



RADIO TEST REPORT

Test Report No.: 11319287S-B-R2

Applicant : Nintendo Co., Ltd.
Type of Equipment : Game Controller
Model No. : HAC-013
FCC ID : BKEHAC013
Test regulation : FCC Part15 Subpart C: 2016
Test result : Complied

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7. This test report covers Radio technical requirements.
It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
8. This report is a revised version of 11319287S-B-R1. 11319287S-B-R1 is replaced with this report.

Date of test: July 21 to December 8, 2016

**Representative
test engineer:**

Kenichi Adachi
Engineer
Consumer Technology Division

Approved by :

Akio Hayashi
Leader
Consumer Technology Division



- The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
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13-EM-F0429

REVISION HISTORY

Original Test Report No.: 11319287S-B

Revision	Test report No.	Date	Page revised	Contents
- (Original)	11319287S-B	October 24, 2016	-	-
1	11319287S-B-R1	December 26, 2016	- (full-revision)	Update
2	11319287S-B-R2	January 19, 2017	4, 15, 17, 29-36	Update reference report number, Correction of error

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SECTION 1: Customer information

Company Name : Nintendo Co., Ltd.
Address : 11-1 Hokotate-cho, Kamitoba, Minami-ku, Kyoto 601-8501, Japan
Telephone Number : +81-75-662-9600
Facsimile Number : +81-75-662-9624
Contact Person : Kazuya Kuramoto

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

2.1 Identification of E.U.T.

Type of Equipment : Game Controller
Model No. : HAC-013
Serial No. : Refer to Section 4, Clause 4.2
Rating : DC 5.0 V(USB), DC 3.7 V (battery)
Receipt Date of Sample : April 20, 2016
Country of Mass-production : China
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: HAC-013 (referred to as the EUT in this report) is a Game Controller.

General Specification

Clock frequency(ies) in the system : Bluetooth: 24 MHz, NFC: 27.12 MHz

Radio Specification

[Bluetooth] *1)

Radio Type : Transceiver
Frequency of Operation : 2402 MHz - 2480 MHz
Modulation : FHSS
Power Supply (radio part input) : DC 1.8 V
Antenna type : Inverse-F
Antenna Gain : 2.66 dBi
Operation temperature : +5 deg.C to +35 deg.C

[NFC]

Radio Type : Transceiver
Frequency of Operation : 13.56 MHz
Modulation : ASK
Power Supply (radio part input) : DC 1.8 V
Antenna type : Loop
Operation temperature : +5 deg.C to +35 deg.C

*1) Refer to test report no. 11319287S-A-R2.

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SECTION 3: Test specification, procedures & results

3.1 Test specification

Test Specification : FCC Part 15 Subpart C
FCC Part 15 final revised on November 14, 2016 and effective December 14, 2016

Title : FCC 47 CFR Part 15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits
Section 15.209 Radiated emission limits, general requirements
Section 15.215 Additional provisions to the general radiated emission limitations.
Section 15.225 Operation within the bands 13.110 - 14.010 MHz.

* The revision on November 14, 2016, does not affect the test specification applied to the EUT.

*The EUT has been tested for compliance with FCC Part 15 Subpart B.

3.2 Procedures & Results

Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
Conducted emission	ANSI C63.10:2013 6.Standard test methods	FCC 15.207	-	N/A	5.7 dB (13.56000 MHz, AV, N) 5.7 dB (13.56000 MHz, AV, L1)	Complied
Electric Field Strength of Fundamental Emission	ANSI C63.10:2013 6.Standard test methods	FCC Section15.225 (a)	Radiated	N/A	63.9 dB (Vertical)	Complied
Electric Field Strength of Outside the Allocated bands	ANSI C63.10:2013 6.Standard test methods	FCC Section15.225 (b)(c)	Radiated	N/A	44.8 dB (13.553 MHz, Vertical)	Complied
Electric Field Strength of Spurious Emission	ANSI C63.10:2013 6.Standard test methods	FCC Section15.209 FCC Section15.225 (d)	Radiated	N/A	4.3 dB (40.680 MHz, Vertical)	Complied
20 dB Bandwidth	ANSI C63.10:2013 6.Standard test methods	FCC Section15.215 (c)	Radiated	N/A	-	Complied
Frequency Tolerance	ANSI C63.10:2013 6.Standard test methods	FCC Section15.225 (e)	Radiated	N/A	-	Complied
Note: UL Japan's EMI Work Procedures No.13-EM-W0420 and 13-EM-W0422.						

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FCC Part 15.31 (e)

The EUT is supplied the power from battery or host device.
In either method, the EUT provides stable voltage (DC 1.8 V) constantly to RF Module regardless of input voltage.
In the case of battery method, the test was performed with the full-charged battery.
Therefore, the 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.

3.3 Addition to standard

Item	Test Procedure	Specification	Remarks	Worst Margin	Results
Occupied Bandwidth (99 %)	ANSI C63.10:2013 6.Standard test methods RSS-Gen 6.6	RSS-Gen 4.6.1	Conducted	-	-

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

* Other than above, no addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k = 2$.

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Item	Frequency range	Uncertainty (+/-)			
		No. 1 SAC / SR	No. 2 SAC / SR	No. 3 SAC / SR	No. 4 SAC / SR
Conducted emission (AC Mains) LISN	150 kHz-30 MHz	2.1 dB	2.1 dB	2.6 dB	2.2 dB
Radiated emission (Measurement distance: 3 m)	9 kHz-30 MHz	2.7 dB	2.7 dB	3.1 dB	-
	30 MHz-300 MHz	4.4 dB	4.4 dB	4.6 dB	-
	300 MHz-1 GHz	5.6 dB	5.5 dB	5.3 dB	-
	1 GHz-13 GHz	5.2 dB	5.2 dB	5.2 dB	-
Radiated emission (Measurement distance: 1 m)	13 GHz-18 GHz	4.9 dB	4.9 dB	4.9 dB	-
	18 GHz-40 GHz	4.9 dB	4.9 dB	4.9 dB	-

SAC=Semi-Anechoic Chamber

SR= Shielded Room is applied besides radiated emission

Antenna terminal test	Uncertainty (+/-)
Bandwidth Measurement	1.61%
Duty cycle and Time Measurement	0.012 %

Conducted emission test

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

Radiated emission test

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

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3.5 Test location

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JAB Accreditation No. : RTL02610

	IC Registration No.	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
<input type="checkbox"/> No.1 Semi-anechoic chamber	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
<input type="checkbox"/> No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10 m
<input checked="" type="checkbox"/> No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5 m
<input type="checkbox"/> No.4 Semi-anechoic chamber	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
<input type="checkbox"/> No.1 shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
<input type="checkbox"/> No.2 shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
<input type="checkbox"/> No.3 shielded room	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
<input type="checkbox"/> No.4 shielded room	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
<input checked="" type="checkbox"/> No.5 shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
<input type="checkbox"/> No.6 shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
<input type="checkbox"/> No.8 shielded room	-	3.45 x 5.5 x 2.4	3.45 x 5.5	-
<input checked="" type="checkbox"/> No.1 Measurement room	-	2.55 x 4.1 x 2.5	-	-

3.6 Test setup, Data of EMI & Test instruments

Refer to APPENDIX.

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

4.1 Operating mode

The EUT exercise program used during testing was designed to exercise the various system components in a manner similar to typical use.

Test item	Operating mode	Tested frequency
All items except for Frequency Tolerance	NFC Communication NFC transmitting	13.56 MHz
Frequency Tolerance	NFC transmitting (Unmodulated)	13.56 MHz

Software for testing: NFC RF TEST.exe version 0.2.0.0

Power setting: Fixed.

The carrier level and noise levels were confirmed with and without Tag, and the test was made with the condition that has the maximum noise.

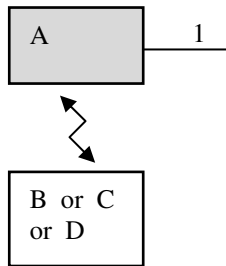
Combinations of the worst case:

Radiated emission (Carrier)	Radiated emission (Below 30MHz)	Radiated emission (Above 30MHz)
With Tag (NFC type B)	With Tag (NFC type B)	With Tag (NFC type B)

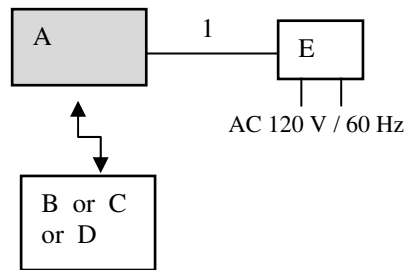
Justification: The system was configured in typical fashion (as customer would normally use it) for testing.

4.2 Configuration of tested system

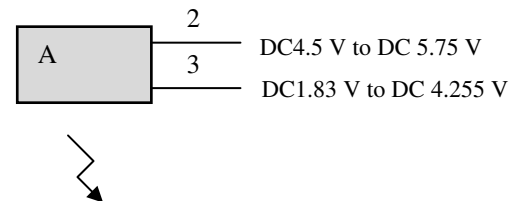
- (1) For radiated emissions tests above 30 MHz *



- (2) For conducted emission tests, radiated emissions tests below 30 MHz and Bandwidth



- (3) For Frequency tolerance



* Pre-check measurement was performed with the EUT (supplied from the host device, and battery operation). It was confirmed that there was no difference.

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Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Game Controller	HAC-013	*1)	Nintendo Co., Ltd.	EUT
B	Tag	NVL-001	-	Nintendo Co., Ltd.	Type A
C	Tag	-	-	-	Type B
D	Tag	-	-	-	Type F
E	AC adapter	HAC-002	-	Nintendo Co., Ltd	-

*1)

	Antenna port conducted tests (frequency tolerance)	Conducted emission tests	Radiated emission tests, Bandwidth
Serial number	A176 (Spec A), C279 (Spec C)	A176 (Spec A) for antenna terminated A161 (Spec A) for with antenna C279 (Spec C) for antenna terminated C314 (Spec C) for with antenna	A161 (Spec A), C314 (Spec C)

Accessory and model differences

The differences between Spec A and Spec C are as following table.

These differences are compatible and are electrically identical having same radio parameters.

Parts	Manufacturer	
	Spec A	Spec C
Crystal Resonators for Bluetooth (X200)	Daishinku	Epson
Resistance for Bluetooth Antenna part (R203)	KAMAYA	Hokuriku
Capacitor for Bluetooth Antenna part (C205, C206)	MURATA	Taiyo
Coil for Bluetooth Antenna part (L200)	TDK	MURATA
Coil for Bluetooth Antenna part (L201)	TDK	MURATA
Crystal Resonators for NFC (X400)	Daishinku	Epson
Capacitor for NFC Antenna part (C412, C413, C414, C416, C417, C418, C419, C420, C421, C422, R400, R403)	MURATA	Taiyo
Coil for NFC Antenna part (L400, L401, L402, L403)	TDK	MURATA
Fuse (F1)	KAMAYA	SKYGATE
Fuse (F2)	KAMAYA	SKYGATE

List of cables used

No.	Cable Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	USB	1.5	Shielded	Shielded	-
2	DC	1.5	Unshielded	Unshielded	-
3	DC	1.5	Unshielded	Unshielded	-

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SECTION 5: Conducted emission

5.1 Operating environment

Test place : See test data (APPENDIX 1)
Temperature : See test data (APPENDIX 1)
Humidity : See test data (APPENDIX 1)

5.2 Test configuration

EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The table is made of Styrofoam and covered with polyvinyl chloride. That has very low permittivity. The rear of tabletop was located 40 cm to the vertical conducting plane. The rear of EUT, including peripherals was aligned and was 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 LISN 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 for the forming a bundle 30 cm to 40 cm long and were hanged at a 40 cm height to the ground plane. Each EUT current-carrying power lead, except the ground (safety) lead, was individually connected through a LISN to the input power source. All unused 50 ohm connectors of the LISN were resistively terminated in 50 ohm when not connected to the measuring equipment. Photographs of the set up are shown in APPENDIX 3.

5.3 Test conditions

Frequency range : 0.15 MHz - 30 MHz
EUT position : Table top
EUT operation mode : Refer to SECTION 4.1

5.4 Test procedure

The AC Mains Terminal Continuous disturbance Voltage had been measured with the EUT via AC adapter within a Shielded room. The EUT via AC adapter was connected to a Line Impedance Stabilization Network (LISN). An overview sweep with peak detection has been performed. The measurements had been performed with a quasi-peak detector and if required, an average detector. The conducted emission measurements were made with the following detection of the test receiver.

Detection Type : Quasi-Peak/ Average
IF Bandwidth : 9 kHz

5.5 Results

Summary of the test results : Pass
Refer to APPENDIX 1

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SECTION 6: Radiated emission

6.1 Operating environment

Test place : See test data (APPENDIX 1)
Temperature : See test data (APPENDIX 1)
Humidity : See test data (APPENDIX 1)

6.2 Test configuration

EUT was placed on a polystyrene platform of nominal size, 0.5 m by 0.5 m, raised 0.8 m above the conducting ground plane. That has very low permittivity.

Photographs of the set up are shown in APPENDIX 3.

6.3 Test procedure

The Radiated Electric Field Strength intensity has been measured on a semi-anechoic chamber with a ground plane at a distance of 3m.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open area 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 Radiated Electric Field Strength intensity has been measured with a ground plane and at a distance of 3 m.

Frequency: From 9 kHz to 30 MHz at distance 3 m (Refer to Figure 2)

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. and 135 deg.) and horizontal polarization. Drawing of the antenna direction is shown in Figure 1.

Frequency: From 30 MHz to 1 GHz at distance 3 m (Refer to Figure 2).

The measuring antenna height was 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.

Measurements were performed with QP, PK, and AV detector.

The radiated emission measurements were made with the following detector function of the test receiver.

	9 kHz to 90 kHz & 110 kHz to 150 kHz	90 kHz to 110 kHz	150 kHz to 490 kHz	490 kHz to 30 MHz	30 MHz to 1 GHz
Detector Type	PK/AV	QP	PK/AV	QP	QP
IF Bandwidth	200 Hz	200 Hz	10 kHz	9 kHz	120 kHz
Distance factor *1)	-80 dB	-80 dB	-80 dB	-40 dB	-
Measuring antenna	Loop antenna				Biconical (30 MHz - 299.99 MHz) Logperiodic (300 MHz - 1 GHz)

*1) FCC 15.31 (f)(2) (9kHz-30MHz)

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

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

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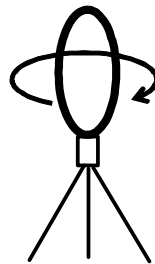
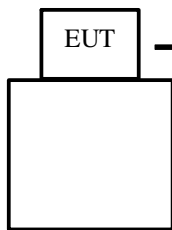
The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

Combinations of the worst case

Frequency	Below 30 MHz	Above 30 MHz
Horizontal	X	Y
Vertical	Y	Y

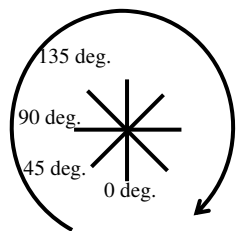
Figure 1: Direction of the Loop Antenna

Side View (Vertical)



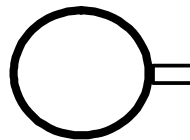
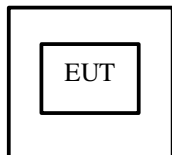
Front side: 0 deg.
Forward direction: clockwise

Top View (Vertical)



Front side: 0 deg.
Forward direction: clockwise

Top View (Horizontal)



Antenna was not rotated.

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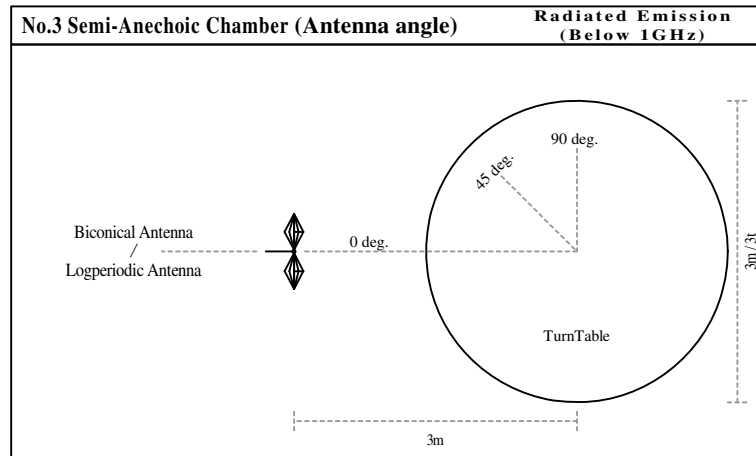


Figure 2. Antenna angle

6.4 Results

Summary of the test results : Pass
Refer to APPENDIX 1

SECTION 7: 20 dB bandwidth & Occupied bandwidth (99 %)

Test procedure

The test was measured with a spectrum analyzer using a test fixture.

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
20 dB Bandwidth	20 MHz	10 kHz	30 kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99 % Occupied Bandwidth	Enough width to display 20 dB Bandwidth	1 % of Span	Three times of RBW	Auto (Single)	Sample	Max Hold *1)	Spectrum Analyzer

*1) The measurement was performed with Max Hold since the duty cycle was not 100%.

Summary of the test results: Pass
Refer to APPENDIX 1

SECTION 8: Frequency Tolerance

Test procedure

The test was measured with a frequency counter using a test fixture.
The temperature test was started after the temperature stabilization time of 30 minutes.
The test was begun from 50 deg.C and the temperature was lowered each 10 deg.C.

Summary of the test results: Pass
Refer to APPENDIX 1

DATA OF CONDUCTED EMISSION TEST

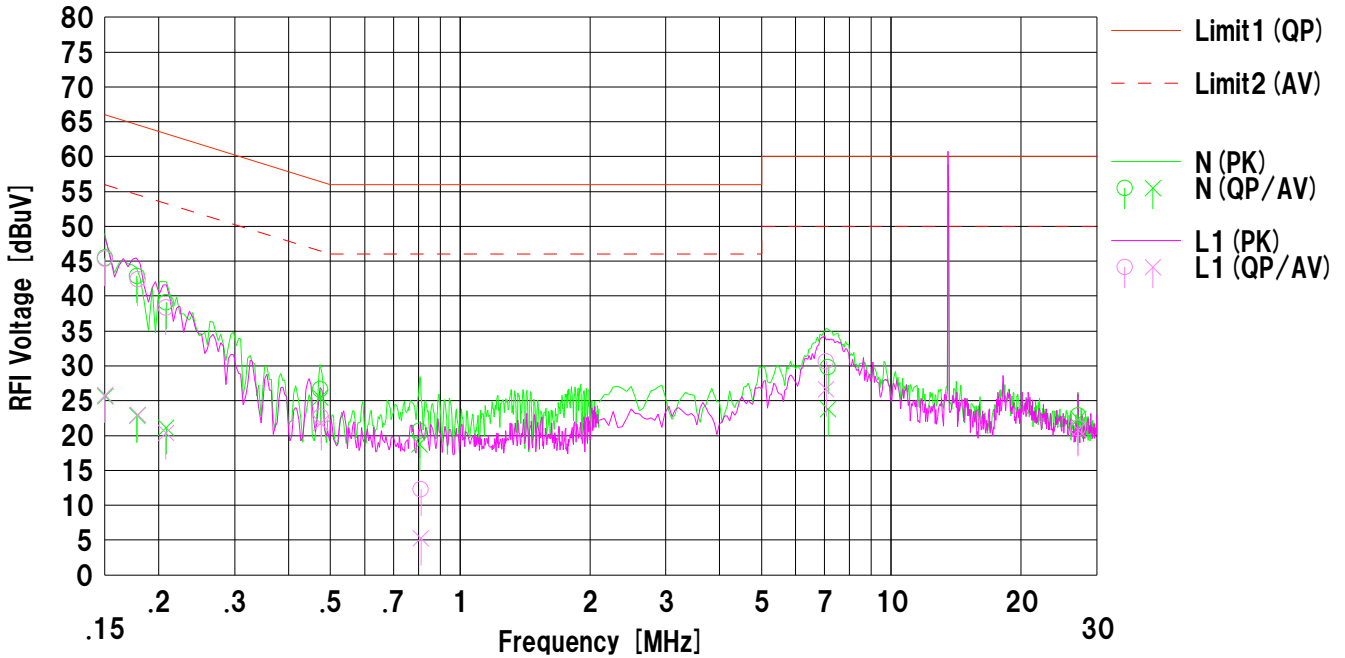
UL Japan, Inc. Shonan EMC Lab. No.2 Shielded Room
Date : 2016/09/30

Company : Nintendo Co., Ltd.
Kind of EUT : Game Controller
Model No. : HAC-013
Serial No. : A161
Remarks : With Tag (Card test mode)

Mode : NFC Communication (type B)
Order No. : 11319287S
Power : AC 120 V/60 Hz (AC adapter input)
Temp./Humi. : 26 deg.C / 44 %RH

Limit1 : FCC 15C (15.207) QP
Limit2 : FCC 15C (15.207) AV

Engineer : Hikaru Shirasawa



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	32.96	13.10	12.54	45.50	25.64	66.00	56.00	20.5	30.3	N	
2	0.17824	30.32	10.28	12.55	42.87	22.83	64.57	54.57	21.7	31.7	N	
3	0.20812	26.56	8.56	12.55	39.11	21.11	63.28	53.28	24.1	32.1	N	
4	0.47464	14.02	12.88	12.58	26.60	25.46	56.43	46.43	29.8	20.9	N	
5	0.80564	8.03	6.13	12.63	20.66	18.76	56.00	46.00	35.3	27.2	N	
6	7.14520	16.39	10.40	13.40	29.79	23.80	60.00	50.00	30.2	26.2	N	
7	27.12000	8.13	7.61	14.75	22.88	22.36	60.00	50.00	37.1	27.6	N	
8	0.15000	32.79	13.26	12.54	45.33	25.80	66.00	56.00	20.6	30.2	L1	
9	0.17864	29.86	10.41	12.55	42.41	22.96	64.55	54.55	22.1	31.5	L1	
10	0.20787	25.79	7.83	12.55	38.34	20.38	63.29	53.29	24.9	32.9	L1	
11	0.47562	10.11	9.18	12.58	22.69	21.76	56.42	46.42	33.7	24.6	L1	
12	0.81164	-0.32	-7.37	12.63	12.31	5.26	56.00	46.00	43.6	40.7	L1	
13	7.07370	17.22	13.24	13.40	30.62	26.64	60.00	50.00	29.3	23.3	L1	
14	27.12000	6.32	6.11	14.75	21.07	20.86	60.00	50.00	38.9	29.1	L1	

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.2 Shielded Room
Date : 2016/10/01

Company : Nintendo Co., Ltd.
Kind of EUT : Game Controller
Model No. : HAC-013
Serial No. : A176
Remarks :

Mode : NFC Communication (type B)
Order No. : 11319287S
Power : AC 120 V/60 Hz (AC adapter input)
Temp./Humi. : 26 deg.C / 44 %RH

DATA OF CONDUCTED EMISSION TEST

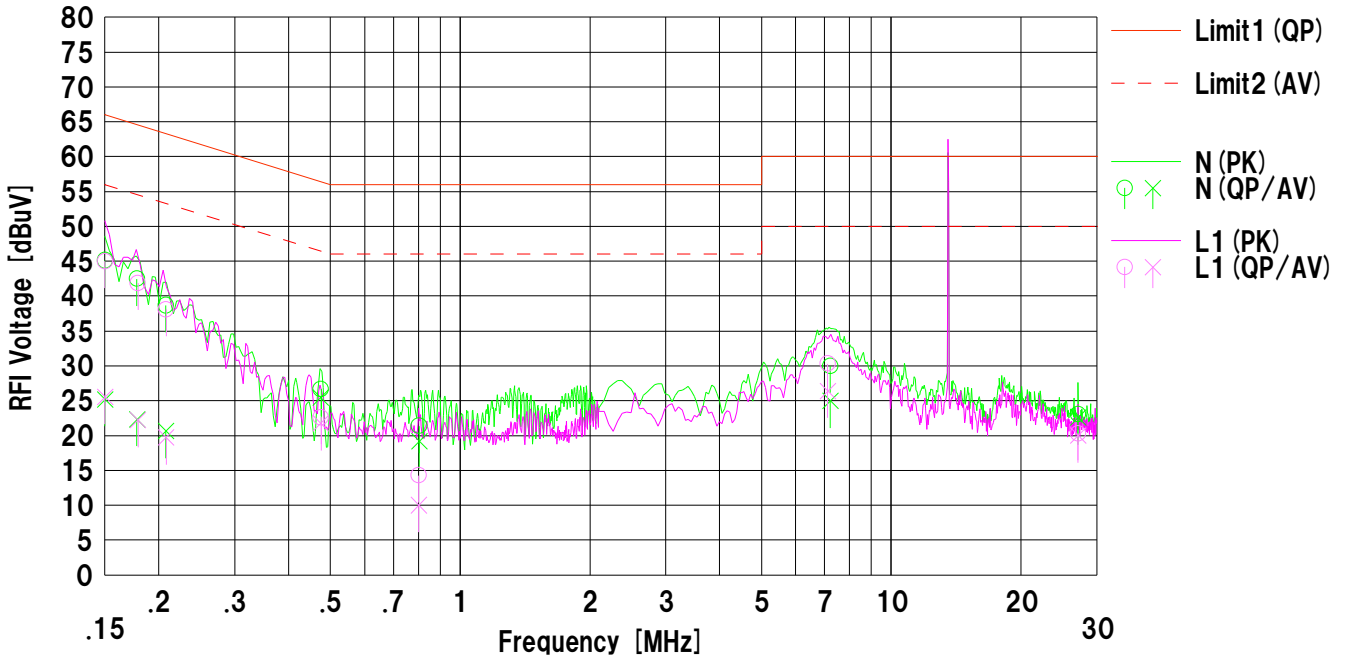
UL Japan, Inc. Shonan EMC Lab. No.2 Shielded Room
Date : 2016/10/01

Company : Nintendo Co., Ltd.
 Kind of EUT : Game Controller
 Model No. : HAC-013
 Serial No. : C314
 Remarks : With Tag (Card test mode)

Mode : NFC Communication (type B)
 Order No. : 11319287S
 Power : AC 120 V/60 Hz (AC adapter input)
 Temp./Humi. : 26 deg.C / 44 %RH

Limit1 : FCC 15C (15.207) QP
 Limit2 : FCC 15C (15.207) AV

Engineer : Hikaru Shirasawa



No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	32.57	12.66	12.54	45.11	25.20	66.00	56.00	20.8	30.8	N	
2	0.17824	29.93	9.78	12.55	42.48	22.33	64.57	54.57	22.0	32.2	N	
3	0.20768	26.11	8.10	12.55	38.66	20.65	63.30	53.30	24.6	32.6	N	
4	0.47592	14.09	12.89	12.58	26.67	25.47	56.41	46.41	29.7	20.9	N	
5	0.80424	8.76	6.51	12.63	21.39	19.14	56.00	46.00	34.6	26.8	N	
6	7.22800	16.56	11.55	13.42	29.98	24.97	60.00	50.00	30.0	25.0	N	
7	27.12000	8.33	7.83	14.75	23.08	22.58	60.00	50.00	36.9	27.4	N	
8	0.15000	32.46	12.97	12.54	45.00	25.51	66.00	56.00	21.0	30.4	L1	
9	0.17892	29.33	9.67	12.55	41.88	22.22	64.54	54.54	22.6	32.3	L1	
10	0.20816	25.52	7.16	12.55	38.07	19.71	63.28	53.28	25.2	33.5	L1	
11	0.47576	10.03	9.15	12.58	22.61	21.73	56.41	46.41	33.8	24.6	L1	
12	0.80258	1.66	-2.62	12.63	14.29	10.01	56.00	46.00	41.7	35.9	L1	
13	7.12920	16.91	12.99	13.40	30.31	26.39	60.00	50.00	29.6	23.6	L1	
14	27.12000	5.56	5.25	14.75	20.31	20.00	60.00	50.00	39.6	30.0	L1	

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.2 Shielded Room
Date : 2016/10/01

Company : Nintendo Co., Ltd.
Kind of EUT : Game Controller
Model No. : HAC-013
Serial No. : C279
Remarks :

Mode : NFC Communication (type B)
Order No. : 11319287S
Power : AC 120 V/60 Hz (AC adapter input)
Temp./Humi. : 26 deg.C / 44 %RH

Data of Electric field strength of Fundamental emission and Spurious emission within the band: FCC15.225(a)(b)(c)

UL Japan, Inc.
Shonan EMC Lab., No.3 Semi Anechoic Chamber

Company: Nintendo Co., Ltd.	Regulation: FCC Part15 Subpart C 15.225
Equipment: Game controller	Test Distance: 3m
Model: HAC-013	Date: July 22, 2016
Sample No.: A161	Temperature: 26 deg.C
Power: DC 3.7 V (battery)	Humidity: 61 %RH
Mode: NFC Communication (13.56 MHz)	ENGINEER: Kenichi Adachi

Remarks: NFC type B, with Tag (axis: H: X / V: Y), Vertical polarization (antenna angle) of the worst case: 0 deg
(Specification: Spec A)

Fundamental emission

No.	FREQ [MHz]	Test Receiver Reading		Antenna Factor [dB/m]	Loss [dB]	AMP GAIN [dB]	Distance factor [dB]	RESULT		LIMIT (30 m) [dBuV/m]	MARGIN	
		Hor	Ver					Hor	Ver			
		[dBuV]	[dBuV]					[dBuV/m]	[dBuV/m]		[dB]	[dB]
1	13.560	58.6	67.4	18.4	6.5	32.2	-40.0	11.2	20.0	83.9	72.7	63.9

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+Distance factor[dB]

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

Limits (30 m)

• 13.553 MHz to 13.567 MHz : 83.9 dBuV/m (FCC 15.225(a))

Spurious emission within the band

No.	FREQ [MHz]	Test Receiver Reading		Antenna Factor [dB/m]	Loss [dB]	AMP GAIN [dB]	Distance factor [dB]	RESULT		LIMIT (30 m) [dBuV/m]	MARGIN	
		Hor	Ver					Hor	Ver			
		[dBuV]	[dBuV]					[dBuV/m]	[dBuV/m]		[dB]	[dB]
1	12.714	30.1	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.1	29.5	46.7	46.6
2	13.110	30.1	30.1	18.4	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.7	46.7
3	13.346	30.2	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	40.5	57.7	57.7
4	13.410	30.2	30.3	18.4	6.5	32.2	-40.0	-17.2	-17.1	40.5	57.7	57.6
5	13.553	44.4	53.0	18.4	6.5	32.2	-40.0	-3.0	5.6	50.4	53.4	44.8
6	13.567	43.7	52.4	18.4	6.5	32.2	-40.0	-3.6	5.1	50.4	54.0	45.4
7	13.710	30.2	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	40.5	57.7	57.7
8	13.773	30.2	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.1	40.5	57.7	57.6
9	14.010	30.2	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.1	29.5	46.7	46.6
10	14.408	30.2	30.2	18.3	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.7	46.7

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+Distance factor[dB]

Outside filed strength frequencies

• Fc ±7 kHz: 13.553 MHz to 13.567 MHz

• Fc ±150 kHz: 13.410 MHz to 13.710 MHz

• Fc ±450 kHz: 13.110 MHz to 14.010 MHz

Fc = 13.56 MHz

Limits (30 m)

• 13.410 MHz to 13.553 MHz and 13.567 MHz to 13.710 MHz : 50.4 dBuV/m (FCC 15.225(b))

• 13.110 MHz to 13.410 MHz and 13.710 MHz to 14.010 MHz : 40.5 dBuV/m (FCC 15.225(c))

• Below 13.110 MHz and Above 14.010 MHz : 29.5 dBuV/m (FCC 15.225(d) and FCC 15.209)

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Data of Electric field strength of Fundamental emission and Spurious emission within the band: FCC15.225(a)(b)(c)

UL Japan, Inc.
Shonan EMC Lab., No.3 Semi Anechoic Chamber

Company: Nintendo Co., Ltd.	Regulation: FCC Part15 Subpart C 15.225
Equipment: Game Controller	Test Distance: 3m
Model: HAC-013	Date: July 22, 2016
Sample No.: A161	Temperature: 26 deg.C
Power: DC 3.7 V (battery)	Humidity: 61 %RH
Mode: NFC transmitting (13.56 MHz)	ENGINEER: Kenichi Adachi

Remarks: NFC type B, without Tag (axis: H: X / V: Y), Vertical polarization (antenna angle) of the worst case: 0 deg (Specification: Spec A)

Fundamental emission

No.	FREQ [MHz]	Test Receiver Reading		Antenna Factor [dB/m]	Loss [dB]	AMP GAIN [dB]	Distance factor [dB]	RESULT		LIMIT (30 m) [dBuV/m]	MARGIN	
		Hor	Ver					Hor	Ver		Hor	Ver
		[dBuV]	[dBuV]					[dBuV/m]	[dBuV/m]		[dB]	[dB]
1	13.560	52.7	61.8	18.4	6.5	32.2	-40.0	5.3	14.5	84.0	78.7	69.5

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+Distance factor[dB]
 Distance factor: $40 \times \log(3 \text{ m}/30 \text{ m}) = -40 \text{ dB}$
 Limits (30 m)
 • 13.553 MHz to 13.567 MHz : 83.9 dBuV/m (FCC 15.225(a))

Spurious emission within the band

No.	FREQ [MHz]	Test Receiver Reading		Antenna Factor [dB/m]	Loss [dB]	AMP GAIN [dB]	Distance factor [dB]	RESULT		LIMIT (30 m) [dBuV/m]	MARGIN	
		Hor	Ver					Hor	Ver		Hor	Ver
		[dBuV]	[dBuV]					[dBuV/m]	[dBuV/m]		[dB]	[dB]
1	12.714	30.1	30.1	18.4	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.8	46.7
2	13.110	30.1	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.8	46.7
3	13.346	30.1	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	40.5	57.7	57.7
4	13.410	30.1	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	40.5	57.7	57.7
5	13.553	38.0	47.7	18.4	6.5	32.2	-40.0	-9.4	0.3	50.5	59.8	50.2
6	13.567	37.6	47.0	18.4	6.5	32.2	-40.0	-9.8	-0.3	50.5	60.3	50.8
7	13.710	30.2	30.2	18.4	6.5	32.2	-40.0	-17.1	-17.1	40.5	57.6	57.6
8	13.773	30.2	30.2	18.4	6.5	32.2	-40.0	-17.1	-17.2	40.5	57.6	57.7
9	14.010	30.2	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.1	29.5	46.7	46.7
10	14.408	30.2	30.2	18.3	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.7	46.7

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+Distance factor[dB]

Outside filed strength frequencies

- Fc ±7 kHz: 13.553 MHz to 13.567 MHz
- Fc ±150 kHz: 13.410 MHz to 13.710 MHz
- Fc ±450 kHz: 13.110 MHz to 14.010 MHz
- Fc = 13.56 MHz

Limits (30 m)

- 13.410 MHz to 13.553 MHz and 13.567 MHz to 13.710 MHz : 50.4 dBuV/m (FCC 15.225(b))
- 13.110 MHz to 13.410 MHz and 13.710 MHz to 14.010 MHz : 40.5 dBuV/m (FCC 15.225(c))
- Below 13.110 MHz and Above 14.010 MHz : 29.5 dBuV/m (FCC 15.225(d)and FCC 15.209)

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Data of Electric field strength of Fundamental emission and Spurious emission within the band: FCC15.225(a)(b)(c)

UL Japan, Inc.
Shonan EMC Lab., No.3 Semi Anechoic Chamber

Company: Nintendo Co., Ltd.	Regulation: FCC Part15 Subpart C 15.225
Equipment: Game Controller	Test Distance: 3m
Model: HAC-013	Date: July 22, 2016
Sample No.: A161	Temperature: 26 deg.C
Power: DC 3.7 V (battery)	Humidity: 61 %RH
Mode: NFC Communication (13.56 MHz)	ENGINEER: Kenichi Adachi

Remarks: NFC type A, with Tag (axis: H: X / V: Y) , Vertical polarization (antenna angle) of the worst case: 0 deg (Specification: Spec A)

Fundamental emission

No.	FREQ [MHz]	Test Receiver Reading		Antenna Factor [dB/m]	Loss [dB]	AMP GAIN [dB]	Distance factor [dB]	RESULT		LIMIT (30 m) [dBuV/m]	MARGIN	
		Hor [dBuV]	Ver [dBuV]					Hor [dBuV/m]	Ver [dBuV/m]		Hor [dB]	Ver [dB]
1	13.560	52.5	61.8	18.4	6.5	32.2	-40.0	5.2	14.5	84.0	78.8	69.5

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+Distance factor[dB]
 Distance factor: $40 \times \log(3 \text{ m}/30 \text{ m}) = -40 \text{ dB}$
 Limits (30 m)
 • 13.553 MHz to 13.567 MHz : 83.9 dBuV/m (FCC 15.225(a))

Spurious emission within the band

No.	FREQ [MHz]	Test Receiver Reading		Antenna Factor [dB/m]	Loss [dB]	AMP GAIN [dB]	Distance factor [dB]	RESULT		LIMIT (30 m) [dBuV/m]	MARGIN	
		Hor [dBuV]	Ver [dBuV]					Hor [dBuV/m]	Ver [dBuV/m]		Hor [dB]	Ver [dB]
1	12.936	30.2	30.2	18.4	6.5	32.2	-40.0	-17.1	-17.2	29.5	46.7	46.7
2	13.110	30.2	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.7	46.7
3	13.349	30.2	30.3	18.4	6.5	32.2	-40.0	-17.1	-17.1	40.5	57.6	57.6
4	13.410	30.2	30.2	18.4	6.5	32.2	-40.0	-17.1	-17.1	40.5	57.6	57.6
5	13.553	37.8	47.5	18.4	6.5	32.2	-40.0	-9.6	0.1	50.5	60.1	50.3
6	13.567	37.7	46.8	18.4	6.5	32.2	-40.0	-9.7	-0.5	50.5	60.2	51.0
7	13.710	30.3	30.3	18.4	6.5	32.2	-40.0	-17.1	-17.1	40.5	57.6	57.6
8	13.771	30.2	30.3	18.4	6.5	32.2	-40.0	-17.1	-17.0	40.5	57.6	57.5
9	14.010	30.3	30.3	18.4	6.5	32.2	-40.0	-17.1	-17.1	29.5	46.6	46.6
10	14.194	30.2	30.3	18.3	6.5	32.2	-40.0	-17.2	-17.1	29.5	46.7	46.7

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+Distance factor[dB]

Outside filed strength frequencies

- Fc ±7 kHz: 13.553 MHz to 13.567 MHz
- Fc ±150 kHz: 13.410 MHz to 13.710 MHz
- Fc ±450 kHz: 13.110 MHz to 14.010 MHz
- Fc = 13.56 MHz

Limits (30 m)

- 13.410 MHz to 13.553 MHz and 13.567 MHz to 13.710 MHz : 50.4 dBuV/m (FCC 15.225(b))
- 13.110 MHz to 13.410 MHz and 13.710 MHz to 14.010 MHz : 40.5 dBuV/m (FCC 15.225(c))
- Below 13.110 MHz and Above 14.010 MHz : 29.5 dBuV/m (FCC 15.225(d)and FCC 15.209)

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Data of Electric field strength of Fundamental emission and Spurious emission within the band: FCC15.225(a)(b)(c)

UL Japan, Inc.
Shonan EMC Lab., No.3 Semi Anechoic Chamber

Company: Nintendo Co., Ltd.	Regulation: FCC Part15 Subpart C 15.225
Equipment: Game Controller	Test Distance: 3m
Model: HAC-013	Date: July 22, 2016
Sample No.: A161	Temperature: 26 deg.C
Power: DC 3.7 V (battery)	Humidity: 61 %RH
Mode: NFC transmitting (13.56 MHz)	ENGINEER: Kenichi Adachi

Remarks: NFC type A, without Tag (axis: H / X / V: Y), Vertical polarization (antenna angle) of the worst case: 0 deg (Specification: Spec A)

Fundamental emission

No.	FREQ [MHz]	Test Receiver Reading		Antenna Factor [dB/m]	Loss [dB]	AMP GAIN [dB]	Distance factor [dB]	RESULT		LIMIT (30 m) [dBuV/m]	MARGIN	
		Hor	Ver					Hor	Ver		Hor	Ver
		[dBuV]	[dBuV]					[dBuV/m]	[dBuV/m]		[dB]	[dB]
1	13.560	53.0	62.8	18.4	6.5	32.2	-40.0	5.6	15.5	84.0	78.4	68.5

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+Distance factor[dB]
 Distance factor: $40 \times \log(3 \text{ m}/30 \text{ m}) = -40 \text{ dB}$
 Limits (30 m)
 • 13.553 MHz to 13.567 MHz : 83.9 dBuV/m (FCC 15.225(a))

Spurious emission within the band

No.	FREQ [MHz]	Test Receiver Reading		Antenna Factor [dB/m]	Loss [dB]	AMP GAIN [dB]	Distance factor [dB]	RESULT		LIMIT (30 m) [dBuV/m]	MARGIN	
		Hor	Ver					Hor	Ver		Hor	Ver
		[dBuV]	[dBuV]					[dBuV/m]	[dBuV/m]		[dB]	[dB]
1	12.936	30.1	30.1	18.4	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.8	46.8
2	13.110	30.1	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.8	46.8
3	13.349	30.2	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	40.5	57.7	57.7
4	13.410	30.2	30.2	18.4	6.5	32.2	-40.0	-17.1	-17.2	40.5	57.6	57.7
5	13.553	38.0	48.7	18.4	6.5	32.2	-40.0	-9.3	1.3	50.5	59.8	49.2
6	13.567	37.9	48.0	18.4	6.5	32.2	-40.0	-9.5	0.7	50.5	60.0	49.8
7	13.710	30.2	30.2	18.4	6.5	32.2	-40.0	-17.1	-17.2	40.5	57.6	57.7
8	13.771	30.2	30.2	18.4	6.5	32.2	-40.0	-17.1	-17.1	40.5	57.6	57.6
9	14.010	30.2	30.2	18.4	6.5	32.2	-40.0	-17.1	-17.1	29.5	46.7	46.7
10	14.194	30.2	30.2	18.3	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.7	46.7

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+Distance factor[dB]

Outside filed strength frequencies

- Fc ±7 kHz: 13.553 MHz to 13.567 MHz
- Fc ±150 kHz: 13.410 MHz to 13.710 MHz
- Fc ±450 kHz: 13.110 MHz to 14.010 MHz
- Fc = 13.56 MHz

Limits (30 m)

- 13.410 MHz to 13.553 MHz and 13.567 MHz to 13.710 MHz : 50.4 dBuV/m (FCC 15.225(b))
- 13.110 MHz to 13.410 MHz and 13.710 MHz to 14.010 MHz : 40.5 dBuV/m (FCC 15.225(c))
- Below 13.110 MHz and Above 14.010 MHz : 29.5 dBuV/m (FCC 15.225(d)and FCC 15.209)

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Data of Electric field strength of Fundamental emission and Spurious emission within the band: FCC15.225(a)(b)(c)

UL Japan, Inc.
Shonan EMC Lab., No.3 Semi Anechoic Chamber

Company: Nintendo Co., Ltd.	Regulation: FCC Part15 Subpart C 15.225
Equipment: Game Controller	Test Distance: 3m
Model: HAC-013	Date: July 22, 2016
Sample No.: A161	Temperature: 26 deg.C
Power: DC 3.7 V (battery)	Humidity: 61 %RH
Mode: NFC Communication (13.56 MHz)	ENGINEER: Kenichi Adachi

Remarks: NFC type F, with Tag (axis: H: X / V: Y), Vertical polarization (antenna angle) of the worst case: 0 deg (Specification: Spec A)

Fundamental emission

No.	FREQ [MHz]	Test Receiver Reading		Antenna Factor [dB/m]	Loss [dB]	AMP GAIN [dB]	Distance factor [dB]	RESULT		LIMIT (30 m) [dBuV/m]	MARGIN	
		Hor [dBuV]	Ver [dBuV]					Hor [dBuV/m]	Ver [dBuV/m]		Hor [dB]	Ver [dB]
1	13.560	52.3	60.6	18.4	6.5	32.2	-40.0	4.9	13.2	84.0	79.1	70.8

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+Distance factor[dB]
 Distance factor: $40 \times \log(3 \text{ m}/30 \text{ m}) = -40 \text{ dB}$
 Limits (30 m)
 • 13.553 MHz to 13.567 MHz : 83.9 dBuV/m (FCC 15.225(a))

Spurious emission within the band

No.	FREQ [MHz]	Test Receiver Reading		Antenna Factor [dB/m]	Loss [dB]	AMP GAIN [dB]	Distance factor [dB]	RESULT		LIMIT (30 m) [dBuV/m]	MARGIN	
		Hor [dBuV]	Ver [dBuV]					Hor [dBuV/m]	Ver [dBuV/m]		Hor [dB]	Ver [dB]
1	12.925	30.1	30.1	18.4	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.8	46.7
2	13.110	30.1	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.8	46.7
3	13.347	30.1	30.1	18.4	6.5	32.2	-40.0	-17.2	-17.2	40.5	57.7	57.7
4	13.410	30.1	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	40.5	57.7	57.7
5	13.553	37.5	46.3	18.4	6.5	32.2	-40.0	-9.9	-1.1	50.5	60.3	51.6
6	13.567	37.2	45.7	18.4	6.5	32.2	-40.0	-10.2	-1.7	50.5	60.7	52.2
7	13.710	30.2	30.2	18.4	6.5	32.2	-40.0	-17.1	-17.1	40.5	57.6	57.6
8	13.778	30.2	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	40.5	57.7	57.7
9	14.010	30.2	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.1	29.5	46.7	46.7
10	14.197	30.2	30.2	18.3	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.7	46.7

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+Distance factor[dB]

Outside filed strength frequencies

- Fc ±7 kHz: 13.553 MHz to 13.567 MHz
- Fc ±150 kHz: 13.410 MHz to 13.710 MHz
- Fc ±450 kHz: 13.110 MHz to 14.010 MHz
- Fc = 13.56 MHz

Limits (30 m)

- 13.410 MHz to 13.553 MHz and 13.567 MHz to 13.710 MHz : 50.4 dBuV/m (FCC 15.225(b))
- 13.110 MHz to 13.410 MHz and 13.710 MHz to 14.010 MHz : 40.5 dBuV/m (FCC 15.225(c))
- Below 13.110 MHz and Above 14.010 MHz : 29.5 dBuV/m (FCC 15.225(d)and FCC 15.209)

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Data of Electric field strength of Fundamental emission and Spurious emission within the band: FCC15.225(a)(b)(c)

UL Japan, Inc.
Shonan EMC Lab., No.3 Semi Anechoic Chamber

Company: Nintendo Co., Ltd.	Regulation: FCC Part15 Subpart C 15.225
Equipment: Game Controller	Test Distance: 3m
Model: HAC-013	Date: July 22, 2016
Sample No.: A161	Temperature: 26 deg.C
Power: DC 3.7 V (battery)	Humidity: 61 %RH
Mode: NFC transmitting (13.56 MHz)	ENGINEER: Kenichi Adachi

Remarks: NFC type F, without Tag (axis: H: X / V: Y), Vertical polarization (antenna angle) of the worst case: 0 deg (Specification: Spec A)

Fundamental emission

No.	FREQ [MHz]	Test Receiver Reading		Antenna Factor [dB/m]	Loss [dB]	AMP GAIN [dB]	Distance factor [dB]	RESULT		LIMIT (30 m) [dBuV/m]	MARGIN	
		Hor	Ver					Hor	Ver		Hor	Ver
		[dBuV]	[dBuV]					[dBuV/m]	[dBuV/m]		[dB]	[dB]
1	13.560	53.5	62.9	18.4	6.5	32.2	-40.0	6.1	15.5	84.0	77.9	68.5

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+Distance factor[dB]

Distance factor: 40 x log (3 m/30 m) = -40 dB

Limits (30 m)

• 13.553 MHz to 13.567 MHz : 83.9 dBuV/m (FCC 15.225(a))

Spurious emission within the band

No.	FREQ [MHz]	Test Receiver Reading		Antenna Factor [dB/m]	Loss [dB]	AMP GAIN [dB]	Distance factor [dB]	RESULT		LIMIT (30 m) [dBuV/m]	MARGIN	
		Hor	Ver					Hor	Ver		Hor	Ver
		[dBuV]	[dBuV]					[dBuV/m]	[dBuV/m]		[dB]	[dB]
1	12.925	30.1	30.1	18.4	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.8	46.7
2	13.110	30.1	30.1	18.4	6.5	32.2	-40.0	-17.3	-17.2	29.5	46.8	46.8
3	13.347	30.1	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	40.5	57.7	57.7
4	13.410	30.1	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	40.5	57.7	57.7
5	13.553	37.7	48.6	18.4	6.5	32.2	-40.0	-9.6	1.2	50.5	60.1	49.3
6	13.567	37.4	47.9	18.4	6.5	32.2	-40.0	-10.0	0.6	50.5	60.5	49.9
7	13.710	30.1	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.1	40.5	57.7	57.6
8	13.778	30.2	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	40.5	57.7	57.7
9	14.010	30.2	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.1	29.5	46.7	46.7
10	14.197	30.1	30.2	18.3	6.5	32.2	-40.0	-17.3	-17.2	29.5	46.8	46.7

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+Distance factor[dB]

Outside filed strength frequencies

• Fc ±7 kHz: 13.553 MHz to 13.567 MHz

• Fc ±150 kHz: 13.410 MHz to 13.710 MHz

• Fc ±450 kHz: 13.110 MHz to 14.010 MHz

Fc = 13.56 MHz

Limits (30 m)

• 13.410 MHz to 13.553 MHz and 13.567 MHz to 13.710 MHz : 50.4 dBuV/m (FCC 15.225(b))

• 13.110 MHz to 13.410 MHz and 13.710 MHz to 14.010 MHz : 40.5 dBuV/m (FCC 15.225(c))

• Below 13.110 MHz and Above 14.010 MHz : 29.5 dBuV/m (FCC 15.225(d)and FCC 15.209)

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Radiated Emission

UL Japan, Inc.
Shonan EMC Lab. No.3 Semi Anechoic Chamber

<p>Company: Nintendo Co., Ltd. Equipment: Game Controller Model: HAC-013 Sample No.: A161 Power: DC 3.7 V (battery) Mode: NFC Communication (13.56 MHz) Remarks: Below 30 MHz(Horizontal X-axis, Vertical Y-axis), NFC type B, with Tag, Vertical polarization (antenna angle) of the worst case: 90 deg Above 30 MHz(Horizontal: Y-axis, Vertical: Y-axis), NFC type B, with Tag (Specification: Spec A)</p>	<p>Regulation: FCC Part15 Subpart C 15.225 Test Distance: 3m Date: July 22, 2016 July 23, 2016 Temperature: 26 deg C 25 deg C Humidity: 61 %RH 60 %RH ENGINEER: Kenichi Adachi Kenichi Adachi</p>
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Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	27.120	QP	30.2	18.6	6.7	32.2	-40.0	-16.6	29.5	46.1	-	139	* Limit: 30 m
Hori.	40.680	QP	41.8	13.6	6.8	32.2	0.0	30.1	40.0	9.9	334	181	
Hori.	54.240	QP	36.6	9.0	6.9	32.2	0.0	20.3	40.0	19.7	254	262	
Hori.	67.800	QP	30.7	6.2	6.8	32.2	0.0	11.5	40.0	28.5	214	22	
Hori.	81.359	QP	29.5	6.1	7.7	32.2	0.0	11.1	40.0	28.9	180	318	
Hori.	94.919	QP	40.0	8.7	7.6	32.1	0.0	24.2	43.5	19.3	269	239	
Hori.	122.039	QP	42.5	12.7	7.4	32.1	0.0	30.6	43.5	12.9	100	92	
Hori.	311.878	QP	40.1	14.2	8.8	32.0	0.0	31.1	46.0	14.9	201	121	
Hori.	827.154	QP	31.2	21.3	10.8	31.5	0.0	31.8	46.0	14.2	100	126	
Vert.	27.120	QP	39.2	18.6	6.7	32.2	-40.0	-7.6	29.5	37.1	-	348	* Limit: 30 m
Vert.	40.680	QP	47.5	13.6	6.8	32.2	0.0	35.7	40.0	4.3	100	93	
Vert.	54.240	QP	38.7	9.0	6.9	32.2	0.0	22.5	40.0	17.6	100	322	
Vert.	67.800	QP	36.0	6.2	6.8	32.2	0.0	16.8	40.0	23.2	100	94	
Vert.	81.359	QP	33.5	6.1	7.7	32.2	0.0	15.2	40.0	24.8	109	92	
Vert.	94.919	QP	45.8	8.7	7.6	32.1	0.0	30.0	43.5	13.5	100	101	
Vert.	122.039	QP	44.7	12.7	7.4	32.1	0.0	32.7	43.5	10.8	100	303	
Vert.	311.878	QP	43.8	14.2	8.8	32.0	0.0	34.8	46.0	11.2	196	114	
Vert.	827.154	QP	36.4	21.3	10.8	31.5	0.0	37.1	46.0	8.9	127	24	

Result = Reading + Ant Factor + Loss (Cable+ATT+ΔAF(above 30 MHz)) - Gain(Amprifier) + Distance factor(below 30 MHz)

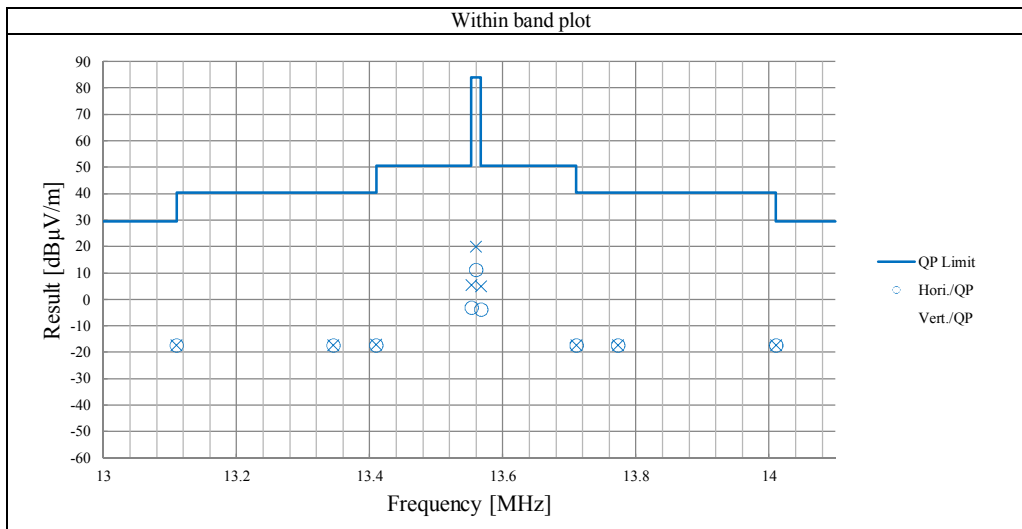
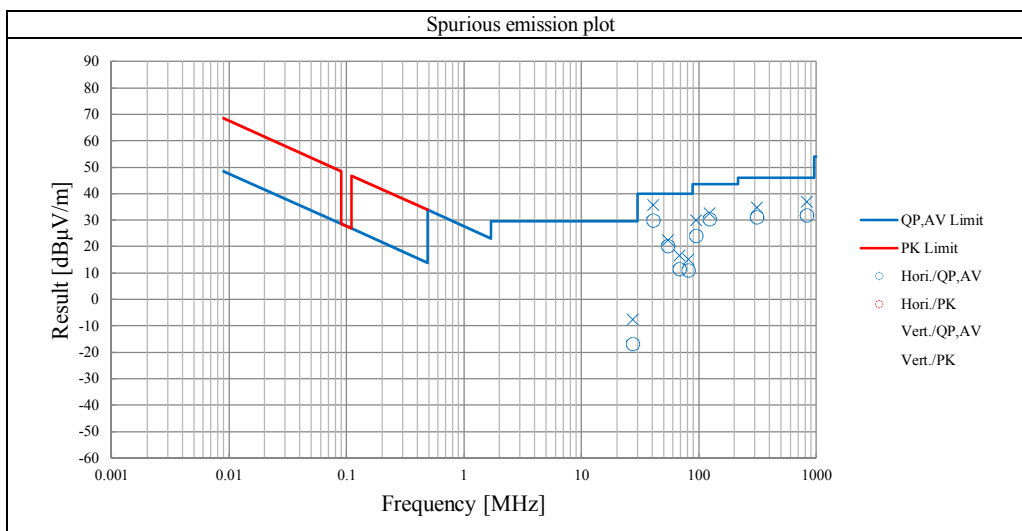
* Other frequency noises omitted in this report were not seen or have enough margin (more than 20 dB).

* Carrier level (Result at 3 m): Hor= 51.2 dBuV/m, Ver= 60 dBuV/m

Radiated Emission (Worst mode plot)

UL Japan, Inc.
Shonan EMC Lab. No.3 Semi Anechoic Chamber

Company:	Nintendo Co., Ltd.	Regulation:	FCC Part15 Subpart C 15.225
Equipment:	Game Controller	Test Distance:	3m
Model:	HAC-013	Date:	July 22, 2016 July 23, 2016
Sample No.:	A161	Temperature:	26 deg.C 25 deg.C
Power:	DC 3.7 V (battery)	Humidity:	61 %RH 60 %RH
Mode:	NFC Communication (13.56 MHz)	ENGINEER:	Kenichi Adachi Kenichi Adachi
EUT axis:	Below 30 MHz(Horizontal X-axis, Vertical Y-axis), NFC type B, with Tag, Vertical polarization (antenna angle) of the worst case: 90 deg		
Remarks:	Above 30 MHz(Horizontal: Y-axis, Vertical: Y-axis), NFC type B, with Tag These plots data contains sufficient number to show the trend of characteristic features for EUT. (Specification: Spec A)		



Data of Electric field strength of Fundamental emission and Spurious emission within the band: FCC15.225(a)(b)(c)

UL Japan, Inc.
Shonan EMC Lab., No.3 Semi Anechoic Chamber

Company: Nintendo Co., Ltd.	Regulation: FCC Part15 Subpart C 15.225
Equipment: Game Controller	Test Distance: 3m
Model: HAC-013	Date: July 23, 2016
Sample No.: C314	Temperature: 25 deg.C
Power: DC 3.7 V (battery)	Humidity: 60 %RH
Mode: NFC Communication (13.56 MHz)	ENGINEER: Kenichi Adachi

Remarks: NFC type B, with Tag (axis: H: X / V: Y), Vertical polarization (antenna angle) of the worst case: 0 deg (Specification: Spec C)

Fundamental emission

No.	FREQ [MHz]	Test Receiver Reading		Antenna Factor [dB/m]	Loss [dB]	AMP GAIN [dB]	Distance factor [dB]	RESULT		LIMIT (30 m) [dBuV/m]	MARGIN	
		Hor	Ver					Hor	Ver		Hor	Ver
		[dBuV]	[dBuV]					[dBuV/m]	[dBuV/m]		[dB]	[dB]
1	13.560	56.6	67.3	18.4	6.5	32.2	-40.0	9.3	19.9	84.0	74.7	64.1

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+Distance factor[dB]
 Distance factor: $40 \times \log(3 \text{ m}/30 \text{ m}) = -40 \text{ dB}$
 Limits (30 m)
 • 13.553 MHz to 13.567 MHz : 83.9 dBuV/m (FCC 15.225(a))

Spurious emission within the band

No.	FREQ [MHz]	Test Receiver Reading		Antenna Factor [dB/m]	Loss [dB]	AMP GAIN [dB]	Distance factor [dB]	RESULT		LIMIT (30 m) [dBuV/m]	MARGIN	
		Hor	Ver					Hor	Ver		Hor	Ver
		[dBuV]	[dBuV]					[dBuV/m]	[dBuV/m]		[dB]	[dB]
1	13.110	30.1	30.1	18.4	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.8	46.7
2	13.410	30.1	30.1	18.4	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.8	46.8
2	13.410	30.1	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	40.5	57.7	57.7
2	13.410	30.1	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	40.5	57.7	57.7
3	13.553	42.0	52.9	18.4	6.5	32.2	-40.0	-5.4	5.6	50.5	55.9	44.9
4	13.567	41.4	52.1	18.4	6.5	32.2	-40.0	-5.9	4.8	50.5	56.4	45.7
4	13.567	30.2	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	40.5	57.7	57.7
4	13.567	30.2	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	40.5	57.7	57.7
5	13.710	30.2	30.2	18.4	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.7	46.7
6	14.010	30.2	30.2	18.3	6.5	32.2	-40.0	-17.2	-17.2	29.5	46.8	46.7

Calculation: Result[dBuV/m]=Reading[dBuV]+Ant.Fac[dB/m]+Loss(Cable+ATT)[dB]-Gain(AMP)[dB]+Distance factor[dB]

Outside filed strength frequencies

- Fc ±7 kHz: 13.553 MHz to 13.567 MHz
- Fc ±150 kHz: 13.410 MHz to 13.710 MHz
- Fc ±450 kHz: 13.110 MHz to 14.010 MHz
- Fc = 13.56 MHz

Limits (30 m)

- 13.410 MHz to 13.553 MHz and 13.567 MHz to 13.710 MHz : 50.4 dBuV/m (FCC 15.225(b))
- 13.110 MHz to 13.410 MHz and 13.710 MHz to 14.010 MHz : 40.5 dBuV/m (FCC 15.225(c))
- Below 13.110 MHz and Above 14.010 MHz : 29.5 dBuV/m (FCC 15.225(d)and FCC 15.209)

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Radiated Emission

UL Japan, Inc.
Shonan EMC Lab. No.3 Semi Anechoic Chamber

<p>Company: Nintendo Co., Ltd. Equipment: Game Controller Model: HAC-013 Sample No.: C314 Power: DC 3.7 V (battery) Mode: NFC Communication (13.56 MHz) Remarks: Below 30 MHz(Horizontal X-axis, Vertical Y-axis), NFC type B, with Tag, Vertical polarization (antenna angle) of the worst case: 90 deg Above 30 MHz(Horizontal: Y-axis, Vertical: Y-axis), NFC type B, with Tag (Specification: Spec C)</p>	<p>Regulation: FCC Part15 Subpart C 15.225 Test Distance: 3m Date: July 23, 2016 Temperature: 25 deg C Humidity: 60 %RH ENGINEER: Kenichi Adachi</p>
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Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Distance Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	27.120	QP	30.2	18.6	6.7	32.2	-40.0	-16.7	29.5	46.2	-	134	* Limit: 30m
Hori.	40.680	QP	39.7	13.6	6.8	32.2	0.0	27.9	40.0	12.1	182	173	
Hori.	54.240	QP	36.3	9.0	6.9	32.2	0.0	20.0	40.0	20.0	400	83	
Hori.	67.800	QP	32.9	6.2	6.8	32.2	0.0	13.7	40.0	26.3	304	136	
Hori.	94.920	QP	39.0	8.7	7.6	32.1	0.0	23.2	43.5	20.3	181	0	
Hori.	122.040	QP	31.8	12.7	7.4	32.1	0.0	19.8	43.5	23.7	132	0	
Hori.	149.159	QP	38.6	14.6	7.9	32.1	0.0	28.9	43.5	14.6	141	0	
Hori.	203.399	QP	33.9	16.3	8.1	32.1	0.0	26.3	43.5	17.3	158	268	
Hori.	338.999	QP	32.7	14.7	8.9	31.9	0.0	24.3	46.0	21.7	158	126	
Hori.	420.358	QP	28.0	16.3	9.3	32.0	0.0	21.5	46.0	24.5	158	172	
Hori.	827.155	QP	33.6	21.3	10.8	31.5	0.0	34.2	46.0	11.8	100	8	
Vert.	27.120	QP	39.4	18.6	6.7	32.2	-40.0	-7.5	29.5	37.0	-	348	* Limit: 30m
Vert.	40.680	QP	46.2	13.6	6.8	32.2	0.0	34.4	40.0	5.6	100	274	
Vert.	54.240	QP	37.2	9.0	6.9	32.2	0.0	20.9	40.0	19.1	100	312	
Vert.	67.800	QP	39.9	6.2	6.8	32.2	0.0	20.8	40.0	19.2	100	265	
Vert.	94.920	QP	44.9	8.7	7.6	32.1	0.0	29.0	43.5	14.5	100	91	
Vert.	122.040	QP	37.5	12.7	7.4	32.1	0.0	25.5	43.5	18.0	100	88	
Vert.	149.159	QP	30.3	14.6	7.9	32.1	0.0	20.6	43.5	22.9	100	92	
Vert.	203.399	QP	33.2	16.3	8.1	32.1	0.0	25.6	43.5	17.9	100	111	
Vert.	338.999	QP	33.4	14.7	8.9	31.9	0.0	25.1	46.0	21.0	159	145	
Vert.	420.358	QP	32.7	16.3	9.3	32.0	0.0	26.3	46.0	19.7	133	275	
Vert.	827.155	QP	30.3	21.3	10.8	31.5	0.0	30.9	46.0	15.1	135	85	

Result = Reading + Ant Factor + Loss (Cable+ATT+ΔAF(above 30 MHz)) - Gain(Amprifier) + Distance factor(below 30 MHz)

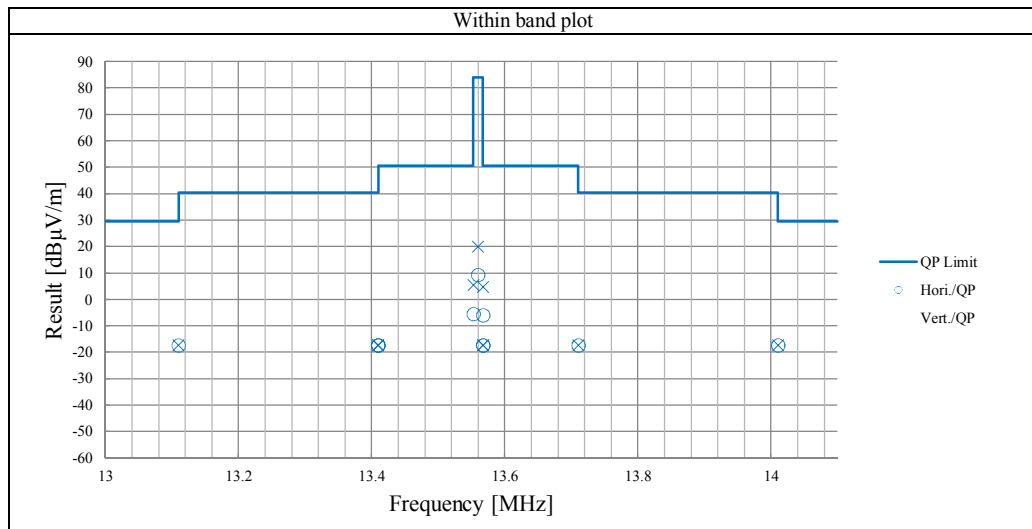
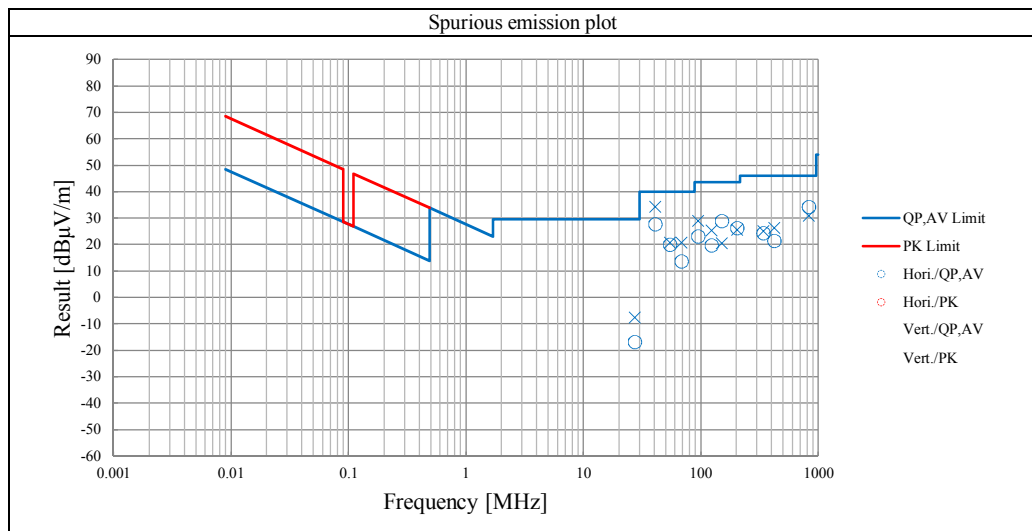
* Other frequency noises omitted in this report were not seen or have enough margin (more than 20 dB).

* Carrier level (Result at 3 m): Hor= 49.3 dBuV/m, Ver= 59.9 dBuV/m

Radiated Emission (Worst mode plot)

UL Japan, Inc.
Shonan EMC Lab. No.3 Semi Anechoic Chamber

Company: Nintendo Co., Ltd. Equipment: Game Controller Model: HAC-013 Sample No.: C314 Power: DC 3.7 V (battery) Mode: NFC Communication (13.56 MHz) EUT axis: Below 30 MHz(Horizontal X-axis, Vertical Y-axis), NFC type B, with Tag, Vertical polarization (antenna angle) of the worst case: 90 deg Above 30 MHz(Horizontal: Y-axis, Vertical: Y-axis), NFC type B, with Tag Remarks: These plots data contains sufficient number to show the trend of characteristic features for EUT. (Specification: Spec C)	Regulation: FCC Part15 Subpart C 15.225 Test Distance: 3m Date: July 23, 2016 Temperature: 25 deg.C Humidity: 60 %RH ENGINEER: Kenichi Adachi
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Data of Frequency Tolerance

UL Japan, Inc.

Shonan EMC Lab. No.5 Shielded room

Company Nintendo Co., Ltd.
 Equipment Game controller
 Model HAC-013
 Serial No. A176
 Power DC 3.7V
 Mode NFC transmitting (13.56 MHz)
 (carrier output mode)

Regulation FCC Part15 Subpart C 15.225 (e)
 Date August 7, 2016
 Temperature 26 deg.C
 Humidity 53 %RH
 ENGINEER Kenichi Adachi

Temperature Variation: -20deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559928	-0.000072	-0.00053	0.010
after 2 minutes	13.56	13.559940	-0.000060	-0.00044	0.010
after 5 minutes	13.56	13.559943	-0.000057	-0.00042	0.010
after 10 minutes	13.56	13.559944	-0.000056	-0.00041	0.010

Temperature Variation: -10deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559968	-0.000032	-0.00024	0.010
after 2 minutes	13.56	13.559976	-0.000024	-0.00018	0.010
after 5 minutes	13.56	13.559978	-0.000022	-0.00016	0.010
after 10 minutes	13.56	13.559979	-0.000021	-0.00015	0.010

Temperature Variation: 0deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559997	-0.000003	-0.00002	0.010
after 2 minutes	13.56	13.559998	-0.000002	-0.00001	0.010
after 5 minutes	13.56	13.559998	-0.000002	-0.00001	0.010
after 10 minutes	13.56	13.559998	-0.000002	-0.00001	0.010

Temperature Variation: 10deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559987	-0.000013	-0.00010	0.010
after 2 minutes	13.56	13.559985	-0.000015	-0.00011	0.010
after 5 minutes	13.56	13.559984	-0.000016	-0.00012	0.010
after 10 minutes	13.56	13.559983	-0.000017	-0.00013	0.010

Temperature Variation: 20deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559972	-0.000028	-0.00021	0.010
after 2 minutes	13.56	13.559969	-0.000031	-0.00023	0.010
after 5 minutes	13.56	13.559967	-0.000033	-0.00024	0.010
after 10 minutes	13.56	13.559966	-0.000034	-0.00025	0.010

UL Japan, Inc.

Shonan EMC Lab.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa 259-1220 JAPAN

Telephone : +81 463 50 6400

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Data of Frequency Tolerance

Temperature Variation: 30deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559957	-0.000043	-0.00032	0.010
after 2 minutes	13.56	13.559953	-0.000047	-0.00035	0.010
after 5 minutes	13.56	13.559952	-0.000048	-0.00035	0.010
after 10 minutes	13.56	13.559951	-0.000049	-0.00036	0.010

Temperature Variation: 40deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559949	-0.000051	-0.00038	0.010
after 2 minutes	13.56	13.559946	-0.000054	-0.00040	0.010
after 5 minutes	13.56	13.559947	-0.000053	-0.00039	0.010
after 10 minutes	13.56	13.559947	-0.000053	-0.00039	0.010

Temperature Variation: 50deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559946	-0.000054	-0.00040	0.010
after 2 minutes	13.56	13.559950	-0.000050	-0.00037	0.010
after 5 minutes	13.56	13.559951	-0.000049	-0.00036	0.010
after 10 minutes	13.56	13.559952	-0.000048	-0.00035	0.010

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Data of Frequency Tolerance

UL Japan, Inc.

Shonan EMC Lab. No.5 Shielded room

Company Nintendo Co., Ltd.

Equipment Game controller

Model HAC-013

Serial No. C279

Power DC 3.7V

Mode NFC transmitting (13.56 MHz)
(carrier output mode)

Regulation FCC Part15 Subpart C 15.225 (e)

Date August 7, 2016

Temperature 26 deg.C

Humidity 53 %RH

ENGINEER Kenichi Adachi

Temperature Variation: -20deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559970	-0.000030	-0.00022	0.010
after 2 minutes	13.56	13.559982	-0.000018	-0.00013	0.010
after 5 minutes	13.56	13.559985	-0.000015	-0.00011	0.010
after 10 minutes	13.56	13.559987	-0.000013	-0.00010	0.010

Temperature Variation: -10deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560002	0.000002	0.00001	0.010
after 2 minutes	13.56	13.560008	0.000008	0.00006	0.010
after 5 minutes	13.56	13.560009	0.000009	0.00007	0.010
after 10 minutes	13.56	13.560010	0.000010	0.00007	0.010

Temperature Variation: 0deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.560009	0.000009	0.00007	0.010
after 2 minutes	13.56	13.560007	0.000007	0.00005	0.010
after 5 minutes	13.56	13.560007	0.000007	0.00005	0.010
after 10 minutes	13.56	13.560007	0.000007	0.00005	0.010

Temperature Variation: 10deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559978	-0.000022	-0.00016	0.010
after 2 minutes	13.56	13.559974	-0.000026	-0.00019	0.010
after 5 minutes	13.56	13.559973	-0.000027	-0.00020	0.010
after 10 minutes	13.56	13.559974	-0.000026	-0.00019	0.010

Temperature Variation: 20deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559963	-0.000037	-0.00027	0.010
after 2 minutes	13.56	13.559956	-0.000044	-0.00032	0.010
after 5 minutes	13.56	13.559953	-0.000047	-0.00035	0.010
after 10 minutes	13.56	13.559952	-0.000048	-0.00035	0.010

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Data of Frequency Tolerance

Temperature Variation: 30deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559934	-0.000066	-0.00049	0.010
after 2 minutes	13.56	13.559926	-0.000074	-0.00055	0.010
after 5 minutes	13.56	13.559925	-0.000075	-0.00055	0.010
after 10 minutes	13.56	13.559923	-0.000077	-0.00057	0.010

Temperature Variation: 40deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559913	-0.000087	-0.00064	0.010
after 2 minutes	13.56	13.559906	-0.000094	-0.00069	0.010
after 5 minutes	13.56	13.559905	-0.000095	-0.00070	0.010
after 10 minutes	13.56	13.559904	-0.000096	-0.00071	0.010

Temperature Variation: 50deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559901	-0.000099	-0.00073	0.010
after 2 minutes	13.56	13.559899	-0.000101	-0.00074	0.010
after 5 minutes	13.56	13.559899	-0.000101	-0.00074	0.010
after 10 minutes	13.56	13.559898	-0.000102	-0.00075	0.010

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Data of Frequency Tolerance

UL Japan, Inc.

Shonan EMC Lab. No.5 Shielded room

Company Nintendo Co., Ltd.

Equipment Game controller

Model HAC-013

Serial No. A176

Power DC 3.7V

Mode NFC transmitting (13.56 MHz)
(carrier output mode)

Regulation FCC Part15 Subpart C 15.225 (e)

Date August 7, 2016

Temperature 26 deg.C

Humidity 53 %RH

ENGINEER Kenichi Adachi

Voltage Variation: DC 4.255 V**Temperature Variation: 20deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559968	-0.000032	-0.00024	0.010
after 2 minutes	13.56	13.559966	-0.000034	-0.00025	0.010
after 5 minutes	13.56	13.559965	-0.000035	-0.00026	0.010
after 10 minutes	13.56	13.559964	-0.000036	-0.00027	0.010

Voltage Variation: DC 3.7 V**Temperature Variation: 20deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559972	-0.000028	-0.00021	0.010
after 2 minutes	13.56	13.559969	-0.000031	-0.00023	0.010
after 5 minutes	13.56	13.559967	-0.000033	-0.00024	0.010
after 10 minutes	13.56	13.559966	-0.000034	-0.00025	0.010

Voltage Variation: DC 3.145 V (Reference data)**Temperature Variation: 20deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559968	-0.000032	-0.00024	0.010
after 2 minutes	13.56	13.559966	-0.000034	-0.00025	0.010
after 5 minutes	13.56	13.559966	-0.000034	-0.00025	0.010
after 10 minutes	13.56	13.559965	-0.000035	-0.00026	0.010

Voltage Variation: 1.83 V (end point voltage)**Temperature Variation: 20deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559966	-0.000034	-0.00025	0.010
after 2 minutes	13.56	13.559966	-0.000034	-0.00025	0.010
after 5 minutes	13.56	13.559967	-0.000033	-0.00024	0.010
after 10 minutes	13.56	13.559967	-0.000033	-0.00024	0.010

* Voltage 1.82 V: EUT can't transmit fundamental emission

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Data of Frequency Tolerance

UL Japan, Inc.

Shonan EMC Lab. No.5 Shielded room

Company Nintendo Co., Ltd.

Equipment Game controller

Model HAC-013

Serial No. C279

Power DC 3.7V

Mode NFC transmitting (13.56 MHz)
(carrier output mode)

Regulation FCC Part15 Subpart C 15.225 (e)

Date August 7, 2016

Temperature 26 deg.C

Humidity 53 %RH

ENGINEER Kenichi Adachi

Voltage Variation: DC 4.255 V**Temperature Variation: 20deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559954	-0.000046	-0.00034	0.010
after 2 minutes	13.56	13.559949	-0.000051	-0.00038	0.010
after 5 minutes	13.56	13.559947	-0.000053	-0.00039	0.010
after 10 minutes	13.56	13.559945	-0.000055	-0.00041	0.010

Voltage Variation: DC 3.7 V**Temperature Variation: 20deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559963	-0.000037	-0.00027	0.010
after 2 minutes	13.56	13.559956	-0.000044	-0.00032	0.010
after 5 minutes	13.56	13.559953	-0.000047	-0.00035	0.010
after 10 minutes	13.56	13.559952	-0.000048	-0.00035	0.010

Voltage Variation: DC 3.145 V (Reference data)**Temperature Variation: 20deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559955	-0.000045	-0.00033	0.010
after 2 minutes	13.56	13.559953	-0.000047	-0.00035	0.010
after 5 minutes	13.56	13.559953	-0.000047	-0.00035	0.010
after 10 minutes	13.56	13.559952	-0.000048	-0.00035	0.010

Voltage Variation: 1.83 V (end point voltage)**Temperature Variation: 20deg.C**

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559966	-0.000034	-0.00025	0.010
after 2 minutes	13.56	13.559965	-0.000035	-0.00026	0.010
after 5 minutes	13.56	13.559964	-0.000036	-0.00027	0.010
after 10 minutes	13.56	13.559962	-0.000038	-0.00028	0.010

* Voltage 1.82 V: EUT can't transmit fundamental emission

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Data of Frequency Tolerance

UL Japan, Inc.

Shonan EMC Lab. No.5 Shielded room

Company Nintendo Co., Ltd.
 Equipment Game controller
 Model HAC-013
 Serial No. A176
 Power DC 5 V (from USB interface)
 Mode NFC transmitting (13.56 MHz)
 (carrier output mode)

Regulation FCC Part15 Subpart C 15.225 (e)
 Date December 8, 2016
 Temperature 22 deg.C
 Humidity 38 %RH
 ENGINEER Kenichi Adachi

Voltage Variation: DC 5.75 V

Temperature Variation: 20deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559953	-0.000047	-0.00035	0.010
after 2 minutes	13.56	13.559950	-0.000050	-0.00037	0.010
after 5 minutes	13.56	13.559948	-0.000052	-0.00038	0.010
after 10 minutes	13.56	13.559949	-0.000051	-0.00038	0.010

Voltage Variation: DC 5 V

Temperature Variation: 20deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559955	-0.000045	-0.00033	0.010
after 2 minutes	13.56	13.559951	-0.000049	-0.00036	0.010
after 5 minutes	13.56	13.559949	-0.000051	-0.00038	0.010
after 10 minutes	13.56	13.559948	-0.000052	-0.00038	0.010

Voltage Variation: DC 4.5 V

Temperature Variation: 20deg.C

* Voltage was DC 4.5 V since the EUT did not operate with the voltage below 4.5 V.

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559958	-0.000042	-0.00031	0.010
after 2 minutes	13.56	13.559954	-0.000046	-0.00034	0.010
after 5 minutes	13.56	13.559953	-0.000047	-0.00035	0.010
after 10 minutes	13.56	13.559951	-0.000049	-0.00036	0.010

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Data of Frequency Tolerance

UL Japan, Inc.

Shonan EMC Lab. No.5 Shielded room

Company Nintendo Co., Ltd.
 Equipment Game controller
 Model HAC-013
 Serial No. C279
 Power DC 5 V (from USB interface)
 Mode NFC transmitting (13.56 MHz)
 (carrier output mode)

Regulation FCC Part15 Subpart C 15.225 (e)
 Date December 8, 2016
 Temperature 22 deg.C
 Humidity 38 %RH
 ENGINEER Kenichi Adachi

Voltage Variation: DC 5.75 V

Temperature Variation: 20deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559961	-0.000039	-0.00029	0.010
after 2 minutes	13.56	13.559954	-0.000046	-0.00034	0.010
after 5 minutes	13.56	13.559952	-0.000048	-0.00035	0.010
after 10 minutes	13.56	13.559950	-0.000050	-0.00037	0.010

Voltage Variation: DC 5 V

Temperature Variation: 20deg.C

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559976	-0.000024	-0.00018	0.010
after 2 minutes	13.56	13.559960	-0.000040	-0.00029	0.010
after 5 minutes	13.56	13.559957	-0.000043	-0.00032	0.010
after 10 minutes	13.56	13.559956	-0.000044	-0.00032	0.010

Voltage Variation: DC 4.5 V

Temperature Variation: 20deg.C

* Voltage was DC 4.5 V since the EUT did not operate with the voltage below 4.5 V.

Test Conditions	Original Frequency (MHz)	Measure Frequency (MHz)	Frequency Error (MHz)	Frequency tolerance (%)	Limit (%)
startup	13.56	13.559968	-0.000032	-0.00024	0.010
after 2 minutes	13.56	13.559957	-0.000043	-0.00032	0.010
after 5 minutes	13.56	13.559955	-0.000045	-0.00033	0.010
after 10 minutes	13.56	13.559954	-0.000046	-0.00034	0.010

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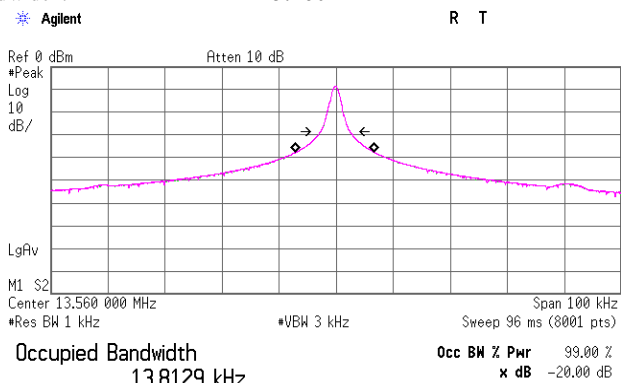
Facsimile : +81 463 50 6401

20dB bandwidth & 99% Occupied bandwidth: FCC 15.215 / RSS-Gen

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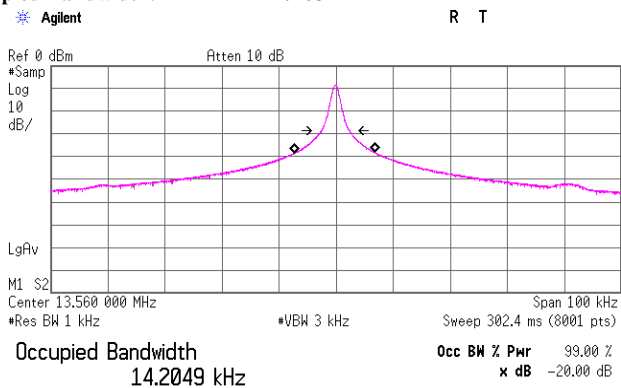
Company:	Nintendo Co., Ltd.	Regulation: FCC Part15 Subpart C 15.215
Equipment:	Game Controller	
Model:	HAC-013	Date: August 7, 2016
Sample No.:	A161	Temperature: 26 deg.C
Power:	DC 3.7 V (battery)	Humidity: 53 %RH
Mode:	NFC transmitting (13.56 MHz)	ENGINEER: Kenichi Adachi
	NFC type A, without Tag (worst width mode)	
	(Specification: Spec A)	

20dB Bandwidth: 5.160 kHz



Transmit Freq Error -254.063 Hz
x dB Bandwidth 5.160 kHz

99% Occupied Bandwidth: 14.205 kHz



Transmit Freq Error -243.593 Hz
x dB Bandwidth 4.948 kHz*

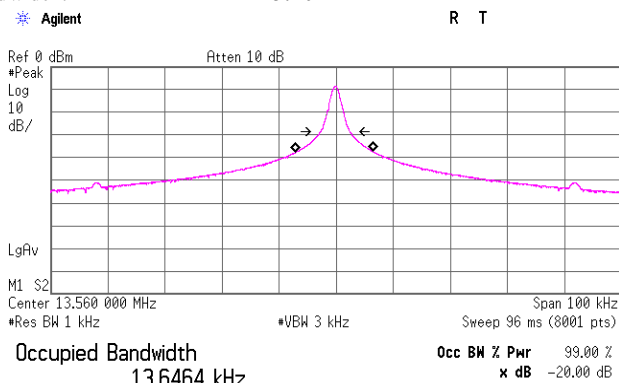
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20dB bandwidth & 99% Occupied bandwidth: FCC 15.215 / RSS-Gen

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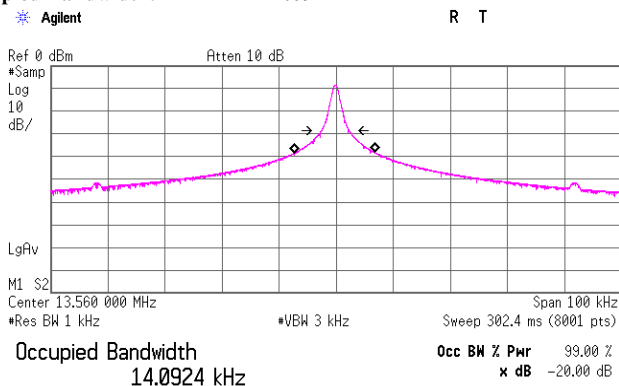
Company:	Nintendo Co., Ltd.	Regulation: FCC Part15 Subpart C 15.215
Equipment:	Game Controller	
Model:	HAC-013	Date: August 7, 2016
Sample No.:	A161	Temperature: 26 deg.C
Power:	DC 3.7 V (battery)	Humidity: 53 %RH
Mode:	NFC transmitting (13.56 MHz)	ENGINEER: Kenichi Adachi
	NFC type B, without Tag (worst width mode)	
	(Specification: Spec A)	

20dB Bandwidth: 5.102 kHz



Transmit Freq Error -269.234 Hz
x dB Bandwidth 5.102 kHz

99% Occupied Bandwidth: 14.092 kHz



Transmit Freq Error -244.498 Hz
x dB Bandwidth 4.882 kHz*

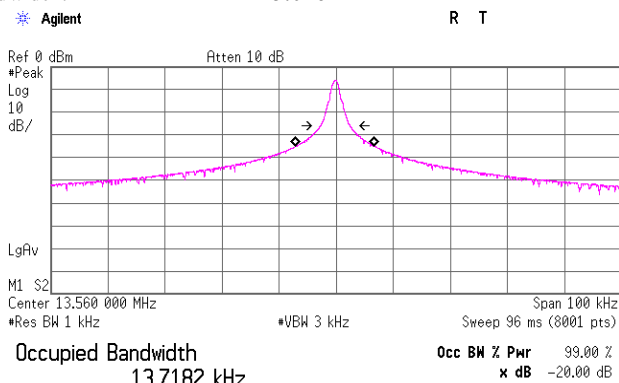
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20dB bandwidth & 99% Occupied bandwidth: FCC 15.215 / RSS-Gen

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Shonan EMC Lab. No.5 Shielded Room

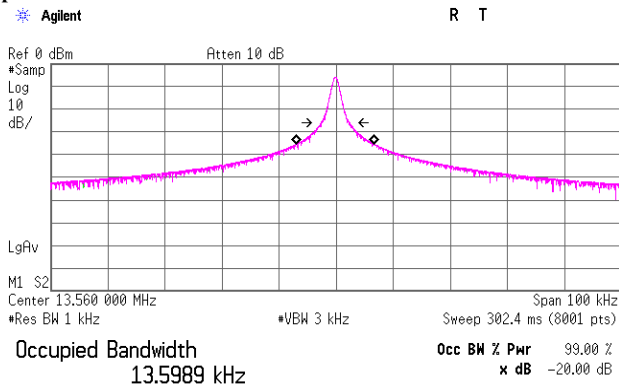
Company:	Nintendo Co., Ltd.	Regulation: FCC Part15 Subpart C 15.215
Equipment:	Game Controller	
Model:	HAC-013	Date: August 7, 2016
Sample No.:	A161	Temperature: 26 deg.C
Power:	DC 3.7 V (battery)	Humidity: 53 %RH
Mode:	NFC transmitting (13.56 MHz)	ENGINEER: Kenichi Adachi
	NFC type F, without Tag (worst width mode)	
	(Specification: Spec A)	

20dB Bandwidth: 5.026 kHz



Transmit Freq Error -283.868 Hz
x dB Bandwidth 5.026 kHz

99% Occupied Bandwidth: 13.599 kHz



Transmit Freq Error -203.821 Hz
x dB Bandwidth 4.937 kHz*

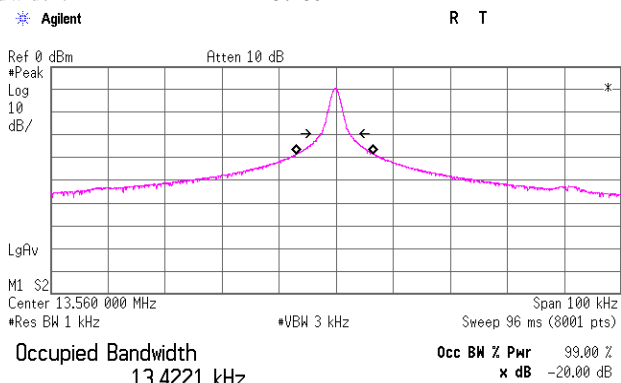
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20dB bandwidth & 99% Occupied bandwidth: FCC 15.215 / RSS-Gen

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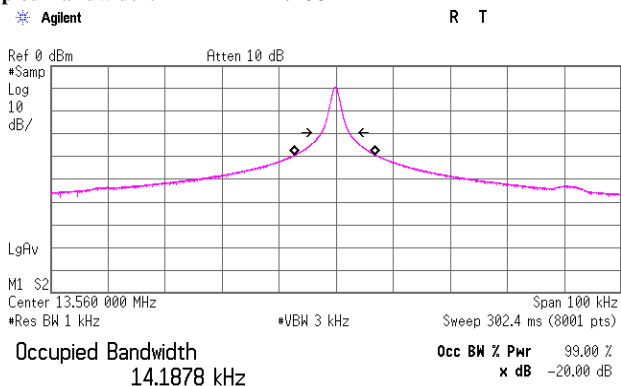
Company:	Nintendo Co., Ltd.	Regulation:	FCC Part15 Subpart C 15.215
Equipment:	Game Controller	Date:	August 7, 2016
Model:	HAC-013	Temperature:	26 deg.C
Sample No.:	C314	Humidity:	53 %RH
Power:	DC 3.7 V (battery)	ENGINEER:	Kenichi Adachi
Mode:	NFC transmitting 13.56 MHz		
	NFC type A, without Tag (worst width mode)		
	(Specification: Spec C)		

20dB Bandwidth: 5.159 kHz



Transmit Freq Error -226.453 Hz
x dB Bandwidth 5.159 kHz

99% Occupied Bandwidth: 14.188 kHz



Transmit Freq Error -239.254 Hz
x dB Bandwidth 4.929 kHz*

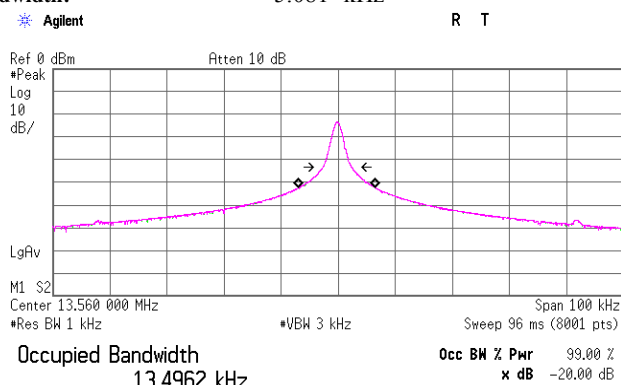
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20dB bandwidth & 99% Occupied bandwidth: FCC 15.215 / RSS-Gen

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Shonan EMC Lab. No.5 Shielded Room

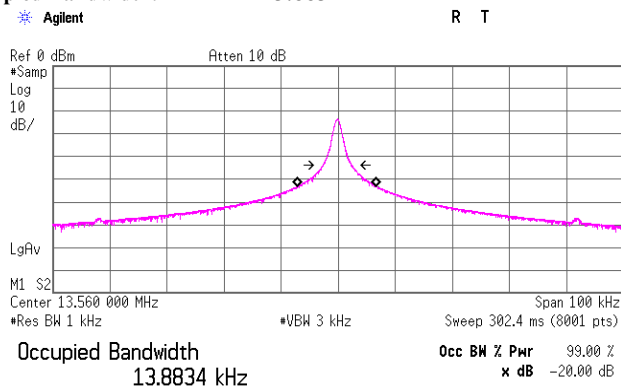
Company:	Nintendo Co., Ltd.	Regulation: FCC Part15 Subpart C 15.215
Equipment:	Game Controller	
Model:	HAC-013	Date: August 7, 2016
Sample No.:	C314	Temperature: 26 deg.C
Power:	DC 3.7 V (battery)	Humidity: 53 %RH
Mode:	NFC transmitting 13.56 MHz	ENGINEER: Kenichi Adachi
	NFC type B, without Tag (worst width mode)	
	(Specification: Spec C)	

20dB Bandwidth: 5.081 kHz



Transmit Freq Error -252.824 Hz
x dB Bandwidth 5.081 kHz

99% Occupied Bandwidth: 13.883 kHz



Transmit Freq Error -217.250 Hz
x dB Bandwidth 4.894 kHz

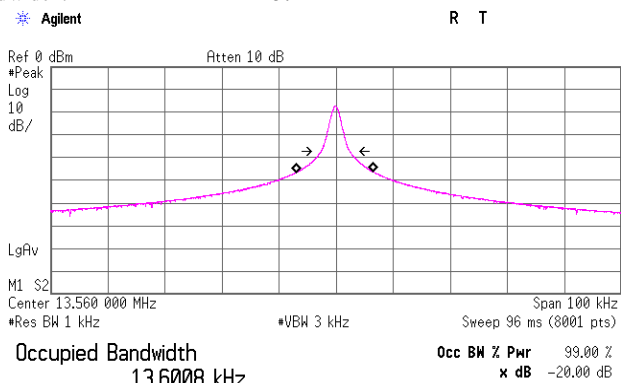
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Telephone :+81 463 50 6400
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20dB bandwidth & 99% Occupied bandwidth: FCC 15.215 / RSS-Gen

UL Japan, Inc.
Shonan EMC Lab. No.5 Shielded Room

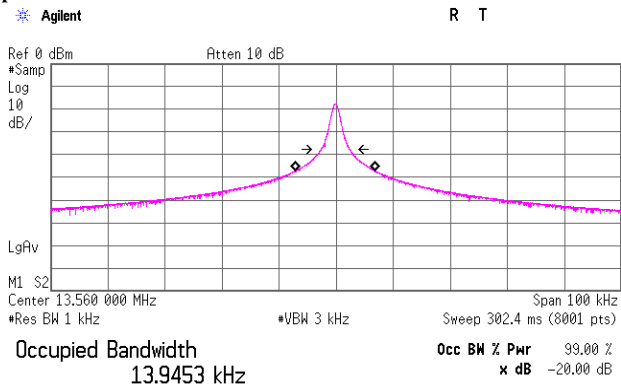
Company:	Nintendo Co., Ltd.	Regulation: FCC Part15 Subpart C 15.215
Equipment:	Game Controller	
Model:	HAC-013	Date: August 7, 2016
Sample No.:	C314	Temperature: 26 deg.C
Power:	DC 3.7 V (battery)	Humidity: 53 %RH
Mode:	NFC transmitting 13.56 MHz	ENGINEER: Kenichi Adachi
	NFC type F, without Tag (worst width mode)	
	(Specification: Spec C)	

20dB Bandwidth: 5.114 kHz



Transmit Freq Error -244.747 Hz
x dB Bandwidth 5.114 kHz

99% Occupied Bandwidth: 13.945 kHz



Transmit Freq Error -240.474 Hz
x dB Bandwidth 4.893 kHz

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APPENDIX 2 Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2016/07/15 * 12
SAEC-ALL	Semi Anechoic Chamber(ME)	TDK	Semi Anechoic Chamber 3m/10m	1, 2, 3	RE	2014/12/26 * 24
SLP-02	Loop Antenna	Rohde & Schwarz	HFH2-Z2	100218	RE	2016/10/28 * 12
SAT6-08	Attenuator	HIROSE ELECTRIC CO.,LTD.	AT-406(40)	-	RE	2016/08/04 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2016/04/22 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2016/02/25 * 12
STR-06	Test Receiver	Rohde & Schwarz	ESCI	101259	RE, CE	2016/03/28 * 12
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE, RFLMF)	-	RE, CE	-
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2016/10/12 * 12
SJM-15	Measure	ASKUL	-	-	RE, CE	-
STS-03	Digital Hitester	Hioki	3805-50	080997823	RE, CE	2016/10/17 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2016/10/18 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A0901	RE	2016/10/18 * 12
SLS-02	LISN	Rohde & Schwarz	ENV216	100512	CE (EUT)	2016/02/08 * 12
SAT3-07	Attenuator	JFW	50HF-003N	-	CE	2016/09/23 * 12
SCC-C9/C10/SRSE-03	Coaxial Cable&RF Selector	Suhner/Suhner/TOYO	RG223U/141PE/NS4906	-/0901-271(RF Selector)	CE	2016/04/22 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2016/12/13 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	TF	2016/09/26 * 12
SFC-01	Microwave Counter	Agilent	53151A	US40511493	AT	2016/04/13 * 12
SAT20-05	Attenuator	Weinschel Corp.	54A-20	Y5649	AT	2016/11/07 * 12
SCC-G13	Coaxial Cable	Suhner	SUCOFLEX 102	31599/2	AT	2016/03/23 * 12
SCC-G14	Coaxial Cable	Suhner	SUCOFLEX 102	31600/2	AT	2016/03/23 * 12
SCH-01	Temperature and Humidity Chamber	Espec	PL-1KT	14020837	AT	2016/04/14 * 12
SSCA-01	Search coil	LANGER	RF-R 400-1	02-0634	TF	Pre Check
SOS-09	Humidity Indicator	A&D	AD-5681	4061484	AT, TF	2016/12/13 * 12
KTS-07	Digital Tester	SANWA	PC500	7019232	AT, TF	2016/10/17 * 12

The expiration date of the calibration is the end of the expired month .
As for some calibrations performed after the tested dates , those test equipment have been controlled by means of an unbroken chains of calibrations .

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

Test Item :

- CE: Conducted emission,
- RE: Radiated emission,
- AT: Antenna terminal conducted test (frequency tolerance)
- TF: Test Fixture test (bandwidth)