



中国认可  
国际互认  
检测  
TESTING  
CNAS L6478



# TEST REPORT

Reference No. .... : WTF20F07044013E  
 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  
 Standards ..... : EN 55014-1:2017  
 EN 55014-2:2015  
 Date of Receipt sample .... : 2020-07-13  
 Date of Test ..... : 2020-07-17  
 Date of Issue ..... : 2020-07-17  
 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 compiler and approver.

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## 1 Test Summary

EMISSION				
Test Item	Test Standard	Class / Severity	Result	
Radiated Emission, 30MHz to 1000MHz	EN 55014-1:2017	Clause 4.3.4	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 61000-4-3:2010	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

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### 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\*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

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.

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### 3.5 Test Facility

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

- **ISED – Registration No.: 21895**

Waltek Services (Foshan) Co., Ltd. has been registered and fully described in a report filed with the Innovation, Science and 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 Services (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 Services (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.

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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.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	01561	Valid
5.	Preamplifier	Lunar E M	LNA1G18-40	20160501002	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	MY48080720	Valid
6.	Power meter	RS	NRP6A	101133	Valid
7.	Power meter	RS	NRP6A	101134	Valid
8.	Electric field probe	Narda	EP 601	611WX70311	Valid

##### 4.1 Software List

Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)	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	±4.1dB	(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 if any measured disturbance level exceeds the disturbance limit.

**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.

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## 5 Emission Test Results

### 5.1 Radiated Emission, 30MHz to 1GHz

Test Requirement..... : EN 55014-1  
Test Method..... : EN 55014-1  
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:

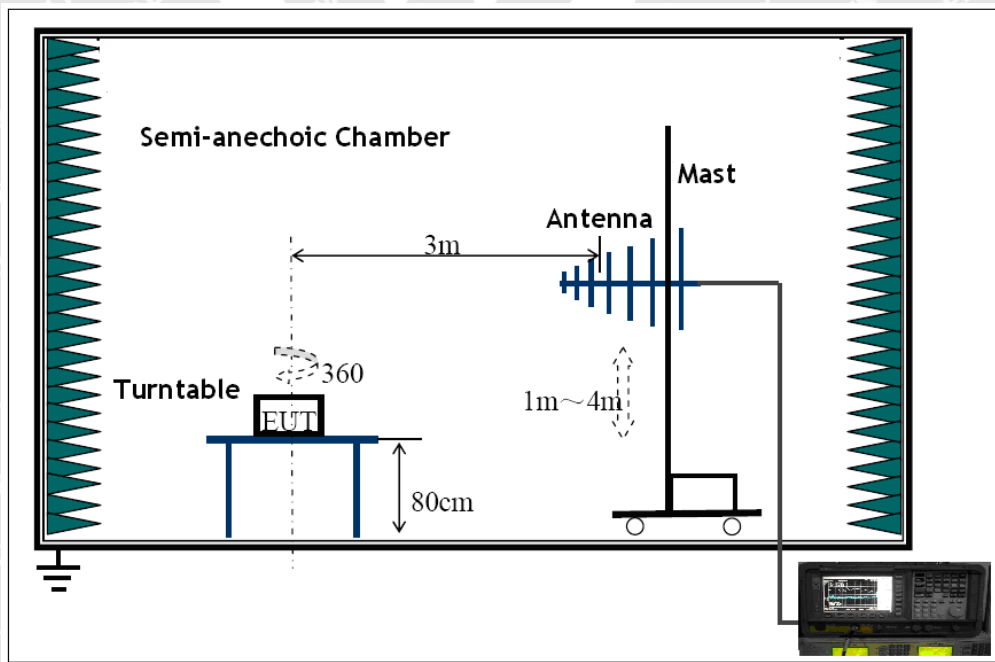
Temperature..... : 23.1°C  
Humidity..... : 51.6%RH  
Atmospheric Pressure..... : 101.2kPa

##### 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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Corr. Factor}$$

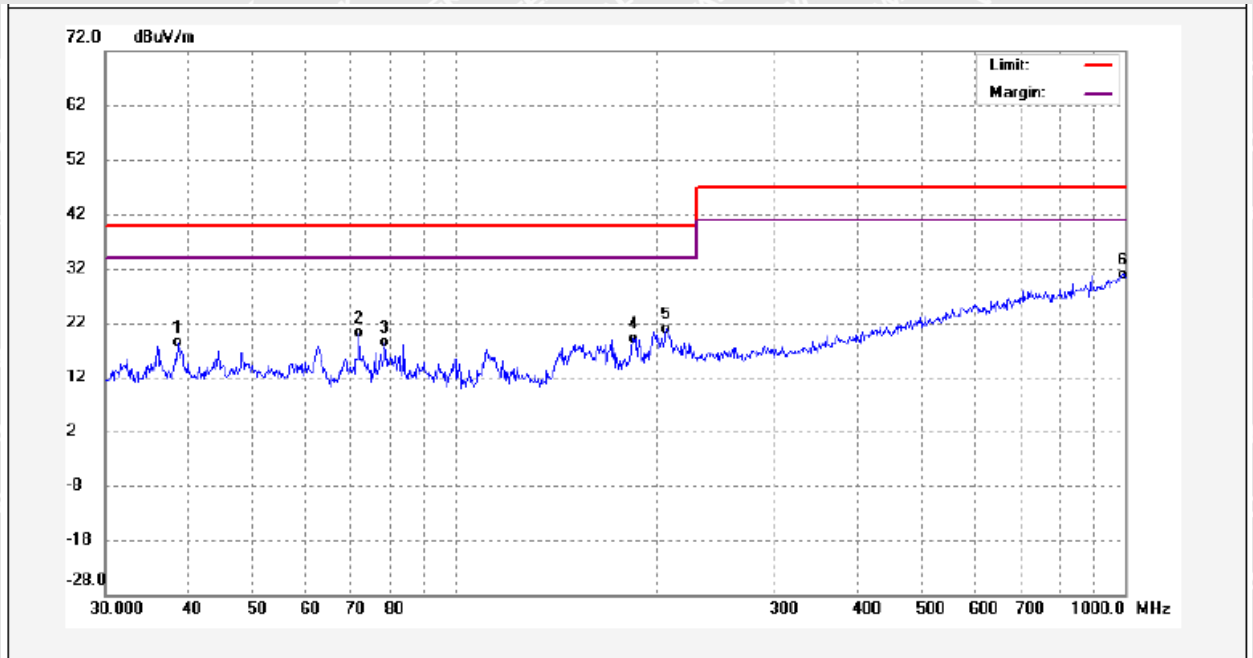
$$\text{Corr. Factor} = \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

### 5.1.5 Radiated Emission Test Data

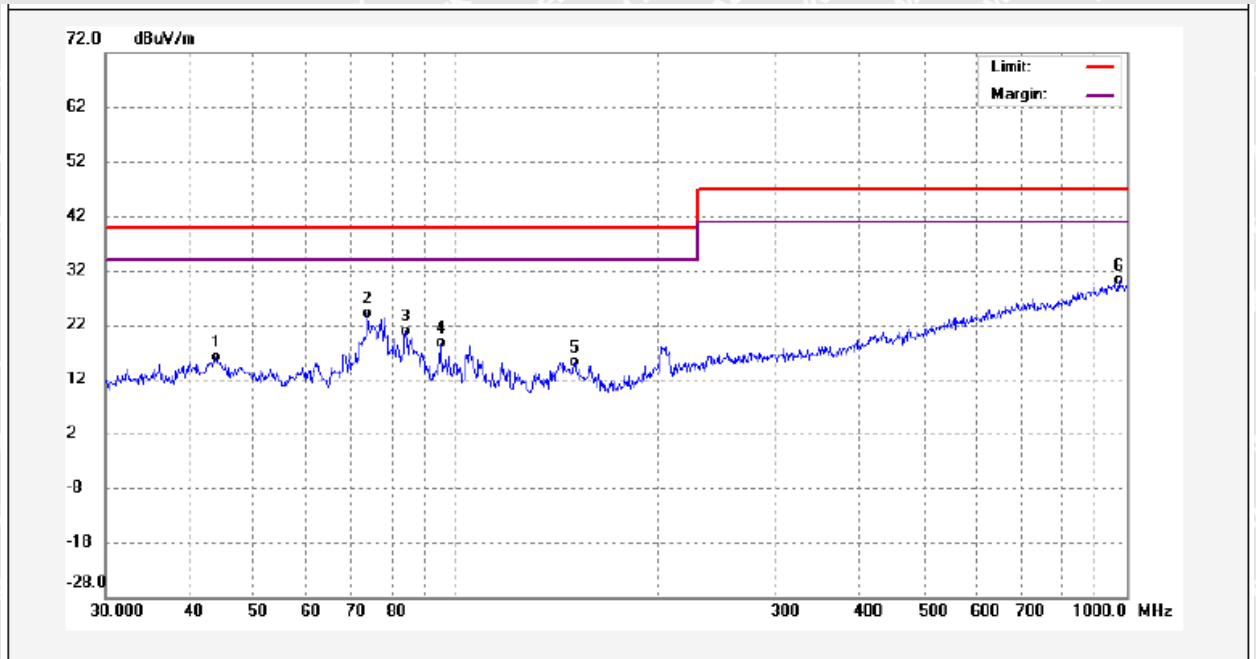
#### Vertical Polarization:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	38.6025	5.65	12.66	18.31	40.00	-21.69	QP	
2	72.0337	9.76	10.39	20.15	40.00	-19.85	QP	
3	78.4683	8.13	10.19	18.32	40.00	-21.68	QP	
4	184.8783	5.40	13.81	19.21	40.00	-20.79	QP	
5	207.0499	6.47	14.33	20.80	40.00	-19.20	QP	
6	994.7539	2.38	28.57	30.95	47.00	-16.05	QP	



**Horizontal Polarization :**



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	43.9967	0.54	15.62	16.16	40.00	-23.84	QP	
2	73.8756	14.63	9.52	24.15	40.00	-15.85	QP	
3	84.3167	10.27	10.57	20.84	40.00	-19.16	QP	
4	94.8931	6.91	11.81	18.72	40.00	-21.28	QP	
5	150.2741	5.30	9.94	15.24	40.00	-24.76	QP	
6	973.3608	2.52	27.57	30.09	47.00	-16.91	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.



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## 6.2 Electrostatic Discharge (ESD)

<b>Test Requirement</b> .....	:	EN 55014-2
<b>Test Method</b> .....	:	IEC 61000-4-2
<b>Test Result</b> .....	:	Pass
<b>Discharge Impedance</b> .....	:	330Ω / 150pF
<b>Discharge Voltage</b> .....	:	Air Discharge: ±8kV Contact Discharge: ±4kV HCP & VCP: ±4kV
<b>Polarity</b> .....	:	Positive & Negative
<b>Number of Discharge</b> .....	:	Minimum 10 times at each test point
<b>Discharge Mode</b> .....	:	Single Discharge
<b>Discharge Period</b> .....	:	1 second minimum

### 6.2.1 E.U.T. Operation

#### Operating Environment:

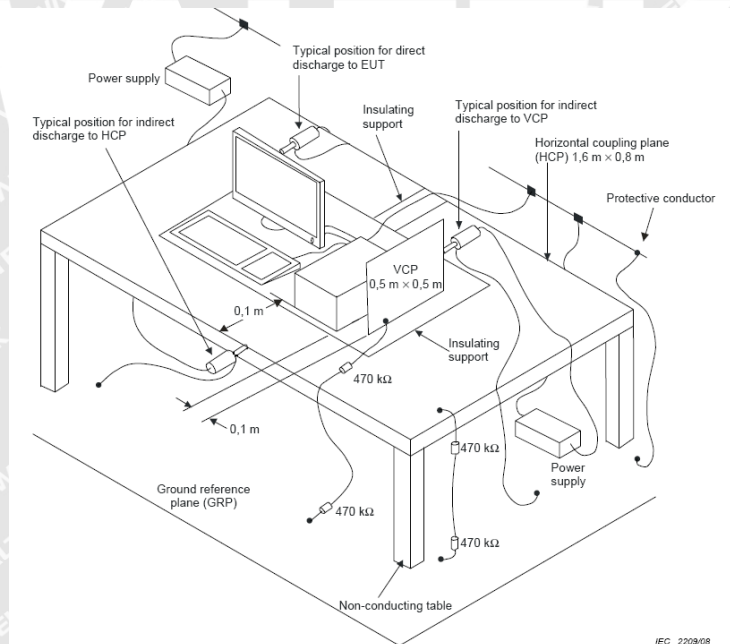
<b>Temperature</b> .....	:	20.2°C
<b>Humidity</b> .....	:	49.5%RH
<b>Barometric Pressure</b> .....	:	100.2kPa

#### EUT Operation:

<b>Input Voltage</b> .....	:	Battery 1.5V
<b>Operating Mode</b> .....	:	On mode

### 6.2.2 Block Diagram of Setup

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







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

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

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

##### Operating Environment:

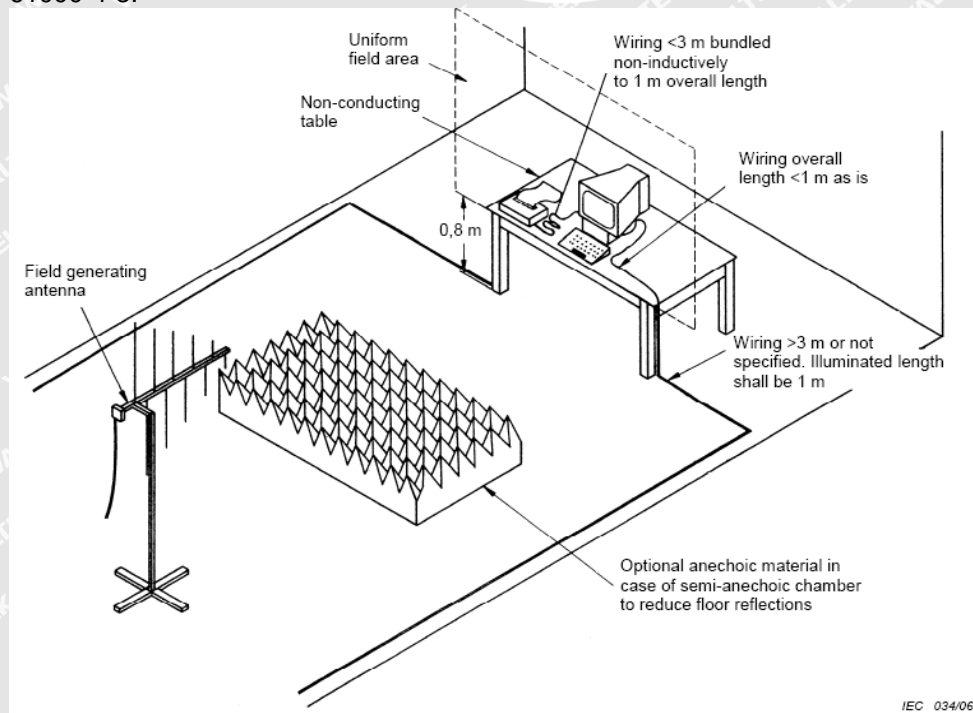
Temperature .....	: 25.8°C
Humidity .....	: 48.9% RH
Barometric Pressure .....	: 100.2kPa

##### 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.



IEC 034/06



### 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)

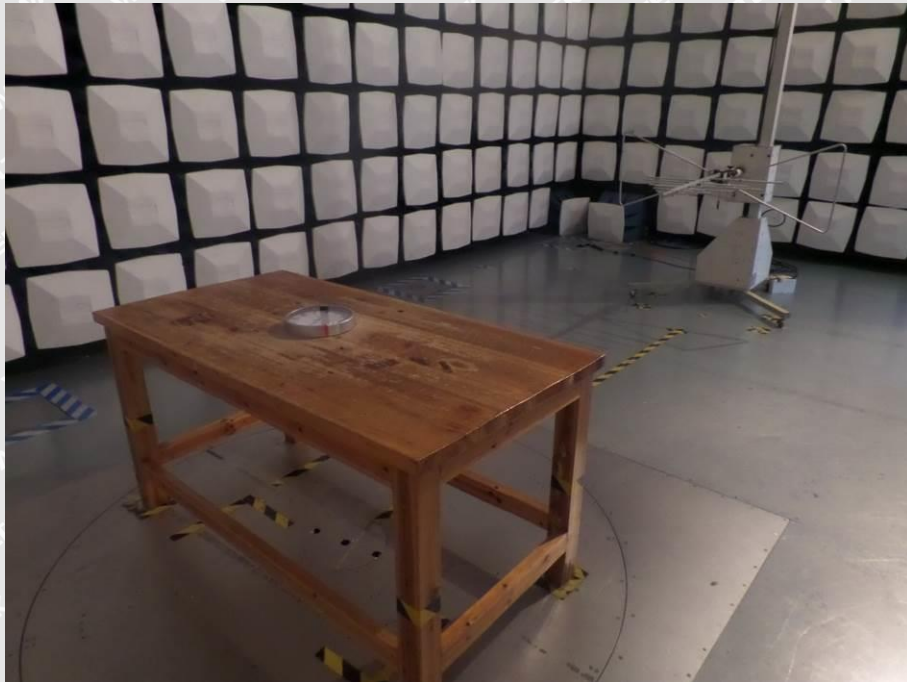


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## 7 Photographs – Test Setup

### 7.1 Photograph – Radiated Emission Test Setup



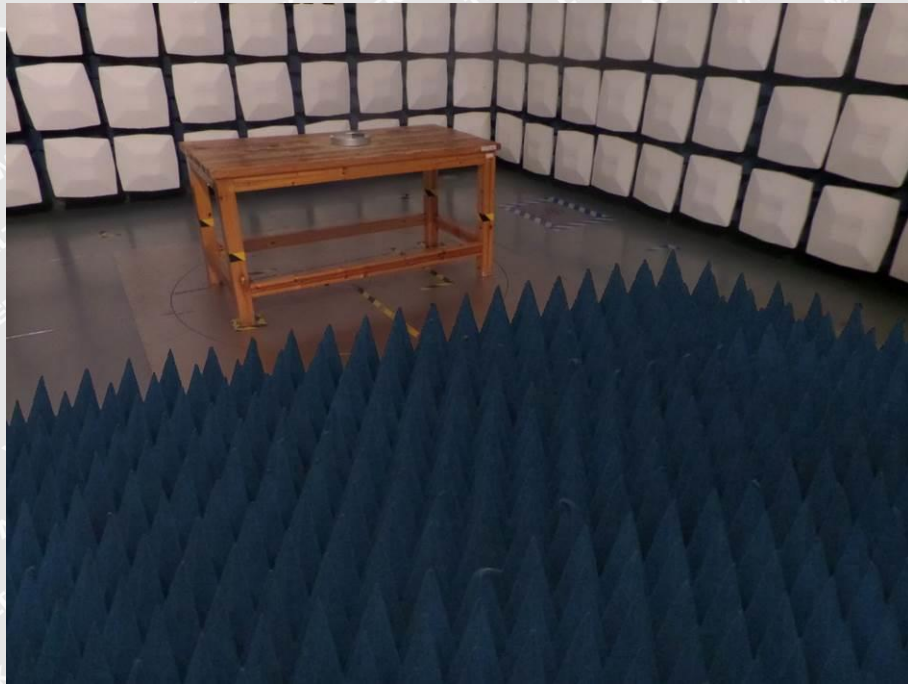
### 7.2 Photograph – ESD Immunity Test Setup







### 7.3 Photograph – Radio-Frequency Electromagnetic Fields Immunity Test Setup



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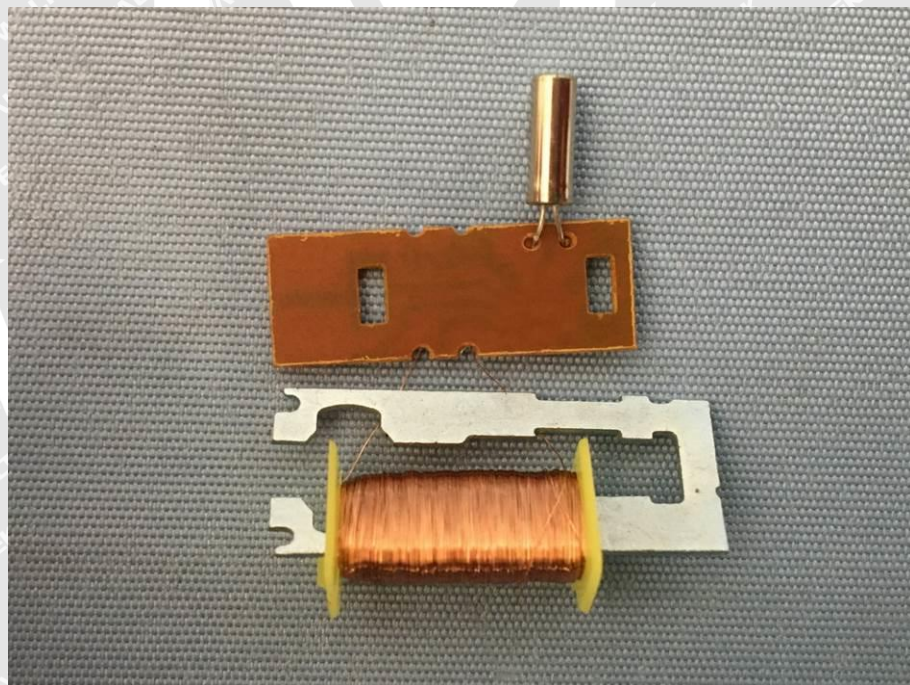
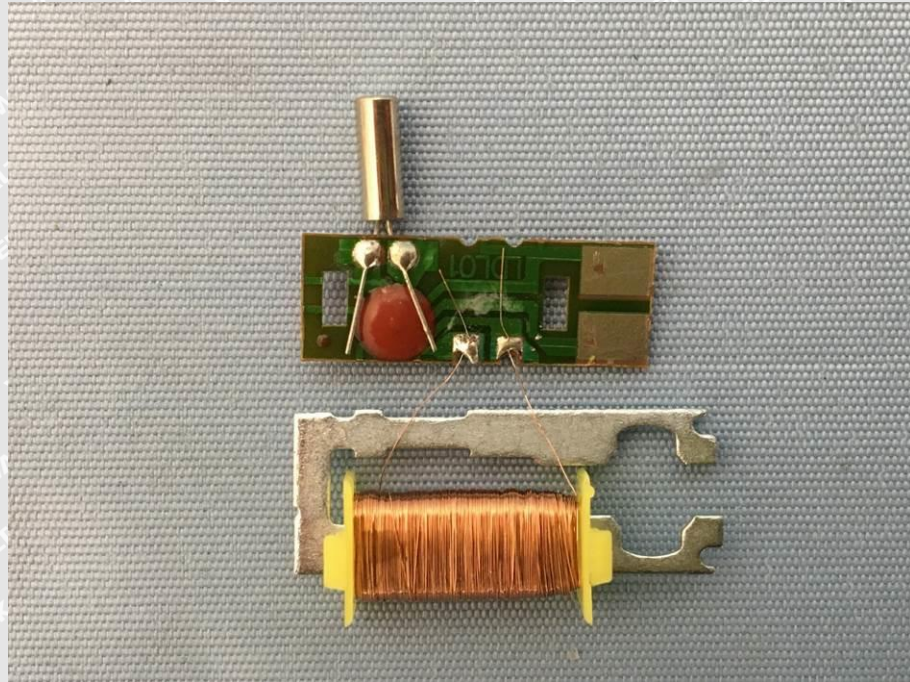
## 8 Photographs – Constructional Details

### 8.1 EUT – External View





## 8.2 EUT – Internal View



==== End of Report ====