOGY CO., LTD.	EUT
B	Laptop PC	7661CB9	L3R2055	lenovo	-
C	AC Adapter	92P1214	11S92P1213Z1ZBG K7AH1F	lenovo	-
D	Mouse	M-UB48	830318-0000	Logitech	-

### List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	AC Cable	3.0	Unshielded	Unshielded	-
2	USB Cable	2.0	Shielded	Shielded	-
3	USB Cable	0.8	Shielded	Shielded	-
4	DC Cable	1.8	Unshielded	Unshielded	-
5	AC Cable	1.0	Unshielded	Unshielded	-

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**Head Office EMC Lab.**

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

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## **SECTION 5: Conducted emission**

### **5.1 Operating environment**

Test place	: No.3 semi anechoic chamber
Temperature	: See data
Humidity	: See data

### **5.2 Test configuration**

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 and its peripherals was 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 LISN/AMN and excess AC cable was bundled in center. 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. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN/ an AMN to the input power source. All unused 50ohm connectors of the LISN/ AMN were resistively terminated in 50ohm when not connected to the measuring equipment. The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT on a horizontal conducting plane 4.0 x 4.0m and a vertical conducting plane 2.0 x 2.0m in a semi Anechoic Chamber. Photographs of the set up are shown in Appendix 3.

### **5.3 Test conditions**

Frequency range	: 0.15MHz-30MHz
EUT position	: Table top
EUT operation mode	: See Clause 4.1

### **5.4 Test procedure**

The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT in the semi Anechoic Chamber. The EUT was connected to a Line Impedance Stabilization Network (LISN)/ Artificial Mains Network (AMN). An overview sweep with peak detection has been performed. The measurements had been performed with a quasi-peak detector and if required, with an average detector. The conducted emission measurements were made with the following detector function of the test receiver.

Detector Type	: QP and CISPR AV
IF Bandwidth	: 9kHz

### **5.5 Test result**

Summary of the test results : Pass

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

### Test Procedure

EUT was placed on a urethane platform of nominal size, 1.0m by 1.5m, raised 0.8m above the conducting ground plane. The 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 (angle of loop antenna: 0deg., 45deg., 90deg., 135deg. and 180deg.) 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

Frequency	From 9kHz to 90kHz and From 110kHz to 150kHz	From 90kHz to 110kHz	From 150kHz to 490kHz	From 490kHz to 30MHz	From 30MHz to 1GHz	Above 1GHz
Instrument used	Test Receiver					Spectrum Analyzer
Detector	PK/AV	QP	PK/AV	QP	QP	PK AV
IF Bandwidth	200Hz	200Hz	9kHz	9kHz	120kHz	RBW: 1MHz VBW: 3MHz RBW: 1MHz VBW: 10Hz

The test was made on EUT at the normal use position.

\* FCC Part 15 Section 15.31 (f)(2) / IC RSS-Gen 4.11 (9kHz-30MHz)

$$9\text{kHz} - 490\text{kHz} [\text{Limit at 3m}] = [\text{Limit at 300m}] - 40\log\left(\frac{3}{300}\right)$$

$$490\text{kHz} - 30\text{MHz} [\text{Limit at 3m}] = [\text{Limit at 30m}] - 40\log\left(\frac{3}{30}\right)$$

Measurement range : 0.09M-1GHz  
Test data : APPENDIX  
Test result : Pass

\*The test was performed at a distance of 3m since carrier level was low.

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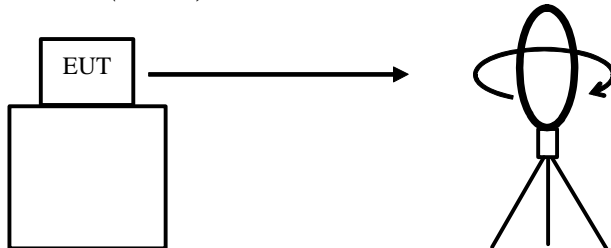
## SECTION 7: Other test

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
20dB Bandwidth	100kHz	1kHz	3kHz	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	Sample	Single	Spectrum Analyzer
Frequency Tolerance	-	-	-	-	-	-	Frequency counter

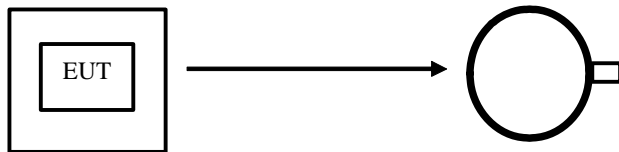
Test data : APPENDIX  
Test result : Pass

Figure 1: Direction of the Loop Antenna

*Side View (Vertical)*

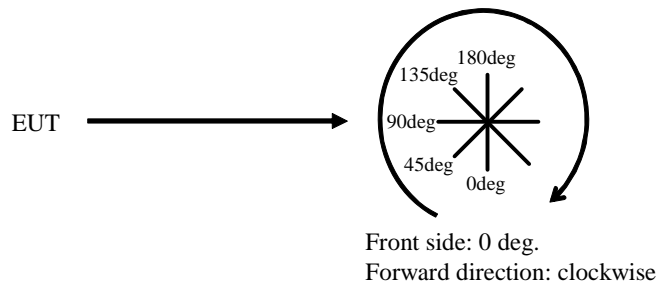


*Top View (Horizontal)*



Antenna was not rotated.

*Top View (Vertical)*



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## APPENDIX 1: Data of EMI test

### Conducted emission

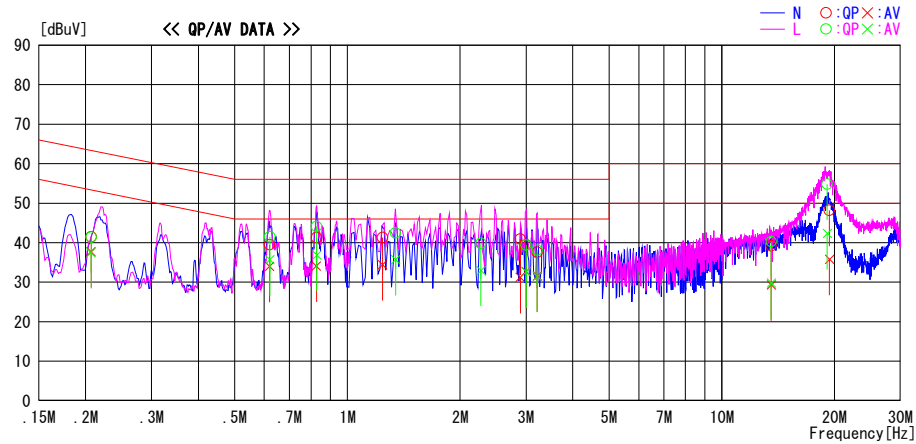
#### DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber  
Date : 2013/01/24

Report No. : 10003538  
Power : AC 120V / 60Hz  
Temp./Humi. : 24deg. C / 35% RH  
Engineer : Tomohisa Nakagawa

Mode / Remarks : RFID Print mode

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]		
0.20679	28.4	24.6	13.1	41.5	37.7	63.3	53.3	21.8	15.6	N	
0.20686	28.3	24.4	13.1	41.4	37.5	63.3	53.3	21.9	15.8	L	
0.61913	26.3	20.8	13.2	39.5	34.0	56.0	46.0	16.5	12.0	N	
0.62080	28.3	22.5	13.2	41.5	35.7	56.0	46.0	14.5	10.3	L	
0.82688	28.0	20.8	13.3	41.3	34.1	56.0	46.0	14.7	11.9	N	
0.82764	30.8	23.6	13.3	44.1	36.9	56.0	46.0	11.9	9.1	L	
1.24064	27.9	21.0	13.4	41.3	34.4	56.0	46.0	14.7	11.6	N	
1.34494	29.1	22.3	13.4	42.5	35.7	56.0	46.0	13.5	10.3	L	
2.27544	26.4	19.6	13.4	39.8	33.0	56.0	46.0	16.2	13.0	L	
2.89523	27.5	17.8	13.4	40.9	31.2	56.0	46.0	15.1	14.8	N	
3.00249	26.1	19.3	13.4	39.5	32.7	56.0	46.0	16.5	13.3	N	
3.00400	26.0	19.2	13.4	39.4	32.6	56.0	46.0	16.6	13.4	L	
3.21725	24.1	18.1	13.5	37.6	31.6	56.0	46.0	18.4	14.4	N	
3.21793	24.6	18.0	13.5	38.1	31.5	56.0	46.0	17.9	14.5	L	
13.56000	25.9	15.4	14.4	40.3	29.8	60.0	50.0	19.7	20.2	L	
13.56000	24.8	14.9	14.4	39.2	29.3	60.0	50.0	20.8	20.7	N	
19.12625	40.1	27.6	14.7	54.8	42.3	60.0	50.0	5.2	7.7	L	
19.39050	33.5	21.1	14.7	48.2	35.8	60.0	50.0	11.8	14.2	N	

CHART:WITH FACTOR,Peak hold data. CALCULATION:RESULT=READING+C.F(L1SN LOSS + ATTEN LOSS + CABLE LOSS)  
Except for the above table : adequate margin data below the limits.

\*The limit is rounded down to one decimal place.

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

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

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## Fundamental emission and Spectrum Mask

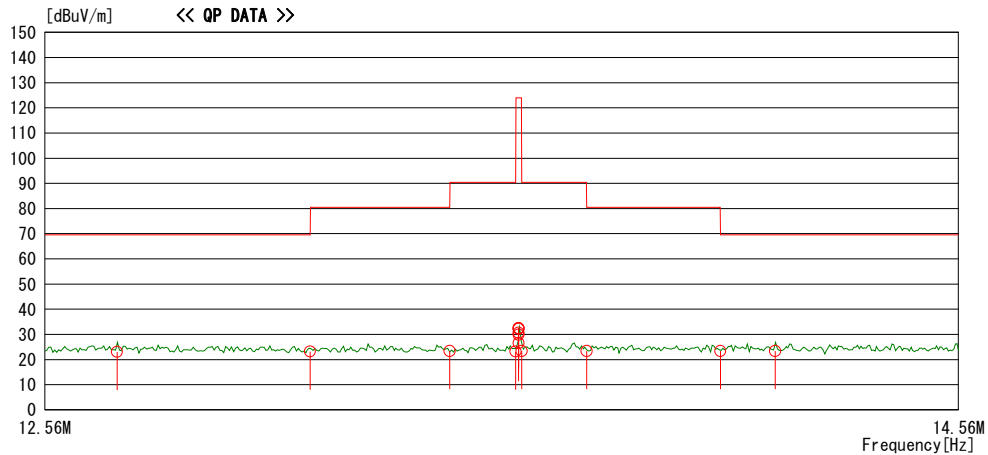
### DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber  
Date : 2013/01/25

Report No. : 10003538  
Power : AC 120V / 60Hz  
Temp. / Humi. : 23deg. C. / 30%  
Engineer : Shinya Watanabe

Mode / Remarks : RFID Print mode

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP  
All other spurious emissions were less than 20dB for the limit.



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]	
12.70800	47.9	QP	19.3	6.6	50.7	23.1	69.5	46.4	0	A	0
13.11000	48.0	QP	19.3	6.6	50.7	23.2	69.5	46.3	0	A	0
13.41000	48.1	QP	19.3	6.6	50.6	23.4	80.5	57.1	0	A	0
13.55300	47.9	QP	19.3	6.6	50.6	23.2	90.4	67.2	0	A	0
13.56000	57.0	QP	19.3	6.7	50.6	32.4	123.9	91.5	0	A	266
13.56000	56.7	QP	19.3	6.7	50.6	32.1	123.9	91.8	45	A	240
13.56000	54.4	QP	19.3	6.7	50.6	29.8	123.9	94.1	90	A	178
13.56000	55.2	QP	19.3	6.7	50.6	30.6	123.9	93.3	135	A	134
13.56000	57.0	QP	19.3	6.7	50.6	32.4	123.9	91.5	180	A	266
13.56000	51.2	QP	19.3	6.7	50.6	26.6	123.9	97.3	0	A	304
13.56700	48.0	QP	19.3	6.7	50.6	23.4	90.4	67.0	0	A	0
13.71000	47.9	QP	19.3	6.7	50.6	23.3	80.5	57.2	0	A	0
14.01000	48.0	QP	19.3	6.7	50.6	23.4	69.5	46.1	0	A	0
14.13400	48.0	QP	19.2	6.7	50.6	23.3	69.5	46.2	0	A	0

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

\*The limit is rounded down to one decimal place.

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

UL Japan, Inc.

Head Office EMC Lab.

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

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

## Spurious emission

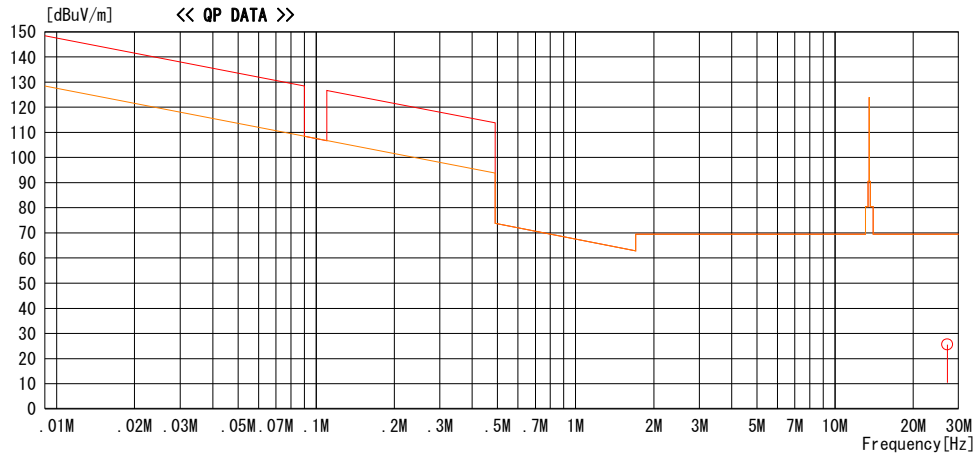
### DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber  
Date : 2013/01/25

Report No. : 10003538  
Power : AC 120V / 60Hz  
Temp. / Humi. : 23deg. C. / 30%  
Engineer : Shinya Watanabe

Mode / Remarks : RFID Print mode

LIMIT : FCC15.225 3m, 9-90kHz:PK, 110-490kHz:PK, other:QP  
FCC15.225 3m, 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	48.5	QP	20.9	6.9	50.6	25.7	69.5	43.8	0	A	360

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

\*The limit is rounded down to one decimal place.

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

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## Spurious emission

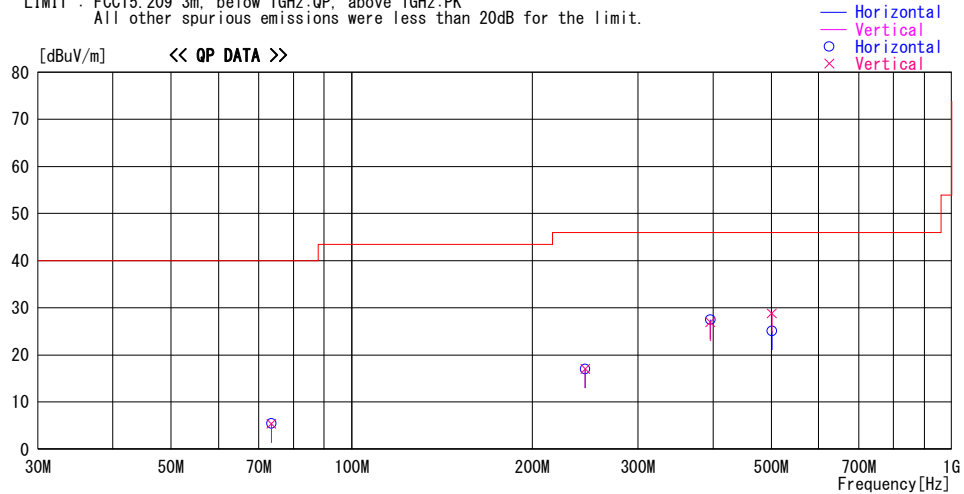
### DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber  
Date : 2013/01/25

Report No. : 10003538  
Power : AC 120V / 60Hz  
Temp./Humi. : 23deg. C / 30% RH  
Engineer : Shinya Watanabe

Mode / Remarks : RFID Print mode

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 [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Gain [dB]							
73.500	23.2	QP	6.5	-24.3	5.4	0	100	Hori.	40.0	34.6	
73.500	23.2	QP	6.5	-24.3	5.4	0	100	Vert.	40.0	34.6	
245.000	22.3	QP	17.2	-22.5	17.0	0	100	Hori.	46.0	29.0	
245.000	22.3	QP	17.2	-22.5	17.0	0	100	Vert.	46.0	29.0	
395.989	31.6	QP	17.3	-21.4	27.5	15	226	Hori.	46.0	18.5	
395.989	31.1	QP	17.3	-21.4	27.0	22	160	Vert.	46.0	19.0	
501.710	27.6	QP	18.1	-20.6	25.1	274	300	Hori.	46.0	20.9	
501.710	31.3	QP	18.1	-20.6	28.8	343	100	Vert.	46.0	17.2	

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)

\*The limit is rounded down to one decimal place.

\*The test result is rounded off to one or two decimal places, so some differences might be observed.

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

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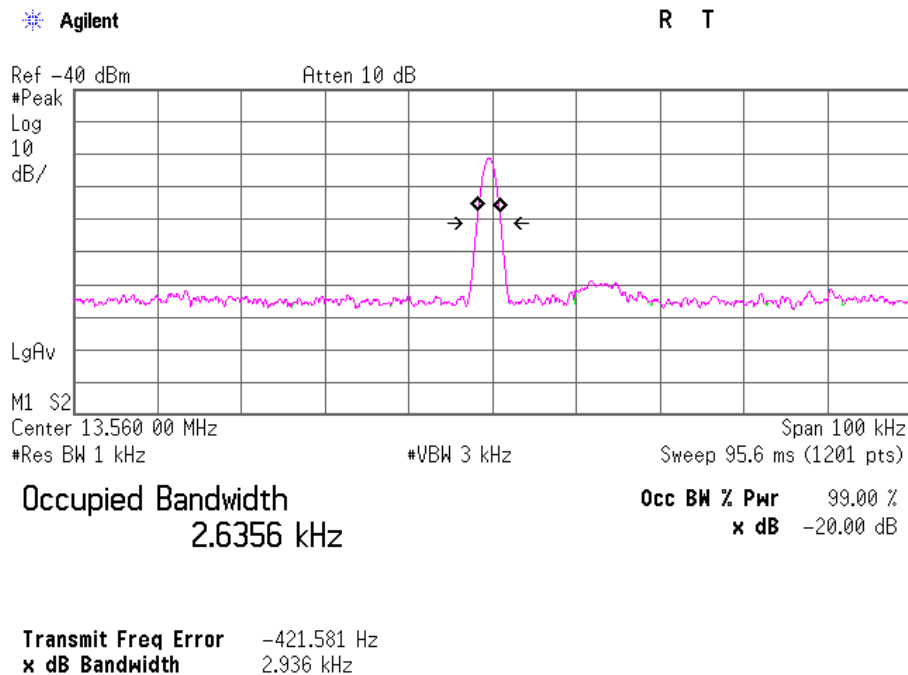
Facsimile : +81 596 24 8124



## 20dB Bandwidth

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber  
Report No. 10003538H  
Date 01/25/2013  
Temperature/ Humidity 23 deg.C / 30% RH  
Engineer Shinya Watanabe  
Mode RFID Print mode

FREQ [MHz]	20dB Bandwidth [kHz]
13.56	2.94



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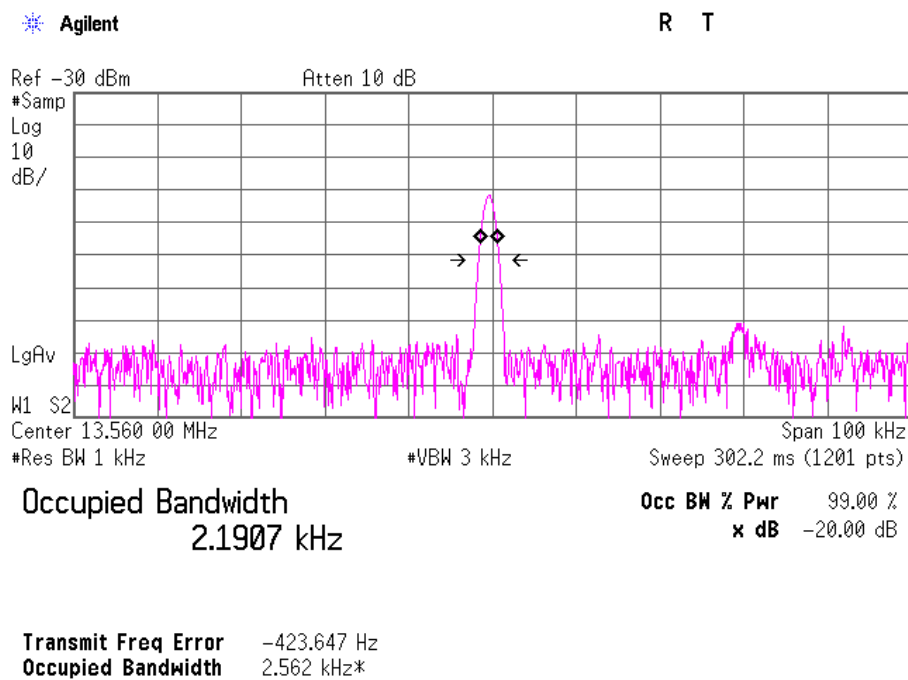
Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

## 99% Occupied Bandwidth

Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber  
Report No. 10003538H  
Date 01/25/2013  
Temperature/ Humidity 23 deg.C / 30% RH  
Engineer Shinya Watanabe  
Mode RFID Print mode

FREQ [MHz]	99% Occupied Bandwidth [kHz]
13.56	2.19



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

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

## Frequency Tolerance

Test place Head Office EMC Lab. No.7 Shielded room  
Report No. 10003538H  
Date 01/31/2013  
Temperature/ Humidity 20 deg.C/ 32% RH  
Engineer Keisuke Kawamura  
Mode RFID Print mode

Test Condition deg.C	Volts	Test Timing	Measured freq [MHz]	Freq error [MHz]	Result [ppm]	Limit (+/- 0.01%) [+/- ppm]	Margin [ppm]
20deg.C	276V	Power on	13.55959000	-0.00041000	-30.24	100.00	69.76
		on 2min.	13.55958900	-0.00041100	-30.31	100.00	69.69
		on 5min.	13.55958800	-0.00041200	-30.38	100.00	69.62
		on 10min.	13.55958600	-0.00041400	-30.53	100.00	69.47
	138V	Power on	13.55959300	-0.00040700	-30.01	100.00	69.99
		on 2min.	13.55959100	-0.00040900	-30.16	100.00	69.84
		on 5min.	13.55958900	-0.00041100	-30.31	100.00	69.69
		on 10min.	13.55958700	-0.00041300	-30.46	100.00	69.54
	120V	Power on	13.55961200	-0.00038800	-28.61	100.00	71.39
		on 2min.	13.55960900	-0.00039100	-28.83	100.00	71.17
		on 5min.	13.55960400	-0.00039600	-29.20	100.00	70.80
		on 10min.	13.55960000	-0.00040000	-29.50	100.00	70.50
	102V	Power on	13.55960200	-0.00039800	-29.35	100.00	70.65
		on 2min.	13.55959900	-0.00040100	-29.57	100.00	70.43
		on 5min.	13.55959700	-0.00040300	-29.72	100.00	70.28
		on 10min.	13.55959400	-0.00040600	-29.94	100.00	70.06
	85V	Power on	13.55959600	-0.00040400	-29.79	100.00	70.21
		on 2min.	13.55959400	-0.00040600	-29.94	100.00	70.06
		on 5min.	13.55959200	-0.00040800	-30.09	100.00	69.91
		on 10min.	13.55959000	-0.00041000	-30.24	100.00	69.76
50deg.C.	120V	Power on	13.55951000	-0.00049000	-36.14	100.00	63.86
		on 2min.	13.55955500	-0.00044500	-32.82	100.00	67.18
		on 5min.	13.55955100	-0.00044900	-33.11	100.00	66.89
		on 10min.	13.55954800	-0.00045200	-33.33	100.00	66.67
	40deg.C.	Power on	13.55958400	-0.00041600	-30.68	100.00	69.32
		on 2min.	13.55957200	-0.00042800	-31.56	100.00	68.44
		on 5min.	13.55956600	-0.00043400	-32.01	100.00	67.99
		on 10min.	13.55956200	-0.00043800	-32.30	100.00	67.70
	30deg.C.	Power on	13.55961000	-0.00039000	-28.76	100.00	71.24
		on 2min.	13.55959800	-0.00040200	-29.65	100.00	70.35
		on 5min.	13.55959200	-0.00040800	-30.09	100.00	69.91
		on 10min.	13.55958600	-0.00041400	-30.53	100.00	69.47
	20deg.C.	Power on	13.55961200	-0.00038800	-28.61	100.00	71.39
		on 2min.	13.55960900	-0.00039100	-28.83	100.00	71.17
		on 5min.	13.55960400	-0.00039600	-29.20	100.00	70.80
		on 10min.	13.55960000	-0.00040000	-29.50	100.00	70.50
	10deg.C.	Power on	13.55964200	-0.00035800	-26.40	100.00	73.60
		on 2min.	13.55963900	-0.00036100	-26.62	100.00	73.38
		on 5min.	13.55963500	-0.00036500	-26.92	100.00	73.08
		on 10min.	13.55963200	-0.00036800	-27.14	100.00	72.86
	0deg.C.	Power on	13.55963000	-0.00037000	-27.29	100.00	72.71
		on 2min.	13.55963900	-0.00036100	-26.62	100.00	73.38
		on 5min.	13.55964100	-0.00035900	-26.47	100.00	73.53
		on 10min.	13.55964200	-0.00035800	-26.40	100.00	73.60
	-10deg.C.	Power on	13.55959500	-0.00040500	-29.87	100.00	70.13
		on 2min.	13.55961600	-0.00038400	-28.32	100.00	71.68
		on 5min.	13.55962500	-0.00037500	-27.65	100.00	72.35
		on 10min.	13.55962900	-0.00037100	-27.36	100.00	72.64
-20deg.C	120V	Power on	13.55953500	-0.00046500	-34.29	100.00	65.71
		on 2min.	13.55956100	-0.00043900	-32.37	100.00	67.63
		on 5min.	13.55958000	-0.00042000	-30.97	100.00	69.03
		on 10min.	13.55958700	-0.00041300	-30.46	100.00	69.54

Limit : 13.56 13.56 MHz +/-0.01 % (+/- 100ppm) = +/- 0.001356 MHz

## APPENDIX 2: Test instruments

### EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE/CE	2012/02/24 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE/CE	2012/02/06 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE/CE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE/CE	-
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	RE/CE	2012/02/03 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE/CE	2012/08/23 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2012/10/08 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2012/10/08 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2012/07/12 * 12
MAT-09	Attenuator(6dB)	Weinschel Corp	2	BK7973	RE	2012/11/06 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2012/03/16 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE(EUT)	2013/01/07 * 12
MLS-07	LISN(AMN)	Schwarzbeck	NSLK8127	8127364	CE(AE)	2013/01/07 * 12
MTA-31	Terminator	TME	CT-01	-	CE	2013/01/21 * 12
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/ SFM141(3m)/ suoform141-PE(1m)/ 421-010(1.5m)/ RFM-E321(Switcher)	-/00640	CE/RE	2012/07/12 * 12
MAT-65	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2013/01/09 * 12
MLPA-01	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100017	RE	2012/10/12 * 12
MCC-143	Coaxial Cable	UL Japan	-	-	RE	2012/07/27 * 12
MPA-15	Pre Amplifier	SONOMA INSTRUMENT	315	260698	RE	2012/04/06 * 12
MOS-04	Digital Humidity Indicator	N.T	NT-1800	MOS04	FT	2012/02/06 * 12
MSA-06	Spectrum Analyzer	Agilent	E4407B	MY45107638	FT	2012/04/04 * 12
MCH-06	Temperature and Humidity Chamber	Tabai Espec	PL-1KT	14007630	FT	2012/04/20 * 12
MLPA-06	Loop Antenna	UL Japan	-	-	FT	Pre Check

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

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