



TEST REPORT

Reference No. : WTF17S1194904E
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
Address : The same as above
Product : 5000mAh power bank
Model(s) : MO9209
Trademark : N/A
Standards : EN 55032:2015
EN 55024: 2010+A1:2015
Date of Receive sample : 2017-11-10
Date of Test : 2017-11-11 to 2017-11-24
Date of Issue : 2017-11-25
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 Laboratories Introduction

Waltek Services Test Group Ltd. is one of the largest and the most comprehensive third party testing organizations in China, our headquarter located in Shenzhen (CNAS Registration No. L3110, A2LA Certificate Number: 4243.01) and have branches in Foshan (CNAS Registration No. L6478), Dongguan (CNAS Registration No. L9950), Zhongshan, Suzhou (CNAS Registration No. L7754), Ningbo and Hong Kong, Our test capability covered four large fields: safety test. Electronic Magnetic Compatibility(EMC), reliability and energy performance, Chemical test. Meanwhile, Waltek has got recognition as registration and accreditation laboratory from EMSD (Electrical and Mechanical Services Department), and American Energy star, FCC(The Federal Communications Commission), CPSC(Consumer Product Safety Commission), CEC(California energy efficiency), IC(Industry Canada) and ELI(Efficient Lighting Initiative). It's the strategic partner and data recognition laboratory of international authoritative organizations, such as UL, Intertek(ETL-SEMKO), CSA, TÜV Rheinland, TÜV SÜD, etc. As a professional, comprehensive, justice international test organization, we still keep the scientific and rigorous work attitude to help each client satisfy the international standards and assist their product enter into globe market smoothly.

Waltek Services (Shenzhen) Co., Ltd.

A. Accreditations for Conformity Assessment (International)

Country/Region	Accreditation Body	Scope	Note
USA	CNAS (Registration No.: L3110) A2LA (Certificate No.: 4243.01)	FCC ID \ DOC \ VOC	1
Canada		IC ID \ VOC	2
Japan		MIC-T \ MIC-R	-
Europe		EMCD \ RED	-
Taiwan		NCC	-
Hong Kong		OFCA	-
Australia		RCM	-
India	International Services	WPC	-
Thailand		NTC	-
Singapore		IDA	-

Note:

1. FCC Designation No.: CN1201. Test Firm Registration No.: 523476.
2. IC Canada Registration No.: 7760A

B. TCBs and Notify Bodies Recognized Testing Laboratory.

Recognized Testing Laboratory of ...	Notify body number
TUV Rheinland	Optional.
Intertek	
TUV SUD	
SGS	
Phoenix Testlab GmbH	0700
Element Materials Technology Warwick Ltd	0891
Timco Engineering, Inc.	1177
Eurofins Product Service GmbH	0681



2 Revision History

Test report #	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTF17S1194904E	2017-11-10	2017-11-11 to 2017-11-24	2017-11-25	original	-	Valid



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3 Test Summary

EMISSION		
Test Item	Test Standard	Result
Conducted Emissions from the AC mains power ports 150KHz to 30MHz	EN 55032	N/A
Asymmetric Mode Conducted Emissions 150KHz to 30MHz	EN 55032	N/A
Conducted Differential Voltage Emissions 30MHz to 2150MHz	EN 55032	N/A
Radiated Emissions, 30MHz to 1000MHz	EN 55032	Pass
Radiated Emissions, Above 1GHz	EN 55032	N/A
Harmonic Current	EN 61000-3-2	N/A
Voltage Fluctuation and Flicker	EN 61000-3-3	N/A
IMMUNITY		
Test Item	Test Method	Result
Electrostatic Discharge(ESD)	IEC 61000-4-2	Pass
Radiation Immunity (80MHz to 1GHz)	IEC 61000-4-3	Pass
Electrical Fast Transients (EFT)	IEC 61000-4-4	N/A
Surges	IEC 61000-4-5	N/A
Injected Currents, 0.15MHz to 80MHz	IEC 61000-4-6	N/A
Power-frequency magnetic fields	IEC 61000-4-8	N/A
Voltage Dips and Voltage interruptions	IEC 61000-4-11	N/A

Remark:

Pass

Test item meets the requirement

Fail

Test item does not meet the requirement

N/A

Test case does not apply to the test object



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5 General Information

5.1 General Description of E.U.T

Product : 5000mAh power bank

Model(s) : MO9209

5.2 Details of E.U.T.

Ratings : Input: 5V $\overline{=}$ 1.0A, 5000mAh, 18.5WH
Output: 5V $\overline{=}$ 2.0A (Max)

5.3 Standards Applicable for Testing

The tests were performed according to following standards:

EN 55032: 2015	Electromagnetic compatibility-Requirements for Information technology equipment Radio disturbance characteristics — Limits and methods of measurement
EN 55024: 2010+A1:2015	Electromagnetic compatibility-Requirements for Information technology equipment — Immunity characteristics — Limits and methods of measurement

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5.4 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 Lab: N/A

Lab address: N/A

Test items: N/A

5.5 Abnormalities from Standard Conditions

None.



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6 Equipment Used during Test

6.1 Equipment List

3m Semi-anechoic Chamber for Radiation(TDK)						
Item	Equipment	Manufacturer	Model No.	Serial No	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	2017-04-13	2018-04-12
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2017-04-09	2018-04-08
3	Amplifier	ANRITSU	MH648A	M43381	2017-04-13	2018-04-12
4	Cable	HUBER+SUHNER	CBL2	525178	2017-04-13	2018-04-12
Electrostatic Discharge						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Electrostatic Discharge Simulator	SCHLODER	SESD 216	606144	2016-11-14	2017-11-13
Radio-frequency electromagnetic fields						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Signal Generater	R&S	SMB100A	105942	2017-09-12	2018-09-11
2	RF Power Amplifier	BONN Elektronik	BLWA0830-160/100/40D	128740	2017-09-12	2018-09-11
3	Gestockte Breitband (S tacked) Log.-per.Antenna	SCHWARZBECK	STLP9128D	043	2017-09-12	2018-09-11
4	Power Meter	R&S	NRP2	102031	2017-09-12	2018-09-11



6.2 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Radiation	30MHz~1000MHz	±5.03dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.



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7 Emission Test Results

7.1 Radiation Emission, 30MHz to 1000MHz

Test Requirement.....	: EN 55032
Test Method	: EN 55032
Test Result	: Pass
Frequency Range.....	: 30MHz to 1000MHz
Class/Severity	: Class B/Table A.10 of EN 55032

7.1.1 E.U.T. Operation

Operating Environment:

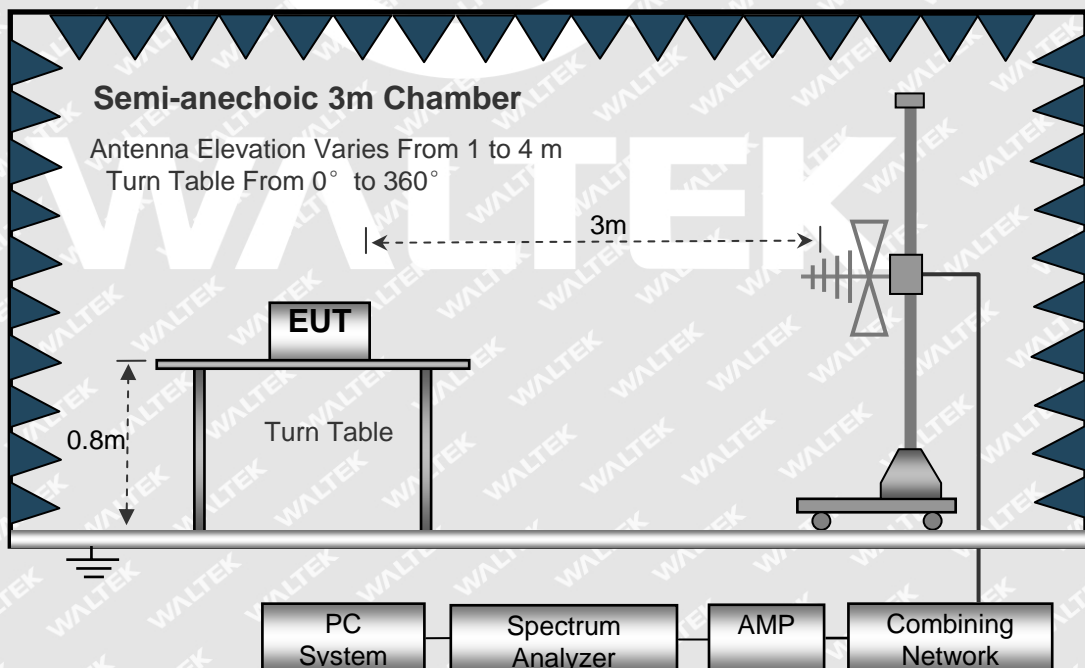
Temperature	: 23°C
Humidity.....	: 53.8%RH
Atmospheric Pressure	: 101.5kPa

EUT Operation:

Input Voltage.....	: DC 5V
Operating Mode.....	: Full load mode
Remark	: Only the worst case were record in the report.

7.1.2 Block Diagram of Test Setup

The Radiation Emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the EN 55032.



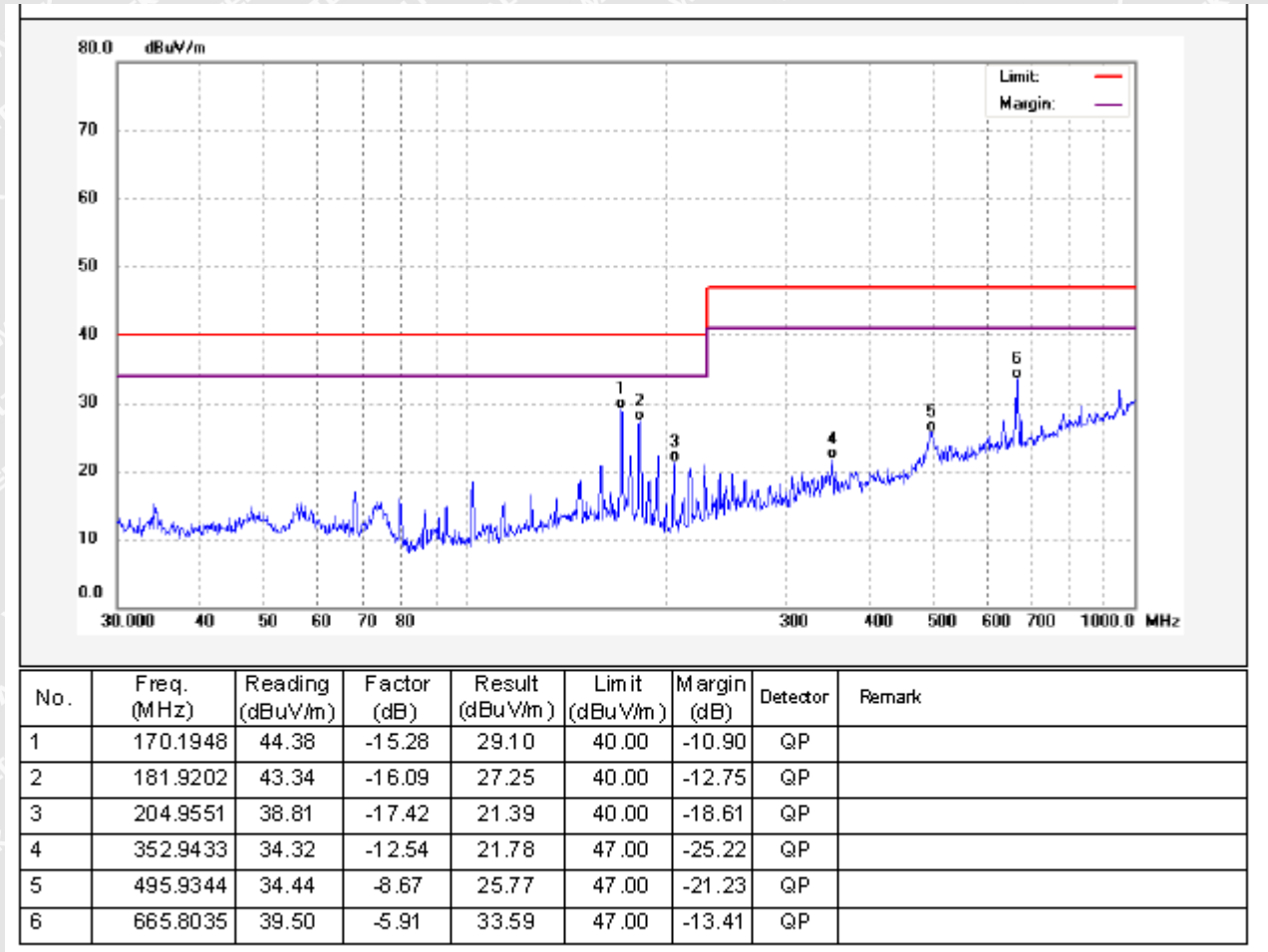
7.1.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for both the Antenna Vertical Polarization and Antenna Horizontal Polarization. Quasi-peak measurements were performed if peak emissions were within 6dB of the Quasi-peak limit line.



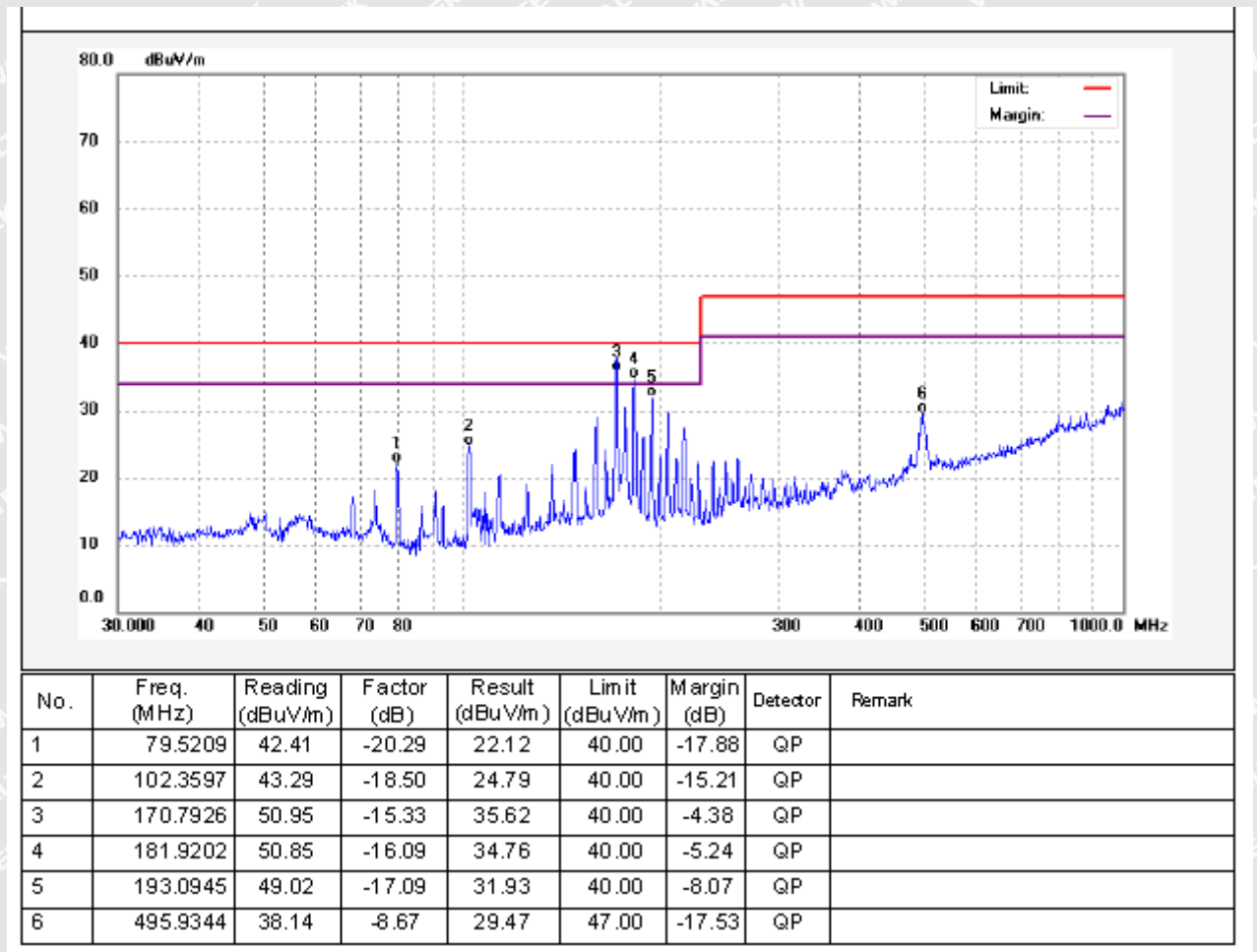
7.1.4 Radiation Emission Test Data, 30MHz to 1000MHz

Antenna polarization: Vertical





Antenna polarization: Horizontal



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8 Immunity Test Results

8.1 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.



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8.2 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 50 times at each test point(25 of each polarity)
Discharge Mode	:	Single Discharge
Discharge Period.....	:	1 second minimum

8.2.1 E.U.T. Operation

Operating Environment:

Temperature

Humidity

Atmospheric Pressure.....

EUT Operation:

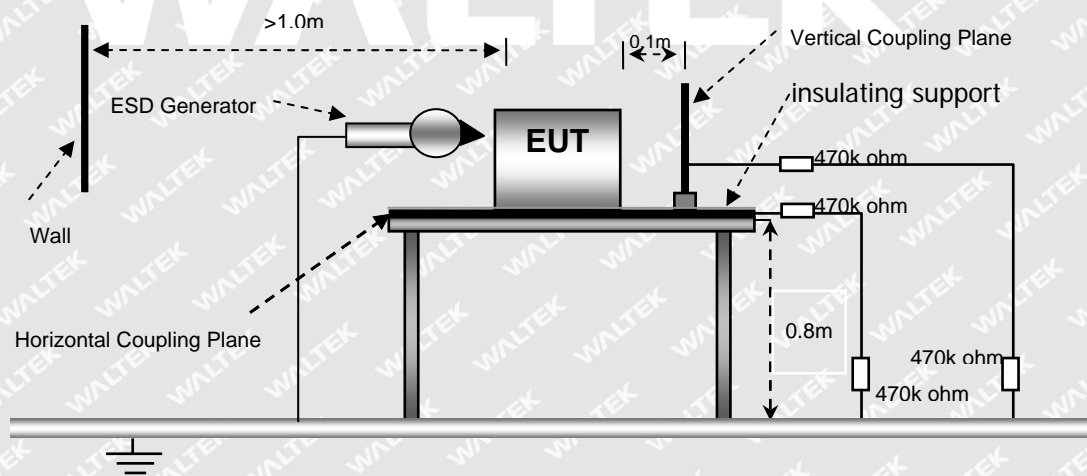
Input Voltage.....

Operating Mode.....

Remark

8.2.2 Block Diagram of Setup

The ESD test was performed in accordance with the IEC 61000-4-2.





8.2.3 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)

8.2.4 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)

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8.3 Radio-frequency electromagnetic fields

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

8.3.1 E.U.T. Operation

Operating Environment:

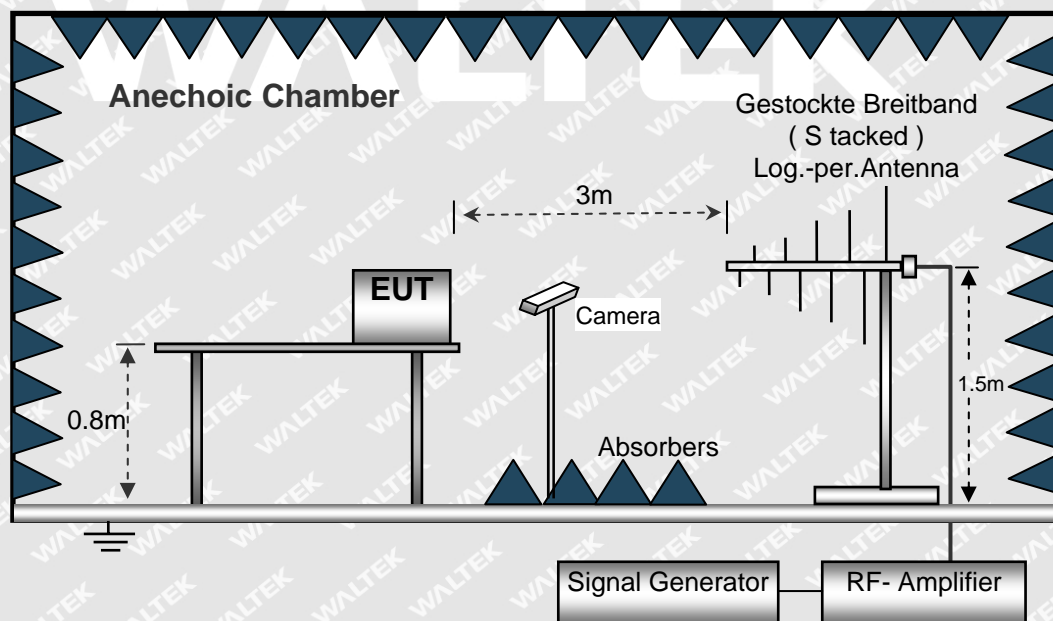
Temperature.....	: 23°C
Humidity.....	: 53.0% RH
Barometric Pressure.....	: 101.1kPa

EUT Operation:

Input Voltage.....	: DC 5V
Operating Mode.....	: Full load mode
Remark.....	: Only the worst case were record in the report.

8.3.2 Block Diagram of Setup

The Radio-frequency electromagnetic fields Immunity test was performed in accordance with the IEC 61000-4-3.





8.3.3 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)

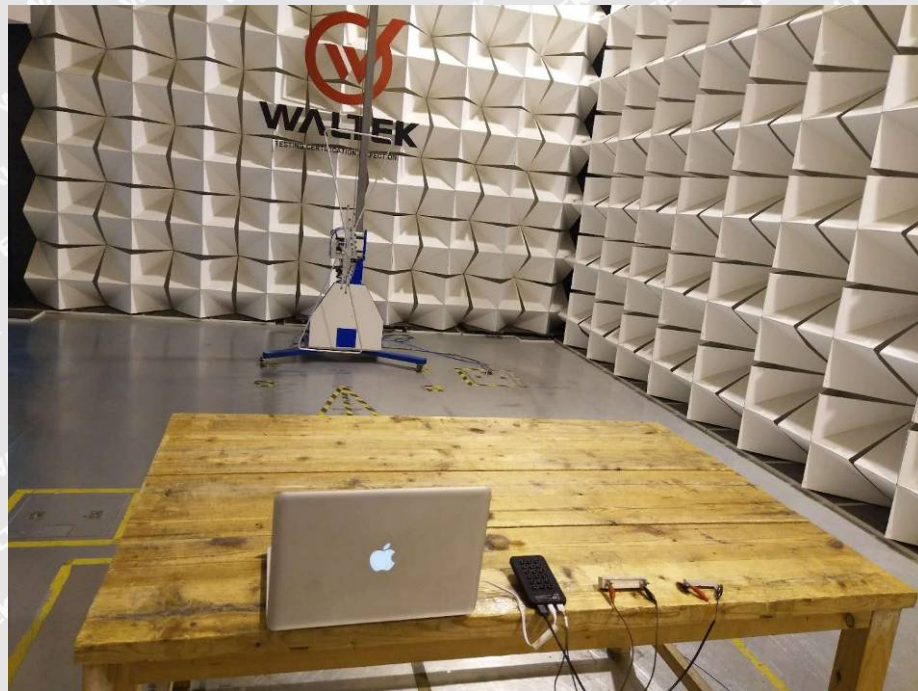


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9 Photographs – Test Setup

9.1 Photograph – Radiation Emission Test Setup for Below 1GHz

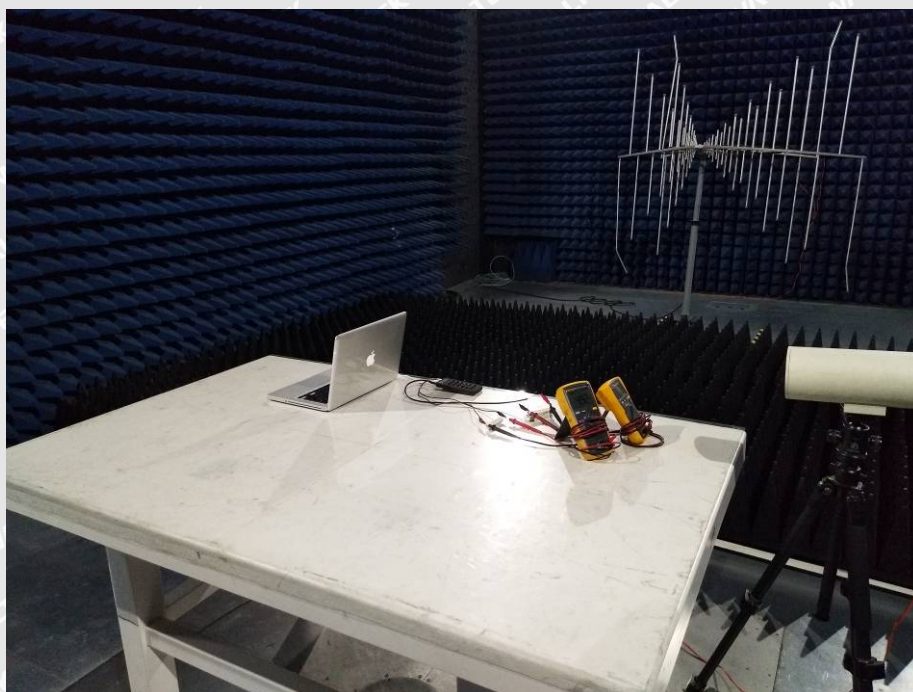


9.2 Photograph – ESD Immunity Test Setup





9.3 Photograph – Radio-frequency electromagnetic fields Test Setup



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10 Photographs – Constructional Details

10.1 EUT – External View









==== End of Report ====

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