



# CMA Testing and Certification Laboratories

廠商會檢定中心

## TEST REPORT

Report No. : AS0071124(4) Date : 11 Dec 2014

Application No. : LS073033(5)

Applicant : KODA International Development Ltd  
506A, 5th Floor, Harbour Crystal Ctr.,  
100 Granville Road, Tsimshatsui, Kowloon  
Hong Kong

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

Brand	Sample Description	Model No.
Capello	Wireless Speaker & Alarm Clock with USB phone charger and dual alarm, Wireless Speaker & Alarm Clock, Wireless Alarm Clock with USB Charging, Wireless Alarm Clock with USB Charger, Decorative Clock Capello	CA-50i, Charge Up

Radio Frequency : 2402MHz – 2480 MHz Transceiver  
 Rating : 4 x 1.5V AA size batteries  
 AC 100 – 240V to DC 5V adaptor (HB10-050150SPA)  
 No. of submitted sample : Two (2) piece (s)

Date Received : 21 Nov 2014

Test Period : 24 Nov 2014 to 09 Dec 2014.

Test Requested : FCC Part 15 Certificate

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

Test Engineer : Mr. LEUNG Shu-kan, Ken

Test Result : See attached sheet(s) from page 2 to 36.

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

Remark : All two models are the same in circuitry and components; therefore model CA-50i was chosen to be the representative of the test sample. The difference between the tested sample and declared model(s) is/are model no. and sample description.

*For and on behalf of*  
 CMA Industrial Development Foundation Limited

Authorized Signature : \_\_\_\_\_

  
 Mr. WONG Lap-pong, Andrew  
 Manager  
 Electrical Division

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FCC ID: 2ADLH-CA-50I



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### 1 General Information

#### 1.1 General Description

The equipment under test (EUT) is Bluetooth speaker. The EUT is power 5V adaptor. The EUT has Bluetooth mode, Aux-in mode and Charging mode. It can receive digital audio signal from other wireless devices and playback the audio signal. An Aux input terminal supports audio input by 3.5mm terminal. The USB port is used for charging other devices. It has no function with computer

The brief circuit description is listed as follows:

- IC301 and its associated circuit act as Bluetooth module
- IC2 and its associated circuit act as amplifier
- IC-3, IC-4 and its associated circuit act as LDO
- U4 and its associated circuit act as MCU
- LED2 and its associated circuit act as LED display
- K1, K2, K3, K4, K5, K6, K7, K8, K9 and its associated circuit act as control key



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### 1.2 Location of the test site

FCC Registered Test Site 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,  
Fo Tan, Shatin,  
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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
Spectrum Analyzer	R&S	FSV40	100628	17 Dec 2014	1Year
Broadband Antenna	Schaffner	CBL6112B	2718	06 Jan 2015	1Year
Loop Antenna	EMCO	6502	00056620	28 Oct 2015	2Years
Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-531	24 Nov 2016	2Years
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170442	18 Jun 2015	2Years
Broadband Pre-Amplifier	Schwarzbeck	BBV 9718	9718-119	24 Nov 2016	2Years
Broadband Pre-Amplifier	Schwarzbeck	BBV 9719	9719-010	17 Jun 2015	2Years
Coaxial Cable	Schaffner	RG 213/U	N/A	06 Jan 2015	1Year
Coaxial Cable	Suhner	RG 214/U	N/A	06 Jan 2015	1Year
Coaxial Cable	Suhner	Sucoflex_102	N/A	24 Nov 2015	1Year
LISN	Rohde & Schwarz	ESH3-Z5	100038	10 Dec 2014	1Year
Coaxial Cable	Tyco Electronics	RG58C/U	N/A	10 Dec 2014	1Year

### 1.4 List of supporting equipment

iPod 8GB (SN: YM9312JE2ME) (Supplied by CMA)



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### 1.5 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.

For 30MHz to 1GHz, broadband antenna with its vertical and horizontal plane is placed 3m from the EUT and rotated about its vertical and horizontal axis for maximum response at each azimuth about the EUT. And the reference point of antenna shall be 1 m above the ground.

For above 1GHz, horn antenna with its vertical and horizontal plane is placed 3m from the EUT and rotated about its vertical and horizontal axis for maximum response at each azimuth about the EUT. Preamplifier and High Pass filter was used for measurements. The reference point of antenna shall be 1 m above the ground.

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



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### 2.2 Test Result

#### Subpart C

Peak Detector data were measured unless otherwise stated.

“#” means emissions appear within the restricted bands shall follow the requirement of section 15.205.

The frequencies from fundamental up to that tenth harmonics were investigated, and emissions more 20dB below limit were not reported. Thus, those highest emissions were presented in next page (section 2.3).

It was found that the EUT meet the FCC requirement.

#### Subpart B

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

The frequencies from 30MHz to 1000MHz were investigated, and emissions more the 20dB below limited were not reported. Thus, those higher emissions were presented 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

pursuant to

the requirement of FCC Part 15 subpart C

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	24	°C
Relative humidity:	62	%

Detector: Peak RBW: 1MHz VBW: 3MHz Operation mode: Transmission

Testing frequency range: 9kHz to 25GHz

Channel	Frequency (MHz)	Polarity (H/V)	Reading at 3m (dBμV)	Transducer Factor (dB/m)	Field Strength at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
Low	2402.130	V	97.8	- 6.3	91.5	114.0	- 22.5
	#4803.464	V	44.5	2.4	46.9	74.0	- 27.1
	#4803.491	H	44.1	2.4	46.5	74.0	- 27.5
	7205.841	V	27.8	10.8	38.6	74.0	- 35.4
Middle	2441.152	V	97.4	- 6.3	91.1	114.0	- 22.9
	#4881.998	V	42.1	2.4	44.5	74.0	- 29.5
	#4882.216	H	41.5	2.4	43.9	74.0	- 30.1
	#7323.067	V	28.0	10.8	38.8	74.0	- 35.2
High	2479.958	V	96.3	- 6.3	90.0	114.0	- 24.0
	#4959.738	V	47.7	2.4	50.1	74.0	- 23.9
	#4959.991	H	47.3	2.4	49.7	74.0	- 24.3
	#7439.961	V	27.9	10.8	38.7	74.0	- 35.3

Remark: Peak measurement values are lower than average limit, therefore average measurement is not necessary.

Other emissions more than 20dB below the limit are not reported.



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### 2.3 Radiated Emission Measurement Data (Con't)

#### Radiated emission

pursuant to

the requirement of FCC Part 15 subpart B

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	24	° C
Relative humidity:	62	%

Detector: Quasi-peak

RBW: 120kHz

VBW: 300kHz

Testing frequency range: 9kHz to 25GHz

Operation: 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)
#124.731	H	9.3	14.4	23.7	43.5	- 19.8
202.812	H	9.3	12.0	21.3	43.5	- 22.2
398.543	H	12.5	16.8	29.3	46.0	- 16.7
462.355	H	10.2	20.6	30.8	46.0	- 15.2
487.873	H	10.9	20.6	31.5	46.0	- 14.5
531.733	H	9.6	22.2	31.8	46.0	- 14.2
770.677	H	11.2	23.5	34.7	46.0	- 11.3

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



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### 2.3 Radiated Emission Measurement Data (Con't)

#### Radiated emission

pursuant to

**the requirement of FCC Part 15 subpart B**

Environmental conditions:

Parameter	Recorded value	
Ambient temperature:	24	° C
Relative humidity:	62	%

Detector: Quasi-peak

RBW: 120kHz

VBW: 300kHz

Testing frequency range: 9kHz to 25GHz

Operation: Charging and Aux-in

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)
#37.907	V	10.9	18.7	29.6	40.0	- 10.4
48.439	V	13.3	12.8	26.1	40.0	- 13.9
55.428	V	15.5	10.6	26.1	40.0	- 13.9
60.805	V	20.2	7.6	27.8	40.0	- 12.2
85.576	V	12.4	8.5	20.9	40.0	- 19.1
#172.609	V	12.5	11.9	24.4	43.5	- 19.1
177.623	V	18.5	11.9	30.4	43.5	- 13.1

Remark: Other emissions 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 connected to adaptor for charging

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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### **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 TSup9.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 ExPho2.jpg and InPho1.jpg to InPho11.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

The plot saved in TestRpt3.pdf shows the fundamental emission is confined in the specified band. It shows the 20dB bandwidth met the 15.215 requirement for frequency band 2400 to 2483.5 MHz.

The plot saved in TestRpt4.pdf shows the band edge is fulfil 15.209 requirement.

#### 5.2 Duty cycle

Not Applicable

#### 5.3 Transmission time

Not Applicable

#### 5.4 Power Spectral Density

Not Applicable

#### 5.5 Average on time

Not Applicable



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### 6 Appendices

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A2	Photos of the set-up of Conducted Emissions	2	pages
A3	Photos of External Configurations	1	page
A4	Photos of Internal Configurations	6	pages
A5	ID Label/Location	1	page
A6	Conducted Emission Measurement Data	3	pages
A7	Band Edge	2	pages
A8	20dB Bandwidth Plot	2	pages



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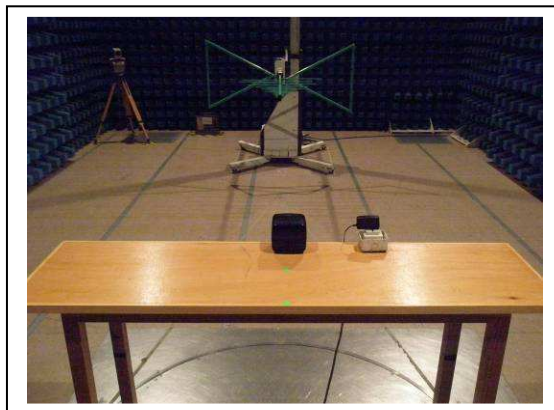
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## TEST REPORT

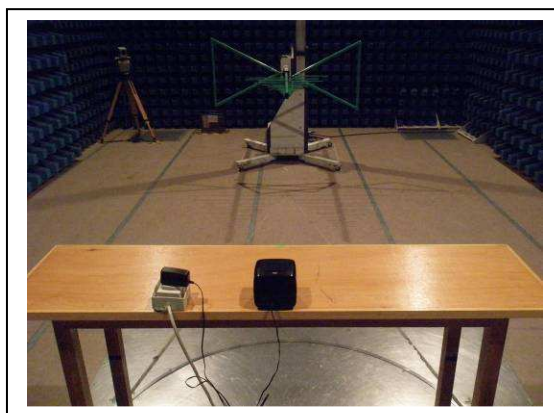
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### A1. Photos of the set-up of Radiated Emissions



(Front view, 30MHz – 1GHz)



(Back view, 30MHz – 1GHz)

Tested by:

Handwritten signature of Mr. LEUNG Shu-kan, Ken.

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Handwritten signature of Mr. WONG Lap-pong, Andrew.

Mr. WONG Lap-pong, Andrew





# CMA Testing and Certification Laboratories

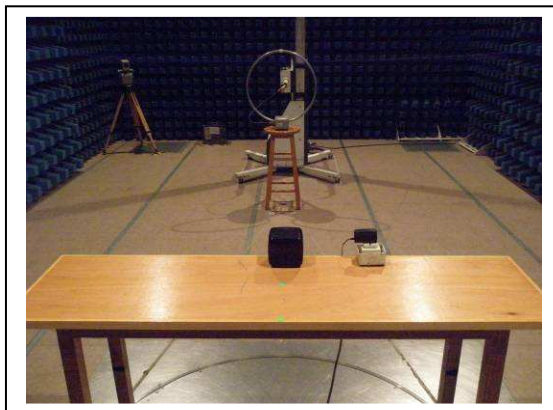
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### A1. Photos of the set-up of Radiated Emissions



(Front view, 9kHz – 30MHz)



(Back view, 9kHz – 30MHz)

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



# CMA Testing and Certification Laboratories

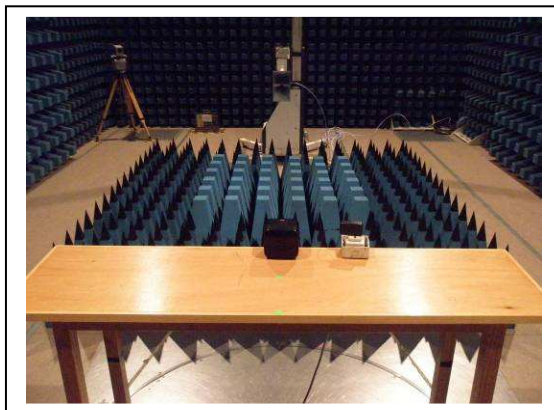
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## TEST REPORT

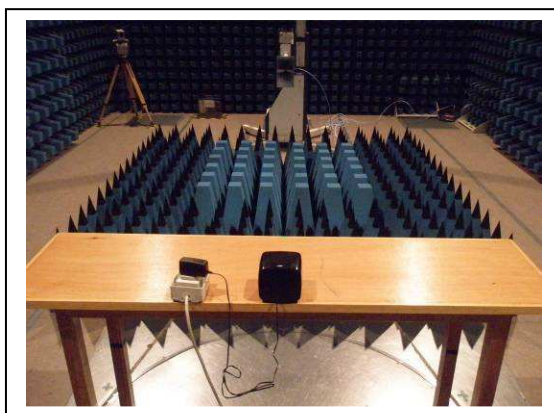
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### A1. Photos of the set-up of Radiated Emissions



(Front view, 1GHz – 25GHz)



(Back view, 1GHz – 25GHz)

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



# CMA Testing and Certification Laboratories

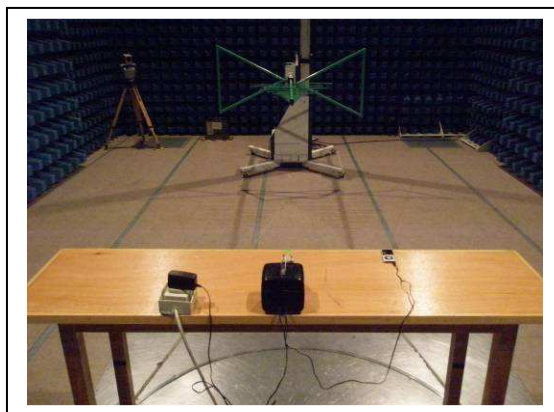
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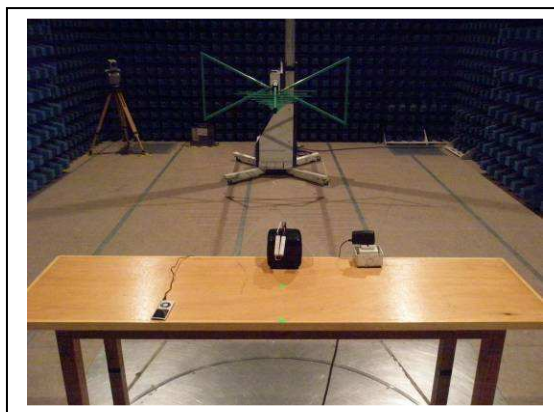
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### A1. Photos of the set-up of Radiated Emissions



(Front view, Charging and Aux-in)



(Back view, Charging and Aux-in)

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



# CMA Testing and Certification Laboratories

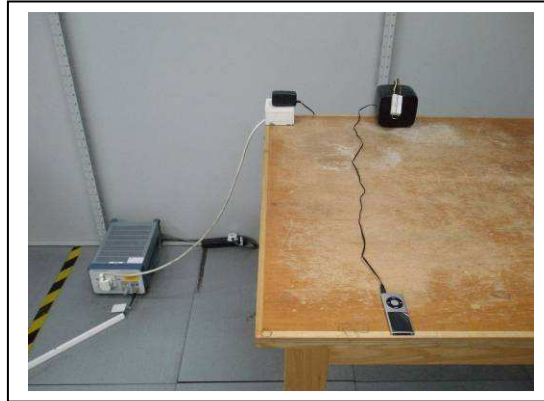
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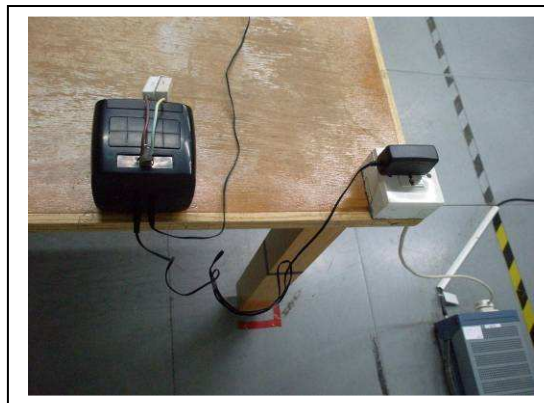
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### A2. Photos of the set-up of Conducted Emission



(front view)



(rear view)

Tested by:

Handwritten signature of Mr. LEUNG Shu-kan, Ken.

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Handwritten signature of Mr. WONG Lap-pong, Andrew.

Mr. WONG Lap-pong, Andrew



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### A2. Photos of the set-up of Conducted Emission



(side view)

Tested by:

Handwritten signature of Mr. LEUNG Shu-kan, Ken.

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Handwritten signature of Mr. WONG Lap-pong, Andrew.

Mr. WONG Lap-pong, Andrew



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### A3. Photos of External Configurations



(External Configuration 1)



(External Configuration 2)

Tested by:

A handwritten signature in black ink, appearing to read 'Ken'.

Mr. LEUNG Shu-kan, Ken

Reviewed by:

A handwritten signature in black ink, appearing to read 'Andrew'.

Mr. WONG Lap-pong, Andrew



# CMA Testing and Certification Laboratories

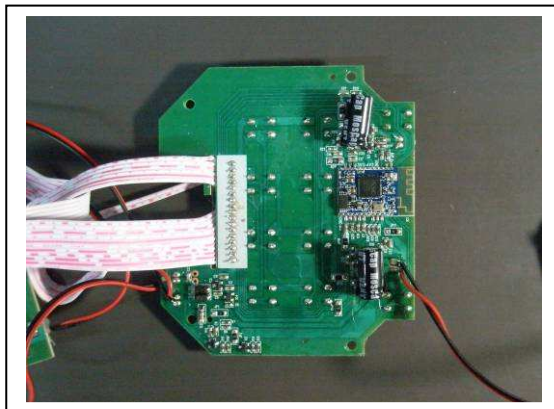
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## TEST REPORT

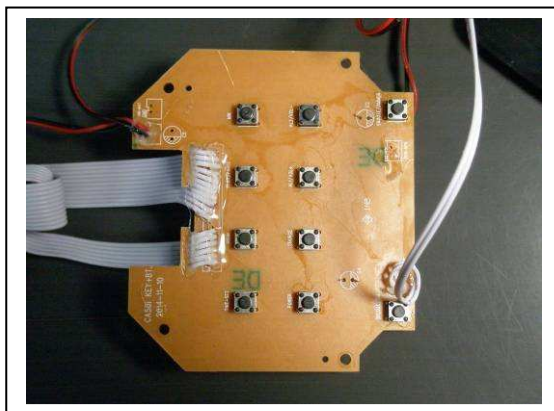
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### A4. Photos of Internal Configurations



Internal Configuration 1



Internal Configuration 2

Tested by:

Handwritten signature of Mr. LEUNG Shu-kan, Ken.

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Handwritten signature of Mr. WONG Lap-pong, Andrew.

Mr. WONG Lap-pong, Andrew



# CMA Testing and Certification Laboratories

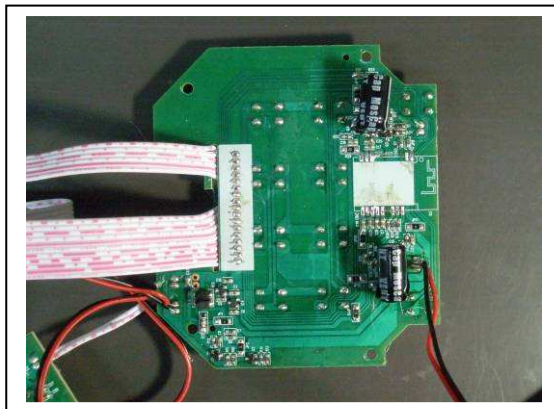
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## TEST REPORT

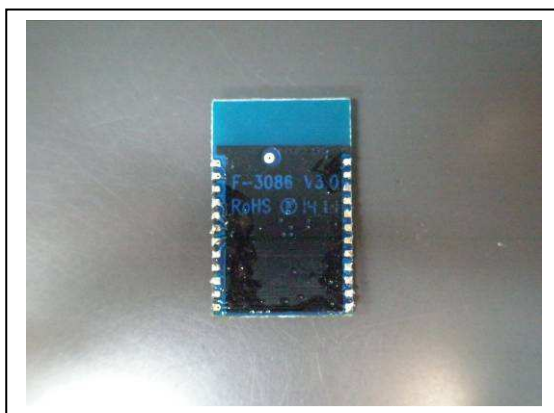
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Date : 11 Dec 2014

### A4. Photos of Internal Configurations



Internal Configuration 3



Internal Configuration 4

Tested by:

A handwritten signature in black ink, appearing to be 'Ken'.

Mr. LEUNG Shu-kan, Ken

Reviewed by:

A handwritten signature in black ink, appearing to be 'Andrew'.

Mr. WONG Lap-pong, Andrew





# CMA Testing and Certification Laboratories

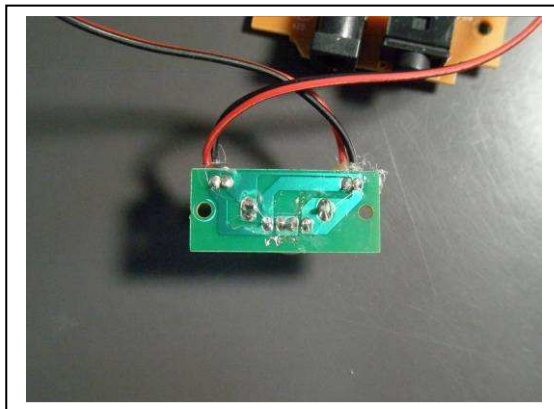
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## TEST REPORT

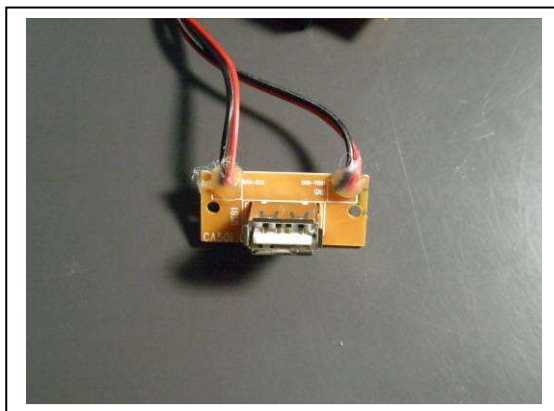
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Date : 11 Dec 2014

### A4. Photos of Internal Configurations



Internal Configuration 5



Internal Configuration 6

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



# CMA Testing and Certification Laboratories

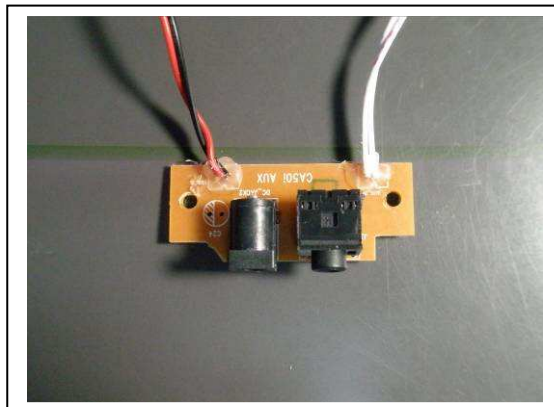
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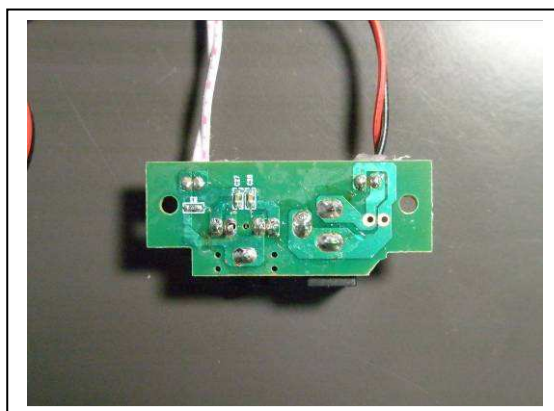
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### A4. Photos of Internal Configurations



Internal Configuration 7



Internal Configuration 8

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



# CMA Testing and Certification Laboratories

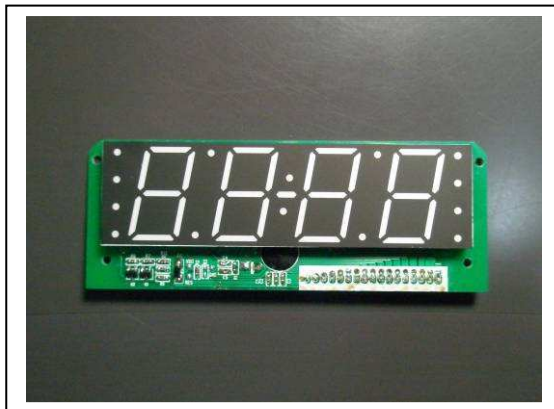
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## TEST REPORT

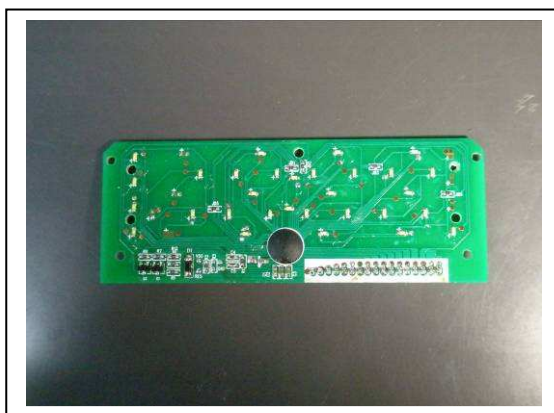
Report No. : AS0071124(4)

Date : 11 Dec 2014

### A4. Photos of Internal Configurations



Internal Configuration 9



Internal Configuration 10

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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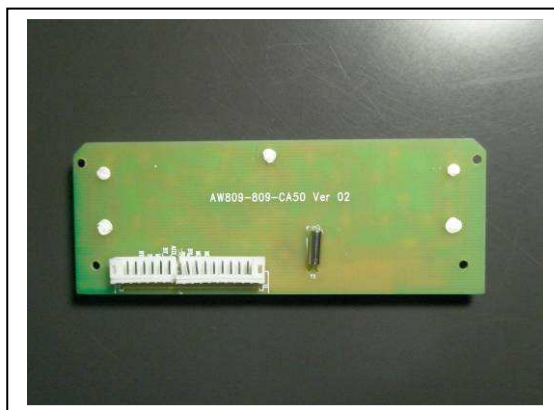
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## TEST REPORT

Report No. : AS0071124(4)

Date : 11 Dec 2014

### A4. Photos of Internal Configurations



Internal Configuration 11

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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## TEST REPORT

Report No. : AS0071124(4)

Date : 11 Dec 2014

### A5. ID Label / Location



Label 1



Label 2

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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## TEST REPORT

Report No. : AS0071124(4)

Date : 11 Dec 2014

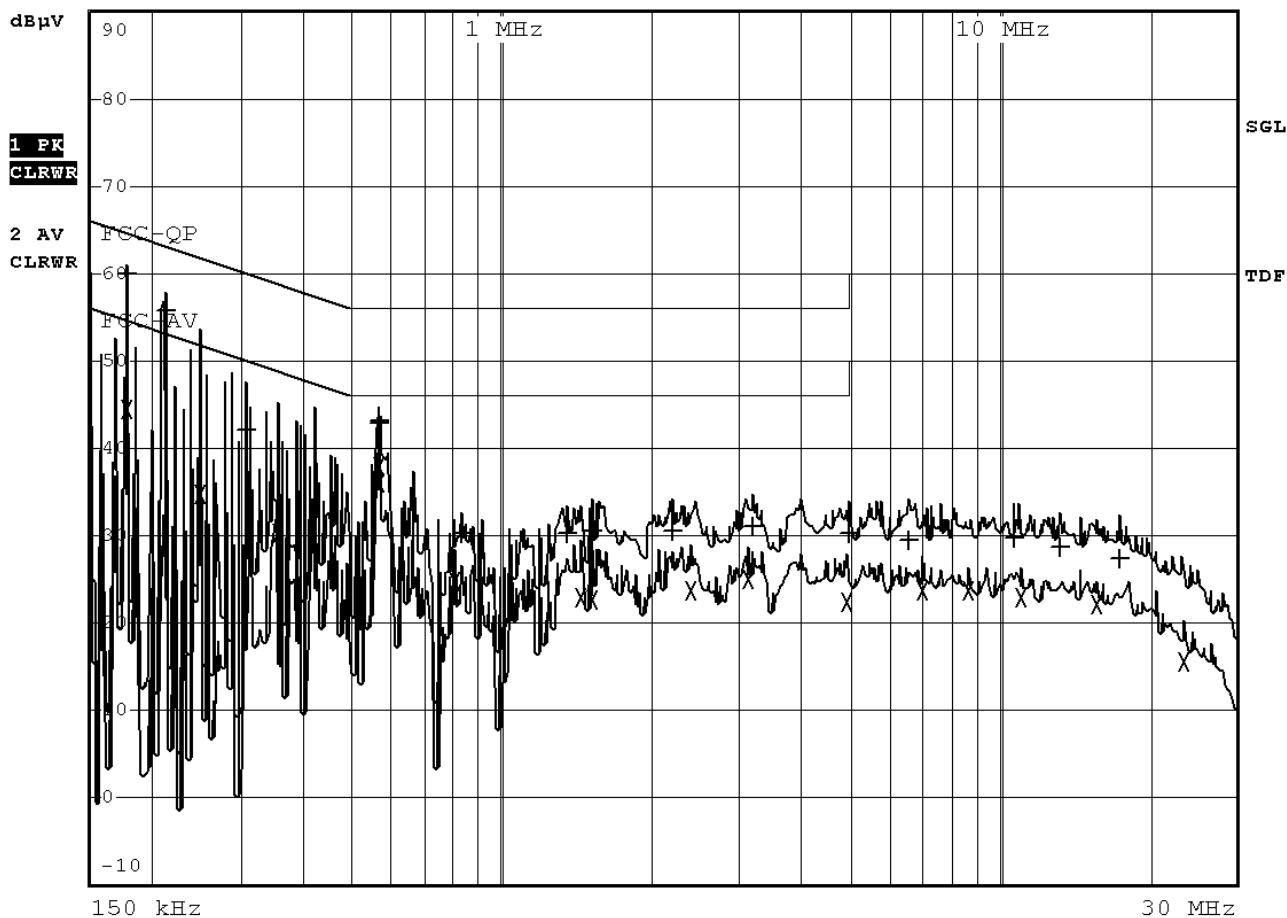
### A6. Conducted Emission Measurement Date



RBW 9 kHz

MT 1 s

Att 10 dB AUTO PREAMP OFF



Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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## TEST REPORT

Report No. : AS0071124(4)

Date : 11 Dec 2014

### A6. Conducted Emission Measurement Data

EDIT PEAK LIST (Final Measurement Results)				
Trace1:	FCC-QP			
Trace2:	FCC-AV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dB $\mu$ V		DELTA LIMIT dB
1 Quasi Peak	177 kHz	59.86	N gnd	-4.76
2 Average	177 kHz	44.49	N gnd	-10.13
1 Quasi Peak	213 kHz	55.84	N gnd	-7.24
2 Average	249 kHz	34.79	N gnd	-16.99
1 Quasi Peak	307.5 kHz	41.97	N gnd	-18.06
2 Average	357 kHz	30.40	N gnd	-18.39
1 Quasi Peak	563 kHz	43.19	L1 gnd	-12.80
2 Average	563 kHz	37.86	L1 gnd	-8.13
1 Quasi Peak	567.5 kHz	42.75	L1 gnd	-13.24
2 Average	567.5 kHz	36.16	L1 gnd	-9.83
2 Average	801.5 kHz	24.67	L1 gnd	-21.32
1 Quasi Peak	828.5 kHz	30.38	L1 gnd	-25.61
1 Quasi Peak	1.3595 MHz	30.41	L1 gnd	-25.58
2 Average	1.4405 MHz	22.93	L1 gnd	-23.06
1 Quasi Peak	1.5305 MHz	30.57	L1 gnd	-25.42
2 Average	1.5305 MHz	22.78	L1 gnd	-23.21
1 Quasi Peak	2.2055 MHz	30.61	L1 gnd	-25.38
2 Average	2.417 MHz	23.75	L1 gnd	-22.24
2 Average	3.1415 MHz	25.14	L1 gnd	-20.85
1 Quasi Peak	3.191 MHz	30.99	L1 gnd	-25.00

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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## TEST REPORT

Report No. : AS0071124(4)

Date : 11 Dec 2014

### A6 Conducted Emission Measurement Data

EDIT PEAK LIST (Final Measurement Results)				
Trace1:	FCC-QP			
Trace2:	FCC-AV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dB $\mu$ V		DELTA LIMIT dB
2 Average	4.928 MHz	22.53	N gnd	-23.46
1 Quasi Peak	4.9865 MHz	30.39	N gnd	-25.61
1 Quasi Peak	6.575 MHz	29.62	N gnd	-30.37
2 Average	7.0475 MHz	23.65	N gnd	-26.35
2 Average	8.636 MHz	23.62	N gnd	-26.37
1 Quasi Peak	10.751 MHz	29.64	N gnd	-30.35
2 Average	11.1335 MHz	23.02	N gnd	-26.97
1 Quasi Peak	13.2845 MHz	28.79	N gnd	-31.20
2 Average	15.674 MHz	22.15	N gnd	-27.84
1 Quasi Peak	17.4245 MHz	27.30	N gnd	-32.69
2 Average	23.558 MHz	15.63	N gnd	-34.36

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew





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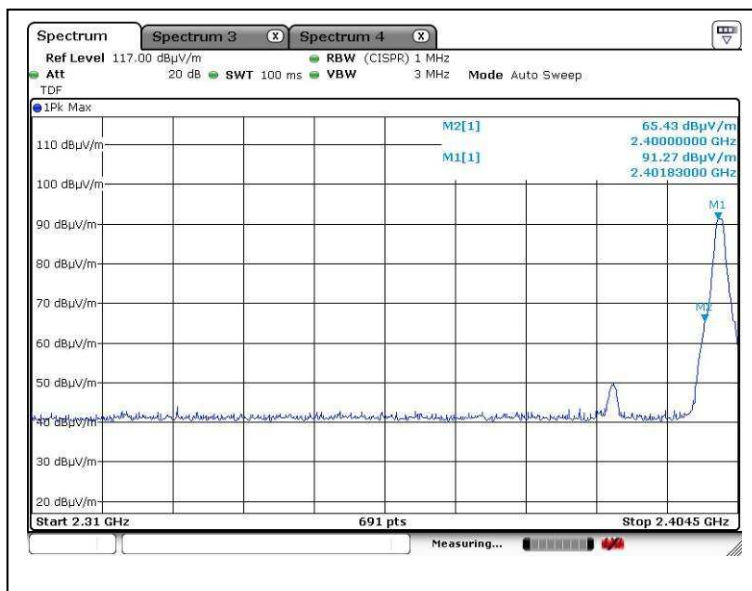
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## TEST REPORT

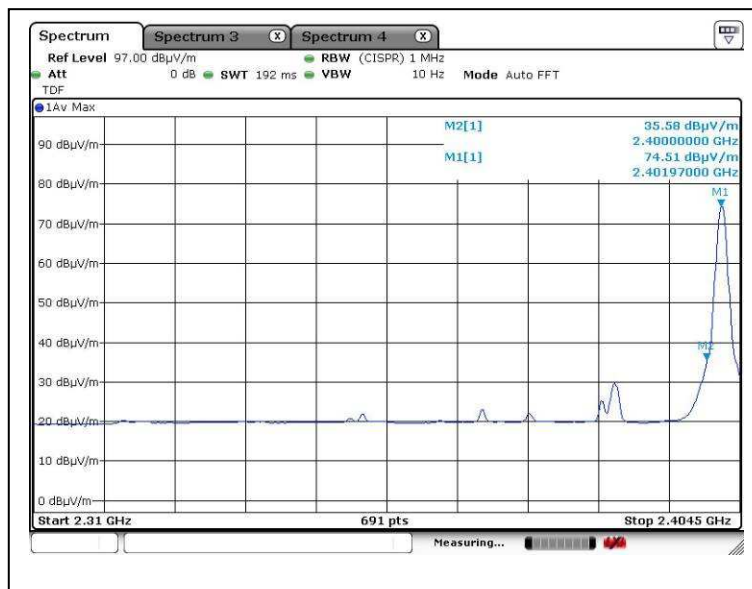
Report No. : AS0071124(4)

Date : 11 Dec 2014

### A7. Band Edge



Lower edge (Peak measurement)



Lower edge (Average measurement)

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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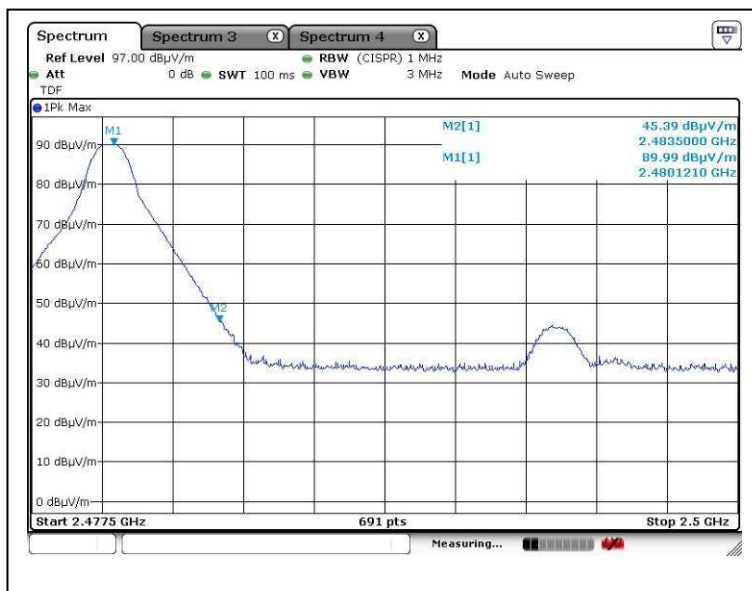
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## TEST REPORT

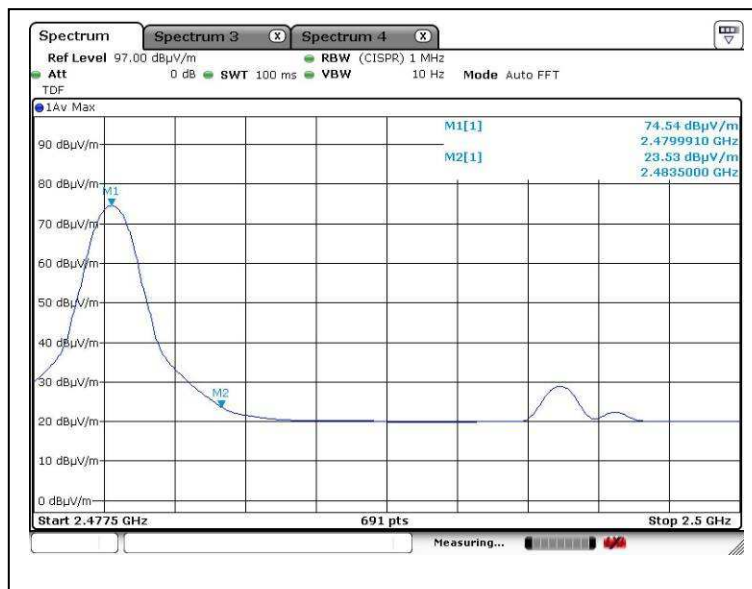
Report No. : AS0071124(4)

Date : 11 Dec 2014

### A7. Band Edge



Higher edge (Peak measurement)



Higher edge (Average measurement)

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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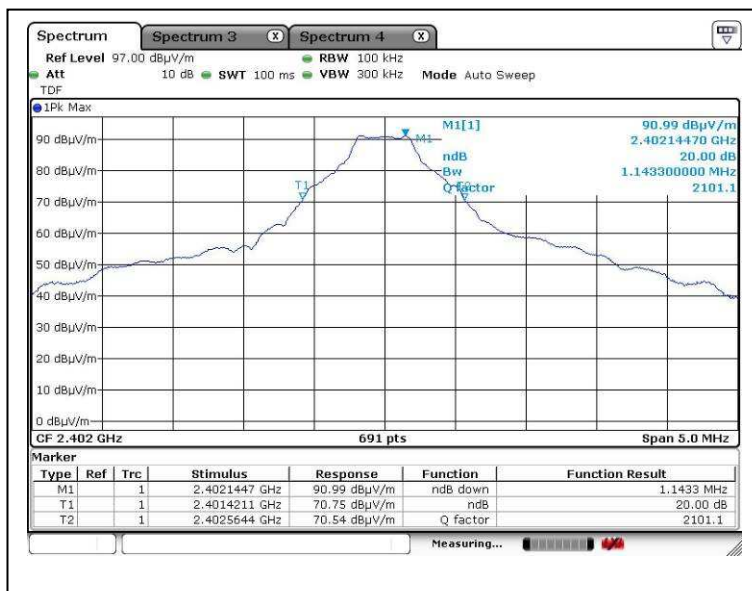
廠商會檢定中心

## TEST REPORT

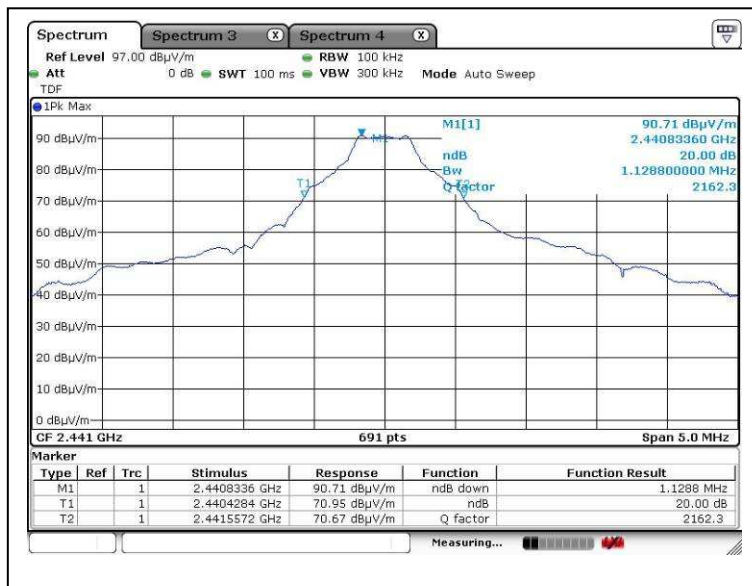
Report No. : AS0071124(4)

Date : 11 Dec 2014

### A8. 20dB Bandwidth Plot



Bandwidth 1 (2402MHz)



Bandwidth 2 (2441MHz)

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew



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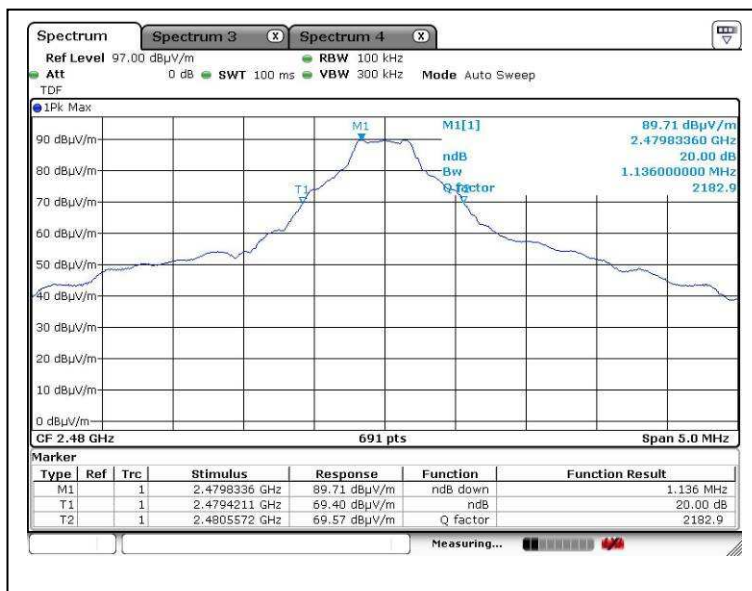
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## TEST REPORT

Report No. : AS0071124(4)

Date : 11 Dec 2014

### A8. 20dB Bandwidth Plot



Bandwidth 3 (2480MHz)

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

Tested by:

Mr. LEUNG Shu-kan, Ken

Reviewed by:

Mr. WONG Lap-pong, Andrew