中国认可
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检测
TESTING
CNAS L6478

TEST REPORT

Reference No.	:	WTF16F1267148E
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	:	Luggage scale with power bank and torch
Model No.	:	MO9016
Standards	:	EN 55032:2015 EN 55015:2013 EN 55015:2013+A1:2015 EN 55024:2010+A1:2015 EN 61547:2009
Date of Receipt sample	:	2016-12-05
Date of Test	:	2016-12-07 to 2017-03-30
Date of Issue	:	2017-03-31
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			
Test Item	**Test Standard**	**Class / Severity**	**Result**
Radiation Emission, 30MHz to 1000MHz	EN 55032:2015 EN 55015:2013+A1:2015	Table A.4 Clause 4.4.2	Pass
Radiated electromagnetic disturbance, 9kHz to 30MHz	EN 55015:2013+A1:2015	Clause 4.4.1	Pass

IMMUNITY (EN 55024:2010+A1:2015,EN 61547:2009)				
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
N/A	Test case does not apply to the test object
*	The Radio-frequency electromagnetic fields test is not in our CNAS scope, the test was subcontracted to a CNAS accredited laboratory and test result is pass.

2 Contents

3 General Information

3.1 General Description of E.U.T.

Product Name ..... : Luggage scale with power bank and torch

Model No. ..... : MO9016

Remark..... : ---

3.2 Details of E.U.T.

Technical Data..... : Battery 3.7V or DC 5V by USB port

3.3 Description of Support Units

The EUT has been tested as an independent unit. MO9016 is the test sample. All tests were performed in the condition of battery 3.7V input or 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 55015:2013 EN 55015:2013+A1:2015	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment
EN 55024:2010+A1:2015	Information technology equipment — Immunity characteristics — Limits and methods of measurement.
EN 61547:2009	Equipment for general lighting purposes — EMC immunity requirements

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: Radio-frequency electromagnetic fields

Lab information: Waltek Services (Shenzhen) Co.,Ltd.

3.7 Abnormalities from Standard Conditions

None.

4 Equipment Used during Test

Radiated electromagnetic disturbance(9kHz to 30MHz)					
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Status**
1.	EMI Test Receiver	R&S	ESCI	101178	Valid
2	Three Loops Antenna	SCHWARZBECK	HXYZ9170	213	Valid
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 Generator	R&S	SMB100A-B106	105942	Valid
2.	RF Power Amplifier	R&S	BLWA0830-160/100/40D	128740	Valid
3.	Logarithmic periodic antennas	R&S	STLP9128D	043	Valid
4.	Dynamometer	R&S	NRP2-2*Z91	102031	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)

(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 Electromagnetic Disturbance, 9kHz to 30MHz

Test Requirement..... : EN 55015 Clause 4.4.1

Test Method..... : EN 55015 Clause 9.1

Test Result..... : Pass

Frequency Range..... : 9kHz to 30MHz

Class/Severity..... : Table 3a of EN55015

5.1.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 24.8°C

Humidity..... : 49.3%RH

Barometric Pressure..... : 101.2kPa

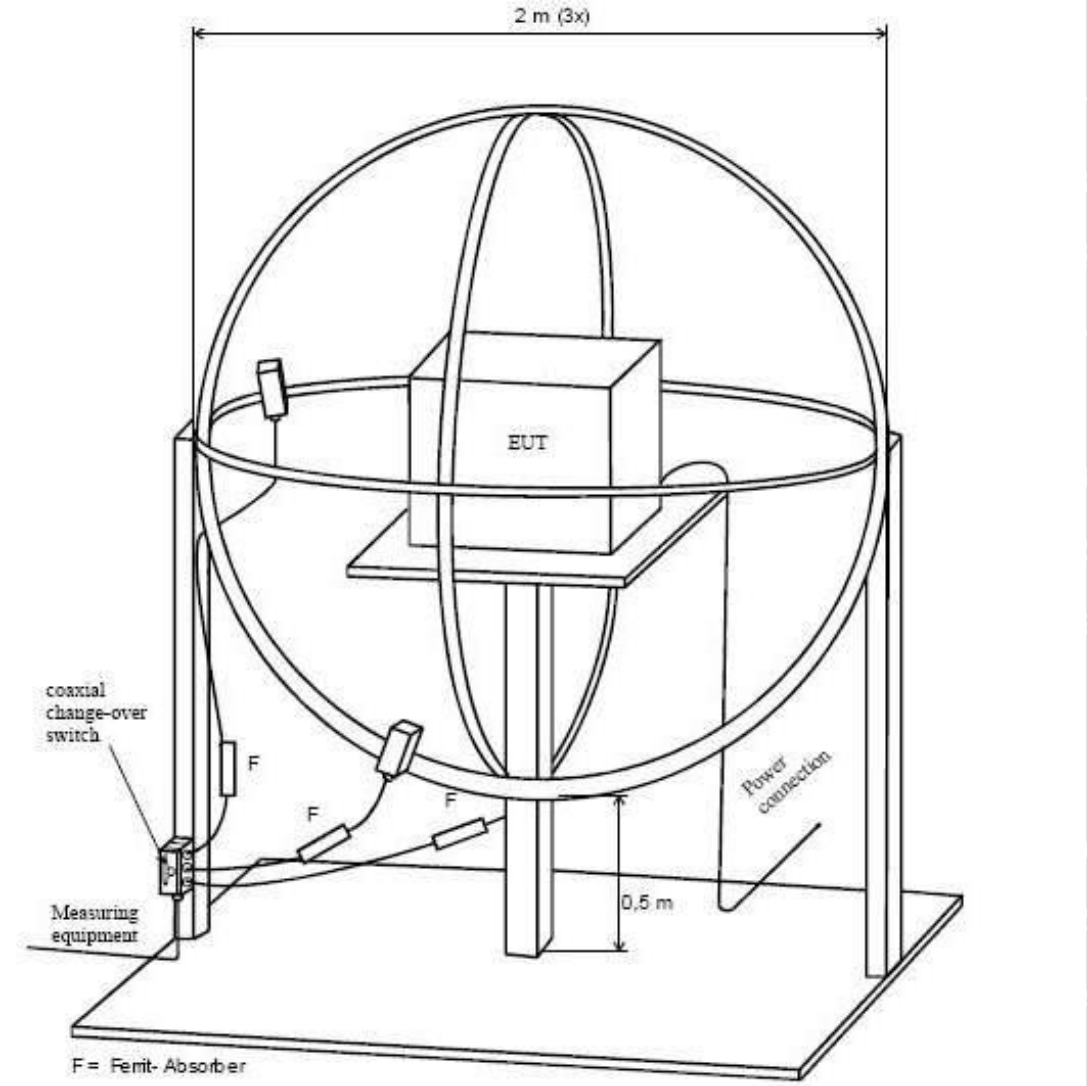
EUT Operation:

Input Voltage ..... : Battery 3.7V

Operating Mode..... : Lighting mode

5.1.2 Block Diagram of Test Setup

The Radiated Electromagnetic Disturbance (9kHz to 30MHz) test was performed in accordance with the EN 55015.

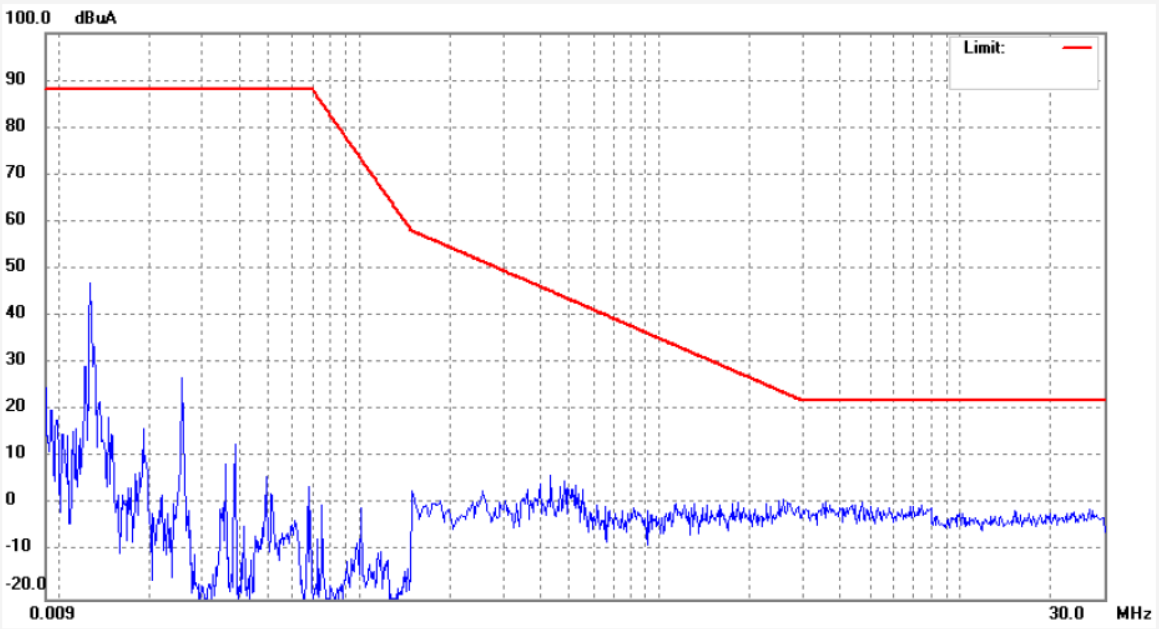


5.1.3 Measurement Data

According to the data in section 5.2.4, the EUT complied with the EN55015 standards.

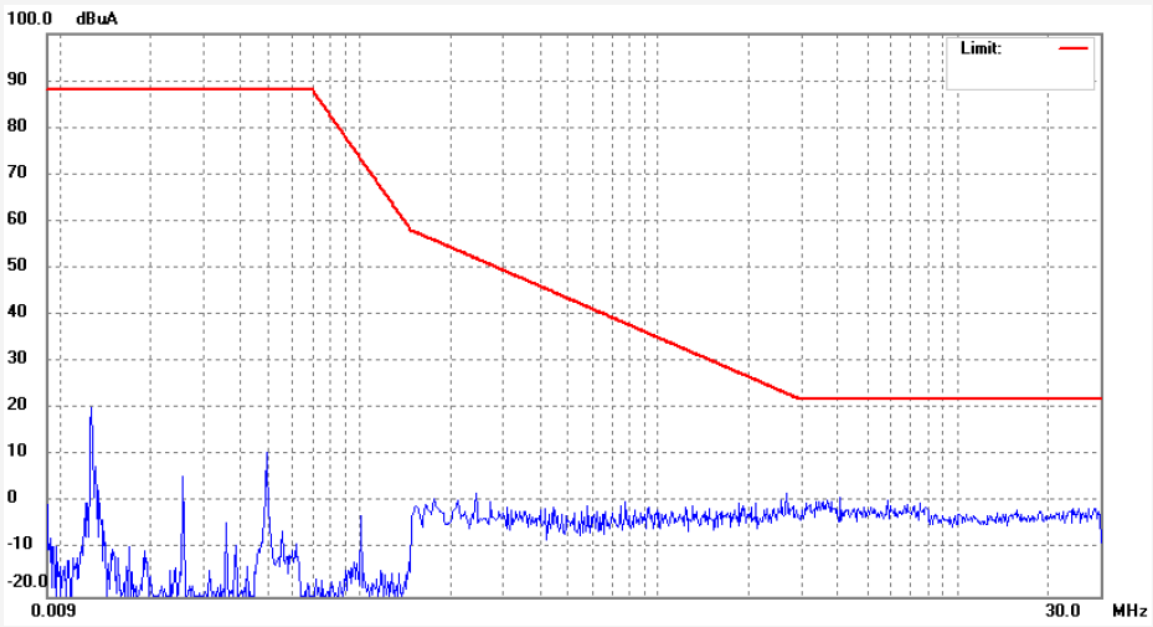
5.1.4 Radiated Electromagnetic Disturbance test data, 9kHz to 30MHz

Loop X:



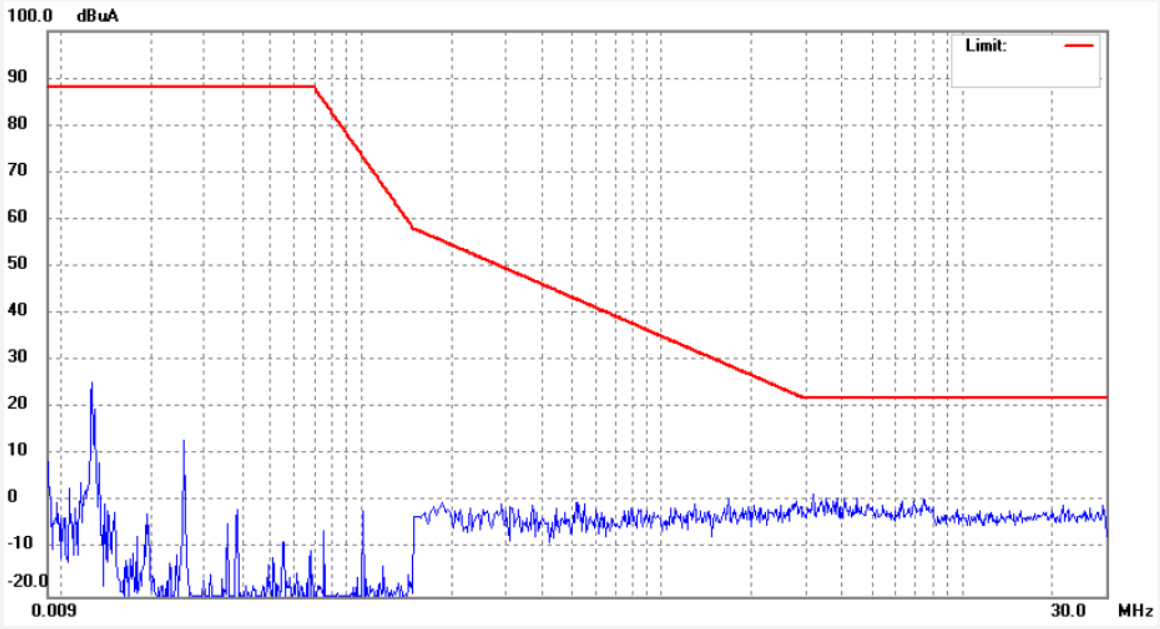
No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector	Remark

Loop Y:



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector	Remark

Loop Z:



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector	Remark

5.2 Radiated Emission

Test Requirement..... : EN 55032, EN 55015

Test Method..... : EN 55032, Clause 10 of CISPR 22

Test Limit..... : Table A.4 of EN 55032, Table 3b of EN55015

Test Result..... : Pass

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

Class...... : Class B

5.2.1 E.U.T. Operation

Operating Environment:

Temperature ..... : 24.8°C

Humidity..... : 49.8%RH

Atmospheric Pressure..... : 101.2 kPa

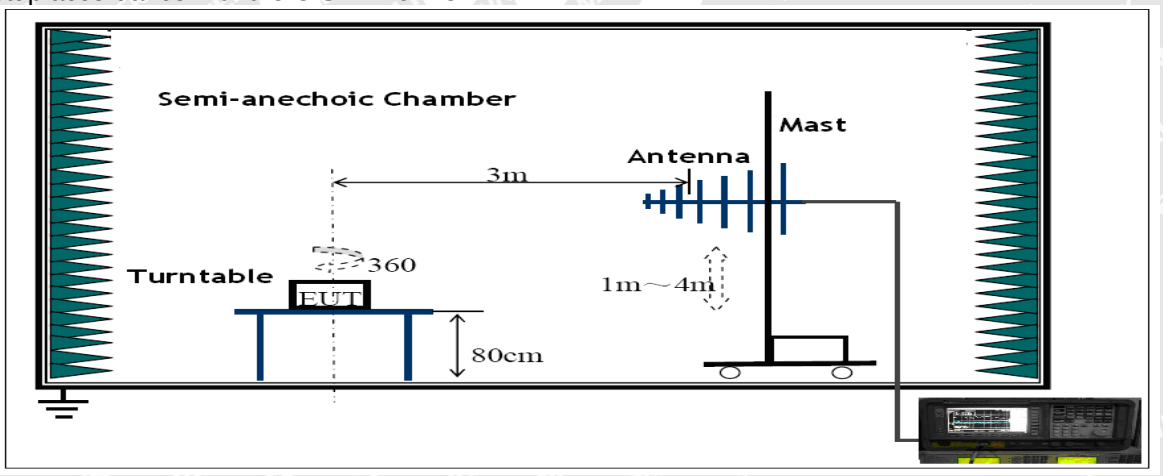
EUT Operation:

Input Voltage ..... : Battery 3.7V ; DC 5V by USB Port

Operating Mode..... : Scale mode; Discharging mode; Charging mode; Lighting mode

5.2.2 Block Diagram of Test Setup

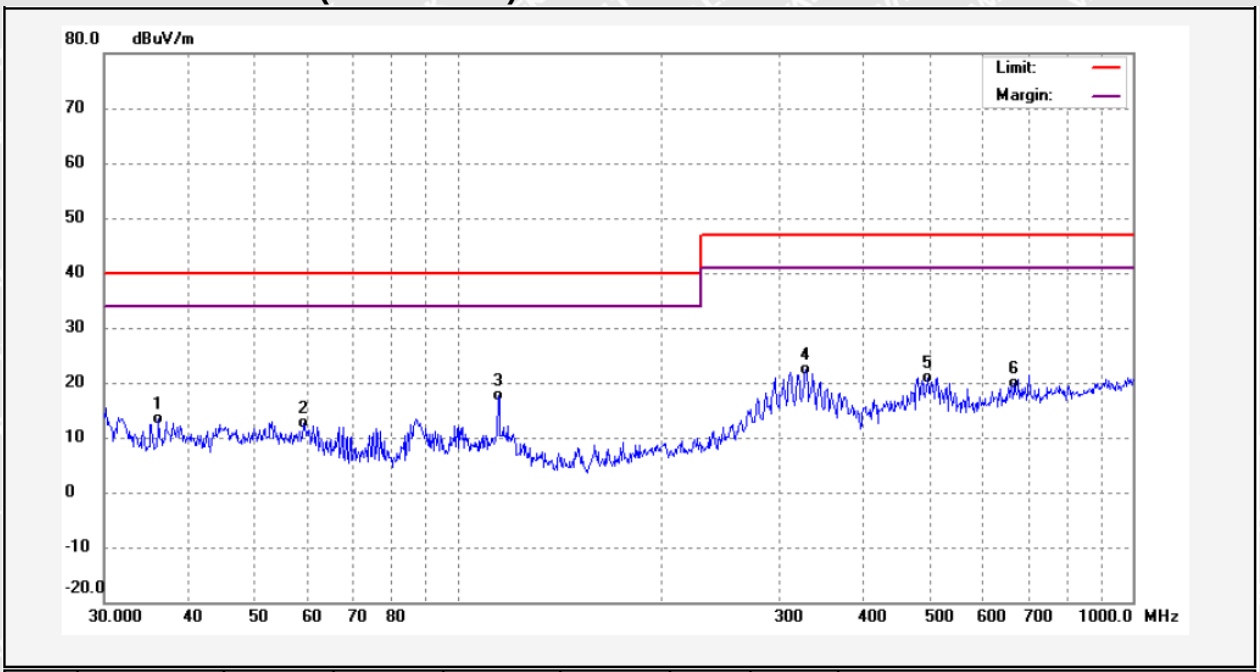
The Radiated Emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the CISPR 16-2-3.



5.2.3 Radiated Emission Test Data

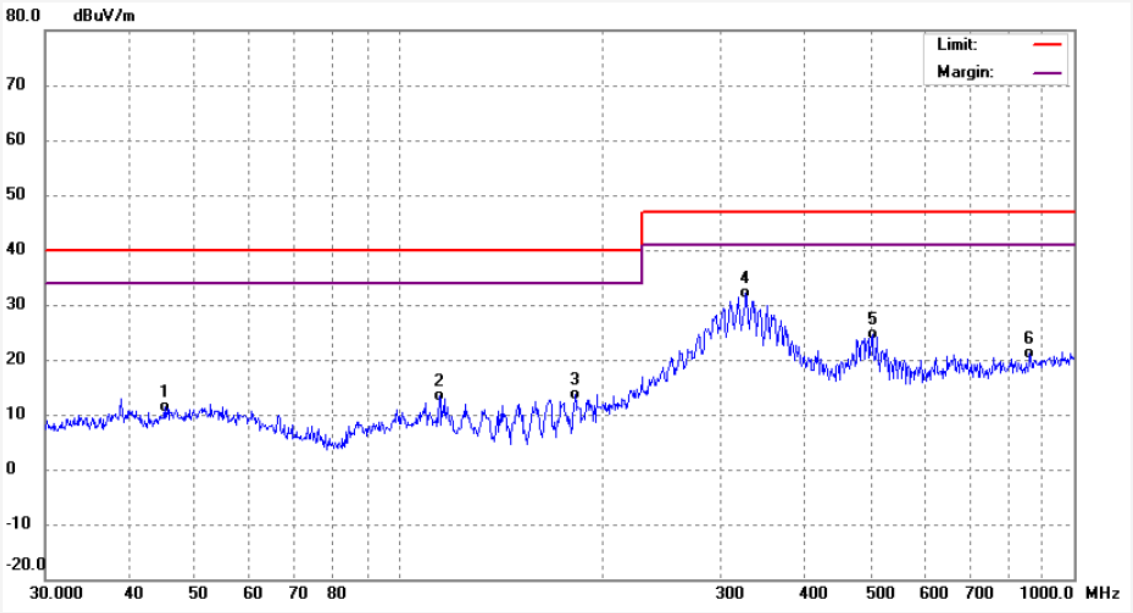
According to the data in section 5.2.3, the EUT complied with the EN 55032 standards.

Vertical Polarization (Scale mode)



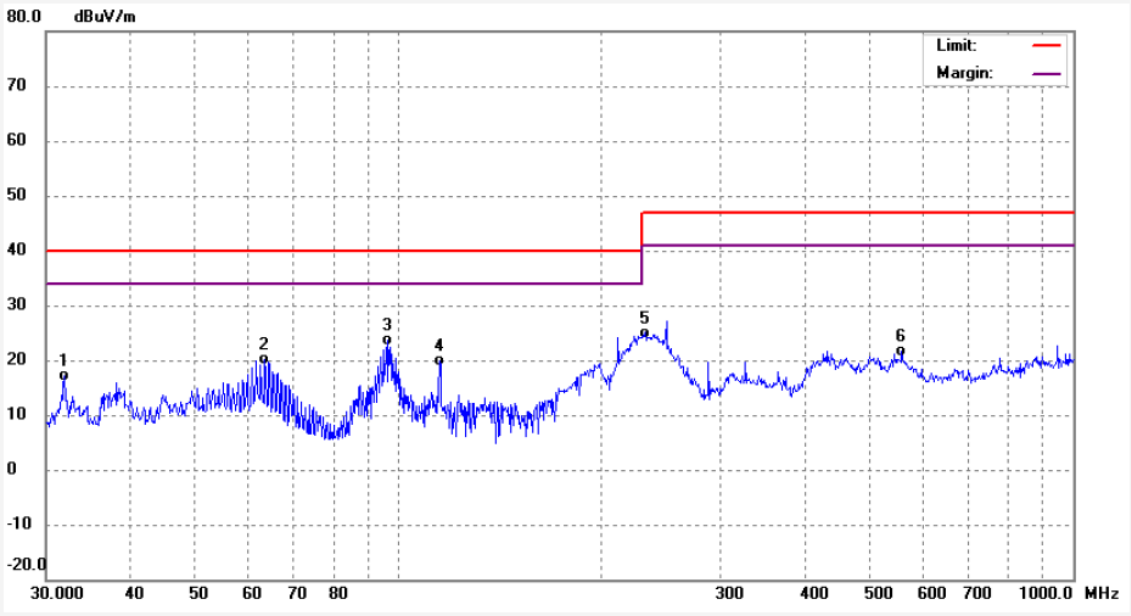
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	36.1272	28.61	-15.22	13.39	40.00	-26.61	QP	
2	59.2325	27.49	-14.83	12.66	40.00	-27.34	QP	
3	114.9169	34.22	-16.62	17.60	40.00	-22.40	QP	
4	327.8873	35.71	-13.24	22.47	47.00	-24.53	QP	
5	497.6765	31.38	-10.39	20.99	47.00	-26.01	QP	
6	668.1423	26.90	-7.12	19.78	47.00	-27.22	QP	

Horizontal Polarization (Scale mode)



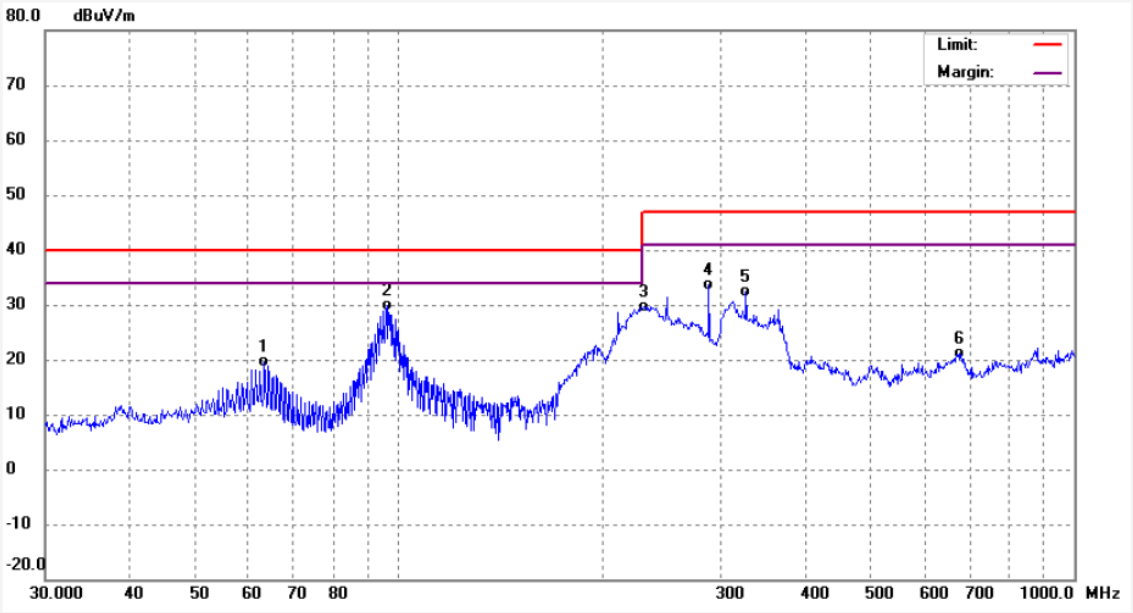
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	45.0583	25.33	-14.05	11.28	40.00	-28.72	QP	
2	114.9168	30.03	-16.62	13.41	40.00	-26.59	QP	
3	182.5592	31.21	-17.57	13.64	40.00	-26.36	QP	
4	326.7395	45.42	-13.37	32.05	47.00	-14.95	QP	
5	502.9395	34.88	-10.16	24.72	47.00	-22.28	QP	
6	860.0351	25.60	-4.54	21.06	47.00	-25.94	QP	

Vertical Polarization (Discharging mode)



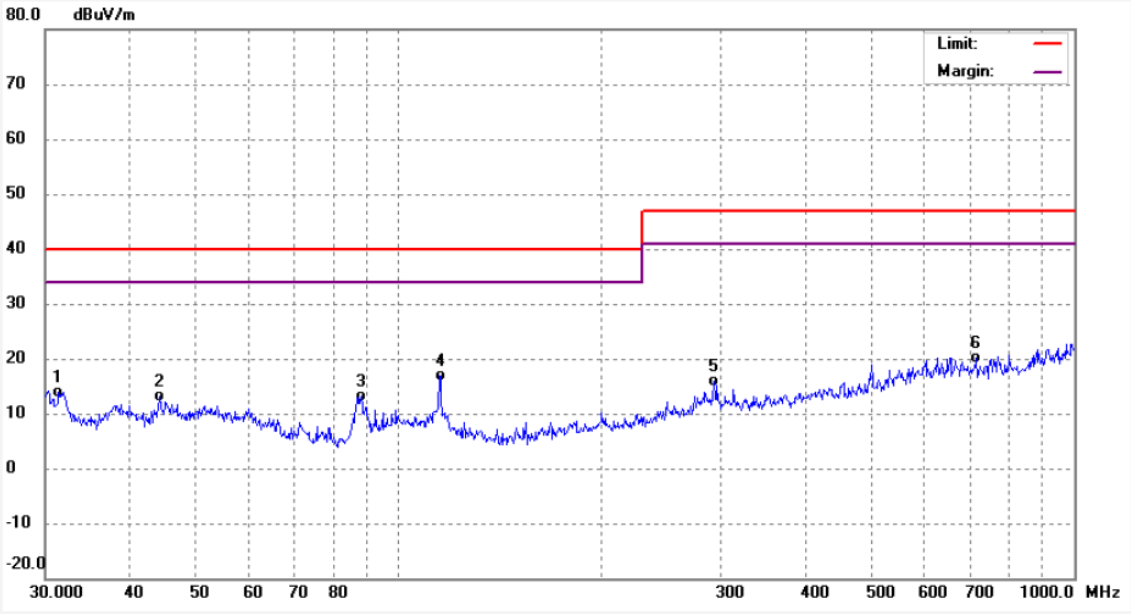
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	31.9546	32.12	-15.05	17.07	40.00	-22.93	QP	
2	63.3132	36.47	-16.28	20.19	40.00	-19.81	QP	
3	96.0986	39.96	-16.37	23.59	40.00	-16.41	QP	
4	114.9169	36.51	-16.62	19.89	40.00	-20.11	QP	
5	231.7179	41.11	-16.11	25.00	47.00	-22.00	QP	
6	556.7744	30.63	-8.95	21.68	47.00	-25.32	QP	

Horizontal Polarization (Discharging mode)



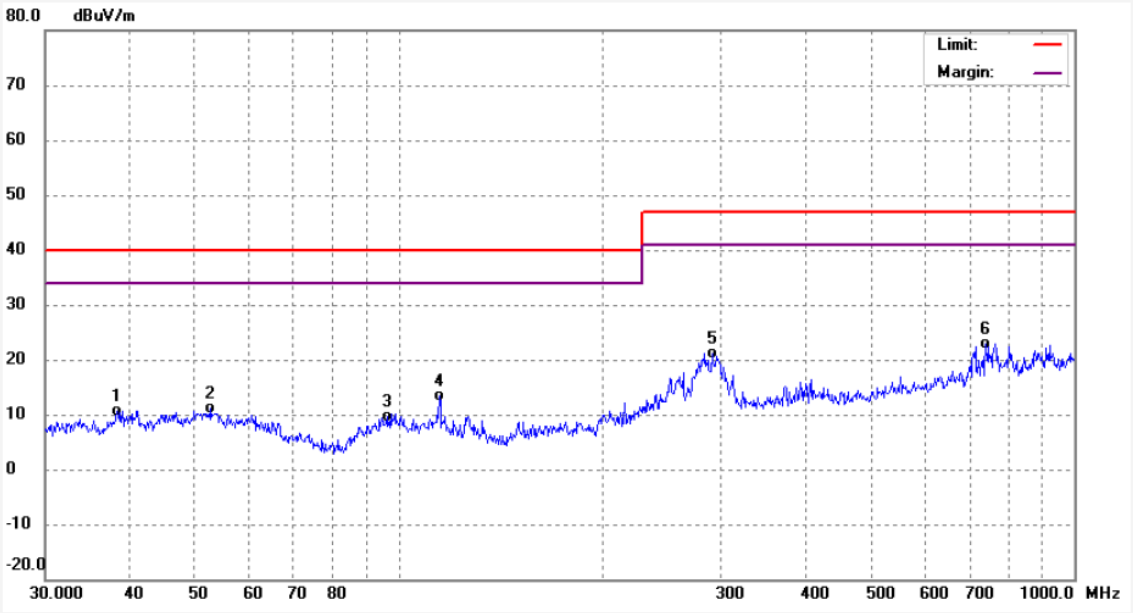
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	63.3132	35.92	-16.28	19.64	40.00	-20.36	QP	
2	96.0986	46.29	-16.37	29.92	40.00	-10.08	QP	
3	230.9068	45.82	-16.14	29.68	47.00	-17.32	QP	
4	287.9904	48.00	-14.41	33.59	47.00	-13.41	QP	
5	326.7395	45.72	-13.37	32.35	47.00	-14.65	QP	
6	675.2080	28.35	-7.24	21.11	47.00	-25.89	QP	

Vertical Polarization (Charging mode)



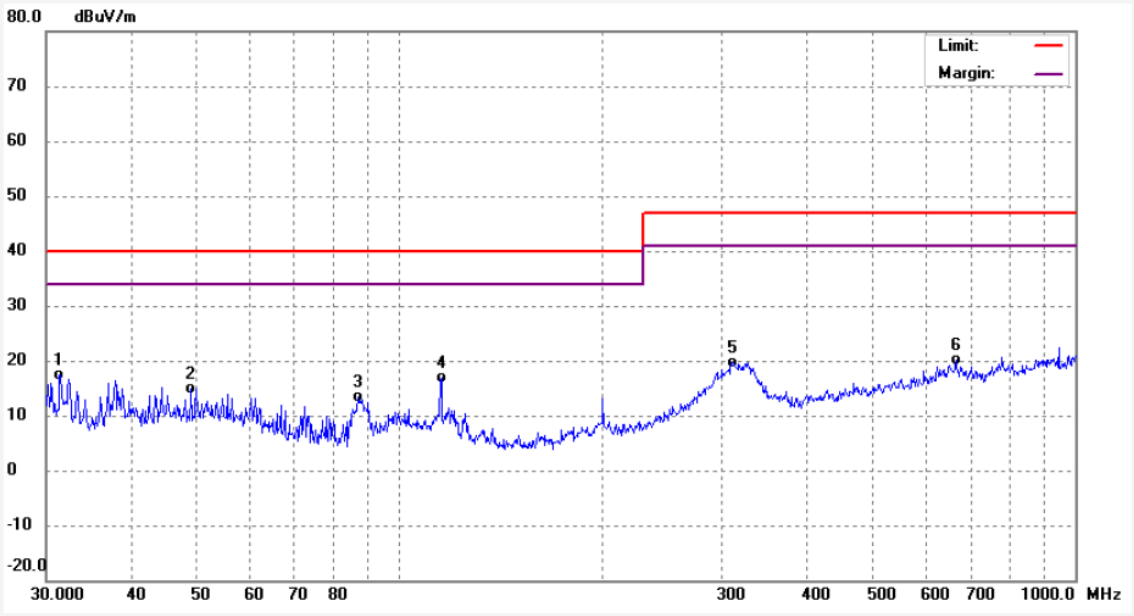
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	31.3992	29.18	-15.19	13.99	40.00	-26.01	QP	
2	44.2752	27.38	-14.16	13.22	40.00	-26.78	QP	
3	88.0329	31.22	-18.20	13.02	40.00	-26.98	QP	
4	115.3205	33.54	-16.69	16.85	40.00	-23.15	QP	
5	293.0842	29.87	-14.09	15.78	47.00	-31.22	QP	
6	716.6820	26.71	-6.54	20.17	47.00	-26.83	QP	

Horizontal Polarization (Charging mode)



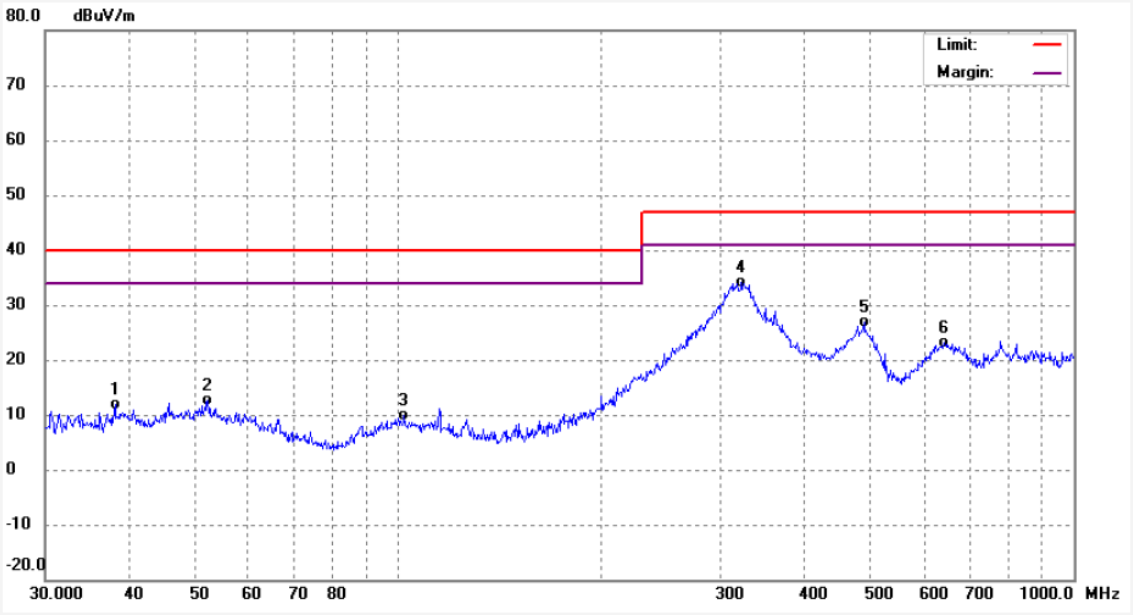
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	38.3462	25.16	-14.50	10.66	40.00	-29.34	QP	
2	52.7600	25.02	-13.79	11.23	40.00	-28.77	QP	
3	96.0986	25.94	-16.37	9.57	40.00	-30.43	QP	
4	114.9169	30.10	-16.62	13.48	40.00	-26.52	QP	
5	291.0360	35.22	-14.13	21.09	47.00	-25.91	QP	
6	739.6604	29.18	-6.31	22.87	47.00	-24.13	QP	

Vertical Polarization (Lighting mode)



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	31.3992	32.60	-15.19	17.41	40.00	-22.59	QP	
2	49.1865	28.52	-13.66	14.86	40.00	-25.14	QP	
3	86.8068	31.75	-18.48	13.27	40.00	-26.73	QP	
4	115.3205	33.69	-16.69	17.00	40.00	-23.00	QP	
5	311.0867	33.52	-13.91	19.61	47.00	-27.39	QP	
6	665.8035	27.31	-7.23	20.08	47.00	-26.92	QP	

Horizontal Polarization (Lighting mode)



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	38.0783	26.49	-14.55	11.94	40.00	-28.06	QP	
2	52.2079	26.40	-13.82	12.58	40.00	-27.42	QP	
3	102.0014	25.71	-15.78	9.93	40.00	-30.07	QP	
4	322.1886	48.06	-13.83	34.23	47.00	-12.77	QP	
5	489.0269	37.62	-10.77	26.85	47.00	-20.15	QP	
6	642.8613	30.84	-7.80	23.04	47.00	-23.96	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 61547
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:

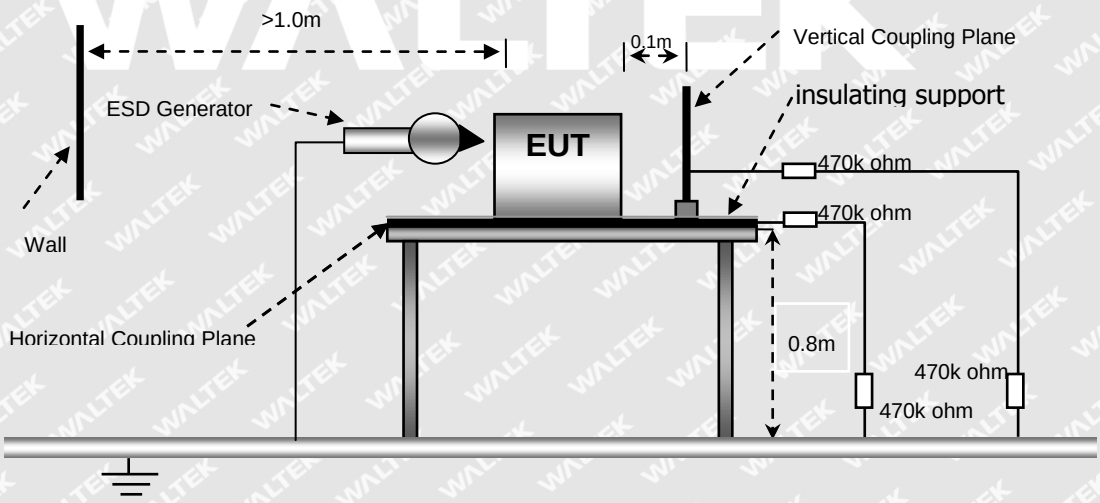
Temperature.....	:	21.0°C
Humidity	:	56.5%RH
Atmospheric Pressure.....	:	102.0kPa

EUT Operation:

Input Voltage	:	DC 5V by USB port
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, EN 61547

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..... : 22.0°C

Humidity ..... : 58.0%RH

Barometric Pressure ..... : 101.8kPa

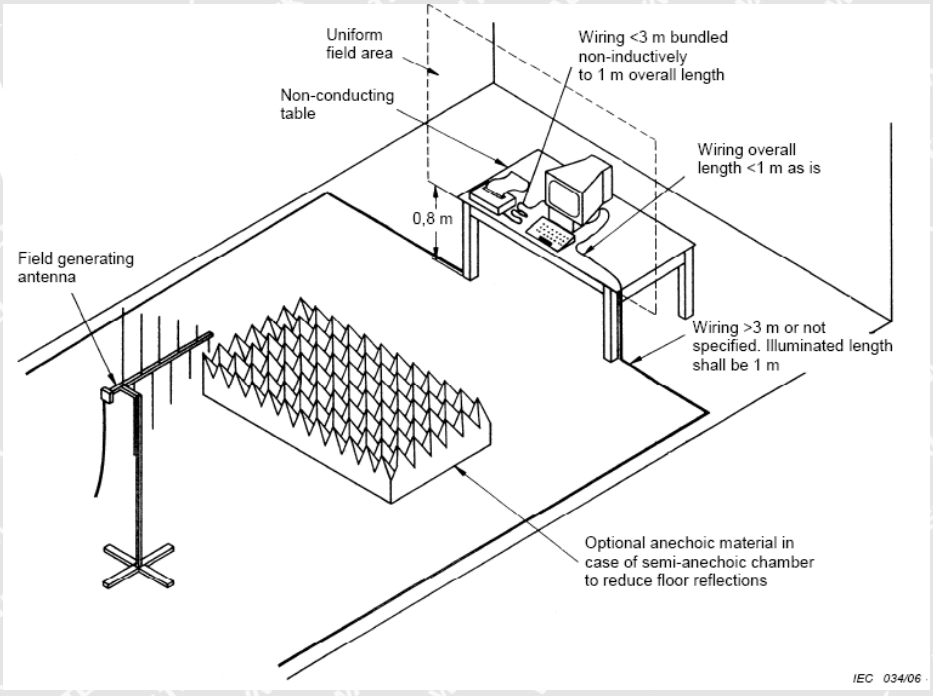
EUT Operation:

Input Voltage..... : Battery 3.7V

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*

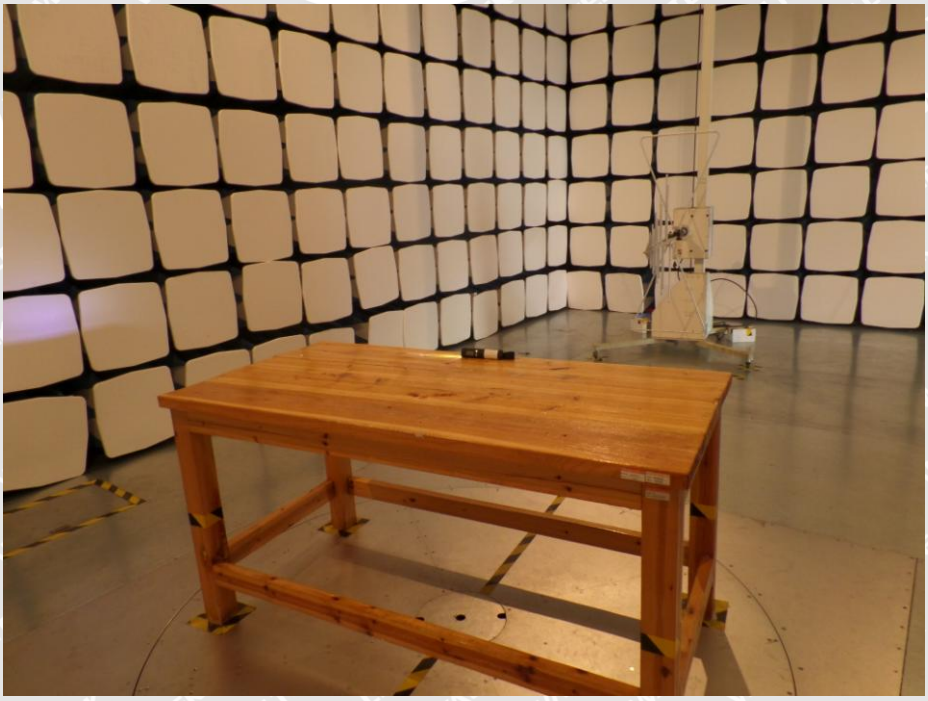
Remark:

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

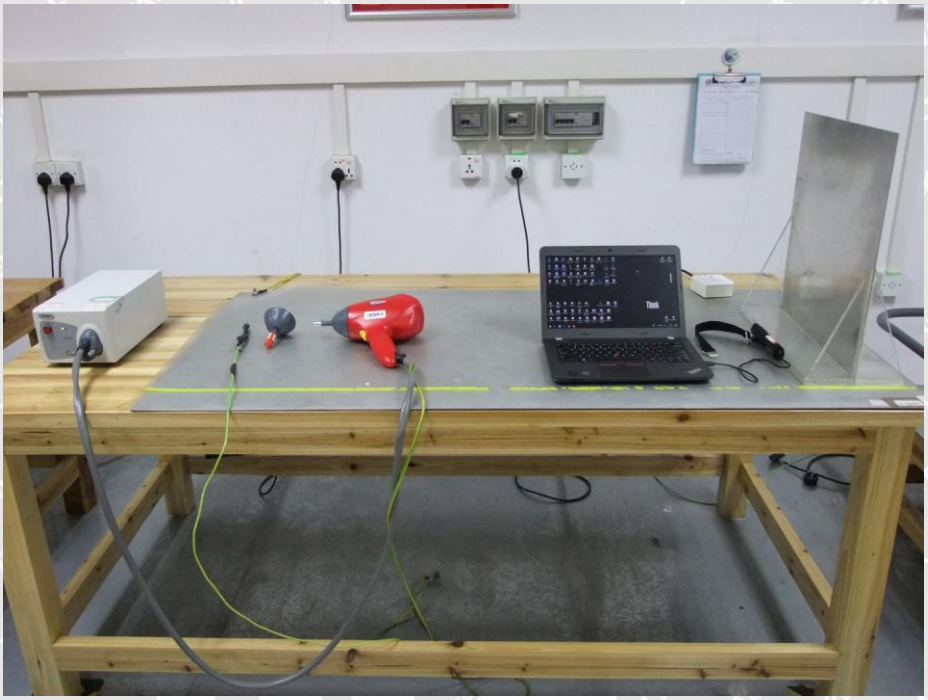
7 Photographs – Test Setup

7.1 Photograph – Radiated electromagnetic disturbance Test Setup, 9kHz to 30MHz

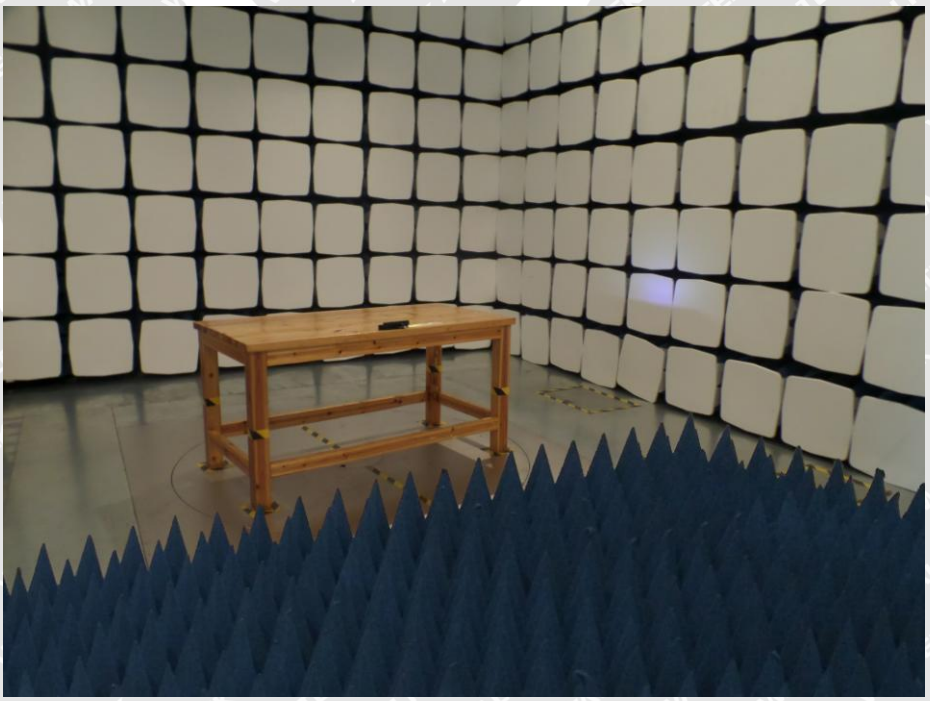
7.2 Photograph –Radiated Emission Test Setup



7.3 Photograph –ESD Test Setup



7.4 Photograph - Radiated immunity Test Setup



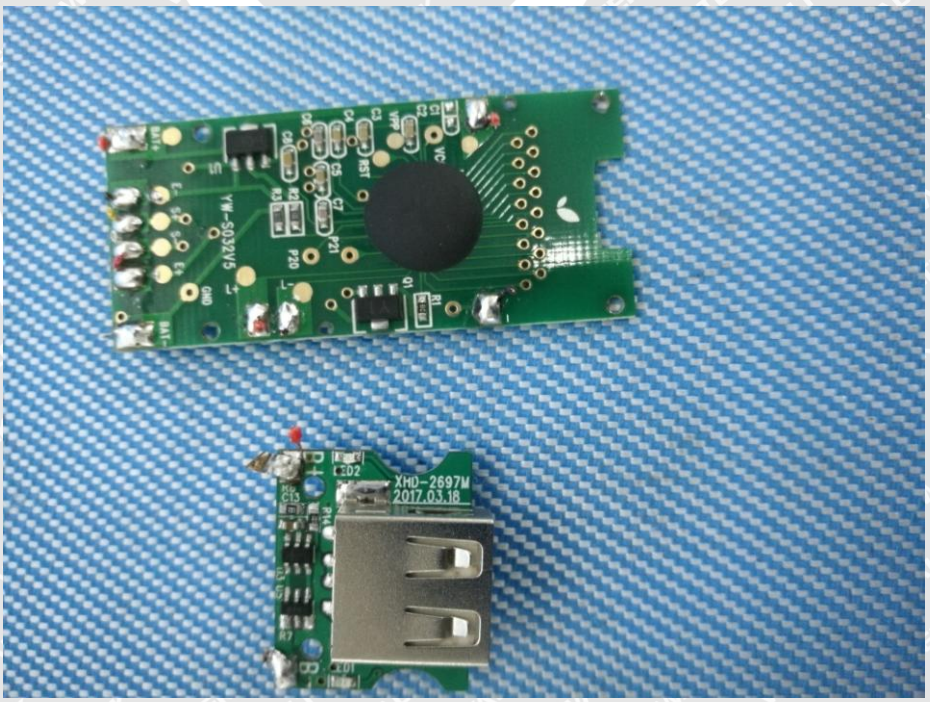
8 Photographs – Constructional Details

8.1 EUT – Front View

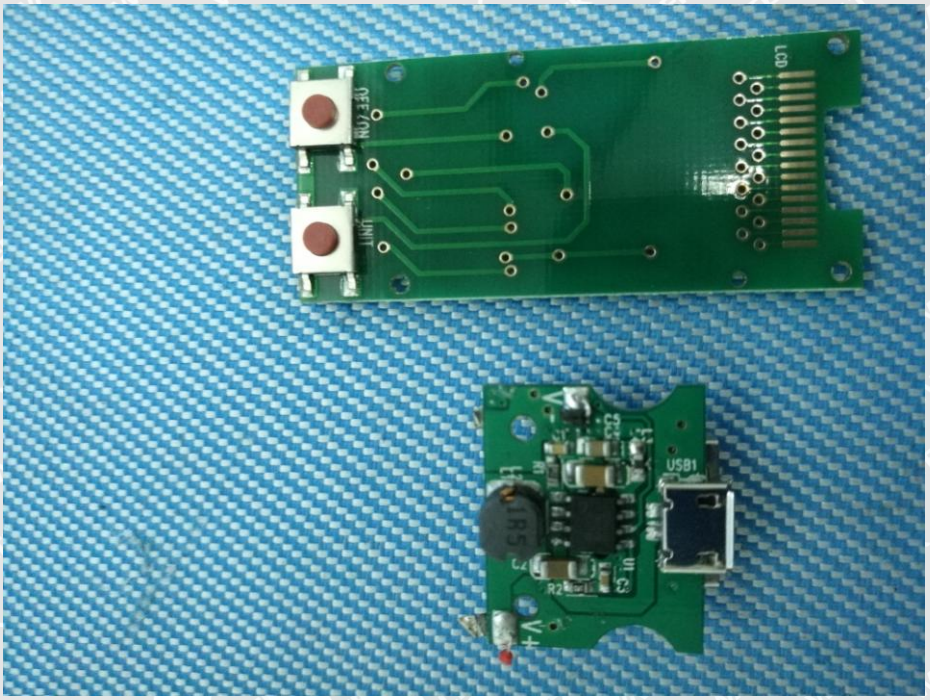
8.2 EUT –Back View

8.3 EUT – Open View

8.4 EUT – PCB Front View



8.5 EUT – PCB Back View



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