



Ke Mei Ou Lab Corp.

E506, 5th Floor, No.39 Keji Middle 2nd Rd, Science & Technology  
Park, Nanshan District, Shenzhen, P. R. China  
Tel: + 86 755 83642690 Fax: + 86 755 83297077  
[www.kmolab.com](http://www.kmolab.com)


# FCC & IC TEST REPORT

Under  
FCC Part 15D for Isochronous UPCS Devices and  
RSS-213, Issue 3 & RSS-Gen Issue 4

Prepared For :

## Binatone Electronics International Limited

Floor 23A, 9Des, Voeux Road West, Sheung Wan, Hong Kong

|  |
|--|
| <b>FCC ID: VLJC100-LX-HS</b>   |
| <b>IC: 4522A-C100LX</b>  |
| <b>EUT: Digital Cordless Telephone</b>   |
| <b>Model: C1001LX, C1002LX,<br/>C1003LX, C1004LX<br/>(Handset Unit)</b>  |
| June 12, 2016<br><b>Issue Date:</b>  |
| Extension Report<br><b>Report Type:</b>  |
| <i>Eric Guo</i><br><b>Test Engineer: Eric Guo</b>  |
| <br><b>Review By: Apollo Liu / Manager</b> |

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## 1. General Information

### 1.1 Notes

The test results of this report relate exclusively to the test item specified in 1.5. The KMO Lab does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the KMO Lab.

### 1.2 Testing Laboratory

#### Ke Mei Ou Laboratory Co., Ltd.

ANSI-ASQ National Accreditation Board/ACLASS ISO/IEC 17025 Accredited Lab for telecommunication standards. The Registration Number is AT-1532. The testing quality system meets with ISO/IEC-17025 requirements, This approval results is accepted by MRA of ILAC.

FCC Test Site Registration Number: 962205

IC Test Site Registration Number: 4986A-2

Internet: [www.kmolab.com](http://www.kmolab.com)

### 1.3 Details of Applicant

Name : Binatone Electronics International Limited  
Address : Floor 23A, 9Des, Voeux Road West, Sheung Wan, Hong Kong

### 1.4 Application Details

Date of Receipt of Application : February 29, 2016  
Date of Receipt of Test Item : February 29, 2016  
Date of Test : March 29~March 30, 2016

### 1.5 Test Item

Manufacturer : Same as applicant  
Address : Same as applicant  
Trade Name : Motorola  
Model No.(Base) : C1001LX  
Model No.(Extension) : C1002LX, C1003LX, C1004LX  
Description : Digital Cordless Telephone

### Additional Information

Frequency : 1921.536~1928.448MHz  
RF Power : 104.232mW (Conducted Peak)  
Number of Channels : 5  
Type of Modulation : GFSK  
Power Supply : DC 7.5V/0.3A(Adapter model: MN-A703-L145)  
DC 7.5V/300mA(Adapter model: S003AIU0750030)  
Antenna : Internal (0dBi)

| UPCS Channel    | Frequency (MHz) |
|-----------------|-----------------|
| Upper Band Edge | 1930.000        |
| 0 (Highest)     | 1928.448        |
| 1               | 1926.720        |
| 2               | 1924.992        |
| 3               | 1923.264        |
| 4 (Lowest)      | 1921.536        |
| Lower Band Edge | 1920.000        |

Requirement: FCC15.303(d),(g) Within 1920~1930 MHz band for isochronous devices.

### 1.6 Test Standards

|  |
|--|
| FCC Part 15D for Isochronous UPCS Devices and RSS-213, Issue 2 & RSS-Gen Issue 3 |
|--|

Note: All radiated measurements were made in all three orthogonal planes. The values reported are the maximum values.

## 2. Technical Test

### 2.1 Summary of Test Results

The EUT has been tested according to the following specifications:

| FCC Rule<br>FCC Part15,<br>Subpart D | IC Rule<br>IC RSS-213,<br>Issue3 | Test Type                     | Result | Notes    |
|--------------------------------------|----------------------------------|-------------------------------|--------|----------|
| 15.107(a)<br>15.207(a)               | 5.4<br>RSS-GEN 8.8               | Power Line Conducted Emission | PASS   | Complies |
| 15.319(b)                            | 5.1                              | Digital Modulation Techniques | PASS   | Complies |
| 15.19(a)3                            | RSP-100 3.1                      | Labeling requirements         | PASS   | Complies |
| 15.317, 15.203                       | RSS-GEN 8.3                      | Antenna Requirement           | PASS   | Complies |
| 15.319(g)<br>15.109(a)<br>15.209(a)  | RSS-GEN 8.9                      | Spurious Emissions (Radiated) | PASS   | Complies |

1. Only applies for equipment that transmits unacknowledged control and signaling information

2. The client declares that the tested equipment does not implement this provision

3. Not required if the Conducted Out-of-Band Emissions test is Passed

### 2.2 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement         | Frequency         | Uncertainty |
|---------------------|-------------------|-------------|
| Conducted emissions | 0.15MHz~30MHz     | 1.72        |
| Radiated emissions  | 30MHz ~ 300MHz    | 3.88        |
| Radiated emissions  | 300MHz ~1000MHz   | 3.86        |
| Radiated emissions  | 1000MHz ~18000MHz | 5.28        |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

Consistent with industry standard (e.g. CISPR 22: 2006, clause 11, Measurement Uncertainty) determining compliance with the limits shall be based on the results of the compliance measurement. Consequently the measured emissions being less than the maximum allowed emission result in this being a compliant test or passing test.

The acceptable measurement uncertainty value without requiring revision of the compliance statement is based on conducted and radiated emissions being less than  $U_{CISPR}$  which is 3.6dB and 5.2dB respectively. KMO values (called  $U_{Lab}$  in CISPR 16-4-2) is less than  $U_{CISPR}$  as shown in the table above. Therefore, MU need not be considered for compliance.

### 2.3 Antenna Requirement

According to Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

The EUT no antenna connector for internal antenna. This is permanently attached antenna and meets the requirements of this section.

7.1.4(RSS-GEN) - A transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest-gain antenna of each combination of transmitter and antenna type for which certification is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type and having equal or lesser gain as an antenna that had been successfully tested for certification with the transmitter, will also be considered certified with the transmitter, and may be used and marketed with the transmitter. The manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.

## 2.4 Description of Tested Device

The EUT is a DECT Handset and is an initiating device as described in ANSI C63.17 and is designed to operate together with a DECT Base Station, which is the responding device.

## 2.5 EUT Modification

This product is an extension of original report under VLJC100-LX-HS

The applicant declare that the reasons for this Class II permissive change as below:

Add two power adapter (Model: MN-A703-L145 / S003AIU0750030) and has the same electrical specification with original power adapter

Anything else are the same as before.

### 3. Technical Characteristics Test

#### 3.1 Conducted Emission Test

##### 3.1.1 Test Equipment

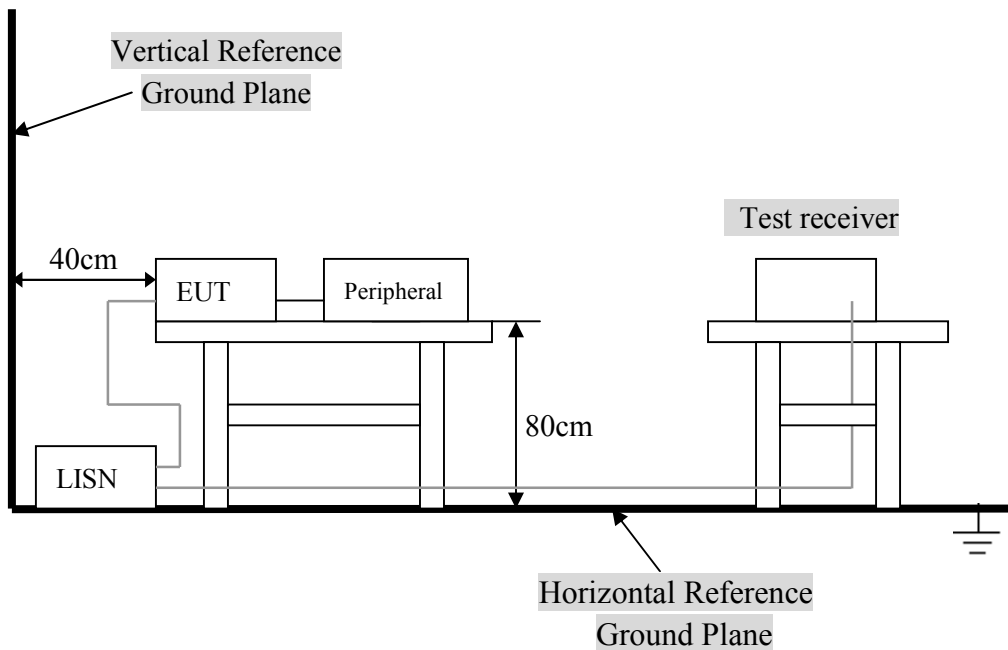
Please refer to Section 6 this report.

##### 3.1.2 Test Procedure

For AC line conducted emission test, the EUT along with its peripherals were placed on a 1.0m (W) x 1.5m (L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN), which provided 50ohm coupling impedance for measuring instrument. The LISN housing, measuring instrument case, reference ground plane, and vertical ground plane were bounded together. The excess power cable between the EUT and the LISN was bundled.

All connecting cables of EUT and peripherals were manipulated to find the maximum emission.

##### 3.1.3 Test Setup



For the actual test configuration, Please refer to the related items – Photos of Testing.

### 3.1.4 Configuration of the EUT

For emissions testing, the equipment under test (EUT) was set up to transmit continuously in burst mode with pseudo-random data to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables (if any) were manipulated to produce worst-case emissions.

\* Associated Antenna Descriptions: The antenna used in this product is embedded antenna.

#### A. EUT

| Device                     | Manufacturer      | Model # | FCC ID        |
|----------------------------|-------------------|---------|---------------|
| Digital Cordless Telephone | Same as applicant | C1001LX | VLJC100-LX-HS |

#### B. Internal Devices

| Device | Manufacturer | Model # | FCC ID |
|--------|--------------|---------|--------|
| N/A    |              |         |        |
|        |              |         |        |
|        |              |         |        |
|        |              |         |        |
|        |              |         |        |

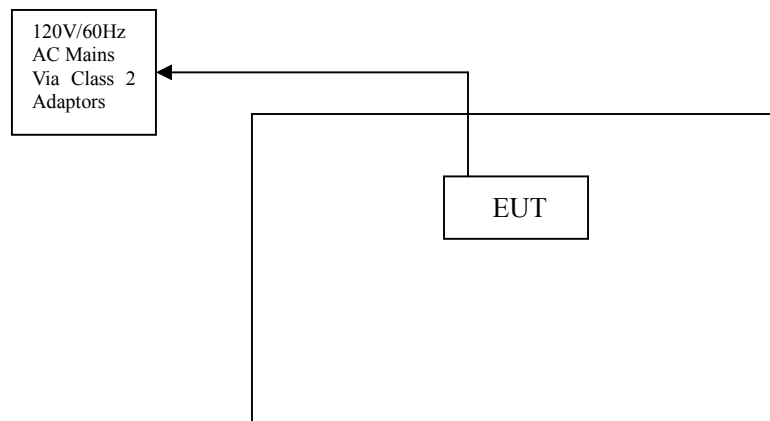
#### C. Peripherals

| Device | Manufacturer | Model #<br>Serial # | FCC ID/<br>DoC | Cable |
|--------|--------------|---------------------|----------------|-------|
| N/A    |              |                     |                |       |
| N/A    |              |                     |                |       |
| N/A    |              |                     |                |       |
| N/A    |              |                     |                |       |

### 3.1.5 EUT Operating Condition

Operating condition is according to ANSI C63.10:2013.

- A. Setup the EUT and simulators as shown on follow.
- B. Enable RF signal and confirm EUT active.
- C. Modulate output capacity of EUT up to specification.



### 3.1.6 Conducted Power Line Emission Limits

| FCC Part 15 Paragraph 15.207 (dBuV) |               |               |
|-------------------------------------|---------------|---------------|
| Frequency Range (MHz)               | Class A QP/AV | Class B QP/AV |
| 0.15 – 0.5                          | 79/66         | 66-56/56-46   |
| 0.5 – 5.0                           | 73/60         | 56/46         |
| 5.0 - 30                            | 73/60         | 60/50         |

**NOTE** : In the above table, the tighter limit applies at the band edges.



### 3.1.7 Conducted Power Line Test Result

|              |                              |             |          |
|--------------|------------------------------|-------------|----------|
| Product      | : Digital Cordless Telephone | Test Mode   | : Normal |
| Test Item    | : Conducted Emission Data    | Temperature | : 25 °C  |
| Test Voltage | : DC 7.5V                    | Humidity    | : 56%RH  |
| Test Result  | : <b>PASS</b>                |             |          |

The frequency spectrum from 0.15 MHz to 30 MHz was investigated. All readings are quasi -peak values with a resolution bandwidth of 9 KHz.

- Temperature : 26 °C
- Humidity : 53 % RH

Adapter model: MN-A703-L145

| FCC 15 Class B  |                   |       |             |                 |       |              |              |       |           |           |
|-----------------|-------------------|-------|-------------|-----------------|-------|--------------|--------------|-------|-----------|-----------|
| Frequency (MHz) | Read Level (dBuV) |       | Factor (dB) | Emission (dBuV) |       | Line/Neutral | Limit (dBuV) |       | Margin QP | (dBuV) AV |
|                 | QP                | AV    |             | QP              | AV    |              | QP           | AV    |           |           |
| 0.154           | 35.31             | 21.48 | 10.30       | 45.61           | 31.78 | Line         | 65.78        | 55.78 | -20.17    | -24.00    |
| 0.154           | 35.02             | 21.05 | 10.30       | 45.32           | 31.35 | Neutral      | 65.78        | 55.78 | -20.46    | -24.43    |
| 0.166           | 33.85             | 20.99 | 10.30       | 44.15           | 31.29 | Line         | 65.16        | 55.16 | -21.01    | -23.87    |
| 0.162           | 35.49             | 21.53 | 10.30       | 45.79           | 31.83 | Neutral      | 65.36        | 55.36 | -19.57    | -23.53    |
| 0.186           | 33.59             | 20.84 | 10.30       | 43.89           | 31.14 | Line         | 64.21        | 54.21 | -20.32    | -23.07    |
| 0.186           | 33.15             | 20.32 | 10.30       | 43.45           | 30.62 | Neutral      | 64.21        | 54.21 | -20.76    | -23.59    |

#### FCC 15 Class B

Note: NF = No Significant Peak was Found.

Adapter model: S003AIU0750030

| FCC 15 Class B  |                   |       |             |                 |       |              |              |       |           |           |
|-----------------|-------------------|-------|-------------|-----------------|-------|--------------|--------------|-------|-----------|-----------|
| Frequency (MHz) | Read Level (dBuV) |       | Factor (dB) | Emission (dBuV) |       | Line/Neutral | Limit (dBuV) |       | Margin QP | (dBuV) AV |
|                 | QP                | AV    |             | QP              | AV    |              | QP           | AV    |           |           |
| 0.426           | 33.26             | 30.38 | 10.40       | 43.66           | 40.78 | Line         | 57.33        | 47.33 | -13.67    | -6.55     |
| 0.442           | 27.27             | 23.28 | 10.40       | 37.67           | 33.68 | Neutral      | 57.02        | 47.02 | -19.35    | -13.34    |
| 0.454           | 34.33             | 29.92 | 10.40       | 44.73           | 40.32 | Line         | 56.80        | 46.80 | -12.07    | -6.48     |
| 0.734           | 21.82             | 16.61 | 10.40       | 32.22           | 27.01 | Neutral      | 56.00        | 46.00 | -23.78    | -18.99    |
| 0.630           | 26.49             | 22.73 | 10.40       | 36.89           | 33.13 | Line         | 56.00        | 46.00 | -19.11    | -12.87    |
| 11.762          | 22.76             | 14.09 | 10.80       | 33.56           | 24.89 | Neutral      | 60.00        | 50.00 | -26.44    | -25.11    |

#### FCC 15 Class B

Note: NF = No Significant Peak was Found.

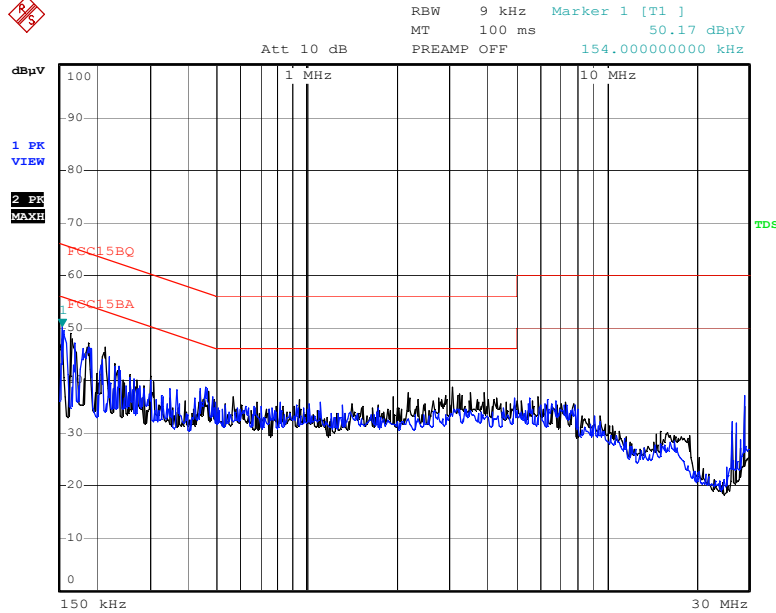
Note:

- 1.Uncertainty in conducted emission measured is <+/-2dB.
- 2.The emission levels of other frequencies were very low against the limit.
- 3.All Reading Levels are Quasi-Peak and Average value.
- 4.Emission = Meter Reading + Factor; Factor = Insertion Loss + Cable Loss.
- 5.Margin Value = Emission Level - Limit Value.

**Conducted Emission**  
**FCC 15.207**

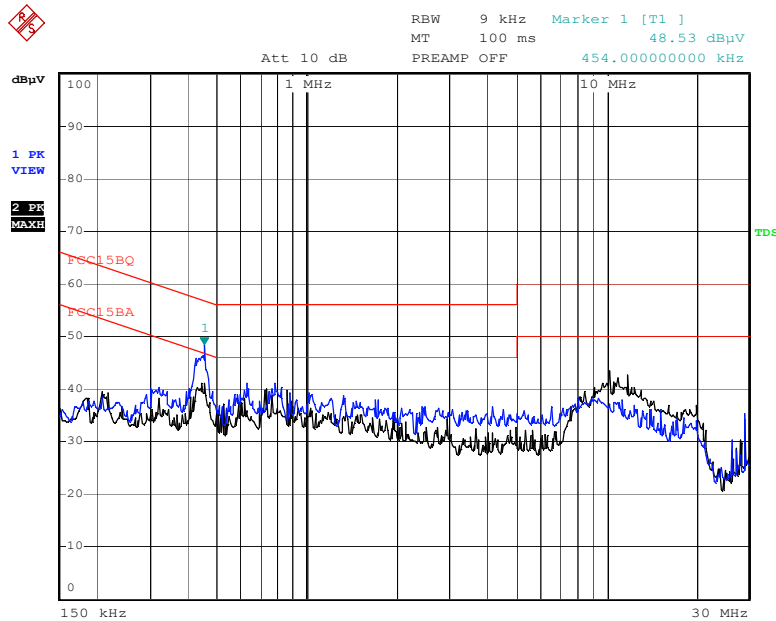
EUT: Digital Cordless Telephone  
Test Specification: LINE&NEUTRAL  
Comment:

Adapter model: MN-A703-L145



Date: 29.MAR.2016 16:48:42

Adapter model: S003AIU0750030



Date: 29.MAR.2016 16:56:39

### 3.6 Radiated Spurious Emission

#### 3.6.1 Test Equipment

Please refer to section 6 this report.

#### 3.6.2 Test Procedure

The transmitter was placed on a wooden turntable and was transmitting in a non radiating dummy load which was directly connected to the antenna connector. The battery was replaced by monitored voltage source. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna was height and polarization as well as the EUT azimuth where varied in orders to identify the maximum level of emission from the EUT. The test was performed by placing the EUT on 3 orthogonal axis. The frequency range up to tenth harmonic of the fundamental frequency was investigated. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution. All tests was performed for the lower, the middle and the highest frequency.

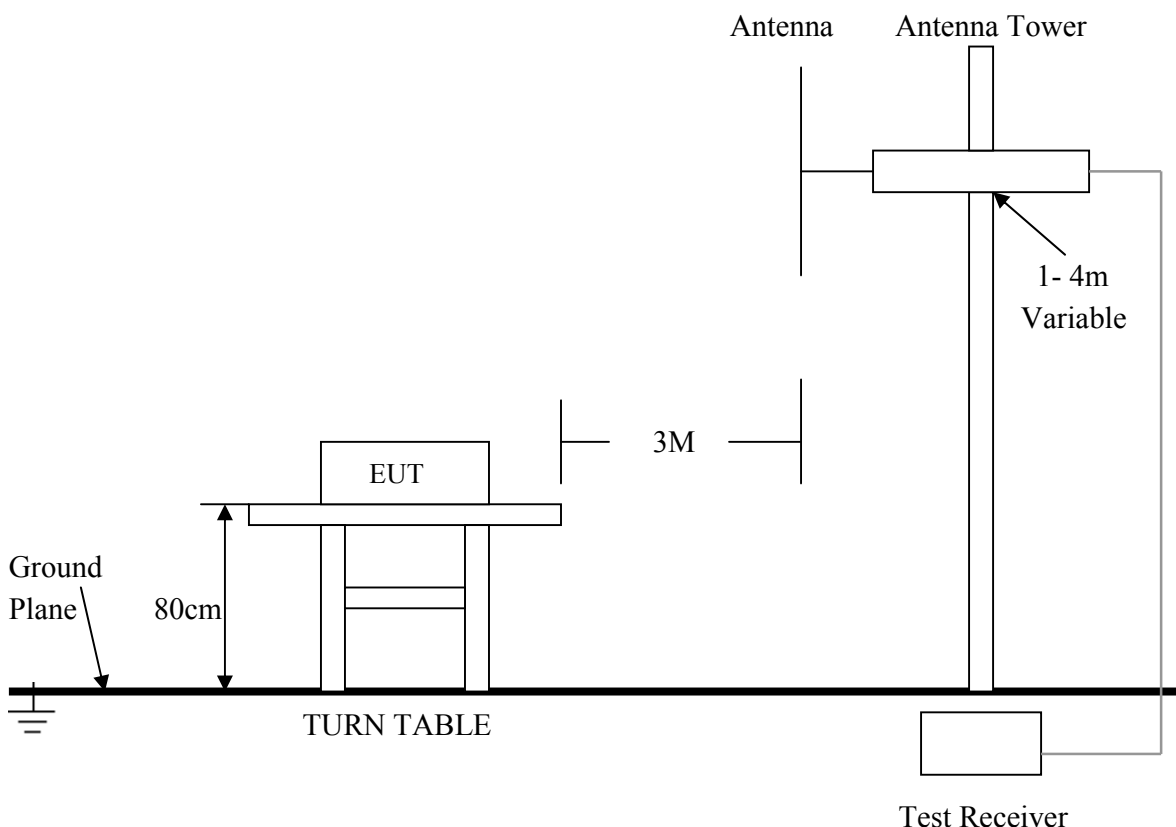
The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.17 - 2006. The specification used was the FCC 15§ 15.319(g).

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

| Frequency Range | RWB    | Video B/W | IF B/W | Detector |
|-----------------|--------|-----------|--------|----------|
| 30~1000MHz      | 100kHz | 300kHz    | 120kHz | QP       |
| Above 1GHz      | 1MHz   | 1MHz      | /      | PK       |
|                 | 1MHz   | 30Hz      | /      | AV       |

#### 3.6.3 Test Setup



For the actual test configuration, please refer to the related items – Photos of Testing.

#### 3.6.4 Configuration of The EUT

Same as section 3.1.4 of this report

### 3.6.5 EUT Operating Condition

Same as section 3.1.5 of this report

### 3.6.6 Limit

According to FCC§15.319(g), notwithstanding other technical requirements specified in this subpart, attenuation of emissions below the general emission limits in §15.209 is not required.

### 3.6.7 Radiated Spurious Emission Test Result

|              |                              |             |                    |
|--------------|------------------------------|-------------|--------------------|
| Product      | : Digital Cordless Telephone | Test Mode   | : CH Low ~ CH High |
| Test Item    | : Radiated Spurious Emission | Temperature | : 25 °C            |
| Test Voltage | : DC 7.5V                    | Humidity    | : 56%RH            |
| Test Result  | : <b>PASS</b>                |             |                    |

#### For Frequency from 30MHz to 1GHz

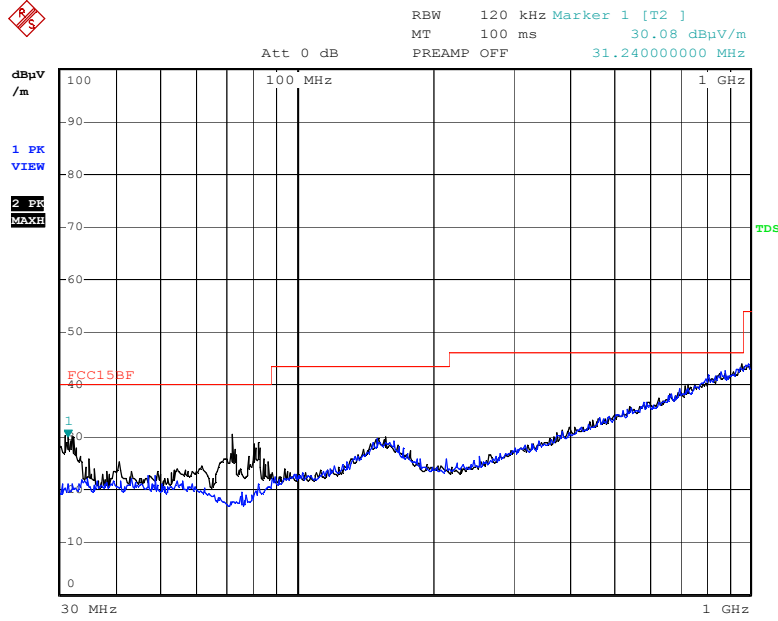
Adapter model: MN-A703-L145

| FCC 15 Class B  |                   |             |                   |              |                |             |
|-----------------|-------------------|-------------|-------------------|--------------|----------------|-------------|
| Frequency (MHz) | Read Level (dBuV) | Factor (dB) | Emission (dBuV/m) | Horiz./Vert. | Limit (dBuV/m) | Margin (dB) |
| 464.36          | 11.79             | 15.59       | 27.38             | Horiz./      | 46.0           | -18.62      |
| 31.240          | 13.16             | 12.06       | 25.22             | Vert.        | 40.0           | -14.78      |
| 697.360         | 13.85             | 18.87       | 32.72             | Horiz./      | 46.0           | -13.28      |
| 71.960          | 16.47             | 7.24        | 23.71             | Vert.        | 40.0           | -16.29      |
| 862.840         | 13.43             | 22.68       | 36.11             | Horiz./      | 46.0           | -9.89       |
| 82.120          | 16.72             | 7.43        | 24.15             | Vert.        | 40.0           | -15.85      |
| FCC 15 Class B  |                   |             |                   |              |                |             |

Adapter model: S003AIU0750030

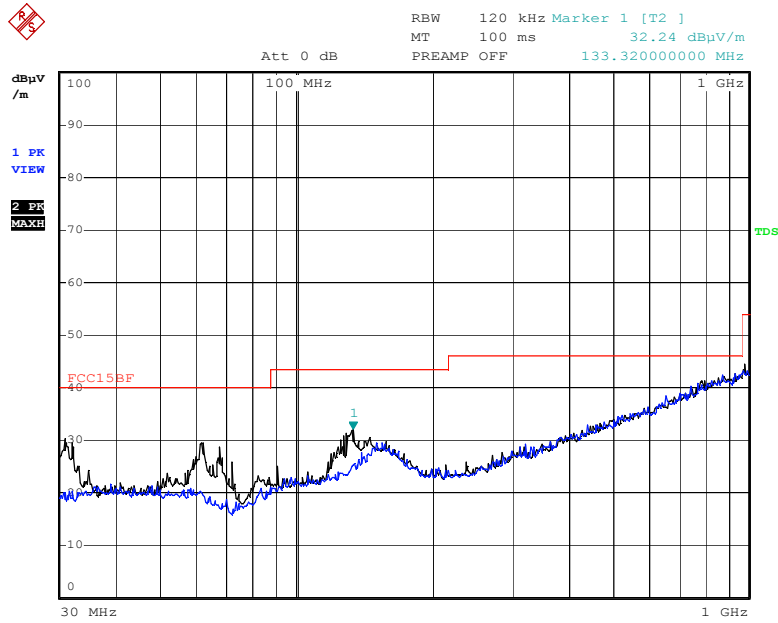
| FCC 15 Class B  |                   |             |                   |              |                |             |
|-----------------|-------------------|-------------|-------------------|--------------|----------------|-------------|
| Frequency (MHz) | Read Level (dBuV) | Factor (dB) | Emission (dBuV/m) | Horiz./Vert. | Limit (dBuV/m) | Margin (dB) |
| 440.840         | 11.06             | 15.59       | 26.65             | Horiz./      | 46.0           | -19.35      |
| 30.760          | 14.77             | 12.06       | 26.83             | Vert.        | 40.0           | -13.17      |
| 654.400         | 12.92             | 18.87       | 31.79             | Horiz./      | 46.0           | -14.21      |
| 62.120          | 14.78             | 8.81        | 23.59             | Vert.        | 40.0           | -16.41      |
| 770.000         | 13.34             | 20.89       | 34.23             | Horiz./      | 46.0           | -11.77      |
| 133.320         | 13.51             | 13.83       | 27.34             | Vert.        | 43.5           | -16.16      |
| FCC 15 Class B  |                   |             |                   |              |                |             |

**Radiated Emission**  
**Adapter model: MN-A703-L145**



Date: 29.MAR.2016 17:14:39

**Adapter model: S003AIU0750030**



Date: 29.MAR.2016 17:46:14

## 4. Photos of Testing

### 4.1 EUT Test Photographs

PP Conducted Emission test view



PP Radiated Emission test view (Frequency from 30MHz to 1GHz)



### 4. 2 EUT Detailed Photographs

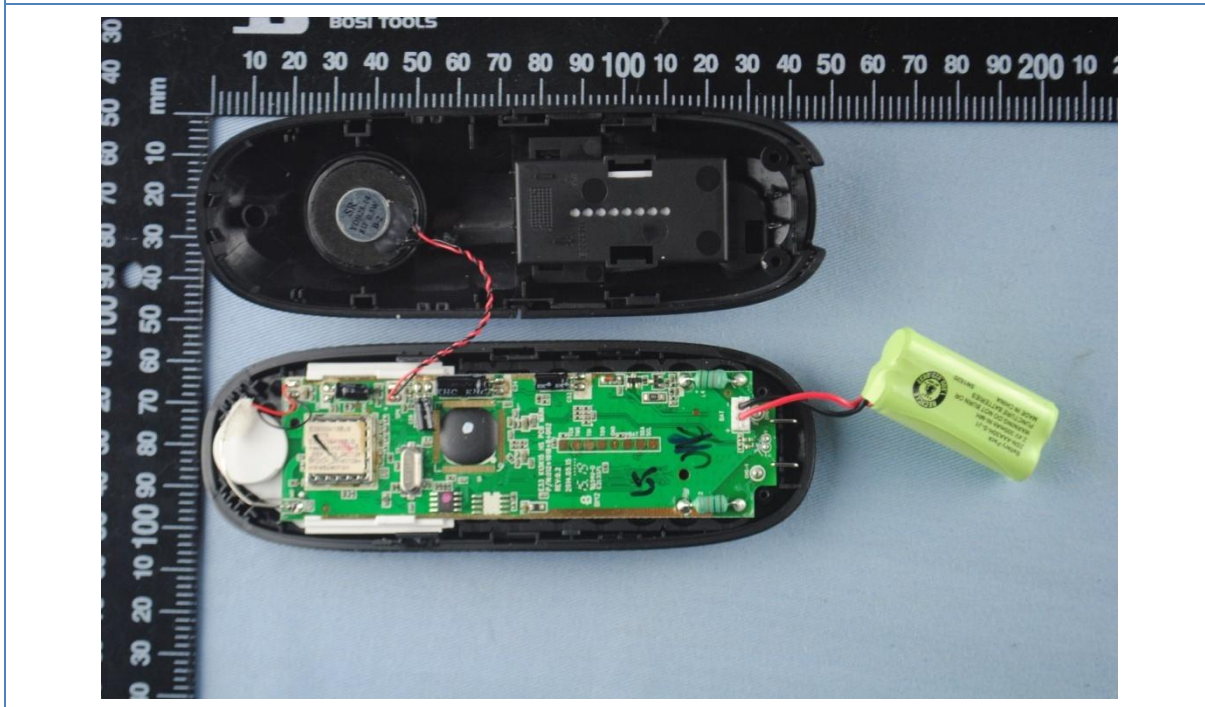
PP EUT top view



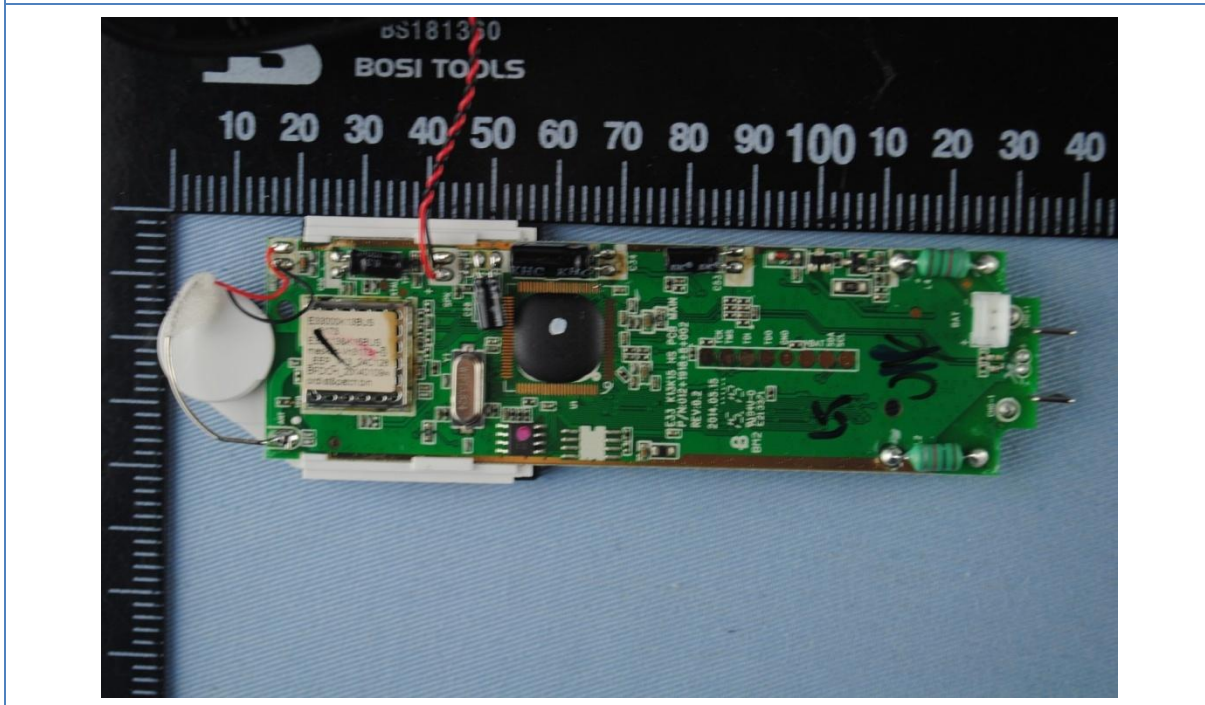
EUT bottom view



EUT inside whole view

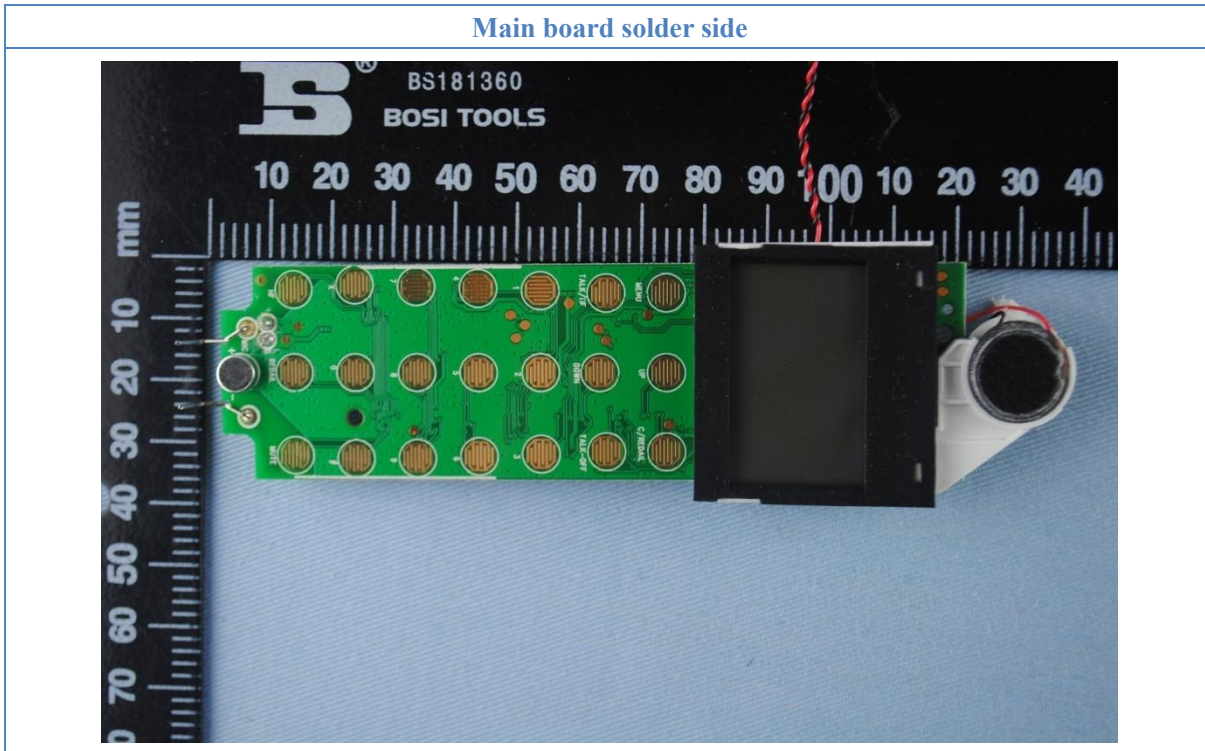


Main board component side





Main board solder side



Adapter base top view



Adapter base bottom view



Adapter top view (Meic)



Adapter side view



Adapter top view (Information)



Adapter side view



## 5. FCC ID Label

Refer to FCC ID label.

## 6. Test Equipment

The following test equipments were used during the radiated & conducted emission test:

| Equipment/<br>Facilities                   | Manufacturer       | Model #        | Serial No. | Due Date        |
|--|--------------------|----------------|------------|-----------------|
| Turntable                                  | Innco systems GmbH | CT-0801        | KMO-SZ114  | NCR             |
| Antenna Tower                              | Innco systems GmbH | MM4000-PP      | KMO-SZ115  | NCR             |
| Controller                                 | Innco systems GmbH | CO2000         | KMO-SZ116  | NCR             |
| Pre-Amplifier                              | Agilent            | 87405C         | KMO-SZ155  | Dec.6, 2016     |
| Pre-Amplifier                              | Com-Power          | PAM-840        | KMO-SZ156  | Dec.6, 2016     |
| Horn Antenna                               | Com-Power          | AH-840         | KMO-SZ157  | Dec.6, 2016     |
| EMI Test Receiver                          | Rohde & Schwarz    | ESPI7          | KMO-SZ002  | June 27, 2016   |
| Spectrum Analyzer                          | Rohde & Schwarz    | FSP40          | KMO-SZ003  | June 27, 2016   |
| Signal Generator                           | FLUKE              | PM5418+Y/C     | KMO-SZ020  | May 27, 2016    |
| Loop Antenna                               | Rohde & Schwarz    | HFH2-Z2        | KMO-SZ004  | August 19, 2018 |
| Trilog-Super Broadband<br>Antenna          | SCHWARZBECK        | VULB9161       | KMO-SZ005  | August 27, 2018 |
| Trilog-Super Broadband<br>Antenna          | SCHWARZBECK        | VULB9161       | KMO-SZ006  | August 19, 2018 |
| Broad-Band Horn Antenna                    | SCHWARZBECK        | BBHA 9120D     | KMO-SZ007  | August 19, 2018 |
| Broad-Band Horn Antenna                    | SCHWARZBECK        | BBHA 9120D     | KMO-SZ008  | August 19, 2018 |
| AMN  | Rohde & Schwarz    | ESH3-Z5        | KMO-SZ009  | June 27, 2016   |
| Pulse Limiter                              | SCHWARZBECK        | VTSD 9561-F    | KMO-SZ077  | Nov.29, 2016    |
| ISN  | SCHWARZBECK        | NTFM 8158 CAT3 | KMO-SZ070  | Nov.19, 2016    |
| ISN  | SCHWARZBECK        | NTFM 8158 CAT5 | KMO-SZ071  | Nov.19, 2016    |
| ISN  | SCHWARZBECK        | NTFM 8158 CAT6 | KMO-SZ072  | Nov.19, 2016    |
| KMO Shielded Room                          | KMO                | KMO-001        | KMO-SZ036  | NCR             |
| Coaxial Cable with<br>N-Connectors         | SCHWARZBECK        | AK9515H        | KMO-SZ037  | Sep.18, 2016    |
| AC Power Source / Analyzer                 | Agilent            | 6813B          | KMO-SZ166  | July 22, 2016   |
| Power Meter                                | Rohde & Schwarz    | OSP-B157       | KMO-HK015  | Nov.6, 2016     |
| Digital Radio Communication<br>Tester      | Rohde & Schwarz    | CMD60          | KMO-SZ169  | April 10, 2016  |
| Universal Radio<br>Communication Tester    | Rohde & Schwarz    | CMU200         | KMO-SZ170  | April 10, 2016  |
| Regulatory Test System<br>30 MHz to 40 GHz | Rohde & Schwarz    | TS8997         | KMO-HK015  | Nov.6, 2016     |
| Program Control Telephone<br>Exchanger     | Excelltel          | CDX8000-M      | KMO-SZ221  | NCR             |
| 3m Anechoic Chamber                        | KMO                | KMO-3AC        | KMO-3AC-1  | Nov.12, 2016    |
| Temperature<br>Chamber                     | TABAI              | PSL-4GTW       | N/A        | Feb.10, 2017    |