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检测
TESTING
CNAS L3110

TEST REPORT

Reference No.	:	WTF18F06116623E
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	:	103221
Product Name	:	Bluetooth Speaker
Model No.	:	MO9261
Standards	:	EN 55032:2015 EN 55024:2010+A1:2015
Date of Receipt sample	:	2018-07-02
Date of Test	:	2018-07-02 to 2018-07-18
Date of Issue	:	2018-07-18
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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Approved by:

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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
Radiation Emission, 1GHz to 6GHz	EN 55032:2015	Table A.5	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	Test item meets 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 ..... : Bluetooth Speaker

Model No. ..... : MO9261

Remark ..... : ---

3.2 Details of E.U.T.

Technical Data ..... : Li-Ion 300mAh battery x 5.5.g; Recharged Voltage: 3.7 V

3.3 Description of Support Units

The EUT has been tested as an independent unit. MO9261 is the test sample. All tests were performed in the condition of DC 5V input 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.

4 Equipment Used during Test

Radiated Emission					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1.	EMI Test Receiver	R&S	ESCI	101296	Valid
2.	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Valid
3.	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Valid
4.	Cable	HUBER+SUHNER	CBL2	525178	Valid
ESD					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1.	Electrostatic Discharge Simulator	Em Test	DITO	V0745103094	Valid
Radio-frequency electromagnetic fields					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1.	Signal Generater	R&S	SMB100A	105942	Valid
2.	RF Power Amplifier	BONN Elekronik	BLWA0830-160/100/40D	128740	Valid
3.	Gestockte Breitband (Stacked) Log.-per.Antenna	SCHWARZBECK	STLP9128D	043	Valid
4.	Power Meter	R&S	NRP2	102031	Valid

4.1 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

4.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conducted Emission	150kHz~30MHz	±2.66dB	(1)
Radiated Emission	30MHz~1000MHz	±5.03dB	(1)
Radiated Emission	1GHz ~ 6GHz	±4.96dB	(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 , 30MHz to 1000MHz

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 ..... : 23.1°C

Humidity..... : 48.5%RH

Atmospheric Pressure ..... : 101.2 kPa

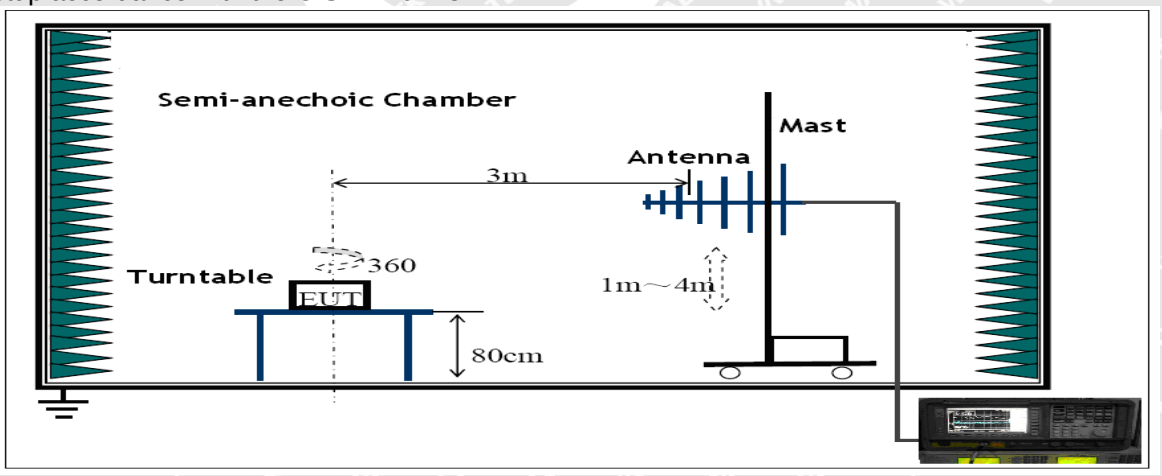
EUT Operation:

Input Voltage ..... : USB 5V

Operating Mode..... : Discharging+BT mode or Charging+BT mode

5.1.2 Block Diagram of Test Setup

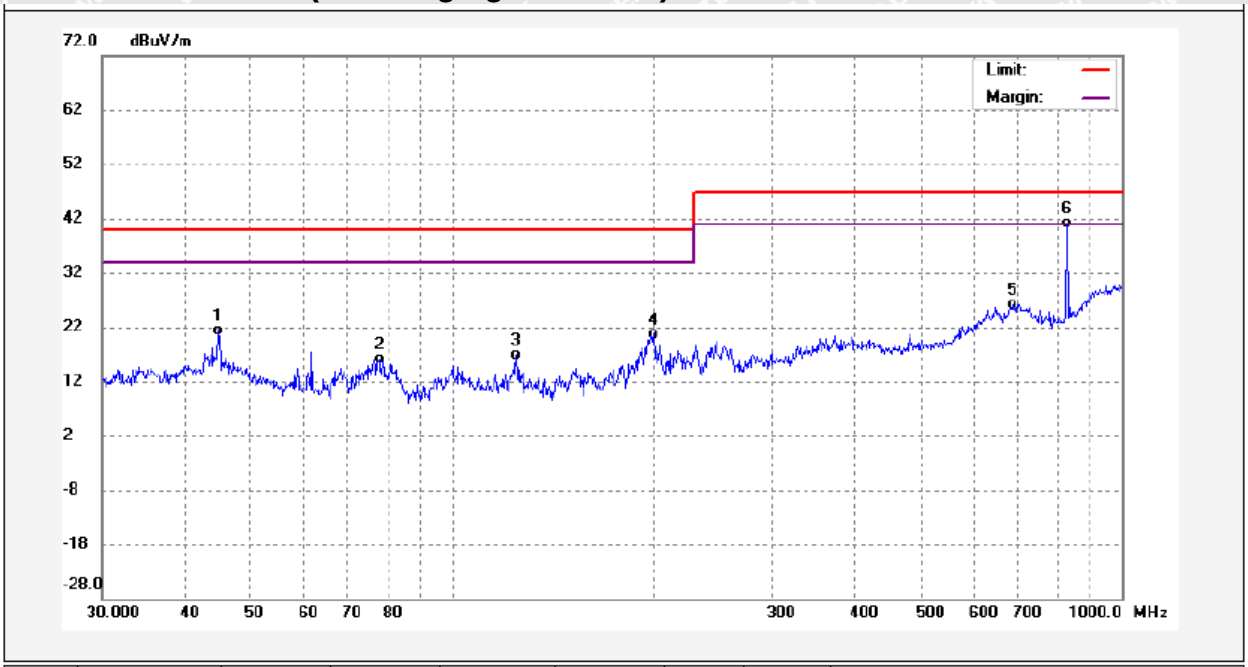
The Radiated Emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the CISPR 16-2-3.



5.1.3 Radiated Emission Test Data

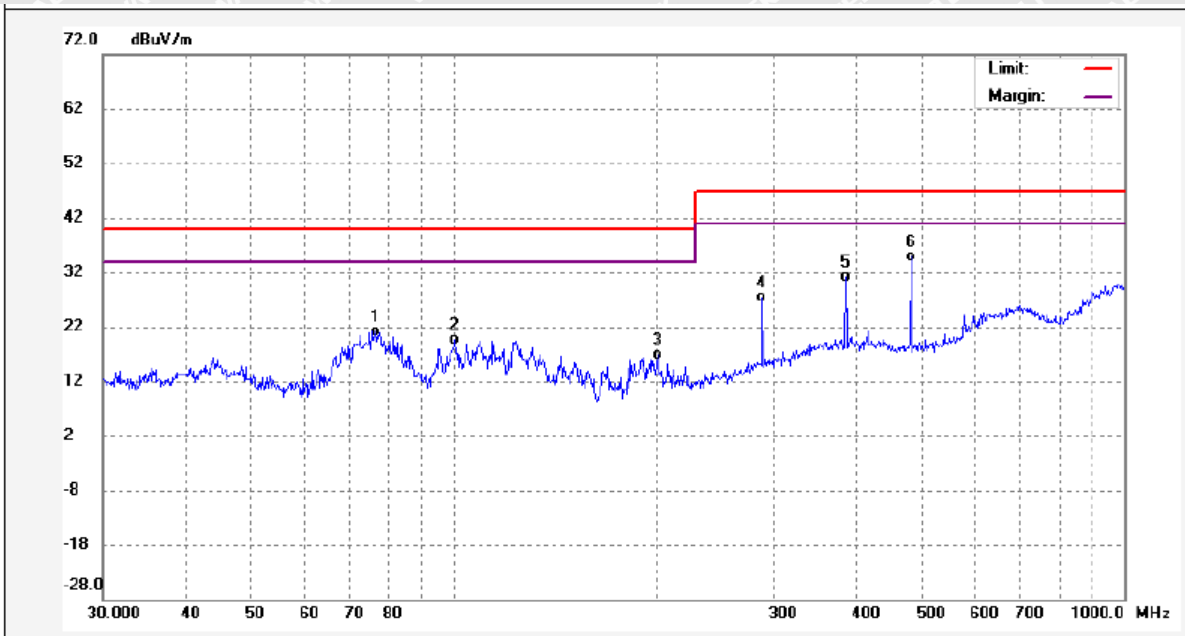
According to the data in section 5.2.4, the EUT complied with the EN 55032 standards.

Vertical Polarization (Discharging+BT mode)



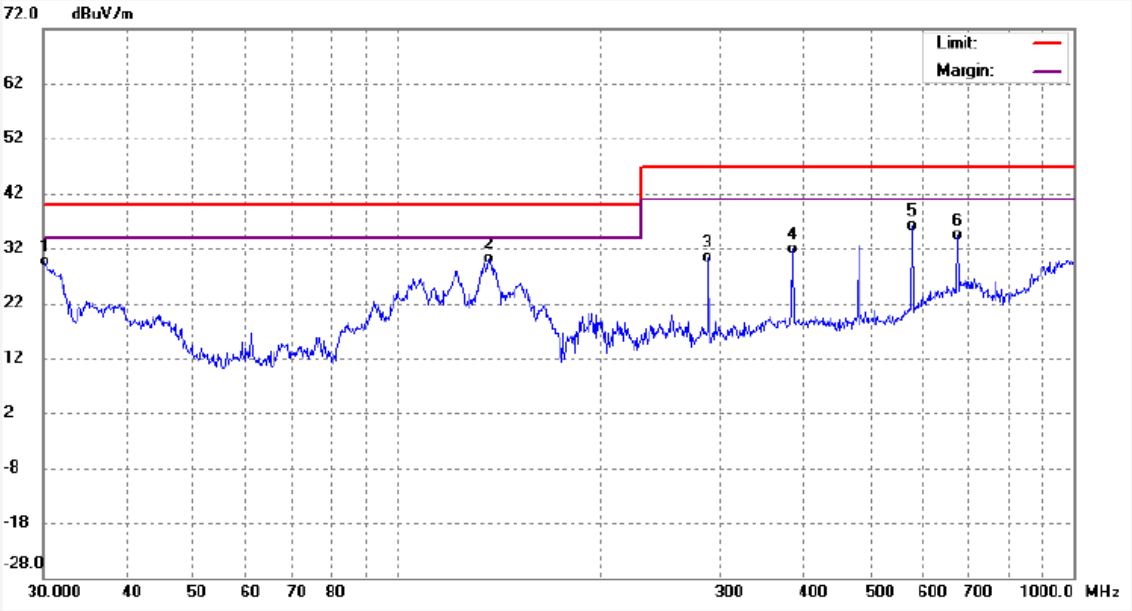
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	44.7433	5.55	15.87	21.42	40.00	-18.58	QP	
2	77.8654	7.69	8.39	16.08	40.00	-23.92	QP	
3	124.5690	5.63	11.16	16.79	40.00	-23.21	QP	
4	199.2855	9.08	11.67	20.75	40.00	-19.25	QP	
5	687.1507	1.28	24.90	26.18	47.00	-20.82	QP	
6	827.4934	17.26	23.93	41.19	47.00	-5.81	QP	

Horizontal Polarization (Discharging+BT mode)



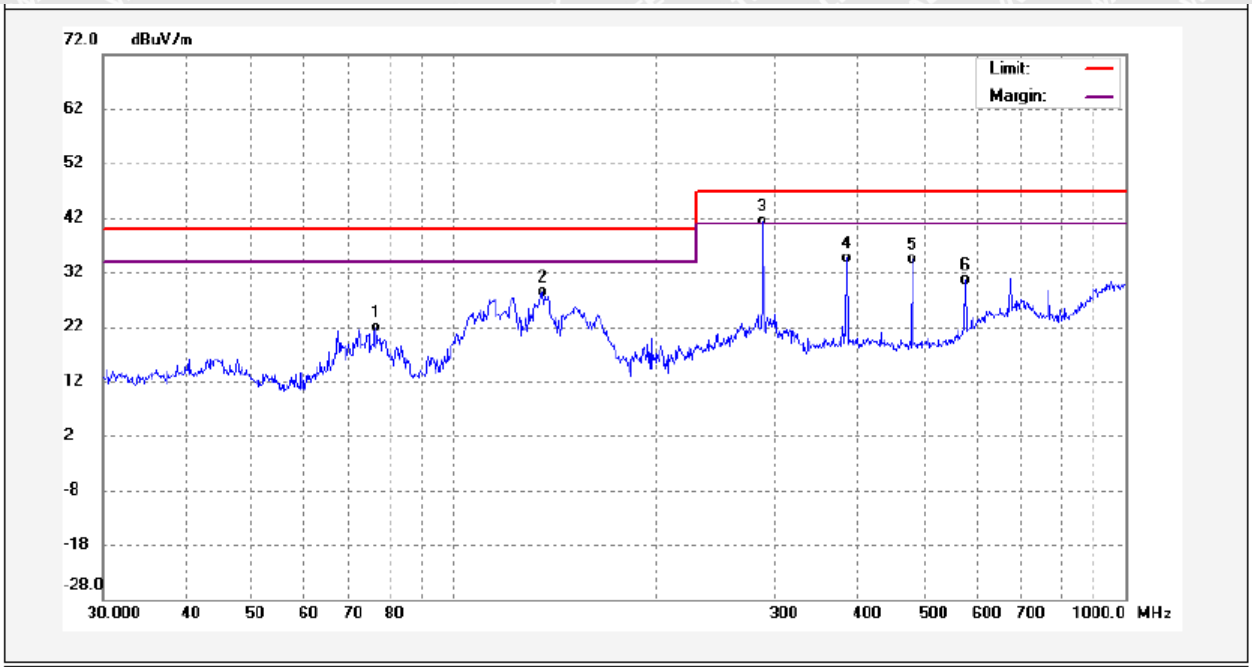
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	76.5121	12.78	8.37	21.15	40.00	-18.85	QP	
2	100.5806	8.00	11.64	19.64	40.00	-20.36	QP	
3	201.3930	5.25	11.66	16.91	40.00	-23.09	QP	
4	287.9904	11.83	15.51	27.34	47.00	-19.66	QP	
5	383.9318	11.99	19.25	31.24	47.00	-15.76	QP	
6	480.5276	16.48	18.36	34.84	47.00	-12.16	QP	

Vertical Polarization (Charging+BT mode)



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	30.1054	16.54	13.16	29.70	40.00	-10.30	QP	
2	136.4598	20.41	9.65	30.06	40.00	-9.94	QP	
3	287.9904	14.92	15.47	30.39	47.00	-16.61	QP	
4	383.9318	12.89	18.95	31.84	47.00	-15.16	QP	
5	576.6443	15.71	20.35	36.06	47.00	-10.94	QP	
6	672.8444	10.30	24.14	34.44	47.00	-12.56	QP	

Horizontal Polarization (Charging+BT mode)



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	76.5121	13.42	8.37	21.79	40.00	-18.21	QP	
2	135.5062	18.65	9.82	28.47	40.00	-11.53	QP	
3	287.9904	25.87	15.51	41.38	47.00	-5.62	QP	
4	383.9318	15.27	19.25	34.52	47.00	-12.48	QP	
5	480.5276	16.08	18.36	34.44	47.00	-12.56	QP	
6	576.6443	10.18	20.41	30.59	47.00	-16.41	QP	

5.2 Radiated Emission ,1GHz to 6GHz

Test Requirement..... : EN 55032

Test Method..... : EN 55032

Test Limit..... : Table A.5 of EN 55032

Test Result..... : Pass

Frequency Range..... : 1GHz to 6GHz

Class..... : Class B

5.2.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 23.1°C

Humidity..... : 48.5%RH

Atmospheric Pressure ..... : 101.2 kPa

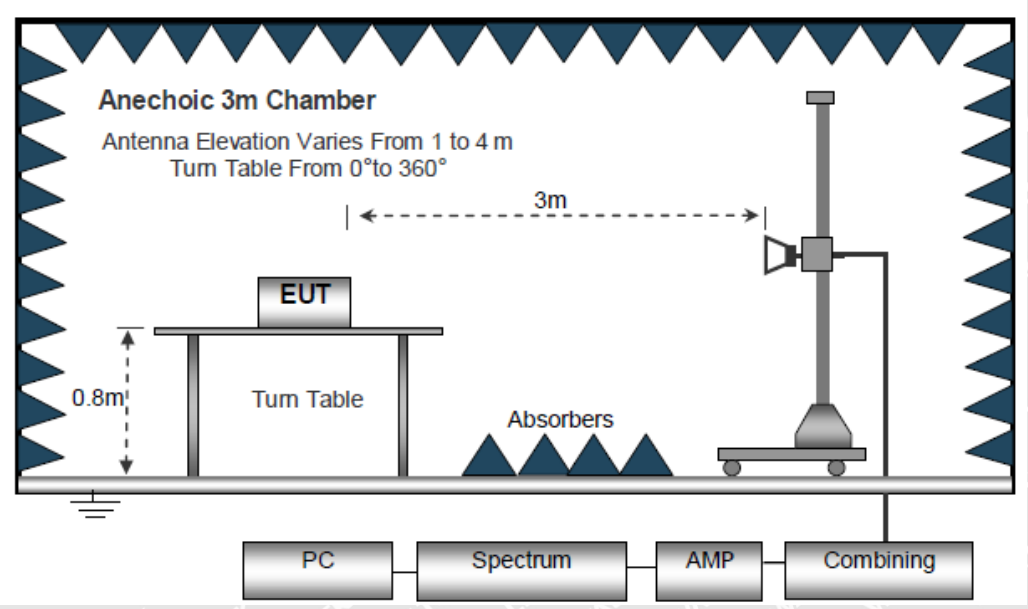
EUT Operation:

Input Voltage ..... : USB 5V

Operating Mode..... : Discharging+BT mode or Charging+BT mode

5.2.2 Block Diagram of Test Setup

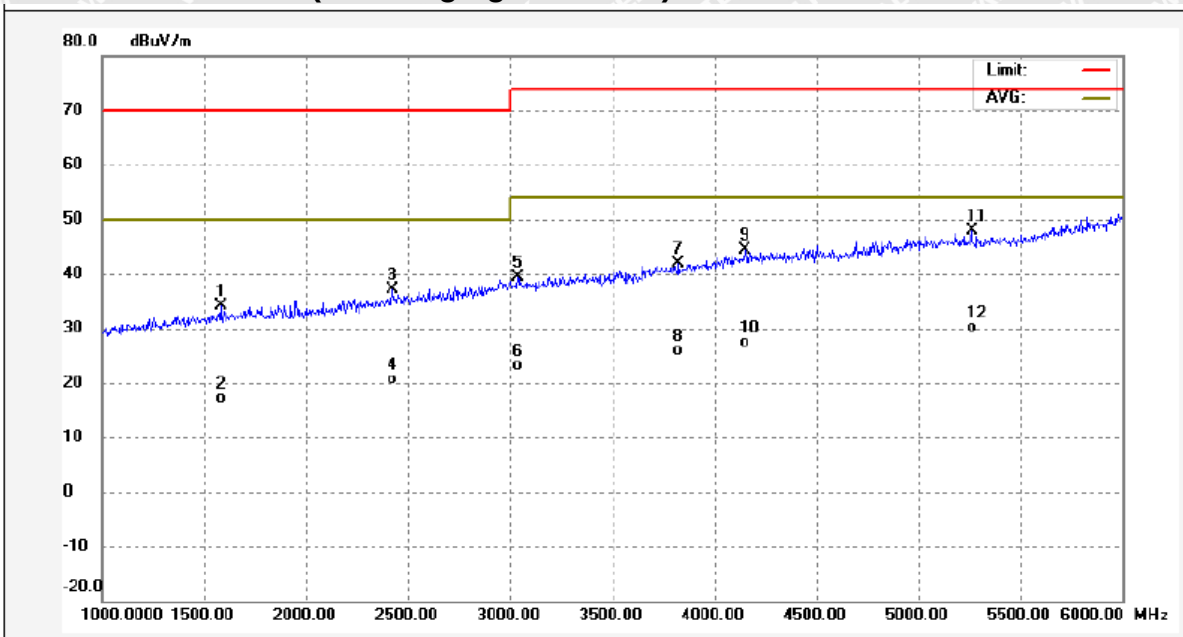
The Radiated Emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the CISPR 16-2-3.



5.2.3 Radiated Emission Test Data

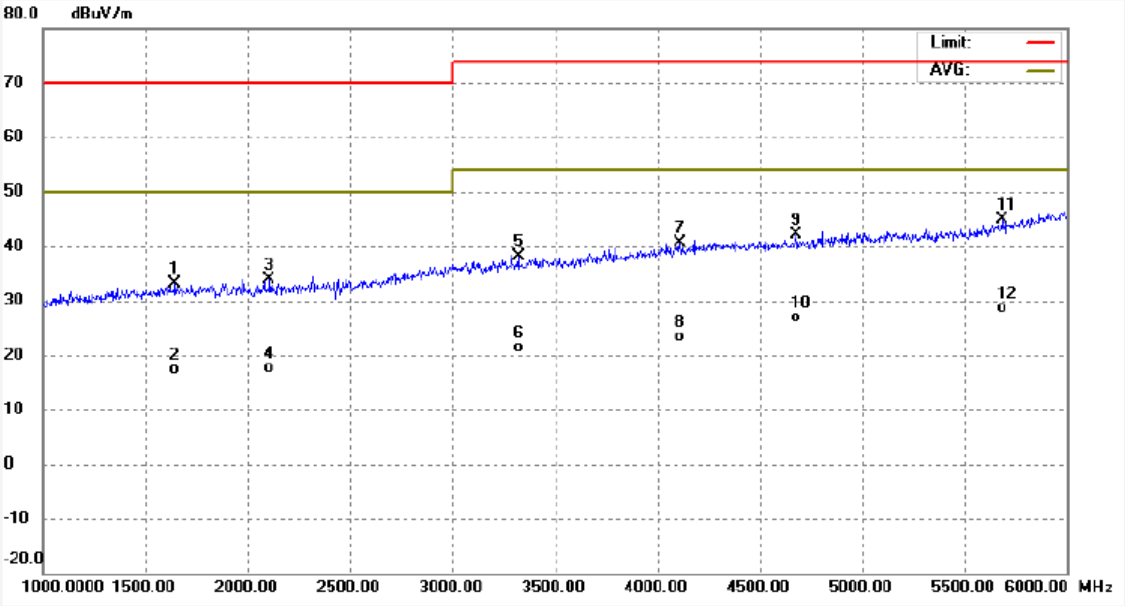
According to the data in section 5.2.4, the EUT complied with the EN 55032 standards.

Vertical Polarization (Discharging+BT mode)



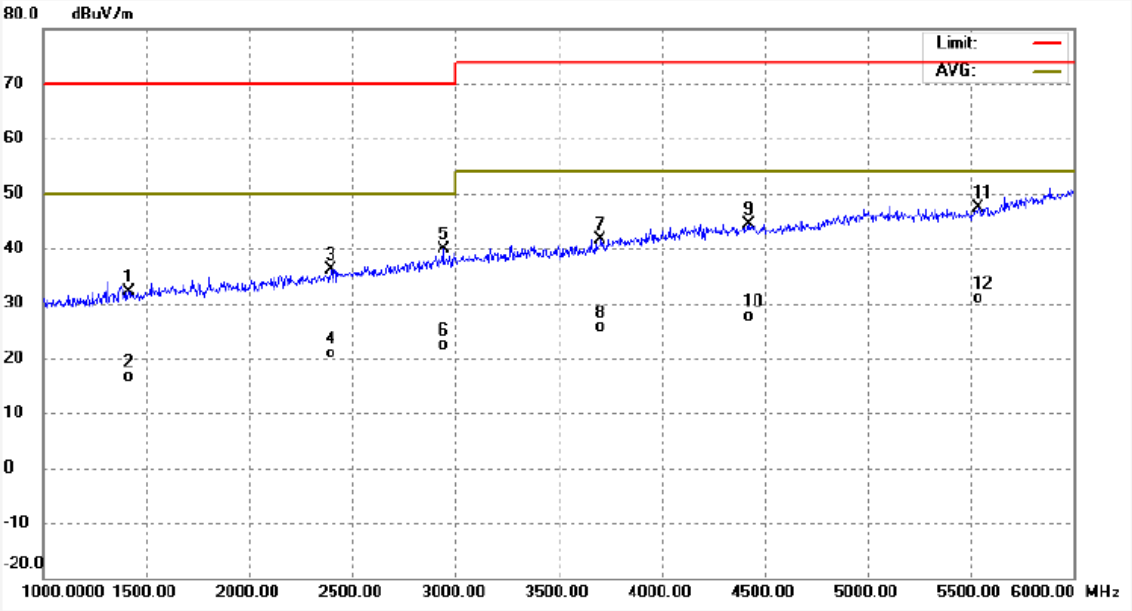
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1580.000	47.81	-13.59	34.22	70.00	-35.78	peak	
2	1580.000	30.82	-13.59	17.23	50.00	-32.77	AVG	
3	2420.000	48.04	-10.82	37.22	70.00	-32.78	peak	
4	2420.000	31.47	-10.82	20.65	50.00	-29.35	AVG	
5	3035.000	48.26	-8.90	39.36	74.00	-34.64	peak	
6	3035.000	32.02	-8.90	23.12	54.00	-30.88	AVG	
7	3825.000	48.56	-6.62	41.94	74.00	-32.06	peak	
8	3825.000	32.40	-6.62	25.78	54.00	-28.22	AVG	
9	4150.000	49.78	-5.44	44.34	74.00	-29.66	peak	
10	4150.000	32.82	-5.44	27.38	54.00	-26.62	AVG	
11	5260.000	49.87	-2.01	47.86	74.00	-26.14	peak	
12	5260.000	32.12	-2.01	30.11	54.00	-23.89	AVG	

Horizontal Polarization (Discharging+BT mode)



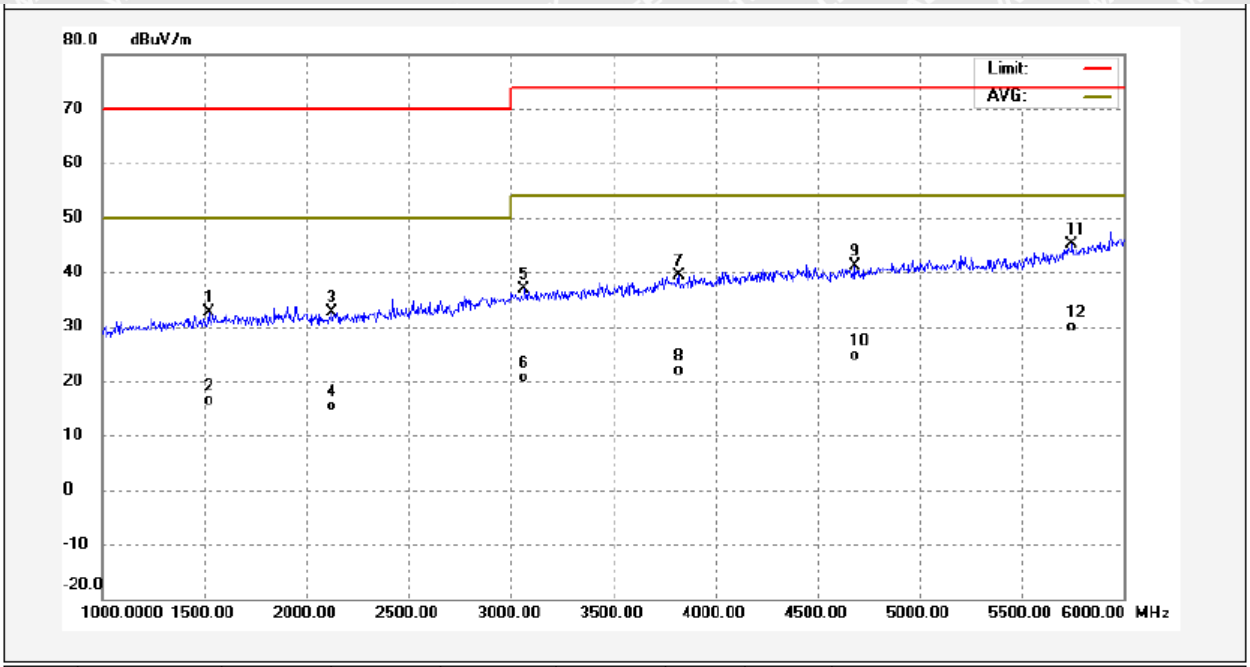
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1645.000	46.76	-13.75	33.01	70.00	-36.99	peak	
2	1645.000	31.13	-13.75	17.38	50.00	-32.62	AVG	
3	2105.000	47.27	-13.50	33.77	70.00	-36.23	peak	
4	2105.000	31.06	-13.50	17.56	50.00	-32.44	AVG	
5	3320.000	48.44	-10.32	38.12	74.00	-35.88	peak	
6	3320.000	31.79	-10.32	21.47	54.00	-32.53	AVG	
7	4110.000	49.37	-8.70	40.67	74.00	-33.33	peak	
8	4110.000	32.15	-8.70	23.45	54.00	-30.55	AVG	
9	4675.000	49.11	-7.00	42.11	74.00	-31.89	peak	
10	4675.000	33.87	-7.00	26.87	54.00	-27.13	AVG	
11	5680.000	50.30	-5.32	44.98	74.00	-29.02	peak	
12	5680.000	33.97	-5.32	28.65	54.00	-25.35	AVG	

Vertical Polarization (Charging+BT mode)



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1415.000	46.23	-14.06	32.17	70.00	-37.83	peak	
2	1415.000	30.60	-14.06	16.54	50.00	-33.46	AVG	
3	2395.000	47.04	-10.93	36.11	70.00	-33.89	peak	
4	2395.000	31.75	-10.93	20.82	50.00	-29.18	AVG	
5	2940.000	48.96	-9.17	39.79	70.00	-30.21	peak	
6	2940.000	31.54	-9.17	22.37	50.00	-27.63	AVG	
7	3705.000	48.70	-7.07	41.63	74.00	-32.37	peak	
8	3705.000	32.78	-7.07	25.71	54.00	-28.29	AVG	
9	4420.000	48.95	-4.54	44.41	74.00	-29.59	peak	
10	4420.000	32.22	-4.54	27.68	54.00	-26.32	AVG	
11	5535.000	49.09	-1.82	47.27	74.00	-26.73	peak	
12	5535.000	32.70	-1.82	30.88	54.00	-23.12	AVG	

Horizontal Polarization (Charging+BT mode)



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1520.000	46.27	-13.75	32.52	70.00	-37.48	peak	
2	1520.000	30.22	-13.75	16.47	50.00	-33.53	AVG	
3	2125.000	46.00	-13.45	32.55	70.00	-37.45	peak	
4	2125.000	28.73	-13.45	15.28	50.00	-34.72	AVG	
5	3065.000	47.78	-10.86	36.92	74.00	-37.08	peak	
6	3065.000	31.50	-10.86	20.64	54.00	-33.36	AVG	
7	3820.000	48.87	-9.38	39.49	74.00	-34.51	peak	
8	3820.000	31.29	-9.38	21.91	54.00	-32.09	AVG	
9	4680.000	48.06	-6.99	41.07	74.00	-32.93	peak	
10	4680.000	31.62	-6.99	24.63	54.00	-29.37	AVG	
11	5745.000	50.23	-5.09	45.14	74.00	-28.86	peak	
12	5745.000	34.93	-5.09	29.84	54.00	-24.16	AVG	

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.

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:

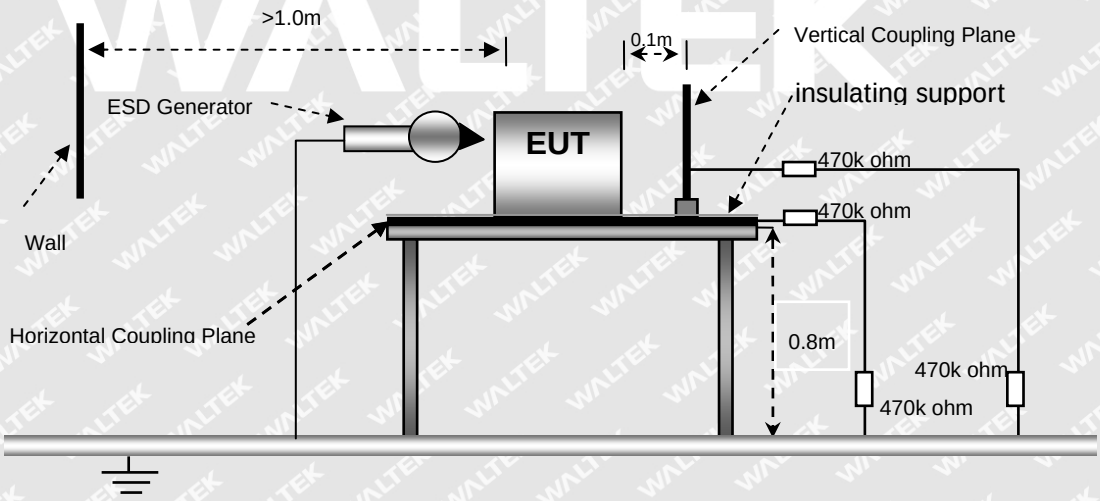
Temperature	:	23.4°C
Humidity	:	52.7%RH
Atmospheric Pressure	:	101.3kPa

EUT Operation:

Input Voltage	:	USB 5V
Operating Mode	:	On 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)

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

6.3.1E.U.T. Operation

Operating Environment:

Temperature ..... : 23.2°C

Humidity ..... : 46.8%RH

Barometric Pressure ..... : 100.1Pa

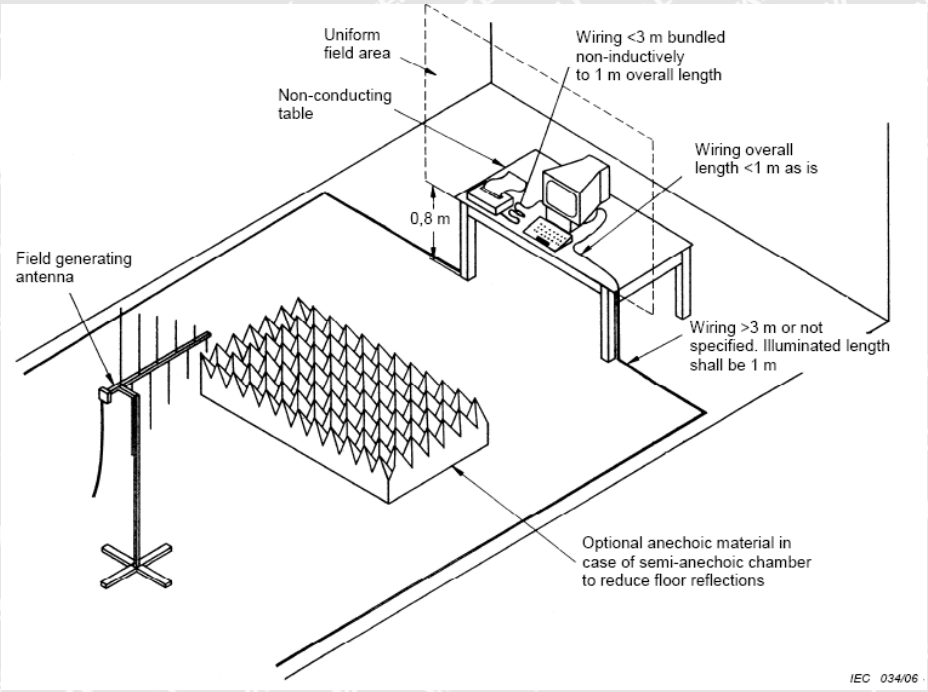
EUT Operation:

Input Voltage ..... : USB 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.



6.3.3 Test Results

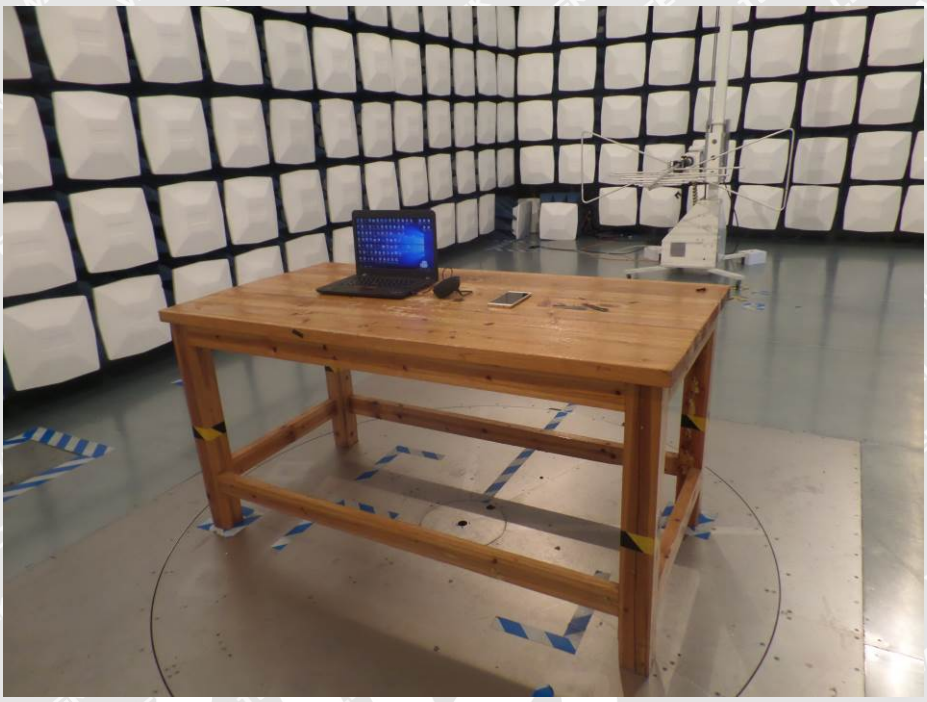
Frequency	Face of EUT	Antenna polarisation	Test Level	Step Size	Dwell Time	Performance Criterion	Result
80 to 1000MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
80 to 1000MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*

Remark:

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

7 Photographs – Test Setup

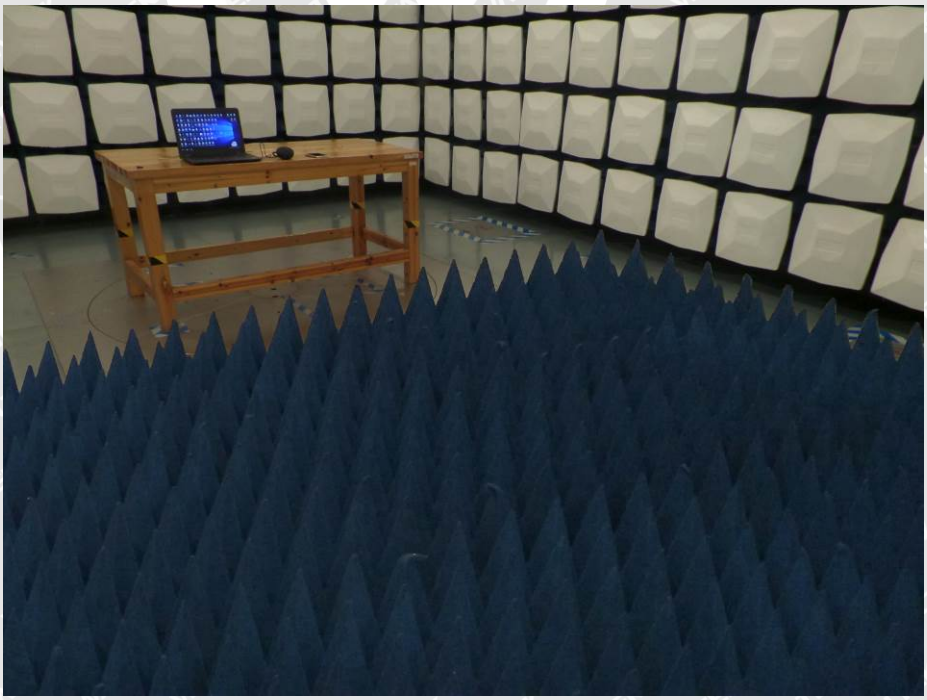
7.1 Photograph –Radiated Emission Test Setup, 30MHz to 1GHz



7.2 Photograph –Radiated Emission Test Setup, 1GHz to 6GHz

7.3 Photograph –ESD Test Setup

7.4 Photograph - Radiated immunity Test Setup

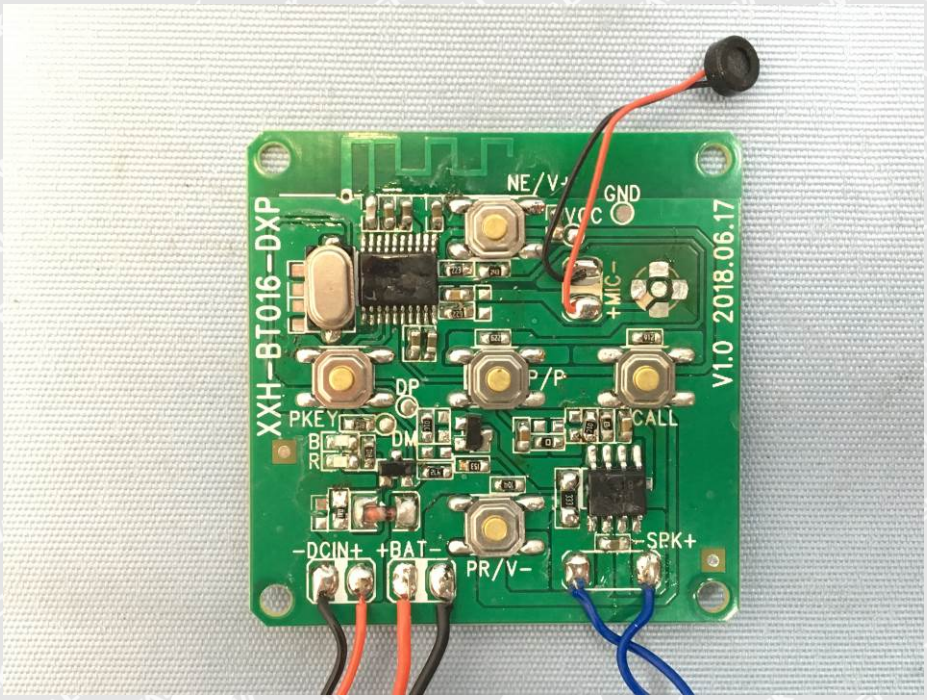


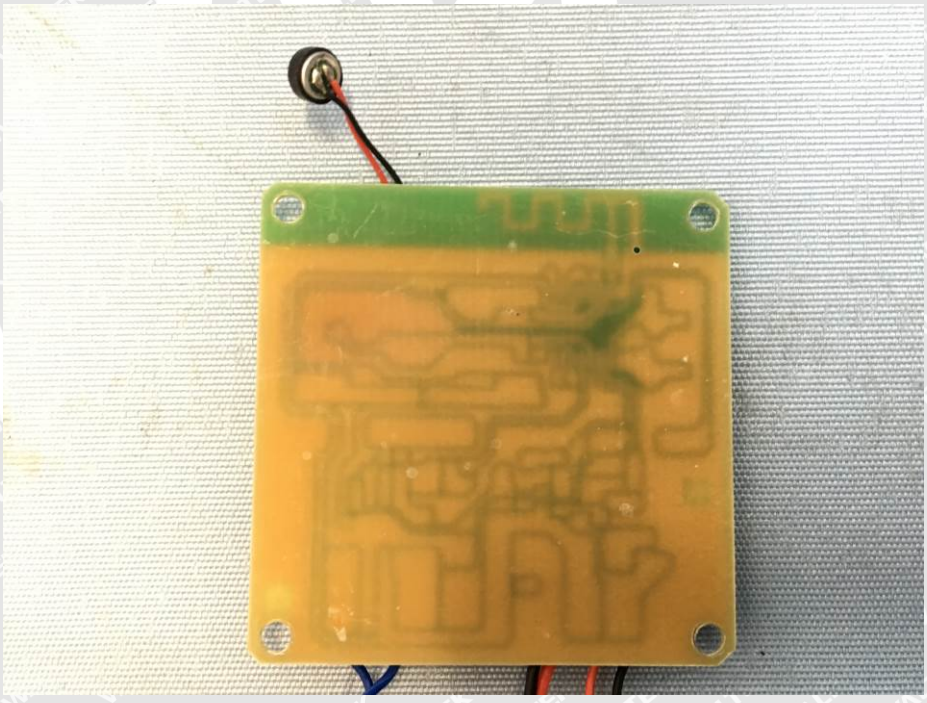
8 Photographs – Constructional Details

8.1 EUT –Front View

8.2 EUT –Back View

8.3 EUT –Internal View





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