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检测
TESTING
CNAS L6478

TEST REPORT

Reference No.	:	WTF19F03017760E
Applicant	:	Mid Ocean Brands B.V.
Address	:	7/F., Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Manufacturer	:	114538
Product Name	:	Wireless power bank
Model No.	:	MO9238
Standards	:	EN 55032:2015 EN 55035:2017 EN 55011:2016+A1:2017 EN 61000-6-1:2007
Date of Receipt sample	:	2019-04-01
Date of Test	:	2019-04-02
Date of Issue	:	2019-04-03
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, 150kHz to 30MHz	EN 55011:2009+A1:2010	Table 12	Pass
Radiation Emission, 30MHz to 1000MHz	EN 55032:2015	Table A.4	Pass

IMMUNITY (EN 55035:2017, EN 61000-6-1:2007)				
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
Radio-frequency electromagnetic fields (2.6GHz , 3.5GHz, 5GHz)	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	:	Wireless power bank
Model No......	:	MO9238
Remark	:	---

3.2 Details of E.U.T.

Technical Data	:	Micro Input: DC 5V, 2A USB Output: DC 5V, 2A Wireless Input: DC 5V, 0.65A Wireless Output: DC 5V, 0.9A Type-C Input & Output: DC 5V, 2A Capacity: 8000mAh/29.6Wh

3.3 Description of Support Units

The EUT has been tested as an independent unit. MO9238 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 55032:2015	Electromagnetic compatibility of multimedia equipment — Emission Requirements
EN 55035:2017	Electromagnetic compatibility of multimedia equipment - Immunity requirements
EN 55011:2016+A1:2017	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

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 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 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.

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
ESD					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1.	ESD Simulator	TESEQ	NSG437	521	Valid
Continuous RF electromagnetic field disturbances					
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	STLP9128E	Valid
4.	Stacked double logarithmic periodic antenna	SCHWARZBECK	STLP 9149	STLP 9149 #476	Valid
5.	RF signal generator	Agilent	N5181A	MY48080720	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
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 , 150kHz to 1000MHz

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

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

Test Limit..... : Table 12 of EN 55011, Table A.4 of EN 55032

Test Result..... : Pass

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

Class...... : Class B

5.1.1 E.U.T. Operation

Operating Environment:

Temperature..... : 23.2°C

Humidity..... : 50.9%RH

Atmospheric Pressure..... : 100.8 kPa

EUT Operation:

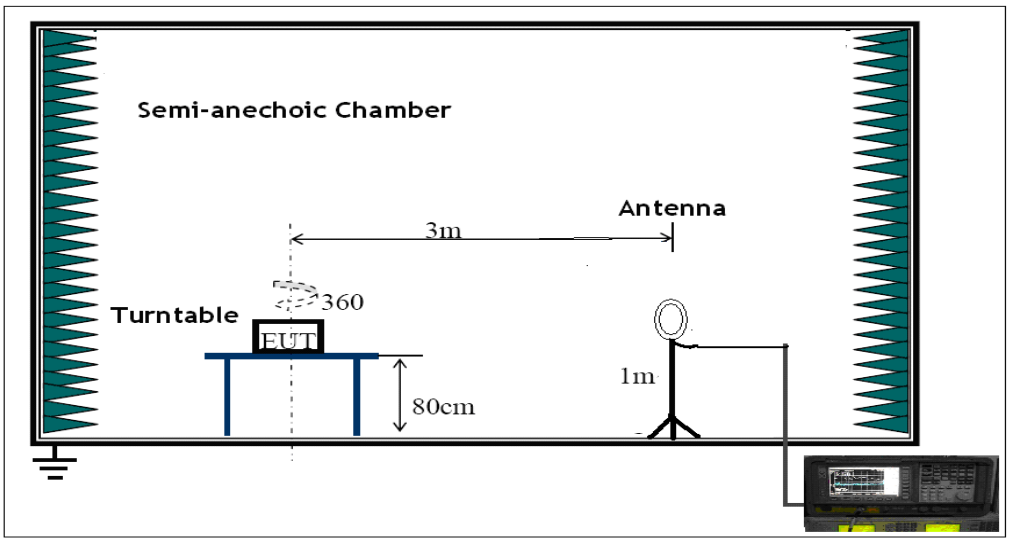
Input Voltage..... : DC 5V

Operating Mode..... : Wireless mode; Charging mode; USB Output mode

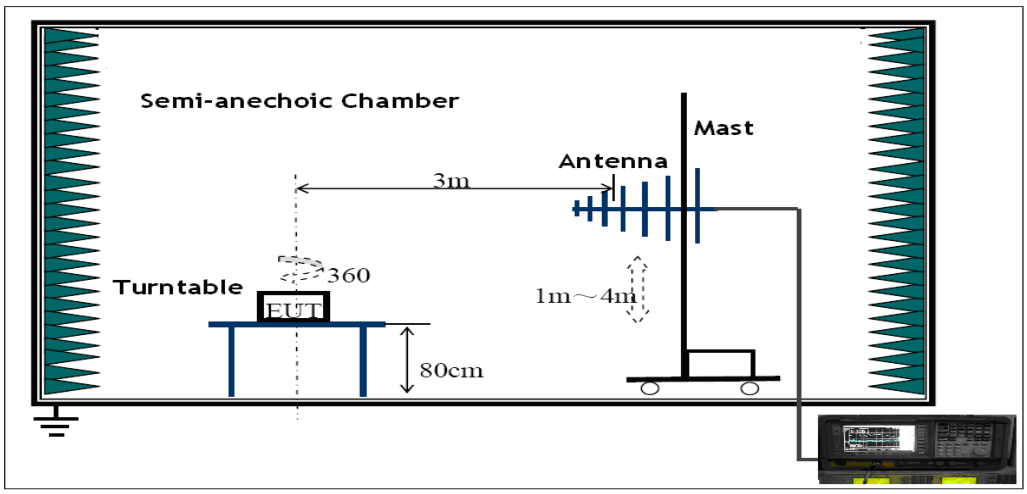
5.1.2 Block Diagram of Test Setup

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

Below 30MHz



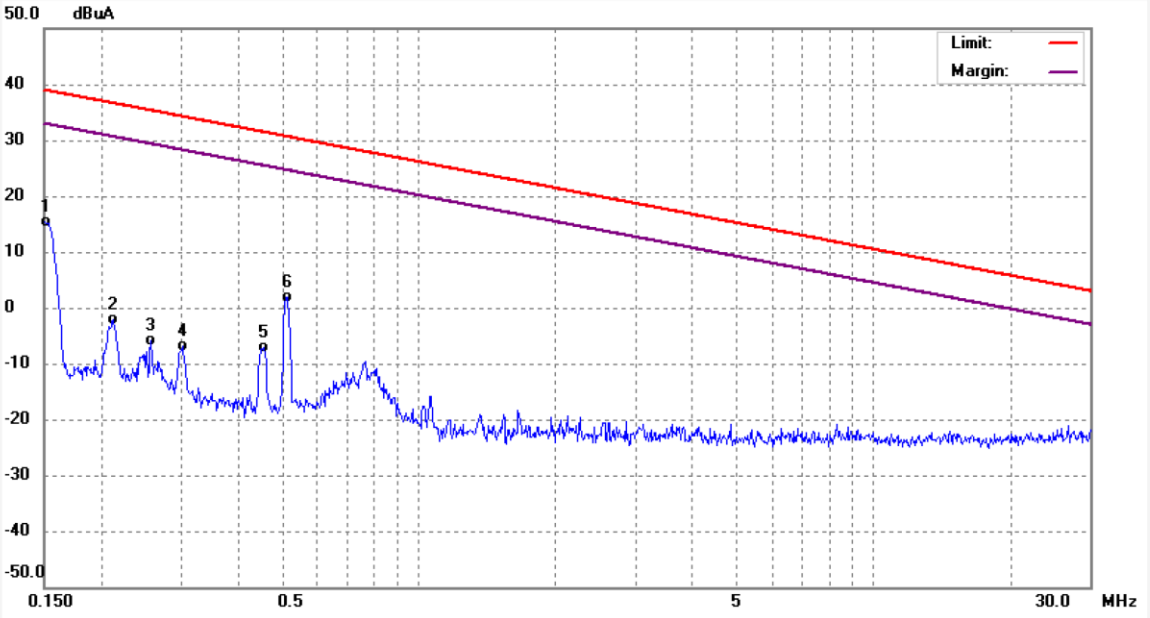
30MHz to 1GHz



5.1.3 Radiated Emission Test Data, 0.15MHz to 30MHz

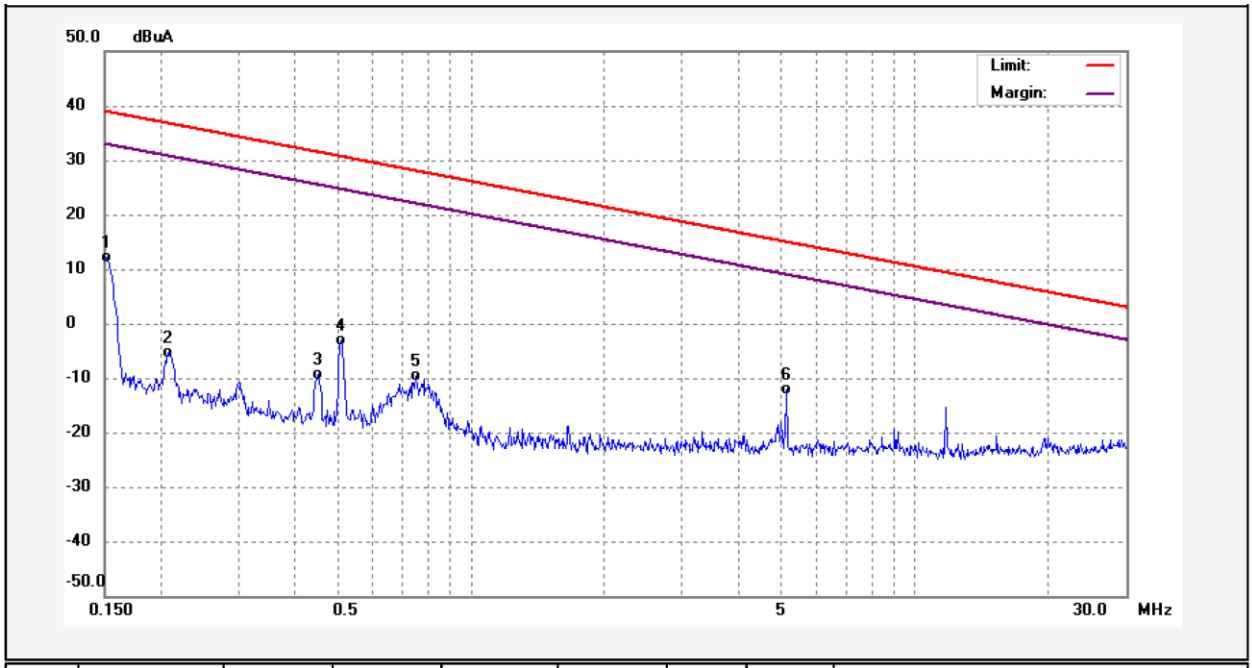
According to the data in section 5.1.3, the EUT complied with the EN 55011 standards.

Vertical Polarization(Wireless mode):



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector	Remark
1	0.1500	45.94	-30.57	15.37	39.00	-23.63	QP	
2	0.2128	28.39	-30.62	-2.23	36.62	-38.85	QP	
3	0.2575	24.78	-30.69	-5.91	35.32	-41.23	QP	
4	0.3019	24.07	-30.87	-6.80	34.24	-41.04	QP	
5	0.4564	24.33	-31.48	-7.15	31.44	-38.59	QP	
6	0.5128	33.57	-31.59	1.98	30.64	-28.66	QP	

Horizontal Polarization(Wireless mode):

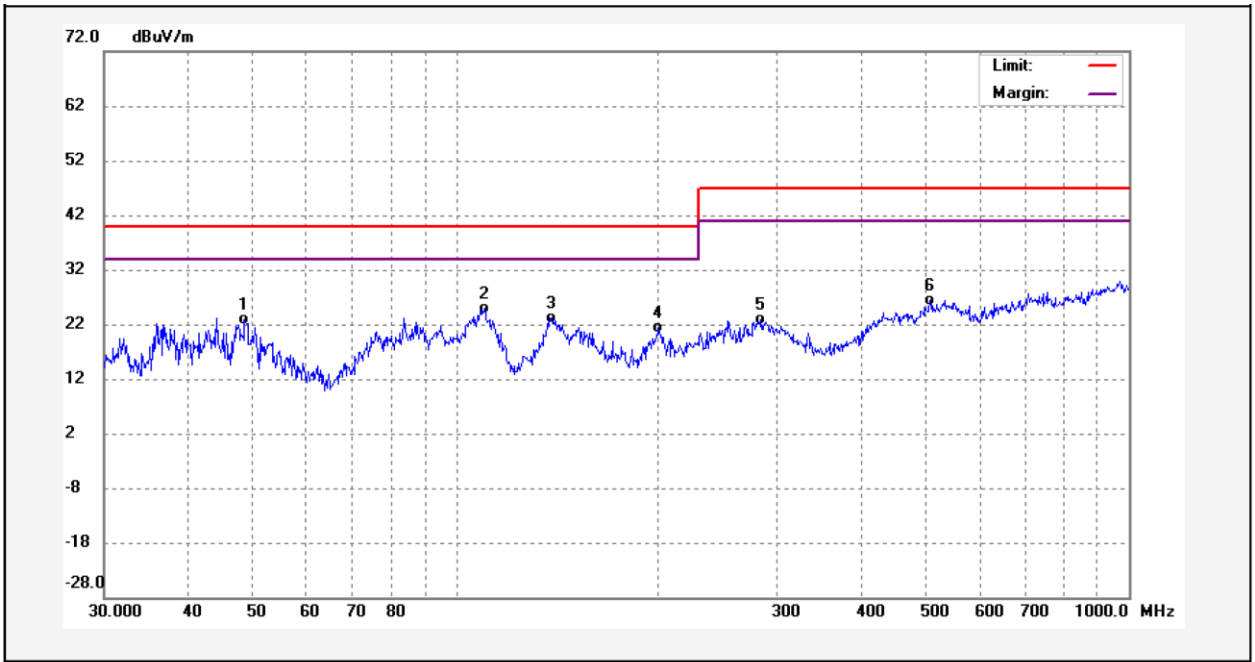


No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector	Remark
1	0.1500	42.73	-30.57	12.16	39.00	-26.84	QP	
2	0.2083	25.23	-30.62	-5.39	36.76	-42.15	QP	
3	0.4516	22.17	-31.46	-9.29	31.51	-40.80	QP	
4	0.5101	28.41	-31.60	-3.19	30.68	-33.87	QP	
5	0.7508	20.90	-30.43	-9.53	28.05	-37.58	QP	
6	5.1390	18.28	-30.29	-12.01	14.99	-27.00	QP	

5.1.4 Radiated Emission Test Data, 30MHz to 1000MHz

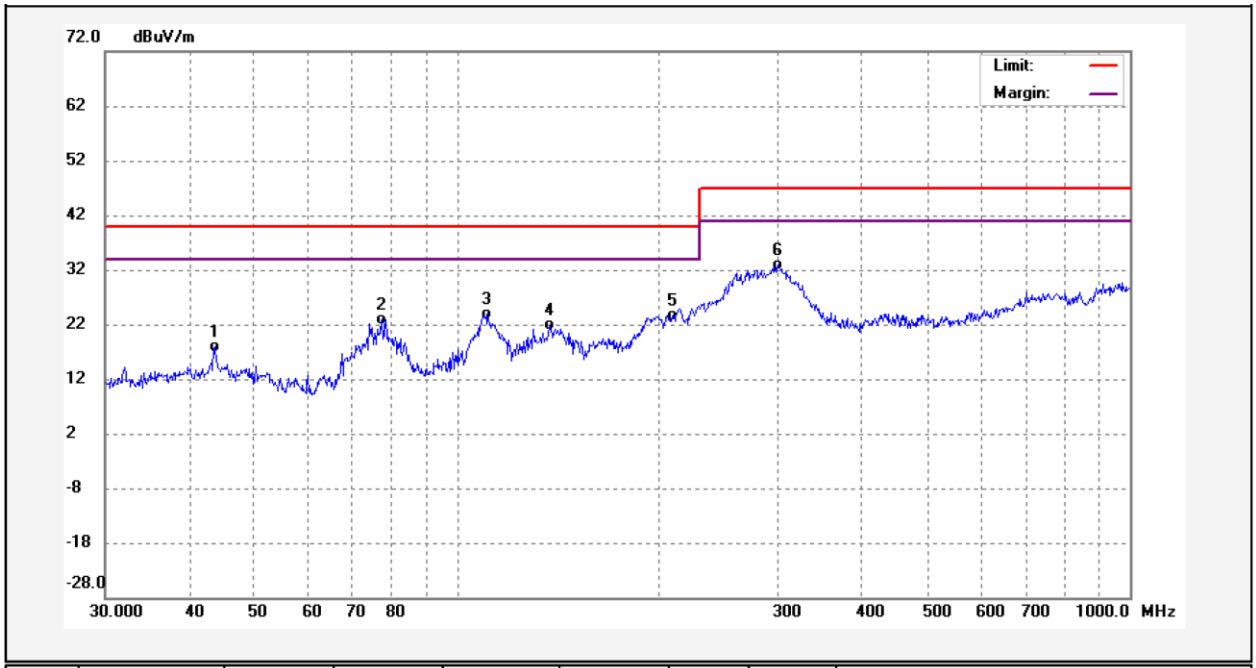
According to the data in section 5.2.4, the EUT complied with the EN 55032 standards.

Vertical Polarization (Charging mode):



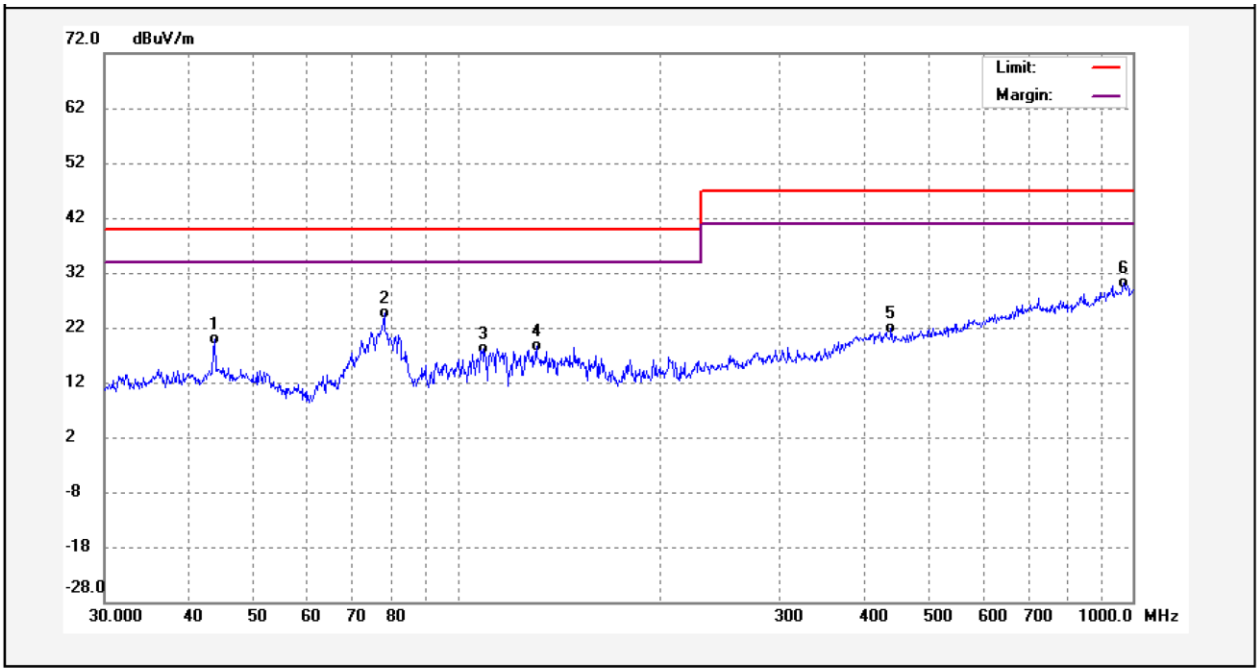
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	48.5016	9.23	13.63	22.86	40.00	-17.14	QP	
2	110.1816	13.59	11.27	24.86	40.00	-15.14	QP	
3	138.3873	13.13	10.06	23.19	40.00	-16.81	QP	
4	199.9856	8.20	13.09	21.29	40.00	-18.71	QP	
5	283.9791	6.66	16.19	22.85	47.00	-24.15	QP	
6	506.4791	5.90	20.51	26.41	47.00	-20.59	QP	

Horizontal Polarization (Charging mode):



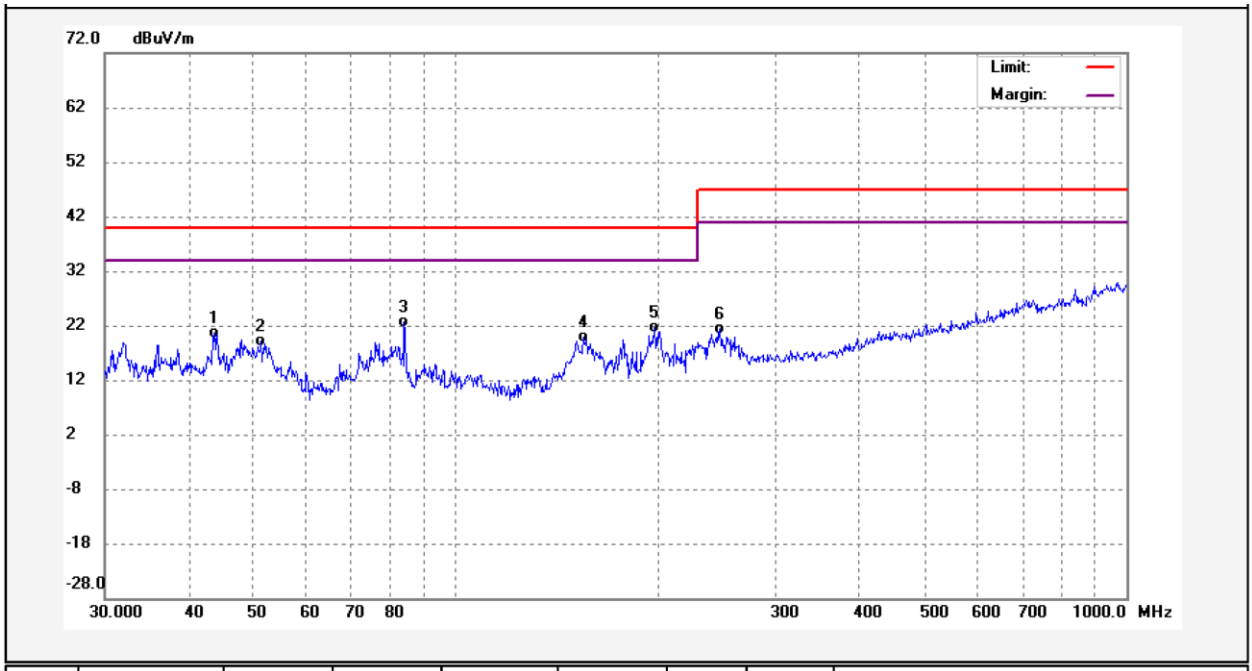
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	43.6584	2.63	15.21	17.84	40.00	-22.16	QP	
2	77.3212	13.44	9.47	22.91	40.00	-17.09	QP	
3	110.5687	12.57	11.32	23.89	40.00	-16.11	QP	
4	137.4202	11.95	9.85	21.80	40.00	-18.20	QP	
5	209.3129	10.40	13.22	23.62	40.00	-16.38	QP	
6	300.3672	16.85	16.12	32.97	47.00	-14.03	QP	

Vertical Polarization (Wireless mode):



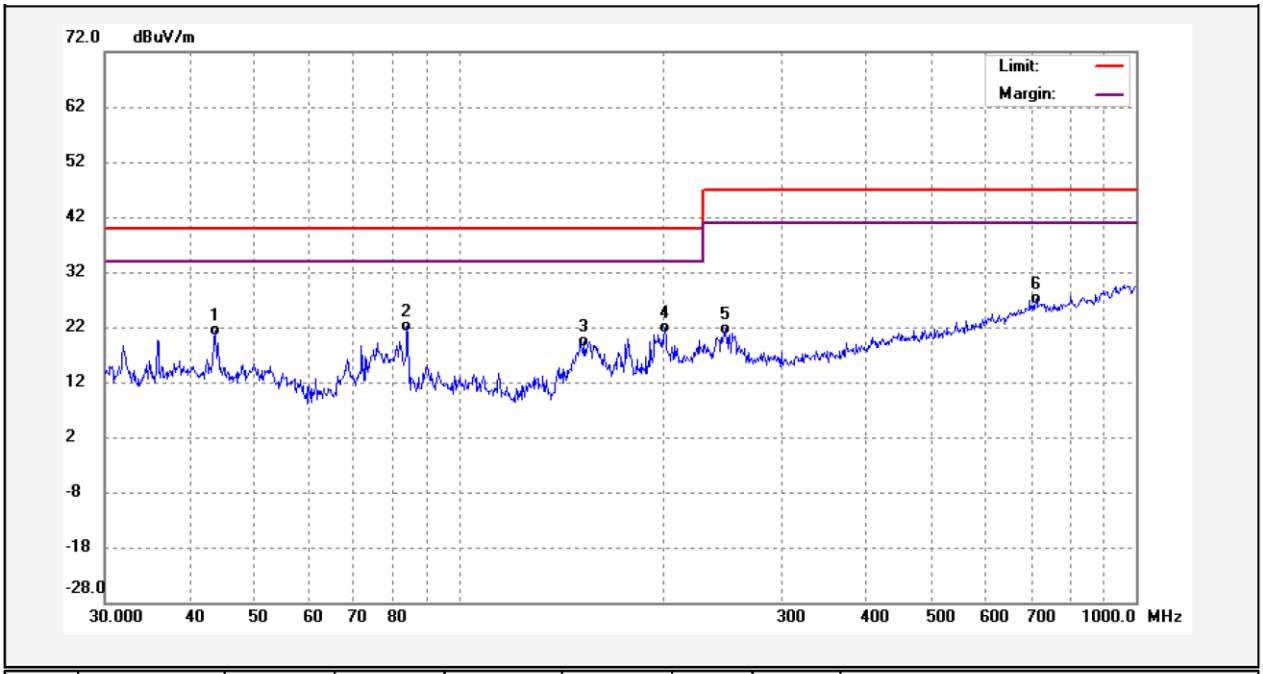
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	43.6584	4.58	15.21	19.79	40.00	-20.21	QP	
2	77.8654	15.26	9.41	24.67	40.00	-15.33	QP	
3	109.0286	6.73	11.46	18.19	40.00	-21.81	QP	
4	130.8369	8.32	10.30	18.62	40.00	-21.38	QP	
5	438.6554	2.51	19.33	21.84	47.00	-25.16	QP	
6	968.9338	2.55	27.65	30.20	47.00	-16.80	QP	

Horizontal Polarization (Wireless mode):



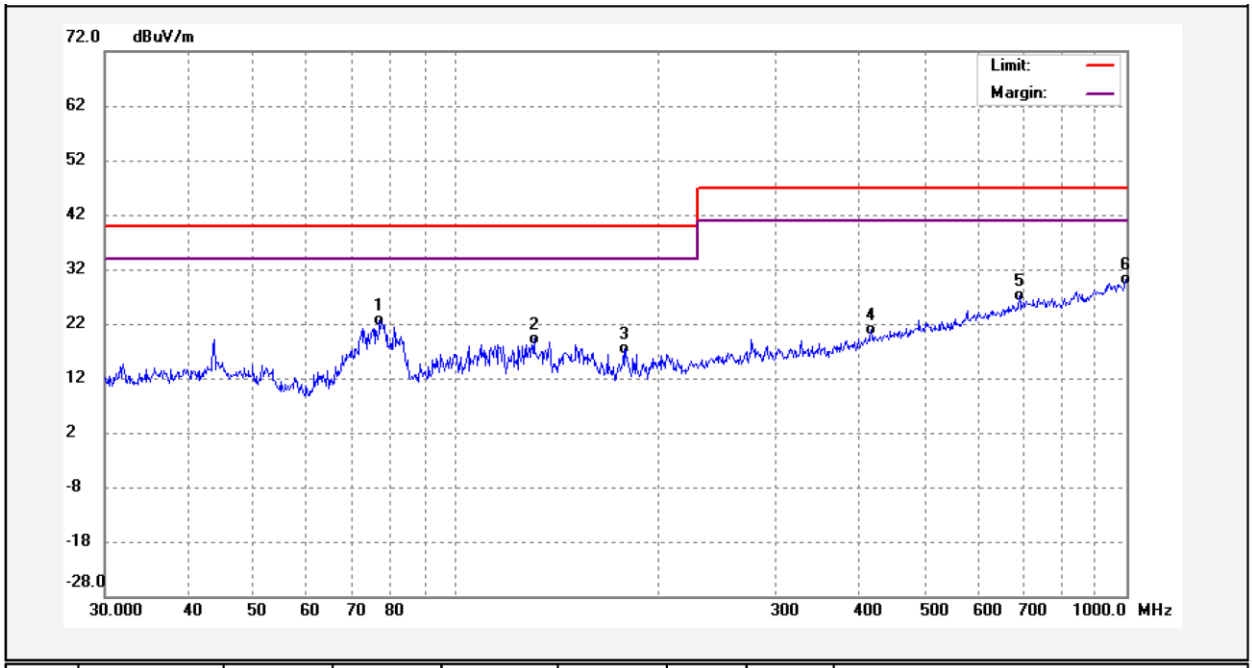
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	43.6584	5.88	14.66	20.54	40.00	-19.46	QP	
2	51.3005	5.91	13.11	19.02	40.00	-20.98	QP	
3	83.8156	12.43	10.15	22.58	40.00	-17.42	QP	
4	154.8204	9.14	10.74	19.88	40.00	-20.12	QP	
5	197.8928	8.59	13.00	21.59	40.00	-18.41	QP	
6	247.6819	5.65	15.64	21.29	47.00	-25.71	QP	

Vertical Polarization (USB Output mode):



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	43.6584	6.67	14.66	21.33	40.00	-18.67	QP	
2	83.8156	12.05	10.15	22.20	40.00	-17.80	QP	
3	153.2004	8.75	10.67	19.42	40.00	-20.58	QP	
4	201.3930	8.63	13.13	21.76	40.00	-18.24	QP	
5	247.6819	6.11	15.64	21.75	47.00	-25.25	QP	
6	711.6734	2.30	24.87	27.17	47.00	-19.83	QP	

Horizontal Polarization (USB Output mode):



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	77.0505	13.04	9.49	22.53	40.00	-17.47	QP	
2	130.8369	8.95	10.30	19.25	40.00	-20.75	QP	
3	178.1327	5.73	11.70	17.43	40.00	-22.57	QP	
4	416.1791	1.85	19.07	20.92	47.00	-26.08	QP	
5	691.9867	2.90	24.28	27.18	47.00	-19.82	QP	
6	996.4996	2.63	27.60	30.23	47.00	-16.77	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.

6.2 Electrostatic Discharge(ESD)

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

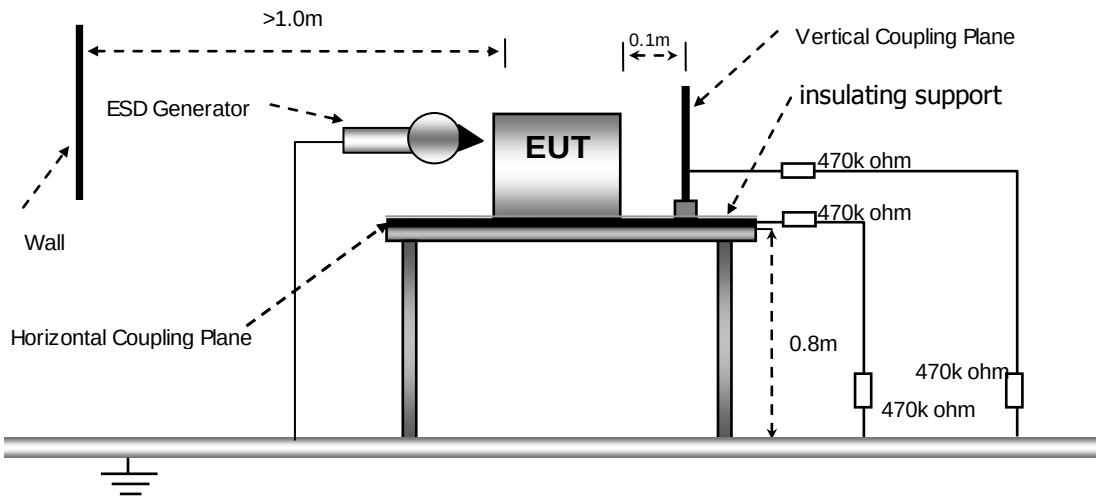
Temperature	:	24.7°C
Humidity.....	:	59.1%RH
Atmospheric Pressure	:	100.2kPa

EUT Operation:

Input Voltage	:	DC 5V
Operating Mode	:	Working 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 6GHz

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..... : 24.3°C

Humidity ..... : 59.1%RH

Barometric Pressure ..... : 100.2Pa

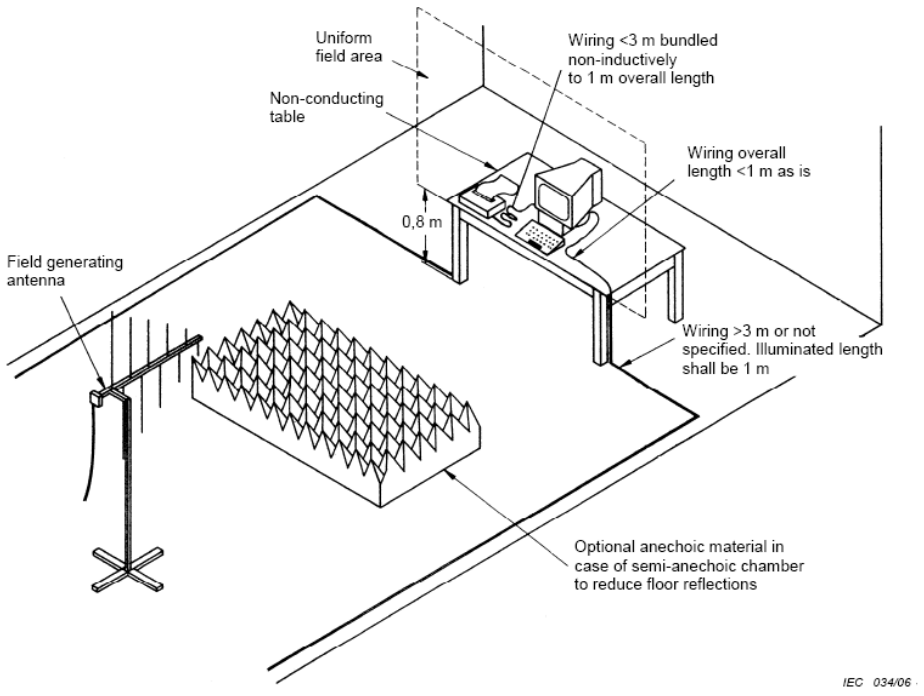
EUT Operation:

Input Voltage ..... : DC 5V

Operating Mode..... : Working 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*
1400 to 2000MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
1400 to 2000MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*
2000 to 2700MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
2000 to 2700MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*
1800MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
1800MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*
2600MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
2600MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*
3500MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
3500MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*
5000MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	1s	A	Pass*
5000MHz	Front, Back, Left, Right	Vertical	3V/m	1%	1s	A	Pass*

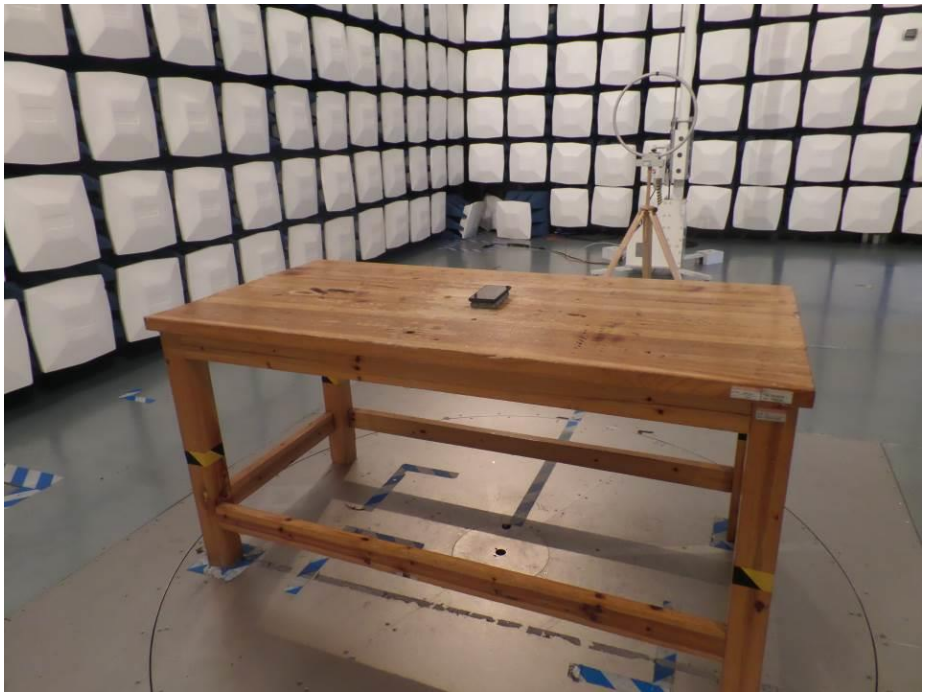
Remark:

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

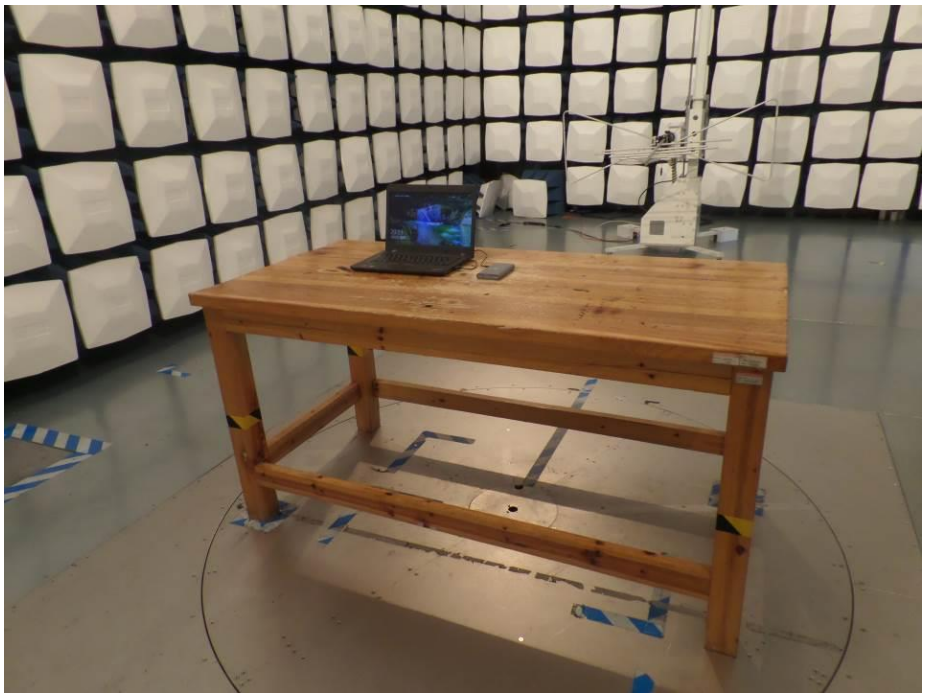
7 Photographs – Test Setup

7.1 Photograph –Radiated Emission Test Setup

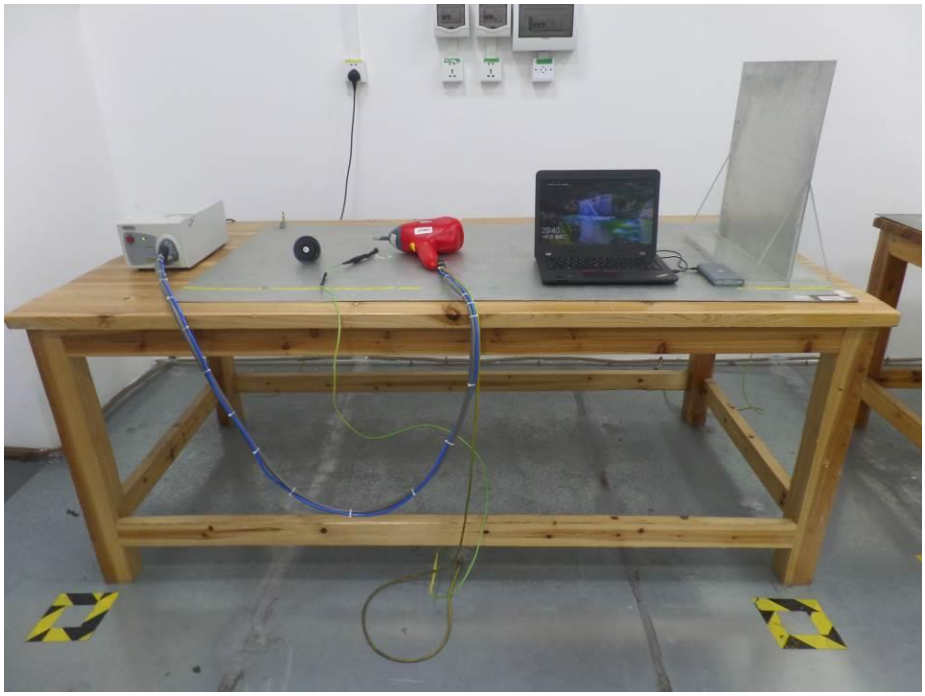
Below 30MHz



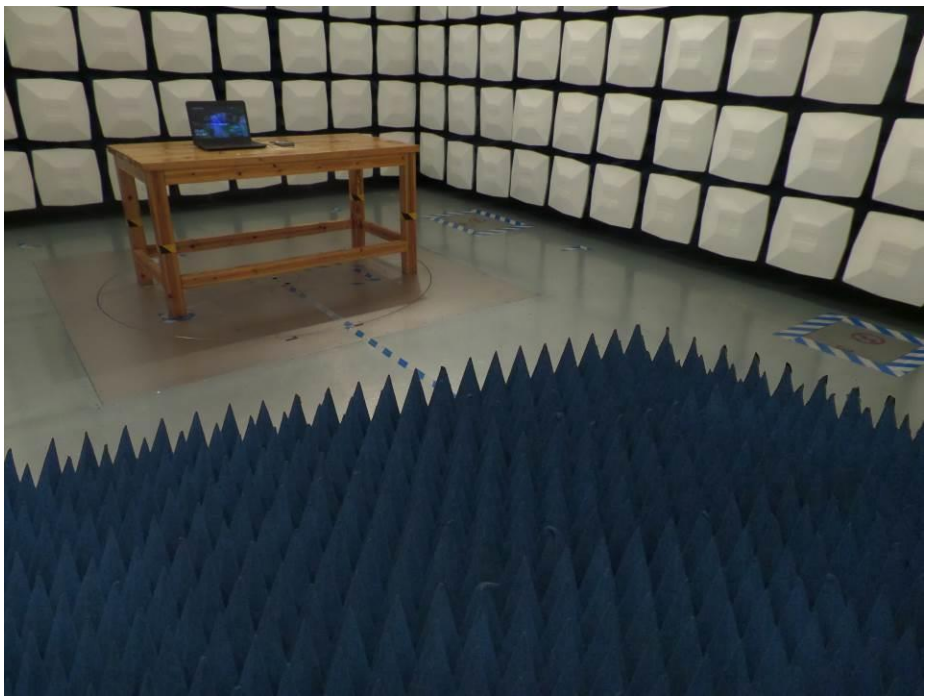
30MHz to 1GHz



7.2 Photograph –ESD Test Setup

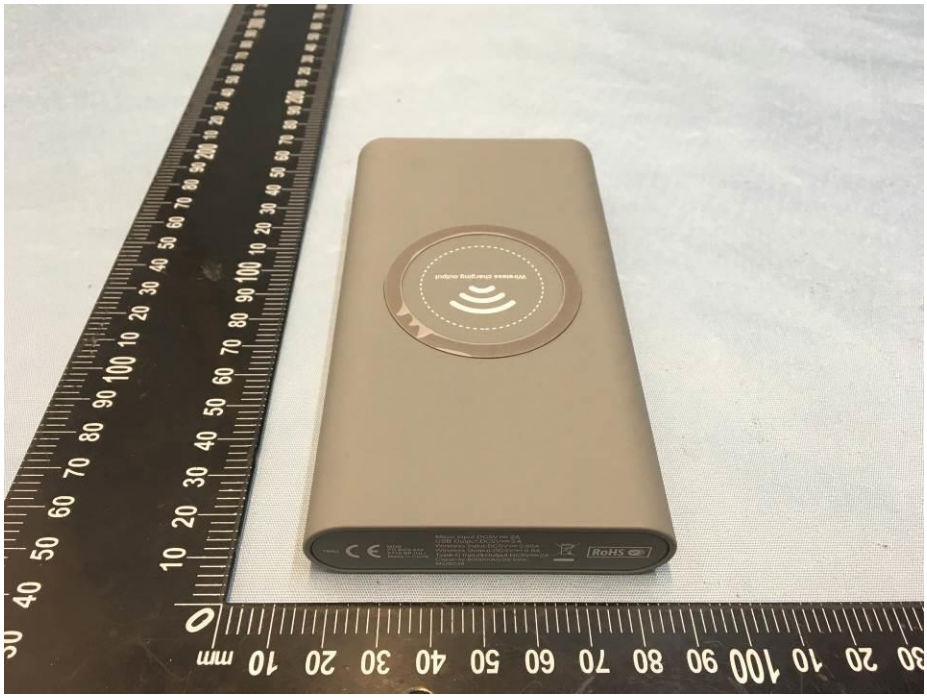


7.3 Photograph - Radiated immunity Test Setup

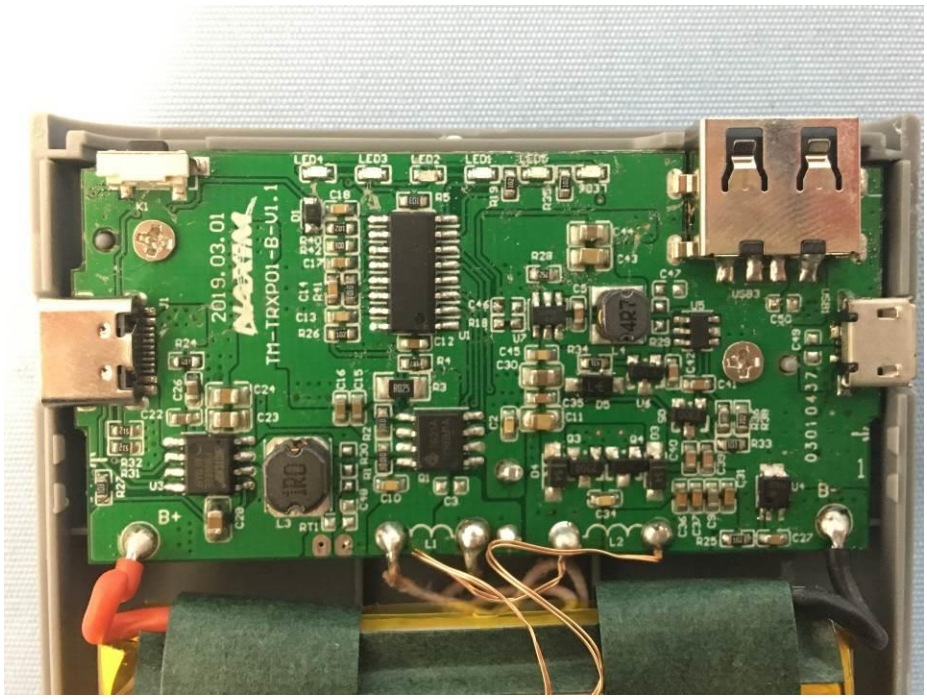


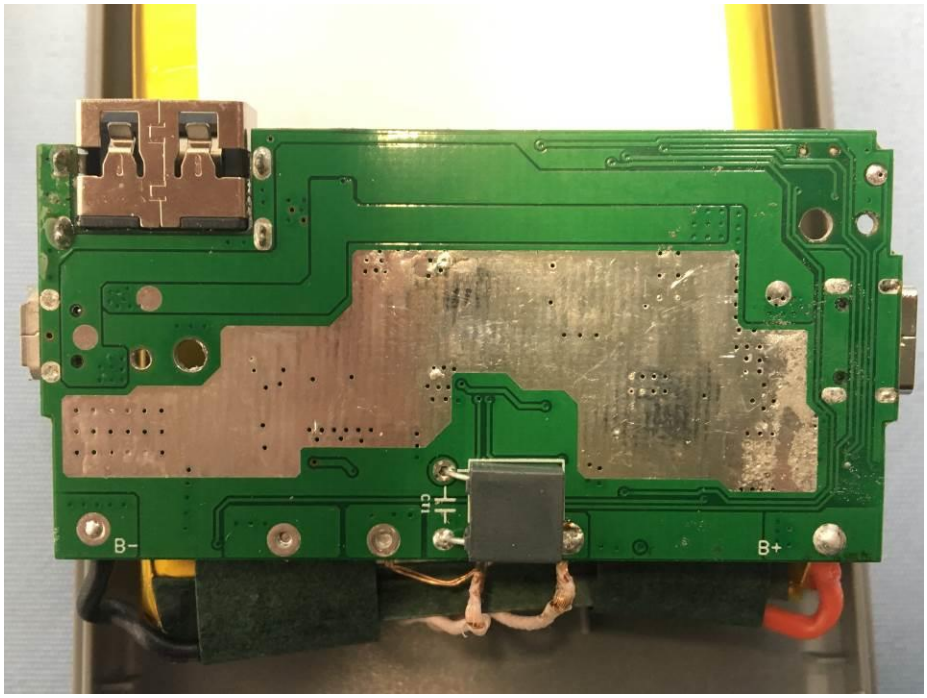
8 Photographs – Constructional Details

8.1 EUT – External View



8.2 EUT – Internal View





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