



RADIO TEST REPORT

Test Report No. : 32LE0231-HO-01-B-R1

Applicant : Omron Healthcare Co., Ltd.
Type of Equipment : Omron NFC Communication Tray
Model No. : HHX-IT3-Z
Test regulation : FCC Part 15 Subpart C: 2012
FCC ID : Q6ZHHXIT3Z
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 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 32LE0231-HO-01-B. 32LE0231-HO-01-B is replaced with this report.

Date of test: July 9 to September 6, 2012

Representative test
engineer:

Shinya Watanabe
Engineer of WiSE Japan,
UL Verification Service

Approved by:

Masanori Nishiyama
Manager of WiSE Japan,
UL Verification Service



NVLAP LAB CODE: 200572-0

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<http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap>

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13-EM-F0429

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SECTION 1: Customer information

Company Name	:	Omron Healthcare Co., Ltd.
Address	:	53 Kunotsubo, Terado-cho, Muko, Kyoto 617-0002 Japan
Telephone Number	:	+81-75-925-2035
Facsimile Number	:	+81-75-925-2036
Contact Person	:	Hirokazu Furukawa

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

2.1 Identification of E.U.T.

Type of Equipment	:	Omron NFC Communication Tray
Model No.	:	HHX-IT3-Z
Serial No.	:	Refer to Section 4, Clause 4.2
Receipt Date of Sample	:	August 1, 2012
Country of Mass-production	:	Japan
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model No: HHX-IT3-Z (referred to as the EUT in this report) is the Omron NFC Communication Tray.

Clock frequency(ies) in the system : 27.12MHz

Equipment Type	:	Transceiver
Frequency of Operation	:	13.56MHz
Type of Modulation	:	ASK
Antenna Type	:	Loop Coil
Antenna Gain	:	-53.33dBi
Power Supply	:	DC 5.0V
Power Supply (inner)	:	DC 3.0V

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2012, final revised on August 13, 2012 and effective September 12, 2012

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 August 13, 2012 does not affect the test specification applied to the EUT.

* The EUT complies with FCC Part 15 Subpart B: 2012, final revised on August 13, 2012 and effective September 12, 2012.

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]13.4dB 0.19919MHz, N [AV]6.1dB 0.39874MHz, N	Complied	-
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	70.1dB, 13.56000MHz, QP, 0deg.	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	46.6dB 13.11000MHz, 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	0.6dB 583.367MHz, Horizontal, 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 3.0V) constantly to RF part regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203/15.212 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
7×10^{-6}	9×10^{-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 report meets the limits unless the uncertainty is taken into consideration.

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3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
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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
1. NFC Continuous Tx	With/Without Tag
2. NFC Continuous Tx (Antenna: 33 ohm terminated)	Without Tag
3. RFID Continuous Tx	With/Without Tag
4. RFID Continuous Tx (Antenna: 33 ohm terminated)	Without Tag
5. Standby	Without Tag
6. Transmitting (Tx) Mod off	-
The EUT was operated in a manner similar to typical use during the tests.	

Test Item	Operating mode
Conducted emission	1, 2, 3, 4, 5
Electric Field Strength of Fundamental Emission and Spectrum Mask	1, 3
Spurious Emission (Below 30MHz)	1(Without Tag), 3(Without Tag) *1)
Spurious Emission (Above 30MHz)	1(Without Tag), 3(With Tag) *2)
20dB Bandwidth and 99% Occupied Bandwidth	1(Without Tag), 3(Without Tag) *1)
Frequency Tolerance	6

*1) The test was performed on the mode which was the worst in Electric Field Strength of Fundamental Emission test.

*2) The test was performed on the mode which was the worst in the precheck.

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

Frequency Tolerance:

Temperature : -30deg.C to +50deg.C Step 10deg.C
Voltage : Normal Voltage AC 120V
Maximum Voltage AC 138V, Minimum Voltage AC 102V (AC 120V ±15%)

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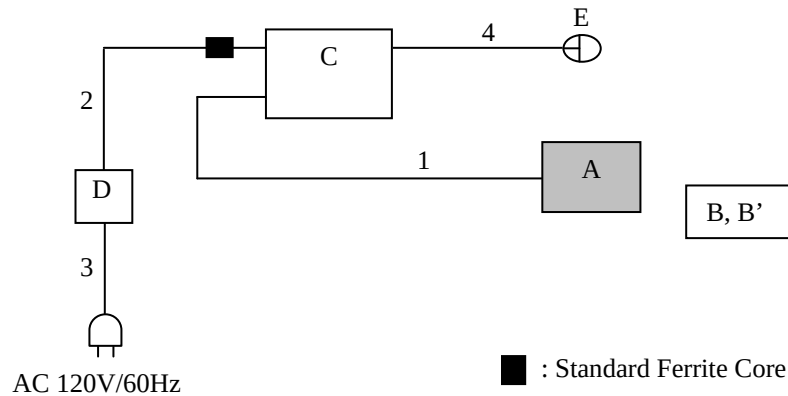
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4.2 Configuration and peripherals



*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	Omron NFC Communication Tray	HHX-IT3-Z	PT061	Omron Healthcare Co., Ltd.	EUT
B	NFC Tag	HJA-312	PT171	Omron Healthcare Co., Ltd.	-
B'	RFID Tag	HJ-2015IT	-	Omron Healthcare Co., Ltd.	-
C	Laptop PC	BL530VH6B	99185918A	NEC	-
D	AC Adapter	ADP-60NH	9903033DD	NEC	-
E	Mouse	BSMLU04	A11201	BUFFALO	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	USB Cable	0.9	Shielded	Shielded	-
2	DC Cable	1.9	Unshielded	Unshielded	-
3	AC Cable	1.0	Unshielded	Unshielded	-
4	USB Cable	1.5	Shielded	Shielded	-

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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 AV
IF Bandwidth	: 9kHz

5.5 Test result

Summary of the test results : Pass

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

Test Procedure

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane. The Radiated Electric Field Strength has been measured in a Semi Anechoic Chamber with a ground plane. The height of the measuring antenna varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength. The measurements were performed for both vertical (angle of loop antenna: 0deg., 45deg., 90deg., and 135 deg.) 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
Antenna Type	Loop	Biconical	Logperiodic

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
Instrument used	Test Receiver				
Detector	PK/AV	QP	PK/AV	QP	QP
IF Bandwidth	200Hz	200Hz	9kHz	9kHz	120kHz

- 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.

* 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 : 9k-1GHz
Test data : APPENDIX
Test result : Pass

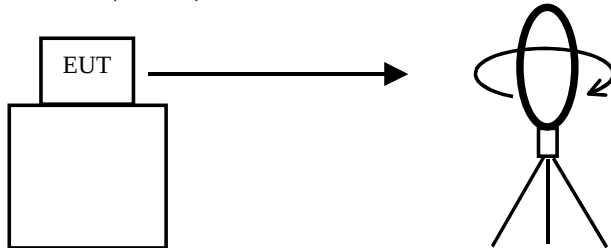
SECTION 7: Other test

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
20dB Bandwidth	100kHz	3kHz	10kHz	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 *1)	Max Hold *1)	Spectrum Analyzer
Frequency Tolerance	-	-	-	-	-	-	Frequency counter
*1) The measurement was performed with Peak detector, Max Hold since the duty cycle was not 100%.							

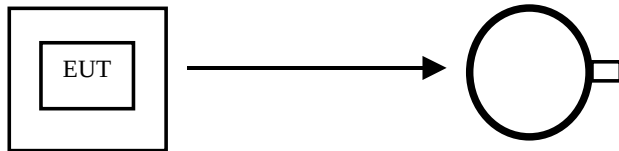
Test data : APPENDIX
Test result : Pass

Figure 1: Direction of the Loop Antenna

Side View (Vertical)

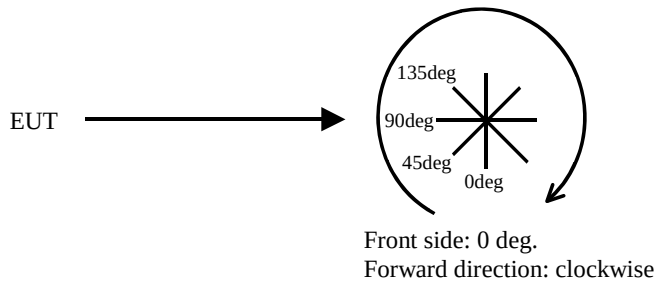


Top View (Horizontal)



Antenna was not rotated.

Top View (Vertical)



APPENDIX 1: Data of EMI test

Conducted emission

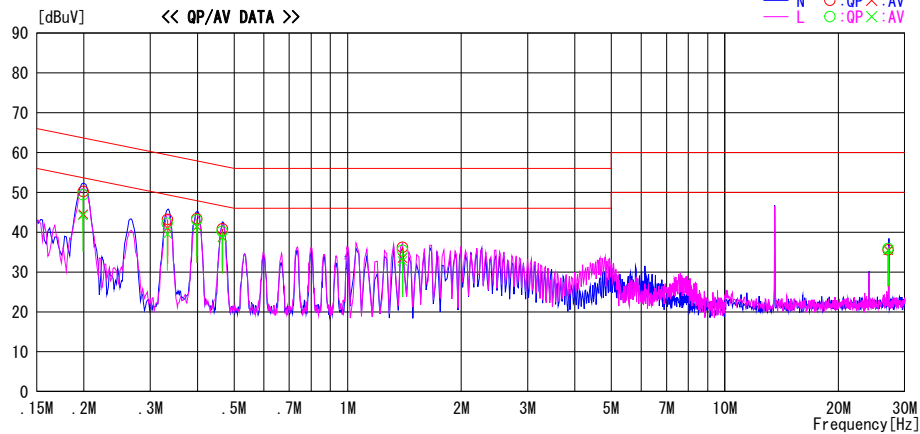
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No. 3 Semi Anechoic Chamber
Date : 2012/09/06

Report No. : 32LE0231-HO-01
Power : AC 120V / 60Hz
Temp./Humi. : 25deg. C / 64% RH
Engineer : Satofumi Matsuyama

Mode / Remarks : NFC Continuous Tx With 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]		
0.19919	37.0	31.3	13.2	50.2	44.5	63.6	53.6	13.4	9.1	N	
0.33312	29.9	27.8	13.3	43.2	41.1	59.4	49.4	16.2	8.3	N	
0.39888	30.1	28.1	13.3	43.4	41.4	57.9	47.9	14.5	6.5	N	
0.46586	27.5	25.5	13.3	40.8	38.8	56.6	46.6	15.8	7.8	N	
1.39821	22.8	20.1	13.4	36.2	33.5	56.0	46.0	19.8	12.5	N	
27.12000	20.7	20.5	14.9	35.6	35.4	60.0	50.0	24.4	14.6	N	
0.19870	36.2	31.0	13.2	49.4	44.2	63.7	53.7	14.3	9.5	L	
0.33292	28.9	26.2	13.3	42.2	39.5	59.4	49.4	17.2	9.9	L	
0.39834	29.8	28.1	13.3	43.1	41.4	57.9	47.9	14.8	6.5	L	
0.46551	26.9	25.4	13.3	40.2	38.7	56.6	46.6	16.4	7.9	L	
1.39764	22.1	19.4	13.4	35.5	32.8	56.0	46.0	20.5	13.2	L	
27.12000	21.0	20.7	14.9	35.9	35.6	60.0	50.0	24.1	14.4	L	

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

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

Conducted emission

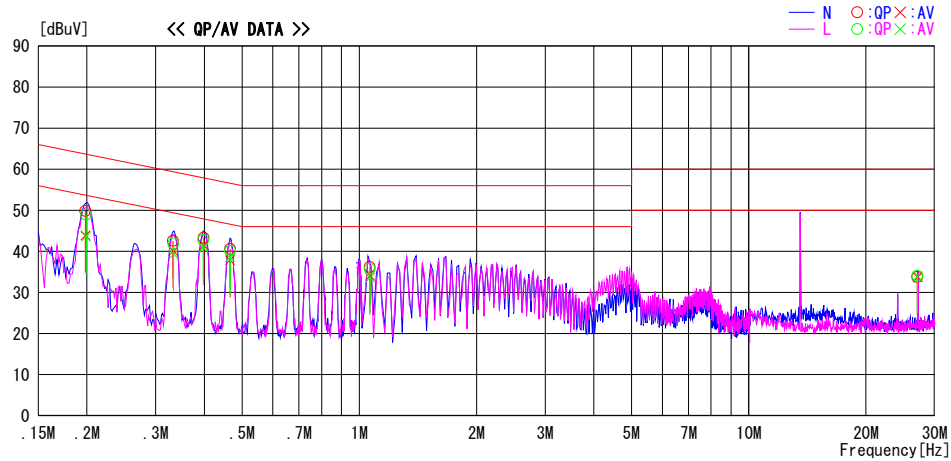
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UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2012/09/06

Report No. : 32LE0231-HO-01
Power : AC 120V / 60Hz
Temp./Humi. : 25deg. C / 64% RH
Engineer : Satofumi Matsuyama

Mode / Remarks : NFC Continuous Tx Without Tag

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.19818	36.6	30.7	13.2	49.8	43.9	63.7	53.7	13.9	9.8	N	
0.33284	29.3	26.8	13.3	42.6	40.1	59.4	49.4	16.8	9.3	N	
0.39862	30.0	28.1	13.3	43.3	41.4	57.9	47.9	14.6	6.5	N	
0.46581	27.3	24.6	13.3	40.6	37.9	56.6	46.6	16.0	8.7	N	
1.06455	22.9	20.8	13.3	36.2	34.1	56.0	46.0	19.8	11.9	N	
27.12000	18.8	18.8	14.9	33.7	33.7	60.0	50.0	26.3	16.3	N	
0.19882	35.7	30.4	13.2	48.9	43.6	63.7	53.7	14.8	10.1	L	
0.33360	28.6	26.0	13.3	41.9	39.3	59.4	49.4	17.5	10.1	L	
0.39786	29.4	27.6	13.3	42.7	40.9	57.9	47.9	15.2	7.0	L	
0.46601	26.8	25.3	13.3	40.1	38.6	56.6	46.6	16.5	8.0	L	
1.06467	22.4	20.3	13.3	35.7	33.6	56.0	46.0	20.3	12.4	L	
27.12000	19.1	19.1	14.9	34.0	34.0	60.0	50.0	26.0	16.0	L	

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

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Conducted emission

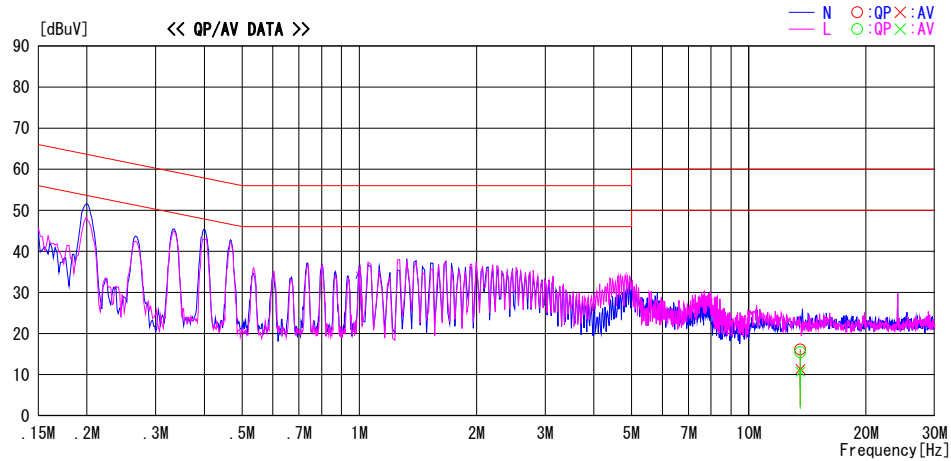
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Engineer : Satofumi Matsuyama

Mode / Remarks : NFC Continuous Tx without Tag (Antenna: 33 ohm terminated)

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
13.56000	1.8	-3.0	14.3	16.1	11.3	60.0	50.0	43.9	38.7	N	
13.56000	1.2	-3.6	14.3	15.5	10.7	60.0	50.0	44.5	39.3	L	

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

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

Conducted emission

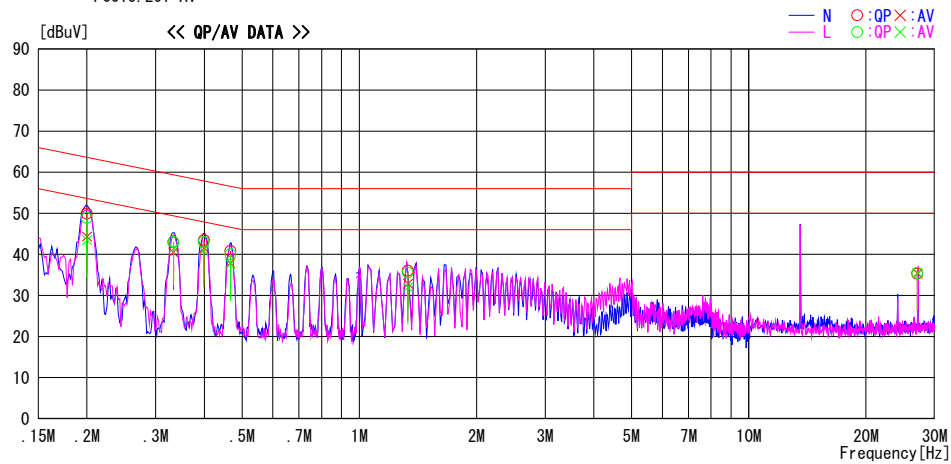
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2012/09/06

Report No. : 32LE0231-HO-01
Power : AC 120V / 60Hz
Temp./Humi. : 25deg. C / 64% RH
Engineer : Satofumi Matsuyama

Mode / Remarks : RFID Continuous Tx With Tag

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.19988	36.7	31.1	13.2	49.9	44.3	63.6	53.6	13.7	9.3	N	
0.33307	29.6	27.2	13.3	42.9	40.5	59.4	49.4	16.5	8.9	N	
0.39976	30.2	28.2	13.3	43.5	41.5	57.9	47.9	14.4	6.4	N	
0.46672	27.5	24.6	13.3	40.8	37.9	56.6	46.6	15.8	8.7	N	
1.33296	22.6	19.5	13.4	36.0	32.9	56.0	46.0	20.0	13.1	N	
27.12000	20.4	20.4	14.9	35.3	35.3	60.0	50.0	24.7	14.7	N	
0.19988	35.6	30.3	13.2	48.8	43.5	63.6	53.6	14.8	10.1	L	
0.33336	29.7	28.2	13.3	43.0	41.5	59.4	49.4	16.4	7.9	L	
0.39830	29.7	27.7	13.3	43.0	41.0	57.9	47.9	14.9	6.9	L	
0.46696	26.7	24.4	13.3	40.0	37.7	56.6	46.6	16.6	8.9	L	
1.33304	22.2	18.6	13.4	35.6	32.0	56.0	46.0	20.4	14.0	L	
27.12000	20.6	20.6	14.9	35.5	35.5	60.0	50.0	24.5	14.5	L	

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

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

Conducted emission

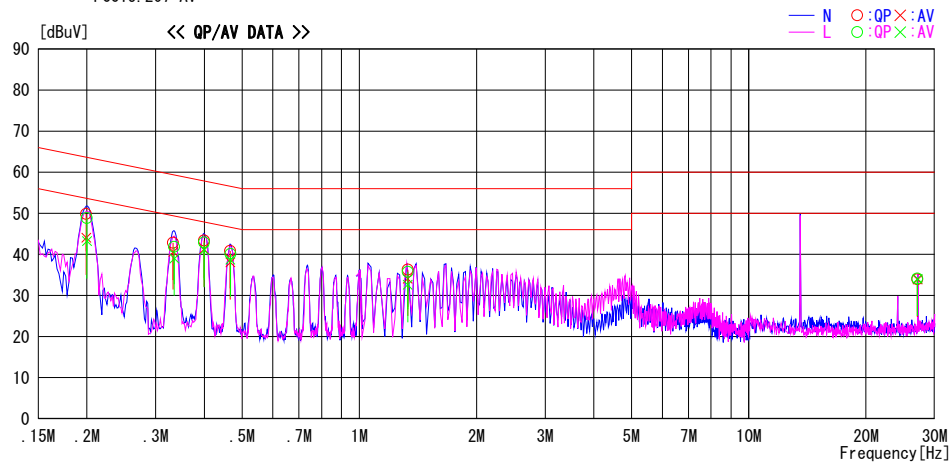
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2012/09/06

Report No. : 32LE0231-HO-01
Power : AC 120V / 60Hz
Temp./Humi. : 25deg. C / 64% RH
Engineer : Satofumi Matsuyama

Mode / Remarks : RFID Continuous Tx 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]		
0.19912	36.6	30.9	13.2	49.8	44.1	63.6	53.6	13.8	9.5	N	
0.33288	29.5	27.3	13.3	42.8	40.6	59.4	49.4	16.6	8.8	N	
0.39944	30.1	27.9	13.3	43.4	41.2	57.9	47.9	14.5	6.7	N	
0.46656	27.5	24.8	13.3	40.8	38.1	56.6	46.6	15.8	8.5	N	
1.33220	22.9	20.7	13.4	36.3	34.1	56.0	46.0	19.7	11.9	N	
27.12000	19.0	19.0	14.9	33.9	33.9	60.0	50.0	26.1	16.1	N	
0.19988	35.6	30.0	13.2	48.8	43.2	63.6	53.6	14.8	10.4	L	
0.33489	28.5	25.7	13.3	41.8	39.0	59.3	49.3	17.5	10.3	L	
0.39964	29.6	27.8	13.3	42.9	41.1	57.9	47.9	15.0	6.8	L	
0.46681	26.8	25.4	13.3	40.1	38.7	56.6	46.6	16.5	7.9	L	
1.33232	22.3	19.2	13.4	35.7	32.6	56.0	46.0	20.3	13.4	L	
27.12000	19.2	19.2	14.9	34.1	34.1	60.0	50.0	25.9	15.9	L	

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

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

Conducted emission

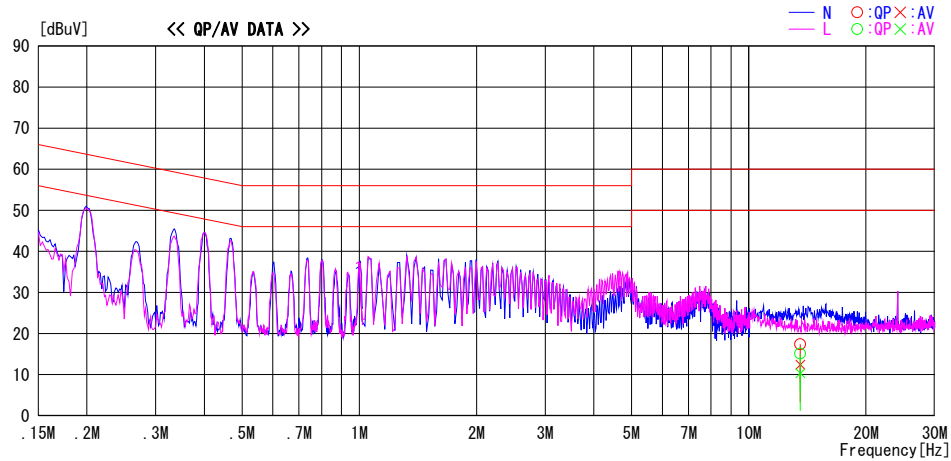
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2012/09/06

Report No. : 32LE0231-HO-01
Power : AC 120V / 60Hz
Temp./Humi. : 25deg. C / 64% RH
Engineer : Satofumi Matsuyama

Mode / Remarks : RFID Continuous Tx without Tag(Antenna: 33 ohm terminated)

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]		
13.56000	3.1	-1.9	14.3	17.4	12.4	60.0	50.0	42.6	37.6	N	
13.56000	0.8	-4.0	14.3	15.1	10.3	60.0	50.0	44.9	39.7	L	

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

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

Conducted emission

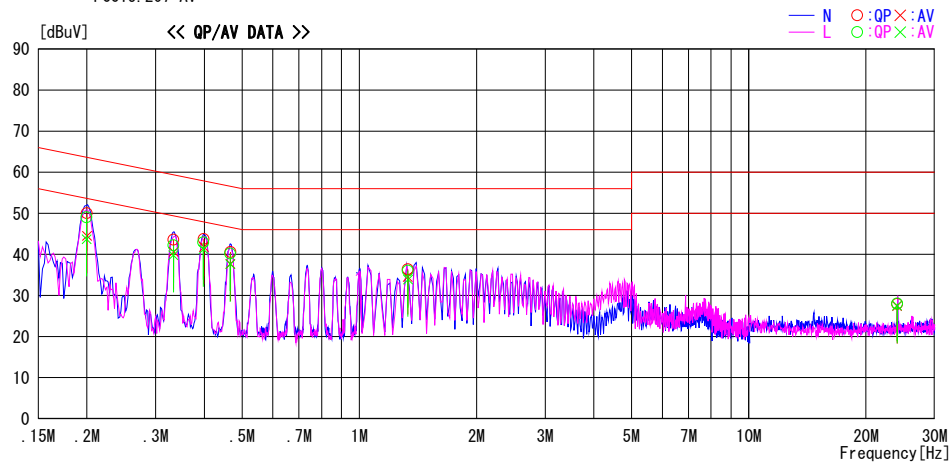
DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2012/09/06

Report No. : 32LE0231-HO-01
Power : AC 120V / 60Hz
Temp./Humi. : 25deg. C / 64% RH
Engineer : Satofumi Matsuyama

Mode / Remarks : Standby Without Tag

LIMIT : FCC15.207 QP
FCC15.207 AV



Frequency [MHz]	Reading Level		Corr. Factor [dB]	Results		Limit		Margin		Phase	Comment
	QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dB]	AV [dB]		
0.19992	36.8	31.3	13.2	50.0	44.5	63.6	53.6	13.6	9.1	N	
0.33356	30.3	27.3	13.3	43.6	40.6	59.4	49.4	15.8	8.8	N	
0.39874	30.4	28.5	13.3	43.7	41.8	57.9	47.9	14.2	6.1	N	
0.46708	27.3	24.4	13.3	40.6	37.7	56.6	46.6	16.0	8.9	N	
1.33219	23.0	21.1	13.4	36.4	34.5	56.0	46.0	19.6	11.5	N	
0.19936	35.8	30.5	13.2	49.0	43.7	63.6	53.6	14.6	9.9	L	
0.33320	28.9	26.5	13.3	42.2	39.8	59.4	49.4	17.2	9.6	L	
0.39806	29.6	27.9	13.3	42.9	41.2	57.9	47.9	15.0	6.7	L	
0.46663	26.9	24.3	13.3	40.2	37.6	56.6	46.6	16.4	9.0	L	
1.33287	22.6	20.5	13.4	36.0	33.9	56.0	46.0	20.0	12.1	L	
24.04488	13.1	12.6	14.8	27.9	27.4	60.0	50.0	32.1	22.6	N	
24.04470	13.2	12.7	14.8	28.0	27.5	60.0	50.0	32.0	22.5	L	

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

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

Fundamental emission and Spectrum Mask

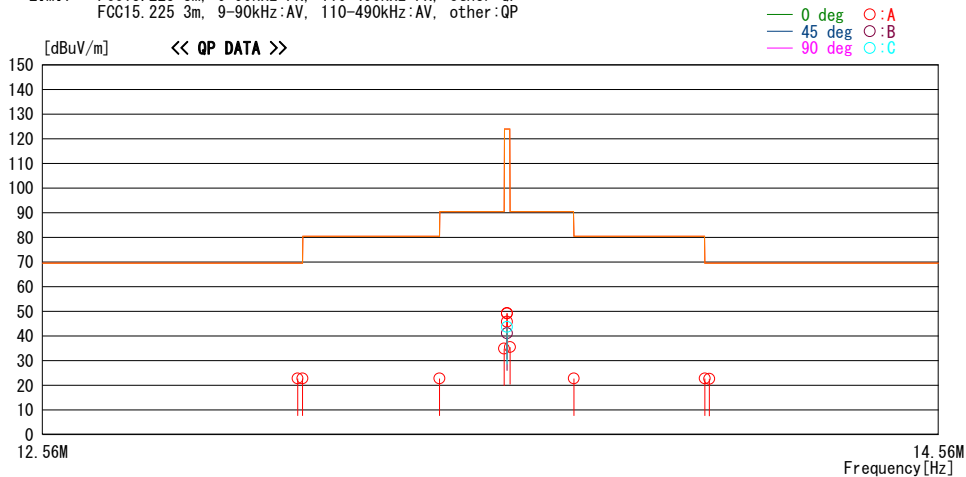
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2012/09/06

Report No. : 32LE0231-HO-01
Power : AC 120V / 60Hz
Temp. / Humi. : 25deg. C / 64% RH
Engineer : SatoFumi Matsuyama

Mode / Remarks : NFC Continuous Tx With Tag

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]	
13.10000	29.4	QP	19.1	6.6	32.3	22.8	69.5	46.7	0	A	208
13.11000	29.4	QP	19.1	6.6	32.3	22.8	69.5	46.7	0	A	208
13.41000	29.4	QP	19.0	6.6	32.3	22.7	80.5	57.8	0	A	208
13.55300	41.6	QP	18.9	6.6	32.3	34.8	90.4	55.6	0	A	208
13.56000	55.9	QP	18.9	6.7	32.3	49.2	123.9	74.7	0	A	208
13.56000	47.8	QP	18.9	6.7	32.3	41.1	123.9	82.8	45	B	211
13.56000	50.4	QP	18.9	6.7	32.3	43.7	123.9	80.2	90	C	265
13.56000	55.8	QP	18.9	6.7	32.3	49.1	123.9	74.8	135	A	251
13.56000	52.5	QP	18.9	6.7	32.3	45.8	123.9	78.1	0	A	208
13.56700	42.1	QP	18.9	6.7	32.3	35.4	90.4	55.0	0	A	208
13.71000	29.4	QP	18.9	6.7	32.3	22.7	80.5	57.8	0	A	208
14.01000	29.5	QP	18.8	6.7	32.3	22.7	69.5	46.8	0	A	208
14.02000	29.4	QP	18.8	6.7	32.3	22.6	69.5	46.9	0	A	208

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.)

Fundamental emission and Spectrum Mask

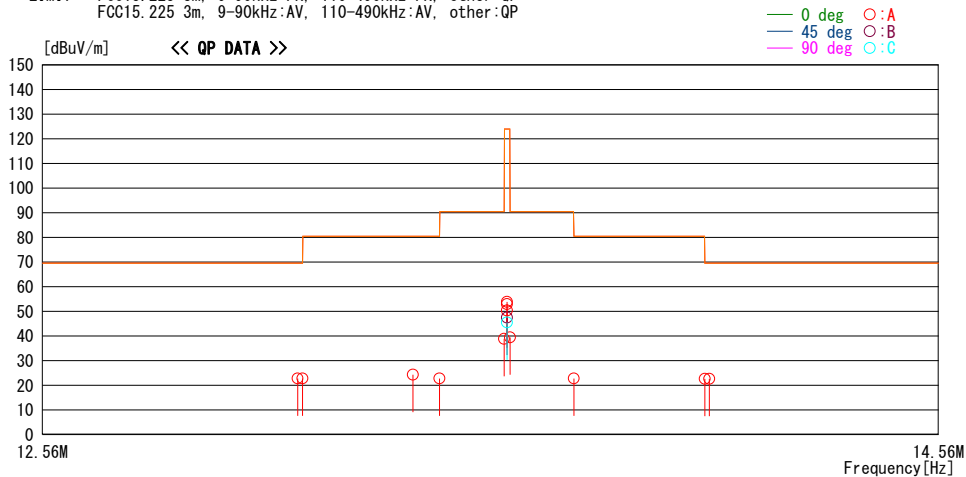
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2012/09/06

Report No. : 32LE0231-HO-01
Power : AC 120V / 60Hz
Temp. / Humi. : 25deg. C / 64% RH
Engineer : SatoFumi Matsuyama

Mode / Remarks : NFC Continuous Tx Without Tag

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]	
13.10000	29.4	QP	19.1	6.6	32.3	22.8	69.5	46.7	0	A	208
13.11000	29.4	QP	19.1	6.6	32.3	22.8	69.5	46.7	0	A	208
13.35100	30.9	QP	19.0	6.6	32.3	24.2	80.5	56.3	0	A	226
13.41000	29.5	QP	19.0	6.6	32.3	22.8	80.5	57.7	0	A	208
13.55300	45.6	QP	18.9	6.6	32.3	38.8	90.4	51.6	0	A	208
13.56000	60.5	QP	18.9	6.7	32.3	53.8	123.9	70.1	0	A	208 Worst
13.56000	54.2	QP	18.9	6.7	32.3	47.5	123.9	76.4	45	B	209
13.56000	52.1	QP	18.9	6.7	32.3	45.4	123.9	78.5	90	C	269
13.56000	59.6	QP	18.9	6.7	32.3	52.9	123.9	71.0	135	A	237
13.56000	57.0	QP	18.9	6.7	32.3	50.3	123.9	73.6	0	A	281 Loop:Hor
13.56700	46.1	QP	18.9	6.7	32.3	39.4	90.4	51.0	0	A	208
13.71000	29.4	QP	18.9	6.7	32.3	22.7	80.5	57.8	0	A	208
14.01000	29.4	QP	18.8	6.7	32.3	22.6	69.5	46.9	0	A	208
14.02000	29.4	QP	18.8	6.7	32.3	22.6	69.5	46.9	0	A	208

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.)

Fundamental emission and Spectrum Mask

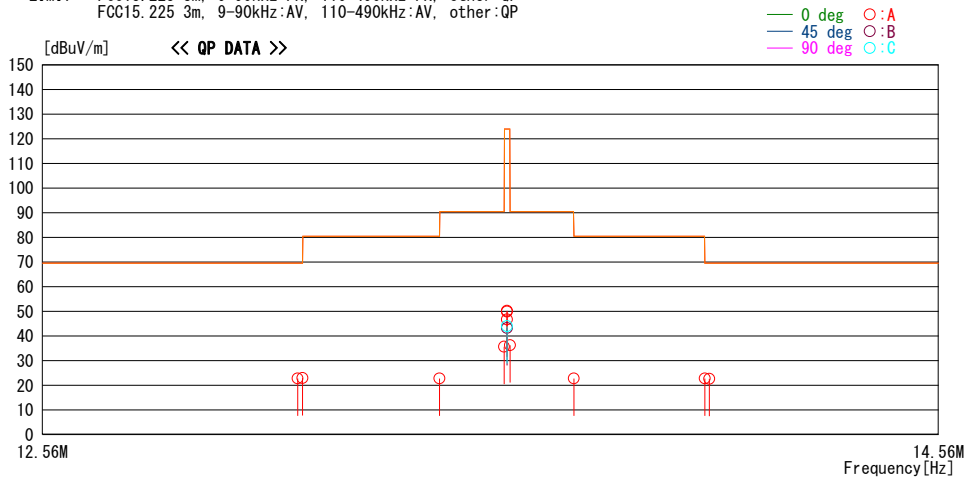
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2012/09/06

Report No. : 32LE0231-HO-01
Power : AC 120V / 60Hz
Temp. / Humi. : 25deg. C / 64% RH
Engineer : Satofumi Matsuyama

Mode / Remarks : RFID Continuous Tx With Tag

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]	
13.10000	29.4	QP	19.1	6.6	32.3	22.8	69.5	46.7	0	A	221
13.11000	29.5	QP	19.1	6.6	32.3	22.9	69.5	46.6	0	A	221
13.41000	29.5	QP	19.0	6.6	32.3	22.8	80.5	57.7	0	A	221
13.55300	42.4	QP	18.9	6.6	32.3	35.6	90.4	54.8	0	A	221
13.56000	53.4	QP	18.9	6.7	32.3	46.7	123.9	77.2	0	A	136
13.56000	56.9	QP	18.9	6.7	32.3	50.2	123.9	73.7	0	A	221
13.56000	49.9	QP	18.9	6.7	32.3	43.2	123.9	80.7	45	B	213
13.56000	50.6	QP	18.9	6.7	32.3	43.9	123.9	80.0	90	C	258
13.56000	56.5	QP	18.9	6.7	32.3	49.8	123.9	74.1	135	A	245
13.56700	42.9	QP	18.9	6.7	32.3	36.2	90.4	54.2	0	A	221
13.71000	29.5	QP	18.9	6.7	32.3	22.8	80.5	57.7	0	A	221
14.01000	29.5	QP	18.8	6.7	32.3	22.7	69.5	46.8	0	A	221
14.02000	29.4	QP	18.8	6.7	32.3	22.6	69.5	46.9	0	A	221

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.)

Fundamental emission and Spectrum Mask

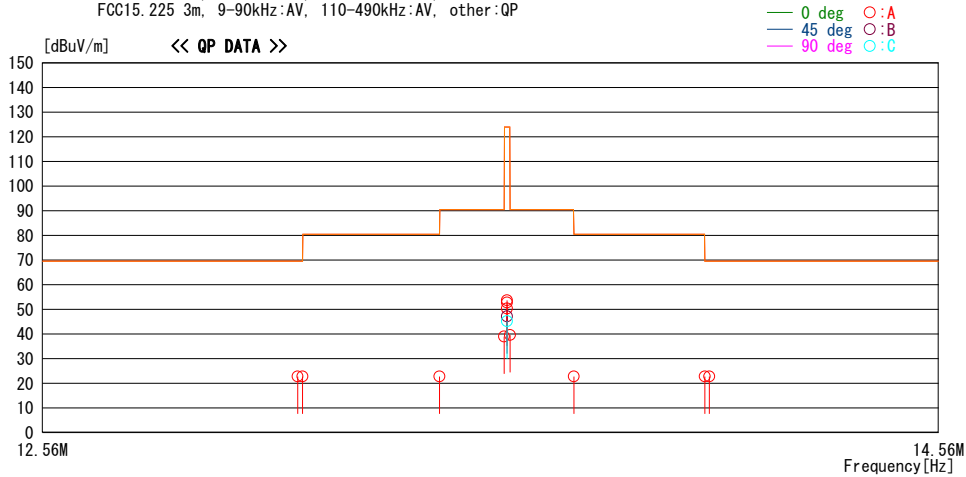
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2012/09/06

Report No. : 32LE0231-HO-01
Power : AC 120V / 60Hz
Temp. / Humi. : 25deg. C / 64% RH
Engineer : Satofumi Matsuyama

Mode / Remarks : RFID Continuous Tx Without Tag

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]	
13.10000	29.4	QP	19.1	6.6	32.3	22.8	69.5	46.7	0	A	248
13.11000	29.4	QP	19.1	6.6	32.3	22.8	69.5	46.7	0	A	248
13.41000	29.4	QP	19.0	6.6	32.3	22.7	80.5	57.8	0	A	248
13.55300	45.7	QP	18.9	6.6	32.3	38.9	90.4	51.5	0	A	248
13.56000	57.0	QP	18.9	6.7	32.3	50.3	123.9	73.6	0	A	253
13.56000	60.4	QP	18.9	6.7	32.3	53.7	123.9	70.2	0	A	248
13.56000	53.8	QP	18.9	6.7	32.3	47.1	123.9	76.8	45	B	227
13.56000	51.8	QP	18.9	6.7	32.3	45.1	123.9	78.8	90	C	276
13.56000	59.5	QP	18.9	6.7	32.3	52.8	123.9	71.1	135	A	247
13.56700	46.2	QP	18.9	6.7	32.3	39.5	90.4	50.9	0	A	248
13.71000	29.5	QP	18.9	6.7	32.3	22.8	80.5	57.7	0	A	248
14.01000	29.5	QP	18.8	6.7	32.3	22.7	69.5	46.8	0	A	248
14.02000	29.5	QP	18.8	6.7	32.3	22.7	69.5	46.8	0	A	248

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

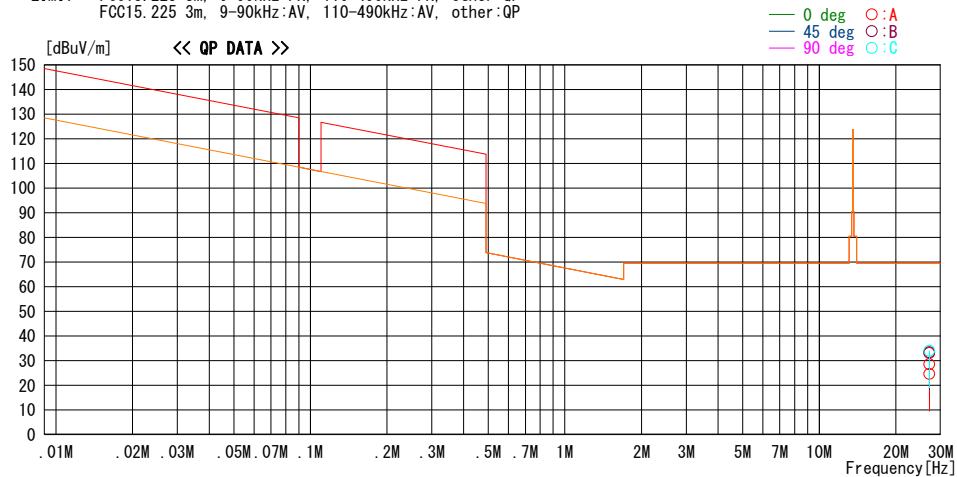
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2012/09/06

Report No. : 32LE0231-HO-01
Power : AC 120V / 60Hz
Temp. / Humi. : 25deg. C / 64% RH
Engineer : SatoFumi Matsuyama

Mode / Remarks : NFC Continuous Tx Without Tag

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	39.7	QP	18.9	6.9	32.2	33.3	69.5	36.2	45	B	332
27.12000	40.3	QP	18.9	6.9	32.2	33.9	69.5	35.6	90	C	270
27.12000	34.9	QP	18.9	6.9	32.2	28.5	69.5	41.0	0	A	352
27.12000	39.5	QP	18.9	6.9	32.2	33.1	69.5	36.4	135	A	208
27.12000	31.0	QP	18.9	6.9	32.2	24.6	69.5	44.9	0	A	322 Loop:Hor

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

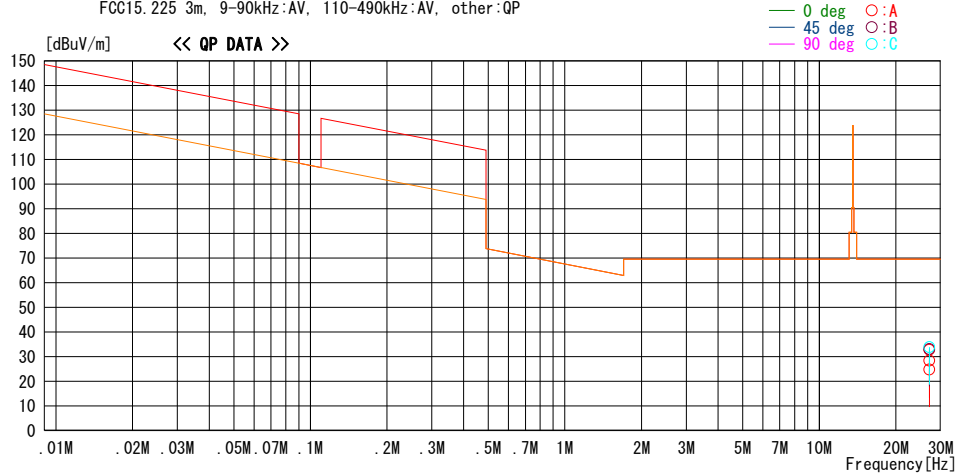
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2012/09/06

Report No. : 32LE0231-HO-01
Power : AC 120V / 60Hz
Temp. / Humi. : 25deg. C / 64% RH
Engineer : SatoFumi Matsuyama

Mode / Remarks : RFID Continuous Tx Without Tag

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	39.5	QP	18.9	6.9	32.2	33.1	69.5	36.4	45	B	344
27.12000	40.2	QP	18.9	6.9	32.2	33.8	69.5	35.7	90	C	289
27.12000	34.7	QP	18.9	6.9	32.2	28.3	69.5	41.2	0	A	278
27.12000	39.2	QP	18.9	6.9	32.2	32.8	69.5	36.7	135	A	163
27.12000	31.1	QP	18.9	6.9	32.2	24.7	69.5	44.8	0	A	311 Loop:Hor

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

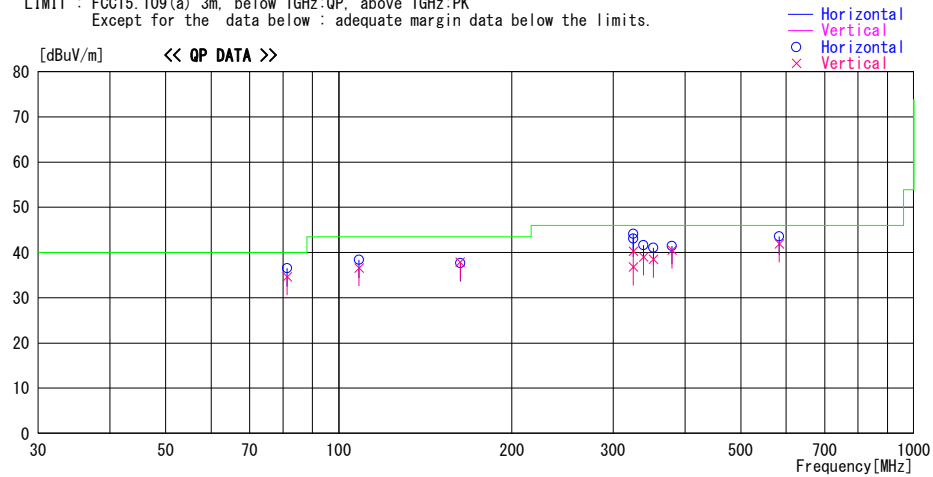
DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2012/08/29

Report No. : 32LE0231-HO-01
Power : AC 120V / 60Hz
Temp./Humi. : 25deg. C / 65% RH
Engineer : Shinya Watanabe

Mode / Remarks : NFC Continuous Tx Without Tag

LIMIT : FCC15.109(a) 3m. below 1GHz:QP, above 1GHz:PK
Except for the data below : adequate margin data below the limits.



Frequency [MHz]	Reading [dBuV]	DET	Antenna		Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]	Comment
			Factor [dB/m]	Loss& Gain [dB]							
81.363	54.0	QP	6.7	-24.2	36.5	175	231	Hori.	40.0	3.5	
81.363	52.1	QP	6.7	-24.2	34.6	105	175	Vert.	40.0	5.4	
108.479	51.1	QP	11.3	-24.0	38.4	0	174	Hori.	43.5	5.1	
108.479	49.3	QP	11.3	-24.0	36.6	121	100	Vert.	43.5	6.9	
162.718	45.6	QP	15.5	-23.4	37.7	69	191	Hori.	43.5	5.8	
162.718	45.8	QP	15.5	-23.4	37.9	124	100	Vert.	43.5	5.6	
325.438	50.9	QP	15.2	-22.0	44.1	175	100	Hori.	46.0	1.9	
325.438	43.6	QP	15.2	-22.0	36.8	135	169	Vert.	46.0	9.2	
325.438	49.9	QP	15.2	-22.0	43.1	175	100	Hori.	46.0	3.0	With Tag
325.438	47.1	QP	15.2	-22.0	40.3	128	164	Vert.	46.0	5.7	With Tag
339.001	47.8	QP	15.7	-21.9	41.6	189	100	Hori.	46.0	4.4	
339.001	45.2	QP	15.7	-21.9	39.0	119	180	Vert.	46.0	7.0	
352.561	46.7	QP	16.2	-21.8	41.1	192	100	Hori.	46.0	4.9	
352.561	44.1	QP	16.2	-21.8	38.5	126	176	Vert.	46.0	7.5	
379.680	46.0	QP	17.1	-21.6	41.5	205	100	Hori.	46.0	4.5	
379.680	45.0	QP	17.1	-21.6	40.5	168	149	Vert.	46.0	5.5	
583.367	44.6	QP	19.2	-20.2	43.6	226	200	Hori.	46.0	2.4	
583.367	42.9	QP	19.2	-20.2	41.9	214	100	Vert.	46.0	4.1	

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

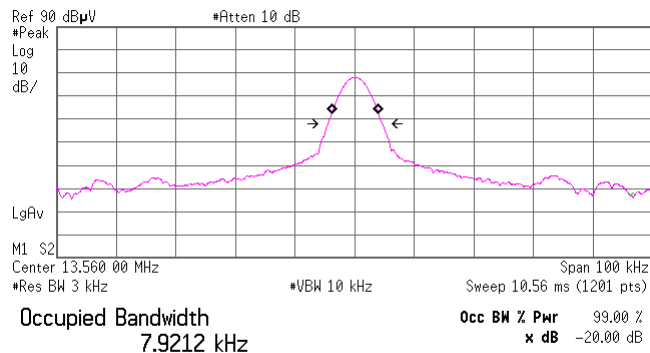
Test place Head Office EMC Lab. No.3 Semi Anechoic Chamber
Report No. 32LE0231-HO-01
Date 09/06/2012
Temperature/ Humidity 25 deg.C / 64% RH
Engineer Satofumi Matsuyama
Mode Tx Mod on without Tag

NFC Continuous Tx

FREQ [MHz]	20dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
13.56	9.15	7.92

Agilent 19:06:19 Feb 29, 2012

R T



Transmit Freq Error 83.040 Hz

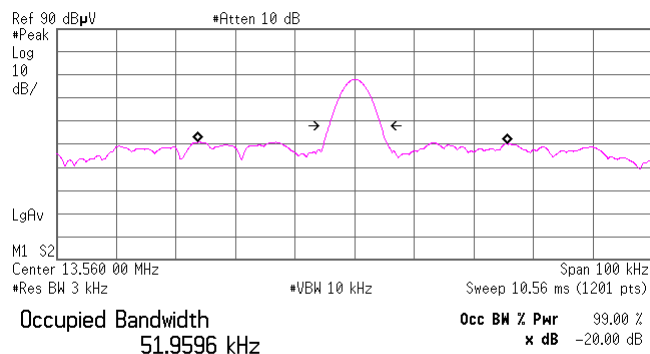
x dB Bandwidth 9.152 kHz

RFID Continuous Tx

FREQ [MHz]	20dB Bandwidth [kHz]	99% Occupied Bandwidth [kHz]
13.56	8.75	51.96

Agilent 19:12:11 Feb 29, 2012

R T



Transmit Freq Error -317.150 Hz

x dB Bandwidth 8.747 kHz

Frequency Tolerance

Test place	Head Office EMC Lab. No.7 shielded room
Report No.	32LE0231-HO-01
Date	07/09/2012
Temperature/ Humidity	22 deg.C/ 44% RH
Engineer	Takayuki Shimada
Mode	Tx Mod off

Test Condition deg.C Volts		Test Timing	Measured freq [MHz]	Freq error [MHz]	Result [ppm]	Limit (+/- 0.01%) [+/- ppm]	Margin [ppm]
20deg.C	102V	Power on	13.560093	0.000093	6.86	100.00	93.14
		on 2min.	13.560084	0.000084	6.19	100.00	93.81
		on 5min.	13.560074	0.000074	5.46	100.00	94.54
		on 10min.	13.560069	0.000069	5.09	100.00	94.91
	120V	Power on	13.560098	0.000098	7.23	100.00	92.77
		on 2min.	13.560084	0.000084	6.19	100.00	93.81
		on 5min.	13.560091	0.000091	6.71	100.00	93.29
		on 10min.	13.560080	0.000080	5.90	100.00	94.10
	138V	Power on	13.560087	0.000087	6.42	100.00	93.58
		on 2min.	13.560071	0.000071	5.24	100.00	94.76
		on 5min.	13.560080	0.000080	5.90	100.00	94.10
		on 10min.	13.560105	0.000105	7.74	100.00	92.26
50deg.C.	120V	Power on	13.560093	0.000093	6.86	100.00	93.14
		on 2min.	13.560087	0.000087	6.42	100.00	93.58
		on 5min.	13.560106	0.000106	7.82	100.00	92.18
		on 10min.	13.560135	0.000135	9.96	100.00	90.04
40deg.C.		Power on	13.560065	0.000065	4.79	100.00	95.21
		on 2min.	13.560076	0.000076	5.60	100.00	94.40
		on 5min.	13.560082	0.000082	6.05	100.00	93.95
		on 10min.	13.560057	0.000057	4.20	100.00	95.80
30deg.C.		Power on	13.560108	0.000108	7.96	100.00	92.04
		on 2min.	13.560081	0.000081	5.97	100.00	94.03
		on 5min.	13.560065	0.000065	4.79	100.00	95.21
		on 10min.	13.560092	0.000092	6.78	100.00	93.22
20deg.C.		Power on	13.560060	0.000060	4.42	100.00	95.58
		on 2min.	13.560079	0.000079	5.83	100.00	94.17
		on 5min.	13.560072	0.000072	5.31	100.00	94.69
		on 10min.	13.560082	0.000082	6.05	100.00	93.95
10deg.C.		Power on	13.560126	0.000126	9.29	100.00	90.71
		on 2min.	13.560146	0.000146	10.77	100.00	89.23
		on 5min.	13.560133	0.000133	9.81	100.00	90.19
		on 10min.	13.560125	0.000125	9.22	100.00	90.78
0deg.C.		Power on	13.560078	0.000078	5.75	100.00	94.25
		on 2min.	13.560129	0.000129	9.51	100.00	90.49
		on 5min.	13.560094	0.000094	6.93	100.00	93.07
		on 10min.	13.560121	0.000121	8.92	100.00	91.08
-10deg.C.		Power on	13.560052	0.000052	3.83	100.00	96.17
		on 2min.	13.560096	0.000096	7.08	100.00	92.92
		on 5min.	13.560134	0.000134	9.88	100.00	90.12
		on 10min.	13.560105	0.000105	7.74	100.00	92.26
-20deg.C		Power on	13.560006	0.000006	0.44	100.00	99.56
		on 2min.	13.560035	0.000035	2.58	100.00	97.42
		on 5min.	13.560056	0.000056	4.13	100.00	95.87
		on 10min.	13.560101	0.000101	7.45	100.00	92.55
-30deg.C		Power on	13.559927	-0.000073	-5.38	100.00	94.62
		on 2min.	13.559973	-0.000027	-1.99	100.00	98.01
		on 5min.	13.559988	-0.000012	-0.88	100.00	99.12
		on 10min.	13.560037	0.000037	2.73	100.00	97.27
Limit :		13.56	13.56 MHz +/-0.01 % (+/- 100ppm) =			+/- 0.001356 MHz	

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	CE/RE	2012/02/24 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	CE	2012/02/06 * 12
MJM-15	Measure	KOMELON	KMC-36	-	CE/RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	CE/RE	-
MSA-10	Spectrum Analyzer	Agilent	E4448A	MY46180655	CE/RE	2012/02/03 * 12
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	CE/RE	2012/08/23 * 12
MLS-06	LISN(AMN)	Schwarzbeck	NSLK8127	8127363	CE	2012/02/06 * 12
MCC-112	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W(10m)/ SFM141(3m)/ sucoform141-PE(1m)/ 421-010(1.5m)/ RFM-E321(Switcher)	-/00640	CE	2012/07/12 * 12
MAT-66	Attenuator(13dB)	JFW Industries, Inc.	50FP-013H2 N	-	CE	2012/01/28 * 12
MLPA-01	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100017	RE	2011/10/19 * 12
MCC-143	Coaxial Cable	UL Japan	-	-	RE	2012/07/27 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2012/03/16 * 12
MAT-09	Attenuator(6dB)	Weinschel Corp	2	BK7973	RE	2011/11/02 * 12
MOS-04	Digital Humidity Indicator	N.T	NT-1800	MOS04	FT	2012/02/06 * 12
MCH-06	Temperature and Humidity Chamber	Tabai Espec	PL-1KT	14007630	FT	2012/04/20 * 12
MFC-01	Microwave Counter	Advantest	R5373	120100309	FT	2012/08/16 * 12
MCC-64	Coaxial Cable	UL Japan	-	-	FT	2012/03/22 * 12
MJM-06	Measure	PROMART	SEN1955	-	RE	
MSA-05	Spectrum Analyzer	Advantest	R3273	160400285	RE	2011/11/23 * 12
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	100635	RE	2012/04/05 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2011/10/15 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2011/10/15 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2012/07/12 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2012/03/16 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	RE	2012/02/06 * 12
MLPA-01	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100017	RE	2011/10/19 * 12
MCC-143	Coaxial Cable	UL Japan	-	-	RE	2012/07/27 * 12

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item: CE: Conducted Emission
RE: Radiated Emission
FT: Frequency Tolerance

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