# TEST REPORT

| | | | | |
|---|---|---|---|---|
| Report No. | : | AS0026127(7) | Date : | 14 May 2014 |
| Application No. | : | LS014037(4) | | |
| Applicant | : | JY Enterprise Limited<br>Unit 23B, 6/F, Block A, Wah Lok Industrial Centre, 31-41 Shan Mei Street, Fotan, Shatin, Hong Kong | | |
| Sample Description | : | Three (3) items of submitted sample stated to be Bluetooth Speaker of Model No. JY3031BT, DD05140005-C<br>Sample registration No. : RS015706-001, RS018464-001<br>Radio Frequency : 2402MHz ~ 2480MHz Transceiver<br>Rating : 3.7V rechargeable battery | | |
| Date Received | : | 22 Apr 2014, 13 May 2014 | | |
| Test Period | : | 25 Apr 2014 to 14 May 2014 | | |
| Test Requested | : | FCC Part 15 Certificate | | |
| Test Method | : | 47 CFR Part 15 (10-1-12 Edition)<br>ANSI C63.4 – 2009<br>FCC Public Notice DA 00-705 | | |
| Test Engineer | : | Mr. LEUNG Shu-kan, Ken | | |
| Test Result | : | See attached sheet(s) from page 2 to 56. | | |
| Conclusion | : | The submitted sample was found to comply with requirement of FCC Part 15 Subpart B and C. | | |

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

Authorized Signature : _____

Mr. WONG Lap-pong, Andrew
Manager
Electrical Division



FCC ID: 2ABVAJY3031BT



CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatcl.com Web Site: http://www.cmatcl.com

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CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatcl.com Web Site: http://www.cmatcl.com

# 1 General Information

## 1.1 General Description

The equipment under test (EUT) is a 2.4GHz Bluetooth speaker. The EUT is power by 3.7V rechargeable battery. It can connect to other wireless device by bluetooth and then play the music. The micro-USB port is only for battery chary charging. The mini-USB port is only the connecting port between main and auxiliary speaker. Both USB ports do not have data transfer function and do not have function when connecting computer.

For the Bluetooth mode, it supports standard Bluetooth V3.0+EDR or below revision protocol for data synchronization. After paring with other standard Bluetooth device, it can play the music.

The Bluetooth module used in the speaker has been test and approved by official Bluetooth Special Interest Group (SIG) member. All technical requirements including hopping rate, Frequency channels, Pseudo randomly order list and Bandwidth has been tested and complied with Spread Spectrum System requirements. The compliance information was listed at Bluetooth SIG with ID code is B020097 for model No CW6635.

A non standardized Bluetooth protocol or other Gaussian frequency-shift keying (GFSK) digital modulation signal was unable to synchronize the Bluetooth speaker.

A Bluetooth trademark was printed on the speaker enclosure to indicate it communicate with Bluetooth protocol only.

The USB port is unable to synchronize with personal computer, this port is for 3.7V battery charging only.

**Pseudorandom frequency hopping sequence**
The channel is represented by a pseudo-random hopping sequence hopping through the 79 RF channels. The hopping sequence is unique for the piconet and is determined by the Bluetooth device address of the master; the phase in the hopping sequence is determined by the Bluetooth clock of the master. The channel is divided into time slots where each slot corresponds to an RF hop frequency. Consecutive hops correspond to different RF hop frequencies. The nominal hop rate is 1600 hops/s. Example of a 79 hopping sequence in data mode: 40, 21, 44, 23, 42, 53, 46, 55, 48, 33, 52, 35, 50, 65, 54…

**Equal Hopping Frequency Use**
All Bluetooth units participating in the piconet are time and hop-synchronized to the channel.

**System Receiver Input Bandwidth**





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The input bandwidth of the receiver is 1 MHz. In every connection one Bluetooth device is the master and the other one is slave. The aster determines the hopping sequence. The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master. Additionally the type of connection (e.g. single multisport (packet) is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also the slave of the connection will use these settings. Repeating of a packet has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means, a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence.

**Equipment Description**

15.247(g): In accordance with the Bluetooth Industry Standard, the system is designed to comply With all of The regulations in Section 15.247 when the transmitter is presented with a continuous data (or information) system.

15.247(h): In accordance with the Bluetooth Industry Standard, the system does not coordinate it channels selection/ hopping sequence with other frequency hopping systems for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters.

The brief circuit description is listed as follows:

| | |
|---|---|
| - LED1, LED2, LED3, LED4 | and its associated circuit act as LED display |
| - MicroUSB1, D5, Q2, LED8 | and its associated circuit act as charging |
| - SW2, R188 | and its associated circuit act as switch |
| - U8, U7, Q1 | and its associated circuit act as Bluetooth module |
| - U6, U5 | and its associated circuit act as audio DAC |
| - U1 | and its associated circuit act as audio amplifier |
| - U3, U4 | and its associated circuit act as motor |

Antenna type : PCB Antenna
Antenna gain : 0dBi
Modulation technique : GFSK
Number of channel : 79 channels





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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,
New Territories,
Hong Kong.





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Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatcl.com Web Site: http://www.cmatcl.com

### 1.3 List of measuring equipment

| Equipment | Manufacturer | Model No. | Serial No. | Calibration Due Date | Calibration Period |
|---|---|---|---|---|---|
| EMI Test Receiver | R&S | ESCI | 100152 | 08 Jul 2014 | 1Year |
| Spectrum Analyzer | R&S | FSP30 | 100628 | 15 Aug 2014 | 1Year |
| Broadband Antenna | Schaffner | CBL6112B | 2718 | 06 Jan 2015 | 1Year |
| Loop Antenna | EMCO | 6502 | 00056620 | 15 Sep 2014 | 1Year |
| Horn Antenna | Schwarzbeck | BBHA 9120D | 9120D-531 | 09 Oct 2014 | 1Year |
| Horn Antenna | Schwarzbeck | BBHA 9170 | BBHA9170442 | 16 May 2015 | 2Years |
| Broadband Pre-Amplifier | Schwarzbeck | BBV 9718 | 9718-119 | 09 Oct 2014 | 1Year |
| Broadband Pre-Amplifier | Schwarzbeck | BBV 9719 | 9719-010 | 16 May 2015 | 2Years |
| LISN | R&S | ESH3-Z5 | 100038 | 10 Dec 2014 | 1Year |
| Coaxial Cable | Schaffner | RG 213/U | N/A | 28 May 2014 | 1Year |
| Coaxial Cable | Suhner | RG 214/U | N/A | 28 May 2014 | 1Year |
| Coaxial Cable | Suhner | Sucoflex_102 | N/A | 09 Oct 2014 | 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 and DA 00-705.

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 axes to determine which attitude and configuration produce the highest emission during measurement for Radiated Emission measurement.





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Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
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## 2.2 Test Result

Summary

| Section in FCC part 15 | Description | Result |
|---|---|---|
| 15.205(a), 15.209, 15.247(d) | Transmitter radiated spurious field strength and other emissions | Page 10-12 |
| 15.209 | Receiver emissions | Page 13 |
| 15.209 | Voltage disturbance | Page 14, 34, 35 |
| 15.247 (a)(1), Part 2.1 and DA-00705 | Hopping sequence | Page 36, 37 |
| 15.247 (a)(1) | 20dB bandwidth and 99% bandwidth | Page 38-40 |
| 15.247 (a)(1) | Channel Spacing (Frequency separation) | Page 41, 42 |
| 15.247 (a)(1)(iii) | Number of hopping frequency | Page 43 |
| 15.247 (d) | Band Edge | Page 44, 45 |
| 15.247 (a)(1)(iii) | Dwell Time (Bluetooth Average On Time) | Page 46-54 |
| 15.247 (b)(1) | Maximum Peak output power | Page 10, 55, 56 |

Subpart C:
Peak Detector and Average 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 emission more 20dB below limited were not reported. Thu, those higher emissions were presented in next page (section 2.3).

Subpart B:
The emissions meet 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 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.





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Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
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## 2.3 Maximum peak output power

**Conductive measurements**

**pursuant to**

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

Environmental conditions:

| Parameter | Recorded value | |
|---|---|---|
| Ambient temperature: | 26 | ° C |
| Relative humidity: | 60 | % |

Operation Mode: Transmission

| Channel | Frequency (MHz) | Reading (dBm) | Reading (mW) | Limit (mW) | Margin (mW) |
|---|---|---|---|---|---|
| 00 | 2402.007 | - 2.62 | 0.547 | 1000.0 | - 999.453 |

| Channel | Frequency (MHz) | Reading (dBm) | Reading (mW) | Limit (mW) | Margin (mW) |
|---|---|---|---|---|---|
| 39 | 2441.014 | - 2.91 | 0.511 | 1000.0 | - 999.489 |

| Channel | Frequency (MHz) | Reading (dBm) | Reading (mW) | Limit (mW) | Margin (mW) |
|---|---|---|---|---|---|
| 78 | 2479.985 | - 3.83 | 0.414 | 1000.0 | - 999.586 |

The plot saved in TestRpt9.pdf shows the transmission power was less than 1 watt.





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Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
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## 2.4 Radiated Emission Measurement Data

**Radiated emission**

**pursuant to**

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

Environmental conditions:

| Parameter | Recorded value | |
|---|---|---|
| Ambient temperature: | 26 | ° C |
| Relative humidity: | 80 | % |

Detector: Peak RBW: 1MHz VBW: 3MHz

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) |
|---|---|---|---|---|---|---|---|
| 00 | 2402.075 | V | 54.0 | 31.6 | 85.6 | 114.0 | - 28.4 |
| | #4803.942 | H | 55.1 | 2.0 | 57.5 | 74.0 | - 16.5 |
| | 7205.632 | V | 39.9 | 10.2 | 50.7 | 74.0 | - 23.3 |
| | 7205.965 | H | 45.3 | 12.9 | 56.1 | 74.0 | - 17.9 |
| 39 | 2441.008 | V | 53.6 | 31.6 | 85.2 | 114.0 | - 28.8 |
| | #4881.869 | V | 51.8 | 2.0 | 54.2 | 74.0 | - 19.8 |
| | #7322.891 | V | 42.6 | 10.2 | 53.4 | 74.0 | - 20.6 |
| | #7323.173 | H | 46.8 | 12.9 | 57.6 | 74.0 | - 16.4 |
| 78 | 2480.013 | V | 53.6 | 31.6 | 85.2 | 114.0 | - 28.8 |
| | #4960.115 | V | 53.3 | 2.0 | 55.7 | 74.0 | - 18.3 |
| | #4960.152 | H | 51.3 | 10.2 | 62.1 | 74.0 | - 11.9 |
| | #7440.166 | H | 45.4 | 12.9 | 56.2 | 74.0 | - 17.8 |

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





CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatcl.com Web Site: http://www.cmatcl.com

Report No. : AS0026127(7) Date : 14 May 2014

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

**Radiated emission**

**pursuant to**

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

Environmental conditions:

| Parameter | Recorded value | |
|---|---|---|
| Ambient temperature: | 26 | ° C |
| Relative humidity: | 80 | % |

Detector: Average RBW: 1MHz VBW: 10Hz

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) |
|---|---|---|---|---|---|---|---|
| 00 | 2402.028 | V | 53.0 | 31.6 | 84.6 | 94.0 | - 9.4 |
| | #4804.130 | H | 43.9 | 2.0 | 46.3 | 54.0 | - 7.7 |
| | 7206.000 | V | 32.6 | 10.2 | 43.4 | 54.0 | - 10.6 |
| | 7206.081 | H | 36.4 | 12.9 | 47.2 | 54.0 | - 6.8 |
| 39 | 2441.028 | V | 52.8 | 31.6 | 84.4 | 94.0 | - 9.6 |
| | #4882.108 | V | 45.0 | 2.0 | 47.4 | 54.0 | - 6.6 |
| | #7323.079 | V | 37.8 | 10.2 | 48.6 | 54.0 | - 5.4 |
| | #7323.080 | H | 38.1 | 12.9 | 48.9 | 54.0 | - 5.1 |
| 78 | 2480.028 | V | 52.8 | 31.6 | 84.4 | 94.0 | - 9.6 |
| | #4960.115 | V | 45.4 | 2.0 | 47.8 | 54.0 | - 6.2 |
| | #4960.094 | H | 42.7 | 10.2 | 53.5 | 54.0 | - 0.5 |
| | #7440.007 | H | 38.7 | 12.9 | 49.5 | 54.0 | - 4.5 |

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





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Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatcl.com Web Site: http://www.cmatcl.com

## 2.4 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: | 25 | ° C |
| Relative humidity: | 70 | % |

Detector: Quasi-peak (Below 1GHz), Peak (Above 1GHz)
RBW: 120kHz VBW: 300kHz (Below 1GHz)
RBW: 1MHz VBW: 3MHz (Above 1GHz)
Operation Mode: Receiving mode
Testing frequency range: 9kHz to 25GHz

| 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) |
|---|---|---|---|---|---|---|
| 384.009 | V | 12.2 | 16.8 | 29.0 | 46.0 | - 17.0 |
| 598.014 | V | 10.7 | 22.2 | 32.9 | 46.0 | - 13.1 |
| 608.014 | V | 10.5 | 22.8 | 33.3 | 46.0 | - 12.7 |
| 640.015 | V | 10.7 | 22.8 | 33.5 | 46.0 | - 12.5 |
| 4800.112 | H | 49.4 | 2.0 | 51.4 | 54.0 | - 2.6 |
| 4800.123 | V | 44.7 | 2.0 | 46.7 | 54.0 | - 7.3 |
| 4878.126 | V | 45.3 | 2.0 | 47.3 | 54.0 | - 6.7 |
| 4878.128 | H | 49.8 | 2.0 | 51.8 | 54.0 | - 2.2 |
| 4956.124 | H | 49.9 | 2.0 | 51.9 | 54.0 | - 2.1 |
| 4956.125 | V | 46.2 | 2.0 | 48.2 | 54.0 | - 5.8 |

Remark: Other emissions more than 20dB below the limit are not reported.
Peak measurement over 1GHz are lower than average limit, therefore average measurement is not necessary





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Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatcl.com Web Site: http://www.cmatcl.com

## 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 adaptor.

It was found that the EUT met the FCC requirement.

### 3.3 Graph and Table of Conducted Emission Measurement Data

For electronic filling, 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 ExPho7.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

Bluetooth:

The plot saved in TestRpt4.pdf shows the 20dB bandwidth and 99% bandwidth:

| Frequency Channel (MHz) | 20dB bandwidth (kHz) | 99% bandwidth (kHz) |
|---|---|---|
| 2402 | 1114.3 | 998.5 |
| 2441 | 1128.8 | 1005.7 |
| 2480 | 1114.3 | 1005.7 |

The plot saved in TestRpt5.pdf shows the channel spacing has minimum 25 kHz or two-third of 20dB bandwidth of hopping channel.

| Frequency (MHz) | Channel spacing (kHz) | Two-third of 20dB bandwidth (kHz) | Minimum bandwidth (kHz) |
|---|---|---|---|
| 2402 | 1005.8 | 665.7 | 25 |
| 2441 | 1005.8 | 670.5 | 25 |
| 2480 | 1013.0 | 670.5 | 25 |

The plot saved in TestRpt6.pdf shows the frequency hopping channel over 75 hopping frequency.

The plot saved in TestRpt7.pdf shows the fundamental emission is confined in the specified band. It shows the 20dB bandwidth and band edge meet the 15.247(d) and 15.205 requirement.





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Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
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**5.2 Duty cycle**

Not Applicable

**5.3 Transmission time**

Not Applicable

**5.4 Power Spectral Density**

Not Applicable

**5.5 Hopping sequence**

The plot saved in TestRpt3.pdf shows the hopping sequence is pseudorandom randomly distributed. Four example of continuous fundamental frequency hopping pattern was as below:

The 1st example of fundamental frequency = 2.454080GHz
The 2nd example of fundamental frequency = 2.422900GHz
The 3rd example of fundamental frequency = 2.440060GHz
The 4th example of fundamental frequency = 2.416860GHz

Result:
Fc 1 – Fc 2 = +31.18MHz
Fc 2 – Fc 3 = -17.16MHz
Fc 3 – Fc 4 = +23.20MHz

It was found the hopping pattern is pseudorandom random.





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**5.6 Average on time**

The plot saved in TestRpt8.pdf shows the average on time for frequency hopping channel is within 0.4 seconds.

The calculation for average on time as below:

Average hopping channel = Number of transmitted carrier / Sweep time

Average on time = Packet on time x Average hopping channel

Dwell time = Average on time x Total frequency hopping channel x 0.4

Test result:

| Frequency Channel (MHz) | Packet | Dwell Time (Seconds) | Limit (Seconds) | Margin (Seconds) |
|---|---|---|---|---|
| 2402 | DH1 | 0.128 | 0.4 | - 0.272 |
| 2402 | DH3 | 0.121 | 0.4 | - 0.279 |
| 2402 | DH5 | 0.121 | 0.4 | - 0.279 |
| 2441 | DH1 | 0.247 | 0.4 | - 0.153 |
| 2441 | DH3 | 0.299 | 0.4 | - 0.101 |
| 2441 | DH5 | 0.289 | 0.4 | - 0.111 |
| 2480 | DH1 | 0.346 | 0.4 | - 0.054 |
| 2450 | DH3 | 0.350 | 0.4 | - 0.050 |
| 2480 | DH5 | 0.273 | 0.4 | - 0.127 |





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## 6 Appendices

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| A13 | Transmission Power | 2 | pages |





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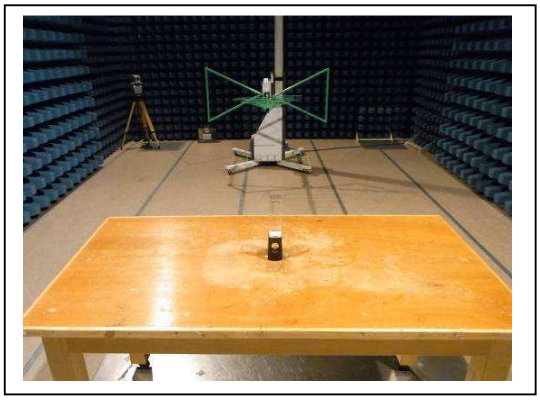
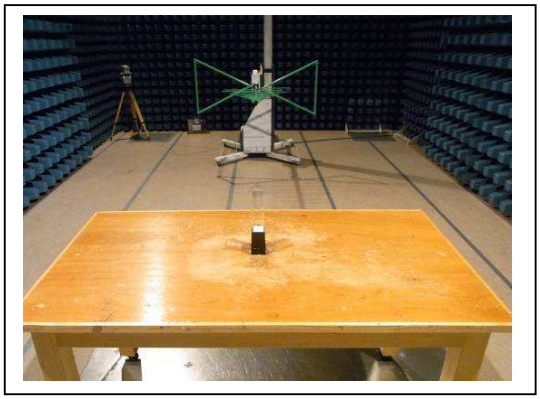
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatcl.com Web Site: http://www.cmatcl.com

Report No. : AS0026127(7) Date : 14 May 2014

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



(Front view, 30MHz – 1GHz)



(Back view, 30MHz – 1GHz)

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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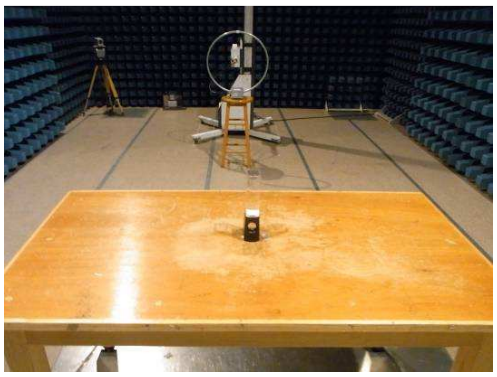
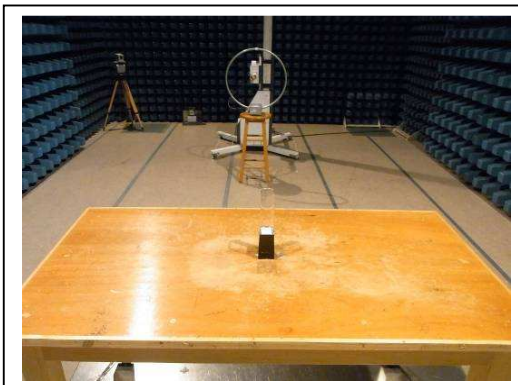


(Front view, 9KHz – 30MHz)



(Back view, 9KHz – 30MHz)

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew



FCC ID: 2ABVAJY3031BT



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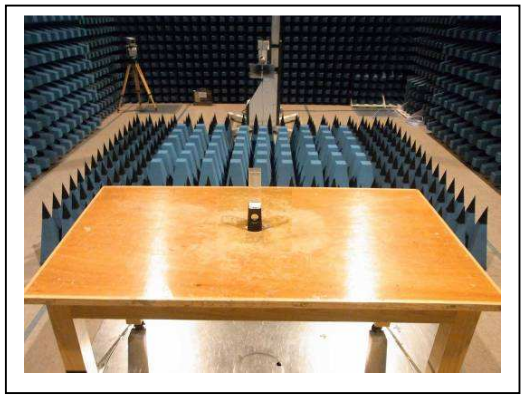
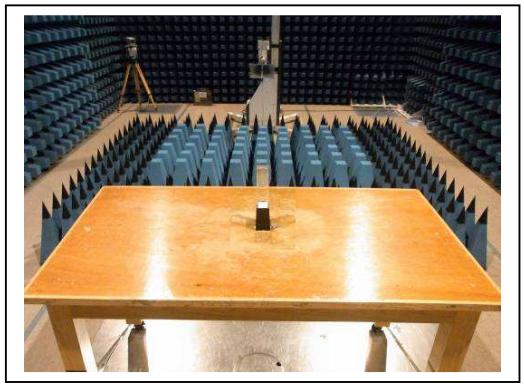


(front view, 1GHz – 25GHz)



(rear view, 1GHz – 25GHz)

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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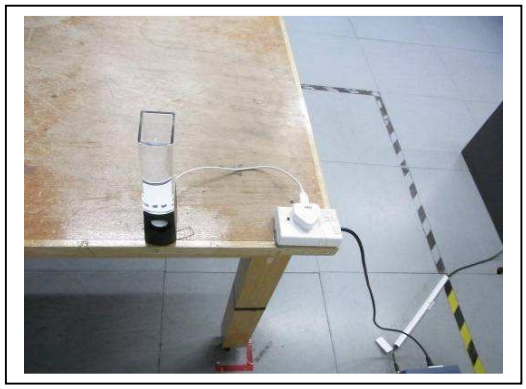
## A2 Photos of the set-up of Conducted Emission

(front view)



(rear view)

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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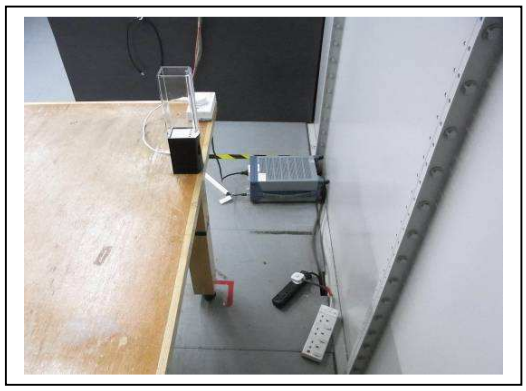
Report No. : AS0026127(7) Date : 14 May 2014

**Photos of the set-up of Conducted Emission**



(side view)

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew



FCC ID: 2ABVAJY3031BT



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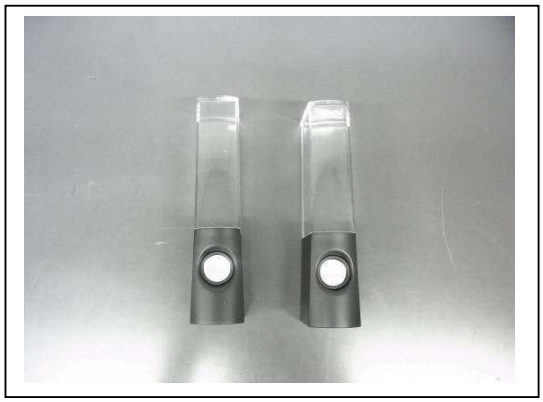
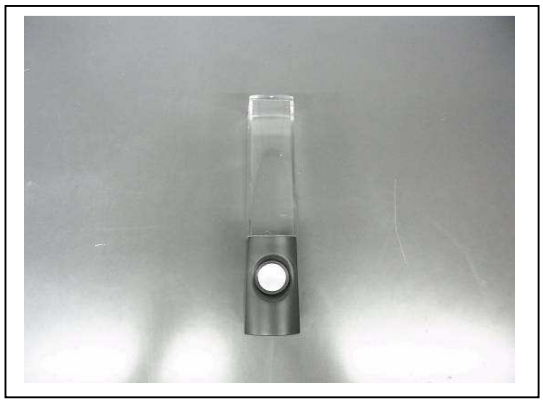
Report No. : AS0026127(7) Date : 14 May 2014

## A3. Photos of External Configurations



External Configuration 1



External Configuration 2 (Main speaker)

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew



FCC ID: 2ABVAJY3031BT



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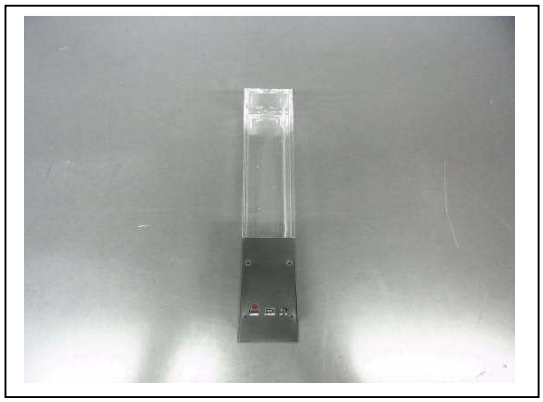
## A3. Photos of External Configurations



External Configuration 3 (Main speaker)

External Configuration 4 (Main speaker)

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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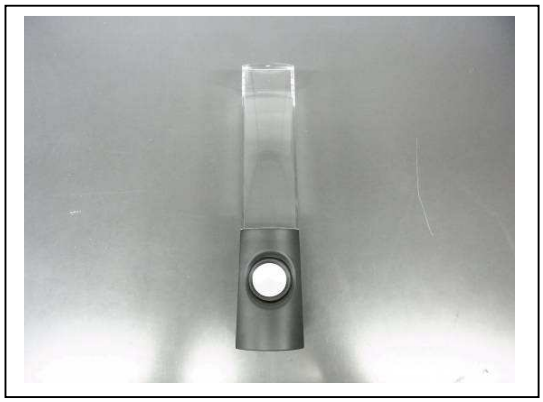
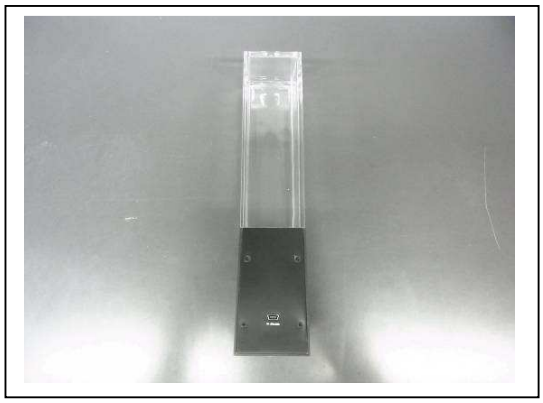
## A3. Photos of External Configurations



External Configuration 5 (Auxiliary speaker)



External Configuration 6 (Auxiliary speaker)

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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## A3. Photos of External Configurations

External Configuration 7 (Auxiliary speaker)

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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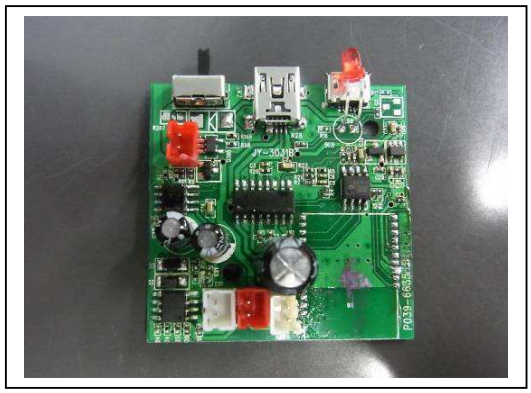
## A4. Photos of Internal Configurations

Internal Configuration 1 (Main speaker, main board)



Internal Configuration 2 (Main speaker, main board)

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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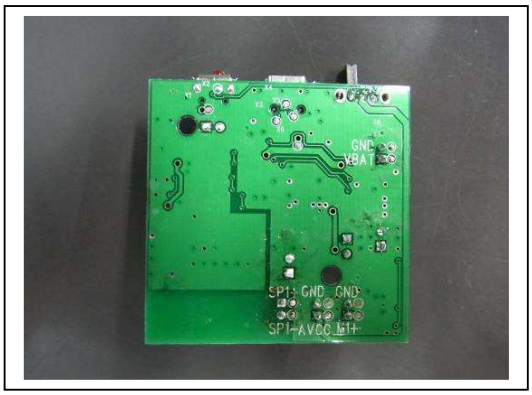
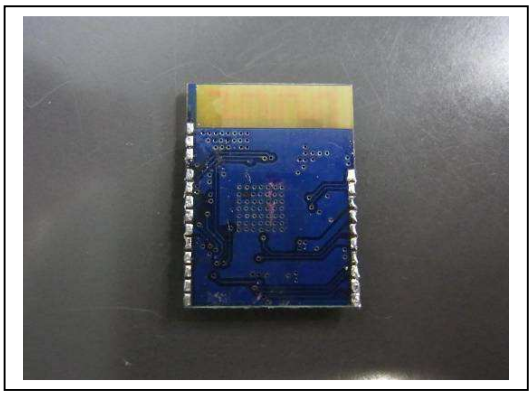
## A4. Photos of Internal Configurations




Internal Configuration 3 (Main speaker, main board)



Internal Configuration 4 (Main speaker, module)

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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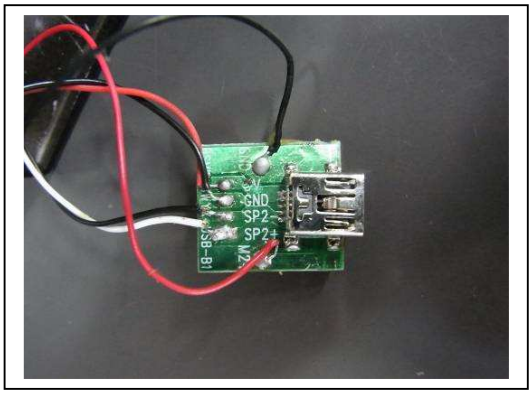
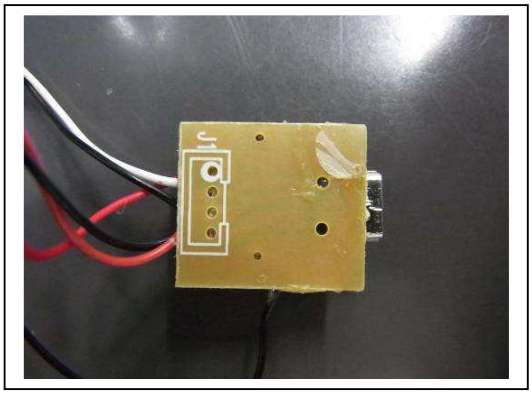
## A4. Photos of Internal Configurations




Internal Configuration 5 (Auxiliary speaker)



Internal Configuration 6 (Auxiliary speaker)

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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**A5. ID Label / Location**


Label 1


Label 2

Tested by: Reviewed by:

Mr. LEUNG Shu-kan, Ken Mr. WONG Lap-pong, Andrew





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## A5. ID Label / Location


Label 3


Label 4

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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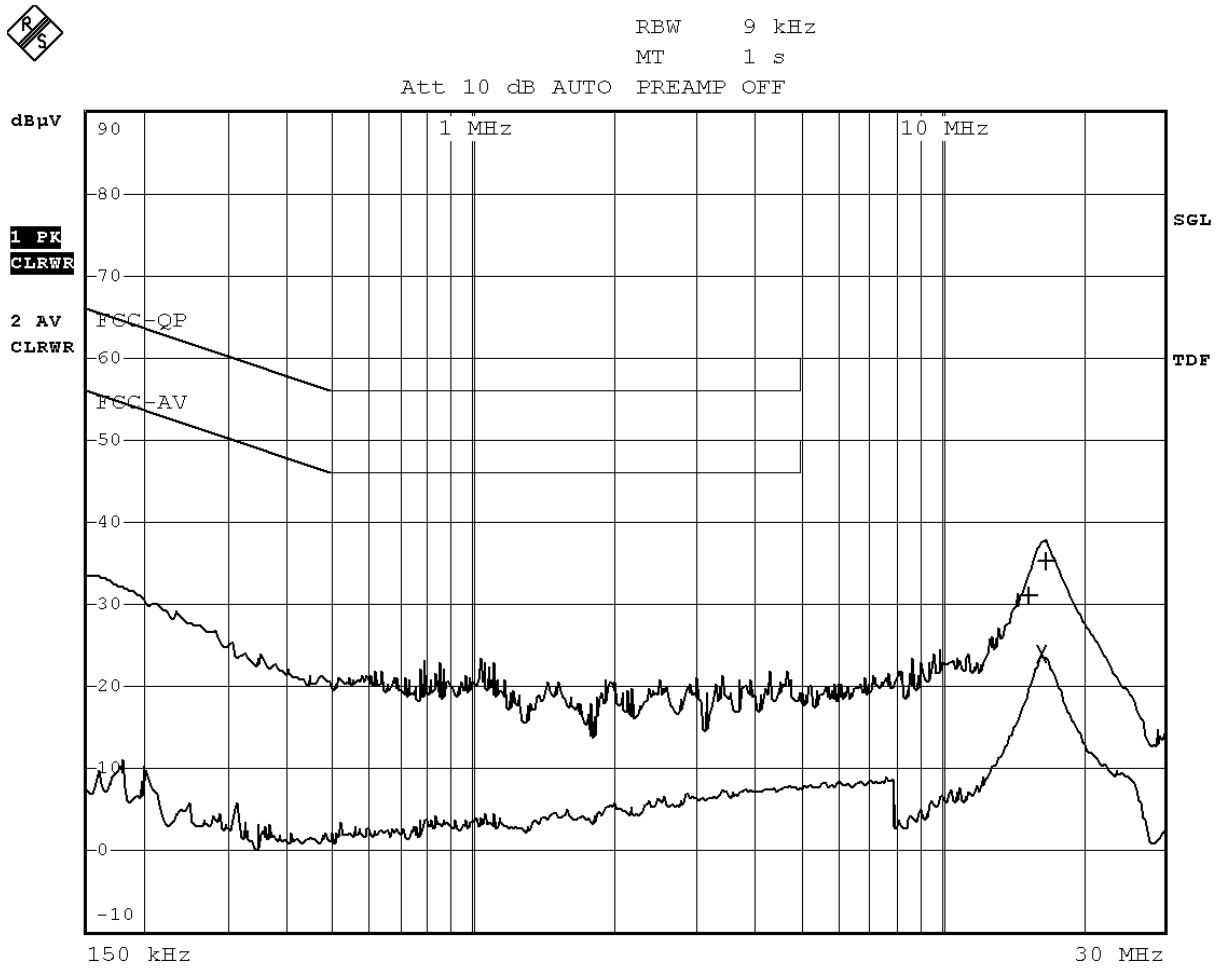
Report No. : AS0026127(7) Date : 14 May 2014

## A6 Conducted Emission Measurement Date




Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew



FCC ID: 2ABVAJY3031BT



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Report No. : AS0026127(7) Date : 14 May 2014

## A6 Conducted Emission Measurement Date

| EDIT PEAK LIST (Final Measurement Results) | | | |
|---|---|---|---|
| Trace1: | FCC-QP | | |
| Trace2: | FCC-AV | | |
| Trace3: | --- | | |
| TRACE | FREQUENCY | LEVEL dBµV | DELTA LIMIT dB |
| 1 Quasi Peak | 15.47 MHz | 31.12 N gnd | -28.87 |
| 2 Average | 16.47 MHz | 23.99 N gnd | -26.00 |
| 1 Quasi Peak | 16.68 MHz | 35.17 N gnd | -24.82 |

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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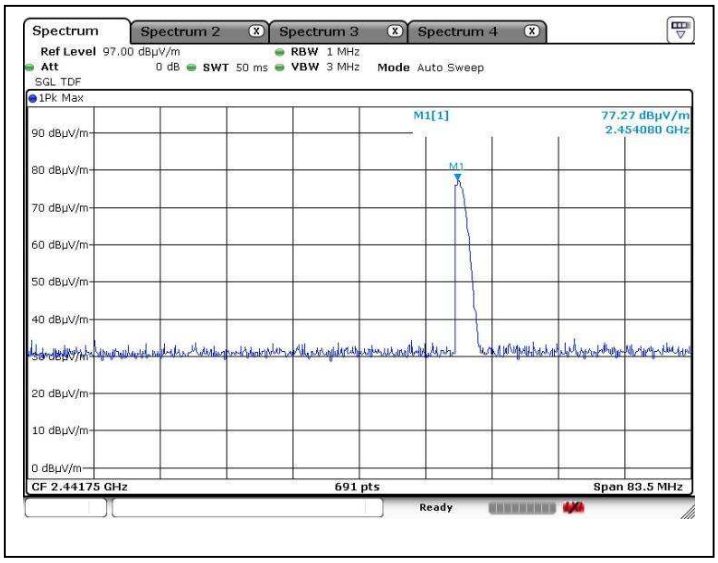
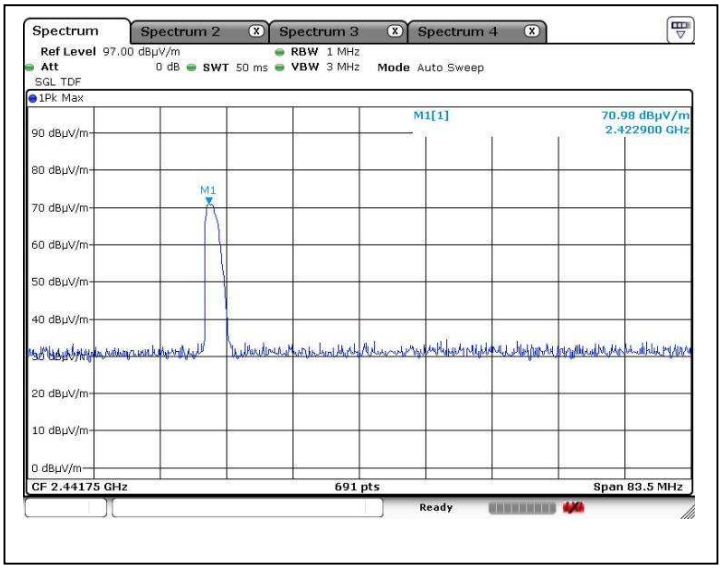
## A7. Hopping sequence




1st example of fundamental frequency




2nd example of fundamental frequency

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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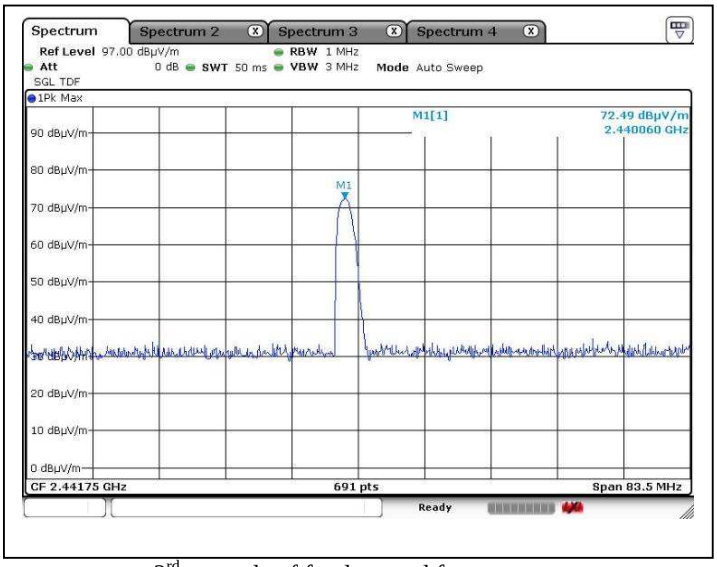
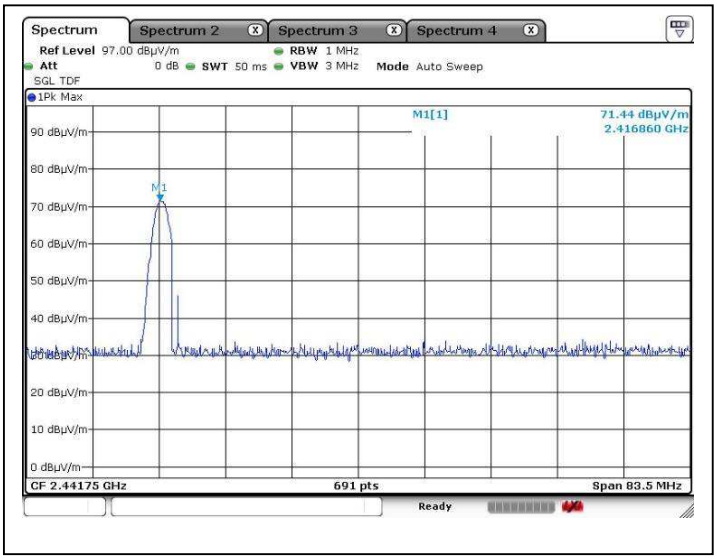
## A7. Hopping sequence




3rd example of fundamental frequency




4th example of fundamental frequency

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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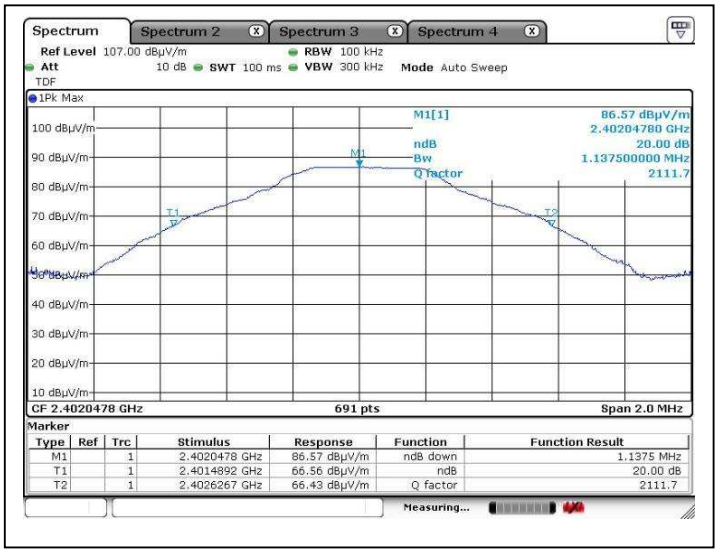
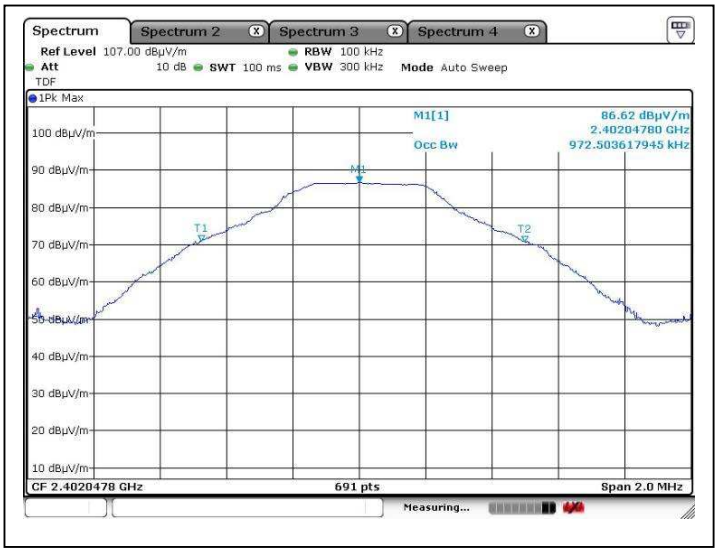
## A8. 20 dB bandwidth and 99% bandwidth

Channel: CH00




20 dB bandwidth




99% bandwidth

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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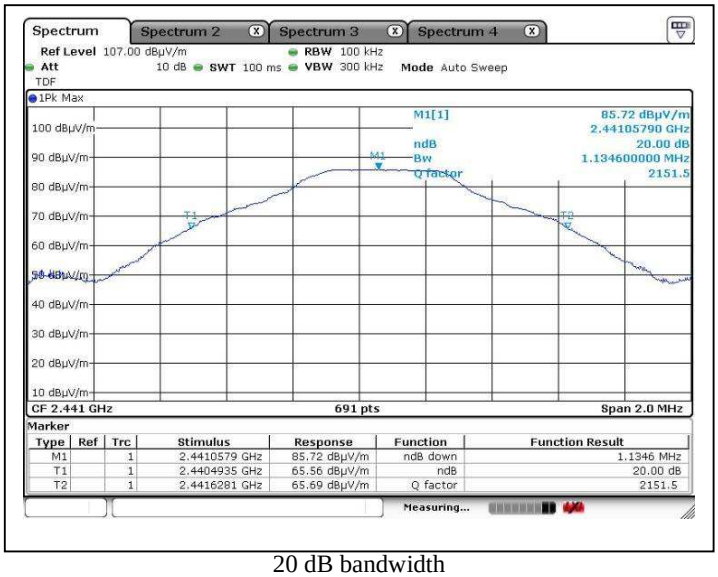
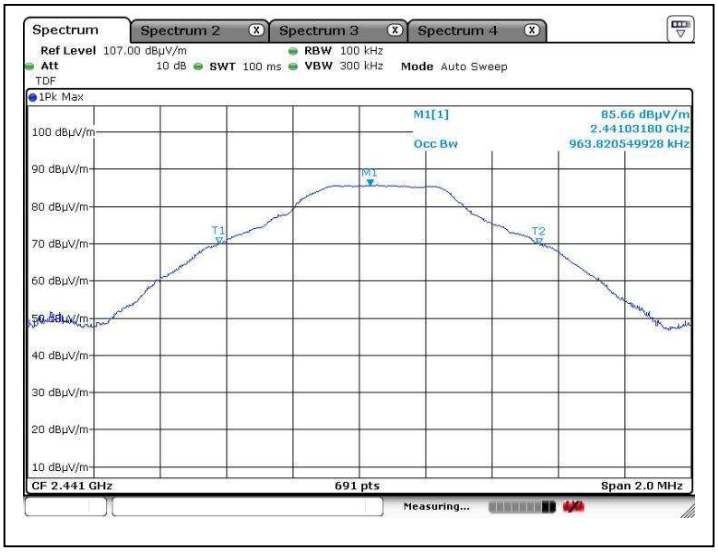
## A8. 20 dB bandwidth and 99% bandwidth

Channel: CH39




20 dB bandwidth




99% bandwidth

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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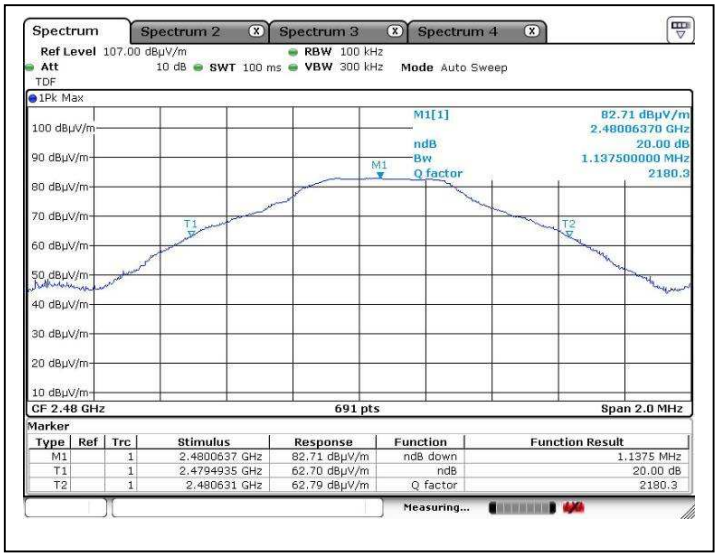
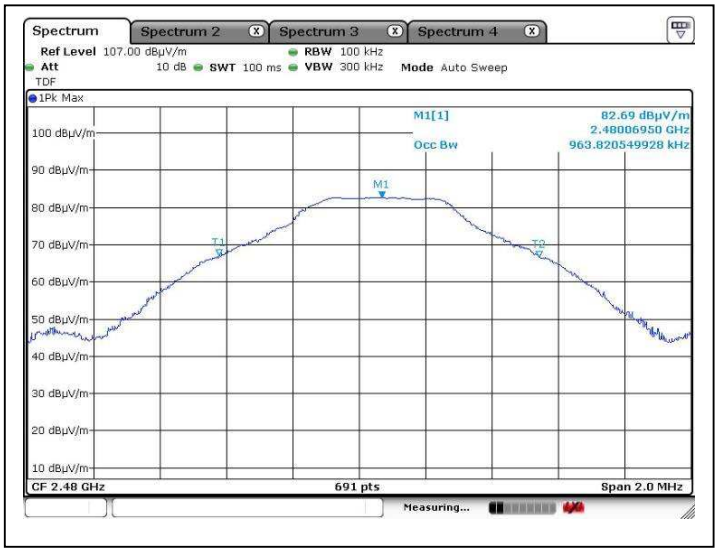
Report No. : AS0026127(7) Date : 14 May 2014

## A8. 20 dB bandwidth and 99% bandwidth

Channel: CH78




20 dB bandwidth




99% bandwidth

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew



FCC ID: 2ABVAJY3031BT



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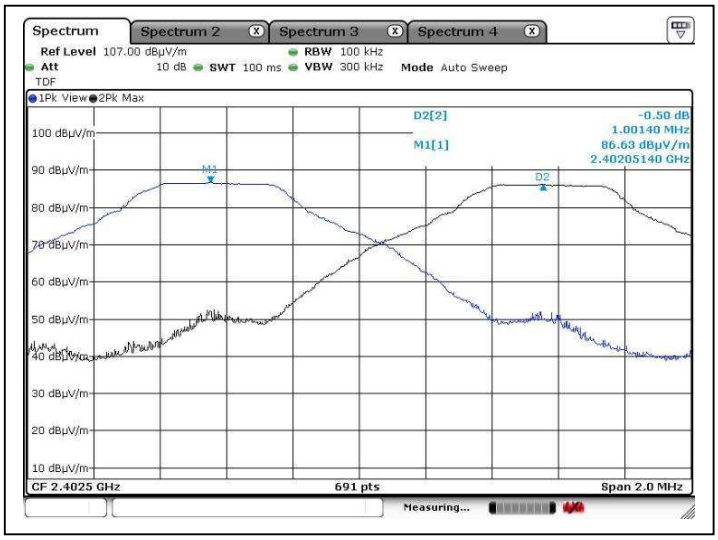
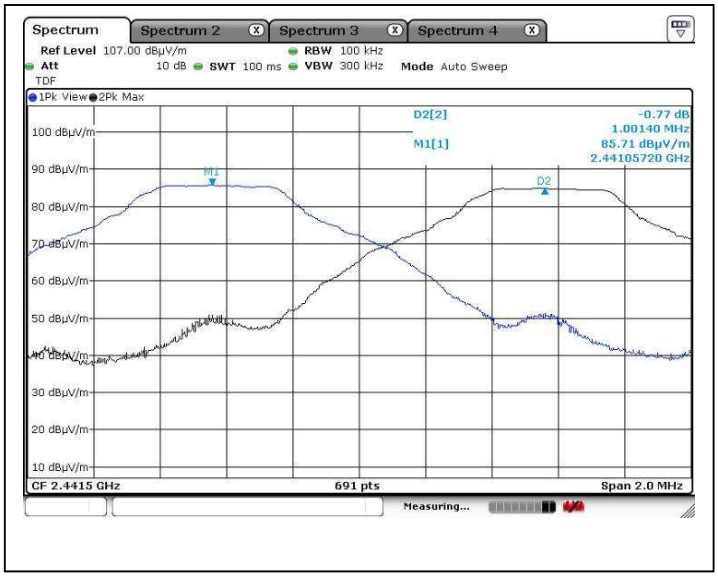
## A9. Bluetooth Channel Spacing




CH00-CH01




CH39-CH40

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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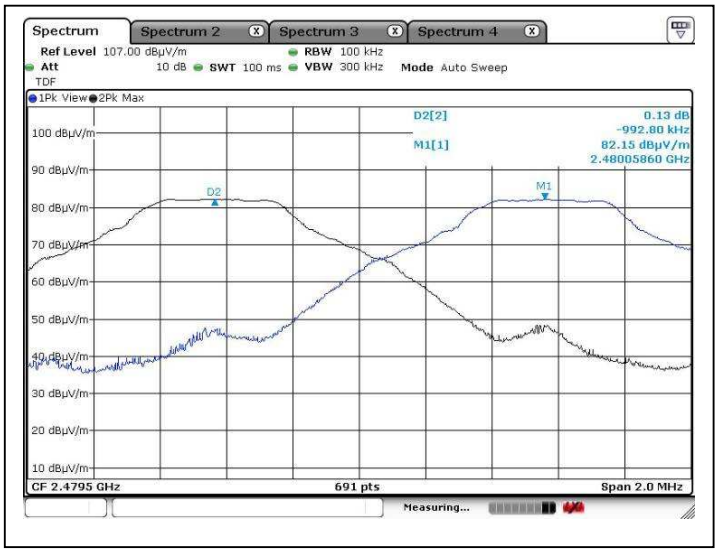
## A9. Bluetooth Channel Spacing




CH77-CH78

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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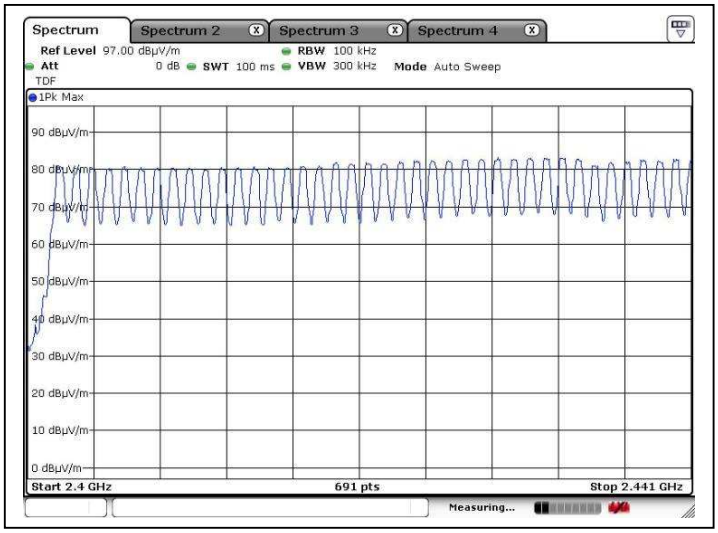
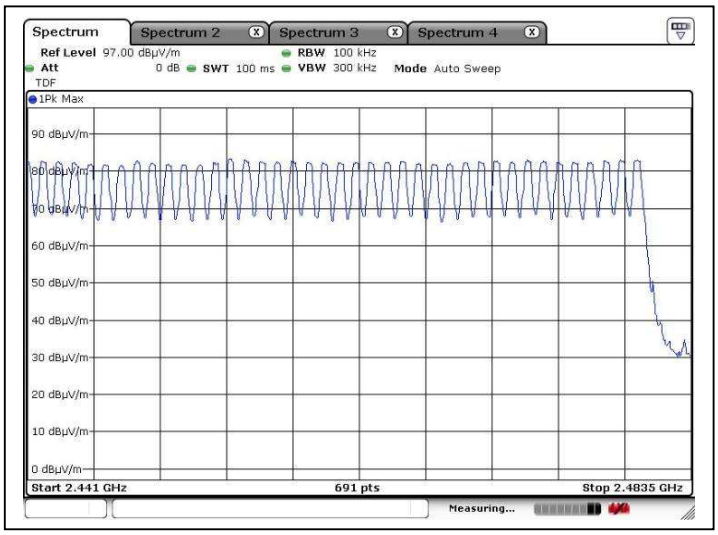
## A10. Bluetooth Hopping Channel




CH00-CH39




CH39-CH78

Tested by: Mr. LEUNG Shu-kan, Ken

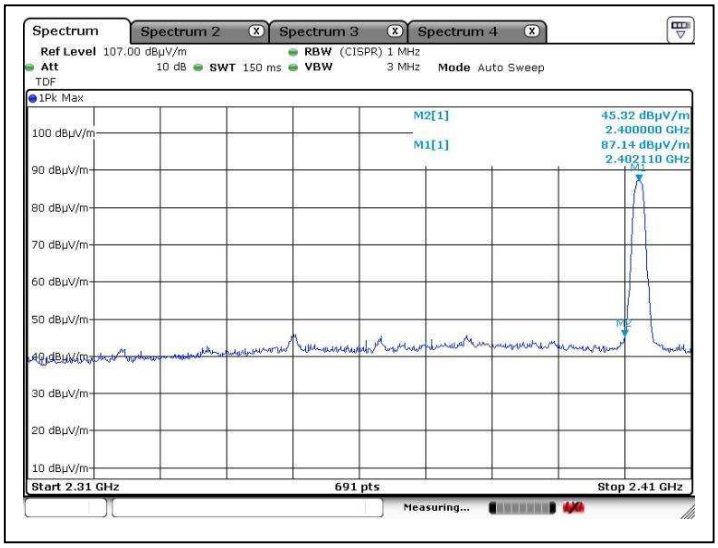
Reviewed by: Mr. WONG Lap-pong, Andrew



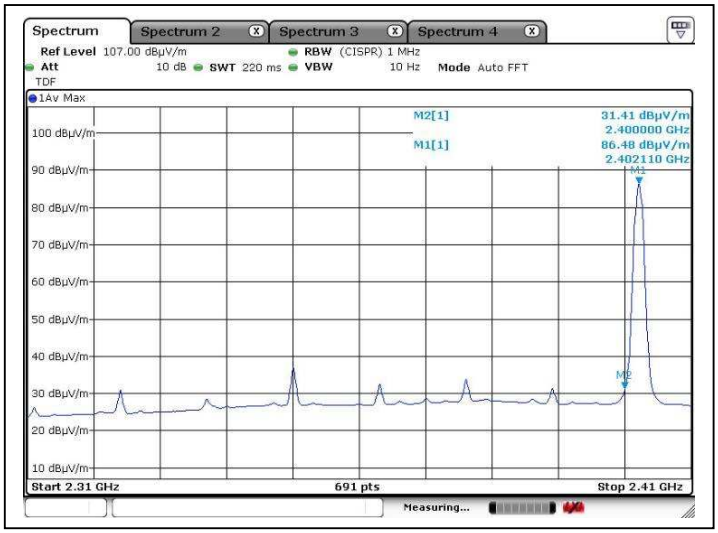


CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatcl.com Web Site: http://www.cmatcl.com

## A11. Bluetooth Band Edge




Lower edge (Peak measurement)




Lower edge (Average measurement)

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew

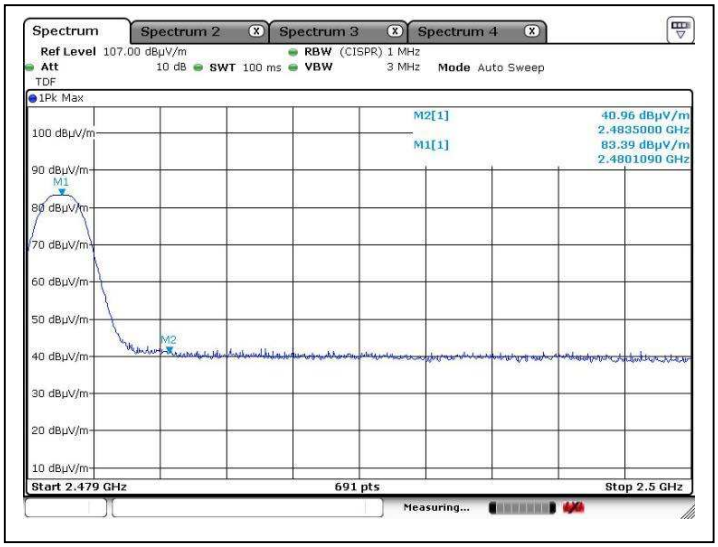




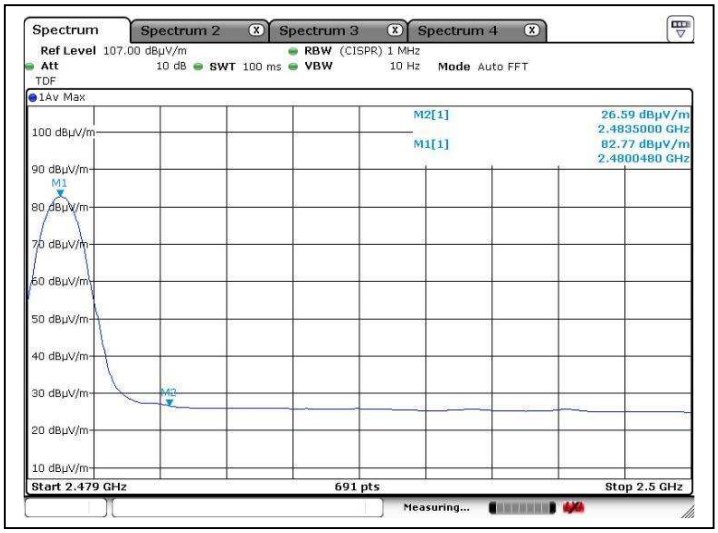
CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatcl.com Web Site: http://www.cmatcl.com

Report No. : AS0026127(7) Date : 14 May 2014

## A11. Bluetooth Band Edge




Upper edge (Peak measurement)




Upper edge (Average measurement)

Tested by: Reviewed by:

Mr. LEUNG Shu-kan, Ken Mr. WONG Lap-pong, Andrew



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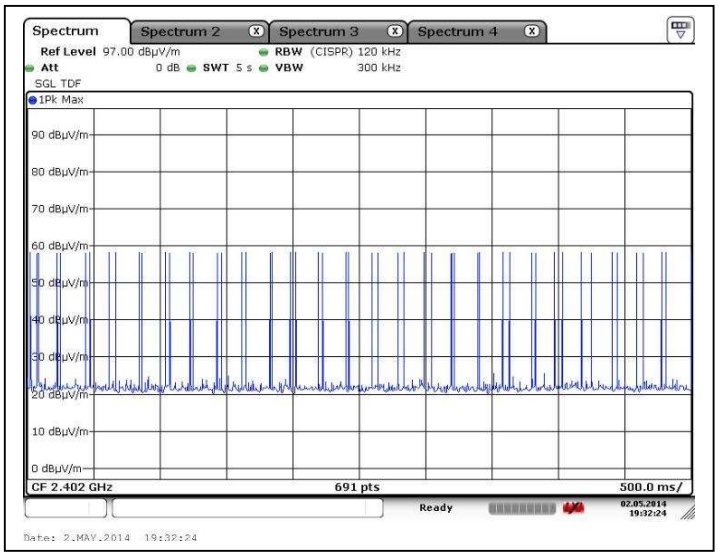
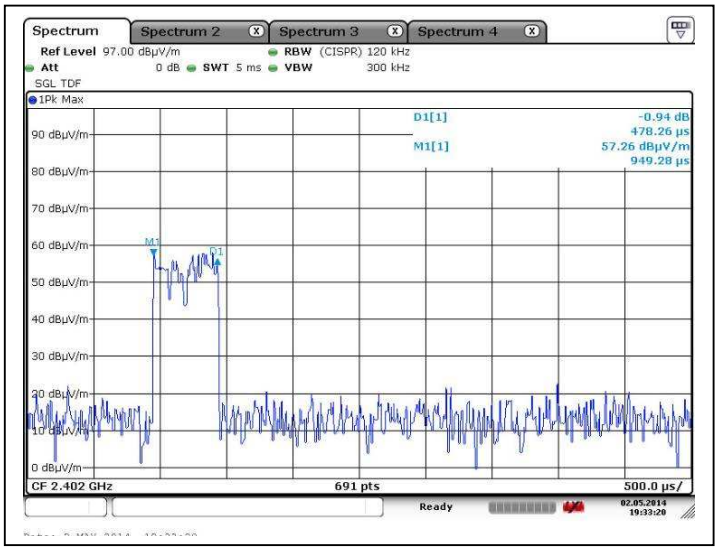
CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatcl.com Web Site: http://www.cmatcl.com

## A12. Bluetooth Average On Time

Packet: DH1
Channel: CH00




Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
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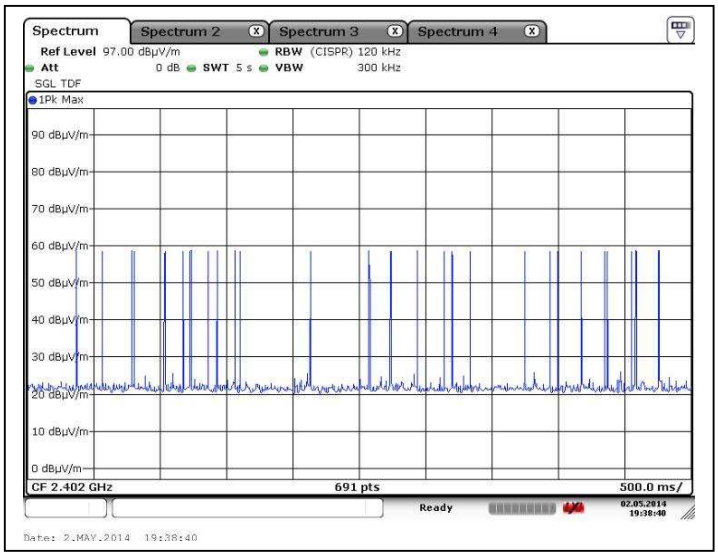
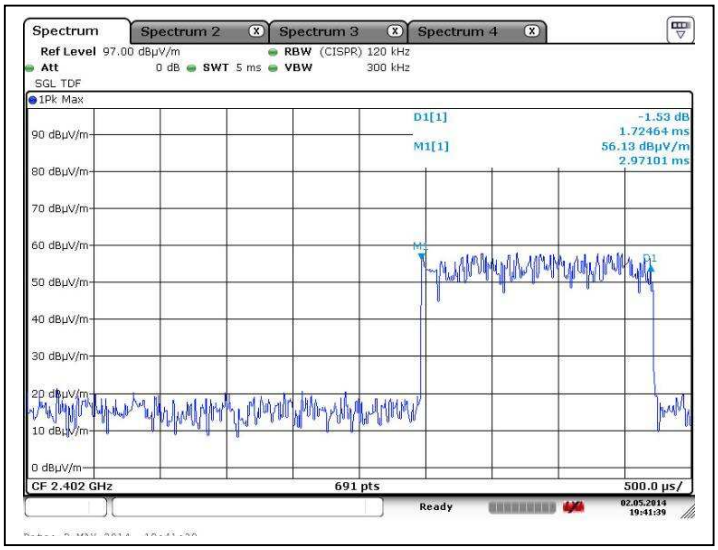
## A12. Bluetooth Average On Time

Packet: DH3
Channel: CH00




Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew

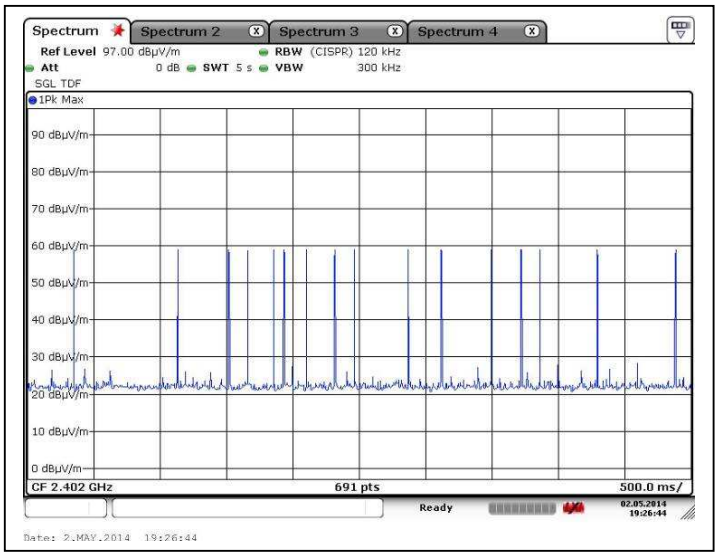


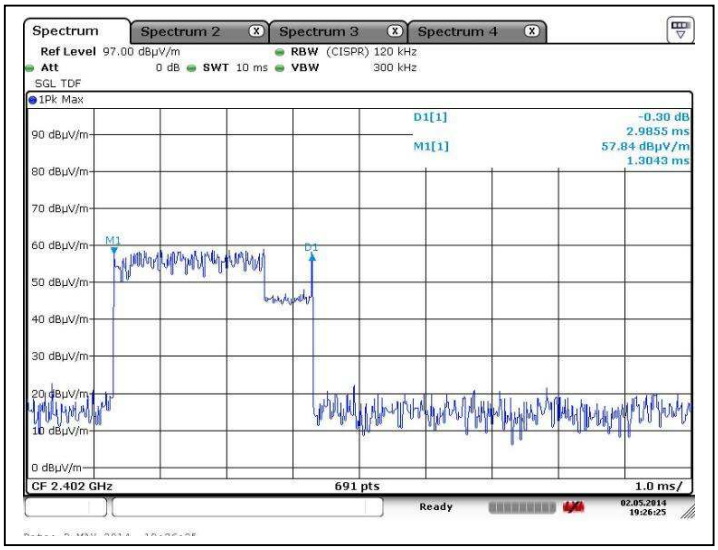


CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatcl.com Web Site: http://www.cmatcl.com

## A12. Bluetooth Average On Time

Packet: DH5
Channel: CH00




Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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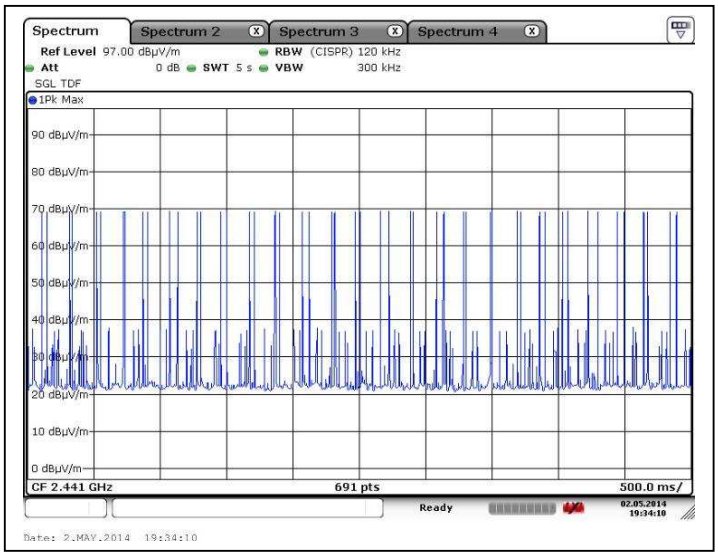
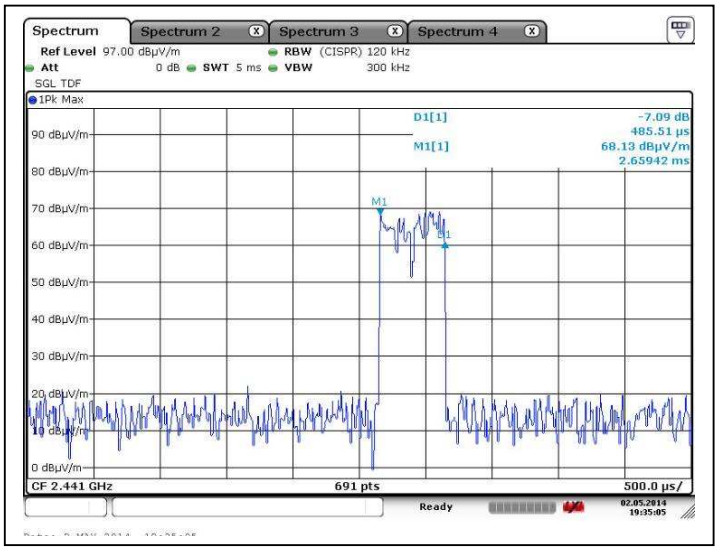
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatcl.com Web Site: http://www.cmatcl.com

## A12. Bluetooth Average On Time

Packet: DH1
Channel: CH39




Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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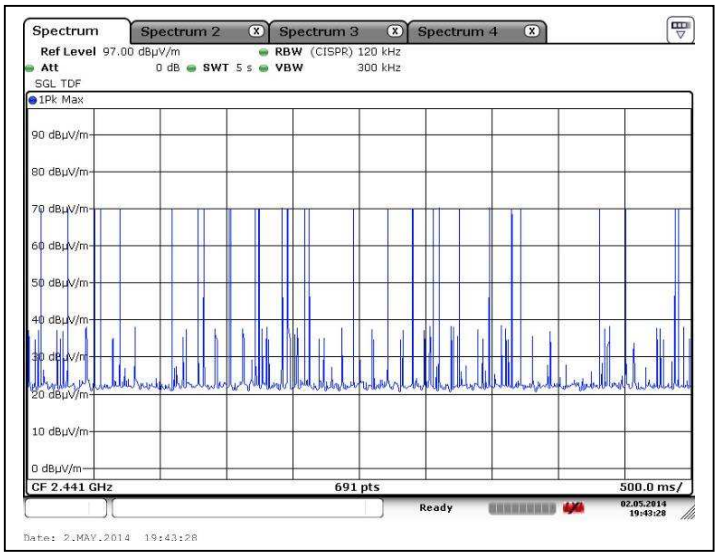
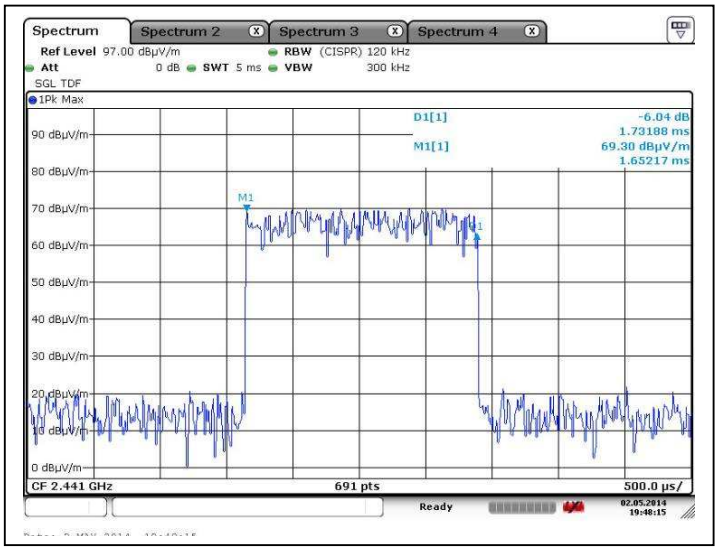
## A12. Bluetooth Average On Time

Packet: DH3
Channel: CH39




Tested by: Mr. LEUNG Shu-kan, Ken

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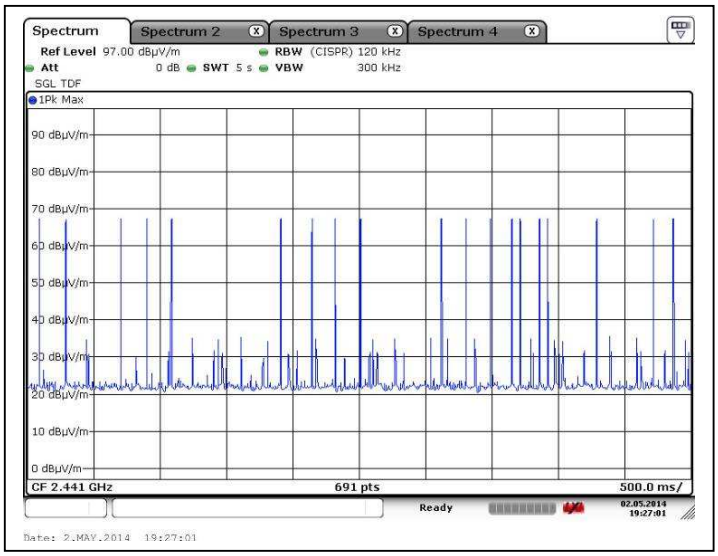
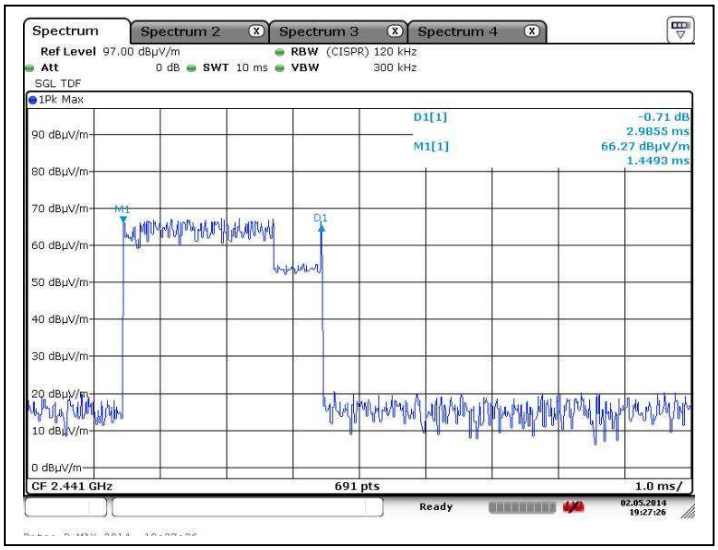
## A12. Bluetooth Average On Time

Packet: DH5
Channel: CH39




Tested by: Mr. LEUNG Shu-kan, Ken

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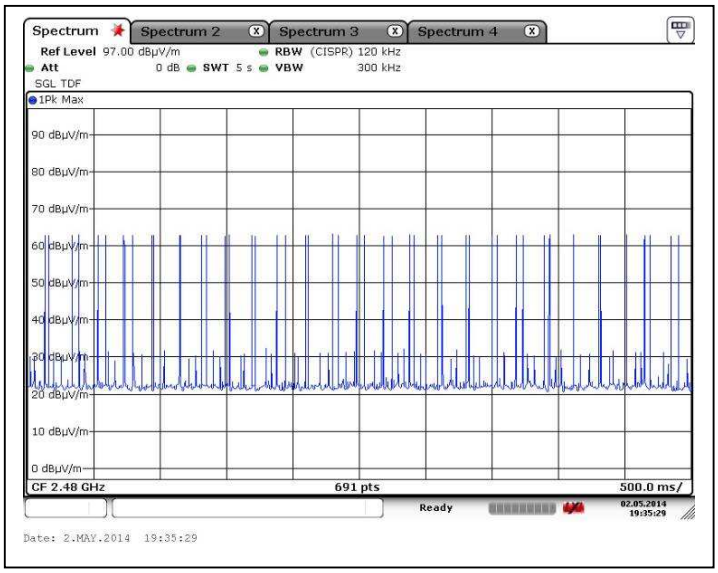
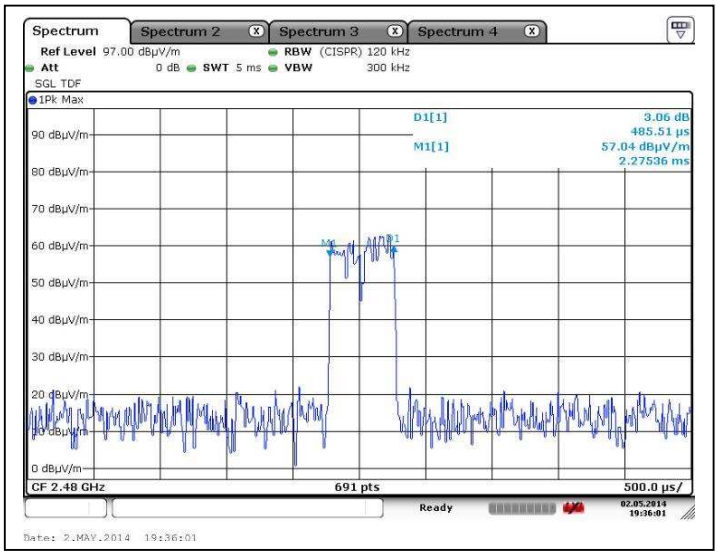
CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatcl.com Web Site: http://www.cmatcl.com

## A12. Bluetooth Average On Time

Packet: DH1
Channel: CH78




Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
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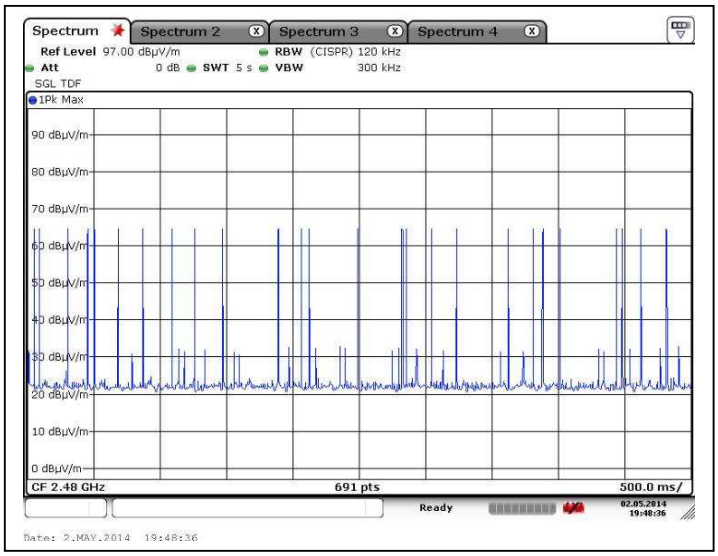
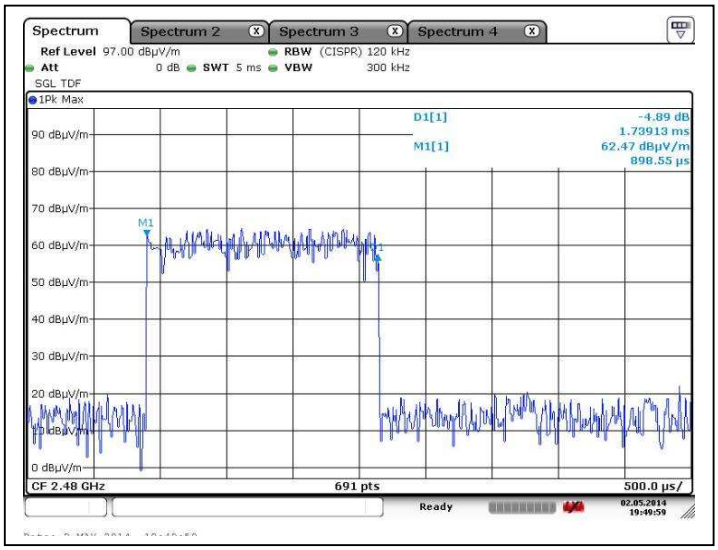
## A12. Bluetooth Average On Time

Packet: DH3
Channel: CH78




Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew





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Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
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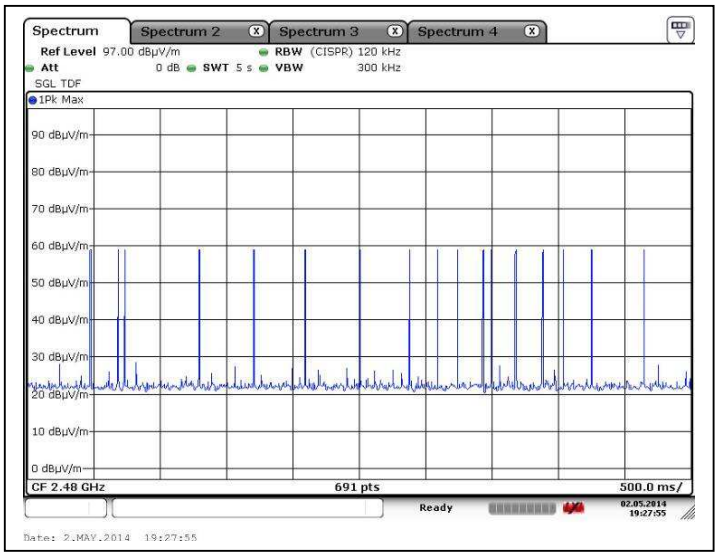
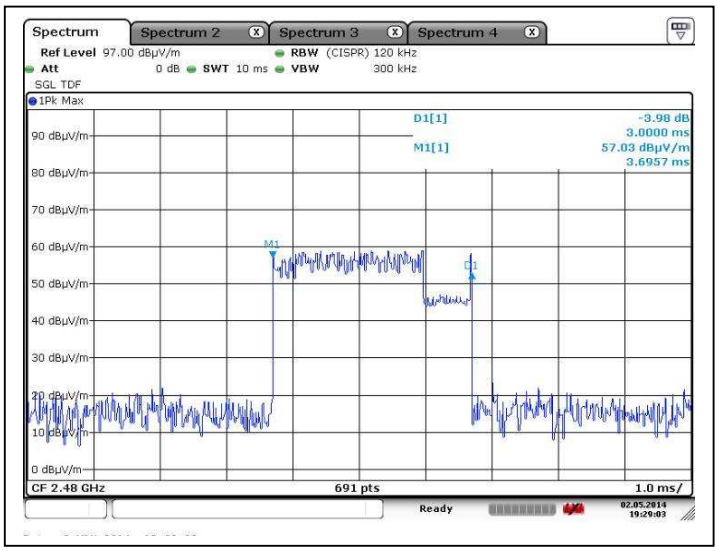
## A12. Bluetooth Average On Time

Packet: DH5
Channel: CH78




Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew



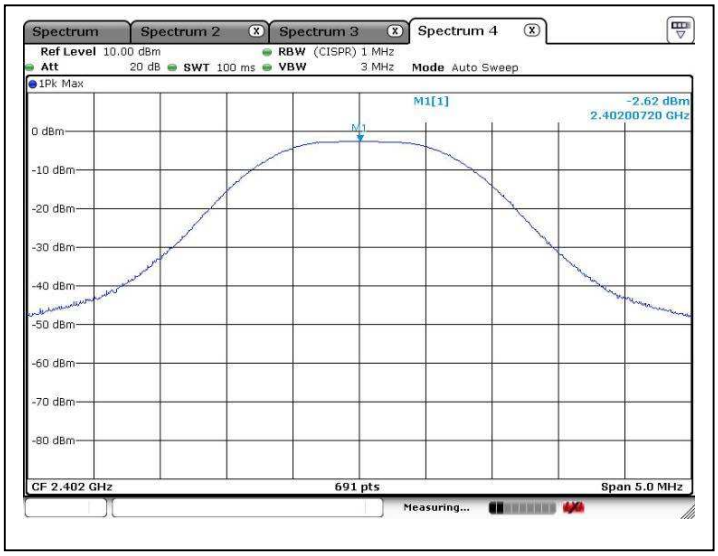


CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatcl.com Web Site: http://www.cmatcl.com

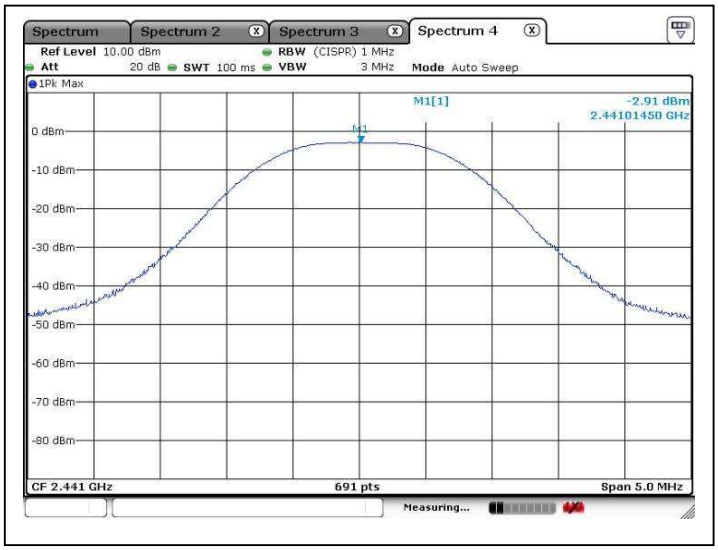
Report No. : AS0026127(7) Date : 14 May 2014

## A13. Transmission Power

Channel: CH00




Channel: CH39




Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew



FCC ID: 2ABVAJY3031BT



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Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
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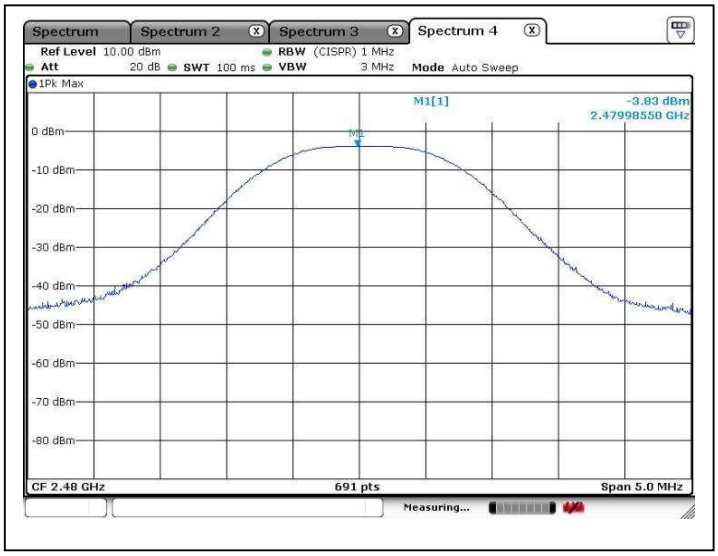
Report No. : AS0026127(7) Date : 14 May 2014

## A13. Transmission Power

Channel: CH78




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

Tested by: Mr. LEUNG Shu-kan, Ken

Reviewed by: Mr. WONG Lap-pong, Andrew



FCC ID: 2ABVAJY3031BT



CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
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