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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

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

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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

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 : 106.170mW (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 3 & RSS-Gen Issue 4

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 FCC Part15, Subpart D	IC Rule IC RSS-213, Issue3	Test Type	Result	Notes
15.107(a) 15.207(a)	5.4 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) 15.109(a) 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 Base Station and is a responding device as described in ANSI C63.17 and is designed to operate together with a DECT Handset, which is the initiating device.

2. 5 EUT Modification

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

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

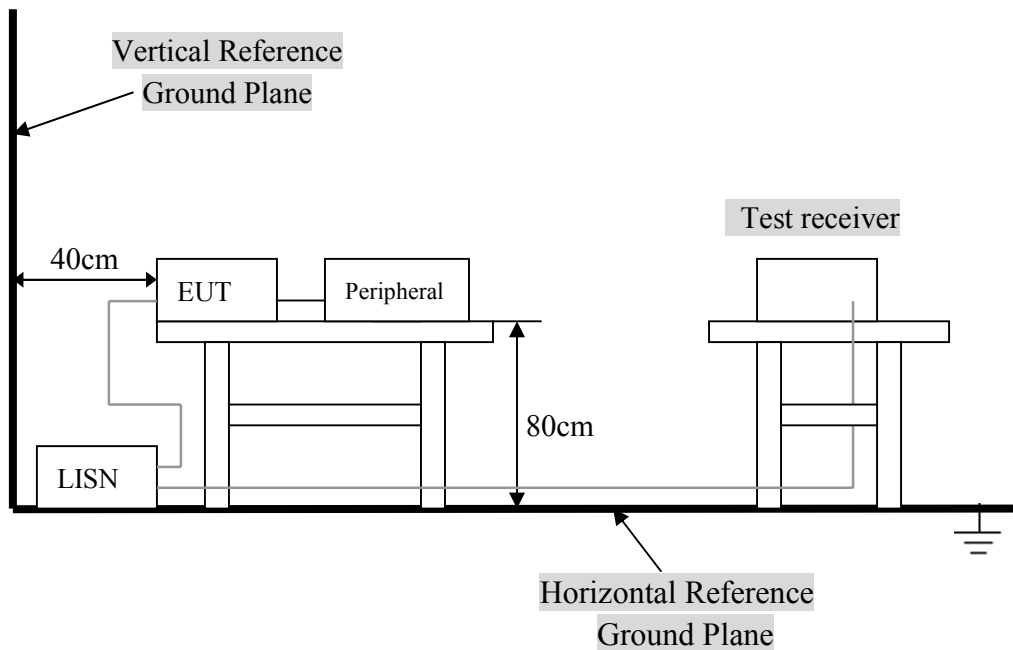
Please refer to Section 6 this report.

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-BS

B. Internal Devices

Device	Manufacturer	Model #	FCC ID
N/A			

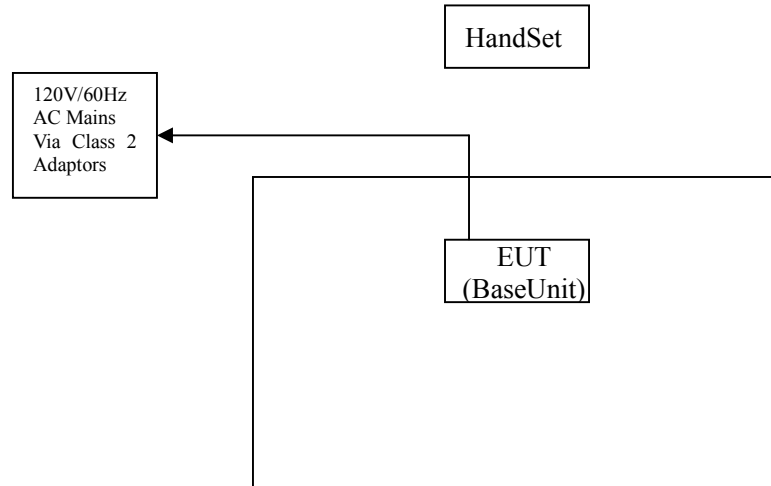
C. Peripherals

Device	Manufacturer	Model # Serial #	FCC ID/ DoC	Cable
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 6.5V	Humidity	: 56%RH
Test Result	: PASS		

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		
0.158	35.15	22.29	10.30	45.45	32.59	Line	65.57	55.57	-20.12	-22.98
0.166	32.33	19.84	10.30	42.63	30.14	Neutral	65.16	55.16	-22.53	-25.02
0.234	28.59	19.13	10.30	38.89	29.43	Line	62.31	52.31	-23.42	-22.88
1.846	22.44	14.99	10.40	32.84	25.39	Neutral	56.00	46.00	-23.16	-20.61
0.442	32.96	24.71	10.40	43.36	35.11	Line	57.02	47.02	-13.66	-11.91
3.106	25.41	17.34	10.50	35.91	27.84	Neutral	56.00	46.00	-20.09	-18.16
FCC 15 Class B										

Note: NF = No Significant Peak was Found.

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		
0.442	39.58	27.16	10.40	49.98	37.56	Line	57.02	47.02	-7.04	-9.46
8.382	32.74	15.75	10.70	43.44	26.45	Neutral	60.00	50.00	-16.56	-23.55
0.506	32.05	19.16	10.40	42.45	29.56	Line	56.00	46.00	-13.55	-16.44
9.034	33.17	16.88	10.70	43.87	27.58	Neutral	60.00	50.00	-16.13	-22.42
0.622	32.91	20.85	10.40	43.31	31.25	Line	56.00	46.00	-12.69	-14.75
9.358	33.93	17.45	10.70	44.63	28.15	Neutral	60.00	50.00	-15.37	-21.85
1.354	30.61	18.86	10.50	41.11	29.36	Line	56.00	46.00	-14.89	-16.64
10.534	32.93	18.14	10.80	43.73	28.94	Neutral	60.00	50.00	-16.27	-21.06
9.698	32.87	19.42	10.70	43.57	30.12	Line	60.00	50.00	-16.43	-19.88
11.554	32.95	18.59	10.80	43.75	29.39	Neutral	60.00	50.00	-16.25	-20.61
10.862	32.13	18.84	10.80	42.93	29.64	Line	60.00	50.00	-17.07	-20.36
12.678	31.17	16.63	10.80	41.97	27.43	Neutral	60.00	50.00	-18.03	-22.57
FCC 15 Class B										

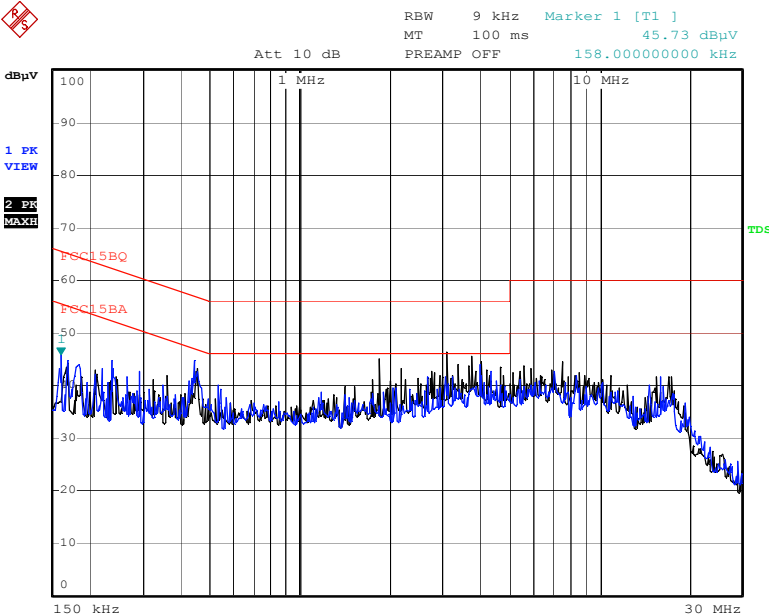
Note: NF = No Significant Peak was Found.

Note:

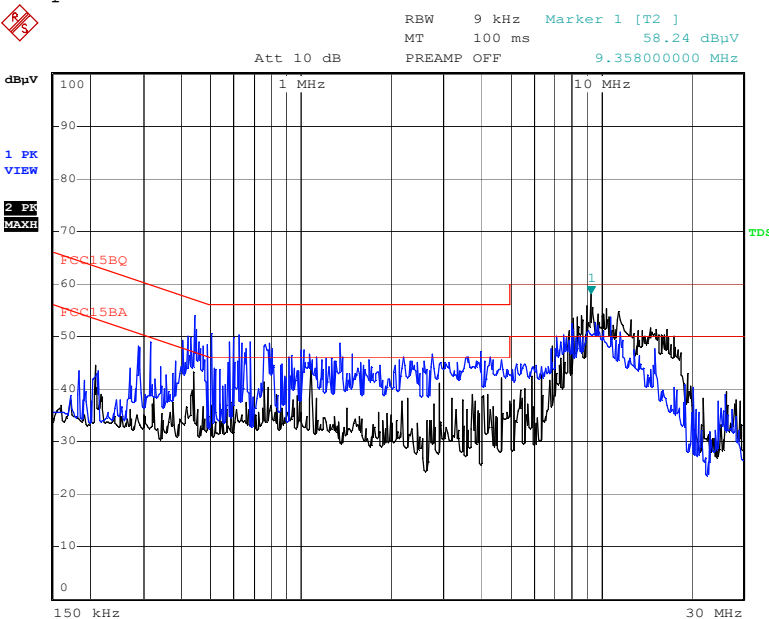
- 1.Uncertainty in conducted emission measured is ± 2 dB.
- 2.The emission levels of other frequencies were very low against the limit.
- 3.All Reading Levels are Quasi-Peak and Average value.
- 4.Emission = Meter Reading + Factor; Factor = Insertion Loss + Cable Loss.
- 5.Margin Value = Emission Level - 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 16:21:41
Adapter model: S003AIU0750030



Date: 29.MAR.2016 16:32:16

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.

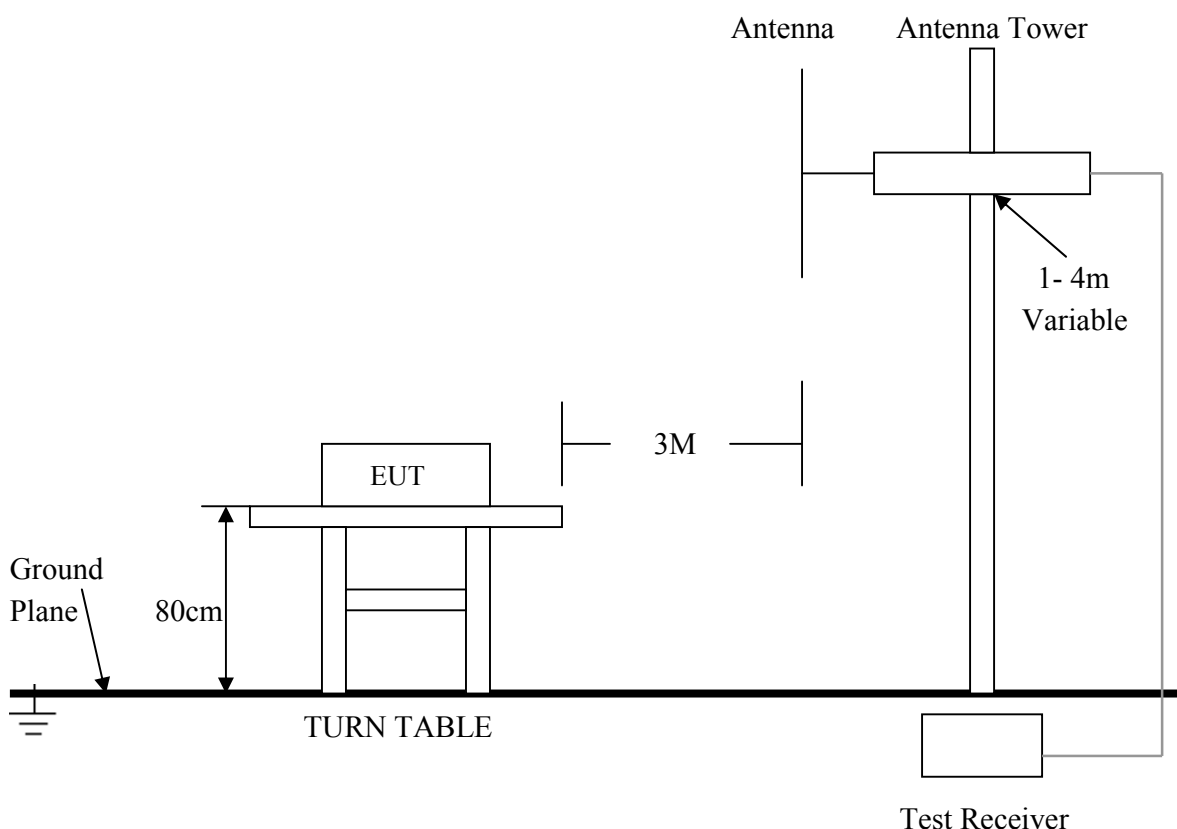
The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.17 - 2006. The specification used was the FCC 15§ 15.319(g).

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 6.5V	Humidity	: 56%RH
Test Result	: PASS		

For Frequency from 30MHz to 1GHz

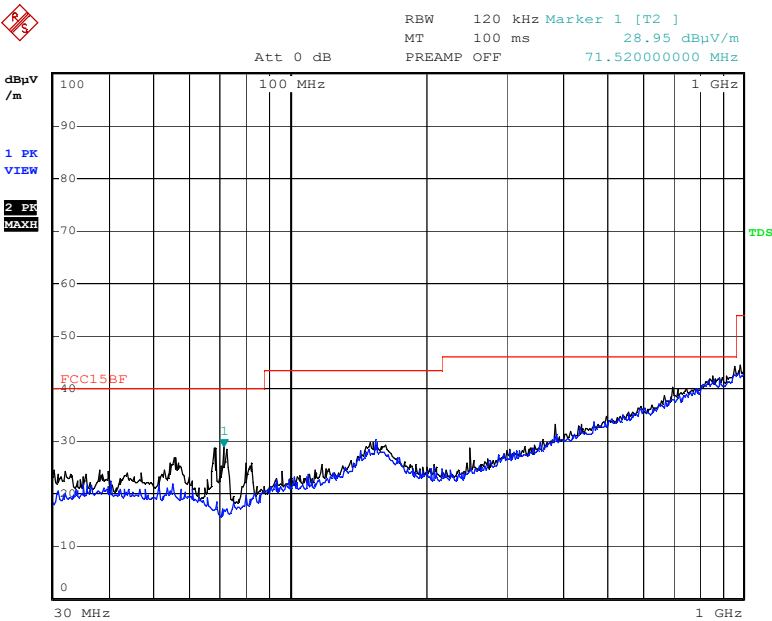
Adapter model: MN-A703-L145

FCC 15 Class B						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Emission (dBuV/m)	Horiz./ Vert.	Limit (dBuV/m)	Margin (dB)
154.600	13.06	10.96	24.02	Horiz./	43.5	-19.48
68.760	15.61	8.81	24.42	Vert.	40.0	-15.58
469.880	12.20	15.59	27.79	Horiz./	46.0	-18.21
71.520	16.64	7.24	23.88	Vert.	40.0	-16.12
836.680	13.17	22.68	35.85	Horiz./	46.0	-10.15
721.680	12.45	20.89	33.34	Vert.	46.0	-12.66
FCC 15 Class B						

Adapter model: S003AIU0750030

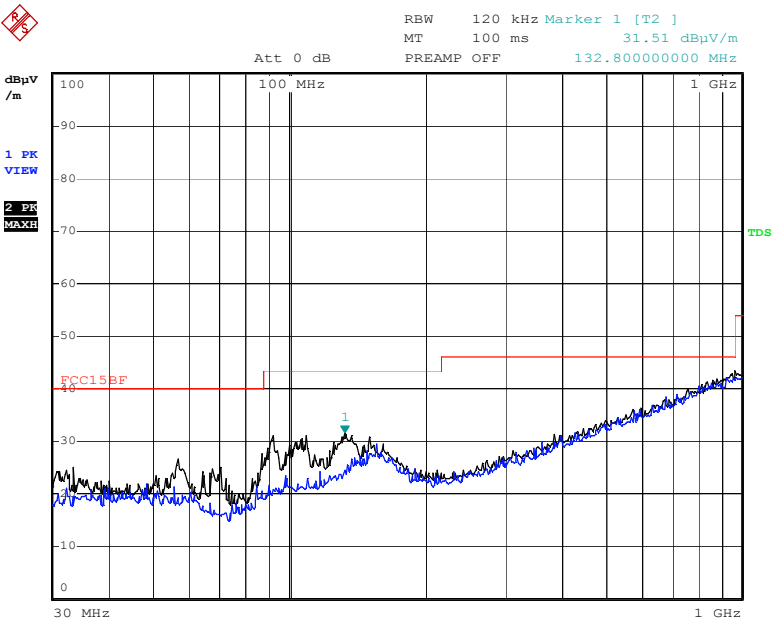
FCC 15 Class B						
Frequency (MHz)	Read Level (dBuV)	Factor (dB)	Emission (dBuV/m)	Horiz./ Vert.	Limit (dBuV/m)	Margin (dB)
597.920	14.59	17.29	31.88	Horiz./	46.0	-14.12
92.320	22.65	7.93	30.58	Vert.	43.5	-12.92
722.280	12.38	20.89	33.27	Horiz./	46.0	-12.73
108.840	16.38	8.67	25.05	Vert.	43.5	-18.45
865.320	13.48	22.68	36.16	Horiz./	46.0	-9.84
132.800	13.81	13.83	27.64	Vert.	43.5	-15.86
FCC 15 Class B						

Radiated Emission
Adapter model: MN-A703-L145



Date: 30.MAR.2016 10:17:57

Adapter model: S003AIU0750030



Date: 30.MAR.2016 10:32:40

4. Photos of Testing

4.1 EUT Test Photographs

FP Conducted Emission test view



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



4.2 EUT Detailed Photographs

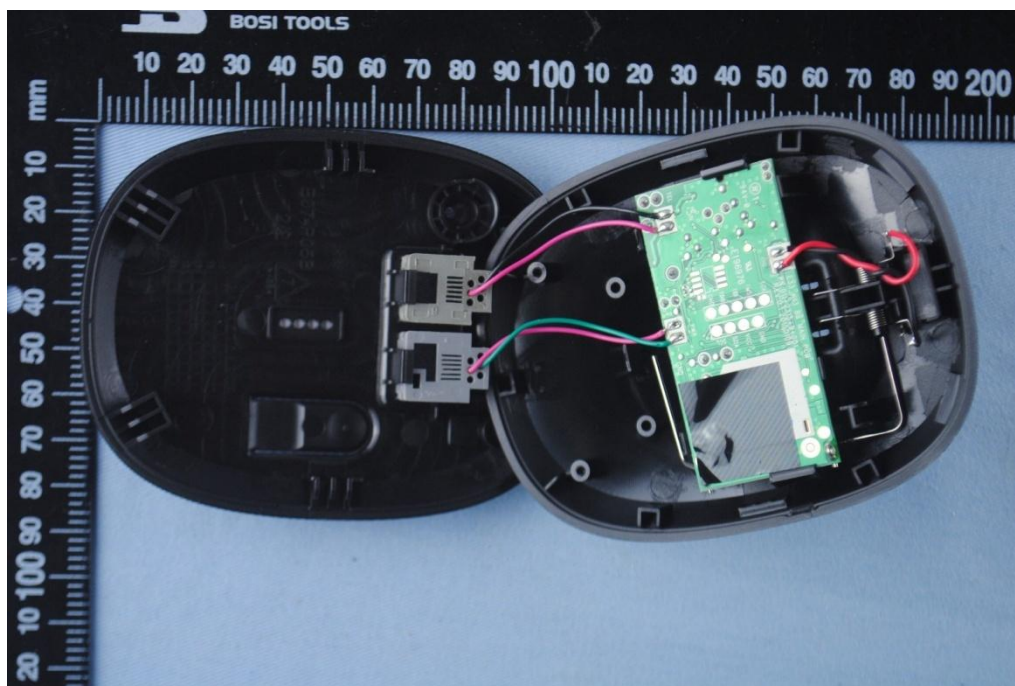
FP EUT top view



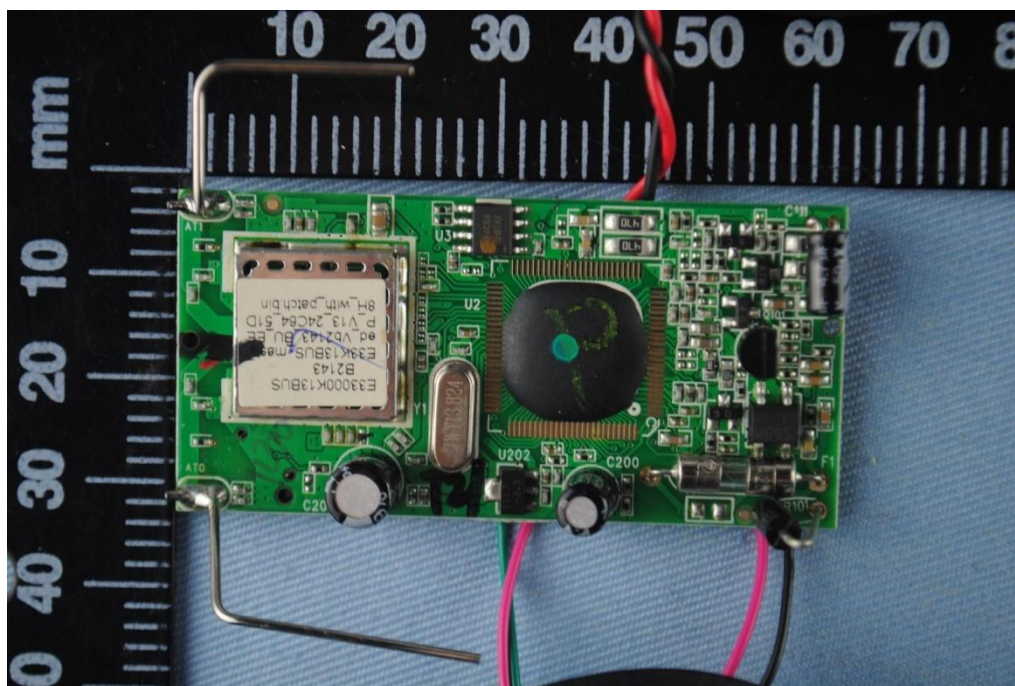
EUT bottom view



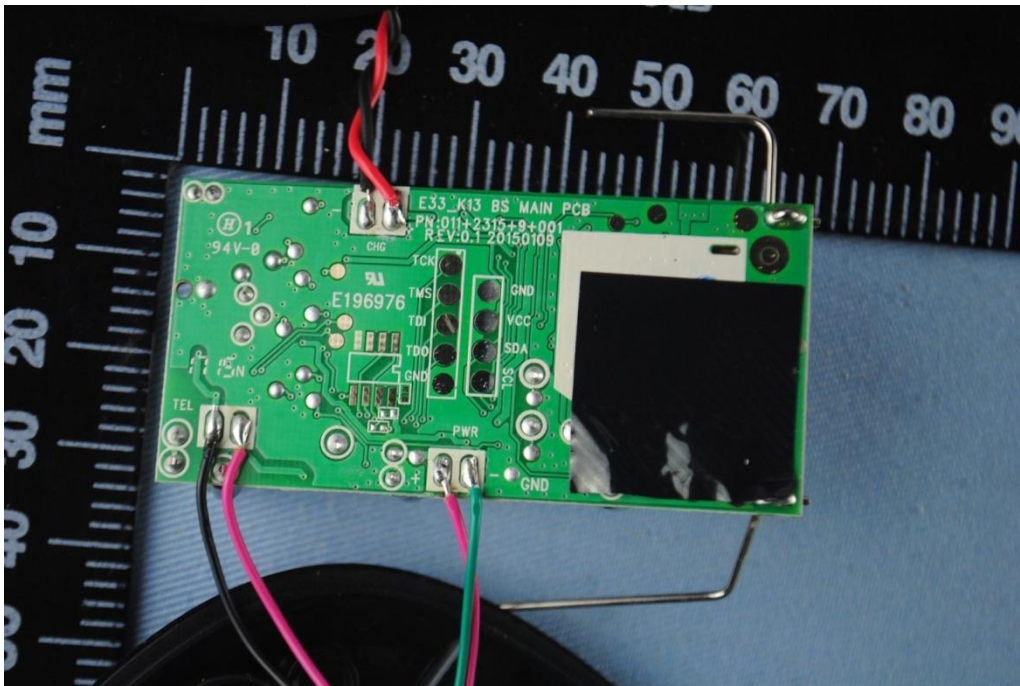
EUT inside whole view



Main board component side



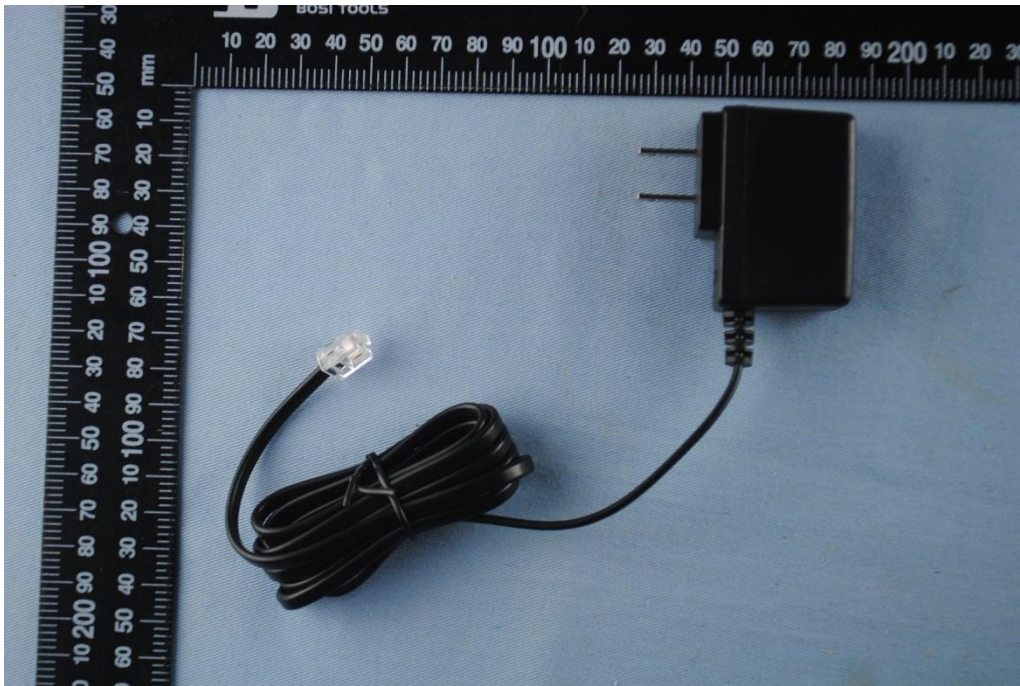
Main board solder side



Adapter top view (Meic)



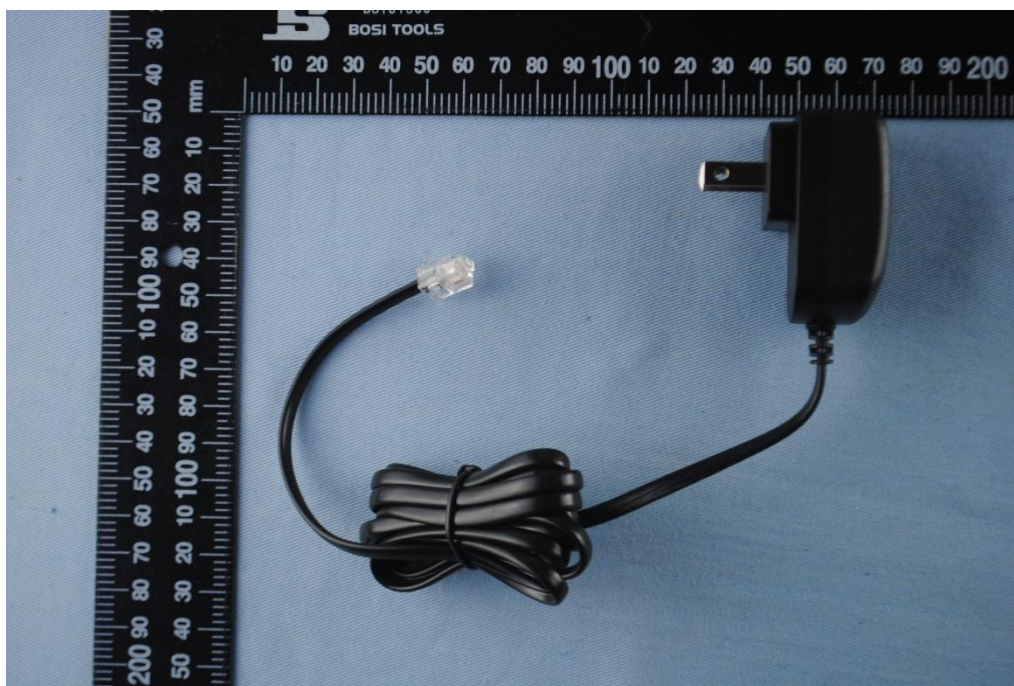
Adapter side view



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/ 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 Antenna	SCHWARZBECK	VULB9161	KMO-SZ005	August 27, 2018
Trilog-Super Broadband 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 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 Tester	Rohde & Schwarz	CMD60	KMO-SZ169	April 10, 2016
Universal Radio Communication Tester	Rohde & Schwarz	CMU200	KMO-SZ170	April 10, 2016
Regulatory Test System 30 MHz to 40 GHz	Rohde & Schwarz	TS8997	KMO-HK015	Nov.6, 2016
Program Control Telephone Exchanger	Excelltel	CDX8000-M	KMO-SZ221	NCR
3m Anechoic Chamber	KMO	KMO-3AC	KMO-3AC-1	Nov.12, 2016
Temperature Chamber	TABAI	PSL-4GTW	N/A	Feb.10, 2017