中国认可
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检测
TESTING
CNAS L3110

TEST REPORT

Reference No.	:	WTF18F05112727E
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	:	The same as above
Product Name	:	Bluetooth speaker with wireless charger
Model No.	:	MO9450-06
Standards	:	EN 55011:2009+A1:2010 EN 61000-6-1:2007 EN 55032:2015 EN 55024:2010+A1:2015
Date of Receipt sample	:	2018-05-28
Date of Test	:	2018-05-28 to 2018-06-04
Date of Issue	:	2018-06-04
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 55011:2009+A1:2010, EN 55032:2015)			
Test Item	**Test Standard**	**Class / Severity**	**Result**
Radiation Emission, 150kHz to 30MHz	EN 55011:2009+A1:2010	Table 12	Pass
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 61000-6-1:2007, 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
Radio-frequency electromagnetic fields (1.4GHz to 2.0GHz)	IEC 61000-4-3:2010	3V/m, 80%, 1kHz, Amp. Mod.	A	Pass
Radio-frequency electromagnetic fields (2.0GHz to 2.7GHz)	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 with wireless charger

Model No. ..... : MO9450-06

Remark ..... : ---

3.2 Details of E.U.T.

Technical Data ..... : Input: USB 5V;
Wireless charger output: 5V 2A

3.3 Description of Support Units

The EUT has been tested as an independent unit. MO9450-06 is the test sample. All tests were performed in the condition of DC 5V input with Notebook powered by USB port.

3.4 Standards Applicable for Testing

The tests were performed according to following standards:

EN 55011:2009+A1:2010	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
EN 61000-6-1:2007	Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
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.	Mobile Phone	--	SAMSUNG	SM-G9500	R28J53EFNBN
2.	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	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 Power Amplifier	OPHIR	5225F	1051/1712	Valid
2.	RF Power Amplifier	OPHIR	5293F	1051/171.	Valid
3.	Stacked double logarithmic periodic antenna	SCHWARZBECK	STLP9128E-SPECIAL	STLP 9128E	Valid
4.	Stacked double logarithmic periodic antenna	SCHWARZBECK	STLP 9149	STLP 9149 #476	Valid
5.	RF signal generator	Agilent	N5181A	MY48080720	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)
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

Test Requirement..... : EN 55011, EN 55032

Test Method..... : EN 55011, EN 55032

Test Limit..... : Table A.4 of EN 55011, EN 55032

Test Result..... : Pass

Frequency Range..... : 0.15MHz to 30MHz, 30MHz to 1000MHz

5.1.1 E.U.T. Operation

Operating Environment:

Temperature..... : 23.1°C

Humidity..... : 48.2%RH

Atmospheric Pressure..... : 101.2 kPa

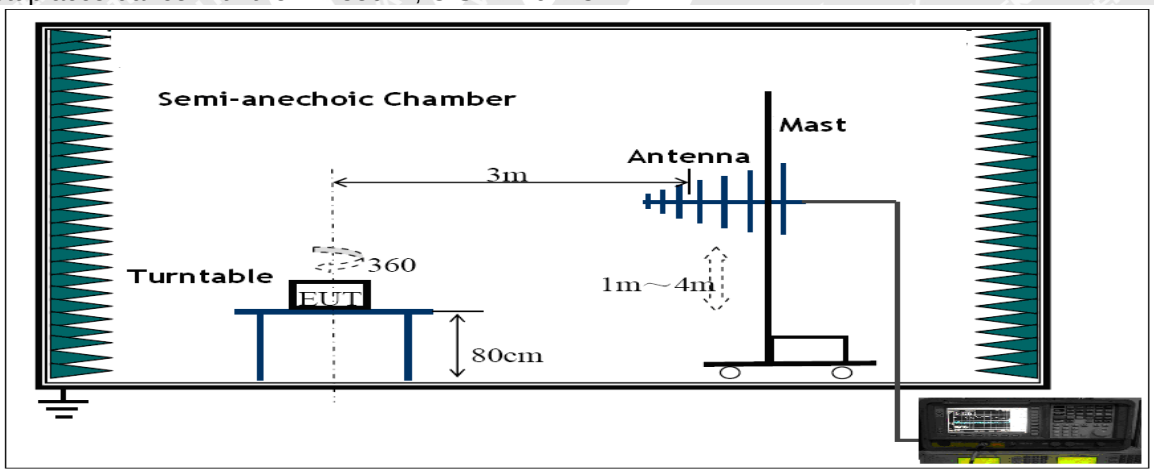
EUT Operation:

Input Voltage..... : DC 5V

Operating Mode..... : BT with wireless charging mode (worst case)

5.1.2 Block Diagram of Test Setup

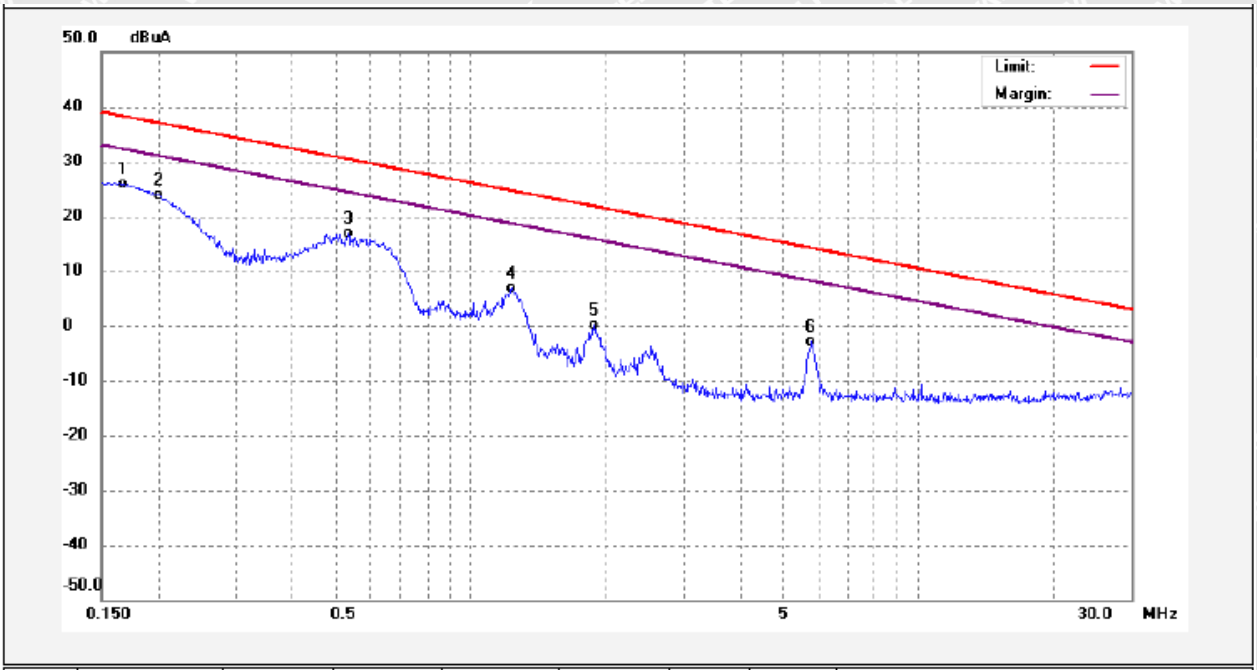
The Radiated Emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the EN 55011, CISPR 16-2-3.



5.1.3 Radiated Emission Test Data

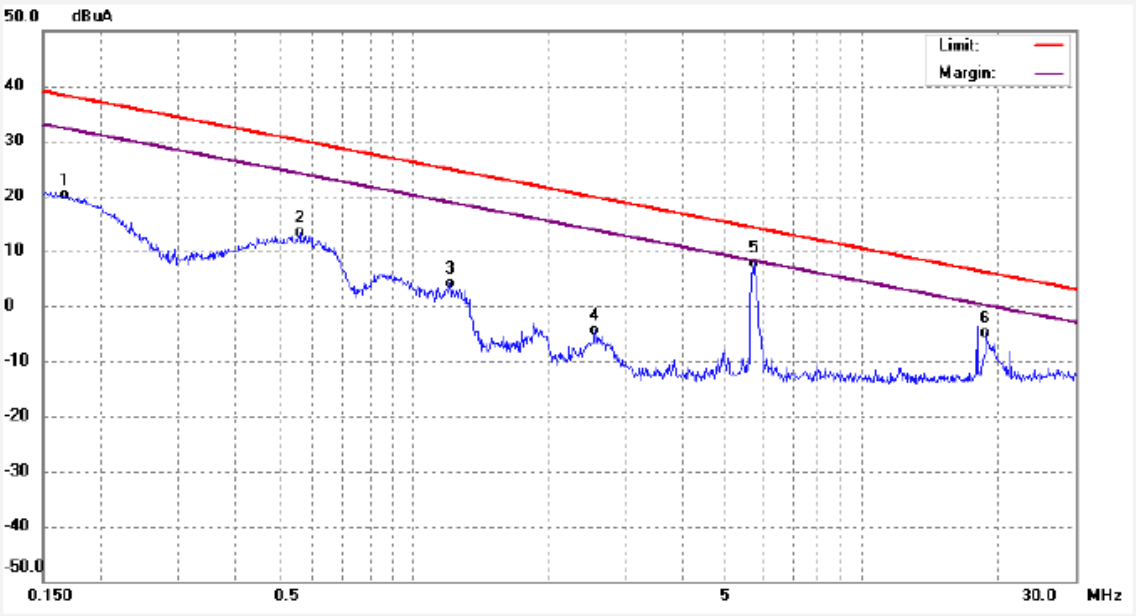
According to the data in section 5.2.4, the EUT complied with the EN 55011 standards.

Vertical Polarization



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector	Remark
1	0.1677	58.02	-32.06	25.96	38.24	-12.28	QP	
2	0.2007	55.77	-31.90	23.87	37.02	-13.15	QP	
3	0.5322	48.52	-31.72	16.80	30.39	-13.59	QP	
4	1.2357	38.40	-31.52	6.88	24.67	-17.79	QP	
5	1.8879	31.64	-31.41	0.23	21.79	-21.56	QP	
6	5.7743	28.94	-31.75	-2.81	14.19	-17.00	QP	

Horizontal Polarization

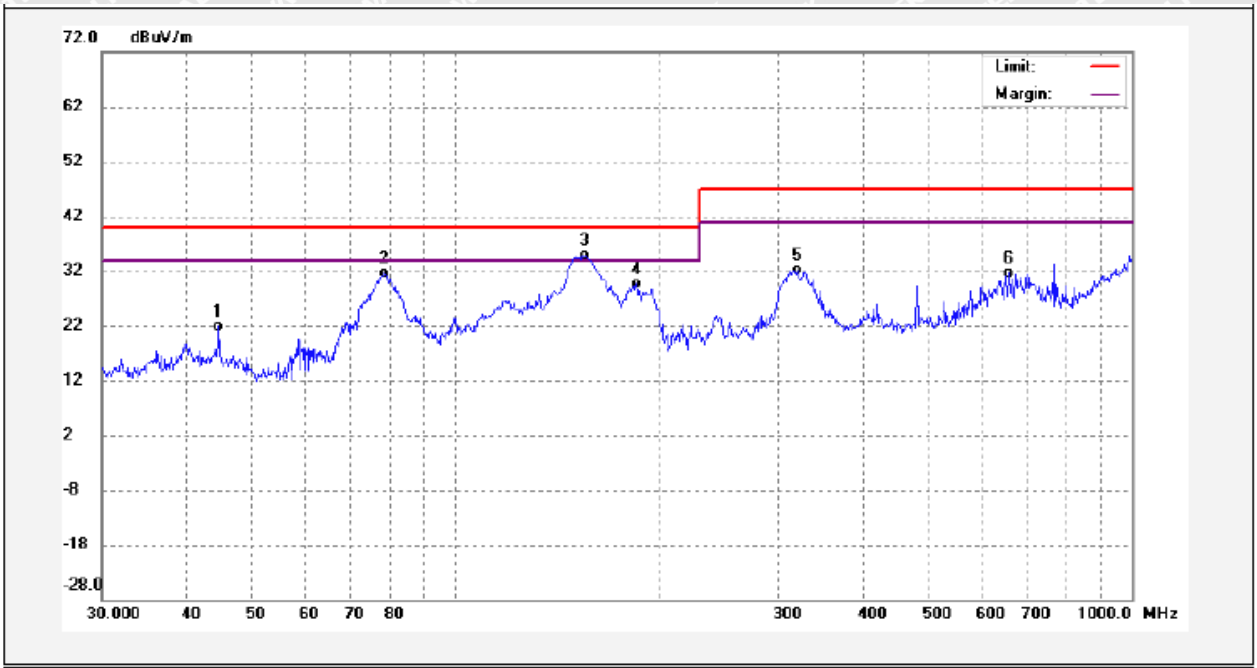


No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector	Remark
1	0.1668	52.26	-32.07	20.19	38.27	-18.08	QP	
2	0.5581	45.08	-31.72	13.36	30.07	-16.71	QP	
3	1.2098	35.68	-31.52	4.16	24.81	-20.65	QP	
4	2.5400	27.07	-31.47	-4.40	19.77	-24.17	QP	
5	5.7437	39.55	-31.74	7.81	14.23	-6.42	QP	
6	18.9205	26.44	-31.25	-4.81	6.13	-10.94	QP	

5.1.4 Radiated Emission Test Data, 30MHz to 1000MHz

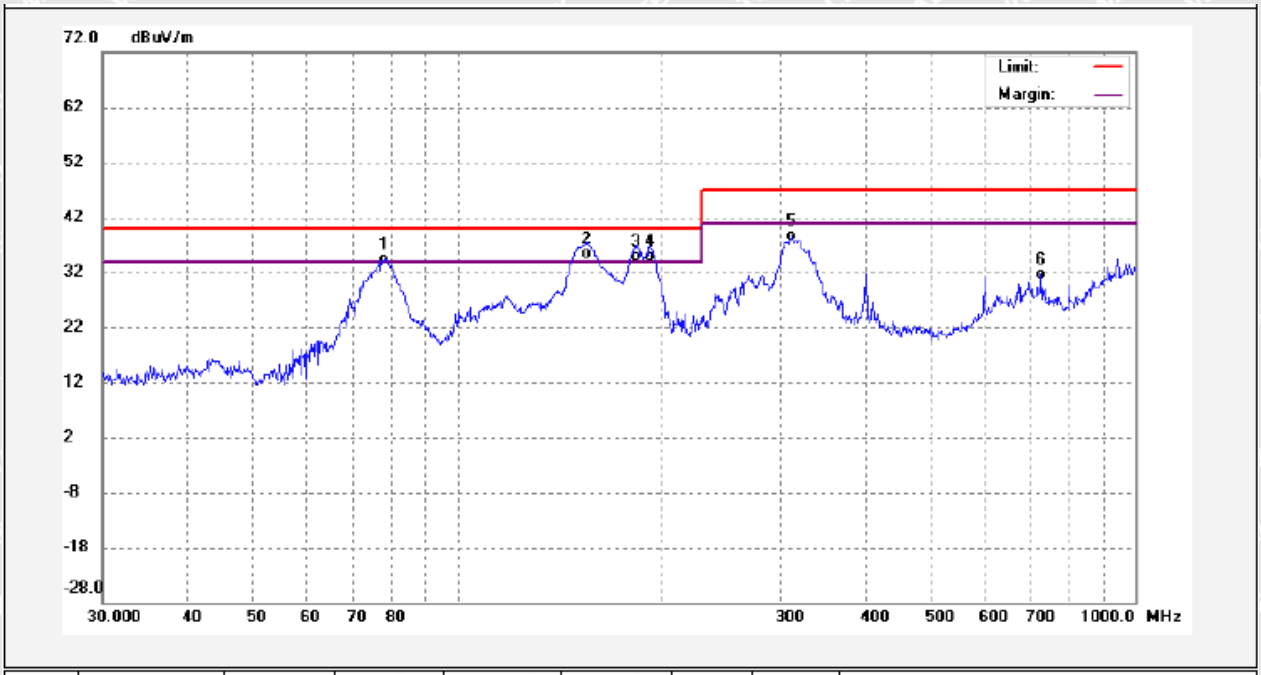
According to the data in section 5.1.4, the EUT complied with the EN 55011, EN 55032 standards.

Vertical Polarization



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	44.5868	5.58	16.21	21.79	40.00	-18.21	QP	
2	78.4133	22.76	8.83	31.59	40.00	-8.41	QP	
3	154.8204	26.09	8.81	34.90	40.00	-5.10	QP	
4	185.1378	18.39	11.36	29.75	40.00	-10.25	QP	
5	319.9369	14.61	17.56	32.17	47.00	-14.83	QP	
6	656.5299	6.23	25.48	31.71	47.00	-15.29	QP	

Horizontal Polarization



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	77.8653	25.71	8.76	34.47	40.00	-5.53	QP	
2	154.8204	26.21	9.10	35.31	40.00	-4.69	QP	
3	183.8440	23.95	11.03	34.98	40.00	-5.02	QP	
4	192.4185	22.98	11.86	34.84	40.00	-5.16	QP	
5	311.0866	20.96	17.55	38.51	47.00	-8.49	QP	
6	726.8052	5.66	26.00	31.66	47.00	-15.34	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..... : 48.2%RH

Atmospheric Pressure ..... : 101.2 kPa

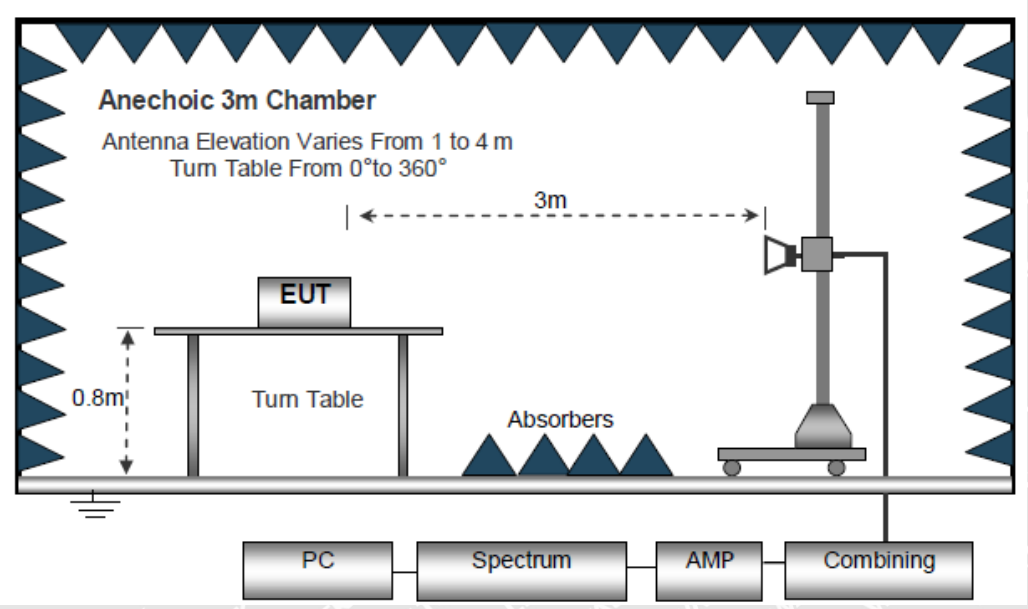
EUT Operation:

Input Voltage ..... : DC 5V

Operating Mode..... : BT with wireless charging mode (worst case)

5.2.2 Block Diagram of Test Setup

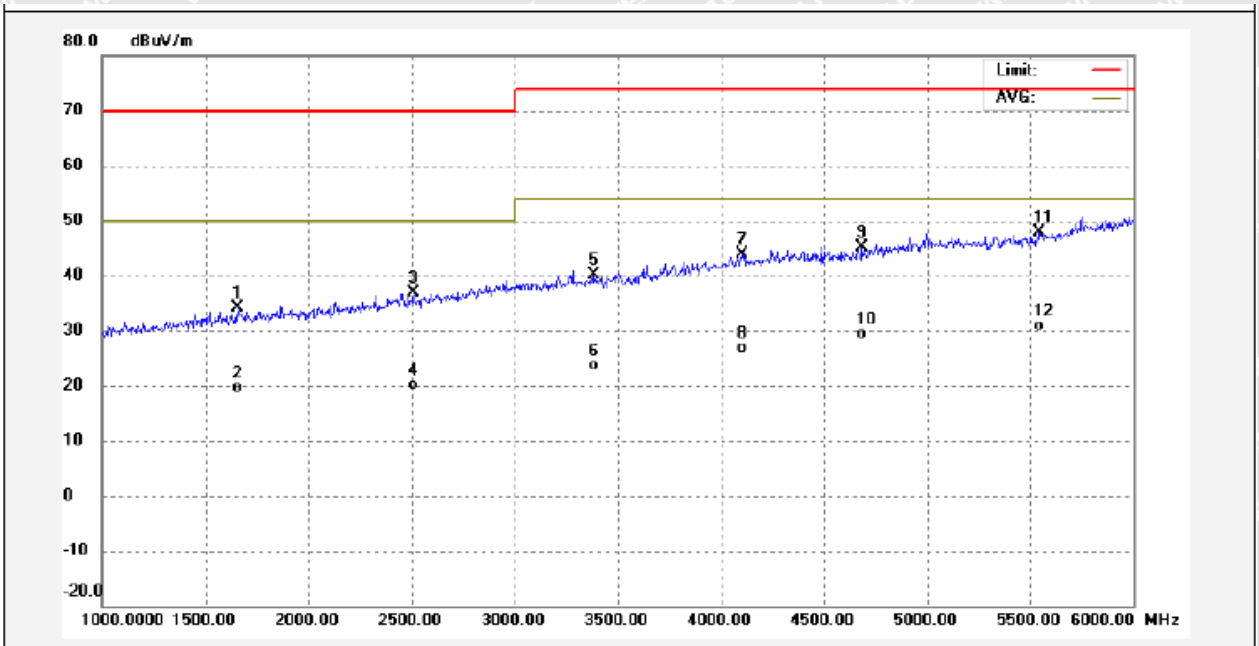
The Radiated Emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the CISPR 16-2-3.



5.2.3 Radiated Emission Test Data

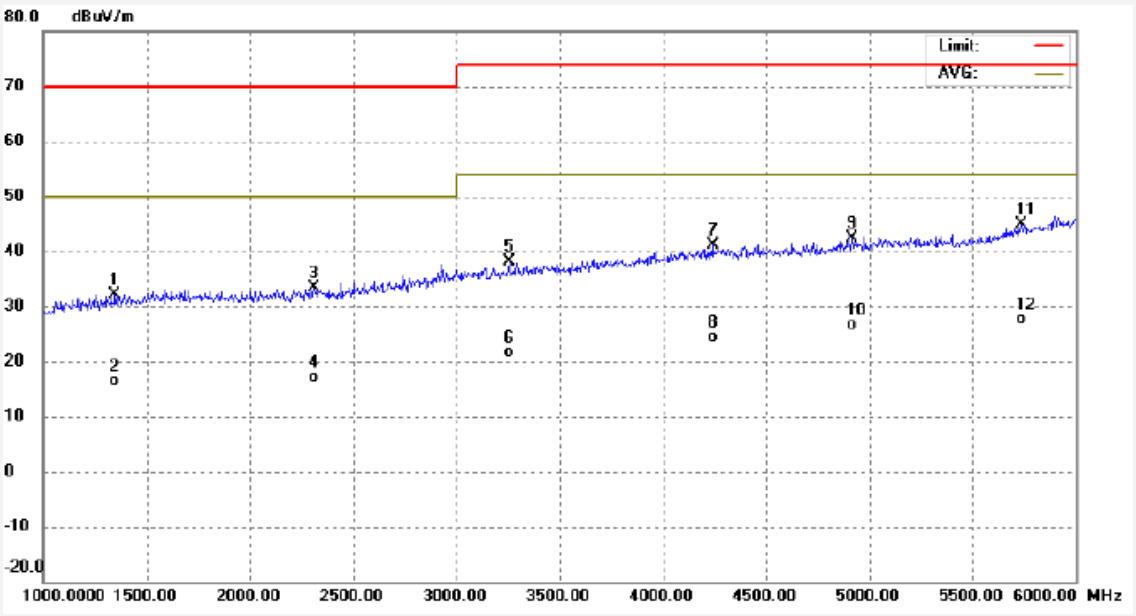
According to the data in section 5.2.4, the EUT complied with the EN 55032 standards.

Vertical Polarization



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1655.000	47.53	-13.43	34.10	70.00	-35.90	peak	
2	1655.000	33.09	-13.43	19.66	50.00	-30.34	AVG	
3	2510.000	47.18	-10.42	36.76	70.00	-33.24	peak	
4	2510.000	30.55	-10.42	20.13	50.00	-29.87	AVG	
5	3385.000	48.12	-8.10	40.02	74.00	-33.98	peak	
6	3385.000	31.64	-8.10	23.54	54.00	-30.46	AVG	
7	4105.000	49.47	-5.59	43.88	74.00	-30.12	peak	
8	4105.000	32.47	-5.59	26.88	54.00	-27.12	AVG	
9	4685.000	48.59	-3.45	45.14	74.00	-28.86	peak	
10	4685.000	32.87	-3.45	29.42	54.00	-24.58	AVG	
11	5540.000	49.59	-1.81	47.78	74.00	-26.22	peak	
12	5540.000	32.68	-1.81	30.87	54.00	-23.13	AVG	

Horizontal Polarization



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1345.000	46.61	-14.37	32.24	70.00	-37.76	peak	
2	1345.000	30.72	-14.37	16.35	50.00	-33.65	AVG	
3	2310.000	46.32	-13.05	33.27	70.00	-36.73	peak	
4	2310.000	30.26	-13.05	17.21	50.00	-32.79	AVG	
5	3255.000	48.59	-10.46	38.13	74.00	-35.87	peak	
6	3255.000	32.14	-10.46	21.68	54.00	-32.32	AVG	
7	4240.000	49.39	-8.28	41.11	74.00	-32.89	peak	
8	4240.000	32.66	-8.28	24.38	54.00	-29.62	AVG	
9	4915.000	48.85	-6.38	42.47	74.00	-31.53	peak	
10	4915.000	32.90	-6.38	26.52	54.00	-27.48	AVG	
11	5735.000	49.89	-5.13	44.76	74.00	-29.24	peak	
12	5735.000	32.87	-5.13	27.74	54.00	-26.26	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 61000-6-1, 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:

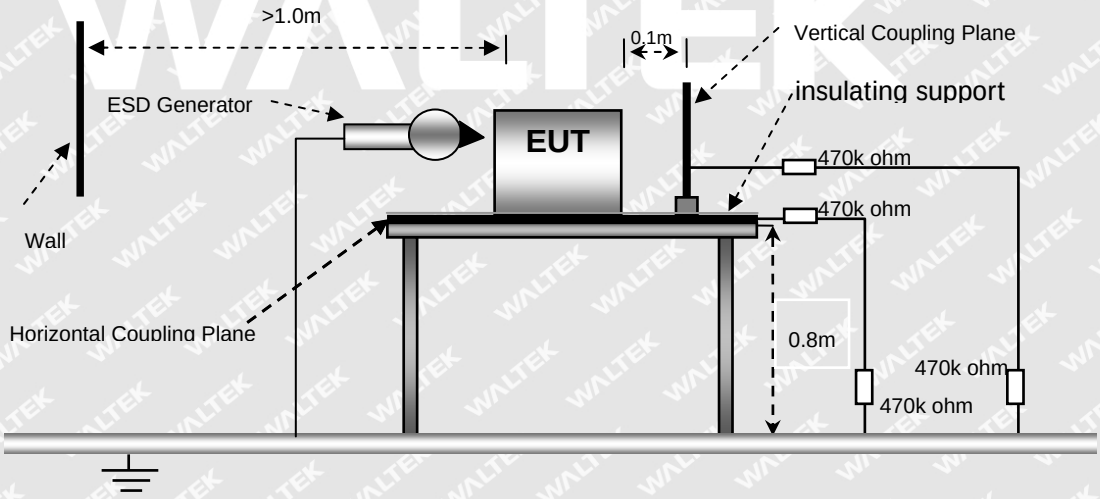
Temperature	:	23.4°C
Humidity	:	53.4%RH
Atmospheric Pressure	:	101.3 kPa

EUT Operation:

Input Voltage	:	DC 5V
Operating Mode	:	BT with wireless charging mode (worst case)

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

Test Requirement ..... : EN 61000-6-1, EN 55024

Test Method ..... : IEC 61000-4-3

Test Result ..... : Pass

Frequency Range ..... : 80MHz to 1GHz, 3V/m, 80%
1.4GHz to 2.0GHz, 3V/m, 80%
2.0GHz to 2.7GHz, 1V/m, 80%

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..... : 101.3 kPa

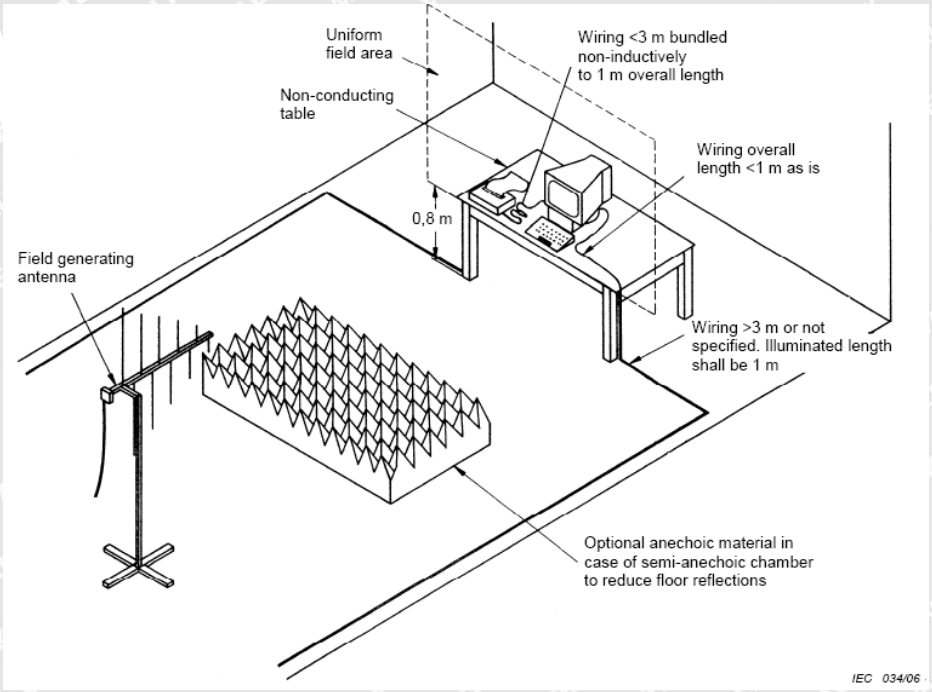
EUT Operation:

Input Voltage..... : DC 5V

Operating Mode..... : BT with wireless charging mode (worst case)

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*

Frequency	Face of EUT	Antenna polarisation	Test Level	Step Size	Dwell Time	Performance Criterion	Result
1.4 to 2.0GHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
1.4 to 2.0GHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*

Frequency	Face of EUT	Antenna polarisation	Test Level	Step Size	Dwell Time	Performance Criterion	Result
2.0 to 2.7GHz	Front, Back, Left, Right	Horizontal	1V/m	1%	1s	A	Pass*
2.0 to 2.7GHz	Front, Back, Left, Right	Vertical	1V/m	1%	1s	A	Pass*

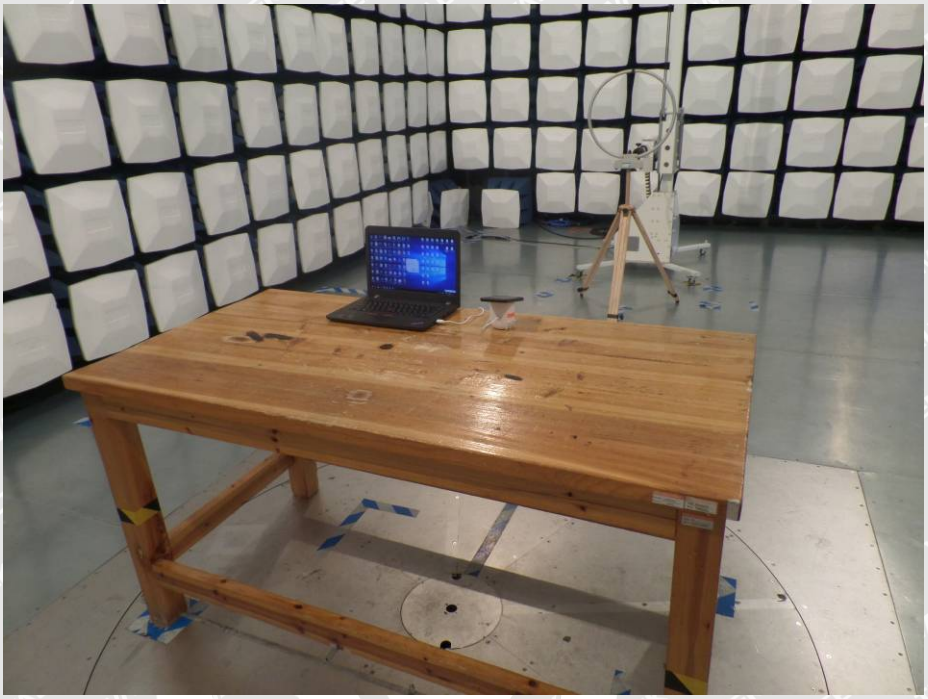
Remark:

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

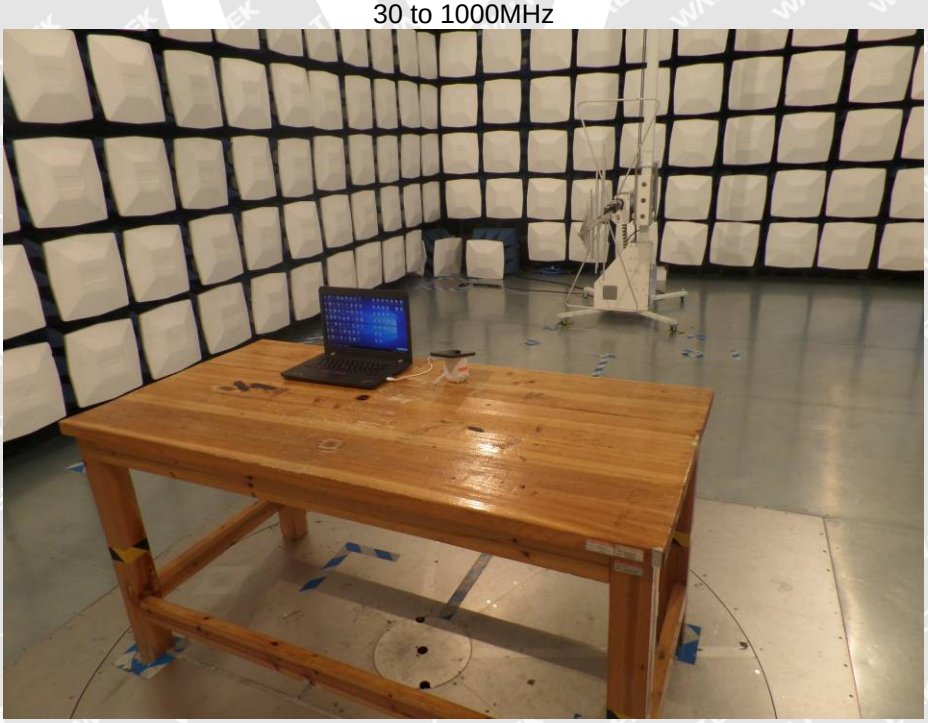
7 Photographs – Test Setup

7.1 Photograph –Radiated Emission Test Setup

Below 30MHz

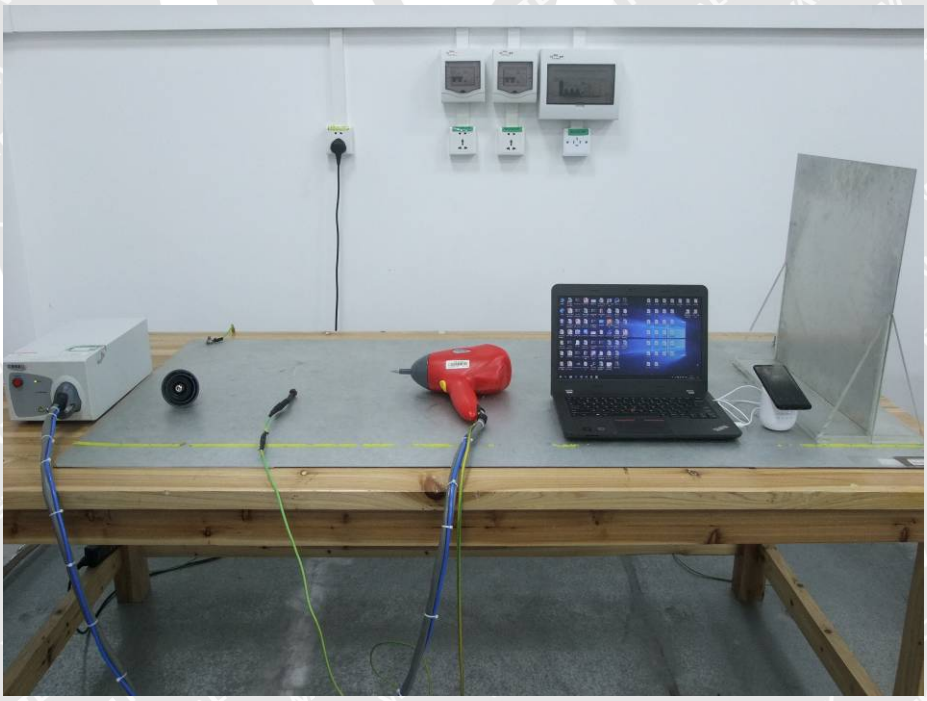


30 to 1000MHz

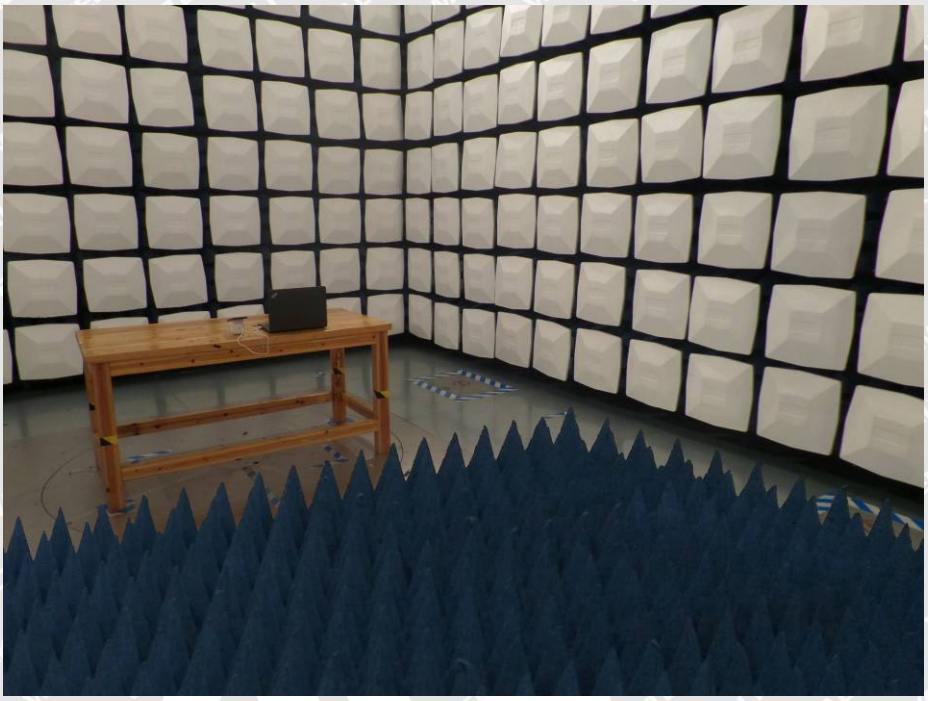


7.2 Photograph –Radiated Emission Test Setup, 1GHz to 6GHz

7.3 Photograph –ESD Test Setup

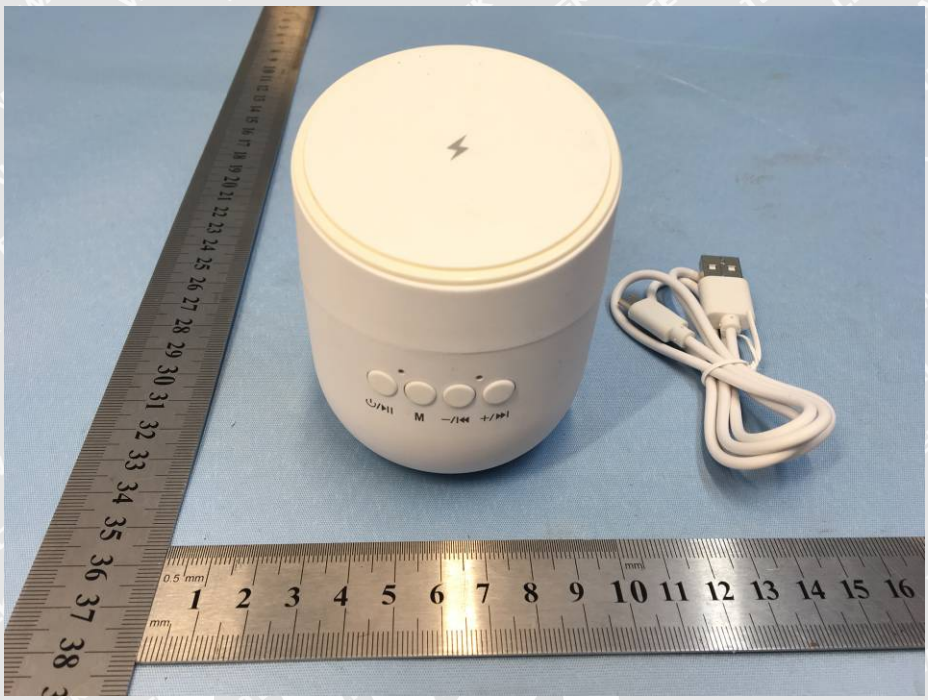


7.4 Photograph - Radiated immunity Test Setup

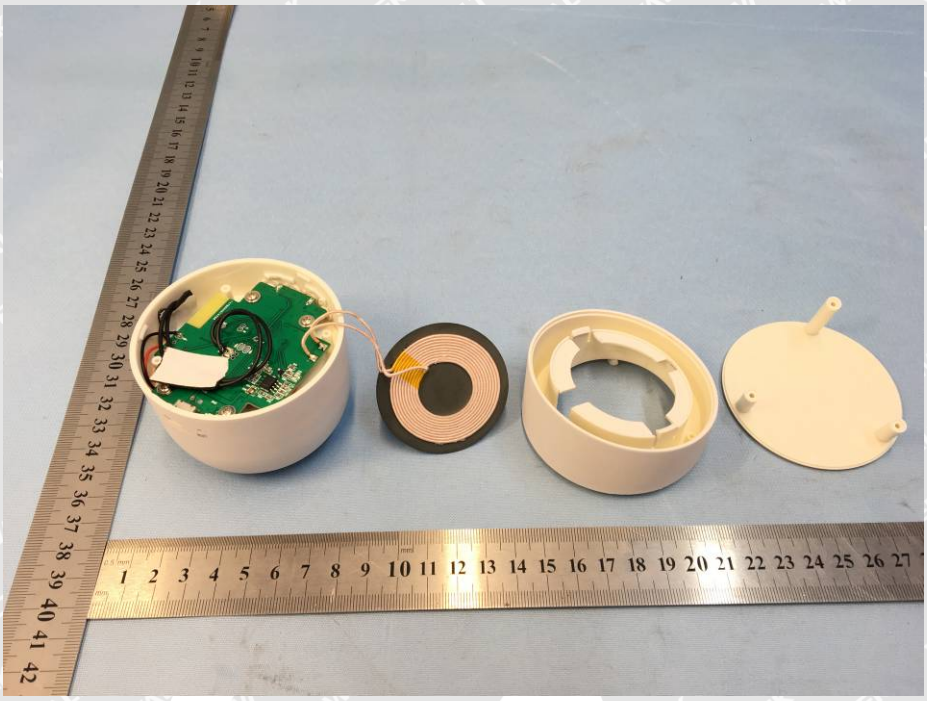


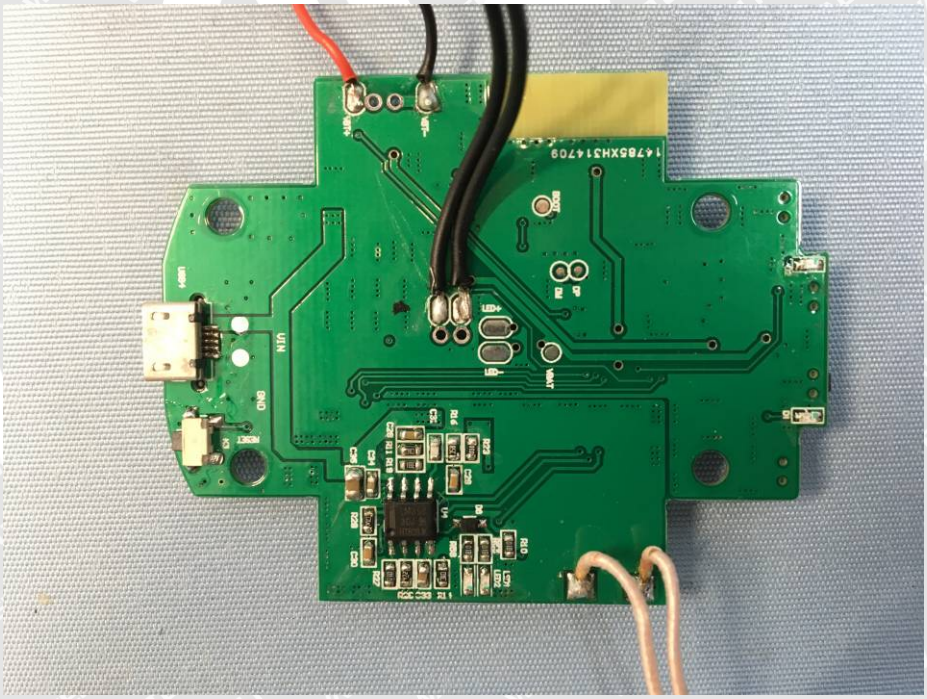
8 Photographs – Constructional Details

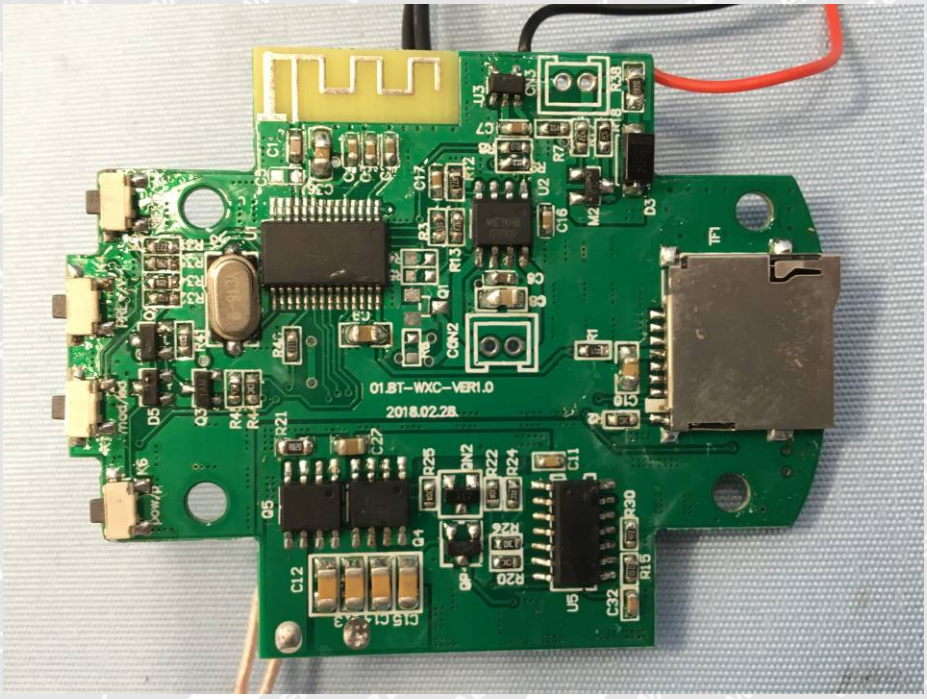
8.1 EUT –External Photos



8.2 EUT –Internal Photos







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