



中国认可  
国际互认  
检测  
TESTING  
CNAS L6478



# TEST REPORT

Reference No. .... : WTF17F1092453E  
Applicant ..... : Mid Ocean Brands B.V.  
Address ..... : Unit 201 2/F., Laford Centre, 838 Lai Chi Kok Road, Cheung Sha  
Wan, Kowloon, Hong Kong.  
Manufacturer ..... : 109617  
Product Name ..... : Weather Station  
Model No. .... : MO9239  
Standards ..... : EN 55032:2015  
EN 55024:2010+A1:2015  
Date of Receipt sample .... : 2017-10-19  
Date of Test ..... : 2017-10-19 to 2017-10-20  
Date of Issue ..... : 2017-10-21  
Test Report Form No. .... : WEO-55032A-01A  
Test Result ..... : Pass

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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## 1 Test Summary

EMISSION (EN 55032:2015)				
Test Item	Test Standard	Class / Severity	Result	
Radiation Emission, 30MHz to 1000MHz	EN 55032:2015	Table A.4	Pass	
IMMUNITY ( EN 55024:2010+A1:2015)				
Test Item	Test Method	Class / Severity	Performance Criteria	Result
Electrostatic Discharge(ESD)	IEC 61000-4-2:2008	±4 kV Contact ±8 kV Air	B	Pass
Radio-frequency electromagnetic fields (80MHz to 1GHz)	IEC 61000-4-3:2010	3V/m, 80%, 1kHz, Amp. Mod.	A	Pass

Remark:

Pass

N/A

Test item meets the requirement

Test case does not apply to the test object

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### 3 General Information

#### 3.1 General Description of E.U.T.

Product Name ..... : Weather Station

Model No. .... : MO9239

Remark..... : ---

#### 3.2 Details of E.U.T.

Technical Data..... : Batteries: 3\*AAA 1.5V

#### 3.3 Description of Support Units

The EUT has been tested as an independent unit. MO9239 is the test sample. All tests were performed in the condition of Batteries: 3\*AAA 1.5V input and were tested with Notebook powered by USB port.

#### 3.4 Standards Applicable for Testing

The tests were performed according to following standards:

EN 55032:2015 Electromagnetic compatibility of multimedia equipment — Emission Requirements

EN 55024:2010+A1:2015 Information technology equipment — Immunity characteristics — Limits and methods of measurement.

#### 3.5 Special Accessories and Auxiliary Equipment

Item	Equipment	Technical Data	Manufacturer	Model No.	Serial No.
1.	Notebook	AC 230V/50Hz	Lenovo	ThinkPad Edge E430	00426-OEM-8992662-00400



### 3.6 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

Yes       No

If Yes, list the related test items and lab information:

Test items: ---

Lab information: ---

### 3.7 Abnormalities from Standard Conditions

None.



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## 4 Equipment Used during Test

Radiated Emission					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMI Test Receiver	R&S	ESR7	101566	Valid
2.	Active Loop Antenna	SCHWARZBECK	FMZB1519B	00004	Valid
3.	Trilog Broadband Antenna	SCHWARZBECK	VULB 9162	9162-117	Valid
4.	Preamplifier	SCHWARZBECK	BBV 9743	BBV 9743#170	Valid
ESD					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	ESD Simulator	TESEQ	NSG437	521	Valid
Radio-frequency electromagnetic fields					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	RF Generator	R&S	SMB100A-B106	105942	Valid
2.	RF Power Amplifier	R&S	BLWA0830-160/100/40D	128740	Valid
3.	Logarithmic periodic antennas	R&S	STLP9128D	043	Valid
4.	Dynamometer	R&S	NRP2-2*Z91	102031	Valid

### 4.1 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conducted Emission	150kHz~30MHz	±2.66dB	(1)
Radiated Emission	30MHz~1000MHz	±4.56dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .





## 5 Emission Test Results

### 5.1 Radiated Emission

Test Requirement.....	: EN 55032
Test Method.....	: EN 55032
Test Limit.....	: Table A.4 of EN 55032
Test Result.....	: Pass
Frequency Range.....	: 30MHz to 1000MHz
Class.....	: Class B

#### 5.1.1 E.U.T. Operation

##### Operating Environment:

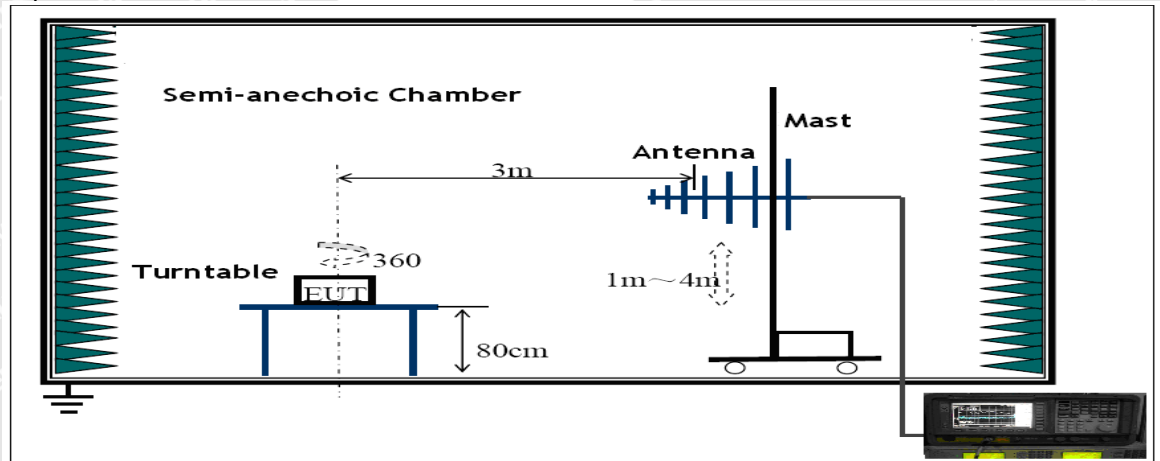
Temperature.....	: 24°C
Humidity.....	: 58%RH
Atmospheric Pressure.....	: 101.2 kPa

##### EUT Operation:

Input Voltage.....	: Batteries: 3*AAA 1.5V or DC 5V by USB Port
Operating Mode.....	: Battery mode or USB mode

#### 5.1.2 Block Diagram of Test Setup

The Radiated Emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the CISPR 16-2-3.

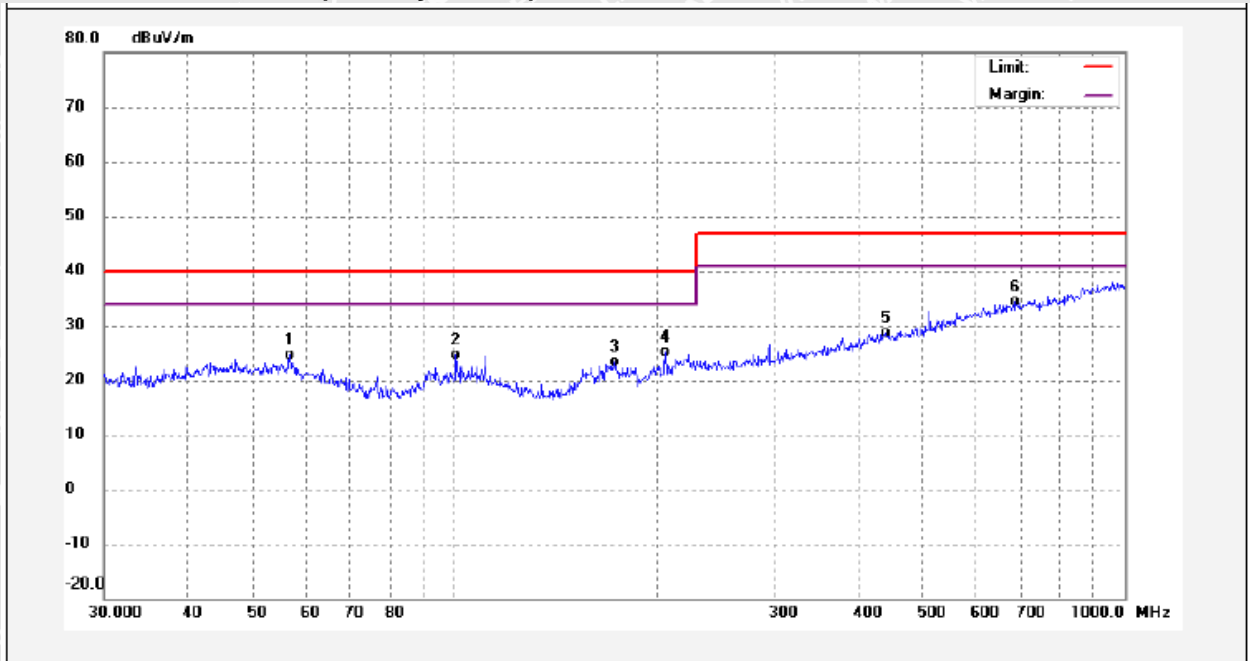




### 5.1.3 Radiated Emission Test Data

According to the data in section 5.2.4, the EUT complied with the EN 55032 standards.

#### Vertical Polarization (battery mode)



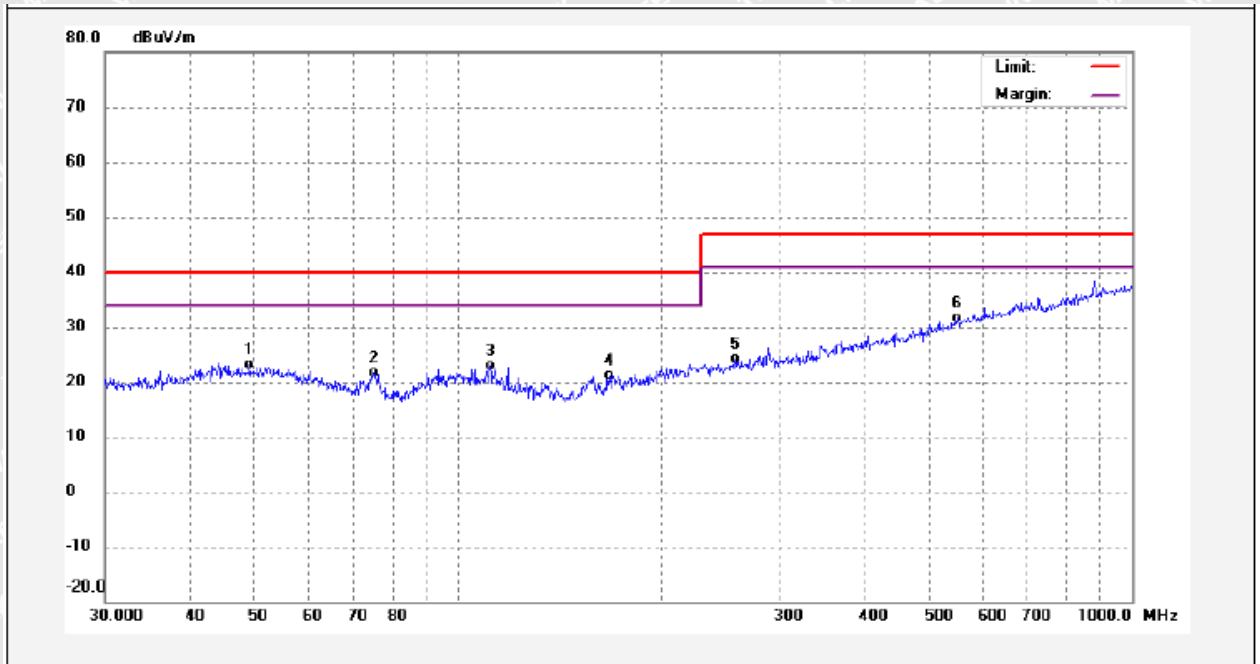
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	56.7917	11.39	13.30	24.69	40.00	-15.31	QP	
2	100.5806	12.22	12.49	24.71	40.00	-15.29	QP	
3	173.8135	13.12	10.34	23.46	40.00	-16.54	QP	
4	206.3976	12.40	12.84	25.24	40.00	-14.76	QP	
5	440.1963	9.88	18.64	28.52	47.00	-18.48	QP	
6	687.1507	11.00	23.36	34.36	47.00	-12.64	QP	







**Horizontal Polarization (battery mode)**

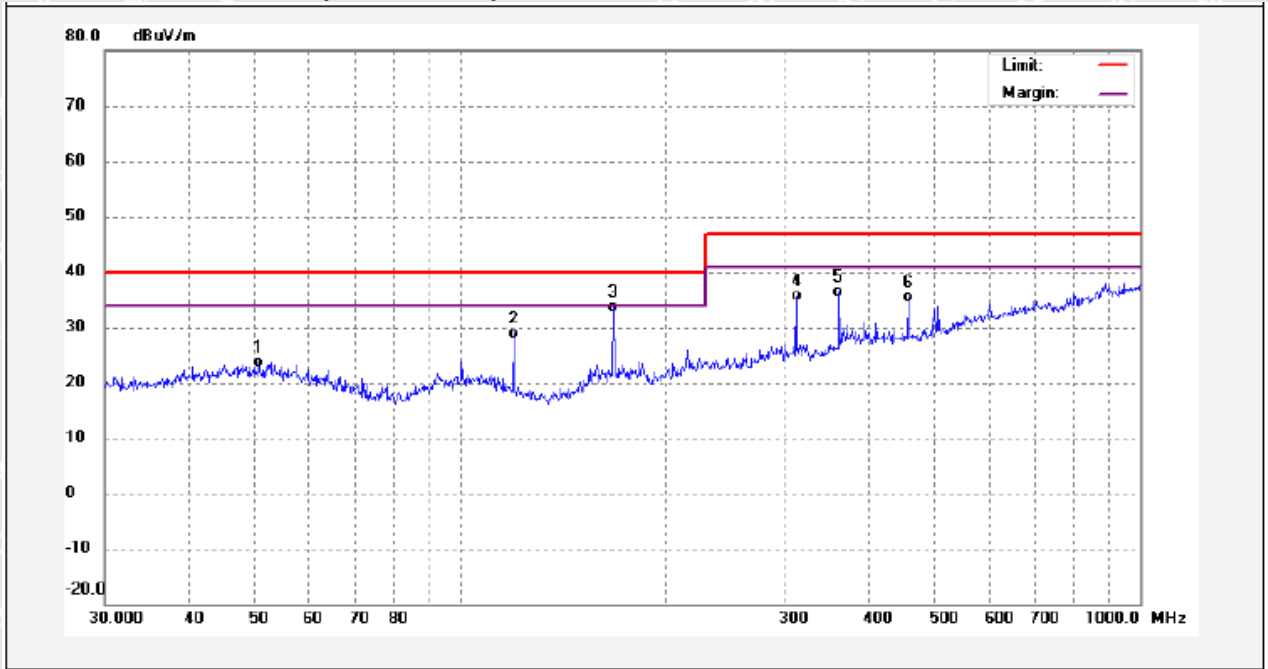


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	49.1865	8.72	14.34	23.06	40.00	-16.94	QP	
2	75.1822	12.18	9.34	21.52	40.00	-18.48	QP	
3	111.7380	10.82	12.13	22.95	40.00	-17.05	QP	
4	167.8243	11.23	10.00	21.23	40.00	-18.77	QP	
5	258.3264	9.84	14.27	24.11	47.00	-22.89	QP	
6	550.9480	10.56	21.10	31.66	47.00	-15.34	QP	





**Vertical Polarization (USB mode)**

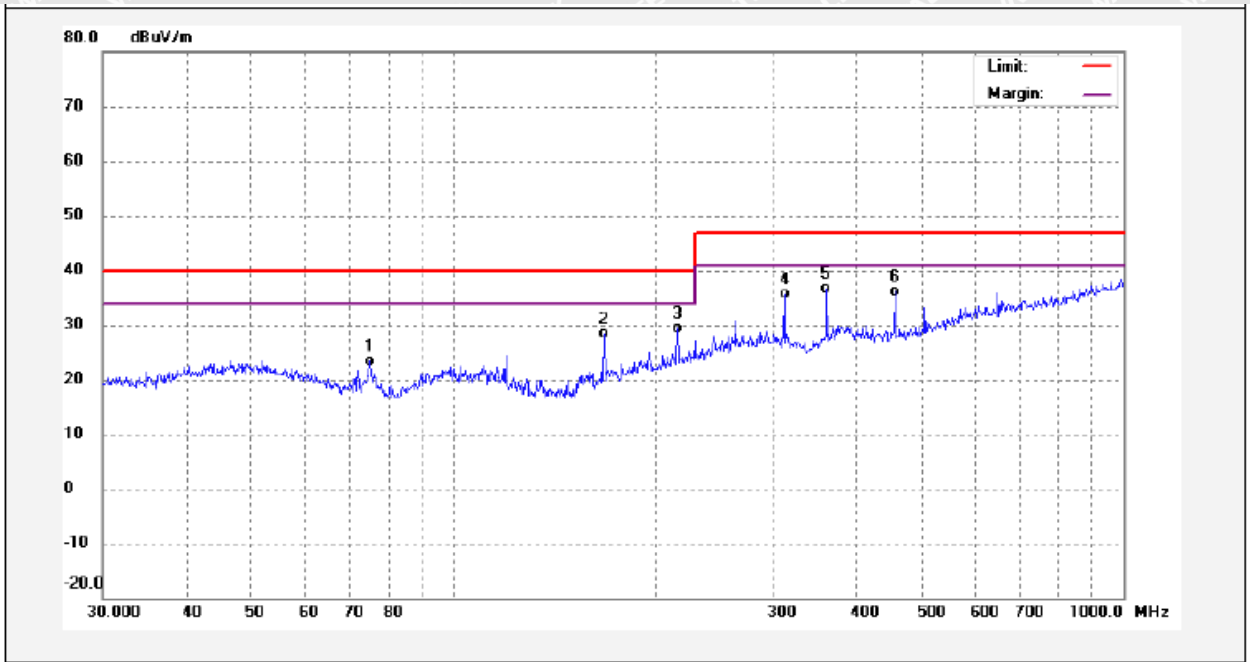


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	50.5860	9.48	14.26	23.74	40.00	-16.26	QP	
2	119.8556	18.07	10.77	28.84	40.00	-11.16	QP	
3	167.8243	23.56	10.00	33.56	40.00	-6.44	QP	
4	312.1794	20.19	15.52	35.71	47.00	-11.29	QP	
5	360.4476	19.51	16.79	36.30	47.00	-10.70	QP	
6	455.9058	16.50	18.96	35.46	47.00	-11.54	QP	





**Horizontal Polarization (USB mode)**



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	75.1822	14.05	9.34	23.39	40.00	-16.61	QP	
2	167.8243	18.38	10.00	28.38	40.00	-11.62	QP	
3	216.0240	16.22	13.11	29.33	40.00	-10.67	QP	
4	312.1794	20.18	15.52	35.70	47.00	-11.30	QP	
5	360.4476	19.78	16.79	36.57	47.00	-10.43	QP	
6	455.9058	17.29	18.96	36.25	47.00	-10.75	QP	







## 6 Immunity Test Results

### 6.1 Performance Criteria

**Performance criterion A:** The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. 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 from what the user may reasonably expect from the apparatus if used as intended.

**Performance criterion 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 (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however, 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, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

**Performance criterion C:** Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

For further details, please refer to EN 55024.



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## 6.2 Electrostatic Discharge(ESD)

Test Requirement.....	:	EN 55024
Test Method .....	:	IEC 61000-4-2
Test Result .....	:	Pass
Discharge Impedance .....	:	330Ω / 150pF
Discharge Voltage .....	:	Air Discharge: ±8kV Contact Discharge: ±4kV HCP & VCP: ±4kV
Polarity.....	:	Positive & Negative
Number of Discharge .....	:	Minimum 10 times at each test point
Discharge Mode .....	:	Single Discharge
Discharge Period.....	:	1 second minimum

### 6.2.1 E.U.T. Operation

Operating Environment:

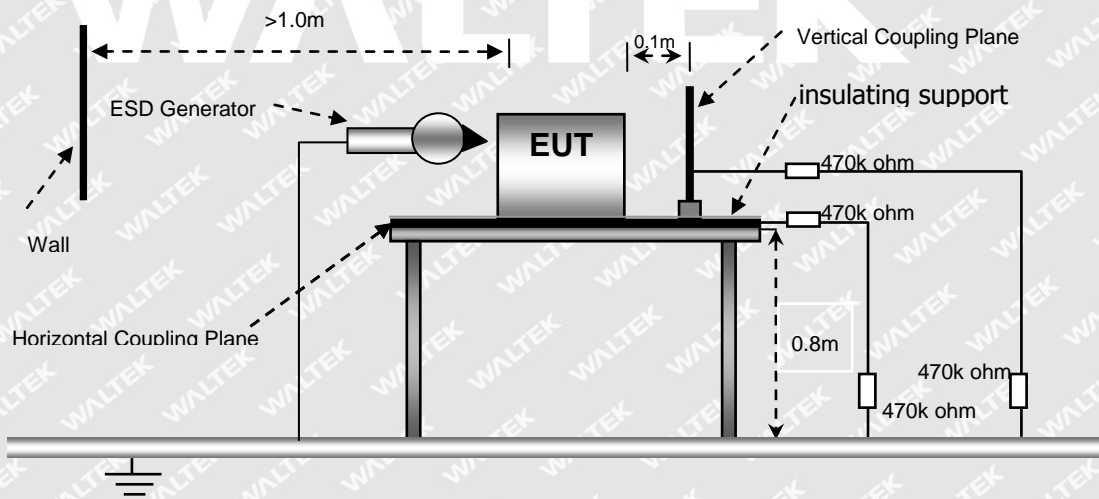
Temperature.....	:	21.3°C
Humidity .....	:	57.6%RH
Atmospheric Pressure.....	:	100.2kPa

EUT Operation:

Input Voltage .....	:	Batteries: 3*AAA 1.5V or DC 5V by USB Port
Operating Mode.....	:	Battery mode or USB mode

### 6.2.2 Block Diagram of Test Setup

The ESD test was performed in accordance with the IEC 61000-4-2.





### 6.2.3 Direct Discharge Test Results

**Observations :**                      **Test points :** 1. All Exposed Surface & Seams;  
2. All metallic part

Direct Discharge			Test Results	
Applied Voltage (kV)	Performance Criterion	Test Point	Contact Discharge	Air Discharge
±8	B	1	N/A	Pass*
±4	B	2	Pass*	N/A

Remark: \* During the test no deviation was detected to the selected operation mode(s)

### 6.2.4 Indirect Discharge Test Results

**Observations :**                      **Test points :** 1. All sides.

Indirect Discharge			Test Results	
Applied Voltage (kV)	Performance Criterion	Test Point	Horizontal Coupling	Vertical Coupling
±4	B	1	Pass*	Pass*

Remark: \* During the test no deviation was detected to the selected operation mode(s)

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### 6.3 Radio-frequency electromagnetic fields, 80MHz to 1GHz

Test Requirement .....	: EN 55024
Test Method .....	: IEC 61000-4-3
Test Result .....	: Pass
Frequency Range .....	: 80MHz to 1GHz
Test level .....	: 3V/m
Modulation .....	: 80%, 1kHz Amplitude Modulation.
Face of EUT .....	: Front, Back, Left, Right
Antenna polarisation ..	: Horizontal & Vertical

#### 6.3.1 E.U.T. Operation

##### Operating Environment:

Temperature..... : 20.9°C

Humidity..... : 57.5%RH

Barometric Pressure..... : 100.2kPa

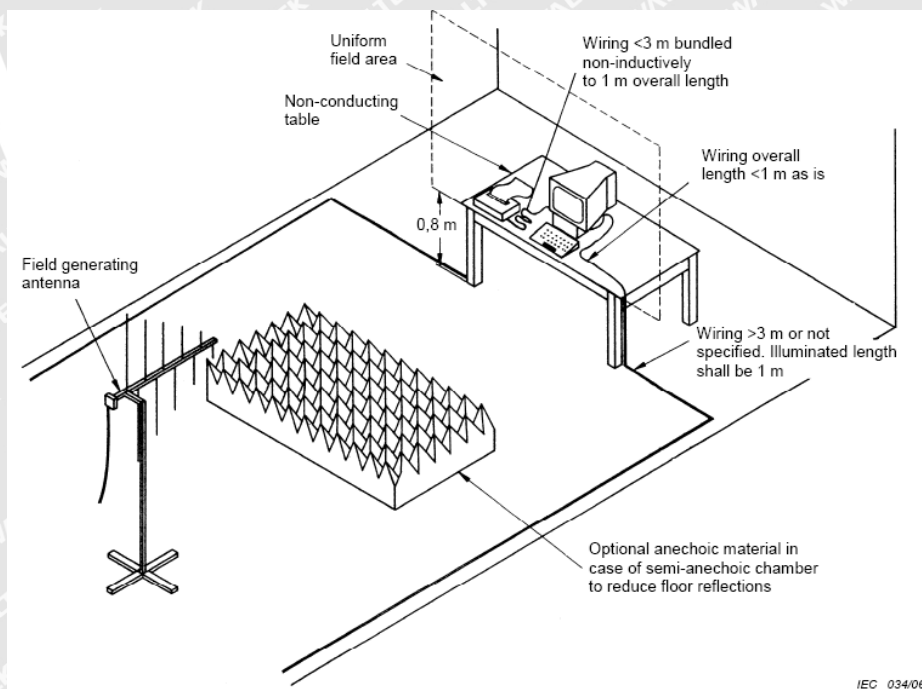
##### EUT Operation:

Input Voltage..... : Batteries: 3\*AAA 1.5V or DC 5V by USB Port

Operating Mode..... : Battery mode or USB mode

#### 6.3.2 Block Diagram of Setup

The Radio-frequency electromagnetic fields Immunity test was performed in accordance with the IEC 61000-4-3.





### 6.3.3 Test Results

Frequency	Face of EUT	Antenna polarisation	Test Level	Step Size	Dwell Time	Performance Criterion	Result
80 to 1000MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
80 to 1000MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*

Remark:

- \* During the test no deviation was detected to the selected operation mode(s)

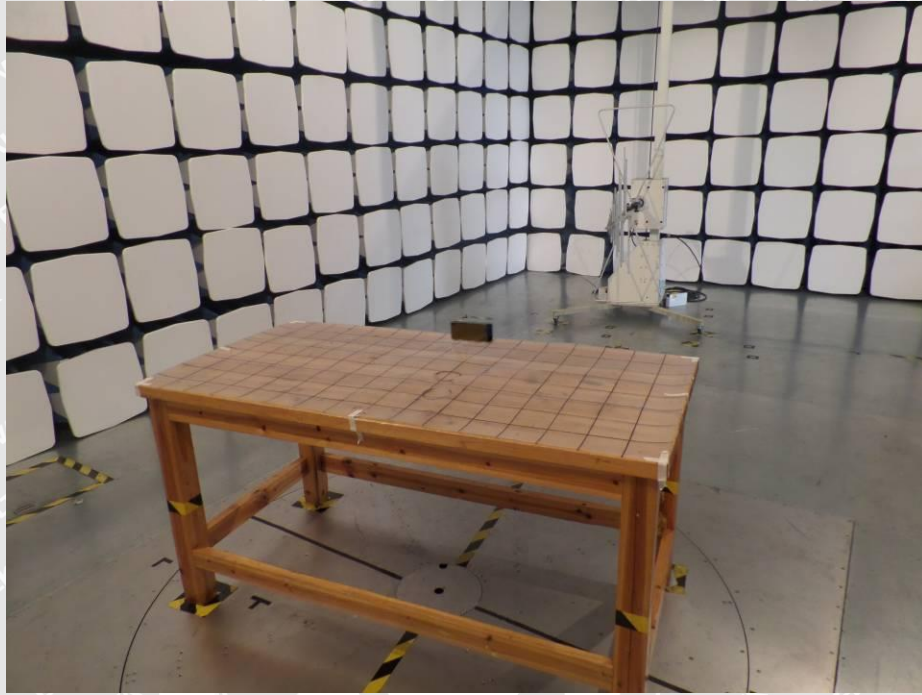


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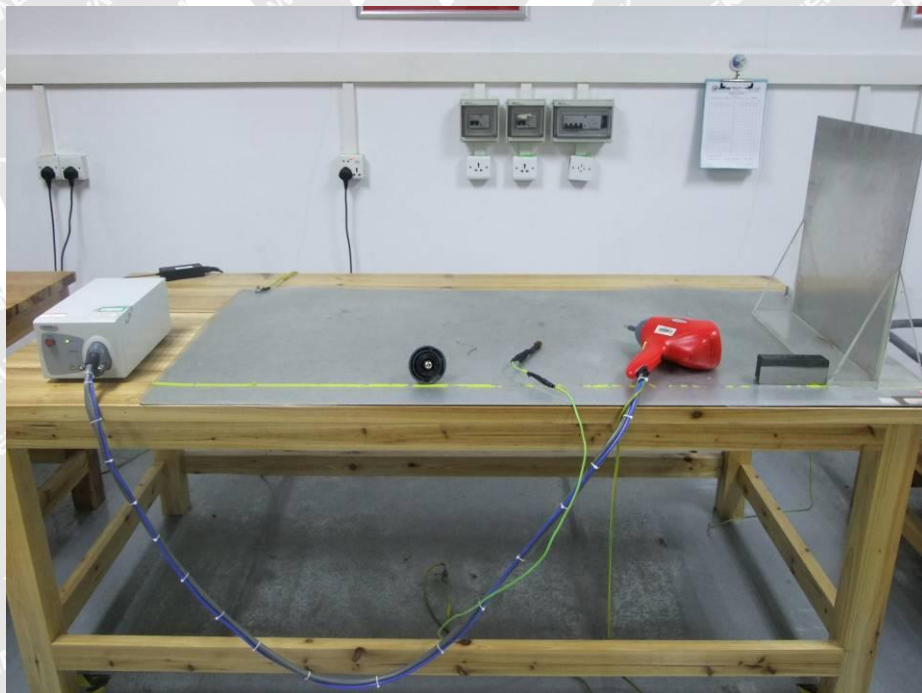


## 7 Photographs – Test Setup

### 7.1 Photograph – Radiated Emission Test Setup



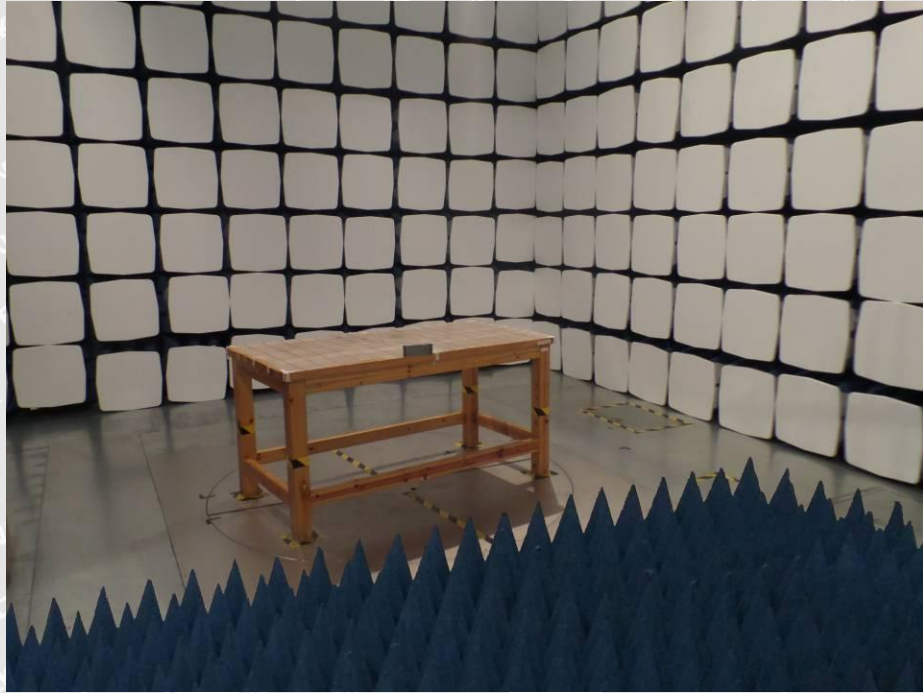
### 7.2 Photograph –ESD Test Setup







### 7.3 Photograph - Radiated immunity Test Setup



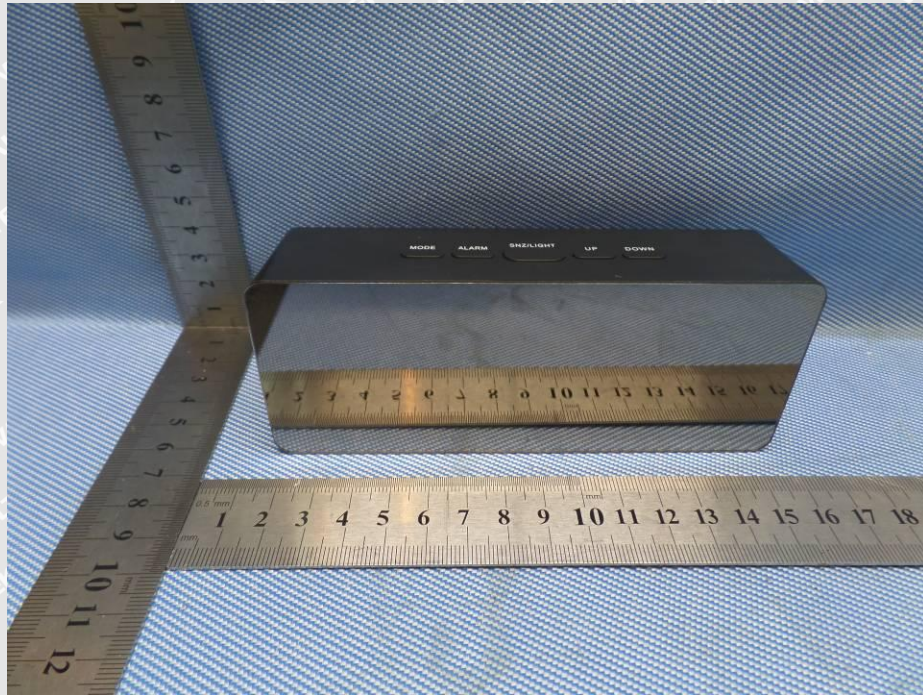
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## 8 Photographs – Constructional Details

### 8.1 EUT – Front View



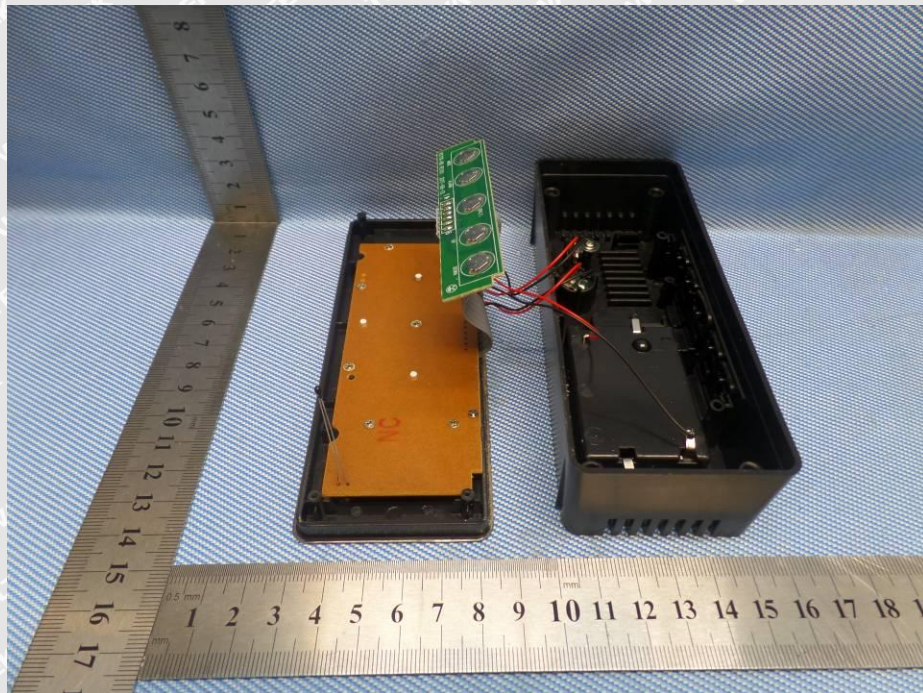
### 8.2 EUT –Back View



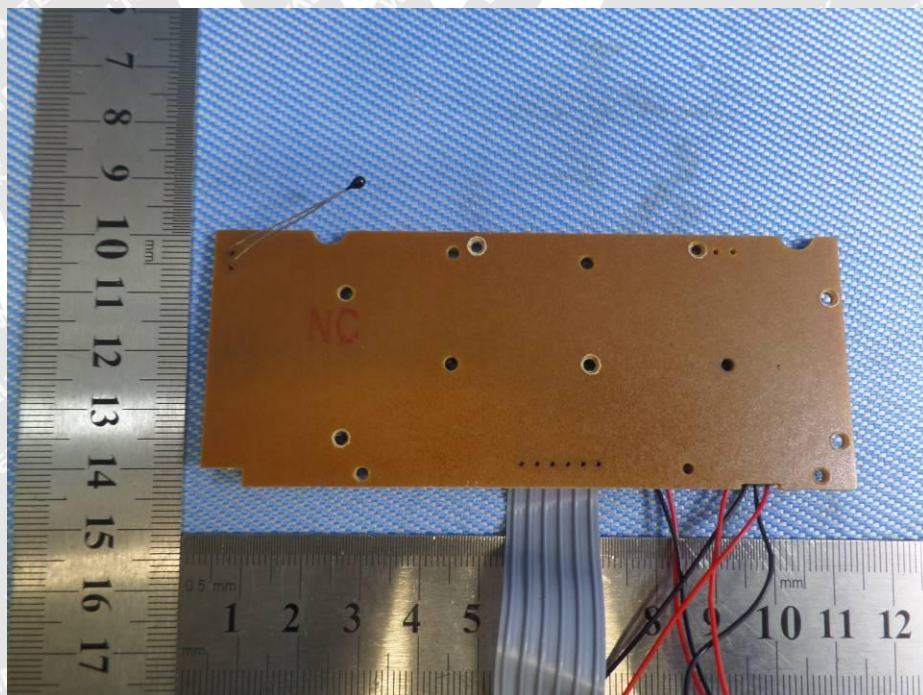




### 8.3 EUT –OpenView



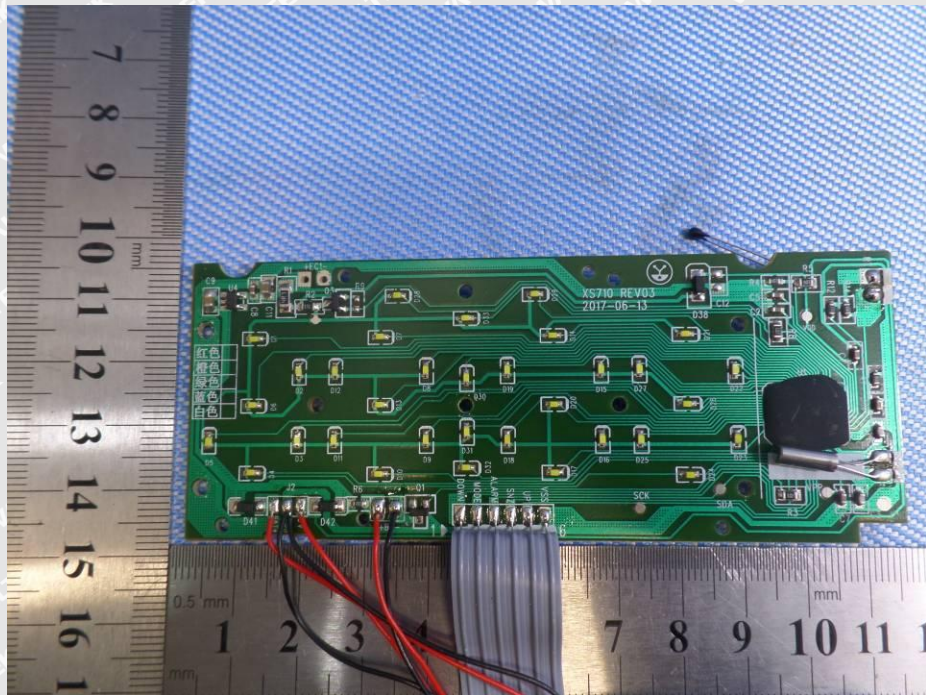
### 8.4 EUT –PCB 1- Front View



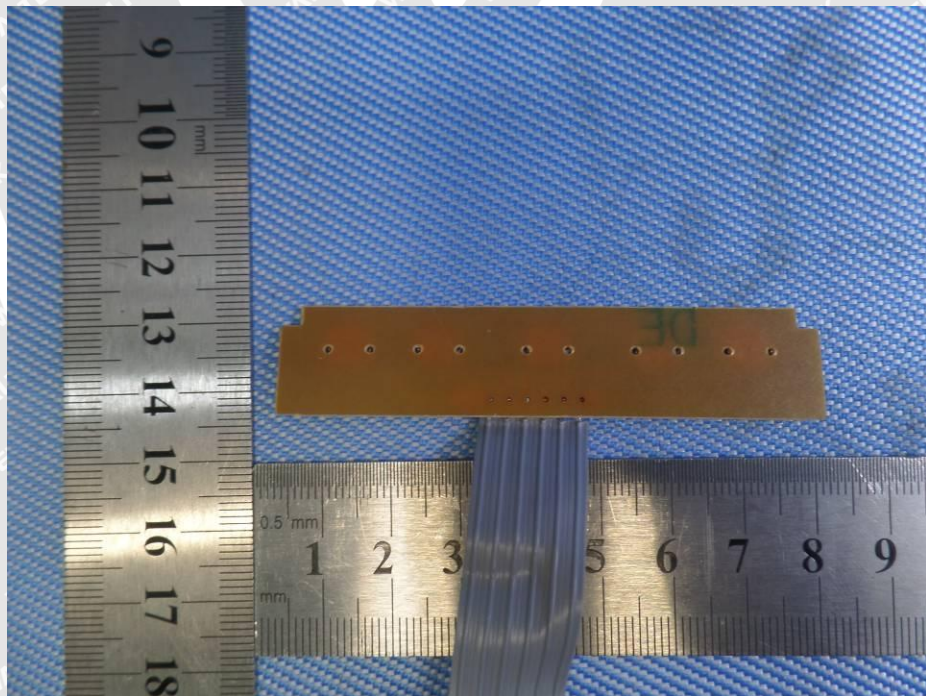




### 8.5 EUT –PCB 1- Back View



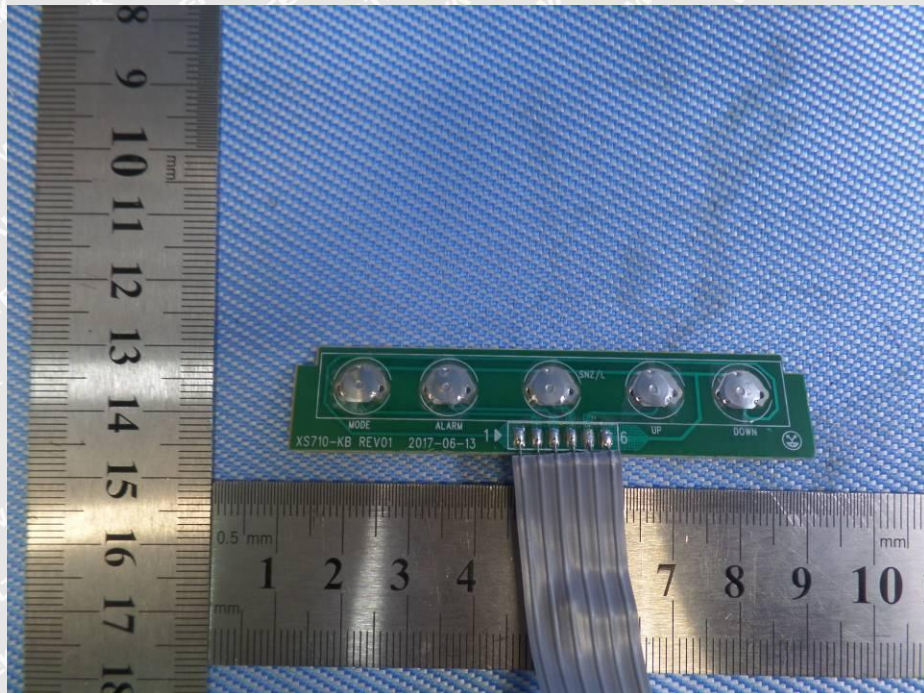
### 8.6 EUT –PCB 2- Front View







### 8.7 EUT –PCB 2- Back View



===== End of Report =====

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