

# TESTING CERTIFICATE



**CTK Co., Ltd.**  
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Certificate No.:  
CTK-2015-00544  
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## 1. Client

- Name : Cresyn Co., Ltd.
- Address : 5 Gangnam-daero 107-gil, Seocho-gu, Seoul, Korea  
(137-702)
- Date of Receipt : 2015-03-18



## 2. Manufacturer

- Name : Cresyn Co., Ltd.
- Address : 5 Gangnam-daero 107-gil, Seocho-gu, Seoul, Korea  
(137-702)

**3. Use of Report :** For FCC certification

**4. Test Sample / Model:** Bluetooth Stereo Earphones / BT 110

**5. Date of Test :** 2015-03-25 to 2015-04-06

**6. Test Standard(method) used :** FCC Part 15 Subpart B  
ICES-003, Issue 5

**7. Testing Environment:** refer to 10 pages to 15 pages

**8. Test Results :** refer to 10 pages to 15 pages

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full.

Affirmation	Tested by Jang Bongjun: (Signature) EMC Test Engineer	Approved by Park Young-joon: (Signature) Technical Manager
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2015-05-11

Republic of KOREA **CTK Co., Ltd.**



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## REPORT REVISION HISTORY

Date	Revision	Page No
2015-05-11	Issued (CTK-2015-00544)	All

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## 1.0 General Product Description

No.	ITEM	APPLICATION
1	Test Sample	Bluetooth Stereo Earphones
2	Model	BT 110
3	Variant Model	-
4	Dimensions (W x L)	635 mm × 34.9 mm
5	Mobility	<input checked="" type="checkbox"/> Table-top <input type="checkbox"/> Floor-standing <input type="checkbox"/> Built-in <input checked="" type="checkbox"/> Portable
6	Maximum Clock Frequency	26 MHz
7	Electrical Ratings	Input: DC 5 V(USB port of Notebook Computer)
		Output: -
		Battery: Li-ion polymer Battery 75 mAh
8	Test Voltage / Frequency	Voltage: AC 120 V(AC/DC ADAPTOR of Notebook Computer)
		Frequency: 60 Hz

### 1.1 Model Differences

Not applicable

### 1.2 Device Modifications

The following modifications were necessary for compliance:

Not applicable



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### 1.3 EUT Configuration(s)

See Appendix A for individual test set-up configuration(s). The following peripheral devices and/or interface cables were connected during the measurement:

Peripheral Devices

Device	Model No.	Serial No.	Manufacturer
Notebook Computer	NT-R480	Z07093FZ400685L	Samsung Electronics Co., Ltd.
AC/DC ADAPTOR	CPA09-002A	-	Chicony Power Technology Co., Ltd.
Keyboard	PCK-200 U	121002325	imation
Mouse	3D-510	-	LG Electronics.

Cable Description

No.	From		To		Type of Cable		
	Device	I/O Port	Device	I/O Port	Length (m)	Shielded or Unshielded	Ferrite Core [Y/N]
1	EUT	Micro USB	Notebook computer	USB1	0.5	S	N
2	Notebook computer	USB2	Mouse	-	1.5	S	N
3		USB3	Keyboard	-	1.5	S	N
4		DC IN	AC/DC ADAPTOR	DC OUT	1.5	U	Y
5	AC/DC ADAPTOR	AC Power	AC Mains	-	1.8	U	N

\* Shielded or Unshielded : Unshielded=U, Shielded=S

### 1.4 Test Software

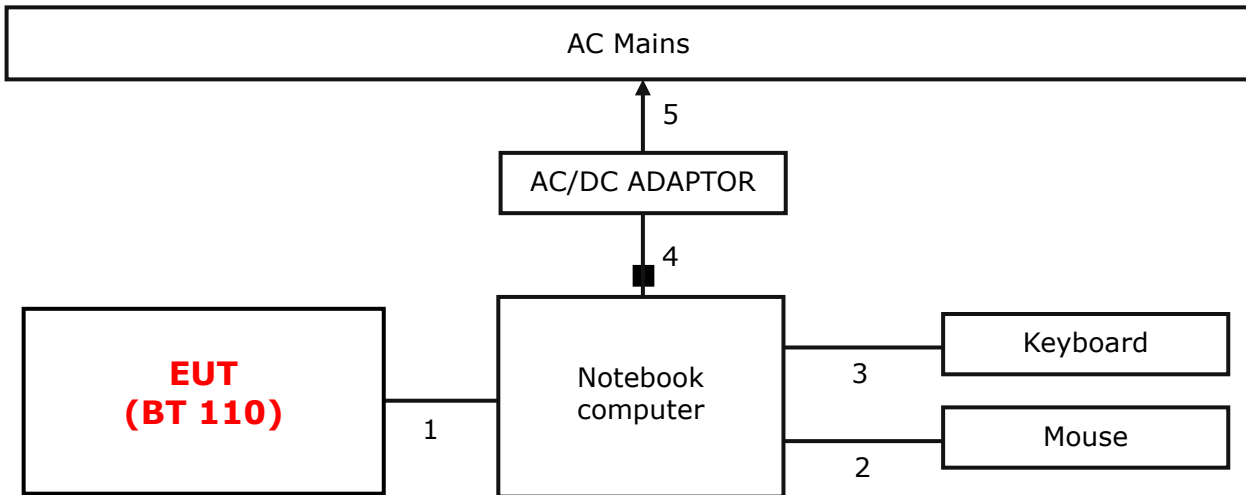
- EMC Test V 1.0
- Display Test Patterns - V1.5
- Ping.exe
- Not applicable

### 1.5 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

- |   |   |
|---|---|
| <input type="checkbox"/> Standby                | <input type="checkbox"/> Scrolling 'H'                                      |
| <input type="checkbox"/> Color Bar Display      | <input type="checkbox"/> Data Read/Write                                    |
| <input type="checkbox"/> USB PLAY               | <input type="checkbox"/> DVD Play   |
| <input type="checkbox"/> USB Data Communication | <input type="checkbox"/> Serial Data Communication                          |
| <input type="checkbox"/> AUX IN                 | <input checked="" type="checkbox"/> Charging mode through Notebook Computer |
| <input type="checkbox"/> DLNA                   | <input type="checkbox"/> MP3 Play   |

## 1.6 Configuration





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## 1.7 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

## 1.8 Test Facility

The measurement facility is located at (Ho-dong) 113, Yejik-ro, Cheoin-gu, Yong-in-si, Gyeonggi-do, Korea. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

## 1.9 Measurement Procedure

Preliminary AC power line conducted emissions tests were performed shielded room. To find worst mode, several typical mode and typical cable position were tested.

Final AC power line conducted emissions test was performed shielded room. (location is same as Preliminary test)

Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

Preliminary radiated emissions test were performed Semi-Anechoic Chamber or anechoic chamber (Distance of antenna and EUT was 3 m). To find worst mode, several typical mode and typical cable position were tested and peak level and frequency were recorded.

Final radiated emissions test was performed Semi-Anechoic Chamber.

Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.





\* Measurement procedures was In accordance with ANSI C63.4-2009 7.3.3, 7.3.4, 8.3.1.1, 8.3.1.2, 8.3.2.1, 8.3.2.2

Note #1: Comparing this test result and FCC Part 18 limits, the emission of this product can also meet the FCC Part 18.305 Field Strength Limits and 18.307 Conduction Limits.

Note #2: These results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations.

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## 1.10 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Registration Number	Logo
USA	FCC	FCC Part 15 & 18 EMI (Electromagnetic Interference / Emission)	805871	
JAPAN	VCCI	VCCI V-3 EMI (Electromagnetic Interference / Emission)	C-986 T-1843 R-3627 G-387	
KOREA	MSIP	EMI (Electromagnetic Interference / Emission) EMS (Electromagnetic Susceptibility / Immunity)	KR0025	
CANADA	IC	ICES-003, Issue 5 EMI (Electromagnetic Interference / Emission)	8737A-2	

## 1.11 Measurement Uncertainty

Compliance of the product is based on the measured value.

However, the measurement uncertainty is included for information purposes.

The measurement uncertainties given below are based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

Measurement Type	Frequency Range	Expanded Uncertainty
Conducted Emission	9 kHz to 150 kHz	2.78 dB (C.L.: Approx. 95 %, $k=2$ )
Conducted Emission	150 kHz to 30 MHz	2.70 dB (C.L.: Approx. 95 %, $k=2$ )
Disturbance Power	30 MHz to 300 MHz	3.74 dB (C.L.: Approx. 95 %, $k=2$ )
Radiated Emission	30 MHz to 1000 MHz	3.66 dB (C.L.: Approx. 95 %, $k=2$ )
Radiated Emission	1 GHz Above	4.16 dB (C.L.: Approx. 95 %, $k=2$ )



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## 2.0 EMC Test Regulations/Standards

The tests were performed according to following regulations:

Applied standard	Title	Applied	Test Result
FCC Part 15 Subpart B ICES-003, Issue 5 <input type="checkbox"/> Class A <input checked="" type="checkbox"/> Class B	Conducted Voltage Emissions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> MET <input type="checkbox"/> NOT MET
	Radiated Electric Field Emissions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> MET <input type="checkbox"/> NOT MET



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### 3.0 Results of Individual Test

#### 3.1 Conducted Voltage Emissions of Mains ports

**Test Date**

2015-04-06

**Test Location**

Shielded Room

**Test Equipment**

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
EMI Test Receiver	ESCI3	Rohde & Schwarz	100032	2016-02-02	<input type="checkbox"/>
LISN	ENV216	Rohde & Schwarz	101235	2015-07-30	<input type="checkbox"/>
LISN	ENV216	Rohde & Schwarz	101236	2015-07-30	<input type="checkbox"/>
EMI Test Receiver	ESR7	Rohde & Schwarz	101088	2015-07-29	<input type="checkbox"/>
LISN	ENV216	Rohde & Schwarz	101151	2015-11-07	<input type="checkbox"/>
LISN	ESH3-Z5	Rohde & Schwarz	100207	2015-11-07	<input type="checkbox"/>
EMI Test Receiver	ESCI7	Rohde & Schwarz	100816	2015-12-05	<input checked="" type="checkbox"/>
LISN	ENV216	Rohde & Schwarz	101760	2016-02-02	<input checked="" type="checkbox"/>
LISN	NNLK 8121	SCHWARZBECK	8121-644	2015-08-21	<input type="checkbox"/>
LISN	ENV216	Rohde & Schwarz	101150	2016-02-02	<input type="checkbox"/>

**Test Software**

ESCI7, ESCI3 : EMC32 Ver. 8.50.0

ESR7 : EMC32 Ver. 8.53.0

**Frequency Range of Measurement**

150 kHz to 30 MHz

**Instrument Setting**

IF Band Width: 9 kHz

**Climate Condition**

Temperature: (22 ± 1) °C

Relative Humidity: (40 ± 1) %

Atmospheric Pressure: 99 kPa

**Test Result**

The requirements are:  MET  NOT MET

Frequency (MHz)	Measured Data (dBµV)	Margin (dB)	Remark
0.181 500	54.2	10.3	Quasi-peak

The Result is calculated by using the following formula;

\* Result = Limit – Margin (Result included the correction factor)

\* Correction factor = Cable Loss + Insertion loss of LISN



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## Test Data

[Line: L1]

Test

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# Test Report

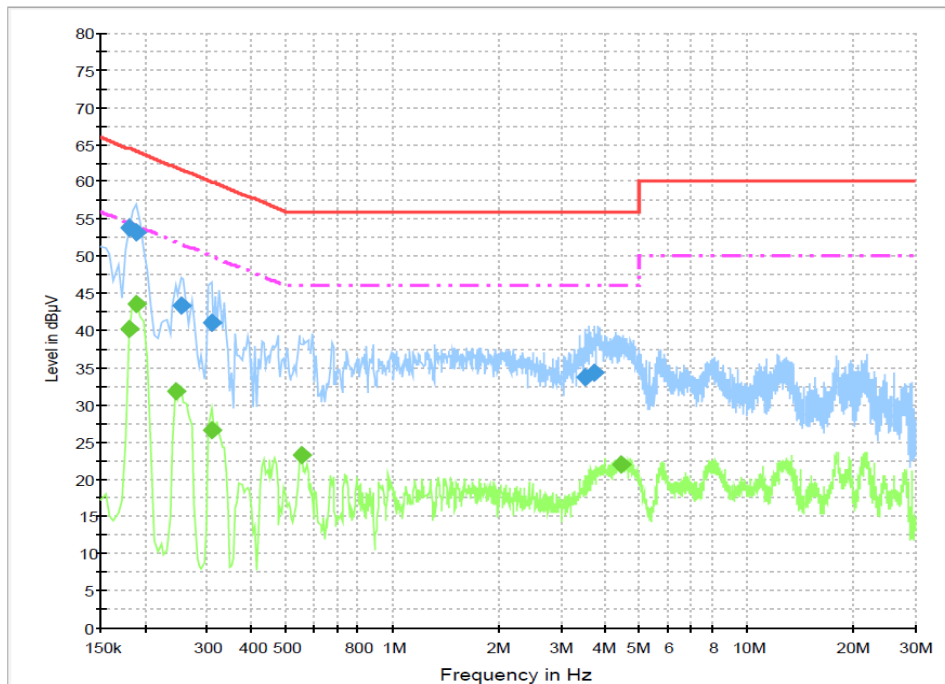
## Common Information

Test Model Name: BT 110  
Test Mode: Notebook Charging Mode  
Manufacturer: Cresyn Co., Ltd.  
Tester: JANG, BONG JUN

## Hardware Setup: EMI conducted Voltage with ENV216\_FO(101760) - [EMI conducted]

Subrange 1  
Frequency Range: 150 kHz - 30 MHz  
Receiver: ESCI 7 [ESCI 7]  
@ GPIB0 (ADR 23), SN 100816/007, FW 4.42  
Signal Path: ESCI 7-ENV216 FO(101760)  
Correction Table: 3-2 CE Cable Loss  
LISN: ENV216 FO(101760)  
Correction Table (Line 0): ENV216\_FO\_N(101760)  
Correction Table (Line 1): ENV216\_FO\_L1(101760)

CISPR 22 Class B\_L1



4/6/2015

9:33:43



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Test

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**Final Result 1**

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.181500	53.9	1000.0	9.000	On	L1	9.8	10.5	64.4
0.190500	53.3	1000.0	9.000	On	L1	9.8	10.8	64.0
0.253500	43.5	1000.0	9.000	On	L1	9.6	18.2	61.6
0.307500	41.1	1000.0	9.000	On	L1	9.7	19.0	60.0
3.511500	33.7	1000.0	9.000	On	L1	9.8	22.3	56.0
3.718500	34.3	1000.0	9.000	On	L1	9.8	21.7	56.0

**Final Result 2**

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.181500	40.3	1000.0	9.000	On	L1	9.8	14.1	54.4
0.190500	43.5	1000.0	9.000	On	L1	9.8	10.5	54.0
0.244500	31.8	1000.0	9.000	On	L1	9.6	20.2	51.9
0.307500	26.6	1000.0	9.000	On	L1	9.7	23.4	50.0
0.555000	23.3	1000.0	9.000	On	L1	9.9	22.7	46.0
4.416000	22.1	1000.0	9.000	On	L1	9.8	23.9	46.0

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[Line : Neutral]

Test

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## Test Report

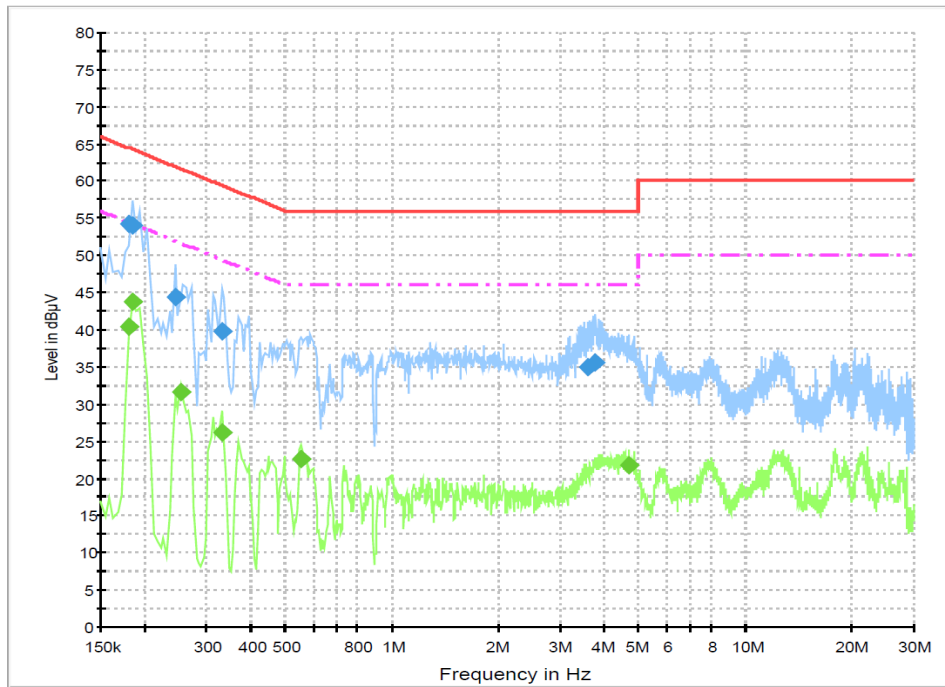
### Common Information

Test Model Name: BT 110  
Test Mode: Notebook Charging Mode  
Manufacturer: Cresyn Co., Ltd.  
Tester: JANG, BONG JUN

### Hardware Setup: EMI conducted Voltage with ENV216\_FO(101760) - [EMI conducted]

Subrange 1  
Frequency Range: 150 kHz - 30 MHz  
Receiver: ESCI 7 [ESCI 7]  
@ GPIB0 (ADR 23), SN 100816/007, FW 4.42  
Signal Path: ESCI 7-ENV216 FO(101760)  
Correction Table: 3-2 CE Cable Loss  
LISN: ENV216 FO(101760)  
Correction Table (Line 0): ENV216\_FO\_N(101760)  
Correction Table (Line 1): ENV216\_FO\_L1(101760)

CISPR 22 Class B\_N



4/6/2015

9:39:04



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Test

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**Final Result 1**

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.181500	54.2	1000.0	9.000	On	N	9.8	10.3	64.4
0.186000	53.9	1000.0	9.000	On	N	9.8	10.3	64.2
0.244500	44.4	1000.0	9.000	On	N	9.6	17.6	61.9
0.330000	39.8	1000.0	9.000	On	N	9.8	19.7	59.5
3.597000	35.0	1000.0	9.000	On	N	9.7	21.0	56.0
3.777000	35.7	1000.0	9.000	On	N	9.7	20.3	56.0

**Final Result 2**

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.181500	40.4	1000.0	9.000	On	N	9.8	14.0	54.4
0.186000	43.8	1000.0	9.000	On	N	9.8	10.4	54.2
0.253500	31.6	1000.0	9.000	On	N	9.6	20.0	51.6
0.330000	26.2	1000.0	9.000	On	N	9.8	23.3	49.5
0.555000	22.6	1000.0	9.000	On	N	9.9	23.4	46.0
4.686000	21.8	1000.0	9.000	On	N	9.7	24.2	46.0

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## 3.2 Radiated Electric Field Emissions (Below 1 GHz)

### Test Date

2015-03-25

### Test Location

10 m SAC (test distance :  10 m,  3 m)

### Test Equipment

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
EMI Test Receiver	ESCI7	Rohde & Schwarz	100814	2015-12-05	<input checked="" type="checkbox"/>
Bilog Antenna	CBL6111C	Schaffner	2551	2016-05-08	<input checked="" type="checkbox"/>
6dB Attenuator	DNF	Rohde & Schwarz	272.4110.50-2	2015-11-07	<input checked="" type="checkbox"/>
Amplifier	310	Sonoma Instrument Co.	291721	2016-02-02	<input checked="" type="checkbox"/>

### Test Software

TOYO EMI software Ver. 5.1.0

### Frequency Range of Measurement

30 MHz to 1 GHz

### Instrument Setting

IF Band Width: 120 kHz

### Climate Condition

Temperature: (20 ± 1) °C

Relative Humidity: (41 ± 1) %

Atmospheric Pressure: 99 kPa

### Test Result

The requirements are:  MET  NOT MET

Frequency (MHz)	Measured Data (dB $\mu$ V/m)	Margin (dB)	Remark
269.711	35.0	11.0	Quasi-peak

The Result is calculated by using the following formula;

\* Result = Reading + Correction factor

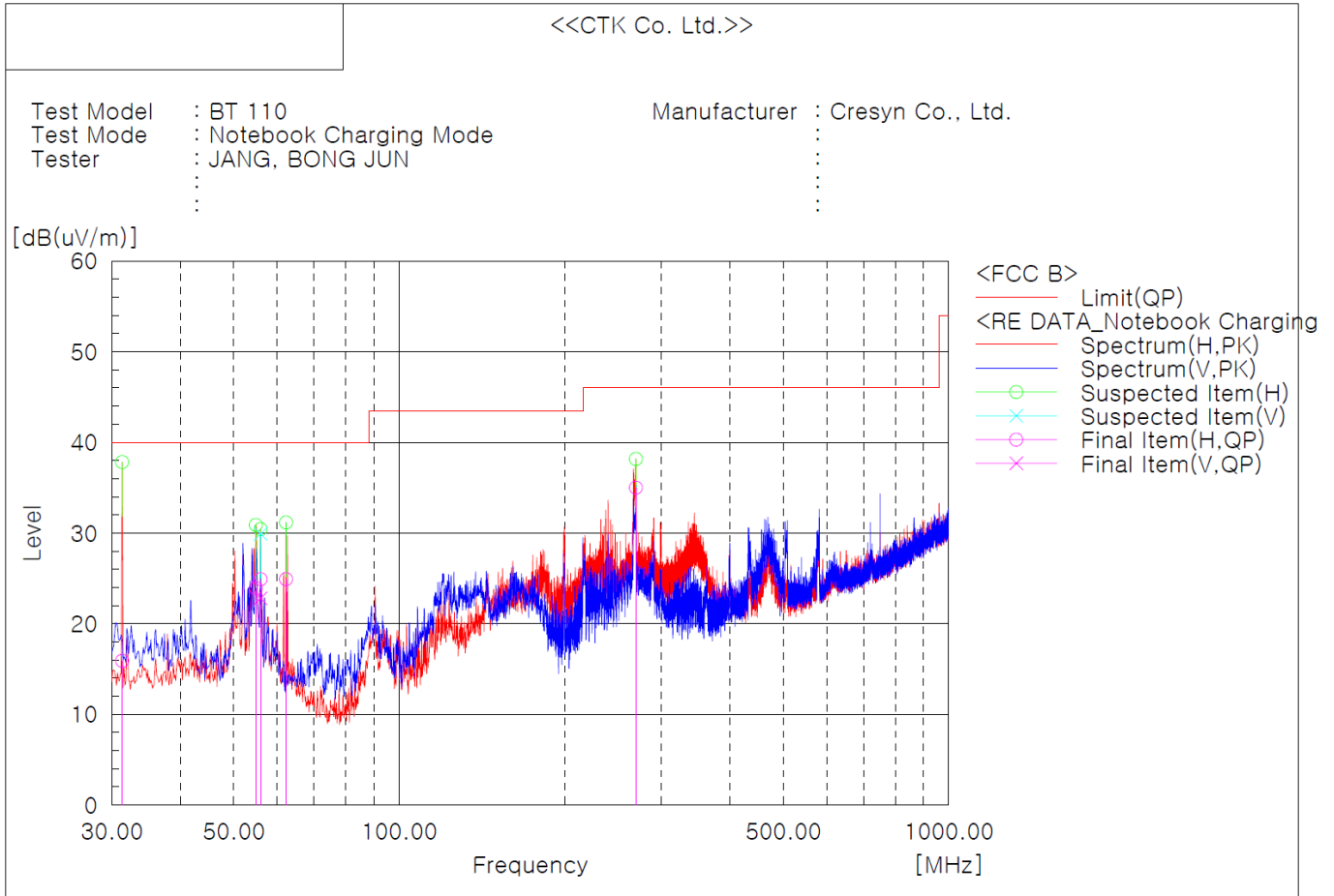
\* Correction factor = Antenna Factor + Cable Loss + 6 dB attenuator – Amp Gain



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### Test Data



#### Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	31.334	H	29.5	-13.6	15.9	40.0	24.1	400.0	88.0
2	54.856	H	36.5	-12.6	23.9	40.0	16.1	307.0	198.0
3	55.948	H	37.5	-12.6	24.9	40.0	15.1	307.0	49.0
4	55.948	V	35.4	-12.6	22.8	40.0	17.2	294.0	125.0
5	62.253	H	38.6	-13.7	24.9	40.0	15.1	400.0	162.0
6	269.711	H	45.3	-10.3	35.0	46.0	11.0	100.0	235.0



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### 3.3 Radiated Electric Field Emissions (Above 1 GHz)

**Test Date**  
**Not Applicable**

**Test Location**  
 3 m SAC

**Test Equipment**

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
EMI Test Receiver	ESCI7	Rohde & Schwarz	100816	2015-12-05	<input type="checkbox"/>
Double Ridged Guide Antenna	3117	ETS-Lindgren	154525	2015-07-03	<input type="checkbox"/>
Preamplifier	8449B	Agilent Technologies	3008A02011	2015-12-26	<input type="checkbox"/>

**Test Software**  
 TOYO EMI software Ver. 5.1.0

**Frequency Range of Measurement**  
 1 GHz to 6 GHz

**Instrument Setting**  
 IF Band Width: 1 MHz

**Climate Condition**  
 Temperature:  
 Relative Humidity:  
 Atmospheric Pressure:

**Test Result**  
 The requirements are:  MET  NOT MET

Frequency (MHz)	Measured Data (dBµV/m)	Margin (dB)	Remark

The Result is calculated by using the following formula;  
 \* Result = Reading + Correction factor  
 \* Correction factor = Antenna Factor + Cable Loss- Amp Gain

**Test Data**

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## **APPENDIX A - Test Setup Photos and Configuration**



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## Conducted Voltage Emissions of Mains Ports

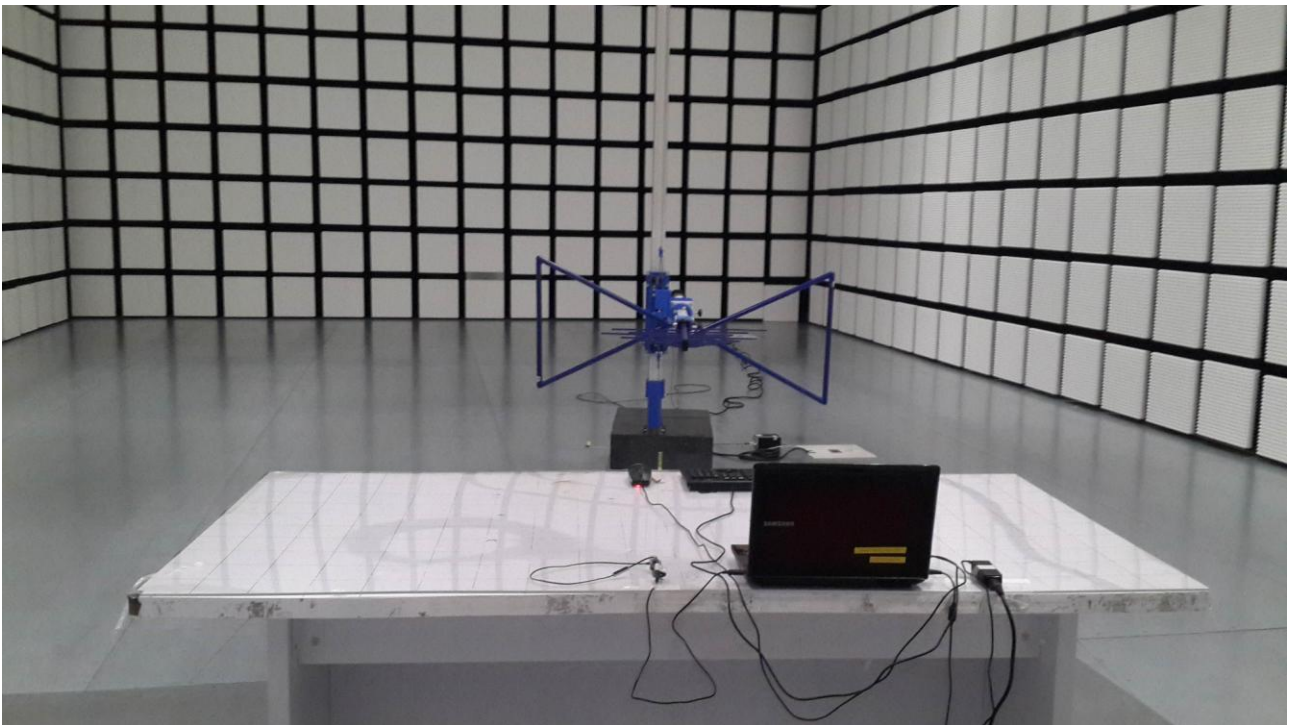




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## Radiated Electric Field Emissions (Below 1 GHz)





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**Radiated Electric Field Emissions (Above 1 GHz)**

*Not Applicable*



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## **APPENDIX B – EUT Photographs**

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## EUT External Photographs





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## EUT External Photographs



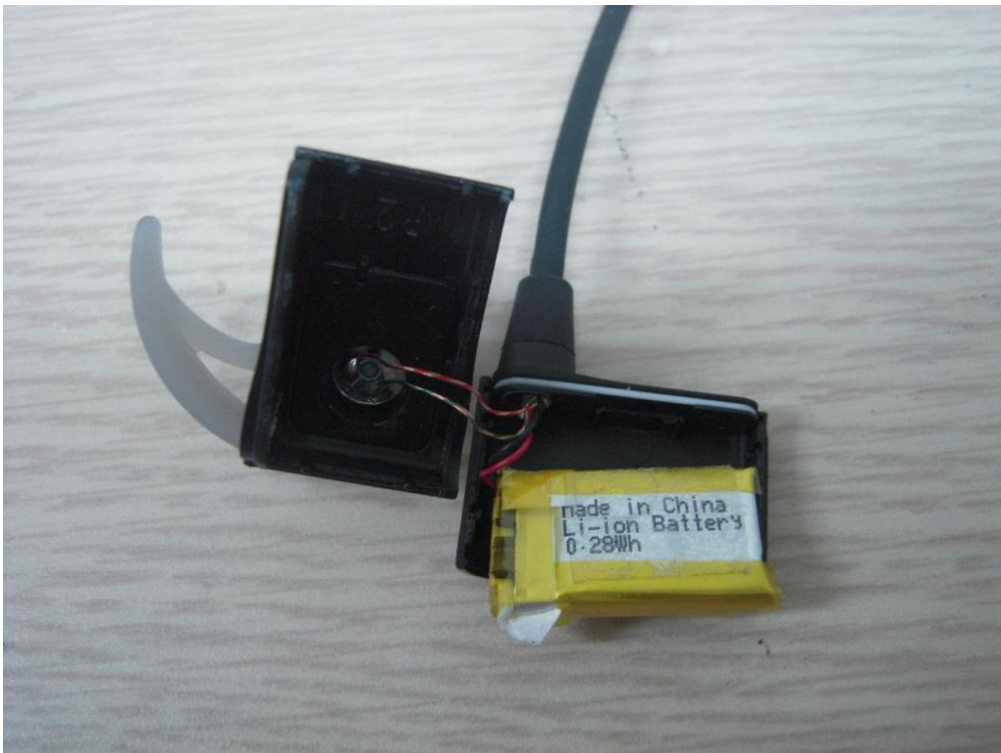




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## EUT Internal Photographs





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## PCB





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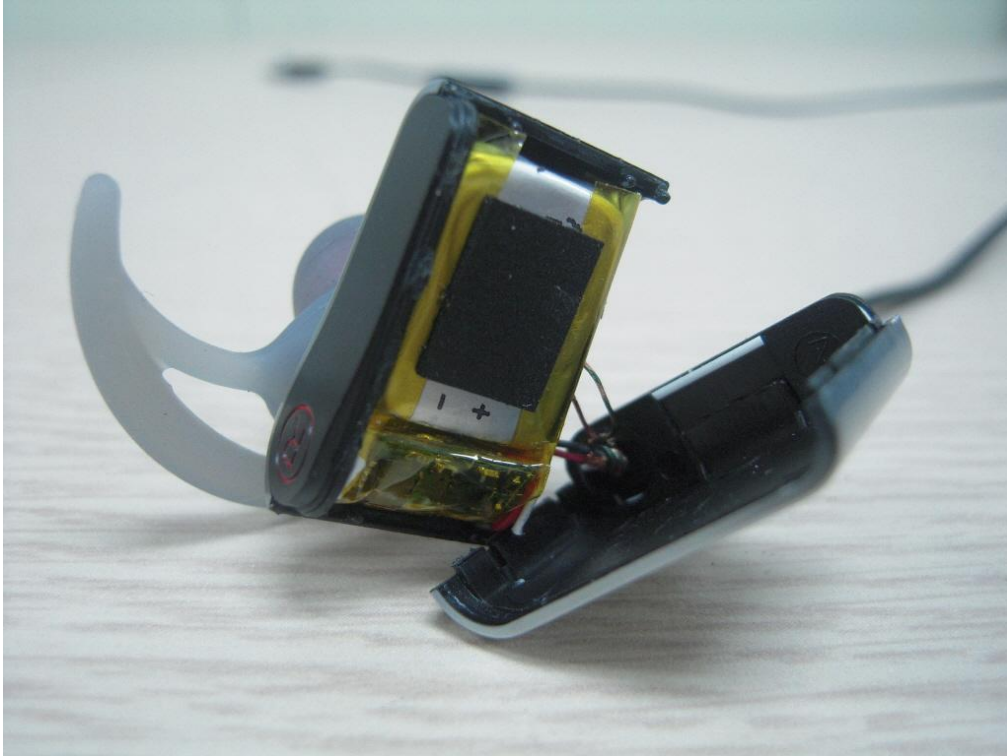






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## Label and Location

