

EMC Test Report

Certificate No. : TB211029576
Applicant : North-south Technology Industrial (Shenzhen) Co., Ltd.
Equipment Under Test (EUT)
EUT Name : DOOR ALARM
Model No. : NB06
Series Model No. : NB07, NB08, NB09, NB10, NB12, NB15, NB18.
Brand Name : Nooberone
Receipt Date : 2021-10-27
Test Date : 2021-10-28 to 2021-11-04
Issue Date : 2021-11-04
Standards : EN 55032:2015/A11:2020
EN 55035:2017/A11:2020
Conclusions : **PASS**

In the configuration tested, the EUT complied with the standards specified above. The EUT technically complies with the 2014/30/EU Directive requirements

Test/Witness Engineer :

Joy

Engineer Supervisor :

IVAN SU

Engineer Manager :

Ray Lai



This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

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Revision History

Report No.	Version	Description	Issued Date
TB-EMC184352	Rev.01	Initial issue of report	2021-11-04

1. General Information

1.1. Client Information

Applicant	:	North-south Technology Industrial (Shenzhen) Co., Ltd.
Address	:	416, Building E, Shunxing Industrial Zone, No. 10, Zhongxing Road, Ma'antang Community, Bantian Street, Longgang District, Shenzhen, China
Manufacturer	:	North-south Technology Industrial (Shenzhen) Co., Ltd.
Address	:	416, Building E, Shunxing Industrial Zone, No. 10, Zhongxing Road, Ma'antang Community, Bantian Street, Longgang District, Shenzhen, China

1.2. General Description of EUT (Equipment Under Test)

EUT Name	:	DOOR ALARM
Model(s)	:	NB06, NB07, NB08, NB09, NB10, NB12, NB15, NB18.
Model Difference	:	All these models are identical in the same PCB layout and electrical circuit, the only difference is model name for commercial, therefore, testing was performed with NB06 only.
Brand Name	:	Nooberone
Class of EUT	:	☐ Class A ☒ Class B
EUT Type	:	☒ Table top ☐ Floor standing ☐ combination
F_x	:	≤108MHz
Power supply	:	DC 4.5V from Battery
F_x : Highest internal frequency.		

1.3. Description of Operating Mode

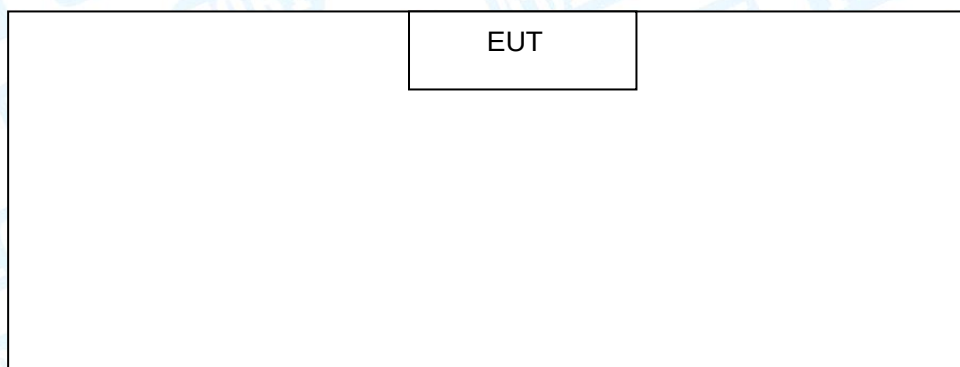
To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Working Mode

The EUT system operated these modes were found to be the worst case during the pre-scanning test as Following:

For EMI Test	
Final Test Mode	Description
Mode 1	Working Mode
For EMS Test	
Final Test Mode	Description
Mode 1	Working Mode

1.1. Block Diagram Showing the Configuration of System Tested



1.4. Description of Support Units

Equipment Information				
Name	Model	S/N	Manufacturer	Used “√”
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----	----	----	----	----
Note: N/A				

1.5. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

Test	Parameters	Expanded Uncertainty (U_{Lab})	Expanded Uncertainty (U_{Cispr})
Conducted Emission	Level Accuracy: 9kHz~150kHz 150kHz to 30MHz	± 3.50 dB ± 3.10 dB	± 4.0 dB ± 3.6 dB
Radiated Emission	Level Accuracy: 9kHz to 30 MHz	± 4.60 dB	N/A
Radiated Emission	Level Accuracy: 30MHz to 1000 MHz	± 4.50 dB	± 5.2 dB
Radiated Emission	Level Accuracy: Above 1000MHz	± 4.20 dB	N/A
Mains Harmonic	Voltage	$\pm 3.11\%$	N/A
Voltage Fluctuations & Flicker	Voltage	$\pm 3.25\%$	N/A

1.6. General Performance Criterion

General

General performance criteria are defined in 8.2, 8.3 and 8.4. These criteria shall be used during the testing of primary functions where no relevant annex is applicable.

When assessing the impact of a disturbance on a function, the assessment should take into consideration the function's performance prior to the application of the disturbance and only identify as failures those changes in performance that are a result of the disturbance.

Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state 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.

Performance criterion B

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

After the test, 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), or recovery time, 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.

Performance 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. A reboot or re-start operation is allowed.

Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

1.7. Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Building 6, Rundongsheng Industrial Zone, Longzhu, Xixiang, Bao'an District, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

A2LA Certificate No.: 4750.01

The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01. FCC Accredited Test Site Number: 854351.

IC Registration No.: (11950A)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A.

2. TEST Results Summary

EMISSION (☒ EN 55032:2015/A11:2020)			
Description of test items	Standards	Class	Results
Conducted disturbance at mains terminals	EN 55032:2015/A11:2020	☐ Class A ☐ Class B	N/A
Conducted disturbance for asymmetric mode	EN 55032:2015/A11:2020	☐ Class A ☐ Class B	N/A ₍₂₎
Conducted differential voltage emission	EN 55032:2015/A11:2020	Class B	N/A ₍₂₎
Radiated Disturbance	EN 55032:2015/A11:2020	☐ Class A ☒ Class B	Pass
Harmonic current emissions	EN 61000-3-2: 2014	☐ Class A ☐ Class D	N/A
Voltage fluctuation and flicker	EN 61000-3-3: 2013		N/A
Note: (1) Class A/Class B: Applicable to AC mains power ports (2) Class A: Applicable to wired network ports, optical fibre ports with metallic shield or tension members and antenna ports. Class B: Applicable to wired network ports, optical fibre ports with metallic shield or tension members, broadcast receiver tuner ports and antenna ports. Applicable to ports listed above and intended to connect to cables longer than 3 m. (3) Class B: Applicable to TV broadcast receiver tuner ports with an accessible connector, RF modulator output ports and FM broadcast receiver tuner ports with an accessible connector. (4) Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes. Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors and television receivers.			

IMMUNITY (☒ EN 55035:2017/A11:2020)		
Description of test items	Standards	Results
Electrostatic Discharge (ESD)	EN 61000-4-2: 2009	Pass
Continuous RF Electromagnetic Field Disturbances	EN 61000-4-3: 2006+A2:2008+A2: 2010	Pass
EFT/B Immunity	EN 61000-4-4: 2012	N/A
Surge Immunity	EN 61000-4-5: 2014	N/A
Continuous RF Disturbances	EN 61000-4-6: 2014	N/A
Power frequency magnetic field	EN 61000-4-8: 2010	N/A ₍₁₎
Voltage dips, >95% reduction	EN 61000-4-11: 2004	N/A
Voltage dips, 30% reduction		
Voltage interruptions		
Broadband impulse noise disturbances, repetitive	EN 61000-4-6: 2014	N/A ₍₂₎
Broadband impulse noise disturbances, isolated		
Note: N/A is an abbreviation for Not Applicable. (1) Not applicable, Applicable only to equipment containing devices intrinsically susceptible to magnetic fields, the EUT is not containing devices susceptible to magnetic fields. (2) Not applicable, Applicable only to CPE xDSL ports.		

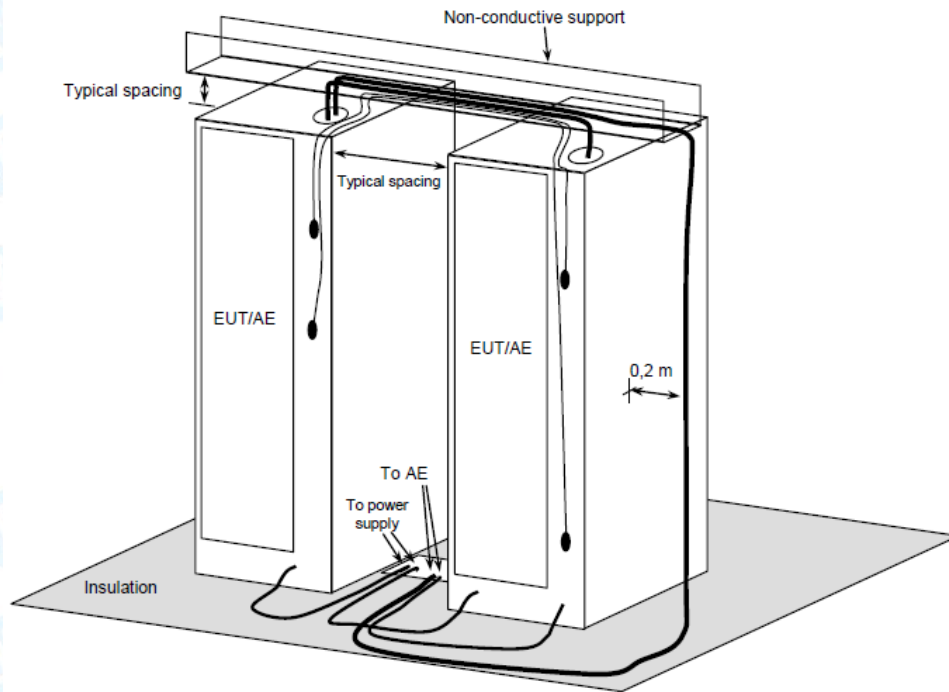
3. Test Software

Test Item	Test Software	Manufacturer	Version No.
Radiation Emission	EZ-EMC	EZ	FA-03A2RE

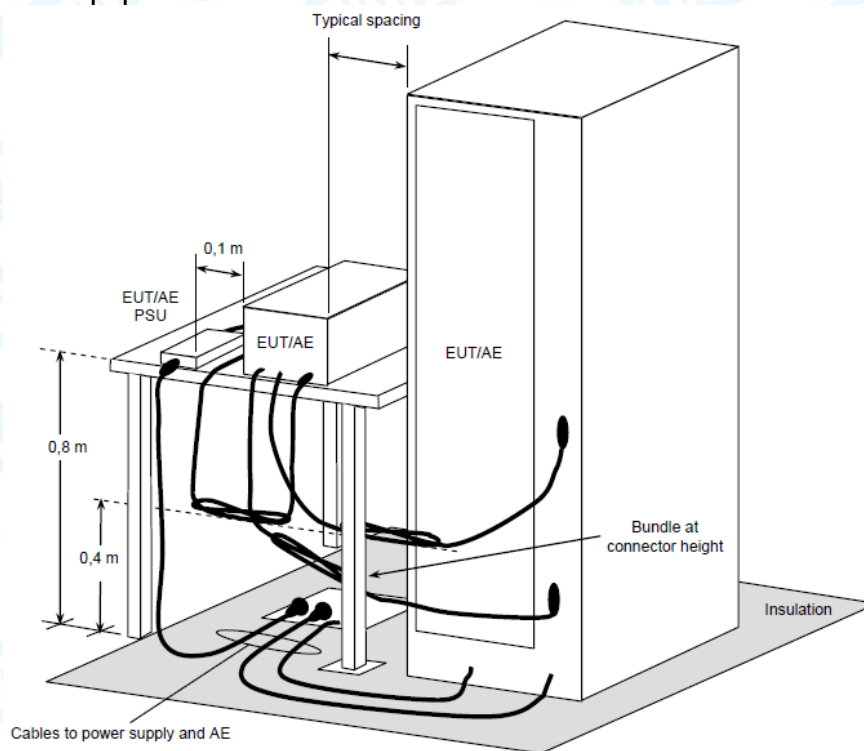
4. Test Equipment Used

Radiation Emission Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Spectrum Analyzer	Rohde & Schwarz	FSV40-N	102197	Jul. 02, 2021	Jul. 01, 2022
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 02, 2021	Jul. 01, 2022
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 01, 2020	Feb.28, 2022
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 01, 2020	Feb.28, 2022
Horn Antenna	SCHWARZBECK	BBHA 9170	1118	May. 20, 2021	May. 19, 2022
Loop Antenna	SCHWARZBECK	FMZB 1519 B	1519B-059	Jul. 06, 2021	Jul. 05, 2022
Pre-amplifier	SONOMA	310N	185903	Feb. 25, 2021	Feb.24, 2022
Pre-amplifier	HP	8449B	3008A00849	Feb. 25, 2021	Feb.24, 2022
HF Amplifier	Tonscend	TAP0184050	AP21C806129	Sep. 03, 2021	Sep. 02, 2022
Discharge Immunity Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
ESD Tester	TESEQ	NSG437	304	Jul. 06, 2021	Jul. 05, 2022
Radiated Immunity Test					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due Date
Gestockte Log.-Per.-Breitband-antenna Stacked Log.-Per.-Broadband	SCHWARZBECK	STLP 9129	162	N/A	N/A
Electric field probe	Narda	EP 601	811ZX01000	Jun. 05, 2021	Jun. 04, 2022
Signal Generator	Agilent	N5181A	MY50141953	Sep. 03, 2021	Sep. 02, 2022
EPM Series Power Meter	KEYSIGT	N1914A	MY61180020	May 04, 2021	May 03, 2022
Power Sensor	KEYSIGT	E9301A	MY61130007	Mar. 15, 2021	Mar. 14, 2022
Power Sensor	KEYSIGT	E9301A	MY61130011	Mar. 15, 2021	Mar. 14, 2022
Radio Frequency Switch	Tonscend	JS0806s	21E8060428	N/A	N/A
Microwave Power amplifier	Micotop	MPA-80-100 0-250	MPA2105144	N/A	N/A
Microwave Power amplifier	Micotop	MPA-1000-6 000-100	MPA2105150	N/A	N/A

☐ For floor standing equipment



☐ For combination equipment



5.3. Test Procedure

Measurement was performed according to clause 7.3 of CISPR 16-2-3.

The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m. The table was rotated 360 degrees to determine the position of the highest radiation. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

The initial step in collecting radiated emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range.

If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.

Highest internal frequency (Fx)	Highest measured frequency for radiated measurement	Measured Bandwidth
$F_x \leq 108 \text{ MHz}$	1 GHz	120kHz
$108 \text{ MHz} < F_x \leq 500 \text{ MHz}$	2 GHz	1MHz
$500 \text{ MHz} < F_x \leq 1 \text{ GHz}$	5 GHz	1MHz
$F_x > 1 \text{ GHz}$	5*Fx up to a maximum of 6 GHz	1MHz

NOTE 1: For FM and TV broadcast receivers, Fx is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.

NOTE 2: For outdoor units of home satellite Equipment receiving systems highest measured frequency shall be 18GHz.

5.4. Deviation From Test Standard

No deviation

5.5. Test Data

Please refer to the Attachment A.

6. Electrostatic Discharge Immunity Test

6.1 Test Requirements

6.1.1. Test Standard

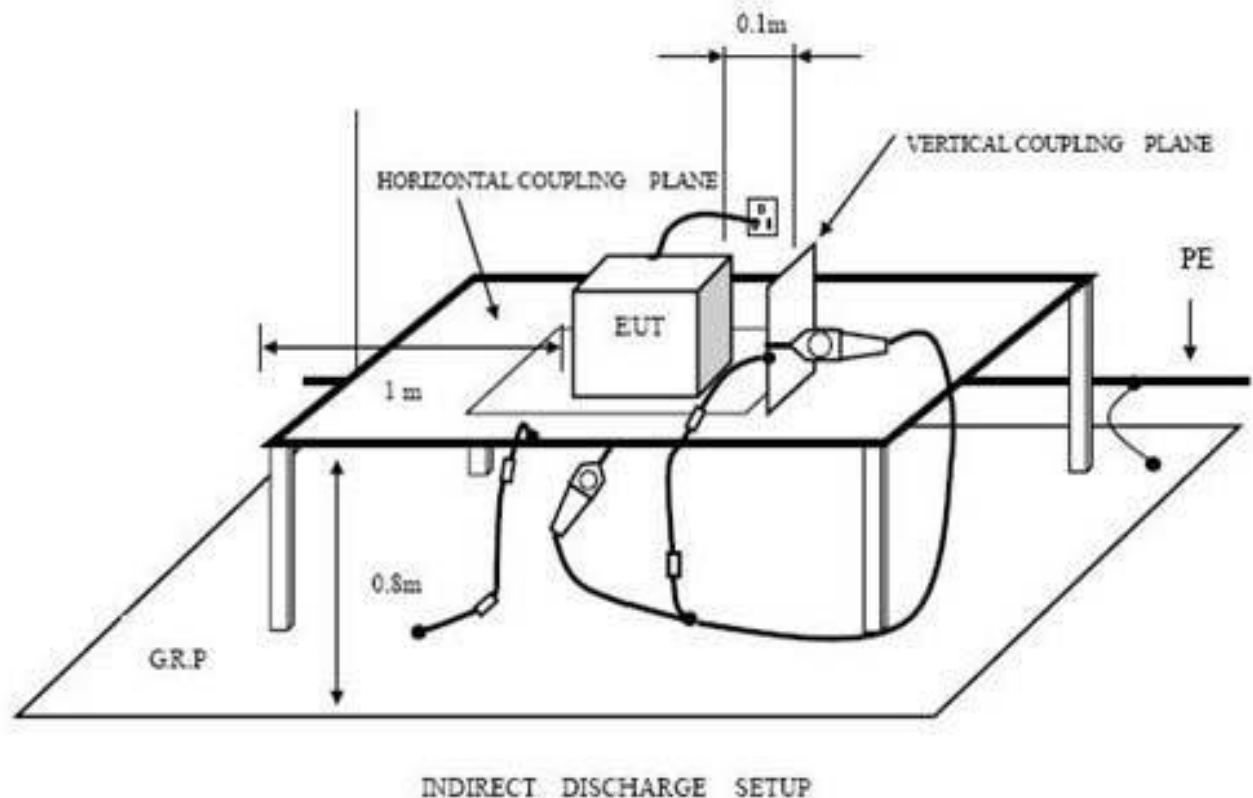
EN 55035:2017/A11:2020 (EN 61000-4-2:2009)

6.1.2. Test Level

Discharge Impedance:	330 ohm/ 150pF
Discharge Voltage:	Air Discharge: 2kV/4kV/8kV(Direct) Contact Discharge: 2kV/4kV (Direct /Indirect)
Polarity:	Positive& Negative
Number of Discharge:	Air Discharge: min.20 times at each test point Contact Discharge: min.200 times in total
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

6.1.3. Performance criterion: B

6.2. Test Setup



6.3. Test Procedure

6.3.1. Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

6.3.2. Contact Discharge:

All the procedure shall be same as air discharge. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

6.3.3. Indirect discharge for horizontal coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

6.3.4. Indirect discharge for vertical coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

6.4. Deviation From Test Standard

No deviation

6.5. Test Data

Please refer to the Attachment B.

7. Radiated Electromagnetic Field Immunity Test

7.1. Test Requirements

7.1.1. Test Standard

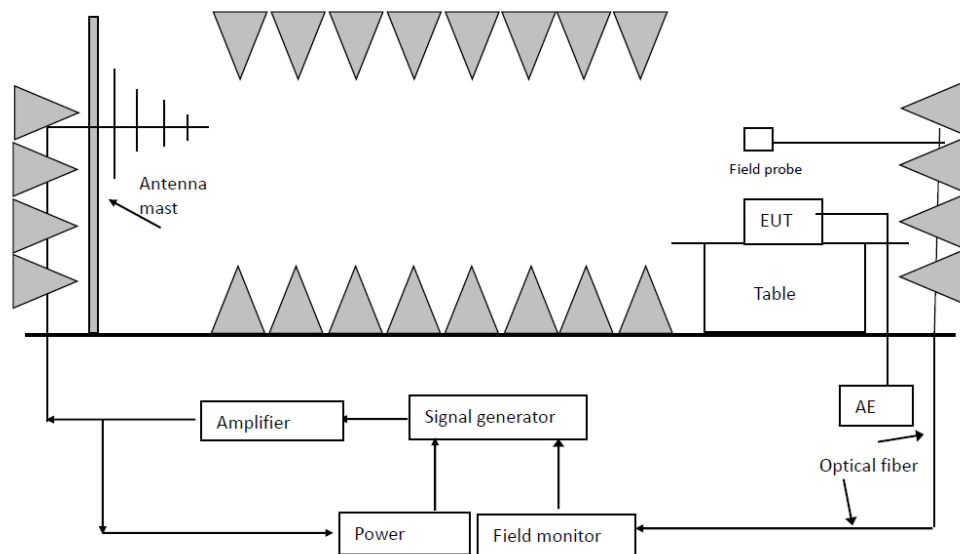
EN 55035:2017/A11:2020 (EN 61000-4-3)

7.1.2 Test Level

Level	Field Strength V/m
1	1
2	3
3	10
X	Special

Performance criterion: **A**

7.2. Test Setup



7.3. Test Procedure

The EUT are placed on a table, which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna, which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna is set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually.

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

All the scanning conditions are as following:

Condition of Test	Remark
Fielded strength	3V/m (Severity Level 2)
Radiated signal	Modulated
Scanning frequency	80-1000MHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz
Sweep time of radiated	0.0015 Decade/s
Dwell time	1 Sec.

7.4. Deviation From Test Standard

No deviation

7.5. Test Data

Please refer to the Attachment C.

8. Photographs - Constructional Details

Photo 1 Appearance of EUT



Photo 2 Appearance of EUT

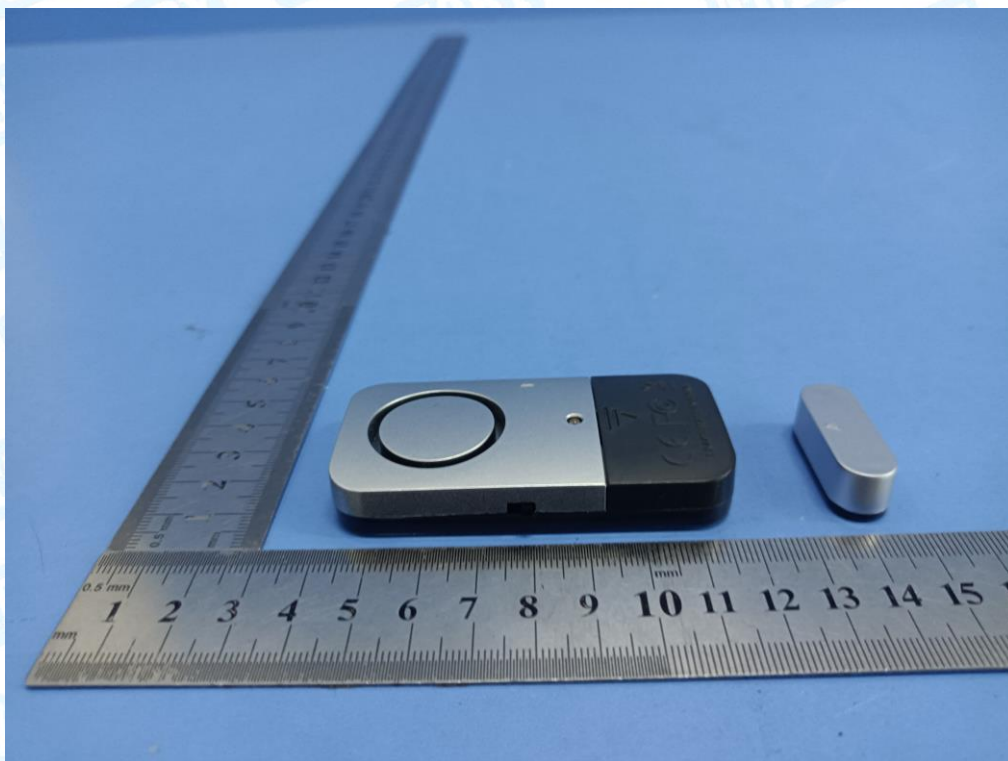


Photo 3 Appearance of EUT



Photo 4 Internal of EUT



Photo 5 Appearance of PCB

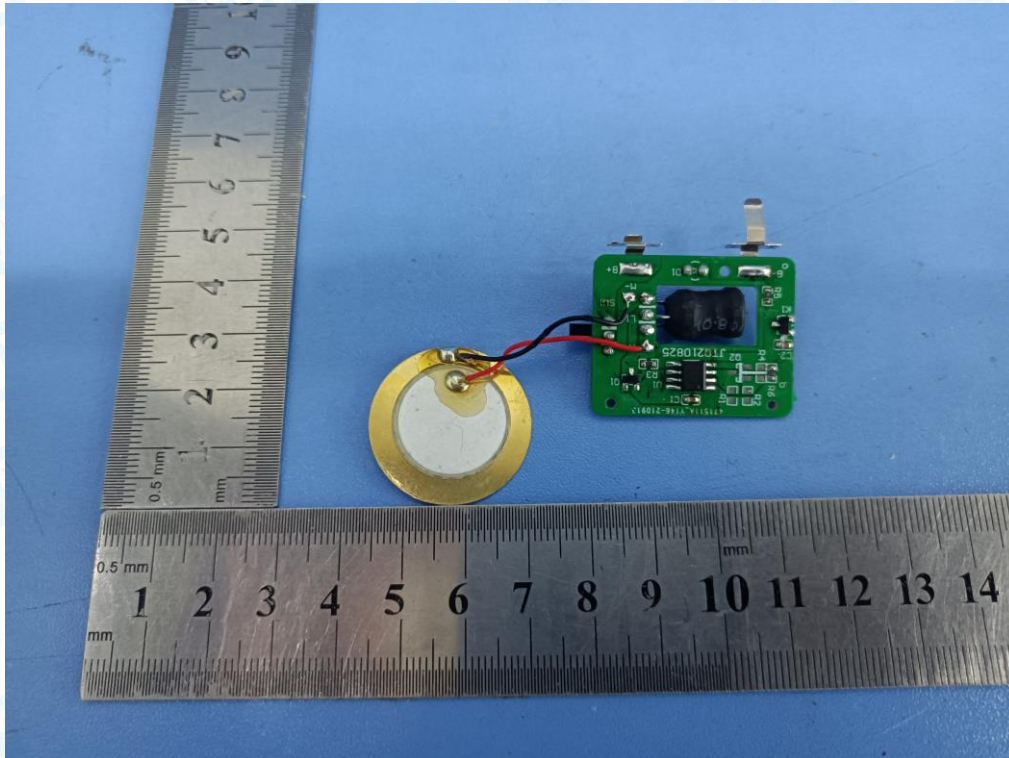


Photo 6 Appearance of PCB

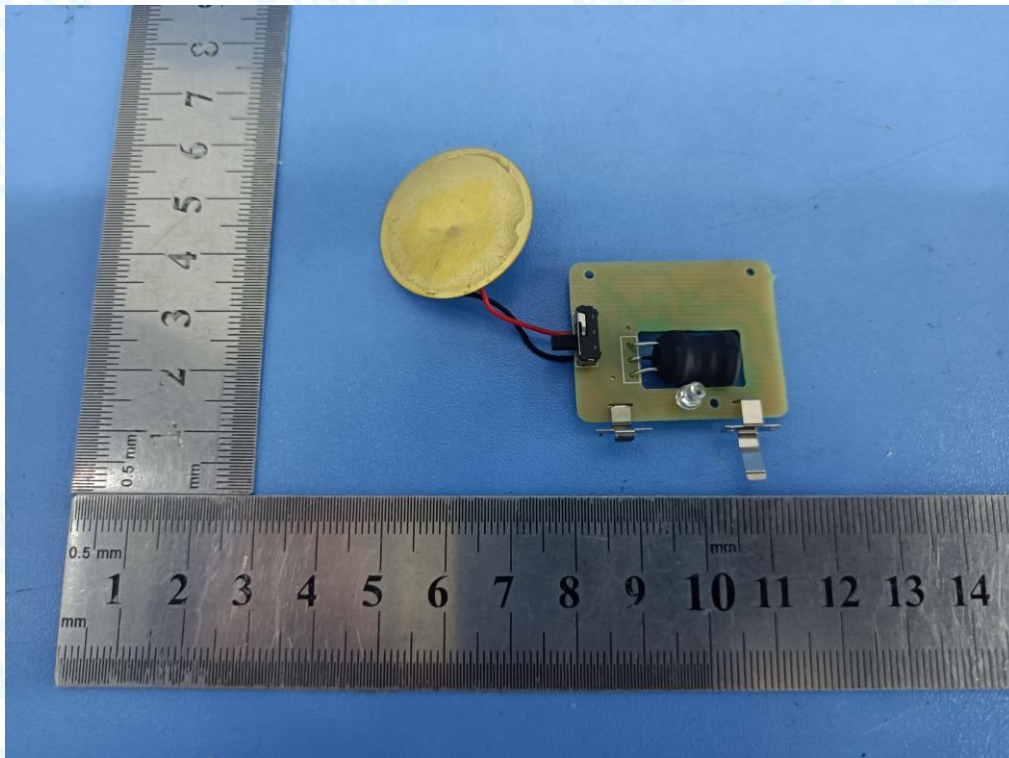


Photo 7 Appearance of Battery



9. Photographs - Test Setup

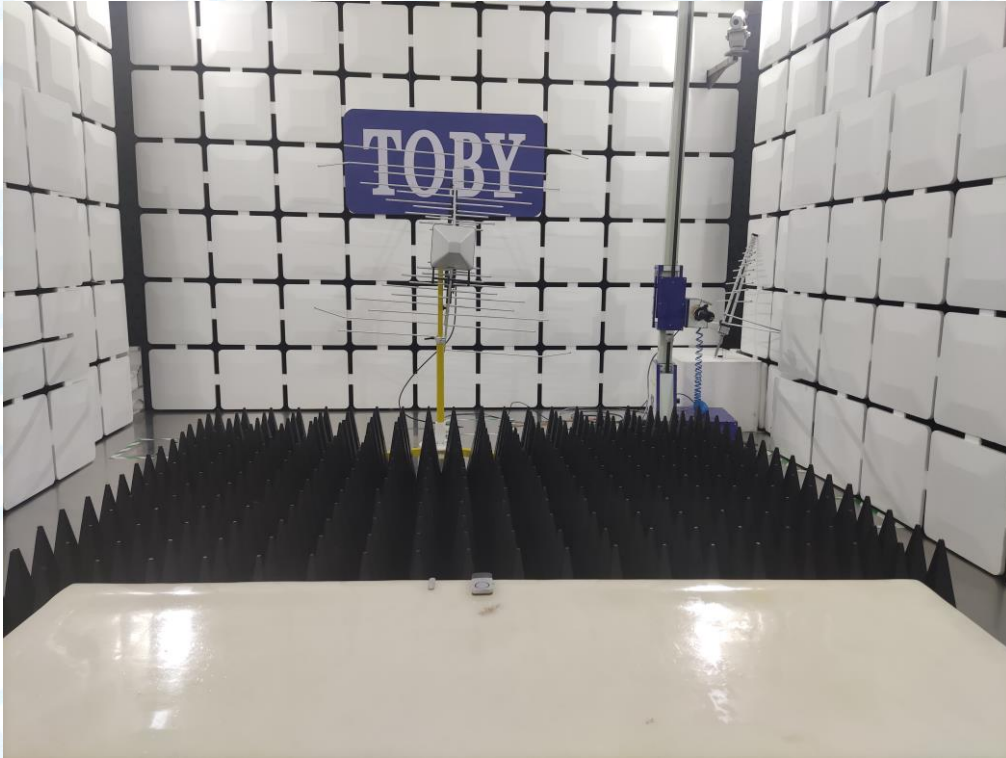
Radiated Emission Test Setup



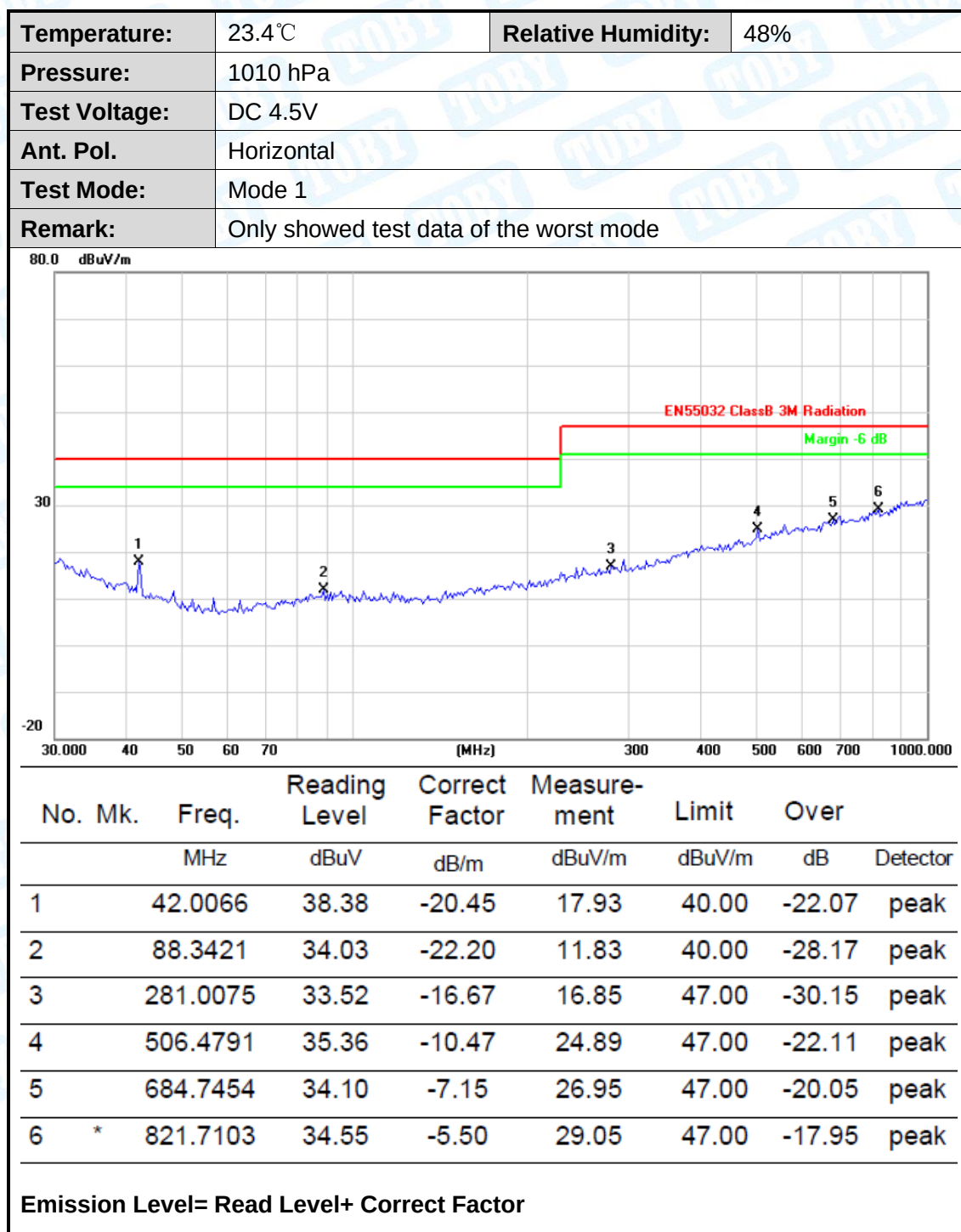
Electrostatic Discharge Test Setup



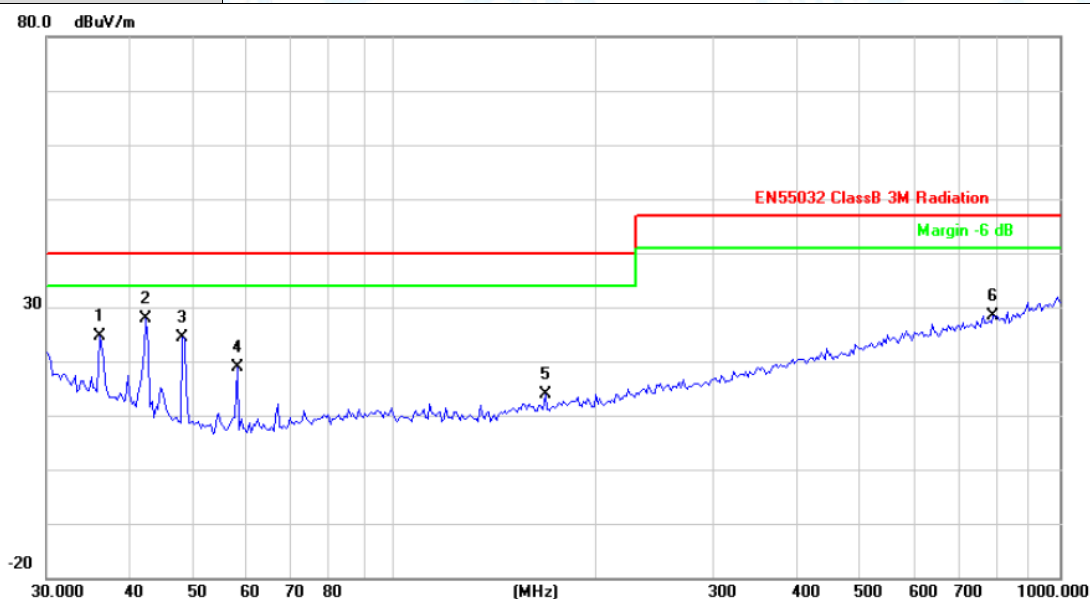
RF Field Strength Susceptibility Test Setup



Attachment A--Radiated Emission Test Data



Temperature:	23.4°C	Relative Humidity:	48%
Pressure:	1010 hPa		
Test Voltage:	DC 4.5V		
Ant. Pol.	Vertical		
Test Mode:	Mode 1		
Remark:	Only showed test data of the worst mode		



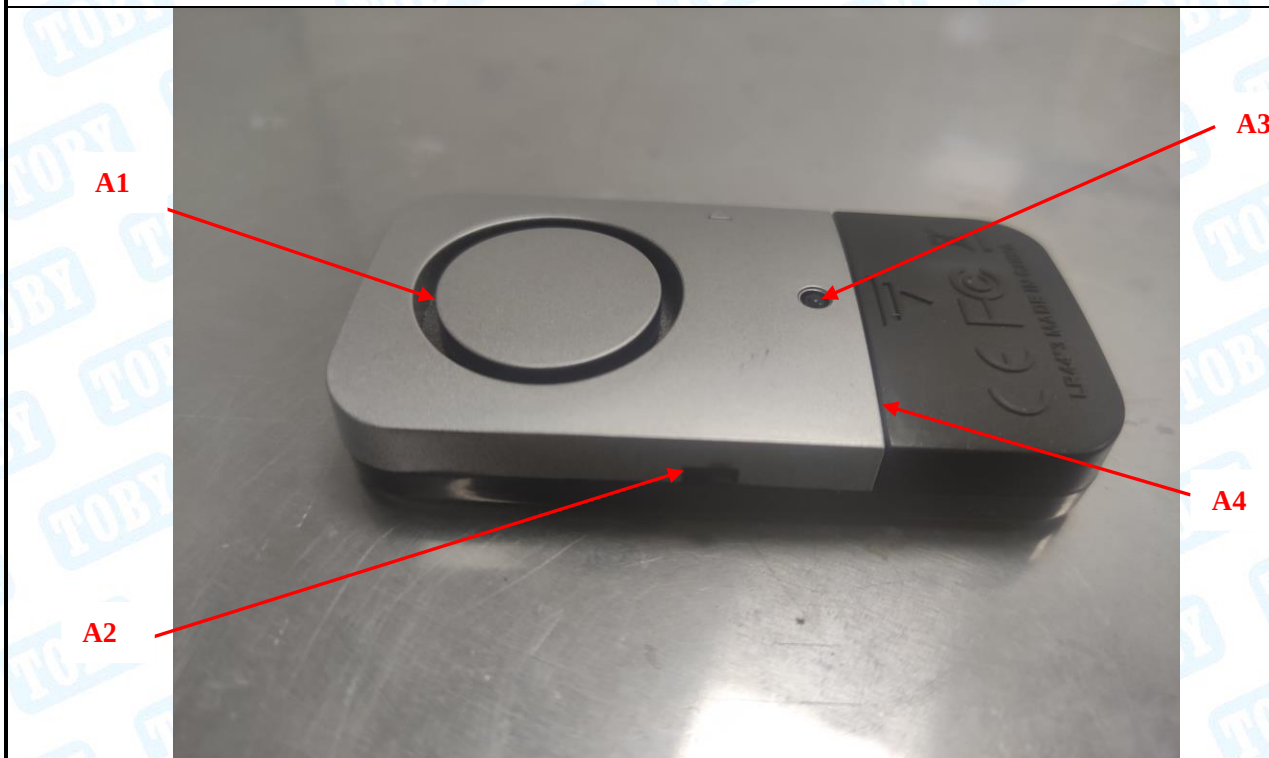
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		36.0007	42.31	-17.60	24.71	40.00	-15.29	peak
2	*	42.3022	48.51	-20.59	27.92	40.00	-12.08	peak
3		47.9940	47.15	-22.89	24.26	40.00	-15.74	peak
4		57.9993	43.35	-24.40	18.95	40.00	-21.05	peak
5		168.4138	34.66	-20.72	13.94	40.00	-26.06	peak
6		793.3960	34.08	-5.69	28.39	47.00	-18.61	peak

Emission Level= Read Level+ Correct Factor

Attachment B--Electrostatic Discharge Test Data

Temperature : 23.5℃		Humidity : 56%	
Power supply : DC 4.5V		Test Mode : Mode 1	
Required Performance Criteria: B			
Air Discharge: ±2/±4/±8kV Contact Discharge: ±2/±4kV			
Location	Test Level (kV)	Judgment	Result
A1	±2kV±4kV±8kV	A	PASS
A2		A	
A3		A	
A4		A	
/	±2kV±4kV	/	
HCP	±4kV	A	
VCP	±4kV	A	

Test Location Photos



Note:

- 1) Criteria A: There was no change operated with initial operating during the test.
- 2) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 3) Criteria C: The system shut down during the test.

Attachment C--RF Field Strength Susceptibility Test Data

Temperature	: 23.8°C	Humidity	: 52%							
Power supply	: DC 4.5V	Test Mode	: Mode 1							
Required Performance Criteria: A										
Modulation: AM 80% , Field strength: 3V/m, Pulse: 1 kHz.										
Antenna Polarity	Actual Performance Criteria				Result					
	Frequency Range: 80~1000MHz									
	EUT Position									
	Front	Right	Rear	Left						
H	A	A	A	A	PASS					
V	A	A	A	A	PASS					
EUT Position	Frequency								Result	
	1800MHz		2600MHz		3500MHz		5000MHz			
	Antenna Polarity									
	H	V	H	V	H	V	H	V		
Front	A	A	A	A	A	A	A	A	PASS	
Right	A	A	A	A	A	A	A	A	PASS	
Rear	A	A	A	A	A	A	A	A	PASS	
Left	A	A	A	A	A	A	A	A	PASS	
Remark:										
1) Criteria A: There was no change operated with initial operating during the test.										
2) Criteria B: The EUT function loss during the test, but self-recoverable after the test.										
3) Criteria C: The system shut down during the test.										

-----END OF REPORT-----