CMA Testing and Certification Laboratories
廠商會檢定中心

TEST REPORT

Report No. : AT0012605(3) Date : 02 Mar 2015

Application No. : LS040587(2)

Applicant : Smarthome Products Ltd
Rm B808-9, 8/F., Sea View Estate 2-8 Watson Road, North Point
Hong Kong

Sample Description : One(1) item of submitted sample stated to be :

Sample Description	Model number
433MHz Wireless Door Chime Receiver	WP402USL / WP515USL / WP723USL / WP753USL / WP811 USL / WP801 USL / WP812USL and WP802USL

Radio Frequency : 433.92MHz Receiver
Rating : AC 120V
No. of submitted sample : Nine (9) piece (s)

Date Received : 12 Feb 2015.

Test Period : 16 Feb 2015 to 26 Feb 2015.

Test Requested : FCC Part 15 Certification.

Test Method : 47 CFR Part 15 (10-1-12 Edition), ANSI C63.4 – 2009

Test Result : See attached sheet(s) from page 2 to 33.

Conclusion : The submitted sample was found to comply with requirement of FCC Part 15 Subpart B.

Remark : All eight models are same in circuitry and components and construction, and therefore model WP402USL was chosen to be representative of the test sample. The difference(s) between the tested model and the declared model(s) is/are Model no., and Outlook.

For and on behalf of
CMA Industrial Development Foundation Limited

Authorized Signature : _____ Page 1 of 33
Mr. WONG Lap-pong, Andrew
Manager
Electrical Division

FCC ID: LQP-WP8901-WRP200

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TEST REPORT

Report No. : AT0012605(3) Date : 02 Mar 2015

Table of Contents

1 General Information 3
1.1 General Description 3
1.2 Location of the test site 4
1.3 List of measuring equipment 5
1.4 Measurement Uncertainty 6
2 Description of the radiated emission test 7
2.1 Test Procedure 7
2.2 Test Result 8
2.3 Radiated Emission Measurement Data 9
3 Description of the Line-conducted Test 10
3.1 Test Procedure 10
3.2 Test Result 10
3.3 Graph and Table of Conducted Emission Measurement Data 10
4 Photograph 11
4.1 Photographs of the Test Setup for Radiated Emission and Conducted Emission 11
4.2 Photographs of the External and Internal Configurations of the EUT 11
5 Supplementary document 12
5.1 Bandwidth 12
5.2 Duty cycle 12
5.3 Transmission time 12
6 Appendices 13

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1 General Information

1.1 General Description

The equipment under test (EUT) is a receiver for doorbell. It operates at 433.92MHz and the oscillation of radio receiving circuit is generated by a crystal. The EUT is powered by AC 120V. When the EUT received the radio signal from transmitter, it will decode the signal and play the sound..

The brief circuit description is listed as follows:

- U6 and its associated circuit act as RF receiver
- Y1 and its associated circuit act as oscillator
- F1 and its associated circuit act as RF filter
- U5 and its associated circuit act as voice MCU
- U1 and its associated circuit act as MCU
- U2 and its associated circuit act as flash memory

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1.2 Location of the test site

FCC Registration Number: 552221

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2009. A Semi-Anechoic Chamber Testing Site is set up for investigation and located at:

Ground Floor, Yan Hing Centre,
9 – 13 Wong Chuk Yeung Street,
Fo Tan, Shatin,
New Territories,
Hong Kong.

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2009. A shielded room is located at :

Ground Floor, Yan Hing Centre,
9 – 13 Wong Chuk Yeung Street,
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1.3 List of measuring equipment

Equipment	Manufacturer	Model No.	Serial No.	Calibration Due Date	Calibration Period
EMI Test Receiver	R&S	ESCI	100152	28 Aug 2015	1Year
Broadband Antenna	Schaffner	CBL6112B	2692	19 Feb 2016	2Years
Coaxial Cable	Schaffner	RG 213/U	N/A	19 Feb 2016	1Year
Coaxial Cable	Suhner	RG 214/U	N/A	19 Feb 2016	1Year
Artificial Mains Network	R&S	ENV216	101232	13 Nov 2015	1Year
Coaxial Cable	Tyco Electronics	RG 58C/U	N/A	13 Nov 2015	1Year

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1.4 Measurement Uncertainty

The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.

Radiated emissions

Frequency	Uncertainty (U_{lab})
30MHz ~ 200MHz (Horizontal)	4.63dB
30MHz ~ 200MHz (Vertical)	4.65dB
200MHz ~1000MHz (Horizontal)	4.45dB
200MHz ~1000MHz (Vertical)	4.41dB

Conducted emissions

Frequency	Uncertainty (U_{lab})
150kHz ~ 30MHz	2.47dB

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2 Description of the radiated emission test

2.1 Test Procedure

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2009.

The equipment under test (EUT) was placed on a non-conductive turntable with dimensions of 1.5m x 1m and 0.8m high above the ground. 3m from the EUT, a broadband antenna mounting on the mast received the signal strength. The turntable was rotated to maximize the emission level. The antenna was then moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated.

For below 30MHz, a loop antenna with its vertical plane is placed 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1 m above the ground.

The device was rotated through three orthogonal axes to determine which attitude and configuration produce the highest emission during measurement.

A signal generator was used to radiate an unmodulated continuous wave (CW) signal to the EUT (super-regenerative receiver) at its operating frequency in order to “cohere” the characteristic broadband emissions from the receiver.

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Report No. : AT0012605(3) Date : 02 Mar 2015

2.2 Test Result

Quasi-Peak Detector data was measured unless otherwise stated.

"#" means emissions appearing within the restricted bands shall follow the requirement of section 15.205.

The emissions meeting the requirement of section 15.109 are based on measurements employing the CISPR quasi-peak detector below 1000MHz and average detector for frequencies above 1000MHz

The frequencies from 30MHz to 1000MHz were investigated, and emission more than 20dB below limit were not reported. Thus those highest emission were present in next page (section 2.3)

It was found that the EUT meet the FCC requirement.

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2.3 Radiated Emission Measurement Data

Radiated emission

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	23	° C
Relative humidity:	73	%

Detector: Quasi-Peak RBW: 100kHz VBW: 300kHz Operation mode: Receiving

Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Antenna Factor and Cable Loss (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
42.474	H	5.1	15.9	21.0	40.0	- 19.0
85.094	H	7.6	8.9	16.5	40.0	- 23.5
#133.818	H	6.8	14.1	20.9	43.5	- 22.6
195.591	H	7.0	11.7	18.7	43.5	- 24.8
240.951	H	8.1	13.0	21.1	46.0	- 24.9
272.996	H	7.3	15.7	23.0	46.0	- 23.0
335.061	H	8.1	17.1	25.2	46.0	- 20.8

Remark: Other emission more than 20dB below the limit are not reported.

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3 Description of the Line-conducted Test

3.1 Test Procedure

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2009. The EUT was setup as described in the procedures, and both lines were measured.

3.2 Test Result

The EUT is connected to 120V AC.

It was found that the EUT met the FCC requirement.

3.3 Graph and Table of Conducted Emission Measurement Data

For electronic filing, the document is saved with filename TestRpt2.pdf.

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Report No. : AT0012605(3) Date : 02 Mar 2015

4 Photograph

4.1 Photographs of the Test Setup for Radiated Emission and Conducted Emission

For electronic filing, the photos are saved with filename TSup1.jpg to TSup5.jpg.

4.2 Photographs of the External and Internal Configurations of the EUT

For electronic filing, the photos are saved with filename ExPho1.jpg to ExPho16.jpg and InPho1.jpg to InPho6.jpg.

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5 Supplementary document

The following document were submitted by applicant, and for electronic filing, the document are saved with the following filenames:

Document	Filename
ID Label/Location	LabelSmp.jpg
Block Diagram	BlkDia.pdf
Schematic Diagram	Schem.pdf
Users Manual	UserMan.pdf
Operational Description	OpDes.pdf

5.1 Bandwidth

Not applicable.

5.2 Duty cycle

Not applicable.

5.3 Transmission time

Not applicable.

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TEST REPORT

Report No. : AT0012605(3) Date : 02 Mar 2015

6 Appendices

A1	Photos of the set-up of Radiated Emissions	1	page
A2	Photos of the set-up of Conducted Emissions	2	pages
A3	Photos of External Configurations	8	pages
A4	Photos of Internal Configurations	3	pages
A5	ID Label/Location	4	pages
A6	Conducted Emission Measurement Data	2	pages

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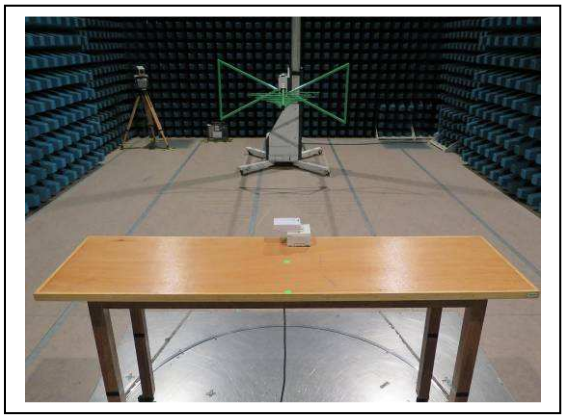
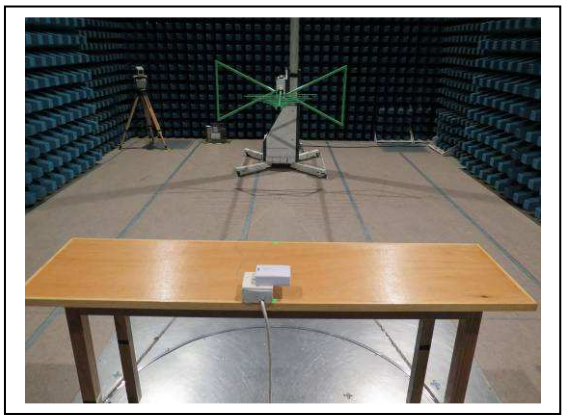
A1. Photos of the set-up of Radiated Emissions



(Front view)



(Back view)

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Reviewed by: Mr. WONG Lap-pong, Andrew

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A2. Photos of the set-up of Conducted Emissions

(Front view)

(Back view)

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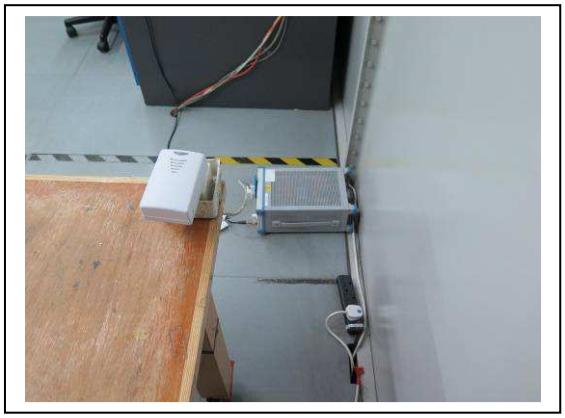
A2. Photos of the set-up of Conducted Emissions



(Side view)

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A3. Photos of External Configurations

External Configuration 1
(WP402USL)

External Configuration 2
(WP402USL)

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A3. Photos of External Configurations

External Configuration 3
(WP515USL)

External Configuration 4
(WP515USL)

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A3. Photos of External Configurations

External Configuration 5
(WP723USL)

External Configuration 6
(WP723USL)

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A3. Photos of External Configurations

External Configuration 7
(WP753USL)

External Configuration 8
(WP753USL)

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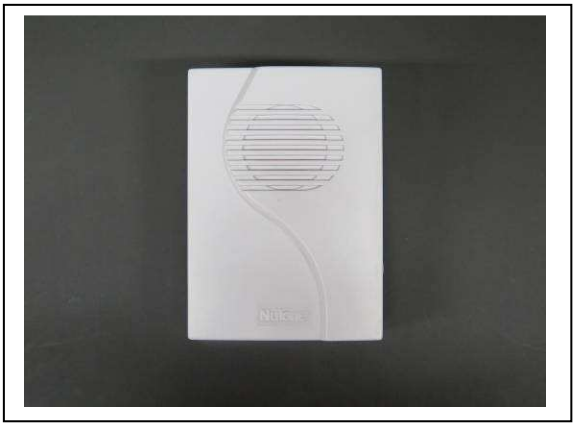
A3. Photos of External Configurations



External Configuration 9
(WP811USL)

External Configuration 10
(WP811USL)

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A3. Photos of External Configurations

External Configuration 11
(WP801USL)

External Configuration 12
(WP801USL)

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TEST REPORT

Report No. : AT0012605(3) Date : 02 Mar 2015

A3. Photos of External Configurations

External Configuration 13
(WP812USL)

External Configuration 14
(WP812USL)

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TEST REPORT

Report No. : AT0012605(3) Date : 02 Mar 2015

A3. Photos of External Configurations

External Configuration 15
(WP802USL)

External Configuration 16
(WP802USL)

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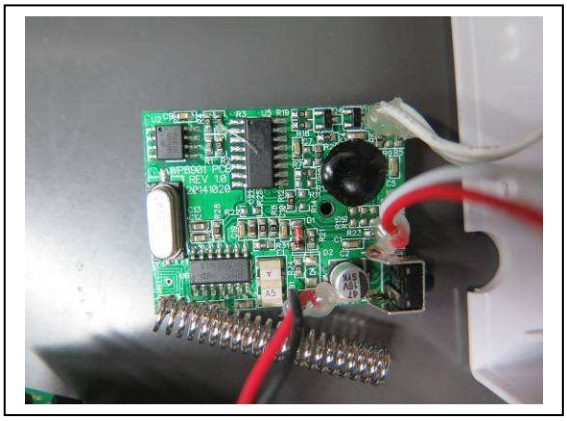
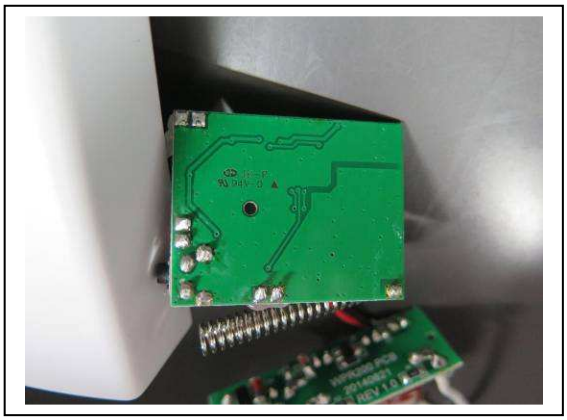
A4. Photos of Internal Configurations



Internal Configuration 1



Internal Configuration 2

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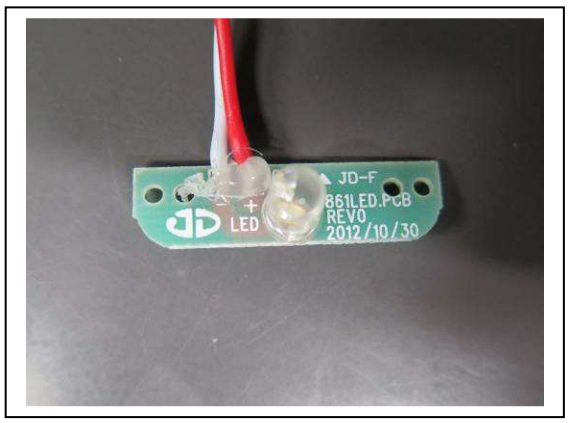
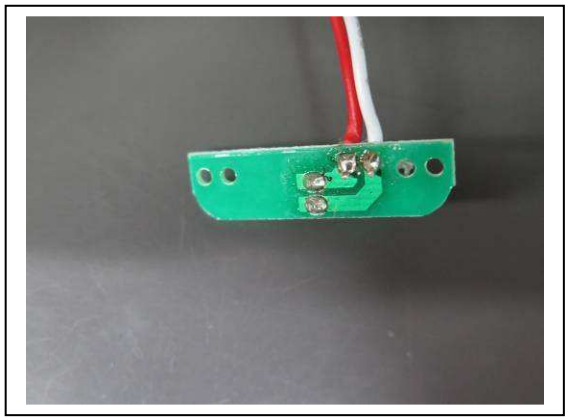
A4. Photos of Internal Configurations



Internal Configuration 3



Internal Configuration 4

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew

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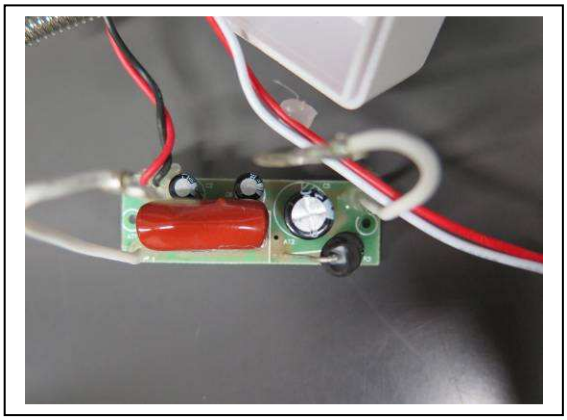
TEST REPORT

Report No. : AT0012605(3) Date : 02 Mar 2015

A4. Photos of Internal Configurations



Internal Configuration 5

Internal Configuration 6

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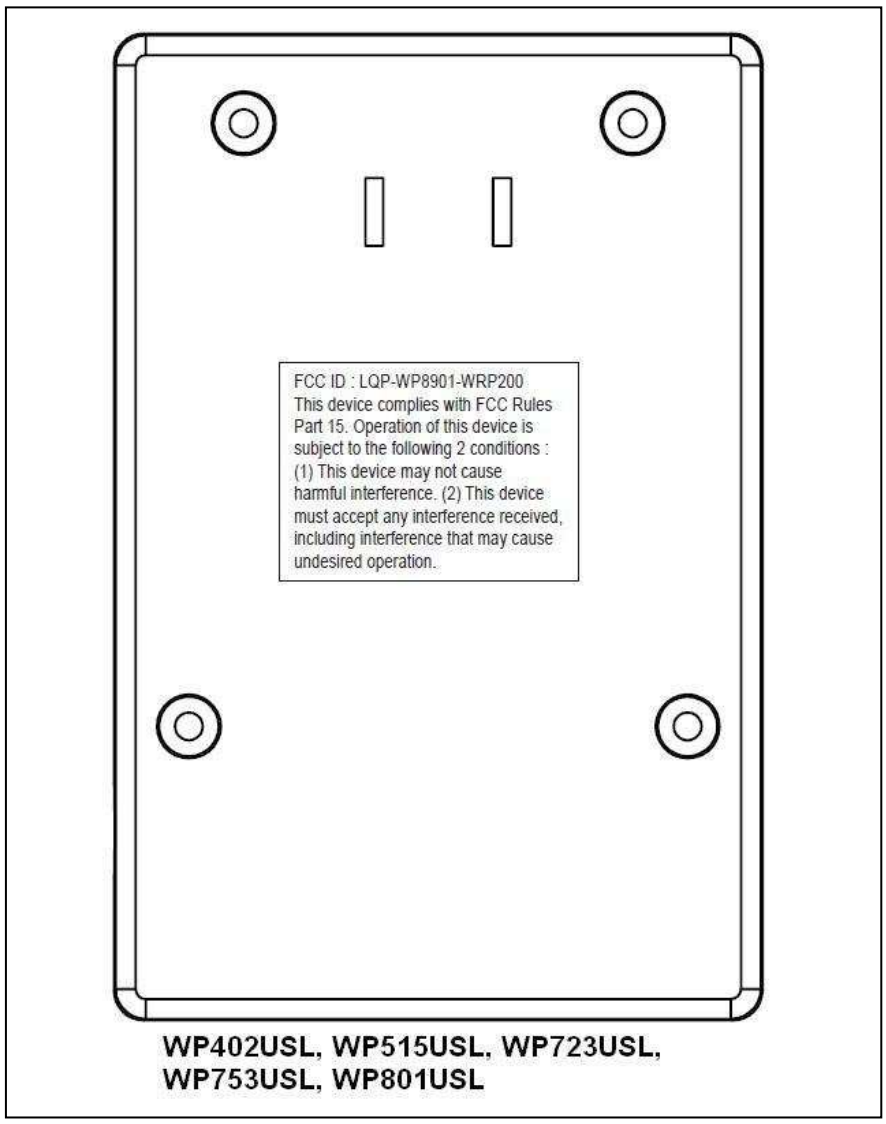
TEST REPORT

Report No. : AT0012605(3) Date : 02 Mar 2015

A5. ID Label / Location



ID Label 1

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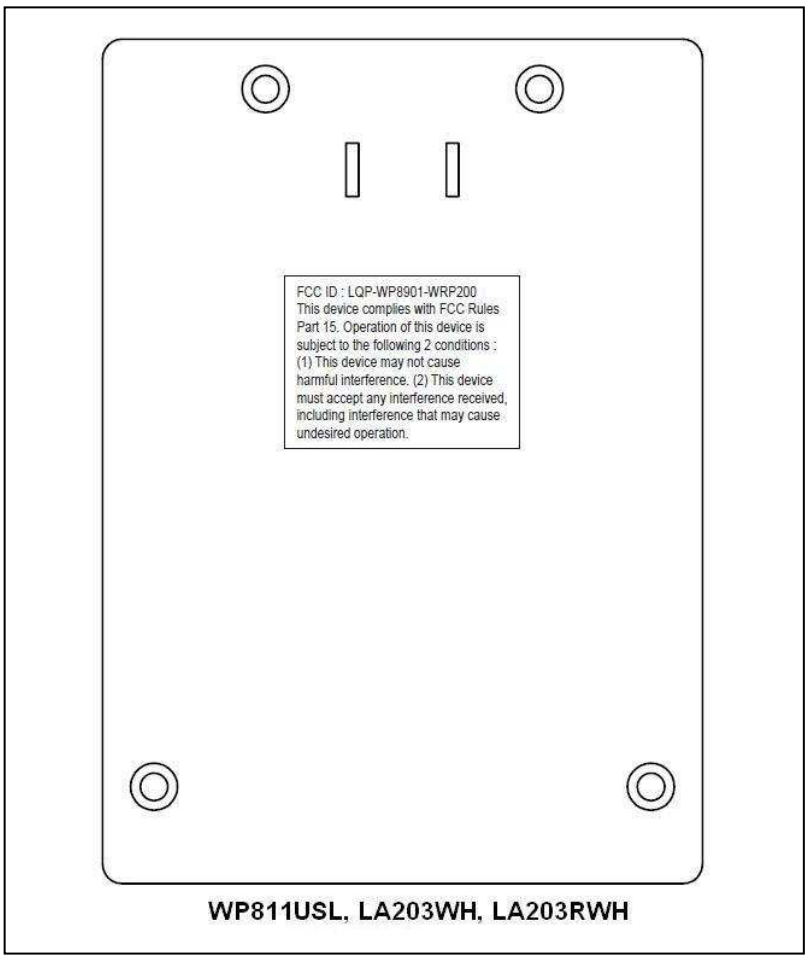

ID Label 2

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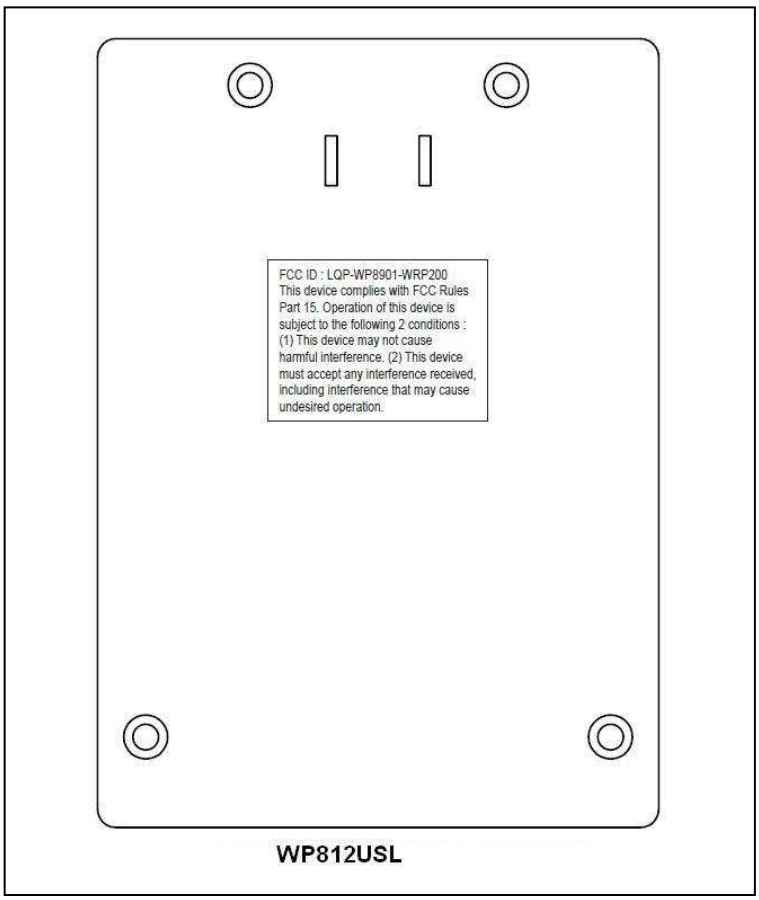
A5. ID Label / Location



ID Label 3

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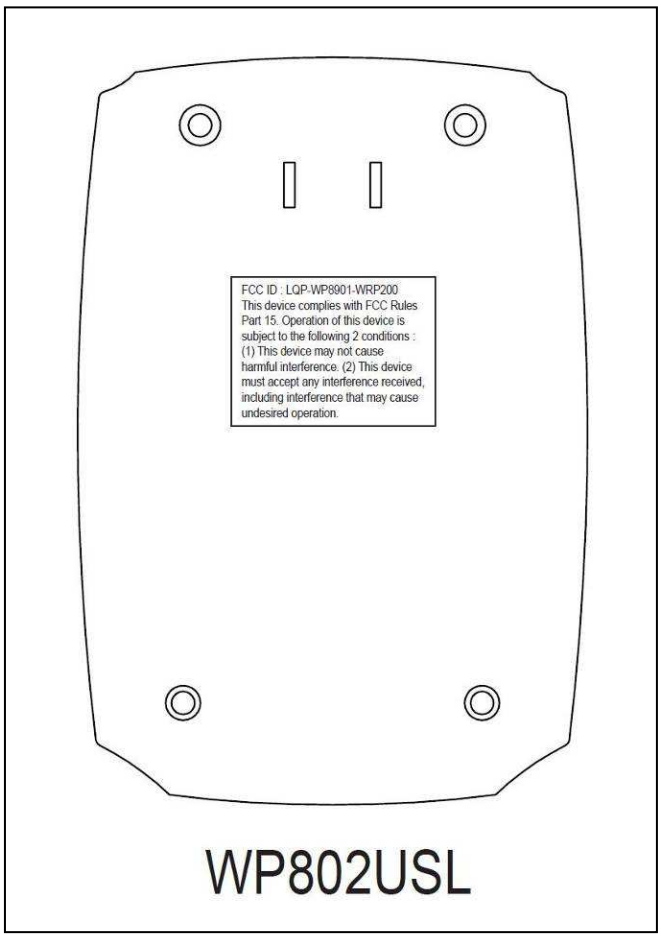
A5. ID Label / Location



ID Label 4

Tested by: Mr. LEUNG Shu-kan, Ken

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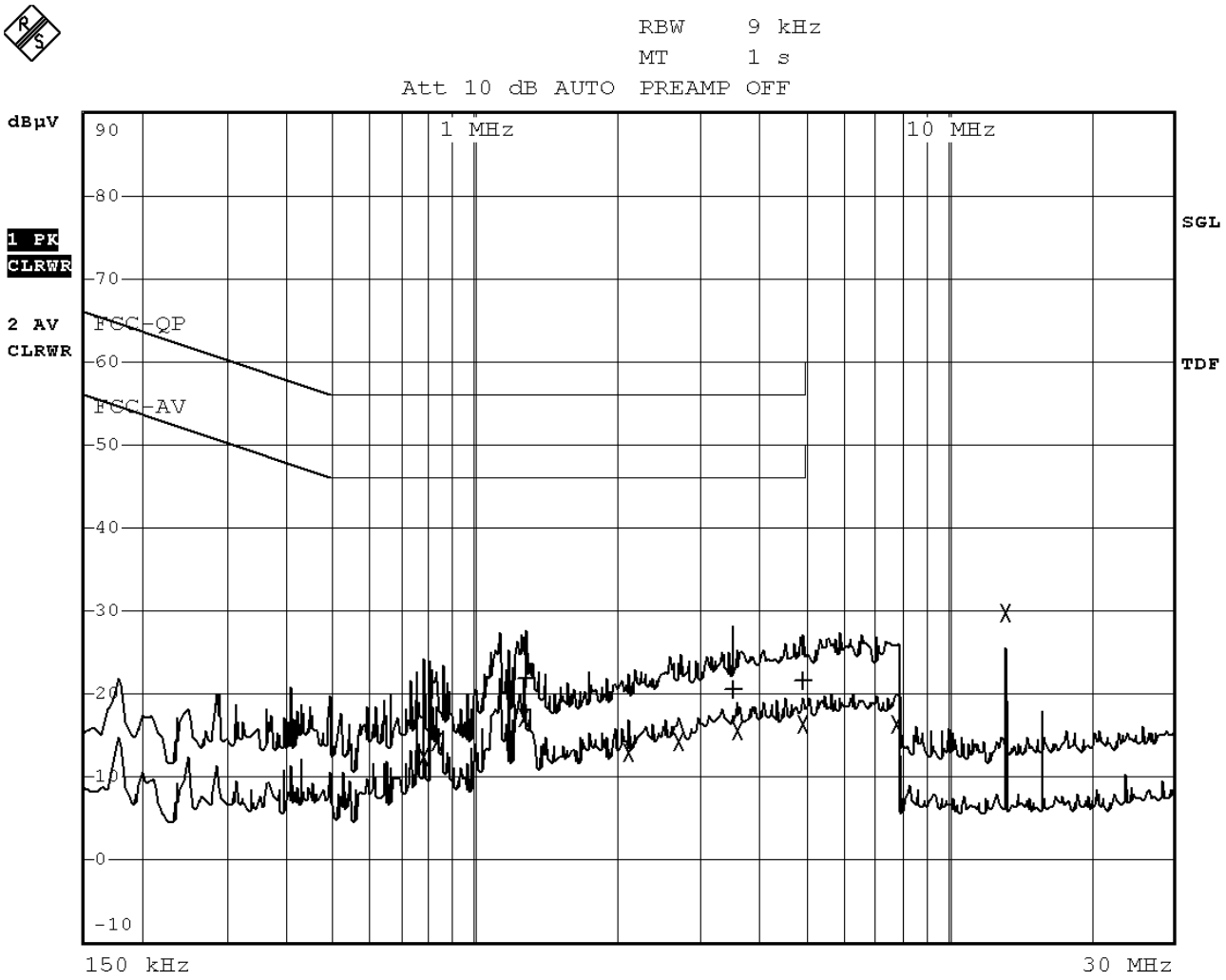
Report No. : AT0012605(3) Date : 02 Mar 2015

A6. Conducted Emission Measurement Data



Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew

FCC ID: LQP-WP8901-WRP200

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TEST REPORT

Report No. : AT0012605(3) Date : 02 Mar 2015

A6. Conducted Emission Measurement Data

EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC-QP		
Trace2:	FCC-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	779 kHz	12.47 L1 gnd	-33.52
2 Average	828.5 kHz	14.30 N gnd	-31.69
2 Average	1.2695 MHz	17.10 N gnd	-28.89
1 Quasi Peak	1.283 MHz	21.82 N gnd	-34.17
2 Average	2.12 MHz	13.06 N gnd	-32.94
2 Average	2.7095 MHz	14.35 N gnd	-31.65
1 Quasi Peak	3.524 MHz	20.64 N gnd	-35.35
2 Average	3.614 MHz	15.55 L1 gnd	-30.44
1 Quasi Peak	4.964 MHz	21.50 N gnd	-34.49
2 Average	4.964 MHz	16.42 L1 gnd	-29.57
2 Average	7.772 MHz	16.47 L1 gnd	-33.52
2 Average	13.226 MHz	29.67 N gnd	-20.32

***** End of Report *****

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