



**ISO/IEC17025 Accredited Lab.**

Report No: EMC1411102-01

File reference No: 2014-12-09

Applicant:

Product: Bluetooth Earphone

Brand Name: ILE

Model No: BTH-040, BTH-042, BTH-026

Test Standards: ETSI EN301 489-1 v 1.9.2 (2011-09)  
ETSI EN301 489-17 v 2.2.1 (2012-09)

Test result: The EMC testing has been performed on the submitted samples and found in compliance with council EMC Directive 2004/108/EC and R & TTE Directive 1999/5/EC

Approved By

*Jack Chung*

Jack Chung

EMC Manager

Dated: December 09, 2014

**Results appearing herein relate only to the sample tested**

**The technical reports is issued errors and omissions exempt and is subject to withdrawal at**

**SHENZHEN TIMEWAY TESTING LABORATORIES**

Room 512-519, 5/F., East Tower, Building 4, Anhua Industrial Zone, Futian District, Shenzhen, Guangdong, China

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### **Special Statement:**

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meets with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

#### **CNAS-LAB Code: L2292**

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

#### **FCC-Registration No.: 899988**

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.:899988.

#### **IC- Registration No.: IC5205A-02**

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration No.: IC 5205-02.

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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 TIMEWAY 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 TIMEWAY Lab.

### 1.2 Testing Laboratory

#### SHENZHEN TIMEWAY TESTING LABORATORIES.

Room 512-519, 5/F., East Tower, Building 4, Anhua Industrial Zone, Futian District, Shenzhen, Guangdong, China

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Site on File With the Federal Communications and Commission – United States

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A-02

For 3m & 10 m OATS

### 1.3 Details of Applicant

Name: Richen Industrial Co., Ltd.

Address: Rm.1203, Building 4 East, Saige Technopark, Huaqiang North Road, Futian District, Shenzhen, China

### 1.4 Application Details

Date of Receipt of Application: Nov 18, 2014

Date of Receipt of Test Item: Nov 18, 2014

Date of Test: Nov 18, 2014~ Dec 05, 2014

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### 1.5 Test Item

Manufacturer:

Address:

Brand Name:

Model No.: BTH-040

Additional Model No.: BTH-042

Additional Brand Name: N/A

Description: Bluetooth Earphone

### Additional Information

Frequency: 2402-2480MHz for Bluetooth

Number of Channels: 79 channel for Bluetooth

Channel Spacing: 1MHz for Bluetooth

Antenna Designation: Integral Antenna and the maximum Gain of this antenna is 0dBi;

Type of Modulation: GFSK,  $\pi/4$ DQPSK, 8DPSK

Extreme Temp. Tolerance: -20°C to 55°C

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## 1.6 List of Ports

Port	Description	Classification <sup>1</sup>	Maximum cable Length	Cable Type
N/A				

Note <sup>1</sup>ports shall be classified as ac power, dc power or signal/control port.

<sup>2</sup>Maximum cable length corresponding to the appropriate ports shall be classified as  $\leq 3\text{m}$  or  $> 3\text{m}$ .

## 1.7 Ancillary and Peripheral Devices

Description	Designation	Serial No.	Manufacturer
N/A	-	--	--

### List of Peripheral Devices Used for Testing

Description	Designation	Serial No.	Manufacturer
N/A			

Note: An Equipment (apparatus) used in connection with a receiver or transmitter is considered as an ancillary Equipment (apparatus) if:

- The equipment is intended for use in conjunction with a receiver or transmitter to provide additional operational and/or control features to the radio equipment. (e.g. to extend control to another position or location); and
- The equipment cannot be used on a stand alone basis to provide user functions independently of a receiver or transmitter; and
- The receiver or transmitter to which it is connected, is capable of providing some intended operation such as transmitting and/or receiving without the ancillary equipment (i.e. it is not a sub-unit of the main equipment essential to the main equipment basic functions).

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## 1.8 Test Standards

<b>ETSI EN 301 489-1 v 1.9.2 (2011-09)</b>
Electromagnetic compatibility and Radio spectrum Matters (ERM);
Electromagnetic Compatibility (EMC) standard for radio equipment and services;
Part 1: Common technical requirements
<b>ETSI EN 301 489-17 v 2.2.1 (2012-09)</b>
Electromagnetic compatibility and Radio spectrum Matters (ERM);
Electromagnetic Compatibility (EMC) standard for radio equipment and services;
Part 17: Specific conditions for 2.4GHz wideband transmission systems and 5GHz high performance RLAN equipment

## 1.9 Test or Witness Test Engineering

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

Test By: \_\_\_\_\_

Printing Name: Terry Tang

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## 2. Technical Test

### 2.1 Summary of Test Results

No deviations from the technical specification(s) were ascertained in the course of the tests Performed	
Final Verdict: (Only "Passed" if all Measurements are "Passed")	<b>Pass</b>

### 2.2 Test Report

#### Emission (EMI)

EMI Phenomenon	Port	Requirement		EUT Setup	Result	Applicability
		Standard	Basic Standard			
Conducted Interference Voltage	AC Mains	ETSI EN 301489-1: 2011-09 Clause 8.4	EN 55022:2010 +AC: 2011	Refer to Section 4	Complies	Applicable
Radiated Interference Field Strength 30~1000MHz	Enclosure	ETSI EN 301489-1: 2011-09 Clause 8.2	EN 55022:2010 +AC: 2011	Refer to Section 4	Complies	Not Applicable
Harmonic Current Emissions	AC Mains Input Port	ETSI EN 301489-1: 2011-09 Clause 8.5	EN 61000-3-2:2006 + A1: 2009 +A2:2009	Refer to Section 4	Complies	Not Applicable
Flicker & Voltage Fluctuation	AC Mains Input Port	ETSI EN 301489-1: 2011-09 Clause 8.6	EN 61000-3-3:2013	Refer to Section 4	Complies	Applicable

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### Immunity (EMS)

EM3 Phenomenon	Port	Requirement		EUT Setup	Result	Applicability
		Standard	Basic Standard			
Electronic Discharge (ESD)	Enclosure	ETSI EN 301489-1: 2011-09 Clause 9.3	EN 61000-4-2: 2009	Refer to Section 4	Complies	Applicable
RF-Electro-Magnetic Field (80-1000MHz) And 1400-2700MHz)	Enclosure	ETSI EN 301489-1: 2011-09 Clause 9.2	EN 61000-4-3: 2006	Refer to Section 4	Complies	Applicable
Fast Transients, Burst	Power Line AC/DC	ETSI EN 301489-1: 2011-09 Clause 9.4	EN 61000-4-4: 2004 +A1:2010	Refer to Section 4	Complies	Applicable
Surge	Power Line (1 phase)	ETSI EN 301489-1: 2011-09 Clause 9.6	EN 61000-4-5: 2006	Refer to Section 4	Complies	Applicable
Transients & Surge Vehicular Environment	Power Line ( Car Charge)	ETSI EN 301489-1: 2011-09 Clause 9.8	ISO 7637-1/2:1990 (12/124VDC)	N/A	Complies	Not Applicable
RF Common Mode (0.15-80MHz)	Power Line AC/DC signal Lines	ETSI EN 301489-1: 2011-09 Clause 9.5	EN 61000-4-6: 2009	Refer to Section 4	Complies	Applicable
Vol. Dips, Interruptions & Fluctuations (AC Power)	Input & Output AC Ports only	ETSI EN 301489-1: 2011-09 Clause 9.7	EN 61000-4-11 2004	Refer to Section 4	Complies	Applicable

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**N/A=Not Applicable**

-Performance criteria A for immunity tests with phenomena of a continuous nature;

Communication between the EUT and AP and Bluetooth device in the front of pings should not drop during the test.

-Performance criteria B for immunity tests with phenomena of a transient nature;

N/A

-Performance criteria C for immunity tests with power interruptions exceeding a certain time.

N/A

**Note: For details see subclause 6.1 ETSI EN 301 489-17**

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## **Clause 8.2 Emission Test – Radiated Emission**

This test assesses that ability of ancillary equipment to limit their internal noise from being radiated from the enclosure.

### **According to EMC basic standard (EN 55022)**

Measurement according to EMC basic standard, The test results correspond to the 3m Semi-Anechoic Chamber results.

The EUT and its simulators are placed on a turntable which is 0.8 meter above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna is set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to EN55022: 2010 +AC:2011 on radiated measurement.

Radiated emissions were investigated over the frequency range from 30MHz to 1 GHz using a receiver bandwidth of 120kHz.

Radiated emissions were investigated over the frequency range from 30MHz to 6 GHz

Radiated Emission was performed at an antenna to EUT distance of 3 meters.

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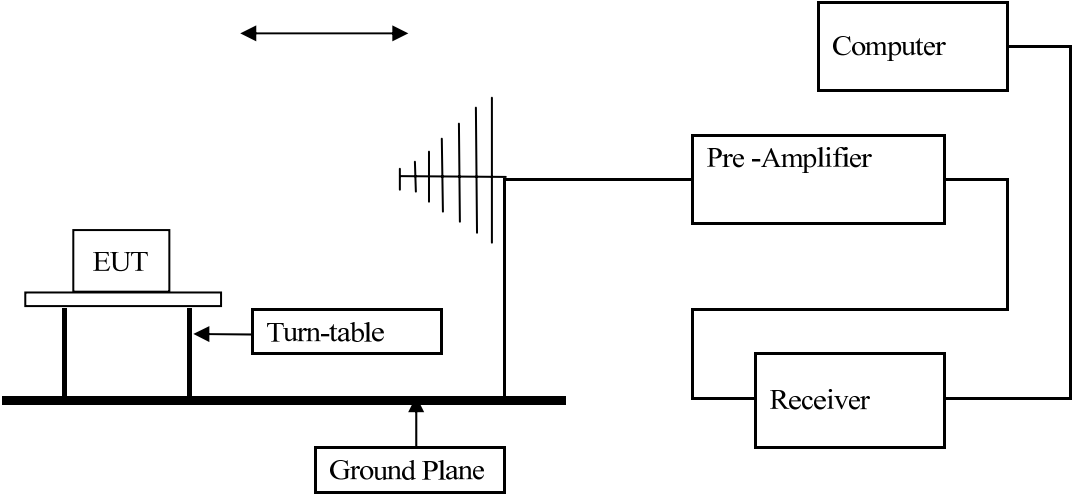
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**Radiated Emission Test**

**Block diagram of Test setup**

Distance = 3m



**Power line conducted Emission Limit**

Frequency Range (MHz)	Distance (m)	Quasi-Peak limits (dB $\mu$ V/m)
30-230	10/3	30.0/40.0
230-1000	10/3	37.0/47.0
1000-3000	3	50 (AV) /70 (PK)
3000-6000	3	54 (AV) /74 (PK)

Note: The lower limit shall apply at the transition frequencies

**Test result**

Please refer to following table

**Note: the test item not applicable to the EUT, because the test item is applicable to the enclosure of ancillary equipment**

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#### Clause 8.4 AC Line Conducted Emissions

According to EMC Basic Standard (EN 55022 [7] Class-B)

1. For the table top EUT the distance to the reference ground plane (wall) should be 40 cm.
2. AC input line plugged into LISN.

#### Results

Power Line (L, N)	EUT Operating mode or operating mode no.	Detector (Peak, AV, QP)	Additional (scan-) Information (e.g. Pre-test Fast scan, Maxhold, Final measurement.)	Result (Passed / Failed)
L=>GND	--	QP & AV	Tx Operating Normal	Pass
N=>GND	--	QP & AV	Tx Operating Normal	Pass

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

. Temperature: 25°C  
. Humidity: 53% RH

Note: the worse cases was selected to conducted the test

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**A: Conducted Emission on Live Terminal (150kHz to 30MHz)**

**EUT Operating Environment**

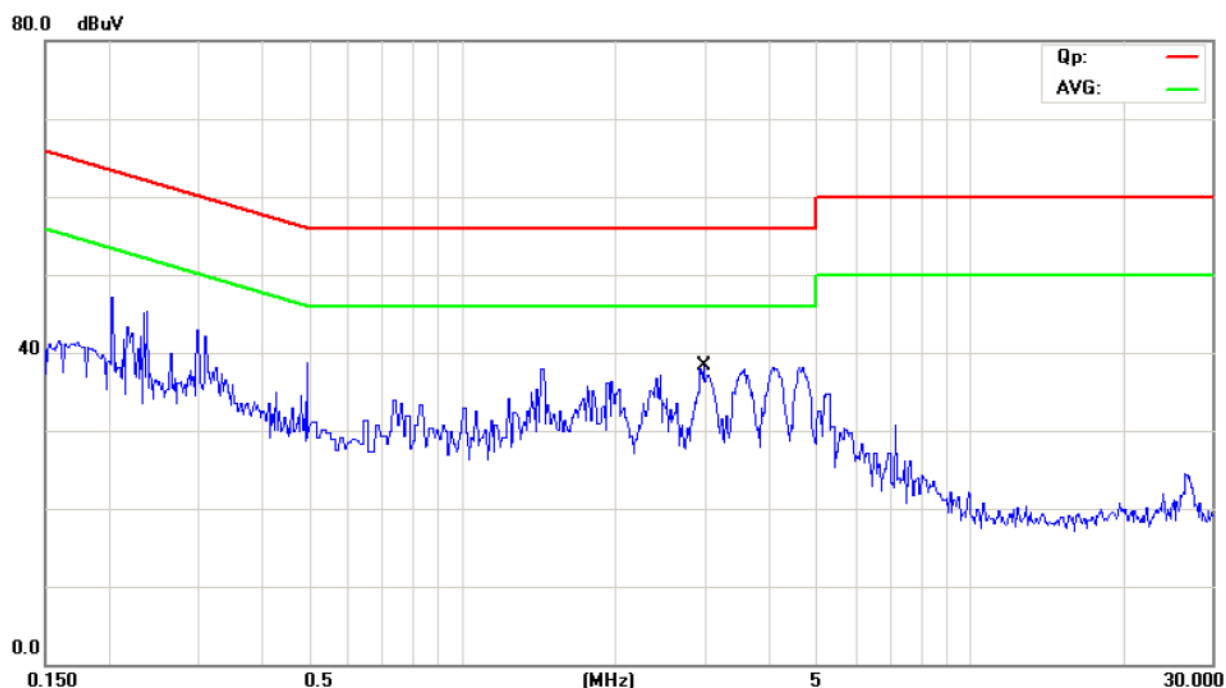
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

**EUT set Condition: Communication by Bluetooth**

**Equipment Level: Class B**

**Results: PASS**

Please refer to following diagram for individual



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	dBuV	Factor	ment	dBuV	dB	Detector	Comment
1	*	2.9780	15.20	12.69	27.89	56.00	-28.11	QP	
2		2.9780	-2.40	12.69	10.29	46.00	-35.71	AVG	

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**B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)**

**EUT Operating Environment**

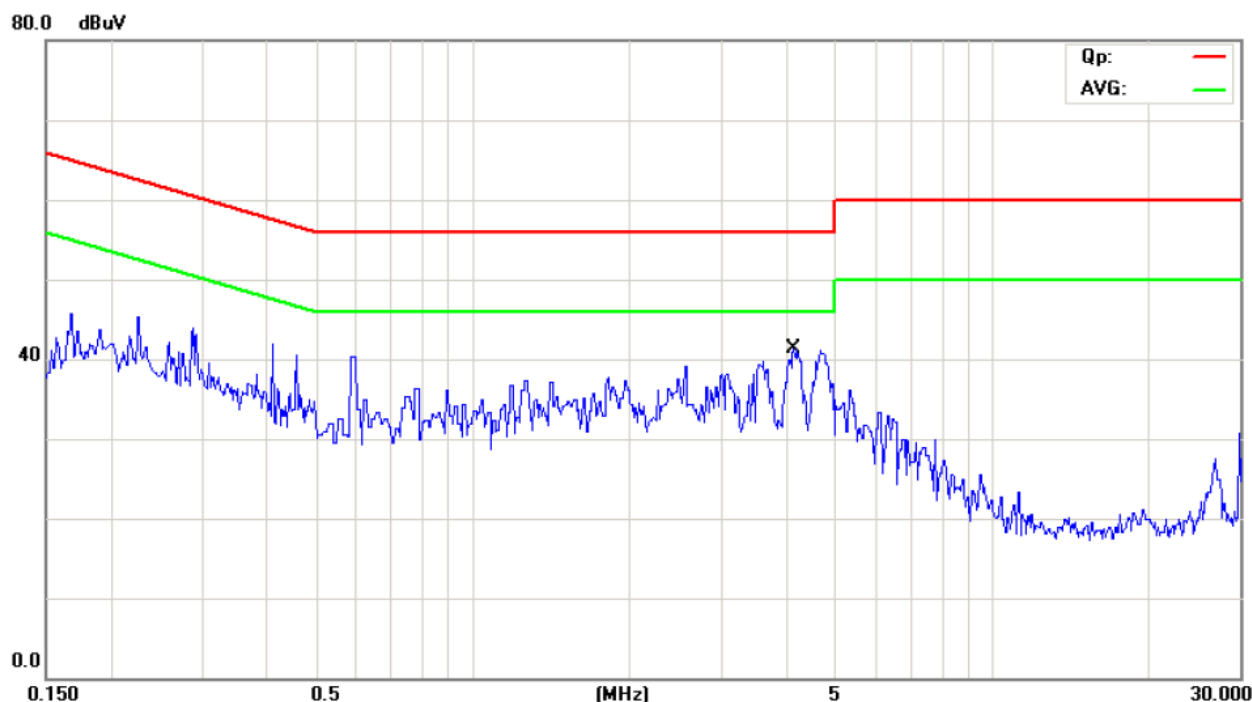
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

**EUT set Condition: Communication by Bluetooth**

**Equipment Level: Class B**

**Results: Pass**

Please refer to following diagram for individual



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	4.1221	20.90	13.15	34.05	56.00	-21.95	QP	
2		4.1221	0.20	13.15	13.35	46.00	-32.65	AVG	

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### Clause 8.5 Harmonic Current Emissions

This test was performed as per EMC Basic Standard EN61000-3-2 :2006+A1:2009+A2:2009

EUT Operating Mode

Charging Battery

#### Results

Port	EUT Operating mode or operating mode no.	Result (Passed / Failed)
AC Input	Charging Battery	N/A

**Table 1 - Limit of Harmonics Current Measurement**

Limits for Class A equipment	
Harmonics order (n)	Max. permissible harmonics current (A)
Odd harmonics	
3	2.3
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
$15 \leq n \leq 39$	$0.15 \times 15/n$
Even harmonics	
2	1.08
4	0.43
6	0.30
$8 \leq n \leq 40$	$0.23 \times 8/n$

Note:

- For Class A equipment, the harmonics of the input current shall not exceed the absolute values given in table 1.
- For Class B equipment, the harmonics of the input current shall not exceed the values given in table 1 multiplied by factor of 1, 5.

**Table 2 - Limit of Harmonics Current Measurement**

Limits for Class C equipment	
Harmonics order (n)	Max. permissible harmonics current expressed as a percentage of the input current at the fundamental frequency (A)

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Odd harmonics only	
2	2
3	$30 \times \lambda^*$
5	10
7	7
9	5
$11 \leq n \leq 39$	3

Note: The harmonic current limits of lighting equipment shall not exceed the relative limits given in table 2.

Table 3 - Limit of Harmonics Current Measurement		
Limits for Class D equipment		
Harmonics order (n)	Maximum permissible harmonic current per watt mA/W	Maximum permissible harmonic current A
Odd harmonics only		
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
13<=n<=39	3.85/n	See table 1
11<= n<=39	3	

Note: The harmonic of the input current shall not exceed the values that can be derived from table 3.

### Test Equipment

Please refer to Section 6 this report.

### Test Procedure

- The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.
- The EUT is classified as follows:
  - Class A Balanced three-phase equipment and all other equipment, except that stated in one of the following classes.
  - Class B Portable tools.
  - Class C Lighting equipment, including dimming devices.
  - Class D Equipment having an input current with “special wave shape” and an active input power,  $P \leq 600W$

**Note: Due to the DC operation, this test item not applicable**

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## Clause 8.6 Flicker and Voltage Fluctuation

This test was performed as per EMC Basic Standard EN 61000-3-3: 2013

EUT Operating Mode

### Communication by Bluetooth

#### Results

Port	EUT Operating mode or operating mode no.	Result (Passed / Failed)
AC Input	<b>Communication by Bluetooth</b>	Pass

#### Limits of Voltage Fluctuation and Flicks Measurement

Test Item	Limit	Note
$P_{st}$	1.0	Pst means short-term flicker indicator
$P_{lt}$	0.65	Plt means long-term flicker indicator
$T_{dt}$ (ms)	500	Tdt means maximum time that dt exceeds 3%.
$d_{max}$ (%)	4	Dmax means maximum relative voltage change.
dc (%)	3.3	Dc means relative steady-state voltage change.

#### Test Equipment

Please refer to Section 6 this report.

#### Test Procedure

- The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.
- During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT 10 minutes and the observation period for long-term flicker indicator is 2 hours.

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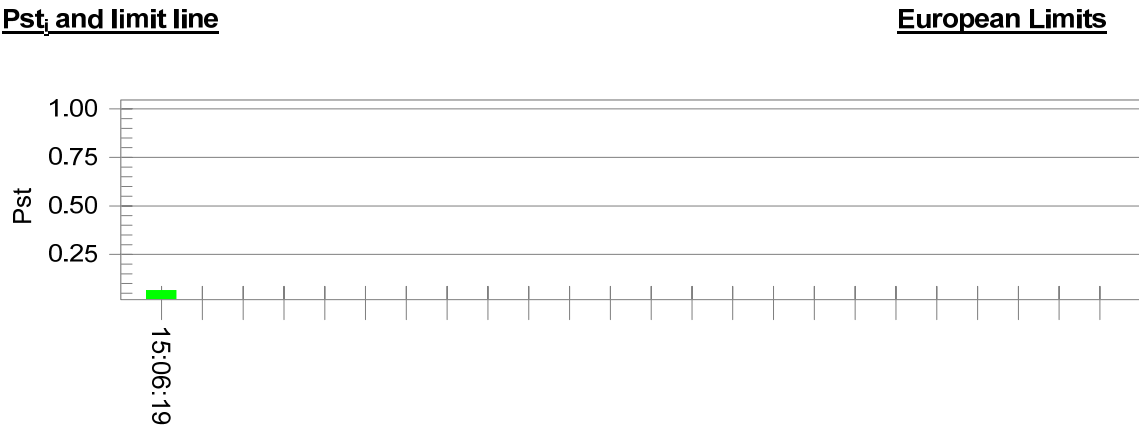
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Flicker Test Summary per EN/IEC61000-3-3 (Run time)

EUT: BTH-040	Tested by: JIM	
Test category: All parameters (European limits)	Test Margin: 100	
Test date: 2014-11-20	Start time: 14:55:59	End time: 15:06:19
Test duration (min): 10	Data file name: F-000649.cts_data	
Comment: Comments		
Customer: Customer		

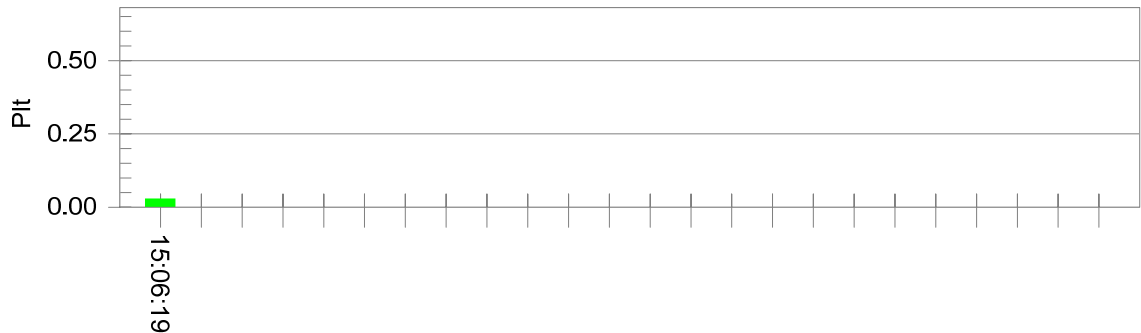
Test Result: Pass                      Status: Test Completed



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**Plt and limit line**



**Parameter values recorded during the test:**

<b>Vrms at the end of test (Volt): 229.76</b>				
<b>Highest dt (%):</b>	<b>0.00</b>	<b>Test limit (%):</b>	<b>3.30</b>	<b>Pass</b>
<b>Time(mS) &gt; dt:</b>	<b>0.0</b>	<b>Test limit (mS):</b>	<b>500.0</b>	<b>Pass</b>
<b>Highest dc (%):</b>	<b>0.00</b>	<b>Test limit (%):</b>	<b>3.30</b>	<b>Pass</b>
<b>Highest dmax (%):</b>	<b>0.00</b>	<b>Test limit (%):</b>	<b>4.00</b>	<b>Pass</b>
<b>Highest Pst (10 min. period):</b>	<b>0.064</b>	<b>Test limit:</b>	<b>1.000</b>	<b>Pass</b>
<b>Highest Plt (2 hr. period):</b>	<b>0.028</b>	<b>Test limit:</b>	<b>0.650</b>	<b>Pass</b>

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## Clause 9.2 Immunity Test – Radiated, RF Electromagnetic Field

### According to EMC Basic Standard (EN 61000-4-3[9])

Tx&Rx Operating Mode: Communication by Bluetooth

Type of Port: Enclosure

Performance Criterion: CT/CR

The distance between the turn-table axis and Tx&Rx-antenna is 3m.

Field strength = 3V/m

Start Frequency = 80MHz      Stop Frequency = 2700MHz

Frequency Step = 1MHz

The test signal is amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1000 Hz

### Results

Frequency (MHz)	Antenna Polarity	Radiation to	Reaction of the EUT During and after test	Result
80-1000, 1400-2700	Horizontal	Front	No reactions recognized	Pass
80-1000, 1400-2700	Vertical	Front	No reactions recognized	Pass
80-1000, 1400-2700	Horizontal	Rear	No reactions recognized	Pass
80-1000, 1400-2700	Vertical	Rear	No reactions recognized	Pass
80-1000, 1400-2700	Horizontal	Left	No reactions recognized	Pass
80-1000, 1400-2700	Vertical	Left	No reactions recognized	Pass
80-1000, 1400-2700	Horizontal	Right	No reactions recognized	Pass
80-1000, 1400-2700	Vertical	Right	No reactions recognized	Pass

Note: Performance criteria A observed.

### Test Equipment

Please refer to Section 6 this report.

### Test Procedure

The EUT and load, which are placed on a table that is 0.8 meter above ground, are placed with one coincident with The calibration plane such that the distance from antenna to the EUT was 3 meters.

Both horizontal and vertical polarization of the antenna and four sides of the EUT are set on measurement.

In order to judge the EUT performance, a CCD camera is used to monitor EUT screen.

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### Clause 9.3 Electrostatic Discharge

According to EMC basic standard (EN61000-4-2[10])

Tx&Rx Operating Mode: Communication by Bluetooth

Type of Port: Enclosure, Key Button, Cable, HCP, VCP

Performance Criterion: TT/TR

For the table top EUT the distance to the reference ground plane should be 80 cm.

Direct contact discharge on conducting surfaces of EUT

Indirect air discharge on insulating surfaces of EUT

$\pm 2\text{kV}$ ,  $\pm 4\text{kV}$  direct discharge &  $\pm 2\text{kV}$ ,  $\pm 4\text{kV}$ ,  $\pm 8\text{kV}$  air discharge

#### Test Results

Item	Contact Discharge to conducted surfaces and to coupling planes		Air Discharge at insulating surfaces
	Direct Contact Discharge	Indirect Contact Discharge	
Test Voltage	Reaction of EUT / Result	Reaction of EUT / Result	Reaction of EUT / Result
+2kV	n.r.r Passed	n.r.r Passed	n.r.r Passed
-2kV	n.r.r Passed	n.r.r Passed	n.r.r Passed
+4kV	n.r.r Passed	n.r.r Passed	n.r.r Passed
-4kV	n.r.r Passed	n.r.r Passed	n.r.r Passed
+8kV	-	-	n.r.r Passed
-8kV	-	-	n.r.r Passed

Remarks: n.r.r. = no reaction recognized

Performance Criteria A observed and No any function degraded during the tests.

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## Clause 9.4 Fast Transients Common Mode

According to EMC basic standard (EN61000-4-4 [11])

Tx&Rx Operating Mode: Communication by Bluetooth

Type of Port: AC mains power input/output port

Performance Criterion: TT/TR

For the table top EUT the distance to the reference ground plane should be 10 cm.

The test level for ac mains power input ports shall be 1KV open circuit.

### Test Setup

Burst on Power Line (direct injection)

### Test Results

Adjustment on UCS 500 M4: Trigger “AUTO”, Burst length: 15ms					Test Time:	60s for every voltage and polarity		
						120s for every voltage and polarity		
Testing on power Line (direct injection)		Reaction of The Test Object During and after Test						Result
Test Voltage	Repetition Frequency	L1 =>GND (+=>GND)	L2=> GND	L3=> GND	N=> GND	PE=> GND	L1, N, => GND	
-0.5kV	5kHz	n.r.r	N/A	N/A	n.r.r	N/A	n.r.r	Pass
+0.5kV	5kHz	n.r.r	N/A	N/A	n.r.r	N/A	n.r.r	Pass
-1.0kV	5kHz	n.r.r	N/A	N/A	n.r.r	N/A	n.r.r	Pass
+1.0kV	5kHz	n.r.r	N/A	N/A	n.r.r	N/A	n.r.r	Pass

Remarks: n.r.r. = no reaction recognized, N/A = not applicable.

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## Clause 9.5 RF Common Mode

According to EMC basic standard (EN61000-4-6 [10])

Tx&Rx Operating Mode: Communication by Bluetooth

Type of Port: AC mains power input/output port

Performance Criterion: CT/CR

Start Frequency = 150KHz    Stop Frequency = 80MHz

Frequency Step = 50kHz in the range of 150kHz-5MHz

1% increment in the range of 5MHz-80MHz

The test signal is amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1000 Hz

## Test Setup

Injection via CDN or BIC clamp

## Test Results

Injection On	Injection Via	Reaction of the EUT During and after test	Result
AC input power line	CDN	No reactions recognized	<b>Pass</b>

Performance criteria A observed

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## Clause 9.7 Voltage Dips and Interruption

### According to EMC basic standard (EN61000-4-11 [13])

Tx&Rx Operating Mode: Communication by Bluetooth

Type of Port: AC mains power input/output port

Performance Criterion: TT/TR

For the table top EUT the distance to the reference ground plane should be 80 cm.

The test of voltage dip level shall be- a vol. Reduction of the supply vol. 0% for 10ms and 20ms and 30% for 500ms

The test of voltage interruption level shall be- a vol. Reduction of the supply vol. 0% for 5000ms

### Test Results

For each test 3 repetitions in an interval of 10s time for decrease or increase of supply voltage: T down/up  
< 5uS(due to switching)

#### Voltage Dips

Terminal Supply Voltage	Start by Trigger Angle (AC)	Duration of Test Voltage	Test Voltage	Reaction of EUT during and after Test	Result
$U_1$		$T_{U2}$	$U_2$		
100% $U_N$ : 230V	0°	10ms	0% $U_N$ : 0V	n.r.r- performance criteria A observed	<b>Pass</b>
100% $U_N$ : 230V	0°	20ms	0% $U_N$ : 0V	n.r.r- performance criteria A observed	<b>Pass</b>
100% $U_N$ : 230V	0°	500ms	70% $U_N$ : 161V	n.r.r- performance criteria A observed	<b>Pass</b>
Voltage Interruption					
100% $U_N$ : 230V	0°	5000ms	0% $U_N$ : 0V	n.r.r- performance criteria B observed	<b>Pass</b>

n.r.r- no reaction recongnized

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## Clause 9.8 Surges Common & Differential Mode (1-phase)

According to EMC basic standard (EN61000-4-5 [14])

Tx&Rx Operating Mode: Communication by Bluetooth

Type of Port: AC mains power input/output port

Performance Criterion: TT/TR

For the table top EUT the distance to the reference ground plane should be 80 cm.

1KV open circuit for common mode & 0.5KV open circuit for differential mode.

### Test Results

5 pulses for each polarity and test voltage, alternating and negative/positive, triggered in case of AC- powerline: 0°, 45°, 90° 180°, 270°, referred to the line frequency. (L1)

Repetition rate is 1 per min.

Test Voltage	Reaction of the test object during and after test by trigger angle/pulse no.(coupling on DC-lines =>trigger angle not relevant).					Result
	0°/pulse no1, 2	45 <sup>0</sup> /pulse, no.3, 4	90°/pulse, no. 5, 6	180°/pulse, no. 7, 8	270°/pulse, no. 9, 10	
Capacitive coupling on AC line: L1=>N or DC lines lines +=>- (Ri=2 Ω /C =18uF)						
-0.5kV	No reaction	No reaction	No reaction	No reaction	No reaction	<b>Pass</b>
+0.5kV	Recognized	Recognized	Recognized	Recognized	Recognized	
-1.0kV	No reaction	No reaction	No reaction	No reaction	No reaction	<b>Pass</b>
+1.0kV	Recognized	Recognized	Recognized	Recognized	Recognized	
-2.0Kv	N/A	N/A	N/A	N/A	N/A	<b>N/A</b>
+2.0kV						
- kV	N/A	N/A	N/A	N/A	N/A	<b>N/A</b>
+kV						

Performance Criteria A Observed.

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### 3.0 CE Mark label specification

Text of the mark is black or white in color and is left justified. Labels are printed in indelible ink on permanent adhesive backing and shall be affixed at a conspicuous location on the EUT or silk-screened onto the EUT.



Mark Location: Rear enclosure

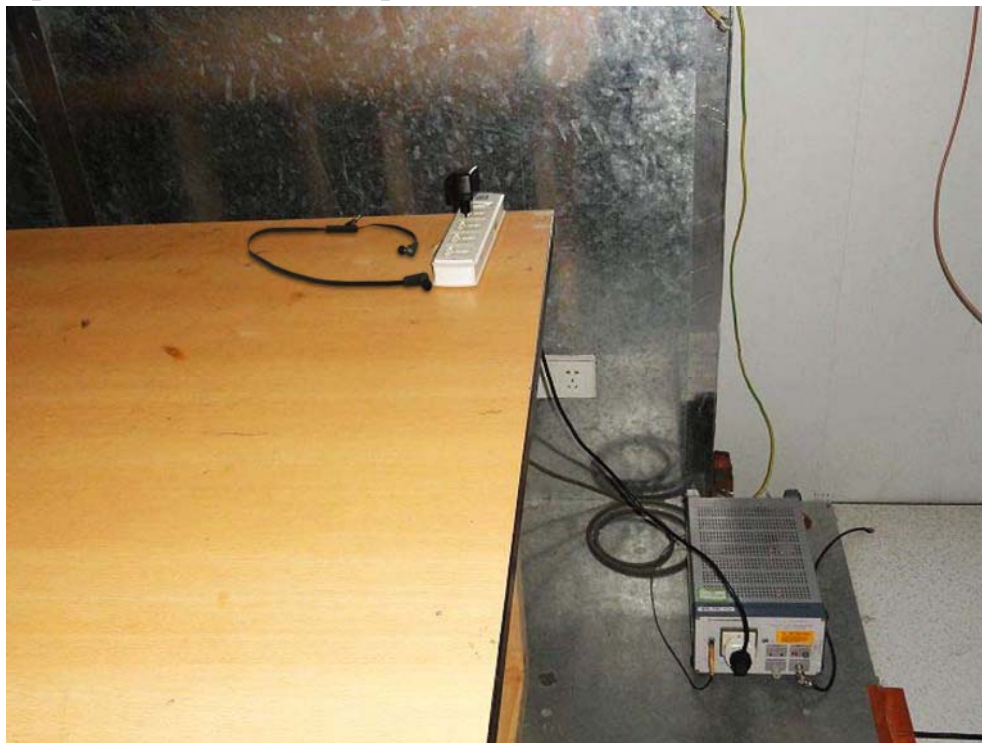
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#### 4. Photographs – Test Setup

##### 4.1 Photograph – Conducted Test Setup



##### 4.2 Radiated Emission Test Setup

##### Photograph –Radiated Emission Test Setup-N/A

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## 5.0 Photos of EUT

### Outside view



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Outside view



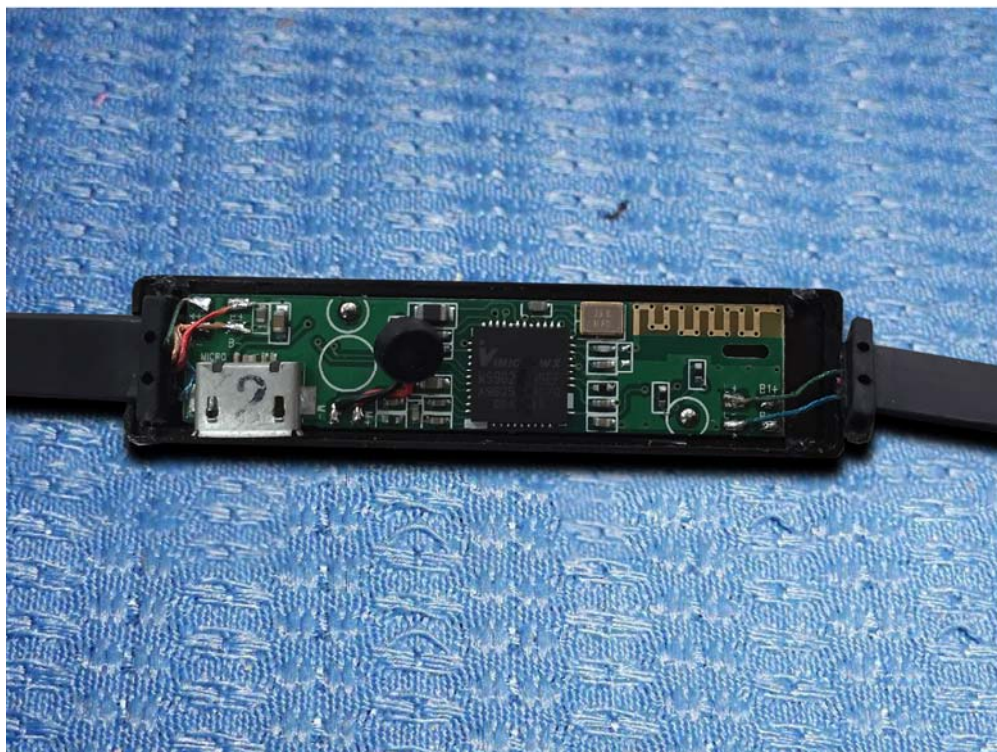
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Inside view

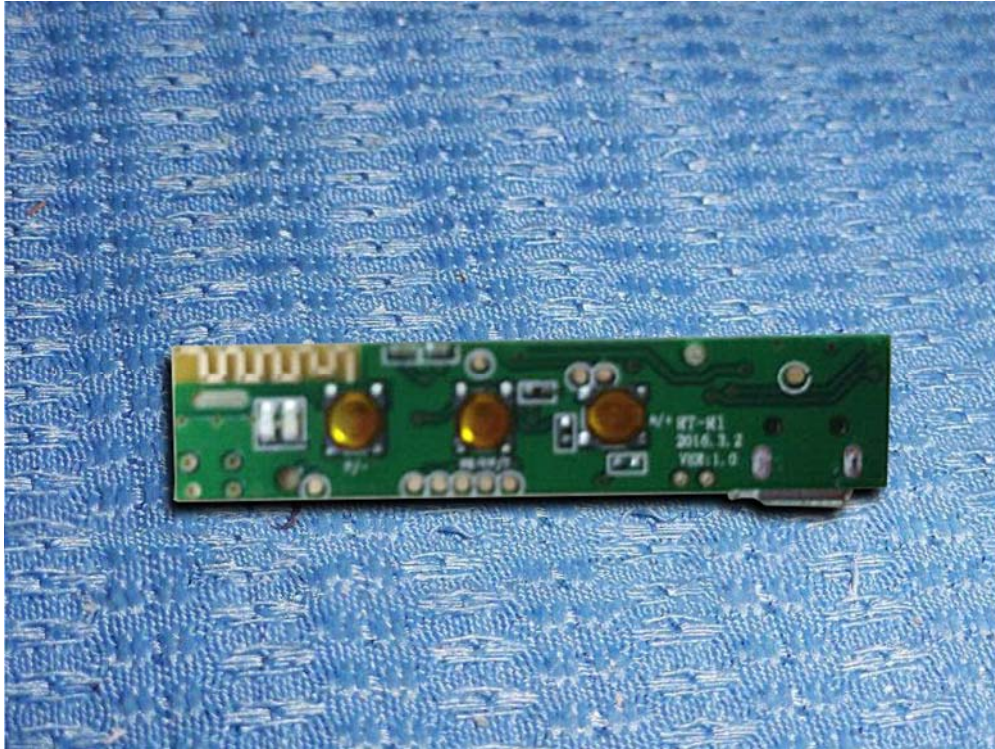


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Inside view



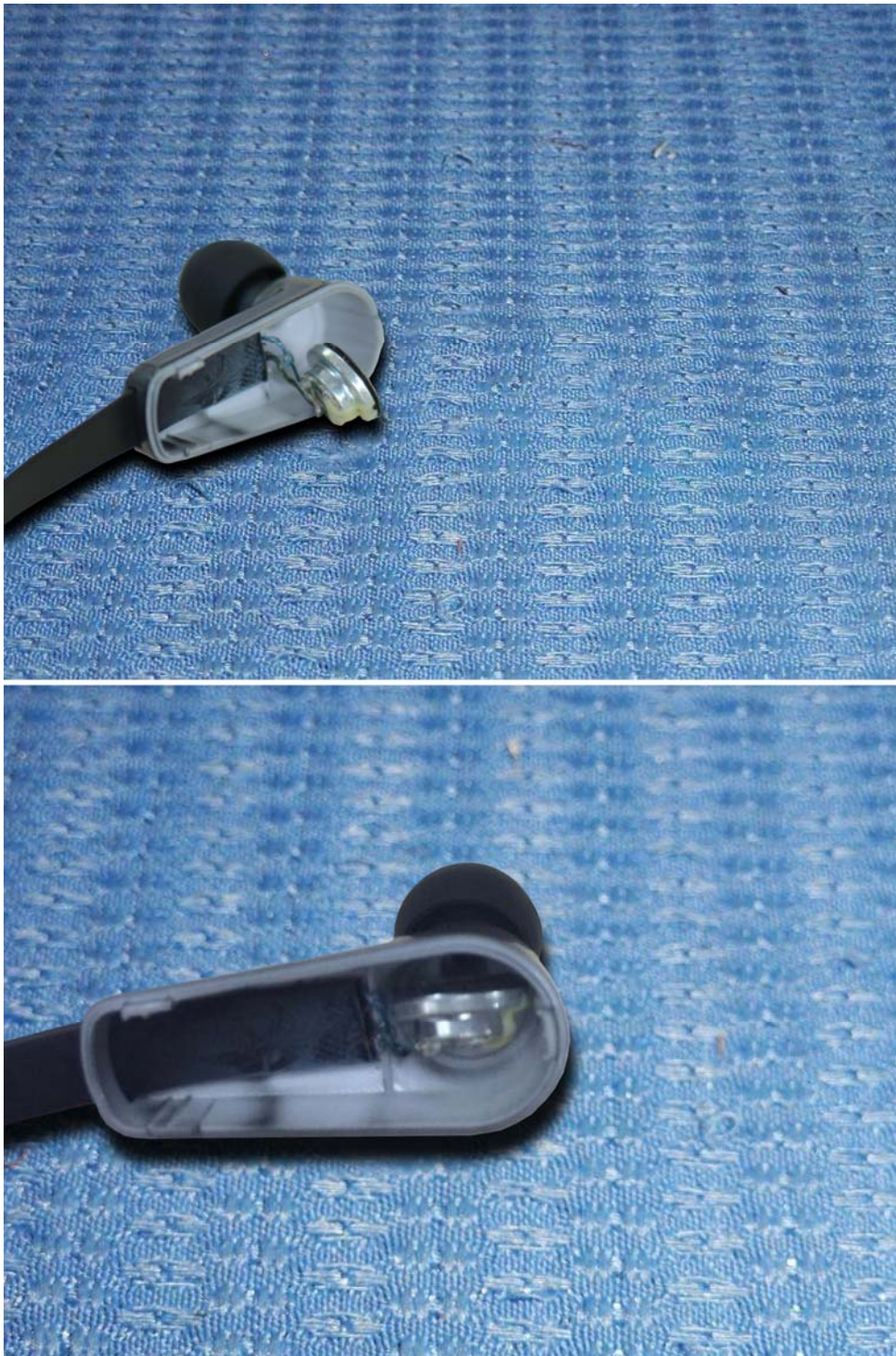
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Inside view

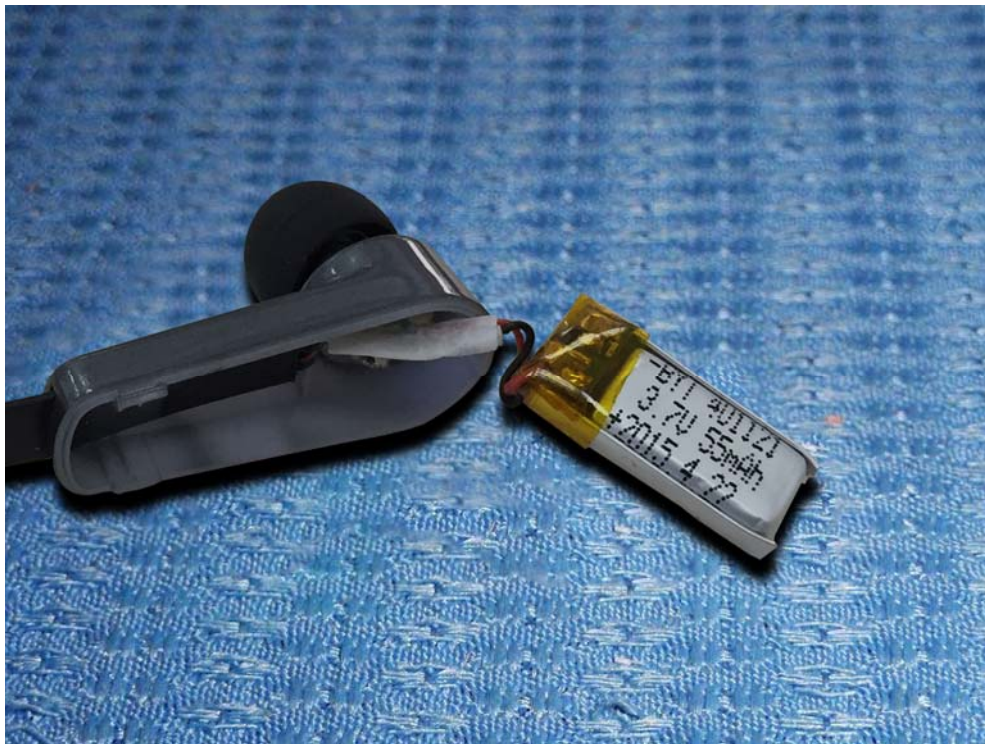


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Inside view



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6.0	Test Equipments				
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2014-08-24	2015-08-23
Absorbing Clamp	ROHDE&SCHWARZ	MDS-21	100126	2014-08-24	2015-08-23
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100294	2014-08-24	2015-08-23
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100253	2014-08-24	2015-08-23
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2014-08-24	2015-08-23
ESDV Test Receiver	ROHDE&SCHWARZ	ESDV	100008	2014-08-24	2015-08-23
4-WIRE ISN	ROHDE&SCHWARZ	ENY 41	830663/044	2014-08-24	2015-08-23
GG ENY22 Double 2-Wire ISN	ROHDE&SCHWARZ	ENY22	83066/016	2014-08-24	2015-08-23
Impuls-Begrenzer	ROHDE&SCHWARZ	ESH3-Z2	100281	2014-08-24	2015-08-23
System Controller	CT	SC100	-	2014-08-24	2015-08-23
Printer	EPSON	PHOTO EX3	CFNH234850	2014-08-24	2015-08-23
FM-AM Signal Generator	JUNGJIN	SG-150M	389911177	2014-08-24	2015-08-23
Color TV Pattern Generator	PHILIPS	PM5418	LO621747	2014-08-24	2015-08-23
Computer	IBM	8434	1S8434KCE99BLXLO*	-	-
Oscillator	KENWOOD	AG-203D	3070002	2014-08-24	2015-08-23
Spectrum Analyzer	HAMEG	HM5012	-	-	-
Power Supply	LW	APS1502	-	-	-
5K VA AC Power Source	California Instruments	5001iX	56060	2014-08-24	2015-08-23
CDN	EM TEST	CDN M2/M3	-	2014-08-24	2015-08-23
Attenuation	EM TEST	ATT6/75	-	2014-08-24	2015-08-23
Resistance	EM TEST	R100	-	2014-08-24	2015-08-23

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Electromagnetic Injection Clamp	LITTHI	EM101	35708	2014-08-24	2015-08-23
Inductive Components	EM TEST	MC2630	-	2014-08-24	2015-08-23
Antenna	EM TEST	MS100	-	2014-08-24	2015-08-23
Signal Generator	ROHDE&SCHWARZ	SMT03	100029	2014-08-24	2015-08-23
Power Amplifier	AR	150W1000	300999	2014-08-24	2015-08-23
Field probe	Holaday	HI-6005	105152	2014-08-24	2015-08-23
Bilog Antenna	Chase	CBL6111C	2576	2014-08-24	2015-08-23
Loop Antenna	EMCO	6502	00042960	2014-08-24	2015-08-23
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2014-08-24	2015-08-23
3m OATS	--	--	N/A	2014-08-24	2015-08-23
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170265	2014-08-24	2015-08-23
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-631	2014-08-24	2015-08-23
Power meter	Anritsu	ML2487A	6K00003613	2014-08-24	2015-08-23
Power sensor	Anritsu	MA2491A	32263	2014-08-24	2015-08-23
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2014-08-24	2015-08-23
LISN	AFJ	LS16C	10010947251	2014-08-24	2015-08-23
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2014-08-24	2015-08-23
9*6*6 Anechoic	--	--	N/A	2014-08-24	2015-08-23

## End of the report

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