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**Shenzhen Branch**

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Report No.: SZEM170300184601  
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## **TEST REPORT**

**Application No.:** SZEM1703001846IT  
**Applicant:** EMBEST TECHNOLOGY CO., LTD.  
**Address of Applicant:** Tower B 4/F, Shanshui Building, Nanshan Yungu Innovation Industry Park,  
Liuxian Ave.No.1183, Nanshan District, Shenzhen, Guangdong, China  
**Manufacturer:** EMBEST TECHNOLOGY CO., LTD.  
**Address of Manufacturer:** Tower B 4/F, Shanshui Building, Nanshan Yungu Innovation Industry Park,  
Liuxian Ave.No.1183, Nanshan District, Shenzhen, Guangdong, China  
**Factory:** EMBEST TECHNOLOGY CO., LTD.  
**Address of Factory:** Tower B 4/F, Shanshui Building, Nanshan Yungu Innovation Industry Park,  
Liuxian Ave.No.1183, Nanshan District, Shenzhen, Guangdong, China  
**Equipment Under Test (EUT):**  
**EUT Name:** Flick HAT  
**Model No.:** V1.1  
**Standards:** EN 55032:2015  
EN 55024:2010+A1:2015  
**Date of Receipt:** 2017-03-16  
**Date of Test:** 2017-03-17 to 2017-03-20  
**Date of Issue:** 2017-03-29

<b>Test Result :</b>	<b>Pass*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EU Declaration of Conformity and compliance with all relevant EU Directives.



Jack Zhang

EMC Laboratory Manager



The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2017-03-29		Original

Authorized for issue by:			
Tested By			
	Moon Zhang /Project Engineer	2017-03-20	Date
Checked By			
	Eric Fu /Reviewer	2017-03-29	Date



## 2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Radiated Disturbance (30MHz-1GHz)	EN 55032:2015	EN 55032:2015	Class B	Pass

Immunity Part				
Item	Standard	Method	Requirement	Result
Electrostatic Discharge	EN 55024:2010 +A1:2015	EN 61000-4-2:2009	4kV Contact Discharge 8kV Air Discharge	Pass
Radiated Immunity (80MHz-1GHz)	EN 55024:2010 +A1:2015	EN 61000-4-3:2006 +A1:2008+A2:2010	3V/m, 80%, 1kHz Amp. Mod.	Pass

InternalSource	UpperFrequency
Below 108MHz	1GHz
108MHz to 500MHz	2GHz
500MHz to 1GHz	5GHz
Above 1GHz	5 times the highest frequency or 6 GHz, whichever is less



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## 4 General Information

### 4.1 Details of E.U.T.

Power supply:

Supplied by Associated Module

### 4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	T430u	REF. No.SEA1800
Mouse	Lenovo	M-U0025-O	REF. No.:SEA2400
Router	NETGEAR	DGN2200	REF. No.SEA2200
Associated Module	Supplied by client	N/A	N/A
Associated Cable 1	Supplied by client	N/A	N/A
Associated Cable 2	SANBO	SU-T21	REF. No.SEA0700



#### 4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radiated emission	4.5dB (30MHz-1GHz )
2	Radiated Immunity	1.64dB (80MHz-1GHz )
3	ESD	6 %
4	Temperature test	1 °C
5	Humidity test	3%



#### **4.4 Test Location**

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

#### **4.5 Test Facility**

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

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen 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.: 556682.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

#### **4.6 Deviation from Standards**

None

#### **4.7 Abnormalities from Standard Conditions**

None

#### **4.8 Monitoring of EUT for All Immunity Test**

Visual: Monitored the work status of the EUT.

Audio: None



## 5 Equipment List

Radiated Disturbance(30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2016-05-13	2017-05-13
EMI Test Receiver (9k-3GHz)	Rohde & Schwarz	ESR	SEM004-03	2016-04-25	2017-04-25
Trilog-Broadband Antenna (30M-1GHz)	Schwarzbeck	VULB9168	SEM003-18	2016-06-29	2019-06-29
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-03	2016-07-06	2017-07-06

Electrostatic Discharge					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
ESD Ground Plane	SGS(3m*3m)	N/A	SEN006-01	N/A	N/A
ESD Generator	TESEQ AG	NSG 437	SEM019-02	2016-07-14	2017-07-14

Radiated Immunity(80MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Fully-Anechoic Chamber 2	Chang Zhou Zhong Shuo	854	SEM001-05	2014-06-10	2017-06-10
Signal Generator	Rohde & Schwarz	SMB100A	SEM006-11	2016-04-25	2017-04-25
Broadband Amplifier(80MHz-1GHz)	Rohde & Schwarz	BBA150-BC250	SEM005-12	2016-10-09	2017-10-09
Broadband Amplifier(800MHz-6GHz)	Rohde & Schwarz	BBA150-D30E30	SEM005-13	2017-1-20	2018-1-20
Power Sensor	Rohde & Schwarz	NRP-Z91	SEM009-09	2016-04-25	2017-04-25
Power Sensor	Rohde & Schwarz	NRP-Z91	SEM009-08	2016-04-25	2017-04-25
Log-periodic Antenna(0.07-3GHz)	Schwarzbeck	VUSLP9111 E	SEM003-19	N/A	N/A
Stacked Double Log-periodic Antenna (0.7-10.5GHz)	Schwarzbeck	STLP 9149	SEM003-24	N/A	N/A





General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2016-10-12	2017-10-12
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2016-05-18	2017-05-18

## 6 Emission Test Results

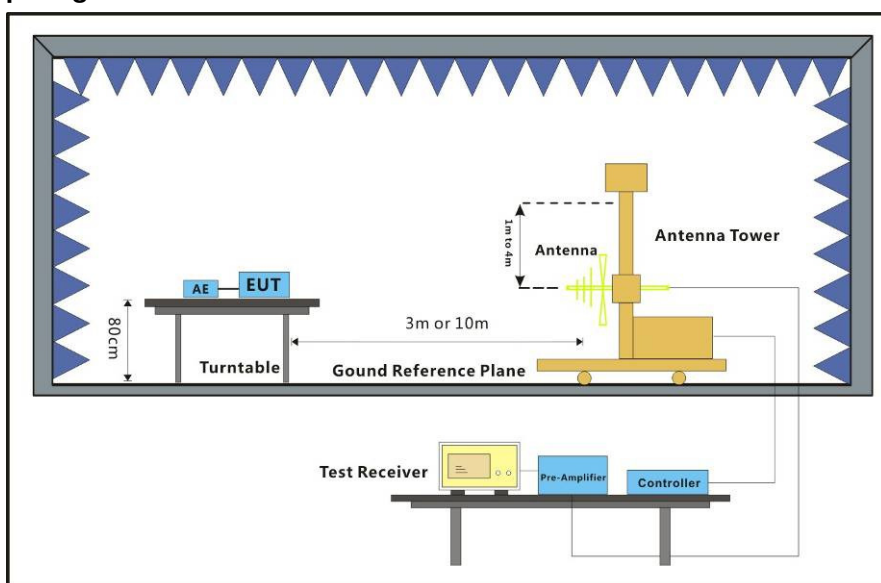
## 6.1 Radiated Disturbance(30MHz-1GHz)

Test Requirement:	EN 55032:2015
Test Method:	EN 55032:2015
Frequency Range:	30MHz to 1GHz
Measurement Distance:	10m
Limit:	
30MHz-230MHz	30 dB(μV/m) quasi-peak
230MHz-1GHz	37 dB(μV/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz

### 6.1.1 E.U.T. Operation

Operating Environment:			
Temperature:	25.0 °C	Humidity:	55 % RH
		Atmospheric Pressure:	1015 mbar
Pretest these mode to find the worst case:	a:Normal Working_keep EUT working normally. b: Idle mode.		
The worst case for final test:	a:Normal Working_keep EUT working normally.		

### 6.1.2 Test Setup Diagram

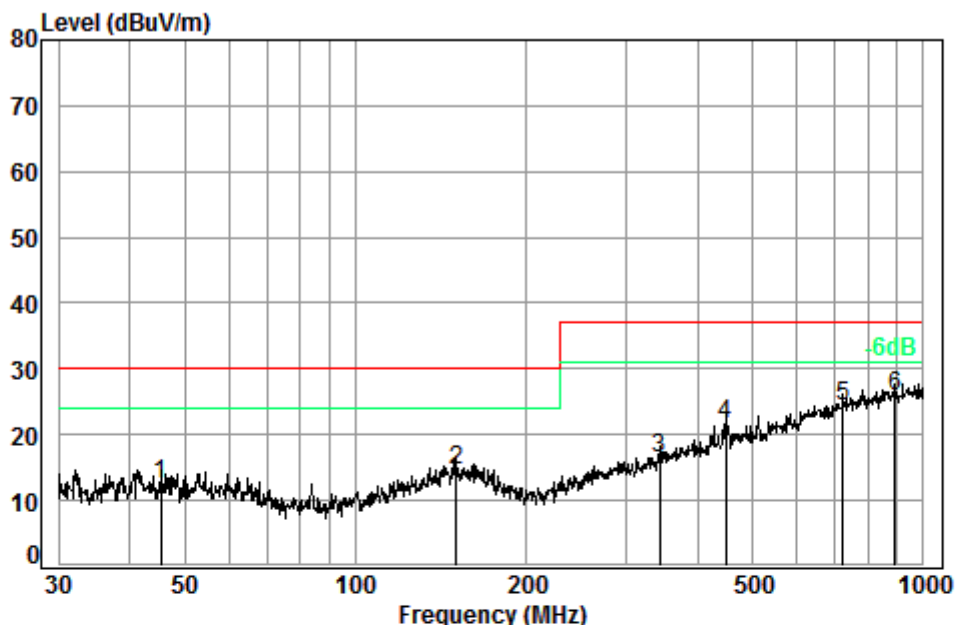


### 6.1.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.



Mode:a; Polarization:Horizontal



Condition: 10m HORIZONTAL

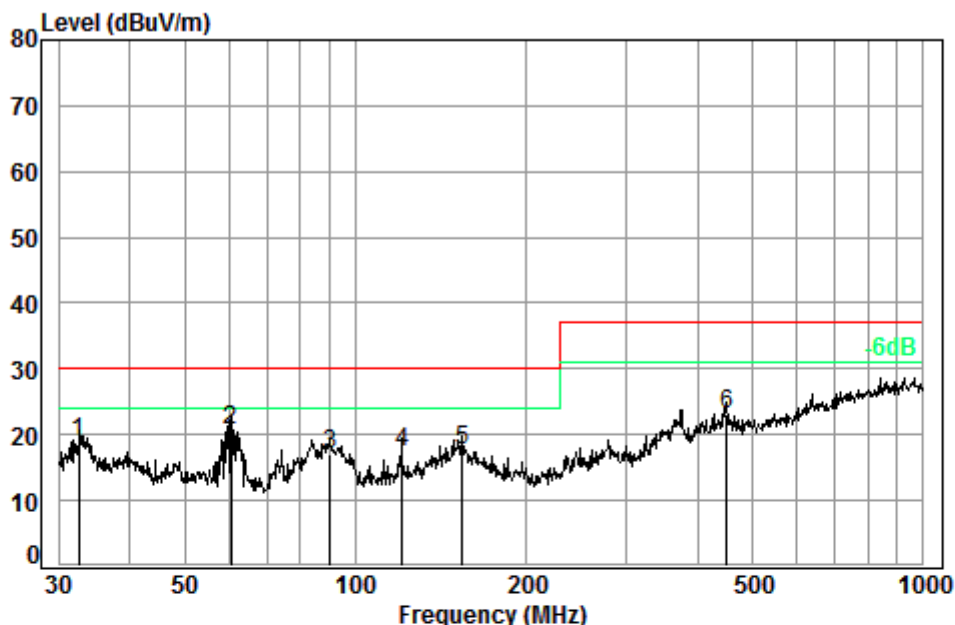
Job No. : 01846IT

Test mode: a

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	45.38	6.81	12.89	32.99	25.87	12.58	30.00	-17.42
2	150.54	7.45	13.41	32.74	26.37	14.49	30.00	-15.51
3	343.18	8.22	13.72	32.60	26.95	16.29	37.00	-20.71
4	449.56	8.42	16.17	32.60	29.46	21.45	37.00	-15.55
5	721.73	9.20	20.41	32.60	27.24	24.25	37.00	-12.75
6 pp	890.73	9.50	22.10	32.51	26.70	25.79	37.00	-11.21



Mode:a; Polarization:Vertical



Condition: 10m VERTICAL

Job No. : 01846IT

Test mode: a

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	32.63	6.70	12.56	32.97	32.50	18.79	30.00	-11.21
2	60.28	7.00	11.94	32.95	34.68	20.67	30.00	-9.33
3	90.22	7.20	8.71	32.83	34.03	17.11	30.00	-12.89
4	120.70	7.30	11.53	32.77	31.29	17.35	30.00	-12.65
5	154.28	7.47	13.40	32.74	29.59	17.72	30.00	-12.28
6	451.14	8.43	16.19	32.60	30.95	22.97	37.00	-14.03

## **7 Immunity Test Results**

### **7.1 Performance Criteria Description in EN 55024:2010+A1:2015**

**Criterion A**

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment 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, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

**Criterion B**

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test.

If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

**Criterion C**

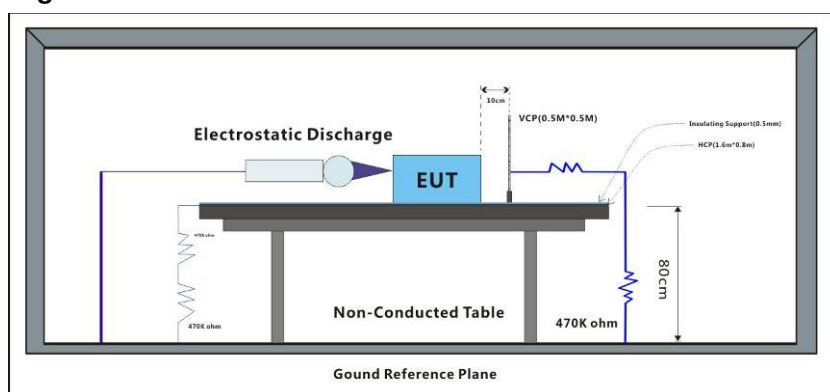
Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

## 7.2 Electrostatic Discharge

Test Requirement: EN 55024:2010+A1:2015  
 Test Method: EN 61000-4-2:2009  
 Performance Criterion: B  
 Discharge Impedance: 330Ω/150pF  
 Number of Discharge: Minimum of four test points (a minimum of 50 discharges at each point)  
 Discharge Mode: Single Discharge  
 Discharge Period: 1 second minimum

### 7.2.1 Test Setup Diagram



### 7.2.2 E.U.T. Operation

Operating Environment:

Temperature: 24.0 °C Humidity: 52 % RH Atmospheric Pressure: 1015 mbar

Test mode: a: Normal Working\_keep EUT working normally.

b: Idle mode.

### 7.2.3 Test Results:

Observations: Test Point:

1. All insulated enclosure and seams.
2. All accessible metal parts of the enclosure.
3. All side

Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Horizontal Coupling	4	+	3	B
Horizontal Coupling	4	-	3	B
Vertical Coupling	4	+	3	B
Vertical Coupling	4	-	3	B

### Results:

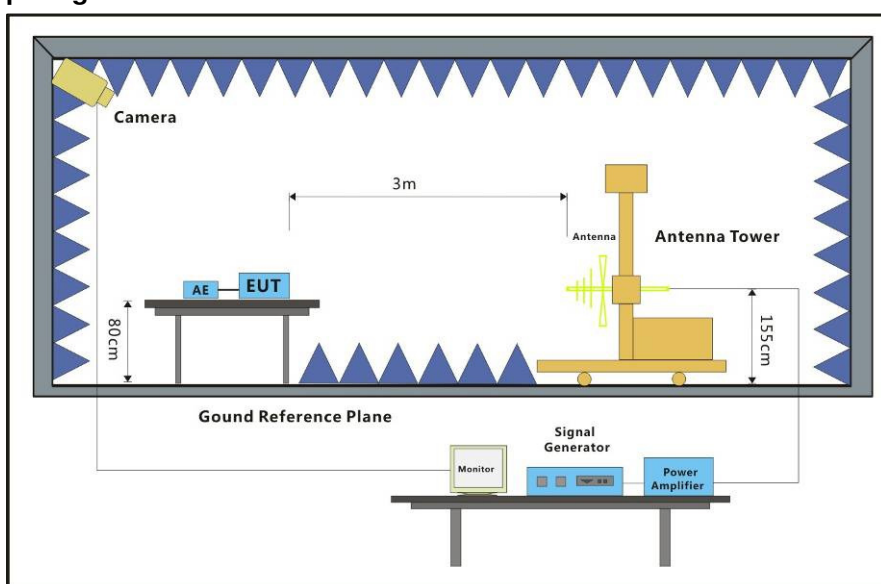
A: No degradation in the performance of the EUT was observed.

B: The communication is paused when testing on the HCP/VCP, but it can recover automatically.

### 7.3 Radiated Immunity(80MHz-1GHz)

Test Requirement: EN 55024:2010+A1:2015  
 Test Method: EN 61000-4-3:2006+A1:2008+A2:2010  
 Performance Criterion: A  
 Frequency Range: 80MHz to 1GHz  
 Antenna Polarisation: Vertical and Horizontal  
 Modulation: 1kHz,80% Amp. Mod,1% increment

#### 7.3.1 Test Setup Diagram



#### 7.3.2 E.U.T. Operation

Operating Environment:

Temperature: 22.0 °C Humidity: 52 % RH Atmospheric Pressure: 1015 mbar

Test mode: a:Normal Working\_keep EUT working normally.

b: Idle mode.

#### 7.3.3 Test Results:

Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	3	Front	2s	A
80MHz-1GHz	3	Back	2s	A
80MHz-1GHz	3	Left	2s	A
80MHz-1GHz	3	Right	2s	A
80MHz-1GHz	3	Top	2s	A
80MHz-1GHz	3	Underside	2s	A

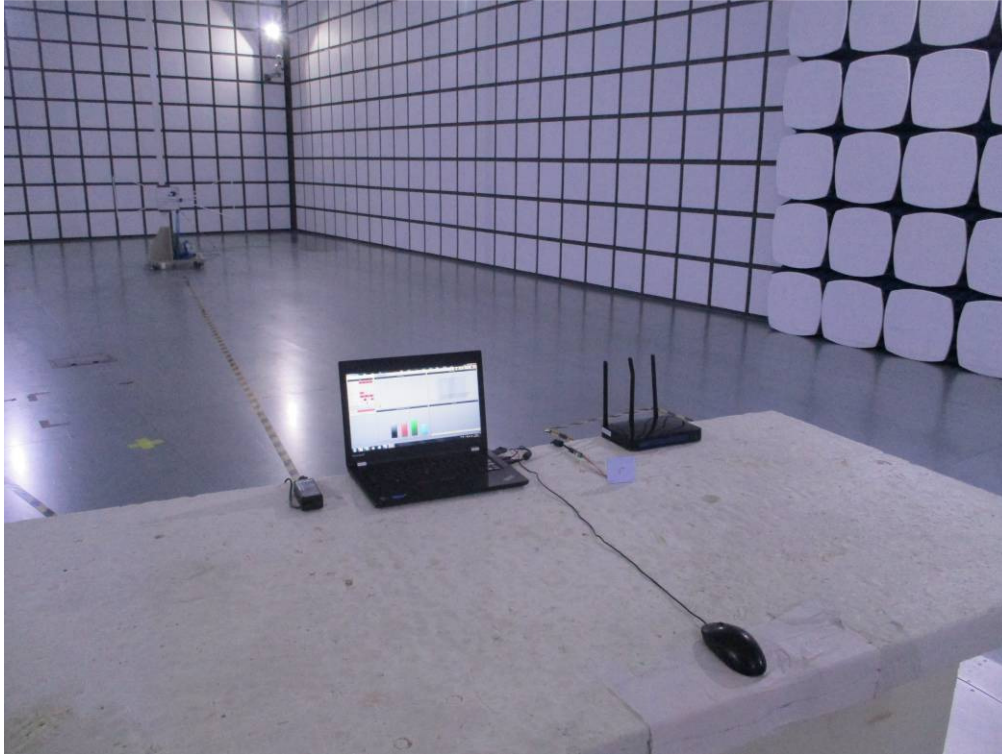
#### Results:

A: No degradation in the performance of the EUT was observed.



## 8 Photographs

### 8.1 Radiated Disturbance(30MHz-1GHz) Test Setup



### 8.2 Electrostatic Discharge Test Setup





### 8.3 Radiated Immunity(80MHz-1GHz) Test Setup



## 8.4 EUT Constructional Details

