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检测
TESTING
CNAS L6478

TEST REPORT

Reference No.	:	WTF22F11232116E
Applicant	:	Mid Ocean Brands B.V.
Address	:	7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Manufacturer	:	103941
Product Name	:	Round shape wall clock
Model No.	:	KC2669
Test specification	:	EN 55014-1:2017+A11:2020 EN 55014-2:2015
Date of Receipt sample	:	2022-11-22
Date of Test	:	2022-11-22
Date of Issue	:	2022-11-28
Test Report Form No.	:	WEH-55014A-03B
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 approver.

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Tested by: Leo. Feng
Leo Feng

Approved by: Danny zhou
Danny Zhou

1 Test Summary

EMISSION			
Test Item	**Test Standard**	**Class / Severity**	**Result**
Radiated Emission, 30MHz to 1000MHz	EN 55014-1:2017+A11:2020	Clause 4.3.4.5	Pass

IMMUNITY (EN 55014-2:2015)				
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: 2006+A1:2007+ A2:2010	3V/m, 80%, 1kHz, Amp. Mod.	A	Pass

Remark:

Pass	Test item meets the requirement
Fail	Test item does not meet the requirement
N/A	Test case does not apply to the test object

2 Contents

3 General Information

3.1 General Description of E.U.T.

Product Name ..... : Round shape wall clock

Model No. ..... : KC2669

Remark ..... : ---

3.2 Details of E.U.T.

Technical Data ..... : Battery 1.5V

3.3 Description of Support Units

The EUT has been tested as an independent unit. KC2669 is the test sample. All tests were performed in the condition of Battery 1.5V.

3.4 Standards Applicable for Testing

The tests were performed according to following standards:

EN 55014-1:2017+A11:2020	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1:Emission
EN 55014-2:2015	Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus-Part 2: Immunity Product Family Standard.

3.5 Test Facility

The test facility has a test site registered with the following organizations:

- **ISED – Registration No.: 21895**

Waltek Testing Group (Foshan) Co., Ltd. has been registered and fully described in a report filed with the Innovation, Science an Economic Development Canada(ISED). The acceptance letter from the ISED is maintained in our files. Registration ISED number:21895, March 12, 2019

- **FCC – Registration No.: 820106**

Waltek Testing Group (Foshan) Co., Ltd. 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 820106, August 16, 2018

- **NVLAP – Lab Code: 600191-0**

Waltek Testing Group (Foshan) Co., Ltd. EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 600191-0.
This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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.

4 Equipment Used during Test

☒Radiated Emission (30MHz to 1GHz) 1#					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1.	3m Semi-anechoic Chamber	CHANGCHUANG	9m×6m×6m	---	Valid
2.	EMI Test Receiver	R&S	ESR7	101566	Valid
3.	Trilog Broadband Antenna	SCHWARZBECK	VULB 9162	9162-117	Valid
4.	Coaxial Cable (below 1GHz)	HUBER+SUHNER	CBL3-NN-12+3m	214NN320	Valid
☐Radiated Emission (30MHz to 1GHz) 2#					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1.	3m Semi-anechoic Chamber	YIHENG	10m×5.3m×3.5m	YH2021071804	Valid
2.	EMI Test Receiver	R&S	ESR7	102454	Valid
3.	Trilog Broadband Antenna	SCHWARZBECK	VULB 9163	01418	Valid
4.	Coaxial Cable (below 1GHz)	YIHENG	LMR240UF-NMSM-7.5	---	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 Power Amplifier	OPHIR	5225R	1051/1712	Valid
2.	RF Power Amplifier	OPHIR	5293RE	1051/171	Valid
3.	Stacked double logarithmic periodic antenna	SCHWARZBECK	STLP9128E-SPECIAL	142	Valid
4.	Stacked double logarithmic periodic antenna	SCHWARZBECK	STLP 9149	476	Valid
5.	RF signal generator	Agilent	N5181A	MY48180720	Valid
6.	Power meter	RS	NRP6A	101133	Valid
7.	Power meter	RS	NRP6A	101134	Valid

☐: ***Not Used***
☒: ***Used***

4.1 Software List

Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission 1#)	FARATRONIC	EZ-EMC	RA-03A1-1
EMI Test Software (Radiated Emission 2#)	FARATRONIC	EZ-EMC	RA-03A1-1
Radiated Immunity Test Software	TONSCEND	JS35-RS	V2.0.1.7

4.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Radiated Emission	30MHz~1GHz	±4.5dB	(1)

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

4.3 Special Accessories and Auxiliary Equipment

Item	Equipment	Technical Data	Manufacturer	Model No.	Serial No.
1.	/	/	/	/	/

4.4 Decision Rule

Compliance or non-compliance with a disturbance limit shall be determined in the following manner.

If U_{LAB} is less than or equal to U_{cispr}, then

-Compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;

-Non-compliance is deemed to occur is any measured disturbance level exceeds the disturbance limt.

If U_{LAB} is greater than U_{cispr}, then

-Compliance is deemed to occur if no measured disturbance level, increased by (U_{LAB}-U_{cispr}) , exceeds the disturbance limit;

-Non-compliance is deemed to occur if any measured disturbance level, increased by (U_{LAB}-U_{cispr}) , exceeds the disturbance limit.

5 Emission Test Results

5.1 Radiated Emission, 30MHz to 1GHz

Test Requirement ..... : EN 55014-1 Clause 4.3.4.5

Test Method ..... : EN 55014-1 Clause 5.3.4

Test Result ..... : Pass

Frequency Range ..... : 30MHz to 1GHz

Class/Severity ..... : Table 9 of EN 55014-1

5.1.1 E.U.T. Operation

Operating Environment:

Temperature..... : 23.1°C

Humidity ..... : 51.8%RH

Atmospheric Pressure ..... : 101.2kPa

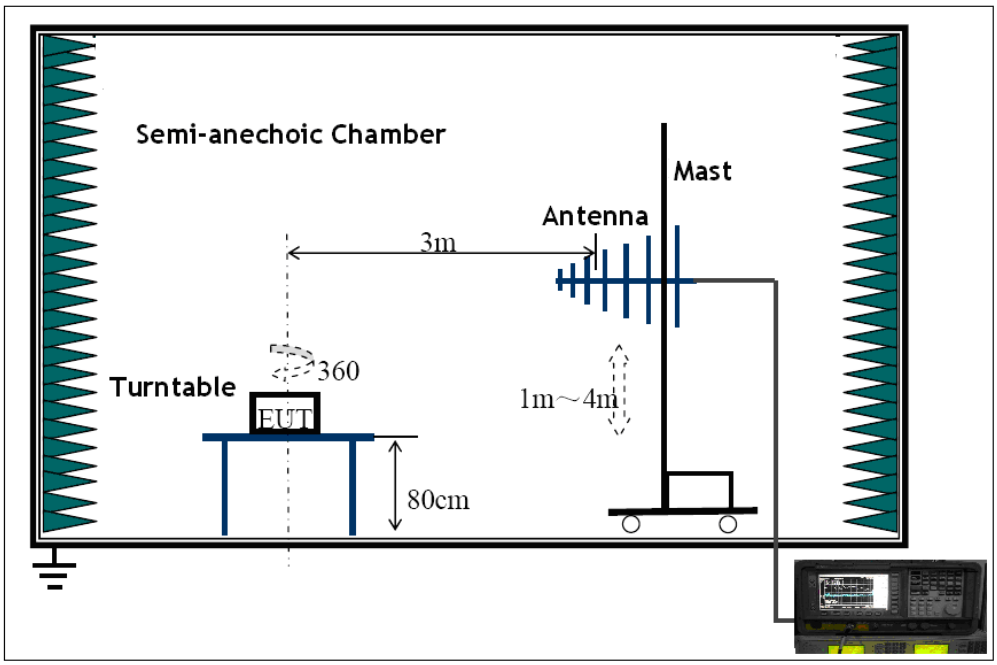
EUT Operation:

Input Voltage..... : Battery 1.5V

Operating Mode ..... : Working mode

5.1.2 Block Diagram of Test Setup

The Radiated Emission test was performed in the 3m Semi- Anechoic Chamber test site and accordance with CISPR16-2-3.



5.1.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for Horizontal & Vertical polarisation. Quasi-peak measurements were performed if peak emissions were within 6dB of the limit line.

5.1.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Corr. Factor

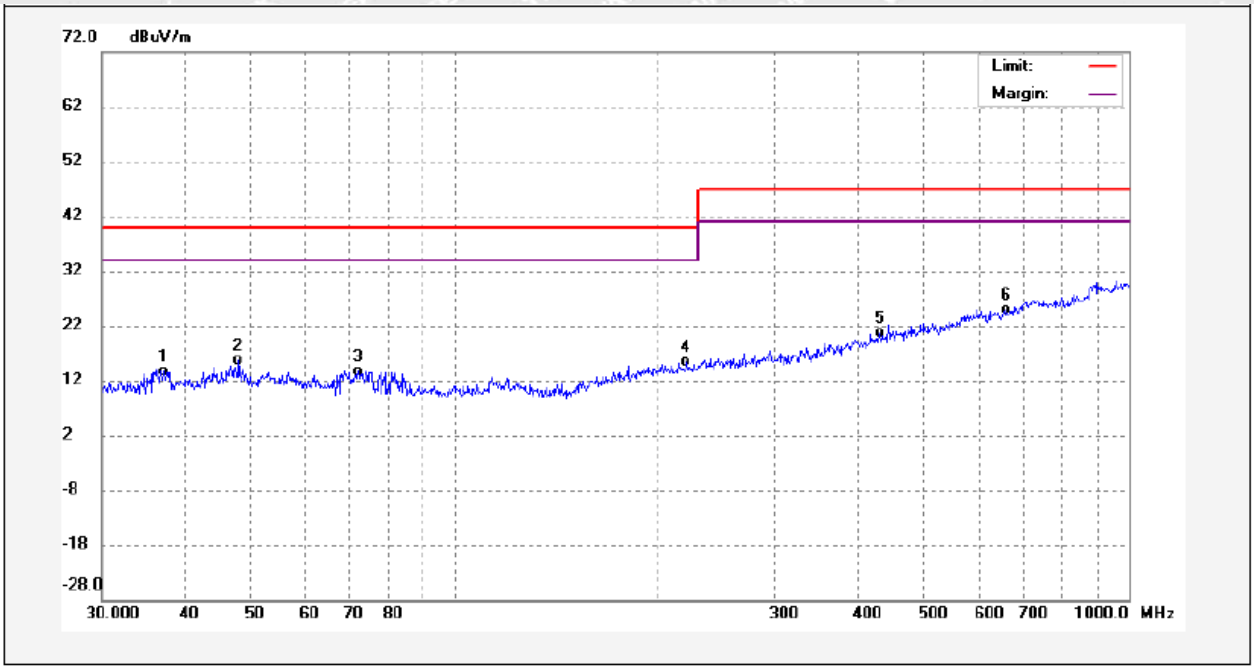
Corr.Factor=Antenna Factor + Cable Factor - Amplifier Gain

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Limit

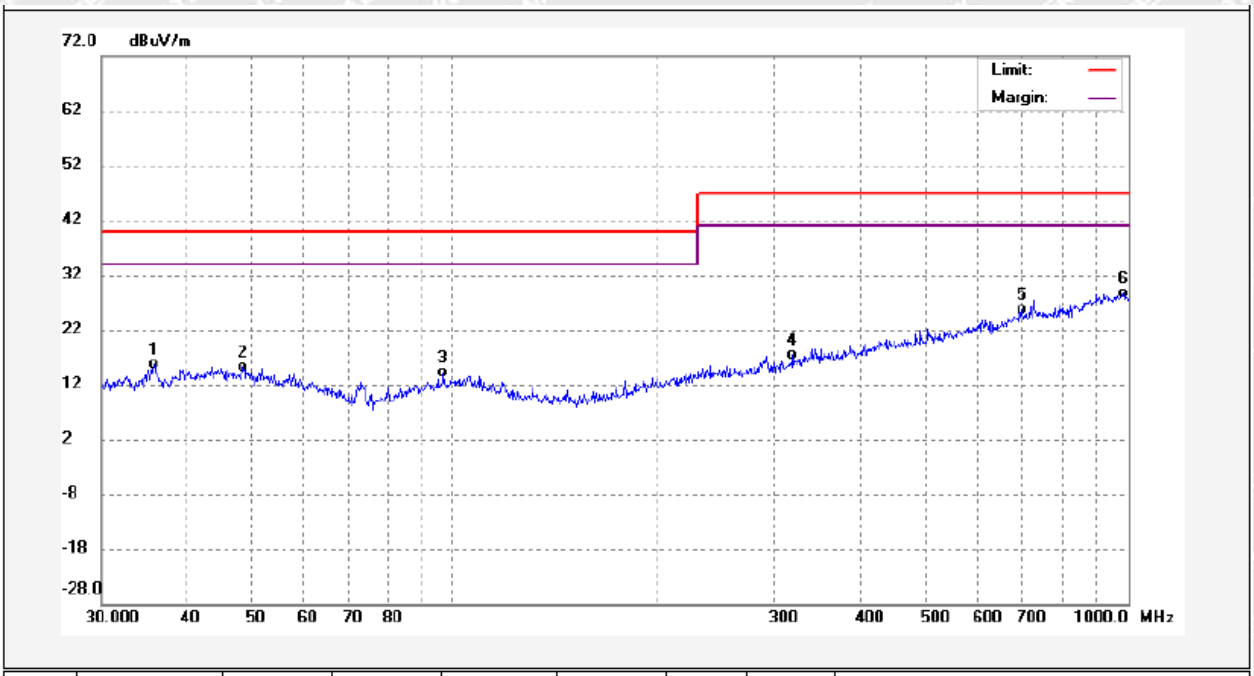
5.1.5 Radiated Emission Test Data

Vertical Polarization:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	37.1810	1.28	12.44	13.72	40.00	-26.28	QP	
2	47.9604	2.00	13.56	15.56	40.00	-24.44	QP	
3	72.1602	3.21	10.37	13.58	40.00	-26.42	QP	
4	221.3145	0.59	14.82	15.41	40.00	-24.59	QP	
5	429.0712	0.95	19.58	20.53	47.00	-26.47	QP	
6	659.2984	1.19	23.73	24.92	47.00	-22.08	QP	

Horizontal Polarization:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	35.9754	1.54	14.05	15.59	40.00	-24.41	QP	
2	48.7402	0.11	15.10	15.21	40.00	-24.79	QP	
3	96.5715	0.58	13.49	14.07	40.00	-25.93	QP	
4	318.5935	0.96	16.33	17.29	47.00	-29.71	QP	
5	696.6124	2.12	23.60	25.72	47.00	-21.28	QP	
6	982.6200	1.45	27.19	28.64	47.00	-18.36	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 55014-2.

6.2 Electrostatic Discharge (ESD)

Test Requirement ..... : EN 55014-2 Clause 5.1

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 ..... : 23.4°C

Humidity ..... : 52.7%RH

Barometric Pressure ..... : 101.1kPa

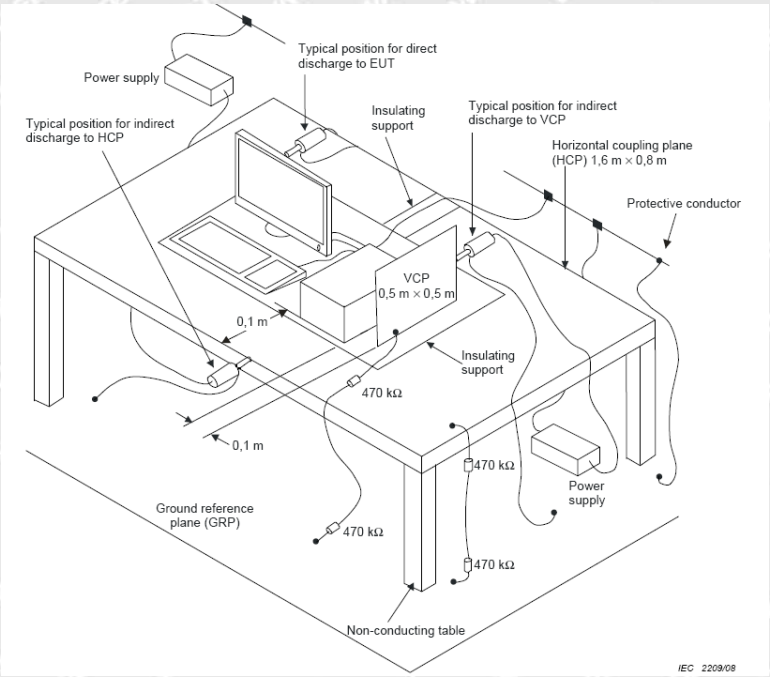
EUT Operation:

Input Voltage ..... : Battery 1.5V

Operating Mode ..... : On mode

6.2.2 Block Diagram of Setup

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



6.2.3Direct 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)

6.3 Radio-Frequency Electromagnetic Fields, 80MHz to 1GHz

Test Requirement ..... : EN 55014-2 Clause 5.5

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

Test Distance ..... : 3m

6.3.1E.U.T. Operation

Operating Environment:

Temperature ..... : 22.7°C

Humidity ..... : 52.4% RH

Barometric Pressure ..... : 100.9kPa

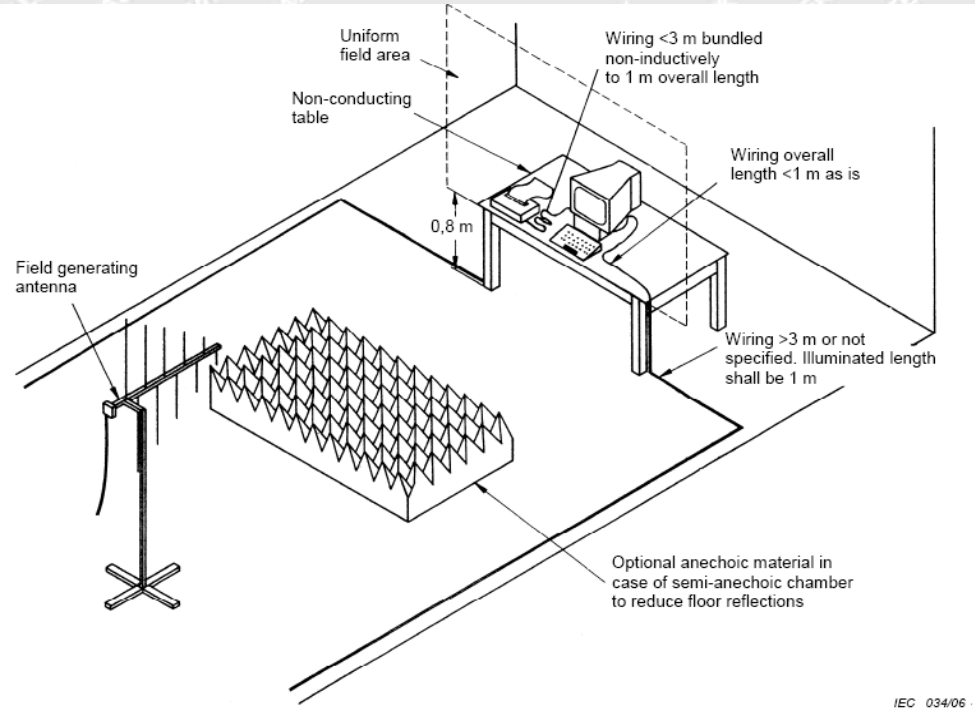
EUT Operation:

Input Voltage ..... : Battery 1.5V

Operating Mode ..... : On 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.



6.3.3Test Results

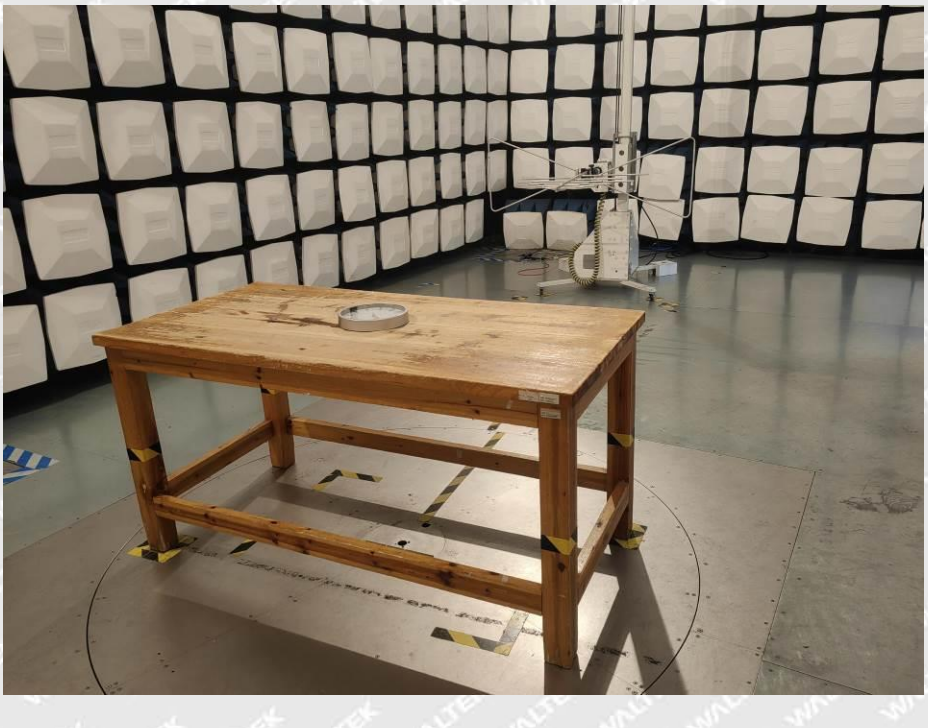
Frequency	Face of EUT	Antenna polarisation	Test Level	Step Size	Dwell Time	Performance Criterion	Result
80 to 1000MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
80 to 1000MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*

Remark:

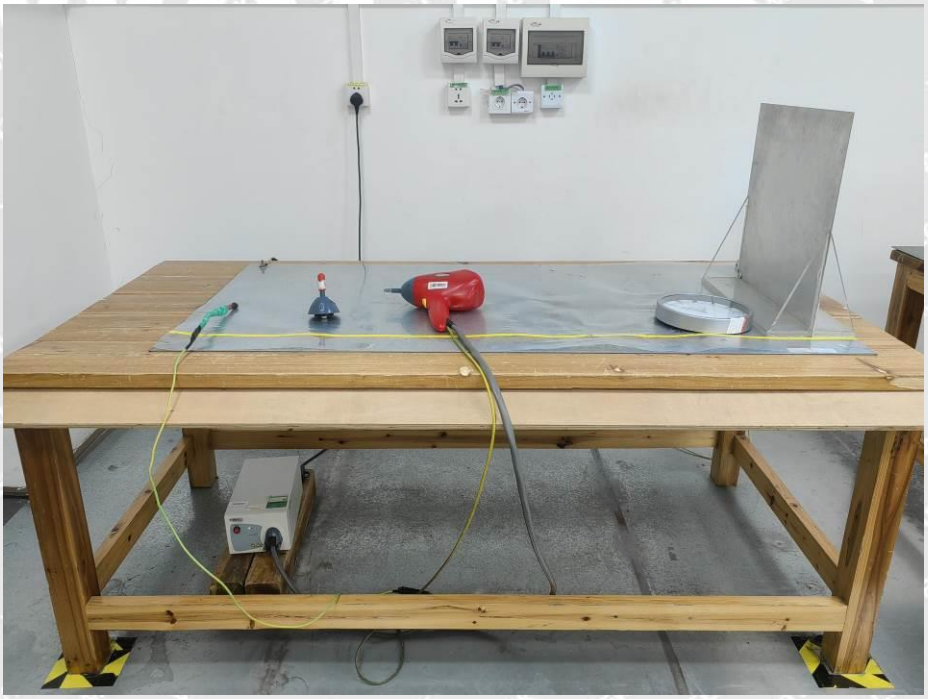
* During the test no deviation was detected to the selected operation mode(s)

7 Photographs – Test Setup

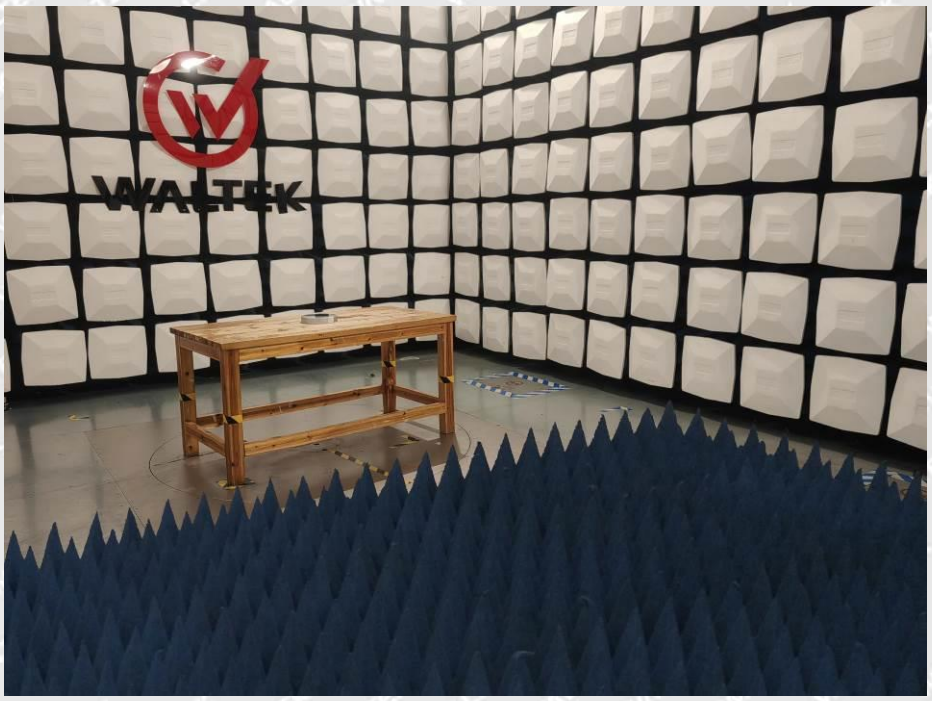
7.1 Photograph – Radiated Emission Test Setup



7.2 Photograph – ESD Immunity Test Setup



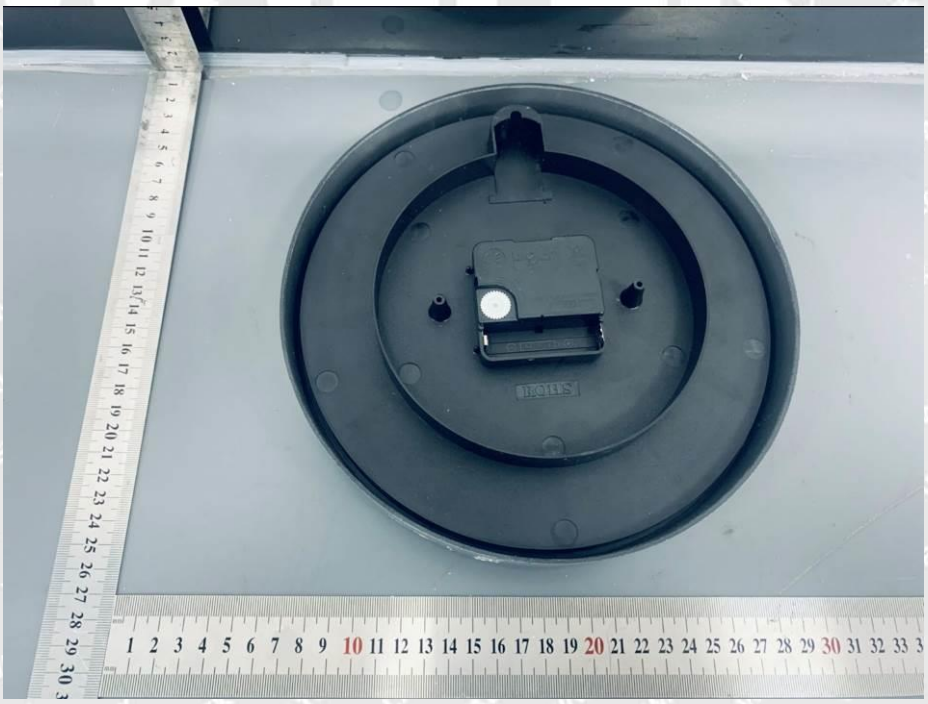
7.3 Photograph – Radio-Frequency Electromagnetic Fields Immunity Test Setup



8 Photographs – Constructional Details

8.1 EUT – Front View

8.2 EUT – Back View



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