



## EMC TEST REPORT

**Product Name** : Tire Gauge  
**Trade Name** : N/A  
**Model Name** : H627  
**Serial Number** : N/A  
**Technical Data** : DC 6V  
**Report Number** : EESZD08110001  
**Date** : Aug. 16, 2011  
**Regulations** : See below

Test Standards	Results
<input checked="" type="checkbox"/> EN 61000-6-3: 2007	PASS
<input checked="" type="checkbox"/> EN 61000-6-1: 2007	PASS

Prepared by:

**CENTRE TESTING INTERNATIONAL (SHENZHEN) CORPORATION**  
Building C, Hongwei Industrial Zone, Baoan 70 District,  
Shenzhen, Guangdong, China  
**TEL: +86-755-3368 3668**  
**FAX: +86-755-3368 3385**

Check No.: 40019873

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*(Note: N/A means not applicable)*

## 1. GENERAL INFORMATION

**Applicant:** NINGBO PACIFIC ELECTRONIC CO., LTD.  
No. 22 YUELONG ONE ROAD, NINGHAI, NINGBO,  
ZHEJIANG, CHINA

**Manufacturer:** NINGBO PACIFIC ELECTRONIC CO., LTD.  
No. 22 YUELONG ONE ROAD, NINGHAI, NINGBO,  
ZHEJIANG, CHINA

**EMC Directive:** 2004/108/EC

**Product Name:** Tire Gauge

**Trade Name:** N/A

**Model Name:** H627

**Serial Number:** N/A

**Report Number:** EESZD08110001

**Date of Test:** Aug. 11, 2011 to Aug. 15, 2011

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The test results of this report relate only to the tested sample identified in this report.

Prepared by : Kevin Yang  
Kevin Yang

Reviewed by : Louisa Lu  
Louisa Lu

Approved by : Jimmy Li  
Jimmy Li  
Manager

Date : Aug. 16, 2011



## 2. TEST SUMMARY

The EUT has been tested according to the following specifications:

EMISSION		
Standard	Test Item	Test
EN 61000-6-3	Conducted Emission	N/A <sup>1</sup>
EN 61000-6-3	Radiated Emission	Yes

IMMUNITY (EN 61000-6-1)		
Standard	Test Item	Test
IEC 61000-4-2	Electrostatic discharge	Yes
IEC 61000-4-3	Radio-frequency electromagnetic field	Yes
IEC 61000-4-4	Fast transients	N/A <sup>1</sup>
IEC 61000-4-5	Surges	N/A <sup>1</sup>
IEC 61000-4-6	Radio-frequency common mode	N/A <sup>1</sup>
IEC 61000-4-8	Power-frequency magnetic fields	N/A <sup>2</sup>
IEC 61000-4-11	Voltage dips and voltage interruptions	N/A <sup>1</sup>

Remark:

1. The power supply of EUT is by battery.
2. The EUT doesn't contain any device susceptible to magnetic fields.

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

Test item	Value (dB)
Radiated disturbance	4.4

## 4. PRODUCT INFORMATION AND TEST SETUP

### 4.1 PRODUCT INFORMATION

Technical Data: DC 6V

### 4.2 TEST SETUP CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

## 5. FACILITIES AND ACCREDITATIONS

### 5.1 TEST FACILITY

All measurement facilities used to collect the measurement data are located at Building C, Hongwei Industrial Zone, Baoan 70 District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

### 5.2 TEST EQUIPMENT LIST

**Instrumentation:** The following list contains equipments used at CTI for testing.

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

3M Semi-anechoic Chamber - Radiated disturbance Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	07/09/2012
Spectrum Analyzer	Agilent	E4440A	MY46185649	03/29/2012
Biconilog Antenna	ETS-LINGREN	3142C	00044562	07/05/2012
Multi device Controller	ETS-LINGREN	2090	00057230	N/A

Shielding Room No. 3 - Electrostatic discharge Test (IEC 61000-4-2)				
Equipment	Manufacturer	Model	Serial No.	Due Date
ESD Simulator	EM TEST	ESD30C	V0603101091	04/05/2012

3M Full-anechoic Chamber - Radio-frequency electromagnetic field Test (IEC 61000-4-3)				
Equipment	Manufacturer	Model	Serial No.	Due Date
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	07/09/2012
ESG Vector signal generators	Agilent	E4438C	MY45095744	03/29/2012
Power Amplifier	AR	150W1000	0322288	07/06/2012
Power Amplifier	AR	25S1G4A	0321112	07/06/2012
Biconilog Antenna	ETS-LINGREN	3142C	00044562	07/05/2012
Horn Antenna	ETS-LINGREN	3117	00057407	07/06/2012

### 5.3 LABORATORY ACCREDITATIONS AND LISTINGS

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.



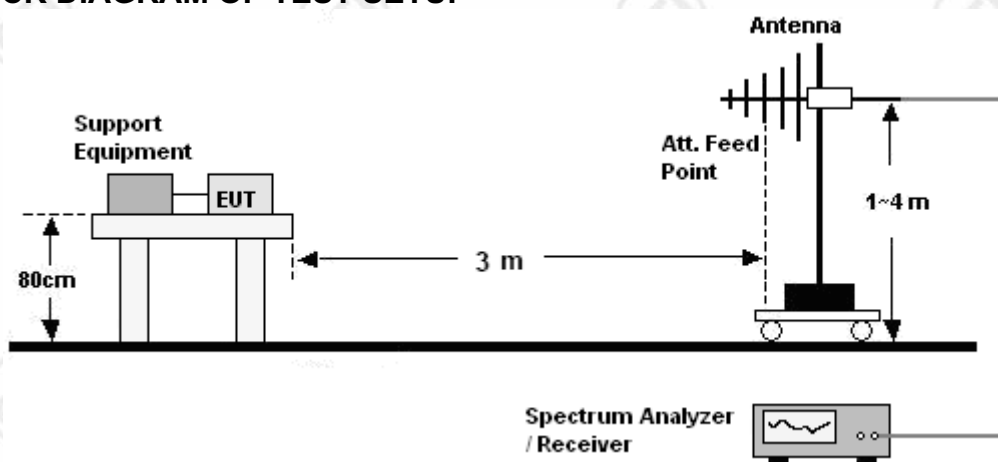
## 6. RADIATED DISTURBANCE

### 6.1 LIMITS

Frequency (MHz)	Quasi-peak limits at 3m dB(μV/m)
30-230	40
230-1000	47

**NOTE:** The lower limit shall apply at the transition frequencies.

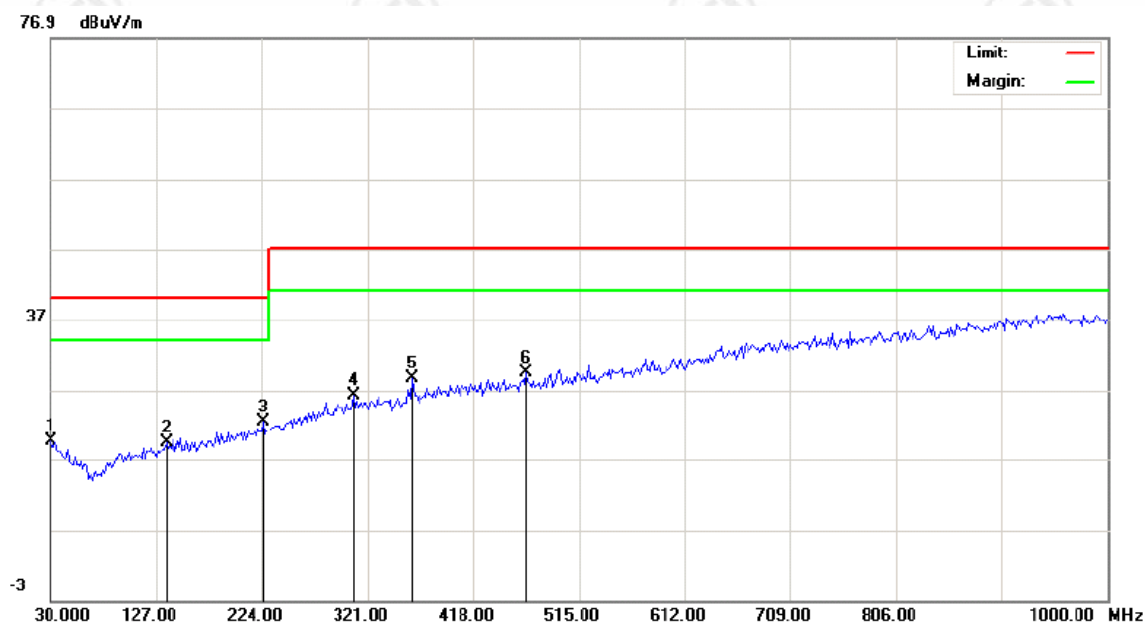
### 6.2 BLOCK DIAGRAM OF TEST SETUP



### 6.3 TEST PROCEDURE

- The EUT was placed on the non-conductive turntable above the ground at a chamber.
- Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where EUT radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

## 6.4 GRAPHS AND DATA



Site site #1

Polarization: **Horizontal**

Temperature: 25

Limit: EN 61000-6-3 Radiation

Power: DC 6V

Humidity: 56 %

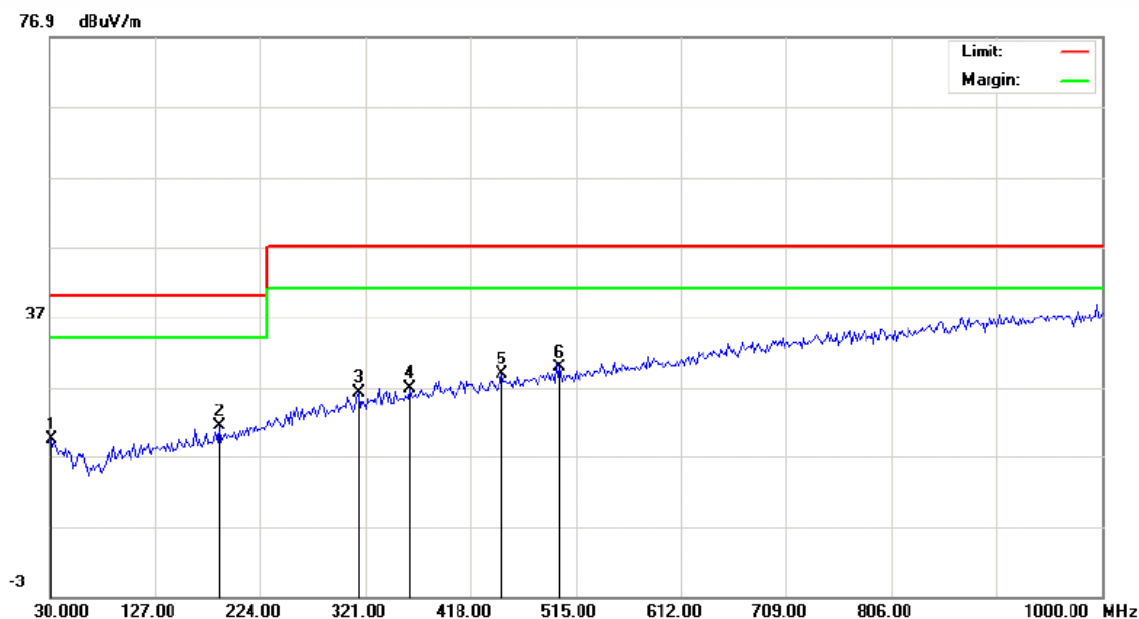
EUT: Tire Gauge

M/N: H627

Mode: NORMAL

Note:

No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	30.0000	6.89			12.65	19.54			40.00		-20.46		P	
2	136.6999	8.07			11.25	19.32			40.00		-20.68		P	
3	225.6167	8.44			13.95	22.39			40.00		-17.61		P	
4	308.0667	9.06			17.06	26.12			47.00		-20.88		P	
5	361.4166	10.29			18.31	28.60			47.00		-18.40		P	
6	466.5000	9.23			20.23	29.46			47.00		-17.54		P	



Site site #1

Polarization: **Vertical**

Temperature: 25

Limit: EN 61000-6-3 Radiation

Power: DC 6V

Humidity: 56 %

EUT: Tire Gauge

M/N: H627

Mode: NORMAL

Note:

No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV/m)			Limit (dBuV/m)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	31.6167	7.01			12.40	19.41			40.00		-20.59		P	
2	186.8166	8.86			12.60	21.46			40.00		-18.54		P	
3	314.5332	8.97			17.21	26.18			47.00		-20.82		P	
4	361.4166	8.51			18.31	26.82			47.00		-20.18		P	
5	447.1000	8.90			19.94	28.84			47.00		-18.16		P	
6	500.4499	8.97			20.75	29.72			47.00		-17.28		P	



## 7. IMMUNITY TEST

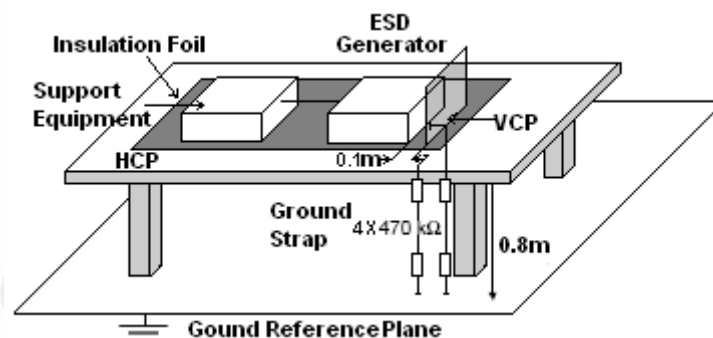
General Performance Criteria	
Product Standard	EN 61000-6-1:2007
<b>CRITERION A</b>	The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.
<b>CRITERION B</b>	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.
<b>CRITERION C</b>	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

## 7.1 ELECTROSTATIC DISCHARGE

### 7.1.1 TEST SPECIFICATION

Basic Standard	: EN 61000-6-1 & IEC 61000-4-2
Test Port	: Enclosure port
Discharge Impedance	: 330 ohm / 150 pF
Discharge Mode	: Single Discharge
Discharge Period	: one second between each discharge

### 7.1.2 BLOCK DIAGRAM OF TEST SETUP



### 7.1.3 TEST PROCEDURE

- Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation.
- The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
- The time interval between two successive single discharges was at least 1 second.
- The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.
- Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.
- At least ten single discharges (in the most sensitive polarity) were applied to the Horizontal Coupling Plane at points on each side of the EUT. The ESD generator was positioned vertically at a distance of 0.1 meters from the EUT with the discharge electrode touching the HCP.
- At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the EUT.

#### 7.1.4 RESULTS & PERFORMANCE

**EUT** : Tire Gauge  
**Power** : DC 6V  
**Mode** : NORMAL

**M/N** : H627  
**Temperature** : 25℃  
**Humidity** : 56%

Discharge Method	Discharge Position	Voltage (±kV)	Min. No. of Discharge per polarity (Each Point)	Required Level	Performance Criterion
Contact Discharge	Conductive Surfaces	4	10	B	A
	Indirect Discharge HCP	4	10	B	A
	Indirect Discharge VCP	4	10	B	A
Air Discharge	Slots, Apertures, and Insulating Surfaces	2, 4, 8	10	B	B*

Remark\*: There is an error on display screen during the test and it can recover by itself after test.

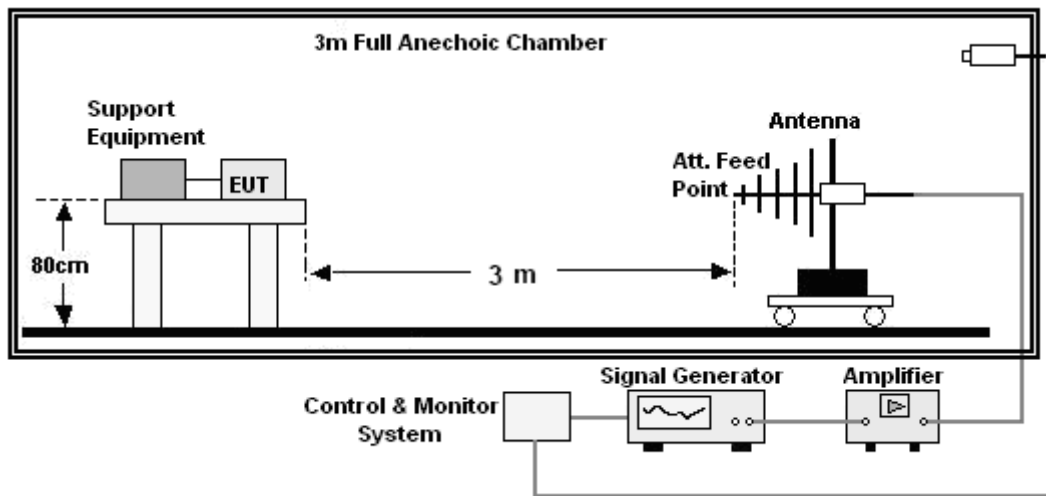
## 7.2 RADIO-FREQUENCY ELECTROMAGNETIC FIELD

### 7.2.1 TEST SPECIFICATION

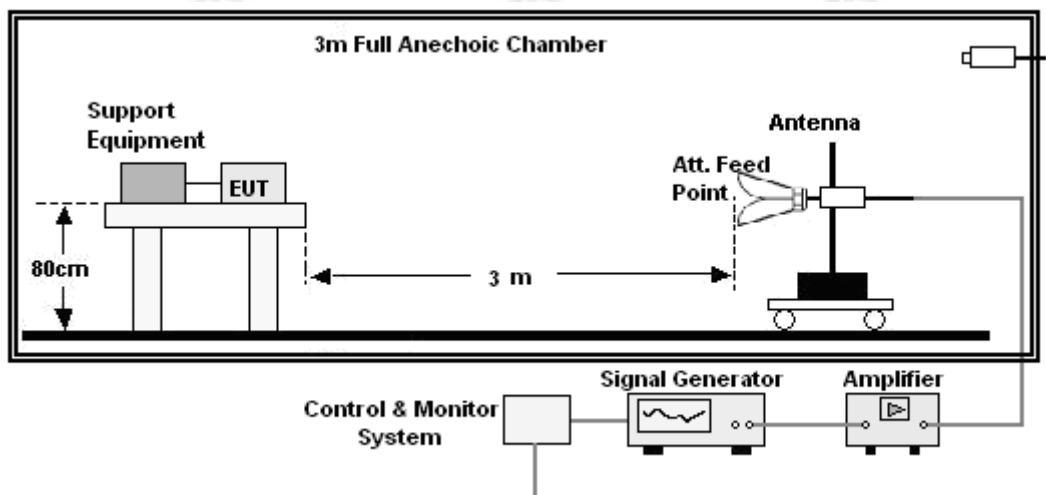
<b>Basic Standard</b>	: EN 61000-6-1 & IEC 61000-4-3
<b>Test Port</b>	: Enclosure port
<b>Step Size</b>	: 1%
<b>Modulation</b>	: 1kHz, 80% AM
<b>Dwell Time</b>	: 1 second
<b>Polarization</b>	: Horizontal & Vertical

### 7.2.2 BLOCK DIAGRAM OF TEST SETUP

Below 1GHz:



Above 1GHz:



### 7.2.3 TEST PROCEDURE

a. The testing was performed in a fully-anechoic chamber. The transmit antenna was located at a distance of 3m or 1m from the EUT.

b. The frequency range is swept from 80MHz to 1000MHz and 1400MHz to 2700MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s. Where the frequency range is swept incrementally, the step size was 1%.

c. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

### 7.2.4 RESULT & PERFORMANCE

**EUT** : Tire Gauge

**Power** : DC 6V

**Mode** : NORMAL

**M/N** : H627

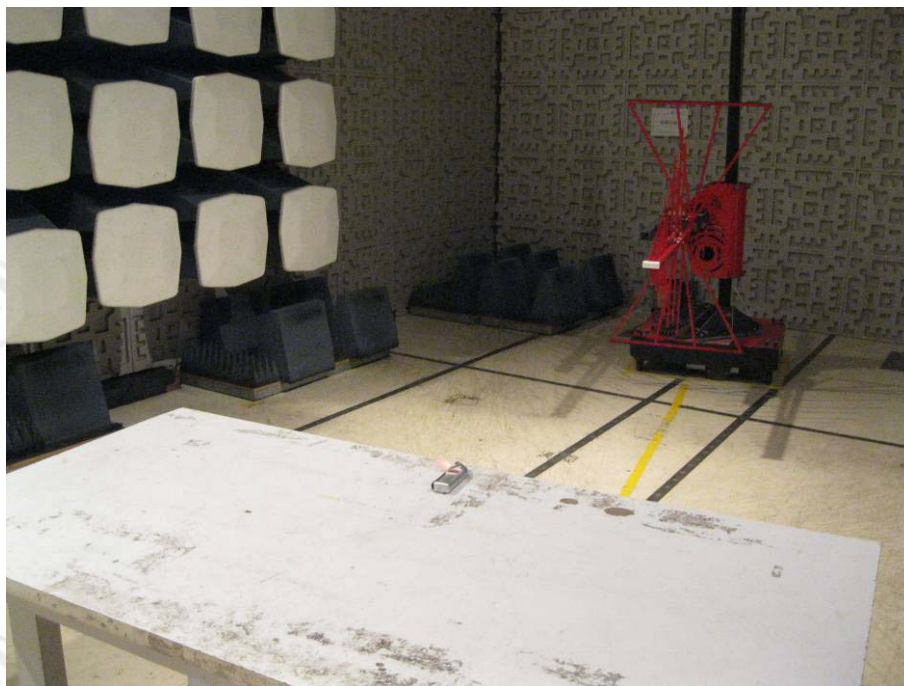
**Temperature** : 25°C

**Humidity** : 56%

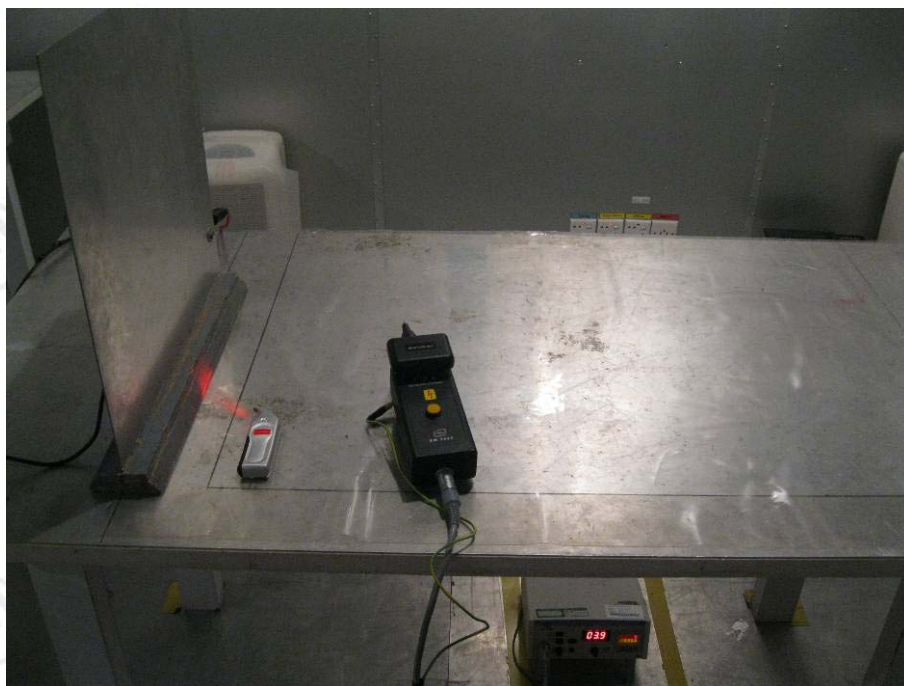
Frequency (MHz)	Position	Field Strength (V/m)	Required Level	Performance Criterion
80 - 1000	Front, Right, Back, Left	3	A	A
1400 - 2000	Front, Right, Back, Left	3	A	A
2000 - 2700	Front, Right, Back, Left	1	A	A



## APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

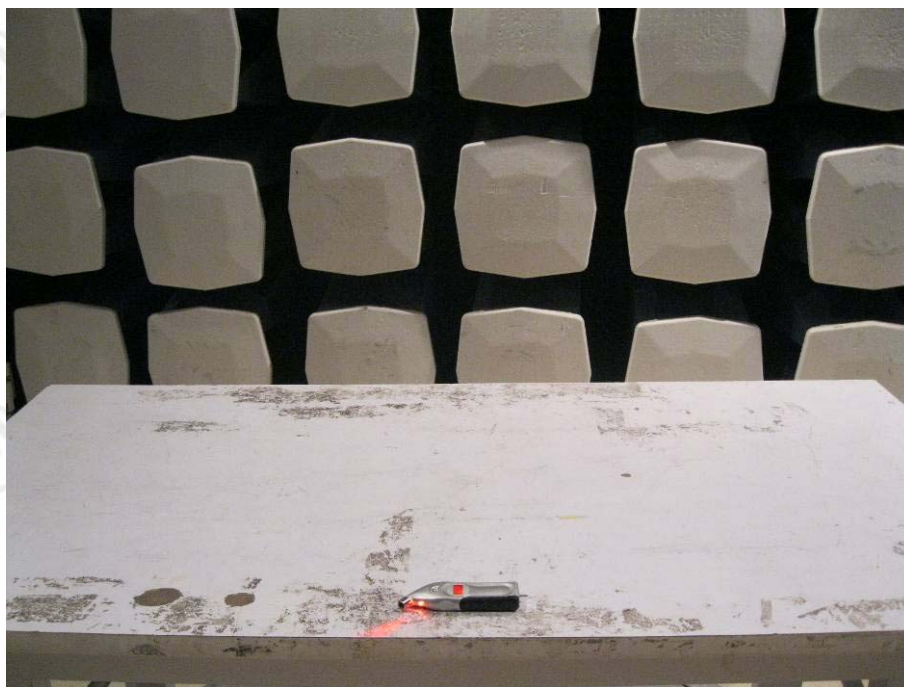


**RADIATED DISTURBANCE TEST SETUP**



**ELECTROSTATIC DISCHARGE TEST SETUP**





**RADIO-FREQUENCY ELECTROMAGNETIC FIELD TEST SETUP**

## APPENDIX 2 PHOTOGRAPHS OF EUT



View of EUT-1

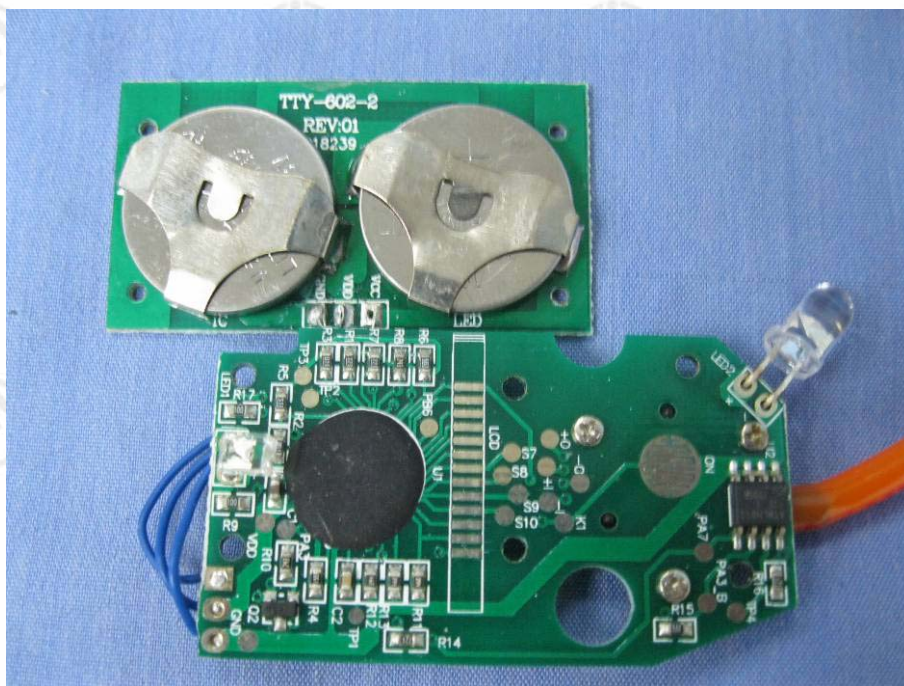


View of EUT-2

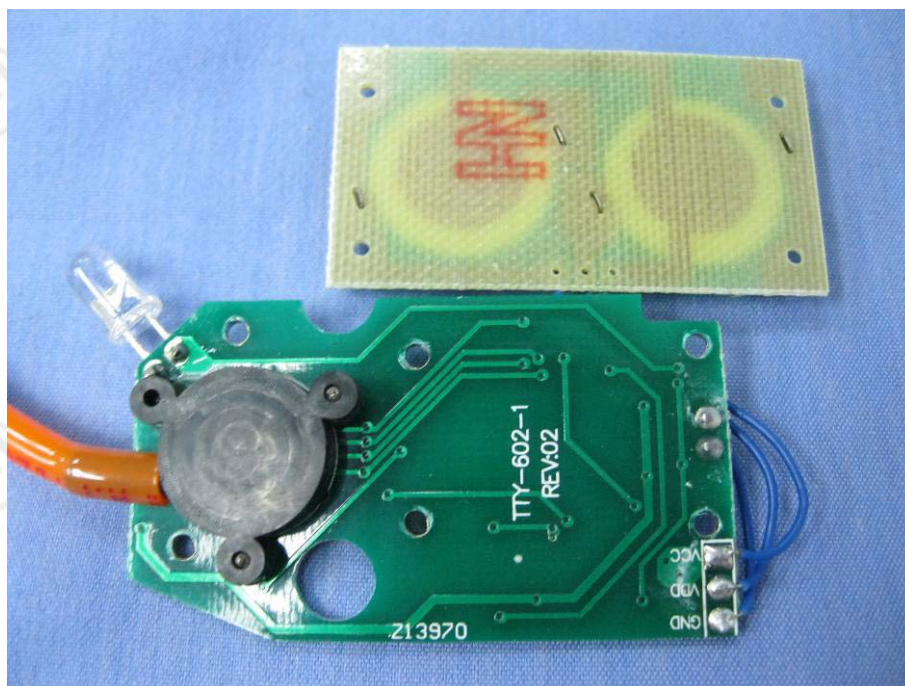




View of EUT-3



View of EUT-4



View of EUT-5

----End of the report----