



中国认可
国际互认
检测
TESTING
CNAS L6478



TEST REPORT

Reference No. : WTF17F1298719E
 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. : MO9260
 Standards : EN 55032:2015
 EN 55024:2010+A1:2015
 Date of Receipt sample : 2017-12-25
 Date of Test : 2017-12-29 to 2018-01-22
 Date of Issue : 2018-01-22
 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.

Prepared By:

Waltek Services (Foshan) Co., Ltd.

Address: No. 13-19, 2/F, 2nd Building, Sunlink International Machinery City, Chencun Town, Shunde District, Foshan, Guangdong, China.

Tel:+86-757-23811398

Fax:+86-757-23811381

Compiled by

Roy Hong

Roy Hong / Project Engineer

Approved by:



Tom Xiao

Tom Xiao / Manager



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

N/A

*

Test item meets the requirement

Test case does not apply to the test object

The test is not in our CNAS scope, the test was subcontracted to a CNAS accredited laboratory and test result is pass.

WALTEK



2 Contents

	Page
COVER PAGE	1
1 TEST SUMMARY	2
2 CONTENTS	3
3 GENERAL INFORMATION	4
3.1 GENERAL DESCRIPTION OF E.U.T.	4
3.2 DETAILS OF E.U.T.	4
3.3 DESCRIPTION OF SUPPORT UNITS	4
3.4 STANDARDS APPLICABLE FOR TESTING	4
3.5 SUBCONTRACTED.....	5
3.6 ABNORMALITIES FROM STANDARD CONDITIONS.....	5
4 EQUIPMENT USED DURING TEST	6
4.1 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	6
4.2 MEASUREMENT UNCERTAINTY	6
5 EMISSION TEST RESULTS	7
5.1 RADIATED EMISSION , 30MHZ TO 1000MHZ.....	7
5.1.1 <i>E.U.T. Operation</i>	7
5.1.2 <i>Block Diagram of Test Setup</i>	7
5.1.3 <i>Radiated Emission Test Data</i>	8
5.2 RADIATED EMISSION ,1GHZ TO 6GHZ.....	12
5.2.1 <i>E.U.T. Operation</i>	12
5.2.2 <i>Block Diagram of Test Setup</i>	12
5.2.3 <i>Radiated Emission Test Data</i>	13
6 IMMUNITY TEST RESULTS	17
6.1 PERFORMANCE CRITERIA	17
6.2 ELECTROSTATIC DISCHARGE(ESD).....	18
6.2.1 <i>E.U.T. Operation</i>	18
6.2.2 <i>Block Diagram of Test Setup</i>	18
6.2.3 <i>Direct Discharge Test Results</i>	19
6.2.4 <i>Indirect Discharge Test Results</i>	19
6.3 RADIO-FREQUENCY ELECTROMAGNETIC FIELDS, 80MHZ TO 1GHZ	20
6.3.1 <i>E.U.T. Operation</i>	20
6.3.2 <i>Block Diagram of Setup</i>	20
6.3.3 <i>Test Results</i>	21
7 PHOTOGRAPHS – TEST SETUP	22
7.1 PHOTOGRAPH –RADIATED EMISSION TEST SETUP, 30MHZ TO 1GHZ	22
7.2 PHOTOGRAPH –RADIATED EMISSION TEST SETUP, 1GHZ TO 6GHZ.....	22
7.3 PHOTOGRAPH –ESD TEST SETUP	23
7.4 PHOTOGRAPH - RADIATED IMMUNITY TEST SETUP	23
8 PHOTOGRAPHS – CONSTRUCTIONAL DETAILS	24
8.1 EUT – FRONT VIEW.....	24



3 General Information

3.1 General Description of E.U.T.

Product Name : Bluetooth Speaker
Model No. : MO9260
Remark..... : ---

3.2 Details of E.U.T.

Technical Data..... : Charging input: DC 5V by USB port, 500mA
Battery: Lithium battery 3.7V, 300mAh

3.3 Description of Support Units

The EUT has been tested as an independent unit. MO9260 is the test sample. All tests were performed in the condition of DC 5V input with Notebook powered by USB port and battery 3.7V. The worst case is DC 5V input, only the worst case was recorded and reported.

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.

WALTEK



3.5 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.

3.6 Abnormalities from Standard Conditions

None.



WALTEK



4 Equipment Used during Test

Radiated Emission					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	EMC Analyzer	Agilent	E7405A	MY45114943	Valid
2.	Broadband Antenna	SCHWARZBECK	VULB9163	336	Valid
3.	Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-148	Valid
4.	10m Coaxial Cable with N- plug	SCHWARZBECK	AK 9515 H	---	Valid
5.	10m 50 Ohm Coaxial Cable with N-plug	SCHWARZBECK	AK 9513	---	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 Special Accessories and Auxiliary Equipment

Test Item: ESD					
Item	Equipment	Technical Data	Manufacturer	Model No.	Serial No.
1.	Notebook	AC 230V/50Hz	Lenovo	ThinkPad Edge E430	00426-OEM-8992662-00400
Test Item: RE, RS					
Item	Equipment	Technical Data	Manufacturer	Model No.	Serial No.
1.	Notebook	AC 230V/50Hz	Lenovo	ThinkPad E470c	00426-OEM-8992662-00006

4.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Radiated Emission	30MHz~1000MHz	±5.03dB	(1)
Radiated Emission	1GHz ~ 6GHz	±5.47dB	(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:

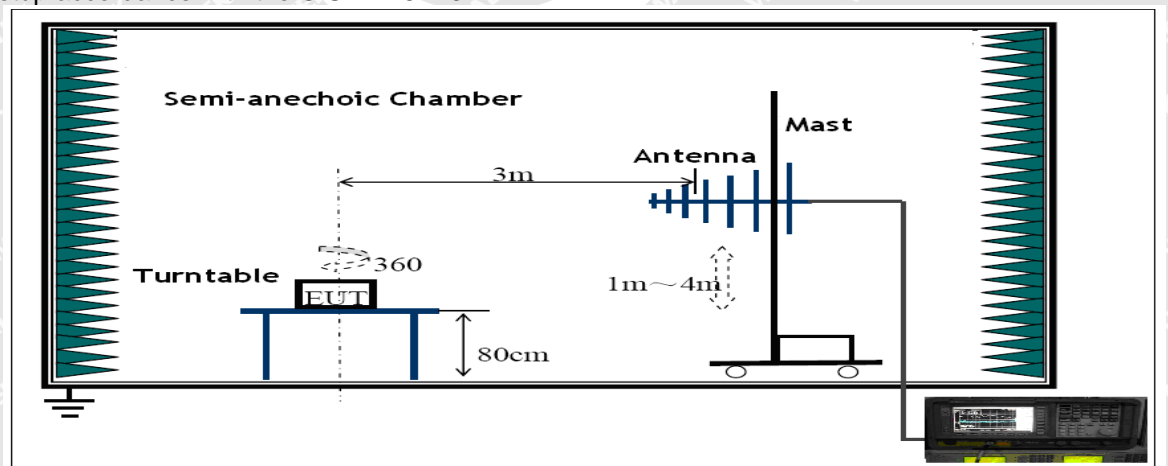
Temperature : 24°C
Humidity..... : 51%RH
Atmospheric Pressure..... : 101.2 kPa

EUT Operation:

Input Voltage : DC 5V by USB port
Operating Mode..... : Bluetooth + charging mode; AUX+charging 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.

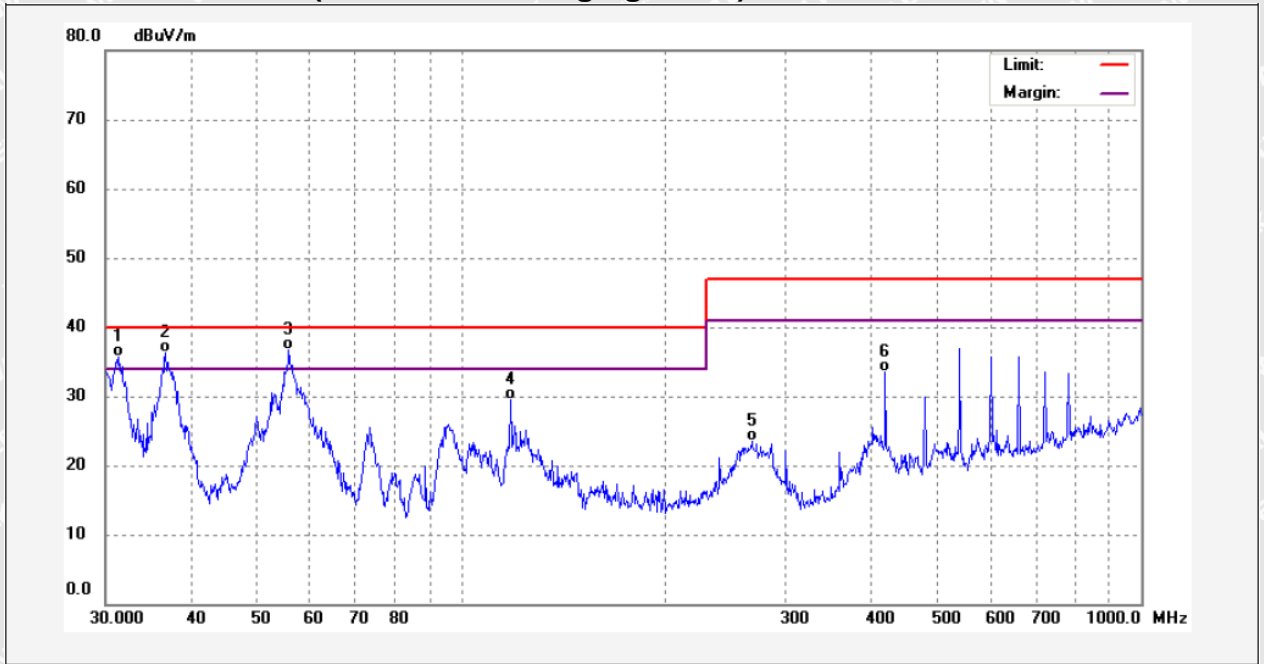




5.1.3 Radiated Emission Test Data

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

Vertical Polarization(Bluetooth + charging mode)

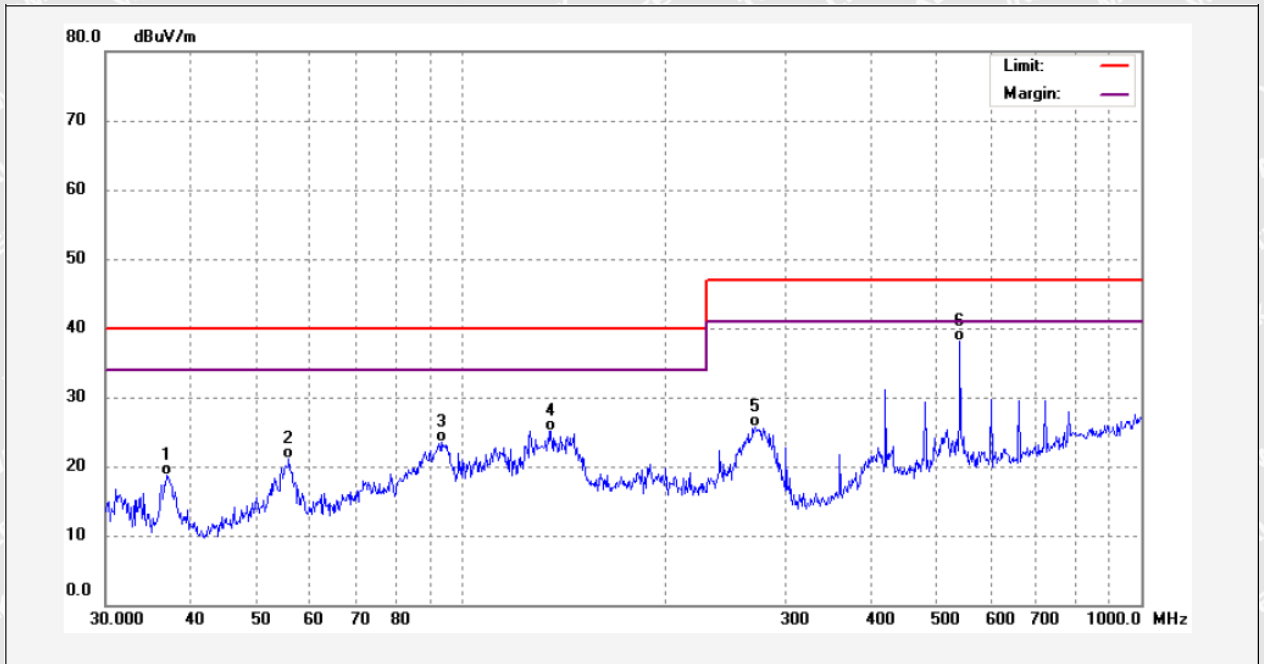


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	31.3992	52.80	-17.19	35.61	40.00	-4.39	QP	
2	36.7662	53.17	-16.94	36.23	40.00	-3.77	QP	
3	55.8047	53.76	-17.09	36.67	40.00	-3.33	QP	
4	118.1862	46.58	-17.17	29.41	40.00	-10.59	QP	
5	267.5454	38.32	-14.84	23.48	47.00	-23.52	QP	
6	420.5803	45.16	-11.69	33.47	47.00	-13.53	QP	





Horizontal Polarization(Bluetooth + charging mode)

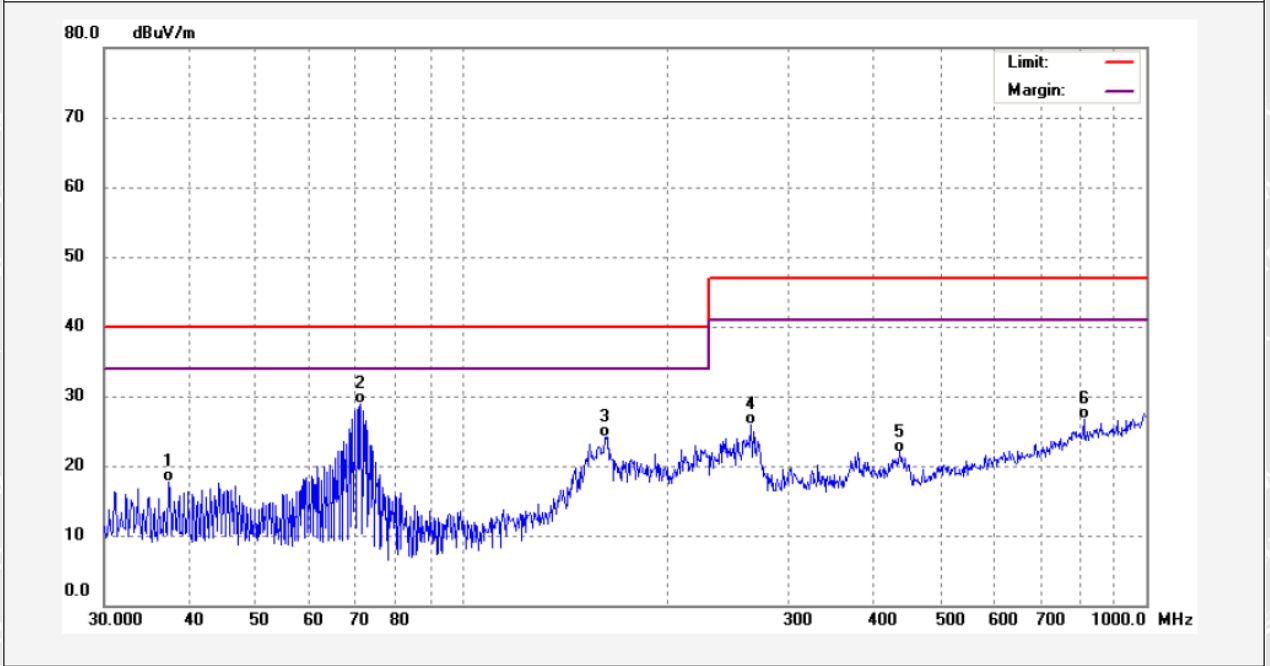


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	36.8953	35.60	-16.93	18.67	40.00	-21.33	QP	
2	55.8047	38.21	-17.09	21.12	40.00	-18.88	QP	
3	93.4402	42.96	-19.52	23.44	40.00	-16.56	QP	
4	135.5062	41.11	-15.96	25.15	40.00	-14.85	QP	
5	270.3748	40.51	-14.81	25.70	47.00	-21.30	QP	
6	541.3725	47.21	-9.19	38.02	47.00	-8.98	QP	

WALTEK



Vertical Polarization(AUX + charging mode)

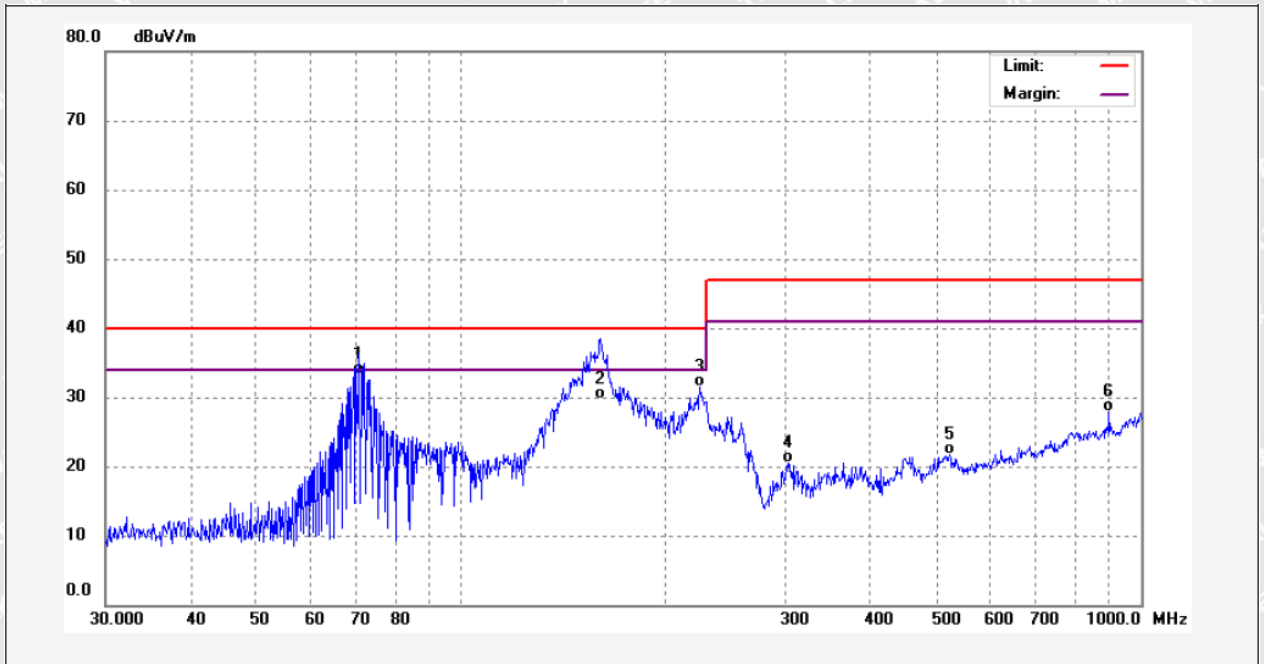


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	37.2854	34.58	-16.90	17.68	40.00	-22.32	QP	
2	71.0803	47.53	-18.64	28.89	40.00	-11.11	QP	
3	161.4742	39.33	-15.24	24.09	40.00	-15.91	QP	
4	264.7457	40.81	-14.88	25.93	47.00	-21.07	QP	
5	435.5898	33.39	-11.39	22.00	47.00	-25.00	QP	
6	810.2653	30.38	-3.62	26.76	47.00	-20.24	QP	





Horizontal Polarization(AUX + charging mode)



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	70.8315	51.91	-18.61	33.30	40.00	-6.70	QP	
2	160.3456	44.87	-15.17	29.70	40.00	-10.30	QP	
3	224.5193	48.17	-16.66	31.51	40.00	-8.49	QP	
4	302.4811	34.94	-14.37	20.57	47.00	-26.43	QP	
5	522.7179	30.96	-9.28	21.68	47.00	-25.32	QP	
6	896.9965	30.97	-3.08	27.89	47.00	-19.11	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:

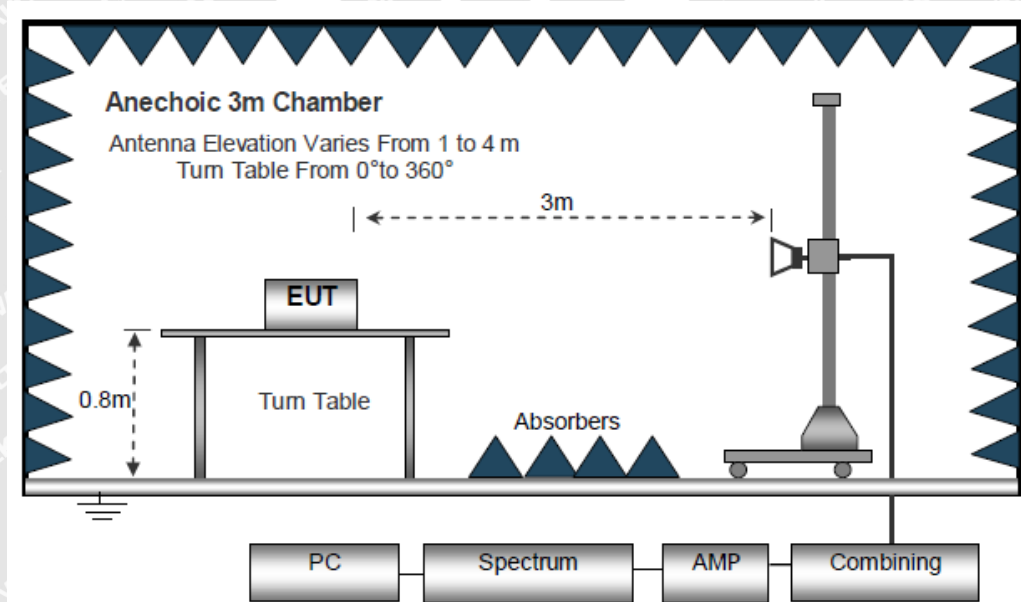
Temperature.....	: 23.1°C
Humidity.....	: 48.5%RH
Atmospheric Pressure.....	: 101.2 kPa

EUT Operation:

Input Voltage.....	: DC 5V by USB port
Operating Mode.....	: Bluetooth + charging mode; AUX+charging 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.

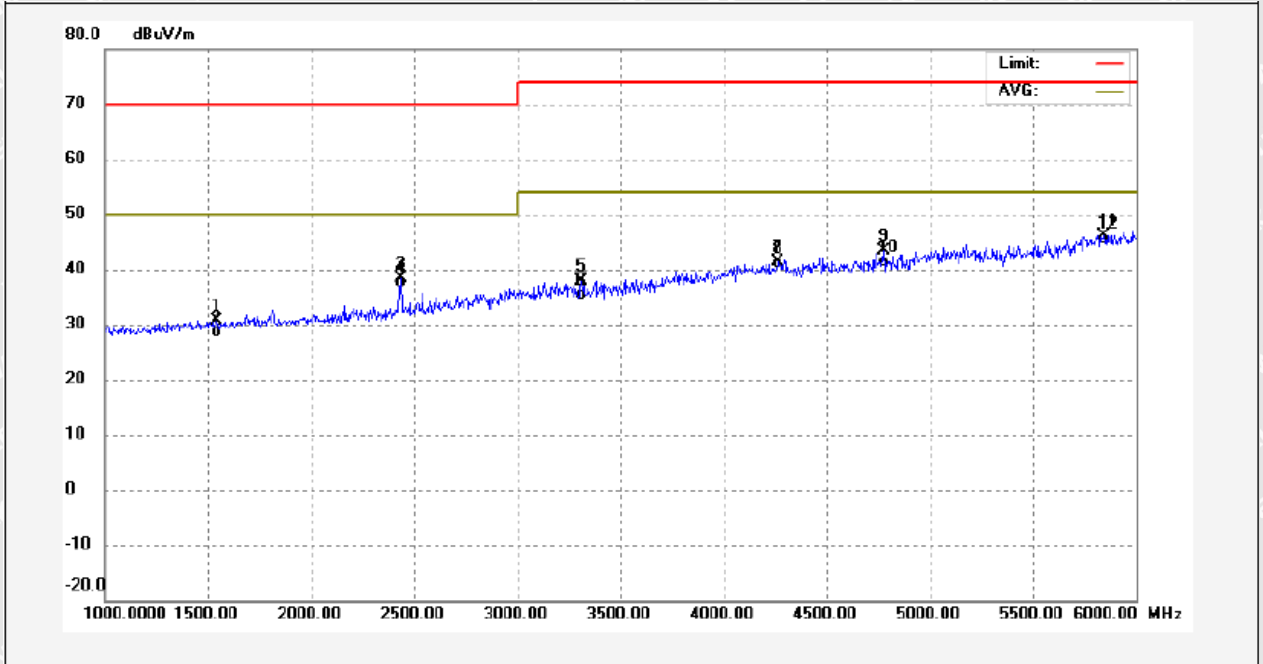




5.2.3 Radiated Emission Test Data

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

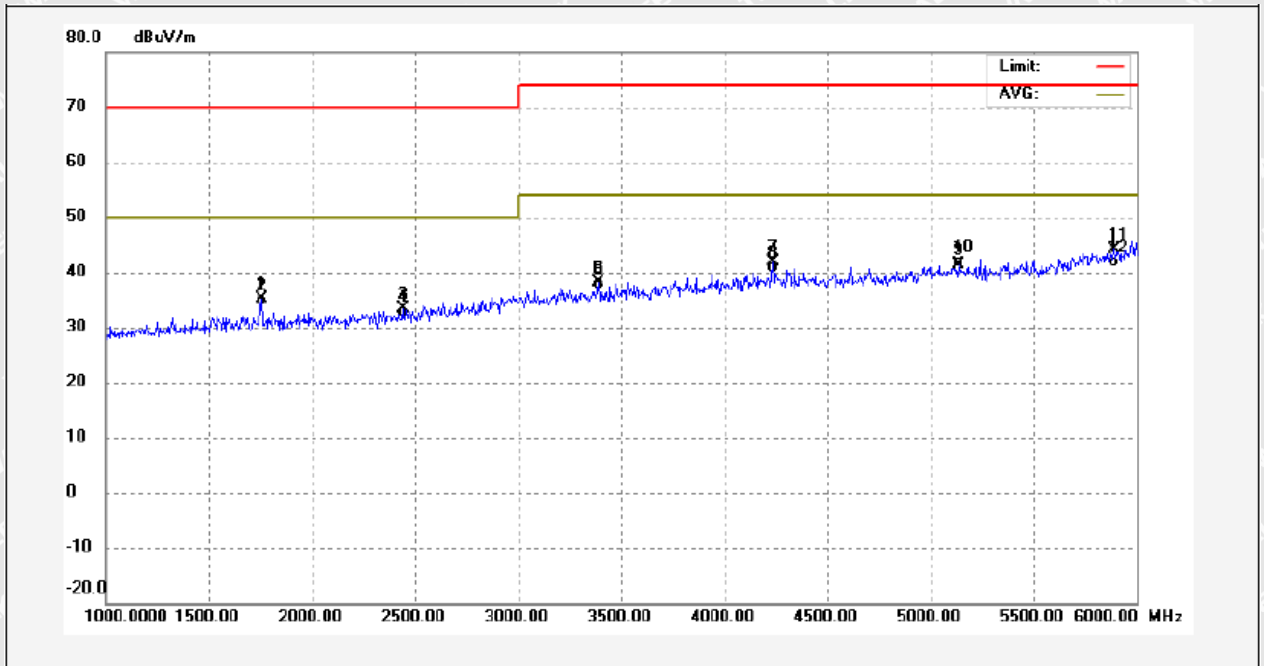
Vertical Polarization(Bluetooth + charging mode)



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1540.000	44.24	-13.63	30.61	70.00	-39.39	peak	
2	1540.000	42.24	-13.63	28.61	50.00	-21.39	AVG	
3	2435.000	48.63	-10.30	38.33	70.00	-31.67	peak	
4	2435.000	48.01	-10.30	37.71	50.00	-12.29	AVG	
5	3310.000	45.81	-7.84	37.97	74.00	-36.03	peak	
6	3310.000	43.19	-7.84	35.35	54.00	-18.65	AVG	
7	4265.000	46.44	-5.07	41.37	74.00	-32.63	peak	
8	4265.000	46.24	-5.07	41.17	54.00	-12.83	AVG	
9	4775.000	46.64	-3.38	43.26	74.00	-30.74	peak	
10	4775.000	44.82	-3.38	41.44	54.00	-12.56	AVG	
11	5845.000	47.42	-1.20	46.22	74.00	-27.78	peak	
12	5845.000	46.88	-1.20	45.68	54.00	-8.32	AVG	



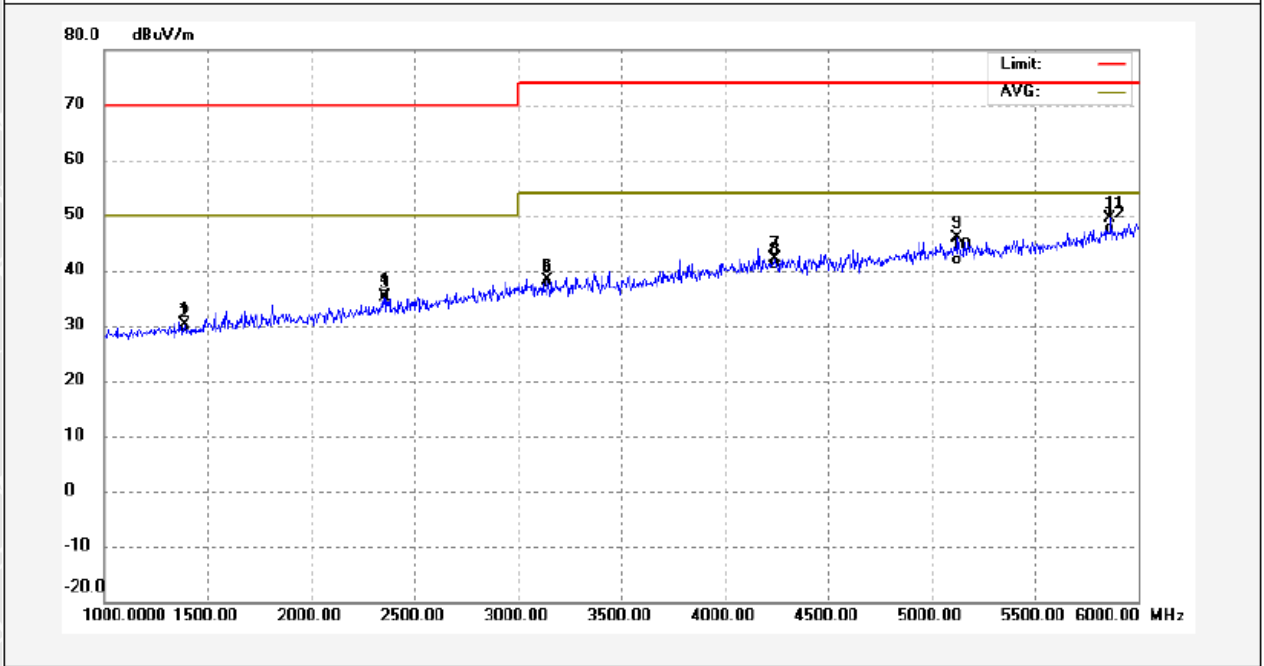
Horizontal Polarization(Bluetooth + charging mode)



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1755.000	48.59	-13.46	35.13	70.00	-34.87	peak	
2	1755.000	48.43	-13.46	34.97	50.00	-15.03	AVG	
3	2440.000	45.65	-12.33	33.32	70.00	-36.68	peak	
4	2440.000	45.13	-12.33	32.80	50.00	-17.20	AVG	
5	3390.000	47.81	-9.77	38.04	74.00	-35.96	peak	
6	3390.000	47.54	-9.77	37.77	54.00	-16.23	AVG	
7	4235.000	50.10	-8.28	41.82	74.00	-32.18	peak	
8	4235.000	49.23	-8.28	40.95	54.00	-13.05	AVG	
9	5135.000	47.95	-6.48	41.47	74.00	-32.53	peak	
10	5135.000	48.28	-6.48	41.80	54.00	-12.20	AVG	
11	5890.000	49.16	-5.13	44.03	74.00	-29.97	peak	
12	5890.000	46.92	-5.13	41.79	54.00	-12.21	AVG	



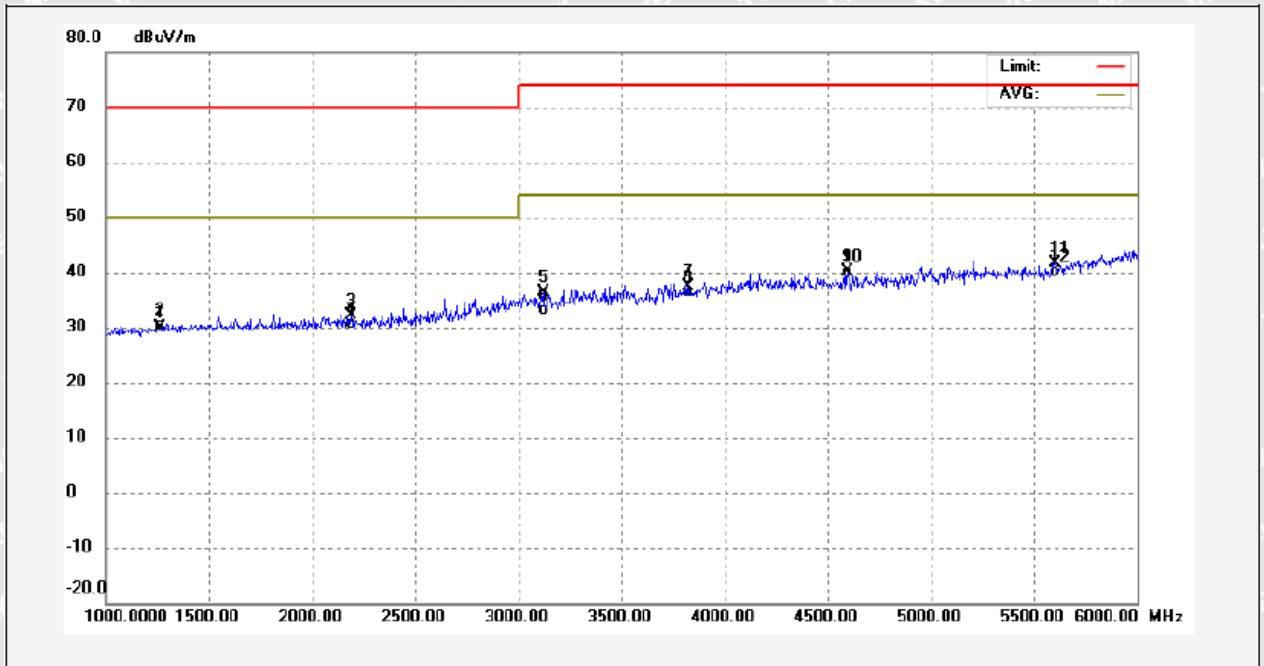
Vertical Polarization(AUX + charging mode)



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1390.000	44.38	-14.18	30.20	70.00	-39.80	peak	
2	1390.000	43.75	-14.18	29.57	50.00	-20.43	AVG	
3	2355.000	45.74	-10.64	35.10	70.00	-34.90	peak	
4	2355.000	46.31	-10.64	35.67	50.00	-14.33	AVG	
5	3140.000	46.34	-8.15	38.19	74.00	-35.81	peak	
6	3140.000	46.08	-8.15	37.93	54.00	-16.07	AVG	
7	4245.000	47.28	-5.11	42.17	74.00	-31.83	peak	
8	4245.000	46.25	-5.11	41.14	54.00	-12.86	AVG	
9	5125.000	48.26	-2.42	45.84	74.00	-28.16	peak	
10	5125.000	44.20	-2.42	41.78	54.00	-12.22	AVG	
11	5865.000	50.47	-1.14	49.33	74.00	-24.67	peak	
12	5865.000	48.84	-1.14	47.70	54.00	-6.30	AVG	



Horizontal Polarization(AUX + charging mode)



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1265.000	44.55	-14.76	29.79	70.00	-40.21	peak	
2	1265.000	45.15	-14.76	30.39	50.00	-19.61	AVG	
3	2190.000	44.88	-12.82	32.06	70.00	-37.94	peak	
4	2190.000	43.50	-12.82	30.68	50.00	-19.32	AVG	
5	3120.000	46.56	-10.21	36.35	74.00	-37.65	peak	
6	3120.000	43.32	-10.21	33.11	54.00	-20.89	AVG	
7	3825.000	46.38	-9.08	37.30	74.00	-36.70	peak	
8	3825.000	45.58	-9.08	36.50	54.00	-17.50	AVG	
9	4595.000	47.74	-7.49	40.25	74.00	-33.75	peak	
10	4595.000	47.66	-7.49	40.17	54.00	-13.83	AVG	
11	5605.000	47.69	-5.98	41.71	74.00	-32.29	peak	
12	5605.000	46.14	-5.98	40.16	54.00	-13.84	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.



WALTEK



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:

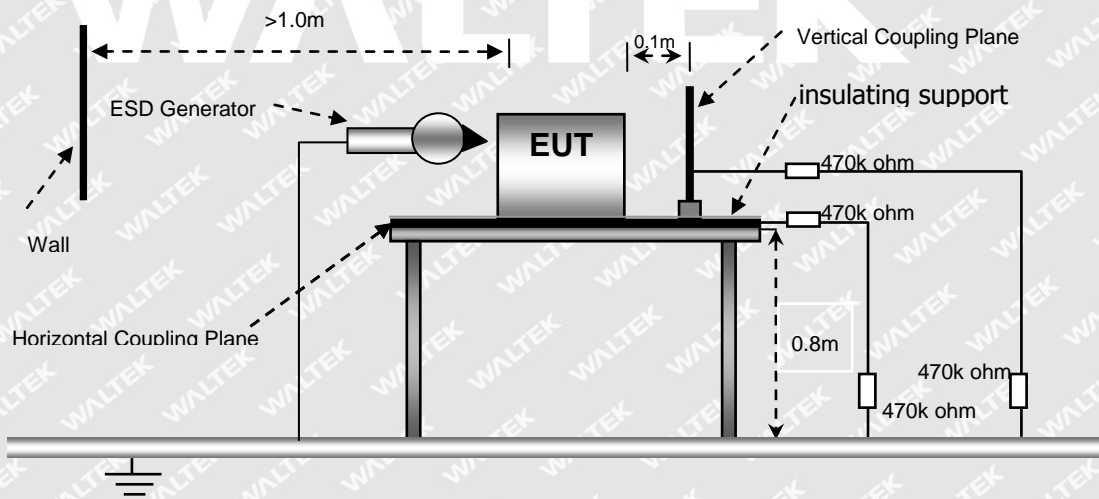
Temperature..... : 20.2°C
 Humidity..... : 54.7%RH
 Atmospheric Pressure : 100.8kPa

EUT Operation:

Input Voltage..... : DC 5V by USB port
 Operating Mode..... : Bluetooth link + charging mode; AUX + charging 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)

WALTEK



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

6.3.1 E.U.T. Operation

Operating Environment:

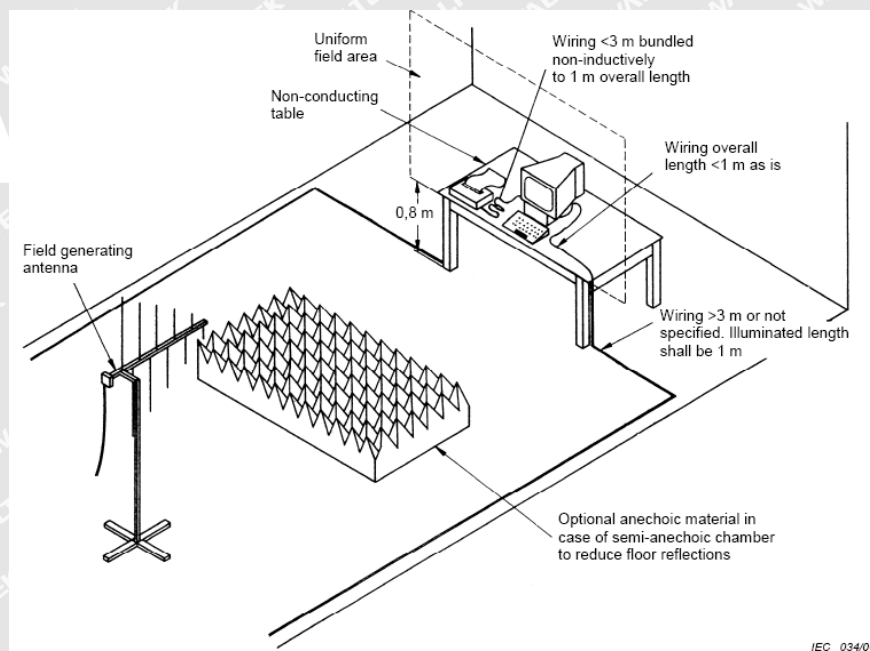
Temperature	: 19.5°C
Humidity	: 53.6%RH
Barometric Pressure	: 100.6kPa

EUT Operation:

Input Voltage	: DC 5V by USB port
Operating Mode	: Bluetooth link + charging mode; AUX + charging 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)



WALTEK

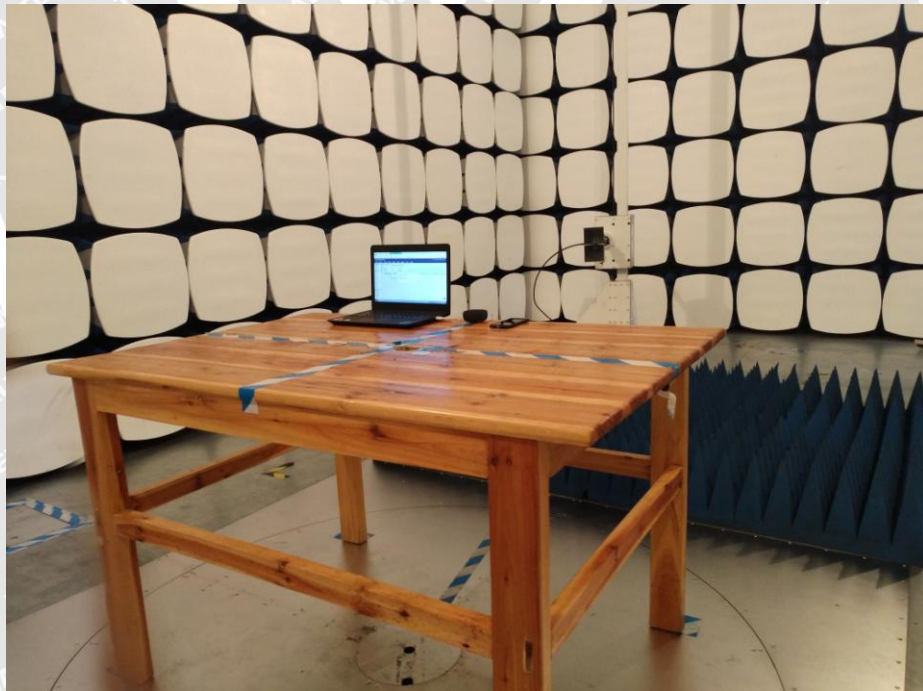


7 Photographs – Test Setup

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

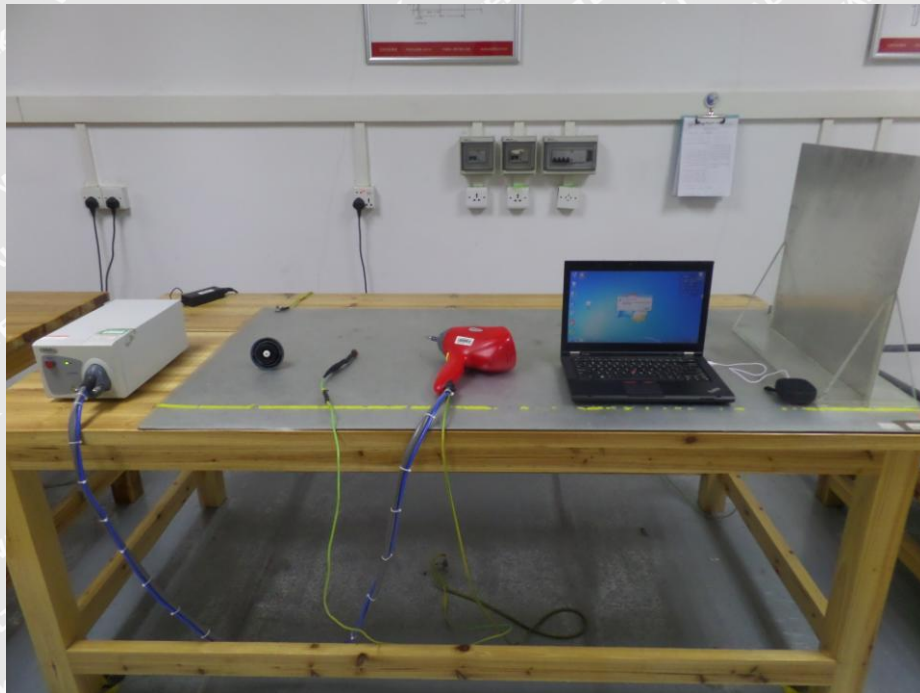


7.2 Photograph –Radiated Emission Test Setup, 1GHz to 6GHz

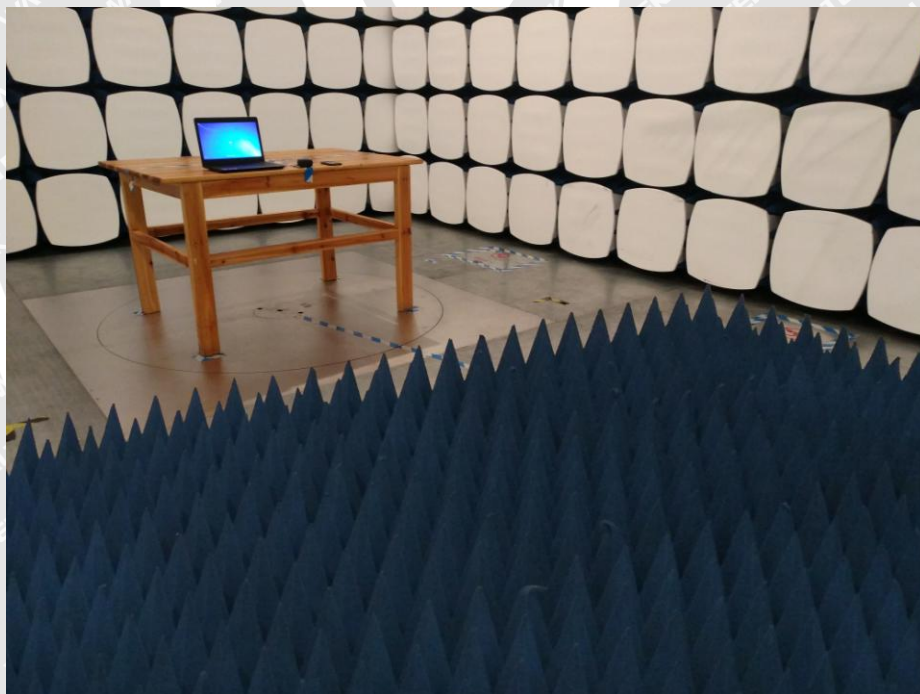




7.3 Photograph –ESD Test Setup



7.4 Photograph - Radiated immunity Test Setup





8 Photographs – Constructional Details

8.1 EUT – Front View









==== End of Report ====



WALTEK