



RADIO TEST REPORT

Test Report No. : 10310961H-A

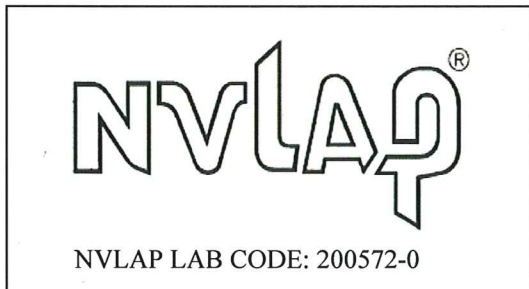
Applicant : Panasonic Corporation
Type of Equipment : SMART FOB
Model No. : HK1310A
Test regulation : FCC Part 15 Subpart C: 2014
FCC ID : ACJ932HK1310A
Test Result : Complied

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

Date of test: May 13 and 27, 2014

Representative test engineer: T. Nakagawa
Tomohisa Nakagawa
Engineer
Consumer Technology Division

Approved by: M. Imura
Motoya Imura
Engineer
Consumer Technology Division



This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address,
<http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap>

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Ise EMC Lab.

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SECTION 1: Customer information

Company Name : Panasonic Corporation
Address : 600 Saedo-cho, Tsuzuki-ku, Yokohama City 224-8539 Japan
Telephone Number : +81-45-939-1144
Facsimile Number : +81-45-939-1917
Contact Person : Masahiro Yoshii

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

2.1 Identification of E.U.T.

Type of Equipment : SMART FOB
Model No. : HK1310A
Serial No. : Refer to Clause 4.2
Receipt Date of Sample : April 24, 2014
Country of Mass-production : Japan, 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 No: HK1310A (referred to as the EUT in this report) is the SMART FOB.

General Specification

Clock frequency(ies) in the system : 13.08148MHz

Radio Specification

[Transmitter part]

Radio Type : Transceiver
Frequency of Operation : 433.92MHz
Modulation : FSK
Operating voltage (inner) : DC 3.0V
Method of Frequency Generation : Crystal
Antenna type : PCB pattern and plate antenna
Antenna Gain : -20dBi

[Receiver part]*

Radio Type : Receiver
Frequency of Operation : 125kHz
Modulation : ASK
Antenna Type : Ferrite Antenna (3 axes)
Method of Frequency Generation : None

* Receiver part was tested according to FCC Part 15 Subpart B standard. Please see UL Japan, Inc. Test Report No. 10310961H-B.

* Original test model (HK1310A) has the variant model (HK1310B).
The difference between HK1310A and HK1310B is only the case design.
The test was performed with either case which had the worst result.
They are completely identical in Radio and EMC characteristics.

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SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 15 Subpart C: 2014, final revised on May 1, 2014 and effective June 2, 2014

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.231 Periodic operation in the band 40.66 - 40.70MHz
and above 70MHz

* The revision on May 1, 2014 does not affect the test specification applied to the EUT.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
Conducted emission	FCC: ANSI C63.4:2003 7. AC powerline conducted emission measurements IC: RSS-Gen 7.2.4	FCC: Section 15.207 ----- IC: RSS-Gen 7.2.4	N/A	N/A*1)	-
Automatically Deactivate	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: -	FCC: Section 15.231(a)(1) ----- IC: RSS-210 A1.1.1	N/A	Complied	Radiated
Electric Field Strength of Fundamental Emission	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: RSS-Gen 4.8	FCC: Section 15.231(b) ----- IC: RSS-210 A1.1.2	0.4dB 433.920MHz Vertical	Complied	Radiated
Electric Field Strength of Spurious Emission	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: RSS-Gen 4.9	FCC: Section 15.205 Section 15.209 Section 15.231(b) IC: RSS-210 A1.1.2, 2.5.1 RSS-Gen 7.2.5	1.5dB 2603.520MHz Horizontal	Complied	Radiated
-20dB Bandwidth	FCC: ANSI C63.4:2003 13. Measurement of intentional radiators IC: -	FCC: Section 15.231(c) ----- IC: Reference data	N/A	Complied	Radiated

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

*1) The test is not applicable since the EUT does not have AC Mains.

FCC 15.31 (e)

This test was performed with the New Battery (DC 3.0V) and the constant voltage was supplied to the EUT during the tests. 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.

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3.3 Addition to standard

Item	Test Procedure	Specification	Worst margin	Results	Remarks
99% Occupied Bandwidth	IC: RSS-Gen 4.6.1	IC: RSS-Gen 4.6.1	N/A	Complied	Radiated

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)	Radiated emission						
	(3m*)(+dB)				(1m*)(+dB)		(0.5m*)(+dB)
	9kHz -30MHz	30MHz -300MHz	300MHz -1GHz	1GHz -10GHz	10GHz -18GHz	18GHz -26.5GHz	26.5GHz -40GHz
No.1	4.0dB	5.1dB	5.0dB	5.1dB	6.0dB	4.9dB	4.3dB
No.2	3.9dB	5.2dB	5.0dB	4.9dB	5.9dB	4.7dB	4.2dB
No.3	4.3dB	5.1dB	5.2dB	5.2dB	6.0dB	4.8dB	4.2dB
No.4	4.6dB	5.2dB	5.0dB	5.2dB	6.0dB	5.7dB	4.2dB

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

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

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	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	4.0 x 4.5 x 2.7m	4.0 x 4.5 m	-
No.6 measurement room	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	8.0 x 4.6 x 2.8m	2.4 x 2.4m	-
No.11 measurement room	-	6.2 x 4.7 x 3.0m	4.8 x 4.6m	-

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

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

Refer to APPENDIX.

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

4.1 Operating Modes

Test Item*	Mode
Duty Cycle	Normal use mode
Automatically Deactivate Electric Field Strength of Fundamental Emission Electric Field Strength of Spurious Emission -20dB & 99% Occupied Bandwidth	Transmitting mode (Tx)
* The system was configured in typical fashion (as a customer would normally use it) for testing. * End users cannot change the settings of the output power of the product.	

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4.2 Configuration and peripherals

This page has been submitted for a separate exhibit.

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SECTION 5: Radiated emission (Electric Field Strength of Fundamental and Spurious Emission)

Test Procedure and conditions

EUT was placed on a urethane platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane. The EUT was set on the center of the tabletop.
Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. Photographs of the set up are shown in Appendix 3.

[Transmitting mode]

(Below 30MHz)

The noise level was checked by moving a search-coil (Loop Antenna) close to the EUT.

(Above 30MHz)

The Radiated Electric Field Strength has been measured on Semi anechoic chamber with a ground plane and at a distance of 3m.
The measuring antenna height was varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field strength.
The measurements were performed for both vertical and horizontal antenna polarization.
The radiated emission measurements were made with the following detector function of the test receiver/spectrum analyzer.

Test Antennas are used as below;

Frequency	Below 30MHz	30MHz to 300MHz	300MHz to 1GHz	Above 1GHz
Antenna Type	Loop	Biconical	Logperiodic	Horn

	From 9kHz to 90kHz and From 110kHz to 150kHz	From 90kHz to 110kHz	From 150kHz to 490kHz	From 490kHz to 30MHz	From 30MHz to 1GHz	Above 1GHz
Detector Type	Peak	Peak	Peak	Peak	Peak and Peak with Duty factor	Peak and Peak with Duty factor
IF Bandwidth	200Hz	200Hz	9.1kHz	9.1kHz	120kHz	PK: S/A:RBW 1MHz, VBW 3MHz

- The carrier level and noise levels were measured at each position of all three axes X, Y and Z, and the position that has the maximum noise was determined.
Noise levels of all the frequencies were measured at the position.

This EUT has two modes which mechanical key is inserted or not. The worst case was confirmed with and without mechanical key, as a result, the test with mechanical key was the worst case. Therefore the test with mechanical key was performed only.

*The result is rounded off to the second decimal place, so some differences might be observed.

Measurement range : 30MHz-4.4GHz
Test data : APPENDIX
Test result : Pass

SECTION 6: Automatically deactivate

Test Procedure

The measurement was performed with Electric field strength using a spectrum analyzer.

Test data : APPENDIX
Test result : Pass

SECTION 7: -20dB and 99% Occupied Bandwidth

Test Procedure

The measurement was performed in the antenna height to gain the maximum of Electric field strength.

Test	Span	RBW	VBW	Sweep	Detector	Trace	Instrument used
20dB Bandwidth	5MHz	56kHz	150kHz	Auto	Peak	Max Hold	Spectrum Analyzer
99% Occupied Bandwidth	Enough width to display 20dB Bandwidth	1 % of Span	Three times of RBW	Auto	Peak *1)	Max Hold *1)	Spectrum Analyzer
*1) The measurement was performed with Peak detector, Max Hold since the duty cycle was not 100%.							

Test data : APPENDIX
Test result : Pass

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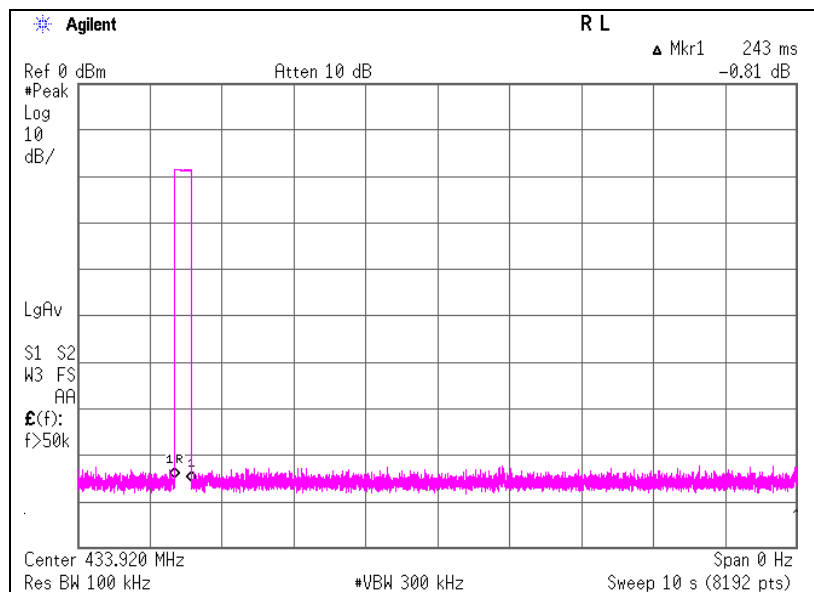
Facsimile : +81 596 24 8124

APPENDIX 1: Data of EMI test

**Automatically deactivate
Keyless system**

Test place : Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No. : 10310961H
Date : 05/13/2014
Temperature/ Humidity : 21deg. C / 56% RH
Engineer : Tomohisa Nakagawa
Mode : Transmitting mode

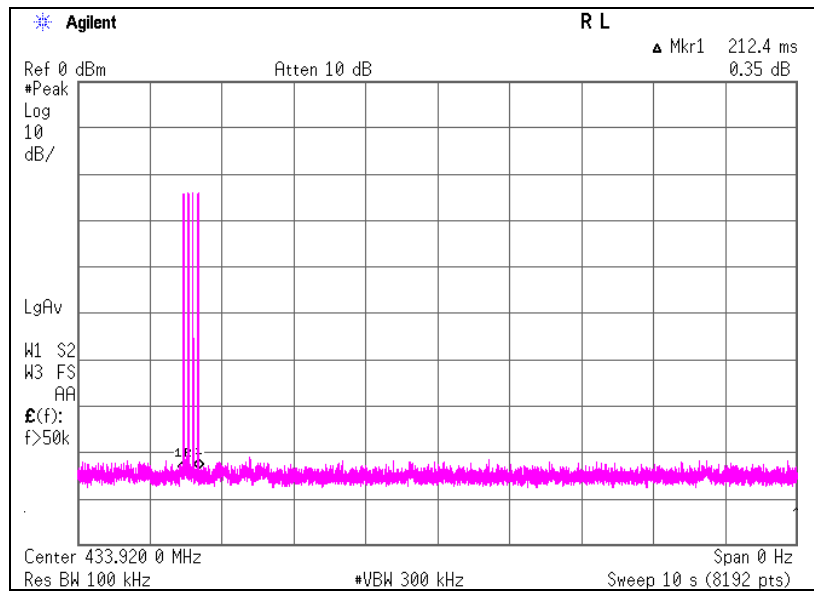
Time of Transmitting [sec]	Limit [sec]	Result
0.243	5.00	Pass



Automatically deactivate
Smart system

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	10310961H
Date	05/13/2014
Temperature/ Humidity	21deg. C / 56% RH
Engineer	Tomohisa Nakagawa
Mode	Transmitting mode

Time of Transmitting [sec]	Limit [sec]	Result
0.2124	5.00	Pass



Radiated Emission (Electric Field Strength of Fundamental and Spurious Emission)
Keyless system

Test place : Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No. : 10310961H
Date : 05/13/2014
Temperature/ Humidity : 21deg. C / 56% RH
Engineer : Tomohisa Nakagawa
Mode : Transmitting mode

PK

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit dBuV/m	Margin [dB]		Remark Inside or Outside of Restricted Bands
		Hor	Ver					Hor	Ver		Hor	Ver	
433.920	PK	81.8	82.0	17.6	9.3	28.5	-	80.2	80.4	100.8	20.6	20.4	Carrier
867.840	PK	38.2	36.0	22.0	11.0	28.0	-	43.2	41.0	80.8	37.6	39.8	Outside
1301.760	PK	49.2	52.3	25.8	1.8	35.4	-	41.4	44.5	73.9	32.5	29.4	Inside
1735.680	PK	45.5	47.4	26.9	2.1	35.0	-	39.5	41.4	80.8	41.3	39.4	Outside
2169.600	PK	45.0	45.2	27.3	2.3	34.8	-	39.8	40.0	80.8	41.0	40.8	Outside
2603.520	PK	64.2	59.0	27.1	2.6	34.6	-	59.3	54.1	80.8	21.5	26.7	Outside
3037.440	PK	57.2	55.9	28.0	2.8	34.4	-	53.6	52.3	80.8	27.2	28.5	Outside
3471.360	PK	56.1	57.4	29.1	3.1	34.0	-	54.3	55.6	80.8	26.5	25.2	Outside
3905.280	PK	50.6	50.1	30.1	3.3	33.7	-	50.3	49.8	73.9	23.6	24.1	Inside
4339.200	PK	44.5	44.0	30.9	3.5	33.8	-	45.1	44.6	73.9	28.8	29.3	Inside

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

PK with Duty factor

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit dBuV/m	Margin [dB]		Remark
		Hor	Ver					Hor	Ver		Hor	Ver	
433.920	PK	81.8	82.0	17.6	9.3	28.5	0.0	80.2	80.4	80.8	0.6	0.4	Carrier
867.840	PK	38.2	36.0	22.0	11.0	28.0	0.0	43.2	41.0	60.8	17.6	19.8	Outside
1301.760	PK	49.2	52.3	25.8	1.8	35.4	0.0	41.4	44.5	53.9	12.5	9.4	Inside
1735.680	PK	45.5	47.4	26.9	2.1	35.0	0.0	39.5	41.4	60.8	21.3	19.4	Outside
2169.600	PK	45.0	45.2	27.3	2.3	34.8	0.0	39.8	40.0	60.8	21.0	20.8	Outside
2603.520	PK	64.2	59.0	27.1	2.6	34.6	0.0	59.3	54.1	60.8	1.5	6.7	Outside
3037.440	PK	57.2	55.9	28.0	2.8	34.4	0.0	53.6	52.3	60.8	7.2	8.5	Outside
3471.360	PK	56.1	57.4	29.1	3.1	34.0	0.0	54.3	55.6	60.8	6.5	5.2	Outside
3905.280	PK	50.6	50.1	30.1	3.3	33.7	0.0	50.3	49.8	53.9	3.6	4.1	Inside
4339.200	PK	44.5	44.0	30.9	3.5	33.8	0.0	45.1	44.6	53.9	8.8	9.3	Inside

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Duty factor (Refer to Duty factor data sheet)

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

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Radiated Emission (Electric Field Strength of Fundamental and Spurious Emission)
Smart system

Test place : Ise EMC Lab. No.4 Semi Anechoic Chamber
Report No. : 10310961H
Date : 05/15/2014
Temperature/ Humidity : 24deg. C / 58% RH
Engineer : Takumi Shimada
Mode : Transmitting mode

PK

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit dBuV/m	Margin [dB]		Remark Inside or Outside of Restricted Bands
		Hor	Ver					Hor	Ver		Hor	Ver	
433.920	PK	85.4	84.9	18.1	10.8	32.0	-	82.3	81.8	100.8	18.5	19.0	Carrier
867.840	PK	31.4	30.7	23.8	13.1	31.3	-	37.0	36.3	80.8	43.8	44.5	Outside
1301.760	PK	51.8	55.2	25.2	1.9	34.4	-	44.5	47.9	73.9	29.4	26.0	Inside
1735.680	PK	42.6	42.7	26.2	2.2	33.5	-	37.5	37.6	80.8	43.3	43.2	Outside
2169.600	PK	43.1	45.2	27.5	2.5	32.9	-	40.2	42.3	80.8	40.6	38.5	Outside
2603.520	PK	59.8	53.7	28.8	2.7	32.7	-	58.6	52.5	80.8	22.2	28.3	Outside
3037.440	PK	53.6	57.5	29.3	3.0	32.5	-	53.4	57.3	80.8	27.4	23.5	Outside
3471.360	PK	56.7	57.0	29.5	3.2	32.3	-	57.1	57.4	80.8	23.7	23.4	Outside
3905.280	PK	45.6	45.9	30.9	3.3	32.2	-	47.6	47.9	73.9	26.3	26.0	Inside
4339.200	PK	42.2	41.9	31.2	3.5	32.1	-	44.8	44.5	73.9	29.1	29.4	Inside

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

PK with Duty factor

Frequency [MHz]	Detector	Reading [dBuV]		Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result [dBuV/m]		Limit dBuV/m	Margin [dB]		Remark
		Hor	Ver					Hor	Ver		Hor	Ver	
433.920	PK	85.4	84.9	18.1	10.8	32.0	-12.7	69.6	69.1	80.8	11.2	11.7	Carrier
867.840	PK	31.4	30.7	23.8	13.1	31.3	-12.7	24.3	23.6	60.8	36.5	37.2	Outside
1301.760	PK	51.8	55.2	25.2	1.9	34.4	-12.7	31.8	35.2	53.9	22.1	18.7	Inside
1735.680	PK	42.6	42.7	26.2	2.2	33.5	-12.7	24.8	24.9	60.8	36.0	35.9	Outside
2169.600	PK	43.1	45.2	27.5	2.5	32.9	-12.7	27.5	29.6	60.8	33.3	31.2	Outside
2603.520	PK	59.8	53.7	28.8	2.7	32.7	-12.7	45.9	39.8	60.8	14.9	21.0	Outside
3037.440	PK	53.6	57.5	29.3	3.0	32.5	-12.7	40.7	44.6	60.8	20.1	16.2	Outside
3471.360	PK	56.7	57.0	29.5	3.2	32.3	-12.7	44.4	44.7	60.8	16.4	16.1	Outside
3905.280	PK	45.6	45.9	30.9	3.3	32.2	-12.7	34.9	35.2	53.9	19.0	18.7	Inside
4339.200	PK	42.2	41.9	31.2	3.5	32.1	-12.7	32.1	31.8	53.9	21.8	22.1	Inside

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amplifier) + Duty factor (Refer to Duty factor data sheet)

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

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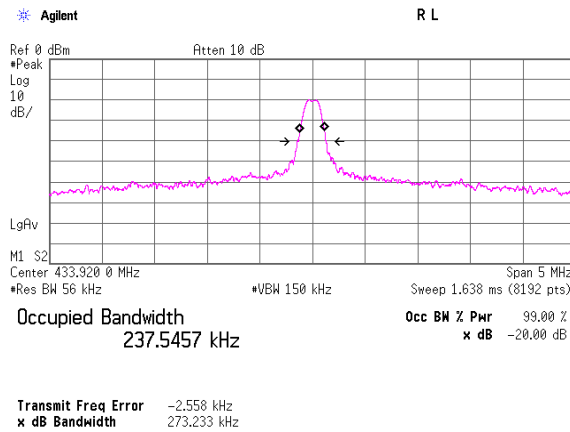
-20dB and 99% Occupied Bandwidth
Keyless system

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	10310961H
Date	05/13/2014
Temperature/ Humidity	21deg. C / 56% RH
Engineer	Tomohisa Nakagawa
Mode	Transmitting mode

Bandwidth Limit : Fundamental Frequency $433.92 \text{ MHz} \times 0.25\% = 1084.80 \text{ kHz}$

-20dB Bandwidth [kHz]	Bandwidth Limit [kHz]	Result
273.23	1084.80	Pass

99% Occupied Bandwidth [kHz]	Bandwidth Limit [kHz]	Result
237.55	1084.80	Pass



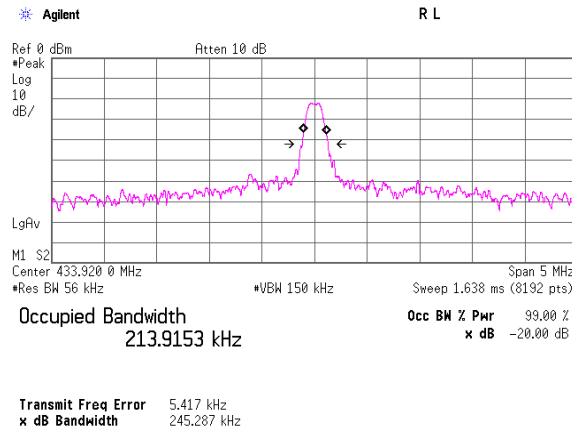
-20dB and 99% Occupied Bandwidth
Smart system

Test place	Ise EMC Lab. No.3 Semi Anechoic Chamber
Report No.	10310961H
Date	05/27/2014
Temperature/ Humidity	20deg. C / 56% RH
Engineer	Tomohisa Nakagawa
Mode	Transmitting mode

Bandwidth Limit : Fundamental Frequency $433.92 \text{ MHz} \times 0.25\% = 1084.80 \text{ kHz}$

-20dB Bandwidth [kHz]	Bandwidth Limit [kHz]	Result
245.29	1084.80	Pass

99% Occupied Bandwidth [kHz]	Bandwidth Limit [kHz]	Result
213.92	1084.80	Pass

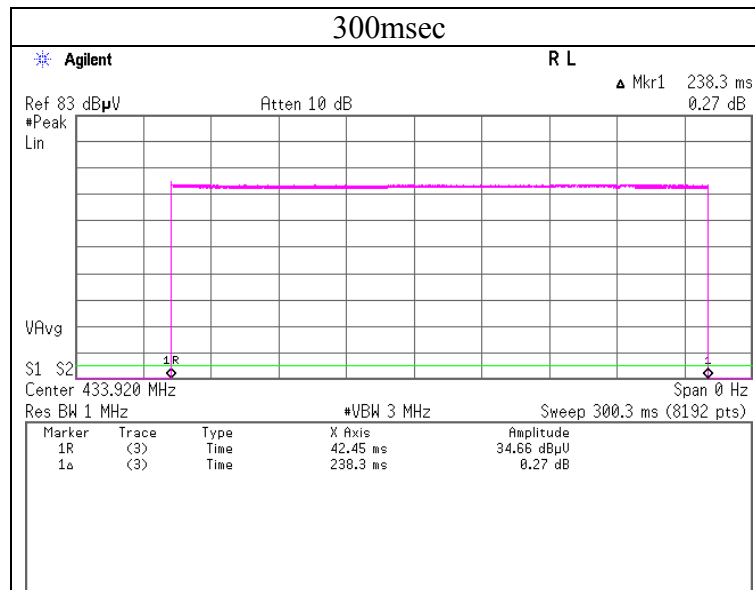
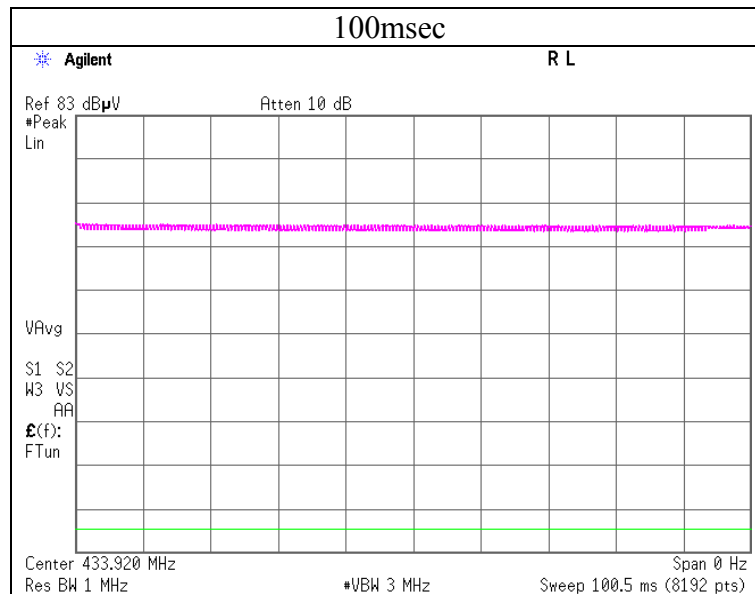


Duty Cycle Keyless system

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	10310961H
Date	05/27/2014
Temperature/ Humidity	20deg. C / 56% RH
Engineer	Tomohisa Nakagawa
Mode	Normal operation mode

(Total)

ON time [ms]	Cycle [ms]	Duty (On time/Cycle)	Duty [dB]
100.50	100.50	1.00	0.0



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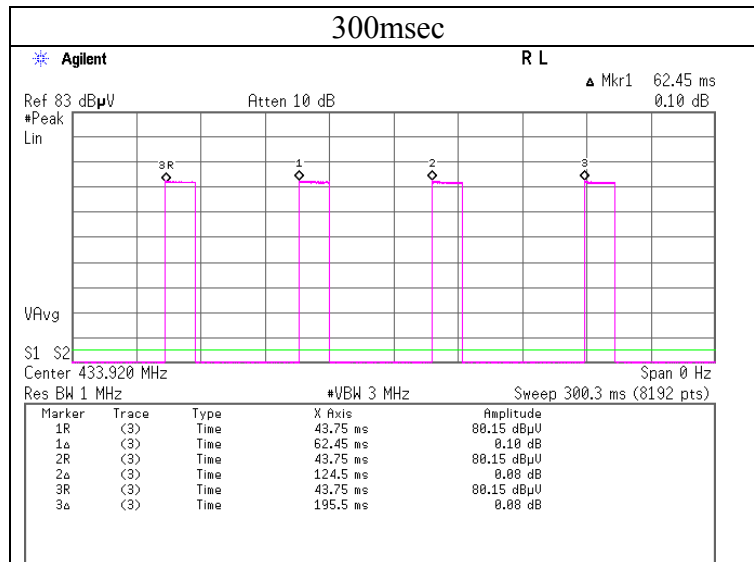
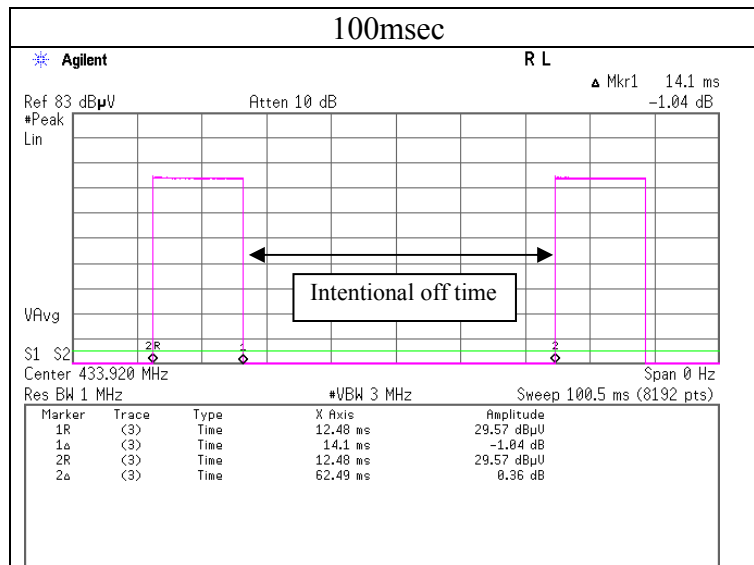
Facsimile : +81 596 24 8124

Duty Cycle Smart system

Test place	Ise EMC Lab. No.2 Semi Anechoic Chamber
Report No.	10310961H
Date	05/27/2014
Temperature/ Humidity	20deg. C / 56% RH
Engineer	Tomohisa Nakagawa
Mode	Normal operation mode

(Total)

ON time [ms]	Cycle [ms]	Duty (On time/Cycle)	Duty [dB]
14.10	62.49	0.23	-12.9



*Theoretical duty factor in application material (Theory of Operation) which submitted by customer is
 $20 \log \{13.59(\text{ms})/58.88174(\text{ms})\} \approx -12.7\text{dB}$.
Therefore the duty factor was calculated using -12.7dB severer than actual measured value.

APPENDIX 2: Test Instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2013/06/30 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2014/02/20 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2013/11/25 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2013/06/11 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2013/10/13 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2013/10/13 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2014/02/20 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2013/11/26 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2013/09/12 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2014/02/21 * 12
MCC-166	Microwave Cable	Junkosha	MWX221	1303S120(1m) / 1311S167(5m)	RE	2013/11/27 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2014/01/21 * 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:

RE: Radiated emission, 99% Occupied Bandwidth, -20dB bandwidth , Automatically deactivate and Duty cycle tests

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