EMI TEST REPORT

Test Report No. : 10064276H-R3

Applicant	:	**DENSO CORPORATION**
Type of Equipment	:	**Remote Keyless Entry System and TPMS (Receiver)**
Model No.	:	**23AAP**
FCC ID	:	**HYQ23AAP**
Test regulation	:	**FCC Part 15 Subpart B: 2013**
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 the limits of the above regulation.
4. The test results in this test 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 any agency of the Federal Government.
6. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
7. This report is a revised version of 10064276H-R2. 10064276H-R2 is replaced with this report.

Date of test: November 3 to 5, 2013

Representative test engineer:
Shinya Watanabe
Engineer of WiSE Japan,
UL Verification Service

Approved by:
Masanori Nishiyama
Manager of WiSE Japan,
UL Verification Service

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☒ There is no testing item of "Non-accreditation".

RTL02610

UL Japan, Inc.
Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
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REVISION HISTORY

Original Test Report No.: 10064276H

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10064276H	November 15, 2013	-	-
1	10064276H-R1	November 22, 2013	P. 4	Correction of Section 2.2. From 23AAB to 23AAP.
2	10064276H-R2	December 9, 2013	P. 4	Correction of Feature of EUT in Section 2.2.
2	10064276H-R2	December 9, 2013	P. 8	Addition of following sentence in Section 4.1; * Refer to the table in “Theory of Operation_ Variation_23AAP” for test mode.
3	10064276H-R3	December 16, 2013	P.13 , P.37	Correction of the description “PK” to “AV ” the third and fourth line from the top in the data table.

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CONTENTS **PAGE**

SECTION 1: Customer information

Company Name	:	DENSO CORPORATION
Address	:	1-1, Showa-cho, Kariya-shi, Aichi-ken, 448-8661, Japan
Telephone Number	:	+81-566-20-3953
Facsimile Number	:	+81-566-25-4792
Contact Person	:	MASASHI URABE

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

2.1 Identification of E.U.T.

Type of Equipment	:	Remote Keyless Entry System and TPMS (Receiver)
Model No.	:	23AAP
Serial No.	:	Refer to Section 4, Clause 4.2
Receipt Date of Sample	:	October 23, 2013
Country of Mass-production	:	Japan, United States of America
Condition of EUT	:	Engineering prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product description

Model No: 23AAP (referred to as the EUT in this report) is Remote Keyless Entry System and TPMS (Receiver).
23AAP has 15 variations. For details of variations, see “Theory of Operation”.
Hereinafter, Remote Keyless Entry System is called “RKES” in this report.

Feature of EUT:
<RKES mode>

RKE System is mainly used for locking or unlocking the doors of the vehicle.
The transmitter sends a radio wave signal while the button is pushed.
The receiver becomes active in response to the signal from the transmitter.

<TPMS mode>

Tire Pressure Monitoring System is used for monitoring and indicating information of air pressure in vehicle’s tires.
Transmitter sends the data that informs air pressure in vehicle’s tire to the receiver.
The data also includes the information of temperature, battery voltage and identity code of transmitter.
The receiver judges the data, and if the data of air pressure and others is not in a normal condition, the receiver sends signal to a warning lamp.
Then, the warning lamp warns drivers.

Type of receiving system	:	Super-heterodyne
Frequency of Operation	:	RKES (CH1): 314.35 MHz RKES (CH2): 312.10 MHz TPMS: 314.98 MHz
Oscillator Frequency	:	25.2 MHz (Crystal)
Type of Modulation	:	RKES: FSK (F1D) TPMS: FSK (F1D)
Power Supply	:	DC12.0V
Antenna Type	:	ANT1: Internal antenna (Inverse F antenna / Inverse L antenna) ANT2: External antenna

Note:
RKES: Remote Keyless Entry System
TPMS: Tire Pressure Monitoring System

SECTION 3: Test specification, procedures & results

3.1 Test specification

Test specification : FCC Part 15 Subpart C: 2013, final revised on September 30, 2013 and effective October 30, 2013

Title : FCC 47CFR Part15 Radio Frequency Device
Subpart B Unintentional Radiators

3.2 Procedures and results

Item	Test Procedure	Limits	Deviation	Worst margin	Result
Conducted emission	**FCC:** ANSI C63.4: 2003 7. AC powerline conducted emission measurements **IC:** ICES-003 4.1	Class B	N/A *1)	N/A	N/A
Radiated emission	**FCC:** ANSI C63.4: 2003 8. Radiated emission measurements **IC:** ICES-003 4.1	Class B	N/A	15.5dB 602.400MHz Vertical, QP	Complied
Antenna Terminal	**FCC:** ANSI C63.4: 2003 12. Measurement of unintentional radiators other than ITE **IC:** RSS-Gen 4.10	Receiver	N/A	31.6 dB 1520.400MHz	Complied

*Note: UL Japan, Inc's EMI Work Procedure 13-EM-W0420.
*1) The test is not applicable since the EUT is not the device that is designed to be connected to the public utility (AC) power line.

3.3 Addition to standard

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 test report has enough margin, more than the site margin.

3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999 Facsimile : +81 596 24 8124

	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.75 x 5.4 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.8 x 4.6 x 2.8m	2.4 x 2.4m	-
No.11 measurement room	-	-	3.1 x 3.4 x 3.0m	2.4 x 3.4m	-

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

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

Refer to APPENDIX.

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

4.1 Operating modes

The mode used: 1. RKES Receiving mode (312.10MHz)
2. RKES Receiving mode (314.35MHz)
3. TPMS Receiving mode (314.98MHz)

* Refer to the table in "Theory of Operation_Variation_23AAP" for test mode.

Regarding RKES Receiving mode (312.10MHz / 314.35MHz), internal antenna receiving was tested with Variation No. 11, because Variation No.11 had the highest emission level compared to the other representative variants (Variation No. 2, 5, 9, and 14) of the table in "Theory of Operation".
Also, external antenna receiving was tested with Variation No. 2 as representative, because there was no difference in circuit construction by variations.

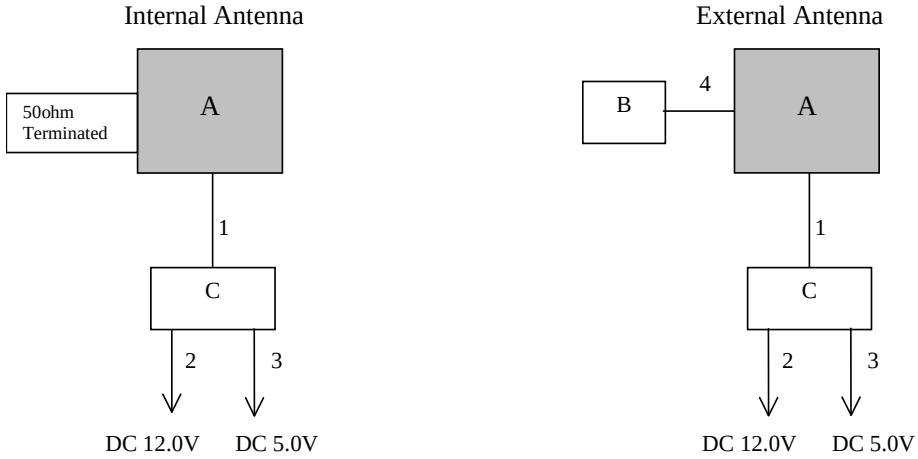
Regarding TPMS Receiving mode (314.98MHz), internal antenna receiving was tested with Variation No. 11 which was the worst-variation of RKES Receiving mode.
Also, external antenna receiving was tested with Variation No. 9 as representative, because there was no difference in circuit construction by variations.

Among Variation No.1 to 15,

- the difference due to the feeding point and antenna variation of the internal antenna was confirmed with Variation No. 2, 5, 9, 11, and 14.
- regarding External antenna, variants with External antenna were tested, which were the worst condition for EMI.

As a result, enough margin for the limit was observed.

4.2 Configuration and peripherals



*Cabling and setup were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	Remote Keyless Entry System and TPMS (Receiver)	23AAP	004 (Variation No. 11) *1) 001 (Variation No. 2) 003 (Variation No. 9) 002 (Variation No. 5) 005 (Variation No. 14)	DENSO CORPORATION	Only serial No. 004, 001, 003 were EUT. Serial No. 004 was tested in internal antenna receiving mode. Serial No. 001 was tested in external antenna receiving mode of RKES. Serial No. 003 was tested in external antenna receiving mode of TPMS. For details, see "Theory of Operation."
B	External Antenna	-	001	DENSO CORPORATION	-
C	Checker	-	-	DENSO CORPORATION	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Signal Cable	1.2	Unshielded	Unshielded	-
2	DC Cable	1.1	Unshielded	Unshielded	-
3	DC Cable	1.1	Unshielded	Unshielded	-
4	Antenna Cable	0.2	Shielded	Shielded	-

***1) Variations owing to antenna matching (Inverse F Antenna Type**) *See "Theory of Operation" for details.
TYPE4 which was used for the tests has 308 "Capacitor 5pF" and 309 "Nothing".
The result of Radiated emission test was mainly from characteristics of Local Oscillator.
If the range of 306, 307, 308 and 309 becomes "Capacitor 0.5 - 100pF", or "Inductor 1 - 100nH", there is no influence on the result of Radiated emission test.

SECTION 5: Radiated Emission

5.1 Operating environment

Test place : No.4 semi anechoic chamber
Temperature : See data
Humidity : See data

5.2 Test configuration

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

5.3 Test conditions

Frequency range : 30MHz-300MHz (Biconical antenna) / 300MHz-1000MHz (Logperiodic antenna)
1000MHz -2000MHz (Horn antenna)
Test distance : 3m
EUT position : Table top
EUT operation mode : See Clause 4.1

5.4 Test procedure

The height of the measuring antenna varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.
The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver, or the Spectrum Analyzer.
The radiated emission measurements were made with the following detector function of the test receiver and the Spectrum analyzer.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer
IF Bandwidth	QP: BW 120kHz	PK: RBW:1MHz/VBW: 3MHz AV *1): RBW:1MHz/VBW:10Hz

*1) When using Spectrum analyzer, the test was made with adjusting span to zero by using peak hold.

- The 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.

5.5 Test result

Summary of the test results: Pass

Date: November 3 and 4, 2013 Test engineer: Shinya Watanabe

SECTION 6: Antenna Terminal

6.1 Operating environment

Test place : No.6 Measurement room
Temperature : See data
Humidity : See data

6.2 Test configuration

EUT was placed on a wooden table of nominal size, 1.0m by 1.5m, raised 0.8m from the ground.
Photographs of the set up are shown in Appendix 3.

6.3 Test conditions

Frequency range : 30MHz-1000MHz / 1000MHz-2000MHz
Test distance : N/A
EUT position : Table top
EUT operation mode : See Clause 4.1

6.4 Test procedure

The Antenna Terminal was measured with a spectrum analyzer connected to the antenna port.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Spectrum Analyzer	Spectrum Analyzer
IF Bandwidth	PK: RBW:100kHz/VBW: 100kHz	PK: RBW:1MHz/VBW: 3MHz

6.5 Test result

Summary of the test results: Pass

Date: November 5, 2013 Test engineer: Shinya Watanabe

APPENDIX 1: Data of EMI test

Radiated Emission

Variation No. 11 Internal Antenna

(Below 1GHz)

DATA OF RADIATED EMISSION TEST

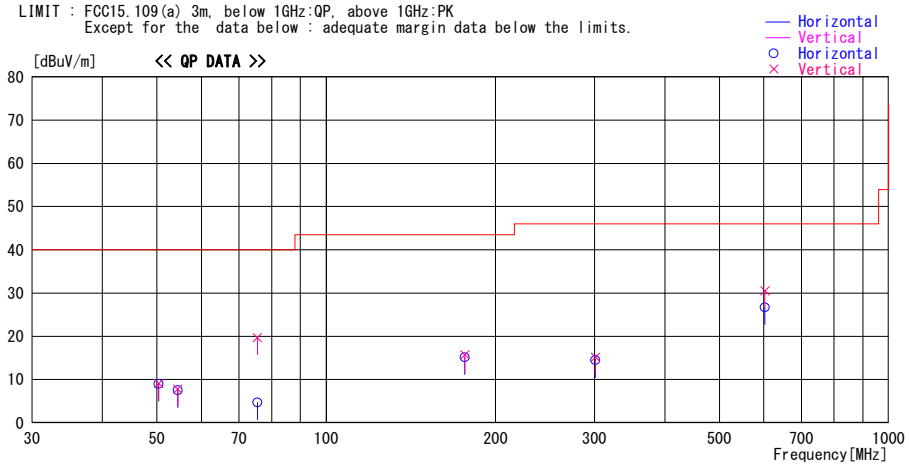
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/03

Report No. : 10064276H

Temp./Humi. : 21deg. C / 56% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 312.1MHz Axis(Hori:X , Vert:X)

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



Frequency [MHz]	Reading [dBuV]	DET	Antenna Factor [dB/m]	Loss& Gain [dB]	Level [dBuV/m]	Angle [Deg]	Height [cm]	Polar.	Limit [dBuV/m]	Margin [dB]
50.400	22.9	QP	10.8	-24.7	9.0	0	100	Hori.	40.0	31.0
50.400	23.0	QP	10.8	-24.7	9.1	0	100	Vert.	40.0	30.9
54.500	22.9	QP	9.3	-24.7	7.5	0	100	Hori.	40.0	32.5
54.500	23.2	QP	9.3	-24.7	7.8	0	100	Vert.	40.0	32.2
75.451	22.6	QP	6.6	-24.5	4.7	0	100	Hori.	40.0	35.3
75.451	37.6	QP	6.6	-24.5	19.7	77	100	Vert.	40.0	20.3
176.400	22.3	QP	16.0	-23.2	15.1	0	100	Hori.	43.5	28.4
176.400	22.9	QP	16.0	-23.2	15.7	0	100	Vert.	43.5	27.8
301.200	22.5	QP	14.2	-22.2	14.5	0	100	Hori.	46.0	31.5
301.200	23.2	QP	14.2	-22.2	15.2	0	100	Vert.	46.0	30.8
602.400	27.5	QP	19.5	-20.3	26.7	43	136	Hori.	46.0	19.3
602.400	31.3	QP	19.5	-20.3	30.5	19	100	Vert.	46.0	15.5

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

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

Radiated Emission

Variation No. 11 Internal Antenna

(Above 1GHz)

DATA OF RADIATED EMISSION TEST

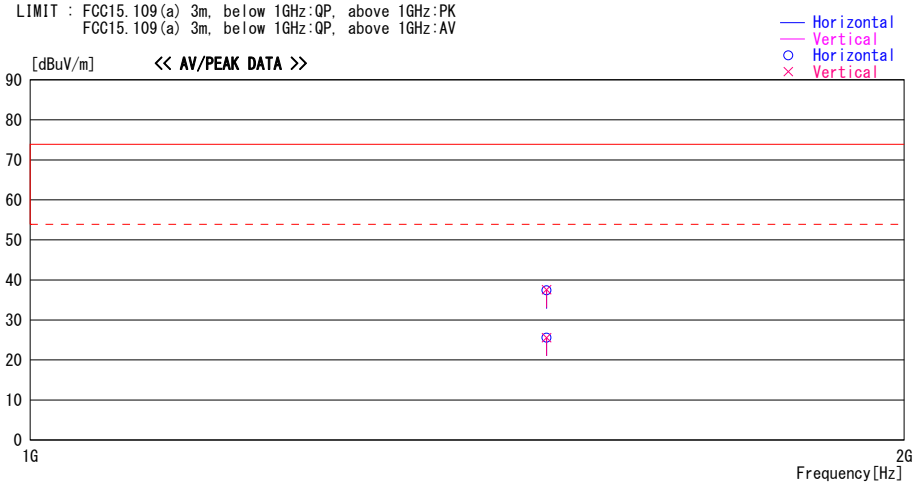
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 312.1MHz Axis(Hori:X , Vert:X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
1506.000	43.3	PK	25.7	-31.6	37.4	0	100	Hori.	73.9	36.5
1506.000	43.5	PK	25.7	-31.6	37.6	0	100	Vert.	73.9	36.3
1506.000	31.5	AV	25.7	-31.6	25.6	0	100	Hori.	53.9	28.3
1506.000	31.5	AV	25.7	-31.6	25.6	0	100	Vert.	53.9	28.3

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

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

Radiated Emission

Variation No. 11 Internal Antenna

(Below 1GHz)

DATA OF RADIATED EMISSION TEST

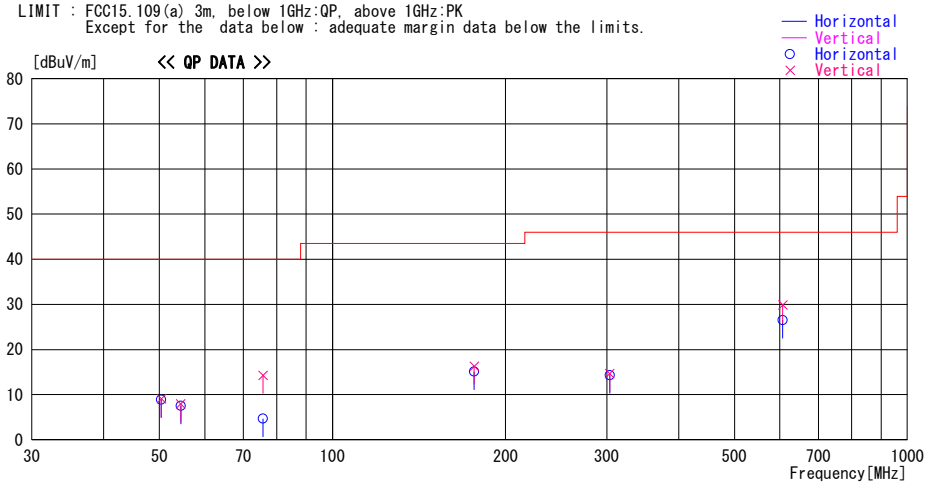
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/03

Report No. : 10064276H

Temp./Humi. : 21deg. C / 56% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 314.35MHz Axis(Hori:X , Vert:X)

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



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
50.400	22.8	QP	10.8	-24.7	8.9	0	100	Hori.	40.0	31.1
50.400	23.0	QP	10.8	-24.7	9.1	0	100	Vert.	40.0	30.9
54.500	22.9	QP	9.3	-24.7	7.5	0	100	Hori.	40.0	32.5
54.500	23.4	QP	9.3	-24.7	8.0	0	100	Vert.	40.0	32.0
75.750	22.6	QP	6.6	-24.5	4.7	0	100	Hori.	40.0	35.3
75.750	32.2	QP	6.6	-24.5	14.3	97	100	Vert.	40.0	25.7
176.400	22.3	QP	16.0	-23.2	15.1	0	100	Hori.	43.5	28.4
176.400	23.5	QP	16.0	-23.2	16.3	0	100	Vert.	43.5	27.2
303.450	22.1	QP	14.3	-22.1	14.3	0	100	Hori.	46.0	31.7
303.450	22.5	QP	14.3	-22.1	14.7	0	100	Vert.	46.0	31.3
606.900	27.2	QP	19.6	-20.3	26.5	55	138	Hori.	46.0	19.5
606.900	30.6	QP	19.6	-20.3	29.9	23	100	Vert.	46.0	16.1

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

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

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Radiated Emission

Variation No. 11 Internal Antenna

(Above 1GHz)

DATA OF RADIATED EMISSION TEST

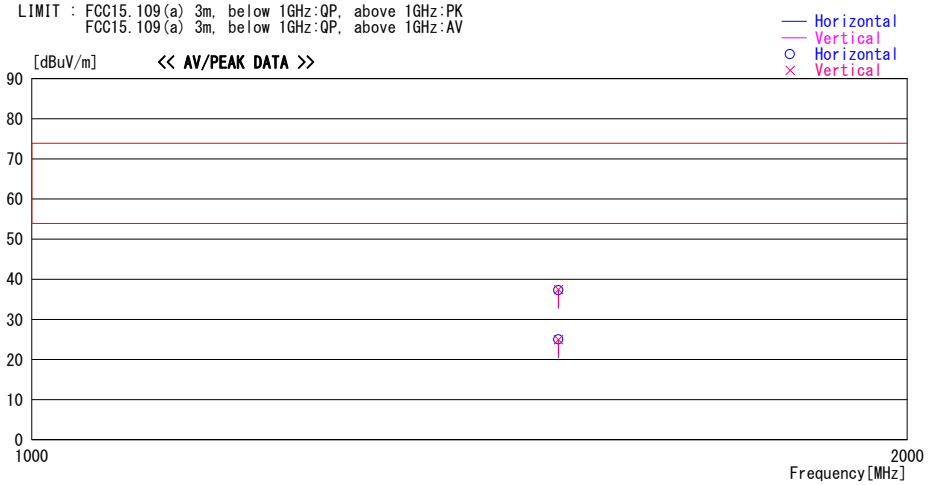
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 314.35MHz Axis(Hori:X , Vert:X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
1517.250	43.1	PK	25.8	-31.6	37.3	0	100	Hori.	73.9	36.6
1517.250	43.2	PK	25.8	-31.6	37.4	0	100	Vert.	73.9	36.5
1517.250	30.8	AV	25.8	-31.6	25.0	0	100	Hori.	53.9	28.9
1517.250	30.8	AV	25.8	-31.6	25.0	0	100	Vert.	53.9	28.9

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

*The limit is rounded down to one decimal place.
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Radiated Emission

Variation No. 11 Internal Antenna

(Below 1GHz)

DATA OF RADIATED EMISSION TEST

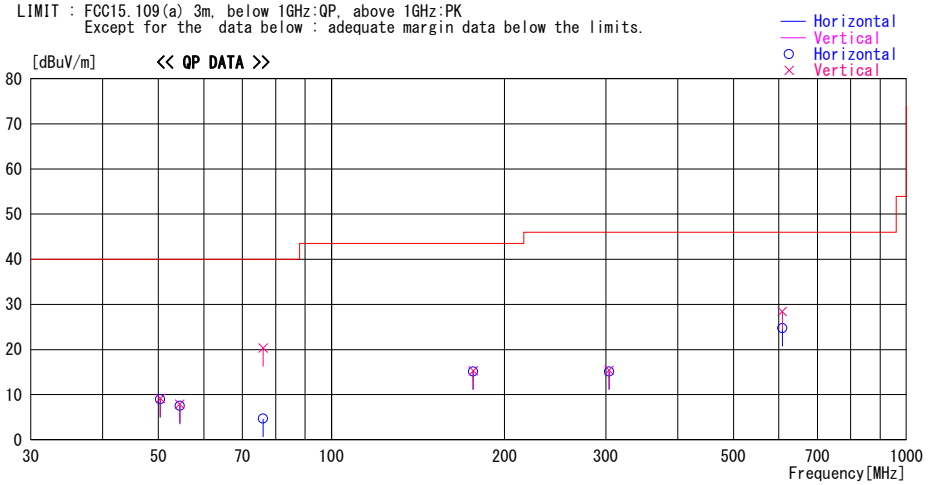
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : TPMS Receiving mode 314.98MHz Axis(Hori:X , Vert:X)

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



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
50.400	22.9	QP	10.8	-24.7	9.0	0	100	Hori.	40.0	31.0
50.400	23.1	QP	10.8	-24.7	9.2	0	100	Vert.	40.0	30.8
54.500	22.9	QP	9.3	-24.7	7.5	0	100	Hori.	40.0	32.5
54.500	23.3	QP	9.3	-24.7	7.9	0	100	Vert.	40.0	32.1
76.070	22.6	QP	6.6	-24.5	4.7	0	100	Hori.	40.0	35.3
76.070	38.2	QP	6.6	-24.5	20.3	73	100	Vert.	40.0	19.7
176.400	22.3	QP	16.0	-23.2	15.1	0	100	Hori.	43.5	28.4
176.400	22.5	QP	16.0	-23.2	15.3	0	100	Vert.	43.5	28.2
304.080	22.9	QP	14.3	-22.1	15.1	0	100	Hori.	46.0	30.9
304.080	23.2	QP	14.3	-22.1	15.4	0	100	Vert.	46.0	30.6
608.160	25.4	QP	19.6	-20.3	24.7	57	151	Hori.	46.0	21.3
608.160	29.1	QP	19.6	-20.3	28.4	24	100	Vert.	46.0	17.6

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

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

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Radiated Emission

Variation No. 11 Internal Antenna
(Above 1GHz)

DATA OF RADIATED EMISSION TEST

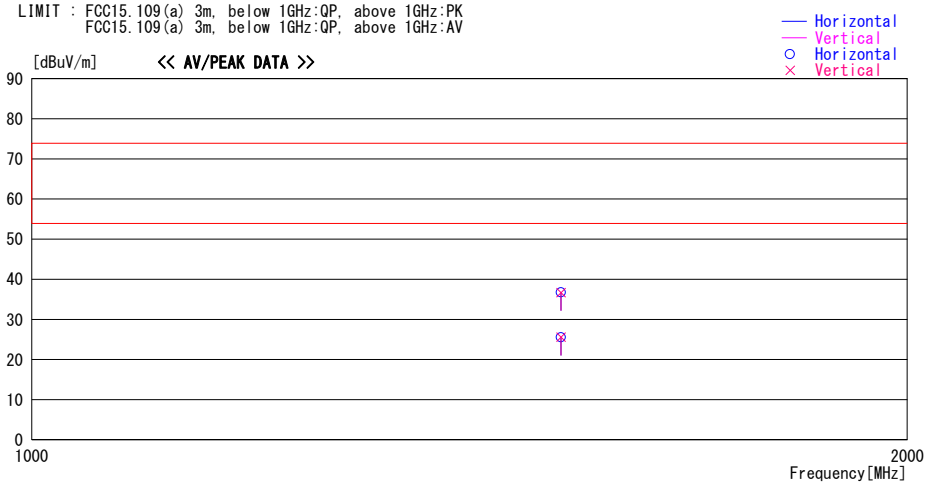
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : TPMS Receiving mode 314.98MHz Axis(Hori:X , Vert:X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
1520.400	42.5	PK	25.8	-31.6	36.7	0	100	Hori.	73.9	37.2
1520.400	42.5	PK	25.8	-31.6	36.7	0	100	Vert.	73.9	37.2
1520.400	31.4	AV	25.8	-31.6	25.6	0	100	Hori.	53.9	28.4
1520.400	31.4	AV	25.8	-31.6	25.6	0	100	Vert.	53.9	28.3

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

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

Radiated Emission

Variation No. 2 External Antenna
(Below 1GHz)

DATA OF RADIATED EMISSION TEST

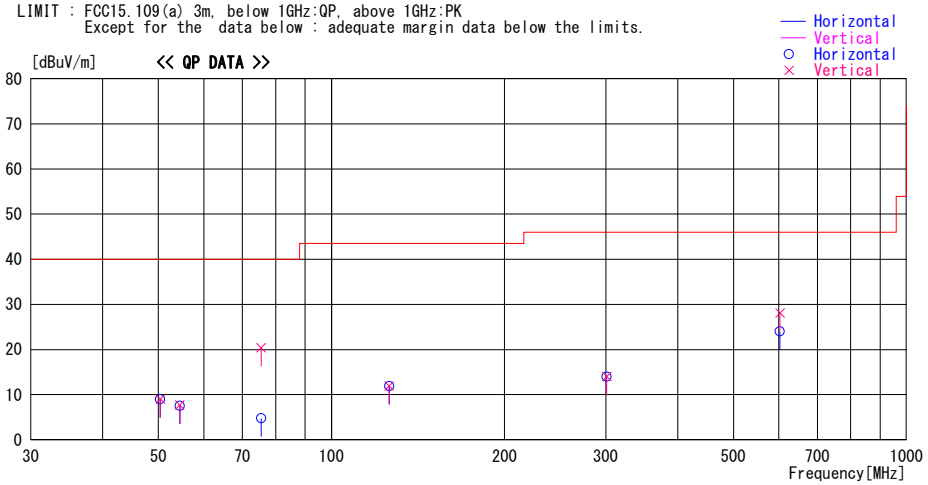
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 312.1MHz Axis(Hori:X , Vert:X) Ext-Ant

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



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
50.400	22.9	QP	10.8	-24.7	9.0	0	100	Hori.	40.0	31.0
50.400	22.9	QP	10.8	-24.7	9.0	0	100	Vert.	40.0	31.0
54.500	22.9	QP	9.3	-24.7	7.5	0	100	Hori.	40.0	32.5
54.500	23.1	QP	9.3	-24.7	7.7	0	100	Vert.	40.0	32.3
75.460	22.7	QP	6.6	-24.5	4.8	0	100	Hori.	40.0	35.2
75.460	38.3	QP	6.6	-24.5	20.4	84	100	Vert.	40.0	19.6
126.000	22.3	QP	13.3	-23.7	11.9	0	100	Hori.	43.5	31.6
126.000	22.3	QP	13.3	-23.7	11.9	0	100	Vert.	43.5	31.6
301.200	22.0	QP	14.2	-22.2	14.0	0	100	Hori.	46.0	32.0
301.200	22.0	QP	14.2	-22.2	14.0	0	100	Vert.	46.0	32.0
602.400	24.8	QP	19.5	-20.3	24.0	300	179	Hori.	46.0	22.0
602.400	28.9	QP	19.5	-20.3	28.1	191	100	Vert.	46.0	17.9

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

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

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Radiated Emission

Variation No. 2 External Antenna

(Above 1GHz)

DATA OF RADIATED EMISSION TEST

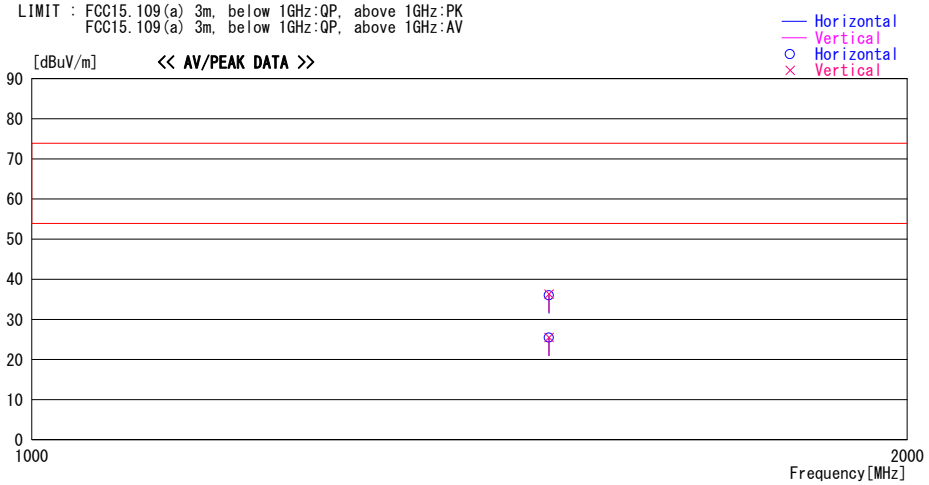
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 312.1MHz Axis(Hori:X , Vert:X) Ext-Ant

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
1506.000	41.9	PK	25.7	-31.6	36.0	0	100	Hori.	73.9	37.9
1506.000	42.2	PK	25.7	-31.6	36.3	0	100	Vert.	73.9	37.6
1506.000	31.4	AV	25.7	-31.6	25.5	0	100	Hori.	53.9	28.4
1506.000	31.4	AV	25.7	-31.6	25.5	0	100	Vert.	53.9	28.4

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

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

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Radiated Emission

Variation No. 2 External Antenna

(Below 1GHz)

DATA OF RADIATED EMISSION TEST

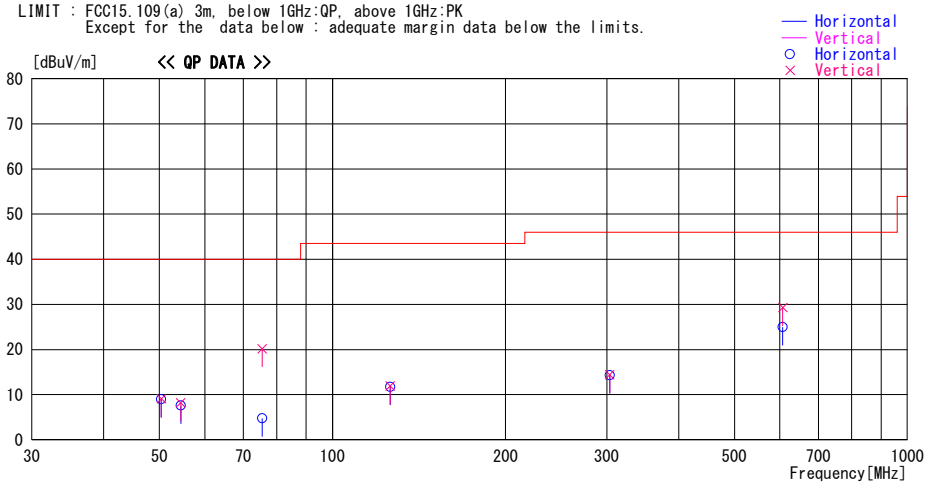
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 314.35MHz Axis(Hori:X , Vert:X) Ext-Ant

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



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
50.400	22.9	QP	10.8	-24.7	9.0	0	100	Hori.	40.0	31.0
50.400	23.0	QP	10.8	-24.7	9.1	0	100	Vert.	40.0	30.9
54.500	23.0	QP	9.3	-24.7	7.6	0	100	Hori.	40.0	32.4
54.500	23.6	QP	9.3	-24.7	8.2	0	100	Vert.	40.0	31.8
75.460	22.7	QP	6.6	-24.5	4.8	0	100	Hori.	40.0	35.2
75.460	38.1	QP	6.6	-24.5	20.2	87	100	Vert.	40.0	19.8
126.000	22.1	QP	13.3	-23.7	11.7	0	100	Hori.	43.5	31.8
126.000	22.3	QP	13.3	-23.7	11.9	0	100	Vert.	43.5	31.6
303.450	22.1	QP	14.3	-22.1	14.3	0	100	Hori.	46.0	31.7
303.450	22.2	QP	14.3	-22.1	14.4	0	100	Vert.	46.0	31.6
606.900	25.7	QP	19.6	-20.3	25.0	301	178	Hori.	46.0	21.0
606.900	30.0	QP	19.6	-20.3	29.3	198	100	Vert.	46.0	16.7

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

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

Radiated Emission

Variation No. 2 External Antenna
(Above 1GHz)

DATA OF RADIATED EMISSION TEST

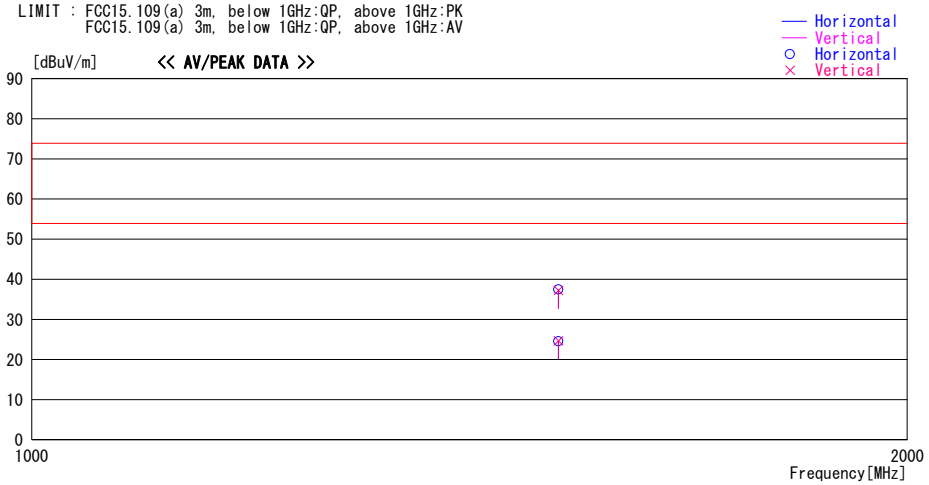
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 314.35MHz Axis(Hori:X , Vert:X) Ext-Ant

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
1517.250	43.3	PK	25.8	-31.6	37.5	0	100	Hori.	73.9	36.4
1517.250	43.0	PK	25.8	-31.6	37.2	0	100	Vert.	73.9	36.7
1517.250	30.4	AV	25.8	-31.6	24.6	0	100	Hori.	53.9	29.3
1517.250	30.5	AV	25.8	-31.6	24.7	0	100	Vert.	53.9	29.2

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

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

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Radiated Emission

Variation No. 9 External Antenna

(Below 1GHz)

DATA OF RADIATED EMISSION TEST

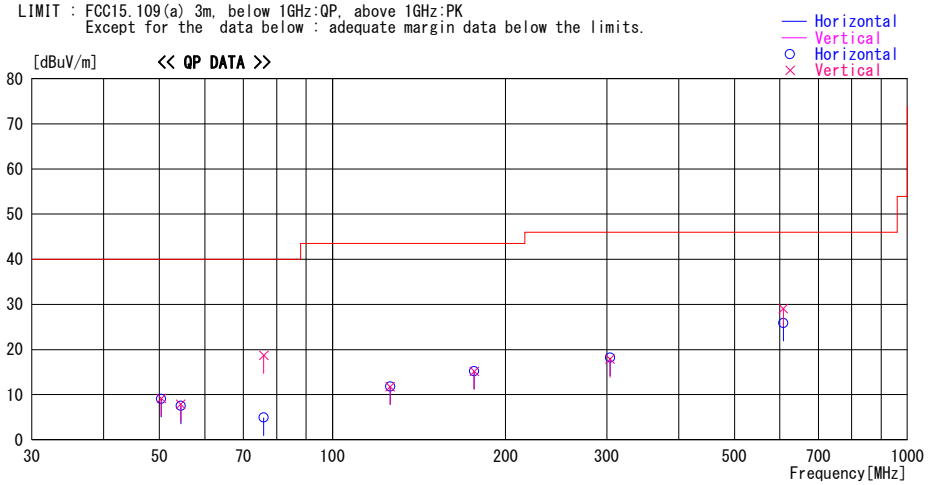
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/03

Report No. : 10064276H

Temp./Humi. : 21deg. C / 56% RH
Engineer : Shinya Watanabe

Mode / Remarks : TPMS Receiving mode 314.98MHz Axis(Hori:X , Vert:X) Ext-Ant

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



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
50.400	23.0	QP	10.8	-24.7	9.1	0	100	Hori.	40.0	30.9
50.400	23.1	QP	10.8	-24.7	9.2	0	100	Vert.	40.0	30.8
54.500	22.9	QP	9.3	-24.7	7.5	0	100	Hori.	40.0	32.5
54.500	23.3	QP	9.3	-24.7	7.9	0	100	Vert.	40.0	32.1
75.970	22.8	QP	6.6	-24.5	4.9	0	100	Hori.	40.0	35.1
75.970	36.6	QP	6.6	-24.5	18.7	74	100	Vert.	40.0	21.3
126.000	22.2	QP	13.3	-23.7	11.8	0	100	Hori.	43.5	31.7
126.000	22.2	QP	13.3	-23.7	11.8	0	100	Vert.	43.5	31.7
176.400	22.4	QP	16.0	-23.2	15.2	0	100	Hori.	43.5	28.3
176.400	22.4	QP	16.0	-23.2	15.2	0	100	Vert.	43.5	28.3
304.080	26.0	QP	14.3	-22.1	18.2	165	154	Hori.	46.0	27.8
304.080	25.7	QP	14.3	-22.1	17.9	322	100	Vert.	46.0	28.1
608.160	26.6	QP	19.6	-20.3	25.9	64	143	Hori.	46.0	20.1
608.160	29.8	QP	19.6	-20.3	29.1	24	100	Vert.	46.0	16.9

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

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

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Radiated Emission

Variation No. 9 External Antenna

(Above 1GHz)

DATA OF RADIATED EMISSION TEST

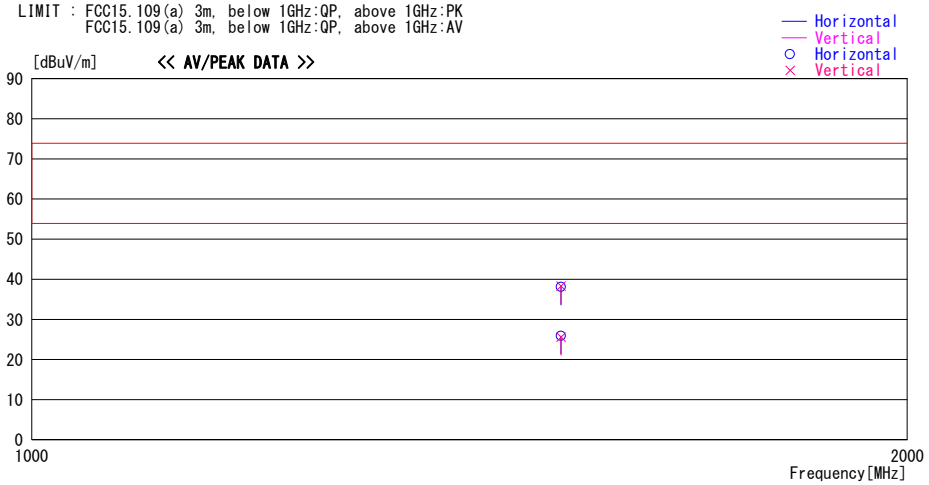
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : TPMS Receiving mode 314.98MHz Axis(Hori:X , Vert:X) Ext-Ant

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
1520.400	43.9	PK	25.8	-31.6	38.1	0	100	Hori.	73.9	35.8
1520.400	44.1	PK	25.8	-31.6	38.3	0	100	Vert.	73.9	35.6
1520.400	31.7	AV	25.8	-31.6	25.9	0	100	Hori.	53.9	28.0
1520.400	31.4	AV	25.8	-31.6	25.6	0	100	Vert.	53.9	28.3

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

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

Radiated Emission

Variation No. 2 Internal Antenna

(Reference data: Below 1GHz)

DATA OF RADIATED EMISSION TEST

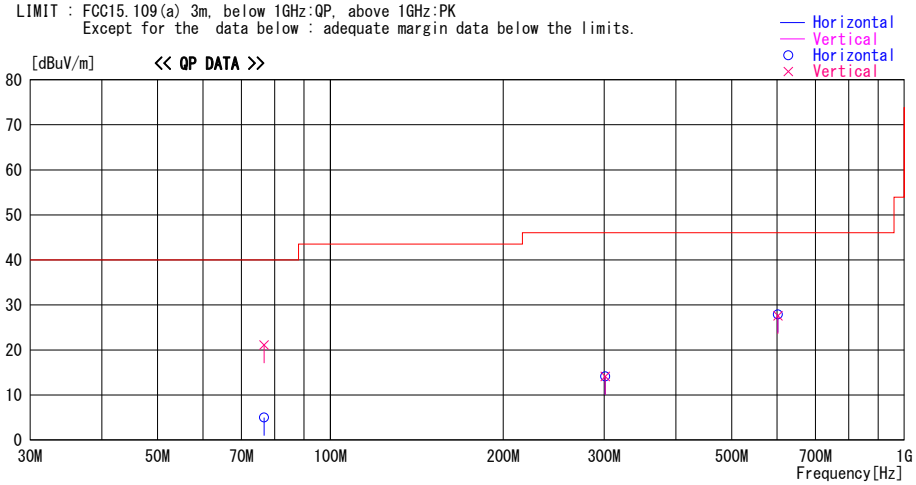
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 312.1MHz Axis(Hori:X , Vert:X)

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



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
76.660	22.8	QP	6.6	-24.4	5.0	0	100	Hori.	40.0	35.0
76.660	38.9	QP	6.6	-24.4	21.1	62	100	Vert.	40.0	18.9
301.200	22.1	QP	14.2	-22.2	14.1	0	100	Hori.	46.0	31.9
301.200	22.1	QP	14.2	-22.2	14.1	0	100	Vert.	46.0	31.9
602.400	28.7	QP	19.5	-20.3	27.9	198	144	Hori.	46.0	18.1
602.400	28.4	QP	19.5	-20.3	27.6	33	100	Vert.	46.0	18.4

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

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

Radiated Emission

Variation No. 2 Internal Antenna

(Reference data: Above 1GHz)

DATA OF RADIATED EMISSION TEST

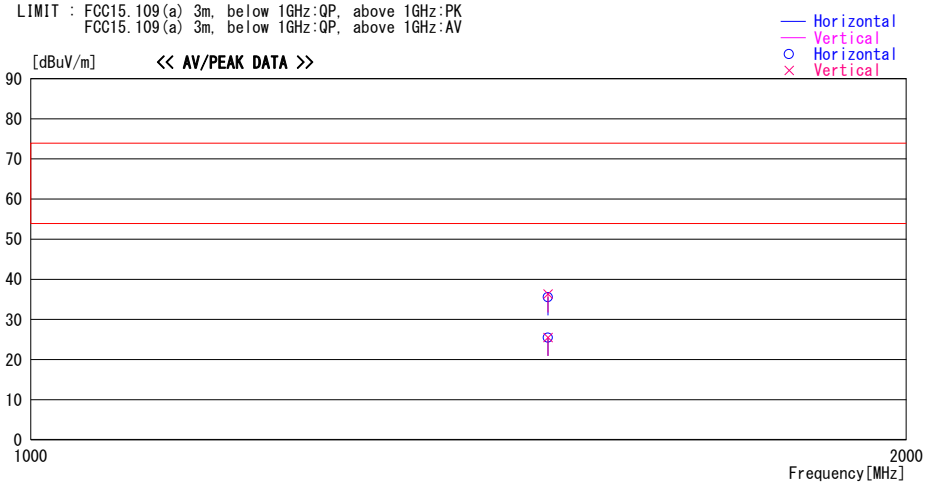
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 312.1MHz Axis(Hori:X , Vert:X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
1506.000	41.5	PK	25.7	-31.6	35.6	0	100	Hori.	73.9	38.3
1506.000	42.2	PK	25.7	-31.6	36.3	0	100	Vert.	73.9	37.6
1506.000	31.4	AV	25.7	-31.6	25.5	0	100	Hori.	53.9	28.4
1506.000	31.4	AV	25.7	-31.6	25.5	0	100	Vert.	53.9	28.4

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

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

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Radiated Emission

Variation No. 2 Internal Antenna

(Reference data: Below 1GHz)

DATA OF RADIATED EMISSION TEST

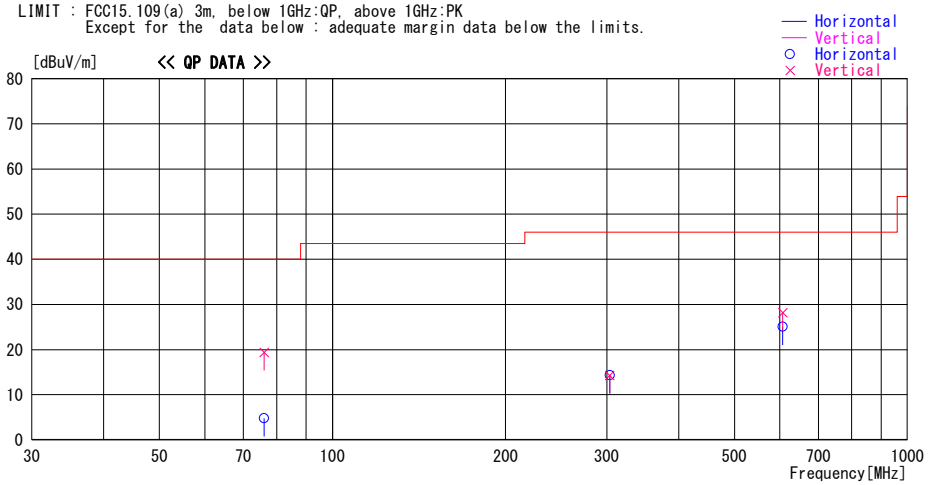
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 314.35MHz Axis(Hori:X , Vert:X)

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



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
76.090	22.7	QP	6.6	-24.5	4.8	0	100	Hori.	40.0	35.2
76.090	37.3	QP	6.6	-24.5	19.4	84	100	Vert.	40.0	20.6
303.450	22.1	QP	14.3	-22.1	14.3	0	100	Hori.	46.0	31.7
303.450	22.1	QP	14.3	-22.1	14.3	0	100	Vert.	46.0	31.7
606.900	25.8	QP	19.6	-20.3	25.1	31	155	Hori.	46.0	20.9
606.900	28.9	QP	19.6	-20.3	28.2	0	100	Vert.	46.0	17.8

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

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

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Radiated Emission

Variation No. 2 Internal Antenna

(Reference data: Above 1GHz)

DATA OF RADIATED EMISSION TEST

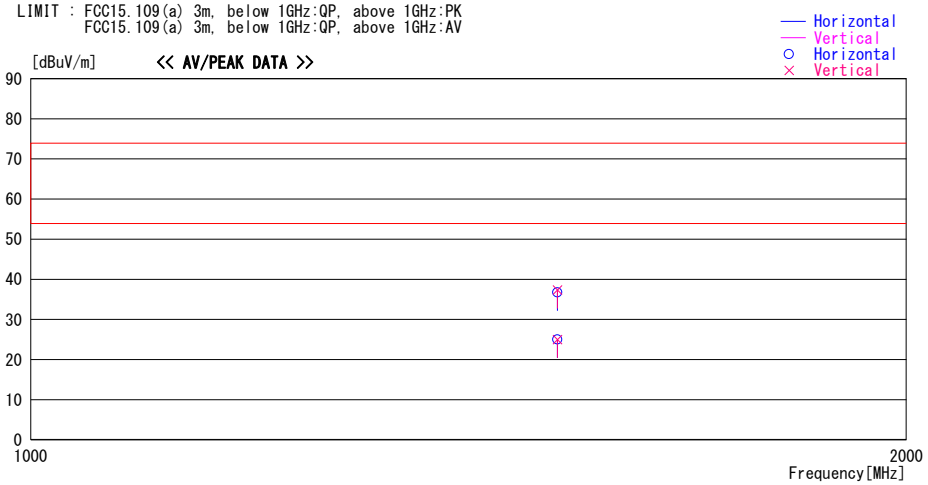
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 314.35MHz Axis(Hori:X , Vert:X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
1517.250	42.5	PK	25.8	-31.6	36.7	0	100	Hori.	73.9	37.2
1517.250	43.1	PK	25.8	-31.6	37.3	0	100	Vert.	73.9	36.6
1517.250	30.8	AV	25.8	-31.6	25.0	0	100	Hori.	53.9	28.9
1517.250	30.8	AV	25.8	-31.6	25.0	0	100	Vert.	53.9	28.9

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

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

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Radiated Emission

Variation No. 5 Internal Antenna

(Reference data: Below 1GHz)

DATA OF RADIATED EMISSION TEST

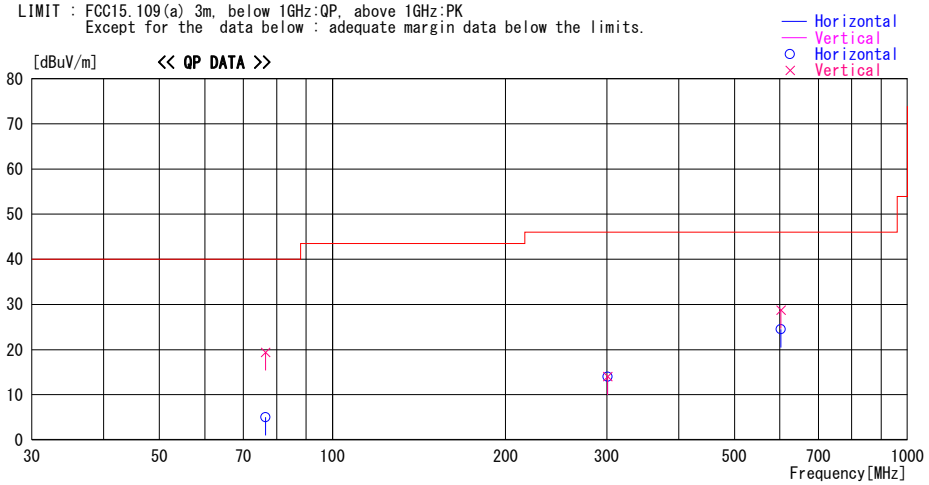
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/03

Report No. : 10064276H

Temp./Humi. : 21deg. C / 56% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 312.1MHz Axis(Hori:X , Vert:X)

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



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
76.533	22.8	QP	6.6	-24.4	5.0	0	100	Hori.	40.0	35.0
76.533	37.2	QP	6.6	-24.4	19.4	50	100	Vert.	40.0	20.6
301.200	22.0	QP	14.2	-22.2	14.0	0	100	Hori.	46.0	32.0
301.200	22.0	QP	14.2	-22.2	14.0	0	100	Vert.	46.0	32.0
602.400	25.3	QP	19.5	-20.3	24.5	53	100	Hori.	46.0	21.5
602.400	29.5	QP	19.5	-20.3	28.7	24	100	Vert.	46.0	17.3

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

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

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Radiated Emission

Variation No. 5 Internal Antenna

(Reference data: Above 1GHz)

DATA OF RADIATED EMISSION TEST

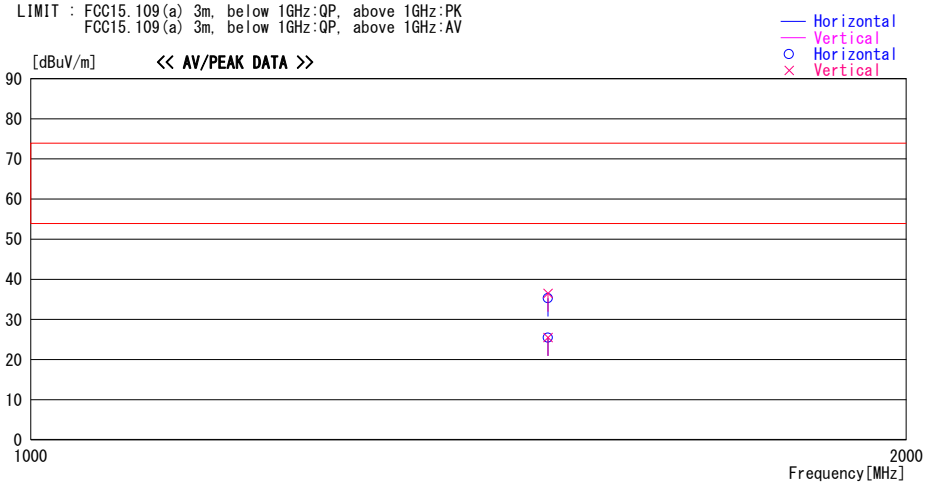
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 312.1MHz Axis(Hori:X , Vert:X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
1506.000	41.2	PK	25.7	-31.6	35.3	0	100	Hori.	73.9	38.6
1506.000	42.4	PK	25.7	-31.6	36.5	0	100	Vert.	73.9	37.4
1506.000	31.4	AV	25.7	-31.6	25.5	0	100	Hori.	53.9	28.4
1506.000	31.4	AV	25.7	-31.6	25.5	0	100	Vert.	53.9	28.4

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

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

Radiated Emission

Variation No. 5 Internal Antenna

(Reference data: Below 1GHz)

DATA OF RADIATED EMISSION TEST

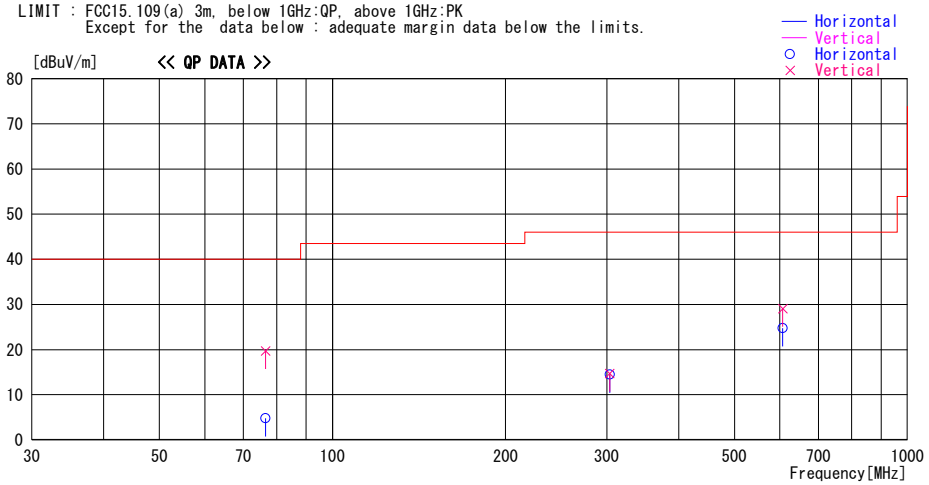
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/03

Report No. : 10064276H

Temp./Humi. : 21deg. C / 56% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 314.35MHz Axis(Hori:X , Vert:X)

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



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
76.533	22.6	QP	6.6	-24.4	4.8	0	100	Hori.	40.0	35.2
76.533	37.5	QP	6.6	-24.4	19.7	97	100	Vert.	40.0	20.3
303.450	22.3	QP	14.3	-22.1	14.5	0	100	Hori.	46.0	31.5
303.450	22.5	QP	14.3	-22.1	14.7	0	100	Vert.	46.0	31.3
606.900	25.4	QP	19.6	-20.3	24.7	47	140	Hori.	46.0	21.3
606.900	29.8	QP	19.6	-20.3	29.1	25	100	Vert.	46.0	16.9

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

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

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Radiated Emission

Variation No. 5 Internal Antenna

(Reference data: Above 1GHz)

DATA OF RADIATED EMISSION TEST

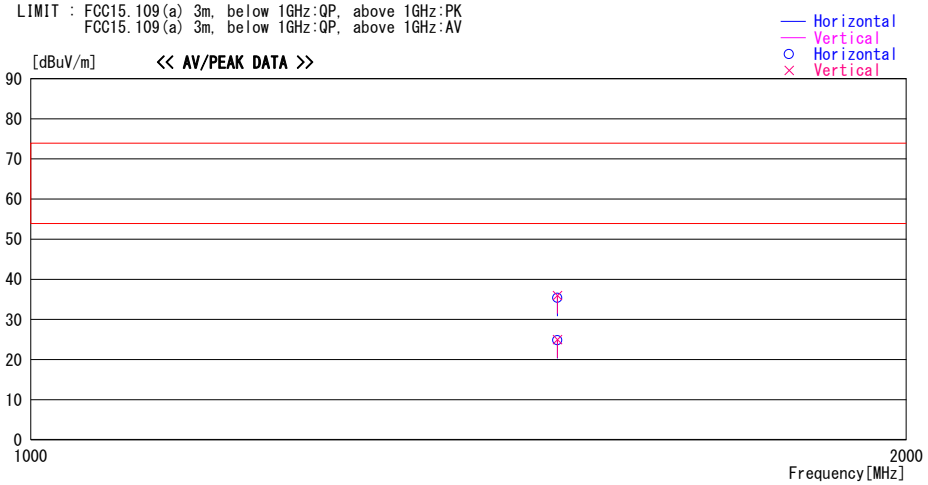
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 314.35MHz Axis(Hori:X , Vert:X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
1517.250	41.2	PK	25.8	-31.6	35.4	0	100	Hori.	73.9	38.5
1517.250	41.8	PK	25.8	-31.6	36.0	0	100	Vert.	73.9	37.9
1517.250	30.6	AV	25.8	-31.6	24.8	0	100	Hori.	53.9	29.1
1517.250	30.8	AV	25.8	-31.6	25.0	0	100	Vert.	53.9	28.9

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

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

Radiated Emission

Variation No. 9 Internal Antenna

(Reference data: Below 1GHz)

DATA OF RADIATED EMISSION TEST

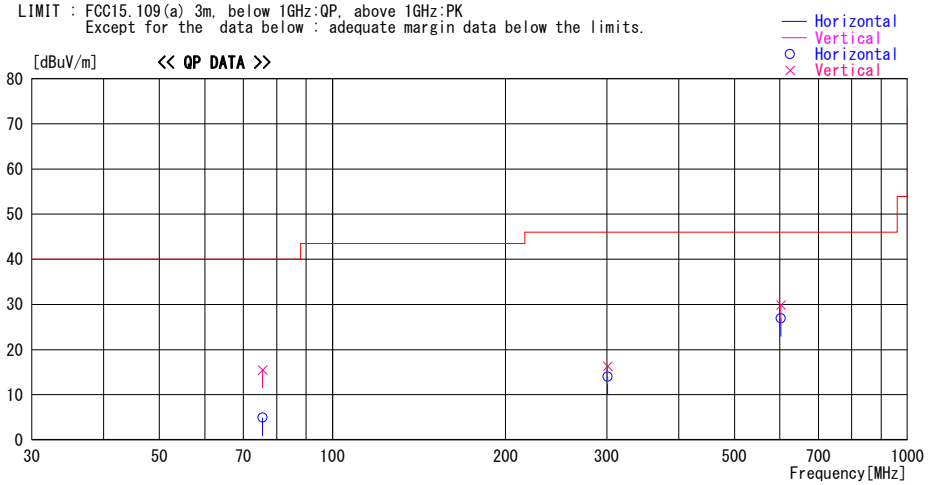
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/03

Report No. : 10064276H

Temp./Humi. : 21deg. C / 56% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 312.1MHz Axis(Hori:X , Vert:X)

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



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
75.650	22.8	QP	6.6	-24.5	4.9	0	100	Hori.	40.0	35.1
75.650	33.4	QP	6.6	-24.5	15.5	75	100	Vert.	40.0	24.5
301.200	22.0	QP	14.2	-22.2	14.0	0	100	Hori.	46.0	32.0
301.200	24.3	QP	14.2	-22.2	16.3	0	100	Vert.	46.0	29.7
602.400	27.7	QP	19.5	-20.3	26.9	52	153	Hori.	46.0	19.1
602.400	30.7	QP	19.5	-20.3	29.9	26	100	Vert.	46.0	16.1

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

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

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Radiated Emission

Variation No. 9 Internal Antenna

(Reference data: Above 1GHz)

DATA OF RADIATED EMISSION TEST

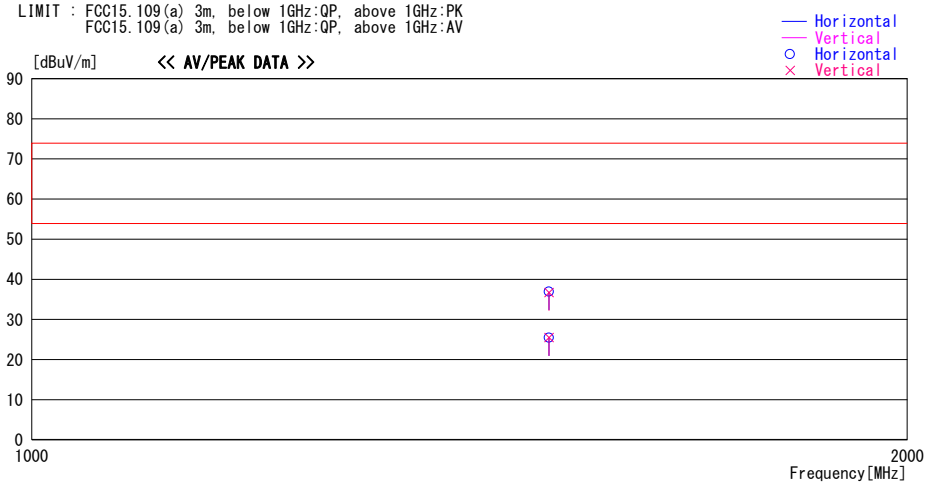
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 312.1MHz Axis(Hori:X , Vert:X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
1506.000	42.8	PK	25.7	-31.6	36.9	0	100	Hori.	73.9	37.0
1506.000	42.6	PK	25.7	-31.6	36.7	0	100	Vert.	73.9	37.2
1506.000	31.4	AV	25.7	-31.6	25.5	0	100	Hori.	53.9	28.4
1506.000	31.4	AV	25.7	-31.6	25.5	0	100	Vert.	53.9	28.4

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

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

Radiated Emission

Variation No. 9 Internal Antenna

(Reference data: Below 1GHz)

DATA OF RADIATED EMISSION TEST

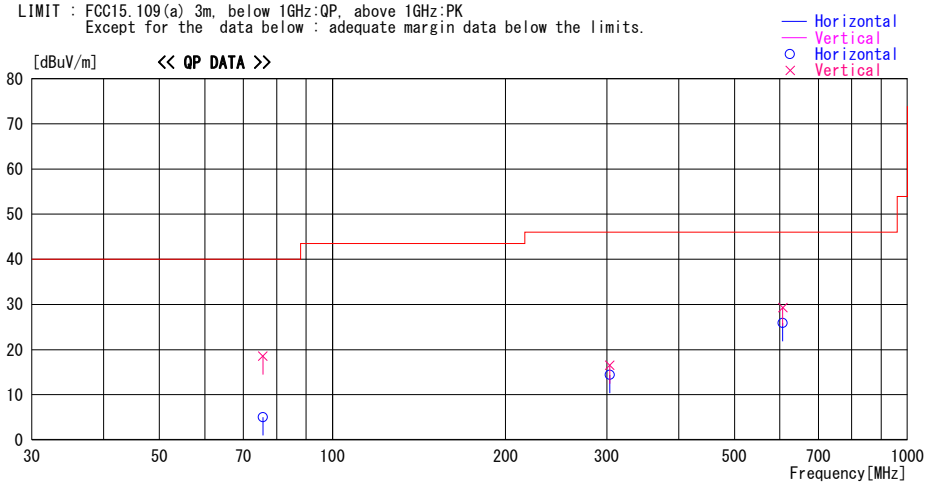
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/03

Report No. : 10064276H

Temp./Humi. : 21deg. C / 56% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 314.35MHz Axis(Hori:X , Vert:X)

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



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
75.660	22.9	QP	6.6	-24.5	5.0	347	300	Hori.	40.0	35.0
75.660	36.4	QP	6.6	-24.5	18.5	72	100	Vert.	40.0	21.5
303.450	22.2	QP	14.3	-22.1	14.4	2	100	Hori.	46.0	31.6
303.450	24.3	QP	14.3	-22.1	16.5	2	100	Vert.	46.0	29.5
606.900	26.6	QP	19.6	-20.3	25.9	53	157	Hori.	46.0	20.1
606.900	30.0	QP	19.6	-20.3	29.3	23	100	Vert.	46.0	16.7

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

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

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Radiated Emission

Variation No. 9 Internal Antenna

(Reference data: Above 1GHz)

DATA OF RADIATED EMISSION TEST

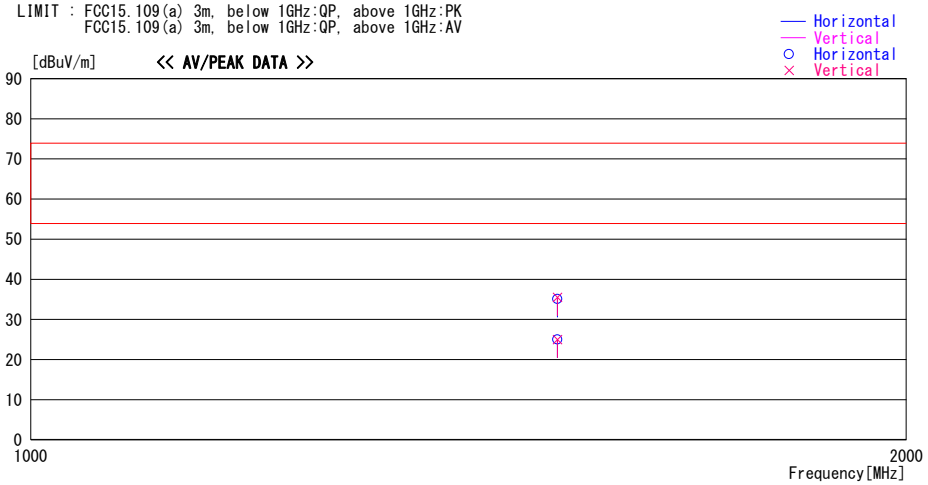
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 314.35MHz Axis(Hori:X , Vert:X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
1517.250	40.9	PK	25.8	-31.6	35.1	0	100	Hori.	73.9	38.8
1517.250	41.3	PK	25.8	-31.6	35.5	0	100	Vert.	73.9	38.4
1517.250	30.8	AV	25.8	-31.6	25.0	0	100	Hori.	53.9	28.9
1517.250	30.8	AV	25.8	-31.6	25.0	0	100	Vert.	53.9	28.9

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

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

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Radiated Emission

Variation No. 14 Internal Antenna

(Reference data: Below 1GHz)

DATA OF RADIATED EMISSION TEST

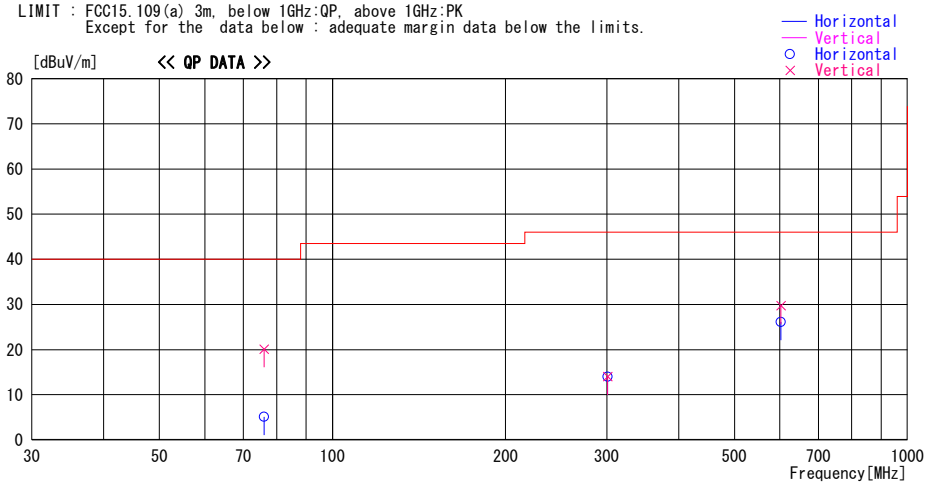
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/03

Report No. : 10064276H

Temp./Humi. : 21deg. C / 56% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 312.10MHz Axis(Hori:X , Vert:X)

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



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
76.051	23.0	QP	6.6	-24.5	5.1	0	100	Hori.	40.0	34.9
76.051	38.0	QP	6.6	-24.5	20.1	60	100	Vert.	40.0	19.9
301.200	22.0	QP	14.2	-22.2	14.0	0	100	Hori.	46.0	32.0
301.200	22.0	QP	14.2	-22.2	14.0	0	100	Vert.	46.0	32.0
602.400	26.9	QP	19.5	-20.3	26.1	39	100	Hori.	46.0	19.9
602.400	30.5	QP	19.5	-20.3	29.7	23	100	Vert.	46.0	16.3

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

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

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Radiated Emission

Variation No. 14 Internal Antenna

(Reference data: Above 1GHz)

DATA OF RADIATED EMISSION TEST

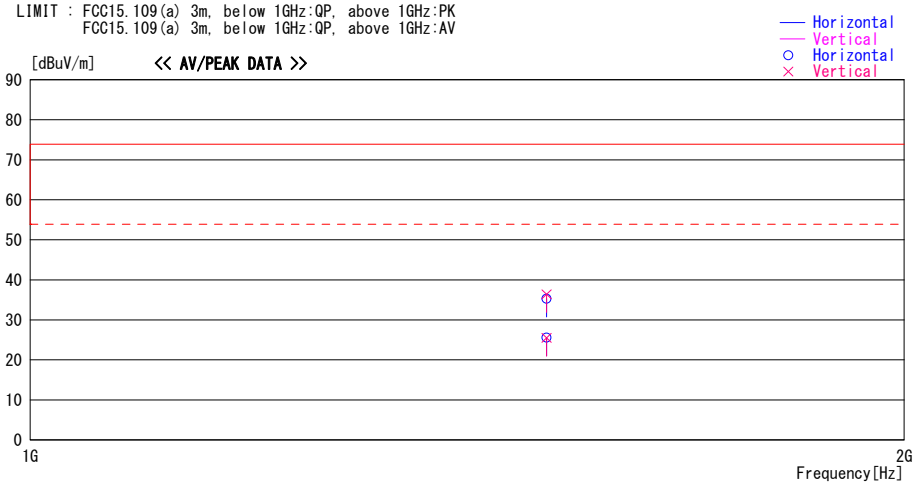
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 312.1MHz Axis(Hori:X , Vert:X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
1506.000	41.2	PK	25.7	-31.6	35.3	0	100	Hori.	73.9	38.6
1506.000	42.3	PK	25.7	-31.6	36.4	0	100	Vert.	73.9	37.5
1506.000	31.5	AV	25.7	-31.6	25.6	0	100	Hori.	53.9	28.3
1506.000	31.4	AV	25.7	-31.6	25.5	0	100	Vert.	53.9	28.4

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

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

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Radiated Emission

Variation No. 14 Internal Antenna

(Reference data: Below 1GHz)

DATA OF RADIATED EMISSION TEST

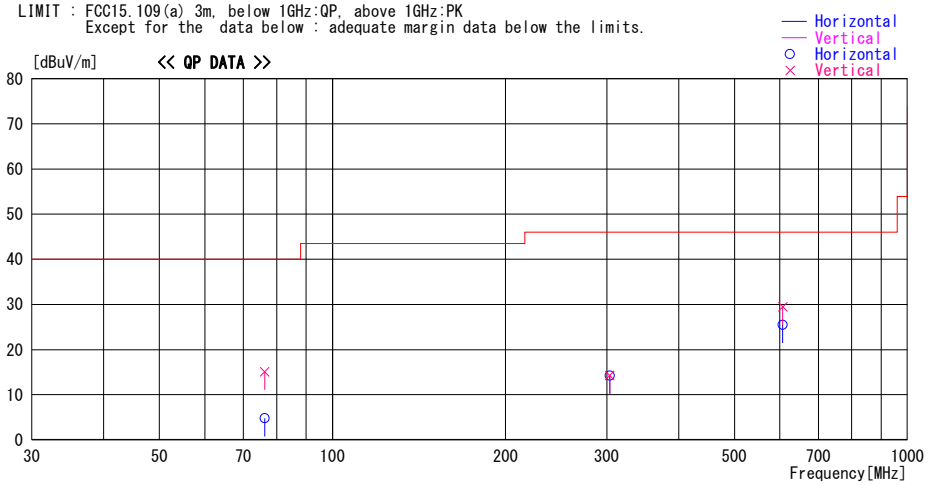
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/03

Report No. : 10064276H

Temp./Humi. : 21deg. C / 56% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 314.35MHz Axis(Hori:X , Vert:X)

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



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
76.254	22.7	QP	6.6	-24.5	4.8	0	100	Hori.	40.0	35.2
76.254	33.0	QP	6.6	-24.5	15.1	77	100	Vert.	40.0	24.9
303.450	22.0	QP	14.3	-22.1	14.2	0	100	Hori.	46.0	31.8
303.450	22.1	QP	14.3	-22.1	14.3	0	100	Vert.	46.0	31.7
606.900	26.2	QP	19.6	-20.3	25.5	31	100	Hori.	46.0	20.5
606.900	30.2	QP	19.6	-20.3	29.5	22	100	Vert.	46.0	16.5

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

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

Radiated Emission

Variation No. 14 Internal Antenna

(Reference data: Above 1GHz)

DATA OF RADIATED EMISSION TEST

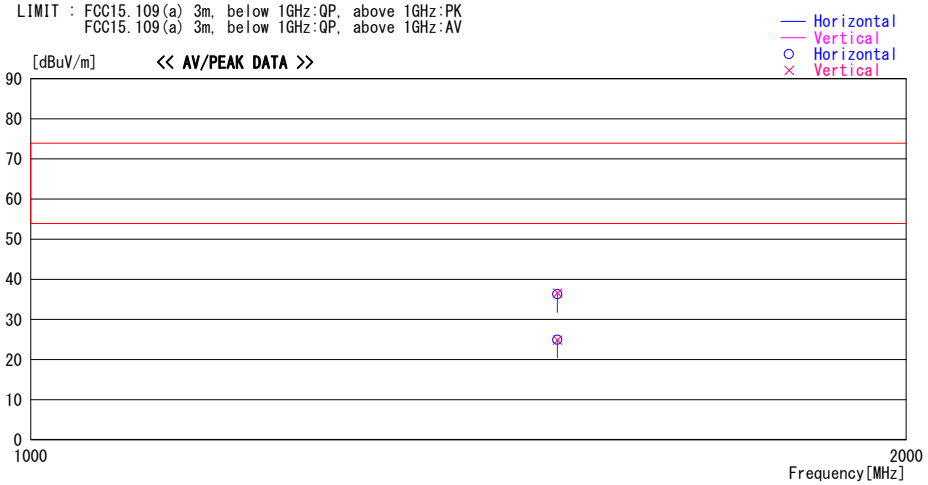
UL Japan, Inc. Head Office EMC Lab. No.3 Semi Anechoic Chamber
Date : 2013/11/04

Report No. : 10064276H

Temp./Humi. : 21deg. C / 63% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 314.35MHz Axis(Hori:X , Vert:X)

LIMIT : FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:PK
FCC15.109(a) 3m, below 1GHz:QP, above 1GHz:AV



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV/m]	[Deg]	[cm]		[dBuV/m]	[dB]
1517.250	42.1	PK	25.8	-31.6	36.3	0	100	Hori.	73.9	37.6
1517.250	42.4	PK	25.8	-31.6	36.6	0	100	Vert.	73.9	37.3
1517.250	30.7	AV	25.8	-31.6	24.9	0	100	Hori.	53.9	29.0
1517.250	30.7	AV	25.8	-31.6	24.9	0	100	Vert.	53.9	29.0

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

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

Antenna Terminal Conducted Emission

Variation No. 2 External Antenna

DATA OF RADIATED EMISSION TEST

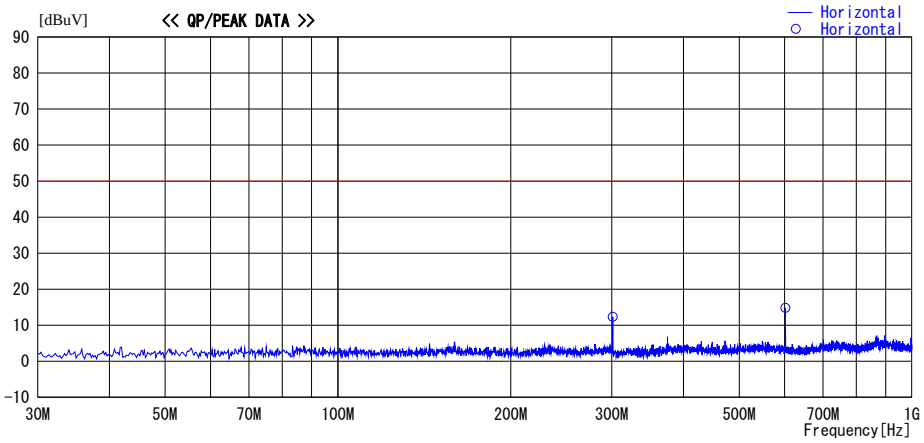
UL Japan, Inc. Head Office EMC Lab. No.6 shielded room
Date : 2013/11/05

Report No. : 10064276H

Temp./Humi. : 22deg. C / 51% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 312.1MHz Ext-Ant

LIMIT : FCC15.111 Antenna terminal measurement
Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV]	[Deg]	[cm]		[dBuV/m]	[dB]
301.200	37.7	PK	0.0	-25.4	12.3	0	100	Hori.	50.0	37.7
602.400	39.9	PK	0.0	-25.1	14.8	0	100	Hori.	50.0	35.2

CHART:WITH FACTOR
CALCULATION:RESULT = READING + LOSS(CABLE+ATTEN.) - GAIN(AMP)

Antenna Terminal Conducted Emission

Variation No. 2 External Antenna

DATA OF RADIATED EMISSION TEST

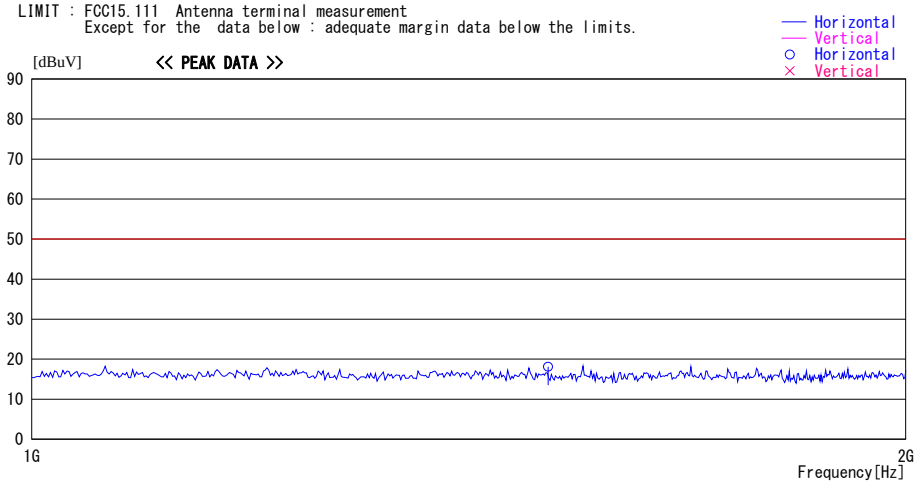
UL Japan, Inc. Head Office EMC Lab. No.6 shielded room
Date : 2013/11/05

Report No. : 10064276H

Temp./Humi. : 22deg. C / 51% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 312.1MHz Ext-Ant

LIMIT : FCC15.111 Antenna terminal measurement
Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV]	[Deg]	[cm]		[dBuV/m]	[dB]
1506.000	44.3	PK	0.0	-26.2	18.1	0	100	Hori.	50.0	31.9

CHART:WITH FACTOR
CALCULATION:RESULT = READING + LOSS(CABLE+ATTEN.) - GAIN(AMP)

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Antenna Terminal Conducted Emission

Variation No. 2 External Antenna

DATA OF RADIATED EMISSION TEST

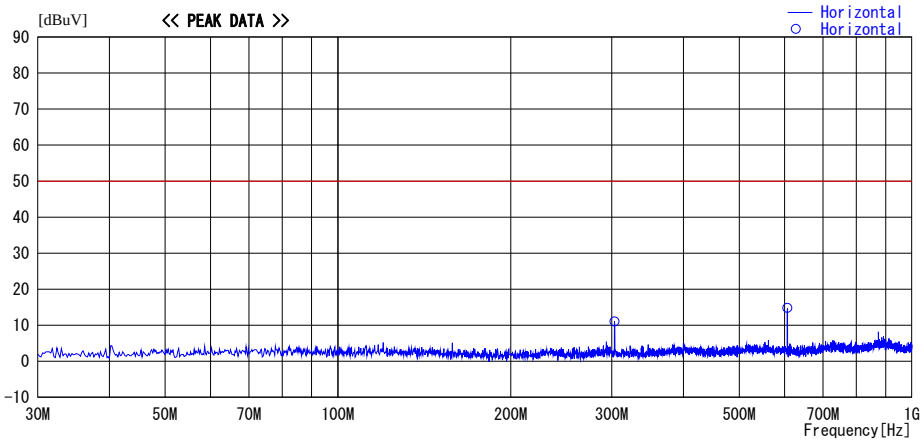
UL Japan, Inc. Head Office EMC Lab. No.6 shielded room
Date : 2013/11/05

Report No. : 10064276H

Temp./Humi. : 22deg. C / 51% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 314.35MHz Ext-Ant

LIMIT : FCC15.111 Antenna terminal measurement
Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV]	[Deg]	[cm]		[dBuV/m]	[dB]
303.450	36.4	PK	0.0	-25.4	11.0	0	100	Hori.	50.0	39.0
606.900	39.9	PK	0.0	-25.1	14.8	0	100	Hori.	50.0	35.2

CHART:WITH FACTOR
CALCULATION:RESULT = READING + LOSS(CABLE+ATTEN.) - GAIN(AMP)

Antenna Terminal Conducted Emission

Variation No. 2 External Antenna

DATA OF RADIATED EMISSION TEST

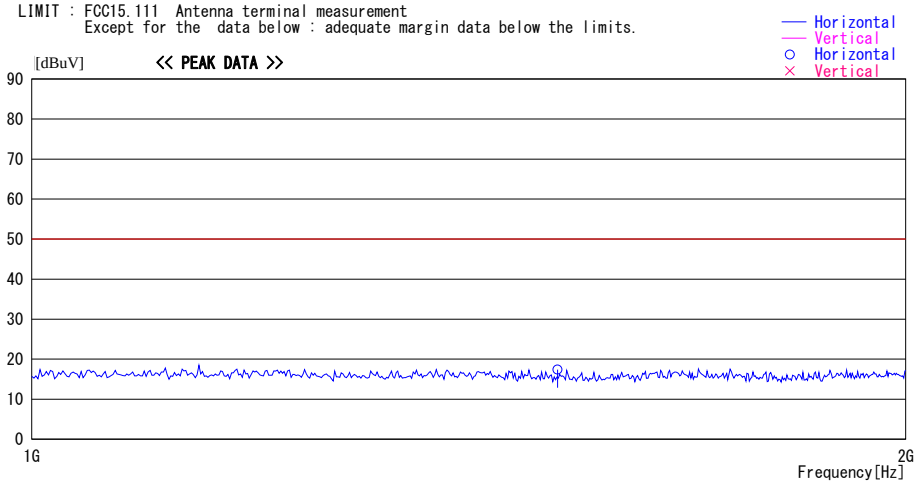
UL Japan, Inc. Head Office EMC Lab. No.6 shielded room
Date : 2013/11/05

Report No. : 10064276H

Temp./Humi. : 22deg. C / 51% RH
Engineer : Shinya Watanabe

Mode / Remarks : RKES Receiving mode 314.35MHz Ext-Ant

LIMIT : FCC15.111 Antenna terminal measurement
Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV]	[Deg]	[cm]		[dBuV/m]	[dB]
1517.250	43.6	PK	0.0	-26.2	17.4	0	100	Hori.	50.0	32.6

CHART:WITH FACTOR
CALCULATION:RESULT = READING + LOSS(CABLE+ATTEN.) - GAIN(AMP)

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Antenna Terminal Conducted Emission

Variation No. 9 External Antenna

DATA OF RADIATED EMISSION TEST

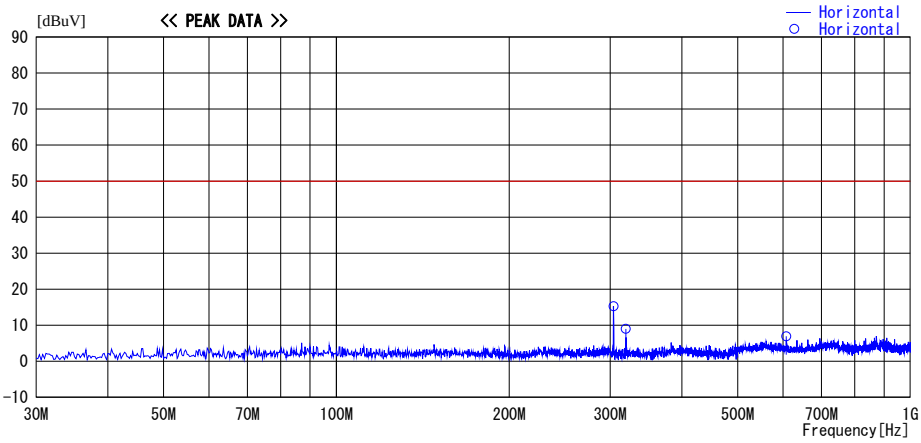
UL Japan, Inc. Head Office EMC Lab. No.6 shielded room
Date : 2013/11/05

Report No. : 10064276H

Temp./Humi. : 22deg. C / 51% RH
Engineer : Shinya Watanabe

Mode / Remarks : TPMS Receiving mode 314.98MHz Ext-Ant

LIMIT : FCC15.111 Antenna terminal measurement
Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV]	[Deg]	[cm]		[dBuV/m]	[dB]
304.080	40.7	PK	0.0	-25.4	15.3	0	100	Hori.	50.0	34.7
319.586	34.4	PK	0.0	-25.4	9.0	0	100	Hori.	50.0	41.0
608.160	32.0	PK	0.0	-25.1	6.9	0	100	Hori.	50.0	43.1

CHART:WITH FACTOR
CALCULATION:RESULT = READING + LOSS(CABLE+ATTEN.) - GAIN(AMP)

Antenna Terminal Conducted Emission

Variation No. 9 External Antenna

DATA OF RADIATED EMISSION TEST

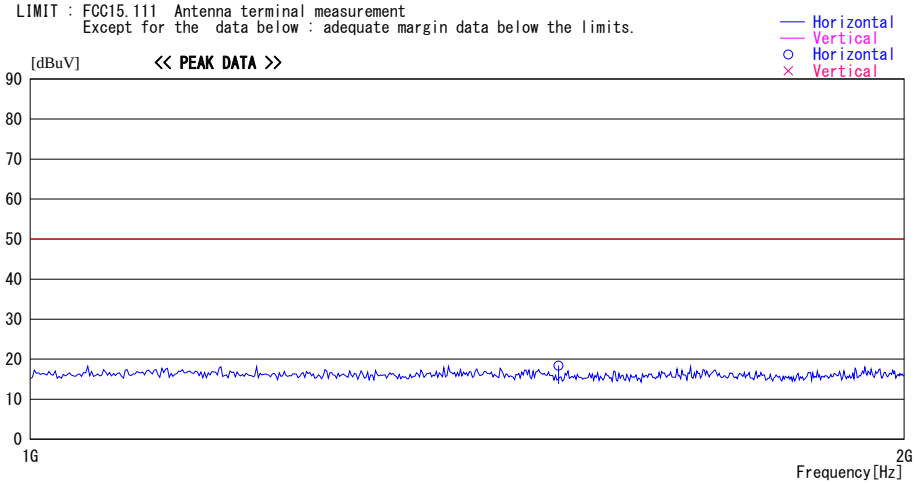
UL Japan, Inc. Head Office EMC Lab. No.6 shielded room
Date : 2013/11/05

Report No. : 10064276H

Temp./Humi. : 22deg. C / 51% RH
Engineer : Shinya Watanabe

Mode / Remarks : TPMS Receiving mode 314.98MHz Ext-Ant

LIMIT : FCC15.111 Antenna terminal measurement
Except for the data below : adequate margin data below the limits.



Frequency	Reading	DET	Antenna Factor	Loss& Gain	Level	Angle	Height	Polar.	Limit	Margin
[MHz]	[dBuV]		[dB/m]	[dB]	[dBuV]	[Deg]	[cm]		[dBuV/m]	[dB]
1520.400	44.6	PK	0.0	-26.2	18.4	0	100	Hori.	50.0	31.6

CHART:WITH FACTOR
CALCULATION:RESULT = READING + LOSS(CABLE+ATTEN.) - GAIN(AMP)

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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)
MAEC-03	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2013/02/28 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	RE	2013/02/26 * 12
MJM-16	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MTR-08	Test Receiver	Rohde & Schwarz	ESCI	100767	RE	2013/08/20 * 12
MBA-03	Biconical Antenna	Schwarzbeck	BBA9106	1915	RE	2013/10/13 * 12
MLA-03	Logperiodic Antenna	Schwarzbeck	USLP9143	174	RE	2013/10/13 * 12
MCC-51	Coaxial cable	UL Japan	-	-	RE	2013/07/23 * 12
MAT-70	Attenuator(6dB)	Agilent	8491A-006	MY52460153	RE	2013/04/05 * 12
MPA-13	Pre Amplifier	SONOMA INSTRUMENT	310	260834	RE	2013/03/12 * 12
MSA-03	Spectrum Analyzer	Agilent	E4448A	MY44020357	RE	2012/11/20 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2013/05/17 * 12
MCC-133	Microwave Cable	HUBER+SUHNER	SUCOFLEX104	336164/4(1m) / 340640(5m)	RE	2013/09/27 * 12
MPA-11	MicroWave System Amplifier	Agilent	83017A	MY39500779	RE	2013/03/12 * 12
MOS-14	Thermo-Hygrometer	Custom	CTH-201	-	AT	2013/02/26 * 12
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	AT	2013/06/14 * 12
MCC-64	Coaxial Cable	UL Japan	-	-	AT	2013/03/22 * 12
MMP-01	Matching Pad Anritsu	Anritsu	MB-009	40063	AT	2013/07/22 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	AT	2013/03/12 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	MY39500780	AT	2013/03/19 * 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